

Date: July 5, 2016

Project: Kake Bulk Fuel and Rural Power
System Upgrades

Solicitation No.: 16155

Addendum No. One

TO ALL PLANHOLDERS:

The enclosed addendum amends the proposal documents for the above referenced Project.

Acknowledgment of this addendum is required on the Proposal Submittal. Failure to do so may subject the proposer to disqualification.

Sincerely,

Rich Wooten, CDT, CPSM
Contract Compliance Specialist

ADDENDUM TO THE DESIGN/BUILD DOCUMENTS	Page Number 1	No. of Pages 3 (Attachments 32 pages)
Addendum No. ONE	Date Addendum Issued: July 5, 2016	
Issuing Office Rich Wooten, CDT, CPSM Alaska Industrial Development Export Authority 813 W Northern Lights Blvd Anchorage, AK 99503 Phone: (907) 771-3019 Fax: (907) 771-3044	Previous Addenda Issued None	
Project: Kake Bulk Fuel and Rural Power System Upgrades Solicitation No.: 16155	Date and Hour Quotes Due: July 21, 2016 at 3:00 p.m., prevailing Anchorage time.	

NOTICE TO PROPOSERS:

Proposers must acknowledge receipt of this addendum prior to the hour and date set for proposal due date by one of the following methods:

- (a) By acknowledging receipt of this addendum on the proposal form submitted.
- (b) By email or telefacsimile which includes a reference to the project and addendum number.

The proposal documents require acknowledgment individually of all addenda to the drawings and/or specifications. This is a mandatory requirement and any proposal received without acknowledgment of receipt of addenda may be classified as not being a responsive proposal. If, by virtue of this addendum it is desired to modify a proposal already submitted, such modification may be made by email or telefacsimile provided such an email or telefacsimile makes reference to this addendum and is received prior to the opening hour and date specified above.

The Proposal documents for the above project are amended as follows (All other terms and conditions remain unchanged):

GENERAL – QUESTIONS & ANSWERS

1) **Q:** I am wondering if the metal panels found in the specification are being used on this project, and if so, are substitution requests being accepted for equal panels?

A: Yes, metal panels are used on this project. The Contractor may submit requests for substitutions, See Section 01630 Product Options and Substitutions.

2) **Q:** 1.06 Quality Assurance:
Testing: What type of weld testing is the independent testing firm to provide on the tanks? On a UL tank we would typically have the testing firm do only a visual inspection of the welds.

A: See below for clarification of Above Ground Fuel Tank independent weld testing

Q: Tank Leak Test: The normal shop test is an air test of all weld seams at 3-5 psi with a soap solution and not a hydrostatic which would introduce water to the inside of the tanks and also disposal of the waste water. Is the air test an acceptable test?

A: See below for clarification of Above Ground Fuel Tank leak test acceptable methods.

3) **Q:** 1.07 A.3 Design Requirements:

There is no stilling well detail shown for the clock gauge. Is an aluminum drop tube which is commonly used throughout the industry be acceptable? This would need to be added to your equipment package.

A: See below.

4) **Q:** On Drawing C4.03 it requires a minimum of four saddles. The two outboard saddles are required by UL to be located ¼ of the diameter in from each end. If we add two more saddles it would make the

saddle spacing 4' apart center to center can this tank have 3 saddles?

A: A minimum of four saddles are required. See above for changes to minimum saddle requirements for other tanks.

PROPOSAL AND CONTRACT REQUIREMENTS

BIDDING AND CONTRACT DOCUMENTS

A. Modifications to Bidding and Contract Documents

1. Section 15175 Aboveground Fuel Storage Tanks, Article 1.06 Quality Assurance, Paragraph B (Page 15175-4):

Delete Paragraph B in its entirety and replace with the following:

B. Testing: Provide independent testing firm to perform visual inspections of all tank fabrication welds and witness leak testing.

- B. Section 15175 Aboveground Fuel Storage Tanks, Article 1.06 Quality Assurance, Paragraph C (Page 15175-4):

Delete Paragraph C in its entirety and replace with the following:

C. Tank Leak Test: Provide tank integrity testing in the form of air testing or hydrostatic testing in accordance with UL 142.

DESIGN DRAWINGS

A. Modifications to Kake Bulk Fuel Upgrade Schedule A DRAWINGS:

1. Sheet C4.01:

Delete the entire sheet and replace with the attached Sheet C4.01 which includes the following changes:

- *Changes the minimum number of saddle supports per tank to EIGHT.*
- *Modifies Detail 2 to add 2" Aluminum Clock Gauge Stilling Well.*

2. Sheet C4.02:

Delete the entire sheet and replace with the attached Sheet C4.02 which includes the following changes:

- *Changes the minimum number of saddle supports per tank to EIGHT.*
- *Modifies Detail 2 to add 2" Aluminum Clock Gauge Stilling Well.*

3. Sheet C4.03:

Delete the entire sheet and replace with the attached Sheet C4.03 which includes the following changes:

- *Modifies Detail 2 to add 2" Aluminum Clock Gauge Stilling Well.*

4. Sheet C4.04:

Delete the entire sheet and replace with the attached Sheet C4.04 which includes the following changes:

- *Modifies Detail 4 to add 2" Aluminum Clock Gauge Stilling Well.*
- *Modifies Drop Tube Float.*

B. Modifications to Kake Rural Power System Upgrade Schedule B DRAWINGS:

1. Sheet G1.02:

Delete the entire sheet and replace with the attached Sheet G1.02 which includes the following changes:

- *Changes to the Mechanical and Electrical Sheet Index to include 95% module connection drawings for Contractor reference.*
2. Sheets M3.0, M3.1, M3.2, M3.3, M3.4, M4.1, M4.2, M4.3, M4.4, M5.1, M5.2, M5.3, M6.1, M6.2, M7.1, M7.2, FS1, FS2, E3.1, E3.2, E3.3, E3.4, E3.5, E4.1, E4.2, E4.3, E5, E6.1, E6.2, E7.1, E7.2, E7.3:

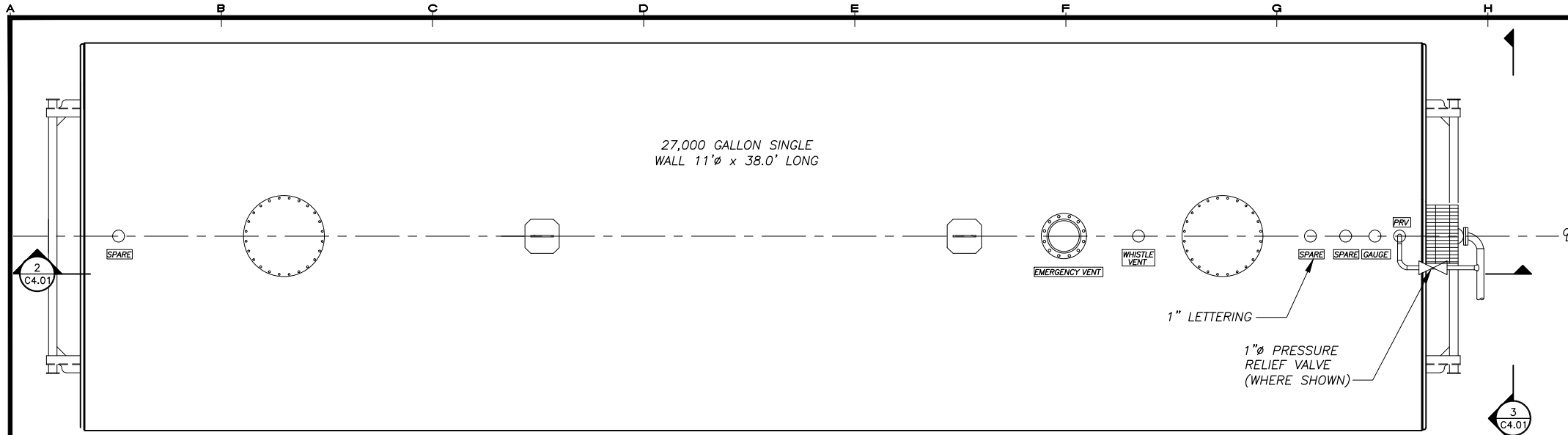
Include attached Sheet M3.0, M3.1, M3.2, M3.3, M3.4, M4.1, M4.2, M4.3, M4.4, M5.1, M5.2, M5.3, M6.1, M6.2, M7.1, M7.2, FS1, FS2, E3.1, E3.2, E3.3, E3.4, E3.5, E4.1, E4.2, E4.3, E5, E6.1, E6.2, E7.1, E7.2, E7.3 to the contract plan set which includes the following:

- *Contractor reference details for module connection.*

Attachments:

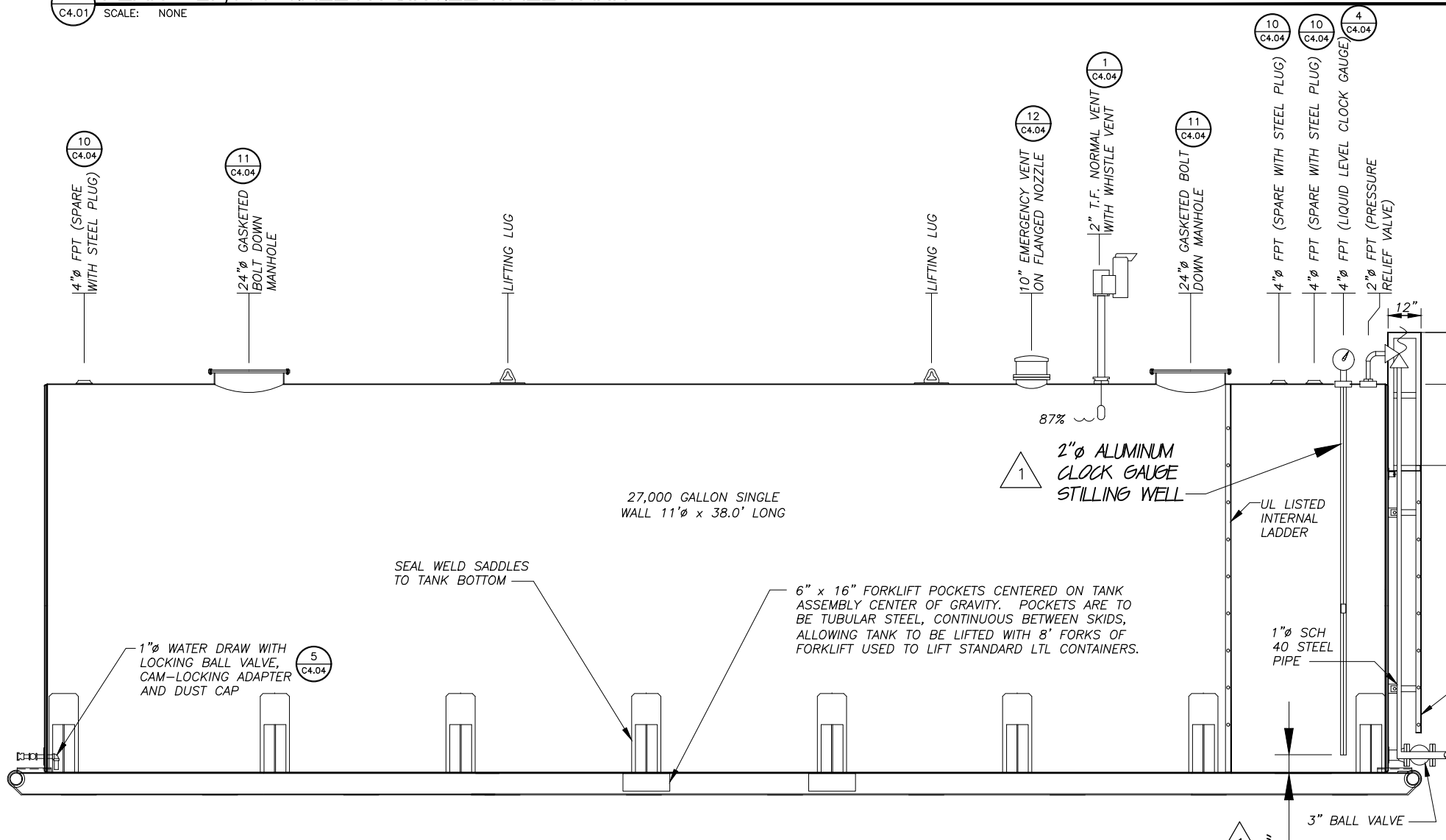
1. Kake Bulk Fuel Upgrade Revised Sheets C4.01, C4.02, C4.03, C4.04 (4page)
2. Kake Rural Power System Upgrade Revised Sheet G1.02 (1 page)
3. Kake Rural Power System Upgrade Mechanical and Electrical Contractor Reference Drawings Sheets M3.0, M3.1, M3.2, M3.3, M3.4, M4.1, M4.2, M4.3, M4.4, M5.1, M5.2, M5.3, M6.1, M6.2, M7.1, M7.2, FS1, FS2, E3.1, E3.2, E3.3, E3.4, E3.5, E4.1, E4.2, E4.3, E5, E6.1, E6.2, E7.1, E7.2, E7.3 (32 pages)

END OF ADDENDUM

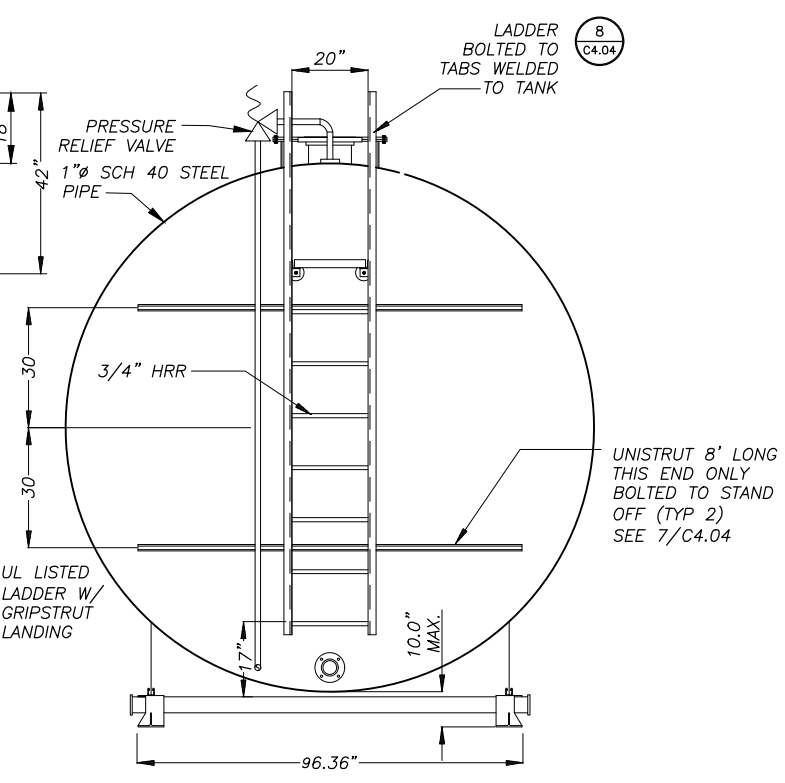


1 PLAN - 27,000 GALLON SINGLE WALL TANK
SCALE: NONE

- NOTES:**
- SEE SHEET G1.03 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
 - TANKS SHALL BE UL142 LISTED AND LABELED.
 - PROVIDE LABELING ON TANK IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE, INCLUDING BUT NOT LIMITED TO:
 - PRODUCT IDENTIFICATION
 - COMPARTMENT STORAGE CAPACITY
 - TARE WEIGHT
 - NFPA 704
 - INTERNATIONAL FIRE CODE CHAPTER 34.
 - THIS DRAWING IS A PROTOTYPICAL TANK DRAWING. CONTRACTOR SHALL MODIFY BUNG LOCATIONS AS NECESSARY TO MATCH PIPING REQUIREMENTS. SUBMIT SHOP DRAWING WITH ANY PROPOSED REVISIONS HIGHLIGHTED FOR ENGINEER REVIEW.
 - TANKS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CURRENT VERSIONS OF UL142, STATE OF ALASKA FIRE AND LIFE SAFETY REGULATIONS (13 AAC50), ASME B 31.3, ASME B 31.4, AND ASME B 31.4A.
 - LADDER, HANDRAILS, AND CATWALK MUST MEET ALL APPLICABLE OSHA STANDARDS. LADDERS, HANDRAILS AND CATWALK SHALL BE BOLT-ON UNITS. CONTRACTOR SHALL HOT DIP GALVANIZE EXISTING LADDERS, HANDRAILS AND AND CATWALK OR PROVIDE NEW GALVANIZED LADDERS, HANDRAILS AND CATWALK.
 - NORMAL VENT MUST BE MINIMUM OF 12 FEET ABOVE ADJACENT FINISH GRADE.
 - TANKS SADDLES AND SKIDS: PROVIDE TANK SADDLE AND SKID SYSTEMS DESIGNED IN ACCORDANCE WITH UL 142. TANK SADDLES AND SKIDS SHALL BE SUITABLE FOR SKIDDING EMPTY TANK INTO POSITION. PROVIDE A MINIMUM OF ~~FOUR~~ **EIGHT** SADDLES PER TANK. SKIDS SHALL BE W8x35 OR APPROVED EQUAL.
 - TANKS SHALL BE CONSTRUCTED OF ASTM A-36 PLATE AND STRUCTURAL STEEL AND PAINTED PER THE SPECIFICATIONS.

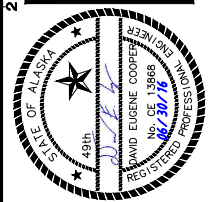


2 SECTION - 27,000 GALLON SINGLE WALL TANK
SCALE: NONE



3 END VIEW
SCALE: NONE

REVISIONS MARK	DATE	DESCRIPTION
1	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW
2	6/30/16	ADDENDUM 1



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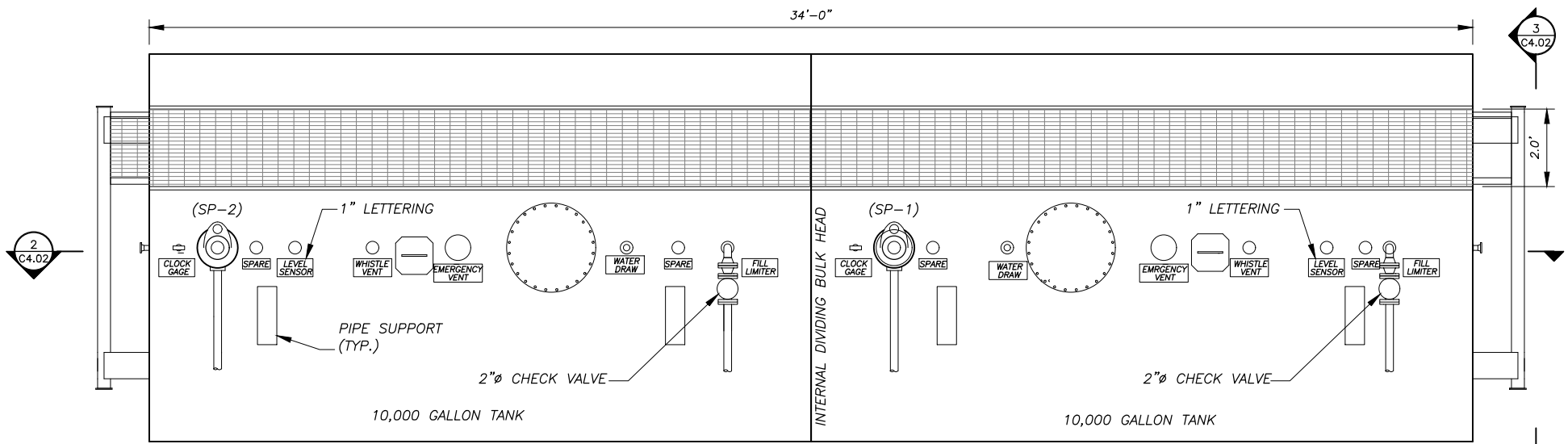
- ENGINEERING
- EARTH SCIENCE
- PROJECT MANAGEMENT
- PLANNING

ALASKA ENERGY AUTHORITY
AKE BULK FUEL UPGRADES
KAKE, ALASKA

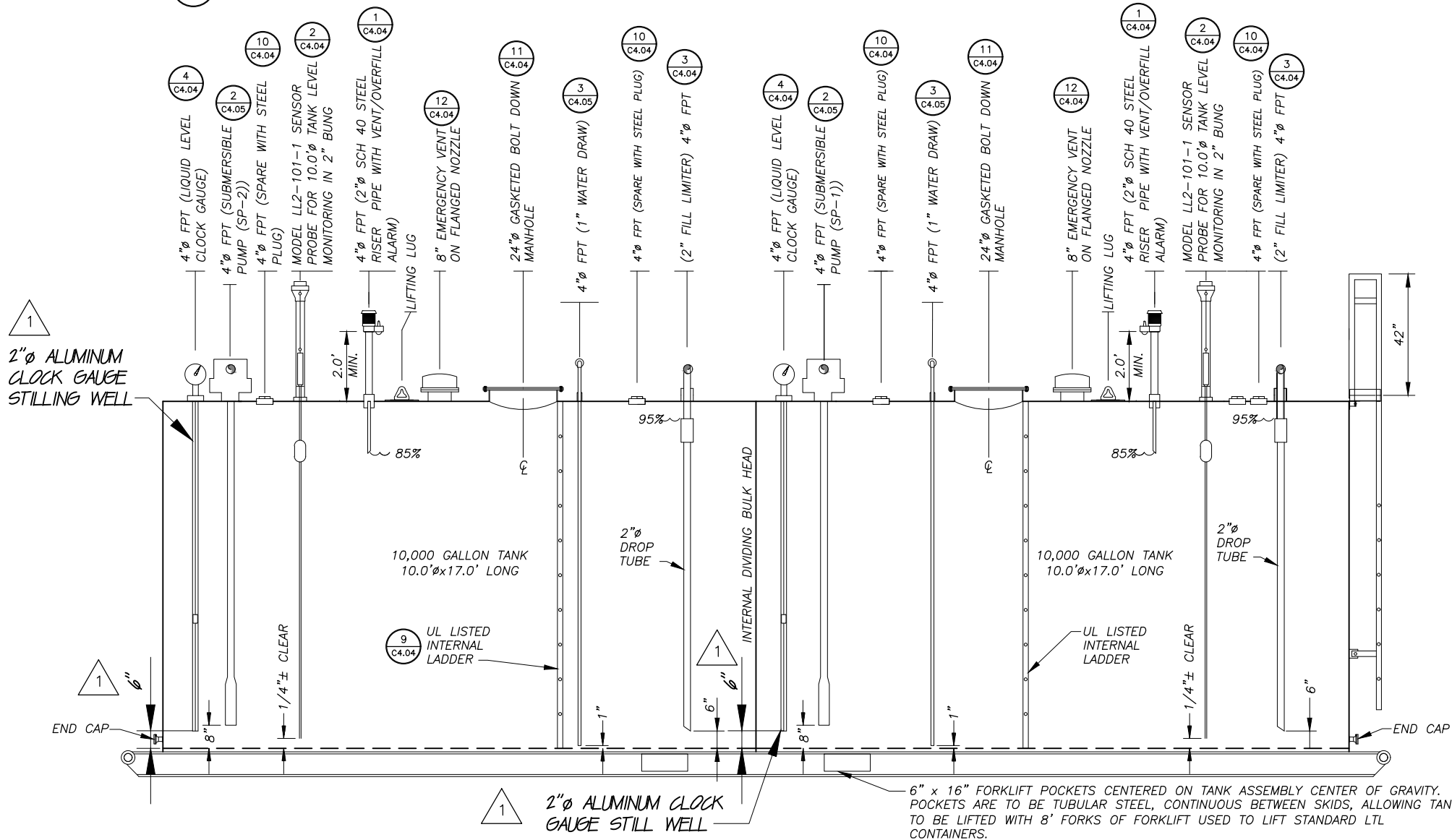
SHEET TITLE	
27,000 GALLON SINGLE WALL BULK TANK	
SHEET	C4.01
DRAWN BY	KK
CHECKED BY	MRS
DATE	05/25/16
SCALE	NONE
JOB NUMBER	13-040

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 XREF: 13040-00_B01-BK

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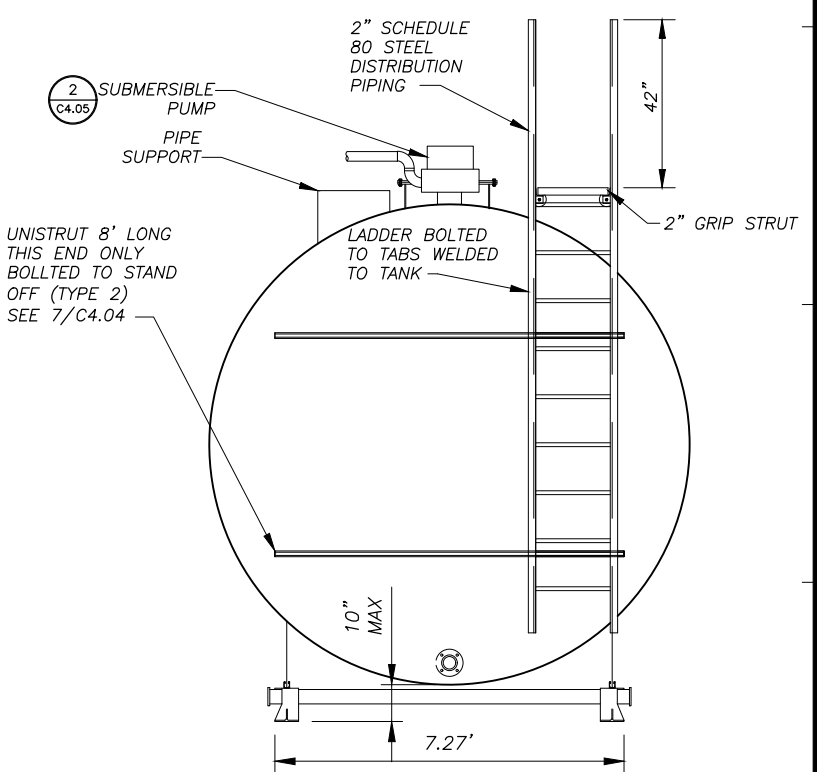
1 PLAN - 20,000 GALLON DUAL PRODUCT DISPENSING TANK
 SCALE: NONE



2 SECTION - 20,000 GALLON DUAL PRODUCT DISPENSING TANK
 SCALE: NONE

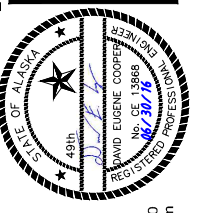
NOTES:

- SEE SHEET G1.03 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
- TANKS SHALL BE UL142 LISTED AND LABELED.
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3 END VIEW
 SCALE: NONE

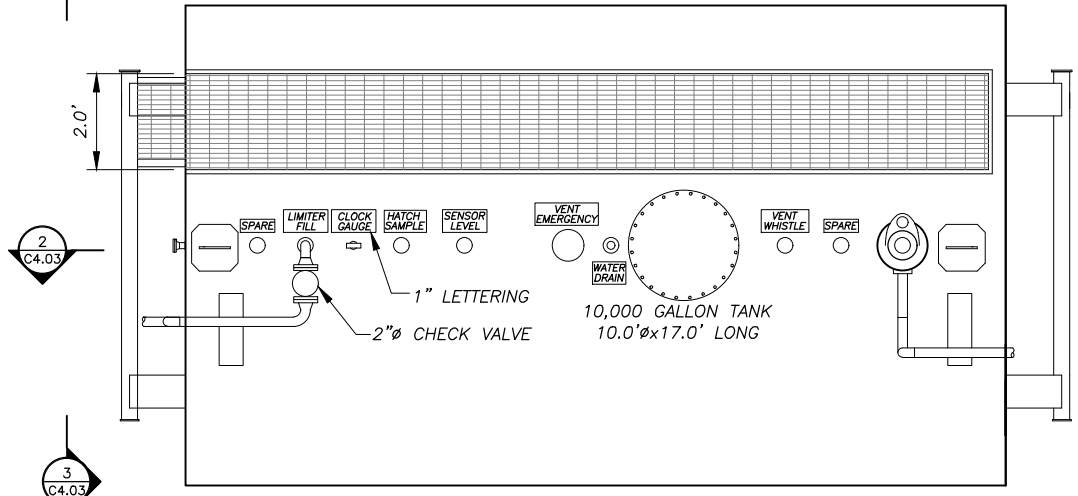
REVISIONS	DATE	DESCRIPTION
1	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW
2	6/30/16	ADDENDUM 1



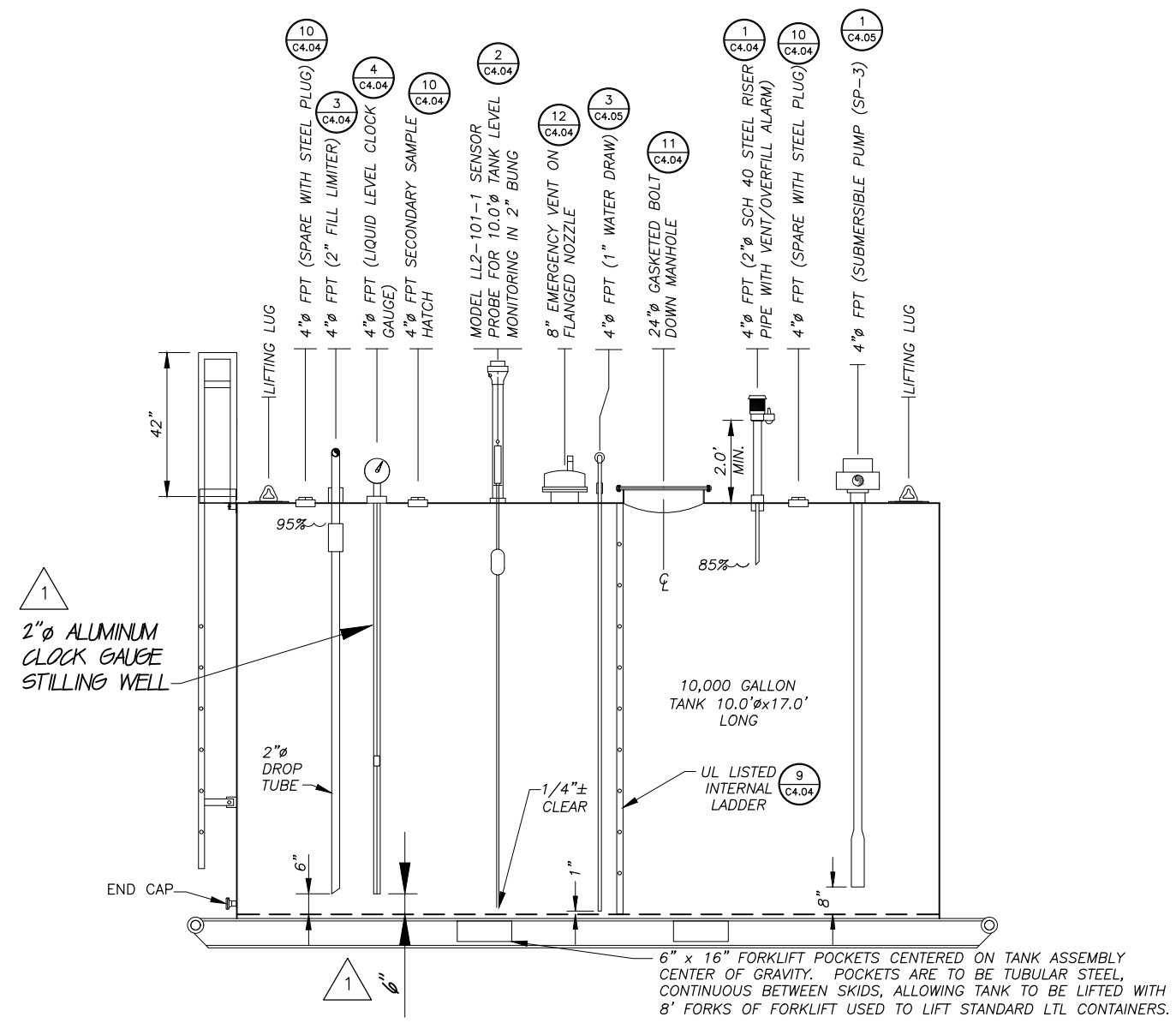
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 KAKE BULK FUEL UPGRADES
 20,000 GALLON DUAL PRODUCT DISPENSING TANK
 SHEET TITLE
 SHEET
C4.02
 DRAWN BY: KK CHECKED BY: MRS
 DATE: 05/25/16 SCALE: AS NOTED
 JOB NUMBER: 13-040

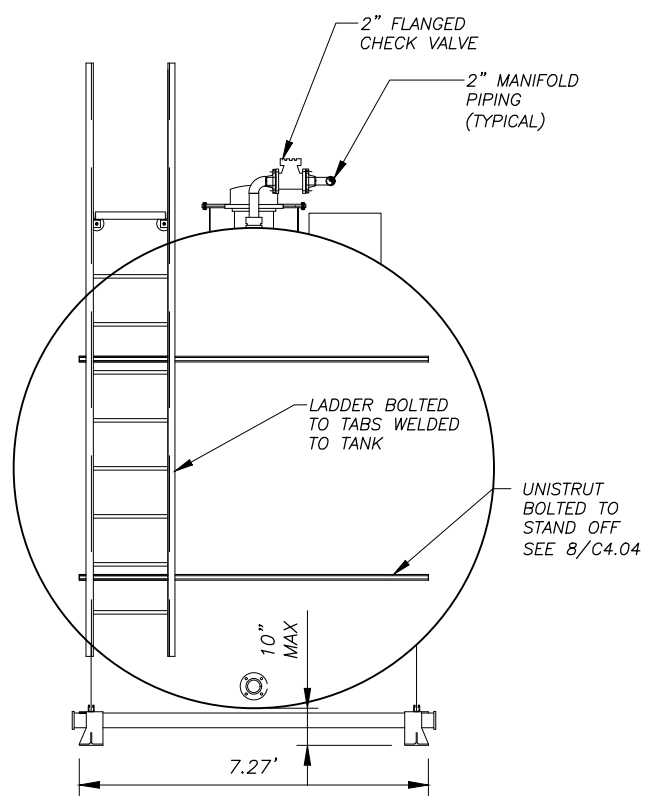
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1 PLAN - 10,000 GALLON SINGLE PRODUCT DISPENSING TANK
 SCALE: NONE



2 SECTION - 10,000 GALLON SINGLE PRODUCT DISPENSING TANK
 SCALE: NONE

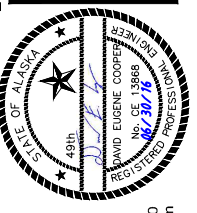


3 END VIEW
 SCALE: NONE

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REVISIONS	DATE	DESCRIPTION
1	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW
2	6/30/16	ADDENDUM 1



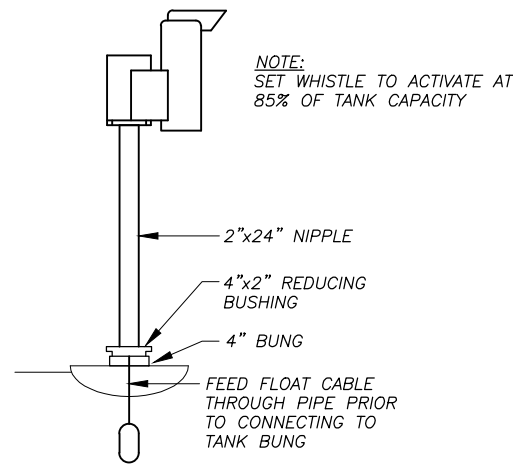
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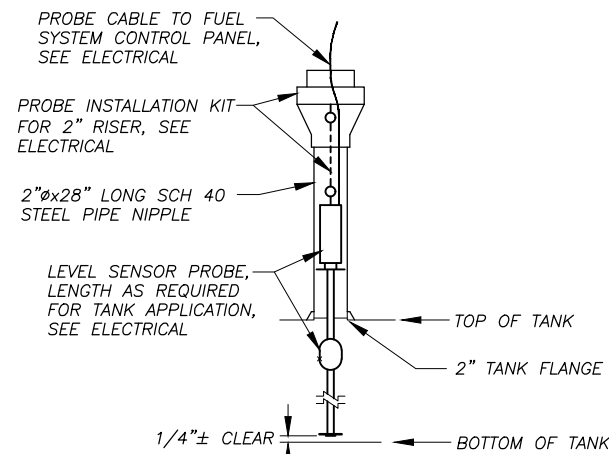
SHEET TITLE
10,000 GALLON SINGLE PRODUCT DISPENSING TANK

SHEET
C4.03

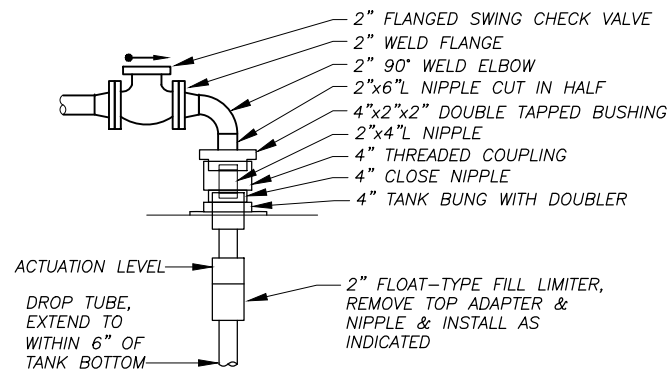
DRAWN BY: KK CHECKED BY: MRS
 DATE: 05/25/16 SCALE: AS NOTED
 JOB NUMBER: 13-040



1 VENT/OVERFILL ALARM
C4.04 SCALE: NONE

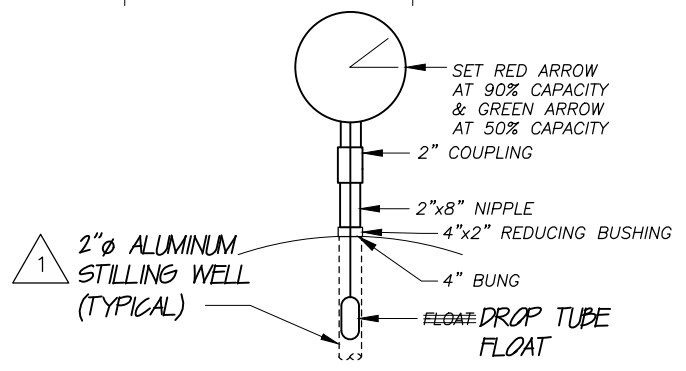


2 LEVEL SENSOR PROBE
C4.04 SCALE: NONE



NOTE: PIPING SIZED TO PROVIDE SHUT OFF WHEN ACTUATION LEVEL IS AT 95% CAPACITY. FIELD VERIFY SHUT OFF HEIGHT & ADJUST LINKAGE AS REQUIRED.

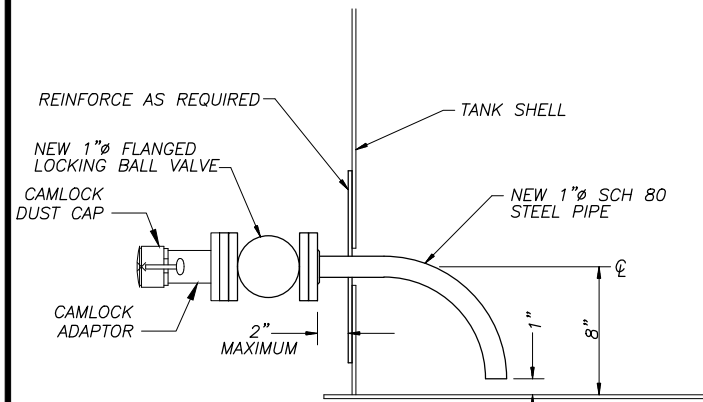
3 FILL LIMITER
C4.04 SCALE: NONE



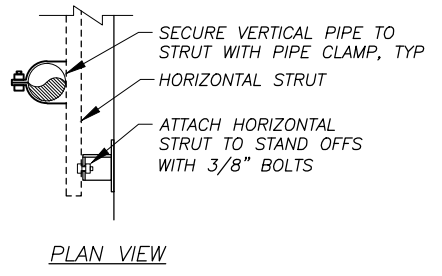
CLOCK GAUGE NOTES:

1. FEED FLOAT CABLE THROUGH NIPPLE PRIOR TO CONNECTING TO TANK.
2. GREASE FLOAT PRIOR TO INSTALLING IN TANK TO PREVENT FREEZING TO BOTTOM.
3. CALIBRATE GAUGE AFTER FILLING TANK AND VERIFY WITH MANUAL GAUGING ROD.
4. ENSURE THAT BACK COVER PLATE IS PROPERLY SEALED AFTER REASSEMBLY (ANY LOOSENESS OR RATTLING WHEN TAPPED INDICATES A POOR SEAL).

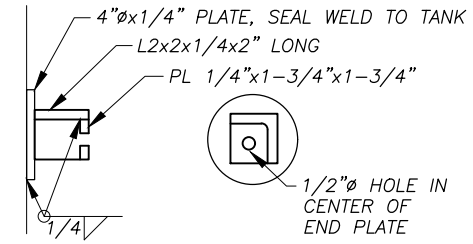
4 CLOCK GAUGE
C4.04 SCALE: NONE



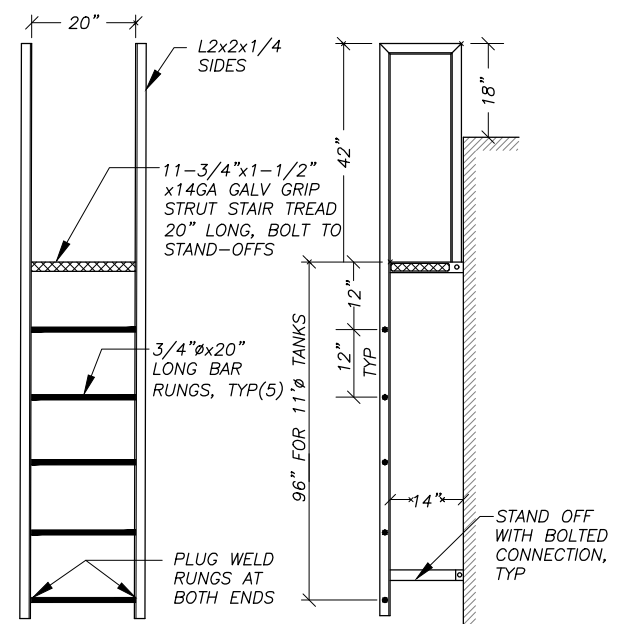
5 BULK FUEL WATER DRAW
C4.04 SCALE: NONE



6 TANK HEAD PIPE SUPPORT
C4.04 SCALE: NONE

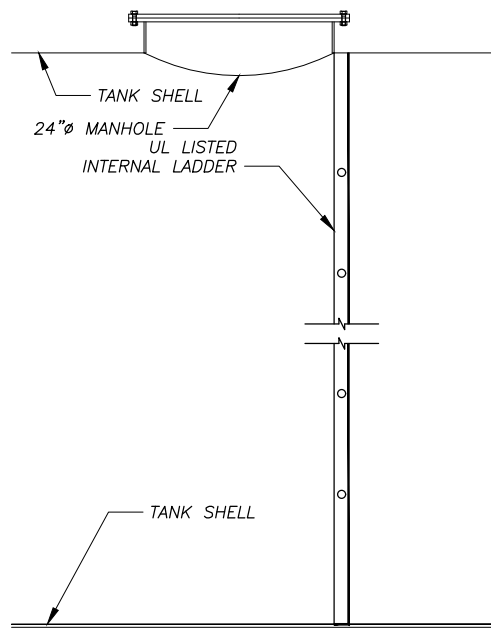


7 PIPE SUPPORT STAND OFF
C4.04 SCALE: NONE

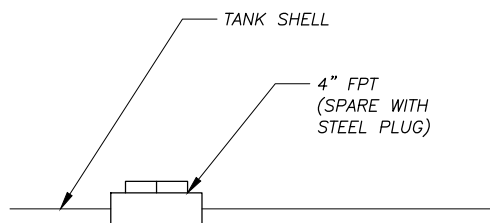


NOTE:
1. BULK FUEL TANK LADDER SHOWN
2. PROVIDE SIMILAR LADDER WITH CATWALK ON TOP OF TANK FOR 10,000 AND 20,000 GALLON PRODUCT DISPENSING TANKS.

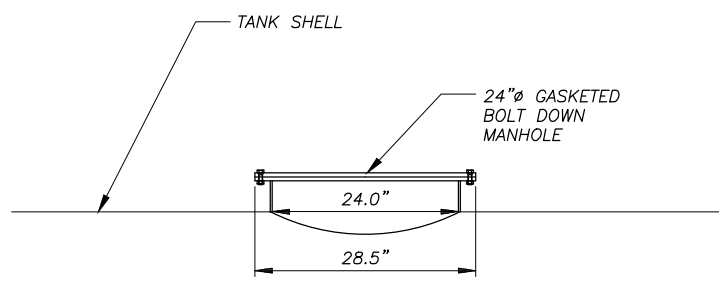
8 LADDER FABRICATION
C4.04 SCALE: NONE



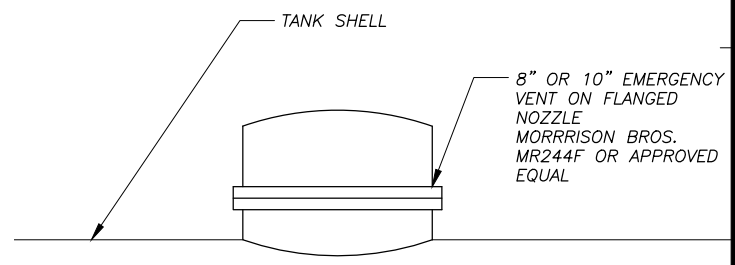
9 INTERIOR LADDER
C4.04 SCALE: NONE



10 SPARE
C4.04 SCALE: NONE



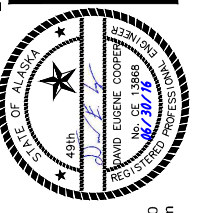
11 MANHOLE
C4.04 SCALE: NONE



12 EMERGENCY VENT
C4.04 SCALE: NONE

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LAYOUT: C4.04 TANK DETAILS
XREF: 14025_00_B01

REVISIONS	DATE	DESCRIPTION
1	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW
2	6/30/16	ADDENDUM 1



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KAKE BULK FUEL UPGRADES

ALASKA ENERGY AUTHORITY
ALASKA ENERGY AUTHORITY
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SHEET TITLE
TANK APPURTENCE DETAILS

SHEET
C4.04

DRAWN BY: KK
CHECKED BY: MRS

DATE: 05/25/16
SCALE: AS SHOWN

JOB NUMBER: 13-040

H:\jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP-0102, 1=1, 07-05-16 at 10:36 by jkk
 LAYOUT: G1.02 - DRAWING INDEX
 VIEW: G10201_H_PDF
 XREF: 13-040-00-B01

GENERAL

- G1.01 COVER SHEET AND LOCATION MAP
- G1.02 DRAWING INDEX
- G1.03 GENERAL NOTES, LEGEND AND ABBREVIATIONS
- G1.04 PROJECT LAYOUT PLAN
- G1.05 SURVEY CONTROL DIAGRAM

CIVIL

- C1.01 IPEC DEMOLITION PLAN
- C1.02 IPEC POWER PLANT SITE PLAN
- C1.03 IPEC POWER PLANT GRADING PLAN
- C1.04 IPEC POWER PLANT MODULE SECTIONS

- C2.01 DETAILS
- C2.02 PERIMETER FENCE DETAILS

ARCHITECTURAL

- A1.1 POWER PLANT FLOOR PLAN
- A1.2 POWER PLANT REFLECTED CEILING PLAN

- A2.1 POWER PLANT ELEVATIONS
- A2.2 POWER PLANT ELEVATIONS
- A2.3 POWER PLANT INTERIOR ELEVATIONS
- A2.4 POWER PLANT INTERIOR ELEVATIONS
- A2.5 POWER PLANT DOOR SCHEDULE AND DETAILS

- A3.1 POWER PLANT SECTIONS
- A3.2 POWER PLANT SECTIONS AND DETAILS

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- S1.0 POWER PLANT GENERAL NOTES AND FOUNDATION DETAILS
- S1.1 POWER PLANT FOUNDATION FLOOR PLANS
- S1.2 POWER PLANT CEILING FRAMING AND DETAILS
- S1.3 POWER PLANT STRUCTURAL DETAILS

- S2.1 POWER PLANT SECTIONS AND DETAILS
- S2.2 POWER PLANT ROOF BOLT PLAN AND DETAILS
- S2.3 POWER PLANT ROOF FRAMING PLAN AND DETAILS

- S3.1 POWER PLANT ACCESS STAIR

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- M3.0 MODULAR POWER PLANT WARNING SIGN & PLACARD PLAN
- M3.1 EQUIPMENT LAYOUT PLAN & BACK WALL ELEVATION
- M3.2 SECTIONS, ELEVATIONS, & DETAILS
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- E1.1 OVERALL PROJECT PLAN, STAKING SHEET, & SCHEDULE OF DRAWINGS
- E1.2 COMMUNITY FEEDER & POLE INSTALLATION DETAILS
- E1.3 SITE PLAN
- E1.4 MODULAR POWER PLANT ENLARGED SITE PLAN & DETAILS
- E1.5 OLD POWER PLANT, NEW WORK PLAN & DETAILS

- E2 ELECTRICAL SPECIFICATIONS & EQUIPMENT SPECIFICATIONS

- E3.1 WIREWAY PLAN & DETAIL
- E3.2 WALL ELEVATIONS
- E3.3 WALL ELEVATIONS
- E3.4 SECTIONS & DETAILS
- E3.5 DETAILS

- E4.1 LIGHTING PLAN & DETAILS
- E4.2 RECEPTACLE PLAN & DETAILS
- E4.3 STATION SERVICE PLAN & DETAILS

- E5 CONTROL, INSTRUMENTATION, & DATA PLAN & DETAILS

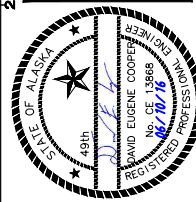
- E6.1 SWITCHGEAR ENCLOSURE LAYOUT
- E6.2 SWITCHGEAR ONE-LINE & SCHEMATICS

- E7.1 DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS
- E7.2 DAY TANK CONTROL PANEL LAYOUT & TERMINAL STRIPS
- E7.3 DAY TANK CONTROL PANEL SEQUENCE OF OPERATION & DETAILS

NOTE:

THE FOR REFERENCE ONLY MECHANICAL AND ELECTRICAL GENERATOR MODULE CONSTRUCTION SHEETS ARE PROVIDED IN ADDENDUM TO THE BID DOCUMENTS. THESE SHEETS ARE ISSUED AS 95% DRAWINGS AND ARE PROVIDED TO CONTRACTOR AS REFERENCE DRAWINGS. THESE SHEETS INCLUDE THE GENERATOR MODULE CONNECTION DETAILS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISASSEMBLING THE GENERATOR MODULE IN ANCHORAGE AND REASSEMBLING THE GENERATOR MODULE ON THE MODULE FOUNDATION IN KAKE, ALASKA.

REVISIONS	DATE	DESCRIPTION
MARK	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW
	6/30/16	ADDENDUM 1



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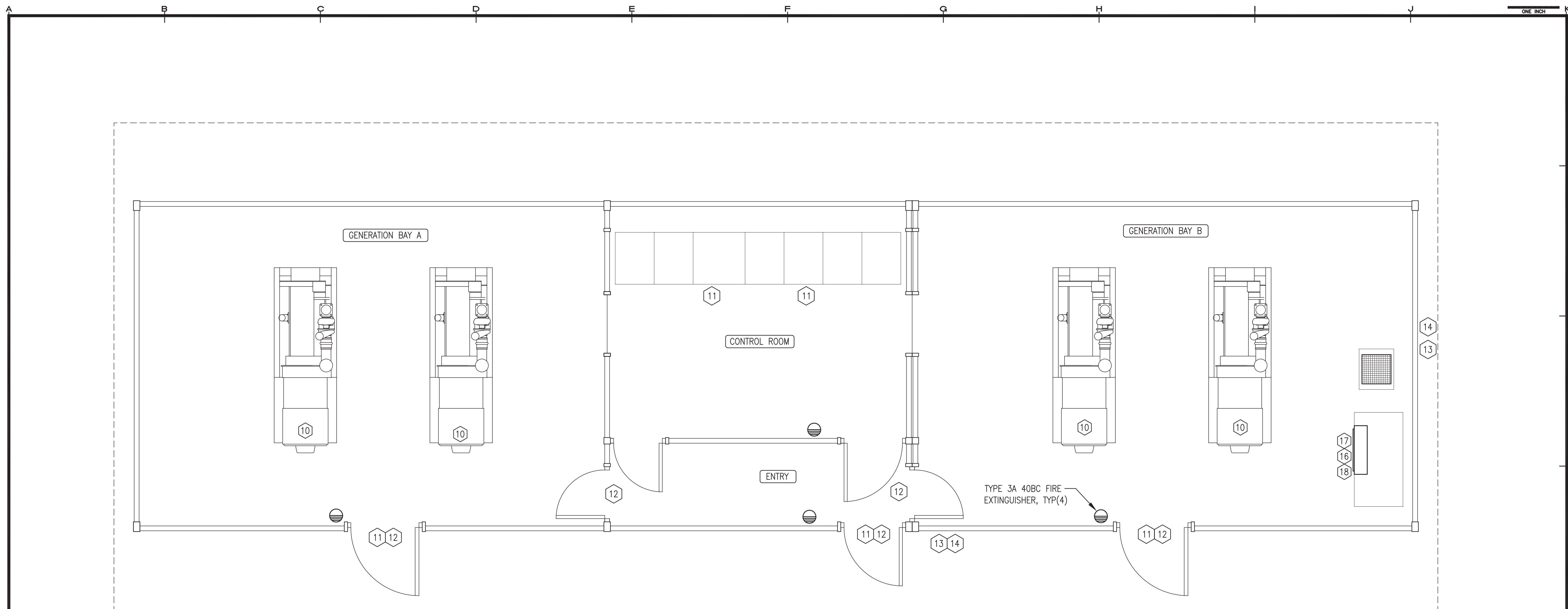
SHEET TITLE
DRAWING INDEX

SHEET
G1.02

DRAWN BY: RSB
 CHECKED BY: MRS

DATE: 06/10/16
 SCALE: NONE

JOB NUMBER: 13-039

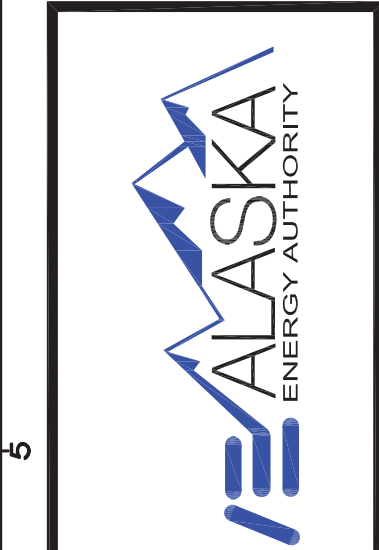


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1 MODULAR POWER PLANT FIRE EXTINGUISHER & WARNING SIGN/PLACARD PLAN
M3.0 3/8"=1'-0"

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

10"x14"x0.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS. WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, COLOR AS INDICATED, ONE SIDE ONLY. DECALS SIMILAR EXCEPT NO ALUMINUM BACKING PLATE. WARNING LITES OR EQUAL.

WARNING SIGNS - RED LETTERS ON WHITE BACKGROUND.

10 "CAUTION: THIS UNIT STARTS AUTOMATICALLY, LOCK & TAG OUT PRIOR TO SERVICE" (6"x4")

11 "DANGER HIGH VOLTAGE, AUTHORIZED PERSONNEL ONLY"

12 "CAUTION HEARING & EYE PROTECTION REQUIRED"

13 "FUEL OIL DAY TANK ALARM"

14 "IN CASE OF FUEL SPILL CALL DEC 1-800-478-9300"

15 not used

INFORMATIONAL PLACARDS - BLACK LETTERS ON WHITE BACKGROUND.

16 "TO MANUALLY FILL DAY TANK IN CASE OF EMERGENCY:
1) TURN OFF POWER TO THE DAY TANK CONTROL PANEL
2) MANUALLY OPEN ACTUATOR VALVE AT TANK FARM USING A WRENCH
3) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
4) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"

17 "TO CHANGE ENGINE OIL:
1) LOCK & TAG GENERATOR OUT OF SERVICE
2) OPEN NORMALLY CLOSED DRAIN VALVE AT GEN
3) TURN ON PUMP TIMER & PUMP OUT ENGINE OIL
4) CHANGE FILTER
5) CLOSE DRAIN VALVE & REFILL ENGINE
6) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
7) TOP OFF & PLACE ENGINE BACK IN SERVICE"

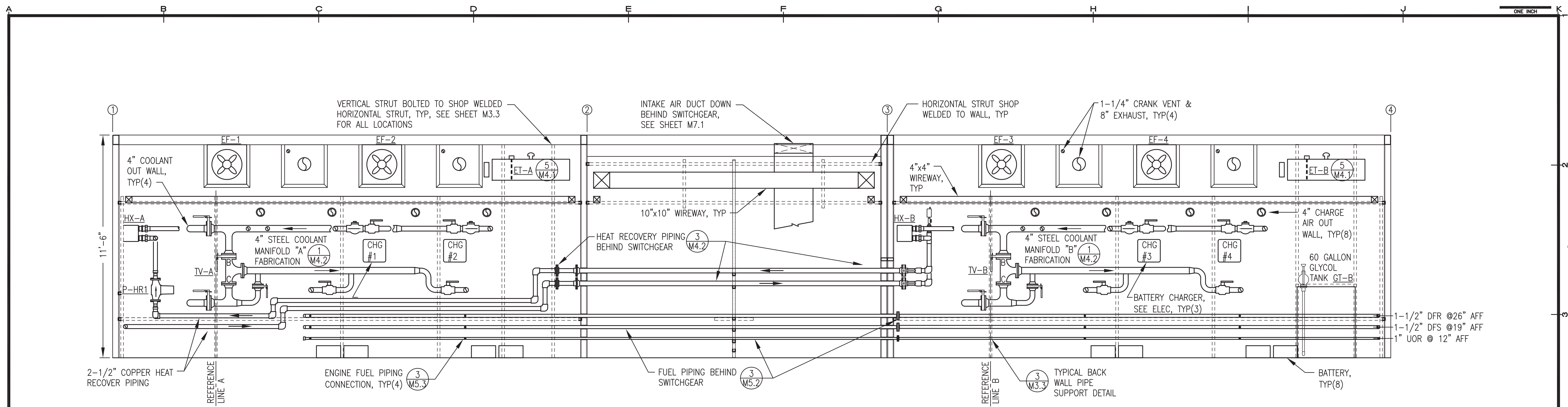
18 "CHECK BULK TANK LEVEL DAILY, SWITCH TO A DIFFERENT BULK TANK WHEN LEVEL DROPS BELOW 12" "

INSTALLATION - SECURE EACH DECAL TO CLEAN WALL OR DOOR SURFACES OR INSTALL SIGNS WITH STAINLESS STEEL SCREWS.

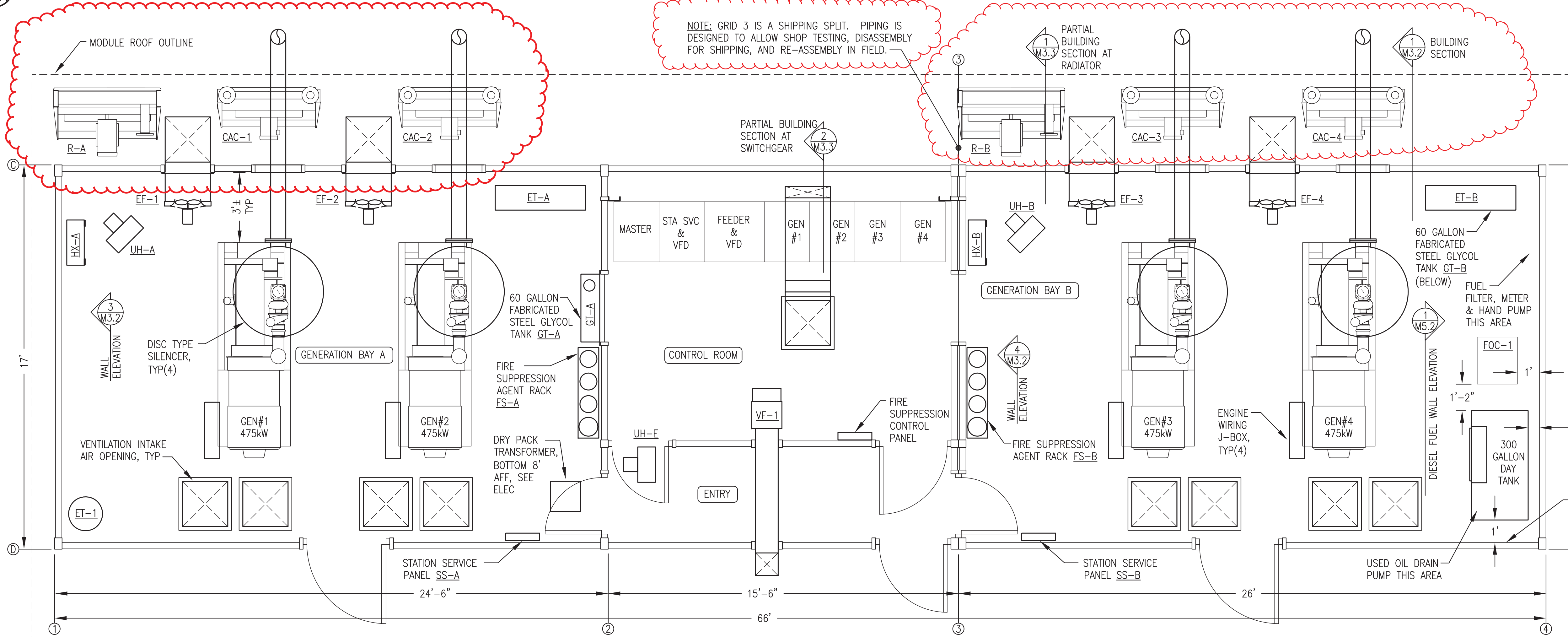
NOTES:
1) SEE FIRE SUPPRESSION PLANS AND SPECIFICATIONS FOR ADDITIONAL PLACARDS TO BE PROVIDED WITH FIRE SUPPRESSION SYSTEM. INSTALL ALL SIGNS AS INDICATED.
2) SEE BULK FUEL UPGRADE DESIGN FOR ADDITIONAL PLACARDS AND SIGNS AT TANK FARM.

THIS SHEET SHOWS MODULE
SHOP FABRICATION WORK THAT
IS N.I.C. AND IS PROVIDED FOR
REFERENCE ONLY.

SHEET TITLE	
MODULAR POWER PLANT WARNING SIGN & PLACARD PLAN	
SHEET	
M3.0	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



1 BACK WALL ELEVATION
M3.1 3/8"=1'-0"



2 EQUIPMENT LAYOUT PLAN
M3.1 3/8"=1'-0"

NOTE: GRID 3 IS A SHIPPING SPLIT. PIPING IS DESIGNED TO ALLOW SHOP TESTING, DISASSEMBLY FOR SHIPPING, AND RE-ASSEMBLY IN FIELD.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

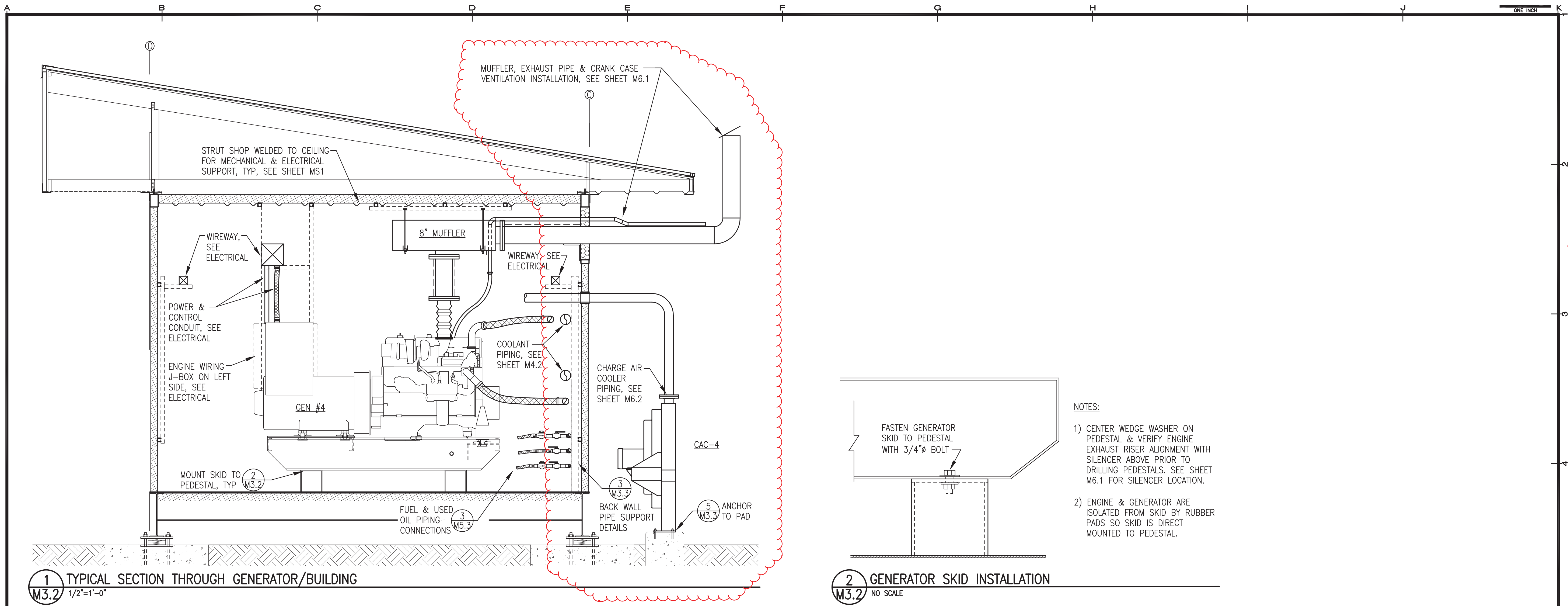
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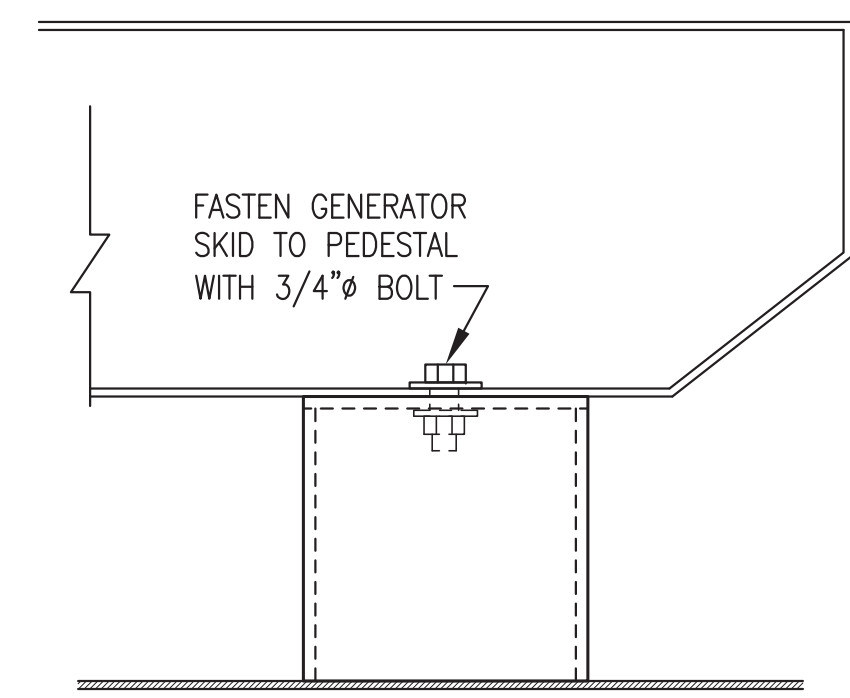
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SHEET TITLE	
EQUIPMENT LAYOUT PLAN & BACK WALL ELEVATION	
SHEET	
M3.1	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	

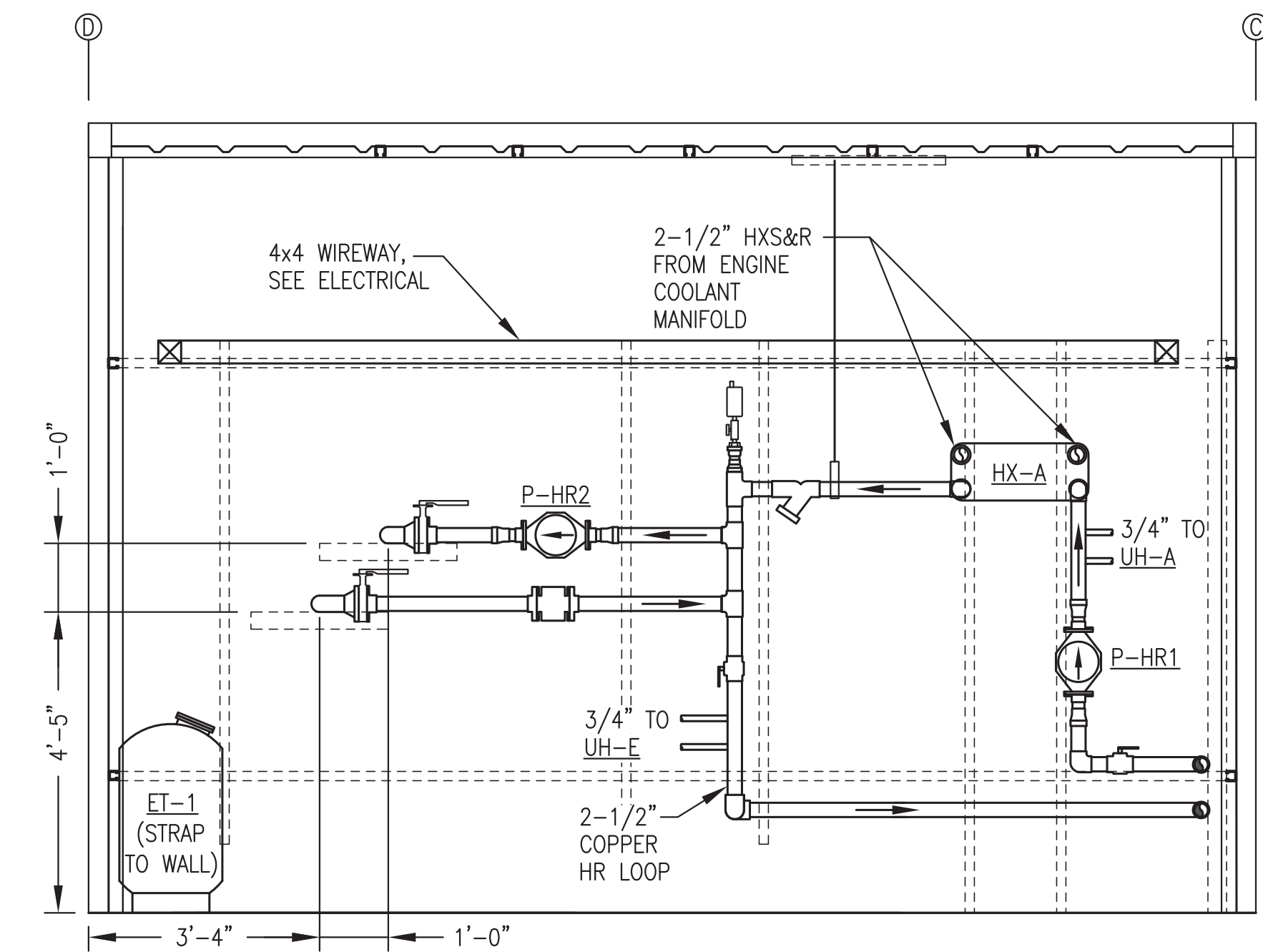


1 TYPICAL SECTION THROUGH GENERATOR/BUILDING
M3.2 1/2"=1'-0"

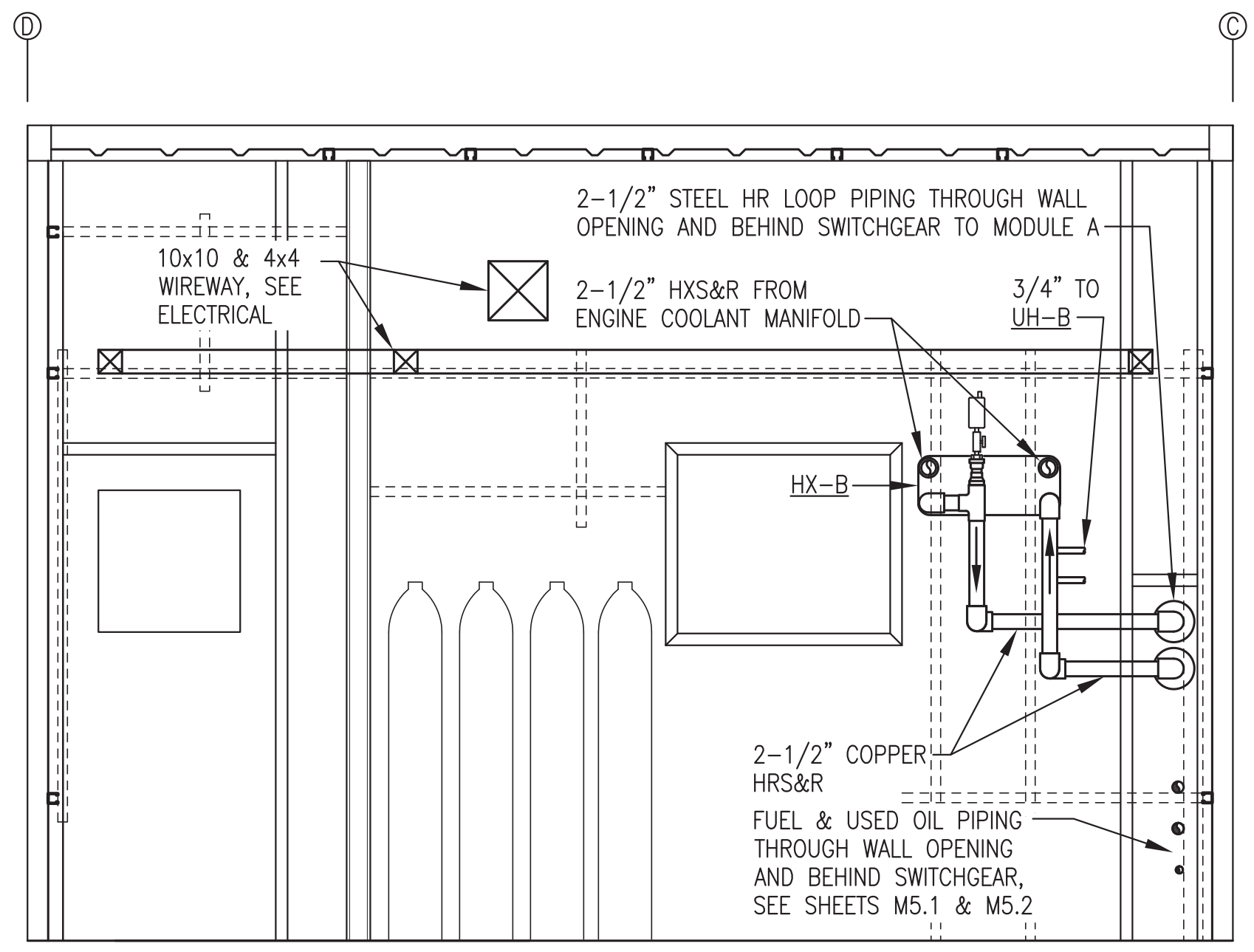


2 GENERATOR SKID INSTALLATION
M3.2 NO SCALE

- NOTES:
- 1) CENTER WEDGE WASHER ON PEDESTAL & VERIFY ENGINE EXHAUST RISER ALIGNMENT WITH SILENCER ABOVE PRIOR TO DRILLING PEDESTALS. SEE SHEET M6.1 FOR SILENCER LOCATION.
 - 2) ENGINE & GENERATOR ARE ISOLATED FROM SKID BY RUBBER PADS SO SKID IS DIRECT MOUNTED TO PEDESTAL.



3 GENERATION BAY A LEFT WALL ELEVATION
M3.2 1/2"=1'-0"



4 GENERATION BAY B LEFT WALL ELEVATION
M3.2 1/2"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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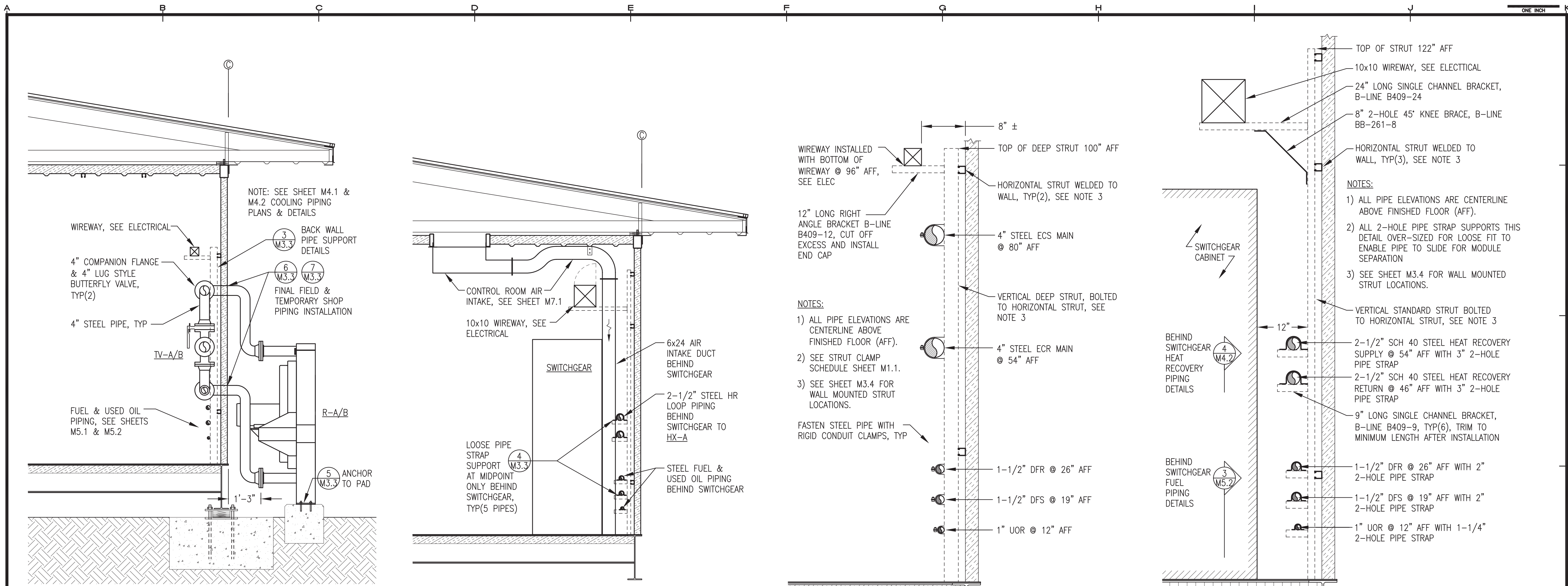
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SHEET TITLE	
SECTIONS, ELEVATIONS, & DETAILS	
SHEET	
M3.2	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	

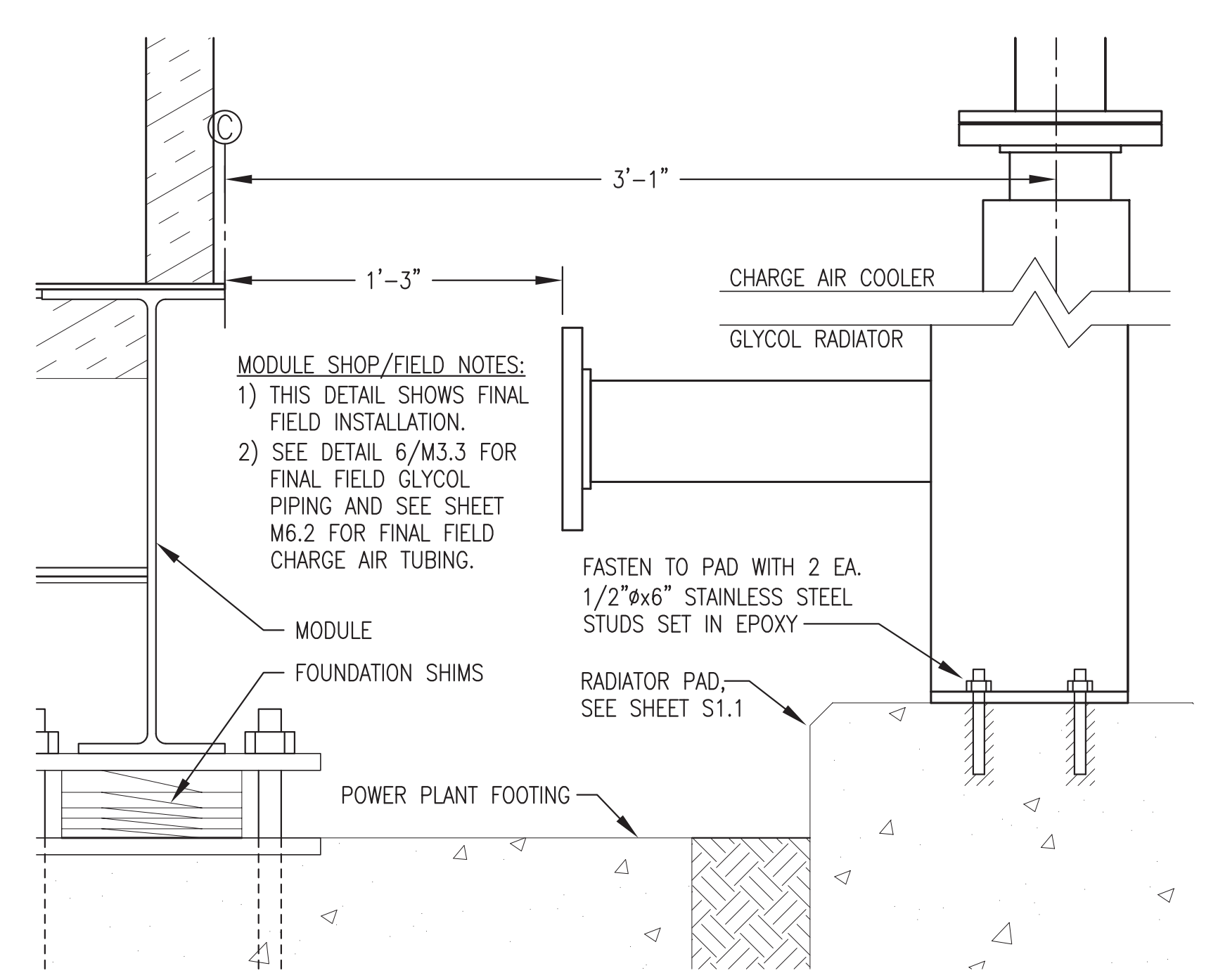


1 PARTIAL SECTION AT RADIATOR
1/2"=1'-0"

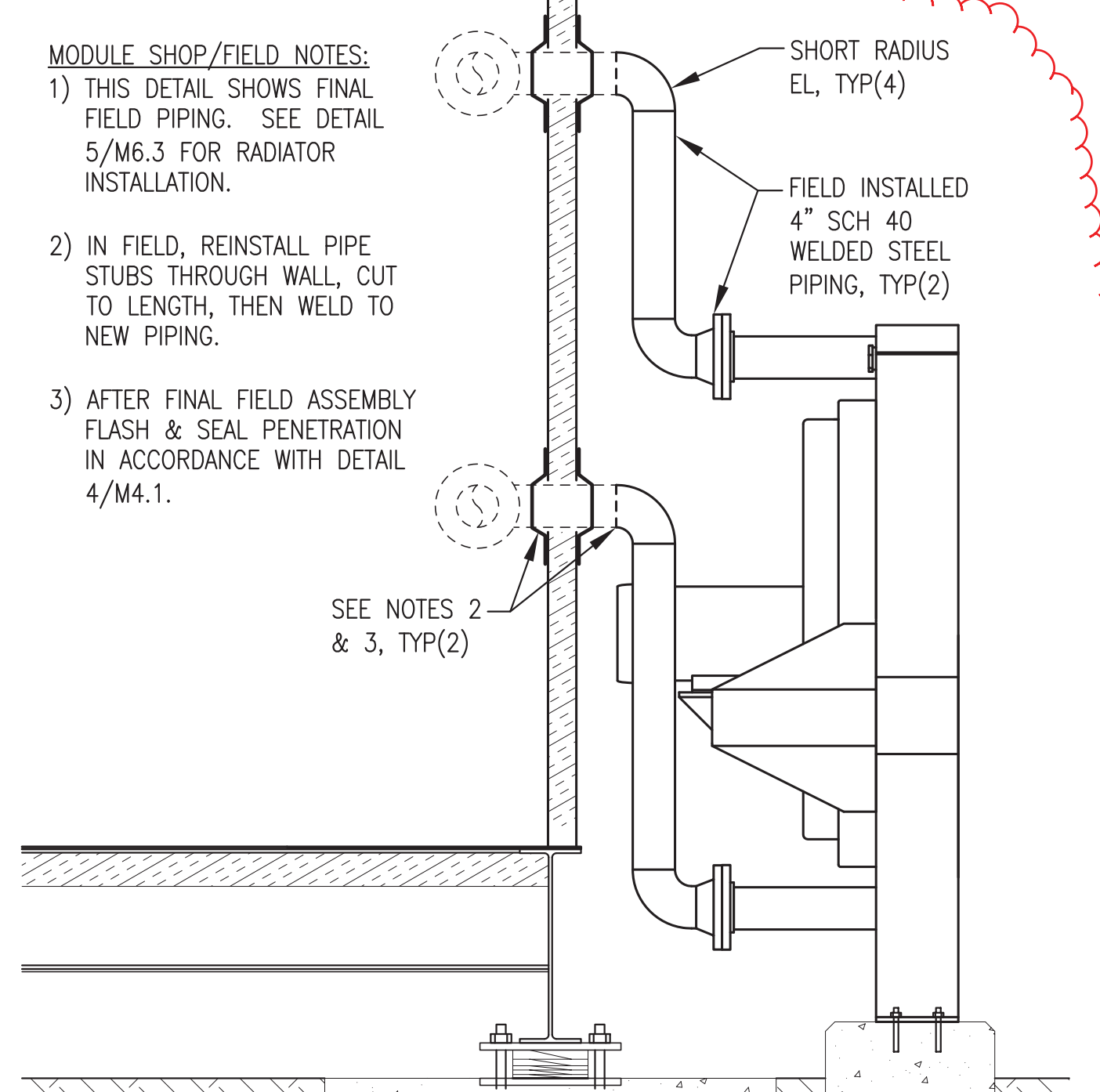
2 PARTIAL SECTION AT SWITCHGEAR
1/2"=1'-0"

3 TYPICAL BACK WALL PIPE SUPPORT DETAIL
1"=1'-0"

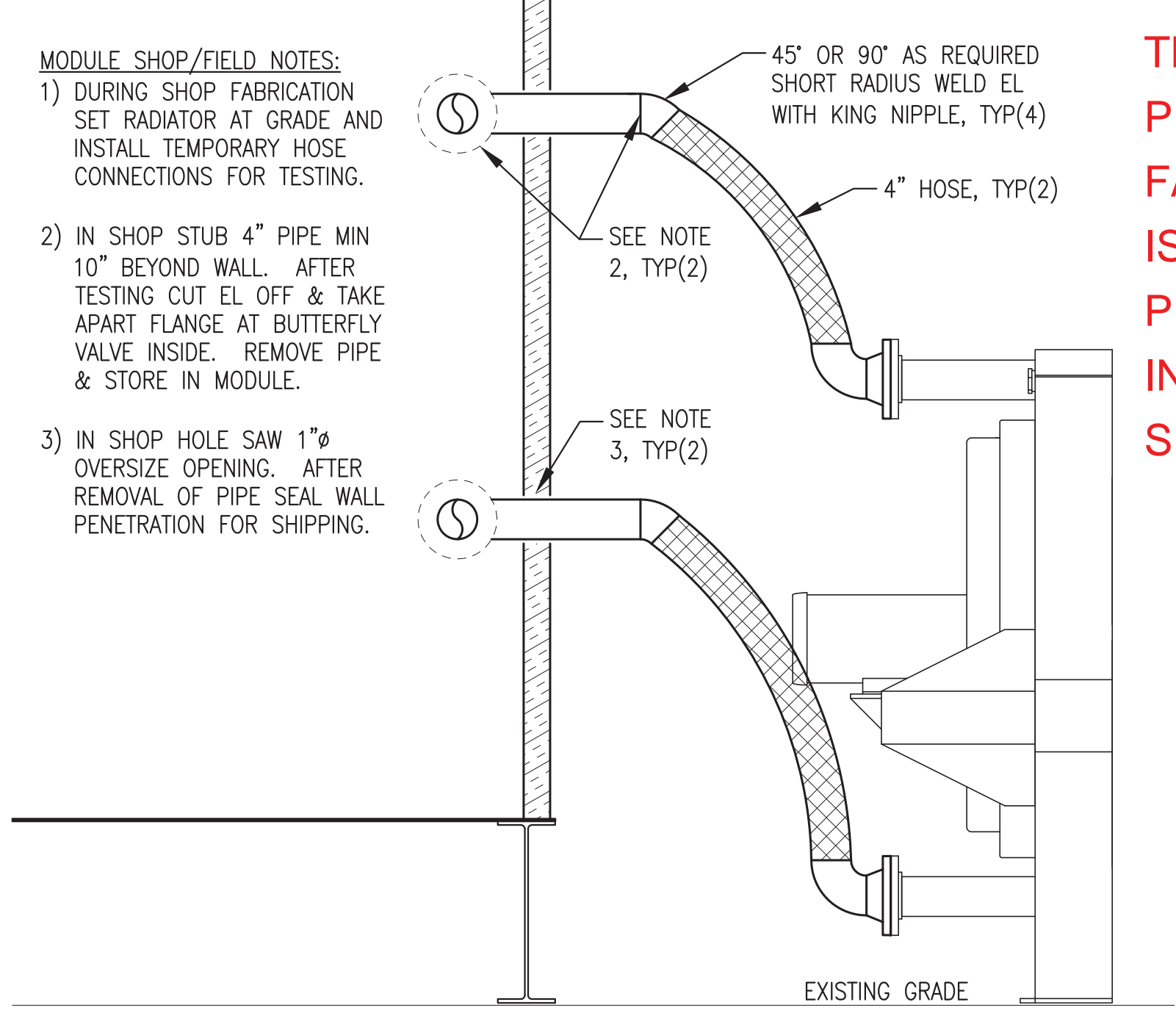
4 LOOSE PIPE SUPPORT DETAIL (BEHIND SWITCHGEAR)
1"=1'-0"



5 GLYCOL & CHARGE AIR COOLER ANCHOR DETAIL
NO SCALE



6 GLYCOL RADIATOR FINAL FIELD PIPING
NO SCALE



7 GLYCOL RADIATOR TEMPORARY PIPING AT SHOP
NO SCALE

REVISIONS	MARK	DATE	DESCRIPTION
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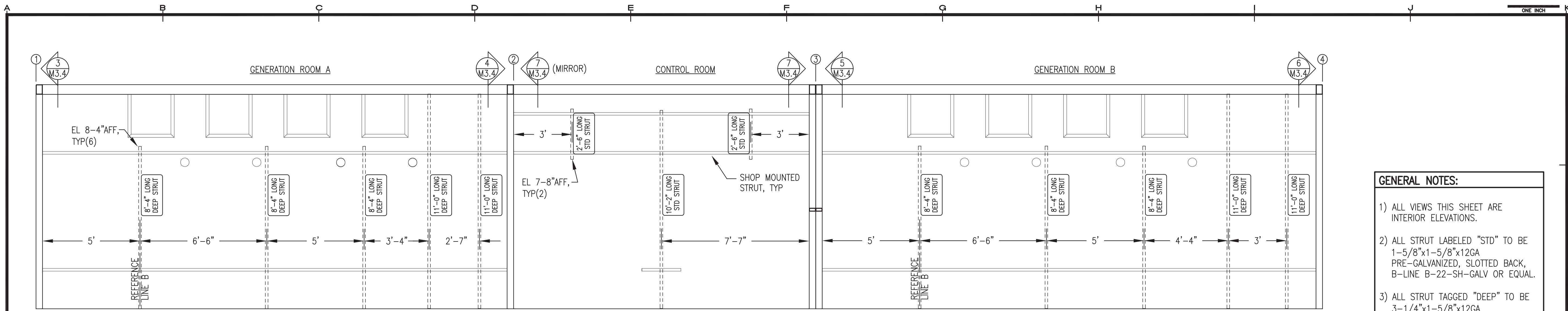
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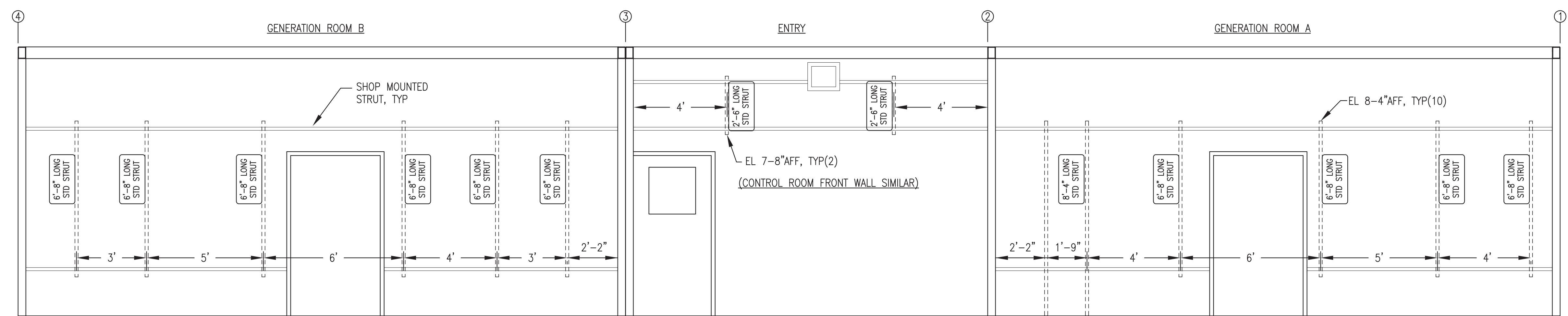
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SHEET TITLE	
SECTIONS & DETAILS	
SHEET	
M3.3	
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DATE: JUNE 16	SCALE: AS SHOWN
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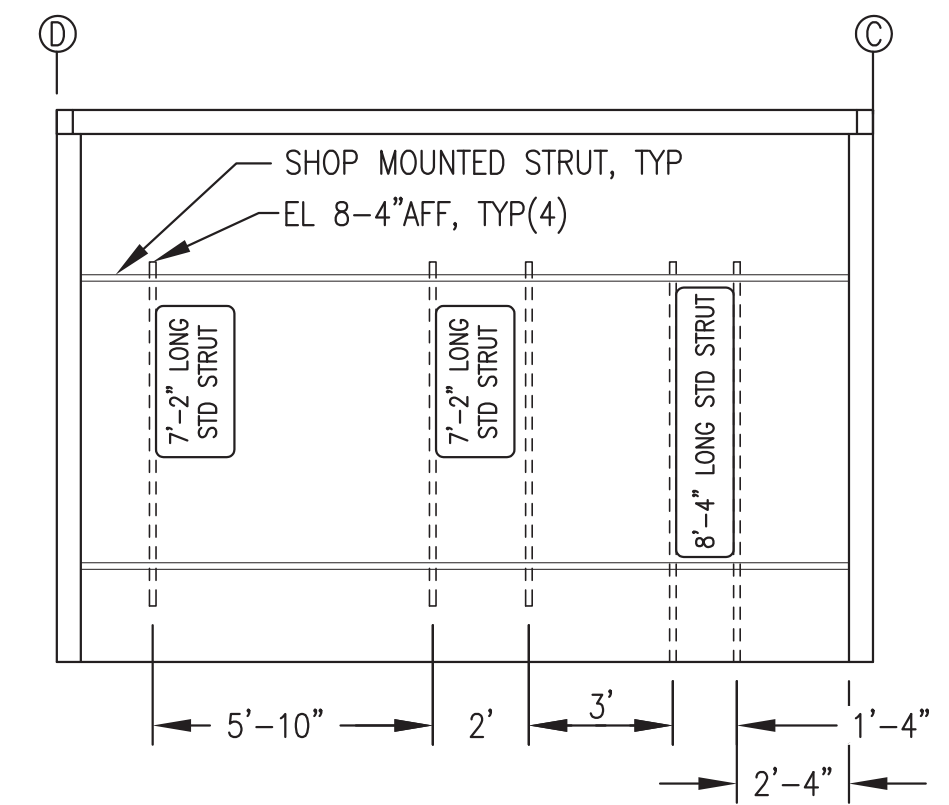


1 BACK WALL STRUT LAYOUT (GRID LINE C)
M3.4 3/8"=1'-0"

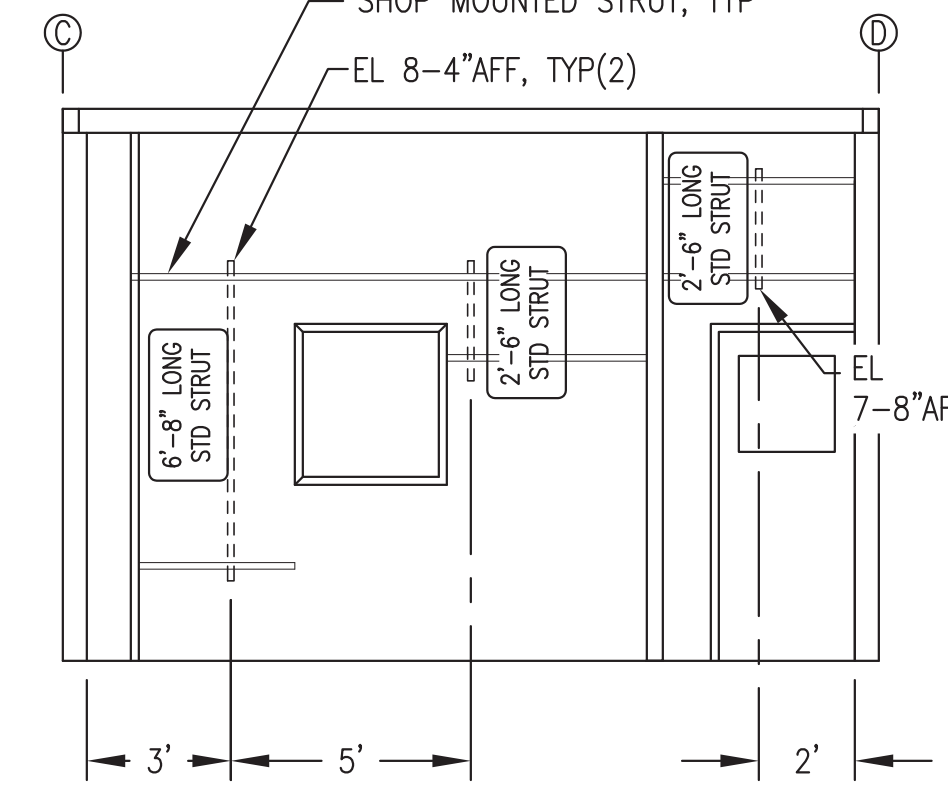


2 FRONT WALL STRUT LAYOUT (GRID LINE D)
M3.4 3/8"=1'-0"

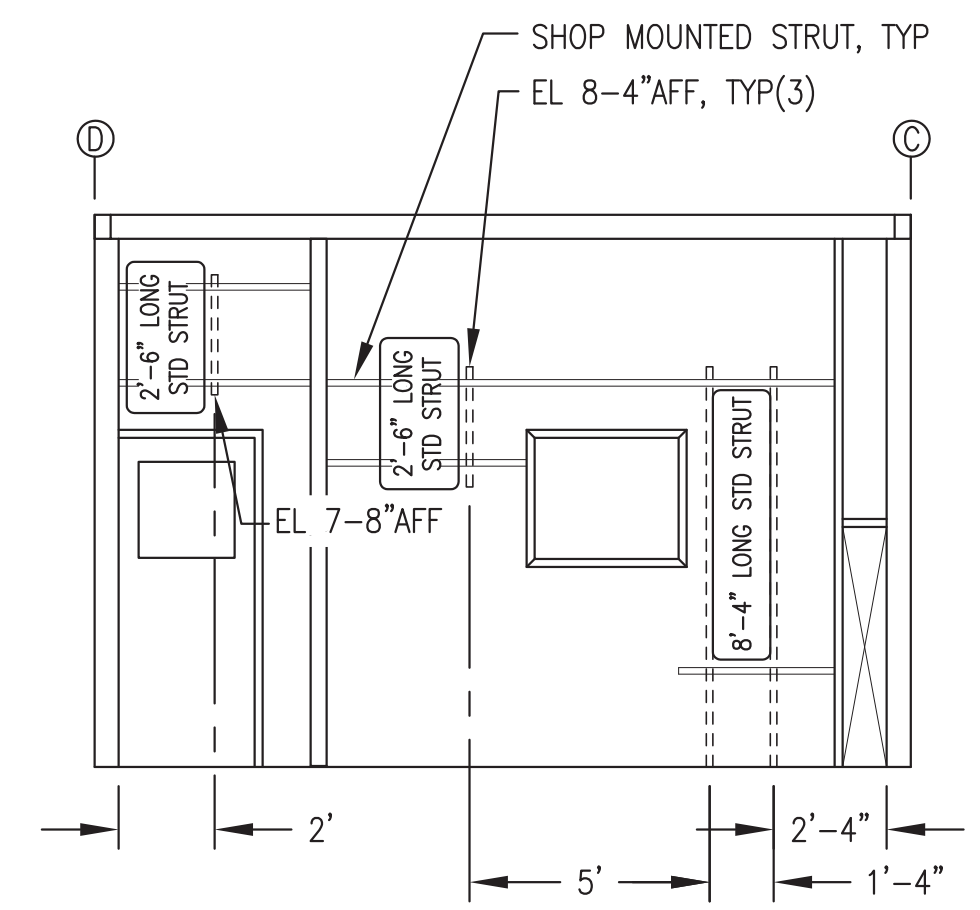
THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.



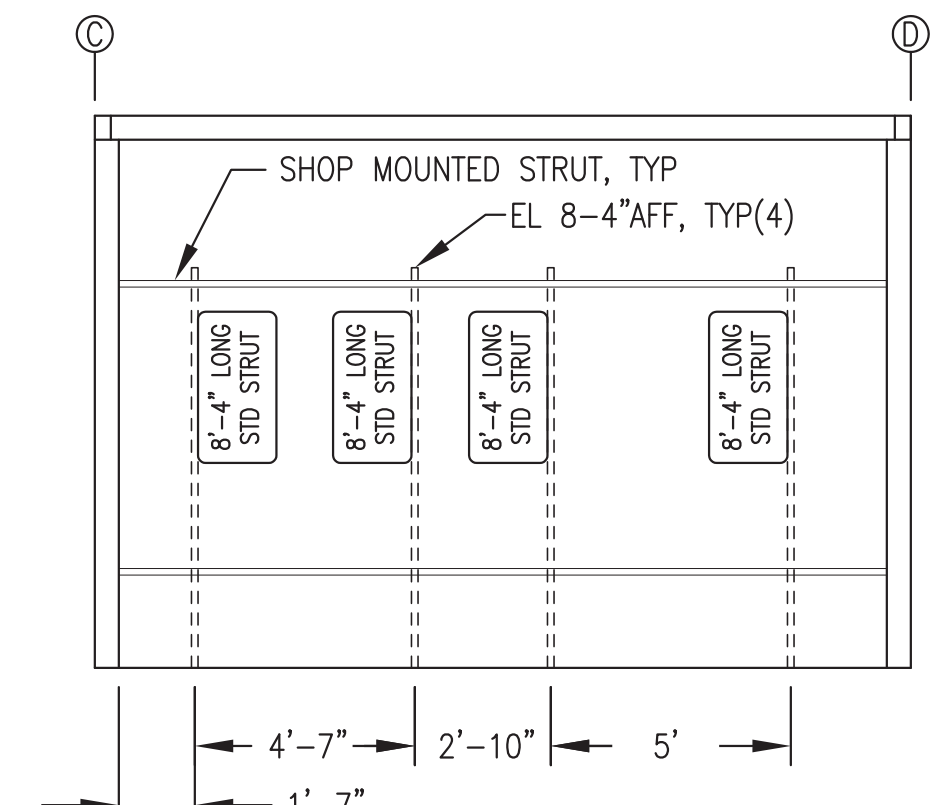
3 GEN ROOM A LEFT WALL STRUT LAYOUT
M3.4 3/8"=1'-0"



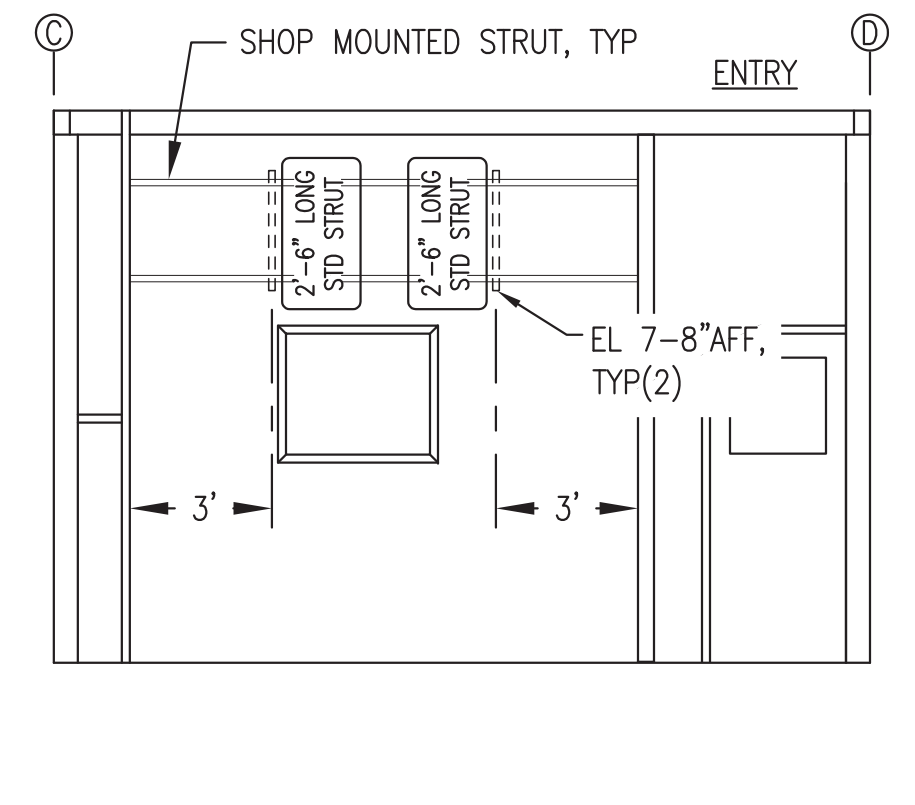
4 GEN ROOM A RIGHT WALL STRUT LAYOUT
M3.4 3/8"=1'-0"



5 GEN ROOM B LEFT WALL STRUT LAYOUT
M3.4 1/4"=1'-0"



6 GEN ROOM B END WALL STRUT LAYOUT
M3.4 3/8"=1'-0"



7 CTRL ROOM RIGHT WALL STRUT LAYOUT
M3.4 3/8"=1'-0" (CTRL ROOM LEFT WALL SIMILAR)

- GENERAL NOTES:**
- 1) ALL VIEWS THIS SHEET ARE INTERIOR ELEVATIONS.
 - 2) ALL STRUT LABELED "STD" TO BE 1-5/8"x1-5/8"x12GA PRE-GALVANIZED, SLOTTED BACK, B-LINE B-22-SH-GALV OR EQUAL.
 - 3) ALL STRUT TAGGED "DEEP" TO BE 3-1/4"x1-5/8"x12GA PRE-GALVANIZED, SLOTTED BACK, B-LINE B-11-SH-GALV OR EQUAL.
 - 4) PURCHASE ALL STRUT IN 20' LENGTHS TO MINIMIZE SPLICES.
 - 5) ALL HORIZONTAL STRUT SHOP WELDED TO WALLS AS PART OF MODULE FABRICATION.
 - 6) ALL VERTICAL STRUT LOCATION DIMENSIONS ARE CENTERLINE FROM FACE OF TUBE STEEL COLUMNS.
 - 7) CONNECT ALL VERTICAL STRUT TO HORIZONTAL STRUT WITH 1/2"x1-1/2" HEX SOCKET (ALLEN) HEAD CAP SCREWS, STRUT NUTS, AND LOCK WASHERS.

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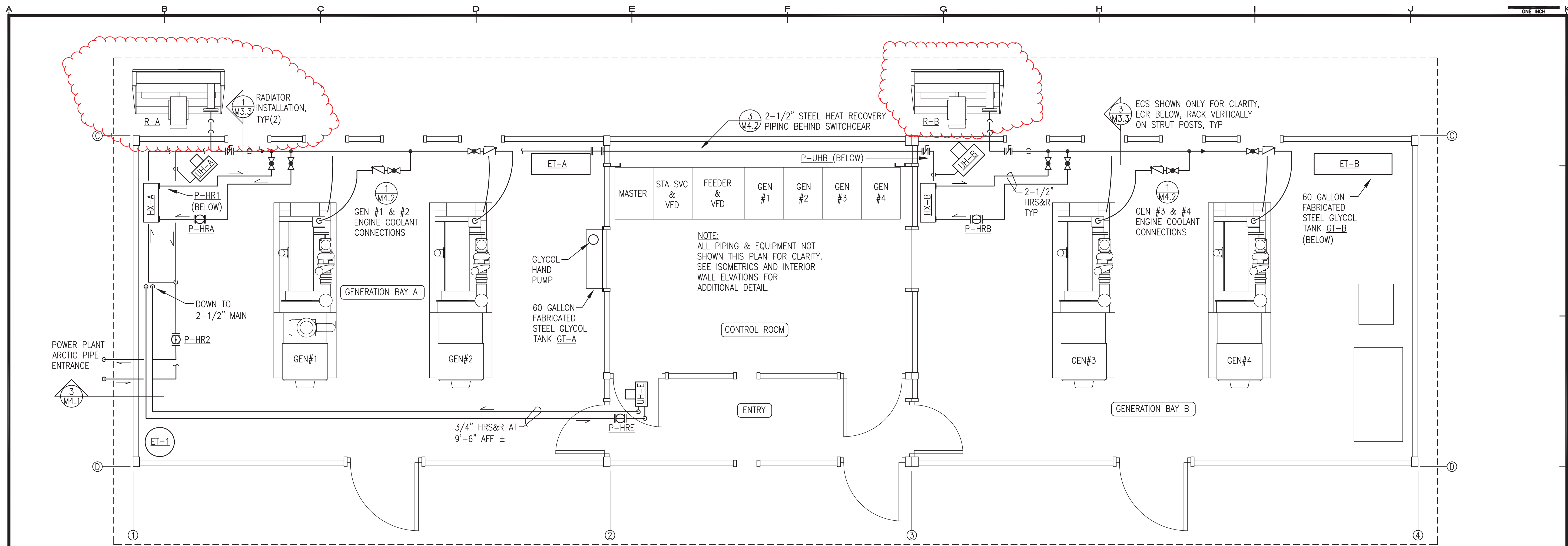
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SHEET TITLE	
STRUT LAYOUT ON WALLS	
SHEET	
M3.4	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



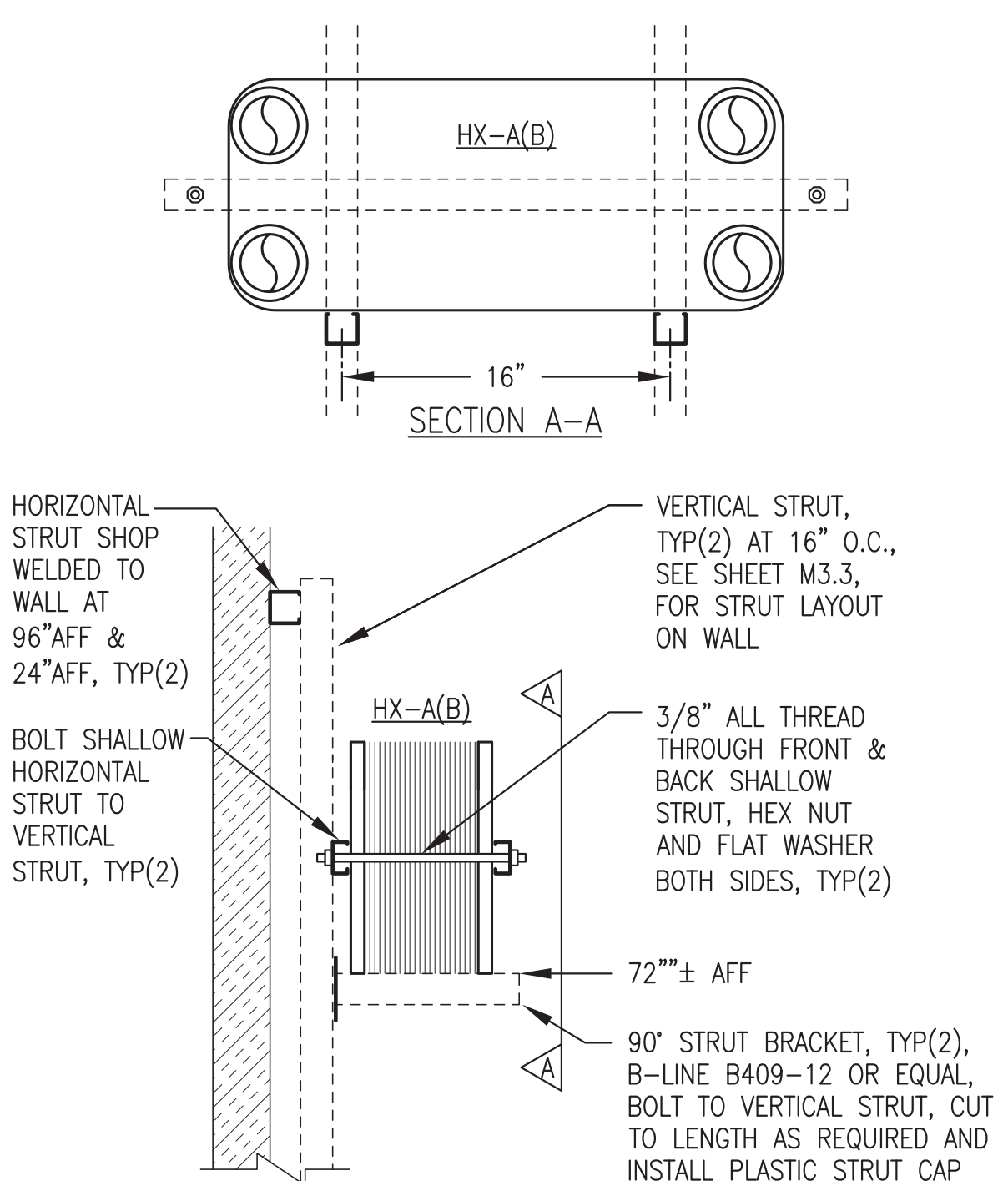
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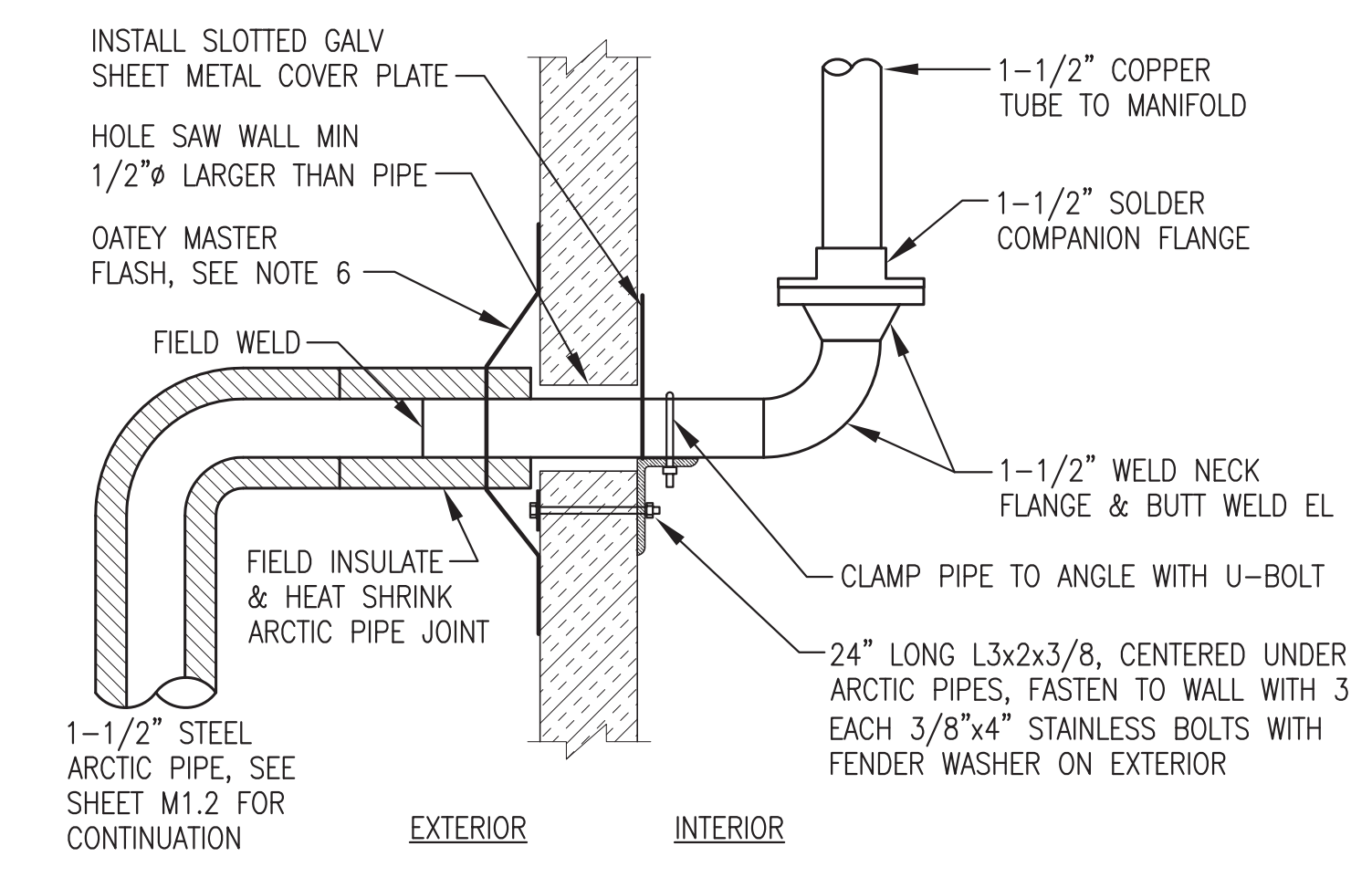
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1 COOLANT & HEAT RECOVERY PIPING PLAN
 M4.1 3/8"=1'-0"



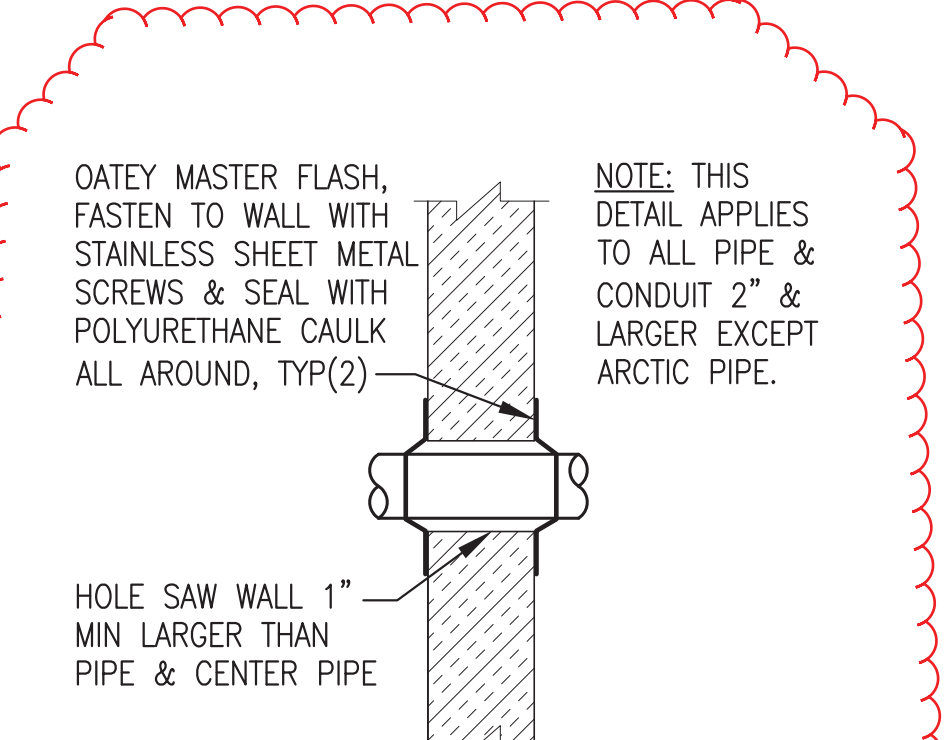
2 HEAT EXCHANGER SUPPORT FROM WALL
 M4.1 NO SCALE

- MODULE SHOP/FIELD NOTES:**
- 1) SEE ELEVATION 3/M3.2 FOR PENETRATION LOCATIONS.
 - 2) ONE PIPE SHOWN. PROVIDE TWO IDENTICAL.
 - 3) FINAL FIELD INSTALLATION SHOWN. FOR SHOP FABRICATION STUB PIPE 8" MIN BEYOND WALL & TEMPORARILY CONNECT SUPPLY TO RETURN FOR TESTING.
 - 4) AFTER TESTING REMOVE TEMPORARY CONNECTION, BREAK FLANGE JOINT, AND STORE PIPE IN MODULE. SEAL WALL PENETRATION FOR SHIPPING.
 - 5) IN FIELD REINSTALL PIPE THROUGH WALL AND WELD TO ARCTIC PIPE AS SHOWN.
 - 6) AFTER FINAL FIELD ASSEMBLY INSTALL FLASHING OVER ARCTIC PIPE, FASTEN TO WALL WITH STAINLESS STEEL SHEET METAL SCREWS, AND SEAL TO WALL SURFACE WITH POLYURETHANE CAULKING.

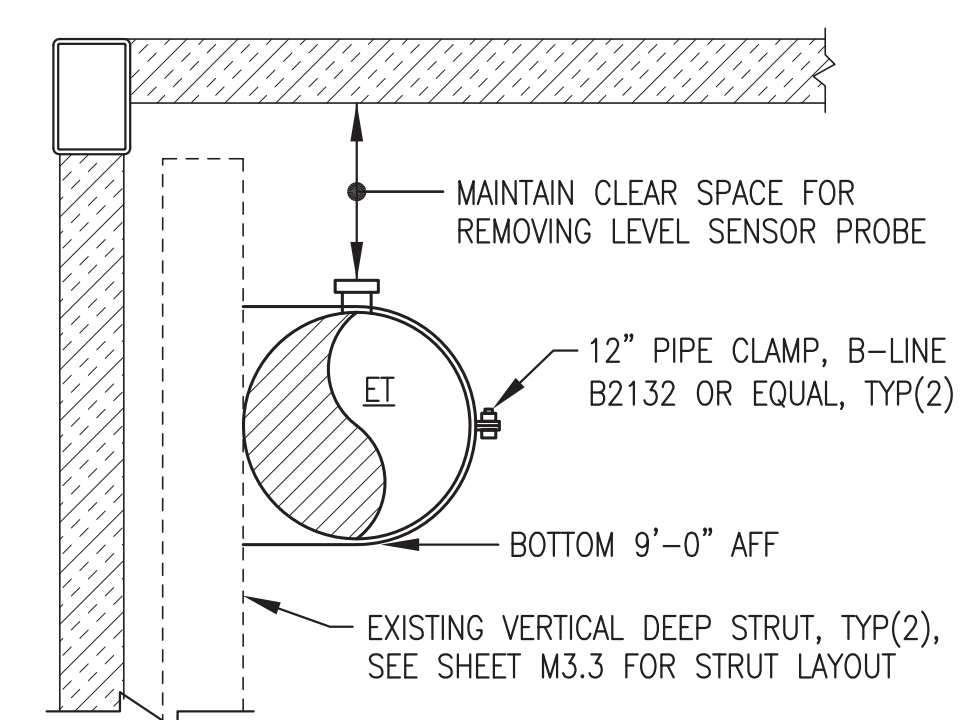


3 ARCTIC PIPE WALL PENETRATION
 M4.1 NO SCALE

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.



4 TYP WALL PENETRATION
 M4.1 NO SCALE



5 EXP TANK ET-A (B) SUPPORT
 M4.1 NO SCALE

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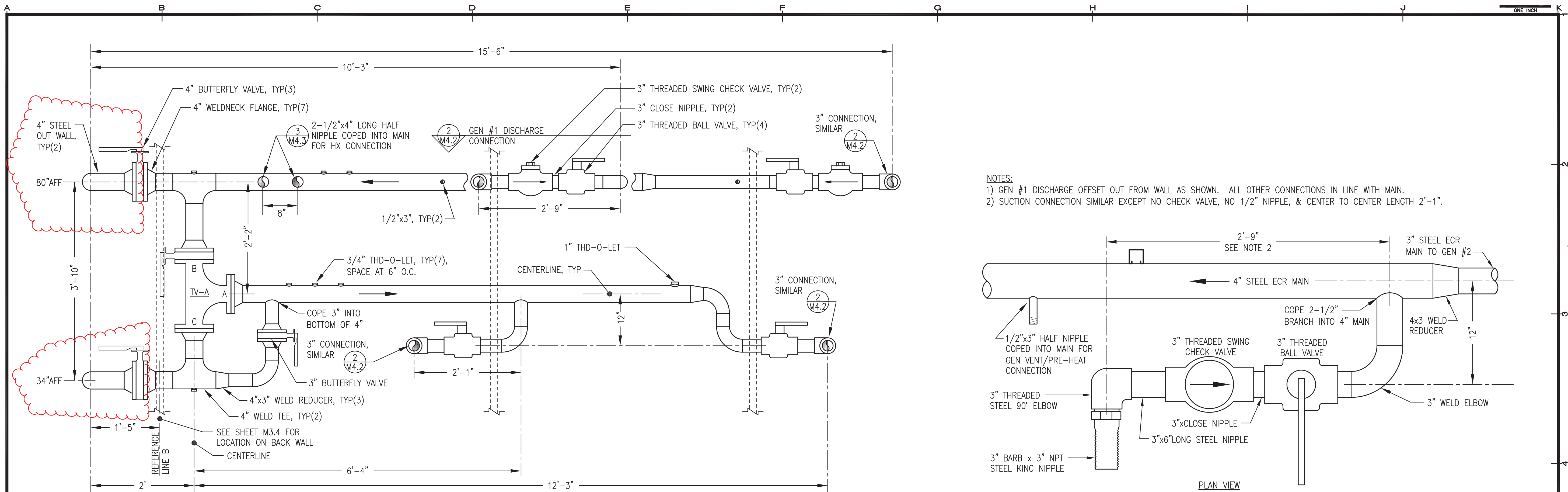
SHEET TITLE
 COOLANT & HEAT RECOVERY PLAN & DETAILS

SHEET
M4.1

DRAWN BY: WJP
 CHECKED BY: BCG

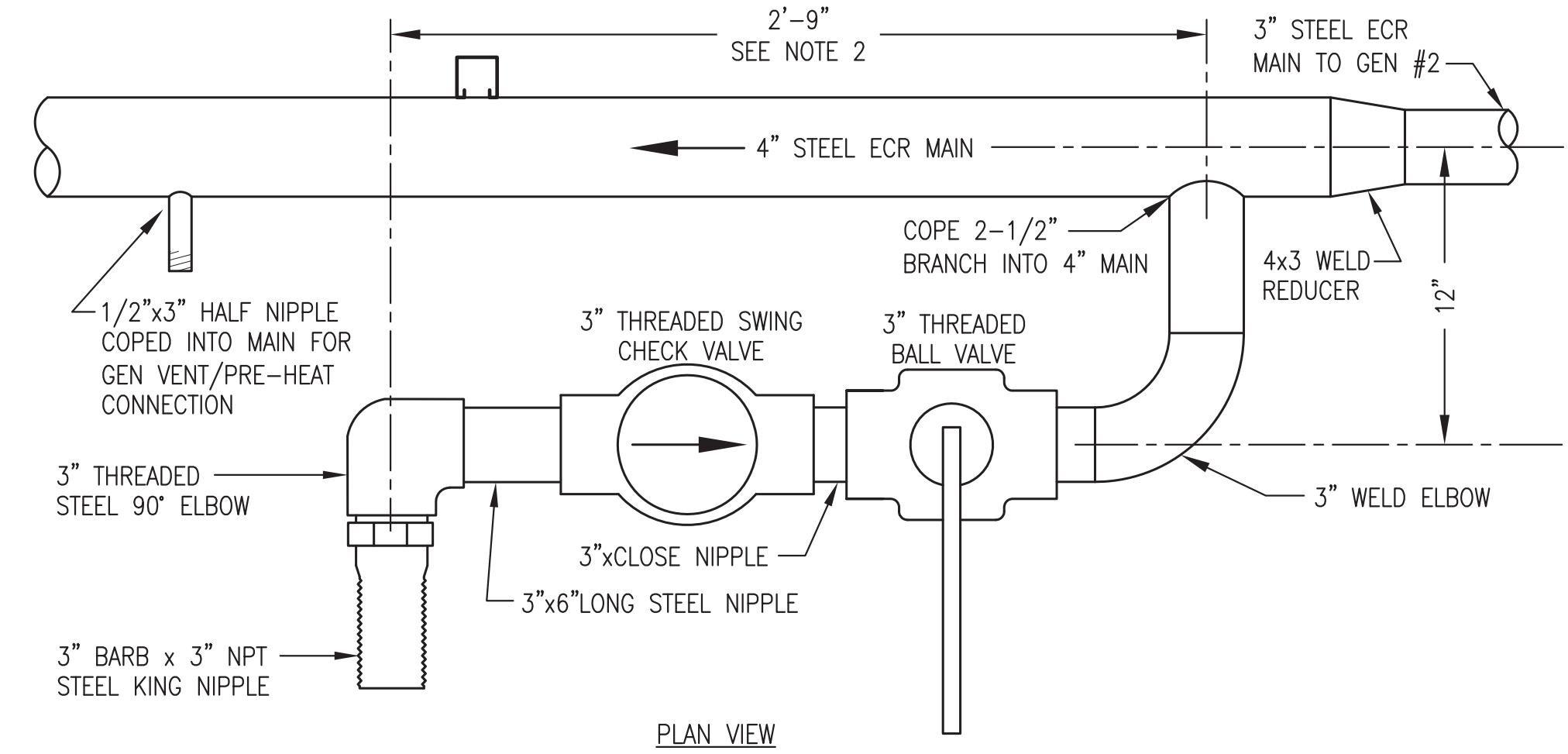
DATE: JUNE 16
 SCALE: AS SHOWN

JOB NUMBER:

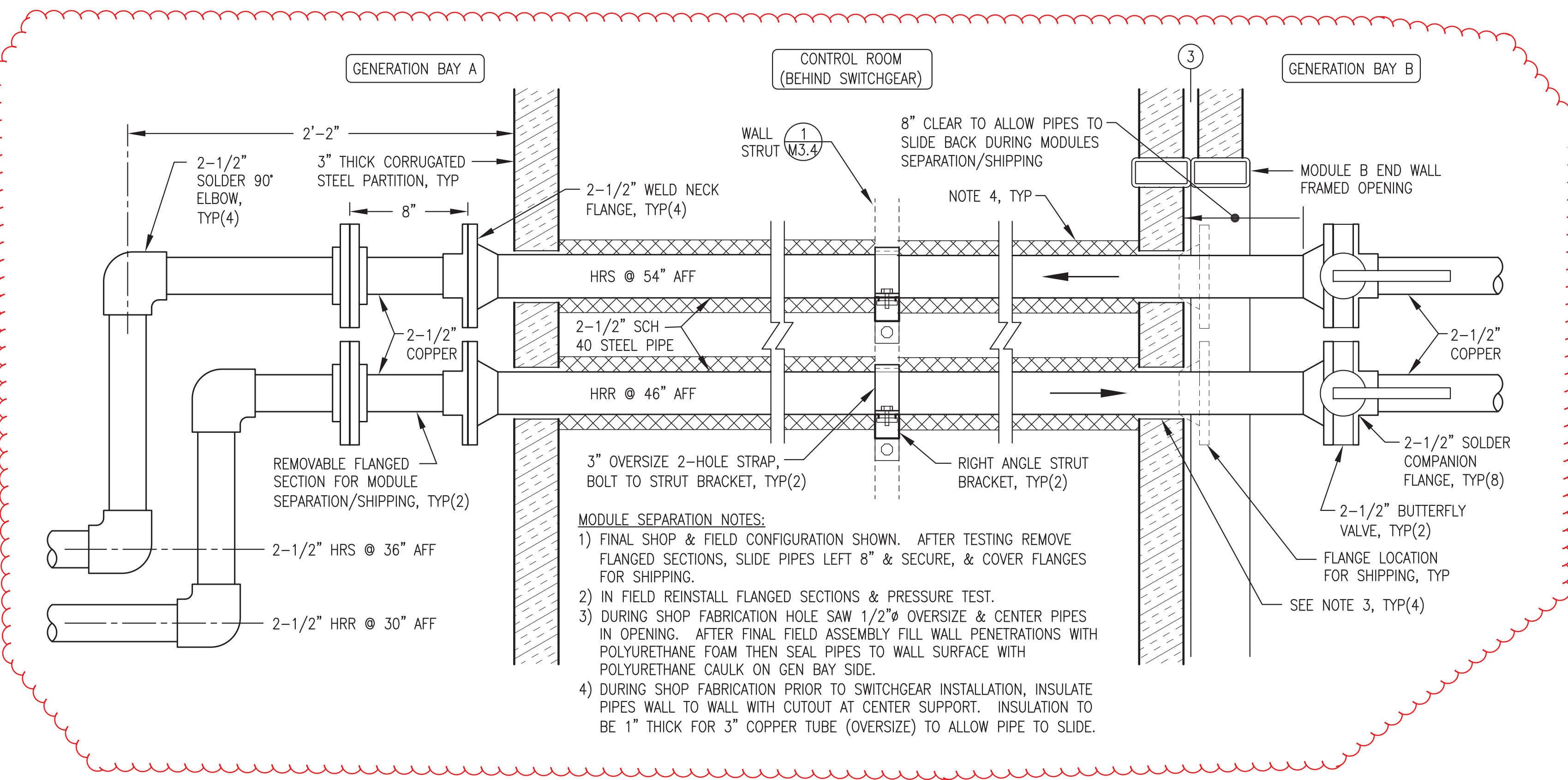


1 COOLANT MANIFOLD "A" FABRICATION (MANIFOLD "B" SIMILAR)
M4.2 1"=1'-0"

NOTES:
1) GEN #1 DISCHARGE OFFSET OUT FROM WALL AS SHOWN. ALL OTHER CONNECTIONS IN LINE WITH MAIN.
2) SUCTION CONNECTION SIMILAR EXCEPT NO CHECK VALVE, NO 1/2" NIPPLE, & CENTER TO CENTER LENGTH 2'-1".



2 GENERATOR #1/3 PIPING CONNECTION
M4.2 2"=1'-0"



3 HEAT RECOVERY PIPING BEHIND SWITCHGEAR
M4.2 2"=1'-0"

MODULE SEPARATION NOTES:
1) FINAL SHOP & FIELD CONFIGURATION SHOWN. AFTER TESTING REMOVE FLANGED SECTIONS, SLIDE PIPES LEFT 8" & SECURE, & COVER FLANGES FOR SHIPPING.
2) IN FIELD REINSTALL FLANGED SECTIONS & PRESSURE TEST.
3) DURING SHOP FABRICATION HOLE SAW 1/2" Ø OVERSIZE & CENTER PIPES IN OPENING. AFTER FINAL FIELD ASSEMBLY FILL WALL PENETRATIONS WITH POLYURETHANE FOAM THEN SEAL PIPES TO WALL SURFACE WITH POLYURETHANE CAULK ON GEN BAY SIDE.
4) DURING SHOP FABRICATION PRIOR TO SWITCHGEAR INSTALLATION, INSULATE PIPES WALL TO WALL WITH CUTOUT AT CENTER SUPPORT. INSULATION TO BE 1" THICK FOR 3" COPPER TUBE (OVERSIZE) TO ALLOW PIPE TO SLIDE.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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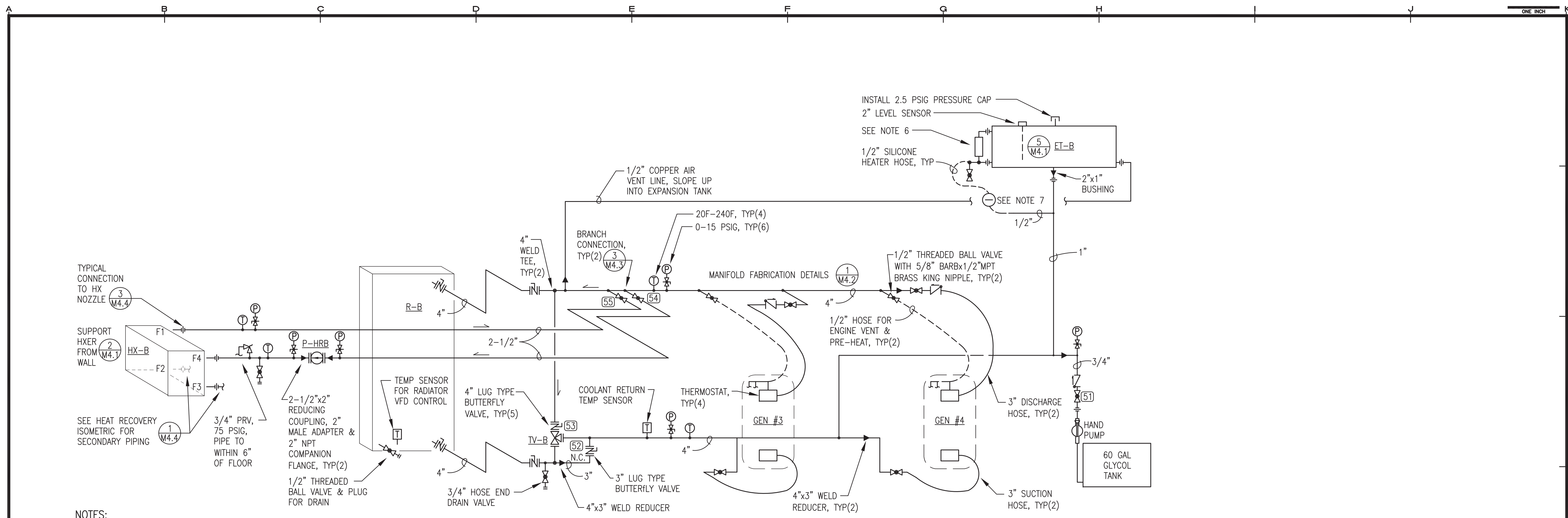
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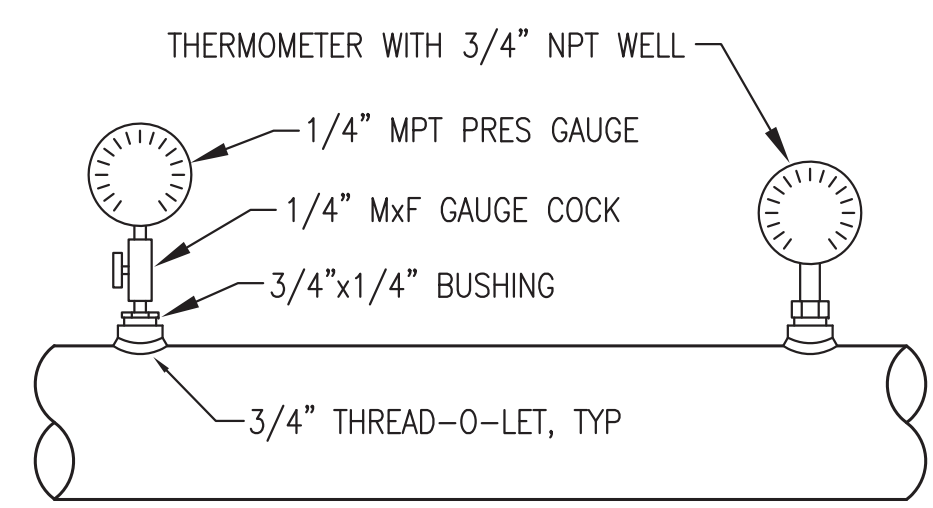
SHEET TITLE	
COOLING MANIFOLDS & HEAT RECOVERY PIPING DETAILS	
SHEET	
M4.2	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



NOTES:

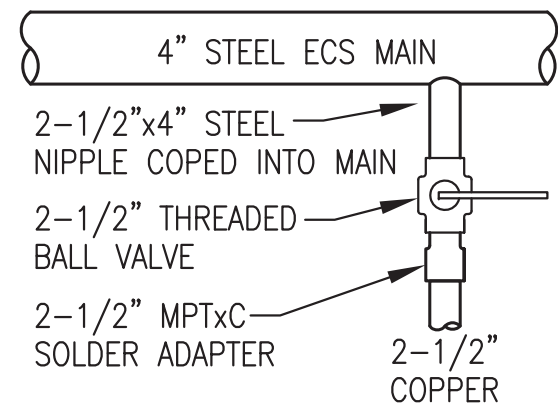
- 1) ALL 3" AND LARGER PIPING SHOWN THIS ISOMETRIC SCH 40 STEEL WITH WELDED JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL 2-1/2" AND SMALLER PIPE SHOWN THIS ISOMETRIC TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.
- 2) UNLESS INDICATED OTHERWISE MAKE ALL CONNECTIONS TO STEEL MAINS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 3/4" THREAD-0-LET AND MAKE ALL SIMILAR CONNECTIONS TO COPPER BRANCH PIPING WITH 1" T-DRILL TAP AND 3/4" CxFPT ADAPTER. SEE DETAILS. INSTALL THREADED BRASS BUSHINGS AS REQUIRED. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS IN STEEL MAINS WITH COPED CONNECTIONS AND IN COPPER MAINS WITH T-DRILL TAPS AS REQUIRED UNLESS INDICATED OTHERWISE.
- 3) ALL PRESSURE GAUGES IN ENGINE COOLING MAINS AND HEAT EXCHANGER PRIMARY SUPPLY 0-15 PSIG. ALL THERMOMETERS 20-240F. ALL TEMPERATURE SENSORS 20-240F RANGE 4-20mA TRANSMITTERS.
- 4) UPON COMPLETION OF FABRICATION FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.
- 5) INSULATE COOLANT PIPING MAINS FROM GENERATOR VALVES TO WALL PENETRATIONS. ALL OTHER PIPING NOT INSULATED.
- 6) INSTALL 9" LONG COOLANT SITE GAUGE ON 1/2" TEES, INSTALL 1/2" THREADED BALL VALVE WITH PLUG IN BOTTOM FOR DRAIN.
- 7) LOW COOLANT ALARM SWITCH PROVIDED WITH GENERATORS, MOUNT WITH SWITCH POINT ELEVATION LEVEL WITHIN 12" OF BOTTOM OF TANK. CONNECT TO HOSE WITH 1/2"NPTx5/8" BARB.

1 GEN #3/4 COOLANT MANIFOLD B PIPING ISOMETRIC (GEN #1/2 ENGINE COOLANT MANIFOLD A SIMILAR)
 M4.3 NO SCALE



- NOTES:**
- 1) LEAVE GAUGE COCKS OPEN ON PRESSURE GAUGES.
 - 2) TEMP SENSOR SIMILAR TO THERMOMETER WITH 3/4"x1/2" BUSHING.

2 TYPICAL INSTRUMENT INSTALLATION
 M4.3 NO SCALE



3 BRANCH PIPE CONNECTION
 M4.3 NO SCALE

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

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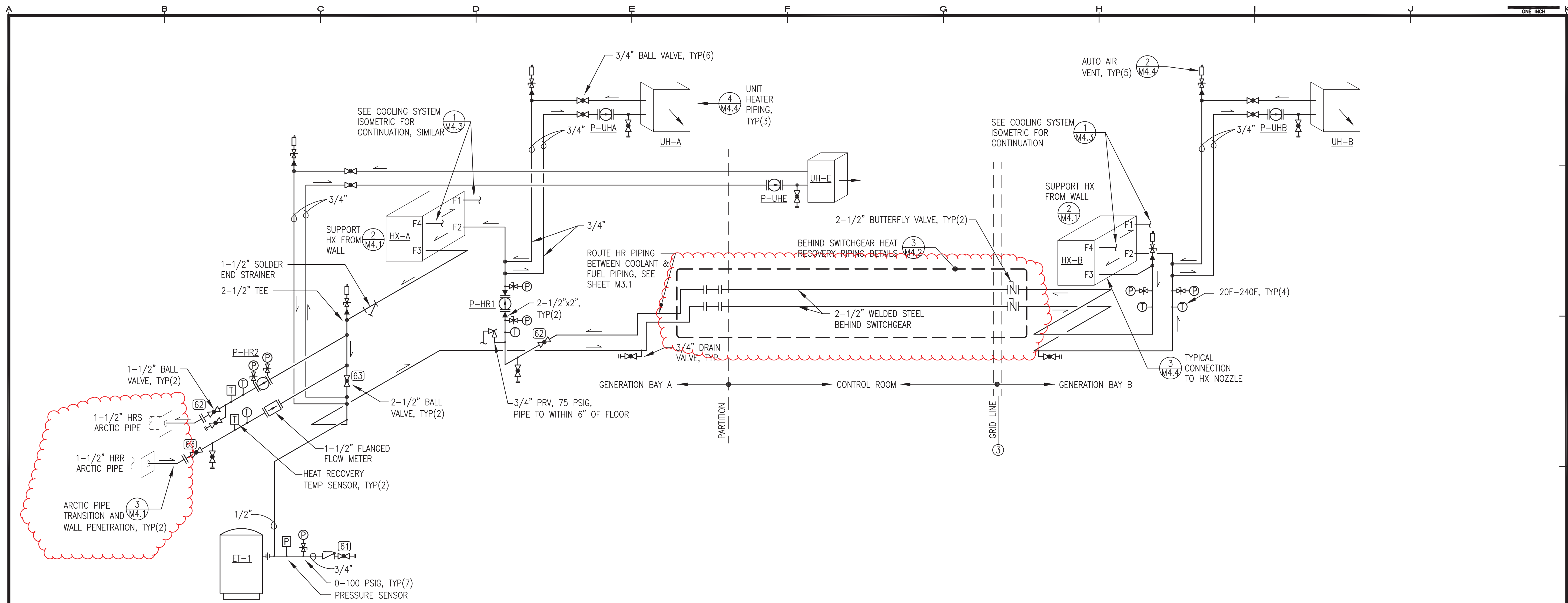
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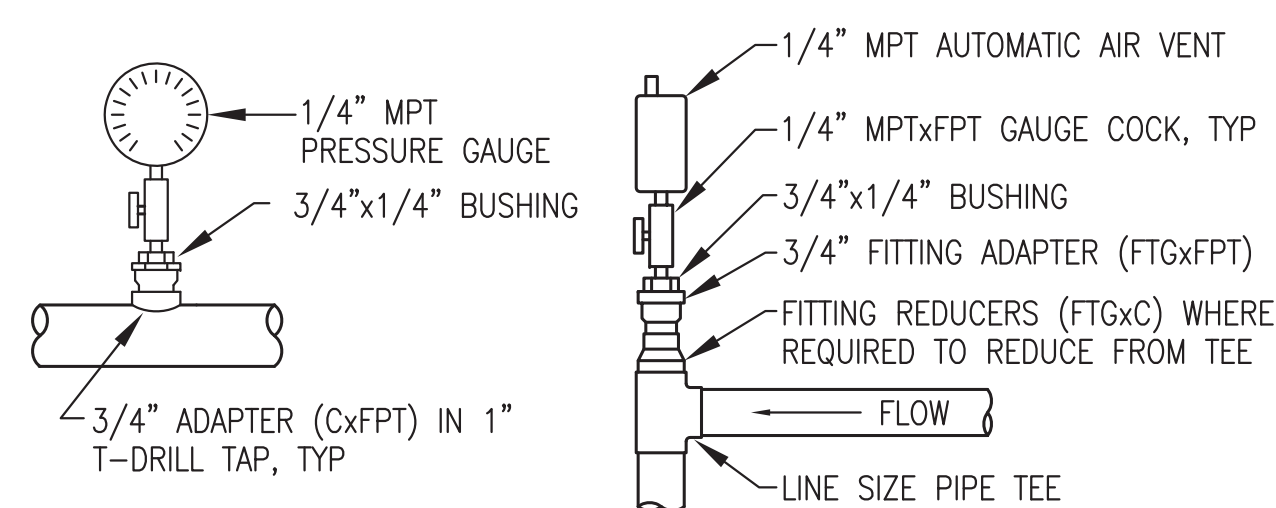
SHEET TITLE	
COOLING ISOMETRIC & DETAILS	
SHEET	
M4.3	
DRAWN BY: WJP	CHECKED BY: BCG
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NOTES:

- 1) ALL PIPING SHOWN THIS ISOMETRIC 2-1/2" TYPE L HARD DRAWN COPPER UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS UNLESS SPECIFICALLY INDICATED OTHERWISE.
- 2) UNLESS SPECIFIED OTHERWISE MAKE ALL CONNECTIONS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 1" T-DRILL TAP AND 3/4" CxFPT ADAPTER. SEE DETAILS, SIMILAR. INSTALL THREADED BRASS BUSHINGS AS REQUIRED.
- 3) ALL PRESSURE GAUGES 0-100 PSIG. ALL THERMOMETERS 20-240F. ALL TEMPERATURE SENSORS 20-240F RANGE 4-20mA TRANSMITTERS.
- 4) UPON COMPLETION OF FABRICATION VALVE OFF HEAT EXCHANGERS, UNIT HEATERS AND ELECTRIC BOILER, FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.
- 5) INSULATE HEAT RECOVERY PIPING MAINS.
- 6) SET P-HR2 TO OPERATE ON SPEED 2.

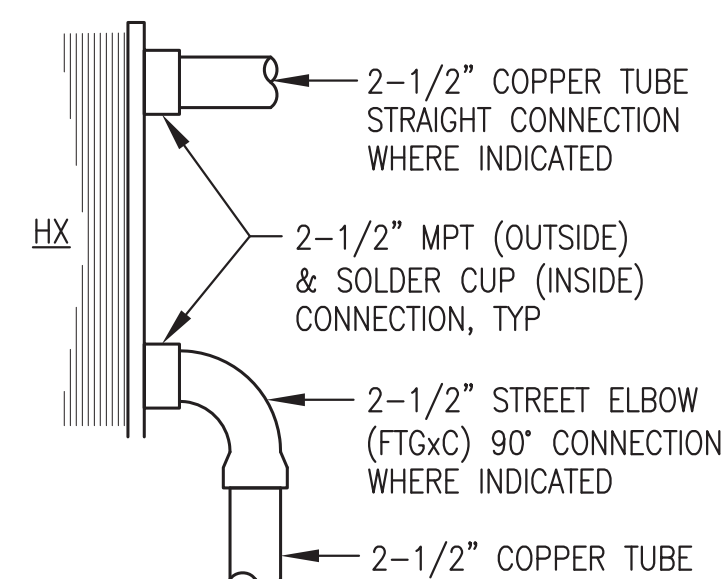
1 HEAT RECOVERY SYSTEM PIPING ISOMETRIC
M4.4 NO SCALE



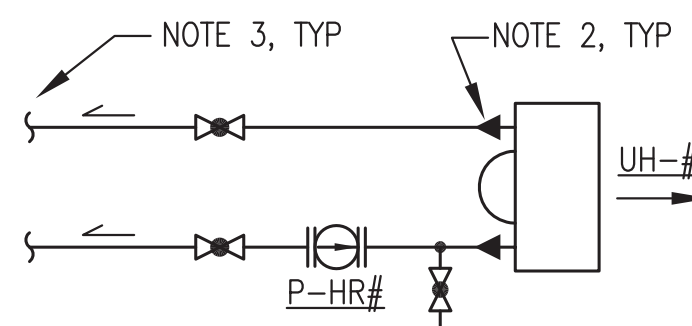
TYPICAL COPPER TUBE INSTALLATIONS

- NOTES:**
- 1) CLOSE GAUGE COCKS ON AIR VENTS AFTER BLEEDING SYSTEM OF AIR. LEAVE GAUGE COCKS OPEN ON PRESSURE GAUGES.
 - 2) TEMP SENSOR SIMILAR TO THERMOMETER WITH 3/4"x1/2" BUSHING.

2 TYPICAL AIR VENT/INSTRUMENT INSTALLATION
M4.4 NO SCALE



3 HX PIPING CONNECTION
M4.4 NO SCALE



- NOTES:**
- 1) SET PUMP ON SPEED 3.
 - 2) CONNECT WITH 1-1/4"x3/4" BRASS BUSHING & 3/4" MPTxC ADAPTER.
 - 3) ALL BRANCH PIPING 3/4" TYPE L COPPER. CONNECT TO MAINS WITH T-DRILL TAPS. ROUTE & PITCH TO VENT TO AIR VENT.

4 UNIT HEATER PIPING
M4.4 NO SCALE

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SHEET TITLE
HEAT RECOVERY ISOMETRIC & DETAILS

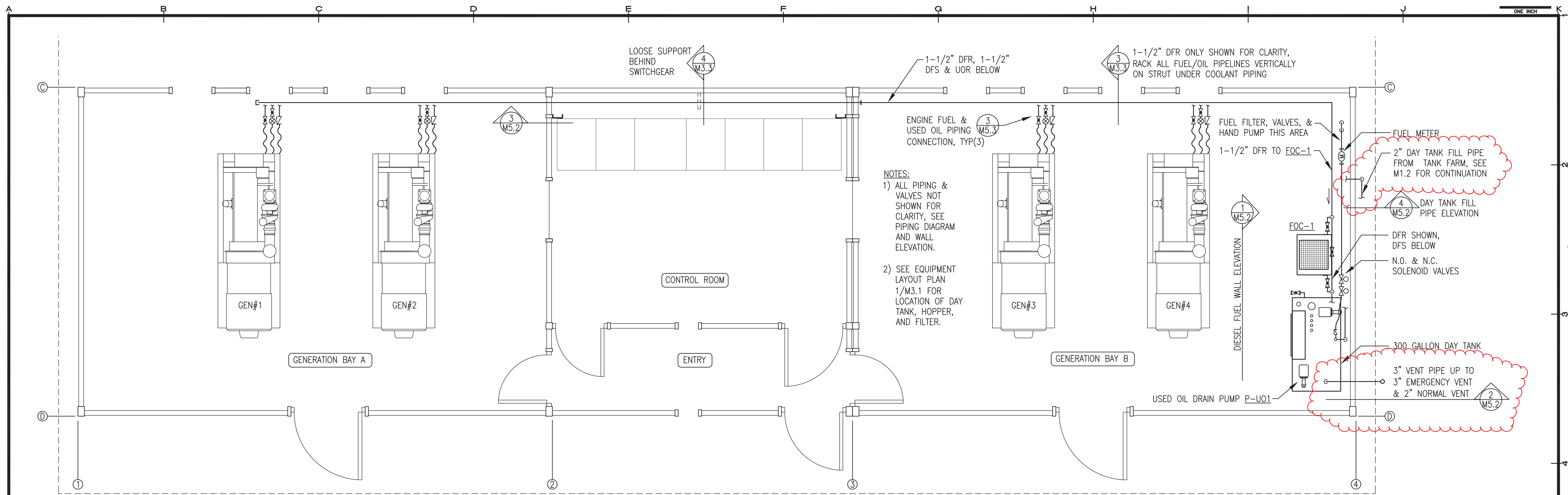
SHEET
M4.4

DRAWN BY: WJP
CHECKED BY: BCG

DATE: JUNE 16
SCALE: AS SHOWN

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THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.



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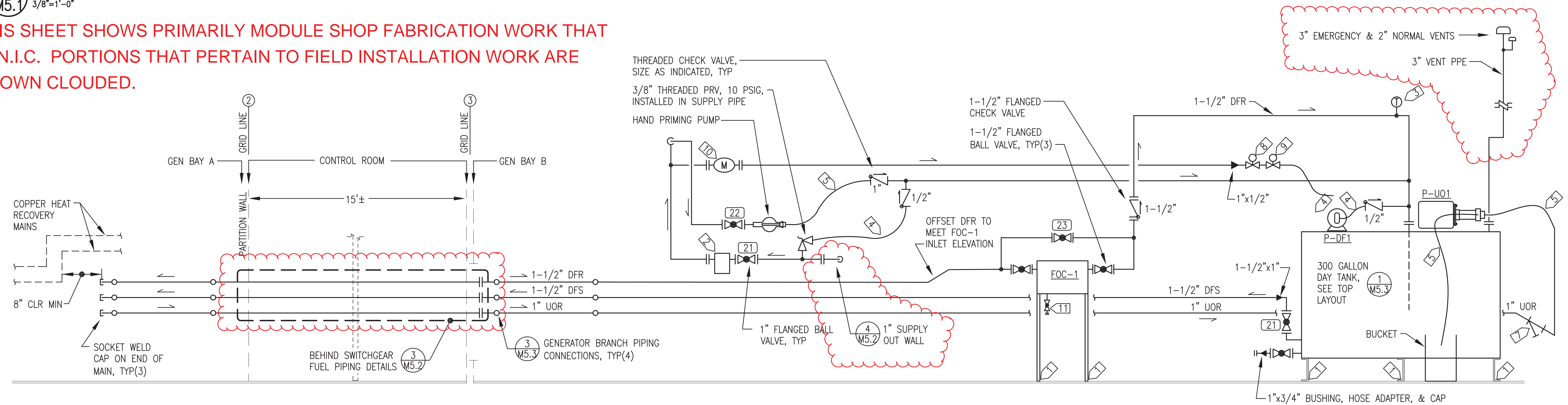
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1 DIESEL FUEL SYSTEM & USED OIL PIPING PLAN
 M5.1 3/8"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.



PIPING DIAGRAM SPECIFIC NOTES:

- 1) TAP FLOOR AND FASTEN WITH 3/8" BOLTS.
- 2) 1" ANSI 150# FLANGED FILTER, REMOVE DRAIN VALVE & INSTALL 1/8" Mx F DRAIN COCK.
- 3) 20-240°F THERMOMETER, INSTALL THERMAL WELL IN 3/4" THREAD-O-LET.
- 4) #10 HOSE WITH 1/2" OR 3/8" NPT SWIVEL ENDS.
- 5) #12 HOSE WITH NPT SWIVEL ENDS, 1/2", 3/4", OR 1" AS REQ TO MATCH PIPING OR PUMPS.
- 6) NOT USED
- 7) 1" THREADED STRAINER IN 1" UOR WITH GAUGE COCK BLOW DOWN.
- 8) 1/2" NO SOLENOID VALVE.
- 9) 1/2" NC SOLENOID VALVE.

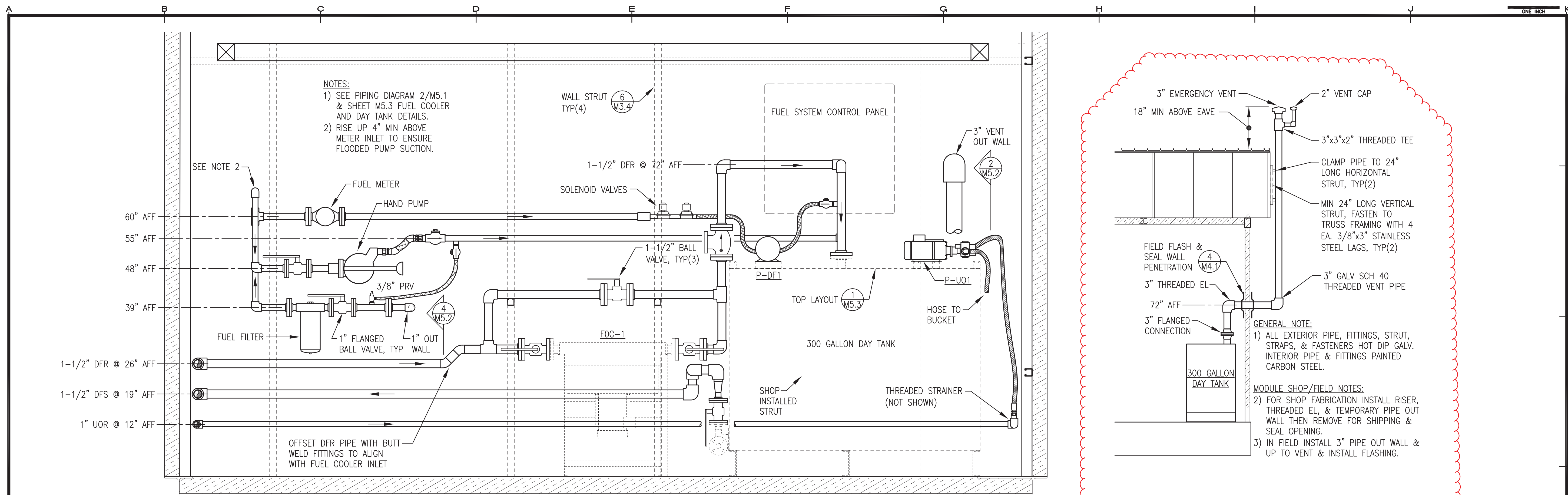
PIPING DIAGRAM GENERAL NOTES:

- 1) FABRICATE DAY TANK PER AEA STANDARD POWER PLANT TANK FABRICATION DETAILS. PLUG/CAP ALL SPARE OPENINGS.
- 2) ALL DAY TANK SUPPLY AND RETURN PIPING 1" SCH 80 EXCEPT WHERE INDICATED AS 1-1/2". ALL VENT PIPING 3" SCH 40.
- 3) ALL PIPING JOINTS SOCKET OR BUTT WELD EXCEPT FOR THREADED CONNECTIONS TO EQUIPMENT AND VALVES.

2 DIESEL FUEL & USED OIL PIPING DIAGRAM
 M5.1 NO SCALE

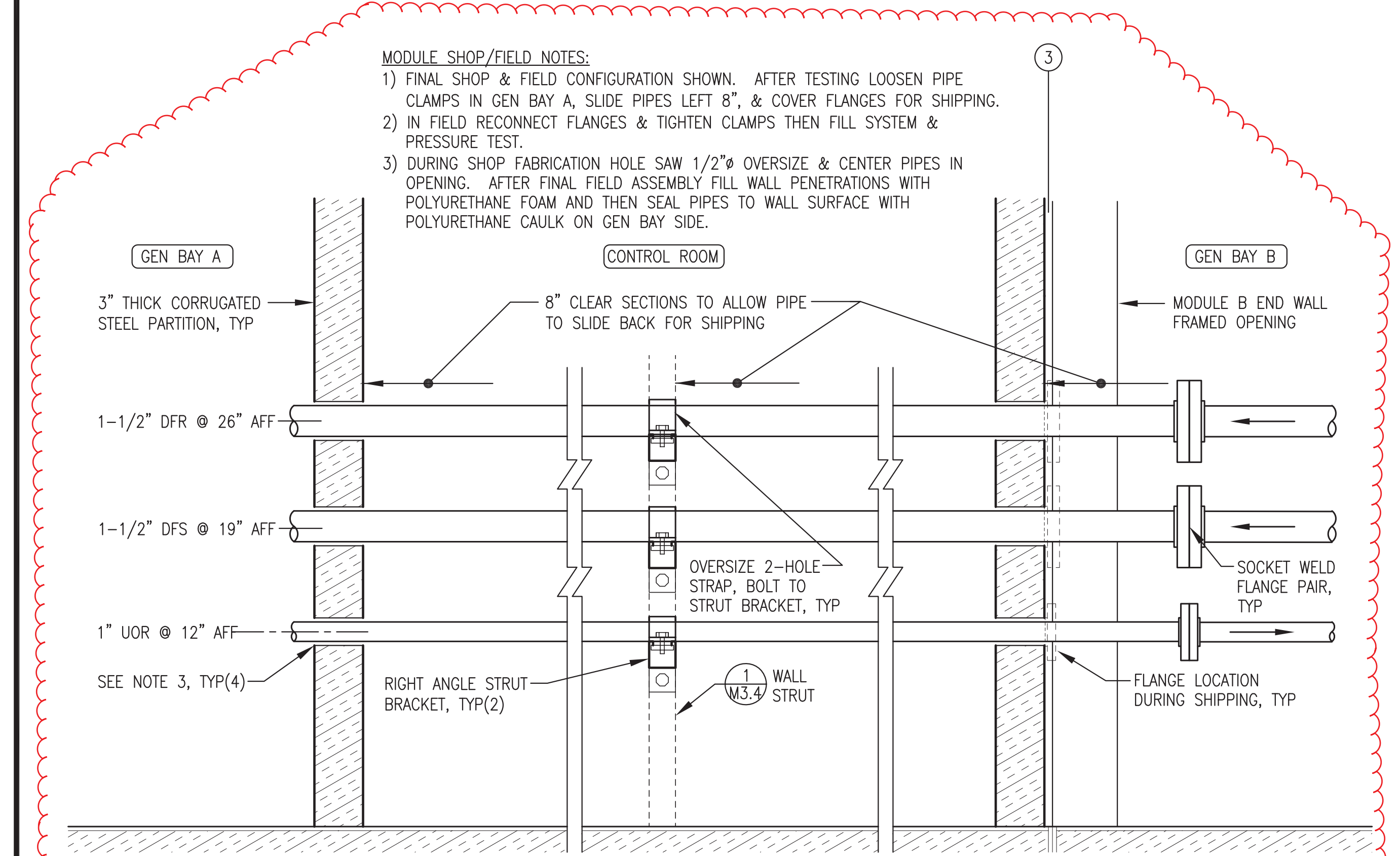
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SHEET TITLE: DIESEL FUEL & USED OIL PIPING PLAN & DIAGRAM
 SHEET: M5.1
 DRAWN BY: WJP
 CHECKED BY: BCG
 DATE: JUNE 16
 SCALE: AS SHOWN
 JOB NUMBER:

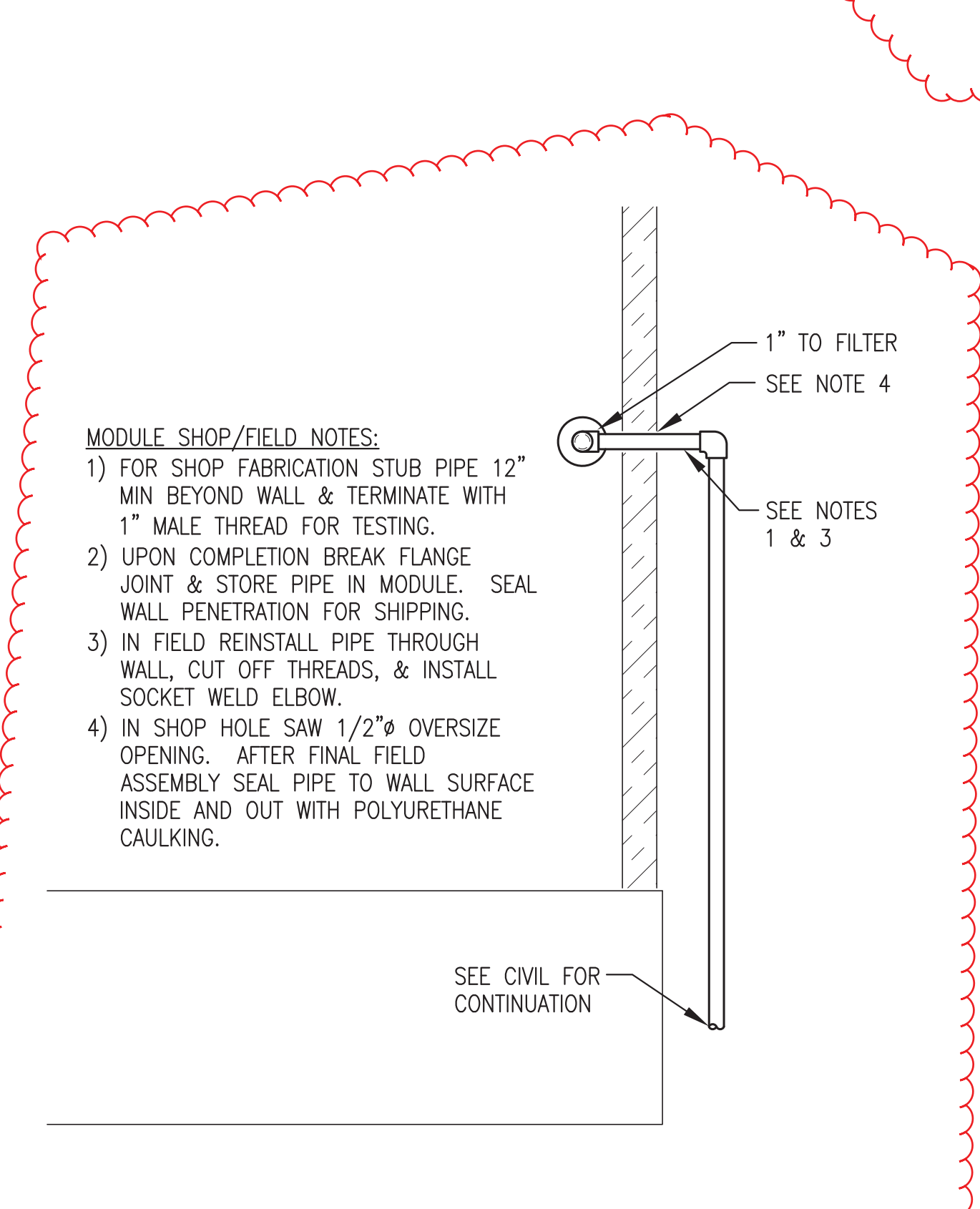


1 DIESEL FUEL & USED OIL WALL ELEVATION
 M5.2 1"=1'-0"

2 DAY TANK VENT INSTALLATION
 M5.2 3/8"=1'-0"



3 BEHIND SWITCHGEAR FUEL PIPING DETAILS
 M5.2 2"=1'-0"



4 DAY TANK FILL PIPE MODULE ENTRANCE
 M5.2 1"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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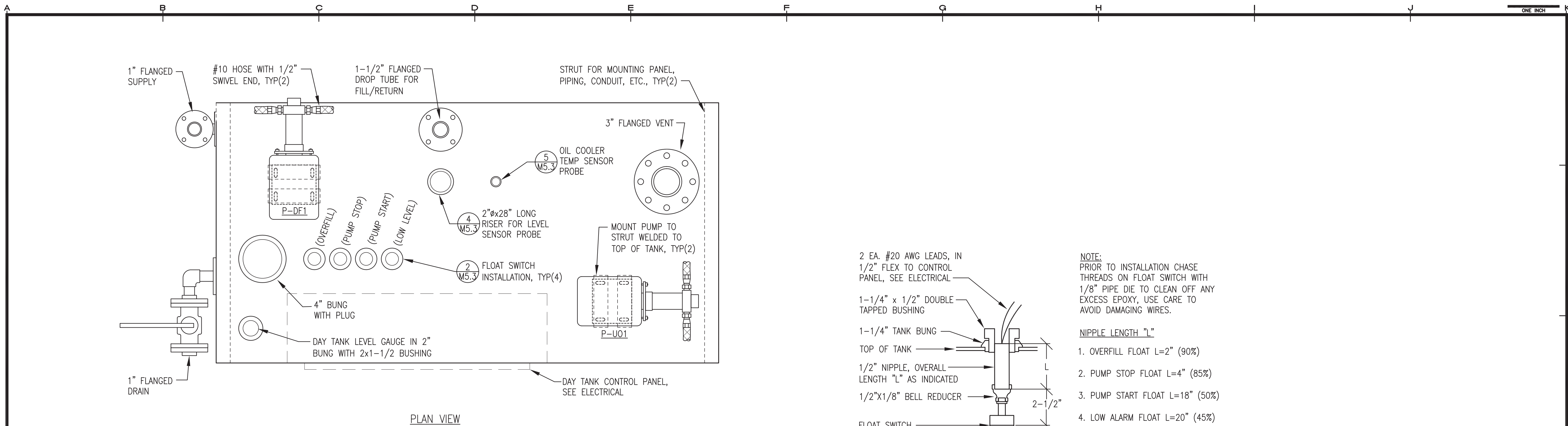
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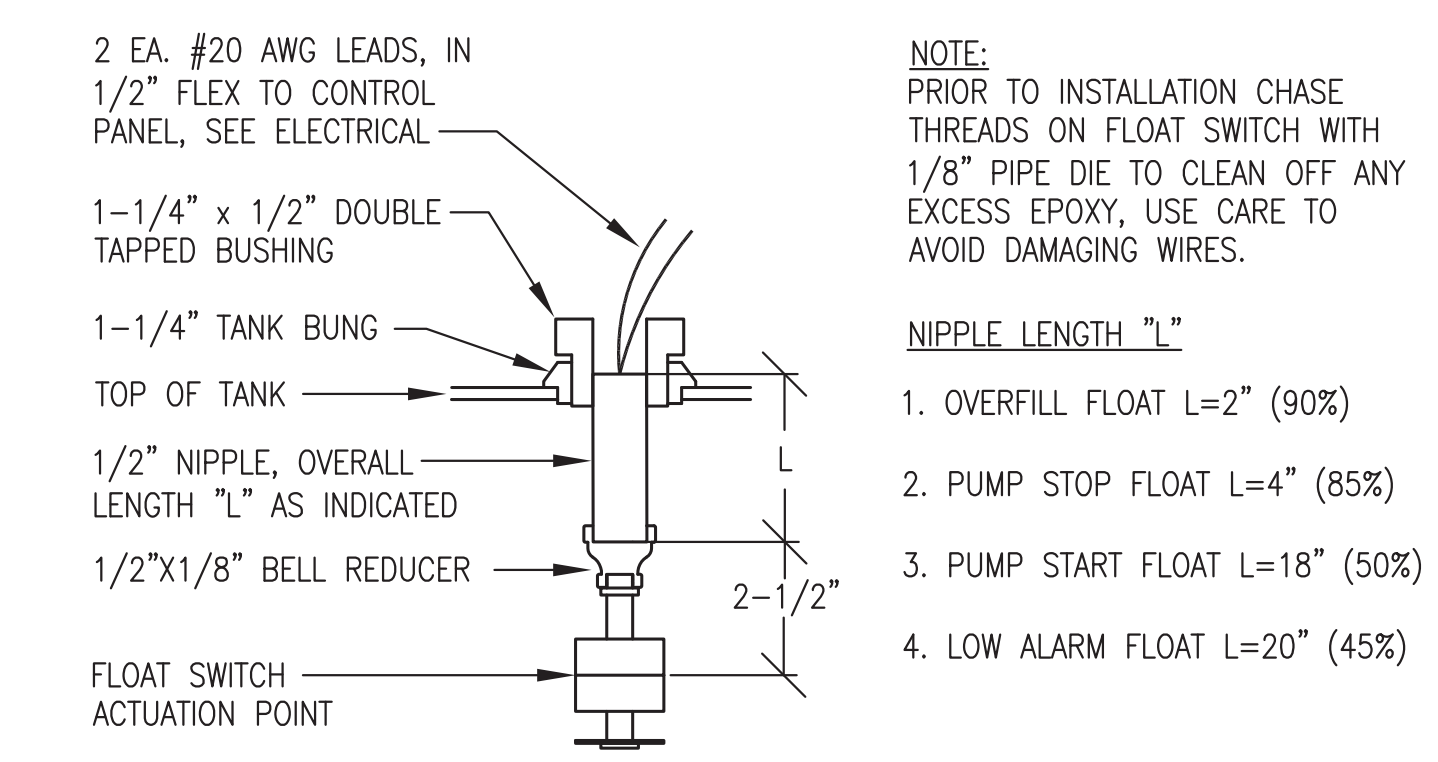


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DIESEL FUEL & USED OIL PIPING DETAILS	
SHEET	
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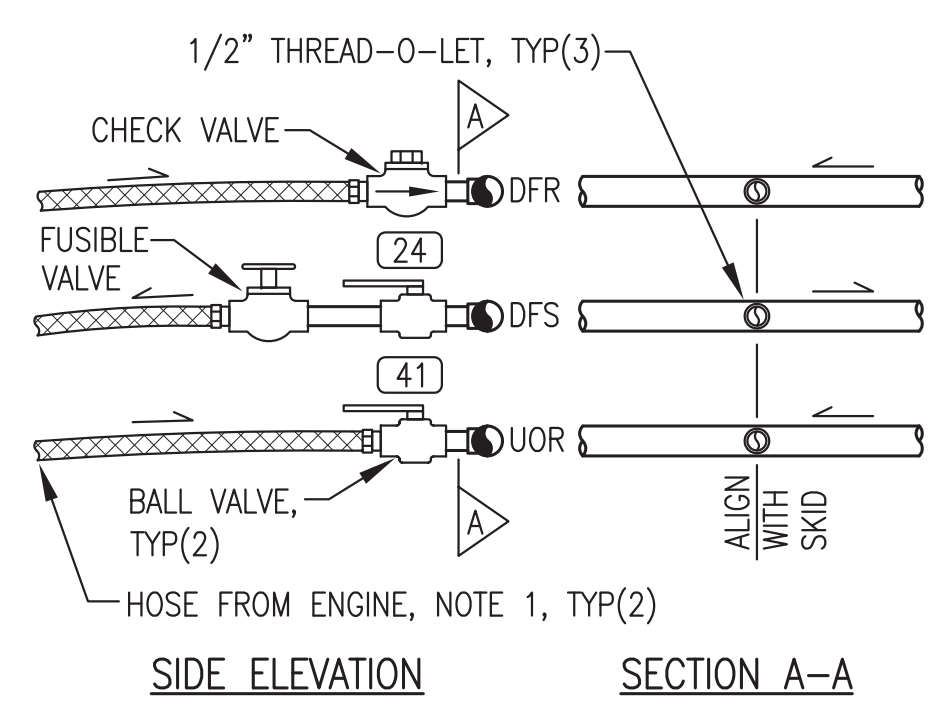


1 TOP OF DAY TANK -- PLAN VIEW
M5.3 NO SCALE

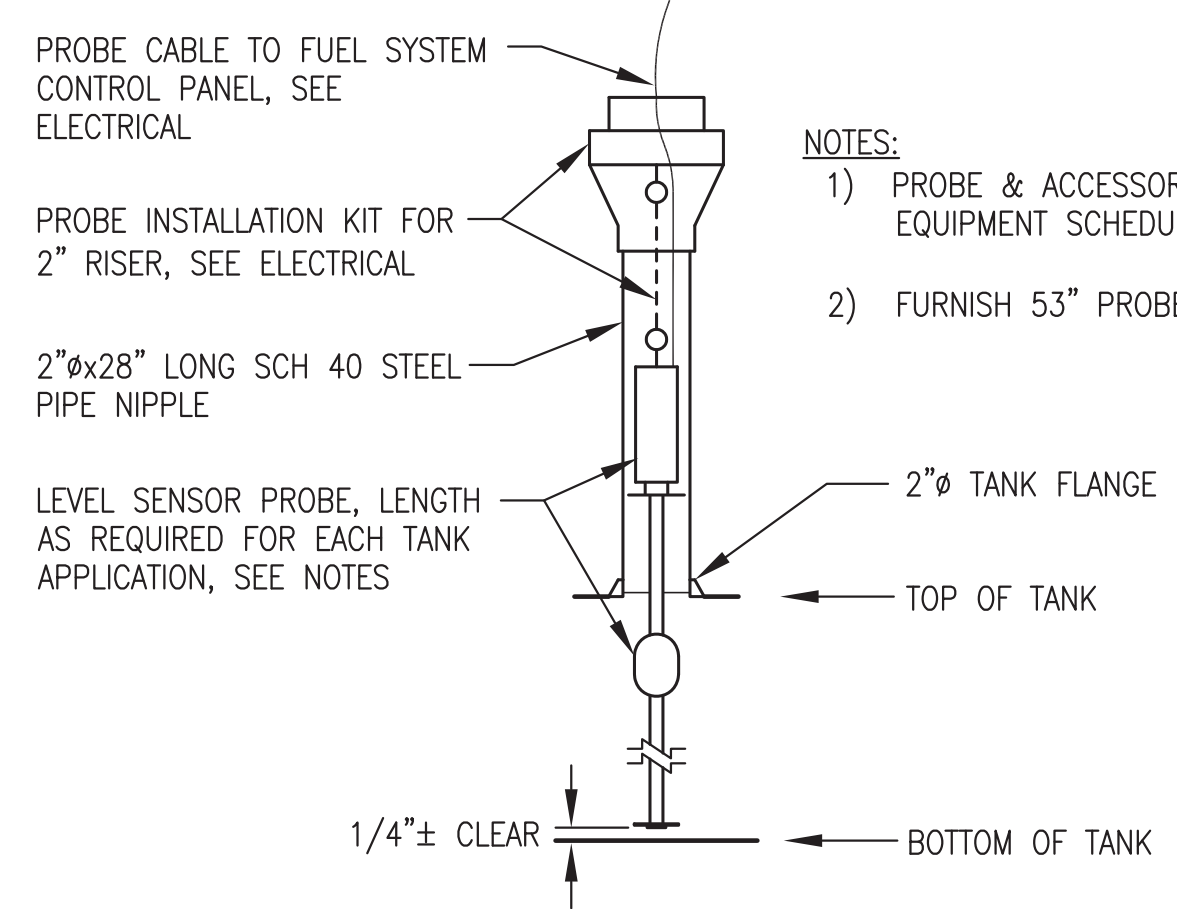


2 DAY TANK FLOAT SWITCH INSTALLATION
M5.3 NO SCALE

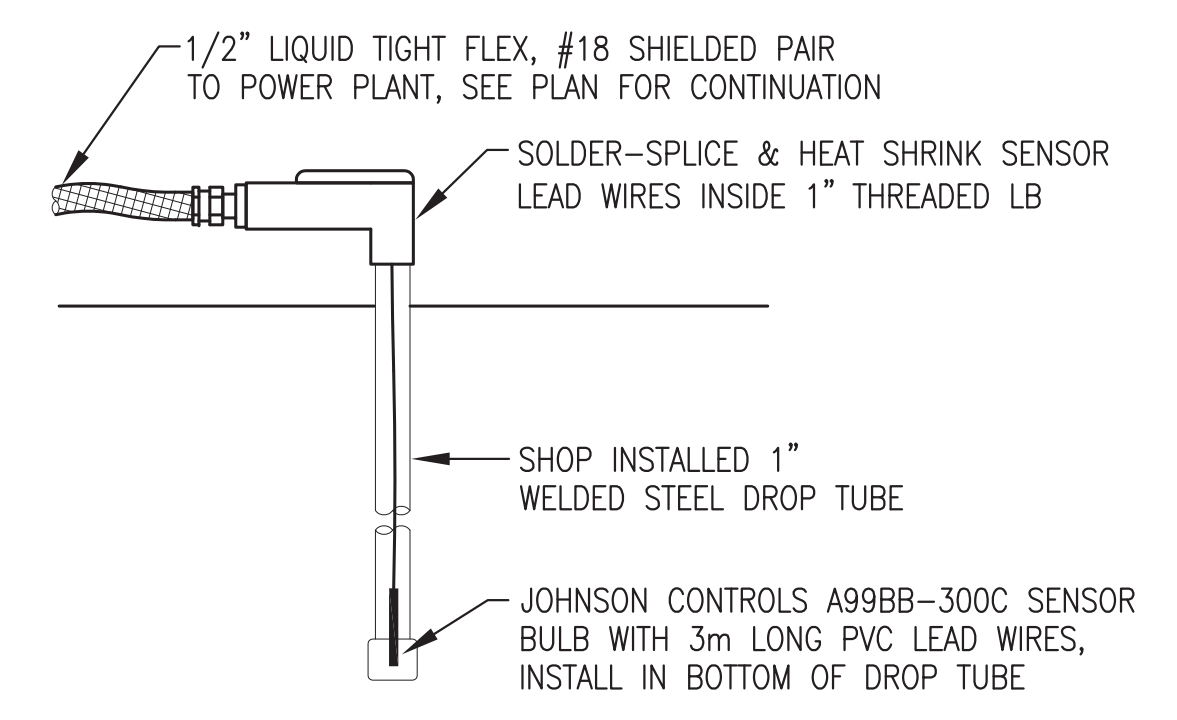
- NOTES:
- AEROQUIP HOSES PROVIDED WITH ENGINE, SIZE VARIES PER ENGINE & PRODUCT. ALL EQUIPPED WITH JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH & RE-INSTALL ENDS.
 - ALL PIPING & NIPPLES SCH 80. ALL VALVES 1/2" SIZE WITH THREADED ENDS.



3 ENGINE FUEL PIPING CONNECTION
M5.3 NO SCALE



4 TYPICAL LEVEL SENSOR PROBE INSTALLATION
M5.3 NO SCALE



5 COOLER TEMPERATURE SENSOR INSTALLATION
M5.3 NO SCALE

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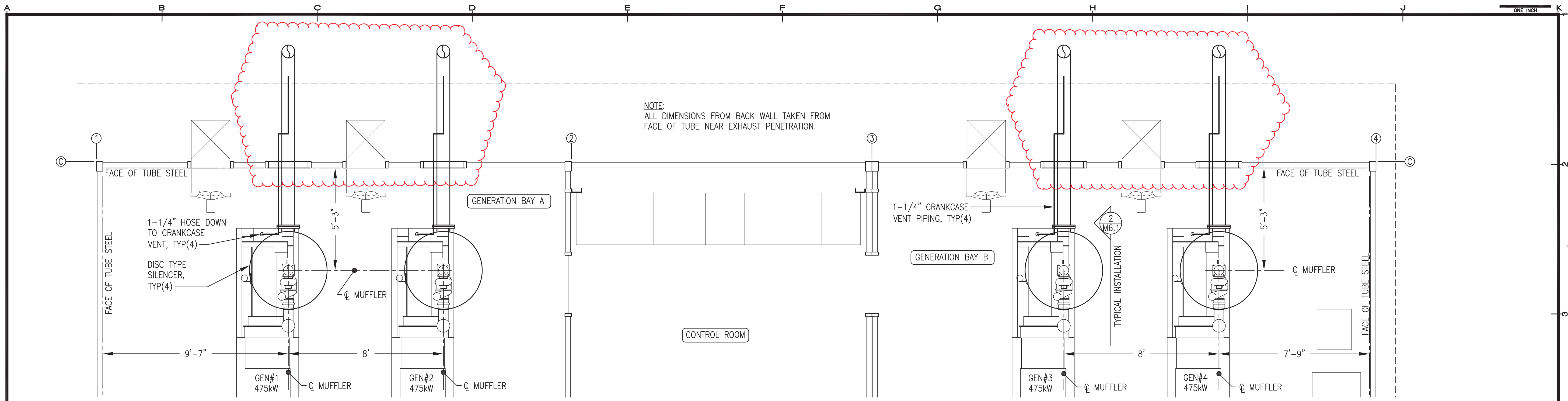
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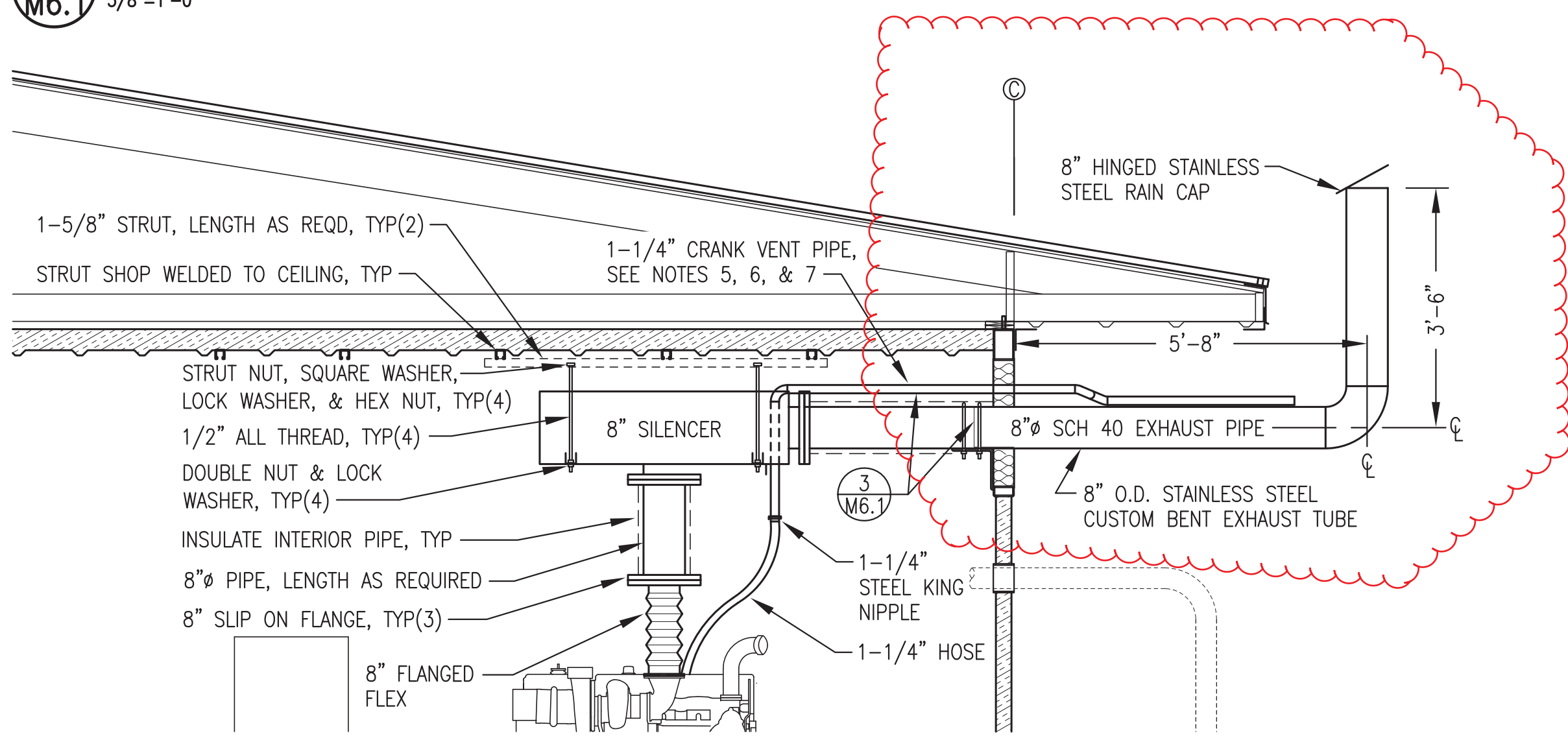
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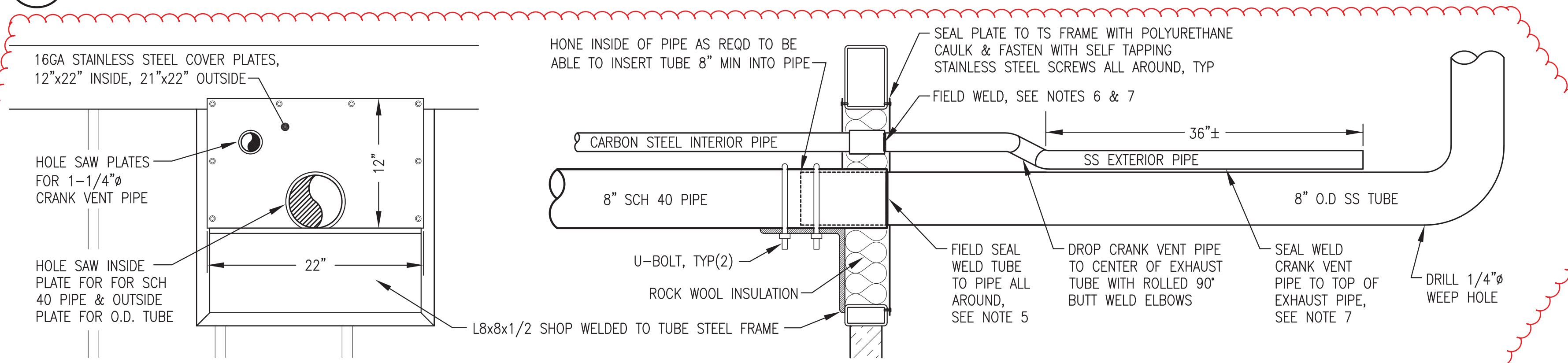
SHEET TITLE	
DIESEL FUEL & USED OIL PIPING DETAILS	
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1 EXHAUST & CRANK VENT PLAN
M6.1 3/8"=1'-0"



2 TYPICAL SILENCER, EXHAUST & CRANK VENT PIPE INSTALLATION
M6.1 1/2"=1'-0"



3 INSULATED WALL PENETRATION & CRANK VENT TERMINATION
M6.1 1-1/2"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

- EXHAUST/CRANK VENT SYSTEM GENERAL NOTES & SHOP/FIELD NOTES:**
- 1) FLEXES FURNISHED WITH GENERATORS. MUFFLERS, CONNECTING PIPE, FLANGES, AND ACCESSORIES FURNISHED AS PART OF MODULE CONSTRUCTION.
 - 2) MUFFLERS TO BE CRITICAL GRADE, INTERNALLY INSULATED DISK STYLE, SIZE AS INDICATED. ALL EXHAUST PIPE EXTERIOR OF WALL PENETRATION TYPE 304 STAINLESS STEEL O.D. TUBING. ALL INTERIOR EXHAUST PIPE SCH 40 CARBON STEEL. ALL FLANGES ANSI 150# FLAT FACED. INSTALL HIGH TEMPERATURE FULL FACE STAINLESS STEEL AND GRAPHITE GASKETS, DURABLE BLACK OR EQUAL.
 - 3) INSULATE INTERIOR EXHAUST PIPING WITH 1-1/2" MEDIUM TEMPERATURE INSULATION FROM FLEX TO MUFFLER AND FROM MUFFLER TO WALL PENETRATION.
 - 4) ALL CRANK VENT PIPING ON EXTERIOR OF COUPLING TYPE 304 STAINLESS STEEL WITH BUTT WELD FITTINGS. ALL INTERIOR PIPING CARBON STEEL WITH SOCKET WELD FITTINGS.
 - 5) SHOP FABRICATE AND INSTALL COMPLETE EXHAUST ASSEMBLY AS SHOWN FOR MODULE LOAD TEST BUT DO NOT WELD SS TUBE TO PIPE. REMOVE OUTLET TUBE FOR SHIPPING. IN FIELD RE-INSTALL OUTLET TUBE & WELD TO PIPE.
 - 6) SHOP FABRICATE AND INSTALL COMPLETE CRANK VENT ASSEMBLY AS SHOWN FOR MODULE LOAD TEST BUT DO NOT WELD COUPLING. REMOVE EXTERIOR PIPE WITH EXHAUST TUBE FOR SHIPPING.
 - 7) IN FIELD RE-INSTALL EXTERIOR PIPE, WELD COUPLING AS INDICATED, AND SEAL WELD EXTERIOR PIPE TO EXHAUST TUBE ON BOTH SIDES AS SHOWN.

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EXHAUST & CRANK VENT PLAN & DETAILS

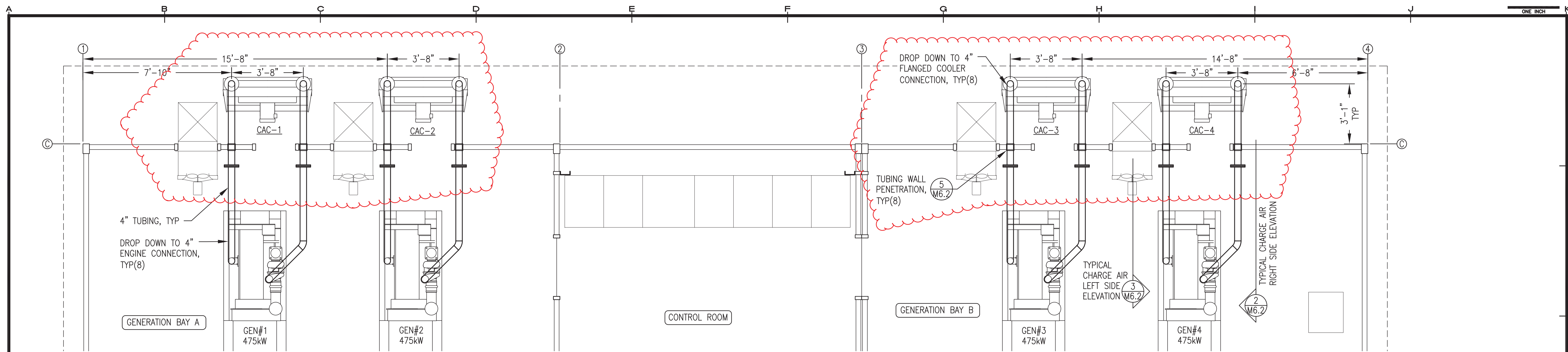
SHEET TITLE

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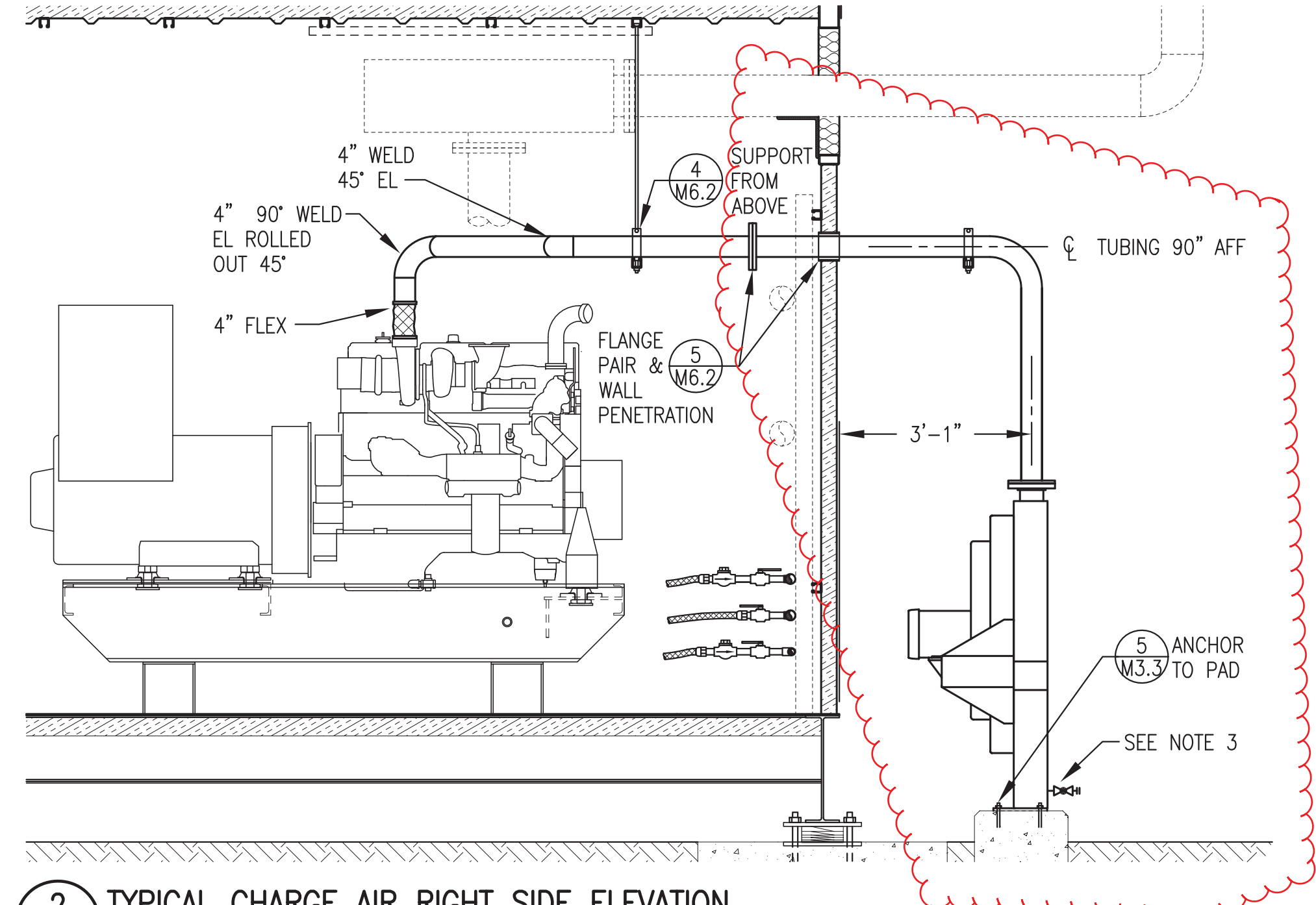
M6.1

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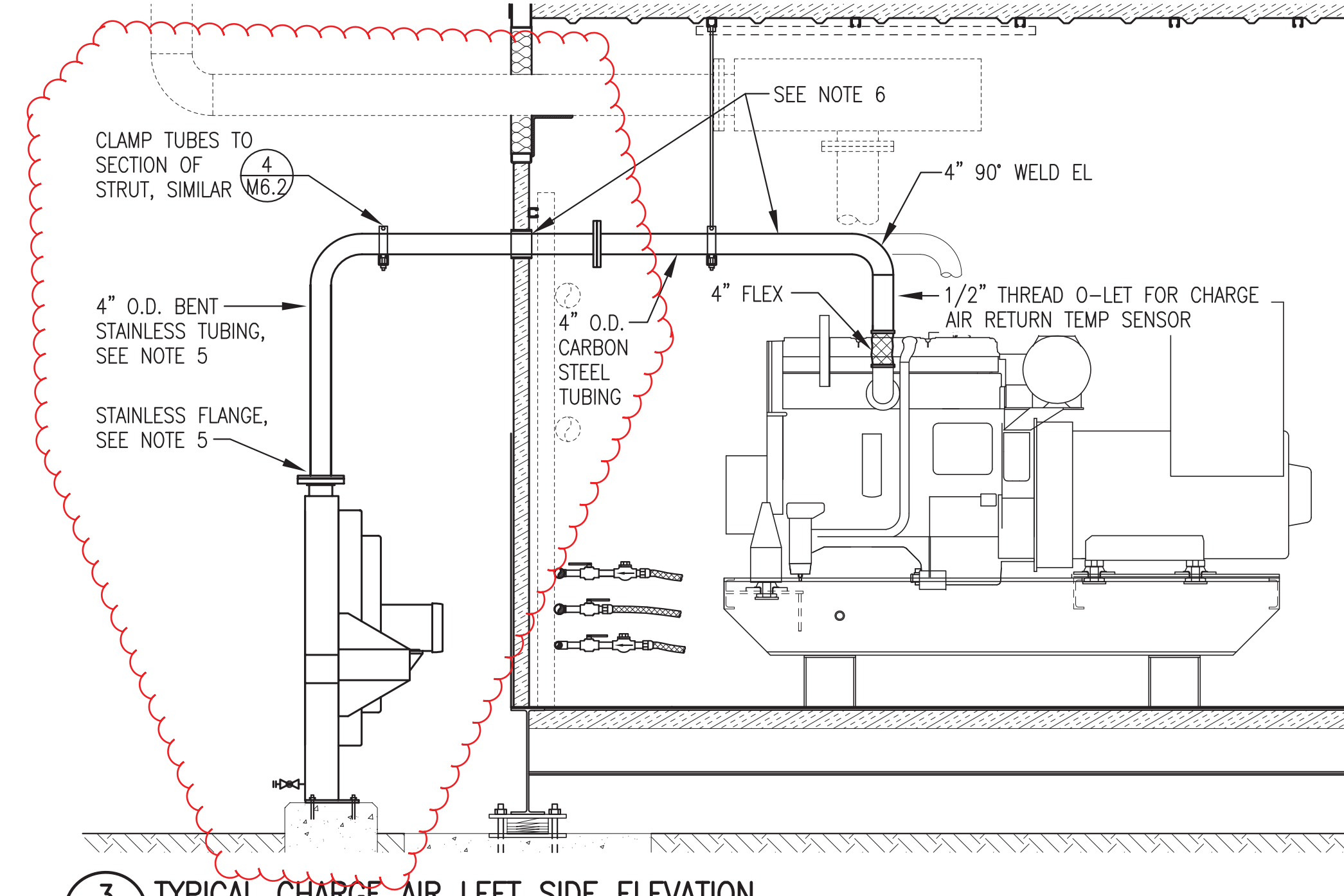
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1 CHARGE AIR PLAN
M6.2 3/8"=1'-0"

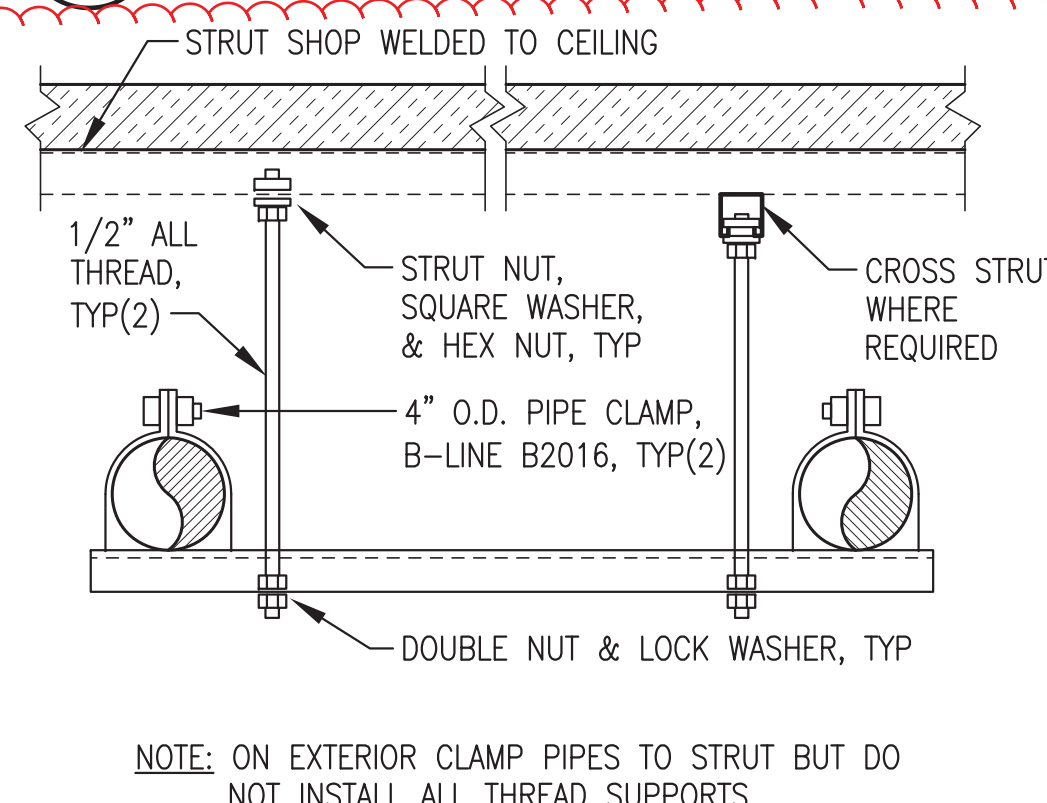


2 TYPICAL CHARGE AIR RIGHT SIDE ELEVATION
M6.2 1/2"=1'-0"

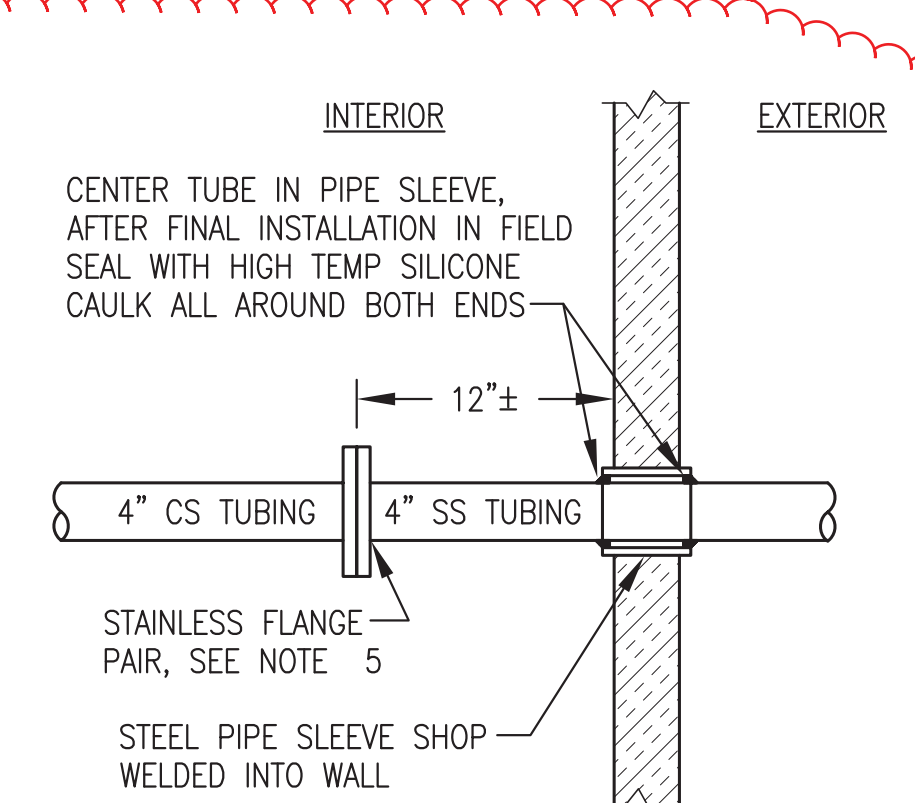


3 TYPICAL CHARGE AIR LEFT SIDE ELEVATION
M6.2 1/2"=1'-0"

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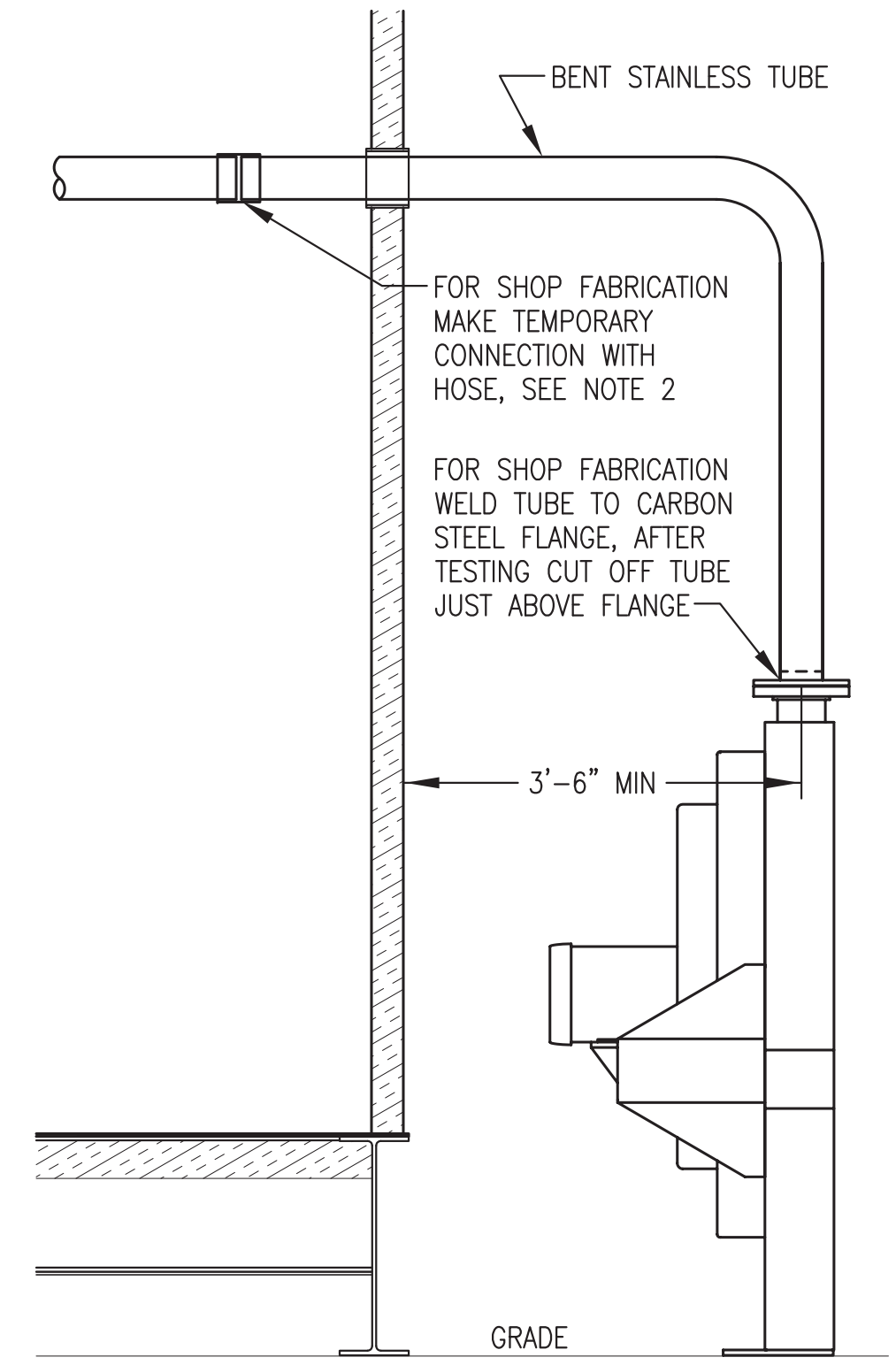
4 TUBING SUPPORT FROM CEILING
M6.2 NO SCALE



5 TUBING WALL PENETRATION
M6.2 NO SCALE

CHARGE AIR SYSTEM GENERAL NOTES & SHOP/FIELD NOTES:

- 1) ALL TUBING TO BE LIGHT WALL O.D. EXHAUST TUBING, SIZE AS INDICATED, CARBON STEEL ON INTERIOR, TYPE 304 STAINLESS STEEL EXTERIOR OF FLANGE PAIR AS INDICATED. ALL ELBOWS TO BE LONG RADIUS FITTINGS TO MATCH TUBING. ALL JOINTS TO BE WELDED EXCEPT AS INDICATED.
- 2) ALL FLEX CONNECTIONS HIGH TEMPERATURE DOUBLE HUMP SILICONE TURBO SLEEVES WITH RINGS, 4" I.D. X 6" LONG, TCFA-N40-R6 OR EQUAL. FASTEN WITH STAINLESS STEEL T-BOLT CLAMPS.
- 3) FIELD INSTALL 3/4" THREADED BALL VALVE AND PLUG FOR TANK DRAIN, 2 PER COOLER.
- 4) DURING SHOP FABRICATION SET COOLER AT GRADE, SHOP FABRICATE AND INSTALL COMPLETE CHARGE AIR ASSEMBLY WITH TEMPORARY CONNECTIONS AS SHOWN IN DETAIL 6/M6.2. AFTER SHOP TESTING CUT OFF CARBON STEEL FLANGE AT COOLER AND REMOVE EXTERIOR BENT TUBE FOR SHIPPING.
- 5) IN FIELD CUT BENT TUBE TO MATCH FINAL COOLER LOCATION AND WELD STAINLESS FLANGES AT COOLER CONNECTION AND FLANGE PAIR AS SHOWN IN DETAIL 5/M6.2. MAKE FINAL FIELD COOLER CONNECTIONS AND FLANGE PAIR JOINT WITH O.D. TUBE BY ANSI 150# STAINLESS STEEL PLATE FLANGES. INSTALL HIGH TEMPERATURE FULL FACE GASKETS, DURABLA BLACK OR EQUAL.
- 6) AFTER FINAL FIELD ASSEMBLY SEAL PENETRATION IN ACCORDANCE WITH DETAIL 5/M6.2. INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO WALL PENETRATION WITH YARN TAPE, SEE SPECIFICATIONS.



6 SHOP CHARGE AIR CONNECTION
M6.2 NO SCALE

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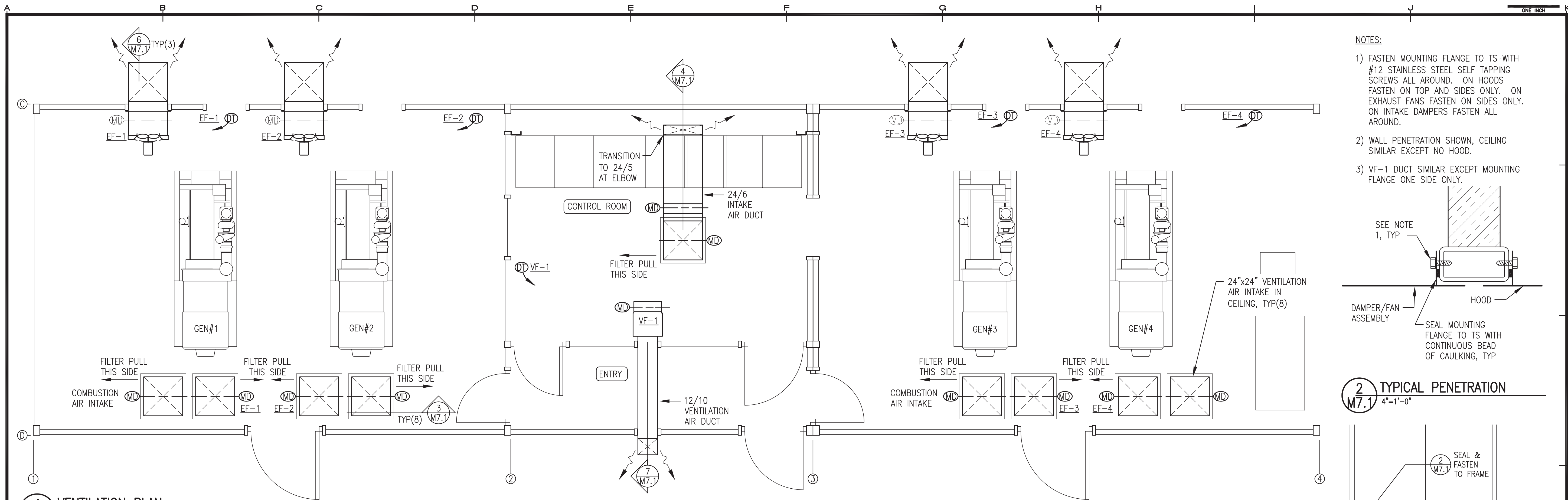
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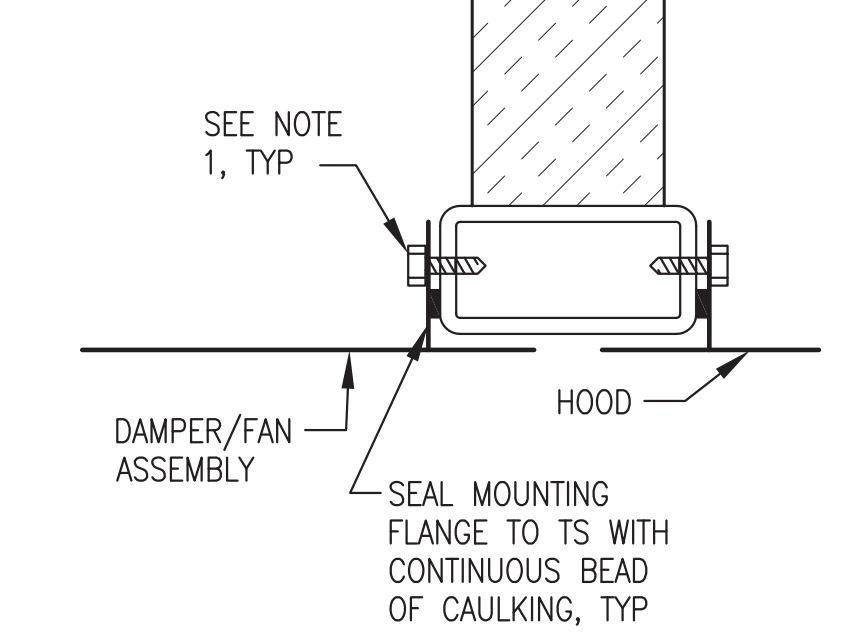
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SHEET TITLE CHARGE AIR PLAN & DETAILS	
SHEET M6.2	
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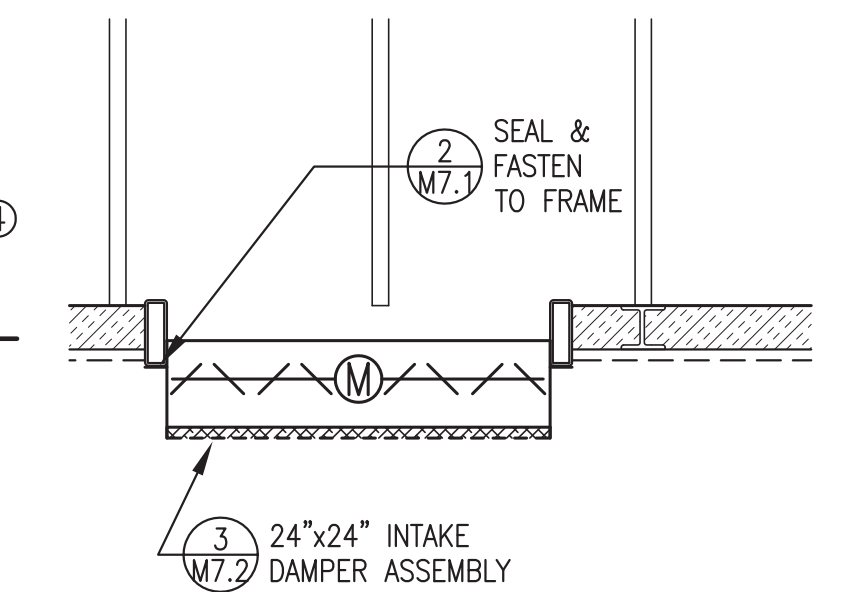


1 VENTILATION PLAN
M7.1 3/8"=1'-0"

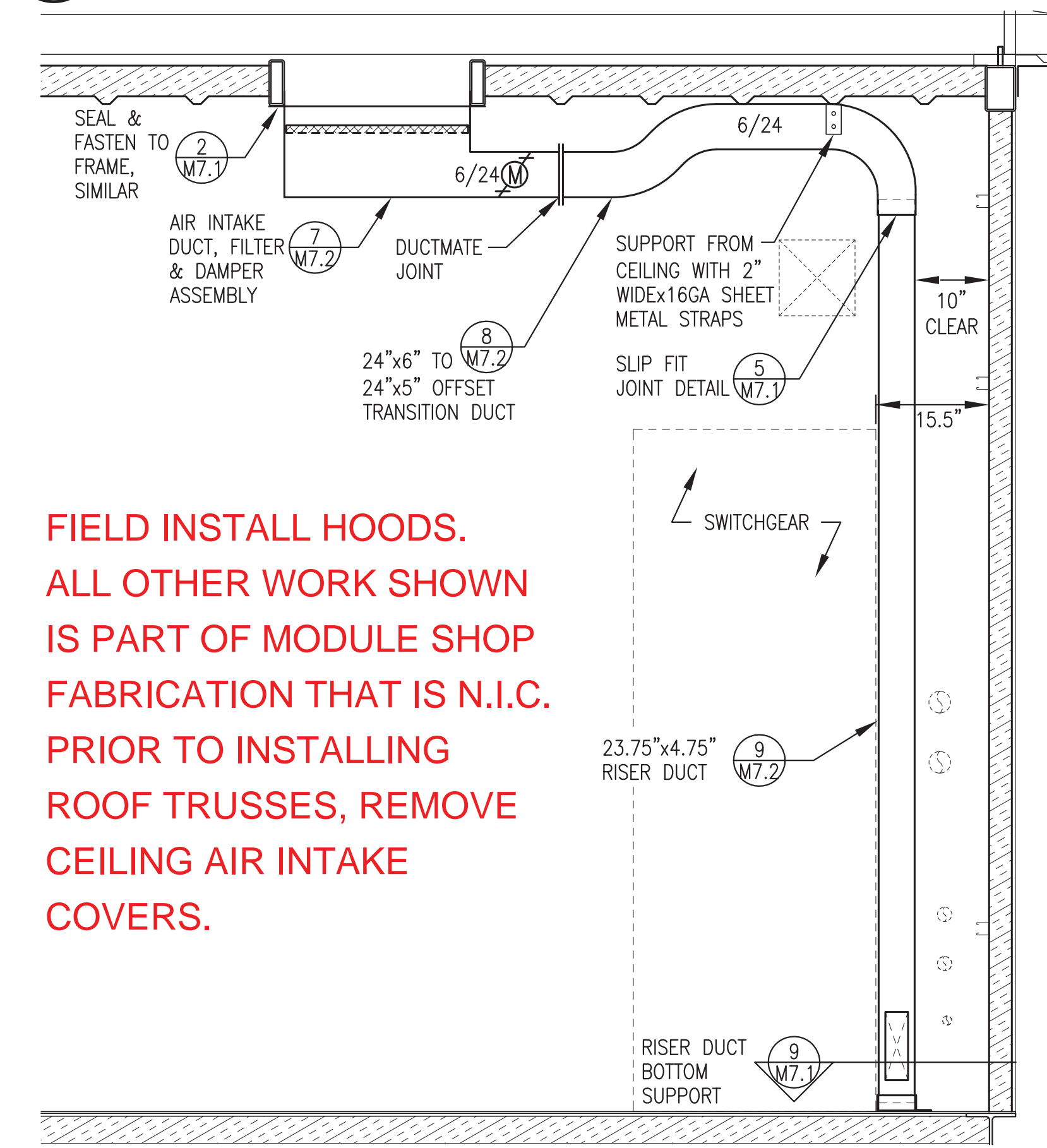
- NOTES:
- 1) FASTEN MOUNTING FLANGE TO TS WITH #12 STAINLESS STEEL SELF TAPPING SCREWS ALL AROUND. ON HOODS FASTEN ON TOP AND SIDES ONLY. ON EXHAUST FANS FASTEN ON SIDES ONLY. ON INTAKE DAMPERS FASTEN ALL AROUND.
 - 2) WALL PENETRATION SHOWN, CEILING SIMILAR EXCEPT NO HOOD.
 - 3) VF-1 DUCT SIMILAR EXCEPT MOUNTING FLANGE ONE SIDE ONLY.



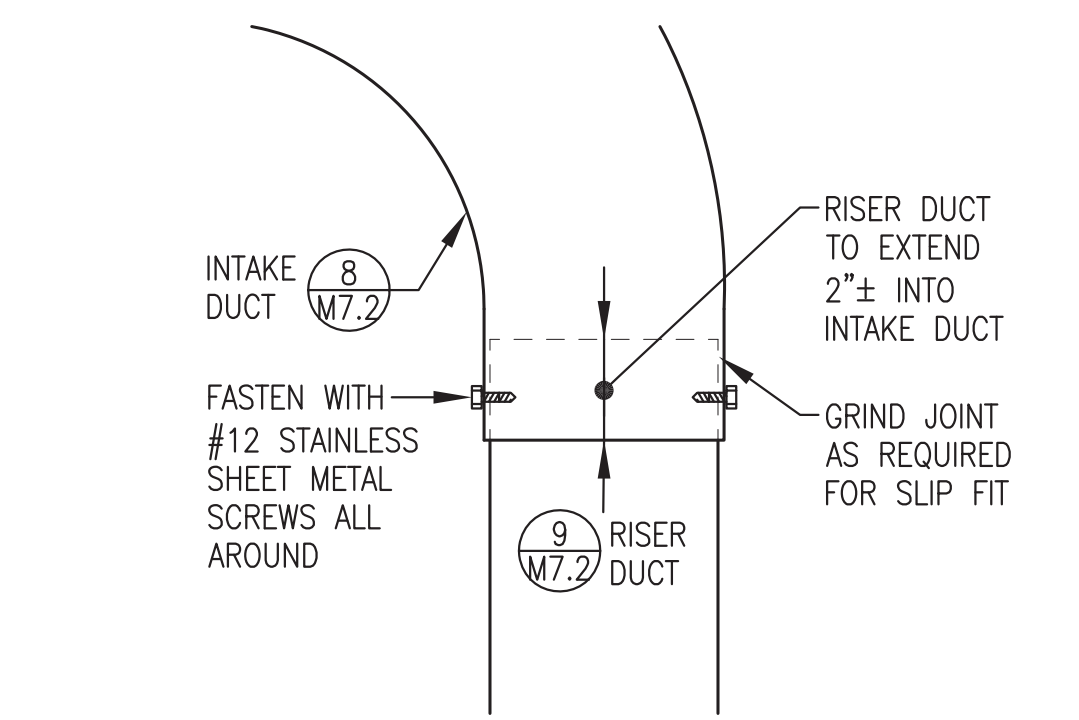
2 TYPICAL PENETRATION
M7.1 4"=1'-0"



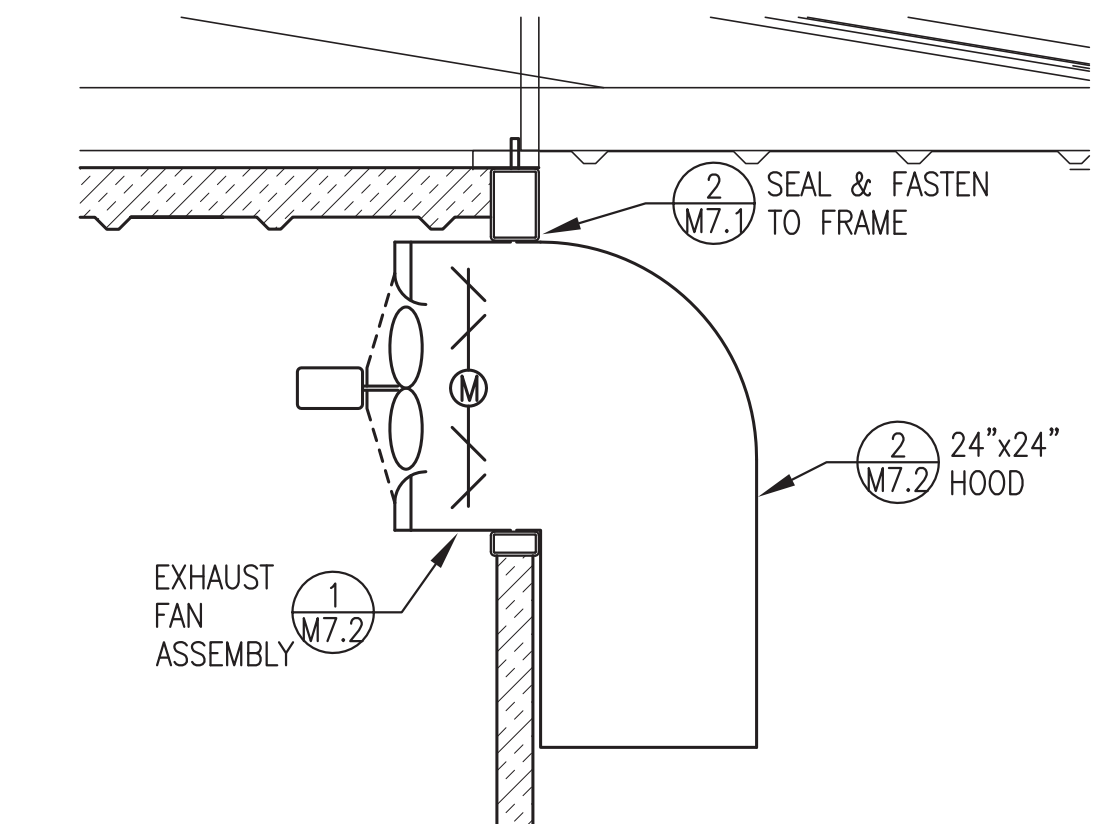
3 INTAKE DAMPER INSTALLATION
M7.1 3/4"=1'-0"



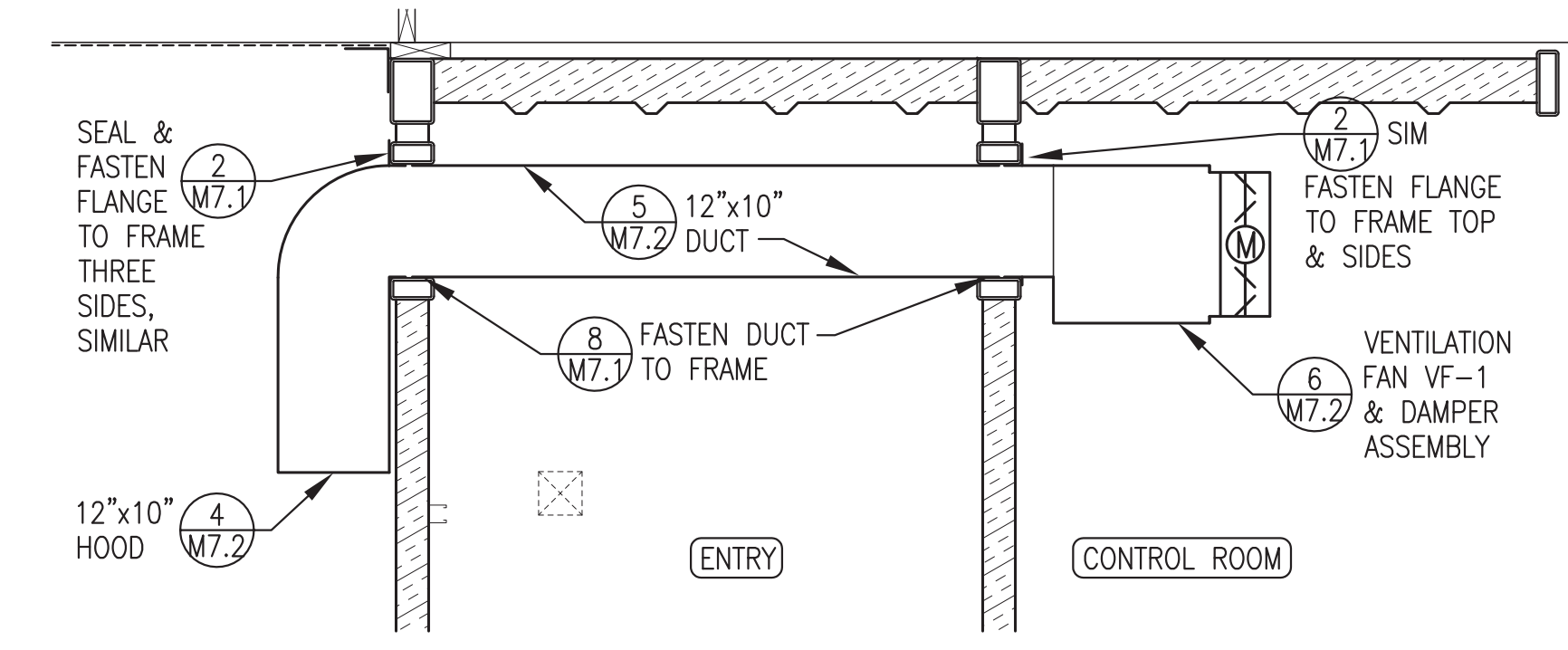
4 INTAKE AIR DUCT INSTALLATION
M7.1 3/4"=1'-0"



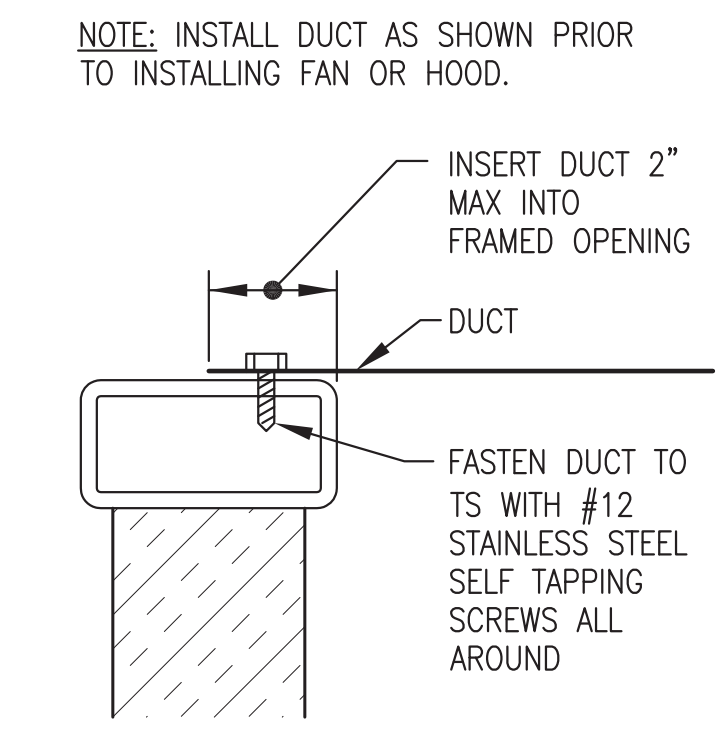
5 INTAKE AIR DUCT SLIP-FIT JOINT DETAIL
M7.1 4"=1'-0"



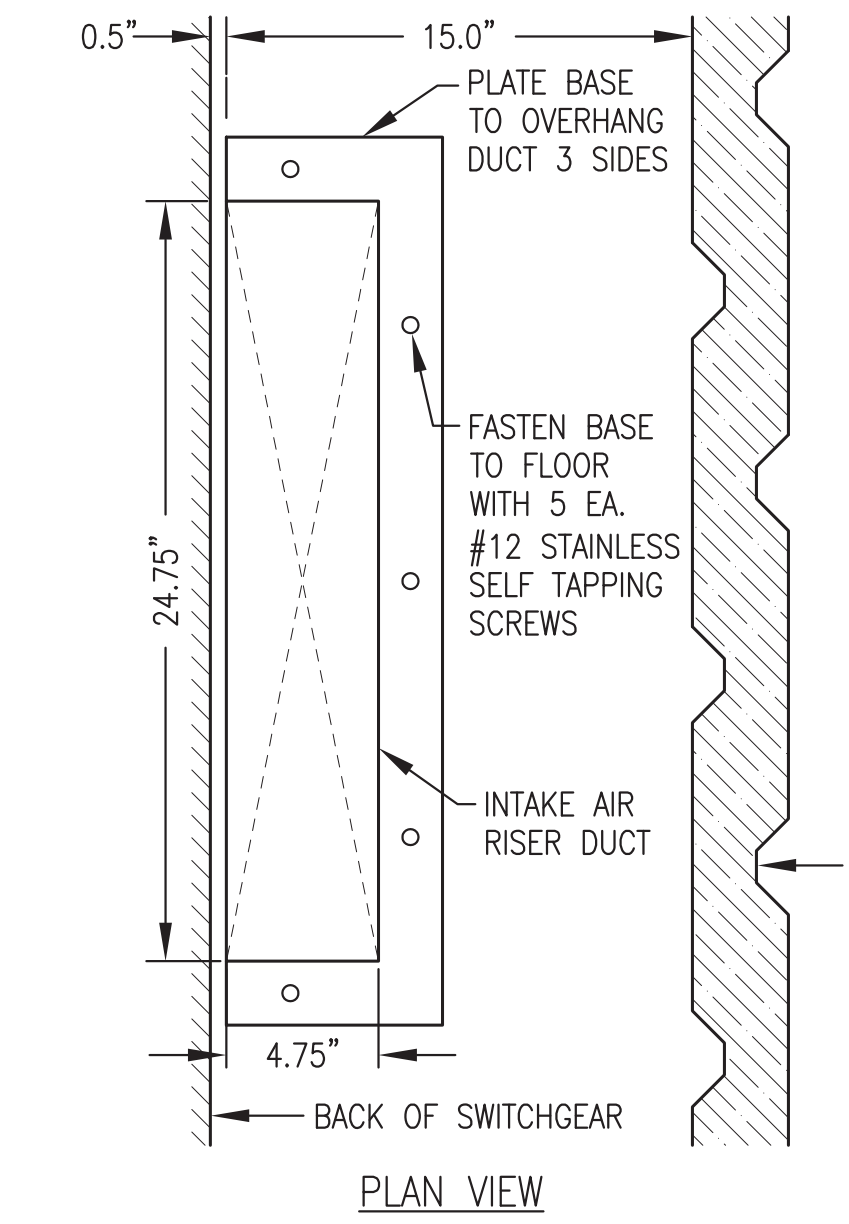
6 EXHAUST FAN INSTALLATION
M7.1 3/4"=1'-0"



7 FAN VF-1 INSTALLATION
M7.1 3/4"=1'-0"



8 VF-1 DUCT PENETRATION
M7.1 4"=1'-0"



9 RISER DUCT BOTTOM SUPPORT
M7.1 2"=1'-0"

FIELD INSTALL HOODS.
ALL OTHER WORK SHOWN IS PART OF MODULE SHOP FABRICATION THAT IS N.I.C. PRIOR TO INSTALLING ROOF TRUSSES, REMOVE CEILING AIR INTAKE COVERS.

REVISIONS	MARK	DATE	DESCRIPTION
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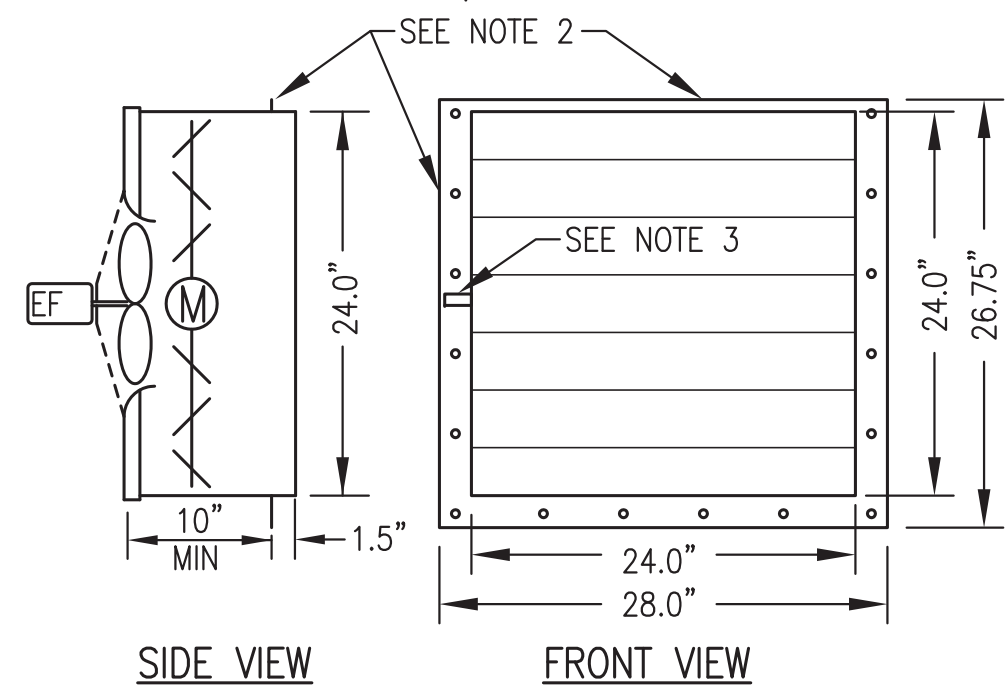
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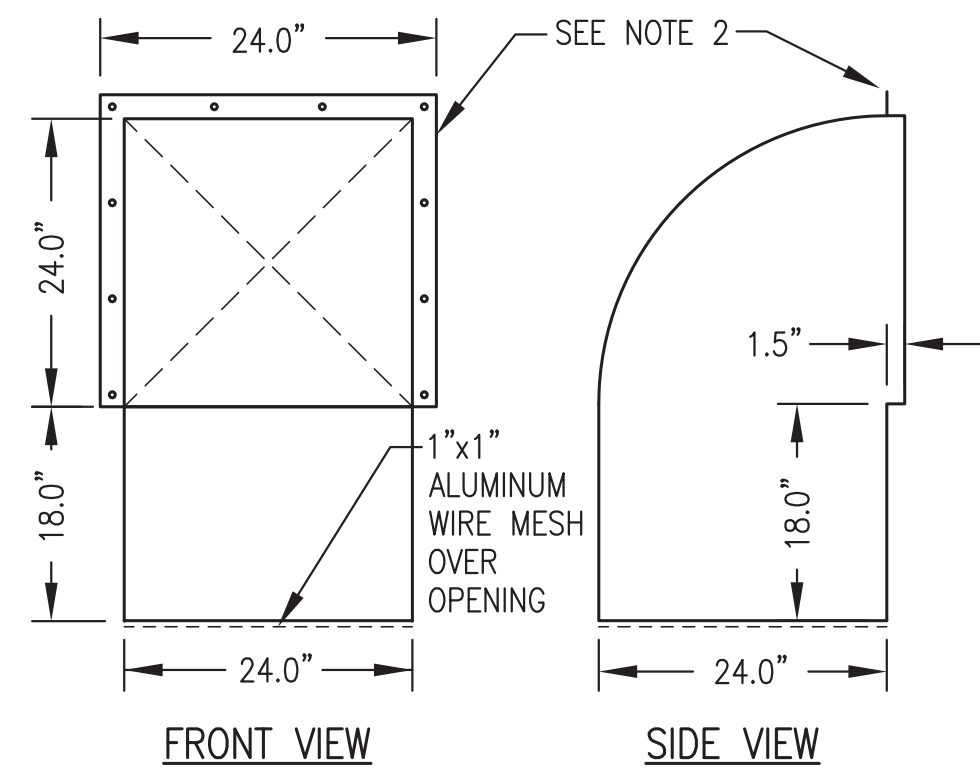
KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE	
VENTILATION PLAN & DETAILS	
SHEET	
M7.1	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



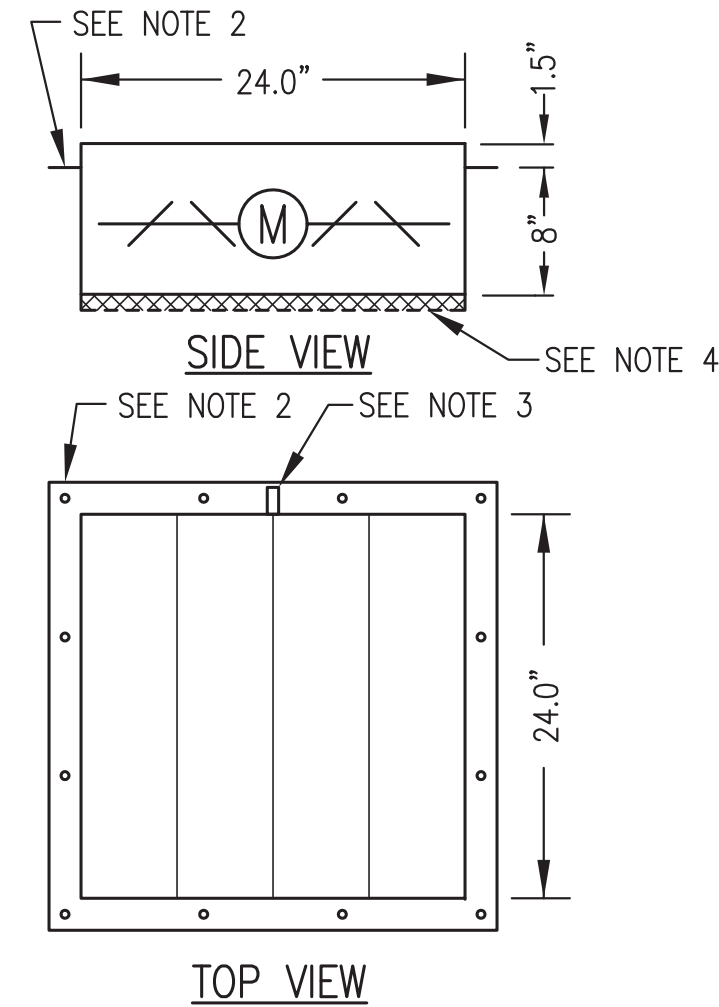
- NOTES:**
- 1) FABRICATE THREE IDENTICAL ASSEMBLIES COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ON BOTTOM AND SIDES WITH 1/4" HOLES AT 5"± O.C., PROVIDE 3/4" MOUNTING FLANGE ON TOP, NO HOLES.
 - 3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE LEFT SIDE. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES. FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

1 EXHAUST FAN ASSEMBLY FABRICATION
M7.2 1"=1'-0"



- NOTES:**
- 1) FABRICATE THREE IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 8"± O.C.

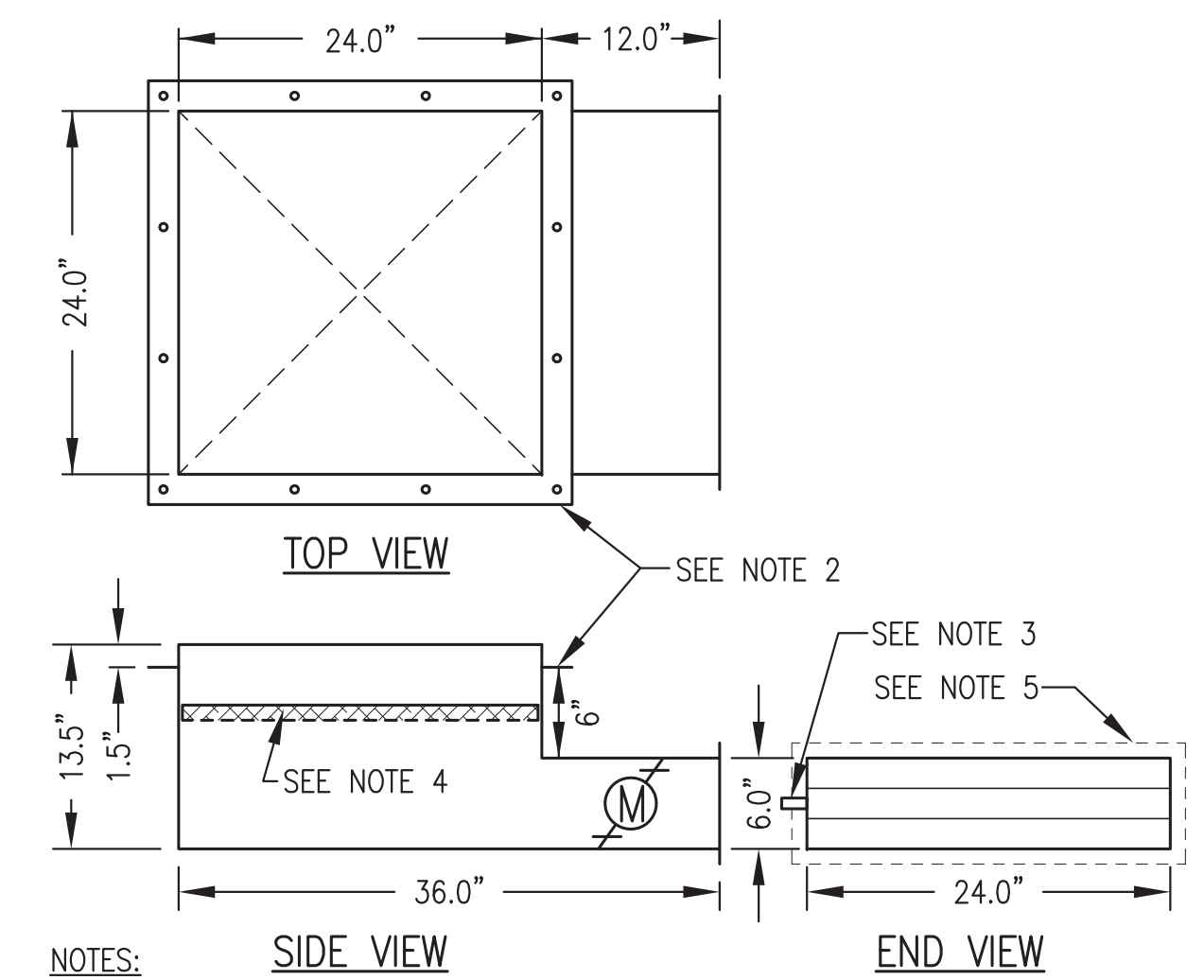
2 EXHAUST HOOD FABRICATION
M7.2 3/4"=1'-0"



- NOTES:**
- 1) FABRICATE SIX IDENTICAL 24"x24" VENTILATION INTAKE ASSEMBLIES.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ALL AROUND WITH 1/4" HOLES AT 9" O.C.
 - 3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON ONE SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES.
 - 4) INSTALL FRAME FOR REMOVABLE 24"x24"x1" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE TO ALLOW FILTERS TO SLIDE OUT. SEE PLAN VIEW FOR DAMPER ACTUATOR AND FILTER PULL ORIENTATION.

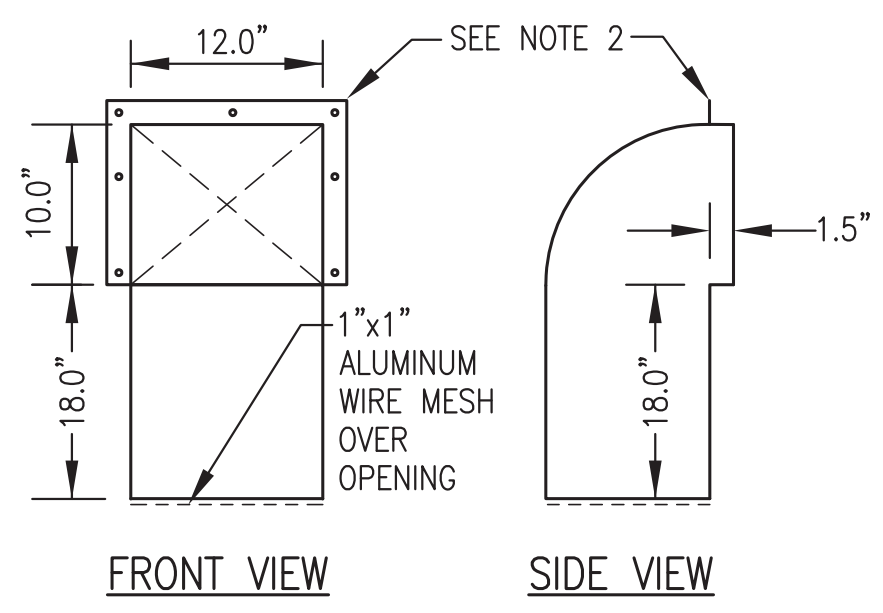
3 GENERATION ROOM INTAKE AIR DAMPER FABRICATION
M7.2 1"=1'-0"

VENTILATION EQUIPMENT SPECIFICATIONS	
GENERAL – PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL MECHANICAL CODE AND APPLICABLE SMACNA STANDARDS.	EXHAUST FANS – DIRECT DRIVE 18"Ø PROPELLER SIDEWALL EXHAUST FAN, 3,592 CFM AT 0.375" SP, 1,725 RPM. FURNISH WITH SPECIAL 3/4 HP, 115 V, 1 PH VARIGREEN MOTOR WITH OPTIONAL 0-10V LEADS. GREENHECK SE1-18-424-VG (3/4 HP) OR EQUAL.
INSTALLATION – EQUIPMENT INSTALLATION IS NOT PART OF THE FABRICATION SCOPE OF WORK. FAN AND DAMPER ASSEMBLIES AND HOODS WILL BE SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS. FASTEN AND SUPPORT ALL FABRICATIONS AS INDICATED.	VENTILATION FAN VF-1 – DIRECT DRIVE IN-LINE CENTRIFUGAL FAN, 475 CFM AT 0.50" SP, 1,080 RPM, 1/6 HP, 115 V, 1 PH. GREENHECK CSP-A710 OR EQUAL.
EXTERIOR SHEET METAL FABRICATIONS – FABRICATE ALL HOODS FROM MINIMUM 0.090" THICK TYPE 5052 ALUMINUM USING CONTINUOUS SEAL WELDS FOR ALL JOINTS.	DAMPERS – OPPOSED BLADE LOW-LEAKAGE CONTROL DAMPER, GALVANIZED STEEL CONSTRUCTION, 304 STAINLESS STEEL BEARINGS AND JAMB SEALS, EPDM BLADE SEALS. GREENHECK VCD-23 NO SUBSTITUTES. SEE FABRICATION DETAILS FOR SIZES.
INTERIOR SHEET METAL FABRICATIONS – FABRICATE ALL DAMPER AND FAN ASSEMBLIES FROM MINIMUM 20 GAUGE GALVANIZED SHEET METAL USING STANDARD MECHANICAL JOINTS. SEAL ALL JOINTS AIR TIGHT. AT BIDDERS OPTION INTERIOR FABRICATIONS MAY BE MADE OF WELDED ALUMINUM EQUIVALENT TO HOODS.	ACTUATORS – INSTALL 120V SPRING RETURN ACTUATOR, BELIMO AF-BUP, NO SUBSTITUTES.



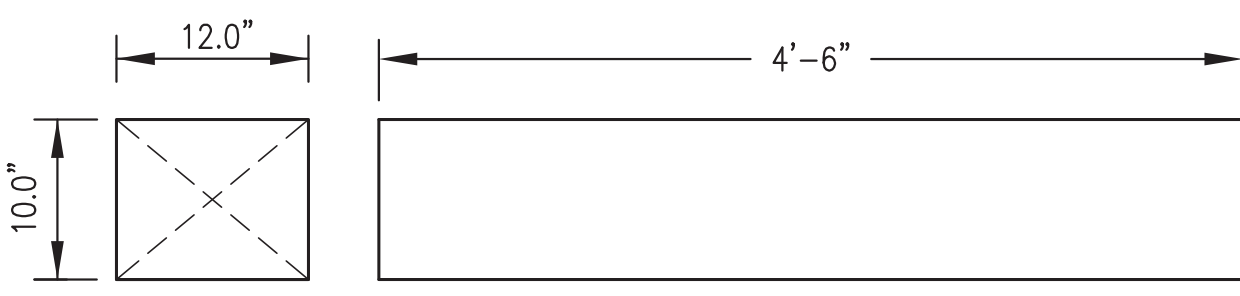
- NOTES:**
- 1) FABRICATE ONE CONTROL ROOM INTAKE AIR ASSEMBLY.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ALL AROUND WITH 1/4" HOLES AT 9" O.C.
 - 3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON ONE SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES.
 - 4) INSTALL FRAME FOR REMOVABLE 24"x24"x1" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE FOR FILTER REMOVAL. SEE PLAN FOR DAMPER ACTUATOR & FILTER PULL ORIENTATION.
 - 5) SHOP MOUNT DUCT MATE CONNECTION

7 CONTROL ROOM INTAKE DAMPER FABRICATION
M7.2 1"=1'-0"



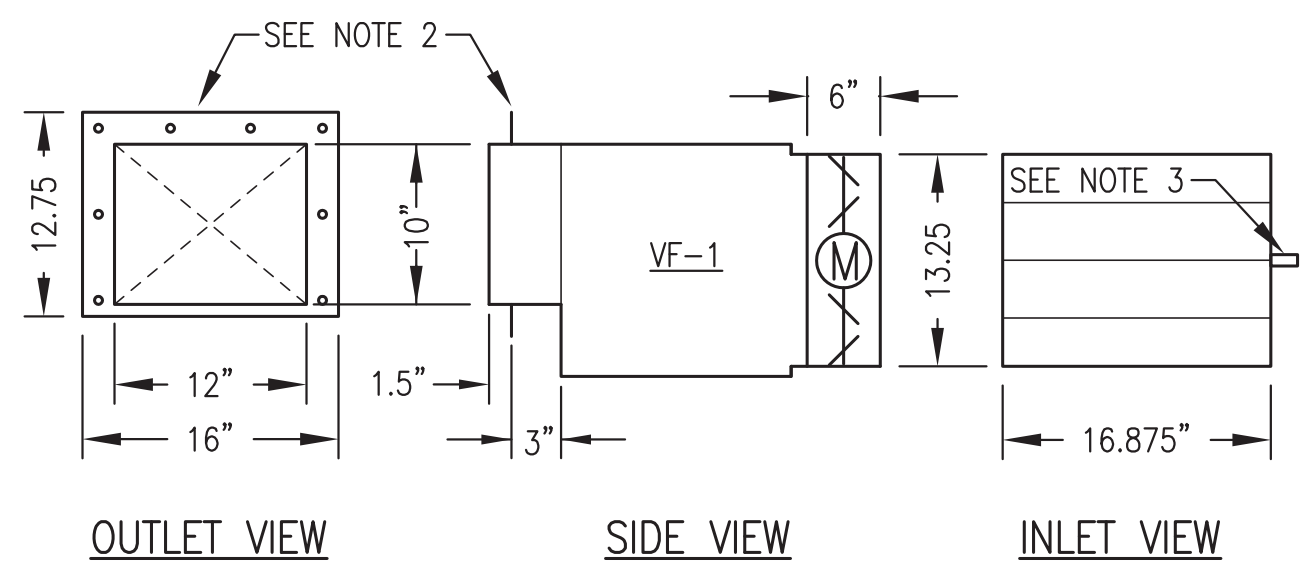
- NOTES:**
- 1) FABRICATE ONE HOOD FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 8"± O.C.

4 VF-1 DISCHARGE HOOD FABRICATION
M7.2 1"=1'-0"



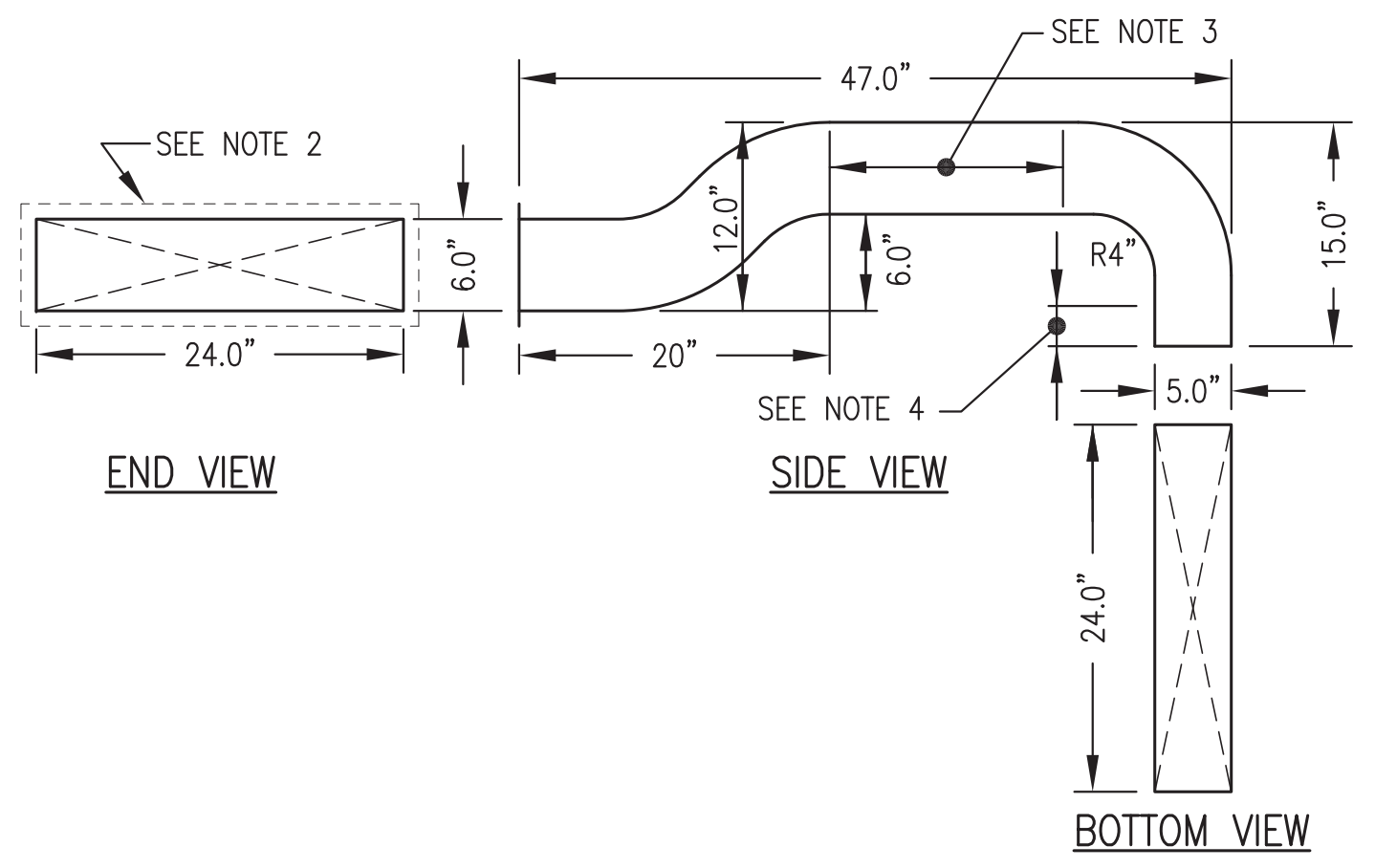
- NOTES:**
- 1) FABRICATE ONE DUCT FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

5 FAN VF-1 DISCHARGE DUCT FABRICATION
M7.2 1"=1'-0"



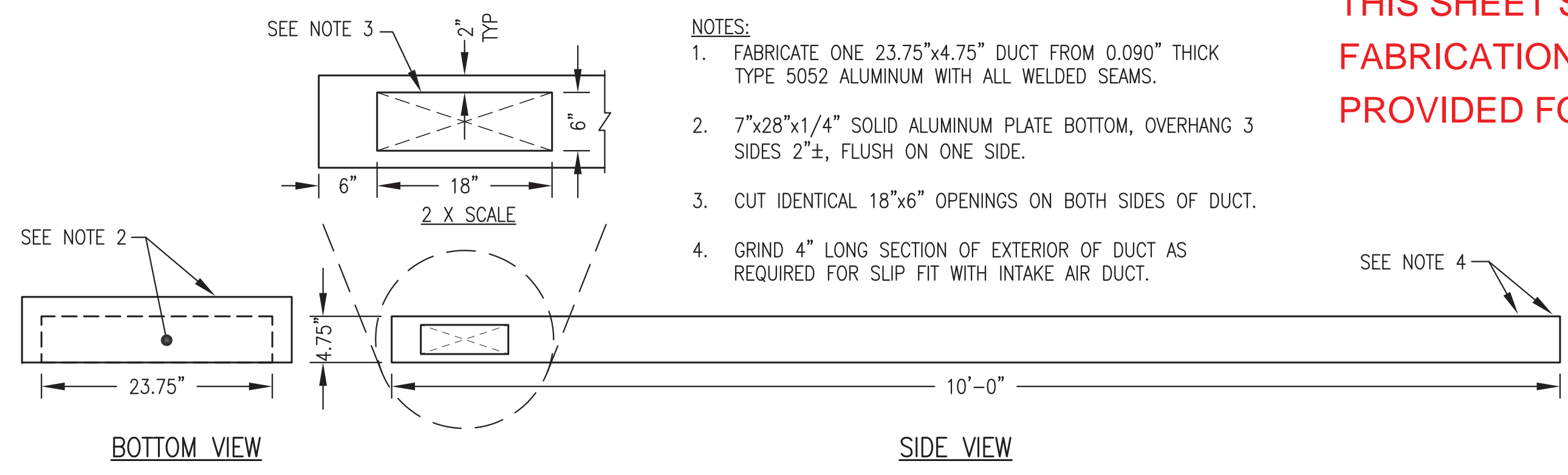
- NOTES:**
- 1) FABRICATE ONE ASSEMBLY COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.
 - 2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP AND SIDES WITH 1/4" HOLES AT 5"± O.C., PROVIDE 3/4" MOUNTING FLANGE ON BOTTOM, NO HOLES.
 - 3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE RIGHT SIDE. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES. FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

6 VENTILATION FAN VF-1 ASSEMBLY FABRICATION
M7.2 1"=1'-0"



- NOTES:**
1. FABRICATE ONE DUCT FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 2. SHOP MOUNT DUCT MATE CONNECTION
 3. MINIMUM 16" LONG STRAIGHT SECTION OF 24/6 DUCT
 4. MINIMUM 4" LONG STRAIGHT SECTION OF 24/5 DUCT. GRIND INTERIOR AS REQUIRED FOR SLIP FIT WITH RISER DUCT.

8 CONTROL ROOM INTAKE AIR DUCT FABRICATION
M7.2 1"=1'-0"



- NOTES:**
1. FABRICATE ONE 23.75"x4.75" DUCT FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 2. 7"x28"x1/4" SOLID ALUMINUM PLATE BOTTOM, OVERHANG 3 SIDES 2"±, FLUSH ON ONE SIDE.
 3. CUT IDENTICAL 18"x6" OPENINGS ON BOTH SIDES OF DUCT.
 4. GRIND 4" LONG SECTION OF EXTERIOR OF DUCT AS REQUIRED FOR SLIP FIT WITH INTAKE AIR DUCT.

9 CONTROL ROOM RISER DUCT FABRICATION
M7.2 1"=1'-0"

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

REVISIONS	MARK	DATE	DESCRIPTION
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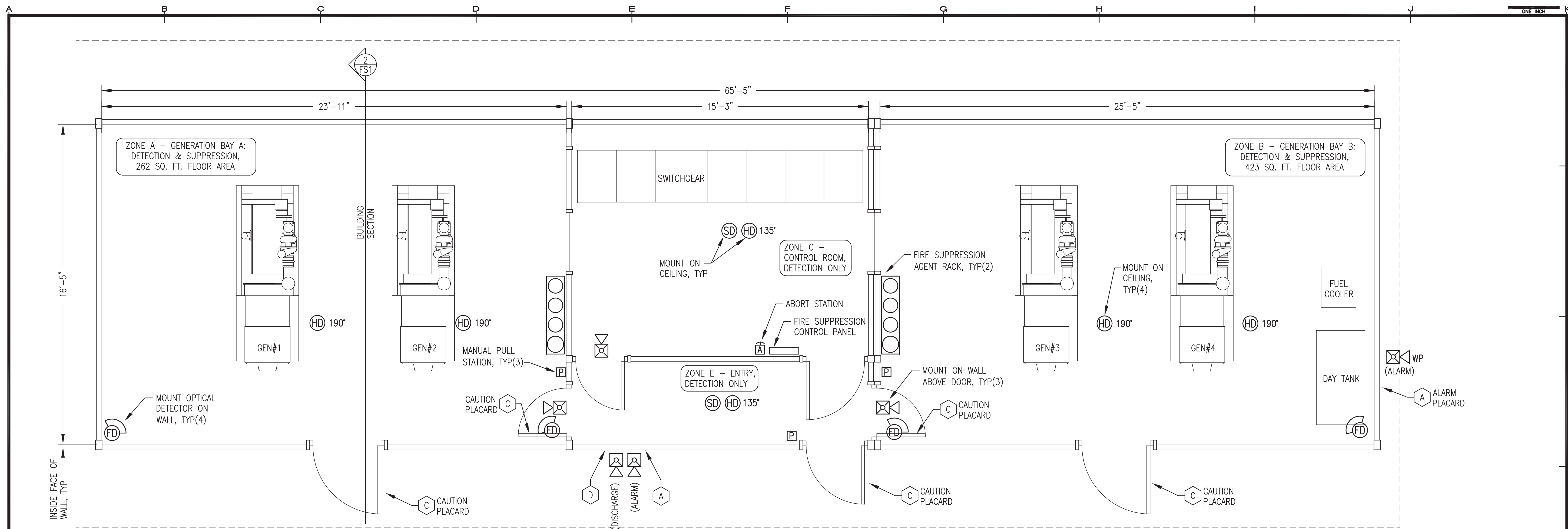
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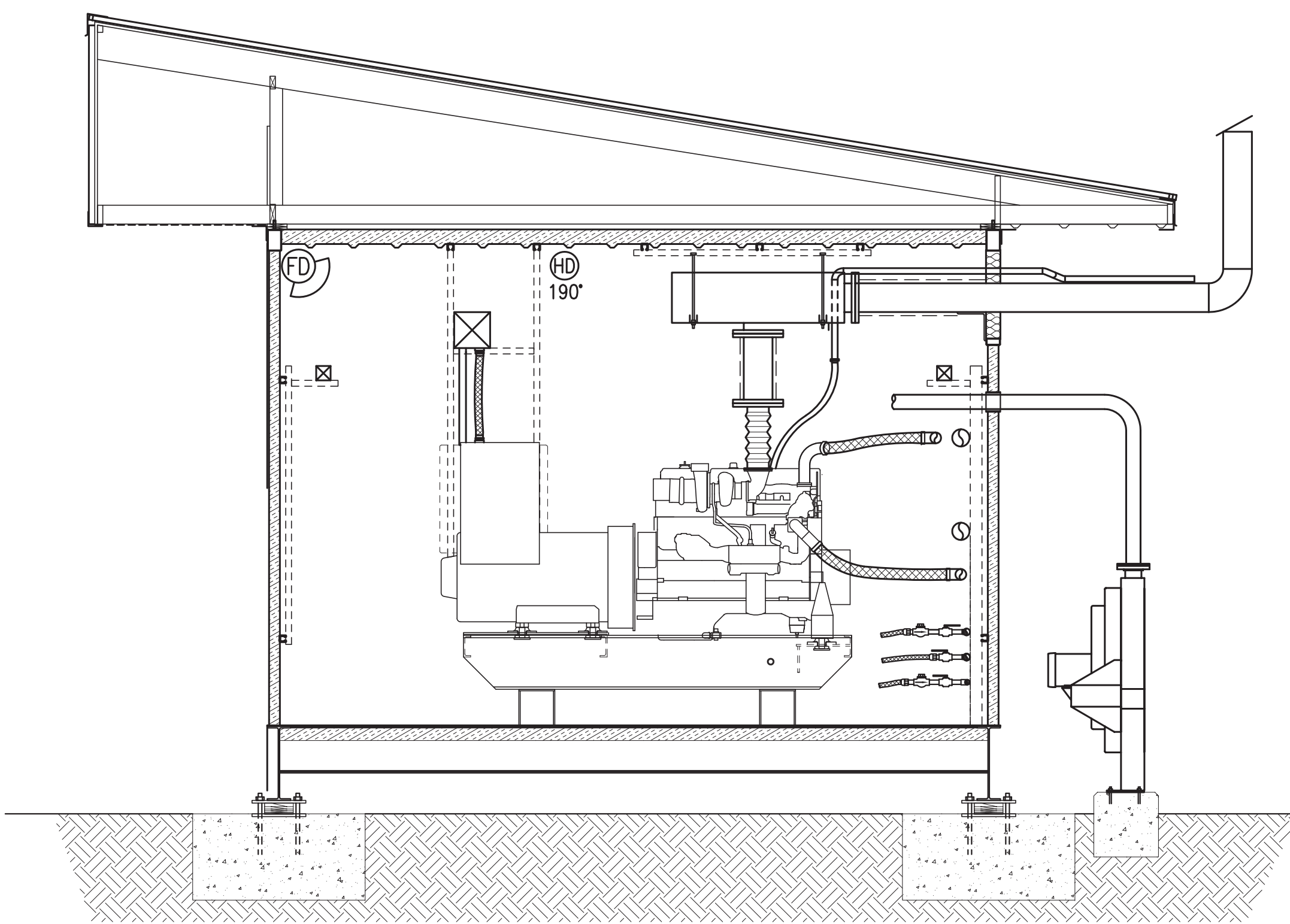


ALASKA ENERGY AUTHORITY
KAKE RPSU PROJECT
KAKE, ALASKA

SHEET TITLE	
SHEET METAL FABRICATION DETAILS & SPECIFICATIONS	
SHEET	
M7.2	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



1 FIRE SUPPRESSION SYSTEM PLAN
3/8"=1'-0"



2 TYPICAL SECTION THROUGH MODULE
3/8"=1'-0"

NOTES:

- 1) INTERIOR FINISH OF ALL WALLS, FLOOR, AND CEILING WELDED STEEL PLATE. CEILING HEIGHT IN ALL ROOMS 10'-2" ABOVE FINISHED FLOOR.
- 2) ALL DOORS SELF-CLOSING WITH GASKETS. ALL BUILDING PIPING AND CONDUIT PENETRATIONS SEALED LIQUID TIGHT. ALL BUILDING DUCT PENETRATIONS EQUIPPED WITH MOTORIZED DAMPERS THAT CLOSE ON GENERATOR SHUT DOWN.

FIRE SUPPRESSION SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
[P]	MANUAL PULL STATION	[HD]135'	NORMAL TEMP. (135°F) DETECTOR
[A]	ABORT STATION	[HD]190'	HIGH TEMP. (190°F) DETECTOR
[X]	INTERIOR ALARM HORN/STROBE	[FD]	FLAME (OPTICAL) DETECTOR
[X]WP	EXTERIOR ALARM HORN/STROBE	[SD]	SMOKE (IONIZATION) DETECTOR

FIRE SUPPRESSION PLACARD SCHEDULE

SYMBOL	DESCRIPTION
[A]	"FIRE ALARM"
[C]	"CAUTION, ROOM PROTECTED BY WATER MIST FIRE PROTECTION SYSTEM, IN CASE OF FIRE KEEP DOOR CLOSED AND DO NOT ENTER"
[D]	"FLASHING LIGHT MEANS FIRE SUPPRESSION AGENT HAS DISCHARGED"

FIRE SUPPRESSION WIRE SCHEDULE

SYMBOL	CIRCUIT DESCRIPTION	WIRE TYPE	WIRE COLOR
A	24V DC POWER	#14 AWG SOLID	RED & BLACK
B	DETECTION CIRCUITS	#14 AWG SOLID	BLUE & YELLOW
C	ANNUNCIATION ALARM	#14 AWG SOLID	BROWN & ORANGE
D	ANNUNCIATION DISCHARGE	#14 AWG SOLID	WHITE, & GRAY
E	24V DC AUX POWER	#14 AWG SOLID	RED & BLACK WITH GRAY STRIPE

PRIOR TO PACKAGING MODULE FOR SHIPPING, REMOVE EXTERIOR ALARM HORNS AND BACKBOXES, COIL CONDUCTORS INSIDE, AND SEAL WALL PENETRATIONS. IN FIELD RE-INSTALL AND TERMINATE.

REVISIONS	MARK	DATE	DESCRIPTION
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ALASKA ENERGY AUTHORITY
 KAKE, ALASKA

SHEET TITLE	
FIRE SUPPRESSION SYSTEM PLAN SECTION & LEGEND	
SHEET	
FS1	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	

PART 1 – GENERAL

1.01 SCOPE

A. The work involves design, installation, testing, and certification of an automatic fire suppression system for a power generation module. The module is built in two sections (shipping splits) to facilitate shipping and installation at the final destination. Module A consists of a generation bay with a single diesel engine generator, a control room, and an entry. Module B consists of a generation bay with two diesel engine generators. The module will be completely fabricated and assembled in Anchorage with the two sections bolted together into a single structure.

B. All generation equipment and supporting mechanical and electrical systems will be installed prior to installation of the fire suppression system. All fire suppression system installation, testing, certification, and training will occur in Anchorage. Upon final acceptance by the AEA in Anchorage, the module will be separated and shipped to Kipnuk for installation and commissioning.

1.02 WORK INCLUDED

A. Submittals including CAD drawings.

B. Obtain a State of Alaska, Fire Marshal Plan Review Permit.

C. Furnish equipment and deliver to designated location. Materials not specifically detailed in this specification but required for system completion shall be provided by Contractor at no additional cost to AEA.

D. Field installation of agent racks, agent discharge piping, termination of wiring to devices, programming fire control panel, and acceptance testing and certification of completed system.

E. Minimum four hours operation training with the owner and/or designees.

F. Operation and Maintenance Manuals including as-built drawings.

G. The Contractor shall make a technician available via telephone as required for consultation during the field installation of the system and for troubleshooting and programming revisions after system certification.

H. Excluded from scope are wire, conduit, conduit hangers, fasteners, piping, and field installation of equipment and devices (except for agent racks, agent discharge piping, and final electrical connections as indicated).

1.03 QUALITY ASSURANCE

A. Design shall be prepared by a registered mechanical engineer or technician with minimum NICET Level 3 certification. Designer shall have an appropriate State of Alaska design permit.

B. All equipment shall be new and shall be listed for the intended application. The entire system shall be designed and fabricated in accordance with recognized and acceptable engineering and industry practices.

1.04 REFERENCED STANDARDS:

A. National Fire Protection Association (NFPA) 750 Standard on Water Mist Fire Protection Systems.

B. National Fire Protection Association (NFPA) 72 National Fire Alarm Code.

C. Underwriters Laboratories (UL) UL 864 Control Units for Fire Protective Signaling Systems

D. National Electrical Manufacturer's Association (NEMA).

1.05 SUBMITTALS

A. Within 2 weeks of award of contract provide a complete engineering submittal in Adobe PDF format for review and approval by AEA. Submittal to include:

- 1. Manufacturer, model numbers and quantity of each device.
2. Manufacturer and model of control panel, including installed options.
3. Agent piping layout including size and quantity of nozzles.
4. Calculations.
5. Pre-construction shop drawings. The shop drawings shall indicate compliance with all requirements of the specifications and shall contain at a minimum floor plans, wiring diagrams, panel configuration, device installation details, piping isometrics, material lists, specifications, installation notes, and system sequence of operation.

B. Based upon review comments by Owner/Engineer issue final revised submittal including final construction drawings.

C. Submit a copy of State of Alaska, Fire Marshal Plan Review Permit to AEA.

D. Upon completion of testing and training, provide Operation and Maintenance Manuals. Manuals to include system description, manufacturer's catalog information, programming, instructions, operations and maintenance literature, Material Safety Data Sheets (MSDS) for extinguishing agent, and as-built drawings of completed system. Deliverables to include one bound copy plus 4 CD's with PDF format electronic files of the entire manual.

1.06 SUBSTITUTIONS

A. All substitutions shall be noted on equipment submittals.

1.07 WARRANTY

A. Provide a one-year manufacturer's warranty covering all materials and workmanship of all products supplied. Warranty shall commence from the date of system certification.

PART 2 – MATERIALS

2.01 Fire Suppression Agent

A. The Basis of Design is a high pressure water mist fire suppression system. The system shall be designed and engineered to utilize high pressure nitrogen as the driving medium and shall not utilize electric pumps. Marioff Hi-Fog no substitutes.

2.02 Agent Rack

A. Wall or floor mounted racks shall be provided that contain the agent cylinders, nitrogen cylinder, and piping. Marioff Hi-Fog MAU 150 FS, no substitutes.

2.03 Fire Control Panel

A. The Fire Control Panel shall be a Fike Cheetah XI-50 10-071-R1 or approved equal, and shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with, supervise and control the following types of equipment used to make up the system: intelligent self-calibrating smoke and flame detectors, addressable modules, annunciators, and other system controlled devices.

B. Basic equipment to be included with Fire Control Panel shall be main board with display and keypad, door, hardware, and backbox for panel surface mount installation.

C. System Capacity and General Operation

- 1. The control panel shall be capable of 50 intelligent/addressable devices.
2. The system shall include two Class B (NFPA Style Y) programmable Notification Appliance Circuits. It shall also include three additional programmable Form-C alarm and trouble relays rated at a minimum of 2.0 amps @ 30 VDC.
3. The system shall support up to 99 programmable EIA-485 driven relays for an overall system capacity of 301 circuits.
4. The Fire Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display, individual, color coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire system.
5. All programming or editing of the existing program in the system shall be achieved without special equipment, and without interrupting the alarm monitoring functions of the Fire Control Panel.
6. The Fire Control Panel shall provide the following features:
7. Automatic detect test and drift compensation to extend detector accuracy over life (smoke and flame detectors monitored and automatically calibrated)
8. Sensitivity Test, meeting requirements of NFPA 72, Chapter 5.
9. Maintenance Alert to warn of excessive smoke detector dirt or dust accumulation.
10. System Status Reports to display.
11. Positive Alarm Sequence pre-signal, meeting NFPA 72 3-8.3 requirements.
12. Periodic Detector Test, conducted automatically by software.
13. Pre-alarm for advanced fire warning.
14. Cross Zoning with the capability of: counting two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
15. Walk Test, with check for two detectors set to same address.
16. Adjustable delay and discharge timers.
17. The detector software shall meet NFPA 72, Chapter 7 requirements and be certified by UL as a calibrated sensitivity test instrument.
18. The detector software shall allow manual or automatic sensitivity adjustment.
19. Event history file in nonvolatile memory.
20. Panel to have abort option to manually prevent release of extinguishing agent.
21. Battery back-up in the event of normal AC power failure.
22. Unit to be able to release extinguishing agent in at least two independent hazard zones.

2.04 SECONDARY POWER SOURCE BATTERIES

A. Secondary power shall be provided by 12 volt, gelled electrolyte batteries. The batteries shall be completely maintenance free. Fluid level checks and refilling shall not be required.

B. Batteries shall have sufficient capacity to power the fire system for not less than twenty-four hours plus 30 minutes of alarm upon a normal AC power failure. Note that this is in excess of minimum NFPA requirements.

2.05 HEAT DETECTOR

A. UL Listed, adjustable temperature heat detector. Fike 60-1039 or approved equal. Set to activate at 135°F for normal temperature and 190°F for high temperature.

2.06 FLAME (OPTICAL) DETECTOR

A. UL Listed, flame detectors shall be multi-spectrum, electro-optical, automatic calibrating, digital fire detectors. Fire Sentry Corporation Model SS4-A or approved equal.

2.07 SMOKE (PHOTOELECTRIC) DETECTOR

A. UL Listed, automatic calibrating type, photoelectric smoke detector. Detector to be addressable and provide analog signal to the control panel which may be used for maintenance of detector. Fike 63-1052 or approved equal.

2.08 ANNUNCIATORS

A. Interior Annunciator (Alarm and Discharge) – UL Listed, Horn/strobe combination, minimum 75 candela. Fike 20-123-75WR or approved equal.

B. Exterior Annunciator (Alarm) – Weatherproof, UL Listed horn/strobe combination, minimum 75 candela. Fike 20-123-75WR or approved equal.

C. Exterior Strobe (Discharge) – Weatherproof, UL Listed strobe, minimum 75 candela. Fike 20-124-75WR or approved equal.

2.09 MANUAL PULL STATION

A. Manual "Agent Release" pull station shall be UL Listed, addressable, double action, and provide visible indication that station has been operated. Honeywell FCI MS-2H or approved equal.

B. Manual "Alarm" pull station shall be UL Listed, addressable, double action, and provide visible indication that station has been operated. Honeywell FCI MS-2 or approved equal.

2.10 ABORT STATION

A. UL Listed, mushroom button abort station. Station coloring to be highly visible. Label or provide placard. Fike 10-1639 or approved equal.

2.11 DEVICE MONITORING MODULES

A. UL Listed modules designed for use with intelligent and addressable equipment as required. Fike Series 55 or approved equal.

2.12 RACEWAYS AND CONDUCTORS

A. AEA will furnish and install separate dedicated raceways for all fire suppression system wiring at no cost to Contractor. All raceways shall be surface mounted electrical metallic tubing (EMT). All conduit, boxes, and box cover plates shall be painted red.

B. AEA will furnish and install conductors for all fire suppression system wiring at no cost to Contractor. The 120V AC power shall be copper, #12 AWG, stranded, type THHN insulation, 600V and 75C rated, color per station service scheme. All other conductors shall be copper, #14 AWG, solid, type THHN insulation, 600V and 75C rated, color as indicated by service in accordance with the Fire Suppression Wire Schedule. Note that the shop drawings shall indicate wiring runs according to the letter designations (A B C D E) in the schedule.

2.13 PIPING

A. Contractor shall furnish, install, and pressure test agent discharge tubing/piping in accordance with manufacturer's recommendations.

2.14 SUPPORT

A. Contractor shall furnish and install industry standard hangers for agent discharge piping.

B. AEA will furnish and install all hangers and supports for panel and raceways at no cost to Contractor.

2.15 PLACARDS

A. Provide placards in compliance with NFPA as required. Provide additional warning placards as indicated on the plan in accordance with the placard schedule.

PART 3 – EXECUTION

3.01 DESIGN

A. Design fire suppression system with four zones of coverage as shown on the plan.

1. Generation Bay A shall contain agent rack, discharge piping and nozzles. Two flame detectors shall be cross-zoned so that any one detector will set off alarm and shut-down generators. Any second detector will begin a 30 second countdown to agent release. Two high temperature heat detectors shall be cross-zoned in the same sequence as the flame detectors. Exit shall have a manual "Agent Release" pull station which will begin a 30 second countdown to agent release when activated.

2. Generation Bay B shall contain the same equipment and shall operate with the same sequence as Generation Bay A

3. The Control Room shall contain the control panel, one smoke detector and one normal temperature heat detector. Either detector will set off alarm and will shut-down generators. An abort station shall be located near the control panel. In the event of a false alarm, pressing and holding the abort button will stop the 30 second countdown to release, and silence audible alarms. Once released, audible alarms will resume and 30 second countdown will restart. The abort will not function in the event of a manual release.

4. The Entry shall contain one smoke detector and one normal temperature heat detector. Either detector will set off alarm and will shut-down generators. Exit shall have an "Alarm" manual pull station which will set off alarm and shut down generators when activated but will not cause system discharge.

B. Provide quantity and distribution of nozzles as required to flood protected zone.

C. Provide one interior annunciator in each generation bay and one interior annunciator in control room. Provide two exterior annunciators on the outside of the building to indicate alarm. Provide one additional exterior annunciator (strobe only) on the outside of the building to indicate agent discharge.

3.02 EXECUTION

A. The system shall be designed and installed in accordance with the latest adopted editions of all applicable codes and standards and manufacturer's requirements. Perform all work with skilled craftsmen specializing in said work with all required certifications. Install all materials in a neat, orderly, and secure fashion, as required by these specifications and commonly recognized standards of good workmanship.

B. Contractor shall deliver materials to the Alaska Energy Authority Warehouse, 2601 Commercial Drive, Anchorage AK, 99501. All required materials shall be consolidated and delivered in a single shipment complete with an itemized packing list.

C. Initial field installation of panel, devices, conduit, and wiring will be by AEA upon receipt of required materials from Contractor.

D. Contractor shall install piping, terminate wiring, program panel, test, and certify system, and provide training within three weeks of notification by AEA.

E. Upon completion of testing and certification, all water shall be drained and/or blown out of the system to prevent freeze damage. The system shall be left with one fully charged nitrogen cylinder installed in each rack plus one fully charged spare nitrogen cylinder for each rack.

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

Table with 5 columns: REVISIONS, MARK, DATE, DESCRIPTION. Contains 5 rows of revision information.

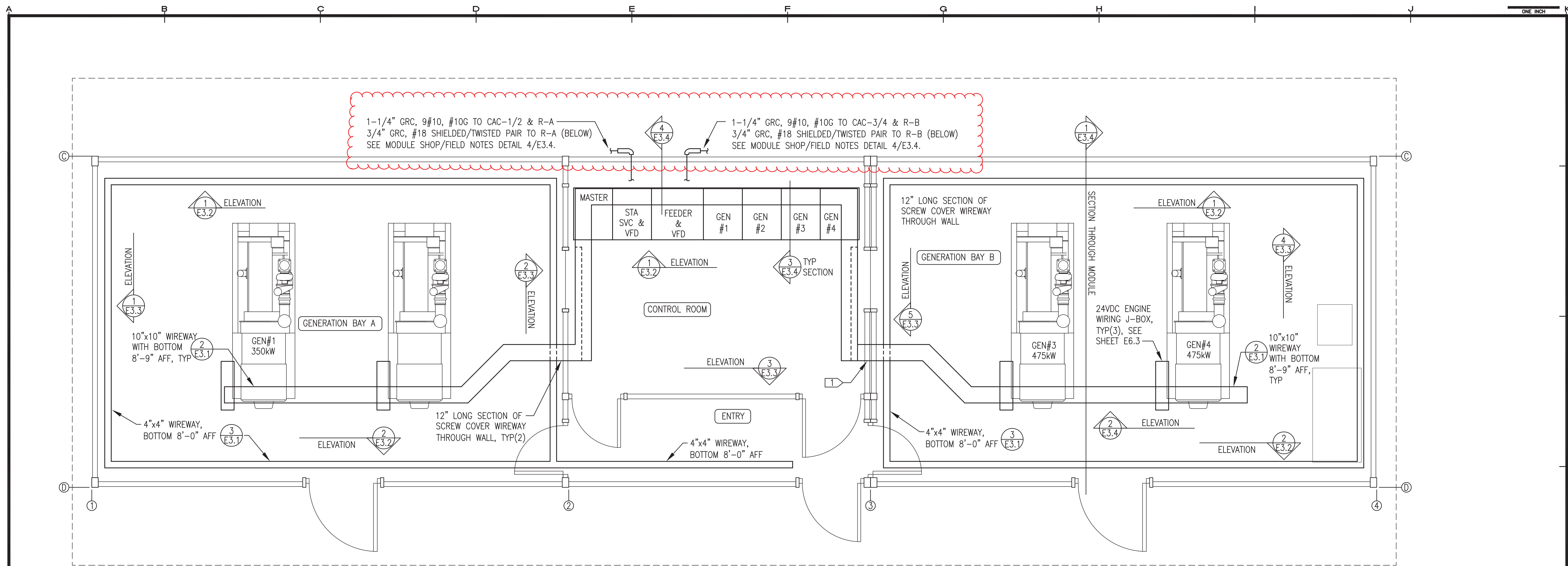
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Logos for HDL ENGINEERING Consultants, Gray Strassel Engineering, Inc., and P.O. 111405 ANC, AK 99511.



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Table with project details: SHEET TITLE (FIRE SUPPRESSION SYSTEM SPECIFICATIONS), SHEET (FS2), DRAWN BY (WJP), CHECKED BY (BCG), DATE (JUNE 16), SCALE (AS SHOWN), JOB NUMBER.



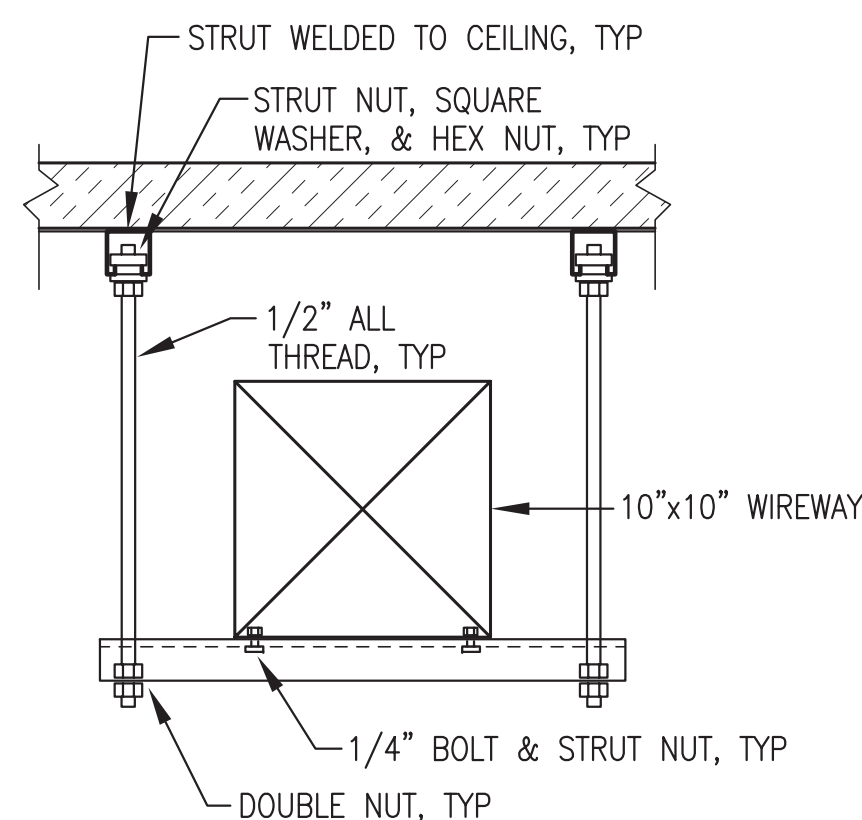
1-1/4" GRC, 9#10, #10G TO CAC-1/2 & R-A
 3/4" GRC, #18 SHIELDED/TWISTED PAIR TO R-A (BELOW)
 SEE MODULE SHOP/FIELD NOTES DETAIL 4/E3.4.

1-1/4" GRC, 9#10, #10G TO CAC-3/4 & R-B
 3/4" GRC, #18 SHIELDED/TWISTED PAIR TO R-B (BELOW)
 SEE MODULE SHOP/FIELD NOTES DETAIL 4/E3.4.

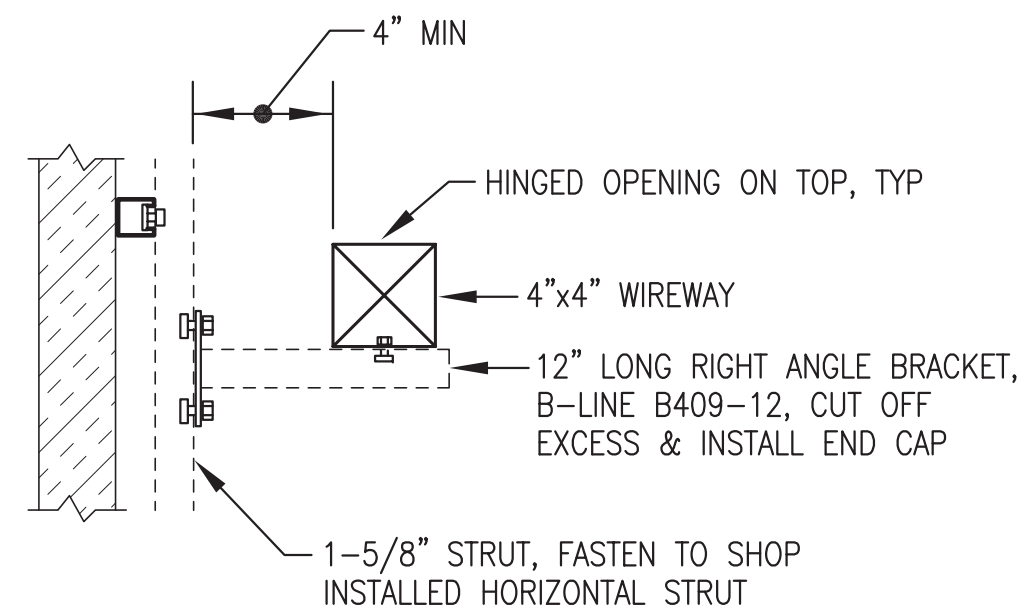
1 STATION SERVICE WIREWAY PLAN
 E3.1 3/8"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

MODULE SHOP/FIELD NOTES:
 1 GENERATOR POWER AND CONTROL CONDUCTORS CROSS THE MODULE SHIPPING SPLIT. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM TERMINATIONS AT GENERATORS AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE CONDUCTORS THEN REMOVE 12" SECTION OF WIREWAY FOR MODULE SEPARATION. IN FIELD, REINSTALL WIREWAY THROUGH WALL THEN PULL ALL CONDUCTORS TO GENERATORS AND TERMINATE.



2 TRAPEZE HANGER
 E3.1 NO SCALE



3 WIREWAY SUPPORT FROM WALL
 E3.1 NO SCALE

REVISIONS	MARK	DATE	DESCRIPTION
	1		
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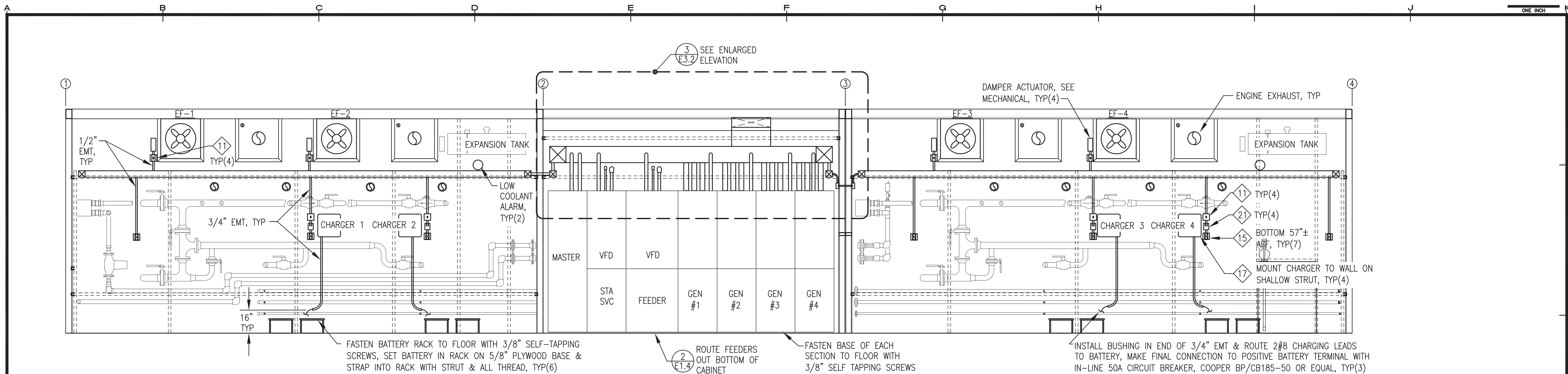
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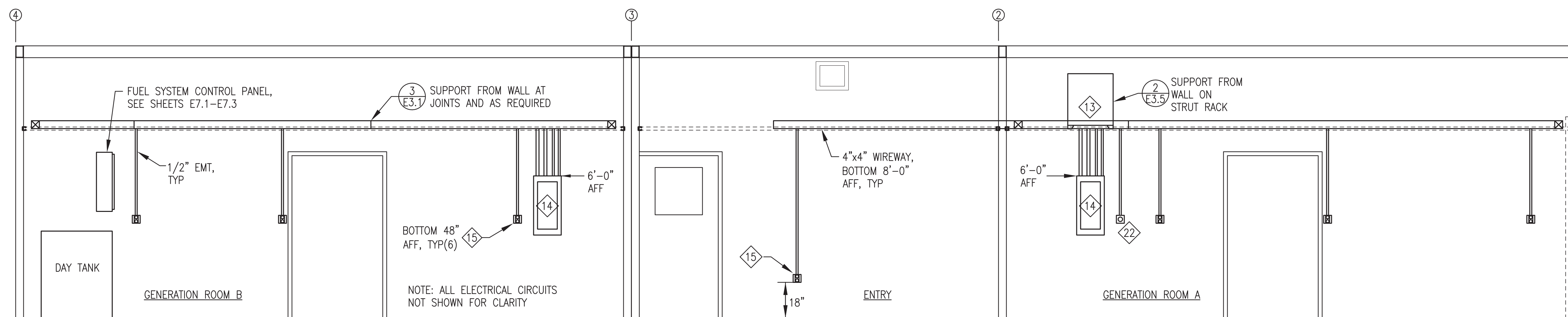
SHEET TITLE
WIREWAY PLAN & DETAILS

SHEET
E3.1

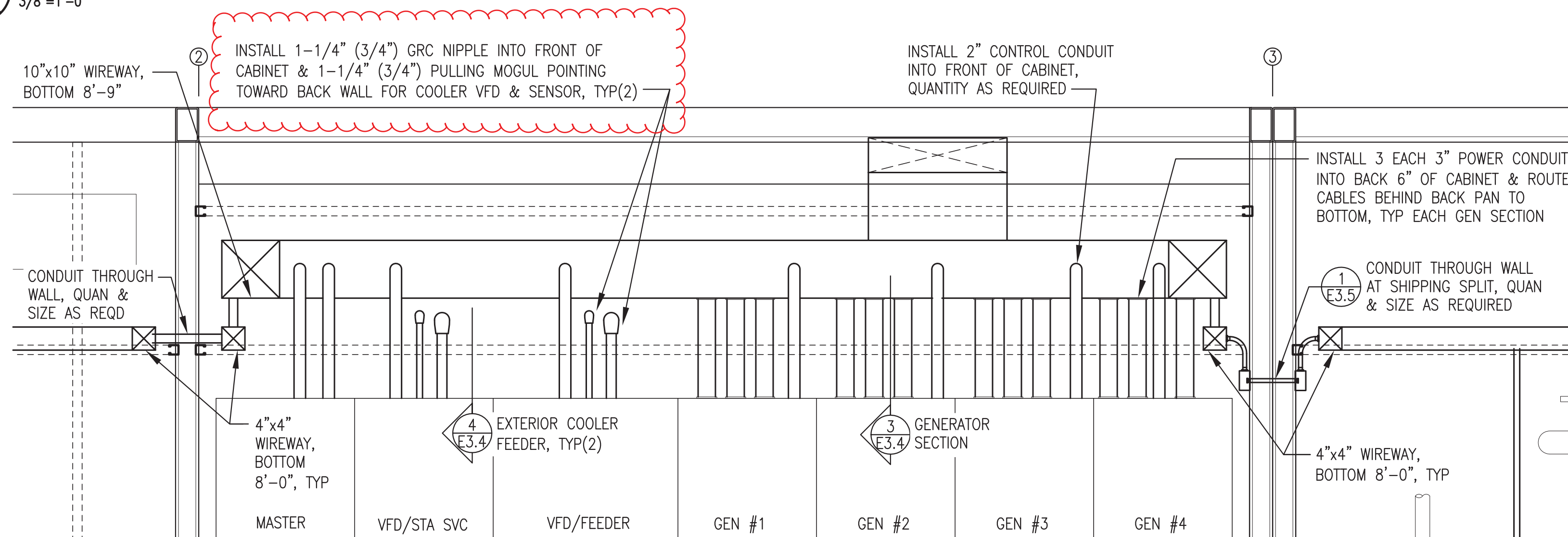
DRAWN BY: WJP CHECKED BY: BCG
 DATE: JUNE 16 SCALE: AS SHOWN
 JOB NUMBER:



1 BACK WALL ELEVATION
E3.2 3/8"=1'-0"



2 WALL ELEVATION AT GRID D
E3.2 3/8"=1'-0"



3 ENLARGED PARTIAL BACK WALL ELEVATION
E3.2 3/16"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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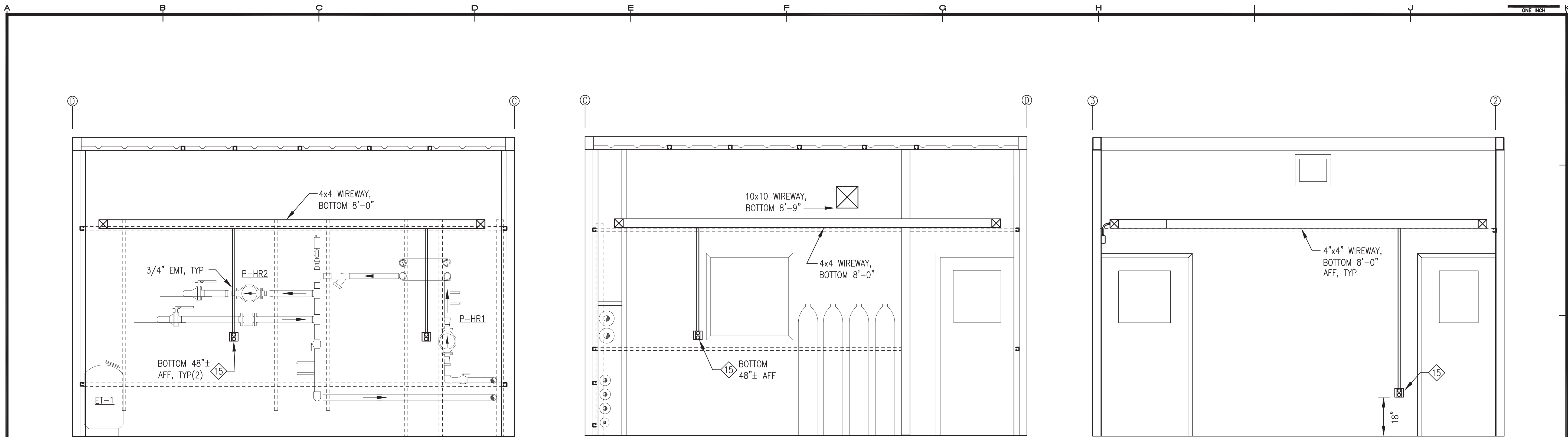
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SHEET TITLE
 WALL ELEVATIONS

SHEET
 E3.2

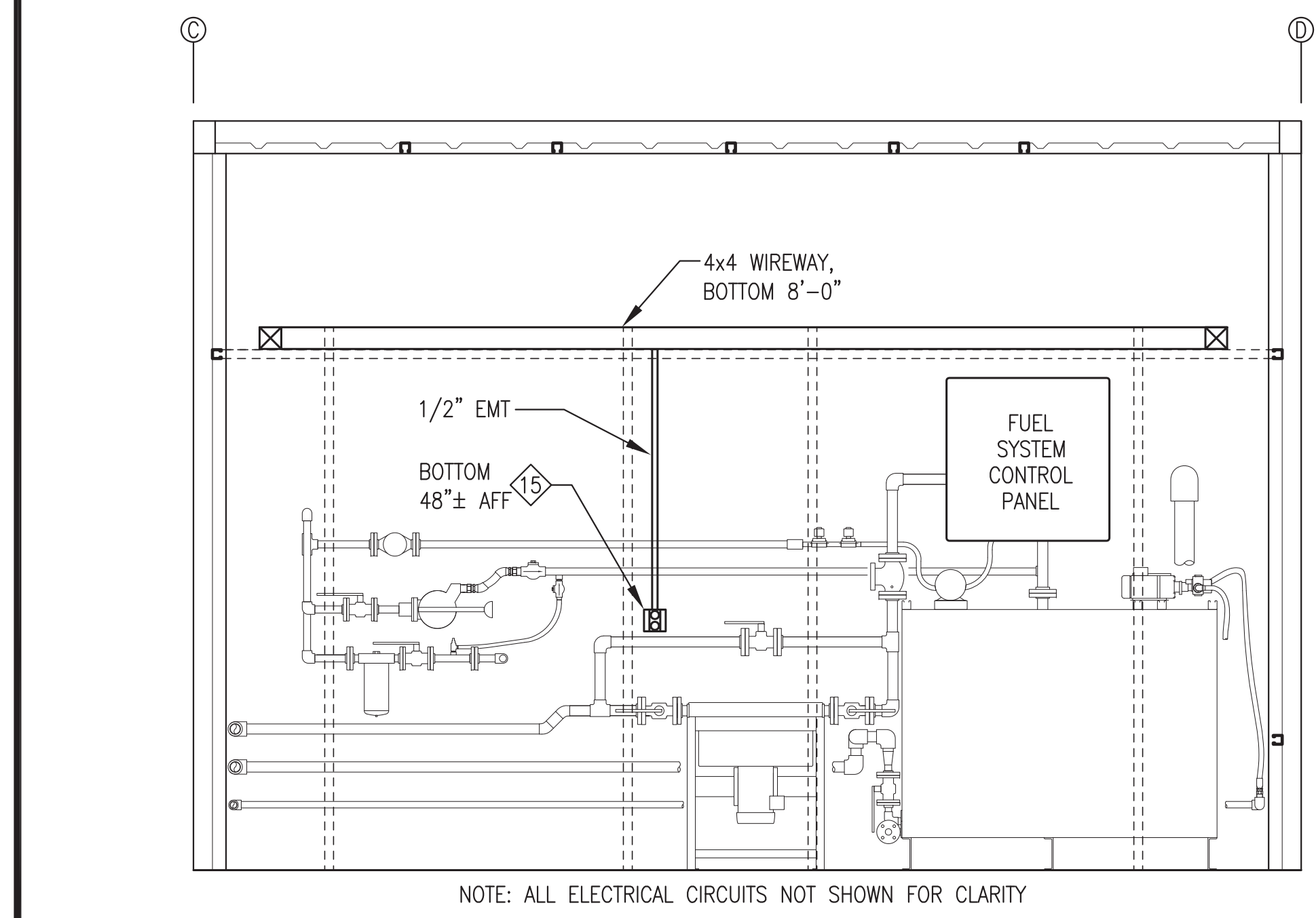
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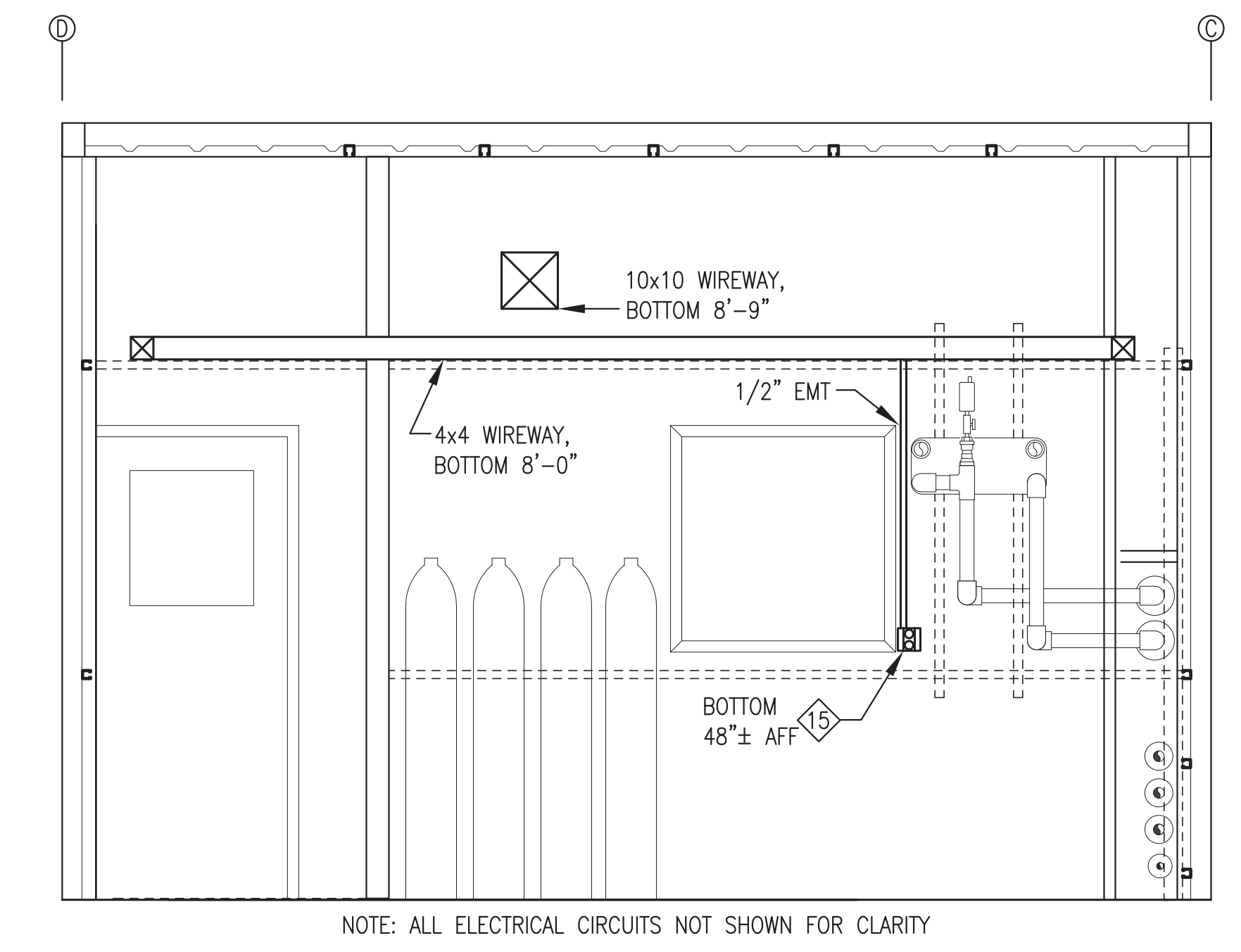
1 ENGINE BAY A LEFT WALL ELEVATION
E3.3 1/2"=1'-0"

2 ENGINE BAY A RIGHT WALL ELEVATION
E3.3 1/2"=1'-0"

3 CONTROL ROOM WALL ELEVATION
E3.3 1/2"=1'-0"



4 ENGINE BAY B RIGHT WALL ELEVATION
E3.3 1/2"=1'-0"



5 ENGINE BAY B LEFT WALL ELEVATION
E3.3 1/2"=1'-0"

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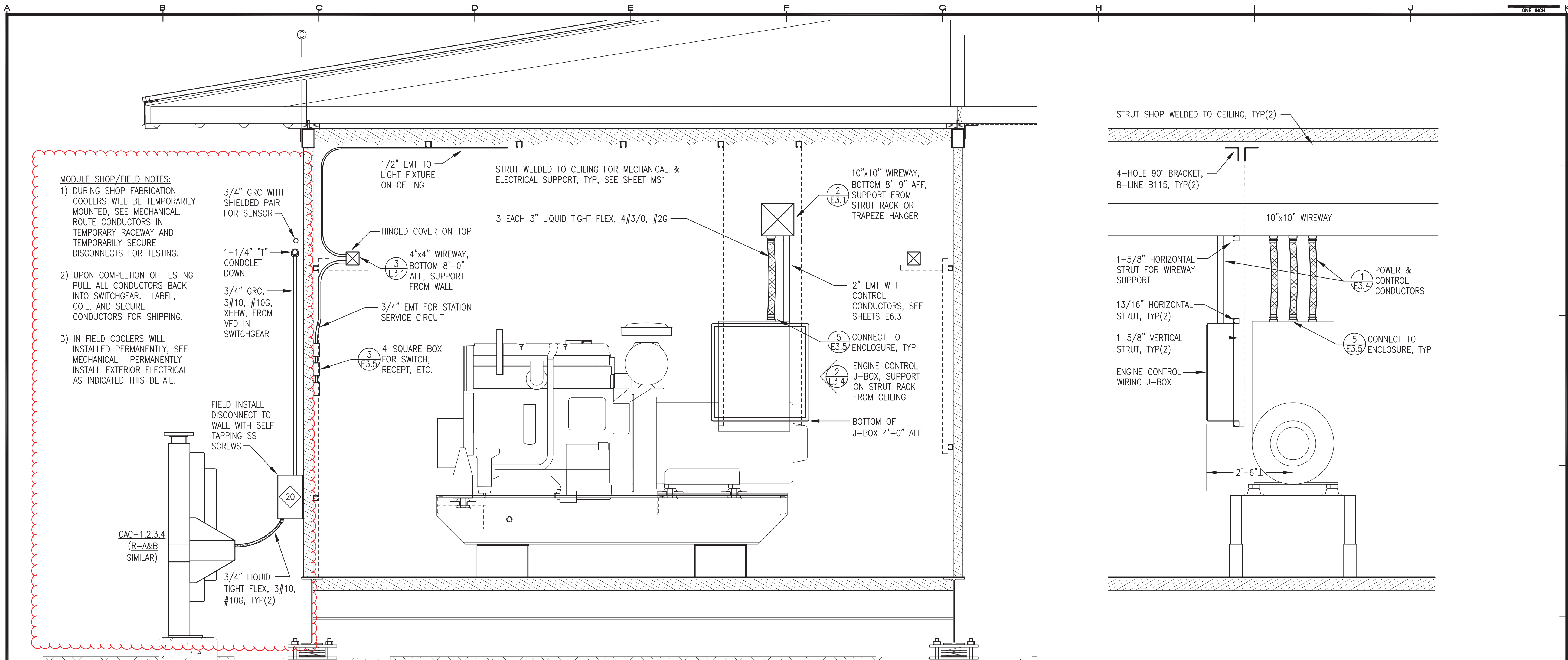
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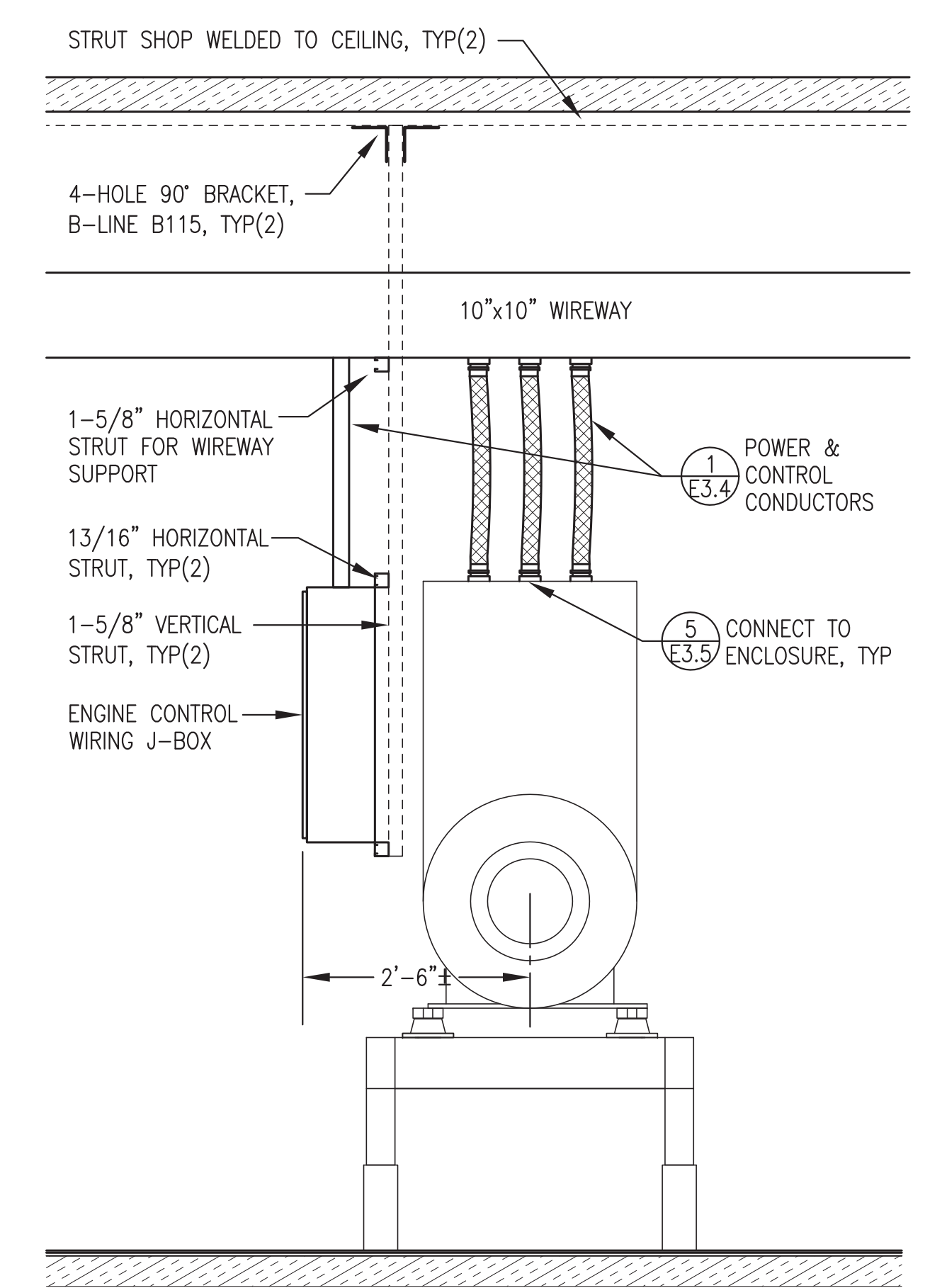


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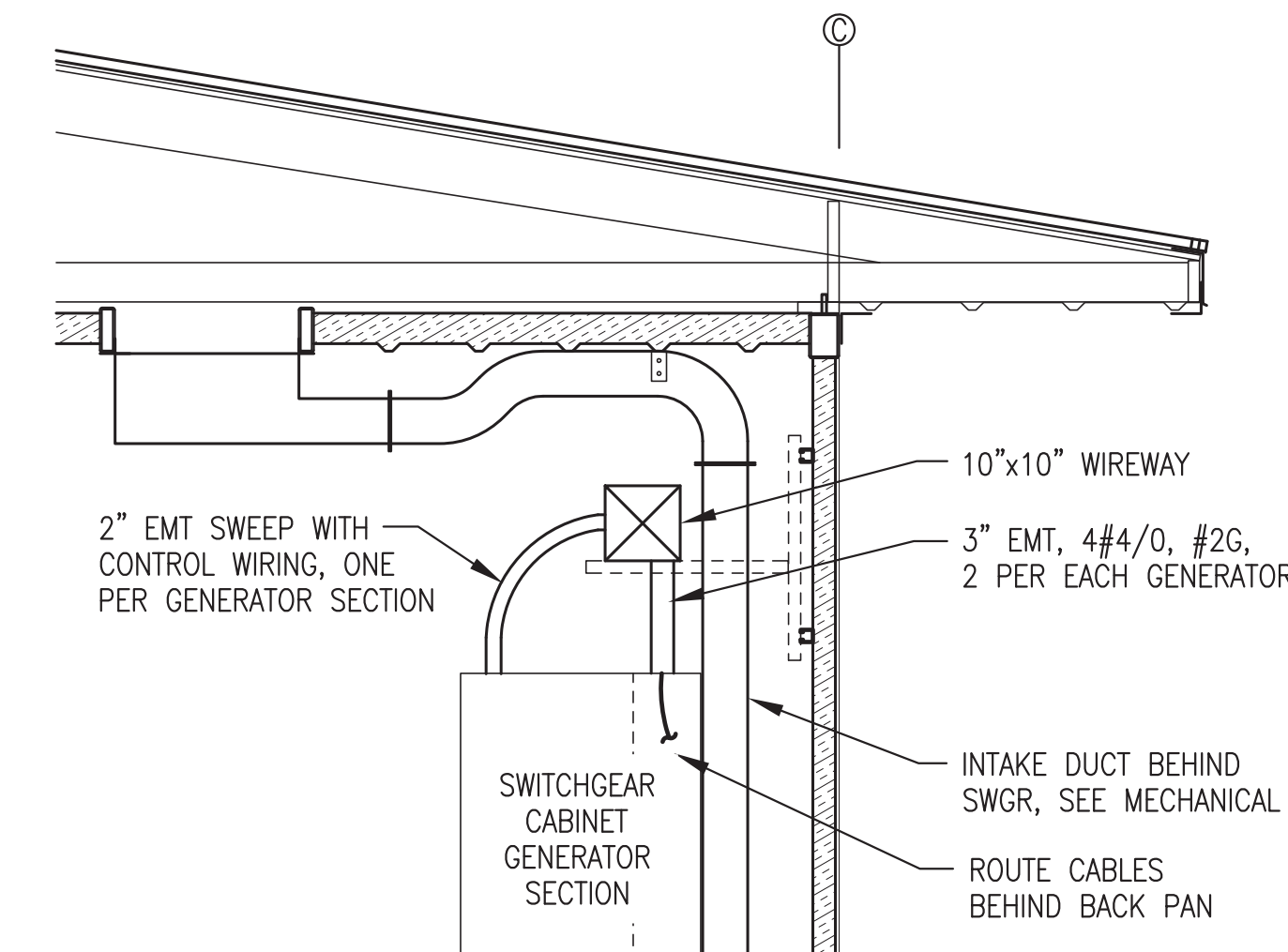
SHEET TITLE WALL ELEVATIONS	
SHEET E3.3	
DRAWN BY WJP	CHECKED BY BCG
DATE JUNE 16	SCALE AS SHOWN
JOB NUMBER	



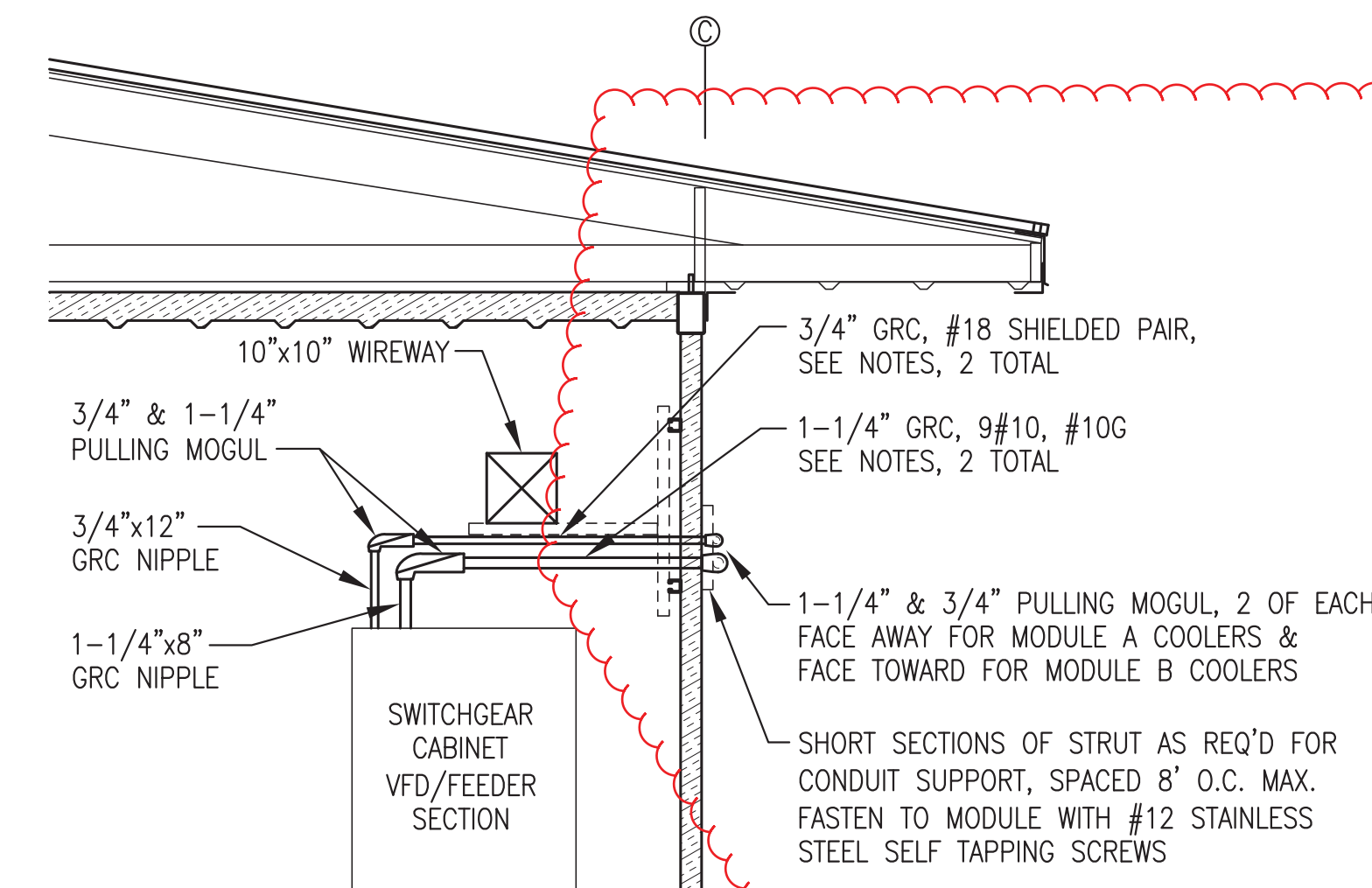
1 TYPICAL SECTION THROUGH GENERATOR
E3.4 3/4"=1'-0"



2 TYPICAL GENERATOR BACK ELEVATION
E3.4 3/4"=1'-0"



3 TYPICAL SECTION THROUGH GENERATOR SECTION
E3.4 1/2"=1'-0"



4 TYPICAL SECTION THROUGH VFD/FEEDER SECTION
E3.4 1/2"=1'-0"

- MODULE SHOP/FIELD NOTES:**
- 1) DURING SHOP FABRICATION STUB GRC 12" MIN BEYOND WALL THEN RUN TEMPORARY RACEWAY TO COOLER, SEE DETAIL1/E3.4.
 - 2) UPON COMPLETION OF TESTING REMOVE GRC AND PULL ALL CONDUCTORS BACK INTO SWITCHGEAR. LABEL, COIL, AND SECURE CONDUCTORS FOR SHIPPING.
 - 3) IN FIELD REINSTALL GRC THROUGH WALL, CUT TO LENGTH, RE-THREAD, & INSTALL MOGUL & GRC ON EXTERIOR WALL.
 - 4) IN SHOP HOLE SAW 1/2"Ø OVERSIZE OPENING. AFTER FINAL FIELD ASSEMBLY SEAL GRC TO WALL SURFACE INSIDE AND OUT WITH POLYURETHANE CAULKING ALL AROUND.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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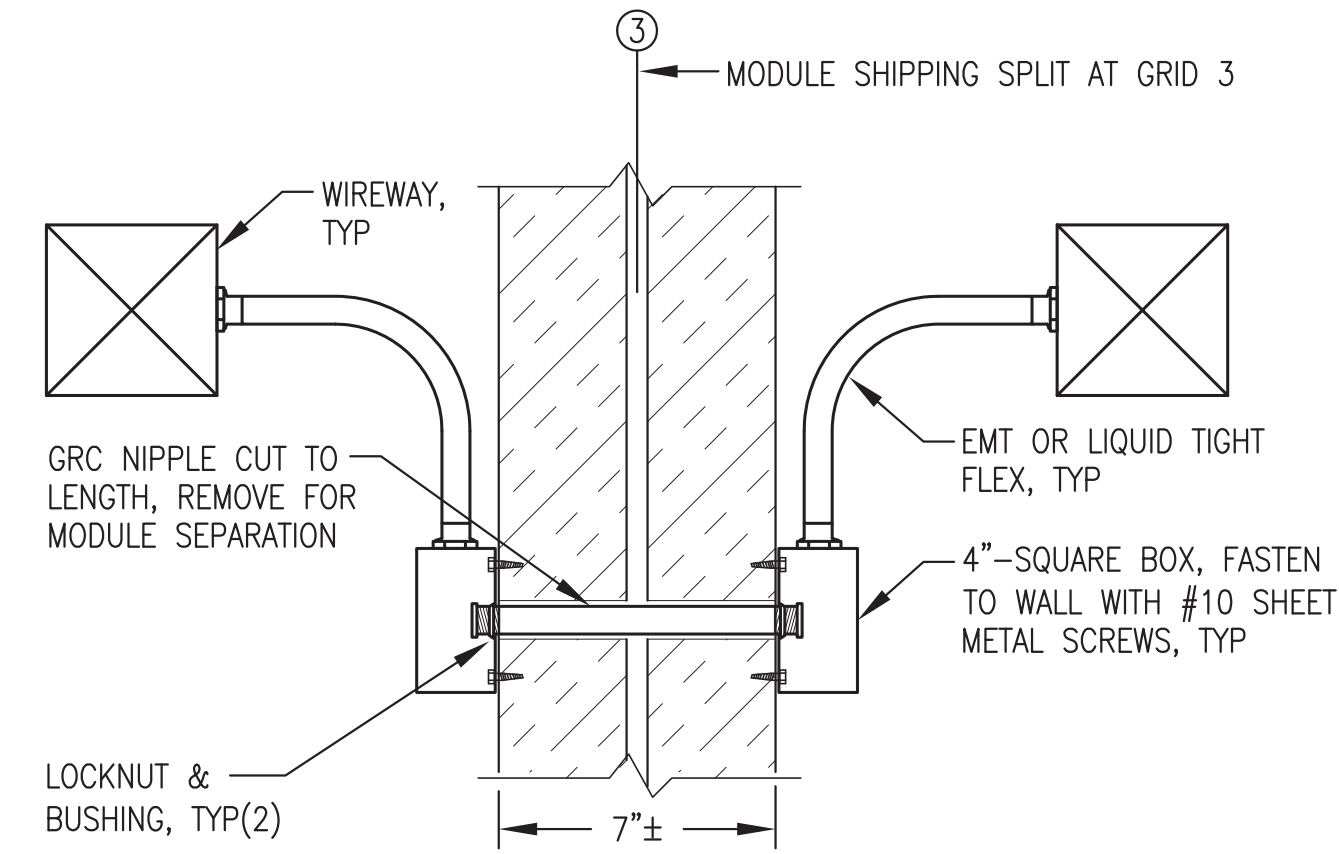
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SHEET TITLE
SECTIONS & DETAILS

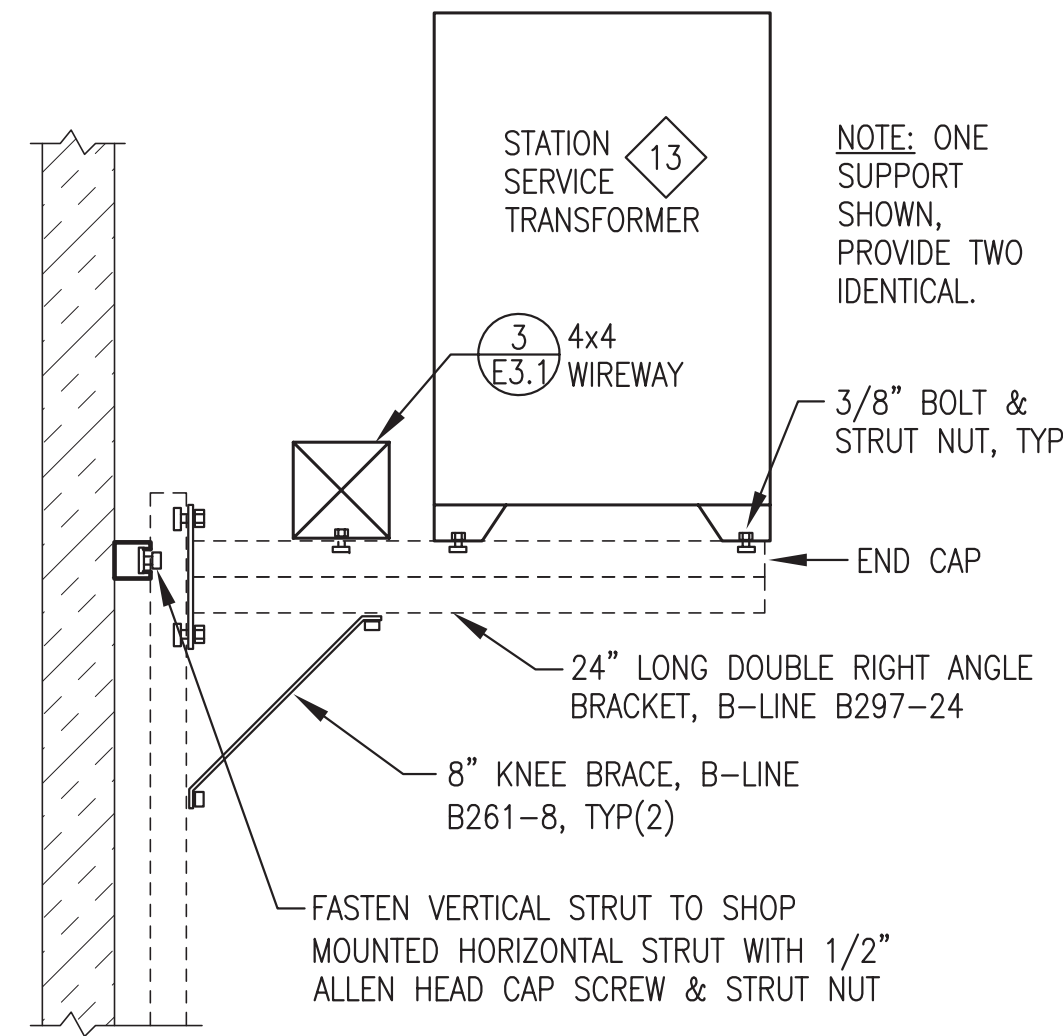
SHEET
E3.4

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 JOB NUMBER:



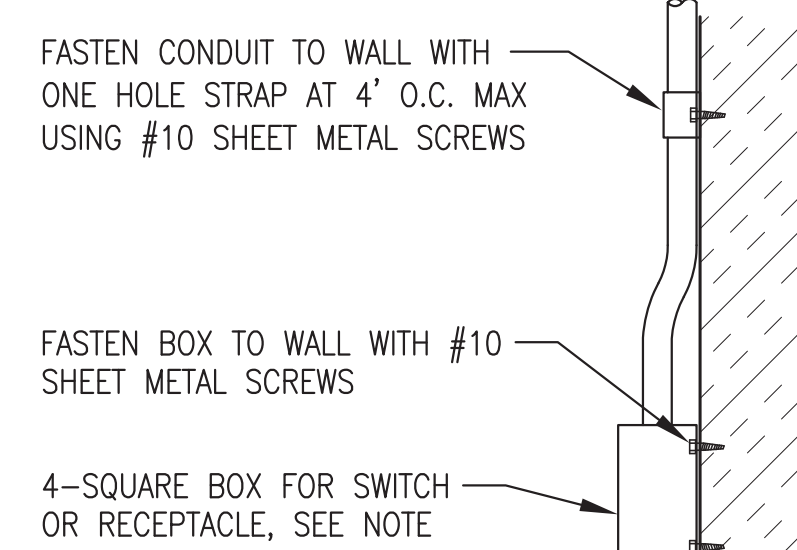
1 MODULE SHIPPING BREAK STATION SERVICE CONDUCTOR RACEWAY DETAIL
E3.5 NO SCALE

- MODULE SHOP/FIELD NOTES:**
- 1) THIS DETAIL PROVIDES A SHIPPING SPLIT POINT FOR STATION SERVICE CONDUCTORS. PROVIDE QUANTITY AND SIZE AS REQUIRED.
 - 2) DURING SHOP FABRICATION INSTALL GRC THROUGH WALL AND PULL CONDUCTORS FOR TESTING.
 - 3) UPON COMPLETION OF TESTING PULL ALL CONDUCTORS INTO CONTROL ROOM AND REMOVE GRC. LABEL, COIL, AND SECURE CONDUCTORS FOR SHIPPING.
 - 4) IN FIELD REINSTALL GRC THROUGH WALL, RE-PULL CONDUCTORS, AND TERMINATE.



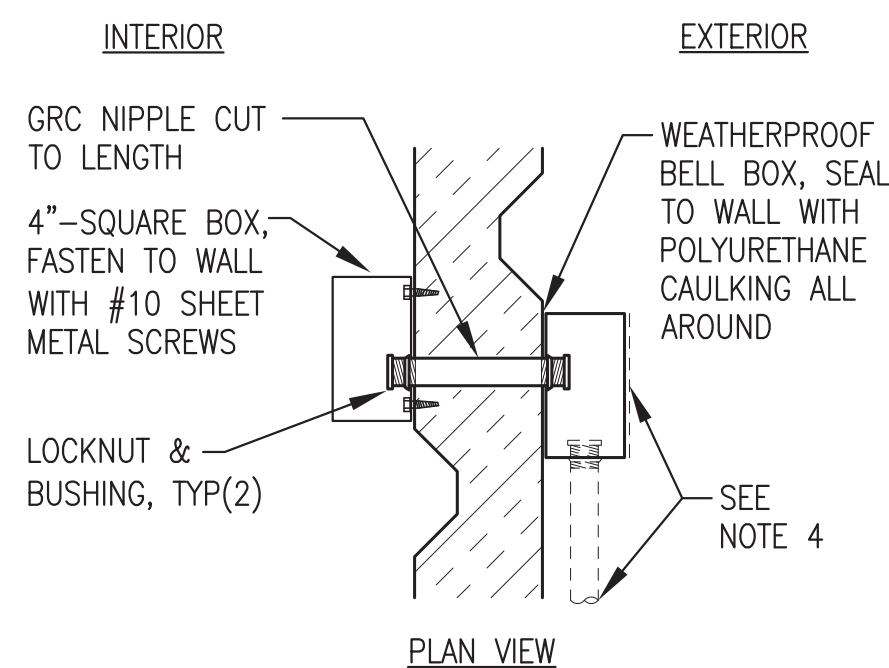
2 STATION SERVICE TRANSFORMER SUPPORT
E3.5 NO SCALE

NOTE: ONE SUPPORT SHOWN, PROVIDE TWO IDENTICAL.



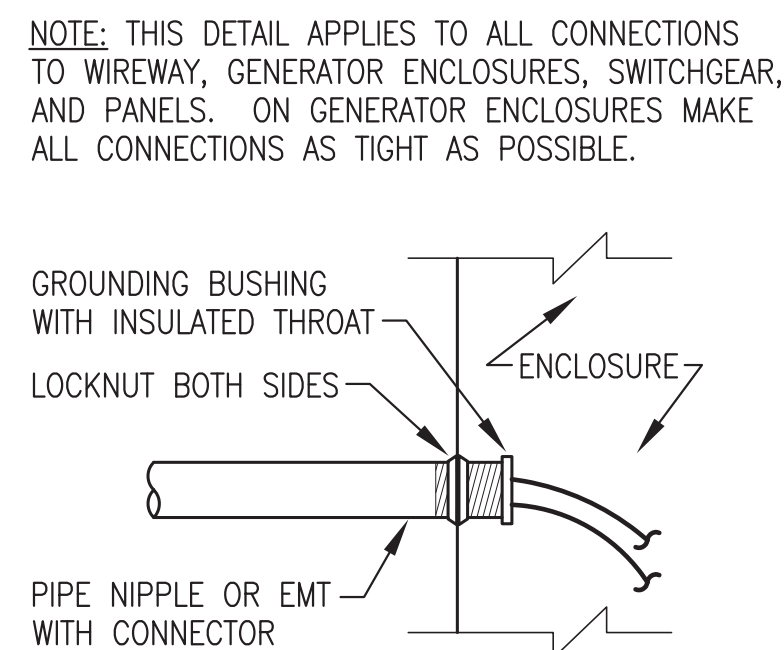
3 TYPICAL INTERIOR DEVICE MOUNTING
E3.5 NO SCALE

NOTE: INSTALL THERMOSTATS & TIMER SWITCHES IN DEEP SINGLE GANG BELL BOX INSTEAD OF 4-SQUARE BOX.



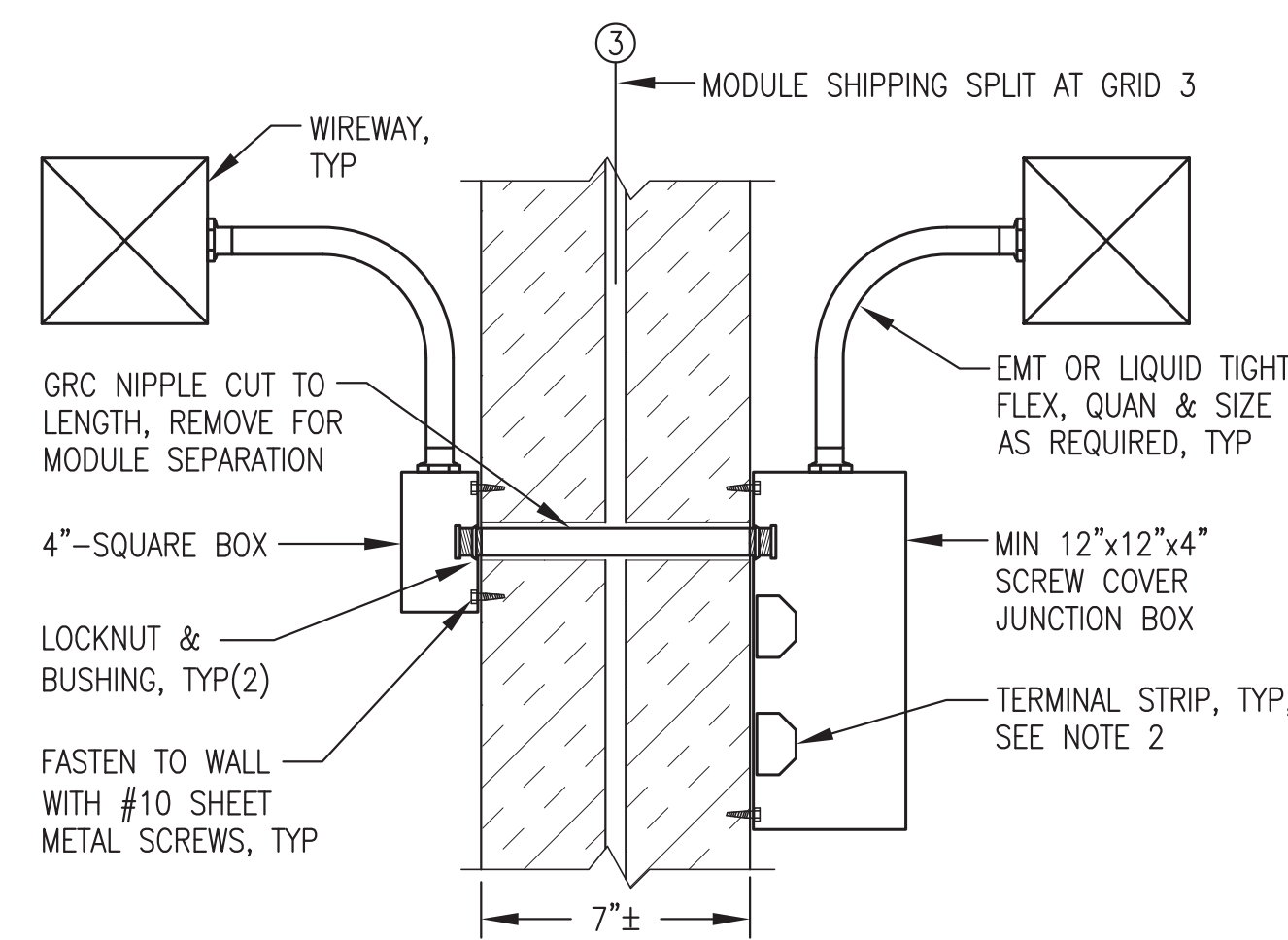
4 TYP EXTERIOR WALL-MOUNT DEVICE INSTALLATION
E3.5 NO SCALE

- MODULE SHOP/FIELD NOTES:**
- 1) DURING SHOP FABRICATION INSTALL AS SHOWN BUT DO NOT SEAL EXTERIOR BOX TO WALL.
 - 2) UPON COMPLETION OF TESTING REMOVE GRC AND EXTERIOR BOX AND PULL CONDUCTORS INTO INTERIOR BOX. LABEL, COIL, AND SECURE CONDUCTORS FOR MODULE SHIPPING.
 - 3) IN FIELD REINSTALL GRC THROUGH WALL, RE-INSTALL EXTERIOR BOX AND SEAL TO WALL, RE-PULL CONDUCTORS, AND TERMINATE.
 - 4) FOR FIELD CONDUIT RUNS BEYOND MODULE INSTALL BLANK COVER ON BELL BOX, SEE SITE PLAN SHEET E1.3.
 - 5) FOR CONDUIT PENETRATIONS WITHOUT BELL BOX SEAL ALL AROUND CONDUIT WITH POLYURETHANE CAULK.



5 TYP ENCLOSURE CONNECTION
E3.5 NO SCALE

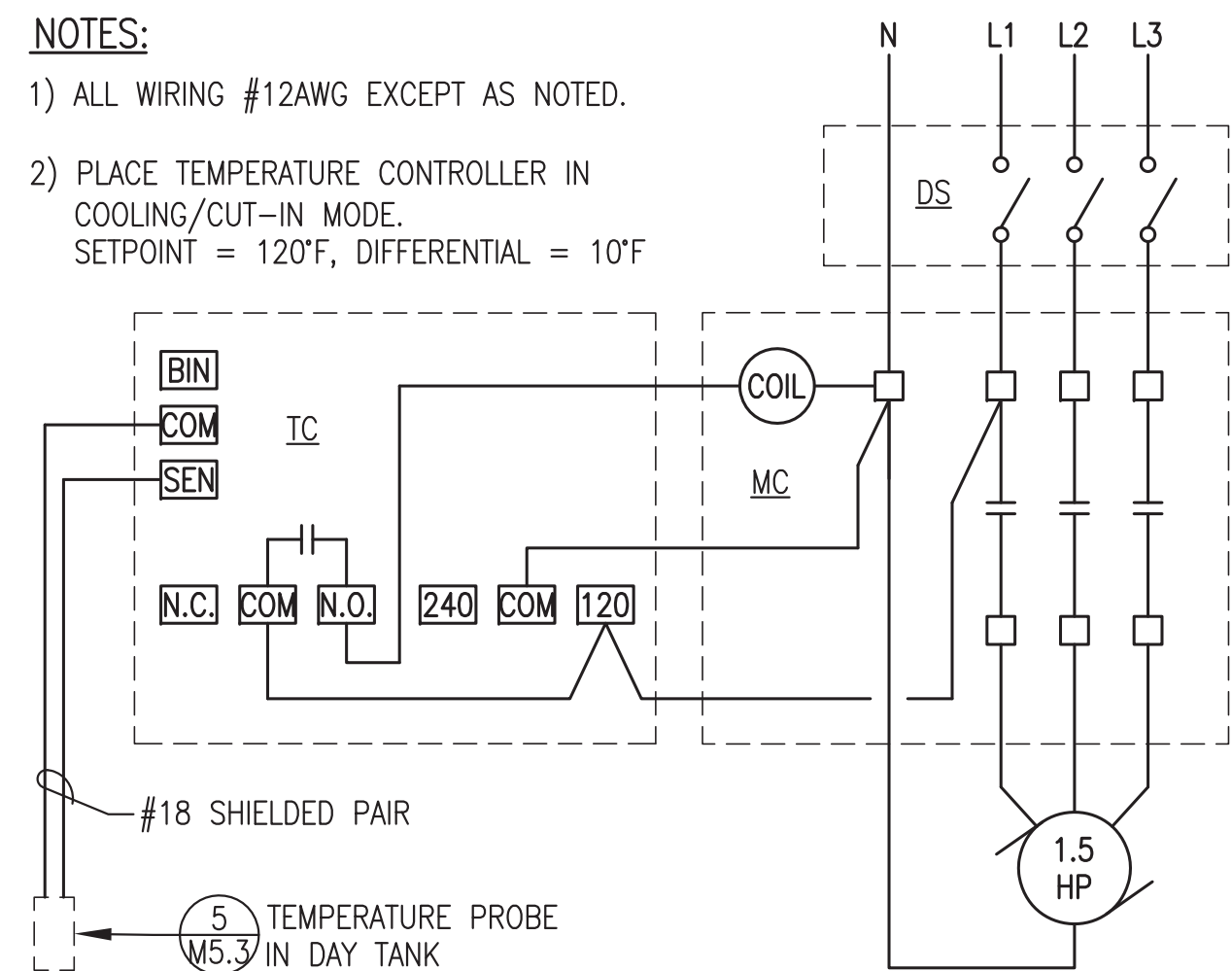
NOTE: THIS DETAIL APPLIES TO ALL CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS. ON GENERATOR ENCLOSURES MAKE ALL CONNECTIONS AS TIGHT AS POSSIBLE.



6 MODULE SHIPPING BREAK CONTROL CONDUCTOR RACEWAY DETAIL
E3.5 NO SCALE

- MODULE SHOP/FIELD NOTES:**
- 1) THIS DETAIL PROVIDES A SHIPPING SPLIT POINT FOR CONTROL CONDUCTORS. PROVIDE MULTIPLE 4 SQUARE BOXES AND GRC NIPPLES AS REQUIRED.
 - 2) INSTALL TERMINAL STRIPS TO SERVE AS SPLICE POINT FOR ALL CONTROL CONDUCTORS INCLUDING SHIELDS, QUANTITY AS REQUIRED.
 - 3) DURING SHOP FABRICATION INSTALL GRC THROUGH WALL AND TERMINATE CONDUCTORS FOR TESTING.
 - 4) UPON COMPLETION OF TESTING DISCONNECT ALL CONDUCTORS FROM CONTROL ROOM SIDE OF TERMINAL STRIP, PULL INTO CONTROL ROOM, AND REMOVE GRC. LABEL, COIL, AND SECURE CONDUCTORS FOR SHIPPING.
 - 5) IN FIELD REINSTALL GRC THROUGH WALL, RE-PULL CONDUCTORS, AND TERMINATE.

- NOTES:**
- 1) ALL WIRING #12AWG EXCEPT AS NOTED.
 - 2) PLACE TEMPERATURE CONTROLLER IN COOLING/CUT-IN MODE. SETPOINT = 120°F, DIFFERENTIAL = 10°F



7 FOC-1 WIRING DIAGRAM
E3.5 NO SCALE

- BILL OF MATERIALS:**
- DS: THREE POLE MOTOR DISCONNECT SWITCH (NO OVERLOAD PROTECTION), 208V, 30A, 7.5HP RATED, INSTALL IN 4x4 PRESSED STEEL BOX WITH METAL COVER. PASS & SEYMOUR 7308
- MC: MOTOR CONTACTOR, IEC STYLE, 9A, 208V, MIN 2HP RATED, 120V COIL, NEMA 1 ENCLOSURE, 5.4-27A ADJUSTABLE RANGE SOLID STATE OVERLOAD, HAND/OFF/AUTO CONTROL. ALLEN BRADLEY 100C09D10, 198BA966, 193EEEB, & 198MT1
- TC: TEMPERATURE CONTROLLER, -30°F TO 212°F, 120VAC WITH PTC TEMPERATURE SENSOR, -40°F TO 250°F, PVC JACKETED CABLE, IMMERSION WELL, 3" LONG PROBE, 1/2" NPT PROCESS CONNECTION. JOHNSON CONTROLS A419ABC-1C & WEL11A-601R

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

REVISIONS MARK	DATE	DESCRIPTION
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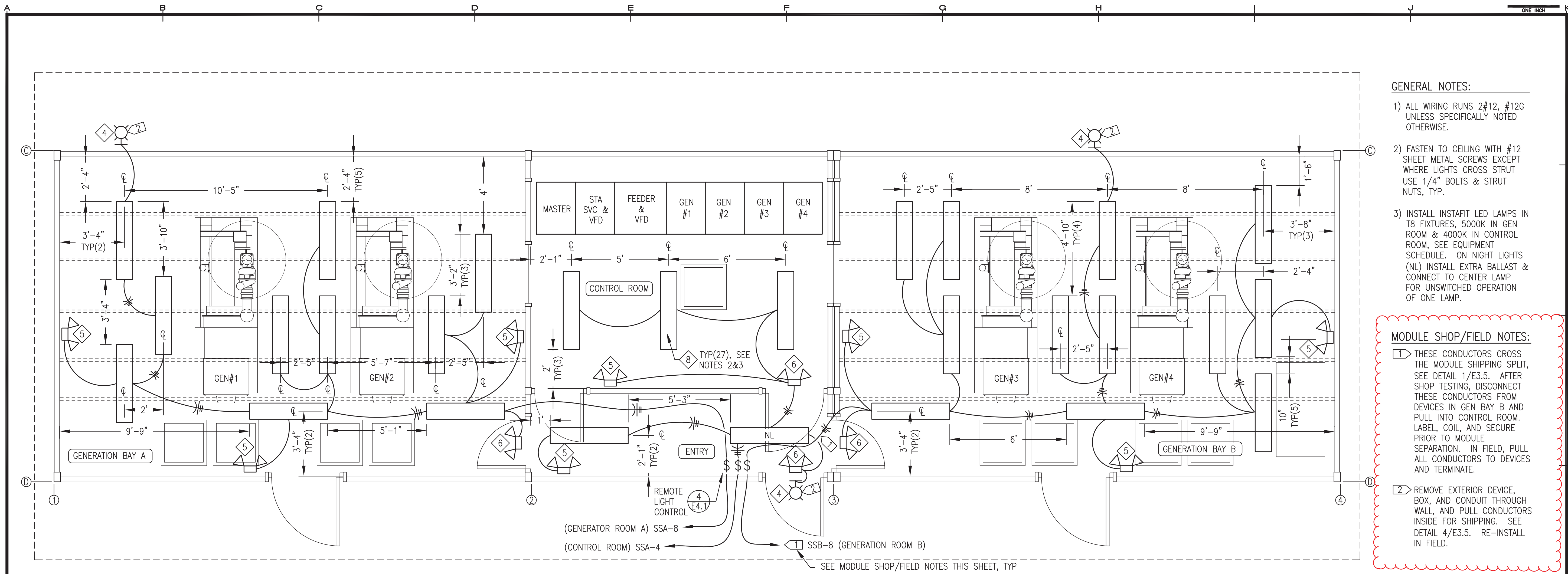


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SHEET TITLE	
DETAILS	
SHEET	
E3.5	
DRAWN BY: WJP	CHECKED BY: BCG
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JOB NUMBER:	

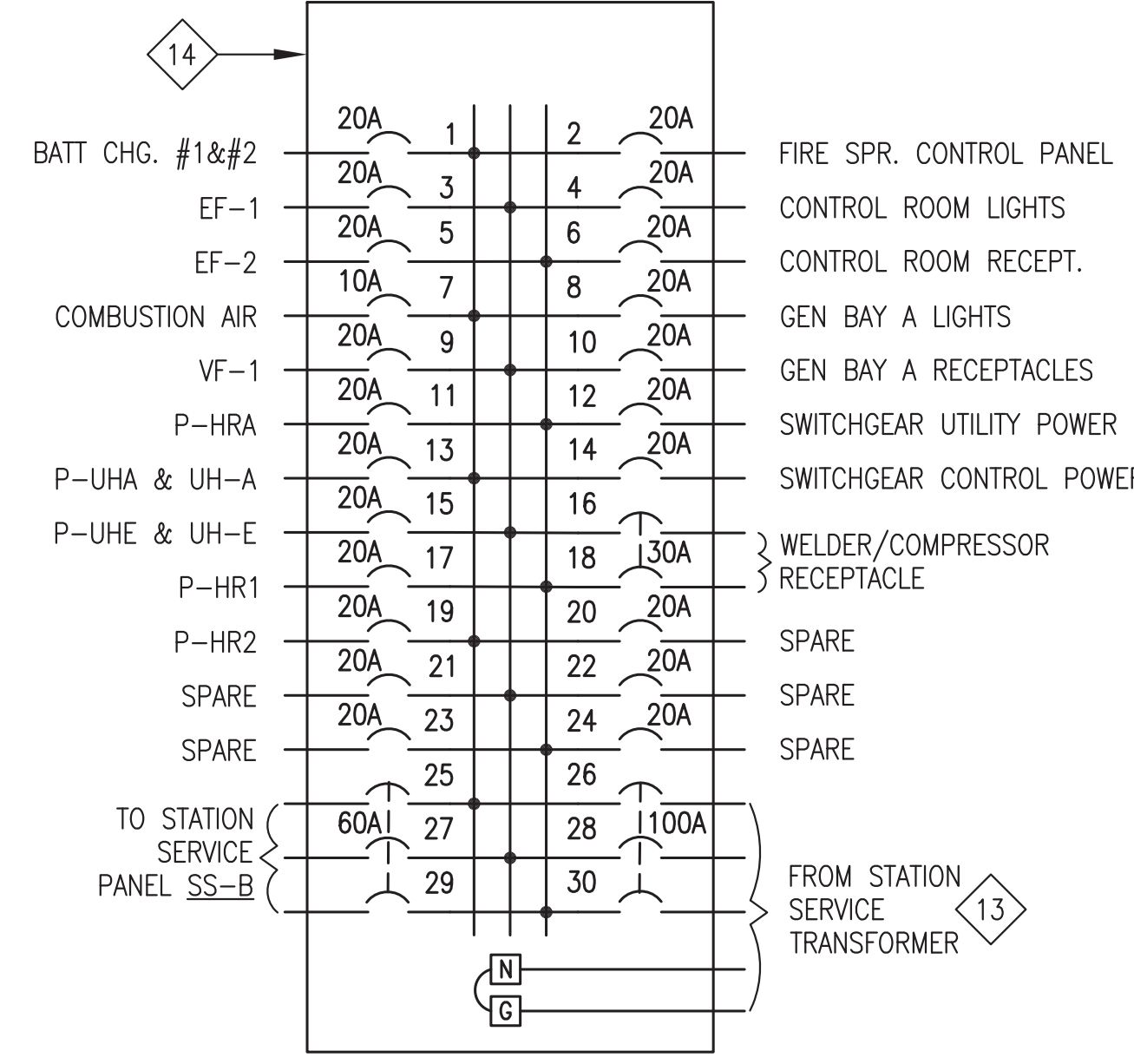


- GENERAL NOTES:**
- 1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.
 - 2) FASTEN TO CEILING WITH #12 SHEET METAL SCREWS EXCEPT WHERE LIGHTS CROSS STRUT USE 1/4" BOLTS & STRUT NUTS, TYP.
 - 3) INSTALL INSTAFIT LED LAMPS IN T8 FIXTURES, 5000K IN GEN ROOM & 4000K IN CONTROL ROOM, SEE EQUIPMENT SCHEDULE. ON NIGHT LIGHTS (NL) INSTALL EXTRA BALLAST & CONNECT TO CENTER LAMP FOR UNSWITCHED OPERATION OF ONE LAMP.

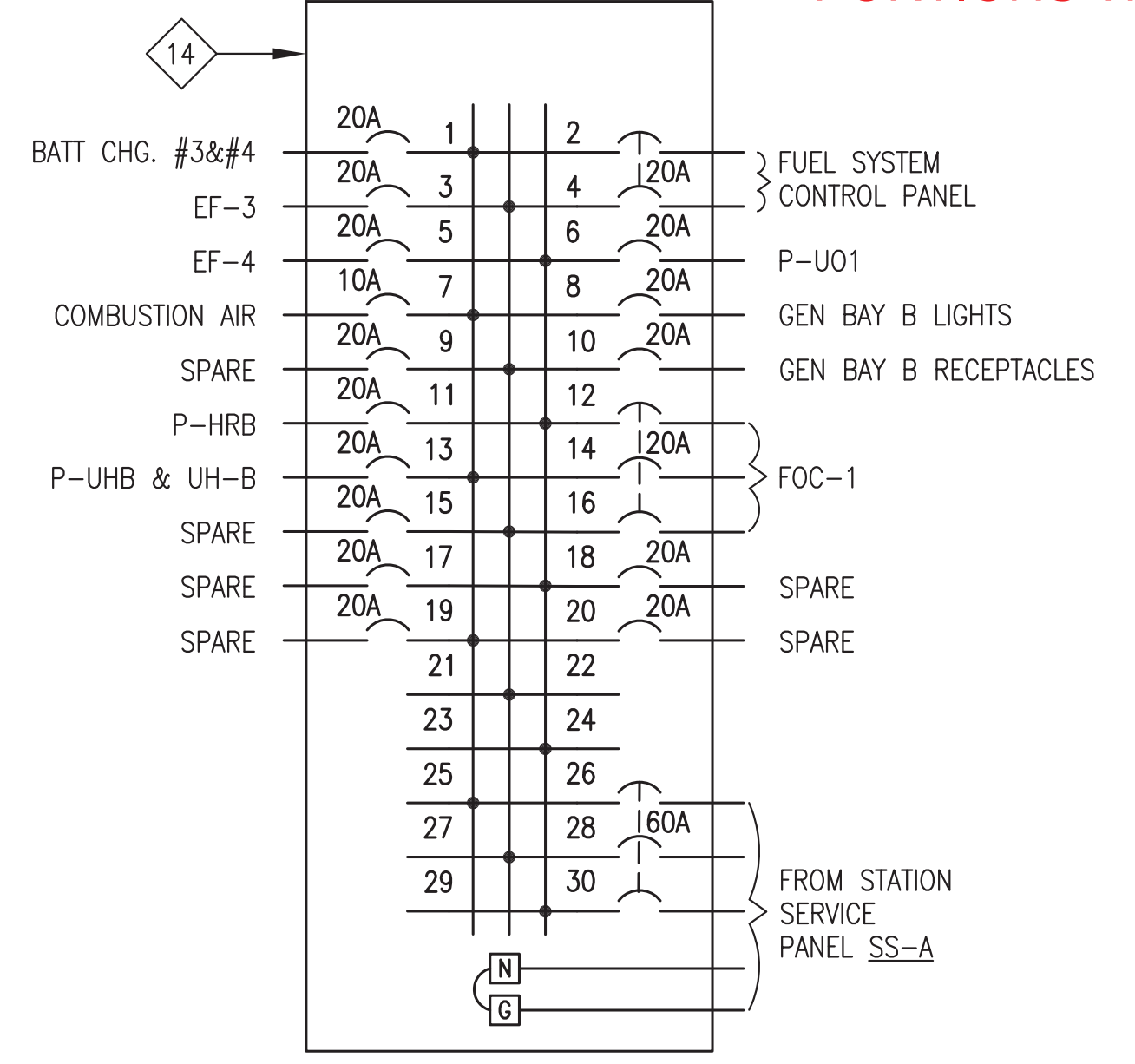
- MODULE SHOP/FIELD NOTES:**
- 1) THESE CONDUCTORS CROSS THE MODULE SHIPPING SPLIT, SEE DETAIL 1/E3.5. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM DEVICES IN GEN BAY B AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE PRIOR TO MODULE SEPARATION. IN FIELD, PULL ALL CONDUCTORS TO DEVICES AND TERMINATE.
 - 2) REMOVE EXTERIOR DEVICE, BOX, AND CONDUIT THROUGH WALL, AND PULL CONDUCTORS INSIDE FOR SHIPPING. SEE DETAIL 4/E3.5. RE-INSTALL IN FIELD.

1 LIGHTING PLAN
E4.1 3/8"=1'-0"

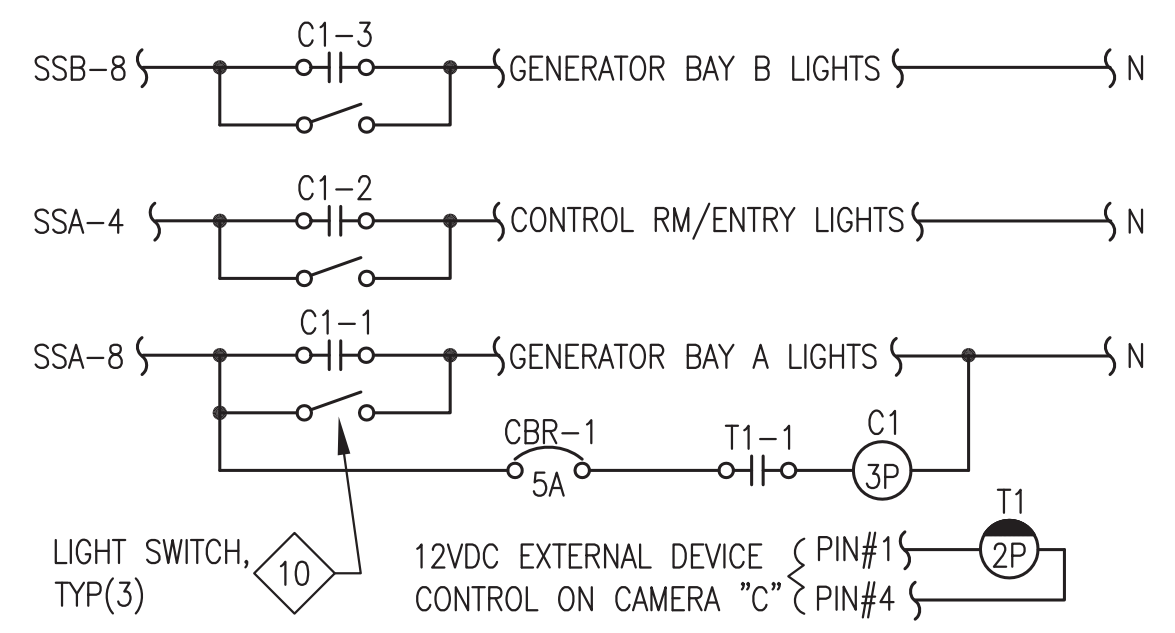
THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.



2 STATION SERVICE PANEL "SSA"
E4.1 NO SCALE



3 STATION SERVICE PANEL "SSB"
E4.1 NO SCALE



- NOTES:**
- 1) INSTALL CONTACTOR, TIMER RELAY, AND CIRCUIT BREAKER IN 12"x12"x6" NEMA 1 JUNCTION BOX ON WALL ABOVE LIGHT SWITCHES.
 - 2) ALL LIGHTING CIRCUIT WIRING MIN #12 AWG. ALL 5A CONTROL CIRCUIT WIRING MIN #16AWG.
 - 3) SET TIMER FOR 5 MINUTES, SINGLE SHOT MODE.
- BILL OF MATERIALS:**
- CB1: 5A, 1P, RAIL MOUNT CIRCUIT BREAKER. ALLEN BRADLEY 1489-A1-050.
- C1: 23A, 3P CONTACTOR, 120V COIL. ALLEN BRADLEY 100-C23D10.
- T1: 10A, DPDT RELAY, 12VDC COIL, WITH SOCKET BASE AND TIMING MODULE. ALLEN BRADLEY 700-HA32Z12 RELAY WITH 700HN204 BASE AND 700HT3 SERIES B TIMING MODULE.

4 LIGHTING REMOTE CONTROL SCHEMATIC
E4.1 NO SCALE

BUILDING PLANS SYMBOL LEGEND	
SYMBOL	DESCRIPTION
SS-##	HOME RUN TO PANEL & BREAKER(S) INDICATED. SHORT DASH INDICATES HOT CONDUCTOR, LONG DASH INDICATES NEUTRAL CONDUCTOR, CURVED DASH INDICATES GROUND CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.
#	ELECTRICAL ITEM - SEE EQUIPMENT SCHEDULE ON SHEET E6
(1/4)	MOTOR (HORSEPOWER INDICATED)
(MD)	MOTORIZED DAMPER - SEE MECHANICAL
(⊖)	125V, 20A, DUPLEX RECEPTACLE
(T)	LINE VOLTAGE THERMOSTAT
(DT)	DIGITAL THERMOSTAT, MODULATING
\$	SNAP SWITCH / SMALL MOTOR DISCONNECT
T\$	TIMER SWITCH
(⊕)	GROUND

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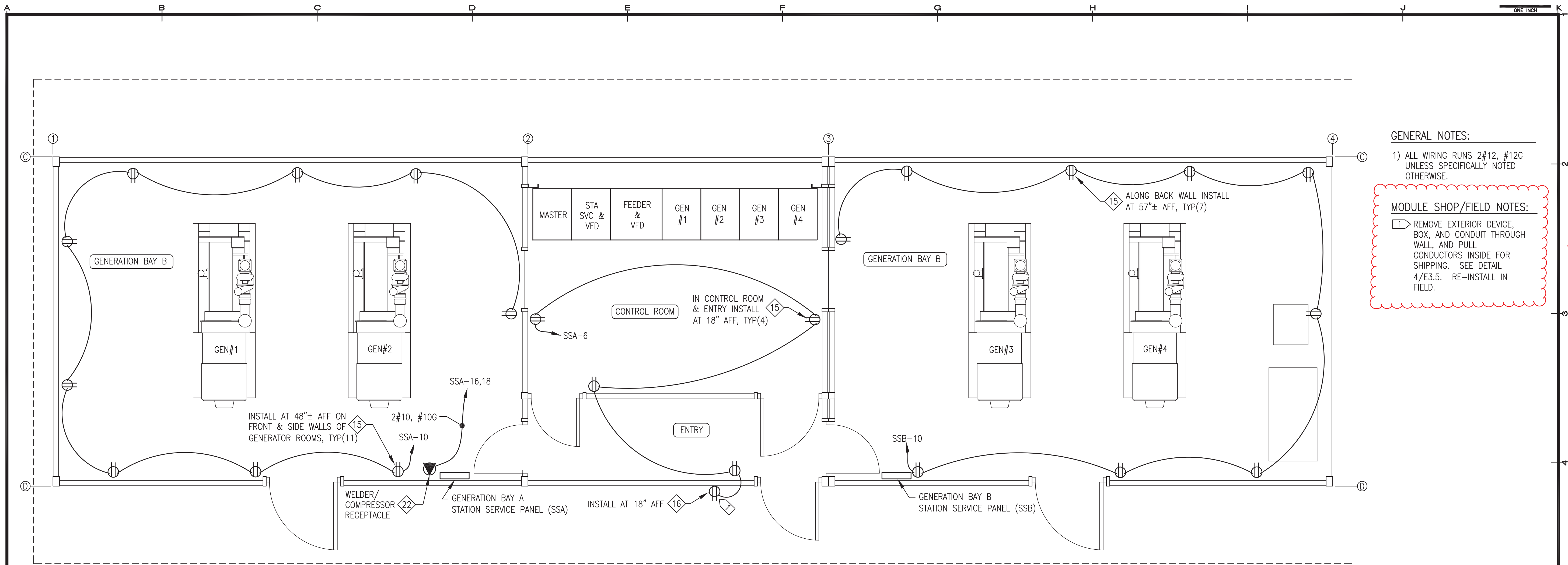
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SHEET TITLE	
LIGHTING PLAN & DETAILS	
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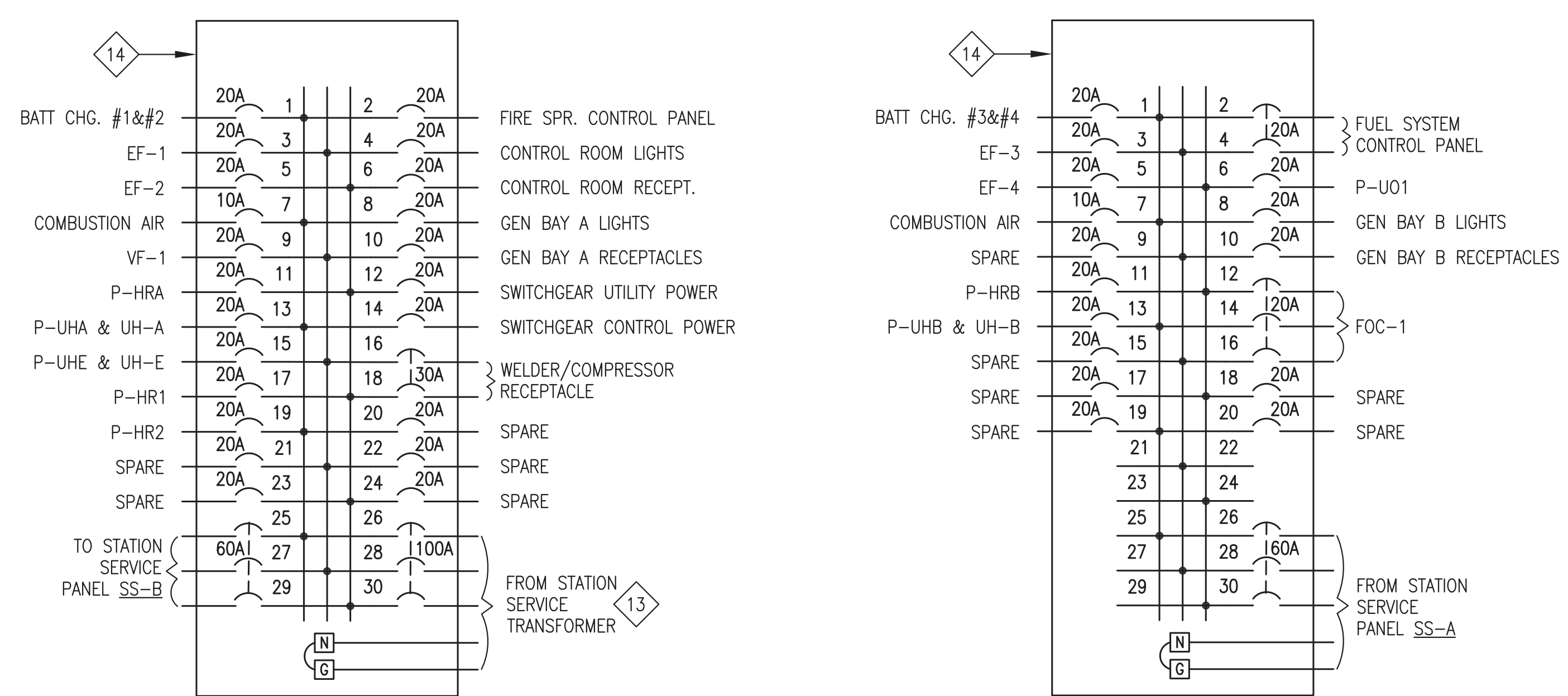
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1 RECEPTACLE PLAN
E4.2 3/8"=1'-0"



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2 STATION SERVICE PANEL "SSA"
E4.2 NO SCALE

3 STATION SERVICE PANEL "SSB"
E4.2 NO SCALE

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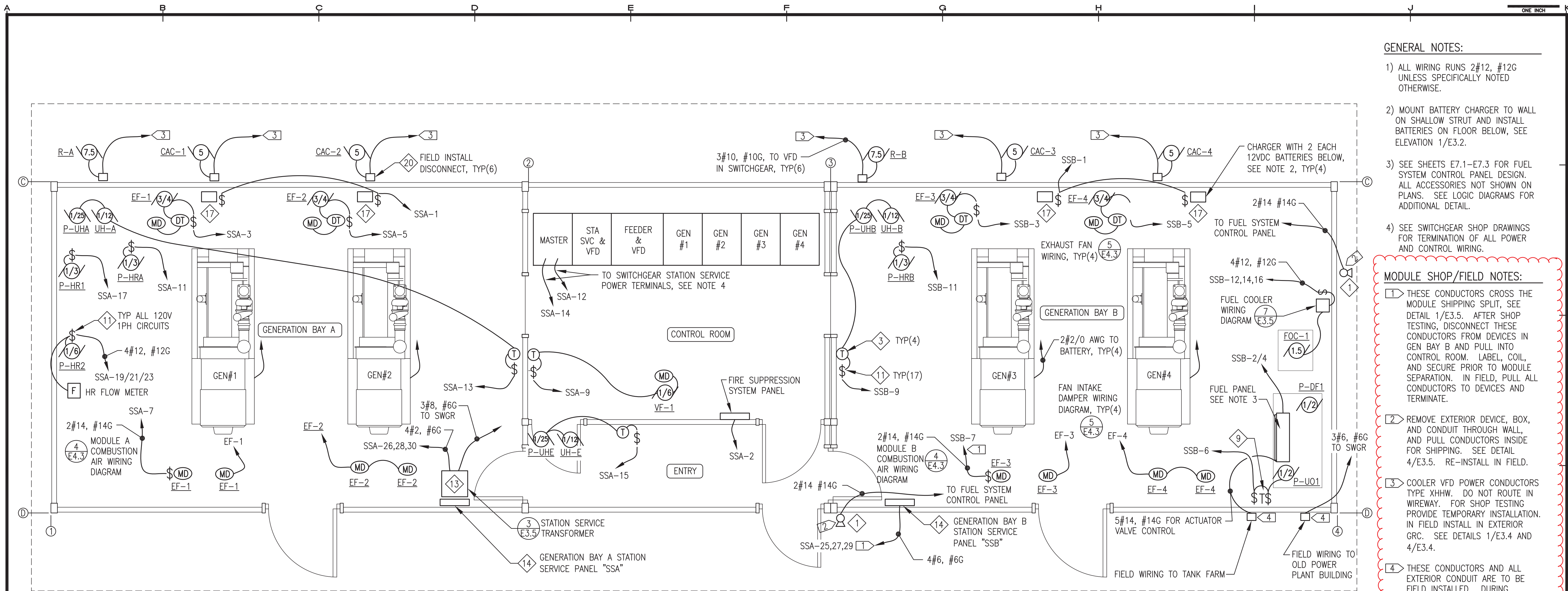
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SHEET TITLE
 RECEPTACLE PLAN & DETAILS

SHEET
E4.2

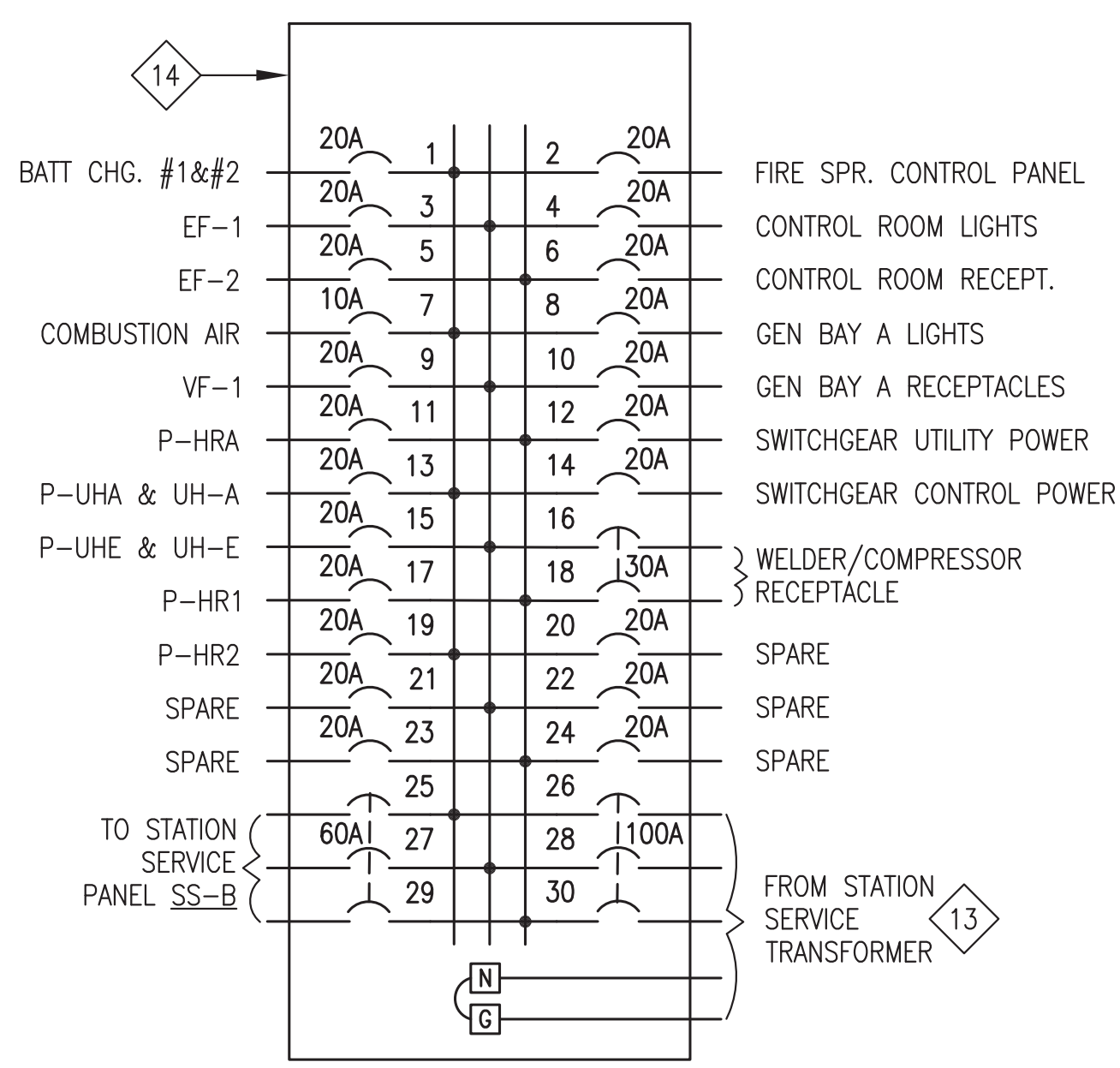
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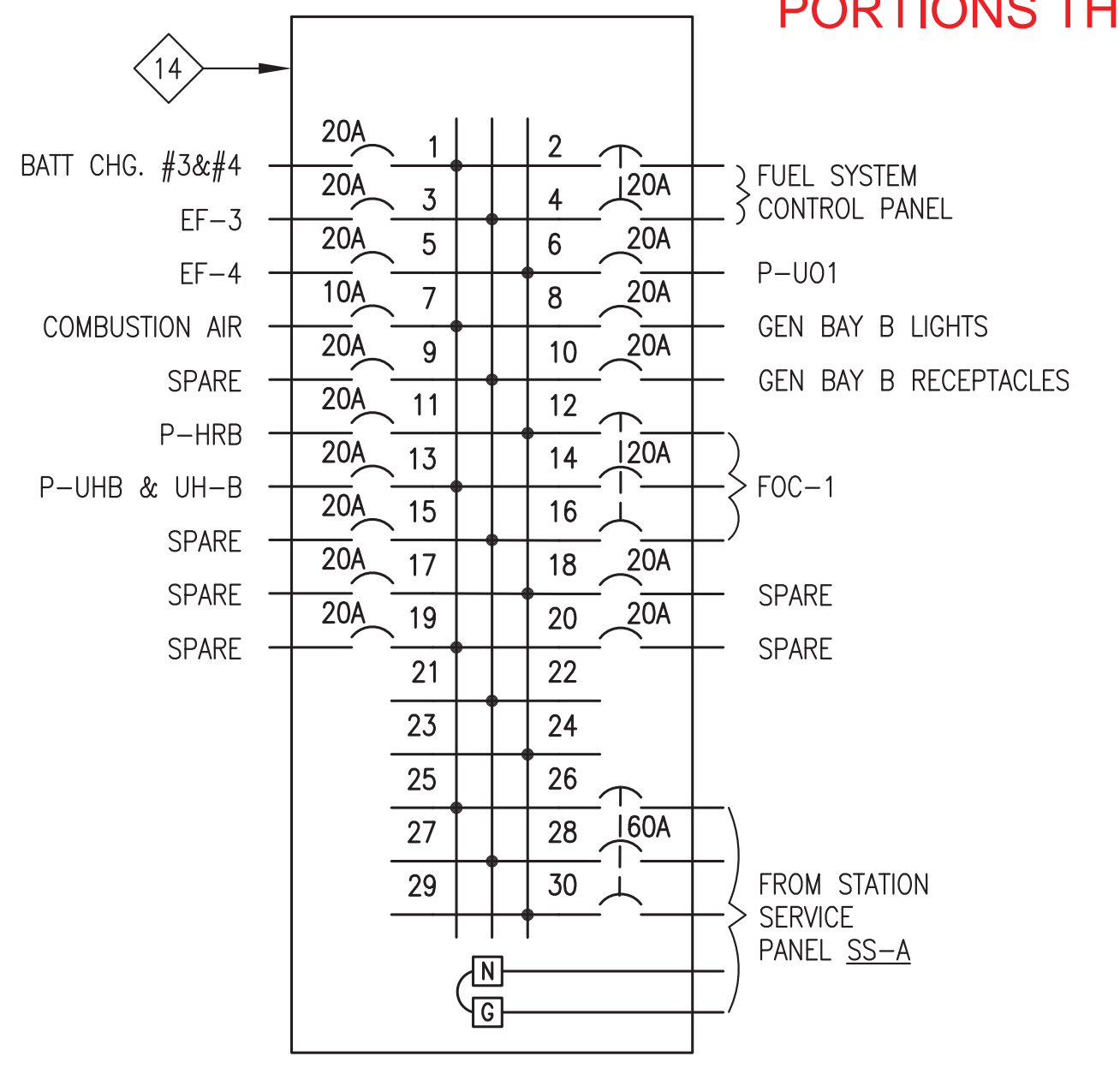
- GENERAL NOTES:**
- 1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.
 - 2) MOUNT BATTERY CHARGER TO WALL ON SHALLOW STRUT AND INSTALL BATTERIES ON FLOOR BELOW, SEE ELEVATION 1/E3.2.
 - 3) SEE SHEETS E7.1-E7.3 FOR FUEL SYSTEM CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.
 - 4) SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.

- MODULE SHOP/FIELD NOTES:**
- 1) THESE CONDUCTORS CROSS THE MODULE SHIPPING SPLIT, SEE DETAIL 1/E3.5. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM DEVICES IN GEN BAY B AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE PRIOR TO MODULE SEPARATION. IN FIELD, PULL ALL CONDUCTORS TO DEVICES AND TERMINATE.
 - 2) REMOVE EXTERIOR DEVICE, BOX, AND CONDUIT THROUGH WALL, AND PULL CONDUCTORS INSIDE FOR SHIPPING. SEE DETAIL 4/E3.5. RE-INSTALL IN FIELD.
 - 3) COOLER VFD POWER CONDUCTORS TYPE XHHW. DO NOT ROUTE IN WIREWAY. FOR SHOP TESTING PROVIDE TEMPORARY INSTALLATION. IN FIELD INSTALL IN EXTERIOR GR. SEE DETAILS 1/E3.4 AND 4/E3.4.
 - 4) THESE CONDUCTORS AND ALL EXTERIOR CONDUIT ARE TO BE FIELD INSTALLED. DURING MODULE SHOP FABRICATION PROVIDE ADEQUATE SPACE IN INTERIOR RACEWAYS TO ALLOW FIELD INSTALLATION OF CONDUCTORS TO POINT OF TERMINATION. SEE SITE PLAN SHEET E1.4 FOR CONTINUATION AND DETAIL 4/E3.5 FOR TYPICAL EXTERIOR WALL PENETRATION.

1 STATION SERVICE POWER PLAN
E4.3 3/8"=1'-0"



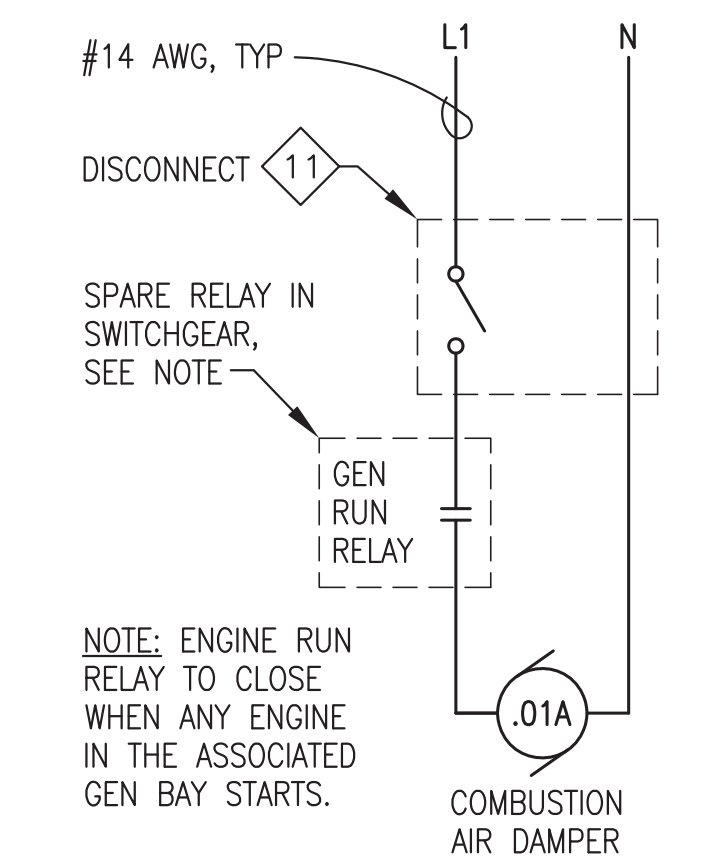
2 STATION SERVICE PANEL "SSA"
E4.3 NO SCALE



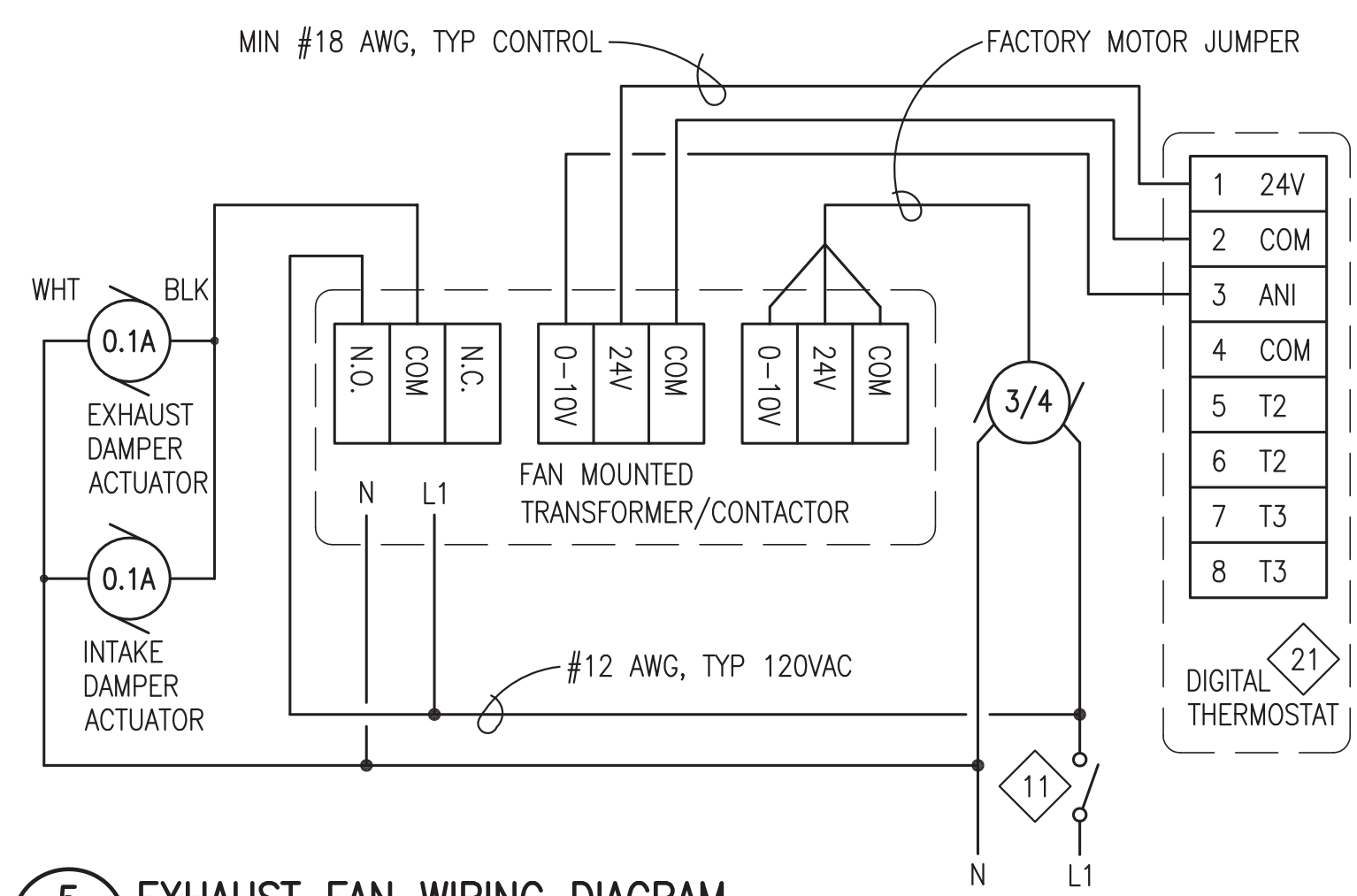
3 STATION SERVICE PANEL "SSB"
E4.3 NO SCALE

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

MAKE THE FOLLOWING SETTINGS ON DIGITAL THERMOSTAT:
APPLICATION = 0 (INTERNAL SENSOR); OUTPUT 1 = 0 (COOL/0-10V);
OUTPUT 2 = 0 (NOT USED); OUTPUT 3 = 0 (NOT USED); OUTPUT 3 ACTIVATION = 0 (100%);
NSB VALUE = 3 (6°F); OUTPUT 1 MIN = 0 (0%); MAX SETPOINT = 90°F; MIN SETPOINT = 50°F



4 TYPICAL COMBUSTION AIR DAMPER WIRING DIAGRAM
E4.3 NO SCALE



5 EXHAUST FAN WIRING DIAGRAM
E4.3 NO SCALE

REVISIONS	DATE	DESCRIPTION
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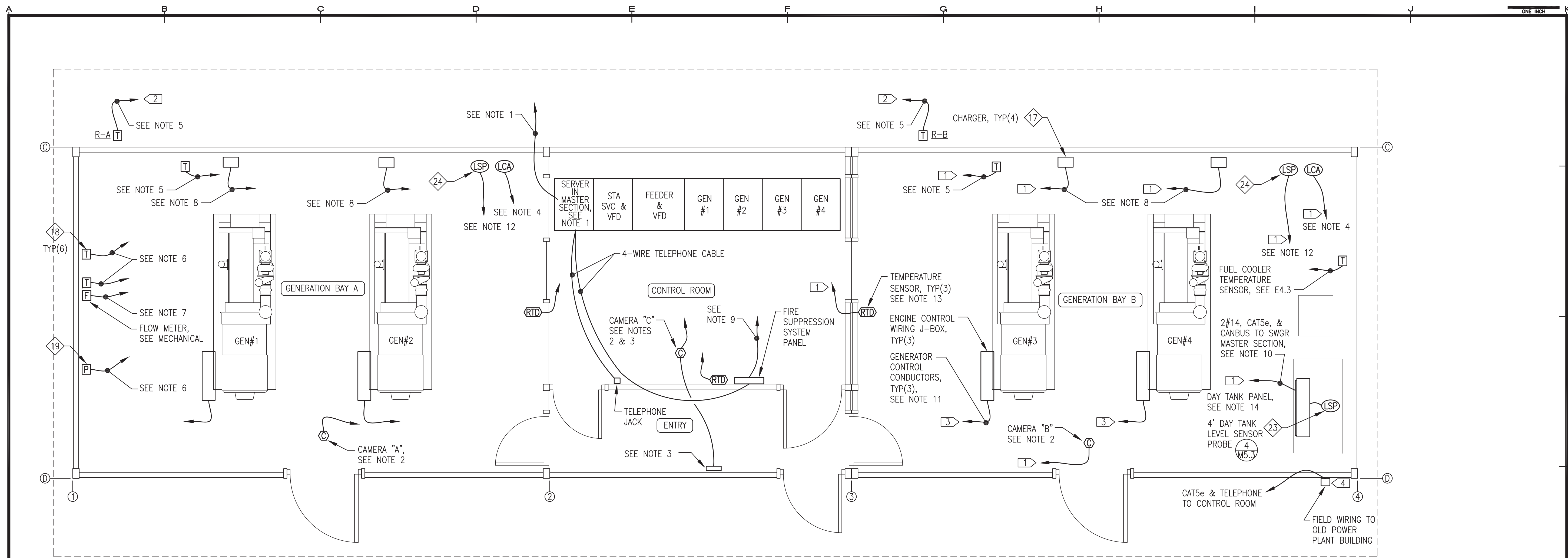
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STATION SERVICE PLAN & DETAILS	
SHEET E4.3	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
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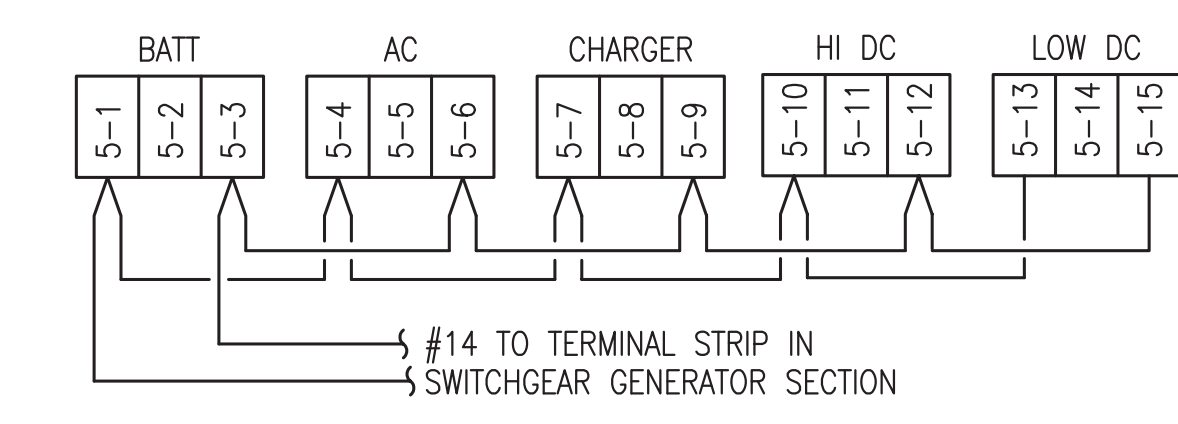
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1 CONTROL, INSTRUMENTATION & DATA PLAN
1/2"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

NOTE: PRIOR TO ENERGIZING MAKE THE FOLLOWING SETTINGS ON CHARGER:
1) AC LINE VOLTAGE SWITCH TO "115V".
2) AUTO BOOST JUMPER TO "NORM".
3) FLOAT VOLTAGE JUMPER TO "13.50/27.00" (FOR GEL CELL).
4) BATTERY RANGE JUMPER TO "24V".



2 BATTERY CHARGER ALARM WIRING DIAGRAM
NO SCALE

INTERIOR CONTROL & INSTRUMENT WIRING NOTES:

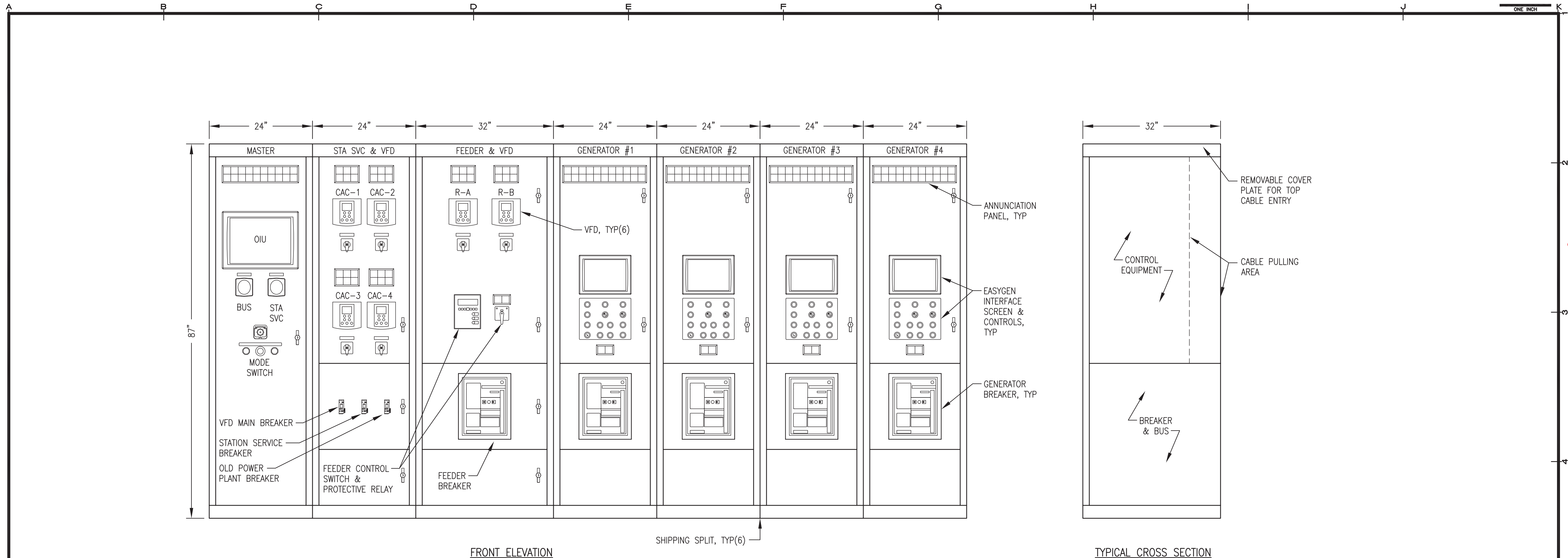
- 1) PROVIDE TELEPHONE AND HIGH SPEED INTERNET SERVICE CONNECTIONS THIS AREA. SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATIONS IN MASTER SECTION.
- 2) ROUTE ETHERNET FROM CAMERA TO ETHERNET SWITCH IN SWITCHGEAR MASTER SECTION (POWER OVER ETHERNET).
- 3) INSTALL CONTACTOR WITH TIMER RELAY FOR REMOTE LIGHTING CONTROL. OPERATE FROM DRY CONTACT ON CAMERA "C". SEE DETAIL 4/E4.1.
- 4) LOW COOLANT LEVEL ALARM SWITCH INSTALLED AT EXPANSION TANK, SEE MECHANICAL. CONNECT TO N.C. SWITCH (WHITE & RED) AND ROUTE 2#14 TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
- 5) INSTALL TEMP TRANSMITTERS WHERE SHOWN ON COOLING PIPING ISOMETRIC. INSTALL 2 OUTSIDE FOR RADIATOR VFD CONTROL. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR VFD SECTION AS INDICATED. SEE NOTE 10.
- 6) INSTALL TWO TEMP TRANSMITTERS AND ONE PRESSURE TRANSMITTER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
- 7) INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P-HR2 DISCONNECT. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
- 8) ROUTE 2#14 FROM BATTERY CHARGER ALARM CONTACTS TO ASSOCIATED SWITCHGEAR GENERATOR SECTION, SEE NOTE 10 AND WIRING DIAGRAM 2/E5.
- 9) ROUTE 2#14 TO SWITCHGEAR MASTER SECTION FOR FIRE ALARM SHUT DOWN. SEE NOTE 10.
- 10) SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.
- 11) ROUTE GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 10x10 WIREWAY WITH POWER CONDUCTORS. SEE NOTE 10.
- 12) #18 TWISTED PAIR FROM LEVEL SENSOR PROBE IN ET-A & ET-B TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
- 13) RTD TEMPERATURE SENSOR PROVIDED WITH SWITCHGEAR. ROUTE #18 SHIELDED TRIAD TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
- 14) SEE SHEETS E7.1-E7.3 FOR FUEL SYSTEM CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.

MODULE SHOP/FIELD NOTES:

- 1) THESE CONDUCTORS CROSS THE MODULE SHIPPING SPLIT, SEE DETAIL 6/E3.5. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM TERMINALS IN GEN BAY B AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE PRIOR TO MODULE SEPARATION. IN FIELD, RE-TERMINATE ALL CONDUCTORS.
- 2) RADIATOR SENSOR CONDUCTORS. DO NOT ROUTE IN WIREWAY. FOR SHOP TESTING PROVIDE TEMPORARY INSTALLATION. IN FIELD INSTALL IN EXTERIOR GRC. SEE DETAILS 1/E3.4 AND 4/E3.4.
- 3) GENERATOR CONTROL CONDUCTORS CROSS THE MODULE SHIPPING SPLIT. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM TERMINATIONS AT GENERATORS AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE CONDUCTORS THEN REMOVE 12" SECTION OF WIREWAY FOR MODULE SEPARATION. IN FIELD, REINSTALL WIREWAY THROUGH WALL THEN PULL ALL CONDUCTORS TO GENERATORS AND TERMINATE.
- 4) THESE CONDUCTORS AND EXTERIOR CONDUIT ARE TO BE FIELD INSTALLED. DURING MODULE SHOP FABRICATION PROVIDE ADEQUATE SPACE IN INTERIOR RACEWAYS TO ALLOW FIELD INSTALLATION OF CONDUCTORS TO POINT OF TERMINATION. SEE SITE PLAN SHEET E1.4 FOR CONTINUATION AND DETAIL 4/E3.5 FOR TYPICAL EXTERIOR WALL PENETRATION

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KAKE, ALASKA

SHEET TITLE	
CONTROL, INSTRUMENTATION, & DATA PLAN & DETAILS	
SHEET	
E5	
DRAWN BY: WJP	CHECKED BY: BCG
DATE: JUNE 16	SCALE: AS SHOWN
JOB NUMBER:	



1 SWITCHGEAR ENCLOSURE LAYOUT
E6.1 NO SCALE

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

REVISIONS MARK	DATE	DESCRIPTION	REVISED NOTES
1	6-1-16		
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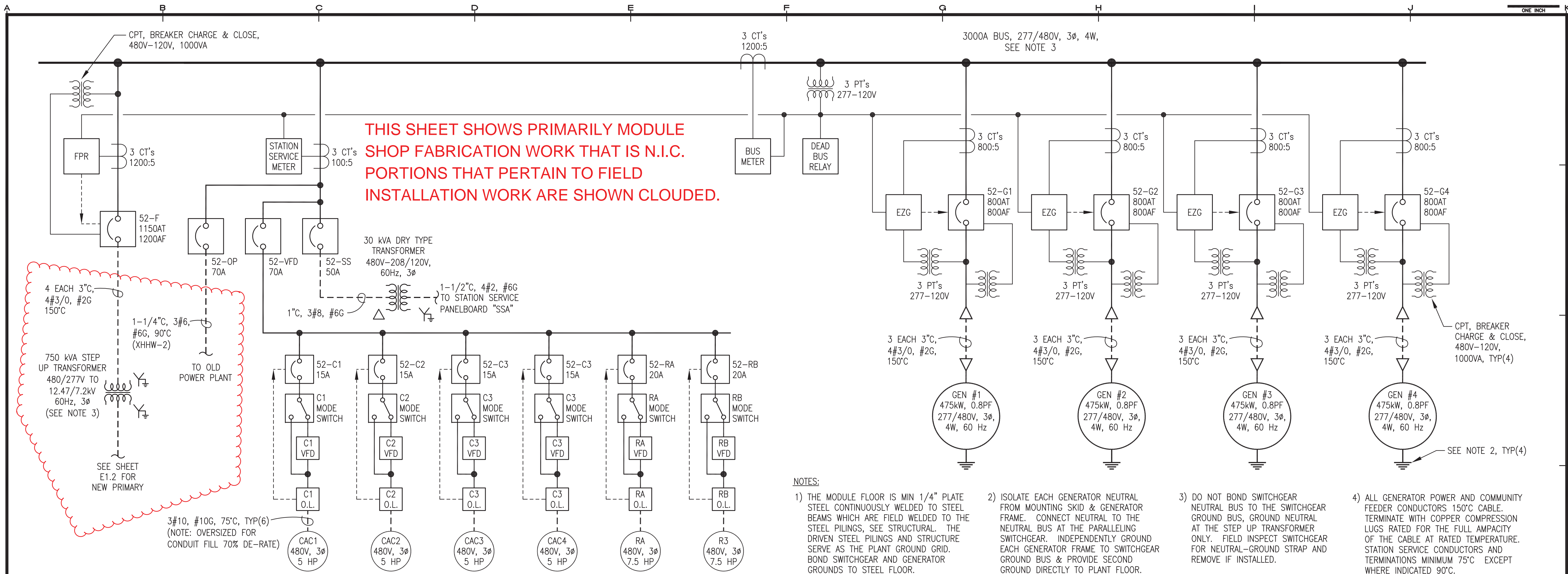
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SHEET TITLE SWITCHGEAR ENCLOSURE LAYOUT	
SHEET E6.1	
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DATE JUNE 16	SCALE AS SHOWN
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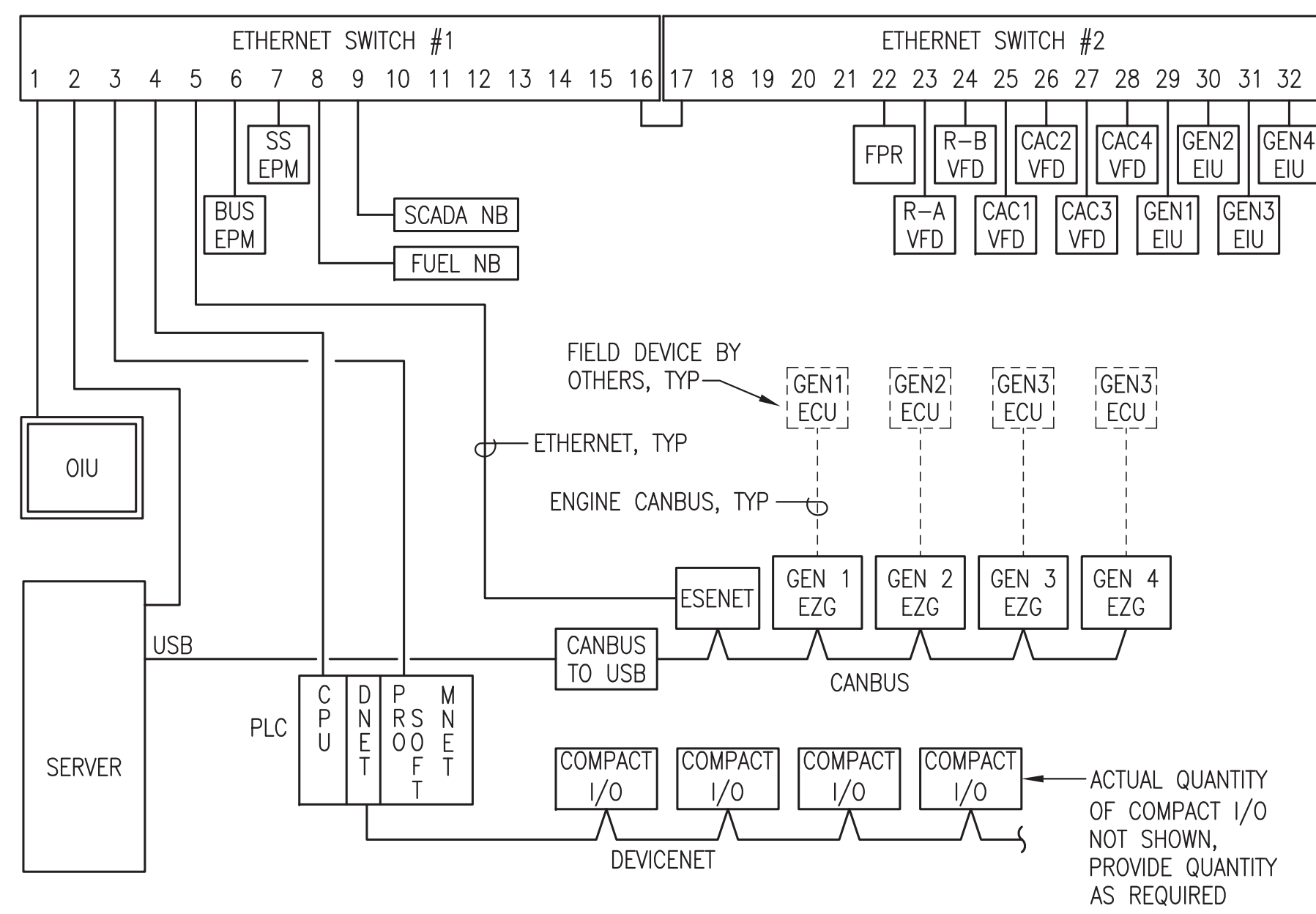
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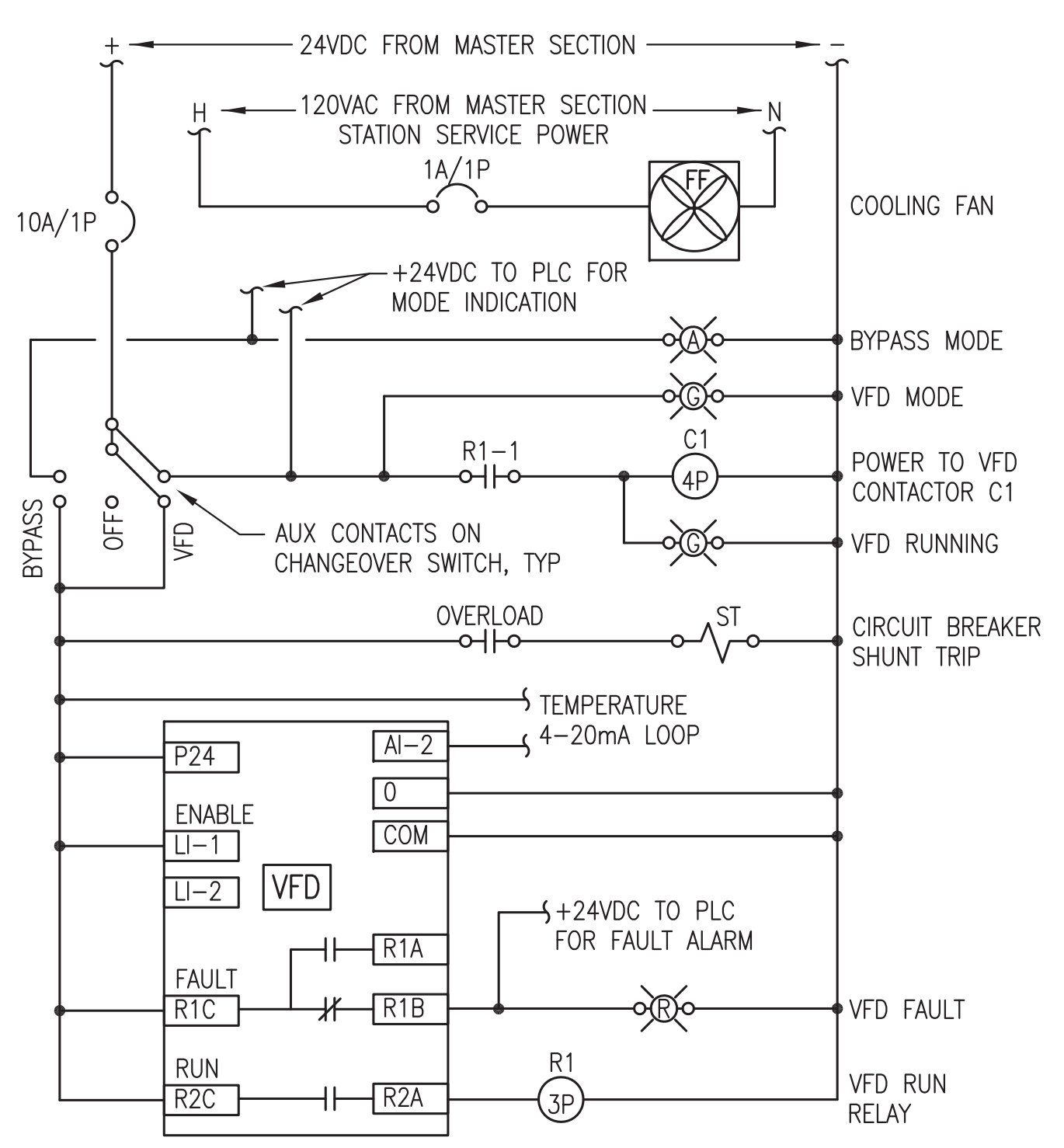


1 SWITCHGEAR ONE-LINE DIAGRAM
 E6.2 NO SCALE

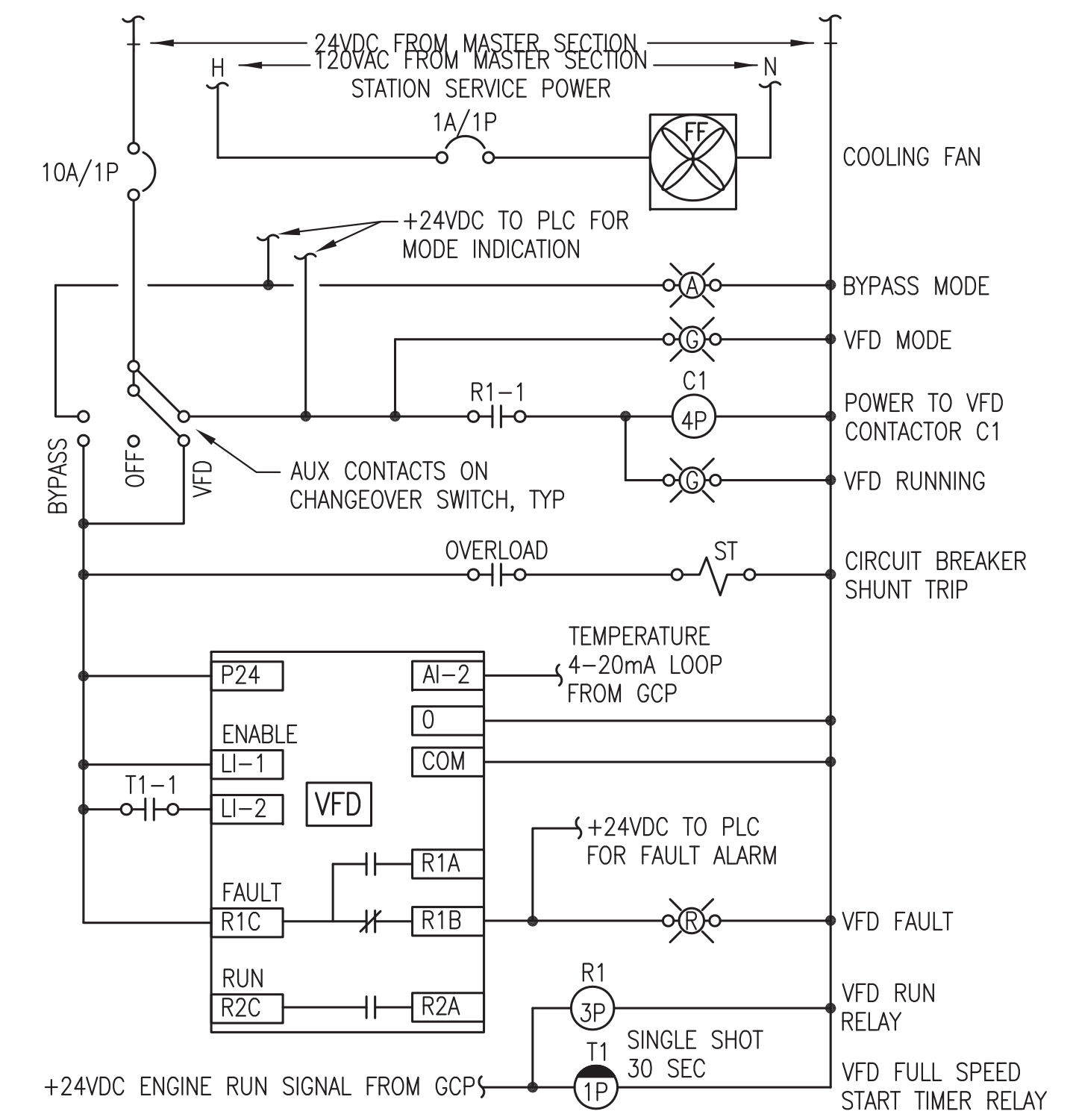
- NOTES: 1) 120VAC POWER FOR SERVER, OIU, AND ETHERNET SWITCH FROM UPS.
 2) 4-20mA FIELD DEVICE WILL BE PROVIDED BY OTHERS FOR TEMPERATURE INPUT TO EACH VFD.



2 COMMUNICATION SCHEMATIC
 E6.2 NO SCALE



3 TYPICAL RADIATOR VFD LOGIC DIAGRAM
 E6.2 NO SCALE



4 TYPICAL CHARGE AIR COOLER VFD LOGIC DIAGRAM
 E6.2 NO SCALE

SWITCHGEAR SYMBOL LEGEND

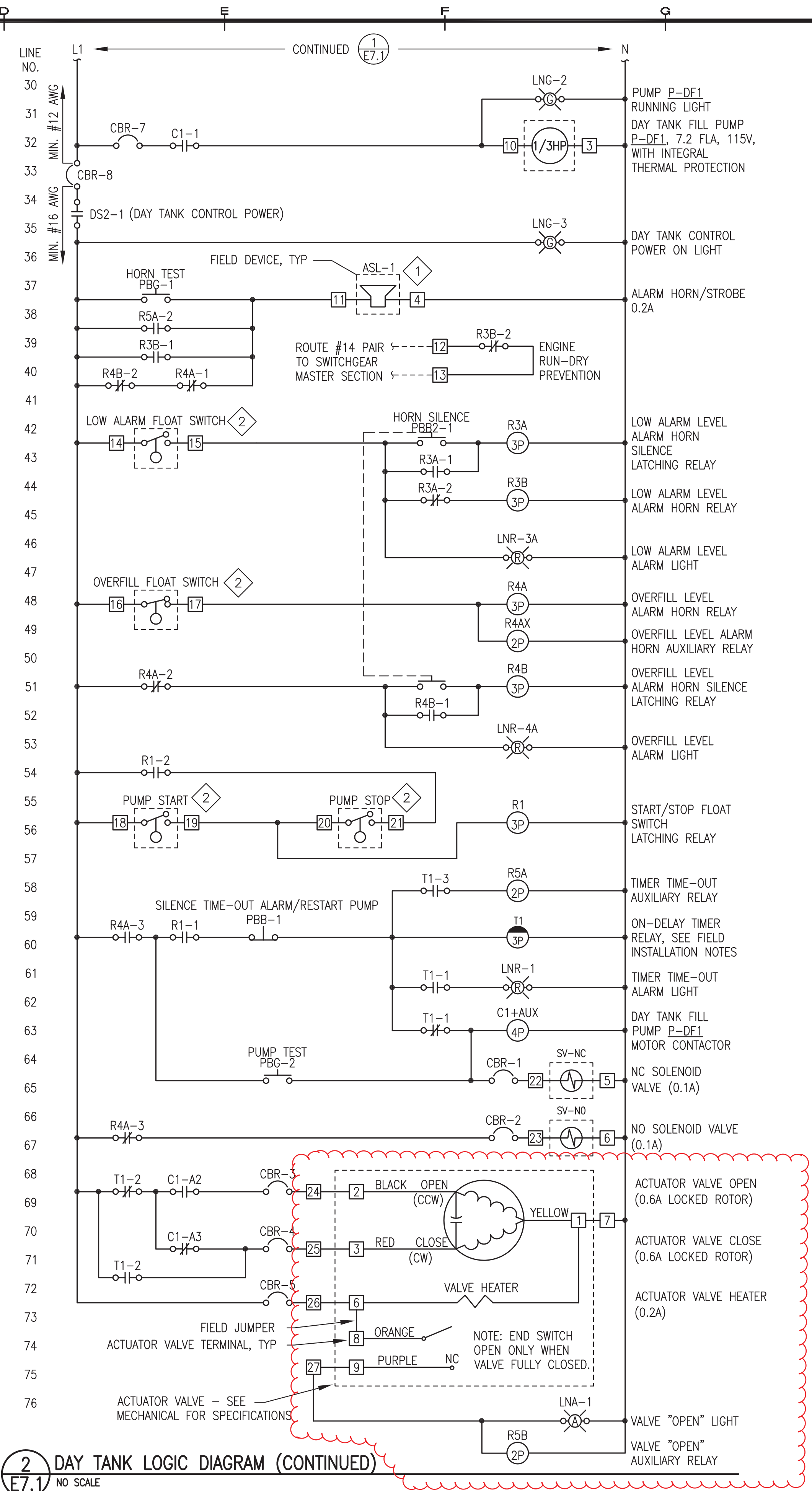
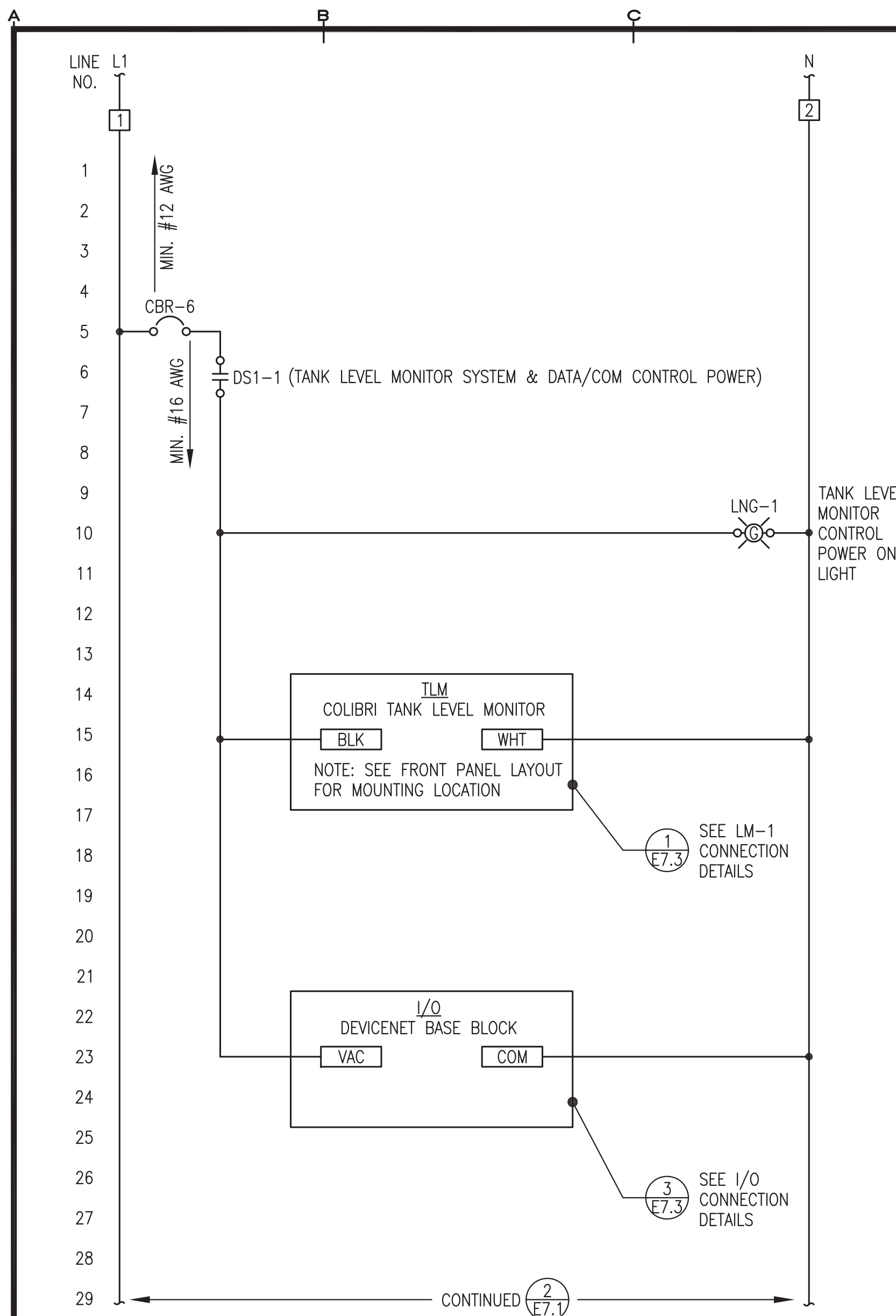
	TRANSFORMER
	PT=POTENTIAL XFMR
	CPT=CONTROL POWER XFMR
	CURRENT TRANSFORMER
	M.R. - INDICATES MULTIRATIO
	CT'S RATING FACTOR RF=2.0
	CIRCUIT BREAKER
	AT=AMP TRIP RATING
	AF=AMP FRAME RATING
	WOODWARD EASYGEN GENSET CONTROLLER
	FEEDER PROTECTION RELAY
	SHOP INSTALLED POWER WIRING/BUS
	FIELD INSTALLED POWER WIRING
	SHOP INSTALLED CONTROL WIRING

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SHEET TITLE: SWITCHGEAR ONE-LINE & SCHEMATICS

SHEET: **E6.2**

DRAWN BY: JTD CHECKED BY: CWV/BCG
 DATE: JUNE 16 AS SHOWN SCALE:
 JOB NUMBER:



BILL OF MATERIALS (NOTE: PROVIDE MATERIALS AS SPECIFIED - NO SUBSTITUTIONS ALLOWED)

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
AUX	1	ALLEN-BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
C	1	ALLEN-BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2,3,4,5	5	ALLEN-BRADLEY	1489-A1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR-6,8	2	ALLEN-BRADLEY	1489-A1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-7	1	ALLEN-BRADLEY	1489-A1-C150	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	2	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
LNG	2	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNR	3	ALLEN-BRADLEY	800HQRH2G	GREEN LED PILOT LIGHT, 12-130V, NEMA 4X
LNA	1	ALLEN-BRADLEY	800HQRH2A	RED LED PILOT LIGHT, 12-130V, NEMA 4X
I/O	1	ALLEN-BRADLEY	1790D-T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
PBB	1	ALLEN-BRADLEY	800HAR2D2	MOMENTARY PUSH BUTTON, 1 NC, NEMA 4X, BLACK
PBB2	1	ALLEN-BRADLEY	800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	2	ALLEN-BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP	1	PHOENIX CONTACTS	FLPPRJ45/RJ45	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R (3P)	5	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	5	ALLEN-BRADLEY	700HN101	11 PIN SOCKET BASE
R (2P)	3	ALLEN-BRADLEY	700HA32A1	DPDT RELAY
	3	ALLEN-BRADLEY	700HN100	8 PIN SOCKET BASE
T	1	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	1	ALLEN-BRADLEY	700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	1	ALLEN-BRADLEY	700HT3	SERIES B TIMING MODULE
TB-1/2	37	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS
*TLM	*1	* OWNER FURNISHED COMPONENT TO BE INSTALLED BY PANEL FABRICATOR IN PANEL FACE AND CONNECTED AS INDICATED		* FRANKLIN/INCON COLIBRI CL6D TANK LEVEL MONITOR CONSOLE, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS FOR UP TO SIX TANKS WITH TEMPERATURE COMPENSATION

LEGEND

R#	CONTROL RELAY	R#-#	NORMALLY OPEN CONTACT	SW-#	NORMALLY OPEN FLOAT SWITCH
T#	TIME DELAY RELAY	SS-#	2-POSITION SELECTOR SWITCH	SW-#	NORMALLY CLOSED FLOAT SWITCH
C#	CONTACTOR	R#-#	NORMALLY CLOSED CONTACT	SV#	SOLENOID VALVE
#	TERMINAL BLOCK	O.L.	OVERLOADS	ASL-#	ALARM & STROBE LIGHT
CB-#	CIRCUIT BREAKER	PB-#	NORMALLY OPEN MOMENTARY PUSH BUTTON		
—	PANEL WIRING	PB-#	NORMALLY CLOSED MOMENTARY PUSH BUTTON		
		---	FIELD WIRING		

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C. PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

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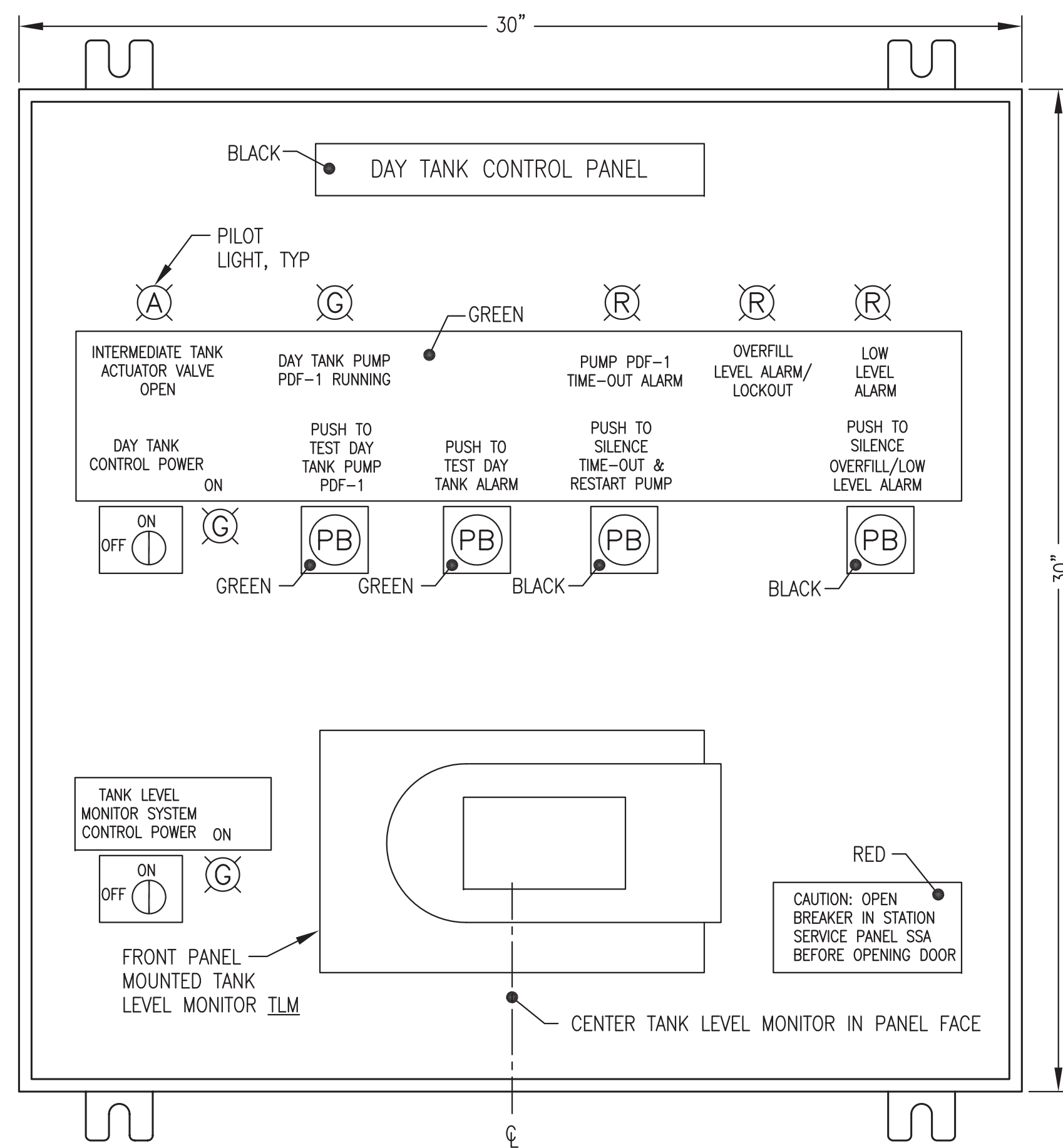
SHEET TITLE
DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

SHEET
E7.1

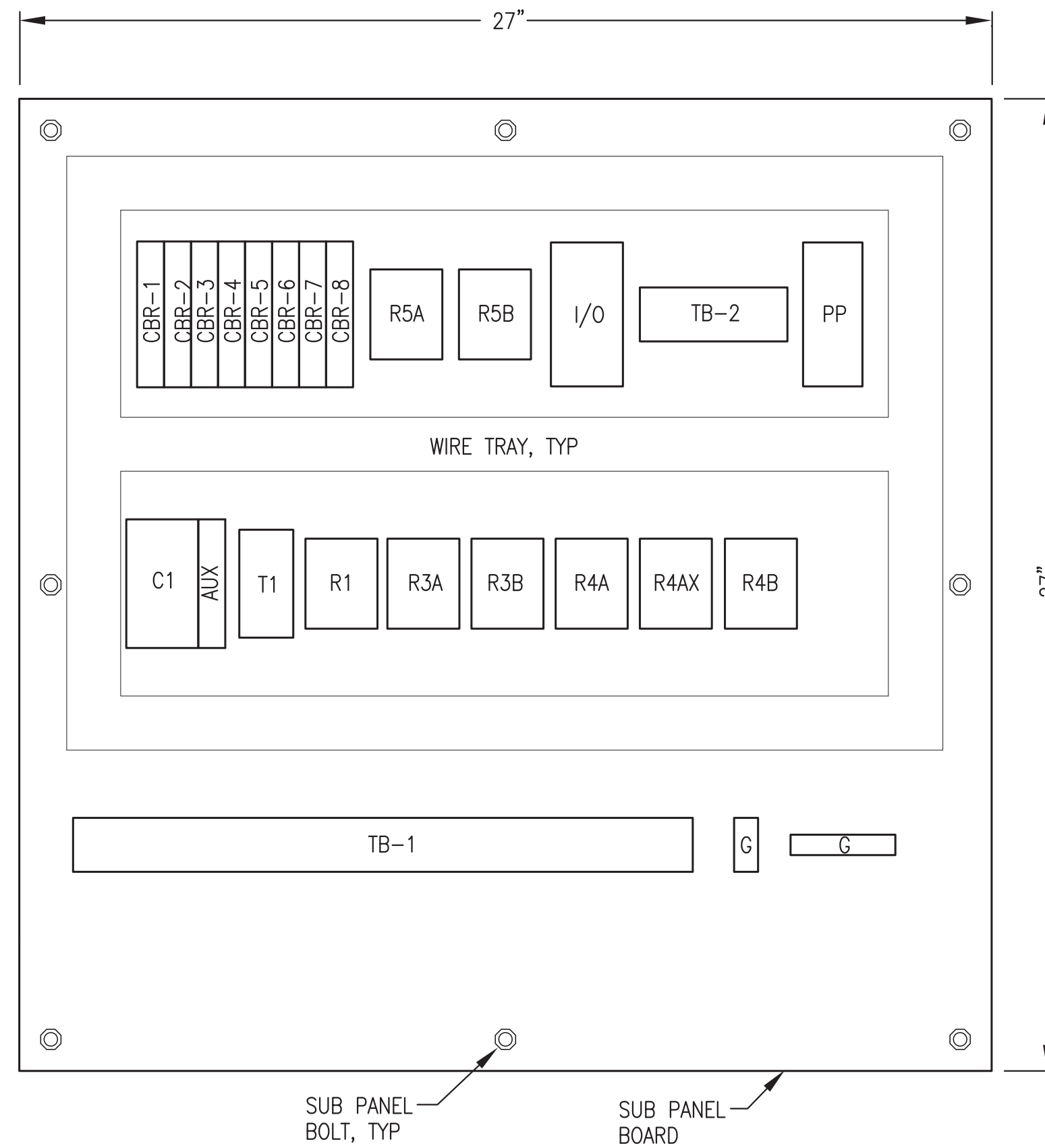
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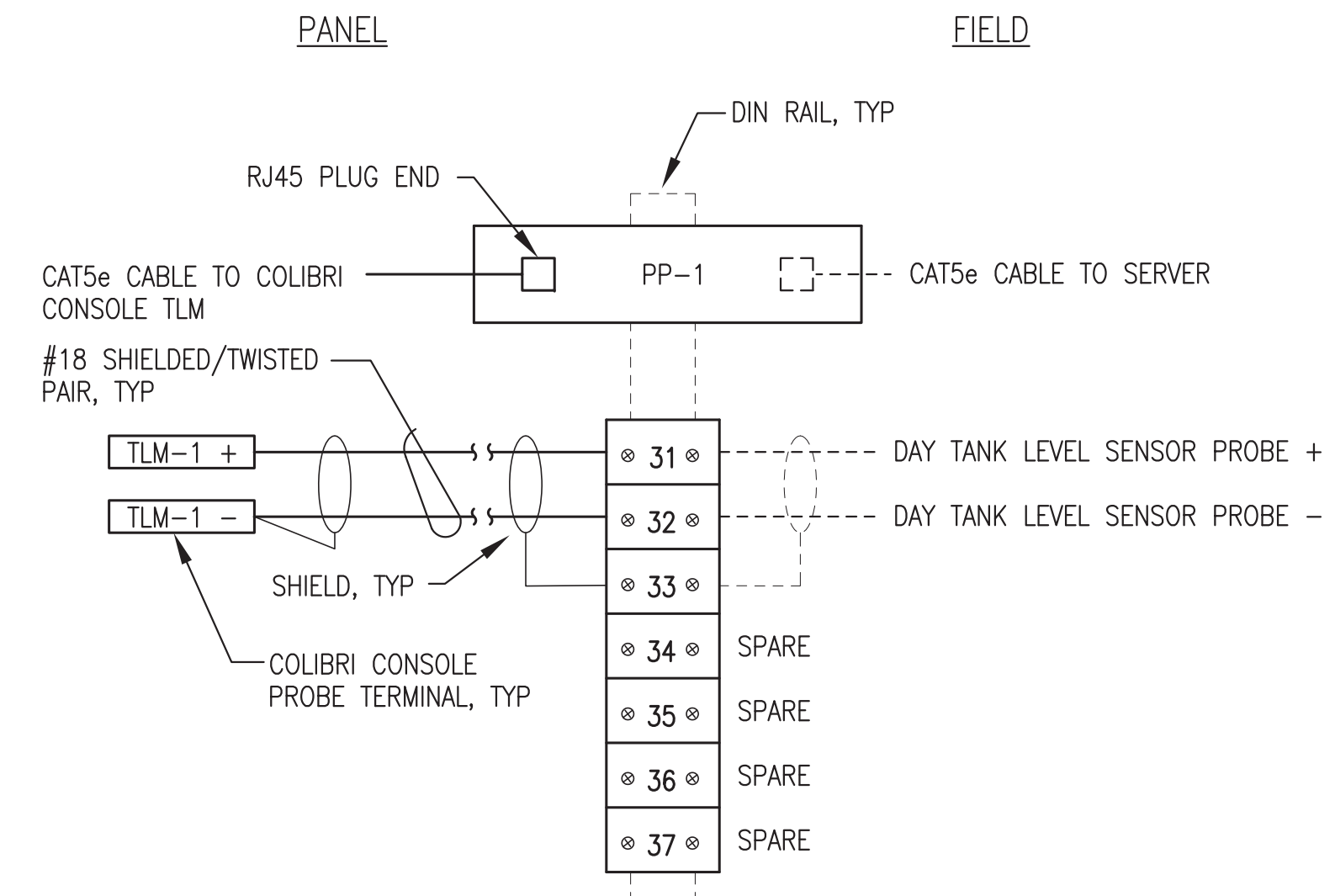
JOB NUMBER:



1 FRONT PANEL LAYOUT
E7.2 NO SCALE



2 SUB PANEL LAYOUT
E7.2 NO SCALE

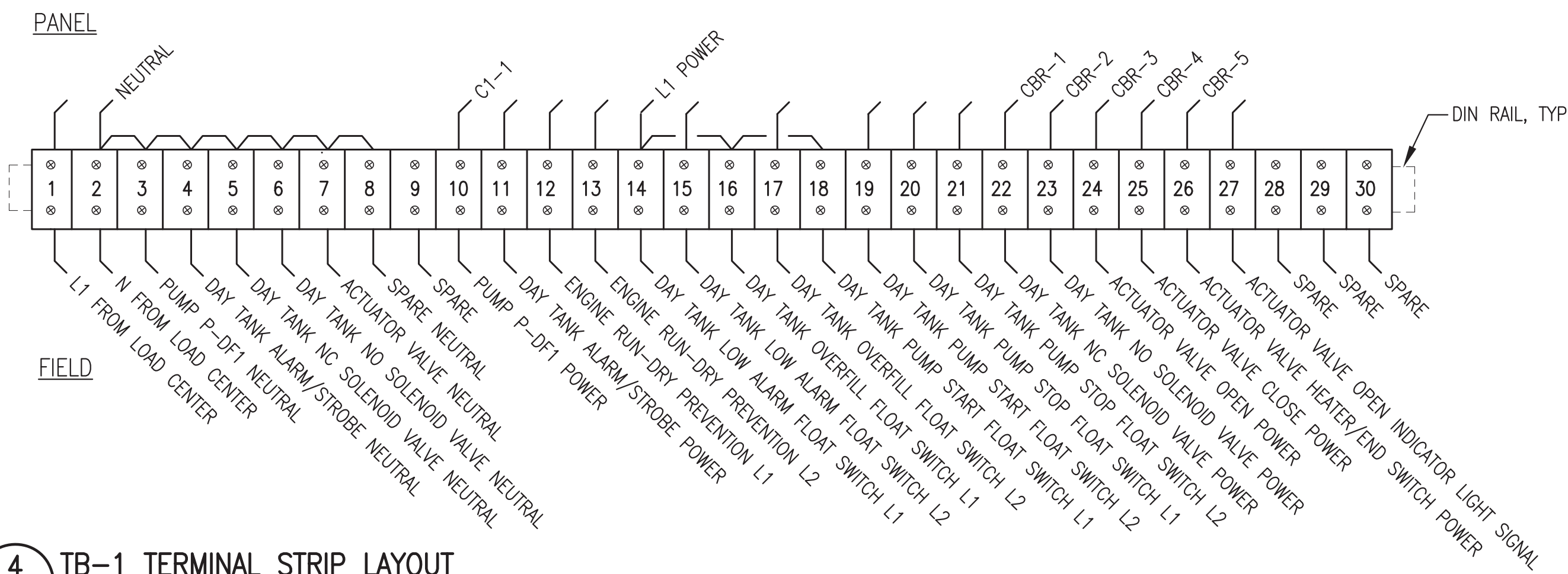


NOTES:

- INSTALL TERMINAL STRIP TB-2 AND ETHERNET PATCH PANEL PP-1 ON VERTICAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP IN THE UPPER RIGHT CORNER OF PANEL TO ACCOMMODATE CONDUCTOR ENTRY THROUGH RIGHT SIDE OF PANEL, SEE SUB-PANEL LAYOUT.

3 TB-2 TERMINAL STRIP AND PP-1 ETHERNET PATCH PANEL LAYOUT
E7.2 NO SCALE

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.



NOTES:

- INSTALL TERMINAL STRIP TB-1 ON HORIZONTAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL, SEE SUB-PANEL LAYOUT.
- IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

4 TB-1 TERMINAL STRIP LAYOUT
E7.2 NO SCALE

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SHEET TITLE
DAY TANK CONTROL PANEL LAYOUT, INSTALLATION & TERMINAL STRIP

SHEET
E7.2

DRAWN BY: JTD CHECKED BY: CWV/BCG
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PANEL NOTES:

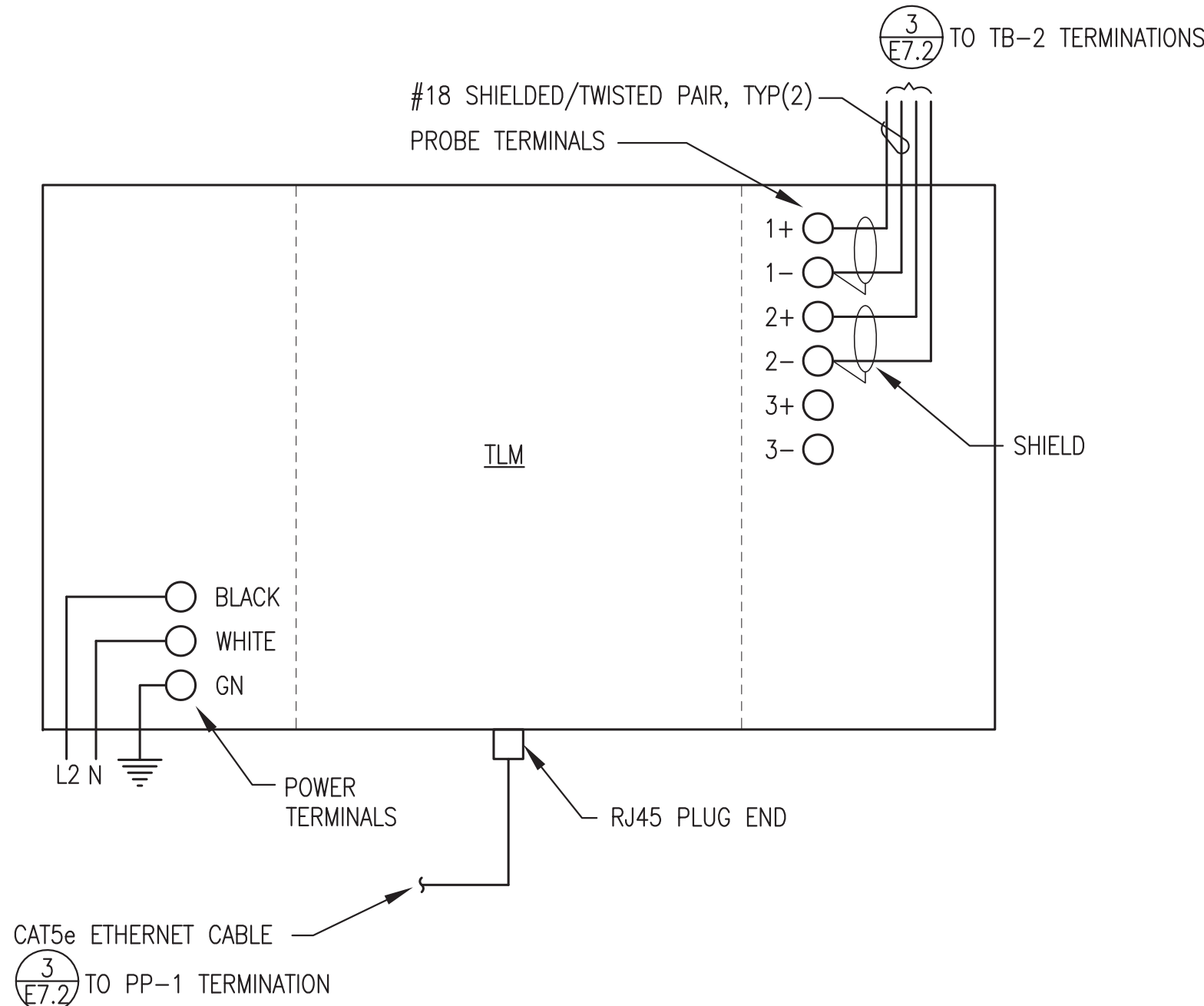
- 1) PROVIDE COMPLETE UL LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. FIELD DEVICES ARE INDICATED WITH DASHED OUTLINE. INSTALL IN A 30" TALL x 30" WIDE x 8" DEEP NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7 FOR PANEL LAYOUT DETAILS.
- 2) USE MIN #12 WIRE FOR ALL CIRCUITS UP TO FIRST IN-LINE PANEL BREAKERS (FOR 20A FEED). USE MIN #16 AWG ON ALL 5 AMP CIRCUITS AND MIN #14 AWG WIRE ON ALL 15A CIRCUITS. FOR ALL JUMPERS THAT RUN CONTINUOUSLY (ONE-PIECE WIRE) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG EACH END WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS). FOR ALL JUMPERS THAT RUN DISCONTINUOUSLY (MULTIPLE WIRES) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG WITH A COMMON JUMPER NUMBER. TAG ALL NEUTRALS WITH A COMMON JUMPER NUMBER. PROVIDE AN AS-BUILT LOGIC WIRING DIAGRAM THAT INCLUDES ALL ASSIGNED JUMPER TAGS.
- 3) LABEL ALL PANEL DEVICES ON BASE OR BACK PANEL ADJACENT TO ITEM. LABEL REMOTE EQUIPMENT CONNECTIONS AT EACH TERMINAL BLOCK BY THE ITEM TITLE AS SHOWN ON THE FIELD SIDE OF THE TERMINAL STRIP DRAWING. PROVIDE BEVELED EDGE WHITE CORE NAMEPLATES AS SHOWN ON THE PANEL FACE LAYOUT AND SECURE TO PANEL FACE WITH A MINIMUM OF TWO STAINLESS STEEL MOUNTING SCREWS, COLOR AS INDICATED.
- 4) BENCH TEST COMPLETED UNIT. PROVIDE MIN 48 HOURS NOTICE TO ENGINEER TO SCHEDULE OBSERVATION OF BENCH TEST. PROVIDE SWITCHES AND LAMPS TO SIMULATE OPERATION OF ALL FIELD DEVICES.
- 5) FIELD WIRING AND FIELD INSTALLED DEVICES PROVIDED BY OTHERS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT PART OF THE PANEL BID.
- 6) POWER TO PANEL PROVIDED FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

FIELD INSTALLATION NOTES:

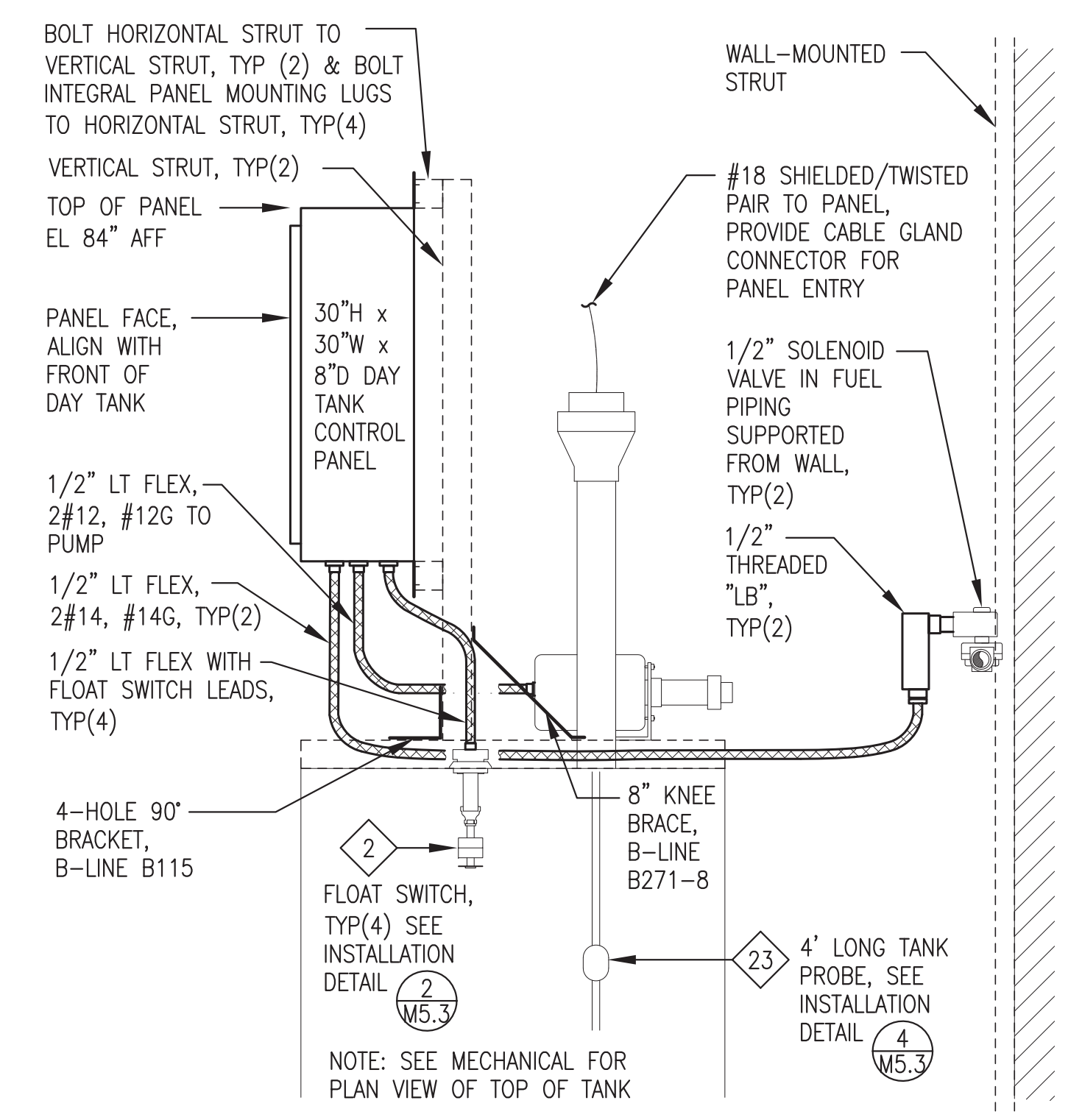
- 1) SEE MECHANICAL FOR DAY TANK INSTALLATION & PIPING. INSTALL CONTROL PANEL & FIELD DEVICES AS INDICATED TO PROVIDE REDUNDANT HIGH & LOW LIMIT CONTROLS & OVERFILL PROTECTION.
- 2) FIELD WIRING TO FLOAT SWITCHES, SOLENOID VALVES, ACTUATOR VALVE, & ALARM HORN #14 AWG. ALL OTHER FIELD WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS. WHEN NOT IN CONDUIT, MAKE JACKETED COM CABLE ENCLOSURE ENTRIES WITH CABLE GLAND CONNECTORS.
- 3) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS ON SHEET E2. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER.
- 4) VERIFY THAT ALL FLOAT SWITCHES ARE ORIENTED FOR N.C. (OPEN ON RISE) OPERATION PRIOR TO INSTALLATION. ALL FLOATS SHOWN ON LOGIC DIAGRAM WITH TANK AT FULL (PUMP STOP) LEVEL.
- 5) FILL PUMP CAVITY WITH LUBE OIL PRIOR TO INITIAL OPERATION. VERIFY PROPER ROTATION OF PUMP. PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO OPERATING DAY TANK PUMP.
- 6) FIELD TEST COMPLETED UNIT TO VERIFY ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOAT SWITCHES BY REACHING IN THROUGH ADJACENT 4" BUNG. TEMPORARILY SET TIMING RELAY TO 30 SECONDS TO VERIFY TIME-OUT AND RESET FUNCTIONS.
- 7) SET TIMING RELAY TIME DELAY TO 45 MINUTES (APPROX. 125 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 4 GPM). ON THE INITIAL TANK FILL, THE PUMP TEST/RESET BUTTON MAY HAVE TO BE MANUALLY RESET IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE "SEQUENCE OF OPERATIONS".

DAY TANK FILL SEQUENCE OF OPERATIONS:

- 1) WHEN THE DAY TANK CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED, THE POWER LIGHT IS ON AND POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE HEATER/"OPEN" LIGHT CIRCUIT.
- 2) WHEN THE DAY TANK IS NOT CALLING FOR FUEL, POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE CLOSE CIRCUIT. WHEN THE ACTUATOR IS IN THE FULLY CLOSED POSITION, THE CLOSING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #2 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT IS OFF.
- 3) NORMAL FILL OPERATION - WHEN THE FUEL LEVEL DROPS TO THE "PUMP START" SWITCH, THE TIMER IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, THE DAY TANK PUMP IS ENERGIZED, AND THE PUMP "ON" LIGHT TURNS ON. WHEN THE ACTUATOR IS IN THE FULLY OPEN POSITION, THE OPENING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #7 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT REMAINS ON. WHEN FUEL REACHES THE "PUMP STOP" FLOAT SWITCH BEFORE THE TIMER TIMES-OUT, THE TIMER IS RESET, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, AND THE PUMP "ON" LIGHT TURNS OFF.
- 4) TIMER OPERATION - IF THE TIMER TIMES-OUT THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "TIME-OUT" ALARM LIGHT TURNS ON, AND THE TIME-OUT ALARM HORN SOUNDS. PRESSING THE "TIME-OUT ALARM SILENCE / PUMP RESTART" BUTTON RESETS THE TIMER, SILENCES THE ALARM HORN, AND STARTS THE NORMAL FILL OPERATION. SEE FIELD INSTALLATION NOTES FOR TIMER SETTING.
- 5) OVERFILL FUEL LEVEL - IF THE TANK OVERFILLS AND THE FUEL LEVEL REACHES THE "OVERFILL" FLOAT SWITCH, THE N.O. DAY TANK SOLENOID VALVE CLOSES, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. PRESSING THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "OVERFILL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL FALLS BELOW THE "OVERFILL" FLOAT SWITCH, THE "OVERFILL LEVEL" ALARM LIGHT TURNS OFF, THE N.O. DAY TANK SOLENOID VALVE OPENS AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED). WHEN THE FUEL LEVEL REACHES THE "PUMP START" FLOAT SWITCH, THE NORMAL FILL OPERATION IS REPEATED.
- 6) LOW FUEL LEVEL - IF THE FUEL LEVEL FALLS BELOW THE "LOW ALARM" FLOAT SWITCH, THE "LOW FUEL LEVEL" ALARM LIGHT TURNS ON, THE ENGINE RUN-DRY PREVENTION DRY CONTACT OPENS, AND THE ALARM HORN SOUNDS. THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "LOW FUEL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL RISES ABOVE THE "LOW ALARM" FLOAT SWITCH THE "LOW FUEL LEVEL" ALARM LIGHT TURNS OFF, THE ENGINE RUN-DRY PREVENTION DRY CONTACT CLOSES, AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED).
- 7) PUMP & HORN TEST - MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST FUNCTION OF THE DAY TANK PUMP AND ALARM HORN. PRESSING THE "PUSH TO TEST DAY TANK PUMP" BUTTON STARTS THE TIMER, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE & ACTUATED BALL VALVE, ENERGIZES THE DAY TANK PUMP, AND TURNS ON THE DAY TANK PUMP "RUNNING" LIGHT. THE "PUSH TO TEST DAY TANK PUMP" BUTTON IS LOCKED OUT IF THE DAY TANK IS AT THE OVERFILL LEVEL. PRESSING THE "PUSH TO TEST DAY TANK ALARM" BUTTON MOMENTARILY ENERGIZES THE ALARM HORN/STROBE.

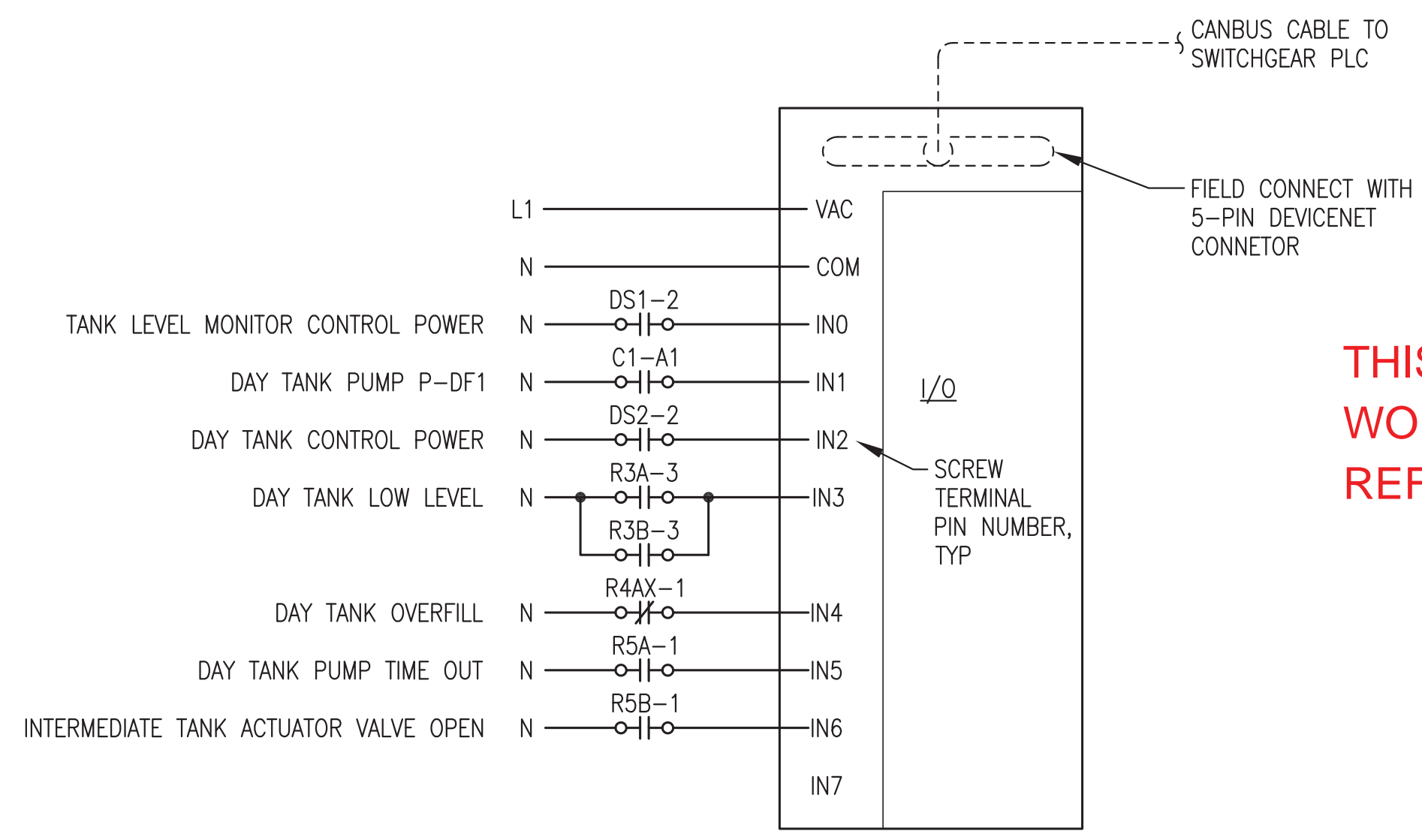


1 TANK LEVEL MONITOR (TLM) CONSOLE CONNECTION DETAILS
E7.3 NO SCALE



NOTE: THIS DETAIL IS FOR FIELD INSTALLATION ONLY AND IS NOT PART OF THE PANEL BID.

2 DAY TANK CONTROL PANEL & DEVICE INSTALLATION
E7.3 NO SCALE



3 DEVICENET TERMINAL BLOCKS (I/O) LOGIC & CONNECTION DETAILS
E7.3 NO SCALE

THIS SHEET SHOWS MODULE SHOP FABRICATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

REVISIONS MARK	DATE	DESCRIPTION NOTES
1	6-1-16	
2		
3		
4		
5		

95% SUBMITTAL NOT FOR CONSTRUCTION

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KAKE RPSU PROJECT
KAKE, ALASKA

DAY TANK CONTROL PANEL SEQUENCE & INTERCONNECTION DETAILS

SHEET **E7.3**

DRAWN BY: JTD
CHECKED BY: CWV/BCG
DATE: JUNE 16
SCALE: AS SHOWN
JOB NUMBER: