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.

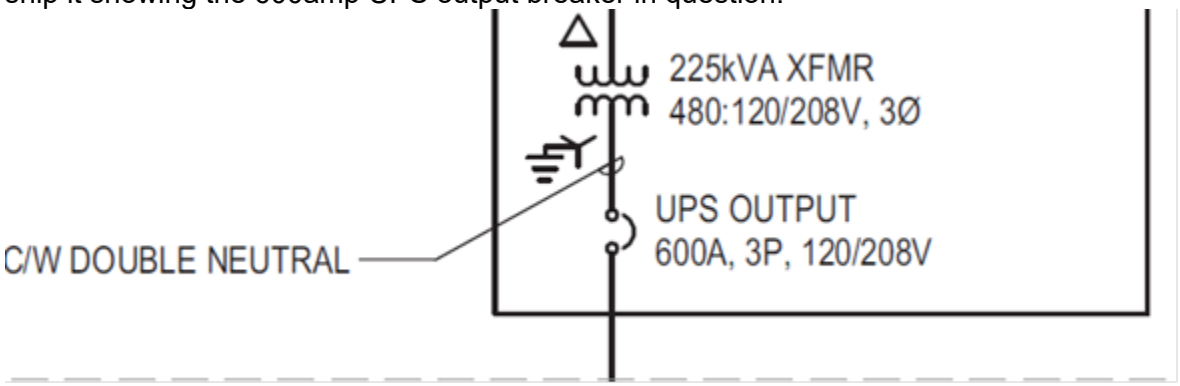
.3 QUESTION: Cummins Has provided many ATS's to Health Care facilities, Military installations, and Data Centers across the province and North America. We would like to submit Cummins CBL Automatic Transfer Switch for Approval to quote on this project.

.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
225kva @ 208v = 625A 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.

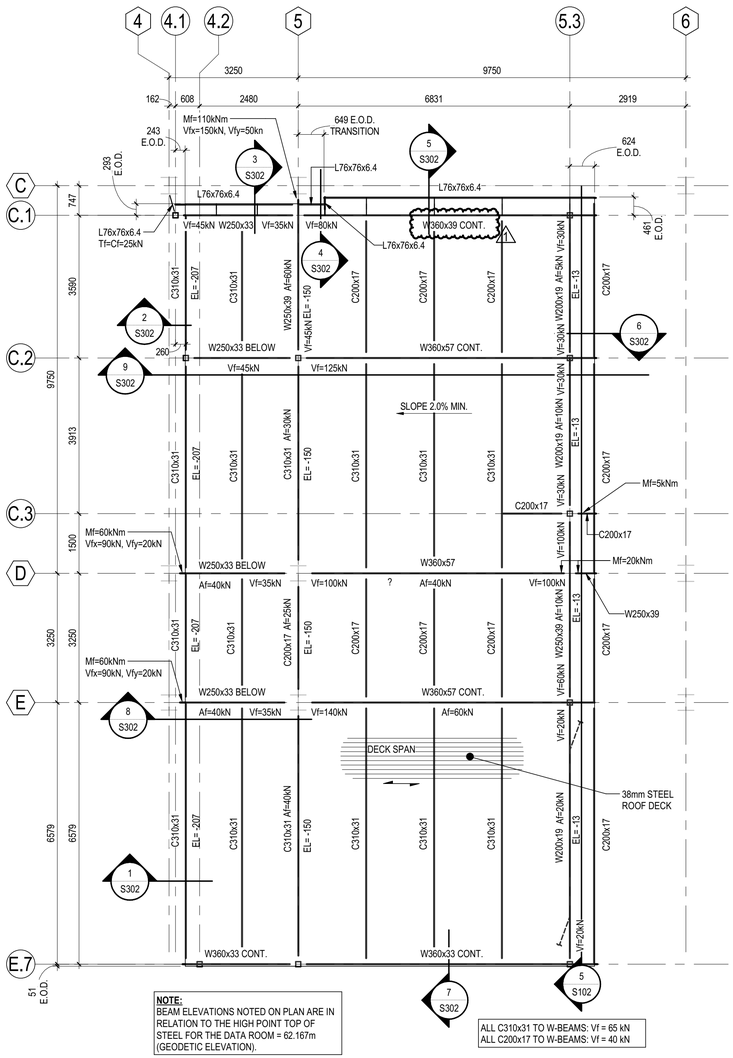
.14 QUESTION: Please confirm that the only galvanized structures on this project are the Vertical Conduit Structure (Ref Drw: S103), and the Generator Enclosure Structure (Ref Drw: S105).

.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.

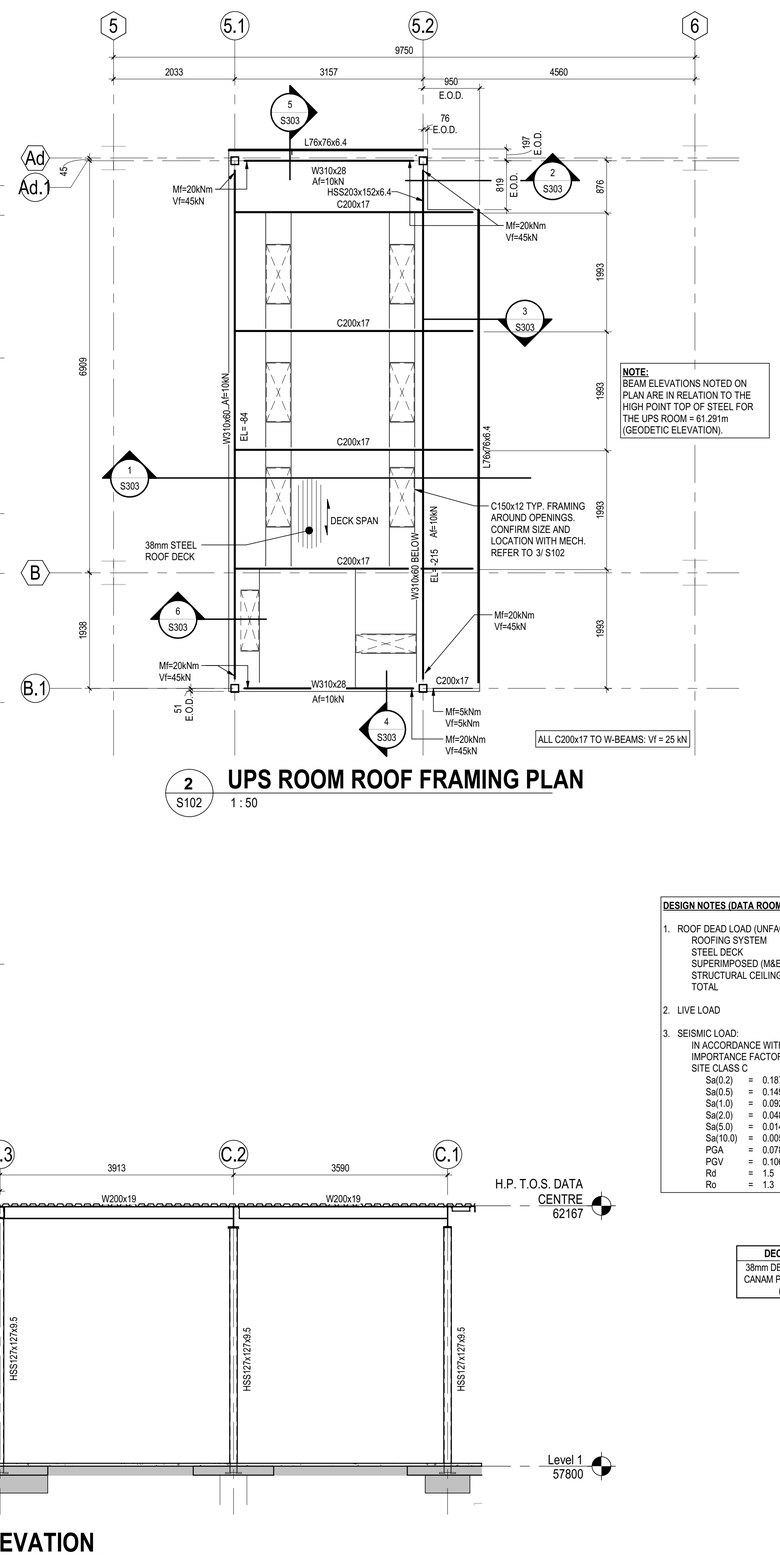
END OF ADDENDUM



NOTE:
BEAM ELEVATIONS NOTED ON PLAN ARE IN RELATION TO THE HIGH POINT TOP OF STEEL FOR THE DATA ROOM = 62.167m (GEODETIC ELEVATION).

ALL C310x31 TO W-BEAMS: Vf = 65 kN
ALL C200x17 TO W-BEAMS: Vf = 40 kN

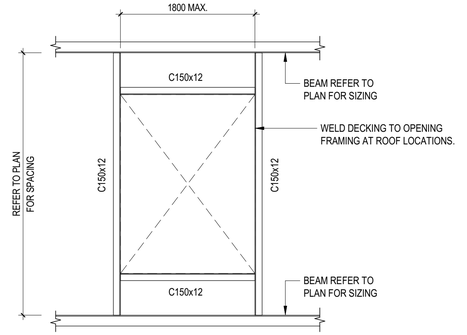
1 S102 DATA ROOM ROOF FRAMING PLAN
1 : 75



NOTE:
BEAM ELEVATIONS NOTED ON PLAN ARE IN RELATION TO THE HIGH POINT TOP OF STEEL FOR THE UPS ROOM = 61.291m (GEODETIC ELEVATION).

ALL C200x17 TO W-BEAMS: Vf = 25 kN

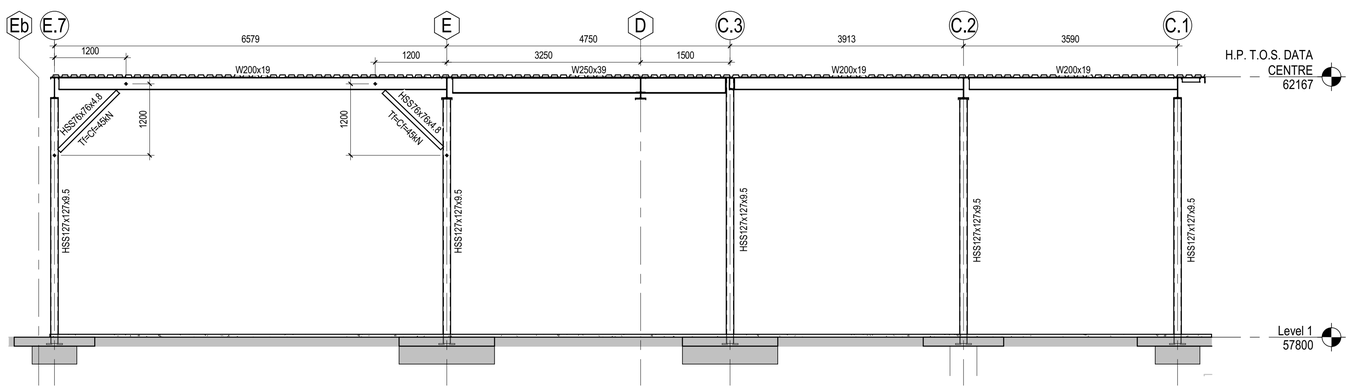
2 S102 UPS ROOM ROOF FRAMING PLAN
1 : 50



NOTES:

1. REFER TO MECH. FOR SIZE AND LOCATIONS OF OPENINGS.
2. FOR OPENINGS LARGER THAN 1800mm, FRAME OPENINGS WITH C200x17.
3. IF MULTIPLE OPENINGS IN ONE AREA, FRAME LARGER OPENINGS WITH C200x17 AND INFILL SMALLER OPENINGS WITH C150x12.

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



5 S102 DATA ROOM BRACING ELEVATION
1 : 50

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

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
pegnl ENGINEERING PERMIT J0291
STANTEC CONSULTING LTD.
07753
Signature or Member Number (Member-in-Responsible Charge)

Stantec

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

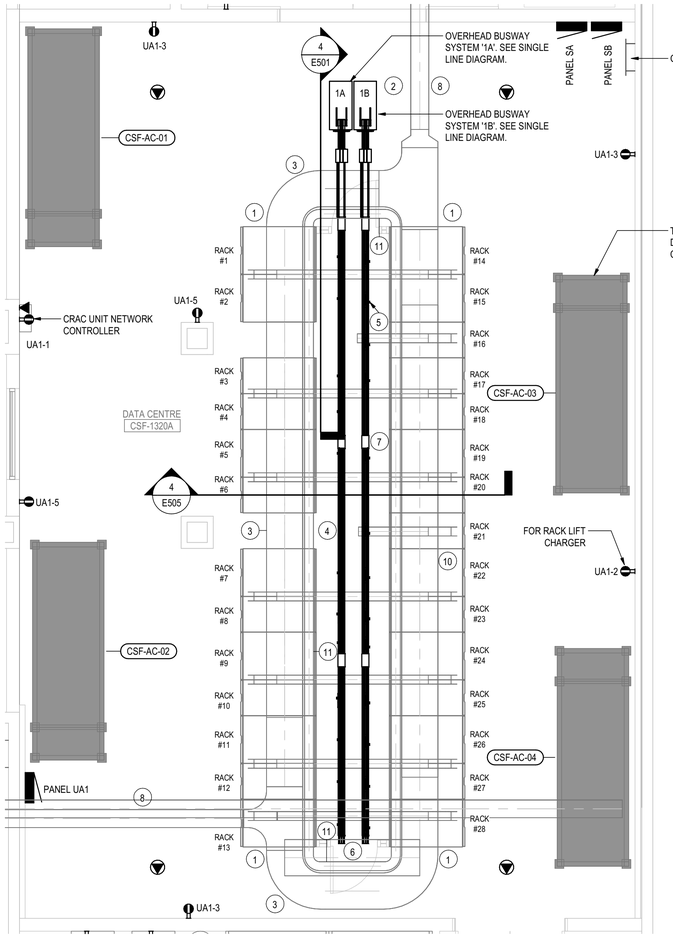
PROJECT NAME:
CSF DATA CENTRE

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:	DRAWN:
A. GIRI	C. BURT
REVIEWED:	APPROVED:
A. MCGRATH	A. MCGRATH
SCALE:	DATE:
As indicated	SEPTEMBER, 2025
STANTEC PROJECT No.	
133412008	**S102**

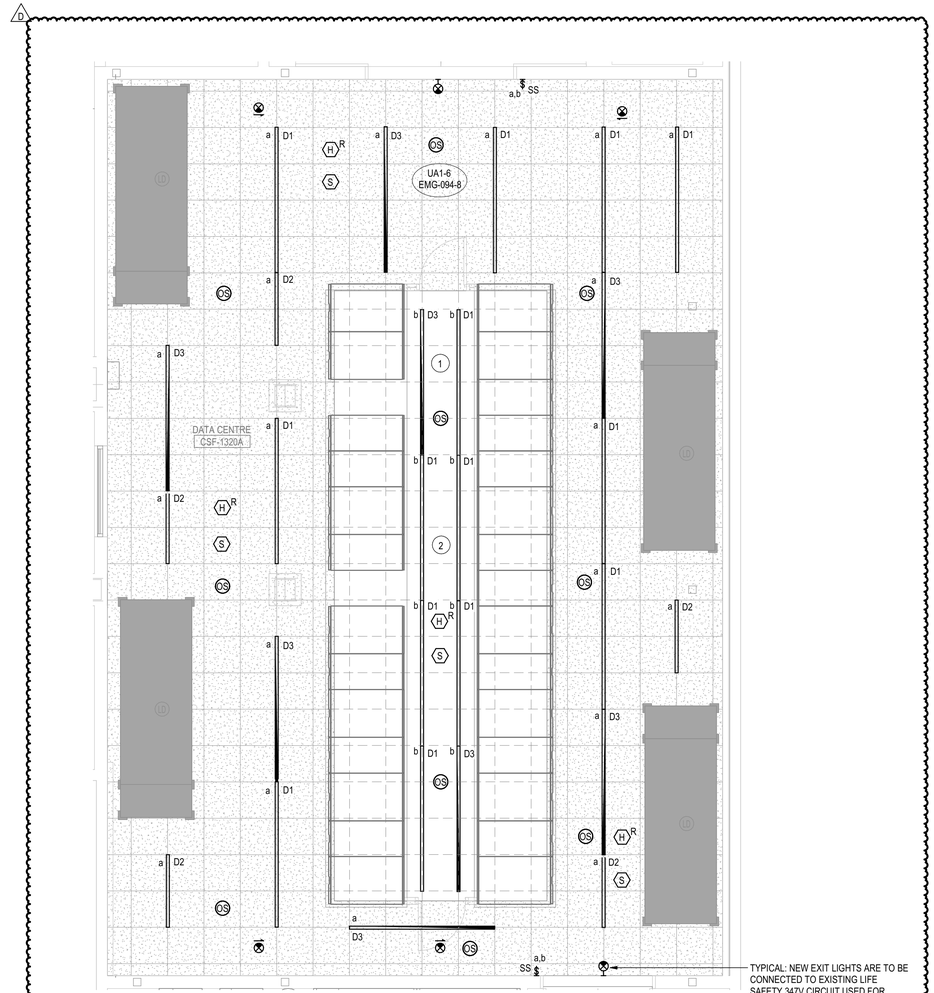


NOTES:

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.

2 E401 ENLARGED POWER AND DATA PLAN - DATA CENTRE 1320A (9)

1 : 50



NOTES:

1. TYPICAL: LIGHTING FIXTURES ARE LAID OUT TO ACCOMODATE 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.

1 E401 ENLARGED LIGHTING PLAN - DATA CENTRE 1320A (3)

1 : 50

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

No.	REVISION	DATE
D	ISSUED FOR ADDENDUM NO. 5	2026.01.22
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
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
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ENGINEERING PERMIT J0291
STANTEC CONSULTING LTD.
04642
Signature or Member Number (Member-in-Responsible Charge)

REGISTERED PROFESSIONAL ENGINEERS NEWFOUNDLAND & LABRADOR
PEGNL Newfoundland and Labrador
BERNIE ROBSON
2026-01-22
DATE

Stantec

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141 Kelsey Drive
St. John's, NL A1B 0L2
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MEMORIAL UNIVERSITY
Department of Facilities Management

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

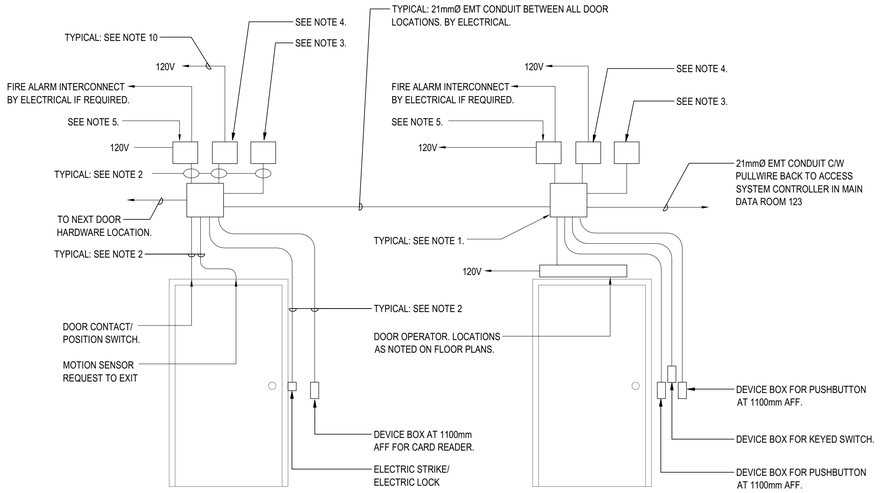
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ENLARGED FLOOR PLANS - DATA CENTRE

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

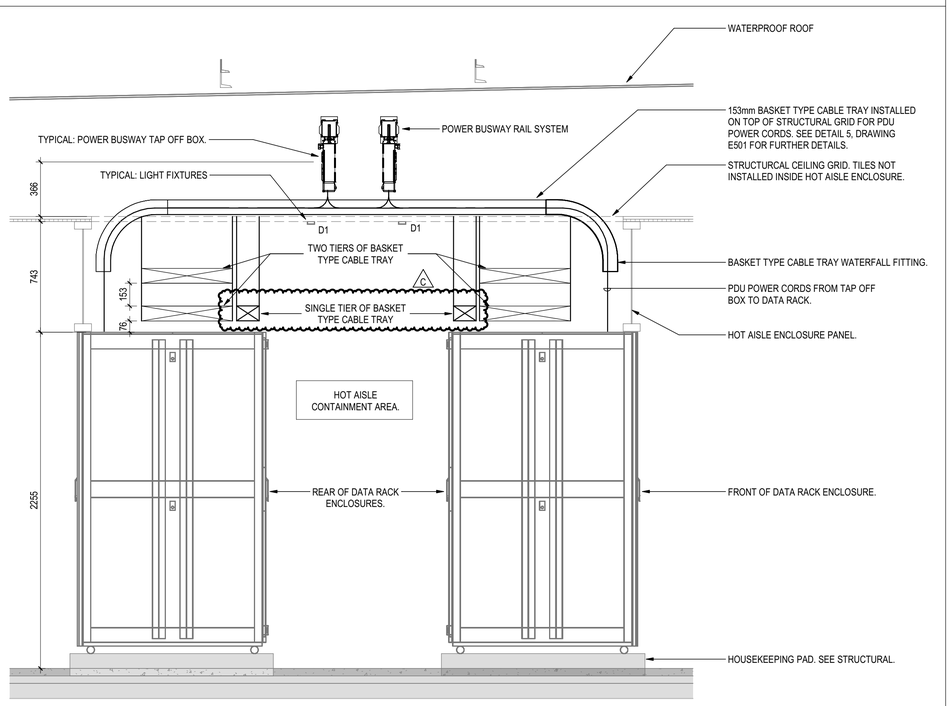


NOTES:

1. 405mm X 405mm X 100mm PULL BOX IN CEILING SPACE ABOVE DOOR. PROVIDE 2' OF LOOPED WIRE AT EACH PULL BOX.
2. 21mmØ EMT CONDUIT C/W PULL WIRE BY ELECTRICAL. WIRING BY DOOR HARDWARE CONTRACTOR.
3. DOOR CONTROL DEVICE (DCD). BY DOOR HARDWARE CONTRACTOR.
4. POWER SUPPLY FOR DCD (ONE FOR UP TO 5 DOORS WITHIN 50' RADIUS). BY DOOR HARDWARECONTRACTOR.
5. POWER SUPPLY FOR DOOR HARDWARE IF REQUIRED. BY DOOR HARDWARE CONTRACTOR.
6. ALL FIRE ALARM INTERCONNECTS BY ELECTRICAL.
7. ALL CONDUIT/BOXES/ROUGH-IN BY ELECTRICAL.
8. ALL 120V WIRING AND CONNECTIONS BY ELECTRICAL.
9. ALL LOW VOLTAGE WIRING AND DEVICES BY DOOR HARDWARE CONTRACTOR.
10. 2 - #12 AWG RW90 COPPER CONDUCTORS PLUS 1 - #12 AWG COPPER BOND IN 21mmØ EMT CONDUIT FOR 120V POWER.
11. COORDINATE EXACT ROUGH-IN REQUIREMENTS AT EACH DOOR LOCATION WITH DOOR HARDWARE INSTALLER PRIOR TO ROUGH-IN.

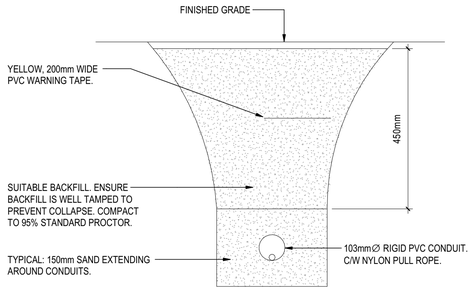
5 TYPICAL DOOR HARDWARE ROUGH-IN DETAIL

E505 N.T.S.



4 SECTION VIEW - CSF-1320A

E505 N.T.S.

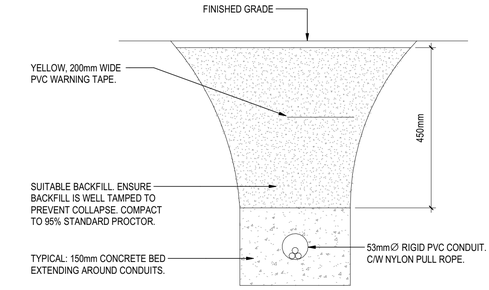


NOTES:

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

3 TYPICAL COMMUNICATION DUCT BANK DETAIL

E505 N.T.S.

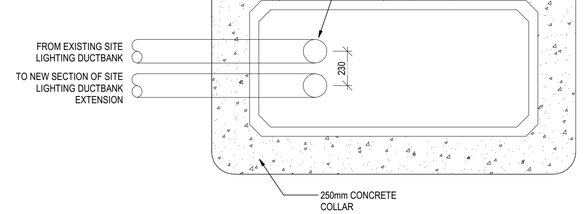


NOTES:

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

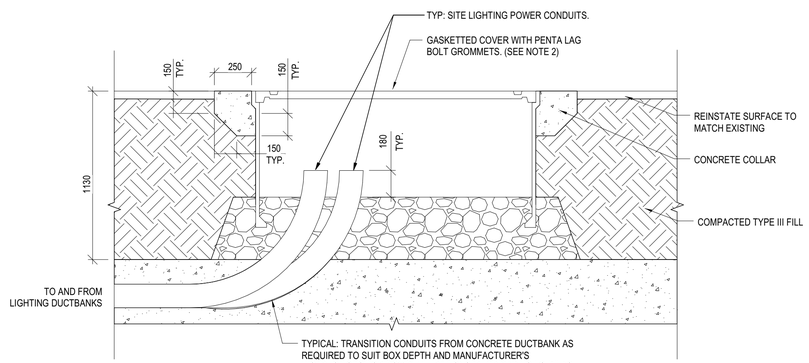
1 TYPICAL SITE LIGHTING DUCT BANK DETAIL

E505 N.T.S.



NOTES:

1. 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.
2. PULL BOX TO BE OPEN BOTTOM WITH GASKETED COVER.
3. LABEL ALL DUCTS IN PULLBOXES WITH STAINLESS STEEL TAGS.



2 UNDERGROUND PULLBOX DETAIL

E505 N.T.S.

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

No.	REVISION	DATE
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

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)

REGISTERED PROFESSIONAL ENGINEER
PEGL Newfoundland and Labrador
BERNIE ROBSON
2025-01-22
DATE
NEWFOUNDLAND & LABRADOR

Stantec

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

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 DETAILS

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

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			

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	22CZ2-44-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	22CZ2-44-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	22CZ2-55VHE-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	22CZ2-55VHE-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-SD4 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-SD4 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
C													
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	FLUORESCENT	6216 lm	4000 K	80	62 W	347 V	(none)	(none)	EXISTING LIGHT FIXTURES. SPECIFICATIONS OF LIGHTS UNCONFIRMED.

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

EMG-094 — LOCATION: Electrical Room 2301 — 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 A	PHASE LOAD B	PHASE LOAD C
Spare	--	--	20A	1	2	20A	--	--	Exit Lights L1	--		
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							

PROVIDE NEW BREAKER FOR CIRCUIT TO NEW EGRESS LIGHTING.

COMMENTS: — CONNECTED LOAD 4663 KW. — TOTAL WATTS 1326 2153 1184
ESTIMATED DEMAND -- KW. — TOTAL AMPS 3.8 6.2 3.4

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

No.	REVISION	DATE
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

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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)

REGISTERED PROFESSIONAL ENGINEER — PEGNL Newfoundland and Labrador — BERNIE ROBSON — 2025-01-22 DATE — NEWFOUNDLAND & LABRADOR

Stantec

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

MEMORIAL UNIVERSITY
Department of Facilities Management

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- 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 SCHEDULES

DESIGNED:	DRAWN:
MG/JD	MG/JD
REVIEWED: -	APPROVED: BR
SCALE: 1 : 100	DATE: SEPTEMBER, 2025
STANTEC PROJECT No.: 133412008	DRAWING No.: **E701**

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

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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.

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

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.

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:

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 till or bedrock at this site are suitable bearing surfaces for placement of structural

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.

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 till 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

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 m 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

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.

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

REGISTERED PROFESSIONAL ENGINEER
PEGA
ERICH W.T. LENZ
SIGNATURE
Oct. 2, 2013
DATE
NEWFOUNDLAND & LABRADOR

PROVINCE OF NEWFOUNDLAND AND LABRADOR
PEGA
PERMIT HOLDER
This Permit Allows
STANTEC CONSULTING LTD.
To practice Professional Engineering in Newfoundland and Labrador.
Permit No. as issued by PEG J0291
which is valid for the year 2013

REGISTERED PROFESSIONAL ENGINEER
LORNE C. BOONE
SIGNATURE
Oct 2 '13
DATE
PROVINCE OF NEWFOUNDLAND

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

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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.

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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:

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

Terminology describing soil structure:

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

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 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
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>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
Very Soft	<0.25	<12.5
Soft	0.25 - 0.5	12.5 - 25
Firm	0.5 - 1.0	25 - 50
Stiff	1.0 - 2.0	50 – 100
Very Stiff	2.0 - 4.0	100 - 200
Hard	>4.0	>200

ROCK DESCRIPTION

Terminology describing rock quality:

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

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	*Extremely Wide*	-
2000-6000	*Very Wide*	*Very Thick*
600-2000	*Wide*	*Thick*
200-600	*Moderate*	*Medium*
60-200	*Close*	*Thin*
20-60	*Very Close*	*Very Thin*
<20	*Extremely Close*	*Laminated*
<6	-	*Thinly Laminated*

Terminology describing rock strength:

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

Terminology describing rock weathering:

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

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Meta-morphic Bedrock | Sedi-mentary Bedrock

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

measured in standpipe, piezometer, or well

inferred

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
γ	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

Stantec

BOREHOLE No. **BH-01**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES OTHER TESTS
							mm		
0		ASPHALT							
		Compact, brown to grey, silty SAND with gravel (SM): FILL			SS	1	225	23	
1				▼	SS	2	250	10	
					SS	3	200	20	
2									
		Loose, grey, silty SAND with gravel (SM) to sandy SILT (ML): FLUVIAL DEPOSITS			SS	4	475	8	
3					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	
					SS	7	200	18	
5									
					SS	8	300	29	S
6									
					SS	9	175	63/275	
7		Fractured to moderately jointed, greenish grey, fresh, strong, SHALE with interbedded sandstone: BEDROCK			NQ	10	100%	65%	
8					NQ	11	100%	85%	
9		End of Borehole Groundwater standpipe installed							
10									

UNDRAINED SHEAR STRENGTH - kPa
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

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

Stantec

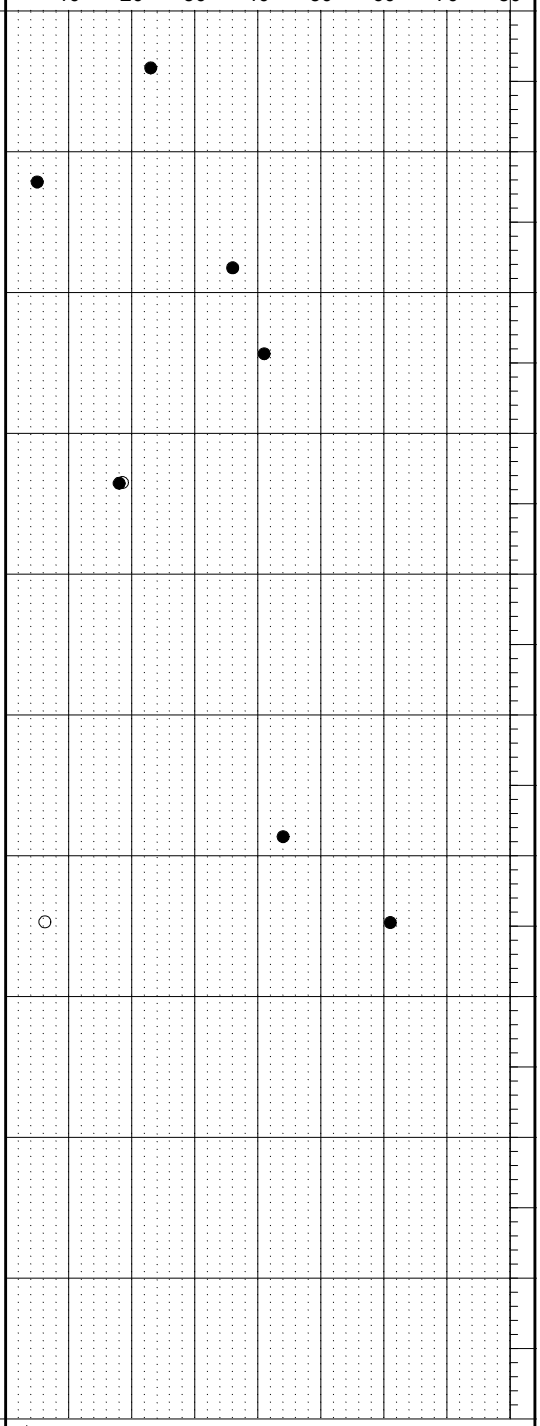
BOREHOLE RECORD

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 TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		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
					SS	6	125	61/250	
4		- Zone of cobbles and/or possible boulders from 3.8 m to 5.5 m depth			WS	7	78%	44%	
					WS	8	80%	0%	
5					WS	9	27%	0%	
6					SS	10	200	44	
					SS	11	350	61	S
7					SS	12	75	100/250	
		Severely fractured to intact, greenish grey, fresh, medium strong to strong, SANDSTONE: BEDROCK			NQ	13	100%	86%	
8									
9					NQ	14	100%	92%	
10									

UNDRAINED SHEAR STRENGTH - kPa
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



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

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BOREHOLE RECORD

BOREHOLE No. **BH-02**
PAGE **2** of **2**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES OTHER TESTS
		Continued from Previous Page					mm		
10					NQ	15	100%	28%	
		End of Borehole							
11		Groundwater standpipe installed							
12									
13									
14									
15									
16									
17									
18									
19									
20									

UNDRAINED SHEAR STRENGTH - kPa
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

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

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BOREHOLE RECORD

BOREHOLE No. **BH-03**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES OTHER TESTS
							mm		
0		ASPHALT							
		Compact, brown to grey, silty SAND with gravel (SM): FILL			SS	1	225	10	
1				▼	SS	2	150	16	
		Compact to very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	3	200	51	
2									
					SS	4	250	34	
3					SS	5	200	30	
4					SS	6	175	52	
					SS	7	150	17	
5									
					SS	8	150	19	
6		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%	
7									
					NQ	11	100%	61%	
8									
					NQ	12	100%	59%	
9		End of Borehole Groundwater standpipe installed							
10									

UNDRAINED SHEAR STRENGTH - kPa
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

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

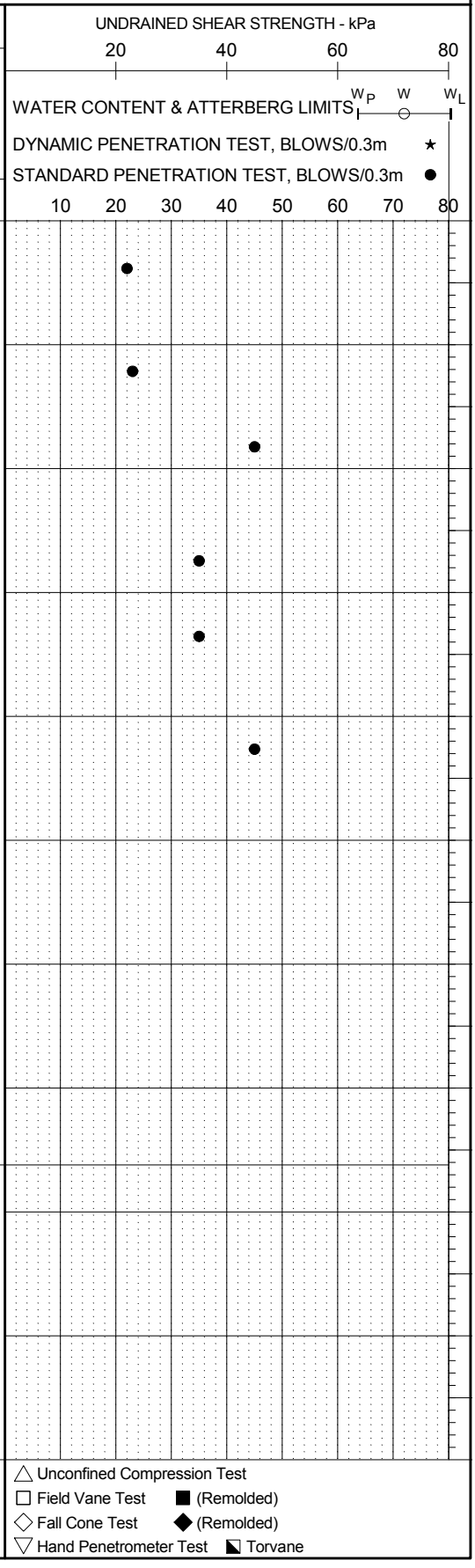
BOREHOLE RECORD

BOREHOLE No. **BH-04**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		Compact, brown, silty SAND with gravel (SM) to silty GRAVEL with sand (GM): FILL			SS	1	325	22	
1				▼	SS	2	325	23	
		Dense, to very dense, grey to greyish brown, silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	3	375	45	
2									
		- 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%	
		End of Borehole							
8									
9									
10									



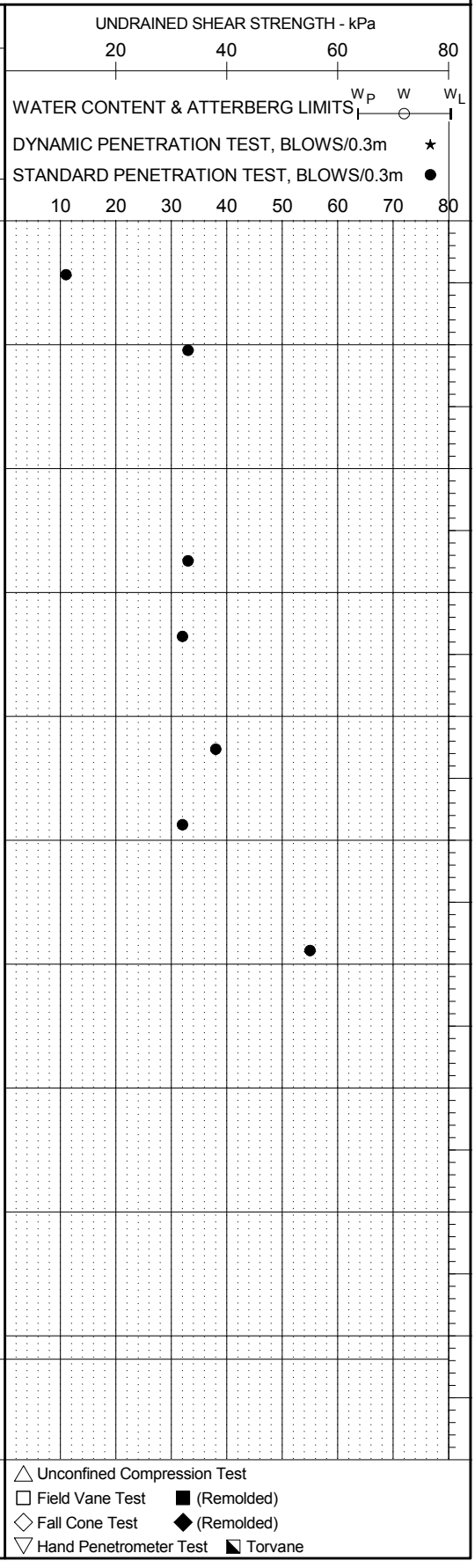
BOREHOLE RECORD

BOREHOLE No. **BH-05**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		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	
					SS	7	250	32	
5					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%	
8					NQ	13	100%	65%	
					NQ	14	100%	85%	
9		End of Borehole Groundwater standpipe installed							
10									



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BOREHOLE RECORD

BOREHOLE No. **BH-06**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES OTHER TESTS
							mm		
0		ASPHALT							
		Compact to very dense, brown to grey, silty SAND with gravel (SM): FILL			SS	1	325	58	
1					SS	2	150	23	
		Compact to dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL			SS	3	100	120/175	
2					SS	4	200	27	
3					SS	5	225	43	
4					SS	6	250	19	
5					SS	7	100	70/100	
		Very severely fractured to fractured, greenish grey, slightly weathered to fresh, medium strong to strong, SHALE with interbedded sandstone: BEDROCK			NQ	8	100%	0%	
6					NQ	9	100%	35%	
7					NQ	10	100%	65%	
					NQ	11	60%	0%	
8					NQ	12	100%	70%	
9		End of Borehole Groundwater standpipe installed							
10									

UNDRAINED SHEAR STRENGTH - kPa
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

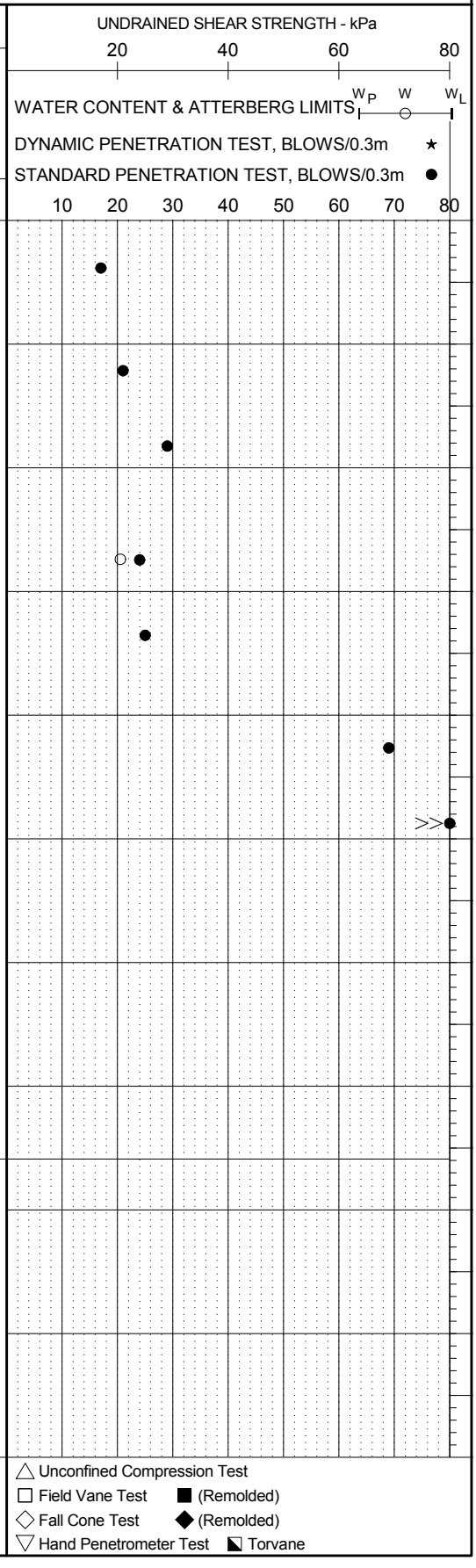
△ Unconfined Compression Test
□ Field Vane Test ■ (Remolded)
◇ Fall Cone Test ◆ (Remolded)
▽ Hand Penetrometer Test ◹ Torvane

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 TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		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	
		Very dense, grey, silty GRAVEL with sand (GM); occasional cobbles: TILL							
4					SS	6	300	69	
					SS	7	280	95	
5					WS	8	50	50/2	
		Very severely fractured to moderately jointed, green to purple, slightly to moderately weathered, medium strong to strong, SANDSTONE: BEDROCK			NQ	9	100%	0%	
6					NQ	10	100%	75%	
					NQ	11	100%	60%	
7									
		End of Borehole							
8		Groundwater standpipe installed							
9									
10									



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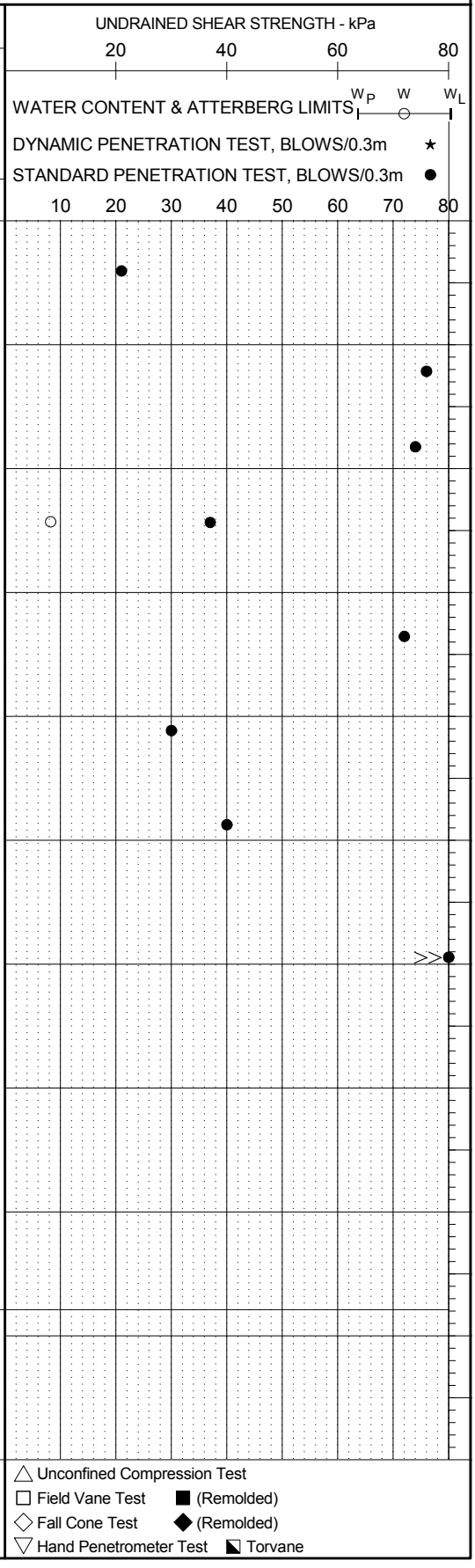
BOREHOLE RECORD

BOREHOLE No. **BH-08**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		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
3					SS	5	225	72	
4					SS	6	275	30	
5					SS	7	0	40	
6					SS	8	425	104	
		Severely fractured to fractured, light red, strong, slightly weathered, SANDSTONE with thin laminations of green sandstone: BEDROCK			NQ	9	88%	78%	
7					NQ	10	100%	69%	
8					NQ	11	100%	73%	
9		End of Borehole Groundwater standpipe installed							
10									



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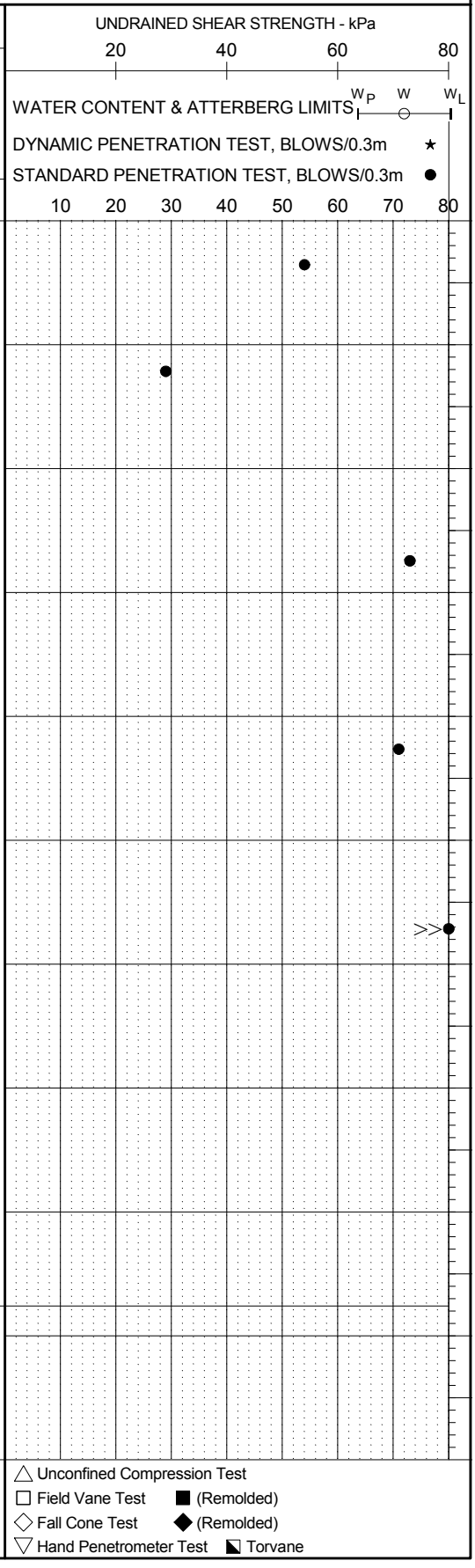
BOREHOLE RECORD

BOREHOLE No. **BH-09**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		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									
6					SS	5	325	82	
		Fractured to intact, greenish grey, slightly weathered to fresh, strong, SHALE: BEDROCK			NQ	6	86%	65%	
7									
8					NQ	7	100%	90%	
		End of Borehole							
9									
10									



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BOREHOLE RECORD

BOREHOLE No. **BH-10**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY OR TCR(%)	SAMPLES N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		Compact, brown, silty SAND with gravel (SM): FILL			SS	1	400	24	
1					SS	2	175	22	
		Compact to dense, grey, silty SAND with gravel (SM) to gravelly SILT with sand (ML): FLUVIAL DEPOSITS			SS	3	325	23	
2									
					SS	4	400	46	S
3		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	
4									
					SS	6	150	74/250	
					WS	7	100%	64%	
5		-480mm diameter boulder at 4.4 m depth			SS	8	200	31	
6					SS	9	450	53	
		Very severely fractured to fractured, greenish grey, slightly weathered, medium strong to strong, SANDSTONE: BEDROCK			NQ	10	87%	17%	
7					NQ	11	100%	62%	
		End of Borehole							
8		Groundwater standpipe installed							
9									
10									

UNDRAINED SHEAR STRENGTH - kPa
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

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

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BOREHOLE RECORD

BOREHOLE No. **BH-11**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
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	
2					SS	3	275	40	
3					SS	4	325	29	S
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									

UNDRAINED SHEAR STRENGTH - kPa
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

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

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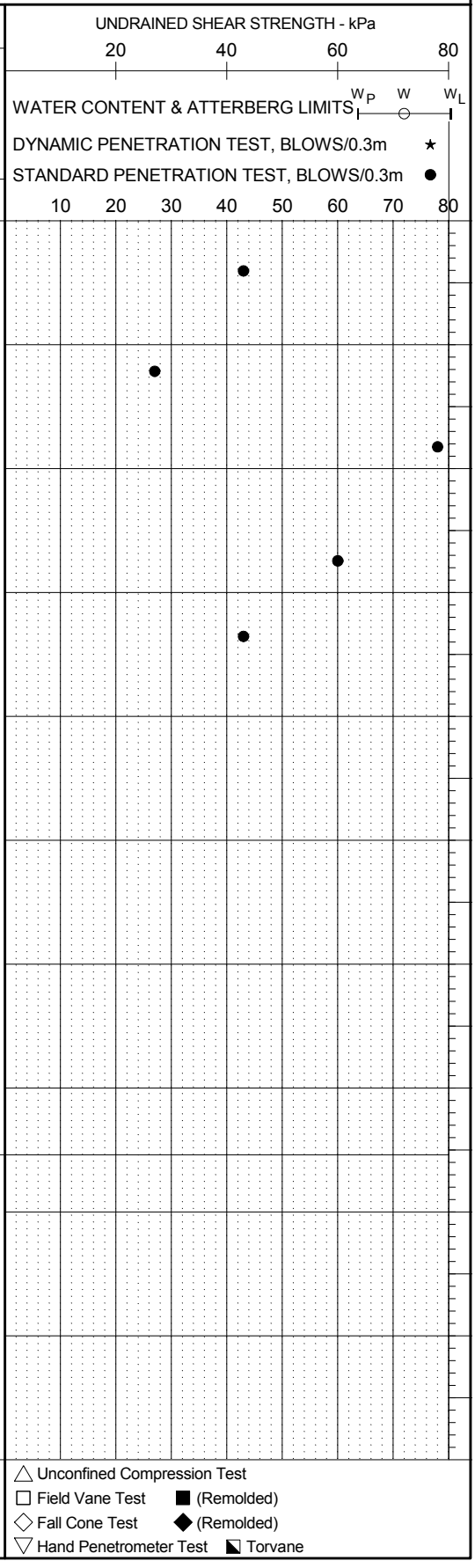
BOREHOLE RECORD

BOREHOLE No. **BH-12**
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 to 8-25-13** WATER LEVEL **0.93m 9-18-13**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		Dense, brown, silty SAND with gravel (SM): FILL			SS	1	300	43	
1		Compact to very dense, grey, silty SAND with gravel (SM) to silty GRAVEL with sand (GM); occasional cobbles: TILL		▼	SS	2	275	27	
2					SS	3	250	78	
3					SS	4	350	60	
					SS	5	275	43	
4									
					SS	6	300	77/300	
5		Fractured to moderately jointed, greenish grey, medium strong, slightly weathered, SHALE: BEDROCK			NQ	7	100%	56%	
					NQ	8	100%	66%	
6					NQ	9	100%	71%	
7					NQ	10	100%	86%	
8		End of Borehole Groundwater standpipe installed							
9									
10									



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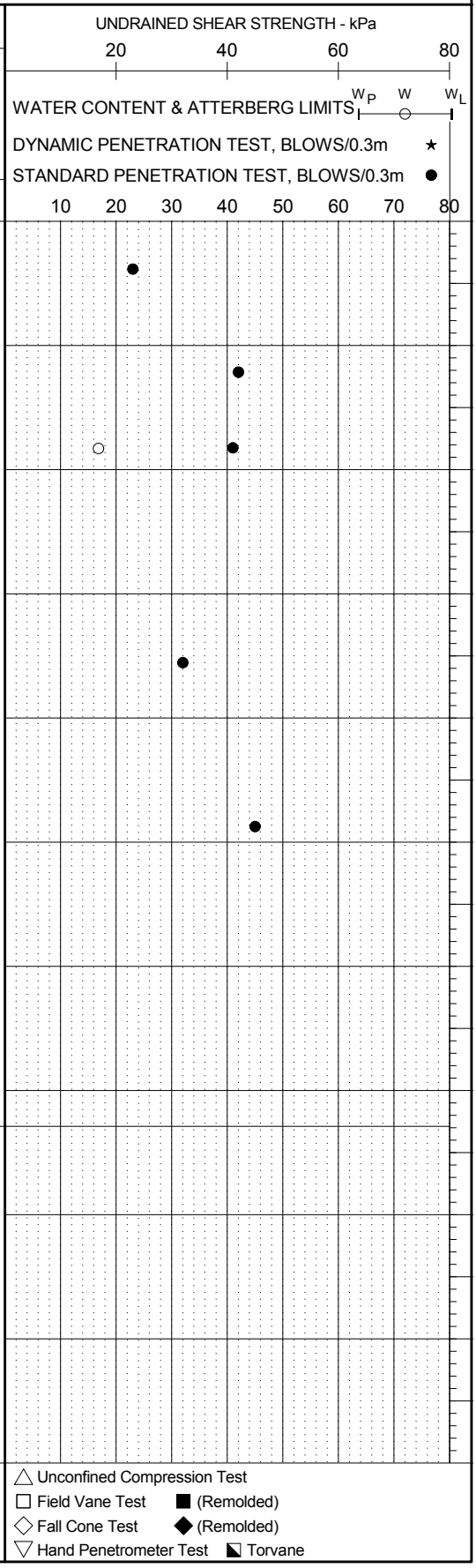
BOREHOLE RECORD

BOREHOLE No. **BH-13**
PAGE **1** of **1**

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**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

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



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BOREHOLE RECORD

BOREHOLE No. **BH-14**
PAGE **1** of **1**

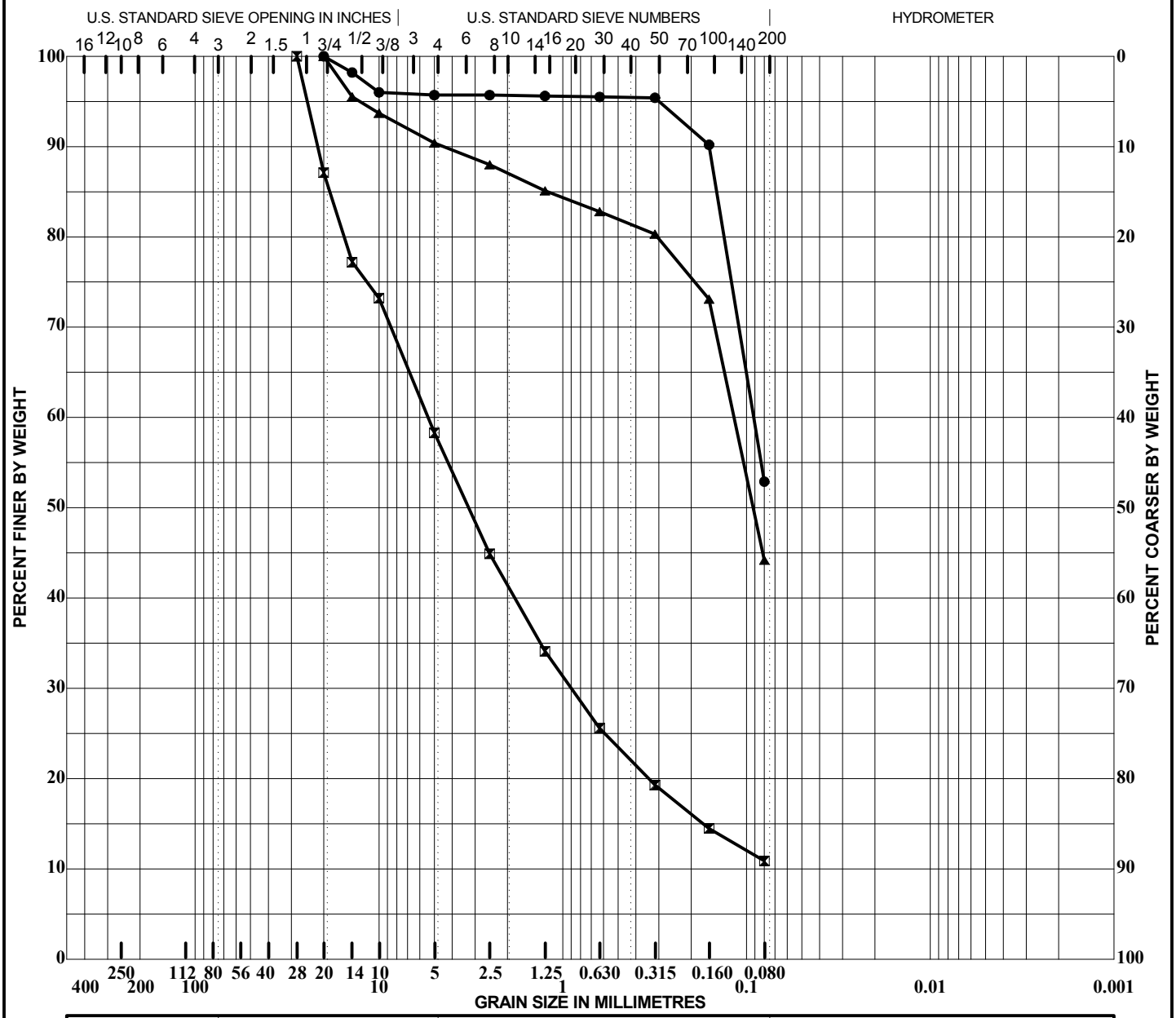
CLIENT **Memorial University of Newfoundland**
PROJECT **Geotechnical Investigation - Proposed MUN Core Sciences Building**
LOCATION **Arctic Avenue and Clinch Crescent, St. John's, NL**
DATES (mm-dd-yy): BORING **8-24-13** WATER LEVEL **1.14m** **9-18-13**

PROJECT No. **140132018**
DRILLING METHOD **Diamond**
SIZE **NQ**
DATUM **Geodetic**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY OR TCR(%)	N-VALUE OR RQD (%)	OTHER TESTS
							mm		
0		ASPHALT							
		Compact to dense, brown, silty SAND with gravel (SM): FILL			SS	1	350	30	
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	
2					SS	3	350	42	
3					SS	4	300	32	
					SS	5	425	30	S
4					SS	6	225	23	
5					SS	7	0	50/50	
6		Severely fractured to moderately jointed, greenish grey, slightly weathered, medium strong to strong, SANDSTONE: BEDROCK			NQ	8	100%	56%	
					NQ	9	100%	31%	
7					NQ	10	100%	79%	
8		End of Borehole Groundwater standpipe installed							
9									
10									

UNDRAINED SHEAR STRENGTH - kPa
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

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



COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (m)	Description	W%	W_L	W_P	I_P
●	BH-01 SS5	3.35	Sandy SILT (ML)	25.0			
⊠	BH-01 SS8	5.79	Well-graded SAND with silt and gravel (SW-SM)	8.2			
▲	BH-02 SS5	3.35	Silty SAND with gravel (SM)	18.6			

	Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-01 SS5	3.35	20.00	0.09			4.3	42.8	52.9	
⊠	BH-01 SS8	5.79	28.00	5.41	0.898		41.7	47.4	10.9	
▲	BH-02 SS5	3.35	20.00	0.12			9.6	46.2	44.2	

REMARKS:

Stantec

Client: **Memorial University of Newfoundland**

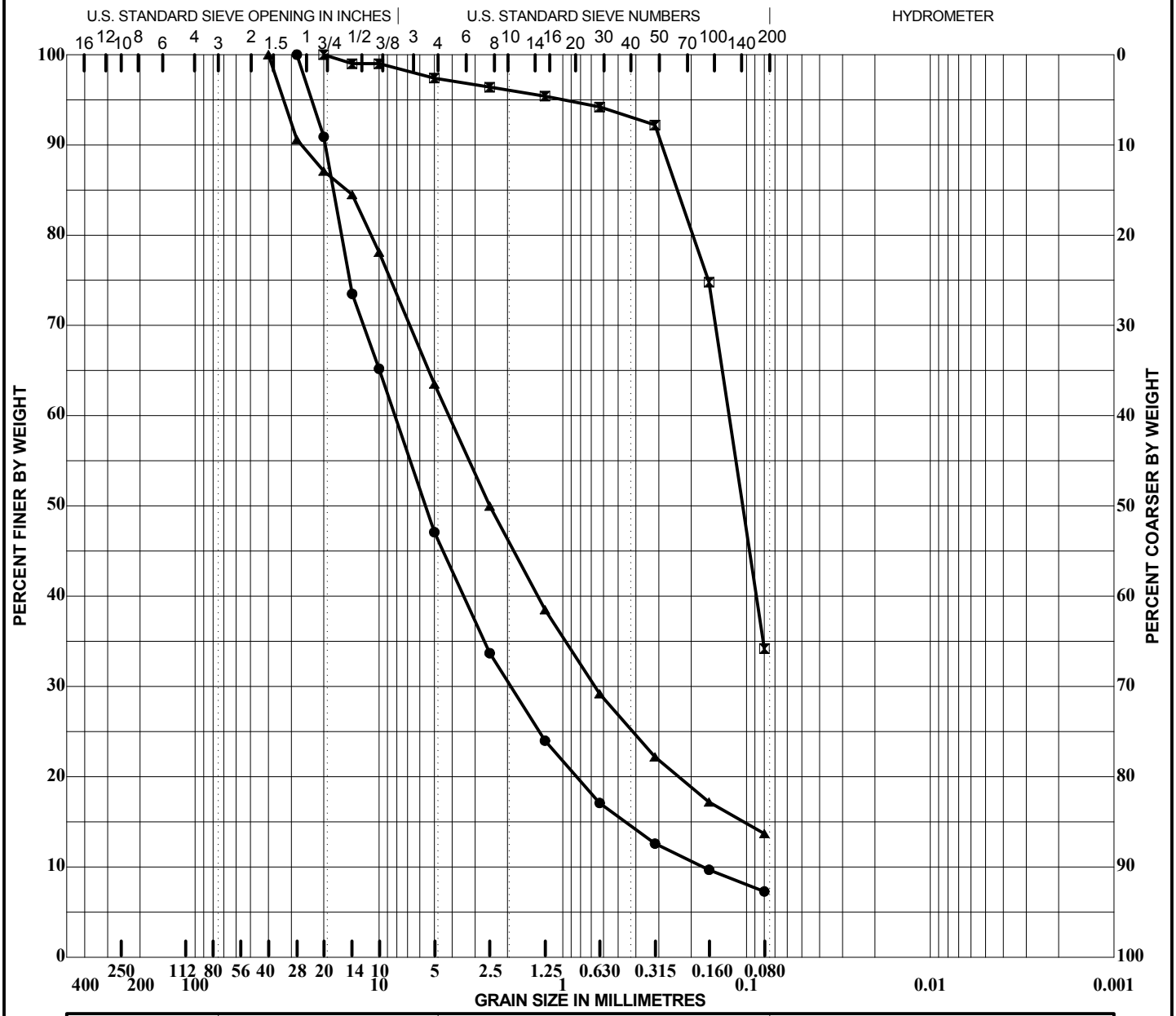
Project: **Geotechnical Investigation - Proposed MUN Core Sciences Building**

Project No.: **140132018**

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

FIGURE 1

GRADATION CURVES



COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (m)	Description	W%	W_L	W_P	I_P
●	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:

Stantec

Client: **Memorial University of Newfoundland**

Project: **Geotechnical Investigation - Proposed MUN Core Sciences Building**

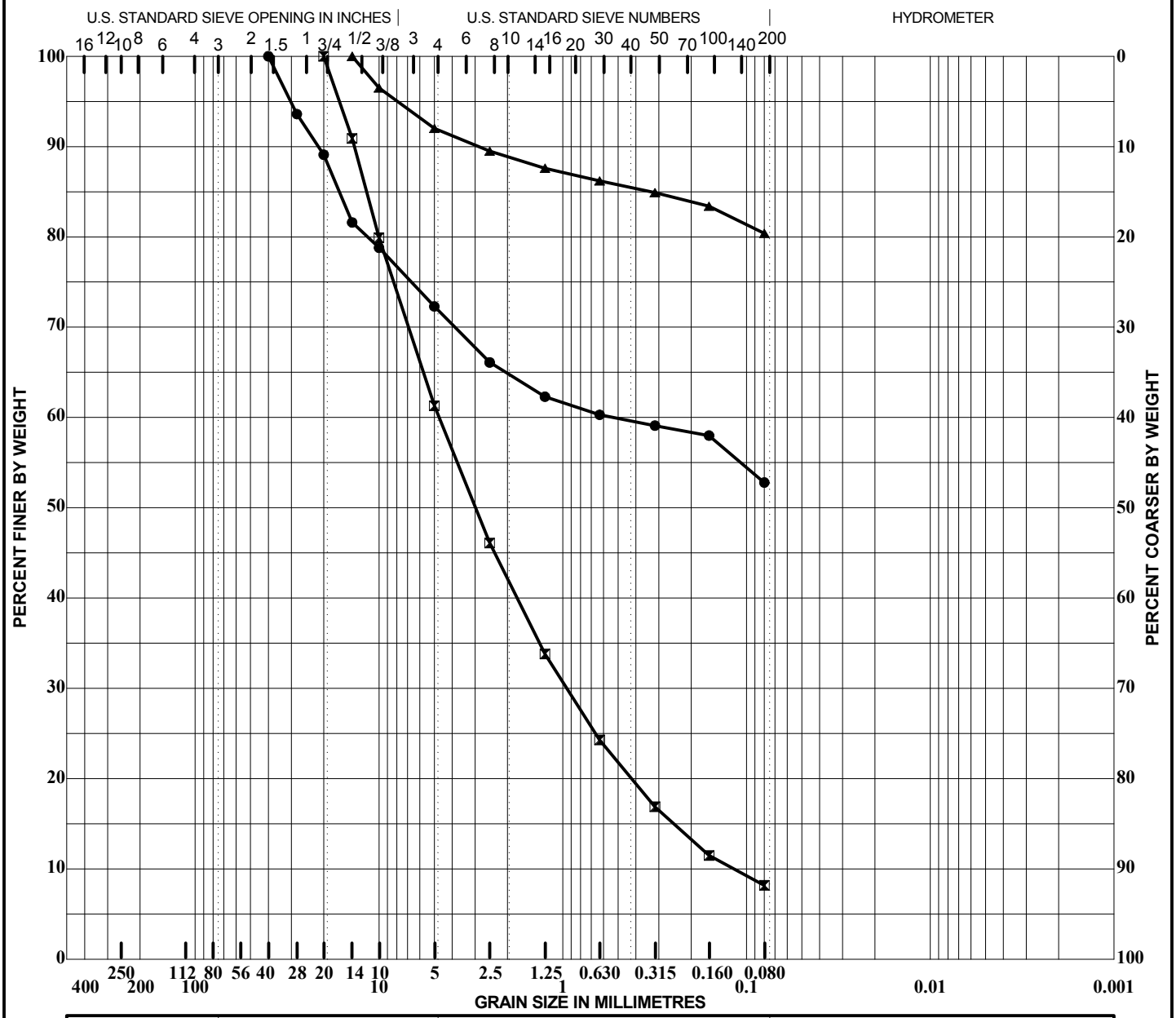
Project No.: **140132018**

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

FIGURE 2

GRADATION CURVES

STANTEC GRAIN SIZE 9/26/13 4:41:46 PM



COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (m)	Description	W%	W_L	W_P	I_P
●	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:

Stantec

Client: **Memorial University of Newfoundland**

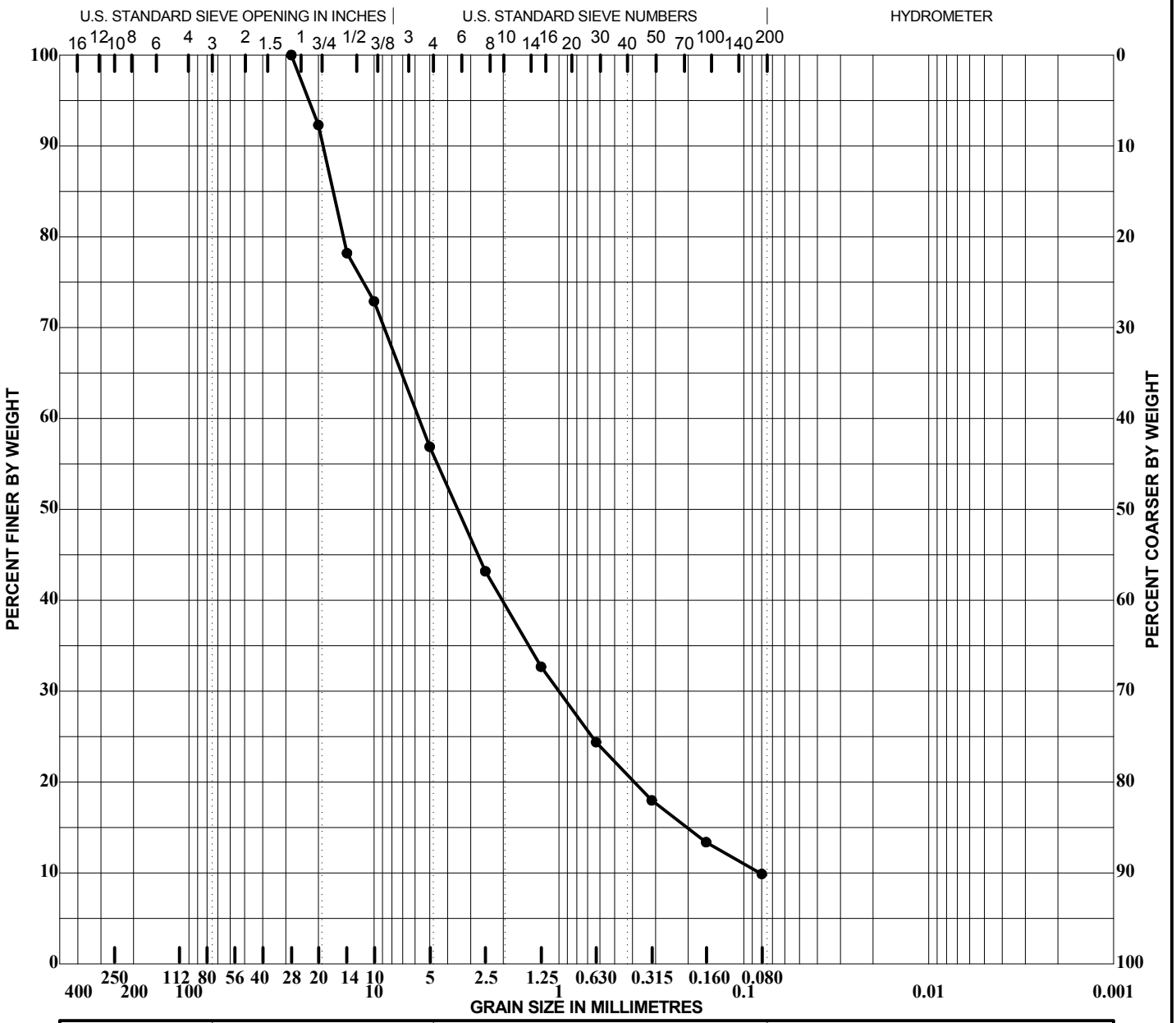
Project: **Geotechnical Investigation - Proposed MUN Core Sciences Building**

Project No.: **140132018**

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

FIGURE 3

GRADATION CURVES



COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth (m)	Description	W%	W_L	W_P	I_P
●	BH-14 SS5	3.35	Well-graded SAND with silt and gravel (SW-SM)	7.0			

	Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-14 SS5	3.35	28.00	5.72	1.000	0.0816	43.1	47.0	9.9	

REMARKS:

Stantec

Client: **Memorial University of Newfoundland**

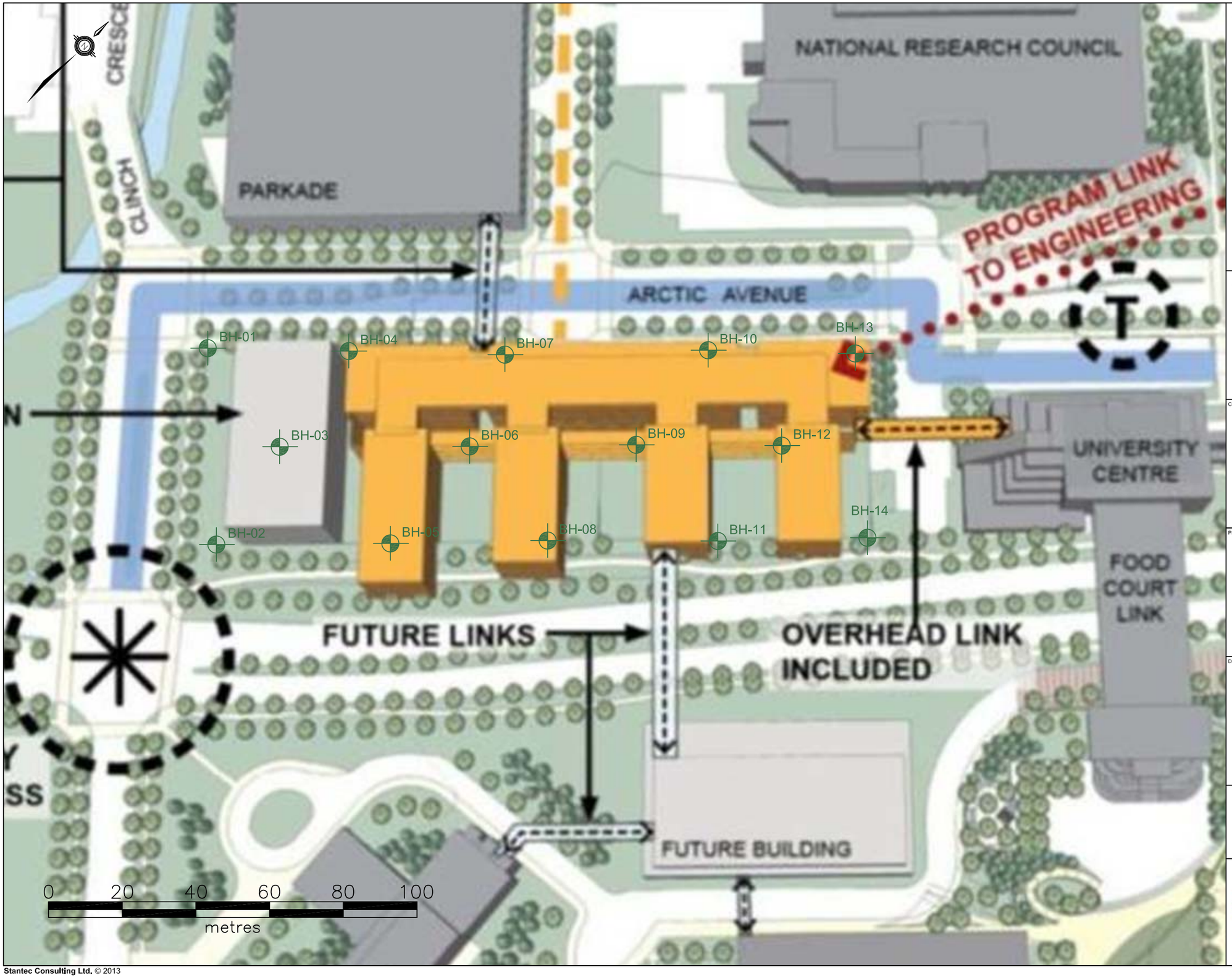
Project: **Geotechnical Investigation - Proposed MUN Core Sciences Building**

Project No.: **140132018**

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

FIGURE 4

GRADATION CURVES



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
MEMORAL 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 coved 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

AC	ACCORDIAN
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
BD	BOARD
BF	BARRIER FREE
BOL	BOLLARD
C/W	COMPLETE WITH
CG	CORNER GUARD
CJ	CONSTRUCTION JOINT
CL	CENTRE LINE
CLG	CEILING
CLR	CLEAR
CMP	COMPOSITE METAL PANEL
CMU	CONCRETE MASONARY UNIT
COJ	CONFIRM ON JOB

COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
DEMO	DEMOLITION
DIA	DIAMETER
DR	DOOR
DWG	DRAWING
EA	EACH
EIFS	EXTERIOR INSULATION FINISH SYSTEM
ELEV	ELEVATION
ELEC	ELECTRICAL
EQ	EQUAL
EW	EYEWASH
EXIST	EXISTING
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER

FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN GR	FINISHED GRADE
FL	FLOOR
FR	FIRE RATED
GALV	GALVANIZED
GL	GLASS
GYP BD	GYPSUM BOARD
H/C	HOT & COLD WATER
HM	HOLLOW METAL
HMI	HOLLOW METAL INSULATED
HORIZ	HORIZONTAL
ID	INSIDE DIAMETER
INS	INSULATION
INT	INTERIOR
LAM	LAMINATED
MAX	MAXIMUM

MECH	MECHANICAL
MET	METAL
MIN	MINIMUM
MIR	MIRRORED
MISC	MISCELLANEOUS
MLWK	MILLWORK
MM	MILLIMETER
MO	MASONRY OPENING
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
O/H	OVER HEAD
OC	ON CENTER
OD	OUTSIDE DIAMETER
PB	POWER DOOR OPERATOR PUSH BUTTON
PLAM	PLASTIC LAMINATED
PSF	PRESSED STEEL FRAME
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN

RO	ROUGH OPENING
ROW	REVERSE OSMOSIS
RWL	RAIN WATER LEADER
SCW	SOLID CORE WOOD
SIM	SIMILAR
SG	SLIDING GRILLE
SO/H	SECTIONAL OVERHEAD
SS	STAINLESS STEEL
STC	SOUND TRANSMISSION CLASSIFICATION
T/O	TOP OF
TOC	TOP OF CURB
TOS	TOP OF STEEL
TYP	TYPICAL
U/S	UNDERSIDE
UNO	UNLESS NOTED OTHERWISE
WC	WASHROOM
WD	WOOD
WRT	WITH RESPECT TO

5 ABBREVIATIONS
A100 1 : 1

GENERAL DOOR / FRAME NOTES

a. EXISTING FLOORS MAY BE UNLEVEL REQUIRING DOORS TO BE UNDERCUT TO SUIT SITE CONDITIONS. IN ALL CASES LIMIT THE UNDERCUT TO 6MM ABOVE THE HIGHEST POINT OF FLOOR.
b. SEE PARTITION TAG FOR FIRE RATING OF WALL ASSEMBLIES. Px-20 DENOTES A 20 MINUTE RATED WALL ASSEMBLY, 45 DENOTES 45 MINUTES, AND SO FORTH.
c. PROVIDE FIRE RATED DOOR ASSEMBLIES IN FIRE RATED WALL ASSEMBLIES AS FOLLOWS (NOTE: RATINGS SHOWN ARE THE MINIMUM REQUIRED):

WALL RATING	-	DOOR RATING
NON RATED	-	0 MIN
45 MIN	-	45 MIN
60 MIN	-	45 MIN
90 MIN	-	60 MIN
120 MIN	-	90 MIN

d. FOR GLAZED DOORS AND FRAMES, PROVIDE CLEAR INSULATED SAFETY GLASSUNITS LOCATED BETWEEN HEATED AND UNHEATED SPACES, CLEAR FIRE RATED GLASS WHEN LOCATED IN FIRE RATED ASSEMBLIES, AND CLEAR SAFETY GLASS IN ALL OTHER LOCATIONS; UNLESS OTHERWISE NOTED.
e. PROVIDE FIRE RATED TYPE LOUVERS WHEN LOUVERS ARE LOCATED IN FIRE RATED DOOR ASSEMBLIES.
f. SEE DOOR SCHEDULE FOR DOOR AND FRAME PAINT / STAIN / LAMINATE COLOUR, UNLESS OTHERWISE NOTED.
g. WHERE NEW DOORS AND OR HARDWARE ARE TO BE INSTALLED IN EXISTING PRESSED STEEL FRAME, MAKE ALL NECESSARY MODIFICATIONS TO THE FRAMES TO ACCOMMODATE THE SPECIFIED HARDWARE. PROVIDE INFILL PLATES WHERE REDUNDANT CUTOUTS ARE VISIBLE AND PROVIDE APPROPRIATE ESCUTCHEON PLATES TO COVER ANY VISIBLE IMPERFECTIONS ON THE LATCH SIDE. ENSURE THE INTEGRITY OF REQUIRED REINFORCEMENT AND PREPARE FRAMES TO RECEIVE SPECIFIED FINISH.
h. INSTALL DOOR FRAMES SHOWN IMMEDIATELY ADJACENT TO CORNERS SUCH THAT THE DISTANCE FROM THE INSIDE FACE OF THE DOOR FRAME TO THE FACE OF THE ADJACENT WALL IS 100MM UNO.
i. REFER TO SPECIFICATION FOR HARDWARE GROUPS.

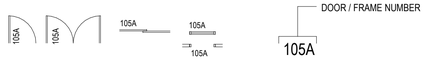
FRAME DETAILS

- PROVIDE WRAP AROUND JAMBS FOR STANDARD STEEL FRAMES IN WOOD / METAL STUD PARTITIONS UP TO 152MM AND CMU PARTITIONS 140MM IN WIDTH; UNLESS OTHERWISE NOTED.

- PROVIDE BUTT JAMBS FOR STANDARD STEEL FRAMES LOCATED IN CMU PARTITIONS GREATER THAN 140MM IN WIDTH, IN CONCRETE WALLS; AND IN WOOD / METAL STUD PARTITIONS OVER 152MM. ALL ALUMINUM FRAMES LOCATED IN WOOD / STEEL STUD PARTITIONS AND IN CMU AND CONCRETE WALLS RECEIVE BUTT FRAMES UNLESS OTHERWISE NOTED.

- REFER TO DRAWINGS AND KEYNOTES FOR OTHER FRAME CONFIGURATIONS.

DOOR AND FRAME OPENING NUMBERS



4 GENERAL DOOR FRAME NOTES
A100 1 : 1

HG01

No. OF	COMPONENT	SIZE	FINISH
6 EA	HINGE	4.5 X 4	652
1 EA	STOREROOM LOCK		626 SCH
1 EA	ELECTRIC STRIKE	12/24 VAC/VDC	630
1 EA	SURFACE CLOSER		689
1 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	ASTRAGAL	x (2) door height	AA
1 EA	CREDENTIAL READER/CONTROLLER	BY GENERAL CONTRACTOR	
1 EA	POWER SUPPLY		LGR
2 EA	FLOOR STOP		

MODE OF OPERATION:
A PERSON CAN ENTER THRU THE DOOR WITH KEY OR BY PRESENTING THEIR CREDENTIAL TO THE READER WHICH WILL RETRACT KEEPER ON ELECTRIC STRIKE AND ALLOW THE DOOR TO BE OPENED. FREE EGRESS AT ALL TIMES

HG02

No. OF	COMPONENT	SIZE	FINISH
6 EA	HINGE	4.5 X 4	652
2 EA	MANUAL FLUSH BOLT		US26D
1 EA	DUST PROOF STRIKE		626
1 EA	STOREROOM LOCK		626
1 EA	OH STOP		652
1 EA	SURFACE CLOSER		689
1 EA	MOUNTING PLATE		689
2 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	ASTRAGAL	x (2) door height	AA

MODE OF OPERATION:
DOOR IS ALWAYS LOCKED ALWAYS NEED A KEY TO GET IN. FREE EGRESS AT ALL TIMES

HG03

No. OF	COMPONENT	SIZE	FINISH
6 EA	HINGE	4.5 X 4	652
2 EA	MANUAL FLUSH BOLT		US26D
1 EA	ELECTRIC STRIKE	12/24 VAC/VDC	630
1 EA	STOREROOM LOCK		626 SCH
1 EA	OH STOP		652
1 EA	SURFACE CLOSER		689
1 EA	MOUNTING PLATE		689
2 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	ASTRAGAL	x (2) door height	AA
1 EA	CREDENTIAL READER/CONTROLLER	BY GENERAL CONTRACTOR	
1 EA	POWER SUPPLY		LGR

MODE OF OPERATION:
A PERSON CAN ENTER THRU THE DOOR WITH KEY OR BY PRESENTING THEIR CREDENTIAL TO THE READER WHICH WILL RETRACT KEEPER ON ELECTRIC STRIKE AND ALLOW THE DOOR TO BE OPENED. FREE EGRESS AT ALL TIMES

HG04

No. OF	COMPONENT	SIZE	FINISH
6 EA	HINGE	4.5 X 4	652
2 EA	MANUAL FLUSH BOLT		US26D
1 EA	ELECTRIC STRIKE	12/24 VAC/VDC	630
1 EA	STOREROOM LOCK		626 SCH
1 EA	OH STOP		652
1 EA	SURFACE CLOSER		689
1 EA	MOUNTING PLATE		689
2 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	ASTRAGAL	x (2) door height	AA
1 EA	CREDENTIAL READER/CONTROLLER	BY GENERAL CONTRACTOR	
1 EA	POWER SUPPLY		LGR

MODE OF OPERATION:
A PERSON CAN ENTER THRU THE DOOR WITH KEY OR BY PRESENTING THEIR CREDENTIAL TO THE READER WHICH WILL RETRACT KEEPER ON ELECTRIC STRIKE AND ALLOW THE DOOR TO BE OPENED. FREE EGRESS AT ALL TIMES. DOORS REQUIRED TO SWING FULL 180°

HG05

No. OF	COMPONENT	SIZE	FINISH
3 EA	HINGE	4.5 X 4	652
1 EA	STOREROOM LOCK		626 SCH
1 EA	SURFACE CLOSER		689
1 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	FLOOR STOP		

MODE OF OPERATION:
A PERSON NEEDS A KEY TO ENTER SPACE FROM CORRIDOR SIDE. FREE EGRESS AT ALL TIMES IN DIRECTION OF EXIT.

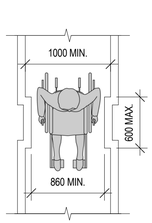
HG06

No. OF	COMPONENT	SIZE	FINISH
3 EA	HINGE	4.5 X 4	652
1 EA	STOREROOM LOCK		626 SCH
1 EA	PUSH/PULL BAR		630
1 EA	SURFACE CLOSER		689
1 EA	KICK PLATE	250mm X 38mm	630
1 EA	GASKETING	x door width x (2) door height	BK
1 EA	FLOOR STOP		

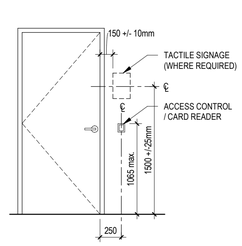
MODE OF OPERATION:
A PERSON NEEDS A KEY TO ENTER SPACE FROM CORRIDOR SIDE. PANIC HARDWARE FITTED TO DOOR IN DIRECTION OF EXIT. FREE EGRESS AT ALL TIMES.

2 DOOR HARDWARE GROUPS
A100 1 : 1

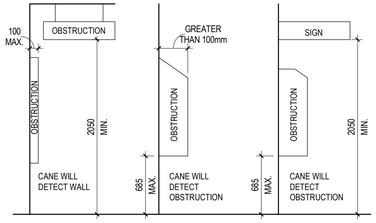
ALL BARRIER FREE REQUIREMENTS TO MEET CSA B651-18 MINIMUM



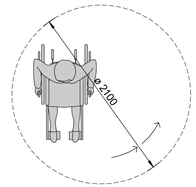
WIDTHS OF INTERIOR ACCESSIBLE ROUTES



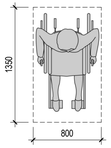
ACCESS CONTROL



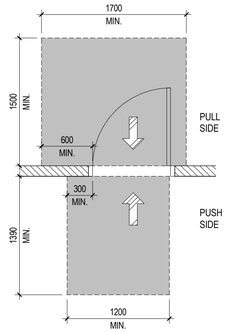
LIMIT OF PROTRUDING OBJECTS



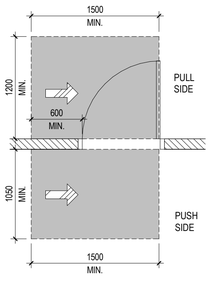
MINIMUM REQUIRED CLEAR AREA FOR WHEEL CHAIR TURNING



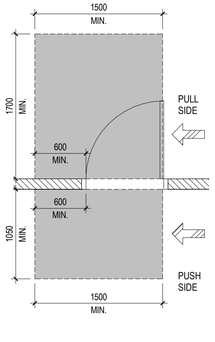
MINIMUM REQUIRED CLEAR FLOOR AREA FOR WHEEL CHAIR USE



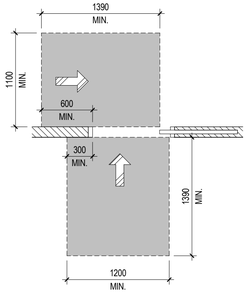
TYPICAL CLEAR MANEUVERING AREA AT DOORS (FRONT APPROACH)



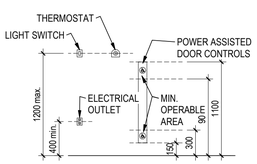
TYPICAL CLEAR MANEUVERING AREA AT DOORS (SIDE APPROACH)



TYPICAL CLEAR MANEUVERING AREA AT DOORS (HINGE SIDE APPROACH)



TYPICAL CLEAR MANEUVERING AREA AT DOORS (SLIDING DOOR FROM FRONT AND SIDE)



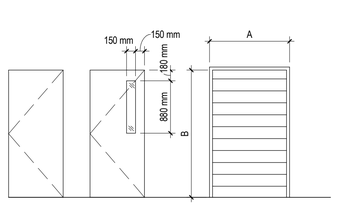
BARRIER FREE MOUNTING HEIGHTS

3 BARRIER FREE CLEARANCES AND MOUNTING HEIGHTS
A100 1 : 35

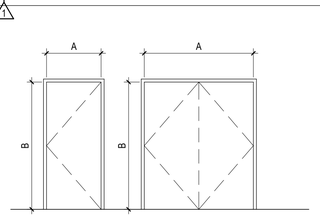
DOOR AND FRAME SCHEDULE

No.	ROOM	WIDTH	HEIGHT	FRAME TYPE	FRAME ELEV.	FRAME FINISH	DOOR TYPE	DOOR ELEV.	DOOR FINISH	FRR	HDWR	Comments
13C5A	FM CORRIDOR	1070	2135	PSF	F1	PT	HM	D2	PT		HG06	
1318A	UPS ROOM	1220	2135	PSF	F1	PT	HM	D1	PT	90MIN	HG03	CARD READER
1318B	STAGING AREA	2134	2438	O/H		PT	O/H	D3	PT			CHAIN OPERATED HOIST. FIT LOCKABLE SLIDE LOCKS TO BOTH JAMBS OF DOOR ON STAGING ROOM SIDE
1319A	SUPPR. SYSTEM/BOTTLE STORAGE	1830	2135	PSF	F2	PT	HM	D1	PT		HG03	CARD READER
1321A	STAGING AREA	915	2135	PSF	F1	PT	HM	D1	PT		HG01	CARD READER
1321AA	DATA CENTRE	1830	2135	PSF	F2	PT	HM	D2	PT	90MIN	HG04	CARD READER
1321AB	DATA CENTRE	1830	2135	PSF	F2	PT	HM	D2	PT	90MIN	HG02	
1324A	FM CORRIDOR	915	2135	PSF	F1	PT	HM	D1	PT		HG06	

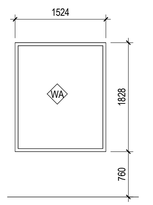
1



DOOR ELEVATIONS



FRAME ELEVATIONS
*DIRECTION OF DOOR SWINGS ARE GENERIC, REFER TO PLAN FOR DIRECTION OF DOOR SWING



WINDOW ELEVATION

1 DOOR, FRAME AND WINDOW ELEVATIONS
A100 1 : 50

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

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

GENERAL NOTES

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Permit/Seal

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

Stantec

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

MEMORIAL UNIVERSITY
Department of Facilities Management

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

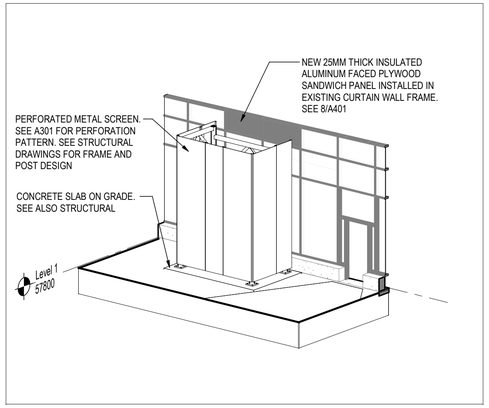
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

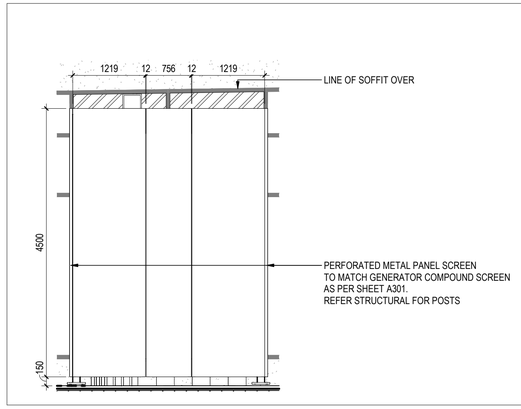
DRAWING TITLE:

GENERAL PROJECT NOTES AND DETAILS

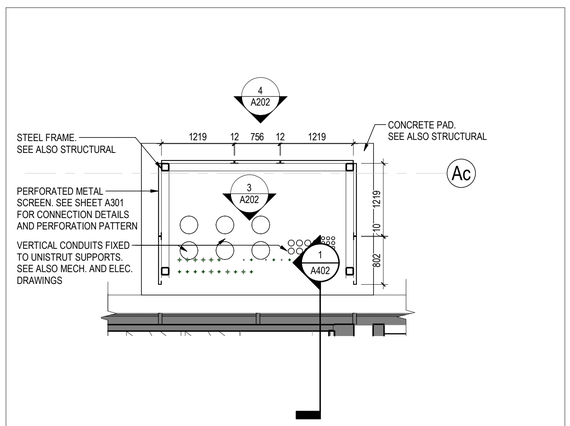
DESIGNED: JHH	DRAWN: NH
REVIEWED: -	APPROVED: JHH
SCALE: As indicated	DATE: OCTOBER, 2024
STANTEC PROJECT No. 133412008	DRAWING No. A100



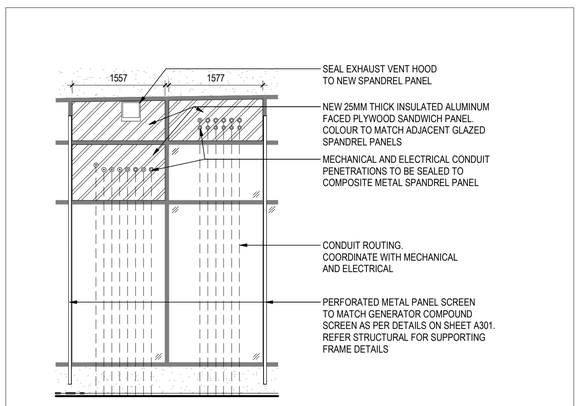
5 CONDUIT ENCLOSURE
5 / A202



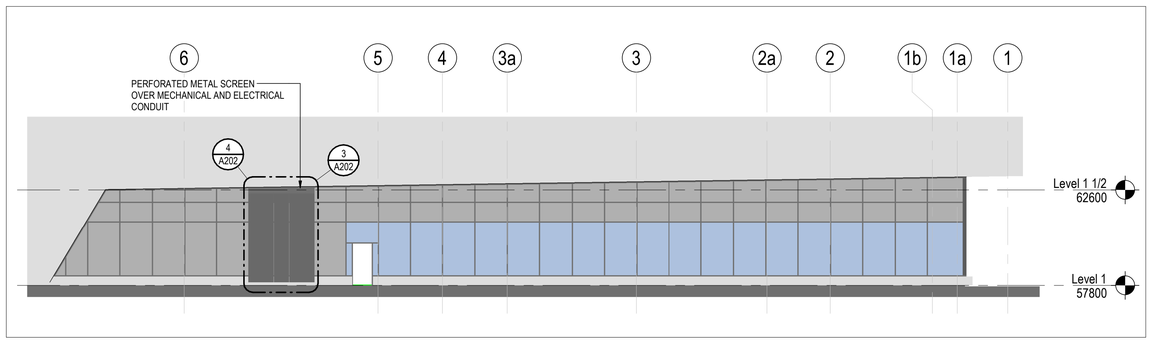
4 CONDUIT ENCLOSURE - FRONT ELEVATION
4 / A202 — 1 : 50



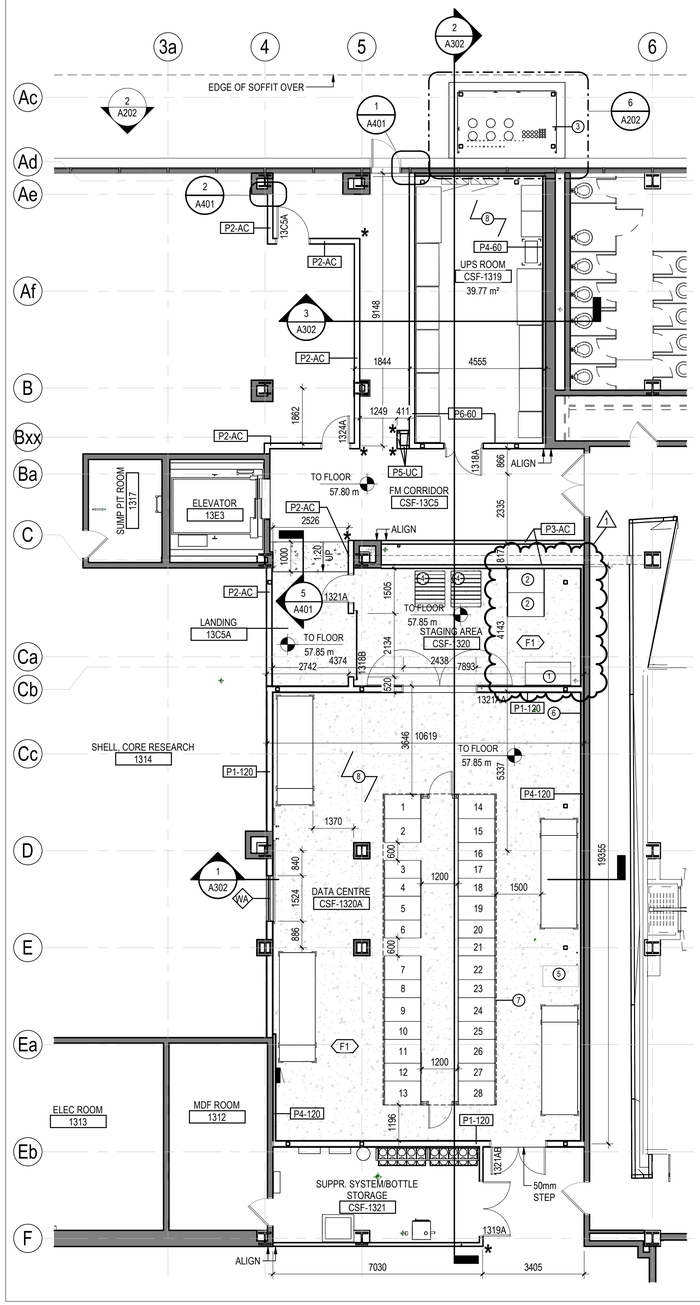
6 ENLARGED PLAN - CONDUIT ENCLOSURE
6 / A202 — 1 : 50



3 ENLARGED ELEVATION - CONDUIT ENCLOSURE
3 / A202 — 1 : 50



2 EXTERIOR BUILDING ELEVATION
2 / A202 — 1 : 150



1 PARTIAL PLAN - LEVEL 1
1 / A202 — 1 : 100

SHEET NOTES
THESE NOTES APPLY ONLY TO THE WORK ILLUSTRATED ON THIS SHEET

1 ALL PARTITION AND WALL DIMENSIONS TO FACE OF STUD UNLESS NOTED OTHERWISE.

2 GENERAL SHEET NOTE 2.

3 GENERAL SHEET NOTE 3.

ⓧ KEYNOTES
THESE NOTES APPLY ONLY TO PARTICULAR WORK IDENTIFIED BY KEYNOTE MARKERS.

1 WORK BENCH. OWNER SUPPLIED
2 TEST RACKS
3 PERFORATED METAL SCREEN TO MATCH GENERATOR COMPOUND AS PER SHEET A301. REFER ALSO STRUCTURAL FOR POST DETAILS
4 PALLET STORAGE SPACE FOR STANDARD 48" x 40" PALLET
5 CHARGING STATION FOR OWNER SUPPLIED RACK LIFT
6 INSTALL NEW 300X300 ACCESS HATCHES IN NEW GYPSUM WALL PARTITION AT ALL EXISTING ELECTRICAL BOX LOCATIONS. CONTRACTOR TO QUANTIFY ON SITE.
7 LINE OF HOT AISLE CONTAINMENT SYSTEM OVER
8 MOULD RESISTANT DRYWALL PANELS TO BE INSTALLED ON INSIDE FACE OF WALLS ENCLOSING THIS SPACE

FLOOR PLAN LEGEND

DOOR/FRAME TAGS

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 m²
CSF-1320	STAGING AREA	30.47 m²
CSF-1319	UPS ROOM	39.77 m²
CSF-1321	SUPPR. SYSTEM/BOTTLE STORAGE	22.19 m²
13C5A	LANDING	12.25 m²
CSF-13C5	FM CORRIDOR	53.41 m²
TOTAL		312.78 m²

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

No.	REVISION	DATE
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0	ISSUED FOR TENDER	2025.09.11

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NEWFOUNDLAND AND LABRADOR MEMBER
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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

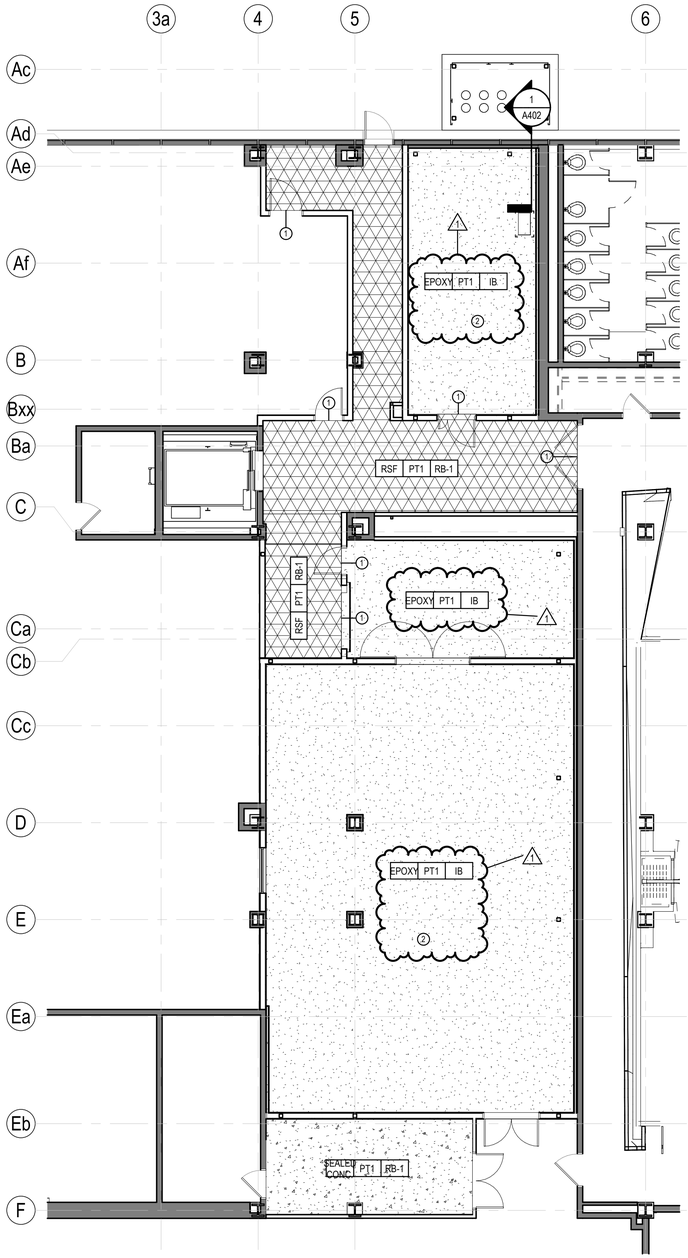
CORE SCIENCE FACILITY
ST. JOHN'S, NL

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. A202



1 A204 **FINISHES PLAN - LEVEL 1**

1 : 100

ROOM FINISH SCHEDULE

Number	Name	Wall Finish	Base Finish	Floor Finish	Ceiling Finish
13C5A	LANDING	PT1	RB-1	RSF	ACT-1
CSF-13C5	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

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. C/W 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

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

No.	REVISION	DATE
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0	ISSUED FOR TENDER	2025.09.11

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

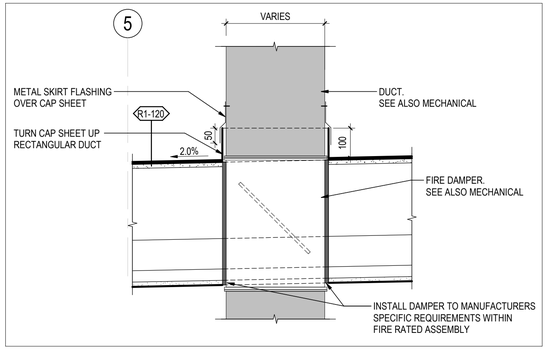
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

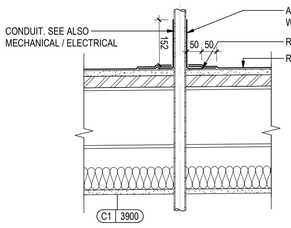
DRAWING TITLE:

FINISHES PLAN

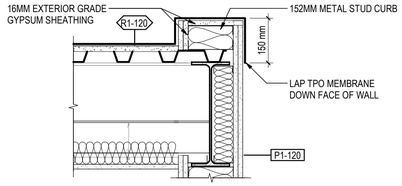
DESIGNED:	DRAWN:
JHH	NH
REVIEWED:	APPROVED:
-	JHH
SCALE:	DATE:
As indicated	OCTOBER, 2024
STANTEC PROJECT No.	DRAWING No.
133412008	**A204**



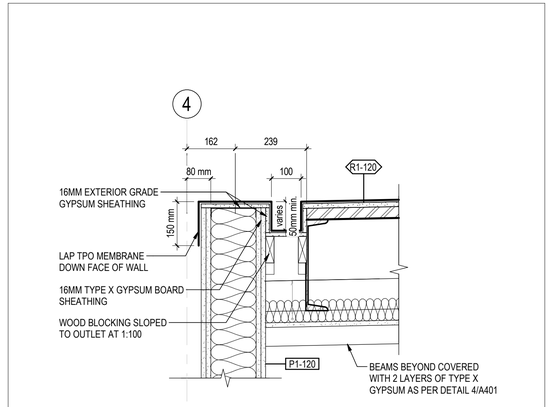
16 A401 **SECTION DETAIL - ROOF PENETRATION**
1 : 10



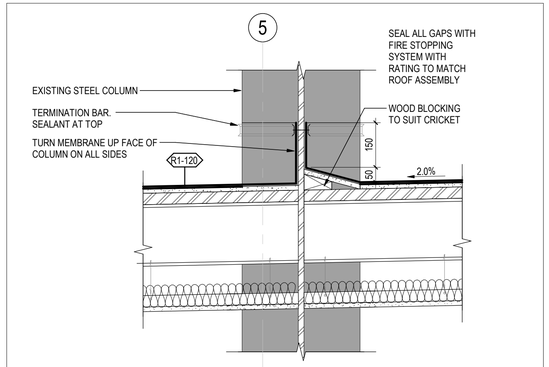
12 A401 **INTERIOR ROOF - PIPE PENETRATION**
1 : 10



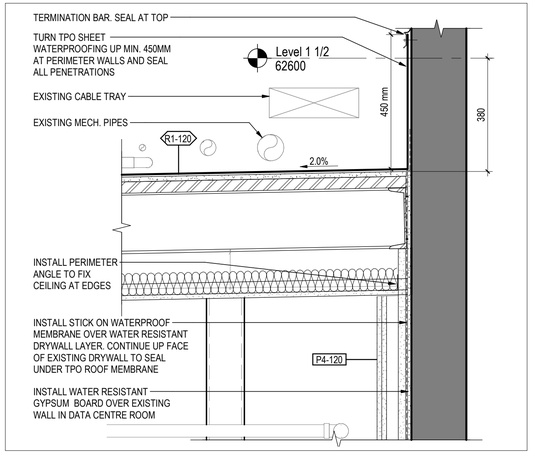
11 A401 **SECTION DETAIL - ROOF EDGE**
1 : 10



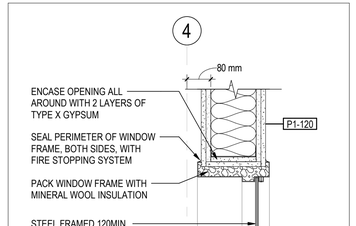
15 A401 **INTERIOR ROOF - GUTTER DETAIL**
1 : 10



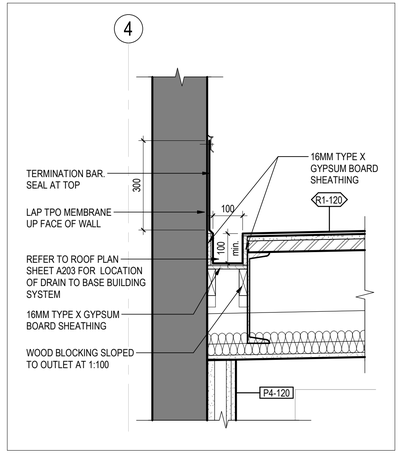
14 A401 **SECTION - COLUMN ROOF PENETRATION**
1 : 10



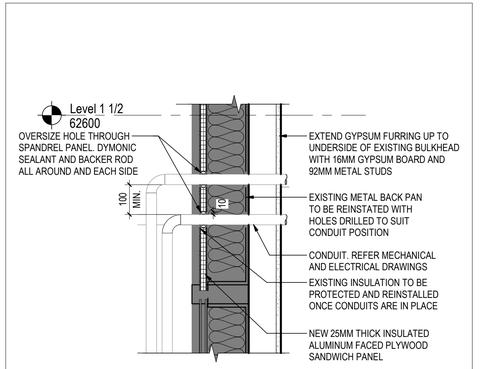
13 A401 **INTERIOR ROOF - JUNCTION WITH EXISTING**
1 : 10



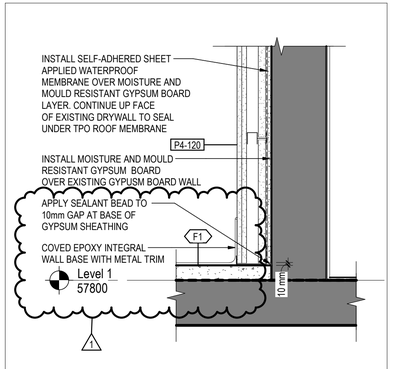
10 A401 **RATED WINDOW SECTION**
1 : 10



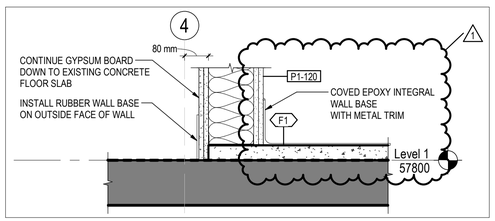
9 A401 **ROOF JUNCTION TO EXISTING**
1 : 10



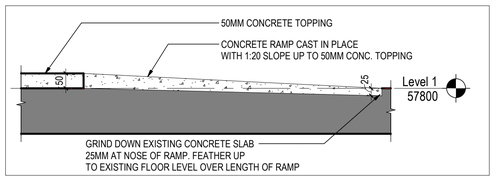
8 A401 **EXTERIOR CONDUIT PENETRATION**
1 : 10



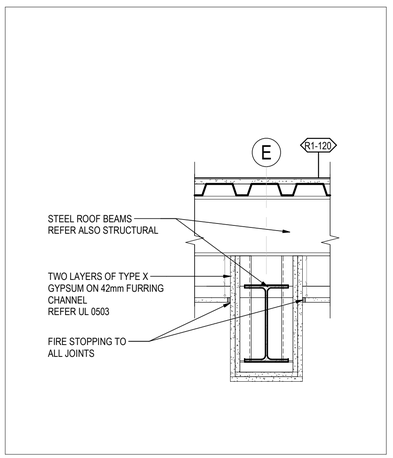
7 A401 **SECTION DETAIL - WALL BASE**
1 : 10



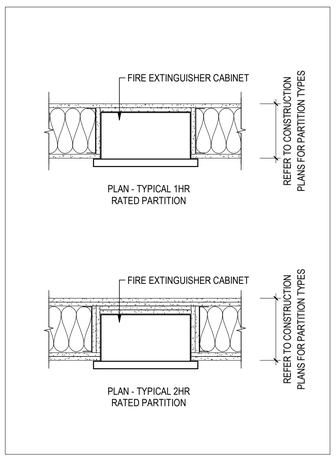
6 A401 **SECTION - RATED WALL TO FLOOR**
1 : 10



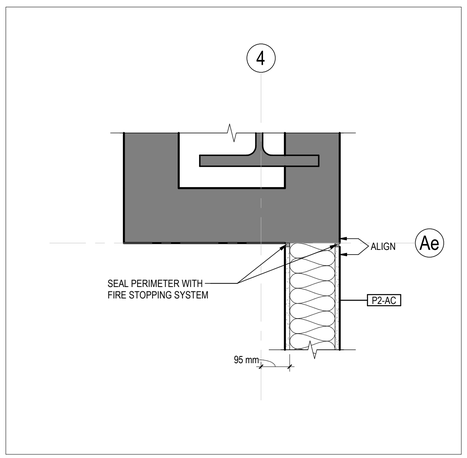
5 A401 **CAST IN PLACE CONCRETE RAMP**
1 : 10



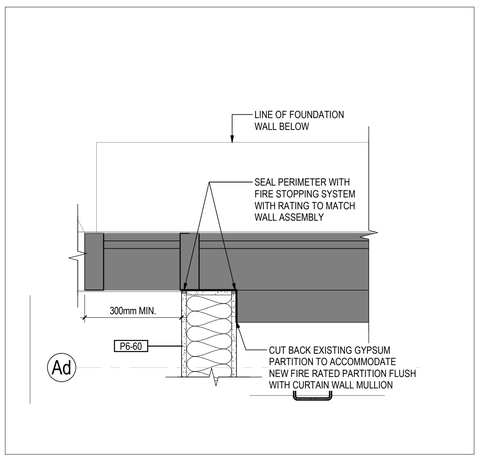
4 A401 **RATED BEAM ENCASEMENT**
1 : 10



3 A401 **SEMI-RECESSED FEC**
1 : 10



2 A401 **PLAN - WALL JUNCTION TO EXISTING**
1 : 10



1 A401 **PLAN - WALL JUNCTION TO EXTERIOR**
1 : 10

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

No.	REVISION	DATE
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

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

Stantec

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

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

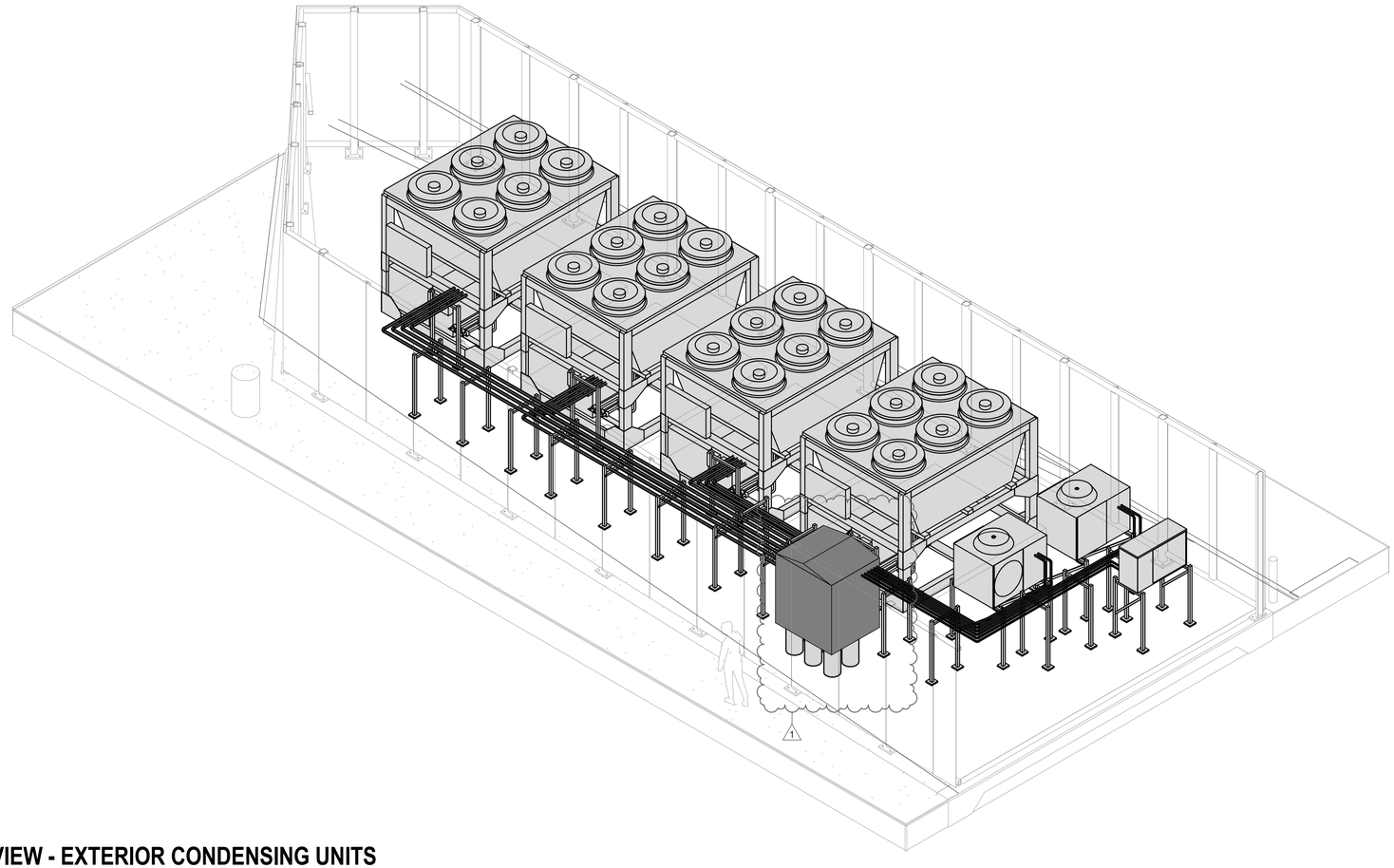
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

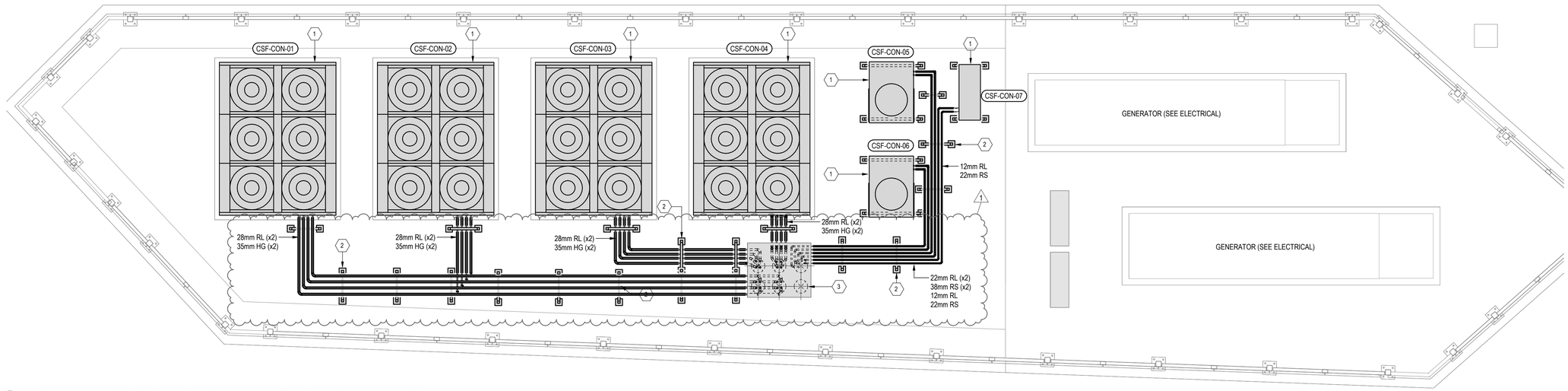
INTERIOR DETAILS

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



1
M304

3D PERSPECTIVE VIEW - EXTERIOR CONDENSING UNITS



2
M304

ENLARGED PLAN - MECHANICAL SITE LAYOUT

1 : 50

GENERAL NOTES

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

DRAWING NOTES

1. EXTERIOR CONDENSING UNIT. CONDENSING UNIT TO BE SECURED AND MOUNTED ON STAND C/W VIBRATION ISOLATORS. SECURE STAND TO CONCRETE PAD.
2. 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.
3. 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

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Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR
pegnl
ENGINEERING PERMIT J0291
STANTEC CONSULTING LTD.
04862
Signature or Member Number (Member-in-Responsible Charge)

Stantec

Stantec Consulting Ltd.
200-325 25 Street SE
Calgary, AB T2A 7H8
Tel: (403) 716-8000 • www.stantec.com

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

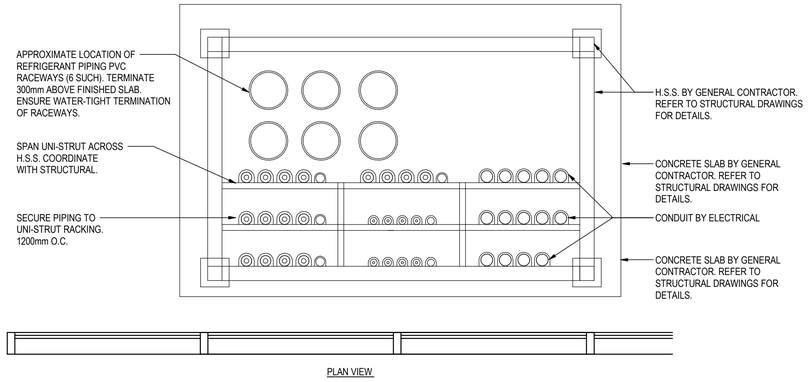
CORE SCIENCE FACILITY
ST. JOHN'S, NL

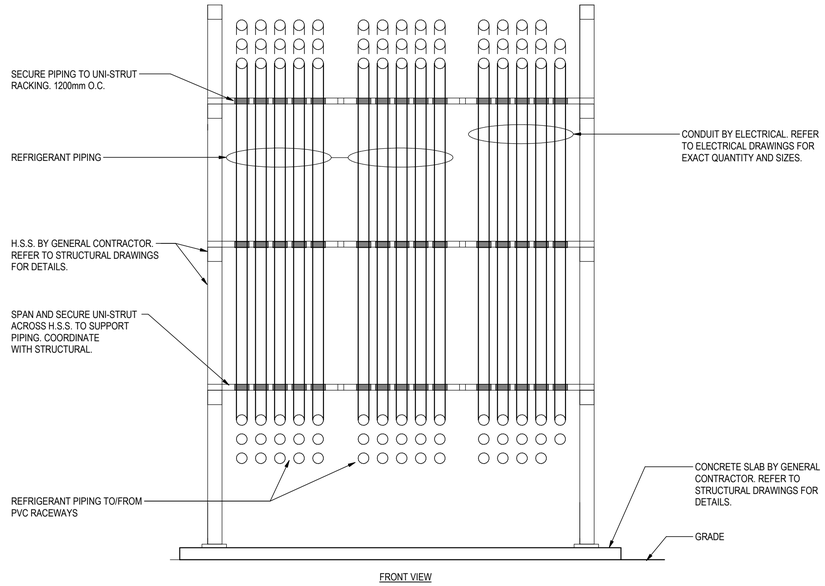
MUN Project #: CSF-004-23

DRAWING TITLE:

ENLARGED FLOOR PLAN - SITE PLAN

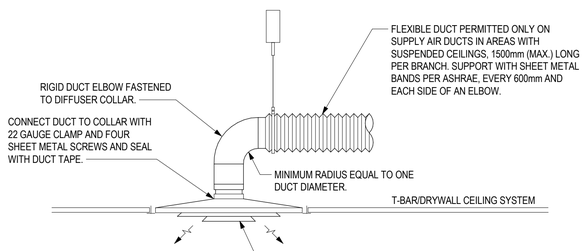
DESIGNED:	DRAWN:
WP	CH
REVIEWED:	APPROVED:
WP	WP
SCALE:	DATE:
As indicated	OCTOBER 2024
STANTEC PROJECT No.	DRAWING No.
133412008	**M304**





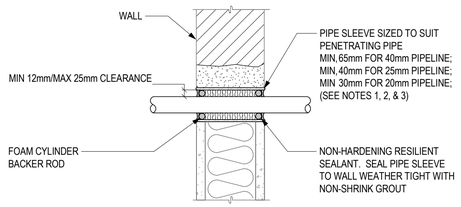
1 M401 EXTERIOR PIPE SUPPORT DETAIL

1 : 25



2 M401 SUPPLY DIFFUSER CONNECTION DETAIL

N.T.S.

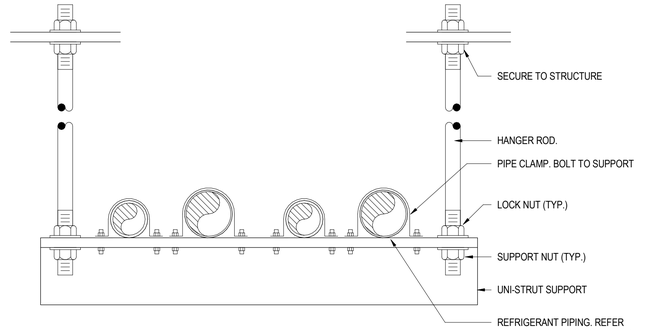


NOTES:

1. PIPE SUPPORTS TO BE SPACED SUFFICIENTLY FROM PARTITION LINE TO ALLOW FOR INSTALLATION/SEALING.
2. FOR STUD WALLS MILD STEEL SLEEVE BEDDED IN SEALANT TO SEAL OFF STUD WORK.
3. FOR BLOCK WALLS THICKNESS OF STEEL SLEEVE TO BE SUFFICIENT TO SUPPORT MORTAR ABOVE, MINIMUM THICKNESS 1.6mm.

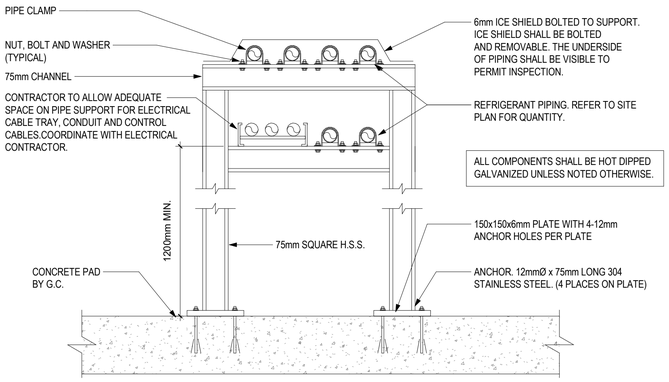
3 M401 PIPE/WALL PENETRATION DETAIL

N.T.S.



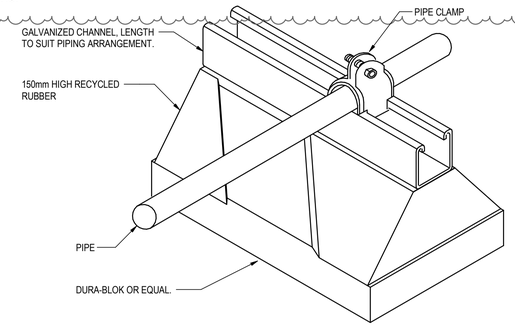
4 M401 REFRIGERANT PIPING INTERIOR SUPPORT

N.T.S.



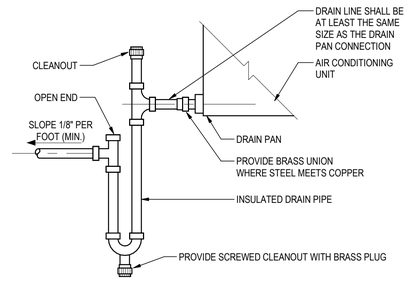
5 M401 EXTERIOR PIPE SUPPORTS

N.T.S.



6 M401 DATA CENTRE ROOF PIPING SUPPORT DETAIL

N.T.S.



7 M401 AC UNIT CONDENSATE DRAIN DETAIL

N.T.S.

A - DETAIL
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C - DRAWING No.

No.	REVISION	DATE
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0	ISSUED FOR TENDER	2025.09.11

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Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR
pegnl ENGINEERING PERMIT J0291
STANTEC CONSULTING LTD.
04862
Signature or Member Number (Member-in-Responsible Charge)

Stantec

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200-325 25 Street SE
Calgary, AB T2A 7H8
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Department of Facilities Management

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PRIMARY DATA CENTRE REPLACEMENT

CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

MECHANICAL DETAILS

DESIGNED:	DRAWN:
WP	CH
REVIEWED:	APPROVED:
WP	WP
SCALE:	DATE:
As indicated	OCTOBER 2024
STANTEC PROJECT No.	DRAWING No.
133412008	M401

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
- AIM — ADDRESSABLE INPUT MODULE
- ARCM — AREA OF REFUGE COMMUNICATION MASTER UNIT
- ARCR — AREA OF REFUGE COMMUNICATION REMOTE UNIT
- AOM — ADDRESSABLE OUTPUT MODULE
- D — ELECTRICALLY OPERATED SMOKE OR FIRE/SMOKE DAMPER CONNECTION
- DCL — DOOR CLOSER
- DH — DOOR HOLDER
- CHIME, WALL MOUNTED
- HORN, CEILING MOUNTED
- HORN, WALL MOUNTED
- F — PULL STATION
- FAA — FIRE ALARM ANNUNCIATOR
- FACP — FIRE ALARM CONTROL PANEL
- FAT — FIRE ALARM TRANSMITTER
- FATC — FIRE ALARM TERMINAL CABINET
- GAP — GRAPHIC ANNUNCIATOR PANEL
- H — HEAT DETECTOR
- NAC — FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT PANEL
- PS — PRESSURE DETECTOR/SWITCH
- R — INTERFACE RELAY
- S — SMOKE DETECTOR, CEILING MOUNTED
- SMOKE DETECTOR, WALL MOUNTED
- SS — SMOKE DETECTOR, SINGLE STATION
- S H — SMOKE/HEAT DETECTOR
- S H CO — SMOKE/HEAT/CARBON MONOXIDE DETECTOR
- SPEAKER, CEILING MOUNTED
- SPEAKER, WALL MOUNTED
- VS — VALVE SUPERVISORY TAMPER SWITCH
- WF — FLOW DETECTOR/SWITCH

HEAT/SMOKE DETECTOR TYPES

- H C#/F# — FIXED TEMPERATURE, # INDICATES °C OR °F
- H R — RATE OF RISE
- H RC#/F# — COMBINED RATE OF RISE/FIXED TEMPERATURE
- S AS — AIR SAMPLING
- S BR — BEAM DETECTOR RECEIVER
- S BT — BEAM DETECTOR TRANSMITTER
- S E — ELEVATOR RECALL
- S I — IONIZATION
- S ID — IN DUCT
- S P — 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
- ATS — AUTOMATIC TRANSFER SWITCH
- T — 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)
- J — JUNCTION BOX, CEILING OR ABOVE CEILING MOUNTED
- J — JUNCTION BOX, WALL MOUNTED
- J — JUNCTION BOX, IN-GROUND
- PB — 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
- $M — TOGGLE SWITCH, MOTOR RATED
- TOUCHLESS AUTOMATIC DOOR OPENER
- DDC — DIRECT DIGITAL CONTROL PANEL
- R — RELAY
- THERMOSTAT
- TC — TIME CLOCK
- VFD — VARIABLE FREQUENCY DRIVE

LUMINAIRES

CIRCUITS EMERGENCY	CIRCUITS NORMAL	
N/A	L01	LUMINAIRE IDENTIFICATION, SEE LUMINAIRES SCHEDULE
N/A	a	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
N/A		EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
	N/A	WALL MOUNTED EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
	N/A	WALL MOUNTED EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
N/A		EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
	N/A	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
- $a — LOWER-CASE LETTER(S) NEAR SWITCH DENOTE SWITCH LEG(S)
- $2 — DOUBLE POLE SWITCH
- $3 — THREE-WAY SWITCH
- $4 — FOUR-WAY SWITCH
- $D — LOW VOLTAGE DIMMER SWITCH EQUAL TO WATTSTOPPER LMDM-101
- $T — LOW VOLTAGE TIME SWITCH EQUAL TO WATTSTOPPER TS-400-24
- $SS — LOW VOLTAGE SCENE SWITCH EQUAL TO WATTSTOPPER LMSW-105
- $O — OCCUPANCY SENSOR SWITCH
- $P — SWITCH WITH PILOT LIGHT
- $PC — PHOTOCELL SWITCH
- OS — OCCUPANCY SENSOR SWITCH, CEILING MOUNTED. EQUAL TO WATTSTOPPER LMDC-100
- VS — VACANCY SENSOR SWITCH, CEILING MOUNTED. EQUAL TO WATTSTOPPER LMDC-100
- PC — PARTITION SENSOR CONTROL
- PS — PHOTO SENSOR CONTROL
- PS — PHOTO SENSOR CONTROL, CEILING MOUNTED
- R — RELAY
- T — REMOTE TRANSFORMER FOR LIGHTING 347:120V.

RECEPTACLES

CIRCUITS EMERGENCY	CIRCUITS NORMAL	
		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
N/A		INDICATES FULLY CONTROLLED
N/A		INDICATES 15A
N/A		INDICATES TWIST LOCK
N/A		INDICATES MOUNTED ABOVE COUNTER BACKSPLASH
N/A		MULTI-SERVICE ASSEMBLY (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE CEILING BOX (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE FLOOR BOX (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE FURNITURE BOX (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE POKE THRU (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE POWER POLE (RECEPTACLES AS INDICATED)
N/A		MULTI-SERVICE WALL BOX (RECEPTACLES AS INDICATED)
N/A		PLUG STRIP (HORIZONTAL/VERTICAL)
N/A		CLOCK RECEPTACLE, 120V
		CORD DROP, 120V
		CEILING CORD DROP, 120V

RECEPTACLE TYPES

- A — ARC FAULT CIRCUIT INTERRUPTER
- AT — ARC FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- D — DEDICATED CIRCUIT
- G — GROUND FAULT CIRCUIT INTERRUPTER
- GT — GROUND FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- IG — ISOLATED GROUND
- S — SURGE PROTECTOR
- T — TAMPER RESISTANT
- U — INTEGRAL USB PORT(S)
- WP — WEATHER RESISTANT COVER

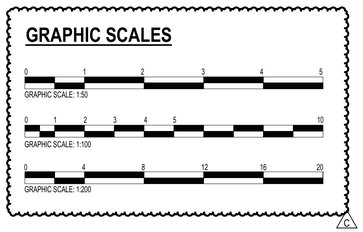
WORK DEFINITION

- NEW WORK
- EXISTING
- REMOVE EXISTING
- REMOVE EXISTING ELECTRICAL EQUIPMENT
- FUTURE
- TEMPORARY, AS NOTED
- ?## — KEY NOTE
- ??? — EQUIPMENT IDENTIFICATION
- E — INDICATES EXISTING TO REMAIN
- ER — INDICATES EXISTING TO BE REMOVED
- RL — INDICATES EXISTING TO BE RELOCATED
- NL — INDICATES NEW LOCATION

PROJECT NOTES

1. THE ELECTRICAL CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM AUTHORITIES HAVING JURISDICTION AND PAY ALL ASSOCIATED FEES.
2. 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.
3. 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.
4. 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.
5. WHERE DIRECTED TO USE OR RETAIN EXISTING CIRCUITS, AND THE CIRCUIT NUMBERS DIFFER FROM THE DRAWING, UPDATE DIRECTORIES AND RECORD DRAWINGS.
6. 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.
7. 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.
8. 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.
9. 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.

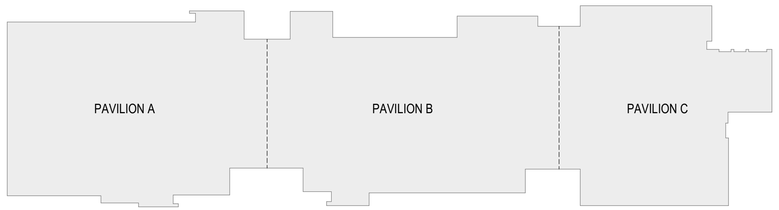
GRAPHIC SCALES



PROJECT DEMOLITION NOTES

1. 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.
   PRIOR TO COMMENCING WITH DEMOLITION, IDENTIFY ALL POWER, LIGHTING, COMMUNICATION, AND SIGNAL CIRCUITS PASSING THROUGH THE DEMOLITION AREA OR EXTENDING BEYOND THE DEMOLITION AREA. COORDINATE WITH DEMOLITION WORK OF OTHER TRADES.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

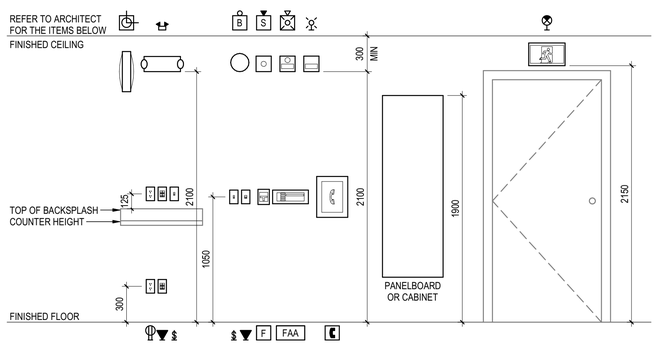
Sheet List	
Sheet Number	**Sheet Name**
E001	ELECTRICAL LEGEND
E100	ELECTRICAL SITE PLAN
E101	PARTIAL CAMPUS SITE PLAN - COMMUNICATIONS PATHWAY
E102	KEY PLAN - POWER AND COMMUNICATIONS ROUTING
E200	DEMOLITION FLOOR PLANS - CORE SCIENCE FACILITY
E201	LIGHTING FLOOR PLAN - CORE SCIENCE FACILITY
E202	POWER AND SYSTEMS FLOOR PLAN - CORE SCIENCE FACILITY
E401	ENLARGED FLOOR PLANS - DATA CENTRE
E402	ENLARGED FLOOR PLANS - UPS ROOM AND MECHANICAL EQUIPMENT PLAN
E403	ENLARGED DISTRIBUTION AND ELECTRICAL SERVICES ROUTING PLANS
E404	ENLARGED DISTRIBUTION AND ELECTRICAL SERVICES ROUTING PLANS
E405	ENLARGED COMMUNICATION ROUTING PLANS
E406	ENLARGED COMMUNICATION ROUTING PLANS
E407	ENLARGED COMMUNICATION ROUTING PLANS - ENGINEERING BUILDING
E501	ELECTRICAL DETAILS
E502	ELECTRICAL DETAILS
E503	SITE PLAN DETAILS
E504	AUTOMATION DETAILS
E505	ELECTRICAL DETAILS
E506	LIGHTING CONTROL DETAILS
E601	SINGLE LINE DIAGRAM
E602	GROUNDING RISER DIAGRAM
E603	FIRE ALARM AND DATA RISER DIAGRAM
E701	ELECTRICAL SCHEDULES



KEYPLAN - CORE SCIENCE FACILITY (CSF)

N.T.S.

STANDARD MOUNTING HEIGHTS



A - DETAIL
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No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

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Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR
pegnl ENGINEERING PERMIT J0291
STANTEC CONSULTING LTD.
04642
Signature or Member Number (Member-in-Responsible Charge)

REGISTERED PROFESSIONAL ENGINEERS OF NEWFOUNDLAND & LABRADOR
PEGNL
BERNIE ROBSON
2026-01-15
DATE

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

MEMORIAL UNIVERSITY
Department of Facilities Management

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

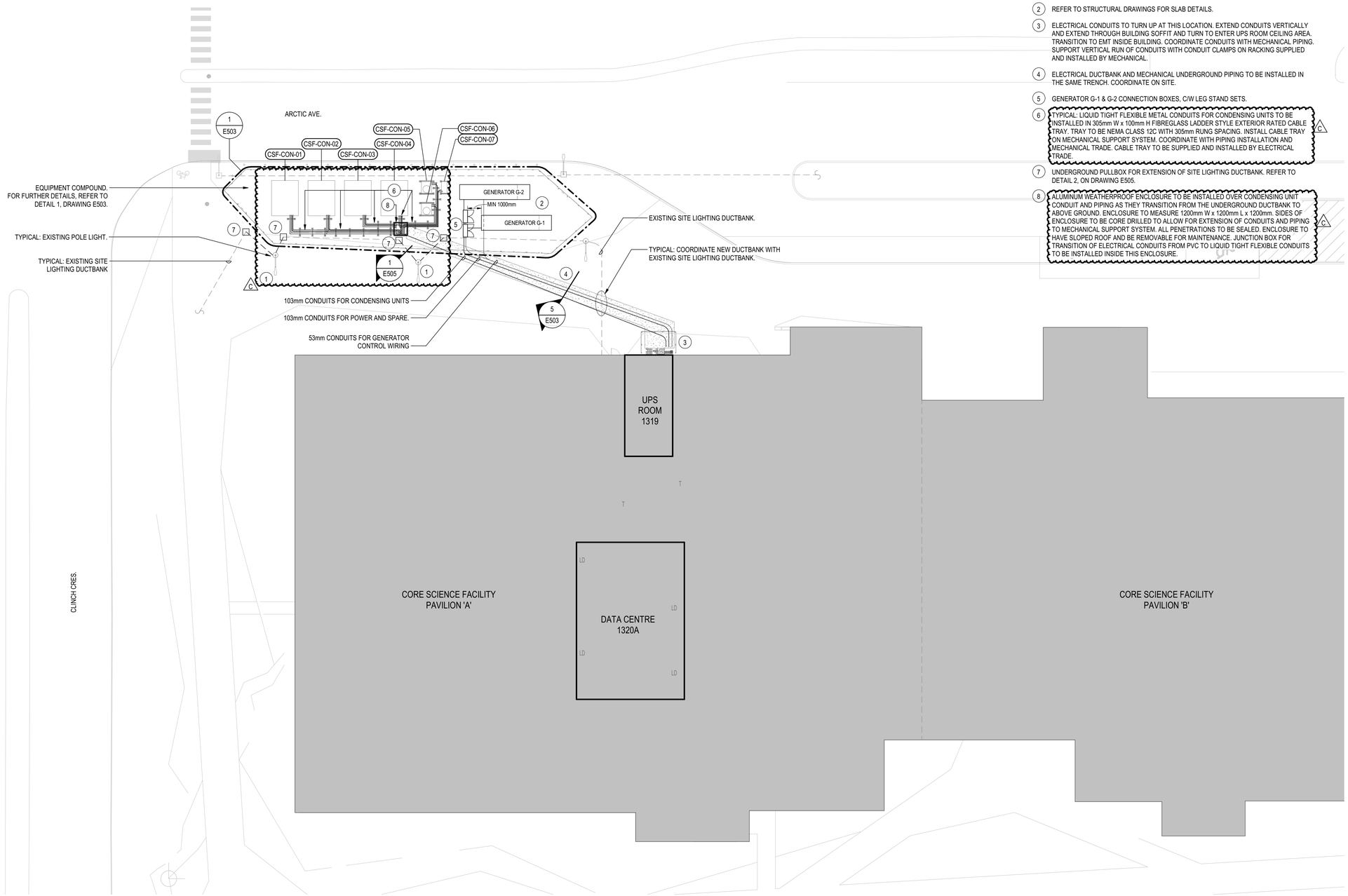
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL LEGEND

DESIGNED:	DRAWN:
MG/JD	MG/JD
REVIEWED:	APPROVED:
-	BR
SCALE:	DATE:
As indicated	SEPTEMBER, 2025
STANTEC PROJECT No.	DRAWING No.
133412008	**E001**



NOTES:

1. 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.
2. REFER TO STRUCTURAL DRAWINGS FOR SLAB DETAILS.
3. 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.
4. ELECTRICAL DUCTBANK AND MECHANICAL UNDERGROUND PIPING TO BE INSTALLED IN THE SAME TRENCH. COORDINATE ON SITE.
5. GENERATOR G-1 & G-2 CONNECTION BOXES, C/W LEG STAND SETS.
6. 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. C
7. UNDERGROUND PULLBOX FOR EXTENSION OF SITE LIGHTING DUCTBANK. REFER TO DETAIL 2, ON DRAWING E505.
8. 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. C

1 E100 ELECTRICAL SITE PLAN - CORE SCIENCE FACILITY

1 : 200

A - DETAIL
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C - DRAWING No.

No.	REVISION	DATE
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B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

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Permit/Seal

PROVINCE OF NEWFOUNDLAND AND LABRADOR
pegnl
ENGINEERING
PERMIT J0291
STANTEC CONSULTING LTD.
04642
Signature or Member Number
(Member-in-Responsible Charge)

REGISTERED PROFESSIONAL ENGINEERS
PEGNL Newfoundland and Labrador
BERNIE ROBSON
SIGNATURE
2026-01-15
DATE
NEWFOUNDLAND & LABRADOR

Stantec

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141 Kelsey Drive
St. John's, NL A1B 0L2
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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

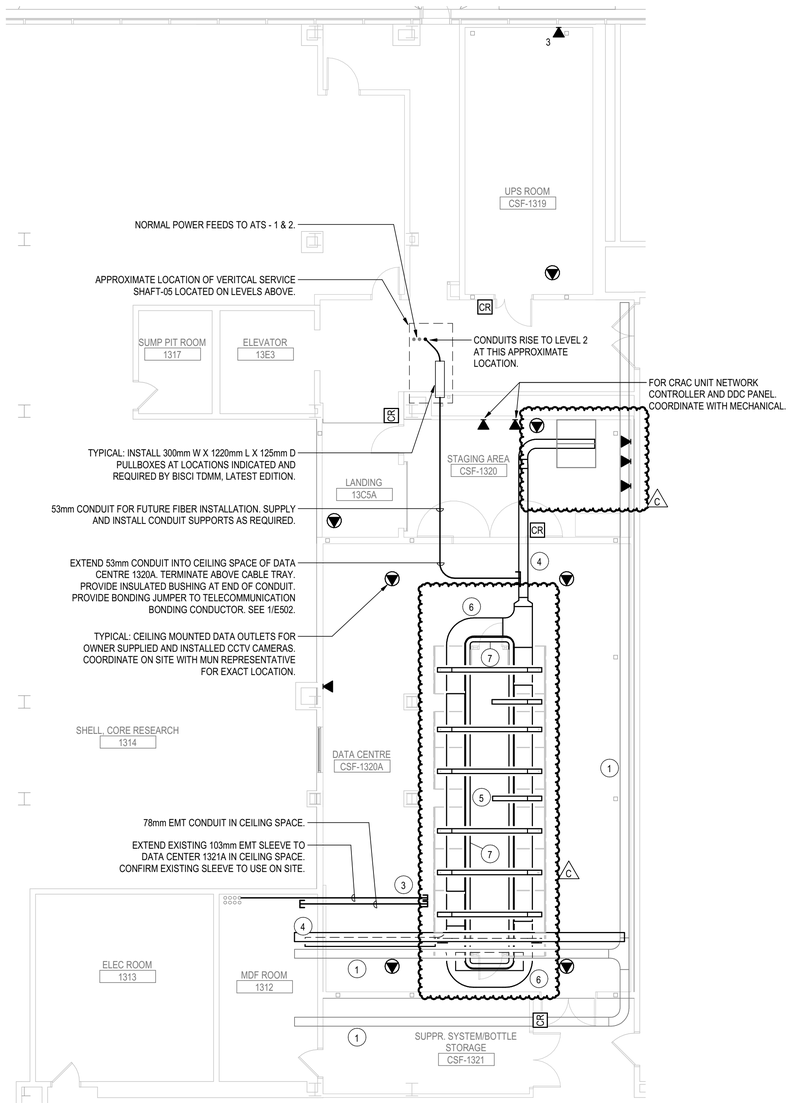
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL SITE PLAN

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: 1 : 200	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. **E100**

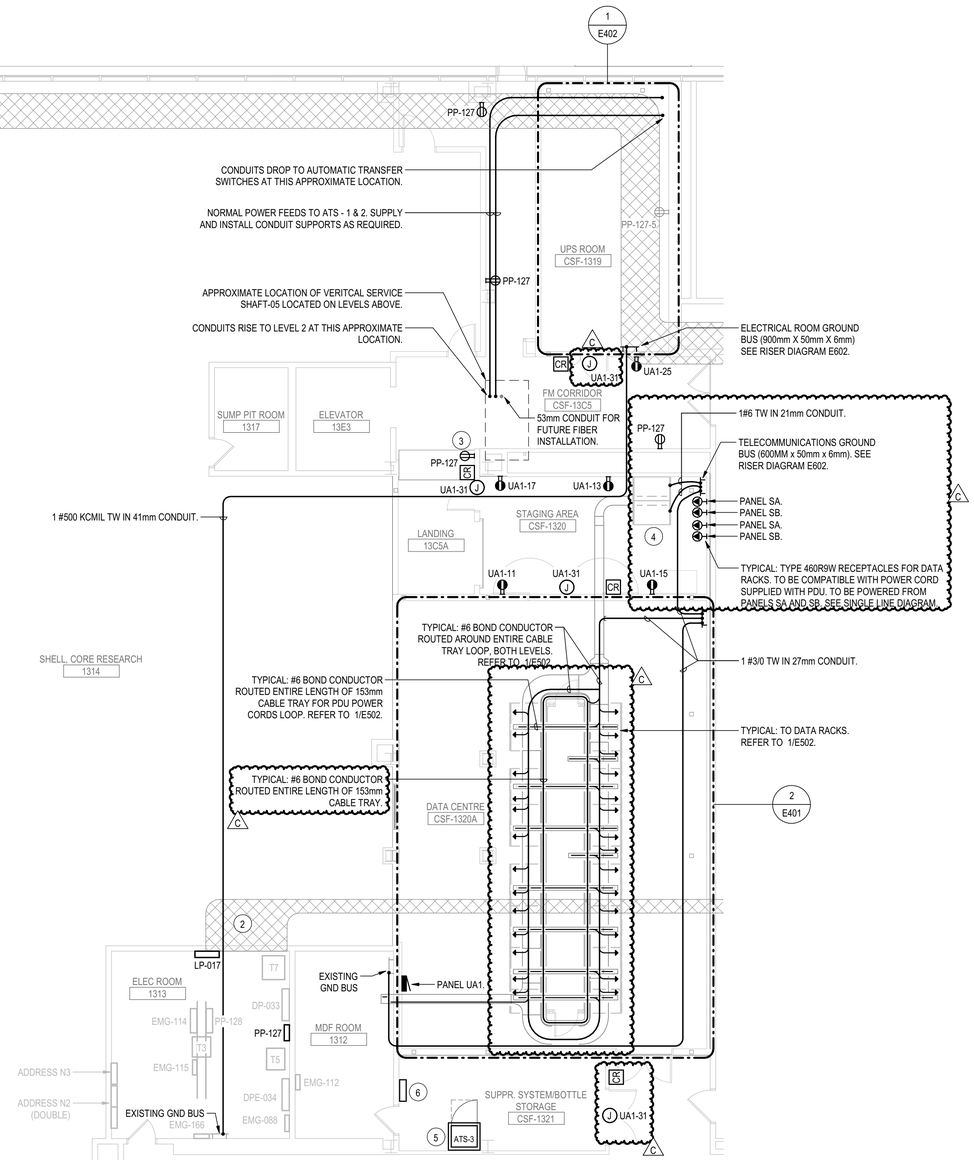


KEYNOTES FOR SYSTEMS:

1. TYPICAL: CABLE TRAY INDICATED AS SHADED IS EXISTING IN THE LEVEL 1.5 SPACE.
2. REFER TO DATA RISER DIAGRAM ON DRAWING E603 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. C
6. TWO TIERS OF 607mm 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 SEALING. 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. C

2 SYSTEMS FLOOR PLAN LAYOUT - LEVEL 1

2 / E202 — 1 : 100



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 RECEPTACTLE 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.

1 POWER FLOOR PLAN LAYOUT - LEVEL 1

1 / E202 — 1 : 100

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

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PEGNL Newfoundland and Labrador
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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

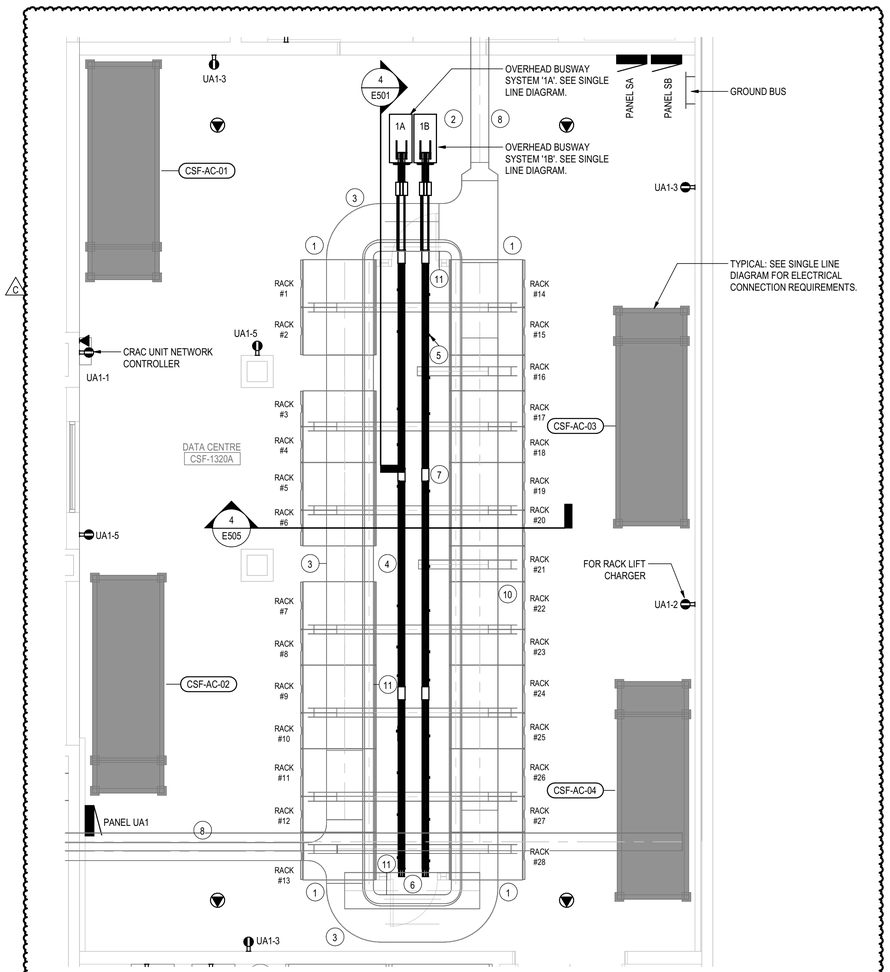
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

POWER AND SYSTEMS FLOOR PLAN - CORE SCIENCE FACILITY

DESIGNED:	DRAWN:
MG/JD	MG/JD
REVIEWED:	APPROVED:
-	BR
SCALE: 1 : 100	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. **E202**

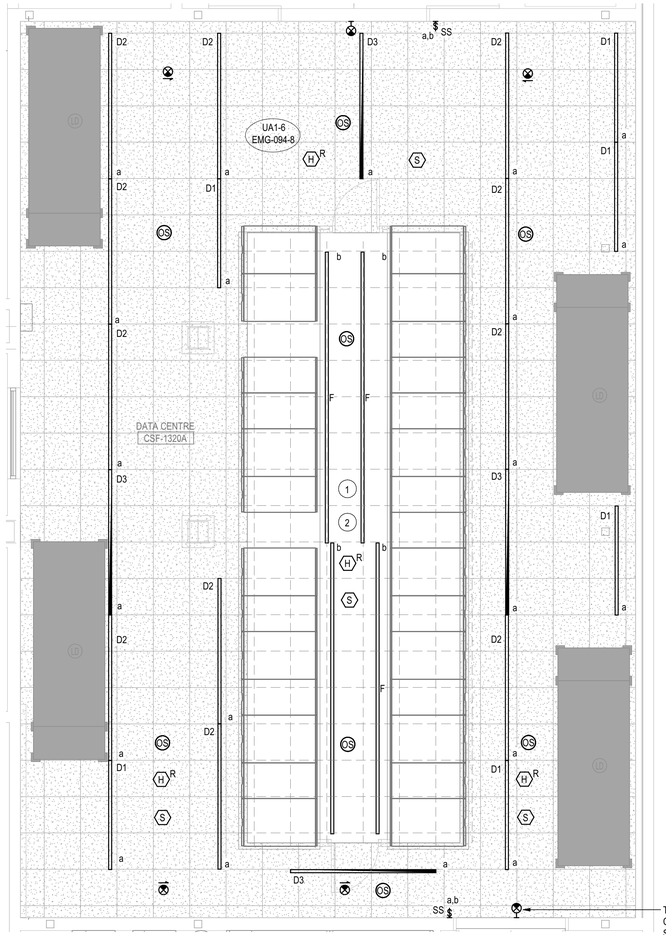


NOTES:

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. C

2 ENLARGED POWER AND DATA PLAN - DATA CENTRE 1320A

E401 — 1 : 50 — 9



NOTES:

1. TYPICAL: LIGHTING FIXTURES ARE LAID OUT TO ACCOMODATE 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.

1 ENLARGED LIGHTING PLAN - DATA CENTRE 1320A

E401 — 1 : 50 — 3

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

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

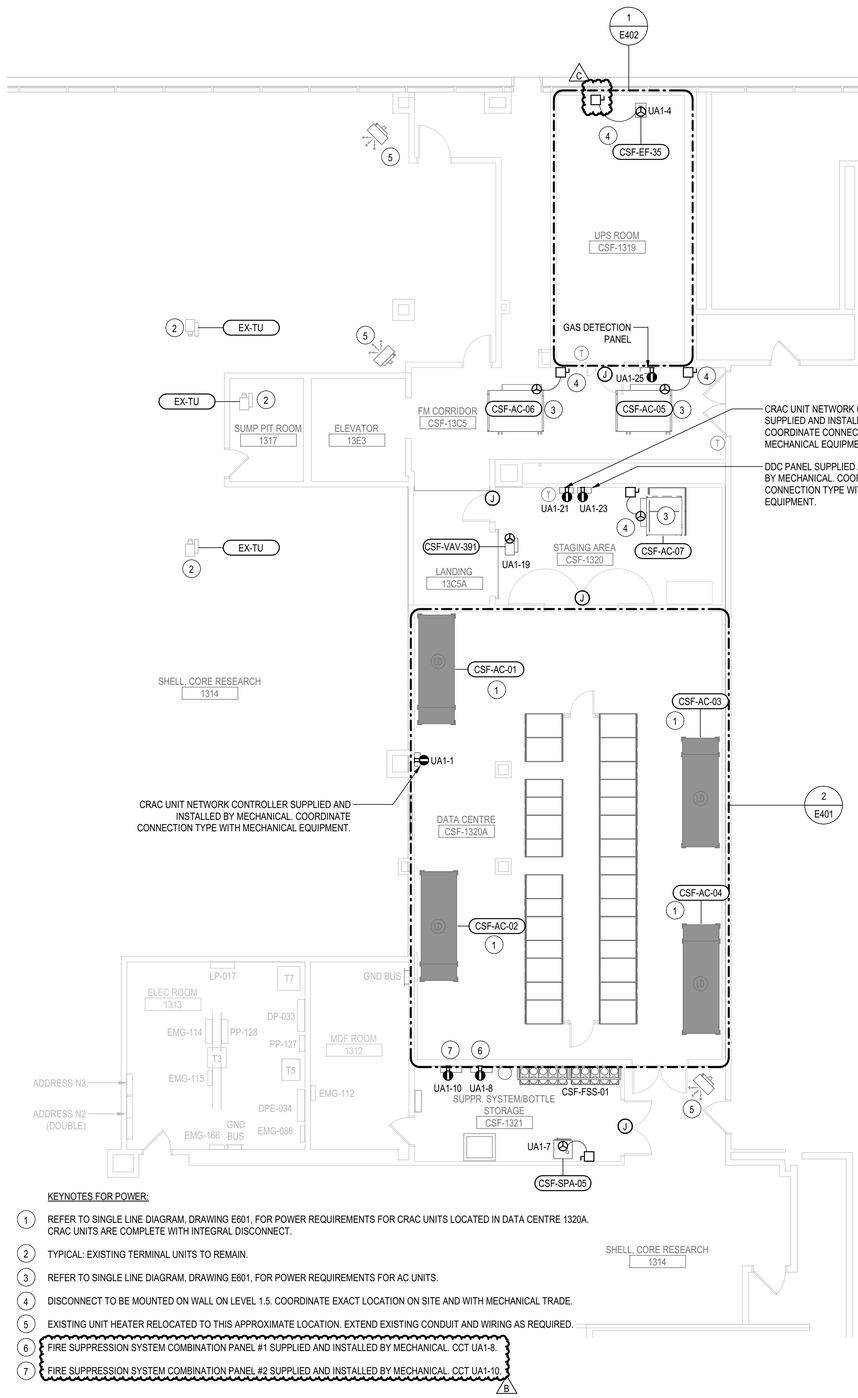
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ENLARGED FLOOR PLANS - DATA CENTRE

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



KEYNOTES FOR POWER:

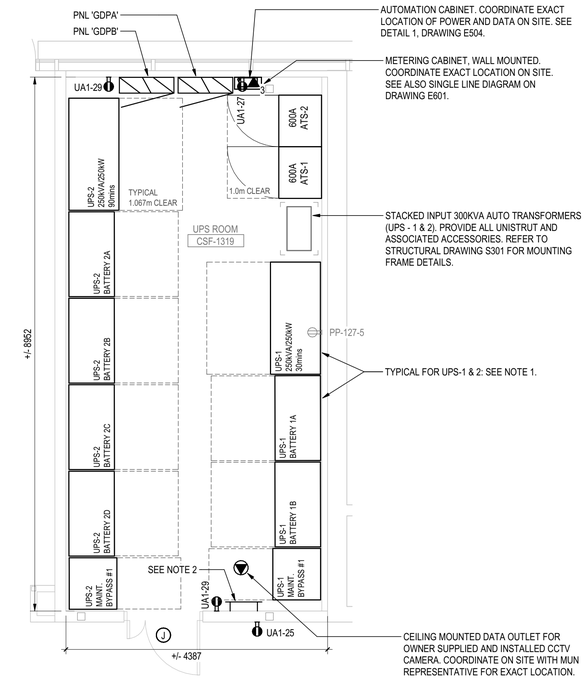
1. REFER TO SINGLE LINE DIAGRAM, DRAWING E601, FOR POWER REQUIREMENTS FOR CRAC UNITS LOCATED IN DATA CENTRE 1320A. CRAC UNITS ARE COMPLETE WITH INTEGRAL DISCONNECT.
2. TYPICAL: EXISTING TERMINAL UNITS TO REMAIN.
3. REFER TO SINGLE LINE DIAGRAM, DRAWING E601, FOR POWER REQUIREMENTS FOR AC UNITS.
4. DISCONNECT 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. /B

3 E402 MECHANICAL EQUIPMENT FLOOR PLAN LAYOUT - LEVEL 1

1 : 100

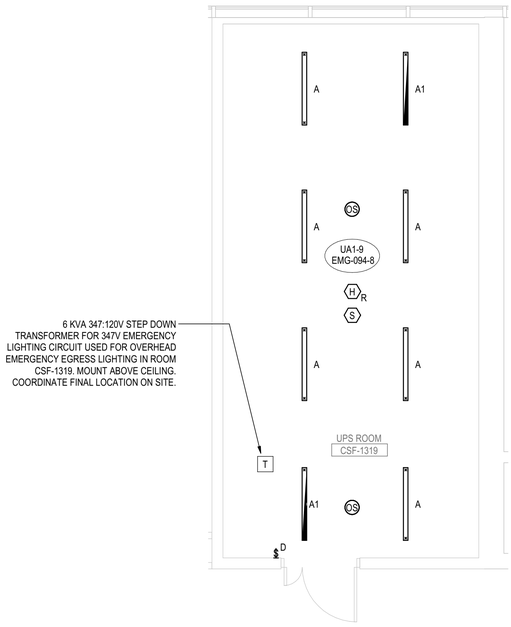
NOTES:

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



2 E402 ENLARGED LIGHTING PLAN - UPS ROOM

1 : 50

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

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
A	ISSUED FOR TENDER	2025.09.11

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PROJECT NAME:

PRIMARY DATA CENTRE REPLACEMENT

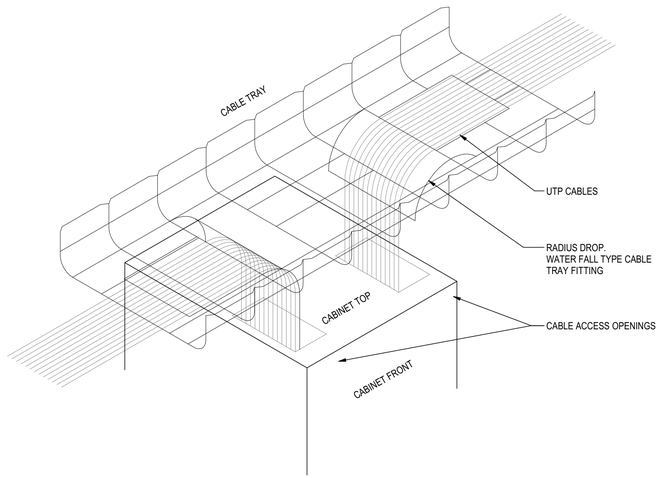
CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ENLARGED FLOOR PLANS - UPS ROOM AND MECHANICAL EQUIPMENT PLAN

DESIGNED:	DRAWN:
MG/JD	MG/JD
REVIEWED:	APPROVED:
-	BR
SCALE:	DATE:
As indicated	SEPTEMBER, 2025
STANTEC PROJECT No.	DRAWING No.
133412008	**E402**

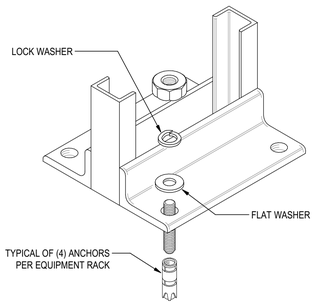


NOTE:

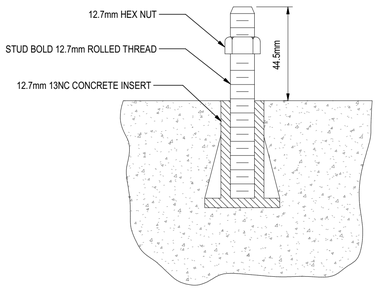
1. CONTACTOR SHALL ROUTE CABLES INTO CABINETS VIA RADIUS DROPS IN CABLE TRAY, AND INTO THE INTERIOR SIDE OF CABINETS, THROUGH ACCESS OPENINGS. DO NOT ROUTE CABLES INTO THE CENTER OF THE CABINET WHERE THEY MIGHT INTERFERE WITH OWNER EQUIPMENT OR ACCESS TO PATCH PANELS.
2. TWO ROWS OF CABLE TRAY TO BE INSTALLED ABOVE DATA CABINETS PER CABLE TRAY DETAIL SHOWN ON DRAWING E502.

1 E501 TYPICAL CABINET CABLING DETAIL

N.T.S.



ANCHOR DETAIL FOR EQUIPMENT RACK



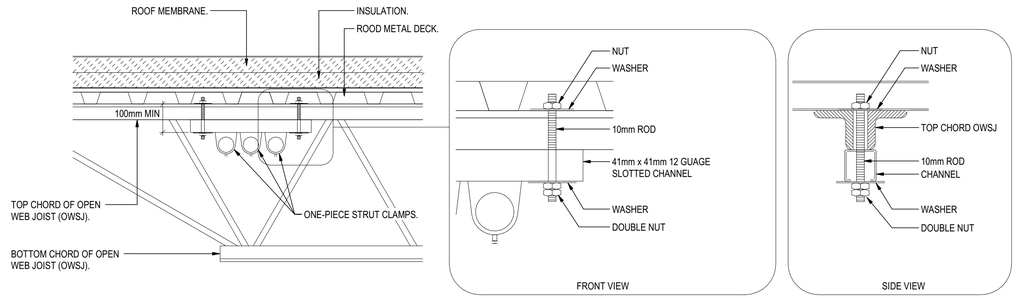
CABLE RACK ANCHOR BOLT

3 E501 ANCHOR BOLT

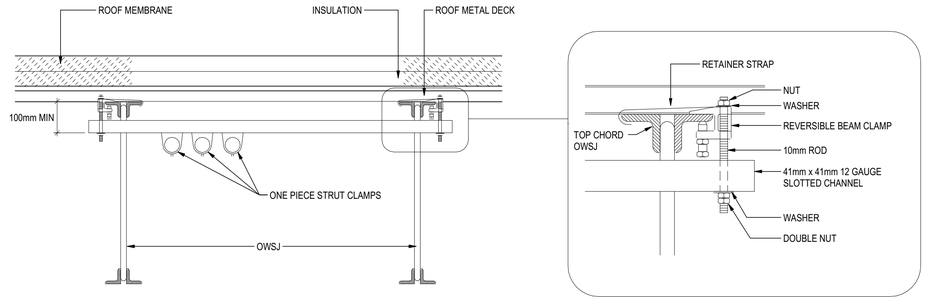
N.T.S.

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.



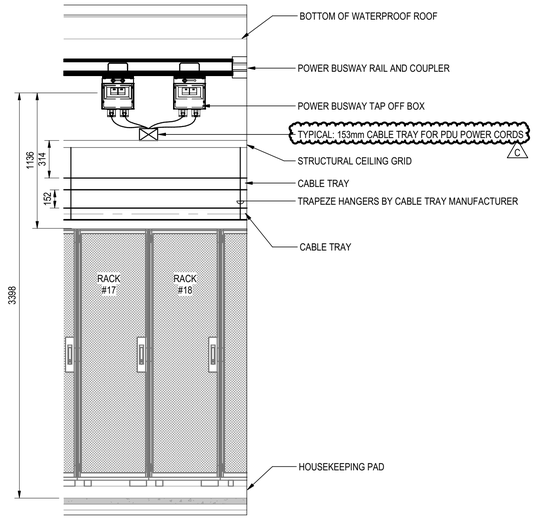
CONDUITS INSTALLED PERPENDICULAR TO OPEN WEB STEEL JOISTS (OWSJ.)



CONDUITS INSTALLED PARALLEL TO OPEN WEB STEEL JOISTS (OWSJ.)

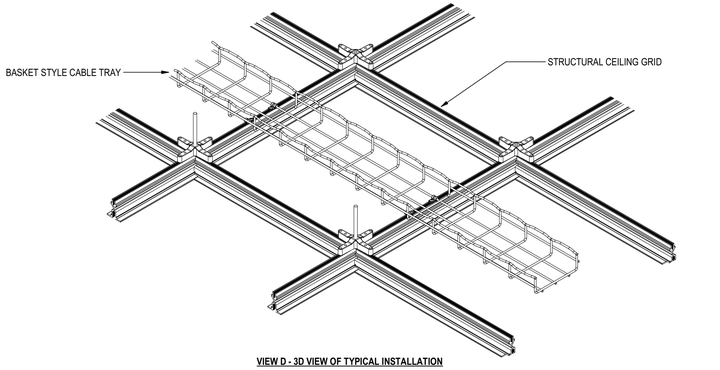
2 E501 TYPICAL CONDUIT INSTALLATION

N.T.S.

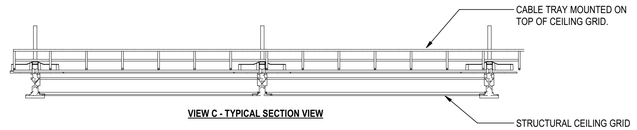


4 E501 POWER BUSWAY ELEVATION DETAIL

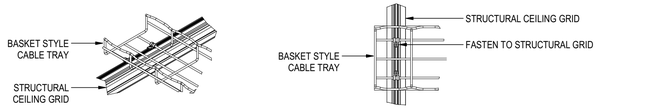
1 : 25



VIEW D - 3D VIEW OF TYPICAL INSTALLATION



VIEW C - TYPICAL SECTION VIEW



VIEW A - 3D VIEW

VIEW B - TOP VIEW

5 E501 TOP MOUNTED CABLE TRAY DETAILS

N.T.S.

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

No.	REVISION	DATE
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PRIMARY DATA CENTRE REPLACEMENT

CORE SCIENCE FACILITY
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

ELECTRICAL DETAILS

DESIGNED:	DRAWN:
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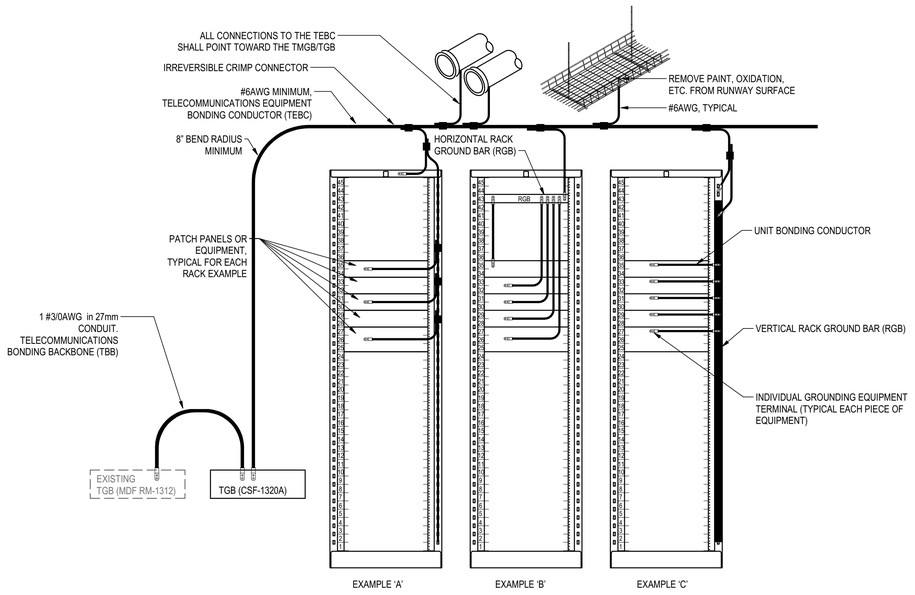
SCALE:	DATE:
As indicated	SEPTEMBER, 2025
STANTEC PROJECT No.	DRAWING No.
133412008	**E501**

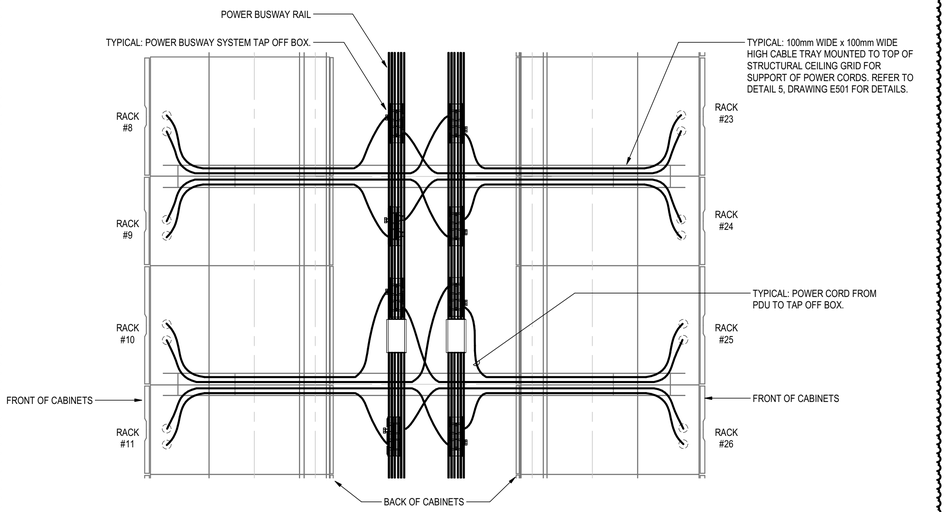


1 E502 TYPICAL: TELECOMMUNICATIONS SYSTEM GROUNDING REQUIREMENTS

N.T.S.

NOTES:

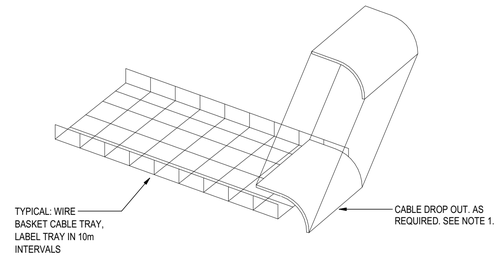
1. REFER TO SINGLE LINE DIAGRAM FOR FURTHER INFORMATION.
2. EXACT LOCATION OF GROMMET AT TOP OF RACK TO BE DETERMINED ON SITE.



C

3 E502 POWER BUSWAY CONNECTION DETAIL

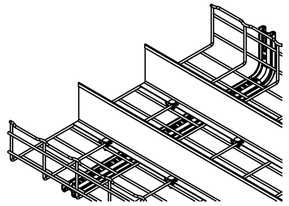
N.T.S.



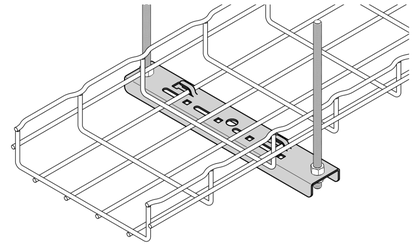
NOTES:

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.
2. PROVIDE ADJUSTABLE SPLICE PLATES AT CABLE TRAY HORIZONTAL BENDS/TEE AS REQUIRED BY MANUFACTURER. SEE PLANS FOR TRAY ROUTING AND BENDS/TEES.

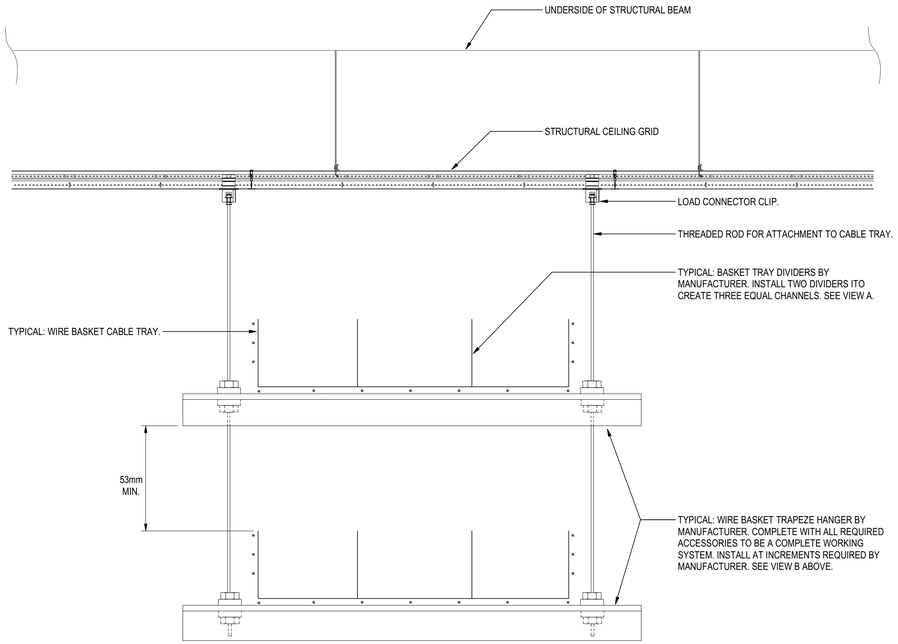
VIEW C - CABLE DROP OUT FITTING



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.

2 E502 CABLE TRAY INSTALLATION DETAIL

N.T.S.

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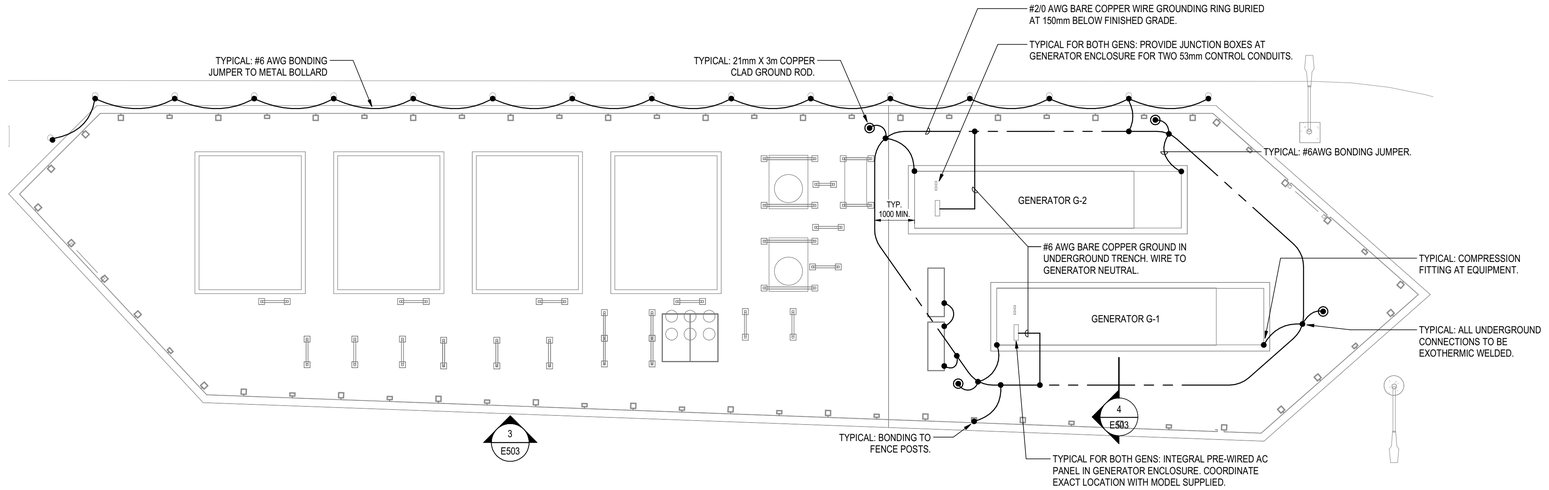
ST. JOHN'S, NL

MUN Project #: CSF-004-23

DRAWING TITLE:

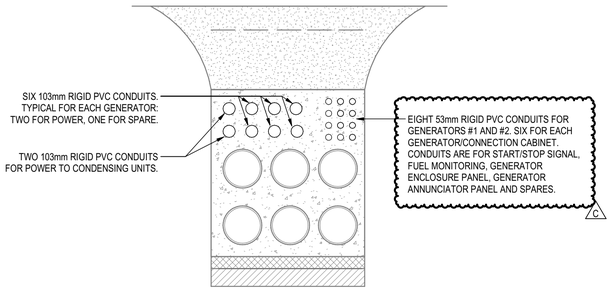
ELECTRICAL DETAILS

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. **E502**



1 E503 GENERATOR GROUNDING INSTALLATION DETAIL

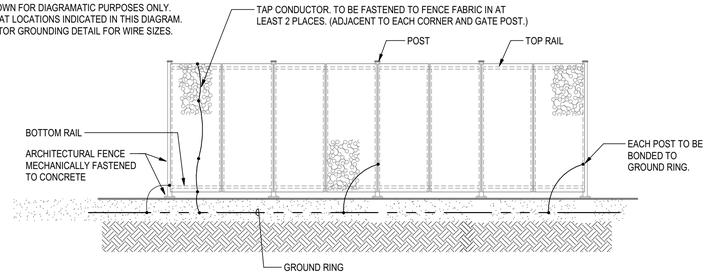
N.T.S.



2 E503 DUCTBANK DETAIL - ELECTRICAL INSTALLATIONS

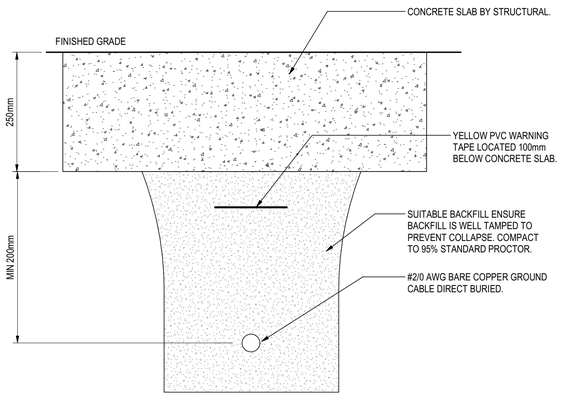
N.T.S.

NOTE:
FENCE LAYOUT SHOWN FOR DIAGRAMATIC PURPOSES ONLY.
PROVIDE BONDING AT LOCATIONS INDICATED IN THIS DIAGRAM.
REFER TO GENERATOR GROUNDING DETAIL FOR WIRE SIZES.



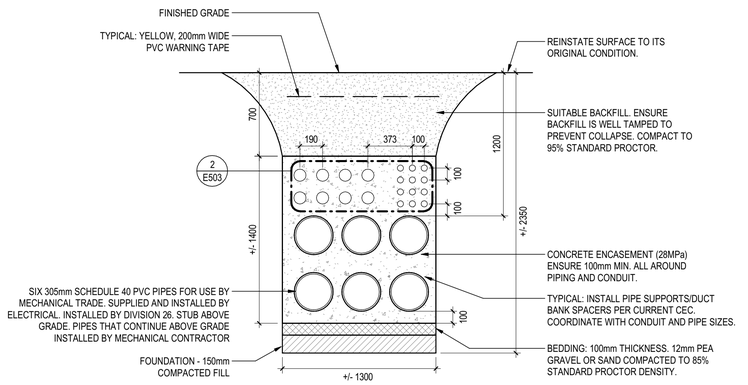
3 E503 FENCE GROUNDING DETAIL

N.T.S.



4 E503 GROUNDING TRENCH SECTION

N.T.S.



5 E503 DUCTBANK DETAIL FOR MECHANICAL AND ELECTRICAL SERVICES

N.T.S.

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

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
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)

REGISTERED PROFESSIONAL ENGINEERS NEWFOUNDLAND & LABRADOR
PEGNL Newfoundland and Labrador
BERNIE ROBSON
SIGNATURE
2026-01-15
DATE

Stantec

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

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

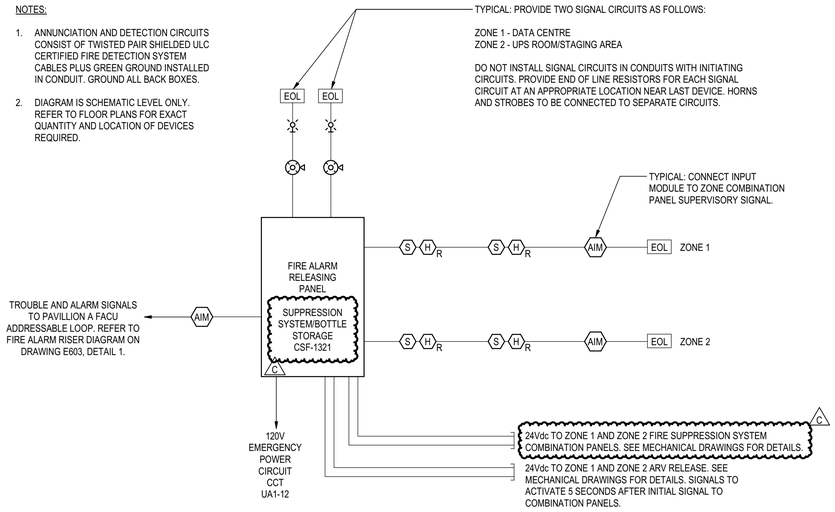
DRAWING TITLE:

SITE PLAN DETAILS

DESIGNED: MG/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: As indicated	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. **E503**

NOTES:

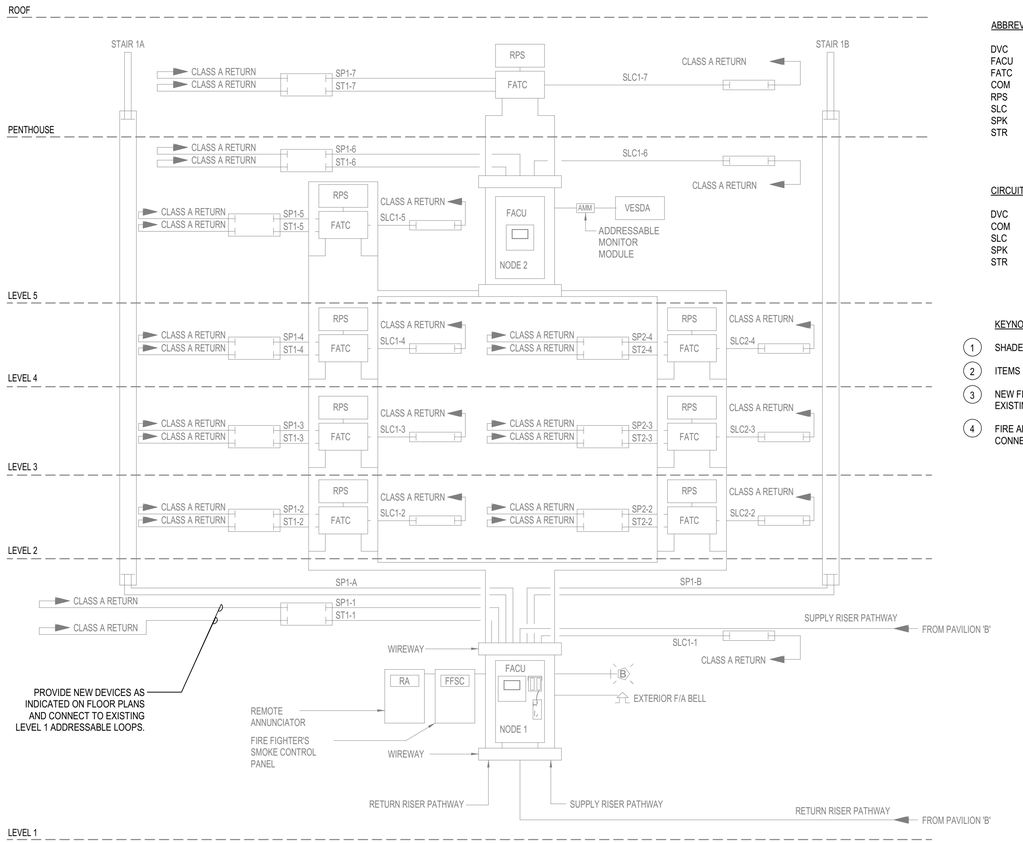
1. ANNUNCIATION AND DETECTION CIRCUITS CONSIST OF TWISTED PAIR SHIELDED ULC CERTIFIED FIRE DETECTION SYSTEM CABLES PLUS GREEN GROUND INSTALLED IN CONDUIT. GROUND ALL BACK BOXES.
2. DIAGRAM IS SCHEMATIC LEVEL ONLY. REFER TO FLOOR PLANS FOR EXACT QUANTITY AND LOCATION OF DEVICES REQUIRED.



3 E603 FIRE ALARM RELEASING PANEL

N.T.S.

DETAIL OMITTED



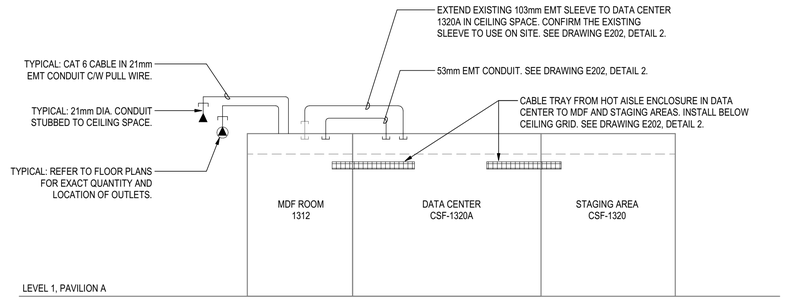
1 E603 PARTIAL EXISTING CSF FIRE ALARM RISER DIAGRAM - PAVILION A - REVISED

1 2 3 4

N.T.S.

NOTES:

1. ALL DATA CABLING TO BE SUPPLIED AND INSTALLED UNDER THIS CONTRACT. TO BE INSTALLED AS PER MUNNET SPECIFICATIONS.
2. PROVIDE PULL WIRE IN ALL EMPTY CONDUITS. PROVIDE ALL CABLES FROM END TO END WHERE INDICATED.



2 E603 PARTIAL DATA RISER DIAGRAM

N.T.S.

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:

1. SHADED ITEMS INDICATE EXISTING INSTALLATIONS.
2. ITEMS IN BOLD INDICATE NEW OR REVISED INSTALLATIONS.
3. NEW FIRE ALARM DEVICES ARE TO BE COMPATIBLE WITH EXISTING FIRE ALARM SYTEM.
4. FIRE ALARM SYSTEM TO BE RE-VERIFIED AFTER ALL NEW CONNECTIONS ARE COMPLETED.

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

No.	REVISION	DATE
C	ISSUED FOR ADDENDUM NO. 4	2026.01.15
B	RE-ISSUED FOR TENDER	2025.12.05
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PROVINCE OF NEWFOUNDLAND AND LABRADOR
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PEGL Newfoundland and Labrador
BERNIE ROBSON
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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/JD	DRAWN: MG/JD
REVIEWED: -	APPROVED: BR
SCALE: N.T.S.	DATE: SEPTEMBER, 2025
STANTEC PROJECT No. 133412008	DRAWING No. **E603**

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 Authroity).

.2 Preliminary Cx schedule. Submit final Cx schedule to PCfor 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 PCfor 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 1st and September 15th when outside ambient temperatures are at least 22°C;

.2 Winter sequence commissioning to take place between November 1st and March 31st 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’sapproval.

.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^2 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/m3, 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/m2, 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/m³.

.2 Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

.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 form 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.

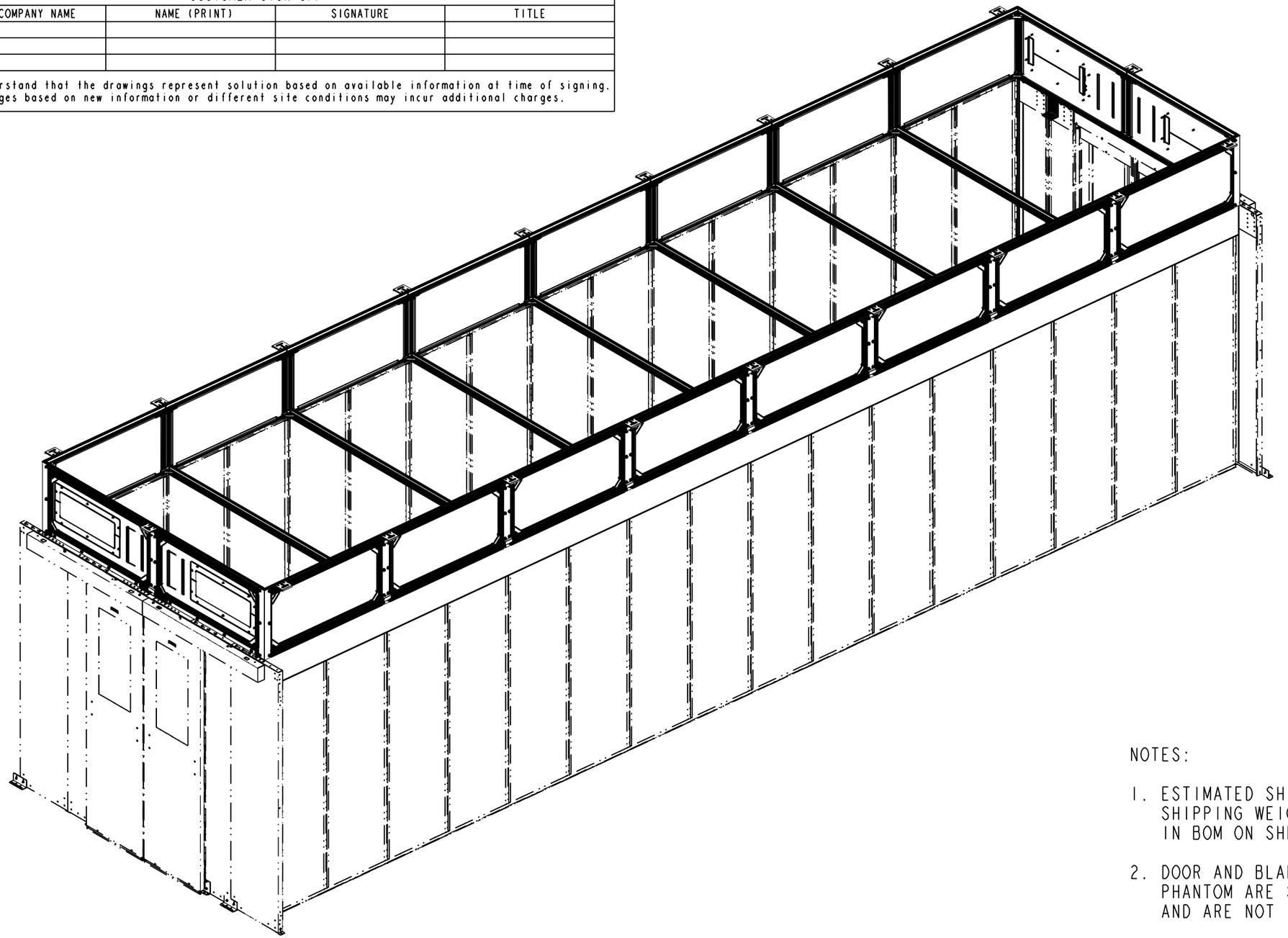
.2 Repair damage to adjacent materials caused by glazing installation.

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

REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER
A	-	-	PRODUCTION RELEASE	CO-0268125

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
.XX ± .02
.XXX ± .005
∠ ± 1°
ALL DIMENSIONS IN INCHES

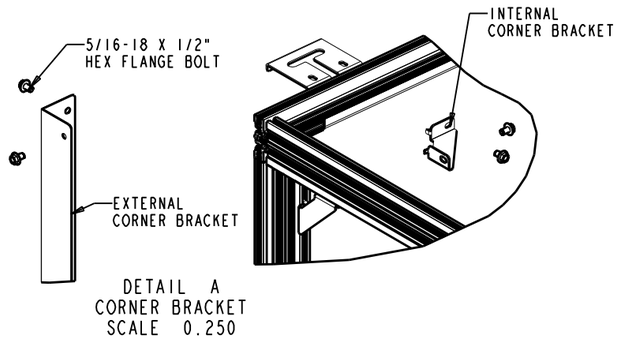
CAGE NUMBER:	81824
DESIGN MGMT SITE:	Worcester
MATERIAL:	
MATERIAL FINISH:	Powder Coat - Variable
SPEC #	-

ORIG EPR:	EPR235639 CO-0268125	
DES. BY	DNelson	06/12/23
DRWN. BY	DNelson	09/11/23
PROD GRP	80 - RapidPod	
COLOR:	-	
CRS GA:	N/A	
OTHER:	SEE NOTES	

ASY - RAPIDPOD CTO, 24H 96W 386L, FAA
-

SHEET:	1 OF 4	REV DATE:	-
D	17800036	REV	A

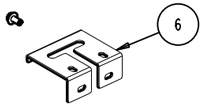
RELEASE STATUS
Production



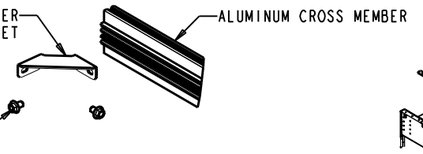
DETAIL A
CORNER BRACKET
SCALE 0.250

CAUTION ! !

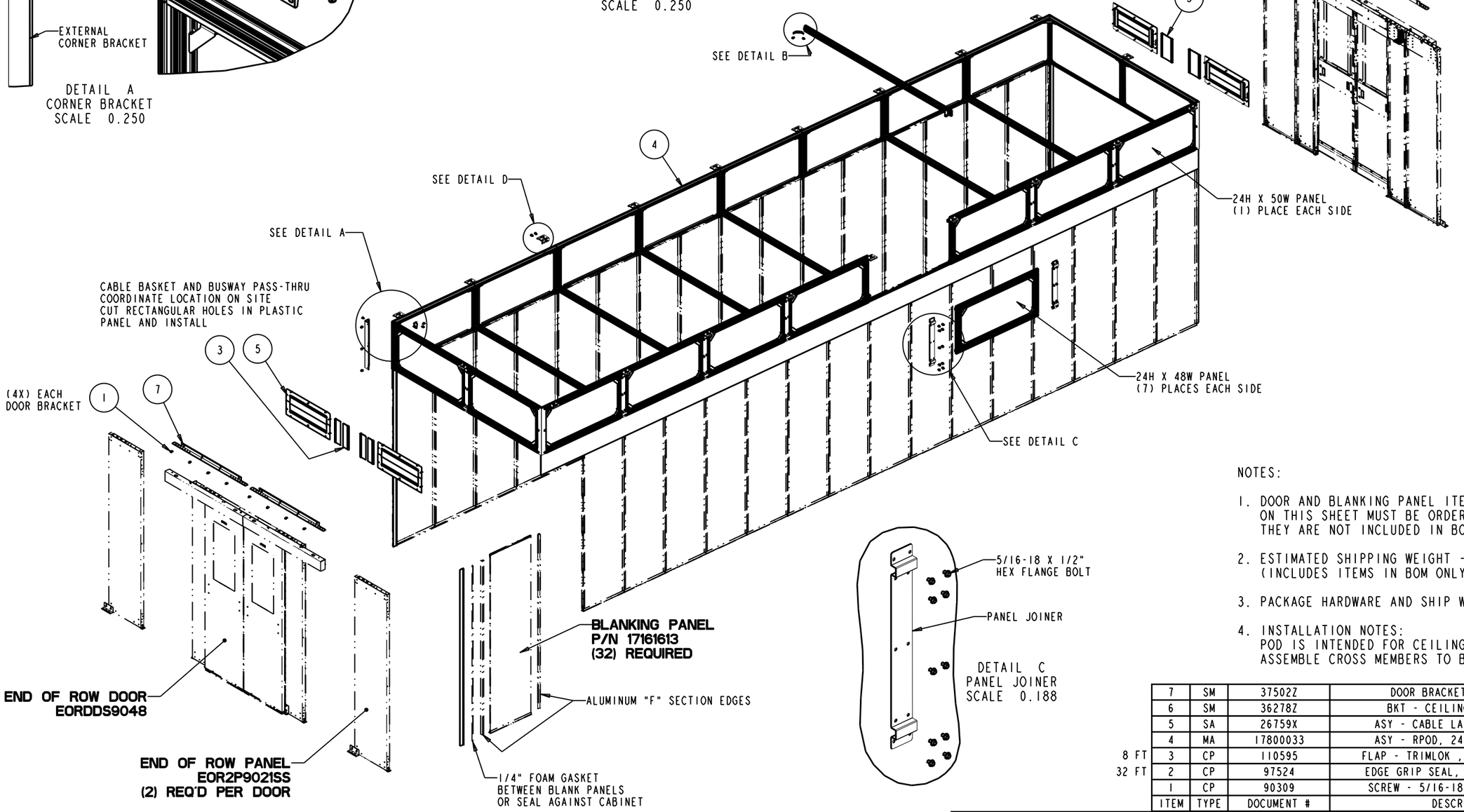
5/16-18 X 5/8"
HEX FLANGE BOLT
REQ'D FOR
CEILING BRACKETS



DETAIL D
CEILING BRACKET
SCALE 0.250



DETAIL B
CROSS-MEMBER
SCALE 0.250



DETAIL C
PANEL JOINER
SCALE 0.188

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

	ITEM	TYPE	DOCUMENT #	DESCRIPTION	QTY
	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
8 FT	3	CP	110595	FLAP - TRIMLOK ,3" 7B1375B3X5/16C	-
32 FT	2	CP	97524	EDGE GRIP SEAL, 1.75" WIDE, EPDM	4
	1	CP	90309	SCREW - 5/16-18X5/8" SERRHXWSHR	56

CUT TO 90"
USE WITH END LOCATION PANELS ONLY
INTERFACE TO DOOR

Choose one:
PPAPA (CUSTOM LEVEL A)
PPAP3 (LEVEL 3)
PPAPC (CATALOG ITEM)
NA (MFD. PART OR EXEMPT)

PPAP LEVEL:	NA

REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER
A	-	-	PRODUCTION RELEASE	CO-0268125

DRAWN IN THIRD ANGLE PROJECTION

TOLERANCE UNLESS SPEC'D .XX ± .02 .XXX ± .005 ∠ ± 1° 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	DNelson	06/12/23
DRWN. BY	DNelson	09/11/23
PROD GRP	80 - RapidPod	
COLOR:	-	
CRS GA:	N/A	
OTHER:	SEE NOTES	

EATON

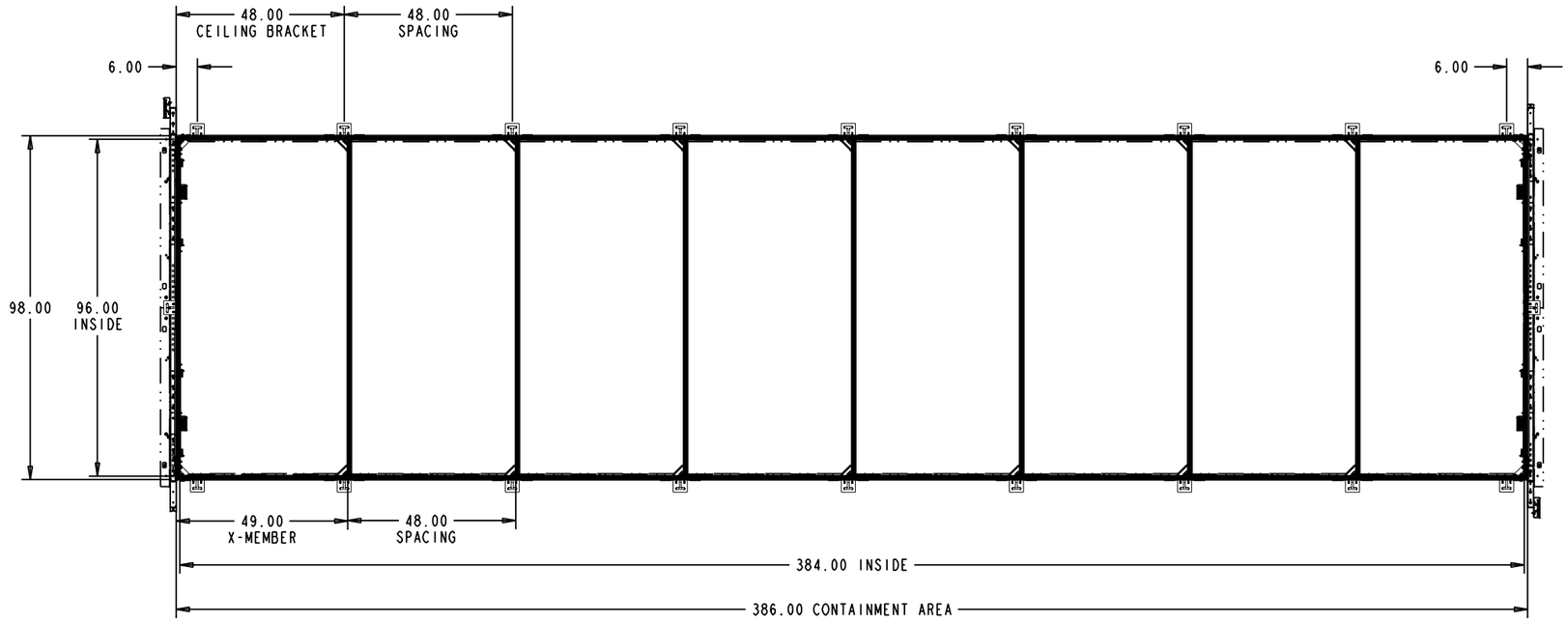
ASY - RAPIDPOD CTO, 24H 96W 386L, FAA
-

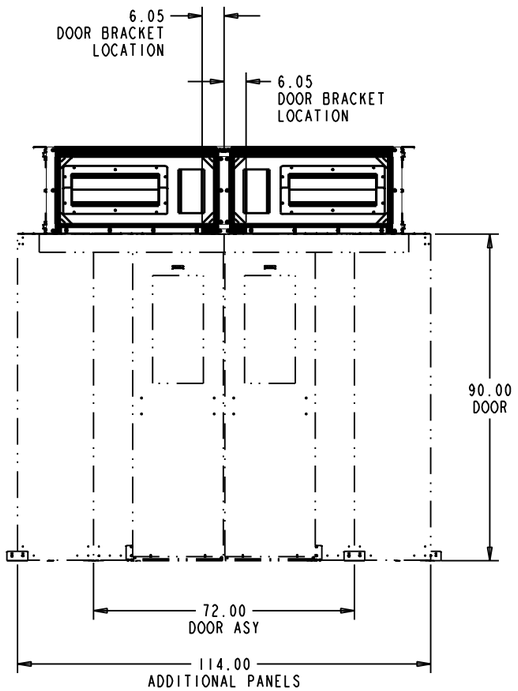
SHEET:	REV DATE:
2 OF 4	-

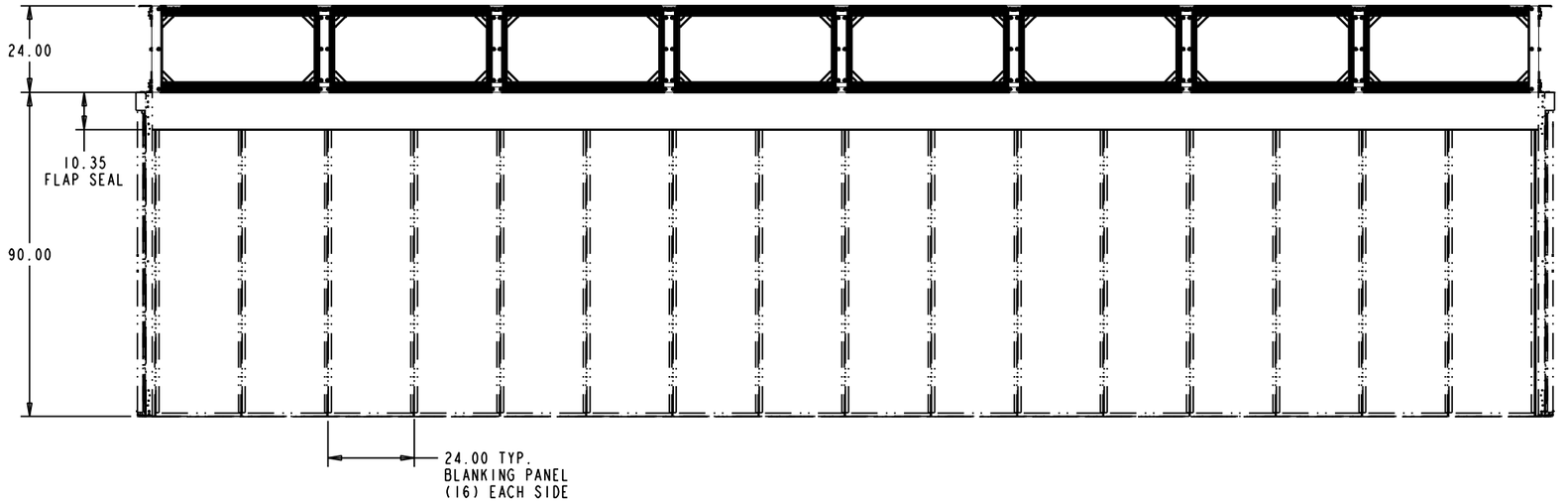
D	17800036	REV	A

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

REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER
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DRAWN IN THIRD ANGLE PROJECTION

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ALL DIMENSIONS IN INCHES

CAGE NUMBER: 81824
DESIGN MGMT SITE: Worcester

ORIG EPR:	EPR235639 CO-0268125	
DES. BY	DNelson	06/12/23
DRWN. BY	DNelson	09/11/23
PROD GRP	80 - RapidPod	
COLOR:	-	
CRS GA:	N/A	
MATERIAL:		
OTHER:	SEE NOTES	
MATERIAL FINISH:	Powder Coat - Variable	
SPEC #	-	

EATON

ASY - RAPIDPOD CTO, 24H 96W 386L, FAA
-

SHEET: 3 OF 4 | REV DATE: -

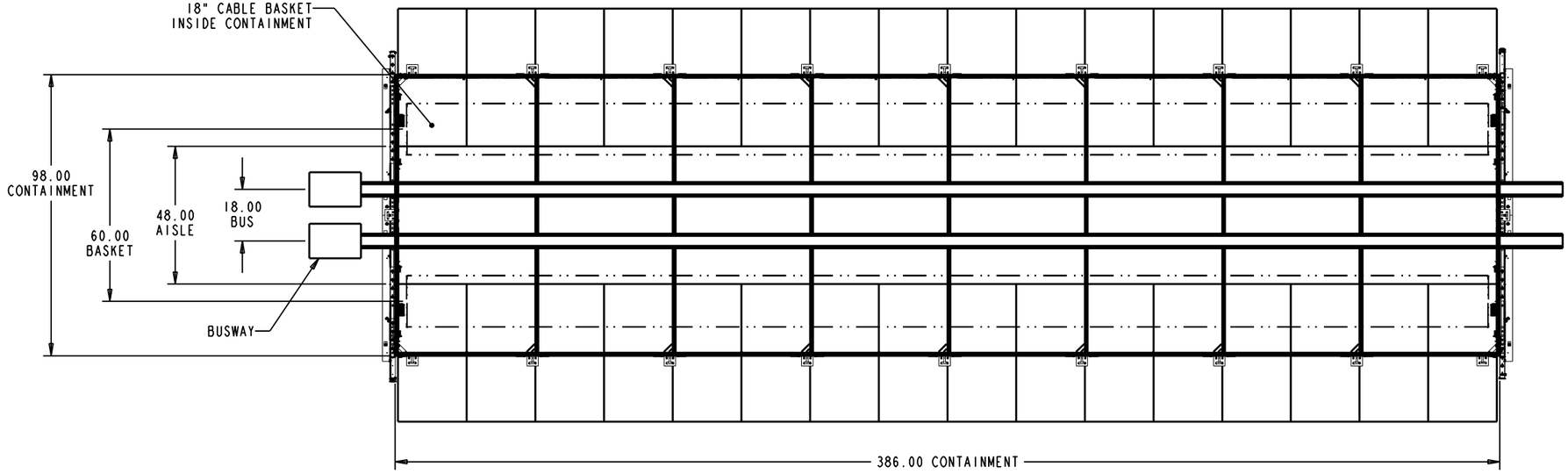
D	17800036	REV	A

RELEASE STATUS
Production

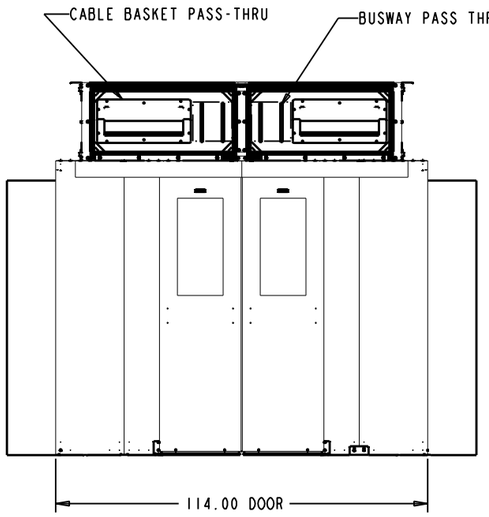
GENERAL ARRANGEMENT

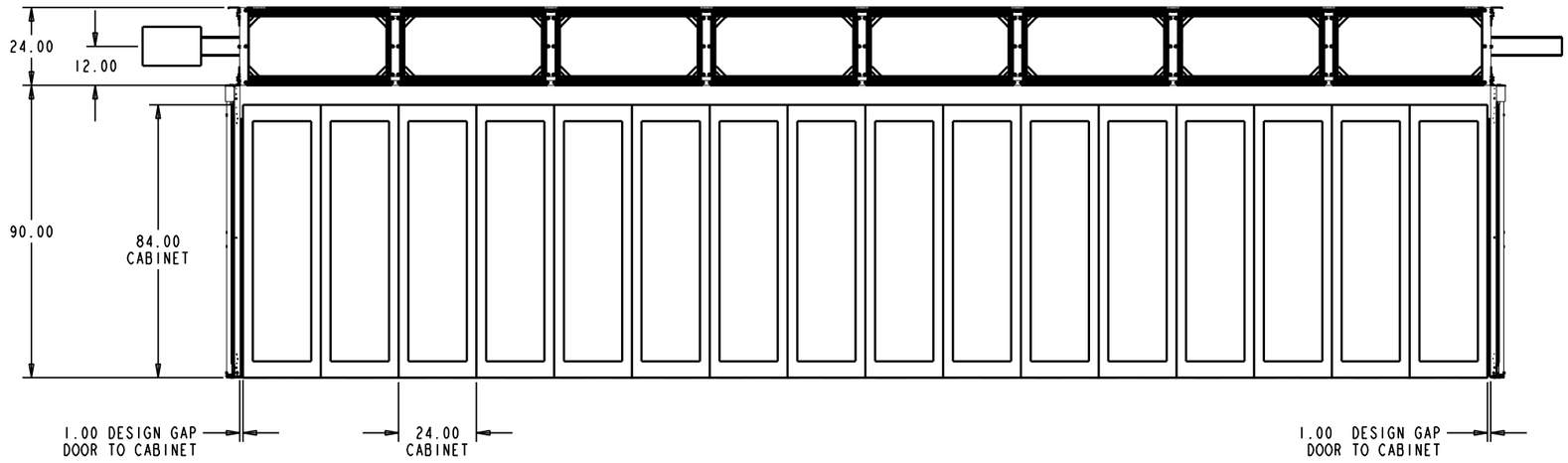
1. CABINETS, DOORS, BUSWAY, CABLE BASKETS ARE NOT INCLUDED IN THIS SKU.

2. REFER TO SHEET 2 & 3 FOR ADDTIONAL 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

REV	REV. DATE	REV'D BY	CURRENT REVISION DESCRIPTION	ECN OR EPR NUMBER
A	-	-	PRODUCTION RELEASE	CO-0268125

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TOLERANCE UNLESS SPEC'D
.XX ± .02
.XXX ± .005
∠ ± 1°
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	DNelson	06/12/23
DRWN. BY	DNelson	09/11/23
PROD GRP	80 - RapidPod	
COLOR:	-	
CRS GA:	N/A	
OTHER:	SEE NOTES	

EATON

ASY - RAPIDPOD CTO, 24H 96W 386L, FAA
-

SHEET: 4 OF 4	REV DATE: -
D 17800036	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 5th, 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 <u>Notice of non-mandatory Site Visit:</u>

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