

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 10  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Friday, February 13, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Not Applicable.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Not Used.

### 1.6 CHANGES TO SPECIFICATION

- .1 Section 00 01 10 – Table of Contents
- .1 Update the Table of Contents to include Section 26 12 16.02 – Autotransformers.  
Section is attached to this addendum.
- .2 Section 23 07 19 – HVAC Piping Insulation:
- .1 Reference: 3.6 Piping Insulation Schedules
- .1 Append “Refrigeration Hot Gas” and “Refrigeration Liquid” to the piping insulation schedule under 3.6. All refrigeration piping to be insulated with 25mm of insulation, TIAC code A-6.

## 1.7 QUESTIONS AND RESPONSES

- .1 QUESTION: Based on the transformer description(s) this RFQ is for 2 x 300kVA Autotransformers. If this is correct, then the entire specification provided for this job would not be applicable to these items. Also, the Delta-Wye-N winding configuration as indicated on the single line wouldn't be applicable either.
  - .1 ANSWER: There are 4 x 300kva transformers used on this project. Two UPS input auto transformers and two UPS output transformers. The output transformers are to conform with the provided specifications (Section 26 12 16.01 - Dry Type Transformers up to 600 V Primary) and are delta-wye configuration. The delta-wye symbology on the input transformers can be ignored as these are auto transformers.
- .2 QUESTION: Below are our typical notes/exceptions for this specification. You will see two notes regarding electrostatic shielding. Depending on what the customer chooses for shielding, it will have an impact on the warranty period. The single shield option will carry a 10yr warranty while the double shielding will have a 1yr warranty period.
  - .1 ANSWER: A 10-year warranty period is required per 2.2.1
- .3 QUESTION: Section 26 12 16.01 1.5.1.4 Transformer will be factory tested as per CSA C9 standards. Please see test adders below if efficiency data is required.
  - .1 ANSWER: Efficiency data is required as indicated.
- .4 QUESTION: Section 26 12 16.01 1.5.2 HPS shall submit product data (shop drawing) in HPS standard format.
  - .1 ANSWER: This is acceptable.
- .5 QUESTION: Section 26 12 16.01 2.1.2 Quoting HPS standard core construction.
  - .1 ANSWER: This is acceptable.
- .6 QUESTION: Section 26 12 16.01 2.2.1 Quoting HPS standard warranty.
  - .1 ANSWER: A 10-year warranty period is required
- .7 QUESTION: Section 26 12 16.01 2.2.4 Transformers quoted shall be complete with an HPS standard NEMA-3R rated enclosure.
  - .1 ANSWER: This is acceptable
- .8 QUESTION: Section 26 12 16.01 2.2.5 Quoting HPS standard enclosure finish; see attached technical particulars for details.
  - .1 ANSWER: Finish color must be per Section 26 05 00, Common Work Requirements – Electrical.
- .9 QUESTION: Section 26 12 16.01 2.2.8 HPS is providing their standard taps.
  - .1 ANSWER: This is acceptable.
- .10 QUESTION: Section 26 12 16.01 2.2.10 Transformer quoted is designed to meet DOE 2016 / NRCAN 2019 (also meets ON Reg.404/12) energy efficiency regulations.
  - .1 ANSWER: This is acceptable.

- .11 QUESTION: Section 26 12 16.01 2.2.12 (Single Electrostatic Shield)  
- Quoting HPS standard electrostatic shielding performance.  
Or  
Section 26 12 16.01 2.2.12 (Double Electrostatic Shield)  
-HPS is quoting Common Mode Noise Attenuation as follows:  
100dB between 60Hz and 1kHz  
90dB between 1kHz and 10kHz  
80dB between 10kHz and 100kHz  
  
-HPS is quoting Transverse Mode Noise Attenuation as follows:  
10dB @ 10kHz  
20dB @ 100kHz  
40dB @ 1000kHz  
.1 ANSWER: Electrostatic shield performance is to meet the minimum requirements stated under Clause 2.2.12
- .12 QUESTION: Section 26 12 16.01 2.3 HPS is taking exception; to be supplied by others.  
.1 ANSWER: These options are required. It is up to the contractor to coordinate how these requirements are met.
- .13 QUESTION: Section 26 12 16.01 2.5 HPS to complete factory production test per CSA C9 standards. Optional type tests can be provided as follows:  
-Heat Run as per CSA C9 - X\$ per unit, Witness X\$ per unit  
-Sound Tests as per CSA C9 - X\$ per unit, Witness X\$ per unit  
-No-load losses - \$X  
-Load losses - \$X  
-Impedance - \$X  
-Exciting Current - \$X per unit  
-Resistance - \$X  
.1 ANSWER: Testing is to be provided to meet the requirements of 26 12 16.01 submittals.
- .14 QUESTION: According to the single line diagram, T-1 and T-2 are 300kVA auto transformers. The spec says "Test transformers for losses and efficiency to confirm compliance with NRCAN and CSA C802.2" but CSA C802.2 and NRCAN don't apply to auto transformers (Dry-type transformers - Natural Resources Canada). This means that if we do the test on site, we won't have any pass/fail criterion since the standards don't apply. It might be worth highlighting this to them and recommending that the efficiency test be moved to the factory. Normally, efficiency testing is never done on site (even for non-auto transformers).  
.1 ANSWER: A new spec Section 26 12 16.02 – Autotransformers has been issued to address specific autotransformer requirements.
- .15 QUESTION: Please confirm that as per spec section 26 05 21 (2.1.4) that aluminum conductors will be allowed to be used for this project?  
.1 ANSWER: Type ACM conductors are permitted for feeders above 60 amps as per Specification Section 26 05 21.

- .16 QUESTION: RFI 4 LAN Data Drops: Addendum #8 Question 27 States The data in question to the EMCS from the PDUs is to be provided over BACnet/IP from the PDUs to the EMCS.  
• Will the data from the PDUs come from a PDU network device that will send the data from all 60 PDUs to the EMCS via a single LAN connection or is a LAN cable and network drop required to each of the 60 PDUs. Please confirm as this impacts wiring costs.
- .1 PDUs shall be capable of being daisy-chained. A maximum of 32 PDUs may utilize a single network connection while maintaining individual IP addresses. The location of the headend equipment shall be confirmed during construction, and cable routing shall be coordinated accordingly.
- .17 QUESTION: Generator section 26 32 13:  
2.23 Source Quality Control, 2.23.3 and 2.23.8 call out Manufacturers standard tests and Prototype tests, and 2.23.9.7 calls for factory testing but "Upon request, a witness test, or a certified test record to be sent prior to shipment"  
Can we get clarification on the Witness testing and if an allowance should be carried?
- .1 ANSWER: Witness testing will not be required for this project.
- .18 QUESTION: Generator section 26 32 13:  
3.4 calls for load bank testing, please note 3.4.6 Standby units cannot be tested at 110%, so an extra hour will be added for full 8hr load bank,.
- .1 ANSWER: Noted. Testing for 8 hours up to 100% rated load is acceptable. Readings shall be taken and recorded every 15 minutes over the final hour of run time as noted.
- .19 QUESTION: Generator section 26 32 13:  
But 3.4.8 also calls for running generators on load (Building loads), is the engineer insisting on so much testing?
- .1 ANSWER: The requirements of 3.2.4.8 involving continuous strip recorders shall be deleted.
- .20 QUESTION: Section 26 32 13:  
1) 2.2.6.2 - Is there a spec for the Fuel Cooler called out? Or Manufacturer Recommended?
- .1 ANSWER: Manufacturers standard offering for the specified generator capacity is acceptable.
- .21 QUESTION: Section 26 32 13:  
2) 2.3.13 - Engineer insisting on embedded thermistors? Manufacturer offers RTDs in lieu of thermistors.
- .1 ANSWER: Stator winding temperature protection may be provided by embedded temperature sensors (RTDs or thermistors) installed by the alternator manufacturer and wired to provide alarm and automatic shutdown upon exceeding manufacturer recommended limit.
- .22 QUESTION: Section 26 32 13:  
3) 2.16.24 - Our generator has horizontal air intake, and then the discharge exiting the



engine is horizontal into a silencer in the exhaust plenum, where it exits vertically. Is this acceptable?

- .1 ANSWER: The intent of this clause is to prohibit enclosure designs that have openings in the top and can cause snow to accumulate inside the enclosure. If the design does not allow this to occur, it meets the intent of this clause.

.23 QUESTION: Section 26 32 13.02:

1) 2.1.22 - Is an alternative to the Foxfab cabinet acceptable?

- .1 ANSWER: Yes, Foxfab is listed as a Standard of Acceptance. Alternates are acceptable.

.24 QUESTION: Regarding the CRAC unit and its integration into EBI. Can these units also have control via EBI for this system?

- .1 ANSWER: No, the CRAC units are to be controlled by the vendor provided control system. The intent is to have a link from the EBI Front end to the Vendor's front end.

.25 QUESTION: If the contractor must bring in equipment that exceeds the current door or opening dimensions, will the Owner permit temporary modification, removal, or enlargement of doors?

- .1 ANSWER: With respect to the inquiry regarding temporary modifications to existing doorways or openings within the Pav A shell space, the Owner will permit temporary modification, removal, or enlargement of the existing doorway or curtainwall.

All such work must be coordinated in advance with the Owner, and all costs associated with the modifications, including temporary protection, removal, reinstatement, and any required engineering, shall be borne entirely by the Contractor. The Contractor shall ensure that any modifications are minimally invasive, limited to the extent strictly required to facilitate equipment access, and that all affected building elements are restored to their original condition upon completion.

.26 QUESTION: We plan on using Tier 4 rated equipment; is use of gas/diesel powered equipment permitted indoors? If so, are there requirements to transmit exhaust outdoors?

- .1 ANSWER: Regarding the use of Tier 4 or any other gas powered or diesel powered equipment within the building, the Owner confirms that gas or diesel machinery is not permitted inside the building. Contractors are required to plan equipment handling accordingly and to utilize alternative non combustion equipment where interior work is required.

**END OF ADDENDUM**

**PART 1**      **GENERAL**

**1.1**            **RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2**            **SECTION INCLUDES**

- .1 Dry-type, enclosed & ventilated non-isolated Autotransformers as indicated

**1.3**            **RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 91 13.13 – Commissioning (Cx) Requirements.
- .3 Section 26 05 00 – Common Work Results - Electrical.

**1.4**            **REFERENCES**

- .1 ANSI C57.12.01/NEMA ST 20-Dry Type Transformer for General Applications
- .2 IEEE C57.110-1998
- .3 UL, CSA

**1.5**            **SUBMITTALS**

- .1 Product Data for each type and size of transformer indicated.
  - .1 Physical: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features.
  - .2 Product warranty.
- .2 Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - .1 Wiring Diagrams: Power, signal, and control wiring.
  - .2 No load & full load losses per NEMA ST20; impedances.
- .3 Qualification Data: For testing agency.

- .4 Source quality-control test reports.
- .5 Field quality-control test reports.
- .6 Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

## **1.6 QUALITY ASSURANCE**

- .1 Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL).
- .2 Source Limitations: Obtain each transformer type through one source from a single manufacturer.
- .3 Electrical Components, Devices and Accessories: Listed and labelled to Canadian Electrical Code (CEC), by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- .1 Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

## **1.8 COORDINATION**

- .1 Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and form work requirements are specified in Division 03.
- .2 Coordinate installation of wall-mounting and structure-hanging supports with actual transformer provided.

## **Part 2 PRODUCTS**

### **2.1 GENERAL TRANSFORMER REQUIREMENTS**

- .1 Three phase autotransformers shall be either ventilated type or encapsulated. All three phases transformer shall be constructed with three winding and a single core. Convection air cooled.

- .2 Transformers shall be designed, constructed and rated in accordance with UL, CSA, and NEMA standards.
- .3 Auto Transformers have no isolation from primary to secondary and the neutral is only a mid point and should not be grounded as a distribution isolated transformer.
- .4 The transformer shall be derated as per ANSI/IEEE C57.110.

## **2.2 RATINGS**

- .1 Provide a 10-year pro-rated product Warranty.
- .2 Primary Voltage: 600 Volts
- .3 Secondary Voltage: 480 Volts
- .4 kVA Rating: 300 kVA
- .5 System Frequency: 60 Hertz

## **2.3 BASIC REQUIREMENTS**

- .1 Standard impedance at 60Hz: 4% to 6.5%
- .2 Name Plate Rating: Load profile K-factor rated, 60Hz
- .3 Insulation Class: 220°C system
- .4 Temperature Rise: 130°C
- .5 Core construction: high grade non-aging, fully processed silicon steel laminations or better.
- .6 Coil conductors: continuous copper windings, with terminations brazed, welded or bolted.
- .7 Impregnation: vacuum impregnated polyester resin.
- .8 Sound level to meet NEMA ST-20
- .9 Enclosure: ventilated, NEMA 3R
- .10 Enclosure Finish: Refer to Section 26 05 00, Common Work Requirements – Electrical.

- .11 Transformers shall terminate in mounting pads. Mounting lugs will be included on all units. Contractors shall provide all necessary lugs not already provided with transformer.
- .12 Anti-vibration pads/isolators shall be used between the transformer core and coil and the enclosure.
- .13 UL listed, CSA approved
- .14 Built to NEMA ST-20 and in accordance with all applicable UL, CSA and ANSI/IEEE standards
- .15 Ground core & coil assembly to enclosure with a flexible copper grounding strap or equivalent.
- .16 Voltage Taps
- .17 Neutral Termination
- .18 Mounting:
  - .1 Wall or floor as indicated on drawings.

## **2.4 IDENTIFICATION DEVICES**

- .1 Nameplates: Engraved, laminated-plastic or metal nameplate for each transformer, mounted with corrosion-resistant screws. Name-plated label products are specified in 26 05 00 – Common Work Requirements - Electrical.

## **Part 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Examine conditions for compliance with enclosure and ambient temperature requirements for each transformer.
- .2 Verify that field measurements are as needed to maintain working clearances required by CSA C22.1 – Canadian Electrical Code and manufacturer's written instructions.
- .3 Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- .4 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2        INSTALLATION**

- .1      Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer.
- .2      Construct concrete bases and structural support racks and anchor floor-mounting transformers according to manufacturer's written instructions.

### **3.3        CONNECTIONS**

- .1      Ground equipment according to Section 26 05 28 – Grounding – Secondary.
- .2      Connect wiring according to Section 26 05 21 - Wires and Cables – 0-1000V.

### **3.4        FIELD QUALITY CONTROL**

- .1      Perform tests and inspections and prepare test reports.
  - .1      Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- .2      Tests and Inspections:
  - .1      Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - .2      Test transformers for losses and efficiency to confirm compliance with NRCan and CSA C802.2.
- .3      Remove and replace units that do not pass tests or inspections, and retest as specified above.
- .4      Test Labelling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

### **3.5        ADJUSTING**

- .1      Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding name plate voltage plus 10 percent and not being lower than name plate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.

- .2 Output Settings Report: Prepare a written report recording output voltages and tap settings.

**3.6 CLEANING**

- .1 Vacuum dirt and debris; do not use compressed air to assist in cleaning.

**END OF SECTION**

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 9

TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Wednesday, February 4, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Deadline for receipt of bids has been revised. The new tender closing date is **February 19<sup>th</sup>, 2026, at 3:00PM (NST)**  
**New Access code: 2772 781 0246**

**Please note: There will be no further extensions granted for this open call.**

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Not Applicable

### 1.6 CHANGES TO SPECIFICATION

- .1 Not Applicable

### 1.7 QUESTIONS AND RESPONSES

- .1 Another addendum will be issued addressing questions to date.

**END OF ADDENDUM**



## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 8  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Friday, January 30, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Not Applicable.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Drawing M701 – Mechanical Schedules:
- .1 Reference 'Split System AC Unit Schedule': Revise Refrigerant Type for all split systems to be R-32
- .2 Reference 'Condensing Unit (CRAC) Schedule': Revise Refrigerant type for all CRAC Condensing Units to be R-454B
- .2 Drawing E505 – Electrical Details
- .1 Refer to Detail 5, Typical Door Hardware Rough-in Detail:
- .1 Electrical contractor to supply and install conduit/cabling for electric lockset in door hardware groups HG-01, HG-03 and HG-04. Route 8C #22 cable in 27mm EMT conduit from door hardware controller at top of door to wire transfer loop at hinge side of door. Wire transfer loop supplied and installed by architectural, coordinate exact location on site.

- .3 Drawing E601 – Single Line Diagram:
  - .1 Tagged feeders for clarification purposes.
  - .2 Added new feeder types and tagged where these are to be used.

## 1.6 CHANGES TO SPECIFICATION

- .1 Section 07 54 23 - Thermoplastic Polyolefin (TPO) Roofing
  - .1 Add Section 07 54 23 as attached to this Addendum.
- .2 Section 23 82 00.16 – Incremental Heating and Cooling Units
  - .1 Revise clause 2.1.1 to read as follows:

“Each CRAC unit shall be provided with MERV 13 filters, EC driven fans, premium efficiency motors, dual refrigeration system complete with remote mounted condensing units, and ‘Econo Phase’ refrigerant pump units. Condensing units shall use tandem digital scroll compressors. The system shall be controlled by vendor supplied microprocessor based controllers complete with integrated ‘teamwork’ mode to coordinate operation of multiple units, BMS interface via BacNet (for remote monitoring only), disconnect switches at each indoor and outdoor unit, smoke sensors, two cable type water leak detectors (zone and point leak detectors), humidifier modules, smoke sensors, floor stands and return air plenums. Systems shall utilize R-454B refrigerant, provide refrigeration leak detectors within the indoor and outdoor equipment in accordance with the requirements of CSA B52.”
  - .2 Revise clause 2.1.6 to read as follows:

“Refrigerant: R-454B”
  - .3 Revise clause 2.3.2.6 to read as follows:

“Refrigeration System: Single circuit for units up to 5 nominal tons, dual circuit for systems larger than 5 tons. Include liquid line filter drier, externally equalized expansion valve, and suction pressure transducer. The refrigeration system shall be pre-charged with nitrogen and sealed prior to shipping to site. Provide refrigeration leak detection sensors within the unit cabinet in accordance with CSA B52. Split system refrigerant shall be R-32.
  - .4 Append the following under clause 3.1.2:

“.4 The contractor shall supply a load bank to adequately sized to suit the manufacturers startup and commissioning requirements. Coordinate load bank requirements with the CRAC unit manufacturer.”
- .3 Section 25 05 01 – EMCS: General Requirements
  - .1 Delete clause 1.6.11
- .4 Section 25 90 01 – EMCS
  - .1 Append the following to clause 1.3.2 Data Hall Environmental Control:

“.5 Refrigeration Leak Detection & Mitigation: Air conditioning equipment utilizes R-454B refrigerant which is classified as an A2L mildly flammable refrigerant. In accordance with the requirements of CSA B52:23, the manufacturer shall provide refrigerant leak detectors integral to all indoor and outdoor units. In the event of a leak detection the units shall respond as follows:

- .1 All components within the unit which may spark or arc, and all components forming part of the refrigeration system shall be de-energized within the effected unit.
  - .2 An audible alarm within the space shall be initiated.
  - .3 A visual alarm in the form of a strobe light shall be initiated within the space.
  - .4 Alarms shall be raised in the vendors control system and communicated to the building automation system
  - .5 If not already running, air circulation fans within *all* CRAC units shall start, and shall remain running until manually disabled.”
- .2 Append the following to clause 1.3.3 Staging Area Environmental Control:
- “.5 Refrigeration Leak Detection & Mitigation: Air conditioning equipment utilizes R-32 refrigerant which is classified as an A2L mildly flammable refrigerant. In accordance with the requirements of CSA B52:23, the manufacturer shall provide refrigerant leak detectors integral to all indoor and outdoor units. In the event of a leak detection the units shall respond as follows:
- .1 All components within the unit which may spark or arc, and all components forming part of the refrigeration system shall be de-energized within the effected unit.
  - .2 An audible alarm within the space shall be initiated.
  - .3 A visual alarm in the form of a strobe light shall be initiated within the space.
  - .4 Alarms shall be raised in the vendors control system and communicated to the building automation system
  - .5 If not already running, air circulation fans within the evaporator units shall start and shall remain running until manually disabled.”
- .3 Append the following to clause 1.3.4 UPS Room Environmental Control:
- “.4 Refrigeration Leak Detection & Mitigation: Air conditioning equipment utilizes R-32 refrigerant which is classified as an A2L mildly flammable refrigerant. In accordance with the requirements of CSA B52:23, the manufacturer shall provide refrigerant leak detectors integral to all indoor and outdoor units. In the event of a leak detection the units shall respond as follows:
- .1 All components within the unit which may spark or arc, and all components forming part of the refrigeration system shall be de-energized within the effected unit.
  - .2 An audible alarm within the space shall be initiated.
  - .3 A visual alarm in the form of a strobe light shall be initiated within the space.
  - .4 Alarms shall be raised in the vendors control system and communicated to the building automation system
  - .5 If not already running, air circulation fans within the evaporator units shall start and shall remain running until manually disabled.”

- .4 Append the following to clause 1.3.5.1 Alarm Conditions:  
“.15 Refrigeration Leak Detection Alarms, including identification of which specific system has detected a leak.”

## 1.7 QUESTIONS AND RESPONSES

- .1 QUESTION: Dwg. E503 What is the diameter of the Bollard? (#6 AWG bonding)  
.1 ANSWER: Bollards are 150mm diameter. Refer to Detail 8 on Drawing S501.
- .2 QUESTION: Dwg. E503 Fence pipe diameter not given for gnd clamps. U.N.O. will use 1.5” dia top/bottom rail, 2” dia. mid post, 3” dia corner and gate post.  
.1 ANSWER: Fence structure is detailed on structural drawings. Coordinate connection details with fence supplier.
- .3 QUESTION: Dwg. E602 note for perimeter bus. Need drawing E201.5C and E508  
.1 ANSWER: This note is shaded and is referencing existing equipment and base building drawings. These drawings are not relevant for the current scope.

### .4 QUESTION:

#### SYMBOL LEGEND:

ERGB	ELECTRICAL ROOM GROUND BUS (900mm X 50mm X 6mm) <i>We can supply a 914.4mm x 50.8mm x 6.3mm - need hole size/pattern?</i>
TGB	TELECOMMUNICATIONS GROUND BUS (600mm X 50mm X 6mm) <i>We can supply a 609.6mm x 50.8mm x 6.3mm # TGBA24L14P</i>
TMGB	TELECOMMUNICATIONS MAIN GROUND BUS (900mm X 100mm X 6mm) <i>We can supply a 736.6mm x 101.6mm x 6.3mm #TMGBA29L41P</i>
SGB	SGB SERVER ROOM GROUND BUS (600mm X 0mm X 6mm) <i>We can supply a 609.6mm x ? mm x 6.3mm - need hole size/pattern?</i>

- .1 ANSWER: Suggested alternative sizing is acceptable. Hole and size patterns need to be coordinated with quantity and types of cables being terminated.
- .5 QUESTION: Regarding the two 600A normal power feeders leaving panels DP-011 and DP-013 and routing to ATS #1 and #2, it was observed during the CSF site visit that there is very limited space in the ceiling of the electrical room corridor where the drawings indicate we are to penetrate into Shaft #15 room 2110 and rise to the penthouse above. Please confirm there is sufficient space in the ceiling location indicated in detail 7 drawing E403 for these two feeders to route from the electrical room 1160 to the penthouse above. Please see attached picture of the ceiling.  
.1 ANSWER: Based on our review of the site and the design intent shown in Detail 7 on Drawing E403, there is adequate space within the ceiling area to route the two 600 A feeders from panels DP 011 and DP 013 into Shaft #15 (Room 2110) and upward to the penthouse. The routing shown on the contract drawings was coordinated with the architectural and structural models during design. While the ceiling space in the corridor is limited, the feeders are intended to pass through the

shaft wall at the approximate location indicated on E403, where sufficient vertical clearance and a defined pathway exist. Field adjustment of the exact conduit routings may be required to navigate around existing obstructions.

- .6 QUESTION: On Page A100 in the Door & Frame Schedule, it has opening 1321AB as an F1 type Frame with HG01. On page A202 it shows the opening as a Double Frame. Can you please confirm the correct Frame Type and correct Hardware Group?
- .1 ANSWER: Use frame type F2 and HG02 for Door 1321AB
- .7 QUESTION: Can you also confirm if Window Type WA is Steel or Aluminum?
- .1 ANSWER: Window Type WA is Steel framed. Addendum #4 includes spec section for Pressed Steel Frames and associated glazing.
- .8 QUESTION: Drawing A402 Detail #7 - Roof Drain Termination indicates a Trough Drain Assembly draining towards a Roof Drain and drawing M301 Note #14 indicates only a 75mm Drain to serve the Roof Trough. Please clarify use of roof drain for draining new roof structure.
- .1 ANSWER: Detail 7/A402 is included to demonstrate the intent for terminating the membrane of the roof trough at the drain point including the clamping ring. Note 14 on M301 indicates a 75mm drain connecting into the roof trough. It should be assumed this 75mm drain pipe is to connect to the trough via the drain assembly. Given the space constraints in the width of the trough, a 75mm shower-type drain (Zurn or similar) would be suitable in this instance
- .9 QUESTION: The drawings show there are (6) Stainless Steel Corner Guards. The spec calls out stainless steel corner guards with a retainer and snap-on cover with color matched end caps. This sounds like a vinyl corner guard. Also, there is no leg length noted on the drawings or in the spec. (1.5", 2", 3" etc..). Please Clarify.
- .1 ANSWER: The intention is to install Stainless Steel corner guards with 2" leg length
- .10 QUESTION: Upon reviewing Addendum 4 In Part 1 1.5 Changes to Drawings .1 it states Hardware Group HG-02 to be removed. On the new Drawings A100 in the Door and Frame Schedule it shows Opening #1321AB with Hardware Group HG02. On the original Drawings this opening has Hardware Group HG01. Please clarify.
- .1 ANSWER: Door 1319A updated to HG03 to include card reader at client request, Door 1321AB updated to HG-02 as it was noticed that HG-01 was not suitable for a double door. HG-02 no longer removed from project.
- .11 QUESTION: Specification section 07 54 23 - Thermoplastic Polyolefin (TPO) Roofing is listed in the table of contents; however, the section is missing from the specification. Please provide or confirm it is not required.
- .1 ANSWER: Section 07 54 23 is attached to this addendum.
- .12 QUESTION: Reference the Monitoring Matrix on Electrical Drawing E701. Q1 CPI PDU monitoring parameter for "PDU Plug Loads and on off condition". Is this hardwired DDC Inputs or via a BacNet IP integration? Will the PDUs provide a BACnet communication port where this information can be obtained.

- .1 ANSWER: The Eaton EVMAGU23X-E PDU features a Gigabit Network Module (GNM) that supports multiple communication protocols for network management, including Modbus, Web/SNMP, and BACnet.
- .13 QUESTION: There is no thickness or detail provided for interior housekeeping pad as shown on drawing#S101. Please clarify.
- .1 ANSWER: Refer to detail 6/S501 for the thickness of interior housekeeping pads.
- .14 QUESTION: For exterior enclosure fence framing, can the horizontal members be bolted to vertical HSS columns or they have to be welded?
- .1 ANSWER: Bolted connection is preferable. Refer to detail 2/S105 and 3/S105.
- .15 QUESTION: Is there is access for a small machine to get inside the building for interior foundation works or is hand digging required?
- .1 ANSWER: As noted on the drawing S101, the contractor is responsible for locating all existing underground services prior to excavation (including hand digging as required to confirm locations). The method of excavation is at the contractor's discretion, provided that all existing underground conduits, utilities, and other building elements are protected from damage.
- .16 QUESTION: Drawing # E504 show details and notes on an Automation cabinet. Can you please confirm that this is the same Gen/ATS Comms Cabinet shown on the Single line Diagram E601. Is there a Detailed Specification section for this item ?
- .1 ANSWER: Yes, the details and notes for the Automation Cabinet shown on Drawing E504 refer to the same cabinet identified as the Gen/ATS Comms Cabinet on the Single Line Diagram (Drawing E601). The detailed specification for this cabinet is provided under Section 26 94 43 – Programmable Logic Controllers.
- .17 QUESTION: Can the consultant provide a specification on the perforated fence and was there a certain brand/company that this design replicates? Will alternates be accepted without an exact perforated pattern?
- .1 ANSWER: Basis of design is Hendrick H-CLAD-HD Flat Panels as identified in spec section 07 42 00 with varying sized perforations to create the image depicted in the drawings. Alternates will be reviewed upon submission. However, the pattern / perforations is an important piece of the overall picture given the prominent location of the enclosure. Find included with addendum #5, revised spec section 07 42 00, to further clarify the level of quality we are expecting for these perforated metal panels.
- .18 QUESTION: Spec section 25 05 01 article 1.6.11. Page 7 of 10 "The EMCS shall be fully accessible from both MUN's and Eastern Health's local area network." Q1 – the two customer Networks are not connected, Will this connection be provided under this project by customers?
- .1 ANSWER: Access to/from Eastern Health's LAN is not required. Refer to this addendum for specification revision.
- .19 QUESTION: Spec Section 25 90 01 article 1.3.2.6 Page 5 of 9 This section of the spec states communication from the CRAC units to the Honeywell EBI to be done using

Modbus over ethernet. Modbus communication is very labour intensive and difficult to implement. The preferred standard for interoperable communication is BACnet. Q2 -Is BACnet communication available with the new equipment being installed?

.1 ANSWER: BACNet communication from the Vertiv iCom network is available.

.20 QUESTION: Control Schematic 3 on Drawing M601 shows the Gas Detection Control Detail. The detail shows the an analog output from the gas detection panel directly controlling the exhaust fan speed. Gas Detection panels typically do not have a PID control loop built in to control fan speed. Usually it is done via start stop relays wired from the gas detection panel to the fan starter. An alternate is to bring the gas level from the gas detection system into a separate controller and from the separate controller provide a PID control loop to modulate fan speed. Q3 – Please provide an acceptable product model number of a gas panel with a PID loop to control fan speed please specify this device.

.1 ANSWER: The basis of design is a MSA Sentry IO controller and MSA gas detection devices. This is a programmable device, including analog outputs which can provide the required 0-10VDC signal to the EC motor control (Greenheck Vari-Green HOA controller is the basis of design). Default options for remote monitoring listed from MSA include Modbus TCP/IP, Modbus RTU, or EtherNet/IP/DLR.

.21 QUESTION: With the current changes in regulations with refrigeration the equipment listed in the above schedule will be phasing out the current refrigeration (R407C and R410A). Currently the phase out time line for the units in the Split System AC Unit Schedule has not been established by the tender closing date but the phase out date for the units listed in CRAC Unit Schedule and Condensing (CRAC) Schedule is as follows:

- a. Last order placement July 1st, 2026
- b. Last ship date November 1st, 2026
- c. Last installation date December 31st, 2026

Would Low GWP refrigerant be accepted? R32 would be used for units listed in the Split System AC Unit Schedule and R454B for units listed in the CRAC Unit Schedule and Condensing (CRAC) Schedule.

.1 ANSWER: R-32 / R-454B refrigerant is acceptable; The equipment vendor shall provide refrigerant leak detectors integrated with the indoor units in compliance with CSA B52:23. Refer to revised sequence of operations provided in this addendum.

.22 QUESTION: The equipment listed in the CRAC Unit and Condensing (CRAC) Schedules are charge sensitive and require a heat load during refrigerant charging and setting up the systems(s). A 50% minimum heat load will be required for each DSE150 or 50% total system load if the project requires testing complete CRAC system. It is recommended that bidding contractors include the cost of supplying a multi step resistive load bank during the commissioning of the system. Can an addendum be issued to bidder to include this in their submissions.

.1 ANSWER: Load bank requirements for startup and testing has been added. Refer to revisions provided with this addendum.

.23 QUESTION: As per Detail 1 of M601, we would like to clarify that the monitoring of the CRAC units will be through the existing network switch located in Room 1313 and by the existing Honeywell EBI system.

We also are interpreting that the CRAC units will operate as a stand alone system and will require no input/output from the new DDC Panel (BMS/EMCS) System. Please confirm.

- .1 ANSWER: Correct, the CRAC units are to operate as a stand-alone system. Integration to the BAS is required for remote monitoring only.
- .24 QUESTION: Is all LV control wiring shown on M302 and M601 the responsibility of the controls contractor (Honeywell)?
  - .1 ANSWER: Wiring and conduit for 50V or less is the responsibility of the Mechanical contractor or their sub-trades.
- .25 QUESTION: Should the electrical contractor carry any portion of this LV wiring, or is it entirely under Honeywell's scope?
  - .1 ANSWER: Wiring and conduit for 50V or less is the responsibility of the Mechanical contractor or their sub-trades.
- .26 QUESTION: As noted on M201 Keynote #3 "Existing hydronic heater C/W All piping accessories and mounting hardware To be removed and reinstated." Is the intent to for the new DDC System to take over the control of these (three) heater PIC Valves?
  - .1 ANSWER: No, the relocated heaters are to be reconnected to and controlled by the existing system.
- .27 QUESTION: With regards to the Rack PDU's we require some clarifications.
  - .1 Either: Are we required to integrate to the PDUs via a software link ( BACnet or Modbus). If so which software protocol will be provided with the PDU. Will it be an IP connection . ie BACnet over IP or Modbus over IP
    - .1 ANSWER: BACnet/IP
  - .2 OR: Are these physical inputs to a DDC panel? Will the 60 temperature and 60 humidity points be hard wired as physical inputs to the EMCS. If they are to be hardwired, please provide the characteristic of the sensor so we can determine if is compatible with our system. Humidity is normally a voltage or current output i.e. 0-10 Vdc or 4-20ma. which is compatible.
    - .1 ANSWER: These are not physical inputs to the EMCS; temperature and humidity sensors are to be part of the PDU system, data to be provided over BACnet/IP to the EMCS.

**END OF ADDENDUM**



	<b>A - DETAIL</b> <b>B - LOCATION/DRAWING No.</b> <b>C - DRAWING No.</b>	
<b>No.</b>	<b>REVISION</b>	<b>DATE</b>
2	ISSUED FOR ADDENDUM No. 8	2026.01.29
1	ISSUED FOR ADDENDUM No. 4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

## GENERAL NOTES

1. DRAWINGS TO BE READ AS A SET.
2. DO NOT SCALE FROM DRAWINGS
3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal





# Stantec

STANTEC ARCHITECTURE  
 141 KELSEY DRIVE  
 ST. JOHN'S, NL A1B 0L2  
 Tel: (709) 576.1458 • [www.stantec.com](http://www.stantec.com)

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. Do NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



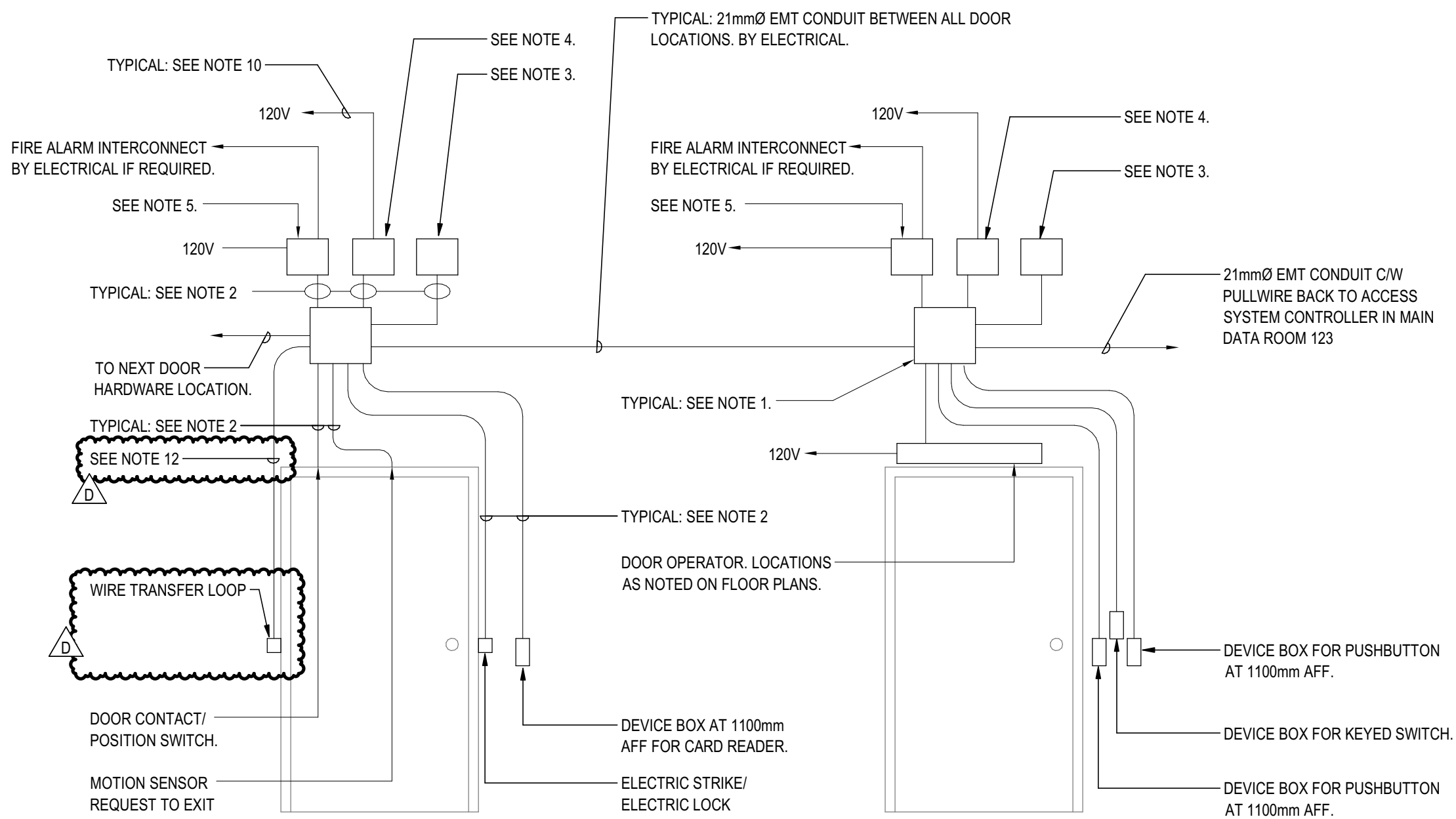
**MEMORIAL UNIVERSITY**

Department of Facilities Management

This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.

- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:	
<b>PRIMARY DATA CENTRE REPLACEMENT</b>	
CORE SCIENCE FACILITY ST. JOHN'S, NL	
MUN Project #: CSF-004-23	
DRAWING TITLE:	
<b>GENERAL PROJECT NOTES AND DETAILS</b>	
DESIGNED: <div style="text-align: center; margin-top: 10px;">JHH</div>	DRAWN: <div style="text-align: center; margin-top: 10px;">NH</div>
REVIEWED: <div style="text-align: center; margin-top: 10px;">-</div>	APPROVED: <div style="text-align: center; margin-top: 10px;">JHH</div>
SCALE: <div style="text-align: center; margin-top: 10px;">As indicated</div>	DATE: <div style="text-align: center; margin-top: 10px;">OCTOBER, 2024</div>
STANTEC PROJECT No.	DRAWING No.
133412008	<b>A100</b>

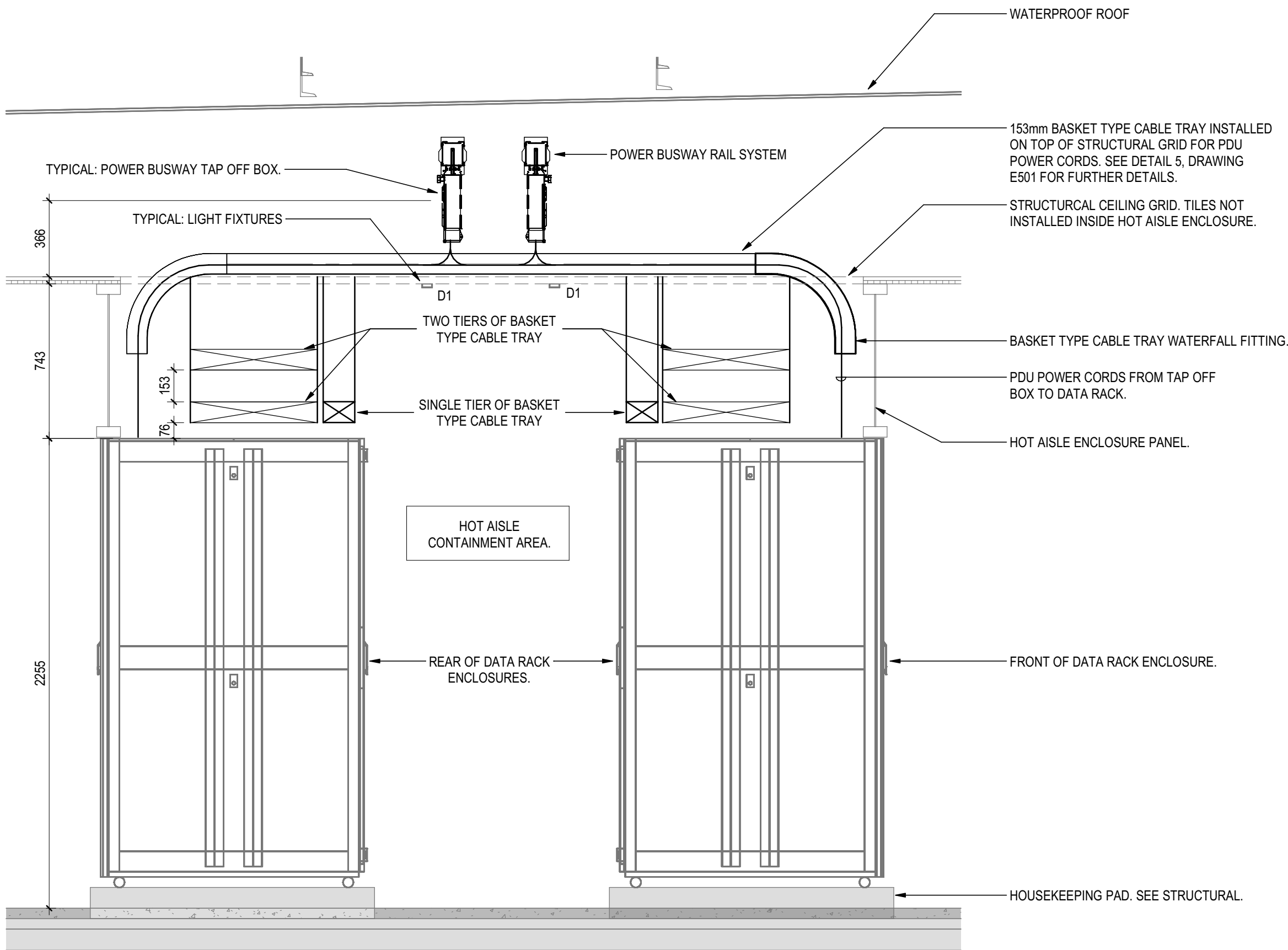


NOTES:

- 405mm X 405mm X 100mm PULL BOX IN CEILING SPACE ABOVE DOOR. PROVIDE 2' OF LOOPED WIRE AT EACH PULL BOX.
- 21mmØ EMT CONDUIT C/W PULL WIRE BY ELECTRICAL. WIRING BY DOOR HARDWARE CONTRACTOR.
- DOOR CONTROL DEVICE (DCD), BY DOOR HARDWARE CONTRACTOR.
- POWER SUPPLY FOR DCD (ONE FOR UP TO 5 DOORS WITHIN 50' RADIUS), BY DOOR HARDWARE CONTRACTOR.
- POWER SUPPLY FOR DOOR HARDWARE IF REQUIRED, BY DOOR HARDWARE CONTRACTOR.
- ALL FIRE ALARM INTERCONNECTS BY ELECTRICAL.
- ALL CONDUIT/BOXES/ROUGH-IN BY ELECTRICAL.
- ALL 120V WIRING AND CONNECTIONS BY ELECTRICAL.
- ALL LOW VOLTAGE WIRING AND DEVICES BY DOOR HARDWARE CONTRACTOR.
- 2 - #12 AWG RW90 COPPER CONDUCTORS PLUS 1 - #12 AWG COPPER BOND IN 21mmØ EMT CONDUIT FOR 120V POWER.
- COORDINATE EXACT ROUGH-IN REQUIREMENTS AT EACH DOOR LOCATION WITH DOOR HARDWARE INSTALLER PRIOR TO ROUGH-IN.
- 8C #22 CABLE IN 27MM EMT CONDUIT FROM DOOR CONTROLLER TO WIRE TRANSFER LOOP WHERE ELECTRIC LOCKS ARE TO BE INSTALLED.

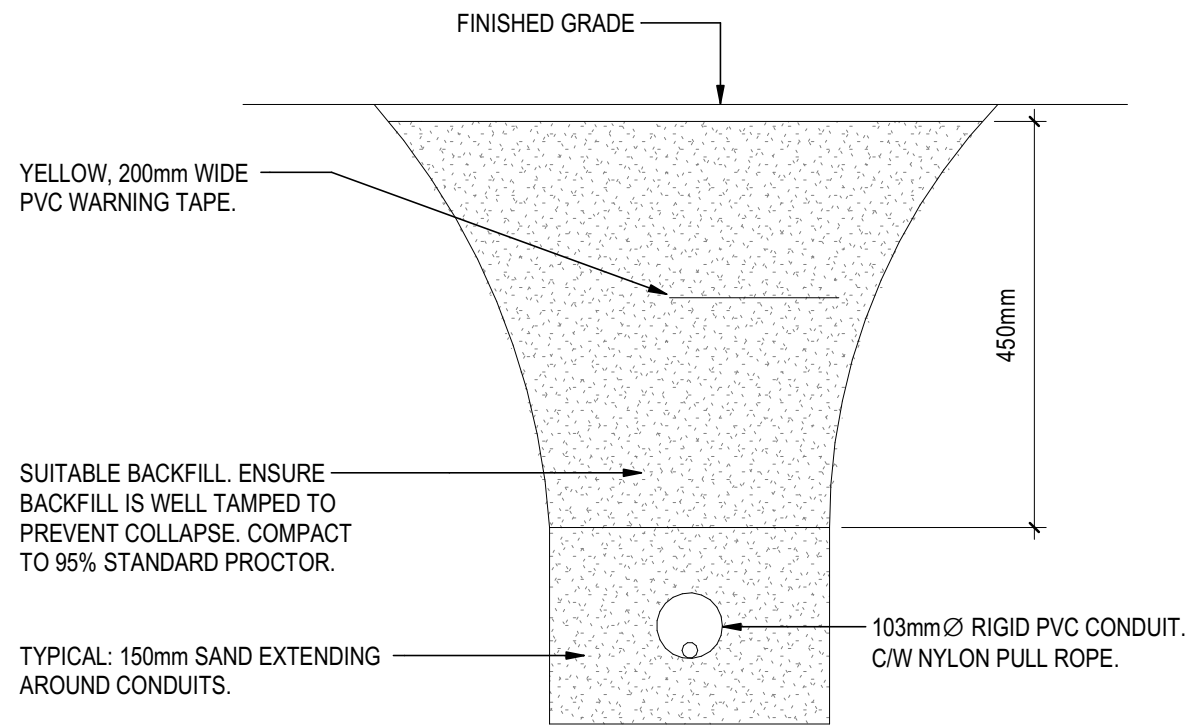
5 TYPICAL DOOR HARDWARE ROUGH-IN DETAIL

N.T.S.



4 SECTION VIEW - CSF-1320A

N.T.S.

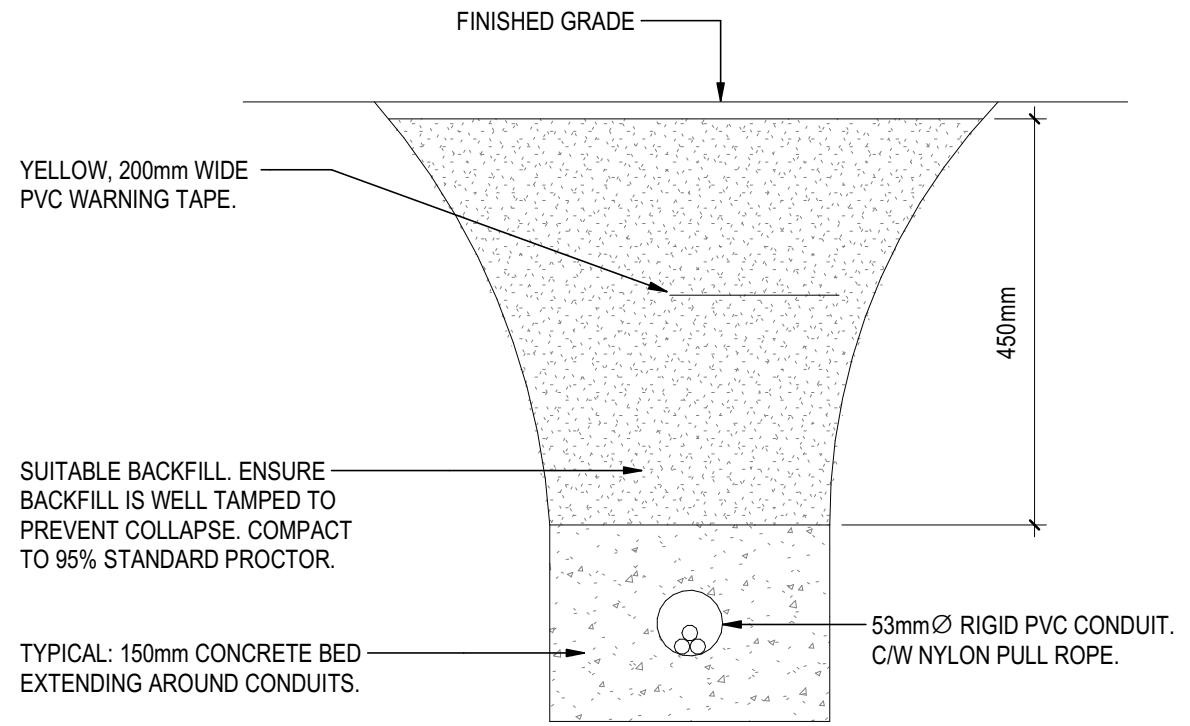


NOTES:

- PROVIDE CONDUIT SUPPORT SPACERS/CRADLES AT MAXIMUM 2m SPACINGS.

3 TYPICAL COMMUNICATION DUCT BANK DETAIL

N.T.S.

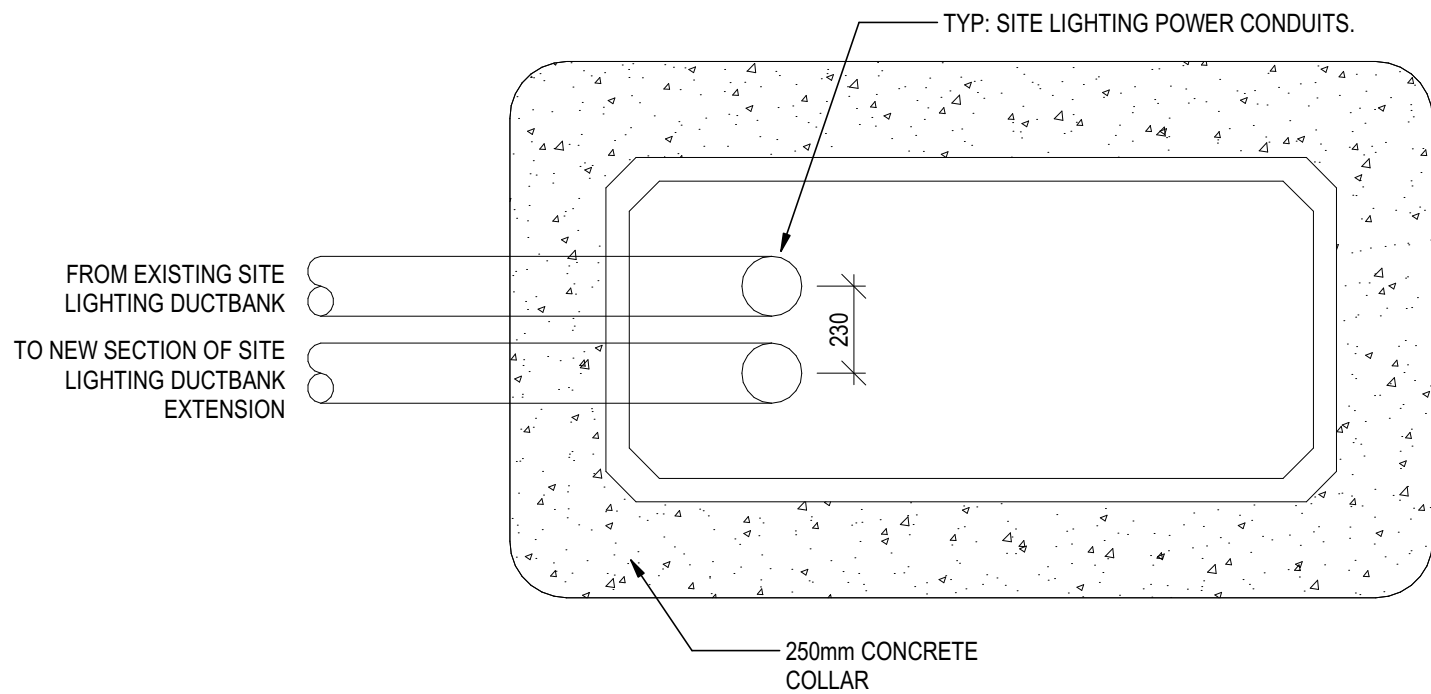


NOTES:

- PROVIDE CONDUIT SUPPORT SPACERS/CRADLES AT MAXIMUM 2m SPACINGS
- THIS DETAIL INDICATES A TYPICAL INSTALLATION. CONFIRM ON SITE THE EXISTING SITE LIGHTING DUCTBANK AND UPDATE TO SUIT.

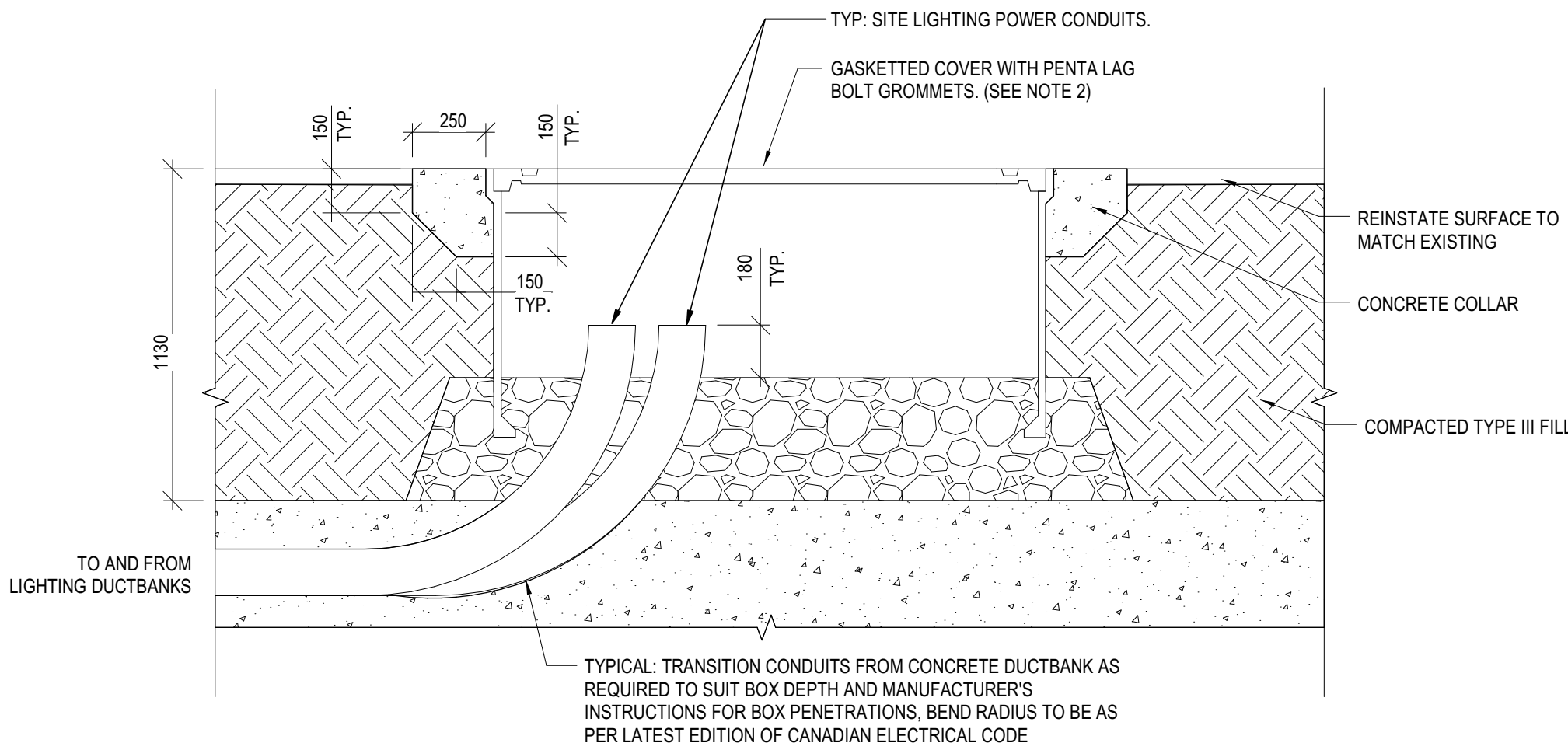
1 TYPICAL SITE LIGHTING DUCT BANK DETAIL

N.T.S.



NOTES:

- FLUSH MOUNTED TIER 22 PULL BOX COMPLETE WITH HEAVY DUTY TIER 22 RATED COVER FOR VEHICLE TRAFFIC C/W PENTA LAG BOLTS OR EQUIVALENT. SEE SPECIFICATION. PULL BOX TO BE MINIMUM 1828mm X 914mm X 914mm. FILL PULL BOX WITH CLASS A CRUSH STONE. PROVIDE 300mm OF CLASS A CRUSH STONE BELOW PULL BOX. CLASS A CRUSH STONE TO BE TAMPED IN 150mm LAYERS. PROVIDE ADDITIONAL BOX EXTENSIONS AS REQUIRED TO MEET DEPTH REQUIREMENTS.
- PULL BOX TO BE OPEN BOTTOM WITH GASKETED COVER.
- LABEL ALL DUCTS IN PULLBOXES WITH STAINLESS STEEL TAGS.



2 UNDERGROUND PULLBOX DETAIL

N.T.S.

A	A - DETAIL	A
B	B - LOCATION/DRAWING No.	B
	C - DRAWING No.	C

No.	REVISION	DATE
D	ISSUED FOR ADDENDUM NO. 8	2026.01.30
C	ISSUED FOR ADDENDUM NO. 5	2026.01.22
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

ENGINEERING PERMIT J0291

STANTEC CONSULTING LTD.

04642

Signature of Member Number (Member-in-Responsible Charge)

REGISTERED PROFESSIONAL ENGINEER

BERNIE ROBINSON

2026-01-29

NEWFOUNDLAND & LABRADOR



Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

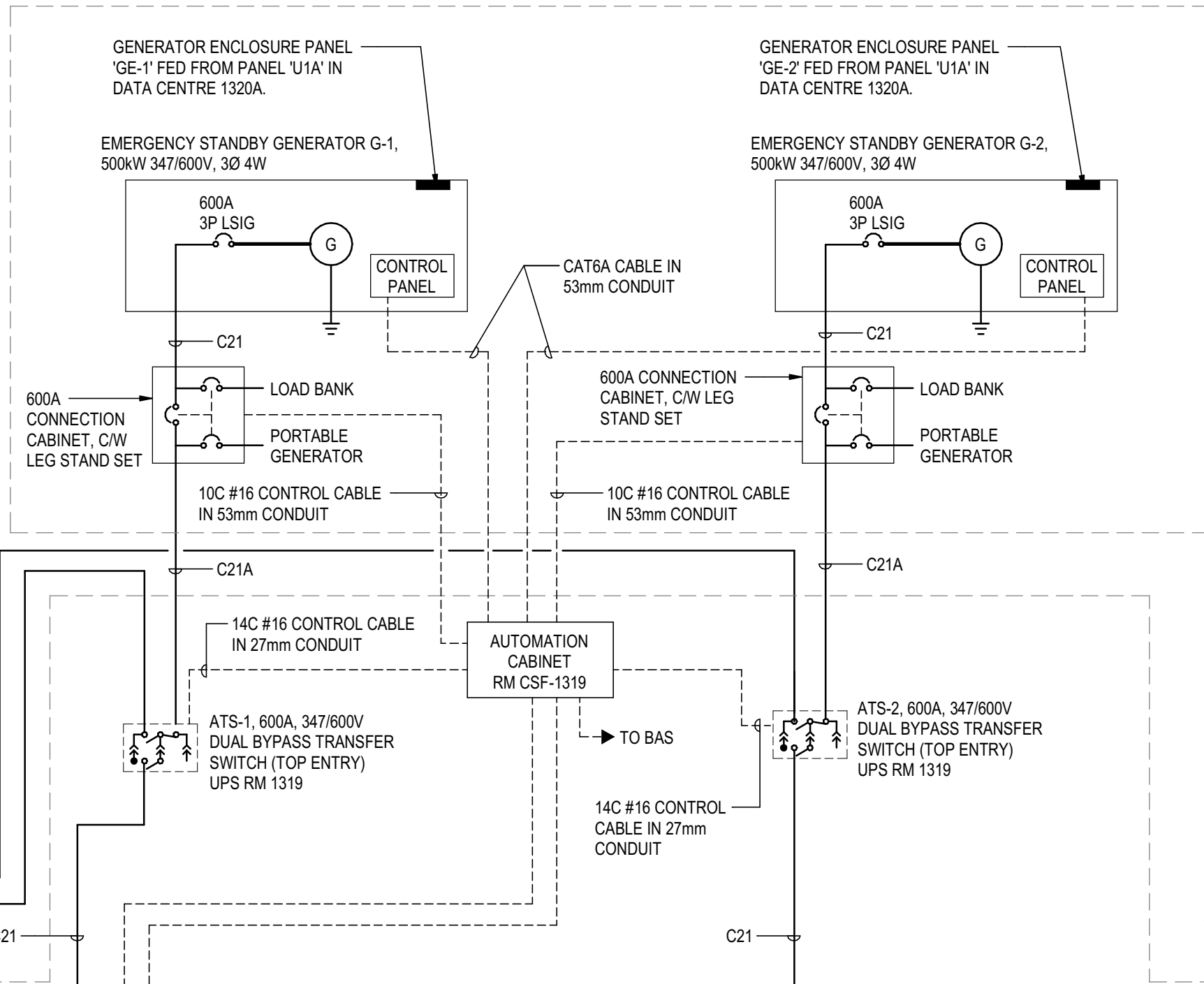
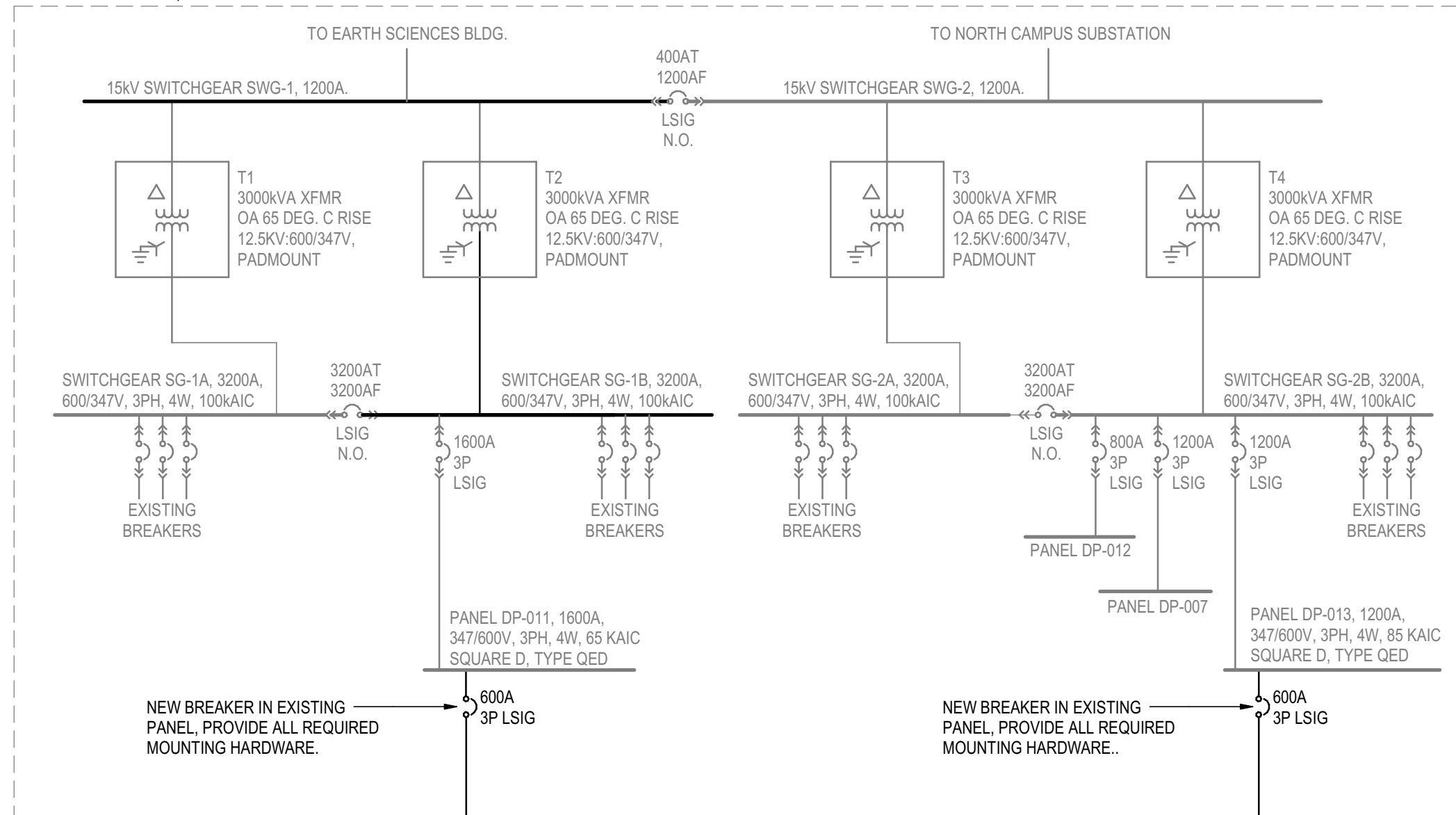
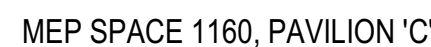
MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL DETAILS

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. <b>E505</b>





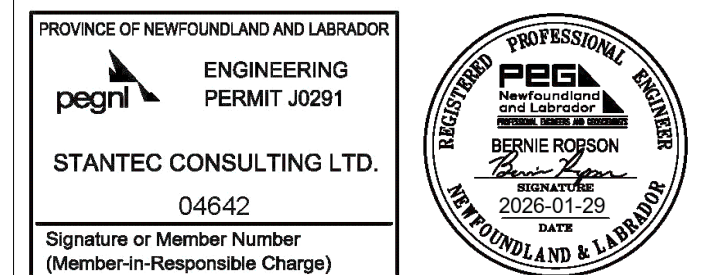
COPPER FEEDERS							
ID	NOMINAL CIRCUIT RATING	SETS	CONDUCTORS	BOND	CONDUIT W/ NEUTRAL (4W)	CONDUIT W/O NEUTRAL (3W)	MAXIMUM LENGTH*
C1	20	1	#12	#12	21 mm	21 mm	
C2	30	1	#10	#12	21 mm	21 mm	
C2A	30	1	#10	#12	53 mm	53 mm	U/G FEEDER
C3	40	1	#8	#10	21 mm	21 mm	
C4	50	1	#6	#10	27 mm	27 mm	
C5A	60	1	#6	#10	27 mm	27 mm	*BASED ON 75 DEGREE
C5B	60	1	#4	#10	35 mm	35 mm	*BASED ON 60 DEGREE
C6	70	1	#4	#8	35 mm	35 mm	
C7A	80	1	#4	#8	35 mm	35 mm	*BASED ON 75 DEGREE
C7B	80	1	#3	#8	35 mm	35 mm	*BASED ON 60 DEGREE
C8	90	1	#3	#8	35 mm	35 mm	
C9A	100	1	#3	#8	35 mm	35 mm	*BASED ON 75 DEGREE
C9B	100	1	#1	#6	41 mm	41 mm	*BASED ON 60 DEGREE
C9C	100	1	#3	#8	53 mm	53 mm	U/G FEEDER
C10	125	1	#1	#6	41 mm	41 mm	
C11	150	1	#1/0	#6	53 mm	41 mm	
C12	175	1	#2/0	#6	53 mm	53 mm	
C13	200	1	#3/0	#6	53 mm	53 mm	
C14	225	1	#4/0	#4	63 mm	53 mm	
C15	250	1	250 kcmil	#4	63 mm	63 mm	
C16	300	1	350 kcmil	#3	78 mm	63 mm	
C17	350	1	500 kcmil	#3	91 mm	78 mm	
C18	400	2	#3/0	#6	53 mm	53 mm	
C19	450	2	#4/0	#4	63 mm	53 mm	
C20	500	2	250 kcmil	#4	63 mm	63 mm	
C21	600	2	350 kcmil	#3	78 mm	63 mm	
C21A	600	2	350 kcmil	#3	103 mm	103 mm	U/G FEEDER
C22A	800	3	350 kcmil	#3	78 mm	63 mm	
C22B	800	4	#3/0	#6	53 mm	53 mm	
C23	900	3	350 kcmil	#3	78 mm	63 mm	
C24	1000	3	500 kcmil	#3	91 mm	78 mm	
C25	800	2	500 kcmil	#3	91 mm	78 mm	

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 8	2026.01.30
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

## GENERAL NOTES

1. DRAWINGS TO BE READ AS A SET.
2. DO NOT SCALE FROM DRAWINGS
3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND MAINTENANCE OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal



Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • [www.stantec.com](http://www.stantec.com)

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions.  
DO NOT scale the drawing - any errors or omissions shall be  
reported to Stantec without delay.



**Department of Facilities Management**

*This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.*

- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:

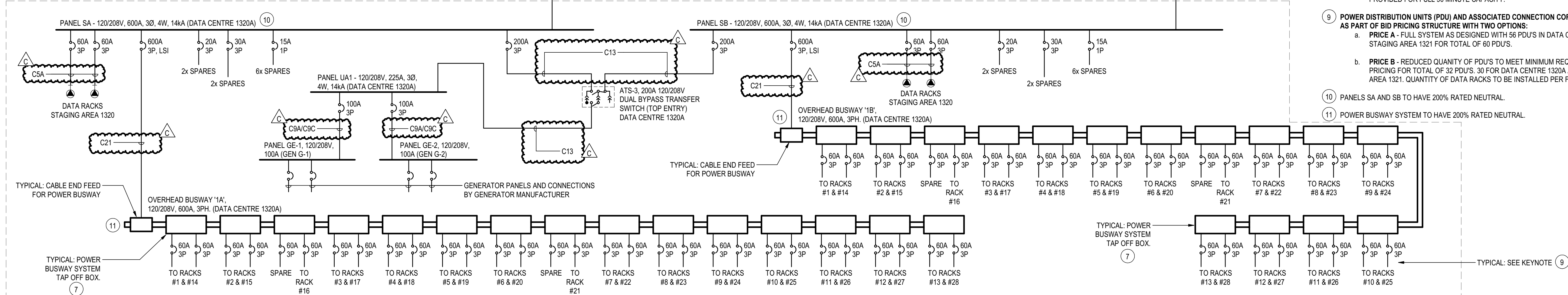
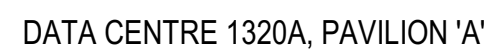
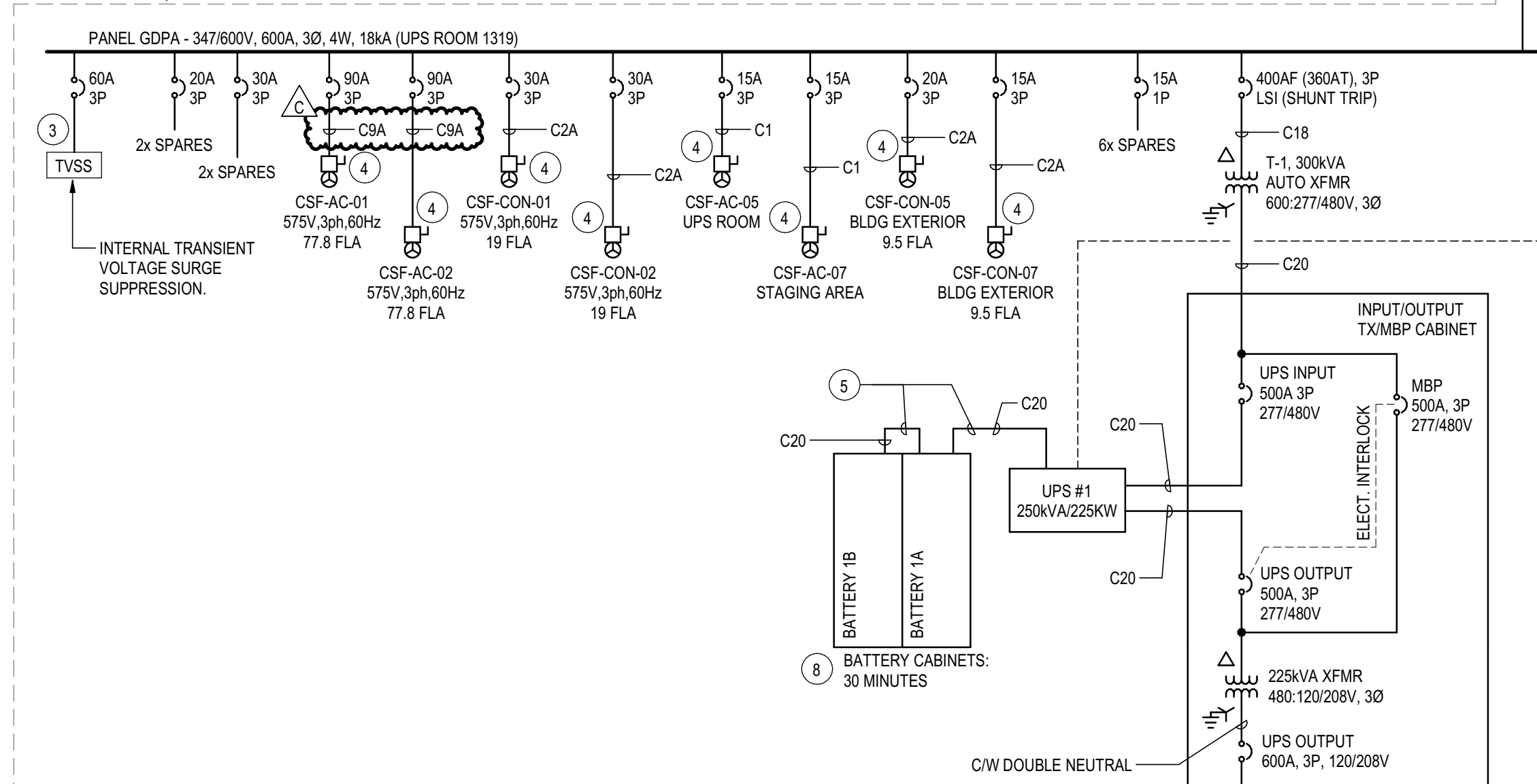
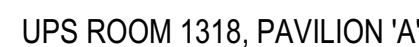
**PRIMARY DATA CENTRE  
REPLACEMENT**

CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: 1 : 1	DATE: SEPTEMBER, 2025
STANTEC PROJECT No.  133412008	DRAWING No.  <b>E601</b>



**PART 1**      **GENERAL**

**1.1**            **RELATED WORK**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 01 35 43 - Environmental Procedures.
- .3      Section 01 45 00 - Quality Control.
- .4      Section 01 61 00 - Common Product Requirements.
- .5      Section 01 74 00 - Cleaning.
- .6      Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7      Section 01 78 00 - Closeout Submittals.
- .8      Section 06 10 53 - Miscellaneous Rough Carpentry.
- .9      Section 07 92 00 - Joint Sealants.

**1.2**            **REFERENCES**

- .1      American Society for Testing and Materials (ASTM)
  - .1      ASTM C 1177/C1177M, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .2      ASTM C 1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - .3      ASTM C 1549, Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
  - .4      ASTM D 638, Standard Test Method for Tensile Properties of Plastics.
  - .5      ASTM D 1004, Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
  - .6      ASTM D 6878/D 6878M, Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
- .2      Canadian General Standards Board (CGSB).

- .1 CAN/CGSB - 51.33 Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .3 Canadian Roofing Contractor's Association (CRCA)
  - .1 CRCA Specification Manual.
- .4 Underwriters Laboratories' of Canada (ULC)
  - .1 CAN/ULC-S701, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702.2, Standard for Mineral Fibre Thermal Insulation for Buildings.
  - .3 CAN/ULC-S704, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

### **1.3 SUBMITTALS**

- .1 Product Data
  - .1 Provide membrane manufacturer's printed data to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements. Include data for each product used in conjunction with roofing membrane.
  - .2 Provide documentation to show the roofing system complies with the wind uplift performance requirements.
- .2 Shop Drawings
  - .1 Provide manufacturer's drawings showing layout, details of construction, identification of materials, membrane fastener pattern and spacing, membrane penetration details.
  - .2 Provide layout for tapered insulation
  - .3 Indicate in shop drawings flashings, control joints, tapered insulation details, roof drains and all required roofing materials.
- .3 Submit manufacturer's certification letter stating the contractor is an authorized installer of the manufacturer's roofing system.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Refer to Section 01 61 00 - Common Product Requirements for storage and handling requirements.
- .2 Deliver roofing materials to site in original, sealed containers with manufacturer's name, brand name and installation instructions intact and legible.

- .3 Store materials off-ground in weatherproof storage.
- .4 Store materials in upright position. Store membrane rolls with selvage edge up, store as per manufacturer's requirements to meet warranty.
- .5 Remove only in quantities required for same day use.
- .6 Place plywood runways over work to protect work and enable work flow.
- .7 Store adhesives and sealants between 15°C and 25°C. If exposed to lower temperature, restore to 15°C minimum temperature before using.
- .8 Store insulation protected from daylight, weather and deleterious materials.

#### **1.5 COMPATIBILITY**

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Owner stating that materials and components, as assembled in system, meet this requirement.

#### **1.6 QUALITY ASSURANCE**

- .1 Provide certificate signed by roofing manufacturer verifying that installer is approved, authorized and/or licensed by manufacturer to install specified products and is eligible to obtain the specified warranty of the section.
- .2 Applicators: minimum 5 years proven experience.
- .3 Manufacturer's representative:
  - .1 Inspect roofing system at the start of construction, midway and as required for commissioning. Additional inspections may be carried out at the discretion of the Roofing System Manufacturer.
  - .2 Provide technical assistance where required to correct installation of roofing system.
  - .3 Provide manufacturer's written acceptance of roofing installation based on specified inspections.
- .4 Refer to Section 01 33 00 – Submittal Procedures and Section 01 45 00 - Quality Control for submission procedures.



## **1.7 JOB CONDITIONS**

- .1 When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- .2 Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommendations. Install roofing only dry conditions and forecasted weather conditions.
- .3 Proceed with work so new roofing materials are not subject to construction traffic. When necessary, provide protection for new roof sections. Inspect upon completion for possible damage.
- .4 Surfaces on which the roofing components (insulation, roofing membranes) is to be applied shall be clean, smooth, dry and free from projections or contaminations.
- .5 New roofing shall be complete and weathertight at the end of the work day.
- .6 Contaminates such as grease, fats, and oils shall not be allowed to come in direct contact with the roofing membrane.

## **1.8 MOCK-UP**

- .1 If requested construct mock-up in accordance with Section 01 45 00 – Quality Control.
- .2 Mock up to be 10 m<sup>2</sup> minimum size showing typical membrane lap joint, one inside and one outside corner parapet flashing. Insulation and fastening method, air/vapour barrier lap, cover board and fastening method and workmanship.

## **1.9 WARRANTY**

- .1 Provide a written guarantee signed and issued in the name of The Owner by the Roofing System Manufacturer stating that roofing system is free from manufacturing defects and that the system will stay in place and remain leak proof for a period of twenty (20) years from date of Substantial Certificate of Completion, subject to the standard limitations and conditions of the manufacturer.
- .2 Provide a written guarantee, signed and issued in the name of the Owner by the Contractor, stating that the roofing application has been performed in compliance with the plans and specifications, and for two (2) years from

the date of Substantial Certificate of Completion, the Contractor shall repair, at no expense to the Owner, any defects which result of a failure to comply with the plans and specifications.

- .3 Defective work shall include, but not limited to: leaking, wind uplift, delamination of roofing materials, reduction of thermal value due to moisture in insulation, crazing and ridging.
- .4 Warranty to be non-prorated.

## **PART 2      PRODUCTS**

### **2.1      DECK COVER**

- .1 Deck Cover: Pre-primed glass mat faced gypsum panel non-asphaltic, highly filled proprietary heat-cured coating on one side, to ASTM C1177, 12.7 mm thick.
- .2

### **2.2      TPO MEMBRANE MATERIALS**

- .1 Thermoplastic Polyolefin (TPO) Membrane:
  - .1 To ASTM D 6878, internally fabric or scrim reinforced, uniform, flexible fabric backed TPO sheet, minimum 2.0 mm nominal thickness. Colour, Grey.
  - .2 TPO membrane properties:
    - .1 Breaking Strength: minimum 1.9 kN.
    - .2 Elongation of Reinforcement Break: 25%.
    - .3 Tearing Strength: minimum 530 N.
    - .4 Brittleness Point: Pass.
    - .5 Ozone Resistance: Pass.
    - .6 Water Absorption Resistance: < 3%.
    - .7 Puncture Resistance: minimum 450 kN.
    - .8 Sheet size: 2.4 m x 30 m.
  - .3 TPO Radiative properties (Initial/3 Years):
    - .1 Solar Reflectance (CRRC): minimum 0.34/0.34
    - .2 Thermal Emittance (CRRC): minimum 0.89/0.88
    - .3 Solar Reflectance Index (SRI): minimum 37/36



- .4 Install contrasting colour TPO sheet, minimum 1.8 m wide, along the entire perimeter of all roof sections. Colour to be as per Owner selection from manufacturer's standard colour range.

## **2.3 SHEET FLASHING**

- .1 Manufacturer's standard unreinforced TPO sheet flashing, minimum 1.4 mm thick, same colour as TPO membrane sheet.

## **2.4 MOLDED FLASHING ACCESSORIES**

- .1 Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc., same colour as TPO membrane sheet.

## **2.5 MEMBRANE ADHESIVES**

- .1 High strength, Low VOC, solvent based rubber contact adhesive for use in interior environments.
  - .1 VOC level <250g/l

## **2.6 FASTENERS**

- .1 Fasteners: minimum #14 mechanical fasteners made of case-hardened carbon steel with corrosion resistance coating, complying with FM standards. 75 mm diameter round or hexagon stress plates complying with CSA B35.3 and FM 4470 approval standards, diameter and lengths as required to suit total assembly thickness. Ensure fasteners have the following deck penetration:
  - .1 For concrete decks: minimum 25 mm.
  - .2 For wood decks: minimum 25 mm.
  - .3 For metal decks: minimum 19 mm and maximum 25 mm longer than assembly being secured. Fasteners to engage metal deck top flange. At gymnasium locations, fastener points of all fasteners to be removed.
- .2 Insulation and cover boards adhesive: single-component, moisture cured, solvent free polyurethane adhesive, dispensed from a portable disposable pre-pressurized container.

## **2.7 ROOF DRAINS**

- .1 As per section 22 05 15 – Plumbing Specialties and Accessories.

- .2 Trench Drain: 100mm wide x 50mm deep (min) with 1:100 slope to drain

## **PART 3      EXECUTION**

### **3.1      WORKMANSHIP**

- .1 Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual, except where specified otherwise.
- .2 Comply with manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.
- .3 Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.
- .4 Install roofing membrane only when surfaces are clean, dry, smooth and free of snow, ice. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application.

### **3.2      PROTECTION**

- .1 Cover walls and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of work.
- .3 Clean off drips and smears of adhesive material immediately.
- .4 Protect roof from traffic and damage.
- .5 Take necessary measures ensuring no penetration of the elements will occur to the building after commencement of work, including but not limited to water.
- .6 Only remove quantities of existing roofing material and install quantities of new roofing materials per day that can be covered with waterproofing membranes.

### **3.3      EXAMINATION ROOF DECKS**

- .1 Examine roof decks and immediately inform of Owner in writing of defects.
- .2 Prior to commencement of work ensure:

- .1 Decks are firm, straight, smooth, dry, and free of snow, ice or frost, and swept clean of dust and debris.
  - .2 Curbs have been built. Coordinate height of roof curbs with Section 06 10 53 – Miscellaneous Rough Carpentry.
  - .3 Roof drains have been installed at proper elevations relative to finished roof surface.
  - .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall.

### **3.4 MEMBRANE ROOFING APPLICATION (METAL ROOF DECK)**

- .1 Deck Cover and Air/Vapour Barrier:
  - .1 Place deck cover with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.
  - .2 Secure deck cover to metal deck using one (1) fastener per board, located at the centre of the board, fasteners to be FMRC approved..
  - .3 Fit butt edge joints in firm contact with one another.
- .2 Membrane Placement and Attachment
  - .1 Fully Adhered System:
    - .1 Unroll membranes and allow to relax for installing.
    - .2 Layout the membrane pieces so that the field and flashing splices are installed to shed water.
    - .3 Apply membrane adhesive to the underside of the membrane and the corresponding substrate at rates required by the manufacturer. Do not apply adhesive to the splice edge of the membrane.
    - .4 Allow adhesive to set as per the adhesive manufacturer's instructions.
    - .5 Roll coated membrane unto coated substrate, avoiding wrinkles. Brush down bonded section of membrane into adhesive with a soft bristle push broom to achieve maximum contact.
    - .6 Clean seam areas, overlap roof membrane and hot-air weld all side and end laps of roofing membrane and sheet flashings, to ensure a watertight seam installation.
- .3 Flashings:

- .1 Install sheet flashings and molded flashings accessories the same day as roofing membrane. Adhere to substrates in accordance with roofing manufacturer's written instructions.

### **3.5 CLEANING**

- .1 Perform in accordance with Section 01 74 00 - Cleaning.
- .2 Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.

**END OF SECTION**

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 8  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Wednesday, January 28, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 The General Conditions shall govern all phases of the Work covered by this Addendum.
- .2 Acknowledge receipt of this addendum in the Tender and Acceptance form.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Not Applicable

### 1.6 CHANGES TO SPECIFICATION

- .1 Section 01 11 00 – Summary of Works
- .1 Reference: 1.3 Work Covered by Contract Documents
- .1 Modify Clause 1.3.5 as follows:
- “.5 Eaton has been preselected as the acceptable manufacturer for all the systems listed under 1.3.4 above. **Alternate products to those specified will not be accepted.**”
- .2 Section 01 25 00 - Substitution Procedures

.1 Reference: 1.5 Action Submittals

.1 Modify Clause 1.5.1.3.1 as follows:

“.1 During Tender period: Addenda. Note that requests for substitutions for equipment and materials listed under Section 01 11 00, Summary of Work, Clause 1.3.4 **will not be entertained**. Bidders must provide the equipment and materials listed as the approved products in the applicable specification sections.”

.3 Section 01 61 00 - Common Product Requirements

.1 Reference: 1.19 Substitution of Material and Equipment

.1 Modify Clause 1.19.1 as follows:

“.1 Substitution for items listed under 01 11 00, Summary of Work, Clause 1.3.4, **will not be considered**.”

1.7 QUESTIONS AND RESPONSES

.1 **Question** –

“We are also wondering about the use of a mobile crane or a spider crane for the erection of the steel structure inside the building. Is this north door the only access for material and personnel. If so, do you know the dimensions for the door? As we will need some sort of device to do the erection.”

**Answer** – Approximate door frame sizes in the area requested are listed below –

Single door exiting Level 1 Pavilion A shell space to the exterior of the North side of the building:

– Width - 34 ¾”, Height – 83”

Double Doors on level 1 between Pavilion A shell space and the hallway to the whale atrium:

– Width – 80”, Height – 95”

Double doors on Level 1, Main building entrance contain a series of double doors of similar dimensions leading from the exterior North side of the building into the whale atrium. One set of double doors within this series:

– Width – 61 ½”, Height – 82 ½”

.2 Request for pictures inside the MDF room in the area where the cable tray enters the room. Please refer to the pictures attached to the document.

**END OF ADDENDUM**



MDF Room doorway looking West







MDF Room doorway looking North





MDF Room North-West Corner  
looking East. Approximate area  
where cable tray enters room







## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 6  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Monday, January 26, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 The General Conditions shall govern all phases of the Work covered by this Addendum.
- .2 Acknowledge receipt of this addendum in the Tender and Acceptance form.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Not Applicable

### 1.6 CHANGES TO SPECIFICATION

- .1 Division 0 – Procurement and Contracting Requirements  
Part 1 – Submission Instructions  
.1 Addition of Clause 1.11 Stipulated Price Contract

#### **1.11 Stipulated Price Contract**

The successful bidder will be required to sign the Department of Facilities Management General Conditions and Agreement Between Owner and Contractor for the Stipulated Price Contract upon receipt of the pre-award letter.

- .2 General Conditions and Agreement Between Owner and Contractor for The Stipulated Price Contract

- .1 Replace the document with the attached updated version

1.7 QUESTIONS AND RESPONSES

- .1 Not Applicable

**END OF ADDENDUM**



**DEPARTMENT OF FACILITIES MANAGEMENT**

**GENERAL CONDITIONS**

**AND**

**AGREEMENT BETWEEN OWNER AND CONTRACTOR**

**FOR**

**THE STIPULATED PRICE CONTRACT**

JANUARY 2026

**DEPARTMENT OF FACILITIES MANAGEMENT**  
**GENERAL CONDITIONS AND AGREEMENT**  
**BETWEEN OWNER AND CONTRACTOR FOR THE STIPULATED PRICE CONTRACT**

**TABLE OF CONTENTS**

<b>1.0</b>	<b>DEFINITIONS.....</b>	<b>3</b>
<b>2.0</b>	<b>GENERAL CONDITIONS.....</b>	<b>6</b>
2.1.0	INTENTIONALLY LEFT BLANK.....	6
2.2.0	DOCUMENTS .....	6
2.3.0	ADDITIONAL INSTRUCTIONS AND SCHEDULE OF WORK .....	7
2.4.0	ENGINEER/ARCHITECT'S DECISIONS.....	7
2.5.0	DELAYS.....	8
2.6.0	OWNER'S RIGHT TO PERFORM WORK, STOP WORK AND/OR TERMINATE CONTRACT .....	9
2.7.0	CONTRACTOR'S RIGHT TO STOP WORK AND/OR TERMINATE CONTRACT ..	11
2.8.0	OTHER CONTRACTORS .....	11
2.9.0	ASSIGNMENT .....	12
2.10.0	SUBCONTRACTORS .....	12
2.11.0	DISPUTES .....	13
2.12.0	INDEMNIFICATION .....	14
2.13.0	CHANGES IN THE WORK AND EXTRA WORK.....	14
2.14.0	VALUATION AND CERTIFICATION OF CHANGES IN THE WORK.....	15
2.15.0	APPLICATION FOR PAYMENT .....	17
2.16.0	CERTIFICATES AND PAYMENTS .....	18
2.17.0	TAXES AND DUTIES .....	22
2.18.0	LAWS, NOTICES, PERMITS AND FEES.....	22
2.19.0	PATENT FEES.....	23
2.20.0	WORKERS' COMPENSATION .....	24
2.21.0	LIABILITY INSURANCE.....	24
2.22.0	PROPERTY INSURANCE.....	26
2.23.0	PROTECTION OF WORK AND PROPERTY .....	28
2.24.0	DAMAGES AND MUTUAL RESPONSIBILITY .....	29
2.25.0	BONDS.....	29
2.26.0	WARRANTY .....	30
2.27.0	CONTRACTOR'S RESPONSIBILITIES AND CONTROL OF THE WORK .....	30
2.28.0	PROJECT MANAGEMENT AND SUPERINTENDENCE .....	31
2.29.0	LABOUR AND PRODUCTS .....	32
2.30.0	SUBSURFACE CONDITIONS .....	33
2.31.0	USE OF THE WORK.....	33
2.32.0	CUTTING AND REMEDIAL WORK.....	34
2.33.0	INSPECTION OF WORK .....	34
2.34.0	REJECTED WORK .....	35
2.35.0	SHOP DRAWINGS AND SAMPLES .....	35
2.36.0	TESTS AND MIX DESIGNS.....	36
2.37.0	MATERIALS AND SUBSTITUTIONS .....	37
2.38.0	TIME OF ESSENCE AND SCHEDULE.....	37

2.39.0	CASH ALLOWANCE .....	37
2.40.0	CLEANUP AND FINAL CLEANING OF THE WORK .....	38
<b>3.0</b>	<b>SUPPLEMENTARY GENERAL CONDITIONS.....</b>	<b>39</b>
<b>4.0</b>	<b>SPECIAL CONDITIONS.....</b>	<b>40</b>
4.1.0	LAYOUT OF WORK .....	40
4.2.0	JOB SIGN.....	40
4.3.0	TEMPORARY OFFICES AND SHEDS.....	40
4.4.0	TEMPORARY SERVICES.....	41
4.5.0	PLANT AND MACHINERY .....	42
4.6.0	PROTECTION OF PUBLIC AND WORKMEN.....	42
4.7.0	CONSTRUCTION SCHEDULE .....	42
4.8.0	OPERATIONS AND MAINTENANCE DATA .....	43
4.9.0	COORDINATION OF WORK.....	44
4.10.0	TRAFFIC MAINTENANCE .....	44
4.11.0	FIRE PROTECTION .....	44
4.12.0	JOB MEETINGS .....	44
4.13.0	AS-BUILT DRAWINGS.....	45
4.14.0	COMPLETION TIME .....	45
4.15.0	CLOSE DOWN OF WORK .....	46
4.16.0	BROKEN GLASS .....	46
4.17.0	HOARDING .....	46
4.18.0	COMMISSIONING.....	46
4.19.0	FINAL CLEAN-UP .....	46
<b>5.0</b>	<b>CAMPUS SAFETY AND HEALTH REGULATIONS.....</b>	<b>56</b>
5.1.0	REGULATIONS, CODES AND STANDARDS.....	56
5.2.0	GENERAL SAFETY REGULATIONS.....	56
<b>6.0</b>	<b>CONTRACTOR PERFORMANCE EVALUATION .....</b>	<b>58</b>
<b>7.0</b>	<b>SIGNATURE PAGE.....</b>	<b>59</b>

## **1.0 DEFINITIONS**

### **1.1.1 Contract Documents**

The Contract Documents consist of the Instructions to bidders, Executed Agreement between the Owner and the Contractor, General Conditions of Contract, Supplementary General Conditions of Contract, Special Conditions, Campus Safety and Health Regulation, , Specifications, Drawings and such other documents forming part of the open call, including all amendments thereto incorporated before their execution and subsequent amendments thereto made pursuant to the provisions of the Contract or agreed upon between the parties. The successful bid and any Addenda to the Specifications issued during the bidding period shall also form part of the Contract Documents.

### **1.1.2 Owner, Engineer/Architect, Contractor**

The Owner, Engineer/Architect and Contractor are the persons, firms or corporation identified as such in the Agreement. The term Owner, Engineer/Architect and Contractor means the Owner, Engineer/Architect and Contractor or their authorized representatives as designated by each party in writing.

### **1.1.3 Subcontractors**

A Subcontractor is a person, firm or corporation having a direct contract with the Contractor to perform a part or parts of the Work included in the Contract, or to supply products worked to a special design according to the Contract Documents but does not include one who merely supplies products not so worked.

### **1.1.4 The Project**

The Project is the total construction contemplated of which the Work performed under the Contract Documents may be the whole or a part.

### **1.1.5 The Work**

The Work means the total construction and related services required by the Contract Documents.

### **1.1.6 Place of Work**

The Place of Work is the designated site or location of the project of which the Work may be the whole or a part.



#### **1.1.7 Products/Materials/Equipment**

The term Products/Materials/Equipment means all materials, machinery, equipment and fixtures forming the Work as required by the Contract Documents but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work and normally referred to as construction machinery and equipment.

#### **1.1.8 Other Contractor**

The term Other Contractor means any persons, firm or corporation employed by or having a separate contract directly or indirectly with the Owner for Work other than that required by the Contract Documents.

#### **1.1.9 Time**

- a) The Contract Time is the time stated in the Open Call for Bid and Acceptance Form for substantial performance of the Work.
- b) The date of substantial performance of the Work is the date certified by the Engineer/Architect.
- c) The term day, as used in the Contract Documents, shall mean the calendar day.
- d) The term working day means any day observed by the construction industry in the area of the place of the Work.

#### **1.1.10 Substantial Performance of the Work**

A Contract shall be deemed to be substantially performed:

- a) When the Work or a substantial part thereof is ready for use or is being used for the purpose intended; and
- b) When the Work to be done under the Contract is capable of completion or correction at a cost of not more than:
  - (i) 3% (Three per centum) of the first two hundred and fifty thousand dollars (\$250,000) of the Contract Price;
  - (ii) 2% (Two per centum) of the next two hundred and fifty thousand dollars (\$250,000) of the Contract Price; and
  - (iii) 1% (One per centum) of the balance of the Contract Price.

- c) When the Work or a substantial part thereof is ready for use or is being used for the purpose intended and where the Work cannot be completed expeditiously for reasons beyond the control of the Contractor, the value of the remaining Work to be completed shall be deducted from the Contract Price in determining substantial performance. As per Section 4.19.0, Substantial Performance will not be issued until the final commissioning of the Work has been successfully completed.
- d) In all cases, time is of the essence regarding substantial performance.

#### **1.1.11 Total Performance of the Work**

Total Performance of the Work shall mean when the entire Work except those items arising from the provision **2.26.0 WARRANTY** has been performed to the requirements of the Contract Documents and is so certified by the Engineer/Architect.

#### **1.1.12 Changes in the Work**

Changes in the Work means additions, deletions or other revisions to the Work within the general scope of Work as contemplated by the Contract Documents.

#### **1.1.13 Extra Work**

Extra Work means any additional work or service, the performance of which is beyond the scope of Work as contemplated by the Contract Documents.

## **2.0 GENERAL CONDITIONS**

### **2.1.0 INTENTIONALLY LEFT BLANK**

### **2.2.0 DOCUMENTS**

**2.2.1** The Contract Documents shall be signed by the Owner and by the Contractor, in accordance with Part 1 – Submission Instructions, Open Call for Bids. A digital copy of the executed Stipulated Price Contract will be provided to the Contractor.

**2.2.2** Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

**2.2.3** In the event of conflicts between Contract Documents, the following shall apply:

- a) Documents of later date shall govern;
- b) Figured dimensions shown on the drawings shall govern even though they may differ from scaled dimensions on the same drawing;
- c) Drawings of larger scale shall govern over those of smaller scale of the same date;
- d) Specifications shall govern over drawings;
- e) Special Conditions shall govern over Specifications;
- f) The General Conditions of Contract shall govern over Specifications;
- g) Supplementary General Conditions shall govern over the General Conditions of the Contract;
- h) The Executed Agreement between the Owner and the Contractor shall govern over all documents.

**2.2.4** The Contractor will be provided, without charge, up to three (3) sets of Contract Documents or parts thereof as are reasonably necessary for the performance of the Work. A .pdf version of the contract documents will also be provided, at the Contractor's request.

**2.2.5** The Contractor shall keep a copy of all current Contract Documents and shop drawings on the site, in good order and available to the Engineer/Architect and or their representatives.

**2.2.6** Drawings, specifications, models and copies thereof furnished to the Contractor are to be used only with respect to the Work. Such documents and models are

not to be otherwise used or revised in any manner without the written authorization of the Owner.

**2.2.7** Models furnished by the Contractor at the Owner's request and expense are the property of the Owner.

**2.2.8** Models furnished by the Contractor that have not been requested by the Owner are at the expense of the Contractor.

### **2.3.0 ADDITIONAL INSTRUCTIONS AND SCHEDULE OF WORK**

**2.3.1** During the progress of the Work, the Engineer/Architect shall furnish to the Contractor such additional instructions as may be necessary to supplement the Contract Documents. All such instructions shall be consistent with the intent of the Contract Documents.

**2.3.2** Additional instructions may include minor changes to the Work which affect neither the Contract Price nor the Contract Time.

**2.3.3** Additional instructions may be in the form of drawings, samples, models or written instructions.

**2.3.4** Additional instructions will be issued by the Engineer/Architect with reasonable promptness and in accordance with any schedule agreed upon for such instructions.

**2.3.5** The Contractor shall prepare and update, as required, a construction schedule indicating the timing of major activities of the Work. The schedule shall be designed to conform with the Contract Time. The schedule shall be submitted to the Engineer/Architect within seven (7) days of the date of the Owner's letter of award. The Contractor shall monitor the progress of the Work relative to the schedule and advise the Engineer/Architect of any revisions required as a result of delays, as provided for in 2.5.0 DELAYS, and indicating what action will be taken to complete the Work within the Contract Time.

### **2.4.0 ENGINEER/ARCHITECT'S DECISIONS**

**2.4.1** The Engineer/Architect, in the first instance, shall decide on questions arising under the contract Documents and interpret the requirements therein. Such decisions shall be given in writing.

**2.4.2** The Contractor shall notify the Engineer/Architect in writing within fourteen (14) days of receipt of a decision of the Engineer/Architect referred to in 2.4.1, if the Contractor believes that a decision by the Engineer/Architect is in error and/or at variance with the Contract Documents. Unless the Contractor fulfils this requirement, subsequent claims by them for extra compensation arising out of the decision will not be accepted.

- 2.4.3** If the question of error and/or variance is not resolved immediately, and the Engineer/Architect decides that the disputed work shall be carried out, the Contractor shall act according to the Engineer/Architect's written decision and carry out the disputed work.

Any questions of change in Contract Price and/or extension of Contract Time due to such error and/or variance shall be decided as provided in **2.11.0 DISPUTES**.

In the absence of an Engineer/Architect, the Owner's decisions will prevail.

## **2.5.0 DELAYS**

- 2.5.1** If it can be clearly shown that the Contractor is delayed in the performance of the Work by any act or fault of the Owner, Engineer/Architect, then the Contract Time shall be extended for such reasonable time as the Engineer/Architect may decide in consultation with the Owner and the Contractor. The Contractor shall be entitled to be reimbursed for any costs incurred by them as a result of such a delay occasioned by the act or fault, provided that it can be clearly shown that the Contractor's forces cannot work efficiently elsewhere on the project and that the incurred cost is limited to that which could not reasonably have been avoided.
- 2.5.2** If the Contractor is delayed in the performance of the Work by a Stop Work Order issued by any court or other public authority and providing that such order was not issued as the result of any act or fault of the Contractor or of anyone employed by them directly or indirectly then the Contract Time shall be extended for such reasonable time as the Engineer/Architect may decide in consultation with the Contractor.
- 2.5.3** If the Contractor is delayed in the performance of the Work by civil disorders, labour disputes, strikes, lockouts, (including lockouts decreed or recommended for its members by a recognized Contractor's Association, of which the Contractor is a member) fire, unusual delay by common carriers or unavoidable casualties, or without limit to any of the foregoing, by any cause of any kind whatsoever beyond the Contractor's control, then the Contract Time shall be extended for such reasonable time as may be decided by the Engineer/Architect in consultation with the Owner and the Contractor, but in no case shall the extension of time be less than the time lost as the result of the event causing the delay, unless such shorter extension of time be agreed to by the Contractor.
- 2.5.4** No extension shall be made for delays unless written notice of claims is given to the Engineer/Architect within fourteen (14) days of its commencement, providing that in the case of the continuing cause of delay one notice shall be necessary.
- 2.5.5** If no schedule is provided under **2.3.0 ADDITIONAL INSTRUCTIONS AND SCHEDULE OF WORK**, no claim for delay will be considered because of failure to furnish instructions until fourteen (14) days after a demand for such instructions had been made and not then unless such claim is reasonable.

No extension shall be made for delays unless written notice of claims is given to the Engineer/Architect within fourteen (14) days of its commencement, providing that in the case of the continuing cause of delay one notice shall be necessary.

If no schedule is provided under **2.3.0 ADDITIONAL INSTRUCTIONS AND SCHEDULE OF WORK**, no claim for delay will be considered because of failure to furnish instructions until fourteen (14) days after a demand for such instructions had been made and not then unless such claim is reasonable.

## **2.6.0 OWNER'S RIGHT TO PERFORM WORK, STOP WORK AND/OR TERMINATE CONTRACT**

**2.6.1** If the Contractor should be adjudged bankrupt or makes a general assignment for the benefit of creditors because of their insolvency or if a Receiver is appointed on account of their insolvency, the Owner may, without prejudice to any other right or remedy they may have, by giving the Contractor or Receiver or Trustee in Bankruptcy written notice, terminate the Contract. If a Performance Bond has been provided by the Contractor guaranteeing faithful performance of the Work, the Owner shall give written notice to the Surety invoking the terms of the bond.

**2.6.2** The Owner may notify the Contractor in writing that they are in default of their contractual obligations, if the Contractor:

- a) Fails to proceed regularly and diligently with the Work; or
- b) Without reasonable cause wholly suspends the carrying out of the Work before the completion thereof; or
- c) Fails to maintain or manage the construction schedule as required by 2.3.5 above; or
- d) Refuses or fails to supply sufficient, properly skilled workers for proper workmanship, products or construction machinery and equipment for the scheduled performance of the Work within five (5) working days of receiving written notice from the Engineer/Architect except in those cases provided in **2.5.0 DELAYS**; or
- e) Fails to make payments due to their Subcontractors, their Suppliers for their workers, or fails to comply with the procedures around Progress Payments in accordance with 2.15.8 and 2.15.9; or
- f) Persistently disregards laws or ordinances, or the Engineer/Architect's instructions; or
- g) Otherwise violates the provisions of their Contract to a substantial degree.

Such written notice by the Owner shall instruct the Contractor to correct the

default within five (5) working days from the receipt of the written notice. If a Performance Bond has been provided by the Contractor, a copy of such written notice will be provided to the Surety.

**2.6.3** If the correction of the default cannot be completed within the five (5) working days specified, the Contractor shall be considered to be in compliance with the Owner's instruction if they:

- a) Commence the correction of the default within the specified time; and
- b) Provide the Owner with an acceptable schedule for such correction; and
- c) Complete the correction in accordance with such schedule.

**2.6.4** If the Contractor fails to correct the default within the time specified or subsequently agreed upon, the Owner may, without prejudice to any other right or remedy they may have:

- a) Correct such default and deduct the cost thereof as certified by the Engineer/Architect from any payment due under the Contract; or
- b) Terminate the Contract by written notice to the Contractor. If a Performance Bond has been provided by the Contractor, the Owner will provide the Surety with a copy of such notice.

**2.6.5** If the Owner terminates the Contract under the conditions set out above, they are entitled to:

- a) Take possession of the premises and products and utilize the temporary buildings, plants, tools, construction machinery and equipment, goods and materials, intended for, delivered to and placed on or adjacent to the Work and may complete the Work by whatever method they may deem expedient but without undue delay or expense;
- b) Withhold any further payments to the Contractor until the Work is finished;
- c) Upon total performance of the Work, charge the Contractor the amount by which the full cost of finishing the Work as certified by the Engineer/Architect including compensation to the Engineer/Architect for their additional services and a reasonable allowance to cover the cost of any corrections required by **2.26.0 WARRANTY** exceeds the unpaid balance of the Contract Price; or if such cost of finishing the Work is less than the unpaid balance of the Contract Price, pay the Contractor the difference;
- d) On expiry of the warranty period, charge the Contractor the amount by which the cost of corrections under **2.26.0 WARRANTY** exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the

allowance, pay the Contractor the difference;

- e) Invoke the terms of the Performance Bond if such Bond has been provided under the Contract.

**2.6.6** The Contractor's obligation under the Contract as to the performance of the Work up to the time of termination will remain in force after such termination.

## **2.7.0 CONTRACTOR'S RIGHT TO STOP WORK AND/OR TERMINATE CONTRACT**

**2.7.1** If the Owner should be adjudged bankrupt or makes a general assignment for the benefit of creditors or if a Receiver is appointed on account of their insolvency, the Contractor may, without prejudice to any other right or remedy they may have, by giving the Owner written notice, terminate the Contract.

**2.7.2** If the Work should be stopped or otherwise delayed for a period of thirty (30) days or more under an order of any court or other public authority and providing that such order was not issued as the result of any act or fault of the Contractor or of anyone directly or indirectly employed by him, the Contractor may, without prejudice to any other right or remedy they may have, by giving the Owner fifteen (15) days' written notice, terminate the Contract.

**2.7.3** The Contractor may notify the Owner in writing that the Owner is in default of their contractual obligations if:

The Engineer/Architect fails to issue a certificate in accordance with **2.16.0 CERTIFICATES AND PAYMENTS;**

- a) The Owner fails to pay the Contractor when due any amount certified by the Engineer/Architect and verified by the audit of the Owner;
- b) The Owner violates the provisions of the Contract to a substantial degree.

Such written notice shall advise the Owner that if such default is not corrected within fifteen (15) days from the receipt of the written notice, the Contractor may, without prejudice to any other right or remedy they may have, stop the Work and/or terminate the Contract.

**2.7.4** If the Contractor terminates the Contract under the conditions set out above, they shall be entitled to be paid for all work performed including reasonable overhead and profit and for any loss sustained upon products, construction machinery and equipment and other damages as the Contractor may have sustained as a result of the termination of the Contract.

## **2.8.0 OTHER CONTRACTORS**

**2.8.1** The Owner reserves the right to let separate contracts in connection with the



project of which the Work is part or do certain work by their own forces.

**2.8.2** The Owner shall, in such cases, coordinate the Work and insurance coverage of other Contractors as it affects the Work of this Contract.

**2.8.3** The Contractor shall coordinate their work with that of other Contractors and connect as specified or shown in the Contract Documents. Any change in the costs incurred by the Contractor in the planning and performance of such work which was not shown or included in the Contract Documents as of the date of signing the Contract, shall be evaluated as provided under 2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK and authorized as provided in 2.13.0 CHANGES IN THE WORK AND EXTRA WORK.

**2.8.4** The Contractor shall report to the Engineer/Architect any apparent deficiencies in other Contractor's work which would affect this Contract immediately as they come to their attention and shall confirm such report in writing. Failure by the Contractor to so report shall invalidate any claims against the Owner by reason of the deficiencies of other Contractor's work except as to those of which they were not reasonably aware.

## **2.9.0 ASSIGNMENT**

**2.9.1** The Contractor shall not assign the Contract or any part thereof or any benefit or interest therein or thereunder without the written consent of the Owner.

## **2.10.0 SUBCONTRACTORS**

**2.10.1** The Contractor agrees to preserve and protect the rights of the Owner under the Contract with respect to any work to be performed under subcontract. The Contractor shall:

- a) Require their Subcontractors to perform their work in accordance with and subject to the terms and conditions of the Contract Documents; and
- b) Be fully responsible to the Owner for acts and omissions of their Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by them.

The Contractor, therefore, agrees that they will incorporate all the terms and conditions of the Contract Documents into all Subcontractor Agreements they enter into with their Subcontractors.

**2.10.2** The Contractor shall employ those Subcontractors proposed by them in writing and accepted by the Owner prior to the signing of the Contract for such portions of the Work as may be designated in the bidding requirements.

**2.10.3** The Owner may, for reasonable cause, object to the use of a proposed

Subcontractor and require the Contractor to employ one of the other Subcontractors

**2.10.4** In the event that the Owner requires a change from any proposed Subcontractor, the Contract price shall be adjusted by the difference in cost occasioned by such required change.

**2.10.5** The Contractor shall not be required to employ as a Subcontractor any person or firm to whom they may reasonably object.

**2.10.6** The Engineer/Architect may, upon reasonable request and at their discretion, provide to a Subcontractor information as to the percentage of the Subcontractor's work which has been certified for payment.

**2.10.7** Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Owner.

## **2.11.0 DISPUTES**

**2.11.1** Differences between the parties to the Contract as to the interpretation, application or administration of this Contract or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved in the first instances by decision of the Engineer/Architect pursuant to the provisions of **2.4.0 ENGINEER/ARCHITECT'S DECISIONS** shall be settled in accordance with the requirement of the General Conditions.

**2.11.2** The Claimant shall give written notice of such dispute to the other party no later than fourteen (14) days after the receipt of the Engineer/Architect's decisions given under **2.4.0 ENGINEER/ARCHITECT'S DECISIONS**. Such notice shall set forth particulars of the matters in dispute, the probable scope, extent and value of the dispute and relevant provisions of the Contract Documents. The other party shall reply to such notice no later than fourteen (14) days after they receive or are considered to have received it, setting out in such reply their grounds and other relevant provisions of the Contract Documents.

**2.11.3** Pending settlement of the dispute, the Engineer/Architect will give such instructions as, in their opinion, are necessary for the proper performance of the Work or to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim they may have. If it is subsequently determined that such instructions were in error or at variance with the Contract Documents, the Owner shall pay the Contractor cost incurred by the Contractor in carrying out such instructions which they were required to do beyond what the Contract Documents correctly understood and interpreted would have required them to do, including costs resulting from interruption of the Work.

**2.11.4** It is agreed that no act by either party shall be construed as a renunciation or waiver of any of their rights or recourse, provided they have given the notices in accordance with Paragraph 2.11.2 and have carried out the instructions as provided in Paragraph 2.11.3.

**2.11.5** If the dispute or claim cannot be resolved to the satisfaction of both parties, either party may refer the matter to such tribunal as the circumstances require.

**2.11.6** In recognition of the obligation of the Contractor to perform the disputed work as provided in Paragraph 2.11.3, it is agreed that settlement of dispute proceedings may be commenced immediately following the dispute in accordance with the foregoing settlement of dispute procedures.

## **2.12.0 INDEMNIFICATION**

**2.12.1** The Contractor shall be liable for and shall indemnify and hold harmless the Owner and the Engineer/Architect, their agents and employees from and against all claims, demands, losses, costs, damages, actions, suits or proceedings whatsoever arising under any statute or Common law.

- a) In respect of personal injury to or the death of any person whomsoever arising out of or in the course of or caused by the carrying out of the Work; and
- b) In respect of any injury or damage whatsoever to any property, real or personal or any chattel real, insofar as such injury or damage arises out of or in the course of or by reason of the carrying out of the Work.

**2.12.2** The Contractor shall not be liable under Paragraph 2.12.1 if the injury, death, loss or damage is due to any act or neglect of the Owner or Engineer/Architect, their agents or employees.

## **2.13.0 CHANGES IN THE WORK AND EXTRA WORK**

**2.13.1** The Owner may, without invalidating the Contract, make changes by altering, adding to or deducting from the Work, with the Contract Price and the Contract Time being adjusted accordingly; and

**2.13.2** No change in the Work shall be made by the Contractor without prior written order from the Owner, and no claim for an addition or deduction to the Contract Price or change in the Contract Time shall be valid unless so ordered and at the same time valued or agreed to be valued as provided in **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**. Signed faxed copies are acceptable at the discretion of the Owner.

## **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**

**2.14.1** The value of any change shall be determined in one or more of the following methods:

- a) By estimate and acceptance in a lump sum;
- b) By unit prices subsequently agreed upon;
- c) By cost and a fixed or percentage fee.

In the case of changes in the Work valued as outlined in Paragraph 2.14.1(a) (as will be the usual case), the Contractor will submit an itemized estimate of all materials and labour (including Subcontractor's work) to complete the change.

In the case of changes in the Work as valued in Paragraph 2.14.1 (c), the Contractor shall submit detailed invoices, vouchers and time sheets for all materials and labour to complete the change.

The submissions in both cases shall be in the manner acceptable to the Engineer/Architect and will show separately the following percentages for overhead and profit:

- (i) The Contractor shall include, in the breakdown, their 15 percent mark-up (10 percent of the estimated cost for the overhead and 5 percent for profit on their portion of the Work
- (ii) When work is performed by one of the Contractor's Subcontractors, the Subcontractor's markup shall be 10 percent of the estimated cost for overhead and 5 percent for profit.
- (iii) The Contractor shall add 10 percent to the Subcontractor's pricing for their own profit and overhead combined.

Mark-ups for both the Contractor and Subcontractors shall be limited to and considered full compensation for:

- (a) all head office costs including salaries (specifically including the costs of superintendence pursuant to **2.28 PROJECT MANAGEMENT & SUPERINTENDENCE**), financing, overhead, profit and risk of undertaking the work.
- (b) all normal administration, communications, supervision and coordination generally associated with routine change orders.
- (c) all costs associated with the normal preparation of the change order quotation such as investigation and estimating time, miscellaneous

discussions and coordination and negotiations.

(d) costs related to:

- i. the purchase or rental of material, plant and equipment;
- ii. small tools and supplies;
- iii. incidental or routine safety and protective measures, except not including labor and materials associated with special safety processes and procedures;
- iv. permits, bonds, insurance, engineering, as-built drawings, project record documents, commissioning and site office facilities. The Contractor will be compensated, without markup, at the end of the Contract, upon presentation of specific invoices or supporting documentation, clearly demonstrating the additional costs incurred for permits, bonds, and insurance associated with the net value of all change order work;
- v. and fines and any insurance deductibles payable upon fault of the Contractor in performance of the Work.

**2.14.2** Notwithstanding the provisions of Paragraph 2.14.1, in case of changes in the Work, the amount charged for equipment rentals shall be that provided in the rental Contract, and no additional amount shall be paid as markup for overhead or profit for the Contractor or Subcontractor.

When a change in the Work is proposed or required, the Contractor shall present to the Engineer/Architect for approval their claim for the change in the Contract Price and/or change in the Contract Time in a form acceptable to the Engineer/Architect and including the appropriate documentation. The Engineer/Architect shall satisfy themselves as to the correctness of such claim, and when approved by the Owner, a change order will be issued to the Contractor to proceed with the change. The value of Work performed in the change shall be included for payment with the regular certificates for payment. Once a change has been approved as to time, there may be no future claim for time due to this change.

**2.14.3** In the case of changes in the Work to be paid for under methods (b) and (c) of Paragraph 2.14.1, the form of presentation of costs and methods of measurement shall be agreed to by the Engineer/Architect and Contractor before proceeding with the change. The Contractor shall keep accurate records, as agreed upon, of quantities or costs and present an account of the cost of the change in the Work, together with vouchers where applicable.

**2.14.4** If the method of valuation, measurement and the change in Contract Price and/or change in Contract Time cannot be promptly agreed upon, and the change is

required to be proceeded with, then the valuation, measurement and the change in Contract Price and/or Contract Time will be subject to final determination in the manner set out in **2.11.0 DISPUTES**. In this case, the Engineer/Architect shall, with the consent of the Owner, issue a written authorization for the change setting out the method of valuation and, if by lump sum, their valuation of the change in Contract Price and/or Contract Time.

**2.14.5** In the case of a dispute in the valuation of a change authorized in the Work and pending final determination of such value, the Engineer/Architect shall certify the value of the Work performed in accordance with their own evaluation of the change and include the amount with the regular certificates for payment. The Contractor shall keep accurate records of quantities and cost of such work.

**2.14.6** It is intended in all matters referred to above that both the Engineer/Architect and Contractor shall act promptly.

**2.14.7** Should the Owner direct the Contractor not to correct work that has been damaged or that was not performed in accordance with the Contract Document, an equitable deduction from the Contract amount by the Architect/Engineer shall be made to compensate the Owner for the uncorrected or uncompleted work.

**2.14.8** Credits will be based on the net cost of material and labour or the net difference in the unit price quantities.

## **2.15.0 APPLICATION FOR PAYMENT**

**2.15.1** Applications for payment on account may be made monthly as the Work progresses.

**2.15.2** Applications for payment shall be made monthly on a date to be agreed upon between the Owner and the Contractor, and the amount claimed shall be for the value proportionate to the amount of the Contract, of the Work performed and products delivered to the site at that date.

**2.15.3** The Contractor shall submit to the Engineer/Architect, before the first application for payment, a schedule of values of the various parts of the Work aggregating the total amount of the Contract Price and divided so as to facilitate evaluation of applications for payment.

**2.15.4** This schedule shall be made out in such form and supported by such evidence as to its correctness as the Engineer/Architect may reasonably direct and, when approved by the Engineer/Architect, shall be used as the basis for application for payment.

**2.15.5** When making application for payment, the Contractor shall submit a statement based upon this schedule. Claims for products delivered to the site but not yet incorporated into the Work shall be supported by such evidence as the

Engineer/Architect may reasonably require to establish the value and delivery of the products.

**2.15.6** With each monthly claim for payment, except the first, the Contractor shall submit a Statutory Declaration attesting that they have made all payments to Subcontractors, Suppliers, and workers on behalf of whom amounts were included in the previous claim for payment.

**2.15.7** Applications for release of holdback monies following the substantial performance of the Work and the application for final payment shall be made at the time in the manner set forth in **2.16.0 CERTIFICATES AND PAYMENTS**.

**2.15.8** For all projects, it should be clearly understood that the University's policy is as follows:

- a) Each Progress Claim must be accompanied by a breakdown indicating amounts included for each Subcontractor;
- b) When the University makes a Progress Payment, it is made in prorated amounts on behalf of those Subcontractors for whom amounts have been included in the corresponding Progress Claim;
- c) The Contractor submitting the Progress Claim **must** make payment of the amounts included for the various Subcontractors to the various Subcontractors within ten (10) working days of issuance of the Progress Payment by the University. A failure to do so that results in a mechanics lien being filed against the University will result in no future Progress Claims being paid until the lien is vacated.
- d) Monthly payment amounts are not final or conclusive as to their value or quality of work performed and are subject to reopening and readjustment

**2.15.9** Contractors not following the above procedures will be considered to be in default of their Contract, and the University may proceed in accordance with **Article 2.6.0 OWNER'S RIGHT TO PERFORM WORK, STOP WORK AND/OR TERMINATE CONTRACT** Subsection **2.6.2 (d)** of the General Conditions.

## **2.16.0 CERTIFICATES AND PAYMENTS**

**2.16.1** The Engineer/Architect shall, within ten (10) days of receipt of an application for payment from the Contractor submitted in accordance with **2.15.0 APPLICATION FOR PAYMENT**, issue a certificate for payment in the amount applied for or such amount as they shall determine to be properly due. If the Engineer/Architect amends the application, they shall promptly notify the Contractor in writing, giving their reason(s) for the amendment.

**2.16.2** The Owner shall, within thirty (30) days of receipt and approval by the Owner of

a certificate for payment from the Engineer/Architect, make payment to the Contractor on account.

**2.16.3** Notwithstanding any other provisions of the Contract:

- a) Where legislation permits and where, upon application by the Contractor, the Engineer/Architect has certified that a Subcontract has been totally performed to their satisfaction prior to the Substantial Performance of this Contract, the Owner may, at their discretion, pay the Contractor the holdback retained for such Subcontractor on the day following the expiration of the Statutory Limitations Period stipulated in the Mechanic's Lien Act applicable to the place of the Work and subject to the following conditions:
  - (i) A copy of the Contract between the Subcontractor and the General Contractor must be submitted.
  - (ii) The Subcontract is completed without deficiencies.
  - (iii) The warranty for the Subcontract will not start until Substantial Performance of the General Contract.
  - (iv) The General Contractor provides an approved Statutory Declaration that all monies have been paid to the said Subcontractor.
  - (v) The General Contractor provides an approved Waiver of Lien from this Subcontractor.
  - (vi) The Contractor and the Subcontractor provide an approved Waiver of Claim for all work associated with this Subcontractor.
  - (vii) A certificate is issued by the Engineer/Architect indicating that the Subcontract has been totally completed to their satisfaction.
  - (viii) The Owner will, at that time, release the total amount specified on the Subcontractor's Contract.

**2.16.4** Notwithstanding the provisions of Paragraph 16.3 (a) and notwithstanding the wording of such certificate, the Contractor shall ensure that such work is protected pending the Total Performance of the Contract and be responsible for the correction of any defects in it regardless of whether or not they were apparent when such certificates were issued.

**2.16.5** The Engineer/Architect shall within ten (10) days of receipt of an application from the Contractor for a Certificate of Substantial Performance make an inspection and assessment of the Work to verify the validity of the application. The Engineer/Architect shall within seven (7) days of their inspection notify the Contractor of their approval or the reasons for their disapproval of the application.



When the Engineer/Architect finds the Work to be substantially performed, they shall issue such a certificate. The date of this certificate shall be the date of Substantial Performance of the Contract. Immediately following the issuance of the Certificate of Substantial Performance, the Engineer/Architect, in consultation with the Contractor, shall establish a reasonable date for the Total Performance of the Contract.

- 2.16.6** Following the issuance of the Certificate of Substantial Performance and upon receipt from the Contractor of all documentation called for in the Contract Documents, the Engineer/Architect shall issue a Certificate for Payment of holdback monies, providing that no lien or privilege claims against the Work exists, that the Contractor has submitted to the Owner a sworn statement that all accounts for labour, Subcontracts, products, construction machinery and equipment and any other indebtedness which may have been incurred by the Contractor in the Substantial Performance of the Work and for which the Owner might in any way be held responsible, have been paid in full and that the Contractor has submitted to the Owner a waiver of all claims associated with this project except holdback monies properly retained. The holdback monies will become due and payable on the day following the expiration of the Statutory Limitation Period stipulated in the Mechanic's Lien Act applicable to the place of buildings. The Owner may retain out of such holdback monies any sum required by law to satisfy any liens against the Work or other monetary claims against the Contractor which may be enforceable against the Owner.
- 2.16.7** The Engineer/Architect shall, within ten (10) days of receipt of an application from the Contractor for payment upon Total Performance of the Contract, make an inspection and assessment of the Work to verify the validity of the application. The Engineer/Architect shall, within seven (7) days of their inspection, notify the Contractor of their approval or the reasons for their disapproval of the application. When the Engineer/Architect finds the Work to be totally performed to their satisfaction, they shall issue a Certificate of Total Performance and certify for payment the remaining monies due to the Contractor under the Contract, less any holdback monies which are required to be retained. The date of this certificate shall be the date of Total Performance of the Contract. The Owner shall, within thirty (30) days of issuance of such certificate, make payment to the Contractor in accordance with the provisions of the Contract.
- 2.16.8** The release of any remaining holdback monies shall become due and payable on the day following the expiration of the Statutory Limitation period stipulated in the Mechanics' Lien Act of the place of building provided that no claims against the Work exists and that the Contractor has submitted to the Owner a sworn statement that all accounts for labour, Subcontractors, products, construction machinery and equipment and any other indebtedness which may have been incurred by the Contractor in the Total Performance of the Work and for which the Owner might in any way be held responsible have been paid in full, except holdback monies properly retained.

**2.16.9** No certificate for payment, any payment made thereunder or any partial or entire use of occupancy of the Work by the Owner shall constitute an acceptance of any work or products not in accordance with the Contract Documents.

**2.16.10** As of the date of Total Performance of the Work as set out in the Certificate of Total Performance of the Work, the Owner expressly waives and releases the Contractor from all claims against the Contractor including, without limitation, those that might arise from the negligence or breach of Contract by the Contractor except one or more of the following:

- a) Those made in writing prior to the date of the Total Performance of the Work and still unsettled;
- b) Those arising from the provisions of **2.12.0 INDEMNIFICATION** or **2.26.0 WARRANTY**;
- c) Those made in writing within a period of six (6) years from the date of Substantial Performance of the Work, as set out in the Certificate of Substantial Performance of the Work or within such shorter period as may be prescribed by any Limitation Statute of the Province of Newfoundland and Labrador and arising from any liability of the Contractor for damages resulting from their performance of the Contract with respect to substantial defects or deficiencies in the Work for which the Contractor is proven responsible.

As used herein, "substantial defects or deficiencies" means those defects or deficiencies in the Work which affect the Work to such an extent or in such manner that a significant part or the whole of the Work is unfit for the purpose intended by the Contract Documents.

**2.16.11** As of the date of Total Performance of the Work, as set out in the Certificate of Total Performance of Work, the Contractor expressly waives and releases the Owner from all claims against the Owner including, without limitation, those that might arise from the negligence or breach of Contract by the Owner except those made in writing prior to the Contractor's application for payment upon Total Performance of the Work and still unsettled.

**2.16.12** In the event of conflict between the provisions of the General Conditions and **2.24.0 DAMAGES AND MUTUAL RESPONSIBILITY**, the provisions of this General Condition shall govern.

**2.16.13** The holdback to be used by the Engineer/Architect when issuing certificates of payment will be ten (10) percent of the value of the Work completed at the date of Contractor's claim.

**2.16.14** Notwithstanding any other provision of this Contract, the Owner may:

- a) In the event of a claim by the Owner against the Contractor for damages arising

out of the performance or non-performance of the Contract, withhold payment of any amount equal to the alleged damages until the liability for damages is established, and no amount of interest will be paid on amounts held under this Clause;

- b) Set-off amounts owing by the Contractor to the Owner;
- c) Following the issuance of the Certificate of Substantial Performance, withhold payment of an amount equal to twice the cost as estimated by the Engineer/Architect of remedying deficiencies until the issuance of a Certificate of Total Performance, and no amount of interest will be paid on amounts held under this Clause.

## **2.17.0 TAXES AND DUTIES**

**2.17.1** Unless otherwise stated in the Supplementary General Conditions, the Contractor shall pay all applicable government sales taxes, goods and services taxes, customs duties and excise taxes with respect to the Contract.

**2.17.2** Any increase or decrease in costs to the Contractor due to changes in such taxes and duties after the date of the Agreement and up to the agreed date of completion shall increase or decrease the Contract Price accordingly. For further clarity, changes to legislation or regulations that purport to decrease speed limits of vehicles (including trains or sailing vessels) do not constitute a tax or duty. If the Owner so desires, the Contractor is to cooperate with the Engineer/Architect and Owner and permit access to books and records in order to establish the amount of such taxes involved.

**2.17.3** The Contractor shall maintain full records of their estimates and of actual costs to them of the Work, together with all proper open calls, quotations, contracts, correspondence, invoices, receipts, payments to Subcontractors and Suppliers and vouchers relating thereto and shall make them available to audit and inspection by the Owner, the Auditor General for Newfoundland and Labrador or by persons acting on their behalf and shall furnish them with any information which they may require from time to time in connection with such records.

## **2.18.0 LAWS, NOTICES, PERMITS AND FEES**

**2.18.1** The laws of the Province of Newfoundland and Labrador shall govern the Work.

**2.18.2** The Contractor shall obtain all permits, licenses and certificates and pay all fees required for the performance of the Work which are in force at the date of open call closing with the following exceptions:

- a) The Contractor shall obtain building permits for the Work but are not required to pay for said permits.
- b) The Contractor shall not include the obtaining of permanent easements or

rights of servitude.

**2.18.3** The Contractor shall give all required notices and comply with all laws, ordinances, rules, regulations, codes and order of all authorities having jurisdiction relating to the Work, to the preservation of the public health and construction safety which are or become in force during the performance of the Work.

**2.18.4** The Contractor shall not be responsible for verifying that the Contract Documents are in compliance with the applicable laws, ordinances, rules, regulations and codes relating to the Work. If the Contract Documents are a variance therewith or changes which necessitate modifications to the Contract Documents are required by the authorities having jurisdiction subsequent to the Open call closing date, the Contractor shall notify the Engineer/Architect in writing requesting direction immediately when any such variance or change is observed by them. The Engineer/Architect will make the changes required to the Contract Documents, and the Contract Price and/or Contract Time shall be adjusted in accordance with **2.13.0 CHANGES IN THE WORK AND EXTRA WORK** and evaluated in accordance with **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**.

**2.18.5** If the Contractor fails to notify the Engineer/Architect in writing and obtain their direction as required in 2.18.4 and performs any work knowing it to be contrary to any laws, ordinances, rules, regulation, codes and orders of any authority having jurisdiction, they shall be responsible for and shall correct any violations thereof and shall bear all costs, expense and damages, attributable to their failure to comply with the provisions of such laws, ordinances, rules, regulations, codes and orders.

## **2.19.0 PATENT FEES**

**2.19.1** The Contractor shall pay all royalties and patent license fees required for the performance of the Contract and such royalties or fees shall be deemed to have been included in the Contract Price. They shall hold the Owner harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to an infringement or an alleged infringement of any patent or invention by the Contractor or anyone for whose acts they may be liable.

**2.19.2** The Owner shall hold the Contractor harmless against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to an infringement or an alleged

infringement of any patent or invention in executing anything for the purpose of the Contract, the model, plan or design of which was supplied to the Contractor by the Owner.

## **2.20.0 WORKERS' COMPENSATION**

- 2.20.1** The Contractor shall be registered with and shall remain in good standing with the Workplace Health and Safety Compensation Commission during the term of their Contract.
- 2.20.2** At any time during the term of the Contract when requested by the Owner, the Contractor shall provide evidence of compliance by themselves and any or all of their Subcontractors.

## **2.21.0 LIABILITY INSURANCE**

### **2.21.1 Comprehensive General Liability Insurance**

- a) Without restricting the generality of **2.12.0 INDEMNIFICATION**, the Contractor shall provide and maintain, either by way of a separate policy or by an endorsement to their existing policy, Comprehensive General Liability Insurance acceptable to the Owner and subject to limits set out in detail below, inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof.
- b) The insurance shall be in the joint names of the Contractor and the Owner. It shall also cover as Additional Insureds all Subcontractors and anyone employed directly or indirectly by the Contractor or their Subcontractors to perform a part or parts of the Work but excluding Suppliers whose only function is to supply and/or transport products to the project site.
- c) The insurance shall also include as Additional Insureds the architectural and engineering consultants of the Owner and Engineer/Architect.
- d) The insurance shall preclude subrogation claims by the Insurer against anyone insured thereunder.
- e) The Comprehensive General Liability Insurance will not be limited to, but shall include coverage for:
  - (i) Premises and Operations Liability
  - (ii) Products or Completed Operations Liability
  - (iii) Blanket Contractual Liability
  - (iv) Cross Liability
  - (v) Elevator and Hoist Liability
  - (vi) Contingent Employer's Liability

- (vii) Personal Injury Liability arising out of false arrest, detention or imprisonment or malicious prosecution, libel, slander or defamation of character, invasion of privacy or wrongful entry
- (viii) Shoring, blasting, excavating, underpinning, demolition, pile driving and caisson work, work below ground surface, tunnelling and grading, as applicable
- (ix) Liability with respect to non-owned, licensed vehicles.

**2.21.2** The Contractor shall provide and maintain liability insurance in respect of owned licensed vehicles subject to limits set out in detail in Article **2.21.0 LIABILITY INSURANCE** subsection **2.21.6**.

**2.21.3** All liability insurance shall be maintained continuously until twelve (12) months after the date the Engineer/Architect issues a Certificate of Substantial Performance.

**2.21.4** The Contractor shall provide the Owner with evidence of all liability insurance prior to the commencement of the Work and shall promptly provide the Owner with a certified true copy of each insurance certificate.

**2.21.5** All liability insurance policies shall contain an endorsement to provide all Additional Insureds with prior notice of changes and cancellations. Such endorsements shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way nor cancelled until thirty (30) days after written notice of such change or cancellation shall have been given to all Additional Insureds."

**2.21.6** The Contractor shall protect themselves and indemnify and save the Owner harmless from any and all claims which may arise from the Contractor's performance or failure of performance of the Contract and for this purpose shall, without restricting the generality of the foregoing, maintain insurance acceptable to the Owner to the following limits:

- a) Where the contract value exceeds \$100,000 (inclusive of HST)
  - Comprehensive General Liability = \$10,000,000.00;
  - Standard Automobile Policy Liability = \$5,000,000.00;
  - Contractor's Pollution Liability = \$5,000,000.00 per occurrence.

And if used directly or indirectly in the performance of The Work:

- Manned Aircraft and Watercraft Liability = \$10,000,000.00;
- Unmanned Aerial Vehicle (drone) Liability = \$5,000,000.00;

- b) Where the contract value is less than \$100,000 (inclusive of HST)
  - Comprehensive General Liability = \$5,000,000.00;
  - Standard Automobile Policy Liability = \$3,000,000.00;
  - Contractor's Pollution Liability = \$3,000,000.00 per occurrence.

And if used directly or indirectly in the performance of The Work:

- Manned Aircraft and Watercraft Liability = \$10,000,000.00;
- Unmanned Aerial Vehicle (drone) Liability = \$5,000,000.00.

Prior to the commencement of any work hereunder, the Contractor shall file with the Owner a copy of each insurance policy and certificate required.

## **2.22.0 PROPERTY INSURANCE**

**2.22.1** Property Insurance is required to be provided by the Contractor if one of the following criteria is met:

- a) The contract value exceeds \$5,000,000.00 (inclusive of HST).
- b) The contract is for a new building or extension, regardless of the contract value.
- c) The contract is for a renovation and will expose the interior elements of a building to the elements of weather, regardless of the contract value. Including, but not limited to, windows or roofing replacement projects.

**2.22.2** The Contractor shall provide and maintain property insurance acceptable to the Owner insuring the full value of the Work in the amount of the replacement cost or the Contract value, whichever is greater, and the full value as stated of products for incorporation into the Work. The insurance shall be in the joint names of the Contractor, the Owner, the Subcontractors as Unnamed Insured or, if they specifically request, as Named Insured. The policies shall preclude subrogation claims by the Insurer against anyone insured thereunder.

**2.22.3** Such coverage shall be provided by EITHER an ALL-RISKS Builders' Risk Policy OR by a combination of a Coverage and Malicious Damage Endorsements and a Builder's Risk Difference in Conditions Policy providing equivalent coverage of Piers, Wharves and Docks, Government Structures Policy.

**2.22.4** The policies shall insure against all risks of direct loss or damage. Such coverage shall apply to:

- a) All products, labour and supplies of any nature whatsoever, the property of the Insureds or of others for which the Insureds may have assumed responsibility, to be used in or pertaining to the site preparations, demolition

of existing structures, erections and/or fabrication and/or reconstruction and/or repair of the insured project, while on the site or in transit, subject to the exclusion of the property specified.

- b) The installation, testing and any subsequent use of machinery and equipment including boilers, pressure vessels or vessels under vacuum.
- c) Damage to the Work caused by an accident to and/or the explosion of any boiler(s) or pressure vessel(s) forming part of the Work.

Such coverage shall exclude construction machinery, equipment, temporary structural and other temporary facilities, tools and supplies used in the construction of the Work and which are not expendable under the Contract.

- 2.22.5** The Contractor shall provide the Owner with evidence of all insurance prior to the commencement of the Work and shall promptly provide the Owner with a certified true copy of each insurance policy.

Policies provided shall contain an endorsement to provide all Named Insureds with prior notice of changes and cancellations. Such endorsements shall be in the following form:

**"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way or cancelled until thirty (30) days after written notice of such change or cancellation shall have been given to all Named Insureds."**

- 2.22.6** All such insurance shall be maintained continuously until ten (10) days after the date the Engineer/Architect issues a certificate of Substantial Performance. All such insurance shall provide for the Owner to take occupancy of the Work or any part thereof during the terms of this insurance. Any increase in the cost of this insurance arising out of such occupancy shall be at the Owner's expense.

- 2.22.7** The policies shall provide that, in the event of a loss, payment for damage to the Work shall be made to the Owner and the Contractor as their respective interests may appear. Damage shall not affect the rights and obligations of either party under the Contract except that the Contractor shall be entitled to such reasonable extension of time for Substantial and Total Performance of the Work as the Engineer/Architect may decide.

- 2.22.8** The Contractor and/or their Subcontractors, as may be applicable, shall be responsible for any deductible amounts under the policies and for providing such additional insurance as may be required to protect the Insureds against loss on items excluded from the policies.

- 2.22.9** When this Contract pertains to a new building or structure with a total bid amount greater than \$25,000.00, the Contractor shall maintain All Risk Builder's Risk



Insurance acceptable to the Owner in the joint names of the Owner and Contractor in the amount of 100 percent of the total value of the Work done and material delivered to the site and payable to the Owner and Contractor as their respective interest may appear.

## **2.23.0 PROTECTION OF WORK AND PROPERTY**

**2.23.1** The Contractor shall protect the property adjacent to the project site from damage as the result of their operations under the Contract.

**2.23.2** The Contractor shall protect the Work and the Owner's property from damage and shall be responsible for any damage which may arise as the result of their operations under the Contract except damage which occurs as the result of:

- a) Errors in the Contract documents; and/or
- b) Acts or omissions by the Owner, their agents, employees or other Contractors

**2.23.3** Should the Contractor, in the performance of this Contract, damage the Work and/or Owner's property and/or property adjacent to the place of the Work, the Contractor shall be responsible for making good such damage at their own expense or pay all costs incurred by others in making good such damage.

**2.23.4** Should any damage occur to the Work and/or Owner's property for which the Contractor is not responsible as provided in of **2.12.0 INDEMNIFICATION**, they shall make good such damage to the Work and, if the Owner so directs, to the Owner's property, and the contract Price and Contract Time shall be adjusted in accordance with in **2.13.0 CHANGES IN THE WORK AND EXTRA WORK** and evaluated in accordance with in **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**.

**2.23.5** The Contractor shall be completely responsible for the safety of the Work as it applies to protection of the public and property and construction of the Work.

The codes that must be followed and enforced for safety are:

- a) The National Building Code, Part 8, Safety Measures at Construction and Demolition Sites (Latest Edition);
- b) Canadian Code for Construction Safety (Latest Edition) as issued by the Associate Committee of the National Building Code;
- c) The Occupational Health and Safety Act (1979) and Regulations.

**2.23.6** Any person not following stipulated safety regulations shall be dismissed.

## **2.24.0 DAMAGES AND MUTUAL RESPONSIBILITY**

- 2.24.1** If either party to this Contract should suffer damage in any manner because of any wrongful act or neglect of the other party or anyone employed by them then they shall be reimbursed by the other party for such damages. The party reimbursing the other party shall be subrogated to the rights of the other party in respect of such wrongful act or neglect if it be that of a third party.
- 2.24.2** Claims under this Contract shall be made in writing to the party liable within a maximum of thirty (30) days after the first observance of such damage and may be adjusted by agreement or in the manner set out in **2.11.0 DISPUTES**.
- 2.24.3** If the Contractor has caused damage to any other Contractor on the Work, the Contractor agrees upon due notice to settle with such other Contractor by agreement or arbitration, if they will so settle. If such other Contractor sues the Owner on account of any damage alleged to have been sustained, the Contractor agrees to fully indemnify the Owner to the extent that the Owner is adjudicated to pay any of the damages. The Owner shall notify the Contractor and may require the Contractor to defend the action at the Contractor's expense. If any final order or judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.
- 2.24.4** If the Contractor becomes liable to pay or satisfy any final order, judgment or award against the Owner then the Contractor, upon undertaking to indemnify the Owner against any and all liability for costs, shall have the right to appeal in the name of the Owner such final order or judgment to any and all courts of competent jurisdiction.
- 2.24.5** Should the Contractor fail to meet the date to substantially perform the Work, as indicated in the Agreement between the Owner and the Contractor, and is unable to provide justification acceptable to the Owner for the delay then the Contractor will be held liable for any liquidated damage amount indicated in **3.0 SUPPLEMENTARY GENERAL CONDITIONS** and may be held liable for payment to the Owner for other damages and losses suffered by the Owner as a result of the Contractor's delay including additional costs for Engineering/Architectural supervision.

## **2.25.0 BONDS**

- 2.25.1** The Contractor shall promptly provide the Owner the surety bonds called for in the Open call Documents.
- 2.25.2** All such bonds shall be issued by a duly incorporated surety company approved by the Owner and authorized to transact a business or surety-ship in the Province of Newfoundland and Labrador.
- 2.25.3** If bonds are called for in the and Acceptance form, Instructions to Bidders or

Supplementary General Conditions, the costs attributable to providing such bonds shall be included in the bid price.

- 2.25.4** Should the Owner require the provision of a bond or bonds by the Contractor other than those provided for under 2.25.3, the Contract Price shall be increased by all costs attributable to providing such bonds.

## **2.26.0 WARRANTY**

- 2.26.1** The Contractor shall be responsible for the proper performance of the Work to the extent that the design and specifications permit such performance.
- 2.26.2** Subject to Paragraph 2.26.1, the Contractor agrees to correct promptly, at their own expense, defects or deficiencies in the Work which appear prior to and during the period of one (1) year from the date of Substantial Performance of the Work or such longer periods as may be specified for certain products or work.
- 2.26.3** The Contractor shall correct and/or pay for any damage to other work resulting from any corrections required under the conditions of Paragraph 2.26.2.
- 2.26.4** Neither the Engineer/Architect's final certificate nor payment thereunder shall relieve the Contractor from their responsibility hereunder.
- 2.26.5** The Owner and/or Engineer/Architect shall give the Contractor written notice of observed defects promptly.

## **2.27.0 CONTRACTOR'S RESPONSIBILITIES AND CONTROL OF THE WORK**

- 2.27.1** The Contractor shall have complete control of the Work and shall effectively direct and supervise the Work so as to ensure conformance with the requirements of the Contract Documents. They shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all parts of the Work under the Contract.
- 2.27.2** The Contractor shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structural and other temporary facilities and the design and execution of construction methods required in their use. The Contractor shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform these functions where required by law or by the Contract Documents and, in all cases, where such temporary facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
- 2.27.3** Notwithstanding the provision of Paragraphs 2.27.1 and 2.27.2 above or any

provisions to the contrary elsewhere in the Contract Documents where such Contract Documents include designs for temporary structural and other temporary facilities or specify a method of construction in whole or in part, such facilities and methods shall be deemed to comprise part of the overall design of the Work, and the Contractor shall not be held responsible for that part of the design or the specified method of construction. The Contractor shall, however, be responsible for the execution of such design or specified method of construction in the same manner that they are responsible for the execution of the Work.

- 2.27.4** The Contractor shall carefully examine the Contract Documents and shall promptly report to the Engineer/Architect any error, inconsistency or omission they may discover. The Contractor shall not be held liable for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents which they may discover, and they shall not proceed with the Work affected until they have received corrected or missing information from the Engineer/Architect.

## **2.28.0 PROJECT MANAGEMENT AND SUPERINTENDENCE**

- 2.28.1** The Contractor shall employ a competent Project Manager and necessary project team. It is the Contractor's responsibility to ensure their project team is qualified and capable of executing the project work.

- 2.28.2** The Project Manager shall be satisfactory to the Engineer/Architect and shall not be changed except for good reason and only then after consultation with an agreement by the Engineer/Architect.

For projects with a bid value greater than \$5 million dollars, excluding HST, the Project Manager shall have a minimum of ten (10) years' experience on construction projects of similar scale, complexity, type and value.

At the Owner's request, the project manager shall be required to submit a resume and cover letter outlining their work experience. The owner reserves its right to refuse the Contractor's suggested Project Manager in the event that the suggested project manager does not meet the above requirements. Such refusal shall not be exercised unreasonably by the Owner.

- 2.28.3** The Contractor shall employ a competent Superintendent and necessary assistants who shall be in attendance at the Work site at all times while the Work is being performed.

The Superintendent shall represent the Contractor at the place of work and instructions given to them by the Engineer/Architect shall be held to have been given to the Contractor. Important instructions shall be confirmed to the Contractor in writing, other instructions will be so confirmed if requested.

For projects with a bid value greater than \$5 million dollars, excluding HST, the Superintendent shall have a minimum of ten (10) years' experience on

construction projects of similar scale, complexity, type and value. The Owner reserves its right to refuse the Contractor's suggested Superintendent in the event that the suggested Superintendent does not meet the above requirements. Such refusal shall not be exercised unreasonably by the Owner.

At the Owner's request, the Superintendent shall be required to submit a resume outlining their work experience.

## **2.29.0 LABOUR AND PRODUCTS**

- 2.29.1** Unless otherwise stipulated elsewhere in the Contract Documents, the Contractor shall provide and pay for all labour, products, tools, construction equipment and machinery, water, heat, light, power, transportation and other facilities and services necessary for the requirements of the Contract Documents.
- 2.29.2** All products provided shall be new unless otherwise specified in the Contract Documents. Any products which are not specified shall be of a quality best suited to the purpose required, and their use shall be subject to the approval of the Engineer/Architect.
- 2.29.3** In carrying out their duties under this Contract, the Contractor shall comply with all Provincial and Federal legislation respecting labour and the employment of labour, where applicable, including the Labour Standards Code and shall not operate in conflict with the Human Rights legislation. In the employment of labour, preference should be given to persons normally residing in Newfoundland and Labrador.
- 2.29.4** The Contractor and Subcontractors shall maintain and keep available for inspection by the Owner, a record of the names and addresses of all persons employed on the project.
- 2.29.5** The Contractor shall maintain good order and discipline among their employees engaged on the Work and shall employ on the Work only employees skilled in their various trades.
- 2.29.6** There shall be no discrimination in the selection of workers for employment on the project in respect to race, religion, views or political affiliation or any other enumerated ground contained in the *Human Rights Act, 2010* of Newfoundland and Labrador, and the office of the Canada Manpower will be used in the recruitment of workers wherever possible.
- 2.29.7** The Contractor shall pay fair wages and shall pay rates of wages and allowances to the various classes of labour not less favourable than those prevailing in the area where the Work is being performed.
- 2.29.8** The Contractor shall be aware that the majority of hourly-paid and maintenance workers employed within the University are unionized. It is of utmost importance

that any labour force used by the Contractor neither disrupts or be disrupted by any labour conditions existing on the University campus. Failure by the Contractor to familiarize themselves with labour conditions on Campus or disruptions to the Contractor's own labour force because of labour conditions on Campus will not relieve them of their obligations to furnish all labour and materials necessary to carry out the requirements of the Contract.

## **2.30.0 SUBSURFACE CONDITIONS**

**2.30.1** The Contractor shall promptly notify the Engineer/Architect in writing if, in their opinion, the subsurface conditions at the project site differ materially from that indicated or reasonably inferred from the Contract Documents.

**2.30.2** After prompt investigation, should the Engineer/Architect determine that conditions do differ materially, they shall issue appropriate instructions for changes in the Work as provided for in **2.13.0 CHANGES IN THE WORK AND EXTRA WORK**.

## **2.31.0 USE OF THE WORK**

**2.31.1** The Contractor shall confine their apparatus, the storage of products and the operations of their employees to limits indicated by laws, ordinances, permits or by instructions of the Engineer/Architect and shall not unreasonably encumber the premises with their products.

**2.31.2** The Contractor shall not load or permit to be loaded any part of the Work with a weight or force that will endanger its safety.

**2.31.3** Unless otherwise provided, the Contractor shall, at their own expense and without expense to the Owner, make suitable provision to accommodate all traffic, either pedestrian or vehicular, over or around the project upon which work is being performed in a manner satisfactory to the Engineer/Architect.

**2.31.4** The Contractor shall provide and maintain at their own expense such fences, barriers, signs, lights and watchmen as may be necessary to prevent avoidable accidents to University Users or to the public generally.

**2.31.5** All work shall be executed with the least possible interference with or disturbance to personnel and the Public. The Contractor shall cooperate with the person in charge of the premises. The Contractor shall ascertain from the Owner's representative the hours during which the work shall be performed, conform to the directions of the representative and to the directions of the said representative in determining the order in which the work shall be done.

**2.31.6** The Contractor shall carry out all work required to maintain the building services and to provide necessary access for personnel and vehicles whenever new work

affects occupied portions of the building.

- 2.31.7** Before final completion of the work, the Owner shall be entitled to make use of any portion of the work which is completed and fit for use for the installation of equipment, storage and furniture, supplies, etc., and for occupancy, if such can be arranged without interfering with the progress of the work.

## **2.32.0 CUTTING AND REMEDIAL WORK**

- 2.32.1** The Contractor shall do all cutting and remedial work that may be required to make the several parts of the Work come together properly and shall coordinate the Work to ensure that this requirement is kept to a minimum.
- 2.32.2** Should the Owner, the Engineer/Architect, other contractors or anyone employed by them, be responsible for ill-timed work necessitating additional cutting and/or remedial work to be performed, it shall be valued as provided in **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK** and added to the Contract Price.
- 2.32.3** Cutting and remedial work shall be performed by specialists familiar with the materials affected and shall be performed in a manner to neither damage nor endanger any work.

## **2.33.0 INSPECTION OF WORK**

- 2.33.1** The Owner, the Engineer/Architect and their authorized representatives shall have access to the Work for inspection wherever it is in preparation or progress. The Contractor shall cooperate to provide reasonable facilities for such access.
- 2.33.2** If parts of the Work are designated for special tests, inspections or approvals in the Contract Documents or by the Engineer/Architect's instructions or the laws or ordinances of the place of the Work, the Contractor shall give the Engineer/Architect timely notice requesting inspection. Inspection by the Engineer/Architect shall be made promptly. The Contractor shall arrange for inspections by other authorities and shall notify the Engineer/Architect with timely notice of the date and time.
- 2.33.3** If the Contractor covers or permits to be covered any of the Work that is designated for special tests, inspections or approvals, before such special tests, the Contractor shall, if so instructed by the Engineer/Architect, uncover the Work, have the inspection satisfactorily completed and make good the Work at their own expense.
- 2.33.4** The Engineer/Architect may order any part of the Work to be specifically examined, should they believe such work not to be in accordance with the requirements of the Contract Documents. If upon examination such work is found not to be in accordance with the requirements of the Contract Documents, the

Contractor shall correct such work and pay the cost of examination and correction. If such work is found to be in accordance with the requirements of the Contract Documents, the Owner will pay the cost of examination and replacement.

- 2.33.5** The Contractors shall furnish promptly to the Engineer/Architect two (2) copies of all certificates and inspection reports relating to the Work.

#### **2.34.0 REJECTED WORK**

- 2.34.1** Defective work, whether the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the Contractor and whether incorporated in the Work or not which has been rejected by the Engineer/Architect as failing to conform to the Contract Documents, shall be removed promptly from the premises by the Contractor and replaced and/or re-executed promptly in accordance with the Contract Documents at the Contractor's expense.

- 2.34.2** Other contractors' work destroyed or damaged by such removals or replacements shall be made good promptly at the Contractor's expense.

- 2.34.3** If, in the opinion of the Engineer/Architect, it is not expedient to correct defective work not done in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work as done and that called for by the Contract, the amount of which shall be determined in the first instance by the Engineer/Architect.

#### **2.35.0 SHOP DRAWINGS AND SAMPLES**

- 2.35.1** The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.

- 2.35.2** The Contractor shall arrange for the preparation of clearly identified shop drawings as called for by the Contract Documents or as the Engineer/Architect may reasonably request.

- 2.35.3** Prior to submission to the Engineer/Architect, the Contractor shall review all shop drawings. By this review, the Contractor represents that they have determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data, or will do so, and that they have checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a responsible person.



The Contractor shall submit shop drawings to the Engineer/Architect for their review with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the Work of other contractors. If either the Contractor or the Engineer/Architect so requests, they shall jointly prepare a schedule fixing the dates for submission and return of shop drawings. Shop drawings shall be submitted in the form of reproducible transparencies or prints as the Engineer/Architect may direct. At the time of the submission, the Contractor shall notify the Engineer/Architect in writing of any deviations in the shop drawings from the requirements of the Contract Documents.

**2.35.4** The Engineer/Architect will review and return shop drawings in accordance with any schedule agreed upon or otherwise with reasonable promptness so as to cause no delay. The Engineer/Architect's review will be for conformity to the design concept and for general arrangements only, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the shop drawings has been approved in writing by the Engineers/Architects.

**2.35.5** The Contractor shall make any changes in shop drawings which the Engineer/Architect may require consistent with the Contract Documents and resubmit, unless otherwise directed by the Engineer/Architect. When resubmitting, the Contractor shall notify the Engineer/Architect in writing of any deviations other than those requested by the Engineer/Architect. Any required resubmission of shop drawings shall be at the sole expense of the Contractor.

**2.35.6** The Contractor shall submit for the Engineer/Architect's approval such standard manufacturer's samples as the Engineer/Architect may reasonably require. Samples shall be labeled as to origin and intended use in the Work and shall conform to the requirements of the Contract Documents.

**2.35.7** The Contractor shall provide samples of special products, assemblies or components when so specified. The cost of such samples not specified shall be authorized as an addition to the Contract Price as provided in **2.13.0 CHANGES IN THE WORK AND EXTRA WORK**.

## **2.36.0 TESTS AND MIX DESIGNS**

**2.36.1** The Contractor shall furnish to the Engineer/Architect test results and mix designs as may be requested. The testing company must first be approved by the Engineer/Architect.

**2.36.2** The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by law, ordinances, rules and regulations relating to the Work and the preservation of public health, shall be authorized as an addition to the Contract Price as provided in **2.13.0 CHANGES IN THE WORK AND EXTRA WORK**.

## **2.37.0 MATERIALS AND SUBSTITUTIONS**

Materials described and named in the specifications with "or approved equal" clause after the Manufacturer's name are so described as to the establish quality only, and substitutions of a similar materials may be made before the award of the Contract provided the Engineer/Architect's approval is obtained. Substitutions after the award

may be considered under special circumstances as indicated in Subsection 1.7.4 in the **INSTRUCTIONS TO Bidders**

- 2.37.1** Requests for substitutions must be accompanied by sufficient information in the form of shop drawings, manufacturer's literature, samples and other data to permit proper investigation of the substitutes proposed, together with any increase or decrease in price.
- 2.37.2** Whenever a substitute is proposed for approval, the Contractor shall guarantee that such proposed substitute will not adversely affect the space requirements allocated on the drawings for the material specified, and they shall agree to bear any additional expense incurred due to their use of the proposed substitute.
- 2.37.3** The Engineer/Architect may accept or reject any or all of the proposed substitutions as they see fit, and their decision on a question of equality shall be final.

## **2.38.0 TIME OF ESSENCE AND SCHEDULE**

- 2.38.1** Time is of the essence of the Contract.

## **2.39.0 CASH ALLOWANCE**

- 2.39.1** The Contract Price includes cash allowances, if any, stated in the Contract Documents.
- 2.39.2** Cash allowances, unless otherwise specified, cover the entire cost to the Contractor of services, products, construction machinery and equipment, freight, unloading, handling, storage, installation and other authorized expenses incurred in performing the Work stipulated under the cash allowances. This also includes the Contractors overhead and profit in connection with such cash allowance.
- 2.39.3** The cash allowance shall not include HST.
- 2.39.4** Where costs under a cash allowance exceed the amount of the allowance, the Contractor shall be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in **2.14.0 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK.**

- 2.39.5** The Contract Price shall be adjusted by change order to provide for any excess or deficit to each cash allowance.
- 2.39.6** Progress payments on account of Work authorized under cash allowance shall be included in the Engineer/Architect's monthly certificates for payment.
- 2.39.7** A schedule shall be prepared jointly by the Engineer/Architect and Contractor to show the items called for under Cash Allowances. They must be authorized by the Owner for ordering purposes so that the progress of the Work will not be delayed.

#### **2.40.0 CLEANUP AND FINAL CLEANING OF THE WORK**

- 2.40.1** The Contractor shall maintain the Work in a tidy condition and free from the accumulation of waste products and debris, other than that caused by the Owner, other contractors or their employees.
- 2.40.2** When the Work is substantially performed, the Contractor shall remove their surplus products, tools, construction machinery and equipment not required for the performance of the remaining Work. They shall also remove waste products and debris, other than that caused by the Owner, other contractors or their employees, and leave the Work clean and suitable for occupancy by the Owner, unless otherwise specified.
- 2.40.3** When the Work is totally performed, the Contractor shall remove their surplus products, tools, construction machinery and equipment. They shall also remove waste products and debris other than that caused by the Owner, other contractors or their employees.

### **3.0 SUPPLEMENTARY GENERAL CONDITIONS**

This page is intentionally left blank.

## **4.0 SPECIAL CONDITIONS**

**ALL SECTIONS STRUCK OUT IN SECTION 4.0 ARE NOT INCLUDED IN THE CONTRACT**

### **4.1.0 LAYOUT OF WORK**

**4.1.1** Other than the original lot lines and a benchmark, both shown on the drawings, establish and maintain all grades, lines, levels and well-built batter boards at all corners of the building. As work progresses, lay out on the forms or rough flooring the exact location of all partitions as a guide to all trades.

**4.1.2** Verify all grades, lines, levels and dimensions as shown on the drawings and report any errors or inconsistencies in the above to the Engineer/Architect before commencing Work.

### **4.2.0 ~~JOB SIGN~~**

~~**4.2.1** At the start of the job, erect two painted signs as detailed and where located by the Engineer/Architect. This will be the only sign or advertisement permitted on the site unless instructed otherwise by the Engineer/Architect.~~

~~**4.2.2** The signs shall be 8'0" x 8'0" plywood, properly supported. It shall be painted and shall show the names of the building, Owner, Prime Consultant, Major Subconsultants, Contractor and Major Subcontractors. A drawing of the signs to be erected will be supplied by the Engineer/Architect.~~

### **4.3.0 TEMPORARY OFFICES AND SHEDS**

**4.3.1** Construct and maintain, until completion of the Contract temporary offices and storage sheds in approved locations on site for the use of staff.

**4.3.2** Buildings shall be of weatherproof wood stud and plywood construction completely equipped with adequate lighting, heating and ventilation, and in addition, the Contractor's office shall be fully furnished with desks, plan tables, storage cabinets, file drawers, chairs, stools and plan racks.

**4.3.3** Provide storage sheds for small tools, equipment, perishable materials, etc., as necessary. All buildings shall be equipped with windows for natural light and doors properly fitted and equipped with locks.

**4.3.4** Maintain offices and storage sheds in good condition to the approval of the Engineer/Architect from start of Work until final completion of Work or, when directed by the Engineer/Architect, remove offices and sheds from the site and leave areas free of debris and waste materials and in a clean and tidy condition.

**4.3.5** Offices and storage sheds required by Trade Contractors, such as mechanical and electrical, shall be provided by the trade requiring them.

~~**4.3.6** Provide an office approximately 120 square feet for the absolute use of the Owner or their representative(s). It shall be properly fitted and furnished with light, heat, telephone, lock and key, shelving, table and chairs and plan rack. The building shall be removed from the site at the completion of the Work.~~

#### **4.4.0 TEMPORARY SERVICES**

##### **4.4.1 Light and Power**

Furnish all temporary light and power required to provide such intensity of light and sufficient power as necessary for the Work to be carried out under the best conditions. Obtain and pay for all permits and inspection tests required by Provincial and/or Municipal authorities. Pay all charges and maintain fixtures and equipment in good working order. This shall include electric heat.

##### ~~**4.4.2 Telephone**~~

~~Install and pay for the operation of one job telephone and one telephone for the use of the Engineer/Architect for the duration of the Contract. Subcontractors requiring individual telephones shall have them installed at their expense. Long distance calls will be at the expense of the party making the calls.~~

##### **4.4.3 Toilets**

At the start of operations, provide and maintain in sanitary condition sufficient temporary toilets and washing facilities for the use of personnel on the job. Conform to requirements of the Department of Health and other authorities having jurisdiction. Supply adequate quantities of disinfectant and toilet paper. When building toilets and washing facilities are operable, they may be used under the same conditions as the temporary toilets with the latter being removed, leaving all surfaces and areas hygienically clean and in immaculate condition.

##### **4.4.4 Heat**

Provide and maintain in good condition a temporary heating system for use when the building is closed in until the project has been handed over to the Owner. Pay for fuel and maintenance of the system. Maintain temperatures at a minimum of 50° F, (higher if required for special trades). Heating equipment not adequately protected or operated in conditions other than those intended by the manufacturer shall be regarded as temporary. Remove all such equipment and replace with new permanent equipment.

When ready for operation, the permanent heating equipment may be used for temporary heating purposes, subject to the conditions of the Mechanical Division of

the specifications. Protect all permanent heating equipment used for temporary heating purposes. Provide satisfactory site conditions for the proper operation of this equipment.

#### **4.4.5 Water Supply**

Provide in two convenient locations outside the building line a fresh water supply for the use of all trades.

Where connection cannot be made to an existing water supply, provide adequate size tanks and keep them filled for use of all trades.

### **4.5.0 PLANT AND MACHINERY**

**4.5.1** Provide all framework, scaffolding, ladders, cranes, derricks, planks, screens, gantries, tarpaulins, tools, equipment and machinery for the proper execution of the Work. Scaffolding shall be erected without damage of the structure or the finishes, be removed to suit the installation of work of other trades and be promptly removed at completion.

**4.5.2** Where it is the normal practice for the trade to provide its own scaffolding, it shall be included in the Subcontract.

### **4.6.0 PROTECTION OF PUBLIC AND WORKMEN**

**4.6.1** Part 8 of the National Building Code of Canada, latest edition, shall apply to this project in its entirety. This covers fencing, barricades, Fire protection, excavation, use of streets or public property, control of vehicular traffic and mechanical methods of demolition.

**4.6.2** The latest edition of Canadian Construction Safety Code shall also apply to all phases of this project.

**4.6.3** The Workplace Health, Safety and Compensation Commission Regulations shall also apply to all phases of this project.

### **4.7.0 CONSTRUCTION SCHEDULE**

**4.7.1** The Contractor shall, within seven (7) days after the Contract is awarded, prepare for the use of the Engineer/Architect and Owner, a construction schedule. It shall indicate as closely as possible the starting and completion dates for the major sections of the Work, together with the Subcontractors' names.

**4.7.2** With each monthly progress claim, submit one (1) copy of the original construction schedule marked in red to show the actual construction progress on the date of the submission of the claim. When necessary, provide an updated construction schedule superseding the original.



#### **4.8.0 OPERATIONS AND MAINTENANCE DATA**

**4.8.1** On completion of the project, submit to the Engineer/Architect one (1) copy of Operations and Maintenance Data and one (1) electronic copy as original editable format.

- a) Title page, labelled "Operation and Maintenance Data", project number, project name, date and list of contents.
- b) Organize contents into applicable sections of work to parallel project specifications breakdown.
- c) Provide electronic document in an acceptable file transfer method (external hard drive or file share), including all original and editable files or, at the direction of the Owner, pdf format.

**4.8.2** Include the following information plus data specified in the technical specifications:

- a) Maintenance instruction for finished surface and materials.
- b) Copy of hardware schedules.
- c) Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size capacity and serial number.
- d) Names, addresses, email and phone numbers of Subcontractors and Suppliers.
- e) Guarantees, warranties and bonds showing:
  - (i) Name and address of project.
  - (ii) Guarantee commencement date (date of Final Certification of Completion).
  - (iii) Duration of guarantee.
  - (iv) Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
  - (v) Signature and Seal of Contractor.
- f) Additional materials used in project listed under various sections showing name of manufacturer and source of supply.

**4.8.3** Neatly type lists and notes. Use clear drawings, diagrams or manufacturer's literature.

**4.8.4** The final certificate will not be issued until requirements of section 4.8 have been received and approved by the Engineer/Architect.

#### **4.9.0 COORDINATION OF WORK**

**4.9.1** The Contractor will coordinate the Work of their Subcontractors and provide necessary instructions and scheduling so as to permit continuous progress in the Work by all trades. They will coordinate work between the Subcontractors on the site to ensure that anchor bolts, plates, attachments, etc., are provided and set in place in a timely manner. They will lay out partitions and assist Subcontractors in establishing the actual location of the fixtures, pipes, outlets, duct conduit, etc., so as to limit the interference of one trade with another. Locations shown on the drawings are approximate. If interference problems are encountered which cannot be resolved on the site, advise the Engineer/Architect before proceeding with the Work. Conceal all mechanical and electrical work unless otherwise indicated.

#### **4.10.0 TRAFFIC MAINTENANCE**

**4.10.1** Do not close or obstruct streets, sidewalks, driveways, etc., without permission from authorities having jurisdiction. Do not place or store materials in street, sidewalks, parking areas, etc., unless so authorized.

#### **4.11.0 FIRE PROTECTION**

**4.11.1** The Contractor's fire protection measures shall include:

- a) An adequate fire alarm signal, the use of fire-resistant tarpaulins, the daily inspection of temporary heating system by competent staff and regular fire patrol;
- b) All temporary wiring shall be done by electricians qualified under the applicable local regulations;
- c) Supply and maintenance of fifteen (15) pounds dry chemicals and/or five (5) gallons soda-acid fire extinguishers in such locations that no working crew has to travel more than fifty (50) feet to an extinguisher station. In any case, there shall be not less than one (1) fully charged extinguisher(s) at the job at any time.

#### **4.12.0 JOB MEETINGS**

**4.12.1** Where the value of the contract exceeds \$100,000 (HST excluded) job meetings

shall occur at definitely prescribed times (minimum once a month), which will be determined after commencement of work, the Contractor shall organize job meetings and send out notices stating time and place to the Owner's representative, the Engineer/Architect, Subconsultants, to all Subcontractors and to other persons whose presences are required at the meetings. They shall take note of all persons attending these meetings and shall, within one (1) week after each job meeting, submit to the Owner, the Engineer/Architect, the Subconsultants and others present, minutes of the meeting which must show any major decisions made and any instructions or information required.

- 4.12.2** Where the value of the contract is less than \$100,000 (HST excluded) job meetings shall occur at the discretion of the Owner's representative but shall not occur fewer than once per month.

#### **4.13.0 AS-BUILT DRAWINGS**

- 4.13.1** The Engineer/Architect will issue to the Contractor three (3) sets of prints of Issued for Construction drawings for the sole purpose of providing "as- built" drawings. The Contractor shall pass these to the relevant Subcontractor who shall keep two (2) sets in their office and one (1) set on the job. As changes occur, the Subcontractor shall make them on the field set. Upon completion of the project, the Subcontractor shall accurately transfer all changes to the two (2) office sets in red ink and pass them to the Engineer/Architect, through the Contractor, for approval. If they are not approved, the Subcontractor shall prepare new sets for resubmission (purchasing additional white prints for this purpose).

- 14.13.2** As-built drawings shall be digital and shall indicate any and all changes in the contract work.

- 14.13.3** Provide electronic as-builts in an acceptable file transfer method (external hard drive or file share)or, at the direction of the Owner, pdf format.

- 14.13.4** The Certificate of Total Performance will not be issued until such drawings have been received and approved.

#### **4.14.0 COMPLETION TIME**

- 4.14.1** The project shall be ready for the use and occupancy by the Owner within the time stated in the Contract Documents. Time is and continues to be of the essence.

- 4.14.2** Prior to the acceptance by the Owner of the Substantial Performance, the Contractor and the Owner shall agree on a list of deficiencies as prepared by the Engineer/Architect for prompt correction and/or completion.

#### **4.15.0 CLOSE DOWN OF WORK**

- 4.15.1** Should the Work be closed down for any cause, the Contractor shall assume all responsibility for its proper protection during such period. They must protect all foundation work and other work liable to be damaged.

#### **4.16.0 BROKEN GLASS**

- 4.16.1** The Contractor shall be held responsible for any damaged, broken or scratched glass and at completion shall replace all such glass at no additional cost to the Owner.

#### **4.17.0 HOARDING**

- 4.17.1** Before starting excavating, construct and thereafter the Contractor shall maintain all necessary hoarding required by Municipal or Provincial regulations or by other authorities having jurisdiction.

#### **4.18.0 COMMISSIONING**

- 4.18.1** The Contractor is responsible for commissioning the Work to ensure that the various parts are operating in a manner as intended by the Contract Documents. Even through individual components and/or parts of the Work may have been tested and approved prior to the substantial completion, the Contractor must coordinate a final commissioning of the complete Work, including at the place of the Work all their major Subcontractors and Suppliers. The final commissioning will be carried out by the appropriate trades working together in a complementary manner such that the successful operation of the whole Work is completed properly to the satisfaction of the Engineer/Architect. **The Substantial Performance Certificate will not be issued until the final commissioning of the Work has been successfully completed.**

#### **4.19.0 FINAL CLEAN-UP**

- 4.19.1** At the end of the job, thoroughly clean the building of all rubbish and surplus materials.
- 4.19.2** Make good all damaged areas in the building caused as a result of the Work of this Contract.
- 4.19.3** Do final cleaning, waxing and polishing of resilient flooring.

## **5.0 CAMPUS SAFETY AND HEALTH REGULATIONS**

Maintaining a healthy and safe environment for all members of the campus community, as well as visitors, is a priority with the University. This involves a commitment from all sectors of the campus community and extends to outside agencies having occasion to come on campus to conduct business.

The following regulations will apply to all work undertaken by contractors and service personnel on any University property.

### **5.1.0 REGULATIONS, CODES AND STANDARDS**

Contractors shall be familiar with and abide by provisions of various safety codes and standards applicable to the work performed and should refer to Article **23. PROTECTION OF WORK AND PROPERTY** in the **General Conditions**.

In particular, strict adherence shall be required to the Provincial Occupational Health and Safety Act and Regulations and the National Building Code of Canada, Part 8.

### **5.2.0 GENERAL SAFETY REGULATIONS**

- a) Contractors/service agencies shall ensure that members of the campus community are not endangered by any work or process in which they may be engaged. Work areas shall be adequately barricaded, and if dust or fumes are generated, suitable enclosures shall be installed to contain such emissions.
- b) No material shall be stored in such a way as to obstruct walkways or represent a danger to pedestrian traffic.
- c) Adequate protection shall be provided to prevent the possibility of materials falling from scaffolding or elevated areas. Areas where materials are being loaded or offloaded shall be barricaded or otherwise protected to prevent unauthorized entry. Where necessary, appropriate warning signs shall be posted.
- d) The work areas must be kept reasonably clean and free from debris which could constitute a fire hazard. Care must be taken to ensure that the work process does not activate fire alarm detection devices. (Generation of dust and fumes can activate smoke detectors causing a false alarm).
- e) Due consideration shall be given to fire safety in buildings. Flammable materials must be kept away from sources of ignition. No work involving the use of open flame devices must be undertaken around flammable solvents or gases.
- f) Do not alter or disturb any materials believed to contain asbestos materials (unless this is a duly authorized part of the project). Should suspect materials be encountered, consult with University officials before proceeding.

- g) Material Safety Data Sheets shall be procured for any hazardous product used on campus. Such sheets shall be made readily available for consultation as required under the Workplace Hazardous Materials Information System.

**NOTE:** The above regulations are not to be considered all-inclusive and are considered to be complementary to the safety requirements outlined in the agreement between the Owner and the Contractor/Service Agency. Certain conditions and circumstances may require adherence to additional safety regulations.

As a general requirement, contract/service personnel are expected to conduct all work on campus in a professional and safe manner and to give priority to the welfare of members of the campus community.

## **6.0 CONTRACTOR PERFORMANCE EVALUATION**

- 6.1.0** The purpose of this process is to maintain an acceptable level of performance with external contractors carrying out work for the Department of Facilities Management.
- 6.2.0** A record of the performance of external contractors will be maintained to identify the following:
- a) Those contractors who by virtue of satisfactory performance will continue to be eligible to submit bids for work at the University;
  - b) Those contractors whose performance is considered unsatisfactory and will be advised of the need to improve performance to remain eligible to submit bids for work at the University;
  - c) Those contractors whose record of unsatisfactory performance will render them ineligible to submit bids for work at the University.
- 6.3.0** Contractors' performance will be evaluated on a points rating system relative to quality of work performed, timeliness in completing work and management/administration of contracts/work and safety parameters.



## 7.0 SIGNATURE PAGE

Open Call for Bid for: Memorial University (the Owner) Open Call Number: \_\_\_\_\_

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

Contractor's Full Business Name:

Contractor's Full Business Mailing Address:

Phone Number: \_\_\_\_\_ Email: \_\_\_\_\_

**Signature(s)**

**Title(s)**

### Contractor:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
I have authority to bind the corporation.

### Witness:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

### Signed of Behalf of Memorial University (the Owner):

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
I have authority to bind the corporation.

### Witness:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

This Stipulated Price Contract is signed at St. John's, NL on this \_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 5  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Friday, January 23, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Not Applicable.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Drawing: S102 - DATA ROOM ROOF PLAN AND UPS WALL SUPPORT PLANS
- .1 Replace with new Drawing S102 attached to this addendum.
- .2 Drawing: M101 - SITE PLAN – MECHANICAL LAYOUT
- .1 Reference Detail 2 – ‘BURIED REFRIGERANT PIPING RACEWAY DETAIL’, revise Note 1 to read as follows:
- “1. All below grade refrigerant joints are to be brazed. Mechanical joints are not acceptable.”
- .3 Drawing: E401 - ENLARGED FLOOR PLANS – DATA CENTRE
- .1 Reference: Detail 1
- .1 Updated lighting layout and lighting types.
- .2 Additional occupancy sensors shown.

.4 Drawing: E403 - ENLARGED DISTRIBUTION AND ELECTRICAL SERVICES  
ROUTING PLANS

- .1 Provide two (2) inline pull boxes on vertical sections of 600A normal power feeders to ATS-1 and ATS-2 at Level 3 (Rm 3308) and Level 5 (Rm 5306). At each pull box install cable support devices. Devices to be Emerson OZ/Gedney Type S or equivalent.

.5 Drawing: E505 - ELECTRICAL DETAILS

.1 Reference: Detail 4

- .1 Clarification - Indicates location of single tier of cable tray that was added as part of Addendum No. 4.

.6 Drawing: E701 - ELECTRICAL SCHEDULES

- .1 Updated lighting types D1, D2, D3. Linear light fixtures to mount to structural ceiling grid. Light supplied to be compatible with structural ceiling that is supplied. Mounting hardware supplied to be compatible with ceiling grid.
- .2 Basis of design for structural ceiling is Dynamax Plus as marketed by Armstrong World Industries. The grid comprises of main beams and cross tees which are both sized at 50mm wide x 92mm high. Both main beams and cross tees have continuous 3/8" threaded boss channels for mounting equipment to including light fixtures.

1.6 CHANGES TO SPECIFICATION

.1 Appendices

- .1 Add Appendix 6 - Geotechnical Investigation Proposed MUN Core Sciences Building as attached to this addendum.

.2 Section 01 35 29.06 – Health and Safety Requirements

.1 Reference: 1.7 Contractors Safety Representative

.1 Revise 1.7.1 as follows:

- “.1 The contractor shall employ a Contractor's Safety Representative (CSR), or have tasks completed by alternate staff member who is on site during the execution of the work, who shall have as a minimum successfully completed the following training, and must have current credentials for those that have expiration dates:"

.3 Section 07 42 00 - Perforated Metal Wall Panels

.1 Reference: 2.1 Perforated Architectural Metals

.1 Revise 2.1.2.1 as follows:

- “.1 Machine / laser cut round holes in varying diameter to create perforated image as per precedent shown on Sheet A301.”

.2 Revise 2.1.4.1 as follows:

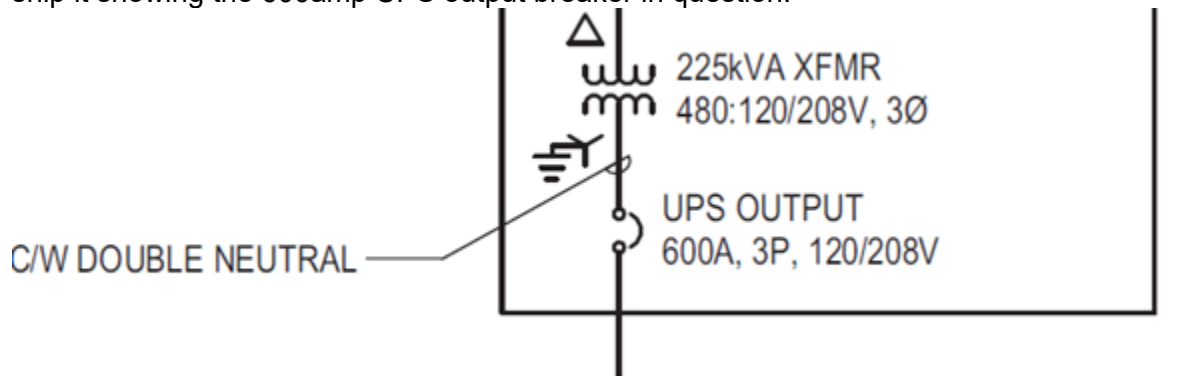
- “.1 12" o.c. – long legs only. Concealed fasteners accessed through appropriately sized perforations in panel. Refer to Approved Products for basis of design.”

- .4 Section 23 23 00 – Refrigerant Piping
  - .1 Reference: 2.1 Underground Piping
    - .1 Revise Clause 2.1.3 as follows:  
“All refrigerant piping installed within underground raceways shall be installed without mechanical joints. All joints shall be brazed.”
- .5 Section 26 36 23 – Automatic Transfer Switches
  - .1 Reference: 2.2 Mechanically Held Transfer Switch
    - .1 Revise Clause 2.2.7 as follows:  
“The ATS shall be provided with fully rated **switched** neutral transfer contacts.”

## 1.7 QUESTIONS AND RESPONSES

- .1 QUESTION: Will teck be acceptable to use in place of conduit? If teck is to be used are there any special requirements for vertical rated teck cable? See attached spec sheet.
  - .1 ANSWER: TECK cable is not acceptable. All feeders to be RW90/RWU90 in conduit as specified on the drawings. Strain relief devices to be provided on vertical runs as indicated in this addendum.
- .2 QUESTION: Specification “Section 26 36 23 - Automatic Transfer Switches” Part 2.2.7 calls for an overlapping neutral. Please clarify the purpose of this option. Overlapping Neutral is an option only used by one manufacturer. All other manufacturers including Cummins have a “Solid” or “Switchable” neutral. A Switchable Neutral performs the same task as the overlapping Neutral.
  - .1 ANSWER: ATS to be revised to switched neutral.
- .3 QUESTION: Cummins Has provided many ATS’s to Health Care facilities, Military installations, and Data Centers across the province and North America. We would like to submit Cummins CBL Automatic Transfer Switch for Approval to quote on this project.
  - .1 ANSWER: Cummins CBL Automatic Transfer Switch has been accepted as an alternate. It is noted that this switch is dimensionally larger than the design basis. Exact layout and configuration of the room to be confirmed by the contractor to ensure all equipment fits within the available space.
- .4 QUESTION: On drawing M101, Note #1 states: "all below grade refrigerant piping to be continuous with no joins." The refrigerant piping sizes that are required for this job are not available in greater than 50' length coils. As it appears, the PVC raceway from surface-to-surface is longer than 50 feet. Will the PVC raceway be relocated to allow for no joins?
  - .1 ANSWER: Brazed joints will be accepted for buried refrigerant piping. Mechanical joints (compression, crimped / press-fit) will not be accepted.

- .5 QUESTION: Clarify this point in terms of both UPS's output breaker sizes. Below is a snip it showing the 600amp UPS output breaker in question.



Note 600amps is insufficient for 225kva @ 208v

$225\text{kva} @ 208\text{v} = 625\text{A}$  sizing the breaker @ 80% = 780A

Additionally, this is odd since the downstream Panels (SA/SB) are shown as 600A rated. Can this be clarified please, as the 600A output breaker at 80% will only allow an output of approx. 173kva. Hence can the UPS's be both downsized to 180KVA or should we allow for an 800amp output breaker and hence change the amperage rating on Panels SA & SB.

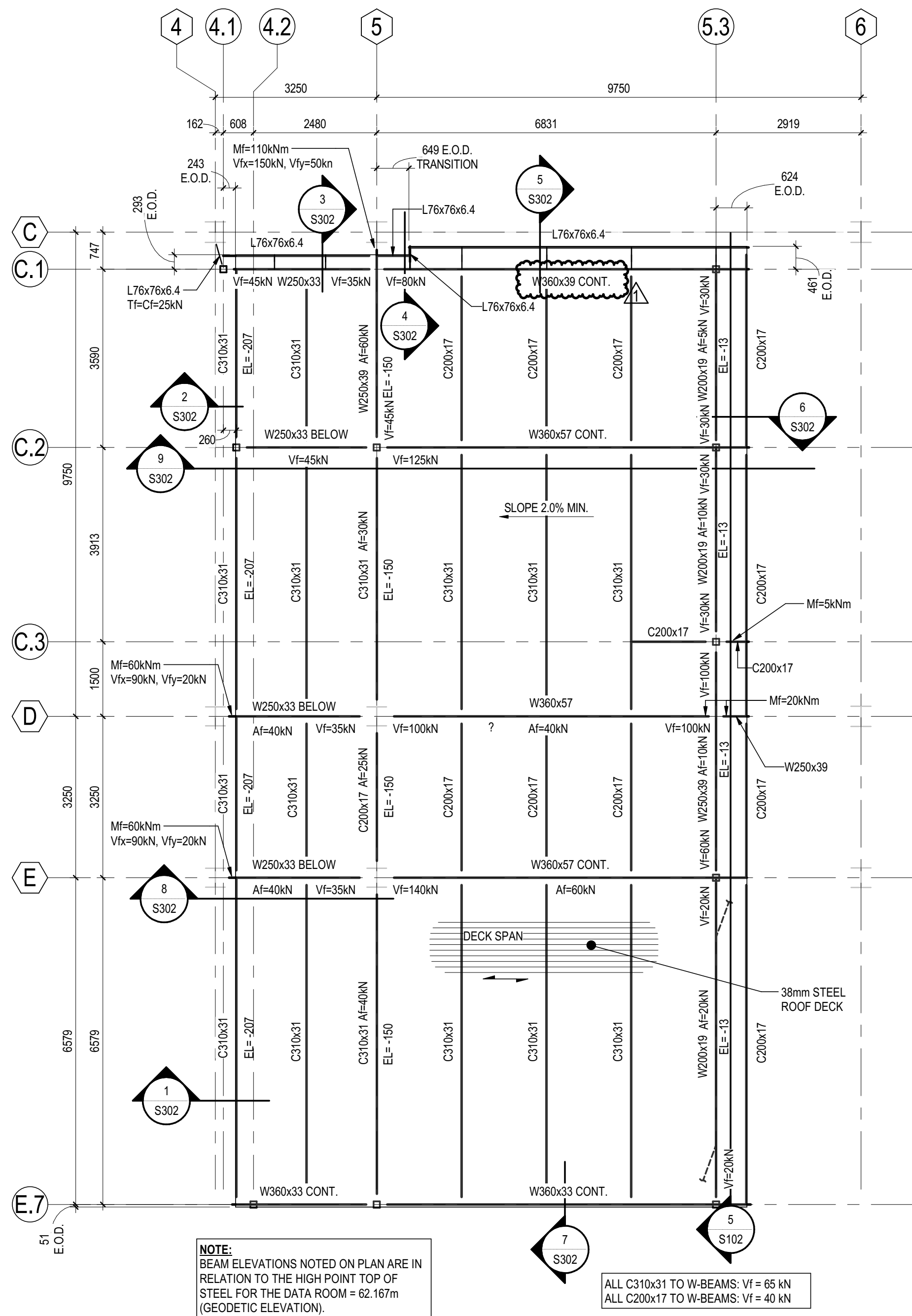
- .1 ANSWER: The breaker sizes and equipment configuration illustrated on the drawing were based on a specific manufacturer. The 600A output breaker must be rated for 100% duty to maximize the bus ratings of the downstream panels SA and SB.
- .6 QUESTION: Has a geotechnical report been completed? If so, please provide.
- .1 ANSWER: Geotechnical Investigation is attached to this addendum.
- .7 QUESTION: Please indicate which manufacturer has provided the existing fire alarm system within the Core Science Facility.
- .1 ANSWER: Chubb is the existing fire alarm system integrator.
- .8 QUESTION: MUNet Specification section 3.3.2.4 contains a table on communications pull box sizes which states for one 2" conduit that a 450mm x 500mm x 200mm size box is required. Electrical drawing E102 Detail 2 shows a 2" conduit within CSF pavilion B with a note on the pull boxes Indicating 300mm x 1220mm x 200mm size is required. Electrical drawings E404, E405 and E406 show the routing of this 2" conduit in CSF pavilion A and C, within the University Center and within the Chemistry/Physics building indicating pull box size of 200mm x 900mm x 100mm is required. Please confirm if we are to size the boxes according to the MUNet Specification or as indicated on the electrical drawings.
- .1 ANSWER: Please supply boxes as indicated on the Electrical drawings.
- .9 QUESTION: Can you please confirm who's supplying the two generators?
- .1 ANSWER: The generators are supplied and installed by Division 26. Acceptable manufacturers: Caterpillar, Kohler, Cummins, MTU or approved equivalent.



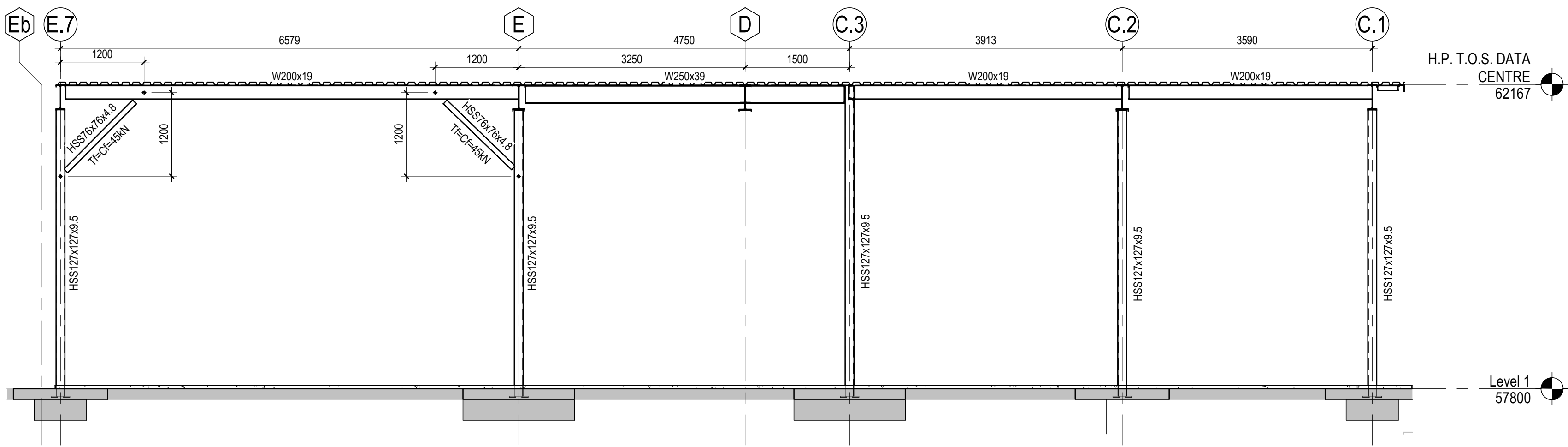
- .10 QUESTION: Where is an acceptable staging area to store material until erection? Is it possible to store material inside adjacent to the construction area?
- .1 ANSWER: Yes, storing material in the shell space area is acceptable. Contractors are required to ensure that material is stored in accordance with safe storage requirements and is securely contained.
- .11 QUESTION: As per Section 01 35 29.06 – Health and Safety Requirements, Part 1.7 – Contractors Safety Representative (CSR) • This section states that the Contractor must employ a qualified CSR. For clarification, is this CSR required to be on-site, full time and 100% dedicated to this project?
- .1 ANSWER: The contractor shall employ a Contractor's Safety Representative (CSR), or have tasks completed by alternate staff member who is on site during the execution of the work.
- .12 QUESTION: Can the General Contractor avail of the space on the west end of the Parkade across from the site for Lay down area/ Office trailer and storage of material? Summary of works states that washrooms onsite within the building can be used as designated by owner and Special conditions states to provide and maintain temporary toilets. Please advise which is correct and if we are to exclude or include costs for washroom facilities?
- .1 ANSWER: This area is not available for the use of a trailer or laydown. An area within the existing shell space can be utilized as a lunch/office area. Washrooms within the building can be used, though coordination between building user groups will determine which are available. Areas designated by Owner's Representative and are predicated on keeping washrooms clean and garbage-free at all times to the satisfaction of the Owner's Representative. Washrooms are to be used by the contractor for their intended use only, as they are also open to building occupants. Construction tools are not permitted in the washrooms. Dust and construction debris must be managed outside the construction area.
- .13 QUESTION: Regarding types D1, D2 and D3 for lighting - the part number indicates use with an Armstrong ceiling. Could you please confirm the ceiling tee section dimensions (e.g., grid type/profile) required to ensure proper fixture fit and compatibility?
- .1 ANSWER: The ceiling in the data centre and UPS rooms are structural suspended ceilings. Our basis of design is Dynamax Plus as marketed by Armstrong World Industries. The grid comprises of main beams and cross tees which are both sized at 50mm wide x 92mm high. Both main beams and cross tees have continuous 3/8" threaded boss channels for mounting equipment to including light fixtures.
- .14 QUESTION: Please confirm that the only galvanized structures on this project are the Vertical Conduit Structure (Ref Drw: S103), and the Generator Enclosure Structure (Ref Drw: S105).
- .1 ANSWER: Galvanized items are the Vertical Conduit Structure (S103), Generator Enclosure Structure (S105), bollards (S501), and pipe support structures/components (M401).

- .15 QUESTION: For both of these structures, please confirm if the steel can be ordered in as galvanized and all shop/field welding to be painted with cold galvanizing after fabrication, so to avoid the high cost of re-sending the fabricated steel back to the mainland for hot dip galvanizing, as there is currently no galvanizing plant on the island.
- .1 ANSWER: Cold galvanizing is not acceptable.

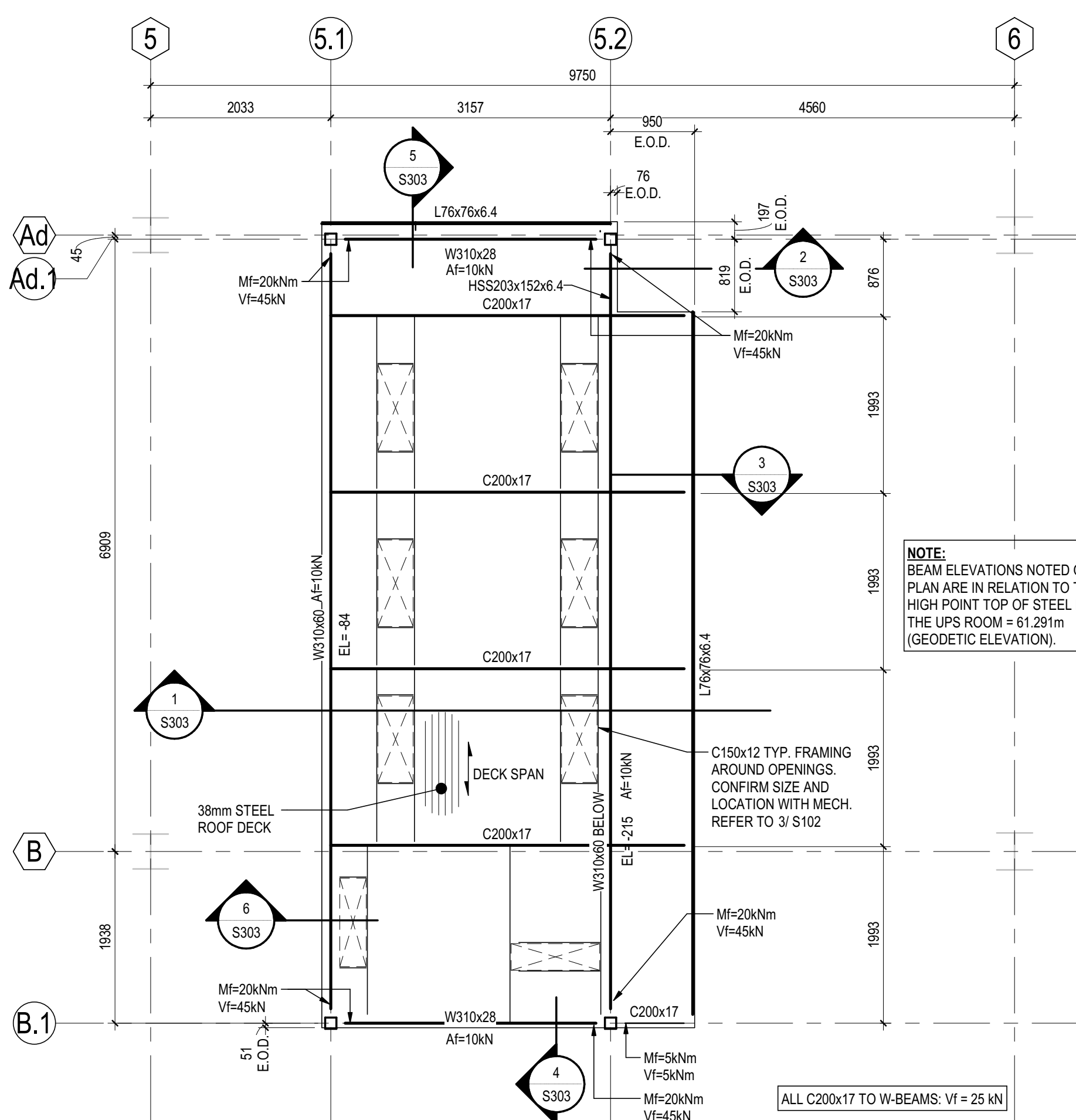
**END OF ADDENDUM**



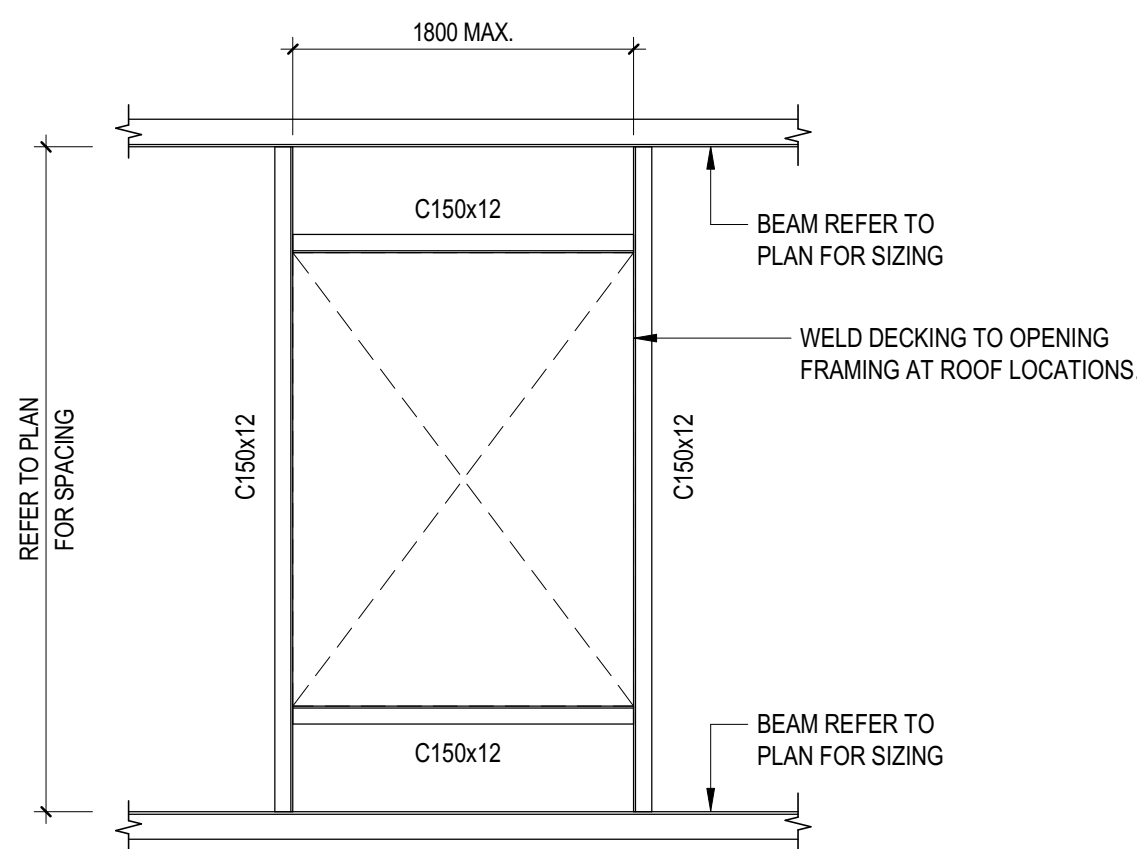
1 DATA ROOM ROOF FRAMING PLAN  
S102 1:75



5 DATA ROOM BRACING ELEVATION  
S102 1:50



2 UPS ROOM ROOF FRAMING PLAN  
S102 1:50



3 TYPICAL FRAMING FOR MECH./ELEC. OPENINGS  
S102 1:20

DESIGN NOTES (DATA ROOM FRAMING)	
1. ROOF DEAD LOAD (UNFACTORED):	
ROOFING SYSTEM	= 0.5 kPa
STEEL DECK	= 0.15 kPa
SUPERIMPOSED (M&E)	= 0.25 kPa
STRUCTURAL CEILING SYSTEM	= 5.45 kPa
TOTAL	= 6.35 kPa + STEEL WEIGHT
2. LIVE LOAD	= 1 kPa
3. SEISMIC LOAD:	
IN ACCORDANCE WITH NBCC2020 SECTION 4.1.8	
IMPORTANCE FACTOR, IE = 1.3 (HIGH)	
SITE CLASS C	
Sa(0.2)	= 0.187
Sa(0.5)	= 0.149
Sa(1.0)	= 0.0925
Sa(2.0)	= 0.0485
Sa(5.0)	= 0.0142
Sa(10.0)	= 0.00506
PGA	= 0.0788
PGV	= 0.106
Rd	= 1.5
Ro	= 1.3

DESIGN NOTES (UPS ROOM FRAMING)	
1. ROOF DEAD LOAD (UNFACTORED):	
ROOFING SYSTEM	= 0.5 kPa
STEEL DECK	= 0.15 kPa
CEILING	= 0.5 kPa
SUPERIMPOSED (M&E)	= 0.25 kPa
TOTAL	= 1.4 kPa + STEEL WEIGHT
2. LIVE LOAD	= 1 kPa
3. SEISMIC LOAD:	
IN ACCORDANCE WITH NBCC2020 SECTION 4.1.8	
IMPORTANCE FACTOR, IE = 1.3 (HIGH)	
SITE CLASS C	
Sa(0.2)	= 0.187
Sa(0.5)	= 0.149
Sa(1.0)	= 0.0925
Sa(2.0)	= 0.0485
Sa(5.0)	= 0.0142
Sa(10.0)	= 0.00506
PGA	= 0.0788
PGV	= 0.106
Rd	= 1.5
Ro	= 1.3

DECK PROFILE	SUPPORT FASTENING	SIDE LAP	PERIMETER SUPPORT	LOCATION
38mm DEEP GALVANIZED CANAM P-3606 - 20 Ga MIN (0.91mm)	36/4 PATTERN. CONNECT STEEL DECK TO SUPPORTS WITH POWER ACTUATED FASTENERS	#10 SCREWS @ 300 O.C.	SUPPORT FASTENING @ 150 O.C. MAX.	DATA ROOM ROOF AND UPS ROOM ROOF

DECK PATTERNS	
PATTERN	DIAGRAM
36/4	

A  
B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A  
B  
C

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM No. 5	2026.01.22
0	ISSUED FOR TENDER	2025.09.12

GENERAL NOTES

1. DRAWINGS TO BE READ AS A SET.

2. DO NOT SCALE FROM DRAWINGS

3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS

4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

ENGINEERING PERMIT 20291

STANTEC CONSULTING LTD.

07759

Signature or Member Number (Member is Responsible Change)

Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458

MEMORIAL UNIVERSITY

Department of Facilities Management

This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.

Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:  
CSF DATA CENTRE

CORE SCIENCE BUILDING,  
PRINCE PHILIP DRIVE, ST. JOHN'S  
NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
DATA ROOM ROOF PLAN AND UPS  
WALL SUPPORT PLANS

DESIGNED:  
A. GIRI

DRAWN:  
C. BURT

REVIEWED:  
A. MCGRATH

APPROVED:  
A. MCGRATH

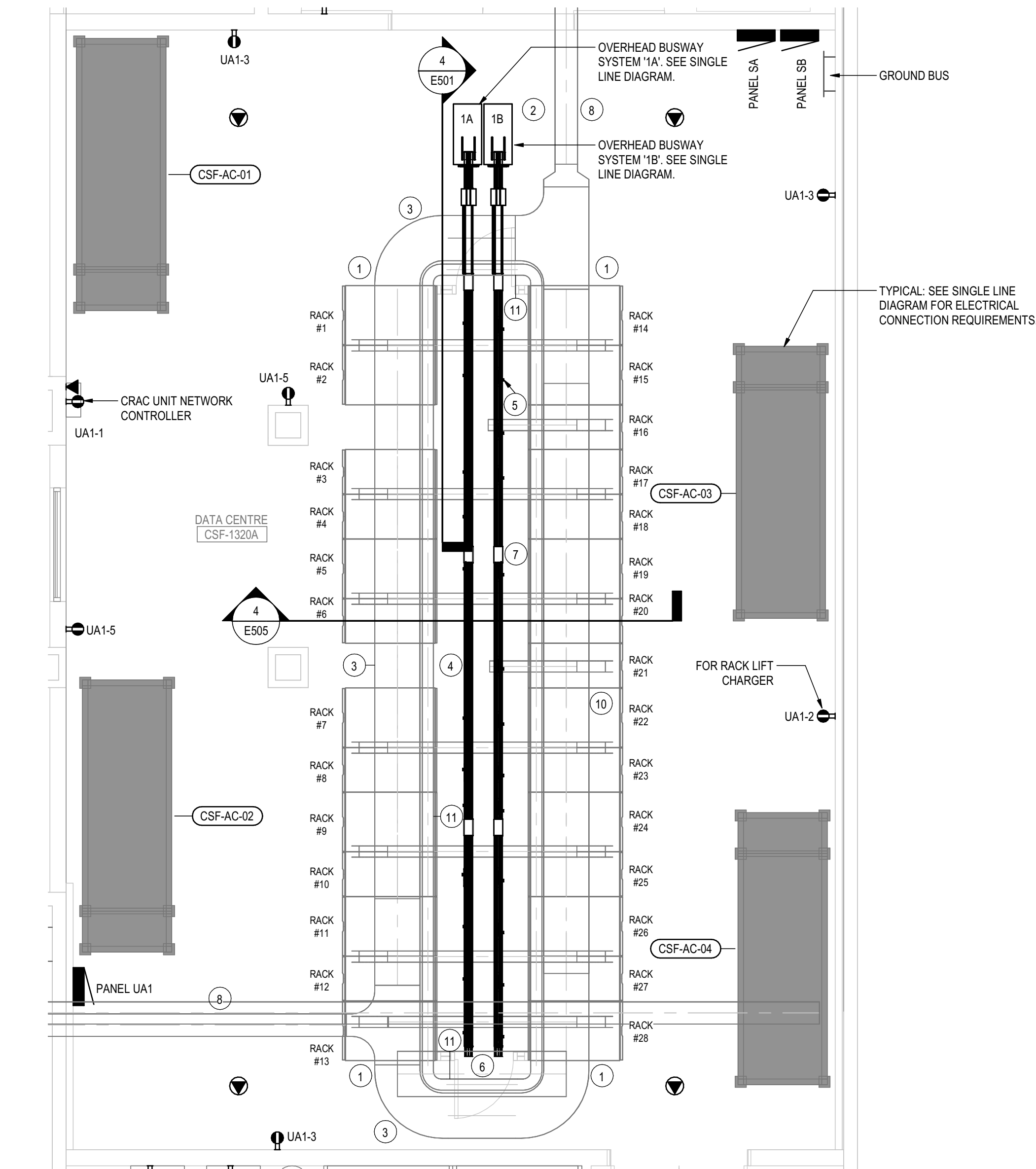
SCALE:  
As indicated

DATE:  
SEPTEMBER, 2025

STANTEC PROJECT No.  
133412008

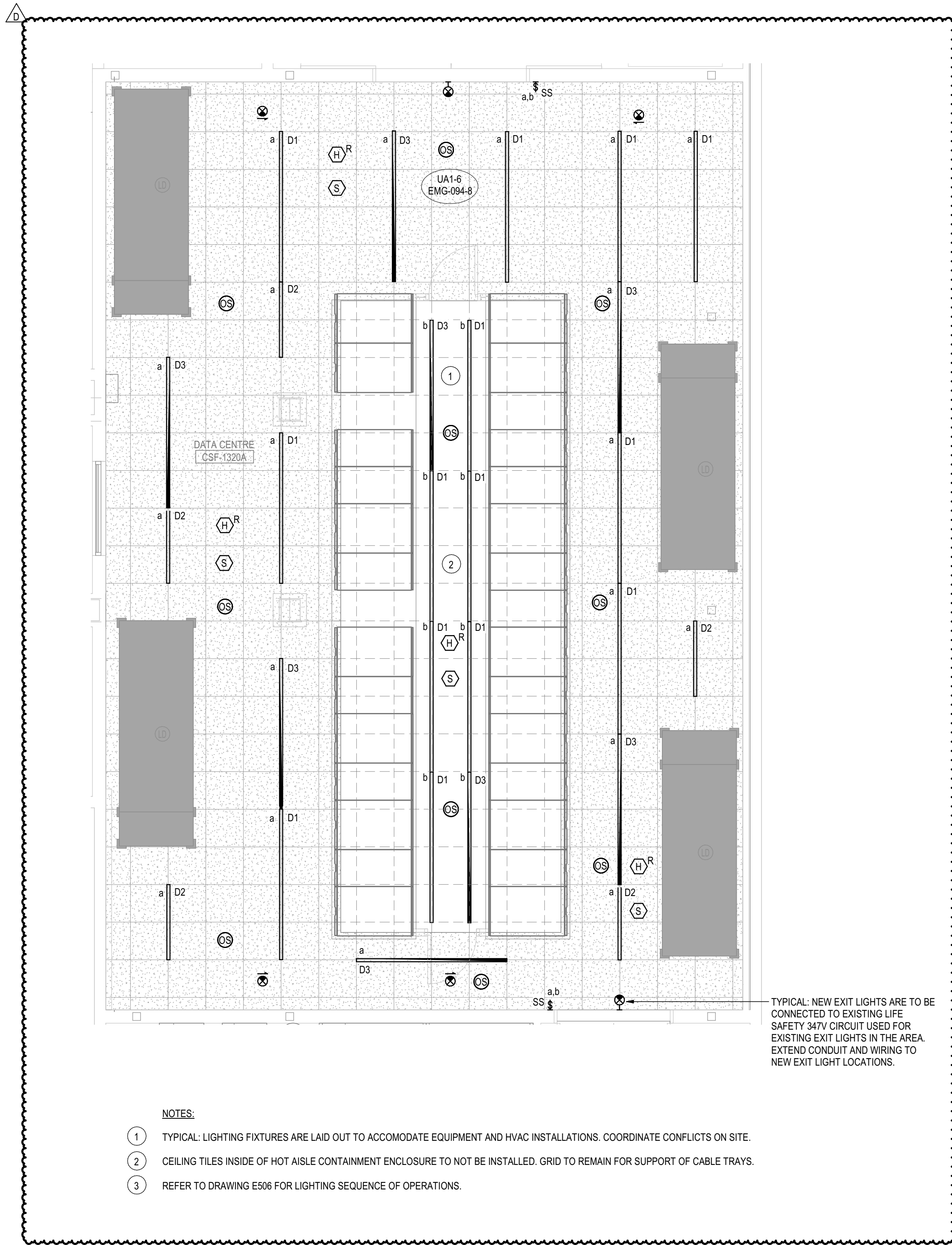
S102





NOTES:

- 1 CABLE TRAY TO PENETRATE HOT AISLE CONTAINMENT ENCLOSURE. COORDINATE WITH CONTAINMENT SYSTEM PANELS TO ENSURE IT IS PROPERLY SEALED.
- 2 CABLE END FEEDS FOR POWER BUSWAY RAIL SYSTEM. INSTALL ABOVE STRUCTURAL GRID. TO BE SUPPORTED FROM STRUCTURE ABOVE.
- 3 TWO TIERS OF 607mm W X 100mm H BASKET TYPE CABLE TRAYS C/W TWO (2) 100mm DIVIDERS PER TRAY. CABLE TRAYS TO BE FACTORY PAINTED WHITE. TRAYS TO BE SUPPORTED FROM STRUCTURAL CEILING GRID SYSTEM. SEE DETAIL 2, DRAWING E502.
- 4 POWER BUSWAY SYSTEM RAILS. PROVIDE LENGTHS OF RAIL REQUIRED TO EXTEND LENGTH OF DATA RACKS AND EXTEND TO CABLE END FEEDS. TO BE SUPPORTED FROM STRUCTURE USING BUSWAY SYSTEM HANGERS.
- 5 POWER BUSWAY SYSTEM TAP OFF BOX. SEE ALSO SINGLE LINE DIAGRAM.
- 6 POWER BUSWAY END CAP REQUIRED AT THE END OF EACH POWER BUSWAY RAIL SYSTEM.
- 7 TYPICAL: POWER BUSWAY COUPLER TO CONNECT SECTIONS OF POWER BUSWAY RAIL SYSTEM TOGETHER.
- 8 SINGLE RUN OF 305 mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND TO MDF AND STAGING ROOM. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE. SEE DETAIL 2, DRAWING E502.
- 9 DATA RACK ENCLOSURES TO BE SECURED TO CONCRETE PAD USING ANCHOR BOLTS. REFER TO DETAIL 3, DRAWING E501.
- 10 TYPICAL: SINGLE RUN OF 153mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND OVER TOP OF DATA RACKS FOR MANAGEMENT OF PDU POWER CORDS. TO BE COMPLETE WITH WATERFALL TYPE FITTINGS TO ALLOW FOR VERTICAL TRANSITION DOWN TO DATA RACKS. TRAY TO MOUNTED AND SECURED TO TOP OF STRUCTURAL CEILING GRID. SEE DETAILS ON DRAWINGS E501 AND E502.
- 11 153 mm W X 100mm H BASKET TYPE CABLE TRAY. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE.



NOTES:

- 1 TYPICAL: LIGHTING FIXTURES ARE LAID OUT TO ACCOMMODATE EQUIPMENT AND HVAC INSTALLATIONS. COORDINATE CONFLICTS ON SITE.
- 2 CEILING TILES INSIDE OF HOT AISLE CONTAINMENT ENCLOSURE TO NOT BE INSTALLED. GRID TO REMAIN FOR SUPPORT OF CABLE TRAYS.
- 3 REFER TO DRAWING E506 FOR LIGHTING SEQUENCE OF OPERATIONS.

A  
B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A  
B  
C

No.	REVISION	DATE
D	ISSUED FOR ADDENDUM NO. 5	2024.01.22
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

1. DRAWINGS TO BE READ AS A SET.

2. DO NOT SCALE FROM DRAWINGS

3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS

4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

ENGINEERING PERMIT J0291

STANTEC CONSULTING LTD.

04642

Signature or Member Number (Member-in-Responsible Charge)

PROFESSIONAL ENGINEER

BERNIE ROBINSON

2026-01-22

NEWFOUNDLAND & LABRADOR

Stantec

Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.  
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

MEMORIAL UNIVERSITY

Department of Facilities Management

*This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.*

- Dedication plaque, Arts & Administration Building, St. John's Campus

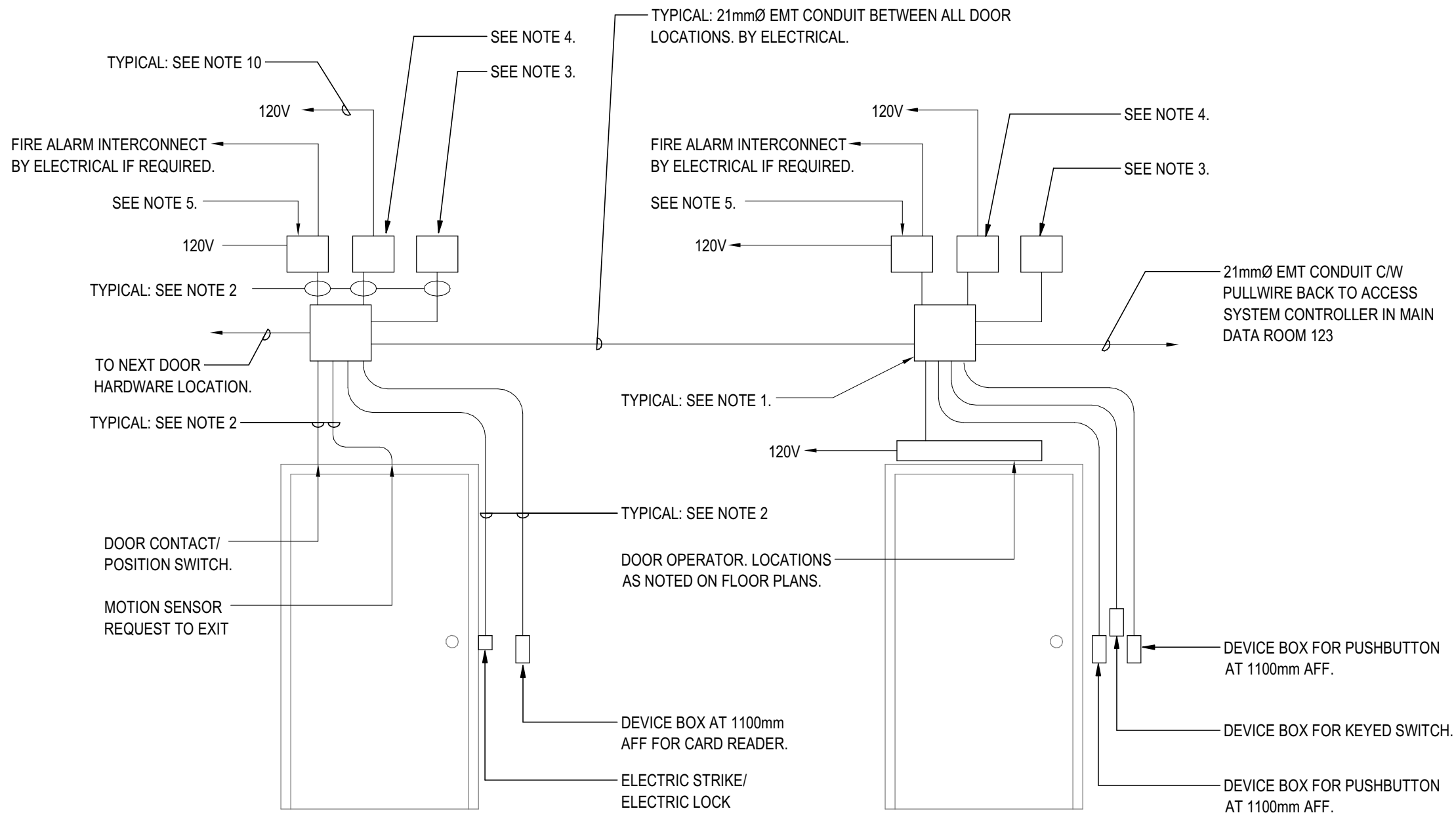
PROJECT NAME:  
PRIMARY DATA CENTRE REPLACEMENT  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
ENLARGED FLOOR PLANS - DATA CENTRE

DESIGNED: MG/UD	DRAWN: MG/UD
REVIEWED: -	APPROVED: BR
SCALE: 1 : 50	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. E401



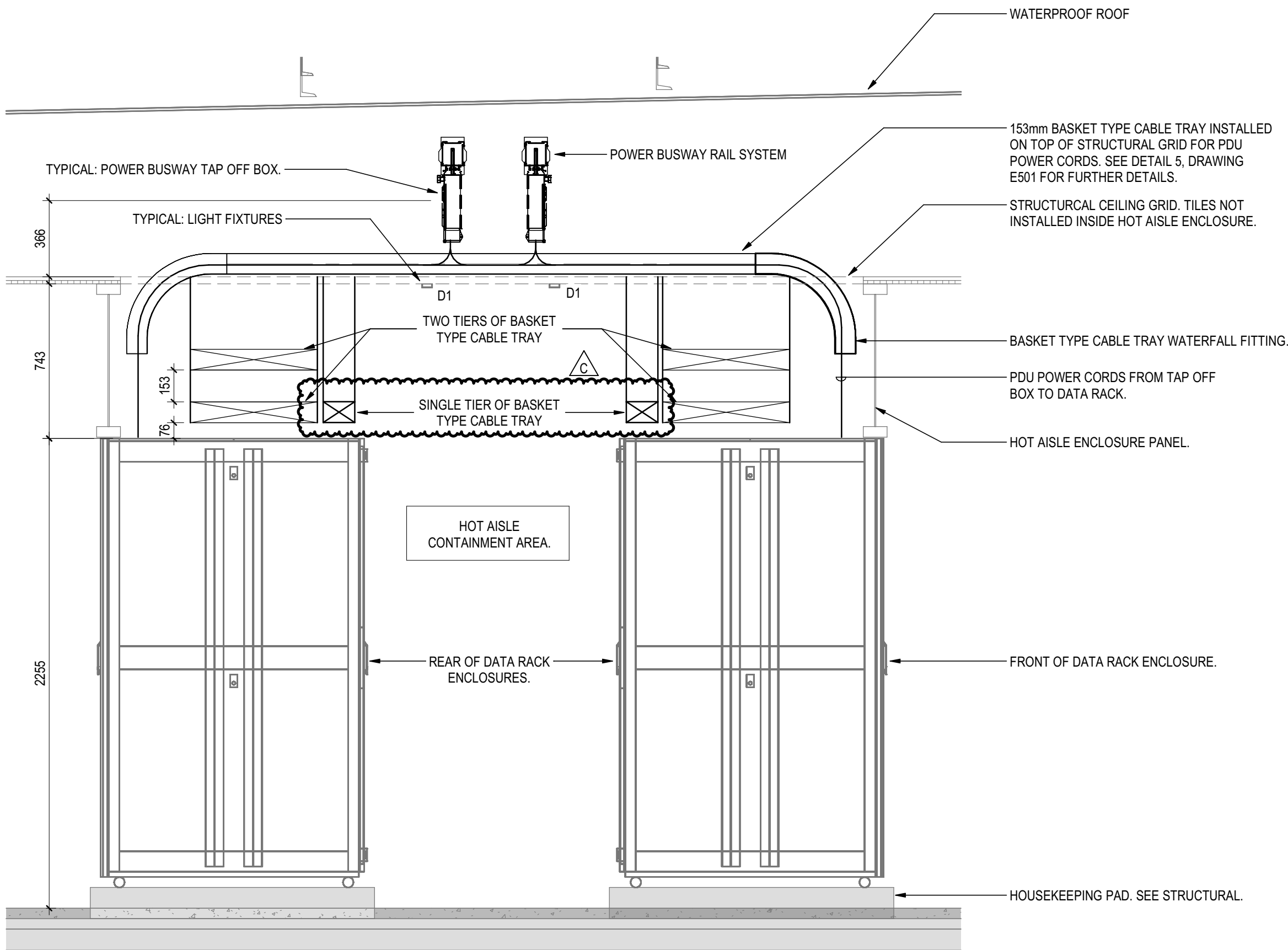


NOTES:

- 405mm X 405mm X 100mm PULL BOX IN CEILING SPACE ABOVE DOOR. PROVIDE 2' OF LOOPED WIRE AT EACH PULL BOX.
- 21mmØ EMT CONDUIT C/W PULL WIRE BY ELECTRICAL. WIRING BY DOOR HARDWARE CONTRACTOR.
- DOOR CONTROL DEVICE (DCD), BY DOOR HARDWARE CONTRACTOR.
- POWER SUPPLY FOR DCD (ONE FOR UP TO 5 DOORS WITHIN 50' RADIUS), BY DOOR HARDWARE CONTRACTOR.
- POWER SUPPLY FOR DOOR HARDWARE IF REQUIRED, BY DOOR HARDWARE CONTRACTOR.
- ALL FIRE ALARM INTERCONNECTS BY ELECTRICAL.
- ALL CONDUIT/BOXES/ROUGH-IN BY ELECTRICAL.
- ALL 120V WIRING AND CONNECTIONS BY ELECTRICAL.
- ALL LOW VOLTAGE WIRING AND DEVICES BY DOOR HARDWARE CONTRACTOR.
- 2 - #12 AWG RW90 COPPER CONDUCTORS PLUS 1 - #12 AWG COPPER BOND IN 21mmØ EMT CONDUIT FOR 120V POWER.
- COORDINATE EXACT ROUGH-IN REQUIREMENTS AT EACH DOOR LOCATION WITH DOOR HARDWARE INSTALLER PRIOR TO ROUGH-IN.

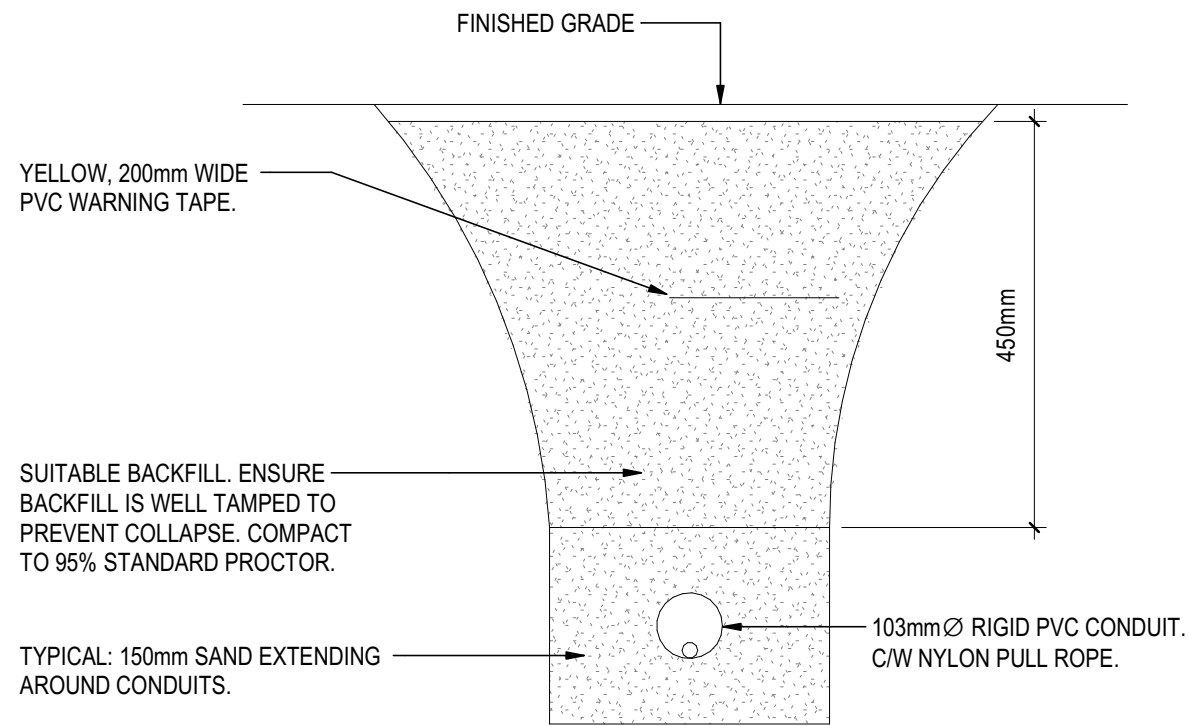
5 TYPICAL DOOR HARDWARE ROUGH-IN DETAIL

N.T.S.



4 SECTION VIEW - CSF-1320A

N.T.S.

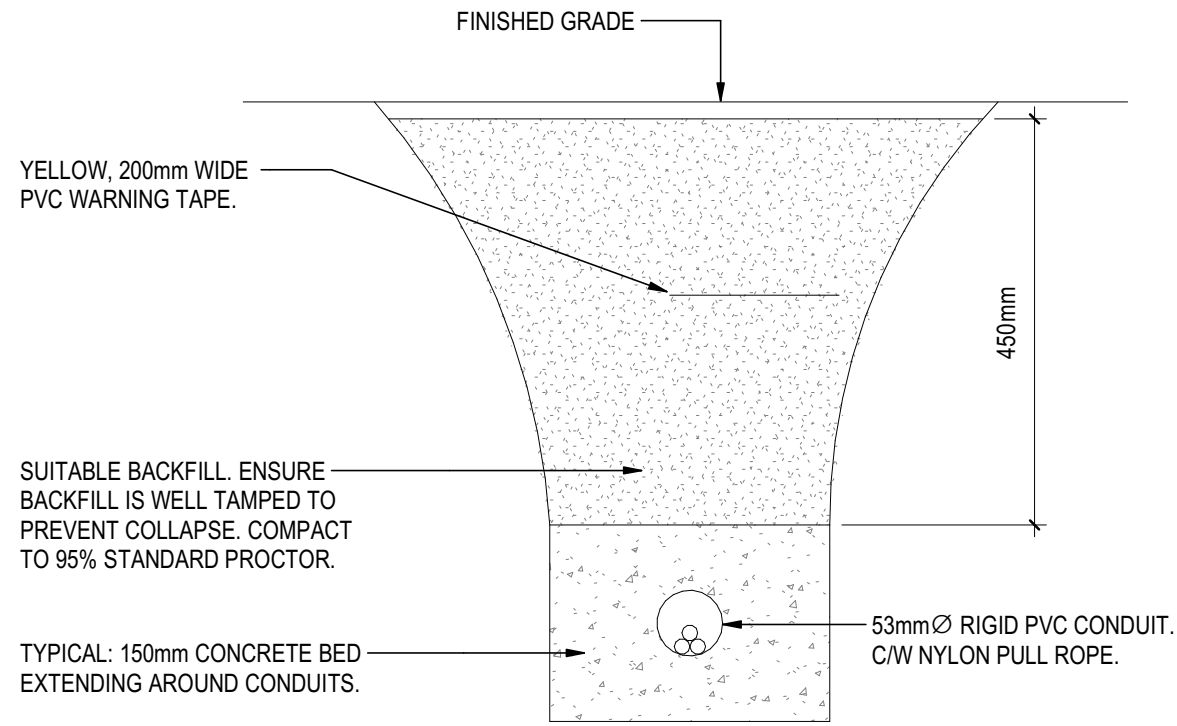


NOTES:

- PROVIDE CONDUIT SUPPORT SPACERS/CRADLES AT MAXIMUM 2m SPACINGS.

3 TYPICAL COMMUNICATION DUCT BANK DETAIL

N.T.S.

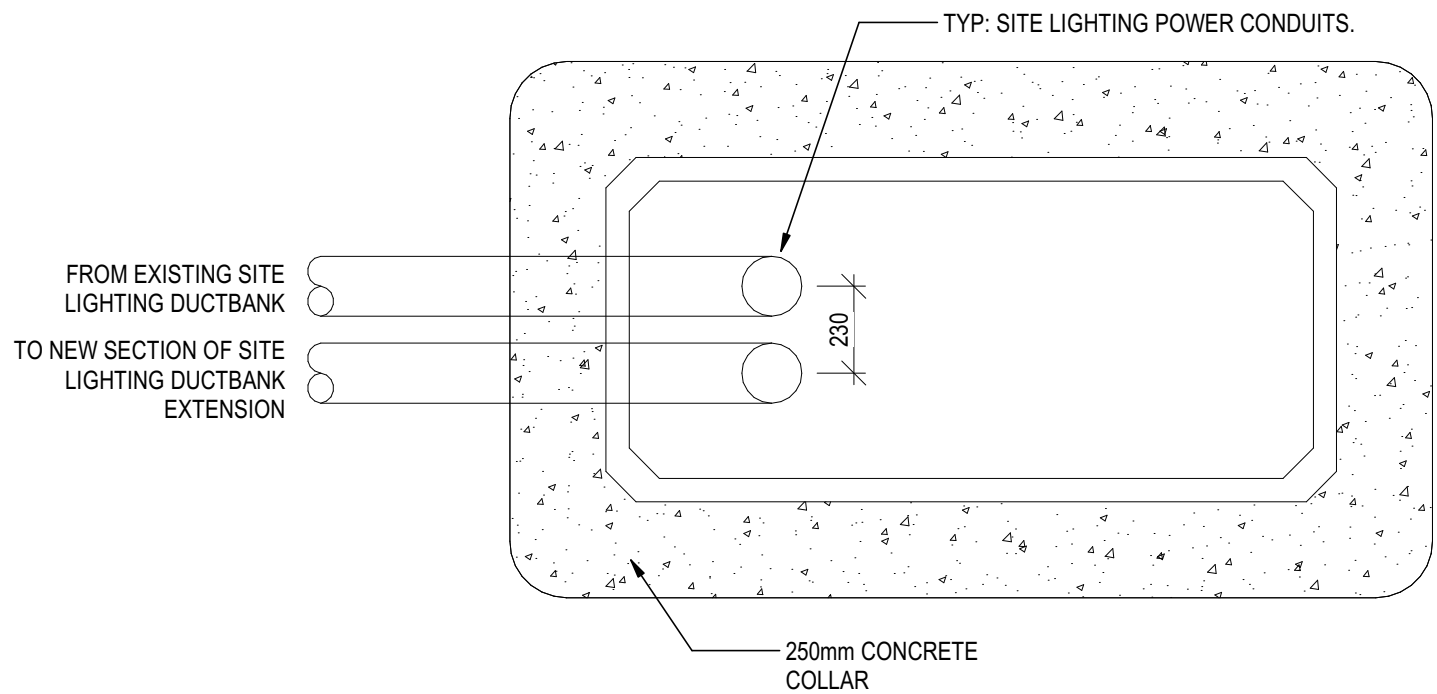


NOTES:

- PROVIDE CONDUIT SUPPORT SPACERS/CRADLES AT MAXIMUM 2m SPACINGS
- THIS DETAIL INDICATES A TYPICAL INSTALLATION. CONFIRM ON SITE THE EXISTING SITE LIGHTING DUCTBANK AND UPDATE TO SUIT.

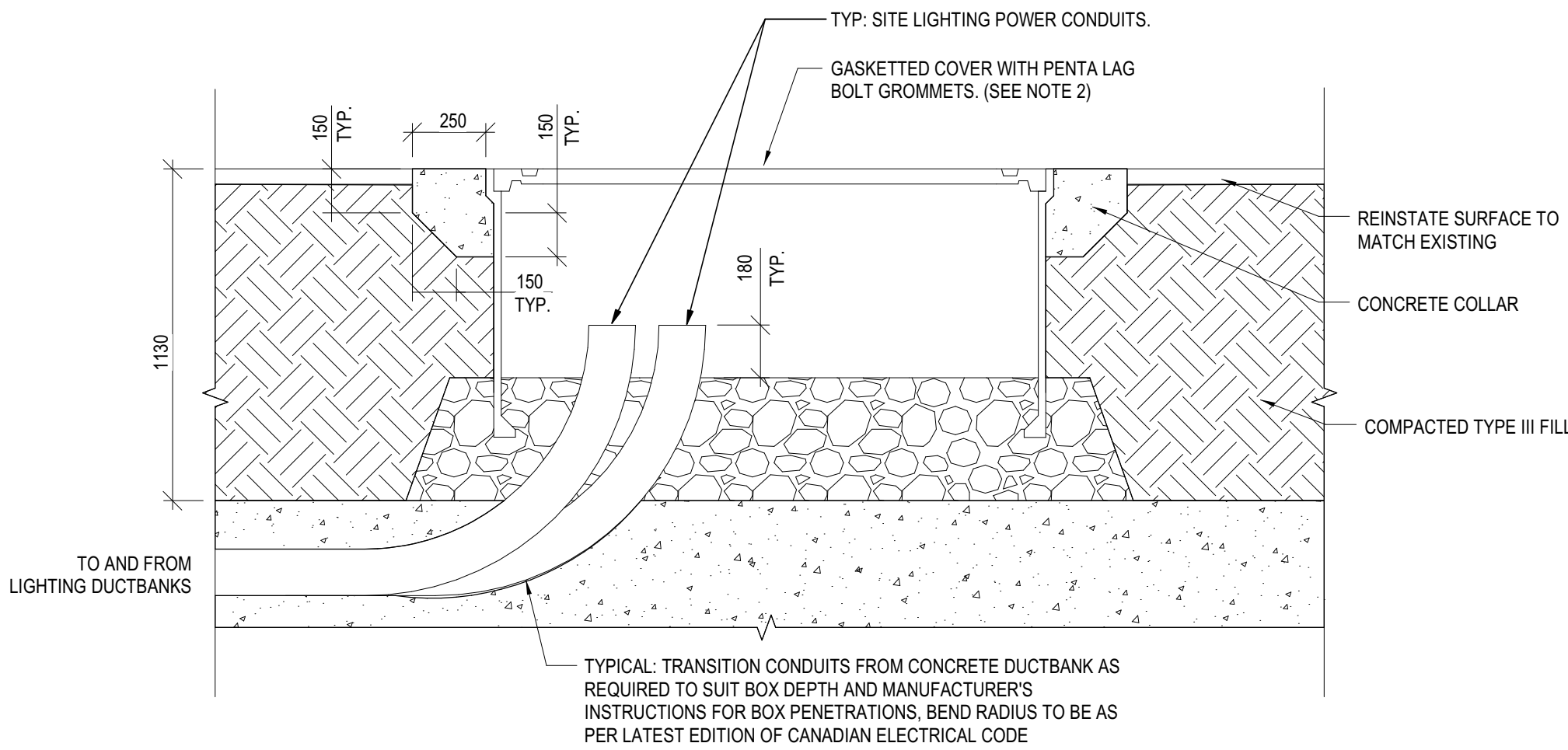
1 TYPICAL SITE LIGHTING DUCT BANK DETAIL

N.T.S.



NOTES:

- FLUSH MOUNTED TIER 22 PULL BOX COMPLETE WITH HEAVY DUTY TIER 22 RATED COVER FOR VEHICLE TRAFFIC C/W PENTA LAG BOLTS OR EQUIVALENT. SEE SPECIFICATION. PULL BOX TO BE MINIMUM 1828mm X 914mm X 914mm. FILL PULL BOX WITH CLASS A CRUSH STONE. PROVIDE 300mm OF CLASS A CRUSH STONE BELOW PULL BOX. CLASS A CRUSH STONE TO BE TAMPED IN 150mm LAYERS. PROVIDE ADDITIONAL BOX EXTENSIONS AS REQUIRED TO MEET DEPTH REQUIREMENTS.
- PULL BOX TO BE OPEN BOTTOM WITH GASKETED COVER.
- LABEL ALL DUCTS IN PULLBOXES WITH STAINLESS STEEL TAGS.



2 UNDERGROUND PULLBOX DETAIL

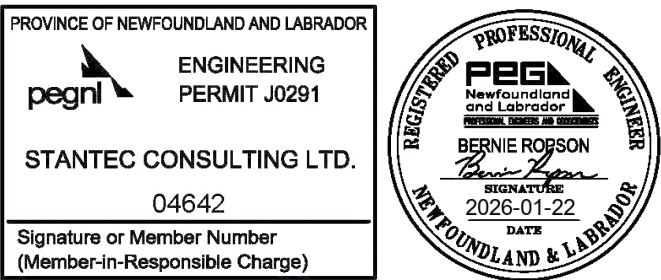
N.T.S.

A B	A - DETAIL B - LOCATION/DRAWING No. C - DRAWING No.	A B C
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 5	2024.01.22
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal



Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL DETAILS

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. <b>E505</b>



MONITORING MATRIX						
DATA GENERATING SYSTEM	MONITORING PARAMETER	PRIMARY MONITORING SYSTEM	PRIMARY NOTIFIED PARTY	SECONDARY MONITORING SYSTEM	SECONDARY NOTIFIED PARTY	REQUIRED INTEGRATIONS
Access Control	Door Hold Open	Genetec or Millennium	Security			
Access Control	Door Forced Open	Genetec or Millennium	Security			
Access Control	Door Access List, including credential holder ID and time stamp	Genetec or Millennium	Security			
Access Control	Security Component failure, line fault, and power loss	Genetec or Millennium	Security			
Access Control	Security Line failure	Genetec or Millennium	Security			
Access Control	Security system power loss	Genetec or Millennium	Security			
Ion Meter	Incoming Normal Power	PME			Facilities	
UPS	Attached Parameters on UPS	PLC				
Generator	Attached Parameters on Generator	PLC			Facilities	
ATS	ATS isolated, Bypassed to normal, Bypassed to the emergency power, Test mode, RUN mode for the Engine Control, Existence of emergency power, Existence of normal power.	PLC			Facilities	
Generator Communication Box	Absence of Portable Generator	PLC			Facilities	
PLC	Parameters on UPS- Generator- ATS - Communication Box	BMS				
CPI PDU	PDU plug loads, on/off condition	BMS	Facilities			
CPI PDU (Temperature and Humidity Sensor)	Temperature and Humidity at Racks	BMS	BMS		Facilities	
Unit Manufacturer	Data hall space temperature	BMS	Facilities			
Unit Manufacturer	Data hall Return plenum temperature	BMS	Facilities			
Unit Manufacturer	Staging area temperature	BMS	Facilities			
Unit Manufacturer	Staging area relative humidity	BMS	Facilities			
Unit Manufacturer	Return air temperature at each CRAC	BMS	Facilities			
Unit Manufacturer	Supply air temperature (x4, 1 per CRAC unit)	BMS	Facilities			
Unit Manufacturer	CRAC unit run-status (x4)	BMS	Facilities			
Unit Manufacturer	CRAC unit Supply air temperature setpoint (x4)	BMS	Facilities			
Unit Manufacturer	Economizer run status (x4)	BMS	Facilities			
Unit Manufacturer	Condensing unit run status (x8)	BMS	Facilities			
Unit Manufacturer	Split Unit run status (x4)	BMS	Facilities			
Unit Manufacturer	Data hall space relative humidity	BMS	Facilities			
Unit Manufacturer	UPS room temperature	BMS	Facilities			
Unit Manufacturer	UPS room humidity	BMS	Facilities			
Unit Manufacturer	UPS room hydrogen alarm	BMS	Facilities			
Unit Manufacturer	UPS room exhaust fan status	BMS	Facilities			
Unit Manufacturer	UPS room exhaust louver damper status.	BMS	Facilities			
Unit Manufacturer	Data hall CO2 (for ventilation control, needed by EBI for HVAC control)	BMS	Facilities			
Mechanical Unit Manufacturer	Water sensors (x4 in data hall, perhaps also x2 or x4 in the UPS room); these are liebert devices that interface with the CRAC units and Split Systems, so these points should come over BACNET to EBI.	BMS	Facilities			
Unit Manufacturer	Outside air temperature.	BMS	Facilities			
Fire Alarm	Pre-action valve activation	Fire Alarm System - Edwards	Facilities			
Vortex	Vortex system activation	Fire Alarm System - Edwards	Facilities			

Stantec											Panel				
Name: UA1				Volts: 208Y/120V				Mains Type: MCB			Type:				
Location: DATA CENTRE CSF-1320A				Phases: 3				Mains Rating: 225 A			AIC Rating:				
Supply From:				Wires: 4				MCB Rating: 200 A			Mounting: Surface				
Serves:								Lugs: Single Lugs			Enclosure: Type 1				
Notes:															
CKT	Circuit Description	Trip	Poles	CB	A		B		C		CB	Poles	Trip	Circuit Description	CKT
1	CRAC UNIT NETOWRK CONT. - RM...	20 A	1		180	180					1	20 A		RACK LIFT CHARGER - RM 1321A	2
3	RECEPT - RM 1320A	20 A	1				540	200			1	20 A		EF-1 - RM 1319	4
5	RECEPT - RM 1320A	20 A	1						360	1307		1	20 A	LIGHTING - RM 1320A	6
7	PAC-1 - RM 1321	20 A	1		0	180					1	15 A		VORTEX CONTROL PANEL - RM 1321	8
9	LIGHTING - UPS ROOM 1319	20 A	1				594	180			1	15 A		VORTEX CONTROL PANEL - RM 1321	10
11	RECEPTACLE - STAGING RM	20 A	1						180	0	--	1	15 A	FA RELEASING PANEL - RM 1321	12
13	RECEPTACLE - STAGING RM	20 A	1		180	0					--	1	15 A	TIME CLOCK - RM 1312	14
15	RECEPTACLE - STAGING RM	20 A	1				180	0			--	1	20 A	SPARE	16
17	RECEPTACLE - STAGING RM	20 A	1						180	0	--	1	20 A	SPARE	18
19	TU-1 - RM 1320A	15 A	1		1000	0					--	1	20 A	SPARE	20
21	CRAC UNIT NETOWRK CONT - RM 1320	15 A	1				180	0			--	1	20 A	SPARE	22
23	DDC PANEL - RM 1320	15 A	1						180	0	--	1	20 A	SPARE	24
25	GAS DETECTION PANEL	15 A	1		180	0					--	1	20 A	SPARE	26
27	CONTROL CABINETS - UPS ROOM	20 A	1				180	0			--	1	20 A	SPARE	28
29	RECEPTACLES - UPS ROOM	20 A	1						360						30
31	CARD ACCESS	15 A	1		0										32
33															34
35															36
37					0	0									38
39	PANEL GE-1 (GENERATOR G-1)	100 A	3	--			0	0			--	3	100 A	PANEL GE-2 (GENERATOR G-2)	40
41									0	0					42
Total Load:					1.90 kVA		2.05 kVA		2.57 kVA						
Total Amps:					16 A		17 A		22 A						
Load Classification					Connected Load		Demand Factor		Estimated Demand		Panel Totals				
HVAC					1200 VA		100.00%		1200 VA						
Lighting					1901 VA		125.00%		2376 VA		Total Conn. Load: 6521 VA				
Power					0 VA		0.00%		0 VA		Total Est. Demand: 6996 VA				
Receptacle					3420 VA		100.00%		3420 VA		Total Conn.: 18 A				
											Total Est. Demand: 19 A				
CB Legend (blank = circuit breaker):															
G = GFCI S = Shunt Trip D = Switching Duty A = AFCI H = HID Rated C = HACR Rated † = Existing Circuit ‡ = Revised Circuit															
Notes:															

EXISTING LIFE SAFETY CSF PANEL

LOCATION: <b>Electrical Room 2301</b>										MOUNTING: AMP. MAINS. 100			
SERVICE: 347/600										BRANCH CIRCUIT I.C. 100k AMPS RMS SYM.			
LOAD DESCRIPTION		LOAD	WIRE	BKR	CIRCUIT		BKR	WIRE	LOAD	LOAD DESCRIPTION		PHASE LOAD	
					1	2	20A	--	--	Exit Lights L1		A	B C
Spare		--	--	20A	1	2	20A	--	--			--	
LIGHTS HALLWAY LVL 2 PAV A		1193	12	15A	3	4	20A			Spare		1193	
LIGHTS BIO LAB LVL 2 PAV A		1184	12	15A	5	6	20A			Spare			1184
LIGHTS BIO LAB LVL 2 PAV A		1326	12	15A	7	8	20A	12		EMERG LTS - CSF-1319, 1320, 1320A		1326	
LIGHTS BIO LAB LVL 2 PAV A		960	12	15A	9	10						960	
Lighting Stairwell 1 Pav 'A'		378	12	15A	11	12							--
Lighting Stairwell 6 Pav 'A'		399	12	15A	13	14							
					15	16							
					17	18							
					19	20							
					21	22							
					23	24							
					25	26							
					27	28							
					29	30							
					31	32							
					33	34							
					35	36							
					37	38							
					39	40							
					41	42							
COMMENTS:										CONNECTED LOAD 4663 KW.		TOTAL WATTS 1326 2153 1184	
										ESTIMATED DEMAND -- KW.		TOTAL AMPS 3.8 6.2 3.4	

PROVIDE NEW BREAKER FOR CIRCUIT TO NEW EGRESS LIGHTING.

LUMINAIRES													
TYPE	DESCRIPTION	MANUFACTURER	CATALOG/SERIES #	ALTERNATE MANUFACTURERS	LAMP			INPUT		CONTROLS		COMMENTS/NOTES	
					TYPE	LUMENS	CCT	CRI (MIN)	WATTS	VOLTAGE	TYPE		RANGE
A	SUSPENDED STRIP LIGHT	METALUX	4SNLED-LD5-50HL-LN-UNV-L840-CD1-U	OR APPROVED EQUAL	LED	5010 lm	4000 K	80	37 W	120 V	0-10V	1%	C/W CHAIN. CONFIRM MOUNTING HEIGHT ON SITE. COORDINATE WITH CEILING INSTALLATIONS
A1	SUSPENDED STRIP LIGHT	METALUX	4SNLED-LD5-50HL-LN-UNV-L840-CD1-U	OR APPROVED EQUAL	LED	5010 lm	4000 K	80	37 W	120 V	0-10V	1%	C/W CHAIN. CONFIRM MOUNTING HEIGHT ON SITE. COORDINATE WITH CEILING INSTALLATIONS. CONNECTED TO LIFE SAFETY CIRCUIT
B	RECESSED 2X2 LIGHT FIXTURE	METALUX	22C22-44-S-UNV-L940-CD1-U	OR APPROVED EQUAL	LED	4422 lm	4000 K	90	33 W	120 V	0-10V	1%	
B1	RECESSED 2X2 LIGHT FIXTURE	METALUX	22C22-44-S-UNV-L940-CD1-U	OR APPROVED EQUAL	LED	4422 lm	4000 K	90	33 W	120 V	0-10V	1%	CONNECTED TO LIFE SAFETY CIRCUIT
B2	RECESSED 2X2 LIGHT FIXTURE	METALUX	22C22-55VHE-S-UNV-L940-CD1-U	OR APPROVED EQUAL	LED	5516 lm	4000 K	90	39 W	120 V	0-10V	1%	
B3	RECESSED 2X2 LIGHT FIXTURE	METALUX	22C22-55VHE-S-UNV-L940-CD1-U	OR APPROVED EQUAL	LED	5516 lm	4000 K	90	39 W	120 V	0-10V	1%	CONNECTED TO LIFE SAFETY CIRCUIT
C	RECESSED 4" SQUARE DOWNLIGHT	SPECTRUM	SDF04LEDXT-30L-40K-MD-DS10-347-CB24-S04 FXT-SG-SOX	OR APPROVED EQUAL	LED	2145 lm	4000 K	80	35 W	347 V	0-10V	1%	TO MATCH EXISTING CORRIDOR LIGHTING IN PAVILION B
C1	RECESSED 4" SQUARE DOWNLIGHT	SPECTRUM	SDF04LEDXT-30L-40K-MD-DS10-347-CB24-S04 FXT-SG-SOX	OR APPROVED EQUAL	LED	2145 lm	4000 K	80	35 W	347 V	0-10V	1%	TO MATCH EXISTING CORRIDOR LIGHTING IN PAVILION B
D1	8" T-BAR INTEGRATED LINEAR LIGHT	VODE	707-Z2-SL-8-96-DM-0-RP50-AE-1-0-Z-HO-40-F6-0-WH-0	OR APPROVED EQUAL	LED	4039 lm	4000 K	90	79 W	120 V	0-10V	1%	MOUNTED TO STRUCTURAL T-BAR CEILING. SUPPLY ALL PARTS AND ACCESSORIES TO MAKE A COMPLETE WORKING LIGHTING SYSTEM. INCLUDE MOUNTING CLIPS COMPATIBLE WITH STRUCTURAL CEILING TO MOUNT DIRECTLY TO GRID.
D2	4" T-BAR INTEGRATED LINEAR LIGHT	VODE	707-Z2-SL-4-48-DM-0-RP50-AE-1-0-Z-HO-40-F6-0-WH-0	OR APPROVED EQUAL	LED	2020 lm	4000 K	90	40 W	120 V	0-10V	1%	MOUNTED TO STRUCTURAL T-BAR CEILING. SUPPLY ALL PARTS AND ACCESSORIES TO MAKE A COMPLETE WORKING LIGHTING SYSTEM. INCLUDE MOUNTING CLIPS COMPATIBLE WITH STRUCTURAL CEILING TO MOUNT DIRECTLY TO GRID.
D3	8" T-BAR INTEGRATED LINEAR LIGHT	VODE	707-Z2-SL-8-96-DM-0-RP50-AE-1-0-Z-HO-40-F6-0-WH-0	OR APPROVED EQUAL	LED	4039 lm	4000 K	90	79 W	120 V	0-10V	1%	CONNECTED TO LIFE SAFETY CIRCUIT. MOUNTED TO STRUCTURAL T-BAR CEILING. SUPPLY ALL PARTS AND ACCESSORIES TO MAKE A COMPLETE WORKING LIGHTING SYSTEM. INCLUDE MOUNTING CLIPS COMPATIBLE WITH STRUCTURAL CEILING TO MOUNT DIRECTLY TO GRID.
E	EXISTING LIGHT FIXTURE: CHAIN HUNG 1220mm GENERAL PURPOSE STRIP LIGHT	UNKNOWN	UNKNOWN	N/A	UNKNOWN SCENT	5210 lm	4000 K	80	62 W	347 V	(10-18)	(10-18)	EXISTING LIGHT FIXTURES. SPECIFICATIONS OF LIGHTS UNCONFIRMED.

A

B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A

B

C

No.	REVISION	DATE
-----	----------	------

## **APPENDIX 6**

### **Geotechnical Investigation Proposed MUN Core Sciences Building**

**Geotechnical Investigation  
Proposed MUN Core Sciences  
Building, Arctic Avenue and  
Clinch Crescent,  
St. John's, NL**



Prepared for:  
Memorial University of  
Newfoundland  
PO Box 4200  
St. John's, NL A1C 5S7

Prepared by:  
Stantec Consulting Ltd.  
607 Torbay Road  
St. John's, NL A1A 4Y6  
Tel: (709) 576-1458  
Fax: (709) 576-2126

**File No: 140132018**

**Final Report**

October 2, 2013

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

**Table of Contents**

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>SITE AND GEOLOGY .....</b>	<b>1</b>
<b>3.0</b>	<b>FIELD PROCEDURES .....</b>	<b>2</b>
<b>4.0</b>	<b>LABORATORY TESTING .....</b>	<b>2</b>
<b>5.0</b>	<b>SUBSURFACE CONDITIONS .....</b>	<b>3</b>
5.1	Asphalt .....	3
5.2	Fill.....	3
5.3	Fluvial Deposits .....	3
5.4	Till.....	4
5.5	Bedrock.....	4
5.6	Groundwater.....	4
<b>6.0</b>	<b>DISCUSSION AND RECOMMENDATIONS .....</b>	<b>5</b>
6.1	Site Preparation .....	6
6.2	Site Construction Dewatering .....	6
6.3	Excavations and Temporary Shoring .....	7
6.4	Structural Fill .....	7
6.5	Foundation and Wall Backfill .....	8
6.6	Preliminary Foundation Design .....	9
6.7	Floor Slab Slabs and Long-Term Drainage Requirements.....	9
6.8	Seismic Site Classification .....	10
6.9	Quality Assurance/Quality Control .....	10
<b>7.0</b>	<b>CLOSURE.....</b>	<b>10</b>

**LIST OF ATTACHMENTS**

Statement of General Conditions  
Symbols and Terms Used on Borehole and Test Pit Records  
Borehole Records  
Figure 1 to 4: Gradation Curves  
Drawing No. 1140132018-GE-01: Borehole Location Plan

**LIST OF TABLES**

Table 5.1	Groundwater Measurements .....	5
Table 6.1	Recommended Compaction Requirements .....	8

# **GEOTECHNICAL INVESTIGATION PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT, ST. JOHN'S, NL**

INTRODUCTION  
October 2, 2013

## **1.0 INTRODUCTION**

Further to the request and authorization of Memorial University of Newfoundland (MUN), Stantec Consulting Ltd. (Stantec) has completed a geotechnical investigation on a parcel of land located in the campus of Memorial University of Newfoundland (MUN), near the intersection of Arctic Avenue and Clinch Crescent in St. John's, Newfoundland and Labrador. The purpose of this geotechnical investigation was to determine the subsurface soil, rock and groundwater conditions at the site to provide geotechnical comments and recommendations for site development and preliminary foundation design for the proposed development. Although final development details were not known at the time of issuing this report, it is understood that the proposed development is to comprise of a multi-story and multi-wing, institutional building. It is further understood that an underground parking garage option is no longer being considered for this development.

The scope of work completed for this project was in general accordance with Stantec's geotechnical proposal dated June 17, 2013, and included the following; a geotechnical field investigation consisting of fourteen (14) boreholes advanced at locations selected by Stantec; completion of a laboratory testing program consisting of ten (10) gradation analyses and moisture content determinations of representative soil samples collected during the field investigation; and, submittal of a geotechnical report.

This report has been prepared specifically and solely for the proposed development described herein and contains all of the findings of this investigation, including geotechnical comments and recommendations.

## **2.0 SITE AND GEOLOGY**

The proposed development is located within the campus of Memorial University of Newfoundland, near the intersection of Arctic Avenue and Clinch Crescent in St. John's, Newfoundland and Labrador, as shown on the attached Drawing No. 140132018-GE-01, Borehole Location Plan. The site is currently occupied by a paved parking lot. Although no topography information of the site was available for inclusion in this report, the site is generally level, varying not more than a couple metres in elevation throughout.

Based on our previous experience in the area and on the existing information from publicly available provincial surficial geological mapping, the native overburden material in the area consists of a thin veneer overlying glacial till, generally less than 5 m in total thickness and extending to bedrock. Bedrock geology at the site is mapped as sedimentary sandstones to siltstones.



**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

FIELD PROCEDURES  
October 2, 2013

### **3.0 FIELD PROCEDURES**

The geotechnical field investigation work at the site consisted of advancing fourteen (14) boreholes from August 21 to 29, 2013, using a model CME-85 truck-mounted geotechnical drill subcontracted by Stantec. The CME-85 drill supplied is capable of advancing a borehole through soil and rock strata in addition to obtaining samples from these strata. The approximate borehole locations are shown on the attached Borehole Location Plan (Drawing No. 140132018-GE-01). Boreholes were advanced through overburden soils into bedrock by the diamond wet-rotary drilling method of NQ-size (76 mm outside diameter). Boreholes were advanced into bedrock at all locations to a total depth below ground surface ranging from 7.3 m in borehole BH-13 to 10.4 m depth in borehole BH-02. Upon completion of each individual borehole, an open-ended plastic standpipe was placed in the borehole and a protective, flush-mount monitoring well cover was installed at the ground surface. It is the responsibility of the Client and/or site Owner to address any potential hazards due to settlement of the monitoring well covers, should it occur at the borehole locations.

The field work was conducted under the supervision of Stantec personnel who maintained detailed field records of the various soil strata and groundwater conditions encountered. The soils were sampled and classified in general accordance with the procedures outlined in the attached explanatory key, Symbol and Terms Used on Borehole Records and Test Pit Records. Representative soil and rock core samples were obtained directly from borehole during the field investigation. All soil samples were stored in moisture proof containers and sent to our laboratory in St. John's for classification and testing. Rock core samples were placed in wooden core boxes and also sent to our laboratory in St. John's. Selected soil samples were chosen for gradation testing as described in the following section. Soil and rock samples remaining after testing will be stored for a period of three months at which time they will be discarded unless instructions to the contrary are received.

The borehole locations were selected by Stantec and established in the field using a surveyors tape. Borehole locations were marked in the field upon completion. Final borehole coordinates and elevations at the surface were not surveyed at the time of issuing this report. It is understood that the Client and/or Developer are responsible for providing the surveying services.; therefore, all measurements reported herein are referenced relative to ground surface at each individual borehole location.

### **4.0 LABORATORY TESTING**

For this investigation, laboratory testing consisting of soil gradation and moisture content determinations were performed on ten (10) representative soil samples obtained within the native, fluvial or till soil layers encountered at the site. The laboratory test results are presented in

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

SUBSURFACE CONDITIONS  
October 2, 2013

the attached Figures 1 to 4, Gradation Curves. It should be noted that due to the use of the SPT (standard penetration test) sampler used in obtaining the soil samples, soil particles larger than the inner diameter opening size of 35 mm would be excluded. A discussion of the gradation analyses results are provided below.

## **5.0 SUBSURFACE CONDITIONS**

Subsurface conditions observed in the boreholes are summarized in the subsections below and described in detail on the attached Borehole Records along with an explanatory key; Symbols and Terms used on Borehole and Test Pit Records.

### **5.1 Asphalt**

A layer of asphalt of approximately 100 mm in thickness was encountered at the surface at all borehole locations.

### **5.2 Fill**

Underlying the asphalt, a layer of fill was encountered at all borehole locations and extended to depths ranging from 0.6 m to 2.3 m below the existing ground surface. Based on visual material classification, the fill varied from a brown, silty sand with gravel (SM), silty gravel with sand (GM) or well-graded gravel with sand (GW). Based on SPT blow count N-values, the relative density for the fill varied from loose to dense, but was generally compact.

### **5.3 Fluvial Deposits**

Underlying the fills materials, a fluvial soil deposit was encountered in the following boreholes: BH-01, BH-07, BH-10, and BH-13. The fluvial deposit layer varied in thickness from 1.6 m in BH-10 to 2.4 m in boreholes BH-07 and BH-13 m. Based on the visual field classifications and laboratory testing results, the layer is described as grey, silty sand (SM) to sandy silt (ML). Based on SPT blow count N-values, the relative density for the fluvial deposit layer varied from compact to dense, except in borehole BH-01 where the layer was classified as loose.

Gradation analyses performed on four (4) representative samples of the fluvial deposit materials indicated a soil gradation range of 3% to 28% gravel, 12% to 63% sand and 34% to 80% fines. The moisture content of the samples tested ranged from 12% to 25%. The results of the gradation analyses are shown on attached Figures 1 to 4.

This stratum at the site seems to be located at the northern site boundary, adjacent to Arctic Avenue. This location possibly coincides with a former geological river or other waterway feature that has since been altered and in-filled.

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

SUBSURFACE CONDITIONS  
October 2, 2013

#### **5.4 Till**

Underlying the fill and/or fluvial deposits was a grey, glacial till layer which was encountered at all borehole locations. The till layer varied in thickness from 1.6 m in BH-07 to 5.5 m in borehole BH-05. Based on visual field and laboratory classifications, the layer varied from silty sand with gravel (SM), well-graded sand with silt and gravel (SW-SM), silty gravel with sand (GM) to well-graded gravel with silt and sand (GW-GM). The till was noted to include occasional to some cobbles and occasional boulders. Generally, the largest particle size was observed to be less than 400 mm in diameter based on encountering one (1) boulder in borehole BH-10 at 4.4 m depth. Additionally, a cobble and/or boulder zone, observed to be generally less than 2 m in thickness, was noted in boreholes BH-03 and BH-13. In terms of relative density, based on SPT index values, the till is classified as compact to dense.

Gradation analyses conducted on six (6) representative samples of the till soil indicated a soil gradation range of 37% to 53% gravel, 40% to 53% sand and 7% to 44% silt and/or clay fines. The moisture content of the samples tested ranged from 7% to 19%. The results of the gradation analyses are shown on attached Figures 1 to 4.

#### **5.5 Bedrock**

Bedrock was encountered at all borehole locations, underlying the fill, fluvial deposit and till layers, at depths below ground surface ranging from 4.9 m in borehole BH-04 to 7.7 m depth in borehole BH-02. The bedrock ranged in classification from greenish grey laminated or thinly bedded shale or light red interbedded sandstone. The bedrock characteristics were generally described as fresh to slightly weathered, and medium strong to strong. Based on rock quality data (RQD) measurements taken in the field, the bedrock quality is noted to vary from very severely fractured to intact.

#### **5.6 Groundwater**

Groundwater measurements were obtained in standpipes installed in each of the boreholes advanced and the data are presented in the following table:

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

DISCUSSION AND RECOMMENDATIONS  
October 2, 2013

**Table 5.1 Groundwater Measurements**

Borehole ID	Groundwater Depth (m.b.g.s.)*	
	Aug. 2013	Sep. 19, 2013
BH-01	1.25	1.26
BH-02	1.25	1.29
BH-03	0.93	0.95
BH-04	†	1.13
BH-05	2.05	2.03
BH-06	†	†
BH-07	†	1.50
BH-08	1.14	1.22
BH-09	0.92	†
BH-10	‡	‡
BH-11	1.04	1.05
BH-12	0.90	0.93
BH-13	†	1.31
BH-14	1.13	1.14

† Wellhead not accessible, parked car.

‡ Obstruction in standpipe, no reading collected

\* Meters below ground surface

It should be noted that water levels may fluctuate seasonally and in response to precipitation events. For a better understanding of the long-term groundwater level trend(s) of the site, additional periodic groundwater level measurements are recommended.

## **6.0 DISCUSSION AND RECOMMENDATIONS**

It is understood that the development proposed for this site is in the planning stages. At the time of issuance of this report, Stantec has not been provided with any site development details. Therefore, the recommendations and discussion presented below are for preliminary planning and design purposes only. Once final foundation design details and site development plans become available, Stantec should be immediately advised for re-evaluation of the recommendations provided in this report.

For discussion purposes herein, it is assumed that standard construction, and site development practices will be used for this proposed development. Further, it is assumed that final grades will be close to the existing site grades. From a site development perspective, the native compact to very dense fill or bedrock at this site are suitable bearing surfaces for placement of structural

# **GEOTECHNICAL INVESTIGATION PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT, ST. JOHN'S, NL**

DISCUSSION AND RECOMMENDATIONS  
October 2, 2013

fill and construction of shallow foundations. All existing fills materials combined with any loose or disturbed fluvial material or native till should be excavated prior to placement of structural fill or foundations. Further detailed recommendations on the site preparation, structural fill placement and compaction along with the design of shallow foundations for this development are discussed in the appropriate subsections below.

## **6.1 Site Preparation**

Site preparation within the proposed building envelope should include the excavation and removal of all existing fills and any loose native till or fluvial deposit soils to expose the undisturbed compact to dense native till, fluvial deposits or bedrock. Any softened or disturbed areas evident upon proof rolling should be over-excavated and replaced with suitably compacted structural fill.

Within the proposed site, the combined thickness of fill materials and loose native fluvial deposits or till soils to be removed, as identified in the boreholes, will vary in thickness from about 0.6 m at borehole location BH-14 to 4.0 m at borehole location BH-01 below existing ground surface.

The site is underlain by silty soils (i.e., fines content in excess of 10%). Typically, where the fines content of a soil is in excess of 10%, the soil will tend to soften and become unsuitable and difficult to work when it becomes wetter than its optimum moisture content and is disturbed. In addition, silty soils that have been successfully compacted and approved, may require removal if they subsequently become wet and softened from water infiltration, precipitation or freezing.

## **6.2 Site Construction Dewatering**

At this site, the groundwater depth below the ground surface at each well (e.g. borehole location) varied from 0.93 m to 2.03 m as obtained from the readings on September 18, 2013. On an average, the water table appears to be at about 1.0 m depth below existing grade at the site. Therefore, excavations will encounter groundwater at the site in the course of site preparation work.

Depending on the final excavation and founding level depths proposed for this development, appropriate construction dewatering measures will be required. Discharge of collected water from the site must be conducted in accordance with applicable environmental guidelines for sediment control and if encountered, any environmental contamination concentrations. The contractor and/or designer should review with Stantec the construction dewatering plans that would be implemented for the proposed development when they become available.



# **GEOTECHNICAL INVESTIGATION PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT, ST. JOHN'S, NL**

DISCUSSION AND RECOMMENDATIONS  
October 2, 2013

## **6.3 Excavations and Temporary Shoring**

All excavations need to be carried out such as not to undermine adjacent structures or induce unacceptable settlements. Stantec should be provided with excavation plans to ensure that adjacent structures are not affected by the proposed excavations.

Temporary slopes in the till or structural fill should not be steeper than 1 horizontal to 1 vertical (1H:1V) with a depth of excavation limited to less than 3.0 m. Where space constraints do not allow for safe sloping of excavations in soils, shoring would be required. Where groundwater seepage into excavations may be present, additional slope flattening or additional mitigation may be required to maintain the stability of temporary slopes.

A layer of fluvial material consisting of fine silty sand and sandy silts soils is located near the northern site boundary, adjacent to Arctic Avenue. Excavations in this layer may result in significant instabilities. Additionally, groundwater infiltration and/or construction disturbance may cause a condition of flowing soils within this layer. Measures to mitigate or reduce the potential construction-related difficulties may include over-excavation and replacement with structural fill and/or braced shoring in this localized area. A geotechnical engineer from Stantec should be on-site to observe the soil condition of this layer during site excavation work.

Although excavations into bedrock are generally not indicated for this development, for planning purposes, temporary excavations into rock would generally be stable at slopes of 1 horizontal to 4 vertical (1H:4V). Pre-splitting, line drilling and controlled blasting will be required to achieve the suggested steep slopes in bedrock. Stantec will be able to comment further on the blasting related matters as the design grades are finalized. Scaling of all of the rock faces should be carried out after excavation and meshing may be required.

Any shoring, soil and rock slopes should be inspected by experienced geotechnical personnel for evidence of instability. The contractor and/or designer should review with Stantec the construction excavation slopes and shoring plans that would be implemented at the construction phase for the proposed development when they become available.

## **6.4 Structural Fill**

Structural fill should consist of a well-graded, free-draining granular material such as pit run sand and gravel or processed blasted rock fill. The maximum particle size should not exceed 200 mm. Within 300 mm of the underside of foundations or slab-on-grade, the maximum particle size should not exceed 100 mm. Use of rock fill is recommended in areas such as excavation bases where wet conditions may be encountered. Excavated soil areas should be proof rolled prior to placement of structural fill or setting of foundation formworks.

Site excavated native fill soils and existing fill materials may be suitable for re-use as structural fill provided the moisture content is maintained within 1% to 2% of its optimum compaction

# GEOTECHNICAL INVESTIGATION

## PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT, ST. JOHN'S, NL

### DISCUSSION AND RECOMMENDATIONS

October 2, 2013

moisture content value and the maximum particle size gradation criteria is followed. If consideration is given to reusing the in situ native soils and/or existing site fills as structural fill, the above noted concerns regarding handling and placement of these materials under wet conditions must be considered otherwise the use of imported structural fill materials is recommended.

Structural fill should be placed in horizontal lifts and compacted to the specifications outlined below in Table 6.1. In addition to the compaction requirements presented in the table below, visual approval of all structural fill during placement is recommended. The lift thickness used during structural fill placement should be compatible with the compaction equipment and material type to ensure the required density is achieved throughout the lift thickness. Due to the particle size distribution of coarser grained soils (e.g., rock fill), verification of the field density by geotechnical personnel by visual inspection during proof rolling will be required. As a general guide, structural fill should be placed in 300 mm to 400 mm lifts and compacted with a 10 tonne vibratory roller.

**Table 6.1 Recommended Compaction Requirements**

Structural Fill Application	Compaction Requirements Percent of Standard Proctor (ASTM D698) maximum dry density
Foundation Areas	100
Roadway/Driveway Areas	100
Floor Slab Areas	98
General Backfill	95

### 6.5 Foundation and Wall Backfill

Foundation and/or wall backfill materials should consist of compacted, well-graded gravel or clear stone, with a maximum size of 100 mm, and be backfilled to within 1.0 m depth of exterior subgrades. Within 1.0 m depth of exterior grades, a less permeable soil material free of organics should be used to reduce surface water infiltration into the foundation drainage system. As an alternative, the surface can be capped with a pavement structure. To reduce the migration of finer soil particles into clear stone backfill and such other dissimilar material interfaces, use of a geotextile filter fabric is recommended. The final exterior grades should be sloped such that surficial water flows are diverted away from the proposed building.

To limit horizontal earth pressures during compaction of materials behind exterior walls, the use of larger compaction equipment (e.g. roller compactors) or equipment mounted compactors (e.g. hydraulic plate compactor/Hoepac) should not be used within 2.0 m of subsurface walls. Compaction within the 2.0 m zone directly behind subsurface walls should be accomplished

# **GEOTECHNICAL INVESTIGATION PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT, ST. JOHN'S, NL**

DISCUSSION AND RECOMMENDATIONS  
October 2, 2013

using hand operated or walk-behind equipment in conjunction with using a horizontal lift thickness not exceeding 150 to 200 mm.

## **6.6 Preliminary Foundation Design**

Shallow foundations founded on the undisturbed, dense to very dense glacial till may be designed using a maximum net allowable bearing pressure of 250 kPa. Foundations constructed on compacted structural fill, such as pit run sand and gravel, may be designed for a maximum net allowable bearing pressure of 150 kPa. If better quality structural fill is used, such as a suitably placed and compacted, well-graded, 100 mm minus processed blasted rock fill, then foundations may be designed using a maximum net allowable bearing pressure of 250 kPa. A stringent quality control program to monitor the selection of structural fill materials, testing, field placement and compaction must be implemented. To minimize differential settlement arising from different bearing pressures on native till and pit run sand and gravel fill, we strongly recommend use of blasted rock fill for site development.

For footing widths greater than 1 m, the associated load induced total settlements for the above recommended allowable bearing pressures are estimated to be to less than 25 mm with differential settlement less than 19 mm.

If applicable, foundations on sound or intact bedrock may be designed a maximum net allowable bearing pressure of 600 kPa. Settlements for foundations on sound bedrock will be negligible.

To confirm the above recommendations pertaining to allowable bearing pressures, the associated load induced settlements should be determined once the final foundation designs are completed.

Foundations should not be placed on frozen ground, and temporary frost protection during freezing conditions should be provided after construction of footings. Exterior footings and footings in unheated areas should have a minimum soil cover of 1,200 mm or equivalent for frost protection.

## **6.7 Floor Slab Slabs and Long-Term Drainage Requirements**

For the preliminary design of floor slabs constructed on compacted granular structural fill subgrades, a modulus of subgrade reaction of 50 MPa/m may be used. This value is based on a 300 mm square steel plate. A 150 mm thick layer of free-draining granular material should be provided immediately beneath the floor slabs, such as a 25 mm minus-sized crushed rock material with permeability greater than 10-1 cm/sec. Use of a vapour barrier beneath floor slabs is recommended in enclosed heated areas.

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

**CLOSURE**

October 2, 2013

The requirements for long-term or permanent drainage control around and below the structures will depend on the details of the site development and the final finished grades. A perforated drain pipe, surrounded with clear stone and leading to a positive discharge is recommended along exterior foundations. An under-slab drainage system leading to a positive discharge or pumping location(s) is recommended if the groundwater level is anticipated to be within 1.0 m of the finished slab on grade elevation.

**6.8 Seismic Site Classification**

Based on the soil and rock conditions encountered at the site, a Seismic Site Response Site Classification of Site Class C is most appropriate for this site. This classification is determined in accordance with clause 4.1.8.4 of the National Building Code of Canada (NBCC, 2005) and assumes that the existing fill materials and loose native till or fluvial deposit soils would be removed.

**6.9 Quality Assurance/Quality Control**

It is recommended that a program of quality assurance, quality control and inspection be carried out by geotechnical personnel during earthworks, and foundation/slab construction. Such a program should include verification of excavation bases and approval before placement of additional structural fill or footing concrete; founding level inspection and approval; compaction testing during structural fill placement; subgrade proof-rolling, and field and laboratory testing during placement of granular fill materials. Stantec would be pleased to provide a cost proposal to undertake such services.

**7.0 CLOSURE**

Use of this report is subject to the Statement of General Conditions, attached. It is the responsibility of Memorial University of Newfoundland who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied. The Statement of General Conditions addresses the following: use of the report; basis of the report; standard of care; interpretation of site conditions; varying or unexpected site conditions; and planning, design or construction.

Stantec requests an opportunity to review the comments and recommendations provided herein when the project specifications and drawings become available.

**GEOTECHNICAL INVESTIGATION  
PROPOSED MUN CORE SCIENCES BUILDING, ARCTIC AVENUE AND CLINCH CRESCENT,  
ST. JOHN'S, NL**

CLOSURE  
October 2, 2013

This report was prepared by the undersigned below with review by Arun Valsangkar, Ph.D, P.Eng., Senior Geotechnical Engineer. We trust this report meets your present requirements. Should any additional information be required, please do not hesitate to contact our office at your convenience.

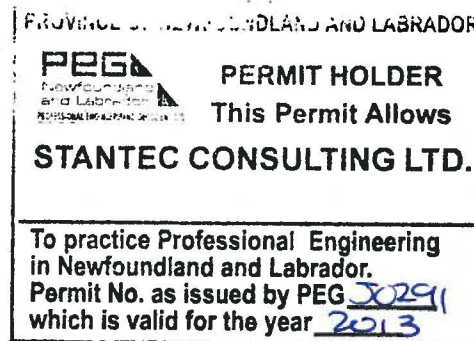
Sincerely,

**STANTEC CONSULTING LTD**

  
Erich Lenz, P.E., P.Eng.  
Geotechnical Engineer

  
Lorne Boone, M.Eng., P.Geo., P.Eng.  
Principal, Senior Geotechnical Engineer

Attachments: Statement of General Conditions  
Symbols and Terms Used on Borehole and Test Pit Records  
Borehole Records  
Figure 1 to 4: Gradation Curves  
Drawing No. 1140132018-GE-01: Borehole Location Plan





## ATTACHMENTS

Statement of General Conditions  
Symbols and Terms Used on Borehole and Test Pit Records  
Borehole Records  
Figure 1 to 4: Gradation Curves  
Drawing No. 1140132018-GE-01: Borehole Location Plan

## STATEMENT OF GENERAL CONDITIONS

**USE OF THIS REPORT:** This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and the Client. Any use which a third party makes of this report is the responsibility of such third party.

**BASIS OF THE REPORT:** The information, opinions, and/or recommendations made in this report are in accordance with Stantec Consulting Ltd.'s present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec Consulting Ltd. is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

**STANDARD OF CARE:** Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

**INTERPRETATION OF SITE CONDITIONS:** Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec Consulting Ltd. at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

**VARYING OR UNEXPECTED CONDITIONS:** Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec Consulting Ltd. must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec Consulting Ltd. will not be responsible to any party for damages incurred as a result of failing to notify Stantec Consulting Ltd. that differing site or sub-surface conditions are present upon becoming aware of such conditions.

**PLANNING, DESIGN, OR CONSTRUCTION:** Development or design plans and specifications should be reviewed by Stantec Consulting Ltd., sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec Consulting Ltd. cannot be responsible for site work carried out without being present.

## SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

### SOIL DESCRIPTION

#### Terminology describing common soil genesis:

<i>Topsoil</i>	- mixture of soil and humus capable of supporting vegetative growth
<i>Peat</i>	- mixture of visible and invisible fragments of decayed organic matter
<i>Till</i>	- unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	- material below the surface identified as placed by humans (excluding buried services)

#### Terminology describing soil structure:

<i>Desiccated</i>	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
<i>Fissured</i>	- having cracks, and hence a blocky structure
<i>Varved</i>	- composed of regular alternating layers of silt and clay
<i>Stratified</i>	- composed of alternating successions of different soil types, e.g. silt and sand
<i>Layer</i>	- > 75 mm in thickness
<i>Seam</i>	- 2 mm to 75 mm in thickness
<i>Parting</i>	- < 2 mm in thickness

#### Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488). The classification excludes particles larger than 76 mm (3 inches). The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

#### Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present:

<i>Trace, or occasional</i>	Less than 10%
<i>Some</i>	10-20%
<i>Frequent</i>	> 20%

#### Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test N-Value (also known as N-Index). A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
<i>Very Loose</i>	<4
<i>Loose</i>	4-10
<i>Compact</i>	10-30
<i>Dense</i>	30-50
<i>Very Dense</i>	>50

#### Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests.

Consistency	Undrained Shear Strength	
	kips/sq.ft.	kPa
<i>Very Soft</i>	<0.25	<12.5
<i>Soft</i>	0.25 - 0.5	12.5 - 25
<i>Firm</i>	0.5 - 1.0	25 - 50
<i>Stiff</i>	1.0 - 2.0	50 - 100
<i>Very Stiff</i>	2.0 - 4.0	100 - 200
<i>Hard</i>	>4.0	>200



## ROCK DESCRIPTION

### Terminology describing rock quality:

RQD	Rock Mass Quality
0-25	<i>Very Poor Quality - Very Severely Fractured, Crushed</i>
25-50	<i>Poor Quality- Severely Fractured, Shattered or Very Blocky</i>
50-75	<i>Fair Quality - Fractured, Blocky</i>
75-90	<i>Good Quality - Moderately Jointed, Sound</i>
90-100	<i>Excellent Quality - Intact, Very Sound</i>

Rock quality classification is based on a modified core recovery percentage (RQD) in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be done on N-size core; however, it can be used on different core sizes if the bulk of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures. The terminology describing rock mass quality based on RQD is subjective and is underlain by the presumption that sound strong rock is of higher engineering value than fractured weak rock.

### Terminology describing rock mass:

Spacing (mm)	Joint Classification	Bedding, Laminations, Bands
> 6000	<i>Extremely Wide</i>	-
2000-6000	<i>Very Wide</i>	<i>Very Thick</i>
600-2000	<i>Wide</i>	<i>Thick</i>
200-600	<i>Moderate</i>	<i>Medium</i>
60-200	<i>Close</i>	<i>Thin</i>
20-60	<i>Very Close</i>	<i>Very Thin</i>
<20	<i>Extremely Close</i>	<i>Laminated</i>
<6	-	<i>Thinly Laminated</i>

### Terminology describing rock strength:

Strength Classification	Grade	Unconfined Compressive Strength (MPa)
<i>Extremely Weak</i>	R0	< 1
<i>Very Weak</i>	R1	1 – 5
<i>Weak</i>	R2	5 – 25
<i>Medium Strong</i>	R3	25 – 50
<i>Strong</i>	R4	50 – 100
<i>Very Strong</i>	R5	100 – 250
<i>Extremely Strong</i>	R6	> 250

### Terminology describing rock weathering:

Term	Symbol	Description
<i>Fresh</i>	W1	No visible signs of rock weathering. Slight discolouration along major discontinuities
<i>Slightly Weathered</i>	W2	Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discoloured.
<i>Moderately Weathered</i>	W3	Less than half the rock is decomposed and/or disintegrated into soil.
<i>Highly Weathered</i>	W4	More than half the rock is decomposed and/or disintegrated into soil.
<i>Completely Weathered</i>	W5	All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact.

### Solid Core Recovery (SCR):

Solid core recovery is defined as the cumulative length of all solid (at full diameter) core in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

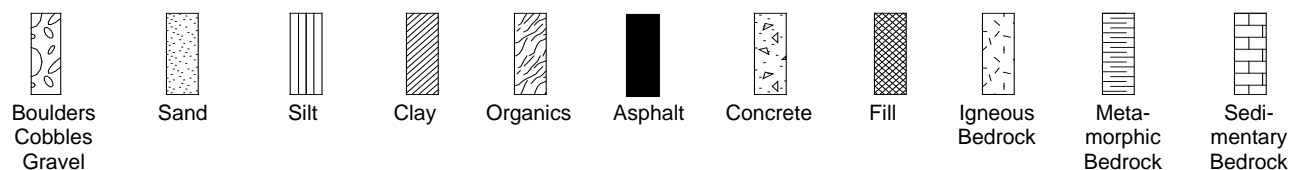
### Fracture Index (FI):

Fracture Index is defined as the number of naturally occurring fractures occurring per 0.3 m length of core. The Fracture Index is reported as a simple count of fractures. For > 25 fractures / 0.3 m length, the Fracture Index is reported as >25.



## STRATA PLOT

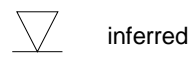
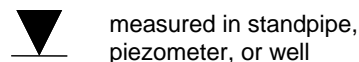
Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.



## SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
WS	Wash sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use of standard size diamond coring bits.

## WATER LEVEL MEASUREMENT



## RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery (or total core recovery - TCR) is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

## N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration was achieved and N-values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g., 50/75). Some design methods make use of N value corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

## DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to A size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (305 mm) into the soil. The DCPT is used as a probe to assess soil variability.

## OTHER TESTS

S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
$\gamma$	Unit weight
$G_s$	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
$Q_u$	Unconfined compression
$I_p$	Point Load Index ( $I_p$ on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer







# BOREHOLE RECORD

BOREHOLE No. **BH-01**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-27-13** WATER LEVEL **1.26m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa									
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$									
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★									
										STANDARD PENETRATION TEST, BLOWS/0.3m ●									
0		ASPHALT								10	20	30	40	50	60	70	80		
		Compact, brown to grey, silty SAND with gravel (SM): FILL			SS	1	225	23											
1					SS	2	250	10											
2					SS	3	200	20											
3		Loose, grey, silty SAND with gravel (SM) to sandy SILT (ML): FLUVIAL DEPOSITS			SS	4	475	8											
					SS	5	450	5	S										
4		Compact to dense, grey, well-graded SAND with silt and gravel (SW-SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	6	100	31											
5					SS	7	200	18											
6					SS	8	300	29	S										
7		Fractured to moderately jointed, greenish grey, fresh, strong, SHALE with interbedded sandstone: BEDROCK			SS	9	175	63/275											
8					NQ	10	100%	65%											
					NQ	11	100%	85%											
9		End of Borehole																	
		Groundwater standpipe installed																	
10																			

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ▣ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-02**  
PAGE **1** of **2**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-21-13** WATER LEVEL **1.29m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa				
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80				
										WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$				
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★				
										STANDARD PENETRATION TEST, BLOWS/0.3m ●				
0		ASPHALT								10	20	30	40	50
		Loose to dense, brown to grey, silty SAND with gravel (SM) to well-graded GRAVEL (GW): FILL			SS	1	200	23						
1					SS	2	150	5						
2					SS	3	25	36						
		Compact to very dense, grey, silty SAND with gravel (SM) to well-graded GRAVEL with silt and sand (GW-GM); occasional to some cobbles: TILL			SS	4	325	41						
3														
					SS	5	300	18	S					
4		- Zone of cobbles and/or possible boulders from 3.8 m to 5.5 m depth			SS	6	125	61/250						
					WS	7	78%	44%						
5					WS	8	80%	0%						
6					WS	9	27%	0%						
7					SS	10	200	44						
8					SS	11	350	61	S					
9														
					SS	12	75	100/250						
10		Severely fractured to intact, greenish grey, fresh, medium strong to strong, SANDSTONE: BEDROCK			NQ	13	100%	86%						
9					NQ	14	100%	92%						
10														

△ Unconfined Compression Test

□ Field Vane Test

◇ Fall Cone Test

▽ Hand Penetrometer Test

■ (Remolded)

◆ (Remolded)

■ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-02**  
PAGE **2** of **2**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-21-13** WATER LEVEL **1.29m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa							
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20	40	60	80				
		Continued from Previous Page								WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$							
										DYNAMIC PENETRATION TEST, BLOWS/0.3m ★							
										STANDARD PENETRATION TEST, BLOWS/0.3m ●							
-10					NQ	15	100%	28%		10	20	30	40	50	60	70	80
		End of Borehole															
-11		Groundwater standpipe installed															
-12																	
-13																	
-14																	
-15																	
-16																	
-17																	
-18																	
-19																	
-20																	

△ Unconfined Compression Test

□ Field Vane Test    ■ (Remolded)

◇ Fall Cone Test    ◆ (Remolded)

▽ Hand Penetrometer Test    ■ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-03**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-27-13** WATER LEVEL **0.95m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa			
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80			
										WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$			
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★			
										STANDARD PENETRATION TEST, BLOWS/0.3m ●			
0		ASPHALT								10	20	30	40
		Compact, brown to grey, silty SAND with gravel (SM): FILL			SS	1	225	10					
1					SS	2	150	16					
2		Compact to very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	3	200	51					
3					SS	4	250	34					
					SS	5	200	30					
4					SS	6	175	52					
5					SS	7	150	17					
6					SS	8	150	19					
7		Severely fractured to moderately jointed, medium strong to strong, greenish grey, SHALE with thinly laminated sandstone: BEDROCK			NQ	9	100%	81%					
					NQ	10	100%	35%					
8					NQ	11	100%	61%					
9					NQ	12	100%	59%					
		End of Borehole											
		Groundwater standpipe installed											
10													

△ Unconfined Compression Test

□ Field Vane Test

◇ Fall Cone Test

▽ Hand Penetrometer Test

■ (Remolded)

◆ (Remolded)

■ Torvane

# BOREHOLE RECORD

BOREHOLE No. **BH-04**  
 PAGE **1** of **1**  
 PROJECT No. **140132018**  
 DRILLING METHOD **Diamond**  
 SIZE **NQ**  
 DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**

PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**

LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**

DATES (mm-dd-yy): BORING **8-28-13**

WATER LEVEL **1.13m**

**8-28-13**

DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa									
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$									
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★									
										STANDARD PENETRATION TEST, BLOWS/0.3m ●									
										10	20	30	40	50	60	70	80		
0		ASPHALT			SS	1	325	22											
		Compact, brown, silty SAND with gravel (SM) to silty GRAVEL with sand (GM): FILL			SS	2	325	23											
1					SS	3	375	45											
2		Dense, to very dense, grey to greyish brown, silty GRAVEL with sand (GM); occasional cobbles: TILL																	
		- black oxidation staining noted within till layer			SS	4	275	35											
3					SS	5	300	35											
4					SS	6	300	45											
					SS	7	225	100/275											
5		Fractured to moderately jointed, greenish grey, slightly weathered, medium strong to strong, SHALE with interbedded sandstone: BEDROCK			NQ	8	88%	88%											
6					NQ	9	100%	67%											
7					NQ	10	100%	76%											
8		End of Borehole																	
9																			
10																			

△ Unconfined Compression Test  
 □ Field Vane Test ■ (Remolded)  
 ◇ Fall Cone Test ◆ (Remolded)  
 ▽ Hand Penetrometer Test ■ Torvane





# BOREHOLE RECORD

BOREHOLE No. **BH-05**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-22-13** WATER LEVEL **2.03m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa									
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$									
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★									
										STANDARD PENETRATION TEST, BLOWS/0.3m ●									
0		ASPHALT								10	20	30	40	50	60	70	80		
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	250	11		●									
1		Dense, grey, silty GRAVEL with sand (GM); occasional to some cobbles: TILL			SS	2	300	33				●							
					SS	3	300	127/400											
2																			
					SS	4	325	33				●							
3					SS	5	300	32				●							
4					SS	6	350	38				●							
5					SS	7	250	32				●							
					WS	8	100%	42%											
					SS	9	225	55											
6					SS	10	0	50/0							●				
		Fractured to moderately jointed, greenish grey, slightly weathered, medium strong, SANDSTONE: BEDROCK			NQ	11	100%	80%											
7					NQ	12	100%	60%											
					NQ	13	100%	65%											
8					NQ	14	100%	85%											
9																			
		End of Borehole																	
		Groundwater standpipe installed																	
10																			

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ▣ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-06**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-26-13** WATER LEVEL **N/A**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa							
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80							
										WATER CONTENT & ATTERBERG LIMITS $w_p$ $w$ $w_L$							
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★							
										STANDARD PENETRATION TEST, BLOWS/0.3m ●							
										10 20 30 40 50 60 70 80							
0		ASPHALT															
		Compact to very dense, brown to grey, silty SAND with gravel (SM): FILL			SS	1	325	58									
1					SS	2	150	23									
					SS	3	100	120/175									
		Compact to dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	4	200	27									
2																	
					SS	5	225	43									
3																	
4																	
					SS	6	250	19									
5																	
					SS	7	100	70/100									
					NQ	8	100%	0%									
6		Very severely fractured to fractured, greenish grey, slightly weathered to fresh, medium strong to strong, SHALE with interbedded sandstone: BEDROCK			NQ	9	100%	35%									
					NQ	10	100%	65%									
7					NQ	11	60%	0%									
8					NQ	12	100%	70%									
9		End of Borehole															
		Groundwater standpipe installed															
10																	

△ Unconfined Compression Test

□ Field Vane Test    ■ (Remolded)

◇ Fall Cone Test    ◆ (Remolded)

▽ Hand Penetrometer Test    ▣ Torvane

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ▣ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-07**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-28-13** to **8-29-13** WATER LEVEL **1.5m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa				
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80				
										WATER CONTENT & ATTERBERG LIMITS $w_p$ $w$ $w_L$				
										DYNAMIC PENETRATION TEST, BLOWS/0.3m $\star$				
STANDARD PENETRATION TEST, BLOWS/0.3m $\bullet$					10 20 30 40 50 60 70 80									
0		ASPHALT					mm							
		Compact, brown to grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM): FILL			SS	1	350	17						
1					SS	2	175	21						
		Compact, grey, silty SAND with gravel (SM): FLUVIAL DEPOSITS			SS	3	375	29						
2														
					SS	4	475	24	S					
3					SS	5	300	25						
4		Very dense, grey, silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	6	300	69						
5					SS	7	280	95						
					WS	8	50	50/2						
6		Very severely fractured to moderately jointed, green to purple, slightly to moderately weathered, medium strong to strong, SANDSTONE: BEDROCK			NQ	9	100%	0%						
					NQ	10	100%	75%						
7					NQ	11	100%	60%						
8		End of Borehole												
		Groundwater standpipe installed												
9														
10														

<

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ■ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-08**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-22-13** to **8-23-13** WATER LEVEL **1.22m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa				
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80				
										WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$				
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m *				
										STANDARD PENETRATION TEST, BLOWS/0.3m •				
0		ASPHALT								10	20	30	40	50
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	350	21						
1		Dense to very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional to some cobbles: TILL			SS	2	250	76						
					SS	3	350	74						
2					SS	4	350	37	S					
					SS	5	225	72						
3					SS	6	275	30						
4					SS	7	0	40						
5					SS	8	425	104						
6					NQ	9	88%	78%						
7		Severely fractured to fractured, light red, strong, slightly weathered, SANDSTONE with thin laminations of green sandstone: BEDROCK			NQ	10	100%	69%						
8					NQ	11	100%	73%						
9		End of Borehole												
		Groundwater standpipe installed												
10														

△ Unconfined Compression Test

□ Field Vane Test    ■ (Remolded)

◇ Fall Cone Test    ◆ (Remolded)

▽ Hand Penetrometer Test    ▣ Torvane



# BOREHOLE RECORD

BOREHOLE No. **BH-09**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-25-13** to **8-26-13** WATER LEVEL **0.92m** **8-26-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa								
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80								
										WATER CONTENT & ATTERBERG LIMITS $w_p$ $w$ $w_L$								
										DYNAMIC PENETRATION TEST, BLOWS/0.3m ★								
STANDARD PENETRATION TEST, BLOWS/0.3m ●										10 20 30 40 50 60 70 80								
0		ASPHALT					mm											
		Compact to very dense, brown, silty SAND with gravel (SM): FILL			SS	1	300	54										
1					SS	2	200	29										
2		Very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with SAND (GM); occasional cobbles: TILL																
					SS	3	325	73										
3																		
4					SS	4	225	71										
5																		
					SS	5	325	82										
6		Fractured to intact, greenish grey, slightly weathered to fresh, strong, SHALE: BEDROCK			NQ	6	86%	65%										
7																		
8					NQ	7	100%	90%										
9		End of Borehole																
10																		

△ Unconfined Compression Test

□ Field Vane Test

◇ Fall Cone Test

▽ Hand Penetrometer Test

■ (Remolded)

◆ (Remolded)

▮ Torvane

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ■ Torvane





# BOREHOLE RECORD

BOREHOLE No. **BH-10**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-29-13** WATER LEVEL **N/A**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa									
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$									
0		ASPHALT					mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★									
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	400	24		STANDARD PENETRATION TEST, BLOWS/0.3m ●									
1					SS	2	175	22		10	20	30	40	50	60	70	80		
2		Compact to dense, grey, silty SAND with gravel (SM) to gravelly SILT with sand (ML): FLUVIAL DEPOSITS			SS	3	325	23											
3					SS	4	400	46	S										
4		Compact to very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles and boulders: TILL			SS	5	225	29											
5					SS	6	150	74/250											
		-480mm diameter boulder at 4.4 m depth			WS	7	100%	64%											
6					SS	8	200	31											
7		Very severely fractured to fractured, greenish grey, slightly weathered, medium strong to strong, SANDSTONE: BEDROCK																	
					NQ	10	87%	17%											
					NQ	11	100%	62%											
8		End of Borehole																	
		Groundwater standpipe installed																	
9																			
10																			

△ Unconfined Compression Test  
□ Field Vane Test ■ (Remolded)  
◇ Fall Cone Test ◆ (Remolded)  
▽ Hand Penetrometer Test ■ Torvane

# BOREHOLE RECORD

BOREHOLE No. **BH-11**  
 PAGE **1** of **1**  
 PROJECT No. **140132018**  
 DRILLING METHOD **Diamond**  
 SIZE **NQ**  
 DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
 PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
 LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
 DATES (mm-dd-yy): BORING **8-23-13** WATER LEVEL **1.05m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa			
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80			
										WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$			
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m *			
										STANDARD PENETRATION TEST, BLOWS/0.3m •			
										10 20 30 40 50 60 70 80			
0		ASPHALT											
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	450	24					
1		Compact to very dense, well-graded SAND with silt and gravel (SW-SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	2	200	72					
					SS	3	275	40					
2													
					SS	4	325	29	S				
3													
4					SS	5	150	41					
5													
					SS	6	350	65					
6					SS	7	275	99/275					
		Very severely fractured to fractured, light red, slightly weathered, medium strong, SANDSTONE with interbedded green sandstone: BEDROCK			NQ	8	68%	36%					
7					NQ	9	100%	0%					
					NQ	10	100%	0%					
8					NQ	11	100%	68%					
		End of Borehole											
9													
10													

△ Unconfined Compression Test  
 □ Field Vane Test ■ (Remolded)  
 ◇ Fall Cone Test ◆ (Remolded)  
 ▽ Hand Penetrometer Test ▣ Torvane





# BOREHOLE RECORD

BOREHOLE No. **BH-13**  
PAGE **1** of **1**  
PROJECT No. **140132018**  
DRILLING METHOD **Diamond**  
SIZE **NQ**  
DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
DATES (mm-dd-yy): BORING **8-29-13** WATER LEVEL **1.31m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa									
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS $W_P$ $W$ $W_L$									
0		ASPHALT					mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★									
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	200	23		STANDARD PENETRATION TEST, BLOWS/0.3m ●									
1		Dense, grey, silty SAND with gravel (SM) to SILT with sand (ML): FLUVIAL DEPOSITS			SS	2	375	42											
2		COBBLES and BOULDERS			SS	3	325	41	S										
3		-maximum particle size, 360mm diameter			WS	4	39%	32%											
4		Dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	5	275	32											
5					SS	6	375	45											
6		Very severely fractured to moderately jointed, greenish grey, strong, slightly weathered, SHALE: BEDROCK			NQ	7	48%	0%											
7					NQ	8	100%	0%											
					NQ	9	100%	77%											
					NQ	10	100%	57%											
		End of Borehole																	
8																			
9																			
10																			

△ Unconfined Compression Test

□ Field Vane Test

◇ Fall Cone Test

▽ Hand Penetrometer Test

■ (Remolded)




◆ (Remolded)

■ Torvane

# BOREHOLE RECORD

BOREHOLE No. **BH-14**  
 PAGE **1** of **1**  
 PROJECT No. **140132018**  
 DRILLING METHOD **Diamond**  
 SIZE **NQ**  
 DATUM **Geodetic**

CLIENT **Memorial University of Newfoundland**  
 PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**  
 LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**  
 DATES (mm-dd-yy): BORING **8-24-13** WATER LEVEL **1.14m** **9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					UNDRAINED SHEAR STRENGTH - kPa							
					TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS	20 40 60 80							
										WATER CONTENT & ATTERBERG LIMITS $w_p$ $w$ $w_L$							
							mm			DYNAMIC PENETRATION TEST, BLOWS/0.3m ★							
										STANDARD PENETRATION TEST, BLOWS/0.3m ●							
										10 20 30 40 50 60 70 80							
0		ASPHALT			SS	1	350	30	S								
		Compact to dense, brown, silty SAND with gravel (SM): FILL															
1		Compact, grey, well-graded SAND with silt and gravel (SW-SM) to silty GRAVEL with sand (GM); occasional to some cobbles: TILL		▼	SS	2	250	47									
					SS	3	350	42									
2																	
					SS	4	300	32									
3					SS	5	425	30			○						
4					SS	6	225	23									
5					SS	7	0	50/50									
		Severely fractured to moderately jointed, greenish grey, slightly weathered, medium strong to strong, SANDSTONE: BEDROCK			NQ	8	100%	56%									
6					NQ	9	100%	31%									
7					NQ	10	100%	79%									
		End of Borehole															
8		Groundwater standpipe installed															
9																	
10																	

△ Unconfined Compression Test

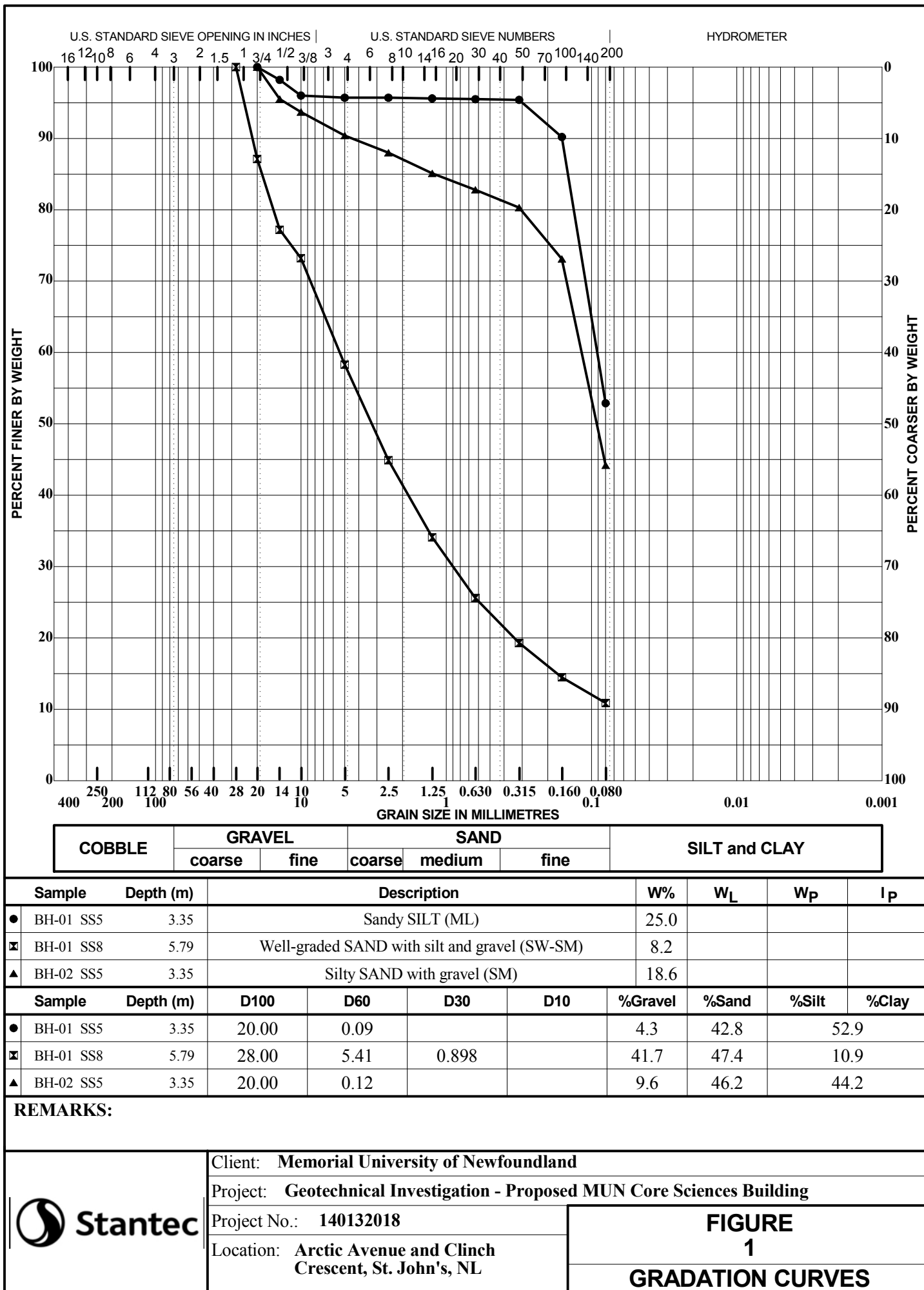
□ Field Vane Test    ■ (Remolded)

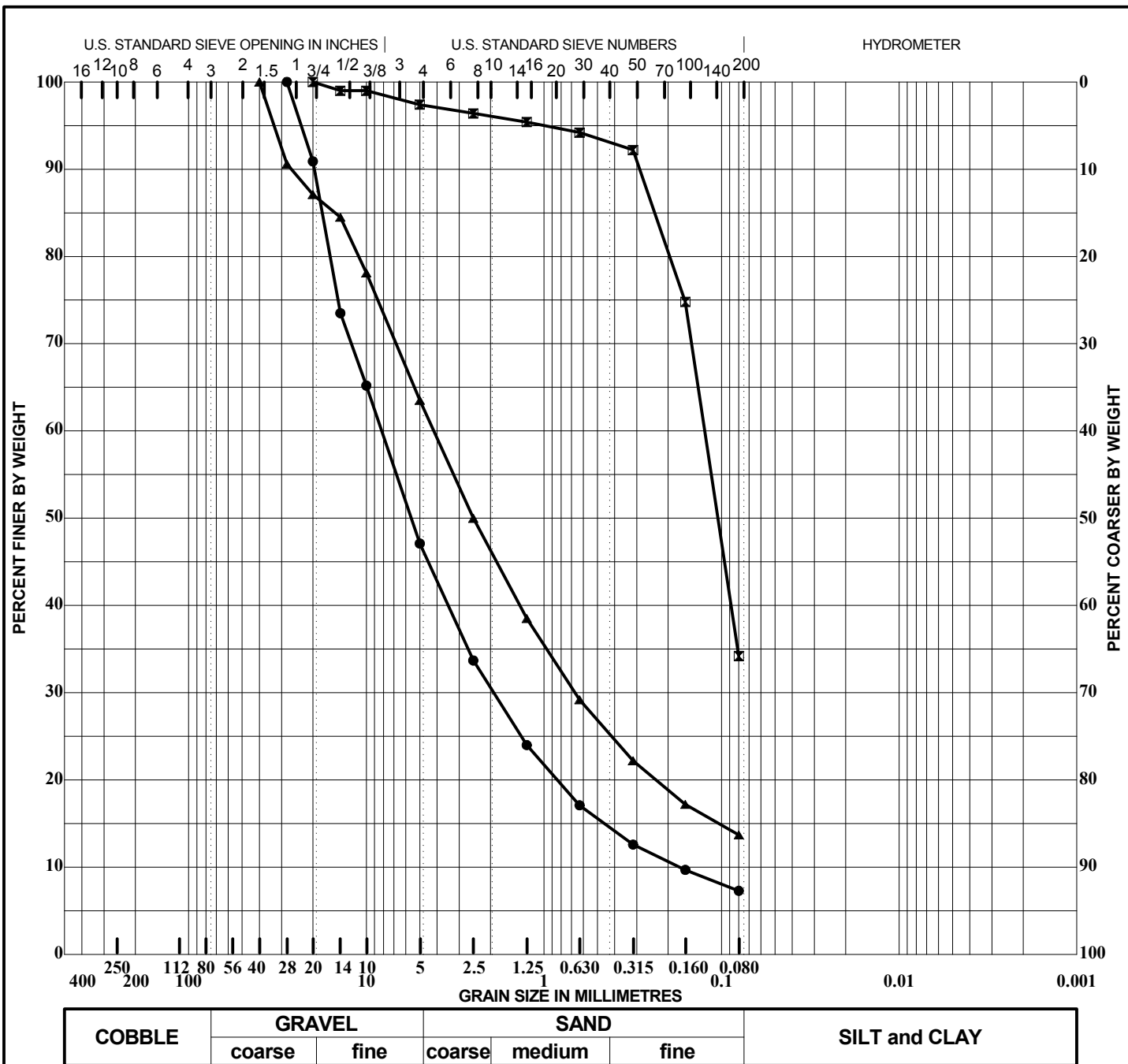
◇ Fall Cone Test    ◆ (Remolded)

▽ Hand Penetrometer Test    ▣ Torvane

△ Unconfined Compression Test  
 □ Field Vane Test ■ (Remolded)  
 ◇ Fall Cone Test ◆ (Remolded)  
 ▽ Hand Penetrometer Test ■ Torvane



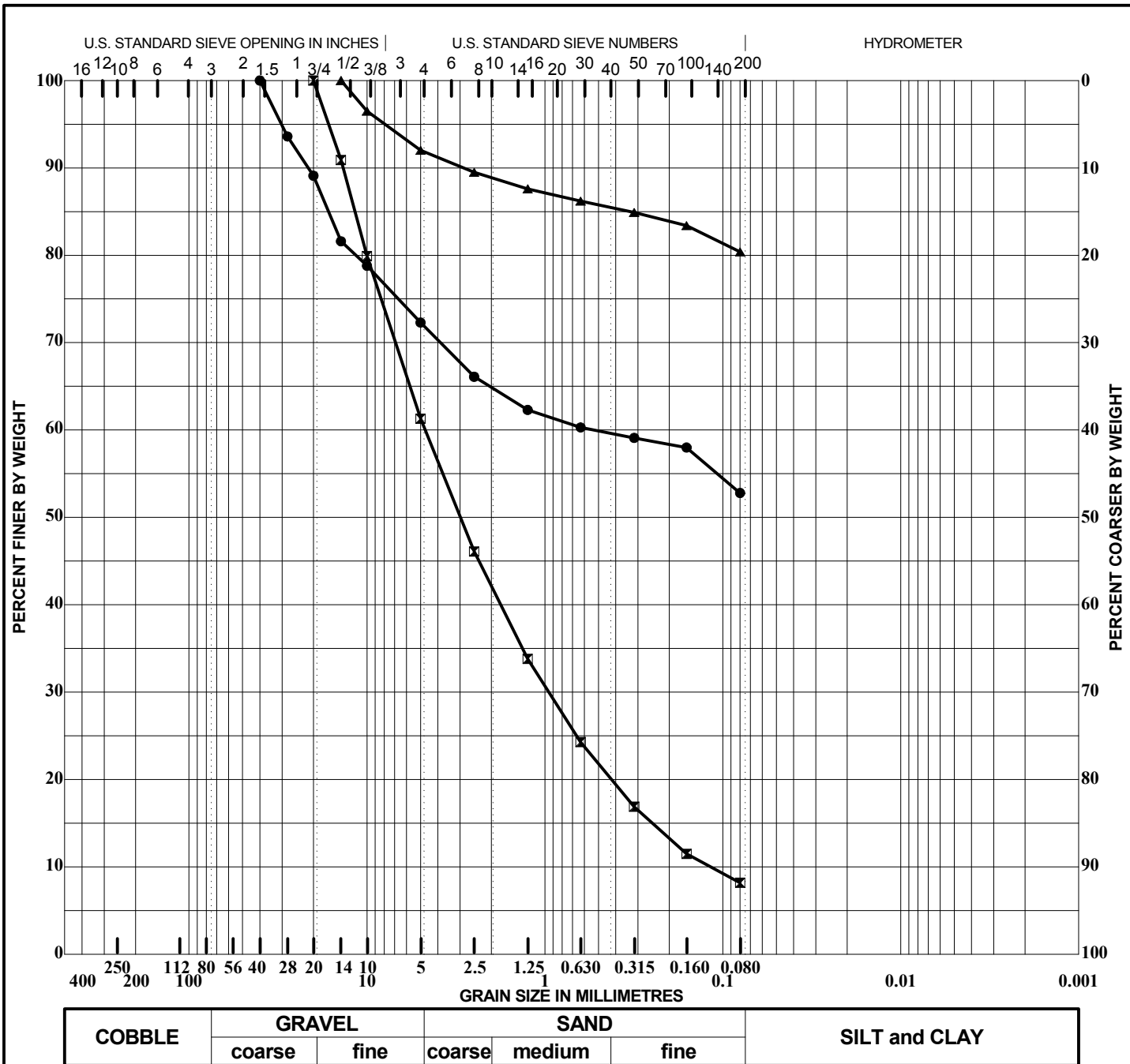




	Sample	Depth (m)	Description				W%	W <sub>L</sub>	W <sub>P</sub>	I <sub>P</sub>
●	BH-02	SS11	6.47	Well-graded GRAVEL with silt and sand (GW-GM)				6.3		
▣	BH-07	SS4	2.74	Silty SAND (SM)				20.6		
▲	BH-08	SS4	2.43	Silty SAND with gravel (SM)				8.3		
	Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-02	SS11	6.47	28.00	8.19	1.919	0.1716	52.9	39.8	7.3
▣	BH-07	SS4	2.74	20.00	0.12			2.6	63.2	34.2
▲	BH-08	SS4	2.43	40.00	4.18	0.668		36.5	49.8	13.7


REMARKS:

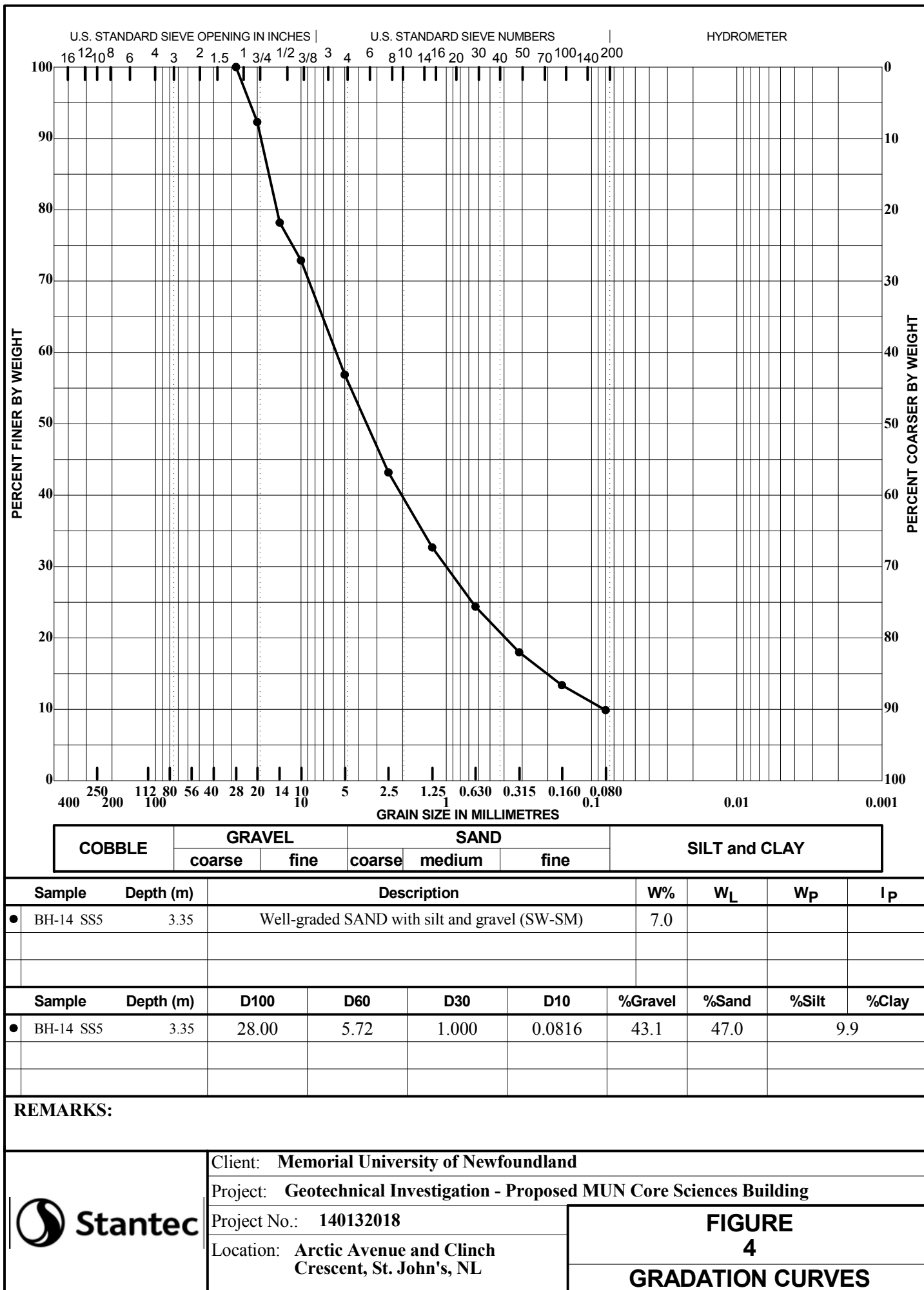
	Client: Memorial University of Newfoundland	
	Project: Geotechnical Investigation - Proposed MUN Core Sciences Building	
	Project No.: 140132018	<b>FIGURE 2 GRADATION CURVES</b>
	Location: Arctic Avenue and Clinch Crescent, St. John's, NL	




	Sample	Depth (m)	Description				W%	W <sub>L</sub>	W <sub>P</sub>	I <sub>P</sub>	
●	BH-10	SS4	2.74	Gravelly SILT with sand (ML)				12.3			
▣	BH-11	SS4	2.74	Well-graded SAND with silt and gravel (SW-SM)				8.2			
▲	BH-13	SS3	1.83	SILT with sand (ML)				16.9			
	Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	BH-10	SS4	2.74	40.00	0.53			27.7	19.5	52.8	
▣	BH-11	SS4	2.74	20.00	4.71	0.950	0.1168	38.7	53.1	8.2	
▲	BH-13	SS3	1.83	14.00				8.0	11.6	80.4	

REMARKS:

	Client: <b>Memorial University of Newfoundland</b>		<b>FIGURE 3 GRADATION CURVES</b>
	Project: <b>Geotechnical Investigation - Proposed MUN Core Sciences Building</b>		
	Project No.: <b>140132018</b>		
	Location: <b>Arctic Avenue and Clinch Crescent, St. John's, NL</b>		





**LEGEND**  
 APPROXIMATE BOREHOLE LOCATION

**NOTES:**  
1) THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.  
2) DO NOT SCALE FROM THIS DRAWING.  
3) DRAWING BASE MAP PROVIDED BY MEMORIAL UNIVERSITY OF NEWFOUNDLAND/STANTEC ARCHITECTURE, 2013.  
4) BOREHOLE LOCATIONS HAVE NOT BEEN SURVEYED AND ARE SHOWN AT APPROXIMATE LOCATIONS ON THIS DRAWING.

CLIENT:  
  
MEMORIAL UNIVERSITY OF  
NEWFOUNDLAND

PROJECT TITLE:  
  
GEOTECHNICAL INVESTIGATION  
PROPOSED CORE SCIENCES BUILDING  
MEMORIAL UNIVERSITY OF  
NEWFOUNDLAND

DRAWING TITLE:  
  
BOREHOLE LOCATION PLAN

Stantec Consulting Ltd.

SCALE: 1:1000 (APPROX.)	DATE: Sep. 27, 2013
DRAWN BY: R.L.	CHECKED BY: E.L.
EDITED BY: E.L.	REV. No. 0
DRAWING No: 140132018-GE-01	
CAD FILE: 140132018-GE-01.DWG	



## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 4  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Monday, January 19, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Not Applicable.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Drawing: A100 - GENERAL PROJECT NOTES AND DETAILS
- .1 Door 1319A hardware group revised to HG-03 to include credential reader and power supply as requested. Hardware Group HG-02 removed from project. Refer to revised Drawing A100 attached to this addendum.
- .2 Drawing: A202 - PARTIAL FLOOR AND EXTERIOR ELEVATION
- .1 Staging area layout revised to allow access to both sides of test racks. Workstation relocated as required. Refer to revised Drawing A202 attached to this addendum.
- .3 Drawing: A204 - FINISHES PLAN & A401 - INTERIOR DETAILS
- .1 Rooms CSF-1319, CSF-1320 & CSF-1320A updated to integral covered epoxy wall bases to replace the rubber bases previously shown in these spaces. Refer to revised Drawings A204 & A401 attached to this addendum.



- .4 Drawing: M302 LEVEL 1 - REFRIGERANT PIPING & CONTROLS LAYOUTS
  - .1 Update Note #5 on M302 to read as follows:  
“Refrigerant piping down through new data centre roof structure. Caulk and seal water tight. Refer to Architectural for fire rating and roof penetration details”.
- .5 Drawing: M304 - ENLARGED FLOOR PLAN – SITE PLAN
  - .1 Refrigerant piping serving condensing units located within the exterior equipment compound is to be terminated within a weatherproof enclosure. Refer to revised Drawing M304 attached to this addendum
- .6 Drawing: M401 - MECHANICAL DETAIL
  - .1 Detail 5 – EXTERIOR PIPE SUPPORTS has been revised to include space for electrical cable tray. Refer to revised Drawing M401 attached to this addendum
- .7 Drawing: E001 - ELECTRICAL LEGEND
  - .1 Added Graphic Scales
- .8 Drawing: E100 - ELECTRICAL SITE PLAN
  - .1 Supply and install aluminum weatherproof enclosure, 1200mm W x 1200mm L x 1200mm H. To be installed over Condensing Unit conduit and piping as they transition from the underground ductbank to above ground. Sides of enclosure to be core drilled to allow for extension of conduits and piping to mechanical support system. All penetrations to be sealed. Enclosure to have sloped roof and be removable for maintenance. Junction box for transition of electrical conduits from PVC to liquid tight flexible conduits to be installed inside this enclosure.
  - .2 Supply and install cable tray on mechanical support system for routing of condensing unit power conduits to each unit from the weatherproof enclosure. Cable tray to be fibreglass, Nema 12C rated, 305mm x 100mm, with rung spacing of 305mm. Coordinate with mechanical trade for the mounting of the tray to their supports.
- .9 Drawing: E202 - POWER AND SYSTEMS FLOOR PLAN – CORE SCIENCE FACILITY
  - .1 Data racks in Staging Area CSF-1320 relocated within room.
  - .2 Detail 1 – Receptacle locations for Data Racks in Staging Area CSF-1320 relocated to accommodate new rack locations.
  - .3 Detail 1 – Data ground bus relocated within Staging Area CSF-1320. Routing of grounding conductors and conduits extended to suit.
  - .4 Detail 1 – grounding layout updated to suit new cable tray layout.
  - .5 Detail 1 – power for card access system added to doors for Rooms CSF-1319 and
  - .6 CSF-1321.
  - .7 Detail 2 – Extend cable tray to new data rack locations within Staging Area CSF-1320.

- .8 Detail 2 – Data outlet locations for Data Racks in Staging Area CSF-1320 relocated.
- .9 Detail 2 – Cable tray layout updates. Quantity of trays for PDU power cords reduced. Addition of 153mm cable tray suspended over data racks.
- .10 Drawing: E401 - ENLARGED FLOOR PLANS – DATA CENTRE
  - .1 Detail 2 – Reduced quantity of cable trays for PDU power cords and adjusted layout.
  - .2 Detail 2 – Cable tray for PDU power cords updated to 153mm wide.
  - .3 Add 153mm W X 100mm H basket type cable tray at inside perimeter of larger 2-tier cable tray. Tray to be factory painted white and supported from structural ceiling grid system.
  - .4 An additional section of power busway system rails is required to connect to cable end feeds to avoid interference with cable tray.
- .11 Drawing: E402 - ENLARGED FLOOR PLANS – UPS ROOM AND MECHANICAL EQUIPMENT PLAN
  - .1 Detail 3 – Updated symbol for Fan CSF-EF-35 in UPS Room CSF-1319 from a starter to a disconnect.
  - .2 Updated naming of panels in Keynotes 6 and 7.
- .12 Drawing: E501 - ELECTRICAL DETAILS
  - .1 Updated Detail 4 to show new width of cable tray for PDU power cords. Tray to be 153mm wide.
- .13 Drawing: E502 - ELECTRICAL DETAILS
  - .1 Detail 3 - updated to reflect new layout of cable tray for PDU power cords.
- .14 Drawing: E503 - SITE PLAN DETAILS
  - .1 Detail 2 – updated description of conduits for ductbank detail.
- .15 Drawing: E603 - FIRE ALARM AND DATA RISER DIAGRAM
  - .1 Deleted Detail 4.
  - .2 Detail 3 – updated naming of panels.
  - .3 Detail 3 – updated room name for Fire Alarm Releasing Panel location.

## 1.6 CHANGES TO SPECIFICATION

- .1 Section 00 01 10 – Table of Contents
  - .1 Update the Table of Contents as follows:
    - .1 Add Section 07 81 00 – Applied Fireproofing.
    - .2 Add Section 08 11 00 – Metal Doors and Frames.
    - .3 Delete Section 08 14 16 – Flush Wood Doors.
    - .4 Add Section 08 80 00 – Glazing.

- .2 Update the specifications as noted above, new sections to add are attached to this addendum, remove sections being deleted as they are no longer required for this project.
- .2 Section 01 91 13.13 – Commissioning (Cx) Requirements
  - .1 Replace specification section with the attached updated version.
- .3 Section 26 25 00.01 – Low Voltage Busways
  - .1 Reference: 2.6 Tap Off Units
    - .1 Revise 2.6.6 as follows:

“2.6.6 Tap off units with receptacles or connectors shall utilize a UL-listed receptacle or connector. The receptacle or connector support standard NEMA or IEC configuration and either bolted to the enclosure or affixed to an electrical cord dropped down from the enclosure. Length the cord drop as required to interface with the provided PDU. Cord drops shall use UL listed strain relief devices. Receptacle or connector tap off units shall come fully assembled and wired from the manufacturer. Field kits for drop cords and receptacles shall not be acceptable.”
  - .2 Reference: 3.5 Testing
    - .1 Revise 3.5.4 as follows:

“3.5.4 Perform infrared scanning of energized busway system under normal building load.”

## 1.7 QUESTIONS AND RESPONSES

- .1 QUESTION: Based on cabinet drawing, indicates having AI/AO modules, assumption is to just carry in panel as spare as there does not appear to be a need for any analog signals to this panel.
  - .1 ANSWER: AI/AO modules is for future use and is not used on the current scope.
- .2 QUESTION: No spec detailing analog output card. Assumption need to carry 5 AO minimum spare capacity please confirm (29 94 43 2.2.9.2)
  - .1 ANSWER: Correct.
- .3 QUESTION: 26 94 43 2.2.3 Central Processing Unit calls out Schneider Harmony Series Model HMIP67BAEN308ENN00. Assumption is two of these for redundancy. Can this be accomplished with Modicon M580 instead of the Harmony series?
  - .1 ANSWER: Yes, two CPUs are required for redundancy. The proposed Modicon M580 constitutes a change in control architecture from an industrial PC-based control platform to a dedicated programmable automation controller. Acceptance will be conditional upon confirmation that all functional, redundancy, cybersecurity, and lifecycle requirements of the specified system are maintained or improved, and that

visualization, licensing, FAT/SAT, and maintenance impacts are fully addressed.

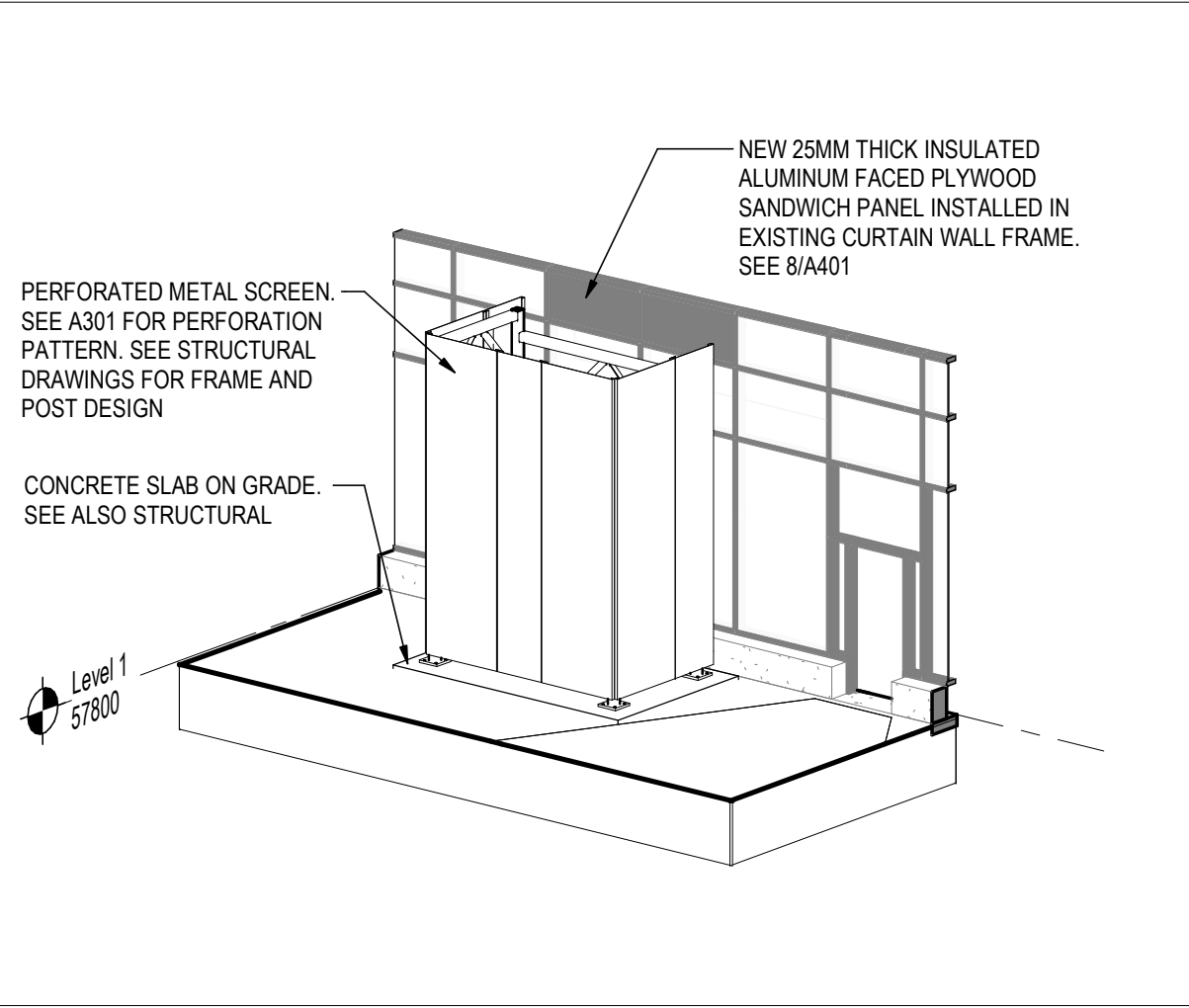
- .4 QUESTION: 26 94 43 2.2.10.1 Ethernet back plane called out as 6 slots + network. Based on number of I/O modules (assuming 3x 16DI, 1xDO, 1xAI, 1xAO + 2 Modbus communication cards for the Generators & UPS) would need at minimum 8 slots. Clause 2.2.2 "Rack shall have sufficient space for the future addition of a minimum of 4 modules" indicates 12 slot backplane. Can we go with a 12 slot back plane or split to two 6 slot backplanes?
  - .1 ANSWER: Please modify Reference Clause 2.2.10.1.1 to 12 slots as indicated. This can be accomplished by either a single 12-slot backplane or dual 6-slot backplanes.
- .5 QUESTION: Digital Input modules are called out as BMXDDI1602 16-input cards, can these be changed to 32 input modules?
  - .1 ANSWER: Yes.
- .6 QUESTION: Network topology inside cabinet indicates 3 managed network switches, can this be accomplished with ring topology between the PLCs and the remote I/O to cut out two of these switches?
  - .1 ANSWER: The proposed ring topology does not maintain the functional intent, resilience characteristics, cybersecurity zoning, or maintainability of the specified managed switch architecture, the request is rejected. The contractor shall proceed in accordance with the originally specified network design incorporating three (3) managed Ethernet switches within the automation cabinet.
- .7 QUESTION: Specification 26 32 13.01 – 2.3.13. Do we need to provide active monitoring for winding temps or just a fused protection circuit for the alternator windings?
  - .1 ANSWER: Thermistors embedded in stator windings shall be actively monitored by the alternator/generator control system and shall provide high-temperature alarm and shutdown functionality. A fused or sacrificial thermistor protection circuit alone is not acceptable.
- .8 QUESTION: The spec calls up both aluminum and galvanized steel for the curtain (2.1.2 and 2.6.1), it also calls up galvanized and powder coat finish. Please Clarify.
  - .1 ANSWER: Curtain slats to be powder coated aluminum.
- .9 QUESTION: It also requests both chain hoist operation and an electrical operator (2.5.2 and 2.6.7). Please clarify.
  - .1 ANSWER: Door to be manually operated with endless chain.
- .10 QUESTION: Can you please confirm if hoarding is required for our area of work within the pavilion?
  - .1 ANSWER: Hording is not required within the pavilion

- .11 QUESTION: Can you please confirm if fireproofing is required for the structural steel elements? There are no specifications for fireproofing in the specifications document.
- .1 ANSWER: Fireproofing of the steel elements within the Data Centre and UPS room is required as per the notes on Code Conformance Plan A102. Spec section "07 81 00 – Applied Fireproofing" included in Addendum #4
- .12 QUESTION: Please provide Eatons Hot Aisle Containment System drawings as referenced in section 27 11 00 - 2.2.6
- .1 ANSWER: Requested drawings are attached to this addendum.

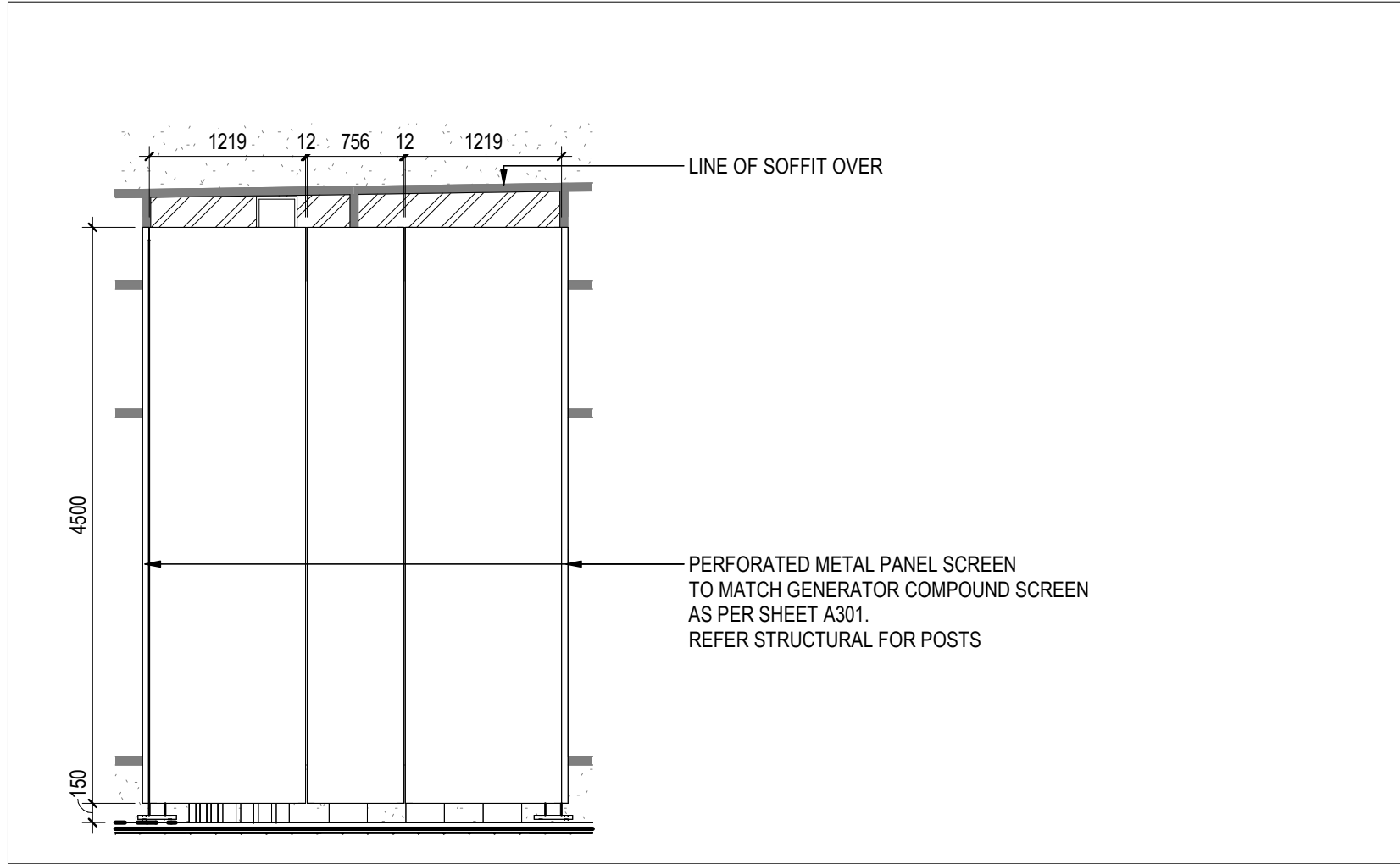
**END OF ADDENDUM**



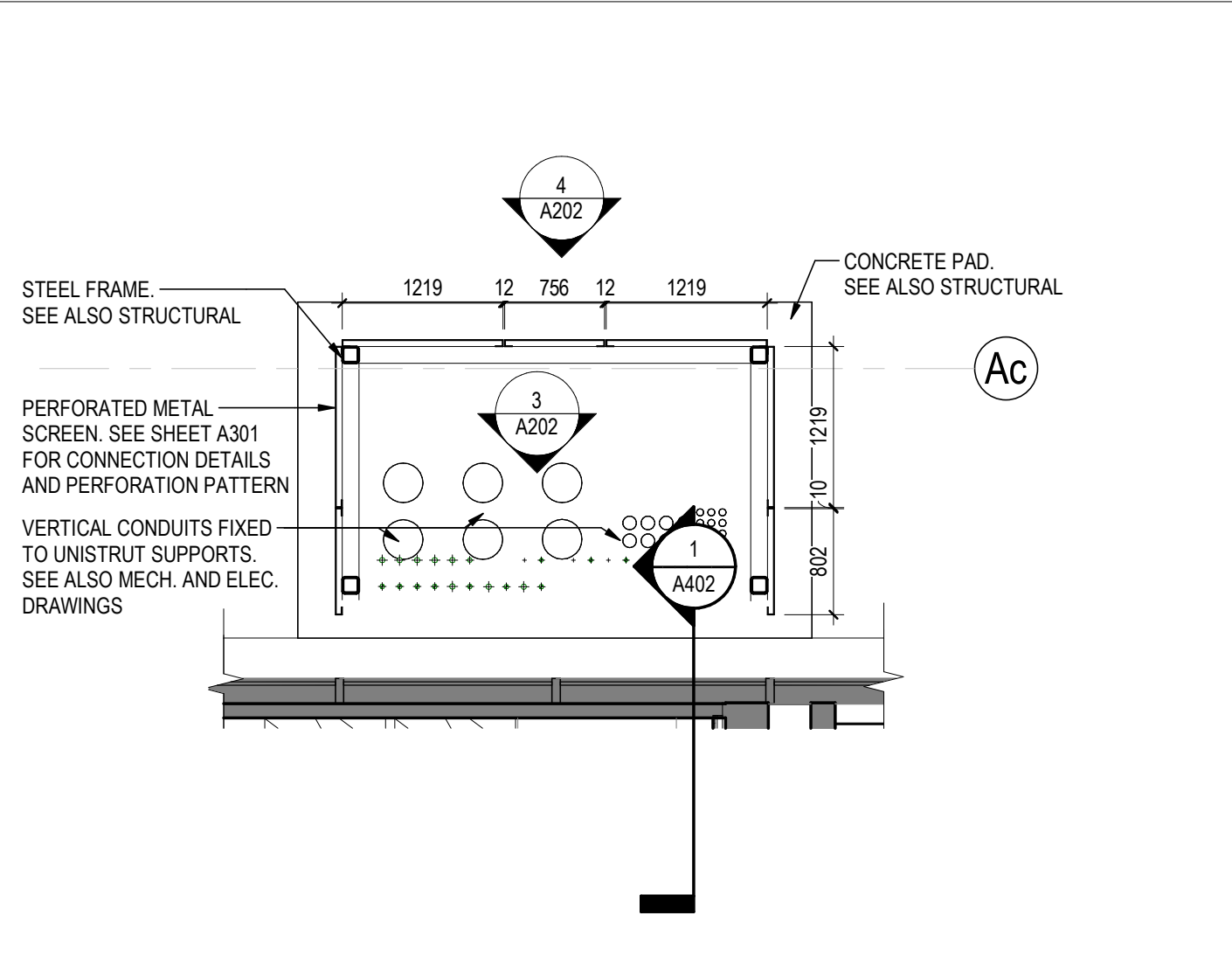




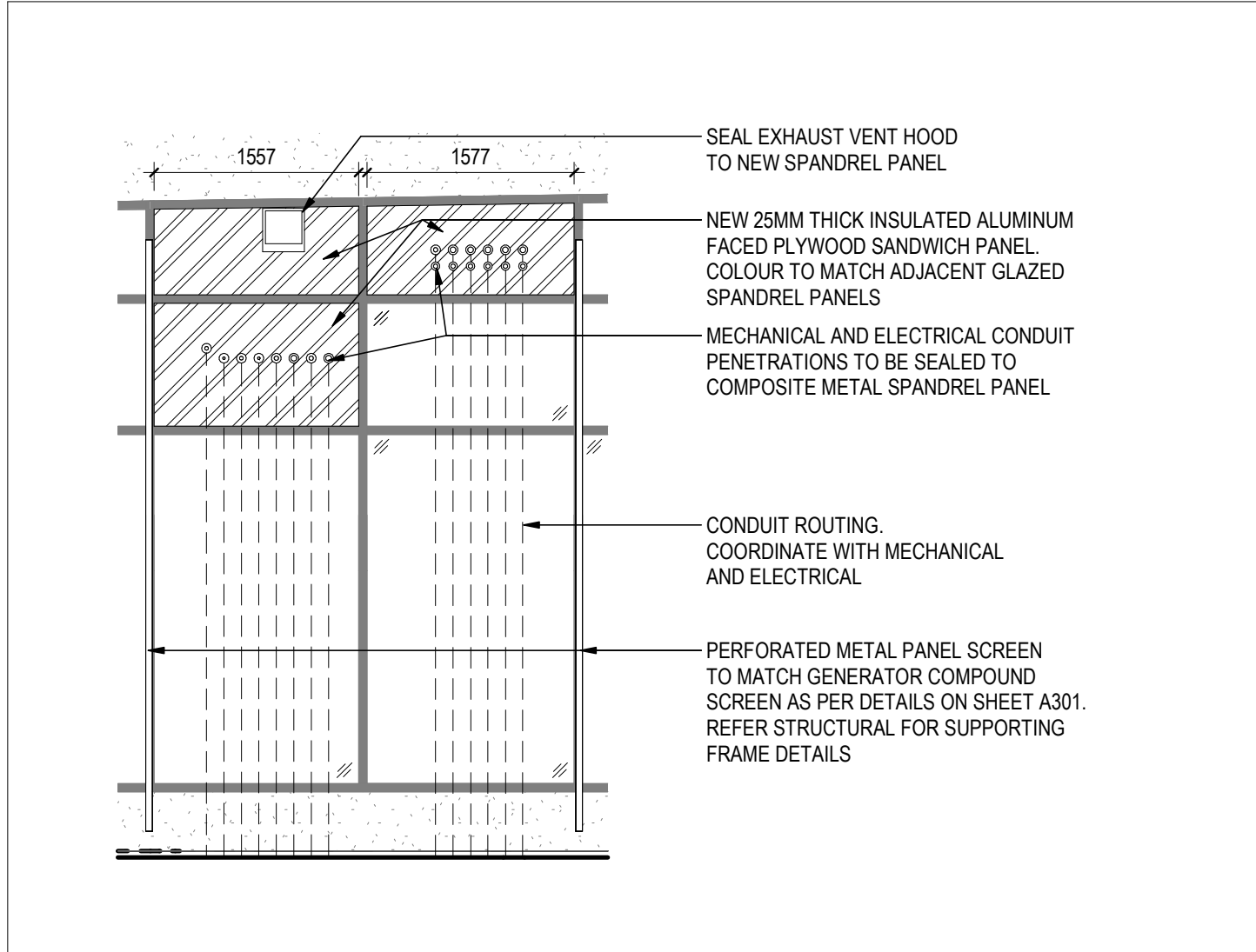
5 CONDUIT ENCLOSURE  
A202



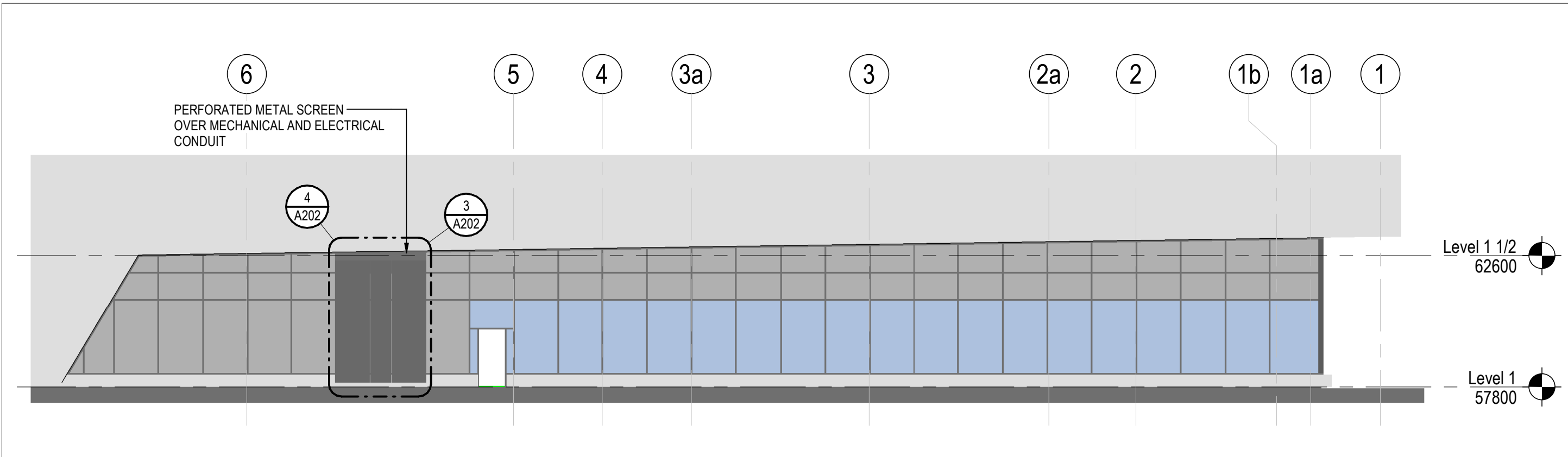
4 CONDUIT ENCLOSURE - FRONT ELEVATION  
A202 1:50



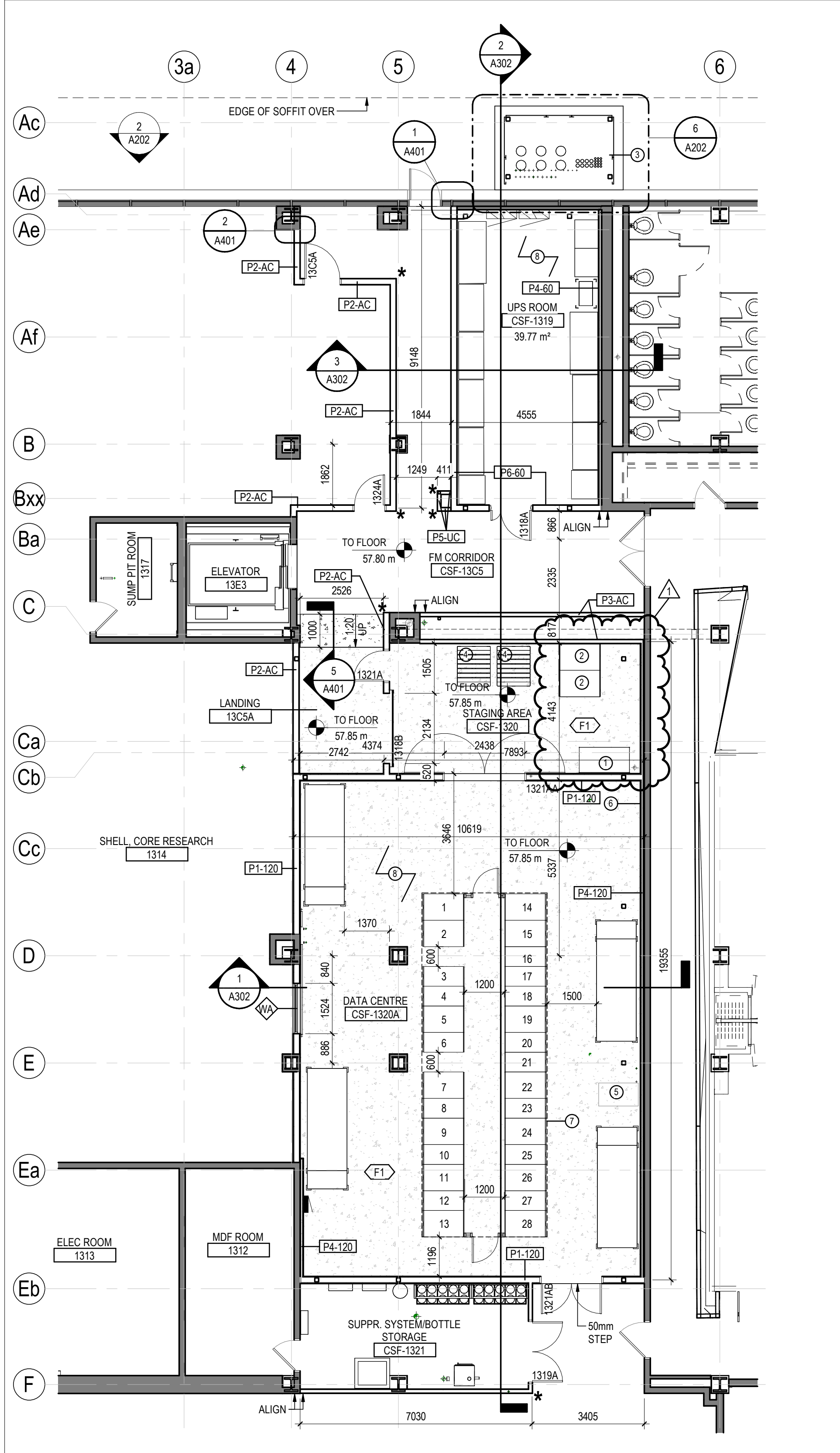
6 ENLARGED PLAN - CONDUIT ENCLOSURE  
A202 1:50



3 ENLARGED ELEVATION - CONDUIT ENCLOSURE  
A202 1:50



2 EXTERIOR BUILDING ELEVATION  
A202 1:150



1 PARTIAL PLAN - LEVEL 1  
A202 1:100

- SHEET NOTES**  
THESE NOTES APPLY ONLY TO THE WORK ILLUSTRATED ON THIS SHEET
- ALL PARTITION AND WALL DIMENSIONS TO FACE OF STUD UNLESS NOTED OTHERWISE.
  - GENERAL SHEET NOTE 2.
  - GENERAL SHEET NOTE 3.

- KEYNOTES**  
THESE NOTES APPLY ONLY TO PARTICULAR WORK IDENTIFIED BY KEYNOTE MARKERS.
- WORK BENCH. OWNER SUPPLIED
  - TEST RACKS
  - PERFORATED METAL SCREEN TO MATCH GENERATOR COMPOUND AS PER SHEET A301. REFER ALSO STRUCTURAL FOR POST DETAILS
  - PALLET STORAGE SPACE FOR STANDARD 48" x 40" PALLET
  - CHARGING STATION FOR OWNER SUPPLIED RACK LIFT
  - INSTALL NEW 300X300 ACCESS HATCHES IN NEW GYPSUM WALL PARTITION AT ALL EXISTING ELECTRICAL BOX LOCATIONS. CONTRACTOR TO QUANTIFY ON SITE.
  - LINE OF HOT AISLE CONTAINMENT SYSTEM OVER
  - MOULD RESISTANT DRYWALL PANELS TO BE INSTALLED ON INSIDE FACE OF WALLS ENCLOSING THIS SPACE

**FLOOR PLAN LEGEND**

- DOOR/FRAME TAGS**
- 100A SEE ARCHITECTURAL PROJECT NOTES AND SCHEDULES SHEET FOR DESCRIPTION.
- PARTITION TAGS**
- Px DENOTES PARTITION ASSEMBLY. SEE ARCHITECTURAL PROJECT NOTES AND SCHEDULES SHEET FOR LIST OF ASSEMBLIES.
- GENERAL LEGEND**
- \* DENOTES LOCATION OF STAINLESS STEEL CORNER GUARD

ROOM SCHEDULE		
Rm. No.	NAME	AREA
CSF-1320A	DATA CENTRE	154.69 m <sup>2</sup>
CSF-1320	STAGING AREA	30.47 m <sup>2</sup>
CSF-1319	UPS ROOM	39.77 m <sup>2</sup>
CSF-1321	SUPPR. SYSTEM/BOTTLE STORAGE	22.19 m <sup>2</sup>
13CSA	LANDING	12.25 m <sup>2</sup>
CSF-13C5	FM CORRIDOR	53.41 m <sup>2</sup>
TOTAL		312.78 m <sup>2</sup>

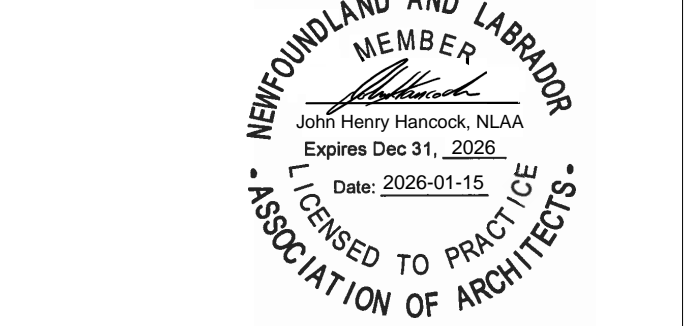
A	A - DETAIL	A
B	B - LOCATION/DRAWING No.	B C
	C - DRAWING No.	

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM NO. 4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

**GENERAL NOTES**

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

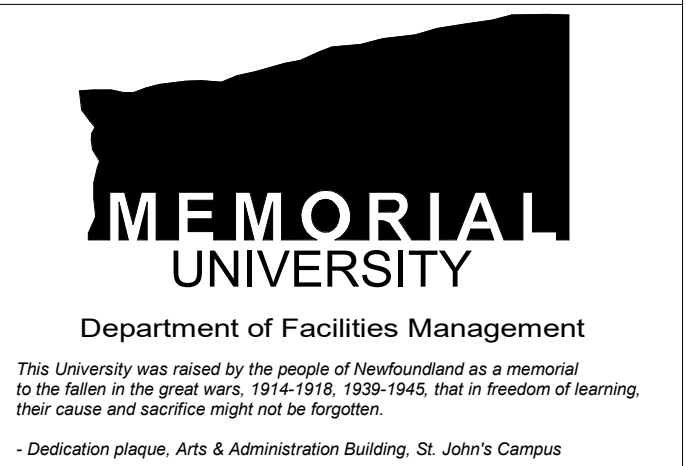
Permit/Seal



STANTEC ARCHITECTURE  
141 KELSEY DRIVE  
ST. JOHN'S, NL A1B 0L2  
Tel: (709) 576.1458 • www.stantec.com

Copyright Reserved  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



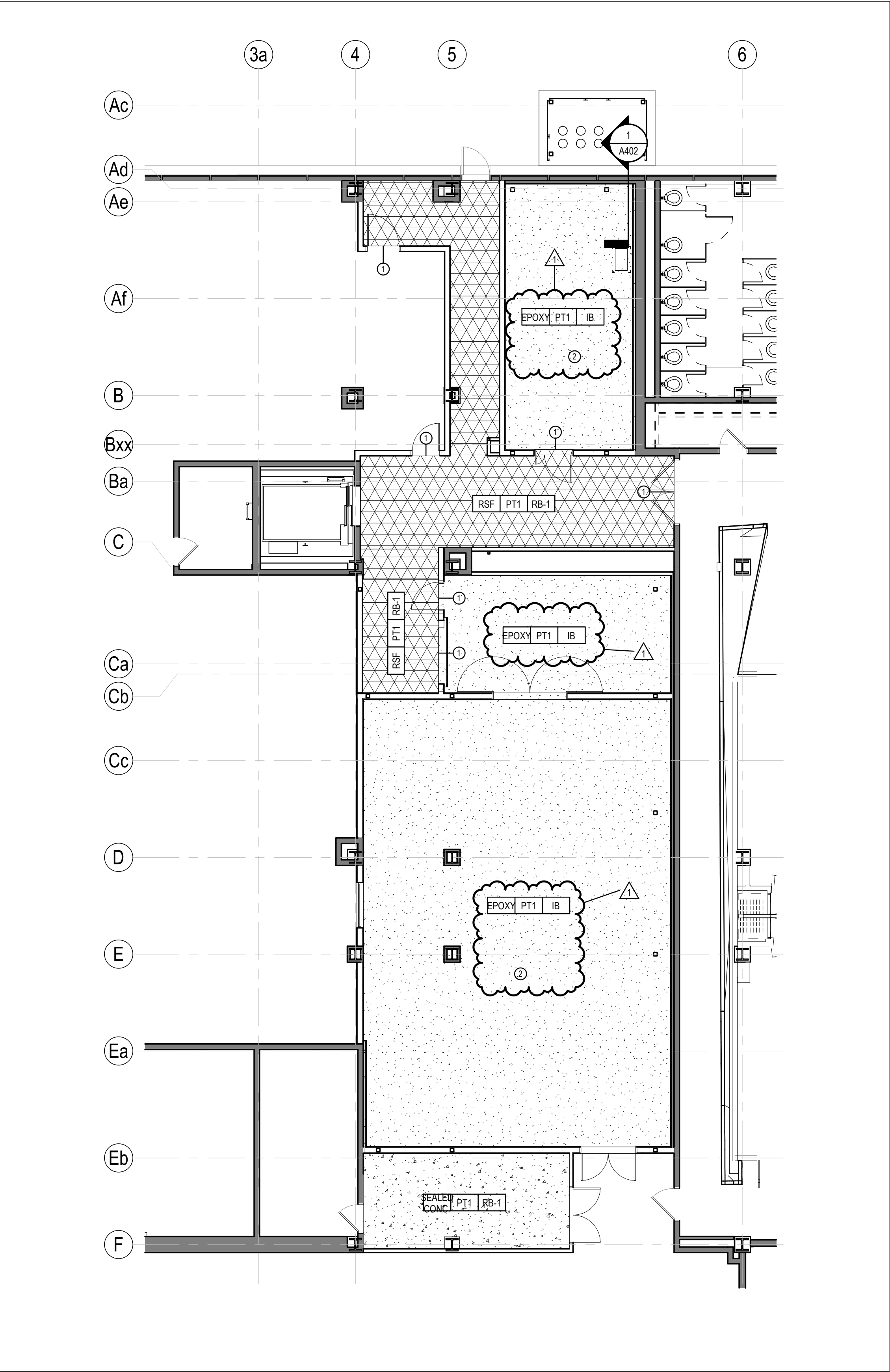
PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
**PARTIAL FLOOR PLAN AND EXTERIOR ELEVATION**

DESIGNED: JHH	DRAWN: NH
REVIEWED: -	APPROVED: JHH
SCALE: As indicated	DATE: OCTOBER, 2024
STANTEC PROJECT No: 133412008	DRAWING No: <b>A202</b>

ROOM FINISH SCHEDULE					
Number	Name	Wall Finish	Base Finish	Floor Finish	Ceiling Finish
13C5A	LANDING	PT1	RB-1	RSF	ACT-1
CSF-13CS	FM CORRIDOR	PT1	RB-1	RSF	ACT-1
CSF-1319	UPS ROOM	PT1	IB	EPOXY	GYP
CSF-1320	STAGING AREA	PT1	IB	EPOXY	ACT-1
CSF-1320A	DATA CENTRE	PT1	IB	EPOXY	ACT-2
CSF-1321	SUPPR. SYSTEM/BOTTLE STORAGE	PT1	RB-1	SEALED CONC.	ACT-1



1  
A204

**FINISHES PLAN - LEVEL 1**

1 : 100

**SHEET NOTES**

THESE NOTES APPLY ONLY TO THE WORK ILLUSTRATED ON THIS SHEET

1 INSTALL APPROPRIATE TRANSITION STRIPS WHERE CHANGE IN FLOORING OCCURS.

**KEYNOTES**

THESE NOTES APPLY ONLY TO PARTICULAR WORK IDENTIFIED BY KEYNOTE MARKERS:

1 FLOORING TRANSITION STRIP  
2 INSTALL INTEGRAL COVED BASE ON UPSTAND OF ALL HOUSE KEEPING PADS INCLUDING METAL TRIM AT TOP.

**FINISHES PLAN LEGEND**

**SEALED CONC.**  
CLEAR SEAL OVER EXISTING CONCRETE FLOOR

**EPOXY**  
ROLLED ON EPOXY FLOOR FINISH. COLOUR CHOSEN BY OWNERS REPRESENTATIVE

**RSF**  
2MM THICK HOMOGENOUS SHEET FLOORING TO MATCH EXISTING ADJACENT CORRIDOR SPACES, CW MATCHING TRIM ON ALL EXPOSED TO VIEW EDGES.

**RB1**  
**RUBBER WALL BASE**  
152MM WITH TOE TO MATCH EXISTING ADJACENT SPACES

**PT1**  
**INTERIOR PAINT**  
WHITE COLOUR TO MATCH BENJAMIN MOORE COLOUR OC-30 OXFORD WHITE OR APPROVED ALTERNATE

**IB**  
**INTEGRAL WALL BASE**  
152MM COVED EPOXY WALL BASE WITH METAL TRIM AT TOP

DESIGNED: JHH

REVIEWED: -

SCALE: As indicated

STANTEC PROJECT No: 133412008

DRAWN: NH

APPROVED: JHH

DATE: OCTOBER, 2024

DRAWING No: **A204**

A  
B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A  
B  
C

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM NO. 4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

**GENERAL NOTES**

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

NEWFOUNDLAND AND LABRADOR  
MEMBER  
John Henry Hancock, NLAA  
Expires Dec 31, 2026  
Date: 2026-01-15  
CONSULTED TO PRACTICE  
ASSOCIATION OF ARCHITECTS

**Stantec**

STANTEC ARCHITECTURE  
141 KELSEY DRIVE  
ST. JOHN'S, NL A1B 0L2  
Tel: (709) 576.1458 • www.stantec.com

Copyright Reserved  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.  
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

**MEMORIAL UNIVERSITY**  
Department of Facilities Management  
*This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.*  
- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
**FINISHES PLAN**

DESIGNED: JHH

DRAWN: NH

REVIEWED: -

APPROVED: JHH

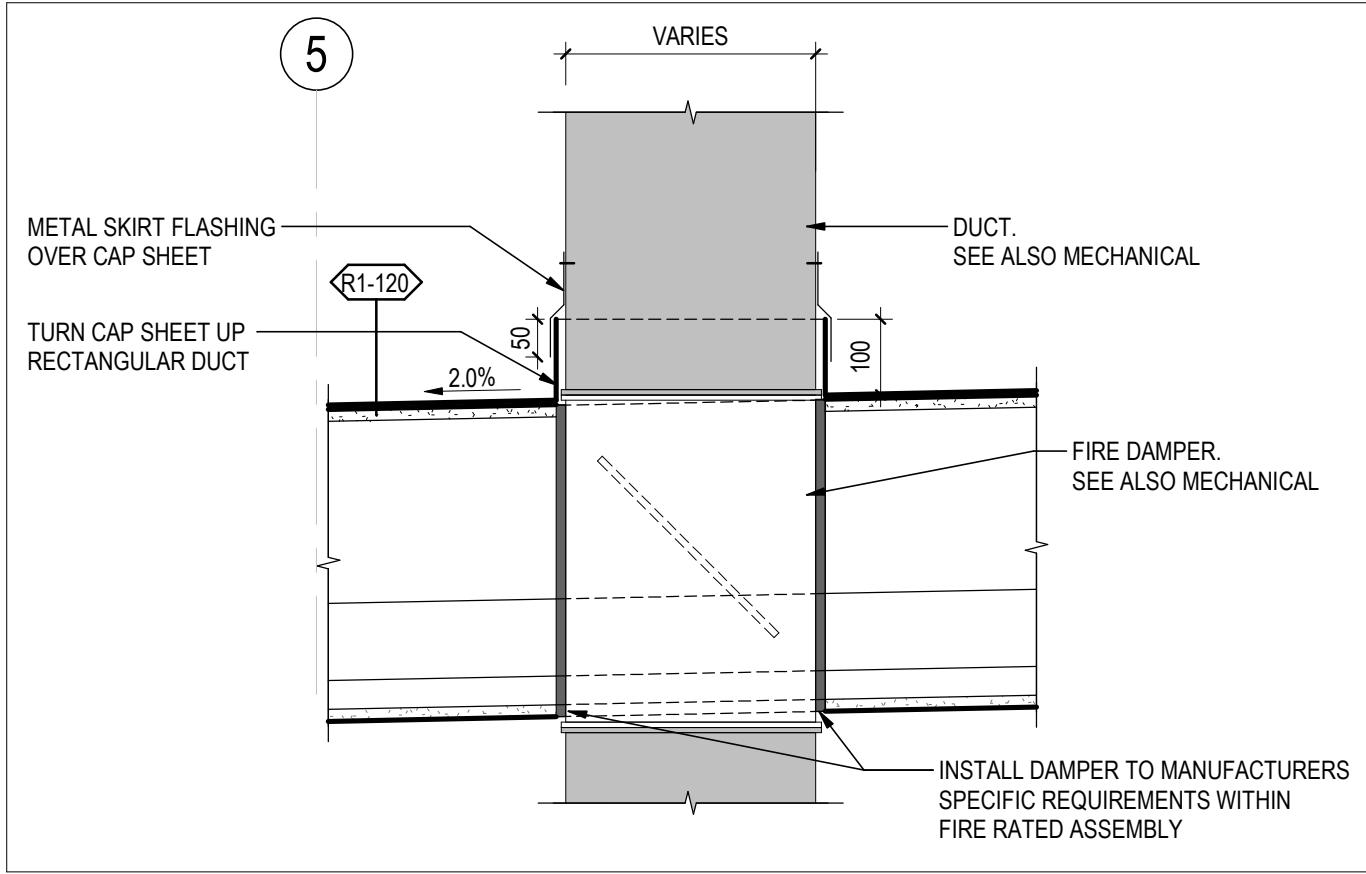
SCALE: As indicated

DATE: OCTOBER, 2024

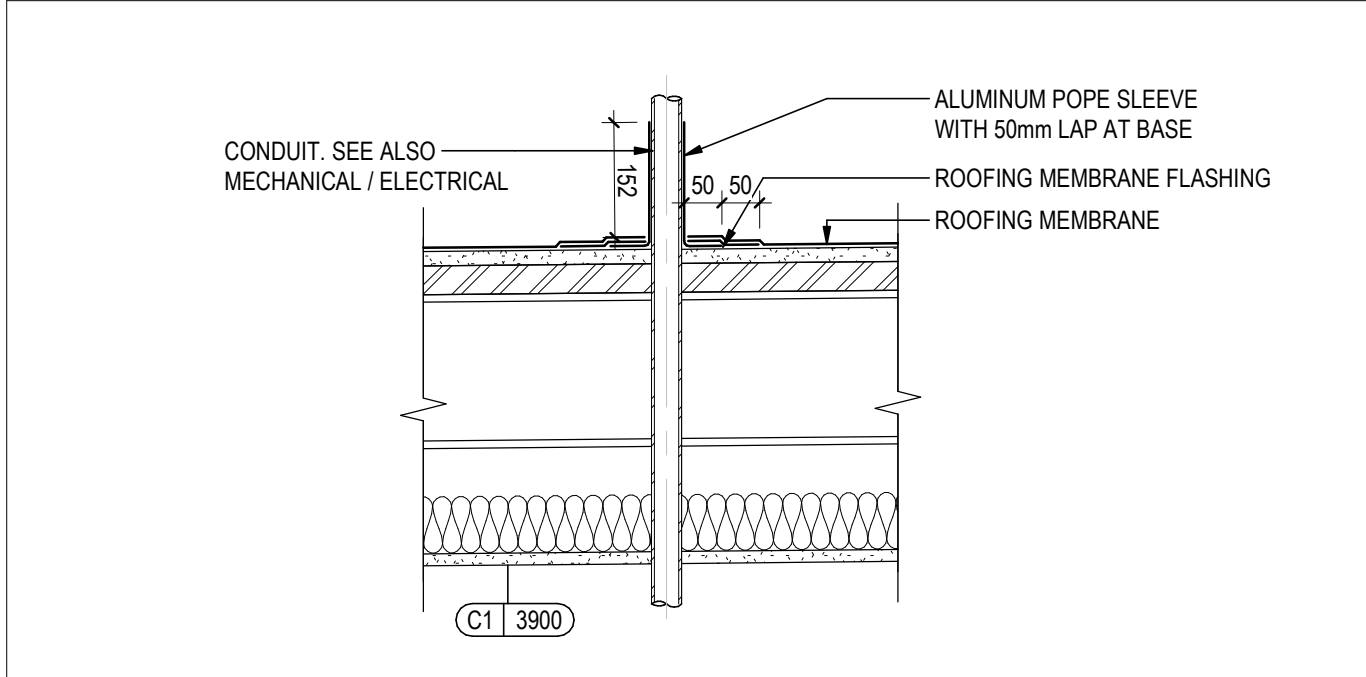
STANTEC PROJECT No: 133412008

DRAWING No: **A204**

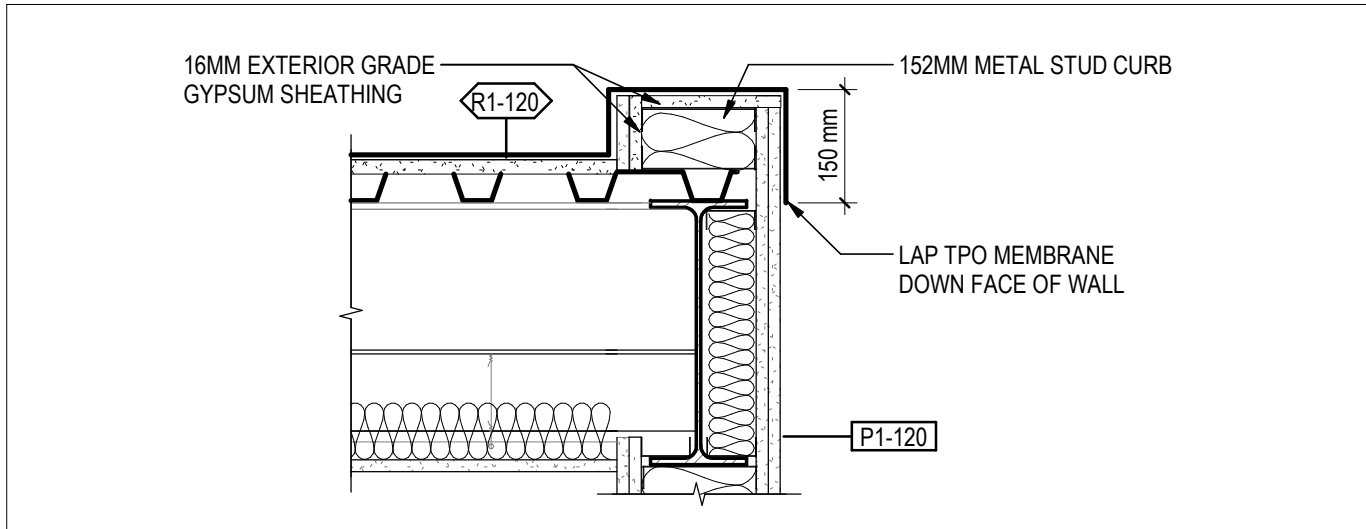




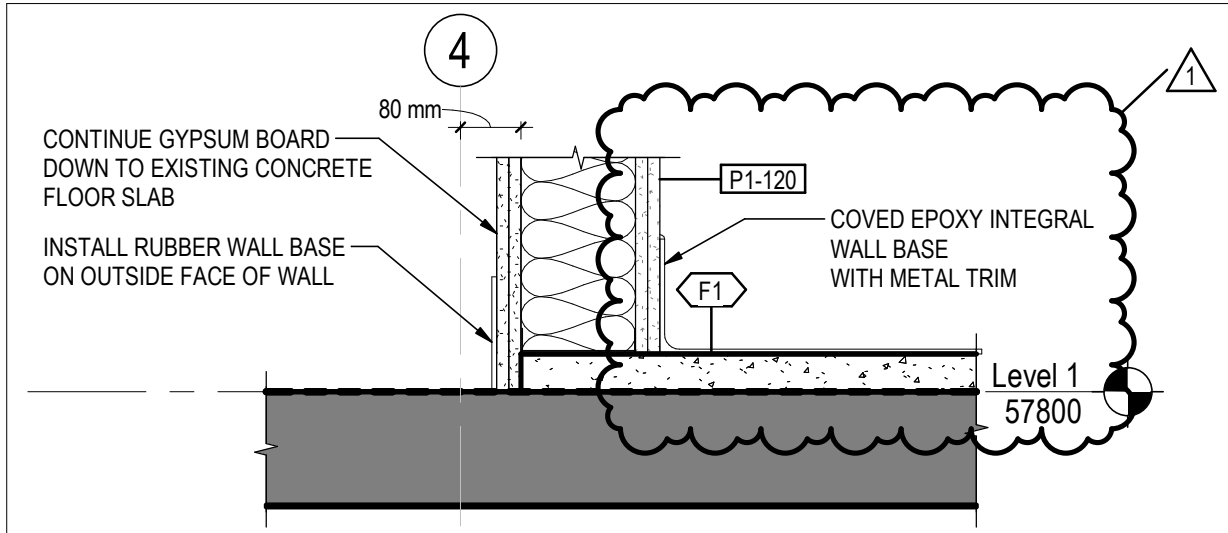
16 SECTION DETAIL - ROOF PENETRATION  
A401 1 : 10



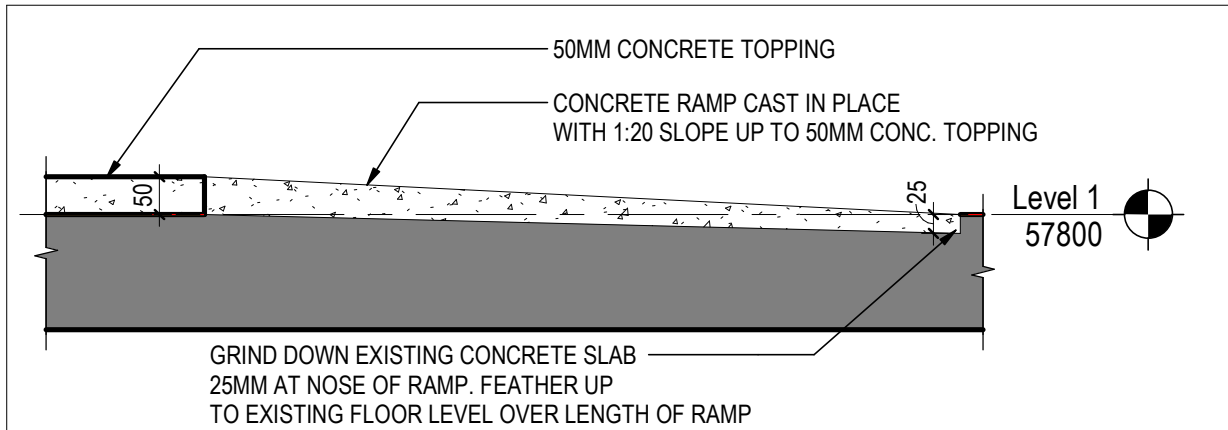
12 INTERIOR ROOF - PIPE PENETRATION  
A401 1 : 10



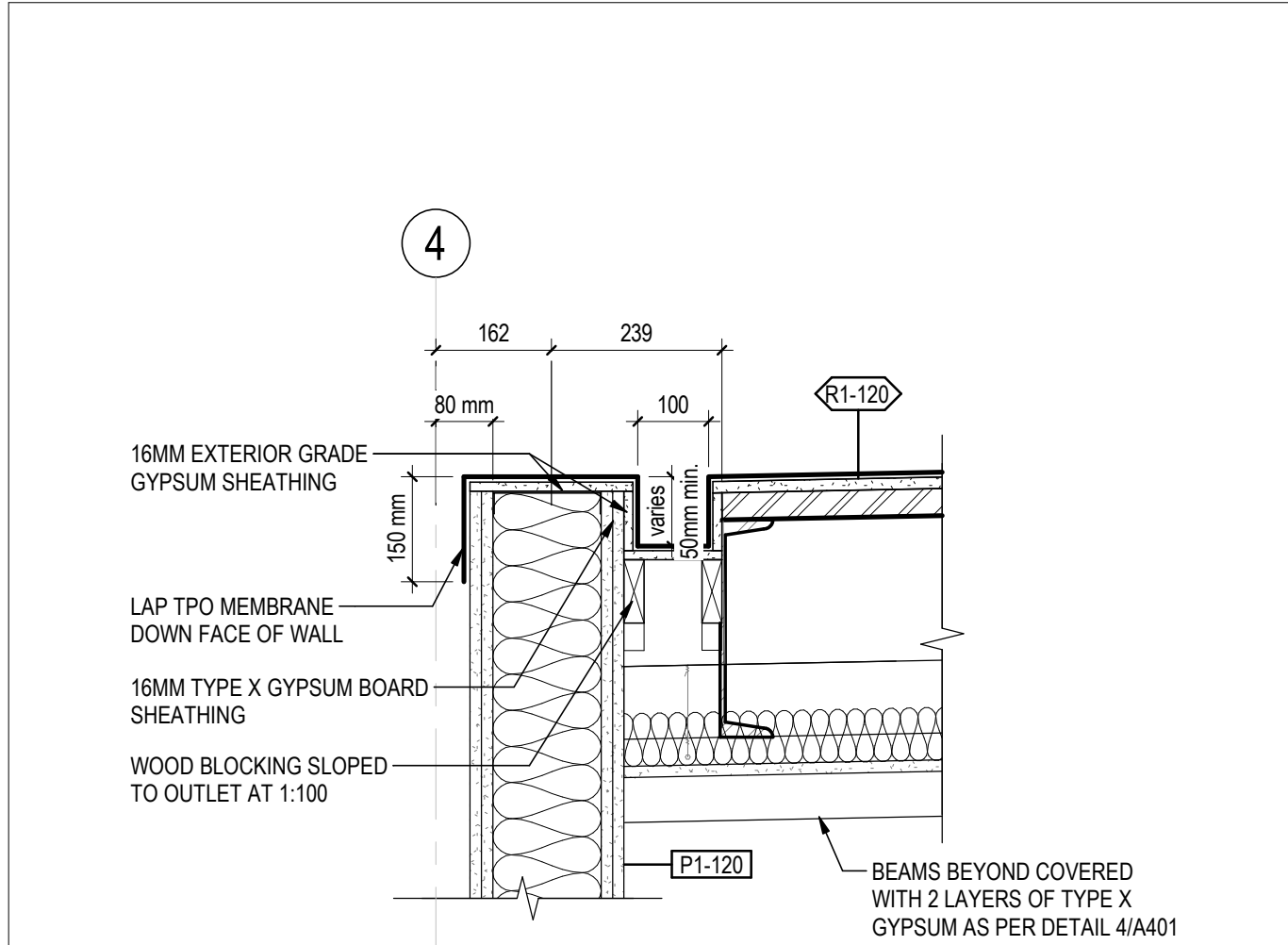
11 SECTION DETAIL - ROOF EDGE  
A401 1 : 10



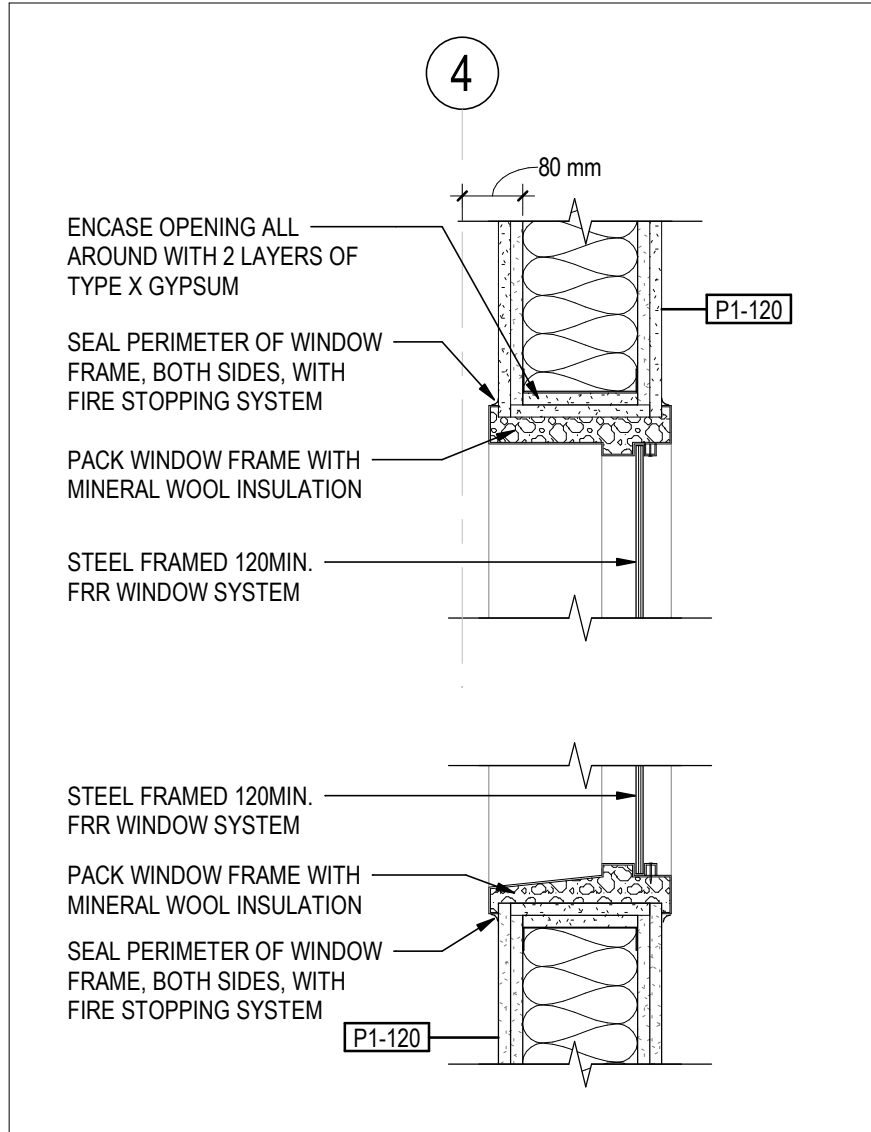
6 SECTION - RATED WALL TO FLOOR  
A401 1 : 10



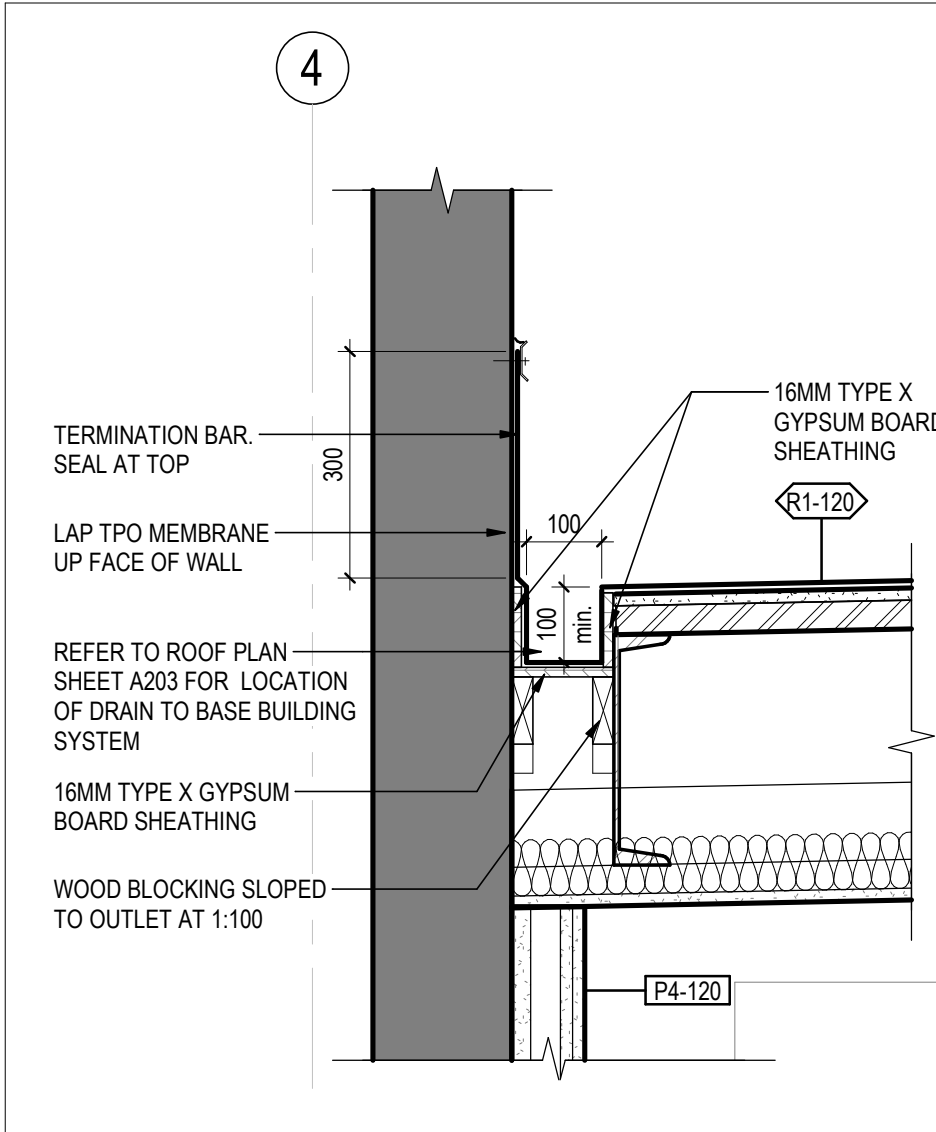
5 CAST IN PLACE CONCRETE RAMP  
A401 1 : 10



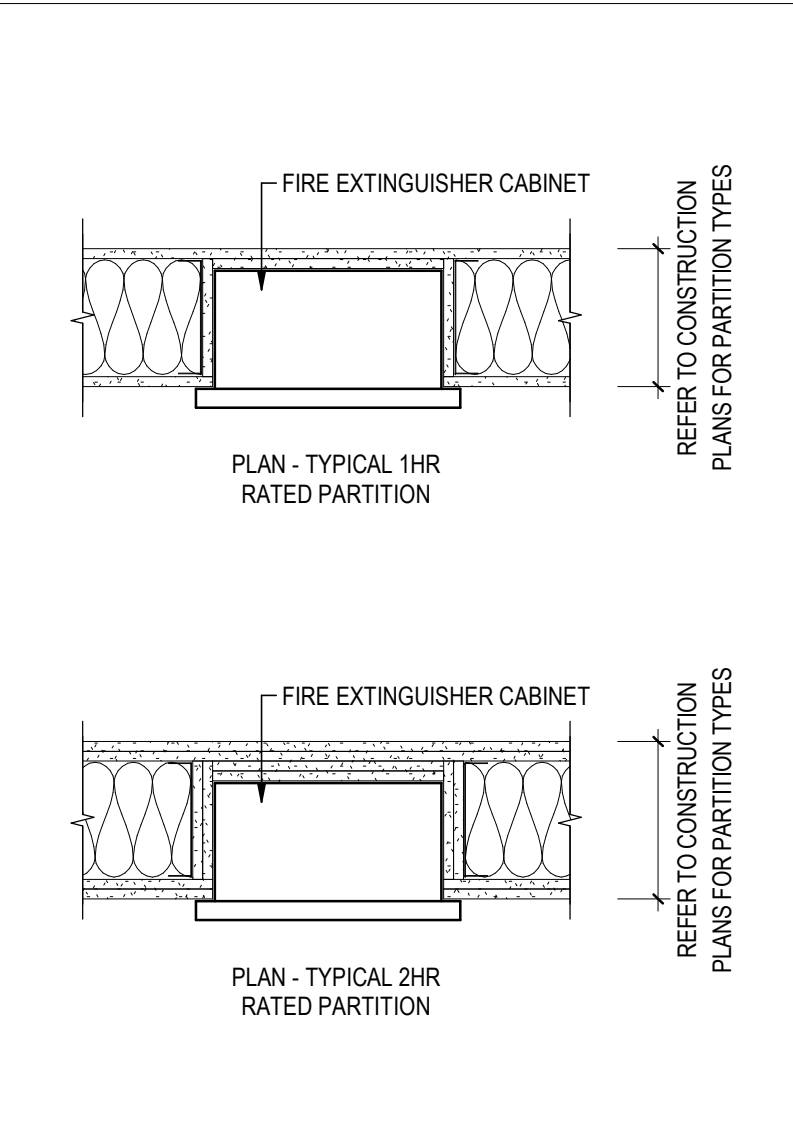
15 INTERIOR ROOF - GUTTER DETAIL  
A401 1 : 10



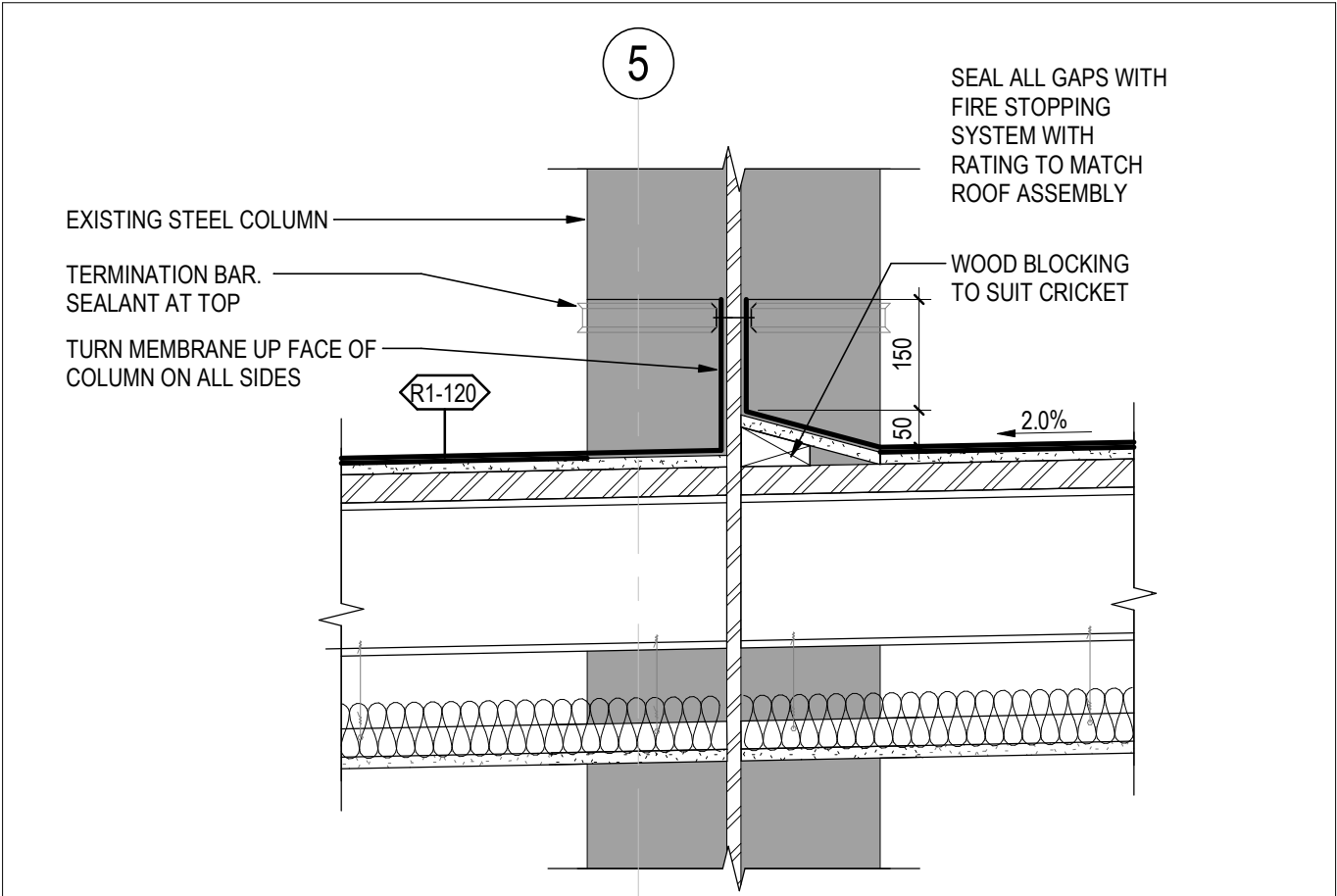
10 RATED WINDOW SECTION  
A401 1 : 10



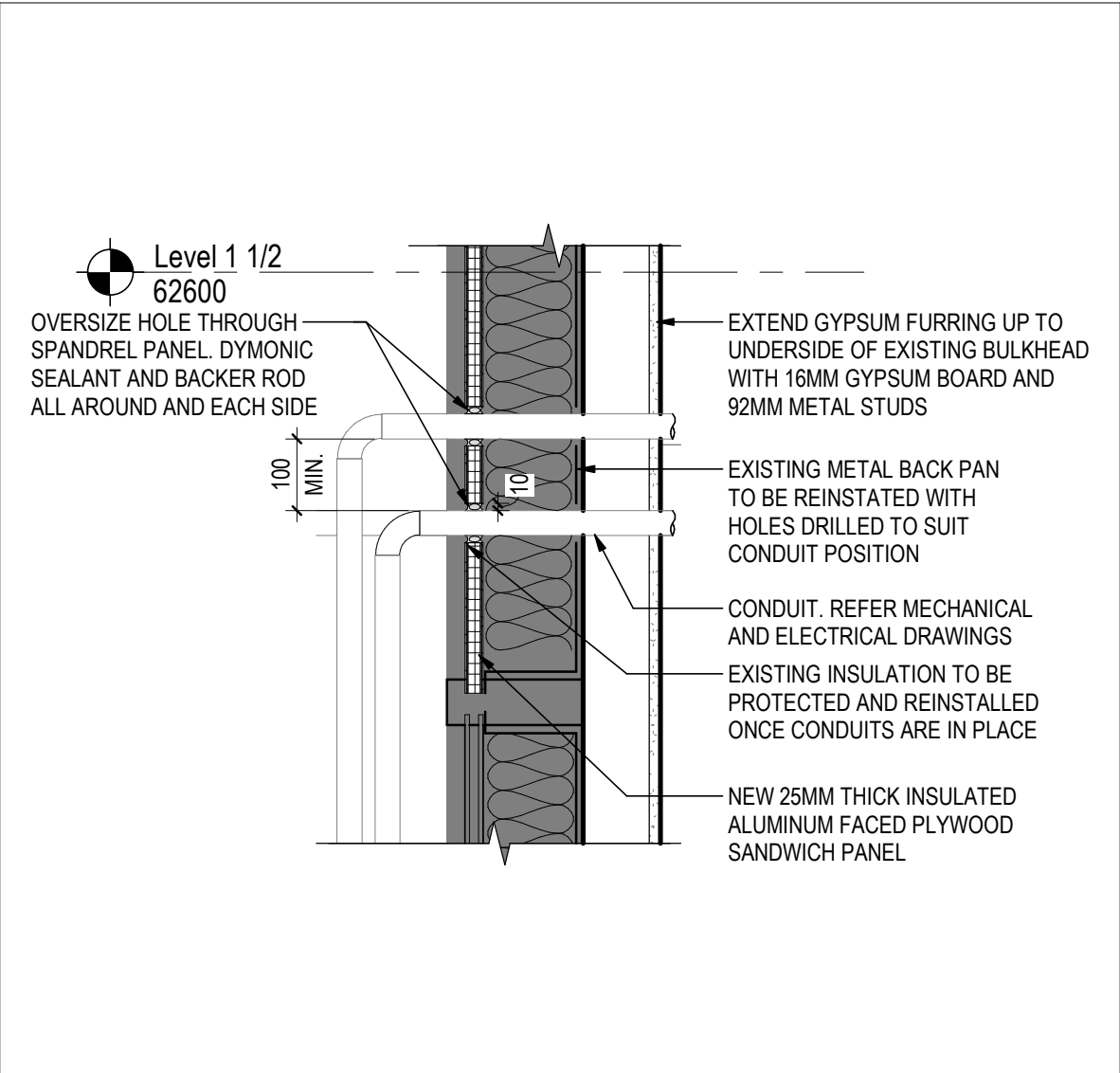
9 ROOF JUNCTION TO EXISTING  
A401 1 : 10



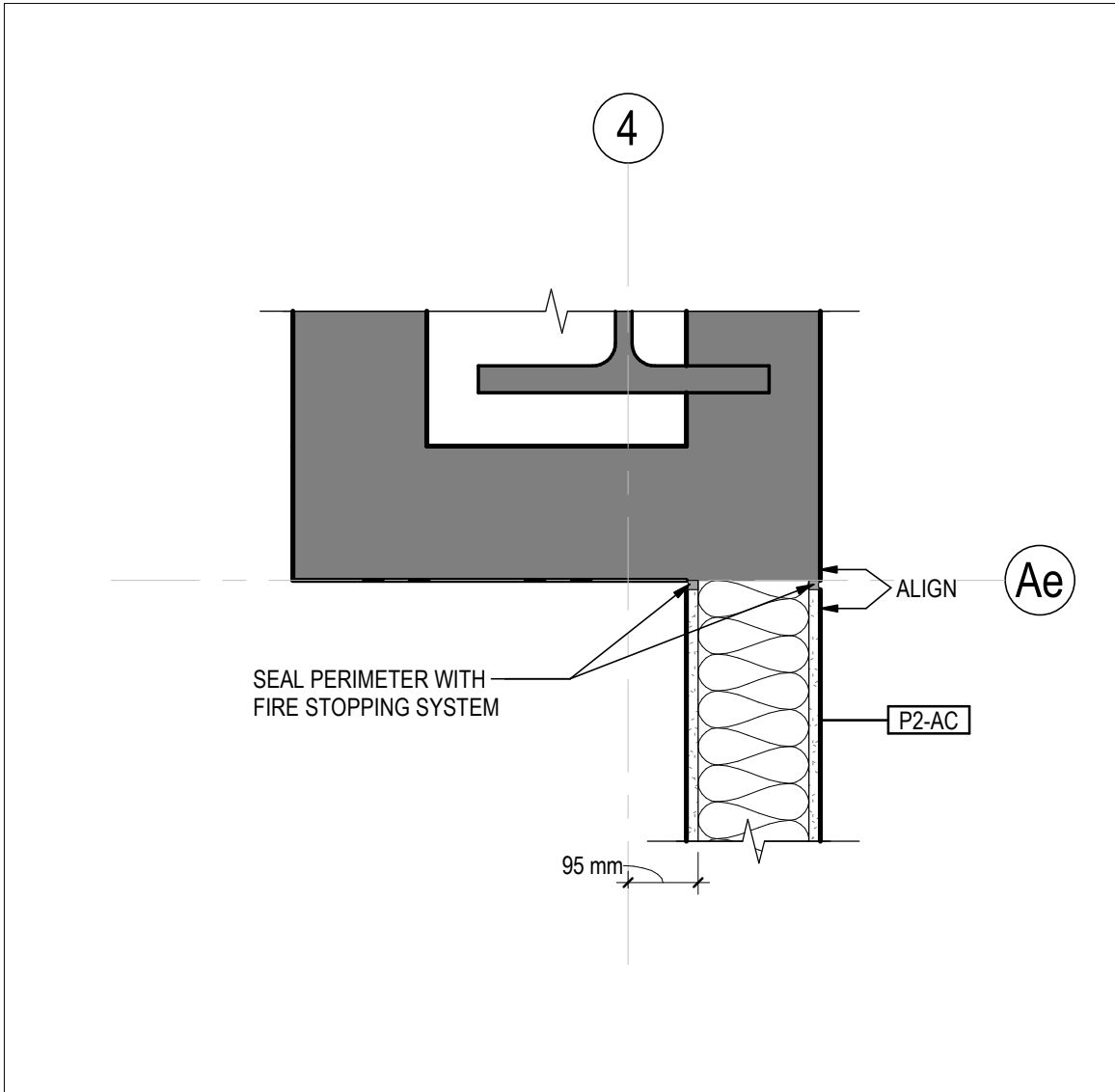
3 SEMI-RECESSED FEC  
A401 1 : 10



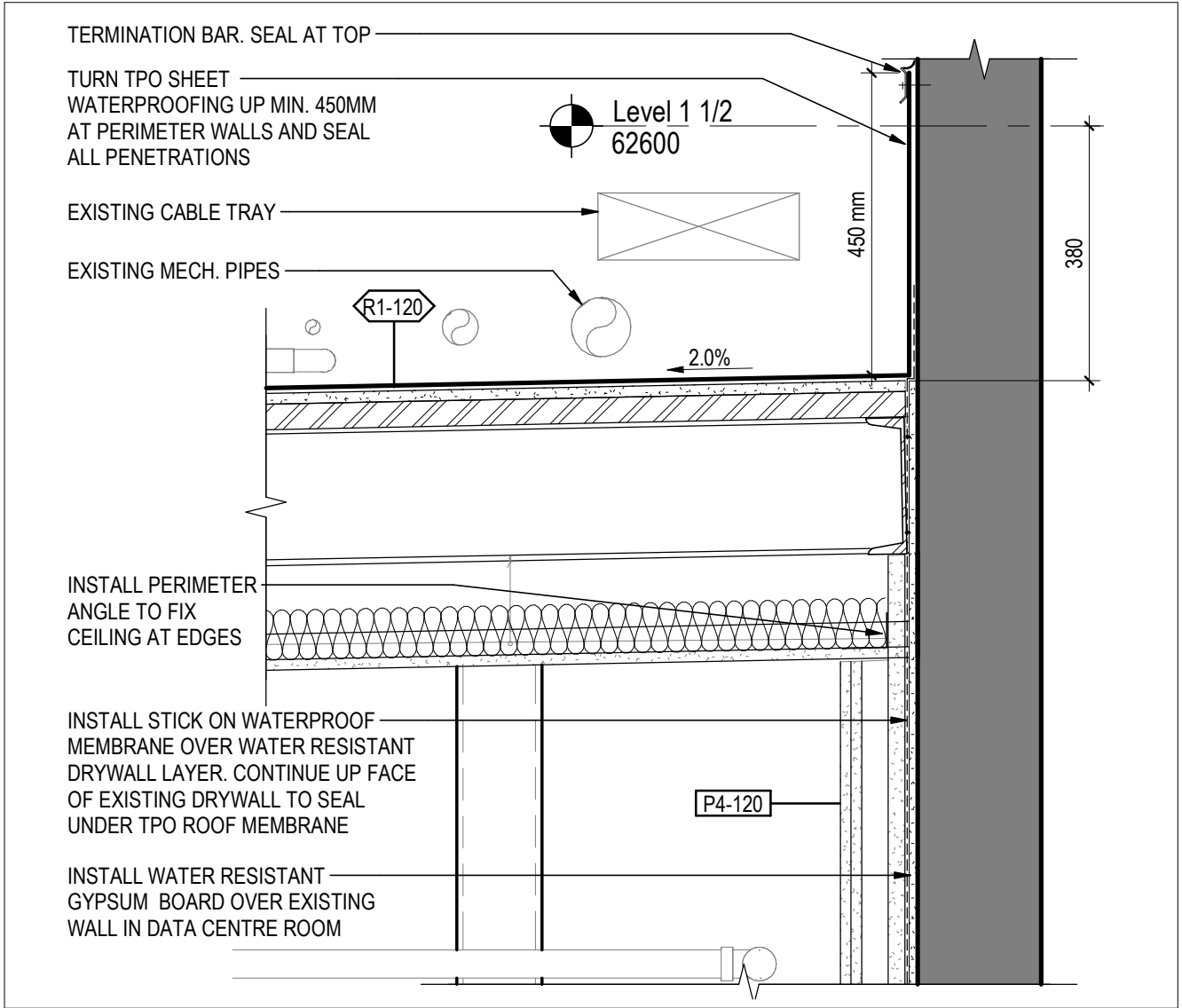
14 SECTION - COLUMN ROOF PENETRATION  
A401 1 : 10



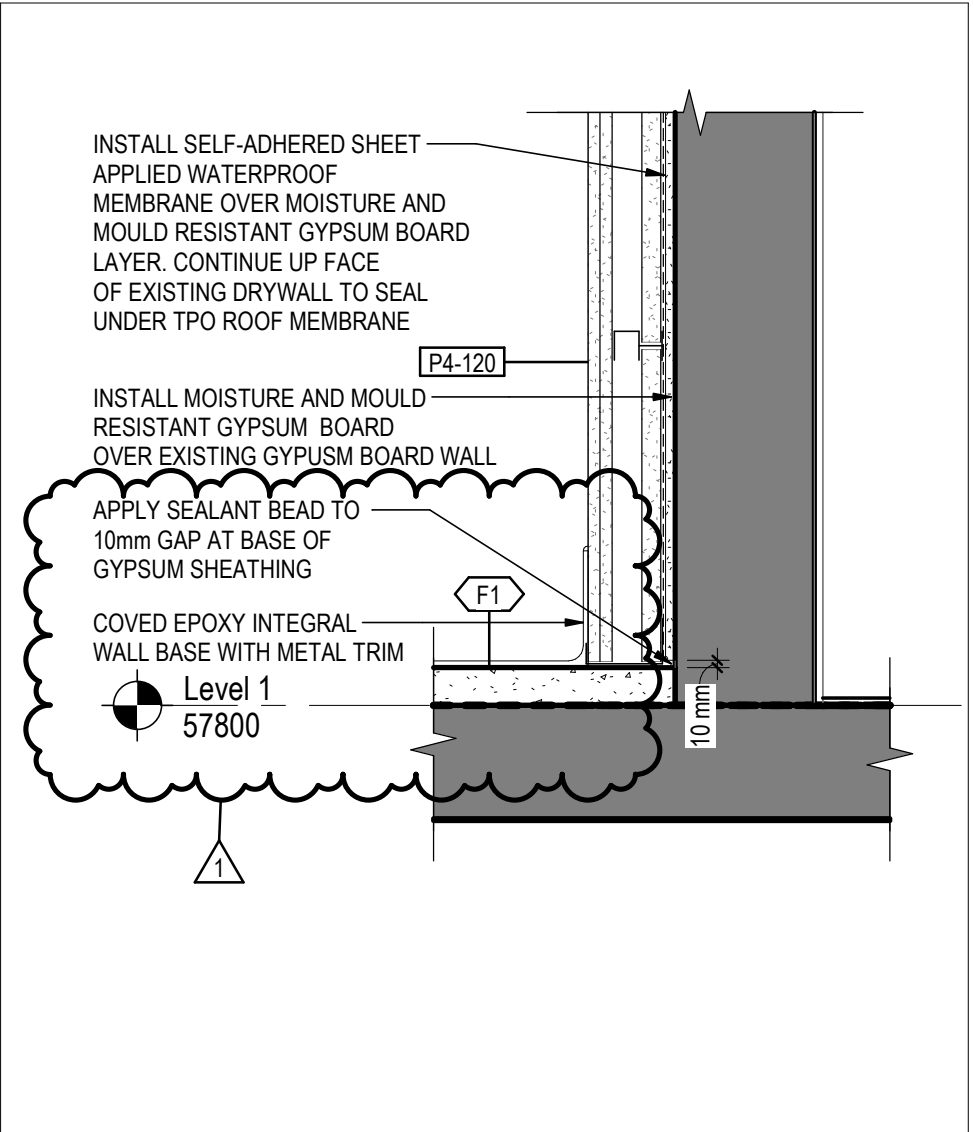
8 EXTERIOR CONDUIT PENETRATION  
A401 1 : 10



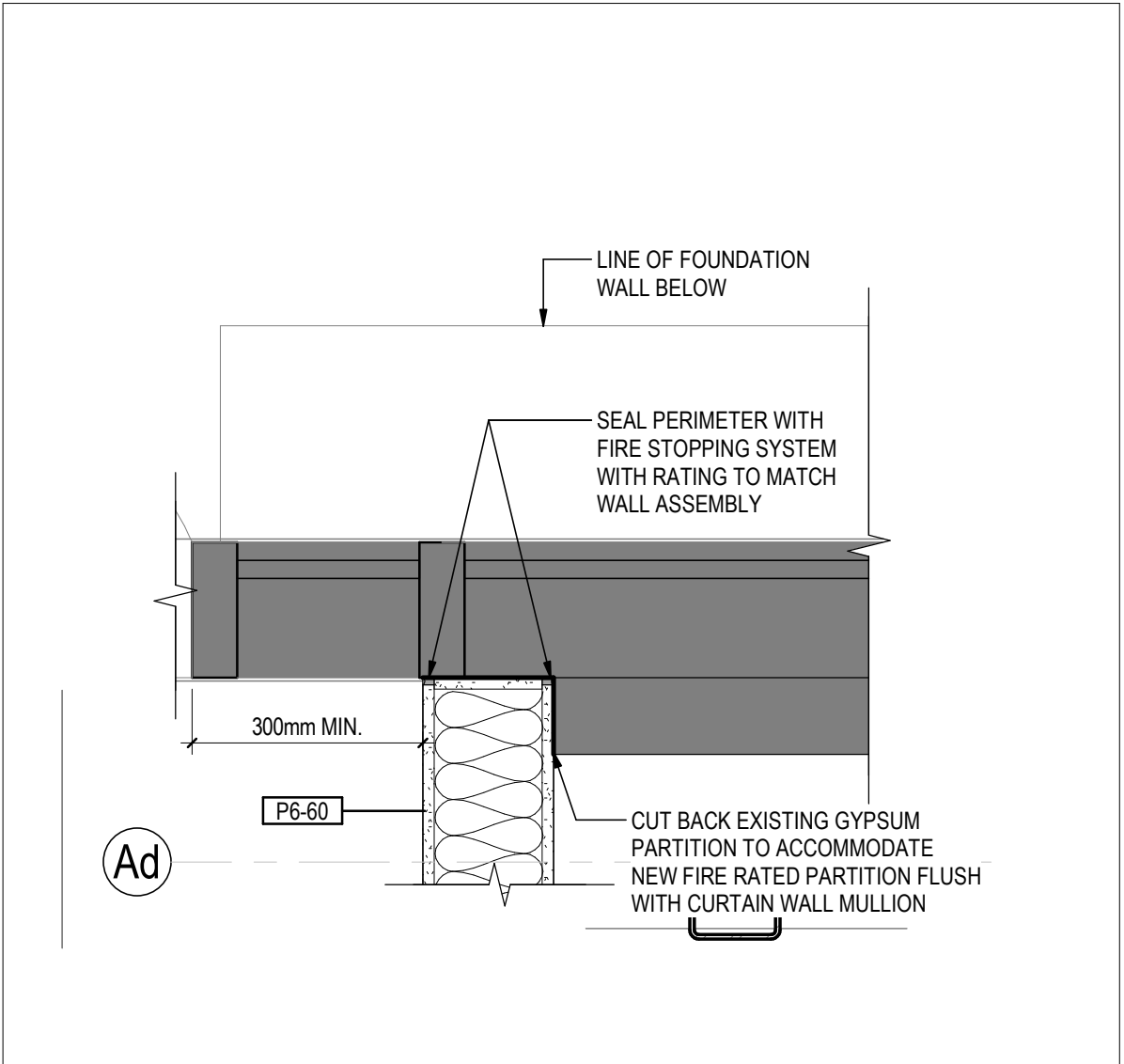
2 PLAN - WALL JUNCTION TO EXISTING  
A401 1 : 10



13 INTERIOR ROOF - JUNCTION WITH EXISTING  
A401 1 : 10



7 SECTION DETAIL - WALL BASE  
A401 1 : 10

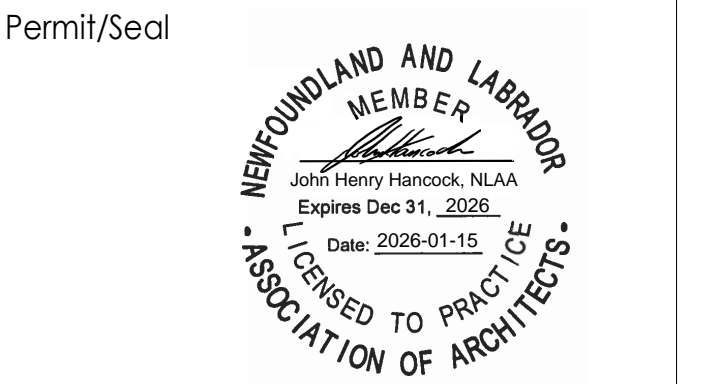


1 PLAN - WALL JUNCTION TO EXTERIOR  
A401 1 : 10

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM NO. 4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

**GENERAL NOTES**

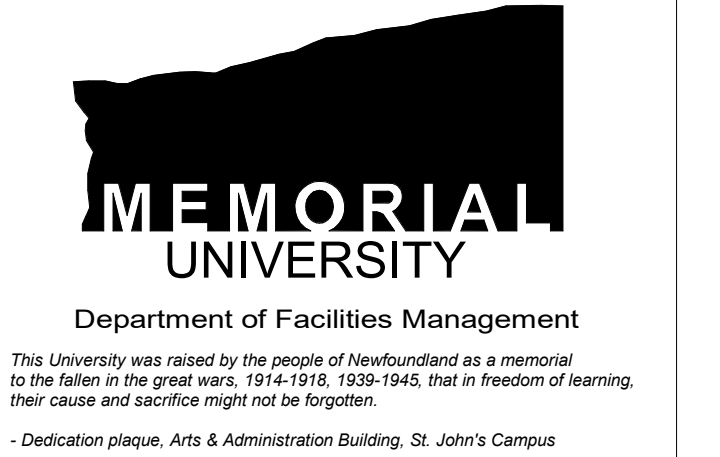
- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.



STANTEC ARCHITECTURE  
141 KELSEY DRIVE  
ST. JOHN'S, NL A1B 0L2  
Tel: (709) 576.1458 • www.stantec.com

Copyright Reserved  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

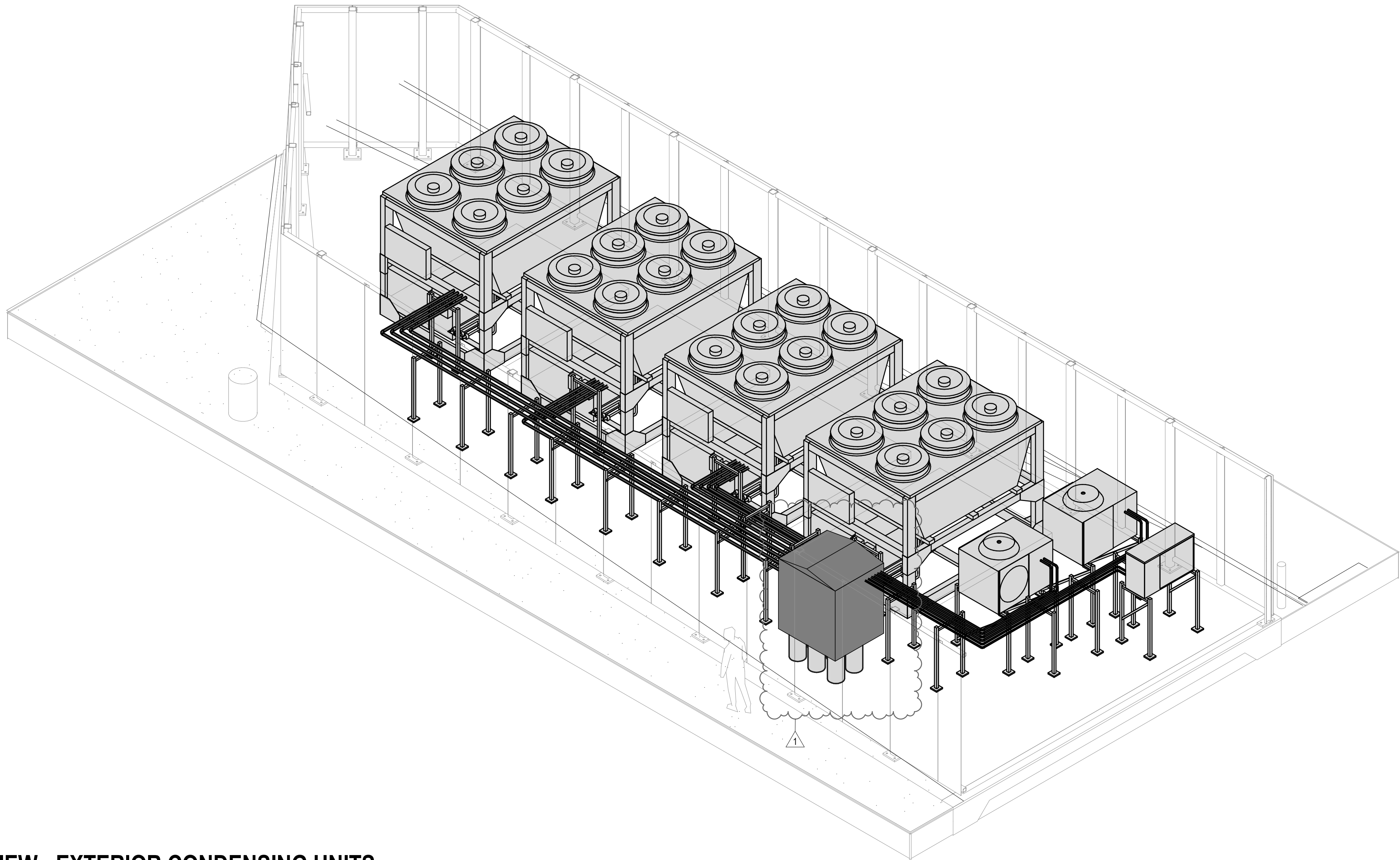
MUN Project #: CSF-004-23

DRAWING TITLE:

INTERIOR DETAILS

DESIGNED: JHH	DRAWN: NH
REVIEWED: -	APPROVED: JHH
SCALE: 1 : 10	DATE: OCTOBER, 2024
STANTEC PROJECT No. 133412008	DRAWING No. <b>A401</b>





GENERAL NOTES

- CONDENSING UNITS TO BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS. ENSURE ALL MAINTENANCE CLEARANCES ARE MAINTAINED.
- ALL REFRIGERANT PIPE SIZES TO BE VERIFIED WITH MANUFACTURER.

DRAWING NOTES

- EXTERIOR CONDENSING UNIT. CONDENSING UNIT TO BE SECURED AND MOUNTED ON STAND C/W VIBRATION ISOLATORS. SECURE STAND TO CONCRETE PAD.
- EXTERIOR REFRIGERANT PIPING TO BE MOUNTED AND SECURED TO SUPPORT STAND 1200mm A.F.G. AT 1200mm O.C. MINIMUM. ALL EXTERIOR PIPING TO BE INSULATED C/W ALUMINUM JACKETING. ALLOW ADEQUATE SPACE FOR ELECTRICAL CONDUIT AND CONTROL CABLING. COORDINATE WITH ELECTRICAL CONTRACTOR. SEE DETAIL ON DRAWING M401.
- ROUTE REFRIGERANT PIPING AND CONTROL WIRING SERVING CONDENSING UNITS DOWN INTO PVC RACEWAYS. SEAL ALL PIPING PENETRATION INTO ENCLOSURE WEATHER-TIGHT. COORDINATE PLACEMENT OF ENCLOSURE WITH ELECTRICAL TO ENSURE MAINTENANCE REQUIREMENTS FOR CONDENSING UNITS ARE MAINTAINED. REFER TO SITE PLAN.

A  
B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A  
B  
C

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM NO.4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal



Stantec Consulting Ltd.  
200-325 25 Street SE  
Calgary, AB T2A 7H8  
Tel: (403) 716-8000 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



Department of Facilities Management

This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.

- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:

**PRIMARY DATA CENTRE  
REPLACEMENT**

CORE SCIENCE FACILITY  
ST. JOHN'S, NL

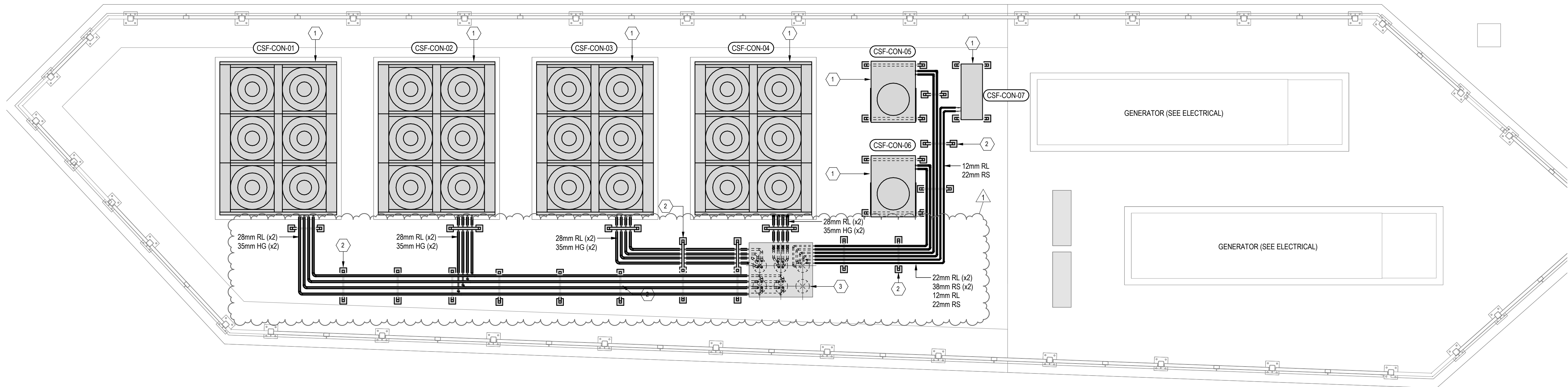
MUN Project #: CSF-004-23

DRAWING TITLE:

**ENLARGED FLOOR PLAN - SITE  
PLAN**

DESIGNED: WP	DRAWN: CH
REVIEWED: WP	APPROVED: WP
SCALE: As indicated	DATE: OCTOBER 2024
STANTEC PROJECT No. 133412008	DRAWING No. <b>M304</b>

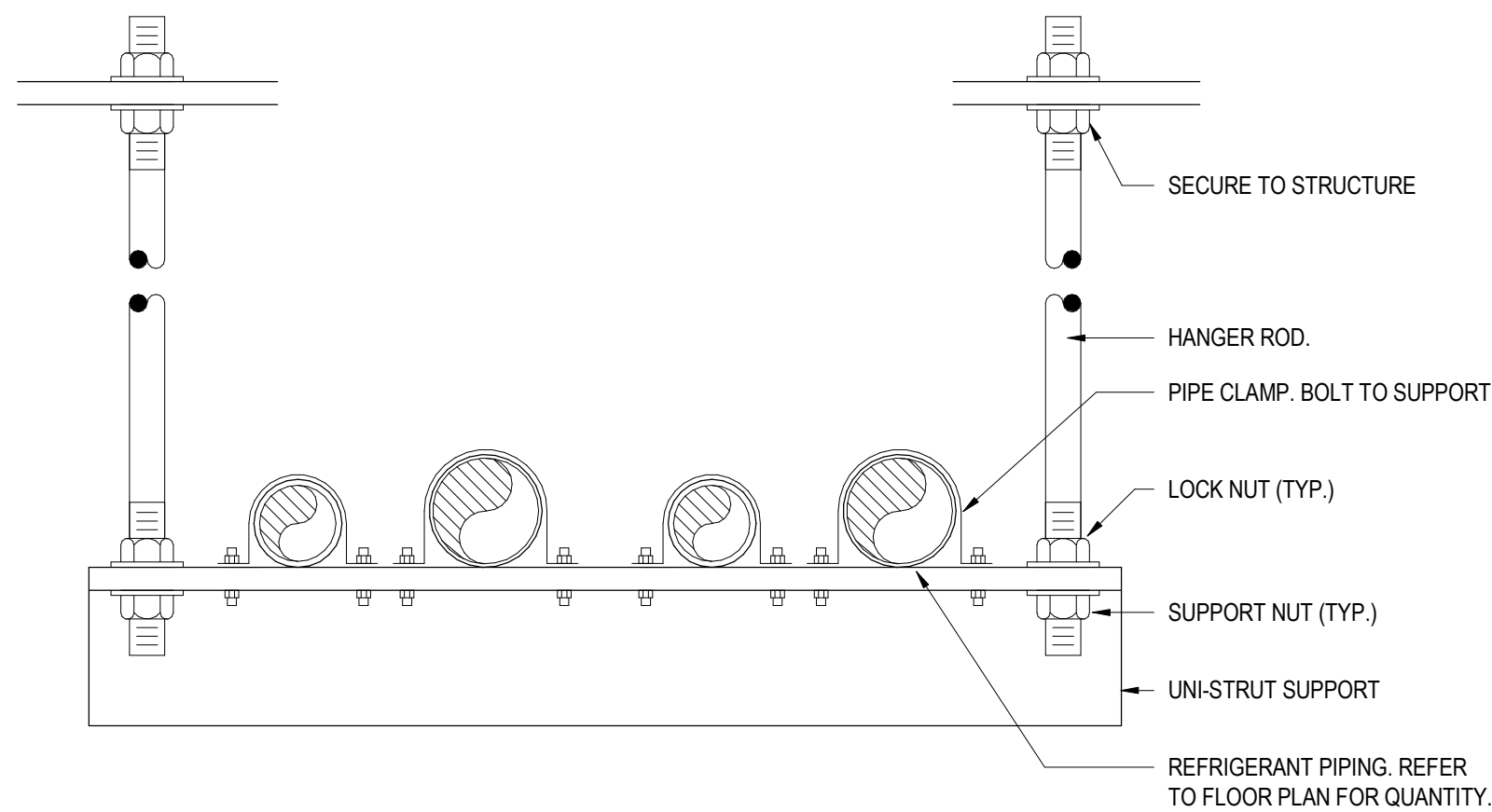
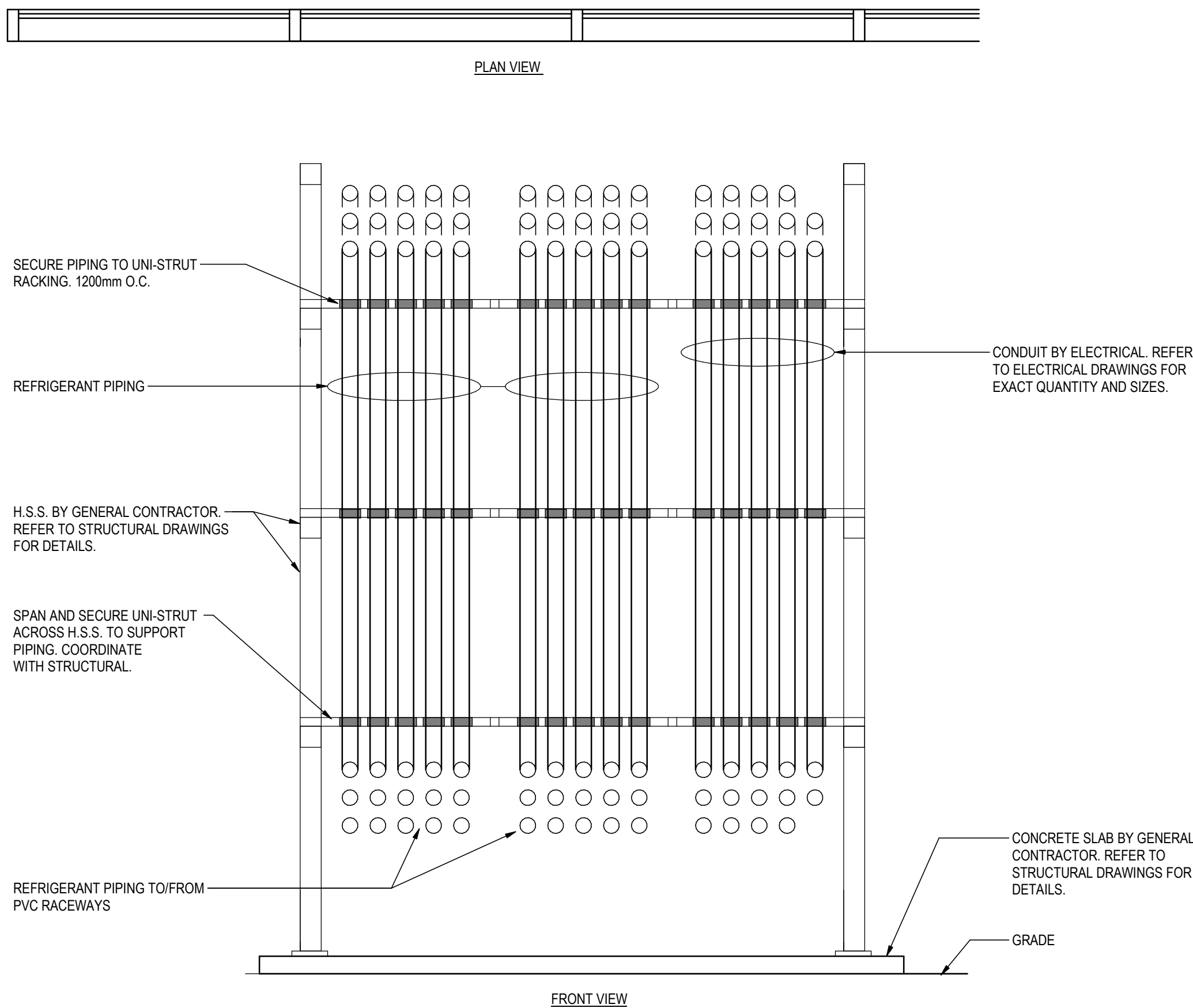
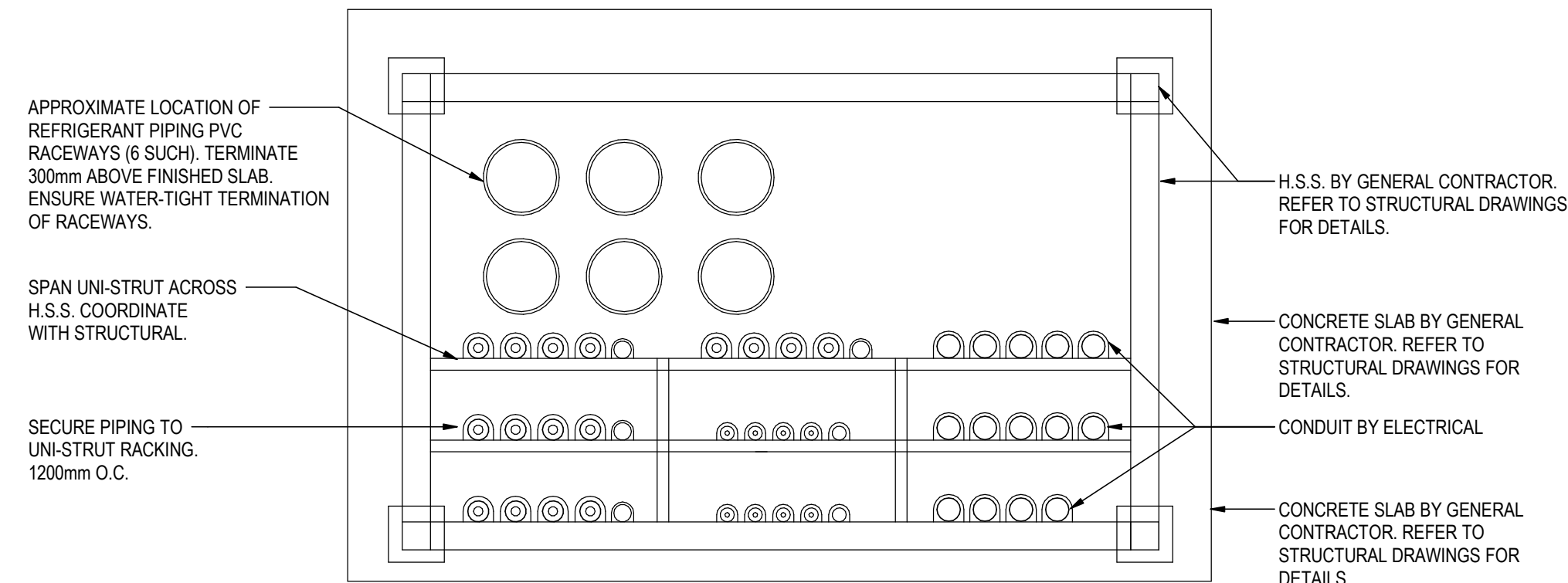
1 3D PERSPECTIVE VIEW - EXTERIOR CONDENSING UNITS



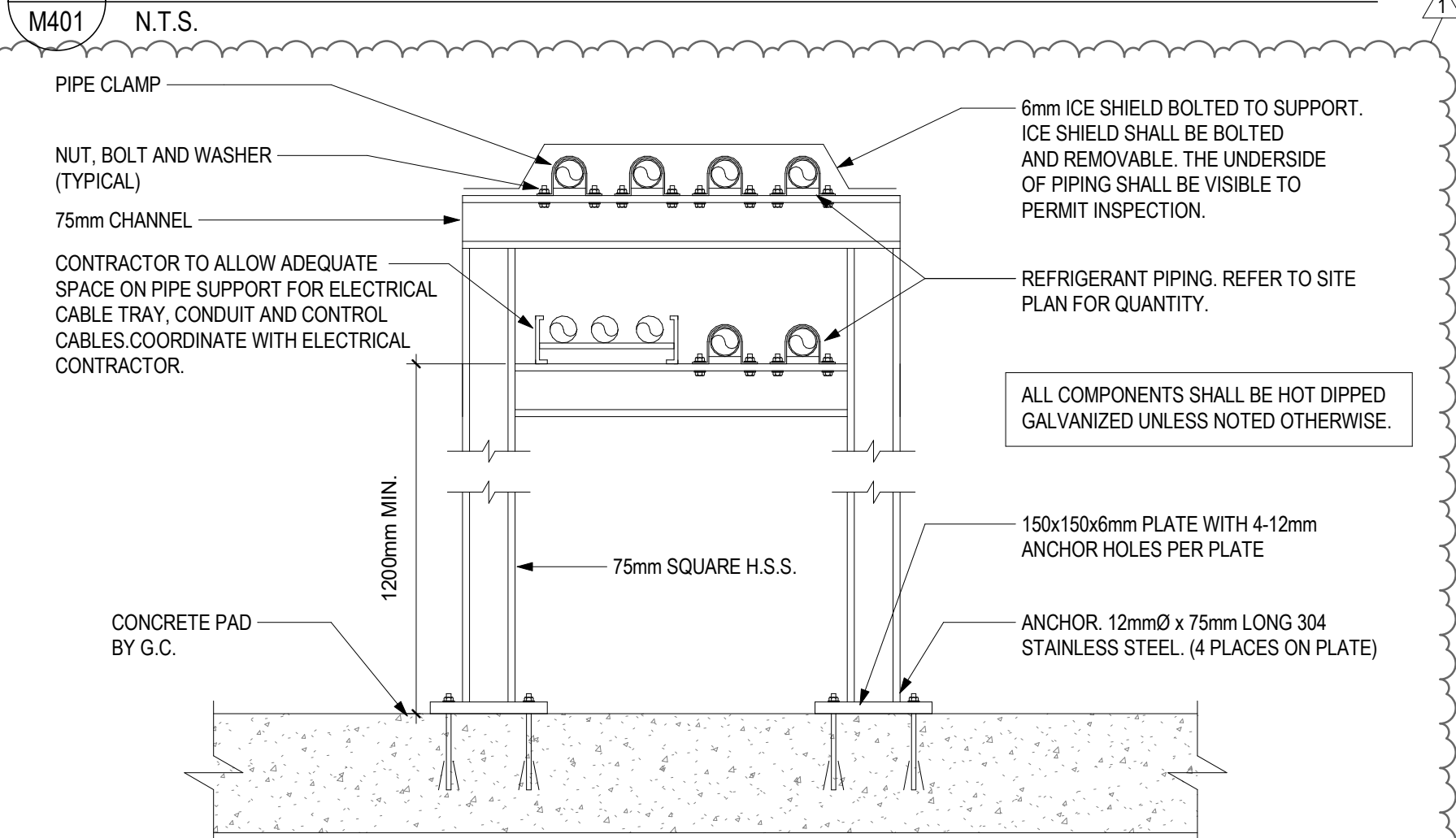
2 ENLARGED PLAN - MECHANICAL SITE LAYOUT

M304 1 : 50

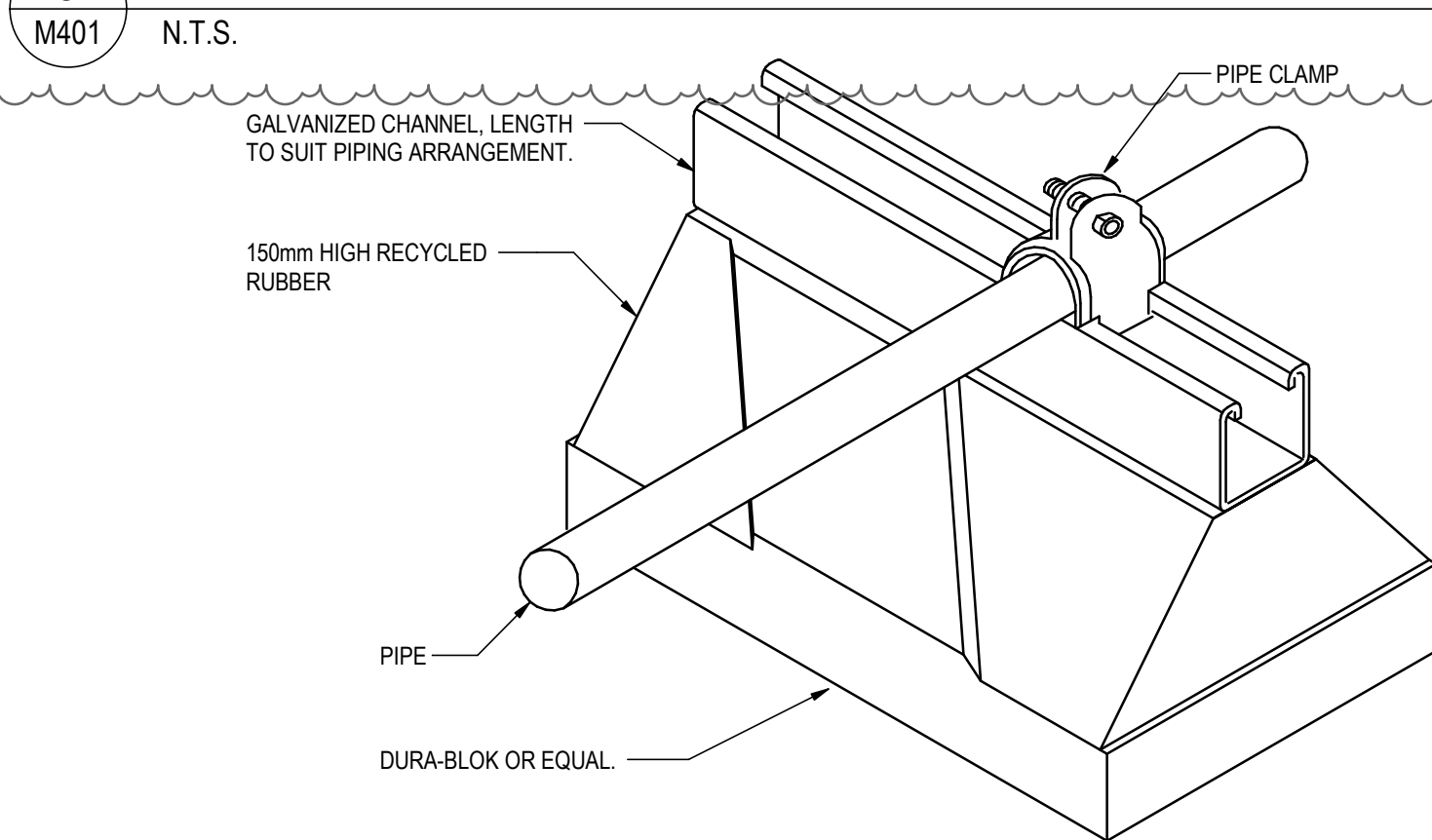




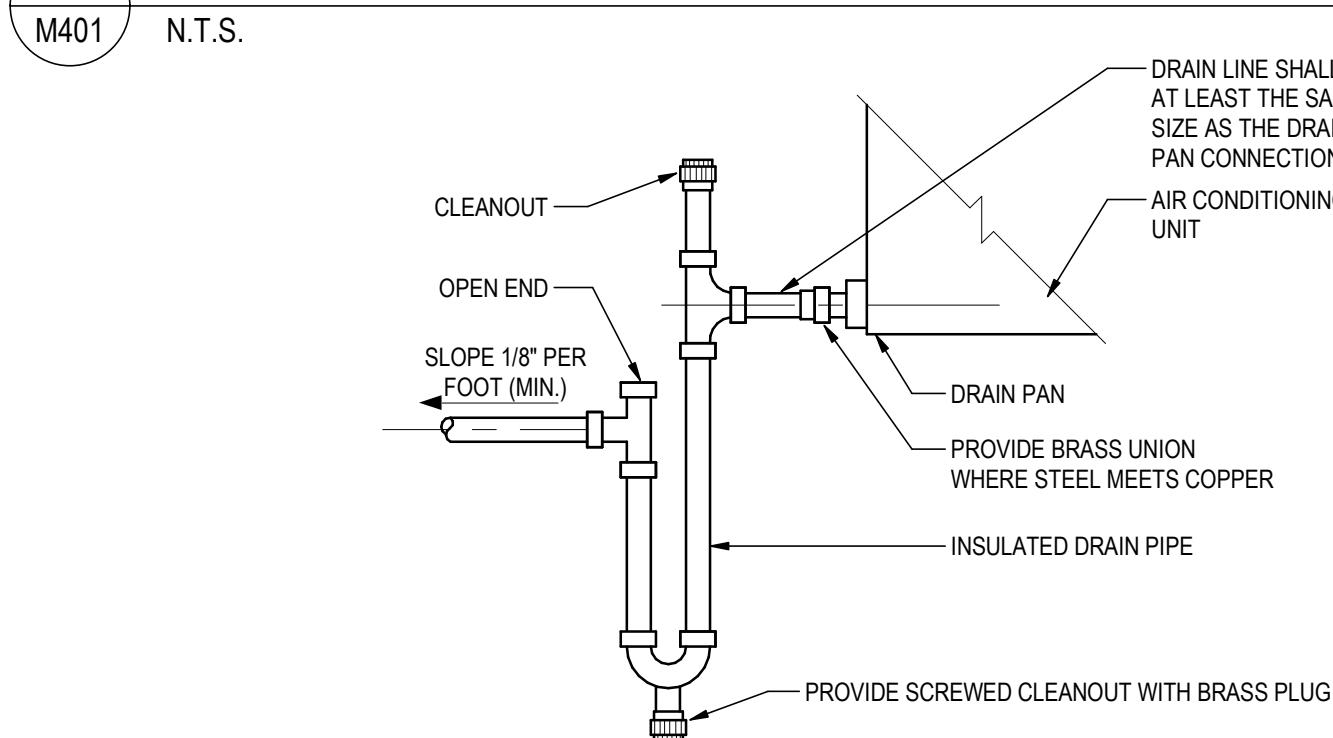
## 4 REFRIGERANT PIPING INTERIOR SUPPORT



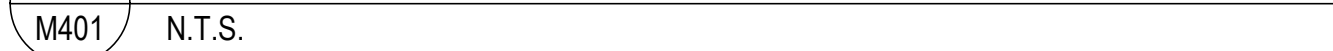
## 5 EXTERIOR PIPE SUPPORTS



## 6 DATA CENTRE ROOF PIPING SUPPORT DETAIL



## 7 AC UNIT CONDENSATE DRAIN DETAIL



A	A - DETAIL	A
B	B - LOCATION/DRAWING No.	B
	C - DRAWING No.	C

No.	REVISION	DATE
1	ISSUED FOR ADDENDUM NO.4	2026.01.15
0	ISSUED FOR TENDER	2025.09.11

### GENERAL NOTES

- DRAWINGS TO BE READ AS A SET.
- DO NOT SCALE FROM DRAWINGS
- THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
- ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

### Permit/Seal

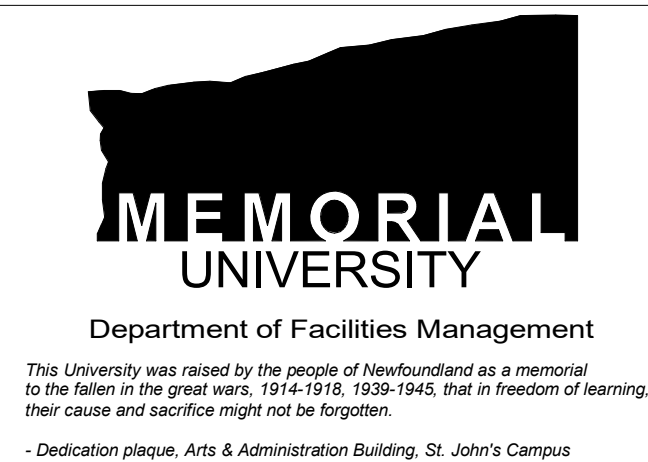


Stantec Consulting Ltd.  
200-325 25 Street SE  
Calgary, AB T2A 7H8  
Tel: (403) 716-8000 • www.stantec.com

### Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



### PROJECT NAME:

### PRIMARY DATA CENTRE REPLACEMENT

CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

### DRAWING TITLE:

### MECHANICAL DETAILS

DESIGNED: WP	DRAWN: CH
REVIEWED: WP	APPROVED: WP
SCALE: As indicated	DATE: OCTOBER 2024
STANTEC PROJECT No. 133412008	DRAWING No. <b>M401</b>



FIRE ALARM

	FIRE SERVICE PHONE STATION OUTLET
	FLAME DETECTOR
	GAS DETECTOR, CARBON MONOXIDE
	HORN AND STROBE LIGHT, CEILING MOUNTED
	HORN AND STROBE LIGHT, WALL MOUNTED
	REMOTE INDICATOR, CEILING MOUNTED
	REMOTE INDICATOR, WALL MOUNTED
	SPEAKER AND STROBE LIGHT, CEILING MOUNTED
	SPEAKER AND STROBE LIGHT, WALL MOUNTED
	STROBE LIGHT, CEILING MOUNTED
	STROBE LIGHT, WALL MOUNTED
	ADDRESSABLE INPUT MODULE
	AREA OF REFUGE COMMUNICATION MASTER UNIT
	AREA OF REFUGE COMMUNICATION REMOTE UNIT
	ADDRESSABLE OUTPUT MODULE
	ELECTRICALLY OPERATED SMOKE OR FIRE/SMOKE DAMPER CONNECTION
	DOOR CLOSER
	DOOR HOLDER
	CHIME, WALL MOUNTED
	HORN, CEILING MOUNTED
	HORN, WALL MOUNTED
	PULL STATION
	FIRE ALARM ANNUNCIATOR
	FIRE ALARM CONTROL PANEL
	FIRE ALARM TRANSMITTER
	FIRE ALARM TERMINAL CABINET
	GRAPHIC ANNUNCIATOR PANEL
	HEAT DETECTOR
	FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT PANEL
	PRESSURE DETECTOR/SWITCH
	INTERFACE RELAY
	SMOKE DETECTOR, CEILING MOUNTED
	SMOKE DETECTOR, WALL MOUNTED
	SMOKE DETECTOR, SINGLE STATION
	SMOKE/HEAT DETECTOR
	SMOKE/HEAT/CARBON MONOXIDE DETECTOR
	SPEAKER, CEILING MOUNTED
	SPEAKER, WALL MOUNTED
	VALVE SUPERVISORY TAMPER SWITCH
	FLOW DETECTOR/SWITCH

HEAT/SMOKE DETECTOR TYPES

	FIXED TEMPERATURE, # INDICATES °C OR °F
	RATE OF RISE
	COMBINED RATE OF RISE/FIXED TEMPERATURE
	AIR SAMPLING
	BEAM DETECTOR RECEIVER
	BEAM DETECTOR TRANSMITTER
	ELEVATOR RECALL
	IONIZATION
	IN DUCT
	PHOTOELECTRIC

ELECTRICAL EQUIPMENT

	208V OR 240V POWER PANELBOARD
	480V OR 600V POWER PANELBOARD
	EQUIPMENT CABINET OR PANEL
	EQUIPMENT CONNECTION, FILL INDICATES EMERGENCY CIRCUIT
	GROUND BAR
	MOTOR CONNECTION, 1Ø
	MOTOR CONNECTION, 3Ø
	AUTOMATIC TRANSFER SWITCH
	TRANSFORMER, NOT TO SCALE
	TRANSFORMER, DRAWN TO SCALE

RACEWAYS

	RACEWAY CONCEALED IN CEILING OR WALL. EXPOSED RACEWAY IS ALLOWED ONLY WHERE NOTED.
	RACEWAY BELOW SLAB OR UNDERGROUND
	RACEWAY UP
	RACEWAY DOWN
	RACEWAY CONTINUATION
	RACEWAY STUB-OUT WITH BUSHING
	SURFACE RACEWAY (HORIZONTAL/VERTICAL)
	JUNCTION BOX, CEILING OR ABOVE CEILING MOUNTED
	JUNCTION BOX, WALL MOUNTED
	JUNCTION BOX, IN-GROUND
	PULL BOX

CONTROLS

	NON-FUSED SAFETY SWITCH
	FUSED SAFETY SWITCH, FUSE RATING INDICATED
	COMBINATION MOTOR STARTER AND FUSED SAFETY SWITCH, FUSE RATING INDICATED
	MOTOR STARTER
	MANUAL MOTOR STARTER
	AUTOMATIC DOOR PUSHPLATE
	DEAD FRONT GFCI
	EMERGENCY SHUTDOWN
	ENCLOSED CIRCUIT BREAKER
	ENCLOSED CONTACTOR
	PUSH BUTTON CONTROL STATION
	TOGGLE SWITCH, MOTOR RATED
	TOUCHLESS AUTOMATIC DOOR OPENER
	DIRECT DIGITAL CONTROL PANEL
	RELAY
	THERMOSTAT
	TIME CLOCK
	VARIABLE FREQUENCY DRIVE

LUMINAIRES

LUMINAIRE IDENTIFICATION, SEE LUMINAIRES SCHEDULE	
LOWER-CASE LETTER(S) NEAR LUMINAIRE DENOTE SWITCH LEG(S)	
	RECESSED RECTANGULAR LUMINAIRE, DRAWN TO SCALE
	SURFACE MOUNTED RECTANGULAR LUMINAIRE, DRAWN TO SCALE
	RECESSED VOLUMETRIC LUMINAIRE, DRAWN TO SCALE
	STRIP LUMINAIRE, LENGTH TO SCALE
	WALL MOUNTED RECTANGULAR LUMINAIRE, LENGTH TO SCALE (NUMBER OF MOUNTING POINTS WILL VARY WITH THE LUMINAIRE LENGTH AND ARE NOT INDICATED.)
	RECESSED DOWNLIGHT LUMINAIRE
	LINEAR PENDANT MOUNTED LUMINAIRE, LENGTH TO SCALE (NUMBER OF MOUNTING POINTS WILL VARY WITH THE LUMINAIRE LENGTH AND ARE NOT INDICATED.)
	WALL MOUNTED LUMINAIRE
	EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
	MULTI-SERVICE EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
	WALL MOUNTED EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
	EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
	WALL MOUNTED EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
	UNDERCABINET TASK LUMINAIRE
	WALL MOUNTED STROBE LIGHT

LIGHTING CONTROLS

	SINGLE POLE SWITCH
	INDICATES WIRELESS CONTROL
	INDICATES BATTERY POWER
	LOWER-CASE LETTER(S) NEAR SWITCH DENOTE SWITCH LEG(S)
	DOUBLE POLE SWITCH
	THREE-WAY SWITCH
	FOUR-WAY SWITCH
	LOW VOLTAGE DIMMER SWITCH EQUAL TO WATTSTOPPER LMDM-101
	LOW VOLTAGE TIME SWITCH EQUAL TO WATTSTOPPER TS-400-24
	LOW VOLTAGE SCENE SWITCH EQUAL TO WATTSTOPPER LMSW-105
	OCCUPANCY SENSOR SWITCH
	SWITCH WITH PILOT LIGHT
	PHOTOCELL SWITCH
	OCCUPANCY SENSOR SWITCH, CEILING MOUNTED. EQUAL TO WATTSTOPPER LMDC-100
	VACANCY SENSOR SWITCH, CEILING MOUNTED. EQUAL TO WATTSTOPPER LMDC-100
	PARTITION SENSOR CONTROL
	PHOTO SENSOR CONTROL
	PHOTO SENSOR CONTROL, CEILING MOUNTED
	RELAY
	REMOTE TRANSFORMER FOR LIGHTING 347-120V.

RECEPTACLES

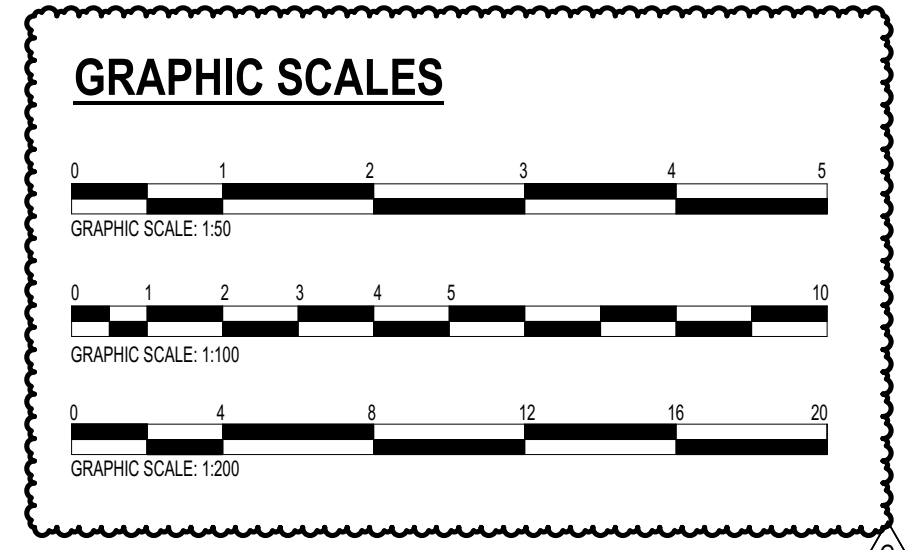
SINGLE RECEPTACLE, 120V	
SINGLE RECEPTACLE, 120V, CEILING MOUNTED	
DUPLEX RECEPTACLE, 120V	
DUPLEX RECEPTACLE, 120V, CEILING MOUNTED	
DOUBLE DUPLEX RECEPTACLE, 120V	
DOUBLE DUPLEX RECEPTACLE, 120V, CEILING MOUNTED	
SPLIT WIRED RECEPTACLE, 120V, TOP CONTROLLED, BOTTOM CONSTANTLY ENERGIZED	
RECEPTACLE, NEMA #	
RECEPTACLE, NEMA #, CEILING MOUNTED	
COMBINATION RECEPTACLE, NEMA # AND 120V	
FURNITURE SYSTEMS RECEPTACLE, 120V	
INDICATES FULLY CONTROLLED	
INDICATES 15A	
INDICATES TWIST LOCK	
INDICATES MOUNTED ABOVE COUNTER BACKSPLASH	
MULTI-SERVICE ASSEMBLY (RECEPTACLES AS INDICATED)	
MULTI-SERVICE CEILING BOX (RECEPTACLES AS INDICATED)	
MULTI-SERVICE FLOOR BOX (RECEPTACLES AS INDICATED)	
MULTI-SERVICE FURNITURE BOX (RECEPTACLES AS INDICATED)	
MULTI-SERVICE POKE THRU (RECEPTACLES AS INDICATED)	
MULTI-SERVICE POWER POLE (RECEPTACLES AS INDICATED)	
MULTI-SERVICE WALL BOX (RECEPTACLES AS INDICATED)	
PLUG STRIP (HORIZONTAL/VERTICAL)	
CLOCK RECEPTACLE, 120V	
CORD DROP, 120V	
CEILING CORD DROP, 120V	
ARC FAULT CIRCUIT INTERRUPTER	
ARC FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT	
DEDICATED CIRCUIT	
GROUND FAULT CIRCUIT INTERRUPTER	
GROUND FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT	
ISOLATED GROUND	
SURGE PROTECTOR	
TAMPER RESISTANT	
INTEGRAL USB PORT(S)	
WEATHER RESISTANT COVER	

WORK DEFINITION

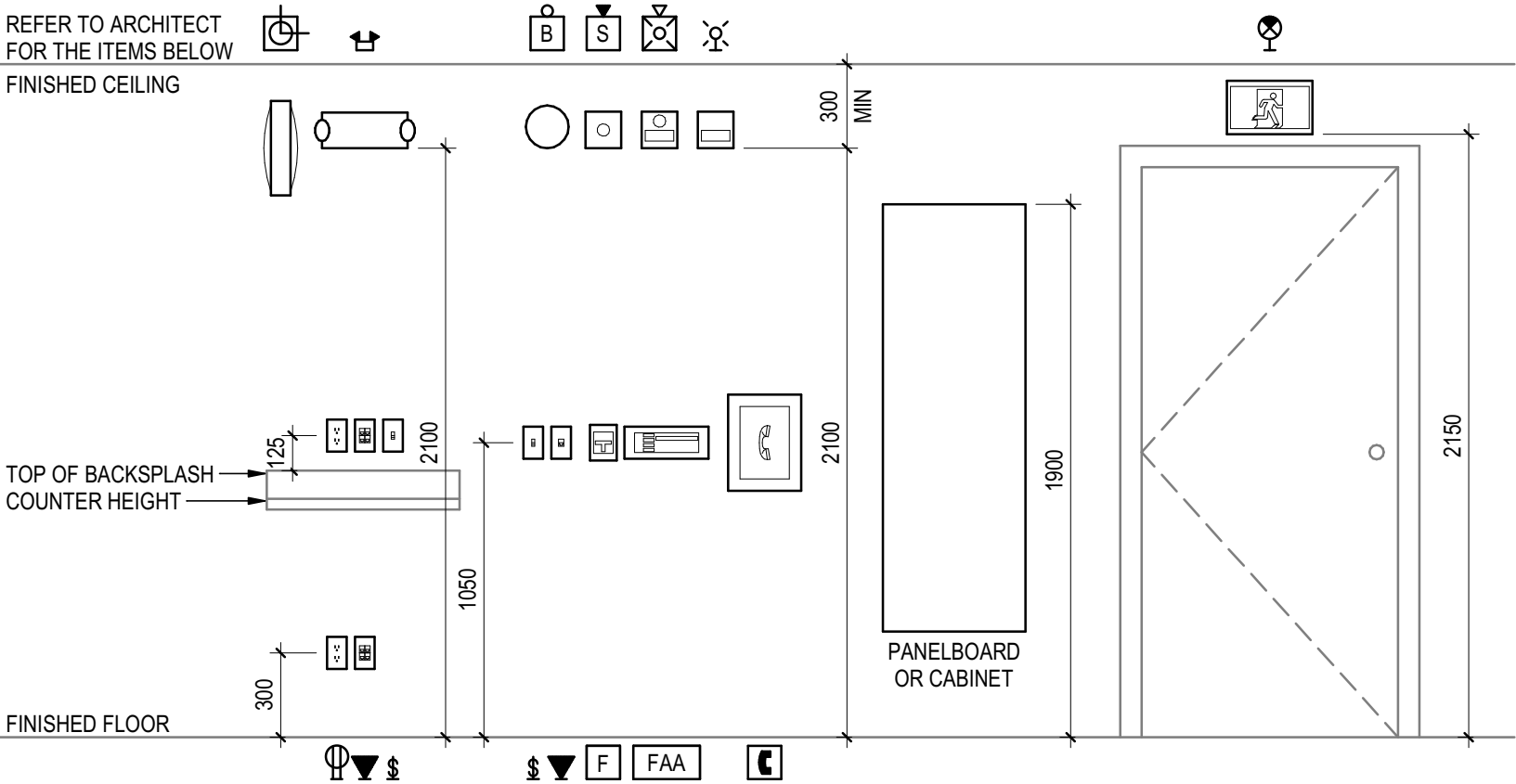
	NEW WORK
	EXISTING
	REMOVE EXISTING
	REMOVE EXISTING ELECTRICAL EQUIPMENT
	FUTURE
	TEMPORARY, AS NOTED
	KEY NOTE
	EQUIPMENT IDENTIFICATION
	INDICATES EXISTING TO REMAIN
	INDICATES EXISTING TO BE REMOVED
	INDICATES EXISTING TO BE RELOCATED
	INDICATES NEW LOCATION

PROJECT NOTES

- THE ELECTRICAL CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM AUTHORITIES HAVING JURISDICTION AND PAY ALL ASSOCIATED FEES.
- LOCATE JUNCTION AND PULL BOXES AS REQUIRED TO ALLOW ACCESS AFTER EQUIPMENT AND APPURTENANCES ARE INSTALLED. COORDINATE EXACT LOCATIONS WITH THE OTHER TRADES. COORDINATE LOCATIONS AND ELEVATIONS OF ELECTRICAL DEVICES WITH DRAWINGS AND OTHER TRADES PRIOR TO INSTALLATION.
- PROTECT PERMANENT BUILDING FINISHES FROM DAMAGE DURING CONSTRUCTION PERIOD. PROVIDE PLYWOOD OR SIMILAR MATERIAL UNDER EQUIPMENT OR MATERIALS STORED ON FLOORS, AND IN AREAS WHERE CONSTRUCTION MAY DAMAGE FINISHES. SURFACES OR FINISHES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE COST OF THE CONTRACTOR AT FAULT.
- CONTRACTORS SHALL COORDINATE LOCATIONS OF FIXTURES AND ELECTRICAL DEVICES INSTALLED IN OR ON THE CEILING WITH ARCHITECTURAL REFLECTED CEILING PLAN. CEILING MOUNTED ELECTRICAL DEVICES SHALL BE MOUNTED IN THE CENTER OF THE CEILING TILES, UNLESS OTHERWISE NOTED.
- WHERE DIRECTED TO USE OR RETAIN EXISTING CIRCUITS, AND THE CIRCUIT NUMBERS DIFFER FROM THE DRAWING, UPDATE DIRECTORIES AND RECORD DRAWINGS.
- PROPERLY SUPPORT PER CODE LOW VOLTAGE CABLING NOT IN CONDUIT. IN AREAS SUCH AS CORRIDORS DESIGNATED FOR NEW CEILINGS AND FINISHES, SUPPORT EXISTING ELECTRICAL DEVICES AND EQUIPMENT IN AND ABOVE THE CEILING, INCLUDING CONDUIT AND CABLING. PROVIDE PROPER PERMANENT SUPPORT AS NEEDED TO COMPLY WITH CODE AND TAKE WEIGHT OFF CEILING SUPPORTS. REMOVE AND REINSTALL ELECTRICAL DEVICES AND EQUIPMENT AS NEEDED FOR PAINTING, WALL COVERINGS, CEILINGS, AND FINISH WORK. REFER TO ARCHITECTURAL DRAWINGS. LOW VOLTAGE CABLING LOCATED IN EXPOSED STRUCTURE (CEILING) AREAS SHALL BE INSTALLED IN CONDUIT (OR CABLE TRAY, IF APPLICABLE) AND ROUTED TIGHT TO DECK. INSTALLATIONS NOT IN COMPLIANCE WITH THIS REQUIREMENT SHALL BE REMOVED AND REINSTALLED AT CONTRACTOR'S EXPENSE.
- WHERE PROJECT PHASING IS INDICATED IN ANY PART OF THE WORKING DOCUMENT PACKAGE, ELECTRICAL CONTRACTOR IS TO PLAN WORK SO AS TO FACILITATE SUCH PHASING.
- FOR BRANCH CIRCUITS OVER 75' (25 METERS) IN LENGTH (TOTAL ONE WAY) FROM THE PANEL, THE ELECTRICAL CONTRACTOR SHALL CALCULATE THE VOLTAGE DROP AND PROVIDE AN APPROPRIATE CONDUCTOR SIZE TO ACHIEVE NO MORE THAN 3% MAXIMUM ALLOWABLE VOLTAGE DROP.
- DO NOT SCALE THE DRAWINGS, BECAUSE OF THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS OR OTHER SIMILAR ITEMS WHICH MAY BE REQUIRED TO MAKE A COMPLETE OPERATING SYSTEM. CAREFULLY INVESTIGATE CONDITIONS AFFECTING WORK AND INSTALL WORK IN SUCH MANNER THAT INTERFERENCES BETWEEN PIPES, CONDUITS, DUCTS, EQUIPMENT, ARCHITECTURAL AND STRUCTURAL FEATURES SHALL BE AVOIDED.



STANDARD MOUNTING HEIGHTS



PROJECT DEMOLITION NOTES

- ANY EXISTING WIRING SERVING DEVICES TO REMAIN IN SERVICE, AND WHICH IS INTERRUPTED BY WORK PERFORMED UNDER THIS CONTRACT, SHALL BE REROUTED TO MAINTAIN CIRCUIT CONTINUITY. CONTRACTOR SHALL ASSUME THE RISK OF MAINTAINING EXISTING SYSTEMS EXCEPT RELOCATION OF WIRING OF #2 AWG AND ABOVE SHALL BE CONSIDERED AN ADDITIONAL COST IF NOT SHOWN TO BE RELOCATED. IF SUCH WIRING IS FOUND THE CONTRACTOR SHALL NOTIFY THE OWNER OF WIRING LOCATION, REASON IT MUST BE REMOVED AND COST OF RELOCATION AND RECEIVE THE OWNER'S APPROVAL BEFORE PROCEEDING WITH THE WORK.
- THE EXISTING BUILDING MUST BE KEPT IN OPERATION AT ALL TIMES. MAINTAIN ELECTRICAL SERVICES AND SYSTEMS AT ALL TIMES TO AREAS BEYOND THE CONSTRUCTION AREA AND MAINTAIN CONTINUITY OF FIRE ALARM, LIFE SAFETY AND SECURITY SYSTEMS TO ALL OCCUPIED AREAS OF THE BUILDING THROUGHOUT THE CONSTRUCTION PERIOD. PROVIDE TEMPORARY WIRING AND BRANCH CIRCUITING AS NECESSARY TO MAINTAIN OPERATION OF EXISTING CIRCUITS AND SYSTEMS EXTENDING BEYOND REMODEL AREA. ASSUME FULL RESPONSIBILITY FOR ANY DISRUPTION TO EXISTING SERVICES. RECONNECT ANY SERVICES WHICH ARE TO REMAIN, AND WHICH HAVE BEEN DISCONNECTED DURING DEMOLITION OR CONSTRUCTION. ARRANGE WORK IN SUCH A MANNER THAT INTERRUPTIONS IN SERVICES OCCUR ONLY AT PRE-SCHEDULED TIMES. CARRY OUT THE WORK WITH A MINIMUM OF NOISE, DUST AND DISTURBANCE.
- PERMANENTLY REMOVE ABANDONED ELECTRICAL EQUIPMENT, LIGHTING FIXTURES, ELECTRICAL DEVICES, POWER AND SIGNALLING WIRING DEVICES AND ASSOCIATED WIRE, RACEWAYS, AND/OR JUNCTION BOXES. THE REMOVAL OR RELOCATION OF EXISTING ELECTRICAL EQUIPMENT PRESENTLY CONCEALED IN EXISTING CONSTRUCTION SHALL BE COORDINATED WITH THE OWNER PRIOR TO REMOVAL OR RELOCATION. RACEWAYS AND CONDUCTORS SHALL BE REMOVED BACK TO THE SOURCE OR NEAREST REMAINING JUNCTION BOX OR DEVICE AS FAR AS PRACTICAL, OR WHERE COMPLETE REMOVAL NOT PRACTICAL, RENDERED PERMANENTLY SAFE.
- ANY EXISTING SYSTEM OUTAGES SHALL BE OF MINIMUM DURATION AND AT A TIME ACCEPTABLE TO THE OWNER. ARRANGED A MINIMUM OF 10 WORKING DAYS IN ADVANCE. LONGER NOTICES AND/OR ADDITIONAL RESTRICTIONS PERTAINING TO OUTAGES MAY BE REQUIRED IN SOME INSTANCES, AS PER SPECIFICATIONS. VERIFY PROTOCOL WITH ALL PROJECT STAKEHOLDERS INCLUDING OWNER, TENANT, CONSTRUCTION MANAGER AND/OR USER GROUP(S) AS APPLICABLE.
- ELECTRICAL EQUIPMENT, FIXTURES, AND/OR DEVICES SCHEDULED TO REMAIN OR TO BE RELOCATED THAT ARE DAMAGED DURING DEMOLITION SHALL BE REPLACED WITH SIMILAR TYPE AS APPROVED BY THE OWNER, AT NO ADDITIONAL CHARGE TO THE OWNER.
- IN THE EVENT THAT DEMOLITION WORK AFFECTS THE STRUCTURAL SUPPORT OF EXISTING ELECTRICAL EQUIPMENT THAT IS TO REMAIN IN SERVICE, IT SHALL BE RE-SUPPORTED IN ACCORDANCE WITH ALL APPLICABLE CODES. PROVIDE TEMPORARY SUPPORTS WHERE REQUIRED.
- UNUSED FLUSH MOUNTED DEVICES, OUTLET AND OTHER BOXES IN FINISHED AREAS SHALL BE REMOVED FROM WALL AND THE REMAINING HOLE PATCHED TO MATCH ADJACENT WALL SURFACES. UNUSED RACEWAYS AND SLEEVES SHALL BE CUT FLUSH AT CEILING, FLOOR OR WALL AND FILLED WITH GROUT OR REQUIRED FIRE SEALANT. UNUSED RACEWAYS ABOVE ACCESSIBLE CEILINGS SHALL BE REMOVED.
- ELECTRICAL MATERIAL SCHEDULED FOR REMOVAL IS TO BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AS PART OF THIS CONTRACT. ANY ELECTRICAL MATERIAL THE OWNER WISHES TO RETAIN TO BECOME THE PROPERTY OF THE OWNER AND TO BE REMOVED AND PLACED AT A LOCATION ON THE SITE AS DIRECTED BY THE OWNER.
- THE DEMOLITION DRAWINGS SHOW THE GENERAL SCOPE OF THE DEMOLITION AND NOT EXACT DETAILS OR TOTAL EXTENT. FOR EXACT DETAILS AND TOTAL EXTENT, EACH SERVICE MUST BE CAREFULLY CHECKED ON SITE. BEFORE REMOVING SERVICES FOLLOW THE SERVICE THROUGH TO ENSURE OTHER AREAS OF THE BUILDING ARE NOT AFFECTED.

A

B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A

B

C

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

1.

DRAWINGS TO BE READ AS A SET.

2.

DO NOT SCALE FROM DRAWINGS

3.

THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS

4.

ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

ENGINEERING PERMIT J0291

STANTEC CONSULTING LTD.  
04642  
Signature of Member Number  
(Member-in-Responsible Charge)

Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

MEMORIAL UNIVERSITY  
Department of Facilities Management  
*This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.*  
- Dedication plaque, Arts & Administration Building, St. John's Campus

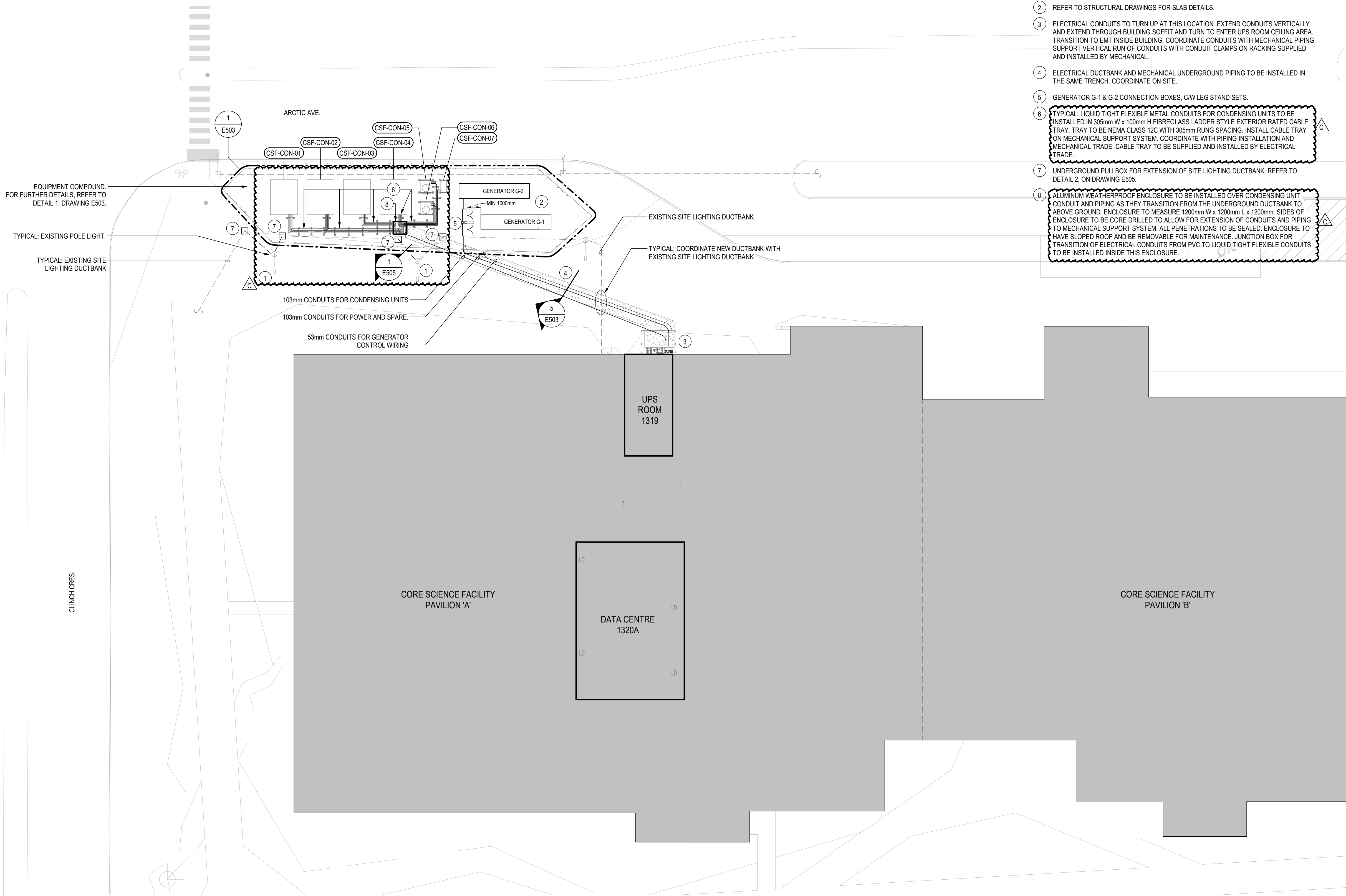
PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
**ELECTRICAL LEGEND**

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. <b>E001</b>





- NOTES:**
- EXISTING LIGHT POLE TO BE RELOCATED FROM ITS ORIGINAL LOCATION. CUT BACK EXISTING SITE LIGHTING DUCTBANK TO ALLOW FOR CONNECTION AND EXTENSION OF CONDUIT AND WIRING TO NEW LIGHT POLE LOCATION. INSTALL UNDERGROUND PULLBOXES AT CONDUIT CONNECTION POINTS. EXTENSION OF CONDUIT TO BE CONCRETE ENCASED TO MATCH EXISTING DUCTBANK. COORDINATE WITH STRUCTURAL FOR THE INSTALLATION OF NEW POLE BASES.
  - REFER TO STRUCTURAL DRAWINGS FOR SLAB DETAILS.
  - ELECTRICAL CONDUITS TO TURN UP AT THIS LOCATION. EXTEND CONDUITS VERTICALLY AND EXTEND THROUGH BUILDING SOFFIT AND TURN TO ENTER UPS ROOM CEILING AREA. TRANSITION TO EMT INSIDE BUILDING. COORDINATE CONDUITS WITH MECHANICAL PIPING. SUPPORT VERTICAL RUN OF CONDUITS WITH CONDUIT CLAMPS ON RACKING SUPPLIED AND INSTALLED BY MECHANICAL.
  - ELECTRICAL DUCTBANK AND MECHANICAL UNDERGROUND PIPING TO BE INSTALLED IN THE SAME TRENCH. COORDINATE ON SITE.
  - GENERATOR G-1 & G-2 CONNECTION BOXES, C/W LEG STAND SETS.
  - TYPICAL: LIQUID TIGHT FLEXIBLE METAL CONDUITS FOR CONDENSING UNITS TO BE INSTALLED IN 305mm W x 100mm H FIBREGLASS LADDER STYLE EXTERIOR RATED CABLE TRAY. TRAY TO BE NEMA CLASS 12C WITH 305mm RUNG SPACING. INSTALL CABLE TRAY ON MECHANICAL SUPPORT SYSTEM. COORDINATE WITH PIPING INSTALLATION AND MECHANICAL TRADE. CABLE TRAY TO BE SUPPLIED AND INSTALLED BY ELECTRICAL TRADE.
  - UNDERGROUND PULLBOX FOR EXTENSION OF SITE LIGHTING DUCTBANK. REFER TO DETAIL 2, ON DRAWING E505.
  - ALUMINUM WEATHERPROOF ENCLOSURE TO BE INSTALLED OVER CONDENSING UNIT CONDUIT AND PIPING AS THEY TRANSITION FROM THE UNDERGROUND DUCTBANK TO ABOVE GROUND. ENCLOSURE TO MEASURE 1200mm W x 1200mm L x 1200mm. SIDES OF ENCLOSURE TO BE CORE DRILLED TO ALLOW FOR EXTENSION OF CONDUITS AND PIPING TO MECHANICAL SUPPORT SYSTEM. ALL PENETRATIONS TO BE SEALED. ENCLOSURE TO HAVE SLOPED ROOF AND BE REMOVABLE FOR MAINTENANCE. JUNCTION BOX FOR TRANSITION OF ELECTRICAL CONDUITS FROM PVC TO LIQUID TIGHT FLEXIBLE CONDUITS TO BE INSTALLED INSIDE THIS ENCLOSURE.

A

B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A

B

C

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

1.

DRAWINGS TO BE READ AS A SET.

2.

DO NOT SCALE FROM DRAWINGS

3.

THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS

4.

ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

pegnl

ENGINEERING  
PERMIT J0291

STANTEC CONSULTING LTD.

04642

Signature or Member Number  
(Member-in-Responsible Charge)

PROFESSIONAL ENGINEER

BERNIE ROJSON

2025-01-15

Stantec

Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

MEMORIAL  
UNIVERSITY

Department of Facilities Management

This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.

- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:

PRIMARY DATA CENTRE  
REPLACEMENT

CORE SCIENCE FACILITY  
ST. JOHN'S, NL

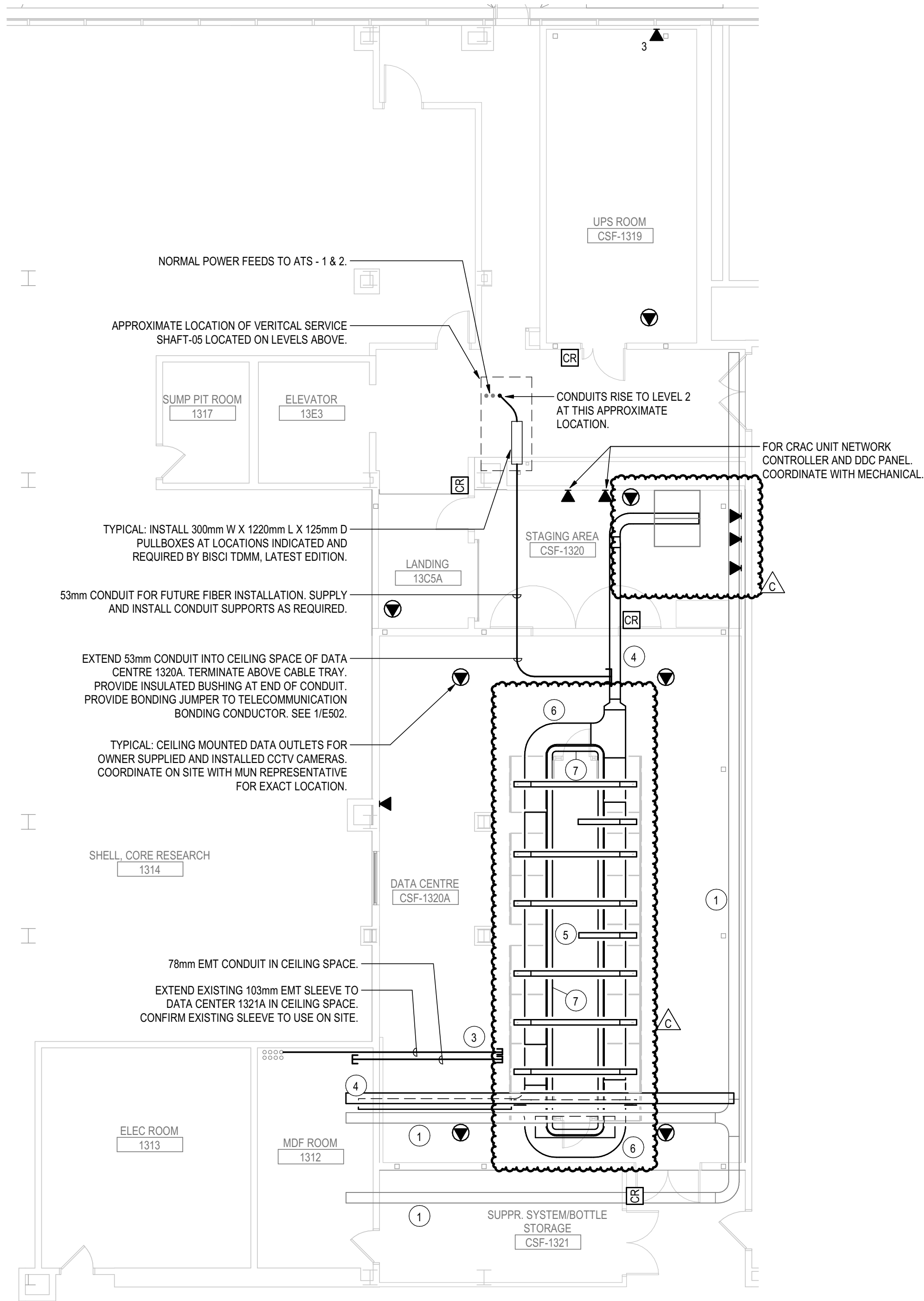
MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL SITE PLAN

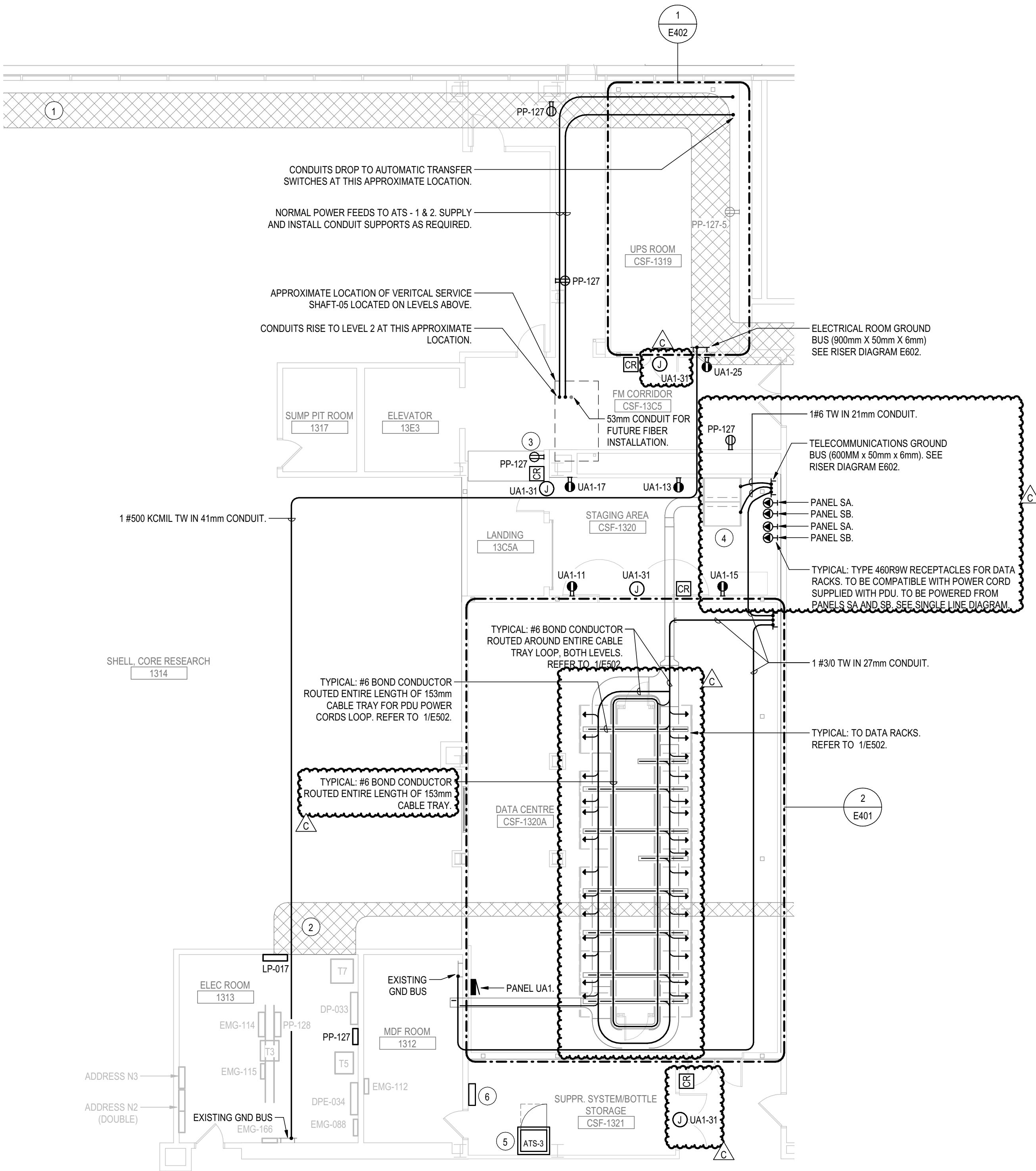
DESIGNED: MG/UD	DRAWN: MG/UD
REVIEWED: -	APPROVED: BR
SCALE: 1 : 200	DATE: SEPTEMBER, 2025
STANTEC PROJECT No: 133412008	DRAWING No.: E100





KEYNOTES FOR SYSTEMS:

- 1 TYPICAL: CABLE TRAY INDICATED AS SHADED IS EXISTING IN THE LEVEL 1.5 SPACE.
- 2 REFER TO DATA RISER DIAGRAM ON DRAWING E803 FOR FURTHER INFORMATION.
- 3 TYPICAL: ALL CONDUIT ENDS TO BE C/W AN INSULATED BUSHING. CONDUITS THAT TERMINATE IN THE DATA CENTRE TO BE BONDED TO THE TELECOMMUNICATION BONDING CONDUCTOR PER DETAIL 1/E502.
- 4 SINGLE RUN OF 305 mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND TO MDF AND STAGING ROOM. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE. SEE DETAIL 2, DRAWING E502.
- 5 TYPICAL: SINGLE RUN OF 153mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND OVER TOP OF DATA RACKS FOR MANAGEMENT OF PDU POWER CORDS. TO BE COMPLETE WITH WATERFALL TYPE FITTINGS TO ALLOW FOR VERTICAL TRANSITION DOWN TO DATA RACKS. SECURE TO TOP OF STRUCTURAL CEILING GRID. SEE DETAILS ON DRAWINGS E501 AND E502.
- 6 TWO TIERS OF 807mm W X 100mm H BASKET TYPE CABLE TRAYS COMPLETE WITH TWO (2) 100mm DIVIDERS PER TRAY. FOR THE MANAGEMENT OF CABLES WITHIN THE HOT AISLE CONTAINMENT ENCLOSURE. WHERE CABLES TRAYS EXTEND OUTSIDE OF ENCLOSURE. COORDINATE WITH ENCLOSURE PANELS TO ENSURE PROPER SEALINGS. CABLE TRAYS TO BE FACTORY PAINTED WHITE. TRAYS TO BE SUPPORTED FROM STRUCTURAL CEILING GRID SYSTEM. SEE DETAIL 2, DRAWING E502.
- 7 153 mm W X 100mm H BASKET TYPE CABLE TRAY. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE.

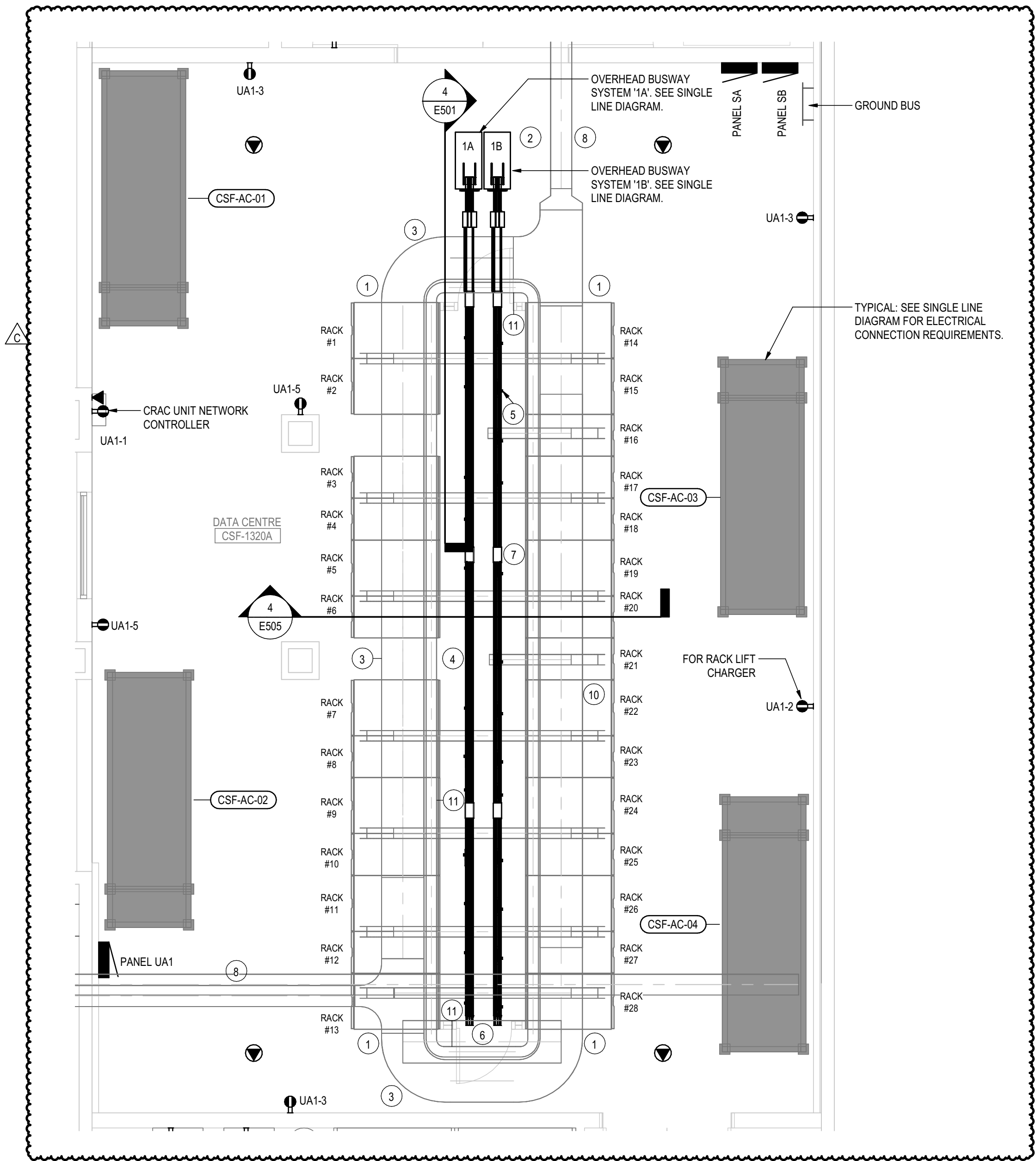


KEYNOTES FOR POWER:

- 1 EXISTING CORE "E" FEEDER CABLES IN CEILING SPACE OF LEVEL 1.5.
- 2 EXISTING FEEDER CABLES IN CEILING SPACE OF LEVEL 1.5, TURNING DOWN IN ELECTRICAL ROOM 1313 TO THEIR ASSOCIATED ELECTRICAL PANELS.
- 3 TYPICAL: CORRIDOR RECEPTACLE TO BE CONNECTED TO EXISTING PANEL PP-127 LOCATED IN ELECTRICAL ROOM 1313. SUPPLY AND INSTALL NEW 20A, 1P BREAKER. CONFIRM CIRCUIT NUMBER ON SITE AND UPDATE AS-BUILT DRAWINGS.
- 4 REFER TO ELECTRICAL SINGLE LINE DIAGRAM, DRAWING E601, FOR POWER REQUIREMENTS TO RACKS.
- 5 AUTOMATIC TRANSFER SWITCH ATS-3, 200A.
- 6 FIRE ALARM RELEASING PANEL. CCT UA1-12. REFER TO DETAIL 3, DRAWING E603.

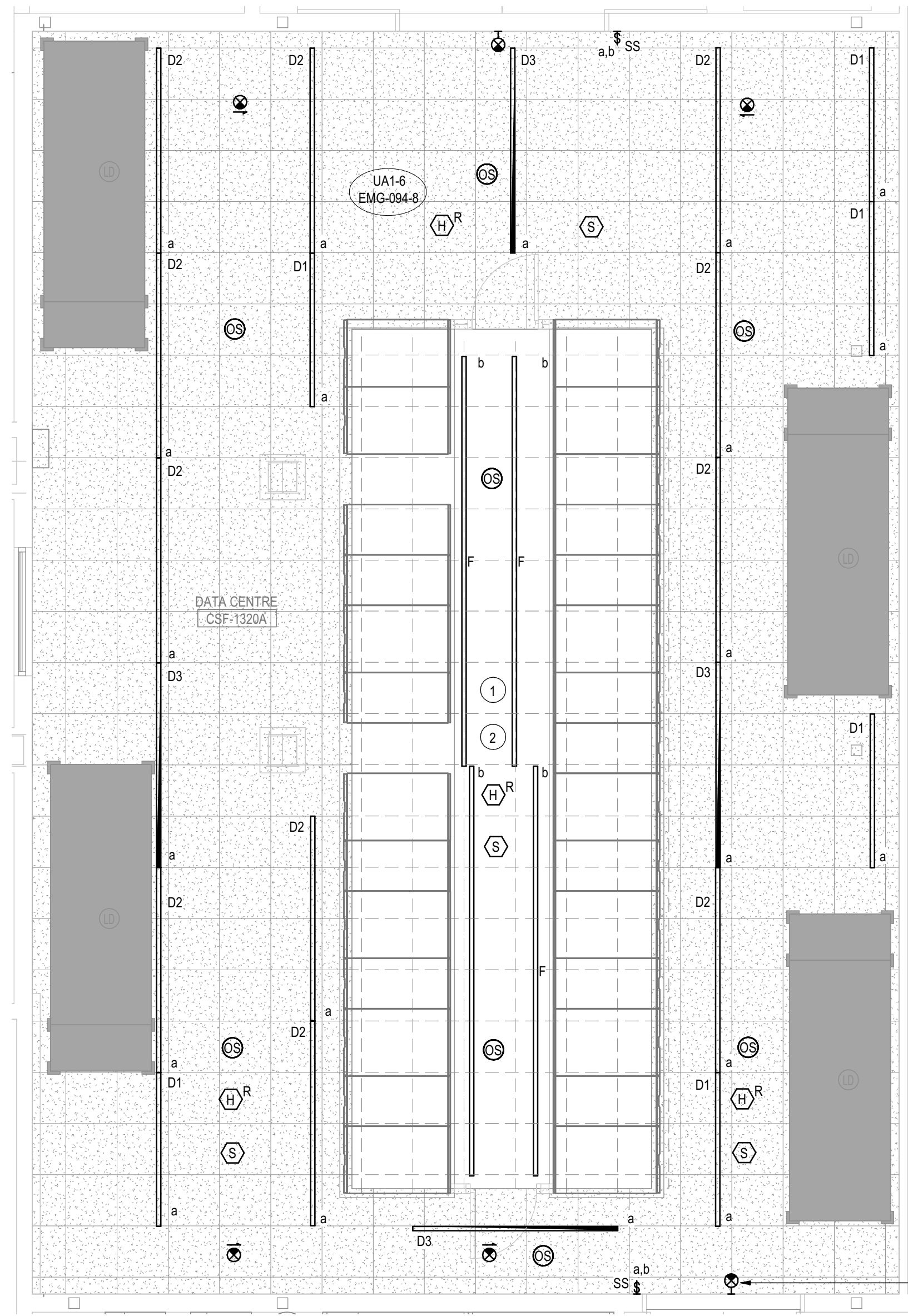
<div><div><div>A</div><div>B</div></div><div>A - DETAIL B - LOCATION/DRAWING No. C - DRAWING No.</div><div><div><div>A</div><div>B</div><div>C</div></div></div></div>		
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11
GENERAL NOTES		
1. DRAWINGS TO BE READ AS A SET.		
2. DO NOT SCALE FROM DRAWINGS		
3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS		
4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.		
Permit/Seal		
<div><div>PROVINCE OF NEWFOUNDLAND AND LABRADOR</div><div><div>ENGINEERING PERMIT J0291</div><div>STANTEC CONSULTING LTD.</div><div>04642</div><div>Signature or Member Number (Member-in-Responsible Charge)</div></div><div><div>REGISTERED PROFESSIONAL ENGINEER</div><div>BERNIE ROJISON</div><div>2026-01-15</div><div>NEWFOUNDLAND &amp; LABRADOR</div></div></div>		
<div><div></div><div>Stantec Consulting Ltd.</div></div> <div>141 Kelsey Drive St. John's, NL A1B 0L2 Tel: (709) 576-1458 • www.stantec.com</div>		
Copyright Reserved		
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.		
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.		
<div><div></div><div>MEMORIAL UNIVERSITY</div><div>Department of Facilities Management</div><div>This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.</div><div>- Dedication plaque, Arts &amp; Administration Building, St. John's Campus</div></div>		
PROJECT NAME:		
PRIMARY DATA CENTRE REPLACEMENT		
CORE SCIENCE FACILITY ST. JOHN'S, NL		
MUN Project #: CSF-004-23		
DRAWING TITLE:		
POWER AND SYSTEMS FLOOR PLAN - CORE SCIENCE FACILITY		
DESIGNED:	MG/JD	DRAWN: MG/JD
REVIEWED:	-	APPROVED: BR
SCALE:	1 : 100	DATE: SEPTEMBER, 2025
STANTEC PROJECT No.	133412008	DRAWING No. E202





NOTES:

- 1 CABLE TRAY TO PENETRATE HOT AISLE CONTAINMENT ENCLOSURE. COORDINATE WITH CONTAINMENT SYSTEM PANELS TO ENSURE IT IS PROPERLY SEALED.
- 2 CABLE END FEEDS FOR POWER BUSWAY RAIL SYSTEM. INSTALL ABOVE STRUCTURAL GRID. TO BE SUPPORTED FROM STRUCTURE ABOVE.
- 3 TWO TIERS OF 607mm W X 100mm H BASKET TYPE CABLE TRAYS C/W TWO (2) 100mm DIVIDERS PER TRAY. CABLE TRAYS TO BE FACTORY PAINTED WHITE. TRAYS TO BE SUPPORTED FROM STRUCTURAL CEILING GRID SYSTEM. SEE DETAIL 2, DRAWING E502.
- 4 POWER BUSWAY SYSTEM RAILS. PROVIDE LENGTHS OF RAIL REQUIRED TO EXTEND LENGTH OF DATA RACKS AND EXTEND TO CABLE END FEEDS. TO BE SUPPORTED FROM STRUCTURE USING BUSWAY SYSTEM HANGERS.
- 5 POWER BUSWAY SYSTEM TAP OFF BOX. SEE ALSO SINGLE LINE DIAGRAM.
- 6 POWER BUSWAY END CAP REQUIRED AT THE END OF EACH POWER BUSWAY RAIL SYSTEM.
- 7 TYPICAL: POWER BUSWAY COUPLER TO CONNECT SECTIONS OF POWER BUSWAY RAIL SYSTEM TOGETHER.
- 8 SINGLE RUN OF 305 mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND TO MDF AND STAGING ROOM. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE. SEE DETAIL 2, DRAWING E502.
- 9 DATA RACK ENCLOSURES TO BE SECURED TO CONCRETE PAD USING ANCHOR BOLTS. REFER TO DETAIL 3, DRAWING E501.
- 10 TYPICAL: SINGLE RUN OF 153mm W X 100mm H BASKET TYPE CABLE TRAY TO EXTEND OVER TOP OF DATA RACKS FOR MANAGEMENT OF PDU POWER CORDS. TO BE COMPLETE WITH WATERFALL TYPE FITTINGS TO ALLOW FOR VERTICAL TRANSITION DOWN TO DATA RACKS. TRAY TO MOUNTED AND SECURED TO TOP OF STRUCTURAL CEILING GRID. SEE DETAILS ON DRAWINGS E501 AND E502.
- 11 153 mm W X 100mm H BASKET TYPE CABLE TRAY. TO BE SUPPORTED BY STRUCTURAL CEILING GRID. TRAY TO BE FACTORY PAINTED WHITE.

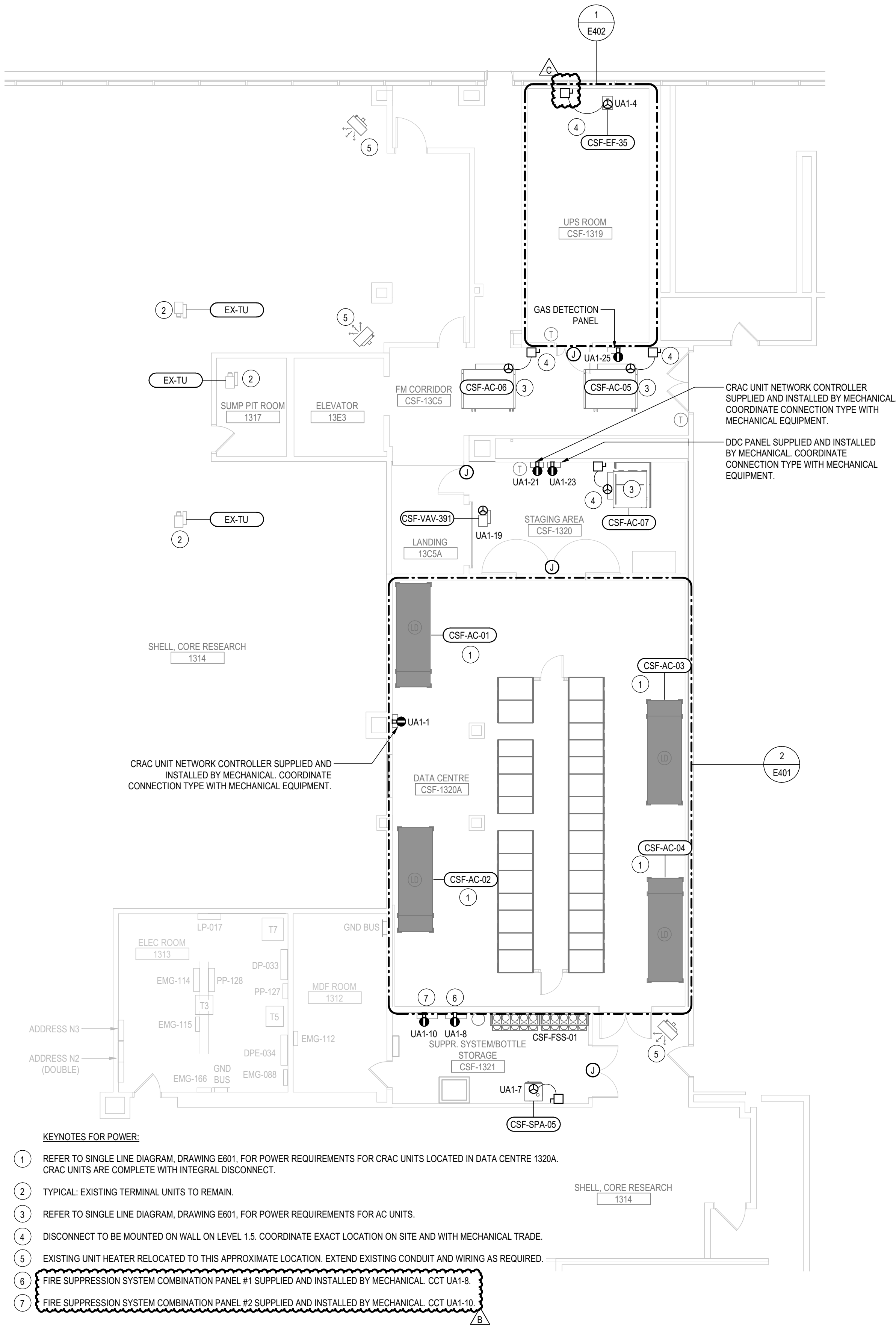


NOTES:

- 1 TYPICAL: LIGHTING FIXTURES ARE LAID OUT TO ACCOMMODATE EQUIPMENT AND HVAC INSTALLATIONS. COORDINATE CONFLICTS ON SITE.
- 2 CEILING TILES INSIDE OF HOT AISLE CONTAINMENT ENCLOSURE TO NOT BE INSTALLED. GRID TO REMAIN FOR SUPPORT OF CABLE TRAYS.
- 3 REFER TO DRAWING E506 FOR LIGHTING SEQUENCE OF OPERATIONS.

<div><div><div>A</div><div>B</div></div><div>A - DETAIL B - LOCATION/DRAWING No. C - DRAWING No.</div><div><div>A</div><div>B</div><div>C</div></div></div>		
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11
GENERAL NOTES		
<ol style="list-style-type: none"><li>1. DRAWINGS TO BE READ AS A SET.</li><li>2. DO NOT SCALE FROM DRAWINGS</li><li>3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS</li><li>4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.</li></ol>		
Permit/Seal		
<div><div>PROVINCE OF NEWFOUNDLAND AND LABRADOR pegni ENGINEERING PERMIT J0291 STANTEC CONSULTING LTD. 04642 Signature or Member Number (Member-in-Responsible Charge)</div><div>REGISTERED PROFESSIONAL ENGINEER BERNIE ROBINSON 2025-01-15 NEWFOUNDLAND &amp; LABRADOR</div></div>		
<div><div></div><div>Stantec Consulting Ltd. 141 Kelsey Drive St. John's, NL A1B 0L2 Tel: (709) 576-1458 • www.stantec.com</div></div>		
Copyright Reserved The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden. The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.		
<div><div></div><div>MEMORIAL UNIVERSITY Department of Facilities Management <i>This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.</i> - Dedication plaque, Arts &amp; Administration Building, St. John's Campus</div></div>		
PROJECT NAME: <b>PRIMARY DATA CENTRE REPLACEMENT</b> CORE SCIENCE FACILITY ST. JOHN'S, NL		
MUN Project #: CSF-004-23		
DRAWING TITLE: <b>ENLARGED FLOOR PLANS - DATA CENTRE</b>		
DESIGNED: MG/UD	DRAWN: MG/UD	
REVIEWED: -	APPROVED: BR	
SCALE: 1 : 50	DATE: SEPTEMBER, 2025	
STANTEC PROJECT No. 133412008	DRAWING No. <b>E401</b>	





KEYNOTES FOR POWER:

- 1 REFER TO SINGLE LINE DIAGRAM, DRAWING E601, FOR POWER REQUIREMENTS FOR CRAC UNITS LOCATED IN DATA CENTRE 1320A. CRAC UNITS ARE COMPLETE WITH INTEGRAL DISCONNECT.
- 2 TYPICAL: EXISTING TERMINAL UNITS TO REMAIN.
- 3 REFER TO SINGLE LINE DIAGRAM, DRAWING E601, FOR POWER REQUIREMENTS FOR AC UNITS.
- 4 DISCONNECT TO BE MOUNTED ON WALL ON LEVEL 1.5. COORDINATE EXACT LOCATION ON SITE AND WITH MECHANICAL TRADE.
- 5 EXISTING UNIT HEATER RELOCATED TO THIS APPROXIMATE LOCATION. EXTEND EXISTING CONDUIT AND WIRING AS REQUIRED.
- 6 FIRE SUPPRESSION SYSTEM COMBINATION PANEL #1 SUPPLIED AND INSTALLED BY MECHANICAL. CCT UA1-8.
- 7 FIRE SUPPRESSION SYSTEM COMBINATION PANEL #2 SUPPLIED AND INSTALLED BY MECHANICAL. CCT UA1-10.

3

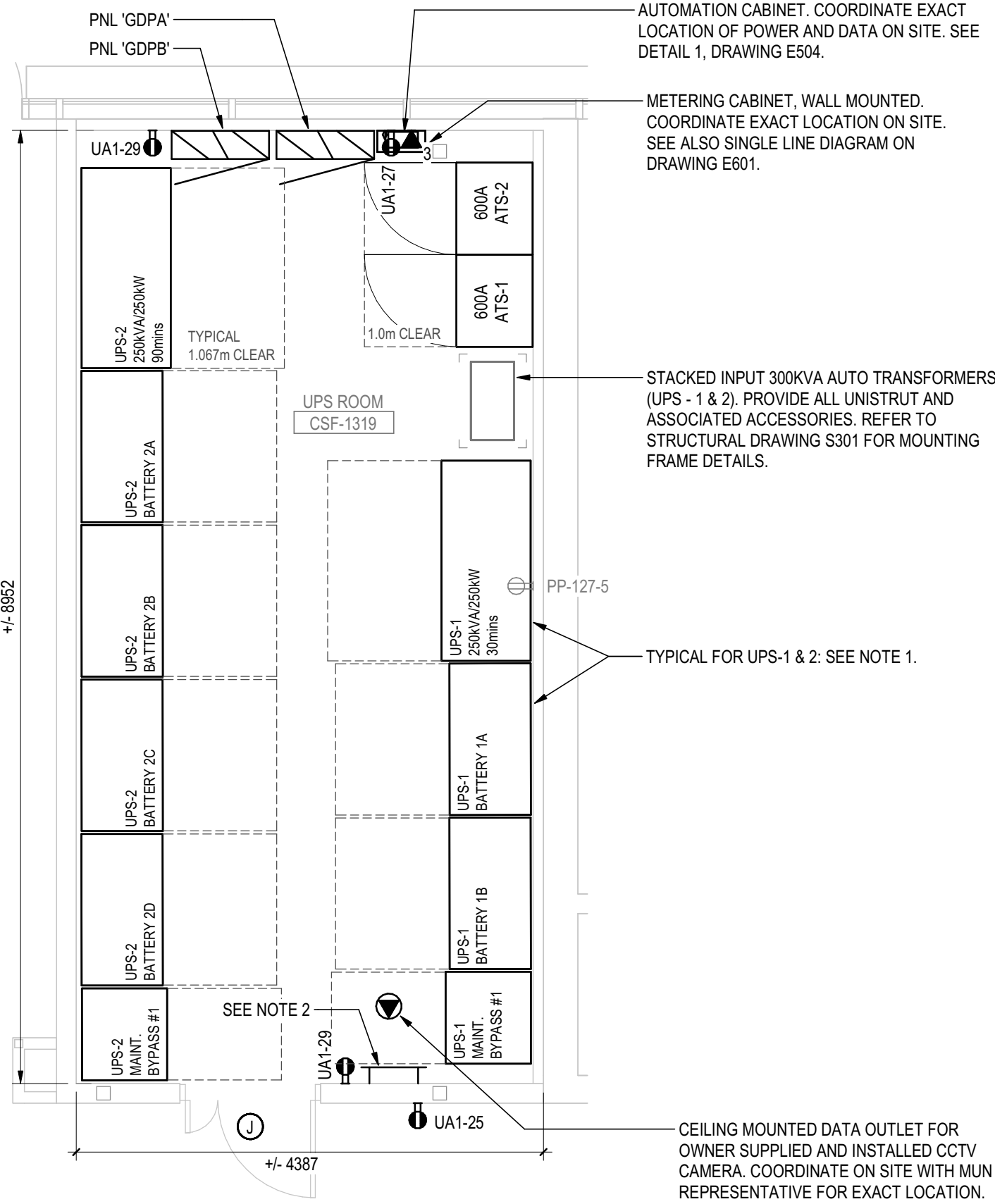
E402

MECHANICAL EQUIPMENT FLOOR PLAN LAYOUT - LEVEL 1

1 : 100

NOTES:

1. UPS / BATTERY / MBP SUPPLIER TO CONFIRM UPS ROOM (CSF-1319) DIMENSIONS ON SITE PRIOR TO SHOP DRAWING SUBMITTAL. FINAL EQUIPMENT LAYOUT AND CONFIGURATION TO BE CONFIRMED BY MANUFACTURER PRIOR TO CONTRACTOR ROUGHIN. CONTRACTOR TO ENSURE LAYOUT C/W EQUIPMENT CLEARANCES MEETS OR EXCEEDS MANUFACTURERS RECOMMENDATIONS AND THE LATEST REQUIREMENTS OF CEC.
2. GROUND BUS (900mm X 50mm X 6mm). SEE RISER DIAGRAM E602.
3. **UPS SYSTEM PRICING TO BE SUBMITTED AS PART OF BID PRICING STRUCTURE WITH TWO OPTIONS (SEE ALSO SINGLE LINE DIAGRAM):**
  - A. **PRICE A** - FULL UPS SYSTEM AS DESIGNED WITH 30 MINUTE AND 90 MINUTE RUNTIMES.
  - B. **PRICE B** - BASE UPS SYSTEM WITH 30 MINUTE RUN TIMES FOR BOTH UNITS WITH UNIT PRICE TO INCREASE RUN TIME IN 15 MINUTE INTERVALS.



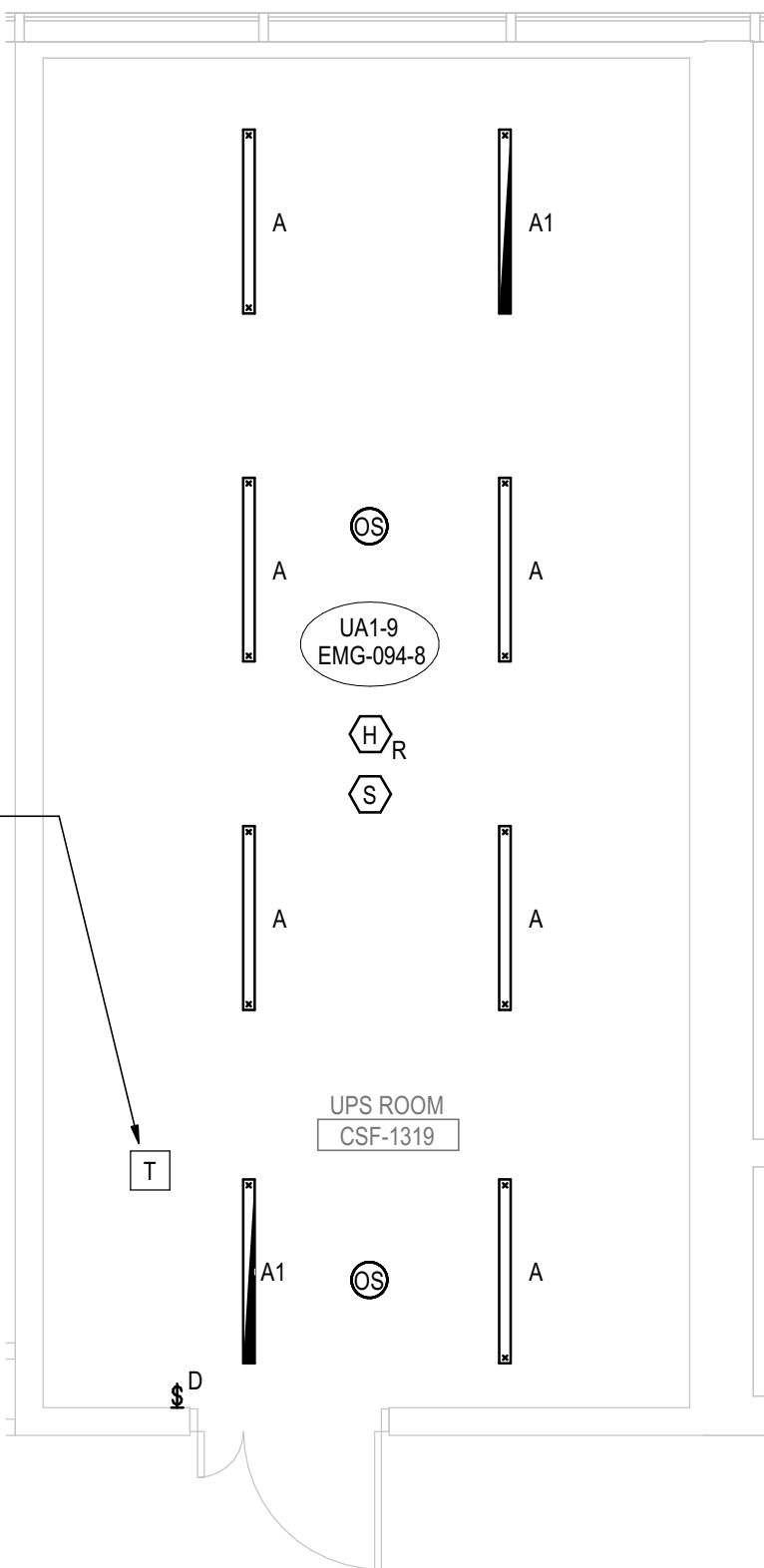
1

E402

ENLARGED FLOOR PLAN - UPS ROOM

1 : 50

6 KVA 347/120V STEP DOWN TRANSFORMER FOR 347V EMERGENCY LIGHTING CIRCUIT USED FOR OVERHEAD EMERGENCY EGRESS LIGHTING IN ROOM CSF-1319. MOUNT ABOVE CEILING. COORDINATE FINAL LOCATION ON SITE.



2

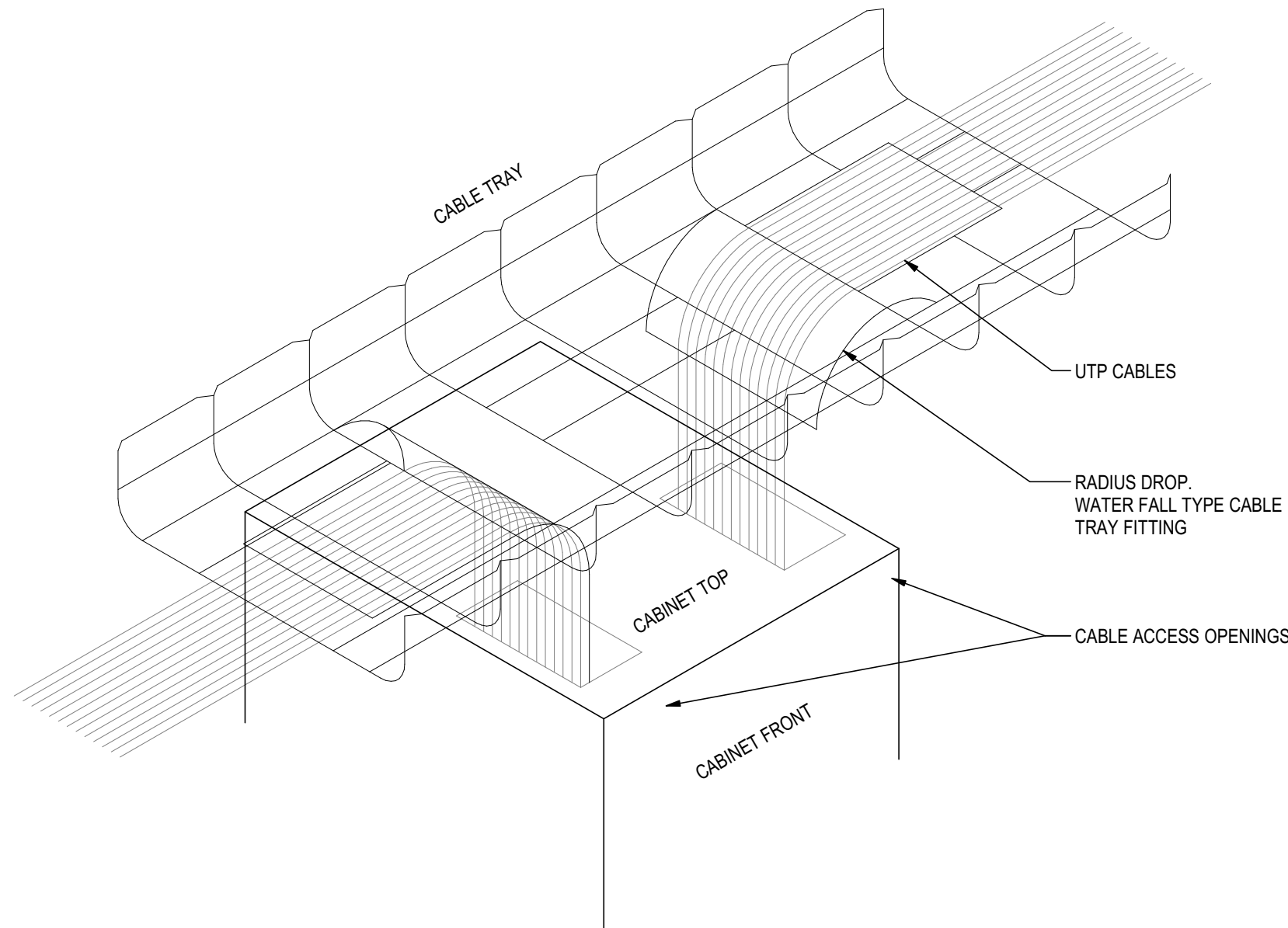
E402

ENLARGED LIGHTING PLAN - UPS ROOM

1 : 50

<div><div><div>A</div><div>B</div></div><div>A - DETAIL B - LOCATION/DRAWING No. C - DRAWING No.</div><div><div><div>A</div><div>B</div><div>C</div></div></div></div>		
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11
GENERAL NOTES		
1. DRAWINGS TO BE READ AS A SET.		
2. DO NOT SCALE FROM DRAWINGS		
3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS		
4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.		
Permit/Seal		
<div><div>PROVINCE OF NEWFOUNDLAND AND LABRADOR</div><div><div>ENGINEERING PERMIT J0291</div><div>STANTEC CONSULTING LTD.</div><div>04642</div><div>Signature or Member Number (Member-in-Responsible Charge)</div></div><div><div>REGISTERED PROFESSIONAL ENGINEER</div><div>BERNIE ROJSON</div><div>2025-01-15</div><div>NEWFOUNDLAND &amp; LABRADOR</div></div></div>		
<div><div><div><div></div><div>Stantec</div></div><div>Stantec Consulting Ltd. 141 Kelsey Drive St. John's, NL A1B 0L2 Tel: (709) 576-1458 • www.stantec.com</div></div></div>		
Copyright Reserved		
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.		
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.		
<div><div><div><div></div><div>MEMORIAL UNIVERSITY</div><div>Department of Facilities Management</div><div>This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.</div><div>- Dedication plaque, Arts &amp; Administration Building, St. John's Campus</div></div></div></div>		
PROJECT NAME:		
PRIMARY DATA CENTRE REPLACEMENT		
CORE SCIENCE FACILITY ST. JOHN'S, NL		
MUN Project #: CSF-004-23		
DRAWING TITLE:		
ENLARGED FLOOR PLANS - UPS ROOM AND MECHANICAL EQUIPMENT PLAN		
DESIGNED:	MG/JD	DRAWN: MG/JD
REVIEWED:	-	APPROVED: BR
SCALE:	As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No.	133412008	DRAWING No. E402



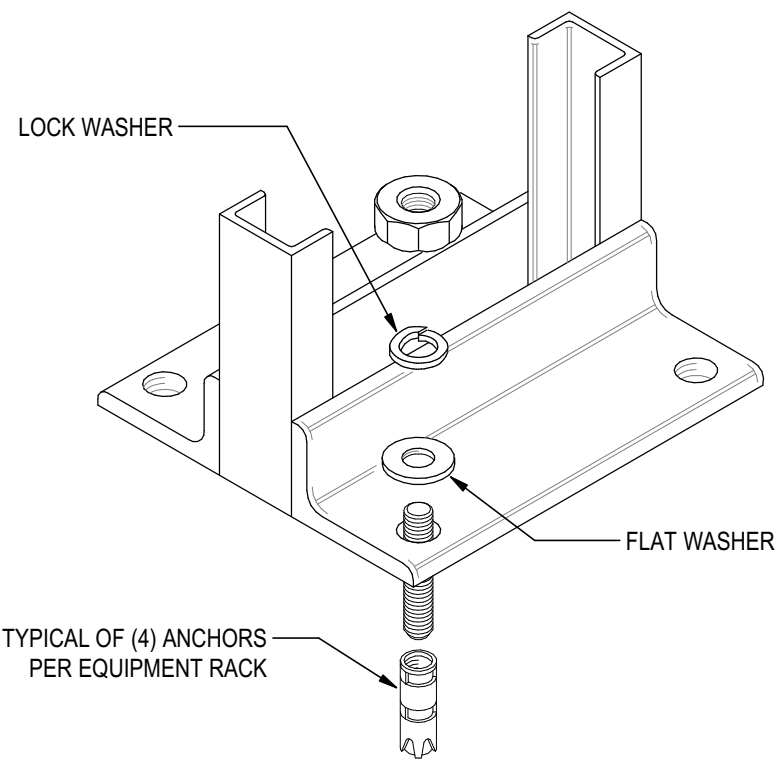


NOTE:

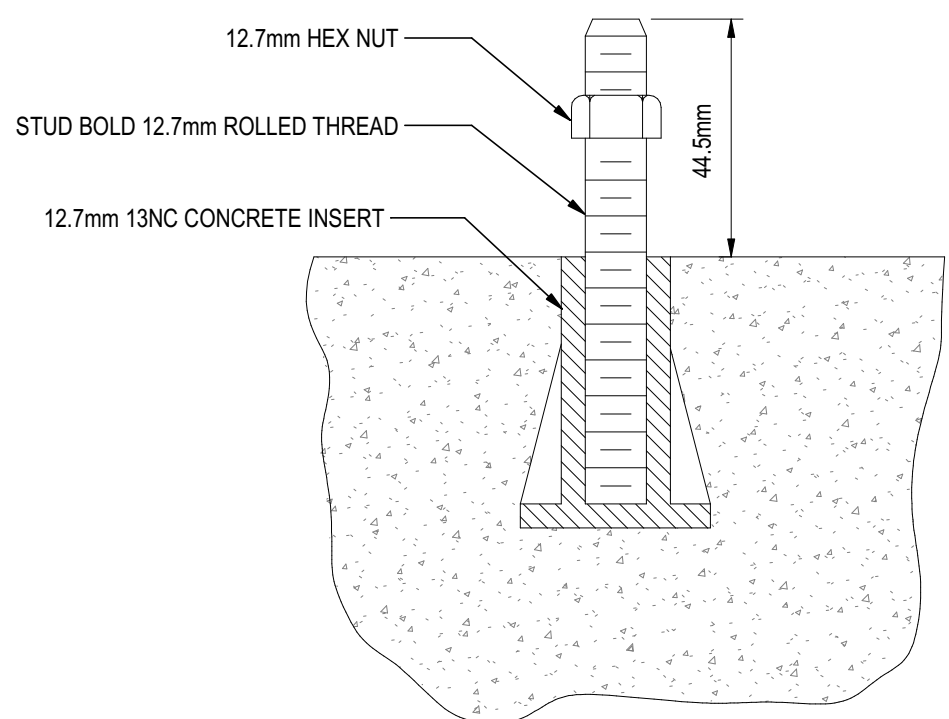
1. CONTACTOR SHALL ROUTE CABLES INTO CABINETS VIA RADIUS DROPS IN CABLE TRAY, AND INTO THE INTERIOR SIDE OF CABINETS, THROUGH ACCESS OPENINGS. DO NOT ROUTE CABLES INTO THE CENTER OF THE CABINET WHERE THEY MIGHT INTERFERE WITH OWNER EQUIPMENT OR ACCESS TO PATCH PANELS.
2. TWO ROWS OF CABLE TRAY TO BE INSTALLED ABOVE DATA CABINETS PER CABLE TRAY DETAIL SHOWN ON DRAWING E502.

1 TYPICAL CABINET CABLING DETAIL

N.T.S.



ANCHOR DETAIL FOR EQUIPMENT RACK



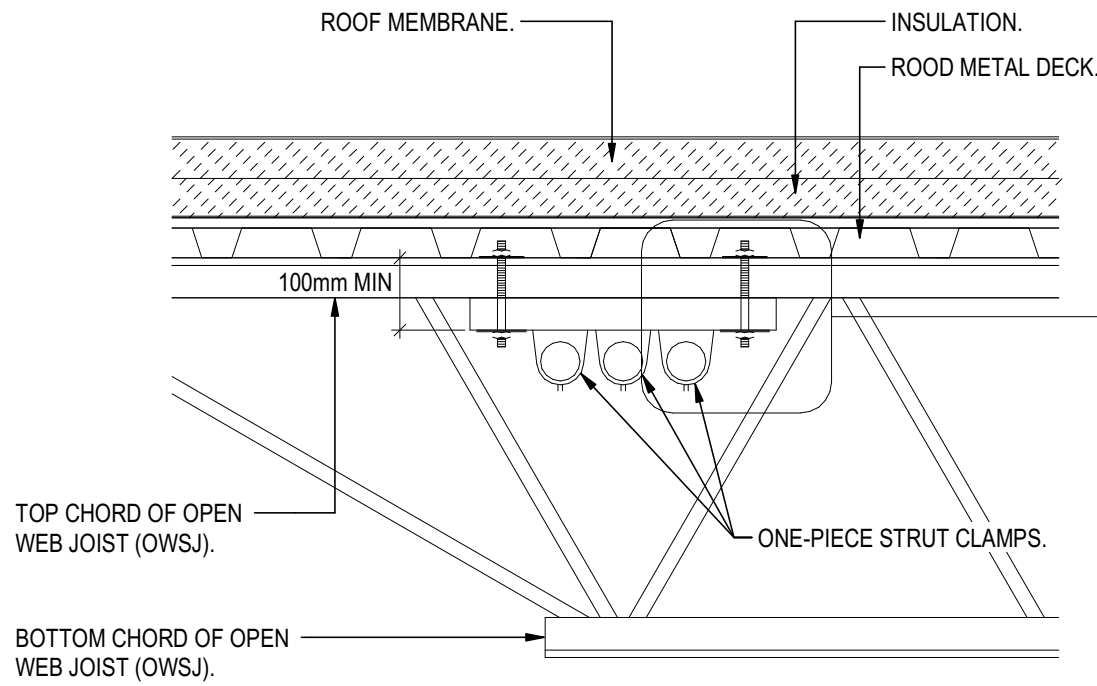
CABLE RACK ANCHOR BOLT

3 ANCHOR BOLT

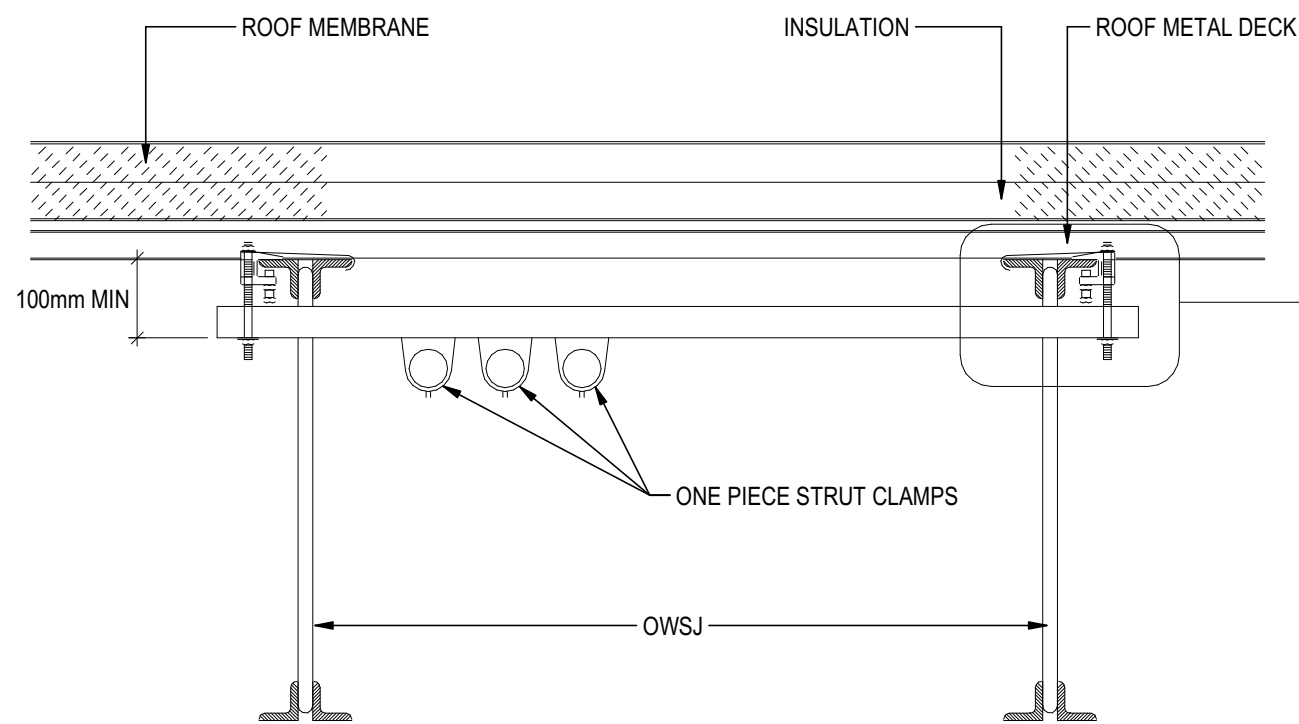
N.T.S.

GENERAL NOTES:

1. DO NOT ATTACH CONDUITS, BOXES, ETC. OR ANY OTHER EQUIPMENT DIRECTLY TO UNDERSIDE OF ROOF STRUCTURE. MAINTAIN A MINIMUM CLEARANCE OF 100mm FROM THE LOWEST PART OF THE ROOF DECK TO THE EQUIPMENT.
2. DO NOT SUPPORT CONDUIT FROM WEB OF JOIST.
3. MAXIMUM OF 27mm CONDUIT(S) ARE ALLOWED TO BE ATTACHED TO JOIST BOTTOM CHORD.
4. MOUNT ASSEMBLY AS HIGH AS POSSIBLE, BUT MAINTAIN MIN 100mm BELOW ROOF DECK. DO NOT INTERFERE WITH WORK OF OTHER TRADES, BLOCK AIR DUST, FIRE PROTECTION OUTLETS OR LIGHT FIXTURES.
5. DO NOT EXCEED 100LBS PER POINT LOAD AT TOP CHORD OF JOIST.



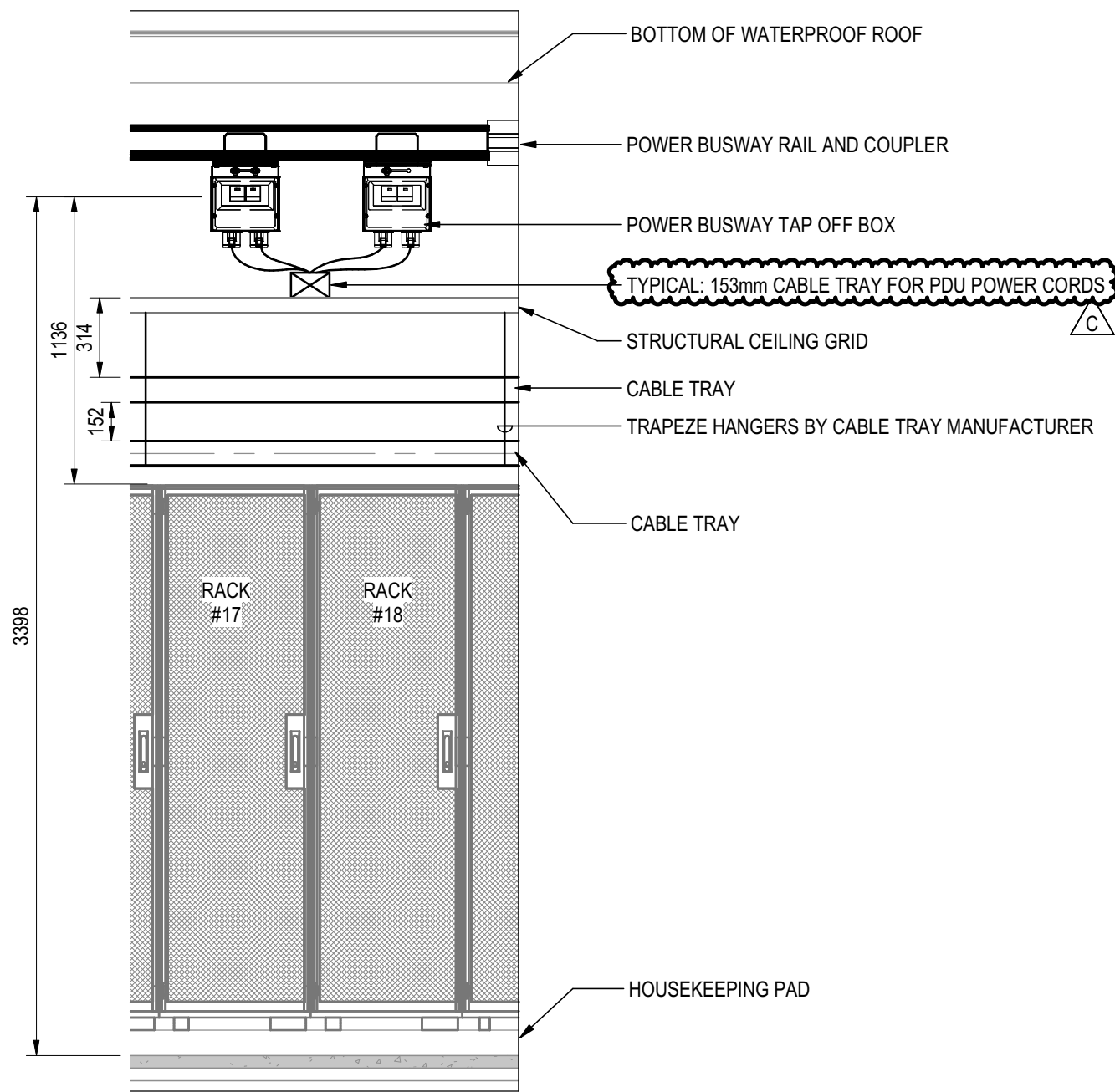
CONDUITS INSTALLED PERPENDICULAR TO OPEN WEB STEEL JOISTS (OWSJ.)



CONDUITS INSTALLED PARALLEL TO OPEN WEB STEEL JOISTS (OWSJ.)

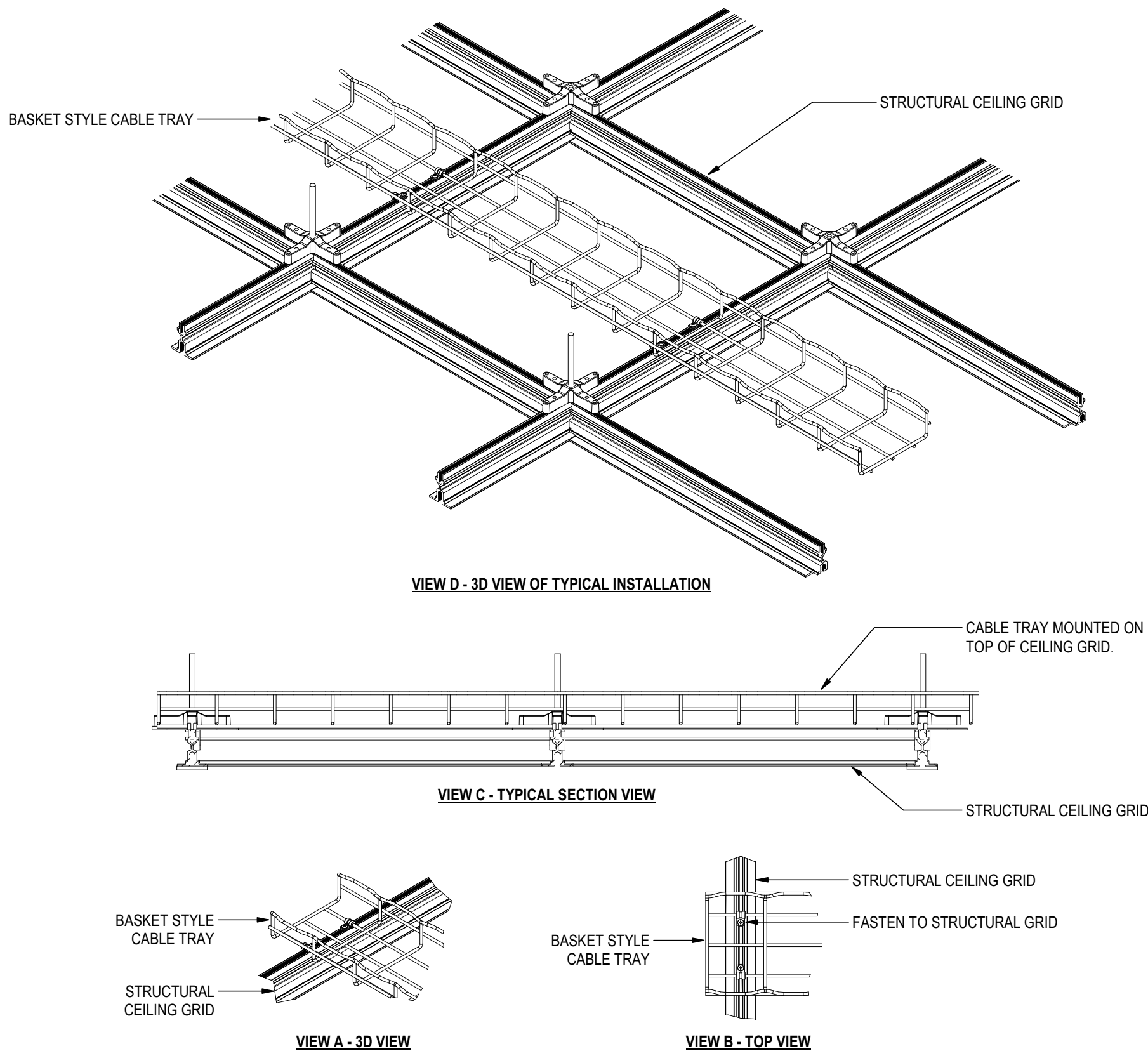
2 TYPICAL CONDUIT INSTALLATION

N.T.S.



4 POWER BUSWAY ELEVATION DETAIL

1 : 25



5 TOP MOUNTED CABLE TRAY DETAILS

N.T.S.

A - DETAIL		
B - LOCATION/DRAWING No.		
C - DRAWING No.		
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

1. DRAWINGS TO BE READ AS A SET.
2. DO NOT SCALE FROM DRAWINGS
3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS
4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal



Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.



Department of Facilities Management  
This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.  
- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

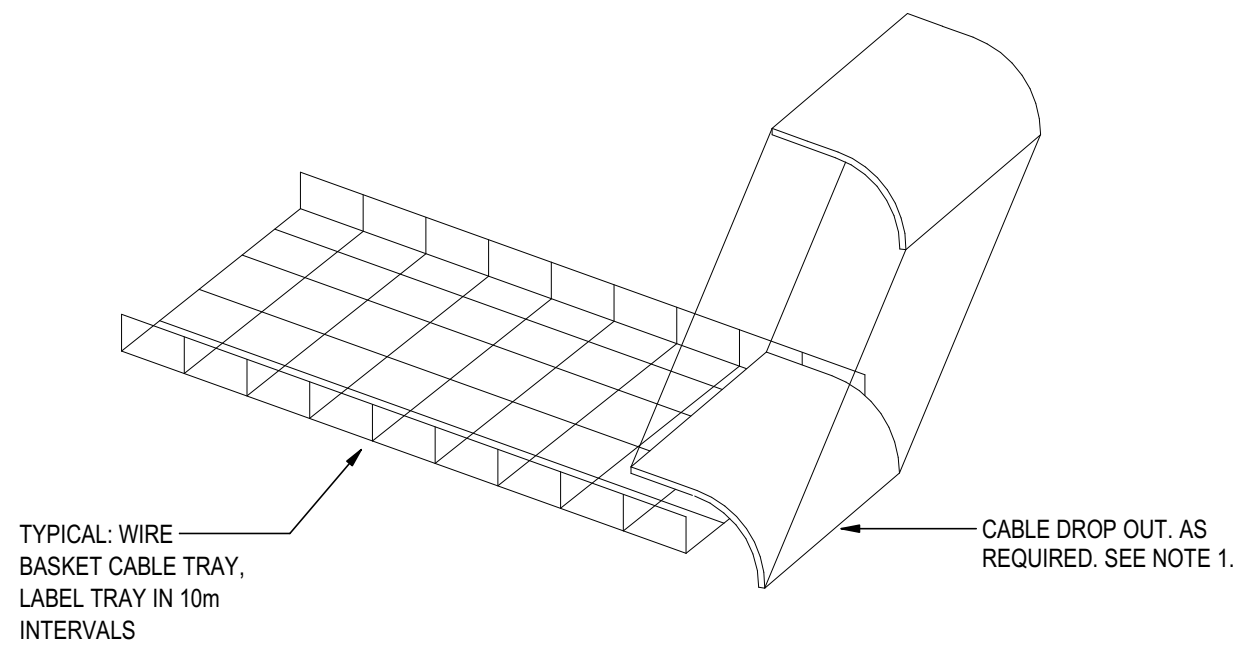
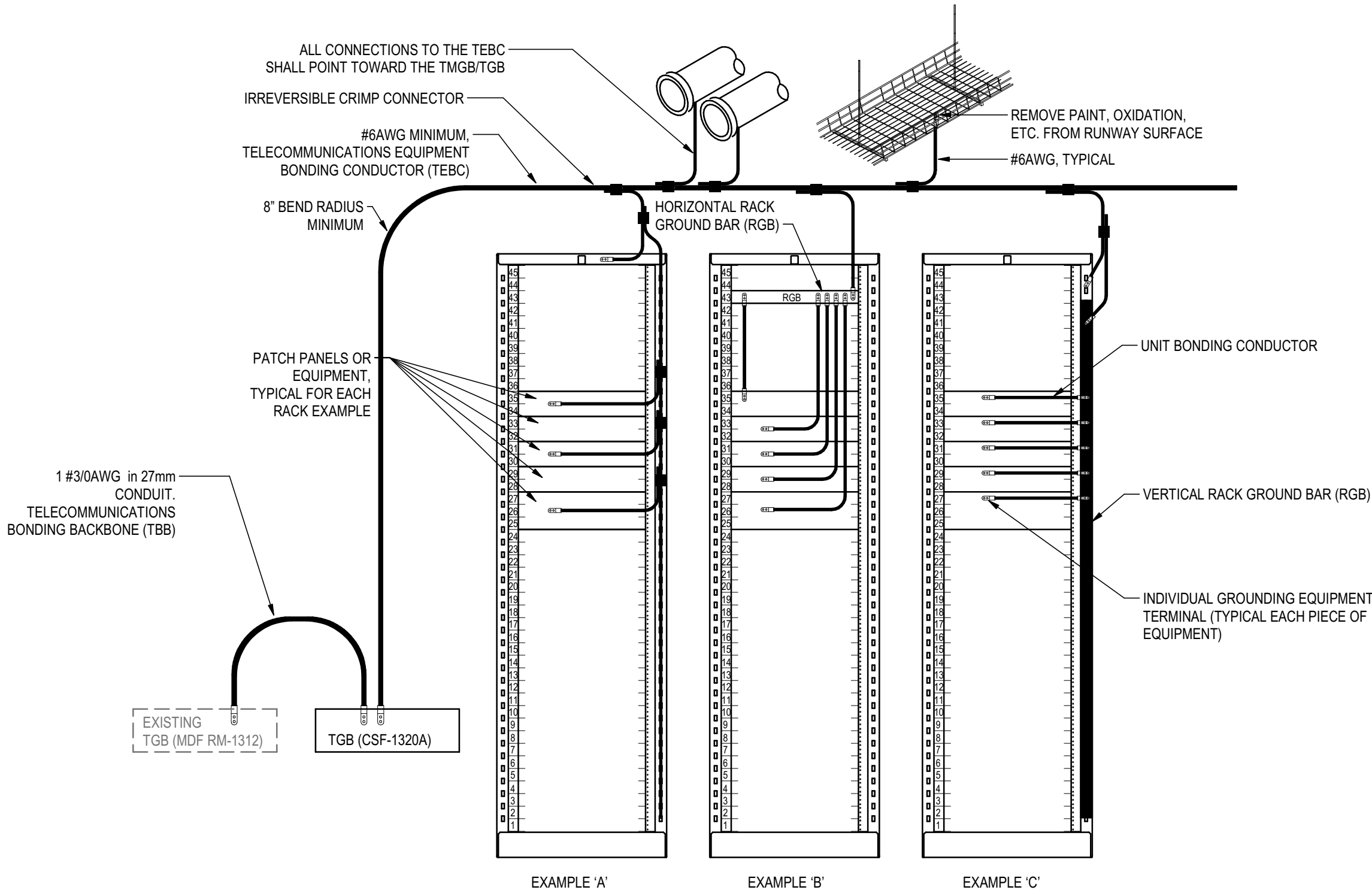
MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL DETAILS

DESIGNED:	MG/JD	DRAWN:	MG/JD
REVIEWED:	-	APPROVED:	BR
SCALE:	As indicated	DATE:	SEPTEMBER, 2025
STANTEC PROJECT No:	133412008	DRAWING No:	E501

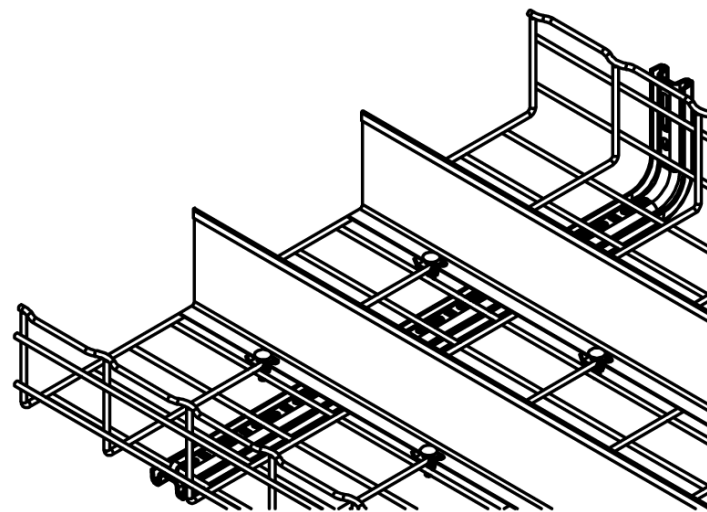




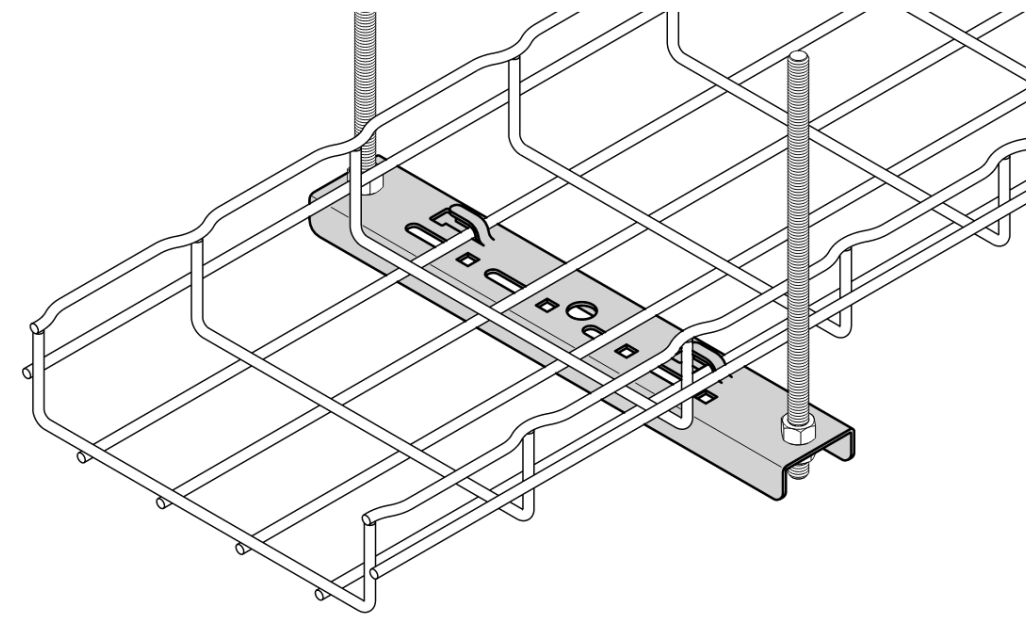
**NOTES:**

1. CABLETRAY DROP-OUTS PROVIDE A ROUNDED SURFACE WITH ADEQUATE RADIUS TO PROTECT CABLE AS IT EXITS FROM TRAY, PREVENTING DAMAGE TO INSULATION. THE LADDER DROP-OUT WILL ATTACH TO WIRE BASKET. SEE MANUFACTURERS INSTALLATION REQUIREMENTS. PROVIDE ADJUSTABLE SPLICE PLATES AT CABLE TRAY HORIZONTAL BENDS/TEE AS REQUIRED BY MANUFACTURER. SEE PLANS FOR TRAY ROUTING AND BENDS/TEES.

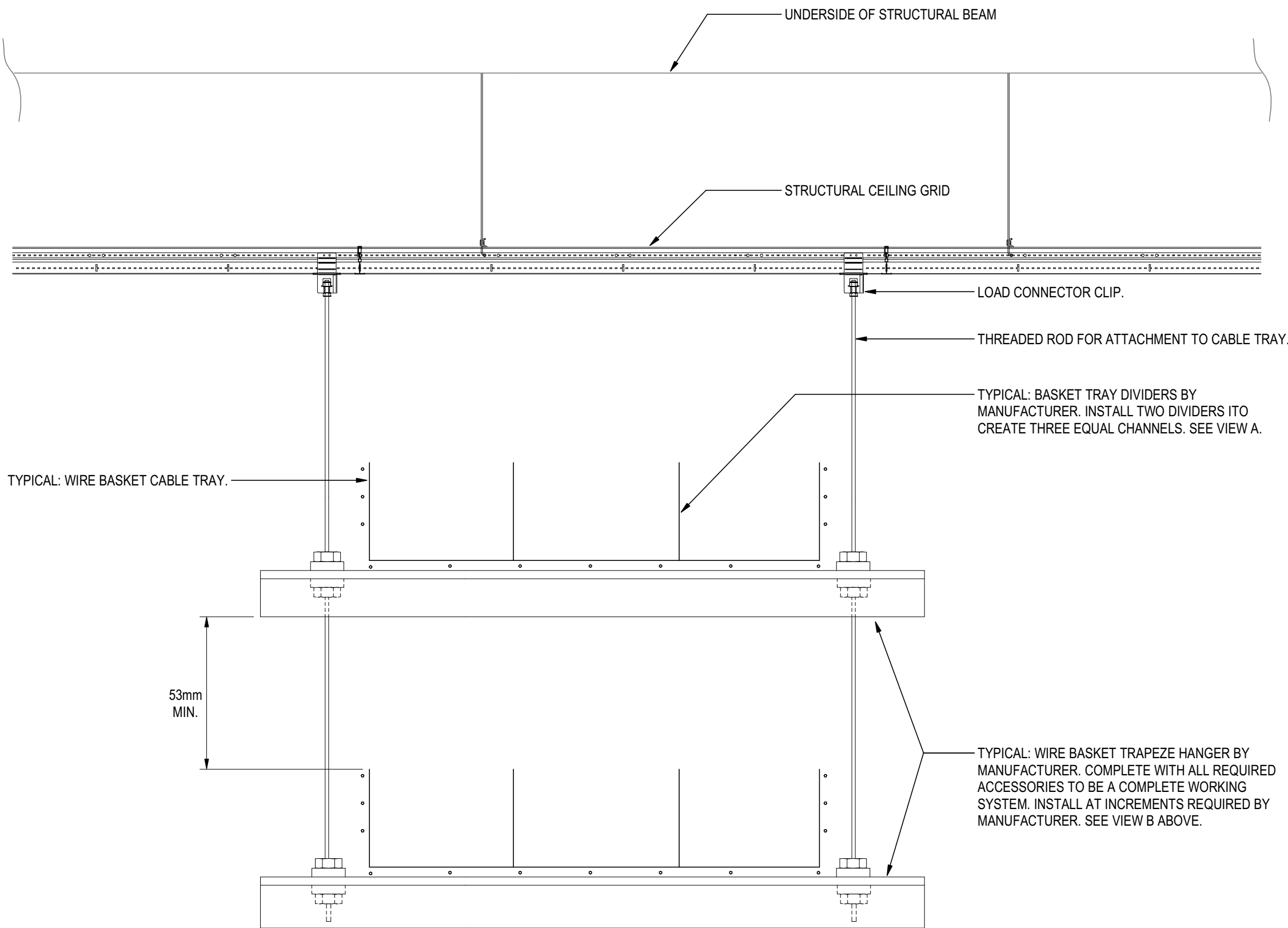
**VIEW C - CABLE DROP OUT FITTING**



**VIEW A - DIVIDERS**

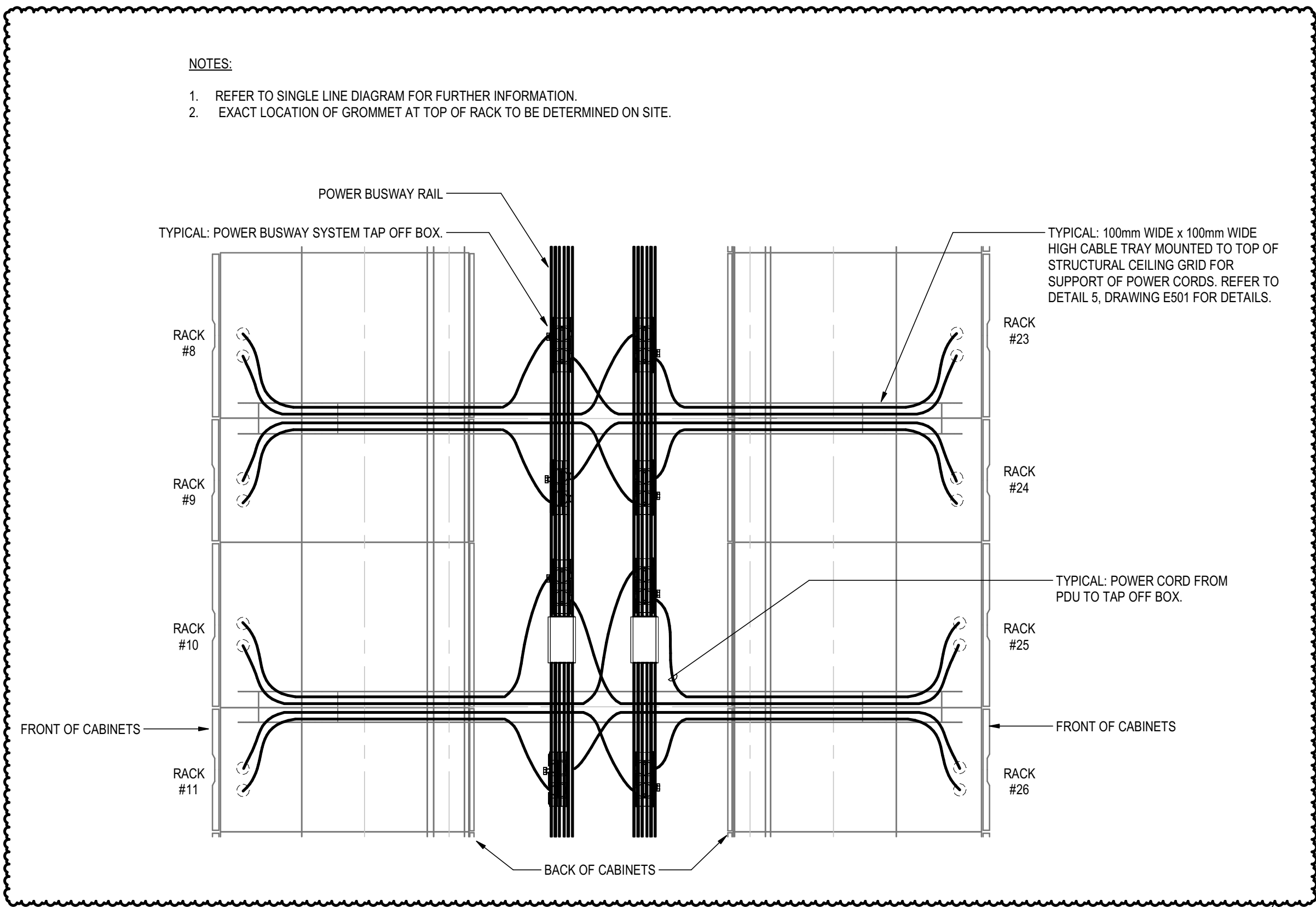


**VIEW B - WIRE BASKET TRAPEZE HANGER**



**NOTE:**

1. DOUBLE TIER CABLE TRAY INSTALLATION IS ONLY REQUIRED WITHIN THE HOT AISLE ENCLOSURE. ONLY ONE TIER OF CABLE TRAY TO BE INSTALLED OUTSIDE OF HOT AISLE ENCLOSURE TO MDF AND STAGING ROOMS.

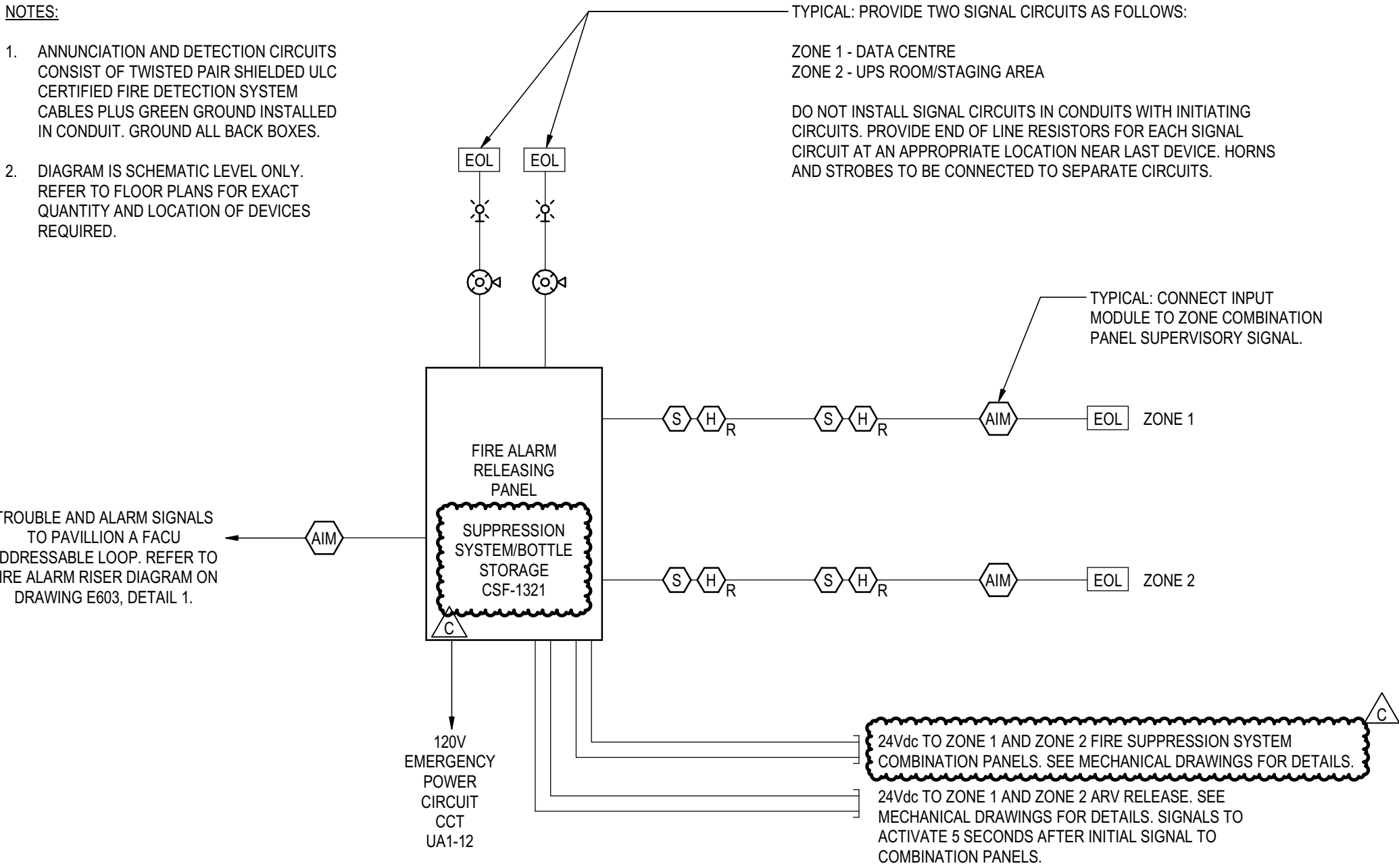


<div><div><div>A</div><div>B</div></div><div>A - DETAIL B - LOCATION/DRAWING No. C - DRAWING No.</div><div><div><div>A</div><div>B</div><div>C</div></div></div></div>		
No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11
<b>GENERAL NOTES</b>		
<ol style="list-style-type: none"><li>1. DRAWINGS TO BE READ AS A SET.</li><li>2. DO NOT SCALE FROM DRAWINGS</li><li>3. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS</li><li>4. ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.</li></ol>		
<div>Permit/Seal<div><div>PROVINCE OF NEWFOUNDLAND AND LABRADOR<div><div>pegnl</div><div>ENGINEERING PERMIT J0291</div></div><div>STANTEC CONSULTING LTD.<div>04642</div><div>Signature or Member Number (Member-in-Responsible Charge)</div></div></div><div><div>REGISTERED PROFESSIONAL ENGINEER AND LABORATOR</div><div><div>BERNIE ROJSON</div><div>2026-01-15</div></div><div>NEWFOUNDLAND &amp; LABRADOR</div></div></div></div>		
<div><div><div><div><div></div><div>Stantec</div></div></div><div>Stantec Consulting Ltd.<div>141 Kelsey Drive</div><div>St. John's, NL A1B 0L2</div><div>Tel: (709) 576-1458 • www.stantec.com</div></div><div>Copyright Reserved<div>The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.</div><div>The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.</div></div><div><div><div><div></div><div>MEMORIAL UNIVERSITY</div><div>Department of Facilities Management</div><div><i>This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.</i></div><div>- Dedication plaque, Arts &amp; Administration Building, St. John's Campus</div></div></div></div></div></div>		
<div>PROJECT NAME: <b>PRIMARY DATA CENTRE REPLACEMENT</b> CORE SCIENCE FACILITY ST. JOHN'S, NL  MUN Project #: CSF-004-23  DRAWING TITLE: <b>ELECTRICAL DETAILS</b></div>		
DESIGNED: MG/JD	DRAWN: MG/JD	
REVIEWED: -	APPROVED: BR	
SCALE: As indicated	DATE: SEPTEMBER, 2025	
STANTEC PROJECT No: 133412008	DRAWING No.: <b>E502</b>	



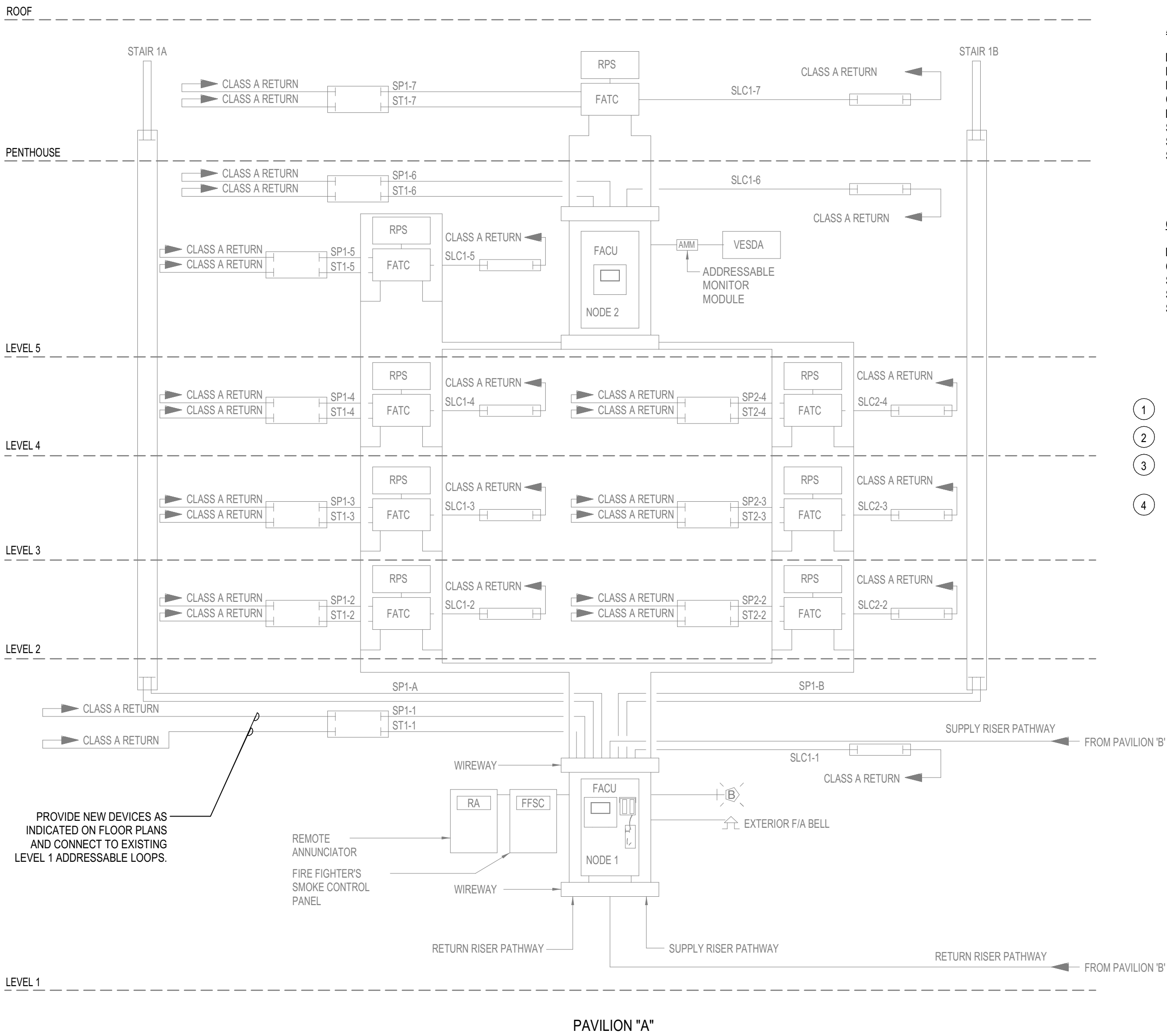






**3**  
E603 FIRE ALARM RELEASING PANEL  
N.T.S.

DETAIL OMITTED



ABBREVIATIONS

DVC DIGITAL VOICE BUS  
FACU FIRE ALARM CONTROL UNIT  
FATC FIRE ALARM TERMINAL CABINET  
COM NETWORK COMMUNICATION CIRCUIT  
RPS REMOTE POWER SUPPLY  
SLC SIGNALING LINE CIRCUIT  
SPK SPEAKER (AUDIO) CIRCUIT  
STR STROBE (VISUAL) CIRCUIT

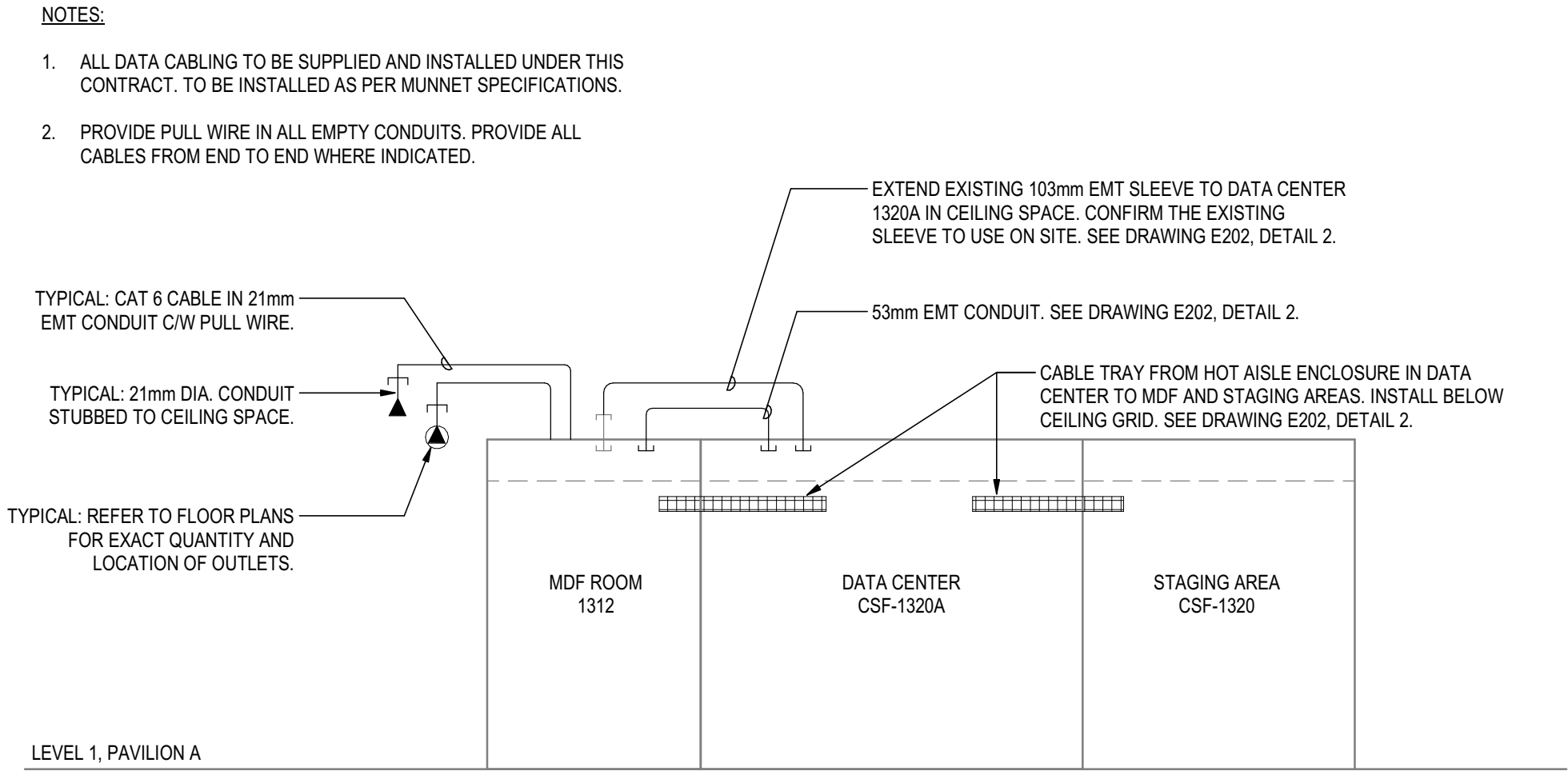
CIRCUIT PATHWAY CLASSIFICATION

DVC CLASS A  
COM CLASS X  
SLC CLASS A  
SPK CLASS A  
STR CLASS A

KEYNOTES:

- SHADED ITEMS INDICATE EXISTING INSTALLATIONS.
- ITEMS IN BOLD INDICATE NEW OR REVISED INSTALLATIONS.
- NEW FIRE ALARM DEVICES ARE TO BE COMPATIBLE WITH EXISTING FIRE ALARM SYTEM.
- FIRE ALARM SYSTEM TO BE RE-VERIFIED AFTER ALL NEW CONNECTIONS ARE COMPLETED.

**1**  
E603 PARTIAL EXISTING CSF FIRE ALARM RISER DIAGRAM - PAVILION A - REVISED  
N.T.S.



**2**  
E603 PARTIAL DATA RISER DIAGRAM  
N.T.S.

A  
B

A - DETAIL  
B - LOCATION/DRAWING No.  
C - DRAWING No.

A  
B  
C

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2024.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

GENERAL NOTES

1.

DRAWINGS TO BE READ AS A SET.

2.

DO NOT SCALE FROM DRAWINGS

3.

THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO SUBMISSION OF TENDERS

4.

ALL DEFICIENCIES FOUND IN THIS DRAWING IS TO BE BROUGHT TO THE ATTENTION OF THE FACILITIES ENGINEERING AND DEVELOPMENT OFFICE OF THE DEPARTMENT OF FACILITIES MANAGEMENT, MEMORIAL UNIVERSITY OF NEWFOUNDLAND PRIOR TO THE SUBMISSION OF THE TENDERS.

Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR

ENGINEERING PERMIT J0291

STANTEC CONSULTING LTD.

04642

Signature or Member Number (Member-in-Responsible Charge)

REGISTERED PROFESSIONAL ENGINEER

BERNIE ROJSON

2025-01-15

NEWFOUNDLAND & LABRADOR

Stantec

Stantec Consulting Ltd.  
141 Kelsey Drive  
St. John's, NL A1B 0L2  
Tel: (709) 576-1458 • www.stantec.com

Copyright Reserved

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

MEMORIAL UNIVERSITY

Department of Facilities Management

*This University was raised by the people of Newfoundland as a memorial to the fallen in the great wars, 1914-1918, 1939-1945, that in freedom of learning, their cause and sacrifice might not be forgotten.*

- Dedication plaque, Arts & Administration Building, St. John's Campus

PROJECT NAME:  
**PRIMARY DATA CENTRE REPLACEMENT**  
CORE SCIENCE FACILITY  
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:  
**FIRE ALARM AND DATA RISER DIAGRAM**

DESIGNED: MG/UD	DRAWN: MG/UD
REVIEWED: -	APPROVED: BR
SCALE: N.T.S.	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. <b>E603</b>

**PART 1**      **GENERAL**

**1.1**            **SUMMARY**

- .1    Section Includes
  - .1    General requirements relating to commissioning of project's components and systems, specifying general requirements for Installation Verification and Performance Verification of components, equipment, sub-systems, systems, and integrated systems.
- .2    Acronyms
  - .1    CxA – Commissioning Authority.
  - .2    Cx – Commissioning.
  - .3    EMCS – Energy Monitoring and Control Systems.
  - .4    O&M – Operation and Maintenance.
  - .5    PV – Performance Verification.
  - .6    TAB – Testing, Adjusting and Balancing.
  - .7    GC – General Contractor
  - .8    TSI – Technical Services Inspector

**1.2**            **COMMISSIONING INTENT**

- .1    Undertake Cx to bring the facility to a fully operational state and free of deficiencies in the most effective and timely manner available, ensuring the design intent is met by all systems.
- .2    Cx incorporates inspection and quality assurance activities as construction progresses, including start up, installation verification, performance verification, fine tuning, and operator training.
- .3    Bear all costs associated with the required personnel and test equipment as outlined in specification sections and CxA provided Cx Manual and all costs with organizing and managing the activities of the applicable subtrades as identified in this section.
- .4    Fully document all tests and inspections performed during the construction, at start up, installation verification and performance verification and fine tuning. Incorporate into final commissioning documentation.
- .5    Provide direct training to designated staff responsible for the operation and maintenance of the building equipment and systems.

**1.3            RELATED SECTIONS**

- .1      Section 01 45 00 - Quality Control.
- .2      Section 01 77 00 - Closeout Procedures.
- .3      Section 01 78 00 - Closeout Submittals.
- .4      Section 01 79 00.13 – Demonstration and Training for Building Commissioning.
- .5      Section 01 91 13.16 - Commissioning (Cx) Forms.

**1.4            COMMISSIONING OVERVIEW**

- .1      Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished project.
- .2      Cx is an intensive quality assurance process that begins at the beginning of the project and continues through to the first year of occupancy. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Representatives Project Requirements.
- .3      Cx activities supplement field quality and testing procedures described in relevant technical sections.
- .4      Cx ensures the built facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities include transfer of critical knowledge to facility operational personnel.
- .5      Complete inspection and verification activities as required by the specifications and CxA provided Cx Manual as construction progresses.
- .6      Take responsibility to:
  - .1      Review the Cx manual with the commissioning team.
  - .2      Complete all items as identified in the Cx manual. This includes work by subcontractors, test agencies, equipment representatives and manufacturer agents.
  - .3      Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with the Contract Documents.
  - .4      Correct deficiencies resulting from installation and performance verifications.

- .5     Test, adjust and balance equipment and systems identified in Divisions 2-44.
- .6     Submit the completed manual and project record documents as specified.
- .7     Update the documentation manuals prior to each project meeting.
- .7     The Substantial Completion Certificate will not be issued until the commissioning process is completed and the final reports and commissioning documentation are received.
- .8     The CxA shall prepare a Cx Manual that provides direction for the Cx process during construction, provides resolution for issues such as scheduling, roles and responsibilities, lines of communication and reporting, approvals and coordination.
- .9     The commissioning process shall be conducted in accordance with the principles and framework outlined in CSA Z320 – Building Commissioning – 2011 (R2021).
- .10    Integrated systems testing to be completed in accordance with CAN/ULC S1001 – Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems – 2011 (Rev 2)

## **1.5            COMMISSIONING TEAM**

- .1     The commissioning team shall consist of:
  - .1     Department Representative(s):
    - .1     Project Coordinator (PC).
    - .2     Engineer/Architect/Consultant (AE).
    - .3     Technical Services Inspectors (TSI).
  - .2     User Representatives/Owner's Representative.
  - .3     General Contractor (GC):
    - .1     Mechanical Contractor.
    - .2     Fire Protection Contractor.
    - .3     Controls Contractor (CC).
    - .4     Electrical Contractor.
    - .5     Fire Alarm Contractor.
    - .6     Security Systems Contractor.
    - .7     Communications Systems Contractor.
  - .4     Commissioning Authority (CxA).
  - .5     Manufacturer's Technicians.

- .6     Testing Agencies.
- .7     Design Consultant (DC).
- .2     Roles of the commissioning team shall be as follows:
  - .1     CxA (Commissioning Authority):
    - .1     CxA role shall be included in the GC contract scope of work.
    - .2     Reviews Owner's Representative's Project Requirements, and design documents at all stages of submittal and provides comments to the PC.
    - .3     Identifies Cx team members.
    - .4     Records all comments as history for the project commissioning.
    - .5     Produces the Commissioning Manual for review by the PC and DC and modifies based on their comments as necessary.
    - .6     Provides "Issued for Construction" Commissioning Manual to the PC.
    - .7     Provides guidance on the Commissioning Process, and responsibilities of Commissioning Team members.
    - .8     Reviews contractor shop drawings for related commissioning information.
    - .9     Coordinates and chairs (in person or via teleconference) the commissioning kick-off meeting and progress meetings.
    - .10    Prepares and distributes the meeting agenda and minutes.
    - .11    Attends (when necessary) Installation Verification.
    - .12    Reviews completed Installation Verification checklists and signs off.
    - .13    Attends Performance Verification and signs off on check lists.
    - .14    Attends Owner's Representative training sessions.
    - .15    Verifies that training is complete.
    - .16    Reviews completed Cx manual.
    - .17    Prepares Summary Commissioning Report and submits to the PC.
    - .18    Prepares letter for PC indicating acceptance of the completed commissioning activities.
    - .19    Verifies that seasonal or deferred Commissioning is completed.
    - .20    Coordinates ten (10) month building review and issues occupant survey.



- .2 GC (General Contractor):
  - .1 Maintains as-built drawings on site during construction.
  - .2 Submits shop drawing in accordance with the specifications.
  - .3 Ensures the Cx Manual is on site and being completed and kept up to date by all sub-trades.
  - .4 Executes the Cx process ensuring that sub-trades perform their responsibilities and integrate Cx into the construction process.
  - .5 Ensures equipment manufacturers and vendors provide documentation to facilitate the Commissioning work and perform startups.
  - .6 Coordinates and schedules Cx activities with the CxA, submits schedule for review and comment by PC.
  - .7 Conducts Installation Verification and signs off checklists.
  - .8 Provides written confirmation all systems are operational prior to start of Performance Verification.
  - .9 Conducts Performance Verification with all required Commissioning Team members present.
  - .10 Ensures that all required personnel are available for the verification.
  - .11 Maintains an up-to-date version of the Cx manual on site with checklists completed on installed/operational systems.
  - .12 Provides all required training.
  - .13 Coordinates location, schedule.
  - .14 Provides facilities (location, materials).
  - .15 Ensures qualified factory-trained technicians are available to facilitate training.
  - .16 Provides copies of all training material.
  - .17 Obtains occupancy approvals/permits.
  - .18 Submits completed manual to CxA.
  - .19 Provides the following information for inclusion in the Commissioning Summary Report.
    - .1 Training Records.
    - .2 Operation and Maintenance Manuals.
    - .3 Warranties.
    - .4 Completed commissioning Checklists.
    - .5 List of spare parts turned over.
  - .20 Supplies maintenance materials and tools as per specification.
  - .21 Attends all commissioning meetings.

- .3 PC (Project Coordinator):
  - .1 Main Owner's Representative contact for CxA during construction phase.
  - .2 Forwards the CxA provided Cx Manual for review by the DC, receives comments and issues them to the CxA.
  - .3 Coordinates Cx schedule with CxA for Installation Verification and Performance Verification and ensures all TI representatives are available to witness testing as required for Installation Verification and Performance Verification.
  - .4 Coordinates training schedules with CxA for Owner's Representative staff.
  - .5 Attends Installation Verification and Performance Verification demonstrations.
  - .6 Ensures Cx manual is on site and kept up to date by the GC.
  - .7 Verifies maintenance materials are provided by the GC as per the contract documents.
  - .8 Ensures GC is maintaining as-built drawings on site during construction.
  - .9 Attends training sessions as necessary and directed by the PC.
  - .10 Attends all commissioning meetings.
  - .11 Coordinates ten (10) month building review and issues occupant survey
- .4 TSI (Technical Services Inspector):
  - .1 Attends Installation Verification and Performance Verification for equipment within their discipline.
  - .2 Signs off on commissioning checklists within their discipline.
  - .3 Attends training sessions as necessary and directed by the PC.
  - .4 Attends all commissioning meetings.
- .5 Sub Trades:
  - .1 Demonstrates correct system performance.
  - .2 Perform commissioning duties as directed by the GC and CxA.
- .6 DC (Design Consultant):
  - .1 Reviews the Owner's Representative Project Requirements and provides comment to the PC.
  - .2 Reviews drafts of the Cx Manual, including the installation and Performance Verification checklists, and provides comments to the PC.

- .3 Incorporates commissioning specification into the project documents.
- .4 Reviews contractor shop drawing submittals.
- .5 Attends periodic site visits to ensure systems meet the design intent and operate as outline in the specifications.
- .6 Attends and signs off checklist for Installation Verification.
- .7 Attends Performance Verification and signs off on checklists for the appropriate discipline.
- .8 Attends training as required.
- .9 Attends commissioning meetings.
- .10 Attends ten (10) month building review activities.
- .7 Owner's Representative:
  - .1 Produces the Owner's Representative Project Requirements and submits to the PC.
  - .2 Reviews all design documents and provides comments to the PC.
  - .3 Coordinates maintenance staff participation in Cx activities.
  - .4 Reviews O&M documentation and attends training.
  - .5 Attends all training sessions.
  - .6 Receives and retains a copy of the Commissioning Summary Report.
  - .7 Provides maintenance representatives to facilitate the ten (10) month building review as necessary.
  - .8 Attends commissioning meetings as necessary.

## **1.6 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS**

- .1 During Cx, should equipment, system components, and associated controls be identified as incorrectly installed, malfunctioning or not performing as per specifications, the contractor shall correct deficiencies, re-verify equipment and components within the system, including related systems as deemed necessary by the Owner's Representative, to ensure effective and accurate operation.
- .2 Minor deficiencies may be corrected at the time of identification. For systems requiring major repairs, the Commissioning Team shall move on to the next system to be commissioned. The Contractor shall notify the PC when the work is complete.
- .3 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor.

**1.7            CONFLICTS**

- .1      Report conflicts between requirements of this section, other sections, and the Cx Manual to the PC to obtain clarification prior to the start of work.
- .2      Failure to report conflict and obtain clarification will result in application of most stringent requirement.

**1.8            SUBMITTALS**

- .1      Prior to starting Cx the Contractor shall provide a set of equipment and system submittals. These submittals are supplemented by the installation and start-up procedures, O&M data, performance data, control drawings and any changes that may affect commissioned systems.
- .2      Submit no later than four (4) weeks after award of Contract:
  - .1      Name of Contractor's CxA (Commissioning Authority).
  - .2      Preliminary Cx schedule. Submit final Cx schedule to PC for review prior to performance verification.
  - .3      Submit the names of all personnel for approval by the PC. Designate who has managerial responsibilities for coordination of installation verification and performance verification.
  - .4      Submit documentation to confirm personnel compliance with quality assurance provisions.
- .3      Any changes to the information submitted must be re-submitted. Ensure certified trades persons, certified testing agencies and/or factory authorized personnel participate in commissioning tasks.
- .4      Prior to the start of Performance Verification:
  - .1      Submit TAB report to PC for review.
  - .2      Submit start-up documentation to PC for review.
  - .3      Submit completed Installation Verification checklists.
- .5      Fifteen (15) days prior to application for Substantial Completion:
  - .1      Submit three (3) copies of final commissioning manual and applicable forms to the PC for review.
  - .2      Submit reports of performance verifications postponed due to seasonal, climatic, occupancy, or other reasons beyond the Contractor's control, promptly after execution of those services.
- .6      Ensure each form bears the required signatures as indicated on the form.
- .7      Submit as-built drawings, schematics, O&M manuals, maintenance materials and warranties to PC for review.

- .8     Where structurally attached equipment is included in the scope of work, engage a third party Professional Structural Engineer, licensed to practice in the Province of Newfoundland and Labrador, for submission of stamped and signed shop drawings indicating acceptable mounting procedures for all equipment which is suspended, mounted or otherwise attached, as per Section 01 33 00 – Submittal Procedures. The Structural Engineer to also verify correct installation of the equipment.

## **1.9            COMMISSIONING DOCUMENTATION**

- .1     Refer to Section 01 91 13.16 - Commissioning (Cx) Forms for requirements and instructions for use.
- .2     Checklists will be provided by the Contractor during the construction stage.
- .3     Installing subcontractors are to date and initial the checklists as construction and verifications are completed.
- .4     The CxA is to submit completed checklists to the PC for review and acceptance.
- .5     Once all documents have been reviewed and accepted the general contractor shall submit final commissioning documents in electronic form (PDF) and original signed copies.

## **1.10          COMMISSIONING SCHEDULE**

- .1     Submit preliminary Cx schedule in Gantt Chart format to PC no later than four (4) weeks after award of contract.
- .2     Submit final Cx schedule in Gantt Chart format to PC for review four (4) weeks prior to performance verification.
- .3     Provide adequate time for Cx activities prescribed in technical sections, commissioning sections and the Cx manual including all on site activities as well as documentation procedures. Time should be allowed for re-verification should any system be rejected upon completion of initial verification.
- .4     Provide adequate time for training.

## **1.11          COMMISSIONING MEETINGS**

- .1     The GC will convene Cx meeting consisting of all members of the design and construction teams to address building systems to be commissioned. Items to be discussed will include commissioning requirements, completion and start-up schedules, and roles and responsibilities.



- .2 CxA to make necessary updates and changes to the Cx Manual and deliver to the PC.
- .3 Convene Cx meetings following project meetings and as specified herein to resolve issues, monitor progress and identify deficiencies relating to Cx.
- .4 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
- .5 At 60% construction completion stage CxA to call a separate Cx meeting to review progress, discuss schedule of equipment start-up activities and prepare for Cx. Issues at meeting to include:
  - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
  - .2 Determine the degree of involvement of trades and manufacturer's representatives in the commissioning process.
- .6 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.
- .7 Meetings will be chaired by the CxA, meeting minutes will be prepared and issued by the CxA. Clarifications to the minutes must be submitted within 5 days of issue, after which, the issued set becomes the official project record.
- .8 Ensure subcontractors and relevant manufacturer representatives are present at 60% and subsequent Cx meetings and as required.

#### **1.12 STARTING AND TESTING**

- .1 Contractor assumes liabilities and costs for inspections, including disassembly and re-assembly after approval, starting, testing and adjusting, and supply of testing equipment, and all associated costs of installation and performance verification.

#### **1.13 WITNESSING OF STARTING AND TESTING**

- .1 Provide twenty-eight (28) days' notice prior to commencement.
- .2 Owner's Representative to witness start-up and testing.
- .3 Contractor's CxA (Commissioning Authority) to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

**1.14 MANUFACTURER'S INVOLVEMENT**

- .1 The Contractor shall obtain manufacturers installation, start-up and operations instructions prior to start-up of components, equipment and systems.
  - .1 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.
  - .2 Modify procedures detrimental to equipment performance and review same with manufacturer before start-up.
- .2 Integrity of warranties:
  - .1 Use manufacturers trained start-up personnel where specified elsewhere in other divisions or required to maintain integrity of warranty.
  - .2 Verify with manufacturer that testing as specified will not void warranties.
- .3 Qualifications of manufacturer personnel:
  - .1 Experienced in design, installation and operation of equipment and systems.
  - .2 Ability to interpret test results accurately.
  - .3 Ability to report results in a clear, concise, logical manner.

**1.15 PROCEDURES**

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting Performance Verification.
- .2 Conduct Commissioning in following distinct phases:
  - .1 Included in delivery and installation:
    - .1 Verification of conformity to specification, approved shop drawings and completion of product information report forms.
    - .2 Visual inspection of quality of installation.
  - .2 Installation Verification: follow accepted start-up procedures.
  - .3 Performance Verification: document equipment performance. Include repetition of tests after correcting deficiencies.
  - .4 Post-substantial performance verification: to include fine-tuning.
- .3 Correct deficiencies and obtain approval from PC after distinct phases have been completed and before commencing next phase.
- .4 Document required tests on checklists provided in the contractor supplied Cx Manual as well on any supplied Manufacturer forms.

- .5 Failure to follow accepted Commissioning Processes will result in re-evaluation of equipment by an independent testing agency selected by PC. If results reveal that equipment Commissioning Process was not in accordance with requirements, and resulted in damage to equipment, implement following:
  - .1 Minor equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by PC.
  - .2 Major equipment/systems: If evaluation report concludes that major damage has occurred, PC shall reject equipment to be removed from site and replaced with new.
  - .3 Subject new equipment/systems to specified Commissioning Process

#### **1.16 COMMISSIONING DOCUMENTATION**

- .1 Assemble Installation Verification documentation and submit to PC for approval before commencement of Performance Verification.
- .2 Installation Verification documentation to include:
  - .1 Factory and on-site test certificates for specified equipment.
  - .2 Inspection reports.
  - .3 Signed Installation Verification check lists.
  - .4 Start-up reports.
  - .5 Step-by-step description of complete start-up procedures, to permit the CxA to repeat start-up at any time.

#### **1.17 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS**

- .1 After Performance Verification, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 With assistance of manufacturer develop written maintenance program and submit to PC for approval before implementation.
- .3 Operate and maintain systems for minimum twenty one (21) days for commissioning to be completed.
- .4 After completion of commissioning, operate and maintain systems until issuance of Substantial Completion

#### **1.18 TEST RESULTS**

- .1 If start-up, testing and/or performance verification produce unacceptable results, repair, replace or repeat specified starting and/or performance verification procedures until acceptable results are achieved.

- .2 Provide personnel, resources and materials, assume all costs for re-verification.

#### **1.19 INSTRUMENTS / EQUIPMENT**

- .1 Submit to PC for review and approval:
  - .1 Complete list of instruments proposed to be used.
  - .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
- .2 Provide all required equipment to complete commissioning.
- .3 Provide all Arc Flash Personal Protective Equipment as required. Provide commissioning personnel with the appropriate Arc Flash Protection training.

#### **1.20 PERFORMANCE VERIFICATION**

- .1 Notify PC at least twenty eight (28) days prior to start of Performance Verifications.
- .2 Start Performance Verification after elements of building affecting start-up and performance verification of systems have been completed.
- .3 Ensure all HVAC systems have been thoroughly cleaned.
- .4 Conduct performance verification once identified pre-requisite activities are completed for a system and approved by the CxA.
- .5 Test all building systems including architectural, structural, civil, mechanical and electrical components and operating procedures by challenging these systems to realistic operating conditions and train operational staff.
- .6 Run systems through all sequences of operation and verify response of components.
- .7 Notwithstanding all-inclusive requirements specified in this section, additional separate commissioning may be required at a later date for equipment and systems whose full operation is dependent on seasonal conditions. Job conditions for Peak Performance Verification are as follows:
  - .1 Summer sequence commissioning to take place between June 1<sup>st</sup> and September 15<sup>th</sup> when outside ambient temperatures are at least 22°C;

- .2 Winter sequence commissioning to take place between November 1<sup>st</sup> and March 31<sup>st</sup> when outside ambient temperature is no greater than minus 10°C.
- .8 Carry out Cx:
  - .1 Under actual operating conditions, over entire operating range, in all modes.
  - .2 On independent systems and interacting systems.
- .9 Cx procedures to be repeatable and reported results are to be verifiable.
- .10 Follow equipment manufacturer's operating instructions.
- .11 EMCS trending to be available as supporting documentation for performance verification.
- .12 CxA to obtain all documentation, including updated points list, controls sequences and setpoints. At completion of commissioning, scan completed manuals to electronic PDF format as required and submit to PC.

#### **1.21 WITNESSING COMMISSIONING**

- .1 CxA along with designated representatives to witness activities and verify results.

#### **1.22 AUTHORITIES HAVING JURISDICTION**

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 If the CxA is not available to witness, the certificates of approval from the Authority Having Jurisdiction will be accepted as adequate.
- .3 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.

#### **1.23 REPEAT VERIFICATIONS**

- .1 Assume costs incurred by Owner's Representative's Commissioning representatives for second and subsequent verifications where:
  - .1 Verification of reported results fails to receive PC's approval.
  - .2 Repetition of second verification again fails to receive approval.



- .3 PC deems Contractor's request for second verification was premature.

#### **1.24 DEFICIENCIES, FAULTS, DEFECTS**

- .1 Report problems, faults or defects affecting Cx to the Owner's Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from PC.
- .2 Correct deficiencies found during start-up and Cx to satisfaction of PC.

#### **1.25 COMPLETION OF COMMISSIONING**

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Except for warranty and seasonal verification activities, complete Cx prior to application for Substantial Completion.
- .3 Cx to be considered complete when all Cx deliverables have been submitted and accepted by PC.
- .4 The CxA is to compile a Final Commissioning Report summarizing all tasks, findings and documentation of the commissioning process. The Final Commissioning Report is to incorporate all test reports by sub-contractors, manufacturer's and controlling authorities including the following list. The Contractor shall turn over all materials per this specification.
  - .1 Evaluation of operating condition of the systems at the time of functional test completion.
  - .2 Deficiencies that were discovered and measures taken to correct them.
  - .3 Functional test procedures and results.
  - .4 Documentation of all commissioning field activities as they progressed.
  - .5 Description and estimated schedule of required deferred testing.
- .5 The Contractor to provide O&M manuals, maintenance materials, warranties and training records.

#### **1.26 ACTIVITIES UPON COMPLETION OF COMMISSIONING**

- .1 When changes are made to baseline components or system settings established during Cx process notify the CxA. The CxA will update and provide Cx forms for affected item.

**1.27 TRAINING**

- .1 In accordance with Section 01 79 00.13 – Demonstration and Training for Building Commissioning, the Cx Manual and respective technical sections.

**1.28 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS**

- .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract. Provide transmittal documenting all materials provided.

**1.29 OCCUPANCY**

- .1 Cooperate fully with PC during stages of acceptance and occupancy of facility.

**1.30 PERFORMANCE VERIFICATION TOLERANCES**

- .1 Application tolerances:
  - .1 Specified range of acceptable deviations of measured values from specified values or specified design criteria, except for special areas, to be within +/- 5 % of specified values.
- .2 Instrument accuracy tolerances:
  - .1 To be of higher order of magnitude than equipment or system being tested.
- .3 Measurement tolerances during verification:
  - .1 Unless otherwise identified, recorded values to be within +/- 2 % of specified values.

**1.31 OWNER'S REPRESENTATIVE'S PERFORMANCE TESTING**

- .1 Performance testing of equipment or system by CxA will not relieve Contractor from compliance with specified start-up and testing procedures.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION**

**3.1 SCHEDULE**

- .1 Provide a detailed schedule as per this section for on-site verification activities by the commissioning team based on the Cx Manual provided by

the contractor. Be responsible for resource allocation respecting the exact number and duration for personnel required to perform the tasks required.

- .2 This schedule shall be submitted with the general construction schedule monthly. The level of detail shall increase as the construction progresses.

### **3.2 COMMISSIONING TASKS**

- .1 Refer to the Cx Manual provided by the contractor for a list of tasks to be conducted for the commissioning process. Further specifics are provided within applicable specification sections.

**END OF SECTION**

**PART 1**      **GENERAL**

**1.1**            **RELATED SECTIONS**

- .1      Section 01 33 00 – Submittal Procedures.
- .2      Section 01 43 39 – Mock Up Requirements.
- .3      Section 01 45 00 – Quality Control.
- .4      Section 07 84 00 – Firestopping.

**1.2**            **REFERENCES**

- .1      American Society for Testing and Materials (ASTM)
  - .1      ASTM E-84, Surface Burning Characteristics of Building Materials.
  - .2      ASTM E-136, (Noncombustibility) Behaviour of Materials in Vertical Tube Furnace at 750 ° C.
  - .3      ASTM E-605, Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - .4      ASTM E-736, Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - .5      ASTM E-759, Effect of Deflection of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - .6      ASTM E-760, Standard for Effect of Impact on Bonding of Sprayed Fire Resistive Materials Applied to Structural Members.
  - .7      ASTM E-761, Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - .8      ASTM E-859, Standard of Air Erosion of Sprayed Fire Resistive Materials Applied to Structural Members.
  - .9      ASTM E-937, Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
  - .10     ASTM G-21, Standard for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- .2      National Fireproofing Contractors Association (NFCA)
  - .1      NFCA – 100, Standard Practice for the Application of Spray-Applied Fire Resistive Materials.
  - .2      NFCA – 200, Field Quality Assurance Procedures for Application of Spray-Applied Fire Resistive Materials.
- .3      Underwriters Laboratories of Canada (ULC)

- .1 CAN/ULC-S101, Standard Method of Fire Endurance Tests of Building Construction and Materials.
- .2 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

### **1.3 SCOPE OF WORK**

- .1 The work under this section includes, but not necessarily limited to, fireproofing of the structural steel and deck in the locations indicated.
- .2 Examine all of the contract documents for requirements which affect work of this section. Other sections which directly relate to the work of this section include, but are not limited to, the following:
  - .1 Section 05 12 23 - Structural Steel for Buildings.
  - .2 Section 05 21 00 – Steel Joist Framing.
  - .3 Section 05 31 00 – Steel Decking.
  - .4 Section 07 84 00 – Fire Stopping.
  - .5 Mechanical – Re: Patching.
  - .6 Electrical – Re: Patching.

### **1.4 SUBMITTALS**

- .1 Test Reports:
  - .1 Submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.
  - .2 Submit test results in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
  - .3 For assemblies not tested and rated, submit proposals based on related designs using accepted fireproofing design criteria.
- .2 Shop Drawings: Submit framing plans, schedules indicating the following:
  - .1 Extent of fireproofing for each construction and fire-resistance rating.
  - .2 Applicable fire-resistance design designations of a qualified testing and inspection agency acceptable to authorities having jurisdiction.
  - .3 Minimum fireproofing thickness needed to achieve required fire-resistance rating of each structural component and assembly.
- .3 Submit 300 x 300 mm size sample of exposed fireproofing for approval of texture and coating.



### **MOCK-UPS**

- .4 Erect mock-up in accordance with Section 01 43 39 – Mock Up Requirements.
- .5 Apply fireproofing to approximately 10 m<sup>2</sup> area of surfaces of mock-up-matching surface to be treated.

## **1.5 PROTECTION**

- .1 Do not apply fireproofing when ambient or substrate temperatures are 7° C or lower, unless temporary protection and heat are provided to maintain temperature at or above this level 24 hours before, during, and 24 hours after product application.
- .2 Ventilate building spaces during and after application of fireproofing, providing complete air changes according to manufacturer's written instructions. Use natural ventilation, and if natural ventilation is insufficient, employ mechanical means as necessary.
- .3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing materials.
- .4 Surfaces to be sprayed must be free of any substance that would impair proper adhesion.
- .5 The contractor shall make available to the fireproofing contractor suitable area(s) for permanent locations for mixing and pumping fireproofing. This area must:
  - .1 Be convenient to the structure.
  - .2 Be able to accommodate delivery of the product.
  - .3 Allow for space for truck storage and trailer parking, and for materials and equipment.
  - .4 Be well drained.
  - .5 Be near a suitable source of potable water.
  - .6 Have a proper source of electrical power, if required.
  - .7 Provide temporary heat and ventilation to comply with manufacturer's recommendations.

## **1.6 QUALITY ASSURANCE**

- .1 Installer Qualifications: Contractor shall be certified, licensed or otherwise qualified by fireproofing manufacturer, and be experienced installing specified products, with minimum five (5) years documented experienced.

- .2 Manufacturer's representative:
  - .1 Inspect fireproofing system at the start of construction, midway and as required for commissioning. Additional inspections may be carried out at the discretion of the Fireproofing System Manufacturer.
  - .2 Provide technical assistance where required in correct installation of roofing system.
- .3 Obtain spray applied fireproofing products from a single source for each product required. Provide secondary materials, acceptable to the fireproofing manufacturer, which are included in the tested and/or listed designs.
- .4 Provide fireproofing materials that have been listed and classified by one or more of the following testing materials:
  - .1 Underwriters Laboratories (UL).
  - .2 Underwriters Laboratories of Canada (ULC).
  - .3 ITS (formerly Warnock Hersey), and
  - .4 Other testing and inspecting agencies acceptable to the Owner and authorities having jurisdiction.
  - .5 All products must be packaged with proper identifications and approval indications acceptable to the testing and/or listing agency.
- .5 Manufacturer shall provide Certification that products supplied are 100% asbestos free.
- .6 Steel Surfaces:
  - .1 Structural steel and steel decking shall be unprimed.
  - .2 Steel surfaces that are painted and/or primed shall meet UL requirements for application and adhesion characteristics. Provide certifications from fireproofing manufacturer of compatibility of fireproofing and painted systems. Restrictions published by UL shall apply.
  - .3 Steel surfaces with incompatible primers or paint shall be remedied by removal of primer or paint, be lathed, otherwise remedied within the requirements of UL, so that adequate and approved bonding can occur, acceptable to authorities having jurisdiction.
- .7 NFCA 200 – Field Quality Assurance Procedures for Application of Spray-Applied Fire Resistive Materials, shall be followed to help ensure that material application meets design requirements for substrate conditions, water control, wet density and thickness.

- .8 Special inspections may be conducted by an Owner engaged ICC Certified Special Inspector for SFRM to perform code mandated inspections following SFRM application.

## **1.7 SEQUENCING**

- .1 Sequence and coordinate application of fireproofing with other related work specified in other sections to comply with the following requirements:
  - .1 Provide temporary enclosures for interior applications to prevent deterioration of applied materials exposed to unfavorable environmental conditions.
  - .2 Avoid exposure of fireproofing to unnecessary damage abrasion.
  - .3 Do not apply fireproofing to metal roof deck until roofing is complete including installation of all air handling systems. Prohibit all roof traffic until application of fireproofing is completed and dry.
  - .4 Do not apply fireproofing until all hangers, clips and other necessary supports are in place, requiring penetration of fireproofing.
  - .5 Ducts, piping and other items that would interfere with the application of fireproofing shall not be installed, until application is complete.

## **1.8 WARRANTY**

- .1 Provide a written guarantee, executed by the Contractor and cosigned by the installer, and issued in the name of the Owner, agreeing to repair or replace sprayed fireproofing materials that fall within one (1) year from the date of Substantial Certificate of Completion.
  - .1 Failures include, but are not limited to, cracking, flaking, eroding in excess of specified requirements, peeling and delamination of sprayed fireproofing from substrates due to defective materials or installation.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials in manufacturer's unopened packages, identified as to trade name, type and other identifying data. Packaging shall bear the ULI or ITS labels and seals for fire resistance ratings.
- .2 Store materials at a temperature above 4° C in a dry location, protected from the weather.
- .3 Damaged packages found unsuitable for use and any materials which have come into contact with contaminants prior to use shall be rejected and removed from site.

**PART 2**      **MATERIALS**

**2.1**            **GENERAL**

- .1      Supply and install fireproofing and acoustical treatment to the steel in the locations and to the extent as shown on the Drawings.

**2.2**            **PERFORMANCE CRITERIA**

- .1      Adhesion: Provide materials that meet or exceed adhesion requirements in accordance with [ASTM E736/E736M](#)
- .2      Thickness and Weight: Determine application thickness and weight of applied fireproofing based on tests of assemblies in accordance with CAN/ULC-S101. Apply same thickness of fireproofing material to all structural components forming a part of the assembly including; but not limited to, cross bracing, support angles and hangers.
- .3      Only assemblies that have been tested in accordance with Limit States Design method are acceptable. Assemblies that require use of a Load Restricted factor in accordance with Working Stress Design methods are not acceptable.
- .4      Engineered Judgements: Provide engineered judgement acceptable to authority having jurisdiction (AHJ) where the protected assembly differs from the tested assembly used to determine thickness.
- .5      Spray-applied fireproofing must not crack, spall or delaminate under downward deflection conditions over a 3 m clear span.
- .6      Fungal Resistance: To [ASTM G21](#), 28 days no growth.
- .7      Air Erosion: To [ASTM E859/E859M](#), maximum 0.25 gram loss per square meter in 24 hours.
- .8      Provide materials containing no asbestos.
- .9      Spray-applied fireproofing must not contribute to corrosion of test panels.

**2.3**            **FIREPROOFING MATERIAL**

- .1      Fireproofing: medium density gypsum cement-based spray applied fire resistive materials comprised of cement binders and lightweight aggregates with the following characteristics:
  - .1      ULC certified and meeting the ULC Design for the Fire Rating indicated.

- .2 Fire Rating: 120MIN.as indicated.
- .3 Cohesion/Adhesion: minimum 19 kPa based on field testing, to ASTM E-736
- .4 Deflection: No cracks or delamination, to ASTM E-759.
- .5 Corrosion Resistance: does not promote corrosion of steel, to ASTM E-937.
- .6 Sound Absorption: 0.85 NRC at 13 mm thickness.
- .7 Density: minimum 350 kg/m<sup>3</sup>, to ASTM E-605.
- .8 Compressive Strength: minimum 800 kPa, to ASTM E-761.
- .9 Combustibility: noncombustible, to CAN/ULC-S114.
- .10 Surface Burning: flame spread – 0, smoke development – 0, to ATSM E-84.
- .11 Air Erosion: 0.00 g/m<sup>2</sup>, to ASTM E-859.
- .12 Thickness: as indicated.

## **2.4 MISCELLANEOUS MATERIALS**

- .1 Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:
  - .1 Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - .2 Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in ULC's Fire Resistance Directory or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E-736.
- .2 Bonding agent as approved by fireproofing manufacturer and complying with requirements in ULC's Fire Resistance Directory or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- .3 Expanded metal lath fabricated from material of weight, configuration and finish required, according to fire-resistance designs indicated and fireproofing manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required at attach lath to substrates and to receive fireproofing.
- .4 Glass or carbon-fibre reinforcing fabric to type, weight and form required to comply with fire-resistance designs indicated, approved and provided by fireproofing manufacturer.



- .5 Metallic reinforcing mesh of type, weight and form required to comply with fire-resistance designs indicated, approved and provided by fireproofing manufacturer. Include pins and attachment.
- .6 Curing Compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.
- .7 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.
- .8 Provide factory added mold inhibitor tested in accordance with ASTM G-21 for areas such as hospitals, testing laboratories, health facilities and other areas if hygienic requirements.
- .9 Use top coats as required and recommended by fireproofing manufacturer or compatible products.

## **2.5 FIRESTOPPING**

- .1 Supply and install fire stopping for all openings and gaps in walls and floors designated as fire separations. Refer to Section 07 84 00 - Firestopping.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Substrate shall be free of material, which would impair bond.
- .2 Verify that painted substrate are compatible and have suitable bonding characteristics to receive fireproofing.
- .3 Remove incompatible materials.
- .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
- .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed. Clean flaking and rust from structural steel by sand blasting as required.

### **3.2 APPLICATION**

- .1 Use trowelled on application for repair and patching.

- .2 Apply bonding adhesive or primer to substrate if recommended by manufacturer.
- .3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.
- .4 Apply fireproofing directly to open web joists without use of expanded lath.
- .5 Tamp smooth, surfaces visible in finished work or as indicated.
- .6 Apply curing compound to surface of cementitious fireproofing as required by manufacturer.

### **3.3 CLEANING AND PROTECTING**

- .1 Immediately after completing spraying operations in each containable area of the Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- .2 Protect fireproofing according to advice of manufacturer and installer, from damage resulting from construction operations or other causes, so fireproofing will be without damage or deterioration at time of Substantial Completion.

### **3.4 PATCHING AND REPAIRING**

- .1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.
- .2 Repair fireproofing by reapplying using same method as original installation or using manufacturer's recommended trowel-applied product.

### **3.5 FIRE SEPARATIONS**

- .1 Coordinate fire separation labelling/stenciling as per Sections 09 91 23 – Interior Painting and 09 01 90.63 – Interior Re-Painting.

**END OF SECTION**

**PART 1**      **GENERAL**

**1.1**            **RELATED SECTIONS**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .3      Section 07 21 20 – Low Expanding Foam Sealant.
- .4      Section 07 92 00 - Joint Sealants.
- .5      Section 08 71 00 - Door Hardware.
- .6      Section 08 80 00 – Glazing.
- .7      Section 09 91 23 - Interior Painting.
- .10     Division 26: Wiring for electronic hardware.

**1.2**            **REFERENCES**

- .1      American Society for Testing and Materials (ASTM)
  - .1      ASTM A653/A653M, Specification for Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot Dip Process.
- .2      Canadian General Standards Board (CGSB)
  - .1      CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
  - .2      CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.
- .3      Canadian Standards Association (CSA)
  - .1      G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2      CSA W59, Welded Steel Construction (Metal Arc Welding).
- .4      Canadian Steel Door Manufacturers' Association, (CSDMA).
  - .1      CSDMA, Specifications for Commercial Steel Doors and Frames.
  - .2      CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors.
- .5      National Fire Protection Association (NFPA)

- .1 NFPA 80, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN4-S104M, Fire Tests of Door Assemblies.
  - .2 CAN4-S105M, Fire Door Frames Meeting the Performance Required by CAN4-S104.
  - .3 CAN/ULC-S701, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .4 CAN/ULC-S702, Thermal Insulation, Mineral Fibre, for Buildings.
  - .5 CAN/ULC-S704, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

### **1.3 DESIGN REQUIREMENTS**

- .1 Design door assembly to withstand minimum 1,000,000 swing cycles in accordance with ANSI A151.1, with no failure of any design features of the door.
- .2 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .3 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
- .4 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 and NFPA 252 for ratings specified or indicated.
- .5 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and NFPA 252 and listed by nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

### **1.4 SUBMITTALS**

- .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware and fire rating and finishes.
- .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing firerating and finishes.

- .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .4 Submit one 300 x 300 mm top corner sample of each type door.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.
- .1 Show butt cutout, glazing stops.

## **1.5 DELIVERY STORAGE AND HANDLING**

- .1 Deliver, store, handle and protect doors and frames in accordance with Section 01 61 00- Common Product Requirements.
- .2 Deliver, handle and store doors and frames at the job site in such a manner as to prevent damage.
- .3 Store doors and frames under cover with doors stored in a vertical position on blocking, clear of floor and with blocking between doors to permit air circulation.

## **1.6 QUALITY ASSURANCE**

- .1 Conform to requirements to ANSI A117.1
- .2 Company specializing in manufacturing products specified with a minimum of five (5) years documented experience.

## **1.7 WARRANTY**

- .1 Provide a written warranty for work of this section from manufacturer for failure due to defective materials and from contractor for failure due to defective installation workmanship, for one (1) year respectively from the date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A653/A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/A653M, ZF75.



## **2.2 DOOR CORE MATERIALS**

- .1 Stiffened: face sheets welded insulated core.
  - .1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m<sup>3</sup>.
  - .2 Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m<sup>3</sup>.
- .2 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.
- .3 Thermal Insulation material must:
  - .1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.
  - .2 Be manufactured using a process that uses chemical compounds with the minimum zone depletion potential (ODP) available.

## **2.3 ADHESIVES**

- .1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

## **2.4 PRIMER**

- .1 Touch-up prime CAN/CGSB-1.181.

## **2.5 ACCESSORIES**

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior top and bottom caps steel.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Door bottom seal: Section 08 71 00 – Door Hardware.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal riveted.
- .7 Sealant: Section 07 92 00 – Joint Sealants.

- .8 Provide low expanding, single component polyurethane foam sealant installed at head and jamb perimeter of door frame for sealing to building air barrier, vapour retarder and door frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior. Refer to Section 07 21 20 – Low Expanding Foam Sealant.
- .9 Glazing: Section 08 80 00 – Glazing.
- .10 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide removable stainless steel glazing beads for dry glazing of snap-on type.
  - .2 Design exterior glazing stops to be tamperproof.
- .11 Finish Painting: to Section 09 91 13 – Exterior Painting and Section 09 91 23 – Interior Painting.

## **2.6 FRAMES FABRICATION GENERAL**

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.2 mm welded, thermally broken type construction.
- .4 Interior frames: 1.2 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, template hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

**2.7 FRAME ANCHORAGE**

- .1 Shim and anchor new doors in accordance with CAN/CSA A440.4.
- .2 Provide appropriate anchorage to floor and wall construction.
- .3 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .4 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .5 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

**2.8 FRAMES: WELDED TYPE**

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

**2.9 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: insulated, hollow steel construction. Interior doors: honeycomb hollow steel construction.
- .3 Fabricate doors with longitudinal edges locked seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

- .4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.
- .5 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .7 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .9 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 ASTM E152 NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .10 Manufacturer's nameplates on doors are not permitted.

## **2.10 HOLLOW STEEL CONSTRUCTION**

- .1 Form each face sheet for exterior doors from 1.2 mm sheet steel.
- .2 Form each face sheet for interior doors from 1.2 sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with insulation as specified.
- .5 Fill voids between stiffeners of interior doors with honeycomb core.

## **2.11 THERMALLY BROKEN DOORS AND FRAMES**

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

## **PART 3      EXECUTION**

### **3.1            INSTALLATION GENERAL**

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

### **3.2            FRAME INSTALLATION**

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

### **3.3            DOOR INSTALLATION**

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor as follows.
  - .1 Hinge side: 1.0 mm.
  - .2 Latch side and head: 1.5 mm.
  - .3 Finished floor: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.



**3.4 FINISH REPAIRS**

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

**3.5 GLAZING**

- .1 Install glazing for doors and frames in accordance with Section 08 80 00 - Glazing.

**3.6 COMMISSIONING**

- .1 Contractor to instruct maintenance personnel in operation and maintenance of doors and hardware.
- .2 Confirm operation and function for all doors and hardware.
- .3 Commissioning will be witnessed by Owner and Certificate will be signed by Contractor and Owner.

**END OF SECTION**

**PART 1**      **GENERAL**

**1.1**            **RELATED SECTIONS**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 01 43 39 – Mock Up Requirements.
- .3      Section 01 45 00 - Quality Control.
- .4      Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .5      Section 01 78 00 - Closeout Submittals.
- .6      Section 07 82 00 – Joint Sealants.
- .7      Section 08 11 14 – Metal Doors & Frames.

**1.2**            **REFERENCES**

- .1      American National Standards Institute (ANSI).
  - .1      ANSI/ASTM E330, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2      American Society for Testing and Materials (ASTM)
  - .1      ASTM C542, Specification for Lock-Strip Gaskets.
  - .2      ASTM D2240, Test Method for Rubber Property – Durometer Hardness.
- .3      Canadian General Standards Board (CGSB).
  - .1      CAN/CGSB-12.1, Tempered or Laminated Safety Glass.
  - .2      CAN/CGSB-12.3, Clear Float Glass
  - .3      CAN/CGSB-12.5, Mirrors, Silvered.
  - .4      CAN/CGSB-12.8, Insulating Glass Units.
  - .5      CAN/CGSB-12.11, Wired Safety Glass.
- .4      Canadian Standards Association (CSA).
  - .1      CSA A440.2, Energy Performance Evaluation of Windows and Sliding Glass Doors.
  - .2      CSA Certification Program for Windows and Doors.

- .5 Glass Association of North American (GANA)
  - .1 GANA Glazing Manual.
  - .2 GANA Laminated Glazing Reference Manual.

### **1.3 SYSTEM DESCRIPTION**

- .1 Performance Requirements:
  - .1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
    - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
  - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads as measured in accordance with ANSI/ASTM E330 and NBC latest edition.
  - .3 Limit glass deflection to 1/200 with full recovery of glazing materials.

### **1.4 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.
- .3 Closeout Submittals:
  - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals

### **1.5 QUALITY ASSURANCE**

- .1 Perform work in accordance with GANA Glazing Manual and Laminated Glazing Reference Manual for glazing installation methods. Provide shop inspection and testing for glass.
- .2 Provide certificate of quality compliance from manufacturer.

### **1.6 MOCK-UPS**

- .1 Construct mock-ups in accordance with Section 01 43 39 – Mock Up Requirements.

- .2 Construct mock-up to including glass glazing, and perimeter air barrier and vapour retarder seal.
- .3 Construct mock-up where directed.

## **1.7 WARRANTY**

- .1 Provide ten (10) year warranty for glazing units from the date of Substantial Completion.

## **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Install glazing when ambient temperature is 10°C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS: FLAT GLASS**

- .1 Float glass: to CAN/CGSB-12.3, Glazing quality, 5 mm minimum thickness.
- .2 Safety glass: to CAN/CGSB-12.5, transparent, 6 mm thick.
  - .1 Type 1, Laminated, Type 2 - tempered
  - .2 Class B - float
  - .3 Category 11
- .3 Silvered mirror glass: to CAN/CGSB-12.5, 4 mm thick.
  - .1 Type 1A - Float glass for normal use
- .4 Wired glass: to CAN/CGSB-12.11, 6 mm thick.
  - .1 Type 1- Polished both sides (transparent)
  - .2 Wire mesh style 3 – square.
- .5 Glass for cabinet and millwork: to CAN/CGSB-12.5, transparent, minimum 4.0 mm thick, unless otherwise indicated.
  - .1 Type 1 - Clear Laminated or Type 2 - Tempered.

### **2.2 MATERIALS: FIRE RATED GLAZING**

- .1 Thickness: 8 mm minimum.

- .2 Fire rating: 120 minutes.
- .3 Impact safety rating: to ANSI Z97.1 and CPSC 16CFR 1201 Cat. I and II.

## **2.3 MATERIALS**

- .1 Sealant: 07 92 00 – Joint Sealants.

## **2.4 ACCESSORIES**

- .1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height.
- .2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
- .4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.
- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C542.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 EXAMINATION**

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.



### **3.3 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

### **3.4 INSTALLATION: EXTERIOR – WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.5 INSTALLATION: INTERIOR DRY METHOD (TAPE AND TAPE)**

- .1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

- .3 Place setting blocks at 1/4 with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described in 3.4.3. Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

### **3.6 INSTALLATION: MIRRORS**

- .1 Set mirrors with clips. Anchor rigidly to wall construction.
- .2 Set in frame.
- .3 Place plumb and level.

### **3.7 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking.
- .3 Remove glazing materials from finish surfaces.
- .4 Remove labels after work is complete.
- .5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacture's instructions.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### **3.8 PROTECTION OF FINISHED WORK**

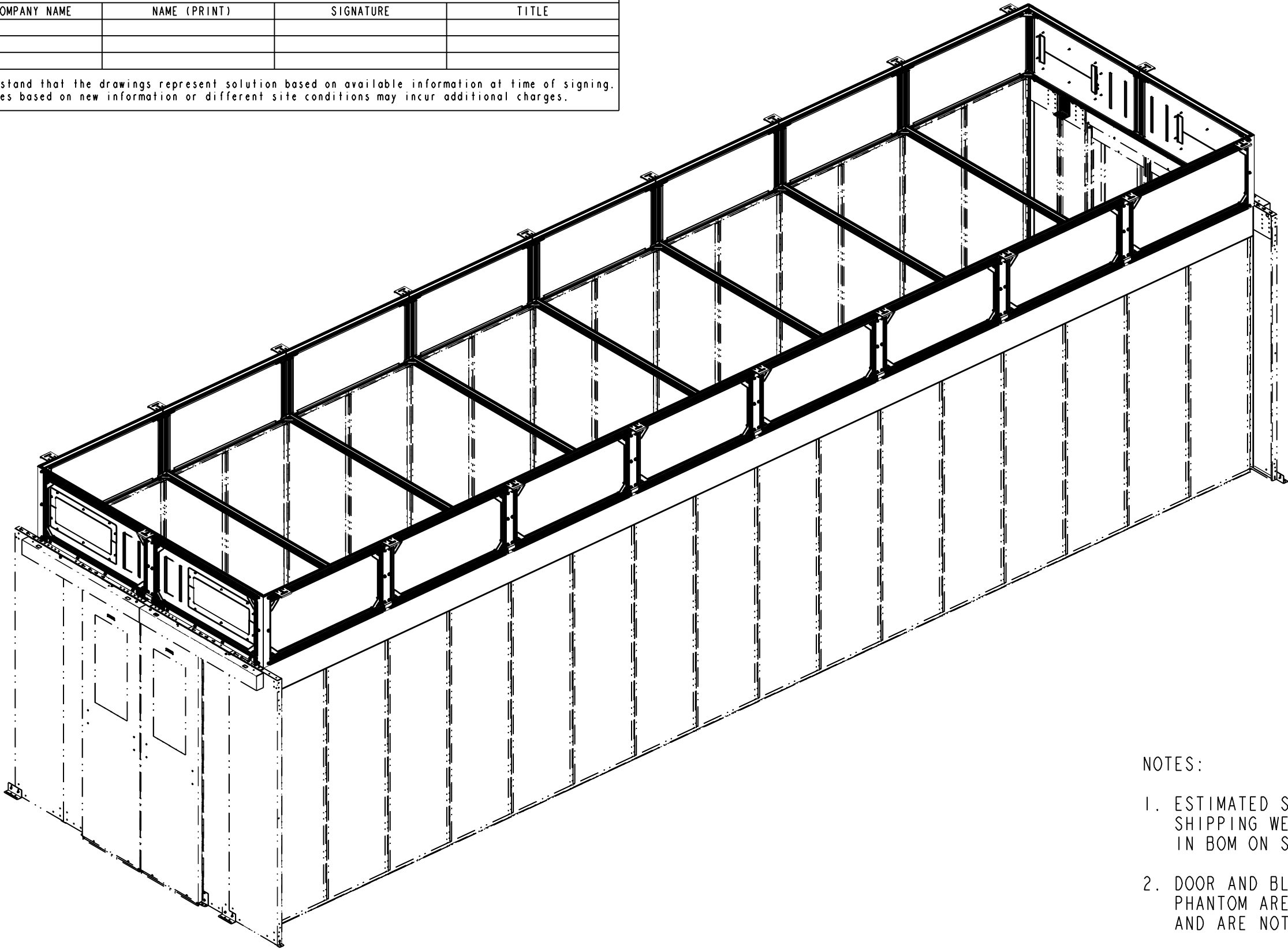
- .1 After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.
- .2 Repair damage to adjacent materials caused by glazing installation.

**END OF SECTION**

CUSTOMER SIGN OFF				
DATE	COMPANY NAME	NAME (PRINT)	SIGNATURE	TITLE

The signed understand that the drawings represent solution based on available information at time of signing. Subsequent changes based on new information or different site conditions may incur additional charges.

RELEASE STATUS
Production





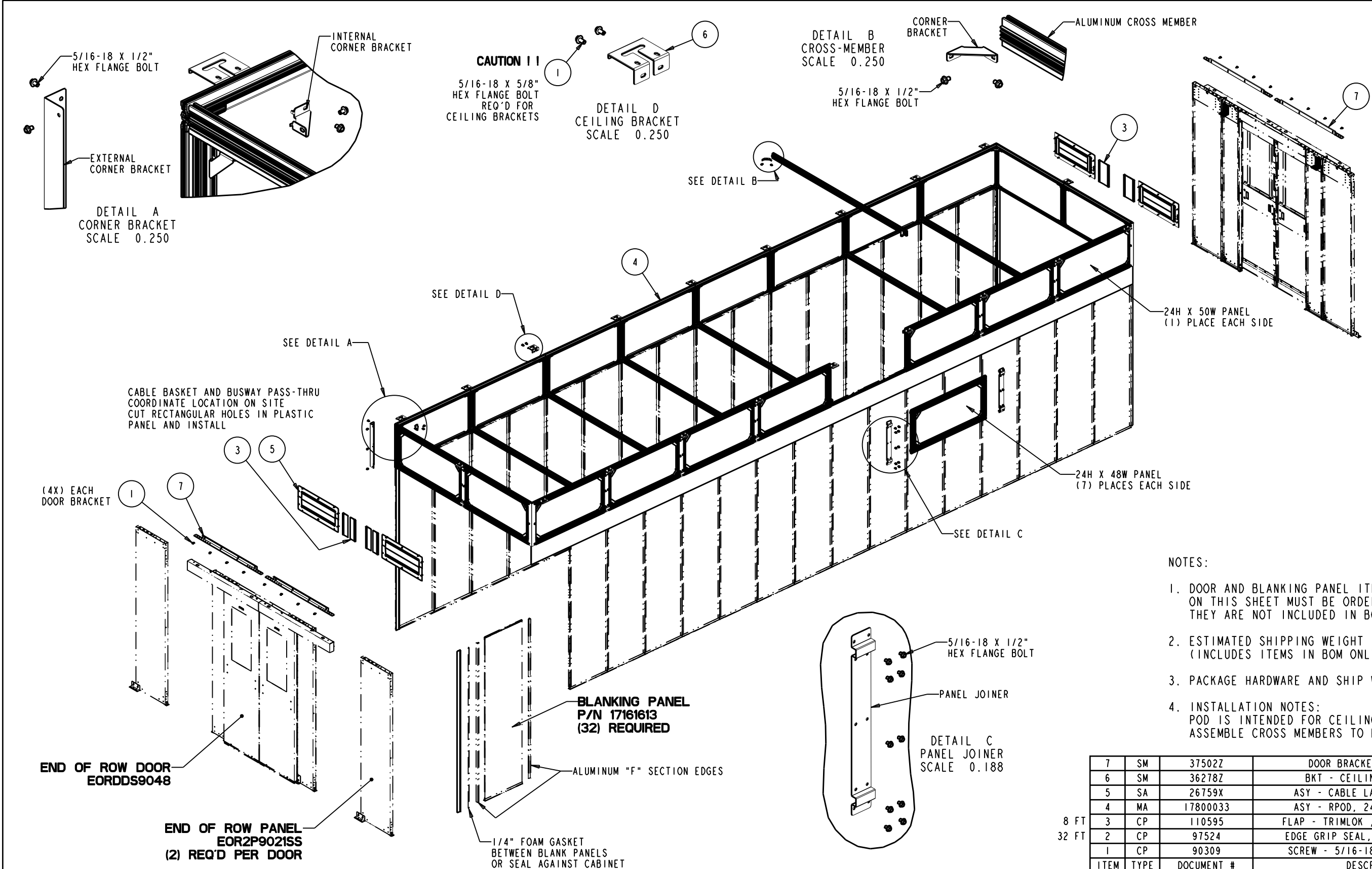
- NOTES:
- 1. ESTIMATED SHIPPING WEIGHT - 690 LBS  
SHIPPING WEIGHT INCLUDES ITEMS  
IN BOM ON SHEET 2 ONLY
  - 2. DOOR AND BLANKING PANEL ITEMS SHOWN IN  
PHANTOM ARE SOLD SEPARATELY  
AND ARE NOT INCLUDED IN BOM FOR 17800036

Choose one:	
PPAPA (CUSTOM LEVEL A)	
PPAP3 (LEVEL 3)	
PPAPC (CATALOG ITEM)	
NA (MFD. PART OR EXEMPT)	
PPAP LEVEL:	NA

A	-	-	PRODUCTION RELEASE	CO-0268125
REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER

EATON CORPORATION - CONFIDENTIAL AND PROPRIETARY  
NOTICE TO PERSONS RECEIVING THIS DOCUMENT AND/OR TECHNICAL INFORMATION  
THIS DOCUMENT, INCLUDING THE DRAWING AND INFORMATION CONTAINED THEREON, IS CONFIDENTIAL AND IS THE EXCLUSIVE PROPERTY OF EATON CORPORATION, AND IS MERELY ON LOAN AND SUBJECT TO RECALL BY EATON AT ANY TIME. BY TAKING POSSESSION OF THIS DOCUMENT, THE RECIPIENT ACKNOWLEDGES AND AGREES THAT THIS DOCUMENT CANNOT BE USED IN ANY MANNER ADVERSE TO THE INTERESTS OF EATON AND THAT NO PORTION OF THIS DOCUMENT MAY BE COPIED OR OTHERWISE REPRODUCED WITHOUT THE PRIOR WRITTEN CONSENT OF EATON. IN THE CASE OF CONFLICTING CONTRACTUAL PROVISIONS, THIS NOTICE SHALL GOVERN THE STATUS OF THIS DOCUMENT. © Eaton Corporation. All Rights Reserved.

THIS DRAWING CONTAINS PROPRIETARY INFORMATION AND IS LOANED SUBJECT TO RETURN UPON DEMAND AND UPON THE EXPRESS CONDITION THAT IT WILL NOT BE USED IN ANY WAY DETRIMENTAL TO THE INTEREST OF EATON CORPORATION	CAGE NUMBER:	81824	ORIG EPR: EPR235639 CO-0268125		
	DES. BY	DNelson	06/12/23		
	DRWN. BY	DNelson	09/11/23	ASY - RAPIDPOD CTO, 24H 96W 386L, FAA	
	DESIGN MGMT SITE:	Worcester	PROD. GRP 80 - RapidPod		
	MATERIAL:		COLOR: -	SHEET: 1 OF 4	
DRAWN IN THIRD ANGLE PROJECTION 	TOLERANCE UNLESS SPEC'D .XX ± .02 .XXX ± .005 ALL DIMENSIONS IN INCHES	MATERIAL FINISH:	Powder Coat - Variable	REV DATE:	-
		SPEC #	-	D	17800036
				REV	A



- NOTES:
1. DOOR AND BLANKING PANEL ITEMS SHOWN IN PHANTOM ON THIS SHEET MUST BE ORDERED SEPARATELY. THEY ARE NOT INCLUDED IN BOM FOR 17800036
  2. ESTIMATED SHIPPING WEIGHT - 690 LBS (INCLUDES ITEMS IN BOM ONLY)
  3. PACKAGE HARDWARE AND SHIP WITH OTHER COMPONENTS
  4. INSTALLATION NOTES:  
POD IS INTENDED FOR CEILING GRID ATTACHMENT ASSEMBLE CROSS MEMBERS TO BOTTOM RAILS ONLY

7	SM	37502Z	DOOR BRACKET - 42W, RPOD	4
6	SM	36278Z	BKT - CEILING GRID OR ROD	20
5	SA	26759X	ASY - CABLE LADDER INTERFACE	4
4	MA	17800033	ASY - RPOD, 24H 96W 386L, FAA	1
3	CP	110595	FLAP - TRIMLOK, 3" 7B1375B3X5/16C	-
2	CP	97524	EDGE GRIP SEAL, 1.75" WIDE, EPDM	4
1	CP	90309	SCREW - 5/16-18X5/8" SERRHXWSHR	56
ITEM			DESCRIPTION	QTY

Choose one:  
PPAPA (CUSTOM LEVEL A)  
PPAP3 (LEVEL 3)  
PPAPC (CATALOG ITEM)  
NA (MFD. PART OR EXEMPT)

PPAP LEVEL: NA

A	-	-	PRODUCTION RELEASE	CO-0268125
REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER

THIS DRAWING CONTAINS PROPRIETARY INFORMATION AND IS LOANED SUBJECT TO RETURN UPON DEMAND AND UPON THE EXPRESS CONDITION THAT IT WILL NOT BE USED IN ANY WAY DETRIMENTAL TO THE INTEREST OF EATON CORPORATION

DRAWN IN THIRD ANGLE PROJECTION

TOLERANCE UNLESS SPEC'D  
.XXX ± .02  
ALL DIMENSIONS IN INCHES

CAGE NUMBER: 81824

DESIGN MGMT SITE: Worcester

MATERIAL:

MATERIAL FINISH: Powder Coat - Variable

SPEC #:

ORIG EPR: EPR235639 CO-0268125

DES. BY: D Nelson 06/12/23

DRWN. BY: D Nelson 09/11/23

PROD. GRP: 80 - RapidPod

COLOR: -

CRS GA: N/A

OTHER: SEE NOTES

**EATON**

ASY - RAPIDPOD CTO, 24H 96W 386L, FAA

SHEET: 2 OF 4

REV DATE: -

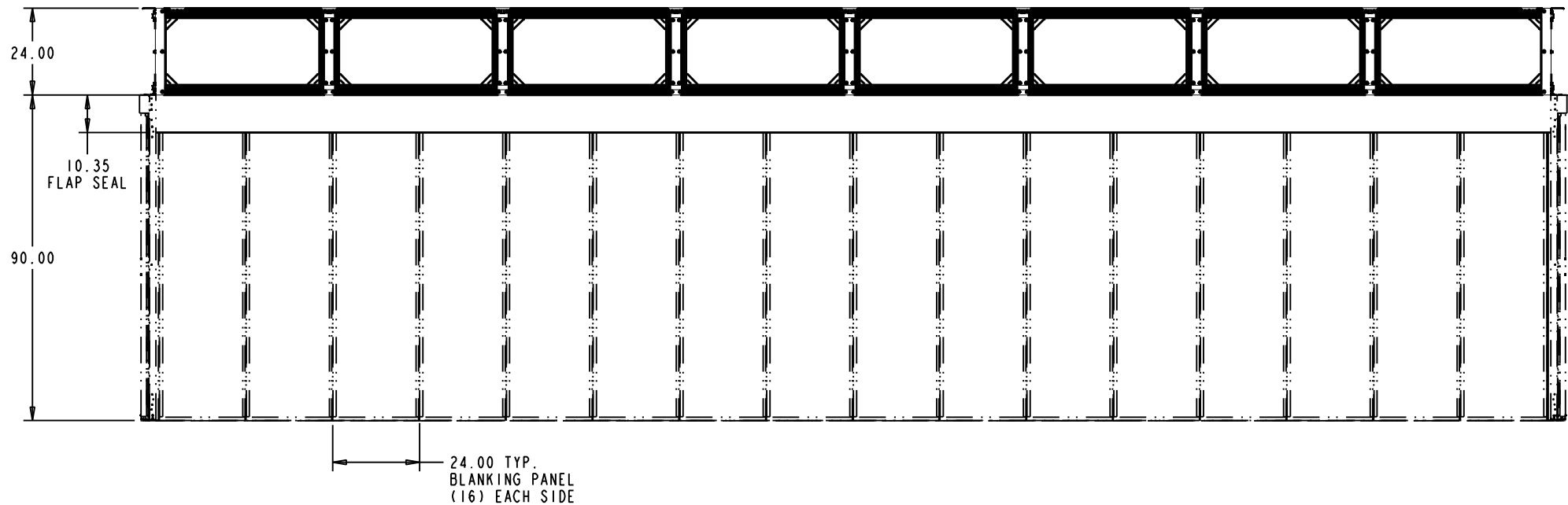
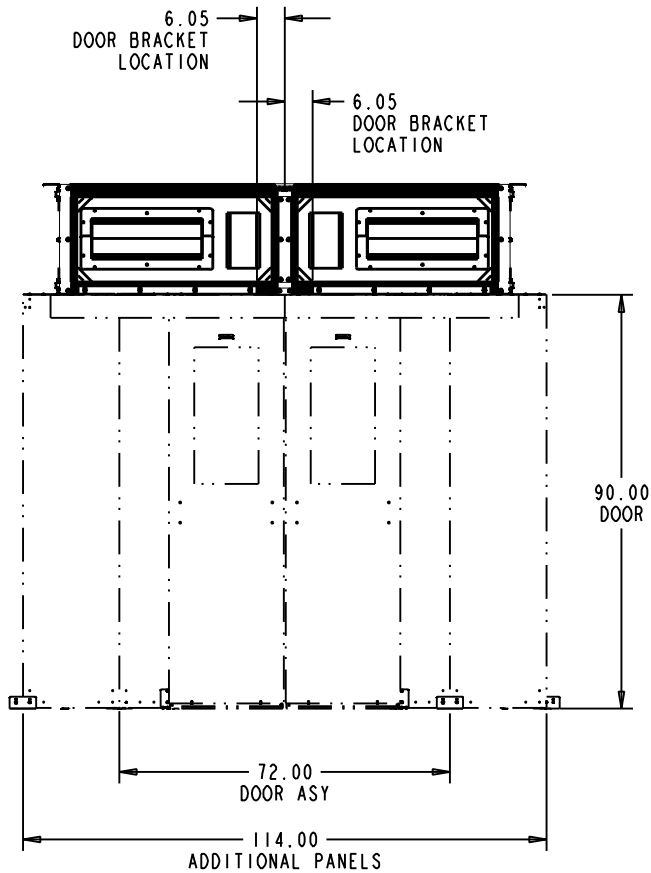
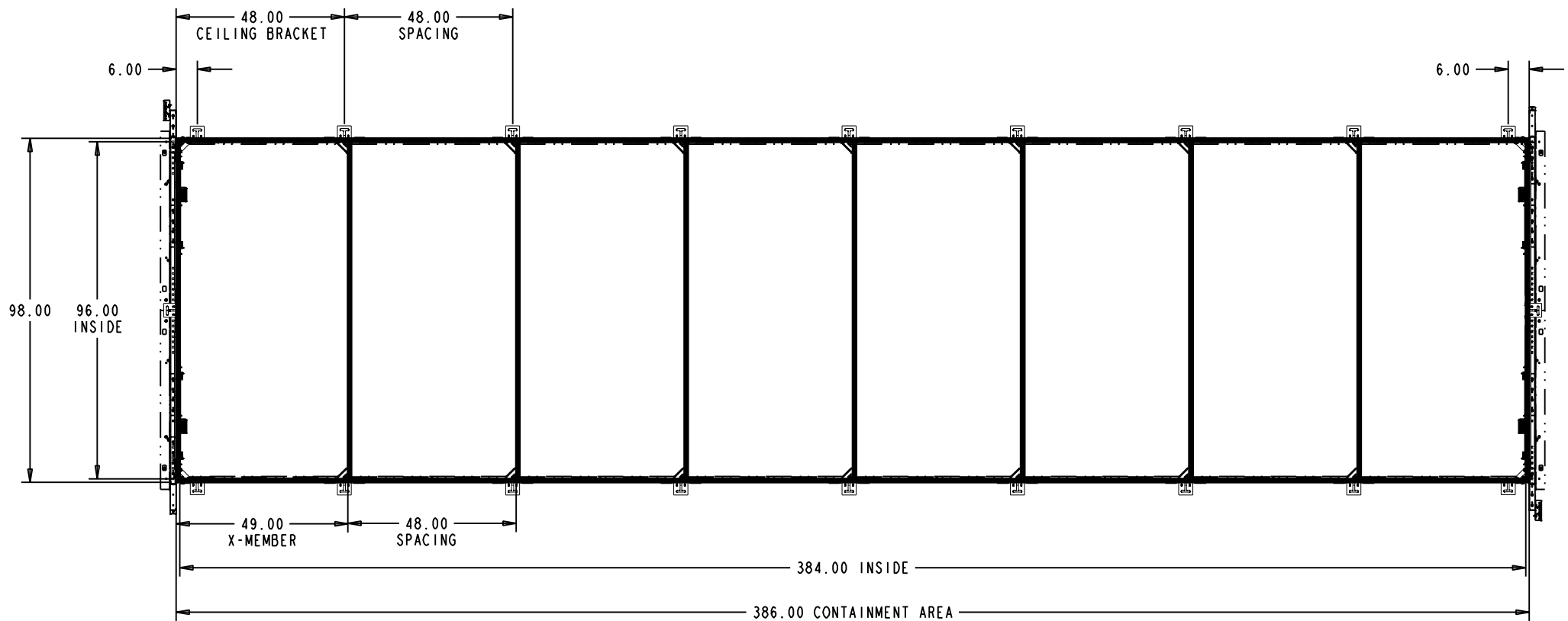
D 17800036 REV A



RELEASE STATUS

Production

DOOR AND BLANKING PANEL ITEMS SHOWN  
IN PHANTOM MUST BE ORDERED SEPARATELY  
THEY ARE NOT INCLUDED IN BOM 17800036



Choose one:  
PPAPA (CUSTOM LEVEL A)  
PPAP3 (LEVEL 3)  
PPAPC (CATALOG ITEM)  
NA (MFD. PART OR EXEMPT)

PPAP LEVEL: NA

EATON CORPORATION - CONFIDENTIAL AND PROPRIETARY  
NOTICE TO PERSONS RECEIVING THIS DOCUMENT AND/OR TECHNICAL INFORMATION  
THIS DOCUMENT, INCLUDING THE DRAWING AND INFORMATION CONTAINED THEREON, IS CONFIDENTIAL AND IS THE EXCLUSIVE PROPERTY OF EATON CORPORATION, AND IS MERELY ON LOAN AND SUBJECT TO RECALL BY EATON AT ANY TIME. BY TAKING POSSESSION OF THIS DOCUMENT, THE RECIPIENT ACKNOWLEDGES AND AGREES THAT THIS DOCUMENT CANNOT BE USED IN ANY MANNER ADVERSE TO THE INTERESTS OF EATON AND THAT NO PORTION OF THIS DOCUMENT MAY BE COPIED OR OTHERWISE REPRODUCED WITHOUT THE PRIOR WRITTEN CONSENT OF EATON. IN THE CASE OF CONFLICTING CONTRACTUAL PROVISIONS, THIS NOTICE SHALL GOVERN THE STATUS OF THIS DOCUMENT.  
© Eaton Corporation, All Rights Reserved.

THIS DRAWING CONTAINS PROPRIETARY INFORMATION AND IS LOANED SUBJECT TO RETURN UPON DEMAND AND UPON THE EXPRESS CONDITION THAT IT WILL NOT BE USED IN ANY WAY DETRIMENTAL TO THE INTEREST OF EATON CORPORATION

DRAWN IN THIRD  
ANGLE PROJECTION  
□  
□ 8

TOLERANCE  
UNLESS SPEC'D  
.XX ± .02  
.XXX ± .005  
≤ .1°  
ALL DIMENSIONS  
IN INCHES

CAGE NUMBER: 81824  
DESIGN MGMT SITE: Worcester  
MATERIAL:   
MATERIAL FINISH:   
SPEC #:

ORIG EPR: EPR235639 CO-0268125  
DES. BY D Nelson 06/12/23  
DRWN. BY D Nelson 09/11/23  
PROD GRP 80 - RapidPod  
COLOR: -  
CRS GA: N/A  
OTHER: SEE NOTES  
Powder Coat - Variable

EATON

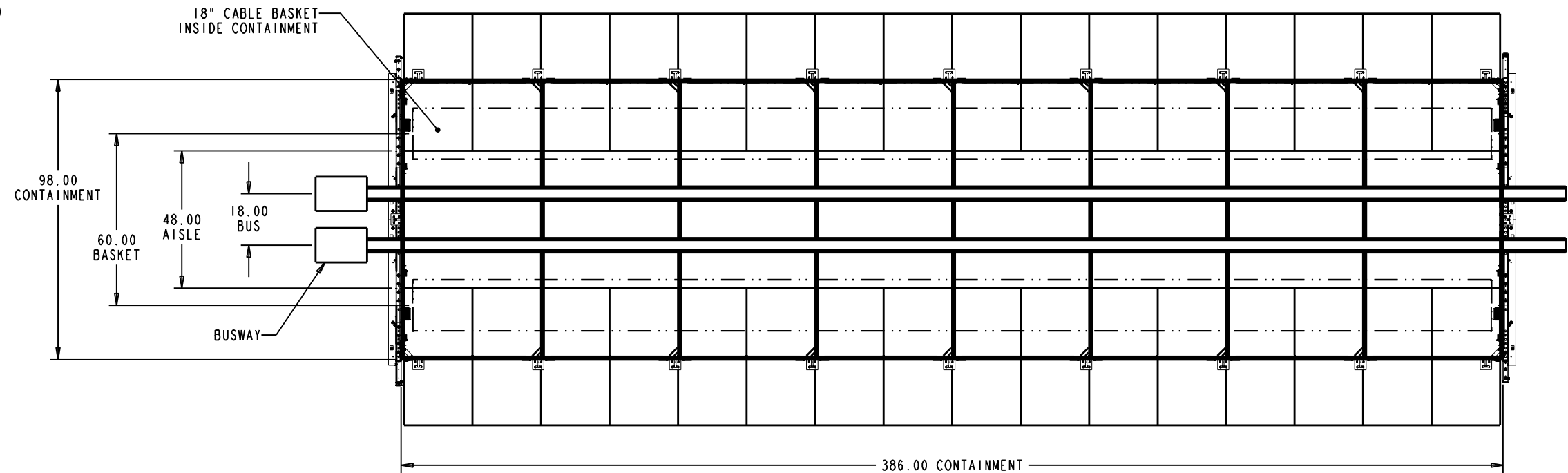
ASY - RAPIDPOD CTO, 24H 96W 386L, FAA

SHEET: 3 OF 4  
REV DATE: -  
D 17800036 REV A

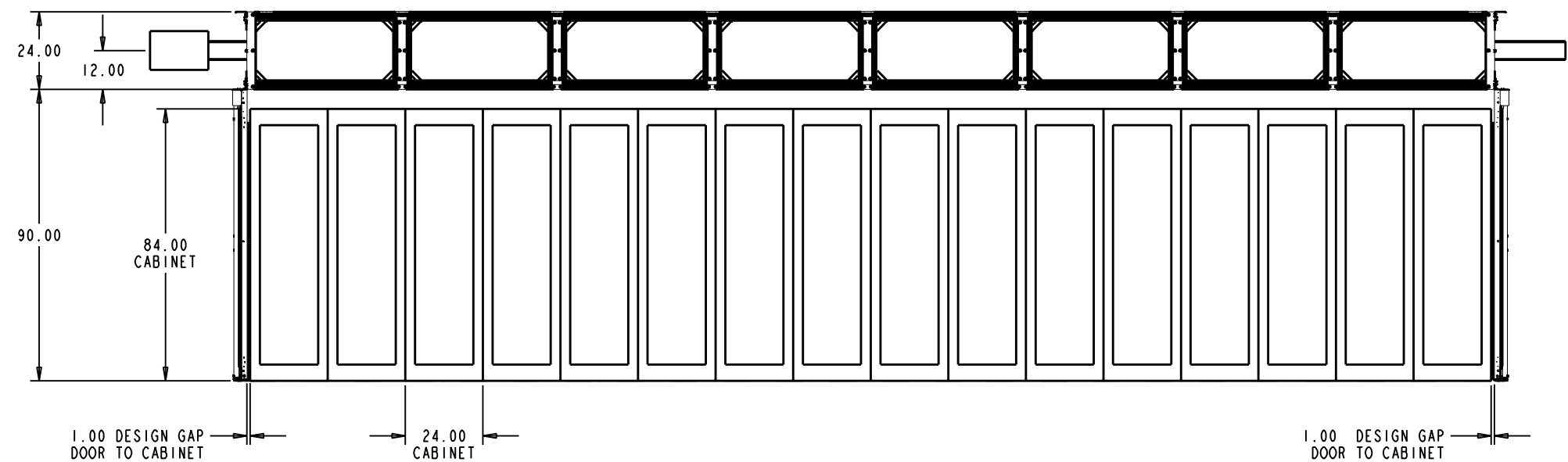
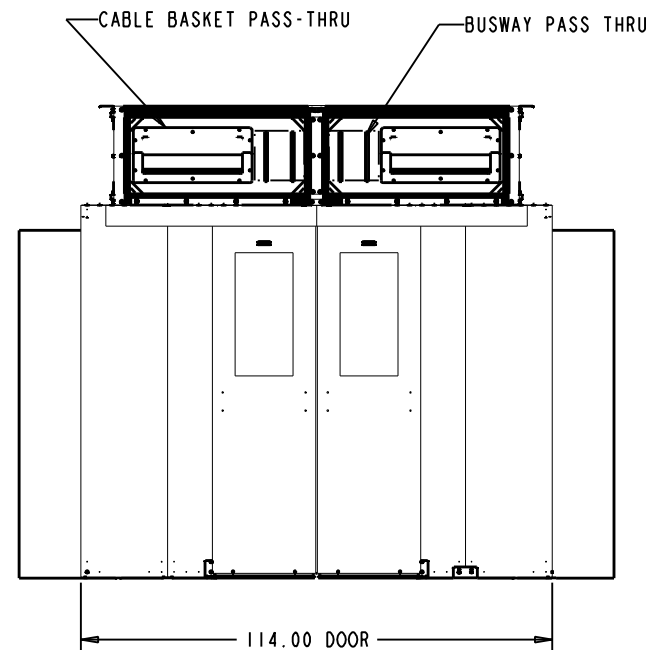
A	-	-	PRODUCTION RELEASE	CO-0268125
REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER

RELEASE STATUS
Production

1. CABINETS, DOORS, BUSWAY, CABLE BASKETS ARE NOT INCLUDED IN THIS SKU.
2. REFER TO SHEET 2 & 3 FOR ADDITIONAL INFORMATION



COORDINATE PASS-THRU LOCATIONS ON SITE  
CUT HOLES IN PLASTIC PANEL AND INSTALL



Choose one:  
PPAPA (CUSTOM LEVEL A)  
PPAP3 (LEVEL 3)  
PPAPC (CATALOG ITEM)  
NA (MFD. PART OR EXEMPT)

PPAP LEVEL:	NA
-------------	----


EATON CORPORATION - CONFIDENTIAL AND PROPRIETARY  
NOTICE TO PERSONS RECEIVING THIS DOCUMENT AND/OR TECHNICAL INFORMATION

THIS DOCUMENT, INCLUDING THE DRAWING AND INFORMATION CONTAINED THEREON, IS CONFIDENTIAL AND IS THE EXCLUSIVE PROPERTY OF EATON CORPORATION, AND IS MERELY ON LOAN AND SUBJECT TO RECALL BY EATON AT ANY TIME. BY TAKING POSSESSION OF THIS DOCUMENT, THE RECIPIENT ACKNOWLEDGES AND AGREES THAT THIS DOCUMENT CANNOT BE USED IN ANY MANNER ADVERSE TO THE INTERESTS OF EATON AND THAT NO PORTION OF THIS DOCUMENT MAY BE COPIED OR OTHERWISE REPRODUCED WITHOUT THE PRIOR WRITTEN CONSENT OF EATON. IN THE CASE OF CONFLICTING CONTRACTUAL PROVISIONS, THIS NOTICE SHALL GOVERN THE STATUS OF THIS DOCUMENT.

C Eaton Corporation, All Rights Reserved.

THIS DRAWING CONTAINS PROPRIETARY  
INFORMATION AND IS LOANED SUBJECT  
TO RETURN UPON DEMAND AND UPON  
THE EXPRESS CONDITION THAT IT WILL  
NOT BE USED IN ANY WAY DETRIMENTAL  
TO THE INTEREST OF EATON CORPORATION

**DRAWN IN THIRD  
ANGLE PROJECTION**



N	TOLERANCE UNLESS SPEC'D
	$.XX \pm .02$ $.XXX \pm .005$ $\leq \pm 1^\circ$
ALL DIMENSIONS IN INCHES	

CAGE NUMBER:
--------------

81824

DESIGN MGMT SITE:  
Worcester

MATERIALS.

MATERIAL.

	MATERIAL FINISH
	SPEC #

ORIG EPR: EPR235639 CO-0268125
--------------------------------

DES. BY D Nelson

E:	PROD GRP	80 - Rap
	COLOR:	-

CRS GA:	N/A
---------	-----

OTHER:	SEE NOTE
--------	----------

SH:	Powder Coat - Vari
C #	-

89 CO-0268125

	06/12/23
	06/11/23

idPod

---

S

Table
-------

**WATON**

ASY - RAPIDPOD CTO, 24H 96W 386L, FAA

SHEET: 4 OF 4

REV DATE:	-
-----------	---

REV	A
-----	---

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 3  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Thursday, January 15, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 Deadline for receipt of tenders has been revised. The new tender closing date is **February 5<sup>th</sup>, 2026, at 3:00PM (NST)**  
**New Access code: 2771 539 8656**

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO DRAWINGS

- .1 Not Applicable

### 1.6 CHANGES TO SPECIFICATION

- .1 Not Applicable

### 1.7 QUESTIONS AND RESPONSES

- .1 Another addendum will be issued addressing questions to date.

**END OF ADDENDUM**

## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 2  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Friday, January 09, 2026

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 The General Conditions shall govern all phases of the Work covered by this Addendum.
- .2 Acknowledge receipt of this addendum in the Tender and Acceptance form.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.
- .2 **Notice of non-mandatory Site Visit:**

Wednesday, January 14th at 12:00 pm.  
Location: Core Science Building – Level 1 Pavilion A (The Whale Pavilion, Closest to Clinch Crescent).

### 1.5 CHANGES TO DRAWINGS

- .1 Not Applicable

## 1.6 CHANGES TO SPECIFICATION

### .1 Section 01 11 00 – Summary of Work

- .1 Reference: 1.3 Work Covered by Contract Documents  
Replace Clause 1.3.5 as follows:

“1.3.5 Eaton has been preselected as the standard of acceptance for all the systems listed under 1.3.4 above. Any alternate proposals must provide an equivalent single source solution for all the above systems. A package comprised of components from several different manufacturers will not be accepted. All requests for alternate package approvals are to be submitted 10 days prior to the Tender closing date and in accordance with Section 01 25 00 - Substitution Procedures.

## 1.7 QUESTIONS AND RESPONSES

- .1 **QUERY:** We would like to request to have Distech Controls added as an Acceptable systems manufacturer in Division 25

**RESPONSE:** *We have no issue with Distech being included in the acceptable control vendors for the Building systems/EMCS work/tie-ins. The CRAC unit control systems need to be by the system vendor, but will need a control contractor to install and integrate to the BMS.*

- .2 **QUERY:** Stipulated Price Contract General Conditions, item 2.28.2 states “The project manager shall submit a resume and cover letter.” Please confirm this is not a mandatory submission requirement for the tender, but is to be submitted after award.

**RESPONSE:** This will not be mandatory for the tender and can be submitted after the award is made at the request of the Owner.

- .3 **QUERY:** Submission Instructions 6.2.1 states “Bids shall be accompanied by a copy of a bid security...” and “Originals to be delivered to Memorial University post tender closing”. Please advise if an electronic bid bond is acceptable or if it is preferred to submit a scan of the hard copy. An electronic bid bond is a verifiable secured document with electronic signatures and seals issued by the Surety company and would be attached as a separate file to the submission email with the tender form.

**RESPONSE:** Currently, we do not accept electronic bid bonds. Please provide bond as per the current document instructions.

END OF ADDENDUM



## PART 1 - ADDENDUM

### 1.1 TITLE

- .1 This Addendum shall be known as:

Addendum 1  
TFM-053-25 – CSF-004-23 Primary Data Centre Replacement

- .2 The Date of the Addendum is Thursday, December 18, 2025

### 1.2 PRECEDENCE

- .1 This amendment to the bid documents is effective immediately.
- .2 This Addendum shall form an integral part of the original bid documents and is to be read in conjunction therewith.
- .3 The Addendum shall take precedence over previously issued bid documents with which it may prove to be at variance.

### 1.3 GENERAL

- .1 The General Conditions shall govern all phases of the Work covered by this Addendum.
- .2 Acknowledge receipt of this addendum in the Tender and Acceptance form.

### 1.4 PURPOSE

- .1 The purpose of the Addendum is to inform bidders of the changes, deletions and additions to be added to the bid documents.

### 1.5 CHANGES TO SPECIFICATION

- .1 Section 01 11 00 – Summary of Work

- .1 Reference: 1.3 Work Covered by Contract Documents

- .1 Add Clause 1.3.8 as follows:

“1.3.8 Bid pricing to be structured with two pricing options for UPS system, PDU's and tap off boxes:

- .1 Price A - full system as designed and indicated on drawings.
- .2 Price B - minimum base requirement met with option for future growth.
- .3 Tap off boxes to be submitted as part of bid pricing structure with two options:

- .1 Price A - full system as designed with 30 tap-off boxes (provides power to 56 PDU's).
      - .2 Price B - reduced quantity of tap-off boxes to meet minimum requirements. Provide pricing for 15 tap-off boxes (provides power for 30 PDU's). Power busway to be installed per full system design.
    - 4. UPS system pricing to be submitted as part of bid pricing structure with two options:
      - .1 Price A - full UPS system as designed with 30-minute and 90-minute runtimes.
      - .2 Price B - base UPS system with 30-minute run times for both units with unit price to increase run time in 15-minute intervals. UPS cabinets to be provided for full 90-minute capacity.
    - 5. Power distribution units (PDU) and associated connection cords to be submitted as part of bid pricing structure with two options:
      - .1 Price A - full system as designed with 56 PDU's in Data Centre 1320A and 4 in Staging Area 1321 for total of 60 PDU's.
      - .2 Price B - reduced quantity of PDUs to meet minimum requirements. Provide pricing for total of 32 PDU's. 30 for Data Centre 1320A and 2 for Staging Area 1321. Quantity of data racks to be installed per full system design.
    - .6 Refer to Tender form for further details."
  - .2 Section 25 01 11 - EMCS: Start-Up, Verification and Commissioning
    - .1 Reference: 1.7 Commissioning
      - .1 Revise Clause 1.7.6 to read as follows:

"1.7.6 Load system with project software. Install software for access to EMCS at Owner's Representative designated site on campus for use during commissioning and for their use afterwards. Use web browser software, compatible with Windows 11 with access via Google Chrome (latest edition)."

**END OF ADDENDUM**