ADDENDUM No. 3

for

Airfield Lighting Vault Expansion
AIP # 3-33-0011-TBD-2025
Bid # FY25-804-38

at the Manchester – Boston Regional Airport

Due to be opened 2:00 p.m., on April 9, 2025

Date: **March 31, 2025**

The attention of firms submitting proposals for the work named above is called to the following modifications to the documents as were issued.

The items set forth herein, whether of clarification, omission, addition and/or substitution, shall be included and form a part of the Proposer's submitted materials and the corresponding contract when issued. No claim for additional compensation, due to lack of knowledge of the contents of this Addendum will be considered.

All Proposer's are advised that receipt of this notice and all attached material must be duly acknowledged in the space provided on the signature page of the proposal documents, and **by the insertion of this sheet, signed, and submitted with your Proposal package.**

This form must be signed and attached to the original copy of your submission.

The attached sheets contain information or clarifications requested or discussed.

Receipt of **Addendum No. 3** to the REQUEST FOR PROPOSALS for **Airfield Lighting Vault Expansion** at the MANCHESTER-BOSTON REGIONAL AIRPORT is hereby acknowledged.

COMPANY NAME: _____

SIGNED BY: _____

NAME AND TITLE PRINTED: _____

TELEPHONE: _____ FAX: _____

GENERAL

In general, this addendum is accomplishing the following:

1. Answers to questions to date.
2. Distribution of pre-bid meeting minutes and sign-in sheets.
3. Update to Drawings E-103, E-106, E-200-202, E-302, E-303, E-401, E-503, M-001, and P-001.

QUESTIONS/CLARIFICATIONS

Addendum Item No.1 -

Q1: Please confirm the required number of S1 cutout in switchgear RS-2. The drawing shows 13 units, but as there are 3 slots for future CCRs, shouldn't there be 16?

A1: Provide an S-1 cutout for all new CCR bays that will be outfitted with a power core. Therefore provide (12) S-1 cutouts for RS-1 and provide (13) S-1 cutouts for RS-2.

Addendum Item No.2 -

Q2: Item No. 330000-1 Electrical Utility Service is an "Allowance" item. What is the actual allowance?

A2: Allowance value currently set at $20,000. Refer to reissued bid form sheets included with Addendum #2.

Addendum Item No.3 -

Q3: Item No. L-115-1 Electrical Manhole 8'x10', Aircraft Rated. There was some mention at the pre-bid walkthrough of a spring assisted square hatch for easier access. However, the detail indicates a round frame and cover. Can you confirm what is required? Possibly include a catalog number.

A3: Spring assisted cover shall be provided for each new manhole, Extra Heavy Duty, 30"x30" opening, EJ #8196 or equal.

Addendum Item No.4 -

Q4: There seems to be a few items that don't have a bid item in the bid form. For instance, fire alarm, grounding, lighting etc. don't have a place in the bid form, so where should we put these items? Please advise.

A4: Please refer to G-003, Building Pay Items, Note 1.

Addendum Item No.5 -

Q5: Can the 300KVA transformer that being used for the temp feed for the existing service be a "used" piece of equipment? Please advise.

A5: A "used" or rental transformer is acceptable. Ensure that the transformer has passed testing for IEEE C57.12.01 and IEEE C57.12.91 standards for dry-type distribution transformers and power transformers.

Addendum Item No.6 -

Q6: Can the 300KVA transformer be installed with temporary wiring means and methods since its only temporary? Please advise.

A6: Please bid as shown on E-301. Assume flexible conduit connection from transformer secondary to conduit system.

Addendum Item No.7 -

Q7: Is there a fire alarm manufacture for the project? I didn't see it in the specs. Please advise.

A7: There is no specific manufacturer required, they just need to meet the requirements of the drawings and specifications.

Addendum Item No.8 -

Q8: On sheet E-202 there's a note about 2-4" RGS conduits coming from each of the new CCR switchgear line up. Where do these conduits terminate. Please advise.

A8: Install (2) 4" RGS conduits from the Cutout Bay for each CCR lineup back to the wall mounted ALCMS Interface Cabinet located adjacent to RS-2.

Addendum Item No.9 -
Q9: On the one- line diagram it shows 2-5" conduits from the pole to the new pad. On sheet E-505 there's a detail that shows 4- 5" conduits terminating at the pad. Please confirm the number of conduits needed.

A9: The one-line diagram takes precedence - 2-5" conduits are needed.

Addendum Item No.10 -
Q10: Do we need to provide the 4 4" for future secondaries as well? Please advise.

A10: The one-line diagram takes precedent - 4-3.5" conduits are needed.

Addendum Item No.11 -
Q11: Does the project require any low voltage conduits from the new riser pole to the building? Please advise.

A11: No.

Addendum Item No.12 -
Q12: In the existing building there appears to be a grounding bar that goes around the perimeter of the electric room. Do we need to duplicate this in the new electric room? Please advise.

A12: Install ground bars as shown on Drawing E-105.

Addendum Item No.13 -
Q13: On the interim one-line diagram it shows a roll up temporary generator. Who is responsible for this equipment? On the final one-line diagram it shows a permanent generator. Is this in our scope? Please advise.

A13: EC is responsible for the temporary generator. The permanent generator will be purchased by the Airport and set and installed by the EC.

Addendum Item No.14 -
Q14: Does this project require a place to have a tap box installed to meet NEC 700.3(F)? Please advise.

A14: Yes, a 1000A manual transfer switch and exterior-mounted tap box will be updated on the drawings.

DRAWINGS

Addendum Item No.15 -
REMOVE Drawings E-103, E-106, E-200-202, E-302, E-303, E-401, E-503, M-001, and P-001 and REPLACE with Drawings E-103, E-106, E-200-202, E-302, E-303, E-401, E-503, M-001, and P-001 attached.

END OF ADDENDUM #3

PRE-BID CONFERENCE

Project Location: **Manchester-Boston Regional Airport** Project No. **(AIP #: TBD)**

Work Covered: **Airfield Lighting Vault Expansion**

Date of Conference: **March 19, 2025** Location: **MHT Airport Board Room**

A. INTRODUCTIONS

Attendees will sign in on the provided spreadsheet.

B. PROJECT BIDDING PROCEDURES AND AWARD OF CONTRACT

1. Bid opening time: 2:00PM EDT on Wednesday, April 2nd, 2025
   Location: Manchester-Boston Regional Airport
   Board Room – 3rd Floor
   1 Airport Road
   Manchester, NH 03103

Any questions answered during this meeting are not legally binding. Any information provided that should be included in bid documents will be supplied in a forthcoming addendum

Proposal

Bids shall be submitted on the approved bid form(s) available from John Pelletier, Jacobs: john.pelletier@jacobs.com. Reference the bid proposal section of the specifications and follow all instructions provided including submittal of project-related questions.

Bid Bond (Bid Security)

Each bidder must deposit with their bid, security in the amount of no less than five (5%) percent of the total bid, in the form and subject to the conditions provided in the Instructions to Bidders in the Contract Specifications.

After the actual bid submission deadline, no bidder may withdraw his/her bid until November 1, 2025.

2. Award of Contract:

The Contract will be awarded to the bidder with the lowest qualified BID.
There are currently no additive alternates to the project (nor are any anticipated).
The estimated total construction cost for this project including alternates is $6M.

If all such bids exceed the available funding, the Owner may reject all bids, may delete work items altogether, or make adjustments to the bid of any form that are mutually acceptable to the Owner and lowest qualified bidder, if necessary to bring the Contract awarded within funds available to finance the project. Such reduction, deletion or modifications of work and bid shall not constitute a basis for withdrawal of the proposal or for adjustment of the unit or lump sum prices bid – subject to the limitations described in Section 40 of the General Provisions.

3. Time of Completion and Liquidated Damages

The Contractor shall agree to complete all work within the durations outlined in the contract documents. The Contractor will be assessed liquidated damages in the sum of two thousand dollars ($2,500.00) per day for each and every calendar day that the project remains incomplete beyond the designated contract duration **for each phase**.

C. PROCEDURE FOR QUESTIONS AND ADDENDUM

1. **Any questions or inquiries must be submitted in writing (email) to John Pelletier. Questions must be received by 11:00AM on Friday, March 29th, 2025.**

2. **The Engineer will issue addenda via email and to the airport website; addenda will be issued not less than 48 hours prior to the time bids are due, without changing the bid date.**

3. A future addenda with all Bidder Questions answered will be provided next week.

4. Addenda issued require acknowledgement of receipt on bid forms.

5. Failure of any bidder to receive any such amendments shall not relieve such bidder from any obligation under his/her bid as submitted.

6. Oral and other interpretations or clarifications will be without legal effect.

D. PROJECT SPONSORS

- Manchester-Boston Regional Airport
- New Hampshire Department of Transportation
- Federal Aviation Administration

E. PREQUALIFICATION STATEMENT:
Documentation provided will be reviewed by Department of Aviation officials prior to any determination of award.

E. LABOR REQUIREMENTS

1. The project shall be bid in accordance with New Hampshire State Law, and,
2. All FAA-AIP projects shall be in accordance with 49 Code of Federal Regulations Part 18.36 (Procurement).

This includes but is not limited to the following:

a. Federal Wage Rates / Minimum Wage

For the purpose of this project, the wage rate determinations shall be considered the governing minimum wage and fringe to be paid.

Davis Bacon Wage Rates for Rockingham County are included in the specifications. The more stringent of these two shall be utilized if conflicting.

b. Weekly payroll statements are required. Submit to Jacobs Resident Project Engineer Project Manager via e-mail.

c. Contract Work Hours and Safety Stds. Act.
(overtime pay, record keeping)

d. Occupational Safety and Health Act of 1970 - OSHA

e. Access to and retention of records for three years.

f. 49 Code of Federal Regulations Part 26 (Federally Assisted Contracts)

g. Disadvantaged Business Enterprise (DBE) Requirements

As recipient of Federal Financial Assistance, Bradley International Airport has a Disadvantaged Business Enterprise (DBE) Program. In accordance with the program this project has a goal of 8.0**%.** The bidder shall make good faith efforts to subcontract 8.0% of the dollar value of the prime contract to small business concerns owned and controlled by socially and economically disadvantaged individuals. In the event the project goal cannot be achieved, the bidder shall submit evidence of his/her good faith effort. Any further coordination with DBELO for MHT will be as needed.

4. Buy American – See certification in Bid Proposal

5. Labor and Materials, and Payment Bonds

F. SCOPE OF PROJECT

1. Airfield Lighting Vault Expansion
   - Existing building constructed in 1999.
     - Equipment therein no longer supported.
   - Expansion of building to house
     - Modern switchgear style installation desired
   - Ductbank to connect homeruns to airfield
     - New structure to receive homerun in TW H infield
   - Some paving/drainage/fence/site work in support of scope
   - Coordination with Eversource for utility upgrade (to 480V equipment)
   - Coordinate with owner for generator swap out

Building Discussion:
- General intent is to expand alongside the existing building.
- Interior height of expansion will increase to house equipment
- Existing building has architectural/MEP modifications upon removal of existing generator and subsequently the existing equipment.
- Existing electrical equipment (CCRs) must remain protected in place until after commissioning of new equipment/ALCMS

Equipment Discussion:
- Intent is to install switchgear-style regulator lineup (480V)
- New ALCMS with new nodes as described
- 20-Way Ductbank and receiving manholes

Payment:
Work that does not fall under FAA Advisory Circulars is under A-001-1.
Work that does fall under FAA AC's is under those items.

G. PROSECUTION OF WORK

1. Project Phasing: 240 Calendar Day Contract Duration:
   - Phase 1: 240 Days
   - Phase 2A: 67 Days
   - Phase 2B: 28 Days

2. Coordination with Airport required on a **daily** basis. Adherence to the SPCD that the contractor will provide in support of the CSPP will be required by the Contractor.

3. Taxiway closure markers and barricades will be handled by the contractor and must be coordinated in advance. Any interruption to airfield operations must be coordinated with the airport in advance.

H. OPERATIONAL SAFETY ON AIRPORTS (FAA AC 150/5370-2)

1. General: Safety of contract

2. Under no circumstances shall private vehicles be allowed access to the airfield work areas.

3. Accurate scheduling and coordination with the Owner/Engineer is required.

4. **Contractor to provide airport approved gate guard for Phase 2 and enforce all airport/TSA mandates for security; Phase 1 does not require a gate guard. Escorts will be provided by the airport in coordination with the contractor.**

5. Operational Safety Notes:
   a. Must follow the Construction Safety and Phasing Plan (CSPP)
   b. Construction barricades & closure markers, as shown on CSPP & Phasing drawings
   c. Access routes must be kept clean as needed for airport traffic, ARFF vehicles, and operations.
   d. All work areas must be swept prior to departing the airport daily.
   e. All airfield lighting must be operational prior to departing the airport daily.
   f. The Airport will inspect all areas prior to reopening to air traffic.
      a. The Contractor must be present for all inspections and correct any found issues prior to reopening the area.

I. OTHER COMMENTS

1. Anticipated Award of Contract is in Mid-Summer, 2025.
2. Anticipated Start date is late September, 2025.

J. Questions?

K. Field Visit

Manchester-Boston
REGIONAL AIRPORT

PROJECT: Airfield Lighting Vault Expansion Project
MEETING: Pre-Bid Meeting
DATE: March 19, 2025, 2:00 PM EDT

SIGN-IN SHEET (IN PERSON)

NAME	COMPANY	PHONE	EMAIL
Derek Tower	MHT	603 624 6592	dtower@flymanchester.com
Shawn Barlow	Jacobs	774-249-8186	shawn.barlow@jacobs.com
Brian Blood	WT	508 331 2560	brian.blood@whiting-turner.com
ADAM HUNTER	WHITING-TURNER	605 537 8261	adam.hunter@whiting-turner.com
Annie Rotondi	WT	508-794-7992	annie.rotondi@whiting-turner.com

Jacobs

DATE: 3/19/2025

MEETING: MHT - Airfield Lighting Vault Expansion - Pre-Bid Meeting

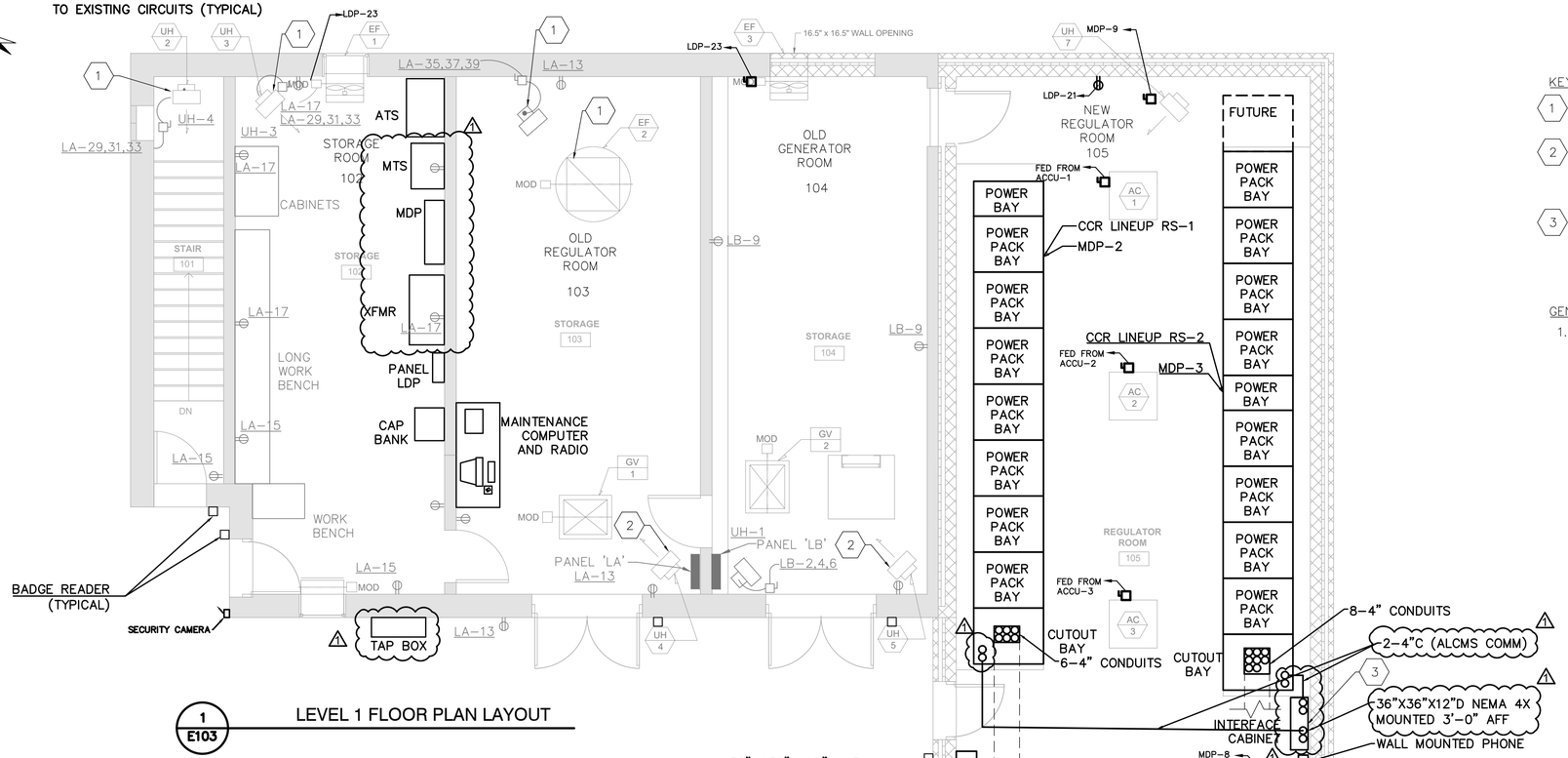
Manchester·Boston
REGIONAL AIRPORT

MEETING ATTENDEES

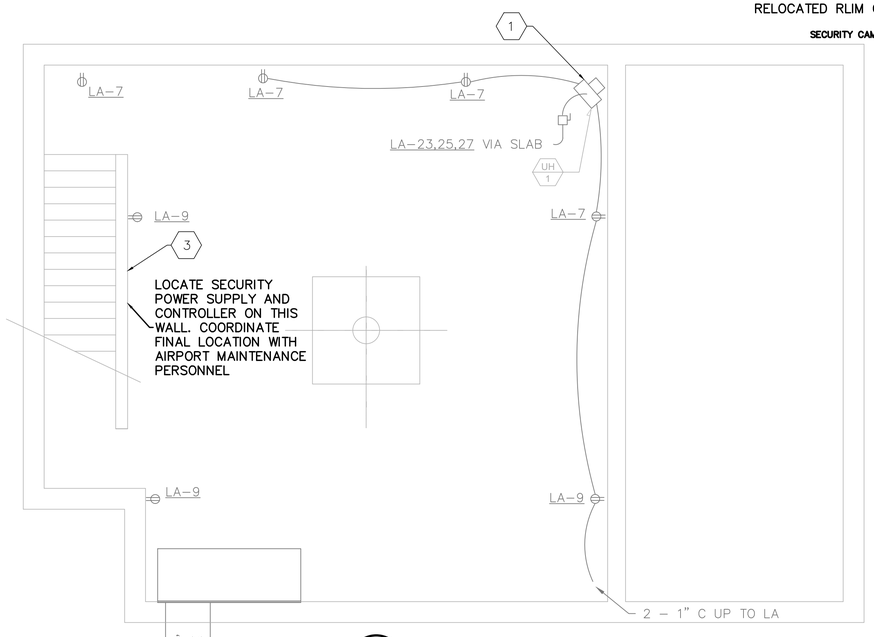
NAME	ORGANIZATION	PHONE NUMBER	EMAIL
John Pelletier	Jacobs	603-518-1775	john.pelletier@jacobs.com
TOM MALAFRONTE	MHT	603.624.6539	TMALAFRONTE@FLYMANCHESTER.COM
Luis Elguezabal	MHT	603-624-6539	LELguezabal@FlyManchester.com
Nick Deres	JACOBS	919.889-6128	nick.deres@jacobs.com
HEATH SAVAGE	MHT	602-869-2187	HSAVAGE@FLYMANCHESTER.COM
Nick Sinotte	ES Boulos	603-731-8159	NSinotte@ESBoulos.com
Ken Moulton	Moulton Elec.	207-460-2115	KMoulton@moulton.com
Chris Winkley	Moulton Electric	207-310-9336	Cwinkley@moulton.com
Jake Maguire	Suffolk	207-653-5797	jamaguire@Suffolk.com
Jim Teixeira	Eaton Crouse Hinds	631-901-4825	jimdteixeira@eaton.com
Mark Guckin	Eaton Crouse Hinds	860-683-4329	markeguckin@eaton.com
nir godel	Eaton crouse Hinds	860-6034389	nirgodel@eaton.com
Toby Trudeau	Eaton Crouse-Hinds	413 537 3413	Tobias Trudeau@Eaton.com
MARK TOWER	MHT	603 624 6556	MTower@flymanchester.com

The City of Manchester, Department of Aviation (the Airport), complies with Federal Title VI laws that assure that no person shall be discriminated against on the grounds of race, color, national origin, sex, creed, or age. The Airport also makes every effort to ensure nondiscrimination in all of its programs and activities, whether those programs are federally funded or not. To accomplish this goal, the Department intends to understand the communities surrounding or in the flight path of the Airport, as well as our customers that use the Airport. Any time communities may be impacted by programs or activities, the Airport will take action to involve them and the general public in the decision-making process. Mr. Wayne Robinson serves as the Airport's point of contact and is responsible for overseeing the Airport's compliance with Title VI matters. Please refer any inquiries to wrobinson@flymanchester.com.

NOTE: CONNECT NEW HEATERS TO EXISTING CIRCUITS (TYPICAL)



1 / E103 LEVEL 1 FLOOR PLAN LAYOUT



2 / E103 LEVEL 0 FLOOR PLAN LAYOUT

KEYED NOTES:

1. CONNECT NEW UNIT HEATER OR EXHAUST FAN TO EXISTING CIRCUIT
2. CONNECT NEW UNIT HEATER TO EXISTING CIRCUIT. EXTEND EXISTING CIRCUIT TO NEW UNIT HEATER LOCATION AND RELOCATE DISCONNECT SWITCH AS REQUIRED.
3. RUN NEW 2" EMT CONDUIT FROM NORTH WALL OF BASEMENT TO SOUTH WALL OF EXPANSION FOR MHT IT USE.

GENERAL NOTES:

1. REFER TO A-901 FOR DOOR HARDWARE SCHEDULE WITH SECURITY HARDWARE REQUIREMENTS.

PROJECT DESIGNER:
Jacobs
2 EXECUTIVE PARK DRIVE
SUITE 205
BEDFORD, NH 03110
PHONE: (603) 666-7181
FAX: (603) 666-7185

SCALE 1/4"= 1'-0"
DATE: MARCH 2025
DESIGNED BY: JM
DRAWN BY: SB
CHECKED BY: JM
APPROVED: NR

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

EXPANDED VAULT ELECTRICAL FLOOR PLAN LAYOUT

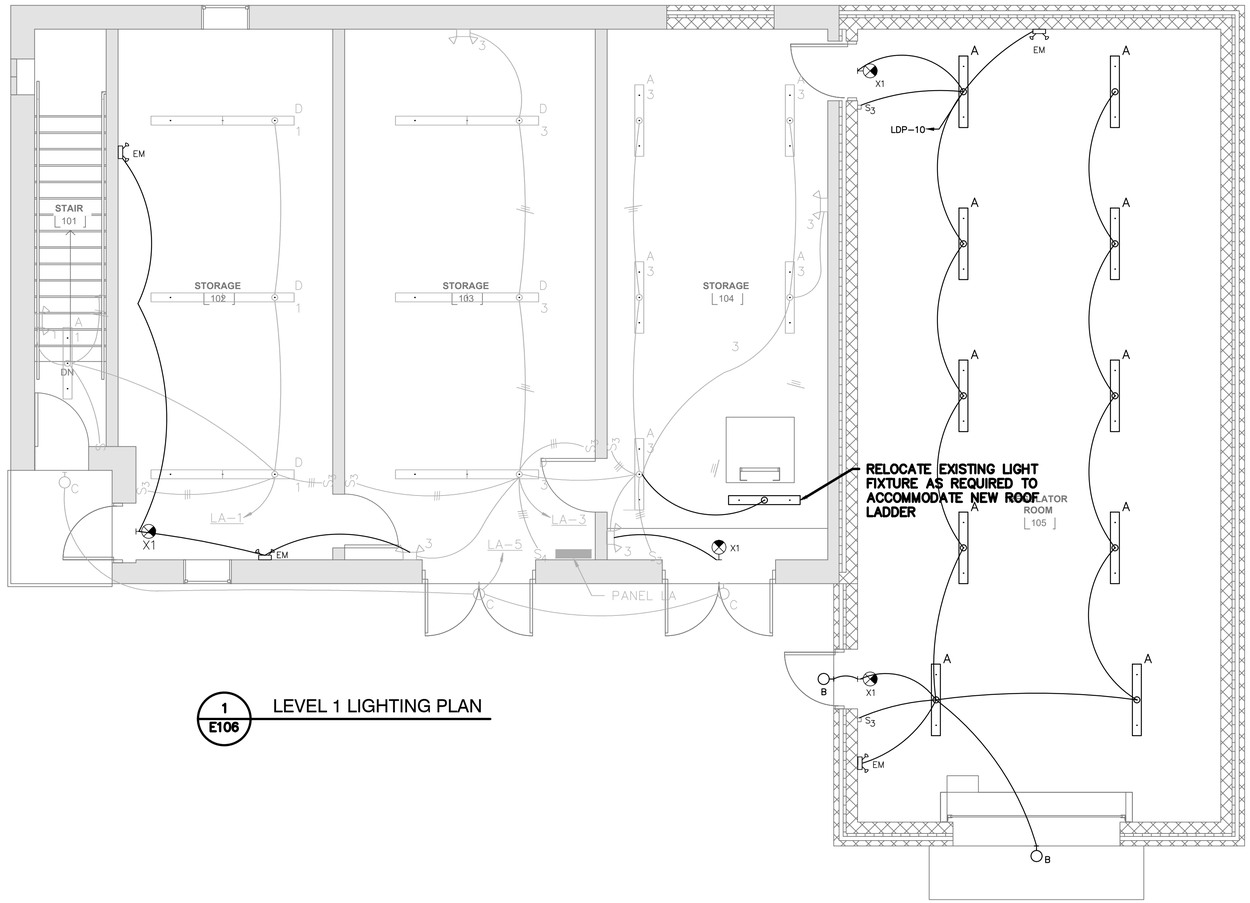
REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1	3/28/2025	ADDENDUM - 3	JAM

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-103
SHEET 57 OF 81
REV

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION



1 E106 LEVEL 1 LIGHTING PLAN

NOTES:

1. RELOCATE EXISTING LIGHT FIXTURE AS REQUIRED TO ACCOMMODATE NEW ROOF LADDER

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL SERIES	LUMEN	COLOR TEMP	VOLTAGE	WATTAGE	MOUNTING TYPE	NOTES
A	4'X1' LED LINEAR PENDENT	LITHONIA LIGHTING	FEM L48 8000LM IMAFL MD MVOLT GZ10 XXK 80CRI	8000	4000 K	120/277 V	38 W	PENDANT	
B	EXTERIOR LED WALL PACK	LITHONIA LIGHTING	WDGE2 LED P3 30K 80CRI T4M MVOLT SRM PE DDBXD	3000	3000 K	120/277 V	32 W	WALL	
X1	EXIT SIGN	LITHONIA LIGHTING	EXRG EL M6	N/A	N/A	120/277 V	1 W	WALL/CEILING	BATTERY BACK UP RED LED SINGLE/DOUBLE-FACE EXIT SIGN. 6" ABOVE DOOR FOR WALL MOUNTING. PROVIDE WITH MOUNTING ACCESSORIES AS REQUIRED.
EM	EMERGENCY LIGHT	EMERGLITE	G-12JSC40-2-L15-FM	1300	N/A	3/8	30 W	WALL	

SCHEDULE NOTES:
1. MANUFACTURERS, MODELS AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.

PROJECT DESIGNER:
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2 EXECUTIVE PARK DRIVE
SUITE 205
BEDFORD, NH 03110
PHONE: (603) 668-7181
FAX: (603) 668-7185

SCALE: 1/4"= 1'-0"
DATE: MARCH 2025
DESIGNED BY: RB
DRAWN BY: SB
CHECKED BY: JM
APPROVED: NR

MANCHESTER • BOSTON REGIONAL AIRPORT
AIRFIELD LIGHTING VAULT EXPANSION

VAULT LIGHTING PLAN

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1	3/27/2025	ADDENDUM - 3	SB

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-106

SHEET 60 OF 81 REV

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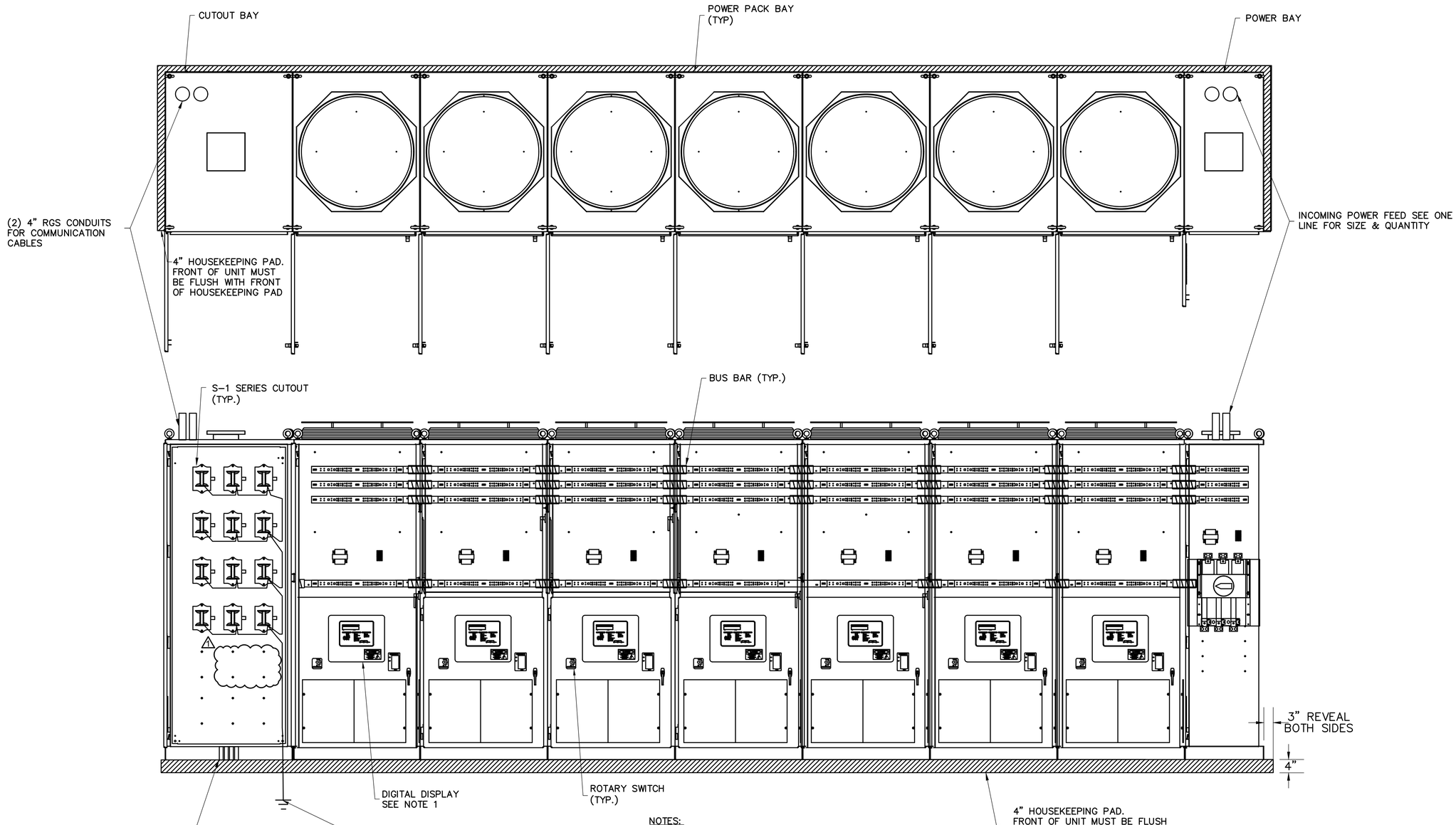

NOTES:

1. DIGITAL DISPLAY SHALL BE CAPABLE OF MONITORING CCR OUTPUT (AMPS, KW, VOLTS) AND INSULATION RESISTANCE OF 5KV FIELD CIRCUIT. SEE SPECIFICATION FOR DETAILS.

1 / E200 CCR SWITCHGEAR RS-1 PLAN AND ELEVATION

NOT TO SCALE

Jacobs
2 EXECUTIVE PARK DRIVE
SUITE 205
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PHONE: (603) 668-7181
FAX: (603) 666-7185

PROJECT DESIGNER:

SCALE:	NTS
DATE: MARCH 2025	
DESIGNED BY:	JM
DRAWN BY:	SB
CHECKED BY:	JM
APPROVED:	NR

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

CONSTANT CURRENT REGULATORS SWITCHGEAR RS-1 ELEVATIONS

REVISIONS			
REV. NO.	DATE	DESCRIPTION	BY
3	3/27/2025	ADDENDUM - 3	JAM

PROJ. NO.: 3-33-0011-TBD-2025

JE FILE: E2X97905

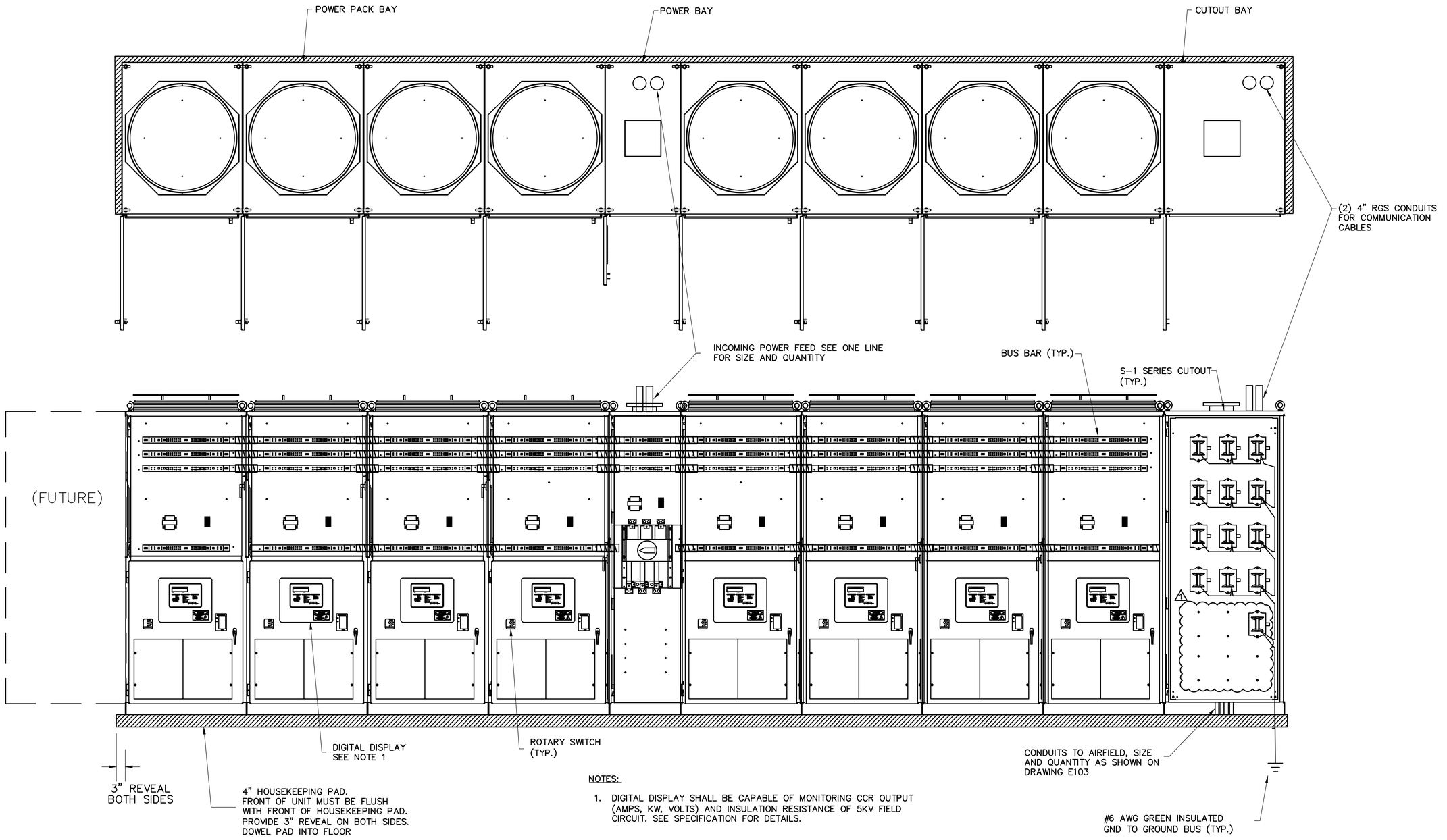
DRAWING NO.

E-200

SHEET 61 OF 81

REV

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION



NOTES:

1. DIGITAL DISPLAY SHALL BE CAPABLE OF MONITORING CCR OUTPUT (AMPS, KW, VOLTS) AND INSULATION RESISTANCE OF 5KV FIELD CIRCUIT. SEE SPECIFICATION FOR DETAILS.

1 / E201 CCR SWITCHGEAR RS-2 PLAN AND ELEVATION

NOT TO SCALE

Jacobs
2 EXECUTIVE PARK DRIVE
SUITE 205
BEDFORD, NH 03110
PHONE: (603) 668-7181
FAX: (603) 666-7185

PROJECT DESIGNER:

SCALE:	NTS
DATE:	MARCH 2025
DESIGNED BY:	JM
DRAWN BY:	SB
CHECKED BY:	JM
APPROVED:	NR

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

CONSTANT CURRENT REGULATORS SWITCHGEAR RS-2 ELEVATIONS

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1	3/27/2025	ADDENDUM - 3	JAM

PROJ. NO.: 3-33-0011-TBD-2025

JE FILE: E2X97905

DRAWING NO.

E-201

SHEET 62 OF 81 REV

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

BUS & CIRCUIT BREAKER RATINGS:

VOLTAGE RATINGS OF BUS:
480 VAC, 60HZ, 3 PHASE, 4 WIRE

BUS BAR AMPACITY RATING:
600 AMP

BUS BAR WITHSTANDING RATING:
65000 AIC

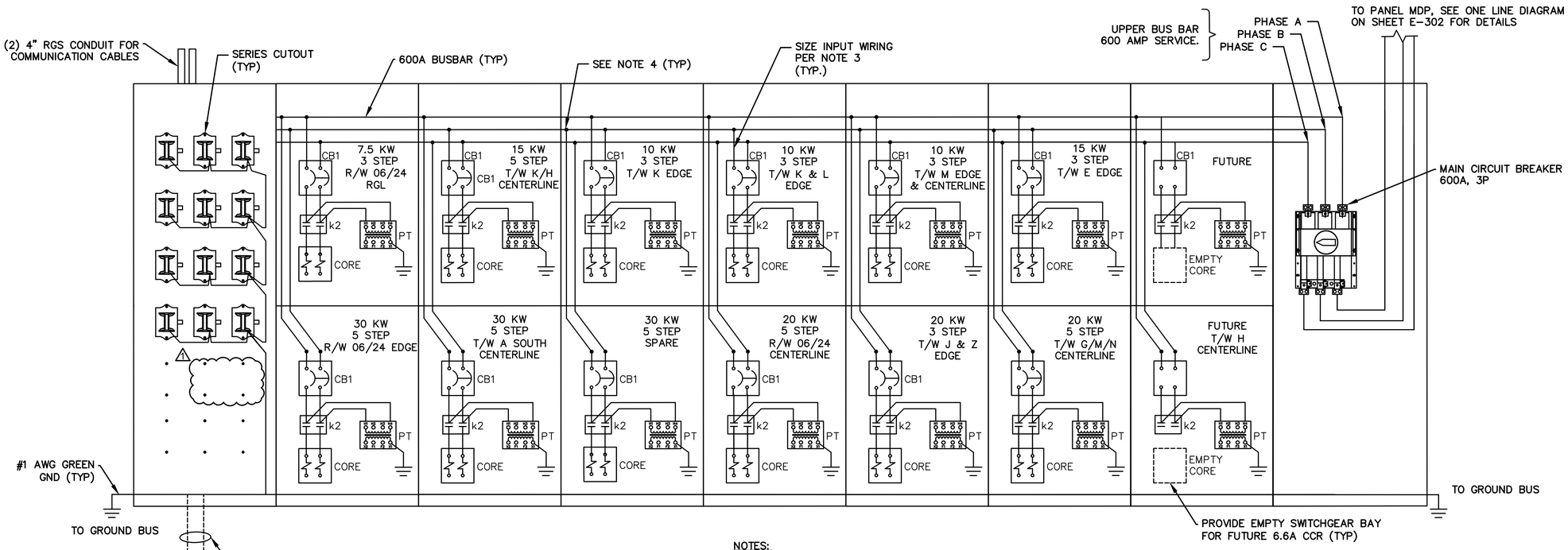
AMPACITY OF MAIN BREAKER:
600 AMP, 3 POLE, 600 VAC

AMPACITY OF CCR CIRCUIT BREAKERS:

KW	CIRCUIT BREAKER SIZE (CB1)
7.5	30A, 2P, 600VAC
10	40A, 2P, 600VAC
15	60A, 2P, 600VAC
20	70A, 2P, 600VAC
30	100A, 2P, 600VAC

CONSTANT CURRENT LINEUP RS-1 REGULATOR INDEX

CCR DESCRIPTION	SIZE (KW)	OUTPUT CURRENT (AMP)	OUTPUT STEPS	TYPE	PHASE CONNECTION	NOTES	INPUT VOLTAGE	MONITORING
R/W 06/24 EDGE	30	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
R/W 06/24 RGL	7.5	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W A SOUTH CENTERLINE	30	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W K/H CENTERLINE	15	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
SPARE	30	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W K EDGE	10	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
R/W 06/24 CENTERLINE	20	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W K & L EDGE	10	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W J & Z EDGE	20	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W M EDGE (& CENTERLINE)	10	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W G/M/N CENTERLINE	20	6.6	5	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W E EDGE	15	6.6	3	FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS
T/W H CENTERLINE (FUTURE)				FERRORESONANT		–	480	L-829, INPUT POWER STATUS, REMOTE/LOCAL STATUS



NOTES:

1. SEE DRAWING E-103 FOR CONSTANT CURRENT REGULATOR LAYOUT PLAN.
2. SEE DRAWING E-402 FOR CONTROL WIRING REQUIREMENTS
3. ALL INPUT WIRING CONNECTED TO BUSBAR SHALL BE #2 AWG WITH 75 DEGREE TERMINATIONS REGARDLESS OF CIRCUIT BREAKER SIZE.
4. PHASE CONNECTION SHOWN ARBITRARY SEE CCR SCHEDULE FOR ACTUAL PHASE CONNECTION
5. INSTALL A MAXIMUM OF (3) HOMERUN CIRCUITS IN A SINGLE 4" CONDUIT
6. L-824 CABLE COLOR SHALL BE BLACK BETWEEN EVERY CCR CORE AND ITS ASSOCIATED S-1 CUTOUT. SEE CIRCUIT CHART ON SHEET E-204 FOR HOMERUN CABLE COLOR TO AIRFIELD.

1 / E202 CCR SWITCHGEAR RS-1 SCHEMATIC PLAN
NOT TO SCALE

PROJECT DESIGNER:
Jacobs
2 EXECUTIVE PARK DRIVE
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BEDFORD, NH 03110
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SCALE:	NTS
DATE:	MARCH 2025
DESIGNED BY:	JM
DRAWN BY:	SB
CHECKED BY:	JM
APPROVED:	NR

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

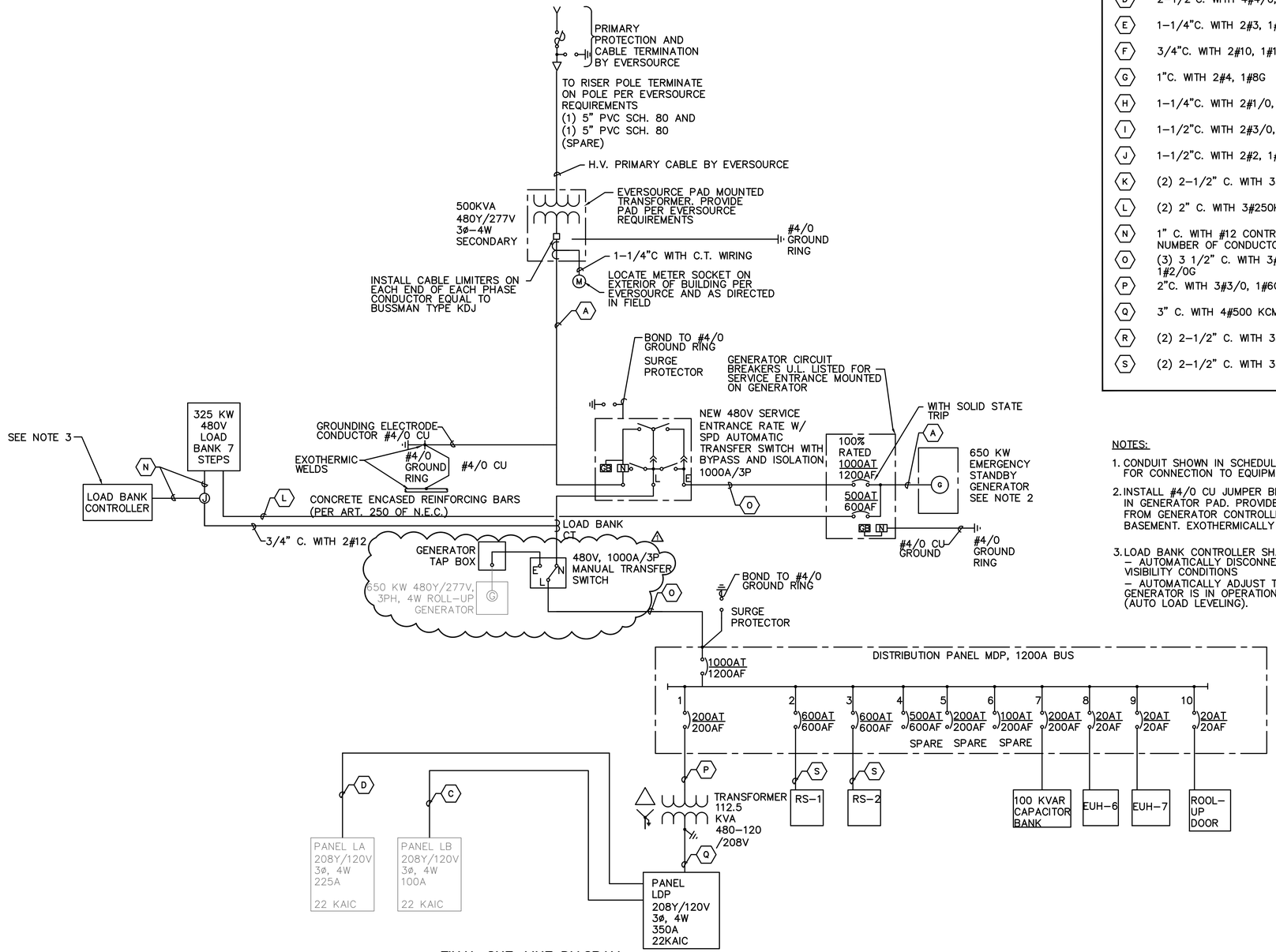
CONSTANT CURRENT SWITCHGEAR LINE-UP RS-1 SCHEDULE

REV. NO.	DATE	DESCRIPTION	BY
3	3/27/2025	ADDENDUM – 3	JAM

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-202
SHEET 60 OF 81
REV 3

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION



FINAL ONE–LINE DIAGRAM

NO SCALE

WIRE/CONDUIT SCHEDULE:

A	(3) 3–1/2"C. WITH 3#400KCMIL, 1#400KCMIL NEUTRAL, 1#1/0 BONDING JUMPER (1) 3–1/2"C. SPARE
B	6x6 WIREWAY WITH 4#350KCMIL, 4#1/0 NEUTRAL PER PHASE AND 1#3/0G
C	1–1/2"C. WITH 4#2, 1#8G
D	2–1/2"C. WITH 4#4/0, 1#4G
E	1–1/4"C. WITH 2#3, 1#8G
F	3/4"C. WITH 2#10, 1#10G
G	1"C. WITH 2#4, 1#8G
H	1–1/4"C. WITH 2#1/0, 1#6G
I	1–1/2"C. WITH 2#3/0, 1#6G
J	1–1/2"C. WITH 2#2, 1#8G
K	(2) 2–1/2" C. WITH 3#250 KCMIL, 1#2G
L	(2) 2" C. WITH 3#250KCMIL, 1#2G
N	1" C. WITH #12 CONTROL AND CT WIRING NUMBER OF CONDUCTORS AS REQUIRED
O	(3) 3 1/2" C. WITH 3#400KCMIL, 1#400 KCMIL NEUTRAL, 1#2/0G
P	2"C. WITH 3#3/0, 1#6G
Q	3" C. WITH 4#500 KCMIL, 1#3G
R	(2) 2–1/2" C. WITH 3#250, 1#2G
S	(2) 2–1/2" C. WITH 3#300, 1#2G

NOTES:

1. CONDUIT SHOWN IN SCHEDULE (E) THRU (K) IS FOR CONNECTION TO EQUIPMENT FROM WIREWAY
2. INSTALL #4/0 CU JUMPER BETWEEN REINFORCING BARS IN GENERATOR PAD. PROVIDE CAT 6 NETWORK CONNECTION FROM GENERATOR CONTROLLER TO NETWORK HUB IN VAULT BASEMENT. EXOTHERMICALLY WELD JUMPER TO BARS.
3. LOAD BANK CONTROLLER SHALL:
   – AUTOMATICALLY DISCONNECT LOAD BANK DURING LOW VISIBILITY CONDITIONS
   – AUTOMATICALLY ADJUST THE LOAD WHILE THE GENERATOR IS IN OPERATION, TO AVOID WET STACKING (AUTO LOAD LEVELING).

PROJECT DESIGNER:
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SCALE: NTS
DATE: MARCH 2025
DESIGNED BY: RB
DRAWN BY: SB
CHECKED BY: JM
APPROVED: NR

MANCHESTER • BOSTON REGIONAL AIRPORT
AIRFIELD LIGHTING VAULT EXPANSION

OVERALL ELECTRICAL VAULT FINAL ONE–LINE DIAGRAM

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
3	3/28/2025	ADDENDUM – 3	RB

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-302
SHEET 68 OF 81
REV 3

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

BUS 400 AMPERE
PANEL RATING 22 KAIC
SUPPLY VOLTAGE 208Y/120V
SERVICE 3ø, 4W, WITH GROUND BUS

PANEL No. LDP

LOCATION STORAGE 102
MOUNTING SURFACE
DRAWING No. E-101

WIRING WIRE	WIRING COND	DESCRIPTION	VA OR W ØA	ØB	ØC	BREAKER POLE	A	CKT NO	BUS CONN		CKT NO	BREAKER POLE	A	VA OR W ØA	ØB	ØC	DESCRIPTION	WIRING COND	WIRING WIRE
			13341					1	x		2	1	20	65			RM 105 & EXTERIOR LIGHTING	3/4"	2#12, 1#12G
2-1/2"C. WITH 4#4/0, 1#4G	3/4"	PANEL LA		11265		3	225	3		x	4								
					10063			5			6	3	100				GENERATOR ACCESSORY	2"	4#2, 1#8G
			4456					7	x		8						PANEL		
2-1/2"C. WITH 4#2, 1#8G	3/4"	PANEL LB		5376		3	100	9		x	10	1	20			442	RM 105 LIGHTING		
					5852			11			12	1	20				SPARE		
								13	x		14	2	20	2100			ACCU-1		
	3/4"	SPARE				3	100	15		x	16				2100				
								17			18	2	20			2100	ACCU-2		
2#12, 1#12G	3/4"	RECEPTACLES : REGULATOR RM	360			1	20	19	x		20			2100					
2#12, 1#12G	3/4"	RECEPTACLES : REGULATOR RM		180		1	20	21		x	22	2	20		2100		ACCU-3		
2#12, 1#12G	3/4"	EF-1			1200	1	20	23			24					2100			
2#12, 1#12G	3/4"	EF-3	1200			1	20	25	x		26	1	20				SPARE		
	3/4"	SPARE				1	20	27		x	28	1	20				SPARE		
	3/4"	SPARE				1	20	29			30	1	20				SPARE		
	3/4"	SPARE				1	20	27	x		28	1	20				SPARE		
	3/4"	SPARE				1	20	29		x	30	1	20				SPARE		
	3/4"	SPARE				1	20	27	x		28	1	20				SPARE		
		TOTAL 1	19357	16821	17115						TOTAL 2								
		TOTAL 2	5265	5642	5200														
		TOTAL 1 + 2	24622	22463	22315														

CONN. LOAD TOTAL 69400
AMPERES

MAIN BREAKER 350A
FEEDER ENTRANCE BOTTOM
FEEDER SIZE SEE ONE-LINE
SOURCE
PANEL TYPE BOLT-ON

MAIN LUGS 400 AMPERE
ENCLOSURE TYPE NEMA 1
ACCESSORIES

BUS 225 AMPERE
PANEL RATING 22 KAIC
SUPPLY VOLTAGE 208Y/120V
SERVICE 3ø, 4W, WITH GROUND BUS

PANEL No. LA

LOCATION
MOUNTING SURFACE
DRAWING No. E-101

WIRING WIRE	WIRING COND	DESCRIPTION	VA OR W ØA	ØB	ØC	BREAKER POLE	A	CKT NO	BUS CONN		CKT NO	BREAKER POLE	A	VA OR W ØA	ØB	ØC	DESCRIPTION	WIRING COND	WIRING WIRE
2#12, 1#12G	3/4"	BASEMENT AND STAIR LIGHTING	958			1	20	1	x		2			267			EXHAUST FAN EF-2		
2#12, 1#12G	3/4"	GEN. & REGULATOR RM LTG		864		1	20	3		x	4	3	15		267		EXHAUST FAN EF-2	3/4"	3#12, 1#12G
2#12, 1#12G	3/4"	EXTERIOR LIGHTING			352	1	20	5			6					267	EXHAUST FAN EF-2		
2#12, 1#12G	3/4"	RECEPTACLES : BASEMENT	720			1	20	7	x		8	2	15	750			CAB. HEATER CH-1	3/4"	2#12, 1#12G
2#12, 1#12G	3/4"	RECEPTACLES : BASEMENT		720		1	20	9		x	10				750		CAB. HEATER CH-1		
		SPARE				1	20	11			12	1	20			1000	RLIM AC FEED	3/4"	2#12, 1#12G
2#12, 1#12G	3/4"	RECEPTACLES : STORAGE [103]	900			1	20	13	x		14	1	20	1000			RLIM AUX	3/4"	2#12, 1#12G
2#12, 1#12G	3/4"	RECEPTACLES : STORAGE [102]		540		1	20	15		x	16	2	15		358		TEST REG	3/4"	2#12, 1#12G
2#12, 1#12G	3/4"	RECEPTACLES : STORAGE [102]			720	1	20	17			18					358	TEST REG		
2#12, 1#12G	3/4"	RECEPTACLES : STORAGE [102]	180			1	20	19	x		20	2	30	1200				3/4"	2#10, 1#10G
		LOAD BANK				1	20	21		x	22				1200				
		UNIT HEATER UH-1			2500			23		x	24	1	20			1000		3/4"	2#12, 1#12G
3#10, 1#10G	3/4"	UNIT HEATER UH-1	2500			3	30	25	x		26	1	20	1000				3/4"	2#12, 1#12G
		UNIT HEATER UH-1		2500				27		x	28	1	20		200		LIGHTING/COMPUTER	3/4"	2#12, 1#12G
		UNIT HEATERS UH-4, UH-3			2200			29		x	30	1	20				ALMCS CONTROL PANEL		
3#10, 1#10G	3/4"	UNIT HEATERS UH-4, UH-3	2200			3	30	31	x		32	1	20				PRIMARY ETHERNET		
		UNIT HEATERS UH-4, UH-3		2200				33		x	34	1	20				SECONDARY ETHERNET		
		UNIT HEATER UH-2			1666			35		x	36	1	20				BASEMENT CIRCUIT		
3#12, 1#12G	3/4"	UNIT HEATER UH-2	1666			3	20	37	x		38						SPACE		
		UNIT HEATER UH-2		1666				39		x	40						SPACE		
		MID FIELD RVR				1	20	41		x	42						SPACE		
		TOTAL 1	9124	8490	7438						TOTAL 2	4217	2775	2625				
		TOTAL 2	4217	2775	2625														
		TOTAL 1 + 2	13341	11265	10063														

CONN. LOAD TOTAL 34669
AMPERES 96
øA AMPERES 111

MAIN BREAKER - N/A -
FEEDER ENTRANCE TOP
FEEDER SIZE SEE ONE-LINE
SOURCE PANEL DP
PANEL TYPE BOLT-ON

MAIN LUGS 225 AMPERE
ENCLOSURE TYPE
ACCESSORIES

BUS 100 AMPERE
PANEL RATING 22 KAIC
SUPPLY VOLTAGE 208Y/120V
SERVICE 3ø, 4W, WITH GROUND BUS

PANEL No. LB

LOCATION
MOUNTING SURFACE
DRAWING No. E-101

WIRING WIRE	WIRING COND	DESCRIPTION	VA OR W ØA	ØB	ØC	BREAKER POLE	A	CKT NO	BUS CONN		CKT NO	BREAKER POLE	A	VA OR W ØA	ØB	ØC	DESCRIPTION	WIRING COND	WIRING WIRE
2#12, 1#12G	3/4"	BATTERY CHARGER	100			1	15	1	x		2			2500					
2#12, 1#12G	3/4"	BLOCK HEATER		1500		2	20	3		x	4	3	30		2500		UNIT HEATER UH-1	3/4"	3#10, 1#10G
					1500			5			6					2500				
2#12, 1#12G	3/4"	LOAD BANK CONTROLLER	1200			1	20	7	x		8			476					
2#12, 1#12G	3/4"	RECEPTACLES		720		1	20	9		x	10	3	15		476		EXHAUST FAN EF-1	3/4"	3#12, 1#12G
2#12, 1#12G	3/4"	DAYTANK PUMP 1/2HP			1176	1	20	11			12					476			
2#12, 1#12G	3/4"	TANK MONITORING PANEL	180			1	15	13	x		14						SPACE		
2#12, 1#12G	3/4"	TANK ALARM CIRCUIT		180		1	15	15		x	16						SPACE		
2#12, 1#12G	3/4"	GENERATOR ROOM BEACON			200	1	20	17			18						SPACE		
		SPARE				1	20	19	x		20						SPACE		
		SPARE				1	20	21		x	22						SPACE		
		SPARE				1	20	23			24						SPACE		
		TOTAL 1	1480	2400	2876						TOTAL 2	2976	2976	2976				
		TOTAL 2	2976	2976	2976														
		TOTAL 1 + 2	4456	5376	5852														

CONN. LOAD TOTAL 15684
AMPERES 44
øC AMPERES 49

MAIN BREAKER - N/A -
FEEDER ENTRANCE TOP
FEEDER SIZE SEE ONE-LINE
SOURCE PANEL DP
PANEL TYPE BOLT-ON

MAIN LUGS 100 AMPERE
ENCLOSURE TYPE NEMA 1
ACCESSORIES

Jacobs
2 EXECUTIVE PARK DRIVE
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PHONE: (603) 668-7181
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PROJECT DESIGNER:

SCALE: NTS
DATE: MARCH 2025
DESIGNED BY: RB
DRAWN BY: SB
CHECKED BY: JM
APPROVED: NR

MANCHESTER • BOSTON REGIONAL AIRPORT
AIRFIELD LIGHTING VAULT EXPANSION

PANELBOARD SCHEDULE

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1	3/27/2025	ADDENDUM - 3	RB

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-303
SHEET 69 OF 81
REV 1

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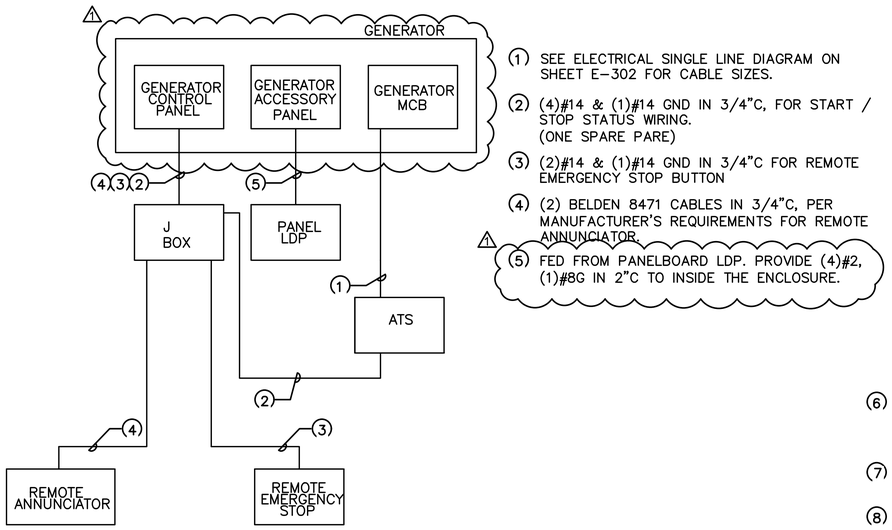
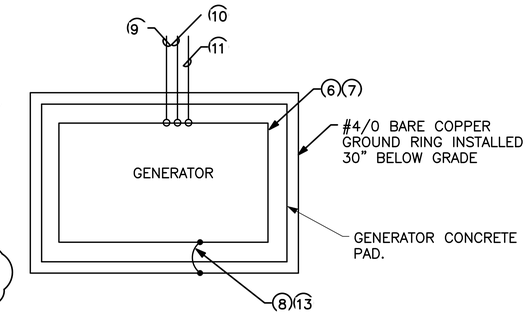


1 / E503 **GENERATOR CONDUIT DETAIL**
NOT TO SCALE



(6) PROVIDE GENERATOR SIZE AND VOLTAGE AS DEFINED ON DRAWING E-302 AND E-001 FOR PERTINENT STATION, DIESEL GENERATOR IN SKINTIGHT WEATERPROOF ENCLOSURE ON NEW CONCRETE PAD AS SHOWN ON SHEET E-001.

(7) ALL EQUIPMENT IN THE GENERATOR ENCLOSURE SHALL BE FACTORY WIRED WITH PROVISIONS FOR EXTERNAL WIRING BY CONTRACTOR.

(8) PROVIDE (1)#4/0 COPPER BONDING CONDUCTOR. BOND GENERATOR, ENCLOSURE TO GENERATOR PAD GROUNDING SYSTEM.

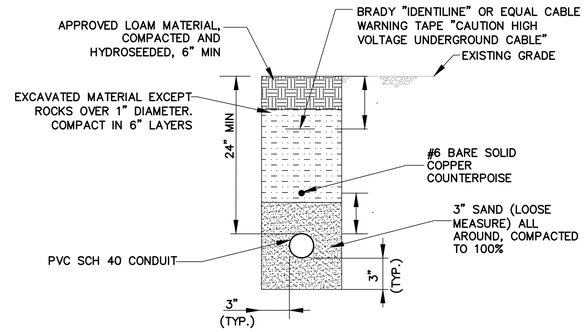
(9) EXTEND ANNUNCIATOR WIRING IN 1"C UP TO GENERATOR CONTROL PANEL INSIDE ENCLOSURE. SEE KEYNOTE 5.

(10) EXTEND SWITCHGEAR CONTROL SIGNALS IN 1"C UP TO GENERATOR CONTROL PANEL INSIDE ENCLOSURE. SEE KEY NOTE 4

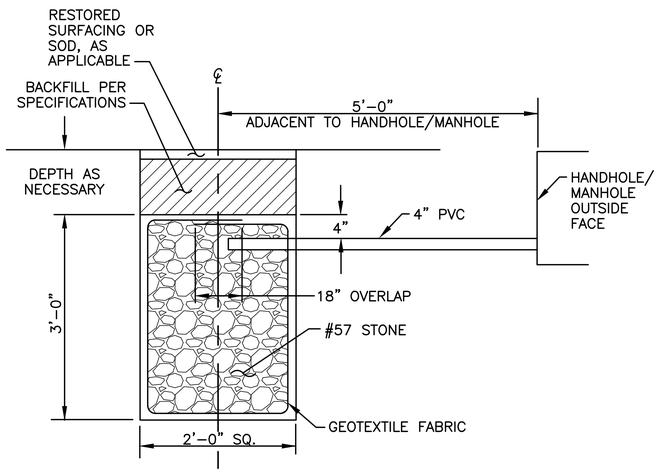
(11) EXTEND CONDUIT FOR REMOTE EMERGENCY STOP UP INTO GENERATOR CONTROL PANEL INSIDE ENCLOSURE. SEE KEYNOTE 3.

(12) COORDINATE ALL CONDUIT PENETRATIONS UP INTO GENERATOR ENCLOSURE WITH APPROVED GENERATOR SHOP DRAWINGS.

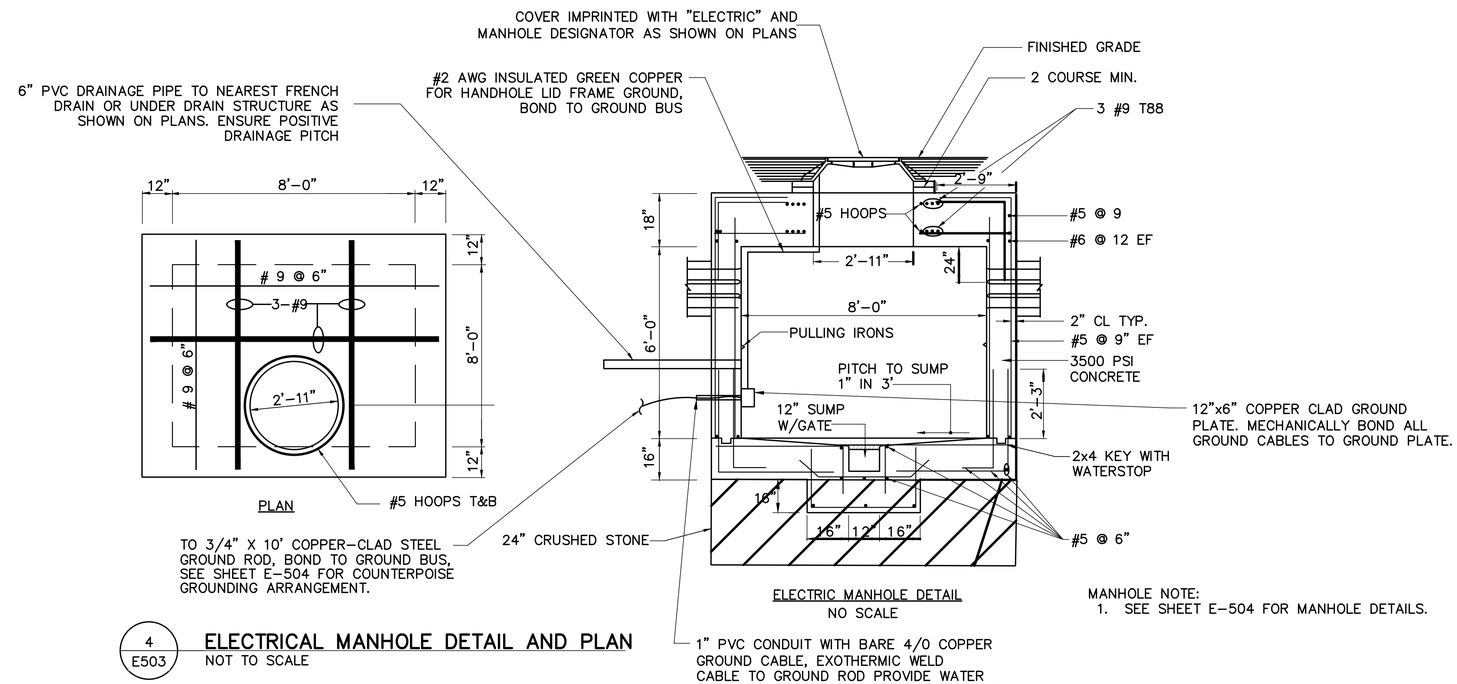
(13) PROVIDE (1)#2/0 GROUNDING ELECTRODE CONDUCTOR FROM GENERATOR ENCLOSURE TO GENERATOR PAD GROUNDING SYSTEM.



2 / E503 **DIRECT BURIED 2" PVC CONDUIT IN TURF**
NOT TO SCALE



3 / E503 **TYPICAL FRENCH DRAIN DETAIL**
NOT TO SCALE



ELECTRIC MANHOLE DETAIL
NO SCALE

MANHOLE NOTE:
1. SEE SHEET E-504 FOR MANHOLE DETAILS.

4 / E503 **ELECTRICAL MANHOLE DETAIL AND PLAN**
NOT TO SCALE

PROJECT DESIGNER: Jacobs
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SCALE:	NTS
DATE: MARCH 2025	
DESIGNED BY:	JM
DRAWN BY:	SB
CHECKED BY:	JM
APPROVED:	NR

MANCHESTER • BOSTON REGIONAL AIRPORT
AIRFIELD LIGHTING VAULT EXPANSION

ELECTRICAL DETAILS SHEET 4 OF 6

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
3	3/27/2025	ADDENDUM - 3	RB

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
E-503
SHEET 78 OF 81
REV

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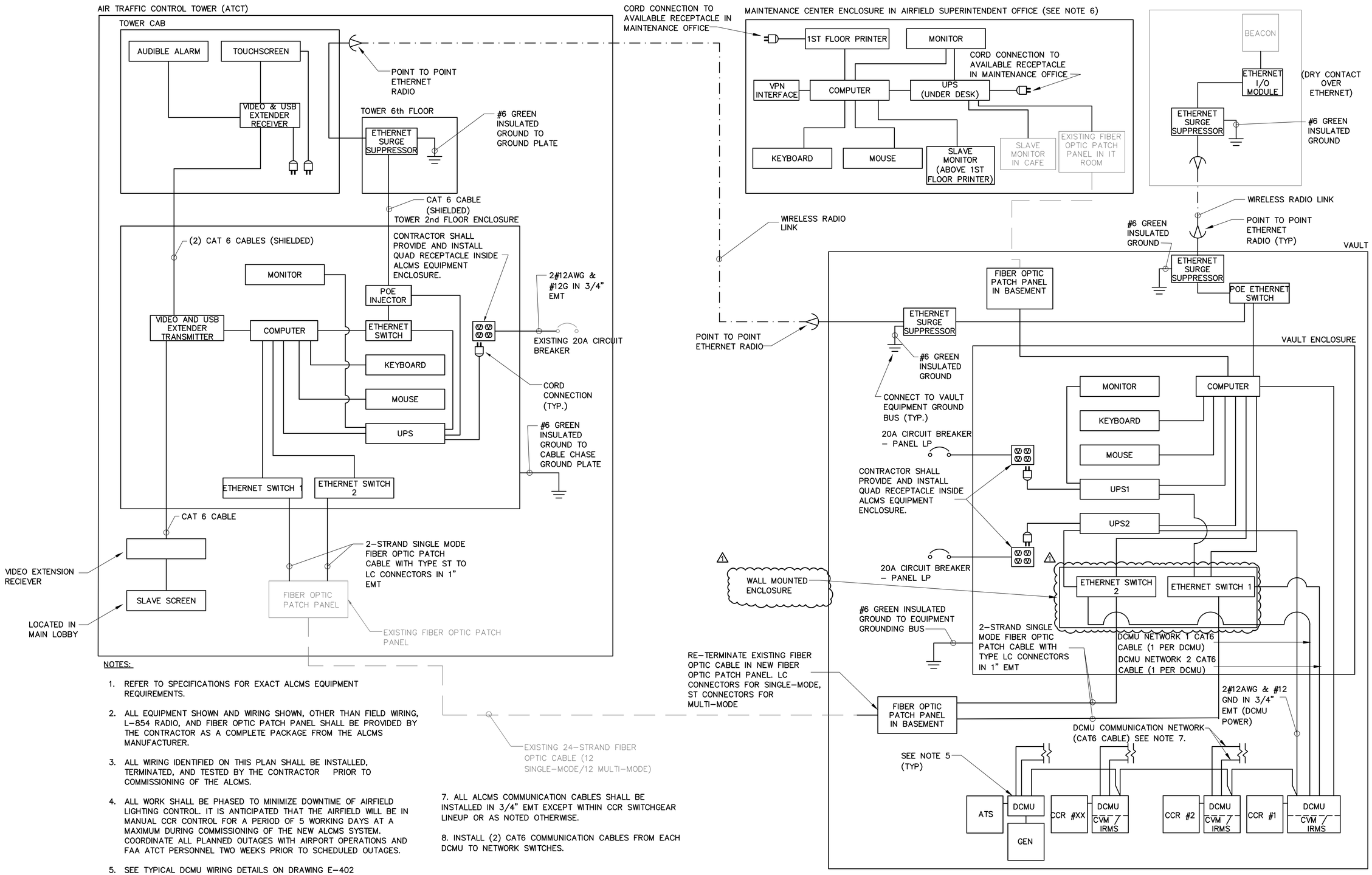
Jacobs - \\mhtfil01\job2024\E2X97905 - MHT Electrical Vault Design\700 CAD\703-Electrical\E500 Electrical Details - Addendum 3.dwg [E503] March 27, 2025 - 3:45pm [BARLOWS2]



NOTES:

1. REFER TO SPECIFICATIONS FOR EXACT ALCMS EQUIPMENT REQUIREMENTS.
2. ALL EQUIPMENT SHOWN AND WIRING SHOWN, OTHER THAN FIELD WIRING, L-854 RADIO, AND FIBER OPTIC PATCH PANEL SHALL BE PROVIDED BY THE CONTRACTOR AS A COMPLETE PACKAGE FROM THE ALCMS MANUFACTURER.
3. ALL WIRING IDENTIFIED ON THIS PLAN SHALL BE INSTALLED, TERMINATED, AND TESTED BY THE CONTRACTOR PRIOR TO COMMISSIONING OF THE ALCMS.
4. ALL WORK SHALL BE PHASED TO MINIMIZE DOWNTIME OF AIRFIELD LIGHTING CONTROL. IT IS ANTICIPATED THAT THE AIRFIELD WILL BE IN MANUAL CCR CONTROL FOR A PERIOD OF 5 WORKING DAYS AT A MAXIMUM DURING COMMISSIONING OF THE NEW ALCMS SYSTEM. COORDINATE ALL PLANNED OUTAGES WITH AIRPORT OPERATIONS AND FAA ATCT PERSONNEL TWO WEEKS PRIOR TO SCHEDULED OUTAGES.
5. SEE TYPICAL DCMU WIRING DETAILS ON DRAWING E-402
6. ALL EQUIPMENT IN MAINTENANCE CENTER SHALL BE INSTALLED IN NEW 1/2 SIZE EQUIPMENT RACK.
7. ALL ALCMS COMMUNICATION CABLES SHALL BE INSTALLED IN 3/4" EMT EXCEPT WITHIN CCR SWITCHGEAR LINEUP OR AS NOTED OTHERWISE.
8. INSTALL (2) CAT6 COMMUNICATION CABLES FROM EACH DCMU TO NETWORK SWITCHES.

PROJECT DESIGNER:
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SCALE:	DATE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
NTS	MARCH 2025	JM	SB	JM	NR

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

ALCMS ARCHITECTURE DIAGRAM

REV. NO.	DATE	DESCRIPTION	BY
3	3/27/2025	ADDENDUM - 3	JAM

PROJ. NO.: 3-33-0011-TBD-2025

JE FILE: E2X97905

DRAWING NO.

E-401

SHEET 71 OF 81

REV

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

SINGLE LINE	DOUBLE LINE	DESCRIPTION
		SUPPLY AIR FLOW
		OUTSIDE AIR FLOW
		RETURN/EXHAUST AIR FLOW
		SUPPLY/OUTSIDE AIR FLOW
		RETURN AIR FLOW
		EXHAUST AIR FLOW
		RECTANGULAR SUPPLY DUCT ELBOW (UP & DN)
		RECTANGULAR RETURN DUCT ELBOW (UP & DN)
		RECTANGULAR EXHAUST DUCT ELBOW (UP & DN)
M		MOTOR OPERATED DAMPER
T	T	TEMPERATURE SENSOR

SINGLE LINE	DESCRIPTION
X	NON-POWERED EQUIPMENT TAG
X X	POWERED EQUIPMENT TAG

NOTE- NOT ALL SYMBOLS APPEAR ON DRAWINGS

ABBREVIATIONS

A	
ARCH	ARCHITECTURAL
B	
BLDG	BUILDING
BTUH	BRITISH THERMAL UNITS PER HOUR
C	
CFM	CUBIC FEET PER MINUTE
D	
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DWG	DRAWING
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EX	EXHAUST
F	
F	FAHRENHEIT
FPM	FEET PER MINUTE
FT	FEET/FOOT
G	
GA	GAUGE
H	
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HZ	HERTZ
K	
KW	KILOWATT
M	
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MECH	MECHANICAL
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
N	
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
P	
PC	PUMPED CONDENSATE
PD	PRESSURE DIFFERENTIAL
PH	PHASE
R	
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
S	
SA	SUPPLY AIR
SPEC	SPECIFICATION
SQ.FT.	SQUARE FOOT
T	
T	THERMOSTAT/TEMPERATURE SENSOR
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
V	
V	VOLT
W	
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WMS	WIRE MESH SCREEN

GENERAL NOTES

1) PROVIDE ACCESS DOORS FOR ALL DEVICES PER SPECIFICATIONS.

2) SEE ARCHITECTURAL DRAWINGS FOR FIREWALL RATINGS AND LOCATIONS.

3) REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING MOUNTED DEVICES.

CONTROLS ABBREVIATIONS

DO	DIGITAL OUTPUT
HOA	HAND OFF AUTO, SELECTOR SWITCH
HS	HAND SWITCH
NC	NORMALLY CLOSED
TT	TEMPERATURE THERMOSTAT
ZP	POSITION SENSOR
ZT	TEMPERATURE SENSOR

INSTRUMENT ABBREVIATIONS

OUTPUTS

MOD MOTORIZED ELECTRIC DAMPER ACTUATOR

CONTROL SYSTEM GENERAL NOTES

1. REFER TO FLOOR PLANS FOR THE LOCATIONS OF ALL SPACE MOUNTED SENSORS AND/OR THERMOSTATS. THERMOSTATS ARE INDICATED BY T

SYMBOL	DESCRIPTION
MOD	MOTOR OPERATED DAMPER
	FAN OR PUMP

SEQUENCE OF CONTROLS - GENERAL

1. SEQUENCES OF OPERATIONS OUTLINED (UNLESS OTHERWISE SPECIFIED) SHALL BE PERFORMED BY A CENTRAL BUILDING AUTOMATION SYSTEM (BAS). ADDRESS IDENTIFIERS FOR ALL POINTS AND VARIABLES SHOWN IN THE DIAGRAMS SHALL BE COORDINATED WITH AND APPROVED BY THE ARCHITECT UNLESS OTHERWISE SPECIFIED. ALL SETPOINTS AND TIME DELAYS SHALL BE ADJUSTABLE BY THE OPERATOR WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS. MONITORING OF ALL FUNCTIONS SHALL BE AVAILABLE. PROVIDE MENU DRIVEN CAPABILITY FOR OPERATOR TO OVERRIDE AUTOMATED START/STOP SEQUENCES FOR EACH PIECE OF EQUIPMENT. IF A SEQUENCE IS DISABLED BY THE OPERATOR BUT AN AUTOMATIC START IS INITIATED, THE SYSTEM SHALL ISSUE AN ALARM STATING THAT THE EQUIPMENT WAS UNABLE TO START/STOP DUE TO USER INPUT. THE SYSTEM SHALL THEN ATTEMPT TO START THE NEXT SEQUENTIAL PIECE OF EQUIPMENT.

2. THE DESIGN INTENT IS FOR THE CONTROL SYSTEM TO MONITOR PRESSURES, TEMPERATURES, AND FLOWS AND TO CONTROL VALVES AND START/STOP EXHAUST FANS. MONITORED DATA WILL BE USED TO ENERGIZE OR DEENERGIZE EQUIPMENT.

3. ALL EQUIPMENT CONTROLLED BY THE BAS SHALL BE CAPABLE OF MANUAL OPERATION THROUGH HAND-OFF-AUTOMATIC (HOA) SWITCHES IN STARTERS PROVIDED. THE POSITIONS OF ALL VALVES CONTROLLED BY THE SYSTEM SHALL BE CAPABLE OF MANUAL POSITIONING (OPEN, CLOSED, MODULATED, AUTO) VIA LABELED POTENTIOMETERS AND MANUAL SWITCHES PROVIDED BY BAS CONTRACTOR.

4. COORDINATE ALL SENSOR INSTALLATION WITH MECHANICAL CONTRACTOR.

5. FAIL-SAFE POSITIONS INDICATED ARE POSITIONS THAT DEVICES WILL GO TO WHEN DEENERGIZED.

6. PROVIDE ADEQUATE DAMPING OF ALL MODULATING CONTROL LOOPS TO PREVENT HUNTING.

7. WHENEVER A UNIT IS SHUTDOWN BECAUSE OF ONE OF ITS SAFETIES, THE SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH DEVICE TO HELP THE OPERATOR TO ISOLATE THE CAUSE OF THE SHUTDOWN.

8. WHENEVER AN ALARM IS INITIATED, THE SYSTEM SHALL RETAIN IN MEMORY THE READINGS AND SET POINTS OF EACH DEVICE TO ASSIST THE OPERATOR TO ISOLATE THE CAUSE OF THE ALARM.

9. IF ANY CONTROL PANEL OR EQUIPMENT MANUFACTURER'S CONTROL SYSTEM LOSES COMMUNICATION WITH THE BAS, AN ALARM SHALL BE GENERATED INDICATING THE LOCATION OF THE FAULT.

UNIT HEATER SCHEDULE

REF	TAG	DESCRIPTION	AREA SERVED	SIZE (L X W X H) (IN.)	HEATING CAPACITY (MBH)	POWER (KW)	AMPS	V/PH/HZ	MANUFACTURER	MODEL	NOTES
UH	1	UNIT HEATER	BASEMENT	19 x 8 x 22	25,6	7,5	9,0	208/3/60	Q-MARK	MUH-07-04	1
UH	2	UNIT HEATER	STAIR 101	14 x 8 x 16	10,2	3,0	10,2	208/3/60	Q-MARK	MUH-03-41	1
UH	3	UNIT HEATER	STORAGE 102	14 x 8 x 16	17,0	5,0	6,0	208/3/60	Q-MARK	MUH-05-04	1
UH	4	UNIT HEATER	STORAGE 103	19 x 8 x 22	25,6	7,5	9,0	208/3/60	Q-MARK	MUH-07-04	1
UH	5	UNIT HEATER	STORAGE 104	19 x 8 x 22	25,6	7,5	9,0	208/3/60	Q-MARK	MUH-07-04	1
UH	6	UNIT HEATER	NEW REG RM	14 x 8 x 16	17,0	5,0	6,0	208/3/60	Q-MARK	MUH-05-41	1
UH	7	UNIT HEATER	NEW REG RM	14 x 8 x 16	17,0	5,0	6,0	208/3/60	Q-MARK	MUH-05-41	1

NOTES:

1. PROVIDE MOUNTING BRACKET & TRANSFORMER WITH 120 V THERMOSTAT.
2. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.

EXHAUST FAN SCHEDULE

REF	TAG	FAN TYPE	AREA SERVED	AIRFLOW (CFM)	EXT. S.P. IN.	MIN. MOTOR HP	RPM	FLA	MCA	MOCP	V/PH/HZ	MANUFACTURER	MODEL	NOTES
EF	1	SIDEWALL PROPELLER EXHAUST FAN	STORAGE 102	600 CFM		0,5	434	6,6	8,2	15	115/1/60	GREENHECK	SE1-14-440-VG	1
EF	2	ROOF CENTRIFUGAL	STORAGE 103	600 CFM	0,125	0,1	1800				115/1/60	GREENHECK	G-095	2
EF	3	SIDEWALL PROPELLER EXHAUST FAN	STORAGE 104	600 CFM		0,5	434	6,6	8,2	15	115/1/60	GREENHECK	SE1-14-440-VG	1

NOTES:

1. PROVIDE 26" WALL HOUSING, DAMPER WITH DAMPER GUARD, AND OSHA MOTOR SIDE GUARD.
2. PROVIDE 12" ROOF CURB.
3. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.

SPLIT AIR CONDITIONING UNIT (AC) SCHEDULE

REF	TAG	AREA SERVED	COOLING CAPACITY (BTUH)	AIRFLOW (CFM)	V/PH/HZ	FLA	MCA	WEIGHT (LB)	MANUFACTURER	MODEL NO.	NOTES
AC	1	NEW REG RM	42000	1200	(208/230)/1/60	0,95	2,0	56	MITSUBISHI ELECTRIC	PLA-A42EA7	1-2
AC	2	NEW REG RM	42000	1200	(208/230)/1/60	0,95	2,0	56	MITSUBISHI ELECTRIC	PLA-A42EA7	1-2
AC	3	NEW REG RM	42000	1200	(208/230)/1/60	0,95	2,0	56	MITSUBISHI ELECTRIC	PLA-A42EA7	1-2

NOTES:

1. PROVIDE WITH LOW AMBIENT OPERATION.
2. PROVIDE CONDENSATE PUMP(S).
3. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.

AIR COOLED CONDENSING UNIT (ACCU) SCHEDULE

REF	TAG	AREA SERVED	COOLING CAPACITY (BTUH)	MCA	MOCP	V/PH/HZ	WEIGHT (LB)	MANUFACTURER	MODEL NO.	NOTES
ACCU	1	NEW REG RM	42000	25,0	31	(208/230)/1/60	211	MITSUBISHI ELECTRIC	PUY-A42NKA7	1
ACCU	2	NEW REG RM	42000	25,0	31	(208/230)/1/60	211	MITSUBISHI ELECTRIC	PUY-A42NKA7	1
ACCU	3	NEW REG RM	42000	25,0	31	(208/230)/1/60	211	MITSUBISHI ELECTRIC	PUY-A42NKA7	1

NOTES:

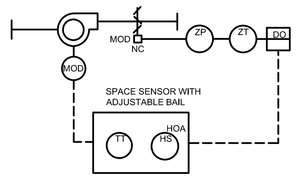
1. PROVIDE WITH LOW AMBIENT OPERATION.
2. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.

GRAVITY VENTILATOR (GV) SCHEDULE

REF	TAG	AREA SERVED	AIRFLOW (CFM)	THROAT W (IN) X L (IN)	CURB CAP W (IN) X L (IN)	MANUFACTURER	MODEL NO.	NOTES
GV	1	STORAGE 103	2374	24 x 30	30 x 36	GREENHECK	FGI	1
GV	2	STORAGE 104	2374	24 x 30	30 x 36	GREENHECK	FGI	1

NOTES:

1. PROVIDE 12" ROOF CURB.
2. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE, BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.



EXHAUST FAN

A. GENERAL

1. FURNISH AND INSTALL SPACE TEMPERATURE THERMOSTAT WHICH SHALL CYCLE THE ROOM EXHAUST FAN ON WHENEVER THE SPACE TEMPERATURE RISES ABOVE 85°F.

EXHAUST FAN CONTROLS 01
SCALE: NOT TO SCALE M-001

PROJECT DESIGNER:

Jacobs
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SCALE:
DATE: MARCH 2025
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED:

MANCHESTER • BOSTON REGIONAL AIRPORT

AIRFIELD LIGHTING VAULT EXPANSION

MECHANICAL LEGEND, SCHEDULES, AND CONTROLS

REVISIONS			
REV. NO.	DATE	DESCRIPTION	BY
3	03-28-2025	ADDENDUM - 3	EL

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
M-001

SHEET 44 OF 81
REV

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

GENERAL NOTES:

1. THE PLUMBING DRAWINGS ARE DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. FIELD VERIFY ALL EXISTING CONDITIONS. WHERE NEW PIPING CONNECTS TO EXISTING, THE NEW PIPE SHALL MATCH IN MATERIAL, SLOPE AND ALIGNMENT. THE PLUMBING CONTRACTOR SHALL COORDINATE HIS WORK WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL TRADES.
2. PROTECT THE WORK FROM DAMAGE OF ANY CAUSE. REPLACE ANY NEW OR EXISTING WORK DAMAGED AT NO COST TO THE OWNER.
3. THE PLUMBING CONTRACTOR SHALL BE FAMILIAR WITH ALL CONTRACT DOCUMENTS FOR ALL TRADES AND COORDINATE WITH OTHER CONTRACTORS.
4. DRAWINGS ARE DIAGRAMMATIC ONLY, FINAL ROUTING OF PIPING AND EQUIPMENT LOCATIONS SHALL BE DETERMINED IN THE FIELD. ADDITIONAL OFFSETS, ELBOWS, ETC., SHALL BE PROVIDED AND INSTALLED WITHOUT ADDITIONAL COST TO THE OWNER..
5. THE PLUMBING CONTRACTOR SHALL COORDINATE ALL ELECTRICAL, FIRE PROTECTION & HVAC REQUIREMENTS WITH THE ELECTRICAL, FIRE PROTECTION AND HVAC CONTRACTORS PRIOR TO ANY INSTALLATION. PROVIDE ANY AND ALL NECESSARY OFFSETS OR RELOCATION FOR COORDINATION WITH OTHER TRADES AND OR STRUCTURE.
6. THE PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE PLUMBING WORK COMPLETE AND READY FOR OPERATION.
7. ALL PLUMBING EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL PLUMBING PRODUCTS SHALL BE APPROVED BY STATE AND LOCAL AUTHORITIES.
8. DEMOLITION WORK SHALL BE DONE BY THE PLUMBING CONTRACTOR, UNLESS NOTED OTHERWISE. THE PLUMBING CONTRACTOR SHALL COORDINATE ALL WORK CONCERNING EXISTING EQUIPMENT AND SYSTEMS REMAINING IN THE BUILDING.
9. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE INTEGRITY, CONDITION, LOCATION AND INVERT ELEVATION OF ANY EXISTING PIPING WHICH IS TO BE REUSED. IF PIPING CANNOT BE REUSED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER TO DETERMINE EXTENT OF REPLACEMENT PRIOR TO ANY REMOVAL.
10. THE PLUMBING CONTRACTOR SHALL INFORM AND COORDINATE WITH THE OWNER ALL NECESSARY INTERRUPTIONS TO EXISTING BUILDING SYSTEMS AND SERVICE THAT MAY AFFECT THE NORMAL OPERATION OF OCCUPIED PORTIONS OF THE BUILDING. THE OWNER SHALL BE INFORMED OF ANY INTERRUPTIONS AT LEAST 24 HOURS IN ADVANCE, AND GRANT PERMISSION FOR EACH SHUT-DOWN.
11. THE PLUMBING CONTRACTOR SHALL INFORM THE OWNER WELL IN ADVANCE OF ANY WORK TO BE UNDERTAKEN IN OCCUPIED AREAS OF THE BUILDING ASSOCIATED WITH THIS PROJECT. THE PLUMBING CONTRACTOR SHALL CONFORM TO THE OWNER'S CRITERIA FOR WORK HOURS, ENVIRONMENTAL ISOLATION, AND NOISE LIMITS IN THE PORTIONS OF THE BUILDING WHICH REMAIN OCCUPIED DURING CONSTRUCTION.
12. PLUMBING CONTRACTOR SHALL CONFORM TO ALL PHASING, AND SEQUENCING REQUIRED BY THESE CONTRACT DOCUMENTS AND THE CONSTRUCTION MANAGER/G.C. SEE ARCHITECTURAL DRAWINGS FOR PHASING PLANS.
13. PLUMBING CONTRACTOR SHALL PERFORM ALL CORES REQUIRED FOR THEIR WORK.
14. PLUMBING CONTRACTOR SHALL INSTALL ALL TEMPORARY VALVES, CAPS AND TESTS AS REQUIRED TO ACCOMMODATE PHASING. ALL CORES SHALL BE PRODUCED FOR APPROVAL BY THE STRUCTURAL ENGINEER PRIOR TO ANY WORK.
15. THE PLUMBING SYSTEMS SHALL BE FULLY OPERATIONAL FOR EACH PHASE OF CONSTRUCTION.
16. PLUMBING CONTRACTOR SHALL PERFORM ALL TEMPORARY PIPING RELOCATIONS, CAPPING, VALVES, AND TESTS OF EXISTING PLUMBING SYSTEMS AS REQUIRED TO MAINTAIN OPERATION IN UN-RENOVATED AREAS OF THE BUILDING PRIOR TO THEIR RENOVATION OF SUCH AREA.
17. ALL EXISTING INVERTS UNDER SLAB SHALL BE VERIFIED PRIOR TO COMMENCEMENT OF ANY WORK.
18. ALL EXISTING STORM DRAINAGE & DOMESTIC WATER PIPING TO REMAIN. SHALL BE RE-INSULATED AND LABELED ACCORDING TO NEW WORK SPECIFICATIONS.

GENERAL INSULATION NOTES:

1. COORDINATE THE INSTALLATION OF INSULATION WORK WITH THE WORK OF OTHER TRADES TO ASSURE THAT SLEEVES AND DUCT OPENINGS IN WALLS ARE OF ADEQUATE SIZE IN ORDER TO AVOID INTERFERENCES AND ALLOW INSULATION TO BE INSTALLED PROPERLY.
2. ALL INSULATION SHALL HAVE COMPOSITE FIRE AND SMOKE, HAZARD RATINGS AS TESTED BY PROCEDURE ASTM-E-84, NFPA 255 AND UL-723, NOT EXCEEDING A FLAME SPREAD OF (25), FUEL CONTRIBUTION OF (50) AND SMOKE DEVELOP OF (50).
3. INSULATION (NEW AND EXISTING) WHICH IS DAMAGED DURING CONSTRUCTION SHALL BE FULLY REPLACED OR NEATLY REPAIRED.
4. INSULATION ON PIPES THROUGH SLEEVES AND OTHER OPENINGS SHALL BE CONTINUOUS WITH NO REDUCTION IN THICKNESS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.

PLUMBING LEGEND

COLD WATER (CW)	
120 HOT WATER (120, 140)	
COND CONDENSATE	
SAN SANITARY	
IW INDIRECT WASTE (IW)	
(V) VENT	
HWR HOT WATER RETURN	
XST EXISTING STORM	
ST STORM	
GR GREASE WASTE	
IWD INDIRECT WASTE DISCHARGE	
IV INDIRECT VENT	
G GAS	
FLOW IN DIRECTION OF ARROW	
SPR SPRINKLER	
PITCH DOWN IN DIR. OF ARROW	
STRAINER	
PRESSURE-REDUCING VALVE	
BALL VALVE	
CHECK VALVE	
GAS COCK	
CAP OR END OF PIPE	
WATER HAMMER ARRESTER	
ELBOW UP THRU FLOOR SHOWN	
PIPE DROP OR RISE	
TEE LOOKING DOWN	
FLOOR CLEANOUT (FCO)	
CLEANOUT	
CONNECT TO EXISTING (CTE)	
EXISTING ROOF DRAIN	
ROOF DRAIN	
XXXXXXX DEMOLISHED PIPE	

UF	UNDER FLOOR
ABC	ABOVE CEILING
INV EL	INVERT ELEVATION
GT	GREASE TRAP
FS	FLOOR SINK
UH	UNIT HEATER
CFH	CUBIC FEET PER HOUR
RTU	ROOF TOP UNIT
VTR	VTR VENT THRU ROOF
IVTR	INDIRECT VENT THRU ROOF
VB	VACUUM BREAKER
HR	HOSE REEL
PVB	PRESSURE VACUUM BREAKER
FIN FL EL	FINISH FLOOR ELEVATION
RD	ROOF DRAIN
BFP	BACK FLOW PREVENTER
PRV	PRESSURE REDUCING VALVE
DW	DISHWASHER
UF	UNDER FLOOR
RWL	RAIN WATER LEADER
ES/EW	EMERGENCY SHOWER/EYE WASH
ETR	EXISTING TO REMAIN
V	VENT

NOTE:
SOME SYMBOLS MAY NOT BE USED ON THIS PROJECT.

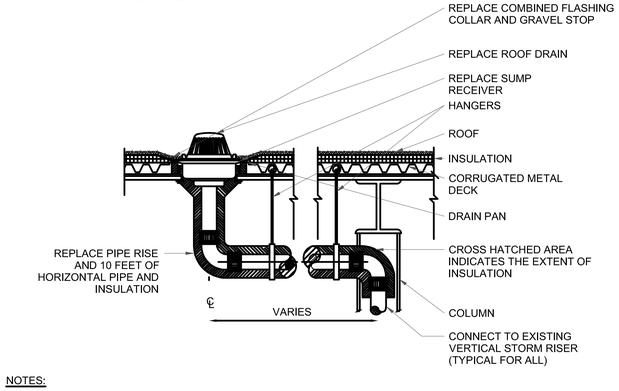
ROOF DRAIN SCHEDULE

FIXTURE DESIG.	BASIS OF DESIGN	DESCRIPTION	REMARKS
RD-1	JAY R. SMITH MODEL #1010-E-R-C-CID	CAST IRON BODY WITH COMBINATION FLASHING COLLAR/GRAVEL STOP AND REMOVABLE CAST IRON DOME	CAULKED CAST IRON BODY WITH COMBINATION MEMBRANE FLASHING CLAMP/GRAVEL GUARD AND LOW SILHOUETTE ALUMINUM DOME, SUPPLIED WITH UNDERDECK CLAMP AND VALNDAL PROOF SECURED TOP. ADD EXTENSION AS NEEDED.

1

SCHEDULE NOTES:

1. MANUFACTURERS, MODELS, AND SERIES MAY INCLUDE BUT ARE NOT LIMITED TO THOSE NAMED IN THE SCHEDULE. ALTERNATE EQUIPMENT MAY BE PROPOSED BY THE CONTRACTOR.



NOTES:

1. REMOVE EXISTING ROOF DRAIN TO ALLOW FOR NEW ROOFING. REPLACE ROOF DRAIN AFTER ROOFING IS APPLIED. SUPPORT EXISTING PIPE FROM STRUCTURE DURING ROOF REPLACEMENT WHERE NO SUPPORT IS EXISTING, FIELD VERIFY.
2. FOR APPROXIMATE LOCATION OF ROOF DRAINS COORDINATE WITH ROOF FRAMING PLAN AND ARCHITECTURAL ROOF PLAN
3. REPLACEMENT OF UP TO 10 FEET OF HORIZONTAL PIPING.

1 ROOF DRAIN DETAIL
NTS

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SCALE:
DATE: MARCH 2025
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED:

MANCHESTER • BOSTON REGIONAL AIRPORT
AIRFIELD LIGHTING VAULT EXPANSION

PLUMBING NOTES, LEGEND, SCHEDULES, AND DETAILS

REV NO.	DATE	DESCRIPTION	BY
1	03-28-2025	ADDENDUM - 3	EL

REVISIONS

PROJ. NO.: 3-33-0011-TBD-2025
JE FILE: E2X97905

DRAWING NO.
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