

TENDER NO: **NAFA/EST/00088**



UEN Registration No.: 201006523 M
Edutrust Cert No.: EDU-2-2020 (Validity: 16/10/2023 – 15/10/2027)

**LEASING OF GRID-TIED SOLAR
PHOTOVOLTAIC (PV) SYSTEM FOR
NANYANG ACADEMY OF FINE ARTS
(NAFA)**

INVITATION TO TENDER

1. Nanyang Academy of Fine Arts (NAFA) invites tender for the leasing of Grid-Tied Solar Photovoltaic (PV) System FOR Nanyang Academy of Fine Arts (NAFA)
2. The following documents that form part of this Tender Document have been prepared to enable prospective vendors to tender for the above-mentioned works that would meet the NAFA's requirements and specifications. These forms may be obtained from <https://www.nafa.edu.sg/contact-us/tenders>.
 - Tender Guidelines
 - Conditions of Contract
 - Draft Banker's Guarantee
 - Technical Specification
 - Tenderer's Offer (FORM A)
 - Tenderer's Profile (FORM B)
 - Major Projects completed by Tenderer's Company within the 3 years (FORM C)
 - Current Projects undertaken by Tenderer's Company (FORM D)
 - Profile of Tenderer's Project Team (FORM E)
3. The Tenderer is required to complete and submit the following documents with password protection to nafatender@nafa.edu.sg before the closing date of tender:
 - Schedule of Rates
 - Tenderer's Offer (FORM A)
 - Tenderer's Profile (FORM B)
 - Major Projects completed by Tenderer's Company within the 3 years (FORM C)
 - Current Projects undertaken by Tenderer's Company (FORM D)
 - Profile of Tenderer's Project Team (FORM E)
 - Appendix I: Statement of Deviation
4. The closing date for submission of tender is **27 Mar 24 (Wednesday), 2.00pm**
5. Tender submitted will be posted in <https://www.nafa.edu.sg/contact-us/tenders>
6. Schedule of payments is thirty (30) days after the successful completion of the Acceptance Test.
7. Liquidated damages will be charged at **1%** of tender award per week for each week's delay (and a proportionate part of this amount for delay for any period of less than a week).

TENDER GUIDELINES

1. DEFINITIONS

- 1.1 All terms used in the Tender Guidelines, which are defined under clause 1 of the Conditions of Contract, shall have the meanings so described to them.

2. SUBMISSION OF TENDER

- 2.1 The tenderer shall complete and sign the Tender's Offer and complete all parts of this Tender Document required to be completed by a tenderer.

- 2.2 The following for your strict compliance:

- a) Tender submissions will be accepted for evaluation via email. Hardcopies of the tenders will not be accepted.
- b) Please submit your tender with password protected to nafatender@nafa.edu.sg before the closing date/time.
- c) Please do not submit the password to NAFA before the closing date/time.
- d) Password will only be submitted upon request by NAFA after the closing date/time.

The above measures taken are to ensure the confidentiality of your tender before the closing date/time. NAFA will not be responsible if the above are not complied.

- 2.3 All expenses incurred in the preparation of this tender shall be borne by the Tenderer.

3. GOODS AND SERVICES TAX (GST)

- 3.1 The tenderer shall not include any Goods and Services Tax (GST) in the Price Schedule of Tender's Offer.
- 3.2 The tenderer shall declare his GST status in his tender. He shall clearly indicate whether he is, or whether he will be a taxable person under the GST Act. He shall, if available, furnish the GST registration number to NAFA.
- 3.3 If the Tenderer is a taxable person under the Singapore GST Act, NAFA will pay the Tenderer, in addition to the rates and prices proposed, the GST chargeable on the supply of Goods and Services provided pursuant to this tender.
- 3.4 A Tenderer who declares himself to be a non-taxable person under the GST Act but who becomes a taxable person after the award of the tender shall forthwith inform NAFA of his change in GST status. He shall be entitled to claim from NAFA any GST charged on the supply of the Goods or Services made by him after his change in GST status.

4. QUERIES

Any queries in respect of this Tender Document or any matter related thereto may be submitted in writing to [Marcus Tong / Marcus.tong@cwsservices](mailto:Marcus.tong@cwsservices.com), [Tay Zi Yuan / ziyuan.tay@cwsservices.com](mailto:ziyuan.tay@cwsservices.com), [Raymond Chia / krchia@nafa.edu.sg](mailto:Raymond.Chia@nafa.edu.sg), [Xavier Tan / txtan@nafa.edu.sg](mailto:Xavier.Tan@nafa.edu.sg) before **27 Mar 24, 2.00pm**

- 4.1 NAFA reserves the absolute right not to entertain or respond to any query, which, in the NAFA's opinion, is inappropriate or improper.
- 4.2 On submitting his tender, the Tenderer shall be deemed to have examined this Tender Document and site conditions and satisfied himself with regard to any query on this Tender Document.

5. PRESENTATION

- 5.1 The Tenderer shall, on the request of NAFA, make a presentation on such aspects of his tender as may be required by NAFA.

6 VALIDITY PERIOD

- 6.1 Tenders submitted shall remain valid for acceptance for a period of **120 days** commencing on the closing date. This validity period may be extended by mutual consent in writing of NAFA and the Tenderer.

7. AWARD

- 7.1 NAFA shall be under no obligation to accept the lowest or any tender.
- 7.2 NAFA shall normally not enter into correspondence with any tenderer regarding the reasons for non-acceptance of a tender.
- 7.3 NAFA reserves the right to accept portion of each tender as NAFA may decide.
- 7.4 The Letter of Acceptance issued by NAFA shall create a binding contract on the part of the tenderer to supply to NAFA the goods and/or services offered in the tender.
- 7.5 The Contract shall be governed by the Conditions of Contract.
- 7.6 NAFA shall notify a successful tenderer of its acceptance of his tender, whether in whole or in part, by sending a purchase order or letter of acceptance to the tenderer and the purchase order or the letter of acceptance shall be deemed good service of such notice.
- 7.7 NAFA may at its discretion require the tenderer to sign a written agreement.
- 7.8 NAFA may make awards to more than one tenderer.

8. DEBARMENT

- 8.1 NAFA reserves the right to debar tenderer from participating in future NAFA tenders if they withdraw after the closing date.

9. VARIATIONS

- 9.1 NAFA reserves the right to negotiate with the tenderer, where exceptional circumstances so necessitate, to vary any provision or part of this Tender Document without reference to any other party. Any such variation shall be subject to the mutual consent in writing of NAFA and the Tenderer.

10. INSURANCE

10.1 Within ten (10) days of the Date of Contract, the tenderer shall deposit with NAFA copies of the insurance policies and premium receipts therefore required under the Conditions of Contract.

CONDITIONS OF CONTRACT

1. DEFINITIONS

NAFA:	Nanyang Academy of Fine Arts
Tenderer:	The company who submits this Tender Document
Contractor:	The Tenderer whose tender has been accepted in whole or in part
Contract Price:	The sum stated in the Form of Tender by the contractor as the price for carrying out and completion of the works
Works:	The supply, delivery to and installation at the Site of the equipment and /or services in conformance and accordance with the Technical Specifications and drawings
Site:	The premises on NAFA, (80, 38 & 151 Bencoolen Street) or any other site designated by NAFA
System Completion Date:	The date which all equipment and/or services shall be functional / ready as specified in the Technical Specifications
Warranty Period:	The period during which the contractor, at his own expense, shall make good to the satisfaction of NAFA and shall promptly attend to any defects whatsoever in the works
Acceptance Test:	Any applicable functional and/or compliance testing carried out as per clause 5 of the Condition of Contract
Performance Requirements:	The acceptance standards of the Acceptance Test as per clause 6 of the Condition of Contract

2. SCOPE OF CONTRACT

- 2.1 The contractor shall carry out and complete the supply of all items of goods and /or services in accordance with the contract in every respect and to the directions and satisfaction of NAFA. Unless otherwise stated in the contract, all goods shall be newly manufactured goods.
- 2.2 The contractor shall do or supply all things, free of charge, which are not expressly specified in this Tender Document but which may be necessary for the proper completion of the Works, or obviously required to be done or supplied in the context of this Tender Document and/or in view of the conditions on the Site.

3. DOCUMENTATION

- 3.1 The contractor shall undertake to supply NAFA with one (1) complete set of comprehensive documentation on all aspects of the equipment/services including documentation to be used for planning, design, installation, operation, maintenance, administration and training purposes. All sets of such documentation shall be of the latest version.

- 3.2 In the event of any conflict between the provisions of any documentation or information or data supplied by the contractor including the supporting data, and the provisions of this tender document exclusive of the supporting data, the provisions of this Tender Document shall prevail unless NAFA agrees otherwise in writing.

4. SYSTEM COMPLETION DATE

- 4.1 The contractor undertakes that the equipment/services shall be delivered, fully installed and operational within the specified period. The contractor shall be entitled to a reasonable extension of time for delays caused by the following:

- force majeure; or
- damage or delay not caused by or due to the wilful act or default or negligence of the contractor or his employees, agents or any person for whom the contractor is responsible.

provided that:

- in respect of all the above events, the contractor has not himself been at fault in failing to guard against or prevent or minimise such delays or damage; and
- the contractor shall make his claim in writing to NAFA for any extension of time within seven (7) days of the date he claims such event took place failing which he shall be deemed to have waived any right he may have had to such extension.

- 4.2 In the event of failure by the contractor to deliver any item of goods or complete the performance of services by the date specified in the contract other than due to the circumstances provided above, NAFA shall have the right

- to cancel all or any items of goods or services from the contract without compensation and obtain them from other sources and all increased costs thereby incurred shall be deducted from any moneys due or to become due to the contractor or shall be recoverable as damages; or,
- to require the contractor to pay or allow NAFA to deduct from any moneys due or become due to the contractor's sum, calculated at the rate as specified in the Invitation To Tender as liquidated damages until the goods are delivered and the services are performed.

5. ACCEPTANCE TEST

- 5.1 If NAFA so required, the equipment and/or service will be subject to an acceptance test conducted by NAFA in accordance with such procedure(s) and method(s) as NAFA may in its absolute discretion deem fit for the purpose of confirming and verifying that the functions, features and performance of the Equipment meet the requirements and standards stipulated in the Technical Specifications.

- 5.2 The Acceptance Test shall be conducted and completed within a period of thirty (30) days from the date of completion of the installation of the equipment. This period may be extended upon mutual agreement to ninety (90) days.

- 5.3 NAFA may conduct such other tests on each item or part of the equipment in accordance with such procedure(s) and method(s) as NAFA may in its absolute discretion deem fit for the purpose of confirming and verifying that the functions, features and performance of such item or part meet with the requirements and standards stipulated in the Technical Specifications which are applicable to such item or part. Such tests may be conducted, at the discretion of NAFA, in

addition to or substitution of the Acceptance test and shall be completed before the expiry of the period stipulated.

6. PERFORMANCE REQUIREMENTS

- 6.1 The equipment when installed must comply with such performance requirements as may be mutually agreed to in writing between NAFA and the Contractor in order to be acceptable to NAFA.

7. COMPLIANCE WITH LAW

- 7.1 The contractor shall comply with and satisfy all requirements under all laws and regulations relevant or applicable to the performance of his obligations under this Contract and shall indemnify NAFA in respect of all costs and expenses and any liabilities whatsoever which may be incurred under or in connection with such laws and regulations.

8. PROPERTY & RISK

- 8.1 The property in any items or part of the Equipment shall pass to NAFA on delivery to the site and the risk therein shall pass on the expiry of the warranty period that relate to the item or part of the Equipment so delivered.

9. VARIATIONS

- 9.1 Any variation of the provisions of this contract shall be subject to the mutual consent on writing of NAFA and the Contractor.

10. ASSIGNMENT

- 10.1 The contractor shall not transfer or assign the contract or any part, share or interests therein.

11. EQUIPMENT AND MATERIALS

- 11.1 All equipment and materials supplied shall be new and in strict conformance with the Technical Specifications and shall be of good quality and suitable for their required purpose.

12. PROCEDURE ON SITE

- 12.1 The contractor shall keep upon the site a competent supervisor who shall attend to the Works at all time. Any instructions given to the supervisor by NAFA shall be deemed to be given to the contractor.
- 12.2 The contractor shall, if required by NAFA, furnish to him a list of the names, nationalities and other particulars of the employees and workmen engaged for or by him for the purpose of the Works.
- 12.3 The Contractor shall be responsible for the proper behaviour of employees and workmen engaged for or by him and shall remove any such employee or workmen who is not acceptable to

NAFA and the contractor shall indemnify NAFA against any claims by such employee or workmen arising from such removal.

- 12.4 Unless prior arrangements are made with and agreed to in writing by NAFA, the Contractor shall carry out all works on the site under his contract during NAFA's official working hours, i.e. Monday to Friday, from 8.00am to 12.00pm and 1.00pm to 6.00pm.
- 12.5 The contractor shall during the execution of the works take all necessary precautions to prevent damage to furniture, fittings and other properties on the site.
- 12.6 Where necessary, the contractor shall supply and place at appropriate places on the Site signs to give warning of work in progress.
- 12.7 The Contractor shall keep the Site clean and shall remove speedily from the site debris and rubbish generated by the works and properly disposes of the same.
- 12.8 NAFA shall not be liable for loss or damage to the Contractor's property placed or left on the Site or elsewhere on NAFA property.

13. PAYMENTS

- 13.1 Payment for the equipment shall be made by NAFA within **thirty (30) days** of the successful completion of the Acceptance Test or the last test to be conducted. Where NAFA does not require any test to be conducted, payment shall be made within **thirty (30) days** of the date on which the equipment is fully installed and operational.

14. LATE COMPLETION

- 14.1 If the proposed Contractor fails to complete the installation of the equipment/or service or the Equipment is not fully operational by the System Completion Date, the Contractor shall be liable to pay liquidated damages at the rate specified in the Invitation to Tender.

15. TERMINATION

- 15.1 NAFA may terminate this Contract with immediate effect by giving notice in writing to the Contractor on any one of the following grounds:
- If the Contractor has wholly suspended work without justification or is failing to proceed with due diligence and due expedition and following expiry of two weeks' written notice from NAFA to that effect has failed to take effective steps to recommence work or is continuing to proceed without due diligence or expedition, as the case may be;
 - If the Contractor refuses or persistently fails or neglects to comply with the instructions of NAFA issued under the provisions of this Contract and following expiry of two weeks written notice from NAFA to that effect has failed to take effective steps to comply with the said instructions; and
 - If the Contractor becomes bankrupt or insolvent or makes a composition with creditors or if, being a company, a winding-up order of any kind is made in respect of the Contractor, or if a receiver or manager is appointed over the Contractor's undertaking or assets or possession of or execution on any part of such undertaking or assets is taken or levied by creditors.

15.2 Upon termination under sub-clause 15.1

- NAFA may engage other contractors to complete those parts of the Works uncompleted by the Contractor and the Contractor shall be liable to NAFA for all additional costs incurred thereby. The Contractor shall also pay liquidated damages for delay calculated in accordance with clause 14 as if he had himself completed the Works on the date of actual completion by those other contractors engaged by NAFA;
- NAFA may withhold payment of any monies payable to the Contractor until the Works are completed and the damages payable to NAFA arising from such termination are quantified and ascertained by NAFA (such quantification and ascertainment to be made within a reasonable time) and if the aggregate amount of such damages and all monies paid to the Contractor under this Contract exceeds the Contract Price, such excess amount shall constitute a debt payable to NAFA by the Contractor; and NAFA may forfeit portion or all amount from the security deposit.
- the Contractor shall remove from the Site, if required by NAFA, any temporary structures, plants, tools, goods, materials and equipment brought thereon by or for the Contractor and if the Contractor fails to do so within the time stipulated in the said notice for such removal, NAFA shall be entitled to store, remove, sell or otherwise deal with or dispose of the same and the Contractor shall be liable to and shall indemnify NAFA for or against any costs, expenses and liabilities whatsoever incurred by NAFA in so dealing with or disposing the same. In the event that the said temporary structures, plants, tools, goods, materials and equipment are sold, the proceeds after the deduction therefrom of such monies as are due to NAFA from the Contractor shall be held for the Contractor for a period of not less than one month from the date of posting of a notice to the Contractor to collect the said proceeds from NAFA and if the said Contractor fails to collect the same from NAFA within the said period, he shall be deemed to have disclaimed any rights to or interests in the said proceeds. The Contractor shall not be entitled to make any claims whatsoever against NAFA or its employees or agents for any action taken by NAFA in accordance with the provisions of this sub-clause.

15.3 The rights of NAFA specified under clause 15 shall be in addition to such other rights and remedies as NAFA may have or be entitled to against the Contractor for breach of contract or otherwise.

16. NON-DISCLOSURE

16.1 The tenderer agrees not to disclose, reveal or divulge to any person or entity any information concerning the organisation, business, finances, transactions or other affairs of NAFA which may come to the tenderer's knowledge at any time during or after the agreement term, unless NAFA grants written consent of such a disclosure. If need to be, all tenderers are required to enter into a non-disclosure agreement with NAFA.

17. INDEMNITIES

17.1 The Contractor shall indemnify and keep NAFA indemnified against all claims, demands, actions, judgements, damages, costs and expenses for personal injury or death arising directly or indirectly from the Works or the performance of this Contract unless the same are due to the act or neglect of NAFA or its employees or agents.

17.2 The Contractor shall indemnify and keep NAFA indemnified against all claims, demands, actions, judgements, damages, costs and expenses for damage to property which are caused directly or indirectly by any act or omission or negligence of the Contractor, his employees or agents or any

person for whom the Contractor is responsible or due to any circumstances within the Contractor's control.

- 17.3 The Contractor shall indemnify and keep NAFA indemnified against all claims, demands, actions, judgements, damages, costs and expenses in respect of any infringement or alleged infringement of any patent, copyright, trade secret or other property right which infringement or alleged infringement arise directly or indirectly from the performance of this Contract or use of the Equipment or any matter relating thereto unless such infringement or alleged infringement is due solely to the use of any specifications or drawings provided by NAFA.
- 17.4 None of the indemnities shall be defeated or reduced by reason of the fact that NAFA may have neglected or omitted to exercise any powers of supervision or control whatsoever that it may have under this contract.

18. THIRD PARTY INSURANCE

18.1 As a condition precedent to the commencement of the Works, the Contractor shall insure:-

- Against his and NAFA's liabilities and that of NAFA's employees in respect of or in connection with personal injuries or death arising directly or indirectly from the Works or the performance of this Contract.
- Against his and NAFA's liabilities and that of NAFA's employees in respect of or in connection with any damage to property (other than the Works) arising directly or indirectly from the Works or the performance of this contract; and
- Against his and NAFA's liabilities and that of NAFA's employees in respect of any liability to the Contractor's employees or workmen or such persons engaged for the purposes of the Works under the Workmen's Compensation Act with any amendments, modifications thereto or re-enactment thereof or any law.
- Such insurance shall be taken out with an insurer approved by NAFA for such period(s) and on such terms as NAFA may require and in default of production of a satisfactory relevant policy or premium receipt or current certificate of insurance from such insurer NAFA may itself insure against the risks described in sub-clause 18.1 and recover the costs thereof from the Contractor and/or deduct such cost from any sums due to the contractor.

19. WAIVER

19.1 The failure by NAFA to enforce at any time or any period any one or more of the terms or conditions of this contract shall not be a waiver of them or of the right at any time subsequently to enforce all terms or conditions of this Contract.

20. NOTICE

20.1 Any notice to be served on the Contractor under this contract may be sent by post in an envelope addressed to the Contractor at his place of business or residence last known to NAFA or at the Contractor's registered office, as the case may be, and any notice so posted shall be deemed to have been given at the time when the same would normally be delivered in the ordinary course of post.

21. ARBITRATION

21.1 Any dispute or difference between the parties in connection with this Tender Document or this Contract or any matter related thereto shall be referred to arbitration in Singapore in accordance with the Arbitration Act with any amendments, modifications thereto or re-enactments thereof.

22. APPLICABLE LAW

22.1 This Tender Document and this Contract shall be construed in accordance with and governed by the Laws of Singapore.

TECHNICAL SPECIFICATIONS

1. General Information

1.1 General Specifications

- 1.1.1 The proposed PV system shall be installed on the selected buildings by maximizing solar generation output of the footprint. The tenderer may offer alternative proposal on top of the allocated space recommended by the Client for Solar Panel installation, subject to the Client's approval.
- 1.1.2 It shall be compulsory for tenderers to attend the site briefing. Submissions by tenderers who do not attend the site briefing will not be considered.
- 1.1.3 The tenderer shall submit only a leasing proposal.
- 1.1.4 All peak power specifications described in the proposal shall be measured at Standard Test Conditions ("STC").
- 1.1.5 The tenderer shall endeavor to maximize the use of PV modules on the roof space or open space provided/recommended. The tenderer shall run through the design and obtain final approval from the Client before starting work.
- 1.1.6 All PV system design and modules proposed by the tenderer shall comply with all relevant prevailing Code of Practices and statutory requirements. All construction shall be conducted in accordance to industrial best practices.
- 1.1.7 The construction period for the whole project, excluding Campus 1 – Tower Block shall be completed within nine (9) months upon award. The tenderer shall factor in the work permit clearance process duration and the embargo periods within NAFA.
- 1.1.8 In the event the awarded tenderer fails to complete the construction project within the agreed-upon time frame as stated in the contract, the awarded tenderer shall be liable to the Client for liquidated damages as compensation for the delay. The liquidated damages for each respective premise shall be set as follows:

$$\text{Liquidated damages} = \text{Total Quantity for the period of delay (MWh)} * [\text{Prevailing SP low-tension (LT) tariff rate for the corresponding period (SGD/MWh)} - \text{Power Purchase Agreement Rate (SGD/MWh)}]$$

where,

The period of delay refers to the date of the agreed-upon completion until the actual date of completion of the project.

- 1.1.9 The awarded tenderer acknowledges that these liquidated damages represent a reasonable estimate of the actual damages that the Client would incur as a result of the delay in completing the construction project. The parties agree that these liquidated damages shall serve as the Client's sole remedy for such delays.

- 1.1.10 In the event the construction project is delayed due to causes beyond the awarded tenderer's reasonable control, including but not limited to acts of God, strikes, lockouts, pandemics, or other labor disputes, the awarded tenderer shall not be liable for liquidated damages during the period of delay caused by such events.
- 1.1.11 The liquidated damages shall not relieve the awarded tenderer of its obligation to complete the construction project as per the contract specifications.
- 1.1.12 The proposed system shall be grid-tied. Generated energy that is not utilized shall be pumped back into the grid. The tenderer shall ensure the design of their grid inverter can be automatically synchronized with the grid.
- 1.1.13 The tenderer shall in their design allow for anti-islanding for solar power in the event of grid supply failure. After grid supply is recovered, the PV system shall be able to revert to normal operations seamlessly.
- 1.1.14 The tenderer can propose any value-added service, on top of the required services stipulated in this tender.
- 1.1.15 The tenderer shall maintain or cause to be maintained during the contract term, the following policies of insurance at its own cost and expense:
- (a) Public, Product and Third-Party liability insurance against injury to persons and damage to property to the value equivalent to the depreciated System cost;
 - (b) Insurance against all workmen's compensation claims, whether pursuant to the Work Injury Compensation Act (Cap. 354) of Singapore at common law or otherwise;
 - (c) During construction, Contractors' all risk insurance (i) in respect of material damage, equivalent to the total price payable hereunder; and (ii) in respect of third-party liability, equivalent to the depreciated System cost; and
 - (d) Machine's all risk insurance (i) in respect of material damage, equivalent to the total price payable hereunder; and (ii) in respect of third-party liability, equivalent to the depreciated System cost.

1.2 Premises

- 1.2.1 The premises to be included in this contract are listed in Appendix II – List of Proposed Locations.
- 1.2.2 The information provided, including but not limited to electrical schematic diagram, estimated footprint of the site etc. are for tenderer's reference only. The tenderer shall carry out exhaustive due diligence on site, to ensure sufficiency and suitability of the proposal and deployment of PV system. The Client shall not be responsible for any delay, cost variation arising from inaccurate information given.

1.3 Scope of works

- 1.3.1 The scope of works shall comprise of design, supply, install, testing and commissioning of the PV system, and subsequently, the operation and maintenance of the PV system over the entire term of the contract. This shall include but not limited to the following:
- (a) Application and construction of shelter structure on Campus 1 – Tower Block
 - (b) Supply and delivery of Solar PV modules to the roofs/open area
 - (c) Design, supply and installation of the mounting brackets for solar PV panels on the roof.

- (d) One (1) lot of control panel with distribution panel
 - (e) One (1) lot of Grid Tied Inverter
 - (f) One (1) lot of DC surge arrestor to protect solar arrays and inverters.
 - (g) One (1) lot of DC surge arrestor to protect solar arrays and inverters.
 - (h) One (1) lot of electrical control panel to house the associated equipment and other electrical control accessories.
 - (i) One (1) lot of monitoring system capable of module level monitoring and mapping of actual PV modules location on site. Monitoring system shall be made accessible remotely via the internet. The tenderer shall apply their own Singtel's internet access for remote monitoring purpose
 - (j) Revenue class electrical meters shall be installed to monitor the total solar energy generated and consumed.
 - (k) All materials, labor, equipment, tools, transportation, etc. and all other necessary items not mentioned above or in the specifications and drawings for the satisfactory completion of the work.
 - (l) Testing and commissioning of the grid-tied solar PV system in accordance with the manufacturer's instructions and procedures.
 - (m) Earthing and Lightning protection system for the solar PV system.
 - (n) Appointment of Licensed Electrical Worker (LEW) (both Building and Installation/Design LEW) and Structural Professional Engineer (PE) to be responsible for the works, including but not limited to modification works etc.
 - (o) Engagement of site maintenance officer, for access and coordination work during installation phase.
 - (p) Operate, monitor and maintain the solar PV system over the entire service/contract period.
 - (q) Removal of the solar PV system at the end of the service period in the event the Client choose not to retain the system at the end of the contract.
- 1.3.2 The tenderer shall, at their own cost, hire specialists and deploy suitable instruments to study the site and to ensure yield is maximized
- 1.3.3 The tenderer shall at their own cost, submit shop drawings on how the cable support would be laid for the Client representative approval before starting work.
- 1.3.4 In the design of the PV system, the tenderer shall ensure the PV system can supply a reliable source of electricity without causing any disruption to the operations of the building.
- 1.3.5 In the whole execution work order from planning, handover to on-going market developments and requirements for the entire period of the contract, as required for the solar system, the tenderer/awarded developer shall at their own cost engage relevant authorities for pre-consultancy, perform all necessary authorities' submissions, obtain approvals from relevant authorities on behalf of the Client, if required. The list of authorities will include but not limited to the following:
- (a) Building Construction Authorities (BCA)
 - (b) Singapore Civil Defence Force (SCDF)
 - (c) Singapore PowerGrid (SPPG)
 - (d) Energy Market Company (EMC)
 - (e) Energy Market Authority (EMA)
 - (f) Urban Redevelopment Authority (URA)
 - (g) National Environment Agency (NEA)

- 1.3.6 All electrical components that are exposed to the weather elements or located near a water pipe shall be housed in IP65 or better enclosures. The tenderer shall take due care in the design of the system to ensure the PV system will not trip any of the building equipment in the event of a malfunction. The proposed system should be able to isolate itself from the Client's electrical system in the event of a malfunction.
- 1.3.7 The tenderer shall propose and at own cost, carry out necessary modification to the main switchboard required and supply and install isolators at the required capacity, to be synchronized to the proposed PV system. The proposal shall subject to Client representative approval before starting work. All cost related for the modification, diversion of downstream loading, provision of temporary power supply etc. shall be deemed included if the proposal is approved.
- 1.3.8 The tenderer shall be fully responsible for the design, construction and operation of the PV system. All works deemed necessary for the satisfactory completion of the project are deemed inclusive in the contract proposal. No additional claims would be entertained for any act of omission due to the tenderer.
- 1.3.9 The tenderer shall deploy the necessary manpower to manage and coordinate all works on site and to ensure timely delivery of works on site.
- 1.3.10 The design and construction of the PV system should not affect the waterproofing on the roof. The tenderer shall make good all damages done to the waterproofing and any damage to the building structure and equipment during the construction and 12-month post-construction of the PV system.
- 1.3.11 The tenderer shall provide a comprehensive set of manufacturer catalogue for their solar module, inverters and other component parts to be used in the solar PV system.
- 1.3.12 Evaluation will be done based on technical data/catalogue submitted, any change in brand/technical data has to be justified and must be of higher standard.
- 1.4 Guaranteed System Performance**
- 1.4.1 Tenderer shall propose a guaranteed system output performance for all premises. In addition to the guaranteed system performance, Tenderer shall ensure a degradation of guaranteed system performance of not more than 0.8% per annum.
- 1.4.2 Performance of the Solar PV system shall be measured on the AC side of the inverters by the Tenderer's revenue-grade kWh meters.
- 1.4.3 If the system does not meet the Guaranteed System Performance, the successful tenderer shall be responsible for improving the system performance at no cost to the Client, until this measured performance is demonstrated. The successful tenderer shall propose the rectification solution(s).
- 1.5 Solar Photovoltaic Modules**
- 1.5.1 The PV modules and all associated components shall be designed for installation in Singapore's climatic conditions, which has high humidity and ambient temperature. All PV modules and components must be rated and warranted to withstand the operating conditions of the intended site installation.
- 1.5.2 All PV modules shall be type tested & certified with relevant IEC standard(s), including IEC 61215, IEC 61646 and IEC 61730.

- 1.5.3 The modules shall come complete with third party type tested and certified solar cable connectors and junction boxes that meet international standards for module interconnection.
- 1.5.4 The PV modules supplied by the Tenderer shall have a power tolerance range of at most 5%.
- 1.5.5 The Tenderer shall ensure that the modules are installed according to the manufacturer's recommendation as such there shall be no claims of degradation of performance of the PV modules arising from installation works during the duration of the warranty period.
- 1.5.6 The temperature coefficient of PV modules shall not exceed 0.5%.
- 1.5.7 The PV modules supplied shall have 25-year performance warranty of at least 80% nominal power by the end of 25 years.
- 1.6 **Grid Tied Inverter**
 - 1.6.1 The inverters shall be third party safety type tested and certified to IEC 62109-1 and IEC 62109-2 and provide sine-wave electrical output that conforms to utility power quality standards as per EMA transmission Code: Jan 2019.
 - 1.6.2 The allowable power factor ranges from 0.9 leading to 0.95 lagging.
 - 1.6.3 The inverters shall fully comply with the utility interface specifications set forth in IEC 61727. The inverters shall also comply with IEC 61000-6 regulations on electromagnetic compatibility emissions as well as IEC 61000-3 regulations on limits for harmonic current and voltage fluctuations emission.
 - 1.6.4 Islanding of an inverter system refers to the condition whereby the Grid's supply fails or is tripped but the inverter continues to maintain a supply to the dedicated load. As a safety requirement, islanding is not allowed. The anti-islanding settings in the inverter are to be made known and confirm by Singapore Power Grid.
 - 1.6.5 Reconnection shall occur if the voltage is within the range of 220V to 240V phase to neutral and the frequency is within 49.5Hz to 50.5Hz and these conditions shall be maintained for a minimum of 1 minute. The output voltage of the inverter system shall be exactly in phase with the voltage of the Grid before connection can occur.
 - 1.6.6 The inverter system and all associated electrical components shall be effectively linked to the main earthing system of the electrical distribution network. Lightning/Surge protective devices shall be installed to protect the inverters against over voltage due to lightning discharge.
 - 1.6.7 The inverter system shall include DC ground-fault protection, which must disable the solar PV module in the event of a short-circuit to ground on the DC input of the inverter.
 - 1.6.8 The inverter system and all associated parts shall have short circuit capacity not less than what is stipulated in PowerGrid's Handbook on "How to apply for Electricity Connection".
 - 1.6.9 The inverter must meet the power quality (PQ) requirement at the electricity supply network point of common coupling (PCC) covered in the Energy Market Authority (EMA)'s Transmission code: Jan 2019.
 - 1.6.10 The inverter must comply with the Power Quality specification of harmonics, voltage fluctuations including flicker, voltage unbalance and voltage disturbance; which stipulate in SP Services Ltd's Grid-Connected Photovoltaic system of Customer's Installation Connected at Low Voltage – Power Quality.

- 1.6.11 The tenderer shall ensure that the inverters are installed under sheltered conditions.
- 1.6.12 The tenderer shall ensure that the completed system complies with the requirements of Singapore PowerGrid.
- 1.6.13 The inverter system shall consist of module-level maximum power point (MPPT) tracking and module-level monitoring.
- 1.6.14 The inverter system shall maintain a fixed string voltage allowing for flexible installation design with multiple orientations, tilts and module types in the same string.
- 1.6.15 The inverter system must have the ability to shut down module's DC voltage whenever the inverter or grid power is shut down.

1.7 **Monitoring System**

- 1.7.1 This section covers the Monitoring System, which is mandatory requirement for the monitoring of the installed solar PV system. The cost of the monitoring system to be installed is deemed to be included in the tender sum. The tenderer shall operate and maintain the monitoring system through the duration of the solar leasing service agreement period. All associated cost of communication/data transfer for monitoring system (e.g. internet cost) shall be fully boreed by awarded tenderer for the whole contract duration.
- 1.7.2 Revenue class electrical meters shall be installed with a class 0.5 CT.
- 1.7.3 The real-time monitoring facility shall have a minimum availability of 99%, which complies with the Power System Operator (PSO) monitoring requirement.
- 1.7.4 Tenderer shall develop a secure web-based monitoring and billing system which log data every minute.
- 1.7.5 Tenderer shall provide log in with different user-level access to the Client to access to the same set of data for monitoring and billing.
- 1.7.6 A comprehensive performance summary of all sites shall be available and updated on a daily basis. Required details for each site in the summary shall include:
 - (a) Daily energy generation in kWh
 - (b) Energy generation and monitoring data shall be published to the portal on a minute- by-minute basis.
 - (c) Statuses of preset alerts. Alerts for individual sites shall be customizable with respect to alert parameters and notification methods. An example is the programming of an email notification to be sent to a nominated email address in the event of total daily energy generation from a site falling below a preset amount.
- 1.7.7 Graphical representation of the performance of individual sites for a defined period of time (daily, weekly, monthly or annually) with the ability to export corresponding numerical datasets in an excel spreadsheet.
- 1.7.8 At the end of each year, the successful tenderer shall provide a report on the power generation and performance of the Solar PV system. The report shall include graphic representation on the power generation, in comparison with past year data.
- 1.7.9 The portal shall be created and hosted by one third party service provider on a neutral and secure server.

1.7.10 The portal shall be able to present module-level, string-level and system wide monitoring of the PV system and allow for fault detection and automatic alerts localized on a virtual site map for accurate troubleshooting.

1.8 **Term**

1.8.1 At the expiration of the Term, the Client shall be entitled to select among the following options:

- (a) Entry into a new agreement with the developer subject to mutually agreeable terms;
- (b) removal of the Solar PV System from the Premises by the developer by a mutually convenient date but in no case > 180-days after such expiry or pre-termination at no cost to the Client; or
- (c) the transfer of ownership of the Solar PV System to the Client subjected to mutually agreeable terms.

1.9 **Documentation Submission**

1.9.1 The tenderer shall in his proposal include:

- (a) List of project references in Singapore for the last 3 or more years. The total installed capacity by the tenderer must exceed 5MWp;
- (b) Proposed Solar panel brand and inverters being used;
- (c) Proposed layout of the solar panels;
- (d) Type of mounting system;
- (e) Proposed project schedule;
- (f) Proposed monitoring system network architecture;
- (g) Bizsafe Level 3 and above certificate;
- (h) ISO9001 certification or equivalent;
- (i) Registered under Building Construction Authority (BCA) under work head category;
- (j) Company's latest ACRA and latest audited financial report; and
- (k) Specifications and brochures of PV modules, inverters, field sensors to be deployed for this project.

1.10 **Safety Requirements**

1.10.1 The Tenderer shall comply with the Workplace Safety & Health (Design for Safety) Regulations stipulated by the Ministry of Manpower (MOM), effective since 1st August 2016.

1.10.2 The Tenderer or Contracted Party actively engaged in on-site construction and operation is strictly required to adhere to the Demerit Point System established by the MOM, and shall not exceed an accumulation of 25 demerit points under aforementioned system at any point in time.

1.11 Evaluation Criteria

Tenders will be evaluated based on the following weightage:

Price		50%
Quality		50%
1	Compliance to Safety Requirements	25%
a.	Tenderer to comply with Workplace Safety & Health (Design for Safety) Regulations stipulated by MOM.	10%
b.	Tenderer/Contracted Party that is engaged to be required to adhere to the Demerit Point System established by MOM. Tenderers shall not exceed an accumulation of 25 demerit points at any point in time.	15%
2	Adherence to Tender Specifications	15%
a.	Tenderers shall demonstrate the following during the tender interview: - Strong understanding of tender scope - Robust and comprehensive plan in place - Strong capability to perform within tender scope - Competent management team support	15%
3	Experience and Track Record	10%
a.	Tenderers show experience in managing and completing similar projects.	5%
b.	Tenderers should be in good financial standing	5%

2. Instructions to tenderers

2.1 Having examined the Instructions to Tenderers, the General Specifications and other documents in the tender ("Tender Documents"), we, the undersigned hereby offer to provide:

21 Years PPA Leasing Model for NAFA Premises

For the period specified in below tender specifications, from the date specified in the Letter of Award strictly in accordance with the Tender Documents all to the entire satisfaction of Nanyang Academy of Fine Arts (hereinafter referred to as "NAFA" or the "Client") or its successors and assigns as stated here under:

Tenderer shall design, finance, supply, install, test, commission, and maintain the grid tied PV system for Solar Leasing, and to comply with all code of practice and Authority requirements. The energy generated shall be consumed solely by the premise, while excess energy generated will be exported to grid.

The Term and the Power Purchase Agreement Price of Electricity Generated by PV System

Tenderers are required to quote a fixed rate and Discount Off Singapore Power published tariff (DOT) as Power Purchase Agreement (PPA) price ("PPA Rate") for the electricity generated by PV system.

In the event SP Services or the authority does not publish the applicable LT tariff rate during the Term, the energy charges for such periods shall be based on the corresponding Fixed Rate quoted by the tenderer.

From the operation date to the last day of the Term:

- (a) The Client shall be obliged to purchase and accept delivery of all energy output from the awarded tenderer at the quoted PPA Rate; and
- (b) the awarded tenderer shall be obliged to sell and deliver all energy output to the Client at the quoted PPA Rate.

Minimum Guaranteed Annual Output, Performance Ratio and Annual Degradation Rate

Tenderers shall specify the minimum guaranteed annual output, performance ratio and annual degradation rate under general specification. The annual degradation rate must not be more than 0.8%

Shortfall of Minimum Guaranteed Annual Output

In the event the aggregate annual energy output for any year during the Term is less than the minimum guaranteed annual output, the Client shall have the right to require the awarded tenderer to:

- (i) Carry out rectify all work (or part thereof) and perform all services necessary to ensure that the aggregate annual energy output for the next year is equal to or greater than the minimum guaranteed annual output; and
- (ii) Match the shortfall in quantity for the year by purchasing local RECs; and
- (iii) Pay to the client as liquidated damages, a sum calculated in accordance with the following formula:

$$\text{Liquidated damages for the year} = \text{Shortfall in Quantity for the year (MWh)} * [\text{simple average of SP low-tension (LT) tariff rate for the year (SGD/MWh)} - \text{Power Purchase Agreement Rate (SGD/MWh)}]$$

where,

Shortfall in Quantity for the year = minimum guaranteed annual output - the aggregate annual energy output for the year in MWh.

If the aggregate annual energy output is less than minimum guaranteed annual output for 2 consecutive years, the Client shall have the right to terminate the contract without consequences. The awarded tenderer shall bear all the cost related to termination, including but not limited to removal of the solar PV system.

3. Ownership of Green Attributes of Electricity Generated by the System

- 3.1 The Client shall retain sole ownership of any carbon credits or renewable energy certificates (green attributes) derived from electricity generated by the System for the duration of the Term. Its rights and interests shall include without limitation the entitlement to report clean energy usage in the Client's sustainability reporting indices.

4. Schedule of rates

4.1 Leasing of Grid-Tied Solar Photovoltaic (PV) system

Premise	Location	Solar PV Capacity	21 – Years PPA Rate		CAPEX Cost for the Construction of Shelter Structure
			Option A: Fixed Rate	Option B: Discount off Tariff (DOT)	
		kWp	SGD / MWh	%	SGD
Campus 1	P2 Tower Roof (RC Flat Roof)				
Campus 1 – Tower Block	Erected Shelter Structure *				
Campus 3	P2 Tower Roof (RC Flat Roof)				

Where Discount off Tariff (DOT) is to be applied on prevailing SP Services published Peak Period Tariff for Low Tension less Use-of-Systems Charge.

*The Solar PV shall be mounted on the erected shelter structure. The design of the structure has been completed and the awarded tenderer shall liaise with NAFA’s architect on the application to the relevant authorities and the construction of the structure, prior to the installation of the Solar PV. For avoidance of doubt, the lease of the Solar PV mounted on the erected shelter structure shall end at the same time as the other two locations, notwithstanding the time period required for the construction of the shelter structure.

4.2 Minimum guaranteed Annual output and annual Degradation Rate

The tenderer shall specify the Minimum Guaranteed Annual Output and Annual Degradation Rate with respect to contract duration in the table below. Please duplicate the table and provide for each specific site.

Year	Minimum Guaranteed Annual Output (MWh)	*Annual Degradation Rate (%)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: Annual Degradation Rate shall not be more than 0.8%

4.3 Termination Fee

The tenderer shall specify the Termination Fee with respect to contract duration in the following table. Please duplicate the table and provide for all sites.

Balance Contract Duration	Termination Fee (SGD)
20 Years	
19 Years	
18 Years	
17 Years	
16 Years	
15 Years	
14 Years	
13 Years	
12 Years	
11 Years	
10 Years	
9 Years	
8 Years	
7 Years	
6 Years	
5 Years	
4 Years	
3 Years	
2 Years	
1 Years	

4.4 Solar PV System information

S/N	Building	Solar PV Capacity (kWp)	Type (s) of PV Panel	Phase / Expected Completion Time		Remarks
				Shelter	Solar PV	
1	Campus 1					
2	Campus 1 – Tower Block					
3	Campus 3					
	Total					

TENDERER'S OFFER		FORM A
To: Nanyang Academy of Fine Arts 80 Bencoolen Street, Singapore 189655		Tender No: NAFA/EST/00088
Name of Tenderer:	Leasing of Grid-Tied Solar Photovoltaic (PV) System at Campus 1 & 3	
Tenderer Address & Telephone No:		
<p>We, _____ (name in block letters) hereby offer and undertake on the acceptance of this tender to supply, deliver, install, test, commission and maintain all the works and items as mentioned in the Technical Specifications and subject to the Conditions of Contract.</p> <p>Our tender is made to subject to the Conditions of Tender and we agree that our tender remains open for consideration for a period of 120 days commencing on the closing date for the submission of tenders i.e., on 27th Mar 2024 (Wed), 2.00pm.</p> <p>We understand that you are not bound to accept the lowest or any tender you may receive and that you reserve the right to and we agree that you may accept our tender in whole or in part in accordance with of Tender Guidelines.</p> <p>Unless and until a formal agreement is executed, as may be required by you in the Tender Guidelines, our offer with any authorised Variations and your written acceptance thereof shall constitute a binding agreement between us.</p> <p>We agree that as and when requested by NAFA, we shall extend the validity of this offer for one or more periods not exceeding in total _____ calendar months.</p> <p>Our price (herein referred to as the "Contract Price") for the equipment and services to be supplied, installed and provided by us is: S\$_____, excluding GST.</p> <p>A breakdown of the Contract Price for the equipment and services is given in the Priced Schedule attached hereto.</p> <p>We further undertake to give you any further information, which you may require.</p> <p>Dated this _____ day of _____, 2024.</p>		
Tenderer's Company or Business Registration No:	Tenderer's official Stamp:	
Authorised Signature:		
Name:	Telephone/Handphone No:	
	Fax:	
Designation:	Email:	
<p><i>NOTICE : This Form must be duly completed and signed. Any change to its wordings may render the Tender liable to DISQUALIFICATION.</i></p>		

TENDERER'S PROFILE		FORM B
Company's Name:		
Address:		
Country of Incorporation:		
Year of Establishment:		
Ownership:		
EPPU/BCA/NPA No. <i>(State Financial Category)</i>		
GST Registration No.		
Total Paid-up Capital:		
<p><i>Please attach copy of the following:</i></p> <ul style="list-style-type: none"> • <i>Organisation Chart</i> • <i>Latest Audited Balance Sheet and P&L Statement</i> • <i>List of Reference Customers</i> 		

MAJOR PROJECTS COMPLETED BY TENDERER'S COMPANY WITHIN THE LAST 3 YEARS					FORM C	
<i>Govt Bodies/Stat Boards/Other Clients</i>	<i>Title</i>	<i>Description of Project</i>	<i>Contract Value</i>	<i>Start Date</i>	<i>End Date</i>	

CURRENT PROJECTS UNDERTAKEN BY TENDERER'S COMPANY							FORM D
<i>Govt Bodies/Stat Boards/Other Clients</i>	<i>Title</i>	<i>Description of Project</i>	<i>Contract Value</i>	<i>Start Date</i>	<i>End Date</i>	<i>Percentage now completed</i>	

PROFILE OF TENDERER'S PROJECT TEAM					FORM E
<i>(Please complete below and state clearly the qualifications and experience of the staff in your team who would be assigned to this project, if awarded.)</i>					
<i>Name</i>	<i>Designation</i>	<i>Yrs of experience</i>	<i>Qualification</i>	<i>Experience(Past & current projects)</i>	<i>Awards</i>

APPENDIX II: LIST OF PROPOSED LOCATIONS

Proposed Locations		Estimated Gross Roof Area (sq m)
80 Bencoolen Street, S189655	Campus 1: P2 Tower Roof (RC Flat Roof)	572
	Campus 1 - Tower Block: Erected shelter structure	187
151 Bencoolen Street, S189656	Campus 3: P2 Tower Roof (RC Flat Roof)	567

APPENDIX III: BROWN ENERGY CONSUMPTION DATA

1. Premise Address : 80 Bencoolen Street, S189655
2. MSSL Account Number : 8919577687
3. Voltage Level (kV)/Type : Low-Tension
4. Historical Monthly Consumption of Premise (Metered)

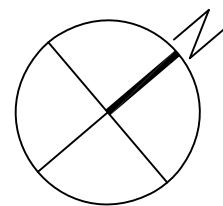
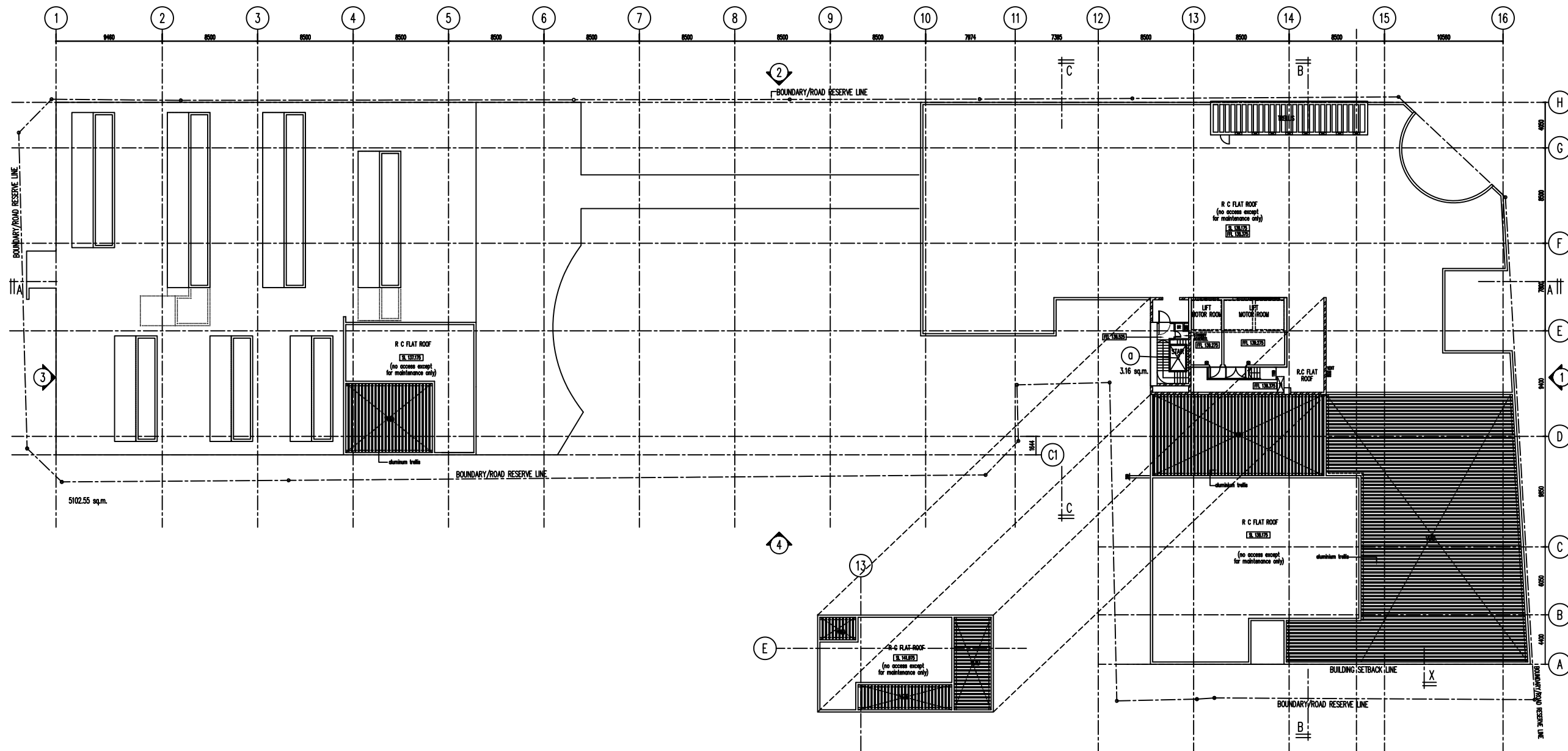
Month	Total (kWh)
July 2023	99,120
August 2023	305,085
September 2023	298,350
October 2023	379,740
November 2023	344,610
December 2023	337,170
Past 6 Months Average	294,013

1. Premise Address : 151 Bencoolen Street, S189656
2. MSSL Account Number : 8919582059
3. Voltage Level (kV)/Type : Low-Tension
4. Historical Monthly Consumption of Premise (Metered)

Month	Total (kWh)
July 2023	51,400
August 2023	107,180
September 2023	117,040
October 2023	140,340
November 2023	130,800
December 2023	138,600
Past 6 Months Average	11,427

APPENDIX IV: FLOOR PLANS


<Please refer to attached drawings below>



ROOF PLAN

REVISION	DESCRIPTION	DATE
XXX	XXX	18-07-2013

OWNER : NANYANG FINE ARTS FOUNDATION LTD.
 ADDRESS : 80 BENCOOLEN ST
 SINGAPORE 189655



TENURE OF LAND :

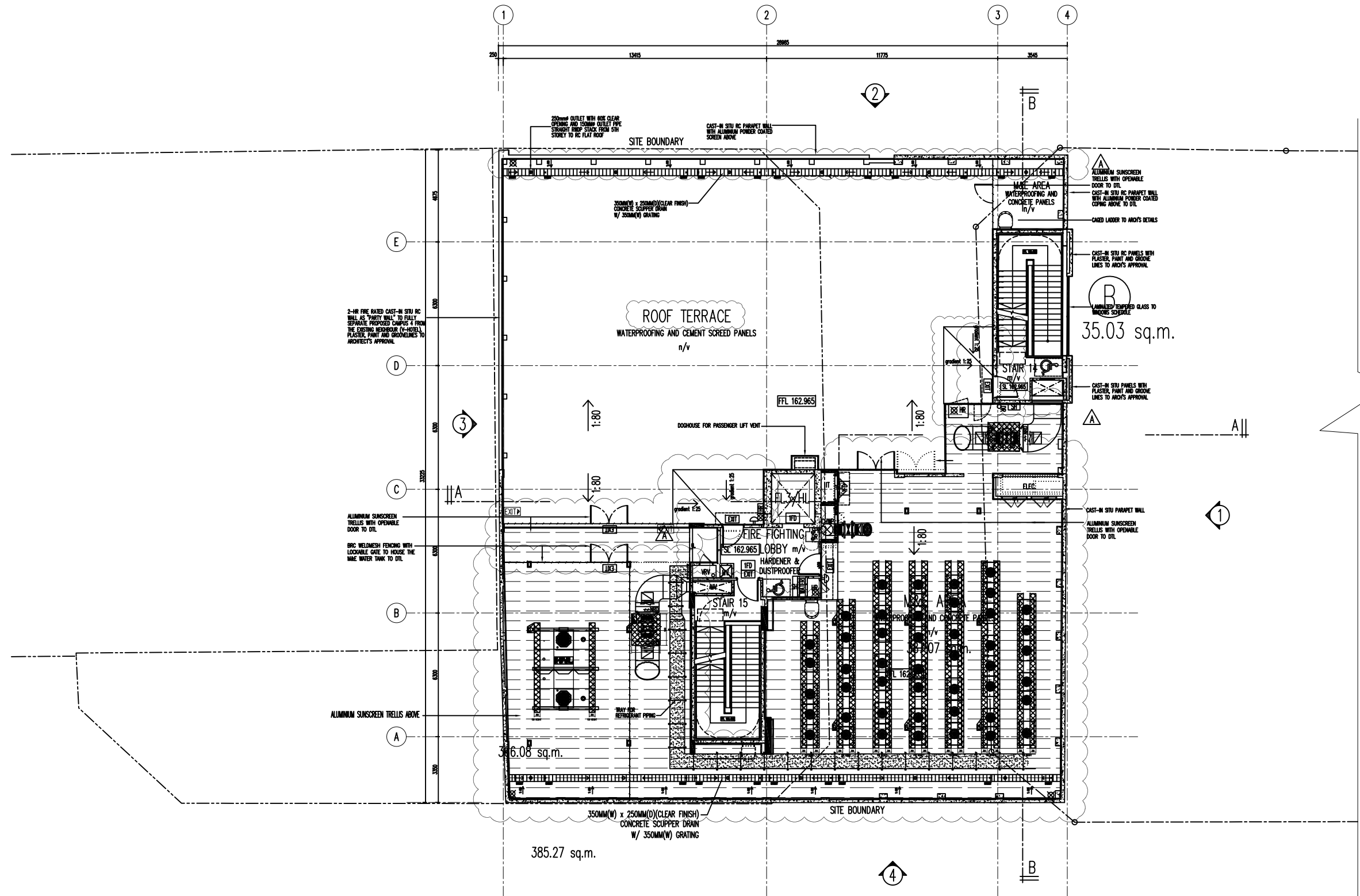
PROJECT TITLE :
 PROPOSED ADDITION OF 7TH STOREY FLOOR AND ADDITIONS AND ALTERATIONS TO EXISTING 6-STOREY EDUCATIONAL INSTITUTION FOR NANYANG ACADEMY OF FINE ARTS (CAMPUS 3) WITH ONE BASEMENT CARPARK ON LOT 00944T TS 12 AT 151 BENCOOLEN STREET

SUBJECT OF DRAWING :
 AIR-CONDITIONING & MECHANICAL VENTILATION SYSTEMS
 MAKE-UP WATER TANK DETAIL

DRAWN BY : KAREN LEE	DATE : 27-09-2017
CHECKED BY : XAVIER TAN JING XUAN	DATE : 31-10-2017
APPROVED BY : ANDY YEO KEE WEI	DATE : 31-10-2017

FILENAME : NAFA-TANK DETAIL


DRAWING NO : TSPL/NAFA/AC/TD-05	SCALE : 1 : 1 TOL: ±1.0 mm SHEET : 10/10	REVISION : A
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 LOWER ROOF PLAN

REVISION	DESCRIPTION	DATE
XXX	XXX	18-07-2013

OWNER : NANYANG FINE ARTS FOUNDATION LTD.
 ADDRESS : 80 BENCOOLEN ST
 SINGAPORE 189655



TENURE OF LAND :

PROJECT TITLE :
 PROPOSED ADDITION OF 7TH STOREY FLOOR
 AND ADDITIONS AND ALTERATIONS TO EXISTING
 6-STOREY EDUCATIONAL INSTITUTION FOR
 NANYANG ACADEMY OF FINE ARTS (CAMPUS 3)
 WITH ONE BASEMENT CARPARK ON LOT 00944T
 TS 12 AT 151 BENCOOLEN STREET

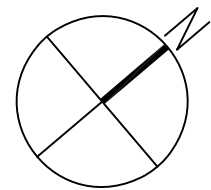
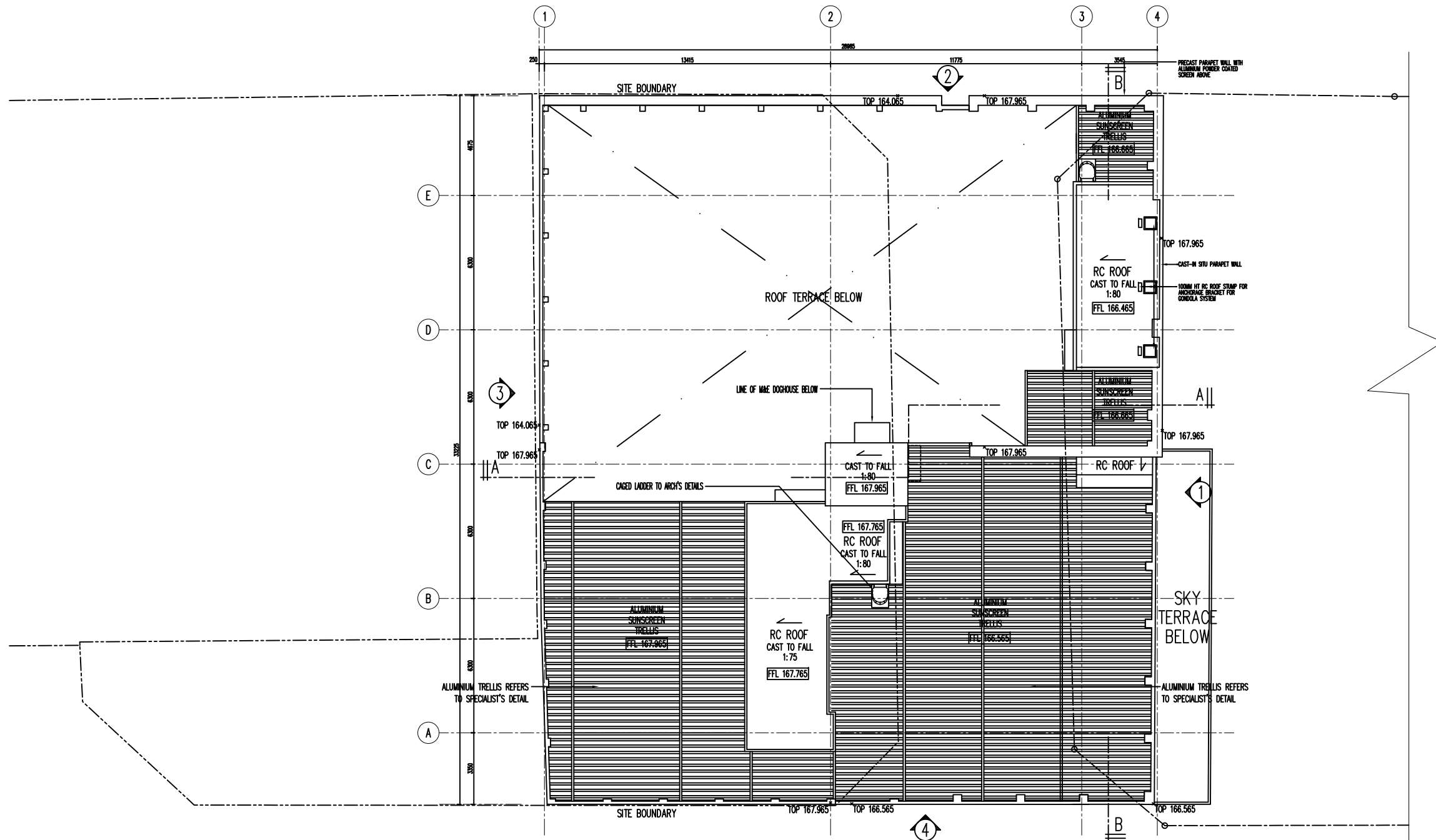
SUBJECT OF DRAWING :
**AIR-CONDITIONING & MECHANICAL
 VENTILATION SYSTEMS**

MAKE-UP WATER
 TANK DETAIL

DRAWN BY : KAREN LEE	DATE : 16-10-2017
CHECKED BY : XAVIER TAN JING XUAN	DATE : 15-11-2017
APPROVED BY : ANDY YEO KEE WEI	DATE : 15-11-2017

FILENAME : TOWER BLOCK LEVEL 8 DETAIL


DRAWING NO : TSPL/NAFA/AC/TD-05	SCALE : 1 : 1 TOL: ±1.0 m ² SHEET: 10/10	REVISION : A
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UPPER ROOF PLAN

REVISION	DESCRIPTION	DATE
XXX	XXX	18-07-2013

OWNER : MANYANG FINE ARTS FOUNDATION LTD.
 ADDRESS : 80 BENCOOLEN ST
 SINGAPORE 189655



TENURE OF LAND :

PROJECT TITLE :

PROPOSED ADDITION OF 7TH STOREY FLOOR AND ADDITIONS AND ALTERATIONS TO EXISTING 6-STOREY EDUCATIONAL INSTITUTION FOR MANYANG ACADEMY OF FINE ARTS (CAMPUS 3) WITH ONE BASEMENT CARPARK ON LOT 00944T TS 12 AT 151 BENCOOLEN STREET

SUBJECT OF DRAWING :

AIR-CONDITIONING & MECHANICAL VENTILATION SYSTEMS

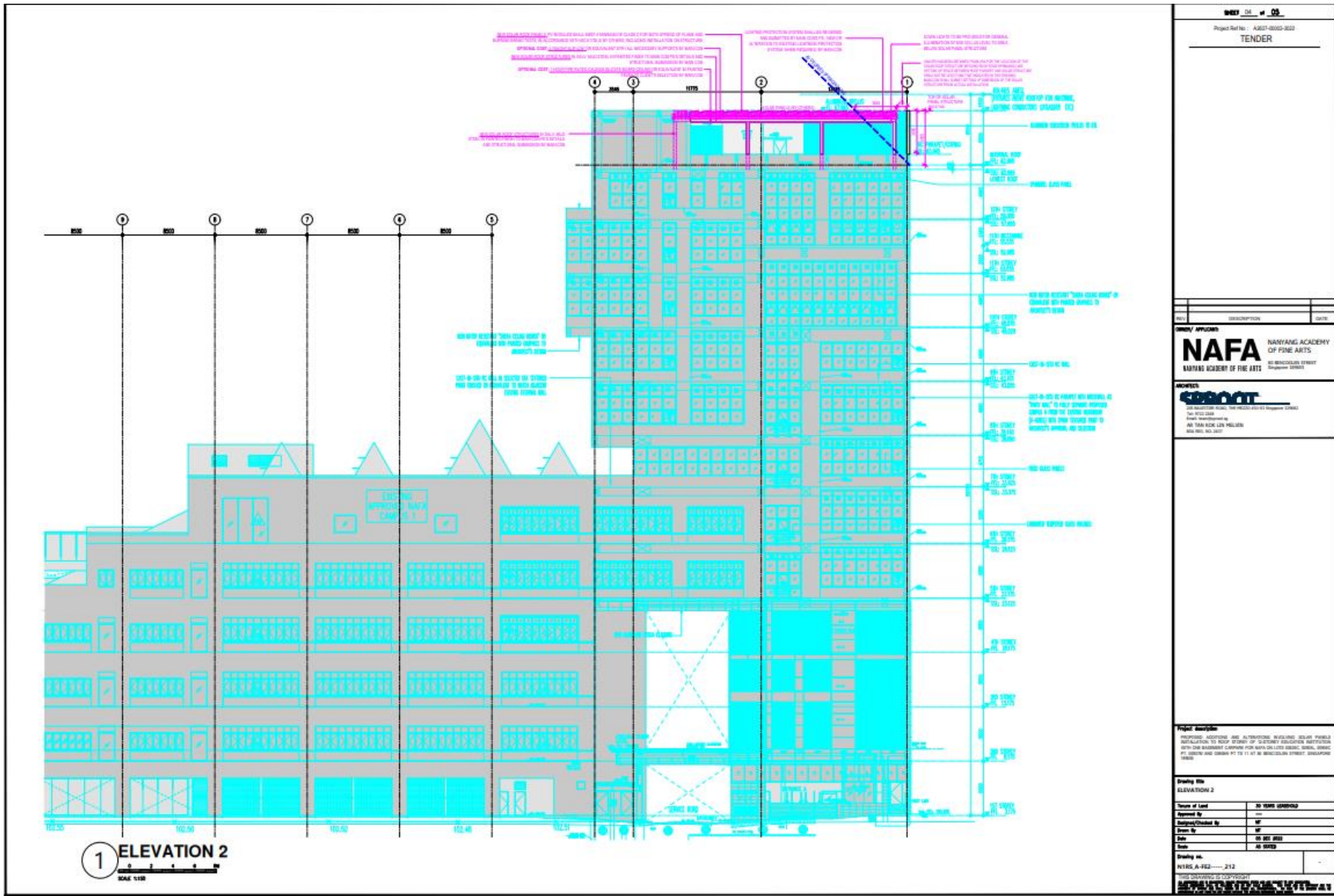
MAKE-UP WATER TANK DETAIL

DRAWN BY : KAREN LEE	DATE : 16-10-2017
CHECKED BY : XAVIER TAN JING XUAN	DATE : 15-11-2017
APPROVED BY : ANDY YEO KEE WEI	DATE : 15-11-2017

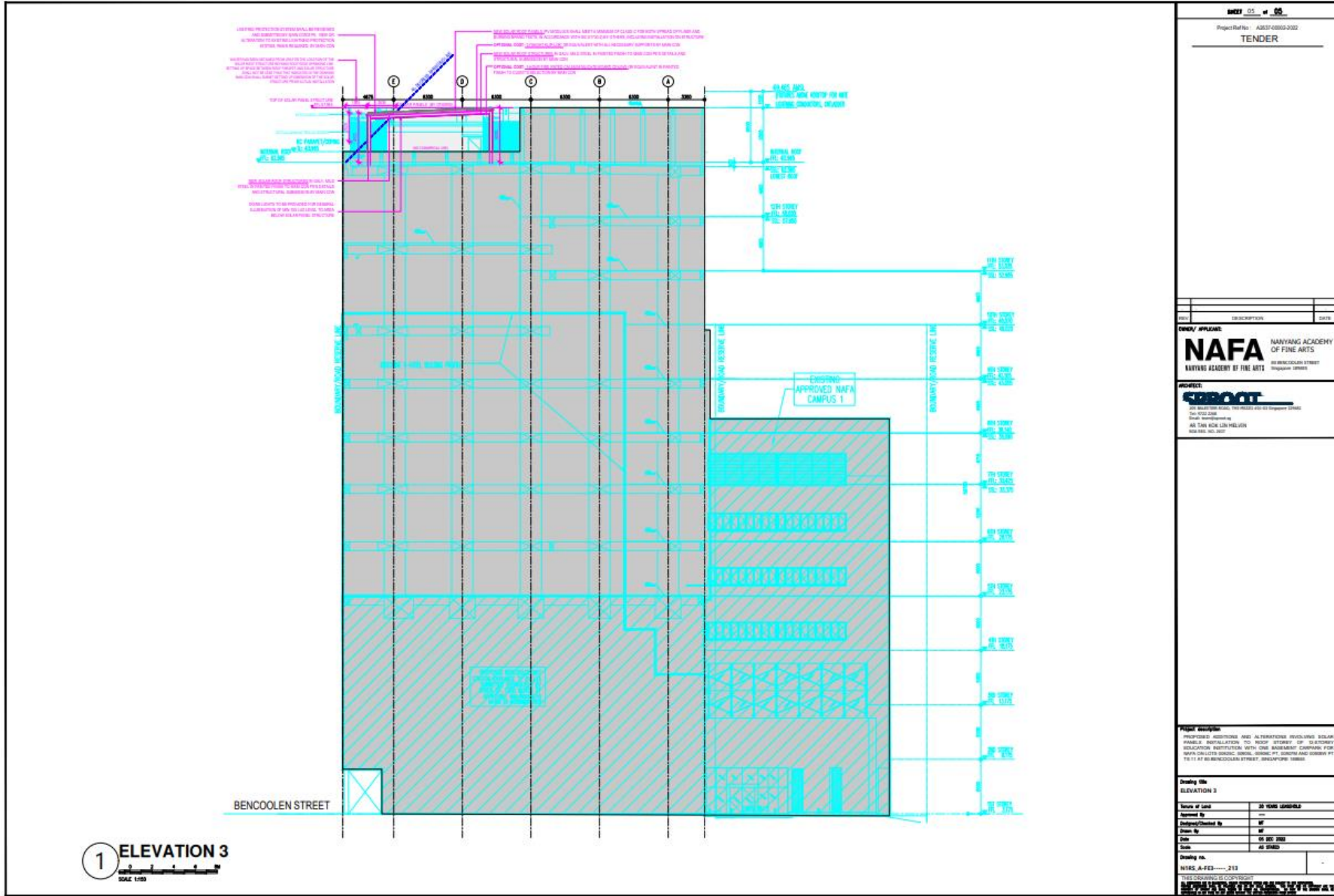
FILENAME : TOWER BLOCK UPPER ROOF DETAIL

DRAWING NO :	SCALE : 1 : 1	REVISION :
TSPL/NAFA/AC/TD-05	TOL: ±1.0 m ²	A
	SHEET: 10/10	

Campus 1 - Tower Block: Proposed Erected Shelter Structure

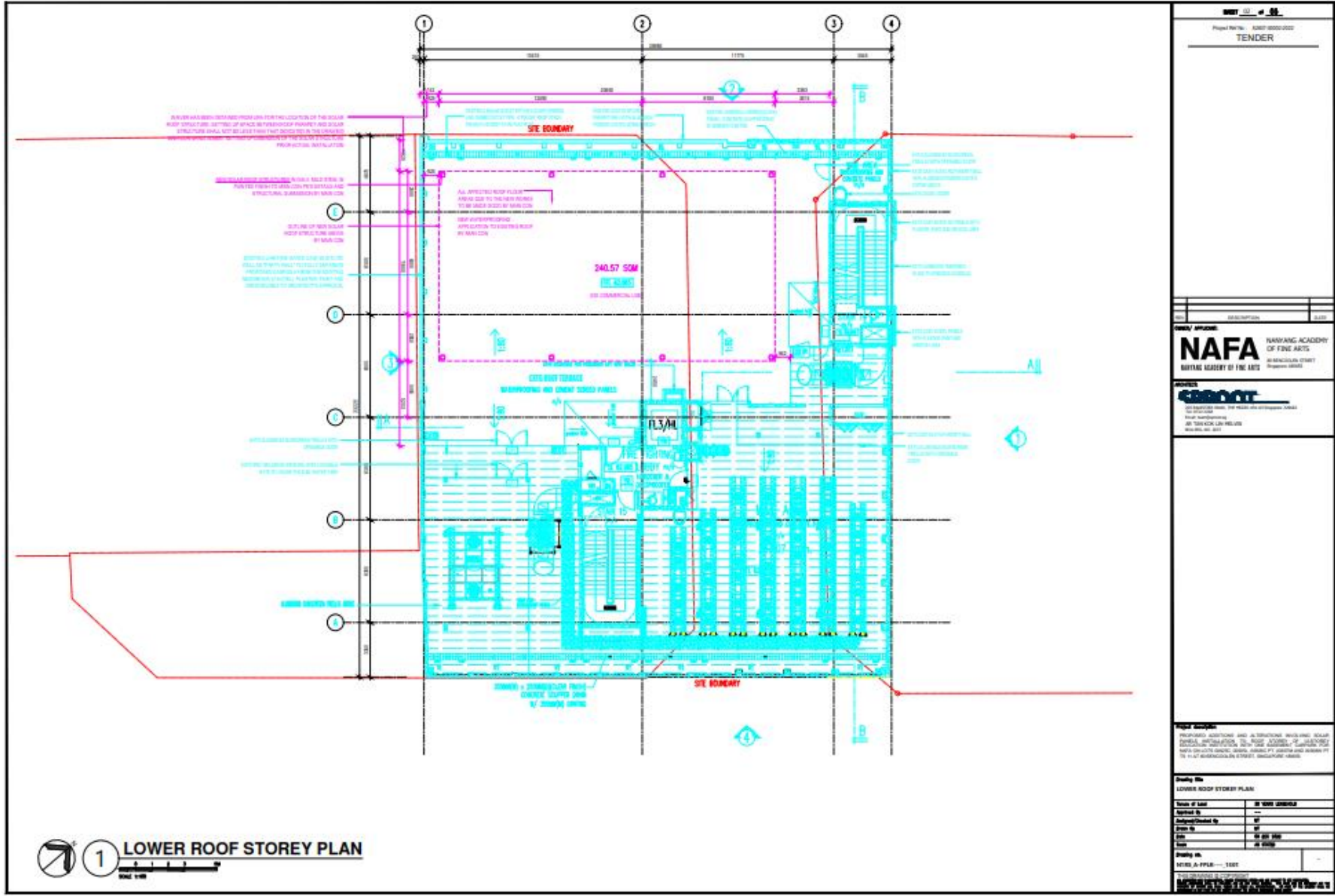


Campus 1 - Tower Block: Proposed Erected Shelter Structure



<p>PROJECT NO. 05</p> <p>Project Ref No: A051-0503-2022</p> <p>TENDER</p>	
<p>DESCRIPTION</p> <p>DATE</p>	
<p>CLIENT / APPLICANT:</p> <p>NAFA NANYANG ACADEMY OF FINE ARTS</p> <p>NANYANG ACADEMY OF FINE ARTS</p> <p>60 BENCOOLEN STREET SINGAPORE 189865</p>	
<p>PROJECT:</p> <p>SUBJECT</p> <p>ALL INFORMATION PROVIDED IS FOR INFORMATION ONLY.</p> <p>THEY WILL BE VALID FOR THE PROJECT ONLY.</p> <p>ALL THIS WORK IS THE PROPERTY OF THE CLIENT.</p>	
<p>Project description:</p> <p>PROPOSED ADDITIONS AND ALTERATIONS INCLUDING SOLAR PANELS, INSULATION TO ROOF, STORES OF STORAGE COLLECTION, RESTROOMS WITH ONE BATHROOM, CHANGE FOR NAFA ON LOT 6 (SINGAPORE, BRUNNEN, PT. BERNARD AND BURNING PT 10 11 AT BENCOOLEN STREET, SINGAPORE 189865).</p>	
<p>Drawing title:</p> <p>ELEVATION 3</p>	
<p>Scale of work: 20 YEARS LIVESCALE</p> <p>Assessed By: ---</p> <p>Designed/Checked By: MF</p> <p>Drawn By: MF</p> <p>Date: 05 DEC 2022</p> <p>Scale: AS SHOWN</p>	
<p>Drawing no.:</p> <p>NAFA_A-FE3-213</p> <p>PROJECT INFORMATION CONSULTANTS</p> <p>ARCHITECTS, ENGINEERS, INTERIORS DESIGNERS, PLANNERS, ENVIRONMENTAL DESIGNERS, LANDSCAPE ARCHITECTS, AND OTHERS</p>	

Campus 1 - Tower Block: Erected Shelter Structure



Project No. NAFA/2017/0002/0002
TENDER

Client: NAFA
NAFA NANYANG ACADEMY OF FINE ARTS
 NANYANG ACADEMY OF FINE ARTS
 100, BRAS BASAH STREET, SINGAPORE 117598

Project: NAFA/2017/0002/0002
 Lower Roof Storey Plan

Project Description: This drawing is a copy of the original drawing. It is not to be used for any other purpose without the written consent of the architect. The architect is not responsible for any errors or omissions in this drawing.

Drawn By	Checked By
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Scale: 1:100

Project No. NAFA/2017/0002/0002

Project Name: Lower Roof Storey Plan

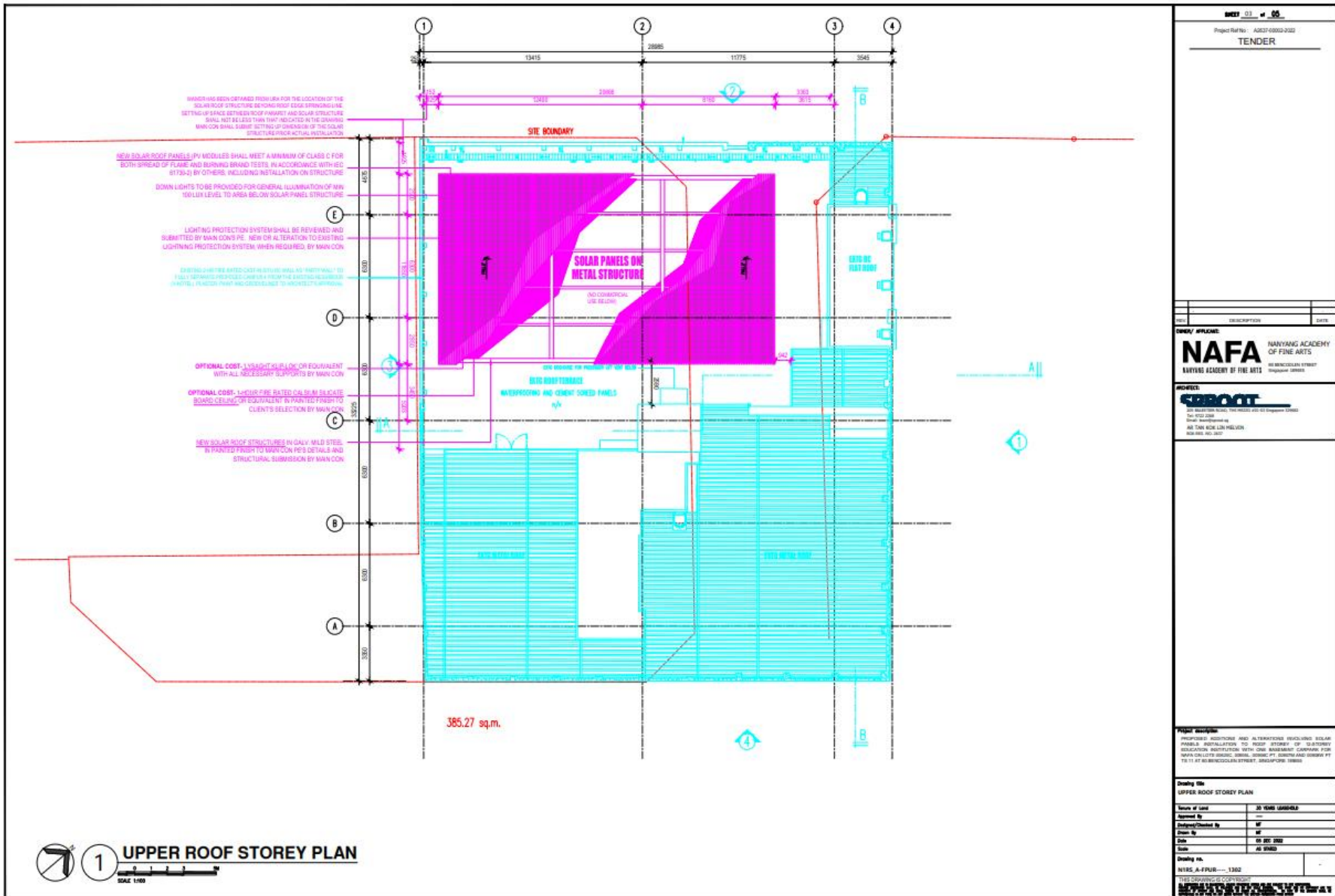
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Project Date: 2017

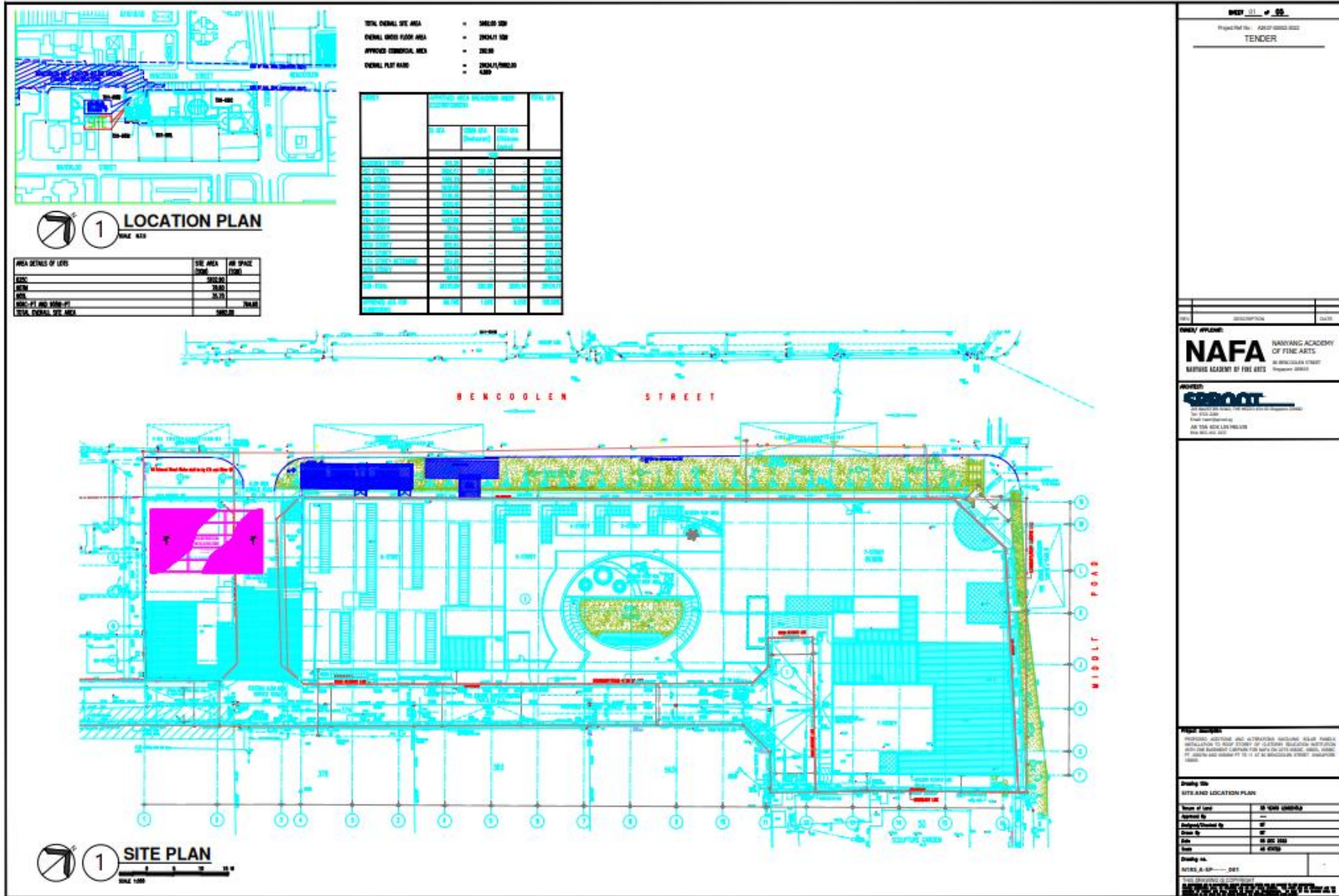
Project Status: TENDER

Project Description: This drawing is a copy of the original drawing. It is not to be used for any other purpose without the written consent of the architect. The architect is not responsible for any errors or omissions in this drawing.

Campus 1 - Tower Block: Proposed Erected Shelter Structure



Campus 1 - Tower Block: Proposed Erected Shelter Structure



SHEET 01 of **02**
Project Ref No: A2021-00003-0002
TENDER

CLIENT AGENCY:
NAFA NANYANG ACADEMY OF FINE ARTS
NANYANG ACADEMY OF FINE ARTS
110 BRISCOLLEN STREET Singapore 348919

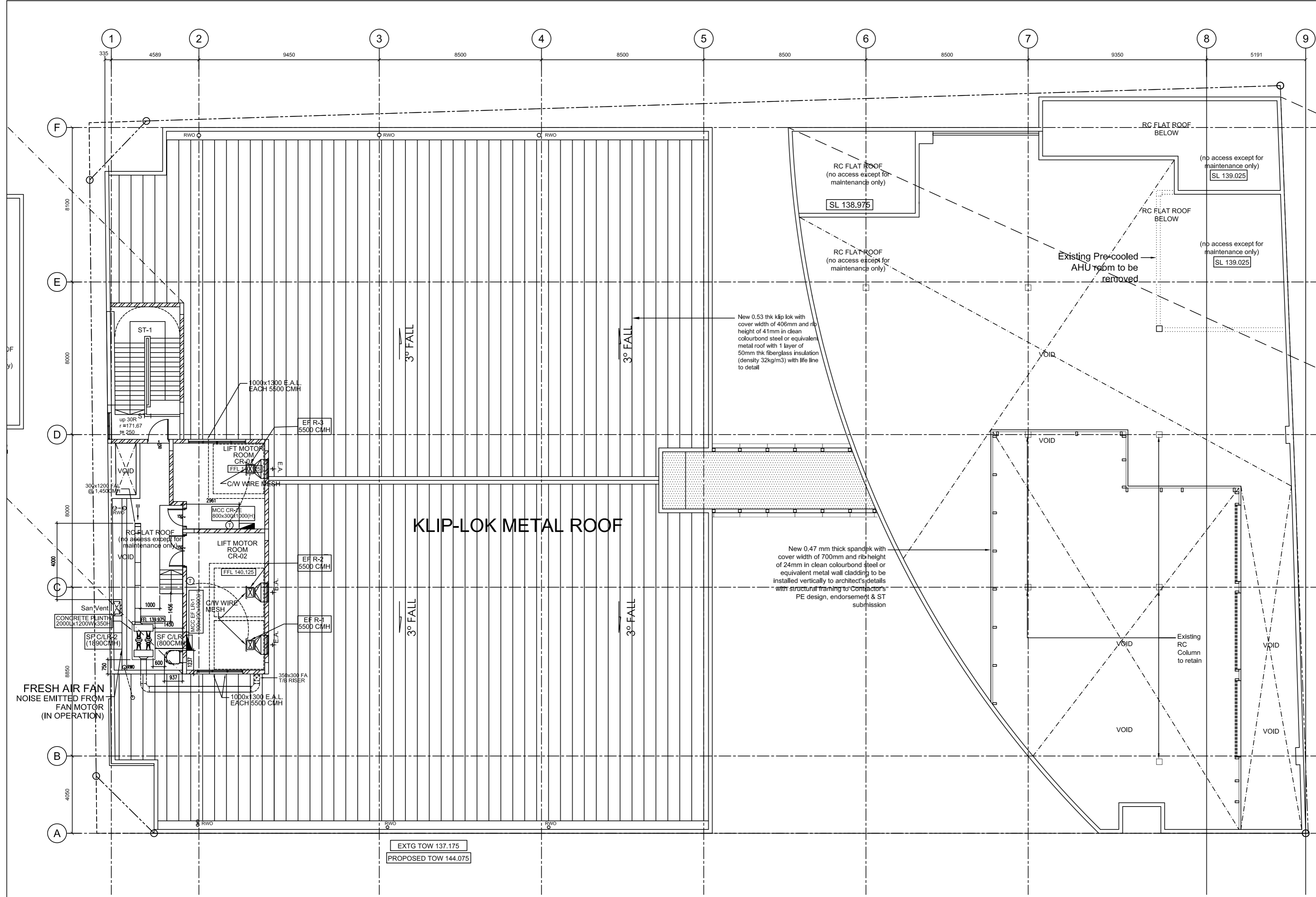
PROJECT:
SERVOOT
110 BRISCOLLEN STREET SINGAPORE 348919
Architectural
ART AND ARCHITECTURE
110 BRISCOLLEN STREET SINGAPORE 348919

Project Description:
PROPOSED SHEDDING AND UTILIZATION INCLUDING ROOF PANELS INSTALLATION TO ROOF STORY OF EXISTING EDUCATION INSTITUTION WITH THE EXISTING CURTAINS ON ROOF ON BRISCOLLEN STREET, 110 BRISCOLLEN STREET SINGAPORE 348919.

Drawing No:
SITE AND LOCATION PLAN

Scale of Site	1:500 GENERAL
Project No	---
Contract No	---
Client No	---
Date	09 DEC 2021
Drawn by	J. CHEN
Checked by	---

SCALE: 1:500



Date Received:
 The shop drawing has been examined by:
 Architect Structural Engineer M & E engineer
 and is returned examination of the drawings do not relieve the Contractor of its responsibilities. Work shall conform to all Drawings and Specifications. The Contractor is responsible for all correctness of dimensions and details in these drawings and for the full coordination of all aspects of the work.
 Examined with no object Examined observation added, Resubmission not required Examined and Resubmission required
 Signed: RSP Architect Planner & Engineer (Pte) Ltd. Pte.

SQUIRE MECH PTE LTD
 Consulting Mechanical & Electrical Engineers
SHOP DRAWINGS REVIEW
 The review is for general compliance with design concept and Contract Documents. The Contractor is responsible for the correctness of dimensions and details, and for the correctness and compatibility of materials and equipment used in the Installation. Comments / corrections made on this shop drawings do not relieve the Contractor of this contractual responsibilities and from compliance with the Specifications.
 When completed, the system shall operate as an integral whole and shall perform in accordance with the Specifications.
 No exception taken To proceed with installation
 Make correction noted Rejected (see remarks)
 To amend and resubmit Rejected (see remarks)
 Signed: _____ Date: _____

PROJECT TITLE:
PROPOSED ADDITION OF 7TH STOREY FLOOR AND ADDITIONS AND ALTERATIONS TO EXISTING 6-STOREY EDUCATIONAL INSTITUTION FOR NANYANG ACADEMY OF FINE ARTS (CAMPUS 3) WITH ONE BASEMENT CARPARK ON LOT 00944T TS 12 AT 151 BENCŒOLEN STREET

OWNER: NANYANG FINE ARTS FOUNDATION LTD.
 ADDRESS: 80 BENCŒOLEN ST SINGAPORE 189655

TENURE OF LAND:
 ARCHITECT:

RSP
 RSP ARCHITECTS PLANNERS & ENGINEERS (PTE) LTD
 15 Scotts Road #07-40 Thong Tek Building Singapore 228218
 Tel: 6737 7544 Fax: 6733 9143 Email: rspsing@rsp.sg

CIVIL AND STRUCTURAL ENGINEER:
RSP
 RSP ARCHITECTS PLANNERS & ENGINEERS (PTE) LTD
 15 Scotts Road #07-40 Thong Tek Building Singapore 228218
 Tel: 6737 7544 Fax: 6733 9143 Email: rspsing@rsp.sg

MECHANICAL AND ELECTRICAL ENGINEER:
SQUIRE MECH PTE LTD
 Consulting M & E Engineers
 11 LORONG 3 TOA PAYOH #01-16/17 BLOCK B JACKSON SQUARE SINGAPORE 319579
 Tel: 6419 8788 FAX: 6354 3321 Email: squiremech@squiremech.com

QUANTITY SURVEYOR:
LANGDON & SEAH SINGAPORE PTE LTD
 1 MAGAZINE ROAD #05-01 CENTRAL MALL SINGAPORE 059667 TEL: 62223888; FAX: 62247089
 EMAIL: (PROJECT) 6062@sg.langdonseah.com

ACOUSTIC CONSULTANT
ACVIRON ACOUSTICS CONSULTANTS PTE LTD
 BLOCK 123 BUKIT MERAH LANE 1 #03-100 SINGAPORE 150123
 TEL: 62735426 FAX: 62705700

MAIN CONTRACTOR:
VANTAGE CONSTRUCTION PTE LTD
 31 MANDAI ESTATE #03-10 INNOVATION PLACE SINGAPORE 729933
 TEL: 65 6834 3380 FAX: 65 6834 3381 Email: vantage@vantage8.com.sg

SUB-CONTRACTOR:
TAKASAGO SINGAPORE PTE LTD
 NO. 1 JALAN KILANG TIMOR #06-01 PACIFIC TECH CENTRE SINGAPORE 159303
 TEL: 737 3312 FAX: 733 7442

SUBJECT OF DRAWING:
AIR-CONDITIONING & MECHANICAL VENTILATION SYSTEMS

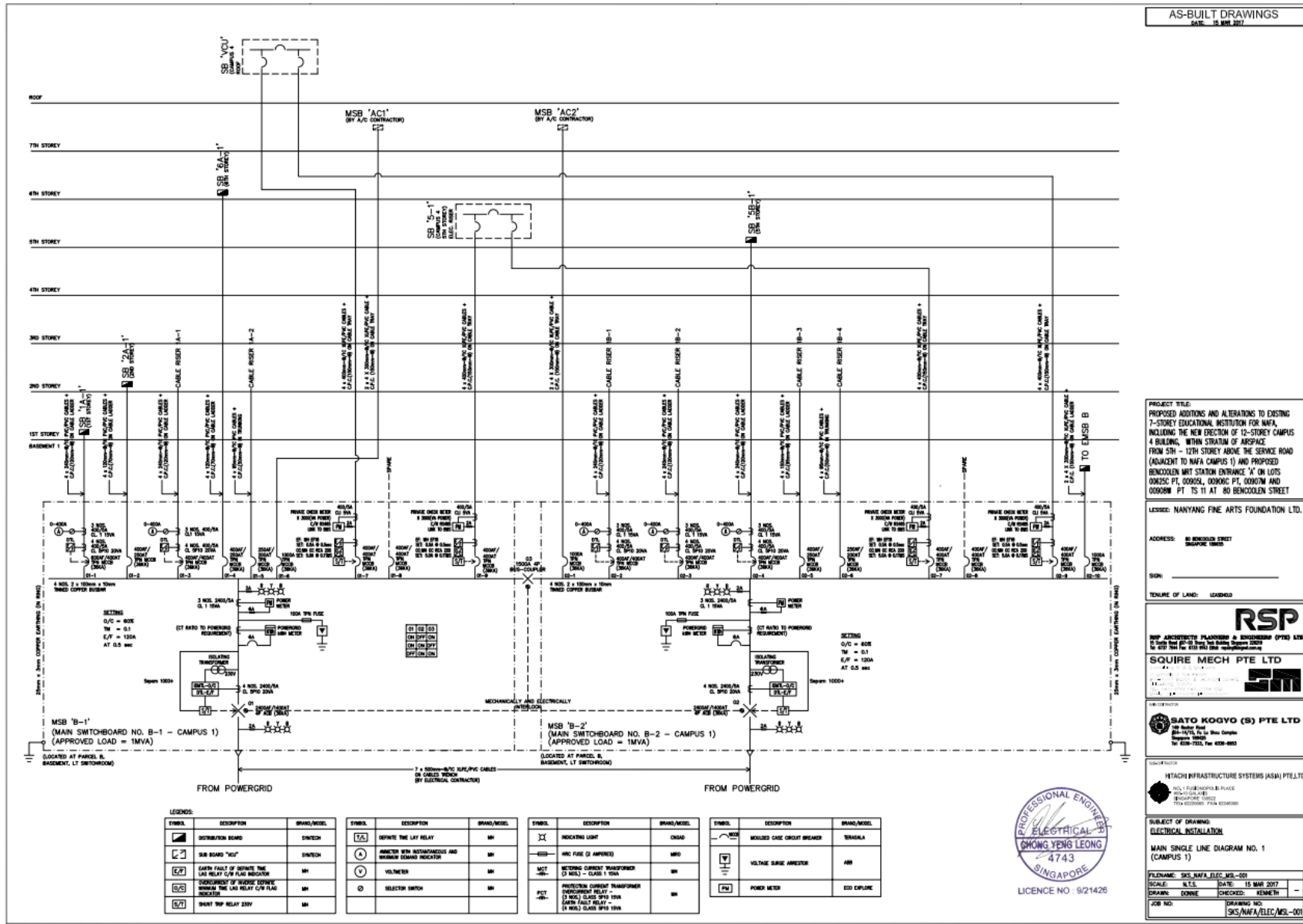
UPPER ROOF PLAN
 ACMV DUCTING & PIPING LAYOUT PLAN

FILENAME: NAFA-ROOF	REV: A
SCALE: 1:100	DATE: 18-07-2013
DRAWN: PG	CHECKED: NAZIM
DRAWING NO: TSPL/NAFA/RF/AC-01	

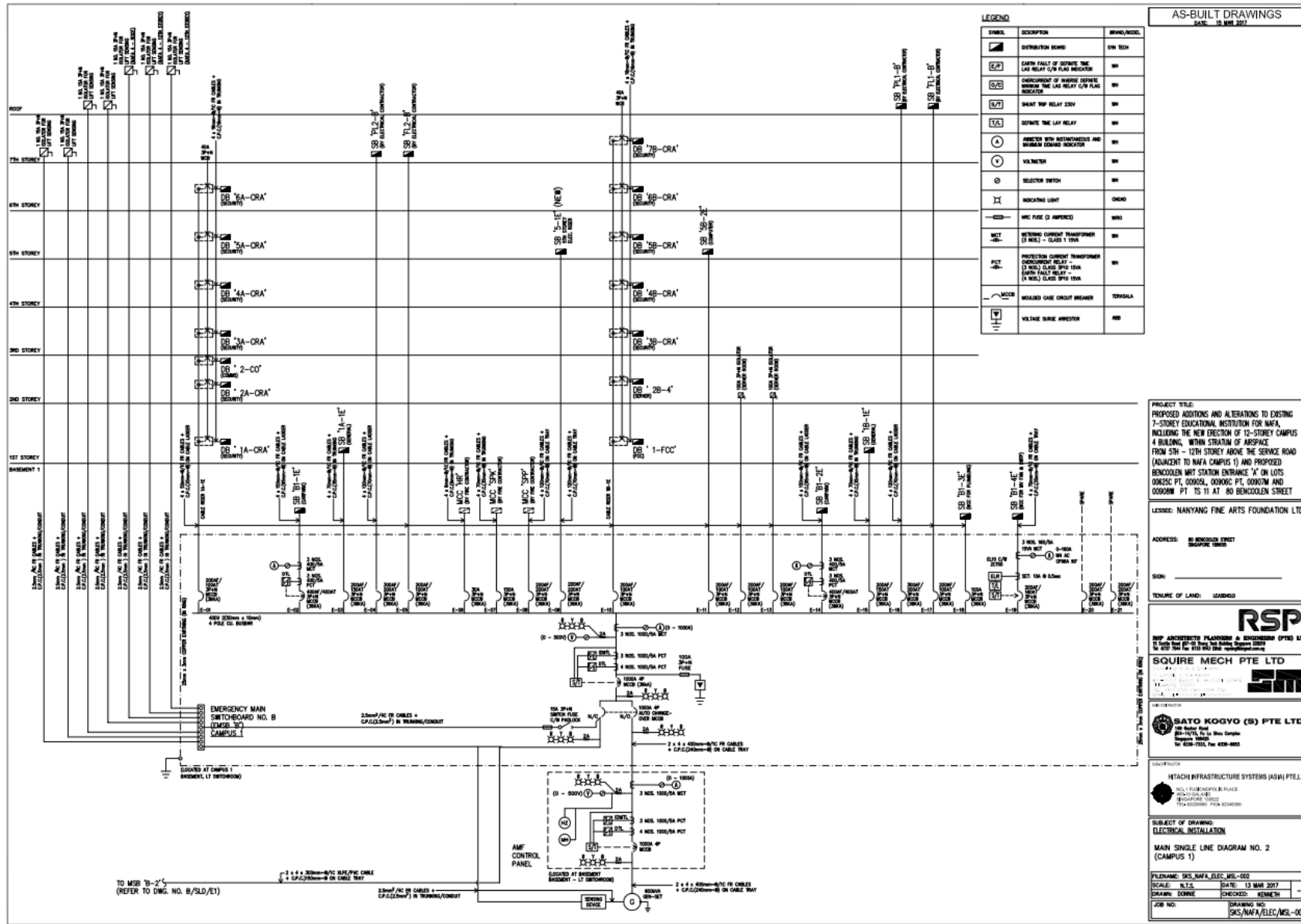
SHOP DRAWING
 DATE: 25/2/2014

REF	DATE	REVISION
O	18/11/2013	PRELIMINARY LAYOUT FOR SMOKE FREE LOBBY FANS AND DUCT LAYOUT
A	25/2/2014	LAYOUT CHANGE AS PER ARCHITECTURAL CHANGES BASE ON ARCHITECT COMMENT

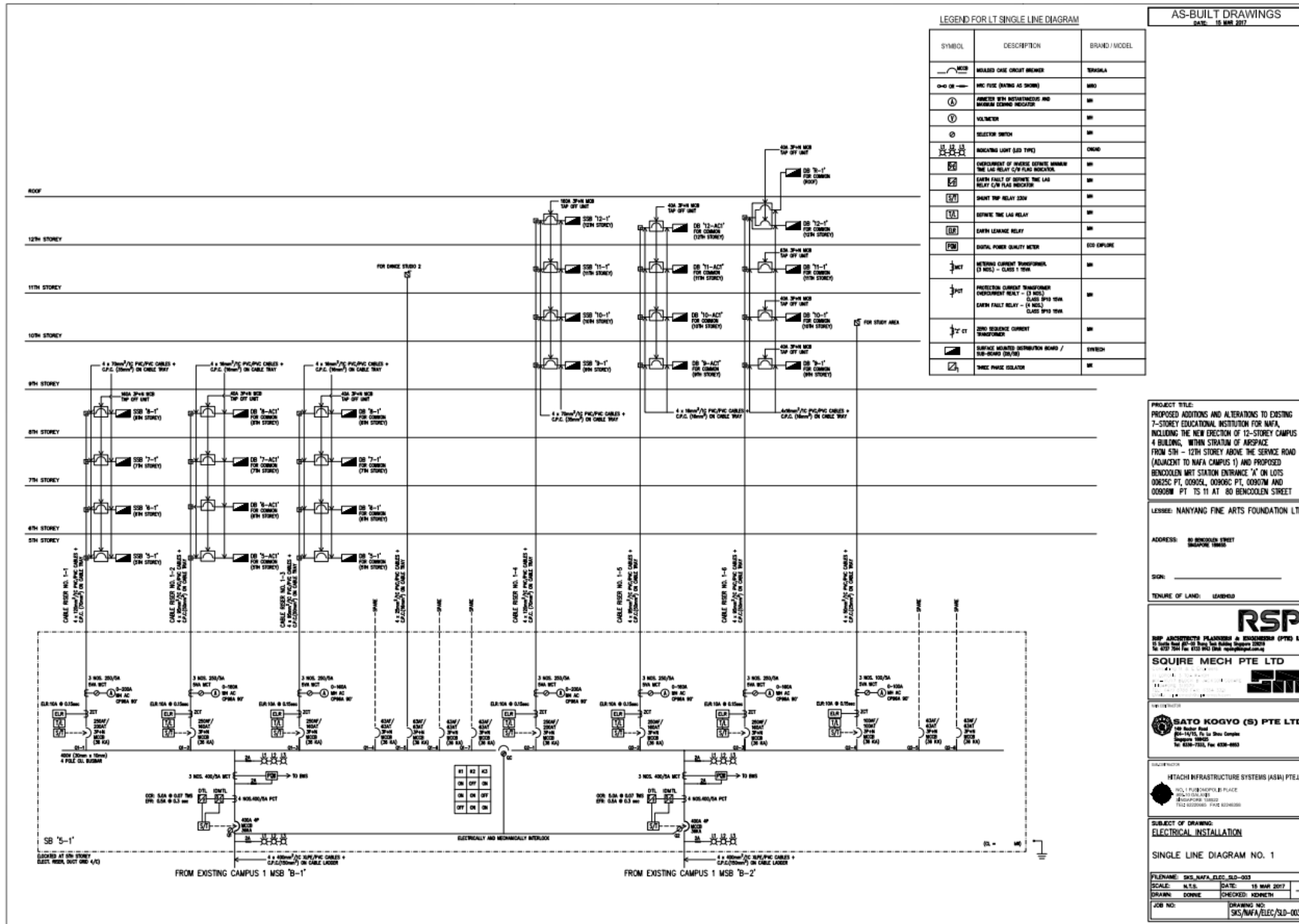
Campus 1: Single Line Drawing



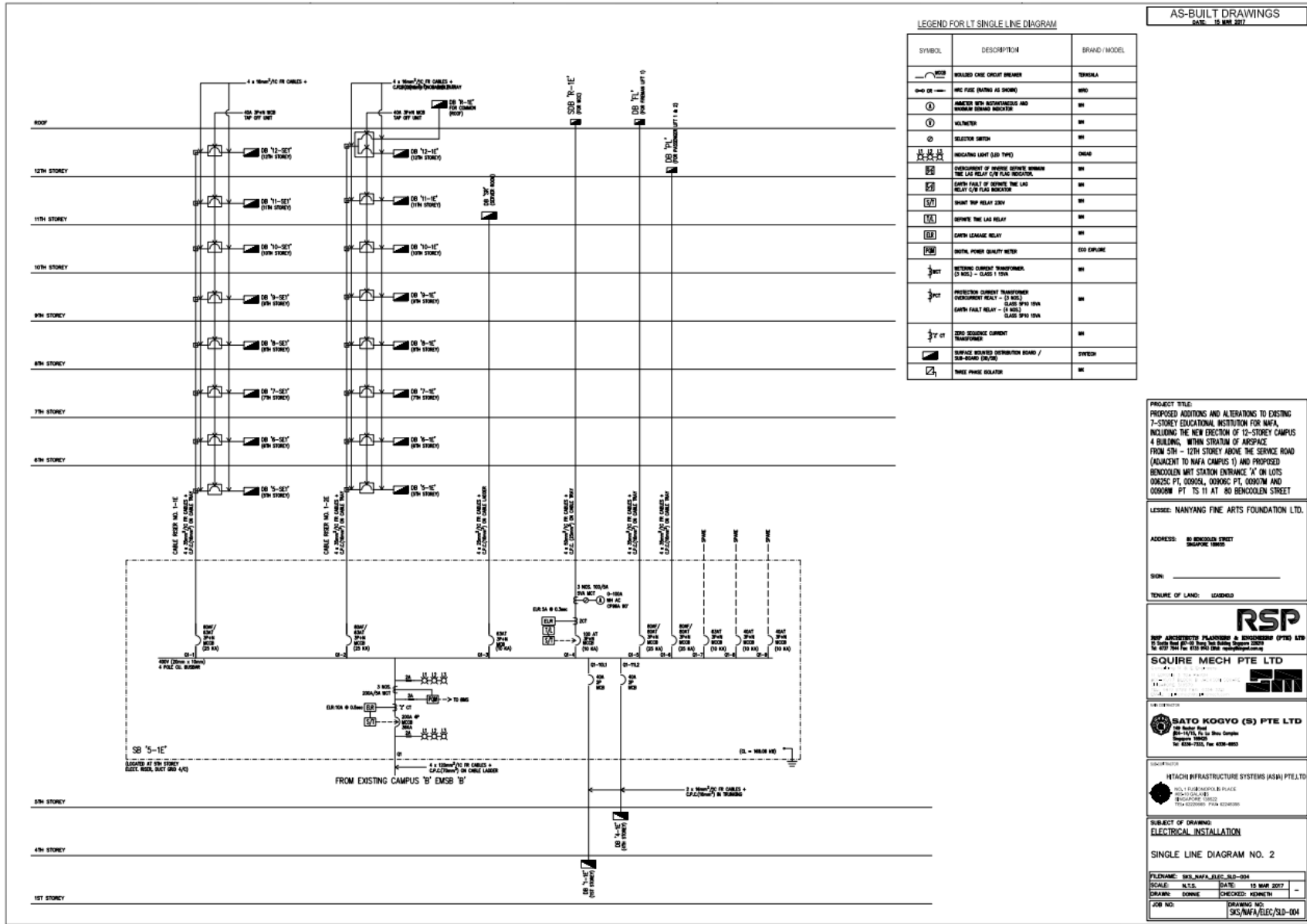
Campus 1 - Tower Block: Single Line Drawing



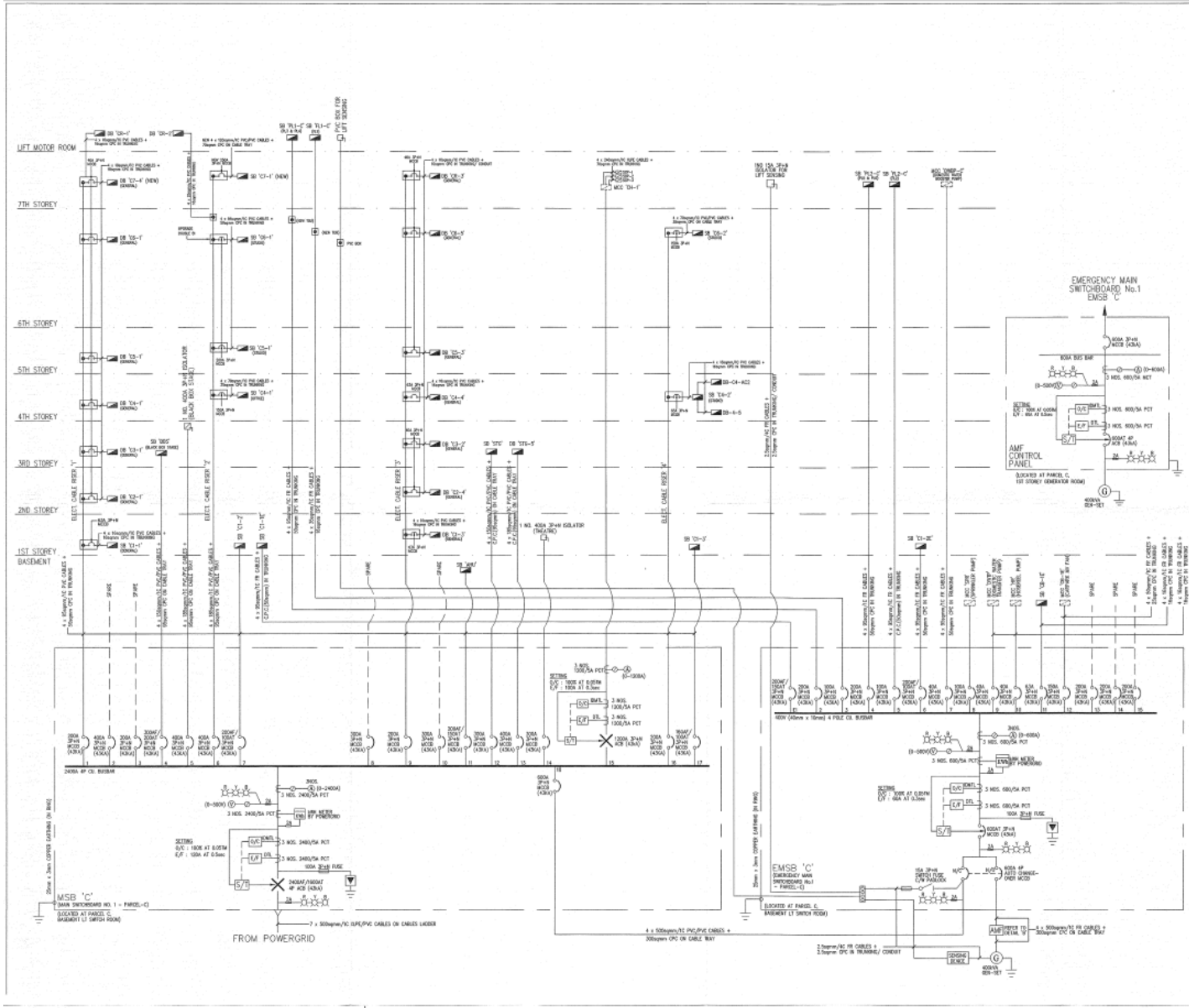
Campus 1 - Tower Block: Single Line Drawing



Campus 1 - Tower Block: Single Line Drawing



Campus 3: Single Line Drawing



LICENCE NO: E/101315
TABLES:

METHOD OF INSTALLATION TRIPPING

Circuit Breaker Rating	TRIPPING TYPE	TRIPPING CURRENT	TRIPPING CAPACITY
100A	1	1000mA	10000VA
100A	2	1000mA	10000VA
100A	3	1000mA	10000VA
100A	4	1000mA	10000VA
100A	5	1000mA	10000VA
100A	6	1000mA	10000VA
100A	7	1000mA	10000VA
100A	8	1000mA	10000VA
100A	9	1000mA	10000VA
100A	10	1000mA	10000VA
100A	11	1000mA	10000VA
100A	12	1000mA	10000VA
100A	13	1000mA	10000VA
100A	14	1000mA	10000VA
100A	15	1000mA	10000VA
100A	16	1000mA	10000VA
100A	17	1000mA	10000VA
100A	18	1000mA	10000VA
100A	19	1000mA	10000VA
100A	20	1000mA	10000VA

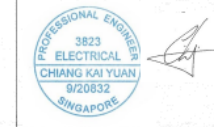
BREAKING CAPACITY OF VCBS, MSB & MCB

VOLTAGE	SHORT TIME WITHSTANDING CURRENT RATING	TRIPPING CAPACITY
220V	25KA FOR 3SEC	-
6.6KV	25KA FOR 3SEC	-
220V 1Ph	6KA	Up to 1000VA
220V 3Ph	6KA	> 500VA to 2500VA
400V 3Ph	6KA	Up to 7500VA
400V 3Ph	25KA FOR 3SEC	> 7500VA to 10000VA
400V 3Ph	25KA FOR 10SEC	> 1000VA to 10000VA
400V 3Ph	6KA FOR 3SEC	> 1000VA to 10000VA

Note: The 3-second duration is not applicable to air-breaker incorporating closed arcing tapping facilities.

MCB CU/B-BREAKER SIZES

Circuit Breaker Rating	Busbar Size
100A/3A	20mm x 3.18mm
100A/3A	25mm x 3.18mm
100A/3A	25mm x 3.18mm
100A	31.75mm x 3.25mm
400A	44.45mm x 3.25mm
600A	45.7mm x 3.25mm
800A	52.0mm x 3.25mm



OWNER:
NANYANG ACADEMY OF FINE ARTS
80 BENCOOLEN STREET
HQ & SCHOOL OF VISUAL ARTS BUILDING
SINGAPORE 189656

LEH:
QUALITY POWER MANAGEMENT PTE. LTD.
16 BOON LAY WAY
#01-43, TRADEHUB 21
SINGAPORE 609965
TEL: 6745 4666
FAX: 6746 4222

LEW: KEM JUNG GEE KEONG
LICENCE NO: 9/12879
HANDPHONE NO: 9668 6321
EMAIL: kem@qpower.com.sg

IN CASE OF EMERGENCY CALL THE NEAREST HOSPITAL.
IN CASE OF EMERGENCY CALL: 995
FOR NON- EMERGENCY CALL: 1777
FOR AMBULANCE ASSISTANCE

PROJECT:
ELECTRICAL INSTALLATION AT 151 BENCOOLEN STREET PARCEL C SINGAPORE 189656 FOR NANYANG ACADEMY OF FINE ARTS

DRAWING TITLE:
ELECTRICAL SINGLE LINE DIAGRAM FOR MSB 'C' & EMSB 'C'

SCALE: N.T.S. DRAWN BY: YUS
DATE: JAN 2015 CHECKED BY: SSM
DRAWING NO: QPM/NAFA-C/ESL01 REV: 0 SHEET: 1 OF 9