STATE OF ALASKA, AIDEA/AEA

KIPNUK RURAL POWER SYSTEM UPGRADE

KIPNUK, ALASKA

DRAWING INDEX

LOCATION MAP

VICINITY MAP

CONSTRUCTION DOCUMENTS

MARCH 16, 2017

OWNER

ALASKA ENERGY AUTHORITY
813 W NORTHERN LIGHTS BLVD
ANCHORAGE, ALASKA 99503
TELEPHONE: 907-771-3000

CIVIL ENGINEER

UMIAQ
6700 ARCTIC SPUR ROAD
ANCHORAGE, ALASKA 99518
TELEPHONE: 907-677-8220

GEOTECHNICAL ENGINEER

GOLDER ASSOCIATES
2121 ABBOTT RD, SUITE 100
ANCHORAGE, ALASKA 99507
TELEPHONE: 907-344-6001

MECHANICAL ENGINEER
ELECTRICAL ENGINEER

GRAY STASSEL ENGINEERING, INC.
P.O. BOX 111405
ANCHORAGE, ALASKA 99511
TELEPHONE: 907-349-0100

ARCHITECT
STRUCTURAL ENGINEER

LCG LANTECH, INC.
250 H ST.
ANCHORAGE, ALASKA 99501
TELEPHONE: 907-243-8985

UMIAQ
6700 Arctic Spur Road · Anchorage, AK 99518 · (907)677-8220

STATE OF ALASKA AIDEA/AEA
KIPNUK RURAL POWER SYSTEM UPGRADE
CONSTRUCTION DOCUMENTS
MARCH 21, 2017 - UMIAQ PROJECT NO. 70184.15

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 Cover Sheet.dwg
PRINTED: 03/21/2017 15:34 David.Hordy LAYOUT: Layout 1 XREFS: None IMAGES: GOOGLE EARTH IMAGE - 01.JPG

GENERAL NOTES

1. FLOOD DATA IS BASED ON FLOOD ELEVATION INVESTIGATION CONDUCTED BY LCMF (NOW UMIAQ) IN 2007. THE FLOOD OF RECORD WAS DETERMINED TO BE 100.0 FEET, BASED ON CORRESPONDENCE WITH ELDERS AND OTHERS IN THE COMMUNITY.
2. FOUNDATION DESIGN IS BASED ON THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT BY DUANE MILLER & ASSOCIATES, DATED JULY 25, 2007.
3. PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST STATE OF ALASKA ADOPTED EDITION OF THE INTERNATIONAL FIRE CODE, THE INTERNATIONAL MECHANICAL CODE, THE INTERNATIONAL BUILDING CODE, AND THE NATIONAL ELECTRICAL CODE INCLUDING STATE OF ALASKA AMENDMENTS. COMPLY WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.
4. THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.
5. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS, AND INSTALLATION DRAWINGS UNLESS INDICATED OTHERWISE.
6. PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN THE REQUIRED WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.
7. MARK UP DESIGN DRAWINGS TO REFLECT FIELD CHANGES THROUGHOUT CONSTRUCTION. TURN OVER "RED LINE" CONSTRUCTION DRAWINGS TO ENGINEER AT COMPLETION OF THE PROJECT.
8. NOT ALL UTILITIES MAY BE SHOWN ON THE PLANS. FIELD LOCATE ALL EXISTING UTILITIES BEFORE BEGINNING CONSTRUCTION. PROTECT UTILITIES AT ALL TIMES DURING CONSTRUCTION, REPAIR ANY DAMAGE IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANIES REQUIREMENTS.
9. PROVIDE AND MAINTAIN ALL SIGNS, BARRICADES AND WARNING LIGHTS AND OTHER PROTECTIVE DEVICES NECESSARY FOR SAFETY.
10. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH U.S. ENVIRONMENTAL PROTECTION AGENCY, ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION, AND STATE & FEDERAL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.
11. COORDINATE WORK REQUIRED BY THIS PROJECT WITH OTHER CONTRACTORS IN THE AREA, HIS SUBCONTRACTORS, THE OWNER, STATE AND FEDERAL AUTHORITIES.
12. SCHEDULE AND COORDINATE DEMOLITION AND NEW CONSTRUCTION ACTIVITIES SUCH THAT COMPLETE AND OPERABLE POWER GENERATION, POWER DISTRIBUTION, AND GENERATOR FUEL SUPPLY SYSTEMS ARE MAINTAINED AT ALL TIMES. ALL OUTAGES SHALL BE COORDINATED A MINIMUM OF 14 DAYS IN ADVANCE WITH THE KIPNUK LIGHT PLANT AND THE KTC.
13. "BY BFU" MEANS SPECIFIED AND PROVIDED BY THE BFU PROJECT AND PROVIDED UNDER THE BFU PORTION OF THIS PROJECT.
14. PROVIDE 20 AMP/240V POWER FOR POWER PLANT MODULE FOR TEMPORARY HEAT UPON ARRIVAL AT THE PROJECT SITE. PROVIDE TEMPORARY UTILITIES AS REQUIRED FOR OPERATION OF THE NEW POWER PLANT DURING STARTUP, DEMONSTRATION, AND TESTING.
15. SEE BFU PROJECT SHEET C0.0 GENERAL NOTES FOR ADDITIONAL GENERAL REQUIREMENTS.

WORK BY OTHERS

ALL WORK SHOWN AND SPECIFIED ON THE CONSTRUCTION DOCUMENTS FOR THE KIPNUK RURAL POWER SYSTEM UPGRADE PROJECT SHALL BE PROVIDED BY THE SUCCESSFUL BIDDER FOR THIS PROJECT UNLESS SPECIFICALLY INDICATED TO BE PROVIDED BY OTHERS.

1. GENERATOR MODULE, COMPLETE INCLUDING COMMISSIONING IN ANCHORAGE ALASKA. THE GENERATOR MODULE WILL BE PROVIDED BY THE AUTHORITY AS A COMPLETE PACKAGE INCLUDING POWER PLANT STEP-UP TRANSFORMER, REMOTE RADIATORS, CHARGE AIR COOLERS, GENERATOR EXHAUST AND CRANK CASE VENT PIPING EXTERIOR TO THE MODULE, VENTILATION HOODS, EXTERIOR ALARM HORN/STROBES, EXTERIOR LIGHTING, EXTERIOR ELECTRICAL RECEPTACLE, AND OTHER ITEMS ON THE EXTERIOR OF THE GENERATOR MODULE REQUIRED TO MAKE A COMPLETE AND OPERABLE POWER PLANT, EXCEPT WHERE OTHERWISE INDICATED.

GENERATOR MODULE WORK PROVIDED BY THIS PROJECT

A. SEE "SECTION 01 11 13 - SUMMARY OF WORK" FOR ADDITIONAL REQUIREMENTS REGARDING THE WORK TO BE PROVIDED BY THIS PROJECT FOR THE RURAL POWER SYSTEM UPGRADE (RPSU) POWER PLANT MODULE PORTION OF THE PROJECT.

B. THE CONTRACTOR WILL RECEIVE POWER PLANT MODULE IN ANCHORAGE, ATTEND MANDATORY WITNESSED OPERATIONAL TEST, DISASSEMBLE MODULE FROM ITS COMMISSIONING CONFIGURATION, DRAIN FLUIDS AS REQUIRED FOR SHIPPING, PACKAGE AND PROTECT ALL ITEMS INCLUDED WITH THE MODULE FOR SHIPMENT, AND SHIP MODULE TO THE PROJECT SITE.

C. THE MANDATORY WITNESSED OPERATIONAL TEST WILL HAVE A MINIMUM DURATION OF TWO (2) EIGHT (8) HOUR DAYS, AND WILL OCCUR WITHIN THE FIRST (30) DAY FOLLOWING THE NOTICE TO PROCEED FOR THIS PROJECT.

D. THE POWER PLANT MODULE HAS BEEN BUILT IN TWO SECTIONS THAT ARE CURRENTLY FULLY ASSEMBLED WHICH MUST BE DISCONNECTED FROM EACH OTHER AND SHIPPED TO THE PROJECT SITE AS TWO SEPARATE UNITS.

E. THE CONTRACTOR MUST PROVIDE POWER PLANT PILE FOUNDATION, FRAMING, PLATFORMS, CATWALKS, STAIRS, HAND RAILS, GUARD RAILS, ROOF STRUCTURE, ROOF PANELS, FLASHING, AND ASSOCIATED ITEMS AS DETAILED. IN ADDITION THE CONTRACTOR MUST PROVIDE ALL HEAT RECOVERY PIPING, FUEL PIPING, WIRING, RACEWAYS, AND ELECTRICAL DISTRIBUTION OUTSIDE OF THE GENERATOR MODULE.

F. UPON ARRIVAL AT THE PROJECT SITE CONNECT MODULE TO TEMPORARY POWER, PLACE EACH SECTION ON FOUNDATION, REJOIN THEM, AND SECURE MODULE TO FOUNDATION, THEN REASSEMBLE IT WITH THE ITEMS INCLUDED WITH OR REMOVED FROM THE MODULE PRIOR TO SHIPPING. AFTER POWER PLANT MODULE IS REASSEMBLED, ALL UTILITIES ARE CONNECTED, FLUIDS REPLACED, HEAT RECOVERY AND ENGINE COOLING SYSTEMS ARE FILLED WITH THE SPECIFIED HEAT TRANSFER FLUIDS THE POWER PLANT MODULE WILL BE COMMISSIONED AT THE PROJECT SITE BY THE AUTHORITY. ANYTHING OPERATIONAL AT THE WITNESSED TEST THAT IS FOUND TO BE DEFECTIVE OR NOT OPERATING PROPERLY UPON FIELD START-UP MUST BE REPLACED OR CORRECTED BY THE CONTRACTOR AT THEIR EXPENSE.

G. POWER PLANT MODULE ON-SITE WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING ITEMS, AS SHOWN AND DETAILED ON THE REFERENCED DRAWING(S):

1. SHEET A2 AND A4; FIELD INSTALLATION OF DOOR AND WINDOW, AT THE MODULE SHIPPING SPLIT, WHICH WAS SUPPLIED WITH THE MODULE.
2. SHEET A3 AND A5; MODULE ROOFING INCLUDING GABLE AND EAVE END WALL PANELS AND FLASHING.
3. SHEET S1; DRIVEN STEEL MODULE FOUNDATION PILES.
4. SHEET S2; MODULE FOUNDATION FRAMING, PLATFORMS, CATWALKS, STAIRS, GUARDRAILS, AND HAND RAILS.
5. SHEET S6; MODULE ROOF TRUSSES AND ASSOCIATE ROOF STRUCTURE.
6. SHEETS S7 THROUGH S10; MODULE FOUNDATION FRAMING, PLATFORMS, CATWALKS, STAIRS, GUARDRAILS, AND HAND RAILS.
7. SHEET S11; MODULE SHIPPING SPLIT REJOINING DETAILS.
8. SHEET M1.1; SCHEDULES SHOW RELEVANT ITEMS FOR EXTERIOR WORK.
9. SHEET M1.2 THROUGH M1.4; HEAT RECOVERY AND FUEL PIPING EXTERIOR TO THE MODULE INCLUDING CONNECTIONS AT THE GENERATOR MODULE.
10. SHEET M2; SPECIFICATIONS COVER RELEVANT ITEMS FOR EXTERIOR WORK.
11. SHEET M3.1 THROUGH M3.3; EXTERIOR EQUIPMENT LOCATIONS AND ATTACHMENT DETAILS.
12. SHEET M4.1; TYPICAL DETAILS FOR HEAT RECOVERY, ENGINE COOLANT, FUEL, AND OTHER MODULE PIPE PENETRATIONS.
13. SHEET M4.1, M4.2 AND M4.3; HEAT RECOVERY PIPING BEHIND THE SWITCH GEAR (FOR MODULE SHIPPING SPLIT), AND EXTERIOR REMOTE RADIATOR AND HEAT RECOVERY PIPING CONNECTIONS.
14. SHEET M5.1 AND M5.2; MODULE FUEL SUPPLY AND DAY TANK VENT PIPE CONNECTION DETAILS, AND BEHIND SWITCH GEAR FUEL AND USED OIL PIPING DETAILS (FOR MODULE SHIPPING SPLIT).
15. SHEET M6.1; GENERATOR EXHAUST AND CRANKCASE VENT PIPING EXTERIOR OF THE MODULE.
16. SHEET M6.2; EXTERIOR CHARGE AIR COOLER PIPING PLANS, SECTIONS AND DETAILS.
17. SHEET M7.1 AND M7.2; VENTILATION HOOD INSTALLATION DETAILS.
18. SHEET FS1; EXTERIOR FIRE ALARM HORN/STROBES AND FIRE ALARM WIRING AT SHIPPING SPLIT.
19. SHEET E1.1 AND E1.2; BULK TANK FARM INTERMEDIATE TANK CONTROL WIRING, EXISTING POWER PLANT STATION SERVICE CONNECTION, AND STEP-UP TRANSFORMER CONNECTION TO SWITCH GEAR.
20. SHEET E1.3; BULK FUEL TANK FARM INTERMEDIATE TANK ELECTRICAL CONNECTIONS.
21. SHEET E2; SPECIFICATIONS COVER RELEVANT ITEMS FOR EXTERIOR WORK.
22. SHEET E3.1, E3.2 AND E3.4; REMOTE RADIATOR AND CHARGE AIR COOLER POWER AND CONTROL WIRING ELECTRICAL CONNECTIONS.
23. SHEET E3.5; TYPICAL SHIPPING BREAK (SPLIT) ELECTRICAL CONDUIT WALL PENETRATION AND EXTERIOR WALL PENETRATION/DEVICE MOUNTING DETAILS.
24. SHEET E4.1; EXTERIOR MODULE LIGHT FIXTURES, AND LIGHTING CIRCUIT THAT CROSSES SHIPPING SPLIT.
25. SHEET E4.2; EXTERIOR MODULE RECEPTACLES.
26. SHEET E4.3; EXTERIOR ELECTRICAL POWER CONNECTIONS FOR REMOTE RADIATORS, CHARGE AIR COOLERS, PLUS MISCELLANEOUS DEVICES AND PANEL BOARDS.
27. SHEET E5; INSTRUMENTATION WIRING CONNECTIONS TO REMOTE RADIATORS, EXTERIOR MOUNTED DEVICES, AND DEVICES WITH WIRING THAT CROSSES SHIPPING SPLIT.
28. SHEET E6.2; EXTERIOR STEP-UP TRANSFORMER WIRING CONNECTION.
29. SHEETS E7.1 AND E7.2; BULK FUEL TANK FARM INTERMEDIATE TANK ACTUATED BALL VALVE AND LEVEL SENSOR CONTROL PANEL WIRING CONNECTIONS.
30. SHEETS EE1.0 THROUGH EE2.6; POWER PLANT MODULE EXTERIOR ELECTRICAL CONNECTION AND POWER DISTRIBUTION SYSTEM WORK.

H. PROJECT MANUAL DIVISIONS 02 THROUGH DIVISION 33 TECHNICAL SPECIFICATIONS ARE FOR THE BFU PROJECT AND THE RPSU SITE (CIVIL) WORK, UNLESS OTHERWISE NOTED. RPSU ARCHITECTURAL, STRUCTURAL, MECHANICAL, FIRE SUPPRESSION, ELECTRICAL, AND EXTERIOR ELECTRICAL TECHNICAL SPECIFICATION ARE ON THE DRAWINGS. PROJECT MANUAL TECHNICAL SPECIFICATION MEANS, METHODS, TOLERANCES, WORKMANSHIP, QUALITY, AND QUALITY CONTROL APPLIES TO ALL WORK.

I. SHOP DRAWINGS AND TECHNICAL DATA MUST BE SUBMITTED FOR ITEMS SPECIFIED ON THE DRAWINGS, WHICH INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING ITEMS:

ARCHITECTURAL:
1. METAL ROOFING INCLUDING GABLE AND EAVE END METAL WALL PANELS, FLASHING, AND FASTENERS. SUBMIT SHOP DRAWINGS AND PRODUCT DATA.

STRUCTURAL:
2. POWER PLANT FOUNDATION AND CATWALK STRUCTURAL FRAMING SHOP DRAWINGS.
3. CATWALK GRATING, HANDRAIL, GUARDRAIL AND STAIR SHOP DRAWINGS.
4. ROOF TRUSS SHOPS.
5. MILL CERTIFICATE(S) FOR POWER PLANT MODULE DRIVEN STEEL FOUNDATION PILES.

MECHANICAL:
6. FUEL PIPE, FITTINGS, AND SUPPORTS.
7. 1-INCH ACTUATED BALL VALVE FOR TANK FARM INTERMEDIATE TANK.
8. PRE-INSULATED ARCTIC PIPE, FITTINGS, AND SUPPORTS.
9. PIPE, FITTINGS, AND FLASHING AT MODULE ENTRANCES.
10. PIPE, FITTINGS, VALVES, AND SUPPORTS AT REMOTE BUILDINGS.
11. HEAT RECOVERY SYSTEM PREMIXED GLYCOL HEAT TRANSFER FLUID.

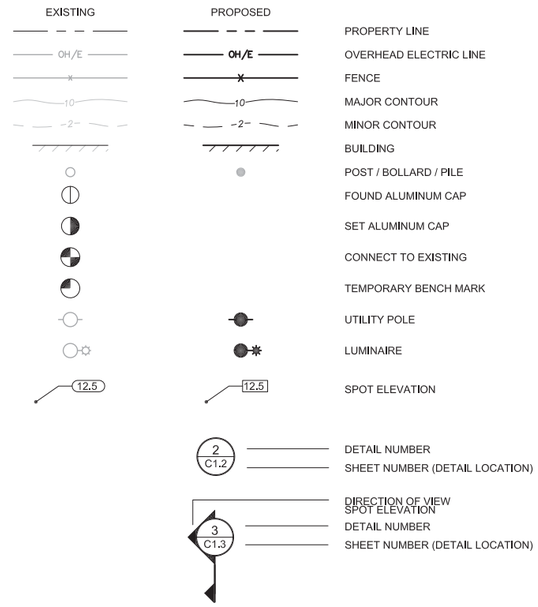
ELECTRICAL:
12. LEVEL SENSOR/PROBE FOR BULK TANK FARM INTERMEDIATE TANK.
13. ELECTRICAL DISCONNECT AT REMOTE BUILDING.

EXTERIOR ELECTRICAL:
14. POWER POLES.
15. POWER POLE LINE HARDWARE.
16. POWER POLE EPOXILATOR STANDOFFS.
17. POWER POLE GUYS.
18. POWER POLE ANCHORS.
19. PRIMARY UNDERGROUND CABLE.
20. PRIMARY OVERHEAD CABLE.
21. SECONDARY OVERHEAD CABLE.

ABBREVIATIONS

AEA	ALASKA ENERGY AUTHORITY
ALT	ALTERNATE
APPROX	APPROXIMATE
ACI	AMERICAN CONCRETE INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BFU	BULK FUEL UPGRADE
BP	BEGINNING OF PROJECT
DET	DETAIL
DIA, Ø	DIAMETER
E	EAST / EASTING
EA	EACH
ELEV	ELEVATION
EP	END OF PROJECT
EXIST	EXISTING
EG	EXISTING GRADE
FF	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
GALV	GALVANIZED
HDG	HOT DIP GALVANIZED
KLP	KIPNUK LIGHT PLANT
KTC	KIPNUK TRIBAL COUNCIL
KLTD	KUGKAKTLIK LIMITED
LKSD	LOWER KUSKOKWIM SCHOOL DISTRICT
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH / NORTHING
NVK	NATIVE VILLAGE OF KIPNUK
NTS	NOT TO SCALE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OC	ON CENTER
OD	OUTSIDE DIAMETER
P/L	PROPERTY LINE
PI	POINT OF INTERSECTION
PT	POINT
REQ'D	REQUIRED
RPSU	RURAL POWER SYSTEM UPGRADE
SHT	SHEET
STA	STATION
TBM	TEMPORARY BENCH MARK
TYP	TYPICAL
UHMWP	ULTRA HIGH MOLECULAR WEIGHT PLASTIC

LEGEND



UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE / DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49 TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
NOTES AND LEGEND

C0.0

SHEET | OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C0.0 Notes and Legend.dwg
PRINTED: 03/21/2017 15:29 David.Hardy LAYOUT: Layout 1 XREFS: 70184.15 TITLE BLOCK.DWG IMAGES: HARDY 3-16-17.TIF

SURVEY CONTROL				
Point #	Raw Description	Elevation	Northing	Easting
1477	FND 3.25" AC	98.274	2175043.6120	2000397.0950
52	SET 2" AC	98.161	2175639.2080	2000293.9450
51	SET 2" AC	98.649	2175265.6750	2000331.2530
53	TBM 1206-65	100.245	2175263.3670	2000353.7860

THE COORDINATES ARE STATE PLANE NAD83 ZONE 8.

BASIS OF BEARINGS SHOWN BETWEEN POINTS 52 AND 1477.

VERTICAL DATUM IS ASSUMED. THE FINISHED FLOOR ELEVATION AT THE NE ENTRANCE OF CHIEF PAUL MEMORIAL SCHOOL IS 109.6'.

0 100 200
SCALE IN FEET

NORTH

KUGUKLIK RIVER

PROPOSED TANK FARM - BY BFU PROJECT

PREVIOUS DEPARTMENT OF EDUCATION PROPERTY LINE, HAS REVERTED BACK TO KTC

PROPOSED POWER PLANT

52

BASIS OF BEARINGS
N 09° 50' 29.68" W 604.96'

KIPNUK TRADITIONAL COUNCIL AND KIPNUK LIGHT PLANT OFFICES

51 53

1477

N 75°50'28" E
1000.00'

AIRPORT PROPERTY

S 05°37'41" E
1011.79'

N 03°00'14" E
723.96'

N 74° E
600'

OH/E

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49 TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

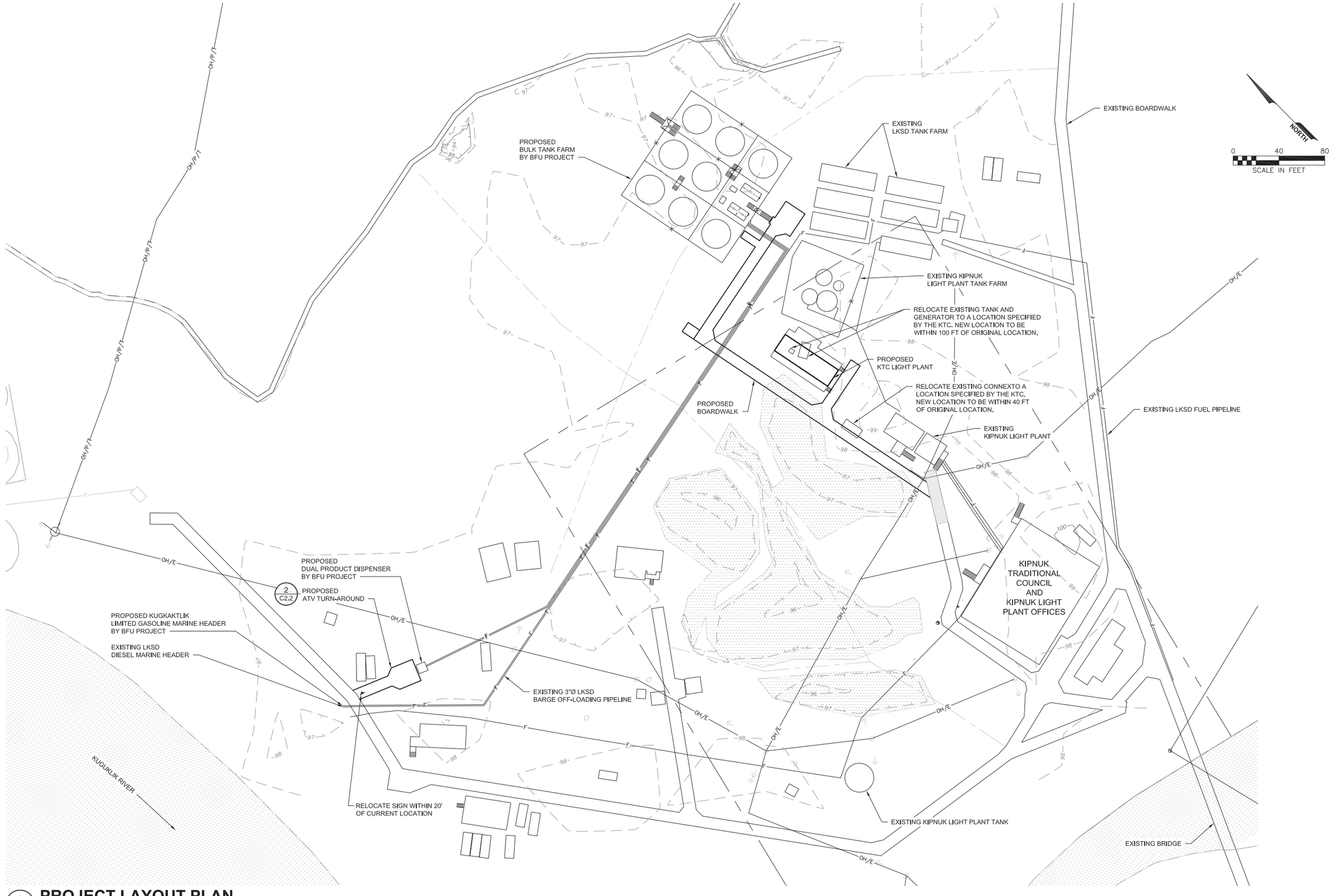
DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
SURVEY CONTROL

C0.1

SHEET OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C0.1 Survey Control.dwg
PRINTED: 03/21/2017 16:04 David.Hardy LAYOUT: C0.1 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.tif



1 C1.1 **PROJECT LAYOUT PLAN**
SCALE: 1" = 40'

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C1.1 Project Layout Plan.dwg
PRINTED: 03/21/2017 16:09 David.Hardy LAYOUT: C1.1 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

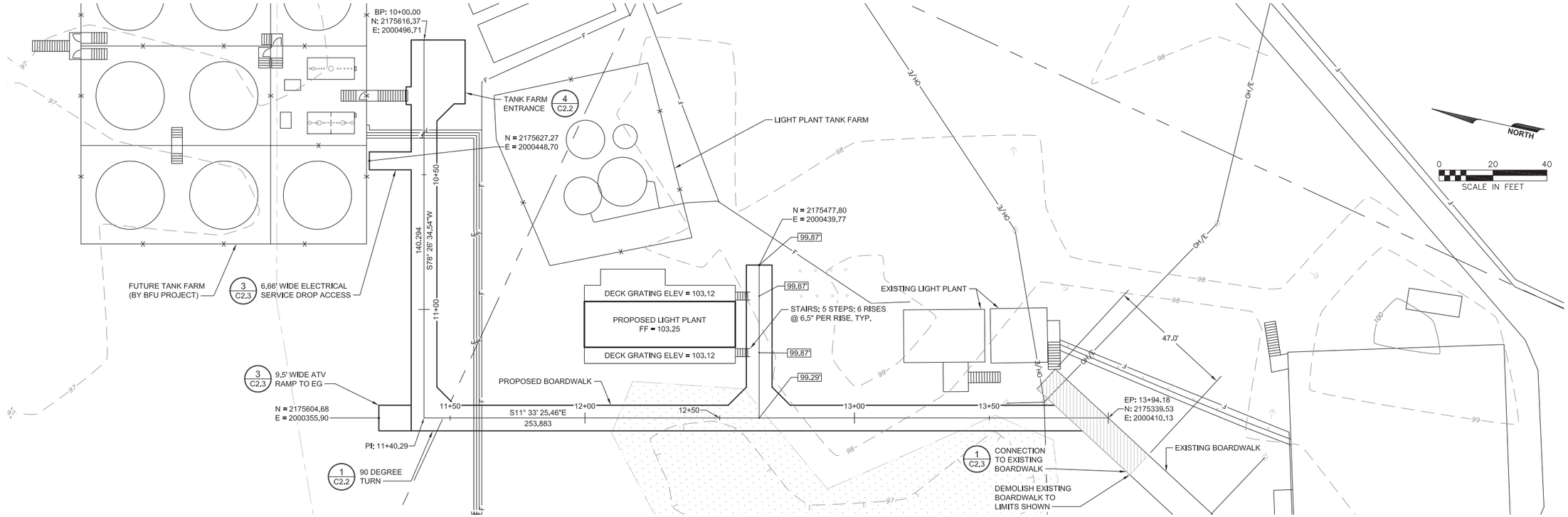
UMIAQ Design & Municipal Services, LLC / AECL1316

DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
PROJECT LAYOUT PLAN

C1.1

SHEET | OF

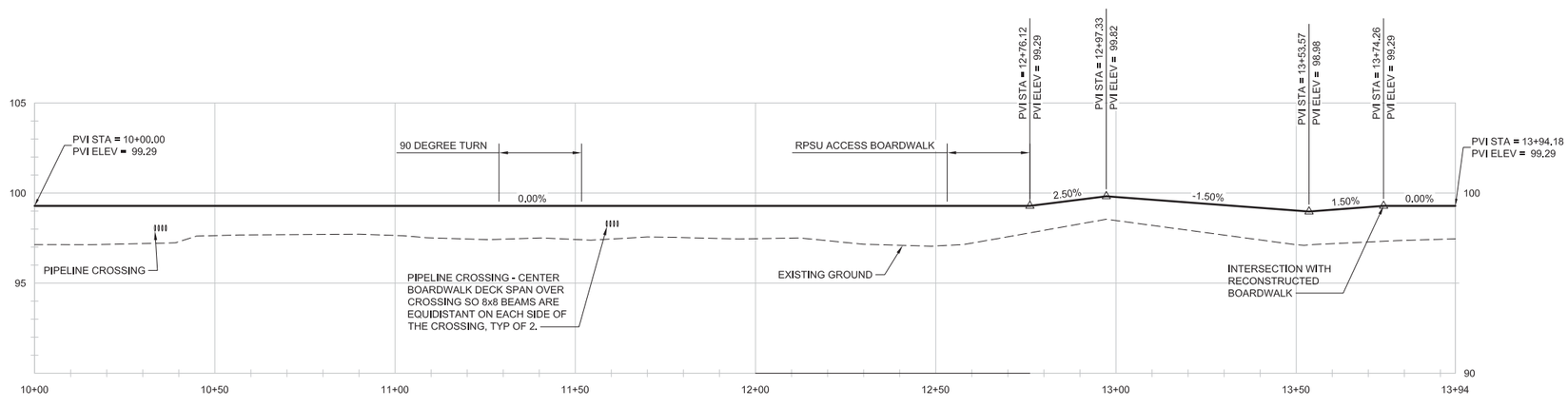


1 C1.2 BOARDWALK PLAN

SCALE: 1" = 20'

NOTES

1. ALL LUMBER TO BE PRESSURE TREATED.
2. TOP SURFACE OF BOARDWALK SHALL NOT BE GREATER THAN 30-INCHES ABOVE SURROUNDING TUNDRA.
3. ADD SHIMS AS REQUIRED TO MEET FINISH GRADE ELEVATIONS.



2 C1.2 BOARDWALK PROFILE

SCALE: 1" = 20'

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49 TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

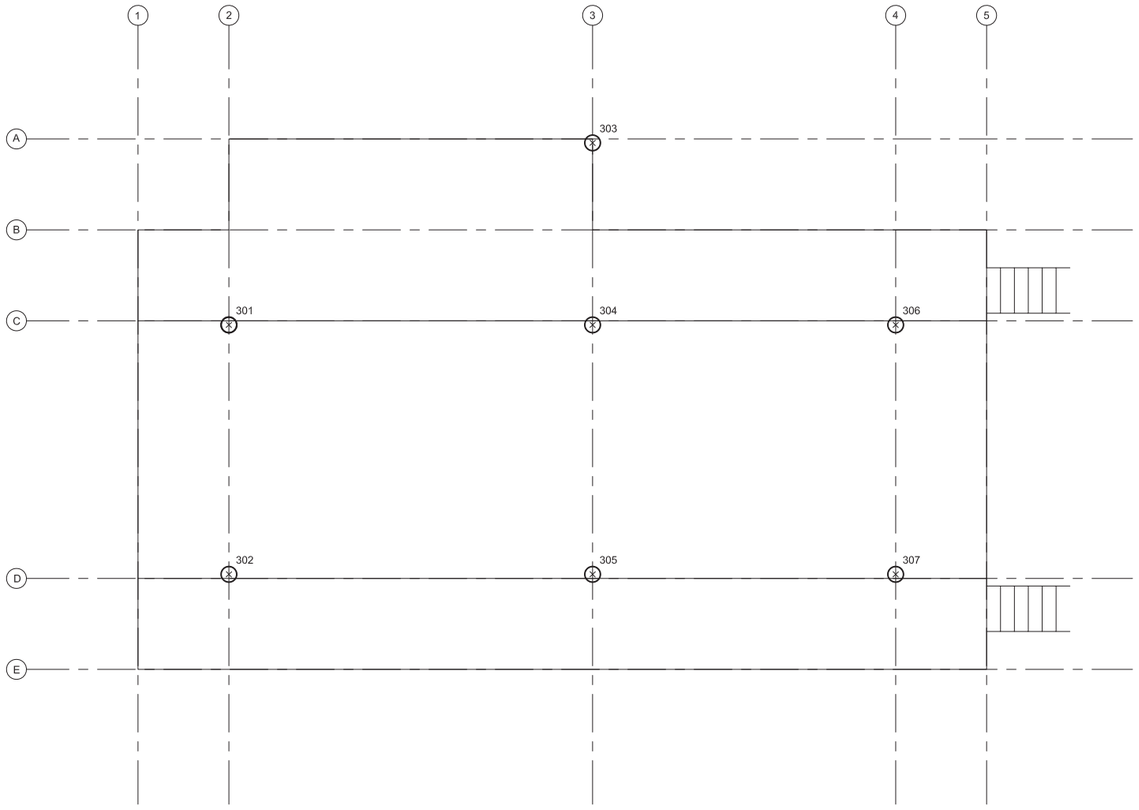
DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
BOARDWALK PLAN & PROFILE

C1.2

SHEET | OF

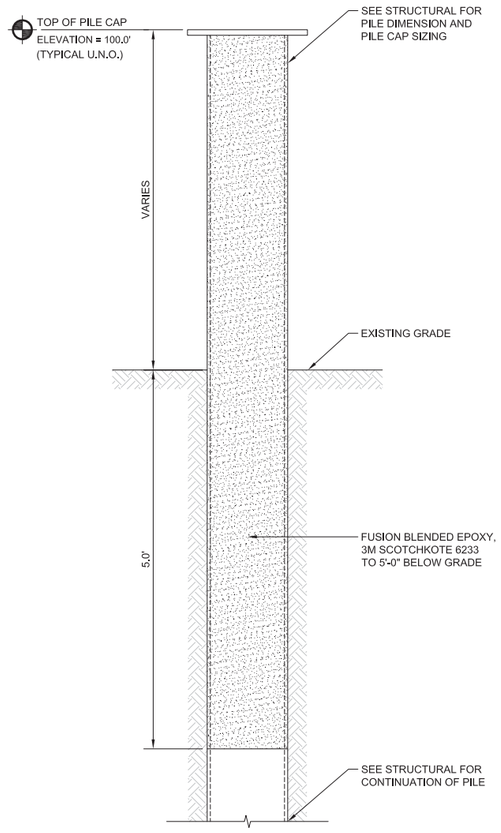
FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C1.1 Project Layout Plan.dwg
PRINTED: 03/21/2017 16:08 David.Hardy LAYOUT: C1.2 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF



PILE LOCATION TABLE		
POINT #	NORTHING	EASTING
301	2175532.73	2000414.49
302	2175529.43	2000398.36
303	2175511.62	2000431.06
304	2175509.21	2000419.29
305	2175505.92	2000403.17
306	2175489.62	2000423.30
307	2175486.32	2000407.18

1 C1.3 PILE LAYOUT PLAN

SCALE: 1" = 5'



2 C1.3 TYPICAL PILE DETAIL

SCALE: 1" = 1'

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

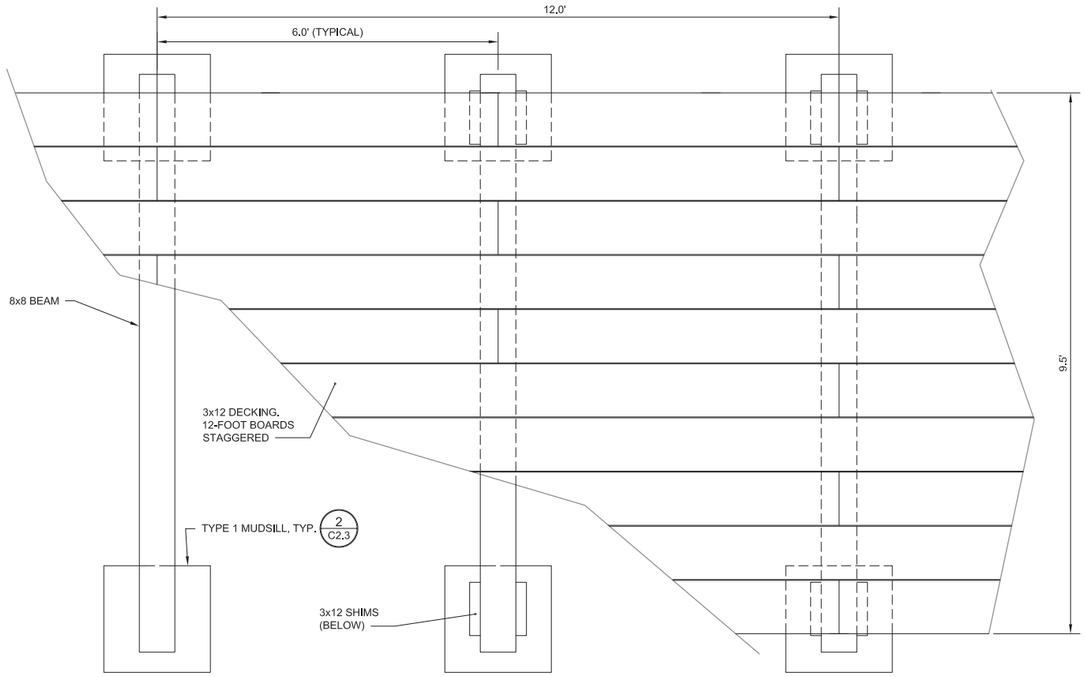
DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
PILE LAYOUT PLAN

C1.3

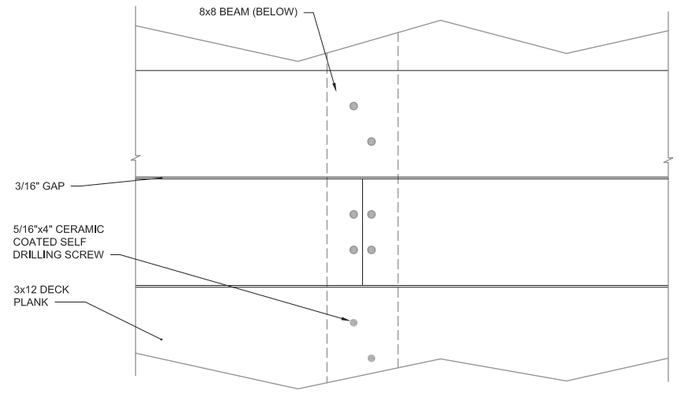
SHEET | OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C1.3 Pile Layout Plan.dwg
PRINTED: 03/21/2017 16:17 David.Hardy LAYOUT: C1.3 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF



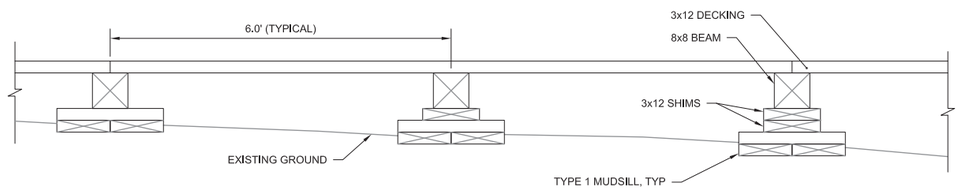
1 C2.1 BOARDWALK PLAN VIEW

SCALE: 3/4" = 1'-0"



2 C2.1 BOARDWALK SCREW PATTERN

SCALE: 1 1/2" = 1'-0"

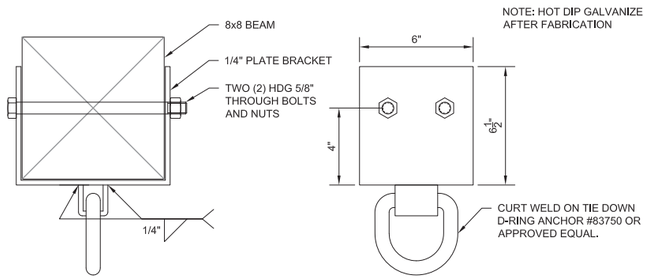


3 C2.1 BOARDWALK PROFILE

SCALE: 3/4" = 1'-0"

4 C2.1 BOARDWALK SECTION

SCALE: 3/4" = 1'-0"



5 C2.1 ANCHOR BRACKET

SCALE: 3" = 1'-0"

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

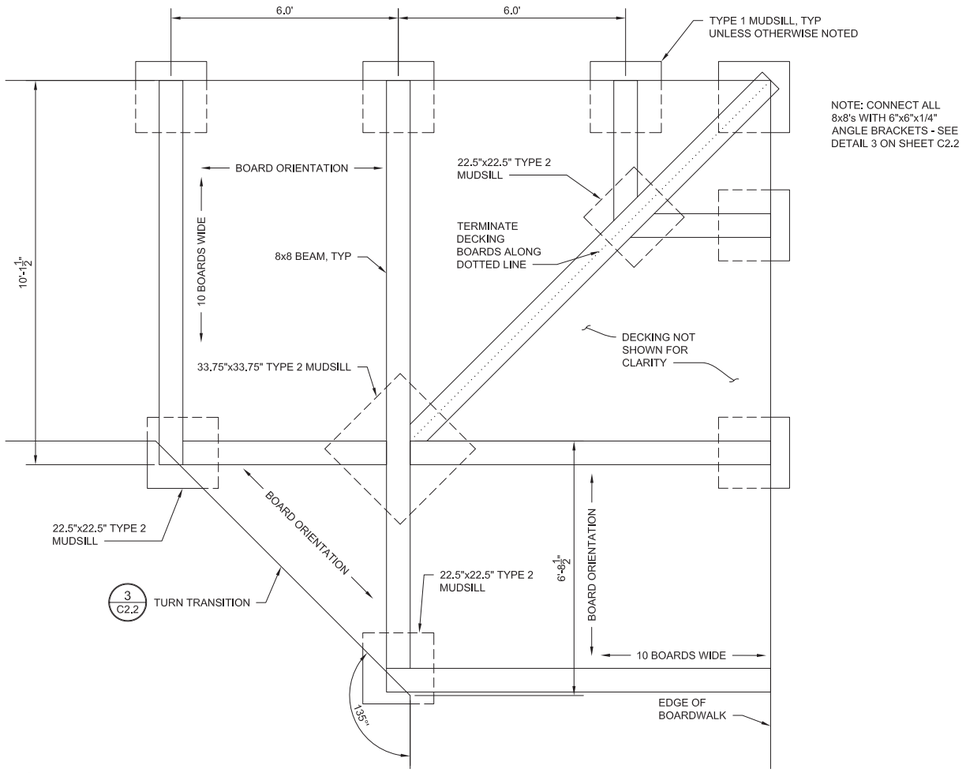
DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
BOARDWALK DETAILS

C2.1

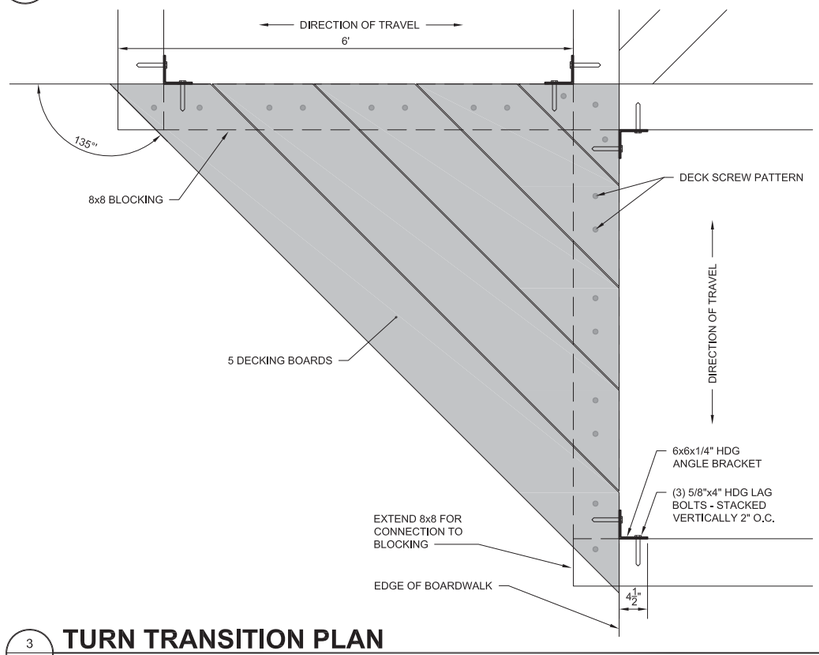
SHEET OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C2.1 Boardwalk Details.dwg
PRINTED: 03/21/2017 16:14 David.Hardy LAYOUT: C2.1 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF



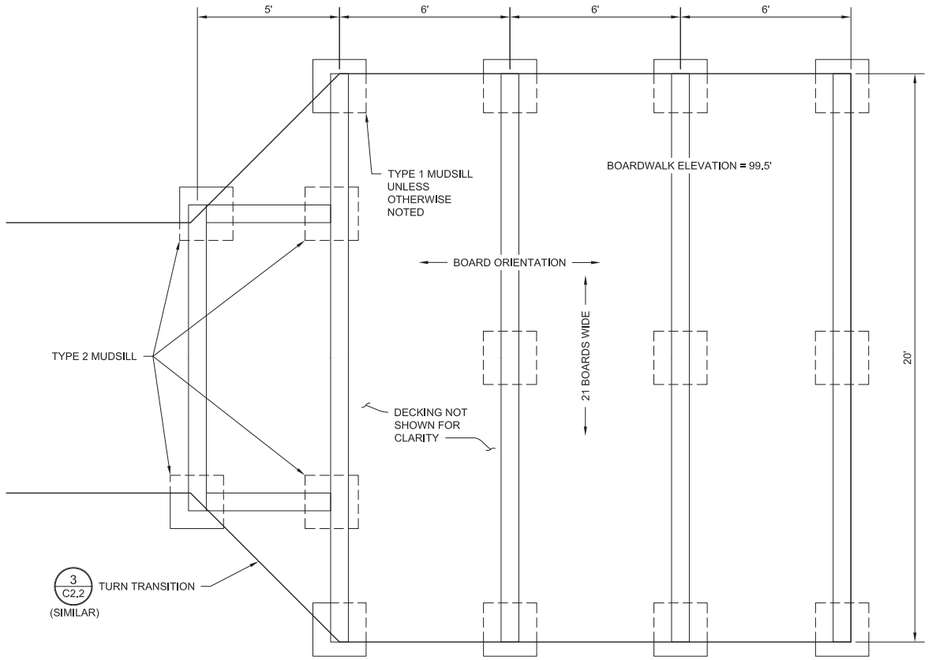
1 C2.2 90 DEGREE TURN FRAMING DETAIL

SCALE: 1/2" = 1'-0"



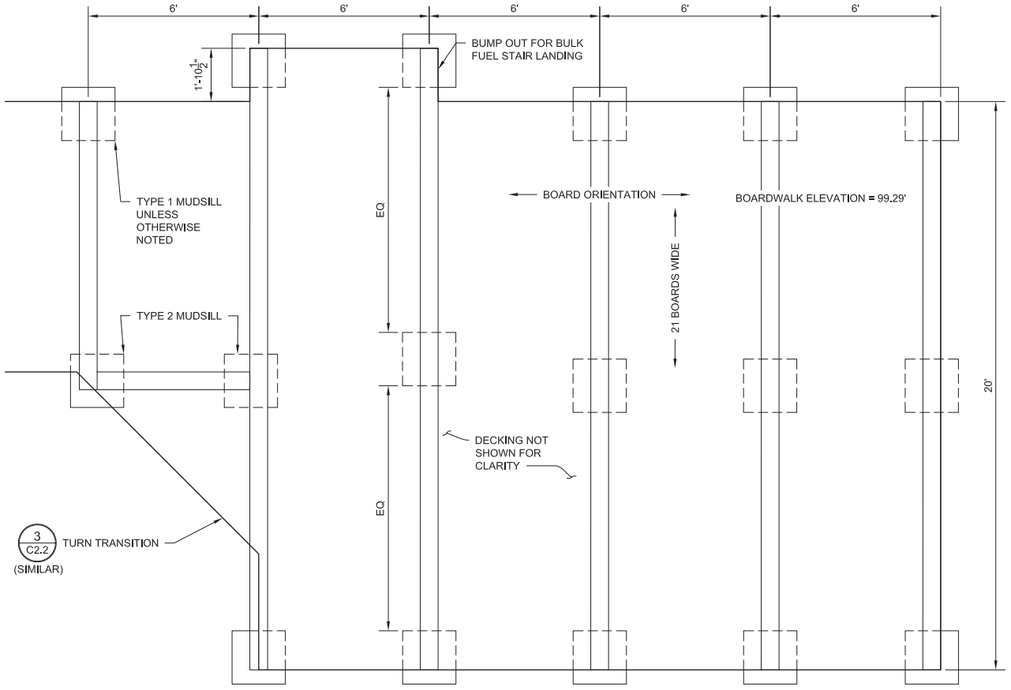
3 C2.2 TURN TRANSITION PLAN

SCALE: 1" = 1'-0"



2 C2.2 DISPENSING STATION BOARDWALK FRAMING PLAN

SCALE: 3/8" = 1'-0"



4 C2.2 TANK FARM ENTRANCE BOARDWALK FRAMING PLAN

SCALE: 3/8" = 1'-0"

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49 TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

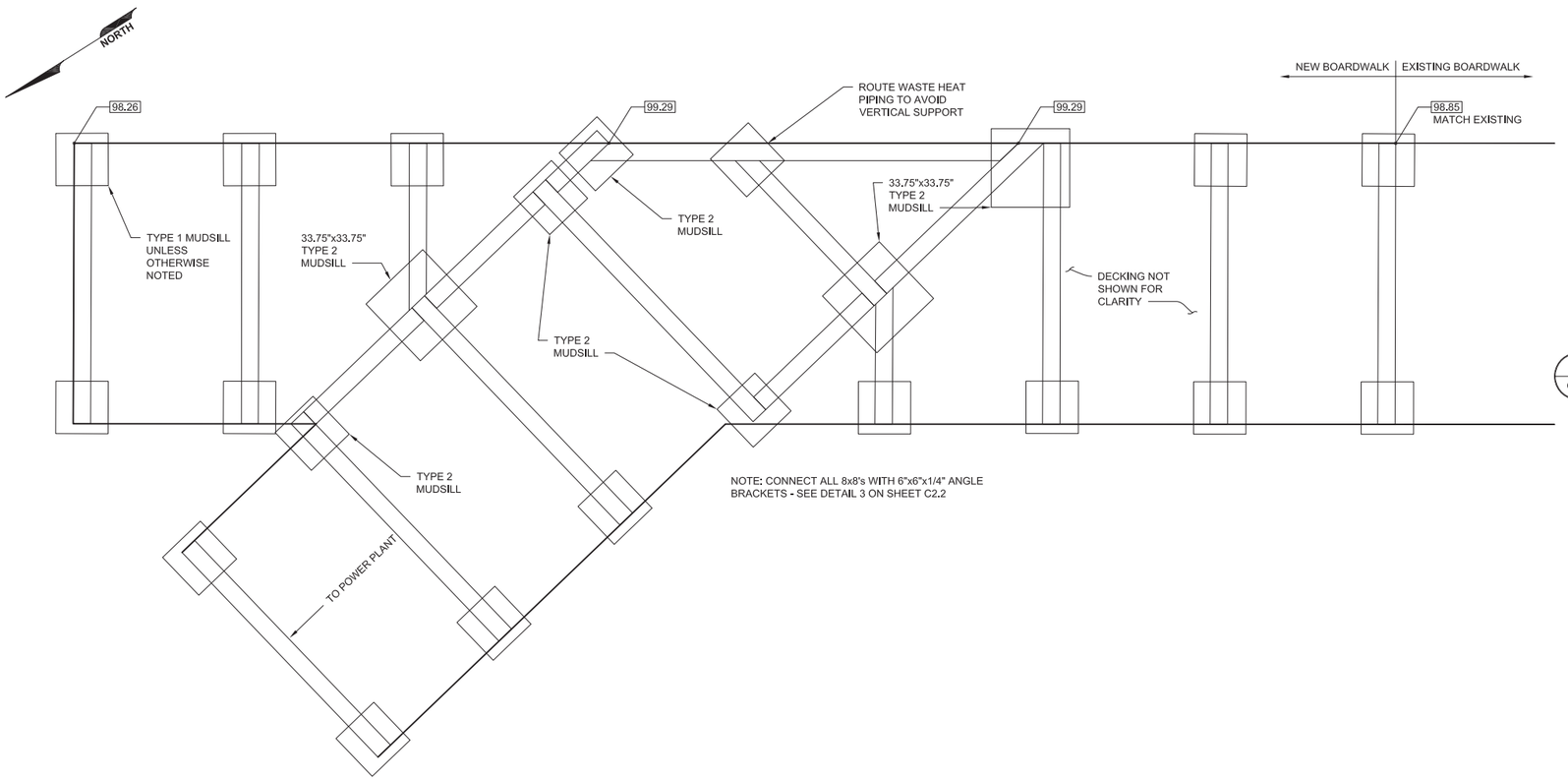
DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
BOARDWALK DETAILS

C2.2

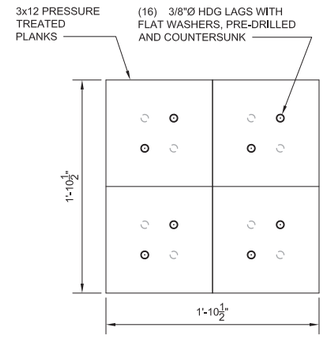
SHEET | OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C2.1 Boardwalk Details.dwg
PRINTED: 03/21/2017 16:12 DavidHardy LAYOUT: C2.2 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF



2 CONNECTION TO EXISTING BOARDWALK DETAIL

2 / C2.2 SCALE: 3/8" = 1'-0"

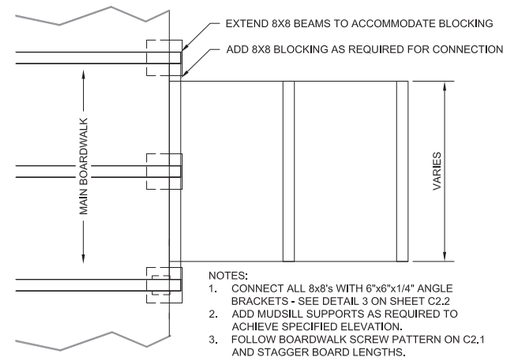


NOTES:

1. TYPE 1 MUDSILLS: (2) LAYERS OF PLANKS AT RIGHT ANGLES TO EACH OTHER. ADD 3x12 SHIMS TO PROVIDE STABLE FOUNDATION TO ELEVATION REQUIRED.
2. TYPE 2 MUDSILLS: MINIMUM OF (2) LAYERS OF PLANKS AT RIGHT ANGELS TO EACH OTHER. INSTALL ADDITIONAL LAYERS AS REQUIRED TO PROVIDE STABLE FOUNDATION TO REQUIRED ELEVATION.
3. 33.75"x33.75" TYPE TWO MUDSILLS: (3) 3x12 PLANKS AT RIGHT ANGELS TO EACH OTHER. INSTALL ADDITIONAL LAYERS AS REQUIRED TO PROVIDE STABLE FOUNDATION TO REQUIRED ELEVATION.
4. FASTEN ALL BLOCKING WITH 3/8"Ø HDG LAGS.

2 MUDSILL DETAIL

2 / C2.3 SCALE: 1 1/2" = 1'-0"

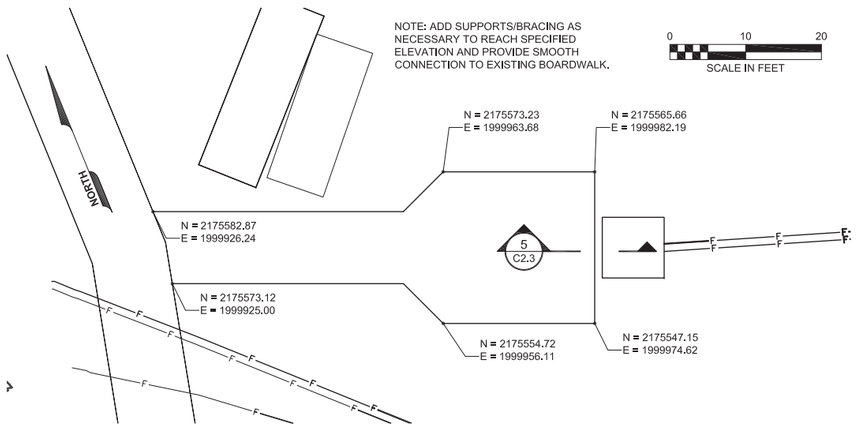


NOTES:

1. CONNECT ALL 8x8's WITH 6"x6"x1/4" ANGLE BRACKETS - SEE DETAIL 3 ON SHEET C2.2
2. ADD MUDSILL SUPPORTS AS REQUIRED TO ACHIEVE SPECIFIED ELEVATION.
3. FOLLOW BOARDWALK SCREW PATTERN ON C2.1 AND STAGGER BOARD LENGTHS.
4. DECKING NOT SHOWN FOR CLARITY.

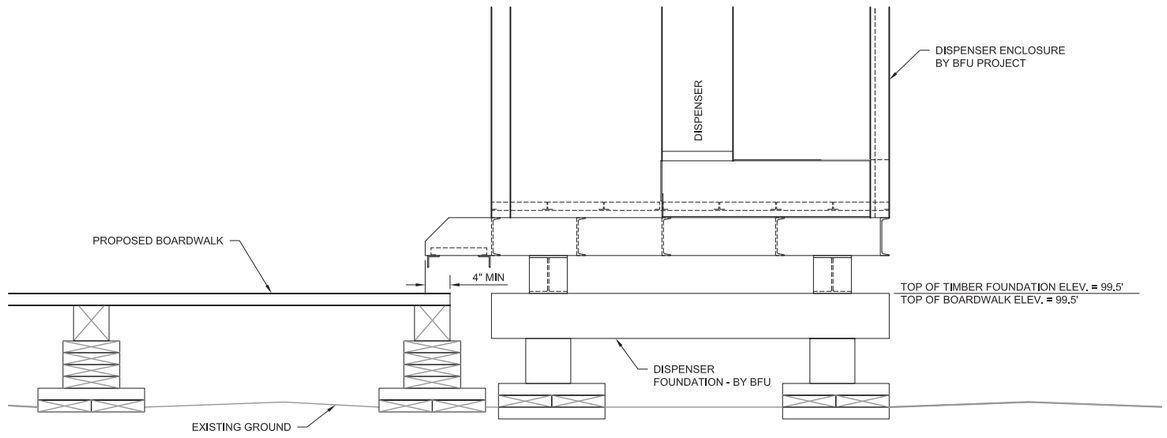
ATV RAMP/ELECTRICAL SERVICE DROP ACCESS

3 / C2.3 SCALE: 1/4" = 1'-0"



4 DISPENSER ENCLOSURE/BOARDWALK PLAN

4 / C2.3 SCALE: 1" = 10'



5 DISPENSER FOUNDATION ELEVATION

5 / C2.3 SCALE: 3/4" = 1' - 0"

UMIAQ
Design & Municipal Services, LLC
6700 Arctic Spur Road Anchorage, AK 99518 (907) 677-8220

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49 TH
David Blaine Hardy
CE-14480
REGISTERED PROFESSIONAL ENGINEER

UMIAQ Design & Municipal Services, LLC / AECL1316

DATE: 03/16/2017
DRAWN BY: DBH
CHECKED BY: DBH
JOB NUMBER: 70184.15

DRAWING TITLE:
BOARDWALK DETAILS

C2.3

SHEET | OF

FILE: M:\Design\Engineering\PROJECTS\70184.15 Kipnuk RPSU Design & CA\DESIGN\Drawings\CIVIL\70184.15 C2.1 Boardwalk Details.dwg
PRINTED: 03/21/2017 16:11 David.Hardy LAYOUT: C2.3 XREFS: (DIESEL evaluation failed) IMAGES: HARDY 3-16-17.TIF

CODE ANALYSIS 2009 EDITION INTERNATIONAL BUILDING CODE

OCCUPANCY CLASSIFICATION

GROUP F-1: FACTORY INDUSTRIAL MODERATE HAZARD – ELECTRIC GENERATION PLANT — REF: IBC-2009, SEC. 306.2

TYPE OF CONSTRUCTION — REF: IBC-2009, TABLE 601

TYPE V-B (NON-RATED) — REF: IBC-2009, SEC. 602.5

BUILDING HEIGHTS AND AREAS — REF: IBC-2009, TABLE 503

ALLOWED 40'-0" 1 STORY 8,500 S.F. PROVIDED: 15'-0" 1 STORY 952 S.F.

FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS — REF: IBC-2009, TABLE 601

STRUCTURAL FRAME 0 HR BEARING WALLS 0 HR INTERIOR PARTITIONS 0 HR FLOOR 0 HR ROOF 0 HR

FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS — REF: IBC-2009, TABLE 602

EXTERIOR WALLS $10' \leq X \leq 30'$ 0 HR

FIRE PROTECTION SYSTEM — REF: IBC-2009, SEC. 903.2.4

FIRE PROTECTION NOT REQUIRED. WATER MIST FIRE SUPPRESSION SYSTEM PROVIDED (SEE MECHANICAL).

OCCUPANT LOAD — REF: IBC-2009, TABLE 1004.1.1

MECHANICAL/STORAGE = 300 S.F./PERSON 952 S.F./300 S.F. PER OCCUPANT = 3 OCCUPANTS

MEANS OF EGRESS – TRAVEL DISTANCE — REF: IBC-2009, TABLE 1016.1

REQUIRED 200' PROVIDED 25'

ARCHITECTURAL GENERAL NOTES:

1) STANDARD MODULAR POWER PLANT DESIGN. SEE CIVIL/MECHANICAL SITE PLANS FOR SPECIFIC LOCATION AND LAYOUTS. PROVIDE SEPARATION TO PROPERTY BOUNDARIES IN ACCORDANCE WITH CODE ANALYSIS.

2) DRAWINGS SHOW MODULE INSTALLED ON TYPICAL FOUNDATION. STRUCTURE DESIGNED FOR INSTALLATION ON PILING TO MEET SITE CONDITIONS.

3) FINISH GRADE TO SLOPE DOWN 6 INCHES MINIMUM WITHIN 10 FEET OF BUILDING PERIMETER TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING.

4) DO NOT BLOCK OR OBSTRUCT ACCESS, REQUIRED PARKING AREAS, OR REQUIRED EGRESS FROM NEIGHBORING FACILITIES. PROVIDE TEMPORARY BARRICADES OR OTHER FORMS OF PROTECTION TO PROTECT EMPLOYEES, RESIDENTS, AND VISITORS FROM INJURIES DURING CONSTRUCTION ACTIVITIES

5) PROJECT MANAGER SHALL BE RESPONSIBLE FOR ALL BUILDING PERMITS, LETTERS OF NON-OBJECTION, UTILITY SERVICES AND APPLICATIONS AS REQUIRED. PROJECT MANAGER OR CONSTRUCTION MANAGER TO BE RESPONSIBLE FOR ALL REQUIRED SAFETY PRECAUTIONS, METHODS AND TECHNIQUES.

6) PROVIDE A COMPLETE AND OPERATIONAL FACILITY. ALL WORK TO BE IN ACCORDANCE WITH CURRENT APPROVED EDITIONS OF THE IBC, IMC, IFC, AND NEC INCLUDING STATE OF ALASKA AMENDMENTS.

7) SEE SHEET A5 FOR DESCRIPTION OF FIELD INSTALLED ROOF SYSTEM.

8) INSULATE ALL WALLS, FLOORS, AND CEILINGS WITH HIGH TEMPERATURE MINERAL FIBER ACOUSTICAL FIRE BATT INSULATION, MIN R VALUE 4 PER INCH, MIN 2000F MELTING TEMP. ROXUL AFB OR EQUAL. FILL ALL PANEL VOIDS OR PROVIDE THICKNESS AS INDICATED ON DRAWINGS. MECHANICALLY FASTEN FLOOR INSULATION TIGHT TO FLOOR.

9) UPON COMPLETION OF FABRICATION ROUND ALL CORNERS AND GRIND EDGES SMOOTH AND PAINT ALL INTERIOR AND EXTERIOR EXPOSED STEEL. PERFORM ALL PAINTING IN A WARM DRY ENVIRONMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING DRYING TIME TO RE-COAT.

10) SANDBLAST EXTERIOR SURFACE TO SSPC-SP-10. PRIME WITH ONE COAT OF REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, NO SUBSTITUTES, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR-RUST 236, NO SUBSTITUTES, TO 12 MILS DRY FILM THICKNESS. FIRST COAT COLOR GRAY, SECOND COAT COLOR WHITE.

11) FINISH EXTERIOR WALLS AND SKIDS (ALL EXPOSED VERTICAL EXTERIOR SURFACES) WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, NO SUBSTITUTES, COLOR WHITE, TO 3 MILS DRY FILM THICKNESS.

12) SANDBLAST INTERIOR SURFACE TO SSPC-SP-6. PRIME AND FINISH WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, TO 8 MILS TOTAL DRY FILM THICKNESS. CEILING COLOR WHITE. WALL AND FLOOR COLOR STRUCTURAL GRAY 4031. NOTE THAT FIRST COAT ON WALLS AND FLOOR MAY BE WHITE.

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

UMIAQ

ICG Lantech Inc

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49th
Ryan E. Wrocklage
No. A11803
9.23.15
REGISTERED PROFESSIONAL ARCHITECT

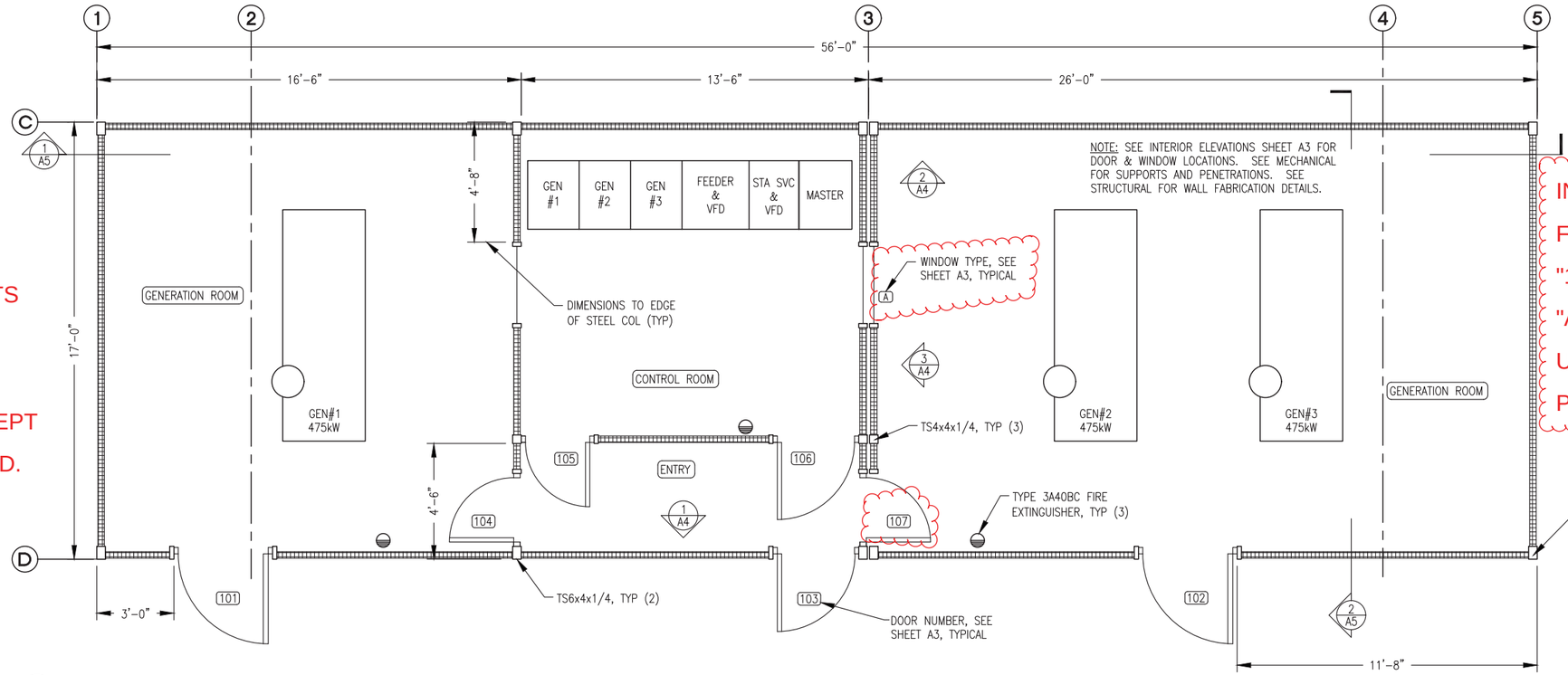
DATE: 09/23/15
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER:

DRAWING TITLE:
MODULE BUILDING CODE ANALYSIS & GENERAL NOTES

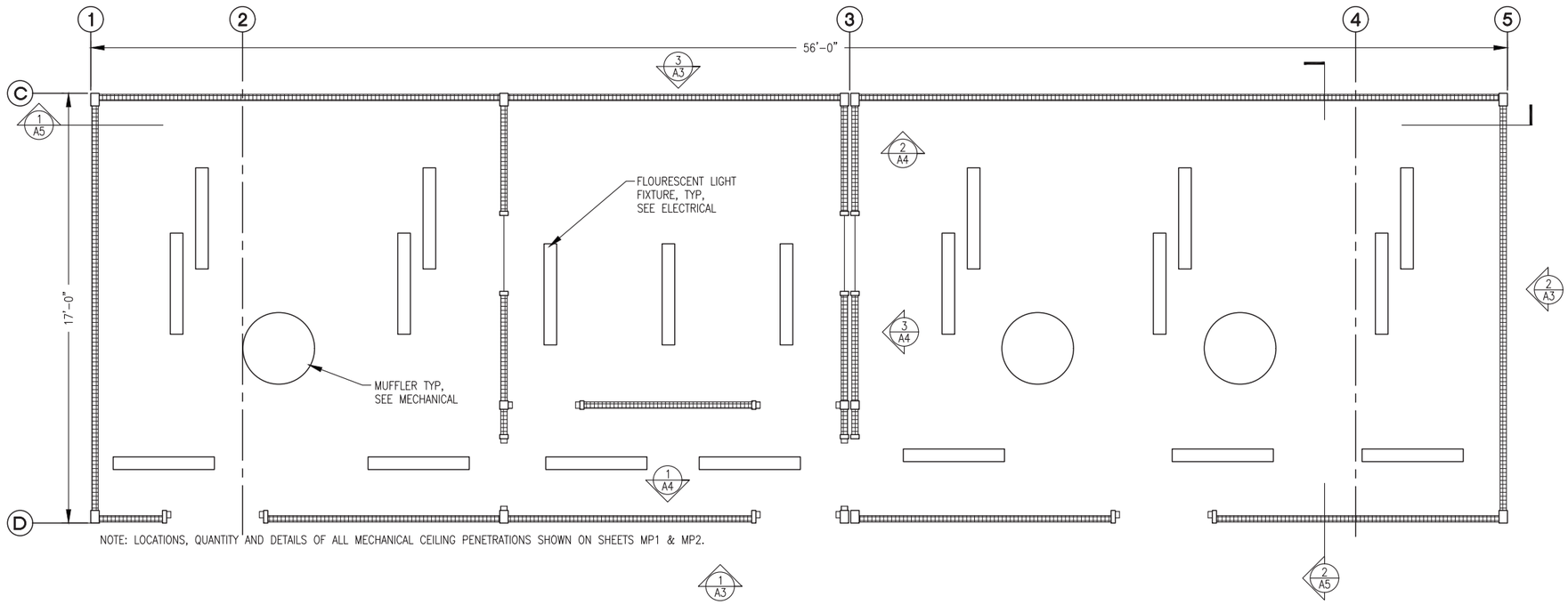
A1

SHEET OF

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY EXCEPT AS SPECIFICALLY NOTED.



1 A2 FLOOR PLAN
3/8"=1'-0"



2 A2 REFLECTED CEILING PLAN
3/8"=1'-0"

UMIAQ
ICG Lantech Inc
architecture · engineering · surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

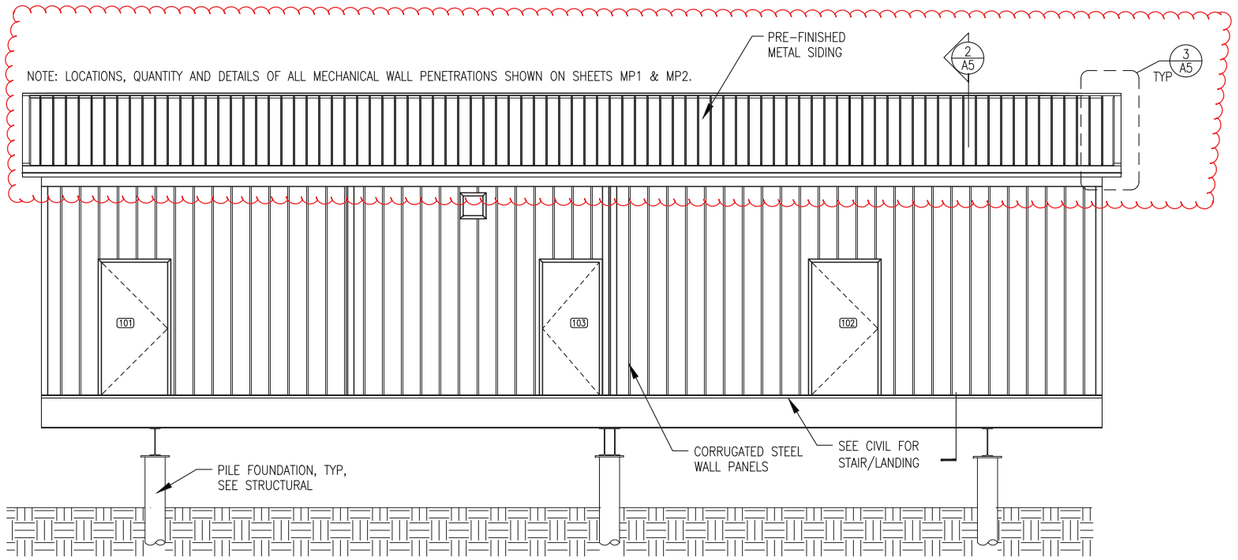
STATE OF ALASKA 49th
Ryan E. Wrocklage
No. A11803
9.23.15
REGISTERED PROFESSIONAL ARCHITECT

DATE: 09/23/15
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER:

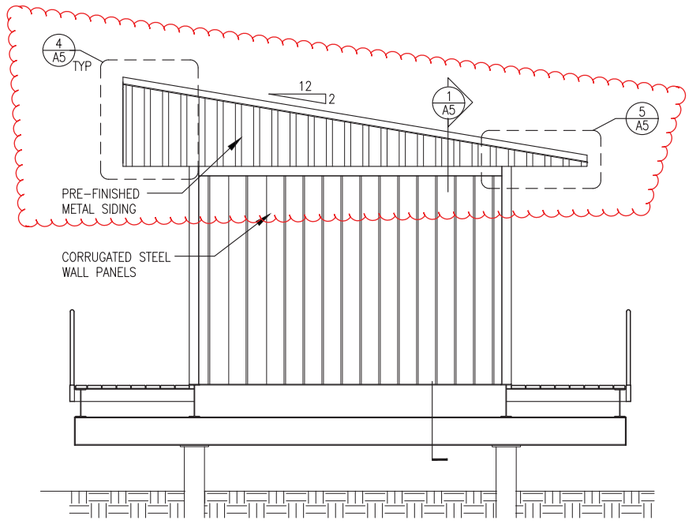
DRAWING TITLE:
MODULE BUILDING FLOOR PLAN & RCP

A2

SHEET | OF

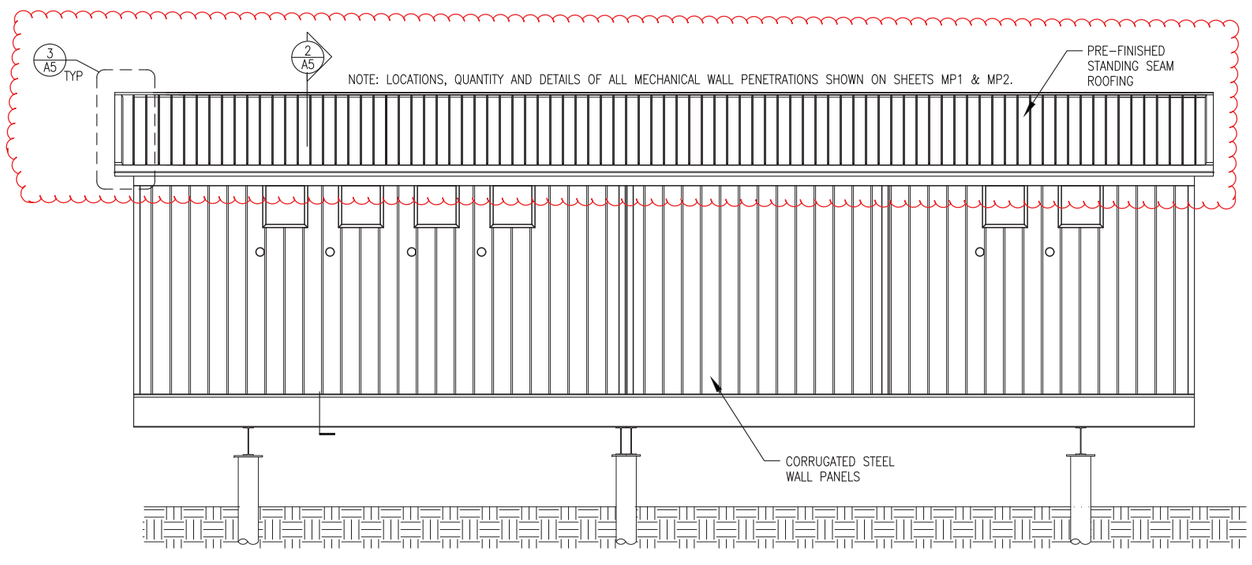


1 A3 FRONT EXTERIOR ELEVATION
1/4"=1'-0"



2 A3 END EXTERIOR ELEVATION
1/4"=1'-0"

THIS SHEET SHOWS ROOF STRUCTURE WHICH IS PROVIDED BY THIS PROJECT, THE REMAINDER OF THE WORK IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.



3 A3 BACK EXTERIOR ELEVATION
1/4"=1'-0"

DOOR CONSTRUCTION							FRAME CONSTRUCTION							
DOOR NO.	WIDTH	HEIGHT	THICK NESS	MATERIAL	CORE	REMARKS	HEAD/JAMB DETAIL	SILL DETAIL	WALL THICKNESS	MATERIAL	TYPE	PROFILE	FIRE RTG	HWR
101	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED		4/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-3
102	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED		4/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-3
103	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}	4/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-1
104	2'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}	6/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2
105	2-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}	6/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2
106	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}	6/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-4
107	2-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}	6/A3	5/A3	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2

DOOR HARDWARE:

HW-1

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1 EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1 EA	CORE	BEST	BROWN CONSTRUCTION CORE
1 EA	DOOR CLOSER	LCN	4040XP x CUSH x AL
1 EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
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	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1 EA	DOOR CLOSER	LCN	4040XP x CUSH x AL
1 EA	KICK PLATE	ROCKWOOD	K1050 10 x 28 x 630
1 EA	MOP PLATE	ROCKWOOD	K1050 10 x 29 x 630
1 EA	SOUND SEAL	PEMKO	2891AS x 30 (HEAD)
2 EA	SOUND SEAL	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 30

HW-3

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1 EA	EXIT LOCK	SCHLAGE	ND25D x RHODES x 626
1 EA	OVERHEAD STOP	ROCKWOOD	OH1004M x US32D
1 EA	WEATHER STRIP	PEMKO	2891AS x 42 (HEAD)
2 EA	WEATHER STRIP	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 42

HW-4

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5 x 630
1 EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1 EA	DOOR CLOSER	LCN	4040XP x CUSH x AL
1 EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
1 EA	MOP PLATE	ROCKWOOD	K1050 10 x 35 x 630
1 EA	SOUND SEAL	PEMKO	2891AS x 36 (HEAD)
2 EA	SOUND SEAL	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 36

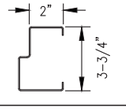
NOTES:

{1} ALL DOORS FURNISHED WITH TOPS INVERTED, CAULKED, AND SEALED.

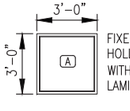
{2} INSTALL 24"x24" INSULATED RE-LIGHT WITH TWO PANES OF LAMINATED SAFETY GLASS IN EACH DOOR PANEL.

{3} DOORS AND DOOR FRAMES GALVANIZED AND FACTORY PRIMED. HOLLOW METAL WINDOW FRAMES FACTORY PRIMED. SPRAY FINISH ALL DOORS AND FRAMES WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

DOOR FRAME PROFILE:



WINDOW TYPES:



FIXED SINGLE RABBET HOLLOW METAL FRAME WITH 2 PANES OF 1/4" LAMINATED SAFETY GLASS

NOTE: DIMENSIONS ARE OVERALL FRAME SIZE.

UMIAQ

IGG Lantech Inc

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

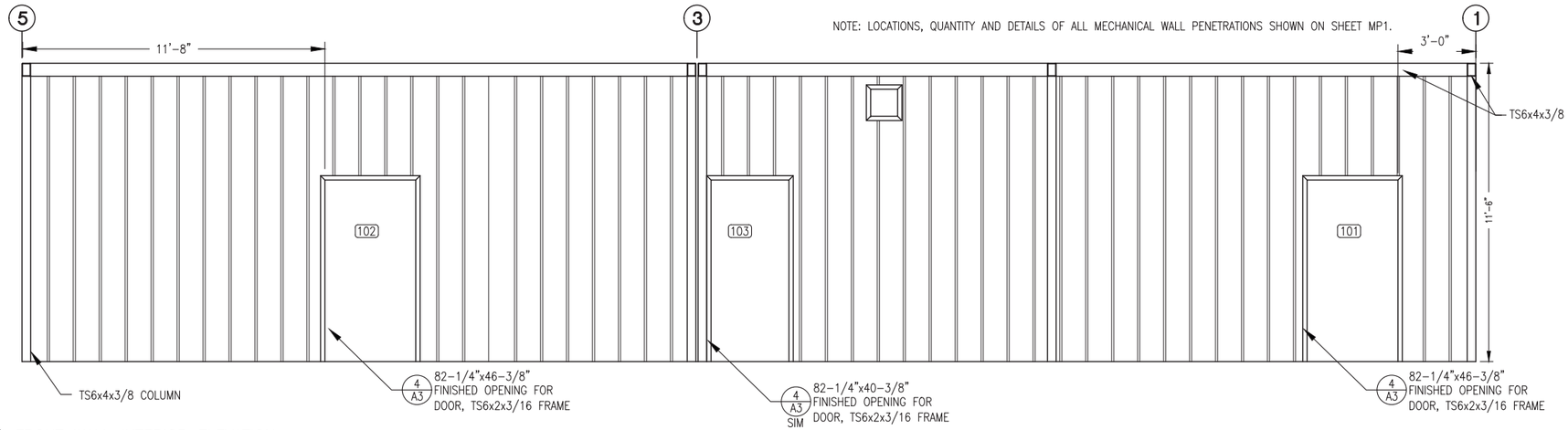
STATE OF ALASKA 49th Ryan E. Wrocklage No. A11803 9.23.15 REGISTERED PROFESSIONAL ENGINEER

DATE: 09/23/15
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER:

DRAWING TITLE:
MODULE BUILDING EXTERIOR ELEVATIONS DOOR & WINDOW SCHEDULE

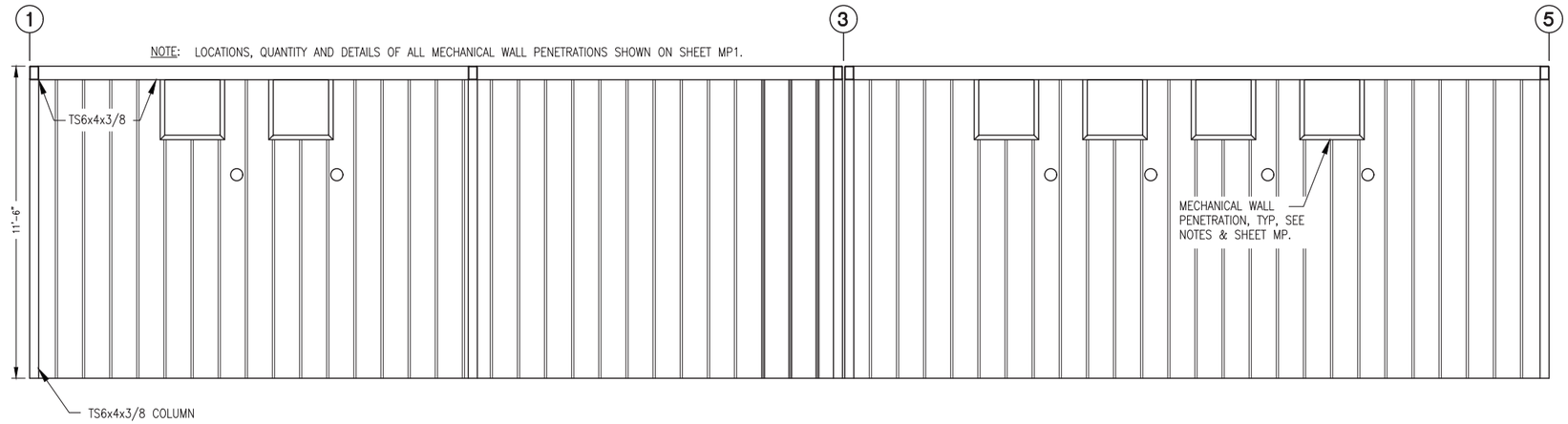
A3

SHEET OF

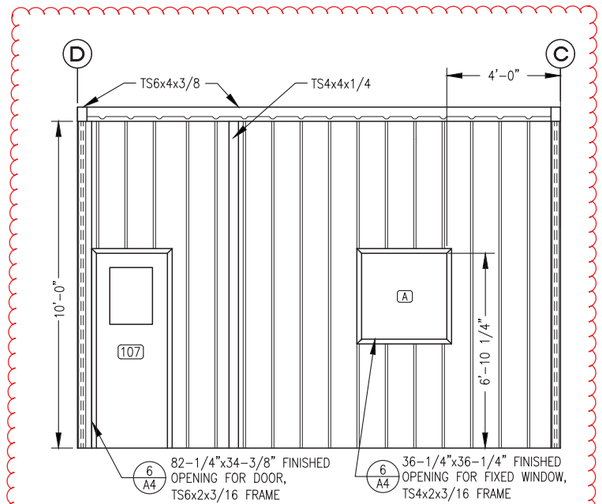


1 A4 FRONT WALL INTERIOR ELEVATION
3/8"=1'-0"

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY UNLESS SPECIFICALLY NOTED.

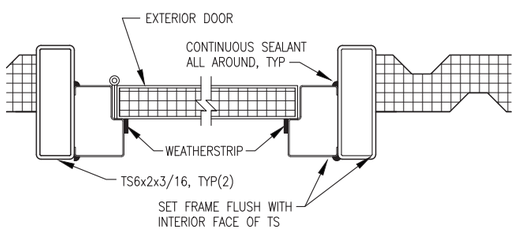


2 A4 PARTIAL GENERATOR ROOM BACK WALL INTERIOR ELEVATION
3/8"=1'-0"

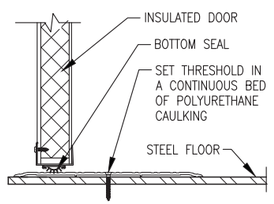


3 A4 CONTROL ROOM WALL INTERIOR ELEVATION
3/8"=1'-0"

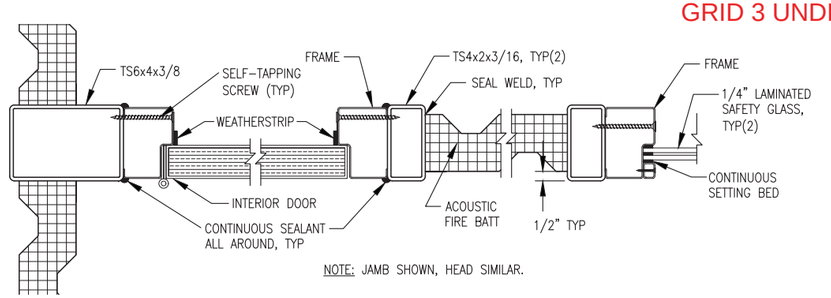
INSTALL OWNER FURNISHED DOOR "107" AND WINDOW "A" AT GRID 3 UNDER THIS PROJECT.



4 A4 TYPICAL EXTERIOR DOOR JAMB/HEAD
3"=1'-0"



5 A4 TYPICAL DOOR THRESHOLD
NO SCALE



6 A4 INTERIOR DOOR AND WINDOW JAMB/HEAD
3"=1'-0"

UMIAQ

ICG Lantech Inc

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REV	DATE	REVISIONS DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

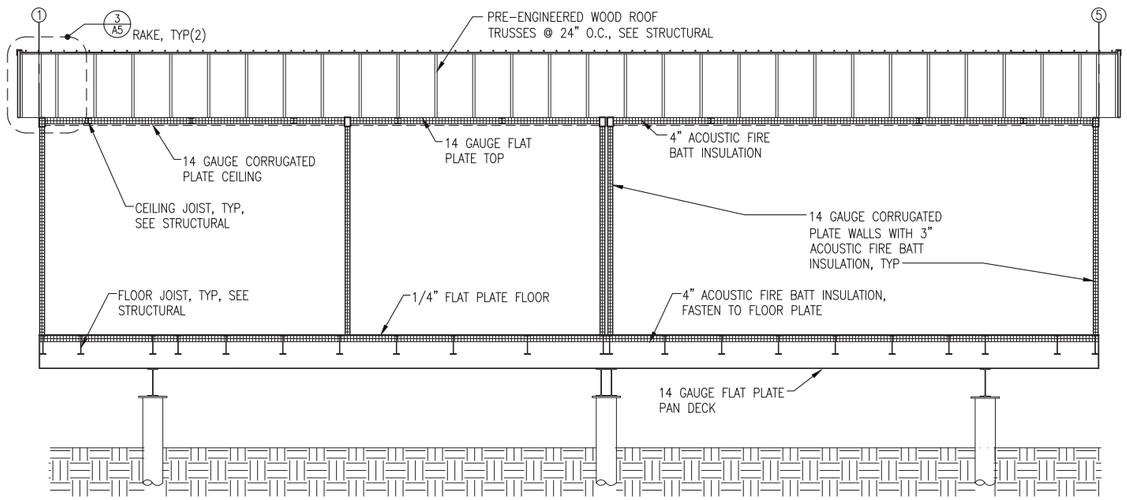
STATE OF ALASKA 49th
Ryan E. Wrocklage
No. A11803
9-23-15
REGISTERED PROFESSIONAL ENGINEER

DATE: 09/23/15
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER:

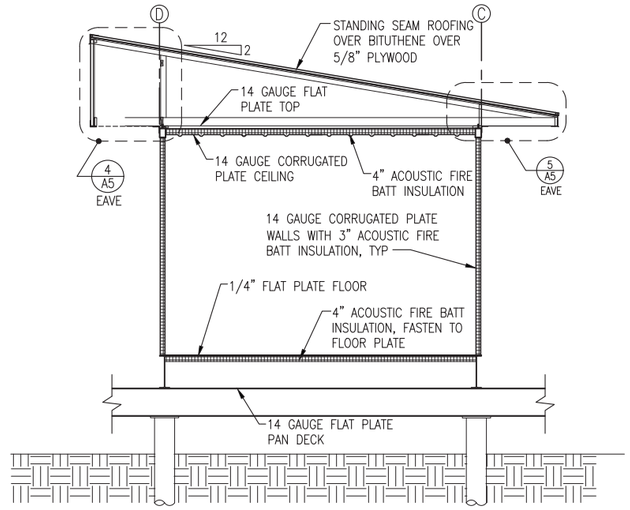
DRAWING TITLE:
MODULE BUILDING
INTERIOR ELEVATIONS
DOOR & WINDOW DETAILS

A4

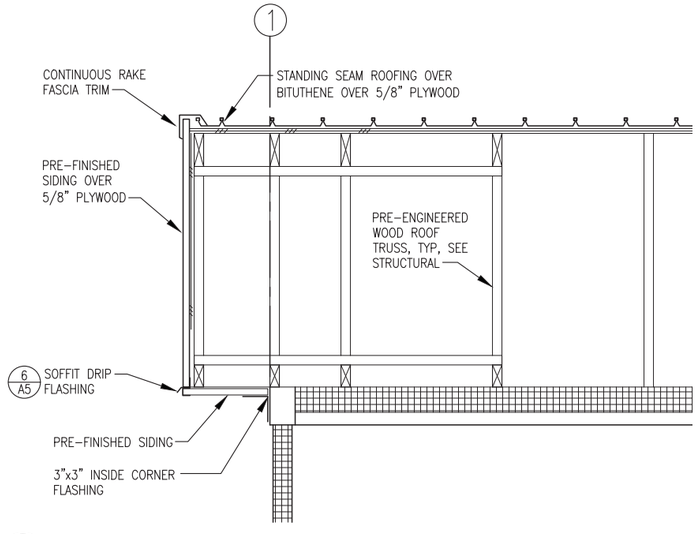
SHEET OF



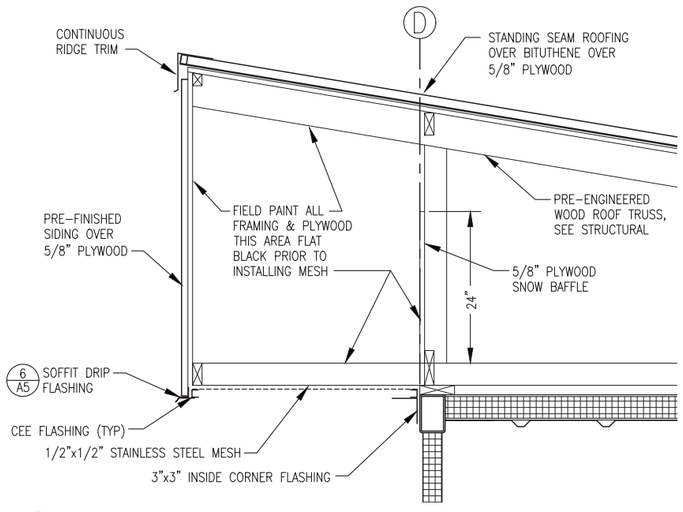
1 A5 BUILDING SECTION
3/8"=1'-0"



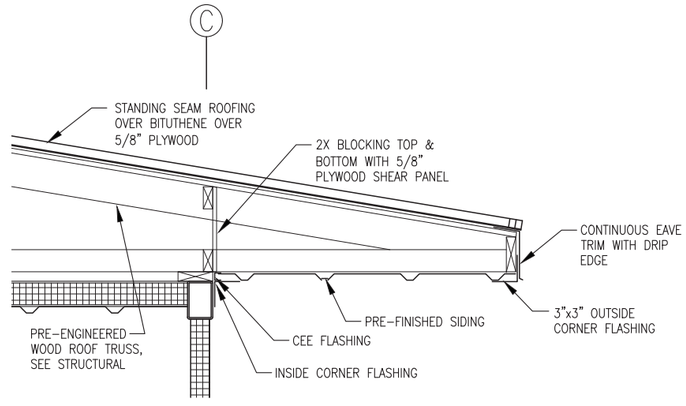
2 A5 BUILDING SECTION
3/8"=1'-0"



3 A5 RAKE DETAIL
1"=1'-0"



4 A5 EAVE DETAIL
1"=1'-0"



5 A5 EAVE DETAIL
1"=1'-0"

ROOFING SYSTEM NOTES:

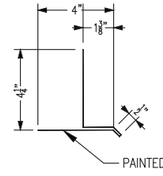
1) FIELD INSTALL TRUSSES TO MODULE STRUCTURE, SEE STRUCTURAL. FIELD INSTALL PLYWOOD SHEATHING, BITUTHENE, AND METAL ROOFING/SIDING AS INDICATED. SEAL AND FLASH ALL SEAMS TO FORM A CONTINUOUS WEATHERPROOF SEAL.

2) ALL ROOFING, SIDING, TRIM, AND FLASHING SHALL BE MIN 24 GAUGE GALVANIZED STEEL WITH KYNAR FINISH, COLOR JADE GREEN. ALL FASTENERS SHALL BE CORROSION RESISTANT STAINLESS STEEL SCREWS AND ALUMINUM RIVETS.

3) ROOFING SHALL BE STANDING SEAM TYPE, 24 GAUGE, 16" NET COVERAGE, 1-5/8" HIGH RIBS AT 8" O.C. AEP SPAN KLIP-RIB OR EQUAL. FURNISH CLIPS AND FASTENERS AS REQUIRED TO MEET LOAD CONDITIONS INDICATED ON SHEET S1.

4) SIDING SHALL BE LOW PROFILE, 24 GAUGE, 36" NET COVERAGE, 1-1/4" HIGH MAJOR RIBS AND 1/4 HIGH MINOR RIBS AT 12" O.C. AEP SPAN SUPER-SPAN OR EQUAL. FURNISH FASTENERS AS REQUIRED TO MEET LOAD CONDITIONS INDICATED ON SHEET S1.

THIS SHEET SHOWS ROOF STRUCTURE WHICH IS PROVIDED BY THIS PROJECT.



6 A5 CUSTOM SOFFIT DRIP FLASHING
3"=1'-0"

UMIAQ

ICG Lantech Inc

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49th
Ryan E. Wrocklage
No. A11803
9.23.15
REGISTERED PROFESSIONAL ARCHITECT

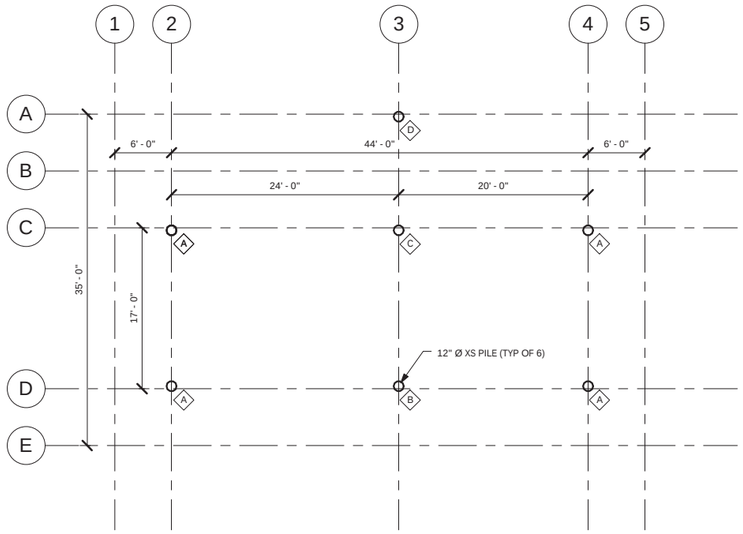
DATE:	09/23/15
DRAWN BY:	RW
CHECKED BY:	RW
JOB NUMBER:	

DRAWING TITLE:
MODULE BUILDING SECTIONS & DETAILS

A5

SHEET | OF

THIS SHEET SHOWS PILE FOUNDATION WHICH IS PROVIDED BY THIS PROJECT. IN ADDITION THE SPECIFICATIONS APPLY TO MATERIAL PROVIDED BY THIS PROJECT FOR THE RPSU PP.



NOTES
1. ALL PILES SHALL BE DRIVEN TO AN EMBEDMENT DEPTH OF 55' AND HAVE A CONE SHAPED DRIVING TIP.

1 / S1 PILE PLAN
1/8" = 1'-0"

EXCEPT:

1) MODULE FOUNDATION AND CATWALK FRAMING SHALL BE PRIMED THE SAME AS THE BFU CONTAINMENT STRUCTURE FRAMING BELOW DIKE FLOOR AS SPECIFIED IN SECTION 09 97 13.23 - EXTERIOR STEEL COATINGS.

2) TOPS OF PILES SHALL BE COATED AS INDICATED ON DETAIL 2/C1.3 AND AS SPECIFIED IN SECTION 31 62 16 - DRIVEN STEEL PILES.

3) CATWALKS, GRATING, STAIRS, HANDRAILS AND GUARDRAILS SHALL BE HOT DIP GALVANIZED AS SPECIFIED IN SECTION 05 50 00 - METAL FABRICATIONS.

PILE LOADS

MARK	DEAD (K) DL	FLOOR LIVE (K) LL	SNOW (K) SL	TOTAL (K) DL + .75 LL + .75 SL	WIND (K)	SEISMIC (K)
A	13.0	5.6	7.7	23.0	7.0 H 2.0 V ±	1.0 H 0.5 V ±
B	15.3	12.1	7.7	30.1	13.9 H 4.0 V ±	2.0 H 1.0 V ±
C	11.2	8.4	7.7	23.3	7.0 H 2.0 V ±	1.0 H 0.5 V ±
D	18.0	6.0	0.0	24.4	7.0 H 2.0 V ±	1.0 H 0.5 V ±

NOTES
1. DEAD LOADS INCLUDE EQUIPMENT LOADS AS PROVIDED BY A.E.A.

ALL STEEL PIPE (PILE) SHALL BE ASTM A252 GRADE 3 (45 KSI), SEE SECTION 01 11 13 - "SUMMARY OF WORK" AND PARAGRAPH TITLED "IMPORTANT NOTES TO CONTRACTOR" FOR PILE OPTION.

STRUCTRUAL GENERAL NOTES

1.0 DESIGN LOADS:

A. BUILDING CODE: 2009 INTERNATIONAL BUILDING CODE (IBC 2009)

B. FLOOR LIVE LOADS: (IBC TABLE 1607.1)
LIGHT STORAGE/MANUFACTURING 125 PSF OR 2000 POUND POINT LOAD
MAXIMUM GENERATOR UNIT WEIGHT 10,000 POUNDS

C. SNOW LOADS: (ASCE 7-02)
GROUND SNOW LOAD, Pg = 40 PSF
COEFFICIENT OF EXPOSURE, Ce = 1.0 , PARTIALLY EXPOSED
SNOW IMPORTANCE FACTOR, Is = 1.2 , CATEGORY IV
THERMAL COEFFICIENT, Ct = 1.2 , COLD, VENTILATED ROOF
ROOF/FLAT SNOW LOAD, Pf = 37.0, PSF

D. WIND LOADS:
BASIC WIND SPEED = 130 MPH, 3 SECOND GUST
WIND IMPORTANCE FACTOR, Iw = 1.15 , CATEGORY IV
EXPOSURE CLASSIFICATION = EXPOSURE C

E. SEISMIC LOADING:
SEISMIC = S = 0.50 S = 0.15
SEISMIC IMPORTANCE FACTOR = 1.50 , CATEGORY IV

SITE CLASS "D"
BASIC SEISMIC FORCE RESISTANCE SYSTEM = BUILDING - BEARING WALL WITH STEEL SHEAR PANELS
FOUNDATION = CANTILEVERED COLUMN
SEISMIC RESPONSE COEFFICIENT, R = 7.0

2.0 FOUNDATIONS:

A. SEE SITE/FOUNDATION PLANS BY OTHERS.

B. THE MODULE DESIGN SHOWS STANDARD INSTALLATION ON PILE FOUNDATION. OTHER TYPES OF AT GRADE FOUNDATIONS MAY BE USED PROVIDED THEY ARE DESIGNED FOR ALL LOAD CONDITIONS INDICATED.

3.0 STRUCTURAL STEEL:

A. THE DESIGN, FABRICATION, AND ERECTION OF ALL STRUCTURAL STEEL SHALL COMPLY WITH THE CODE OF STANDARD PRACTICE OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

B. ALL STEEL PLATE, SHAPES, AND ROLLED SECTIONS SHALL BE ASTM A36. ALL STEEL TUBING SHALL BE ASTM A500, GRADE B. ALL STEEL PIPE SHALL BE A253, GRADE 3 (45 KSI).

C. ALL METAL TO METAL CONNECTIONS SHALL BE EQUAL TO STANDARD CONNECTION, OR AS DETAILED USING A325 BOLTS (BEARING TYPE CONNECTIONS). TIGHTEN HIGH STRENGTH BOLTS WITH PROPERLY CALIBRATED WRENCHES, BY TURN-OF-THE-NUT METHOD, OR BY LOAD WASHERS. ALL CONNECTIONS UNLESS OTHERWISE DETAILED, SHALL HAVE THE MAXIMUM NUMBER OF 3/4" DIAMETER BOLTS USING STANDARD GAUGES AND CLEARANCES.

D. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE CURRENT CODE OF THE AMERICAN WELDING SOCIETY. USE AWS 5.1 E70XX ELECTRODES. MINIMUM FILLET WELD SHALL BE 3/16" EXCEPT FOR SEAL WELDS TO GAUGE METAL AS INDICATED.

E. ALL EXPOSED STEEL SURFACES, OTHER THAN THOSE HOT DIP GALVANIZED (HDG), SHALL BE PREPARED AND PAINTED AS INDICATED IN THE ARCHITECTURAL DRAWINGS.

4.0 WOOD:

A. PLYWOOD ROOF DECK AND WALL SHEATHING SHALL BE TREATED (AWW). 5/8" PLYWOOD SHALL HAVE A PANEL SPAN RATING OF 32/16 - MINIMUM NAILING FOR PANELS, UNLESS OTHERWISE NOTED, SHALL EQUAL 10d NAILS AT 4" CENTERS AROUND PLYWOOD PANEL EDGES AND 10d'S @ 12" CENTERS ALONG INTERMEDIATE FRAMING. BLOCK ALL DIAPHRAGM PANEL EDGES WITH 2X4 FLAT BLOCKING. OSB OR NON-TREATED PLYWOOD PANELS WILL NOT BE ACCEPTED.

B. FRAMING MATERIAL: DOUGLAS FIR OR HEM FIR, NO. 2 OR BETTER MINIMUM FOR JOISTS, STUDS, PANEL JOINTS, WOOD PLATES, BLOCKING, AND HEADERS. MAXIMUM MOISTURE CONTENT SHALL BE 19%. ALL FRAMING MATERIAL SHALL BE TREATED FOR GROUND CONTACT TO 0.4 MINIMUM RETENTION.

C. ALL METAL TO WOOD OR WOOD TO WOOD CONNECTIONS SHALL BE STANDARD OR AS DETAILED ON THE DRAWINGS. ALL FASTENERS IN CONTACT WITH WOOD MEMBERS AND PLYWOOD SHALL BE STAINLESS STEEL.

D. ALL METAL FRAMING ANCHORS AND SPLICE PLATES SHALL BE FABRICATED FROM STAINLESS STEEL AND SHALL SUPPORT THE LOADS INDICATED ON THE DRAWINGS. ANCHORS INDICATED ON THE DRAWINGS ARE "SIMPSON COMPANY" OR EQUAL.

E. MINIMUM NAILING SHALL EQUAL THAT INDICATED IN INTERNATIONAL BUILDING CODE TABLE 2304.9.1 UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS.

F. ERECT WOOD FRAMING MEMBERS TRUE TO LINES AND LEVELS. DO NOT DEVIATE FROM TRUE ALIGNMENT MORE THAN 1/4 INCH.

G. PREMANUFACTURED ROOF TRUSSES: ALL PREMANUFACTURED WOOD TRUSSES SHALL BE "GANG NAIL" OR EQUAL AND SHALL BE FABRICATED FROM TREATED LUMBER WITH STAINLESS STEEL PLATES AND FASTENERS AS INDICATED ABOVE. TRUSSES SHALL DESIGNED FOR THE GRAVITY LOADS, LATERAL LOADS, AND SUPPORT CONDITIONS AS INDICATED ON THE DRAWINGS. NO DURATION OF LOAD INCREASE IN STRESSES WILL BE ALLOWED FOR SNOW LOADING. UNBALANCED SNOW AND DRIFT LOADING IS REQUIRED. SUBMIT TRUSS DESIGNS STAMPED BY AN ENGINEER LICENSED TO PRACTICE IN THE STATE OF ALASKA. TUSS DRAWINGS SHALL INDICATE ALL MATERIALS OF CONSTRUCTION.

UMIAQ
3535 Arctic Blvd. Suite 200
Anchorage, AK 99503
(907) 277-4500

ICG Lantech Inc
architectural • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

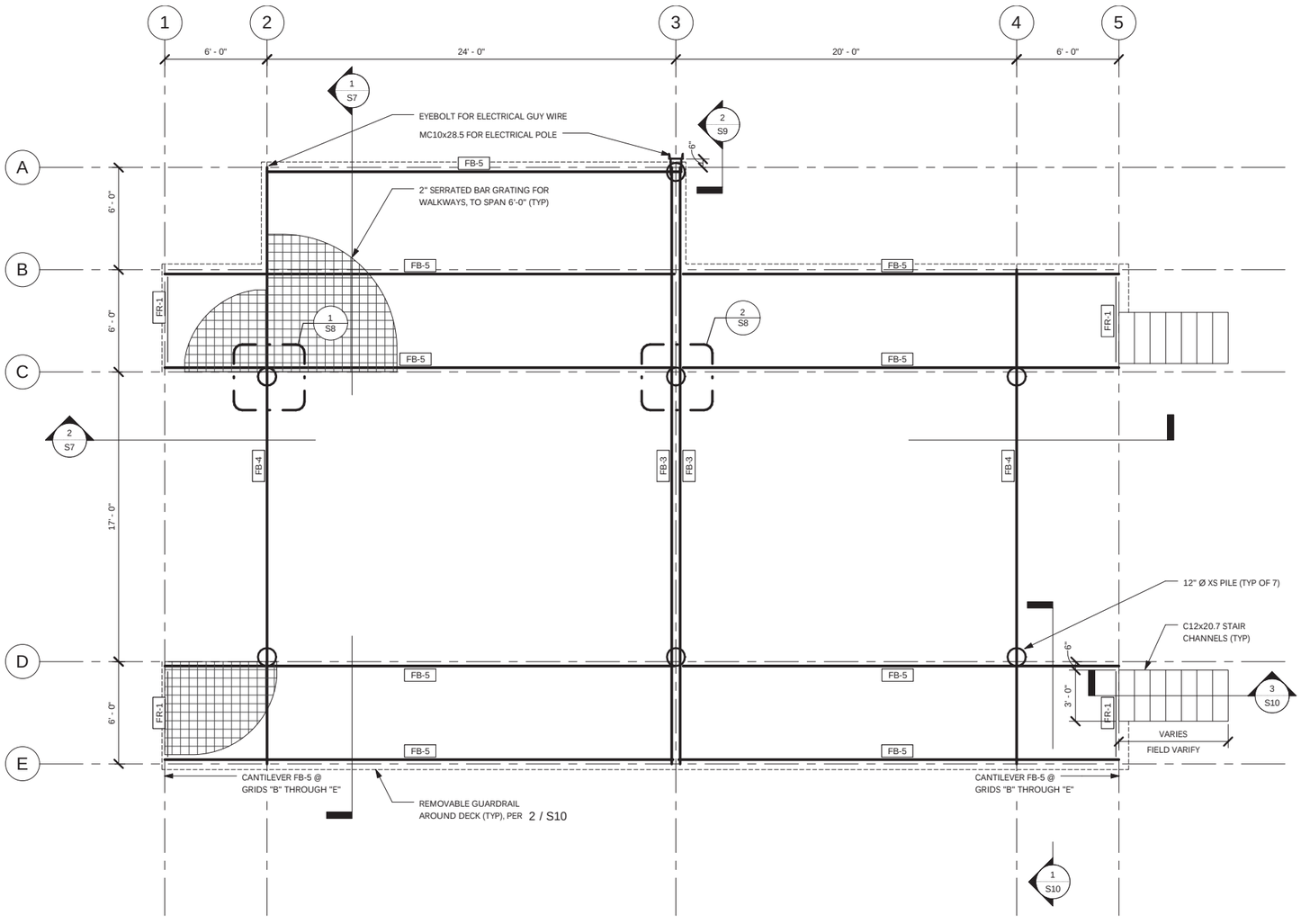
STATE OF ALASKA 49th
Danny O. Graham
SE14022
REGISTERED PROFESSIONAL ENGINEER
9-23-15

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
PILE PLAN

S1

SHEET OF



Catwalk Framing Schedule		
Type Mark	Description	Comments
FB-3	W18X35	DOUBLE CANTILEVER BEAM
FB-4	W18X35	CANTILEVER BEAM
FB-5	W18X35	DECK BEAM
FR-1	W8X15	RIM JOISTS

THIS SHEET SHOWS POWER PLANT MODULE FOUNDATION FRAMING, PLATFORMS, CATWALKS, STAIRS, HANDRAILS, AND GUARDRAILS WHICH ARE PROVIDED BY THIS PROJECT.

NOTES
1. ALL DECK STEEL, DECKING AND FASTENERS SHALL BE HOT DIPPED GALVANIZED PER ASTM A153.

1 / S2 CATWALK FRAMING PLAN
1/4" = 1'-0"

UMIAQ
3000 Arctic Blvd. Suite
Anchorage, AK 99503
(907) 677-6000

ICG Lantech Inc
architectural • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

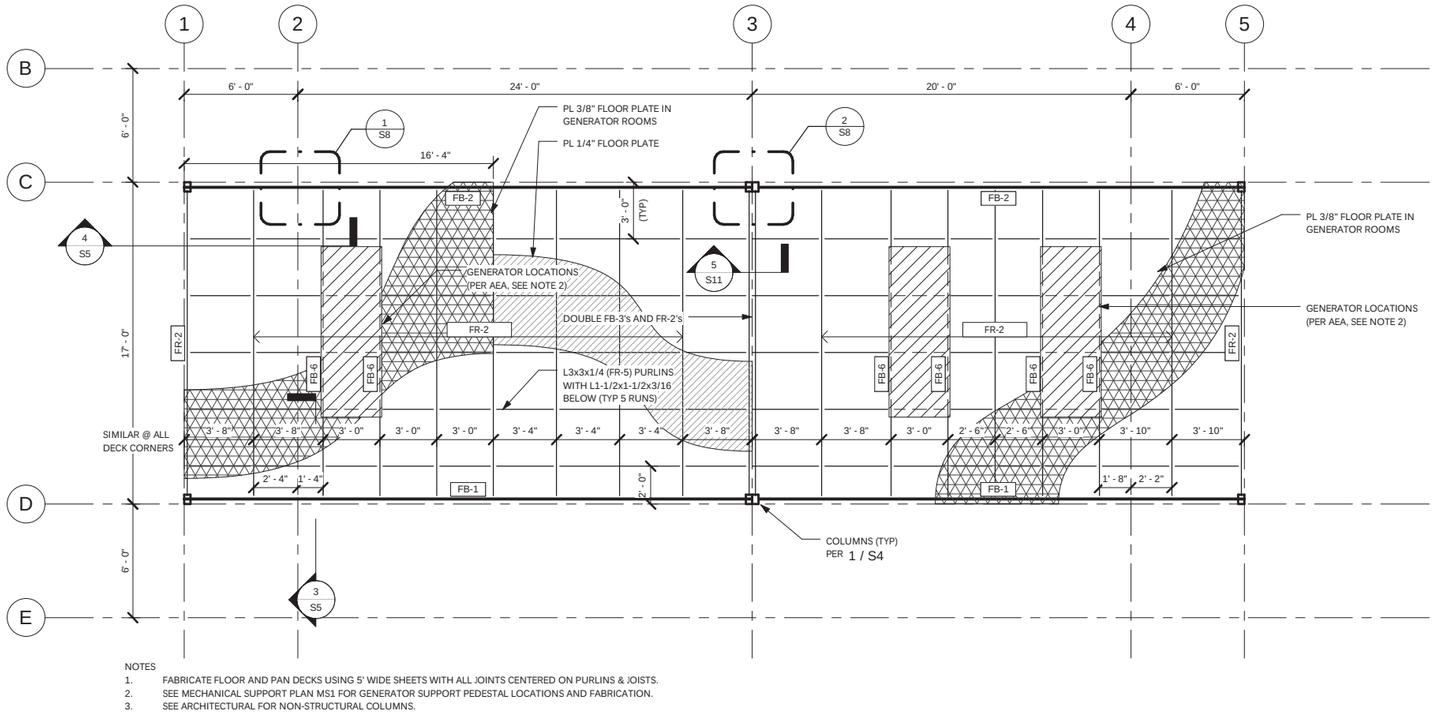
VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49th
Danny O. Gorman
SE14022
9-23-15
REGISTERED PROFESSIONAL ENGINEER

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
CATWALK FRAMING PLAN

S2
SHEET OF



NOTES

1. FABRICATE FLOOR AND PAN DECKS USING 5' WIDE SHEETS WITH ALL JOINTS CENTERED ON PURLINS & JOISTS.
2. SEE MECHANICAL SUPPORT PLAN MS1 FOR GENERATOR SUPPORT PEDESTAL LOCATIONS AND FABRICATION.
3. SEE ARCHITECTURAL FOR NON-STRUCTURAL COLUMNS.

2 / S3 MODULE FRAMING PLAN

1/4" = 1'-0"

Module Framing Schedule		
Type Mark	Description	Comments
FB-1	W21X44	
FB-2	W21X44	
FB-6	W12X40	
FR-2	W12X14	JOISTS @ 4' OC MAX
FR-5	L3X3X1/4	PURLINS @ 3' OC MAX

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
6930 Arctic Spur Road
Anchorage, AK 99518
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

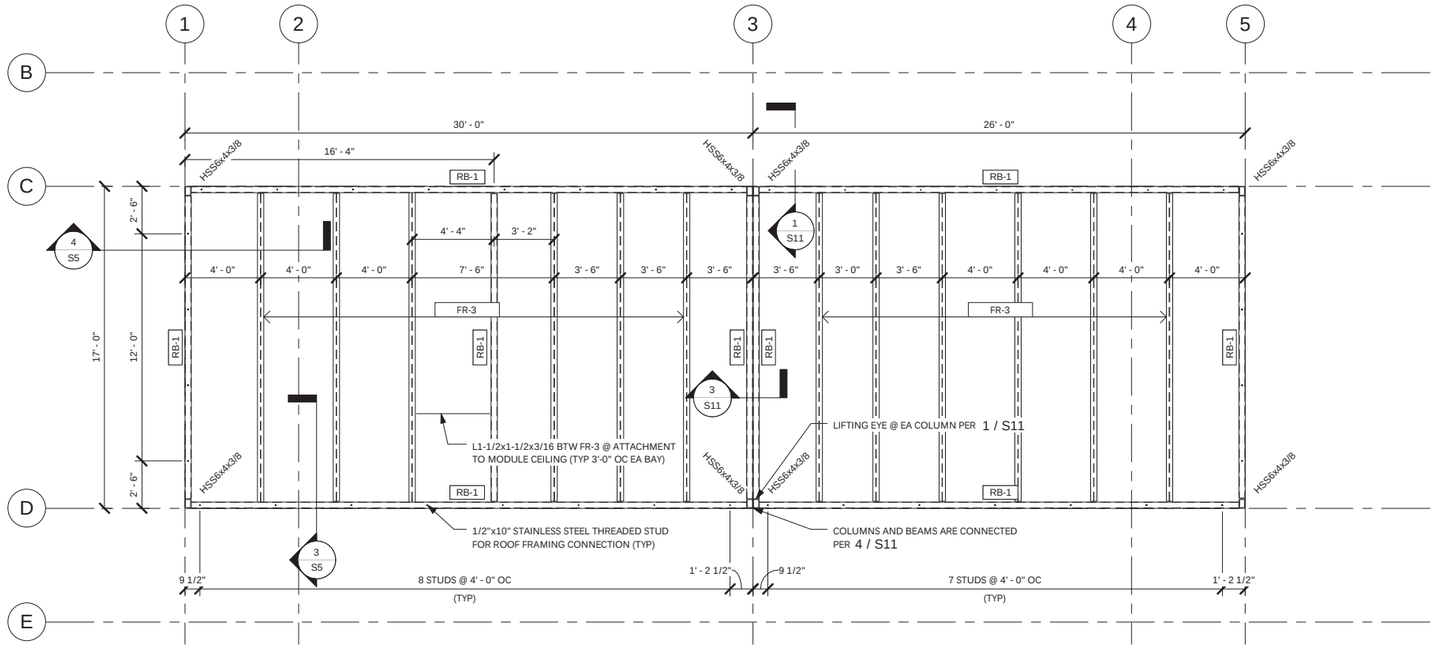
STATE OF ALASKA 49th
Danny O. Gorman
SE14022
REGISTERED PROFESSIONAL ENGINEER
9-23-15

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
MODULE FLOOR FRAMING PLAN

S3

SHEET OF



NOTES
1. FABRICATE CEILING ASSEMBLY USING SHEETS WITH ALL JOINTS CENTERED ON JOISTS.
2. COORDINATE WITH MECHANICAL FOR STRUT SUPPORT LOCATIONS AND INSTALLATION.
3. SEE ARCHITECTURAL FOR NON-STRUCTURAL COLUMNS.

1/S4 CEILING FRAMING PLAN

1/4" = 1'-0"

Module Ceiling Framing Schedule		
Type Mark	Description	Comments
FR-3	W4X13	
RB-1	HSS6X4X3/8	

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
3000 Arctic Blvd Suite 201
Anchorage, AK 99503
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49th Danny O. Gomez SE14022 9-23-15 REGISTERED PROFESSIONAL ENGINEER

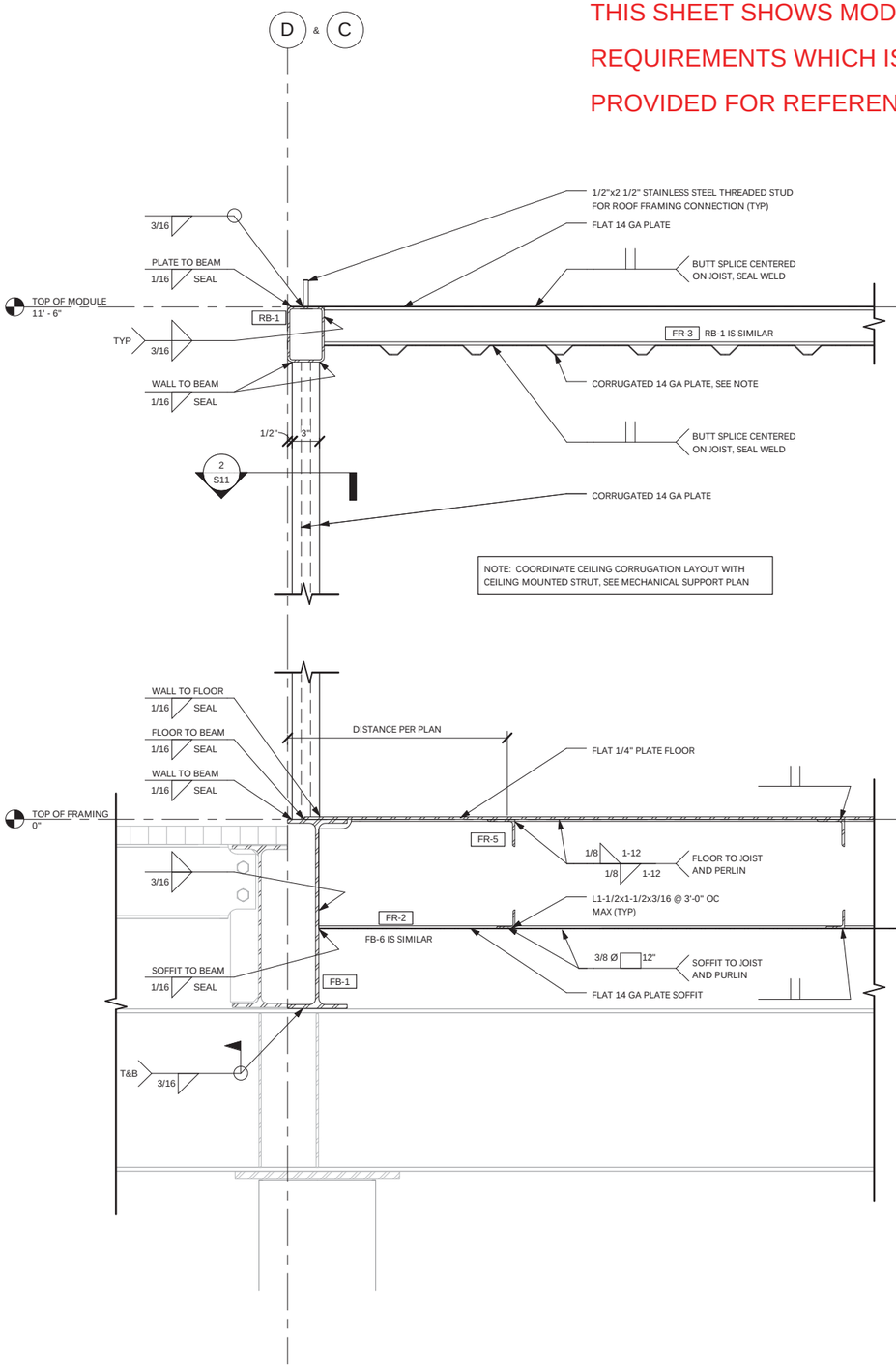
DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
MODULE CEILING FRAMING PLAN

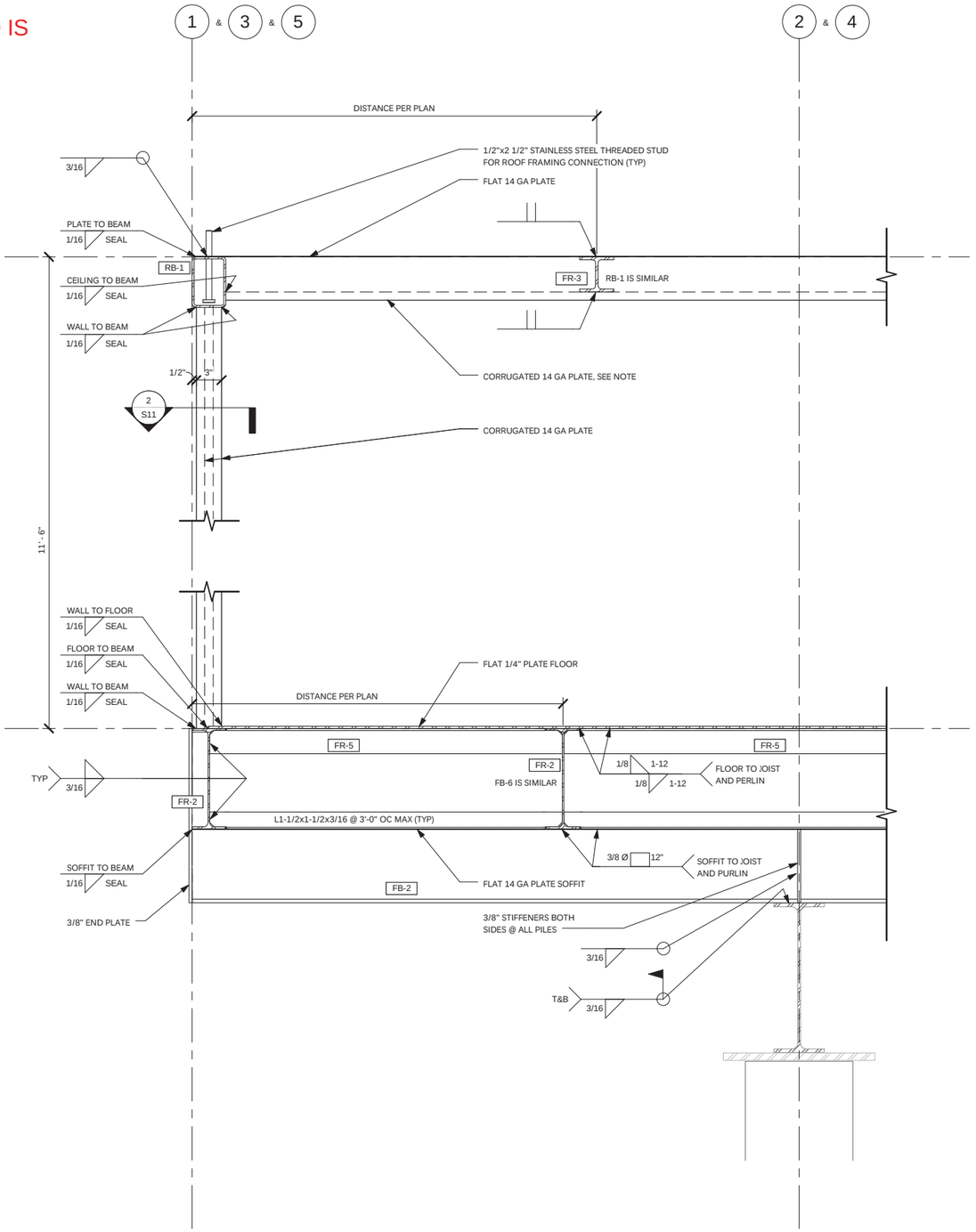
S4

SHEET OF

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.



3 S5 Section 3
1 1/2" = 1'-0"



4 S5 Section 4
1 1/2" = 1'-0"

UMIAQ
3000 Arctic Blvd. Suite
Anchorage, AK 99503
907-677-6800

ICG Lantech Inc
architecture + engineering + surveying

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

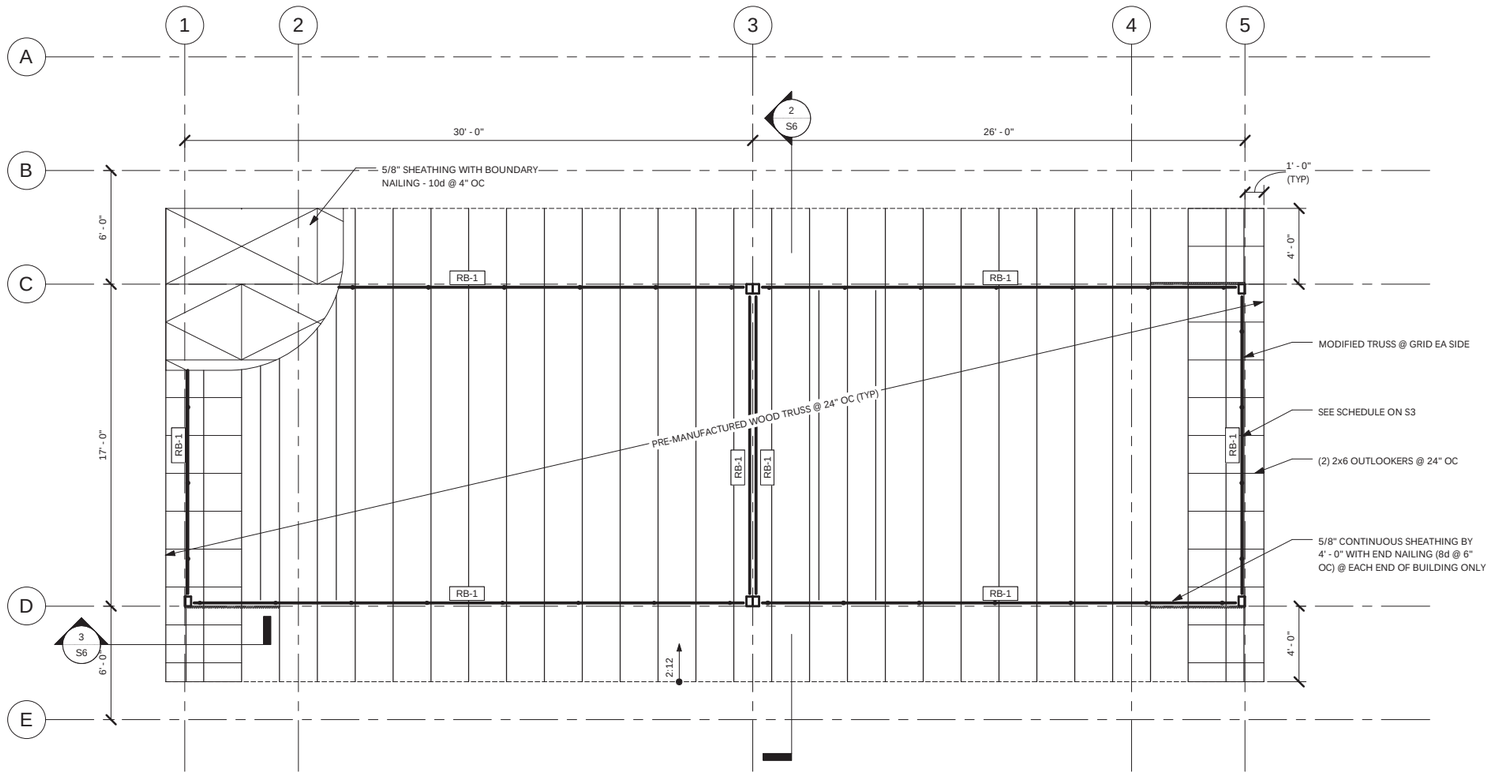
STATE OF ALASKA 49th Danny O. Gilman SE14022 REGISTERED PROFESSIONAL ENGINEER

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
MODULE CONNECTION DETAILS

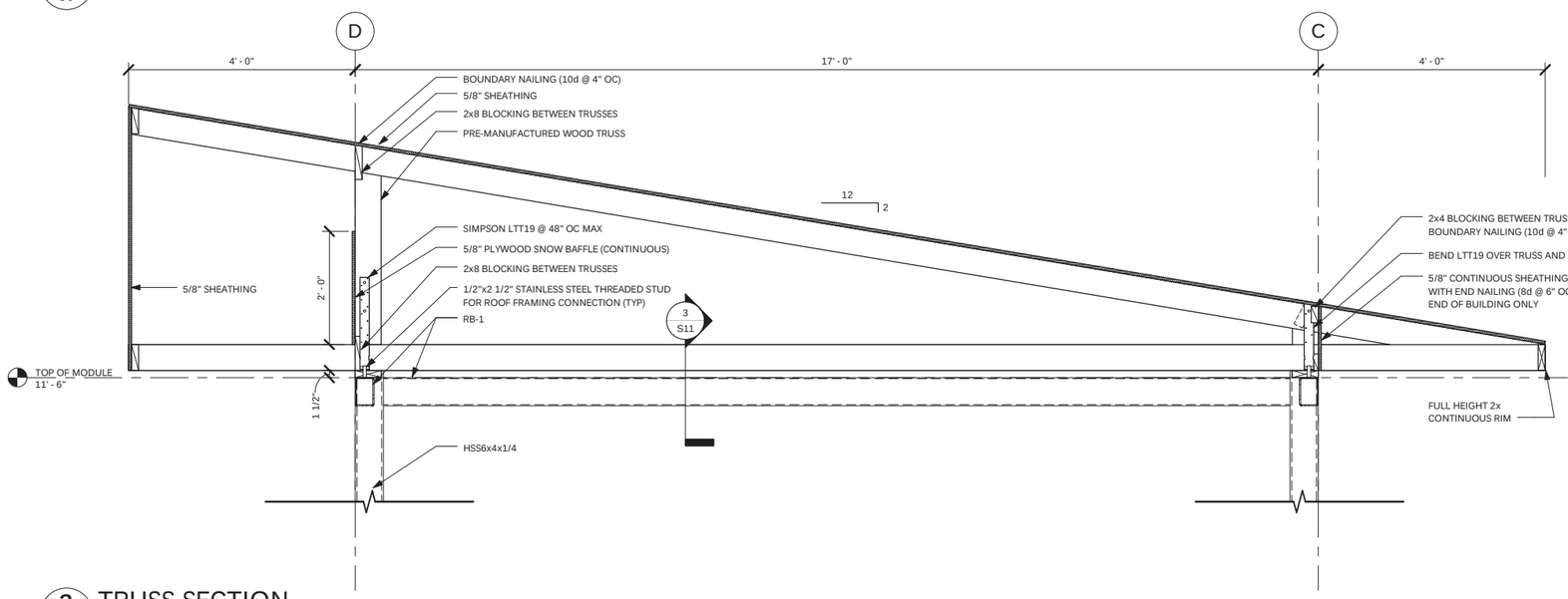
S5

SHEET OF

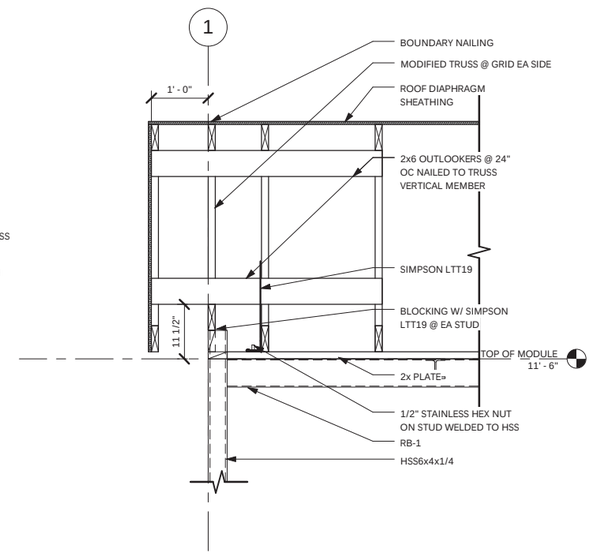


NOTES
1. ALL SHEATHING SHALL BE NAILD AT BOUNDARIES WITH 10d @ 4" OC, ALL EDGES WITH 8d @ 6" OC.

1 S6 ROOF FRAMING PLAN
1/4" = 1'-0"



2 S6 TRUSS SECTION
3/4" = 1'-0"



3 S6 GABLE SECTION
3/4" = 1'-0"

THIS SHEET SHOWS ROOF STRUCTURE WHICH IS PROVIDED BY THIS PROJECT.

UMIAQ
3000 Arctic Blvd. Suite
Anchorage, AK 99503
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49th Danny O. Gorman SE14022 REGISTERED PROFESSIONAL ENGINEER

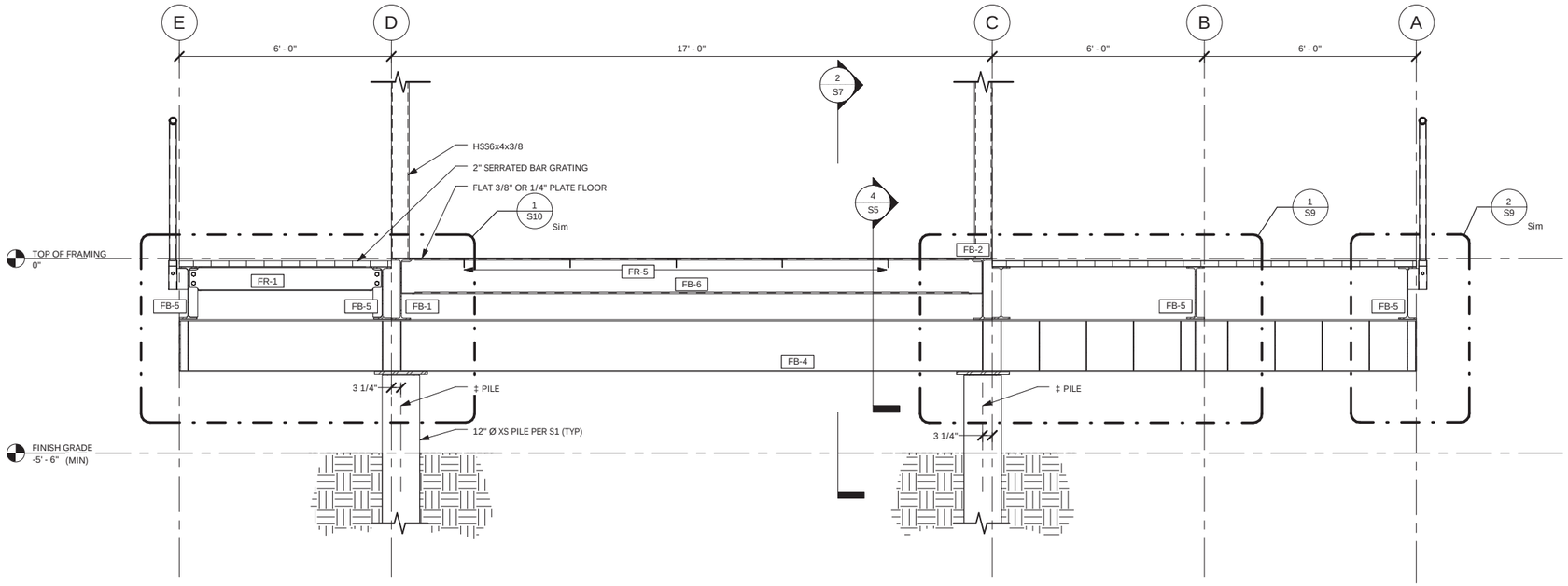
DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
ROOF FRAMING PLAN AND SECTION

S6

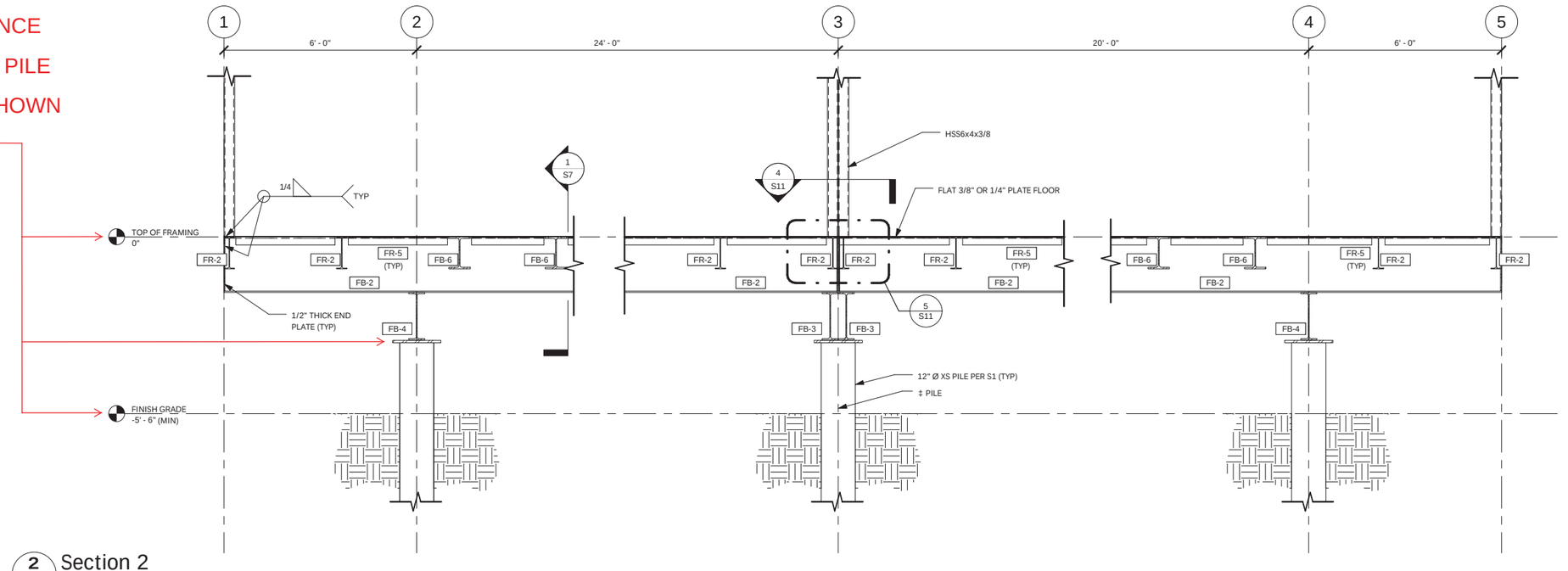
SHEET | OF

THIS SHEET SHOWS PILE FOUNDATION, FOUNDATION FRAMING AND CATWALK WHICH ARE PROVIDED BY THIS PROJECT. POWER PLANT MODULE IS SHOWN, ALTHOUGH IT IS N.I.C. PLACEMENT OF MODULE ON ITS FOUNDATION IS PROVIDED BY THIS PROJECT.



1 S7 Section 1
1/2" = 1'-0"

REPLACE REFERENCE ELEVATIONS WITH PILE CAP ELEVATION SHOWN ON SHEET C1.3



2 S7 Section 2
1/2" = 1'-0"

UMIAQ
6930 Arctic Spur Road
Anchorage, AK 99518
(907) 677-6800

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

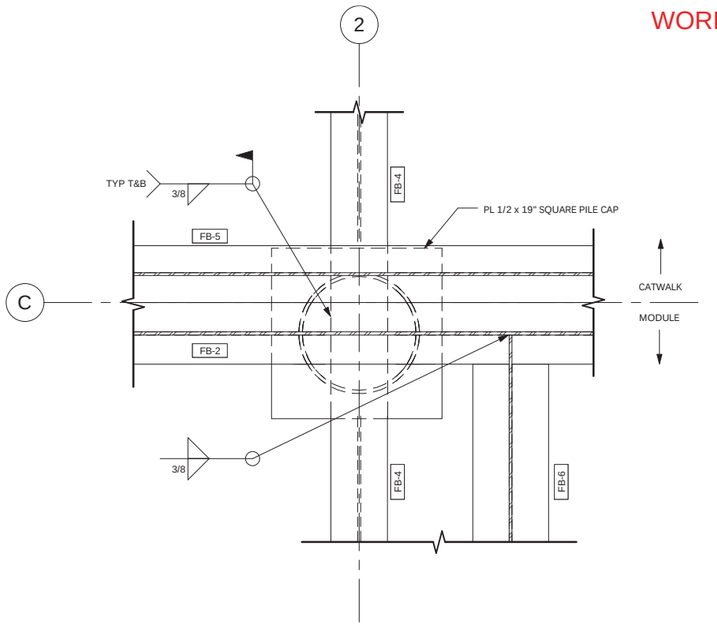
STATE OF ALASKA 49th
Danny O. Gilmore
SE14022
9-23-15
REGISTERED PROFESSIONAL ENGINEER

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

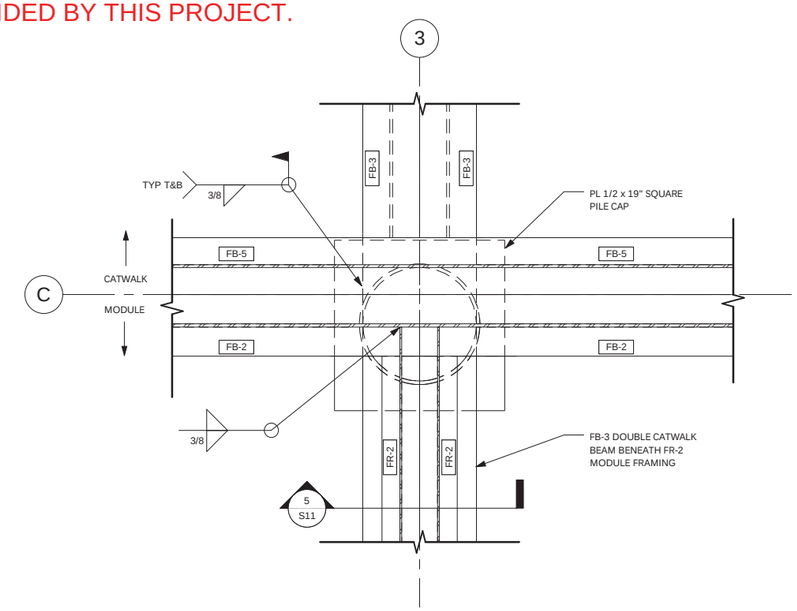
DRAWING TITLE:
FLOOR FRAMING SECTIONS

S7
SHEET OF

WORK SHOWN ON THIS SHEET IS PROVIDED BY THIS PROJECT.



1 S8 BEAM CONNECTION DETAIL
1 1/2" = 1'-0"



2 S8 DOUBLE BEAM CONNECTION DETAIL
1 1/2" = 1'-0"

UMIAQ
6000 Arctic Spur Road
Anchorage, AK 99518
(907) 677-6800

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49th
Danny O. Gorman
SE14022
9-23-15
REGISTERED PROFESSIONAL ENGINEER

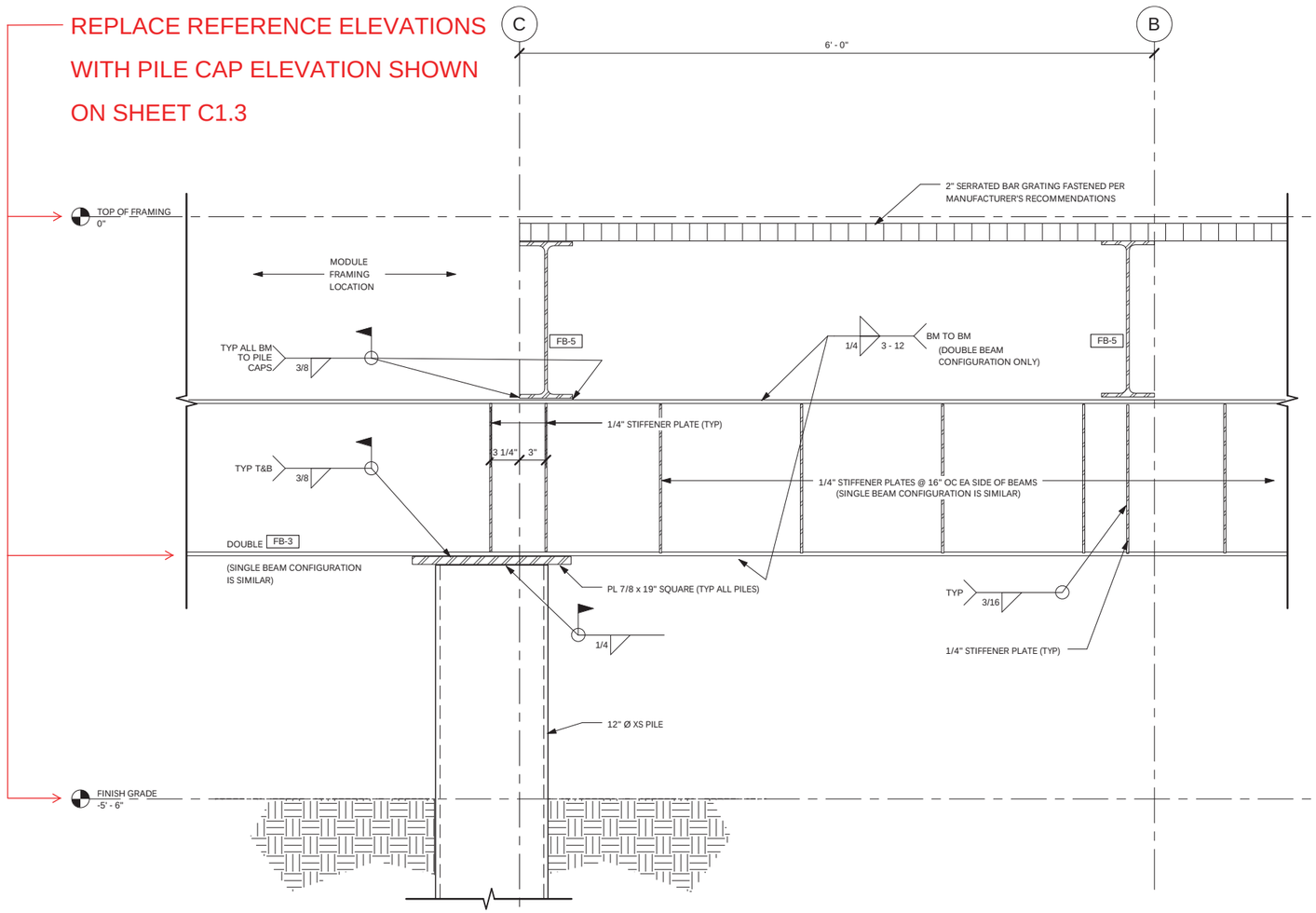
DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
CATWALK FRAMING DETAILS

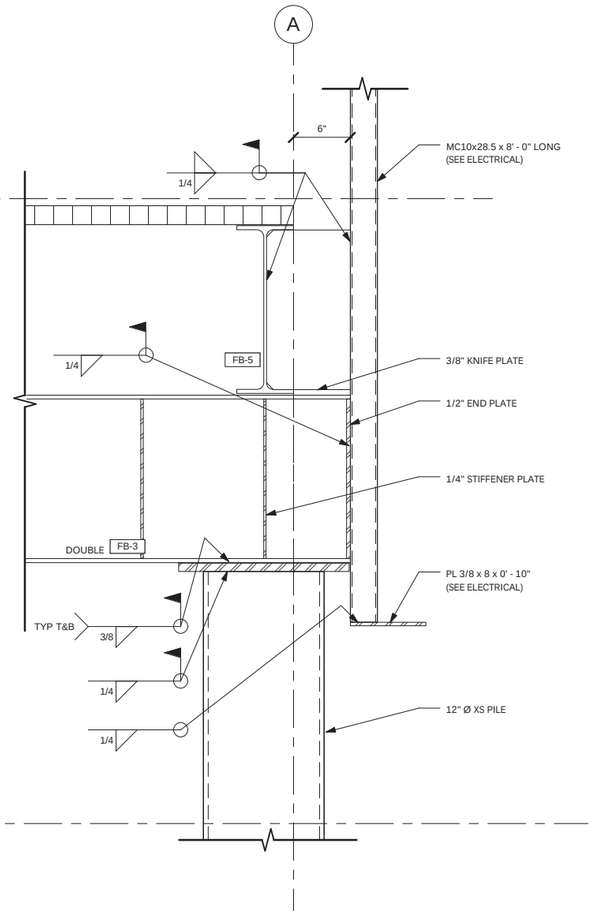
S8

SHEET OF

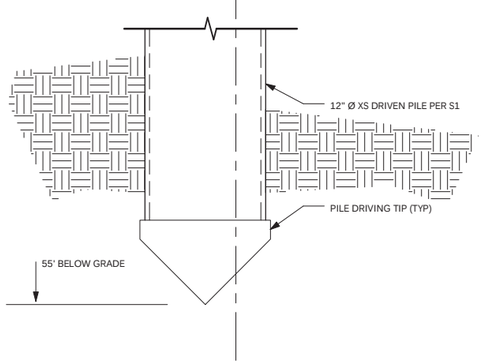
REPLACE REFERENCE ELEVATIONS WITH PILE CAP ELEVATION SHOWN ON SHEET C1.3



1 S9 CANTILEVER SUPPORT SECTION
1 1/2" = 1'-0"



2 S9 POWER POLE CONNECTION @ GRID "3"
1 1/2" = 1'-0"



3 S9 PILE DRIVING TIP
1 1/2" = 1'-0"

WORK SHOWN ON THIS SHEET IS PROVIDED BY THIS PROJECT.

UMIAQ
3000 Arctic Blvd. Suite 205
Anchorage, AK 99503
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

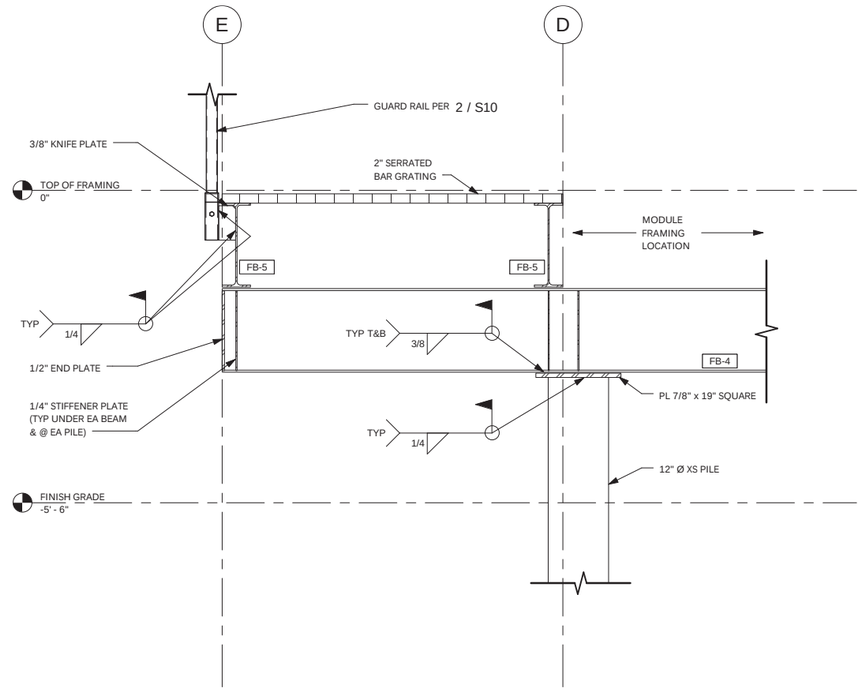
STATE OF ALASKA 49th
Danny O. Graham
SE14023
REGISTERED PROFESSIONAL ENGINEER
9-23-15

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
PILE AND CANTILEVER SECTION

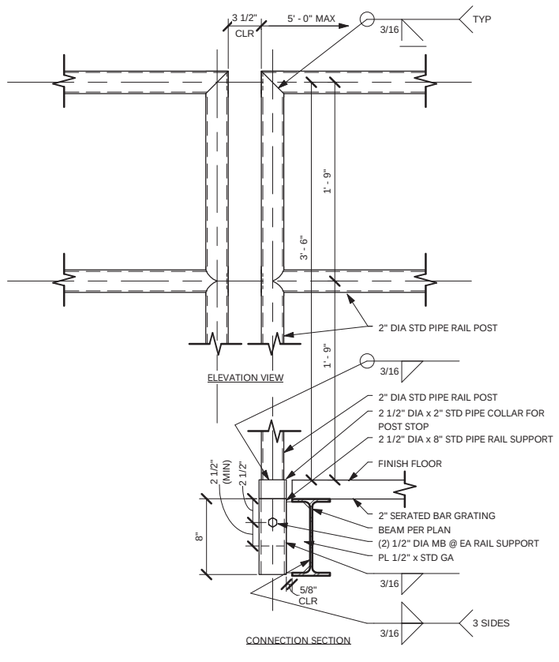
S9

SHEET OF



1 S10 DECK SECTION

3/4" = 1'-0"

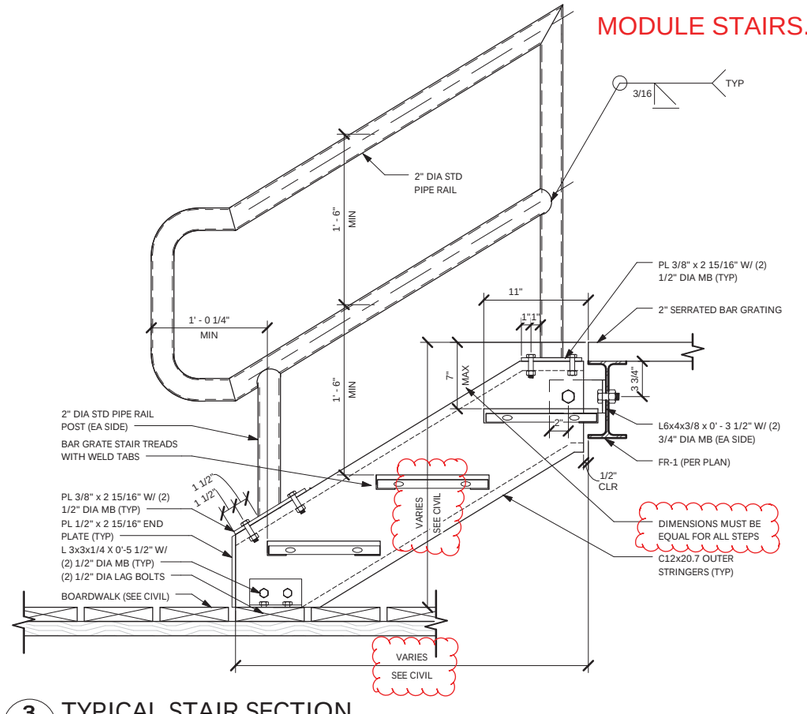


2 S10 REMOVABLE GUARDRAIL DETAIL

1 1/2" = 1'-0"

WORK SHOWN ON THIS SHEET IS PROVIDED BY THIS PROJECT.

NOTE: PER SHEET C1.2 PROVIDE (5) STEPS, (6) RISES AND 6.5" RISES FOR MODULE STAIRS.



3 S10 TYPICAL STAIR SECTION

1 1/2" = 1'-0"

UMIAQ
3000 Arctic Blvd. Suite 204
Anchorage, AK 99503
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

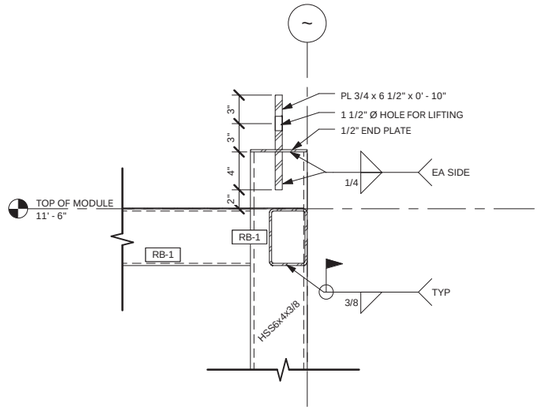
STATE OF ALASKA
49th
Danny O. Gilmore
SE14022
REGISTERED PROFESSIONAL ENGINEER
9-23-15

DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

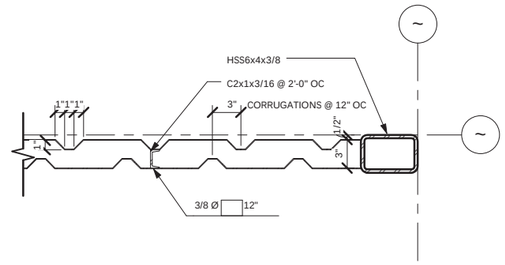
DRAWING TITLE:
CATWALK DETAILS

S10

SHEET OF

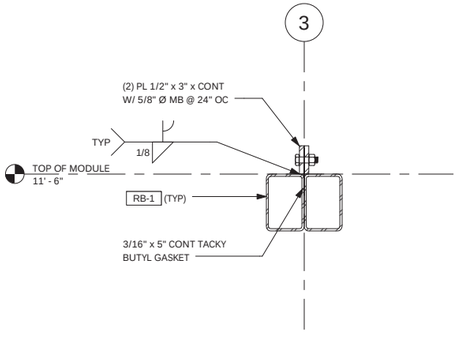


1 S11 LIFTING EYE & COLUMN CONNECTION
1 1/2" = 1'-0"

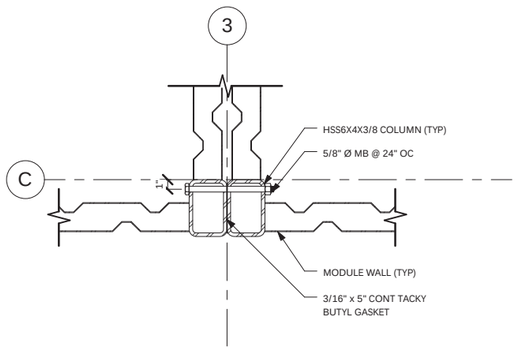


2 S11 EXTERIOR WALL PLAN
1 1/2" = 1'-0"

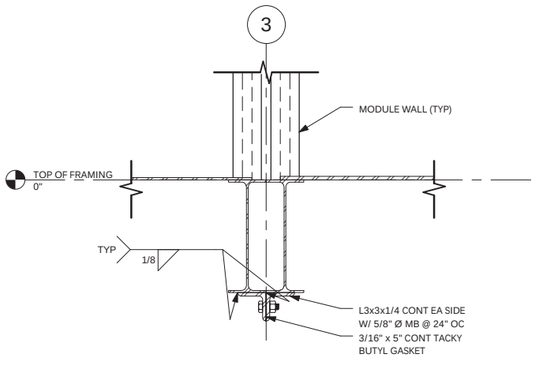
THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY EXCEPT AS OTHERWISE NOTED.



3 S11 MODULE CONNECTION @ BEAMS
1 1/2" = 1'-0"



4 S11 MODULE CONNECTION @ COLUMNS
1 1/2" = 1'-0"



5 S11 MODULE CONNECTION @ FLOOR
1 1/2" = 1'-0"

PROVIDE GASKETS AND MAKE BOLTED CONNECTIONS AT GRID 3 UNDER THIS PROJECT.

UMIAQ
3000 Arctic Blvd. Suite
Anchorage, AK 99503
(907) 677-6650

ICG Lantech Inc
architecture • engineering • surveying

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	DESCRIPTION
REV DATE	

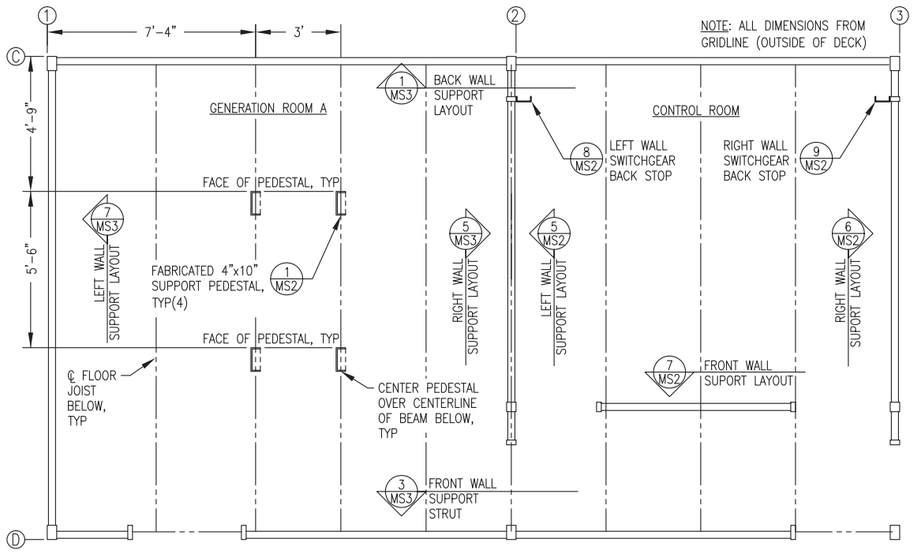
VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49th
Danny O. Gilmore
SE14022
09-23-15
REGISTERED PROFESSIONAL ENGINEER

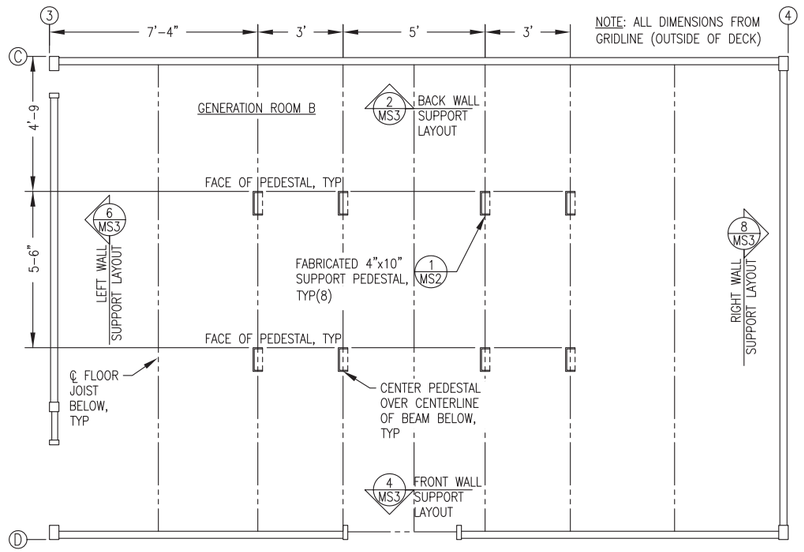
DATE: 09/23/15
DRAWN BY: DM
CHECKED BY: DG
JOB NUMBER:

DRAWING TITLE:
MODULE DETAILS

S11
SHEET OF



MODULE A



MODULE B

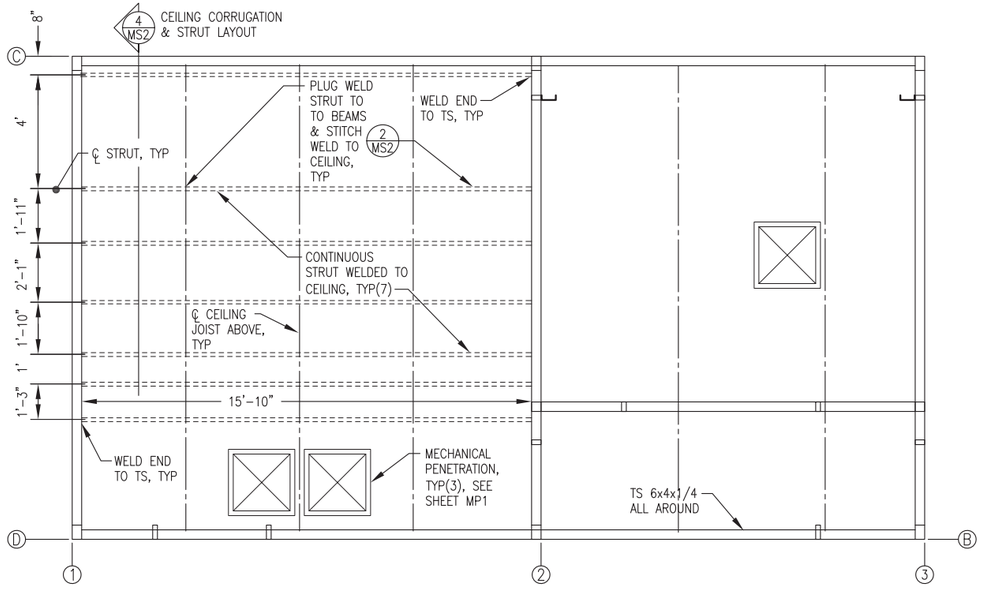
1 MS1 MODULE MECHANICAL SUPPORT FLOOR PLANS

3/8"=1'-0"

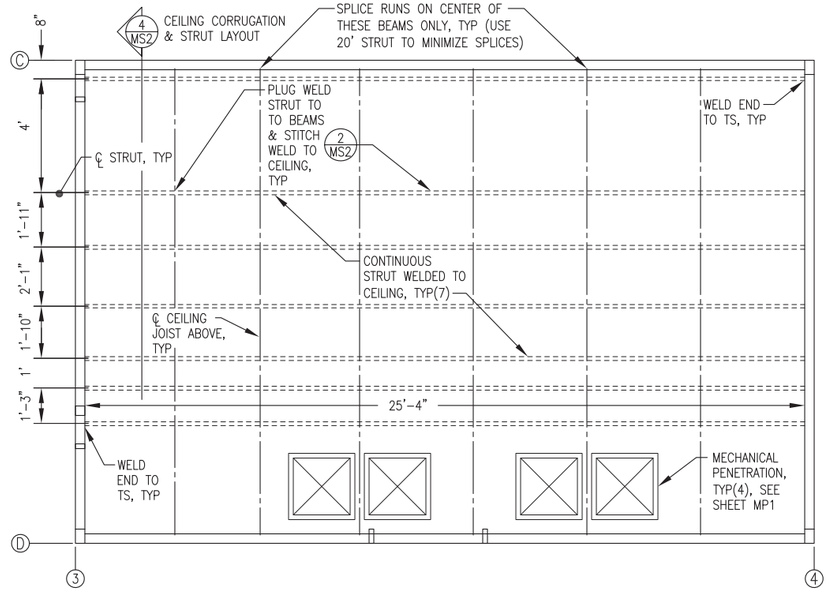
GENERAL NOTES:

1) ALL STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED). B-LINE B22-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MINIMIZE SPLICES.
2) INSTALL ALL SUPPORTS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.

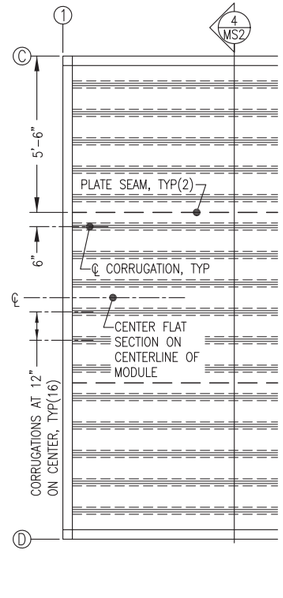
THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.



MODULE A CEILING STRUT LAYOUT



MODULE B CEILING STRUT LAYOUT



CEILING PLATE CORRUGATION LAYOUT

3 MS1 MODULE MECHANICAL SUPPORT REFLECTED CEILING PLANS

3/8"=1'-0"

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

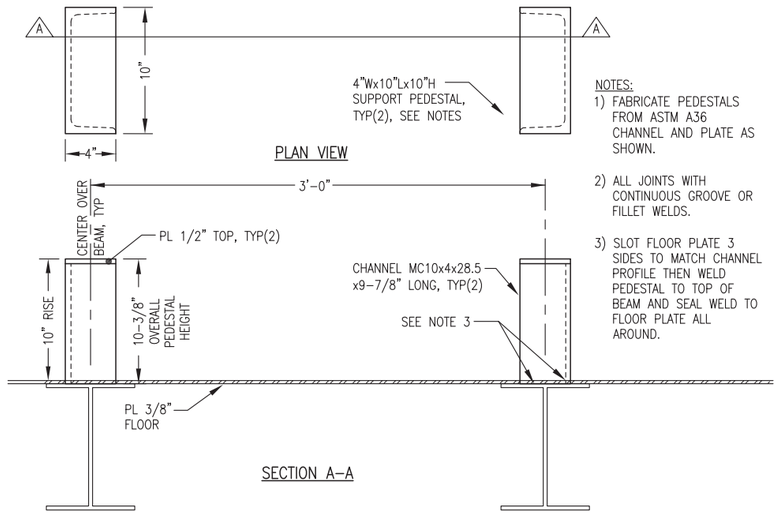
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 9/22/15
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

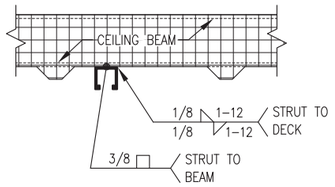
DRAWING TITLE:
MECHANICAL SUPPORT PLANS & DETAILS

MS1

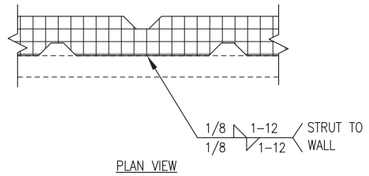
SHEET 1 OF 3



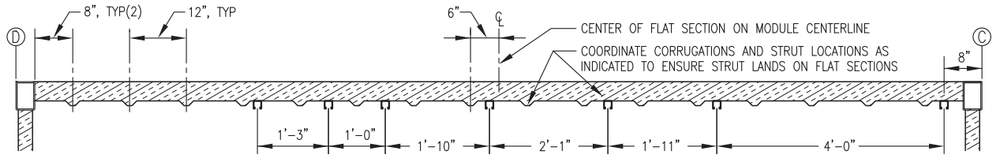
1 MS2 FABRICATED PEDESTAL SUPPORT
6"=1'-0"



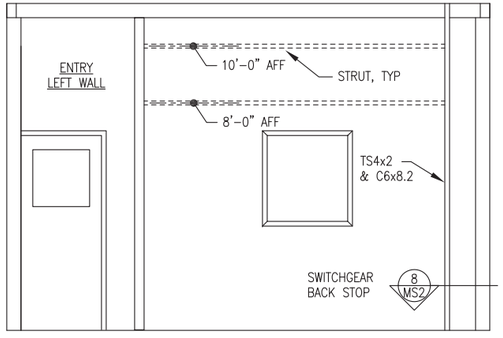
2 MS2 CEILING STRUT ATTACHMENT
NO SCALE



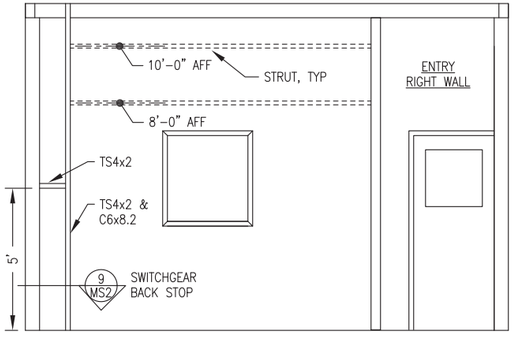
3 MS2 HORIZONTAL WALL STRUT ATTACHMENT
NO SCALE



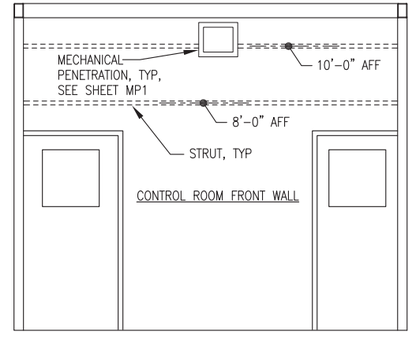
4 MS2 TYPICAL SECTION THROUGH CEILING – CORRUGATION & STRUT LAYOUT
3/4"=1'-0"



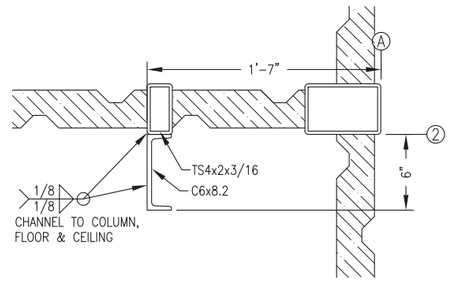
5 MS2 CONTROL ROOM LEFT WALL SUPPORT LAYOUT
3/8"=1'-0"



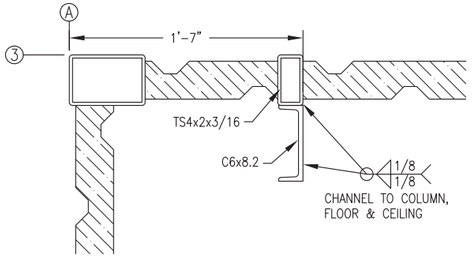
6 MS2 CONTROL ROOM RIGHT WALL SUPPORT LAYOUT
3/8"=1'-0"



7 MS2 CONTROL ROOM FRONT WALL SUPPORT LAYOUT
3/8"=1'-0"



8 MS2 LEFT WALL SWITCHGEAR BACK STOP
NO SCALE



9 MS2 RIGHT WALL SWITCHGEAR BACK STOP
NO SCALE

GENERAL NOTES:

1) DETAILS 5, 6, & 7 THIS SHEET ARE INTERIOR ELEVATIONS.
2) ALL STRUT LOCATION DIMENSIONS ARE CENTERLINE HEIGHT ABOVE FINISHED FLOOR (AFF).
3) ALL STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED). B-LINE B22-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MINIMIZE SPLICES.
4) INSTALL ALL SUPPORTS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.
5) DEE DETAIL 3/MS2 FOR STRUT ATTACHMENT TO WALL.

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

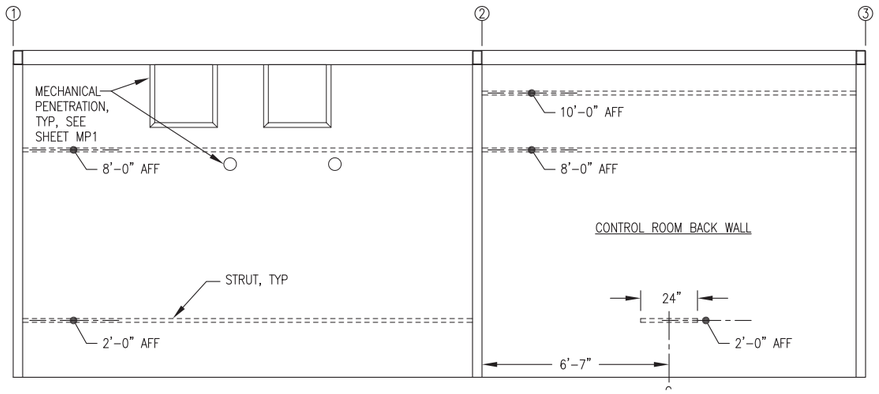
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 9/22/15
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

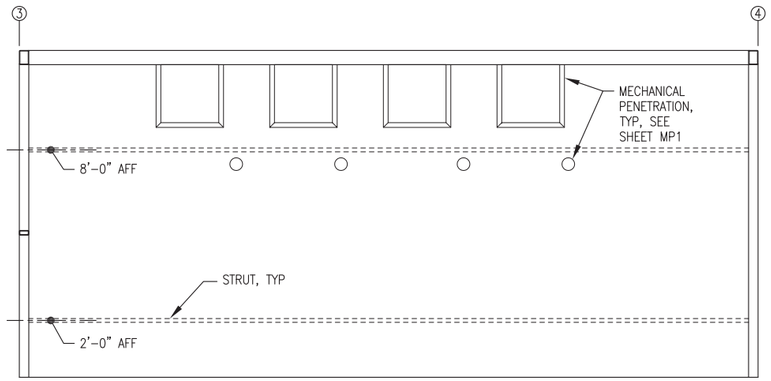
DRAWING TITLE:
MECHANICAL SUPPORT DETAILS

MS2

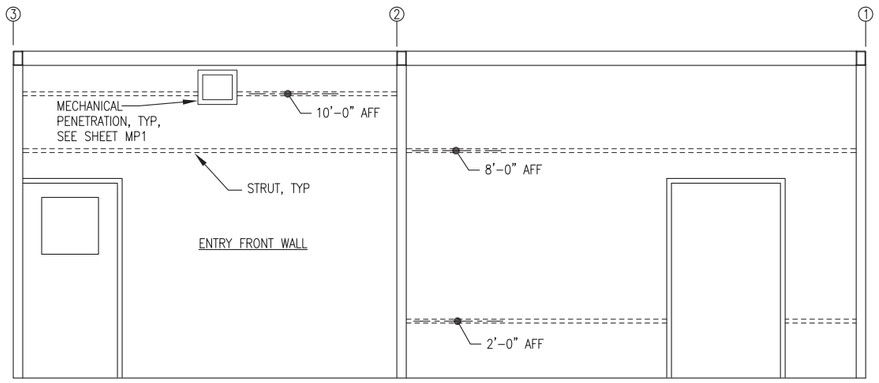
SHEET 2 OF 3



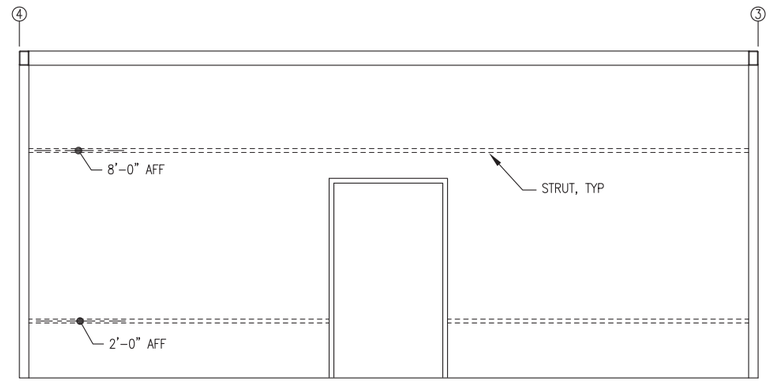
1 MS3 MODULE A BACK WALL SUPPORT LAYOUT
3/8"=1'-0"



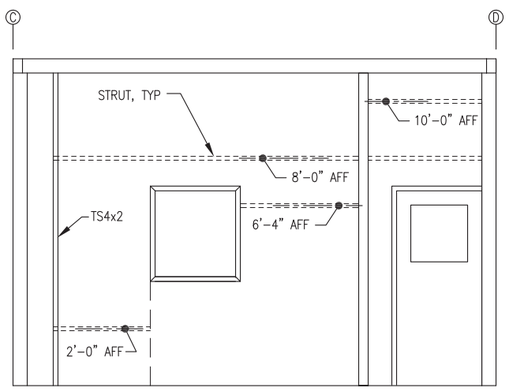
2 MS3 MODULE B BACK WALL SUPPORT LAYOUT
3/8"=1'-0"



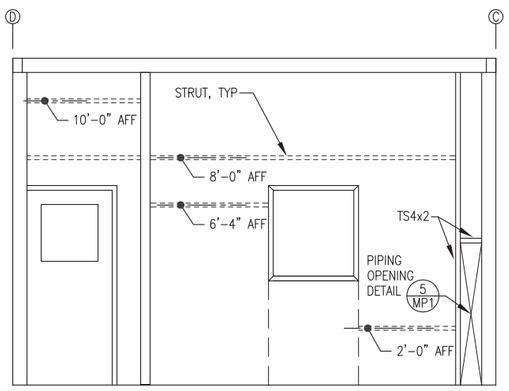
3 MS3 MODULE A FRONT WALL SUPPORT LAYOUT
3/8"=1'-0"



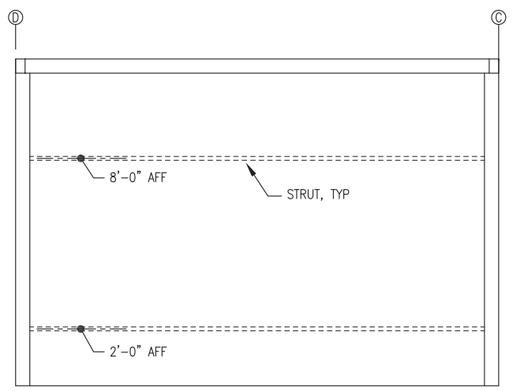
4 MS3 MODULE B FRONT WALL SUPPORT LAYOUT
3/8"=1'-0"



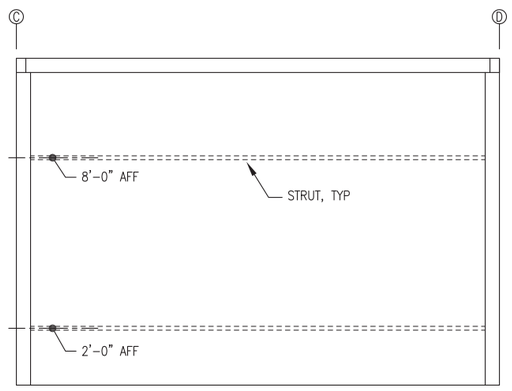
5 MS3 GENERATION ROOM A RIGHT WALL SUPPORT LAYOUT
3/8"=1'-0"



6 MS3 MODULE B LEFT WALL SUPPORT LAYOUT
3/8"=1'-0"



7 MS3 GENERATION ROOM A LEFT WALL SUPPORT LAYOUT
3/8"=1'-0"



8 MS3 MODULE B RIGHT WALL SUPPORTT LAYOUT
3/8"=1'-0"

GENERAL NOTES:

1) ALL VIEWS THIS SHEET ARE INTERIOR ELEVATIONS.
2) ALL STRUT LOCATION DIMENSIONS ARE CENTERLINE HEIGHT ABOVE FINISHED FLOOR (AFF).
3) ALL STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED). B-LINE B22-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MINIMIZE SPLICES.
4) INSTALL ALL SUPPORTS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.
5) DEE DETAIL 3/MS2 FOR STRUT ATTACHMENT TO WALL.

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

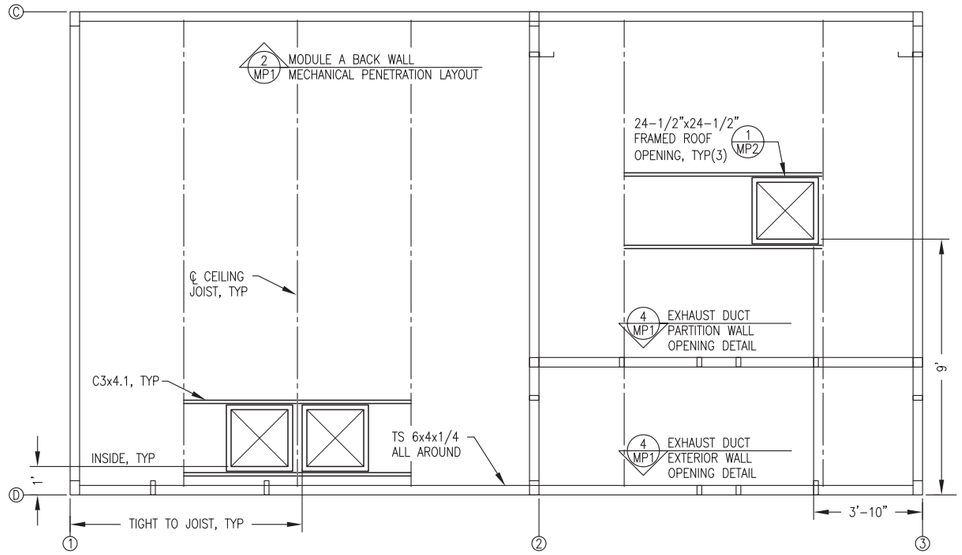
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 9/22/15
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
MECHANICAL SUPPORT DETAILS

MS3

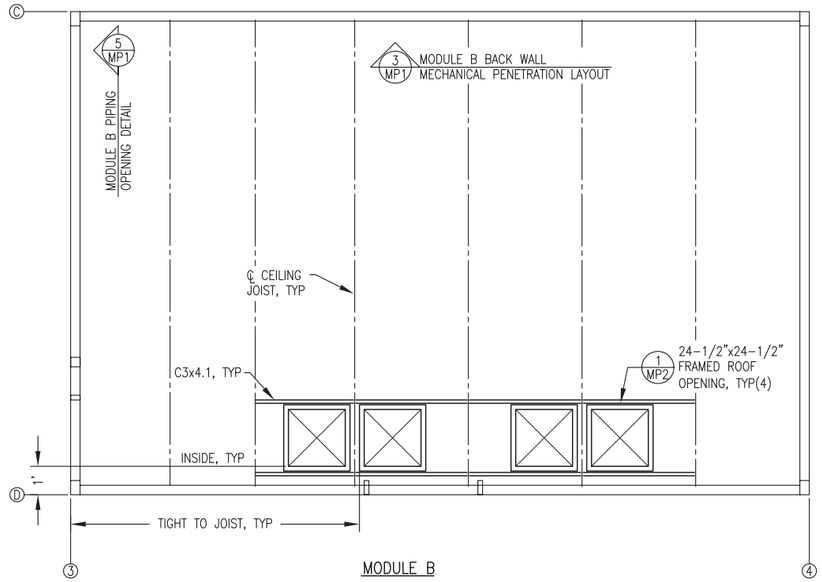
SHEET 3 OF 3



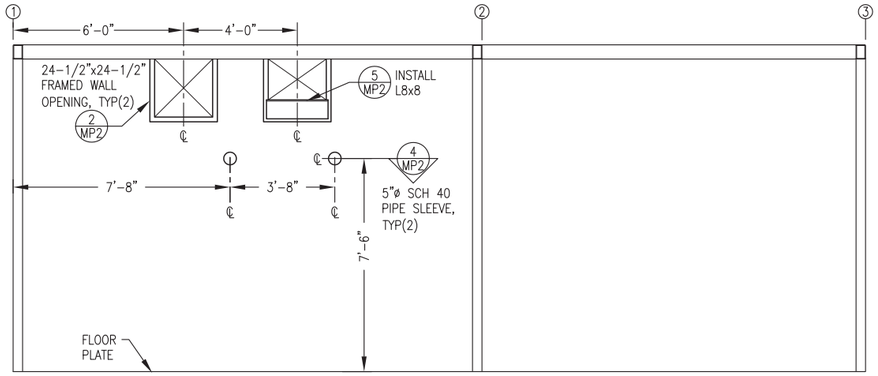
MODULE A

1 MP1 MODULE MECHANICAL PENETRATION PLANS

3/8"=1'-0"

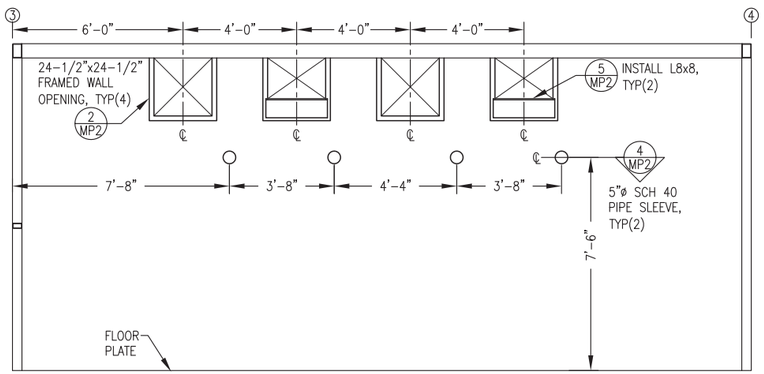


MODULE B



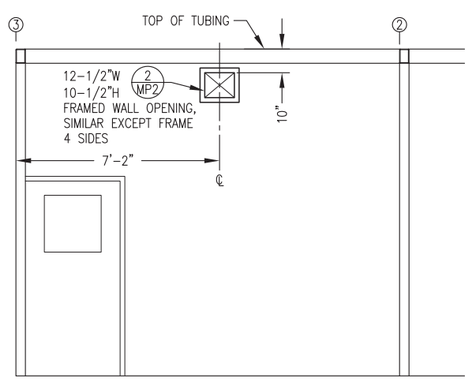
2 MP1 MODULE A BACK WALL MECHANICAL PENETRATION LAYOUT – INTERIOR ELEVATION AT GRIDLINE C

3/8"=1'-0"



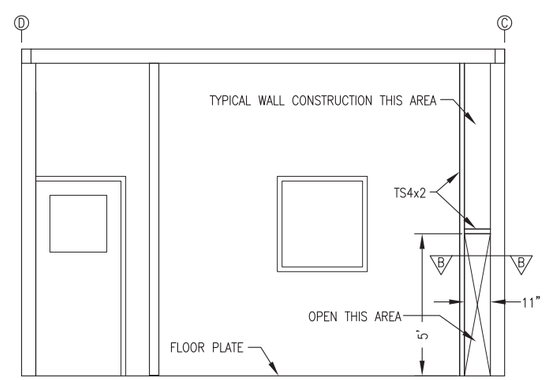
3 MP1 MODULE B BACK WALL MECHANICAL PENETRATION LAYOUT – INTERIOR ELEVATION AT GRIDLINE C

3/8"=1'-0"



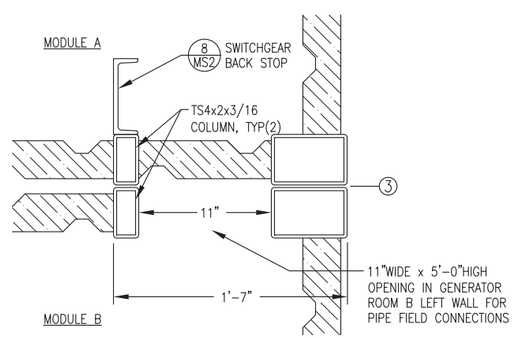
4 MP1 EXHAUST DUCT WALL OPENING DETAIL

3/8"=1'-0"



5 MP1 MODULE B PIPING OPENING DETAIL

3/8"=1'-0"



SECTION B-B (NO SCALE)

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 9/22/15
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

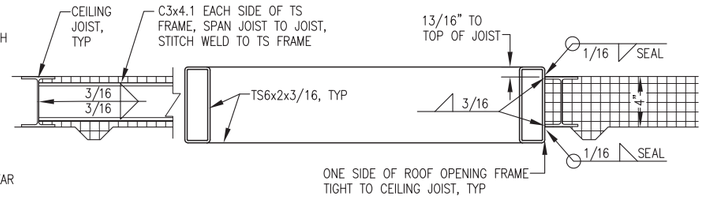
DRAWING TITLE:
MECHANICAL PENTRATIONS PLANS & DETAILS

MP1

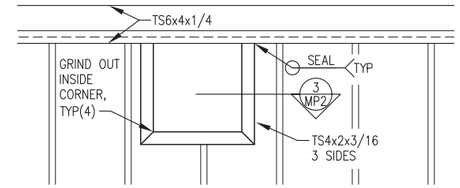
SHEET 1 OF 2

NOTES:

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



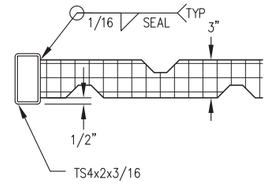
1 MP2 TYPICAL ROOF OPENING DETAIL
2"=1'-0"



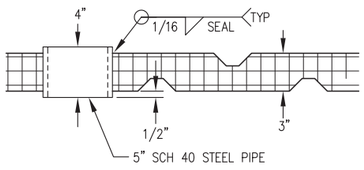
2 MP2 TYPICAL WALL OPENING – ELEVATION
1"=1'-0"

NOTES:

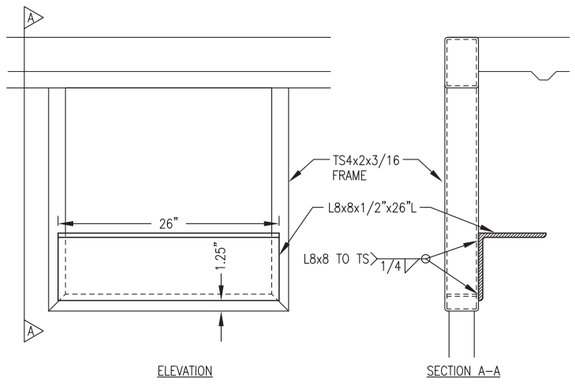
1) FABRICATE FRAMED OPENING WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON ELEVATIONS.
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.



3 MP2 TYPICAL SECTION THROUGH WALL OPENING
2"=1'-0"



4 MP2 TYPICAL PIPE SLEEVE PENETRATION
2"=1'-0"



5 MP2 EXHAUST SUPPORT AT FRAMED OPENING
NO SCALE

THIS SHEET SHOWS MODULE REQUIREMENTS WHICH IS N.I.C. AND IS PROVIDED FOR REFERENCE ONLY.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 9/22/15
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
MECHANICAL PENTRATIONS DETAILS

MP2

SHEET 2 OF 2

LEGEND

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

ABBREVIATIONS

ø	DIAMETER (PHASE)
A	AMPS
AFF	ABOVE FINISHED FLOOR
DFR	DIESEL FUEL RETURN
BTU	BRITISH THERMAL UNIT
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

COOLING/HEAT RECOVERY EQUIPMENT SCHEDULE:

CAC–1 CAC–2 CAC–3	CHARGE AIR COOLERS	SINGLE PASS, VERTICAL ALUMINUM CORE, 4" FLANGED TOP CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 1340 SCFM CHARGE AIR AT 395F IN AND 110F OUT AT 75F AMBIENT, 34" H2O MAX CHARGE AIR PRESSURE DROP. 5 HP, 460 V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO.	DIESEL RADIATOR PART NO. DR3376A
R–A R–B	GLYCOL RADIATOR	SINGLE PASS, 4 ROW, VERTICAL CORE, 4" FLANGED CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 22000 BTU/MIN AT 75'F AMBIENT, 240 GPM 50% ETHYLENE GLYCOL AT 195F IN, 2.5 PSI MAX GLYCOL PRESSURE DROP. 7–1/2 HP, 460 V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO.	DIESEL RADIATOR PART NO. DR3559
TV–A TV–B	THERMOSTATIC VALVES	4" ANSI 125# CAST FACED FLANGES, CAST IRON BODY, FACTORY SET NON–ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS – 185F NOMINAL TEMPERATURE	TPE PART NO. A4010–185
HX–A HX–B	POWER PLANT HEAT EXCHANGERS	316 SS PLATES, BRAZED CONST., 2.5" NPT & SWEAT PORTS, 500 MBH MIN CAPACITY. PRIMARY: 65 GPM 195F EWT (50% ETHYLENE) 1.3 PSI MAX WPD, SECONDARY: 55 GPM 185F LWT (50% PROPYLENE) 1.0 PSI MAX WPD	AMERIDEX SL–140–90
ET–A ET–B	COOLANT EXP. TANK	24 GALLON CAPACITY STEEL TANK FABRICATED IN ACCORDANCE WITH AEA STANDARD POWER PLANT TANK FABRICATION DETAILS.	
ET–1	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 77 GALLON TANK VOL, 34 GAL ACCEPTANCE VOL, 125 PSIG WORKING PRESSURE, 12 PSIG PRE–CHARGE.	AMTROL AX–144V
P–HRA P–HRB	HEAT RECOV. ENGINE CIRC.	65 GPM AT 8' TDH, 1/3HP, 115V, 1ø. PROVIDEC WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50–40/4, SPEED 3
P–HR1	HEAT RECOV. INTERIOR	55 GPM AT 9' TDH, 1/3HP, 115V, 1ø. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50–40/4, SPEED 3
P–HR2	HEAT RECOV. EXTERIOR	55 GPM AT 24' TDH (SPEED 3), 3/4HP, 208V, 3ø. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50–80/2
UH–A	GEN BAY A HEAT	HORIZONTAL DISCHARGE HOT WATER UNIT HEATER, 30.9 MBH AT 4 GPM 200F EWT AND 60F EAT, 1/12HP, 120V, 1ø.	MODINE HC–47
UH–B	GEN BAY B HEAT	HORIZONTAL DISCHARGE HOT WATER UNIT HEATER, 45.6 MBH AT 5 GPM 200F EWT AND 60F EAT, 1/12HP, 120V, 1ø.	MODINE HC–63
UH–E	ENTRY HEAT	HORIZONTAL DISCHARGE HOT WATER UNIT HEATER, 21.7 MBH AT 3 GPM 200F EWT AND 60F EAT, 1/25HP, 120V, 1ø.	MODINE HC–33
P–UHA P–UHB P–UHE	UNIT HEATER CIRCULATING PUMPS	4 GPM AT 15' TDH, 1/25HP, 115V, 1ø. PROVIDE WITH 3/4" SOLDER COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 15–58F, SPEED 3

NOTE: EQUIPMENT SUBSTITUTIONS ALLOWED ON ENGINEER'S APPROVAL OF EQUIVALENCE.

FUEL/OIL EQUIPMENT SCHEDULE:

P–DF1	DAY TANK FILL PUMP	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, DUCTILE IRON CONSTRUCTION WITH STAINLESS STEEL SHAFT, BUNA–N LIP SEAL, CARBON BEARINGS, DIRECT FLEX COUPLED TO 1725 RPM ODP THERMALLY PROTECTED, AUTO RESET MOTOR, 1/3 HP, 115 V, 1 PH, 60 HZ, 4.0 GPM @ 20 PSID.	OBERDORFER C992M3E5QF50
P–DF2 P–U01	DIESEL CIRC, & USED OIL DRAIN PUMPS	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, BRONZE CONSTRUCTION WITH STAINLESS STEEL 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
P–U02	USED OIL INJECTION PUMP	ROTARY GEAR PUMP GEAR PUMP – 1.2 GPH @ 15 PSID, 1/8" FPT INLET AND OUTLET, PEEK GEARS, PTFE SEALS, MAGNETICALLY COUPLED TO 1725 RPM TEFC THERMALLY PROTECTED AUTO RESET MOTOR, 1/4 HP, 115 V, 1 PH, 60 HZ. FURNISH WITH BASE MOUNT S56C FRAME INDUSTRIAL MOTOR, LEESON OR EQUAL.	MICROPUMP GA–V21.J8FS.A PUMP WITH #81518 ADAPTER
HAND PUMP	GLYCOL & DIESEL	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA–N SEALS, ANTI–SIPHONING VALVE.	GPI MODEL HP–100
FC	FUEL COOLER	FINTUBE RADIATION FUEL COOLER, 1–1/4" SCH 40 STEEL PIPE, 4–1/4" ELECTRO–GALV STEEL FINS, 12' LONG.	SLANT FIN S–540–12'

NOTE: EQUIPMENT SUBSTITUTIONS ALLOWED ON ENGINEER'S APPROVAL OF EQUIVALENCE.

PIPE/TUBING STRUT CLAMP SCHEDULE

PIPE/TUBE	CLAMP #	PIPE/TUBE	CLAMP #
1/2" COPPER	BVT062	1/2" STEEL	B2008
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

NOTES:

1) ALL CLAMP NUMBERS ARE B–LINE. EQUIV EQUALS ACCEPTABLE.
2) ALL COPPER TUBE CLAMPS TO BE CUSHIONED, VIBRA–CLAMP OR EQUAL.
3) ALL STEEL PIPE CLAMPS NOT CUSHIONED.

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. NOTE: PROVIDE TAGS NOTED AS DECALS WITHOUT ALUMINUM BACKING PLATE.

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 "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF BLENDER"
24 "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"

BROWN (USED OIL)

41 "NORMALLY CLOSED, OPEN ONLY FOR ENGINE OIL CHANGE"
42 "BLENDER FILTER #1, 10 MICRON HYDROSORB" (DECAL)
43 "BLENDER FILTER #2, 2 MICRON PARTICULATE" (DECAL)

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"
54 "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
55 "NORMALLY OPEN, HEAT RECOVERY RETURN"

ORANGE (HEAT RECOVERY/PROPYLENE GLYCOL)

61 "NORMALLY CLOSED, OPEN ONLY FOR ADDING FLUID – PROPYLENE GLYCOL ONLY"
62 "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
63 "NORMALLY OPEN, HEAT RECOVERY RETURN"

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.

NOTE: FOR ALL VALVES NOT INDICATED WITH A SPECIFIC FUNCTION TAG PROVIDE 1–1/2"ø BRASS TAG LABELED "N.O." FOR NORMALLY OPEN VALVES AND 1"ø BRASS TAG LABELED "N.C." FOR NORMALLY CLOSED VALVES. SECURE TAGS TO VALVE OR ADJACENT PIPE WITH BEADED BRASS CHAIN.

SCHEDULE OF DRAWINGS:

EQUIPMENT ON SCHEDULES THIS SHEET ARE FURNISHED AS PART OF THE MODULE SHOP FABRICATION WORK THAT IS N.I.C. MOST ITEMS ARE ALSO SHOP INSTALLED. EQUIPMENT REQUIRING FINAL FIELD INSTALLATION ARE SHOWN CLOUDED.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION
1	3/6/17	EQUIP OR EQUAL

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

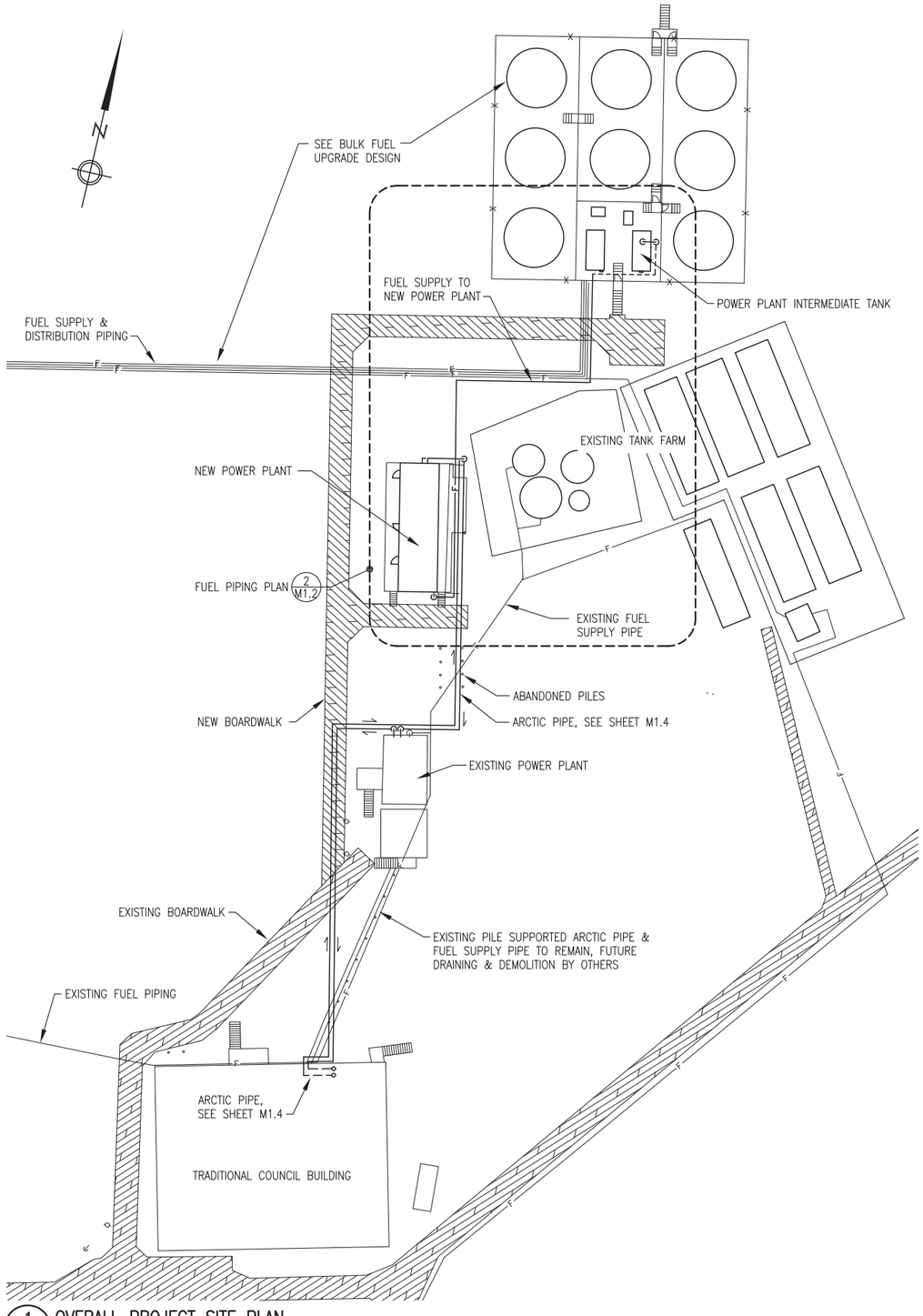
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

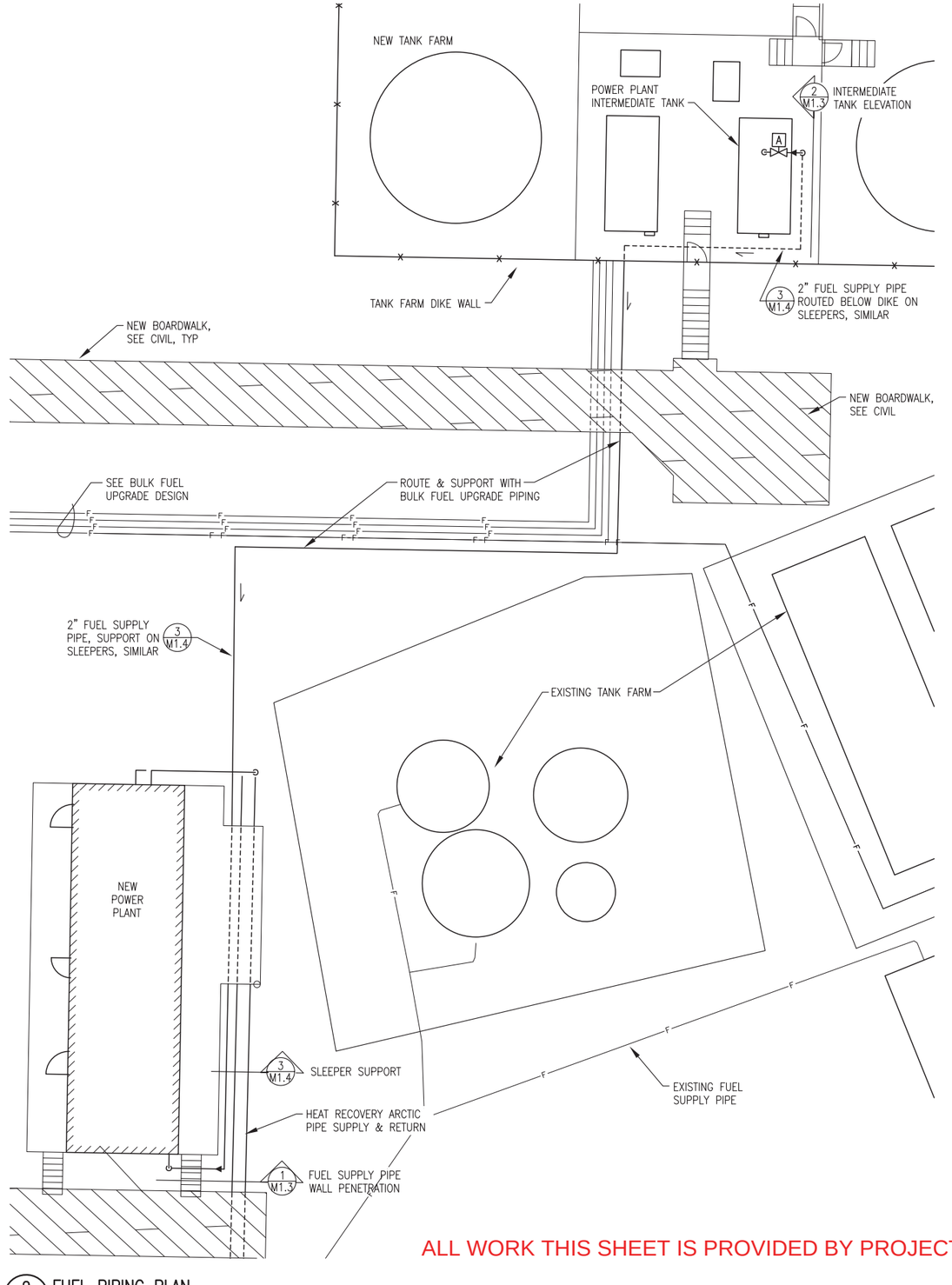
DRAWING TITLE:
LEGEND & SCHEDULES

M1.1

SHEET 1 OF 23



1/M1.2 OVERALL PROJECT SITE PLAN
1"=30'



2/M1.2 FUEL PIPING PLAN
1"=10'

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION
1	3/6/17	MINOR EDITS

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

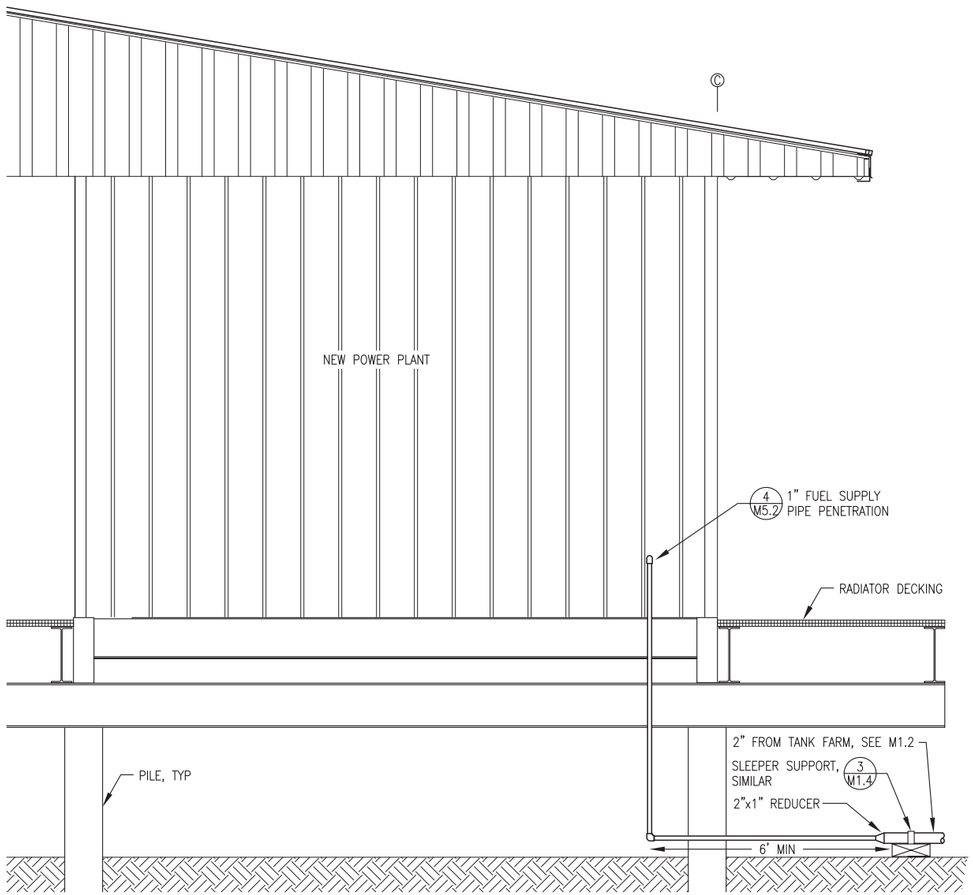
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

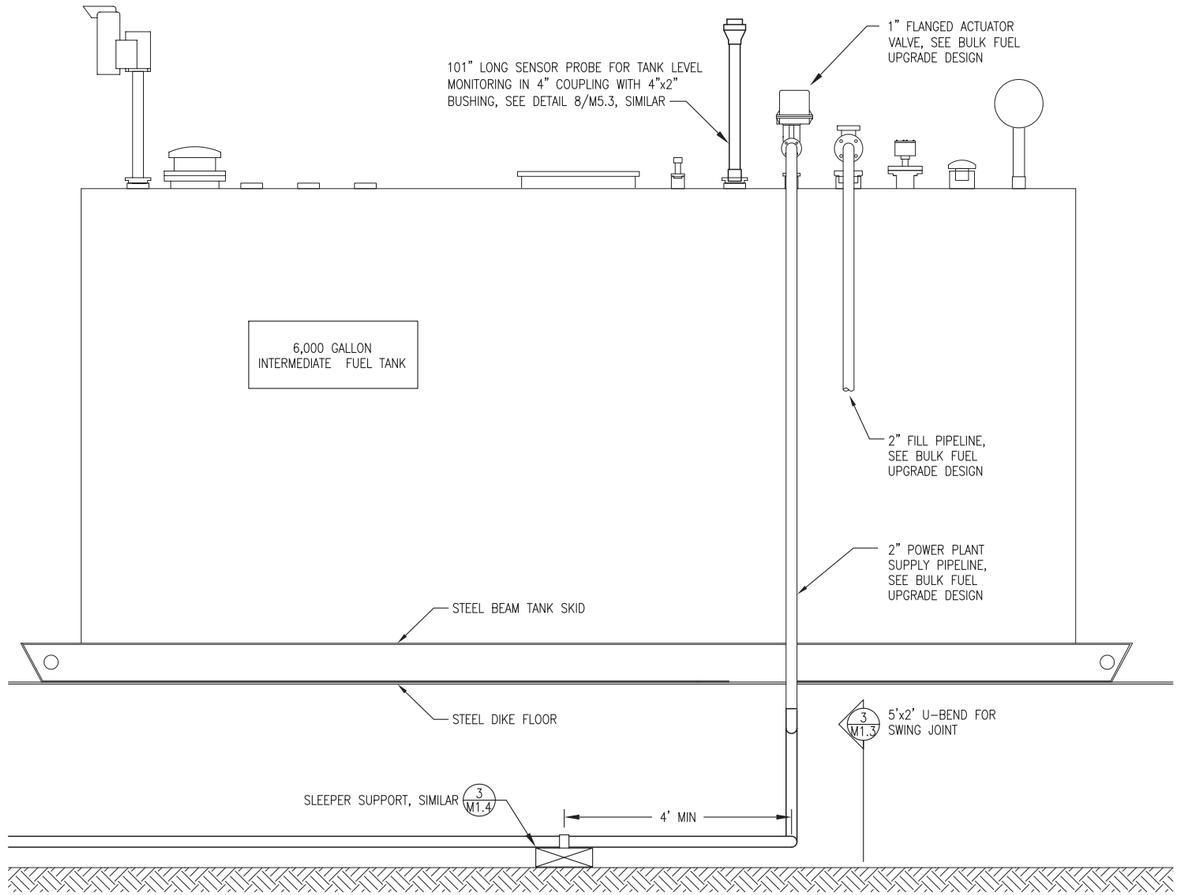
DRAWING TITLE:
OVERALL PROJECT SITE PLAN & FUEL PIPING PLAN

M1.2

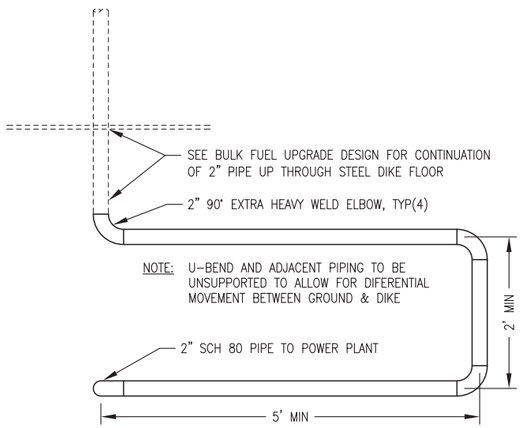
SHEET 2 OF 23



1 M1.3 POWER PLANT FUEL SUPPLY PIPE ENTRANCE
1/2"=1'-0"



2 M1.3 INTERMEDIATE TANK ELEVATION
3/4"=1'-0"



3 M1.3 FUEL PIPELINE SWING JOINT U-BEND AT INTERMEDIATE TANK
NO SCALE

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

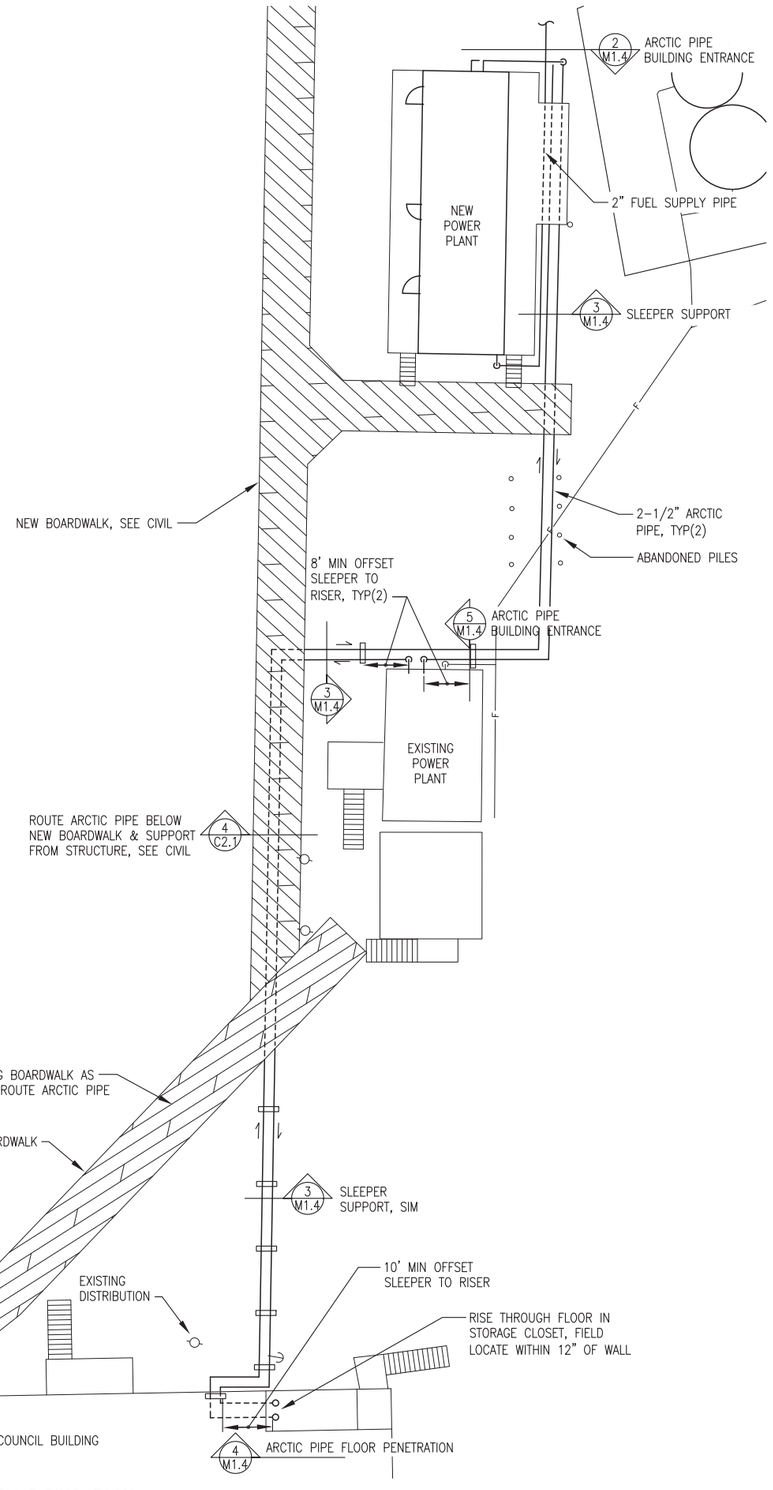
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

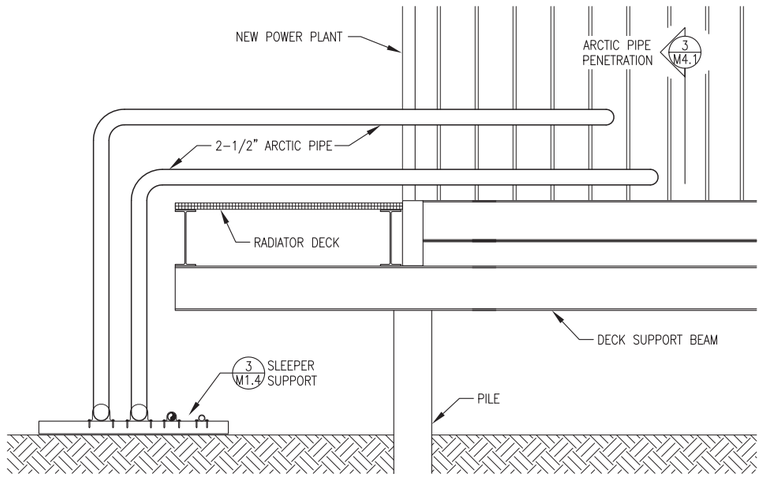
DRAWING TITLE:
FUEL PIPING DETAILS

M1.3

SHEET 3 OF 23

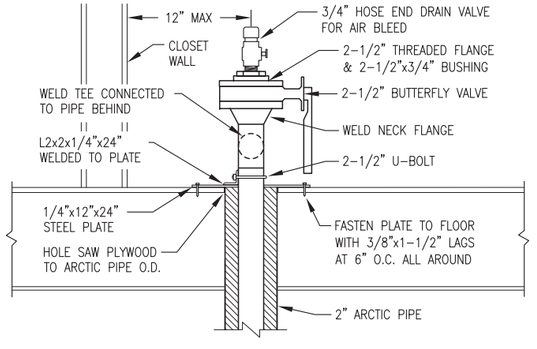


1 M1.4 HEAT RECOVERY PIPING PLAN
1"=15'



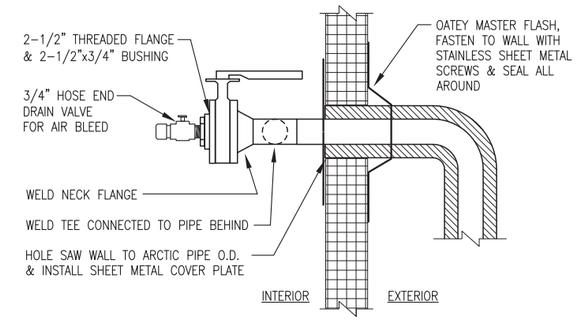
2 M1.4 NEW POWER PLANT ARCTIC PIPE BUILDING ENTRANCE
1/2"=1'-0"

NOTES:
1) ONE PIPE ENTRANCE SHOWN. PROVIDE TWO IDENTICAL PIPES THROUGH COMMON FLOOR PENETRATION PLATE.
2) LOCATE ARCTIC PIPE PENETRATIONS WITHIN 12" OF WALL.
3) CROSSOVER TEE CONNECTION PROVIDED TO ENSURE CONTINUOUS CIRCULATION THROUGH ARCTIC PIPE MAINS.

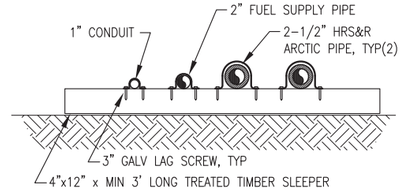


4 M1.4 TRADITIONAL COUNCIL BUILDING ARCTIC PIPE ENTRANCE
NO SCALE

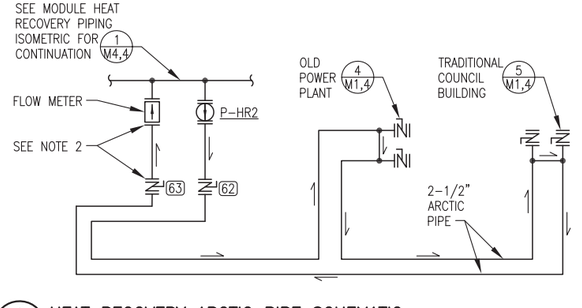
NOTES:
1) ONE PIPE ENTRANCE SHOWN. PROVIDE TWO IDENTICAL.
2) LOCATE ARCTIC PIPE PENETRATIONS MINIMUM 18" ABOVE FLOOR.
3) CROSSOVER TEE CONNECTION PROVIDED TO ENSURE CONTINUOUS CIRCULATION THROUGH ARCTIC PIPE MAINS.



5 M1.4 EXISTING POWER PLANT ARCTIC PIPE BUILDING ENTRANCE
NO SCALE



3 M1.4 TYPICAL PIPE SLEEPER SUPPORT
NO SCALE



6 M1.4 HEAT RECOVERY ARCTIC PIPE SCHEMATIC
NO SCALE

NOTES:

1) ARCTIC PIPE MAINS ARRANGED TO SERVE AS A "PRIMARY LOOP" WITH CONTINUOUS CIRCULATION. ALL FUTURE HEATING SYSTEMS IN OLD POWER PLANT AND TRADITIONAL COUNCIL TO BE SET UP AS PUMPED "SECONDARY LOOPS".

2) UPON COMPLETION OF PRESSURE TESTING INSTALL TEMPORARY "WITCH HAT" STRAINER AT ENTRANCE TO FLOW METER. CHARGE ARCTIC PIPE WITH GLYCOL AND PURGE ALL AIR, SEE SPECIFICATIONS. CIRCULATE GLYCOL FOR 48 HOURS MINIMUM. REMOVE WITCH HAT STRAINER AND ADJACENT RISER PIPE AND CLEAN OUT ALL DEBRIS. FLOOD PIPE AND PURGE ALL AIR.

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION
1	3/6/17	MINOR EDITS

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE:	12/20/16
DRAWN BY:	WJP
CHECKED BY:	BCG
JOB NUMBER:	

DRAWING TITLE:
HEAT RECOVERY PIPING PLAN & DETAILS

M1.4

SHEET 4 OF 23

** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE INTERNATIONAL FIRE CODE AND THE INTERNATIONAL BUILDING CODE INCLUDING STATE OF ALASKA AMENDMENTS. COMPLY WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. WHERE ADDITIONAL OR REPLACEMENT ITEMS ARE REQUIRED, PROVIDE LIKE ITEMS BY THE SAME MANUFACTURER TO THE MAXIMUM EXTENT PRACTICAL. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PROTECT ALL MATERIALS AND EQUIPMENT DURING THE ENTIRE DURATION OF CONSTRUCTION WORK AGAINST CONTAMINATION OR DAMAGE. REPLACE OR REPAIR TO ORIGINAL MANUFACTURED CONDITION ANY ITEMS DAMAGED DURING CONSTRUCTION. IMMEDIATELY REPORT TO THE ENGINEER ANY ITEMS FOUND DAMAGED PRIOR TO COMMENCING CONSTRUCTION.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT, DRILL, OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES. WHERE PREVIOUSLY COMPLETED BUILDING SURFACES OR OTHER FEATURES MUST BE CUT, PENETRATED, OR OTHERWISE ALTERED, SUCH WORK SHALL BE CAREFULLY LAID OUT AND PATCHED TO ORIGINAL CONDITION. SEAL ALL EXTERIOR FLOOR AND WALL PENETRATIONS AS INDICATED.

CONTACT THE ENGINEER ONE-WEEK PRIOR TO COMPLETION OF ALL WORK TO SCHEDULE A SUBSTANTIAL COMPLETION INSPECTION. THE ENGINEER WILL GENERATE A PUNCH LIST OF CORRECTIVE ACTION ITEMS DURING THE INSPECTION. WORK WILL NOT BE CONSIDERED COMPLETE UNTIL ALL CORRECTIVE ACTION ITEMS IN THE ENGINEERS PUNCH LIST HAVE BEEN SATISFACTORILY COMPLETED AND PHOTOGRAPHIC OR OTHER POSITIVE DOCUMENTATION HAS BEEN PROVIDED TO THE ENGINEER.

PROVIDE ONE SET OF DRAWINGS CLEARLY MARKED UP WITH ALL AS-BUILT INFORMATION TO THE ENGINEER WITHIN TWO WEEKS OF COMPLETION.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

** SUPPORTS AND FASTENERS **

SUPPORT PIPING AND EQUIPMENT AS SHOWN ON PLANS USING SPECIFIED SUPPORTS AND FASTENERS. IF NOT DETAILED ON PLANS, SUPPORT FROM STRUCTURAL MEMBERS WITH PIPE HANGERS, CLAMPS, OR PIPE STRAPS SPECIFICALLY INTENDED FOR THE APPLICATION. DO NOT SUPPORT PIPING FROM CONNECTIONS TO EQUIPMENT. INDEPENDENTLY SUPPORT PUMPS AND EQUIPMENT.

STRUCTURAL STEEL – MISCELLANEOUS SHAPES AND PLATE ASTM A-36. RECTANGULAR TUBING ASTM A-500 GRADE B. STRUCTURAL PIPE ASTM A-53 OR ASTM A-106B. PAINT AS INDICATED.

STRUT – COLD FORMED MILD STEEL CHANNEL STRUT, PRE-GALVANIZED FINISH AND SLOTTED BACK UNLESS SPECIFICALLY INDICATED OTHERWISE. STANDARD STRUT – 12 GA, 1-5/8" x 1-5/8", B-LINE B22-SH-GALV OR EQUAL. DOUBLE STRUT – 12 GA, 1-5/8" x 3-1/4", B-LINE B22A-SH-GALV OR EQUAL. SHALLOW STRUT – 14 GA, 1-5/8" x 13/16", B-LINE B54-SH-GALV OR EQUAL. ALL EXTERIOR STRUT HOT DIP GALVANIZED.

FITTINGS AND ACCESSORIES – PROVIDE FITTINGS, BRACKETS, CHANNEL NUTS, AND ACCESSORIES DESIGNED SPECIFICALLY FOR USE WITH SPECIFIED CHANNEL STRUT. ZINC-PLATED CARBON STEEL EXCEPT EXTERIOR HOT DIP GALVANIZED.

PIPE CLAMPS – TWO-PIECE PIPE CLAMP DESIGNED TO SUPPORT PIPE TIGHT TO STRUT. B-LINE B20## OR EQUAL. ZINC-PLATED CARBON STEEL. INSTALL RUBBER ISOLATION STRIP, B-LINE VIBRA CUSHION OR EQUAL, ON COPPER TUBING AND WHERE INDICATED.

PIPE STRAPS – GALVANIZED STEEL TWO-HOLE PIPE STRAP. B-LINE B2400.

FASTENERS – ALL BOLTS, NUTS, AND WASHERS ZINC-PLATED EXCEPT EXTERIOR HOT DIP GALVANIZED.

** PAINTING AND MARKING **

PAINT ALL INTERIOR CARBON STEEL PIPE WITH DIRECT TO METAL ALKYD ENAMEL. WIRE BRUSH AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SHERWIN WILLIAMS DTM OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031. SEE CIVIL FOR EXTERIOR PIPE COATING.

PAINT ALL STEEL FABRICATIONS. SANDBLAST OR WIRE BRUSH TO BARE METAL AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SELF PRIMING EPOXY, SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.

TOUCH UP – FINISH ALL CUT ENDS AND DAMAGED SURFACES OF GALVANIZED AND ZINC PLATED SUPPORTS AND FASTENERS WITH SPRAY ON COLD GALVANIZING COMPOUND, ZRC OR EQUAL. TOUCH UP PAINT ON FABRICATED ITEMS TO MATCH ORIGINAL.

ON COOLANT, HEAT RECOVERY, USED OIL, AND DIESEL FUEL PIPING INSTALL FLOW ARROWS WITH SAME COLOR SCHEME AS VALVE TAGS (SEE VALVE TAG SCHEDULE ON SHEET M1.1). SELF ADHESIVE SETON ARROWS ON A ROLL OR EQUAL. ON INSULATED PIPING INSTALL FLOW ARROWS OVER JACKET.

** INSULATION **

GLYCOL PIPING INSULATION – INSULATE COOLANT AND HEAT RECOVERY PIPING MAINS WHERE INDICATED. INSTALL 1" PRE-FORMED RIGID FIBERGLASS PIPE INSULATION, JOHNS-MANVILLE MICRO-LOK OR EQUAL. COVER WITH ALUMINUN JACKET.

EXHAUST INSULATION – INSULATE EXHAUST PIPES WHERE INDICATED. INSTALL 1-1/2" PRE-FORMED RIGID MINERAL WOOL PIPE INSULATION, ROXUL TECHTON 1200 OR EQUAL. COVER WITH ALUMINUM JACKET.

JACKET – EXTERIOR GRADE EMBOSSED FINISH 0.016" THICK ALUMINUM JACKETING WITH PRE-FORMED ALUMINUM FITTING COVERS, PABCO OR EQUAL.

CHARGE AIR TUBING – INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO WALL PENETRATION. WRAP WITH ASBESTOS FREE SILICA BASED YARN TAPE, LEWCO FT60 OR EQUAL, 3"WIDE. SPIRAL WRAP WITH 50% OVERLAP AND SECURE ENDS WITH HOSE CLAMPS.

** DIESEL FUEL AND LUBE OIL PIPING AND VALVES **

OIL PIPING (DFR, DFS, UOR) – ASTM A106B SEAMLESS BLACK STEEL PIPE, SCHEDULE 80 EXCEPT WHERE INDICATED AS SCHEDULE 40. BUTT WELD JOINTS FOR ALL PIPE 2" DIAMETER AND LARGER. SOCKET WELD OR THREADED JOINTS FOR ALL PIPING SMALLER THAN 2" DIAMETER WITH MINIMUM 3000# FORGED STEEL FITTINGS. PERFORM PIPE WELDING WITH EXPERIENCED WELDER WITH CURRENT API OR EQUIVALENT CERTIFICATION FOR PIPE WELDING IN ALL POSITIONS.

PROVIDE SPIRAL WOUND METALLIC GASKETS AND COAT WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING FLANGED JOINTS. REAM THREADED PIPE ENDS AND THOROUGHLY COAT MALE PIPE ENDS WITH HERCULES GRIPP PIPE JOINT COMPOUND PRIOR TO ASSEMBLING. TEST ALL FUEL OIL PIPING JOINTS WITH MINIMUM 50 PSIG AIR, WITH EACH JOINT SOAKED WITH A FOAMING SOAPY WATER SOLUTION, AND VISUALLY INSPECT EACH JOINT FOR LEAKS. ISOLATE ENGINES PRIOR TO PRESSURE TESTING.

SMALL HOSES – FUEL RATED HOSE, EATON WEATHERHEAD H569 OR EQUAL. SIZE AS INDICATED ON DRAWINGS. PROVIDE RE-USABLE PLATED STEEL JIC SWIVEL ENDS, STRAIGHT OR 90° AS REQUIRED, WITH NPT ADAPTERS.

FLANGED BALL VALVES – REDUCED PORT CARBON STEEL UNI-BODY, ANSI 150# RF FLANGED ENDS, STAINLESS STEEL BALL AND TRIM, LOCKABLE HANDLE, 150 PSIG MINIMUM WORKING PRESSURE. PBV, APOLLO OR APPROVED EQUAL.

THREADED BALL VALVES – CARBON STEEL BODY, THREADED ENDS, STAINLESS STEEL BALL AND TRIM. PBV, APOLLO OR APPROVED EQUAL.

THREADED SWING CHECK VALVES – BRONZE BODY, THREADED ENDS, SWING CHECK STYLE, 150 PSIG MINIMUM WORKING PRESSURE. MILWAUKEE 510-S, HAMMOND OR APPROVED EQUAL, DOMESTIC ONLY.

DAY TANK PRESSURE RELIEF VALVES – BRONZE BODY, HARD SEAT, 3/8" MPT INLET x FPT OUTLET, PRESSURE SETTING AS INDICATED, KINGSTON 103SS OR EQUAL.

USED OIL PRESSURE RELIEF VALVES – BRONZE BODY, HARD SEAT, 1/4" MPT INLET x FPT OUTLET, PRESSURE SETTING AS INDICATED, KINGSTON 103SS OR EQUAL.

FUSIBLE LINK VALVES – BRASS BODY, FPT ENDS, 165F FUSIBLE HEAD. FIROMATIC 300F (1/2"), FIROMATIC 400F (1"), OR EQUAL.

SOLENOID VALVES– 1/2" THREADED END BRASS BODY, 1/2" NPT CONDUIT CONNECTION, 120VAC, SS CORE, MOLDED EPOXY COIL ENCLOSURE, INTERNAL PILOT OPERATED, 150 PSI DIFFERENTIAL OPENING PRESSURE, LIQUID TIGHT AND FULL MODULATION AT 0 PSI DIFFERENTIAL. NORMALLY CLOSED – ASCO CAT. NO. 8210G94 OR APPROVED EQUAL. NORMALLY OPEN – ASCO CAT. NO. 8210G34 OR APPROVED EQUAL.

ELECTRIC ACTUATOR VALVES – LOW TEMPERATURE ACTUATED BALL VALVE ASSEMBLY RATED TO -50 DEG F. TYPE 304 STAINLESS STEEL FABRICATED COUPLING BRACKET, SHAFT, AND FASTENERS CONFIGURED TO ALLOW WRENCH ACCESS FOR MANUAL OPERATION OF VALVE WITHOUT REMOVING ACTUATOR. 1" LOW TEMP BALL VALVE, 150# RF FLANGED ENDS, 360 IN-LB OPERATING TORQUE AT -50 DEG F. NUTRON MODEL T3-R10R01LZ-06 OR APPROVED EQUAL. 120VAC NEMA 7 ACTUATOR CONFIGURED WITHOUT MANUAL OVERRIDE SHAFT EXTENSION, 600 IN-LBS TORQUE, 10 SECOND STROKE TIME, 0.50 LOCKED ROTOR AMPS. RCS MODEL SXR-1023 ELECTRIC ACTUATOR OR APPROVED EQUAL. FURNISH WITH PTC SELF REGULATING HEATER, AUXILIARY SWITCH SET (AUXILIARY SWITCHES 3 & 4) AND EXXON BEACON 325 SEVERE COLD LUBRICANT.

** DIESEL FUEL AND LUBE OIL EQUIPMENT AND SPECIALTIES **

DAY TANK – RECTANGULAR HEAVY GAUGE WELDED STEEL TANK MANUFACTURED IN ACCORDANCE WITH UL STANDARD 142 AND AEA STANDARD POWER PLANT TANK FABRICATION DETAILS, NOMINAL 250 GALLON CAPACITY. FURNISH COMPLETE WITH ALL CONTROLS AND ACCESSORIES AS INDICATED.

USED OIL/DIESEL FUEL BLENDING SYSTEM – FIELD ASSEMBLED SYSTEM FOR BLENDING USED LUBRICATING OIL WITH DIESEL FUEL, CAPABLE OF AUTOMATIC OPERATION, 0.5% USED OIL INJECTION RATE, 30 PSIG OPERATING PRESSURE, TESTED TO 50 PSIG. PROVIDE COMPLETE WITH: 1) USED OIL HOPPER, SIZE AS INDICATED; 2) PUMPS AS INDICATED IN SCHEDULE; 3) TWO STAGE FILTER BANK WITH CIM-TEK VIKING I ELEMENTS, 10 MICRON HYDROSORB ELEMENTS CIM-TEK E-1300HS-10 FIRST STAGE, 2 MICRON PARTICULATE ELEMENT CIM-TEK E-1300-2 FINAL STAGE; 4) 0-15 PSID DIFFERENTIAL PRESSURE GAUGES WITH ADJUSTABLE SPDT SWITCH FOR EACH FILTER, ORANGE RESEARCH 1516DGS-1E-2.5B-C-0-15PSID OR APPROVED EQUAL; 5) NEMA 1 RATED CONTROL PANEL WITH ALARM AND SHUTDOWN FUNCTIONS; 6) ALL ASSOCIATED PIPING, VALVES, AND HOSES AS INDICATED. FABRICATE HOPPER AND FILTER BANK IN ACCORDANCE AEA STANDARD POWER PLANT TANK FABRICATION DETAILS.

THREADED "Y" STRAINERS – "Y" TYPE BRONZE BODY, SCREWED ENDS, GASKETED CAP, 20 MESH STAINLESS STEEL SCREEN, 200 PSIG WORKING PRESSURE, MUELLER #351M OR EQUAL.

DAY TANK FILTERS – IMPACT RESISTANT "SEE-THRU" BOWL, 150 PSIG WORKING PRESSURE, GOLDEN ROD MODEL NO. 495 OR APPROVED EQUAL. FURNISH WITH CUSTOM FABRICATED STEEL TOP WITH ANSI 150# FLANGED CONNECTIONS AND MATCHING THREADS FOR BOWL. PROVIDE WITH STANDARD 10 MICRON FILTER ELEMENT NO. 470-5 AND FUEL FILTER WRENCH NO. 491.

DAY TANK METER – 1" ANSI 300# FLANGED INLET AND OUTLET. CONTOIL 9226-F OR APPROVED EQUAL. FURNISH COMPLETE WITH REED SWITCH PULSER.

DAY TANK GAUGE – MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL FUEL, DIE-CAST ZINC HEAD, 1-1/2" MPT CONNECTION, ZINC-PLATED STEEL GUIDE ROD, BRASS CENTER SHAFT, EPOXY COATED CORK FLOAT, HERMETICALLY SEALED SIDE-VIEW DIAL, 25 PSIG MAXIMUM OPERATING PRESSURE, GUIDE ROD (OPERATING) LENGTH AS INDICATED ON DRAWINGS. ROCHESTER MODEL 8660 WITH SIDE-VIEW DIAL #5025S00570 OR APPROVED EQUAL.

VENT CAPS – ALUMINUM BODY, STAINLESS STEEL SCREEN, FPT CONNECTION, SIZE AS INDICATED. MORRISON FIGURE 155 OR EQUAL.

** GLYCOL PIPING, VALVES, AND SPECIALTIES **

GLYCOL PIPING (ECS, ECR, HRS, HRR) – STEEL OR COPPER PIPE AND FITTINGS AS INDICATED BELOW. PROVIDE FLEXIBLE HOSE FOR CONNECTION TO ALL ENGINES. HYDROSTATICALLY TEST ALL PIPING AT 100 PSIG MINIMUM FOR ONE HOUR WITH NO NOTICEABLE WATER LEAKS OR PRESSURE DROP EXCEPT AS CAUSED BY TEMPERATURE CHANGE. ISOLATE ENGINES AND RADIATORS PRIOR TO PRESSURE TESTING. FLUSH PIPING WITH FRESH WATER PRIOR TO PLACING IN SERVICE.

ALL PIPING LARGER THAN 2-1/2" ASTM A106B SEAMLESS BLACK STEEL PIPE, SCHEDULE 40, WITH BUTT WELD JOINTS. PERFORM PIPE WELDING WITH EXPERIENCED WELDER WITH CURRENT API OR EQUIVALENT CERTIFICATION FOR PIPE WELDING IN ALL POSITIONS.

ALL PIPING 2-1/2" AND SMALLER TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL JOINTS SOLDERED WITH 95/5 TIN/ANTIMONY SOLDER OR SILVER SOLDER EXCEPT ON T-DRILL CONNECTIONS USE COPPER BRAZING ROD. REAM ALL CUT ENDS AND THOROUGHLY CLEAN PIPE ENDS AND FITTINGS PRIOR TO SOLDERING. PROVIDE 150# BRONZE COMPANION FLANGES FOR TRANSITION TO STEEL PIPING OR FLANGED VALVES AND EQUIPMENT.

PROVIDE ANSI 150# FLANGES WHERE INDICATED. INSTALL FULL FACED 1/8" THICK NITRILE RUBBER GASKETS.

ENGINE COOLANT HOSES – SIZE AS INDICATED ON DRAWINGS. WIRE REINFORCED CORRUGATED SILICONE HOSE, PARKER 6621 OR APPROVED EQUAL. INSTALL WITH STAINLESS STEEL T-BOLT CLAMPS.

BUTTERFLY VALVES – LUG STYLE DUCTILE IRON BODY, ANSI 150# FLANGE PATTERN ENDS, STAINLESS STEEL STEM WITH BRONZE BUSHING, BRONZE DISC, EPDM SEATS, LOCKING HANDLE. MILWAUKEE ML233-E OR EQUAL.

BALL VALVES – THREADED OR SOLDER END BRONZE BODY, CHROME PLATED BRONZE OR BRASS BALL, TFE OR VITON PACKING AND SEAT RING, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND, MILWAUKEE OR APPROVED EQUAL. ON 2" AND SMALLER VALVES PROVIDE FULL PORT BALL. ON VALVES LARGER THAN 2" PROVIDE LARGE PORT BALL.

SWING CHECK VALVES – THREADED OR SOLDER END BRONZE BODY, SWING CHECK STYLE, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND, MILWAUKEE OR APPROVED EQUAL.

DRAIN VALVES – BRONZE BODY, 1/2" OR 3/4" SOLDER OR FPT PROCESS CONNECTION BY 3/4" MALE HOSE END WITH CAP AND JACK CHAIN. FNW 427, 428 OR APPROVED EQUAL. INSTALL AT ALL DRAIN AND FILL CONNECTIONS AND WHERE INDICATED.

GAUGE COCK – BRASS BODY, MPT BY FPT ENDS, T-HANDLE. LEGEND VALVE ITEM 101-531 (1/4") OR ITEM 101-532 (3/8"), OR EQUAL. INSTALL ON ALL AIR VENTS, PRESSURE GAUGES, SMALL HOSE CONNECTIONS, AND WHERE INDICATED.

PRESSURE RELIEF VALVES – THREADED END BRONZE BODY, NON-FERROUS INTERNAL COMPONENTS, ASME LABELED, 3/4" NPT CONNECTIONS, 500 MBH MINIMUM CAPACITY, SETPOINT AS INDICATED. WATTS 174A OR EQUAL.

STRAINER – BRONZE BODY, SOLDER ENDS, SIZE AS INDICATED, GASKETED CAP, 20 MESH STAINLESS STEEL SCREEN. MUELLER STEAM #358S OR EQUAL.

GLYCOL FILTER: SCREW-ON CANISTER STYLE FILTER ELEMENT WITH 3/8" NPT CONNECTIONS ON HEAD, WIX #24019 (NAPA 4019) HEAD WITH #24069 (NAPA 4069) ELEMENT OR APPROVED EQUAL.

AUTOMATIC AIR VENTS – BRASS BODY, SELF-CLOSING FLOAT OPERATED VALVE, SCREW ON CAP, 1/4" NPT CONNECTION. MAID-O-MIST AUTO AIR VENT NO. 71 OR EQUAL. PROVIDE WITH BALL VALVE ISOLATION.

LIQUID LEVEL SIGHT GAUGE – BOROSILICATE GLASS TUBE, ALUMINUM BODY, BUNA N SEALS, 1/2" MPT CONNECTIONS, 9" CENTERS. LUBE DEVICES G607-09-A-1-4 OR EQUAL.

EXPANSION TANK CAP – 2-1/2 PSIG PRESSURE, 1-1/2 OZ. VACUUM, 2" NPT CONNECTION. CIM-TEK 60001 OR EQUAL.

** INSTRUMENTATION **

PRESSURE GAUGE – 2-1/2" DIAL SIZE, DRY TYPE, STAINLESS STEEL CASE, TUBE, AND SOCKET, 1/4" NPT BOTTOM CONNECTION. TRERICE NO. 700SS-25 OR APPROVED EQUAL
0-15 PSI 700SS-25-02-L-A-080
0-60 PSI 700SS-25-02-L-A-100

DIFFERENTIAL PRESSURE GAUGES – 2-1/2" DIAMETER DIAL, BRASS BODY, 1/4" FPT IN-LINE CONNECTION, SPDT SWITCH WITH TERMINAL STRIP, ORANGE RESEARCH MODEL NUMBERS AS INDICATED OR APPROVED EQUAL. 0-15 PSID RANGE 1516DGS-1E-2.5B-C-0-15PSID

FLOW METER, 150# ANSI FLANGED CONNECTION, SIZE AS INDICATED, PTFE LINER, HASTELLOY C ELECTRODES, RATED FOR 210F OPERATION. SIEMENS SITRANS FM MAGFLO MAG 3100, OR APPROVED EQUAL. FURNISH WITH TRANSMITTER FOR DIRECT AND REMOTE MOUNTING, 115/230 VAC, 50/60 HZ, AND NEMA 4X BODY. SIEMENS SITRANS F M MAGFLO MAG 5000, CODE NO. FDK:7ME6910, OPTION 1AA10-1AA0, OR APPROVED EQUAL.

THERMOMETER – 3" DIAL SIZE BIMETAL TYPE, STAINLESS STEEL CASE AND STEM, 1% OF FULL SCALE ACCURACY, ADJUSTABLE ANGLE AND SWIVEL HEAD, 2-1/2" STEM LENGTH, 20-240F FAHRENHEIT ONLY RANGE. TRERICE B836-02-05F, OR APPROVED EQUAL. PROVIDE WITH 3/4"NPT BRASS THERMOWELL.

SEE ELECTRICAL EQUIPMENT SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS.

** ARCTIC PIPE **

PRE-INSULATED STEEL ARCTIC PIPE SYSTEM FOR NOT TO EXCEED 250F GLYCOL/WATER SERVICE IN ABOVE GRADE OR DIRECT BURIAL INSTALLATION. PROVIDE WELD ELS, SHELLS/COUPLINGS, INSULATION, SHRINK SLEEVES, AND ALL OTHER COMPONENTS REQUIRED FOR A COMPLETE INSTALLATION. HEAT TRACE AND ALARM WIRES ARE NOT REQUIRED.

PIPE AND FITTINGS – SCHEDULE 40 ASTM A53B ERW STEEL CARRIER PIPE, 40' NOMINAL LENGTHS, DIAMETER AS INDICATED. HDPE JACKET WITH MINIMUM 1" THICK FOAMED IN PLACE POLYURETHANE INSULATION TO COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE CARRIER PIPE AND JACKET TO CREATE A FULLY BONDED SYSTEM THAT WILL EXPAND AND CONTRACT AS A UNIT. PERMA-PIPE XTRU-THERM, ROVANCO, THERMACORE, OR APPROVED EQUAL. PRE-FABRICATED ELBOWS AND TEES TO BE EQUIVALENT CONSTRUCTION TO PIPE WITH ASTM A234 SEAMLESS CARBON STEEL BUTT WELD FITTINGS. ALL FIELD JOINTS TO BE CONFIGURED FOR STRAIGHT BUTT WELDS.

STRAIGHT JOINT KITS TO BE COMPRISED OF RIGID POLYURETHANE INSULATION HALF-SHELLS WITH HDPE CASING AND HEAT SHRINK SLEEVES TO FORM A CONTINUOUS WATER-TIGHT JACKET, CANUSA CSC-X CASING OR APPROVED EQUAL. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

** SEE SHEET M7 FOR VENTILATION EQUIPMENT SPECIFICATIONS **

** MODULE SHOP FABRICATION SYSTEM STARTUP **

PRIOR TO STARTING FUEL AND OIL PUMPS, PRIME CAVITIES WITH LUBE OIL THEN ENERGIZE MOMENTARILY TO VERIFY PROPER ROTATION.

FUEL OIL PIPING – AFTER PRESSURE TESTING PRIME ALL PIPING WITH HAND PRIMING PUMP, FILL FILTERS WITH DIESEL FUEL, AND BLEED OFF AIR PRIOR TO STARTING PUMPS.

VERIFY OPERATION OF ALL FUEL PUMP CONTROLS INCLUDING TIMER, LEVEL ALARMS, AND USED OIL BLENDER.

VERIFY OPERATION OF CHARGE AIR COOLER VARIABLE FREQUENCY DRIVES.

ENGINE COOLANT PIPING – AFTER PRESSURE TESTING AND FLUSHING, FILL SYSTEM WITH A SOLUTION OF EXTENDED LIFE ETHYLENE GLYCOL, SHELL ROTELLA ELC, NO SUBSTITUTES, PREMIXED TO A RATIO OF 50% ETHYLENE GLYCOL TO 50% WATER. AS COOLING SYSTEM COMES UP TO NORMAL OPERATING TEMPERATURE VERIFY OPERATION OF THERMOSTATIC VALVE. SET VARIABLE FREQUENCY DRIVES TO SPECIFIED TEMPERATURES. VERIFY OPERATING SETPOINTS BY READING THERMOMETERS IN PIPING MAINS.

** FIELD SYSTEM STARTUP **

FUEL OIL PIPING – AFTER PRESSURE TESTING PRIME ALL PIPING WITH HAND PRIMING PUMP, FILL FILTERS WITH DIESEL FUEL, AND BLEED OFF AIR PRIOR TO STARTING PUMPS.

HEAT RECOVERY PIPING – AFTER PRESSURE TESTING BLEED AIR RESERVOIR ON EXPANSION TANK AS REQUIRED TO MAINTAIN 10 PSIG RESIDUAL WITH SYSTEM EMPTY. FILL SYSTEM WITH A PRE-MIXED SOLUTION OF HEAVY DUTY (EXTENDED LIFE) 50% PROPYLENE GLYCOL AND 50% WATER, DOWFROST HD, SAFE/T/THERM HD, OR EQUAL. FILL TO 20 PSIG MINIMUM WITH SYSTEM COLD. VENT AIR FROM ALL HIGH POINTS PRIOR TO STARTING CIRCULATING PUMP. CYCLE PUMP ON AND OFF AND VENT HIGH POINTS UNTIL ALL AIR HAS BEEN PURGED FROM PIPING. ADD ADDITIONAL PRE-MIXED GLYCOL SOLUTION AS REQUIRED TO BRING SYSTEM PRESSURE TO 30 PSIG MINIMUM AT EXPANSION TANK AT NORMAL OPERATING TEMPERATURE (180F).

CLEAN ALL SYSTEM STRAINERS AFTER FIRST 48 HOURS OR MORE OF OPERATION. SEE SCHEMATIC 6/M1.4 FOR TEMPORARY STRAINER.

MONITOR SYSTEM OPERATION FOR ONE WEEK MINIMUM BEFORE LEAVING SITE. CHANGE GLYCOL FILTER ELEMENTS AT TIME OF FIRST OIL CHANGE ON EACH ENGINE.

** SEQUENCE OF OPERATION **

DAY TANK WILL HAVE AUTOMATIC FILL CONTROLS WITH REDUNDANT HIGH AND LOW LEVEL ALARMS AND TIMERS. USED OIL/DIESEL FUEL BLENDER WILL RUN ANY TIME DAY TANK FILL PUMP RUNS. SEE FUEL SYSTEM CONTROL PANEL DRAWINGS FOR DETAILED SEQUENCE.

ALL DAMPER MOTORS WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER (FIRE ALARM) IN LESS THAN 30 SECONDS. VENTILATION AIR INTAKE AND EXHAUST MOTORIZED DAMPERS WILL OPEN ANY TIME ASSOCIATED EXHAUST FAN OPERATES. THE COMBUSTION AIR INTAKE MOTORIZED DAMPER(S) WILL OPEN ANY TIME THE ENGINE(S) IN THE ASSOCIATED GENERATION BAY RUN BASED ON A SIGNAL FROM THE SWITCHGEAR.

EXHAUST FANS EF-1, EF-2, AND EF-3 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 GENERATING ROOM TEMPERATURE, 80F, ADJUSTABLE.

UNIT HEATERS AND ASSOCIATED CIRCULATING PUMPS WILL OPERATE ON A CALL FOR HEATING THROUGH A LINE VOLTAGE THERMOSTAT TO MAINTAIN ROOM TEMPERATURE, 65F, ADJUSTABLE.

RADIATOR VARIABLE FREQUENCY DRIVES WILL MODULATE FAN SPEED TO MAINTAIN ENGINE COOLANT RETURN TEMPERATURE OPERATING SETPOINT. FANS WILL OPERATE AT A MINIMUM SPEED OF 10HZ, ADJUSTABLE. FANS WILL SHUT OFF WHEN ENGINE COOLANT RETURN TEMPERATURE IS BELOW THE MINIMUM SETPOINT. NORMAL OPERATING SETPOINT IS 180F AND MINIMUM SETPOINT IS 20F BELOW OPERATING SETPOINT.

CHARGE AIR COOLER FANS WILL OPERATE CONTINUOUSLY ANY TIME ASSOCIATED ENGINE RUNS AND STOP WHEN ENGINE STOPS. VARIABLE FREQUENCY DRIVES WILL OPERATE AT FULL SPEED FOR 30 SECONDS UPON STARTUP AND THEN WILL MODULATE FAN SPEED TO MAINTAIN ENGINE INTAKE MANIFOLD AIR TEMPERATURE OPERATING SETPOINT. MINIMUM FAN SPEED = 10HZ, ADJUSTABLE. SETPOINT = 90F, ADJUSTABLE.

HEAT RECOVERY PUMPS P-HRA, P-HRB, P-HR1, AND P-HR2 WILL OPERATE CONTINUOUSLY UNDER MANUAL CONTROL.

WHEN THE SYSTEM PRESSURE IN THE HEAT RECOVERY PIPING DROPS BELOW 15 PSIG FOR A MINIMUM OF 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF PRESSURE" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

WHEN THE HEAT RECOVERY RETURN TEMPERATURE IS EQUAL TO OR GREATER THAN THE HEAT RECOVERY SUPPLY TEMPERATURE FOR A MINIMUM OF 1 HOUR, AN AMBER LAMP "NO LOAD ON HEAT RECOVERY" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE. WHEN THE HEAT RECOVERY SUPPLY TEMPERATURE IS A MINIMUM OF 1°F GREATER THAN THE HEAT RECOVERY RETURN TEMPERATURE THE LAMP WILL TURN OFF.

WHEN THE FLOW RATE IN THE HEAT RECOVERY PIPING FALLS BELOW 10 GPM FOR A MINIMUM OF 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF FLOW" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

SPECIFICATIONS THIS SHEET APPLY TO BOTH MODULE SHOP FABRICATION WORK AND FIELD INSTALLATION WORK. REFER TO OTHER SHEETS FOR DELINEATION OF FIELD WORK.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION
1	3/6/17	EQUIP OR EQUAL

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

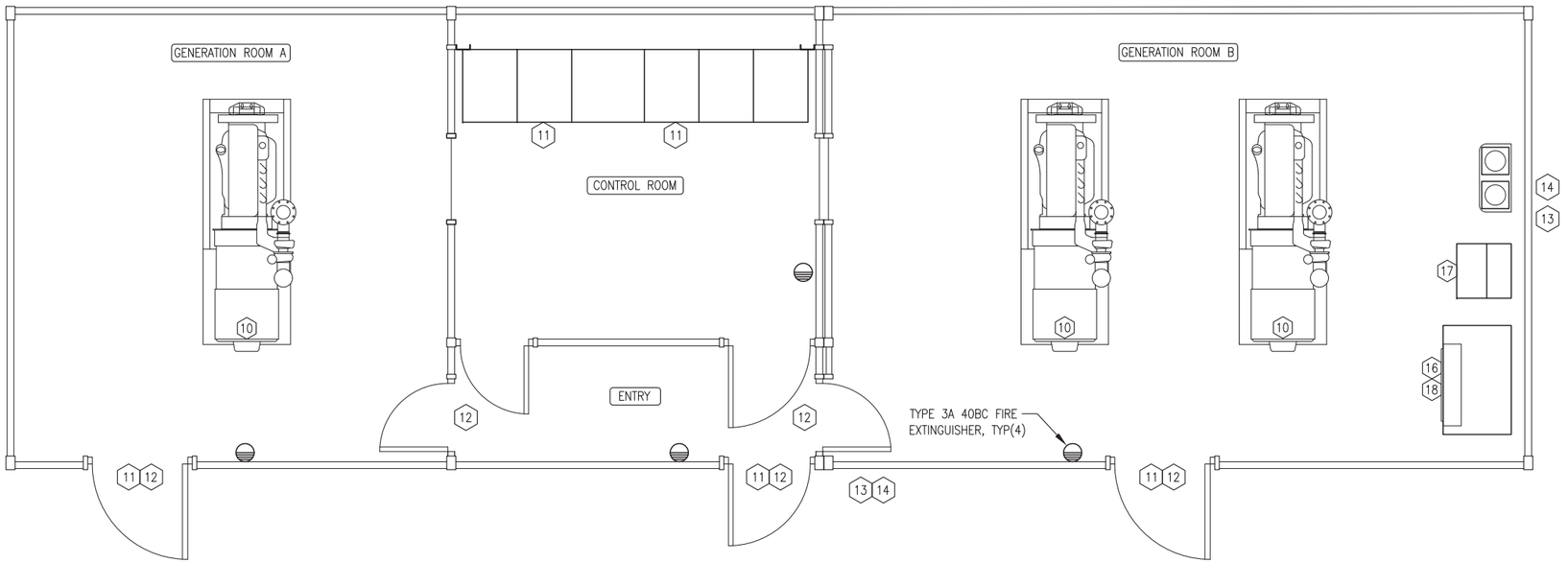
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
MECHANICAL SPECIFICATIONS

M2

SHEET 5 OF 23



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

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

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

WARNING SIGNS - RED LETTERS ON WHITE BACKGROUND.

10 "CAUTION: THIS UNIT STARTS AUTOMATICALLY, LOCK & TAG OUT PRIOR TO SERVICE" (6"X4")

11 "DANGER HIGH VOLTAGE, AUTHORIZED PERSONNEL ONLY"

12 "CAUTION HEARING & EYE PROTECTION REQUIRED"

13 "FUEL OIL DAY TANK ALARM"

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

15 not used

INFORMATIONAL PLACARDS - BLACK LETTERS ON WHITE BACKGROUND.

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

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

18 "CHECK INTERMEDIATE TANK LEVEL DAILY, FILL WHEN BELOW 4'-0"

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

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

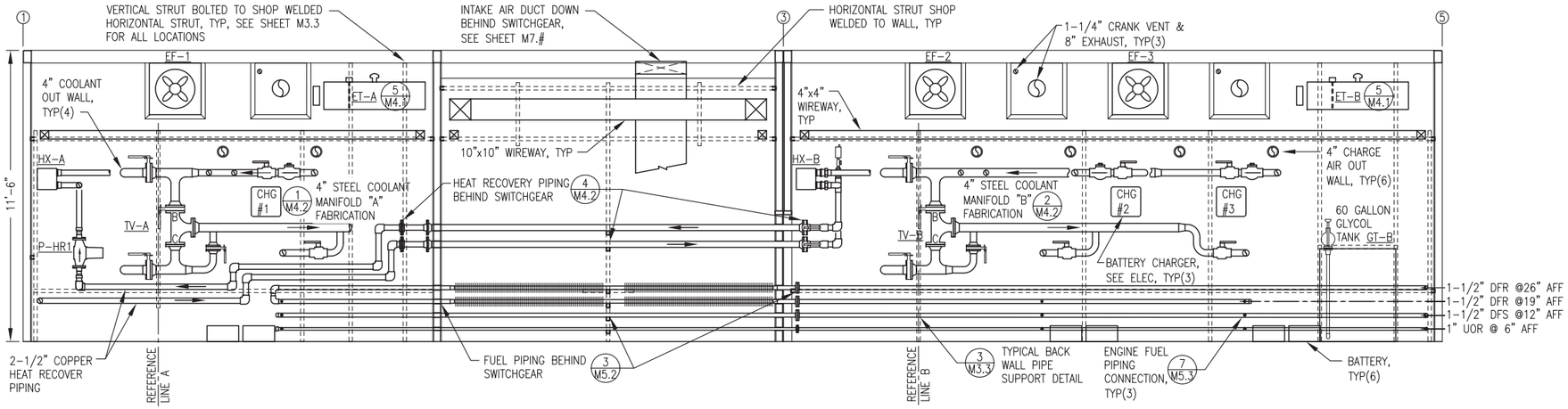
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

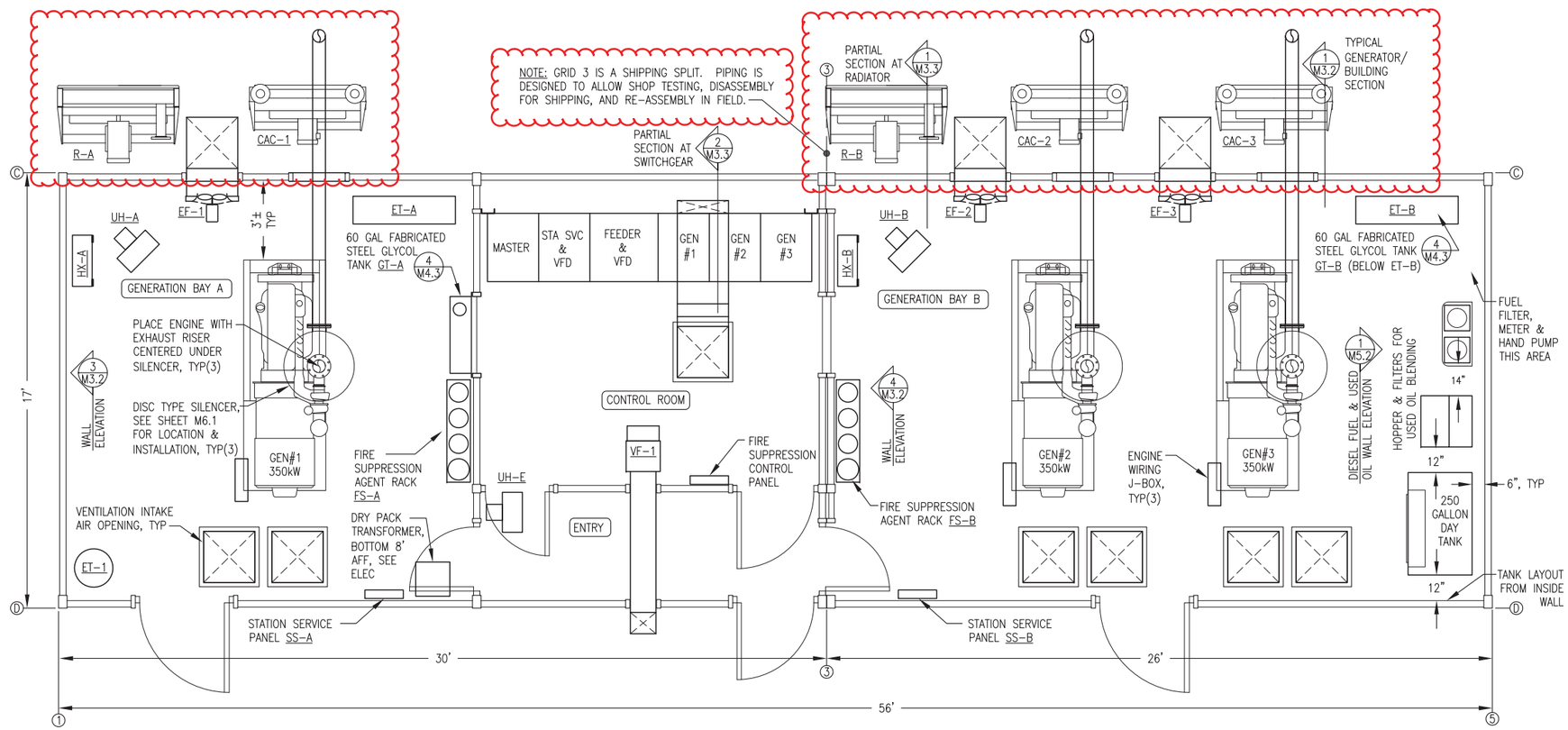
DRAWING TITLE:
WARNING SIGN/PLACARD & FIRE EXTINGUISHER PLAN & SCHEDULE

M3.0

SHEET 6 OF 23



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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

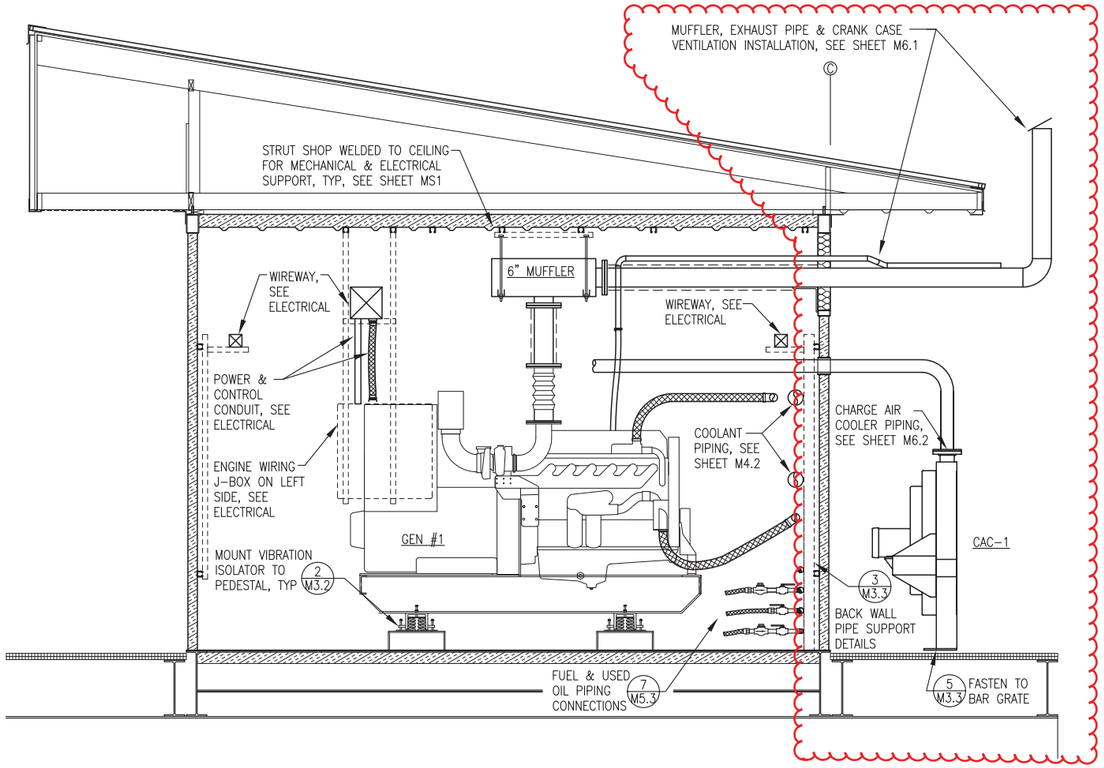
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

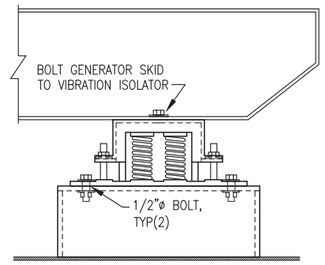
DRAWING TITLE:
EQUIPMENT LAYOUT PLAN & BACK WALL ELEVATION

M3.1

SHEET 7 OF 23



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

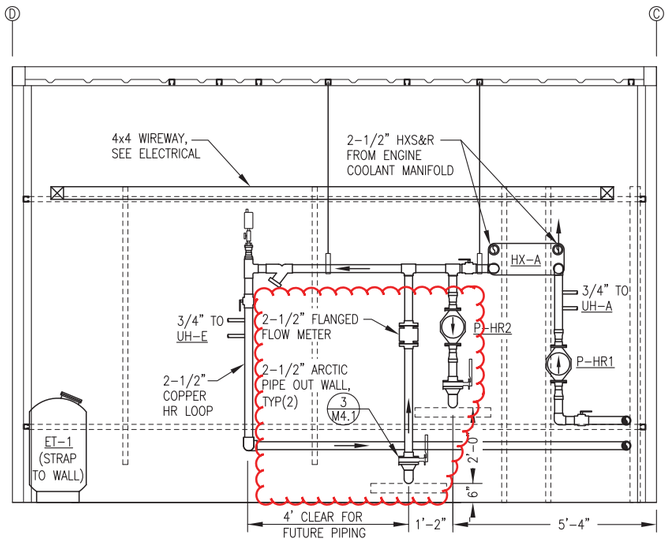


NOTES:

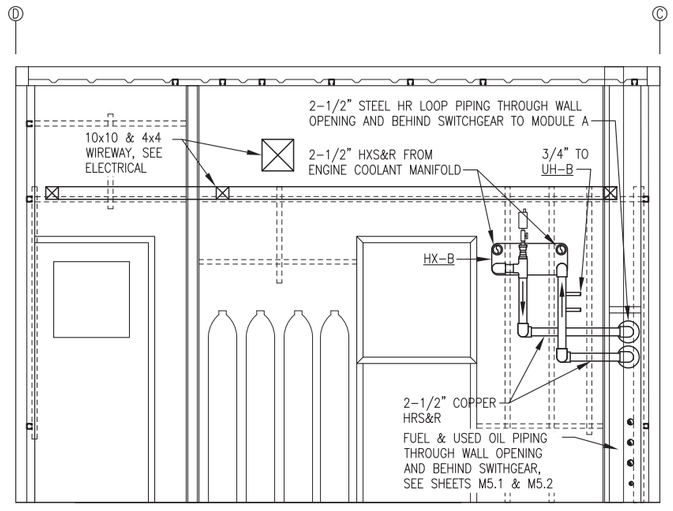
1) CENTER ISOLATOR ON PEDESTAL & VERIFY ENGINE EXHAUST RISER ALIGNMENT WITH SILENCER ABOVE PRIOR TO DRILLING PEDESTALS. SEE SHEET M6.1 FOR SILENCER LOCATION.

2) SPRING VIBRATION ISOLATORS FURNISHED WITH GENERATORS.

2 M3.2 GENERATOR VIBRATION ISOLATOR INSTALLATION
NO SCALE



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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION
1	3/6/17	VALVE AT HXA

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

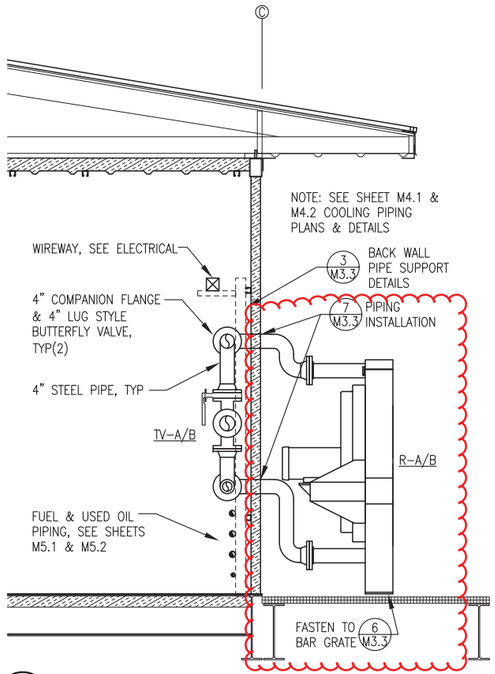
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

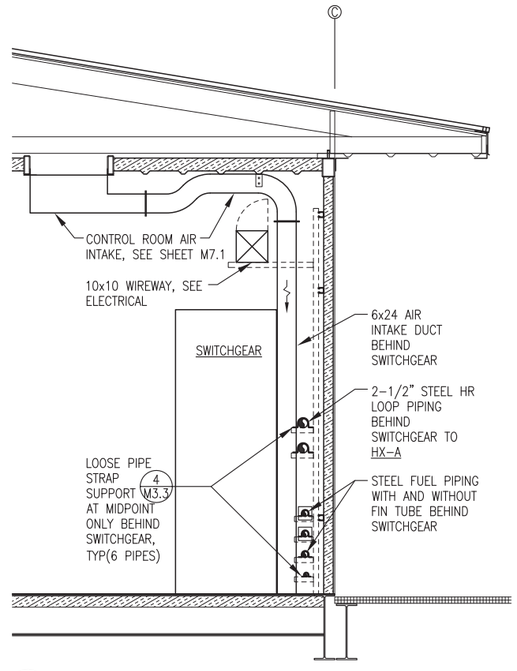
DRAWING TITLE:
SECTIONS, ELEVATIONS, & DETAILS

M3.2

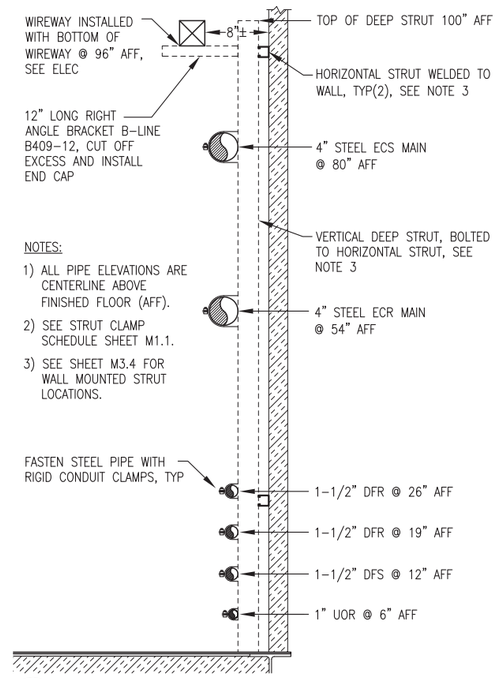
SHEET 8 OF 23



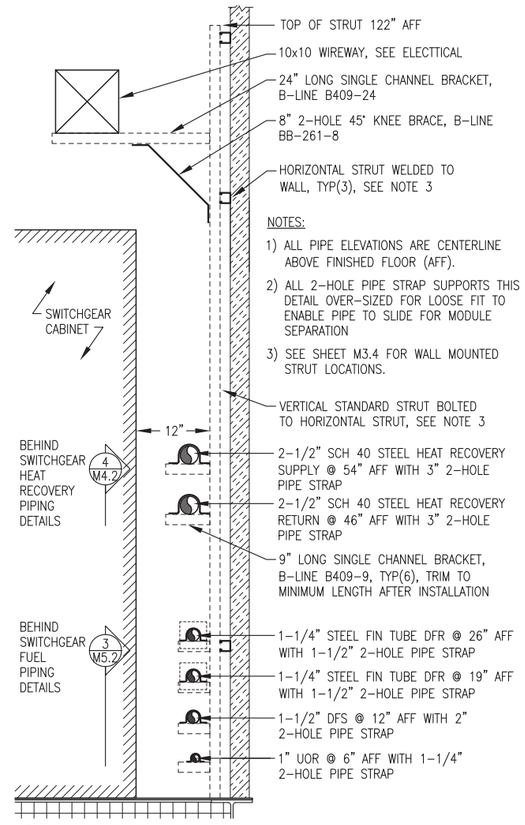
1 M3.3 PARTIAL SECTION AT RADIATOR
1/2"=1'-0"



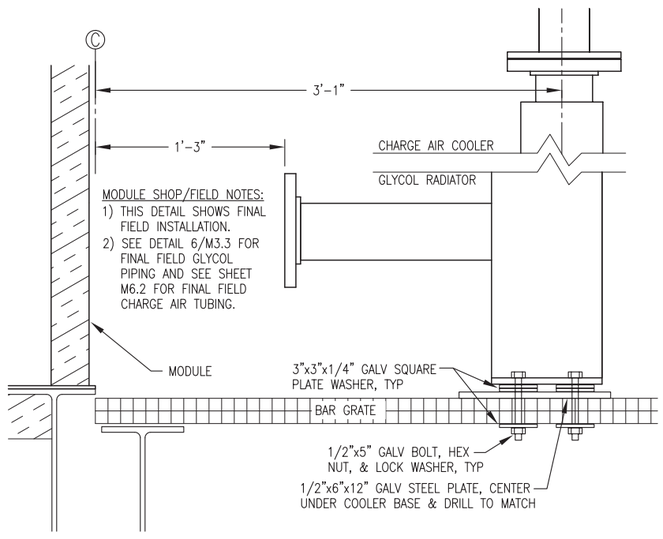
2 M3.3 PARTIAL SECTION AT SWITCHGEAR
1/2"=1'-0"



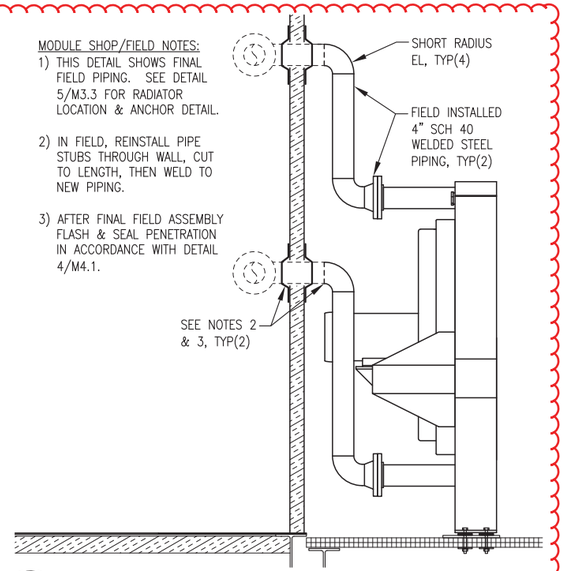
3 M3.3 TYPICAL BACK WALL PIPE SUPPORT DETAIL
1"=1'-0"



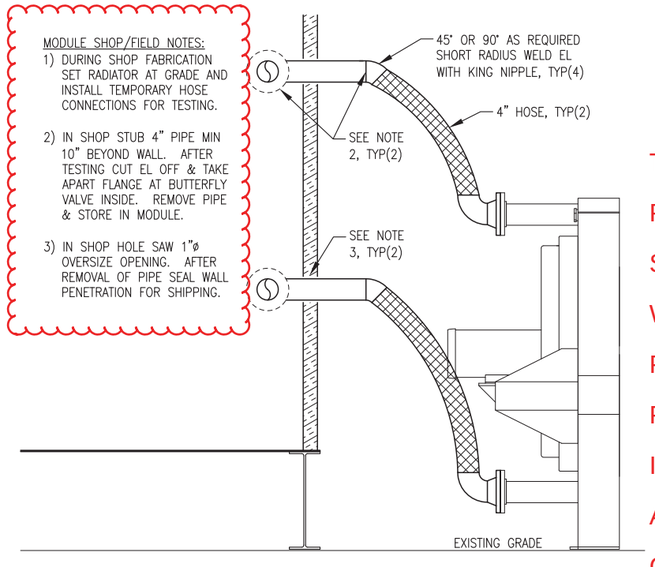
4 M3.3 LOOSE PIPE SUPPORT DETAIL (BEHIND SWITCHGEAR)
1"=1'-0"



5 M3.3 GLYCOL & CHARGE AIR COOLER ANCHOR DETAIL
NO SCALE



6 M3.3 GLYCOL RADIATOR FINAL FIELD PIPING
NO SCALE



7 M3.3 GLYCOL RADIATOR TEMPORARY PIPING AT SHOP
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

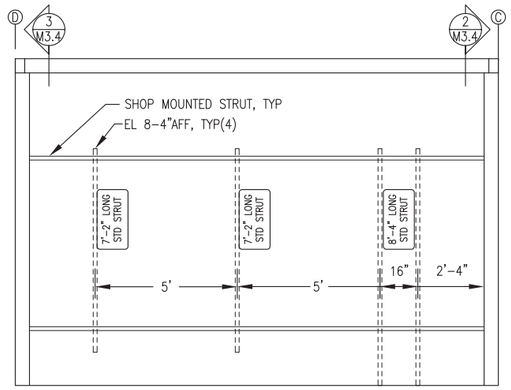
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

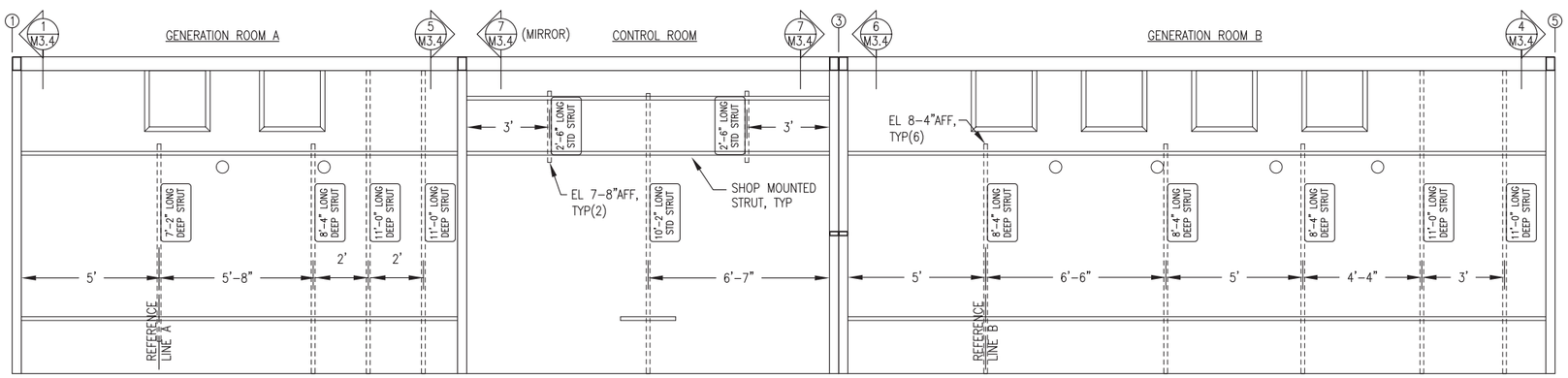
DRAWING TITLE:
SECTIONS & DETAILS

M3.3

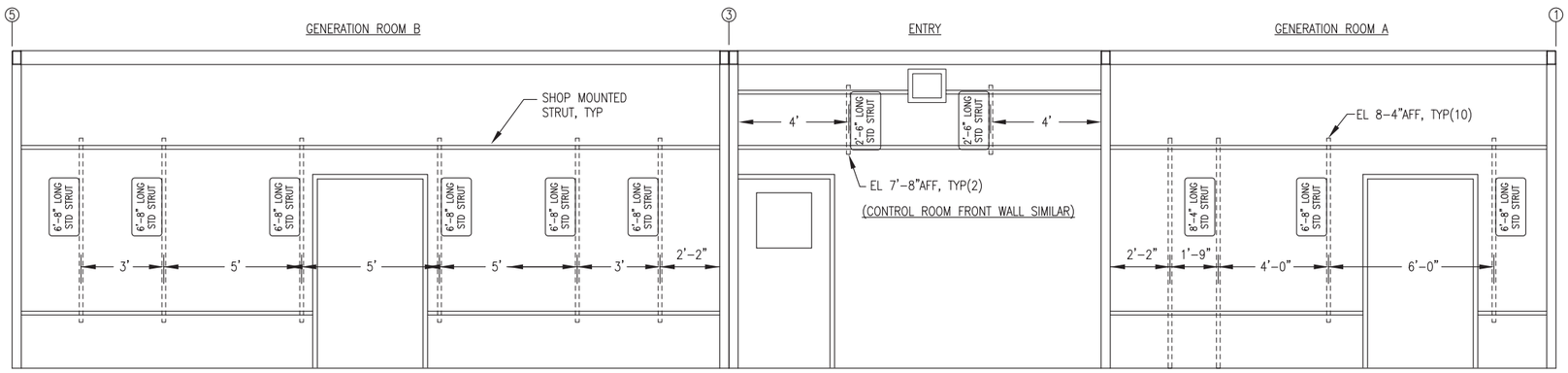
SHEET 9 OF 23



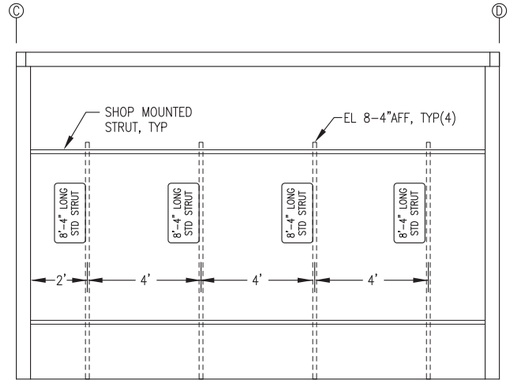
1 M3.4 GENERATION ROOM A END WALL STRUT LAYOUT
3/8"=1'-0"



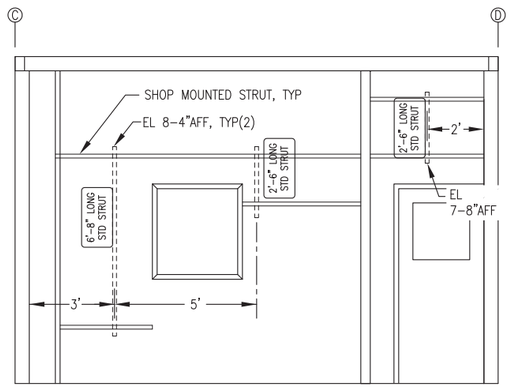
2 M3.4 BACK WALL STRUT LAYOUT (GRID LINE C)
3/8"=1'-0"



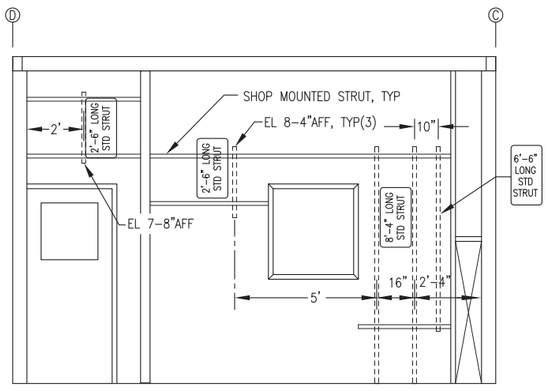
3 M3.4 FRONT WALL STRUT LAYOUT (GRID LINE D)
3/8"=1'-0"



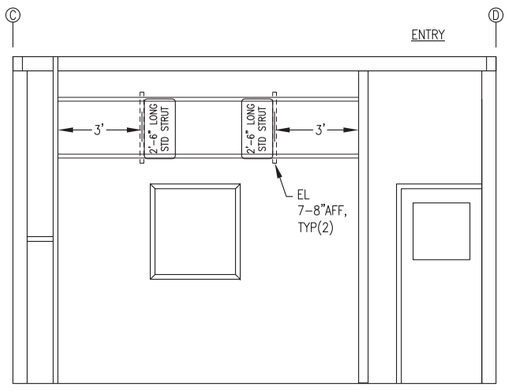
4 M3.4 GENERATION ROOM B END WALL STRUT LAYOUT
3/8"=1'-0"



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



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



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

GENERAL NOTES:

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8320

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

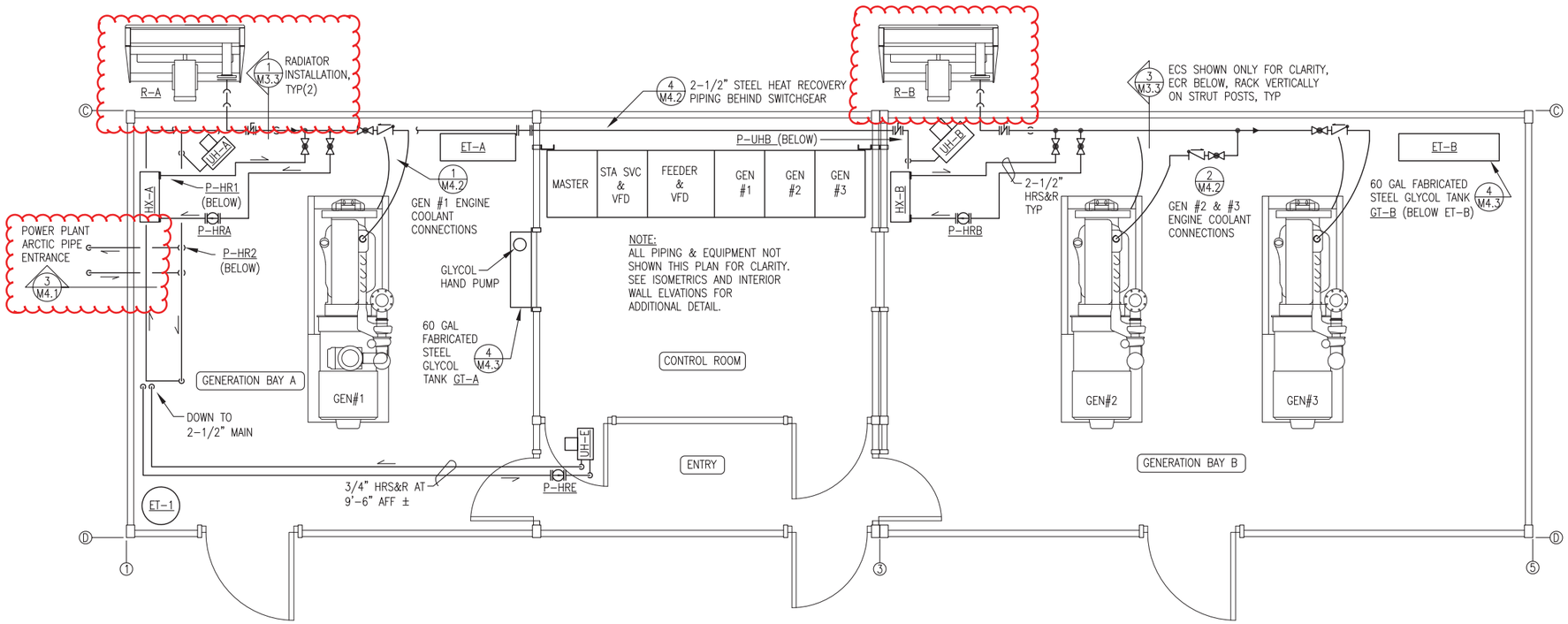
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
STRUT LAYOUT ON WALLS

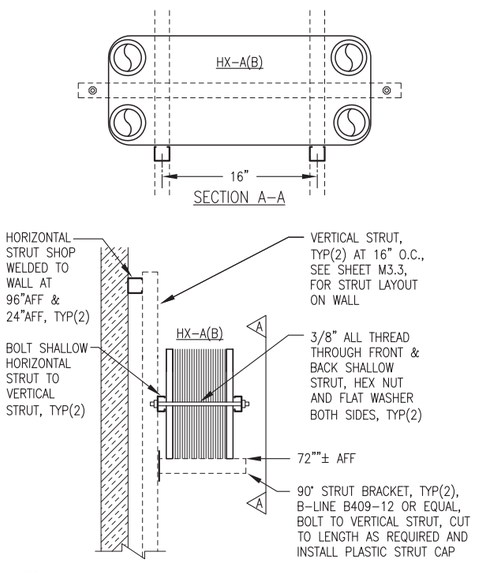
M3.4

SHEET 10 OF 23



1 M4.1 COOLANT & HEAT RECOVERY PIPING PLAN

3/8"=1'-0"

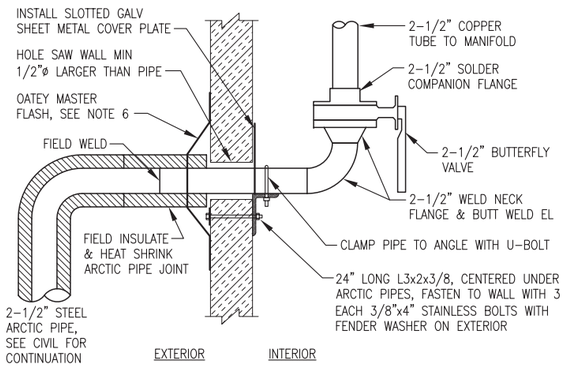


2 M4.1 HEAT EXCHANGER SUPPORT FROM WALL

NO SCALE

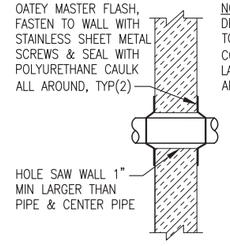
MODULE SHOP/FIELD NOTES:

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



3 M4.1 ARCTIC PIPE WALL PENETRATION

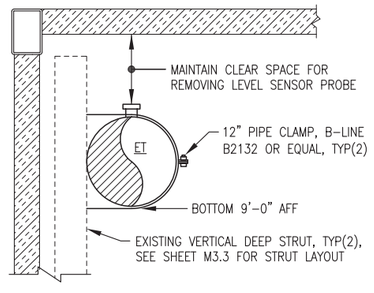
NO SCALE



4 M4.1 TYP FIELD WALL PENETRATION

NO SCALE

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



5 M4.1 EXP TANK ET-A (B) SUPPORT

NO SCALE

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

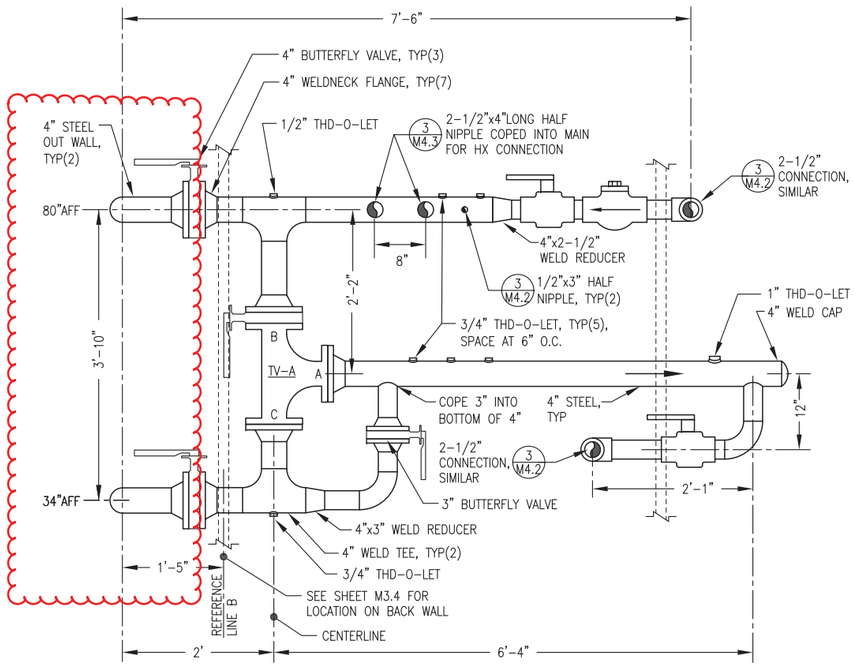
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

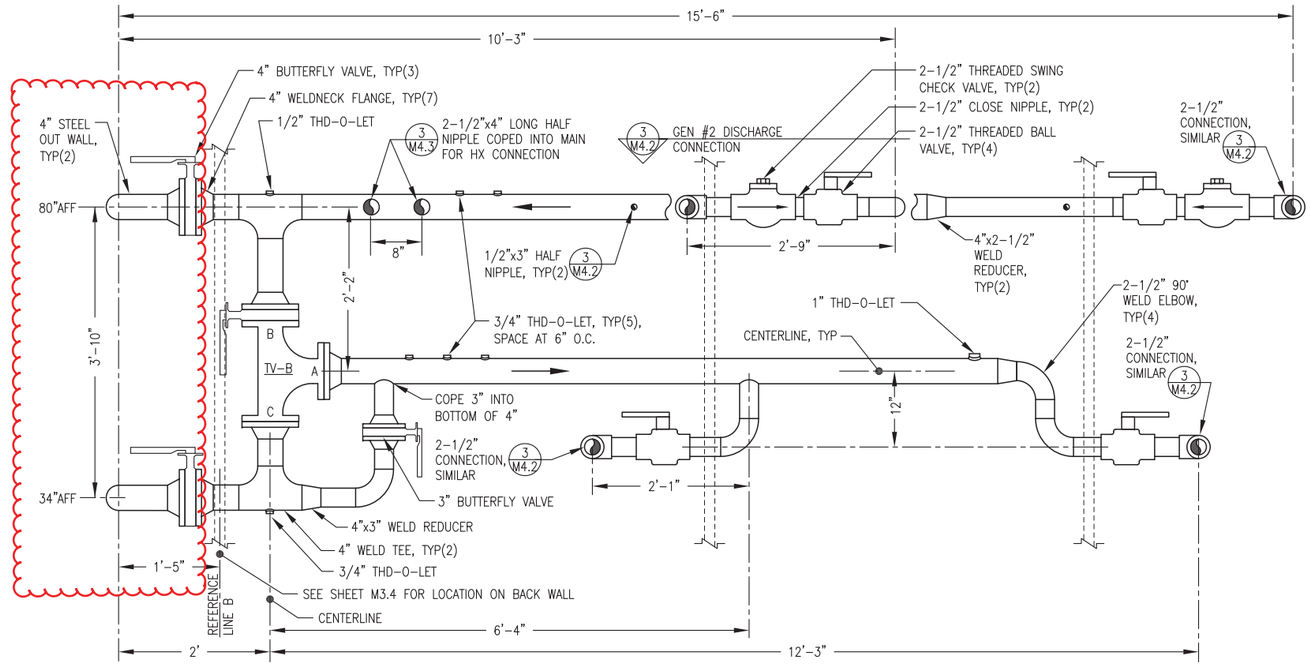
DRAWING TITLE:
COOLANT & HEAT RECOVERY PLAN & DETAILS

M4.1

SHEET 11 OF 23

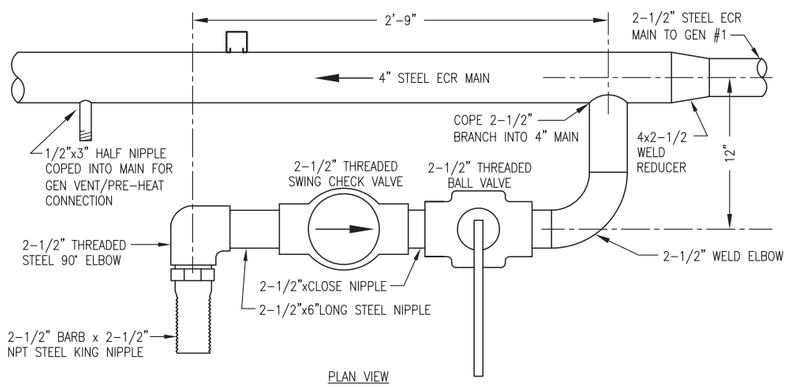


1 M4.2 COOLANT MANIFOLD "A" FABRICATION
1"=1'-0"

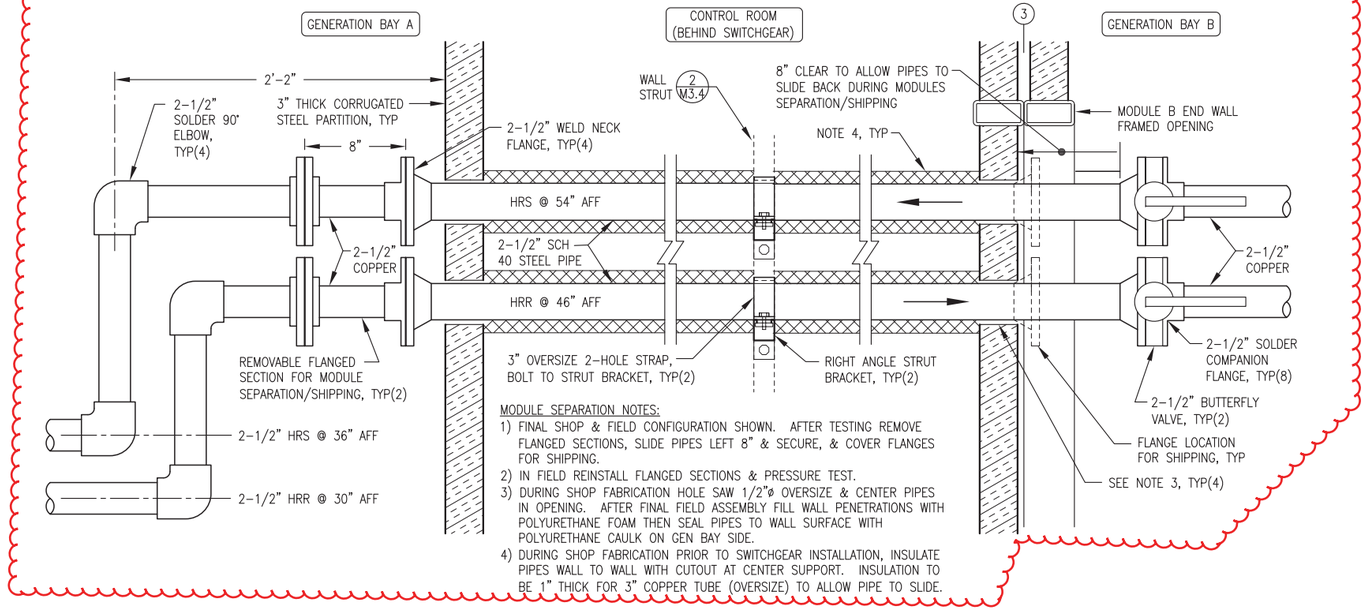


2 M4.2 COOLANT MANIFOLD "B" FABRICATION
1"=1'-0"

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



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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

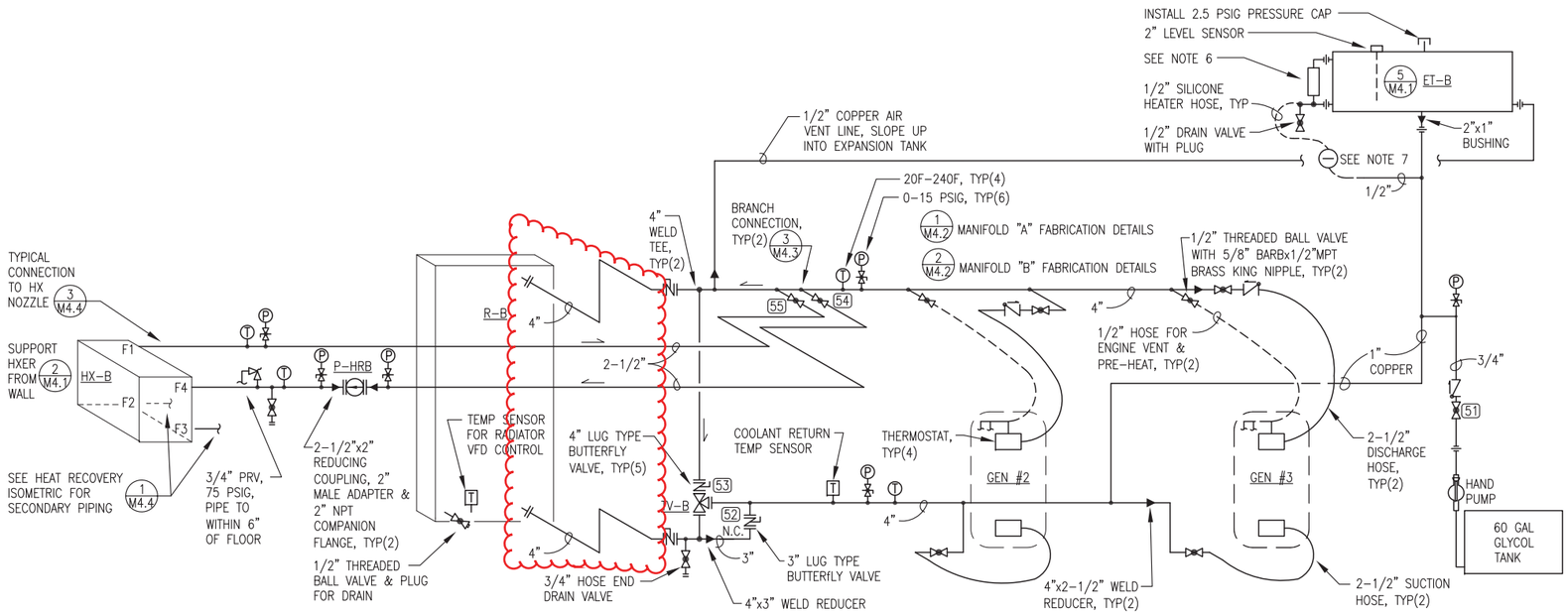
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
COOLING MANIFOLDS & HR PIPING DETAILS

M4.2

SHEET 12 OF 23



NOTES:

1) ALL 3" AND LARGER PIPING SHOWN THIS ISOMETRIC SCH 40 STEEL WITH WELDED JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL 2-1/2" AND SMALLER PIPE SHOWN THIS ISOMETRIC TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.

2) UNLESS INDICATED OTHERWISE MAKE ALL CONNECTIONS TO STEEL MAINS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 3/4" THREAD-O-LET AND MAKE ALL SIMILAR CONNECTIONS TO COPPER BRANCH PIPING WITH 1" T-DRILL TAP AND 3/4" CxFPT ADAPTER. SEE DETAILS. INSTALL THREADED BRASS BUSHINGS AS REQUIRED. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS IN STEEL MAINS WITH COPED CONNECTIONS AND IN COPPER MAINS WITH T-DRILL TAPS AS REQUIRED UNLESS INDICATED OTHERWISE

3) ALL PRESSURE GAUGES IN ENGINE COOLING MAINS AND HEAT EXCHANGER PRIMARY SUPPLY 0-15 PSIG. ALL THERMOMETERS 20-240F. ALL TEMPERATURE SENSORS 20-240F RANGE 4-20mA TRANSMITTERS.

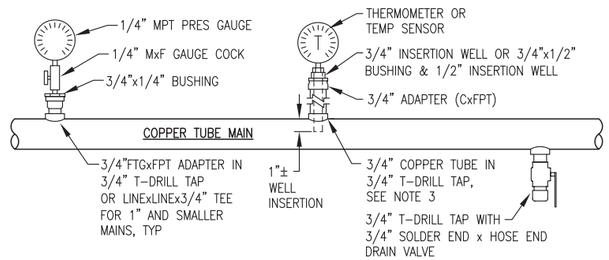
4) UPON COMPLETION OF FABRICATION FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.

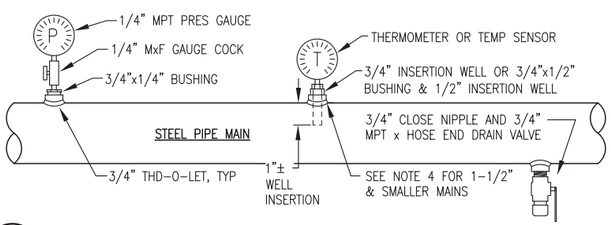
5) INSULATE COOLANT PIPING MAINS FROM GENERATOR VALVES TO WALL PENETRATIONS. ALL OTHER PIPING NOT INSULATED.

6) INSTALL 9" LONG COOLANT SITE GAUGE ON 1/2" TEES, INSTALL 1/2" THREADED BALL VALVE WITH PLUG IN BOTTOM FOR DRAIN.

7) LOW COOLANT ALARM SWITCH PROVIDED WITH GENERATORS, MOUNT WITH SWITCH POINT ELEVATION LEVEL WITHIN 12" OF BOTTOM OF TANK. CONNECT TO BOTTOM WITH 1/2" STREET EL & 1/2"NPTx5/8" BARB. CONNECT TO TOP WITH 1/4" STREET EL & 1/4"NPTx5/8" BARB.

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





NOTES:

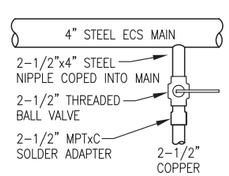
1) USE T-DRILL TAPS AS SHOWN FOR INSTRUMENT INSTALLATIONS IN 1-1/4" AND LARGER COPPER MAINS. USE LINE SIZE TEE FITTINGS FOR INSTALLING INSTRUMENTATION IN 1" AND SMALLER MAINS. ADJUST ADAPTER AND BUSHING SIZES TO MATCH TEES.

2) TEMPERATURE SENSOR INSTALLATION SIMILAR TO THERMOMETER EXCEPT USE 3/4"x1/2" BUSHING AND 1/2" INSERTION WELL.

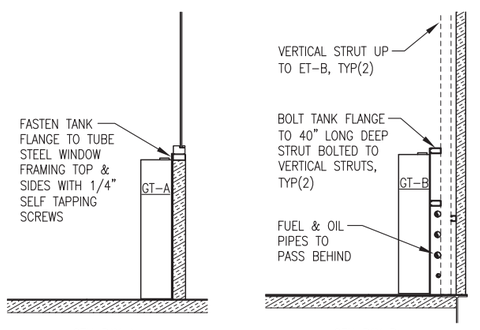
3) FOR MAINS SMALLER THAN 2" AND FOR EXTRA LONG INSERTION WELLS, USE COPPER TUBE RISER AS SHOWN, LENGTH AS REQUIRED FOR WELL INSERTION DEPTH INTO MAIN. FOR ALL OTHER INSERTION WELL INSTALLATIONS OMIT RISER AND INSERT 3/4" FTGxFPT ADAPTER INTO T-DRILL TAP.

4) ON SMALL DIAMETER STEEL FUEL PIPING USE 3/4" NIPPLE & COUPLING TO LIMIT WELL INSERTION TO 1" MAX.

2 M4.3 TYPICAL INSTRUMENT INSTALLATION
NO SCALE



3 M4.3 BRANCH PIPE CONNECTION
NO SCALE



4 M4.3 GLYCOL TANK INSTALLATION
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

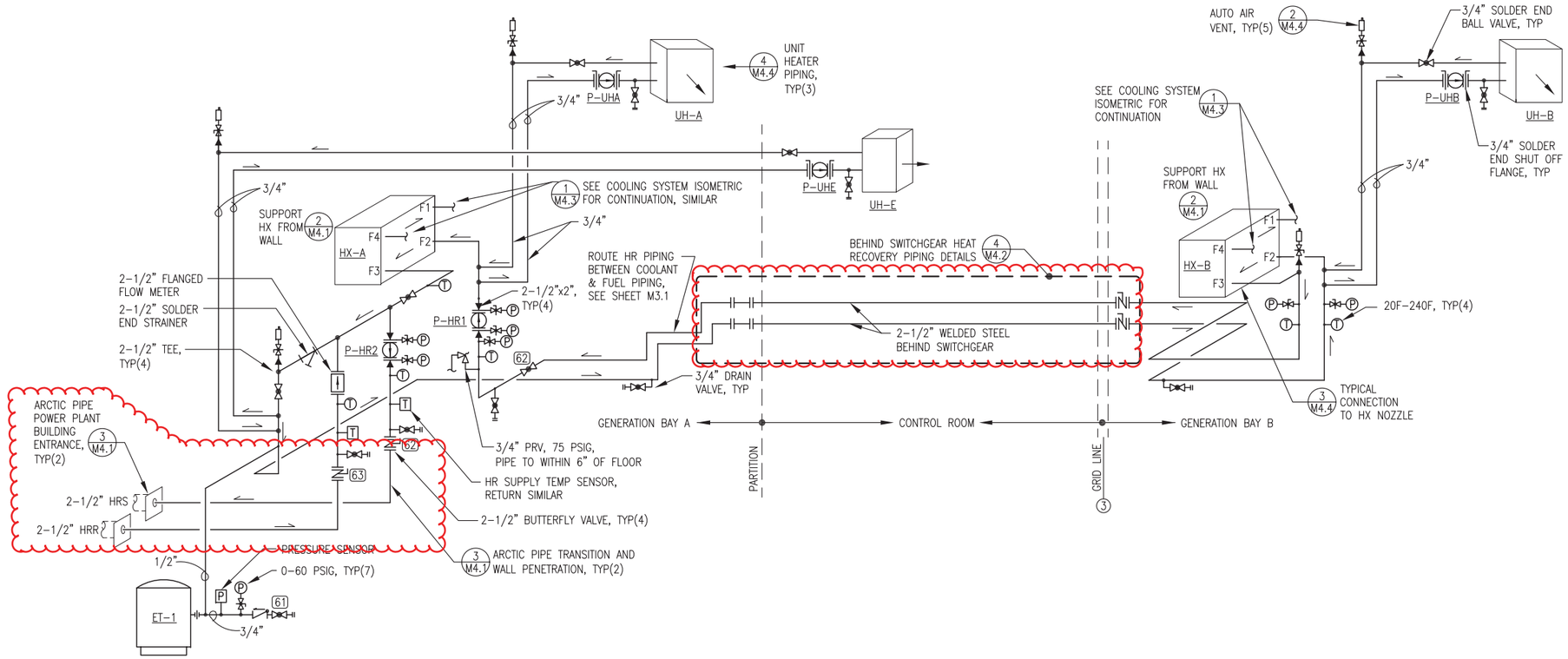
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
COOLING ISOMETRIC & DETAILS

M4.3

SHEET 13 OF 23

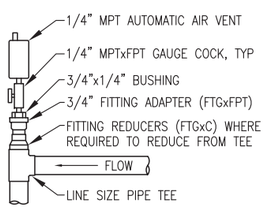


NOTES:

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

1 / M4.4 HEAT RECOVERY SYSTEM PIPING ISOMETRIC

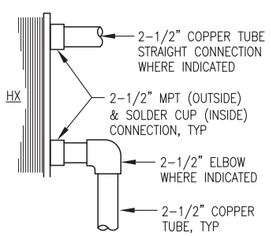
NO SCALE



NOTE: CLOSE GAUGE COCKS ON AIR VENTS AFTER BLEEDING SYSTEM OF AIR. LEAVE GAUGE COCKS OPEN ON PRESSURE GAUGES.

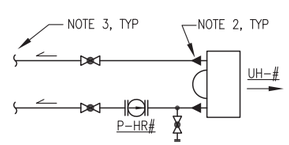
2 / M4.4 TYPICAL AIR VENT INSTALLATION

NO SCALE



3 / M4.4 HX PIPING CONNECTION

NO SCALE



NOTES:

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

4 / M4.4 UNIT HEATER PIPING

NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION
1	3/6/17	VALVE AT HXA

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

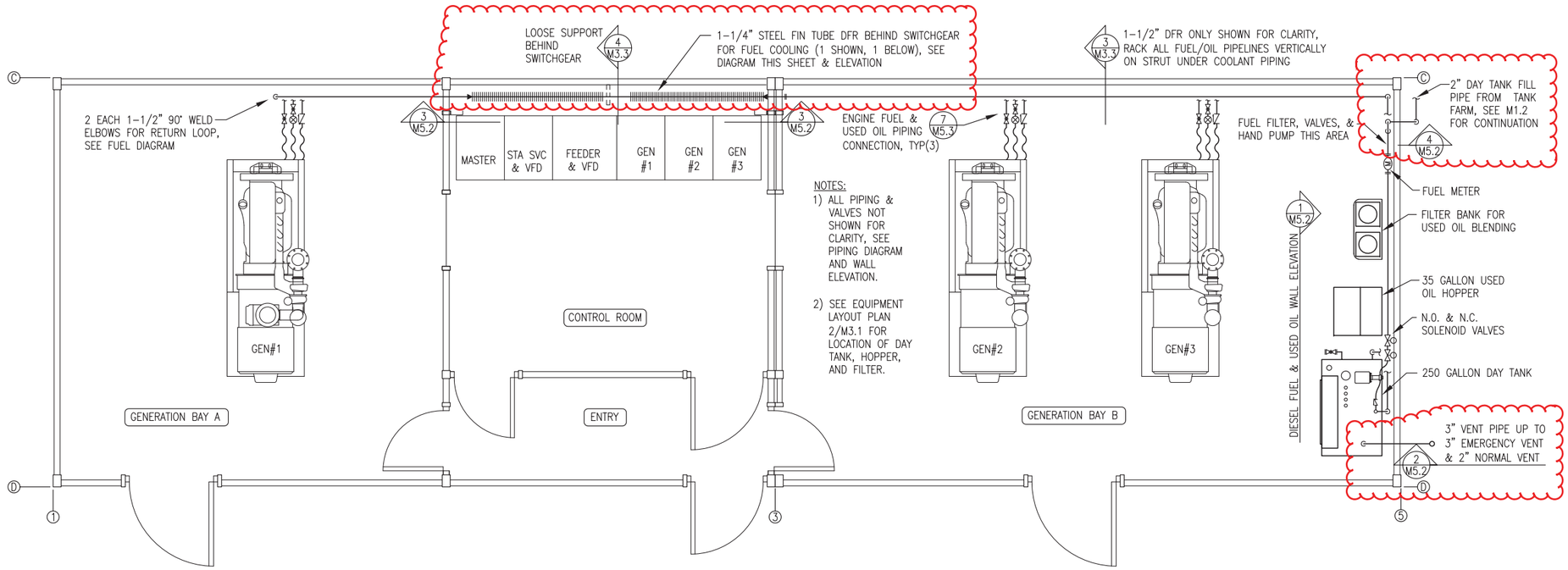
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

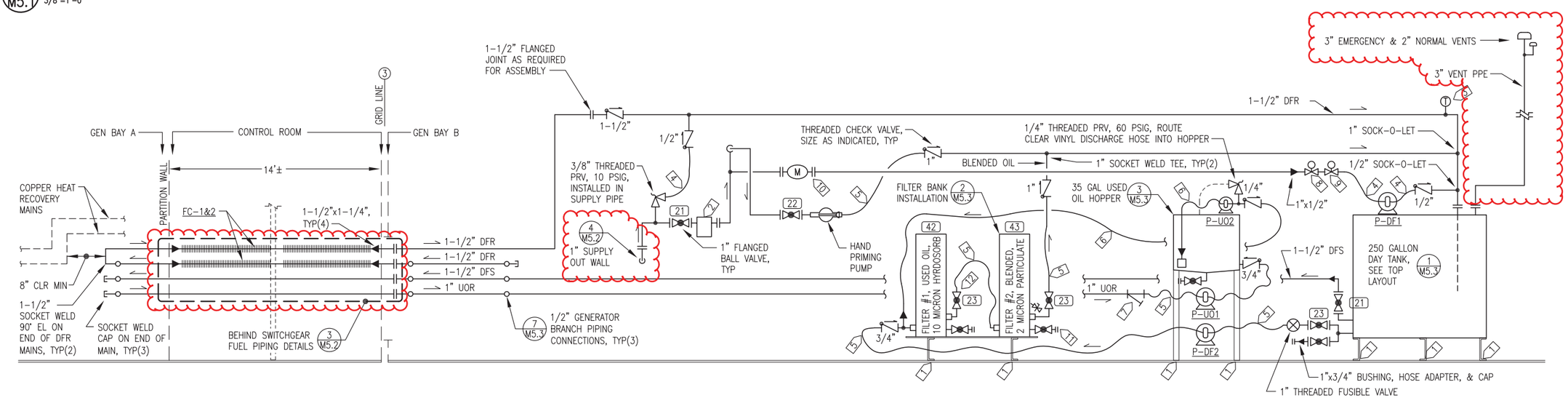
DRAWING TITLE:
HEAT RECOVERY ISOMETRIC & DETAILS

M4.4

SHEET 14 OF 23



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



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

PIPING DIAGRAM SPECIFIC NOTES:

1. TAP FLOOR AND FASTEN WITH 3/8" BOLTS.
2. 1" ANSI 150# FLANGED FILTER, REMOVE DRAIN VALVE & INSTALL 1/8"MxF DRAIN COCK.
3. 20-240°F THERMOMETER, INSTALL THERMAL WELL IN 3/4" THREAD-O-LET.
4. #10 HOSE WITH 1/2" OR 3/8" NPT SWIVEL ENDS.
5. #12 HOSE WITH NPT SWIVEL ENDS, 1/2", 3/4", OR 1" AS RQD TO MATCH PIPING OR PUMPS.
6. #6 HOSE WITH 1/8", 1/4", OR 3/8" NPT SWIVEL ENDS.
7. 1" THREADED STRAINER IN 1" UOR WITH GAUGE COCK BLOW DOWN.
8. 1/2" NO SOLENOID VALVE.
9. 1/2" NC SOLENOID VALVE.
10. METER EQUIPPED WITH 300# FLANGED ENDS, PROVIDE 1" SOCKET WELD ANSI 300# FLANGES & GASKETS
11. 3/4" THREADED BALL VALVE WITH HOSE ADAPTER & CAP, TYP(3).
12. 3/4" THREADED BALL VALVE, TYP(2).

PIPING DIAGRAM GENERAL NOTES:

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

THIS SHEET SHOWS PRIMARILY MODULE SHOP FABRICATION WORK THAT IS N.I.C.

PORTIONS THAT PERTAIN TO FIELD INSTALLATION WORK ARE SHOWN CLOUDED.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

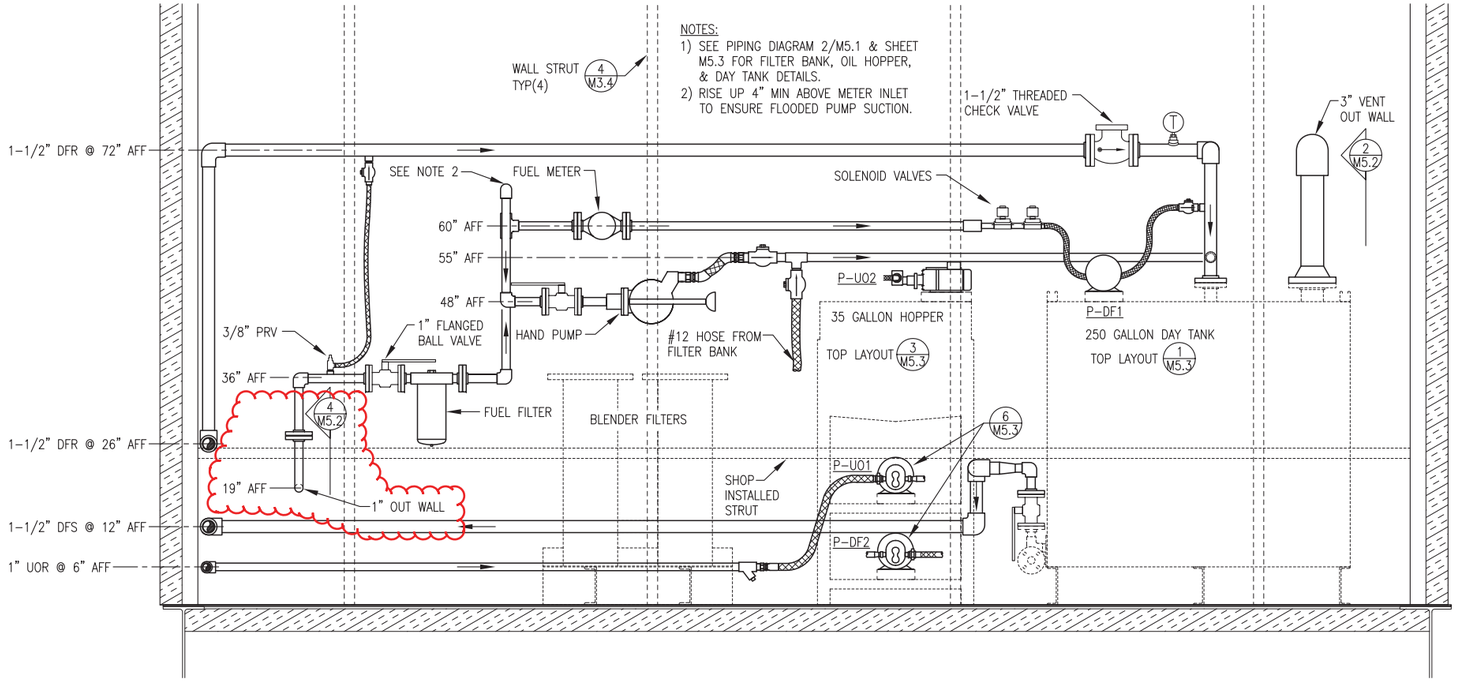
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

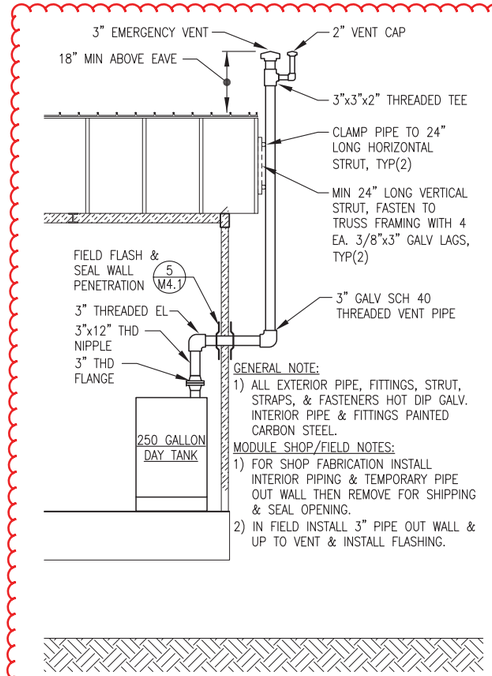
DRAWING TITLE:
DIESEL FUEL & USED OIL PIPING PLAN & DIAGRAM

M5.1

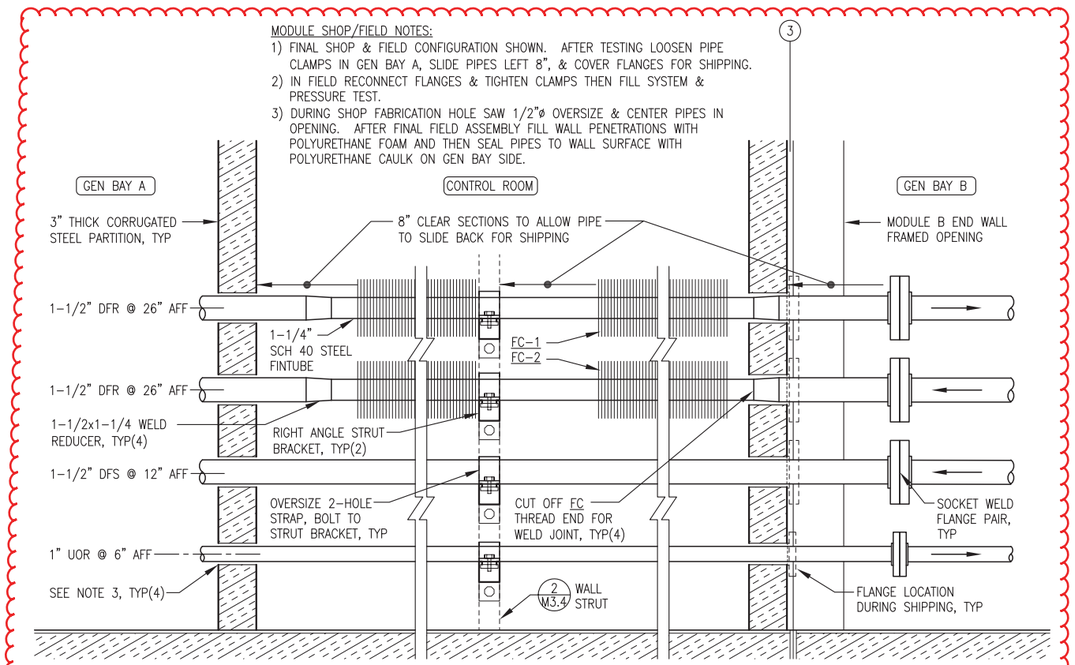
SHEET 15 OF 23



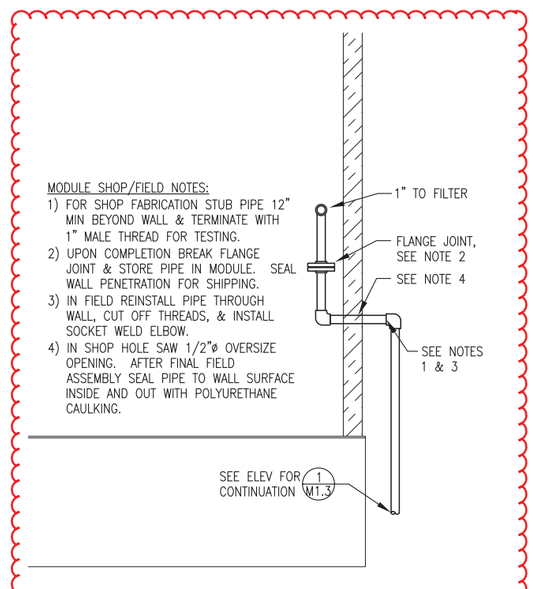
1 M5.2 DIESEL FUEL & USED OIL WALL ELEVATION
1"=1'-0"



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



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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220
Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

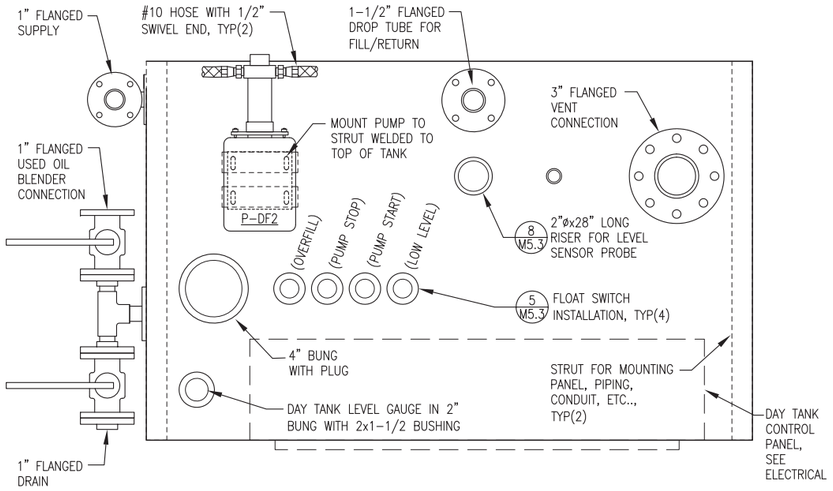
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

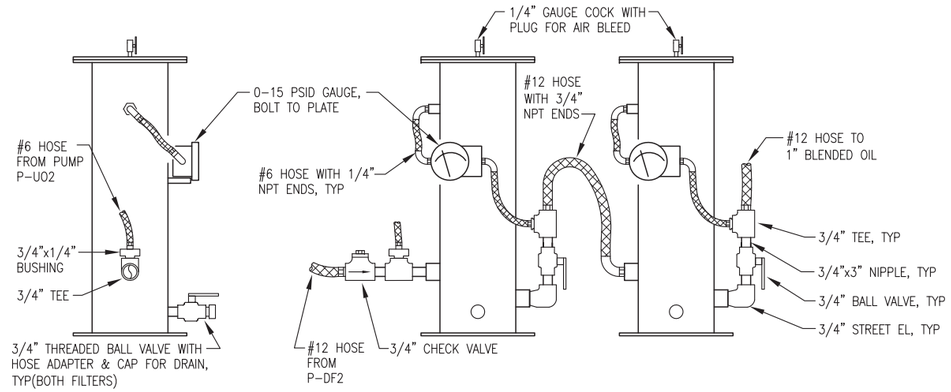
DRAWING TITLE:
DIESEL FUEL & USED OIL PIPING DETAILS

M5.2

SHEET 16 OF 23

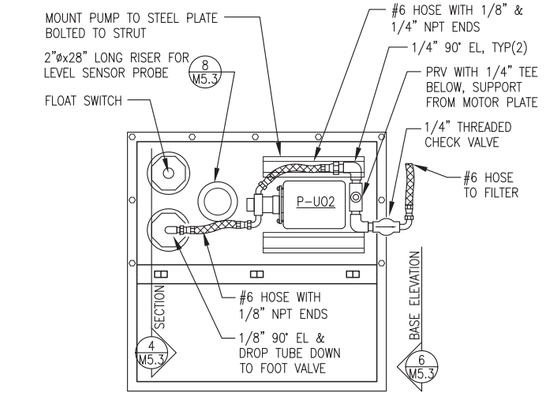


1 M5.3 TOP OF DAY TANK – PLAN VIEW
NO SCALE

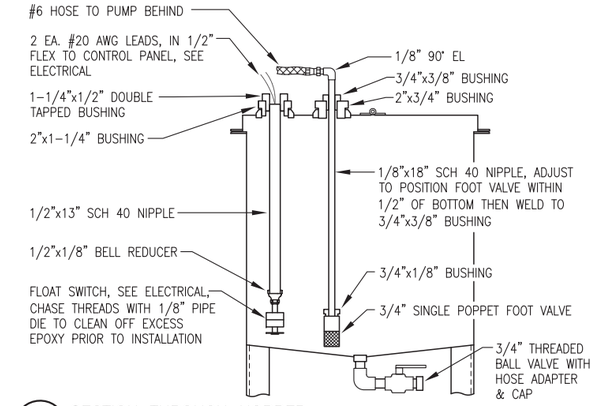


2 M5.3 FILTER BANK ELEVATIONS & INSTALLATION DETAILS
NO SCALE

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

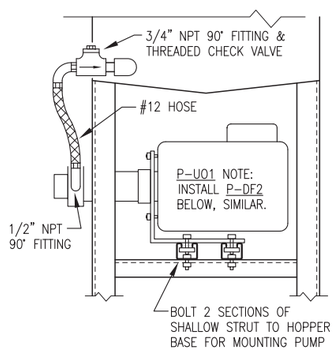


3 M5.3 TOP OF HOPPER – PLAN VIEW
NO SCALE

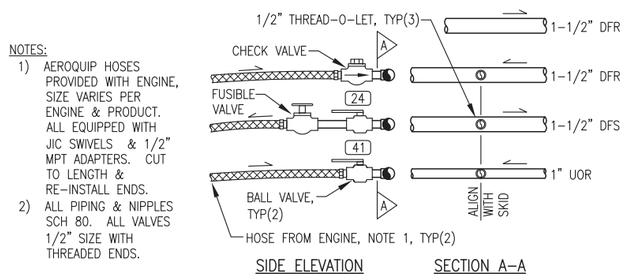


4 M5.3 SECTION THROUGH HOPPER
NO SCALE

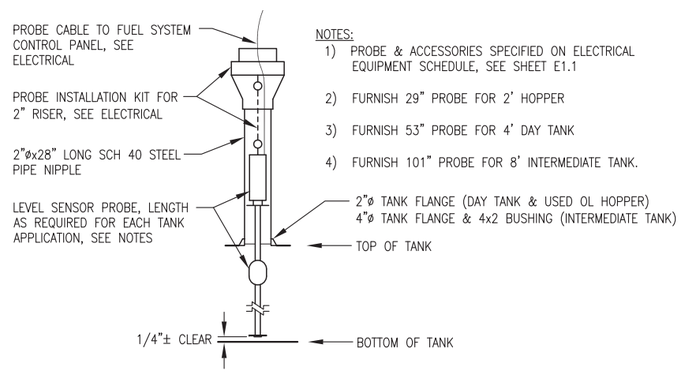
5 M5.3 DAY TANK FLOAT SWITCH INSTALLATION
NO SCALE



6 M5.3 HOPPER BASE ELEVATION
NO SCALE



7 M5.3 ENGINE FUEL PIPING CONNECTION
NO SCALE



8 M5.3 TYPICAL LEVEL SENSOR PROBE INSTALLATION
NO SCALE

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

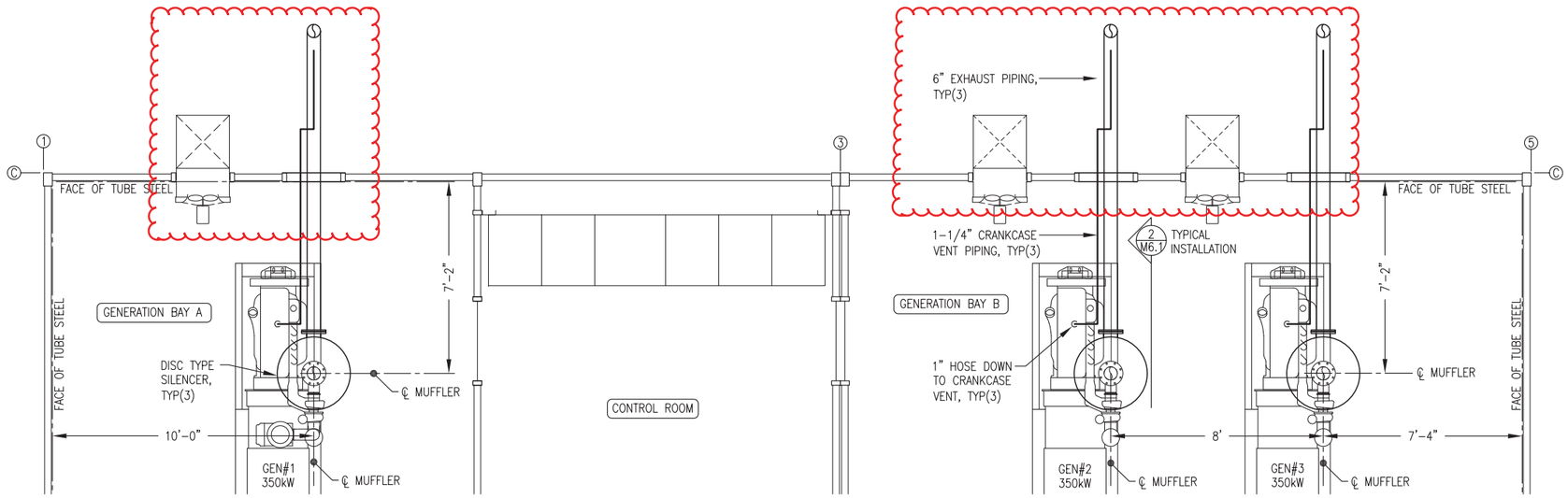
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

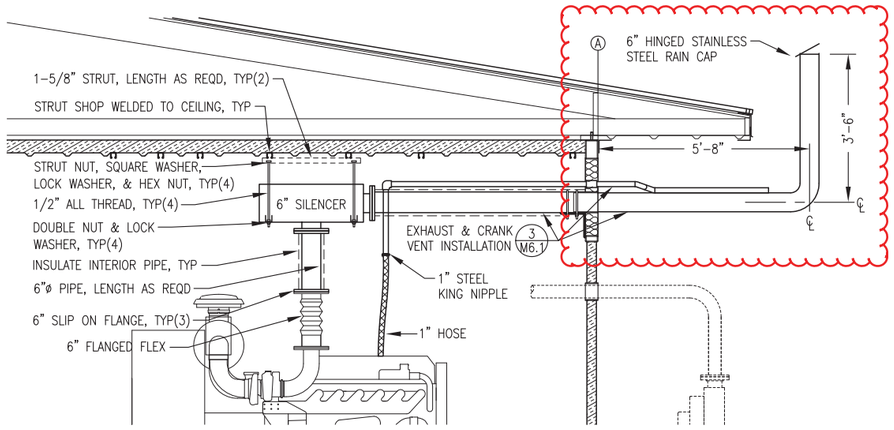
DRAWING TITLE:
DIESEL FUEL & USED OIL PIPING DETAILS

M5.3

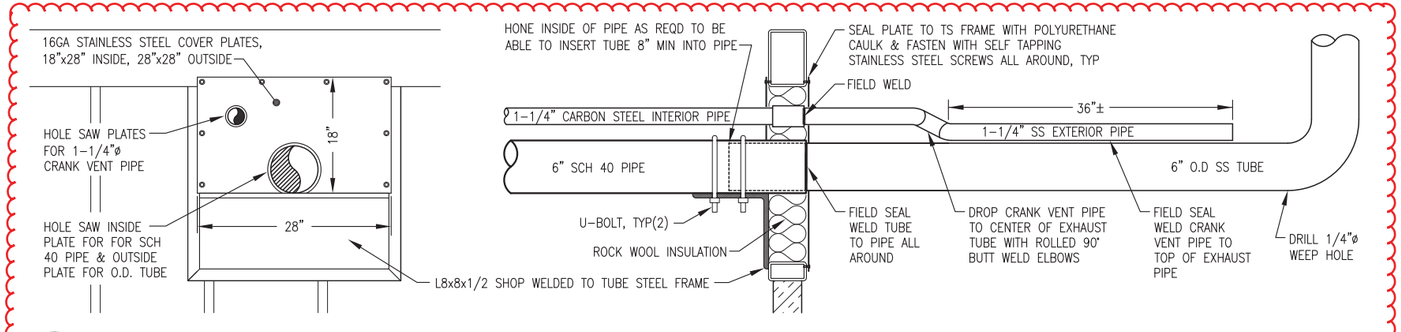
SHEET 17 OF 23



1 M6.1 EXHAUST & CRANK VENT PLAN
3/8"=1'-0"



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



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

EXHAUST SYSTEM GENERAL NOTES:

1) FLEXES TO BE FURNISHED WITH GENERATORS. MUFFLERS, CONNECTING PIPE, FLANGES, AND ACCESSORIES FURNISHED AS PART OF MODULE CONSTRUCTION.

2) MUFFLERS TO BE CRITICAL GRADE WITH INTERNAL THERMAL INSULATION, EM PRODUCTS DCK2 OR EQUAL.

3) ALL EXHAUST PIPE EXTERIOR OF WALL PENETRATION TYPE 304 STAINLESS STEEL O.D. TUBING. ALL INTERIOR EXHAUST PIPE SCH 40 CARBON STEEL. ALL FLANGES ANSI 150# FLAT FACED. INSTALL HIGH TEMPERATURE FULL FACE STAINLESS STEEL AND GRAPHITE GASKETS, DURABLA BLACK OR EQUAL.

4) ALL CRANK VENT PIPING ON EXTERIOR OF COUPLING TYPE 304 STAINLESS STEEL WITH BUTT WELD FITTINGS. ALL INTERIOR PIPING CARBON STEEL WITH SOCKET WELD FITTING. ALL CRANK VENT HOSE OIL RESISTANT SYNTHETIC RUBBER, 190F WORKING TEMP, GOODYEAR ORTAC OR EQUAL.

5) INSULATE INTERIOR EXHAUST PIPING WITH 1-1/2" MEDIUM TEMPERATURE INSULATION, SEE SPECIFICATIONS.

EXHAUST SYSTEM SHOP/FIELD NOTES:

1) SHOP FABRICATE COMPLETE EXHAUST SYSTEM AS SHOWN FOR MODULE LOAD TEST BUT DO NOT WELD EXTERIOR SS TUBE TO INTERIOR PIPE. REMOVE EXTERIOR SS TUBE FOR SHIPPING. IN FIELD RE-INSTALL EXTERIOR SS TUBE AND WELD TO INTERIOR PIPE.

2) SHOP FABRICATE COMPLETE CRANK VENT SYSTEM AS SHOWN FOR MODULE LOAD TEST BUT DO NOT WELD EXTERIOR SS PIPE TO INTERIOR PIPE OR EXTERIOR SS EXHAUST TUBING. REMOVE EXTERIOR SS PIPE FOR SHIPPING. IN FIELD RE-INSTALL EXTERIOR SS PIPE AND WELD TO INTERIOR PIPE AND EXTERIOR SS EXHAUST TUBING. SEE DETAIL 3/M6.1.

3) SHOP INSTALL INSULATION FROM FLEX TO MUFFLER AND FROM MUFFLER TO WALL.

4) SHOP FABRICATE AND INSTALL INTERIOR EXHAUST STAINLESS STEEL COVER PLATES.

5) SHOP FABRICATE EXTERIOR EXHAUST STAINLESS STEEL COVER PLATES. STORE IN MODULE AND FIELD INSTALL AFTER WELDING EXTERIOR TUBE/PIPE TO INTERIOR TUBE/PIPE.

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

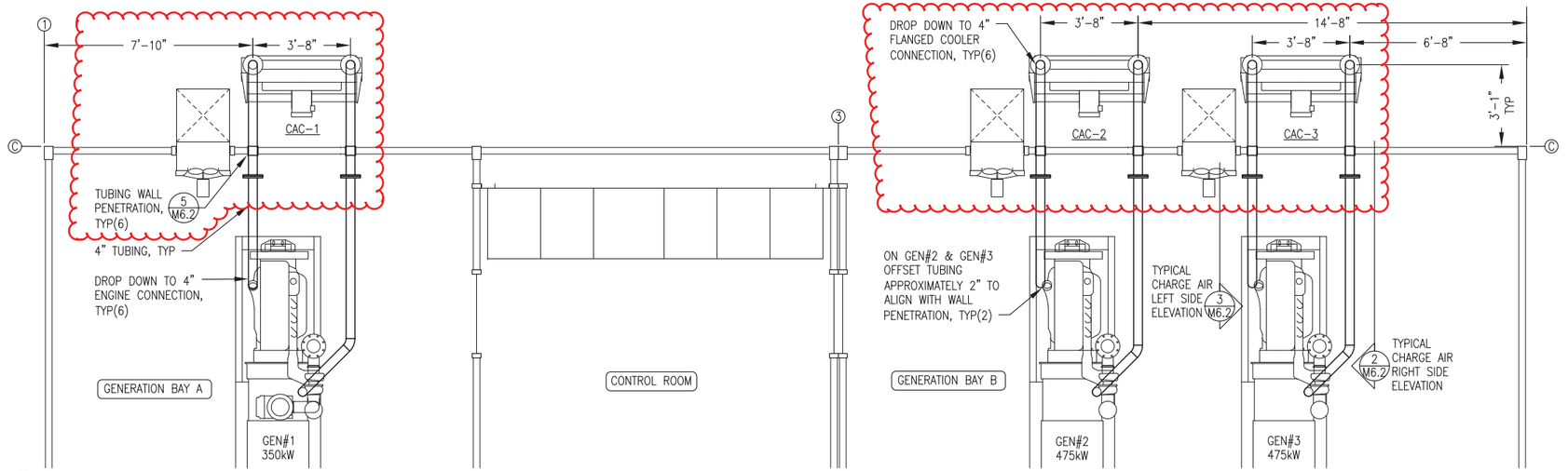
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

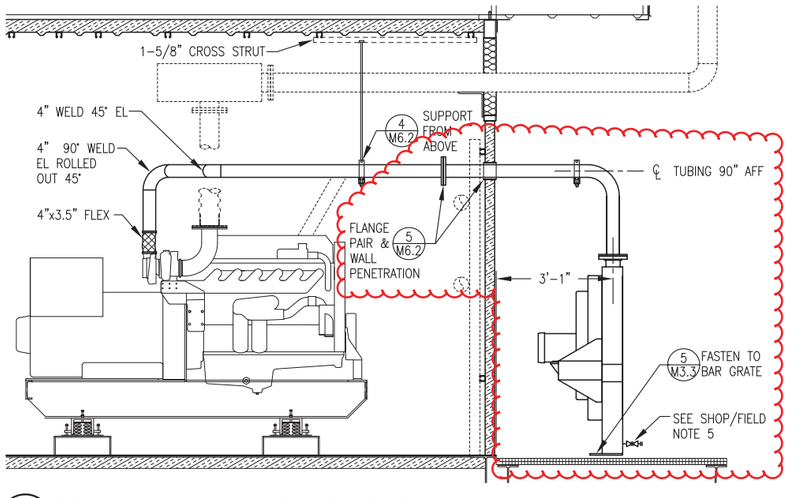
DRAWING TITLE:
EXHAUST & CRANK VENT PLAN & DETAILS

M6.1

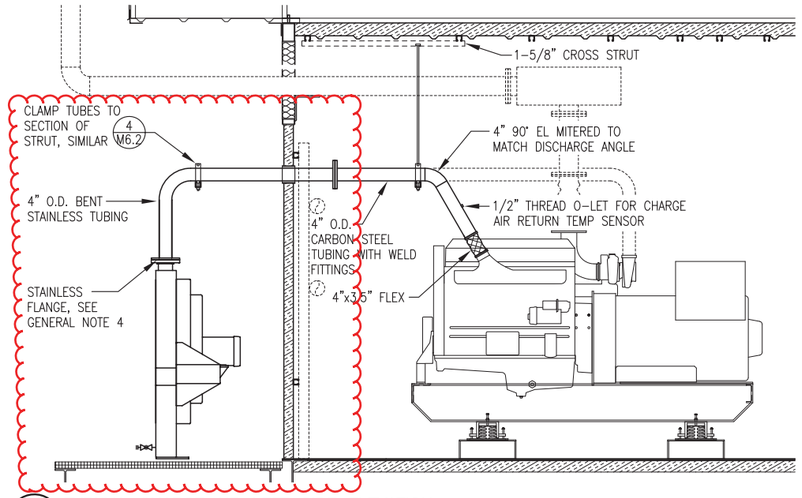
SHEET 18 OF 23



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



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



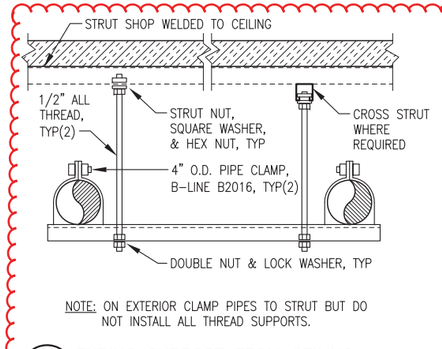
3 M6.2 TYPICAL CHARGE AIR LEFT SIDE ELEVATION
1/2"=1'-0"

CHARGE AIR SYSTEM GENERAL NOTES:

1) ALL CHARGE AIR SYSTEM COMPONENTS TO BE FURNISHED AND INSTALLED AS PART OF MODULE SHOP FABRICATION.
2) ALL TUBING TO BE LIGHT WALL O.D. EXHAUST TUBING, SIZE AS INDICATED, CARBON STEEL ON INTERIOR, TYPE 304 STAINLESS STEEL EXTERIOR OF FLANGE PAIR AS INDICATED. ALL ELBOWS TO BE LONG RADIUS FITTINGS TO MATCH TUBING. ALL JOINTS TO BE WELDED EXCEPT AS INDICATED.
3) ALL FLEX CONNECTIONS HIGH TEMPERATURE DOUBLE HUMP SILICONE TURBO SLEEVES WITH RINGS, 4" I.D. x 3.5" I.D. x 6" LONG, FLEXFAB 7880 OR EQUAL. FASTEN WITH LINED STAINLESS STEEL T-BOLT CLAMPS.
4) MAKE COOLER CONNECTIONS WITH O.D. TUBE BY ANSI 125# STEEL PLATE FLANGES, G.T. EXHAUST PART #41 OR EQUAL. INSTALL HIGH TEMPERATURE FULL FACE GASKETS, DURABLA BLACK OR EQUAL.

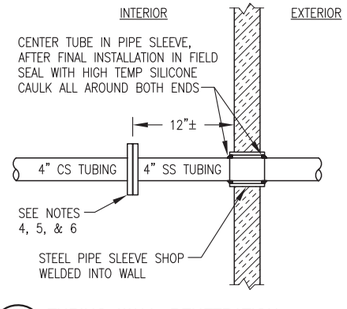
CHARGE AIR SYSTEM SHOP/FIELD NOTES:

1) SHOP FABRICATE COMPLETE CHARGE AIR SYSTEM AS INDICATED. FURNISH ADDITIONAL FLANGES INCLUDING GASKETS AND BOLTS FOR FIELD INSTALLATION BY OTHERS.
2) DURING SHOP FABRICATION RUN TUBING CONTINUOUS FROM COOLER TO ENGINE.
3) DURING SHOP FABRICATION SET COOLER AT GRADE, SHOP FABRICATE AND INSTALL COMPLETE CHARGE AIR ASSEMBLY WITH TEMPORARY CONNECTIONS AS SHOWN IN DETAIL 6/M6.2. AFTER SHOP TESTING CUT OFF CARBON STEEL FLANGE AT COOLER AND REMOVE EXTERIOR BENT TUBE FOR SHIPPING.
4) IN FIELD CUT BENT TUBE TO MATCH FINAL COOLER LOCATION AND WELD STAINLESS FLANGES AT COOLER CONNECTION AND FLANGE PAIR AS SHOWN IN DETAIL 5/M6.2. MAKE FINAL FIELD COOLER CONNECTIONS AND FLANGE PAIR JOINT WITH O.D. TUBE BY ANSI 150# STAINLESS STEEL PLATE FLANGES. INSTALL HIGH TEMPERATURE FULL FACE GASKETS, DURABLA BLACK OR EQUAL
5) AFTER FINAL FIELD ASSEMBLY SEAL PENETRATION IN ACCORDANCE WITH DETAIL 5/M6.2. INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO WALL PENETRATION WITH YARN TAPE, SEE SPECIFICATIONS. FIELD INSTALL 3/4" THREADED BALL VALVE IN COOLER AND PLUG FOR TANK DRAIN, 2 PER COOLER.

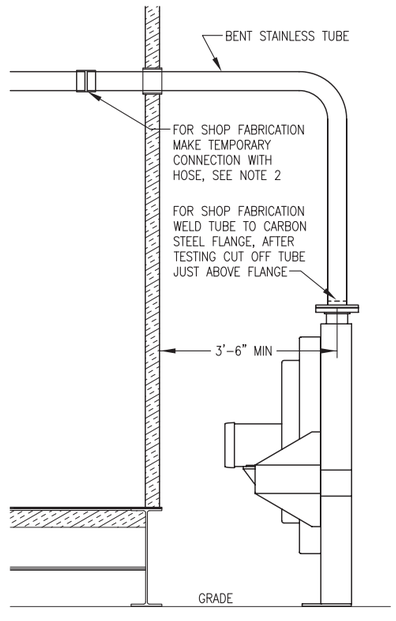


NOTE: ON EXTERIOR CLAMP PIPES TO STRUT BUT DO NOT INSTALL ALL THREAD SUPPORTS.

4 M6.2 TUBING SUPPORT FROM CEILING
NO SCALE



5 M6.2 TUBING WALL PENETRATION
NO SCALE



6 M6.2 SHOP CHARGE AIR CONNECTION
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

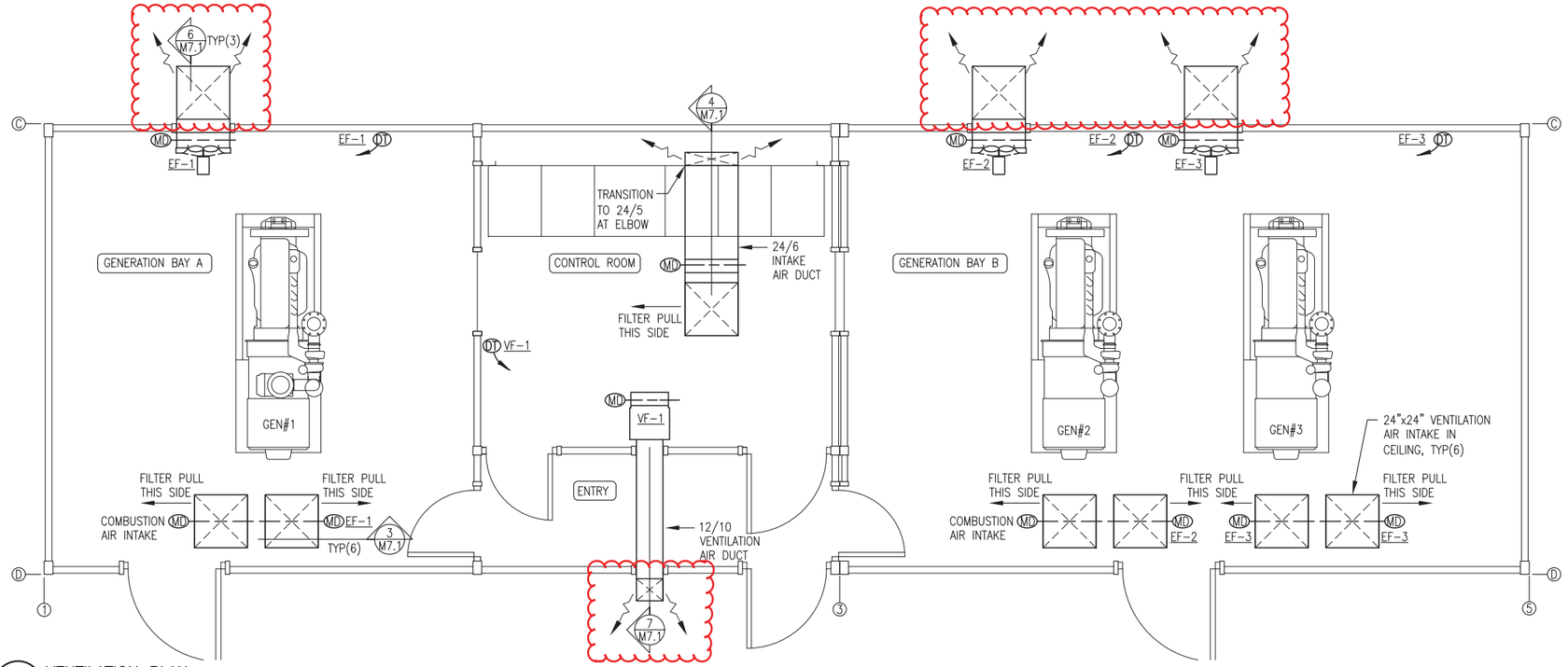
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

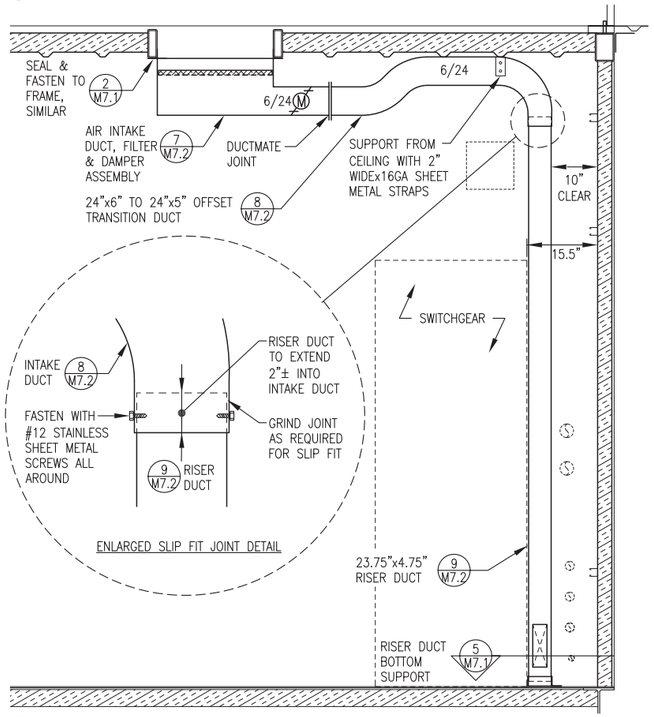
DRAWING TITLE:
CHARGE AIR PLAN & DETAILS

M6.2

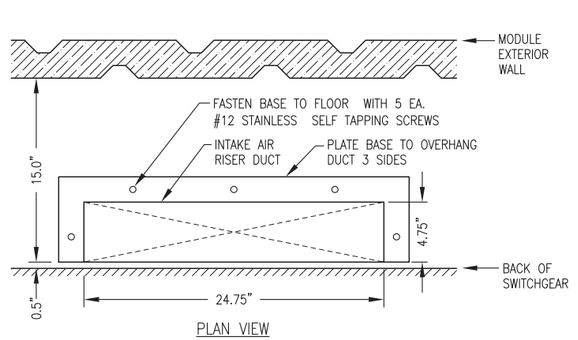
SHEET 19 OF 23



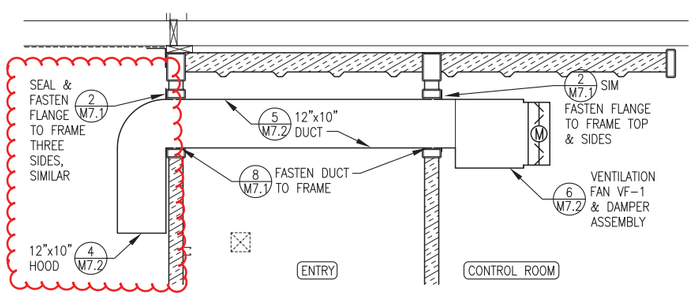
1 M7.1 VENTILATION PLAN
3/8"=1'-0"



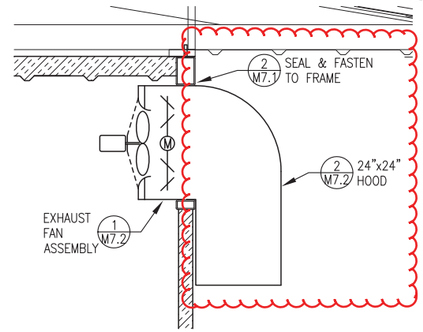
4 M7.1 INTAKE AIR DUCT INSTALLATION
3/4"=1'-0"



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

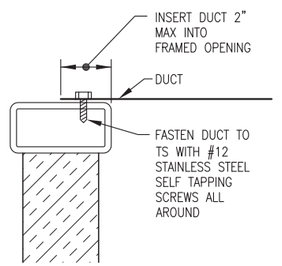


7 M7.1 FAN VF-1 INSTALLATION
3/4"=1'-0"

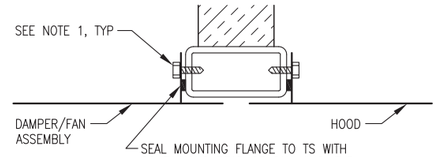


6 M7.1 EXHAUST FAN INSTALLATION
3/4"=1'-0"

NOTE: INSTALL DUCT AS SHOWN PRIOR TO INSTALLING FAN OR HOOD.



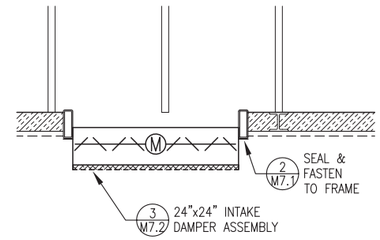
8 M7.1 VF-1 DUCT PENETRATION
4"=1'-0"



NOTES:

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

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



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

VENTILATION SYSTEM SHOP/FIELD NOTES:

1) FURNISH ENTIRE VENTILATION SYSTEM AS PART OF MODULE SHOP FABRICATION.
2) DURING SHOP FABRICATION INSTALL ALL INTERIOR COMPONENTS. TEST FIT OF EXTERIOR HOODS BUT DO NOT INSTALL.
3) IN FIELD INSTALL AND SEAL HOODS AS INDICATED.

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

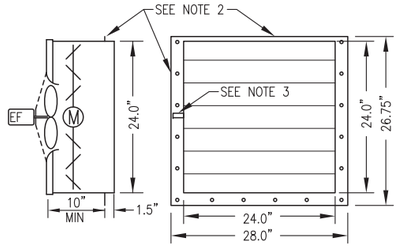
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
VENTILATION PLAN & DETAILS

M7.1

SHEET 20 OF 23



SIDE VIEW FRONT VIEW

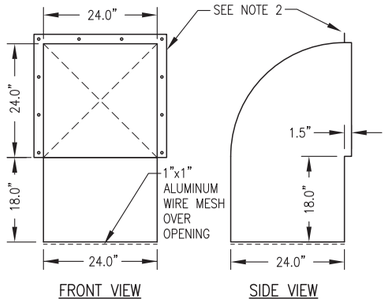
NOTES:

1) FABRICATE THREE IDENTICAL ASSEMBLIES COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON BOTTOM AND SIDES WITH 1/4" HOLES AT 5"± O.C., PROVIDE 3/4" MOUNTING FLANGE ON TOP, NO HOLES.

3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE LEFT SIDE. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES. FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

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



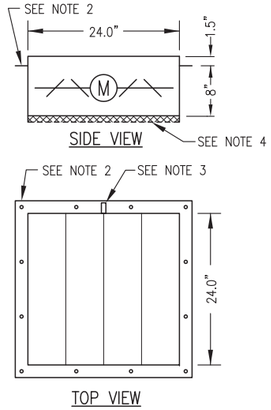
FRONT VIEW SIDE VIEW

NOTES:

1) FABRICATE THREE IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 8"± O.C.

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



SIDE VIEW TOP VIEW

NOTES:

1) FABRICATE SIX IDENTICAL 24"x24" VENTILATION INTAKE ASSEMBLIES.

2) PROVIDE 2" WIDE MOUNTING FLANGE ALL AROUND WITH 1/4" HOLES AT 9" O.C.

3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON ONE SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES.

4) INSTALL FRAME FOR REMOVABLE 24"x24"x1" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE TO ALLOW FILTERS TO SLIDE OUT. SEE PLAN VIEW FOR DAMPER ACTUATOR AND FILTER PULL ORIENTATION.

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

VENTILATION EQUIPMENT SPECIFICATIONS

GENERAL – PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL MECHANICAL CODE AND APPLICABLE SMACNA STANDARDS.

INSTALLATION – EQUIPMENT INSTALLATION IS NOT PART OF THE FABRICATION SCOPE OF WORK. FAN AND DAMPER ASSEMBLIES AND HOODS WILL BE SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS. FASTEN AND SUPPORT ALL FABRICATIONS AS INDICATED.

HOOD AND DUCT FABRICATIONS – FABRICATE ALL HOODS AND THOSE DUCT SECTIONS SPECIFICALLY INDICATED AS ALUMINUM FROM MINIMUM 0.090" THICK TYPE 5052 ALUMINUM USING CONTINUOUS SEAL WELDS FOR ALL JOINTS. GRIND WELDS SMOOTH.

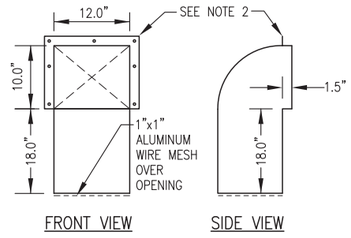
INTERIOR SHEET METAL FABRICATIONS – FABRICATE ALL DAMPER AND FAN ASSEMBLIES FROM MINIMUM 20 GAUGE GALVANIZED SHEET METAL USING STANDARD MECHANICAL JOINTS. SEAL ALL JOINTS AIR TIGHT. AT BIDDERS OPTION INTERIOR FABRICATIONS MAY BE MADE OF WELDED ALUMINUM EQUIVALENT TO HOODS.

EXHAUST FANS – DIRECT DRIVE 18"ø PROPELLER SIDEWALL EXHAUST FAN, 3,592 CFM AT 0.375" SP, 1,725 RPM. FURNISH WITH SPECIAL 3/4 HP, 115 V, 1 PH VARIGREEN MOTOR CONFIGURED FOR 0-10V CONTROL INPUT. GREENHECK SE1-18-424-VG (3/4 HP) OR APPROVED EQUAL.

VENTILATION FAN VF-1 – DIRECT DRIVE IN-LINE CENTRIFUGAL FAN, 475 CFM AT 0.50" SP. FURNISH WITH 1/6 HP, 115 V, 1 PH VARIGREEN MOTOR CONFIGURED FOR 0-10V CONTROL INPUT. GREENHECK CSP-A710-VG OR APPROVED EQUAL.

DAMPERS – OPPOSED BLADE LOW-LEAKAGE CONTROL DAMPER, GALVANIZED STEEL CONSTRUCTION, 304 STAINLESS STEEL BEARINGS AND JAMB SEALS, EPDM BLADE SEALS. GREENHECK VCD-23 OR APPROVED EQUAL. SEE FABRICATION DETAILS FOR SIZES.

ACTUATORS – INSTALL 120V SPRING RETURN ACTUATOR, BELIMO AF-BUP OR APPROVED EQUAL.



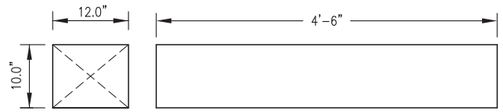
FRONT VIEW SIDE VIEW

NOTES:

1) FABRICATE ONE HOOD FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 8"± O.C.

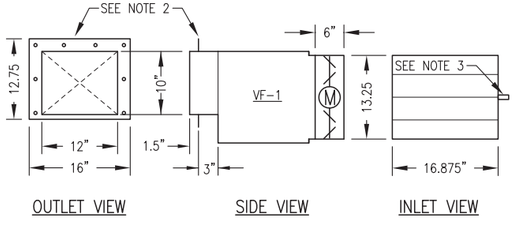
4 M7.2 VF-1 DISCHARGE HOOD FABRICATION
1"=1'-0"



NOTES:

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

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



OUTLET VIEW SIDE VIEW INLET VIEW

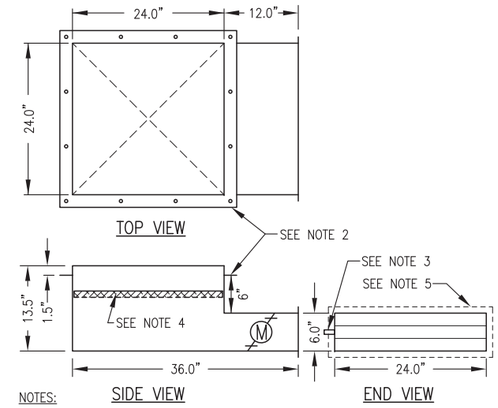
NOTES:

1) FABRICATE ONE ASSEMBLY COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP AND SIDES WITH 1/4" HOLES AT 5"± O.C., PROVIDE 3/4" MOUNTING FLANGE ON BOTTOM, NO HOLES.

3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE RIGHT SIDE. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES. FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

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



SIDE VIEW END VIEW

NOTES:

1) FABRICATE ONE CONTROL ROOM INTAKE AIR ASSEMBLY.

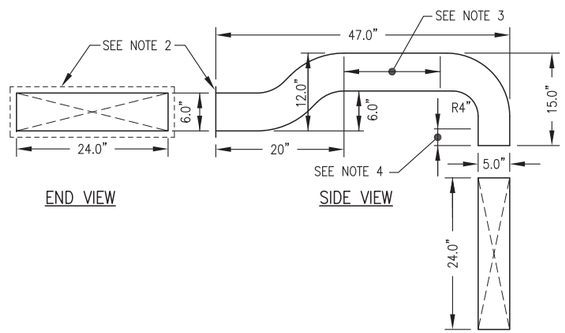
2) PROVIDE 2" WIDE MOUNTING FLANGE ALL AROUND WITH 1/4" HOLES AT 9" O.C.

3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON ONE SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME. INSTALL BELIMO AF-BUP ACTUATOR, NO SUBSTITUTES.

4) INSTALL FRAME FOR REMOVABLE 24"x24"x1" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE FOR FILTER REMOVAL. SEE PLAN FOR DAMPER ACTUATOR & FILTER PULL ORIENTATION.

5) SHOP MOUNT DUCT MATE CONNECTION

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

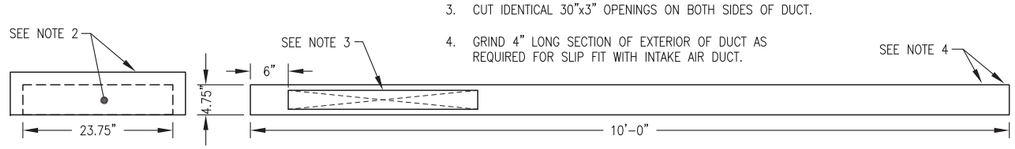


END VIEW SIDE VIEW BOTTOM VIEW

NOTES:

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

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



BOTTOM VIEW SIDE VIEW

NOTES:

1. FABRICATE ONE 23.75"x4.75" DUCT FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.
2. 7"x28"x1/4" SOLID ALUMINUM PLATE BOTTOM, OVERHANG 3 SIDES 2"±, FLUSH ON ONE SIDE.
3. CUT IDENTICAL 30"x3" OPENINGS ON BOTH SIDES OF DUCT.
4. GRIND 4" LONG SECTION OF EXTERIOR OF DUCT AS REQUIRED FOR SLIP FIT WITH INTAKE AIR DUCT.

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION
1	3/6/17	EQUIP OR EQUAL

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

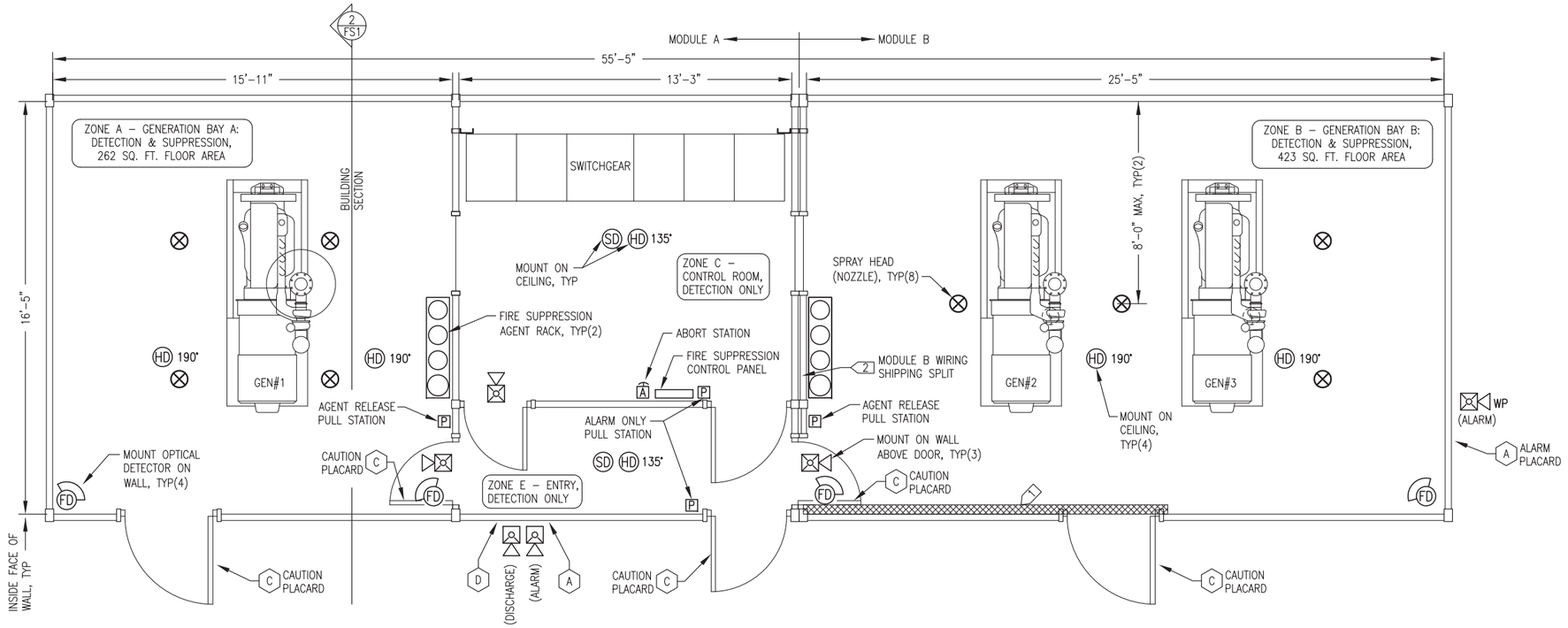
STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

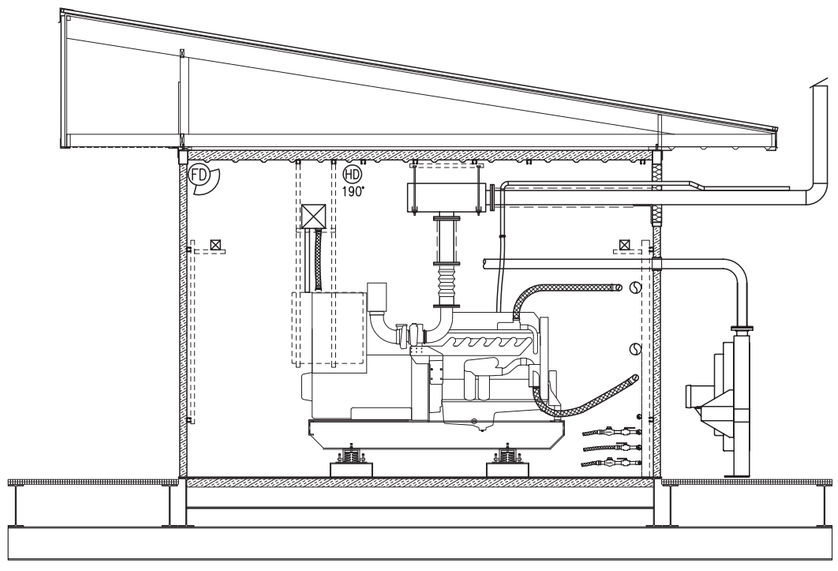
DRAWING TITLE:
SHEET METAL FABRICATION DETAILS & SPECIFICATIONS

M7.2

SHEET 21 OF 23



1 FS1 FIRE SUPPRESSION SYSTEM PLAN
3/8"=1'-0"



2 FS1 TYPICAL SECTION THROUGH MODULE
3/8"=1'-0"

FIRE SUPPRESSION SYMBOL LEGEND

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

FIRE SUPPRESSION PLACARD SCHEDULE

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

FIRE SUPPRESSION WIRE SCHEDULE

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

GENERAL NOTES:

1) INTERIOR FINISH OF ALL WALLS, FLOOR, AND CEILING WELDED STEEL PLATE. CEILING HEIGHT IN ALL ROOMS 11'–2" ABOVE FINISHED FLOOR.

2) ALL DOORS SELF–CLOSING WITH GASKETS. ALL BUILDING PIPING AND CONDUIT PENETRATIONS SEALED LIQUID TIGHT. ALL BUILDING DUCT PENETRATIONS EQUIPPED WITH MOTORIZED DAMPERS THAT CLOSE ON GENERATOR SHUT DOWN.

SPECIFIC NOTES:

1 THE HATCHED AREA INDICATES THE PORTION OF THE ZONE WHERE THE SPRAY HEAD TO WALL DISTANCE EXCEEDS 8'–0". THIS AREA DOES NOT CONTAIN ANY COMBUSTIBLE MATERIAL OR SOURCES OF IGNITION. THE HEAD LAYOUT IS DESIGNED TO PROVIDE THE REQUIRED SUPPRESSION FOR THIS ZONE. NOTE THAT THE ROOM VOLUME IS WITHIN THE MAXIMUM VOLUME LIMITATION OF THE SYSTEM.

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
FIRE SUPPRESSION SYSTEM PLAN, SECTION & LEGEND

FS1

SHEET 22 OF 23

PART 1 – GENERAL

1.01 SCOPE

A. The work involves design, installation, testing, and certification of an automatic fire suppression system for a power generation module. The module is built in two sections (shipping splits) to facilitate shipping and installation at the final destination. Module A consists of a generation bay with a single diesel engine generator, a control room, and an entry. Module B consists of a generation bay with two diesel engine generators and a fuel oil day tank.

B. All generation equipment and supporting mechanical and electrical systems will be installed prior to installation of the fire suppression system. All fire suppression system installation, testing, certification, and training will occur in Anchorage.

C. The module will be completely fabricated and assembled in Anchorage with the two sections bolted together into a single structure. Upon final acceptance by the AEA in Anchorage, the module will be separated and the Module B wiring will be disconnected as noted. The module will then be shipped to Kipnuk for installation, final assembly, and commissioning.

1.02 WORK INCLUDED

A. Submittals including CAD drawings.

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

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

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

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

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

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

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

1.03 QUALITY ASSURANCE

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

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

1.04 REFERENCED STANDARDS:

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

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

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

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

1.05 SUBMITTALS

A. Within 2 weeks of award of contract provide a complete engineering submittal in Adobe PDF format for review and approval by AEA. Submittal to include:
1. Manufacturer, model numbers and quantity of each device.
2. Manufacturer and model of control panel, including installed options.
3. Agent piping layout including size and quantity of nozzles.
4. Calculations.
5. Pre–construction shop drawings. The shop drawings shall indicate compliance with all requirements of the specifications and shall contain at a minimum floor plans, wiring diagrams, panel configuration, device installation details, piping isometrics, material lists, specifications, installation notes, and system sequence of operation.

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

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

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

1.06 SUBSTITUTIONS

A. All substitutions shall be noted on equipment submittals.

1.07 WARRANTY

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

PART 2 – MATERIALS

2.01 Fire Suppression Agent

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

2.02 Agent Rack

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

2.03 Fire Control Panel

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

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

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

2.04 SECONDARY POWER SOURCE BATTERIES

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

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

2.05 HEAT DETECTOR

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

2.06 FLAME (OPTICAL) DETECTOR

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

2.07 SMOKE (PHOTOELECTRIC) DETECTOR

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

2.08 ANNUNCIATORS

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

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

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

2.09 MANUAL PULL STATION

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

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

2.10 ABORT STATION

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

2.11 DEVICE MONITORING MODULES

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

2.12 RACEWAYS AND CONDUCTORS

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

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

2.13 PIPING

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

2.14 SUPPORT

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

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

2.15 PLACARDS

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

PART 3 – EXECUTION

3.01 DESIGN

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

1. Generation Bay A shall contain agent rack, discharge piping and nozzles. Two flame detectors shall be cross–zoned so that any one detector will set off alarm and shut–down generators. Any second detector will begin a 30 second countdown to agent release. Two high temperature heat detectors shall be cross–zoned in the same sequence as the flame detectors. Exit shall have a manual "Agent Release" pull station which will begin a 30 second countdown to agent release when activated.
2. Generation Bay B shall contain the same equipment and shall operate with the same sequence as Generation Bay A
3. The Control Room shall contain the control panel, one smoke detector and one normal temperature heat detector. Either detector will set off alarm and will shut–down generators. An abort station shall be located near the control panel. In the event of a false alarm, pressing and holding the abort button will stop the 30 second countdown to release, and silence audible alarms. Once released, audible alarms will resume and 30 second countdown will restart. The abort will not function in the event of a manual release.
4. The Entry shall contain one smoke detector and one normal temperature heat detector. Either detector will set off alarm and will shut–down generators. Exit shall have an "Alarm" manual pull station which will set off alarm and shut down generators when activated but will not cause system discharge.

B. B. Provide quantity and distribution of nozzles as indicated to flood protected zones with exception as specifically noted.

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

3.02 EXECUTION

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

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

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

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

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

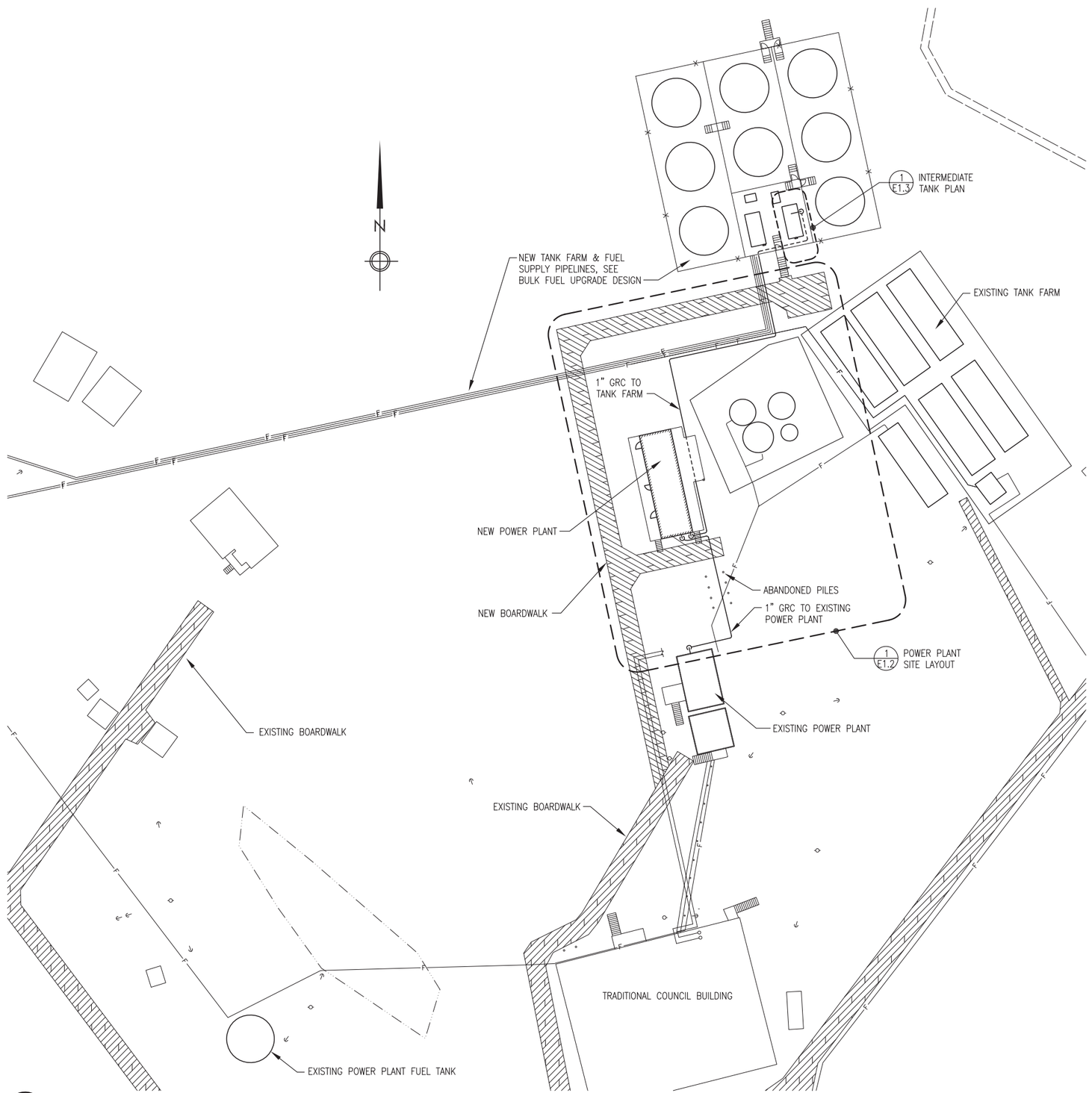
DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
FIRE SUPPRESSION SYSTEM SPECIFICATIONS

FS2

SHEET 23 OF 23

SCHEDULE OF DRAWINGS



1 E1.1 OVERALL PROJECT SITE PLAN
1"=30'

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

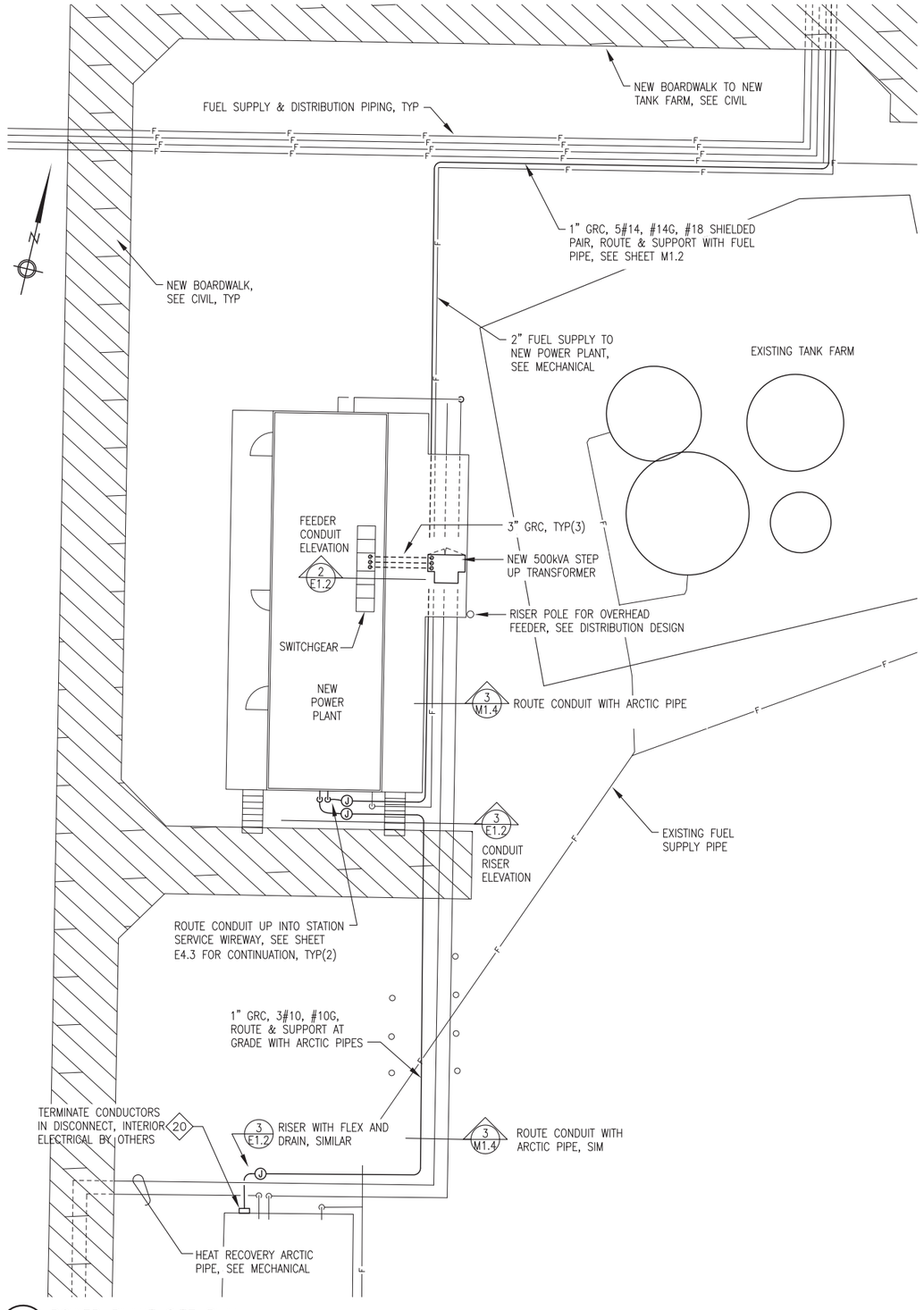
STATE OF ALASKA
49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

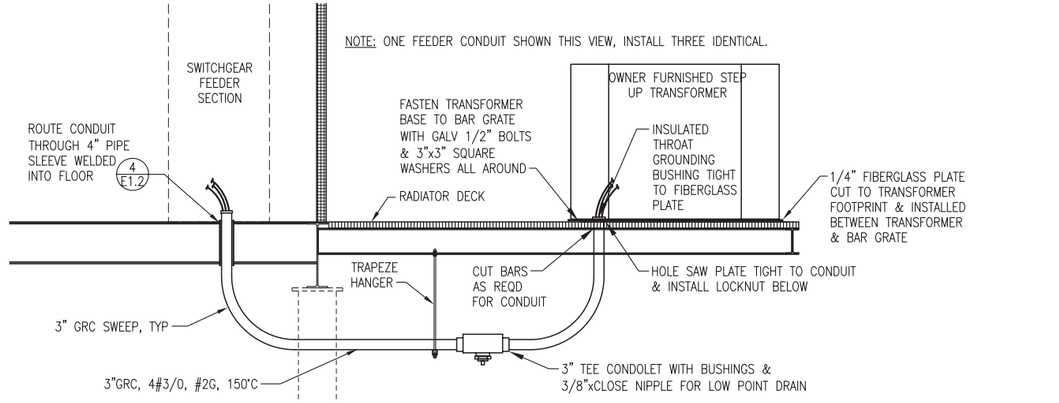
DRAWING TITLE:
SCHEDULE OF DRAWINGS & OVERALL SITE PLAN

E1.1

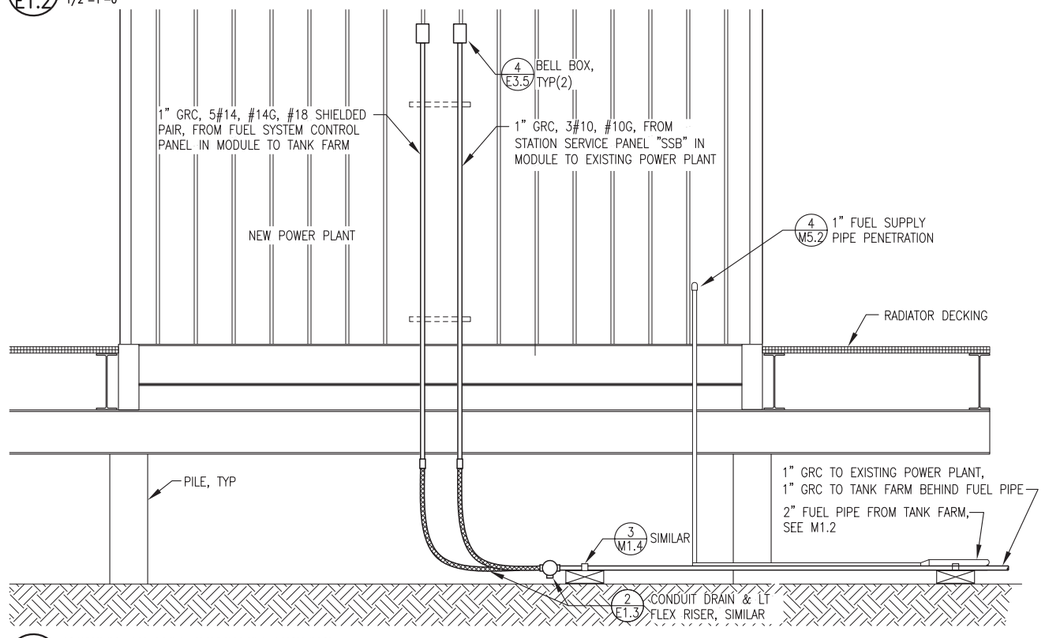
SHEET 1 OF 19



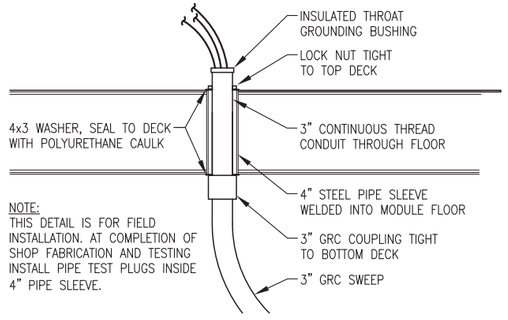
1 E1.2 POWER PLANT SITE PLAN
1"=10'



2 E1.2 FEEDER CONDUIT ELEVATION VIEW
1/2"=1'-0"



3 E1.2 POWER PLANT CONDUIT RISERS
1/2"=1'-0"



4 E1.2 FEEDER CONDUIT MODULE FLOOR PENETRATION
NO SCALE

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS		
REV	DATE	DESCRIPTION
1	3/6/17	ADD FEEDER DRAIN

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

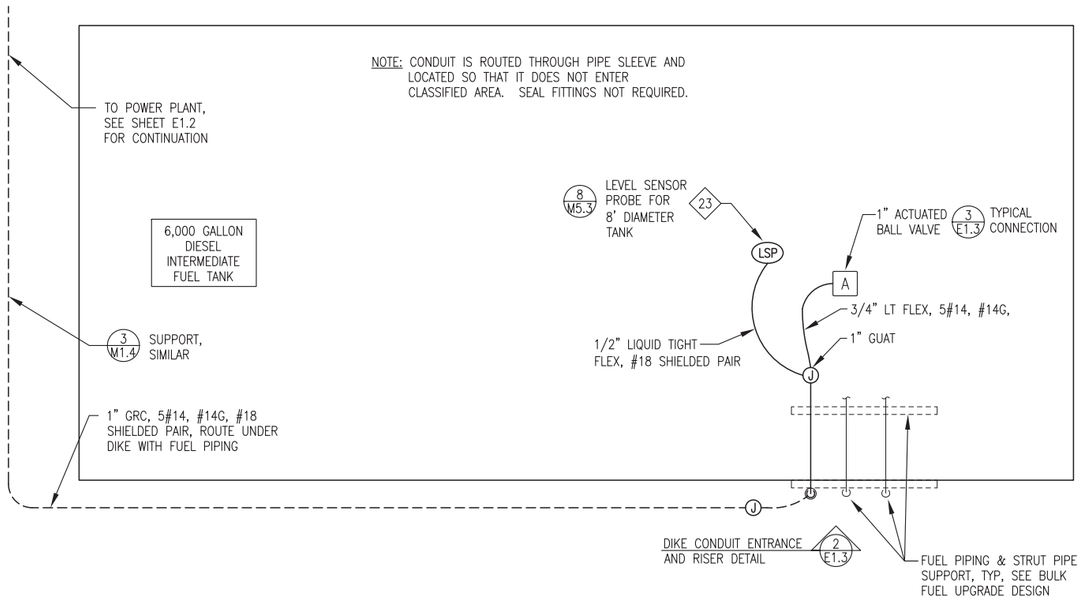
STATE OF ALASKA 49TH
CLOS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

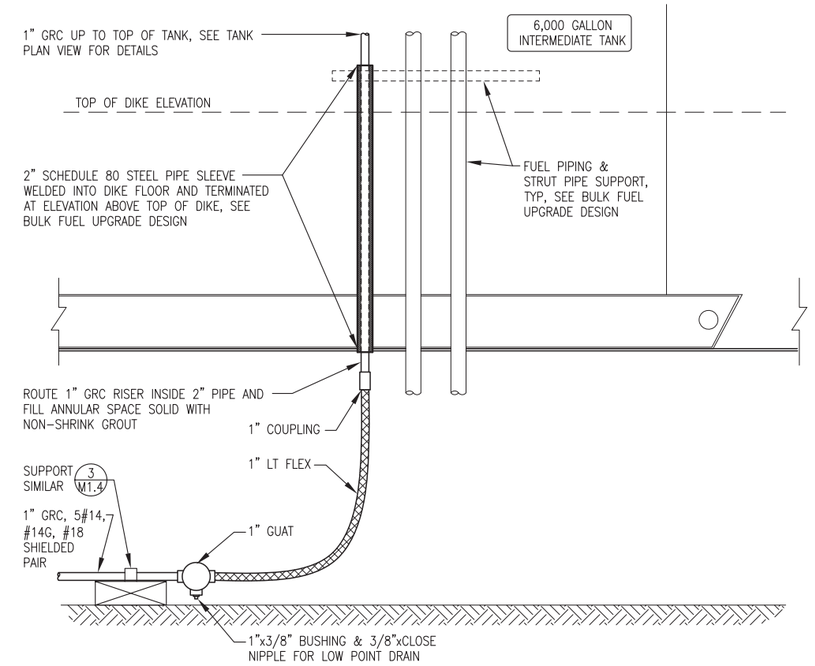
DRAWING TITLE:
POWER PLANT
SITE PLAN & DETAILS

E1.2

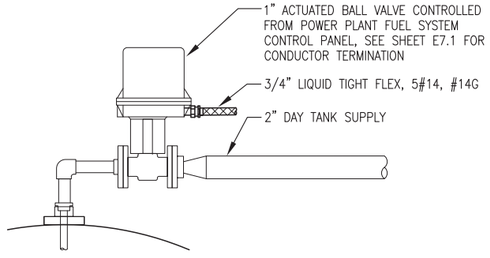
SHEET 2 OF 19



1 E1.3 INTERMEDIATE FUEL TANK PLAN VIEW
3/4"=1'-0"



2 E1.3 DIKE CONDUIT ENTRANCE AND RISER
3/4"=1'-0"



3 E1.3 TYP ACTUATOR VALVE CONNECTION
NO SCALE

ALL WORK THIS SHEET IS PROVIDED BY PROJECT.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
INTERMEDIATE FUEL TANK PLAN & DETAILS

E1.3

SHEET 3 OF 19

** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE INCLUDING STATE OF ALASKA AMENDMENTS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. WHERE ADDITIONAL OR REPLACEMENT ITEMS ARE REQUIRED, PROVIDE LIKE ITEMS BY THE SAME MANUFACTURER TO THE MAXIMUM EXTENT PRACTICAL. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PROTECT ALL MATERIALS AND EQUIPMENT DURING THE ENTIRE DURATION OF CONSTRUCTION WORK AGAINST CONTAMINATION OR DAMAGE. REPLACE OR REPAIR TO ORIGINAL MANUFACTURED CONDITION ANY ITEMS DAMAGED DURING CONSTRUCTION. IMMEDIATELY REPORT TO THE ENGINEER ANY ITEMS FOUND DAMAGED PRIOR TO COMMENCING CONSTRUCTION.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT, DRILL, OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES. WHERE PREVIOUSLY COMPLETED BUILDING SURFACES OR OTHER FEATURES MUST BE CUT, PENETRATED, OR OTHERWISE ALTERED, SUCH WORK SHALL BE CAREFULLY LAID OUT AND PERFORMED, AND PATCHED TO ORIGINAL CONDITION. SEAL ALL EXTERIOR FLOOR AND WALL PENETRATIONS AS INDICATED.

CONTACT THE ENGINEER ONE-WEEK PRIOR TO COMPLETION OF ALL WORK TO SCHEDULE A SUBSTANTIAL COMPLETION INSPECTION. THE ENGINEER WILL GENERATE A PUNCH LIST OF CORRECTIVE ACTION ITEMS DURING THE INSPECTION. WORK WILL NOT BE CONSIDERED COMPLETE UNTIL ALL CORRECTIVE ACTION ITEMS IN THE ENGINEERS PUNCH LIST HAVE BEEN SATISFACTORILY COMPLETED AND PHOTOGRAPHIC OR OTHER POSITIVE DOCUMENTATION HAS BEEN PROVIDED TO THE ENGINEER.

PROVIDE ONE SET OF DRAWINGS CLEARLY MARKED UP WITH ALL AS-BUILT INFORMATION TO THE ENGINEER WITHIN TWO WEEKS OF COMPLETION.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

CHANGE OVER FROM OLD SYSTEMS TO NEW SYSTEMS WILL REQUIRE SHUT DOWN OF THE POWER GENERATION SYSTEM. PLAN OUT AND COORDINATE WORK TO MINIMIZE DISRUPTION OF LOCAL POWER SERVICE. SCHEDULE OUTAGES IN ADVANCE WITH THE VILLAGE OFFICE.

** SUPPORT **

INDEPENDENTLY SUPPORT EACH DEVICE AND RACEWAY FROM STRUCTURES USING STRUT OR FABRICATED BRACKETS. ALL STRUT, BRACKETS, FITTINGS, PIPE CLAMPS, FASTENERS, AND ACCESSORIES SHALL BE GALVANIZED OR ZINC PLATED EXCEPT ON ALL EXTERIOR INSTALLATIONS HOT DIP GALVANIZED.

** DEVICES AND EQUIPMENT **

DEVICES – LISTED FOR INTENDED SERVICE. MANUFACTURER/MODEL IN THE EQUIPMENT SCHEDULE IS PROVIDED TO INDICATE REQUIRED FEATURES. SUBSTITUTIONS OF EQUIVALENT ITEMS WILL BE ACCEPTED UNLESS ITEM SPECIFICALLY INDICATED NO SUBSTITUTES. INSTALL ALL DEVICES SUCH THAT MINIMUM REQUIRED ACCESS CLEARANCE IS MAINTAINED.

CONTROL PANELS – PROVIDE SHOP FABRICATED CONTROL PANELS AS REQUIRED. WHERE SPECIFICALLY INDICATED ON PANEL DRAWINGS PROVIDE LOGIC, LAYOUT, AND DEVICES AS INDICATED. ALL PANELS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH AN APPROPRIATE THIRD PARTY INDEPENDENT STANDARD. BENCH TEST TO BE PERFORMED AT THE MANUFACTURING FACILITY PRIOR TO SHIPMENT.

NAMEPLATES – LAMACOID TYPE BLACK WITH WHITE CORE, BEVELED EDGES. PROVIDE NAMEPLATES FOR EACH DEVICE, DISCONNECT SWITCH, AND CONTROL PANELS/DEVICES. SPECIFICALLY, LABEL ALL BATTERY CHARGERS FOR THE ASSOCIATED GENERATING UNIT. ATTACH NAMEPLATES WITH EPOXY ADHESIVE OR SELF-TAPPING SCREWS.

** RACEWAYS **

INTERIOR – ALL INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING (EMT) EXCEPT WHERE SPECIFICALLY INDICATED AS WIREWAY. WIREWAY SHALL BE NEMA 1 WITH HINGED COVER AND MANUFACTURER PROVIDED CONNECTORS AND FITTINGS.

EXTERIOR – ALL EXTERIOR ABOVE GRADE LOCATIONS SHALL BE GALVANIZED RIGID CONDUIT (GRC). CLEAN AND DE-GREASE THREADS AFTER CUTTING & SPRAY WITH COLD GALV PRIOR TO ASSEMBLY. WRAP ALL JOINTS WITH HEAT SHRINK TAPE AS INDICATED.

FLEX – PROVIDE LIQUID TIGHT OIL RESISTANT FLEXIBLE CONDUIT WHERE INDICATED, AS REQUIRED TO ACCOMMODATE MOVEMENT, AND FOR FINAL CONNECTIONS TO EQUIPMENT REQUIRING SERVICE.

TERMINATION – CONDUITS TERMINATING IN EXTERIOR ENCLOSURES SHALL UTILIZE A WEATHERPROOF CONDUIT HUB. CONDUITS TERMINATING IN INDOOR ENCLOSURES SHALL UTILIZE LOCKNUTS INSIDE AND OUT WITH A METALLIC CONDUIT BUSHING, HUB, OR BOX CONNECTOR INSIDE THE ENCLOSURE.

** CONDUCTORS **

GENERATOR LEADS, COMMUNITY DISTRIBUTION FEEDER, AND BATTERY CABLES – HIGH TEMPERATURE, EXTRA FLEXIBLE CABLE. 1000V, 150°C THERMOSET EPDM INSULATION WITH TIN COATED COPPER CONDUCTOR. COBRA CABLE, HOUSTON WIRE & CABLE, OR APPROVED EQUAL. ON GENERATOR LEADS AND COMMUNITY DISTRIBUTION FEEDER 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 THHN INSULATION, 600V AND 75C RATED.

CONDUCTORS INSTALLED IN EXTERIOR LOCATIONS (EXCEPT 480V COMMUNITY FEEDERS) – CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW-2 INSULATION, 600V AND 90C RATED.

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

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.

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. EQUIPMENT GROUNDING CONDUCTORS FOR THE GENERATOR LEADS SHALL BE TYPE VW-1 AS SPECIFIED FOR GENERATOR LEADS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

GENERATOR CONTROL CONDUCTORS – HIGH TEMPERATURE, EXTRA FLEXIBLE CABLE OR TYPE XHHW AS SPECIFIED ABOVE FOR INDIVIDUAL CONDUCTORS. SPECIALTY CONDUCTORS AS SPECIFIED BELOW WHERE INDICATED.

SHIELDED CONDUCTORS – STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH A STRANDED TINNED COPPER DRAIN WIRE, AND PVC OUTER JACKET. SINGLE PAIR TWISTED #18 AWG, BELDEN #1120A OR EQUAL. SINGLE TRIAD TWISTED #18 AWG, BELDEN #1121A OR EQUAL. FOUR PAIR TWISTED #18 AWG, BELDEN #1049A OR EQUAL. SINGLE PAIR CANBUS CABLE #22 AWG TWISTED PAIRS, BELDEN 3105A OR EQUAL.

ETHERNET CABLE – CATEGORY 5E UNBONDED-PAIR CABLE, FOUR PAIR TWISTED, 24 GAUGE COPPER CONDUCTORS, 300V FEP INSULATION. BELDEN 1585LC OR EQUAL.

** ENGINE GENERATORS **

PROVIDE DETROIT DIESEL SERIES 60 ENGINE-GENERATOR SETS OF PRIME CAPACITY INDICATED, NO SUBSTITUTES. THE ENGINE-GENERATOR SETS SHALL BE MOUNTED ON WELDED STRUCTURAL STEEL BASE COMPLETE WITH VIBRATION ISOLATORS. MATERIALS AND EQUIPMENT SHALL BE NEW AND OF CURRENT DESIGN, DELIVERED TO THE SITE COMPLETELY WIRED, TESTED AND READY FOR INSTALLATION. PROVIDE COMPLETE WITH 24VDC STARTING SYSTEM, EXHAUST SYSTEM, DRIP PAN, AND ALL OTHER ACCESSORIES AS INDICATED AND REQUIRED. SEE THE ENGINE GENERATOR PURCHASE SPECIFICATIONS FOR ADDITIONAL DETAIL.

** PARALLELING SWITCHGEAR **

PROVIDE A FREESTANDING NEMA 1 ENCLOSURE WITH HINGED FRONT-OPENING DOORS. THE PANEL SHALL BE CONFIGURED AS INDICATED IN THE DRAWINGS. PANEL SHALL BE RATED 3,000 AMPERE COPPER, 3-PHASE, 4-WIRE WITH NEUTRAL AND GROUND BUSES. COMPLETE WITH PROVISIONS FOR THREE GENERATORS, MASTER CONTROL, ONE FEEDER, TWO CHARGE AIR COOLER VFDS, AND TWO RADIATOR VFDS AS INDICATED. EQUIPMENT ARRANGEMENT AND SIZES SHALL CONFORM TO THE LAYOUT DRAWINGS AND ONE-LINE DIAGRAM. PANEL SHALL BE PAINTED ANSI 61 GRAY.

IN UPPER SECTION OF EACH GENERATOR SECTION PROVIDE A GENSET CONTROL (EZG), WOODWARD EASYGEN 3100-P2 CONTROLLER WITH AEA CUSTOM PUSH BUTTON CONTROLS AND INTERFACE SCREEN, NO SUBSTITUTES. CONFIGURE THE CONTROL PACKAGE TO PERFORM: AUTOMATIC PARALLELING AND SYNCHRONIZATION; CONTACTOR OPEN/CLOSE CONTROL; ENGINE SPEED CONTROL; LOAD SHARE; SAFETY SHUT DOWNS; PROTECTIVE RELAYING; AND POWER MONITOR WITH VOLTS, AMPS FREQUENCY, KW, PF, AND TOTAL KWH. ALSO PROVIDE MANUAL CONTROL.

PROVIDE THE FOLLOWING PROTECTION FOR EACH GENERATING UNIT: OVERCRANK; OVERSPEED; OVER/UNDER VOLTAGE; OVER/UNDER FREQUENCY; REVERSE POWER; OVERCURRENT; HIGH JACKET WATER TEMPERATURE; HIGH LUBE OIL TEMPERATURE; LOW LUBE OIL PRESSURE; HIGH/LOW LUBE OIL LEVEL; PLUGGED AIR FILTER; HIGH INTAKE AIR TEMPERATURE. PROVIDE ANNUNCIATION PANEL WITH LED LAMPS FOR INDICATION OF ENGINE STATUS AND ALL ALARM CONDITIONS.

IN LOWER SECTION OF EACH GENERATOR SECTION PROVIDE AN ELECTRICALLY OPERATED STATIONARY MOUNT CIRCUIT BREAKER FOR NORMAL ON/OFF LINE CONTROL.

PROVIDE THE FOLLOWING EQUIPMENT IN THE MASTER CONTROL SECTION TO SERVE ALL GENERATING UNITS: PROGRAMMABLE LOGIC CONTROLLER (PLC) FOR AUTOMATIC LOAD CONTROL AND SENSING; OPERATOR INTERFACE UNIT FOR OPERATOR CHANGES TO THE LOAD CONTROL SET POINTS IN THE PLC; MICROPROCESSOR BASED KILOWATT-HOUR METERS FOR THE BUS, AND STATION SERVICE. PROVIDE ANNUNCIATION PANEL WITH LED LAMPS FOR INDICATION OF SYSTEM STATUS AND ALL ALARM CONDITIONS.

PROVIDE FEEDER AND STATION SERVICE SECTIONS COMPLETE WITH: STATIONARY-MOUNT ELECTRICALLY OPERATED CIRCUIT BREAKER FOR THE COMMUNITY FEEDER; FEEDER PROTECTION RELAY; MOLDED CASE CIRCUIT BREAKERS FOR THE VFD AND STATION SERVICE, AND VARIABLE FREQUENCY DRIVES AS INDICATED. ALL CIRCUIT BREAKER SIZES AND TRIP SETTINGS SHALL BE AS INDICATED ON THE ONE-LINE DIAGRAM.

OPERATION – THE PARALLELING SWITCHGEAR SHALL ALLOW THE OPERATOR TO SELECT EITHER MANUAL OPERATION OF ANY OR ALL OF THE GENERATING UNITS OR COMPLETE UNATTENDED AUTOMATIC OPERATION. THE CONTROL SYSTEM SHALL ALLOW THE SELECTION OF ALL OF THE GENERATING UNITS TO OPERATE IN MANUAL OR AUTOMATIC MODE OR A PORTION OF THE GENERATING UNITS TO OPERATE IN MANUAL MODE AND THE REMAINDER IN AUTOMATIC MODE. SELECTION OF MANUAL OR AUTOMATIC MODE SHALL MADE BE WITH THE EZG.

AUTOMATIC – WHEN THE UNIT IS IN THE AUTOMATIC MODE, THE PROGRAMMABLE LOGIC CONTROLLER (PLC) SHALL SENSE THE DEMAND ON THE SYSTEM AND SHALL AUTOMATICALLY SELECT THE MOST APPROPRIATE ENGINE/GENERATOR UNIT OR COMBINATION OF UNITS TO MEET THE DEMAND. THE PLC SHALL COMMAND THE EZG TO AUTOMATICALLY START THE ENGINE/GENERATOR UNITS, BRING THEM TO THE PROPER SPEED, SYNCHRONIZE THE UNITS, AND CLOSE THE GENERATOR TO THE BUS. WHEN THE PLC REMOVES AN ENGINE/GENERATOR FROM SERVICE, THE EZG SHALL REMOVE THE UNIT FROM THE BUS AND ALLOW THE ENGINE TO OPERATE FOR A COOLDOWN PERIOD BEFORE STOPPING THE ENGINE.

MANUAL – IN THE MANUAL MODE, THE OPERATOR SHALL BE ABLE TO START THE ENGINE/GENERATOR USING THE EZG. THE EZG WILL START THE ENGINE/GENERATOR, BRING THE ENGINE UP TO SPEED, AND SYNCHRONIZE THE GENERATOR TO THE BUS. THIS SHALL BE ACCOMPLISHED INDEPENDENTLY FROM THE PLC.

EMERGENCY SHUTDOWN – UPON RECEIPT OF A CONTACT CLOSURE FROM THE FIRE SUPPRESSION SYSTEM OR THE EMERGENCY STOP PUSHBUTTON ALL OPERATING ENGINES SHALL BE IMMEDIATELY SHUT DOWN WITHOUT GOING THROUGH A SHUTDOWN PROCEDURE. THE SYSTEM SHALL REMAIN IN A LOCKOUT CONDITION UNTIL ALL ALARMS ARE CLEARED.

LOW COOLANT SHUTDOWN – UPON RECEIPT OF A CONTACT CLOSURE FROM THE LOW COOLANT LEVEL SWITCH, ALL OPERATING ENGINES ON THE ASSOCIATED COOLING SYSTEM SHALL BE IMMEDIATELY SHUT DOWN WITHOUT GOING THROUGH A SHUTDOWN PROCEDURE AND SHALL REMAIN IN A LOCKOUT CONDITION UNTIL THE ALARM IS CLEARED.

LOW FUEL LEVEL ALARM – A NORMALLY CLOSED CONTACT ON THE DAY TANK CONTROL PANEL SHALL OPEN ON A LOW FUEL LEVEL. THE LOW FUEL LEVEL INDICATION SHALL START A TIME DELAY RELAY, 2 HOURS, ADJUSTABLE, AND ILLUMINATE A RED LAMP "LOW FUEL LEVEL". IF THE FUEL LEVEL HAS NOT BEEN CORRECTED BY THE END OF THE TIMED INTERVAL THE ENGINES SHALL BE SHUT DOWN AND THE ALARM LAMP SHALL REMAIN ILLUMINATED. A MANUAL RESET BUTTON ON THE FRONT OF THE SWITCHGEAR SHALL BE PROVIDED TO RESET THE TIMER RELAY FOR ANOTHER INTERVAL AND PLACE THE ENGINES BACK IN SERVICE (IF TIMED OUT). THE RESET FUNCTION SHALL WORK ANY TIME DURING OR AFTER EXPIRATION OF THE TIMED INTERVAL.

SEE THE AUTOMATIC PARALLELING SWITCHGEAR PURCHASE SPECIFICATIONS FOR ADDITIONAL DETAIL.

** TESTING AND STARTUP**

EACH ENGINE/GENERATOR UNIT SHALL BE LOAD TESTED AT THE FACTORY FOR A MINIMUM OF 8 HOURS.

THE PARALLELING SWITCHGEAR SHALL BE FACTORY TESTED TO VERIFY ALL CONTROL AND ALARM FEATURES.

THE ENTIRE GENERATION PACKAGE SHALL BE FIELD TESTED WITH A LOAD BANK PRIOR TO PLACING IN SERVICE. FIELD TESTING SHALL INCLUDE ALL FEATURES OF BOTH AUTOMATIC AND MANUAL MODES PLUS ALL ALARM AND SHUTDOWN FUNCTIONS. LOCAL PLANT OPERATORS SHALL PARTICIPATE IN ALL TESTING.

ALL STATION SERVICE EQUIPMENT SHALL BE TESTED TO VERIFY PROPER OPERATION. ALL CONTROL AND ALARM FUNCTIONS SHALL BE VERIFIED.

UPON SUCCESSFUL COMPLETION OF TESTING, THE PLANT SHALL BE PLACED IN SERVICE. A MINIMUM OF ONE WEEK OF SYSTEM PERFORMANCE MONITORING AND LOCAL OPERATOR TRAINING SHALL BE PROVIDED UPON SYSTEM STARTUP PRIOR TO LEAVING THE PROJECT SITE.

ELECTRICAL EQUIPMENT SCHEDULE

ITEM NO.	DESCRIPTION	MANUFACTURER
1	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELOCK MT4-115-WH-VNS
2	DAY TANK VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VASPST 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
3	LINE VOLTAGE HEATING/COOLING THERMOSTAT, 16 FLA @ 120V, SPDT, 50F TO 80F RANGE.	DAYTON 1UHH2
4	AREA LIGHT, WIDE DISPERSION WALL PACK. LED, 17.7W, 120-277V DRIVER.	HUBBELL NRG-356L-5K-U-PC
5	EMERGENCY LIGHT, UNIVERSAL MOUNT, WHITE 20 GA STEEL ENCLOSURE, 277/120V INPUT, NI-CAD BATTERY, 12VDC, 180W, DUAL 3.6W LED LAMPS	EXITRONICS RS12N-130-REN-2-2-W
6	EMERGENCY/EXIT COMBO LIGHTS – UNIVERSAL MOUNT, WHITE PLASTIC ENCLOSURE, RED EXIT SIGN, 277/120V INPUT, DUAL 1.5W 9.6V LED LAMPS. WITH OPTIONAL HIGH OUTPUT NI-CAD BATTERY	LITHONIA LHQM-LED-R-HO OR EQUAL
7	NOT USED	
8	SURFACE MOUNTED/SUSPENDED FLUORESCENT FIXTURE, WIDE DISTRIBUTION, 48" LONG, 3 TUBE T8, INSTANT START MULTI VOLTAGE ENERGY SAVING BALLAST, INSTALL PHILLIPS LED INSTA-FIT LAMPS, 16.5W 5000'K IN GENERATION ROOM AND 12.5W 3500'K IN CONTROL ROOM	LITHONIA MS8 ST 3 32 WD MULT WITH PHILLIPS 43489-4 (5000'K) OR PHILLIPS 45359-7 (3500'K)
9	0-5 MINUTE TIMER SWITCH, 120V, 20A, 1HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER.	INTERMATIC FF5M
10	SINGLE POLE SNAP SWITCH, 120V, 20A, METAL, 1-1/2HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER, WHITE.	PASS & SEYMOUR 20AC1-W
11	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER	PASS & SEYMOUR 20AC1-RPL
12	THREE POLE MOTOR DISCONNECT SWITCH WITH OVERLOAD PROTECTION, NEMA 1 ENCLOSURE, 208V, 20A, 3HP RATED, WITH 2.5 FLA HEATER.	ALLEN BRADLEY 609TU-AAA WITH W36 ELEMENT
13	MODULE STATION SERVICE TRANSFORMER – ENERGY STAR COMPLIANT, ENCLOSURE TYPE 1, 30kVA, HV 480 DELTA, LV 208Y/120	EGS ELECTRICAL GROUP CAT. NO. ET2H30S
14	STATION SERVICE PANELBOARD, COPPER BUS, 3 PHASE, 4 WIRE, 120/208V, 100A, 30 CIRCUITS, BOLT-IN BREAKERS, SURFACE MOUNT, NEMA 1	SIEMENS
15	SURFACE MOUNT 125V NEMA 5-20R RECEPTACLE. INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER.	PASS & SEYMOUR 5362W
16	125V NEMA 5-20R GFCI RECEPTACLE. MOUNT IN CAST FDA BOX WITH WEATHERPROOF COVER.	PASS & SEYMOUR 2095-W WITH WEATHERPROOF COVER
17	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
18	TEMPERATURE TRANSMITTER, RTD, 20-240°F RANGE, 4-20mA OUTPUT, 1/2" NPT PIPING CONNECTION, 6mm DIAMETER BY 2.5" LONG STEM, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 800-20/240-1-1-8-8-025-6
19	PRESSURE TRANSMITTER, 0-60 PSIG RANGE, 4-20mA OUTPUT, 1/4" NPT PIPING CONNECTION, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 100-60-1-1-2-7
20	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 4X ENCLOSURE, 3PST, 600V, 30A, MIN 7-1/2HP RATED	SIEMENS HNF361S OR SQUARE D HU361DS
21	MULTIPLE OUTPUT MODULATING DIGITAL THERMOSTAT	HONEYWELL TB7980B
22	NEMA 6-30R RECEPTACLE FOR WELDER/COMPRESSOR, BLACK, 250V, 30A, 2 POLE, WITH GROUND. INSTALL IN DEEP 4"x4" STEEL BOX WITH 2.15"ø HOLE METAL COVER	LEVITON 5372 OR EQUAL
23	TOP-MOUNT TANK PROBE WITH INSTALLATION KIT FOR 2" NPT RISER, WATER TIGHT COMPRESSION GLAND FITTING FOR CABLE ENTRANCE. FRANKLIN FUEL SYSTEMS, NO SUBSTITUTES. PROBE AND RISER LENGTH AS INDICATED IN TANK INSTALLATION DETAILS.	8' TANK PROBE: TSP-LL2-101-I 4' TANK PROBE: TSP-LL2-53-I 2' TANK PROBE: TSP-LL2-29-I FLOAT: INTSP-IDF2 2" FOR DIESEL INSTALLATION KIT: TSP-K2A
24	GLYCOL LEVEL SENSOR PROBE, 2" NPT, 12" PROBE, STAINLESS FLOAT, 1/4" RESOLUTION, NEMA 4 WITH SIGNAL CONDITIONER, 1/2" NPT PORT.	INNOVATIVE COMPONENTS CLM-2012-SS

SPECIFICATIONS AND EQUIPMENT SCHEDULE THIS SHEET APPLY TO BOTH MODULE SHOP FABRICATION WORK AND FIELD INSTALLATION WORK. REFER TO OTHER SHEETS FOR DELINEATION OF FIELD WORK.

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

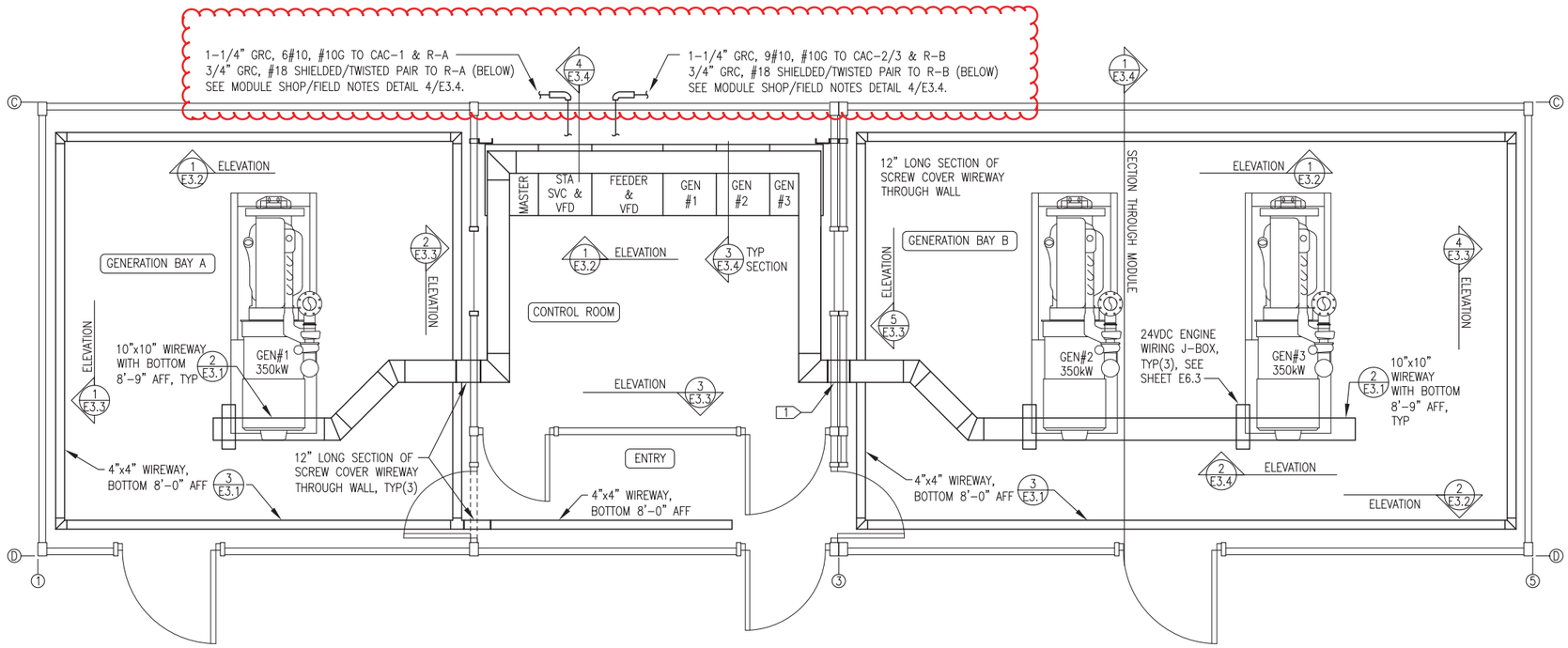
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

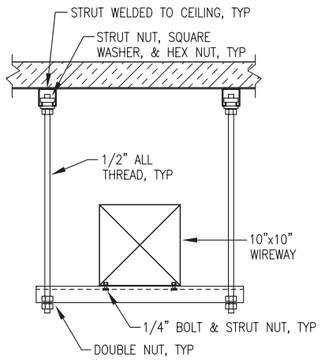
DRAWING TITLE:
ELECTRICAL SPECIFICATIONS & EQUIPMENT SCHEDULE

E2

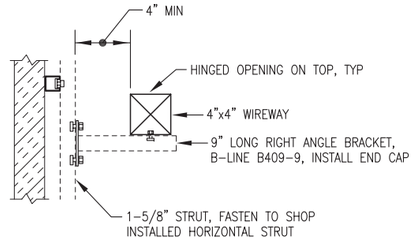
SHEET 4 OF 19



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



2 E3.1 TRAPEZE HANGER
NO SCALE



3 E3.1 WIREWAY SUPPORT FROM WALL
NO SCALE

GENERAL NOTES:

1) GROUND ALL WIREWAY AND MAIN POWER CONDUIT WITH GROUNDING BUSHINGS IN ACCORDANCE WITH DETAIL 5/E3.5.

MODULE SHOP/FIELD NOTES:

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

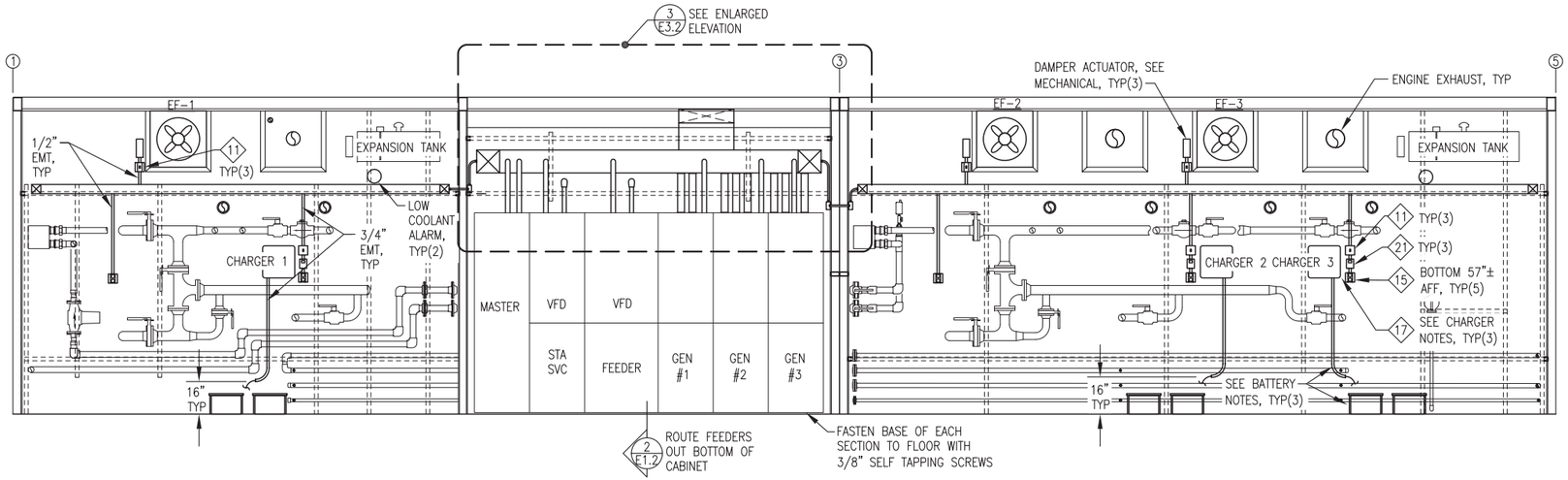
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

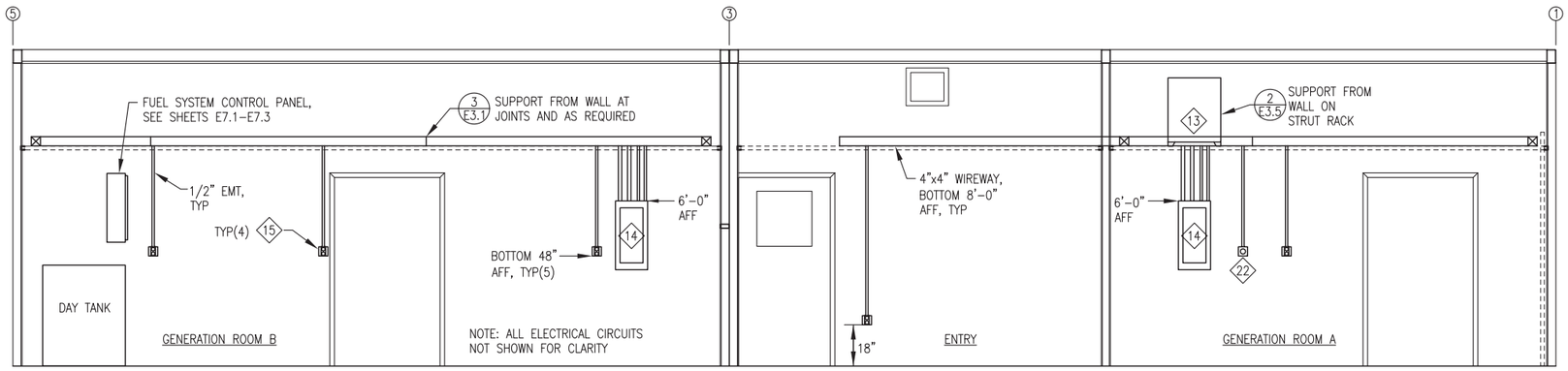
DRAWING TITLE:
WIREWAY PLAN & DETAILS

E3.1

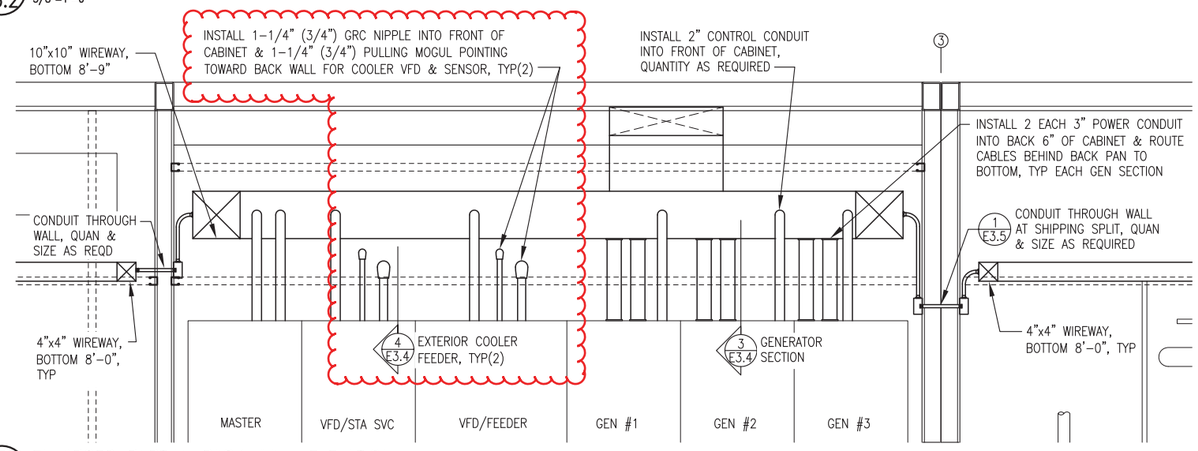
SHEET 5 OF 19



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



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

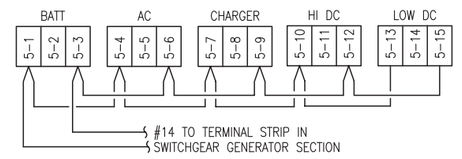


3 E3.2 ENLARGED PARTIAL BACK WALL ELEVATION
3/16"=1'-0"

BATTERY & CHARGER NOTES:

1) MOUNT CHARGER TO WALL ON SHALLOW STRUT AND INSTALL DRIP SHIELD ABOVE.
2) SET CHARGER AND CONNECT ALARMS IN ACCORDANCE WITH DETAIL 4/E3.2.
3) INSTALL 50A FLUSH MOUNT CIRCUIT BREAKER IN CHARGER, COOPER CB187-P50, AND CONNECT TO POSITIVE BATTERY LEAD.
4) ROUTE 3/4" EMT WITH 2#8 CHARGING LEADS TO BATTERY AND INSTALL PLASTIC BUSHING IN END.
5) FASTEN BATTERY RACK TO FLOOR WITH 3/8" SELF-TAPPING SCREWS, SET BATTERY IN RACK ON 5/8" PLYWOOD BASE & STRAP INTO RACK WITH STRUT & ALL THREAD.

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



4 E3.2 BATTERY CHARGER SETUP & ALARM WIRING
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

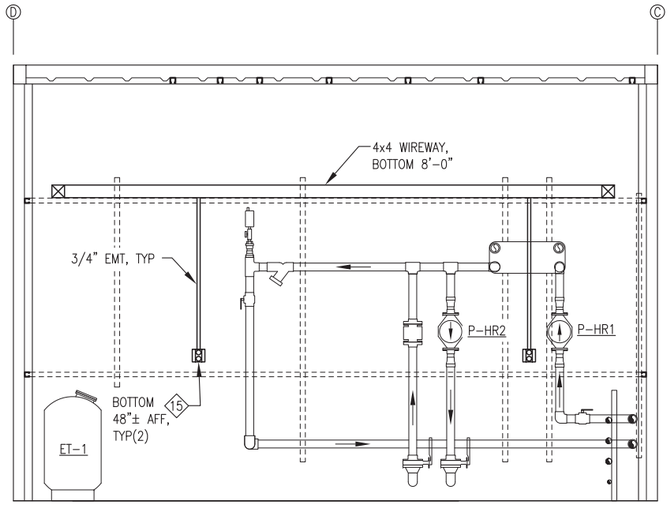
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
WALL ELEVATIONS

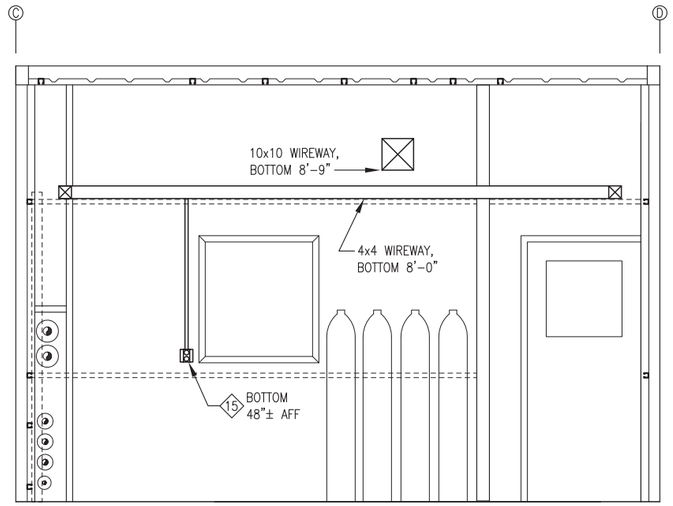
E3.2

SHEET 6 OF 19



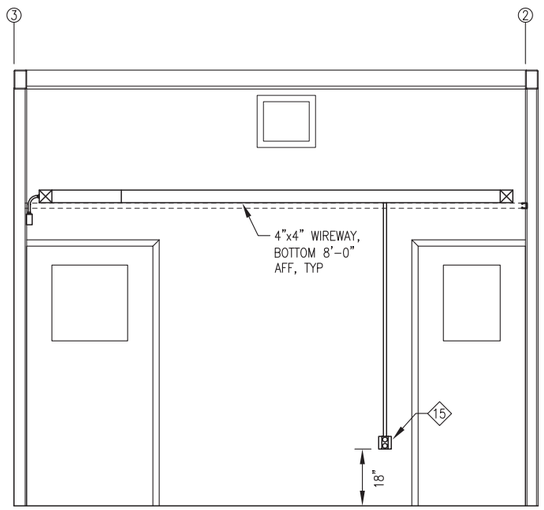
NOTE: ALL ELECTRICAL CIRCUITS NOT SHOWN FOR CLARITY

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

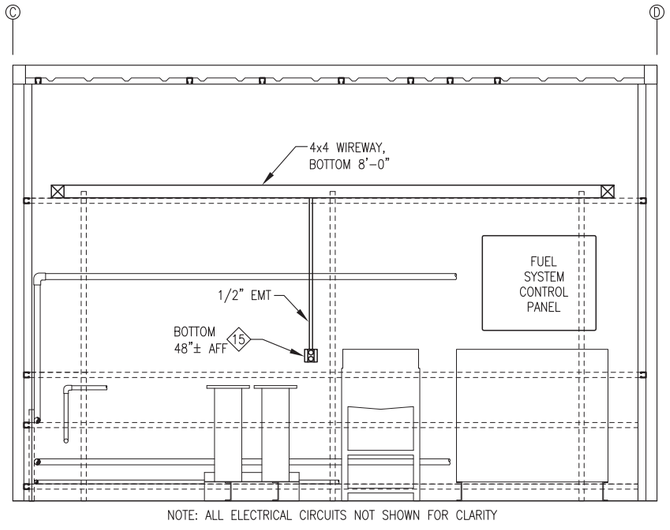


NOTE: ALL ELECTRICAL CIRCUITS NOT SHOWN FOR CLARITY

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

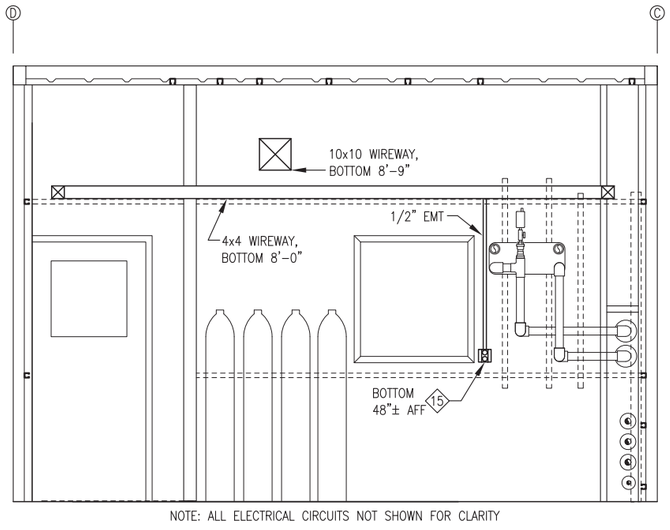


3 E3.3 CONTROL ROOM WALL ELEVATION
1/2"=1'-0"



NOTE: ALL ELECTRICAL CIRCUITS NOT SHOWN FOR CLARITY

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



NOTE: ALL ELECTRICAL CIRCUITS NOT SHOWN FOR CLARITY

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

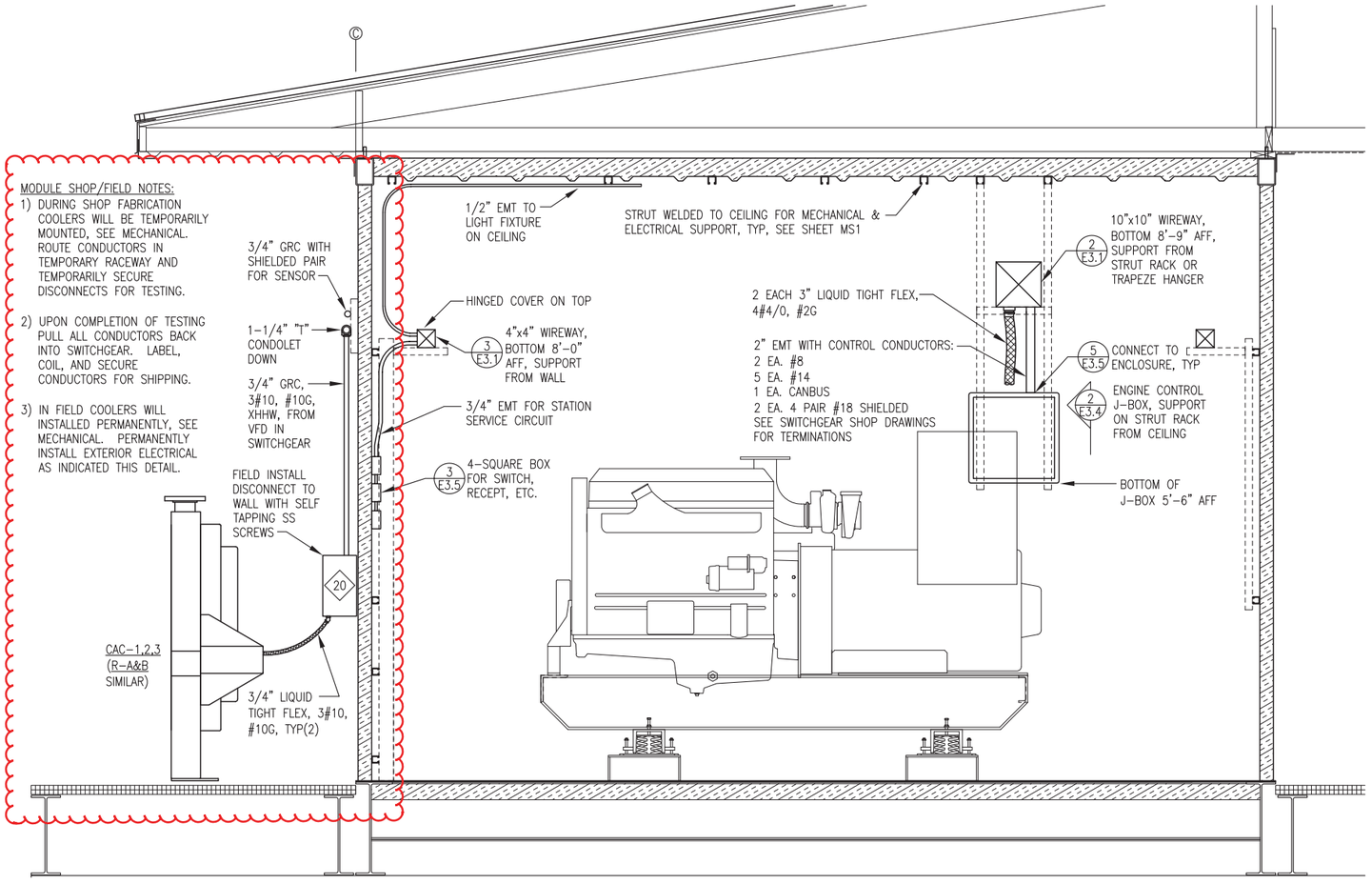
STATE OF ALASKA
49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

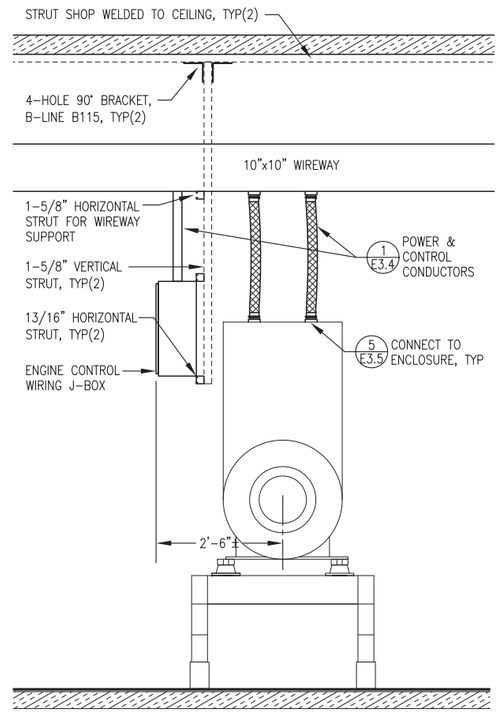
DRAWING TITLE:
WALL ELEVATIONS

E3.3

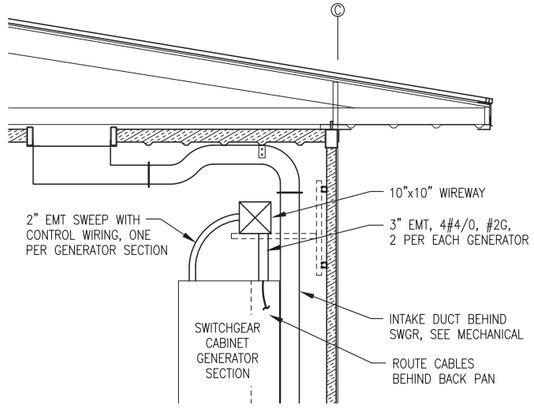
SHEET 7 OF 19



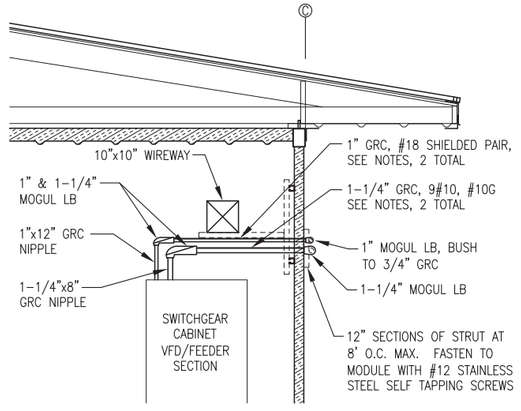
1 E3.4 TYPICAL SECTION THROUGH GENERATOR
3/4"=1'-0"



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



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



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

GENERAL NOTES:
1) ONE SET OF COOLER CONDUIT SHOWN, INSTALL TWO IDENTICAL
2) ONE SET OF EXTERIOR MOGULS FACE AWAY FOR MODULE A & ONE SET FACE TOWARD FOR MODULE B.

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

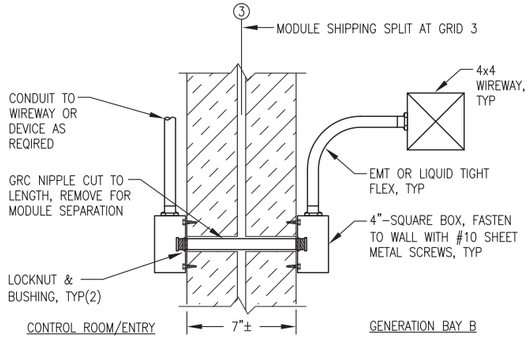
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
SECTIONS & DETAILS

E3.4

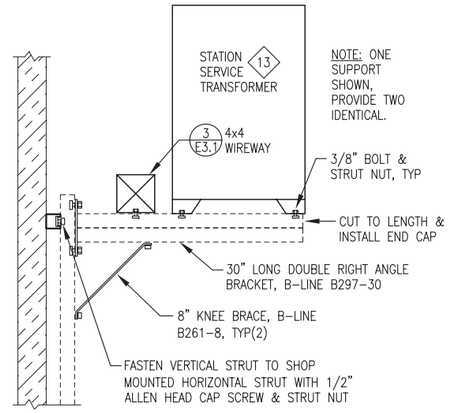
SHEET 8 OF 19



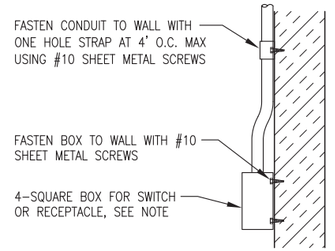
MODULE SHOP/FIELD NOTES:

1) THIS DETAIL PROVIDES A SHIPPING SPLIT POINT FOR STATION SERVICE CONDUCTORS. PROVIDE QUANTITY AND SIZE AS REQUIRED.
2) IN ADDITION TO SPLIT POINTS FOR STATION SERVICE PROVIDE ONE SEPARATE SIMILAR SPLIT FOR FIRE SUPPRESSION MODULE B WIRING. BOX COVERS PAINTED RED. SEE SHEET FS1.
3) DURING SHOP FABRICATION INSTALL GRC THROUGH WALL AND PULL CONDUCTORS FOR TESTING.
4) UPON COMPLETION OF TESTING PULL ALL CONDUCTORS INTO CONTROL ROOM AND REMOVE GRC. LABEL, COIL, AND SECURE CONDUCTORS FOR SHIPPING.
5) IN FIELD REINSTALL GRC THROUGH WALL, RE-PULL CONDUCTORS, AND TERMINATE.

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

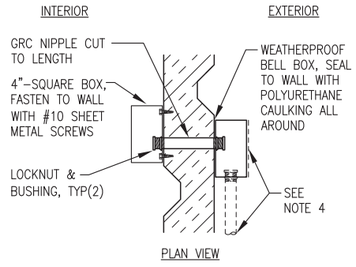


2 / E3.5 STATION SERVICE TRANSFORMER SUPPORT
NO SCALE



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

3 / E3.5 TYPICAL INTERIOR DEVICE MOUNTING
NO SCALE



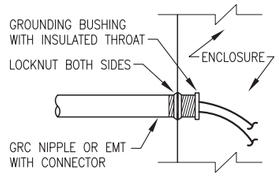
MODULE SHOP/FIELD NOTES:

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

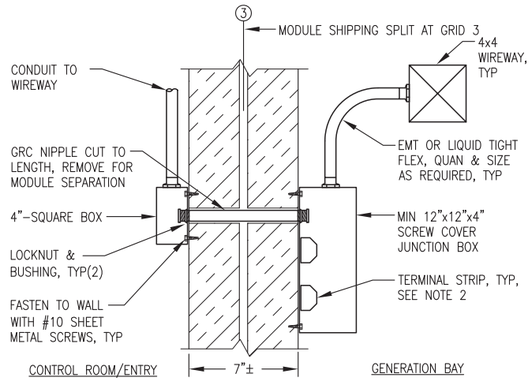
4 / E3.5 TYP EXTERIOR WALL-MOUNT DEVICE INSTALLATION
NO SCALE

NOTES:

1) THIS DETAIL APPLIES TO CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS.
2) AT A MINIMUM INSTALL GROUNDING BUSHING ON ALL GENERATOR POWER CONDUIT, COMMUNITY FEEDER CONDUIT, STATION SERVICE FEEDERS, AND WHERE OTHERWISE INDICATED OR REQUIRED. BOND GROUNDING BUSHING TO EQUIPMENT GROUNDING CONDUCTOR.
3) INSTALL PLASTIC BUSHING WHERE GROUNDING BUSHING IS NOT REQUIRED.
4) ON GENERATOR ENCLOSURES MAKE ALL CONNECTIONS AS TIGHT AS POSSIBLE.



5 / E3.5 TYP ENCLOSURE CONNECTION
NO SCALE



MODULE SHOP/FIELD NOTES:

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

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

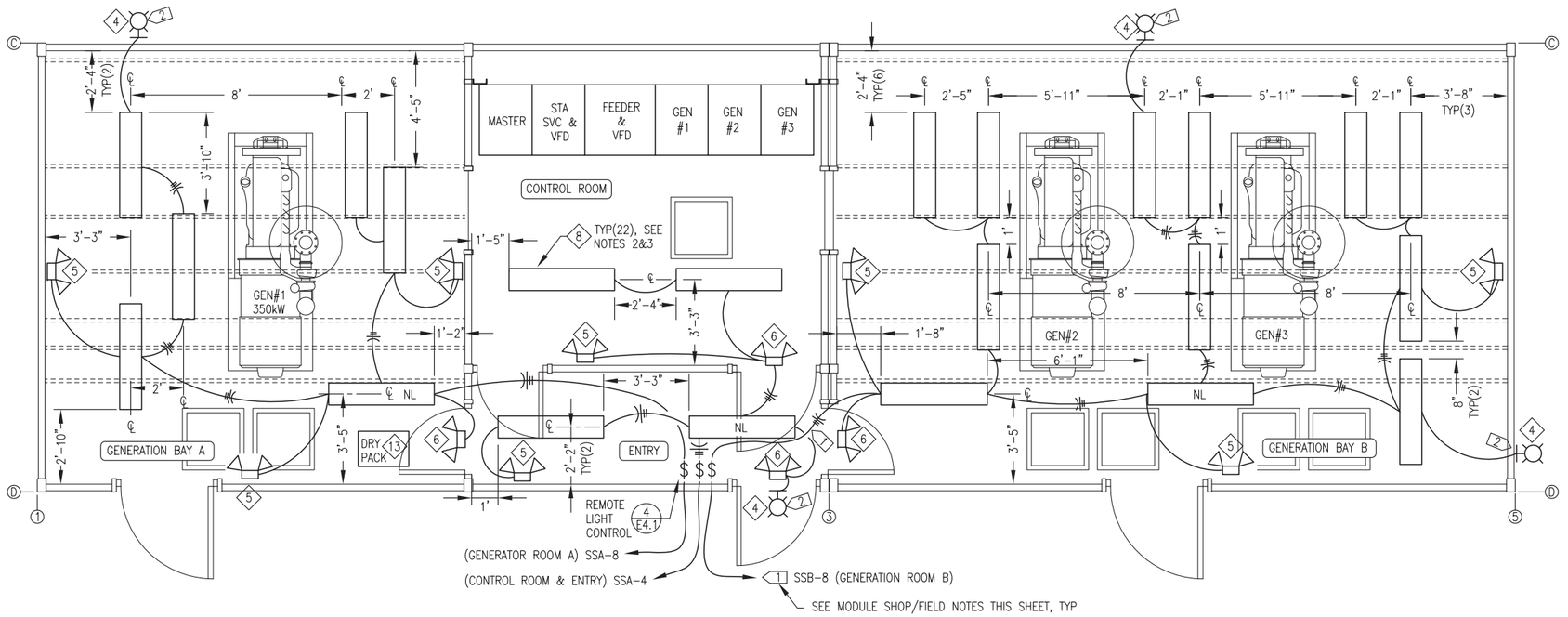
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
DETAILS

E3.5

SHEET 9 OF 19



1 M4.1 LIGHTING PLAN
3/8"=1'-0"

GENERAL NOTES:

1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.
2) FASTEN TO CEILING WITH #12 SHEET METAL SCREWS EXCEPT WHERE LIGHTS CROSS STRUT USE 1/4" BOLTS & STRUT NUTS, TYP.
3) INSTALL INSTAFIT LED LAMPS IN T8 FIXTURES, 5000K IN GEN ROOM & 3500K IN CONTROL ROOM, SEE EQUIPMENT SCHEDULE. ON NIGHT LIGHTS (NL) INSTALL EXTRA BALLAST & CONNECT TO CENTER LAMP FOR UNSWITCHED OPERATION OF ONE LAMP.

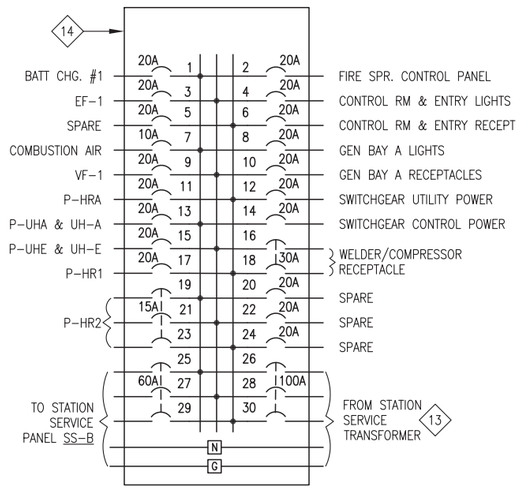
MODULE SHOP/FIELD NOTES:

1 THESE CONDUCTORS CROSS THE MODULE SHIPPING SPLIT, SEE DETAIL 1/E3.5. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM DEVICES IN GEN BAY B AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE PRIOR TO MODULE SEPARATION. IN FIELD, PULL ALL CONDUCTORS TO DEVICES AND TERMINATE.

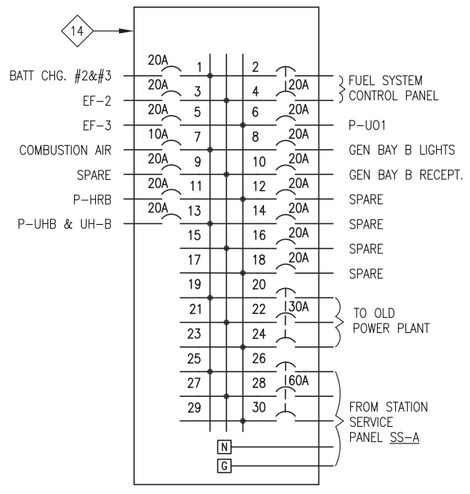
2 REMOVE EXTERIOR DEVICE, BOX, AND CONDUIT THROUGH WALL, AND PULL CONDUCTORS INSIDE FOR SHIPPING. SEE DETAIL 4/E3.5. RE-INSTALL IN FIELD.

BUILDING PLANS SYMBOL LEGEND

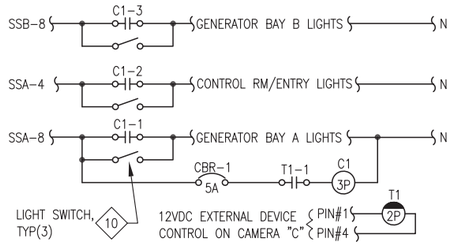
SYMBOL	DESCRIPTION
SS-##	HOME RUN TO PANEL & BREAKER(S) INDICATED. SHORT DASH INDICATES HOT CONDUCTOR, LONG DASH INDICATES NEUTRAL CONDUCTOR, CURVED DASH INDICATES GROUND CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.
#	ELECTRICAL ITEM – SEE EQUIPMENT SCHEDULE ON SHEET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



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



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



NOTES:

1) INSTALL CONTACTOR, TIMER RELAY, AND CIRCUIT BREAKER IN 12"x12"x6" NEMA 1 JUNCTION BOX ON WALL ABOVE LIGHT SWITCHES.
2) ALL LIGHTING CIRCUIT WIRING MIN #12 AWG. ALL 5A CONTROL CIRCUIT WIRING MIN #16AWG.
3) SET TIMER FOR 5 MINUTES, SINGLE SHOT MODE.

BILL OF MATERIALS:

CB1: 5A, 1P, RAIL MOUNT CIRCUIT BREAKER. ALLEN BRADLEY 1489-A1-050.

C1: 23A, 3P CONTACTOR, 120V COIL. ALLEN BRADLEY 100-C23D10.

T1: 10A, DPDT RELAY, 12VDC COIL, WITH SOCKET BASE AND TIMING MODULE. ALLEN BRADLEY 700-HA32Z12 RELAY WITH 700HN204 BASE AND 700HT3 SERIES B TIMING MODULE.

4 E4.1 LIGHTING REMOTE CONTROL SCHEMATIC
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
LIGHTING PLAN & DETAILS

E4.1

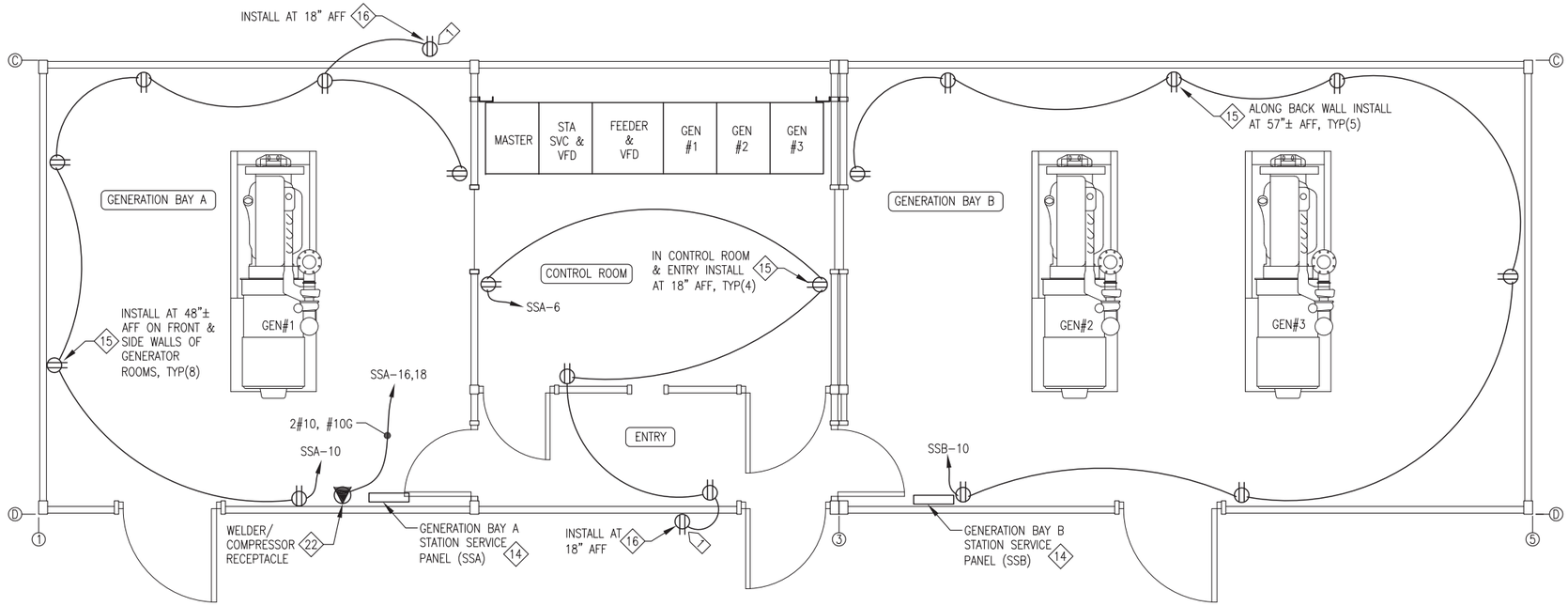
SHEET 10 OF 19

GENERAL NOTES:

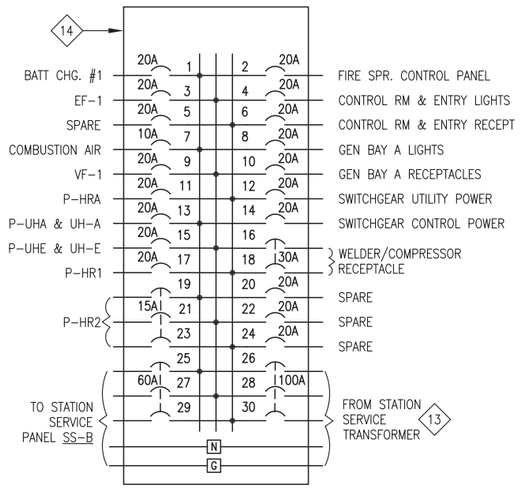
1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

MODULE SHOP/FIELD NOTES:

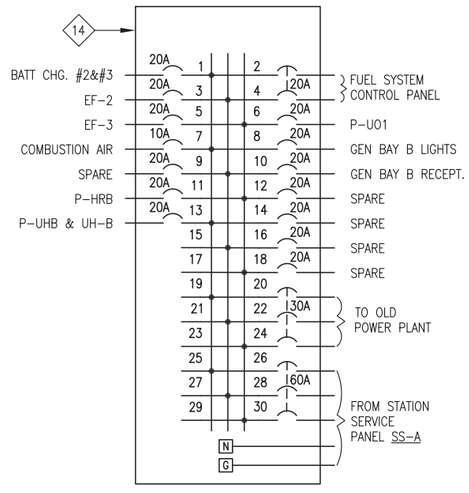
1 REMOVE EXTERIOR DEVICE, BOX, AND CONDUIT THROUGH WALL, AND PULL CONDUCTORS INSIDE FOR SHIPPING. SEE DETAIL 4/E3.5. RE-INSTALL IN FIELD.



1 M4.2 RECEPTACLE PLAN
3/8"=1'-0"



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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

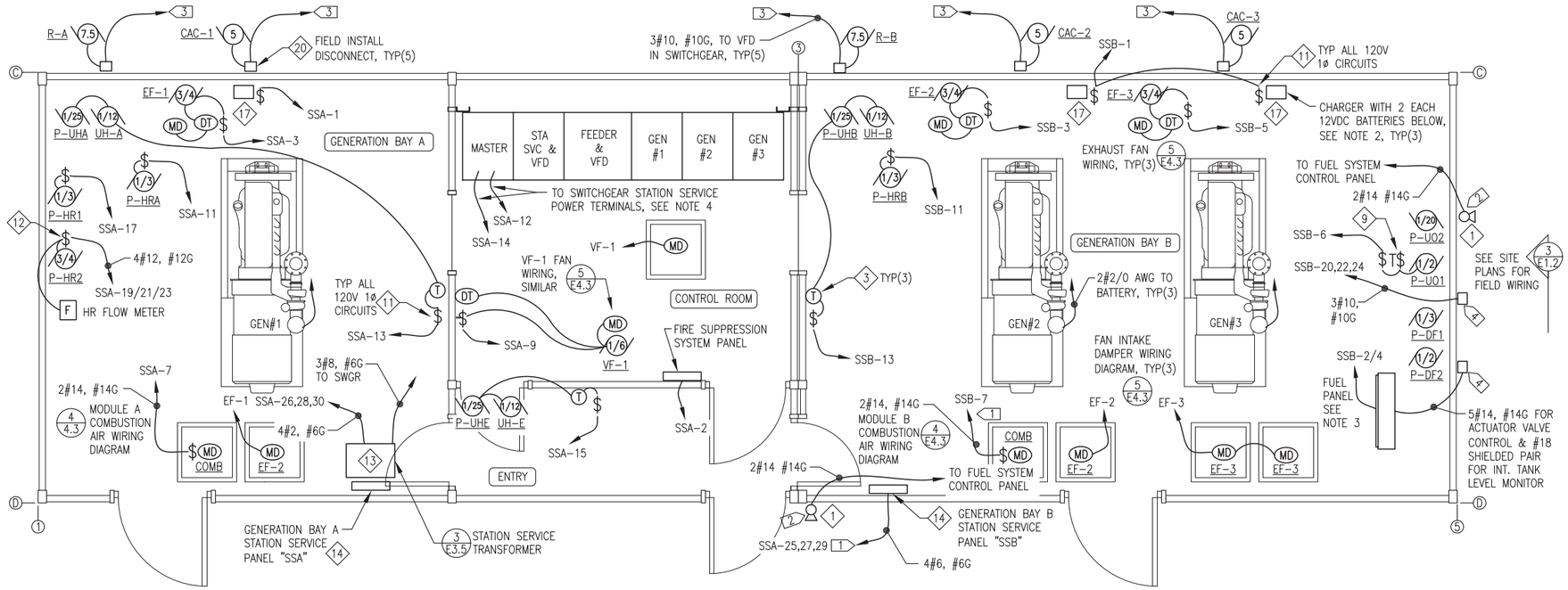
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

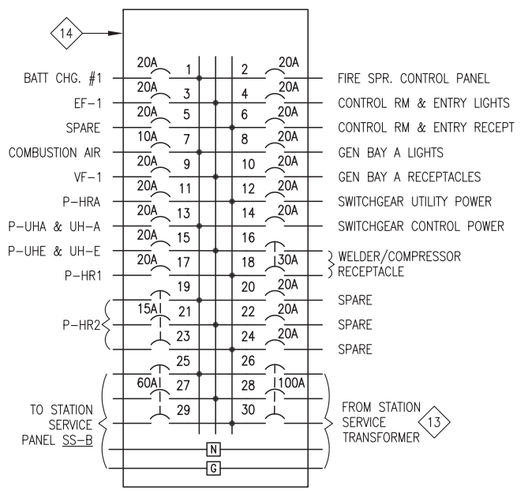
DRAWING TITLE:
RECEPTACLE PLAN & DETAILS

E4.2

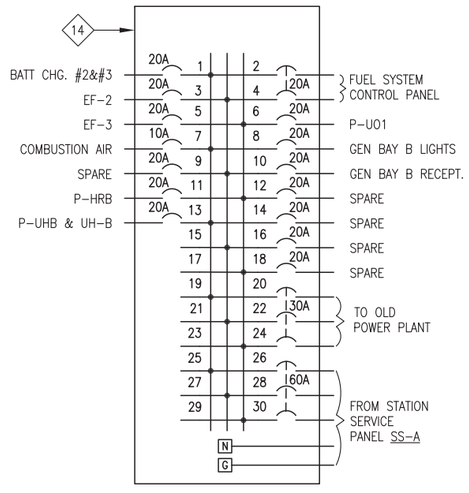
SHEET 11 OF 19



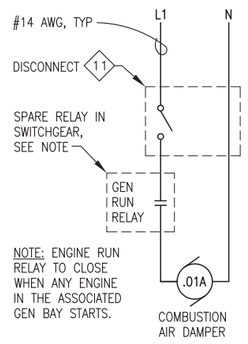
1 E4.3 STATION SERVICE POWER PLAN
3/8"=1'-0"



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

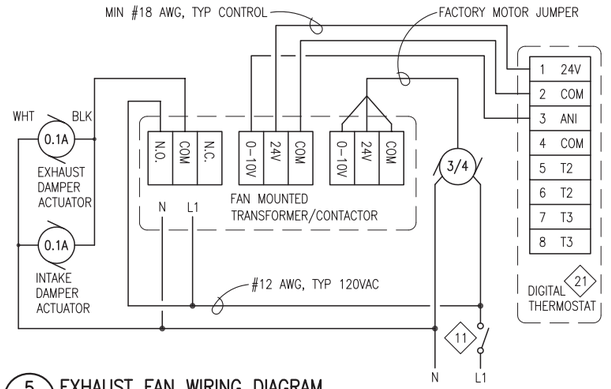


3 E4.3 STATION SERVICE PANEL "SSB"
NO SCALE



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

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



5 E4.3 EXHAUST FAN WIRING DIAGRAM
NO SCALE

GENERAL NOTES:

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

MODULE SHOP/FIELD NOTES:

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REV	DATE	REVISIONS DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

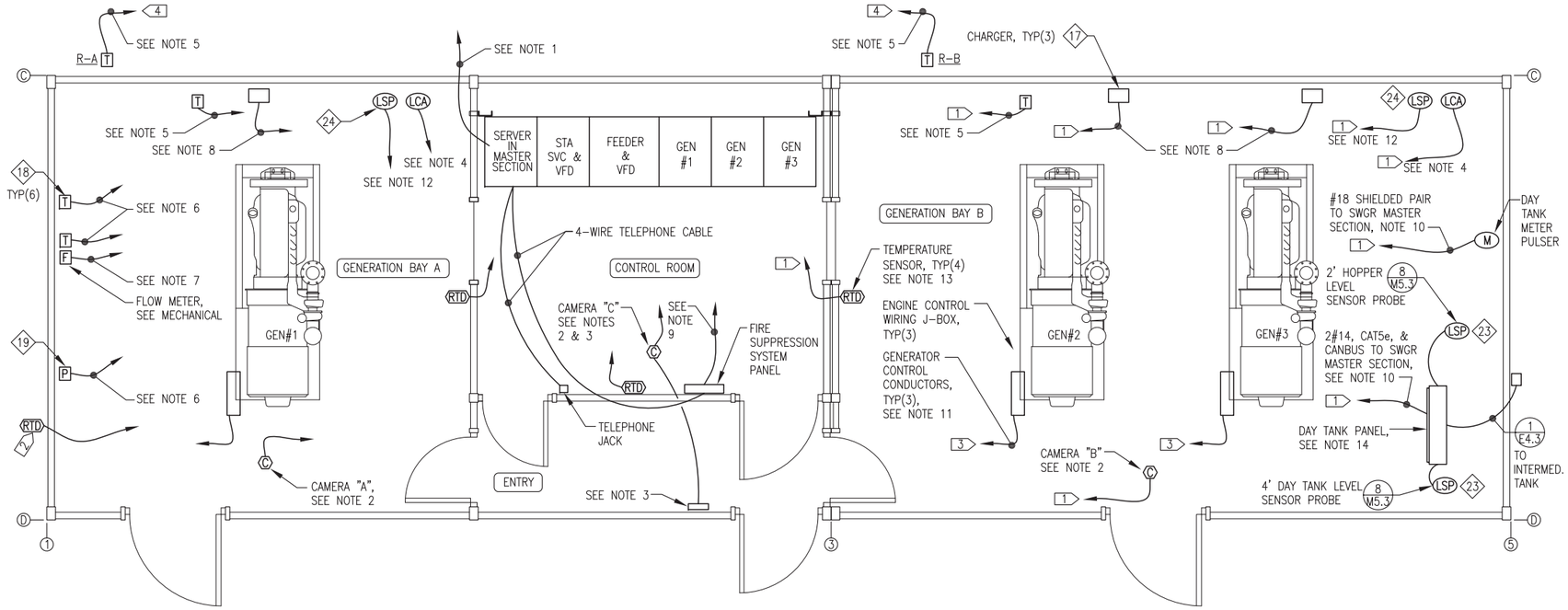
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
STATION SERVICE PLAN & DETAILS

E4.3

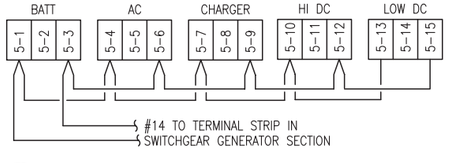
SHEET 12 OF 19



1 E5 CONTROL, INSTRUMENTATION & DATA PLAN

1/2"=1'-0"

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



2 E5 BATTERY CHARGER ALARM WIRING DIAGRAM

NO SCALE

INTERIOR CONTROL & INSTRUMENT WIRING NOTES:

1) PROVIDE TELEPHONE AND HIGH SPEED INTERNET SERVICE CONNECTIONS THIS AREA. SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATIONS IN MASTER SECTION.
2) ROUTE ETHERNET FROM CAMERA TO ETHERNET SWITCH IN SWITCHGEAR MASTER SECTION (POWER OVER ETHERNET).
3) INSTALL 12"x12"x6" JUNCTION BOX WITH CONTACTOR AND TIMER RELAY FOR REMOTE LIGHTING CONTROL. OPERATE FROM DRY CONTACT ON CAMERA "c". SEE DETAIL 4/E4.1.
4) LOW COOLANT LEVEL ALARM SWITCH INSTALLED AT EXPANSION TANK, SEE MECHANICAL. CONNECT TO N.C. SWITCH (WHITE & RED) AND ROUTE 2#14 TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
5) INSTALL TEMP TRANSMITTERS WHERE SHOWN ON COOLING PIPING ISOMETRIC. INSTALL 2 OUTSIDE FOR RADIATOR VFD CONTROL. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR VFD SECTION AS INDICATED. SEE NOTE 10.
6) INSTALL TWO TEMP TRANSMITTERS AND ONE PRESSURE TRANSMITTER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
7) INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P–HR2 DISCONNECT. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
8) ROUTE 2#14 FROM BATTERY CHARGER ALARM CONTACTS TO ASSOCIATED SWITCHGEAR GENERATOR SECTION, SEE NOTE 10 AND WIRING DIAGRAM 2/E5.
9) ROUTE 2#14 TO SWITCHGEAR MASTER SECTION FOR FIRE ALARM SHUT DOWN. SEE NOTE 10.
10) SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.
11) ROUTE GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 10x10 WIREWAY WITH POWER CONDUCTORS. SEE NOTE 10.
12) #18 TWISTED PAIR FROM LEVEL SENSOR PROBE IN ET–A & ET–B TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
13) RTD TEMPERATURE SENSOR PROVIDED WITH SWITCHGEAR. ROUTE #18 SHIELDED TRIAD TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
14) SEE SHEETS E7.1–E7.3 FOR FUEL SYSTEM CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.

MODULE SHOP/FIELD NOTES:

1. THESE CONDUCTORS CROSS THE MODULE SHIPPING SPLIT, SEE DETAIL 6/E3.5. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM TERMINALS IN GEN BAY B AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE PRIOR TO MODULE SEPARATION. IN FIELD, RE–TERMINATE ALL CONDUCTORS.
2. REMOVE EXTERIOR DEVICE, BOX, AND CONDUIT THROUGH WALL, AND PULL CONDUCTORS INSIDE FOR SHIPPING. SEE DETAIL 4/E3.5. RE–INSTALL IN FIELD.
3. GENERATOR CONTROL CONDUCTORS CROSS THE MODULE SHIPPING SPLIT. AFTER SHOP TESTING, DISCONNECT THESE CONDUCTORS FROM TERMINATIONS AT GENERATORS AND PULL INTO CONTROL ROOM. LABEL, COIL, AND SECURE CONDUCTORS THEN REMOVE 12" SECTION OF WIREWAY FOR MODULE SEPARATION. IN FIELD, REINSTALL WIREWAY THROUGH WALL THEN PULL ALL CONDUCTORS TO GENERATORS AND TERMINATE.
4. RADIATOR SENSOR CONDUCTORS. DO NOT ROUTE IN WIREWAY. FOR SHOP TESTING PROVIDE TEMPORARY INSTALLATION. IN FIELD INSTALL IN EXTERIOR GRC. SEE DETAILS 1/E3.4 AND 4/E3.4.

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

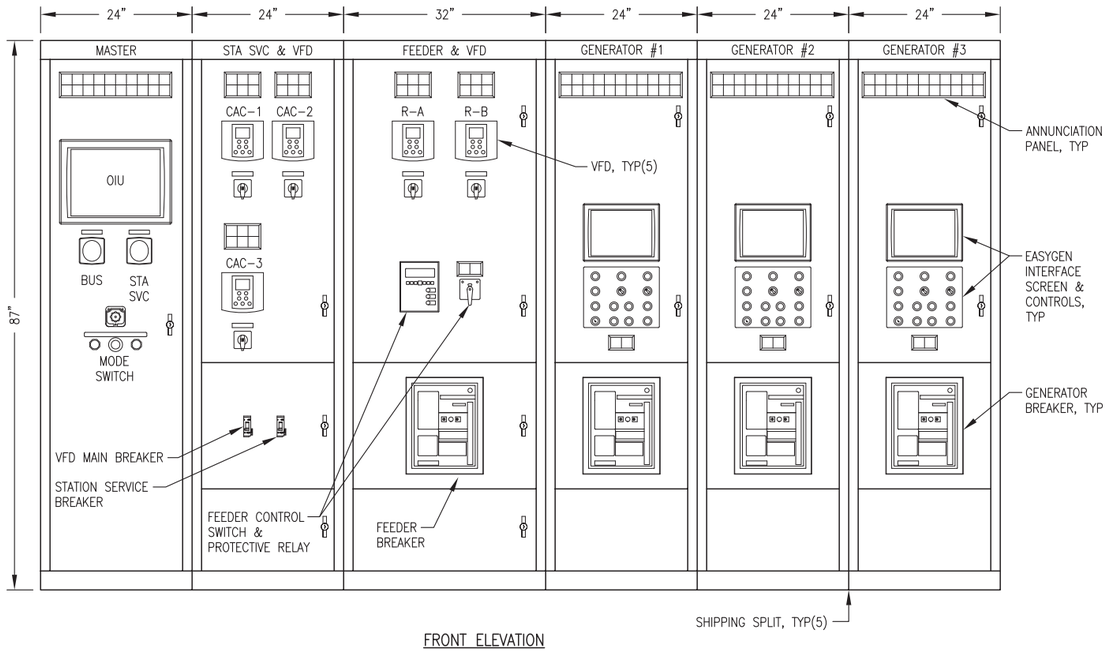
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

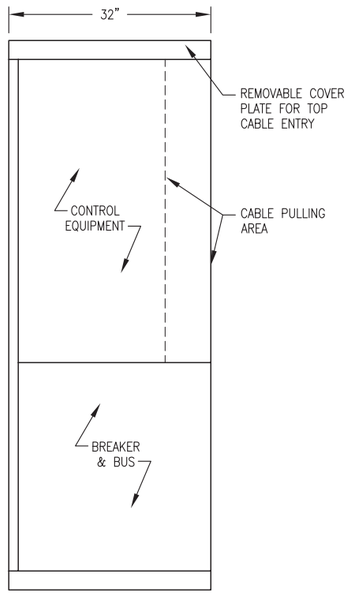
DRAWING TITLE:
CONTROL, INSTRUMENTATION, & DATA PLAN & DETAILS

E5

SHEET 13 OF 19



FRONT ELEVATION



TYPICAL CROSS SECTION

1 E6.1 SWITCHGEAR ENCLOSURE LAYOUT
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

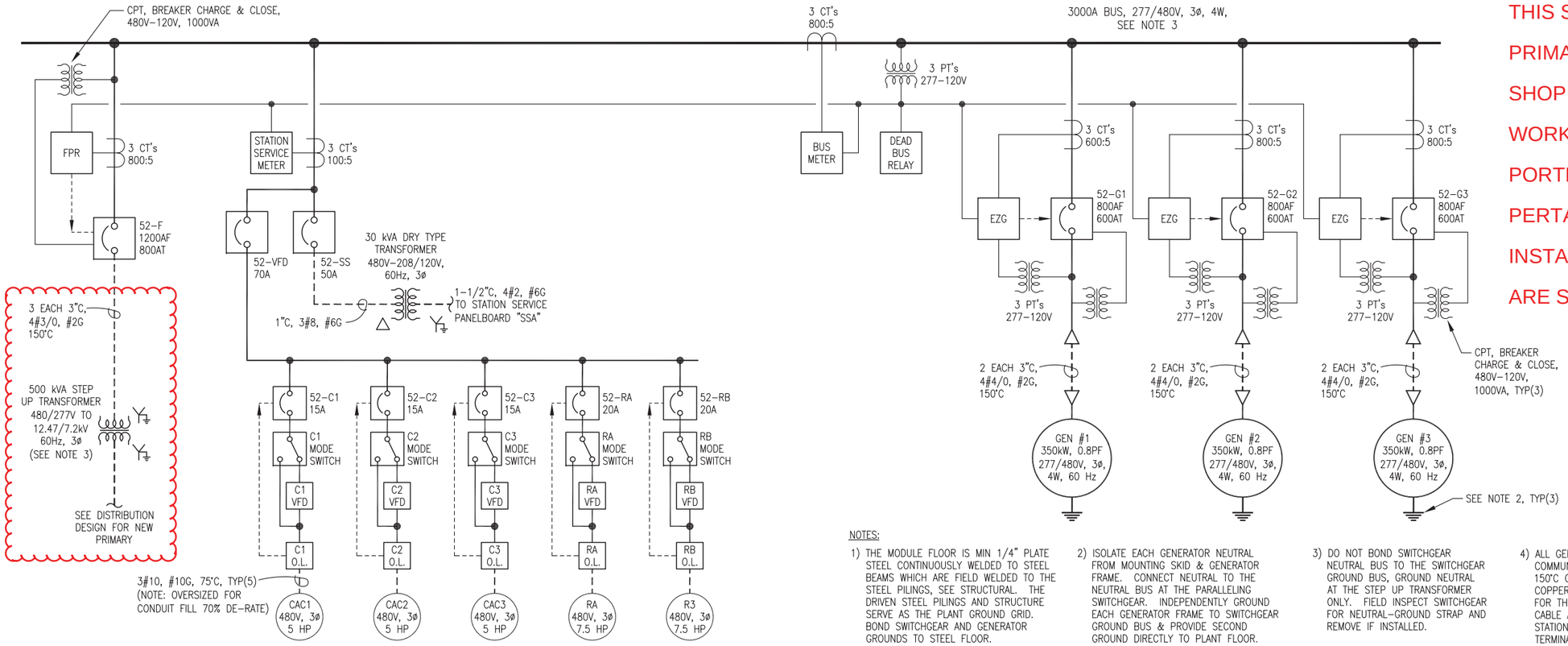
STATE OF ALASKA
49TH
CLOIS W. VERSYP
EE. 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD/BCG
CHECKED BY: BCG/CWV
JOB NUMBER:

DRAWING TITLE:
SWITCHGEAR ENCLOSURE LAYOUT

E6.1

SHEET 14 OF 19



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

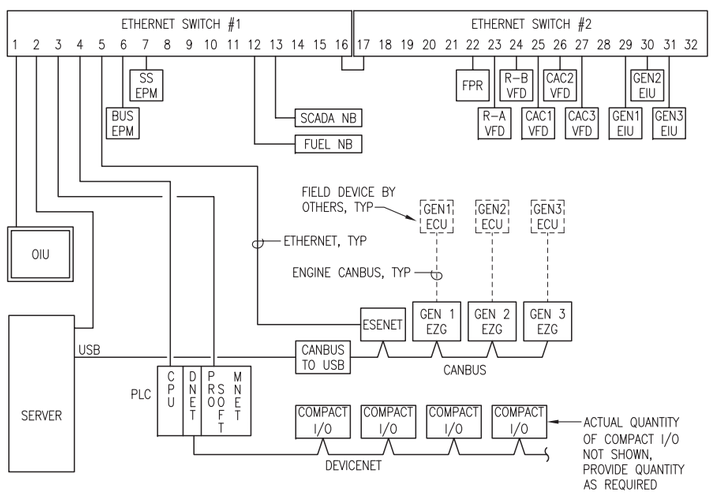
NOTES:

1) THE MODULE FLOOR IS MIN 1/4" PLATE STEEL CONTINUOUSLY WELDED TO STEEL BEAMS WHICH ARE FIELD WELDED TO THE STEEL PILINGS, SEE STRUCTURAL. THE DRIVEN STEEL PILINGS AND STRUCTURE SERVE AS THE PLANT GROUND GRID. BOND SWITCHGEAR AND GENERATOR GROUNDS TO STEEL FLOOR.
2) 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 PLANT FLOOR.
3) DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS, GROUND NEUTRAL AT THE STEP UP TRANSFORMER ONLY. FIELD INSPECT SWITCHGEAR FOR NEUTRAL–GROUND STRAP AND REMOVE IF INSTALLED.
4) ALL GENERATOR POWER AND COMMUNITY FEEDER CONDUCTORS 150°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.

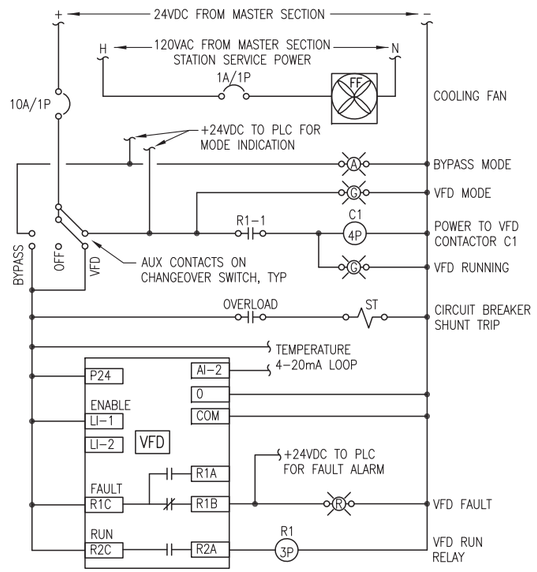
1 E6.2 SWITCHGEAR ONE–LINE DIAGRAM
NO SCALE

NOTES: 1) 120VAC POWER FOR SERVER, OIU, AND ETHERNET SWITCH FROM UPS.

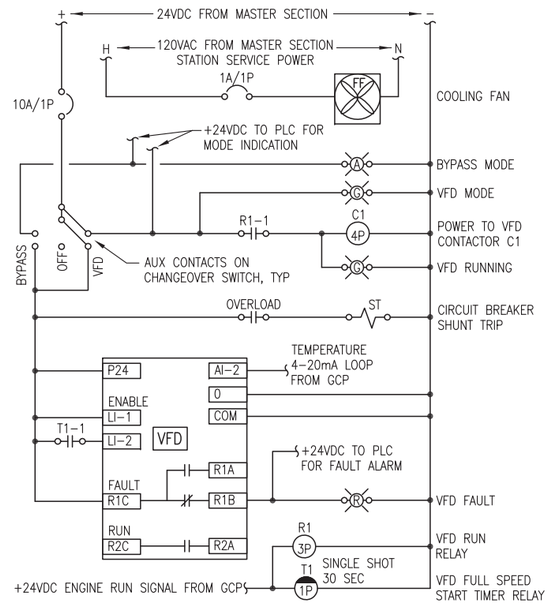
2) 4–20mA FIELD DEVICE WILL BE PROVIDED BY OTHERS FOR TEMPERATURE INPUT TO EACH VFD.



2 E6.2 COMMUNICATION SCHEMATIC
NO SCALE



3 E6.2 TYPICAL RADIATOR VFD LOGIC DIAGRAM
NO SCALE



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

SWITCHGEAR SYMBOL LEGEND

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

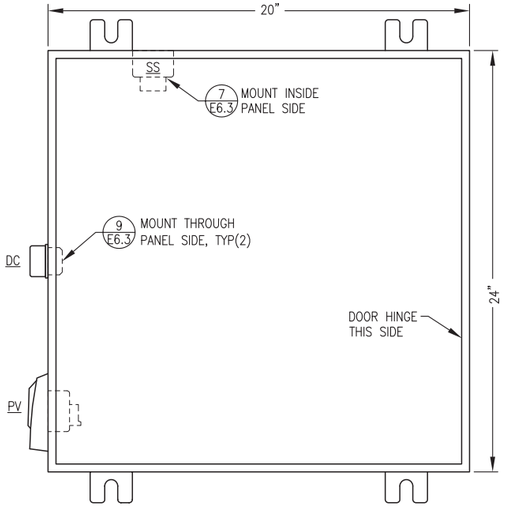
STATE OF ALASKA 49TH — CLOIS W. VERSYP EE 7802 — REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD/BCG
CHECKED BY: BCG/CWV
JOB NUMBER:

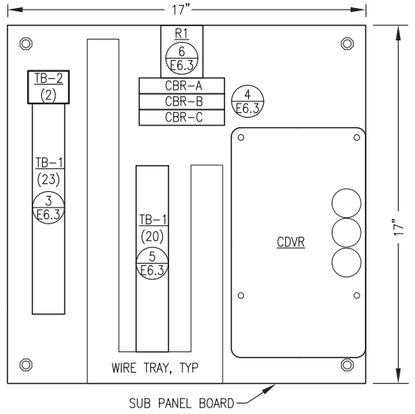
DRAWING TITLE:
SWITCHGEAR ONE–LINE & SCHEMATICS

E6.2

SHEET 15 OF 19



1 E6.3 JUNCTION BOX FRONT PANEL LAYOUT
NO SCALE



2 E6.3 JUNCTION BOX SUB PANEL LAYOUT
NO SCALE

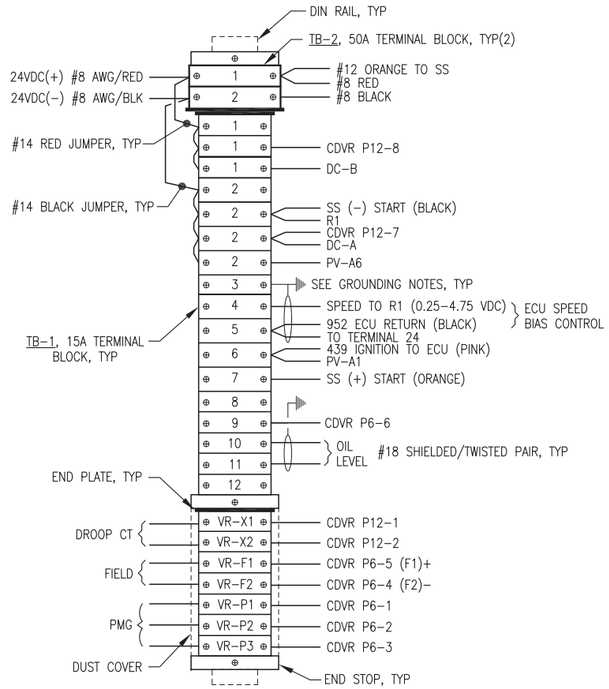
BILL OF MATERIALS	(NOTE: PROVIDE MATERIALS AS SPECIFIED – NO SUBSTITUTES)		
TAG	MANUFACTURER	MODEL	DESCRIPTION
ENCLOSURE	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
CDVR	CATERPILLAR	314-7755	DIGITAL VOLTAGE REGULATOR
	CATERPILLAR	254-1265	HARNESS FOR VOLTAGE REGULATOR
CBR	ALLEN-BRADLEY	1489-A1-C010	RAIL MOUNT CIRCUIT BREAKER, 1-POLE, 1A
DC	DEUTSCH	HD10-9-1939P	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
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 AUXILIARY SOLENOID, 24V
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK

SHOP FABRICATION NOTES:

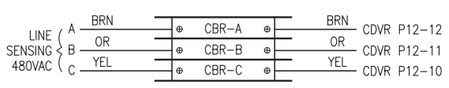
1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
2) INSTALL IN A 20"Hx20"Wx12"D NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS 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 HARNESSES 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 HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

FIELD INSTALLATION NOTES:

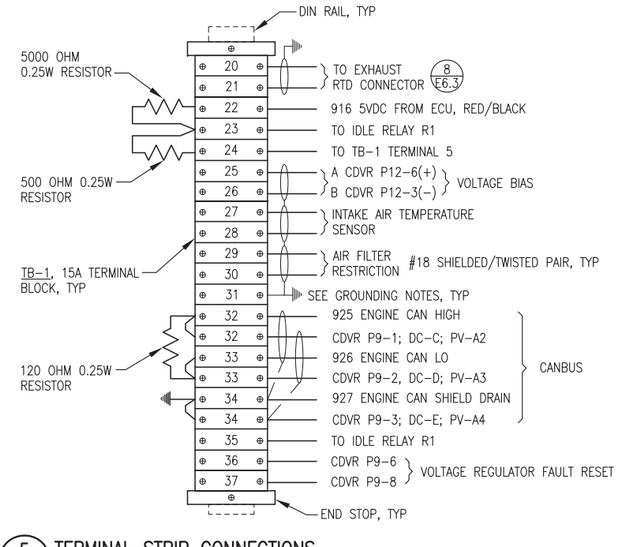
1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS ON SHEET E2. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE NUMBER OF THE ASSOCIATED HOME RUN LANDING ON TERMINAL IN THE CONTROL PANEL.
2) ON SHIELDED CONDUCTORS FROM SWITCHGEAR GROUND ALL SHIELD DRAIN WIRES TO LUGS AT GENERATOR END ONLY.



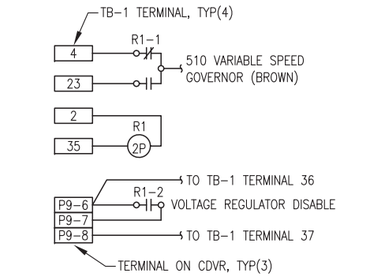
3 E6.3 TERMINAL STRIP CONNECTIONS
NO SCALE



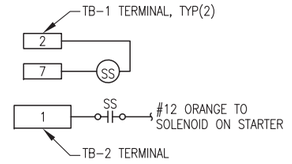
4 E6.3 CIRCUIT BREAKER CONNECTIONS
NO SCALE



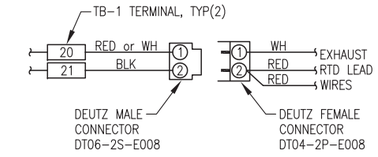
5 E6.3 TERMINAL STRIP CONNECTIONS
NO SCALE



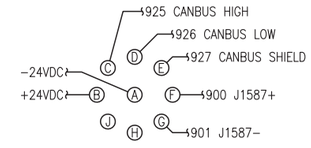
6 E6.3 IDLE RELAY R1 WIRING DIAGRAM
NO SCALE



7 E6.3 STARTER AUX SOLENOID SS WIRING
NO SCALE



8 E6.3 EXHAUST RTD CONNECTOR
NO SCALE



9 E6.3 DIAGNOSTIC CONNECTOR WIRING
NO SCALE

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

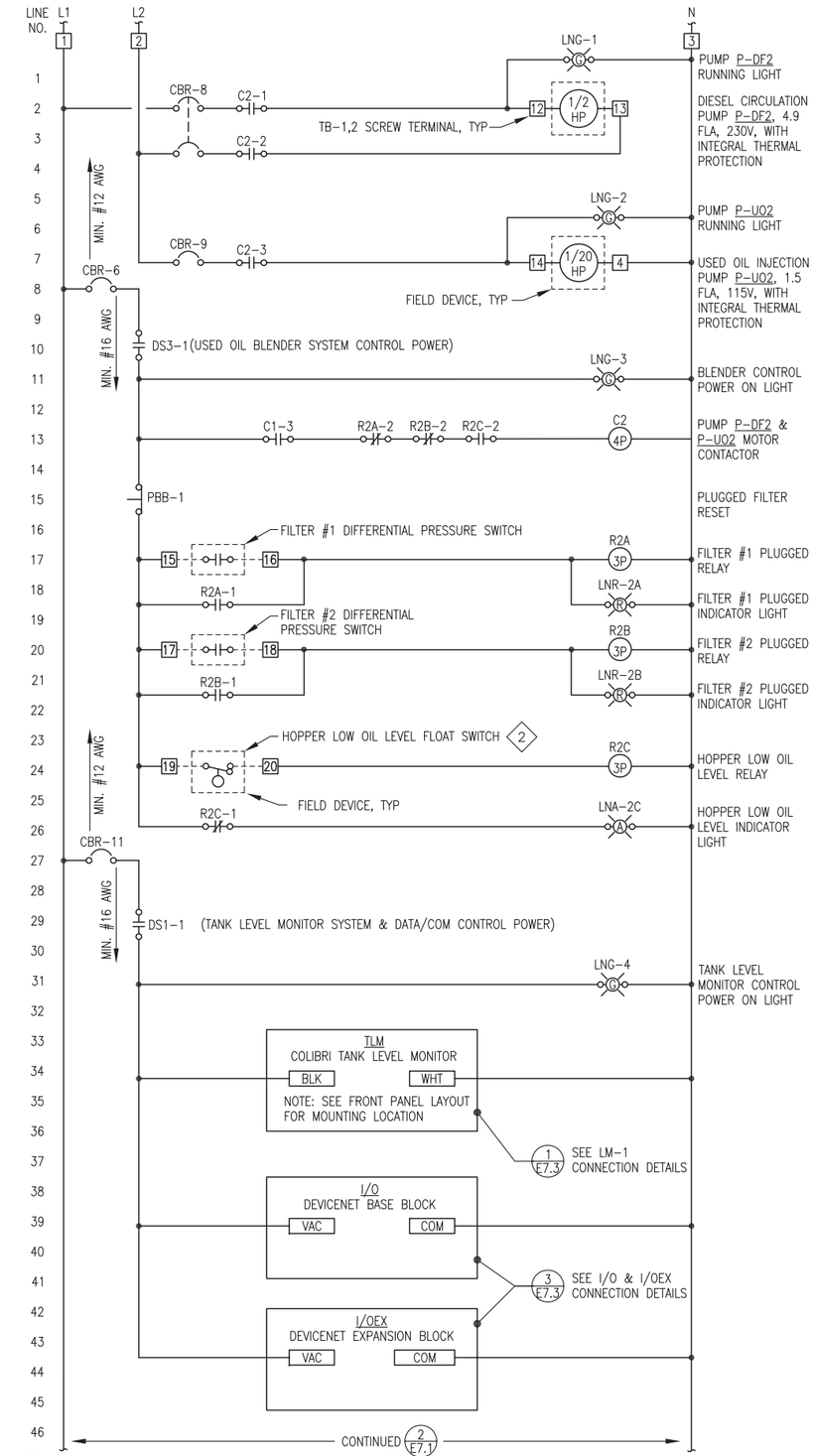
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: JTD/BCG
CHECKED BY: BCG/CWV
JOB NUMBER:

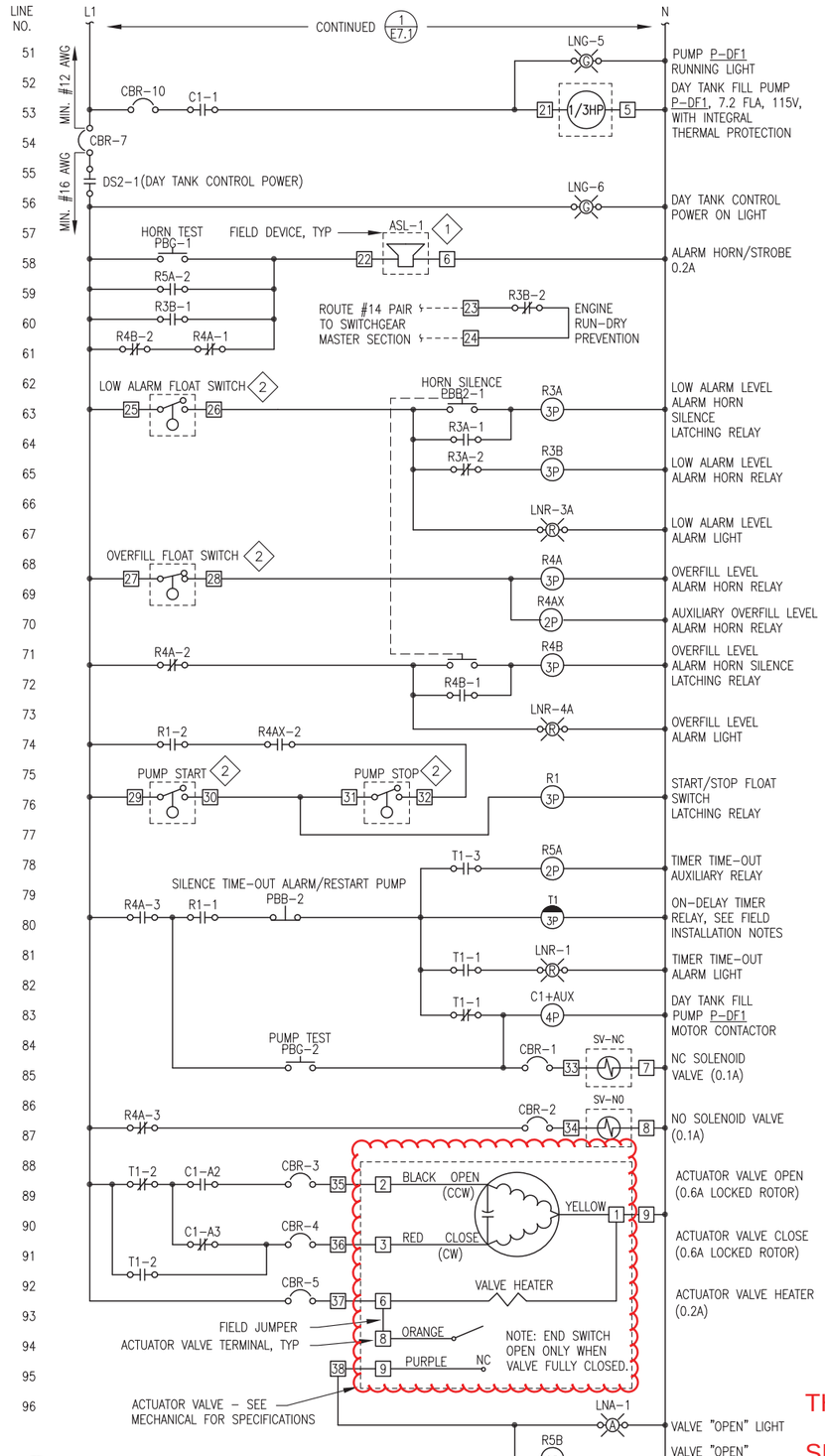
DRAWING TITLE:
24VDC DD SERIES 60 WIRING JUNCTION BOX

E6.3

SHEET 16 OF 19



1 E7.1 **USED OIL BLENDER SYSTEM LOGIC DIAGRAM**
NO SCALE



2 E7.1 **DAY TANK LOGIC DIAGRAM**
NO SCALE

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

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
AUX	1	ALLEN-BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
C	2	ALLEN-BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2,3,4,5	5	ALLEN-BRADLEY	1489-A1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR-6,7,11	3	ALLEN-BRADLEY	1489-A1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-8	1	ALLEN-BRADLEY	1489-A2-C150	RAIL-MOUNT CIRCUIT BREAKER, 2 POLE, 15A
CBR-9,10	2	ALLEN-BRADLEY	1489-A1-C150	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	3	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	3	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	6	ALLEN-BRADLEY	800HQRH2G	GREEN LED PILOT LIGHT, 12–130V, NEMA 4X
LNR	5	ALLEN-BRADLEY	800HQRH2R	RED LED PILOT LIGHT, 12–130V, NEMA 4X
LNA	2	ALLEN-BRADLEY	800HQRH2A	AMBER LED PILOT LIGHT, 12–130V, NEMA 4X
I/O	1	ALLEN-BRADLEY	1790D-T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
I/OEX	1	ALLEN-BRADLEY	1790D-T8A0X	120VAC DEVICENET 8 INPUT EXPANSION TERM. BLOCK
PBB	2	ALLEN-BRADLEY	800HAR2D2	MOMENTARY
PBB2	1	ALLEN-BRADLEY	800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	2	ALLEN-BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP	1	PHOENIX CONTACTS	FLPPRJ45/RJ45	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R (3P)	8	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	8	ALLEN-BRADLEY	700HN101	11 PIN SOCKET BASE
R (2P)	3	ALLEN-BRADLEY	700HA32A1	DPDT RELAY
	3	ALLEN-BRADLEY	700HN100	8 PIN SOCKET BASE
T	1	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	1	ALLEN-BRADLEY	700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	1	ALLEN-BRADLEY	700HT3	SERIES B TIMING MODULE
TB-1,2	50	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS
*TLM	*1	* OWNER FURNISHED COMPONENT TO BE INSTALLED BY PANEL FABRICATOR IN PANEL FACE AND CONNECTED AS INDICATED		* FRANKLIN/INCON COLIBRI CL6D TANK LEVEL MONITOR CONSOLE, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS FOR UP TO SIX TANKS WITH TEMPERATURE COMPENSATION

LEGEND

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

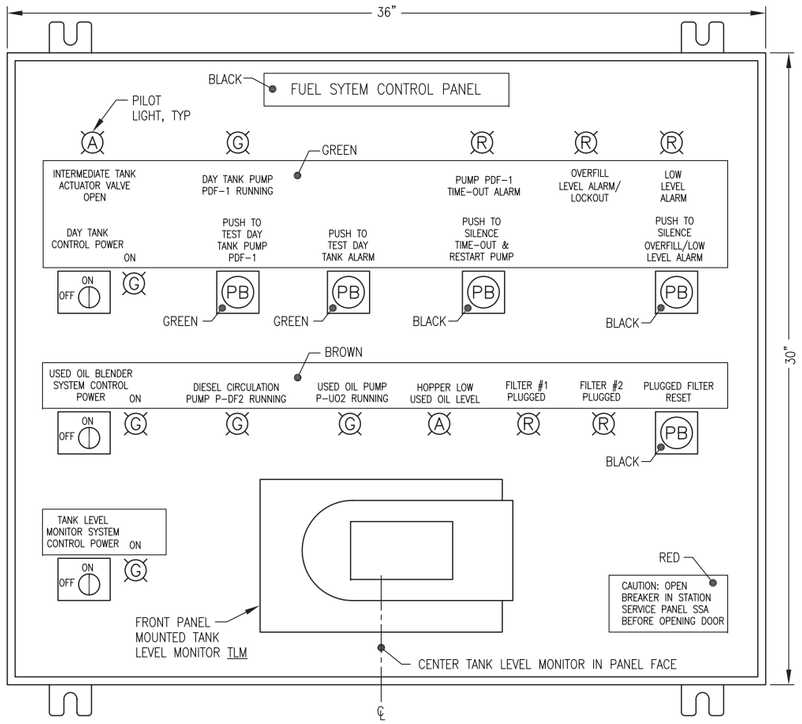
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

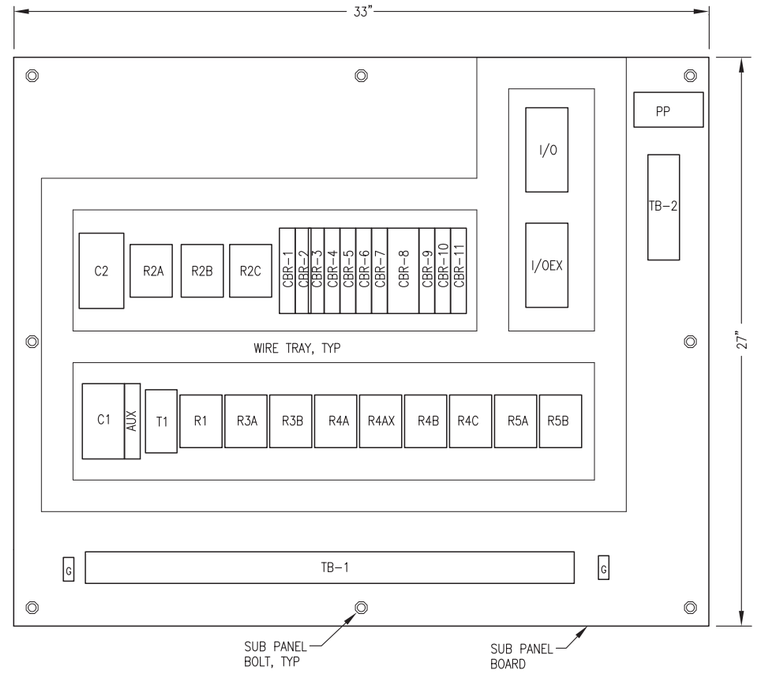
DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

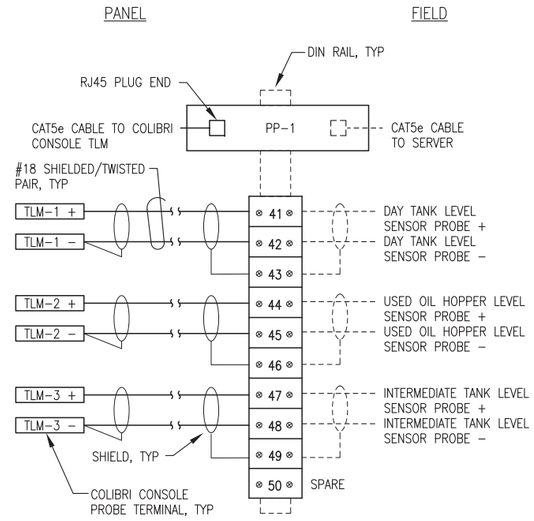
DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

E7.1

SHEET 17 OF 19







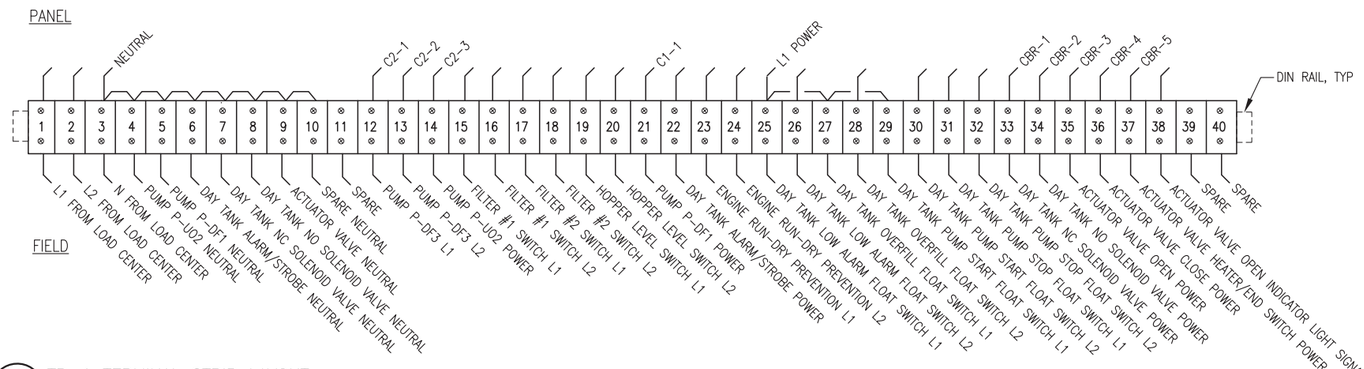
NOTES:

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

1 E7.2 FRONT PANEL LAYOUT
NO SCALE

2 E7.2 SUB PANEL LAYOUT
NO SCALE

3 E7.2 TB–2 TERM STRIP & PP–1 ENTHERNET PANEL LAYOUT
NO SCALE



NOTES:

1) INSTALL TERMINAL STRIP TB–1 ON HORIZONTAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL, SEE SUB–PANEL LAYOUT.

2) IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 —— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL LAYOUT & TERMNAL STRIPS

E7.2

SHEET 18 OF 19

PANEL NOTES:

1) PROVIDE COMPLETE UL LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. FIELD DEVICES ARE INDICATED WITH DASHED OUTLINE. INSTALL IN A 30"TALLx36"WIDEx8"DEEP NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7.2 FOR PANEL LAYOUT DETAILS.

2) USE MIN #12 WIRE FOR ALL CIRCUITS UP TO FIRST IN-LINE PANEL BREAKERS (FOR 20A FEED). USE MIN #16 AWG ON ALL 5 AMP CIRCUITS AND MIN #14 AWG WIRE ON ALL 15A CIRCUITS. TAG EACH END OF ALL JUMPERS WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS).

3) LABEL ALL PANEL DEVICES ON BASE OR BACK PANEL ADJACENT TO ITEM. LABEL REMOTE EQUIPMENT CONNECTIONS AT EACH TERMINAL BLOCK BY THE ITEM TITLE AS SHOWN ON THE FIELD SIDE OF THE TERMINAL STRIP DRAWING. PROVIDE BEVELED EDGE WHITE CORE NAMEPLATES AS SHOWN ON THE PANEL FACE LAYOUT AND SECURE TO PANEL FACE WITH A MINIMUM OF TWO STAINLESS STEEL MOUNTING SCREWS, COLOR AS INDICATED.

4) BENCH TEST COMPLETED UNIT. PROVIDE MIN 48 HOURS NOTICE TO ENGINEER TO SCHEDULE OBSERVATION OF BENCH TEST. PROVIDE SWITCHES AND LAMPS TO SIMULATE OPERATION OF ALL FIELD DEVICES.

5) FIELD WIRING AND FIELD INSTALLED DEVICES PROVIDED BY OTHERS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT PART OF THE PANEL BID.

6) POWER TO PANEL PROVIDED FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

FIELD INSTALLATION NOTES:

1) SEE MECHANICAL FOR DAY TANK INSTALLATION & PIPING. INSTALL CONTROL PANEL & FIELD DEVICES AS INDICATED TO PROVIDE REDUNDANT HIGH & LOW LIMIT CONTROLS & OVERFILL PROTECTION.

2) FIELD WIRING TO FLOAT SWITCHES, SOLENOID VALVES, ACTUATOR VALVE, & ALARM HORN #14 AWG. ALL OTHER FIELD WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS. WHEN NOT IN CONDUIT, MAKE JACKETED COM CABLE ENCLOSURE ENTRIES WITH CABLE GLAND CONNECTORS.

3) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS ON SHEET E2. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER.

4) VERIFY THAT ALL FLOAT SWITCHES ARE ORIENTED FOR N.C. (OPEN ON RISE) OPERATION PRIOR TO INSTALLATION. ALL FLOATS SHOWN ON LOGIC DIAGRAM WITH TANK AT FULL (PUMP STOP) LEVEL.

5) FILL PUMP CAVITY WITH LUBE OIL PRIOR TO INITIAL OPERATION. VERIFY PROPER ROTATION OF PUMP. PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO OPERATING DAY TANK PUMP.

6) FIELD TEST COMPLETED UNIT TO VERIFY ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOAT SWITCHES BY REACHING IN THROUGH ADJACENT 4" BUNG. TEMPORARILY SET TIMING RELAY TO 30 SECONDS TO VERIFY TIME-OUT AND RESET FUNCTIONS.

7) SET TIMING RELAY TIME DELAY TO 45 MINUTES (APPROX. 125 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 4 GPM). ON THE INITIAL TANK FILL, THE PUMP TEST/RESET BUTTON MAY HAVE TO BE MANUALLY RESET IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE "SEQUENCE OF OPERATIONS".

DAY TANK FILL SEQUENCE OF OPERATIONS:

1) WHEN THE DAY TANK CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED, THE POWER LIGHT IS ON AND POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE HEATER/"OPEN" LIGHT CIRCUIT.

2) WHEN THE DAY TANK IS NOT CALLING FOR FUEL, POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE CLOSE CIRCUIT. WHEN THE ACTUATOR IS IN THE FULLY CLOSED POSITION, THE CLOSING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #2 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT IS OFF.

3) NORMAL FILL OPERATION – WHEN THE FUEL LEVEL DROPS TO THE "PUMP START" SWITCH, THE TIMER IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, THE DAY TANK PUMP IS ENERGIZED, THE PUMP "ON" LIGHT TURNS ON, AND THE USED OIL BLENDER RUN SIGNAL DRY CONTACT CLOSES. WHEN THE ACTUATOR IS IN THE FULLY OPEN POSITION, THE OPENING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #7 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT REMAINS ON. WHEN FUEL REACHES THE "PUMP STOP" FLOAT SWITCH BEFORE THE TIMER TIMES-OUT, THE TIMER IS RESET, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, AND THE USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS.

4) TIMER OPERATION – IF THE TIMER TIMES-OUT THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS, THE "TIME-OUT" ALARM LIGHT TURNS ON, AND THE TIME-OUT ALARM HORN SOUNDS. PRESSING THE "TIME-OUT ALARM SILENCE / PUMP RESTART" BUTTON RESETS THE TIMER, SILENCES THE ALARM HORN, AND STARTS THE NORMAL FILL OPERATION. SEE FIELD INSTALLATION NOTES FOR TIMER SETTING.

5) OVERFILL FUEL LEVEL – IF THE TANK OVERFILLS AND THE FUEL LEVEL REACHES THE "OVERFILL" FLOAT SWITCH, THE N.O. DAY TANK SOLENOID VALVE CLOSES, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. PRESSING THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "OVERFILL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL FALLS BELOW THE "OVERFILL" FLOAT SWITCH, THE "OVERFILL LEVEL" ALARM LIGHT TURNS OFF, THE N.O. DAY TANK SOLENOID VALVE OPENS AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED). WHEN THE FUEL LEVEL REACHES THE "PUMP START" FLOAT SWITCH, THE NORMAL FILL OPERATION IS REPEATED.

6) LOW FUEL LEVEL – IF THE FUEL LEVEL FALLS BELOW THE "LOW ALARM" FLOAT SWITCH, THE "LOW FUEL LEVEL" ALARM LIGHT TURNS ON, THE ENGINE RUN-DRY PREVENTION DRY CONTACT OPENS, AND THE ALARM HORN SOUNDS. THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "LOW FUEL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL RISES ABOVE THE "LOW ALARM" FLOAT SWITCH THE "LOW FUEL LEVEL" ALARM LIGHT TURNS OFF, THE ENGINE RUN-DRY PREVENTION DRY CONTACT CLOSES, AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED).

7) PUMP & HORN TEST – MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST FUNCTION OF THE DAY TANK PUMP AND ALARM HORN. PRESSING THE "PUSH TO TEST DAY TANK PUMP" BUTTON STARTS THE TIMER, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE & ACTUATED BALL VALVE, ENERGIZES THE DAY TANK PUMP, TURNS ON THE DAY TANK PUMP "RUNNING" LIGHT AND CLOSES THE USED OIL BLENDER RUN SIGNAL DRY CONTACT. 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.

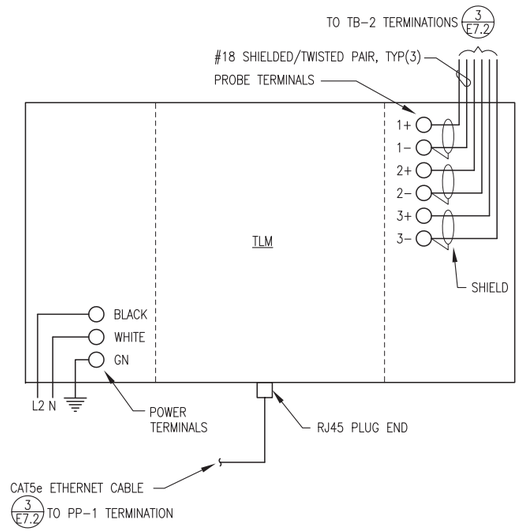
USED OIL BLENDER SYSTEM SEQUENCE OF OPERATIONS:

1) WHEN THE BLENDER CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED; THE GREEN POWER LIGHT IS ON AND POWER IS PROVIDED TO ALL CONTROL DEVICES.

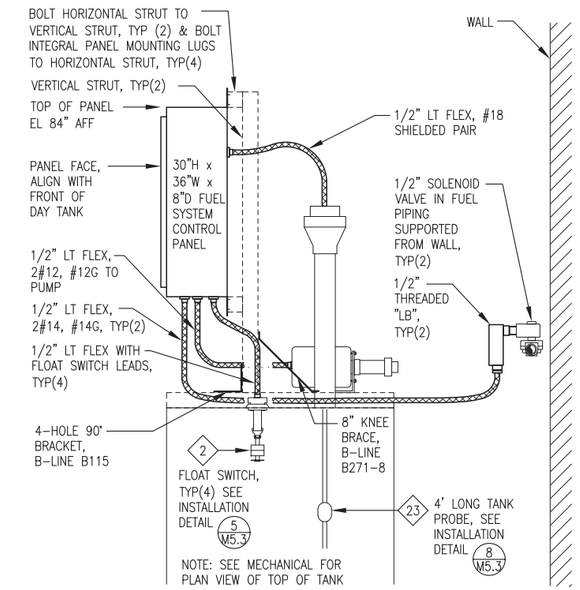
2) NORMAL OPERATION – WHENEVER THE DAY TANK FILL SEQUENCE IS INITIATED, BOTH THE DIESEL CIRCULATING PUMP P-DF2 AND THE USED OIL INJECTION PUMP P-U02 RUN AND THE ASSOCIATED GREEN PUMP RUNNING LIGHTS ARE ON.

3) PLUGGED FILTER – IF THE DIFFERENTIAL PRESSURE ACROSS A FILTER REACHES THE ALARM SETPOINT, BOTH PUMPS STOP RUNNING AND THE RED FILTER PLUGGED LIGHT FOR THE ASSOCIATED FILTER TURNS ON. THE ALARM LATCHES AND THE SYSTEM WILL NOT OPERATE UNTIL THE PROBLEM IS CORRECTED. AFTER THE FILTER ELEMENT HAS BEEN CHANGED THE BLACK RESET BUTTON MUST BE PRESSED TO RESUME NORMAL OPERATION.

4) HOPPER LOW OIL LEVEL – WHEN THE OIL LEVEL FALLS BELOW THE LOW LEVEL FLOAT SWITCH, BOTH PUMPS STOP RUNNING AND THE AMBER HOPPER LOW OIL LEVEL LIGHT TURNS ON. THE SYSTEM WILL NOT OPERATE UNTIL THE USED OIL LEVEL IN THE HOPPER RISES ABOVE THE LOW LEVEL. RESET IS NOT REQUIRED.

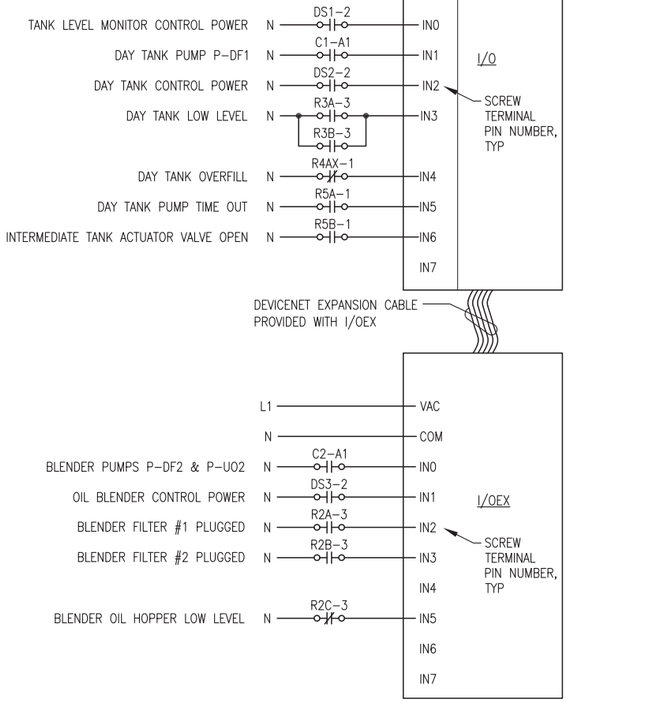


1 E7.3 TANK LEVEL MONITOR (TLM) CONSOLE CONNECTION DETAILS
NO SCALE



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

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



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

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

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

Gray Stassel Engineering, Inc.
P.O. 111405
Anchorage, AK 99511
(907)349-0100

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK POWER PLANT
KIPNUK, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

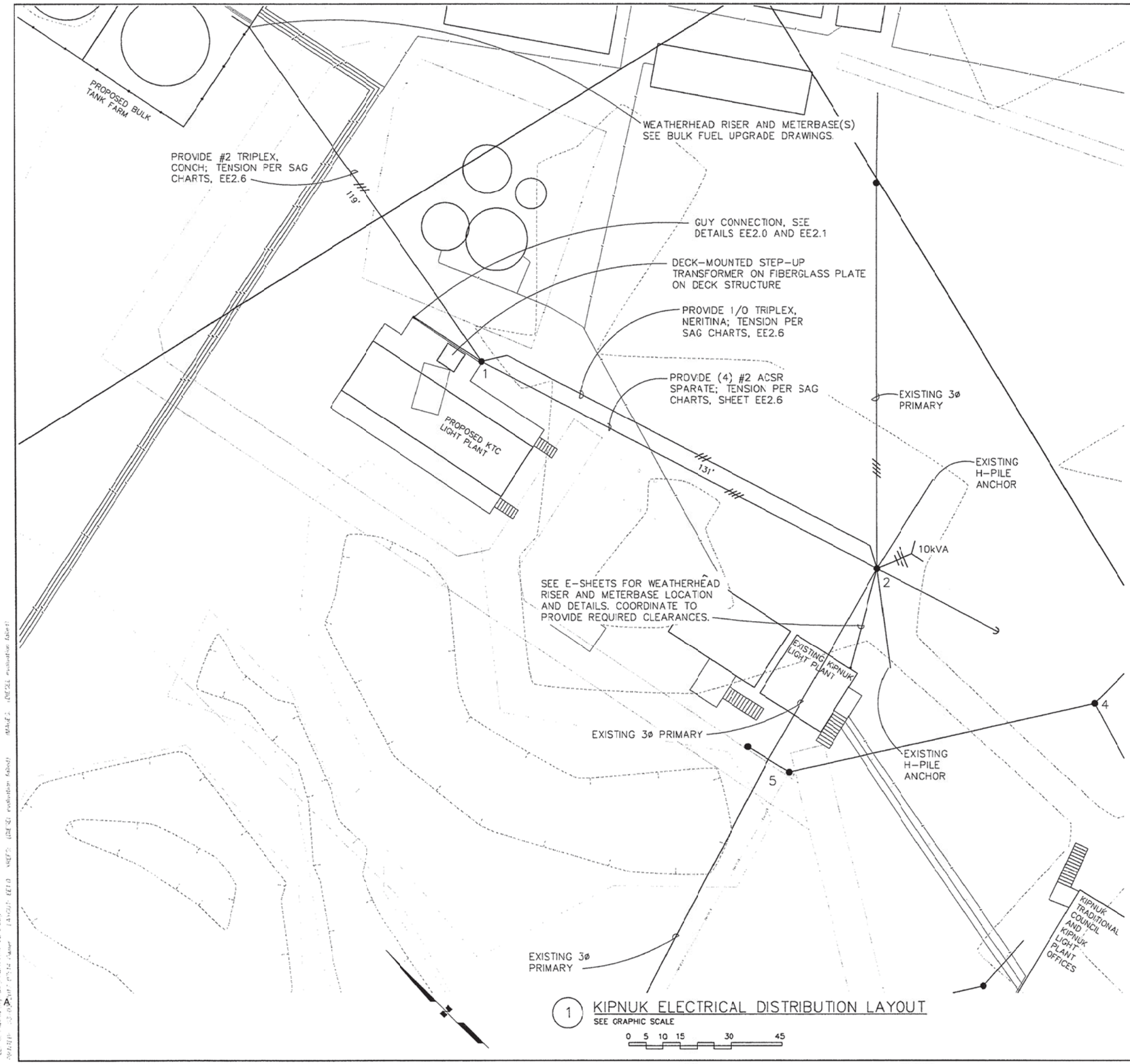
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/20/16
DRAWN BY: WJP
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL SEQUENCE OF OPERATION & DETAILS

E7.3

SHEET 19 OF 19



1 KIPNUK ELECTRICAL DISTRIBUTION LAYOUT

SEE GRAPHIC SCALE

0 5 10 15 30 45

GENERAL NOTES:

1. ALL WORK SHALL COMPLY WITH MOST RECENT EDITION OF THE NESC & RUS STANDARDS. WHERE STANDARDS VARY, THE MOST STRINGENT SHALL APPLY.
2. REQUEST LOCATES PRIOR TO DIGGING. ADJACENT UTILITIES SHOWN ON DRAWING SHALL BE FIELD VERIFIED.
3. PHASING OF CONSTRUCTION AND DEMOLITION SHALL BE SCHEDULED TO MINIMIZE OUTAGES TO CONSUMERS. NEW FACILITIES AND SOURCES ARE TO BE INSTALLED, AS REQUIRED, PRIOR TO RETIREMENT, TO MINIMIZE OUTAGES.
4. RETIRED TRANSFORMERS THAT ARE NOT TO BE SALVAGED AND RETURNED TO THE CITY, ARE TO BE REMOVED FROM VILLAGE AND SHALL BE DISPOSED OF PROPERLY. OTHER RETIRED FACILITIES ARE TO BE PHYSICALLY REMOVED FROM SITE.
5. ALL MATERIAL PROVIDED SHALL BE ON THE RUS APPROVED MATERIALS LIST.
6. PROVIDE ARMOR ROD ON PRIMARY AND NEUTRAL CONDUCTOR AT ALL NON-DEADENDED ATTACHMENTS.
7. PRIMARY SHALL NOT CROSS NEUTRAL IN ANY SPAN.
8. PROVIDE 3" SQUARE CURVED WASHERS ON BOTH SIDES OF ALL EYEBOLTS.
9. SEE DETAIL SHEETS EE2.1 TO EE2.5 FOR ASSEMBLY UNITS REFERENCED.
10. SEE DETAIL SHEET EE2.6 FOR SAG CHARTS.

SHEET NOTES:

STEP-UP TRANSFORMER (SEE SHEET E1.2):
PROVIDE: (3) UM6-1; (6) UM6-10; (3) UM6-15; RISER TO TRANSFORMER CONNECTION (SEE 2/EE2.3).

POLE 1:
PROVIDE: NEW 40/2 POLE, SEE DETAILS SHEET EE2.0. PROVIDE POLE TO CHANNEL ATTACHMENT AND SPLIT-BOLT HARDWARE PER DETAIL 1/EE2.1. PROVIDE VC7-1R FRAMING, AT 18" BELOW POLE TOP, WITH GAIN GRIDS AS REQUIRED; (4) UM5-5; UM2-5 RISER (3"); 3" LIQUIDTITE METALLIC FLEX TO UNDERSIDE OF TRANSFORMER; J6/J6; M52-3; F7-3; E1-3 GUY, ATTACHED 9" BELOW VC7-1R, WITH GUY DECK ATTACHMENT PER DETAIL 2/EE2.1; PROVIDE M2-11P POLE GROUND.

POLE 2:
EXISTING: 45/2 POLE ON H-PILE FOUNDATION; (2) H-PILE ANCHORS WITH TG-92-2 GUY LINK ASSEMBLIES.
RETIRE: C2 FRAMING AND GUY ATTACHMENTS AT POLE.
RELOCATE: GUYS TO NEW ATTACHMENT HEIGHTS.
PROVIDE: VC7-1R FRAMING, WITH GAIN GRIDS AS REQUIRED, FACING POLE 1, INSTALLED AT 9" FROM POLE TOP; VC9-2, WITH GAIN GRIDS AS REQUIRED, INSTALLED AT BISECTOR ANGLE, AT 30" BELOW VC7-1R; G136-10; J6, K11, INSTALLED 18" BELOW VC7-1R NEUTRAL; M52-3; F7-3 ANCHOR; (4) E1-3 GUYS, 1ST OPPOSITE POLE 1, ATTACHED 9" BELOW VC7-1R, 40' LEAD, WITH GUY STRAIN INSULATOR; SECOND AND THIRD GUYS TO EXISTING ANCHORS ATTACHED AT 7" AND 11" BELOW VC9-2; POLE GROUND; FOURTH 6" BELOW J5 OPPOSITE POLE 1.

POLE 5:
EXISTING: H-STRUCTURE WITH PLATFORM MOUNTED TRANSFORMERS.
RETIRE: (3) TRANSFORMERS; PLATFORM; GUARDRAIL CROSSARM ASSEMBLY AT PLATFORM; MULTI-PLEX CONDUCTORS TO OLD POWER PLANT; CUT-OUTS; SURGE ARRESTORS; AND JUMPERS TO TRANSFORMERS.
REPLACE: EPOXILATORS ON WEST SIDE OF DEADEND FRAMING.
PROVIDE: NEUTRAL SPOOL ON EAST SIDE OF DEADEND FRAMING; (3) MODIFIED POLE TOP PIN ASSEMBLY; JUMPERS ACROSS DOUBLE DEADEND WITH #2 ACSR AND H-TAP COMPRESSION CONNECTORS.

UMIAQ
8709 Arctic Spur Road · Anchorage, AK 99518 · (907)677-8320

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

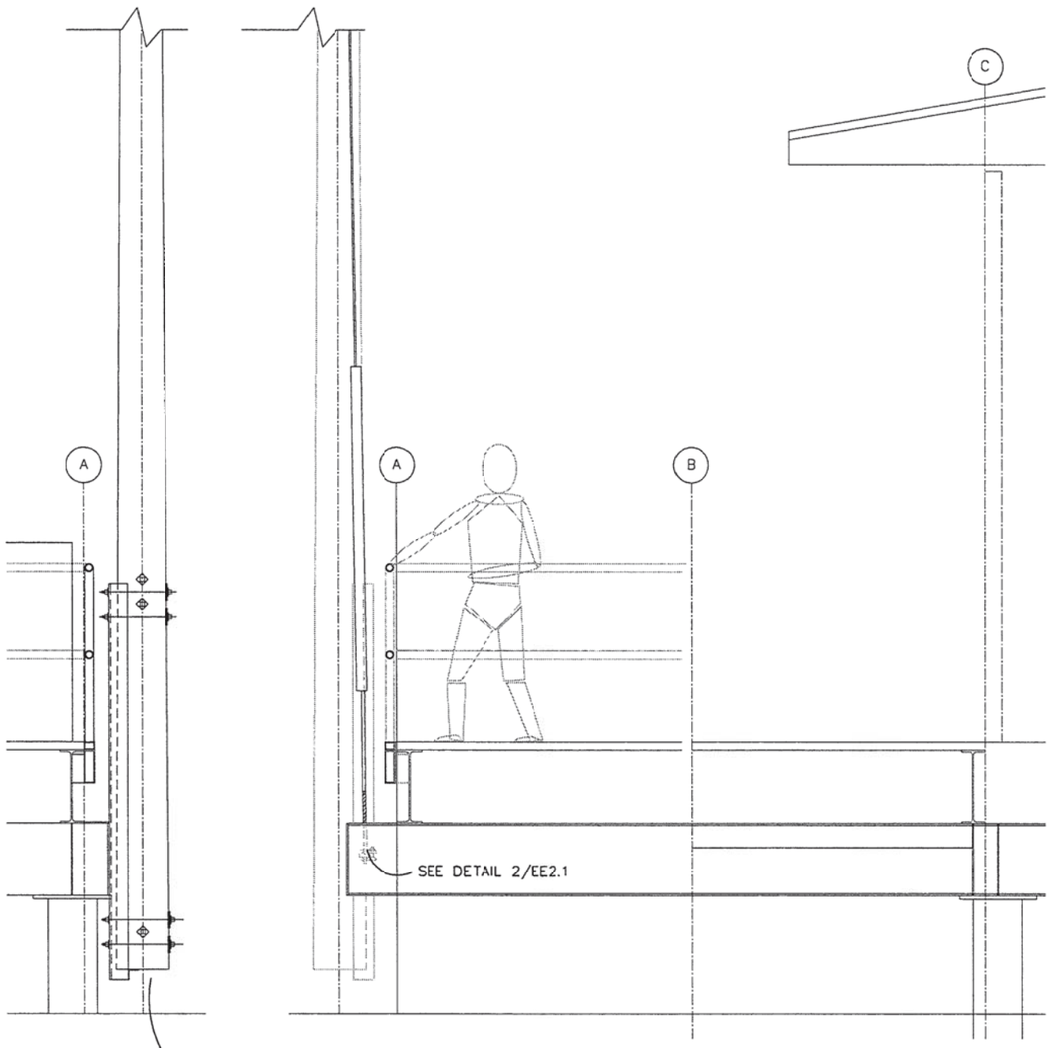
STATE OF ALASKA
49TH
3/3/17
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

DATE:	3/3/17
DRAWN BY:	MME
CHECKED BY:	GME
JOB NUMBER:	70184.15

DRAWING TITLE:
SITE ELECTRICAL LAYOUT

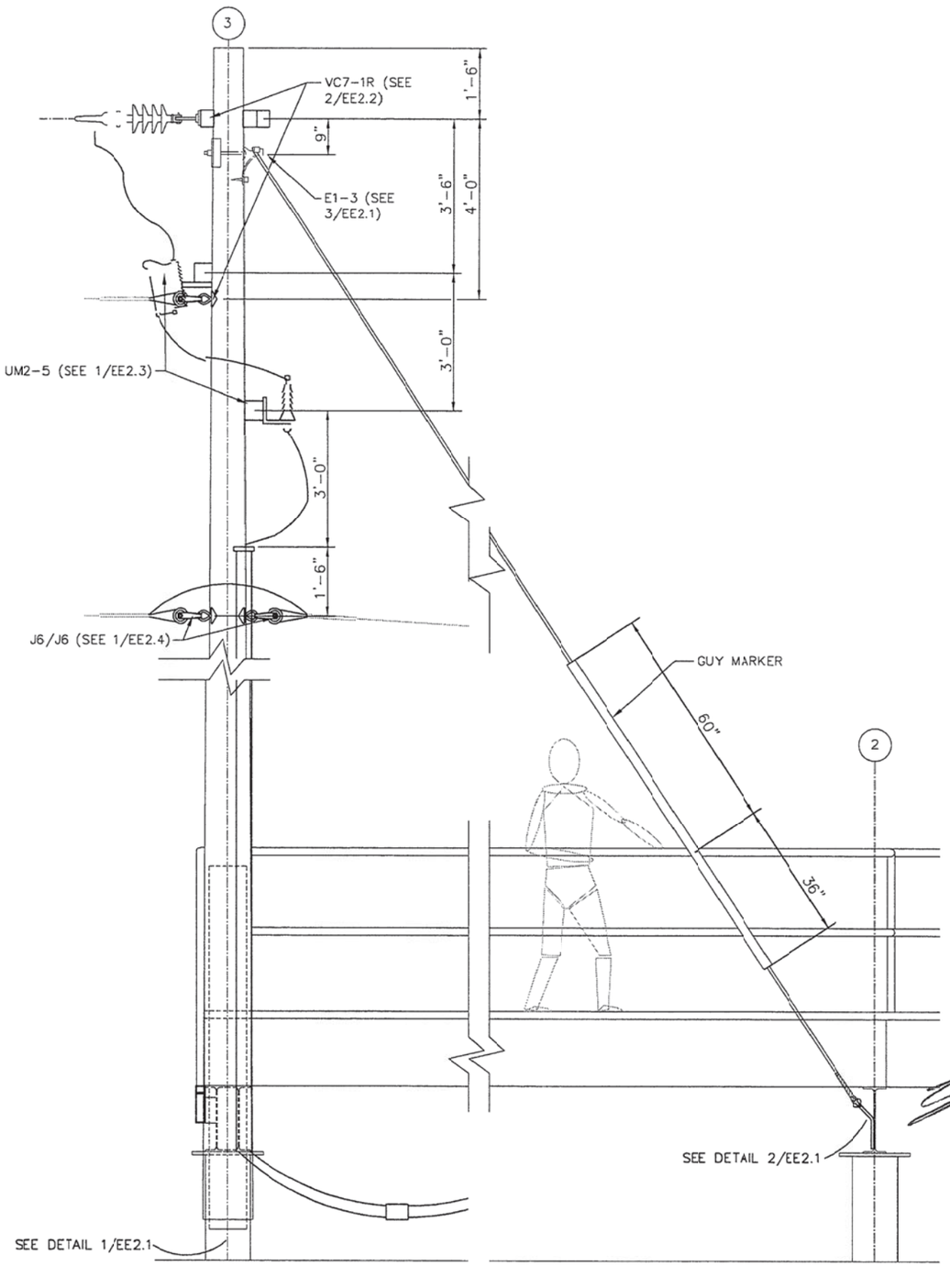
EE1.0

SHEET 1 OF 8



3 POLE 1, TO NORTH
NOT TO SCALE

2 POLE 1:
DECK ATTACH DETAIL – SECTION TO SOUTH
NOT TO SCALE



1 POLE 1:
DECK ATTACH DETAIL – SECTION FACING EAST
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road · Anchorage, AK 99518 · (907)677-4220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

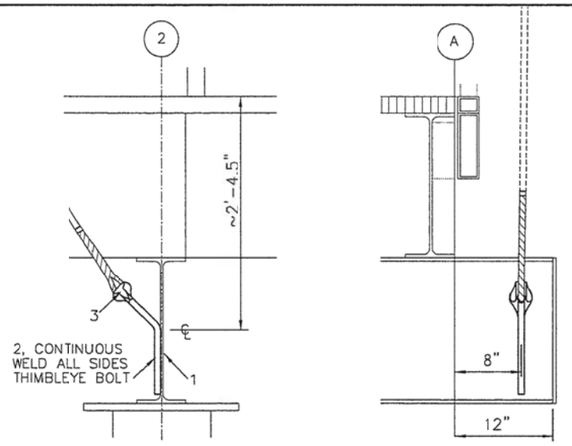
STATE OF ALASKA
49TH
3/3/17
Gregory M. Errico
Cert. No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

DATE:	3/3/17
DRAWN BY:	NME
CHECKED BY:	GME
JOB NUMBER:	70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

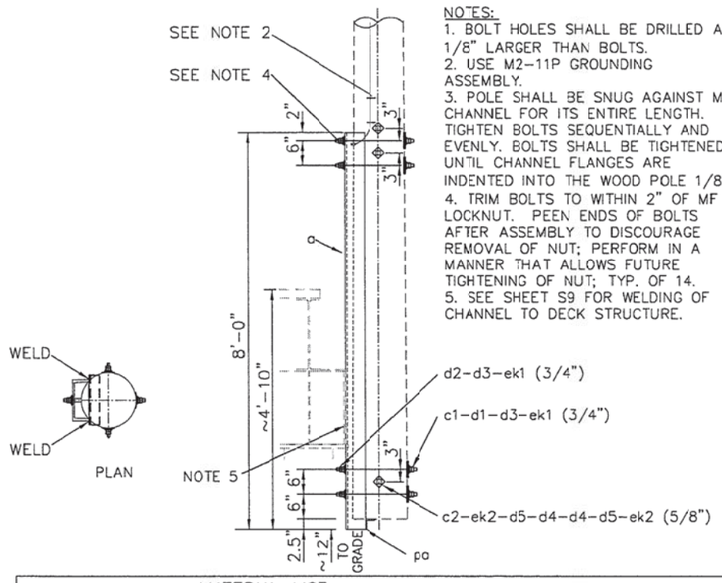
EE2.0

SHEET 2 | OF 8



MATERIAL LIST			
NO.	Qty.	DESCRIPTION	MFR. PART NO.
1	–	BEAM, SEE STRUCTURAL	–
2	1	BOLT, THIMBLEYE, ANGLE, TRIMMED AS REQUIRED	MACLEAN, GD–J8163
3	1	THIMBLEYE BONDING CLAMP	HUBBELL, GB068

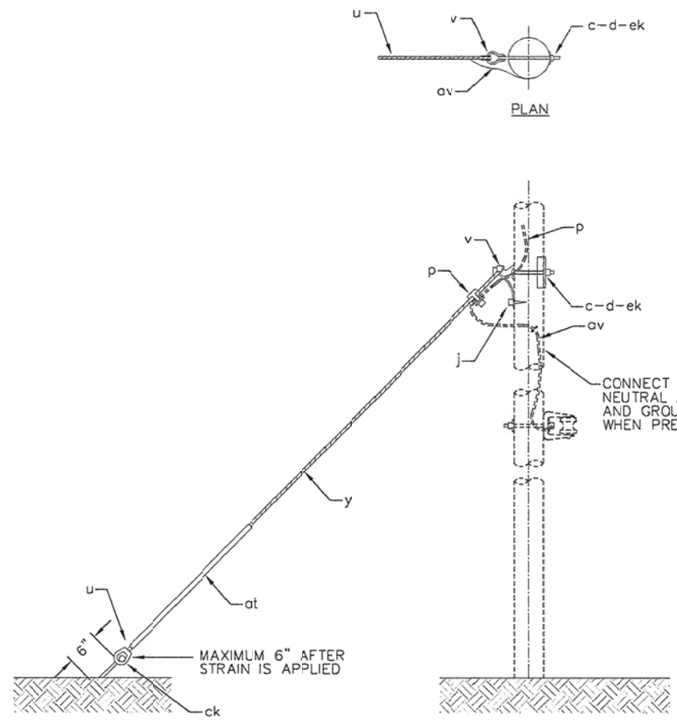
(2) ANCHOR: DECK ATTACH DETAILS
NOT TO SCALE



NOTES:
1. BOLT HOLES SHALL BE DRILLED AT 1/8" LARGER THAN BOLTS.
2. USE M2–11P GROUNDING ASSEMBLY.
3. POLE SHALL BE SNUG AGAINST MC CHANNEL FOR ITS ENTIRE LENGTH. TIGHTEN BOLTS SEQUENTIALLY AND EVENLY. BOLTS SHALL BE TIGHTENED UNTIL CHANNEL FLANGES ARE INDENTED INTO THE WOOD POLE 1/8".
4. TRIM BOLTS TO WITHIN 2" OF MF LOCKNUT. PEEN ENDS OF BOLTS AFTER ASSEMBLY TO DISCOURAGE REMOVAL OF NUT; PERFORM IN A MANNER THAT ALLOWS FUTURE TIGHTENING OF NUT; TYP. OF 14.
5. SEE SHEET S9 FOR WELDING OF CHANNEL TO DECK STRUCTURE.

MATERIAL LIST			
NO.	Qty.	DESCRIPTION	MFR. PART NO.
a	1	MC10x28.5 STEEL CHANNEL x 8' (SEE STRUCTURAL)	–
pa	1	2.5"x2.5"x3/8" STEEL ANGLE x 12"	–
c1	4	BOLT, DA, 3/4" X REQ'D LENGTH	MACLEAN, OR EQUAL
d1	4	WASHER, SQUARE, CURVED 4"x4"x3/8" W/ 13/16" HOLE	MACLEAN, J6838, OR EQ.
d2	4	WASHER, SQUARE, 2–1/4"x2–1/4"x3/16" W/13/16" HOLE	MACLEAN, J1076, OR EQ.
d3	8	SPRING WASHER, 3/4"	MACLEAN, J3541, OR EQ.
ek1	8	LOCKNUT, 3/4" MF TYPE	MACLEAN, J8584, OR EQ.
c2	3	BOLT, DA, 5/8" X REQ'D LENGTH	MACLEAN, OR EQUAL
d4	6	WASHER, SQ., CURVED 3"x3"x1/4" W/ 11/16" HOLE	MACLEAN, J113, OR EQ.
d5	6	SPRING WASHER, 5/8"	MACLEAN, J3540, OR EQ.
ek2	6	LOCKNUT, 5/8" MF TYPE	MACLEAN, J8583, OR EQ.

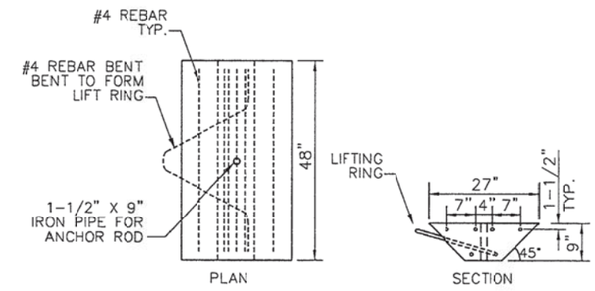
(1) POLE: DECK ATTACH DETAILS
NOT TO SCALE

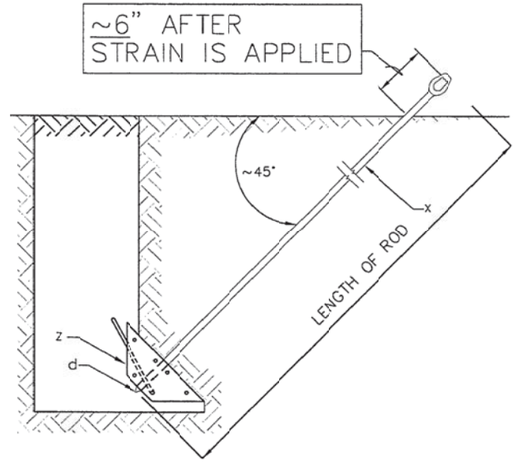


NOTES:
1. FORMED TYPE GRIPS MAY BE USED ONLY WITH SUITABLE ATTACHMENTS, (ITEM V) RECOMMENDED BY GRIP MANUFACTURER.
2. THE LOWER POINT (p) IS FOR LOCATIONS WHERE TWO GUY ATTACHMENTS ARE REQUIRED.
3. WHERE SEPARATE ANCHORS ARE INSTALLED THE MINIMUM SEPARATION SHALL BE FIVE FEET.
4. SPACING BETWEEN ANCHORS SHALL BE SUFFICIENT TO PROVIDE MAXIMUM HOLDING POWER OF EACH ANCHOR.
5. FOR LOOSE SOILS, CONCRETE OR OTHER, POLE FOOTINGS MAY BE REQUIRED.

MATERIAL LIST		
Item	QTY.	DESCRIPTION
c	1	BOLT, MACHINE, 3/4" X REQ'D LENGTH
d	1	WASHER, STEEL, 4" SQUARE, CURVED, 1/4 THICK, WITH 13/16" HOLE, MACLEAN #J1082, OR EQUAL
ek	1	LCCKNUTS, 3/4:
j	1	SCREW, LAG 1/2" x 4"
p	–	CONNECTORS, COMPRESSION, AS REQUIRED
u	2	DEADEND, GUY, PREFORMED, #GDE–1107
fw	1	ATTACHMENT, GUY, HOOK (18,350 lbs.), HUBBELL #GH6, OR EQUAL
y	–	GUY STRAND, 3/8, GALVANIZED STEEL STRAND, EHS, AS REQUIRED
al	–	STAPLES, GROUND WIRE, AS REQUIRED
av	–	JUMPERS, GOUNDING, AS REQUIRED, #6 BARE SOLID COPPER
at	1	GUY MARKER, 96" (ORANGE, YELLOW, OR YELLOW & ORANGE)
ck	1	CLAMP, ANCHOR ROD, BONDING

(3) E1–3
NOT TO SCALE





NOTES:
1. THE ANCHOR ROD AND NUT SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.
2. CONTRACTOR SHALL INSTALL ANCHORS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

MATERIAL LIST		
NO.	NO.	DESCRIPTION
d	1	WASHER, SQUARE, 4" 1–1/8" HOLE
x	1	ROD, ANCHOR, TRIPLE EYE, 1"X10'
z	1	ANCHOR, CONCRETE, 4'–0"

(4) F7–3
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road - Anchorage, AK 99518 - (907)677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

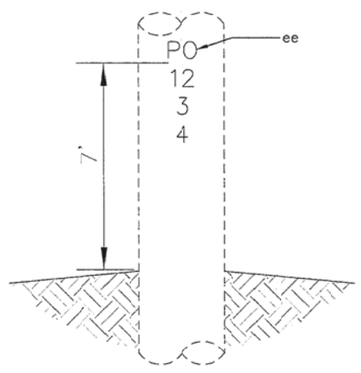
STATE OF ALASKA
Gregory M. Errico
No. EE–10279
REGISTERED PROFESSIONAL ENGINEER

DATE: 3/3/17
DRAWN BY: MME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

EE2.1

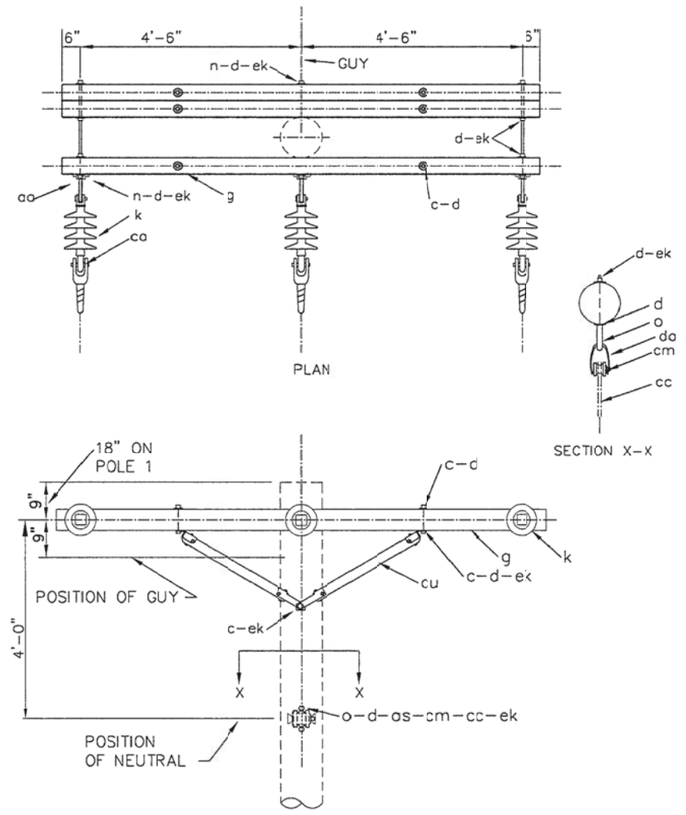
SHEET 3 OF 8



NOTES:
1. INSTALL FACING ROAD OR BOARDWALK.

MATERIAL LIST		
NO.	Qty.	DESCRIPTION
ee	–	LETTER OR NUMBER, ALUMINUM, EMBOSSED, 3" HIGH, PREMAX UAR03_, OR EQUAL; SECURED WITH 1 1/4" ALUMINUM NAILS.

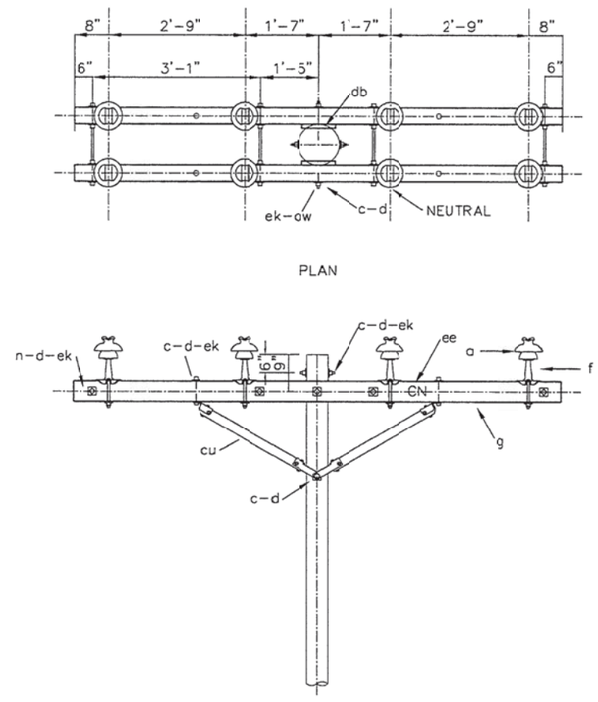
1 M52-3
NOT TO SCALE



NOTE:
1. THIS ASSEMBLY: USES 3" SQUARE CURVED WASHERS (2 REQUIRED, ONE ON EACH SIDE OF NEUTRAL EYE-BOLT).
2. EYEBOLT TO BE TIGHTENED AGAINST WASHER ON BOTH SIDES OF BOLT.

MATERIAL LIST		
Item	NO.	DESCRIPTION
aa	3	NUT, EYE, 5/8"
c	4	BOLT, MACHINE, 1/2" X 6"
c	1	BOLT, MACHINE, 5/8" X REQ'D LENGTH
ca	3	DEADEND, CURVED, BOLTED, HUBBELL PG57C, OR APPROVED EQUAL
cc	1	DEADEND, NEUTRAL, PREFORMED #DG-4542
cm	1	INSULATOR, SPOOL, 3", ANSI 53-2
cu	2	BRACE, WOOD, 60" SPAN, 18" DROP (PAIR)
d	10	WASHER, 2-1/4" SQUARE, 13/16" HOLE
d	4	WASHER, 1-3/8" ROUND, 9/16" HOLE
d	2	WASHER, STEEL, 3" SQUARE, CURVED, 1/4" THICK, 11/16" HOLE
da	1	CLEVIS, NEUTRAL, SWINGING, MACLEAN #GD-J0322, OR APPROVED EQ.
ek	–	LOCKNUTS, AS REQUIRED
g	3	CROSSARM, 3-3/4" X 4-3/4" X 10'-0", TYPE 05
k	3	INSULATOR, SUSP., 25 kV EPOXILATOR, 15,000 lb
n	3	BOLT, DOUBLE ARMING, 5/8" X REQ'D LENGTH
o	1	BOLT, EYE, 5/8" X REQ'D LENGTH
db	2	GAIN, HUBBELL, PG-44 OR EQUAL

2 VC7-1R
NOT TO SCALE



MATERIAL LIST		
NO.	Qty.	DESCRIPTION
a	8	INSULATOR, PIN TYPE, ANSI 56-1, VICTOR #27R, OR EQ.
c	1	BOLT, MACHINE, 5/8 X REQ'D LENGTH
c	4	BOLT, MACHINE, 1/2"XREQ'D LENGTH
d	4	WASHER, 1-3/8" ROUND WITH 9/16" HOLE
d	20	WASHER, 2-1/4" SQUARE WITH 13/16" HOLE
f	8	PIN, CROSSARM, STEEL, CLAMP TYPE, 1-3/8 THREAD, MACLEAN #J3324Z, OR EQUAL
–	4	ARMOR ROD DOUBLE SUPPORT
ah	4	PREFORMED WRAPLOCK TIE, DOUBLE SIDE SUPPORT
g	2	CROSSARM, 3-3/4" X 4-3/4" X 10'-0"
n	6	BOLT, DOUBLE ARMING, 5/8" x REQUIRED LENGTH
cu	2	BRACE, WOOD, 60" SPAN, 18" DROP (PAIR)
ee	4	LETTERS, 2 "C", 2 "N", WITH 1-1/4" ALUMINUM NAILS
ek	4	LOCKNUT 1/2"
ek	20	LOCKNUT, 5/8"
db	2	GAIN, HUBBELL PG-44 OR EQUAL

3 VC9-2
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road · Anchorage, AK 99518 · (907)677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS	
REV	DATE	DESCRIPTION

VERIFY SCALES
0 —— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

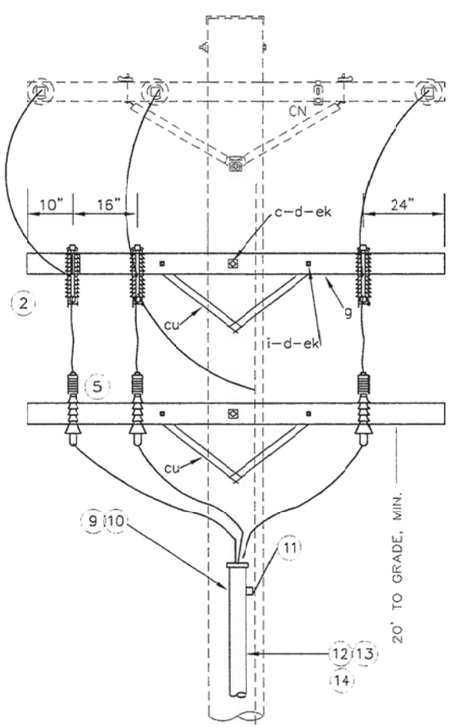
STATE OF ALASKA
49TH
3/3/17
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

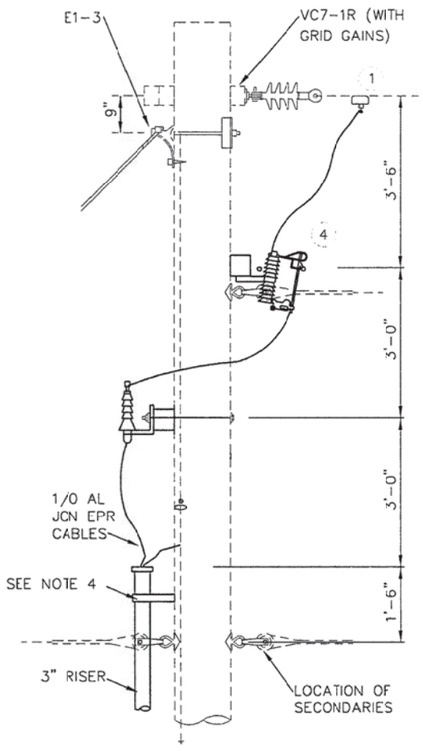
DATE: 3/3/17
DRAWN BY: NME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

EE2.2

SHEET 4 OF 8



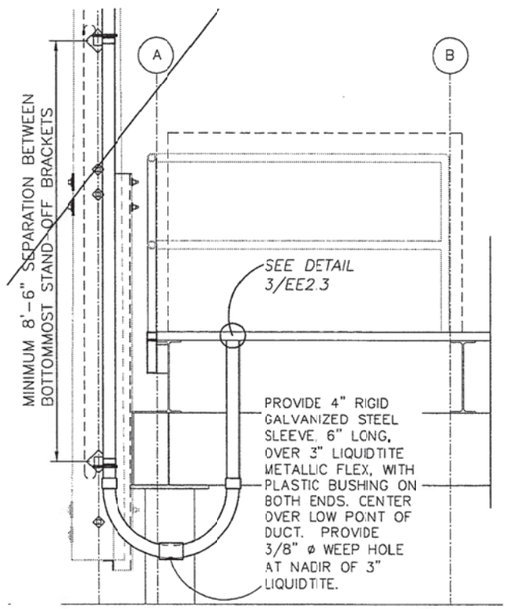


NOTES:
1. CLAMP HOT-LINE CLAMP OVER STIRRUPS.
2. JUMPERS SHALL BE CONTINUOUS FROM BOTTOM OF CUT-OUT THROUGH LIGHTNING ARRESTOR AND THEN TO TERMINATION. JUMPER CONNECTION TO LIGHTNING ARRESTOR SHALL BE SECURE AND DIS-CONNECTABLE WITHOUT SPLICING OR REPLACING THE JUMPER.
3. GROUND, ARRESTORS, TERMINATIONS, RISER PIPE, AND NEUTRAL TO POLE GROUND.
4. MAINTAIN A MINIMUM OF 8'-6" SEPARATION BETWEEN BOTTOMMOST STAND-OFF BRACKETS.
5. INSTALL FIRST PIPE GROUNDING CLAMPS BELOW BOTTOM STAND-OFF BRACKET; INSTALL SECOND GROUNDING CLAMP ABOVE SECOND STAND-OFF BRACKET.

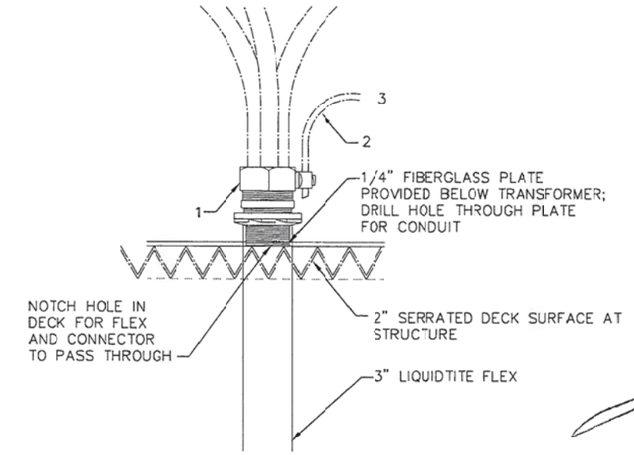
MATERIAL LIST

Item	Qty.	DESCRIPTION
1	3	STIRRUP AND HOT-LINE CLAMP
2	3	JUMPER, #2 COVERED, STRANDED COPPER, TRANSFORMER RISER WIRE
3	–	PRIMARY CABLE, 1/0 STRANDED AL, OKONITE #163-23-3072, OR APPROVED EQUAL
4	3	CUT-OUT, LOAD BREAK, HUBBELL # CP730133PB, OR EQ. WITH 300A SOLID BLADE
5	3	TERMINATION, 25 KV, 3M #7652-S-4-TI, WITH 1/C STEM CONNECTOR 3M #SC0010, OR EQ.
9	1	DUCT SEAL
10	1	NON-METALIC BELL END
11	4	STAND-OFF BRACKET, 12", WILCOR WA12DB, OR EQUAL
12	11	3" RGS CONDUIT (10') WITH COUPLING
12	–	3" PVC (10')
13	–	SCREW LAG 1/2" X 4", (as required)
14	2	PIPE GROUNDING CLAMP, ILSCO #AGC-4, OR EQUAL
15	–	NO. 4 STRANDED COPPER, EQUIPMENT GROUNDING, (as required)
16	–	COPPER COMPRESSION CONNECTORS, BURNDY YC SERIES CONNECTORS, OR EQUAL (as req.)
g	2	CROSSARM, 3-5/8" X 4-5/8" X 8'-0"
c	2	BOLT, MACHINE, 5/8" X REQ'D LENGTH
d	4	WASHER, 2-1/4" SQUARE WITH 13/16" HOLE
cu	4	BRACE, WOOD 28"
i	4	BOLT, CARRIAGE, 3/8" X REQ'D LENGTH
ek	–	LOCKNUTS, (as required)

1 UM2-5: PRIMARY RISER
NOT TO SCALE



2 RISER TO TRANSFORMER CONNECTION
NOT TO SCALE



NOTE:
1. BOND TO TRANSFORMER GROUND LOOP WITH COPPER COMPRESSION CONNECTOR.

MATERIAL LIST

NO.	Qty.	DESCRIPTION	MFR. PART NO.
1	1	CONNECTOR, 3" LIQUIDTITE	RACO #3522-3
2	1	WIRE, GROUND, #2 BARE STRANDED COPPER	–
3	1	CONNECTOR, COMPRESSION, COPPER	–

3 LIQUIDTITE CONNECTOR
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road - Anchorage, AK 99518 - (907)677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 —— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

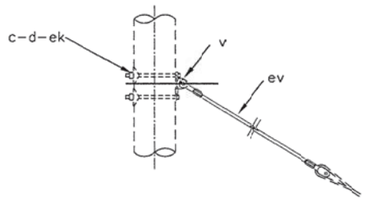
STATE OF ALASKA
3/3/17
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

DATE: 3/3/17
DRAWN BY: MME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

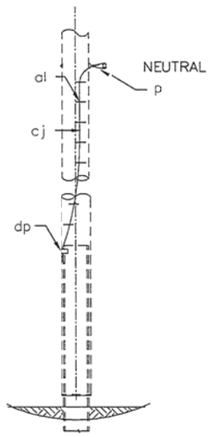
EE2.3

SHEET 5 OF 8



MATERIAL LIST		
NO.	Qty.	DESCRIPTION
ev	1	INSULATOR, GUY STRAIN, CLEVIS/THIMBLE-EYE, 96", 21,000 LBS.
v	1	POLE EYE PLATE, 20,000 LBS.
c	2	BOLT, MACHINE, 3/4" x REQUIRED LENGTH
d	2	WASHER, STEEL, 4" SQUARE, CURVED, 13/16" HOLE
ek	2	LOCKNUT, 3/4"

4 M5–23P
NOT TO SCALE

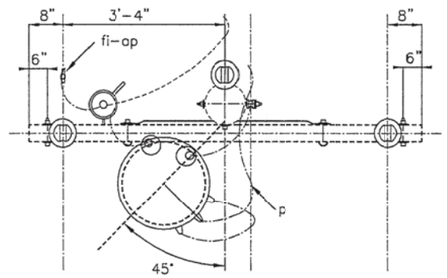


NOTES:
1. GROUND WIRE TO BE LOCATED ON SAME SIDE AS NEUTRAL CONDUCTOR AND IN QUADRANT.
2. STAPLES ON GROUND WIRE SHALL BE 2' APART, EXCEPT FOR A DISTANCE OF 10' ABOVE GROUND AND 8' FROM TOP OF POLE WHERE THEY SHALL BE 6" APART.

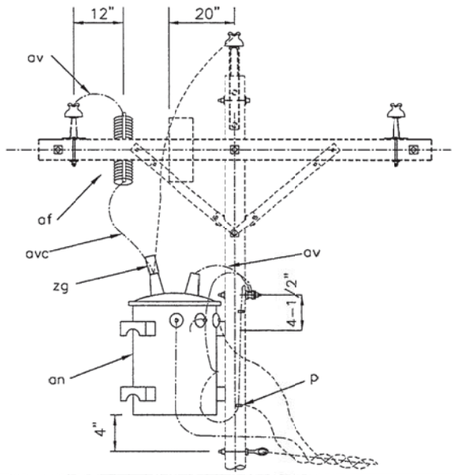
MATERIAL LIST		
Item	NO.	DESCRIPTION
p	as req'd	CONNECTOR, COMPRESSION
al	AS REQ'D	STAPLES, COPPER, AS REQUIRED
cj	AS REQ'D	GROUND WIRE, #4 BARE STRANDED COPPER
dp	1	SERVIT POST, BURNDY #KC22B1 W/ BRONZE NUT AND BRONZE LOCKNUT OR APPROVED EQUAL

3 M2–11P
NOT TO SCALE

TRANSFORMER SPECIFICATION:
1. OVERHEAD, POLE MOUNT, STAINLESS STEEL TANK AND COVER.
2. 10kVA, SINGLE-PHASE, AMORPHOUS CORE.
3. TWO BUSHING, COVER MOUNTED, PRIMARY BUSHING, 95kV BIL.
4. HIGH VOLTAGE: 12,470V GROUNDED WYE/7,200V.
5. LOW VOLTAGE: 240/120V, AND INTERNALLY CONFIGURED TO ALLOW COILS TO BE READILY PARALLELED FOR FULL kVA CAPACITY AT 120V OPERATION.
6. NO INTERNAL HIGH VOLTAGE FUSE LINK; PROVIDE TYPE "S" TRANSFORMERS.
7. THREE BUSHING SECONDARY, 240/120V GROUNDED WYE, CLAMP TYPE.
8. OIL IMMERSED.
9. PRIMARY TAPS ON 7,200V SIDE AT 5% AND 2.5% BELOW UNITY, UNITY, AND 2.5% AND 5% ABOVE UNITY.
10. CERTIFICATION OF PRODUCTION LINE IMPULSE TEST.
11. PRIMARY TERMINALS TO ACCEPT #8 SOLID TO #2 STRANDED.
12. TRANSFORMER SHALL HAVE TWO GROUND CONNECTIONS ACCEPTING #8 SOLID TO #2 STRANDED.
13. TRANSFORMER SHALL HAVE A GROUND STRAP BETWEEN THE SECONDARY NEUTRAL BUSHING AND THE TRANSFORMER TANK.
14. TRANSFORMER MANUFACTURER SHALL BE ON THE RUS APPROVED MANUFACTURERS LIST.

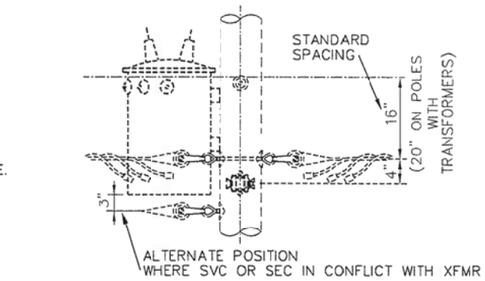


PLAN

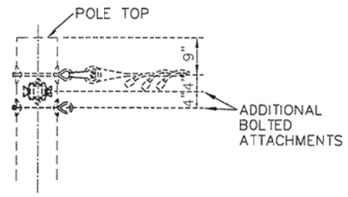


MATERIAL LIST		
NO.	Qty.	DESCRIPTION
af	1	CUTOUT, NON-LOAD BREAK, W/ FUSE & NEMA BRACKET
an	1	TRANSFORMER, PER SPECIFICATION
ap	1	CLAMP, HOTLINE
avc	–	JUMPER, COVERED, #6 (OR #2) CU XHHW, LENGTH AS REQ'D
av	–	GROUND WIRE, #6 AWG BaCuSol, LENGTH AS REQ'D
bb	2	LUG, GROUNDING, TANK
c	2	BOLT, MACHINE, 3/4" X REQ'D LENGTH
d	2	WASHER, 2-1/4" SQUARE WITH 13/16" HOLE
ek	2	LOCKNUT, 3/4"
fi	1	STIRRUP, FORGED
p	–	CONNECTOR, COMPRESSION, AS REQUIRED
	3	CONNECTOR BLOCK, TRANSFORMER, 8-POSITION
zg	1	ANIMAL GUARD

2 G136: SINGLE PHASE POLE MOUNTED TRANSFORMER
NOT TO SCALE

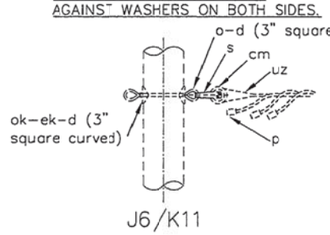


J6/K11, J5, J10/K10 AT PRIMARY POLE

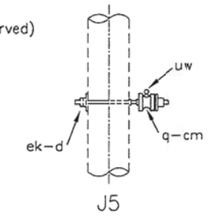


J6/K11, J5, J10/K10 AT SECONDARY POLE

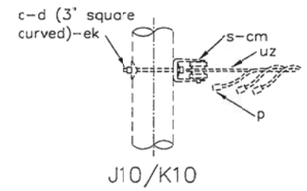
EYEBOLTS TO BE TIGHTENED AGAINST WASHERS ON BOTH SIDES.



J6/K11

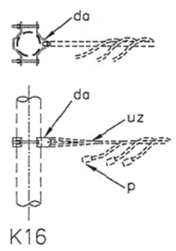


J5

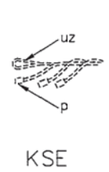


J10/K10

MINIMIZE DRIP LOOPS:
FOR HORIZONTAL TRANSITIONS, DRIP LOOP CONDUCTORS SHALL NOT EXTEND MORE THAN 4" BELOW LOWER ATTACHMENT BOLT.
FOR TRANSITIONS TO TRANSFORMER BUSHINGS, CONDUCTORS SHALL NOT EXTEND MORE THAN 4" BELOW ATTACHMENT BOLT.



K16



KSE

MATERIAL LIST						
NO.	J6 or K11	J5	J10 or K10	K16	KSE	DESCRIPTION
c			1			BOLT, MACHINE, 5/8" X REQ'D LENGTH
o	1					BOLT, OVALEYE, 5/8" x REQ'D LENGTH
cm	1	1	1			INSULATOR, SPOOL, 3", VCTOR #VI2612, OR EQUAL
d		1				WASHER, 2-1/4" SQUARE, 11/16" HOLE
d	2		1			WASHER, 3" SQUARE, CURVED, 11/16" HOLE
da				1		BRACKET, SERVICE MAST, MACLEAN #J0590 OR EQUAL
ek	1	1	1			LOCKNUTS, 5/8"
ok	1					NUT, OVALEYE, 5/8", AS REQ'D
p	3		3	3	3	CONNECTORS, COMPRESSION, (3) H-TAP WITH (2) COVERS OR (2) INSULATED SVC SPLICES AND (1) BARE SVC SPLICE
q		1				BOLT, 5/8" DOUBLE UPSET
s			1			CLEVIS, RIGID, MACLEAN #J1300, OR EQUAL
s	1					CLEVIS, SWINGING, MACLEAN #J0322, OR EQUAL
uz	1		1	1	1	GRIP, SERVICE, DEAD-END, SIZE AS REQ'D FOR #4 TRIPLEX: PREFORMED #SG-4502 FOR #2 TRIPLEX: PREFORMED #SG-4504 FOR 1/0 TRIPLEX: PREFORMED #SG-4544 FOR 4/0 TRIPLEX: PREFORMED #SG-4547
uw		1				TIE, SPOOL FOR #2 TRIPLEX: PREFORMED #SPL-1354-P FOR 1/0 TRIPLEX: PREFORMED #SPL-1355-P

1 J5/J6/J10/K16/KSE
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road · Anchorage, AK 99518 · (907)677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 —— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

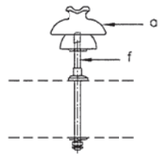
STATE OF ALASKA
49TH
3/3/17
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

DATE: 3/3/17
DRAWN BY: MME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

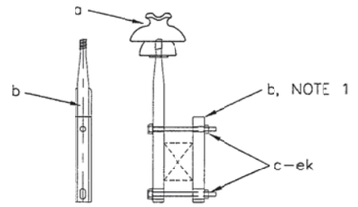
EE2.4

SHEET 6 OF 8



MATERIAL LIST		
NO.	Qty.	DESCRIPTION
a	1	INSULATOR, PIN TYPE, 25kV, ANSI 56-1, VICTOR #27R
f	1	PIN, CROSSARM, STEEL, NYLON THREAD FORGED HV PIN, HUBBELL #4717P OR APPROVED EQUAL.

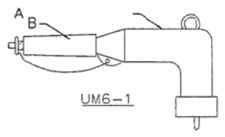
4 VM5-5
NOT TO SCALE



NOTES:
1. CUT OFF END; GRIND EDGES SMOOTH; APPLY (2) COATS OF ZINC RICH PAINT TO CUT EDGE.

MATERIAL LIST		
NO.	Qty.	DESCRIPTION
a	1	INSULATOR, PIN TYPE, 25kV, ANSI 56-1, VICTOR #27R
b	2	PIN, POLE TOP, 20", HUBBELL #2195, OR APPROVED EQUAL
c	2	BOLT, MACHINE, 5/8" x REQUIRED LENGTH
ek	2	LOCKNUTS, AS REQUIRED

5 MODIFIED POLE TOP PIN ASSEMBLY
NOT TO SCALE

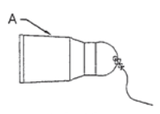


UM6-1

NOTES:
1. INSTALL TERMINATION ON CABLE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. INSTALL ONE WRAP OF MASTIC TAPE OVER CABLE JACKET NEAR ITS CUT-BACK EDGE.
3. CAREFULLY LAY BACK CONCENTRIC NEUTRALS, OVER MASTIC TAPE, PARALLEL WITH CABLE, AND SECURE WITH TAPE.
4. INSTALL MASTIC TAPE OVER LAID BACK NEUTRAL AND ABOVE FIRST MASTIC WRAP.
5. INSTALL COLD SHRINK OVER BASE OF ELBOW EXTENDING OVER LAID BACK CONCENTRIC NEUTRALS.
6. USE ONE STRAND OF CONCENTRIC NEUTRAL TO GROUND TERMINATION BODY.
7. TWIST REMAINING NEUTRALS TOGETHER AND CONNECT TO GROUND IN LOOP WITH A COMPRESSION CONNECTOR.

MATERIAL LIST		
NO.	Qty.	DESCRIPTION
A	1	TERMINATION, ELBOW TYPE, LOADBREAK, 200A, COOPER LE225DD04, OR APPROVED EQUAL
B	1	COLD SHRINK SEAL KIT, 3M 8452, OR APPROVED EQUAL
	–	COMPRESSION CONNECTOR, COPPER, BURNDY YGC2C2, OR APPROVED EQUAL, AS REQ'D

1 UM6-1
NOT TO SCALE

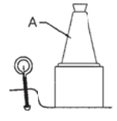


UM6-10

NOTES:
1. ROUTE MANUFACTURER'S BRAIDED BONDING JUMPER UNDER EQUIPMENT GROUNDING LUG TO GROUND; OR CONNECT TO GROUND LOOP WITH A COMPRESSION CONNECTOR.

MATERIAL LIST		
NO.	Qty.	DESCRIPTION
A	1	INSULATED PROTECTIVE CAP, COOPER LPC215, OR APPROVED EQ.
	–	COMPRESSION CONNECTOR, COPPER, BURNDY YGC2C2, OR APPROVED EQUAL, AS REQ'D

2 UM6-10
NOT TO SCALE



UM6-15

NOTES:
1. PROVIDE #8 COPPER, BARE OR GREEN INSULATED, BONDING JUMPER. CONNECT TO STAND-OFF BUSHING WITH THE MANUFACTURERS BONDING PROVISION; AND CONNECT TO GROUND LOOP WITH A WITH A COMPRESSION CONNECTOR.

MATERIAL LIST		
NO.	Qty.	DESCRIPTION
A	1	INSULATED STAND-OFF BUSHING, 200A, WITH STAINLESS STEEL BRACKET, COOPER ISB215S, OR APPROVED EQUAL
	–	#8 COPPER, BARE OR GREEN INSULATED, WIRE
	–	COMPRESSION CONNECTOR, COPPER, BURNDY YGC2C2, OR APPROVED EQUAL, AS REQ'D

3 UM6-15
NOT TO SCALE

UMIAQ
8700 Arctic Spur Road - Anchorage, AK 99518 - (907)677-8220

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS		
REV	DATE	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
49TH
3/3/17
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER

DATE: 3/3/17
DRAWN BY: MME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

EE2.5

SHEET 7 OF 8

Stringing Sag Table Using Initial Sag Ruling Span: 131.0 feet

Conductor NERITINA TRIPLEX Service Drop

NESC Heavy Load Zone Max Tension = 1000 lb

Design: 1000. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	291.	286.	282.	278.	274.	270.	267.	263.	260.	257.	254.	250.	248.	245.	242.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
Sag Span	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
131.0	3.09	3.14	3.19	3.23	3.28	3.33	3.37	3.42	3.46	3.51	3.55	3.59	3.64	3.68	3.72

Stringing Sag Table Using Initial Sag Ruling Span: 131.0 feet

Conductor NERITINA TRIPLEX Service Drop

NESC Heavy Load Zone Max Tension = 1000 lb

Design: 1000. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	291.	286.	282.	278.	274.	270.	267.	263.	260.	257.	254.	250.	248.	245.	242.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
3rd Wave Span	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec
131.0	5.26	5.30	5.34	5.38	5.42	5.45	5.49	5.53	5.56	5.60	5.63	5.67	5.70	5.74	5.77

1 SAG CHARTS: 1/0 TRIPLEX
NOT TO SCALE

Stringing Sag Table Using Initial Sag Ruling Span: 131.0 feet

Conductor SPARATE # 2 AWG 7/ 1 Stranding ACSR

NESC Heavy Load Zone Max Tension = 910 lb

Design: 910. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	276.	253.	232.	214.	198.	184.	172.	162.	153.	145.	138.	131.	126.	121.	116.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
Sag Span	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
131.0	.83	.91	.99	1.07	1.16	1.25	1.33	1.42	1.50	1.59	1.67	1.75	1.83	1.90	1.98

Stringing Sag Table Using Initial Sag Ruling Span: 131.0 feet

Conductor SPARATE # 2 AWG 7/ 1 Stranding ACSR

NESC Heavy Load Zone Max Tension = 910 lb

Design: 910. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	276.	253.	232.	214.	198.	184.	172.	162.	153.	145.	138.	131.	126.	121.	116.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
3rd Wave Span	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec
131.0	2.73	2.85	2.97	3.10	3.22	3.34	3.45	3.56	3.67	3.77	3.86	3.95	4.04	4.12	4.20

2 SAG CHARTS: #2 SPARATE
NOT TO SCALE

Stringing Sag Table Using Initial Sag Ruling Span: 119.0 feet

Conductor CONCH TRIPLEX Service Drop

NESC Heavy Load Zone Max Tension = 700 lb

Design: 700. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	149.	147.	146.	144.	142.	140.	138.	137.	135.	134.	132.	131.	129.	128.	127.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
Sag Span	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
119.0	3.10	3.15	3.18	3.22	3.26	3.30	3.34	3.38	3.42	3.46	3.50	3.54	3.58	3.62	3.65

Stringing Sag Table Using Initial Sag Ruling Span: 119.0 feet

Conductor CONCH TRIPLEX Service Drop

NESC Heavy Load Zone Max Tension = 700 lb

Design: 700. lb @ 0. Deg F , .50 in Ice, 4.00 psf Wind, Initial

H Tens (LBS)	149.	147.	146.	144.	142.	140.	138.	137.	135.	134.	132.	131.	129.	128.	127.
Temp F >	0.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	70.
3rd Wave Span	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec	Sec
119.0	5.27	5.31	5.33	5.36	5.40	5.43	5.47	5.50	5.53	5.56	5.59	5.63	5.66	5.69	5.72

3 SAG CHARTS: CONCH
NOT TO SCALE

1 SAG CHARTS
NOT TO SCALE

UMIAQ
6700 Arctic Spur Road - Anchorage, AK 99518 - (907)677-8320

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
KIPNUK LIGHT PLANT
KIPNUK, ALASKA

ISSUED FOR CONSTRUCTION

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

STATE OF ALASKA
Gregory M. Errico
No. EE-10279
REGISTERED PROFESSIONAL ENGINEER
3/3/17

DATE: 3/3/17
DRAWN BY: NME
CHECKED BY: GME
JOB NUMBER: 70184.15

DRAWING TITLE:
ELECTRICAL DETAILS

EE2.6

SHEET 8 OF 8

A