

Specifications and drawings for

Daniel J. MacDonald Modernization

are amended as follows:

SPECIFICATIONS

1.1 **REVISED SPECIFICATIONS**

- .1 The following revised specifications issued with this addendum supersede previously issued specifications of the same title and number
 - .1 Section No. 00 01 10_R2, Table of Contents
 - .2 Section No. 03 54 16_R1 – Self Levelling Floor Underlayment
 - .3 Section No. 23 36 00_R1, Air Terminal Units
 - .4 Section No. 25 90 01_CS601_R1, Heat Recovery Chillers – Control Points List
 - .5 Section No. 25 90 01_CS611_R1, Chilled Water Distribution System – Control Points List
 - .6 Section No. 25 90 01_CS621_R1, Heating Water Distribution System – Control Points List.
 - .7 Section No. 25 90 01_CS701_R1 Make-Up Air Dedicated Outdoor Air System with Energy Recovery System – Control Points List.
 - .8 Section No. 25 90 01_CS731_R1 Wallfin Convectors Hydronic – Control Points List.
 - .9 Section No. 25 90 01_CS732_R1 Forced Flow Heaters Hydronic – Control Points List.
 - .10 Section No. 25 90 01_CS737_R1 Fan Coil Units – Control Points List.
 - .11 Section No. 25 90 01_CS809_R1 Parking Garage Ventilation – Control Points List
 - .12 Section No. 25 90 01_CS810_R1 Mechanical Room Ventilation – Control Points List
 - .13 Section No. 25 90 01_CS821_R1 Fan Powered VAV Dedicated Outdoor Air System – Control Points List
 - .14 Section No. 25 90 01_CS824_R1 Demand Control Ventilation VAV with Active Chilled Beams – Control Points List
 - .15 Section No. 25 90 01_CS825_R1 Demand Control Ventilation VAV with Fan Coil Units– Control Points List
 - .16 Section No. 25 90 01_CS831_R1 Humidification System – Control Points List

DRAWINGS

1.2 REVISED DRAWINGS

.1 The following Drawings are revised and re-issued with this addendum. Revisions are shown in bubbled areas on drawings. The following descriptions of revisions are for convenience only and do not define or limit the extent of actual revisions indicated on drawings:

- .1 Drawing M40-00 - Fire Protection - Parking Level New Work
 - .1 Clarified note regarding heat tracing.
- .2 Drawing M73-04 - Airflow Schematic
 - .1 Deleted airflow station.
- .3 Drawing E04-02 – Single Line Diagram – Emergency Power
 - .1 Revise two (2) breakers at the panel DP-EM and DP-2AE to LSI breakers as shown on the drawing.
- .4 Drawing E10-00 Power Plan – Parking Level
 - .1 Pump location revised as shown on the drawing.
- .5 Drawing E30-00 Fire Alarm Plan – Parking Level
 - .1 Heat detectors layout revised as shown on the drawing.
 - .2 Fire alarm speakers replaced with combination speaker/strobes as shown on the drawing.
- .6 Drawing E30-01 Fire Alarm Plan – Main Floor
 - .1 All fire alarm speakers, except in staircases, replaced with combination speaker/strobes devices.
- .7 Drawing E30-02 Fire Alarm Plan – Second Floor
 - .1 All fire alarm speakers, except in staircases, replaced with combination speaker/strobes devices.
- .8 Drawing E30-03 Fire Alarm Plan – Third Floor
 - .1 All fire alarm speakers, except in staircases, replaced with combination speaker/strobes devices.
- .9 E30-04 Fire Alarm Plan – Fourth Floor
 - .1 All fire alarm speakers, except in staircases, replaced with combination speaker/strobes devices.
- .10 E30-05 Fire Alarm Plan – Fifth Floor
 - .1 All fire alarm speakers, except in staircases, replaced with combination speaker/strobes devices.

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	26 27 26 Wiring Devices	E	27 May 2022	3
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	Charlottetown - DJM Building Phase II Soil Investigation, prepared by Jacques, Whitford & Associated Ltd.	Info	15 Aug 1980	25

LEGEND TO DOCUMENTS RESPONSIBILITY

- .1 A - Denotes documents prepared by Architect.
- .2 HS – Denotes documents prepared by Health & Safety Advisor, PSPC Human Resources Branch, Construction & Maintenance.
- .3 SC - Denotes documents prepared by Sustainability Consultant.
- .4 Cx – Denotes documents prepared by Commissioning Agent.
- .5 Env - Denotes documents prepared by PSPC Environmental Group.
- .6 S - Denotes documents prepared by Structural Engineer.

- .7 H - Denotes documents prepared by Architectural Hardware Consultant.
- .8 AV - Denotes documents prepared by Audio Visual Consultant
- .9 M - Denotes documents prepared by Mechanical Engineer.
- .10 E - Denotes documents prepared by Electrical Engineer.
- .11 C - Denotes documents prepared by Civil Engineer
- .12 L - Landscape documents prepared by PSPC
- .13 Info - Denotes Information Documents prepared by various entities.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 03 01 37 - Concrete Restoration.
- .2 Section 03 53 10 - Polished Concrete Topping.

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM C109/C109M-21, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. (50-mm) Cube Specimens).
 - .2 ASTM C348-21, Standard Test Method for Flexural Strength of Hydraulic Cement Mortars.
 - .3 ASTM C881/C881M-15, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - .4 ASTM C882/C882M-20, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
 - .5 ASTM C1583/C1583M-20, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
 - .6 ASTM D638-14, Standard Test Method for Tensile Properties of Plastics.
 - .7 ASTM D695-15, Standard Test Method for Compressive Properties of Rigid Plastics.
 - .8 ASTM D732-17, Standard Test Method for Shear Strength of Plastics by Punch Tool.
 - .9 ASTM D790-17, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - .10 ASTM E1155M-14, Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric).
 - .11 ASTM F710-21, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - .12 ASTM F1869-16a, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 - .13 ASTM F2873-13, Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring.
- .2 CSA Group:
 - .1 CAN/CSA A23.1-19/A23.2-19, Concrete Materials and Methods of Concrete Construction/Methods of Tests for Concrete.
- .3 Green Building Initiative (GBI) Canada:
 - .1 Green Globes Canada Design for New Construction and Major Retrofits v.2 <http://www.greenglobes.com>

- .4 Health Canada / Workplace Hazardous Materials Information System 2015 (WHMIS):
 - .1 Safety Data Sheets (SDS).
- .5 International Concrete Repair Institute (ICRI):
 - .1 ICRI Guideline No. 310.2R-2013, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113, Architectural Coatings.
 - .2 SCAQMD Rule 1168, Adhesive and Sealant Applications.

1.3 SECTION INCLUDES

- .1 This Section includes floor elevation survey of the existing slabs using a survey grade, 3D laser scanner.**
- ~~.2~~ This Section includes supply and installation of self-levelling underlayment, as specified, on every floor of the entire building, with the exception of the Atrium where Polished Concrete Topping system is specified.
- ~~.2.3~~ This Section does not include supply and placement of self-leveling underlayment for fully bonded Polished Concrete Topping System (C-TOP-1) in the Atrium, specified in Section 03 53 10.

1.4 UNIT PRICES AND PAYMENT PROCEDURES

- .1 Include in the Contract Price 15,000 m² of self-levelling underlayment with nominal thickness of 25 mm, for a resultant theoretical volume of placed product of 375 m³.
- .2 The above quantity of self-levelling underlayment is estimated. Actual quantity will vary in different areas depending on the site condition and structural capacity of existing slabs.
- .3 Measurement:
 - .1 The work of this Section will be measured on site using cubic metre as a unit of measurement, based on volume of product placed at the project site.
 - .2 The volume will be tallied using Contractor's submitted receipt for bags of materials purchased and used on the project for the actual floor area covered. The installed volume will be cross-checked using the coverage numbers shown on the manufacturer's product datasheets.
- .4 Payment:
 - .1 The work of this Section will be paid based on the actual volume of underlayment installed, and the unit prices stated in the Bid and Acceptance Form.
- .5 The Contract Price will be adjusted according to the actual final quantities.
- .6 Special Documentation
 - .1 Retain proof of purchase along with proof of delivery of materials to the site.

- .2 Submit to Departmental Representative with every application for payment copies of receipts to verify quantity and type of materials purchased and installed on the project.

1.5 STRUCTURAL CAPACITY OF EXISTING SLABS

- .1 Before proceeding with the work of this Section, confirm with Departmental Representative structural capacity and loading information of all existing slabs.
- .2 Refer to Structural Drawings for maximum allowable overlay depth.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shortly after Contract Award, submit proposed Work Plan for approval by Departmental Representative. Work Plan to include the following information:
 - .1 Methodology and sequence of construction;
 - .2 List of products and materials.
- .3 Provide Work Plan together with Shop Drawings and Product Datasheets as a complete package for Departmental Representative's review. Do not proceed with material ordering until review is completed.
- .4 Submit Shop Drawings indicating the following information:
 - .1 Areas where work of this Section is required, for each floor.
 - .2 Refer to structural drawings for maximum height of self-levelling underlayment.
- .5 Submit Product Data:
 - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, and compliance with minimum Product Performance Properties, coverage rate, performance criteria and limitations.
 - .2 Include storage and handling requirements.
 - .3 Include substrate preparation instructions.
- .6 Installation Instructions: Manufacturer's printed instructions for each product.
- .7 Test results: provide to Departmental Representative
 - .1 Copies of concrete substrate tests.
 - .2 Copies of adhesion tests.
- .8 Floor elevation survey results: provide to Departmental Representative**
 - .1 Copies of a final Report.**
 - .2 Digital "point cloud" data.**

1.7 SUSTAINABLE DESIGN SUBMITTALS

- .1 Adhere to the requirements of the Construction Waste Management plan as per Section 01 74 19 Construction Waste Management and Disposal.

- .2 Provide the following documentation in accordance with Section 01 47 15 Sustainable Requirements: Construction:
 - .1 Low-emitting materials: Interior site-applied Paints and Coatings
 - .1 Submit product data/SDS sheets for VOC emitting materials that clearly identifies the VOC content for compliance.
 - .2 Provide certificates for VOC compliance to the following regulations:
 - .1 SCAQMD Rule 1113 or SCAQMD Rule 1168, and
 - .2 Canadian VOC Concentration Limits for Architectural Coatings, Regulation SOR/2009 -264.

1.8 **QUALITY ASSURANCE**

- .1 Single Source Responsibility: to ensure compatibility of products, obtain underlayments, additives, primers, and accessories from the same manufacturer.
- .2 Manufacturer's site inspection: Have the manufacturer's technical representative inspect the Work at suitable intervals during application and at conclusion of the work of this Section, to ensure the Work is correctly installed. Submit manufacturer's inspection reports and verification that the work of this Section is correctly installed.
- .3 Testing of concrete floors:
 - .1 Test concrete substrate to ensure relative humidity or water vapour emission rates are in accordance with manufacturer's recommendations
 - .2 Moisture vapor transmission cannot exceed 1.3 kg per 90 m² per 24 hours using calcium chloride test, reference ASTM F1869.
- .4 Floor Elevation Survey:**
 - .1 Immediately after completion of demolition work, perform an accurate floor elevation survey of the existing slabs, using a survey grade, 3D laser scanner, to determine the elevation differences with a tolerance of 25 mm absolute accuracy and 3mm relative accuracy.**
 - .2 Perform floor elevation survey of the entire building, all floor levels, with the exception of the Basement floor and the Penthouse floor.**
 - .3 Produce a floor flatness and floor levelness plan and record measured readings on the Floor Plans.**
 - .4 Provide to Departmental Representative digital "point cloud" data in the proprietary data format and .e57 format.**
 - .5 Include Comprehensive Report in PDF format, with summary of equipment and methodology used, and final results.**
 - .6 Provide copies to Departmental Representative.**

1.9 **PRE-INSTALLATION MEETING**

- .1 Convene minimum 2 weeks prior to commencing work of this section.
- .2 Require attendance of material's manufacturer, the installer of the work of this Section and the installers of related work. Invite Departmental Representative to attend the pre-installation meeting.
- .3 Meeting agenda includes but is not limited to:

- .1 Structural capacity of the existing slabs.
- .2 Allowable maximum heights of material placement based on reviewed Work Plan and Shop drawings.
- .3 Surface Preparation.
- .4 Materials compatibility.
- .5 Installation procedures.
- .6 Protection of work during and after installation.
- .7 Review coordination with other affected sections.

1.10 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and store materials on site at least 24 hours before work begins.
- .3 Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.
- .4 Protect setting materials from freezing or overheating in accordance with manufacturer's instructions.
- .5 Store materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.
- .6 Do not use frozen materials.

1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.
- .2 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- .3 Protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Epoxy Primer: ASTM C881/C881M, high-performance, two-component, high-modulus epoxy bonding agent, non-shrink, 100 percent solids, VOC content less than 50 g/L. Primer shall be compatible with self-levelling underlayment.
- .2 Self-Leveling Underlayment: Standard Performance, polymer-modified, calcium-aluminate-based, self-curing underlayment, mixed with water at a ratio prescribed by the manufacturer.
 - .1 Industry Standards and Approvals:

- .1 Meeting compression requirements of ASTM F710 and ASTM F2873.
- .2 Green Certification: CRI Green Label Plus.
- .2 Product Performance Properties, minimum, at 23 deg. C and 50% RH:
 - .1 Cured density 128 lbs. per cu. ft. (2.06 kg per L)
 - .2 Compressive strength – ASTM C109 Modified
 - .1 7 days > 2,500 psi (17.2 MPa)
 - .2 28 days > 3,500 psi (25 MPa)
 - .3 VOCs Rule #1168 of California’s SCAQMD: 0 g per L
 - .4 Flexural strength – ASTM C348 (CAN/CSA-A23.2-8C)
 - .1 28 days > 870 psi (6 MPa)
 - .5 Application Properties
 - .1 Minimum thickness over highest point in floor: 3 mm.
 - .2 Single-lift application range: 3 mm to 25mm.
 - .3 Waiting time for secondary applications: 24 hours.
 - .4 Drying time before installation of non-moisture-sensitive floor coverings at 21°C at 25 mm thickness: 24 hours.
 - .5 Drying time before installation of moisture-sensitive floor coverings at 21°C at 25 mm thickness: 72 hours.
- .3 For self leveling polymer-modified underlayment, forming part of the fully bonded System C-TOP-1, refer to Section 03 53 10 - Polished Concrete Topping.
- .4 Aggregate: Well-graded, washed gravel, 3 to 6 mm; or coarse sand as recommended by underlayment manufacturer.
 - .1 Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- .5 Mix water: Potable, free from impurities.
- .6 Materials for concrete repair and crack filling: as specified in Section 03 01 37 - Concrete Restoration.

2.2 EQUIPMENT

- .1 Mixer and pumps: designed for cement materials and in good working condition. Pressure-test the equipment before mixing. Use a mesh screen “sock” at the end of the hose to catch any foreign material that may have fallen into the hopper during mixing.

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Examine substrates for compliance with requirements for conditions affecting performance of the work.
- .2 Ensure that concrete slabs, including concrete repair patching, have been properly cured and dry for minimum of 28 days.

- .3 Report concrete floor test results to Departmental Representative, indicating that relative humidity and water vapour emission rates are in accordance with manufacturer's recommendations.
- .4 Verify that required environmental conditions are maintained during application as well as for 72 hours before and after application. Be familiar with manufacturer's product literature and Safety Data Sheets and comply with precautions, handling procedures and equipment requirements.
- .5 Do not start work until unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of all surfaces and conditions.

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- .3 Subfloor shall be structurally sound. Shot blast or scarify steel trowel concrete, concrete with sealer or curing compound, slick or smooth concrete. Clean subfloor to remove mud, oil, grease, old adhesives, and other contaminating factors before application of work.
- .4 Mechanically profile concrete surfaces in accordance with ICRI Guideline No. 310-2R, to concrete surface profile (CSP) #3.
- .5 Concrete surface repair and crack filling: as specified in Section 03 01 37 - Concrete Restoration.
- .6 Expansion Joints: Allow joints to continue through the underlayment at the same width.
- .7 Fill substrate voids to prevent underlayment from leaking.
- .8 Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 INSTALLATION

- .1 Do not commence work until the building is enclosed, including roof, windows, doors, and other fenestration.
- .2 Perform work of this Section in strict accordance with the reviewed Work Plan and the Shop drawings.
- .3 Read manufacturer's installation instructions thoroughly before installation.
- .4 To ensure a suitable mix and flow, test the mixed material from the pump hose's end in a small test area before general application.
- .5 Mix and apply underlayment components according to product manufacturer written instructions.
- .6 Apply primer over prepared substrate at manufacturer's recommended spreading rate. Apply primer as bonding agent, working the material into the profiled substrate. Completely cover all areas of substrate that will receive the underlayment.
- .7 Place underlayment onto primer while it is tacky to ensure a successful installation.

- .8 Apply enough material to adequately cover all high spots, and fill low spots.
- .9 Spread and screed underlayment onto the properly prepared and primed surface, maintaining a wet edge throughout placement.
- .10 Except at authorized joints, place underlayment as continuously as possible, until application is complete so that no underlayment slurry is placed against underlayment product that has obtained its initial set, to avoid trapping air or creating a cold joint.
- .11 Produce smooth, uniform, level surface meeting specified minimum flatness and levelness tolerances in accordance with ASTM E1155M.
 - .1 Apply a final layer without aggregate to product surface.
 - .2 Install in proper relationship with adjacent construction. Feather edges to match adjacent floor elevations.
- .12 Provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the underlayment has set and cured.
- .13 Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- .14 Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- .15 Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 TOLERANCES

- .1 Finished floors to meet following minimum tolerances in accordance with ASTM E1155M, F-number method:
 - .1 Minimum values shall not be less than $F_F = 35$; $F_L = 25$.
- .2 Correct defect and deficiencies to achieve specified tolerances. No additional costs will be allowed for additional labour or materials required to provide specified level of flatness and levelness.

3.5 FIELD QUALITY CONTROL

- .1 Slump Test: Test underlayment as it is being pumped using a 50 mm x 100 mm cylinder resulting in a patty size of 225 mm plus or minus 25 mm diameter.
- .2 Take at least one set of 3 molded cube samples from each day's application. Test cubes in accordance with modified ASTM C109.
- .3 Provide test results to Departmental Representative.

3.6 PROTECTION

- .1 Protect installation areas from direct sunlight.
- .2 Floors: Protect from all traffic for at least 72 hours after installation.
- .3 Do not step on floor for at least 24 hours; if traffic is unavoidable after that, use plywood stepping boards.
- .4 Protect from heavy traffic for at least 7 days after installation.

3.7 CLEANING

- .1 Leave work area clean at end of each working day.
- .2 Dispose of waste in accordance with applicable Federal, Provincial, and municipal regulations.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .4 Waste Management: Adhere to the requirements of the Construction Waste Management plan as per Section 01 74 19 Construction Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/Air Movement and Control Association (ANSI/AMCA)
 - .1 ANSI/ASHRAE 51-07 (ANSI/AMCA 210-07), Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .2 GB Initiative Canada:
 - .1 GREEN GLOBES Canada Design for New Construction and Major Retrofits v.2, <http://www.greenglobes.com>
- .3 International Organization of Standardization (ISO)
 - .1 ISO 3741-2010, Acoustics-Determination of Sound Power Levels of Noise Sources Using Sound Pressure - Precision Methods for Reverberation Rooms.
- .4 National Fire Protection Association (NFPA)
 - .1 NFPA 90A-21, Standard for the Installation of Air Conditioning and Ventilating Systems.
- .5 Underwriter's Laboratories (UL)
 - .1 UL 181-Edition 11, Factory-Made Air Ducts and Air Connectors.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for air terminal units and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of P.E.I., Canada.
 - .2 Indicate the following:
 - .1 Capacity.
 - .2 Pressure drop.
 - .3 Noise rating.
 - .4 Leakage.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

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- .5 Test and Evaluation Reports:
 - .1 Test data: to ANSI/AMCA Standard 210.
 - .1 Submit published test data on DIN (Direct Internal Noise), in accordance with ISO 3741 made by independent testing agency for 0, 2.5 and 6 m/s branch velocity or inlet velocity.
 - .2 Sound power level with minimum inlet pressure of 0.25 0.5 1 1.5 kPa in accordance with ISO 3741 for 2nd through 7th octave band, also made by independent testing agency.
 - .3 Pressure loss through silencer shall not exceed 60% of inlet velocity pressure maximum.
 - .6 Sustainable Design Submittals: in accordance with Section 01 47 15 Sustainable Requirements: Construction.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for air terminal units for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect air terminal units from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 57 16 IAQ Management: Construction.
- .5 Packaging Waste Management: Adhere to the requirements of the Construction Waste Management plan as per Section 01 74 19 Construction Waste Management and Disposal.

1.5 WARRANTY

- .1 Provide manufacturer's warranty certificate for all installed units.
- .2 Warranty shall include but not limited to labor and materials.
- .3 Manufacturer shall warrant the product for a period of 18 months after project substantial completion. The warranty shall cover all internal components of the product.

~~27 May~~ **29 Jun** 2022**Part 2 Products****2.1 SYSTEM DESCRIPTION****.1 Performance Requirements:**

- .1 Catalogued or published ratings for manufactured items: obtained from tests carried out by manufacturer or those ordered by manufacturer from certified ADC (Air Diffusion Council) testing agency signifying adherence to codes and standards.

2.2 MANUFACTURED UNITS

- .1 Terminal units of the same type to be product of one manufacturer.

2.3 LOW PRESSURE TERMINAL UNITS – TO 750 PA**.1 General**

- .1 Type, model and size as shown on Drawings
 - .2 Operating Pressure
 - .1 Maximum inlet air pressure: 750 Pa.
 - .2 Minimum inlet air pressure: 75 Pa.
 - .3 Maximum pressure drop across unit including attenuator, at 10 m/s inlet velocity: 40 Pa.
 - .4 Air leakage, close damper position: maximum 2% of nominal catalogue rating at an air inlet pressure of 750 Pa
 - .3 Acoustic Ratings
 - .1 Maximum room NC sound pressure level (2 x 10⁻⁴ microbar reference) at maximum inlet pressure: less than 40 at discharge and 42 radiated for box with attenuator mounted exposed (without ceiling).
 - .4 Performance Ratings
 - .1 ARI 880 certified
 - .2 Maintain air quantity within ±5% of set value, between zero and specified rating, and sound level below specified values when operating from minimum to maximum inlet static pressure as given above.
 - .5 Materials
 - .1 Stainless steel: 20 gauge type 316L stainless steel
 - .2 Fibreglass insulation: 20 mm thick (unless otherwise specified), dual density fibreglass. Exposed/cut edges sealed with NFPA-90A approved sealant, or metal caps as specified.
- .2 Single Duct Terminal Units Demand Control Ventilation (DCV)
 - .1 Variable Volume or Constant Volume as per equipment schedules

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- .2 Casing Construction
 - .1 Casing : 22 gauge galvanized steel
 - .2 Insulation Type 1: fibreglass encapsulated in woven fabric liner, and wrapped edges
 - .3 Insulation Type 2: fibreglass with aluminum foil liner and sealed edges
 - .4 Insulation Type 3: fibreglass encapsulated in woven fabric liner, and galvanized steel perforated liner, and metal cap edges
 - .5 Insulation Type 4: fibreglass with galvanized steel solid liner, and metal edge caps
 - .6 Insulation Type 5: fibreglass with galvanized steel perforated liner, with metal edge caps
- .3 Control Elements
 - .1 Pressure independent type
 - .2 Pneumatic velocity sensor, cross tree type, with an accuracy within 5% with a 90° elbow connected at the inlet to the assembly
 - .3 Damper: heavy gauge metal, with edge gasket, self-lubricating bearings, and adjustable minimum stop
 - .4 Damper arranged "normally open" for morning warm-up
 - .5 Controls and damper actuator as specified below.
- .4 Discharge Section
 - .1 Open end or multiple outlet attenuator on box discharge acoustically treated with insulation as described above for the unit casing.
 - .2 Reheat coils where scheduled, complete with access door in bottom of attenuator on inlet side of coil.
- .3 Fan Powered Variable Air Volume Terminal Units Dedicated Outdoor Air System (FPB)
 - .1 Type
 - .1 Variable volume primary air flow and constant volume supply air through fan operation.
 - .2 The FPB incorporates cooling induction coil and heating to use in conjunction with DOAS.
 - .3 Refer to equipment schedule for capacity and additional information.
 - .2 Casing Construction
 - .1 Casing: 22 gauge galvanized steel up to 900 mm wide; 20 gauge minimum galvanized steel over 900 mm wide
 - .2 Internal sound reduction baffle
 - .3 Bottom access door with cam-lock fittings, for fan removal
 - .4 Insulation Type 1: fibreglass encapsulated in woven fabric liner, and wrapped edges

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- .5 Insulation Type 2: fibreglass with aluminum foil liner, galvanized steel perforated liner and metal cap edges
- .6 Insulation Type 3: fibreglass encapsulated in woven fabric liner, and galvanized steel perforated liner, and metal cap edges
- .7 Insulation Type 4: fibreglass with galvanized steel solid liner, and metal edge caps
- .8 Insulation Type 5: fibreglass with galvanized steel perforated liner, with metal edge caps
- .3 Control Elements
 - .1 Pressure independent type primary air regulator
 - .2 Pneumatic velocity sensor, cross tree type, with an accuracy within 5% with a 90° elbow connected at the inlet to the assembly
 - .3 Damper: heavy gauge metal, with edge gasket, and self-lubricating bearings and adjustable minimum stop
 - .4 Single point electrical and control connection, in a single control box with access panel, sealed from the primary air section
 - .5 Controls and damper actuator as specified below.
- .4 Fan and Motor Assembly
 - .1 Forward curved, direct drive, statically and dynamically balanced centrifugal fan suspended on rubber in shear isolators
 - .2 Electrically Commutated Motor, brushless DC design, with built-in inverter and microprocessor based motor controller, to maintain supply air volume independent of system static pressure, permanently lubricated ball bearings.
 - .3 Field manual adjustment of fan speed
 - .4 4-20 mA or 0-10 VDC input for remote BMS fan speed reset
 - .5 115 V, 1 phase, 60 Hz
- .5 Discharge Section
 - .1 Open end or multiple outlet attenuator on box discharge acoustically treated with rigid acoustic insulation held in place with adhesive and pins
 - .2 Open end secondary air inlet silencer acoustically treated with rigid acoustic insulation held in place with adhesive and pins
 - .3 Reheat coils where scheduled, complete with access door in bottom of attenuator on inlet side of coil.
- .6 Performance
 - .1 Maintain primary air quantity within $\pm 5\%$ of set value, between zero and specified rating.

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- .2 Radiated and discharge sound levels below values specified above when operating with maximum primary air, an inlet static pressure of 375 Pa and fan running on medium speed.
- .4 Controls
 - .1 Direct Digital Control (DDC)
 - .1 Provided by the Terminal Unit manufacturer
 - .2 Dedicated microprocessor based controller, with integral damper actuator
 - .3 Electronic flow transducer
 - .4 Standalone operation, capable of interfacing with a Building Management System, and hand-held portable operator interface device
 - .5 Actuator: 24 VDC bi-directional, direct coupled to the damper shaft
 - .6 Factory wired, calibrated and pre-tested, for maximum and minimum air flows
 - .7 Zone temperature sensor: temperature setpoint adjustment, and access for connection of a hand-held operator terminal.
 - .2 Direct Digital Control (Supplied under Section 25 30 01 EMCS Building Controllers)
 - .1 DDC controller with integral damper actuator supplied under Section 25 30 01, and factory installed by the Terminal Unit manufacturer.
 - .2 Electronic flow transducer provided by Terminal Unit manufacturer
 - .3 Factory wired, calibrated and pre-tested, for maximum and minimum air flows
 - .3 Electronic Control
 - .1 Provided by the Terminal Unit manufacturer
 - .2 Electronic controller
 - .3 Electronic flow transducer
 - .4 Electric actuator
 - .5 Electronic thermostat, with setpoint and velocity adjustments
 - .6 Control elements mounted inside of metal enclosure on side of terminal unit
 - .7 Factory wired, calibrated and pre-tested, for maximum and minimum air flows
 - .8 Zone temperature sensor: temperature setpoint adjustment, and access for connection of a hand-held operator terminal.
- .5 Single Point Power Supply
 - .1 Provide single point power wiring for terminal units, at highest voltage and phases as shown on equipment schedules.

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- .2 Main control panel with power distribution:
 - .1 Fused primary / 24 VAC secondary transformers for controls power, with internal disconnect switch.
 - .2 Fused primary / 120 VAC secondary transformers for fan power, for fan powered terminal units, with internal disconnect switch.
 - .3 Fused disconnect switch for electric reheat coil
 - .4 Clear Lexan plastic cover over live terminals on line-side of main disconnect switch.
 - .5 Note : electric heating coil control panel may be used as the Main control panel.
- .3 Separate, externally mounted un-fused disconnect switch to isolate all power to main control panel; no power inside of control panel when access door is open. Provide wiring between disconnect switch and control panel.
- .4 Provide power wiring to fan motor and DDC control unit.

2.4 ACTIVE CHILLED BEAMS

- .1 General:
 - .1 The active beams shall utilize induction of room air across a water coil mounted within the unit to provide sensible cooling or heating as required.
 - .2 The induced air shall mix with primary air and shall be supplied into the space via integrated discharge slot(s).
 - .3 The induced air shall mix with primary air and be supplied into the space at low velocity to produce a displacement system to provide sensible cooling or heating as required.
- .2 Performance:
 - .1 Active beam capacity shall be tested and certified by the manufacturer in accordance with ASHRAE Standard 200 to meet the performance listed on the schedule.
 - .2 Testing of performance shall be conducted in a validated, ISO certified facility with demonstrated capability of testing in accordance with the ASHRAE Standard 200 standard for a minimum of three years with documentation demonstrating repeatability of a standard beam within five percent year over year.
 - .3 Should any performance rating, including supply air volume, chilled water supply temperature, or plenum static pressure, deviate from the schedule, the manufacturer shall submit updated capacity, throw and noise data as well as computational fluid dynamic modeling demonstrating that any changes shall not impact the air distribution in a room that would cause a detriment to the PMV and ADPI rating from the design conditions.

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- .4 Manufacturer shall have a factory testing facility available to perform performance tests of units in accordance with ASHRAE Standard 200 as required.
 - .1 Upon request, up to one percent of units (with a minimum of one for each beam model type) for the project can be tested in accordance with the standard. A request for such testing shall be made with the order and prior to shipment of the active beams.
 - .2 Engineer will have the option of witnessing this test.
- .5 Manufacturer shall also provide performance including the de-rate associated with the discharge grille when applicable to recessed chilled beams.
- .3 Construction:
 - .1 Active beams shall consist of an air inlet, pressurization cavity, metal formed induction nozzles, and enclosed water coil with 2-pipe water connections as indicated on the drawings, linear bar grille, perforated panel, or slot diffuser where applicable, and shall have 2-way discharge as per contract schedule.
 - .2 Air plenum and body casing shall be constructed of minimum 20 gauge galvaneal, consisting of at least one air inlet. Manufacturer shall present data indicating that the pressurized section has a maximum leakage of five percent of the supplied airflow at 1.0 inch water gauge.
 - .3 Exposed active beam casing shall be constructed of minimum 16 gauge powder coated heavy duty steel, consisting of at least one air inlet. Manufacturer shall present data indicating that the pressurized section has a maximum leakage of five percent of the supplied airflow at 1.0 inch water gauge. The casing construction shall allow maintenance personnel to stand on the top of the unit.
- .4 Water Coil:
 - .1 The water coil shall consist of copper tubing mechanically expanded into aluminum plate fins.
 - .2 Coils shall be leak tested by manufacturer to 390 pounds per square inch, to within plus or minus 10 pounds per square inch, shall have a working pressure of 300 pounds per square inch, and shall be AHRI 410 certified.
 - .3 Water connections shall be half inch diameter connections on one end only, and shall be suitable for solder, compression fittings, push on fittings or threaded connection.
 - .4 Fin spacing shall be no greater than 12 fins per inch to prevent dust bridging.
 - .5 Tube thickness shall be at least .016 inches.
 - .6 The coil shall be removable from the room side without requiring the removal of the beam casing from the ceiling.
 - .7 The coil pipe connections shall be upturned 90 degrees to avoid issues with coordination of ceiling installation. Casing shall have connection ports on each side to allow the location of piping connections to be reversed.
- .5 Fastening:
 - .1 Mounting brackets shall be factory installed along the length of the air plenum on the unit.

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- .2 Each beam shall be individually supported by the building structure with a minimum of 4 laterally adjustable fixing points, or as recommended by the manufacturer.
- .3 Installation hardware shall be in accordance with the manufacturer's recommendations and any local codes that dictate hanging requirements.
- .6 Nozzles:
 - .1 Nozzles shall be of a fixed size, selected with respect to cooling and heating requirement, and constructed of formed sheet metal.
- .7 Face:
 - .1 The coil shall be accessible from the room side for inspection and cleaning without the need for tools through a hinged face supported by the beam casing where applicable. For recessed type beams, the coil can be accessed via the ceiling plenum.
 - .1 Room side accessible controls enclosure shall be furnished where indicated.
 - .2 Integrated return section shall be furnished where indicated.
 - .3 Integrated supply air section shall be furnished where indicated.
 - .2 The face shall be completely removable without the use of tools and allow for reversed orientation.
 - .3 The coil shall be accessible from the room side or ceiling plenum for inspection and cleaning.
 - .4 The coil shall be accessible from the room side for inspection and cleaning through a removable face panel.
 - .1 Room side accessible controls enclosure shall be furnished where indicated.
- .8 Paint Finish:
 - .1 The internal casing components and exterior shall be galvanized or painted white.
 - .2 Exposed casing, face, and frame component finish shall be:
 - .1 Painted with B12 White baked-on powder coat finish.
 - .1 The paint finish must demonstrate no degradation when tested in accordance with ASTM D1308 (covered and spot immersion) and ASTM D4752 (MEK double rub) paint durability tests.
 - .2 The paint film thickness shall be a minimum of 2.0 mils.
 - .3 The finish shall have a hardness of 2H.
 - .4 The finish shall withstand a minimum salt spray exposure of 500 hours.
 - .5 The finish shall have an impact resistance of 80 inch-pounds.
- .9 Balancing:
 - .1 Integrated pressure port shall be included with k-factor to read the plenum pressure and corresponding supply air volume. Each active beam shall be supplied with a chart indicating a plenum pressure-primary supply air volume

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relationship to facilitate the reading and adjustment of the primary air volume to match the values indicated on the drawings.

- .10 Water and air break-out connections:
 - .1 The beams shall be shipped sealed to limit the introduction of dust and dirt during shipping and construction.
- .11 Insulation:
 - .1 The exterior shall be insulated with half inch fiberglass insulation;
 - .2 The interior shall be insulated with 1/8 inch fiber-free insulation where indicated in the drawings.
- ~~.12 Integrated Return:~~
 - ~~.1 The return section shall be located at the end of the beam and shall have a minimum length of one foot.~~
 - ~~.2 The beam face shall cover both the coil and the return section and shall be seamless.~~
- ~~.13.12~~ **Accessories:**
 - ~~.1 Flow Regulators:~~
 - ~~.1 Manufacturer shall supply UL2043 listed and UL94 rated plastic volume flow regulators (VFR) to fit within rigid round ducting and maintain an air tight seal by utilizing an integrated gasket. The actual airflows shall be within ten percent (fifteen percent for 50 cubic feet per minute or less) for one of the following rated airflows as selected by the engineer:~~
 - ~~.1 10, 20, 25, 30, 35, 45, 50, or 60 cubic feet per minute for a four inch duct~~
 - ~~.2 35, 50, 60, 75, 90, or 105 cubic feet per minute for a five inch duct~~
 - ~~.3 75, 90, 105, 125, 140, 160, or 175 cubic feet per minute for a six inch duct~~
 - ~~.4 125, 140, 160, 175, 205, 235, 265, or 295 cubic feet per minute for an eight inch duct~~
 - ~~.2.1~~ **Coanda Wings:**
 - .1 Manufacturer shall supply ~~six inch wide~~ **custom made** coanda wings **to have the chilled beams fit the width of the ceiling grid without further adjustments.** Wings shall be constructed of 20 gauge painted steel or 0.060 inch thick aluminum extrusion and installed with no fasteners or hardware visible from the room side.
 - ~~.3.2~~ **Slimline Coupling:**
 - .1 The manufacturer shall provide a means for installing several beams together, end-to-end, such that they appear as a single unit.
 - .2 The discharge slot shall appear as a continuous open channel with no obstructions or visual cues of the multiple beam installation.

~~27 May~~ **29 Jun** 2022**.3 Blank Sections**

- .1 The manufacturer shall provide blank sections of lengths as indicated on the drawings.**
- .2 Blank sections shall be one-piece construction and shall connect seamlessly to the active chilled beams, such that they appear as a single unit.**
- .3 The manufacturer shall supply blank sections painted to match active unit.**

Part 3 Execution**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for air terminal units installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 General
 - .1 Install air terminal units with at least 4 duct diameters of straight duct upstream of inlet.
 - .2 Support terminal boxes from building structure with angles, hangers and supplementary steel before installation of piping and connecting ductwork.
 - .3 Connect supply and return piping to reheat coils with swing joints to allow for pipe expansion and contraction.
 - .4 Install isolating valve on supply and lock shield globe valve and automatic control valve on return of each reheat coil.
 - .5 Provide manual air vent with isolating cock at high point of piping to each coil.
 - .6 Install unit as per manufacturer's requirements.
 - .7 Install chilled beams level and plumb. Maintain sufficient clearance for normal services, maintenance, or in accordance with construction drawings.**
 - .8 Complete chilled beams installation and startup checks according to manufacturer's written instructions and perform the following:**
 - .1 Verify inlet duct connections are as recommended by manufacture to achieve proper performance.**
 - .2 Verify controls and control enclosures are accessible.**

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- .3 Verify control connections are complete to control valves as needed.**
- .4 Verify that any identification tags are visible.**
- .5 Verify controls respond to inputs as specified.**
- .9 Install piping adjacent to beams to allow service and maintenance.**
- .10 Tighten electrical connectors and terminals according to manufacturer's published torque-tightening**
- .2 Electric and DDC Controls
 - .1 Provide 120 VAC and 24 VDC wiring, as required, from junction box provided under Division 26, near each terminal unit, and wire to terminal box fan and controls.
- .3 Testing and Adjustment
 - .1 Adjust fan speed on fan powered terminal boxes to obtain final flow volumes, to minimize use of balancing dampers on downstream ductwork and diffusers.
 - .2 Perform the following chilled beams field tests and inspections and prepare test reports:**
 - .1 After installing the chilled beam and after electrical circuitry has been energized, test for compliance with requirements.**
 - .2 Leak Test: After installation, fill water coils and test for leaks. Repair leaks and retest until no leaks exist.**
 - .3 Operational Test: After electrical circuitry has been energized, start units to conform to proper unit operation.**
 - .4 Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.**
 - .3 Chilled beams manufacturer's field service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report any findings in writing**

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: Adhere to the requirements of the Construction Waste Management plan as per Section 01 74 19 Construction Waste Management and Disposal.

3.4 DEMONSTRATION

- .1 Training: provide training in accordance with Section 01 79 00.13, Commissioning - Operation & Maintenance Personnel Training: Training of O&M Personnel.

END OF SECTION

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Heat Recovery Chillers																
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		HRCH-01_02																
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Heat Recovery Chillers # 01, 02																
POINT IDENTIFICATION				AUXILIARY DEVICES				TYPE	AI	AI/DI		ALARMS				AI	AO/DO		DI/DO							
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR/CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes					
						25	25	25					L2	L1	H1	H2										
						Division																				
1	HRCH-01/02 ST	Heat recovery chiller status	DI	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	CR/ MA	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	HRCH-01/02 CLG S/S	Heat recovery chiller cooling command	DO	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	X	X	X	X	X	X	X	NO	X	X	X	X	X	P4	
3	HRCH-01/02 HTG S/S	Heat recovery chiller heating command	DO	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	X	X	X	X	X	X	X	NO	X	X	X	X	X	P4	
4	P-01/04 ST	Chilled water pump status	DI	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	CR/ MA	X	X	X	X	X	X	X	X	X	X	X	X	P2	
5	P-02/05 ST	Condenser water pump status	DI	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	CR/ MA	X	X	X	X	X	X	X	X	X	X	X	X	P2	
6	P-03/06 ST	Geothermal pump status	DI	on/off	BACnet Chiller Plant controller	25	25	25	X	X	N	CR/ MA	X	X	X	X	X	X	X	X	X	X	X	X	P2	
7	P-03/06 SPD	Geothermal pump speed	AI	%	BACnet Chiller Plant controller	25	25	25	X	X	N	X	X	X	X	X	X	X	X	X	X	X	X	X		
8	P-14A/B/C S/S	Dry cooler pump start/stop	DO	on/off	Relay contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	X	X	X		
9	P-14A/B/C ST	Dry cooler pump status	DI	on/off	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X	P2	
10	P-14A/B/C MOD	Dry cooler pump VFD control	AO	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X	X	X	X		
11	P-14A/B/C SPD	Dry cooler pump VFD position	AI	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X		
12	DC-1 FAN S/S	Dry cooler fans start/stop	DO	on/off	Relay contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	X	X	X	P4	
13	DC-1 FAN ST	Dry cooler fans status	DI	on/off	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X	P2	
14	DC-1 FAN MOD	Dry cooler fans VFD control	AO	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X		
15	DC-1 FAN SPD	Dry cooler fans VFD position	AI	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X		
16	P-12A/B/C S/S	Ground loop pump start/stop	DO	on/off	Relay contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	X	X	X		
17	P-12A/B/C ST	Ground loop pump status	DI	on/off	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X	P2	
18	P-12A/B/C MOD	Ground loop pump VFD set point	AO	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X	X	X	X		
19	P-12A/B/C SPD	Ground loop pump VFD position	AI	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X	X		
20	CHWS T1	Plant chilled water supply temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR CA	3	5	11	X	7	X	X	X	X	X	X	X		
21	CHWR T1	Plant chilled water return temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CA	X	X	X	X	X	X	X	X	X	X	X	X		
22	CWS T1	Plant hot water supply temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CA	48	50	X	X	53	X	X	X	X	X	X	X		
23	CWR T1	Plant hot water return temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X	X	X	X	X		
24	HWS T1	Heating water supply temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR CA	48	50	X	X	53	X	X	X	X	X	X	X		
25	HWR T1	Heating water return temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X	X	X	X	X		
26	GTS T	Geothermal supply temperature (summer/winter)	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR CA	15/-4	18/-2	35/X	38/X	30/1.1	X	X	X	X	X	X	X		
27	GTR T	Geothermal return temperature (summer/ winter)	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	38	X	X	X	X	X	X	X		
28	GTS HE T	Geothermal supply temperature from HE (summer/winter)	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR CA	15/-4	18/-2	35/X	38/X	30/1.1	X	X	X	X	X	X	X		
29	GTS DC T	Geothermal supply temperature from dry cooler (summer)	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR CA	15	18	35	38	30	X	X	X	X	X	X	X		
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points. Setpoint will be determined at startup and balancing																								

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Chilled Water Distribution System													
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		P-10A, B, P-12, P-11,A, B, P-14													
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Chilled Water Distribution													
1	2	3		4	5	6			7	8	9	10	11		12				13	14	15	16	17
POINT IDENTIFICATION					AUXILLIARY DEVICES				TYPE	AI	AI/DI		ALARMS				AI	AO/DO	DI/DO				
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes		
						Division							L2	L1	H1	H2						NO NC	CR OR
1	P-10A/B/C S/S	MAU loop pump start/stop	DO	on/off	Relay contact	25	23	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X			
2	P-10A/B/C ST	MAU loop pump status	DI	on/off	VFD Contact	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2		
3	P-10A/B/C MOD	MAU loop pump VFD set point	AO	%	VFD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X			
4	P-10A/B/C SPD	MAU loop pump VFD position	AI	%	VFD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X			
5	P-11A/B/C S/S	ACB loop pump start/stop	DO	on/off	Relay contact	25	23	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X			
6	P-11A/B/C ST	ACB loop pump status	DI	on/off	VFD Contact	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2		
7	P-11A/B/C MOD	ACB loop pump VFD set point	AO	%	VFD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X			
8	P-11A/B/C SPD	ACB loop pump VFD position	AI	%	VFD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X			
9	V-1 POS	V-1 position command	AO	%	Valve Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X			
10	CHW ACB DP	Differential Pressure in ACB loop	AI	kPa	Diff Press Sensor	25	23	25	Sensor	0-700	Y	X	X	X	X	X	*	X	X	X			
11	CHW MAU DP	Differential Pressure in MAUloop	AI	kPa	Diff Press Sensor	25	23	25	Sensor	0-700	Y	X	X	X	X	X	*	X	X	X			
12	CHWS T2	Chilled water supply temperature to MAU and ACB loops	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	CR	X	X	8	X	7	X	X	X	P9		
13	CHWR T2	Chilled water return temperature from MAU and ACB loops	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X			
14	CHWS ACB T	Chilled water supply temperature to ACB loop	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	CR	13	13.5	16	X	###	X	X	X	P9		
15	CHWR ACB T	Chilled water return temperature from ACB loop	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X			
16	CHWS MAU T	Chilled water supply temperature to MAU loop	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	CR	X	X	8	X	7	X	X	X			
17	CHWR MAU T	Chilled water return temperature from MAU loop	AI	°C	Temperature sensor	25	23	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X			

Remarks: Provide equipment failure alarm, if status doesn't match command, on all equipment status points.
 * Setpoint will be determined at startup and balancing

Project Number		R.056687.005			Consultant		NORR Architects and Engineers			System Reference				Heating Water Distribution System								
Identifier		DJM			MCU Number		By EMCS subcontractor			EMCS System Identifier				P-07, P-08, P-09A, B, P-10								
Descriptor		DJM Building			Location of MCU		B-20, MEP Room 2			EMCS System Descriptor				Heating Water Back-up and Distribution								
1	2	3			4	5	6			7	8	9	10	11	13				14	15	17	18
POINT IDENTIFICATION		AUXILIARY DEVICES			TYPE		AI		AI/DI		ALARMS				AI		AO/DC		DI/DO			
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes	
						Division							L2	L1	H1	H2						NO NC
1	P-07/08 S/S	Electric boiler pump command	DO	on/off	Relay contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	
2	P-07/08 ST	Electric boiler pump status	DI	on/off	Relay contact	25	23	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2
3	P-07/08 MOD	Electric boiler pump control	AO	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X	
4	P-07/08 SPD	Electric boiler pump speed	AI	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	
5	P-09A/B/10 S/S	Heating water pump command	DO	on/off	Relay contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	
6	P-09A/B/10 ST	Heating water pump status	DI	on/off	Relay contact	25	23	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2
7	P-09A/B/C MOD	Heating waterpump control	AO	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	*	X	X	X	
8	P-09A/B/C SPD	Heating water pump speed	AI	%	VFD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	
9	EB-01/02 S/S	Electric boiler enable	DO	on/off	BACnet EB controller	25	23	25	25	Output Device	X	N	X	X	X	X	X	X	X	X	X	P4
10	EB-01/02 ST	Electric boiler status	DI	on/off	BACnet EB controller	25	23	25	25	Output Device	X	N	CR/ MA	X	X	X	X	X	X	X	X	P2
11	ST	Electric boiler supply temperature	AI	°C	BACnet EB controller	25	23	25	25	Output Device	X	N	X	X	X	X	X	X	X	X	X	
12	RT	Electric boiler retun temperature	AI	°C	BACnet EB controller	25	23	25	25	Output Device	X	N	X	X	X	X	X	X	X	X	X	
13	V2 2-POS	V2 position command	DO	on/off	Relay contact	25	22	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	
14	V2 POS	V2 position status	DI	on/off	Relay contact	25	22	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NC	X	X	
15	HW DP	Differential pressure heating loop	AI	kPa	Diff Press Sensor	25	25	25	25	Sensor	0-700	Y	X	X	X	X	X	*	X	X	X	
16	HWS T2	Heating water supply temperature to the loop	AI	°C	Temp Sensor	25	25	25	25	Sensor	-40 to 100	Y	CR/ CA	48	50	X	X	53	X	X	X	
17	HWR T2	Heating water return temperature to the loop	AI	°C	Temp Sensor	25	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X	

Remarks: * Provide equipment failure alarm, if status doesn't match command, on all equipment status points.
 * Setpoint will be determined at startup and balancing

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Makeup Air Dedicated Outdoor Air System with Energy Recovery												
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		MUA-1, MUA-2 and MUA-3												
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Make-up air units #1,2,3												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17						
POINT IDENTIFICATION		AUXILIARY DEVICES					TYPE		AI		A/DI		ALARMS				AI		AO/DC		DIDO	
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxiliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR/CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes	
													L2	L1	H1	H2						NO NC
1	SA T1	Cooling Coil Leaving Air Temp	AI	°C	Averaging Sensor	25	25	25	Sensor	-40 to 100	Y	CR/ CA	X	X	11	12	10	X	X	X		
2	CCV	Cooling Coil Valve Control	AO	%	Valve Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
3	CCV- P	Cooling Coil Valve Position	AI	%	Valve Actuator	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NC	X	X		
4	EA/OA T1/T2	Exhaust / Outdoor Air Temperature	AI	°C	Averaging Sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X		
5	RA FLOW	Exhaust Air Flow	AO	L/s	AFS DP	25	23	25	Output Device	0-10000	Y	CR	1793	1888	X	X	X	X	X	X		
6	EFVFD	Exhaust Fan VFD Control	AO	%	VFD output	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
7	EFVFD-P	Exhaust Fan VFD Position	AI	%	VFD output	25	23	25	Output Device	X	Y	CA	35	38	X	X	X	X	X	X		
8	ERV ST	ERV Status	DI	on/off	Relay	25	25	25	Output Device	X	Y	CR	X	X	X	X	X	NO	X	X		
9	ERV-SS	ERV Enable	DO	on/off	Relay	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	Y	P1, P2, P4	
10	ECON S/S	Free cooling mode enable	DO	on/off	Relay	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
11	RECIRC S/S	Recirculation mode enable	DO	on/off	Relay	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X		
12	L VAV	Low volume fan operation enable	DO	on/off	Relay	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X		
13	M VAV	Medium volume fan operation enable	DO	on/off	Relay	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X		
14	FPD	Final filter Pressure Drop	AI	Pa	Magnehelic DP	25	23	25	Output Device	0-250	Y	X	X	X	X	X	X	X	X	X		
15	FIRE	Firestat	HW	X	X	25	25	25	X	X	Y	X	X	X	X	X	X	X	X	X		
16	FREEZ	Freezestat	HW	X	X	25	25	25	X	X	Y	X	X	X	X	X	X	X	X	X		
17	SA T2	Heating Coil Leaving Air Temp	AI	°C	Averaging Sensor	25	25	25	Sensor	X	Y	CR/ CA	10	12	40	X	13	X	X	X		
18	HCV	Heating Coil Valve Control	AO	%	Valve Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
19	HCV-P	Heating Coil Valve Position	AI	%	Valve Actuator	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NO	X	X		
20	OAD	Outside Air Damper Control	DO	%	Damper Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
21	OAD-P	Outside Air Damper Position	DI	%	Damper Actuator	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NC	X	X		
22	EAD	Exhaust Air Damper Control	DO	%	Damper Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
23	EAD-P	Exhaust Air Damper Position	DI	%	Damper Actuator	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NC	X	X		
24	RAH	Return Air Humidity	AI	%	Humidity Sensor	25	25	25	Sensor	0-100	Y	X	X	X	X	X	X	X	X	X		
25	RAT	Return Air Temperature	AI	°C	Averaging Sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X		
26	SAH	Supply Air Humidity	AI	RH	Humidity Sensor	25	25	25	Sensor	0-100	Y	X	X	X	X	X	X	X	X	X		
27	SASP	Supply Air Static Pressure	AI	Pa	Magnehelic DP	25	25	25	Output Device	0-1250	Y	X	X	X	X	X	X	X	X	X		
28	T1/T2	Energy CoreLeaving Air Temperature	AI	°C	Averaging Sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X		
29	SA FLOW	Supply Air Flow	AI	L/s	AFS DP	25	23	25	Output Device	10000	Y	X	X	X	X	X	X	X	X	X		
30	SF-S	Supply Fan Status	DI	on/off	VFD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
31	SFVFD	Supply Fan VFD Control	AO	%	VFD output	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
32	SFVFD-P	Supply Fan VFD Position	AI	%	VFD output	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
33	OA T	Outdoor Air Temperature	AI	°C	temperature Sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	X	X	X	X	X		
34	OA RH	Outdoor Air Humidity	AI	%	Humidity Sensor	25	25	25	Sensor	0-100	Y	X	X	X	X	X	X	X	X	X		
35	SMK AL	Smoke detected in the SA/ RA duct	DI	on/off	Relay contact	26	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
36	FAS AL	Alarm to FAS	DO	on/off	Relay contact	26	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
37	FAS	Fire Alarm System	DI	on/off	Relay contact	25	25	25	Output Device	X	Y	CR	X	X	X	X	X	NC	X	X		
38	BLDG SP1/2	Building static pressure	AI	Pa	diff. pressure sensor	25	25	25	Sensor	0-50	Y	CR	-5	-10	10	15	3	X	X	X		

Remarks: Provide equipment failure alarm, if status doesn't match command, on all equipment status points.
 Setpoint is 3Pa in the summer and 0Pa in the winter, refer to control schematic 1/M74-01.

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Wallfin Convectors Hydronic															
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		RAD-1, 2, 3, 4															
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Radiators type 1, 2, 3, 4															
1	2	3			4	5	6			7			8	9	10	11	12				13	14	15	16	17
POINT IDENTIFICATION					AUXILLIARY DEVICES					TYPE	AI	AI/DI		ALARMS				AI	AO/DO	DI/DO					
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes				
						Division							L2	L1	H1	H2						NO NC	CR OR	Delay	
1	WF-xx HCV	Wallfin heating control valve command	AO	%	Valve actuator	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	NC	X	X	X	P1	
2	RM T	Space temperature sensor	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CA	16	18	X	X	22	X	X	X					
Remarks:																									

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference				Force Flow Heaters Hydronic												
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier				FFH-01 through 06												
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor				Forced fow heaters 01 through 06												
1	2	3			4	5	6			7			8	9	10	11	13				14	15	17	18
POINT IDENTIFICATION		AUXILLIARY DEVICES					TYPE	AI	AI/DI		ALARMS				AI	AO/DO	DI/DO							
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes			
						Division							L2	L1	H1	H2						NO NC	CR OR	Delay
1	FFH-xx S/S	Force flow heater fan stop start	DI	on/off	VSD Contact Relay	23 25	23 25	25	Output Device	X	Y	X	X	X	X	X	X	X	NO	X	N	P1		
2	FFH-xx ST	Force flow heater fan status	DI	on/off	VSD Contact Relay	23 25	23 25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	X	P2		
3	FFH-xx HCV	Force flow heater valve open/close	AO	%	Valve actuator	23 25	23 25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X				
4	RM T	Space temperature sensor	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CR/ CA	3	7	X	X	10	X	X	X				
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																						

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Fan Coil Units														
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		FCU-1 through 31														
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Fan coil unit # 1 through 31														
1	2	3		4	5	6		7		8	9	10	11	13				14	15	17	18			
POINT IDENTIFICATION		AUXILLIARY DEVICES		TYPE	AI	AI/DI		ALARMS				AI	AO/DO	DI/DO		Applicable programs or notes								
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor				
													L2	L1	H1						H2	NO NC	CR OR	Delay
1	FCU-xx S/S	Fan Coil fan stop start	DI	on/off	VSD Contact Relay	23	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	NO	X	N	P1
2	FCU-xx ST	Fan coil fan status	DI	on/off	VSD Contact Relay	23	25	23	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	X	P2
3	FCU-xx CCV	Fan Cooling Coil Valve Command	AO	%	Valve actuator	23	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
4	FCU-xx HCV	Fan Heating Coil Valve Command	AO	%	Valve actuator	23	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
5	RM T	Space temperature sensor	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	CA	16	18	26	28	24	X	X	X				
6	OCC -OV	Occupancy over-ride	DI	on/off	Switch	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X		
7	RM RH	Space humidity sensor	AI	%	Humidity Sensor	25	25	25	Sensor	0-100	Y	CA	X	X	55	60	50	X	X	X				
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																						

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Parking Garage Ventilation											
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		EF-2											
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Exhaust Fan #2											
1	2	3	4	5	6	7	8	9	10	11	12				13	14	15	16	17		
POINT IDENTIFICATION				AUXILLIARY DEVICES			TYPE	AI	AI/DI		ALARMS				AI	AO/DO		DI/DO			
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes
						Division							L2	L1	H1	H2		NO NC	CR OR		
1	OAD 2POS	Outdoor air damper command	DO	on/off	Relay contact	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X		
2	OAD ES	Outdoor air damper position	DI	on/off	Limit switch	25	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	NC	X	X	
3	EF-S/S	Exhaust Fan Start Stop	DI	on/off	VSD Contact	25	23	25	Output Device	X	Y	X	X	X	X	X	NO	X	N		
4	EF-ST	Exhaust Fan Status	DI	on/off	VSD Contact	25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	P2	
5	EFVSD	Exhaust Fan VSD Control	AO	%	VSD output	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X		
6	EFVSD-P	Exhaust Fan VSD Position	AI	%	VSD output	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X		
7	EAD 2POS	Exhaust air damper command	DO	on/off	Relay contact	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X		
8	EAD ES	Exhaust air damper position	DI	on/off	Limit switch	25	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X		
9	RM T	Space temperature	AI	°C	Temperature sensor	25	25	25	Sensor	-40 to 100	Y	X	X	X	X	26	X	X	X		
10	CO ST	Carbon monoxide system status	DI	on/off	CO Controller	25	25	25	Output Device	x		CR/ MA	X	X	X	X	NC	X	X		
11	EF-S/S	Exhaust Fan Start Stop	DI	on/off	CO Controller	25	25	25	Output Device	X	Y	X	X	X	X	X	NO	X	N		
12	RF-1,2,3 S/S	Recirculation Fan Start Stop	DO	on/off	CO Controller	25	25	25	Output Device	X	X	X	X	X	X	X	NO	X	N		
13	RF-1,2,3 ST	Recirculation Fan Status	DI	on/off	Relay contact	25	25	25	Output Device	X		CR/ MA	X	X	X	X	X	X	X	P2	
14	CO ALARM	Carbon monoxide system alarm	DI	on/off	CO Controller	25	25	25	Output Device	X	X	X	X	X	X	X	NC	X	X		
15	NO2 ALARM	Nitrogen dioxide system alarm	DI	on/off	CO Controller	25	25	25	Output Device	X	X	X	X	X	X	X	NC	X	X		
16	CO	Carbon monoxide sensor	AI	ppm	CO Controller	25	25	25	Sensor	0-250	X	CR	X	X	25	100	25	NC	X	X	
17	NO2	Nitrogen dioxide sensor	AI	ppm	CO Controller	25	25	25	Sensor	0-10	X	CR	X	X	0.7	2	0.7	NC	X	X	

Remarks: Provide equipment failure alarm, if status doesn't match command, on all equipment status points.

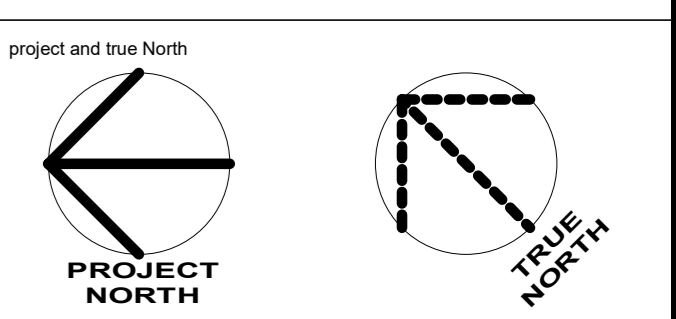
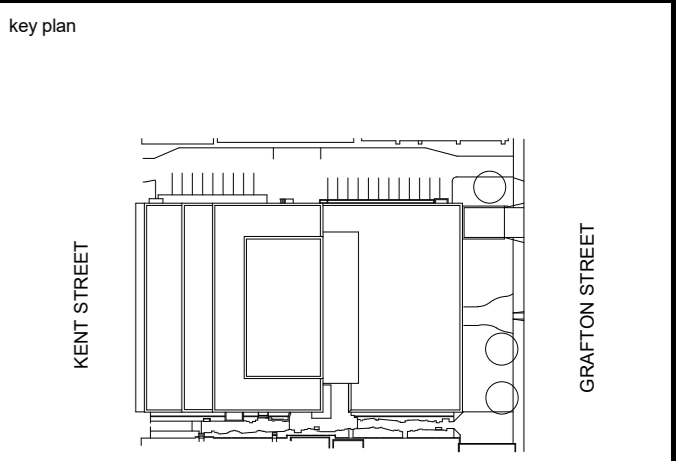
Project Number		R.056687.005			Consultant			NORR Architects and Engineers			System Reference			Mechanical Room Ventilation													
Identifier		DJM			MCU Number			By EMCS subcontractor			EMCS System Identifier			EF-1, SF-1													
Descriptor		DJM Building			Location of MCU			B-20, MEP Room 2			EMCS System Descriptor			Mechanical room supply and exhaust fans													
1	2	3			4	5	6			7			8	9	10	11	12				13	14	15	16	17		
POINT IDENTIFICATION					AUXILIARY DEVICES			TYPE			AI			AI/DI			ALARMS				AI		AO/DO		DI/DO		
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes						
						Division							L2	L1	H1	H2						NO NC	CR OR	Delay			
1	SF-S/S	Supply Fan Start Stop	DI	on/off	VSD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	N				
2	SF-S	Supply Fan Status	DI	on/off	VSD Contact	25	23	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	X	X				
3	SFVSD	Supply Fan VSD Control	AO	%	VSD output	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
4	SFVSD-P	Supply Fan VSD Position	AI	%	VSD output	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
5	OAD 2POS	Outdoor air damper command	DO	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
6	OAD ES	Outdoor air damper position	DI	on/off	Limit switch	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
7	EAD 2POS	Exhaust air damper command	DO	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
8	EAD ES	Exhaust air damper position	DI	on/off	Limit switch	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X	X	X				
9	EF-S/S	Exhaust Fan Start Stop	DI	on/off	VSD Contact	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	N					
10	EF-S	Exhaust Fan Status	DI	on/off	VSD Contact	25	23	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	X	X				
11	EFVSD	Exhaust Fan VSD Control	AO	%	VSD output	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
12	EFVSD-P	Exhaust Fan VSD Position	AI	%	VSD output	25	23	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
13	RM T	Space temperature	AI	°C	Temperature sensor	25	25	25	25	Sensor	-40 to 100	Y	CA	X	X	30	35	26	X	X	X	X					
14	REF ST	Refrigerant concentration status	AI	ppm	Refrigerant detector	25	25	25	25	Sensor	0 to 1000	N	CA CR	X	X	500	900	X	NC	OR	X	X					
15	EFD 2POS	EF-1 intake damper command	DO	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
16	EFD ES	EF-1 intake damper position	DI	on/off	Limit switch	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X	X	X				
17	PB S	Push button START	DO	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
18	PB ST	Push button STOP	DO	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	X	X				
19	OS	Occupancy Sensor	DI	on/off	Relay contact	25	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	X	X	X				
Remarks:		Interlock supply and exhaust fans and associated dampers. Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																									

Project Number		R.056687.005			Consultant			NORR Architects and Engineers			System Reference			Fan Powered DOAS VAV boxes								
Identifier		DJM			MCU Number			By EMCS subcontractor			EMCS System Identifier			FPB-01 through 28								
Descriptor		DJM Building			Location of MCU			B-20, MEP Room 2			EMCS System Descriptor			Fan powered DOAS VAV boxes #1 through 28								
1	2	3	4	5	6	7			8	9	10	11	12				13	14	15	16	17	
POINT IDENTIFICATION					AUXILIARY DEVICES				TYPE	AI	AI/DI		ALARMS				AI	AO/DO	DI/DO			
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes	
						Division							L2	L1	H1	H2						NO NC
1	SF	Supply Fan Start Stop	DI	on/off	Relay contact	25	25	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	N	P1	
2	SF-S	Supply Fan Status	DI	on/off	Relay contact	25	25	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2	
3	FPB FLOW	Fresh Air Flow	AI	l/s	AFS DP	25	23	25	Output Device	0-3000	Y	X	X	X	X	X	X	X	X	X		
4	FPBAD-P	Fresh Air Damper Position	AI	%	Valve Damper actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
5	FPBAD	Fresh Air Damper Control	AO	%	Damper Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
6	HCV	Heating Coil Valve Control	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
7	LAT	Leaving Air Temp	AI	°C	Averaging Sensor	25	25	25	Sensor	-40 to 100	Y	CA	X	X	40	50	X	X	X	X		
8	CCV	Cooling Coil Valve Control	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
9	OCC -OV	Occupancy over-ride	DI	on/off	Switch	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X		
10	SMK AL	Smoke Alarm	Di	on/off	Relay contact	26	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
11	FAS AL	Alarm to FAS	DO	on/off	Relay contact	26	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
12	ZCO2	Zone CO ₂ level	DI	ppm	Zone CO ₂ sensor	25	25	25	Sensor	0-3000	Y	X	X	X	1200	1500	X	X	X	X		
13	RM T	Space Temperature	AI	°C	Temperature Sensor	25	25	25	Sensor	-40 to 100	Y	CA	X	X	26	28	24	X	X	X		
Remarks: Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																						

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		DCV with Active Chilled Beams System											
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		DCV, CB											
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Demand control ventilation VAV boxes with active chilled beams											
1	2	3		4	5	6		7		8	9	10	11	12		13	14	15	16	17	
POINT IDENTIFICATION				AUXILIARY DEVICES				TYPE	AI	AI/DI		ALARMS				AI	AO/DO		DI/DO		
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes
						Division							L2	L1	H1	H2					
1	VAVFLOW	Fresh Air Flow	AI	l/s	AFS DP	25	23	25	Output Device	0-3000	Y	X	X	X	X	X	X	X	X		
2	VAVD-P	Fresh Air Damper Position	AI	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X	
3	VAVD	Fresh Air Damper Control	AO	%	Damper Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	P1	
4	WF-xx HCV	Wallfin heating control valve command	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X	
7 5	CCV	Cooling Coil Valve Control	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X	
8 6	OCC -OV	Occupancy over-ride	DI	on/off	Switch	25	25	25	Output Device	X	Y	X	X	X	X	X	X	X	X		
9 7	ZCO2	Zone CO ₂ level	DI	ppm	Zone CO ₂ sensor	25	25	25	Sensor	0-3000	Y	X	X	X	1200	1500	X	X	X	X	
10 8	RM T	Space Temperature	AI	°C	Temperature Sensor	25	25	25	Sensor	-40 to 100	Y	CA	16	18	26	28	24	X	X	X	
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																			

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		DCV with Fan Coil Unit															
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		DCV w FCU															
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Demand control ventilation VAV boxes with fan coil unit															
1	2	3			4	5	6			7			8	9	10	11	12				13	14	15	16	17
POINT IDENTIFICATION				AUXILLIARY DEVICES				TYPE	AI	A/DI		ALARMS				AI	AO/DO		D/DO						
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxilliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Motor	Applicable programs or notes				
						Division							L2	L1	H1	H2						NO NC	CR OR	Delay	
1	VAVFLOW	Fresh Air Flow	AI	l/s	AFS DP	25	23	25	Output Device	0-3000	Y	X	X	X	X	X	X	X	X	X	X	X			
2	VAVD-P	Fresh Air Damper Position	AI	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X					
3	VAVD	Fresh Air Damper Control	AO	%	Damper Actuator	25	23	25	Output Device	X	Y	X	X	X	X	X	X	X	X	X	P1				
9.4	ZCO2	Zone CO ₂ level	DI	ppm	Zone CO ₂ sensor	25	25	25	Sensor	0-3000	Y	X	X	X	1200	1500	X	X	X	X					
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																							

Project Number		R.056687.005		Consultant		NORR Architects and Engineers		System Reference		Humidification System												
Identifier		DJM		MCU Number		By EMCS subcontractor		EMCS System Identifier		HUM-01												
Descriptor		DJM Building		Location of MCU		B-20, MEP Room 2		EMCS System Descriptor		Humidifier # 01												
1	2	3	4	5	6	7			8	9	10	11	12				13	14	15	16	17	
POINT IDENTIFICATION			AUXILIARY DEVICES			TYPE			AI	AI/DI		ALARMS				AI	AO/DO		DI/DO			
Point Number	Point Identifier	Point descriptor	Type	Eng Units	Auxiliary device or sensing signal	Supplied	Installed	Wired	Sensor or Output Device Signal	Active Sensor Range	Primary Point	CR CA MA	Analog Limits				Set Point	Contact	Action	Heavy Micro	Applicable programs or notes	
													L2	L1	H1	H2						NO NC
1	HUM-S/S	Humidifier enable	AI	l/s	Humidifier controller	25	23	25	Output Device	0-3000	Y	X	X	X	X	X	X	X	X	X	X	
2	HUM-ST	Humidifier status	AI	%	Humidifier controller	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
3	FCU-24 S/S	Fan Coil fan stop start	DI	on/off	VSD Contact Relay	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NO	X	N	P1	
4	FCU-24 ST	Fan coil fan status	DI	on/off	VSD Contact Relay	23 25	23	25	Output Device	X	Y	CR/ MA	X	X	X	X	X	X	X	X	P2	
5	FCU-24 CCV	Fan Cooling Coil Valve Command	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
6	FCU-24 HCV	Fan Heating Coil Valve Command	AO	%	Valve actuator	23 25	23	25	Output Device	X	Y	X	X	X	X	X	X	NC	X	X		
7	RM RH	Space humidity sensor	AI	%	Humidity Sensor	25	25	25	Sensor	0-100	Y	CA	X	45	55	X	50	X	X	X		
8	RM T	Space Temperature	AI	°C	Temperature Sensor	25	25	25	Sensor	-40 to 100	Y	CA	X	18	22	X	20	X	X	X		
Remarks:		Provide equipment failure alarm, if status doesn't match command, on all equipment status points.																				



project legend

no.	description	date
1	ADDITIONAL #7 ISSUED FOR TENDER	2022-06-29
2		2022-06-27

project
DANIEL J MACDONALD MODERNIZATION

161 GRAFTON STREET
 CHARLOTTETOWN, PEI C1A 1L1

design
FIRE PROTECTION - PARKING LEVEL NEW WORK

date	author	designé
2020-8-31		
2020-8-31		
2022-06-29		
Tender		Submission
PWGSC Project Manager		Administrateur de projets TPSCC
project number		no. du projet
		R.056687.005
drawing no.		no. du dessin
		M40-00

- DRAWING NOTES:**
- BUILDING SHALL BE ENTIRELY SPRINKLERED ACCORDING TO THE NATIONAL BUILDING CODE OF CANADA (NBC) AND NATIONAL FIRE CODE OF CANADA (NFC), NFPA-10, NFPA-13, NFPA-14 AND NFPA-20.
 - SPRINKLER HEAD COUNT, LOCATION & STYLE SHOWN ARE FOR GENERAL DESIGN PURPOSES ONLY. SPRINKLER CONTRACTOR TO PRICE A COMPLETE & OPERATIONAL SYSTEM AND INCLUDE SUFFICIENT QUANTITIES & STYLES OF HEADS, MATERIALS, PIPE SIZES, FITTINGS & COMPONENTS FOR AN NFPA 13 COMPLIANT SYSTEM. ANY INFORMATION (E.G., ON EX. SYSTEM) REQUIRED IS TO BE OBTAINED DIRECTLY BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
 - FIRE PROTECTION ENGINEER TO REVIEW REPORT PRODUCED BY CODE CONSULTANT. ALL ALTERNATIVE SOLUTIONS OUTLINED IN THE AFOREMENTIONED REPORT SHALL BE INCORPORATED INTO THE SPRINKLER DESIGN AND SHALL BE REPRESENTED IN SHOP DRAWINGS SUBMITTALS.
 - OFFICE TO BE SPRINKLERED TO NFPA-13-2013 LIGHT HAZARD 4.1 MMIN OVER 139 SQM.
 - MECHANICAL ROOMS TO BE SPRINKLERED TO NFPA-13-2013 ORDINARY HAZARD GROUP 1 & 1.1 MMIN OVER 139 SQM.
 - PARKING GARAGE AND STORAGE AREAS TO BE SPRINKLERED TO NFPA-13-2013 ORDINARY HAZARD GROUP 2 & 2.1 MMIN OVER 139 SQM.
 - PROVIDE FIRE EXTINGUISHER AS REQUIRED BY NBC 2015 AND NFPA 10-2013.
 - PROVIDE CLASS 1 STANDPIPE SYSTEM AS PER NFPA-14-2013.
 - COORDINATE CORING WITH OTHER TRADES TO MINIMIZE DISRUPTION TO IMPACTED AREAS.

- GENERAL NOTES:**
- DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL FLOOR PLANS AND SPECIFICATIONS.
 - ALL EXISTING SERVICES SHOWN ARE APPROXIMATE AND BASED ON EXISTING DRAWINGS. CONTRACTOR SHALL VERIFY ALL LOCATIONS ON SITE.
 - CONTRACTOR TO COORDINATE INSTALLATION WITH ALL OTHER TRADES INVOLVED ON SITE.
 - ENSURE NOT TO DISTURB SERVICES COVERING AREAS NOT INCLUDED IN THE SCOPE. ALL WORK MUST BE COORDINATED WITH DEPARTMENTAL REPRESENTATIVE.
 - CONTRACTOR SHALL VISIT SITE TO EXAMINE EXISTING CONDITIONS.
 - CONTRACTOR TO PROPOSE SOLUTIONS FOR REVIEW TO THE CONSULTANT IF ANY INTERFERENCES OCCUR DUE TO SITE CONDITIONS.
 - CONTRACTOR TO PROVIDE CONNECTION TO RELOCATED EXISTING EQUIPMENT AND ADDED EQUIPMENT DIRECTLY TO BUILDING HVAC SYSTEM AND UPDATE THE BMS ARCHITECTURE AS REQUIRED.

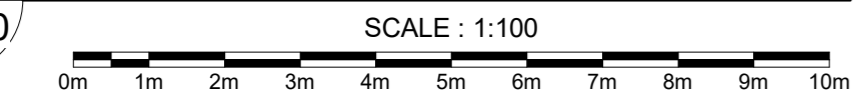
SPRINKLER HEADS LOCATED ON MAIN FLOOR LEVEL. REFER TO DWG. M40-01

PROVIDE INSULATION AND LISTED HEAT TRACING AS PER NFPA 14, 20W PER LINEAR METRE ON THIS SECTION OF WET SPRINKLER STANDPIPE PIPING INCLUDING TO FHV-02. PROVIDE LISTED AMBIENT THERMOSTAT AND GFCI PROTECTION, AS PER NFPA 14. PROVIDE ALARM TO FIRE ALARM SYSTEM.

LISTED STANDPIPE HEAT TRACE CONTROLLER. PROVIDE SUPERVISION AS PER NFPA 14.

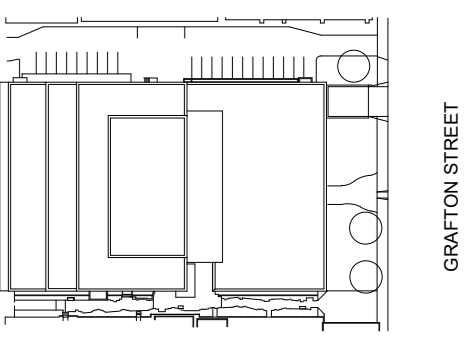
DRY SPRINKLER PIPE TIGHT IN CORNER TO ABOVE. REFER TO DWG. M40-01 FOR CONTINUATION

1 FIRE PROTECTION PARKING LEVEL
 SCALE: 1:100



2
 M40-06

Key plan



project and true North

project legend

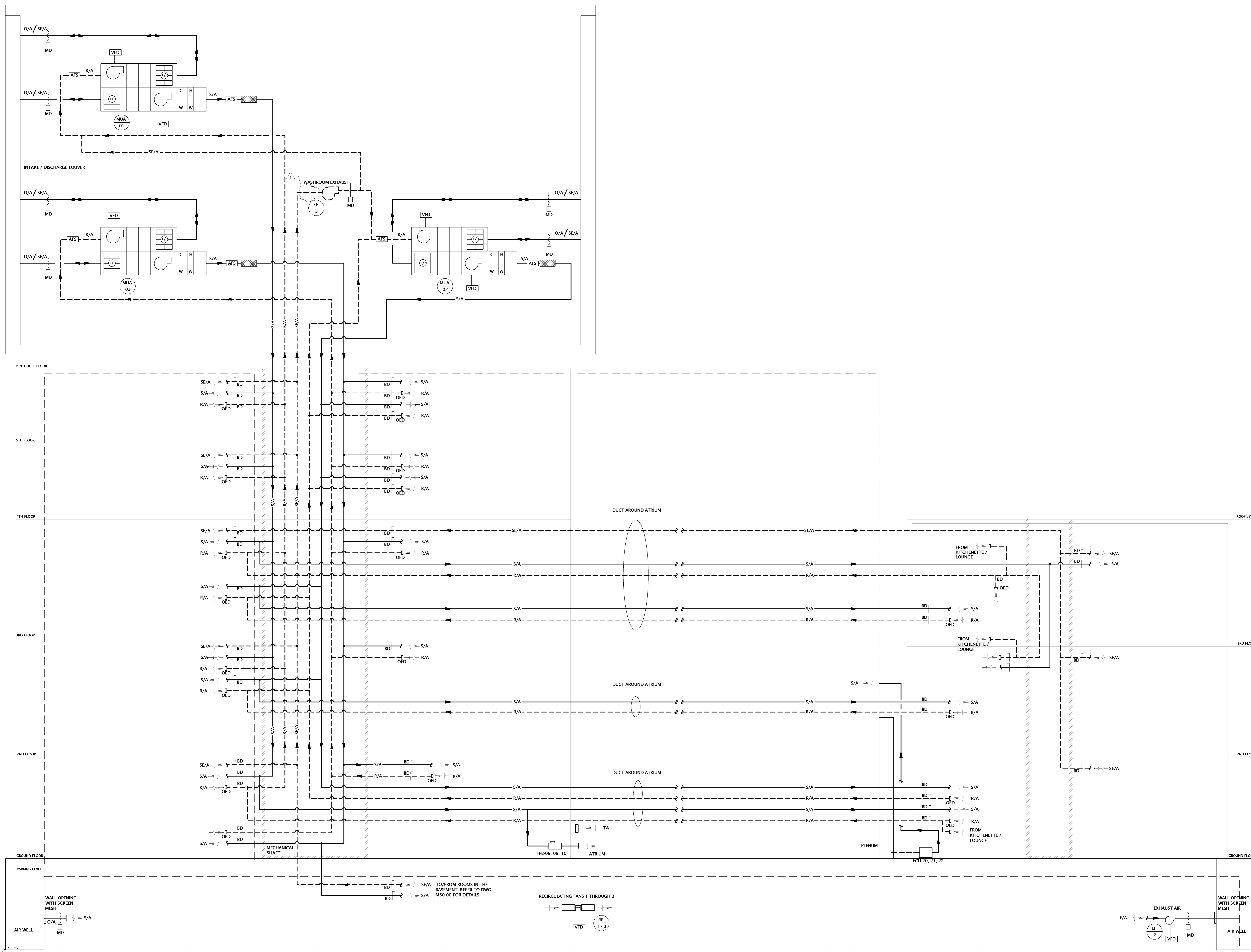
revisions	date
1	2022-06-29
2	2022-06-27

project
DANIEL J MACDONALD MODERNIZATION

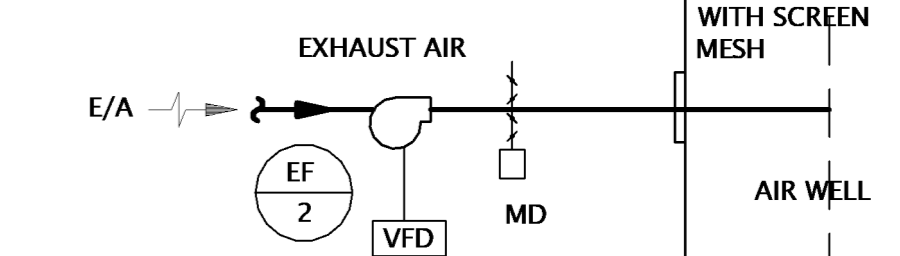
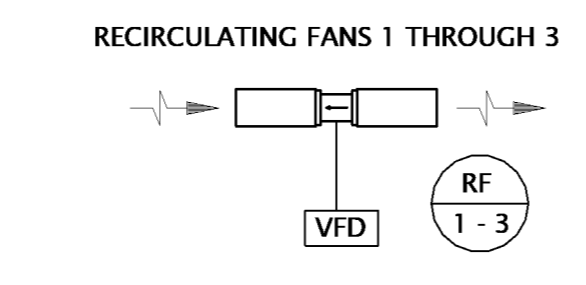
161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

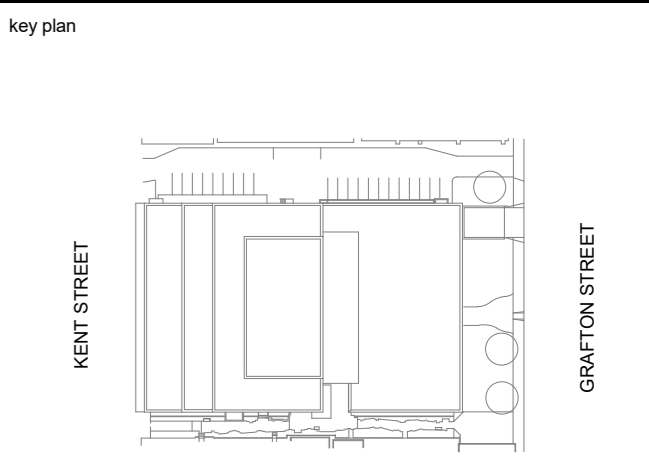
drawing
AIRFLOW SCHEMATIC

designed Designer	conçu
date	2020-11-6
drawn	Autor
date	2020-11-6
approved Checker	approuvé
date	2022-06-29
Tender	Submission
PWGC Project Manager	Administrateur de projets TPSCG
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
M73-04	



1 BUILDING AIRFLOW SCHEMATIC 1
M73-04 N.T.S.





project and true North

project legend

1	ISSUED FOR ADJUDICATION	2022-06-29
2	ISSUED FOR TENDER	2022-06-27

revisions	date
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project **DANIEL J MACDONALD MODERNIZATION**

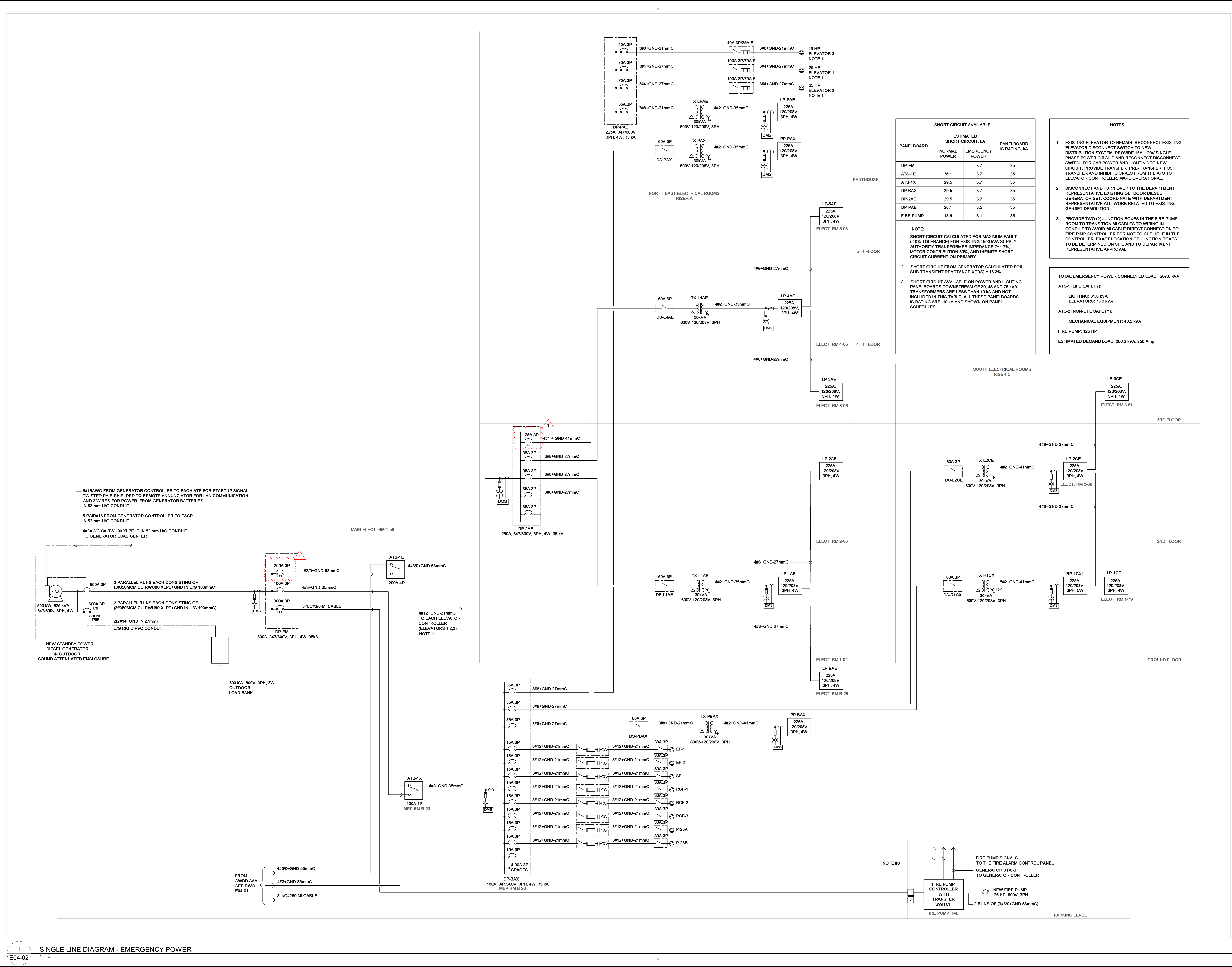
161 GRAFTON STREET
 CHARLOTTETOWN, PEI C1A 1L1

drawing **SINGLE LINE DIAGRAM - EMERGENCY POWER**

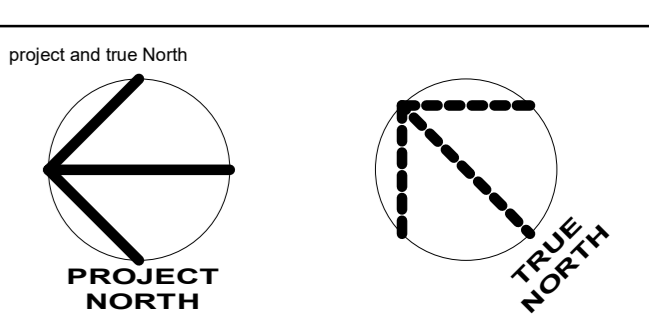
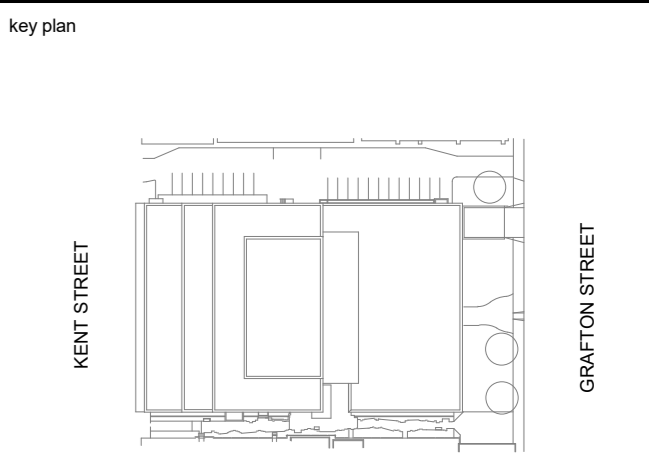
designed NORR	compu
date 19/12/18	
drawn NORR	dessiné
date 19/12/18	
approved SR	approuvé
date 2022-06-29	
Tender	Submission
PWGSC Project Manager	Administrateur de projets TPSCG
project number	no. du projet

R.056687.005

drawing no. **E04-02** no. du dessin



1 SINGLE LINE DIAGRAM - EMERGENCY POWER
 E04-02 N.T.S.



Project and True North



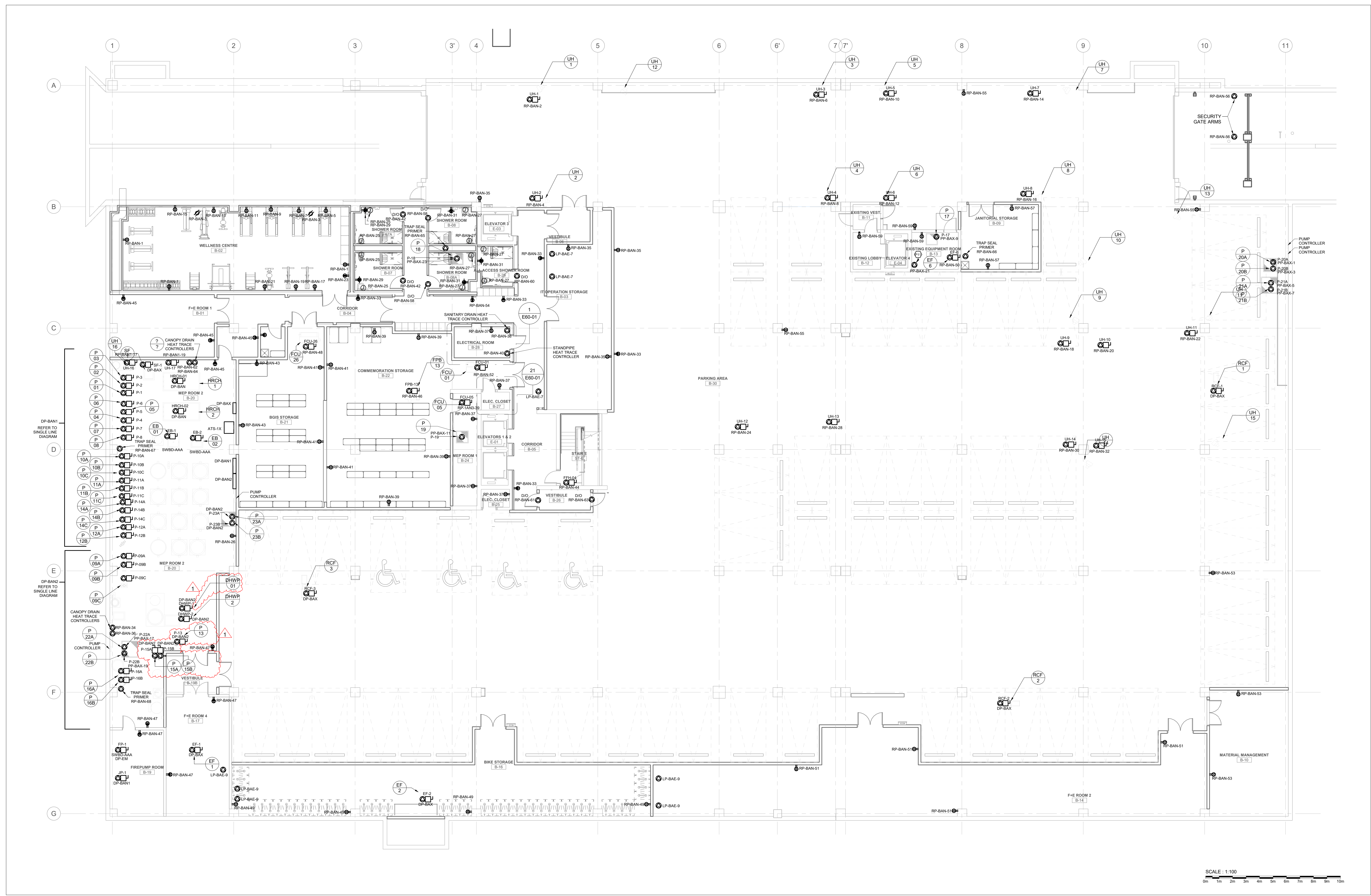
revisions	date
1	ISSUED FOR ADVERTISING 2022-06-29
2	ISSUED FOR TENDER 2022-06-27

project
**DANIEL J MACDONALD
MODERNIZATION**

161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

drawing
**POWER PLAN -
PARKING LEVEL**

designed NORR	conçu
date 12/21/18	
drawn NORR	dessiné
date 12/21/18	
approved SR	approuvé
date 2022-06-29	
Tender	Submission
PWQSC Project Manager	Administrateur de projets TPQSC
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
E10-00	



SCALE: 1:100
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

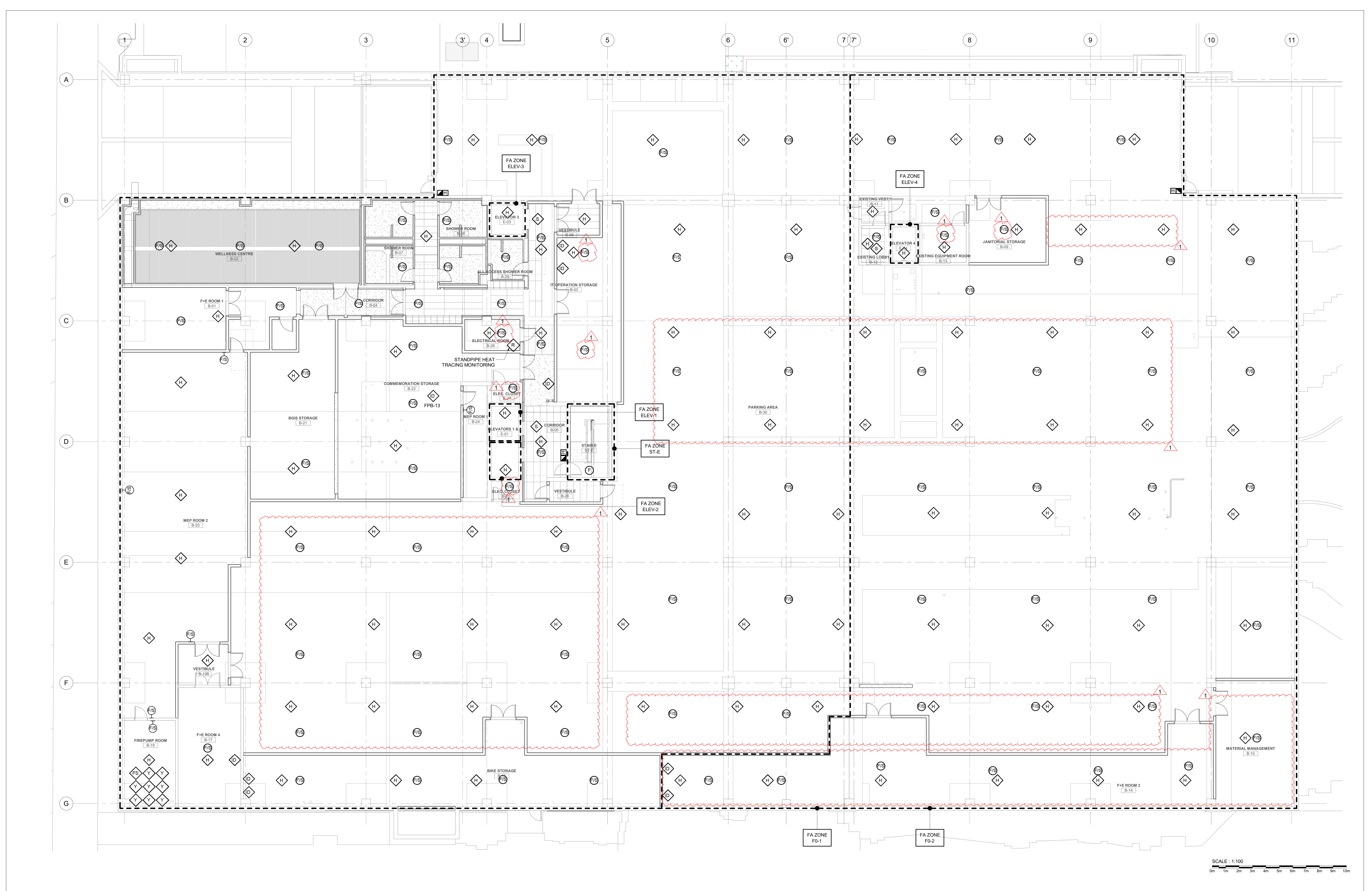
GENERAL NOTES - POWER

- A THESE DRAWINGS AND SPECIFICATIONS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, INTERIOR DESIGNER'S, MECHANICAL, AND OTHER DIVISIONS DRAWINGS. ALL ELECTRICAL WORK SHALL COMPLY WITH OWNERS' REQUIREMENTS AND BASE BUILDING STANDARDS.
- B "AS REQUIRED, MAKE OPERATIONAL" - DENOTES ELECTRICAL INSTALLATION TO SUIT SITE CONDITIONS, TO CONFORM WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND STANDARDS AND INSTALLATION TO INCLUDE ALL NECESSARY MATERIAL EQUIPMENT AND LABOUR (ALTHOUGH NOT SHOWN ON THE DRAWINGS) TO MAKE IT OPERATIONAL. NO ALLOWANCES WILL BE MADE SUBSEQUENTLY FOR ANY CONSIDERATIONS OVERLOOKED.
- C UNLESS NOTED OTHERWISE ALL WIRING AND CONDUITS TO BE CONCEALED.
- D ALL ELECTRICAL EQUIPMENT (LIGHTING FIXTURES, POWER EQUIPMENT AND CABLES) OR ANY OTHER CONTRIVANCE THAT GENERATES EITHER ELECTROMAGNETIC FIELD OR ELECTROMAGNETIC INTERFERENCE ARE TO BE KEPT AT LEAST 12" AWAY FROM THE COMMUNICATION CABLE TRAYS. INSTALL ELECTRICAL EQUIPMENT AND CABLES TO CONFORM TO THE ABOVE REQUIREMENTS.
- E UNLESS NOTED OTHERWISE ALL CIRCUIT NUMBERS SHOWN ARE FOR GROUPING PURPOSES ONLY. SHOW ACTUAL CIRCUIT NUMBERS ON AS-BUILT DRAWINGS.

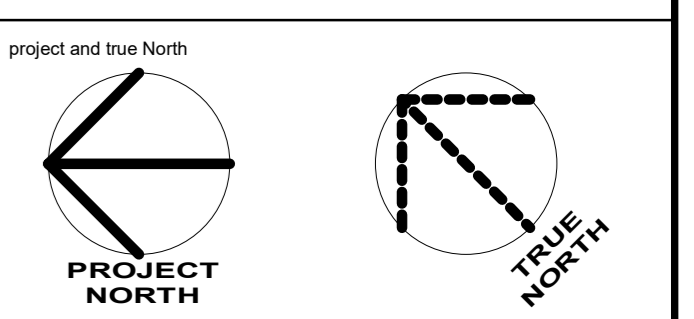
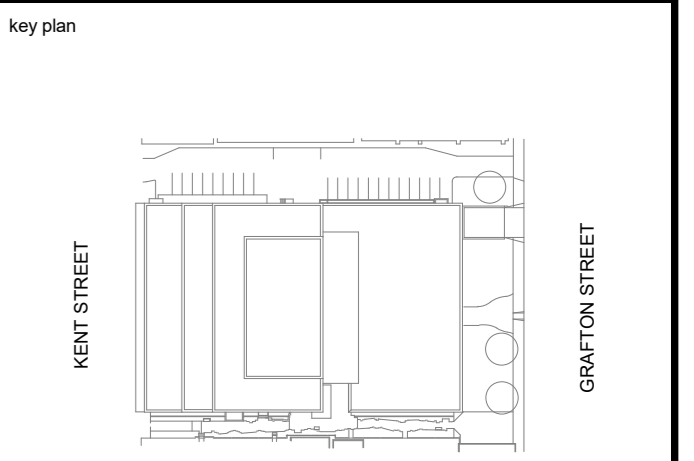
DRAWING KEYNOTES

- P11 PROVIDE NEW POWER FROM CIRCUIT INDICATED FOR RE-CONNECTION OF EXISTING ELEVATOR DISCONNECT SWITCH

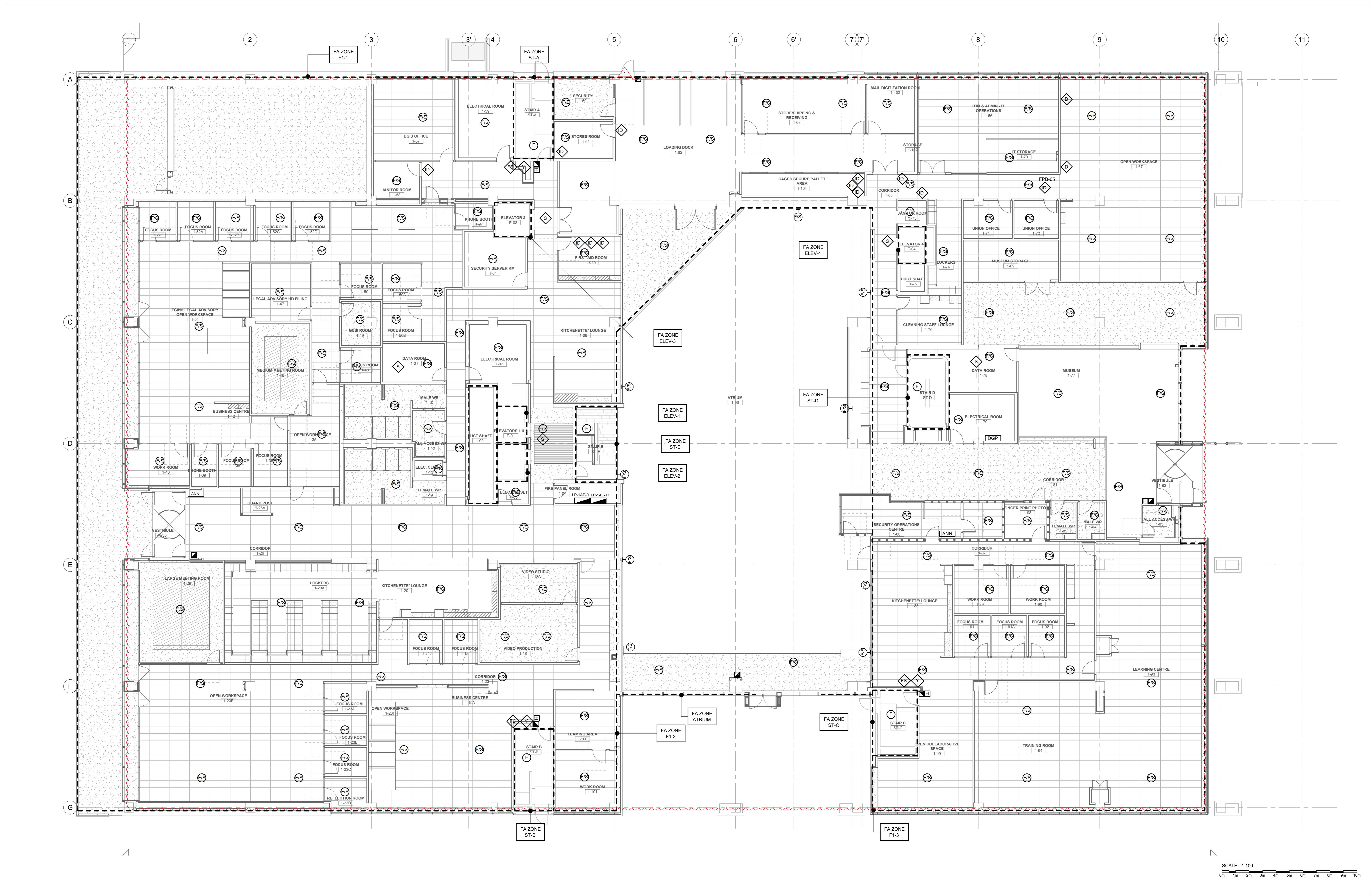
	Travail Public et Services gouvernementaux Canada																																				
<h3>NORR</h3> <p>NORR Architects & Engineers Limited An Ingenium Group Company</p> <p>175 Bloor St. East North Tower, 15th Floor Toronto, ON Canada M4W 3R8 norr.com</p>																																					
<p>Project and true North</p>																																					
<p>Revisions</p> <table border="1"> <thead> <tr> <th>no.</th> <th>ISSUED FOR</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>ISSUED FOR ADDENDUM 02</td> <td>2022-06-29</td> </tr> <tr> <td>2</td> <td>ISSUED FOR TENDER</td> <td>2022-06-27</td> </tr> </tbody> </table>		no.	ISSUED FOR	DATE	1	ISSUED FOR ADDENDUM 02	2022-06-29	2	ISSUED FOR TENDER	2022-06-27																											
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1	ISSUED FOR ADDENDUM 02	2022-06-29																																			
2	ISSUED FOR TENDER	2022-06-27																																			
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<p>DRAWING</p> <h3>FIRE ALARM PLAN - PARKING LEVEL</h3>																																					
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designed	NORR	compu																																			
date	01/02/19																																				
drawn	NORR	dessiné																																			
date	01/02/19																																				
approved	SR	approuvé																																			
date	2022-06-29																																				
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drawing no.	no. du dessin																																				
	E30-00																																				



<p>GENERAL NOTES - FIRE ALARM</p> <p>A THESE DRAWINGS AND SPECIFICATIONS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, INTERIOR DESIGNER'S, MECHANICAL, AND OTHER DIVISIONS DRAWINGS. ALL ELECTRICAL WORK SHALL COMPLY WITH OWNER'S REQUIREMENTS AND BASE BUILDING STANDARDS.</p> <p>B AS REQUIRED, MAKE OPERATIONAL - DENOTES ELECTRICAL INSTALLATION TO SUIT SITE CONDITIONS TO CONFORM WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND STANDARDS AND INSTALLATION TO INCLUDE ALL NECESSARY MATERIAL, EQUIPMENT AND LABOUR (ALTHOUGH NOT SHOWN ON THE DRAWINGS) TO MAKE IT OPERATIONAL. NO ALLOWANCES WILL BE MADE SUBSEQUENTLY FOR ANY CONSIDERATIONS OVERLOOKED.</p> <p>C UNLESS NOTED OTHERWISE ALL WIRING AND CONDUITS TO BE CONCEALED.</p> <p>D ALL ELECTRICAL EQUIPMENT (LIGHTING FIXTURES, POWER EQUIPMENT AND CABLES) OR ANY OTHER CONTRIVANCE THAT GENERATES EITHER ELECTROMAGNETIC FIELD OR ELECTROMAGNETIC INTERFERENCE ARE TO BE KEPT AT LEAST 12' AWAY FROM THE COMMUNICATION CABLE TRAYS. INSTALL ELECTRICAL EQUIPMENT AND CABLES TO CONFORM TO THE ABOVE REQUIREMENTS.</p> <p>E ALL FIRE ALARM ZONE LABELLING TO BE COORDINATED WITH SPRINKLER SYSTEM NOMENCLATURE. LOCATION FOR SUPERVISORY VALVES, FLOW SWITCHES AND LOSS OF PRESSURE TO BE COORDINATED WITH MECHANICAL TRADE. REFER TO MECHANICAL FIRE PROTECTION DRAWINGS, FIRE ALARM RISER DIAGRAM AND FIRE ALARM ZONE ANNUNCIATOR SCHEDULE.</p>	<p>DRAWING KEYNOTES</p> <p>○</p>
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Project legend



SCALE: 1:100
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

GENERAL NOTES - FIRE ALARM

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DRAWING KEYNOTES

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2	ISSUED FOR TENDER	2022-06-27

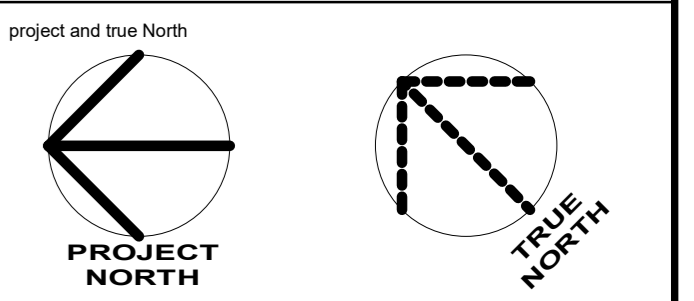
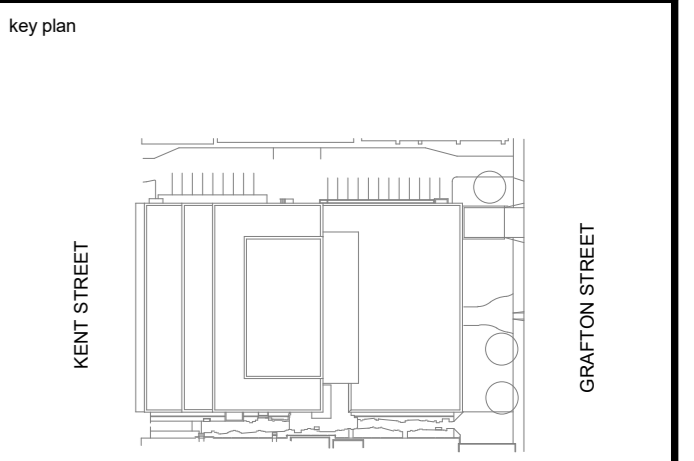
revisions project date

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MODERNIZATION

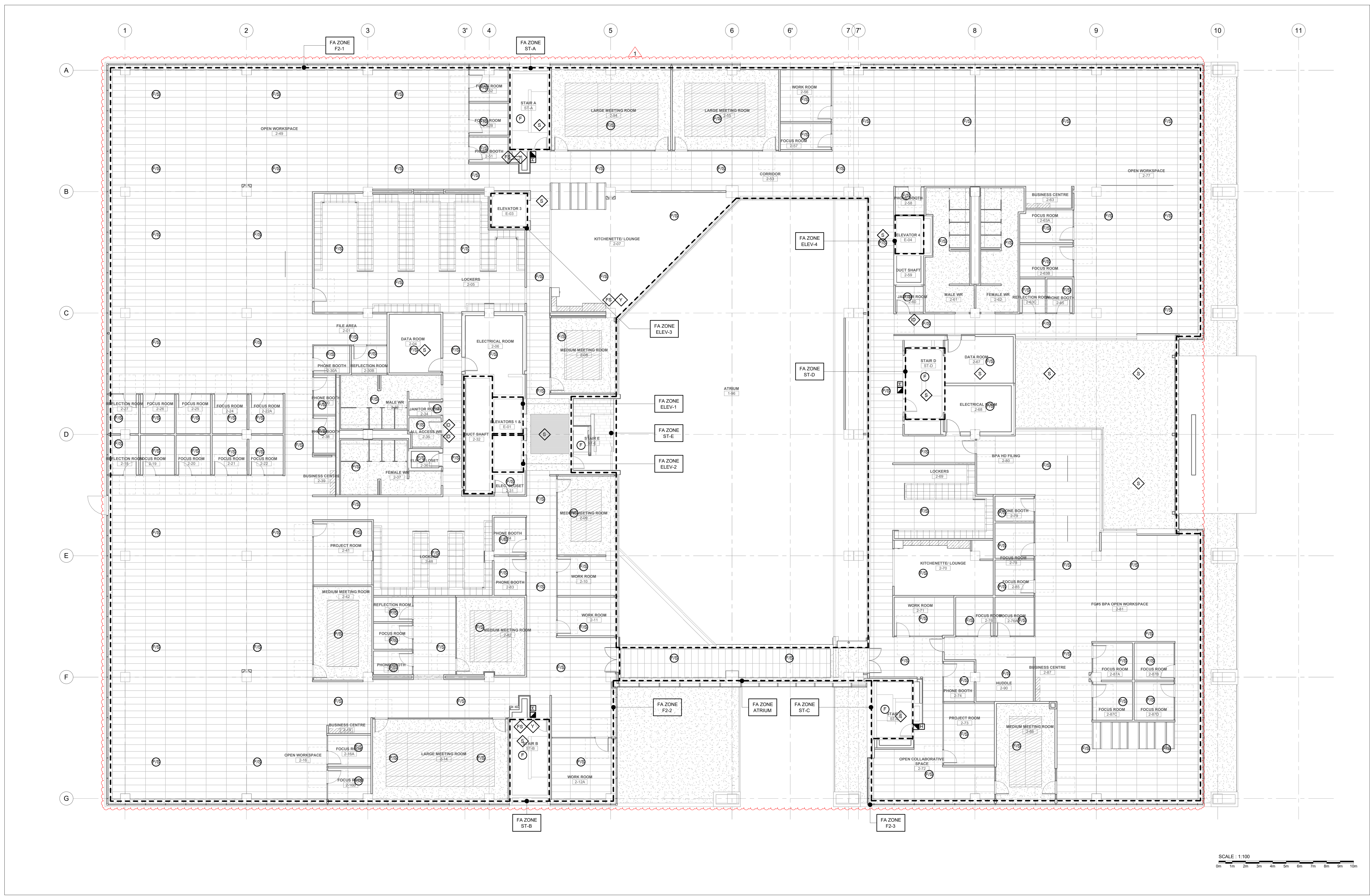
161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

design
**FIRE ALARM PLAN -
MAIN FLOOR**

designed NORR	conpu
date 01/02/19	
drawn NORR	dessiné
date 01/02/19	
approved SR	approuvé
date 2022-06-29	
Project	Submission
PWGCSC Project Manager	Administrateur de projets TPSCC
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
E30-01	



PROJECT NORTH
TRUE NORTH



GENERAL NOTES - FIRE ALARM

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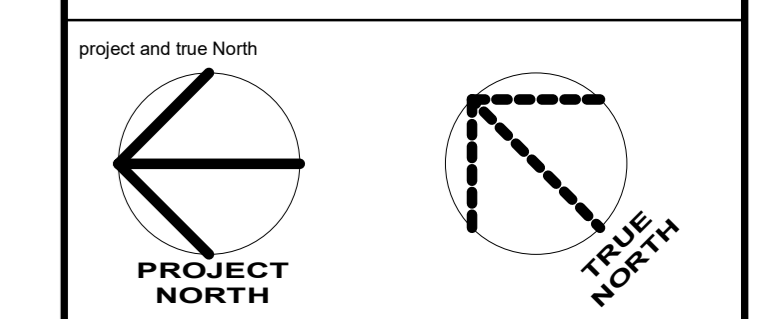
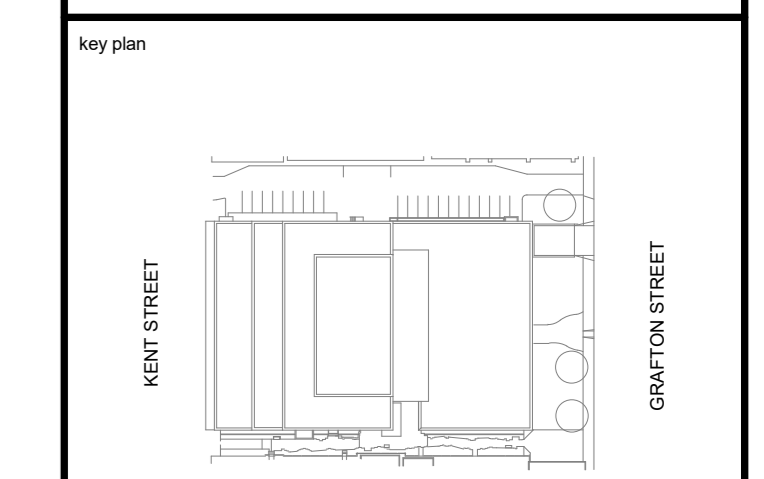
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2	ISSUED FOR TENDER 2022-06-27

project
DANIEL J MACDONALD MODERNIZATION
161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

drawing
FIRE ALARM PLAN - SECOND FLOOR

designed	conpu
NORR	01/02/19
drawn	dessiné
NORR	01/02/19
approved	approuvé
SR	2022-06-29
Tender	Submission
Project Manager	Administrateur de projets TPSCG
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
E30-02	



project legend

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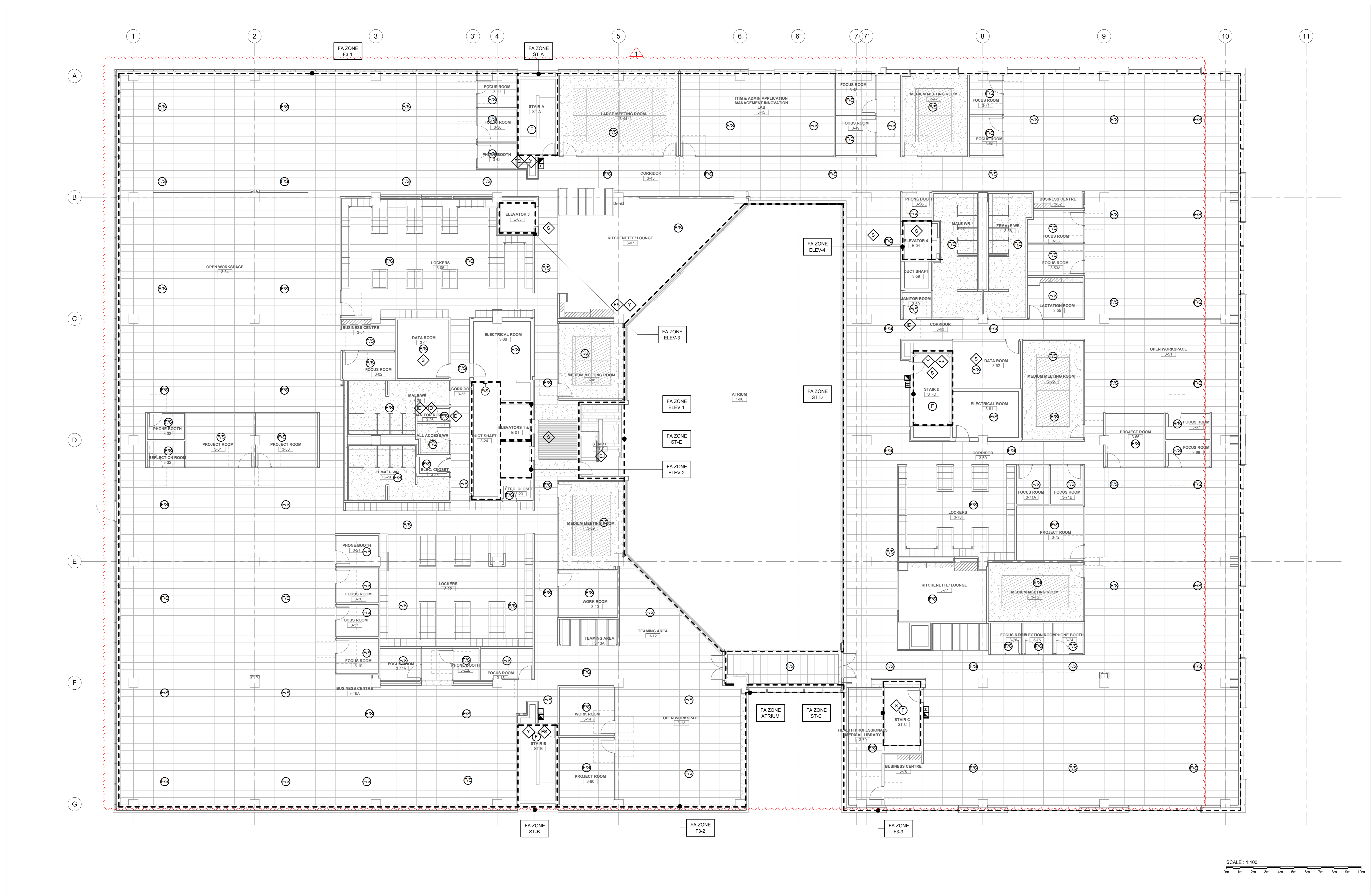
revisions	date
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project
**DANIEL J MACDONALD
MODERNIZATION**

161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

drawing
**FIRE ALARM PLAN -
THIRD FLOOR**

designed NORR	conpu
date 01/02/19	
drawn NORR	dessiné
date 01/02/19	
approved SR	approuvé
date 2022-06-29	
Tender	Submission
FPWGC Project Manager	Administrateur de projets TPWGC
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
E30-03	



GENERAL NOTES - FIRE ALARM

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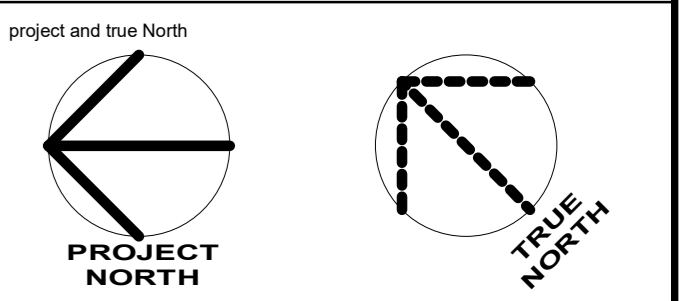
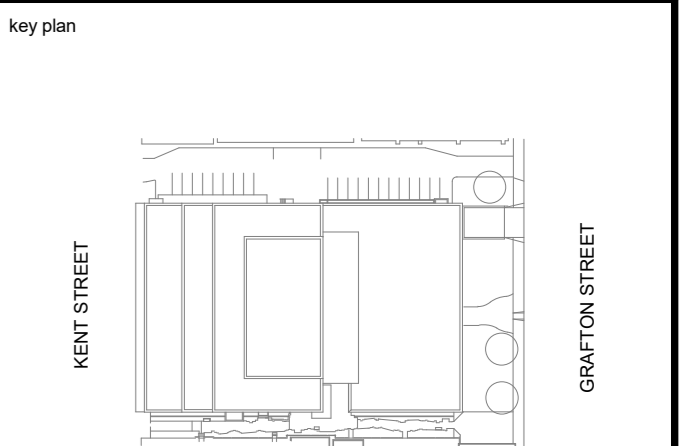
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DRAWING KEYNOTES



project legend

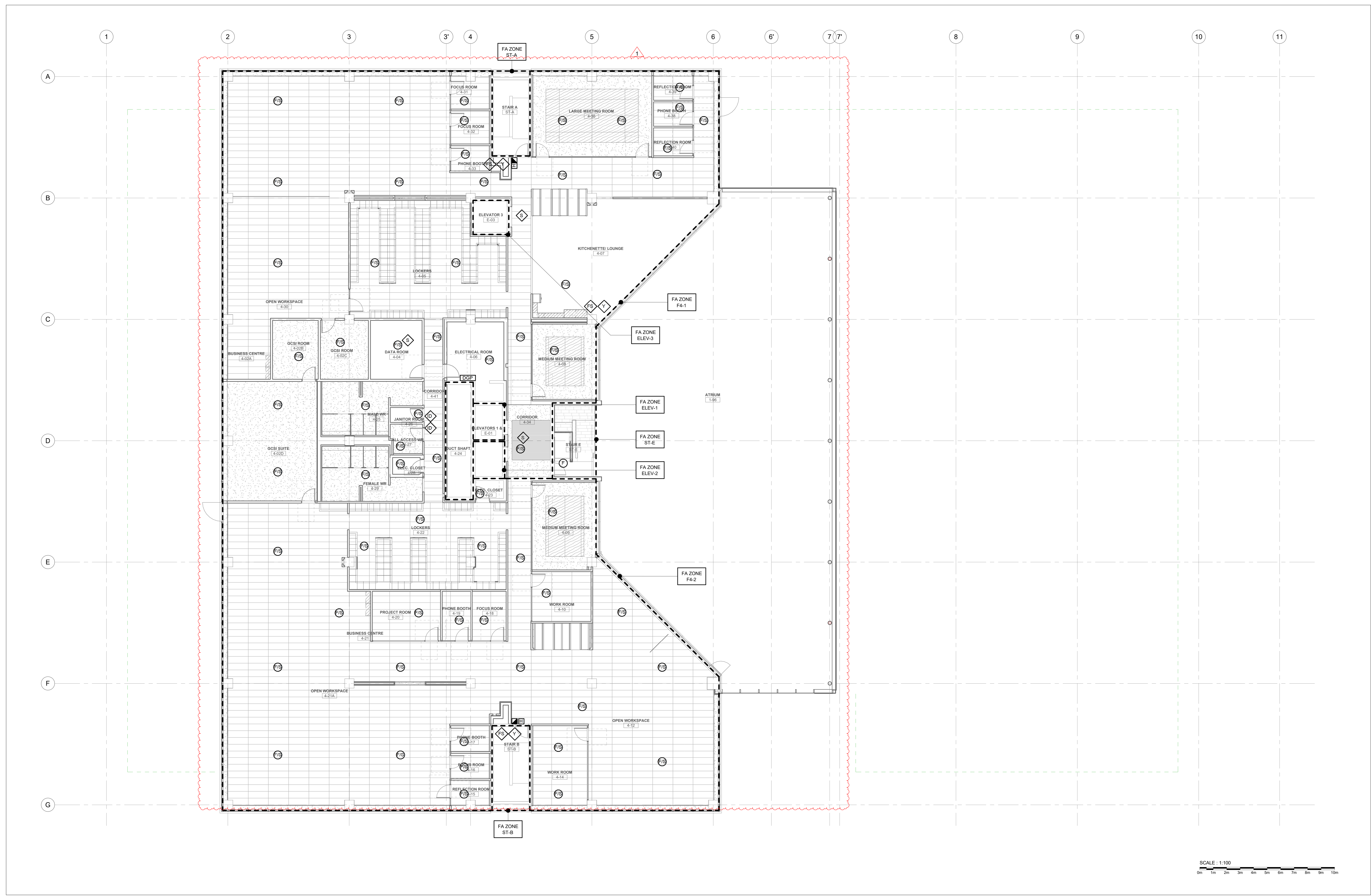
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2	ISSUED FOR TENDER 2022-06-27

project
**DANIEL J MACDONALD
MODERNIZATION**

161 GRAFTON STREET
CHARLOTTETOWN, PEI C1A 1L1

drawing
**FIRE ALARM PLAN -
FOURTH FLOOR**

designed	conpu
NORR	
date	01/02/19
drawn	dessiné
NORR	
date	01/02/19
approved	approuvé
SR	
date	2022-06-29
Tender	Submission
PWGCSC Project Manager	Administrateur de projets TPSCC
project number	no. du projet
R.056687.005	
drawing no.	no. du dessin
E30-04	



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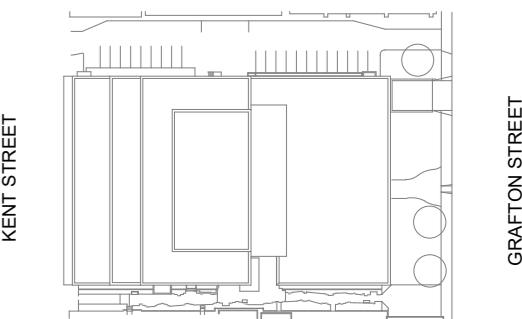
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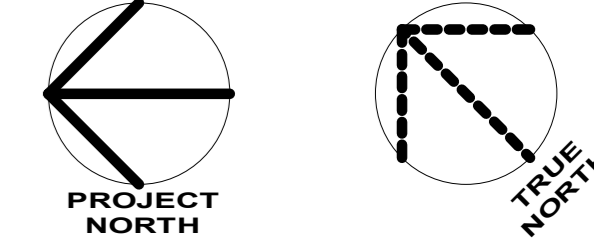
DRAWING KEYNOTES

KEYNOTE	DESCRIPTION
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3	FA ZONE FA-1
4	FA ZONE ELEV-3
5	FA ZONE ELEV-1
6	FA ZONE ST-E
7	FA ZONE ELEV-2
8	FA ZONE FA-2

Key plan



Project and True North



Project legend

1 ISSUED FOR ADJUDICUM 02 2022-06-29

2 ISSUED FOR TENDER 2022-06-27

revisions date

project

DANIEL J MACDONALD MODERNIZATION

161 GRAFTON STREET CHARLOTTETOWN, PEI C1A 1L1

drawing no. E30-05

no. du projet

designed NORR conçu

date 01/02/19

drawn NORR dessiné

date 01/02/19

approved SR approuvé

date 2022-06-29

Tender Soumission

PWGS Project Manager Administrateur de projets TPSCG

project number no. du projet

R.056687.005

drawing no. no. du dessin

E30-05

E-DRM/QDD-E: 553185 v1

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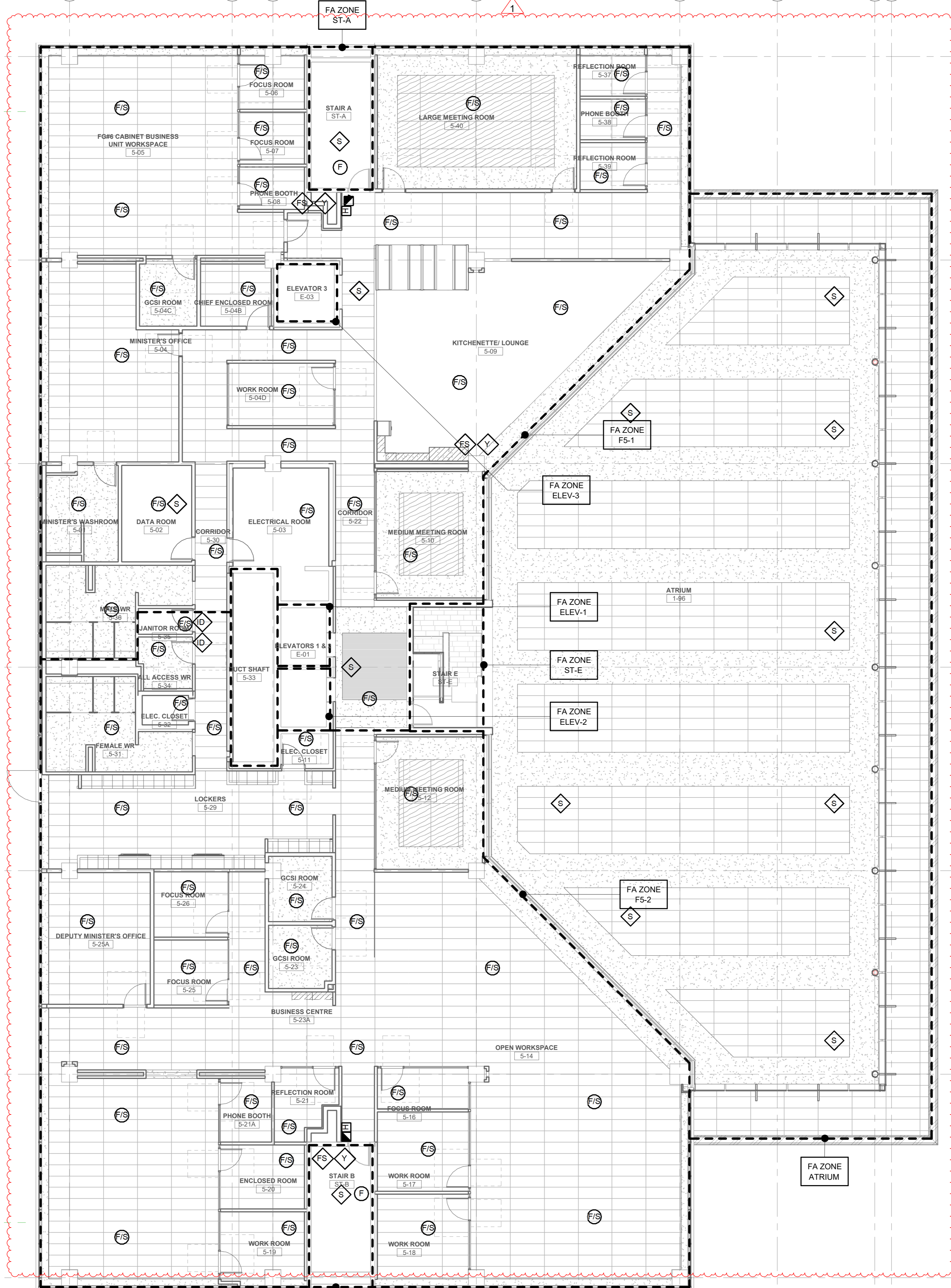
C

D

E

F

G



SCALE: 1:100
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

GENERAL NOTES - FIRE ALARM

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DRAWING KEYNOTES

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