

H:\Jobs\16-035 Mertarvik BFU & RPSU Upgrades (AEA term)\CAD\Drawing\Plan B Design\Power Plant Module Construction\16-035_00_G101_Plan-B-COVER SHEET, 1=1, 02-12-18 at 13:31 By jkk
 LAYOUT: G1.01 - COVER SHEET
 VIEW: G101_H_PDF
 XREF: 16035-00_B03-BK

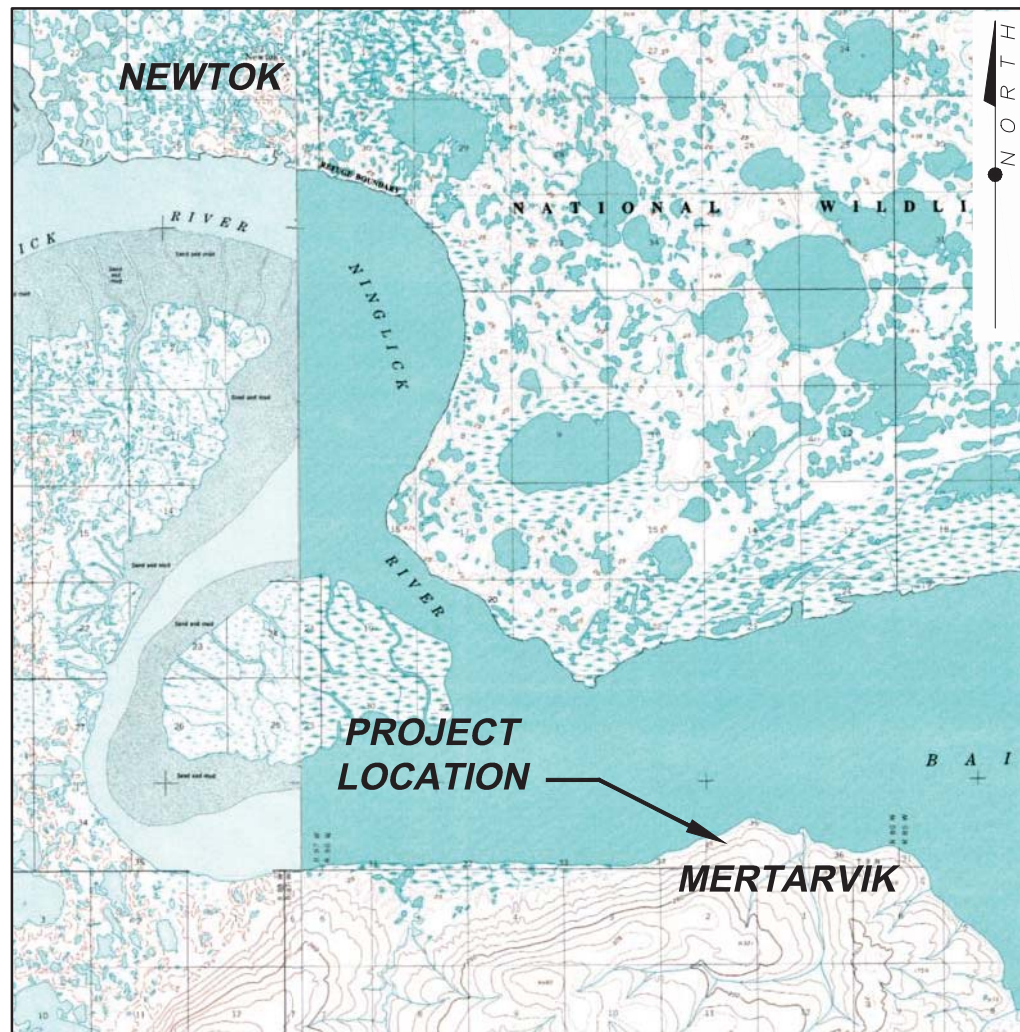
MERTARVIK PHASE I POWER SYSTEM POWER PLANT MODULE

MERTARVIK, ALASKA

FEBRUARY 2018



LOCATION MAP



VICINITY MAP

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- A1.02 CONNEX FLOORING PLAN
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- A3.01 CONNEX SECTIONS
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- M6.1 EXHAUST & CRANK VENT PLAN & DETAILS
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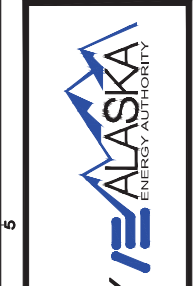
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REVISIONS	DATE	DESCRIPTION



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MERTARVIK PHASE I POWER SYSTEM
 POWER PLANT MODULE
ALASKA ENERGY AUTHORITY
 MERTARVIK, ALASKA

SHEET TITLE	
COVER SHEET, VICINITY MAP, AND SHEET INDEX	
SHEET	
G1.01	
DRAWN BY:	CHECKED BY:
EJ	DC
DATE:	SCALE:
02/12/18	NONE
JOB NUMBER:	
16-035	

H:\jobs\16-035 Mertarvik BFU & RPSU Upgrades (AEA term)\CAD\Drawing\Plan B Design\Power Plant Module Construction\16-035_00_G102_GENERAL NOTES, 1=1, 02-12-18 at 11:13 by jkk
 LAYOUT: G1.02
 VIEW: G103_HL_PDF, G103_HL_PDF, G103_HL_PDF
 XREF: 16035-00_B03-BK

GENERAL NOTES:

1. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE PLANS AND THE BIDDING AND CONTRACT DOCUMENTS TITLED "MERTARVIK PHASE I POWER SYSTEM", DATED FEBRUARY 2018.
2. VERIFY CONDITIONS, DIMENSIONS, AND DETAILS PRIOR TO THE START OF CONSTRUCTION. IF ANY DISCREPANCIES AND/OR UNKNOWN CONDITIONS WHICH AFFECT THE PROJECT ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE MINOR LAYOUT CHANGES, SUBJECT TO APPROVAL BY THE ENGINEER.
3. COMPLY WITH THE REQUIREMENTS OF ASME B31.4, THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL FIRE CODE (IFC), STATE AND FEDERAL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS (OSHA), US ENVIRONMENTAL PROTECTION AGENCY, ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND ALL OTHER STATE, FEDERAL, AND LOCAL LAWS AND REGULATIONS PERTAINING TO THIS PROJECT. ANY WORK PERFORMED BY THE CONTRACTOR CONTRARY TO SUCH LAWS OR REGULATIONS SHALL BE AT THE CONTRACTOR'S SOLE RISK AND EXPENSE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH OTHER CONTRACTORS, HIS SUBCONTRACTORS, THE OWNER, AND STATE AND FEDERAL AUTHORITIES.
5. INSTALL FIRE EXTINGUISHERS WHERE SHOWN ON DRAWINGS.
6. ALL ITEMS SHOWN ARE IN THIS CONTRACT UNLESS SPECIFICALLY INDICATED. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS, AND INSTALLATION DRAWINGS, UNLESS INDICATED OTHERWISE.
7. WORK SHALL BE PERFORMED WITH SKILLED CRAFTSMEN SPECIALIZING IN THE REQUIRED WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THE CONTRACT DOCUMENTS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

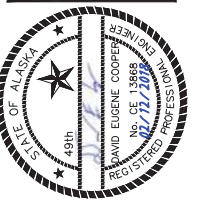
ABBREVIATIONS

FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
HSS	HORIZONTAL STRUCTURAL STEEL
IBC	INTERNATIONAL BUILDING CODE
IFC	INTERNATIONAL FIRE CODE
INC	INCORPORATED
L	ANGLE
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MM	MILLIMETER
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PSF	POUND PER SQUARE FOOT
PSI	POUND PER SQUARE INCH
R	RADIUS
REF	REFERENCE
REQ'D	REQUIRED
RT	RIGHT
S.F.	SQUARE FEET
T&G	TONGUE AND GROOVE
TYP	TYPICAL
W/	WITH

LEGEND

---	EXISTING PROPERTY LINE
- - - - -	EXISTING EASEMENT
— SS —	EXISTING SEWER UTILITY
— WS —	EXISTING WATER UTILITY

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MERTARVIK PHASE I POWER SYSTEM
 POWER PLANT MODULE

ALASKA ENERGY AUTHORITY
 MERTARVIK, ALASKA

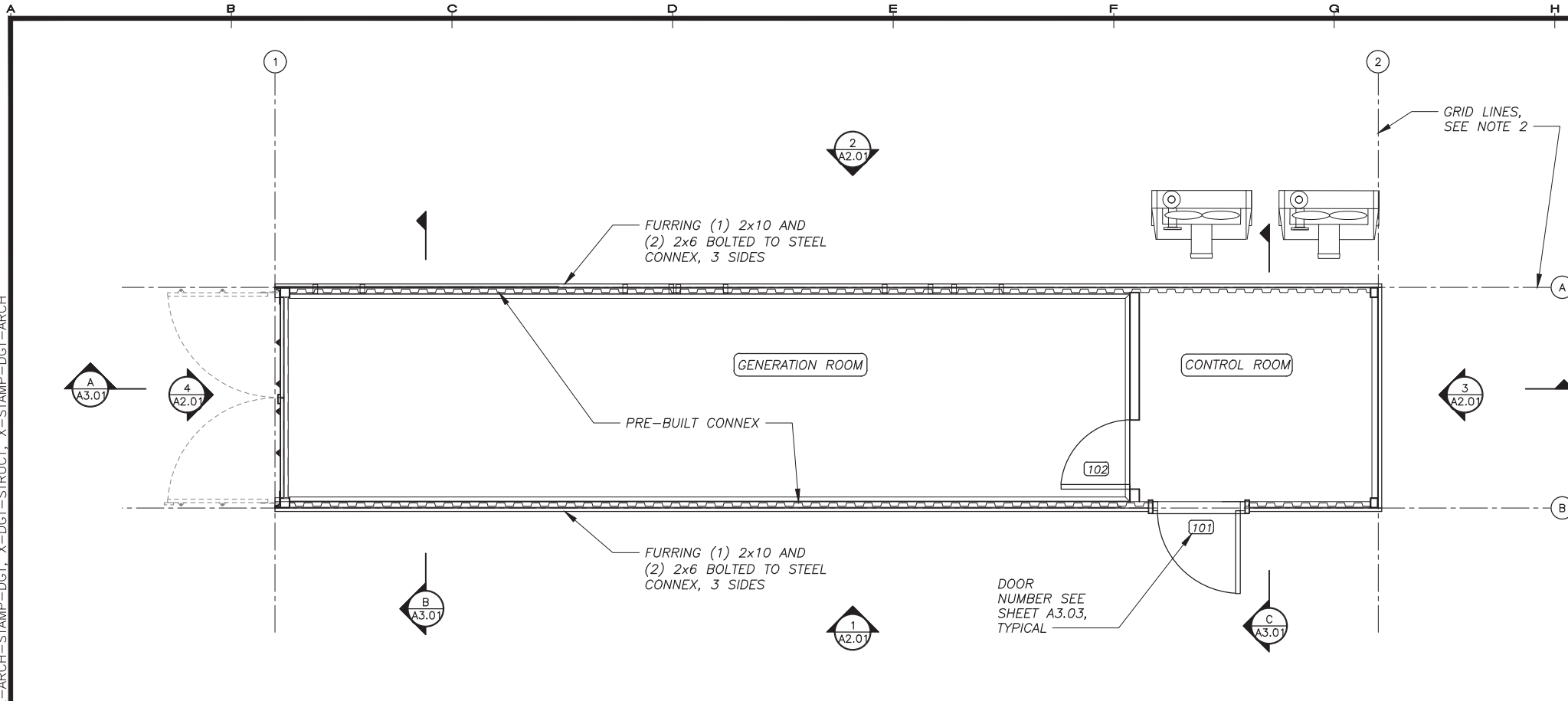
SHEET TITLE
GENERAL NOTES, LEGEND AND ABBREVIATIONS

SHEET
G1.02

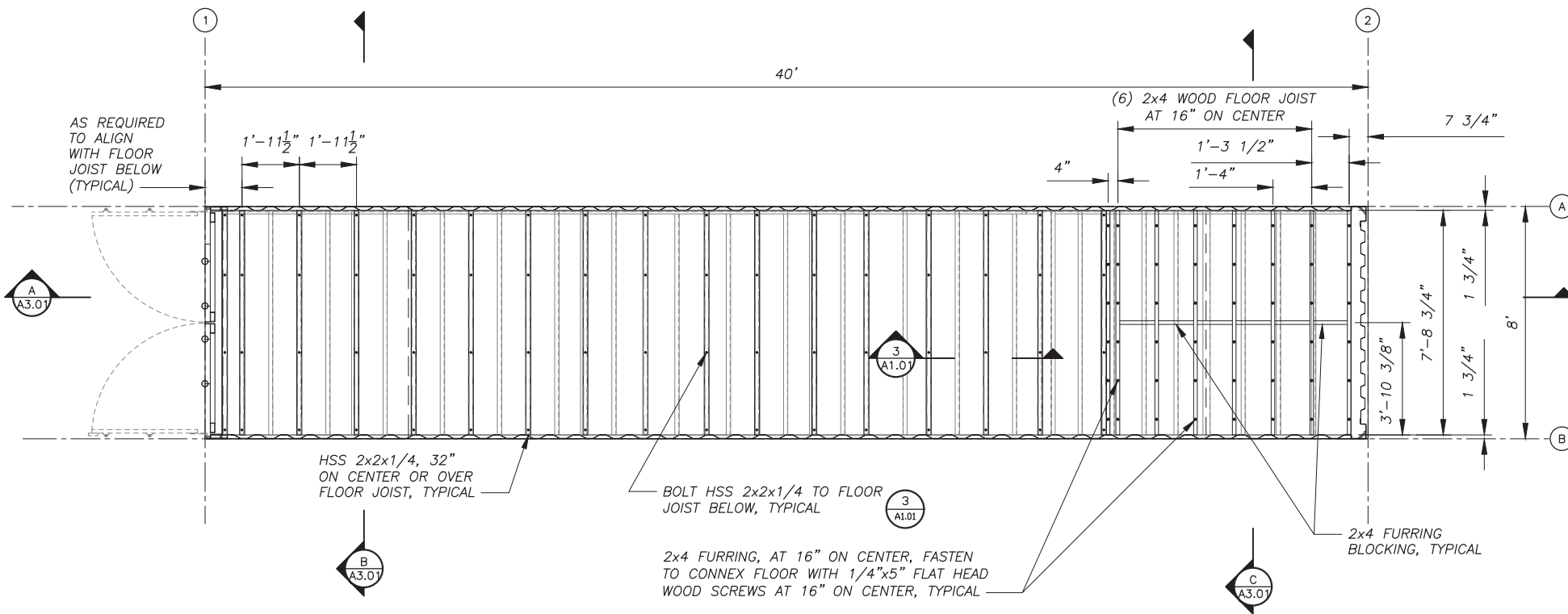
DRAWN BY: EJ	CHECKED BY: DC
DATE: 02/12/18	SCALE: NONE
JOB NUMBER: 16-035	

ONE INCH

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 XREF: 16035-00_B03-BK, X-ARCH-STAMP-DGT, X-ARCH-STRUCT, X-STAMP-DGT-ARCH LAYOUT: A1.01



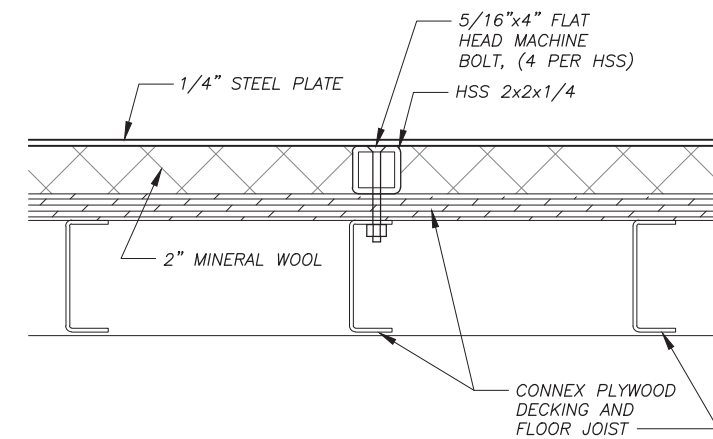
1 FLOOR PLAN - CONNEX
 SCALE: 3/8" = 1'-0"



2 FLOOR INFILL PLAN - CONNEX
 SCALE: 3/8" = 1'-0"

ARCHITECTURAL GENERAL NOTES:

- FURNISH LIKE NEW (ONE TRIP) ISO HIGH CUBE 40' LONG STEEL CONTAINER (CONNEX). SEE SPECIFICATIONS.
- GRID LINES ARE OUTSIDE EDGE OF CORNER POCKETS.



3 CONNEX FLOOR INFILL FOR PLATE INSTALLATION
 SCALE: 3" = 1'-0"

CODE ANALYSIS - 2012 EDITION INTERNATIONAL BUILDING CODE	
OCCUPANCY CLASSIFICATION GROUP F-1: FACTORY INDUSTRIAL MODERATE HAZARD-ELECTRIC GENERATION PLANT	REF: IBC-2012, SEC. 306.2
TYPE OF CONSTRUCTION TYPE V-B (NON-RATED)	REF: IBC-2012, TABLE 601 REF: IBC-2012, SEC. 602.5
BUILDING HEIGHTS AND AREAS ALLOWED 40'-0" 1 STORY 8,500 S.F. PROVIDED: 10'-0" 1 STORY	REF: IBC-2012, TABLE 503 320 S.F.
FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS	REF: IBC-2012, TABLE 601
STRUCTURAL FRAME-OHR, BEARING WALLS-OHR, INTERIOR PARTITIONS-OHR, FLOOR-OHR, ROOF-OHR	
FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS	REF: IBC-2012, TABLE 602
EXTERIOR WALLS 10' ≤ X ≤ 30' 0 HR	
FIRE PROTECTION SYSTEM	REF: IBC-2012, SEC. 903.2.4
FIRE PROTECTION NOT REQUIRED.	
OCCUPANT LOAD	REF: IBC-2012, TABLE 1004.1.2
MECHANICAL/STORAGE = 300 S.F./PERSON 320 S.F./300 S.F. PER OCCUPANT = 1 OCCUPANT	
MEANS OF EGRESS - TRAVEL DISTANCE	REF: IBC-2012, TABLE 1016.2
REQUIRED 200' PROVIDED 32'	
NOTE: SEE CIVIL SITE PLAN FOR LOCATION AND LAYOUT. PROVIDE REQUIRED SEPARATION TO PROPERTY BOUNDARIES IN ACCORDANCE WITH CODE ANALYSIS.	

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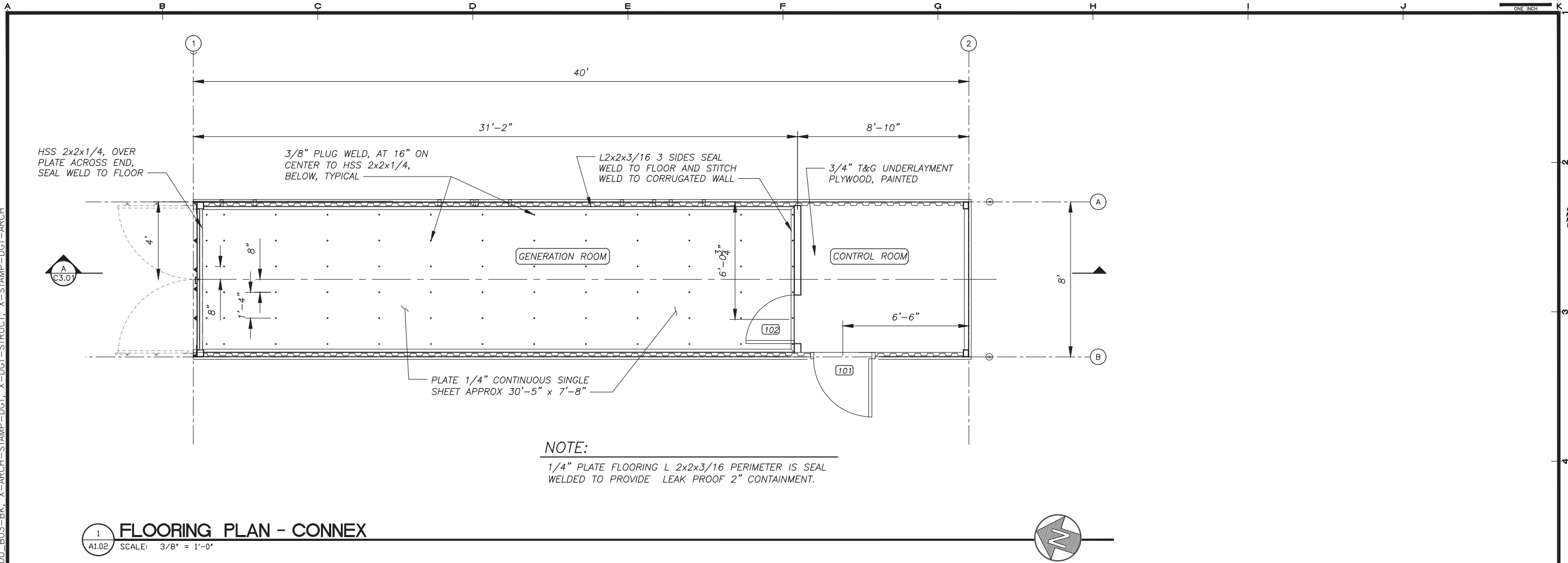
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SHEET TITLE
 CONNEX FLOOR PLAN AND FRAMING PLAN

SHEET
 A1.01

DRAWN BY: KK CHECKED BY: DGT
 DATE: 02/12/18 SCALE: AS SHOWN
 JOB NUMBER: 16-035

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 XREF: 16035-00_B03-BK, X-ARCH-STAMP-DGT, X-DGT-STRICT, X-STAMP-DGT-ARCH



1 FLOORING PLAN - CONNEX
 A1.02 SCALE: 3/8" = 1'-0"

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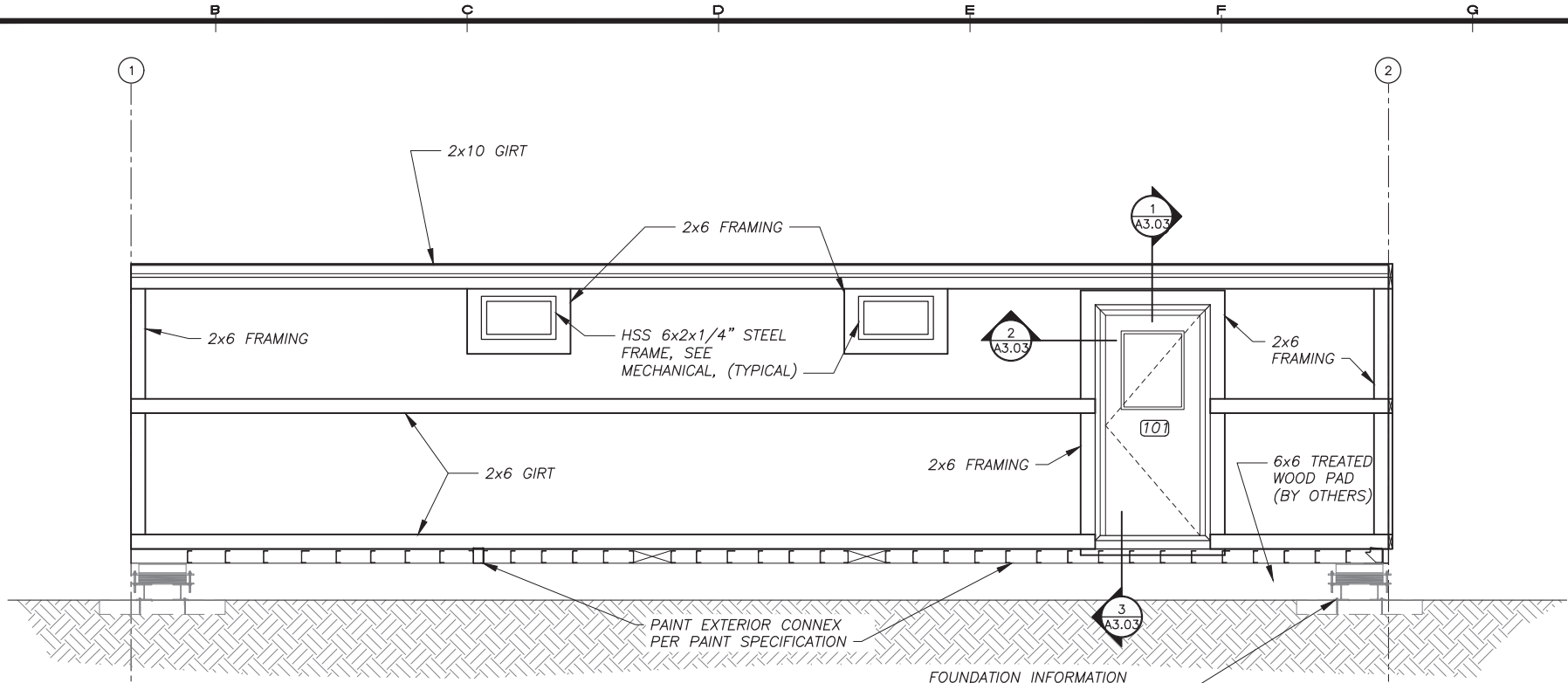
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SHEET TITLE
CONNEX FLOORING PLAN

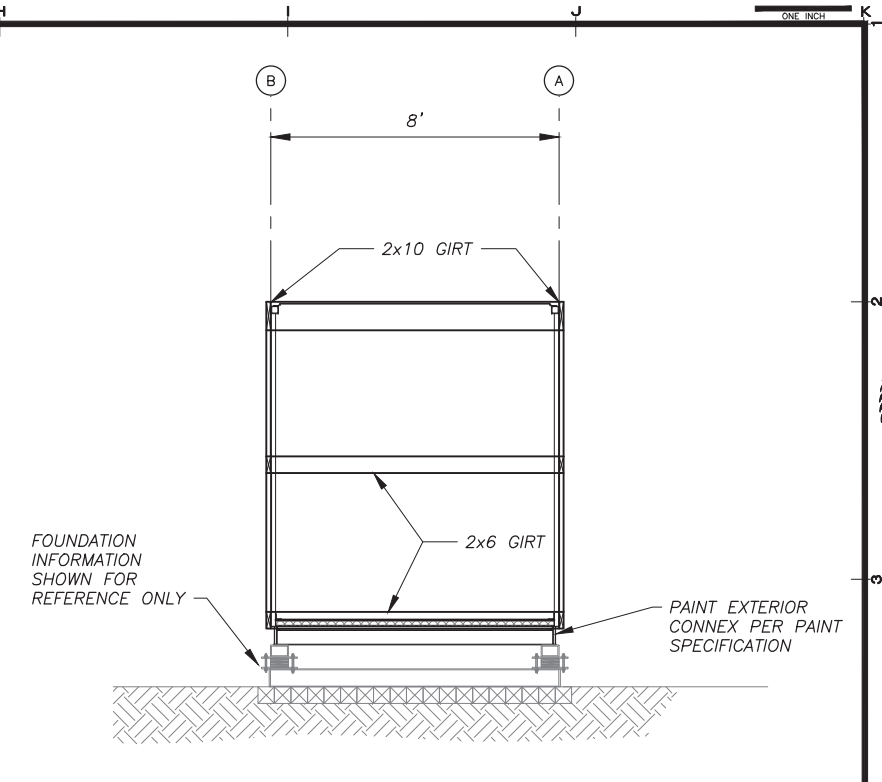
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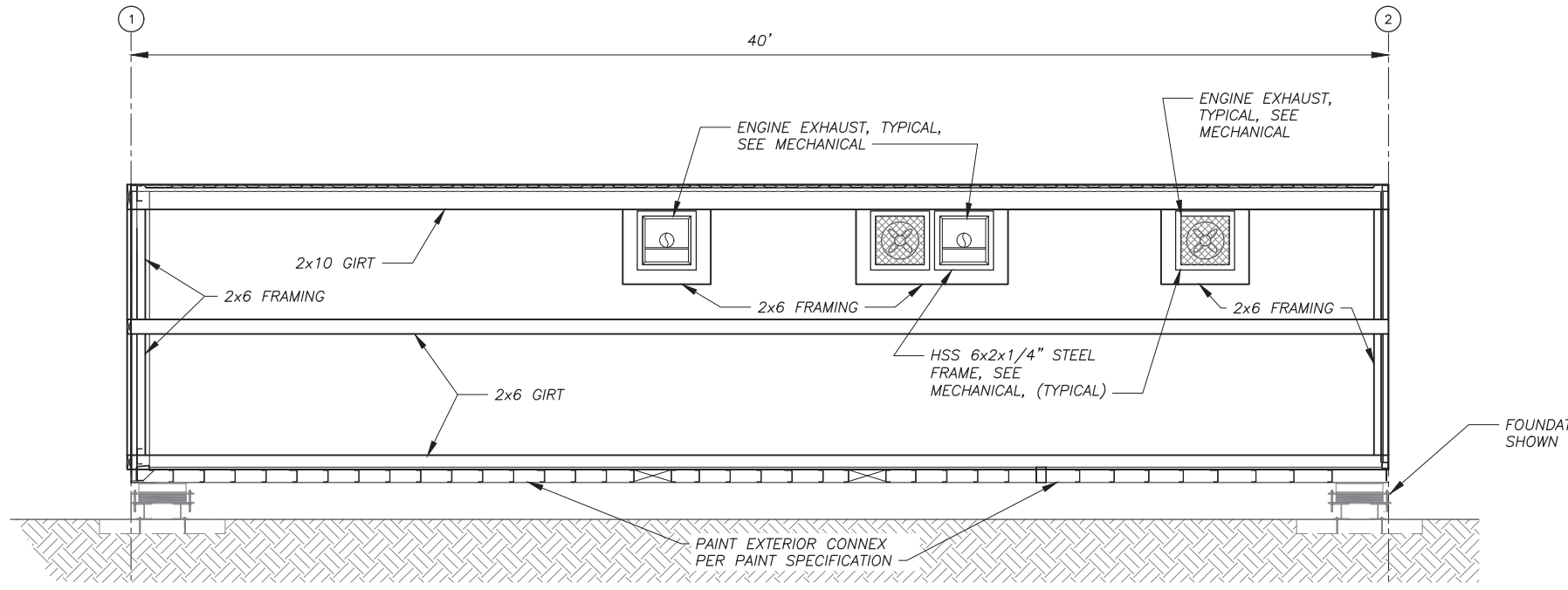
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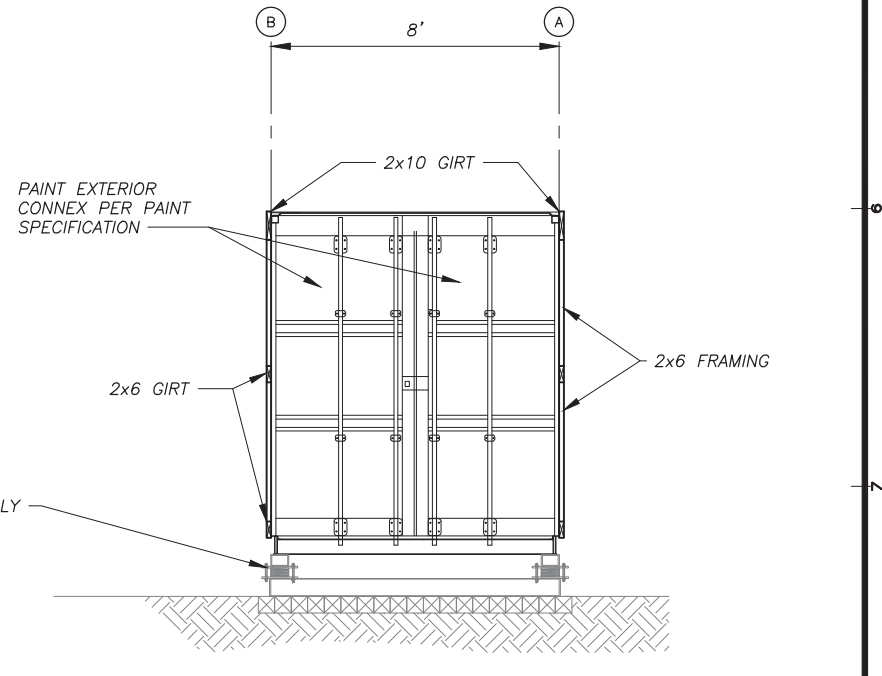
1 WEST ELEVATION - CONNEX
 A2.01 SCALE: 3/8" = 1'-0"



3 SOUTH ELEVATION - CONNEX
 A2.01 SCALE: 3/8" = 1'-0"



2 EAST ELEVATION - CONNEX
 A2.01 SCALE: 3/8" = 1'-0"



4 NORTH ELEVATION - CONNEX
 A2.01 SCALE: 3/8" = 1'-0"

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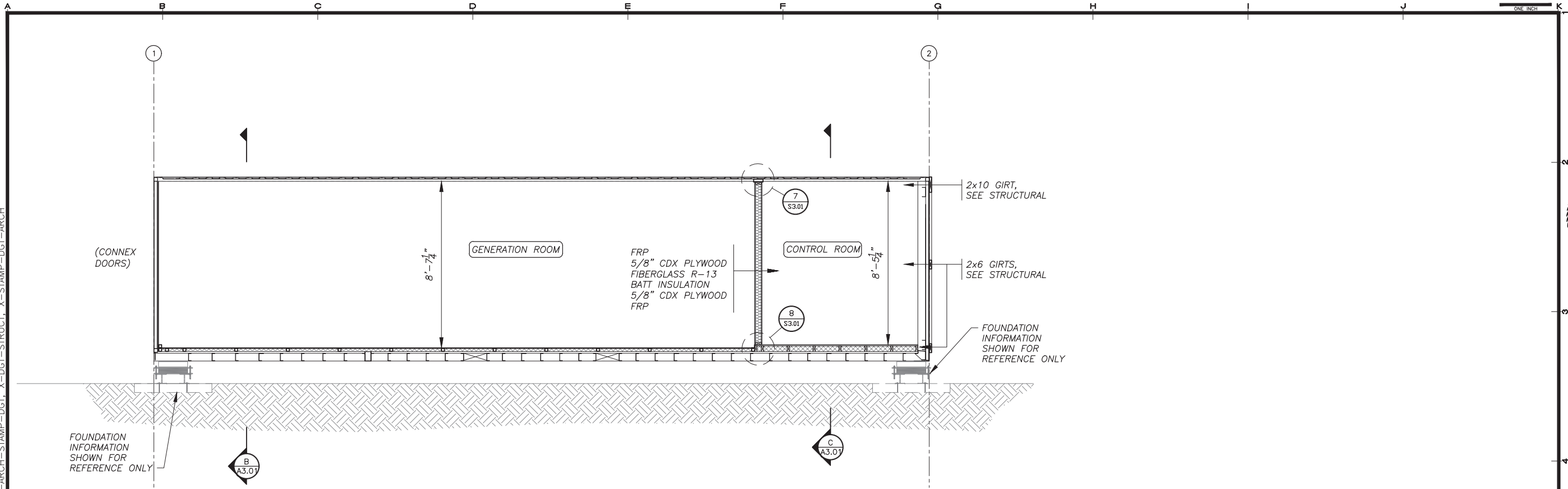
MERTARVIK PHASE I POWER SYSTEM
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SHEET TITLE
CONNEX EXTERIOR ELEVATIONS

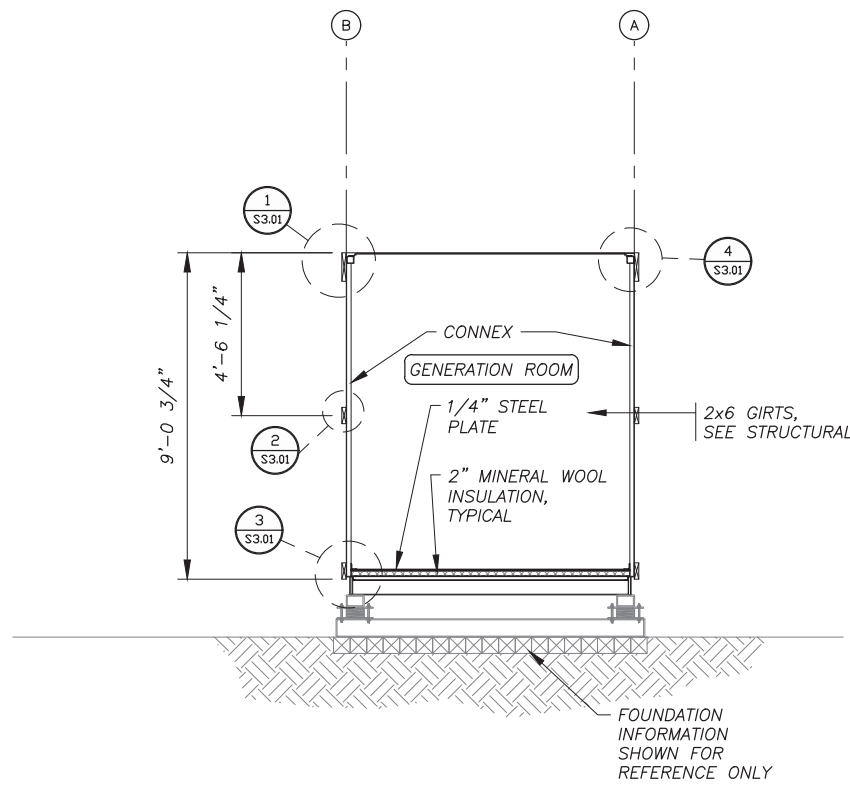
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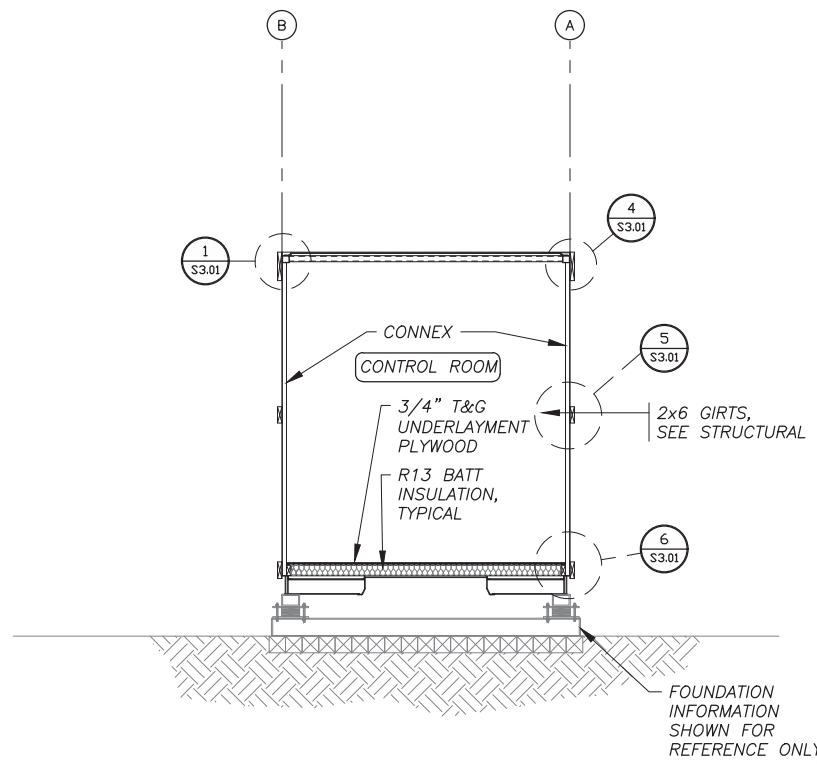
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A
 A3.01 **BUILDING SECTION**
 SCALE: 3/8" = 1'-0"



B
 A3.01 **BUILDING SECTION**
 SCALE: 3/8" = 1'-0"



C
 A3.01 **BUILDING SECTION**
 SCALE: 3/8" = 1'-0"

REVISIONS	DATE	DESCRIPTION

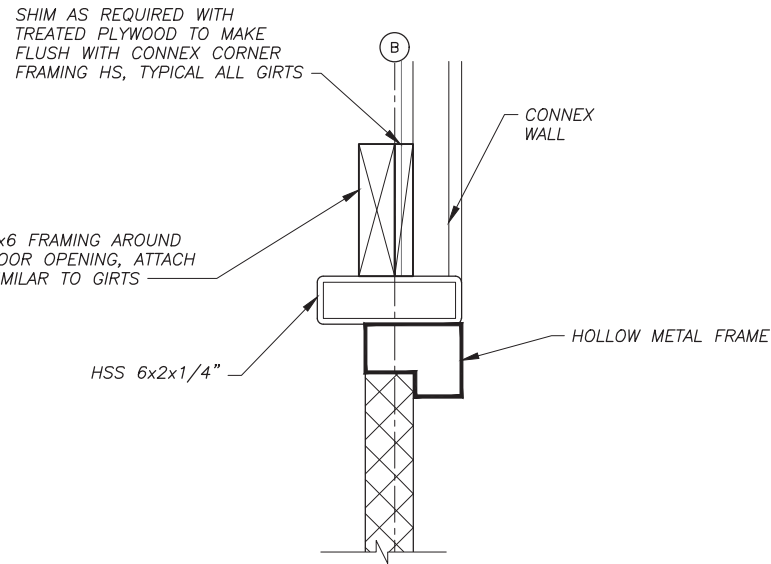


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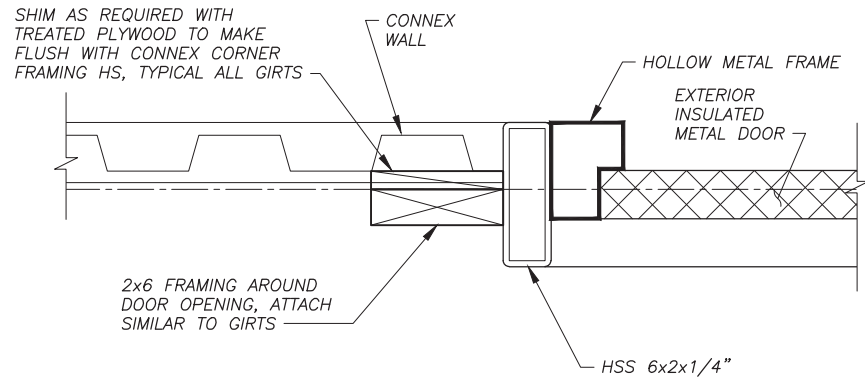
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 MERTARVIK PHASE I POWER SYSTEM
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SHEET TITLE CONNEX SECTIONS	
SHEET A3.01	
DRAWN BY: KK	CHECKED BY: DGT
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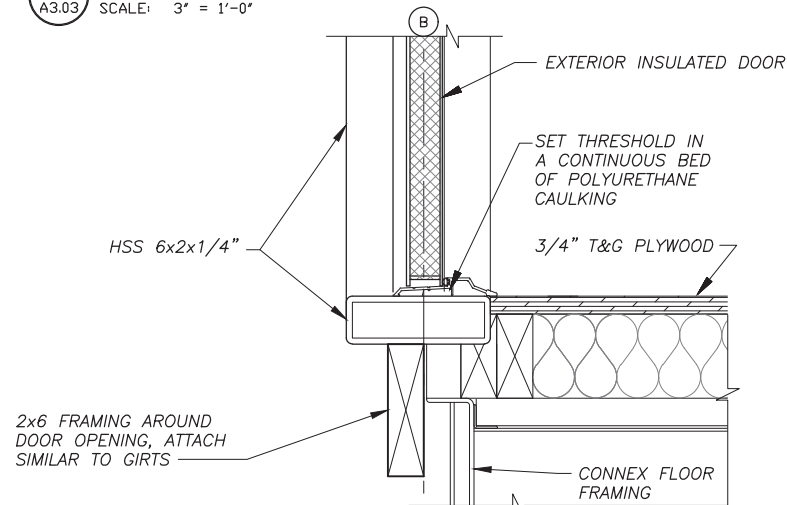
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1 EXTERIOR DOOR HEADER
 SCALE: 3' = 1'-0"



2 EXTERIOR DOOR JAMB
 SCALE: 3' = 1'-0"



3 EXTERIOR DOOR THRESHOLD
 SCALE: NO SCALE

DOOR CONSTRUCTION						FRAME CONSTRUCTION								
DOOR NO.	WIDTH	HEIGHT	THICKNESS	MATERIAL	CORE	REMARKS	HEAD/JAMB DETAIL	SILL DETAIL	WALL THICKNESS	MATERIAL	TYPE	PROFILE	FIRE RTG	HWR
101	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED		4/A1.03	5/A1.03	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-1
102	2'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x18" RE-LIGHT {3}	4/A1.03	5/A1.03	N/A	16 GA. H.M.	KNOCK DOWN	SINGLE RABBETED	NONE	HW-2

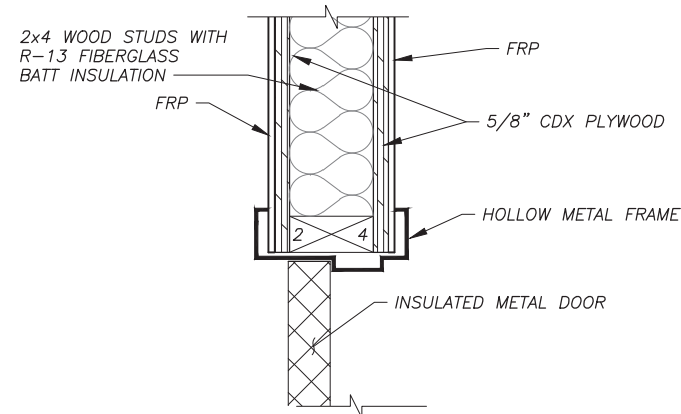
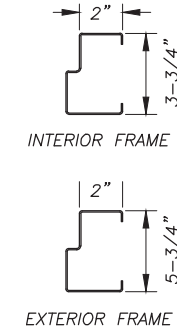
DOOR HARDWARE:

- HW-1**
- 3 EA HINGES HAGER BB1191 4.5 x 4.5NRP x 630
 - 1 EA LOCK SET BEST 93K7AB x 15D x 626
 - 1 EA CORE BEST BROWN CONSTRUCTION CORE
 - 1 EA DOOR CLOSER LCN 4041 x CUSH x 689
 - 1 EA WEATHER STRIP PEMKO 2891AS x 36 (HEAD)
 - 2 EA WEATHER STRIP PEMKO 290AS x 80 (SIDE JAMBS)
 - 1 EA THRESHOLD HAGER 580S x 36
- HW-2**
- 3 EA HINGES HAGER BB1191 4.5 x 4.5 x 630
 - 1 EA LATCH SET BEST 93KON x 15D x 626
 - 1 EA DOOR CLOSER LCN 4041 x CUSH x 689
 - 1 EA WEATHER STRIP PEMKO 2891AS x 30 (HEAD)
 - 2 EA WEATHER STRIP PEMKO 290AS x 80 (SIDE JAMBS)
 - 1 EA THRESHOLD HAGER 580S x 30

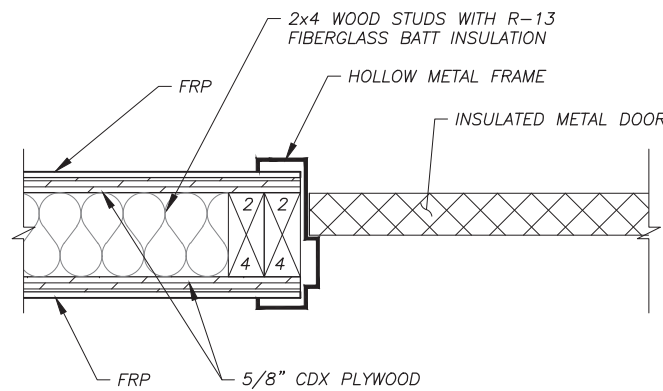
NOTES:

- {1} DOORS AND HOLLOW METAL DOOR FRAMES GALVANIZED AND FACTORY PRIMED. EXTERIOR FRAMES TO BE WELDED. INTERIOR FRAMES TO BE KNOCK DOWN STYLE. ALL FRAMES TO BE DIMPLED AND PUNCHED.
- {2} FIELD FINISH ALL DOORS AND FRAMES WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
- {3} INSTALL 24"x18" INSULATED RE-LIGHT WITH TWO PANES OF 1/4" LAMINATED SAFETY GLASS WITH 1/2" AIR GAP IN DOOR PANEL.
- {4} EXTERIOR DOOR (101) TO HAVE TOP CAPPED AND CAULKED.

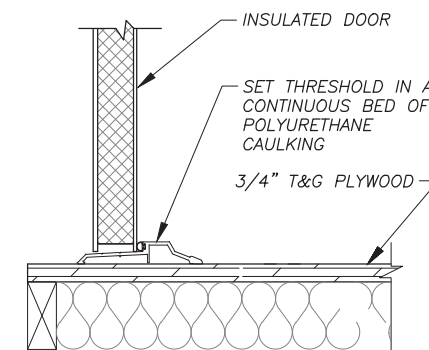
DOOR FRAME PROFILE:



4 INTERIOR DOOR HEADER
 SCALE: 3' = 1'-0"



5 INTERIOR DOOR JAMB
 SCALE: 3' = 1'-0"



6 INTERIOR DOOR THRESHOLD
 SCALE: NO SCALE

FRAMED OPENING NOTES:

- FABRICATE FRAMED OPENINGS FOR DOORS, WINDOWS, ETC, WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
- GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

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SHEET TITLE CONNEX DOOR DETAILS	
SHEET A3.03	
DRAWN BY KK	CHECKED BY DGT
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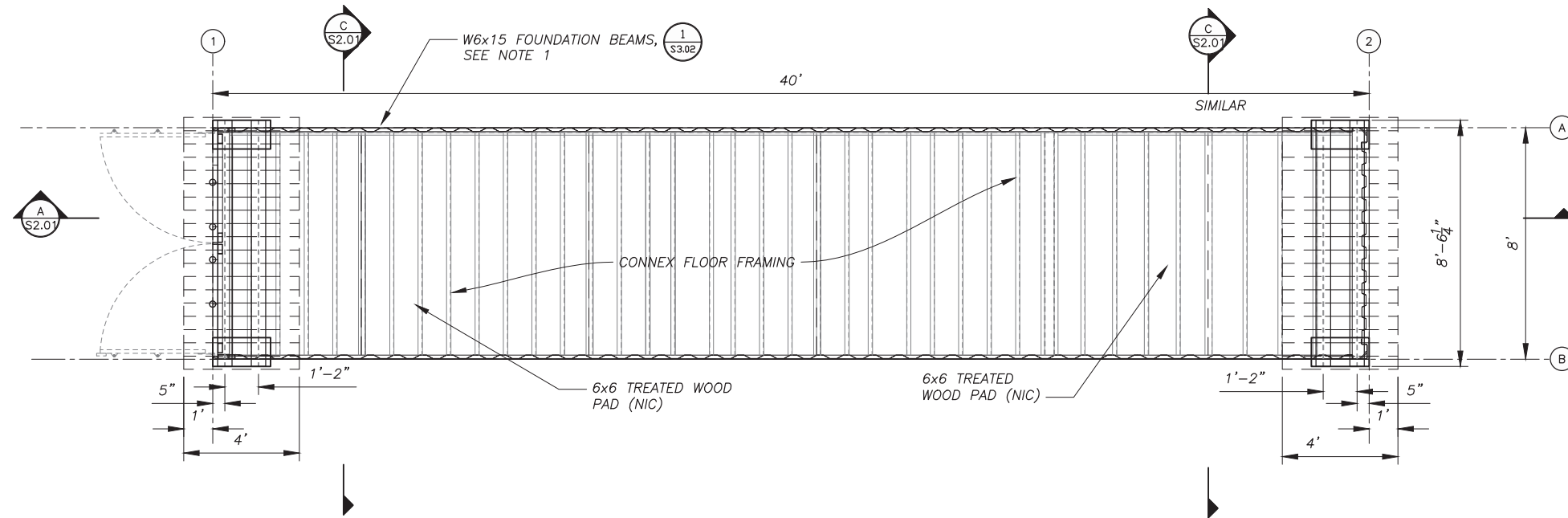
NOTE:

1. PROVIDE W6x15 STEEL FOUNDATION BEAMS AS DETAILED ON SHEET S3.02. FOUNDATION BEAMS SHALL BE FIELD INSTALLED NOT IN CONTRACT.

STRUCTURAL GENERAL NOTES – CONNEX:

1.0 DESIGN LOADS:

- A. BUILDING CODE: 2012 INTERNATIONAL BUILDING CODE (IBC 2012)
- B. FLOOR LIVE LOADS: (IBC TABLE 1607.1)
 LIGHT STORAGE/MANUFACTURING 125 PSF OR 2000 POUND POINT LOAD
 MAXIMUM GENERATOR UNIT WEIGHT 5,000 POUNDS
- C. SNOW LOADS: (ASCE 7-10)
 GROUND SNOW LOAD, $P_g = 40$ PSF
 COEFFICIENT OF EXPOSURE, $C_e = 1.0$, PARTIALLY EXPOSED
 SNOW IMPORTANCE FACTOR, $I_s = 1.2$, CATEGORY IV
 THERMAL COEFFICIENT, $C_t = 1.2$, COLD, VENTILATED ROOF
- D. WIND LOADS:
 BASIC WIND SPEED = 165 MPH, 3 SECOND GUST
 STRENGTH DESIGN LOAD FACTOR = 1.0
 EXPOSURE CLASSIFICATION = EXPOSURE D
- E. SEISMIC LOADING:
 SEISMIC = $S^s = 0.20$ $S^1 = 0.10$
 SEISMIC IMPORTANCE FACTOR = 1.50, CATEGORY IV
- SITE CLASS "D"
 BASIC SEISMIC FORCE RESISTANCE SYSTEM = BUILDING – BEARING WALL WITH STEEL SHEAR PANELS
 FOUNDATION – TREATED WOOD, RE-LOCATABLE FOOTING SYSTEM
- SEISMIC RESPONSE COEFFICIENT, $R = 7.0$



1 CONNEX FOUNDATION PLAN
 S1.01 SCALE: 3/8" = 1'-0"

THIS SHEET SHOWS PRIMARILY WORK THAT IS NOT IN CONTRACT AND IS PROVIDED FOR REFERENCE ONLY.

REVISIONS	MARK	DATE	DESCRIPTION

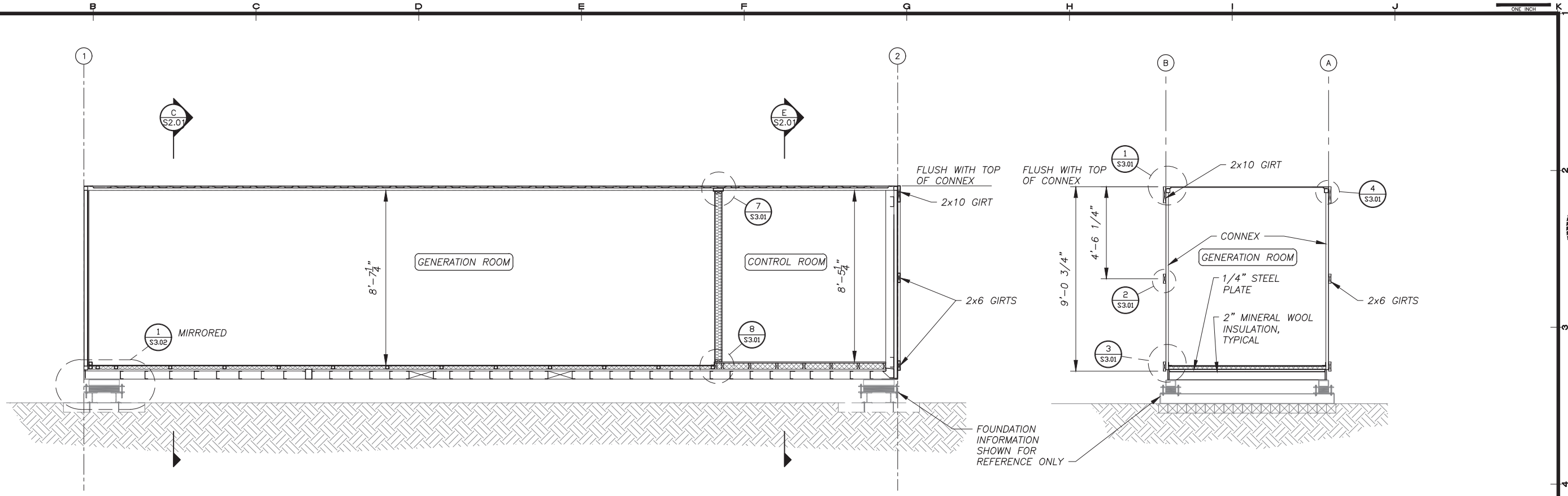


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MERTARVIK PHASE I POWER SYSTEM
 POWER PLANT MODULE
ALASKA ENERGY AUTHORITY
 MERTARVIK, ALASKA

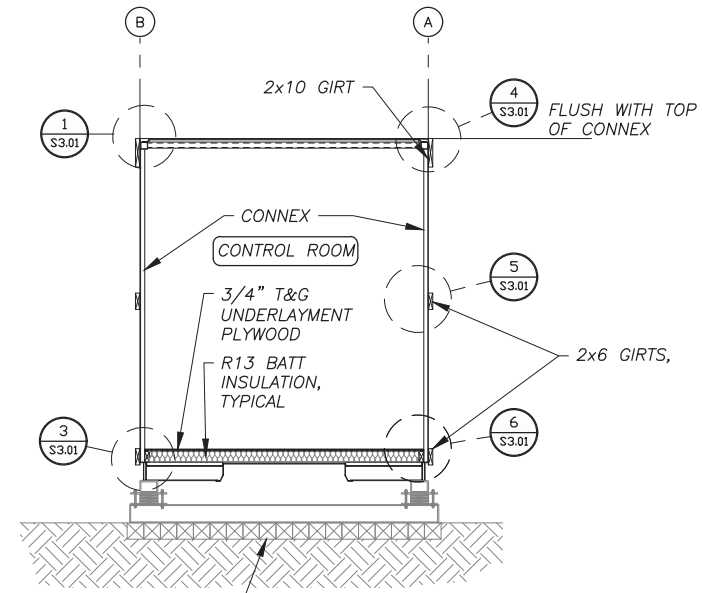
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SHEET S1.01	
DRAWN BY: KK	CHECKED BY: DGT
DATE: 02/12/18	SCALE: AS SHOWN
JOB NUMBER: 16-035	

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 XREF: 16035-00_B03-BK, X-ARCH-STAMP-DGT, X-DGT-STRICT, X-STAMP-DGT-ARCH



A CONNEX SECTION
 S2.01 SCALE: 3/8" = 1'-0"

C CONNEX SECTION
 S2.01 SCALE: 3/8" = 1'-0"



E CONNEX SECTION
 S2.01 SCALE: 3/8" = 1'-0"

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MERTARVIK PHASE I POWER SYSTEM
 POWER PLANT MODULE

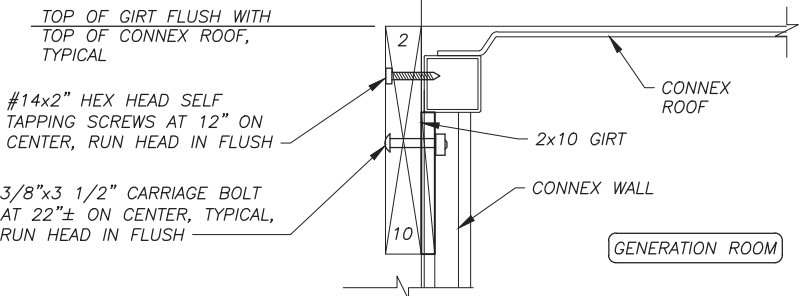
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CONNEX SECTIONS

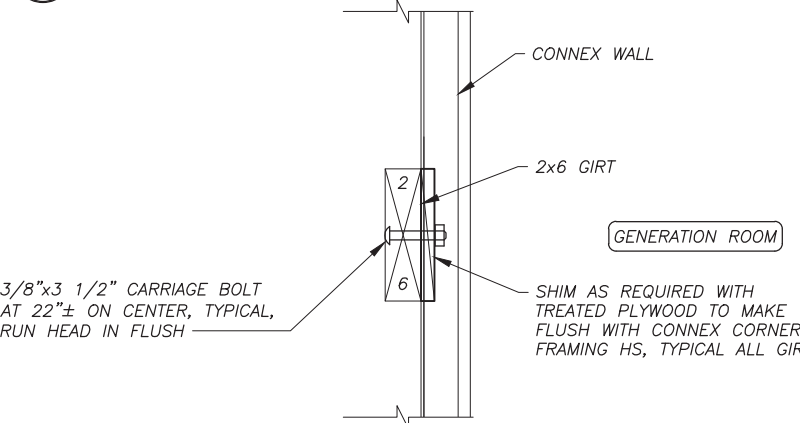
SHEET
S2.01

DRAWN BY: KK	CHECKED BY: DGT
DATE: 02/12/18	SCALE: AS SHOWN
JOB NUMBER: 16-035	

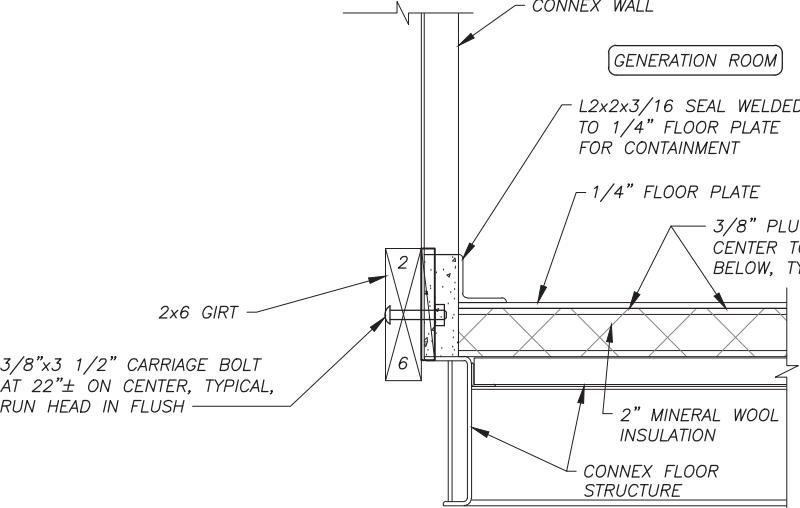
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 XREF: 16035-00_B03-BK, X-ARCH-STAMP-DGT, X-DGT-STRUCT, X-STAMP-DGT-ARCH LAYOUT: S3.01



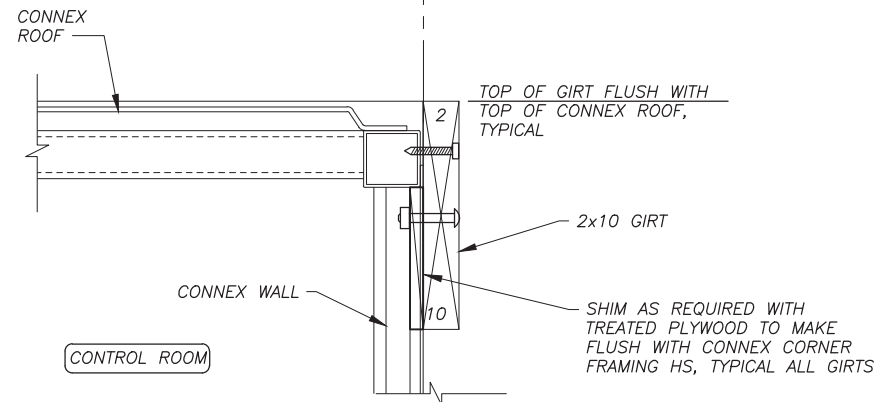
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 S3.01 SCALE: 3' = 1'-0"



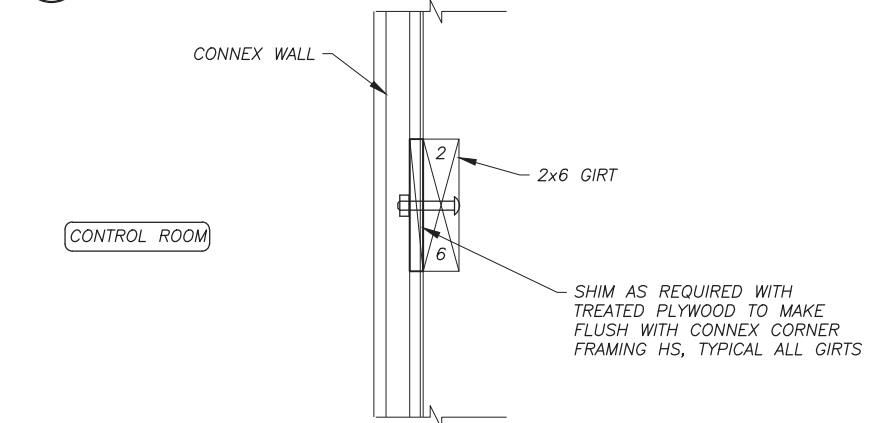
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 S3.01 SCALE: 3' = 1'-0"



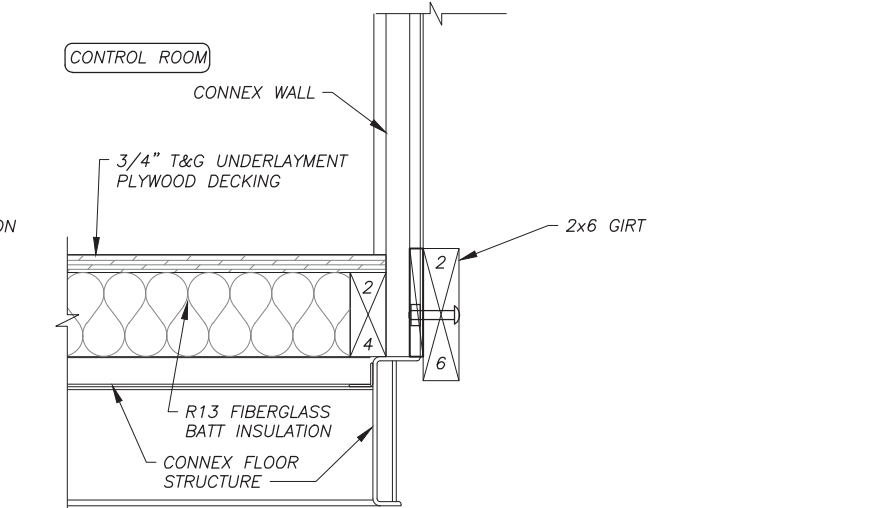
3 SECTION
 S3.01 SCALE: 3' = 1'-0"



4 SECTIONS
 S3.01 SCALE: 3' = 1'-0"



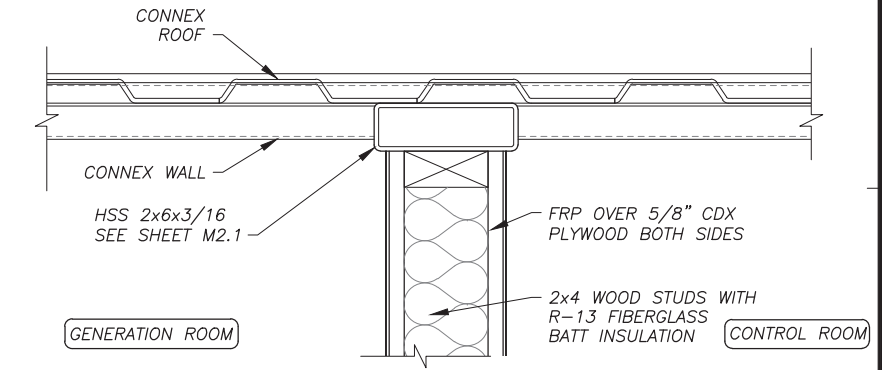
5 SECTION
 S3.01 SCALE: 3' = 1'-0"



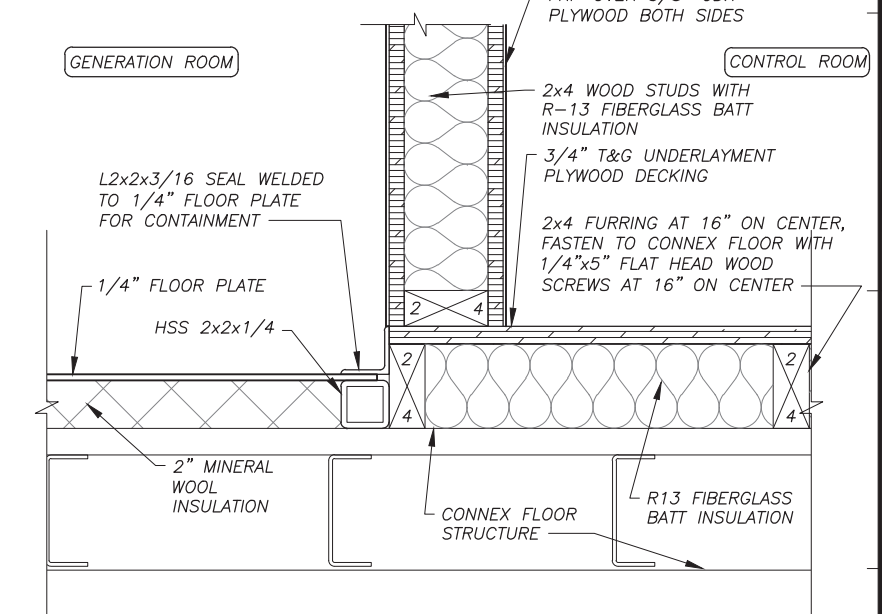
6 SECTION
 S3.01 SCALE: 3' = 1'-0"

STRUCTURAL GENERAL NOTES:

- DO NOT MAKE ANY PENETRATION THROUGH CONNEX ROOF. ALL ATTACHMENTS TO ROOF SHALL BE WELDED. SEE SHEETS M2.1 AND M2.2.



7 SECTION
 S3.01 SCALE: 3' = 1'-0"



8 SECTION
 S3.01 SCALE: 3' = 1'-0"

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MERTARVIK PHASE I POWER SYSTEM
 POWER PLANT MODULE
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SHEET TITLE CONNEX DETAILS	
SHEET S3.01	
DRAWN BY: KK	CHECKED BY: DGT
DATE: 02/12/18	SCALE: AS SHOWN
JOB NUMBER: 16-035	

LEGEND

	BUTTERFLY VALVE
	BALL VALVE
	CHECK VALVE
	HOSE END DRAIN VALVE
	GAUGE COCK
	AUTOMATIC AIR VENT
	THERMOMETER
	PRESSURE GAUGE
	TEMPERATURE SENSOR
	DIGITAL THERMOSTAT
	FLEXIBLE CONNECTOR
	FLANGED JOINT
	UNION
	ELBOW TURNED UP
	ELBOW TURNED DOWN
	PIPING CONNECTION (TEE)
	CHANGE OF PIPE SIZE
	DIRECTION OF FLOW

ABBREVIATIONS

∅	DIAMETER (PHASE)
A	AMPS
AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
DFR	DIESEL FUEL RETURN
DFS	DIESEL FUEL SUPPLY
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
ECR	ENGINE COOLANT RETURN
ECS	ENGINE COOLANT SUPPLY
FPT	FEMALE PIPE THREAD
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GRC	GALVANIZED RIGID CONDUIT
HP	HORSEPOWER
HRR	HEAT RECOVERY RETURN
HRS	HEAT RECOVERY SUPPLY
ID	INSIDE DIAMETER
KW	KILOWATT
LT	LIQUID TIGHT
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM
MPT	MALE PIPE THREAD
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OC	ON CENTER
OD	OUTSIDE DIAMETER
PRV	PRESSURE RELIEF VALVE
PSI	POUNDS/PER SQUARE INCH
PSID	PSI DIFFERENTIAL
PSIG	PSI GAUGE
SCH	SCHEDULE
TDH	TOTAL DEVELOPED HEAD
TYP	TYPICAL
UOR	USED OIL RETURN
V	VOLTS
W	WATTS
WG	WATER GAUGE
WPD	WATER PRESSURE DROP

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES):
SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

INSTRUMENTATION EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
FS	DAY TANK FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VSPST NC/NO SWITCH, 1/8" NPT, 1" MAX ∅ BUNA-N FLOAT FOR S.G.=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
LCA	GLYCOL EXP TANK	LOW COOLANT ALARM FLOAT SWITCH, SEE MECHANICAL DETAILS	MURPHY EL-150-K1

COOLANT SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
R-1 R-2	GLYCOL RADIATOR	SINGLE PASS, 4 ROW, VERTICAL CORE, 3" FLANGED CONNECTIONS, SATIN BLACK ALKYD ENAMEL COATING, EXPANDED METAL GUARD. 6,000 BTU/MIN AT 77°F AMBIENT, 50 GPM 50% ETHYLENE GLYCOL AT 192F IN, 0.22 PSI MAX GLYCOL PRESSURE DROP. 3 HP, 460 V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. DIESEL RADIATOR PART NO. 3490B OR EQUAL	DIESEL RADIATOR 3490
TV-1	COOLANT THERMOSTATIC VALVE	3" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS - 185F NOMINAL TEMPERATURE	FPE #A3010-185
ET-1	GEN COOLANT EXPANSION TANK	24 GALLON CAPACITY TANK, 12.75" O.D x 48" LONG FABRICATED STEEL TANK, SEE FABRICATION DETAIL	CUSTOM FABRICATION
HP-EC	ENGINE COOLANT FILL HAND PUMP	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100

HEATING SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
P-HR1	CONTROL ROOM HEAT PUMP	1 GPM AT 18' TDH, 1/25HP, 115V, 1∅. PROVIDE WITH 3/4" SOLDER COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 15-58FC, SPEED 3
CUH-1	CONTROL ROOM HEAT	FLOOR MOUNTED HOT WATER CABINET UNIT HEATER, 18 MBH AT 1 GPM 180F EWT & 60F EAT.	TOYOTOMI HC-20

VENTILATION SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
EF-1 EF-2	EXHAUST FANS	DIRECT DRIVE 14"∅ PROPELLER SIDEWALL EXHAUST FAN, 2,100 CFM AT 0.375" SP, 1,750 RPM. FURNISH WITH SPECIAL 1/2 HP, 115 V, 1 PH VARIGREEN MOTOR WITH OPTIONAL 0-10V LEADS.	GREENHECK SE1-14-436-VG (1/2 HP)

FUEL SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
P-DT1	DAY TANK FILL PUMP	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, BRONZE CONSTRUCTION WITH SS SHAFTS, BUNA-N SEAL, CARBON BEARINGS, DIRECT FLEX COUPLED TO 1150 RPM ODP THERMALLY PROTECTED, AUTO RESET MOTOR, 1/2 HP, 115 V, 1 PH, 60 HZ, 6.6 GPM @ 20 PSID. PROVIDE WITH 40 PSID INTERNAL PRV.	OBERDORFER N994RH-J46
HP-DT	DAY TANK FILL HAND PUMP	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100
G-DI	DAY TANK GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660 WITH SIDE-VIEW DIAL #5025S00570
F-DI	DAY TANK FILTER	10 MICRON FILTER FOR DIESEL FUEL, CLEAR BOWL WITH BOTTOM DRAIN VALVE, 150 PSIG MAXIMUM OPERATING PRESSURE, 25 GPM MAXIMUM FLOW. REPLACE FPT HEAD ASSEMBLY WITH CUSTOM FABRICATED STEEL HEAD WITH ANSI 150# FLANGED ENDS. FURNISH COMPLETE WITH WRENCH AND 5 SPARE FILTER ELEMENTS.	SUPERIOR MACHINE & WELDING HEAD WITH GOLDEN ROD NO. 495-4 BOWL, 491 WRENCH, 470-5 ELEMENTS
M-DI	DAY TANK METER	STEEL BODY, 1" ANSI 300# FLANGED ENDS, 20-800 GPH FLOW RANGE, 0-RINGS AND SEALS COMPATIBLE WITH #1 DIESEL, DIRECT READ 6-DIGIT REGISTER TO 0.1 GAL, DRY CONTACT PULSER.	ISTEC CONTOIL 9226-F

PIPE/TUBING STRUT CLAMP SCHEDULE

PIPE/TUBE	CLAMP #	PIPE/TUBE	CLAMP #	NOTES:
1/2" COPPER	BVT062	1/2" STEEL	B2008	1) ALL CLAMP NUMBERS ARE B-LINE. EQUIVALENT EQUALS ACCEPTABLE. 2) ALL COPPER TUBE CLAMPS TO BE CUSHIONED, VIBRA-CLAMP. 3) ALL STEEL PIPE CLAMPS NOT CUSHIONED. 4) USE STEEL CLAMPS FOR ALL STEEL PIPE AND RIGID CONDUIT. 5) SEE PLANS, ELEVATIONS, ISOMETRICS, ETC. FOR ACTUAL PIPE SIZES.
3/4" COPPER	BVT087	3/4" STEEL	B2009	
1" COPPER	BVT112	1" STEEL	B2010	
1-1/4" COPPER	BVT125	1-1/4" STEEL	B2011	
1-1/2" COPPER	BVT162	1-1/2" STEEL	B2012	
2" COPPER	BVT212	2" STEEL	B2013	
2-1/2" COPPER	BVT262	2-1/2" STEEL	B2014	
3" COPPER	BVT312	3" STEEL	B2015	
4" COPPER	BVT412	4" STEEL	B2017	

VALVE TAG SCHEDULE:

VALVE TAGS - 3"x5"x.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS, BLACK GERBER THERMAL TRANSFER FILM PRINTED LETTERS ON GERBER 220 HIGH PERFORMANCE VINYL BACKGROUND, COLOR AS INDICATED, ONE SIDE ONLY. WARNING LITES OR EQUAL.

GREEN (DIESEL FUEL)

21 "NORMALLY OPEN, CLOSE ONLY FOR EMERGENCIES & TEMPORARY MAINTENANCE OF DAY TANK & DEVICES"
 22 "NORMALLY CLOSED, OPEN ONLY FOR HAND PRIMING DAY TANK"
 23 not used
 24 "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"

PINK (COOLING/ETHYLENE GLYCOL)

51 "NORMALLY CLOSED, OPEN ONLY FOR ADDING COOLANT - ETHYLENE GLYCOL ONLY"
 52 "NORMALLY CLOSED, OPEN ONLY ON HIGH COOLANT TEMPERATURE ALARM"
 53 "NORMALLY OPEN, CLOSE ONLY ON HIGH COOLANT TEMPERATURE ALARM"

INSTALLATION - SECURE EACH TAG TIGHT TO VALVE, PIPE, OR DEVICE WITH STAINLESS STEEL CABLE TIES OR SAFETY WIRE THROUGH ALL FOUR CORNERS OR FASTEN TO ADJACENT WALL OR SECTION OF STRUT WITH SCREWS.

NOTES:
 1) SEE PIPING PLANS, DIAGRAMS, & ISOMETRICS FOR TAG LOCATIONS.
 2) FOR ALL VALVES NOT INDICATED WITH A SPECIFIC FUNCTION TAG PROVIDE 1-1/2"∅ BRASS TAG LABELED "N.O." FOR NORMALLY OPEN VALVES AND 1"∅ BRASS TAG LABELED "N.C." FOR NORMALLY CLOSED VALVES. SECURE TAGS TO VALVE OR ADJACENT PIPE WITH BEADED BRASS CHAIN.

SEQUENCE OF OPERATIONS

THE DAY TANK WILL HAVE AUTOMATIC FILL CONTROLS WITH REDUNDANT HIGH AND LOW LEVEL ALARMS AND TIMERS. SEE DAY TANK CONTROL PANEL DRAWINGS FOR DETAILED SEQUENCE.

COMBUSTION/VENTILATION AIR INTAKES ARE ALWAYS OPEN (NO MOTORIZED DAMPERS).

EXHAUST MOTORIZED DAMPERS WILL OPEN ANY TIME ASSOCIATED EXHAUST FAN OPERATES. DAMPER MOTORS WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER IN LESS THAN 30 SECONDS.

EXHAUST FANS EF-1 AND EF-2 WILL OPERATE ON A CALL FOR COOLING THROUGH A 24VAC DIGITAL MODULATING THERMOSTAT. THE THERMOSTAT WILL PROVIDE A 0-10V SIGNAL TO MODULATE THE FAN SPEED AS REQUIRED TO MAINTAIN SPACE TEMPERATURE, 75F, ADJUSTABLE.

CABINET UNIT HEATER CUH-1 AND CIRCULATING PUMP P-HR1 WILL OPERATE ON A CALL FOR HEATING THROUGH THE INTERNAL CUH CONTROLS TO MAINTAIN CONTROL ROOM TEMPERATURE, 65F, ADJUSTABLE.

THE RADIATOR FANS WILL OPERATE UNDER CONTROL OF THE TEMPERATURE CONTROLLERS IN THE SWITCHGEAR AS INDICATED IN THE CONTROL SCHEMATIC WITH THE FOLLOWING SETPOINTS:
 R-1 WHEN THE COOLANT DISCHARGE TEMP RISES TO 200F (ADJUSTABLE), RADIATOR R-1 FAN WILL RUN. WHEN THE COOLANT DISCHARGE TEMP FALLS TO 190F (ADJUSTABLE), RADIATOR R-1 FAN WILL STOP.
 R-2 WHEN THE COOLANT DISCHARGE TEMP RISES TO 205F (ADJUSTABLE), RADIATOR R-2 FAN WILL RUN. WHEN THE COOLANT DISCHARGE TEMP FALLS TO 195F (ADJUSTABLE), RADIATOR R-2 FAN WILL STOP.

SEE THE SWITCHGEAR SPECIFICATIONS FOR ENGINE-GENERATOR OPERATING SEQUENCE AND ALARMS.

MODULE SHOP/ON-SITE NOTES:

- ALL WORK SHOWN THIS SHEET IS PART OF THE MODULE SHOP FABRICATION PROJECT EXCEPT AS SPECIFICALLY NOTED.
- FURNISH GLYCOL RADIATORS R-1 AND R-2 AS PART OF THE ON-SITE PROJECT.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

REVISIONS	MARK	DATE	DESCRIPTION
1			
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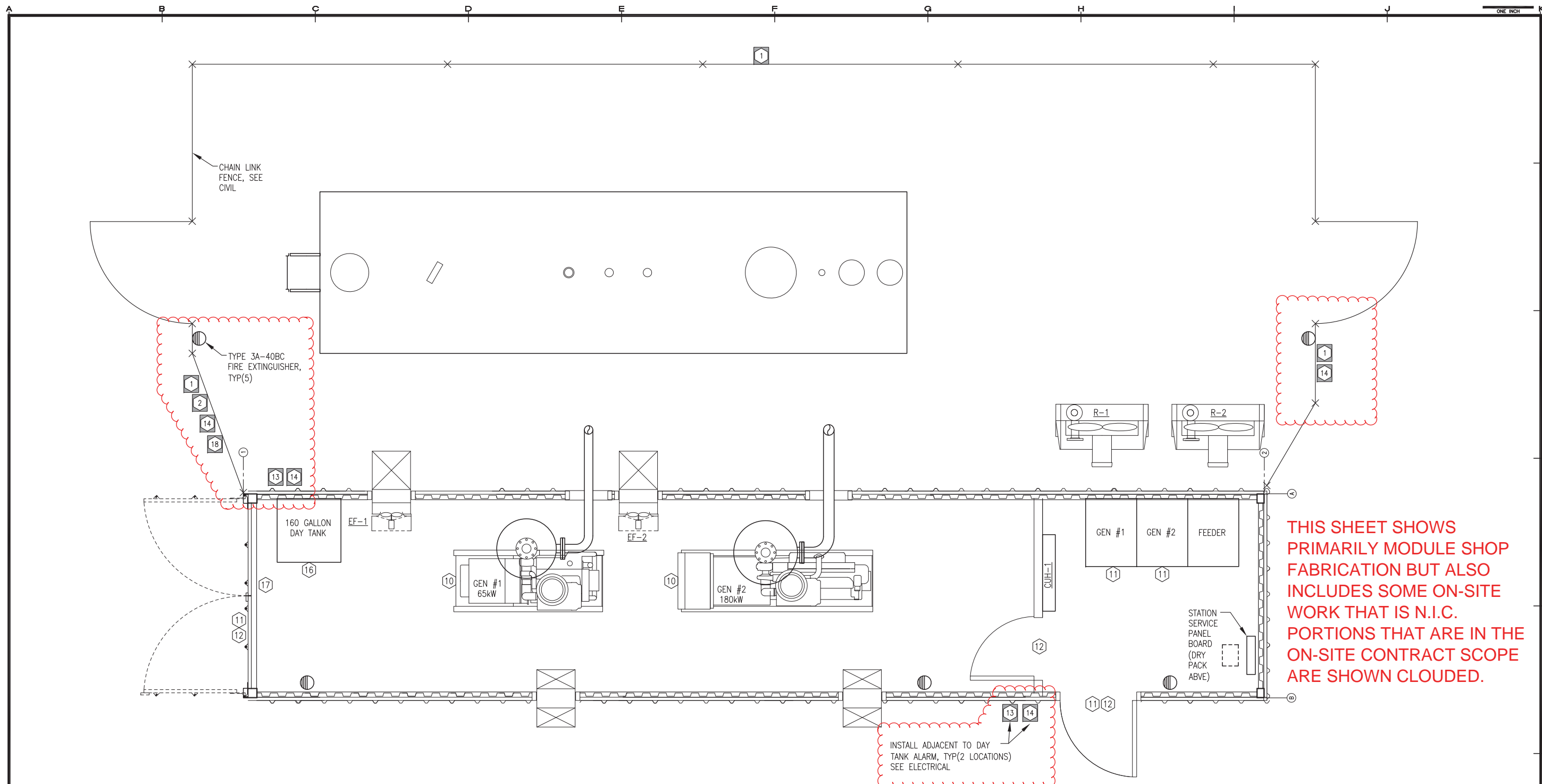
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MERTARVIK PHASE 1 POWER SYSTEM

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 MERTARVIK, ALASKA

SHEET TITLE	
MECHANICAL LEGEND, SCHEDULES, & SEQUENCE OF OPERATIONS	
SHEET	
M1.1	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



1 FIRE EXTINGUISHER, WARNING SIGN & PLACARD PLAN
M1.2 1/2" = 1'-0"

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

WARNING SIGNS & INFORMATIONAL PLACARDS - PROVIDE DECALS AND SIGN BOARDS AS INDICATED IN THE SCHEDULE BELOW, QUANTITY & LOCATION WHERE SHOWN ON THE WARNING SIGN/PLACARD PLAN THIS SHEET.

DECALS - DECALS TO BE WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, ONE SIDE ONLY. WARNING LITES OR EQUAL. APPLY TO FACE OF DOORS OR ELECTRICAL ENCLOSURES WHERE INDICATED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

BOARDS - SIGN BOARDS TO BE EQUAL TO DECALS EXCEPT MOUNTED ON 0.08" ALUMINUM PLATE, 10"x14" UNLESS INDICATED OTHERWISE OR REQUIRED TO BE LARGER FOR SPECIFIED LETTER SIZE. PROVIDE 3/16" HOLES IN ALL FOUR CORNERS. ATTACH TO CHAIN LINK FENCING WITH HOG RINGS OR STAINLESS STEEL TIES. ATTACH TO WALLS OR STRUCTURES WITH STAINLESS STEEL SCREWS OR BOLTS.

WARNING SIGNS - RED LETTERING ON WHITE BACKGROUND.

- 1** "NO SMOKING OR OPEN FLAMES WITHIN 50' OF FUELING OPERATIONS"
- 2** "ATTACH STATIC WIRE AND VERIFY TANK CAPACITY PRIOR TO FILLING TANK"
- 10** "CAUTION: THIS UNIT STARTS AUTOMATICALLY, LOCK & TAG OUT PRIOR TO SERVICE"
- 11** "DANGER HIGH VOLTAGE, AUTHORIZED PERSONNEL ONLY"
- 12** "CAUTION HEARING & EYE PROTECTION REQUIRED"
- 13** "FUEL OIL DAY TANK ALARM"
- 14** "IN CASE OF SPILL CALL DEC 1-800-478-9300"

INFORMATIONAL PLACARDS - BLACK LETTERING ON WHITE BACKGROUND.

- 16** "TO MANUALLY FILL DAY TANK IN CASE OF EMERGENCY:
1) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
2) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"
- 17** "TO CHANGE ENGINE OIL:
1) LOCK & TAG GENERATOR OUT OF SERVICE
2) DRAIN ENGINE OIL INTO BUCKET
3) CHANGE FILTER
4) CLOSE DRAIN VALVE & REFILL ENGINE
5) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
6) TOP OFF & PLACE ENGINE BACK IN SERVICE"
- 18** "CHECK BULK TANK LEVEL DAILY, FILL WHEN BELOW 2'-0"

MODULE SHOP/ON-SITE NOTES:

1. FURNISH AND INSTALL ALL DECALS ON THE MODULE AND ALL INTERIOR FIRE EXTINGUISHERS AS PART OF THE MODULE SHOP FABRICATION PROJECT.
2. FURNISH AND INSTALL ALL BOARDS AND ALL EXTERIOR FIRE EXTINGUISHERS AS PART OF THE ON-SITE PROJECT.

REVISIONS	MARK	DATE
1		
2		
3		
4		
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MERTARVIK PHASE 1 POWER SYSTEM

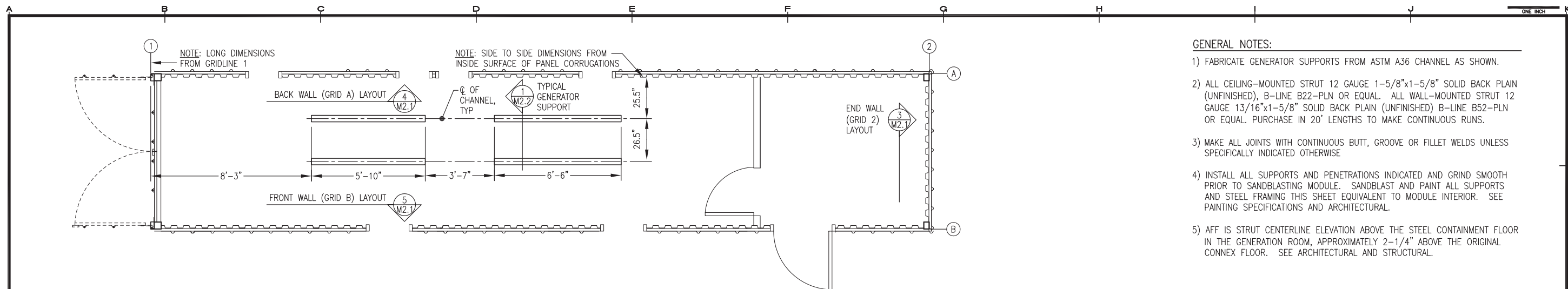
ALASKA ENERGY AUTHORITY
 ENERGY AUTHORITY

MERTARVIK, ALASKA

SHEET TITLE: FIRE EXTINGUISHER, WARNING SIGN, & INFORMATIONAL PLACARD PLAN

SHEET: **M1.2**

DRAWN BY: JTD CHECKED BY: BCG
 DATE: 2/12/18 SCALE: AS NOTED
 JOB NUMBER:



1 FLOOR MECHANICAL SUPPORT PLAN
 M2.1 3/8"=1'-0"

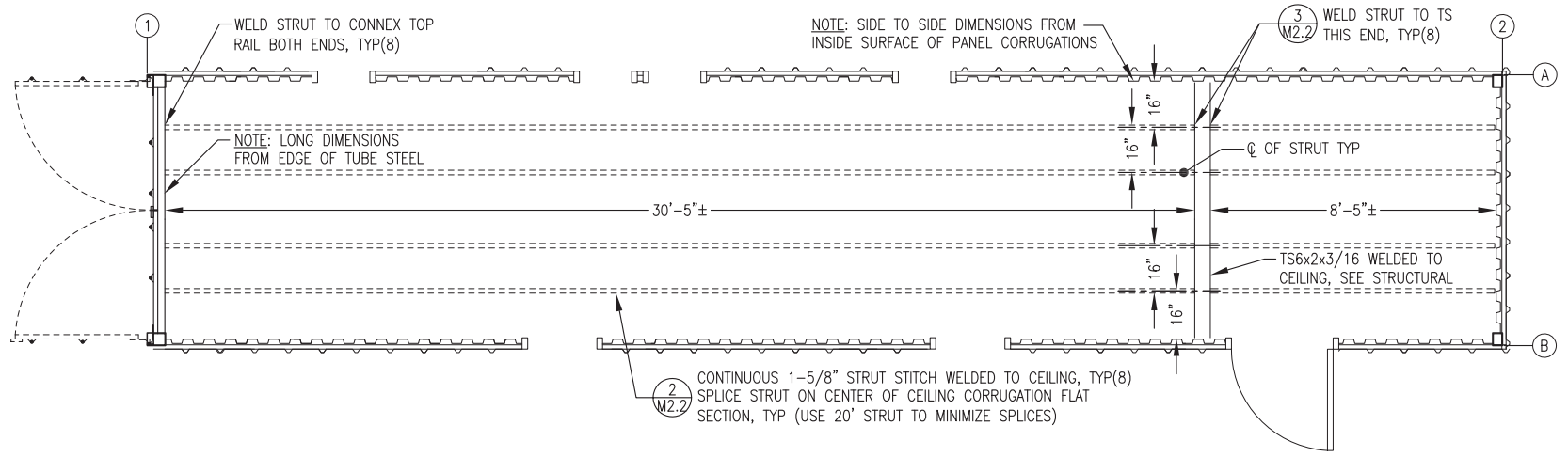
- GENERAL NOTES:**
- 1) FABRICATE GENERATOR SUPPORTS FROM ASTM A36 CHANNEL AS SHOWN.
 - 2) ALL CEILING-MOUNTED STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED), B-LINE B22-PLN OR EQUAL. ALL WALL-MOUNTED STRUT 12 GAUGE 13/16"x1-5/8" SOLID BACK PLAIN (UNFINISHED) B-LINE B52-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MAKE CONTINUOUS RUNS.
 - 3) MAKE ALL JOINTS WITH CONTINUOUS BUTT, GROOVE OR FILLET WELDS UNLESS SPECIFICALLY INDICATED OTHERWISE
 - 4) INSTALL ALL SUPPORTS AND PENETRATIONS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS AND STEEL FRAMING THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE PAINTING SPECIFICATIONS AND ARCHITECTURAL.
 - 5) AFF IS STRUT CENTERLINE ELEVATION ABOVE THE STEEL CONTAINMENT FLOOR IN THE GENERATION ROOM, APPROXIMATELY 2-1/4" ABOVE THE ORIGINAL CONNEX FLOOR. SEE ARCHITECTURAL AND STRUCTURAL.

REVISIONS	MARK	DATE
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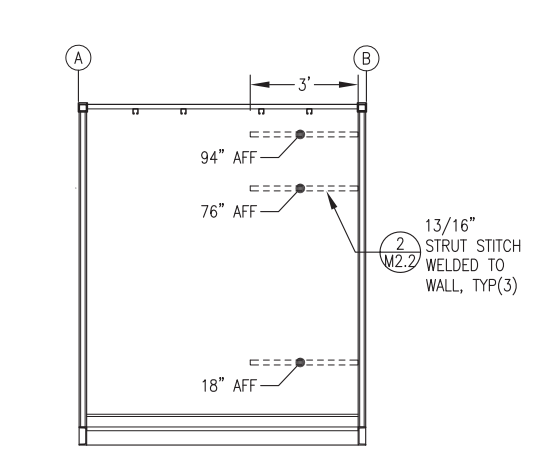


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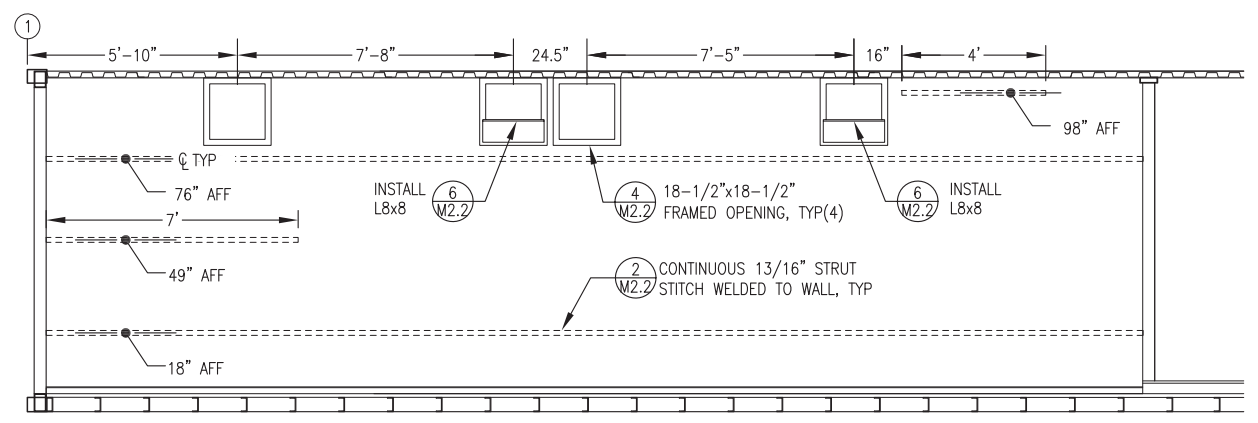
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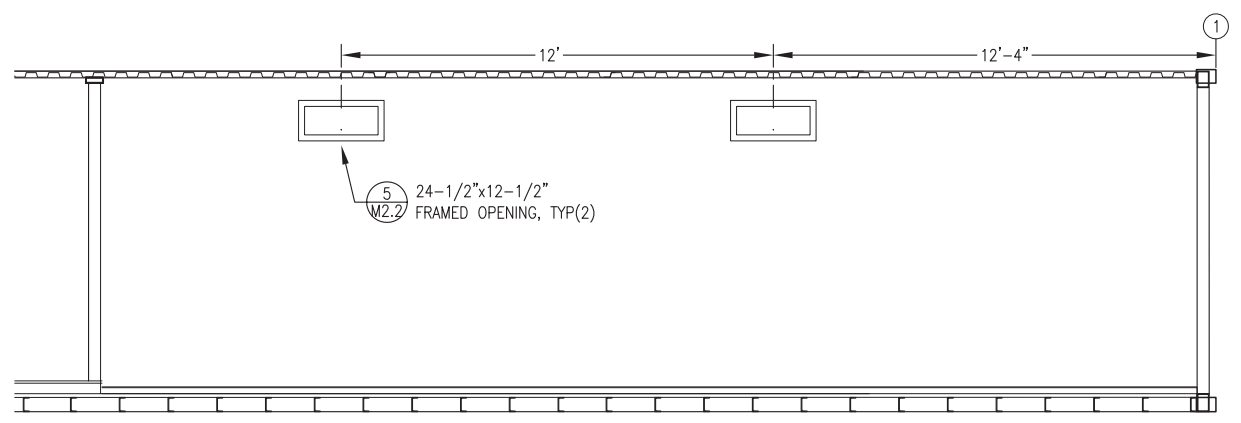
2 CEILING MECHANICAL SUPPORT PLAN
 M2.1 3/8"=1'-0"



3 END WALL (GRID 2) INTERIOR ELEVATION
 M2.1 3/8"=1'-0"



4 BACK WALL (GRID A) INTERIOR ELEVATION
 M2.1 3/8"=1'-0"



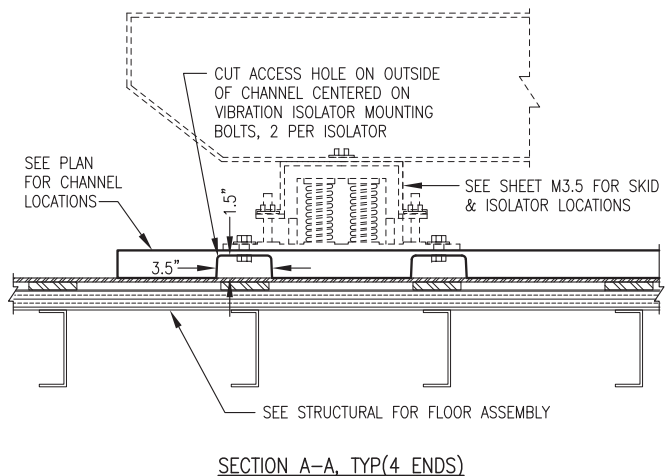
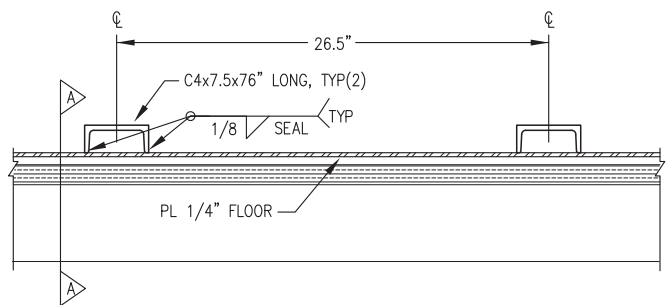
5 FRONT WALL (GRID B) INTERIOR ELEVATION
 M2.1 3/8"=1'-0"

MERTARVIK PHASE 1 POWER SYSTEM

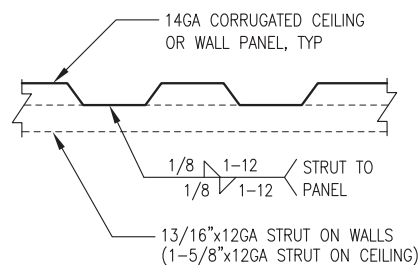
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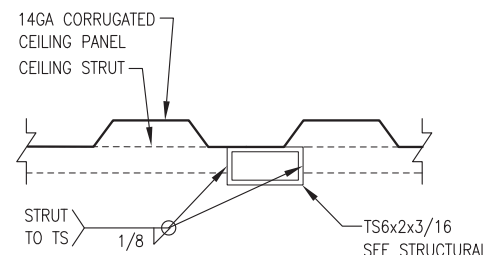
SHEET TITLE	
MECHANICAL SUPPORT & PENETRATION PLANS & ELEVATIONS	
SHEET	
M2.1	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



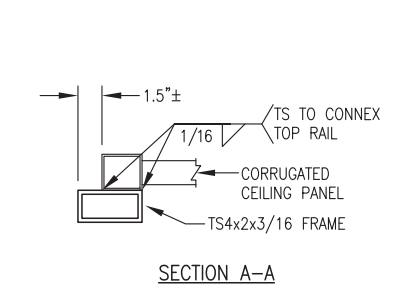
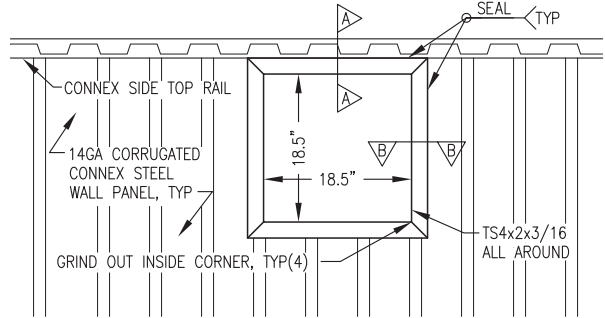
1 GENERATOR SUPPORT CHANNEL FABRICATION
M2.2 1"=6"



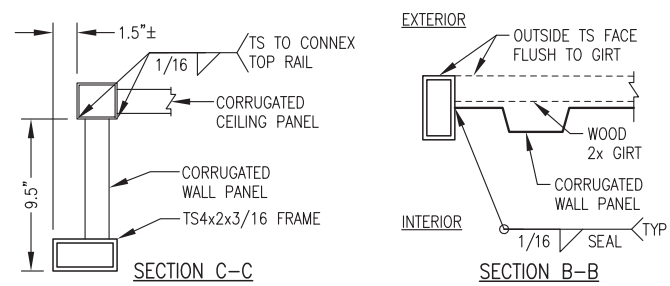
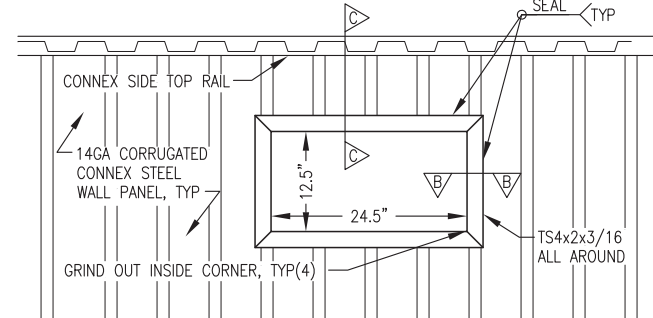
2 STRUT ATTACHMENT TO CEILING/WALL
M2.2 NO SCALE



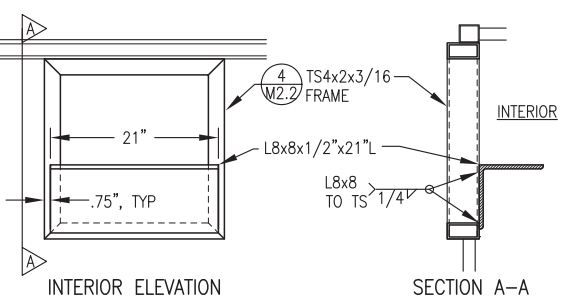
3 STRUT ATTACHMENT TO TS
M2.2 NO SCALE



4 TYPICAL 18-1/2" x 18-1/2" FRAMED OPENING
M2.2 1"=1'-0"



5 TYPICAL 24-1/2" x 12-1/2" FRAMED OPENING
M2.2 1"=1'-0"



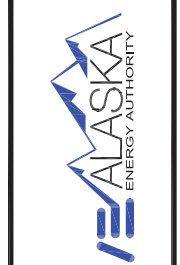
6 EXHAUST SUPPORT AT FRAMED OPENING
M2.2 1"=1'-0"

FRAMED GENERAL OPENING NOTES:
 1) FABRICATE FRAMED OPENINGS WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
 2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED.
 3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

REVISIONS	MARK	DATE
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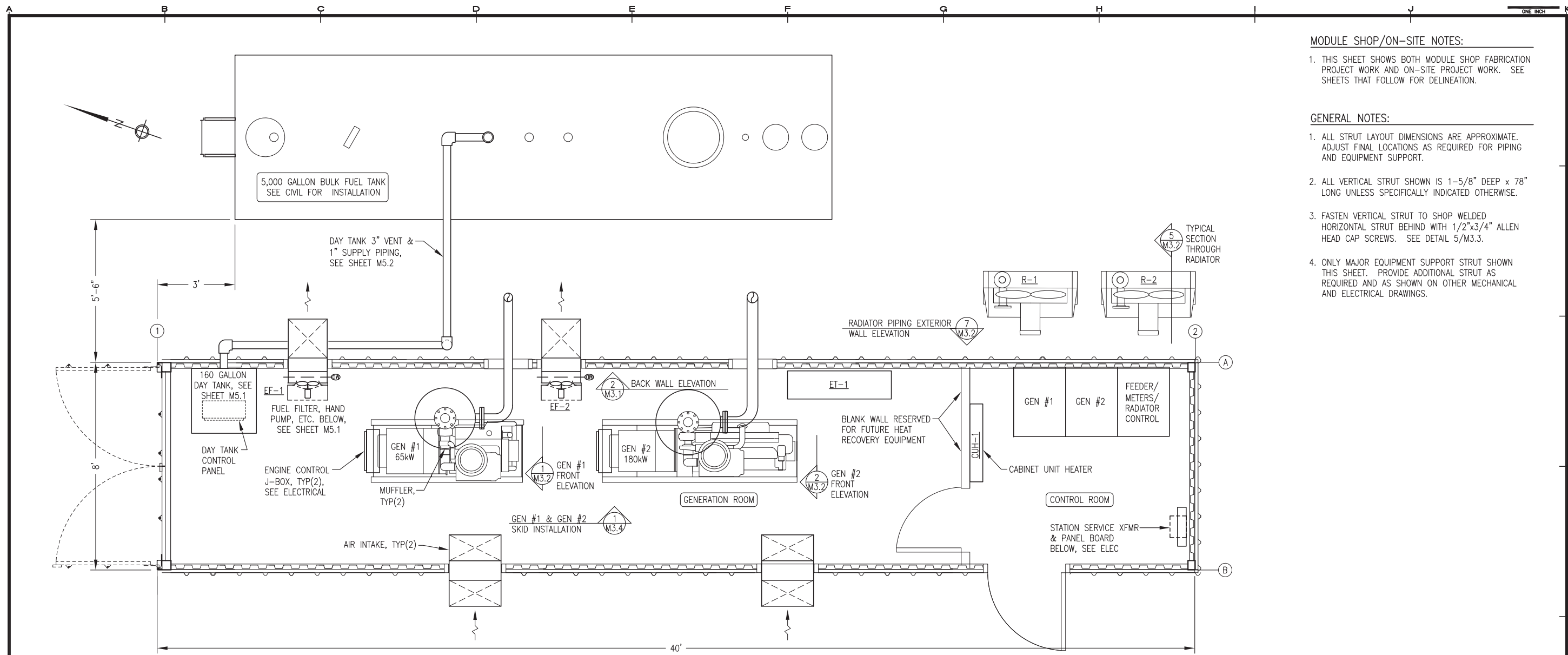


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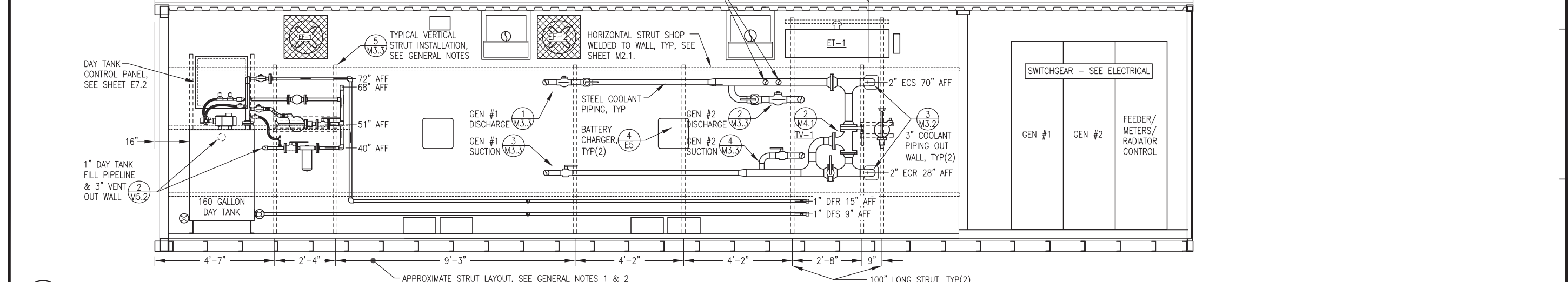
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SHEET TITLE	
MECHANICAL SUPPORT & PENETRATION DETAILS	
SHEET	
M2.2	
DRAWN BY: JTD	CHECKED BY: BCG
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1 EQUIPMENT LAYOUT PLAN
M3.1 1/2"=1'-0"

NOTES: 1) ALL FUEL PIPING AND APPURTENANCES NOT SHOWN THIS VIEW FOR CLARITY. SEE SHEET M5.1 FOR PIPING PLAN, DIAGRAM & DETAILS. 2) ALL ENGINE COOLANT PIPING AND DEVICES SHOWN NOT THIS VIEW FOR CLARITY. SEE SHEETS M4.1 & M4.2 FOR PIPING PLAN, ISOMETRIC & DETAILS.



2 BACK WALL ELEVATION
M3.1 1/2"=1'-0"

MODULE SHOP/ON-SITE NOTES:

1. THIS SHEET SHOWS BOTH MODULE SHOP FABRICATION PROJECT WORK AND ON-SITE PROJECT WORK. SEE SHEETS THAT FOLLOW FOR DELINEATION.

GENERAL NOTES:

1. ALL STRUT LAYOUT DIMENSIONS ARE APPROXIMATE. ADJUST FINAL LOCATIONS AS REQUIRED FOR PIPING AND EQUIPMENT SUPPORT.
2. ALL VERTICAL STRUT SHOWN IS 1-5/8" DEEP x 78" LONG UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. FASTEN VERTICAL STRUT TO SHOP WELDED HORIZONTAL STRUT BEHIND WITH 1/2"x3/4" ALLEN HEAD CAP SCREWS. SEE DETAIL 5/M3.3.
4. ONLY MAJOR EQUIPMENT SUPPORT STRUT SHOWN THIS SHEET. PROVIDE ADDITIONAL STRUT AS REQUIRED AND AS SHOWN ON OTHER MECHANICAL AND ELECTRICAL DRAWINGS.

REVISIONS	MARK	DATE	DESCRIPTION
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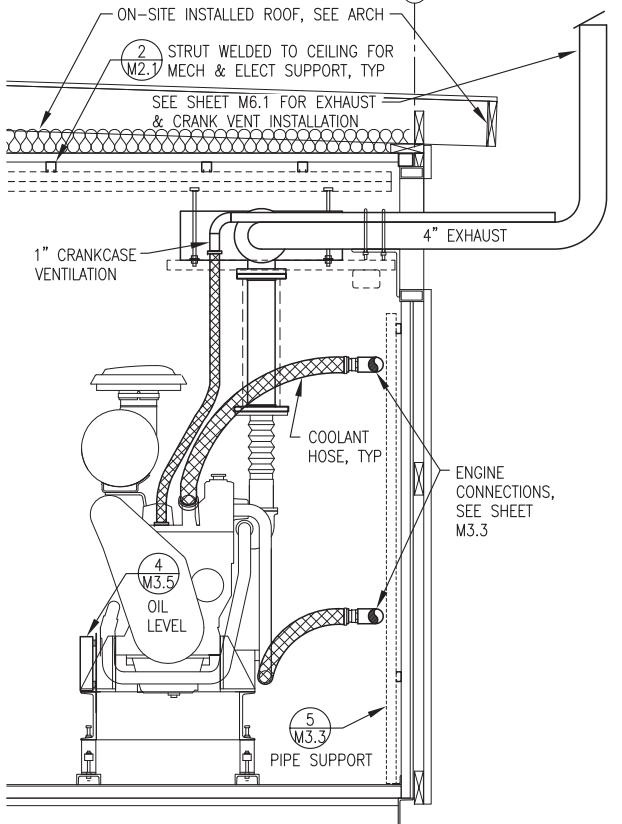
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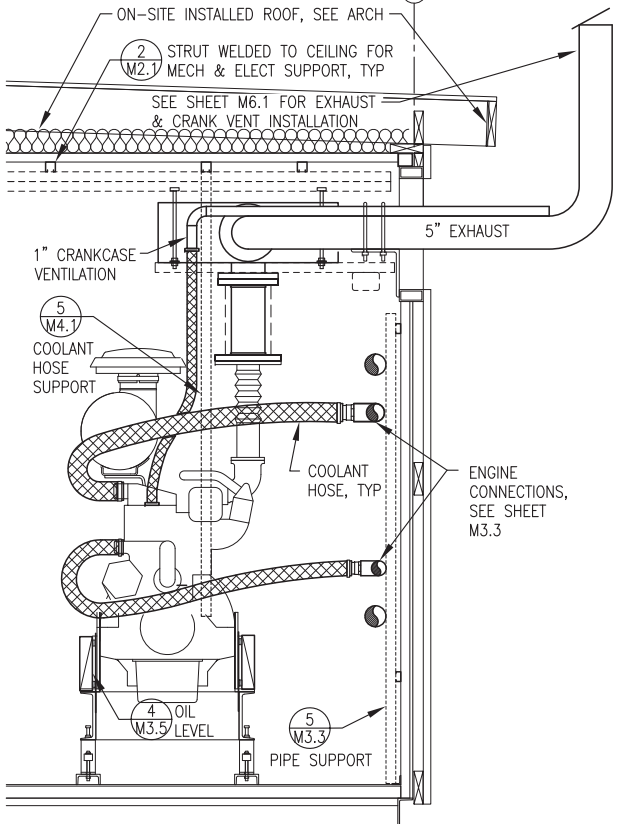
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SHEET TITLE LAYOUT PLAN & WALL ELEVATION	
SHEET M3.1	
DRAWN BY JTD	CHECKED BY BCG
DATE 2/12/18	SCALE AS NOTED
JOB NUMBER:	

THIS SHEET SHOWS PRIMARILY ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE MODULE SHOP FABRICATION CONTRACT SCOPE ARE SHOWN CLOUDED.



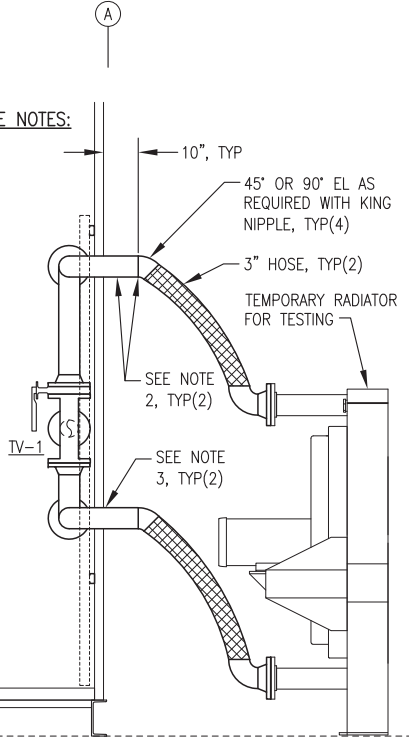
1 GENERATOR #1 FRONT END VIEW
M3.2 3/4"=1'-0"



2 GENERATOR #2 FRONT END VIEW
M3.2 3/4"=1'-0"

MODULE SHOP/ON-SITE NOTES:

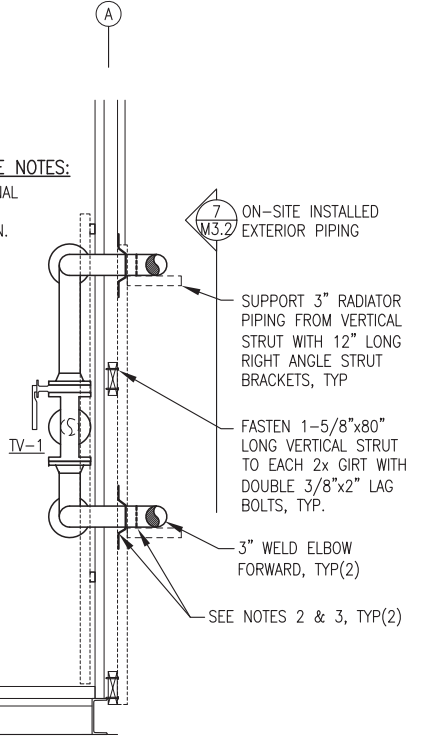
- THIS DETAIL SHOWS TEMPORARY CONFIGURATION FOR TESTING DURING SHOP FABRICATION.
- IN SHOP STUB 3" PIPE MIN 10" BEYOND WALL. AFTER TESTING & DRAINING CUT EL OFF & TAKE PIPING APART AT FIRST FLANGED CONNECTIONS INSIDE MODULE. REMOVE PIPE & STORE IN MODULE.
- IN SHOP HOLE SAW 1"Ø OVERSIZE OPENING. AFTER REMOVAL OF PIPE SEAL WALL PENETRATION FOR SHIPPING.



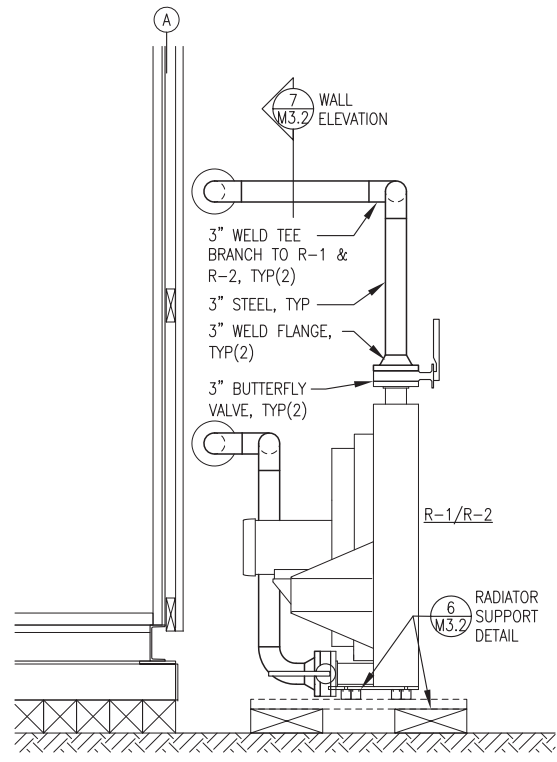
3 TEMPORARY SHOP FABRICATION PIPING OUT WALL
M3.2 3/4"=1'-0"

MODULE SHOP/ON-SITE NOTES:

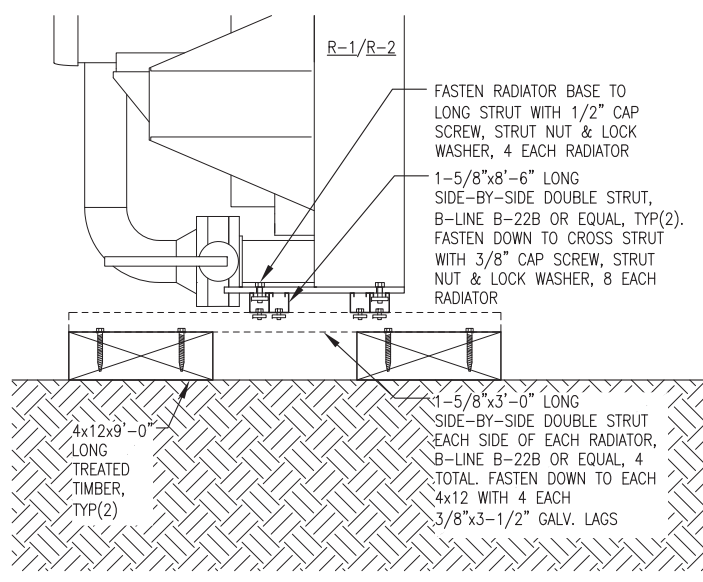
- THIS DETAIL SHOWS FINAL CONFIGURATION DURING ON-SITE CONSTRUCTION.
- ON-SITE REINSTALL PIPE STUBS THROUGH WALL, CUT TO LENGTH, THEN WELD TO NEW PIPING.
- AFTER FINAL ON-SITE ASSEMBLY FLASH & SEAL PENETRATION IN ACCORDANCE WITH DETAIL 6/M3.3.



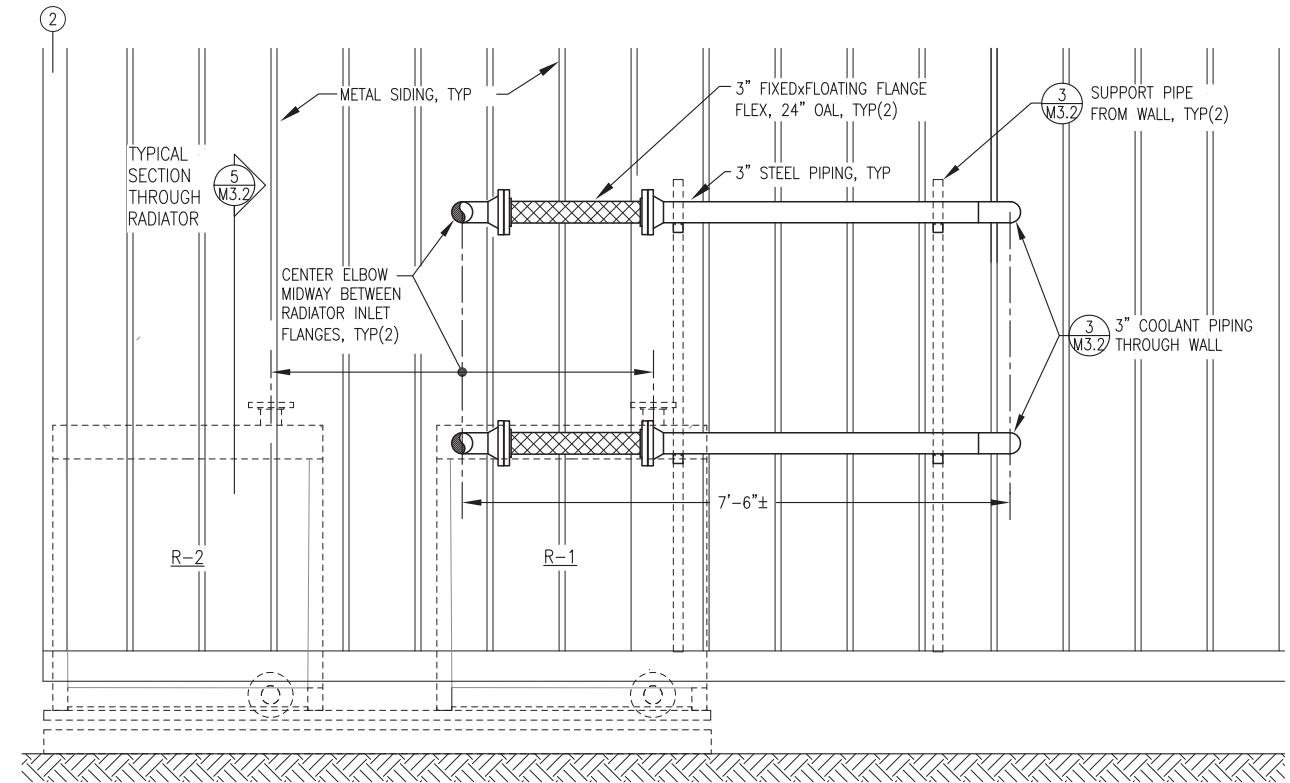
4 FINAL ON-SITE PIPING OUT WALL
M3.2 3/4"=1'-0"



5 TYPICAL SECTION THROUGH RADIATOR
M3.2 3/4"=1'-0"



6 RADIATOR SUPPORT DETAIL
M3.2 NO SCALE



7 RADIATOR PIPING EXTERIOR WALL ELEVATION
M3.2 3/4"=1'-0"

REVISIONS	MARK	DATE	DESCRIPTION
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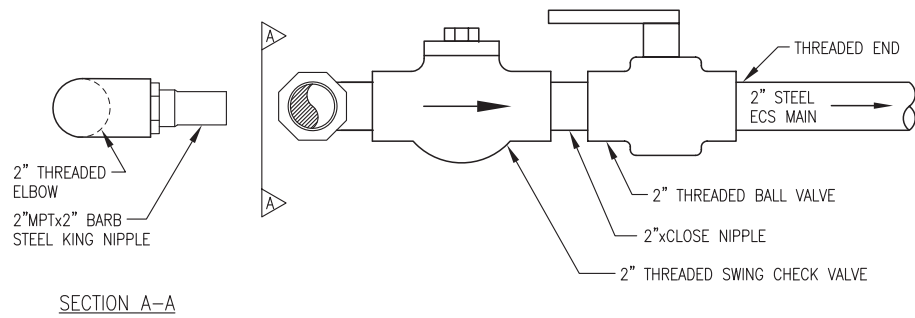
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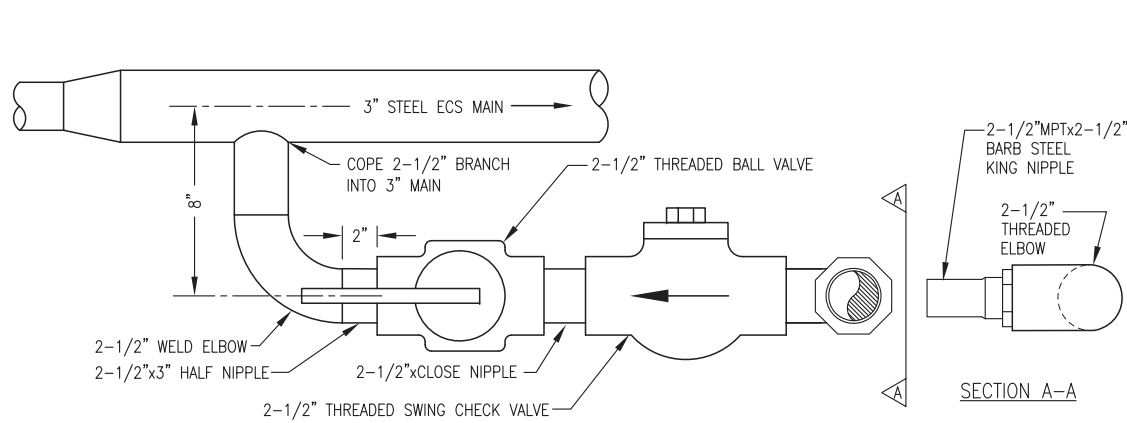
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SHEET TITLE	
SECTIONS, ELEVATIONS, & DETAILS	
SHEET	
M3.2	
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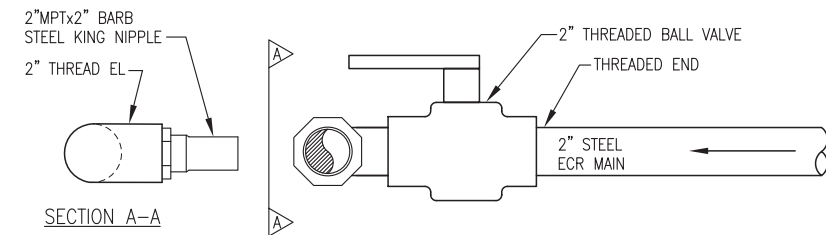
- NOTES:
- 1) MAIN PIPING 2" OR 3" STEEL AS INDICATED WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
 - 2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED.

1 GENERATOR #1 DISCHARGE CONNECTION
M3.3 NO SCALE



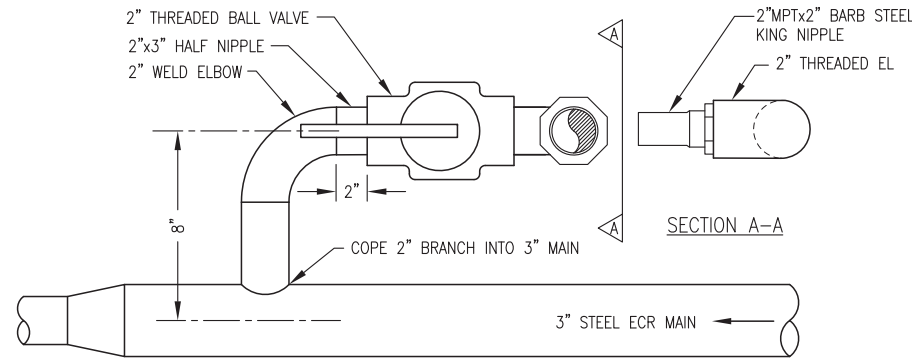
- NOTES:
- 1) MAIN PIPING 2" OR 3" STEEL AS INDICATED WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
 - 2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED.

2 GENERATOR #2 DISCHARGE CONNECTION
M3.3 NO SCALE



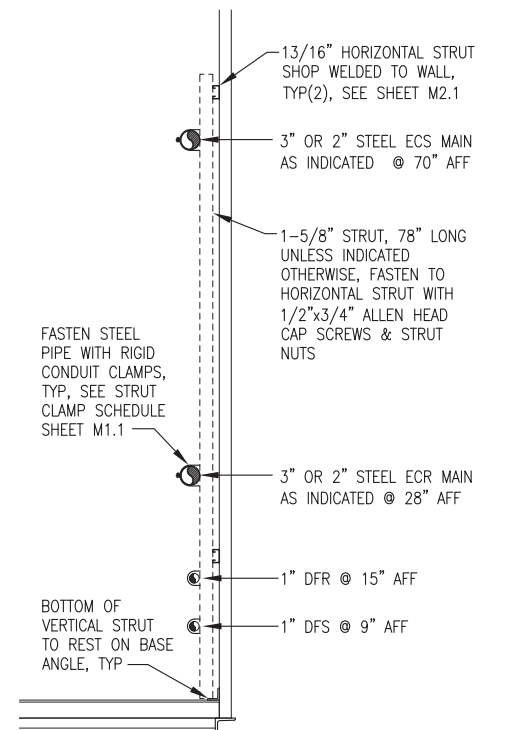
- NOTES:
- 1) MAIN PIPING 2" OR 3" STEEL AS INDICATED WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
 - 2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED.

3 GENERATOR #1 SUCTION CONNECTION
M3.3 NO SCALE

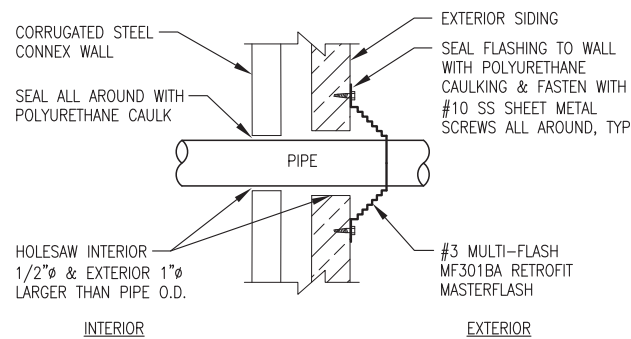


- NOTES:
- 1) MAIN PIPING 2" OR 3" STEEL AS INDICATED WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
 - 2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED.

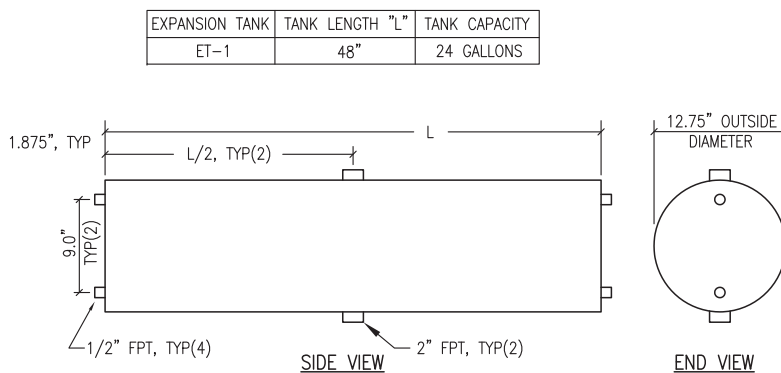
4 GENERATOR #2 SUCTION CONNECTION
M3.3 NO SCALE



5 TYPICAL PIPE SUPPORT AT BACK WALL
M3.3 1"=1'-0"



6 COOLANT PIPE WALL PENETRATION
M3.3 NO SCALE



7 GLYCOL EXPANSION TANK ET-1 FABRICATION
M3.3 1"=6"

EXPANSION TANK GENERAL NOTES:

- 1) FABRICATE SINGLE WALL NOMINAL CAPACITY GLYCOL EXPANSION TANK, SEE TABLE FOR CAPACITIES.
- 2) FABRICATE SHELL FROM MINIMUM 10 GAUGE ASTM A-36 PLATE STEEL ROLLED AND WELDED OR SCHEDULE 5 LIGHTWALL ASTM A53 STEEL PIPE. FABRICATE HEADS FROM 3/16" THICK ASTM A-36 PLATE STEEL. MAKE ALL JOINTS WITH CONTINUOUS FULL-PENETRATION WELDS.
- 3) PROVIDE WITH ALL OPENINGS INDICATED USING MINIMUM 3000# FORGED STEEL PIPE HALF COUPLINGS IN ACCORDANCE WITH U.L. 142 FIGURE 7.1 #2.
- 4) PRESSURE TEST COMPLETED ASSEMBLY TO 15 PSIG MINIMUM.
- 5) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PRIME AND COVER WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
- 6) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS, AIR DRY INTERIOR, AND SEAL ALL TANK OPENINGS WITH PLASTIC PLUGS.

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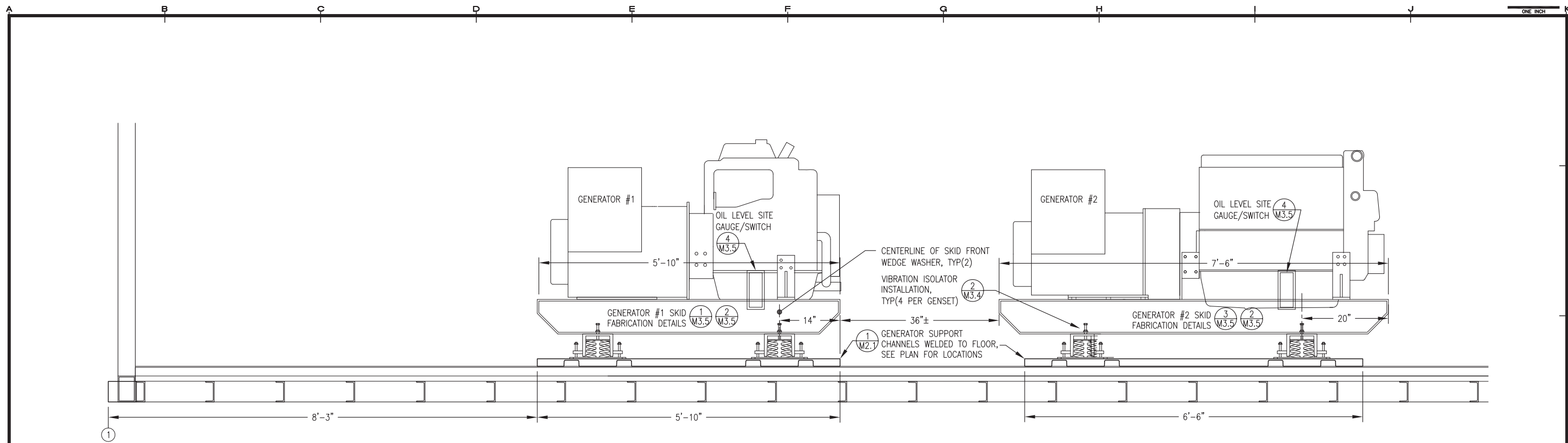
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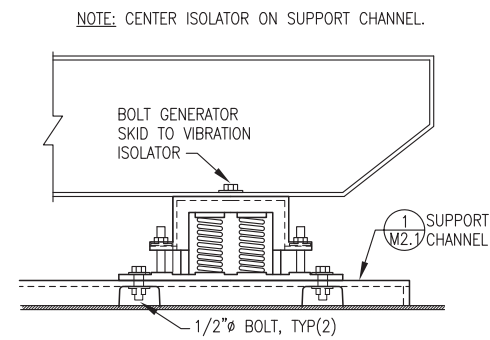
SHEET TITLE
MECHANICAL DETAILS

SHEET
M3.3

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1 GENERATOR #1 & #2 SKID INSTALLATION
M3.4 1"=1'-0"



2 GENERATOR VIBRATION ISOLATOR INSTALLATION
M3.4 NO SCALE

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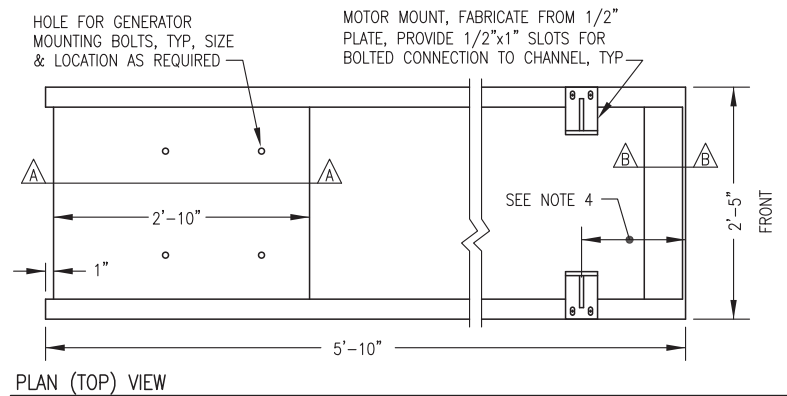
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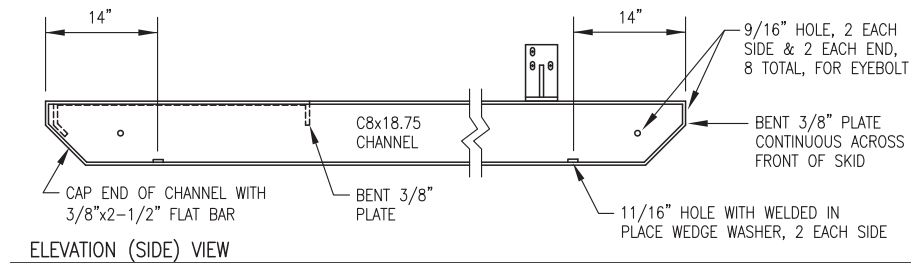


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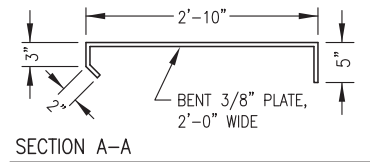
SHEET TITLE	
SECTIONS, ELEVATIONS, & DETAILS	
SHEET	
M3.4	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
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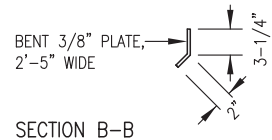
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A-A

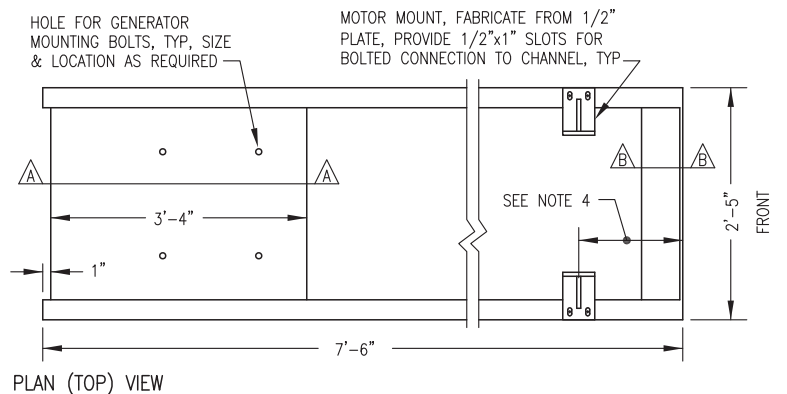


SECTION B-B

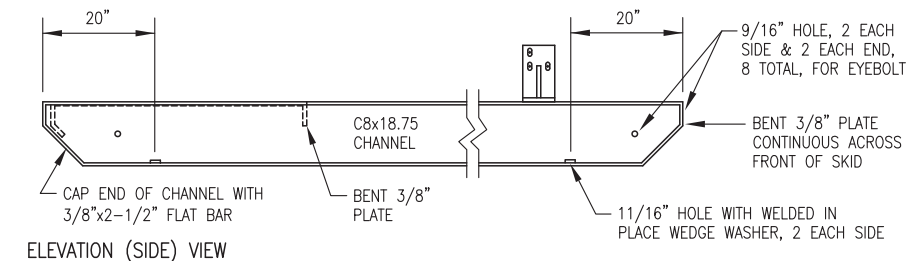
NOTES:

- 1) FABRICATE FROM ASTM A-36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
- 2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL-PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
- 3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE-GENERATOR.
- 4) PLACE ENGINE ON SKID SO THAT THE CENTERLINE OF THE EXHAUST RISER IS 3'-0" FROM THE FRONT OF THE SKID.

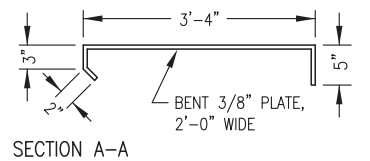
1 GENERATOR #1 SKID FABRICATION
M3.5 NO SCALE



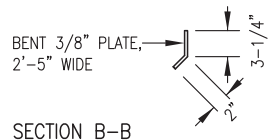
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A-A

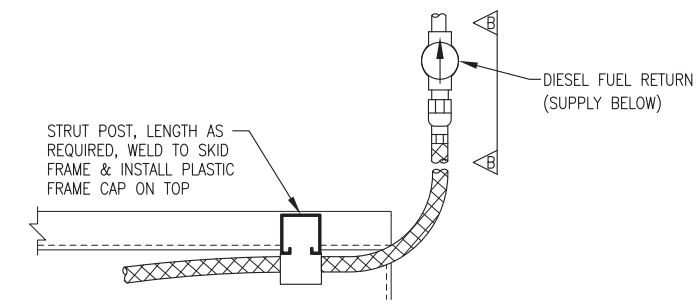


SECTION B-B

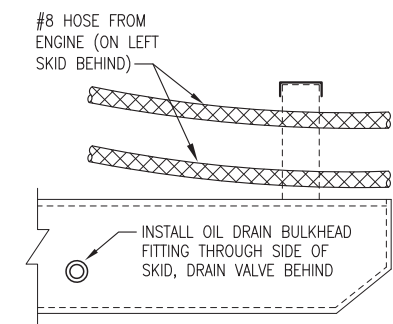
NOTES:

- 1) FABRICATE FROM ASTM A-36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
- 2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL-PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
- 3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE-GENERATOR.
- 4) PLACE ENGINE ON SKID SO THAT THE CENTERLINE OF THE EXHAUST RISER IS 4'-2.5" FROM THE FRONT OF THE SKID.

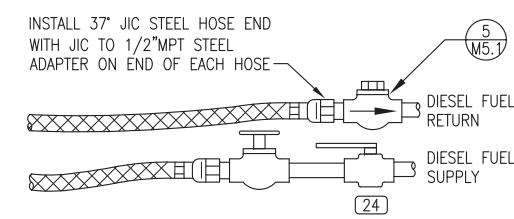
3 GENERATOR #2 SKID FABRICATION
M3.5 NO SCALE



LEFT SKID PLAN (TOP) VIEW

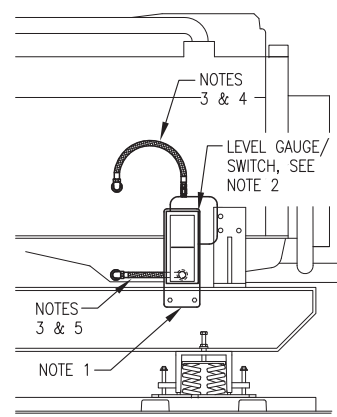


RIGHT SKID ELEVATION (SIDE) VIEW



END ELEVATION VIEW B-B

2 TYPICAL GENERATOR SKID FUEL HOSE TERMINATIONS & OIL DRAIN
M3.5 NO SCALE



4 TYPICAL OIL LEVEL GAUGE/SWITCH INSTALLATION
M3.5 NO SCALE

NOTES:

- 1) 1/4" STEEL SUPPORT PLATE PRE-DRILLED TO MATCH GAUGE/SWITCH MOUNTS, CHANNEL SKID HOLES AND BOTTOM HOSE ENTRANCE. BOLT TO INSIDE (BACK) OF CHANNEL SKID AT HEIGHT AS REQUIRED TO CENTER GAUGE AT NORMAL FULL OIL LEVEL. ADJUST SWITCH CONTACTS 1/2" ABOVE & BELOW.
- 2) MOUNT OIL LEVEL GAUGE/SWITCH TO STEEL SUPPORT PLATE WITH RUBBER SHOCK MOUNTS.
- 3) #8 HOSE WITH 1/2" OR 3/8" NPT JIC SWIVEL ENDS AS REQUIRED.
- 4) CONNECT TOP (VENT) PORT TO ENGINE CRANK CASE WITH HOSE. ROUTE UPPER HOSE TO AVOID LOW POINT TRAPS.
- 5) CONNECT BOTTOM PORT TO ENGINE OIL PAN WITH HOSE. DO NOT TEE INTO OIL DRAIN LINE. ROUTE LOWER HOSE BACK THROUGH PRE-DRILLED HOLE IN STEEL PLATE.

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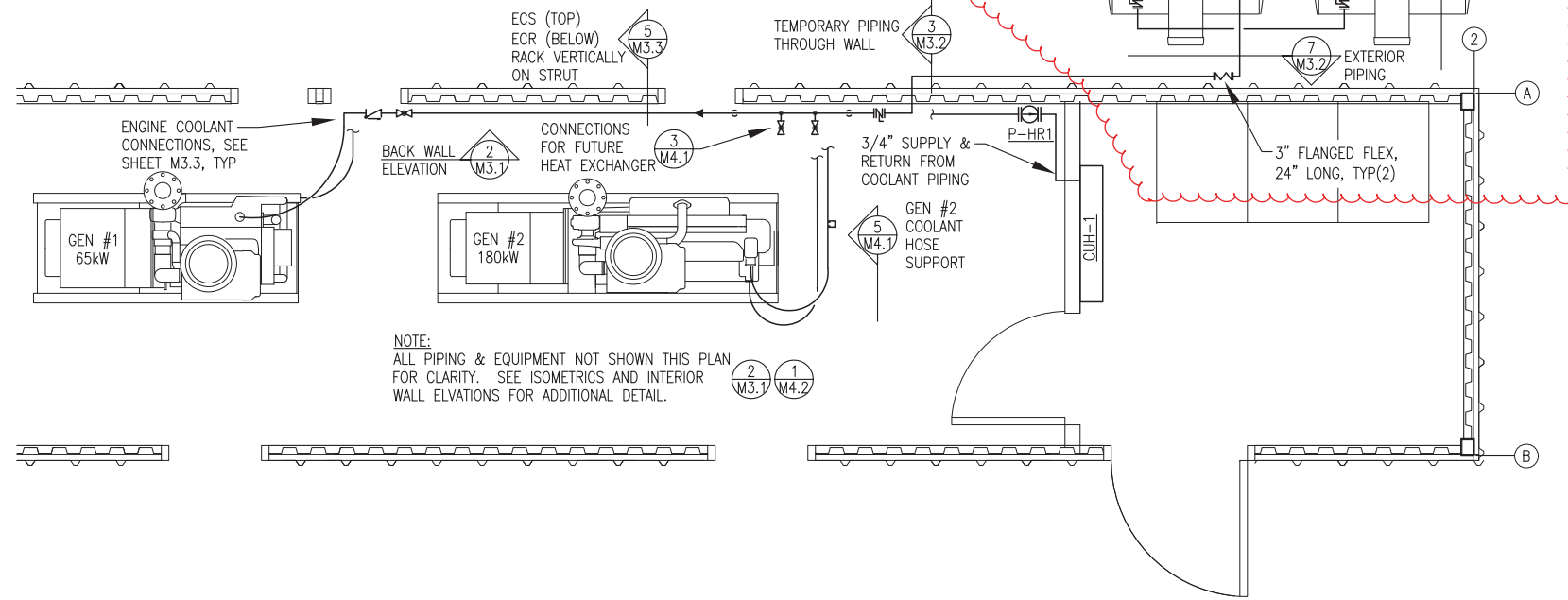
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SHEET TITLE	
GENERATOR DETAILS	
SHEET	
M3.5	
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MODULE SHOP/ON-SITE NOTES:

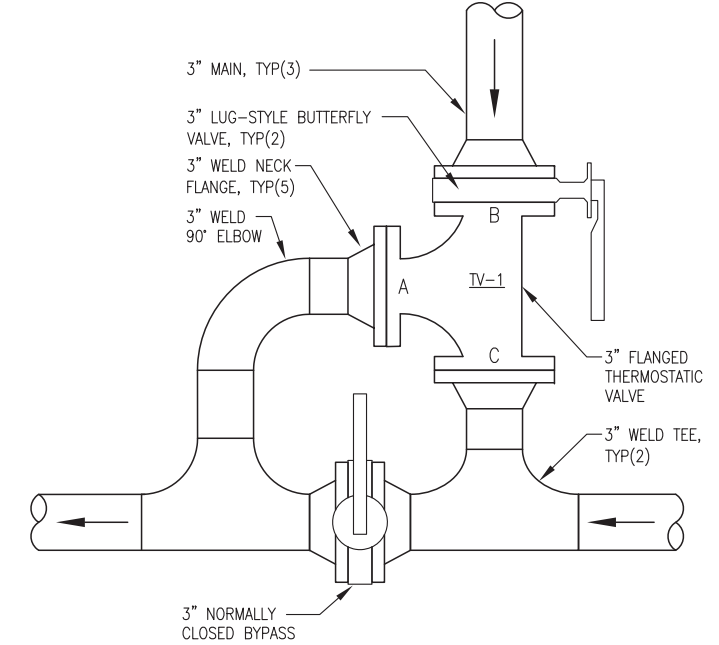
1. ALL INTERIOR WORK INCLUDED IN MODULE SHOP FABRICATION PROJECT WORK AND ALL EXTERIOR WORK INCLUDED ON-SITE PROJECT WORK.



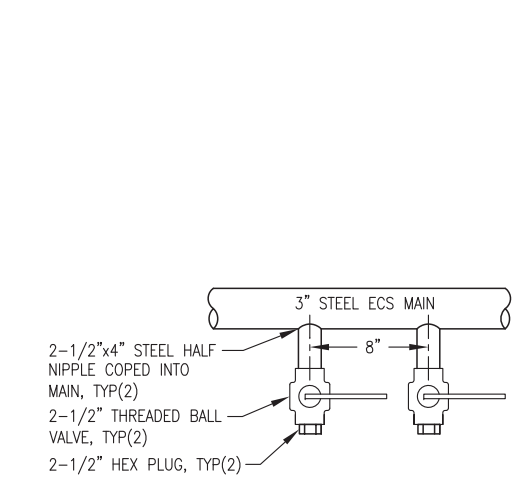
NOTE:
ALL PIPING & EQUIPMENT NOT SHOWN THIS PLAN FOR CLARITY. SEE ISOMETRICS AND INTERIOR WALL ELEVATIONS FOR ADDITIONAL DETAIL.

1 COOLANT PIPING PLAN
M4.1 1/2"=1'-0"

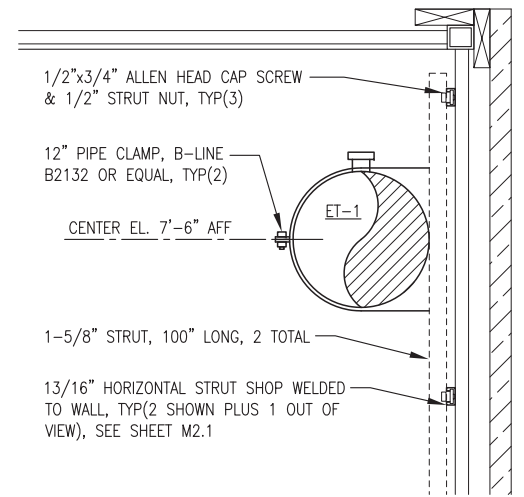
THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.



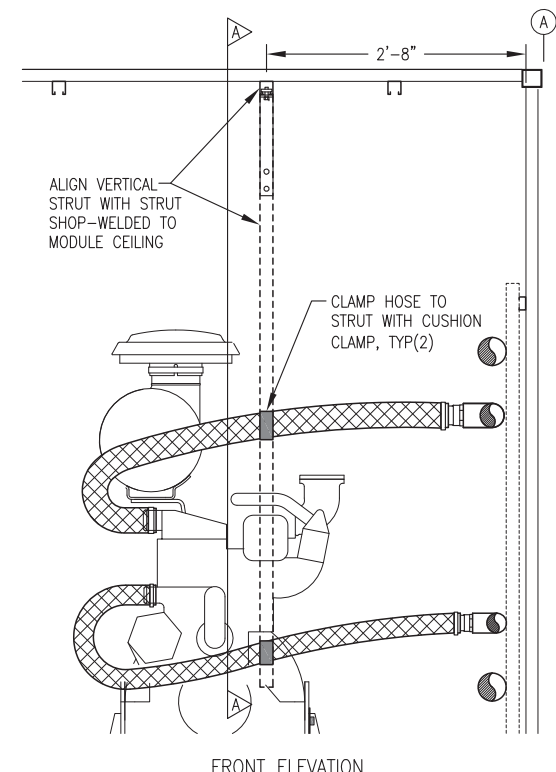
2 TV-1 INSTALLATION
M4.1 NO SCALE



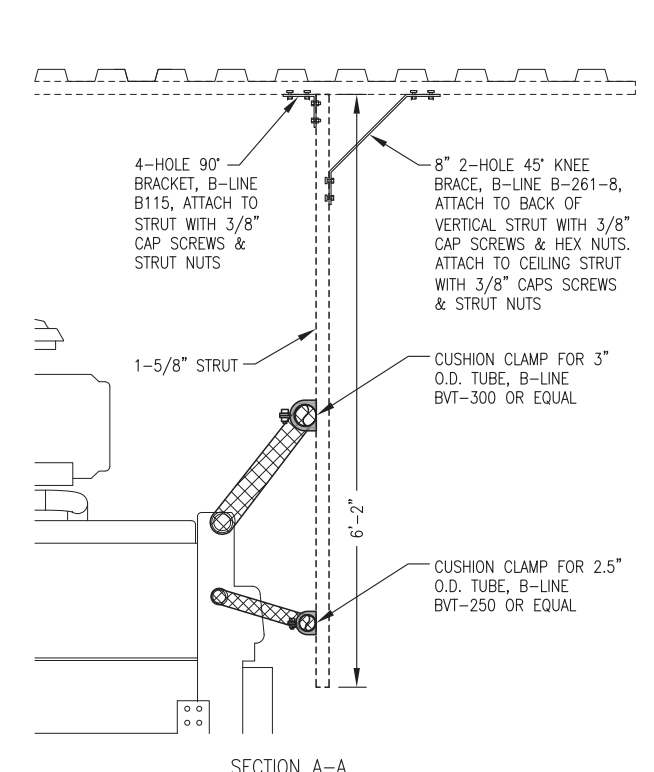
3 CONNECTIONS FOR FUTURE HX
M4.1 NO SCALE



4 EXPANSION TANK SUPPORT
M4.1 NO SCALE



5 GEN #2 COOLANT HOSE SUPPORT DETAIL
M4.1 NO SCALE



REVISIONS	MARK	DATE	DESCRIPTION
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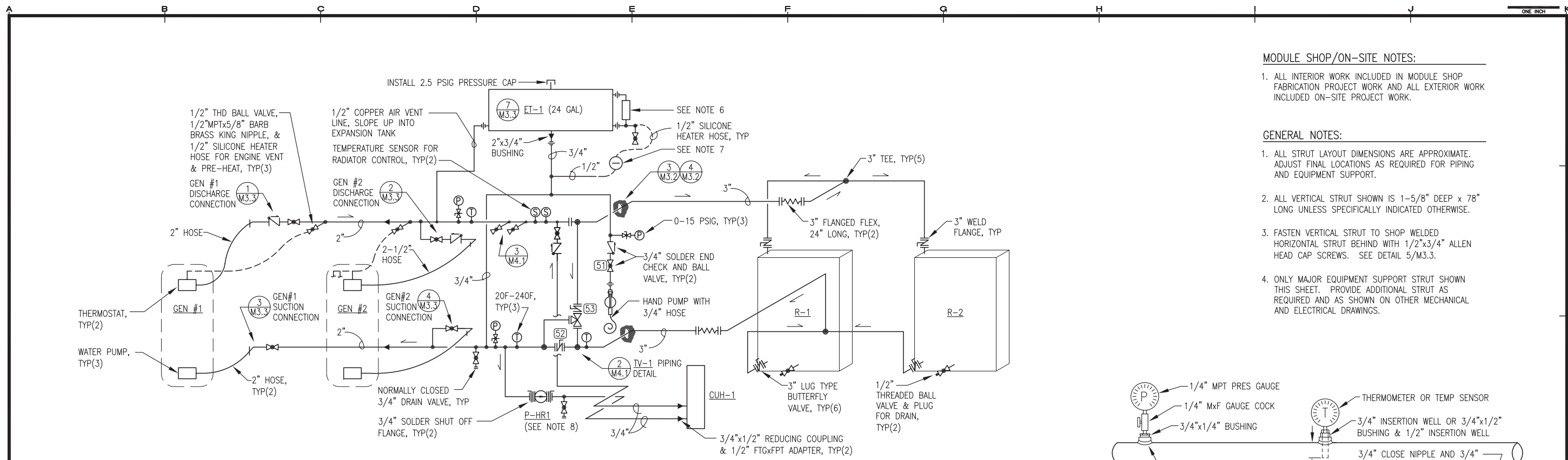
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SHEET TITLE	
COOLANT PIPING PLAN & DETAILS	
SHEET	
M4.1	
DRAWN BY	CHECKED BY
JTD	BCG
DATE	SCALE
2/12/18	AS NOTED
JOB NUMBER:	



NOTES:

- 1) ALL 2" AND LARGER PIPING SHOWN THIS ISOMETRIC SCH 40 STEEL WITH WELDED JOINTS. ALL OTHER PIPE SHOWN THIS ISOMETRIC TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.
- 2) ALL PRESSURE GAUGES 0-15 PSIG. ALL THERMOMETERS 20-240F. TEMPERATURE SENSORS FURNISHED WITH RADIATOR CONTROLS IN SWITCHGEAR.
- 3) UNLESS INDICATED OTHERWISE MAKE ALL CONNECTIONS TO STEEL MAINS FOR INSTRUMENTATION AND DRAINS IN ACCORDANCE WITH DETAIL 2/M4.2. MAKE ALL SIMILAR CONNECTIONS TO COPPER BRANCH PIPING 3/4" T-DRILL TAP OR TEE AND 3/4" FTGXFPT ADAPTER. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS IN STEEL MAINS WITH COPEDED CONNECTIONS AND IN COPPER MAINS WITH T-DRILL TAPS OR TEES AS REQUIRED UNLESS INDICATED OTHERWISE.
- 4) UPON COMPLETION OF FABRICATION FLUSH INTERIOR OF PIPING WITH WATER TO REMOVE ALL DEBRIS AND RESIDUE AND DRAIN PRIOR TO FILLING WITH GLYCOL.
- 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. MOUNT WITH SWITCH POINT ELEVATION LEVEL WITHIN 12" OF BOTTOM OF TANK. CONNECT TO BOTTOM WITH 1/2" STREET EL & 1/2"NPTx5/8" BARB. CONNECT TO TOP WITH 1/4" STREET EL & 1/4"NPTx5/8" BARB.
- 8) SET P-HR1 TO OPERATE ON SPEED 1.

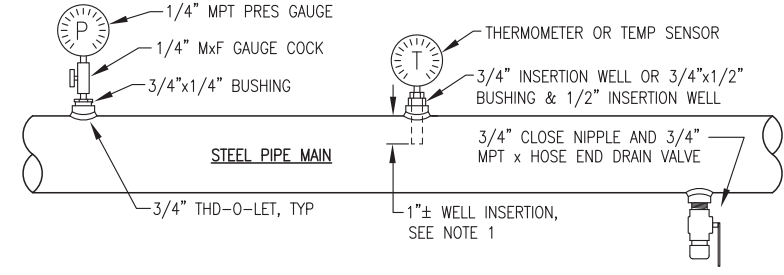
1 COOLING SYSTEM PIPING ISOMETRIC
M4.2 NO SCALE

MODULE SHOP/ON-SITE NOTES:

1. ALL INTERIOR WORK INCLUDED IN MODULE SHOP FABRICATION PROJECT WORK AND ALL EXTERIOR WORK INCLUDED ON-SITE PROJECT WORK.

GENERAL NOTES:

1. ALL STRUT LAYOUT DIMENSIONS ARE APPROXIMATE. ADJUST FINAL LOCATIONS AS REQUIRED FOR PIPING AND EQUIPMENT SUPPORT.
2. ALL VERTICAL STRUT SHOWN IS 1-5/8" DEEP x 78" LONG UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. FASTEN VERTICAL STRUT TO SHOP WELDED HORIZONTAL STRUT BEHIND WITH 1/2"x3/4" ALLEN HEAD CAP SCREWS. SEE DETAIL 5/M3.3.
4. ONLY MAJOR EQUIPMENT SUPPORT STRUT SHOWN THIS SHEET. PROVIDE ADDITIONAL STRUT AS REQUIRED AND AS SHOWN ON OTHER MECHANICAL AND ELECTRICAL DRAWINGS.



NOTES:

- 1) FOR MAINS SMALLER THAN 3" AND FOR EXTRA LONG INSERTION WELLS, INSTALL 3/4" CLOSE NIPPLE & COUPLING TO LIMIT WELL INSERTION DEPTH INTO MAIN.
- 2) TEMPERATURE SENSOR INSTALLATION SIMILAR TO THERMOMETER EXCEPT USE 3/4"x1/2" BUSHING.

2 TYPICAL INSTRUMENT INSTALLATION
M4.2 NO SCALE

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. RADIATORS AND EXTERIOR PIPING ARE IN THE ON-SITE CONTRACT SCOPE AS NOTED.

REVISIONS	MARK	DATE	DESCRIPTION
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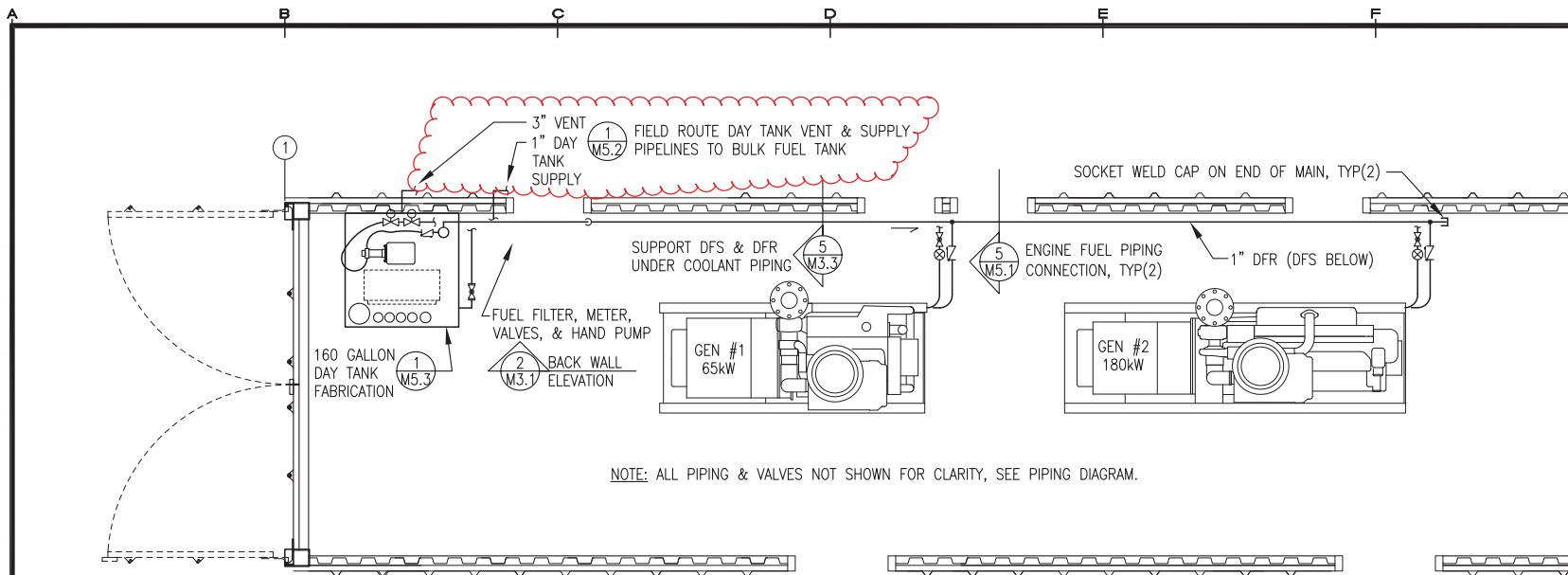


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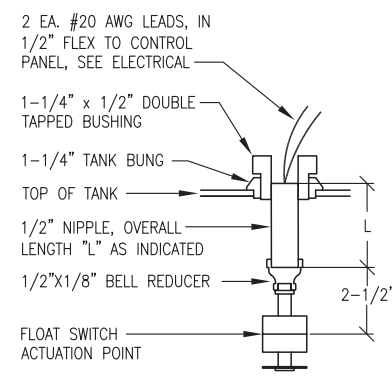
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ALASKA ENERGY AUTHORITY
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SHEET TITLE	
COOLANT SYSTEM ISOMETRIC & DETAILS	
SHEET	
M4.2	
DRAWN BY	CHECKED BY
JTD	BCG
DATE	SCALE
2/12/18	AS NOTED
JOB NUMBER	

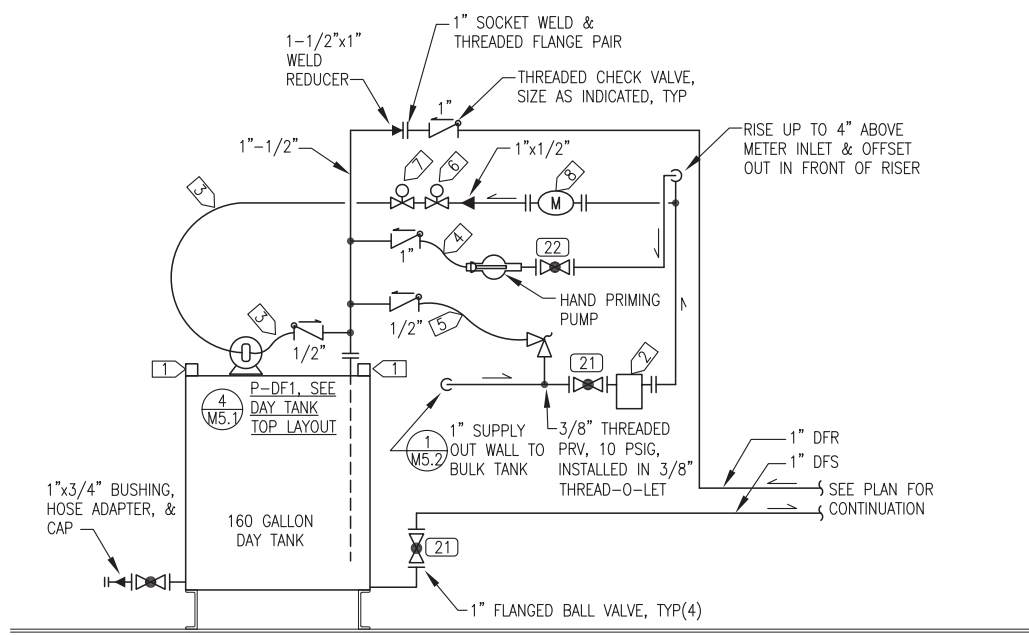


1 MODULE FUEL PIPING PLAN
M5.1 1/2"-1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

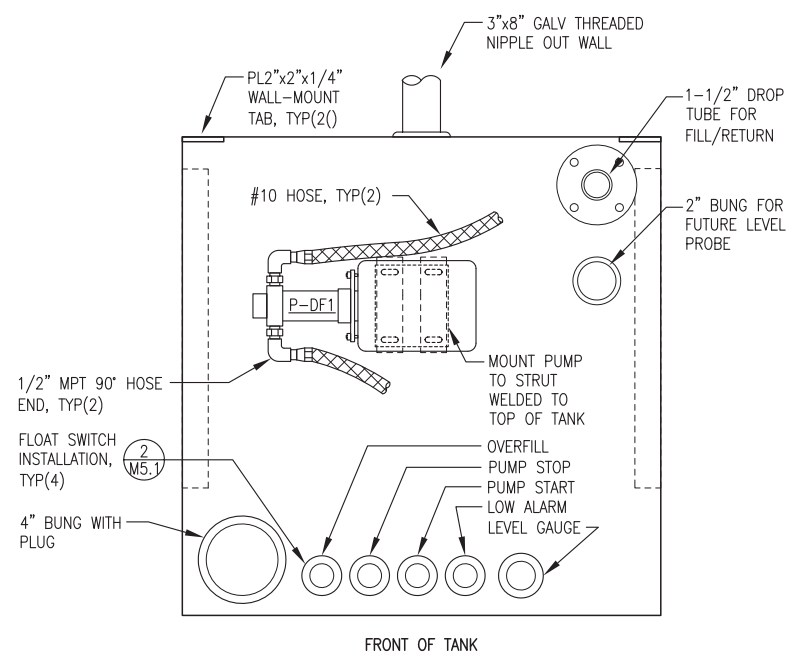


2 DAY TANK FLOAT SWITCH INSTALLATION
M5.1 NO SCALE

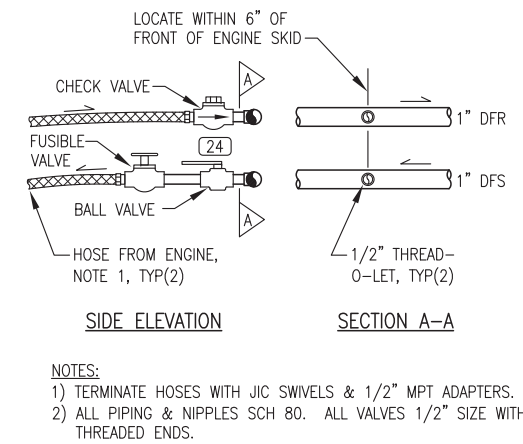


- PIPING DIAGRAM SPECIFIC NOTES:**
- PLACE DAY TANK HARD AGAINST WALL BEHIND & FASTEN TO HORIZONTAL WALL STRUT WITH 1/2" BOLTS & STRUT NUTS.
 - 1" ANSI 150# FLANGED FILTER, REMOVE DRAIN VALVE & INSTALL 1/8" Mx F DRAIN COCK.
 - #10 HOSE WITH 1/2" NPT SWIVEL ENDS.
 - #10 HOSE WITH 1" NPT SWIVEL ENDS.
 - #8 HOSE WITH 1/2" & 3/8" NPT SWIVEL ENDS.
 - 1/2" NO SOLENOID VALVE.
 - 1/2" NC SOLENOID VALVE.
 - METER EQUIPPED WITH 300# FLANGED ENDS, PROVIDE 1" ANSI 300# FLANGES & GASKETS, SOCKET WELD ON INLET & THREADED ON OUTLET.
- PIPING DIAGRAM GENERAL NOTES:**
- SEE END WALL ELEVATION SHEET M3.1 FOR ADDITIONAL PIPING DETAIL AND ELEVATIONS.
 - ALL DAY TANK SUPPLY & RETURN PIPING 1" SCH 80 EXCEPT 1-1/2" DFR RISER ON DAY TANK AS NOTED. ALL DFS & DFR PIPING JOINTS SOCKET OR BUTT WELD EXCEPT FOR THREADED CONNECTIONS TO EQUIPMENT & VALVES.
 - ALL VENT PIPING 3" SCH 40 GALVANIZED STEEL WITH THREADED JOINTS.

3 DIESEL FUEL PIPING DIAGRAM
M5.1 NO SCALE



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



5 ENGINE FUEL PIPING CONNECTION
M5.1 NO SCALE

REVISIONS	MARK	DATE	DESCRIPTION
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SHEET TITLE	
DIESEL FUEL PIPING PLAN, DIAGRAM & DETAILS	
SHEET	
M5.1	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

THIS SHEET SHOWS PRIMARILY ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE MODULE SHOP FABRICATION CONTRACT SCOPE ARE SHOWN CLOUDED.

REVISIONS MARK	DATE	DESCRIPTION
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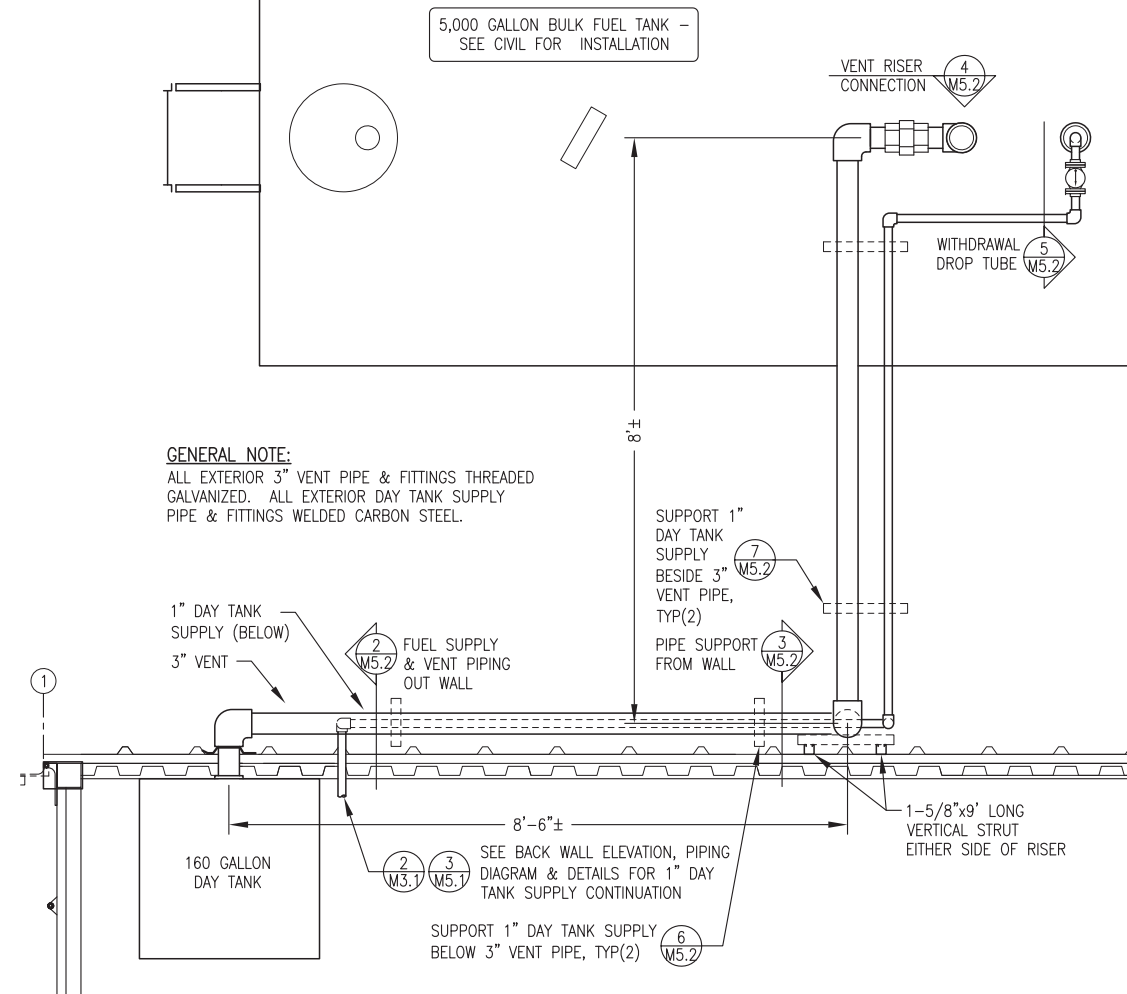


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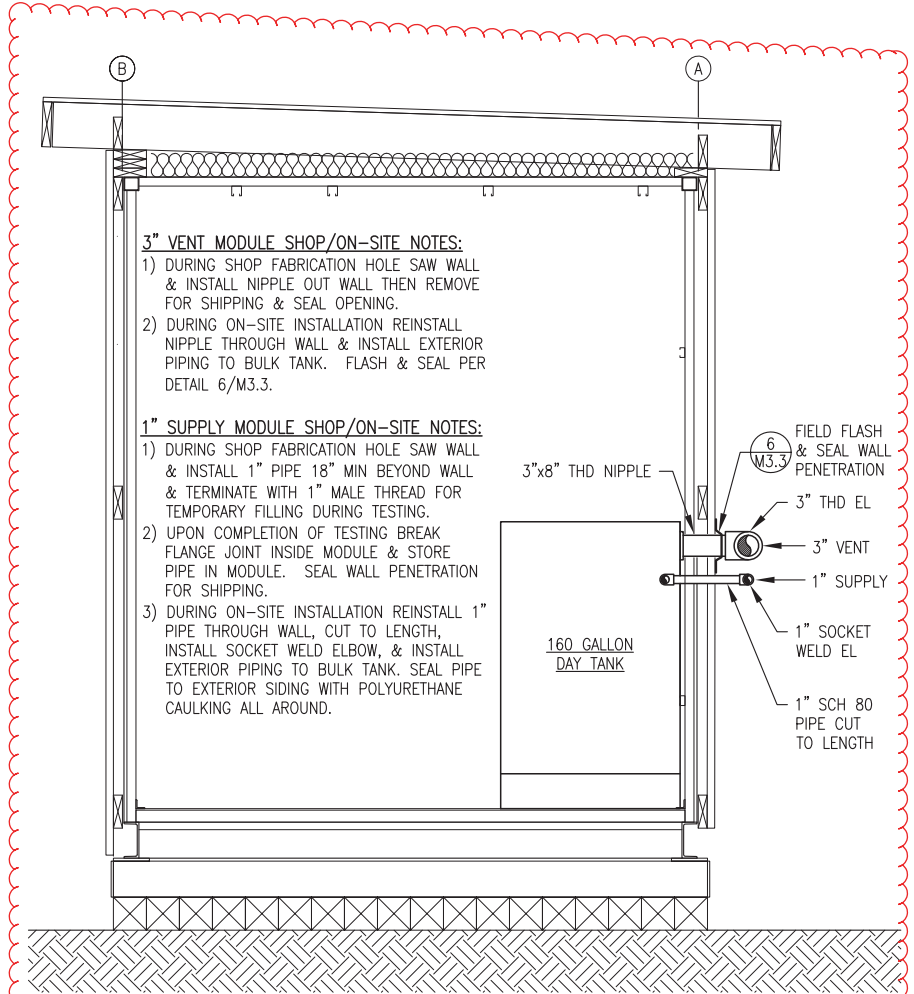


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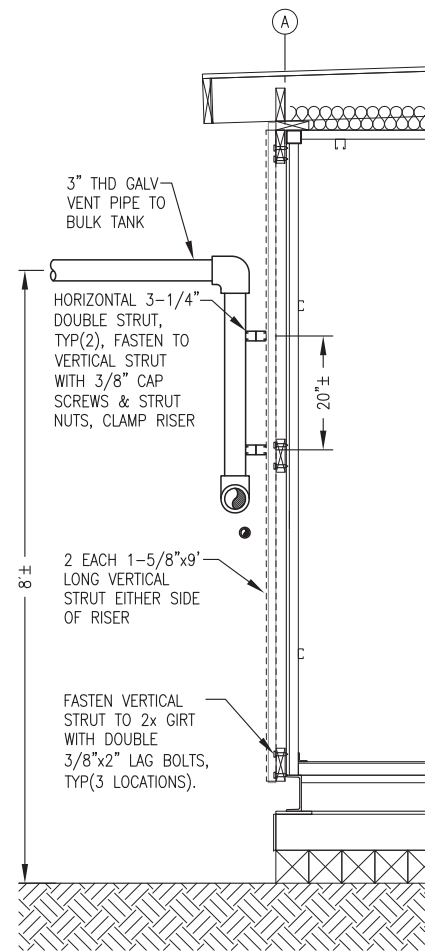
SHEET TITLE	
BULK FUEL TANK PIPING PLAN & DETAILS	
SHEET	
M5.2	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



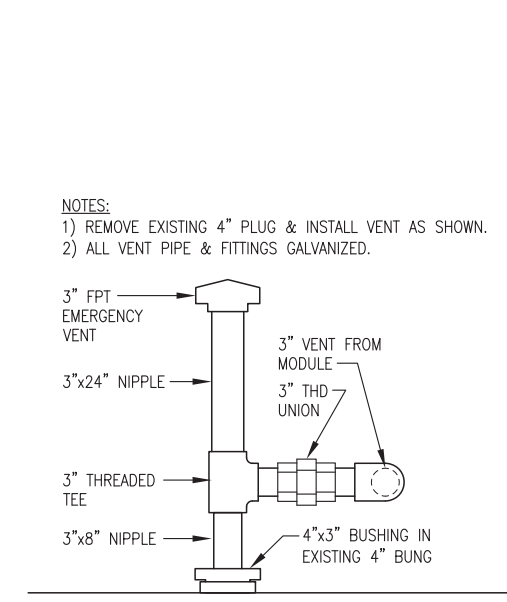
1 BULK FUEL TANK PIPING PLAN
 M5.2 3/4"=1'-0"



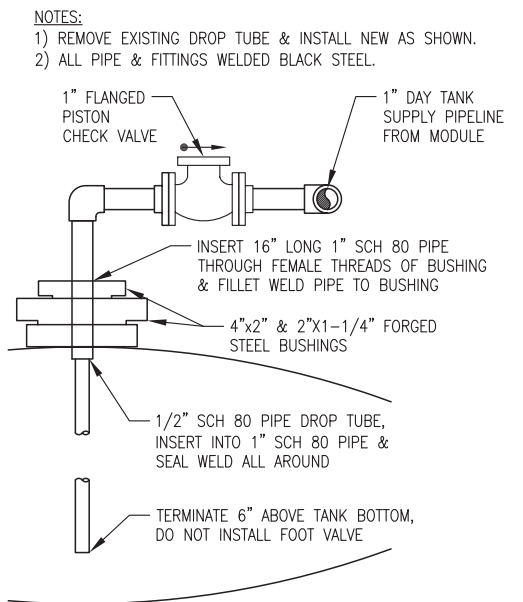
2 FUEL VENT & SUPPLY PIPING OUT WALL
 M5.2 3/4"=1'-0"



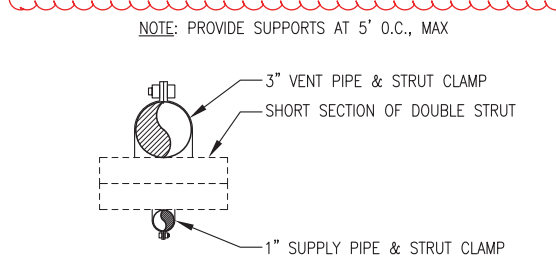
3 PIPING WALL SUPPORT
 M5.2 3/4"=1'-0"



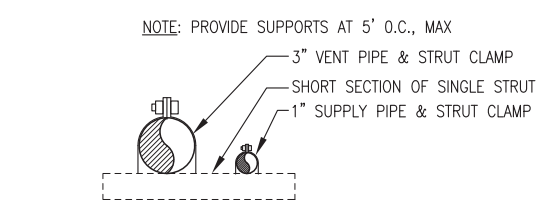
4 VENT RISER CONNECTION
 M5.2 NO SCALE



5 WITHDRAWAL DROP TUBE
 M5.2 NO SCALE



**6 1\"/>
 M5.2 3/4"=1'-0"**



**7 1\"/>
 M5.2 3/4"=1'-0"**

NOTES:
 1) REMOVE EXISTING DROP TUBE & INSTALL NEW AS SHOWN.
 2) ALL PIPE & FITTINGS WELDED BLACK STEEL.

NOTE: PROVIDE SUPPORTS AT 5' O.C., MAX

NOTE: PROVIDE SUPPORTS AT 5' O.C., MAX

NOTES:
 1) REMOVE EXISTING 4\"/>

5,000 GALLON BULK FUEL TANK - SEE CIVIL FOR INSTALLATION

GENERAL NOTE:
 ALL EXTERIOR 3\"/>

**3\"/>
 1) DURING SHOP FABRICATION HOLE SAW WALL & INSTALL NIPPLE OUT WALL THEN REMOVE FOR SHIPPING & SEAL OPENING.
 2) DURING ON-SITE INSTALLATION REINSTALL NIPPLE THROUGH WALL & INSTALL EXTERIOR PIPING TO BULK TANK. FLASH & SEAL PER DETAIL 6/M3.3.**

**1\"/>
 1) DURING SHOP FABRICATION HOLE SAW WALL & INSTALL 1\"/>
 2) UPON COMPLETION OF TESTING BREAK FLANGE JOINT INSIDE MODULE & STORE PIPE IN MODULE. SEAL WALL PENETRATION FOR SHIPPING.
 3) DURING ON-SITE INSTALLATION REINSTALL 1\"/>**

1/2\"/>
 INSERT INTO 1\"/>

TERMINATE 6\"/>
 DO NOT INSTALL FOOT VALVE

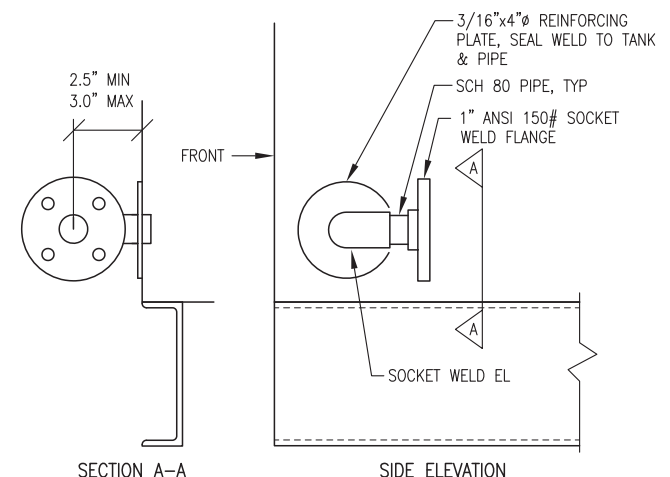
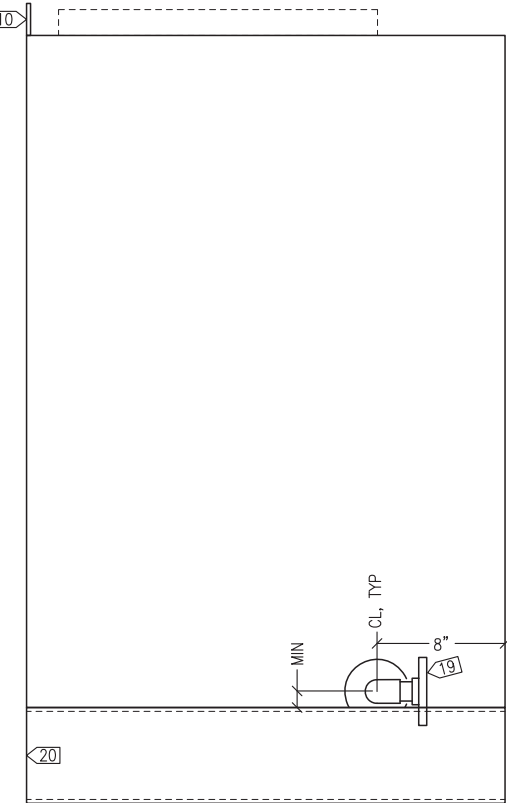
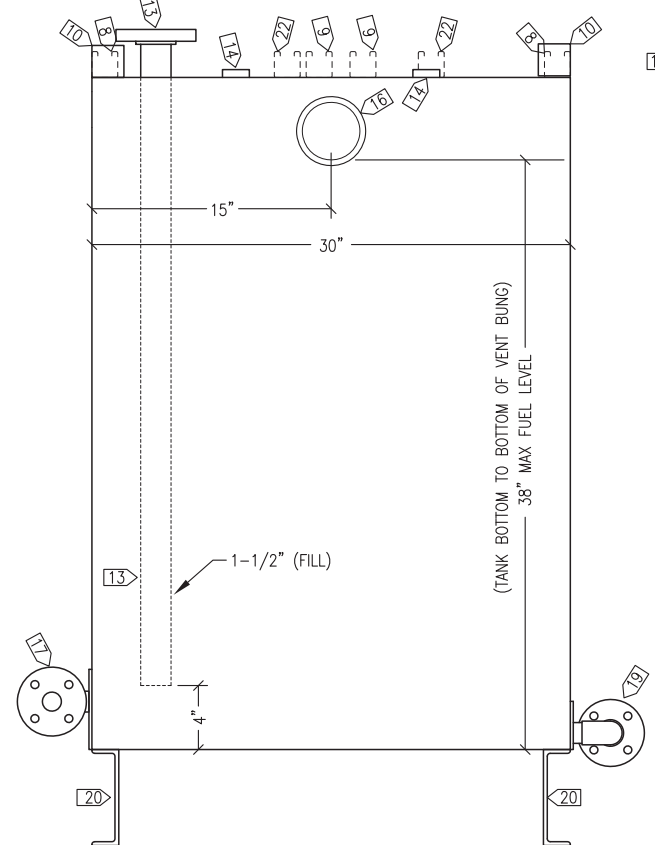
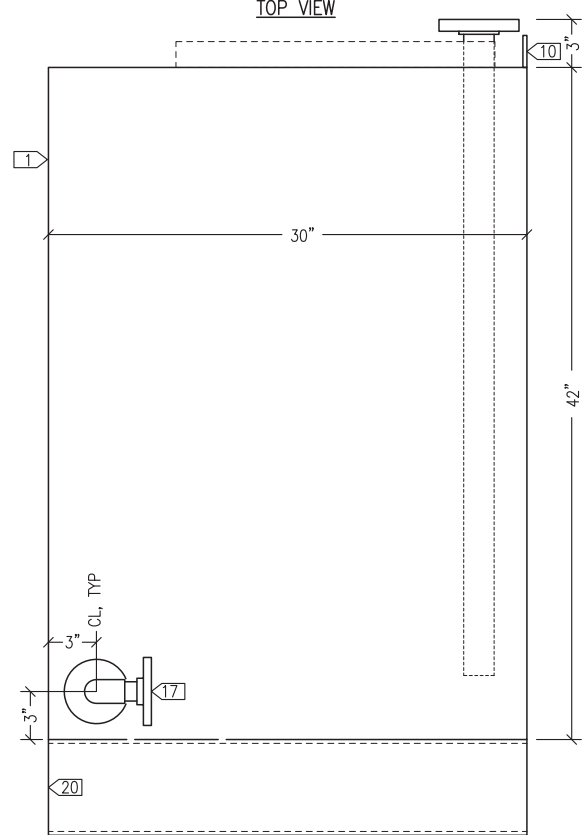
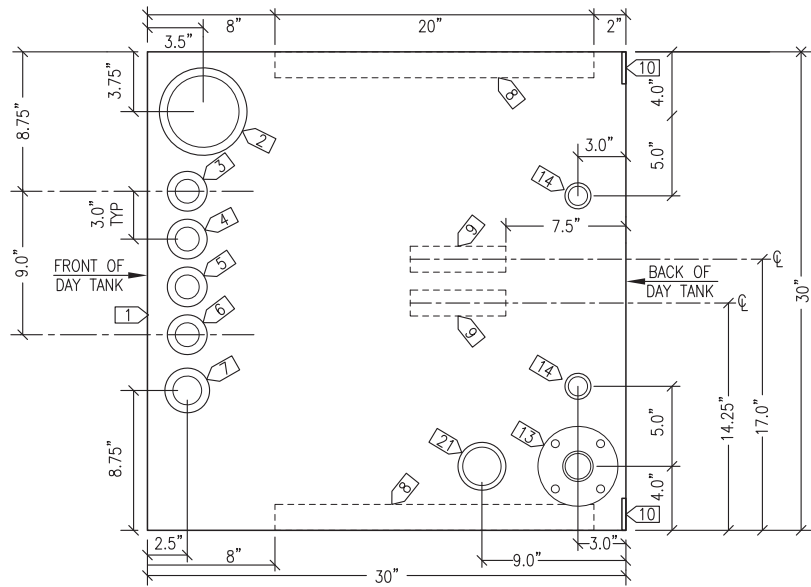
3\"/>
 SHORT SECTION OF SINGLE STRUT
 1\"/>

DAY TANK SPECIFICATIONS:

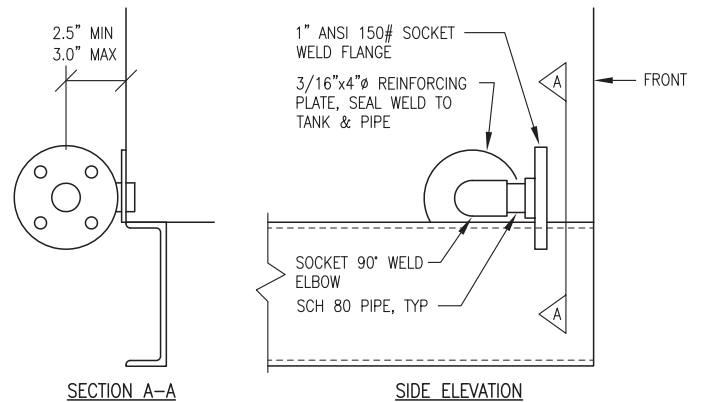
- 1) FABRICATE SINGLE WALL 160 GALLON NOMINAL CAPACITY DAY TANK. FABRICATE IN ACCORDANCE WITH UL 142.
- 2) FABRICATE FROM ASTM A-36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS IN ACCORDANCE WITH UL 142 FIGURE 6.5 - #1, #6, #7, OR #8.
- 3) PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. ALL STRUT TO BE 1-5/8"x1-5/8"x12 GA SOLID BACK PLAIN (BLACK), B-LINE B22 PLN OR EQUAL. SEAL WELD ALL TANK ATTACHMENTS.
- 4) INSTALL ALL FPT OPENINGS IN ACCORDANCE WITH UL 142 FIGURE 7.1 - #4 UNLESS INDICATED OTHERWISE. ALL DROP TUBES SCH 40 ASTM A53 STEEL PIPE WITH MPT OR FLANGED END AS INDICATED.
- 5) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.
- 6) LABEL ALL OPENINGS WITH 1/4" BLACK LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES IN SPECIFIC NOTES.
- 7) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. SEAL ALL MPT OPENINGS WITH THREADED STEEL CAPS. SEAL FPT TANK OPENINGS WITH THREADED STEEL PIPE PLUGS WHERE INDICATED. INSTALL 1-1/4" VENT CAP WHERE INDICATED. SEAL ALL OTHER FPT OPENINGS WITH PLASTIC OR STEEL PLUGS.

DAY TANK SPECIFIC NOTES:

- 1) PROVIDE 2" HIGH LETTERING: "DIESEL FUEL 160 GALLONS"
- 2) 4" FPT (MANUAL FILL) - INSTALL THREADED STEEL PLUG
- 3) 1-1/4" FPT (OVERFILL) - INSTALL VENT CAP FOR SHIPPING
- 4) 1-1/4" FPT (PUMP STOP)
- 5) 1-1/4" FPT (PUMP START)
- 6) 1-1/4" FPT (LOW ALARM)
- 7) 1-1/2" FPT (TANK GAUGE)
- 8) 20"L STRUT
- 9) 6"L STRUT
- 10) PL2"x2"x1/4" WALL-MOUNT TAB
- 11) NOT USED
- 12) NOT USED
- 13) 1-1/2" SCH 40 DROP TUBE (FILL) WITH 150# FLANGE
- 14) 1" FPT (SPARE) - INSTALL THREADED STEEL PLUG
- 15) NOT USED
- 16) 3" FPT (VENT/EMERGENCY VENT)
- 17) 1" FLANGE (SUPPLY) - SEE DETAIL 2/M5.3
- 18) NOT USED
- 19) 1" FLANGE (DRAIN) - SEE DETAIL 3/M5.3
- 20) C6x8.2, 24" LONG, WITH 9/16"Ø MOUNTING HOLE EACH END
- 21) 2" FPT (TANK LEVEL PROBE) - INSTALL THREADED STEEL PLUG



2 1" FLANGED SUPPLY CONNECTION
M5.3 NO SCALE



3 1" FLANGED DRAIN CONNECTION
M5.3 NO SCALE

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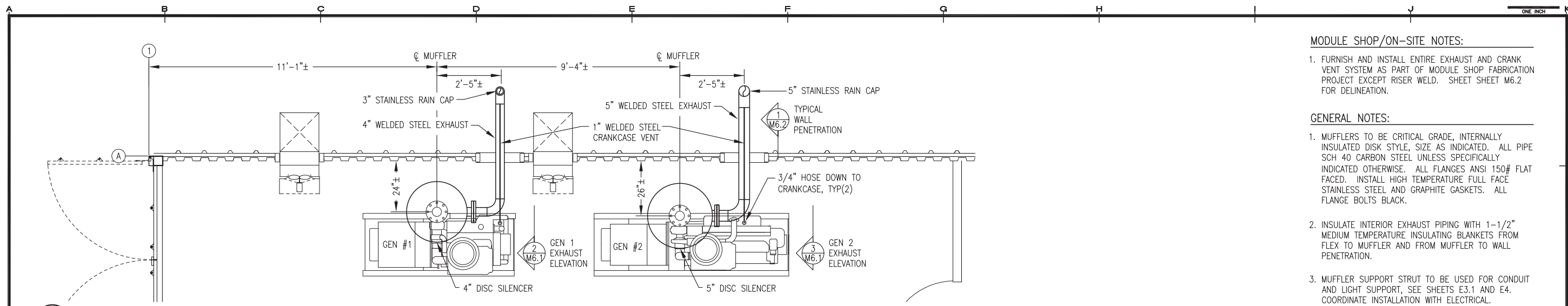
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SHEET TITLE	
160 GALLON DAY TANK FABRICATION	
SHEET	
M5.3	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

1 160 GALLON SINGLE WALL DAY TANK
M5.3 1"=6"



1 MUFFLER, EXHAUST & CRANK VENT PIPE PLAN
M6.1 1/2"=1'-0"

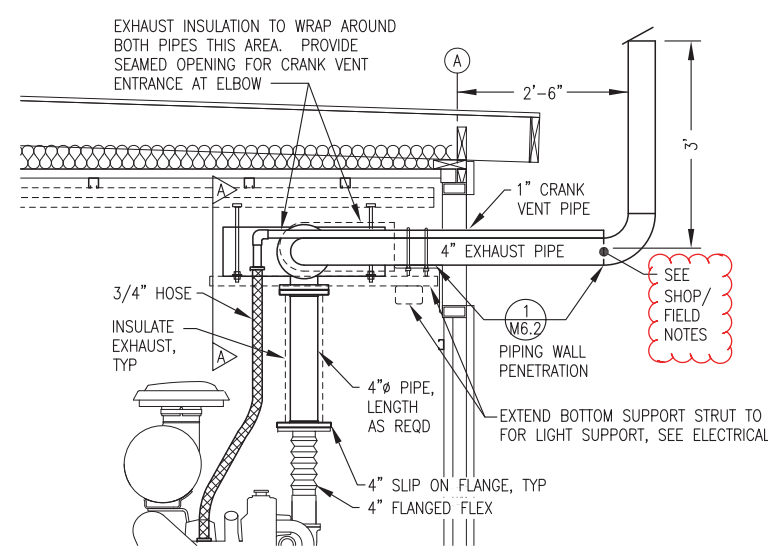
MODULE SHOP/ON-SITE NOTES:

1. FURNISH AND INSTALL ENTIRE EXHAUST AND CRANK VENT SYSTEM AS PART OF MODULE SHOP FABRICATION PROJECT EXCEPT RISER WELD. SHEET SHEET M6.2 FOR DELINEATION.

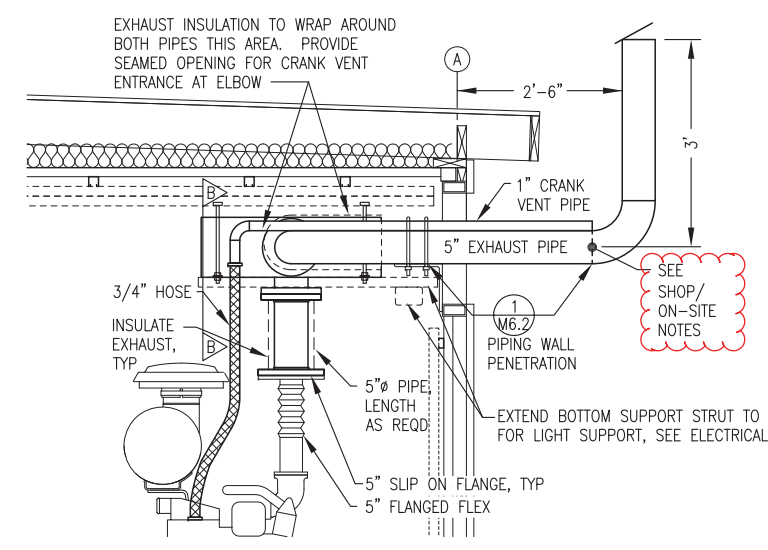
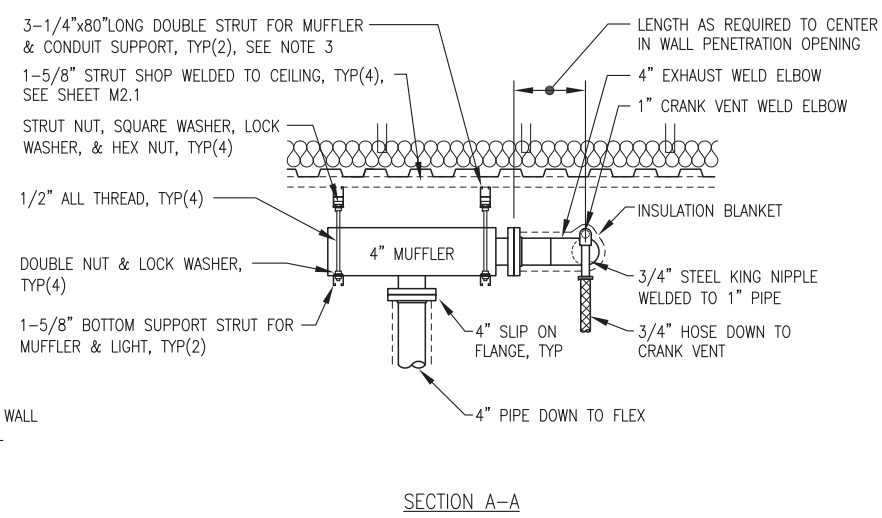
GENERAL NOTES:

1. MUFFLERS TO BE CRITICAL GRADE, INTERNALLY INSULATED DISK STYLE, SIZE AS INDICATED. ALL PIPE SCH 40 CARBON STEEL UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# FLAT FACED. INSTALL HIGH TEMPERATURE FULL FACE STAINLESS STEEL AND GRAPHITE GASKETS. ALL FLANGE BOLTS BLACK.
2. INSULATE INTERIOR EXHAUST PIPING WITH 1-1/2" MEDIUM TEMPERATURE INSULATING BLANKETS FROM FLEX TO MUFFLER AND FROM MUFFLER TO WALL PENETRATION.
3. MUFFLER SUPPORT STRUT TO BE USED FOR CONDUIT AND LIGHT SUPPORT, SEE SHEETS E3.1 AND E4. COORDINATE INSTALLATION WITH ELECTRICAL.

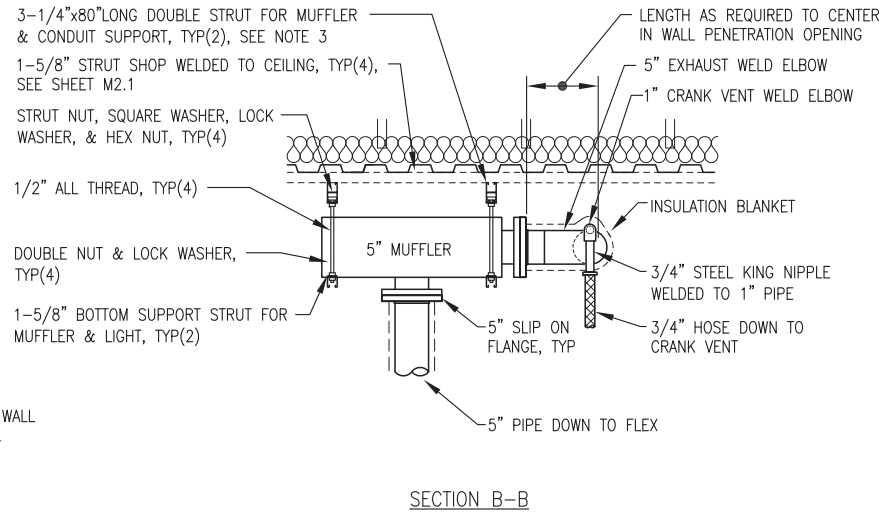
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2 GEN #1 EXHAUST ELEVATION
M6.1 3/4"=1'-0"



3 GEN #2 EXHAUST ELEVATION
M6.1 3/4"=1'-0"



THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

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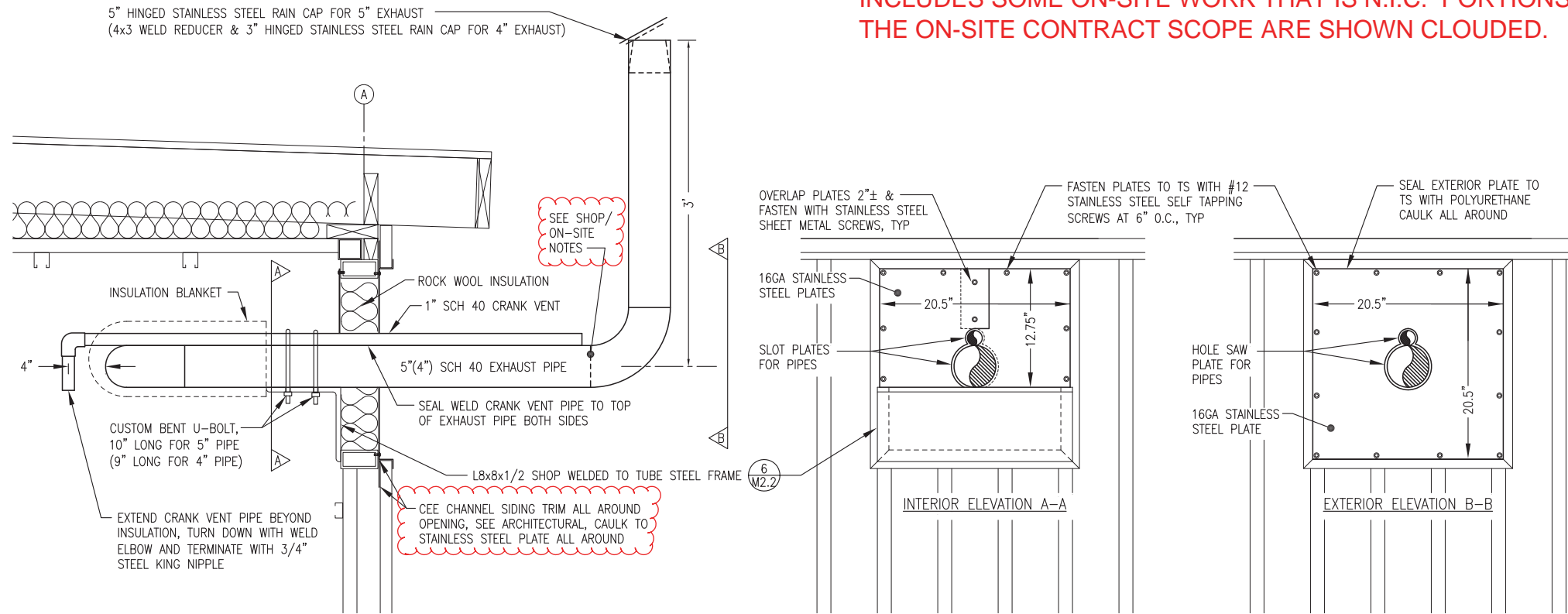
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SHEET TITLE
EXHAUST & CRANK VENT PLAN & DETAILS

SHEET
M6.1

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CHECKED BY: BCG
DATE: 2/12/18
SCALE: AS NOTED
JOB NUMBER:

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.



1 TYPICAL EXHAUST & CRANK VENT PIPING & WALL PENETRATION DETAIL
M6.2 1-1/2"=1'-0"

MODULE SHOP/ON-SITE NOTES:

1. AS PART OF MODULE SHOP FABRICATION PROJECT SHOP FABRICATE AND INSTALL COMPLETE EXHAUST ASSEMBLY AS SHOWN FOR MODULE LOAD TEST BUT DO NOT WELD EXTERIOR EXHAUST RISER AT ELBOW OR SEAL COVER PLATES. REMOVE EXHAUST PIPE/CRANK VENT ASSEMBLY FOR SHIPPING. IN FIELD RE-INSTALL, WELD EXTERIOR RISER AND SEAL COVER PLATES.
2. UPON COMPLETION OF TESTING BREAK FLANGE JOINT INSIDE MODULE AND DISCONNECT HOSE. STORE PIPE IN MODULE. SEAL WALL PENETRATION FOR SHIPPING.
3. DURING ON-SITE INSTALLATION REINSTALL PIPE ASSEMBLY OUT WALL AND WELD RISER AS SHOWN.

REVISIONS MARK	DATE	DESCRIPTION
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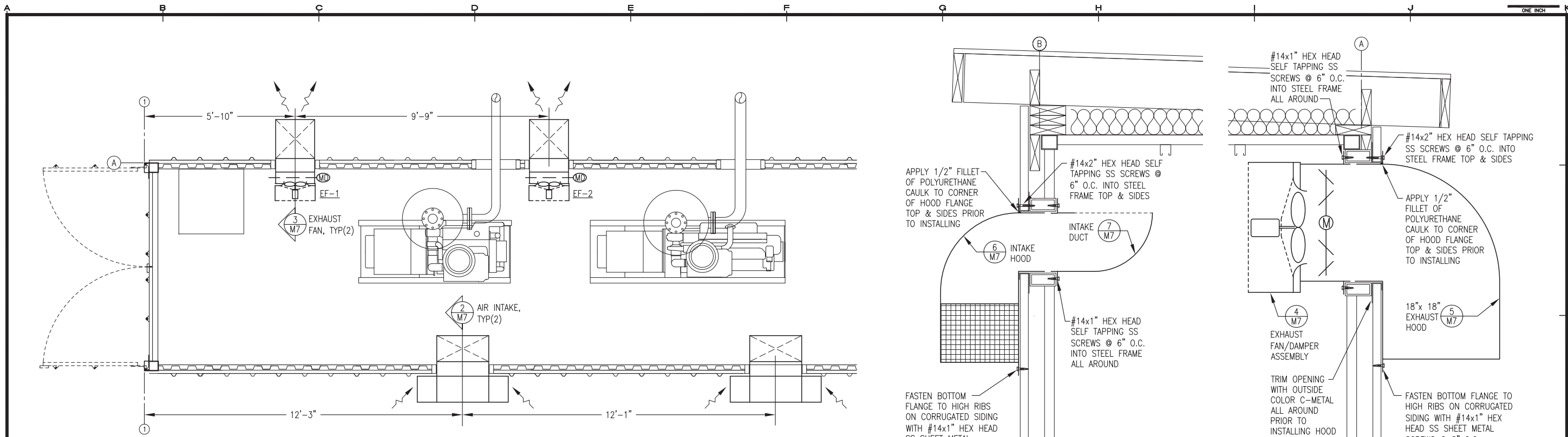
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SHEET TITLE
EXHAUST & CRANK VENT DETAILS

SHEET
M6.2

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JOB NUMBER:

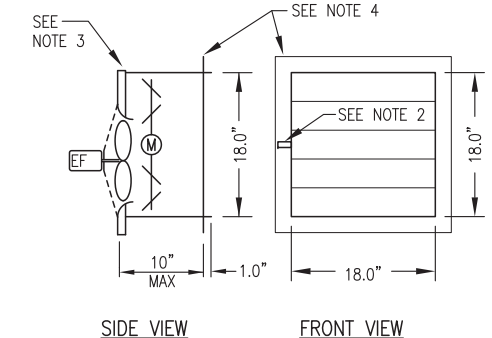


1 VENTILATION PLAN
M7 1/2"=1'-0"

2 AIR INTAKE INSTALLATION
M7 1-1/2"=1'-0"

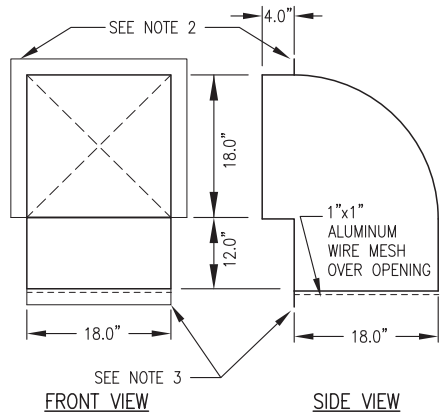
3 EXHAUST FAN INSTALLATION
M7 1-1/2"=1'-0"

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.



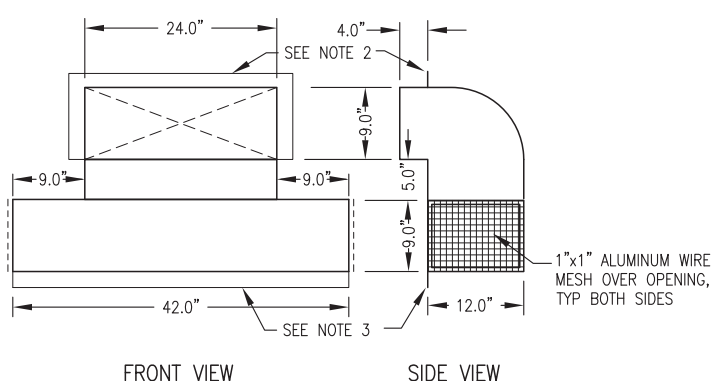
- NOTES:**
- FABRICATE TWO IDENTICAL ASSEMBLIES FROM MINIMUM 20 GAUGE GALVANIZED SHEET METAL COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.
 - PROVIDE MIN 3" DAMPER ROD EXTENSION OPPOSITE SIDES ON TWO ASSEMBLIES. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES. FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.
 - PROVIDE TOP FLAT TRANSITION FROM 18x18 DAMPER TO 20x20 FAN AND CENTER DAMPER ON FAN SIDE-TO-SIDE.
 - PROVIDE 2" FLANGE ALL AROUND

4 EXHAUST FAN ASSEMBLY FABRICATION
M7 1"=1'-0"



- NOTE:**
- FABRICATE TWO IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 - PROVIDE 2" FLANGE TOP & SIDES.
 - PROVIDE 2" FLANGE ACROSS BOTTOM

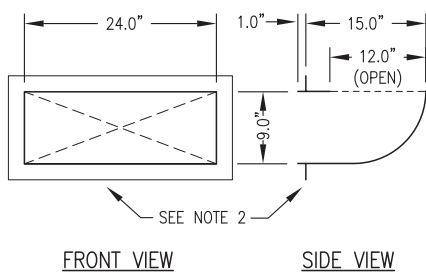
5 EXHAUST HOOD FABRICATION
M7 1"=1'-0"



- NOTES:**
- FABRICATE TWO IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 - PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES.
 - PROVIDE 2" FLANGE ACROSS BOTTOM.

6 INTAKE HOOD FABRICATION
M7 1"=1'-0"

- MODULE SHOP/ON-SITE NOTES:**
- FURNISH ENTIRE VENTILATION SYSTEM AS PART OF MODULE SHOP FABRICATION.
 - AS PART OF MODULE SHOP FABRICATION PROJECT INSTALL ALL INTERIOR COMPONENTS. VERIFY THAT EXTERIOR HOODS FIT WALL OPENINGS BUT DO NOT INSTALL.
 - AS PART OF ON-SITE INSTALLATION PROJECT INSTALL AND SEAL HOODS AS INDICATED.



- NOTES:**
- FABRICATE TWO IDENTICAL DUCTS 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
 - PROVIDE 2" WIDE MOUNTING FLANGE ALL AROUND.

7 INTAKE DUCT FABRICATION
M7 1"=1'-0"

REVISIONS	MARK	DATE	DESCRIPTION
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MERTARVIK PHASE 1 POWER SYSTEM
ALASKA ENERGY AUTHORITY
 MERTARVIK, ALASKA

SHEET TITLE	
VENTILATION PLAN & DETAILS	
SHEET	
M7	
DRAWN BY: JTD	CHECKED BY: BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

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
	MOTOR (HORESPOWER INDICATED)
	MOTORIZED DAMPER - SEE MECHANICAL
	125V, 20A, DUPLEX RECEPTACLE
	LINE VOLTAGE THERMOSTAT
	DIGITAL THERMOSTAT, MODULATING
	SNAP SWITCH / SMALL MOTOR DISCONNECT
	TIMER SWITCH
	GROUND

DISTRIBUTION PLANS SYMBOL LEGEND

SYMBOL	DESCRIPTION
	POWER POLE
	GUY/ANCHOR
	3-PHASE OVERHEAD PRIMARY
	STREET LIGHT
	POLE-MOUNT TRANSFORMER, XX=kVA RATING

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES): SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

ELECTRICAL EQUIPMENT/DEVICE SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
	DAY TANK ALARM HORN/STROBE	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELLOCK MT4-115-WH-VNS
	DAY TANK FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VSPST NC/NO SWITCH, 1/8" NPT, 1" MAX Ø BUNA-N FLOAT FOR S.G.=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
	NOT USED	NOT USED	NOT USED
	AREA LIGHT	AREA LIGHT, WIDE DISPERSION WALL PACK WITH PHOTO CONTROL. LED, 17.7W, 120-277V DRIVER	HUBBELL NRG-356L-5K-U-PC
	EMERGENCY LIGHT	WALL MOUNT, WHITE 20 GA STEEL ENCLOSURE, 277/120VAC, 8.4A INPUT, SEALED LEAD-ACID BATTERY, DUAL 5.3W 6VDC LED LAMPS	HUBBEL DUAL-LITE CCU2
	EMERGENCY/EXIT LIGHT COMBO	WHITE PLASTIC ENCLOSURE, RED EXIT SIGN, 277/120V INPUT, DUAL 1.5W 9.6V LED LAMPS. OPTIONAL HIGH OUTPUT NI-CAD BATTERY	LITHONIA LHQM-LED-R-HO OR EQUAL
	NOT USED	NOT USED	NOT USED
	MODULE INTERIOR LIGHTING	SURFACE MOUNTED LED STRIPLIGHT FIXTURE, 48" LONG, 34W, 5000°K WITH SNAP ON FROSTED DIFFUSER	LITHONIA L1N-L48-5000LM-FST
	NOT USED	NOT USED	NOT USED
	LIGHT SWITCH	SINGLE POLE SNAP SWITCH, 120V, 20A, METAL, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER, IVORY.	HUBBELL 1221-I
	1Ø SMALL MOTOR DISCONNECT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	HUBBELL 1221-PL
	NOT USED	NOT USED	NOT USED
	STATION SERVICE TRANSFORMER	DRY TYPE, ENERGY STAR, ENCLOSURE TYPE 3R WITH INTEGRAL WALL MOUNT BRACKETS, 9 kVA, HV 480 DELTA, LV 208Y/120	HAMMOND HPS C3F009KBS WITH NQT6 CASE
	STATION SERVICE PANELBOARD	COPPER BUS, 3 PHASE, 4 WIRE, 120/208V, 100A, 30 CIRCUITS, BOLT-IN BREAKERS, SURFACE MOUNT, NEMA 1	SIEMENS OR SQUARE D
	STANDARD RECEPTACLE	SURFACE MOUNT 125V NEMA 5-20R RECEPTACLE. INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	PASS & SEYMOUR 5362W
	EXTERIOR GFCI RECEPTACLE	125V NEMA 5-20R GFCI RECEPTACLE. MOUNT IN CAST FDA BOX WITH WEATHERPROOF COVER	PASS & SEYMOUR 2095-W
	BATTERY CHARGER	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VAC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS OR CHARLES EQUAL
	NOT USED	NOT USED	NOT USED
	NOT USED	NOT USED	NOT USED
	RADIATOR MOTOR DISCONNECT	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 30A, MIN 5HP RATED	SQUARE D HU361RB
	DIGITAL THERMOSTAT	MULTIPLE OUTPUT MODULATING DIGITAL THERMOSTAT	HONEYWELL TB7980B
	WELDER/COMPR. RECEPTACLE	NEMA 6-30R, BLACK, 250V, 30A, 2 POLE, WITH GROUND. INSTALL IN DEEP 4"x4" STEEL BOX WITH 2.15" Ø HOLE METAL COVER	LEVITON 5372
	ENCLOSED POWER RELAY	20A, 1HP RATED CONTACT, SPDT, 24VAC COIL, NEMA 1 ENCLOSURE, RED LED PILOT LIGHT	FUNCTIONAL DEVICES RIB2401B
	24VAC CONTROL TRANSFORMER	120V PRIMARY, 24V SECONDARY, 75VA OUTPUT, PLATE MOUNT, INSTALL ON 4"x4" PRESSED STEEL BOX	HONEYWELL AT175A1008 OR EQUAL

INSTRUMENTATION EQUIPMENT SCHEDULE

NOTE: INSTRUMENTATION SHOWN HERE FOR COORDINATION PURPOSES. FURNISH ALL INSTRUMENTATION DEVICES UNDER DIVISION 23 MECHANICAL.

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
	DAY TANK FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VSPST NC/NO SWITCH, 1/8" NPT, 1" MAX Ø BUNA-N FLOAT FOR S.G.=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
	GLYCOL EXP TANK	LOW COOLANT ALARM FLOAT SWITCH, SEE MECHANICAL DETAILS	MURPHY EL-150-K1

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR LEADS & FEEDERS (480V) & ENGINE STARTER CABLES (24VDC)	HIGH TEMPERATURE, EXTRA FLEXIBLE CABLE. 1000V, 150°C THERMOSET EPDM INSULATION, TIN COATED COPPER CONDUCTOR.	COBRA CABLE OR HOUSTON WIRE & CABLE	TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT 150°C.
GENERAL USE CONDUCTORS	CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.		
SHIELDED/TWISTED INSTRUMENT & CONTROL CONDUCTORS	#18 AWG STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE & PVC OUTER JACKET	SINGLE PAIR: BELDEN #1120A FOUR PAIR: BELDEN #1049A SINGLE TRIAD: BELDEN #1121A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
COLOR CODING - UNLESS SPECIFICALLY INDICATED OTHERWISE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS: 480-VOLT POWER CONDUCTORS PHASE A - BROWN PHASE B - ORANGE PHASE C - YELLOW NEUTRAL - WHITE WITH YELLOW STRIPE 120/208-VOLT POWER CONDUCTORS PHASE A - BLACK PHASE B - RED PHASE C - BLUE NEUTRAL - WHITE 24 VOLT DC CONDUCTORS +24VDC - RED WITH GRAY STRIPE -24VDC - BLACK WITH GRAY STRIPE CONTROL & INSTRUMENT CONDUCTORS COLOR CODED PER MANUFACTURER'S STANDARD		NOTES: 1) FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED THE CABLE SHALL BE IDENTIFIED AT EVERY ACCESSIBLE LOCATION. PROVIDE A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION. 2) GROUNDING - PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE CLASS B CONCENTRIC STRANDED, SOFT-DRAWN COPPER OF THE SIZES INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.	

EQUIPMENT SCHEDULES THIS SHEET APPLY TO BOTH MODULE SHOP FABRICATION WORK AND ON-SITE WORK. REFER TO OTHER SHEETS THAT FOLLOW AND SPECIFICATIONS FOR DELINEATION OF WORK.

REVISIONS	MARK	DATE	DESCRIPTION
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MERTARVIK PHASE 1 POWER SYSTEM

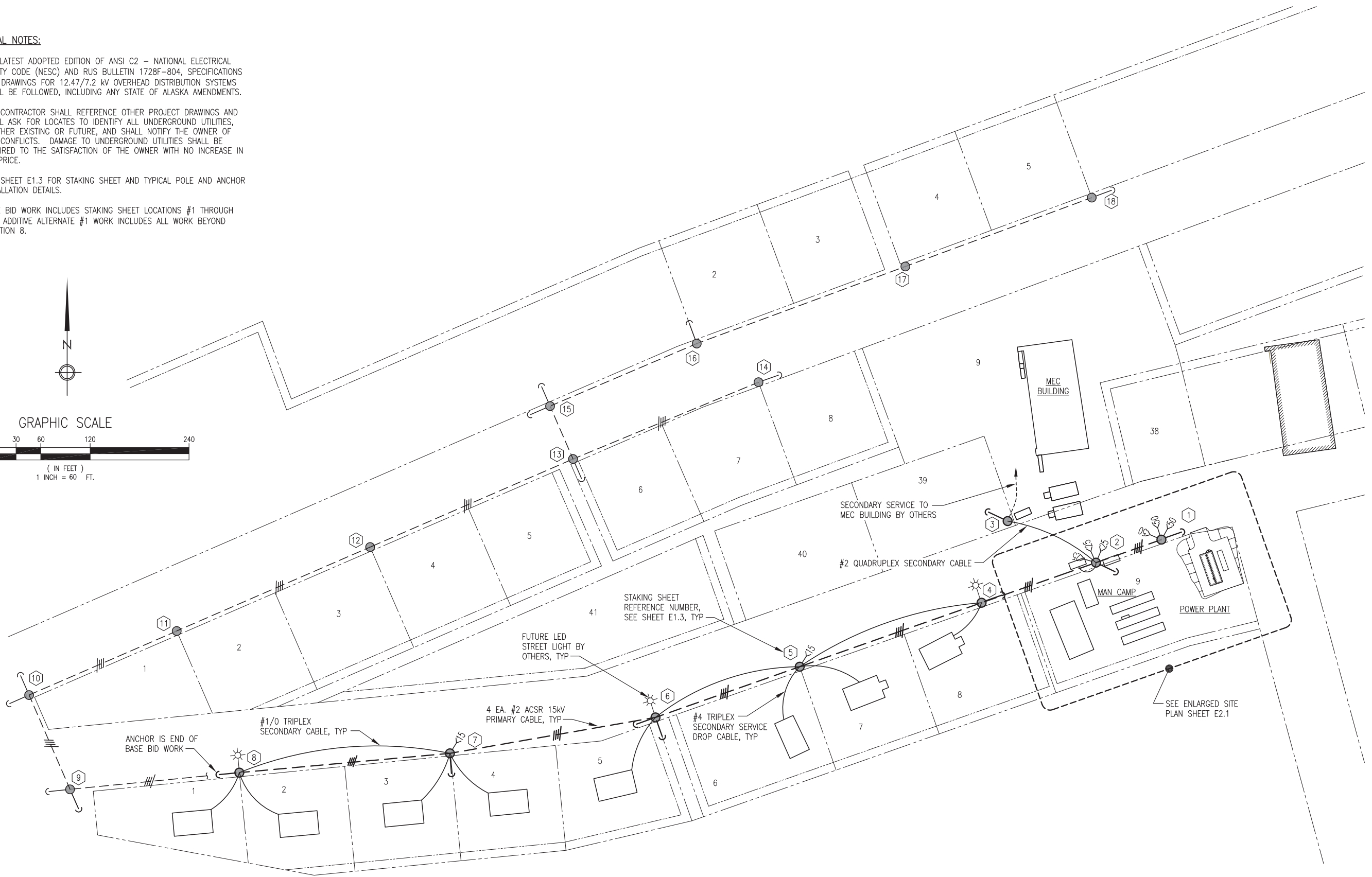
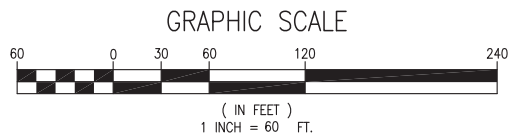
ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

MERTARVIK, ALASKA

SHEET TITLE ELECTRICAL LEGEND & SCHEDULES	
SHEET E1.1	
DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

GENERAL NOTES:

- 1) THE LATEST ADOPTED EDITION OF ANSI C2 – NATIONAL ELECTRICAL SAFETY CODE (NEC) AND RUS BULLETIN 1728F-804, SPECIFICATIONS AND DRAWINGS FOR 12.47/7.2 kV OVERHEAD DISTRIBUTION SYSTEMS SHALL BE FOLLOWED, INCLUDING ANY STATE OF ALASKA AMENDMENTS.
- 2) THE CONTRACTOR SHALL REFERENCE OTHER PROJECT DRAWINGS AND SHALL ASK FOR LOCATES TO IDENTIFY ALL UNDERGROUND UTILITIES, WHETHER EXISTING OR FUTURE, AND SHALL NOTIFY THE OWNER OF ANY CONFLICTS. DAMAGE TO UNDERGROUND UTILITIES SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER WITH NO INCREASE IN BID PRICE.
- 3) SEE SHEET E1.3 FOR STAKING SHEET AND TYPICAL POLE AND ANCHOR INSTALLATION DETAILS.
- 4) BASE BID WORK INCLUDES STAKING SHEET LOCATIONS #1 THROUGH #8. ADDITIVE ALTERNATE #1 WORK INCLUDES ALL WORK BEYOND LOCATION 8.



REVISIONS	MARK	DATE	DESCRIPTION
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MERTARVIK PHASE 1 POWER SYSTEM
ALASKA ENERGY AUTHORITY
 MERTARVIK, ALASKA

SHEET TITLE	
OVERALL DISTRIBUTION PLAN & NOTES	
SHEET	
E1.2	
DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

THIS SHEET SHOWS ON-SITE INSTALLATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

1 OVERALL ELECTRICAL DISTRIBUTION PLAN
 E1.2 1"=60'

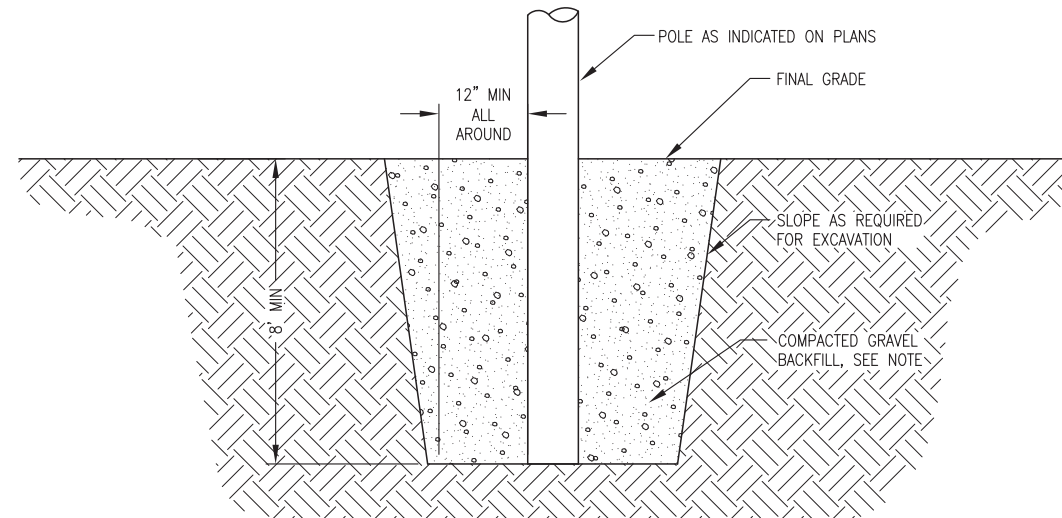
STAKING SHEET																	
LOCATION	PRIMARY				GUY UNIT				PRIMARY CABLE		SECONDARY BACKSPAN		SERVICES		MISC. UNITS		STAKING SHEET NOTES
	QTY	UNIT	POLE	XFMR	NO.	UNIT	LEAD	ANCHOR	QTY	CABLE	QTY	CABLE	QTY	UNIT	QTY	UNIT	
1	1	C5.21L	40', CLASS 4	G3.3G-50 480/277 volt.	1	E1.1	30 FT.	DETAIL 2, E1.3							1	H1.1	1
2	1	C1.11L	40', CLASS 4	G3.3G-25 208/120 volt.	1	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR			1	#2/0 QUADRUPLX	1	H1.1	2
3			40', CLASS 4		1	E1.1	20 FT.	DETAIL 2, E1.3		1	#2 QUADRUPLX				1	J3.1	
4	1	C1.11L	40', CLASS 4		1	E1.1	20 FT.	DETAIL 2, E1.3	4	#2 ACSR			1	#4 TRIPLEX	1	J3.1	1
5	1	C1.11L	40', CLASS 4	G1.4-15 120/240 VOLT 1Ø					4	#2 ACSR	1	#1/0 TRIPLEX	2	#4 TRIPLEX	1	H1.1	2
6	1	C2.21P	40', CLASS 4	G1.4-15 120/240 VOLT 1Ø	2	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR	1	#1/0 TRIPLEX	1	#4 TRIPLEX	1	J3.1	1
7	1	C2.21P	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR			2	#4 TRIPLEX	1	H1.1	1
8	1	C5.21L	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR	1	#1/0 TRIPLEX	2	#4 TRIPLEX	1	J3.1	1
9	2	C5.21L	40', CLASS 4		2	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR							
10	2	C5.21L	40', CLASS 4		2	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR							
11	1	C1.11L	40', CLASS 4						4	#2 ACSR							
12	1	C1.11L	40', CLASS 4						4	#2 ACSR							
13	1	C1.11L A5.2	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR					1	N6.1	
14	1	C5.21	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	4	#2 ACSR							
15	2	A5.1	40', CLASS 4		2	E1.1	30 FT.	DETAIL 2, E1.3	2	#2 ACSR							
16	1	A2.3P	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	2	#2 ACSR							4
17	1	A2.1	40', CLASS 4						2	#2 ACSR							
18	1	A5.1	40', CLASS 4		1	E1.1	30 FT.	DETAIL 2, E1.3	2	#2 ACSR							

STAKING SHEET NOTES

- SEE PLAN SHEETS FOR POWER PLANT PRIMARY FEEDER TO TRANSFORMER. INSTALL CONDUIT UP POLE WITH 3" WEATHERHEAD. PROVIDE A MINIMUM OF 10'-0" TO THE BOTTOM OF THE DRIP LOOP. TRANSFORMER CONNECTION SHALL BE 480/277 VOLT, 3Ø, 4-WIRE, WYE-WYE.
- TRANSFORMER CONNECTION SHALL BE 208/120, 3Ø, 4-WIRE, WYE-WYE.
- TRANSFORMER CONNECTION SHALL BE 120/240 VOLT, 1Ø, 3-WIRE.
- SEE RUS UNIT C5.11G FOR SINGLE-PHASE TAP.

DISTRIBUTION SYSTEM INSTALLATION SPECIFICATIONS & NOTES

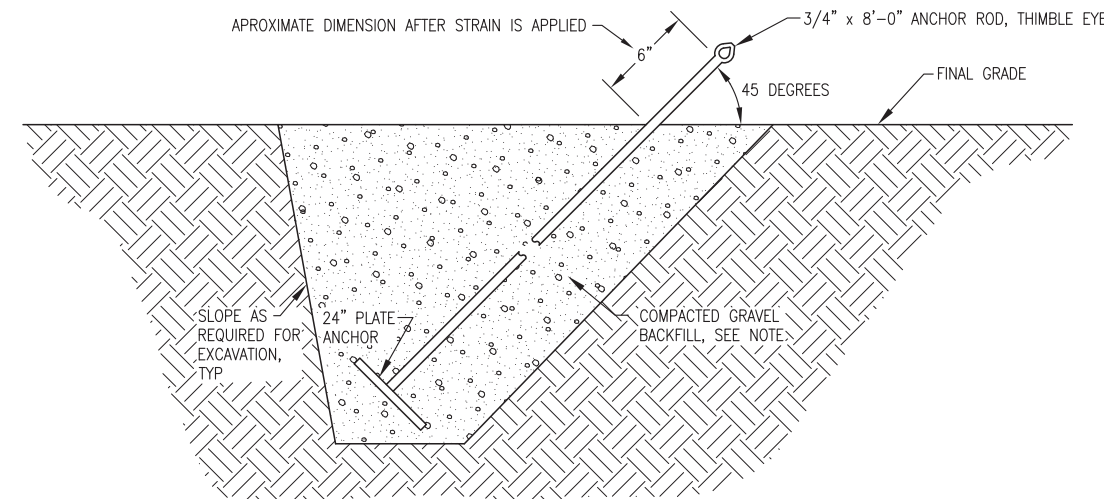
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF RUS BULLETIN 1728F-804 FOR OVERHEAD CONSTRUCTION, UNLESS MODIFIED BY THESE DRAWINGS OR SPECIFICATIONS. ALL MATERIAL SHALL BE RUS APPROVED. OBTAIN COPIES OF THE RUS BULLETINS AND MAINTAIN COPIES ON THE JOBSITE.
- WHERE RUS UNITS ARE REFERENCED, MATERIAL ITEMS MAY NOT BE LISTED IN THE MATERIAL LIST. CONTRACTOR SHALL REFER TO RUS UNIT REFERENCED TO DETERMINE WHAT MATERIAL MUST BE PROVIDED.
- ALL HARDWARE SHALL BE, HOT DIP GALVANIZED OR STAINLESS STEEL. ALL FASTENERS SHALL BE STAINLESS STEEL.
- PRIMARY OVERHEAD CONDUCTOR SHALL BE AS INDICATED ON THE DRAWINGS.
- ALL INSULATOR TIES SHALL BE PREFORMED TYPE. ALL NEUTRAL AND PHASE CONDUCTOR DEADENDS SHALL BE PREFORMED TYPE.
- NOT ALL GROUNDS ARE SHOWN. TIE CABLE SHIELDS TO GROUND AND GROUND ALL METALLIC DEVICES OR EQUIPMENT. GROUND NEUTRAL WIRE AND TRANSFORMER GROUNDED BUSHING ALONG WITH TRANSFORMER CASE. CONNECT CONDUIT RISER AT TOP AND BOTTOM TO GROUND CONDUCTOR AS SHOWN. ROUTE #4 AWG SOLID COPPER GROUND CONDUCTOR DOWN POLE TO SYSTEM GROUND GRID. ATTACH COPPER GROUND CONDUCTOR TO POLE WITH COPPER PLATED STAPLES. ALL CONNECTIONS TO CABLE SHALL BE MADE WITH COPPER COMPRESSION LUGS. NO ALUMINUM CONNECTORS OR CABLES SHALL BE USED, EXCEPT AT CONNECTIONS TO ACSR. AT ACSR CONNECTIONS, USE LUGS RATED FOR COPPER/ALUMINUM.
- LOCKNUTS SHALL BE INSTALLED ON ALL THREADED MATERIAL AND HARDWARE IN ADDITION TO NUTS AND WASHERS. FOR ALL EXTERIOR GRC CLEAN & DE-GREASE THREADS AFTER CUTTING & SPRAY WITH COLD GALV PRIOR TO ASSEMBLY
- QUANTITIES NOT SHOWN. DETERMINE QUANTITIES OF ALL NECESSARY MATERIAL AND EQUIPMENT.



NOTES:

- AUGER MINIMUM 3" DIAMETER HOLE OR EXCAVATE MINIMUM 3" WIDE TRENCH FOR SETTING POLE. IF HOLE IS EXCAVATED DIG AS STEEP AS POSSIBLE TO MINIMIZE HOLE SIZE AND ALIGN TRENCH WITH PRIMARY CONDUCTORS.
- BACKFILL WITH GRAVEL AND COMPACT IN MAXIMUM 8" LIFTS.

1 TYPICAL POLE INSTALLATION
E1.3 NO SCALE



NOTES:

- EXCAVATE MINIMUM 3" WIDE TRENCH FOR SETTING ANCHOR. DIG AS STEEP AS POSSIBLE TO MINIMIZE HOLE SIZE AND ALIGN TRENCH WITH ANCHOR AT 45° SLOPE AS SHOWN.
- BACKFILL WITH GRAVEL AND COMPACT IN MAXIMUM 8" LIFTS.

2 TYPICAL ANCHOR INSTALLATION
E1.3 NO SCALE

THIS SHEET SHOWS ON-SITE INSTALLATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

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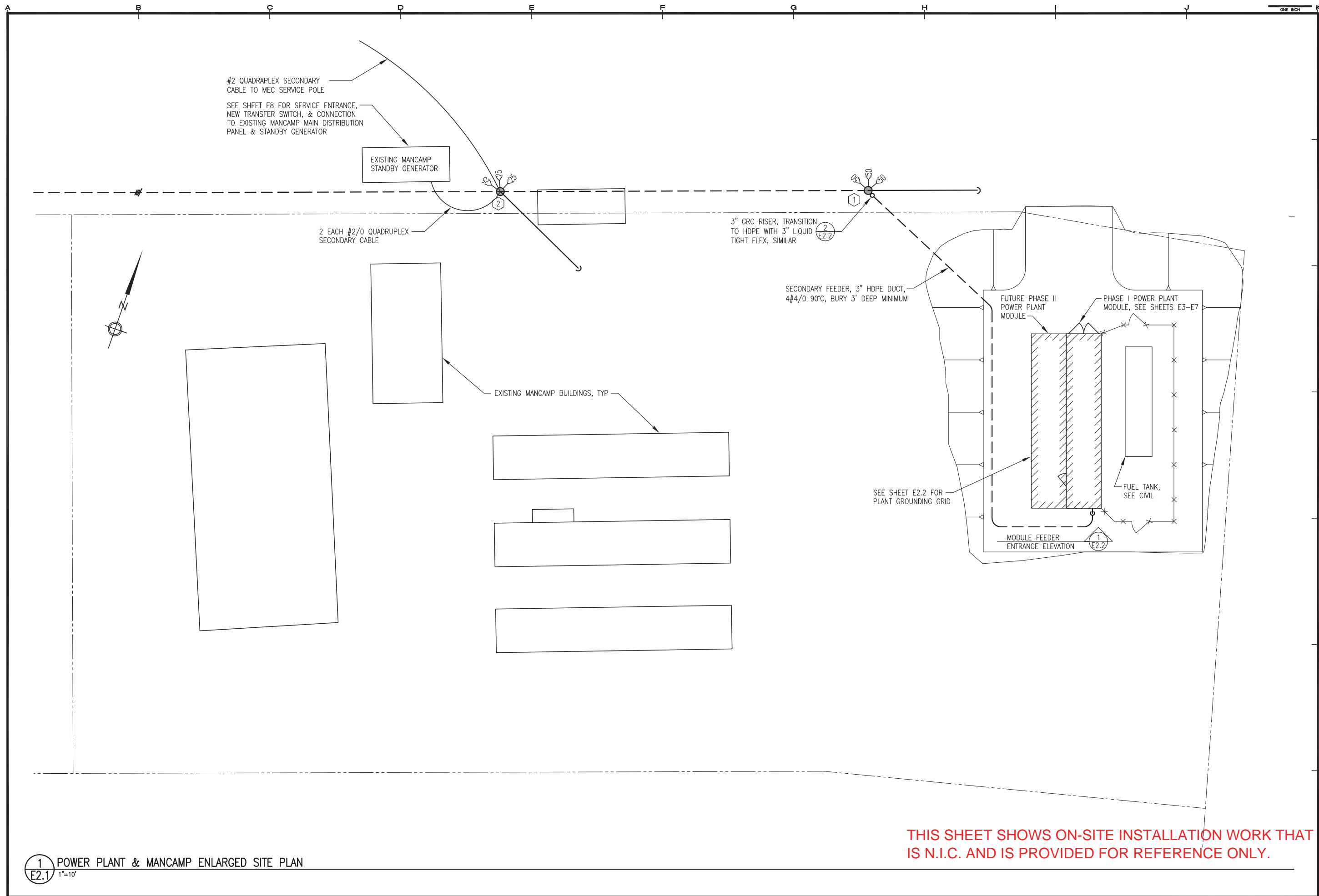
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MERTARVIK PHASE 1 POWER SYSTEM
ALASKA ENERGY AUTHORITY
MERTARVIK, ALASKA

SHEET TITLE	
POLE DETAILS & STAKING SHEET	
SHEET	
E1.3	
DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



#2 QUADRAPLEX SECONDARY CABLE TO MEC SERVICE POLE
 SEE SHEET E8 FOR SERVICE ENTRANCE, NEW TRANSFER SWITCH, & CONNECTION TO EXISTING MANCAMP MAIN DISTRIBUTION PANEL & STANDBY GENERATOR

EXISTING MANCAMP STANDBY GENERATOR

2 EACH #2/0 QUADRAPLEX SECONDARY CABLE

3\"/>

SECONDARY FEEDER, 3\"/>

EXISTING MANCAMP BUILDINGS, TYP

SEE SHEET E2.2 FOR PLANT GROUNDING GRID

FUTURE PHASE II POWER PLANT MODULE

PHASE I POWER PLANT MODULE, SEE SHEETS E3-E7

FUEL TANK, SEE CIVIL

MODULE FEEDER ENTRANCE ELEVATION



REVISIONS	MARK	DATE	DESCRIPTION
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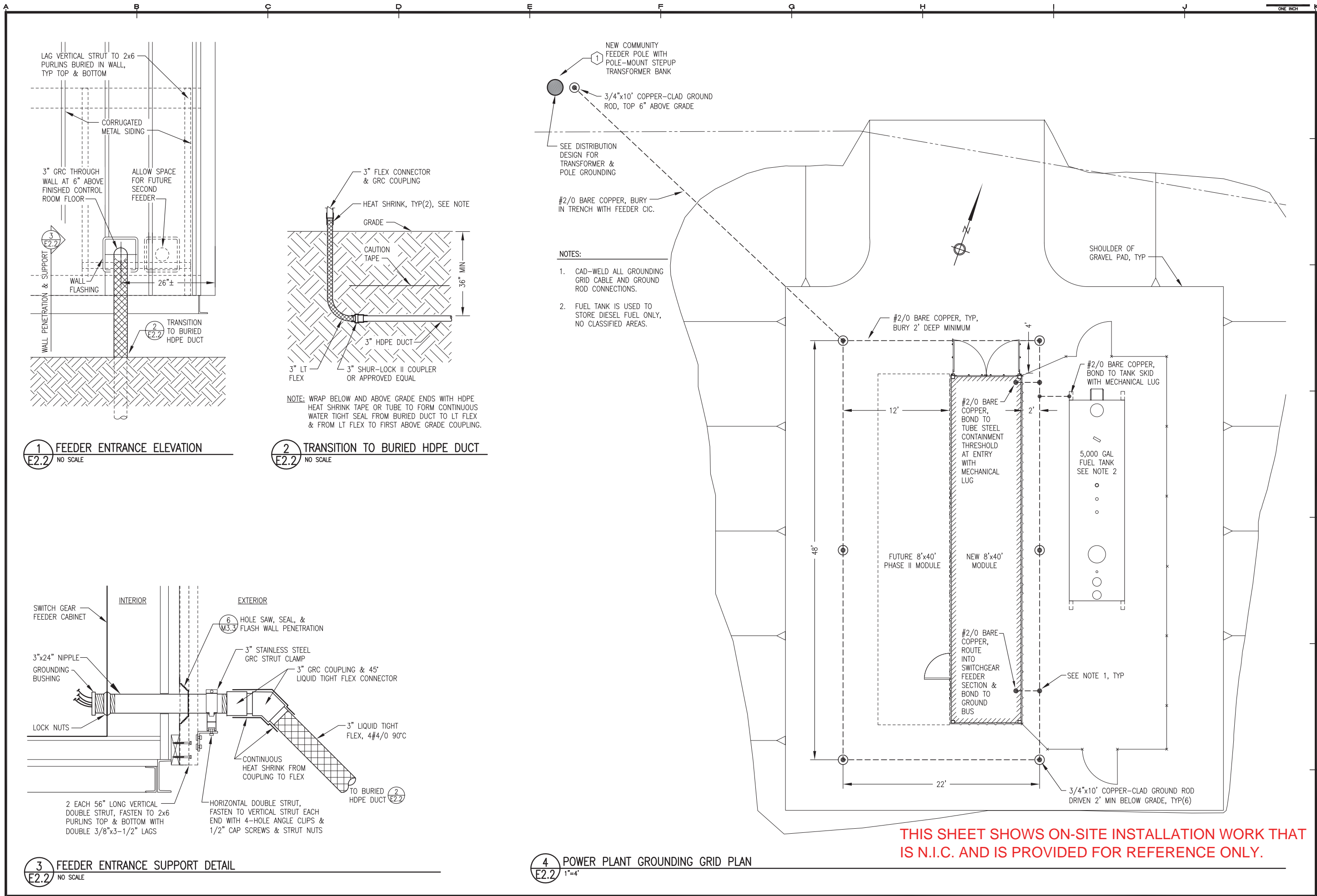
ALASKA ENERGY AUTHORITY
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 MERTARVIK, ALASKA

MERTARVIK PHASE I POWER SYSTEM
 ENLARGED SITE PLAN

1 POWER PLANT & MANCAMP ENLARGED SITE PLAN
 E2.1 1"=10'

THIS SHEET SHOWS ON-SITE INSTALLATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

SHEET TITLE	
ENLARGED SITE PLAN	
SHEET	
E2.1	
DRAWN BY	CHECKED BY
JTD	CWV/BCG
DATE	SCALE
2/12/18	AS NOTED
JOB NUMBER	



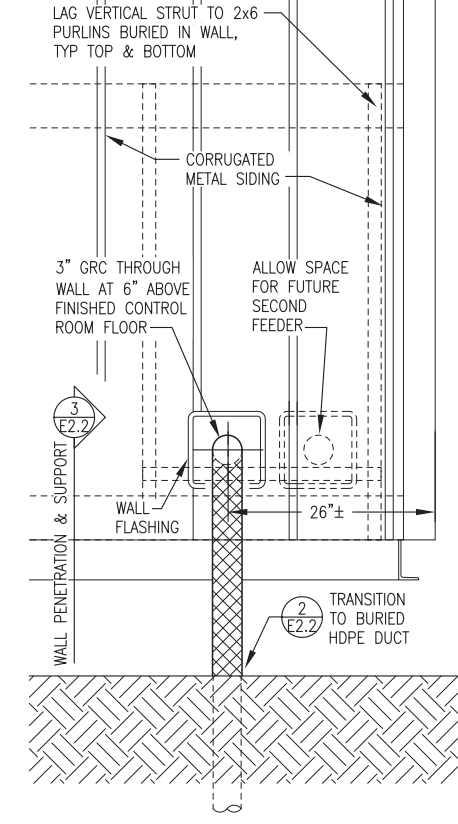
NEW COMMUNITY FEEDER POLE WITH POLE-MOUNT STEPUP TRANSFORMER BANK

3/4"x10" COPPER-CLAD GROUND ROD, TOP 6" ABOVE GRADE

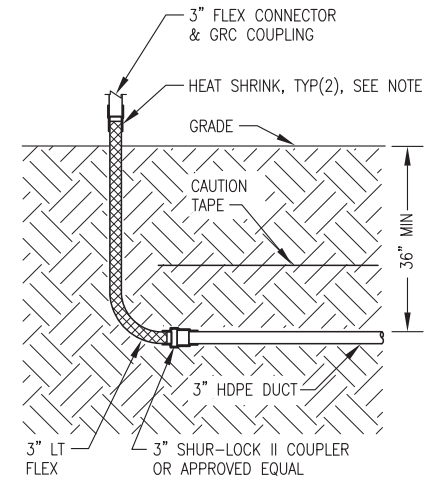
SEE DISTRIBUTION DESIGN FOR TRANSFORMER & POLE GROUNDING

#2/0 BARE COPPER, BURY IN TRENCH WITH FEEDER C.I.C.

- NOTES:
- CAD-WELD ALL GROUNDING GRID CABLE AND GROUND ROD CONNECTIONS.
 - FUEL TANK IS USED TO STORE DIESEL FUEL ONLY, NO CLASSIFIED AREAS.

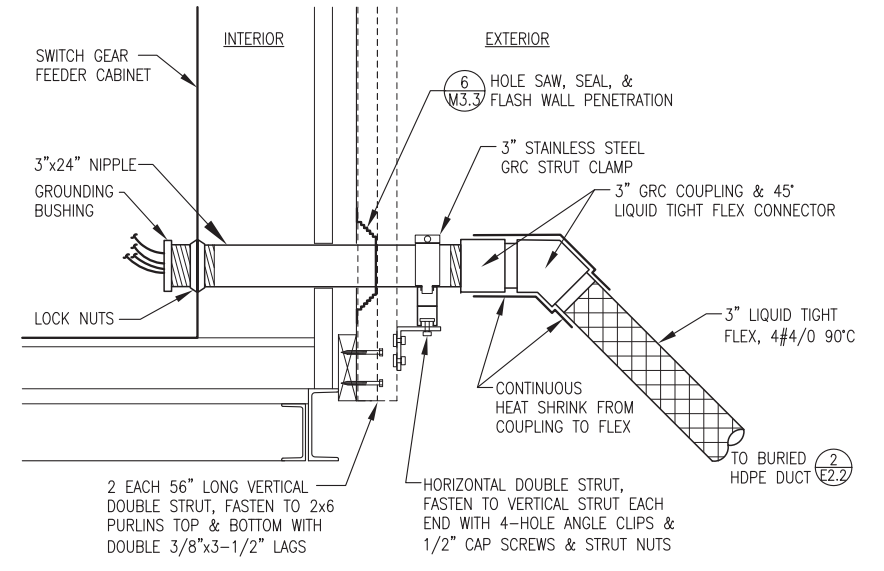


1 FEEDER ENTRANCE ELEVATION
E2.2 NO SCALE



NOTE: WRAP BELOW AND ABOVE GRADE ENDS WITH HDPE HEAT SHRINK TAPE OR TUBE TO FORM CONTINUOUS WATER TIGHT SEAL FROM BURIED DUCT TO LT FLEX & FROM LT FLEX TO FIRST ABOVE GRADE COUPLING.

2 TRANSITION TO BURIED HDPE DUCT
E2.2 NO SCALE



3 FEEDER ENTRANCE SUPPORT DETAIL
E2.2 NO SCALE

4 POWER PLANT GROUNDING GRID PLAN
E2.2 1"=4'

THIS SHEET SHOWS ON-SITE INSTALLATION WORK THAT IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

REVISIONS MARK	DATE	DESCRIPTION
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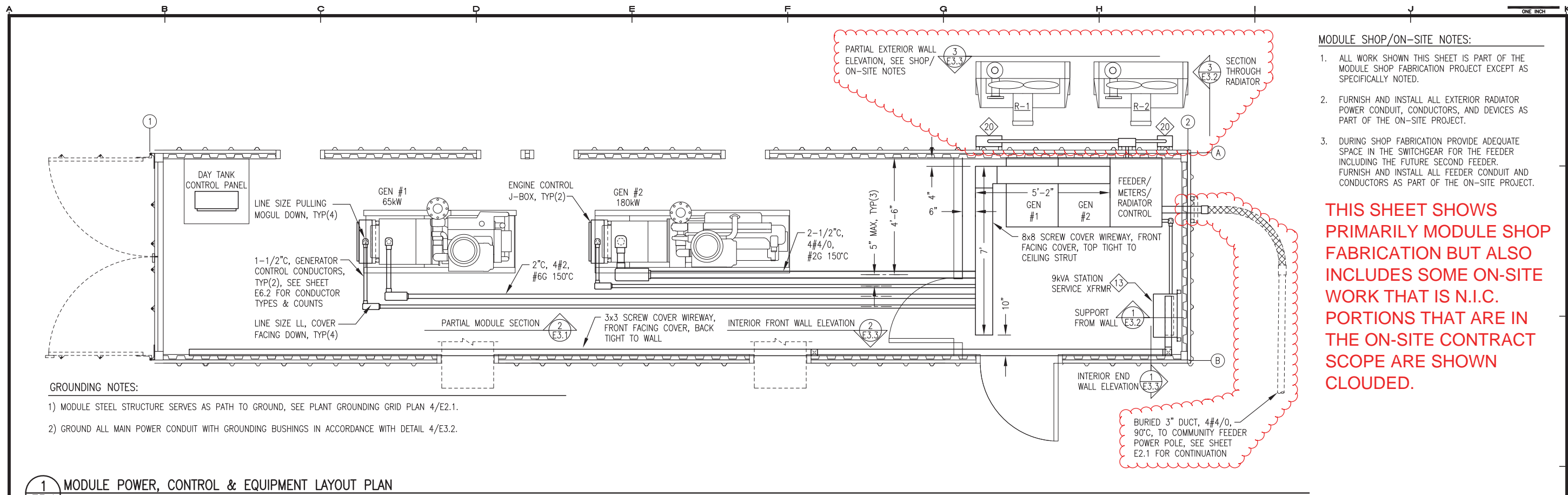
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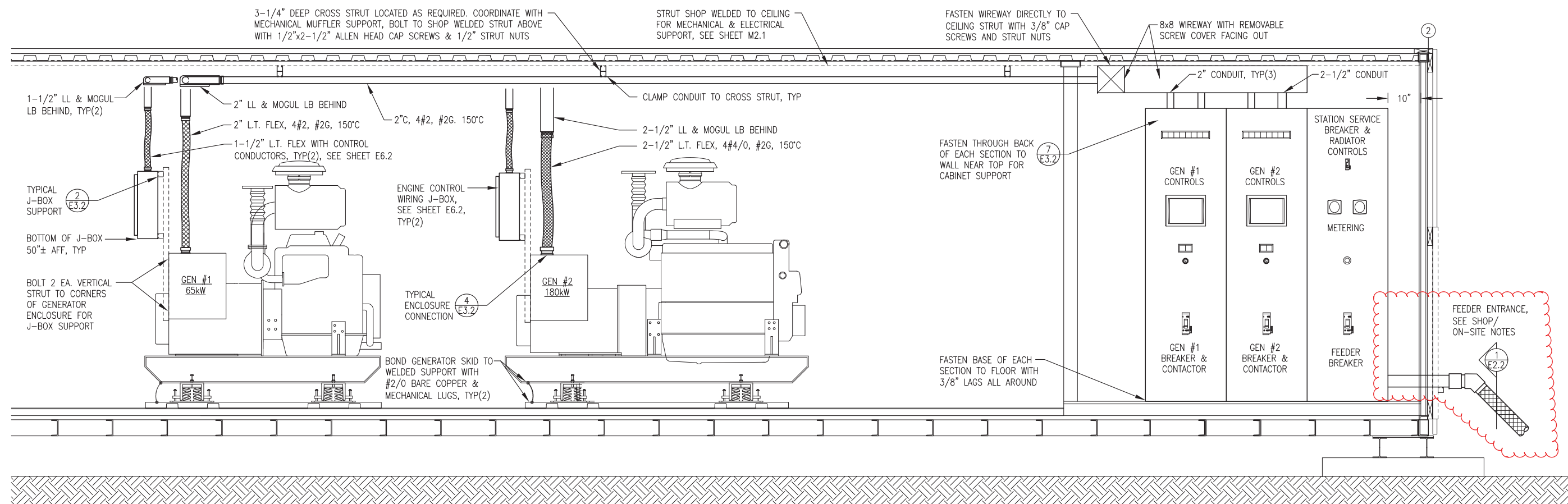
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 MERTARVIK, ALASKA

SHEET TITLE	
GROUNDING GRID PLAN & SITE DETAILS	
SHEET	
E2.2	
DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



1 MODULE POWER, CONTROL & EQUIPMENT LAYOUT PLAN
E3.1 1/2"=1'-0"



2 PARTIAL MODULE SECTION
E3.1 3/4"=1'-0"

REVISIONS	MARK	DATE	DESCRIPTION
1			
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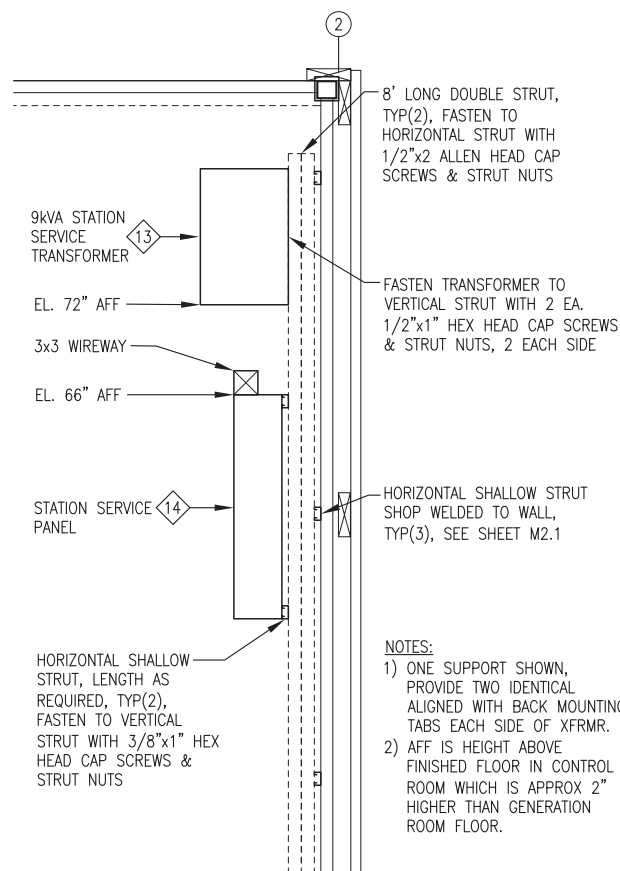
SHEET TITLE
POWER & CONTROL PLAN & SECTION

SHEET
E3.1

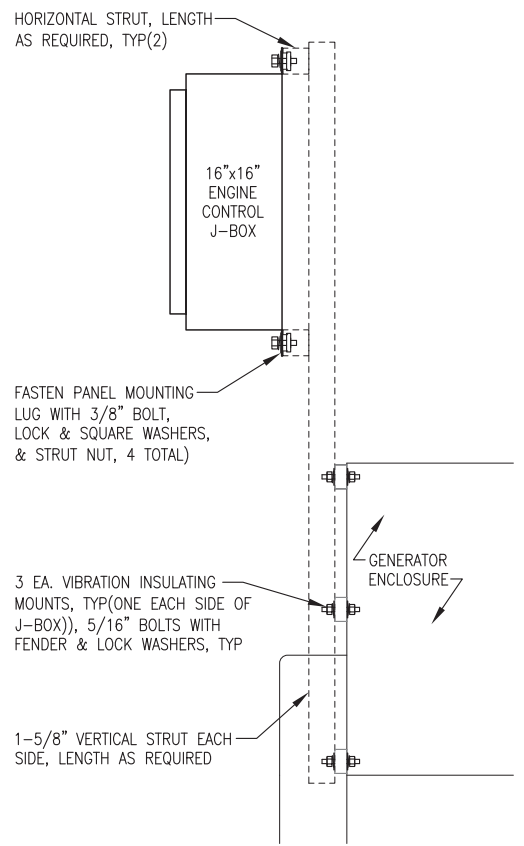
DRAWN BY: JTD
 CHECKED BY: CWV/BCG

DATE: 2/12/18
 SCALE: AS NOTED

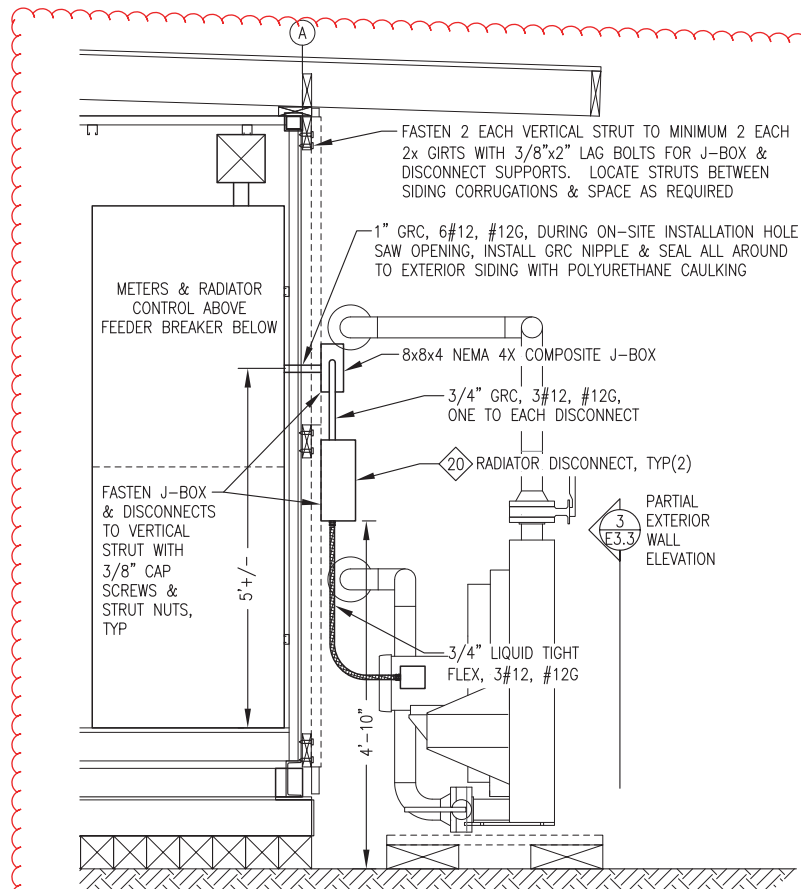
JOB NUMBER:



1 STATION SERVICE TRANSFORMER SUPPORT
E3.2 NO SCALE



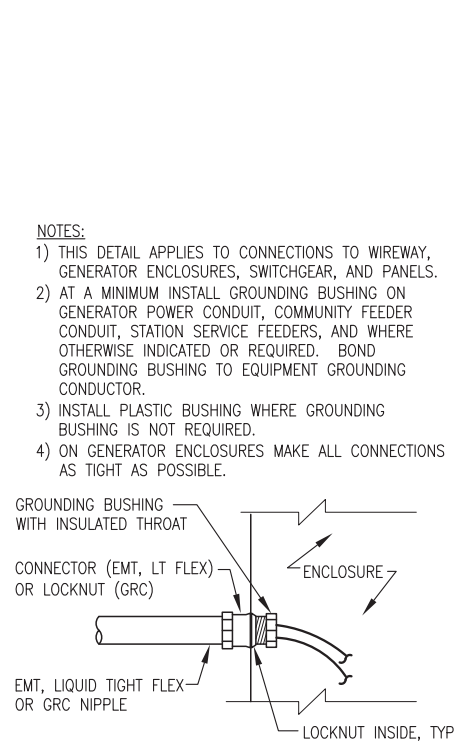
2 ENGINE CONTROL J-BOX SUPPORT
E3.2 NO SCALE



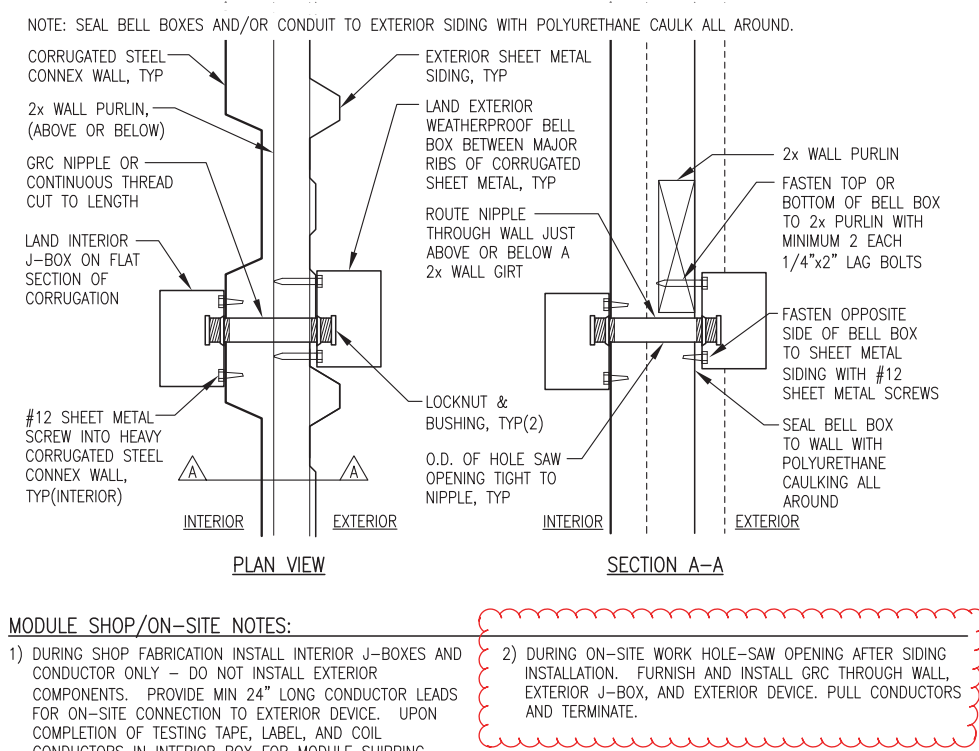
3 SECTION THROUGH RADIATOR R-2 (R-1 SIMILAR)
M3.2 3/4"=1'-0"

GENERAL NOTES:
1) ONE RADIATOR SHOWN, INSTALL TWO IDENTICAL.

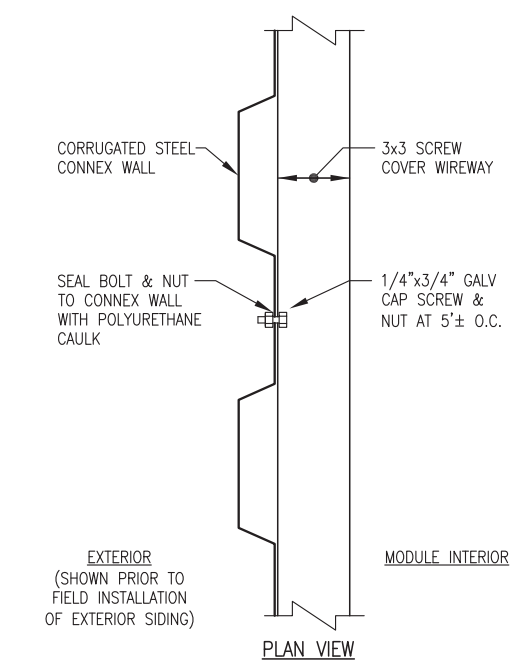
MODULE SHOP/ON-SITE NOTES:
1) DURING SHOP FABRICATION OF MODULE PROVIDE ADEQUATE SPACE IN THE SWITCHGEAR TO ALLOW INSTALLATION OF CONDUIT THROUGH WALL TO RADIATORS.
2) FURNISH AND INSTALL ALL EXTERIOR RADIATOR POWER CONDUIT, CONDUCTORS, AND DEVICES AS PART OF THE ON-SITE PROJECT. SEE DETAIL 3/E3.3.



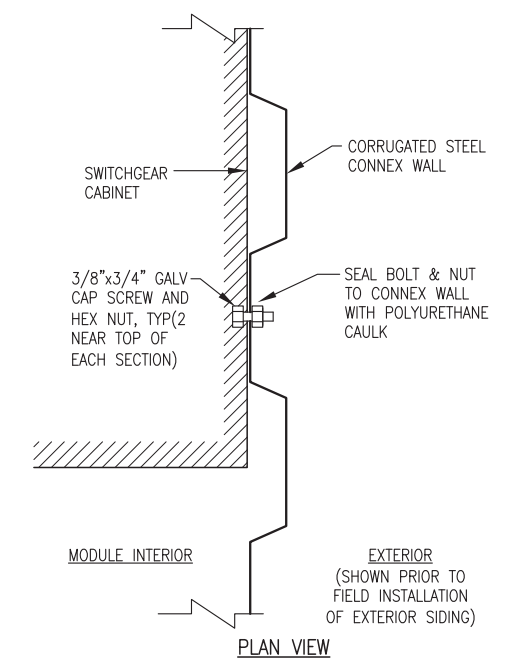
4 TYPICAL ENCLOSURE CONNECTION
E3.2 NO SCALE



5 TYPICAL EXTERIOR DEVICE INSTALLATION
E3.2 NO SCALE



6 WIREWAY SUPPORT FROM WALL
E3.2 NO SCALE



7 SWITCHGEAR SUPPORT FROM WALL
E3.2 NO SCALE

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

REVISIONS	MARK	DATE	DESCRIPTION
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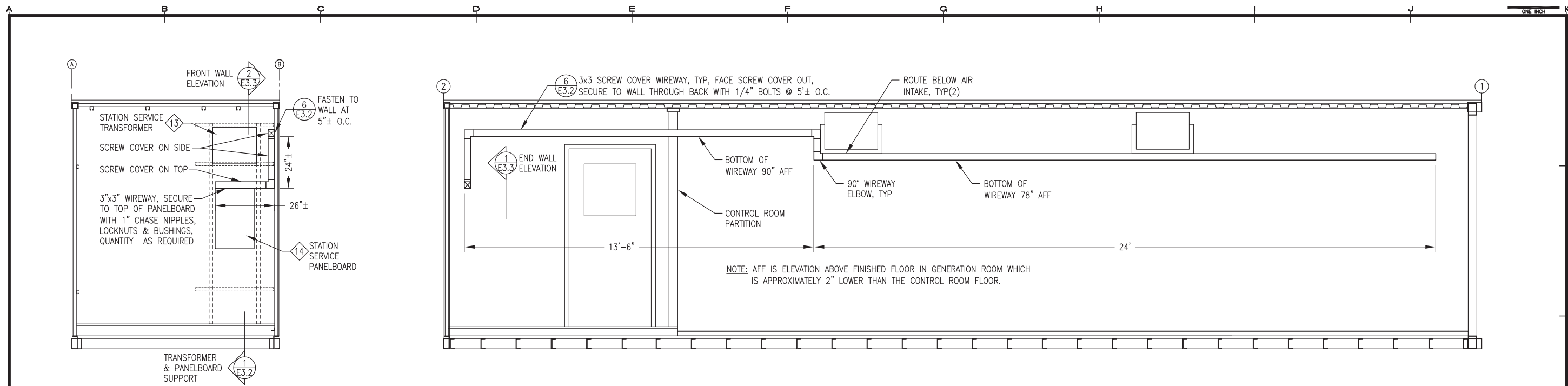
SHEET TITLE
ELECTRICAL DETAILS

SHEET
E3.2

DRAWN BY: JTD
CHECKED BY: CWV/BCG

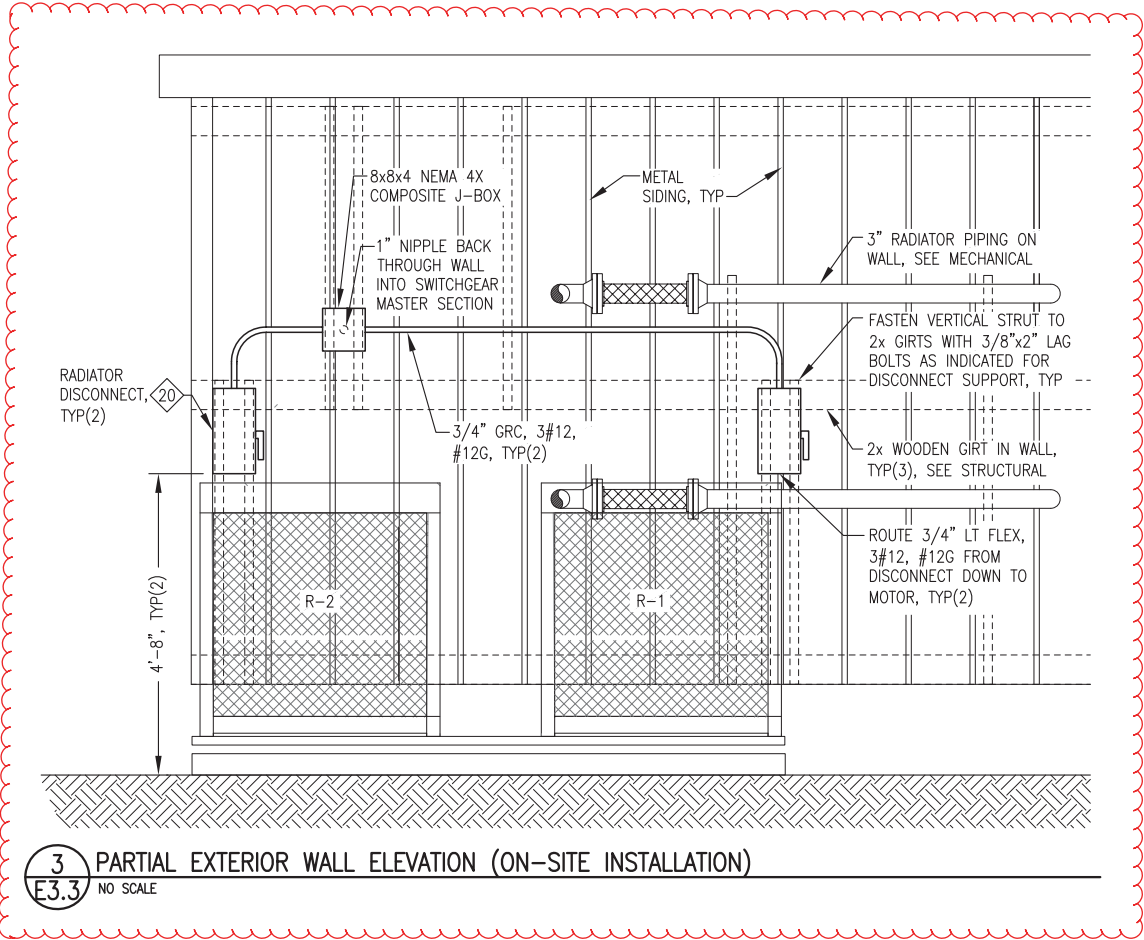
DATE: 2/12/18
SCALE: AS NOTED

JOB NUMBER:



1 INTERIOR END WALL ELEVATION
 E3.3 NO SCALE

2 INTERIOR FRONT WALL ELEVATION
 E3.3 NO SCALE



3 PARTIAL EXTERIOR WALL ELEVATION (ON-SITE INSTALLATION)
 E3.3 NO SCALE

MODULE SHOP/ON-SITE NOTES:

- ALL WORK SHOWN THIS SHEET IS PART OF THE MODULE SHOP FABRICATION PROJECT EXCEPT AS SPECIFICALLY NOTED.
- FURNISH AND INSTALL ALL EXTERIOR RADIATOR POWER CONDUIT, CONDUCTORS, AND DEVICES SHOWN ON DETAIL 3/E3.3 AS PART OF THE ON-SITE PROJECT.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

REVISIONS MARK	DATE	DESCRIPTION
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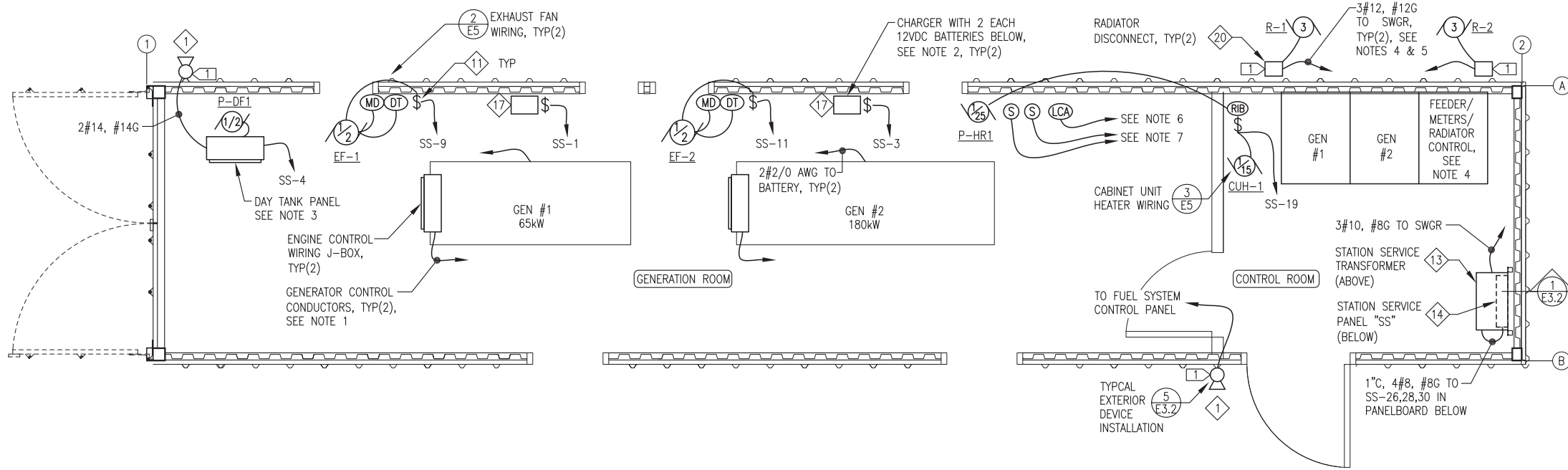


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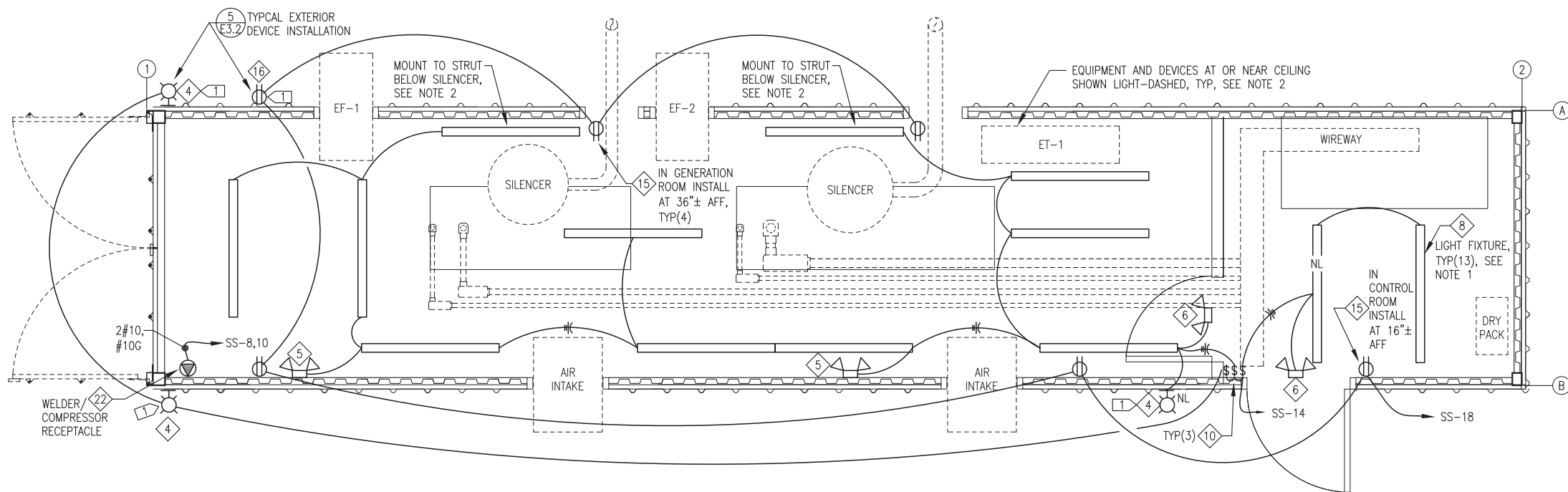
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SHEET TITLE: ELECTRICAL WALL ELEVATIONS
 SHEET: E3.3
 DRAWN BY: JTD
 CHECKED BY: CWV/BCG
 DATE: 2/12/18
 SCALE: AS NOTED
 JOB NUMBER:



1 STATION SERVICE PLAN
E4 1/2"=1'-0"



2 LIGHTING & RECEPTACLE PLAN
E4 1/2"=1'-0"

MODULE SHOP/ON-SITE NOTES:

1. FURNISH AND INSTALL ALL EXTERIOR DEVICES, BOXES, CONDUIT, AND SUPPORTS AS PART OF THE ON-SITE PROJECT. SEE DETAILS 5/E3.2 AND 3/E3.3 FOR ADDITIONAL NOTES.

- STATION SERVICE NOTES:**
- ROUTE GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 1-1/2" CONDUIT. SEE SHEET E6.2 AND NOTE 4.
 - MOUNT BATTERY CHARGER TO WALL ON SHALLOW VERTICAL STRUT AND INSTALL BATTERIES ON FLOOR BELOW, SEE DETAIL 4/E5.
 - ALL DAY TANK ACCESSORIES NOT SHOWN ON PLANS. SEE SHEETS E7.1-E7.2 FOR DAY TANK CONTROL PANEL DESIGN AND INSTALLATION.
 - SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.
 - ROUTE RADIATOR CONDUCTORS TO SWITCHGEAR FEEDER SECTION IN EXTERIOR GRC, SEE SHEETS E3.2 & E3.3.
 - INSTALL LOW COOLANT LEVEL ALARM SWITCH WHERE SHOWN ON PIPING ISOMETRIC 1/M4.2. CONNECT TO N.C. SWITCH (WHITE & RED) AND ROUTE 2#14 TO SWITCHGEAR MASTER SECTION. SEE NOTE 4.
 - INSTALL TWO TEMP SENSORS PROVIDED WITH SWITCHGEAR FOR RADIATOR CONTROL WHERE SHOWN ON PIPING ISOMETRIC 1/M4.2. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR MASTER SECTION. SEE NOTE 4.

- LIGHTING & RECEPTACLES NOTES:**
- LIGHT LOCATIONS SHOWN GENERALLY IN PREFERRED LOCATIONS. COORDINATE INSTALLATION WITH FINAL LOCATION OF EQUIPMENT TO PREVENT INTERFERENCE AND MAXIMIZE LIGHT COVERAGE.
 - SEE EXHAUST SILENCER SUPPORT SHEET M6.1 FOR INSTALLATION SPECIFICALLY FOR SUPPORTING THIS LIGHT, TYP 2 LOCATIONS.
 - ONE EXTERIOR LIGHT AND ONE INTERIOR LIGHT ARE LABELED NL. CONNECT UNSWITCHED TO SERVE AS NIGHT LIGHTS.

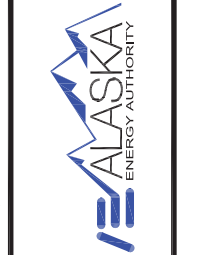
- GENERAL SHEET NOTES:**
- NO SCREWS, BOLTS, OR OTHER PENETRATIONS ARE ALLOWED IN CONNEX STEEL CEILING PANELS. DO NOT MOUNT CONDUIT, LIGHTS, OR ANY OTHER DEVICES DIRECTLY TO CEILING. MOUNT ON SHOP-WELDED STRUT AS INDICATED ON SHEET M2.1 OR MOUNT ON CROSS STRUT BOLTED TO THE SHOP-WELDED STRUT AS REQUIRED.
 - ROUTE MAJORITY OF STATION SERVICE AND CONTROL CONDUCTORS IN WIREWAY ON FRONT WALL, SEE ELEVATION 2/E3.2. FINAL ROUTING TO EQUIPMENT AND DEVICES IN SURFACE MOUNTED CONDUIT. USE LIQUID TIGHT FLEX AS REQUIRED.
 - ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN

REVISIONS	DATE	DESCRIPTION
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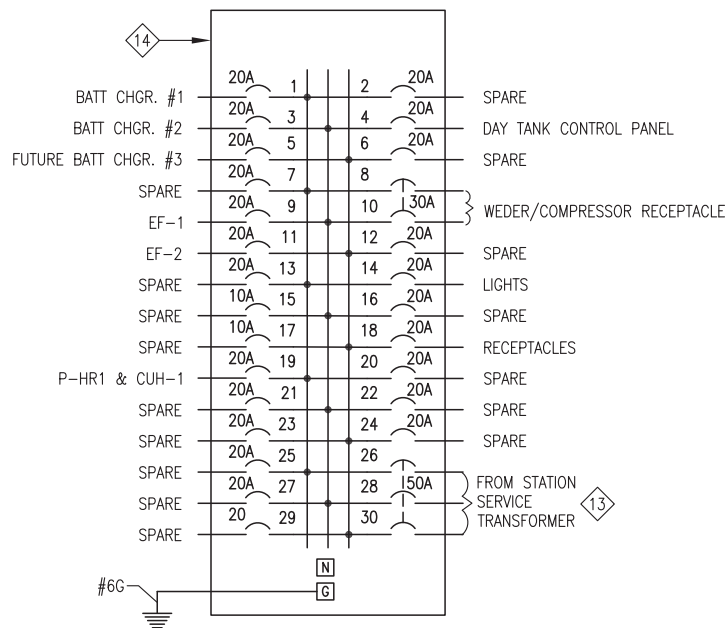


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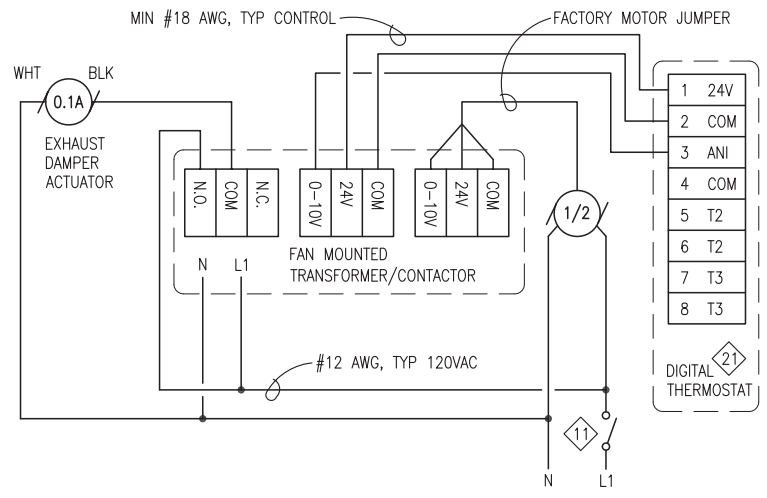


MERTARVIK PHASE 1 POWER SYSTEM
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SHEET TITLE	
STATION SERVICE PLANS	
SHEET	
E4	
DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	

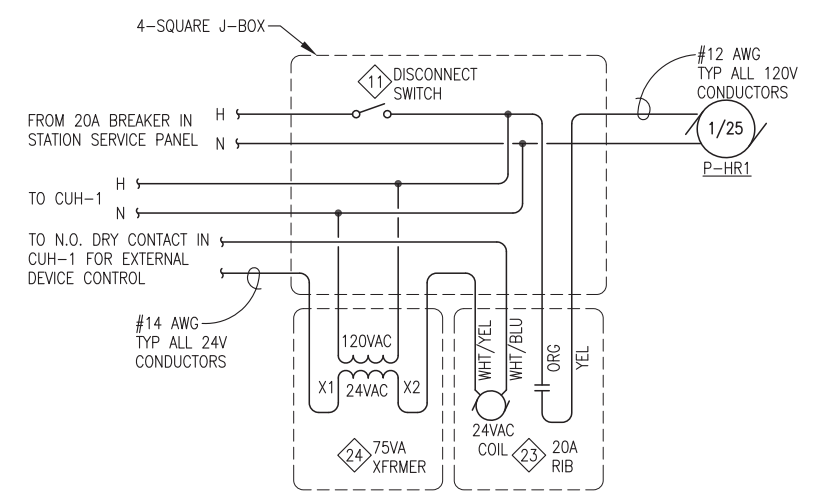


1 STATION SERVICE PANEL "SS"
E5 NO SCALE

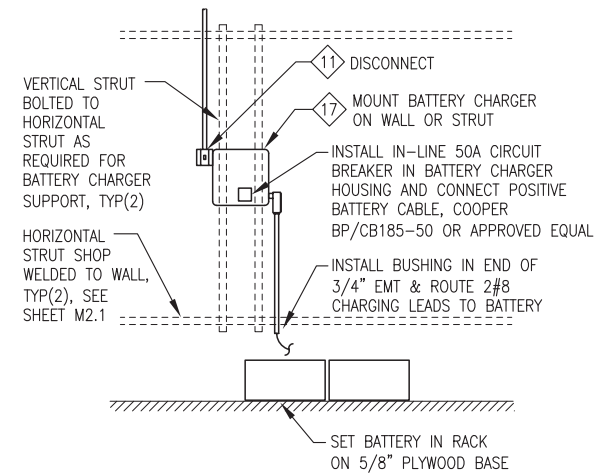


2 EXHAUST FAN WIRING DIAGRAM
E5 NO SCALE

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



3 CUH-1 WIRING DIAGRAM
E5 NO SCALE



4 BATTERY INSTALLATION DETAIL
E5 NO SCALE

REVISIONS	MARK	DATE	DESCRIPTION
1			
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3			
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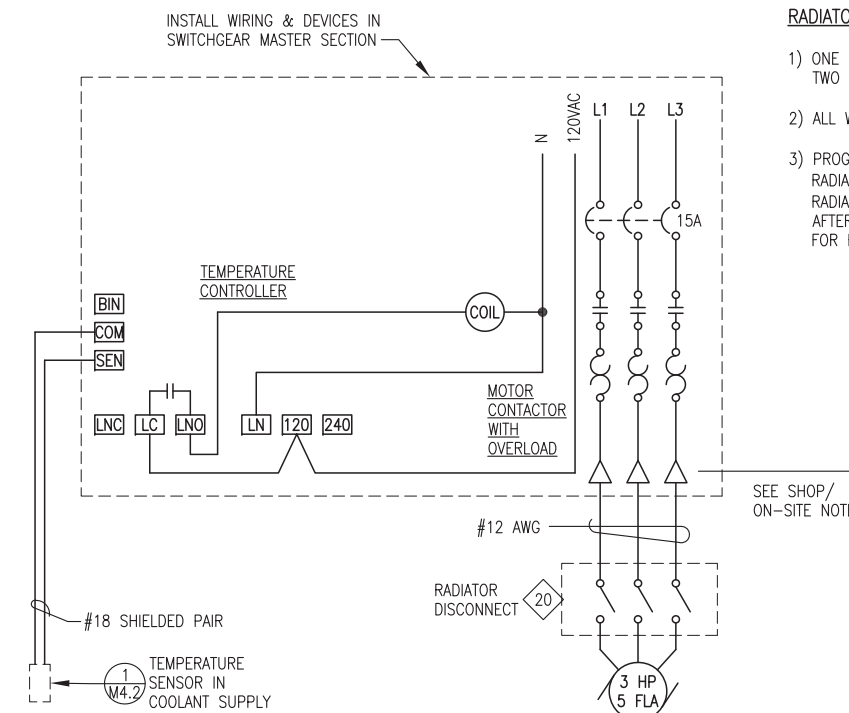
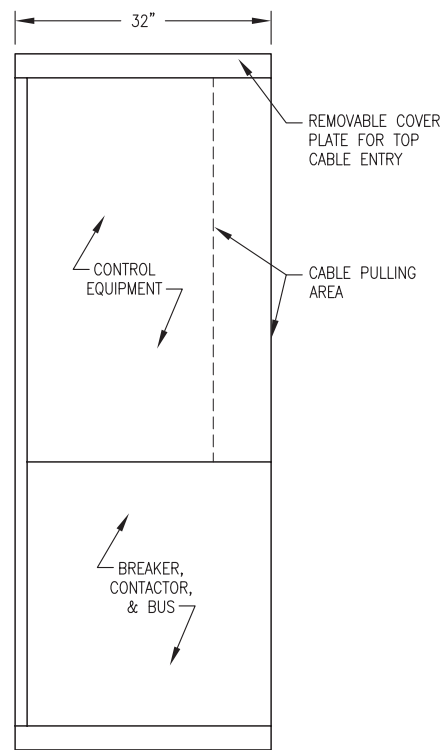
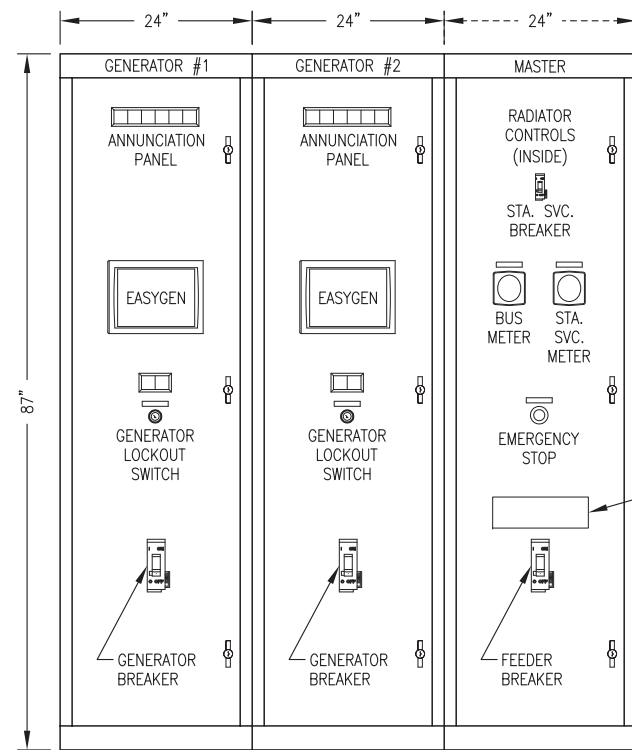
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SHEET TITLE
STATION SERVICE DETAILS

SHEET
E5

DRAWN BY: JTD
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DATE: 2/12/18
SCALE: AS NOTED
JOB NUMBER:

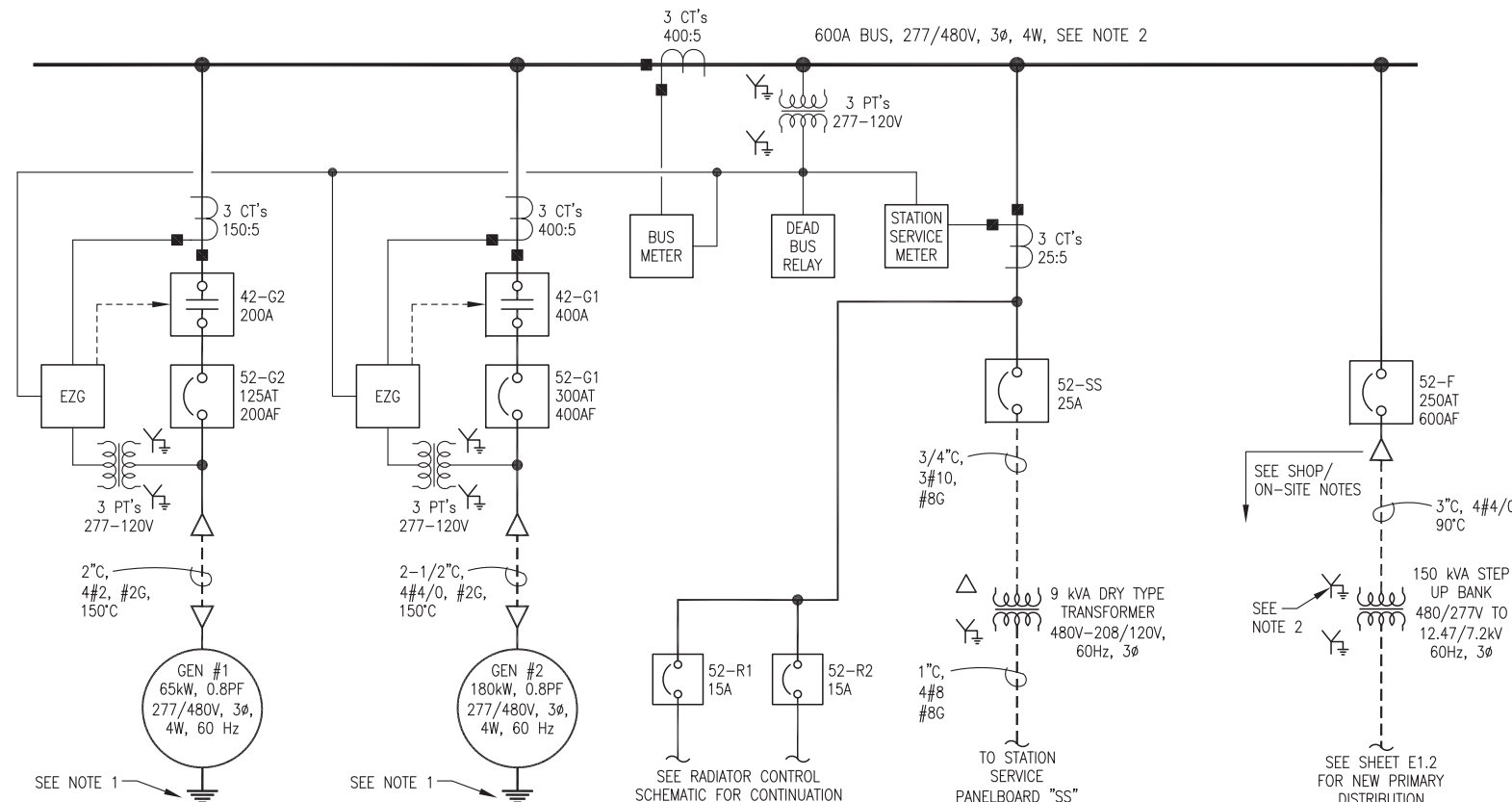


RADIATOR CONTROL NOTES:

- 1) ONE RADIATOR CONTROL SHOWN. PROVIDE TWO IDENTICAL
- 2) ALL WIRING #12 AWG EXCEPT AS NOTED.
- 3) PROGRAM TEMPERATURE CONTROLLERS FOR:
RADIATOR #1 = 200°F ON & 190°F OFF
RADIATOR #2 = 205°F ON & 195°F OFF
AFTER SELECTING VALUES INSTALL JUMPER FOR RESTRICTED MODE

1 SWITCHGEAR ENCLOSURE LAYOUT
E6.1 NO SCALE

2 RADIATOR CONTROL SCHEMATIC
E6.1 NO SCALE



SWITCHGEAR NOTES:

- 1) ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. INDEPENDENTLY GROUND EACH GENERATOR FRAME TO SWITCHGEAR GROUND BUS & PROVIDE SECOND GROUND DIRECTLY TO THE PLANT GROUND GRID, SEE SHEET E3.1.
- 2) DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS. FIELD INSPECT SWITCHGEAR FOR NEUTRAL-GROUND STRAP AND REMOVE IF INSTALLED. GROUND NEUTRAL AT THE STEP UP TRANSFORMERS ONLY.
- 3) ALL GENERATOR POWER CONDUCTORS 150°C CABLE. ALL 480V FEEDER CONDUCTORS 90°C CABLE. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE. STATION SERVICE CONDUCTORS AND TERMINATIONS MINIMUM 75°C.

MODULE SHOP/ON-SITE NOTES:

1. ALL WORK SHOWN THIS SHEET IS PART OF THE MODULE SHOP FABRICATION PROJECT EXCEPT AS SPECIFICALLY NOTED.
2. FURNISH AND INSTALL ALL EXTERIOR RADIATOR POWER CONDUIT, CONDUCTORS, AND DEVICES AS PART OF THE ON-SITE PROJECT. SEE DETAIL 3/E3.3.
3. FURNISH AND INSTALL ALL FEEDER CONDUIT AND CONDUCTORS AND STEP UP TRANSFORMER BANK AS PART OF THE ON-SITE PROJECT.

3 SWITCHGEAR ONE-LINE DIAGRAM LAYOUT
E6.1 NO SCALE

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION BUT ALSO INCLUDES SOME ON-SITE WORK THAT IS N.I.C. PORTIONS THAT ARE IN THE ON-SITE CONTRACT SCOPE ARE SHOWN CLOUDED.

REVISIONS	DATE	DESCRIPTION
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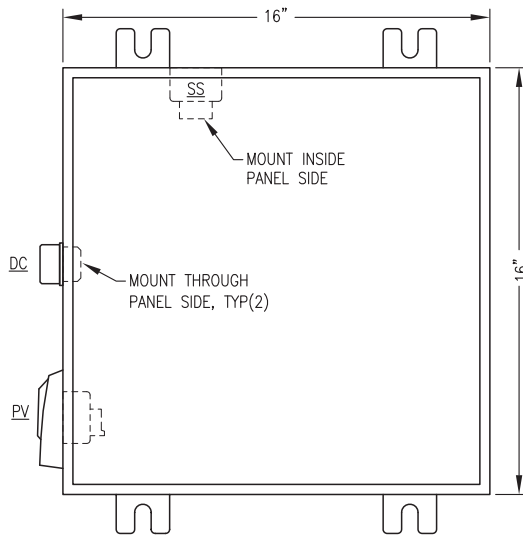
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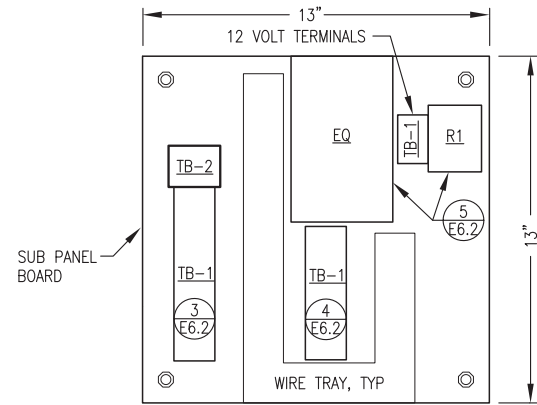
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ENERGY AUTHORITY

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MERTARVIK, ALASKA

SHEET TITLE	
SWITCHGEAR LAYOUT, ONE LINE & SCHEMATICS	
SHEET	
E6.1	
DRAWN BY: BCG	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



1 JUNCTION BOX FRONT PANEL LAYOUT
E6.2 NO SCALE



2 JUNCTION BOX SUB PANEL LAYOUT
E6.2 NO SCALE

BILL OF MATERIALS (NOTE: PROVIDE MATERIALS AS SPECIFIED - NO SUBSTITUTIONS ALLOWED)			
TAG	MANUFACTURER	MODEL	DESCRIPTION
ENCLOSURE	HOFFMAN	A16H16ALP	16x16x8" NEMA 12
	HOFFMAN	A16P16	BACK PANEL
DC	DEUTSCH	HD10-9-96-S-1939	DIAGNOSTIC CONNECTOR, 9-PIN, CAN-BUS
	DEUTSCH	HD18-009	CONNECTOR STRAIN RELIEF
	DEUTSCH	HDC16-9	CONNECTOR PROTECTIVE DUST CAP
	DEUTSCH	HD10-9-GKT	CONNECTOR GASKET
	DEUTSCH	JDL062397	CONNECTOR LANYARD
EQ	SOLAR CONVERTERS	EQ 12/24-20LED2	24VDC TO 12VDC EQUALIZER
PV	MURPHY	PV101-C-MSTD	POWER VIEW W/HARNESS
R1	ALLEN-BRADLEY	700HAB2Z24	DPDT RELAY, 24VDC COIL
	ALLEN-BRADLEY	700HN101	8 PIN SOCKET BASE
SS	CATERPILLAR	9X-8124	STARTER SOLENOID
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK

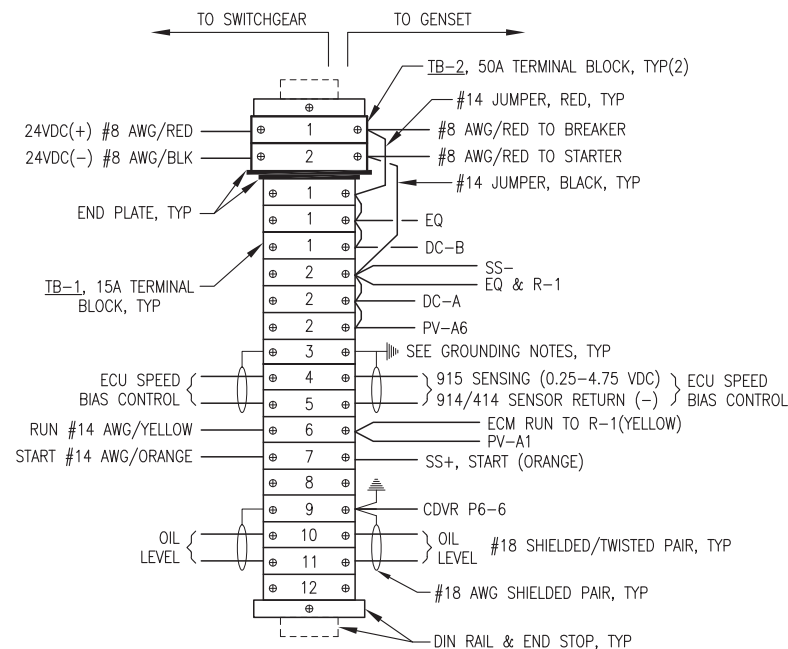
NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

PANEL FABRICATION NOTES:

- 1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
- 2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR.
- 3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
- 4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. TAG EACH END OF ALL JUMPERS WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS).
- 5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT ONE END ONLY.
- 6) PROVIDE WIRING HARNESES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
- 7) SHOP TEST EACH ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

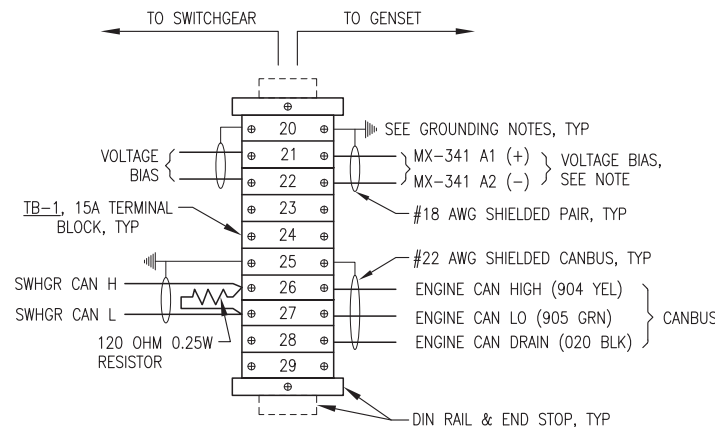
PANEL INSTALLATION NOTES:

- 1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE NUMBER OF THE ASSOCIATED HOME RUN LANDING ON TERMINAL IN THE CONTROL PANEL.
- 2) ON SHIELDED CONDUCTORS FROM SWITCHGEAR GROUND ALL SHIELD DRAIN WIRES TO LUGS AT GENERATOR END ONLY.

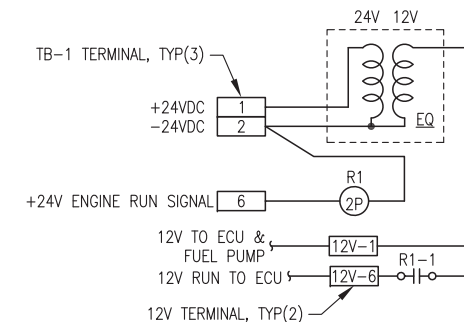


3 TERMINAL STRIP CONNECTIONS
E6.2 NO SCALE

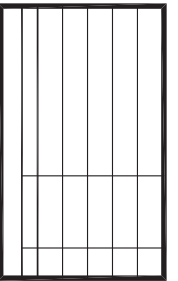
NOTE: VOLTAGE REGULATOR AND DROOP CT FURNISHED AND INSTALLED IN GENERATOR. PROVIDE REMOTE BIAS SIGNAL CONNECTION TO REGULATOR AS INDICATED.



4 TERMINAL STRIP CONNECTIONS
E6.2 NO SCALE



5 12V RUN RELAY R2 WIRING DIAGRAM
E6.2 NO SCALE



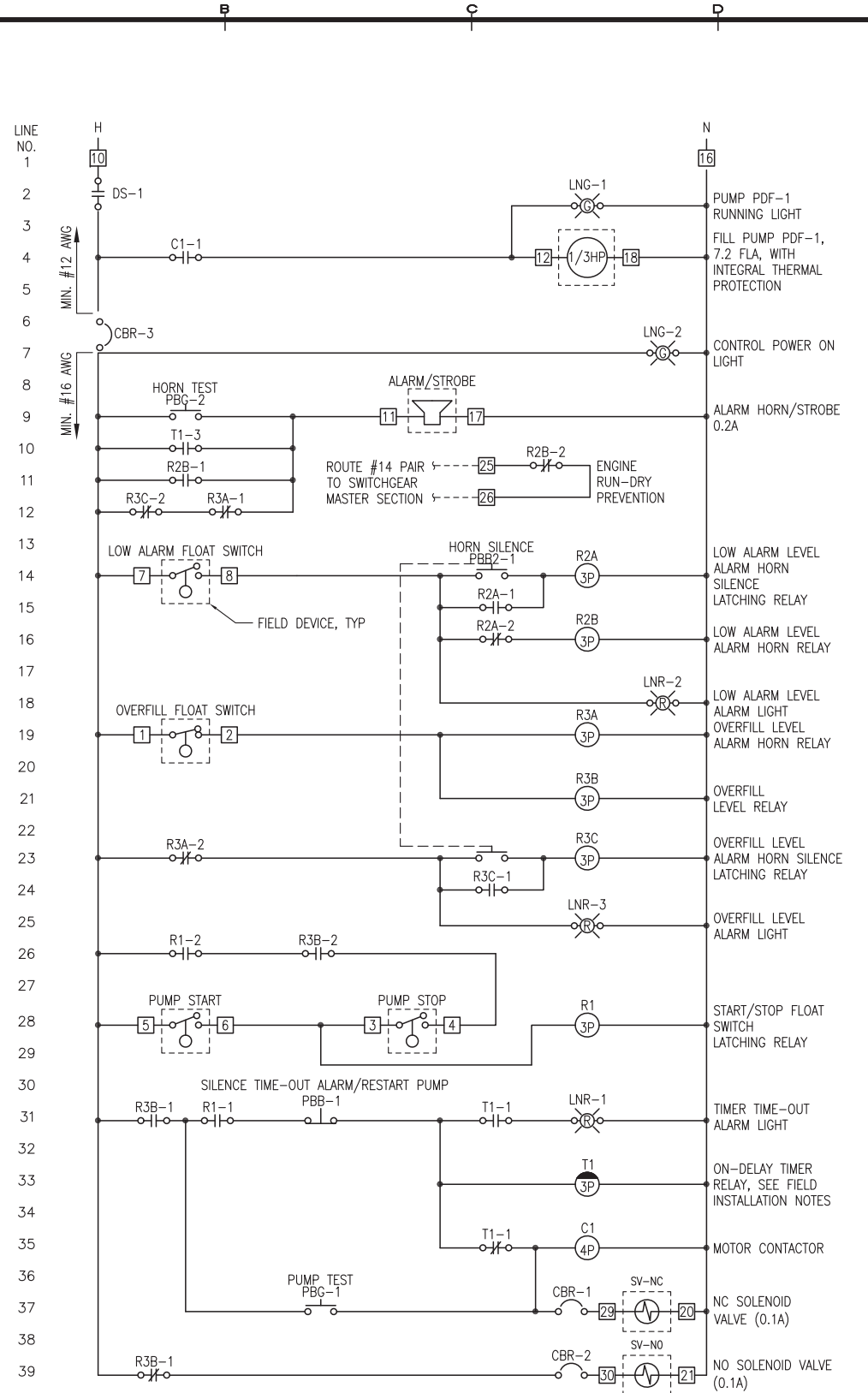
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SHEET TITLE	
ENGINE CONTROL WIRING JUNCTION BOX	
SHEET	
E6.2	
DRAWN BY: BCG	CHECKED BY: CWV/BCG
DATE: 2/12/18	SCALE: AS NOTED
JOB NUMBER:	



1 LOGIC DIAGRAM
E7.1 NO SCALE

PANEL FABRICATION NOTES:

- 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 24"x20"x8" NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7.2 FOR PANEL LAYOUT DETAILS.
- USE MIN #16 AWG ON ALL 5 AMP FUSED CIRCUITS AND MIN #12 AWG WIRE ON ALL OTHER CIRCUITS. TAG EACH END OF ALL JUMPERS WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS).
- 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.
- 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.
- FIELD WIRING AND FIELD INSTALLED DEVICES PROVIDED BY OTHERS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT PART OF THE PANEL BID.
- POWER TO PANEL PROVIDED FROM DEDICATED 20A CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

FIELD INSTALLATION NOTES:

- SEE MECHANICAL FOR DAY TANK INSTALLATION & PIPING. INSTALL CONTROL PANEL & FIELD DEVICES AS INDICATED TO PROVIDE REDUNDANT HIGH & LOW LIMIT CONTROLS & OVERFILL PROTECTION.
- FIELD WIRING TO FLOAT SWITCHES, SOLENOID VALVES, & ALARM HORN #14 AWG. ALL OTHER FIELD WIRING MIN #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS.
- PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A SINGLE POLE CIRCUIT BREAKER IN LISTED LOAD CENTER.
- 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.
- 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.
- 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.
- SET TIMING RELAY TIME DELAY TO 30 MINUTES (APPROX. 55 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 4 GPM). ON THE INITIAL TANK FILL, THE TIME-OUT SILENCE/RESTART BUTTON MAY HAVE TO BE PRESSED IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE SEQUENCE OF OPERATIONS.

SEQUENCE OF OPERATIONS:

- WHEN THE DAY TANK CIRCUIT BREAKER AND DAY TANK DISCONNECT SWITCH ARE CLOSED, AND THE POWER LIGHT IS ON.
- 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 DAY TANK PUMP IS ENERGIZED, AND THE PUMP "ON" LIGHT TURNS 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 CLOSES, THE PUMP DE-ENERGIZES, AND THE PUMP "ON" LIGHT TURNS OFF.
- TIMER OPERATION - IF THE TIMER TIMES-OUT THE N.C. DAY TANK SOLENOID VALVE CLOSES, 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.
- 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 CLOSES, 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.
- 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).
- 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, 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.

BILL OF MATERIALS				
TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
C	1	ALLEN-BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2	2	ALLEN-BRADLEY	1489M1C010	CIRCUIT BREAKER, RAIL STYLE, 1 POLE, 1A
CBR-3	1	ALLEN-BRADLEY	1489M1C050	CIRCUIT BREAKER, RAIL STYLE, 1 POLE, 5A
DS	1	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
LNG	1	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	2	ALLEN-BRADLEY	800HORH2G	GREEN LED PILOT LIGHT, 12-130V, NEMA 4X
LNR	3	ALLEN-BRADLEY	800HORH2R	RED LED PILOT LIGHT, 12-130V, NEMA 4X
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
R	6	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
T	6	ALLEN-BRADLEY	700HN101	11 PIN SOCKET BASE
	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	30	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS

NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

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
TB#	TERMINAL BLOCK	O.L.	OVERLOADS	PB#-#	NORMALLY OPEN MOMENTARY PUSH BUTTON
CB#	CIRCUIT BREAKER	PB#-#	NORMALLY CLOSED MOMENTARY PUSH BUTTON	ASL#-#	ALARM & STROBE LIGHT

REVISIONS	DATE	DESCRIPTION
1		
2		
3		
4		
5		



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MERTARVIK PHASE 1 POWER SYSTEM

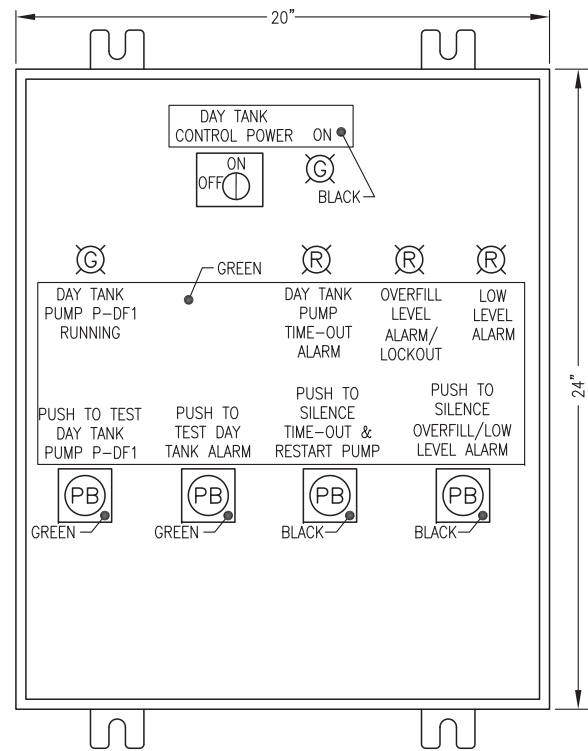
ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

MERTARVIK, ALASKA

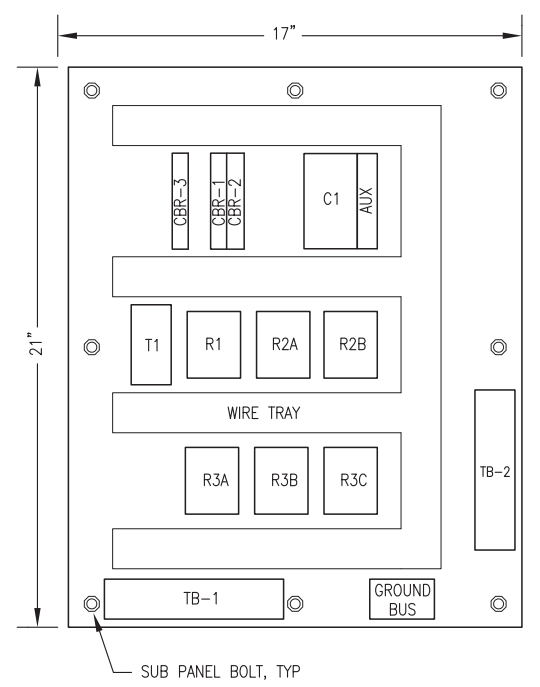
SHEET TITLE
DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

SHEET
E7.1

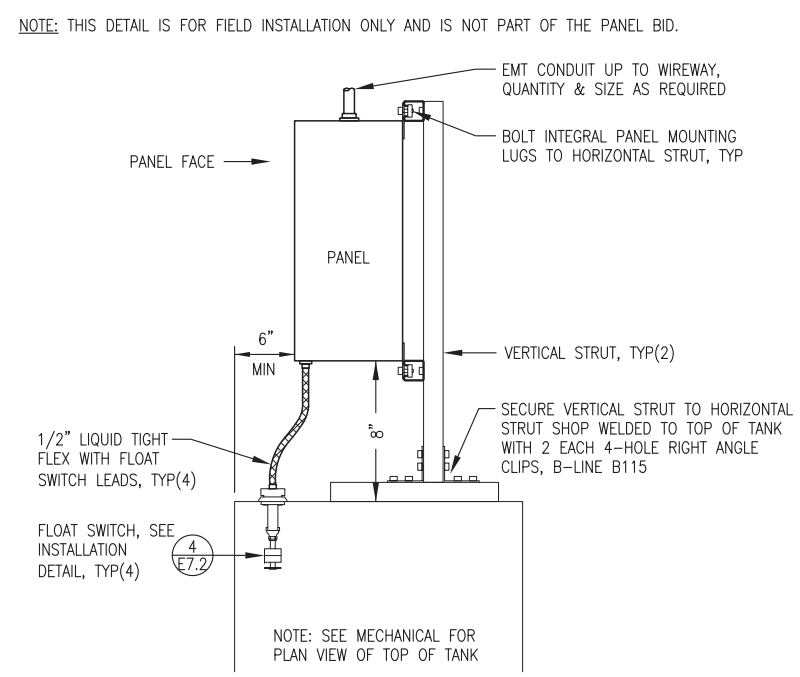
DRAWN BY: JTD
CHECKED BY: CWV/BCG
DATE: 2/12/18
SCALE: AS NOTED
JOB NUMBER:



1 FRONT PANEL LAYOUT
E7.2 NO SCALE

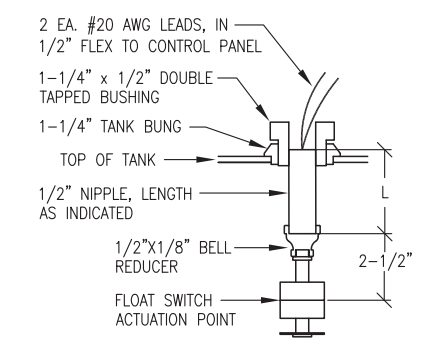


2 SUBPANEL LAYOUT
E7.2 NO SCALE



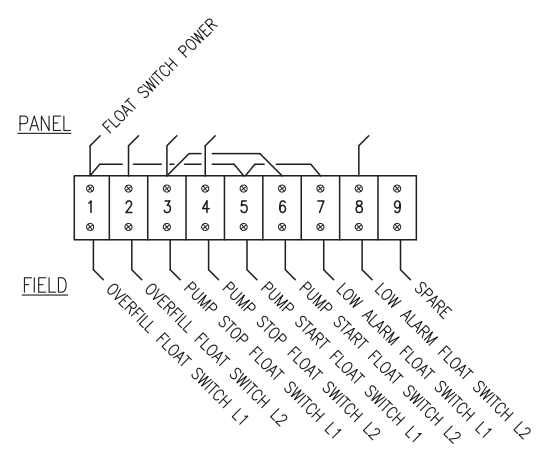
3 DAY TANK CONTROL PANEL INSTALLATION
E7.2 NO SCALE

NOTES:
1) THIS DETAIL IS FOR FIELD INSTALLATION ONLY AND IS NOT PART OF THE PANEL BID.
2) PRIOR TO INSTALLATION CHASE THREADS ON FLOAT SWITCH WITH 1/8" PIPE DIE TO CLEAN OFF ANY EXCESS EPOXY, USE CARE TO AVOID DAMAGING WIRES.



- L = OVERALL LENGTH OF 1/2" NIPPLE
- OVERFILL FLOAT L=2" (90%)
 - PUMP STOP FLOAT L=4" (85%)
 - PUMP START FLOAT L=18" (50%)
 - LOW ALARM FLOAT L=20" (45%)

4 FLOAT SWITCH DETAIL
E7.2 NO SCALE



NOTES:
1) INSTALL TERMINAL STRIP TB-1 HORIZONTALLY AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL - SEE SUBPANEL LAYOUT.

5 TERMINAL STRIP TB-1
E7.2 NO SCALE

PANEL	FIELD
10	CONTROL PANEL POWER FROM STATION SERVICE PANEL SS
11	ALARM/STROBE POWER
C1-1	FILL PUMP PDF-1 MOTOR POWER
13	SPARE
14	SPARE
15	SPARE
16	CONTROL PANEL NEUTRAL FROM STATION SERVICE PANEL SS
17	ALARM/STROBE NEUTRAL
18	FILL PUMP PDF-1 MOTOR POWER NEUTRAL
19	SPARE NEUTRAL
20	DAY TANK NC SOLENOID VALVE NEUTRAL
21	DAY TANK NO SOLENOID VALVE NEUTRAL
22	SPARE NEUTRAL
23	SPARE NEUTRAL
24	SPARE NEUTRAL
25	ENGINE RUN-DRY PREVENTION L1 TO SWITCHGEAR
26	ENGINE RUN-DRY PREVENTION L2 TO SWITCHGEAR
27	SPARE
28	SPARE
CBR-1	NC SOLENOID VALVE POWER
CBR-2	NO SOLENOID VALVE POWER

NOTES:
1. INSTALL TERMINAL STRIP TB-2 VERTICALLY AS SHOWN. LOCATE TERMINAL STRIP TO THE RIGHT OF PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO RIGHT SIDE (FACING) OF PANEL - SEE SUBPANEL LAYOUT.
2. IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

6 TERMINAL STRIP TB-2
E7.2 NO SCALE

REVISIONS	MARK	DATE	DESCRIPTION
1			
2			
3			
4			
5			



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MERTARVIK PHASE 1 POWER SYSTEM

ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

MERTARVIK, ALASKA

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

SHEET
E7.2

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SCALE: AS NOTED
JOB NUMBER: