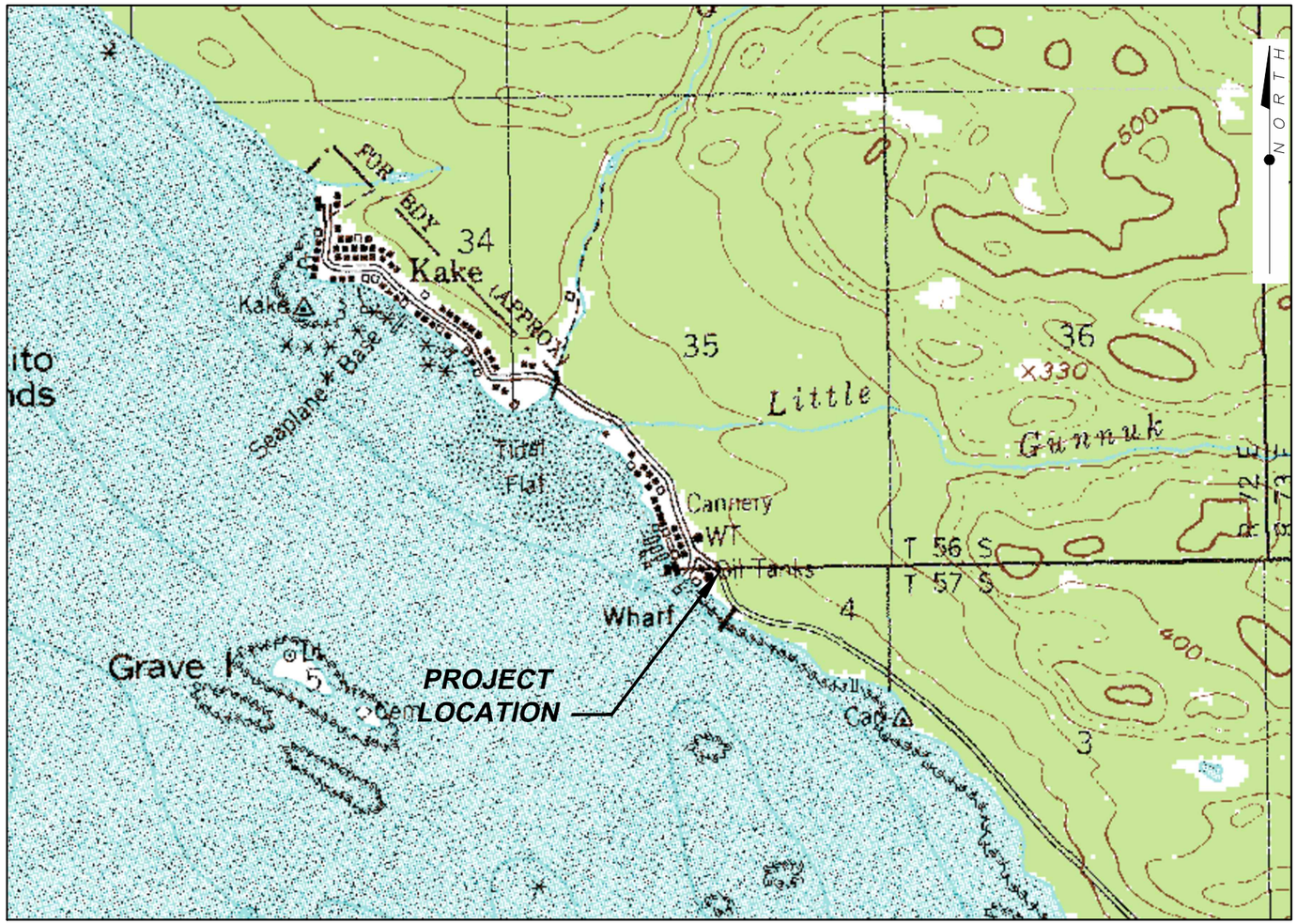
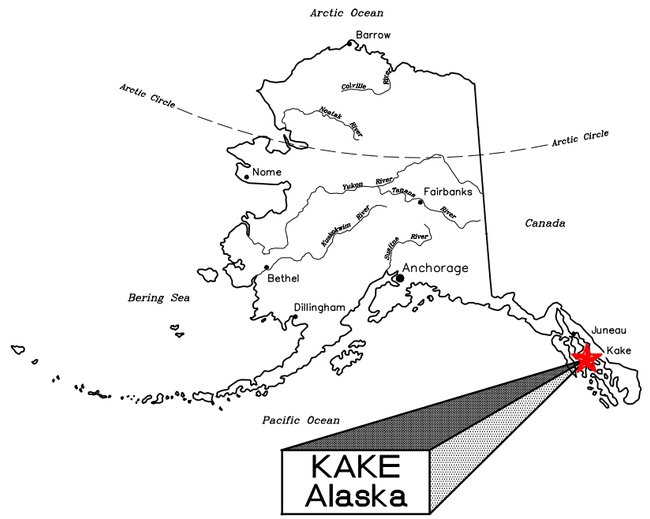
KAKE RURAL POWER SYSTEM UPGRADE

CONSTRUCTION DRAWINGS

KAKE, ALASKA



VICINITY MAP



LOCATION MAP

SCHEDULE B

CONSTRUCTION DRAWINGS

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

STATE OF ALASKA — DAVID EUGENE COOPER — No. CE 13868 — REGISTERED PROFESSIONAL ENGINEER — 4/30/16

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KAKE RURAL POWER SYSTEM UPGRADES
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: COVER SHEET AND LOCATION MAP

SHEET: G1.01

DRAWN BY:	CHECKED BY:
HDL	MRS
DATE: 06/10/16	SCALE: NONE
JOB NUMBER: 13-039	

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP-G101, 1=1, 04-28-16 at 14:51 by jkk
LAYOUT: G1.01 - COVER SHEET
VIEW: G101_L_PDF
XREF: 13040-00_B01

GENERAL

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G1.02	DRAWING INDEX
G1.03	GENERAL NOTES, LEGEND AND ABBREVIATIONS
G1.04	PROJECT LAYOUT PLAN
G1.05	SURVEY CONTROL DIAGRAM

CIVIL

C1.01	IPEC DEMOLITION PLAN
C1.02	IPEC POWER PLANT SITE PLAN
C1.03	IPEC POWER PLANT GRADING PLAN
C1.04	IPEC POWER PLANT MODULE SECTIONS
C2.01	DETAILS
C2.02	PERIMETER FENCE DETAILS

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FOR REFERENCE ONLY	A1.2	POWER PLANT REFLECTED CEILING PLAN
	A2.1	POWER PLANT ELEVATIONS
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FOR REFERENCE ONLY	A2.3	POWER PLANT INTERIOR ELEVATIONS
FOR REFERENCE ONLY	A2.4	POWER PLANT INTERIOR ELEVATIONS
FOR REFERENCE ONLY	A2.5	POWER PLANT DOOR SCHEDULE AND DETAILS
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	S1.1	POWER PLANT FOUNDATION FLOOR PLANS
FOR REFERENCE ONLY	S1.2	POWER PLANT CEILING FRAMING AND DETAILS
FOR REFERENCE ONLY	S1.3	POWER PLANT STRUCTURAL DETAILS
	S2.1	POWER PLANT SECTIONS AND DETAILS
	S2.2	POWER PLANT ROOF BOLT PLAN AND DETAILS
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M1.2	SITE PLAN & DETAILS
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M3.1	EQUIPMENT LAYOUT PLAN & BACK WALL ELEVATION
M3.2	SECTIONS, ELEVATIONS, & DETAILS
M3.3	SECTIONS & DETAILS
M3.4	STRUT LAYOUT ON WALLS
M4.1	COOLANT & HEAT RECOVERY PLAN & DETAILS
M4.2	COOLANT MAINIFOLD & HEAT RECOVERY PIPING DETAILS
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E5	CONTROL, INSTRUMENTATION, & DATA PLAN & DETAILS
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E7.3	DAY TANK CONTROL PANEL SEQUENCE OF OPERATION & DETAILS

NOTE:

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

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

STATE OF ALASKA — 49th — DAVID EUGENE COOPER — No. CE 13868 — REGISTERED PROFESSIONAL ENGINEER — 6/10/16

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ALASKA ENERGY AUTHORITY

KAKE RURAL POWER SYSTEM UPGRADES

KAKE, ALASKA

SHEET TITLE: DRAWING INDEX

SHEET: G1.02

DRAWN BY:	CHECKED BY:
RSB	MRS
DATE: 06/10/16	SCALE: NONE

JOB NUMBER: 13-039

GENERAL

1. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE PLANS AND THE BIDDING AND CONTRACT DOCUMENTS TITLED "KAKE BULK FUEL AND RURAL POWER SYSTEMS UPGRADE", DATED JUNE 10, 2016.

2. THESE PLANS ARE BASED ON A FIELD SURVEY PROVIDED BY HATTENBURG, DILLEY, AND LINNELL LLC (HDL) PERFORMED IN KAKE, ALASKA ON MAY 15, 2015 AND JANUARY 29, 2016. SURVEY CONTROL IS SHOWN ON SHEET G1.07 OF THIS PLAN SET.

3. THE CONTRACTOR SHALL VERIFY SITE CONDITIONS, DIMENSIONS, AND DETAILS PRIOR TO THE START OF CONSTRUCTION. IF ANY DISCREPANCIES AND/OR UNKNOWN CONDITIONS WHICH AFFECT THE PROJECT ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE MINOR LAYOUT CHANGES IN THE FIELD, SUBJECT TO APPROVAL BY THE ENGINEER.

4. NOT ALL UTILITIES MAY BE SHOWN ON THE PLANS. CONTACT LOCAL UTILITIES TO LOCATE ALL EXISTING UNDERGROUND UTILITIES IN THE VICINITY PRIOR TO BEGINNING EXCAVATION. CONTRACTOR SHALL PROTECT UTILITIES AT ALL TIMES DURING CONSTRUCTION, AND REPAIR DAMAGES IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANIES REQUIREMENTS.

5. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL SIGNS, BARRICADES, WARNING LIGHTS, AND OTHER PROTECTIVE DEVICES NECESSARY FOR SAFETY.

6. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF ASME B31.4, THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL FIRE CODE (IFC), STATE AND FEDERAL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS (OSHA), US ENVIRONMENTAL PROTECTION AGENCY, ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND ALL OTHER STATE, FEDERAL, AND LOCAL LAWS AND REGULATIONS PERTAINING TO THIS PROJECT. ANY WORK PERFORMED BY THE CONTRACTOR CONTRARY TO SUCH LAWS OR REGULATIONS SHALL BE AT THE CONTRACTORS SOLE RISK AND EXPENSE.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH OTHER CONTRACTORS, HIS/HER SUBCONTRACTORS, THE OWNER, AND STATE AND FEDERAL AUTHORITIES.

8. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS. INCLUDING BUT NOT LIMITED TO LANDFILL PERMITS, MATERIAL SOURCE PERMITS, BARGE LANDING PERMITS, ROW PERMITS, AND ADEC PERMITS NOT SPECIFICALLY PROVIDED BY OWNER.

9. ALL ITEMS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS, AND INSTALLATION DRAWINGS, UNLESS INDICATED OTHERWISE.

10. WORK SHALL BE PERFORMED WITH SKILLED CRAFTSMEN SPECIALIZING IN THE REQUIRED WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THE CONTRACT DOCUMENTS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

13. THE PURPOSE OF SPECIFYING A NAME BRAND PRODUCT, OR EQUAL, IS TO ESTABLISH THE LEVEL OF QUALITY OF MATERIALS AND EQUIPMENT REQUIRED AND IS NOT A PRODUCT ENDORSEMENT. SUBMIT SUBSTITUTIONS IN WRITING FOR REVIEW AND APPROVAL.

14. GEOTECHNICAL INFORMATION AND FOUNDATION RECOMMENDATIONS FOR THIS PROJECT WERE TAKEN FROM HDL'S MONTH XX, 2015 REPORT TITLED "GEOTECHNICAL EXPLORATION AND ENGINEERING RECOMMENDATIONS BULK FUEL AND POWER PLANT SITE, KAKE, ALASKA".

15. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND SUBMITTALS FOUR WEEKS PRIOR TO PROCUREMENT. SUBMIT VENDOR LIST WITH A LIST OF EQUIPMENT TO BE PROVIDED BY EACH VENDOR. SUBMIT OPERATION AND MAINTENANCE LITERATURE FOR ALL MATERIALS AND EQUIPMENT TO THE ENGINEER FOR INCLUSION IN THE OPERATION MAINTENANCE MANUALS.

16. MARK UP DESIGN DRAWINGS TO REFLECT FIELD CHANGES THROUGHOUT CONSTRUCTION. TURN OVER "RED LINE" CONSTRUCTION DRAWINGS TO ENGINEER AT COMPLETION OF THE PROJECT.

17. CONTRACTOR SHALL PROTECT ALL ITEMS NOT SCHEDULED FOR DEMOLITION DURING CONSTRUCTION. DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION.

18. EARTHWORK SAFETY, EXCAVATION SLOPE STABILITY, AND DEWATERING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

19. CAREFULLY LAY OUT WORK TO MINIMIZE DISRUPTION AND DAMAGE TO EXISTING STRUCTURES.

20. ALL WORK SHOWN IN THIS PLAN SET SHALL BE SCHEDULE B, UNLESS OTHERWISE NOTED.

TESTING, START-UP, AND COMMISSIONING

POWER PLANT:

1. PERFORM POWER PLANT TESTING, COMMISSIONING, AND STARTUP IN ACCORDANCE WITH THE RURAL POWER SYSTEM MECHANICAL DRAWINGS AND SPECIFICATIONS.

2. LEAVE ALL WORK SITES IN AN ORDERLY CONDITION CONSISTENT WITH THAT FOUND UPON ARRIVAL.

EARTHWORK

GENERAL:

1. EARTHWORK SAFETY, EXCAVATION SLOPE STABILITY, AND DEWATERING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

2. CONTACT LOCAL UTILITIES TO LOCATE ALL EXISTING UNDERGROUND UTILITIES IN THE VICINITY PRIOR TO BEGINNING EXCAVATION.

3. CAREFULLY LAY OUT WORK TO MINIMIZE DISRUPTION AND DAMAGE TO EXISTING STRUCTURES.

4. PERFORM ALL WORK IN ACCORDANCE WITH OSHA REQUIREMENTS. BARRICADE OPEN EXCAVATIONS TO PROHIBIT PUBLIC ENTRY.

5. WORK IN INCLEMENT WEATHER IS AT CONTRACTORS RISK. ANY MATERIALS WHICH BECOME UNSTABLE DUE TO IMPROPER SELECTION OF TECHNIQUES, EQUIPMENT, OR OPERATIONS DURING INCLEMENT WET WEATHER SHALL BE REPLACED.

6. EXCAVATIONS AND EMBANKMENT SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT DRAINAGE IS MAINTAINED AT ALL TIMES. ANY AREAS NOT GRADED TO DRAIN SHALL BE KEPT FREE OF STANDING WATER BY PUMPING IF NECESSARY.

7. THE CONTRACTOR SHALL PROVIDE FOR THE PROPER MAINTENANCE OF TRAFFIC FLOW AND ACCESSIBILITY AS MAY BE NECESSARY, AND SHALL ALSO MAKE ADEQUATE PROVISIONS FOR THE SAFETY OF PROPERTY AND PERSONS.

8. EXISTING VEGETATION PROTECTION: THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROTECT THE EXISTING VEGETATION AT THE SITE BEYOND THE LIMITS OF FILL AND EXCAVATION. AREAS OF DAMAGED VEGETATION WILL BE RESEEDED. SEEDING SHALL BE CONDUCTED AFTER FIRST FREEZE IN FALL, OR PRIOR TO JULY 15 FOR BEST GERMINATION.

LEGEND

- EXISTING PROPERTY LINE
- NEW PROPERTY LINE
- PROPOSED LEASE LINE
- EXISTING EASEMENT
- ROAD/TRAIL CENTERLINE
- EXISTING EDGE OF ROAD
- EXISTING WATER LINE
- NEW WATER LINE
- EXISTING ELECTRIC
- EXISTING CONTOUR
- NEW FILL
- EXISTING FILL
- GRADE BREAK
- EXISTING TREE LINE
- CLEARING LIMITS
- NEW CHAIN LINK FENCE
- VERTICAL PIPE TRANSITION
- DISPENSER FUEL LINE BURIED
- POWER LINE
- SEWER LINE
- FORCE MAIN
- TOE
- CONTOURS MINOR
- CONTOURS MAJOR
- DRAINAGE DITCH
- FENCE
- ASSUMED BEDROCK
- BUILDING EXISTING
- GRAVEL PAD
- CONCRETE
- DRAINAGE ROCK
- STRUCTURAL FILL

ABBREVIATIONS

AAC	ALASKA ADMINISTRATIVE CODE
ACI	AMERICAN CONCRETE INSTITUTE
ADEC	ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AFF	ABOVE FINISH FLOOR
ANC	ALAKANUK NATIVE CORPORATION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
API	AMERICAN PETROLEUM INSTITUTE
ASME	AMERICAN SOCIETY MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AWPA	AMERICAN WOOD PROTECTION ASSOCIATION
AWS	AMERICAN WELDING SOCIETY
BTM	BOTTOM
BTU	BRITISH THERMAL UNITS
CASC	CRUSHED AGGREGATE SURFACE COURSE
℄	CENTER LINE
CLR	CLEAR
CONFIG	CONFIGURE
CONT'D	CONTINUED
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARD
DBL	DOUBLE
DFT	DRY FILM THICKNESS
DIA, ⌀	DIAMETER
DOT	ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
EG	EXISTING GRADE
EPA	ENVIRONMENTAL PROTECTION AGENCY
ELEV	ELEVATION
F	FAHRENHEIT
FG	FINISH GRADE
FO	FACE OF
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FPT	FEMALE PIPE THREAD
FT	FEET
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
H	HORIZONTAL
HP	HORSEPOWER
HDL	HATTENBURG, DILLEY, AND LINNELL LLC.
HR	HOUR
IAW	IN ACCORDANCE WITH
IFC	INTERNATIONAL FIRE CODE
IN	INSET
INC	INCORPORATED
IPEC	INSIDE PASSAGE ELECTRIC COOPERATIVE
KTFC	KAKE TRIBAL FUEL COMPANY
L	ANGLE IRON
LB	POUND
LF	LINEAR FEET
LT	LEFT
MAX	MAXIMUM
MECH	MECHANICAL
MIL	0.001 INCH
MIN	MINIMUM
N.C.	NORMALLY CLOSED
NFS	NON-FROST SUSCEPTIBLE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NHP	NEW HEADER PIPE
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OZ	OUNCE
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENT
PL	STEEL PLATE - PLATE STEEL
PRV	PRESSURE RELIEF VALVE
PSF	POUND PER SQUARE FOOT
PSI	POUND PER SQUARE INCH
PSIG	POUND PER SQUARE INCH GAUGE
PT	PRESSURE TREATED
R	RADIUS
REQ'D	REQUIRED
ROW	RIGHT OF WAY
RT	RIGHT
SCH	SCHEDULE
SI	SQUARE INCH
SIM	SIMILAR
SS	STAINLESS STEEL
SSPC	STEEL STRUCTURES PAINTING COUNCIL
STA	STATION
STD	STANDARD
STL	STEEL
SY	SQUARE YARD
TF	TANK FARM
TH	THICKNESS
TS	TUBE STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
V	VERTICAL
W/	WITH
WP	WORKING PRESSURE

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

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ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

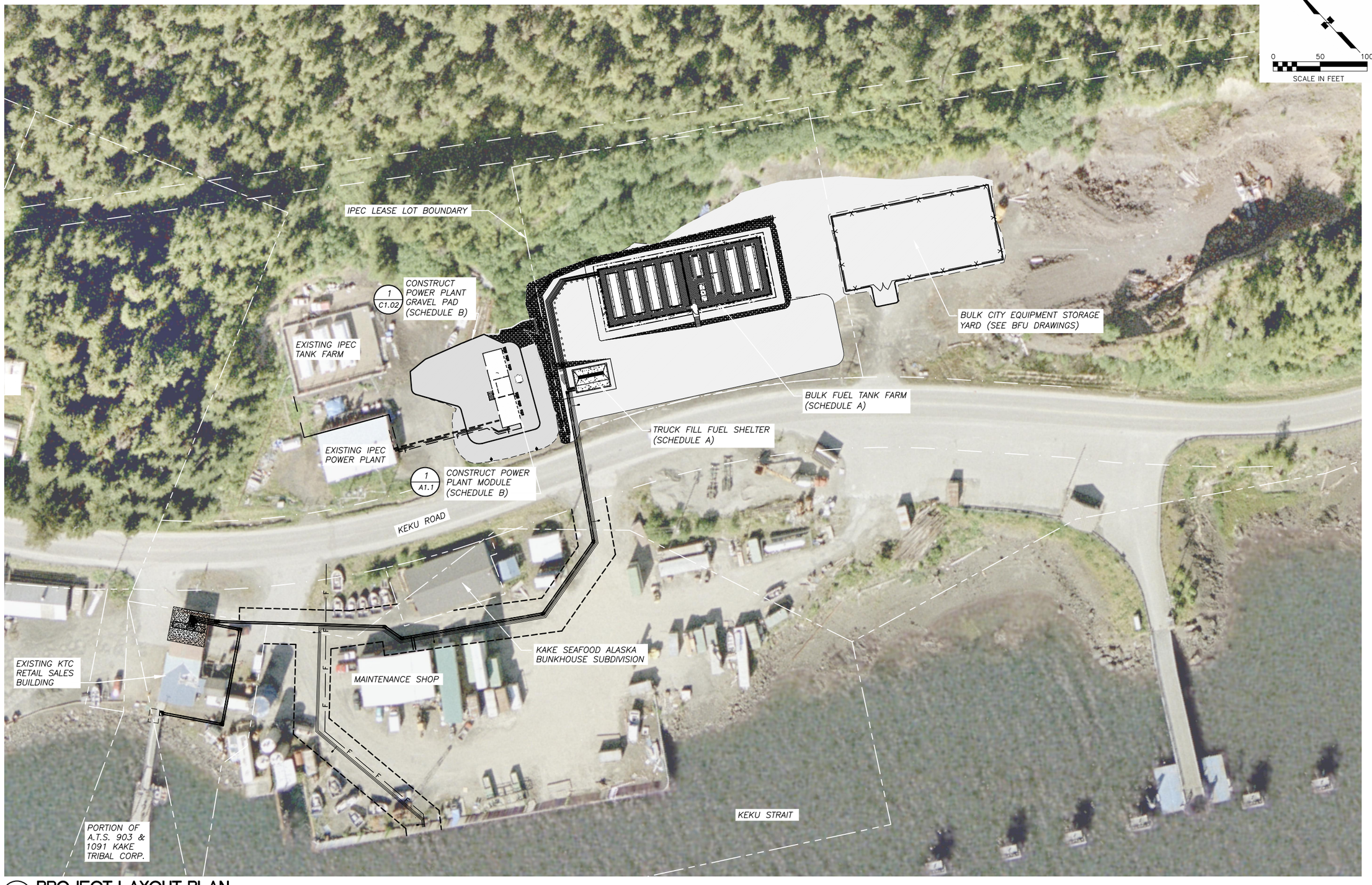
KAKE RURAL POWER SYSTEM UPGRADES
KAKE, ALASKA

SHEET TITLE
GENERAL NOTES, LEGEND AND ABBREVIATIONS

SHEET
G1.03

DRAWN BY:	CHECKED BY:
KK	MRS
DATE: 06/10/16	SCALE: NONE

JOB NUMBER: 13-039



1 G1.04 **PROJECT LAYOUT PLAN**

SCALE: 1" = 50.0'

ONE INCH

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

STATE OF ALASKA — DAVID EUGENE COOPER — No. CE 13868 — REGISTERED Professional ENGINEER — 49th

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ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

KAKE RURAL POWER SYSTEM UPGRADES

KAKE, ALASKA

SHEET TITLE: PROJECT LAYOUT PLAN

SHEET: G1.04

DRAWN BY:	CHECKED BY:
WJB	MRS
DATE: 06/10/16	SCALE: AS SHOWN

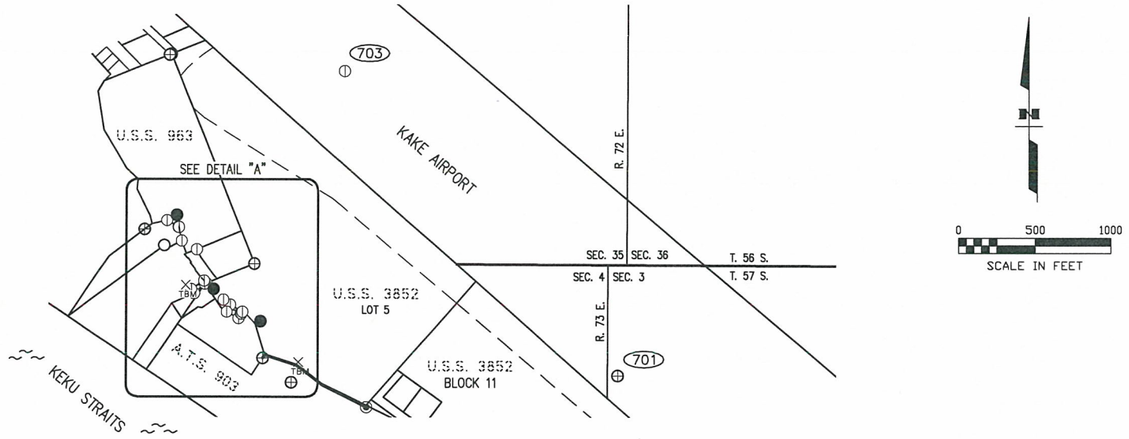
JOB NUMBER: 13-039

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP-G104-PLP, 1=1, 06-14-16 at 09:41 by jkk
LAYOUT: G1.04 - PROJECT LAYOUT PLAN
XREF: 13-039_40_KAKE-SURVEY-BASE, 13040-00_B01-BK, X-SITE-JOSH

SURVEY CONTROL DIAGRAM

LOCATED WITHIN

SECTION 35, T 56 S, R 72 E, AND SECTIONS 4 & 5, AND U.S.S. No 3852 & 963, T 57 S, R 73 E, COPPER RIVER MERIDIAN, KAKE, ALASKA, PETERSBURG RECORDING DISTRICT, 1ST JUDICIAL COURT



LEGEND

⊕	FOUND BRASS MONUMENT
⊙	FOUND ALUMINUM MONUMENT
○	FOUND REBAR
●	SET REBAR WITH ALUMINUM CAP
TBM	SET TEMPORARY BENCH MARK
K.S.A.B.	KAKE SEAFOOD ALASKA BUNKHOUSE
———	SECTION LINE
———	PROPERTY LINE
— — —	EASEMENT LINE
·····	LEASE LINE

NOTES

1. ALL MEASUREMENTS ARE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
2. FIELD SURVEY WAS PERFORMED BY HATTENBURG DILLEY & LINNELL LLC FROM MAY 7, 2015 THROUGH MAY 15, 2015.
3. ADDITIONAL EASEMENTS, AGREEMENTS, & ENCUMBRANCES MAY EXIST THAT ARE NOT SHOWN HEREON.

VERTICAL CONTROL

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
601	1872928	2635262	23.74'	Set 10" Spike in Telephone Pole
602	1873435	2634511	16.41'	Set 10" Spike in Telephone Pole

HORIZONTAL CONTROL STATEMENT

COORDINATE SYSTEM:
THIS PROJECT IS LOCATED ENTIRELY WITHIN THE NAD83 (2011) ALASKA STATE PLANE ZONE 1 U.S. SURVEY FOOT COORDINATE SYSTEM.

BASIS OF COORDINATES:
THE BASIS OF COORDINATES IS CONTROL POINT 702, A 2-1/2" BRASS CAP MONUMENT IN THE CONCRETE RETAINING WALL FOR THE ALASKA FERRY TERMINAL. SAID CONTROL POINT HAS NAD83 (2011) ALASKA STATE PLANE ZONE 1 COORDINATES OF 1872794.6173' NORTH, 2635215.5268' EAST.

VERTICAL CONTROL STATEMENT

ELEVATIONS ARE BASED ON CONTROL POINT 1905 FROM THE ANTHC SURVEY CONTROL DIAGRAM FOR THE "WATER DISTRIBUTION SYSTEM UPGRADES PROJECT" DATED OCTOBER 20, 2014. A CLOSED DIFFERENTIAL LEVEL LOOP WAS THEN RUN FROM CONTROL POINT 1905 THROUGHOUT THE SET PROJECT CONTROL. ANTHC CONTROL POINT 1905, SHOWN HEREON AS HDL CONTROL POINT 702, HAS AN ELEVATION OF 21.30' PER THE AFOREMENTIONED ANTHC SURVEY CONTROL DIAGRAM.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, AND THAT THIS DRAWING REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT THE MONUMENTS SHOWN HEREON ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT TO THE EXTENT SHOWN HEREON.

6-10-16

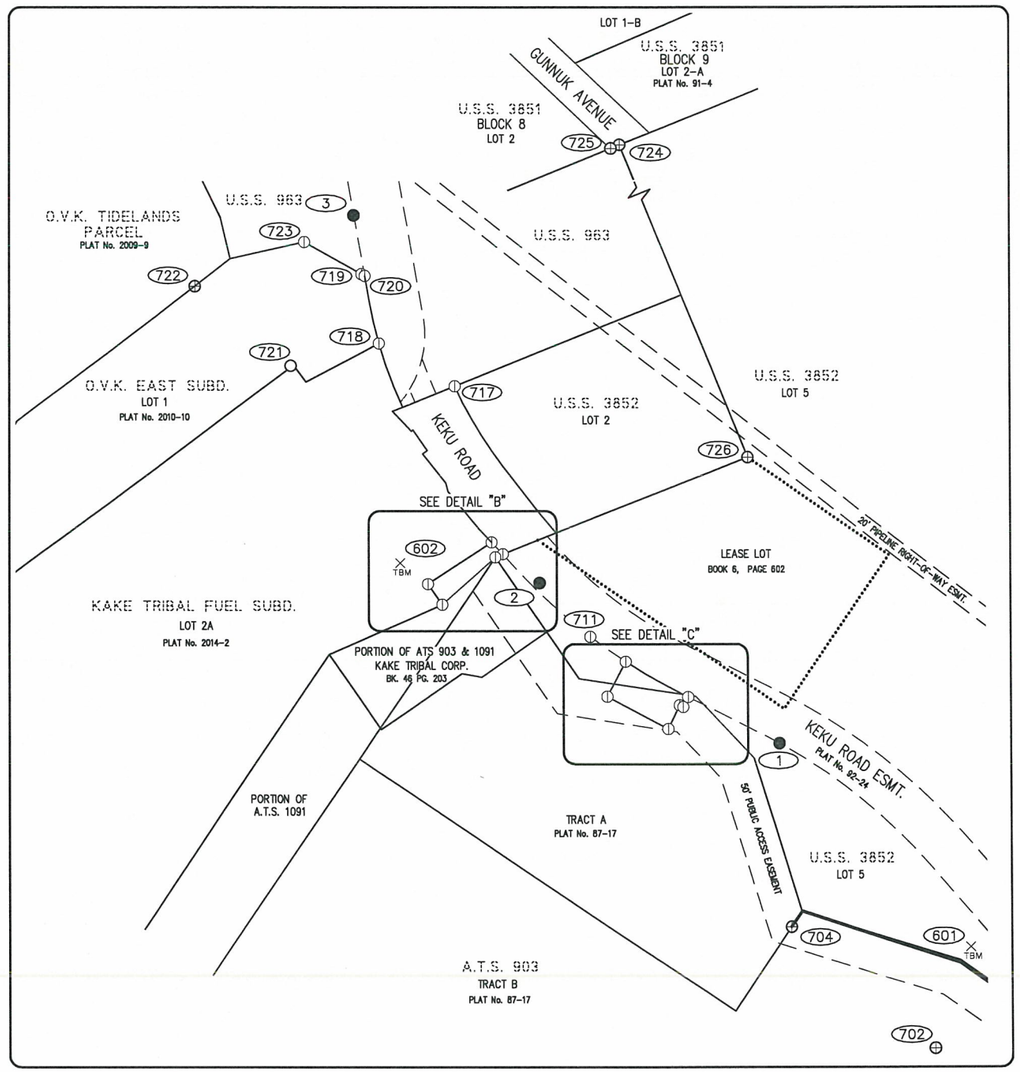
BRADFORD J. RINCKEY, PLS LS-11299 DATE

HORIZONTAL CONTROL*

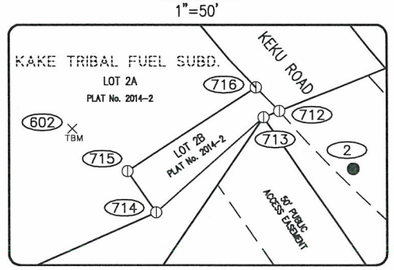
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1873197.1116	2635010.8735	27.08'	Set Rebar With 2" Aluminum Cap
2	1873408.6972	2634696.1427	23.75'	Set Rebar With 2" Aluminum Cap
3	1873893.6886	2634450.3768	34.01'	Set Rebar With 2" Aluminum Cap
701	1872840.1191	2637372.1235	–	Found 3-1/2" Brass Cap Monument
702	1872794.6173	2635215.5268	21.30'	Found 2-1/2" Brass Cap Monument
703	1874838.1793	2635565.1328	–	Found 3-1/2" Aluminum Cap Monument
704	1872954.6013	2635026.4230	–	Found 2-1/2" Brass Cap Monument
705	1873215.9999	2634864.6328	–	Found 2" Aluminum Cap Monument
706	1873247.3737	2634879.4186	–	Found 2" Aluminum Cap Monument
707	1873244.9772	2634884.1174	–	Found 2" Aluminum Cap Monument
708	1873258.0663	2634890.6033	–	Found 2" Aluminum Cap Monument
709	1873304.7602	2634809.4561	–	Found 2" Aluminum Cap Monument
710	1873258.5970	2634785.4013	–	Found 2" Aluminum Cap Monument
711	1873337.6396	2634763.0307	–	Found 2" Aluminum Cap Monument
712	1873446.7091	2634647.4971	–	Found 1-1/2" Aluminum Cap Monument
713	1873442.5594	2634637.2799	–	Found 2" Aluminum Cap Monument
714	1873379.9742	2634566.8062	–	Found 2" Aluminum Cap Monument
715	1873407.1070	2634547.7782	–	Found 2" Aluminum Cap Monument
716	1873462.2256	2634632.3165	–	Found 2" Aluminum Cap Monument
717	1873668.1961	2634583.7530	–	Found 2" Aluminum Cap Monument
718	1873724.8047	2634483.9161	–	Found 2" Aluminum Cap Monument
719	1873816.2288	2634460.7775	–	Found 1-1/2" Aluminum Cap Monument
720	1873813.7558	2634465.1436	–	Found 2" Aluminum Cap Monument
721	1873695.3223	2634367.9916	–	Found 1/2" Rebar
722	1873800.2416	2634241.0633	–	Found 2" Brass Cap Monument
723	1873858.4220	2634385.9225	–	Found 2" Aluminum Cap Monument
724	1874949.9011	2634411.2145	–	Found 3-1/4" Brass Cap Monument
725	1874945.1140	2634399.8426	–	Found 3-1/4" Brass Cap Monument
726	1873574.4725	2634969.4731	–	Found 3-1/4" Brass Cap Monument

*ELEVATIONS MUST BE FIELD VERIFIED PRIOR TO USE

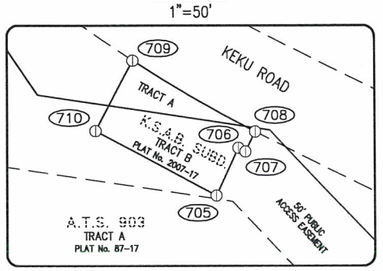
DETAIL "A"
1"=100'



DETAIL "B"
1"=50'



DETAIL "C"
1"=50'



REVISIONS		
MARK	DATE	DESCRIPTION

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No. 11299
REGISTERED PROFESSIONAL LAND SURVEYOR
6-10-16

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ALASKA ENERGY AUTHORITY

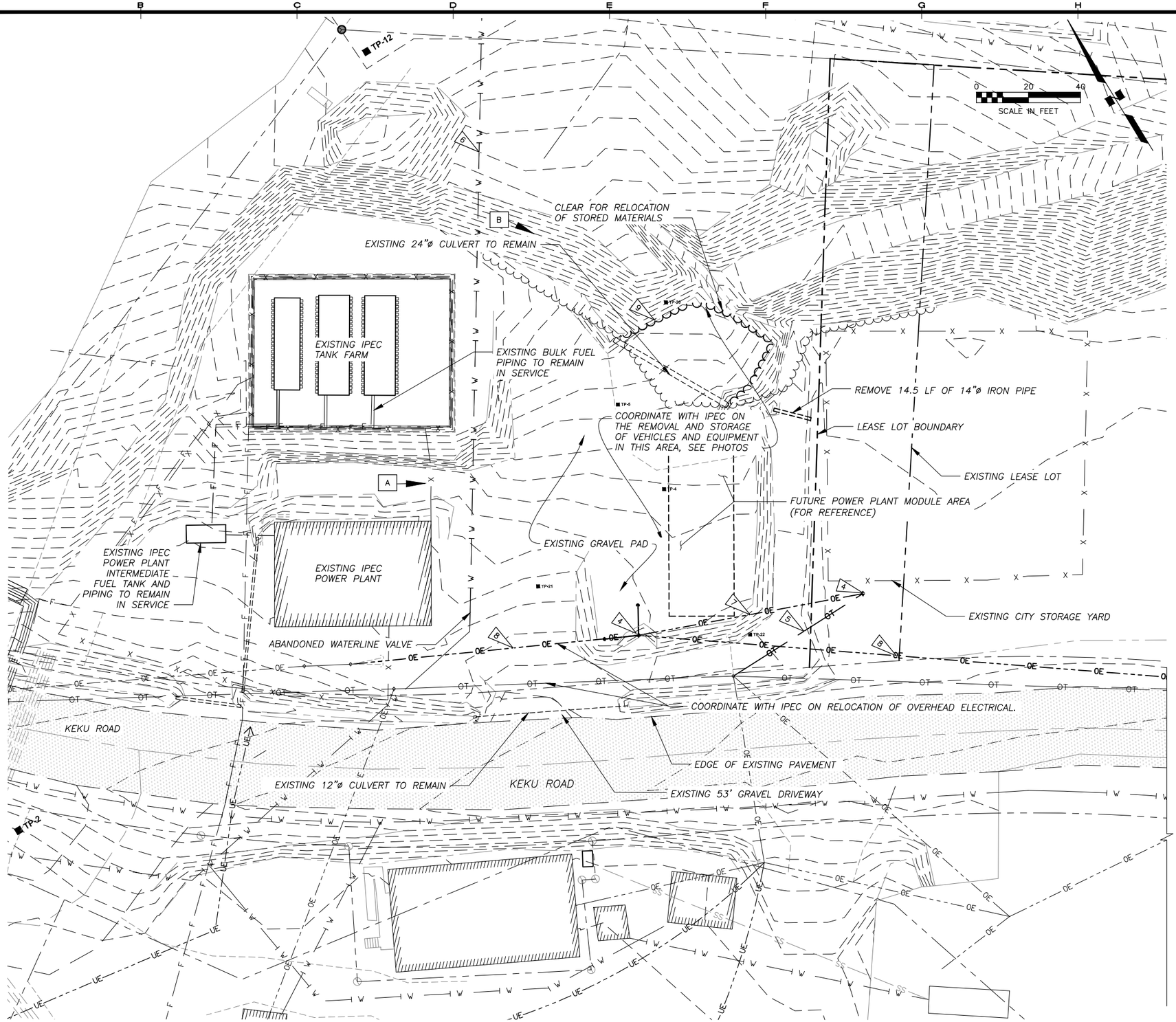
KAKE, ALASKA

SHEET TITLE
SURVEY CONTROL DIAGRAM

SHEET
G1.05

DRAWN BY	CHECKED BY
BAM	RJKA
DATE	SCALE
05/25/16	1" = 500'

JOB NUMBER
13-039



1 C1.01 **DEMOLITION PLAN: IPEC STORAGE AREA**

SCALE: 1" = 20'

NOTES:

1. SEE SHEET G1.03 FOR GENERAL NOTES, LEGEND, SYMBOLS, AND ABBREVIATIONS.
2. IF CONTAMINATED SOIL IS ENCOUNTERED, CONTACT ENGINEER IMMEDIATELY AND REMOVE AND DISPOSE OF IN ACCORDANCE WITH THE PROJECT MANUAL SECTION 02084
3. ALL EXISTING UTILITIES AND INFRASTRUCTURE NOT SCHEDULED FOR DEMOLITION, DECOMMISSIONING, OR REMOVAL SHALL BE PROTECTED FROM DAMAGE. CONTRACTOR SHALL REPAIR OR REPLACE ALL DAMAGED FEATURES AT NO ADDITIONAL COST TO THE OWNER.

4 EXISTING UTILITY POLES AND GUY WIRES TO BE RELOCATED, SEE ELECTRICAL.

5 60 LF OF EXISTING TELEPHONE LINE TO BE REMOVED, SEE ELECTRICAL.

6 EXISTING BURIED WATERLINE TO BE ABANDONED, BY OTHERS.

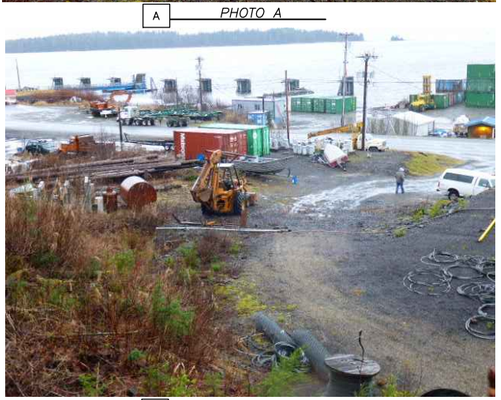
7 88 LF OF EXISTING OVERHEAD SERVICE LINE TO BE REMOVED, SEE ELECTRICAL.

8 EXISTING OVERHEAD ELECTRICAL LINE TO BE RELOCATED, SEE ELECTRICAL.

9 CLEAR EXISTING VEGETATION TO THE TOE OF SLOPE PRIOR TO PLACING FILL. APPROXIMATELY 1500 SQ. FT.

10. ALL CLEARING SHALL BE PREFORMED IN ACCORDANCE WITH "THE MIGRATORY BIRD TREATY ACT". NO CLEARING OPERATIONS ARE PERMITTED BETWEEN APRIL 15TH AND JULY 25th.
11. INSTALL EROSION CONTROL MEASURES IN ACCORDANCE WITH CONTRACT DOCUMENTS.

A PHOTO A



B PHOTO B

STORAGE AREA REMOVAL

SCALE: NOT TO SCALE

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITAL FOR AGENCY REVIEW

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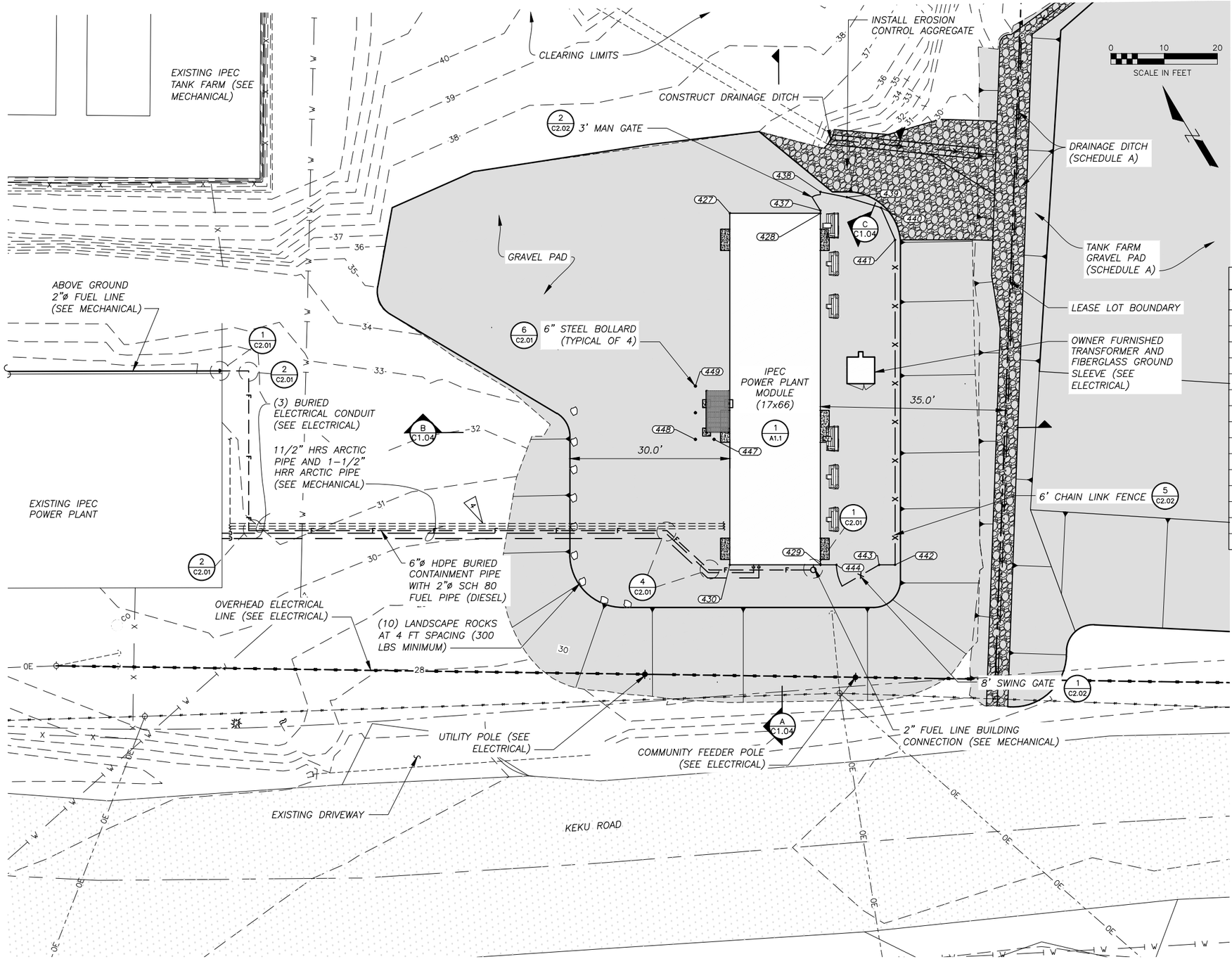
SHEET TITLE: IPEC DEMOLITION PLAN
SHEET: C1.01
DRAWN BY: WJB | CHECKED BY: MRS
DATE: 06/10/16 | SCALE: AS SHOWN
JOB NUMBER: 13-039

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP_C1.01, 1=1, 06-10-16 at 10:17 by jkk
LAYOUT: C1.01 - DEMOLITION PLAN
XREF: 13-039_40_KAKE-SURVEY-BASE, 13-040_00_X-DESIGN-BASE-PPLANT, 13040-00_B01



1 C1.02 **SITE PLAN - IPEC POWER PLANT MODULE**
SCALE: 1" = 10.0'

NOTES:

1. SEE SHEET G1.03 AND G1.04 FOR GENERAL NOTES, LEGEND, SYMBOLS, AND ABBREVIATIONS.
2. SEE SURVEY CONTROL DIAGRAM SHEET G1.07 FOR BASIS OF CONTROL.
3. RELOCATE EXISTING EQUIPMENT AND MATERIALS AS DIRECTED BY PROJECT MANAGER AND CLEAR EXISTING VEGETATION IN ACCORDANCE WITH PROJECT MANUAL PRIOR TO PLACING FILL.
4. ROCK MAY BE ENCOUNTERED DURING TRENCHING. SEE GEOTECHNICAL REPORT AND TRENCH SECTION IN MECHANICAL DRAWINGS. IF ENCOUNTERED REMOVE ROCK BY RIPPING OR OTHER ACCEPTABLE MEANS OF ROCK EXCAVATION/REMOVAL APPROVED BY THE ENGINEER, TO REACH REQUIRED BURIAL DEPTH.
5. ALL WORK ON THIS SHEET IS SCHEDULE B, UNLESS OTHERWISE NOTED.

POWER PLANT SITE COORDINATE TABLE

Point #	Northing	Easting	DESCRIPTION
427	1873372.11	2634998.33	POWER PLANT MODULE CORNER
428	1873363.37	2635012.91	POWER PLANT MODULE CORNER
429	1873306.76	2634978.99	POWER PLANT MODULE CORNER
430	1873315.50	2634964.40	POWER PLANT MODULE CORNER
437	1873363.80	2635013.17	GATE POST
438	1873366.80	2635014.97	FENCE ANGLE POINT
439	1873363.40	2635018.71	FENCE ANGLE POINT
440	1873358.41	2635023.19	FENCE ANGLE POINT
441	1873351.89	2635022.35	FENCE ANGLE POINT
442	1873299.56	2634991.00	FENCE ANGLE POINT
443	1873301.11	2634988.42	FENCE ANGLE POINT
444	1873305.22	2634981.56	FENCE ANGLE POINT
447	1873337.22	2634973.97	BOLLARD
448	1873339.02	2634970.97	BOLLARD
449	1873347.60	2634976.11	BOLLARD

REVISIONS

MARK	DATE	DESCRIPTION
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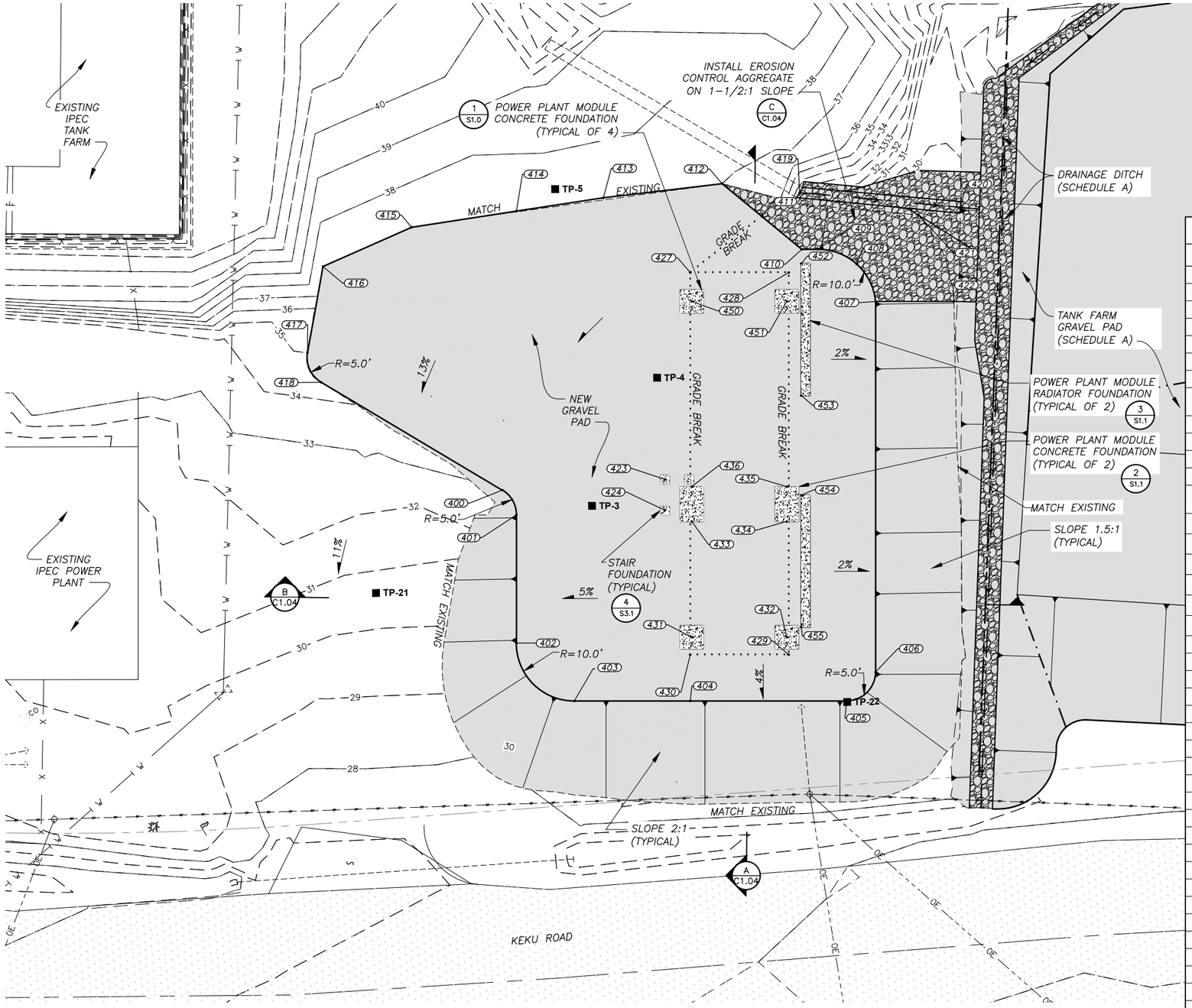
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: IPEC POWER PLANT SITE PLAN
SHEET: C1.02
DRAWN BY: KK | CHECKED BY: MRS
DATE: 06/10/16 | SCALE: AS SHOWN
JOB NUMBER: 13-039

H:\Jobs\13-039 Koke Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP_C102-C104, 1=1, 06-07-16 at 15:05 by jkk
LAYOUT: C1.02 - SITE PLAN
XREF: 13-039_40_KAKE-SURVEY-BASE, 13-040_00_X-DESIGN-BASE-PPLANT, 13040-PP_B001



1 C1.03 **GRADING PLAN - IPEC POWER PLANT**
SCALE: 1" = 10.0'

0 10 20
SCALE IN FEET

NOTES:

1. SEE SHEET G1.03 FOR GENERAL NOTES, LEGEND, SYMBOLS, AND ABBREVIATIONS.
2. SEE SURVEY CONTROL DIAGRAM SHEET G1.05 FOR BASIS OF SURVEY CONTROL.
3. CLEAR EXISTING VEGETATION AND ORGANICS PRIOR TO PLACING FILL.
4. INSTALL EROSION CONTROL MEASURES IN ACCORDANCE WITH CONTRACTOR SWPPP.
5. CONTRACTOR SHALL COORDINATE CONCRETE FOUNDATION DIMENSION AND LOCATION WITH OWNER PROVIDED POWER PLANT MODULE, AND ACCESS STAIRS PRIOR TO CONSTRUCTION CONCRETE FOUNDATIONS.
6. ALL WORK ON THIS SHEET IS SCHEDULE B, UNLESS NOTED OTHERWISE.

Grading Coordinate Table

Point #	Northing	Easting	ELevation	Description
400	1873356.55	2634951.18	34.0	PC PAD CORNER
401	1873351.61	2634951.07	36.0	PT PAD CORNER
402	1873332.63	2634939.70	36.0	PC PAD CORNER
403	1873318.92	2634943.14	36.3	PT PAD CORNER
404	1873308.64	2634960.29	37.0	GRADE POINT
405	1873294.76	2634983.45	37.0	PC PAD CORNER
406	1873296.48	2634990.31	37.0	PT PAD CORNER
407	1873351.37	2635023.21	37.2	PC PAD CORNER/ END EROSION CONTROL AGGREGATE
408	1873358.57	2635023.72	36.8	MIDPOINT PAD
409	1873364.23	2635019.26	37.0	PT PAD CORNER
410	1873365.65	2635016.90	37.0	ANGLE POINT PAD
411	1873374.04	2635013.92	36.5	MIDPOINT PAD
412	1873382.44	2635010.94	± 37.0	ANGLE POINT PAD/MATCH EXISTING/ START EROSION CONTROL AGGREGATE
413	1873390.88	2634992.09	± 37.1	ANGLE POINT PAD/ MATCH EXISTING
414	1873396.61	2634978.04	± 37.0	ANGLE POINT PAD/ MATCH EXISTING
415	1873403.53	2634961.08	± 37.0	ANGLE POINT PAD/ MATCH EXISTING
416	1873405.57	2634944.50	± 37.0	ANGLE POINT PAD/ MATCH EXISTING
417	1873394.24	2634934.59	± 35.0	PC PAD CORNER/ MATCH EXISTING
418	1873388.58	2634933.94	± 34.4	PT PAD CORNER/MATCH EXISTING
419	1873374.25	2635021.63	± 31.8	CENTER DRANIAGE DITCH
420	1873357.78	2635044.12	± 29.8	CENTER DRANIAGE DITCH
421	1873360.36	2635037.21	29.5	END EROSION CONTROL AGGREGATE
422	1873344.43	2635034.80	37.0	END EROSION CONTROL AGGREGATE
423	1873343.70	2634976.21	37.5	CENTER STAIR PAD
424	1873339.13	2634973.46	37.5	CENTER STAIR PAD
427	1873372.11	2634998.33	37.5	POWER PLANT MODULE CORNER
428	1873363.37	2635012.91	37.5	POWER PLANT MODULE CORNER
429	1873306.76	2634978.99	37.5	POWER PLANT MODULE CORNER
430	1873315.50	2634964.40	37.5	POWER PLANT MODULE CORNER
431	1873317.93	2634966.18	37.5	CENTER MODULE CONCRETE FOUNDATION
432	1873309.50	2634980.24	37.5	CENTER MODULE CONCRETE FOUNDATION
433	1873335.09	2634976.46	37.5	CENTER MODULE CONCRETE FOUNDATION
434	1873326.66	2634990.52	37.5	CENTER MODULE CONCRETE FOUNDATION
435	1873331.81	2634993.61	37.5	CENTER MODULE CONCRETE FOUNDATION
436	1873340.23	2634979.54	37.5	CENTER MODULE CONCRETE FOUNDATION
450	1873367.68	2634995.99	37.5	MODULE CONCRETE FOUNDATION
451	1873359.25	2635010.06	37.5	MODULE CONCRETE FOUNDATION
452	1873363.58	2635015.56	38.0	CORNER RADIATOR TOP CONCRETE PAD
453	1873344.03	2635003.85	38.0	CORNER RADIATOR TOP CONCRETE PAD
454	1873329.27	2634995.00	38.0	CORNER RADIATOR TOP CONCRETE PAD
455	1873309.72	2634983.29	38.0	CORNER RADIATOR TOP CONCRETE PAD

REVISIONS			
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	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW	

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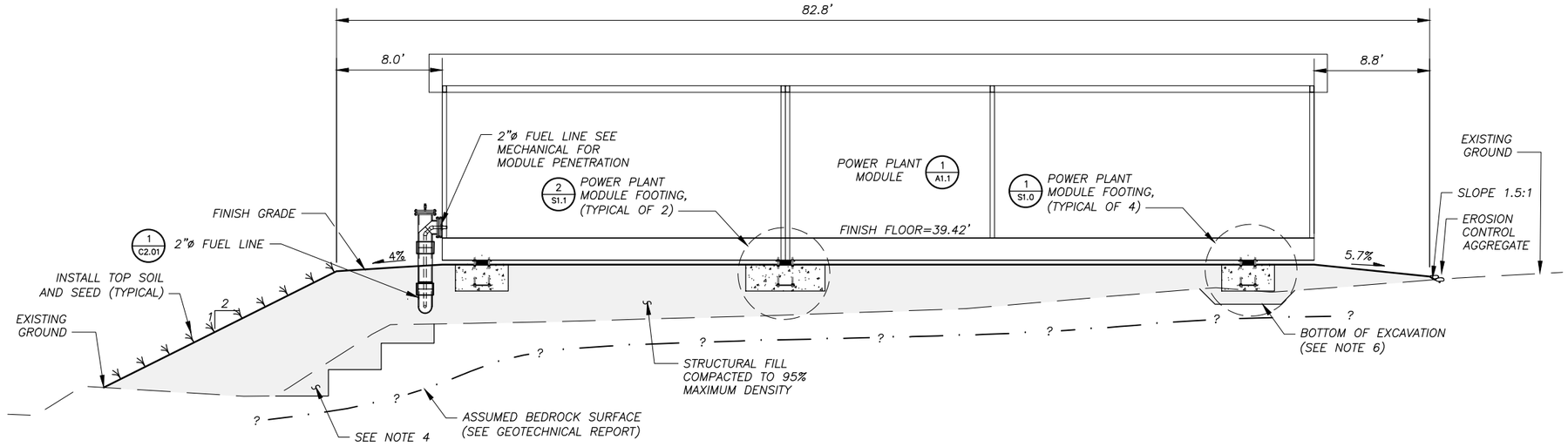
KAKE RURAL POWER SYSTEM UPGRADES
KAKE, ALASKA

SHEET TITLE: IPEC POWER PLANT GRADING PLAN
SHEET: C1.03
DRAWN BY: KK | CHECKED BY: MRS
DATE: 06/10/16 | SCALE: AS SHOWN
JOB NUMBER: 13-039

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP_C102-C104, 1=1, LAYOUT: C1.03 - GRADING PLAN
XREF: 13-039_40_KAKE-SURVEY-BASE, 13-040_00_X-DESIGN-BASE-PPLANT, 13040-PP_BD01

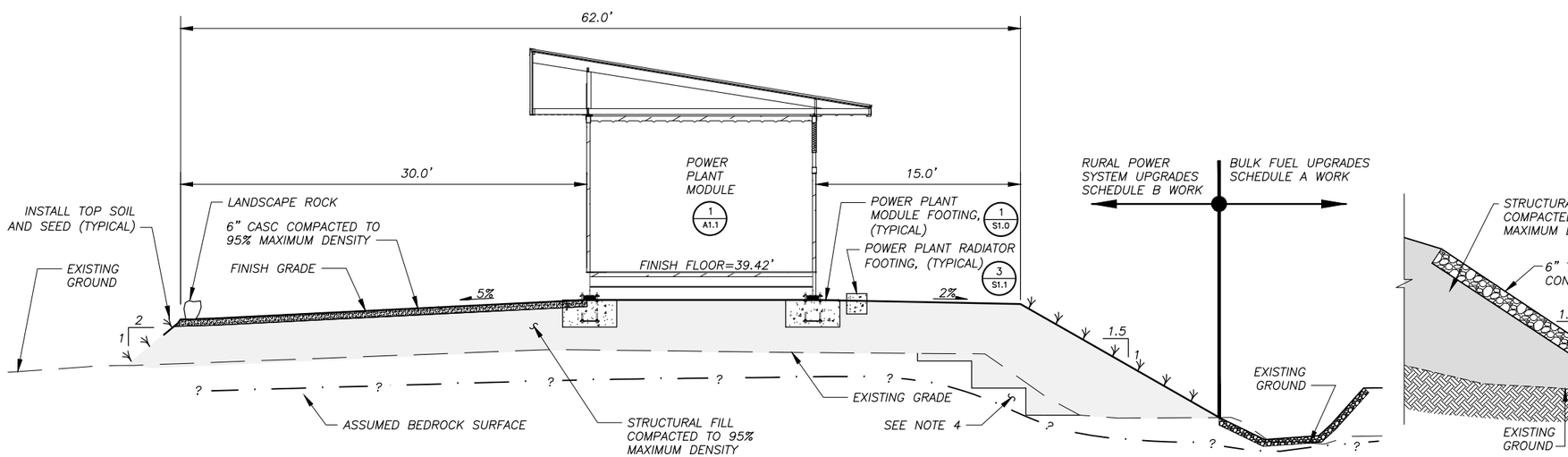


A C1.04 SECTION - IPEC POWER PLANT MODULE

SCALE: 1" = 5.0'

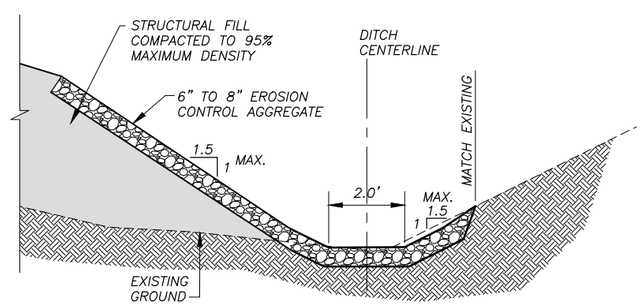
NOTES:

1. SEE SHEET G1.03 AND G1.04 FOR GENERAL NOTES, LEGEND, SYMBOLS, AND ABBREVIATIONS.
2. REMOVE ORGANICS, DEBRIS OR OTHER DELETERIOUS MATERIAL PRIOR TO PLACEMENT OF FILL OR CONSTRUCTION. MATERIAL REMOVED SHALL BE DISPOSED OF AS UNUSABLE EXCAVATION.
3. COMPACT AND PROOF ROLL THE EXPOSED SUBGRADE.
4. BENCH EXISTING SLOPE PRIOR TO PLACING FILL. IF BEDROCK IS ENCOUNTERED DURING TRENCHING, FILL SHALL BE PLACED IN EVEN LAYERS THAT EXTEND TO THE BEDROCK SURFACE. WHERE SOIL IS ENCOUNTERED, THE LAYERS OF FILL SHALL BE BENCHED INTO THE EXISTING SOIL TO FACILITATE PLACEMENT AND COMPACTION. THE HEIGHT OF THE BENCHES SHALL NOT EXCEED TWO FEET AND THE WIDTH OF THE BENCHES SHALL BE MINIMUM OF TWICE THE HEIGHT.
5. FILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.
6. INSTALL A MIN. 12" COMPACTED STRUCTURAL FILL UNDER CONCRETE FOUNDATIONS.



B C1.04 SECTION - IPEC POWER PLANT MODULE

SCALE: 1" = 5.0'



C C1.04 SECTION - DITCH

SCALE: 1" = 2.0'

REVISIONS		
MARK	DATE	DESCRIPTION
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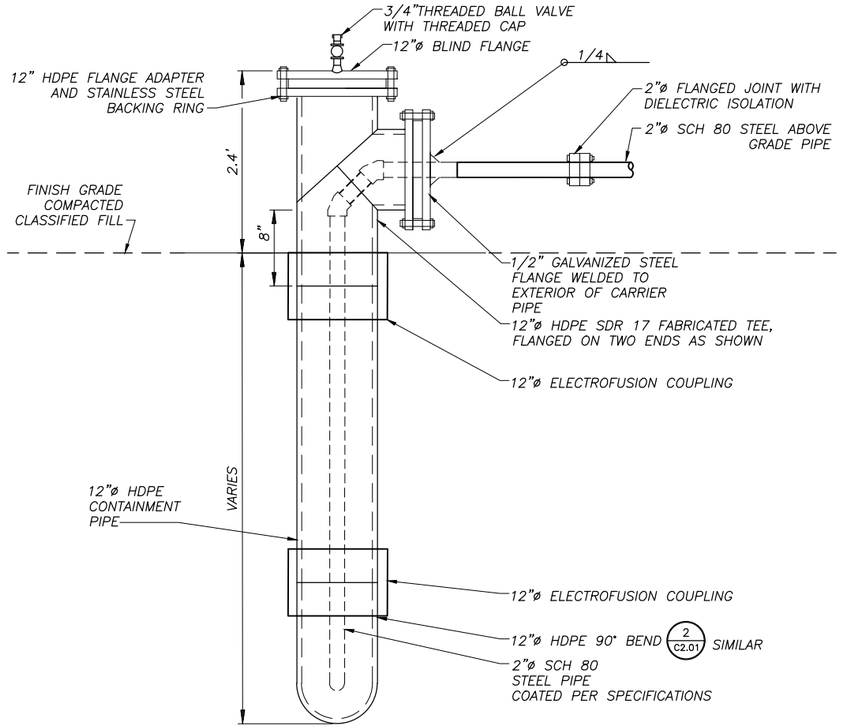
KAKE, ALASKA

SHEET TITLE: IPEC POWER PLANT MODULE SECTIONS

SHEET: C1.04

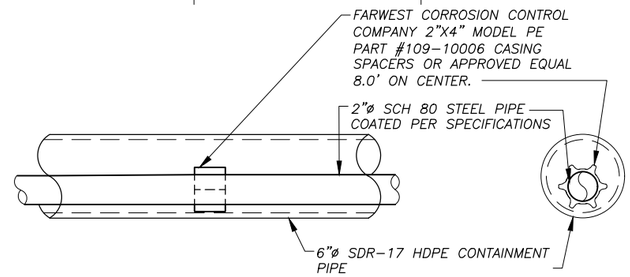
DRAWN BY:	CHECKED BY:
KK	MRS
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13-039	

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_PP_C102-C104, 1=1, 06-07-16 at 15:05 by jkk
LAYOUT: C1.04 - SECTIONS
XREF: 13-039_40_KAKE-SURVEY-BASE, 13-040_00_X-DESIGN-BASE-PPLANT, 13040-PP_BD01



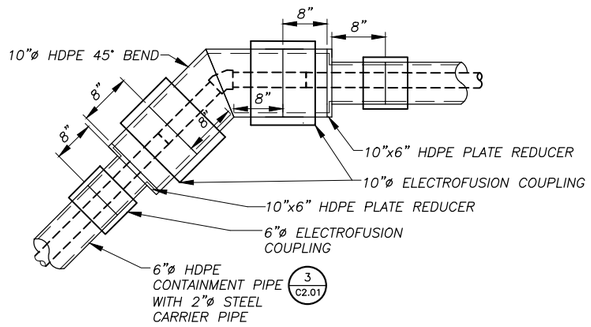
1 C2.01 CONTAINMENT PIPE VERTICAL TRANSITION DETAIL

SCALE: NONE



3 C2.01 CONTAINMENT PIPE DETAIL

SCALE: NONE

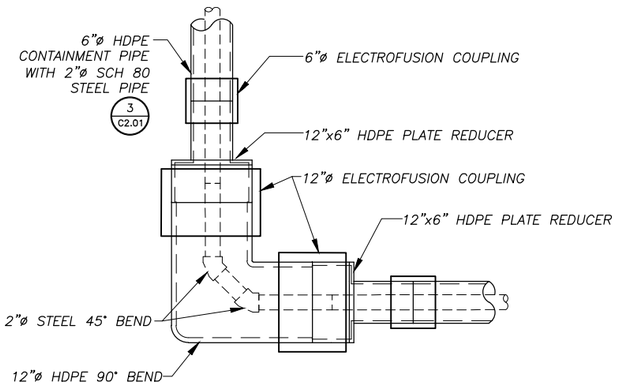


NOTES:

1. SEE SHEET G1.03, AND G1.04 FOR GENERAL NOTES, LEGEND, ABBREVIATIONS, AND SPECIFICATIONS.
2. CARRIER PIPE SHALL BE 2-INCH SCHEDULE 80 BURIED STEEL PIPE SEE SPECIFICATIONS.
3. CONTAINMENT PIPE SHALL BE 6-INCH SDR-17 HDPE PIPE SEE SPECIFICATIONS.
4. RADIUS INSIDE EDGE OF CONTAINMENT PIPE END PRIOR TO INSERTING PIPE. USE CARE WHEN INSERTING PIPE INTO CONTAINMENT PIPE TO AVOID DAMAGING COATINGS.
5. ELECTROFUSION COUPLINGS SHALL BE CENTRAL PLASTICS, OR APPROVED EQUAL.
6. BURIED CONTAINMENT PIPE SHALL HAVE A MINIMUM GRADE OF -0.5% TO VERTICAL TRANSITION AT EXISTING POWER PLANT BUILDING, DEPTH OF PIPE VARIES.

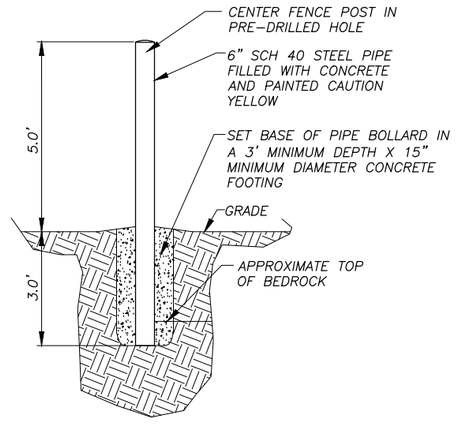
4 C2.01 TYPICAL CONTAINMENT PIPE 45° OR 22 1/2° ANGLE DETAIL

SCALE: NONE



2 C2.01 CONTAINMENT PIPE 90 DEGREE ANGLE DETAIL

SCALE: NONE



5 C2.01 BOLLARD DETAIL

SCALE: 1" = 2'

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITAL FOR AGENCY REVIEW

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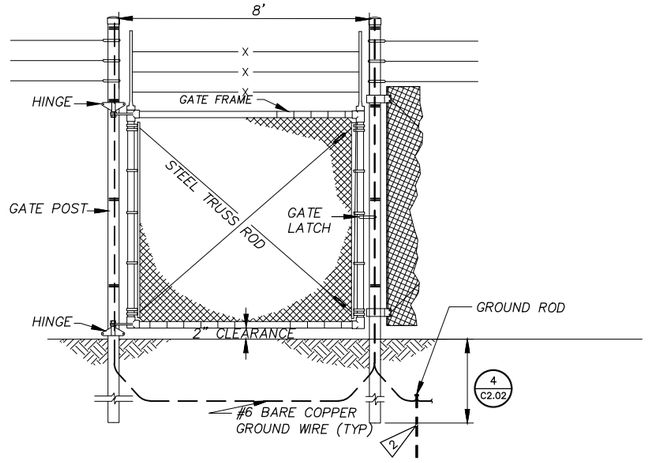
KAKE RURAL POWER SYSTEM UPGRADES
KAKE, ALASKA

SHEET TITLE: DETAILS

SHEET: C2.01

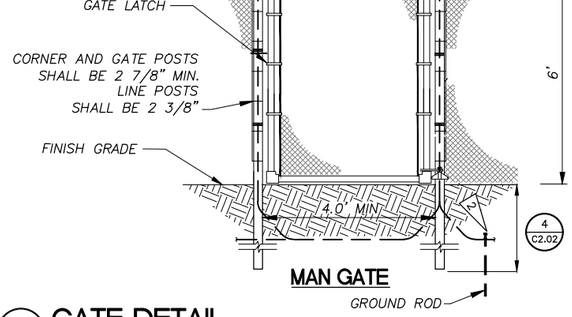
DRAWN BY:	CHECKED BY:
WJB	MRS
DATE:	SCALE:
06/10/16	AS SHOWN

JOB NUMBER: 13-039



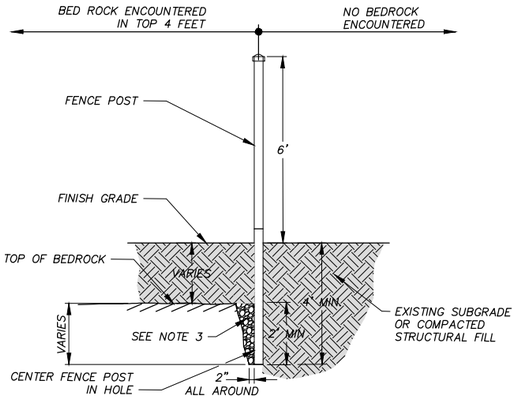
1 C2.02 SWING GATE DETAIL

SCALE: NONE



2 C2.02 GATE DETAIL

SCALE: NONE

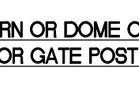


4 C2.02 FENCING POST DETAIL

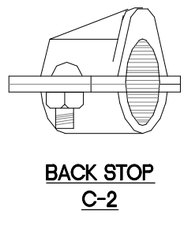
SCALE: NONE

FENCE NOTES:

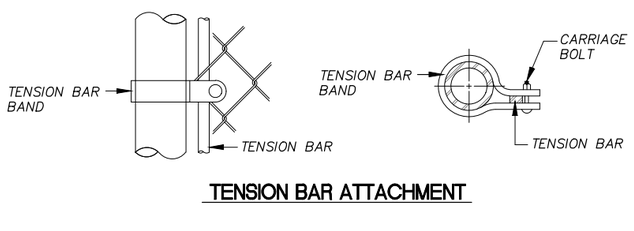
1. PROVIDE ALL MATERIALS AND FASTENERS REQUIRED FOR A COMPLETE SYSTEM IN ACCORDANCE WITH THIS DRAWING, THE PROJECT MANUAL, MANUFACTURER'S INSTALLATION DRAWINGS AND INSTRUCTIONS, AND THE CHAIN LINK FENCE MANUFACTURER'S INSTITUTE.
2. PROVIDE 3/4"x10' COPPER CLAD GROUND ROD IMBEDDED A MINIMUM OF 12' BELOW GRADE AT GATE CORNERS AND END POSTS.
3. IF BEDROCK IS ENCOUNTERED SET FENCE POST 2 FT MINIMUM INTO BEDROCK AND FILL FENCE POST HOLE WITH CONCRETE.



ACORN OR DOME CAP FOR GATE POST



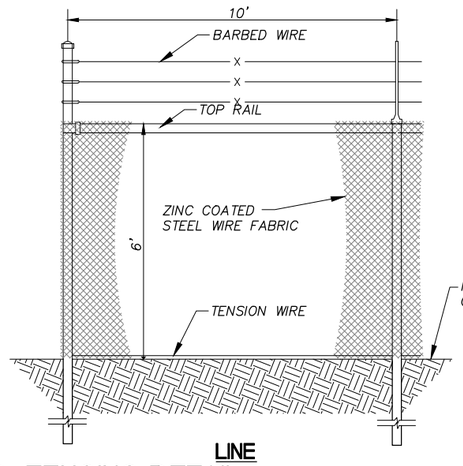
BACK STOP C-2



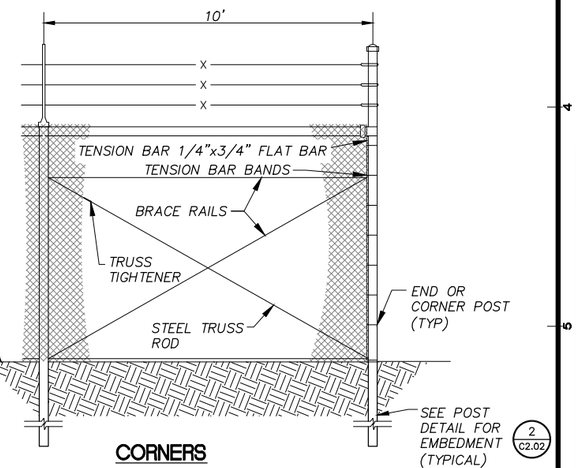
TENSION BAR ATTACHMENT

3 C2.02 FENCE HARDWARE

SCALE: NONE



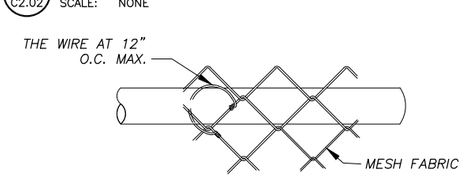
LINE



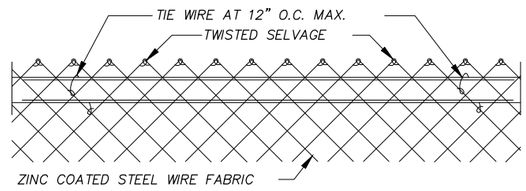
CORNERS

5 C2.02 FENCING DETAIL

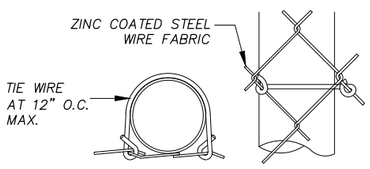
SCALE: NONE

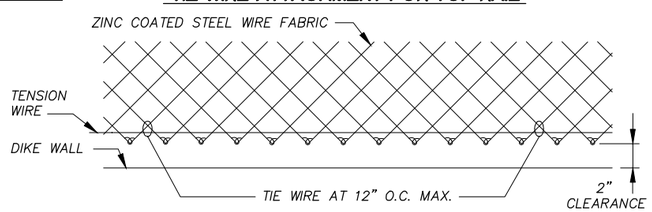


TIE WIRE ATTACHMENT FOR BRACE RAIL



TIE WIRE ATTACHMENT FOR TOP RAIL





6 C2.02 FENCE ATTACHMETN DETAILS

SCALE: NONE

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

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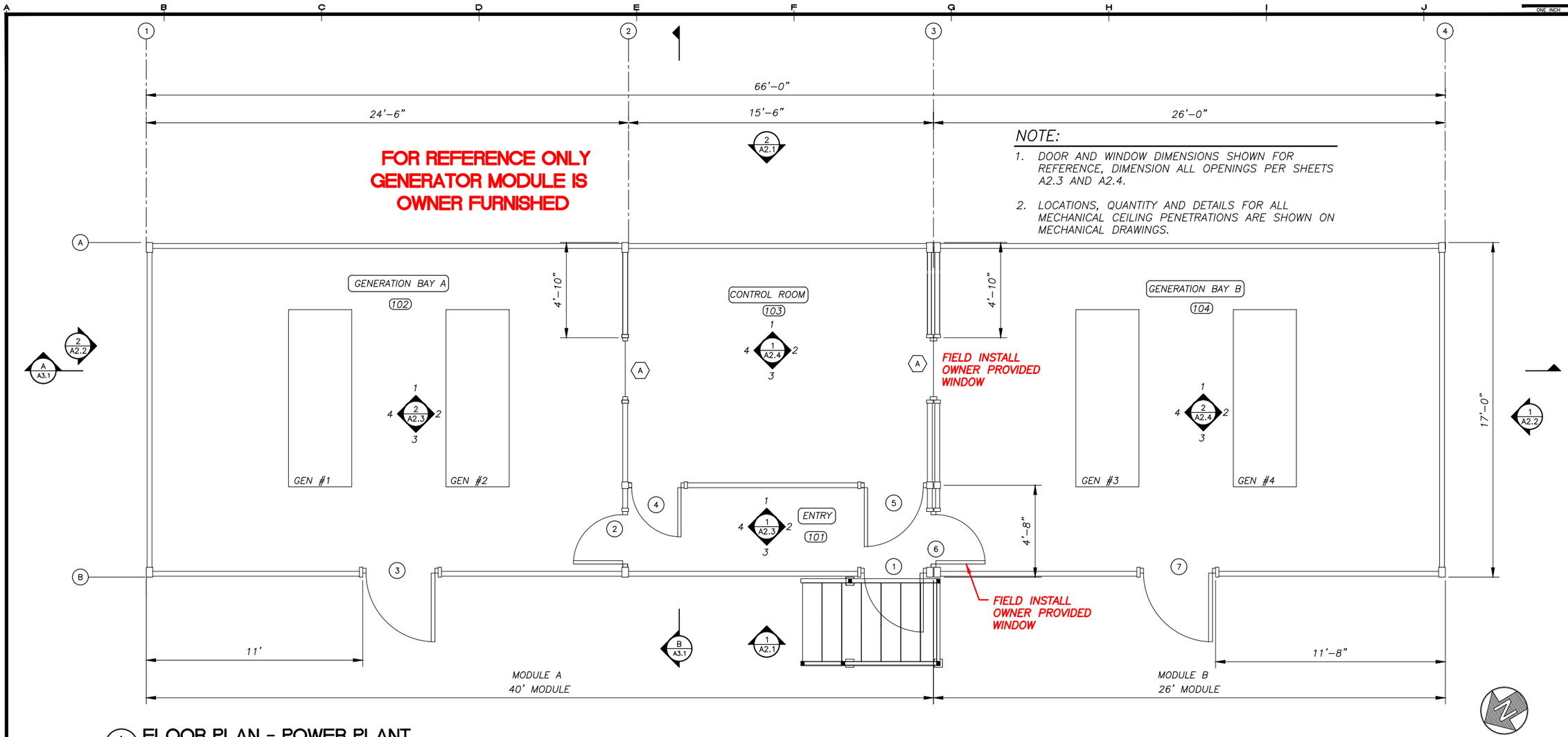
SHEET TITLE: PERIMETER FENCE DETAILS
SHEET: C2.02
DRAWN BY: KK | CHECKED BY: MRS
DATE: 06/10/16 | SCALE: AS NOTED
JOB NUMBER: 13-039

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_C2.02-FENCING, 1=1, 06-10-16 at 10:36 by jkk
LAYOUT: C2.02 FENCING
VIEW: C407_H_PDF
XREF: 13040-00_B01-BK, SWENSON-SIG



1 A1.1 FLOOR PLAN - POWER PLANT

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

CODE ANALYSIS – 2009 EDITION INTERNATIONAL BUILDING CODE

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

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: 17'–0" 1 STORY 1125 S.F.

FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS — REF: IBC–2009, TABLE 601
STRUCTURAL FRAME–0HR, BEARING WALLS–0HR, INTERIOR PARTITIONS–0HR, FLOOR–0HR, ROOF–0HR

FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS — REF: IBC–2009, TABLE 602
EXTERIOR WALLS 10' ≤ X ≤ 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 1125 S.F./300 S.F. PER OCCUPANT= 4 OCCUPANTS

MEANS OF EGRESS – TRAVEL DISTANCE — REF: IBC–2009, TABLE 1016.1
REQUIRED 200' PROVIDED < 25'

ARCHITECTURAL GENERAL NOTES:

1) SEE CIVIL/MECHANICAL SITE PLAN FOR LOCATION AND LAYOUT. PROVIDE SEPARATION TO PROPERTY BOUNDARIES IN ACCORDANCE WITH CODE ANALYSIS.

2) 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

3) 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.

4) 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.

5) SEE SHEET A3.2 FOR DESCRIPTION OF FIELD INSTALLED ROOF SYSTEM.

6) 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.

7) 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.

8) 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.

9) 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.

10) 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.

REVISIONS

MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

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ALASKA ENERGY AUTHORITY
KAKE, ALASKA

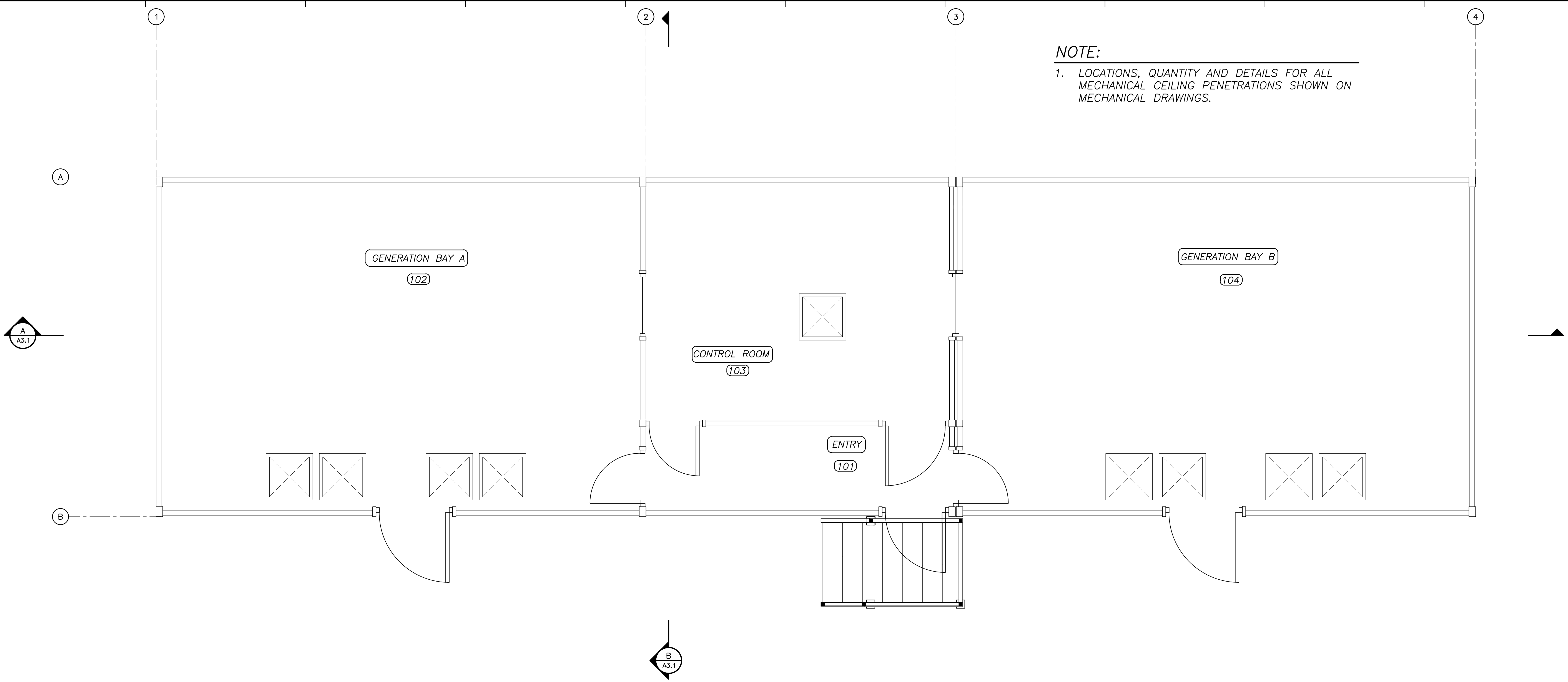
SHEET TITLE: POWER PLANT FLOOR PLAN

SHEET: A1.1

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13–039	

NOTE:

1. LOCATIONS, QUANTITY AND DETAILS FOR ALL MECHANICAL CEILING PENETRATIONS SHOWN ON MECHANICAL DRAWINGS.



1
A1.2
REFLECTED CEILING PLAN - POWER PLANT
SCALE: 3/8" = 1'-0"

FOR REFERENCE ONLY
GENERATOR MODULE IS
OWNER FURNISHED

REVISIONS

MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

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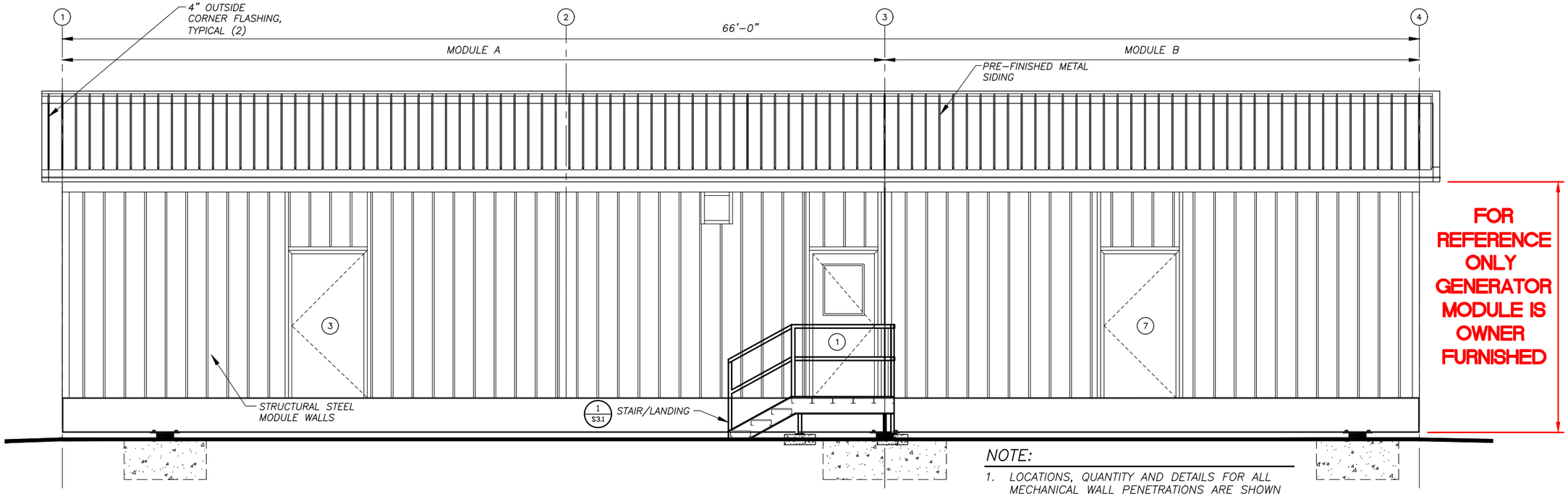
KAKE, ALASKA

SHEET TITLE: POWER PLANT REFLECTED CEILING PLAN

SHEET: A1.2

DRAWN BY: KK	CHECKED BY: DGT
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13-039	

H:\jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_A1.1-A1.2-PP, 1=1, 06-10-16 at 08:27 by jkk
LAYOUT: A1.2 - REFLECTED CEILING PLAN
XREF: 13-040_00_STRCUT-PP-BASE, 13040-00_B01-BK

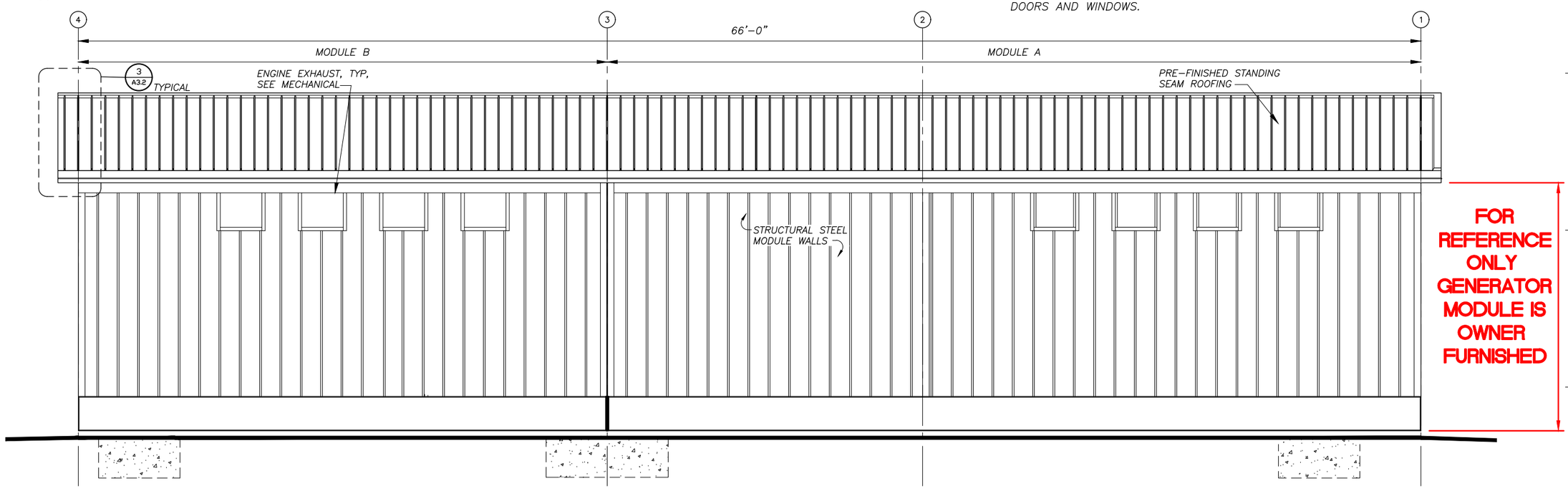


1 A2.1 EAST ELEVATION - FRONT

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

NOTE:

1. LOCATIONS, QUANTITY AND DETAILS FOR ALL MECHANICAL WALL PENETRATIONS ARE SHOWN ON MECHANICAL SHEETS.
2. OWNER SHALL FURNISHED AND INSTALL DOORS AND WINDOWS.



2 A2.1 WEST ELEVATION - BACK

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

REVISIONS

MARK	DATE	DESCRIPTION

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KAKE RURAL POWER SYSTEM UPGRADES

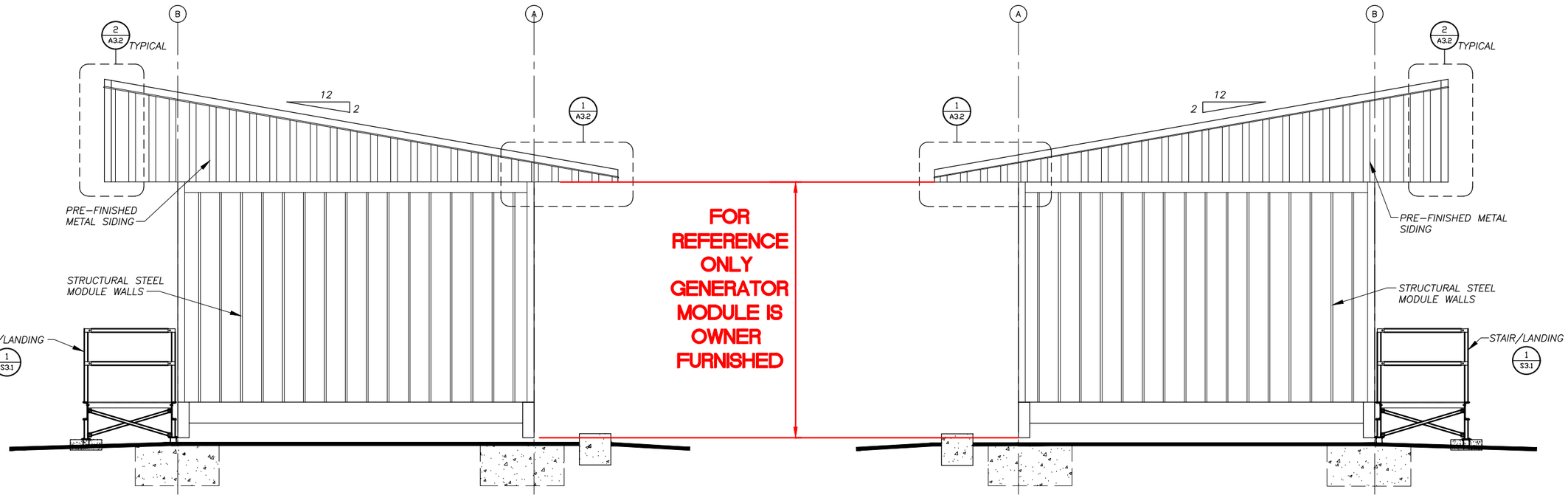
KAKE, ALASKA

SHEET TITLE: POWER PLANT ELEVATIONS

SHEET: A2.1

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

JOB NUMBER: 13-039



1 A2.2 NORTH ELEVATION

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

2 A2.2 SOUTH ELEVATION

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

ROOFING SYSTEM NOTES:

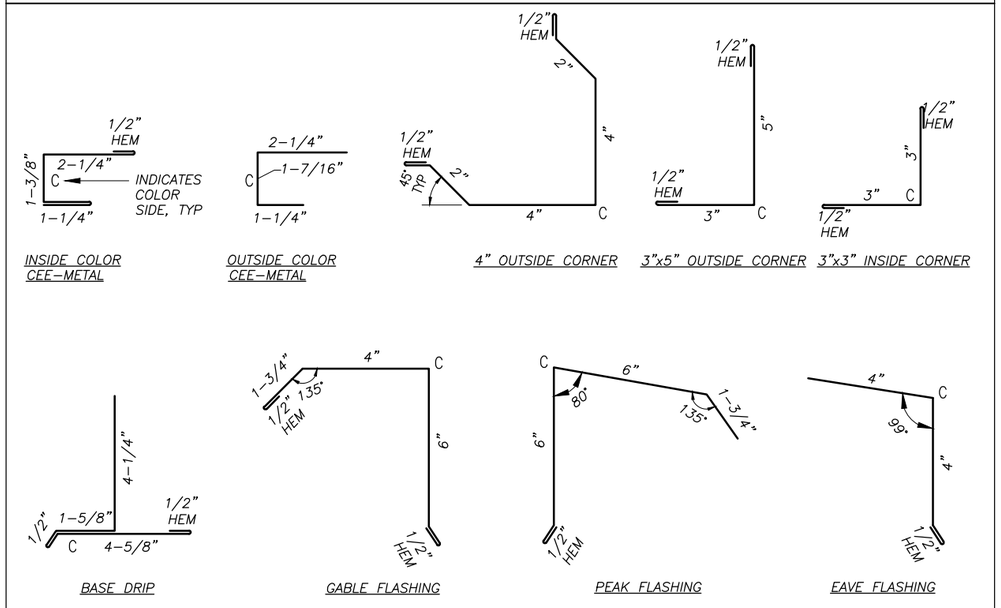
1) FIELD INSTALL TRUSSES TO MODULE STRUCTURE, SEE STRUCTURAL. FIELD INSTALL PLYWOOD SHEATHING, BITUTHENE, AND METAL ROOFING/SIDING AS INDICATED. SEAL AND FLASH ALL SEAMS TO FORM A CONTINUOUS WEATHERPROOF SEAL.

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.

ROOFING SYSTEM TRIM & FLASHING:



H:\jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_A2.1-A2.5-PP, 1:1, 06-10-16 at 09:08 by jkk
LAYOUT: A2.2 - ELEVATIONS
XREF: 13040-00_B01-GSE

REVISIONS		
MARK	DATE	DESCRIPTION

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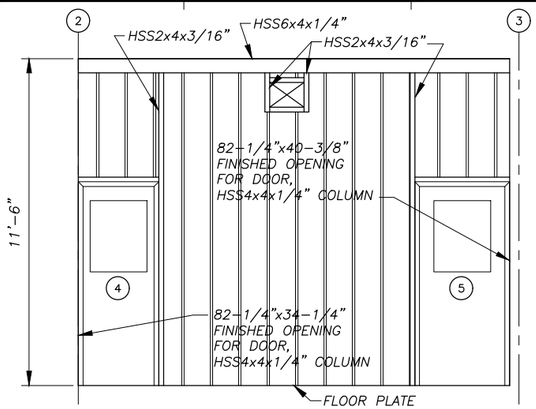
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: POWER PLANT ELEVATIONS

SHEET: A2.2

DRAWN BY:	CHECKED BY:
KK	DGT
DATE:	SCALE:
06/10/16	AS SHOWN

JOB NUMBER: 13-039



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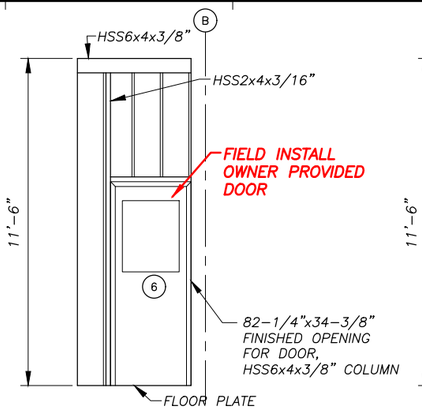
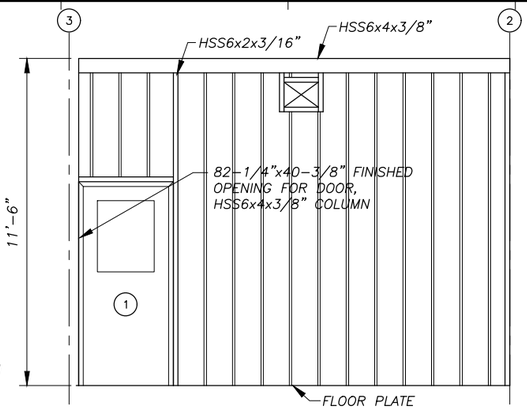
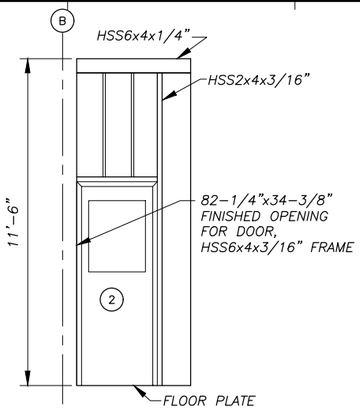


VIEW 2



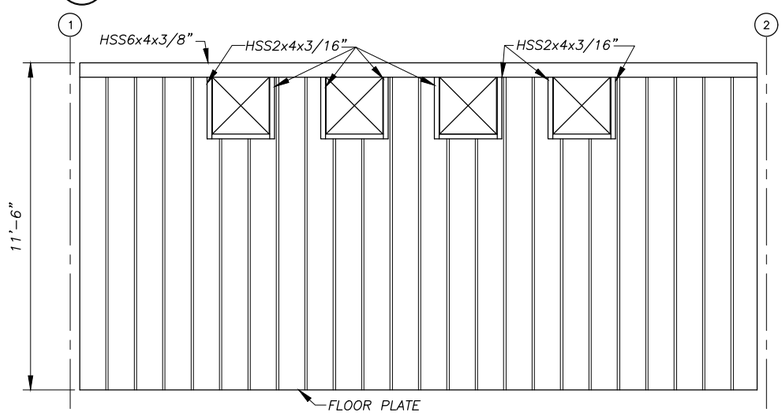
VIEW 3



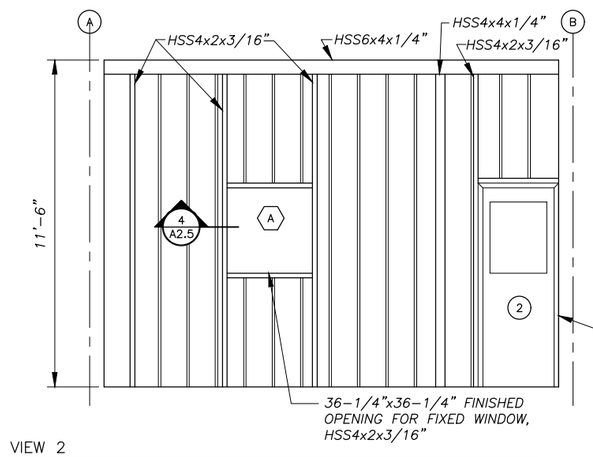
VIEW 4

1 / A2.3 INTERIOR ELEVATION - ENTRY ROOM No. 101

SCALE: NONE



VIEW 1



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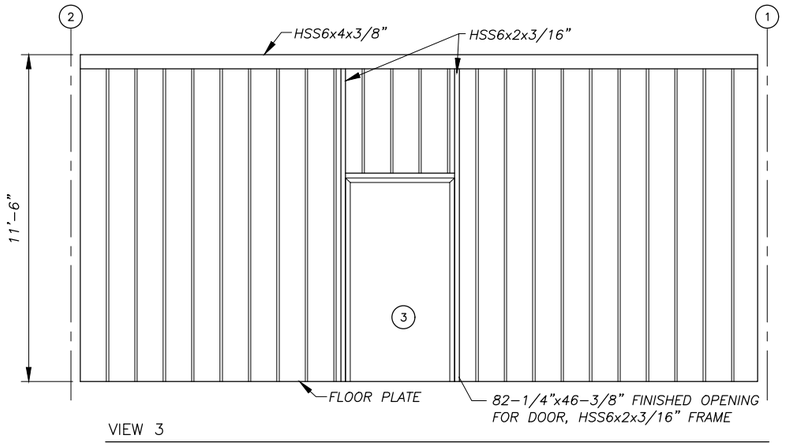

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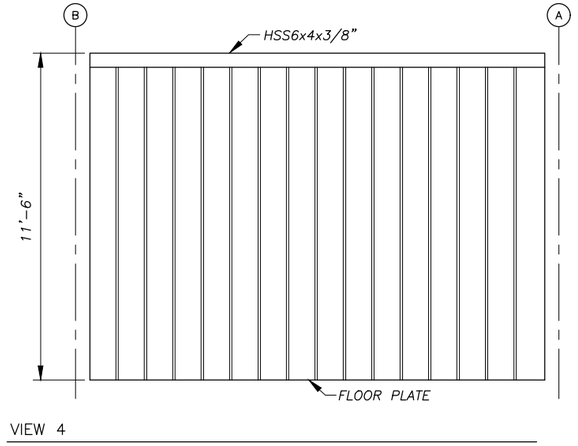

VIEW 4

2 / A2.3 INTERIOR ELEVATION - GENERATION BAY ROOM No. 102

SCALE: NONE

NOTE:

1. LOCATIONS, QUANTITY AND DETAILS FOR ALL MECHANICAL WALL PENETRATIONS SHOWN ON MECHANICAL SHEETS.
2. OWNER SHALL FURNISH AND INSTALL DOORS AND WINDOWS.

FOR REFERENCE ONLY GENERATOR MODULE IS OWNER FURNISHED

REVISIONS

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KAKE, ALASKA

SHEET TITLE: POWER PLANT INTERIOR ELEVATIONS

SHEET: A2.3

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

JOB NUMBER: 13-039

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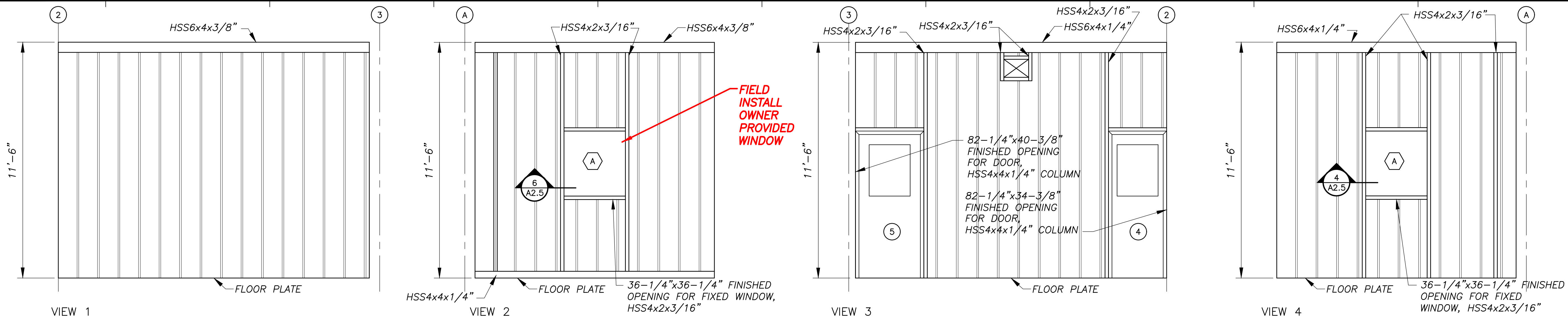
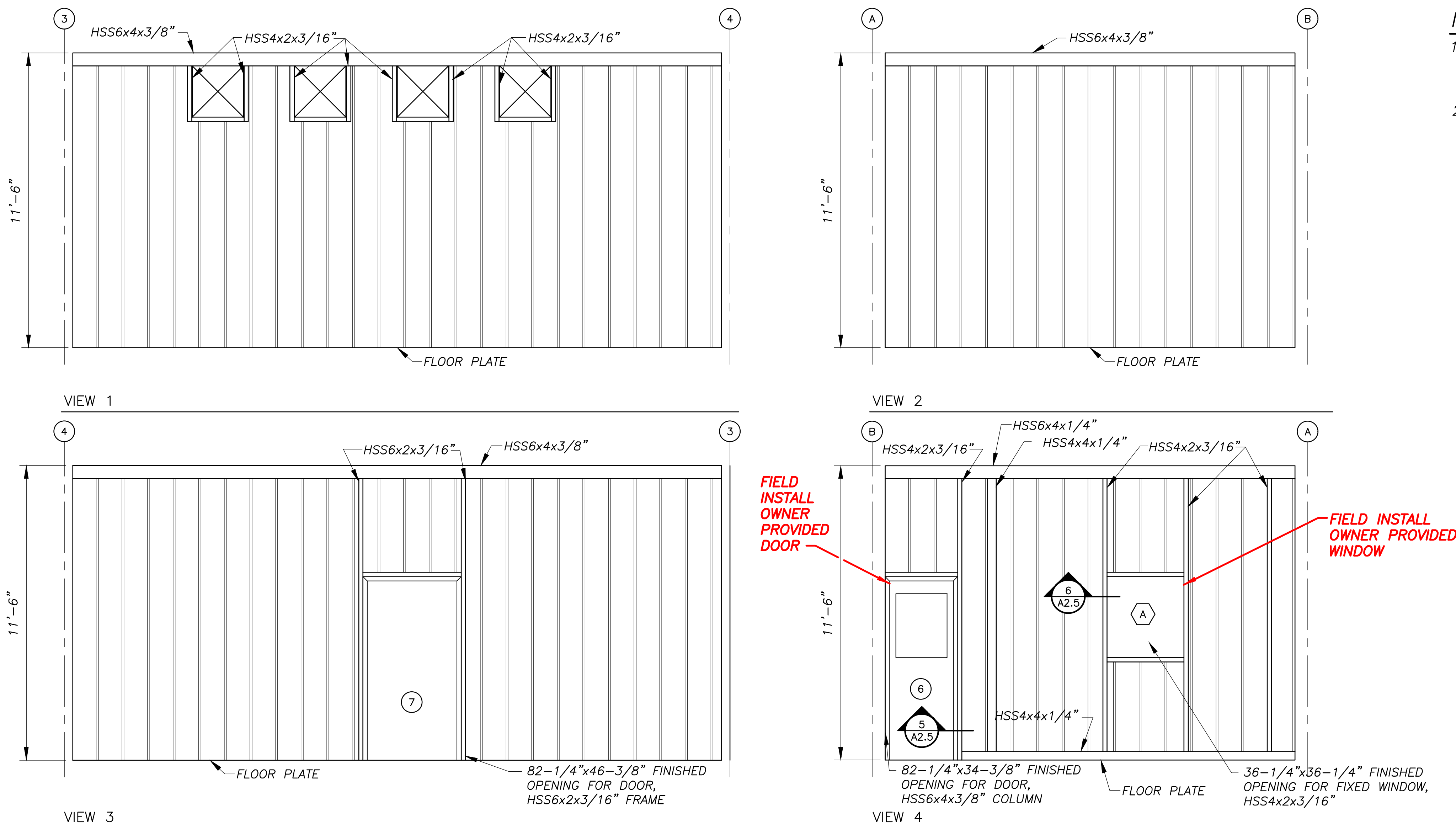
LAYOUT: A2.3 - INTERIOR ELEVATIONS
XREF: 13040-00_B01-GSE



INTERIOR ELEVATION - CONTROL ROOM No. 103

1 A2.4 SCALE: NONE



INTERIOR ELEVATION - GENERATION BAY ROOM No. 102

2 A2.4 SCALE: NONE

NOTE:

1. LOCATIONS, QUANTITY AND DETAILS FOR ALL MECHANICAL WALL PENETRATIONS SHOWN ON MECHANICAL SHEETS.
2. OWNER SHALL FURNISH AND INSTALL DOORS AND WINDOWS.

FOR REFERENCE ONLY GENERATOR MODULE IS OWNER FURNISHED

REVISIONS | MARK | DATE | DESCRIPTION

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KAKE, ALASKA

SHEET TITLE: POWER PLANT INTERIOR ELEVATIONS

SHEET: A2.4

DRAWN BY: KK | CHECKED BY: DGT
DATE: 06/10/16 | SCALE: AS SHOWN
JOB NUMBER: 13-039

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LAYOUT: A2.4 - INTERIOR ELEVATIONS
XREF: 13040-00_B01-GSE

DOOR CONSTRUCTION

DOOR NO.	WIDTH	HEIGHT	THICK NESS	MATERIAL	CORE	REMARKS
1	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}
2	2'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}
3	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	
4	2'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}
5	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}
6	2'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	24"x24" RE-LIGHT {2}
7	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	INSULATED	

FIELD INSTALL OWNER PROVIDED DOOR

FRAME CONSTRUCTION

HEAD/JAMB DETAIL	SILL DETAIL	WALL THICKNESS	MATERIAL	TYPE	PROFILE	FIRE RTG	HWR
2/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-1
4/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2
2/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-3
4/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2
4/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-4
5/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-2
2/A2.5	1/A2.5	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	NONE	HW-3

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

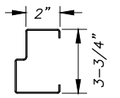
NOTES:

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

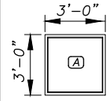
{2} INSTALL 24"x24" INSULATED RE-LIGHT WITH TWO PANES OF LAMINATED SAFETY GLASS IN EACH DOOR PANEL.

{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:



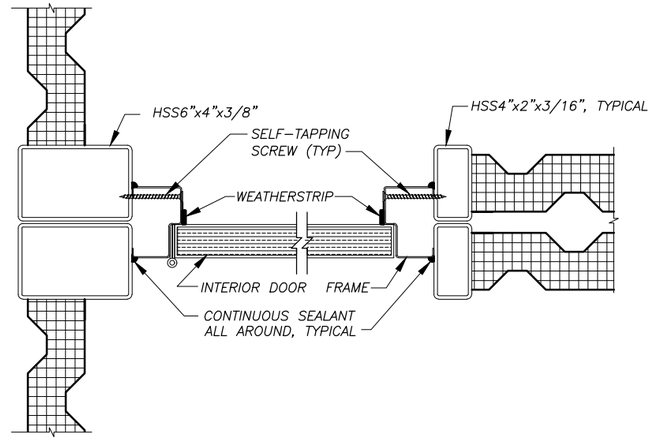
WINDOW TYPES:



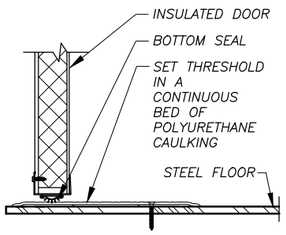
FIXED SINGLE RABBET HOLLOW METAL FRAME WITH 1 PANE OF 1/4" AND 1 PANE OF 3/8" LAMINATED SAFETY GLASS

NOTE: DIMENSIONS ARE OVERALL FRAME SIZE.

FIELD INSTALL OWNER PROVIDED WINDOW SEE SHEET A2.4



5 / A2.5 INTERIOR DOOR JAMB/HEAD
SCALE: NONE



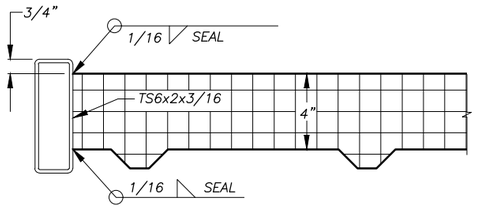
1 / A2.5 TYPICAL DOOR THRESHOLD
SCALE: N.T.S.

FRAMED OPENING NOTES:

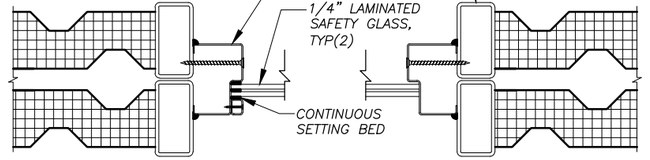
1) FABRICATE FRAMED OPENINGS FOR DOORS, WINDOWS, ETC, WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.

2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON REFLECTED CEILING PLAN.

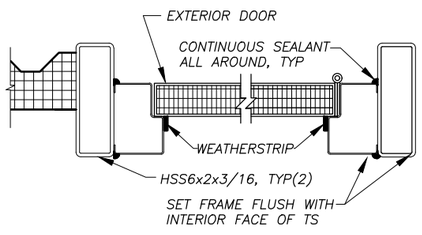
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.



3 / A2.5 FINISH CEILING OPENING DETAIL
SCALE: NONE

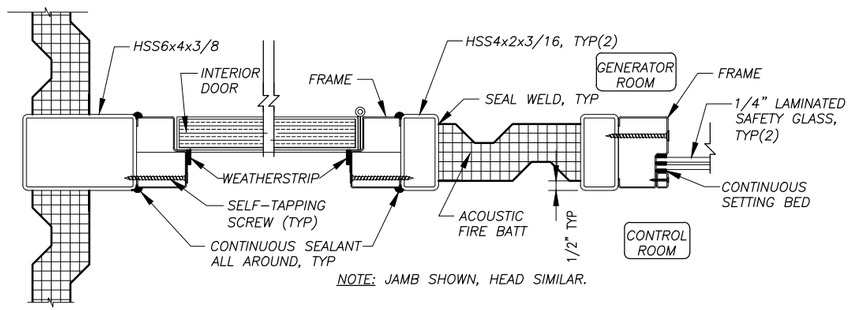


6 / A2.5 INTERIOR WINDOW JAMB/HEAD
SCALE: NONE



NOTE: JAMB SHOWN, HEAD SIMILAR.

2 / A2.5 TYPICAL EXTERIOR DOOR JAMB/HEAD
SCALE: 3" = 1'-0"



NOTE: JAMB SHOWN, HEAD SIMILAR.

4 / A2.5 INTERIOR DOOR AND WINDOW JAMB/HEAD
SCALE: 3" = 1'-0"

NOTE:

1. OWNER SHALL FURNISH AND INSTALL DOORS AND WINDOWS.

FOR REFERENCE ONLY
GENERATOR MODULE
IS OWNER FURNISHED

REVISIONS

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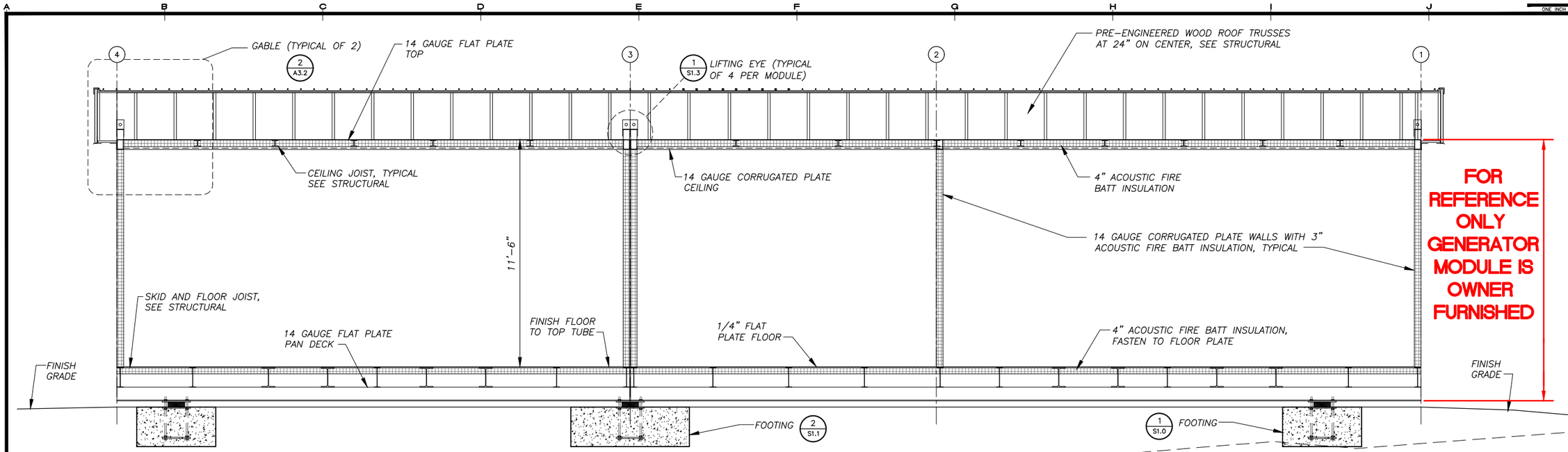
KAKE RURAL POWER SYSTEM UPGRADES
KAKE, ALASKA

SHEET TITLE: POWER PLANT DOOR SCHEDULE AND DETAILS

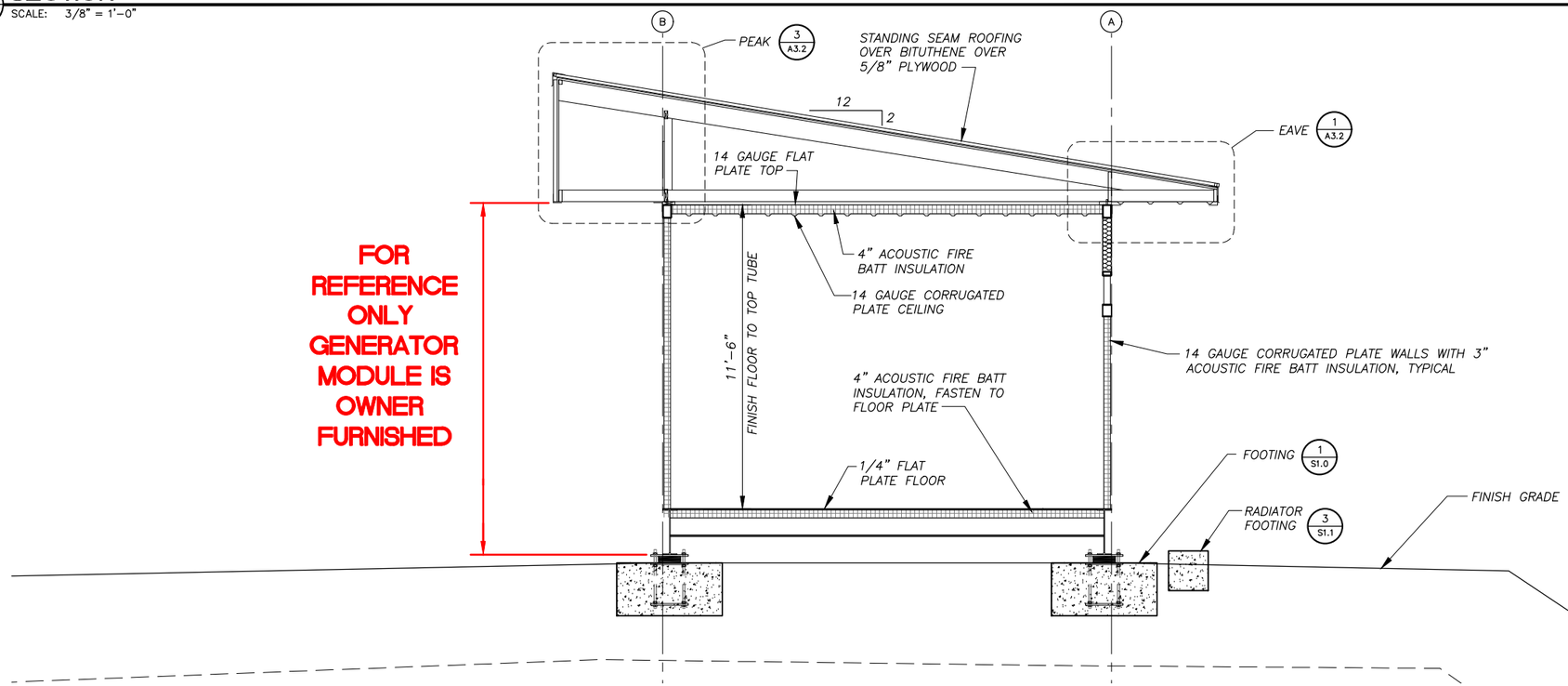
SHEET: A2.5

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

JOB NUMBER: 13-039



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



B / A3.1 **SECTION**
SCALE: 1/4" = 1'-0"

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David G. Thompson
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KAKE RURAL POWER SYSTEM UPGRADES
KAKE, ALASKA

SHEET TITLE
POWER PLANT SECTIONS

SHEET
A3.1

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13-039	

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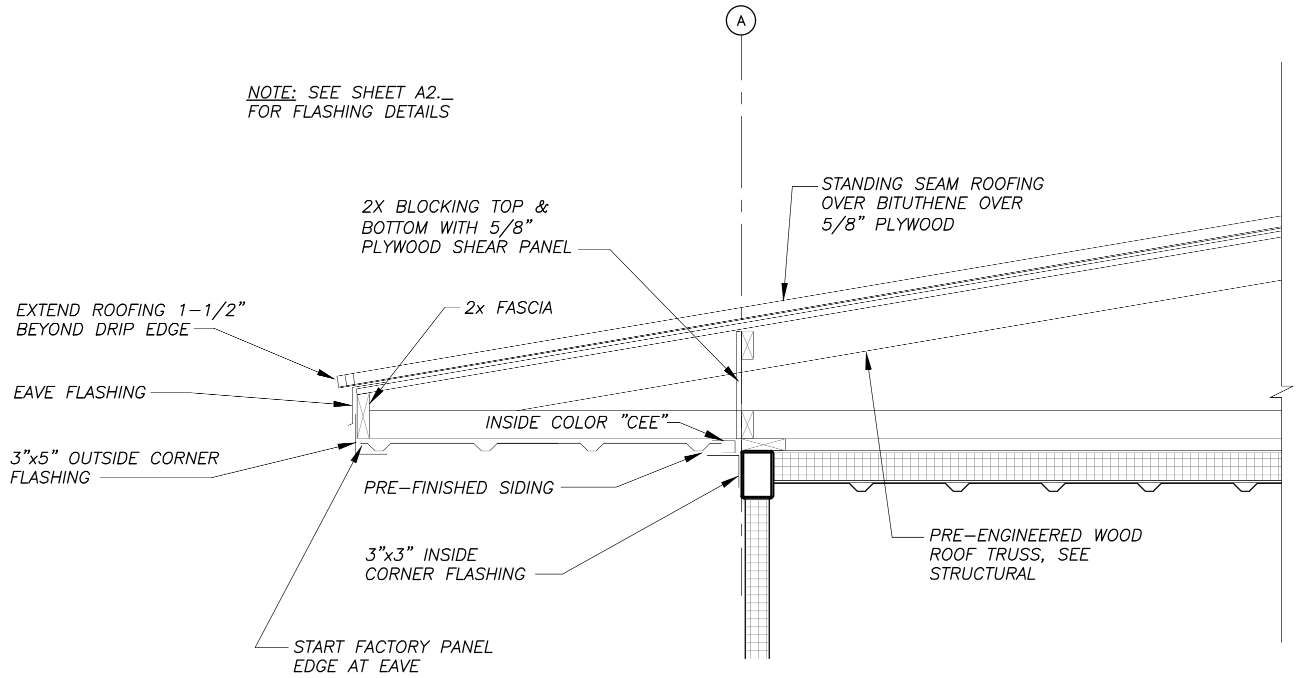
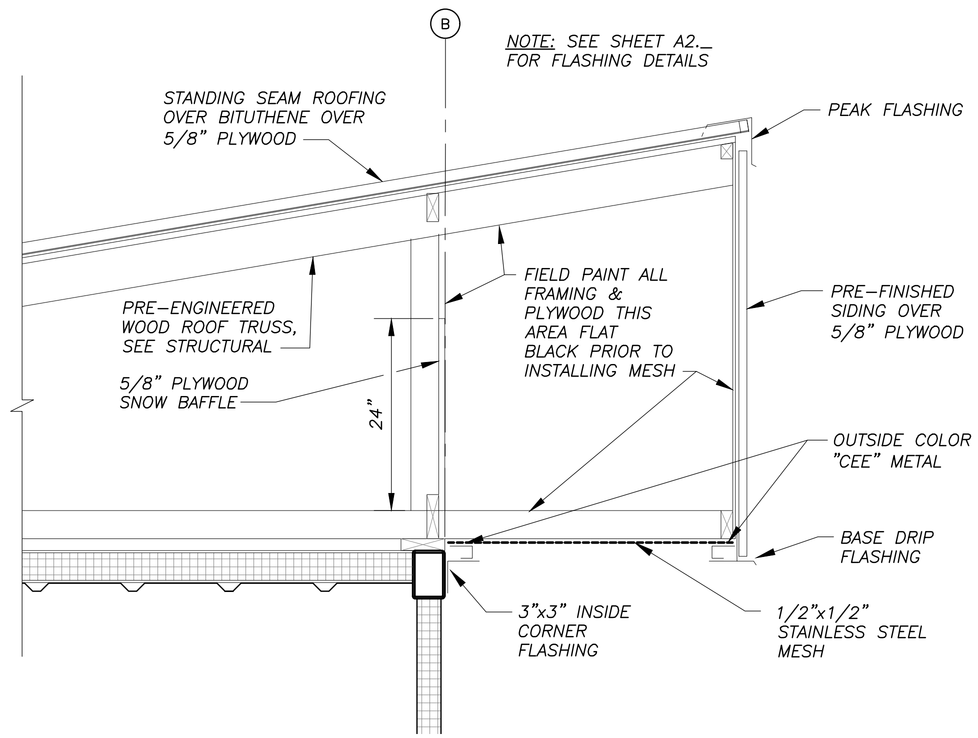
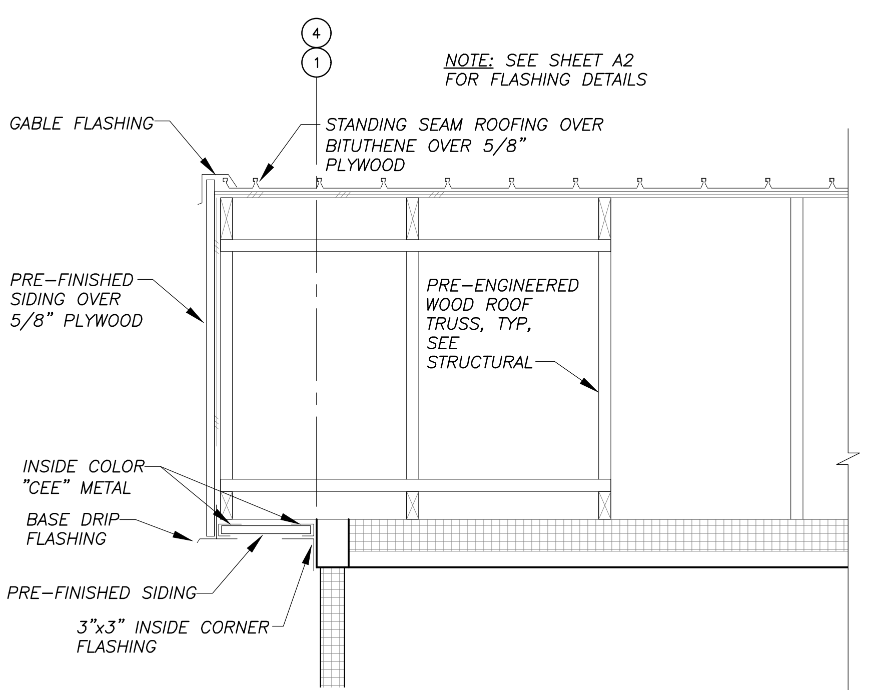
LAYOUT: A3.1 - SECTIONS
XREF: 13-040_00_STRCUT-PP-BASE, 13040-00_B01-GSE



1 A3.2 EAVE DETAIL
SCALE: 1" = 1'-0"



2 A3.2 PEAK DETAIL
SCALE: 1" = 1'-0"



3 A3.2 GABLE DETAIL
SCALE: 1" = 1'-0"

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ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: POWER PLANT SECTIONS AND DETAILS
SHEET: A3.2
DRAWN BY: KK
CHECKED BY: DGT
DATE: 06/10/16
SCALE: AS SHOWN
JOB NUMBER: 13-039

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LAYOUT: A3.2 - SECTIONS
XREF: 13-040_00_STRCUT-PP-BASE, 13040-00_B01-GSE

STRUCTURAL GENERAL NOTES – MODULE:

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 7-10)
GROUND SNOW LOAD, Pg = 60 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

D. WIND LOADS:
BASIC WIND SPEED = 120 MPH, 3 SECOND GUST
WIND IMPORTANCE FACTOR, Iw = 1.15 , CATEGORY IV
EXPOSURE CLASSIFICATION = EXPOSURE C

E. SEISMIC LOADING:
SEISMIC = S_S = 0.422 S_1 = 0.353
SEISMIC IMPORTANCE FACTOR = 1.50 , CATEGORY IV

SITE CLASS "D"
BASIC SEISMIC FORCE RESISTANCE SYSTEM = BUILDING – BEARING WALL WITH STEEL SHEAR PANELS
FOUNDATION – SPREAD CONCRETE FOOTINGS
SEISMIC RESPONSE COEFFICIENT, R = 7.0

2.0 FOUNDATIONS:

A. SEE SITE/FOUNDATION PLANS.

B. THE MODULE DESIGN SHOWS STANDARD CONSTRUCTION ON A SKID SYSTEM INSTALLED ON CONCRETE FOOTINGS.

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.

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 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.

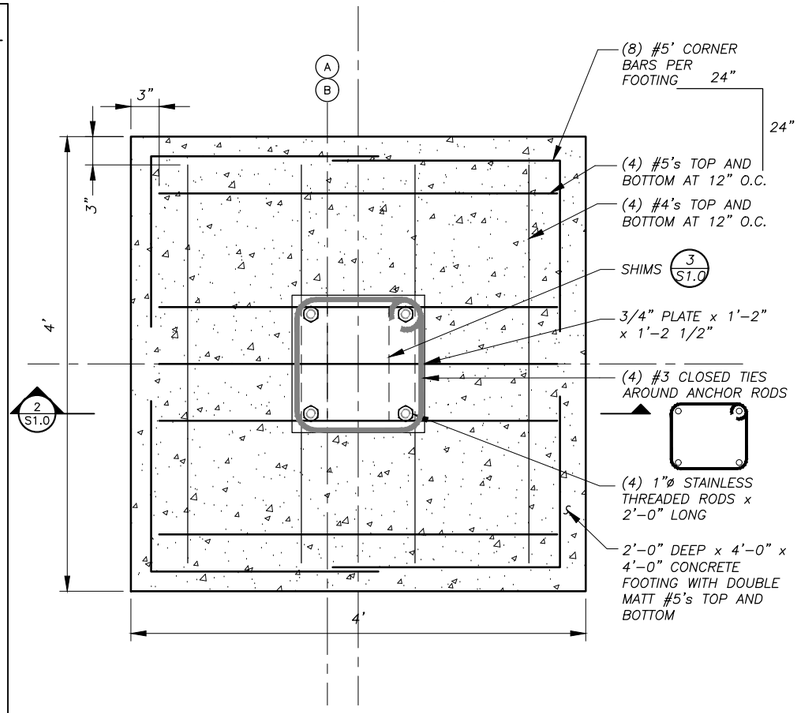
C. ALL METAL TO WOOD OR WOOD TO WOOD CONNECTIONS SHALL BE STANDARD OR AS DETAILED ON THE DRAWINGS. ALL FASTENERS IN CONTACT WITH WOOD MEMBERS AND PLYWOOD SHALL BE STAINLESS STEEL.

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.

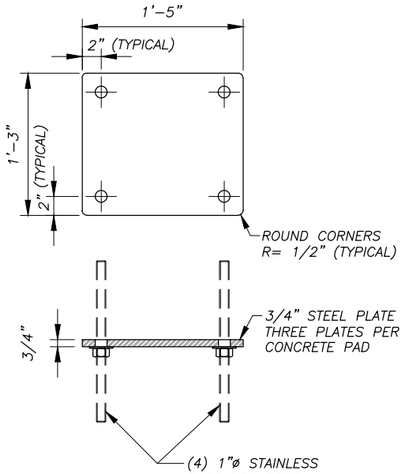
E. MINIMUM NAILING SHALL EQUAL THAT INDICATED IN INTERNATIONAL BUILDING CODE TABLE 2304.9.1 UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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

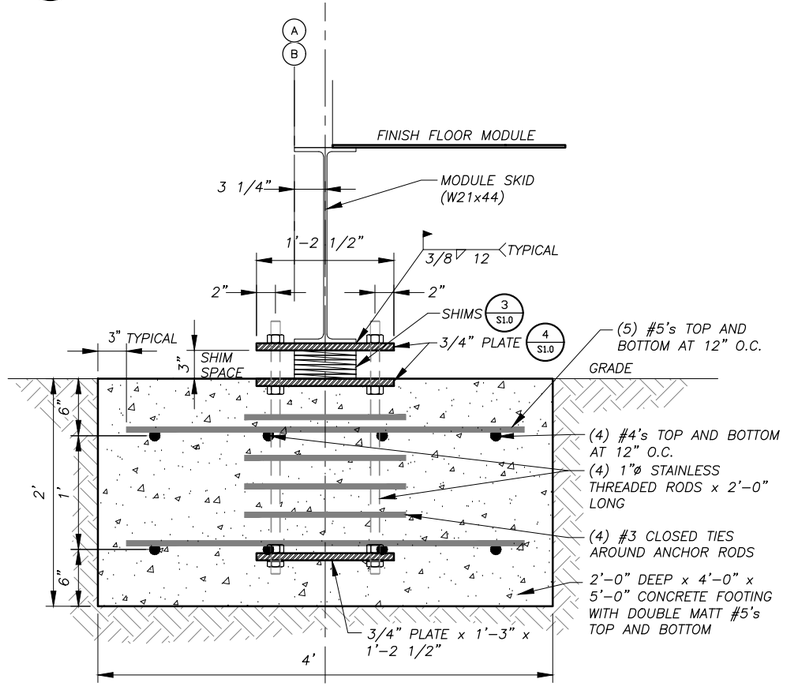
G. PREMANUFACTURED ROOF TRUSSES: ALL PREMANUFACTURED WOOD TRUSSES SHALL BE "GANG NAIL" OR EQUAL AND SHALL BE FABRICATED FROM TREATED LUMBER WITH STAINLESS STEEL PLATES AND FASTENERS AS INDICATED ABOVE. TRUSSES SHALL DESIGNED FOR THE GRAVITY LOADS, WIND & SEISMIC LATERAL & UPLIFT LOADS, AND SUPPORT CONDITIONS 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. TRUSS DRAWINGS SHALL INDICATE ALL MATERIALS OF CONSTRUCTION.



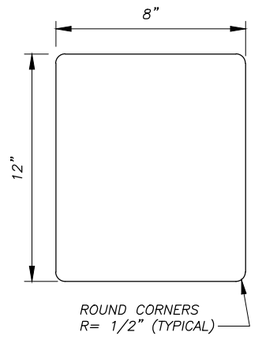
1 PLAN - FOOTING
1 S1.0 SCALE: 1 1/2" = 1'-0"



4 TYPICAL STEEL PLATE
4 S1.0 SCALE: N.T.S.



2 SECTION - FOOTING
2 S1.0 SCALE: 1 1/2" = 1'-0"



SHIM FABRICATION TABLE

THICKNESS	QUANTITY	MATERIAL
1/4"	12	ALUMINUM
1/2"	8	ALUMINUM
1"	4	ALUMINUM

3 TYPICAL SHIM
3 S1.0 SCALE: N.T.S.

REVISIONS		
MARK	DATE	DESCRIPTION
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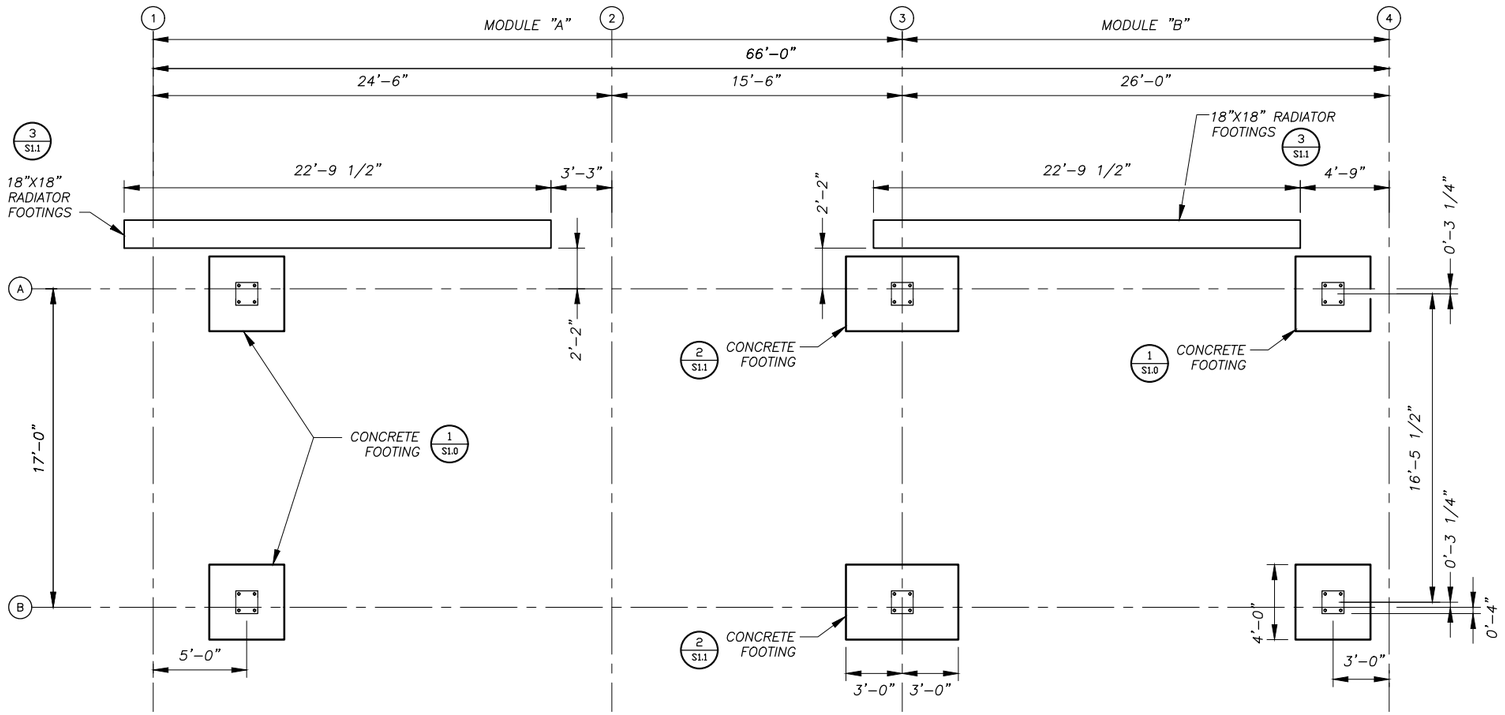
KAKE RURAL POWER SYSTEM UPGRADES
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE
POWER PLANT GENERAL NOTES AND FOUNDATION DETAILS

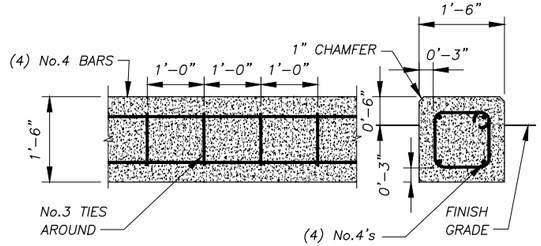
SHEET
S1.0

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13-039	



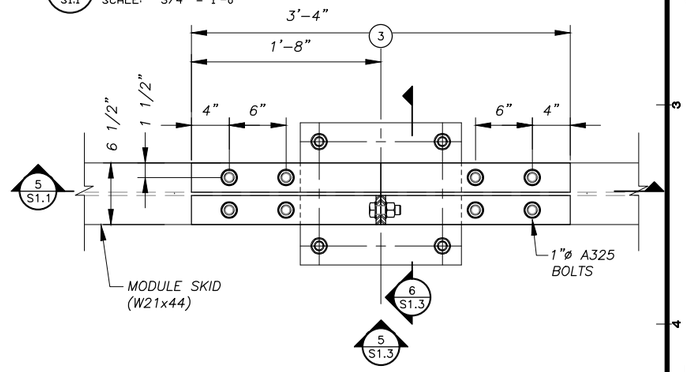
3/S1.1 RADIATOR FOUNDATION

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



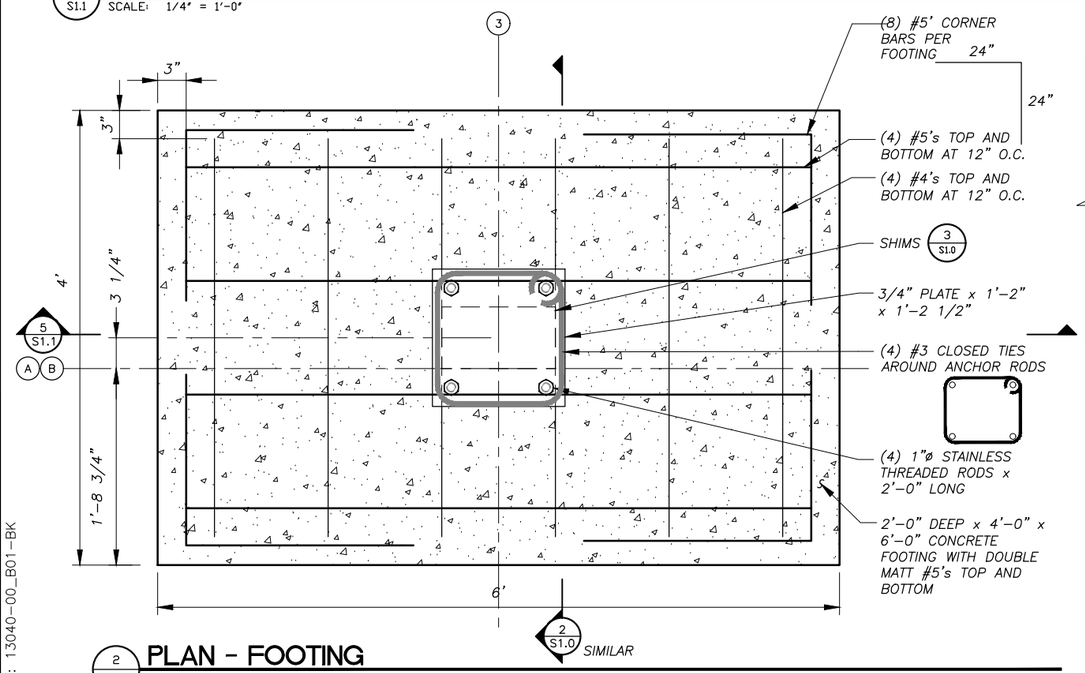
4/S1.1 PLAN - CONNECTION DETAIL

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



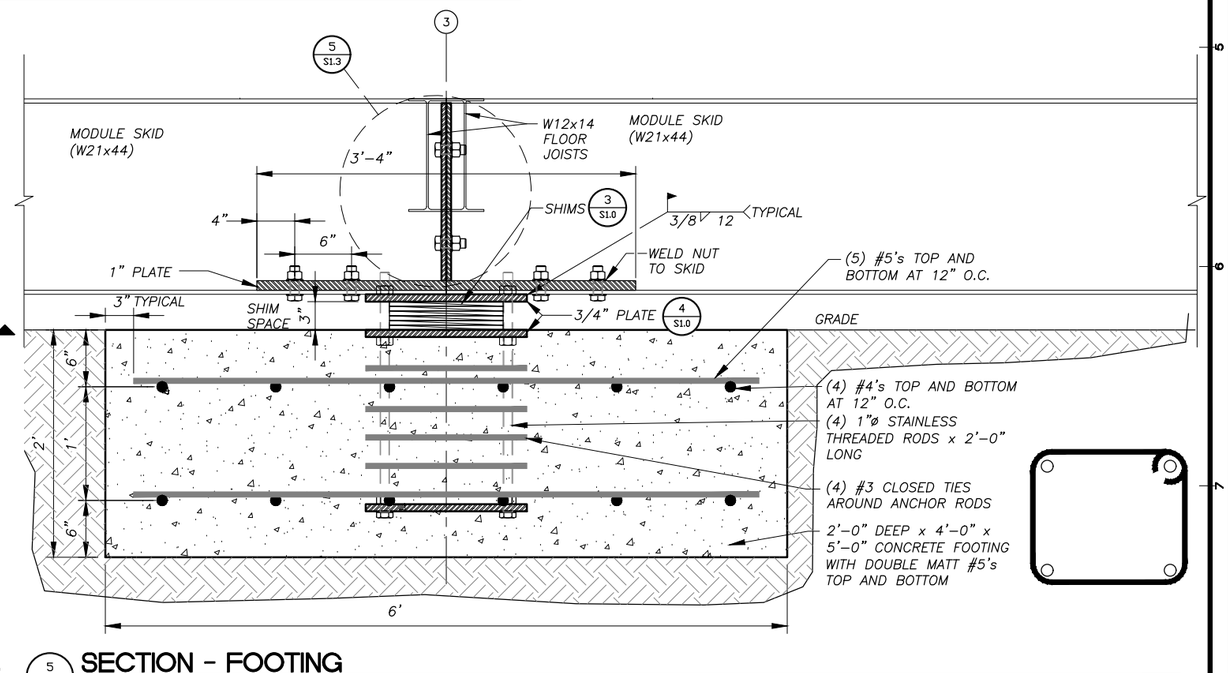
1/S1.1 POWER PLANT FOUNDATION PLAN

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



2/S1.1 PLAN - FOOTING

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



5/S1.1 SECTION - FOOTING

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

REVISIONS		
MARK	DATE	DESCRIPTION
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KAKE RURAL POWER SYSTEM UPGRADES

KAKE, ALASKA

SHEET TITLE: POWER PLANT FOUNDATION AND AND DETAILS

SHEET: S1.1

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

JOB NUMBER: 13-039

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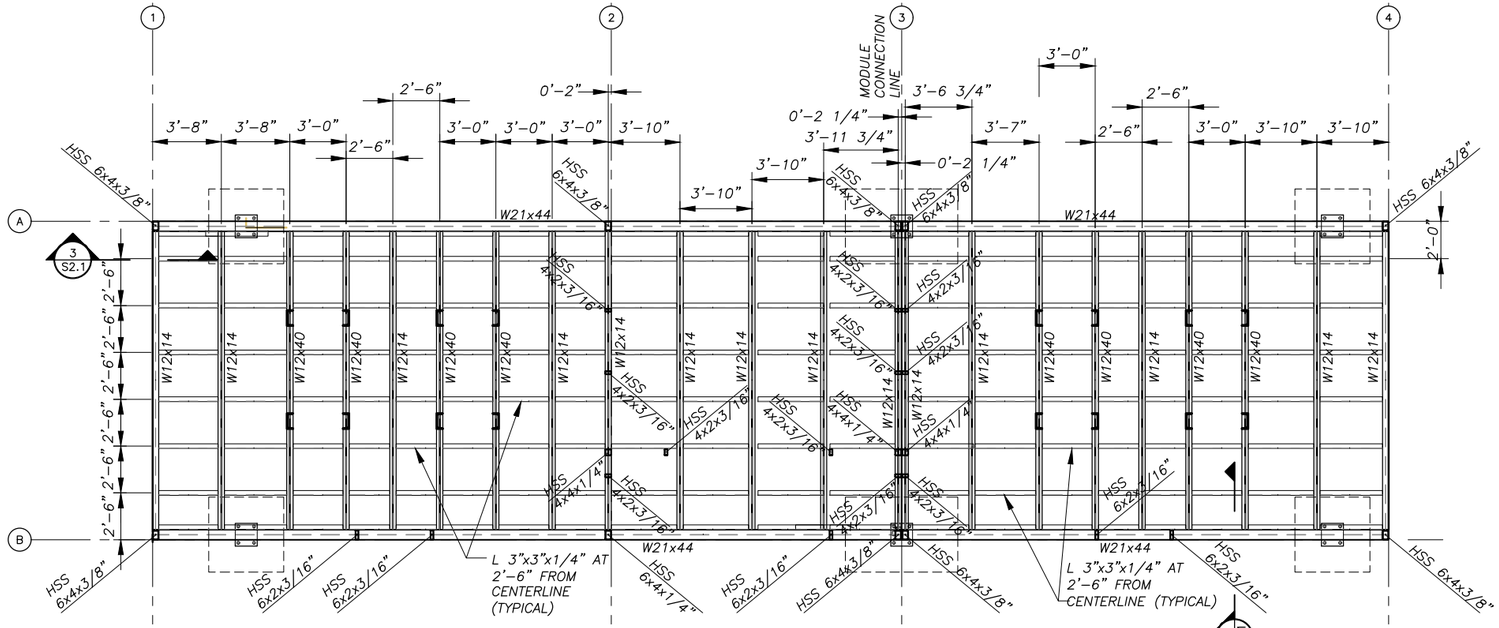
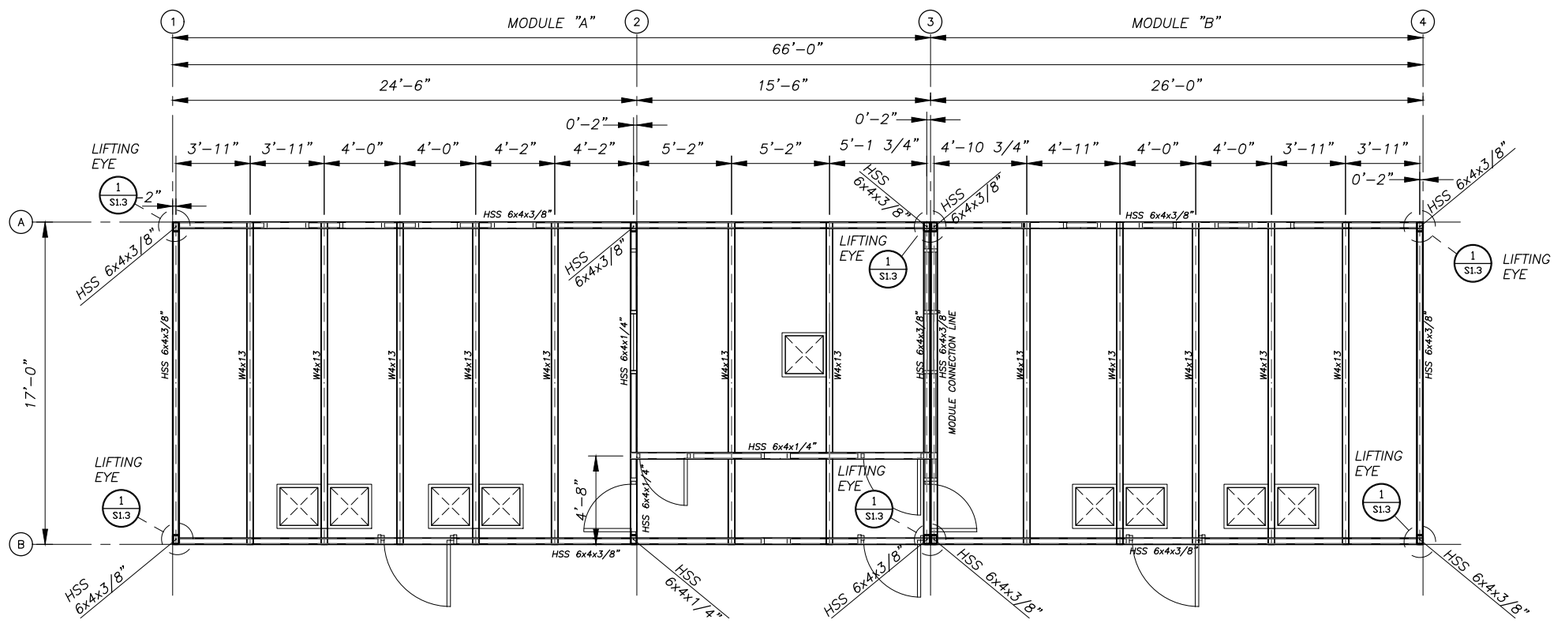
LAYOUT: S1.1 - FOUNDATION PLAN
XREF: 13040-00_B01-BK



1 S1.2 POWER PLANT FLOOR FRAMING PLAN

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



2 S1.2 POWER PLANT CEILING PLAN

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

FOR REFERENCE ONLY
GENERATOR MODULE IS OWNER FURNISHED

REVISIONS		
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SHEET TITLE: POWER PLANT FRAMING AND CEILING PLAN
SHEET: S1.2
DRAWN BY: KK | CHECKED BY: DGT
DATE: 06/10/16 | SCALE: AS SHOWN
JOB NUMBER: 13-039

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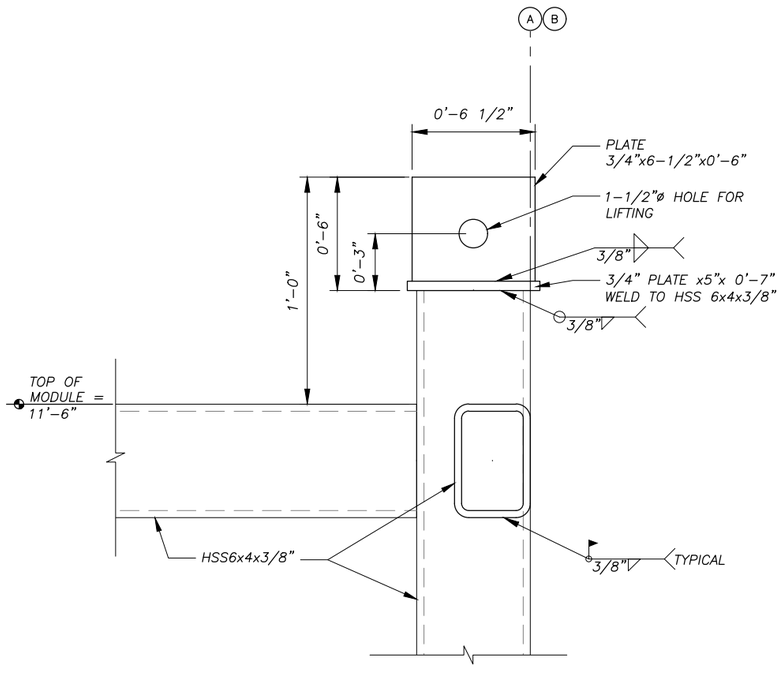
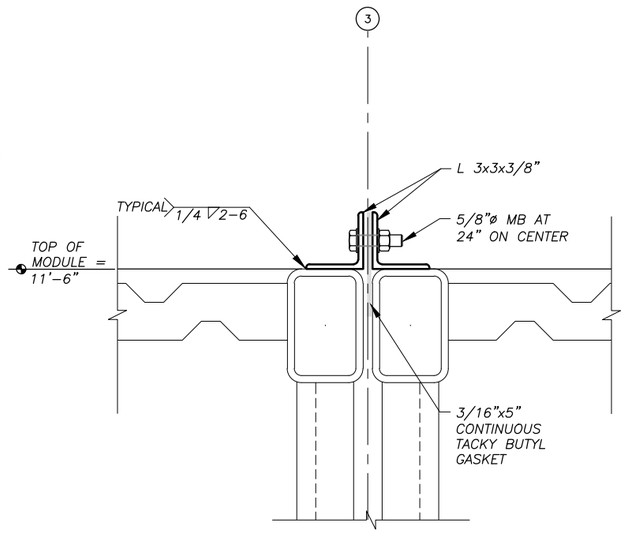
LAYOUT: S1.2 -CEILING PLANS DETAILS
XREF: 13040-00_B01-BK



1 S1.3 LIFTING EYE AND COLUMN CONNECTION

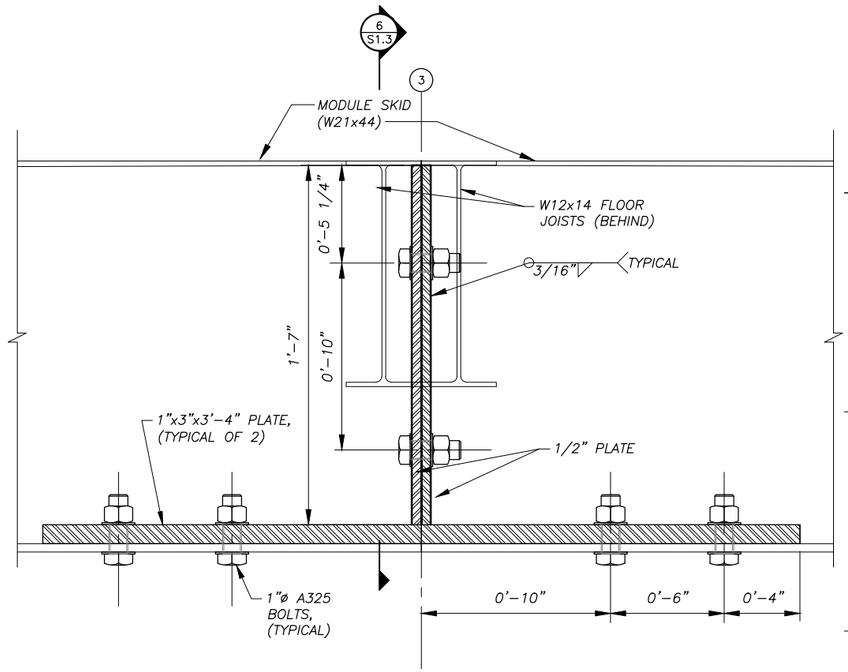
SCALE: 3" = 1'-0"

CONTRACTOR SHALL FURNISH AND INSTALL GASKETS AND MAKE BOLTED CONNECTION FOR MODULE CONNECTION



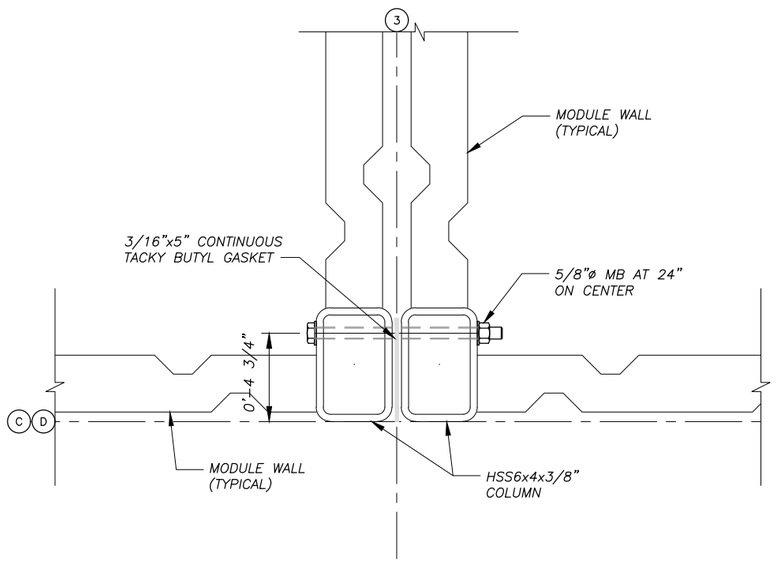
3 S1.3 MODULE CONNECTION AT CEILING BEAMS

SCALE: 3" = 1'-0"



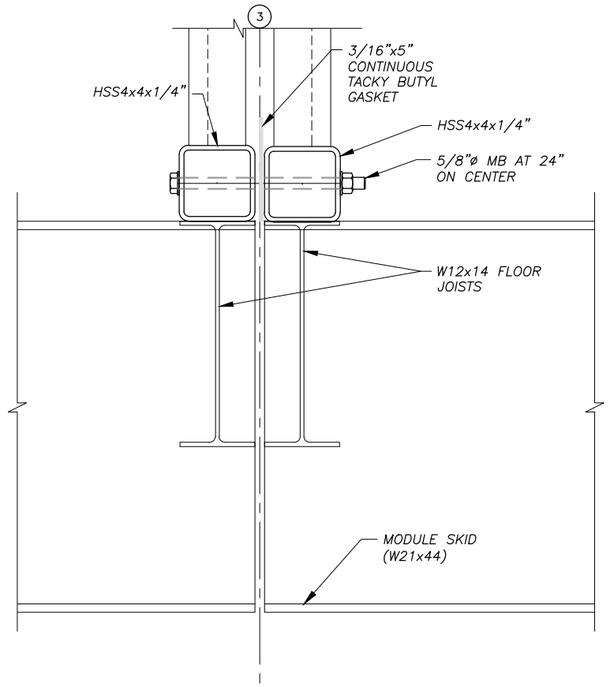
5 S1.3 MODULE CONNECTION AT SKIDS

SCALE: 3" = 1'-0"



2 S1.3 MODULE CONNECTION AT COLUMNS

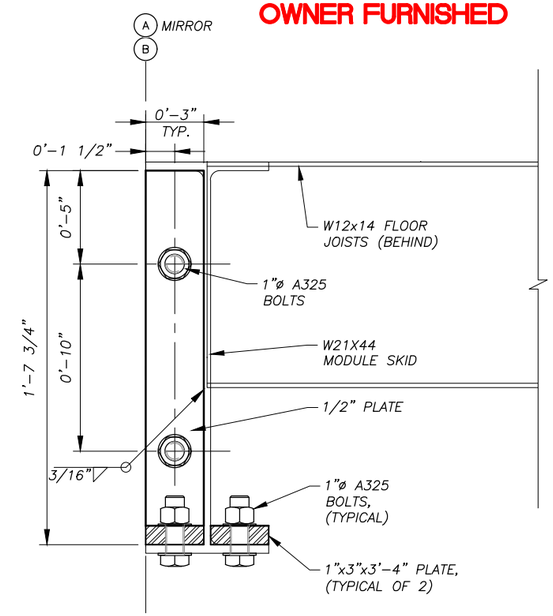
SCALE: 3" = 1'-0"



4 S1.3 MODULE CONNECTION AT FLOOR

SCALE: 3" = 1'-0"

FOR REFERENCE ONLY GENERATOR MODULE IS OWNER FURNISHED



6 S1.3 SECTION

SCALE: 3" = 1'-0"

REVISIONS		
MARK	DATE	DESCRIPTION
	5/04/16	95% SUBMITTAL FOR AGENCY REVIEW

STATE OF ALASKA — 49th — REGISTERED PROFESSIONAL ENGINEER — David G. Thompson — No. 13579-F — 6/10/16

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ALASKA ENERGY AUTHORITY

KAKE RURAL POWER SYSTEM UPGRADES

KAKE, ALASKA

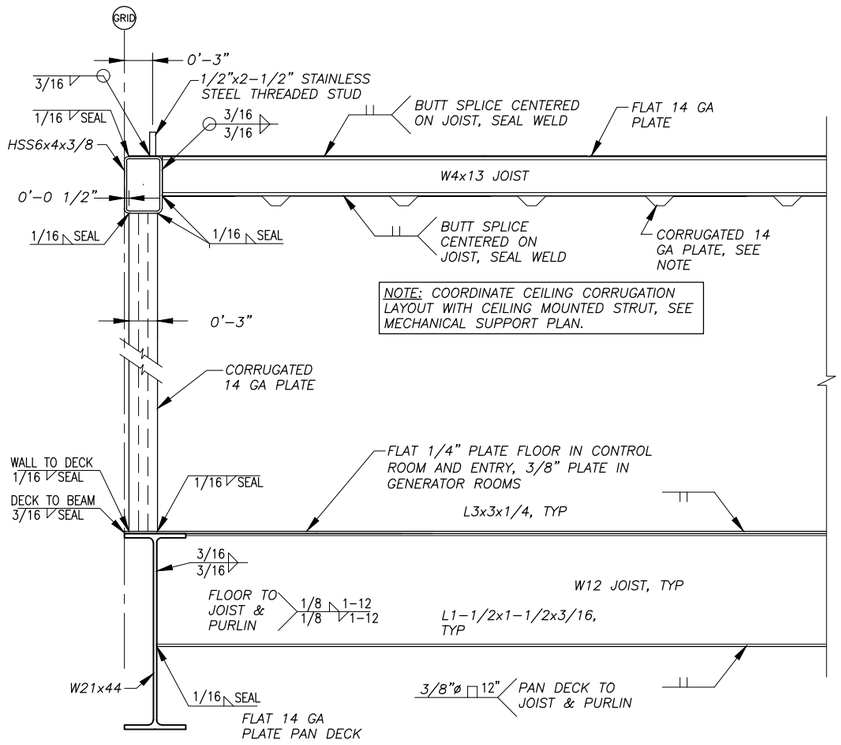
SHEET TITLE: POWER PLANT STRUCTURAL DETAIL

SHEET: S1.3

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

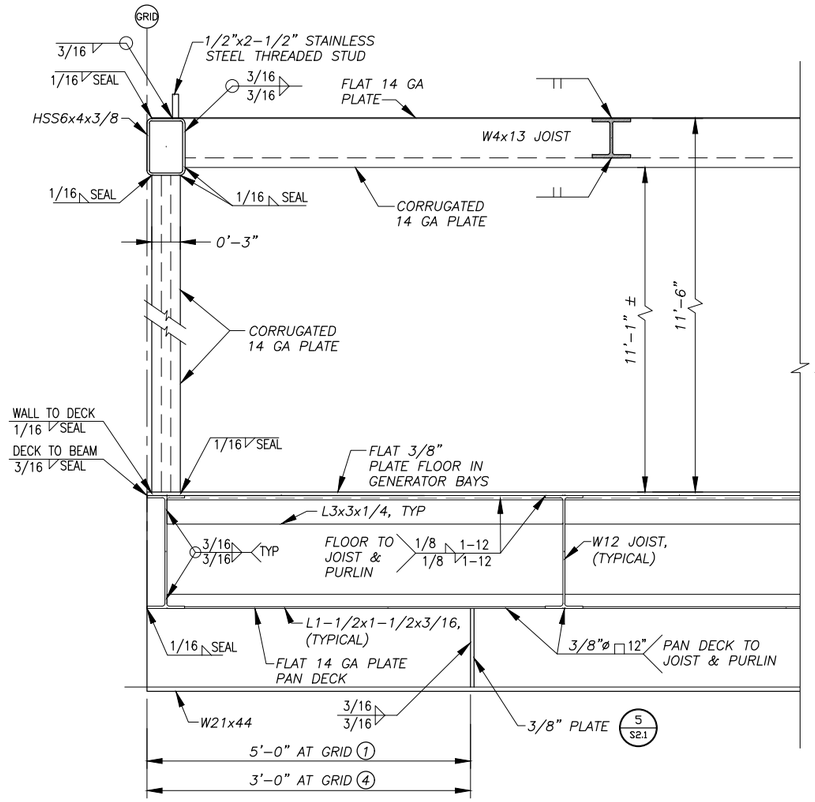
JOB NUMBER: 13-039

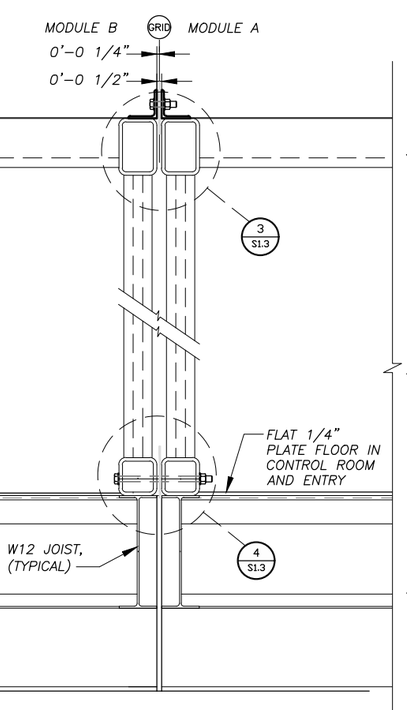
H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_S1.1-MODULE STRUCT, 1=1, 06-08-16 at 08:35 by jkk
LAYOUT: S1.3 DETAILS
XREF: 13040-00_B01-BK



1 S2.1 TYPICAL BUILDING SECTION

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

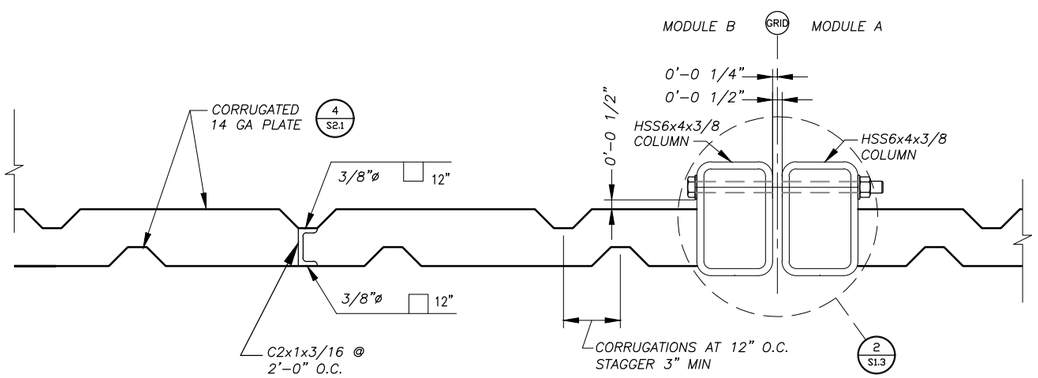




FOR REFERENCE ONLY
GENERATOR MODULE IS OWNER FURNISHED

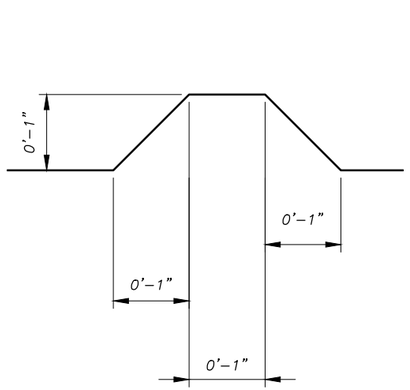
3 S2.1 TYPICAL BUILDING SECTION

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



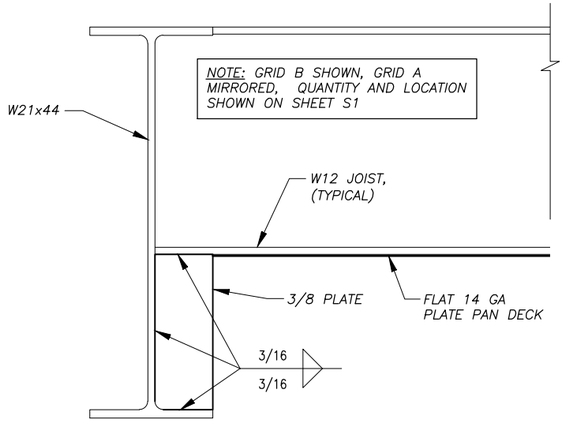
2 S2.1 TYPICAL EXTERIOR WALL - PLAN VIEW

SCALE: 3" = 1'-0"



4 S2.1 TYPICAL CORRUGATION

SCALE: N.T.S.



5 S2.1 ANCHOR HOLE AND WEB STIFFENER DETAIL

SCALE: 3" = 1'-0"

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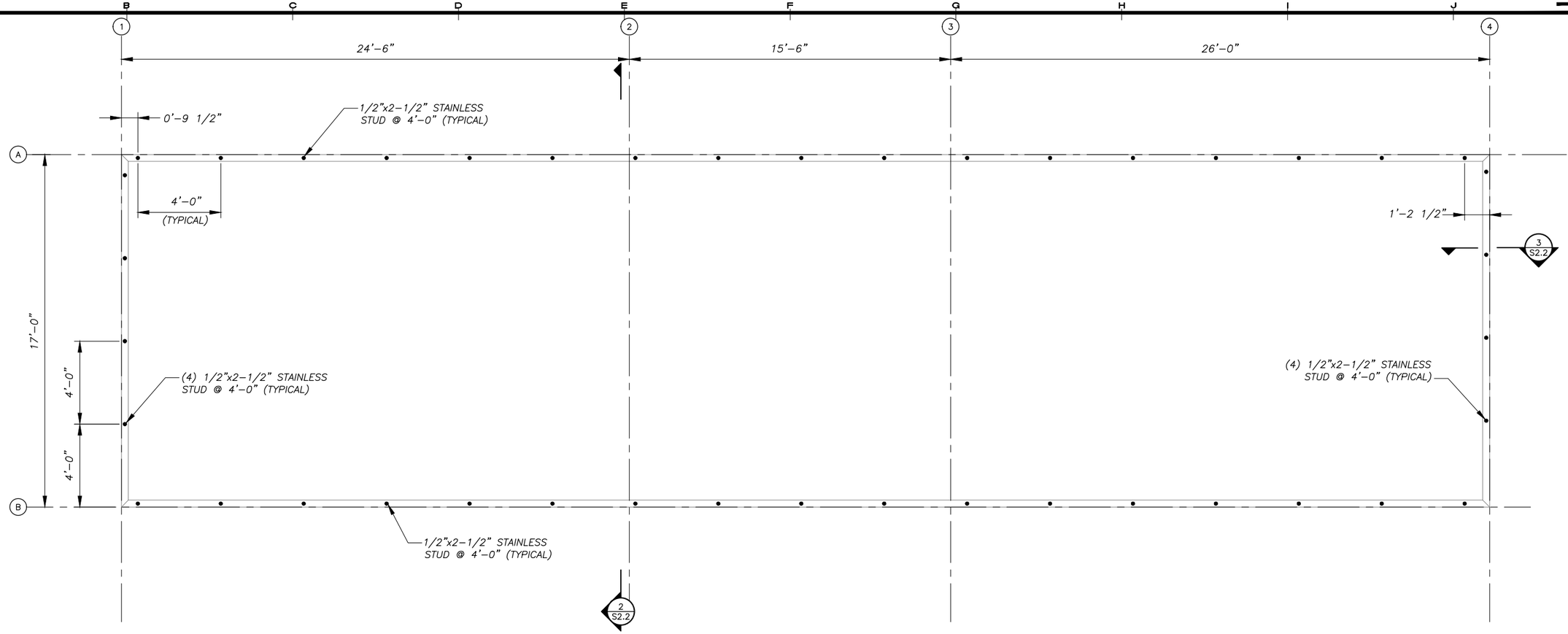
KAKE RURAL POWER SYSTEM UPGRADES
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE
POWER PLANT SECTIONS AND DETAILS

SHEET
S2.1

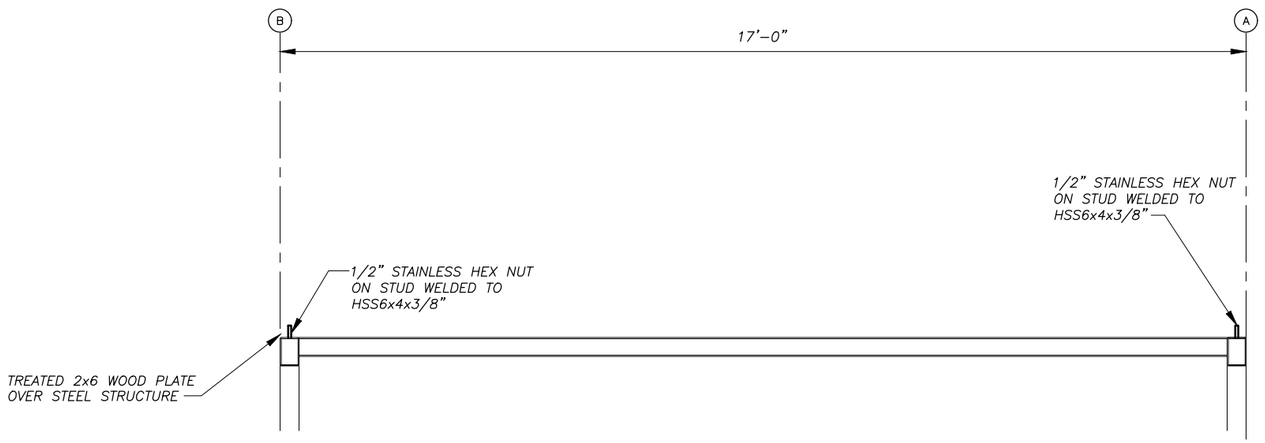
DRAWN BY:	CHECKED BY:
KK	DGT
DATE:	SCALE:
06/10/16	AS SHOWN

JOB NUMBER: 13-039



1 S2.2 ROOF BOLT PLAN

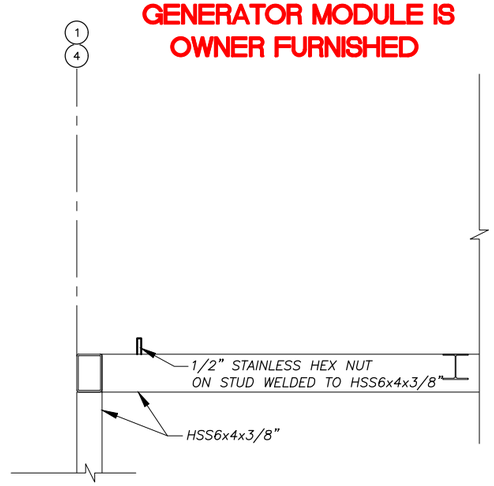
SCALE: 3/8" = 1'-0"



2 S2.2 ROOF TRUSS INSTALLATION

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

FOR REFERENCE ONLY
GENERATOR MODULE IS OWNER FURNISHED



3 S2.2 SECTION

SCALE: 1" = 1'-0"

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ALASKA ENERGY AUTHORITY

KAKE RURAL POWER SYSTEM UPGRADES

KAKE, ALASKA

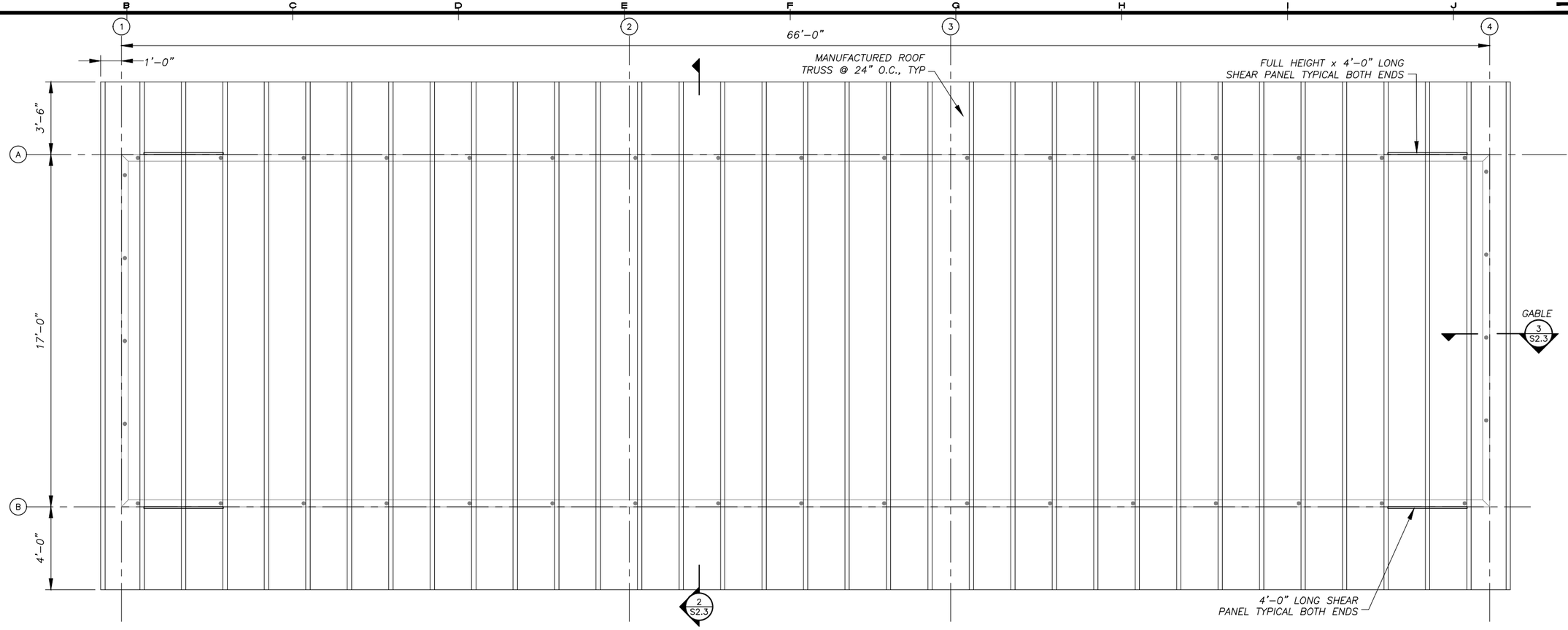
SHEET TITLE: POWER PLANT ROOF BOLT PLAN AND DETAILS

SHEET: S2.2

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

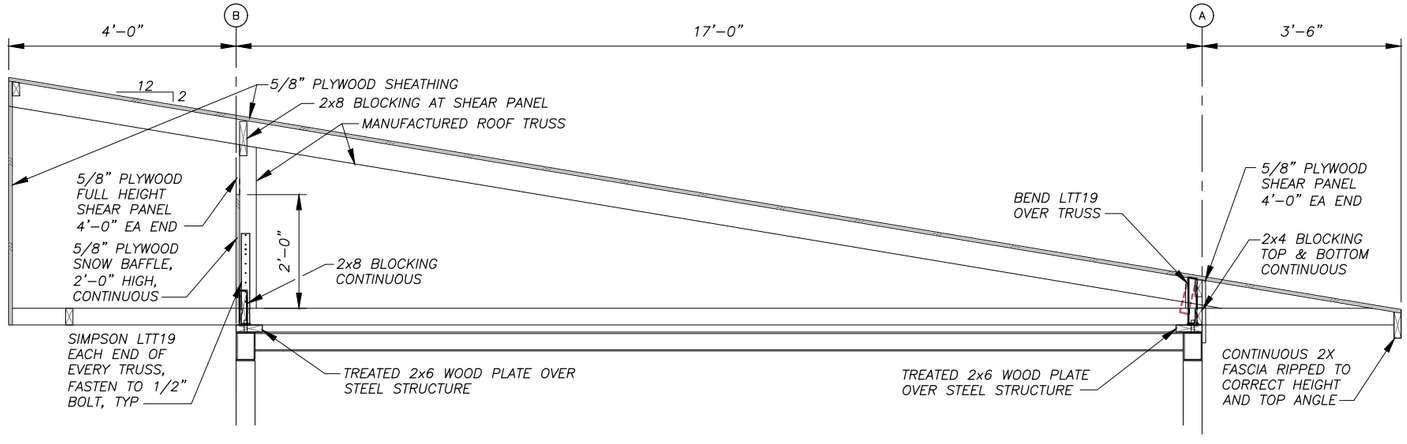
JOB NUMBER: 13-039

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_S2.1-S2.3-MODULE STRUCT, 1=1, 06-10-16 at 09:51 by jkk
LAYOUT: S2.2 - ROOF FRAMING
XREF: 13040-00_B01-BK



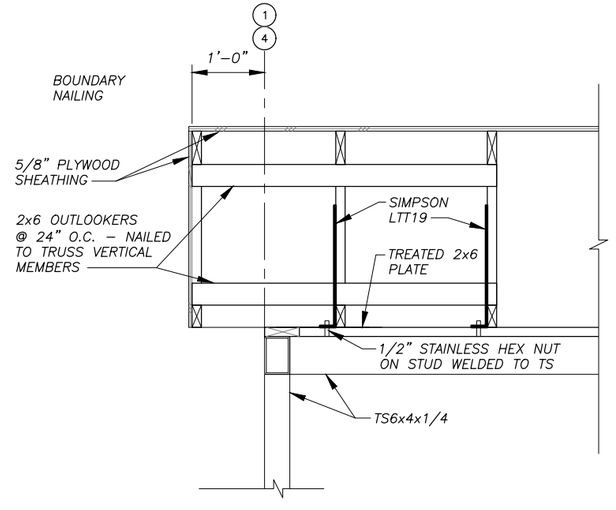
1 S2.3 ROOF FRAMING PLAN

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



2 S2.3 ROOF TRUSS INSTALLATION

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



3 S2.3 TYPICAL GABLE

SCALE: 1" = 1'-0"

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KAKE RURAL POWER SYSTEM UPGRADES

ALASKA ENERGY AUTHORITY

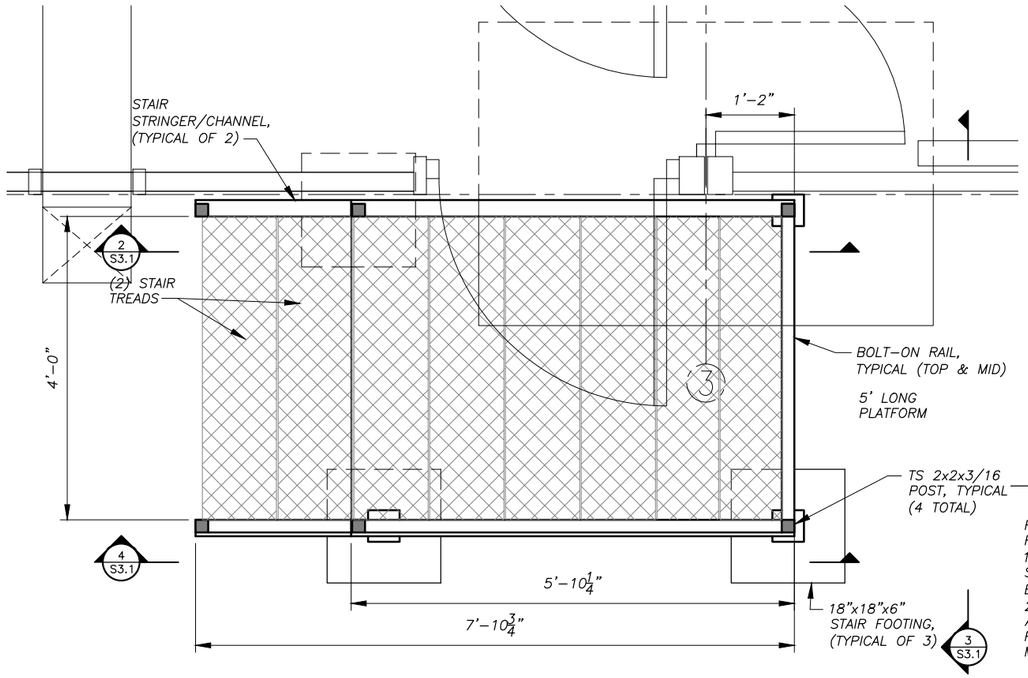
KAKE, ALASKA

SHEET TITLE: POWER PLANT ROOF FRAMING PLAN AND DETAILS

SHEET: S2.3

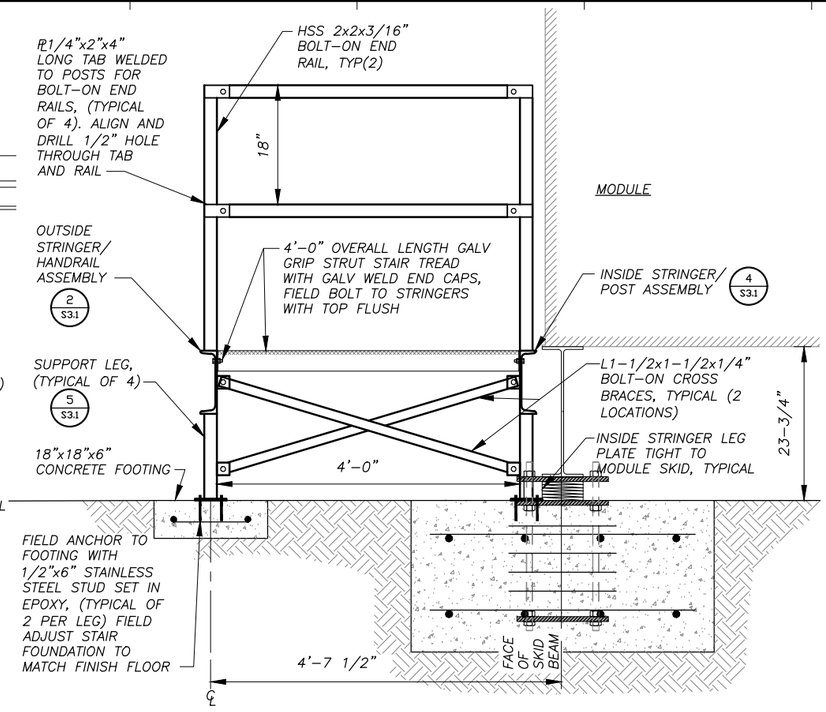
DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN
JOB NUMBER: 13-039	

H:\Jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_00_S2.1-S2.3-MODULE STRUCT, 1=1, 06-10-16 at 09:51 by jkk
LAYOUT: S2.3 - ROOF FRAMING
XREF: 13040-00_B01-BK



1 S3.1 MODULE ACCESS STAIRS PLAN

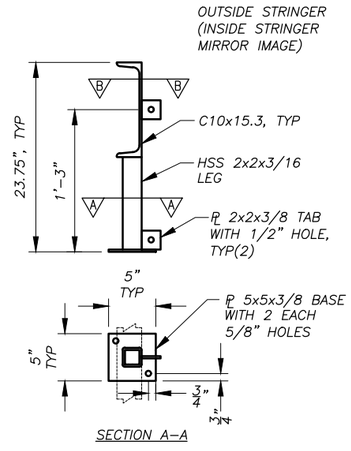
SCALE: 1" = 1'-0"



3 S3.1 MODULE ACCESS STAIRS END ELEVATION

SCALE: 1" = 1'-0"

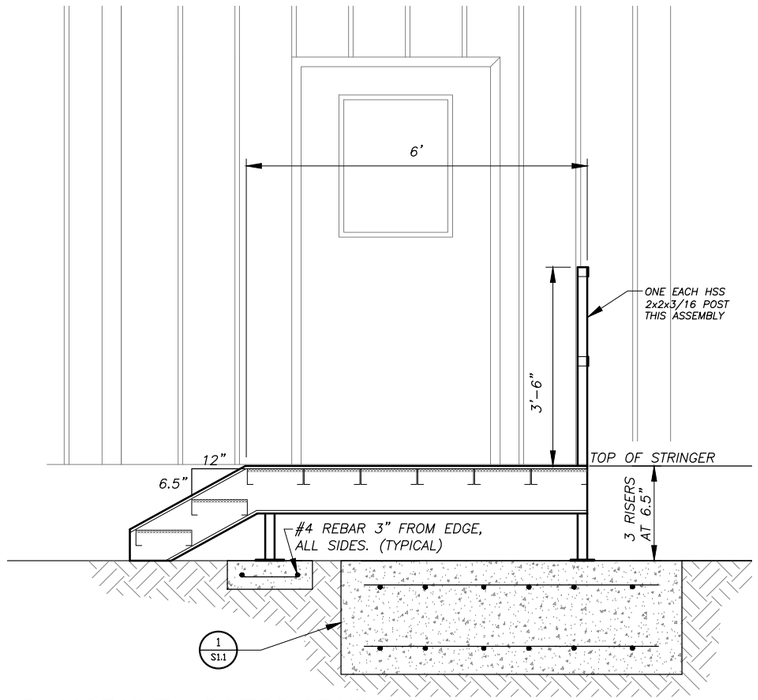
STAIR FABRICATION NOT IN CONTRACT



SECTION A-A

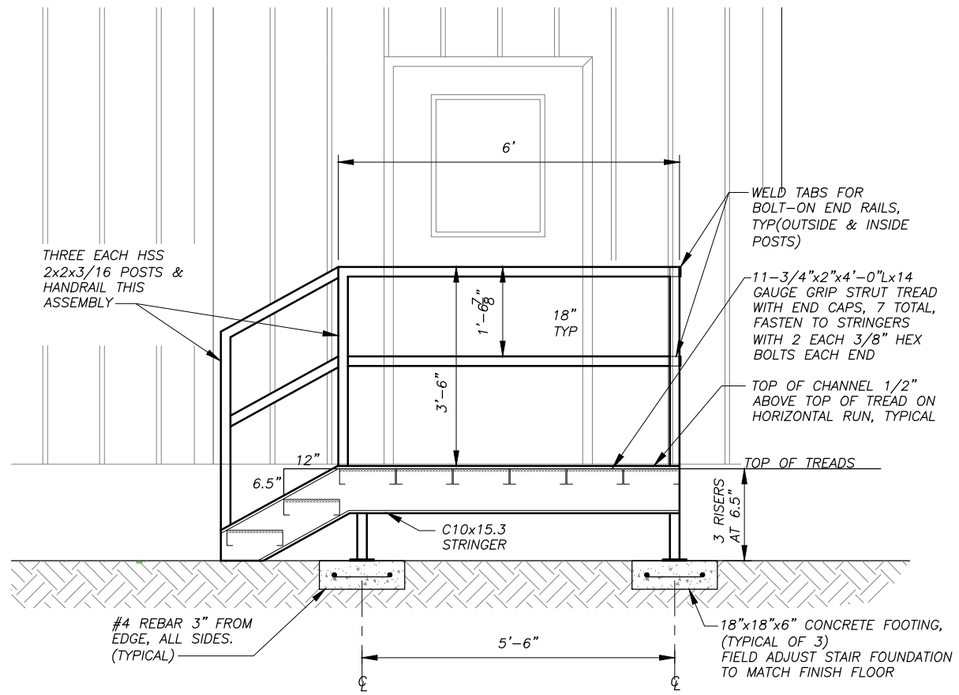
5 S3.1 TYPICAL SUPPORT LEG DETAIL

SCALE: NO SCALE



2 S3.1 MODULE ACCESS STAIR SECTION

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



4 S3.1 MODULE ACCESS STAIR SIDE ELEVATION

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

NOTES:

1. SHOP FABRICATE "KNOCK DOWN" WITH TWO COMPLETE STRINGER/HANDRAIL ASSEMBLIES AND 7 TOTAL 4'-0" LONG STAIR TREADS.
2. SEAL WELD ALL JOINTS. ROUND CORNERS AND GRIND SMOOTH IN PREPARATION FOR COATING. DRILL FOR FIELD BOLTED ASSEMBLY.
3. STAIR TREADS TO BE CUT FROM PRE-GALV GRIP-STRUT PLANKS. WELD PRE-GALV TWO-HOLE END PLATES TO BOTH ENDS OF EACH TREAD. WIRE BRUSH AND APPLY GALVANIZING SOLDER (HOT STICK) TO ALL WELD AREAS.
4. ALL STEEL SHAPES CARBON STEEL. AFTER FABRICATION SANDBLAST ENTIRE STRINGER/ RAIL ASSEMBLIES TO SSPC-SP-10 AND APPLY TWO COATS OF SELF PRIMING SHERWIN-WILLIAMS MACROPOXY 646, COLOR GRAY.
5. FURNISH TYPE 304 STAINLESS STEEL FASTENERS AS REQUIRED FOR FIELD ASSEMBLY.
6. DESIGN INDICATES KNOCK DOWN ASSEMBLY FOR SHIPPING PURPOSES. WHERE SHIPPING ALLOWS ASSEMBLY MAY HAVE WELDED JOINTS EXCEPT FOR GALV STAIR TREADS TO PAINTED FRAME.

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ALASKA ENERGY AUTHORITY

KAKE RURAL POWER SYSTEM UPGRADES — KAKE, ALASKA

SHEET TITLE: POWER PLANT ACCESS STAIRS

SHEET: S3.1

DRAWN BY:	CHECKED BY:
KK	DGT
DATE: 06/10/16	SCALE: AS SHOWN

JOB NUMBER: 13-039

H:\jobs\13-039 Kake Rural Power Systems Upgrade (AIDEA AEA-Term)\04 - CAD\Drawings Design\13-040_PP-S3.1-MODULE STAIRS, 1=1, 06-10-16 at 09:54 by jkk
LAYOUT: S3.01 STAIRS
XREF: 13040-00_B01-BK

SCHEDULE OF DRAWINGS:

VALVE TAG SCHEDULE:

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

GREEN (DIESEL FUEL)

21 "NORMALLY OPEN, CLOSE ONLY FOR EMERGENCIES & TEMPORARY MAINTENANCE OF DAY TANK & DEVICES"
22 "NORMALLY CLOSED, OPEN ONLY FOR HAND PRIMING DAY TANK"
23 not used
24 "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"
25 "NORMALLY CLOSED, LEAVE ONLY ONE VALVE OPEN AT A TIME FOR MODULE DAY TANK SUPPLY"

BROWN (USED OIL)

41 "NORMALLY CLOSED, OPEN ONLY FOR ENGINE OIL CHANGE"

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.

COOLING/HEAT RECOVERY EQUIPMENT SCHEDULE

CAC–1 CAC–2 CAC–3 CAC–4	GENERATOR 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 # DR3376A OR L&M MESABI EQUAL, NO OTHER SUBSTITUTES.
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 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 #DR3559 OR L&M MESABI EQUAL, NO OTHER SUBSTITUTES.
TV–A TV–B	THERMOSTATIC VALVE	4" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON–ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS – 185F NOMINAL TEMPERATURE, FPE #A4010–185, NO SUBSTITUTES.
HX–A HX–B	POWER PLANT HEAT EXCHANGERS	316 SS PLATES, ALL BRAZED CONSTRUCTION, 2.5" NPT PORTS, 500 MBH MIN CAPACITY. AMERIDEX SL–140–90 OR EQUAL. PRIMARY: 65 GPM 195F EWT (50% ETHYLENE) 1.3 PSI MAX WPD, SECONDARY: 55 GPM 185F LWT (50% PROPYLENE) 1.0 PSI MAX WPD
ET–A ET–B	COOLANT EXP. TANK	24 GALLON CAPACITY STEEL TANK FABRICATED IN ACCORDANCE WITH AEA STANDARD POWER PLANT TANK FABRICATION DETAILS.
ET–2	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 68 GALLON TANK VOL, 34 GAL ACCEPTANCE VOL, 125 PSIG WORKING PRESSURE, 12 PSIG PRE–CHARGE. AMTROL AX–120V OR EQUAL.
P–HRA P–HRB	HEAT RECOV. PRIMARY	GRUNDFOS UPS 50–40/4, NO SUBSTITUTES, 1/3HP, 115V, 1ø. WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS. FUTURE 65 GPM AT 8' TDH ON SPEED 3, PRESENT 40 GPM AT 4' TDH ON SPEED 1
P–HR1	HEAT RECOV. SECONDARY	GRUNDFOS UPS 50–40/4, NO SUBSTITUTES, 1/3HP, 115V, 1ø. WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS. FUTURE 55 GPM AT 9' TDH ON SPEED 3, PRESENT 35 GPM AT 5' TDH ON SPEED 1
P–HR2	HEAT RECOV. EXTERIOR	GRUNDFOS UP 26–64, NO SUBSTITUTES, 1/6HP, 115V, 1ø, WITH 1–1/2" NPT COMPANION FLANGES, GASKETS, & BOLTS. 15 GPM AT 13' TDH
UH–A UH–B UH–E	GEN BAY & ENTRY 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, NO SUBSTITUTES.
P–UHA P–UHB P–UHE	UNIT HEATER CIRCULATING PUMPS	4 GPM AT 15' TDH, 1/25HP, 115V, 1ø. GRUNDFOS UPS 15–58F, SPEED 3, NO SUBSTITUTES, WITH 3/4" SOLDER COMPANION FLANGES, GASKETS, & BOLTS.
UH–1	OLD POWER PLANT GENERATION BAY HEAT	HORIZONTAL DISCHARGE HOT WATER UNIT HEATER, 130.9 MBH AT 13.6 GPM 200F EWT AND 60F EAT, 1/3HP, 120V, 1ø. MODINE HC–165, NO SUBSTITUTES.
CUH–1	OLD POWER PLANT OFFICE HEAT	FLOOR MOUNTED HOT WATER CABINET UNIT HEATER, 12.8 MBH AT 0.5 GPM 200F EWT AND 60F EAT, 1/15HP, 120V, 1ø. BEACON MORRIS FI–1050–02 OR EQUAL.
CV–1	CONTROL VALVE	1/2" SOLDER END BRONZE BODY, 300 PSIG WORKING PRESSURE, 50 PSIG DIFF PRESSURE, 120VAC COIL. JOHNSON CONTROLS VG1271AF+923BUA OR EQUAL

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, NO SUBSTITUTES.
P–UO1	USED OIL DRAIN PUMP	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, NO SUBSTITUTES.
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 NO SUBSTITUTES.
FOC–1	FUEL OIL COOLER	HORIZONTAL CORE, 1–1/2" FLANGED CONNECTIONS, ENAMEL COATING, EXPANDED METAL DISCHARGE GUARD. 10 GPM NO.1 DIESEL FUEL, 450BTU/MIN WITH 120F MAX OIL OUTLET TEMPERATURE AT 80F AMBIENT, 1 PSI MAX OIL PRESSURE DROP. 1–1/2 HP, 208V, 3PH MOTOR SUITABLE FOR VFD OPERATION AT 10:1. DIESEL RADIATOR PART # DR4147–00 OR L&M MESABI EQUAL, NO OTHER SUBSTITUTES.

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.
3) ALL STEEL PIPE CLAMPS NOT CUSHIONED.

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

ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS		
MARK	DATE	DESCRIPTION
1		
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4		
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STATE OF ALASKA — REGISTERED PROFESSIONAL ENGINEER — BRIAN C. GRAY — ME 8210 — 49TH

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Gray Stassel Engineering, Inc.

ALASKA ENERGY AUTHORITY

KAKE RPSU PROJECT

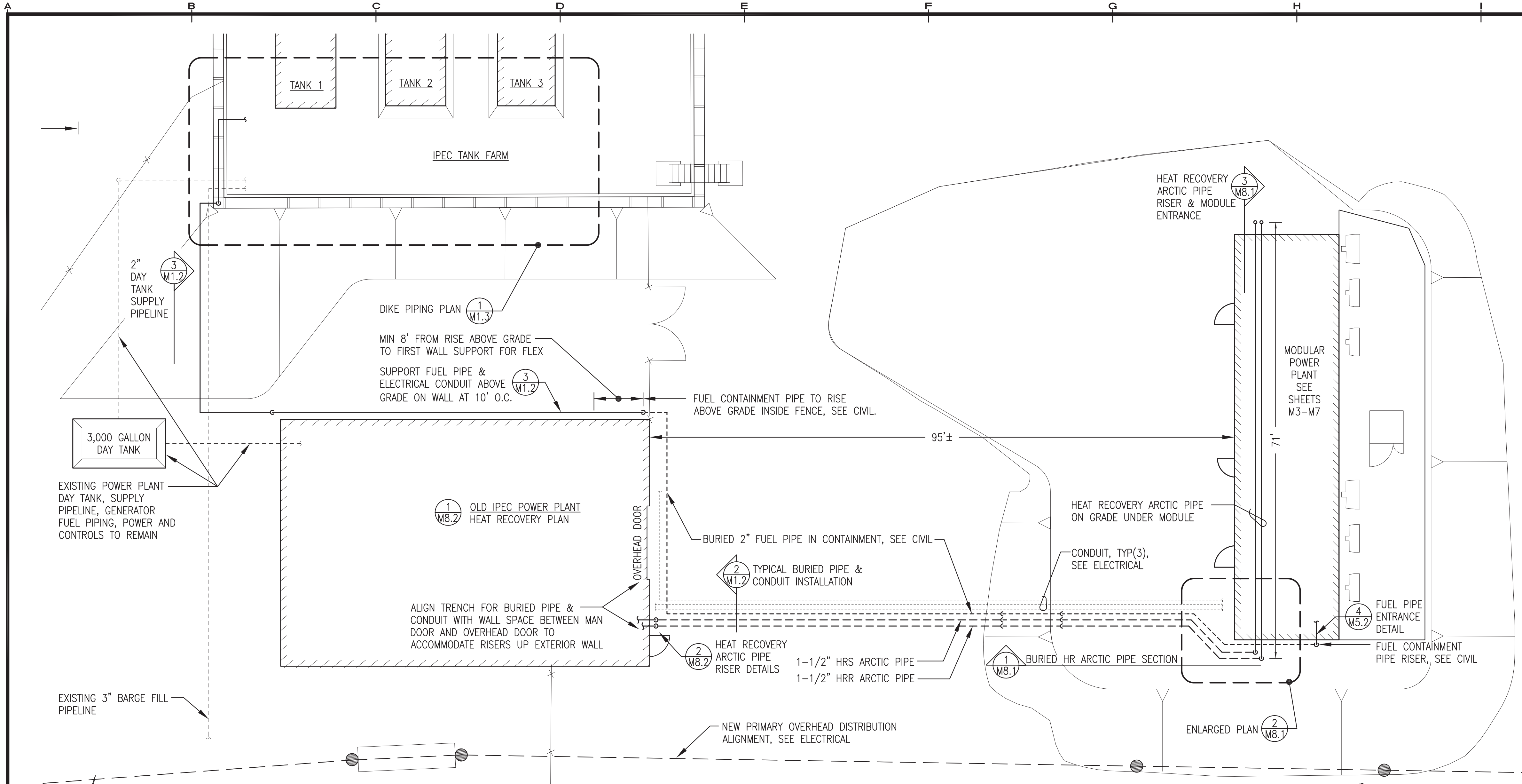
KAKE, ALASKA

SHEET TITLE: LEGENDS & SCHEDULES

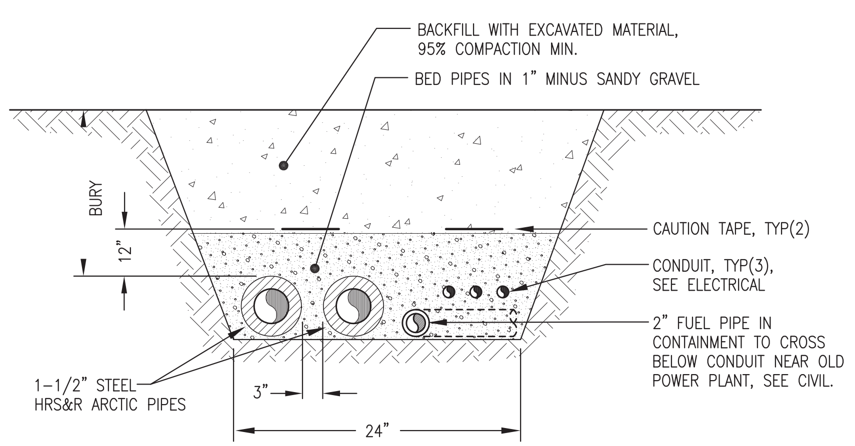
SHEET: M1.1

DRAWN BY:	CHECKED BY:
JTD	BCG
DATE: 6/15/16	SCALE: AS SHOWN

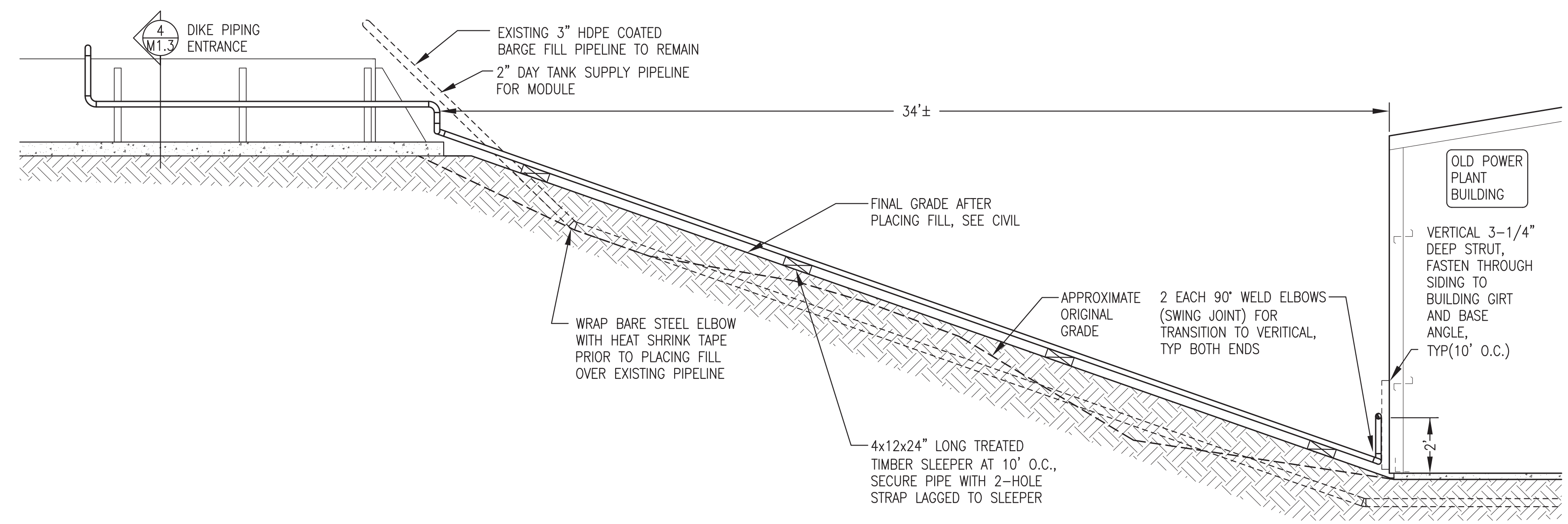
JOB NUMBER:



1 SITE PLAN
M1.2 1"=10'



2 TYPICAL BURIED PIPE & CONDUIT INSTALLATION
M1.2 NO SCALE



3 MODULE DAY TANK SUPPLY PIPELINE CROSS COUNTRY ROUTING DETAIL
M1.2 1"=3'

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KAKE, ALASKA

SHEET TITLE: SITE PLAN & DETAILS

SHEET: M1.2

DRAWN BY:	CHECKED BY:
JTD	BCG
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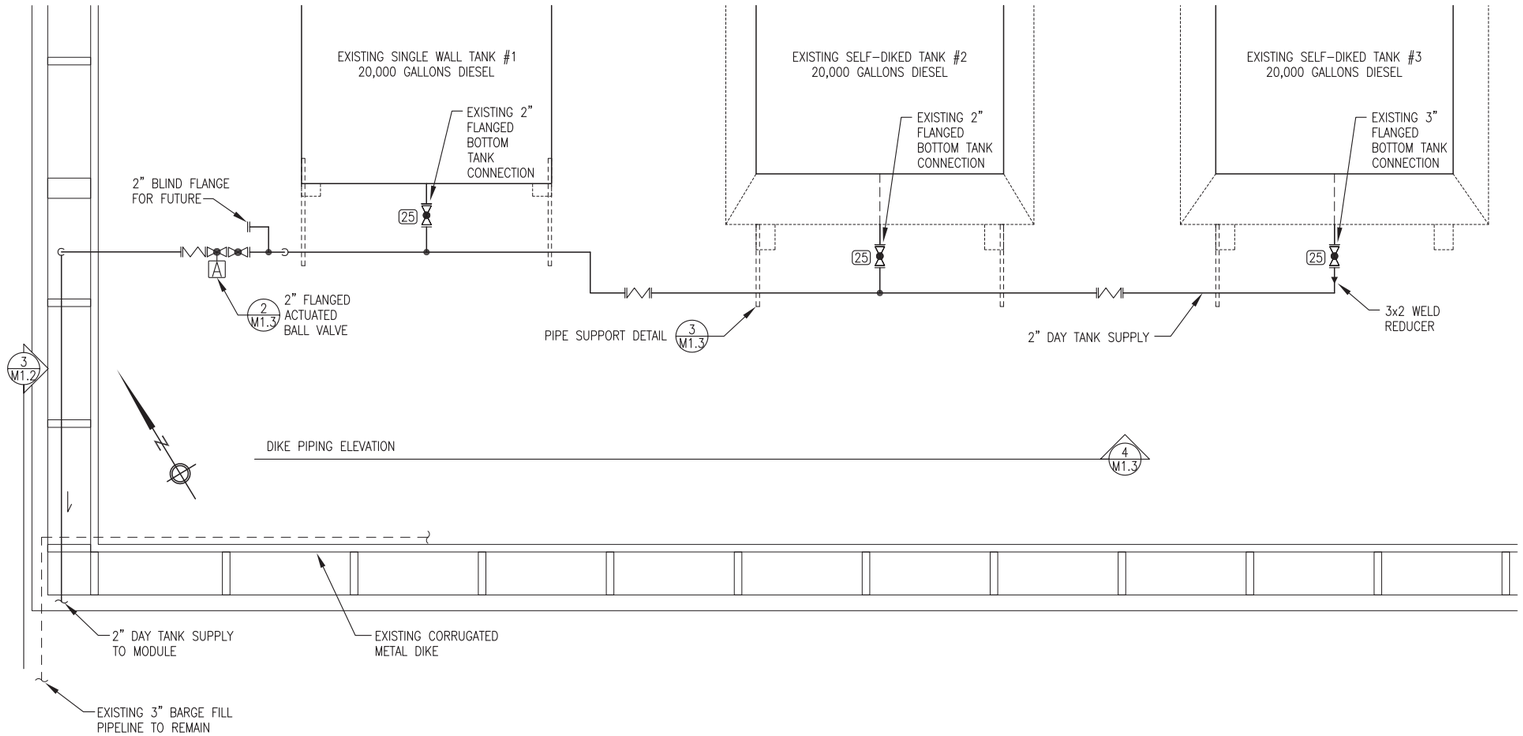
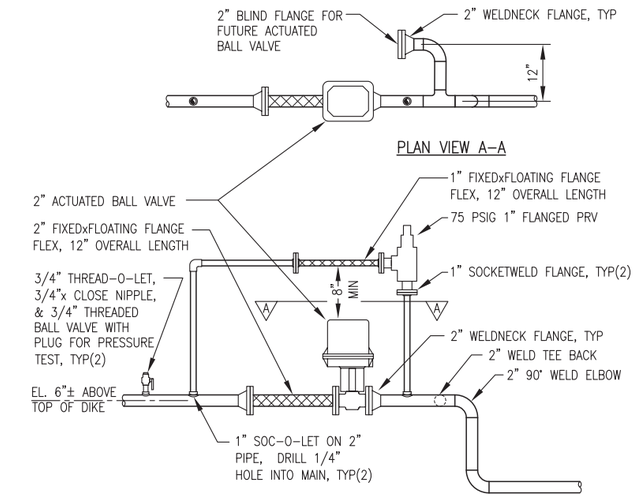
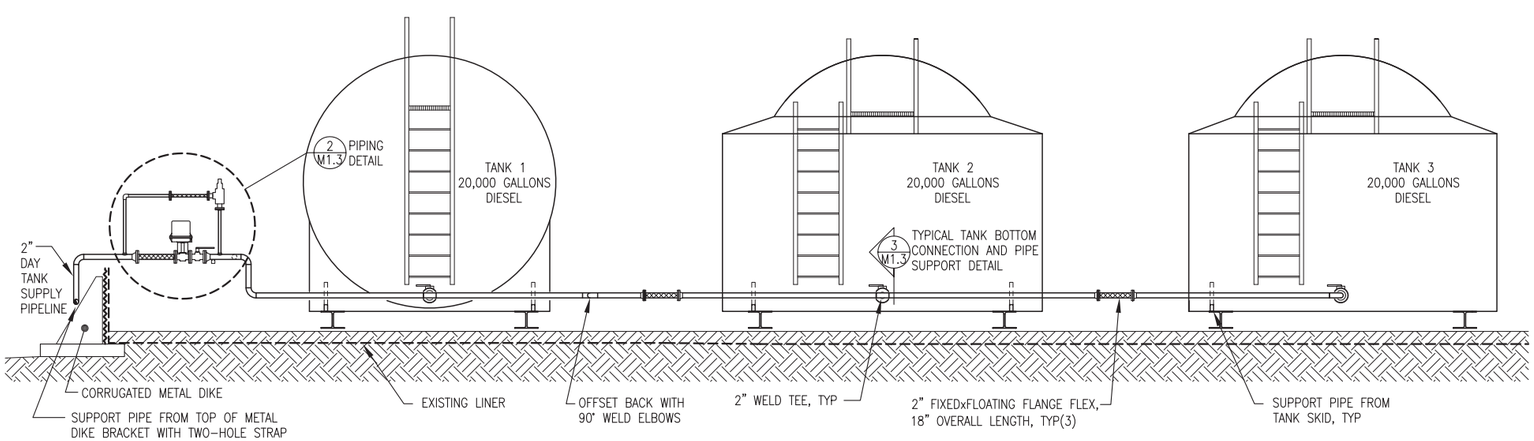
JOB NUMBER:



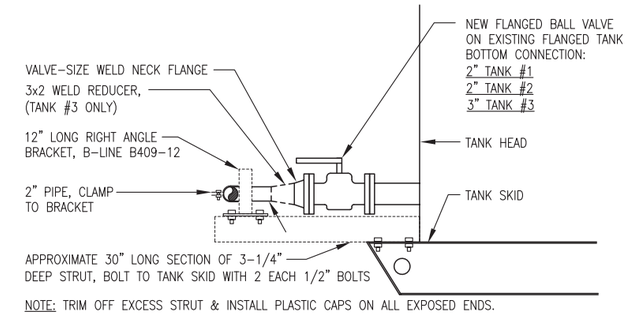
1 M1.3 IPEC TANK FARM PIPING PLAN
1"=3'



2 M1.3 PIPING DETAIL
NO SCALE



4 M1.3 IPEC TANK FARM PIPING ELEVATION
1"=3'



3 M1.3 TANK BOTTOM CONNECTION & PIPE SUPPORT DETAIL
NO SCALE

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

ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE
IPEC TANK FARM FUEL PIPING PLAN & DETAILS

SHEET
M1.3

DRAWN BY:	CHECKED BY:
JTD	BCG
DATE: 6/15/16	SCALE: AS SHOWN

JOB NUMBER:

** 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 TYPE 304 STAINLESS STEEL.

FITTINGS AND ACCESSORIES – PROVIDE FITTINGS, BRACKETS, CHANNEL NUTS, AND ACCESSORIES DESIGNED SPECIFICALLY FOR USE WITH SPECIFIED CHANNEL STRUT. ZINC-PLATED CARBON STEEL EXCEPT EXTERIOR TYPE 304 STAINLESS STEEL.

PIPE CLAMPS – TWO-PIECE PIPE CLAMP DESIGNED TO SUPPORT PIPE TIGHT TO STRUT. B-LINE B20## OR EQUAL. ON STEEL PIPE ZINC-PLATED CARBON EXCEPT ON EXTERIOR TYPE 304 STAINLESS STEEL. ON COPPER TUBING B-LINE VIBRA CUSHION OR EQUAL. SEE SCHEDULE SHEET M1.1.

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

FASTENERS – ALL BOLTS, NUTS, AND WASHERS ZINC-PLATED EXCEPT EXTERIOR TYPE 304 STAINLESS STEEL.

** PAINTING AND MARKING **

PAINT ALL OTHER 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, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

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, NO SUBSTITUTES, 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.

** PAINTING AND MARKING (CONTINUED) **

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 ALUMINUM 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.

FLEXIBLE CONNECTORS – TYPE 321 STAINLESS STEEL CORRUGATED HOSE, TYPE 304 STAINLESS STEEL WIRE DOUBLE BRAIDED OUTER SHIELD. SCH 80 MPT OR 150# ANSI FLANGED ENDS (FIXED OR FLOATING AS INDICATED) 125 PSIG MINIMUM WORKING PRESSURE, DIAMETER AND LIVE (HOSE) OR OVERALL LENGTH AS INDICATED. PENFLEX PW 721 OR EQUAL. FURNISH WITH CERTIFICATION OF MINIMUM 125 PSIG PRESSURE TEST.

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 OR APOLLO, NO OTHER SUBSTITUTES.

THREADED BALL VALVES – CARBON STEEL BODY, THREADED ENDS, STAINLESS STEEL BALL AND TRIM. PBV OR APOLLO, NO OTHER SUBSTITUTES.

THREADED SWING CHECK VALVES – BRONZE BODY, THREADED ENDS, SWING CHECK STYLE, 150 PSIG MINIMUM WORKING PRESSURE. MILWAUKEE 510-S OR HAMMOND 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 200F (1/2") 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, NO SUBSTITUTES. NORMALLY OPEN – ASCO CAT. NO. 8210G34, NO SUBSTITUTES.

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. DG VALVE, OR EQUAL. LOW TEMP BALL VALVE, 150# RF FLANGED ENDS, NUTRON, NO SUBSTITUTES. ELECTRIC ACTUATOR WITH OPERATING VOLTAGE, NEMA RATING, AND TORQUE AS INDICATED. CONFIGURE WITHOUT MANUAL OVERRIDE SHAFT EXTENSION. FURNISH WITH PTC SELF REGULATING HEATER, AUXILIARY SWITCH SET (AUXILIARY SWITCHES 3 & 4), AND EXXON BEACON 325 SEVERE COLD LUBRICANT. RCS, NO SUBSTITUTES.

2" BALL VALVE – 360 IN-LB OPERATING TORQUE @ -50 DEG F. NUTRON MODEL T3-R20R01LZ-05, NO SUBSTITUTES.

1" & 2" 120VAC NEMA 7 ACTUATOR – 600 IN-LBS TORQUE, 10 SECOND STROKE TIME, 0.50 LOCKED ROTOR AMPS. RCS MODEL SXR-1023, NO SUBSTITUTES.

** 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 300 GALLON CAPACITY. FURNISH COMPLETE WITH ALL CONTROLS AND ACCESSORIES AS INDICATED.

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 – CUSTOM FABRICATED STEEL TOP WITH ANSI 150# FLANGED CONNECTIONS, IMPACT RESISTANT "SEE-THRU" BOWL, 150 PSIG WORKING PRESSURE, GOLDEN ROD MODEL NO. 495 – NO SUBSTITUTES. USE STANDARD 10 MICRON FILTER ELEMENT, NO. 470-5. PROVIDE WITH FUEL FILTER WRENCH NO. 491.

DAY TANK METER – 1" ANSI 300# FLANGED INLET AND OUTLET. CONTOIL 9226-F OR 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.

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 3" AND LARGER 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. COAT FLANGE FACES WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING.

ENGINE COOLANT HOSES – SIZE AS INDICATED ON DRAWINGS. WIRE REINFORCED CORRUGATED SILICONE HOSE, PARKER 6621, NO SUBSTITUTES. 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. GRINNELL MODEL LD-8281 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 OR MILWAUKEE, NO SUBSTITUTES. 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 OR MILWAUKEE, NO SUBSTITUTES.

DRAIN VALVES – BRONZE BODY, 3/4" OR 1/2" FPT, BY 3/4" MALE HOSE ENDS WITH CAP AND JACK CHAIN. WATTS B6000CC, OR 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.

** GLYCOL PIPING, VALVES, AND SPECIALTIES (CONTINUED) **

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.

AUTOMATIC AIR VENTS – BRASS BODY, SELF-CLOSING FLOAT OPERATED VALVE, SCREW ON CAP, 1/4" NPT CONNECTION. MAID-O-MIST AUTO AIR VENT NO. 75 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, NO SUBSTITUTES
0-15 PSI 700SS-25-02-L-A-080
0-100 PSI 700SS-25-02-L-A-110

FLOW METER, 150# ANSI FLANGED CONNECTION, SIZE AS INDICATED, PTFE LINER, HASTELLOY C ELECTRODES, RATED FOR 210F OPERATION. SIEMENS SITRANS FM MAGFLO MAG 3100, NO SUBSTITUTES. 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, NO SUBSTITUTES, CODE NO. FDK:7ME6910, OPTION 1AA10-1AA0

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, NO SUBSTITUTES. PROVIDE WITH 3/4"NPT BRASS THERMOWELL.

SEE ELECTRICAL EQUIPMENT SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS.

** SEE SHEET M7 FOR VENTILATION EQUIPMENT SPECIFICATIONS **

** SEE SHEET M8.1 FOR HEAT RECOVERY SYSTEM SPECIFICATIONS **

** 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 STARTING PUMPS.

VERIFY OPERATION OF ALL FUEL PUMP CONTROLS INCLUDING TIMER, LEVEL ALARMS, AND USED OIL BLENDER. VERIFY FUEL COOLER VFD OPERATION AND SETPOINT USING PIPING THERMOMETER.

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 AND TEST LEAD AND BACKUP FUNCTION BY SHUTTING OFF LEAD RADIATOR. VERIFY OPERATING SETPOINTS BY READING THERMOMETERS IN PIPING MAINS.

HEAT RECOVERY PIPING – AFTER PRESSURE TESTING VALVE OFF ALL HEAT EXCHANGERS, UNIT HEATERS, AND SIMILAR DEVICES TO PREVENT DEBRIS FROM ARCTIC PIPE ENTERING EQUIPMENT. FLUSH PIPING WITH FRESH WATER AND DRAIN COMPLETELY. 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. 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. SEE DAY TANK 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, 75F, ADJUSTABLE.

UNIT HEATERS AND ASSOCIATED CIRCULATING PUMPS WILL OPERATE ON A CALL FOR HEATING THROUGH A LINE VOLTAGE THERMOSTAT TO MAINTAIN ROOM TEMPERATURE, 70F, 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 10%, 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 = 10%, 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.

ISSUED FOR CONSTRUCTION JUNE 2016

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

KAKE RPSU PROJECT

ALASKA ENERGY AUTHORITY

KAKE, ALASKA

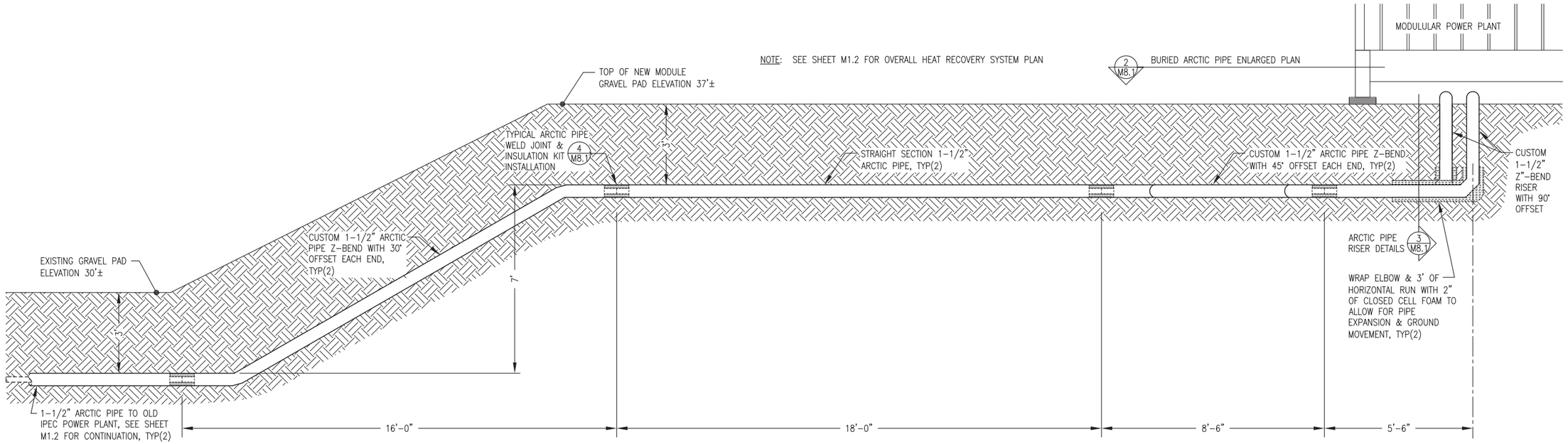
ALASKA ENERGY AUTHORITY

SHEET TITLE
MECHANICAL SPECIFICATIONS

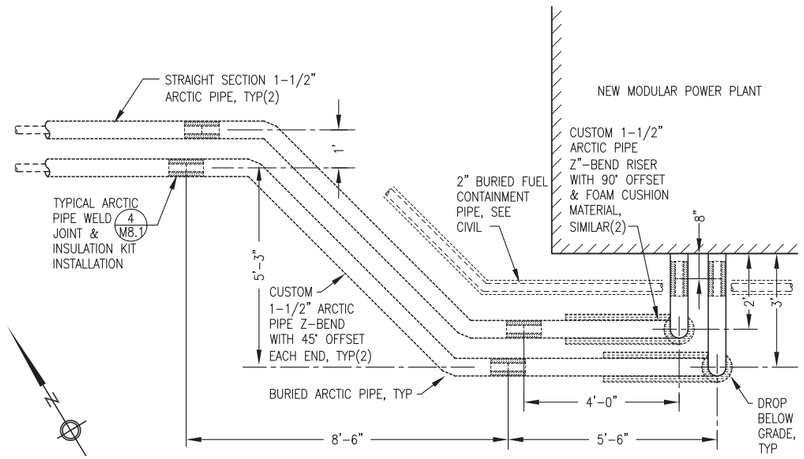
SHEET
M2

DRAWN BY:	CHECKED BY:
WJP	BCG
DATE:	SCALE:
1/15/16	NO SCALE

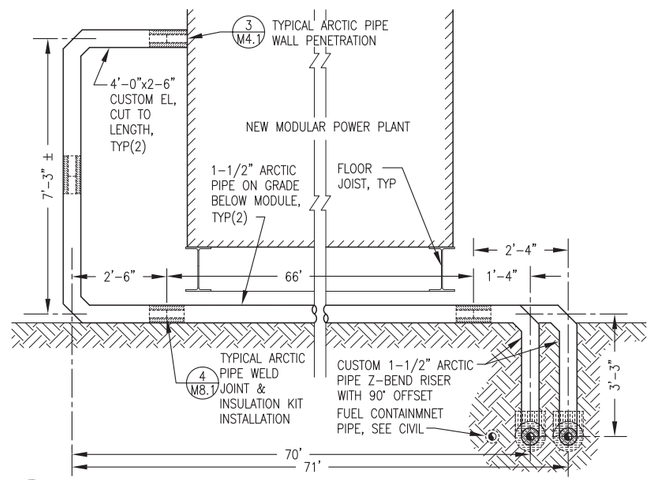
JOB NUMBER:



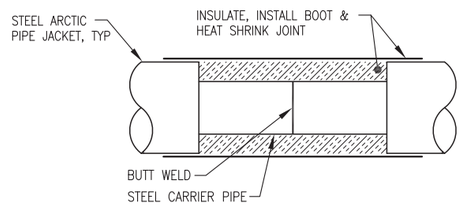
1 M8.1 BURIED ARCTIC PIPE SECTION
1/2"=1'-0"



2 M8.1 BURIED ARCTIC PIPE ENLARGED PLAN
1/2"=1'-0"



3 M8.1 ARCTIC PIPE RISER & MODULE ENTRANCE ELEVATON
1/2"=1'-0"



4 M8.1 TYPICAL ARCTIC PIPE WELDED JOINT & INSULATION DETAIL
NO SCALE

ARCTIC PIPE SPECIFICATIONS

** ARCTIC PIPE **

PRE-INSULATED STEEL ARCTIC PIPE SYSTEM FOR NOT TO EXCEED 250F GLYCOL/WATER SERVICE IN 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. SCHEDULE 40 ASTM A53B ERW STEEL CARRIER PIPE, 40' NOMINAL LENGTHS, DIAMETER AS INDICATED, MINIMUM 1" POLYURETHANE INSULATION, HDPE JACKET, PERMA-PIPE XTRU-THERM, ROVANCO OR APPROVED EQUAL. PRE-FABRICATED ELBOWS AND TEES TO BE EQUIVALENT CONSTRUCTION TO PIPE. ALL FIELD JOINTS TO BE CONFIGURED FOR STRAIGHT BUTT WELDS. STRAIGHT JOINT KITS TO BE COMPRISED OF RIGID POLYURETHANE INSULATION HALF-SHELLS WITH HDPE SHRINK SLEEVES AND FILM TO FORM A CONTINUOUS WATER-TIGHT JACKET, CANUSA CSC-X CASING OR APPROVED EQUAL. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

LOCATE ALL EXISTING UNDERGROUND UTILITIES IN THE VICINITY PRIOR TO BEGINNING EXCAVATION. CAREFULLY LAY OUT WORK TO MINIMIZE DISRUPTION AND DAMAGE TO EXISTING SURFACES. PERFORM ALL WORK IN ACCORDANCE WITH OSHA REQUIREMENTS. BARRICADE OPEN EXCAVATIONS TO PROHIBIT PUBLIC ENTRY.

BACKFILL WITH 1"-MINUS SANDY GRAVEL. FILL IN 8" MAXIMUM LIFTS AND COMPACT TO 95% MINIMUM DRY DENSITY OR AS INDICATED. FINISH GRADE TO PROVIDE POSITIVE DRAINAGE AS INDICATED IN PLANS AND BLEND NEW GRADING INTO EXISTING SURFACES.

** END USER BUILDING PIPING INSULATION **

PIPE INSULATION – INSULATE INTERIOR HEAT RECOVERY & NEW HYDRONIC CONNECTION PIPING ONLY WHERE INDICATED. INSTALL 1" PRE-FORMED RIGID FIBERGLASS PIPE INSULATION WITH PLASTIC FITTING COVERS, JOHNS-MANVILLE MICRO-LOK OR EQUAL. COVER WITH ALL SERVICE JACKET.

** SEE SHEET M2 FOR END USER BUILDING GLYCOL PIPING SPECIFICATIONS **

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

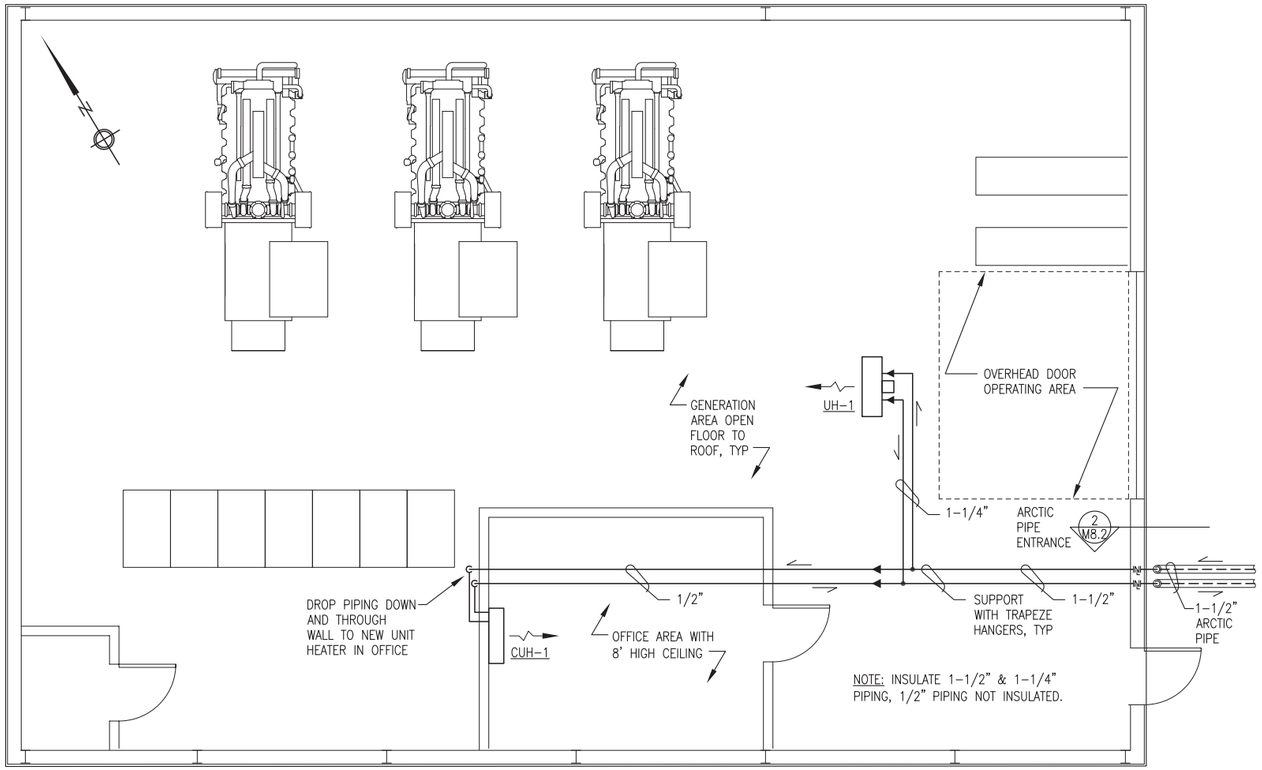
KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE
HEAT RECOVERY SYSTEM
ARCTIC PIPE DETAILS & SPECIFICATIONS

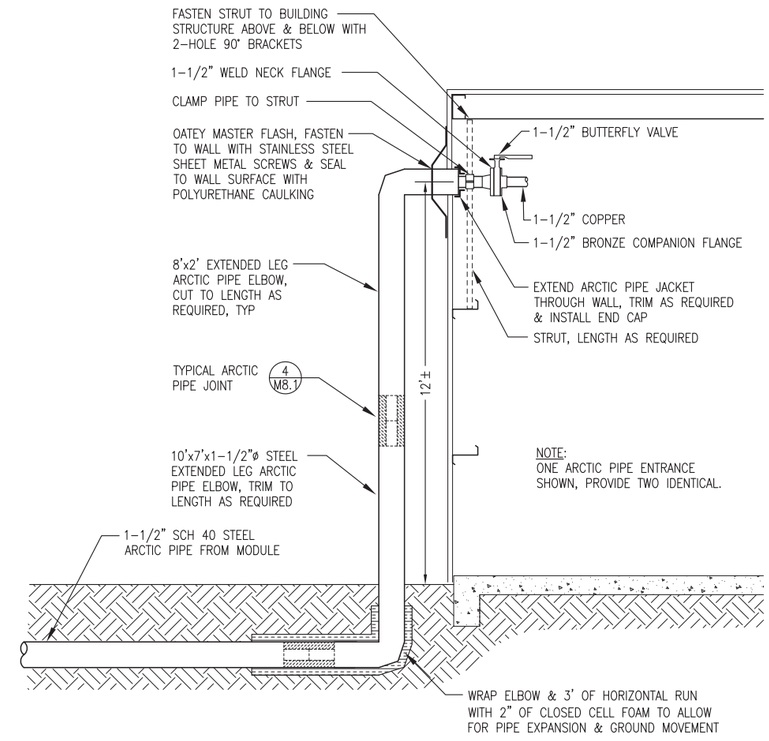
SHEET
M8.1

DRAWN BY:	CHECKED BY:
JTD	BCG
DATE:	SCALE:
6/15/16	AS SHOWN

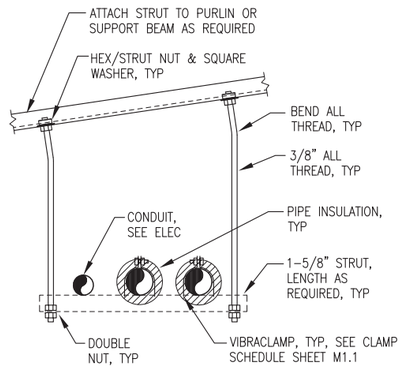
JOB NUMBER:



1 M8.2 OLD IPEC POWER PLANT HEATING PLAN
1/4"=1'-0"



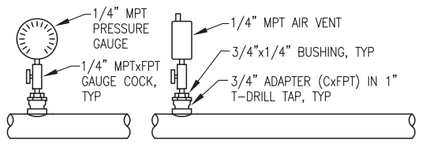
2 M8.2 OLD IPEC POWER PLANT ARCTIC PIPE ENTRANCE
NO SCALE



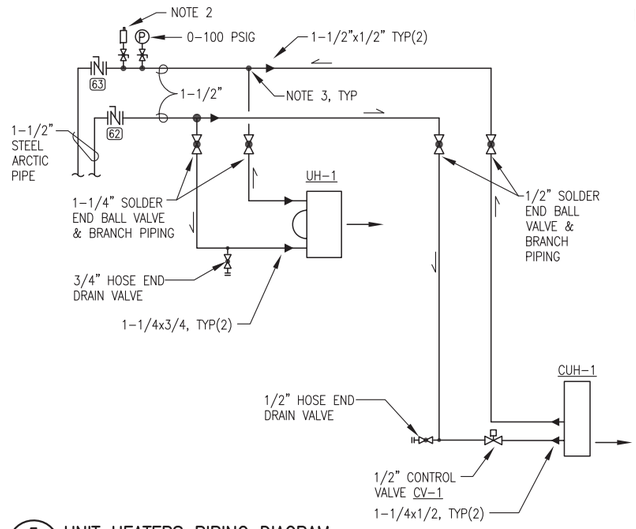
3 M8.2 TYPICAL OVERHEAD PIPING TRAPEZE HANGER
NO SCALE

NOTES:

1. THERMOMETER & TEMPERATURE SENSOR SIMILAR EXCEPT INSTALL WELL IN FITTING ADAPTER. USE 3/4"x1/2" BUSHING AS REQUIRED.
2. TYPICAL COPPER MAIN CONNECTION SHOWN. USE 3/4" THREAD-O-LETS FOR VENT/INSTRUMENT CONNECTION TO STEEL MAINS.



4 M8.2 TYP AIR VENT/INSTRUMENT INSTALLATION
NO SCALE



5 M8.2 UNIT HEATERS PIPING DIAGRAM
NO SCALE

NOTES:

1. ALL PIPING SHOWN THIS DIAGRAM TYPE L HARD DRAWN COPPER UNLESS INDICATED OTHERWISE, SIZE AS INDICATED.
2. PROVIDE AUTOMATIC AIR VENTS IN GHS&R MAINS AT HIGH POINTS AS REQUIRED, SEE INSTALLATION DETAIL 4/M8.2. MOUNT UNIT HEATER AT HEIGHT REQUIRED TO ENSURE RETURN PIPING CONNECTION BELOW MAIN.
3. CONNECT TO MAIN WITH T-DRILL TAP OR REDUCING TEE. ROUTE AND PITCH TO VENT UP INTO MAIN.
4. SUPPORT UNIT HEATER FROM ABOVE WITH ALLTHREAD AND STRUT AS REQUIRED. SUPPORT CABINET UNIT HEATER ON FLOOR IN OFFICE.

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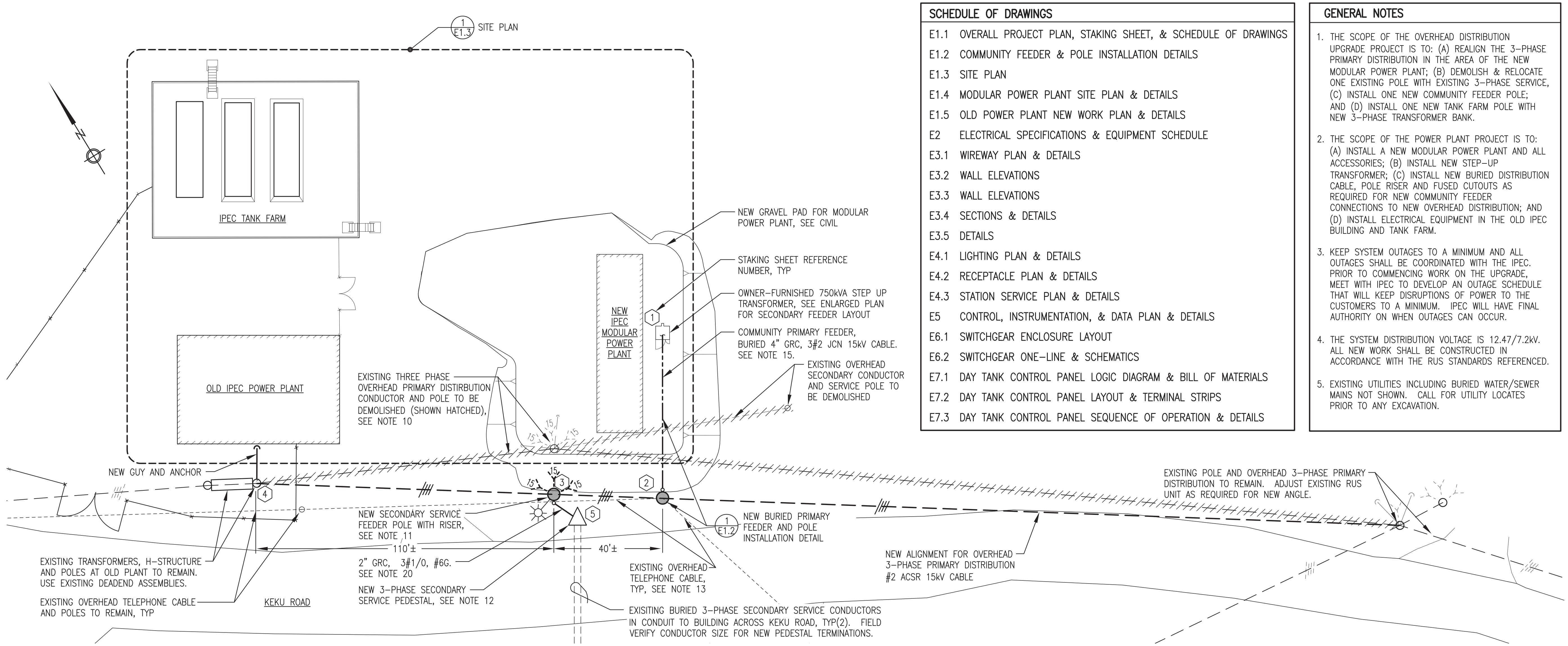
KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE
OLD IPEC POWER PLANT HEAT RECOVERY SYSTEM PLANS & DETAILS

SHEET
M8.2

DRAWN BY:	CHECKED BY:
JTD	BCG
DATE:	SCALE:
6/15/16	AS SHOWN

JOB NUMBER:



1 E1.1 OVERALL PROJECT PLAN
1"=20'

SCHEDULE OF DRAWINGS

GENERAL NOTES

1. THE SCOPE OF THE OVERHEAD DISTRIBUTION UPGRADE PROJECT IS TO: (A) REALIGN THE 3–PHASE PRIMARY DISTRIBUTION IN THE AREA OF THE NEW MODULAR POWER PLANT; (B) DEMOLISH & RELOCATE ONE EXISTING POLE WITH EXISTING 3–PHASE SERVICE, (C) INSTALL ONE NEW COMMUNITY FEEDER POLE; AND (D) INSTALL ONE NEW TANK FARM POLE WITH NEW 3–PHASE TRANSFORMER BANK.
2. THE SCOPE OF THE POWER PLANT PROJECT IS TO: (A) INSTALL A NEW MODULAR POWER PLANT AND ALL ACCESSORIES; (B) INSTALL NEW STEP–UP TRANSFORMER; (C) INSTALL NEW BURIED DISTRIBUTION CABLE, POLE RISER AND FUSED CUTOUTS AS REQUIRED FOR NEW COMMUNITY FEEDER CONNECTIONS TO NEW OVERHEAD DISTRIBUTION; AND (D) INSTALL ELECTRICAL EQUIPMENT IN THE OLD IPEC BUILDING AND TANK FARM.
3. KEEP SYSTEM OUTAGES TO A MINIMUM AND ALL OUTAGES SHALL BE COORDINATED WITH THE IPEC. PRIOR TO COMMENCING WORK ON THE UPGRADE, MEET WITH IPEC TO DEVELOP AN OUTAGE SCHEDULE THAT WILL KEEP DISRUPTIONS OF POWER TO THE CUSTOMERS TO A MINIMUM. IPEC WILL HAVE FINAL AUTHORITY ON WHEN OUTAGES CAN OCCUR.
4. THE SYSTEM DISTRIBUTION VOLTAGE IS 12.47/7.2kV. ALL NEW WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RUS STANDARDS REFERENCED.
5. EXISTING UTILITIES INCLUDING BURIED WATER/SEWER MAINS NOT SHOWN. CALL FOR UTILITY LOCATES PRIOR TO ANY EXCAVATION.

STAKING SHEET

LOCATION	PRIMARY QTY	PRIMARY UNIT	POLE	XFMR	GUY UNIT NO.	GUY UNIT UNIT	GUY UNIT LEAD	ANCHOR	PRIMARY CABLE QTY	PRIMARY CABLE CABLE	SECONDARY QTY	SECONDARY CABLE	SERVICES QTY	SERVICES UNIT	MISC. UNITS QTY	MISC. UNITS UNIT	STAKING SHEET NOTES
1	3	UM6–1		750 KVA STEP–UP PAD MOUNT											1 6 3	UM48–2 UM6–10 UM6–15	1, 2, 4
2	1 1	C1.13 UC2–2	50', CLASS 3														3
3	1 1	C1.13 G3.3	50', CLASS 3	RELOCATE EXISTING.											1	H1.1	
4					1	E1.1	10 FT.	F1.6									
5															1 4	UK5 UJ1–6	1, 2

STAKING SHEET NOTES

1. SEE SHEET E1.4 FOR STEP–UP TRANSFORMER AND PRIMARY/SECONDARY CONDUCTOR INSTALLATION DETAILS.
2. INSTALL JCN CONDUCTORS IN 4" CONDUIT. SEE PLAN SHEETS.
3. SEE SHEET E1.2 FOR NEW FEEDER POLE INSTALLATION DETAILS. DETAIL SIMILAR TO RUS UNITS C1.13 AND UC2–2, EXCEPT AS MODIFIED. OBTAIN COPY OF RUS UNIT C1.13.

DISTRIBUTION SYSTEM INSTALLATION SPECIFICATIONS & NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF RUS BULLETIN 1728F–804 FOR OVERHEAD CONSTRUCTION AND RUS BULLETIN 1728F–806 FOR UNDERGROUND CONSTRUCTION, UNLESS MODIFIED BY THESE DRAWINGS OR SPECIFICATIONS. ALL MATERIAL SHALL BE RUS APPROVED. OBTAIN COPIES OF THE RUS BULLETINS AND MAINTAIN COPIES ON THE JOBSITE.
2. WHERE RUS UNITS ARE REFERENCED, MATERIAL ITEMS MAY NOT BE LISTED IN THE MATERIAL LIST. CONTRACTOR SHALL REFER TO RUS UNIT REFERENCED TO DETERMINE WHAT MATERIAL MUST BE PROVIDED.
3. ALL HARDWARE SHALL BE ALUMINUM, HOT DIP GALVANIZED, OR STAINLESS STEEL. ALL FASTENERS SHALL BE STAINLESS STEEL. RUS UNIT UC2–2 SHALL BE MODIFIED AS INDICATED ON DRAWING E1.2.
4. INSTALL TRANSFORMER ON FIBERGLASS GROUND SLEEVE AS INDICATED.
5. PRIMARY OVERHEAD CONDUCTOR SHALL BE AS INDICATED ON THE DRAWINGS.
6. ALL INSULATOR TIES SHALL BE PREFORMED TYPE. ALL NEUTRAL AND PHASE CONDUCTOR DEADENDS SHALL BE PREFORMED TYPE.
7. NOT ALL GROUNDS ARE SHOWN. TIE CABLE SHIELDS TO GROUND AND GROUND ALL METALLIC DEVICES OR EQUIPMENT. GROUND NEUTRAL WIRE AND TRANSFORMER GROUNDED BUSHING ALONG WITH TRANSFORMER CASE. CONNECT CONDUIT RISER AT TOP AND BOTTOM TO GROUND CONDUCTOR AS SHOWN. ROUTE #4 AWG SOLID COPPER GROUND CONDUCTOR DOWN POLE TO SYSTEM GROUND GRID. ATTACH COPPER GROUND CONDUCTOR TO POLE WITH COPPER PLATED STAPLES. ALL CONNECTIONS TO CABLE SHALL BE MADE WITH COPPER COMPRESSION LUGS. NO ALUMINUM CONNECTORS OR CABLES SHALL BE USED, EXCEPT AT CONNECTIONS TO ACSR. AT ACSR CONNECTIONS, USE LUGS RATED FOR COPPER/ALUMINUM.
8. LOCKNUTS SHALL BE INSTALLED ON ALL THREADED MATERIAL AND HARDWARE IN ADDITION TO NUTS AND WASHERS. FOR ALL EXTERIOR GRC CLEAN & DE–GREASE THREADS AFTER CUTTING & SPRAY WITH COLD GALV PRIOR TO ASSEMBLY
9. QUANTITIES NOT SHOWN. DETERMINE QUANTITIES OF ALL NECESSARY MATERIAL AND EQUIPMENT.
10. CAREFULLY REMOVE EXISTING TRANSFORMER BANK AND STREET LIGHT FOR REUSE BEFORE DEMOLISHING POLE.
11. INSTALL NEW POLE IN NEW ALIGNMENT AS INDICATED. REINSTALL EXISTING 3–PHASE SECONDARY SERVICE TRANSFORMER BANK AND STREET LIGHT. INSTALL NEW SINGLE 2" GRC SECONDARY SERVICE RISER AND ROUT BELOW GRADE TO NEW SECONDARY SERVICE PEDESTAL.
12. LOCATE TWO EXISTING BURIED SECONDARY FEEDERS ON SHOULDER OF ROAD AND CAREFULLY EXCAVATE TO EXPOSE CONDUITS. ROUTE EXISTING FEEDERS TO NEW SECONDARY PEDESTAL AND CONNECT TO BRANCH TERMINALS. ROUTE NEW BURIED CABLE IN 2" GRC FROM PEDESTAL TO RISER ON POLE FOR CONNECTION TO POLE–MOUNTED 15kVA 208V 3–PHASE SECONDARY SERVICE TRANSFORMER BANK. SEE STAKING SHEET.
13. SUPPORT OVERHEAD TELEPHONE FROM NEW POWER POLES IF EXISTING TELEPHONE POLES INTERFERE WITH NEW PRIMARY DISTRIBUTION ROUTING.
14. SECONDARY PEDESTAL, RUS UNIT UK5, FOR SINGLE PHASE SERVICE SHALL BE HUBBELL CATALOG NUMBER SP112136MDH.
15. MEDIUM VOLTAGE CABLE SHALL BE 15 KV, #2 AWG ALUMINUM, STRAND–FILLED, JACKETED MV105, OKONITE CATALOG NUMBER 163–23–3060.
16. RUS UNIT UM6–1 SHALL BE A 200 AMP LOADBREAK ELBOW WITH TEST POINT, COOPER 500–10 LE215AB04T. GROUND THE SHIELD OF ALL PRIMARY CABLES. INSTALL A MOISTURE SEAL ON ALL LOADBREAK ELBOWS, COOPER CS1.
17. ALL RUS UNIT UM6–10 COVER, SHALL BE COOPER 500–21 LPC215.
18. ALL RUS UNIT UM6–15, STANDOFF INSULATOR SHALL BE 15 KV, COOPER.
19. ALL UJ1–6 SECONDARY CONNECTORS SHALL BE 6 OUTLET, #12–#350 MCM, SEALED. HOMAC RAB 350 SERIES, RAB 6.
20. INSTALL 2" CONDUIT RISER UP POLE TO A POINT WHERE THE DRIP LOOP IS GREATER THAN 10 FEET ABOVE GRADE. INSTALL WEATHERHEAD AT TOP OF CONDUIT.

REV #1 ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS MARK	DATE	DESCRIPTION
1	6–15–16	REVISED NOTES
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STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

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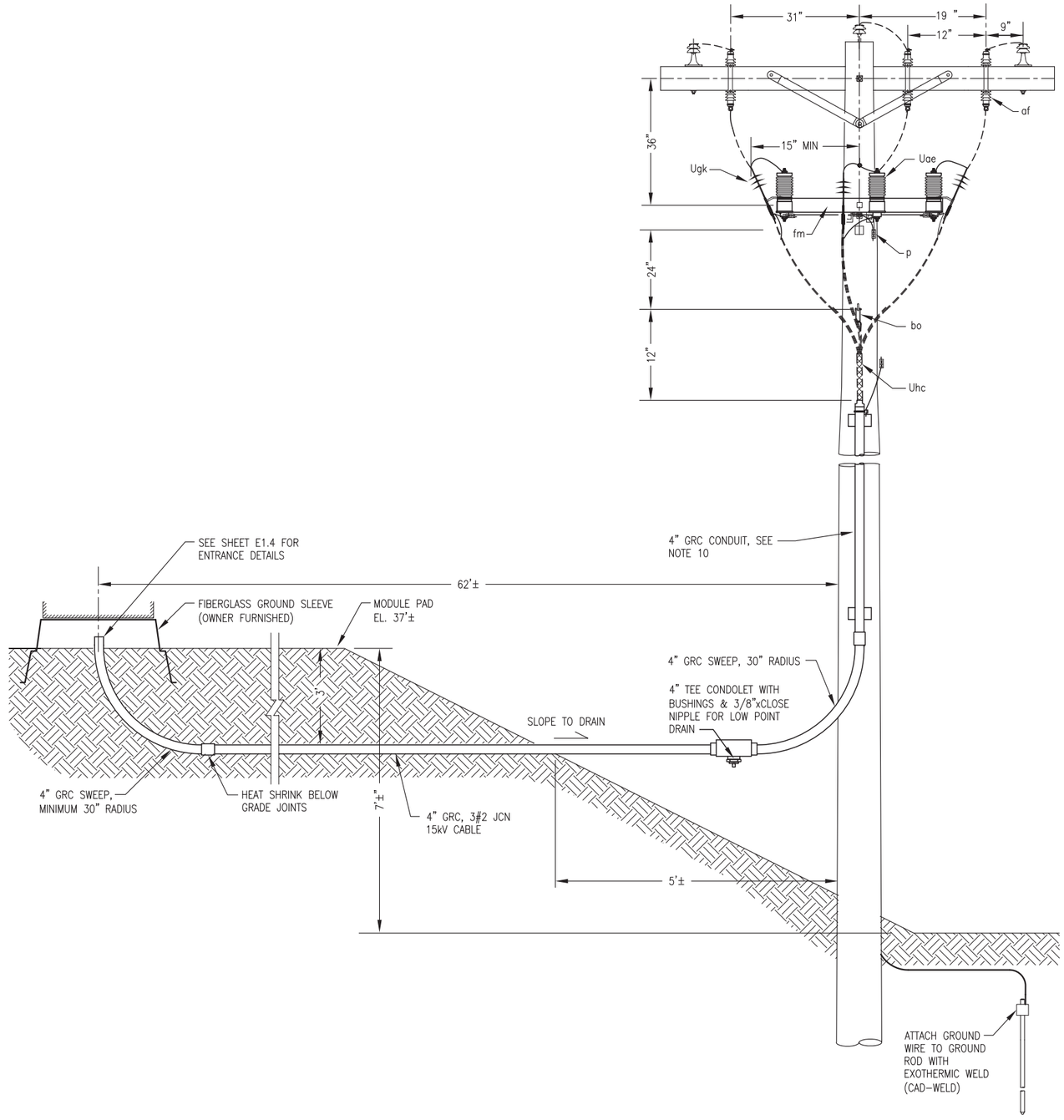
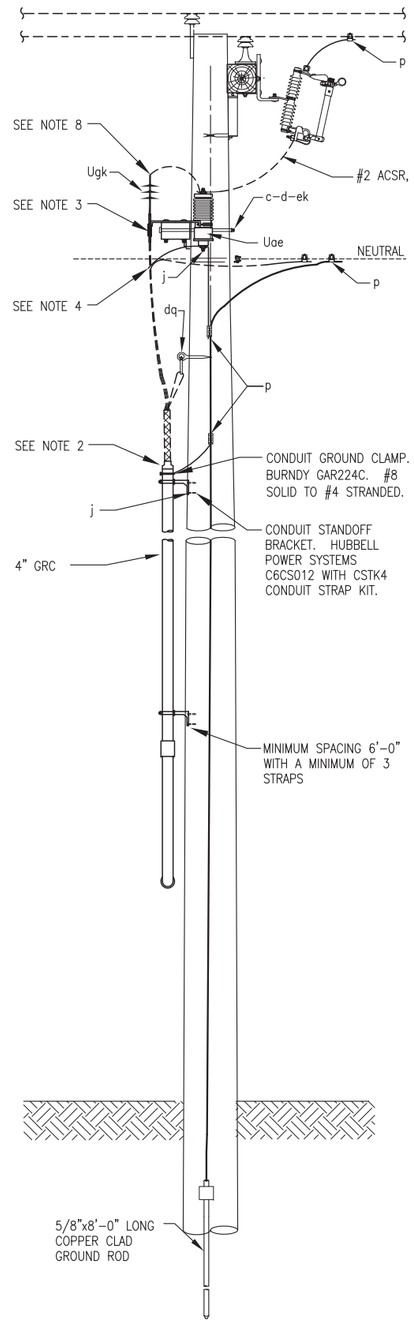
KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: OVERALL PROJECT PLAN, STAKING SHEET, & SCHEDULE OF DRAWINGS

SHEET: E1.1

DRAWN BY: JTD | CHECKED BY: CWV/BCG
DATE: 4/25/16 | SCALE: AS SHOWN
JOB NUMBER:





ITEM	QTY.	MATERIAL
C	1	BOLT, MACHINE, 5/8" X REQUIRED LENGTH.
d	1	WASHER, SQUARE 2 1/4".
j		SCREW, LAG 1/2" X 4" AS REQUIRED.
p		CONNECTORS, AS REQUIRED.
aa	1	EYENUT, 5/8"
af	3	100 AMP OPEN CUTOUT, CHANCE C7 (SEE NOTE 9)
bo	1	ANCHOR, SHACKLE.
dq	1	EYE SCREW, ELLIPTICAL OR DRIVE HOOK.
ek		LOCKNUTS, AS REQUIRED.
fm	1	MOUNTING BRACKET (NOTE 5)
Uae	3	SURGE ARRESTER (SEE NOTE 1)
Ugk	3	CABLE TERMINATION (SEE NOTE 6)
Uhc	3	STAINLESS STEEL CABLE SUPPORT (SEE NOTE 7)

NOTES:

1) PROVIDE 7.65 kV MCOV ARRESTER, 9.0 kV DUTY CYCLE. TOTAL ARRESTER LEAD LENGTH SHALL BE UNDER 3'.
2) INSTALL 3-CONDUCTOR, 15kV, HEAT SHRINK CABLE BREAKOUT BOOT ON THE END OF THE CONDUIT, SELECT THE BREAKOUT BOOT FOR THE CONDUIT SIZE AND THE CONDUCTOR DIAMETER. RAYCHEM, 3M OR APPROVED EQUAL.
3) INSTALL ALUMA-FORM CABLE POSITIONER. MODEL CS-820, PRODUCT #51919.
4) BOND CABLE SHIELDS TO GROUND CONDUCTOR.
5) MOUNTING BRACKET TO BE ALUMAFORM TB-EMB-1-6PA.
6) CABLE TERMINATION TO BE OUTDOOR SKIRTED, COLD SHRINK, 15 kV. 3M 7622-2-2.
7) HUBBELL 1"-1.24", CATALOG NO. 02402017.
8) AT CABLE TERMINATOR, INSTALL COMPRESSION LUG FOR TAP TO ARRESTER. INSTALL MOISTURE SEAL ON LUG TO ENSURE THAT CONNECTION IS WATER TIGHT.
9) PROVIDE 32 AMP SLO-FAST FUSE LINK.
10) FOR ALL EXTERIOR GRC CLEAN & DE-GREASE THREADS AFTER CUTTING & SPRAY WITH COLD GALV PRIOR TO ASSEMBLY.

1 / E1.2 COMMUNITY FEEDER AND POLE INSTALLATION DETAILS
NO SCALE

REV #1 ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS		
MARK	DATE	DESCRIPTION
1	6-15-16	POLE RISER MODIFICATIONS
2		
3		
4		
5		

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Gray Stassel Engineering, Inc.

ALASKA ENERGY AUTHORITY
ENERGY AUTHORITY

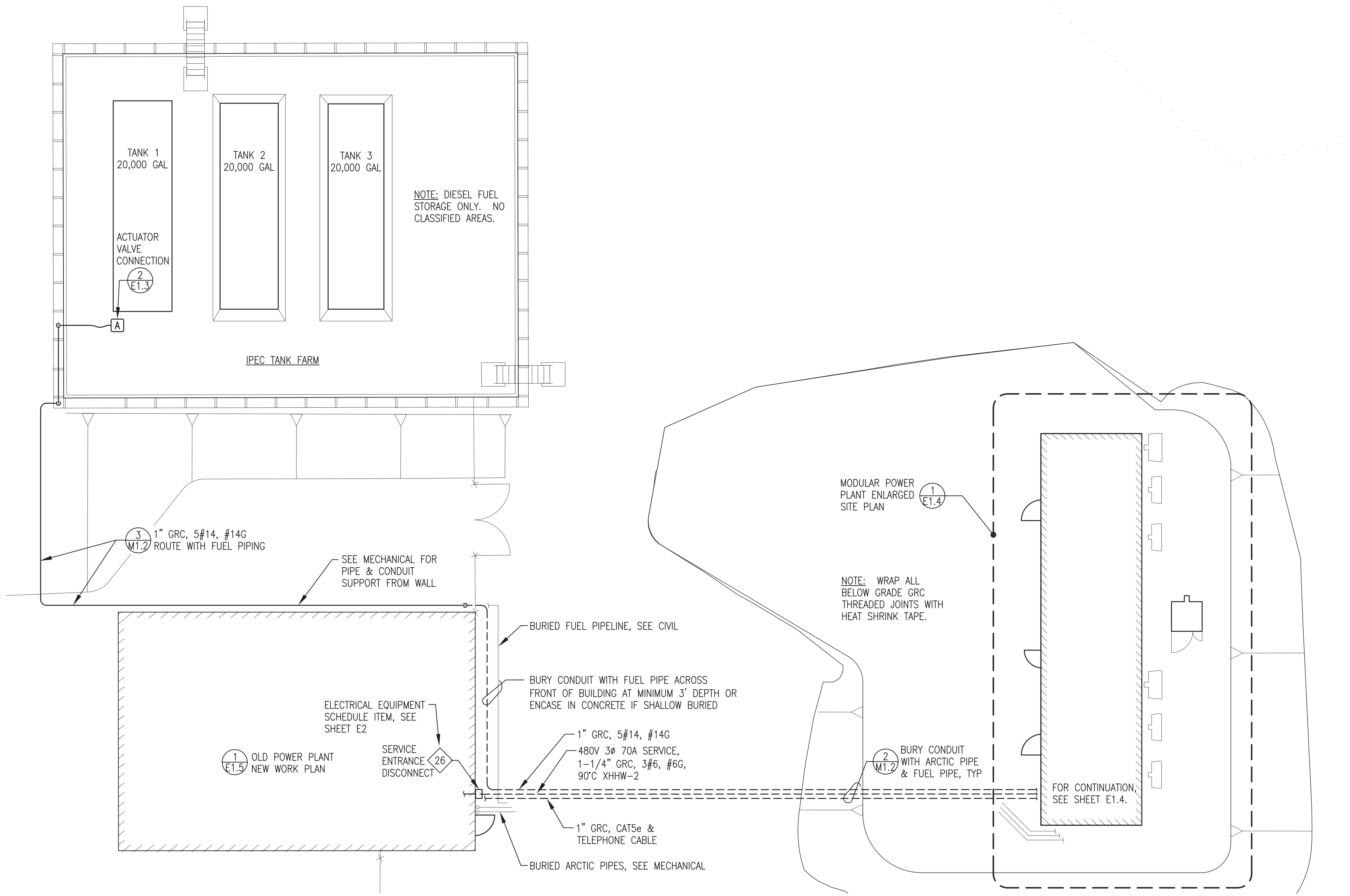
KAKE RPSU PROJECT
KAKE, ALASKA

SHEET TITLE
COMMUNITY FEEDER & POLE INSTALLATION DETAILS

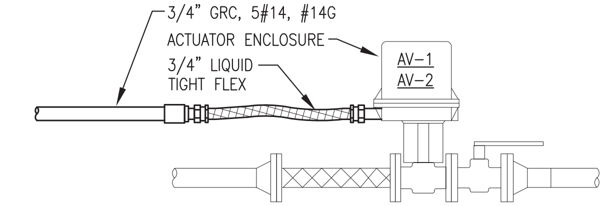
SHEET
E1.2

DRAWN BY:	CHECKED BY:
JTD	CWV/BCG
DATE:	SCALE:
4/25/16	AS SHOWN

JOB NUMBER:



1 E1.3 SITE PLAN
1"=10'



NOTE:
ACTUATOR VALVE CONTROLLED FROM FUEL SYSTEM CONTROl PANEL IN NEW MODULAR POWER PLANT, SEE LOGIC DIAGRAM SHEET E7.1 FOR CONDUCTOR TERMINATIONS.

2 E1.3 TYPICAL ACTUATOR VALVE CONNECTION
NO SCALE

ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
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SHEET TITLE: SITE PLAN

SHEET: E1.3

DRAWN BY: JTD	CHECKED BY: CWV/BCG
DATE: 6/15/16	SCALE: AS SHOWN
JOB NUMBER:	

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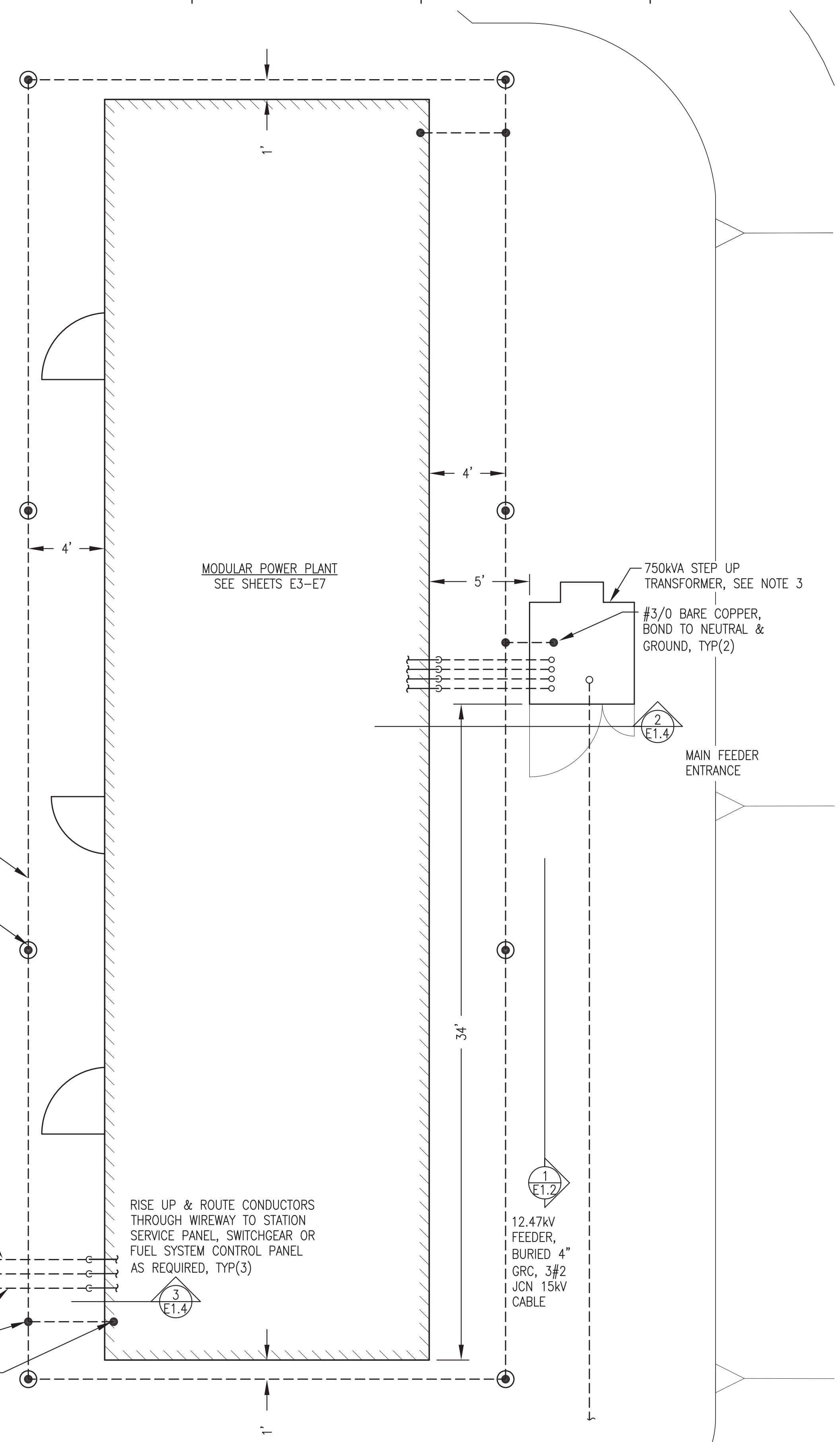
NOTES:

1) CAD-WELD ALL GROUNDING GRID CABLE AND GROUND ROD CONNECTIONS.

2) WHERE SHALLOW BEDROCK IS ENCOUNTERED DRILL MIN 2"ø HOLES IN ROCK AND SET GROUND RODS IN GROUT.

3) OWNER FURNISHED PAD MOUNT 750kVA STEP-UP TRANSFORMER, 277/480V WYE TO 7200/12470 WYE. INSTALL ON OWNER-FURNISHED FIBERGLASS GROUND SLEEVE. PROVIDE TRANSFORMER GROUNDING IN ACCORDANCE WITH RUS CONSTRUCTION UNIT UM48-2.

4) FOR ALL GRC CLEAN & DE-GREASE THREADS AFTER CUTTING & SPRAY WITH COLD GALV PRIOR TO ASSEMBLY.

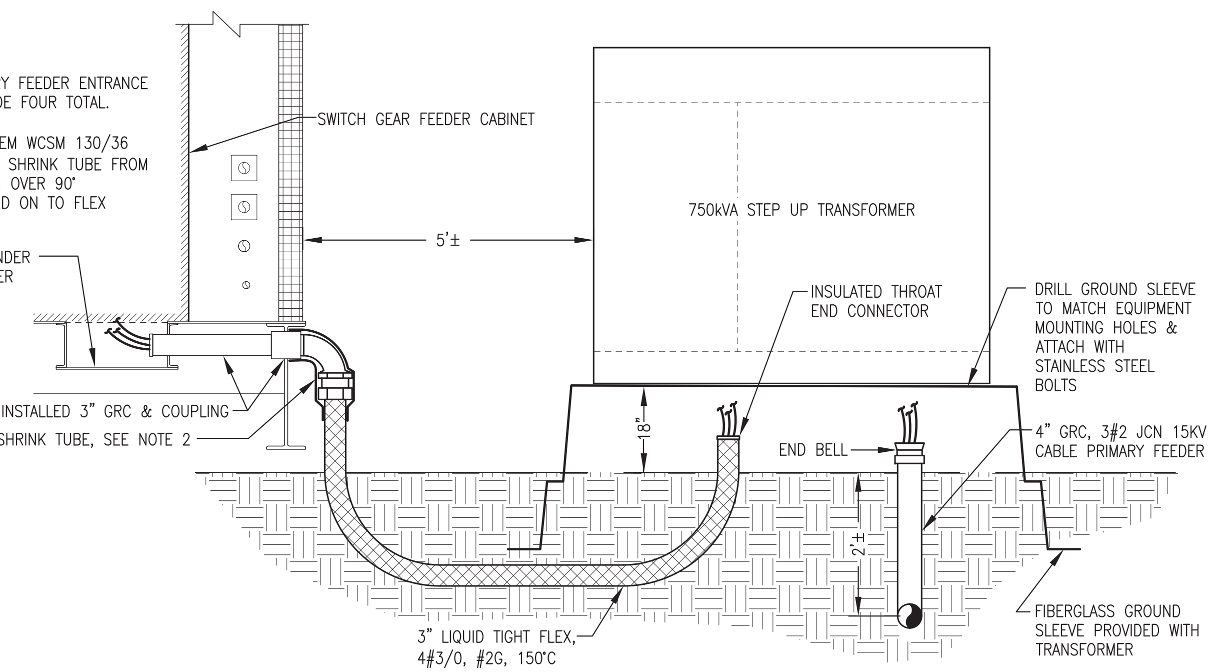


1 E1.4 MODULAR POWER PLANT ENLARGED SITE PLAN
1"=4'

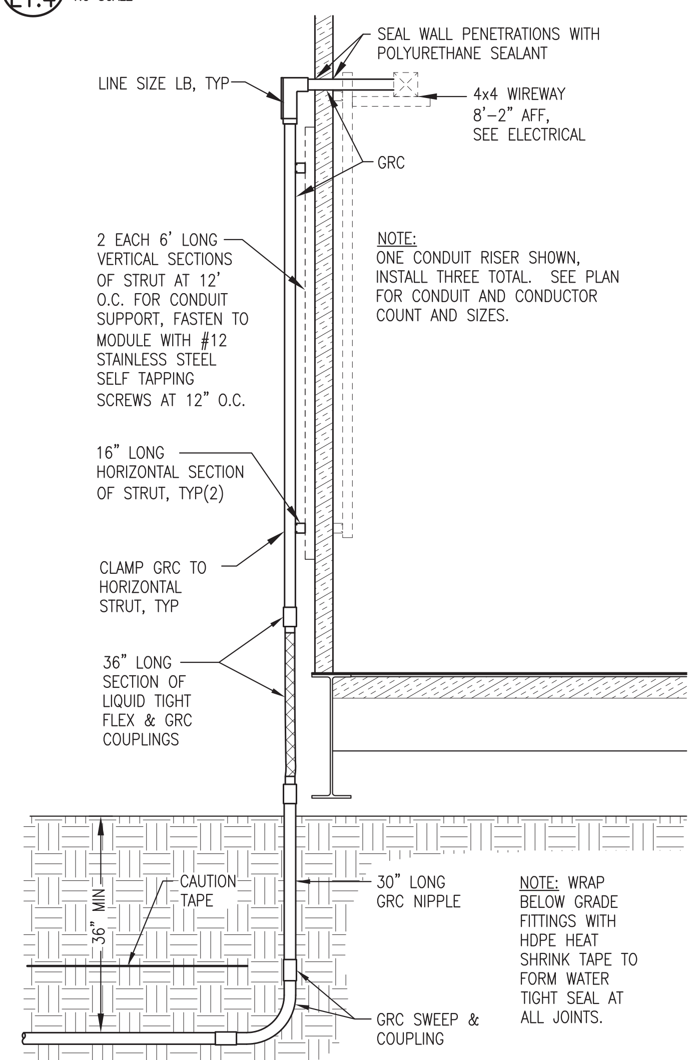
NOTES:

1) ONE SECONDARY FEEDER ENTRANCE SHOWN, PROVIDE FOUR TOTAL.

2) INSTALL RAYCHEM WCSM 130/36 -1500/S HEAT SHRINK TUBE FROM GRC COUPLING, OVER 90° CONNECTOR AND ON TO FLEX



2 E1.4 MAIN FEEDER ENTRANCE
NO SCALE



3 E1.4 BURIED CONDUIT RISER AT MODULE
1"=4'

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
3		
4		
5		

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SHEET TITLE
MODULAR POWER PLANT ENLARGED SITE PLAN & DETAILS

SHEET
E1.4

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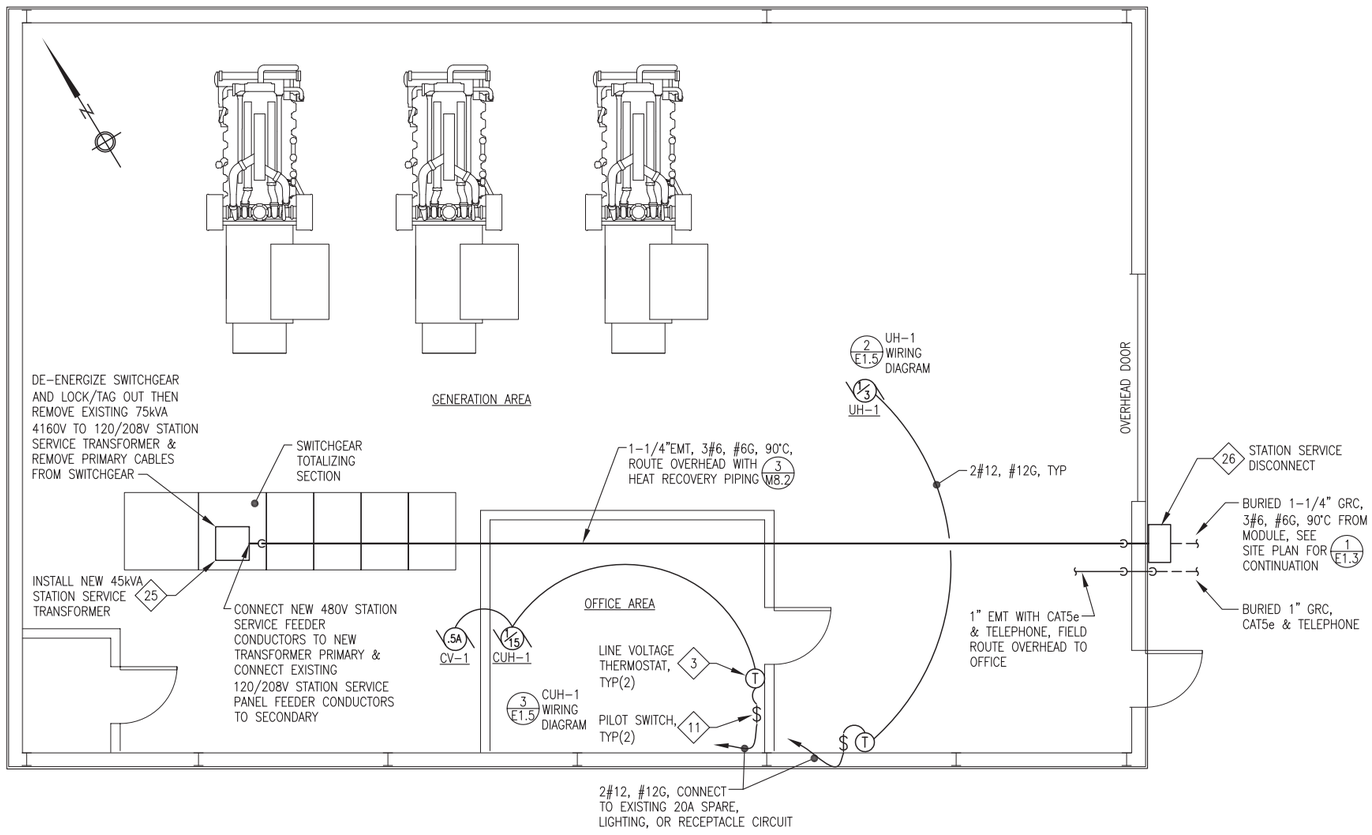
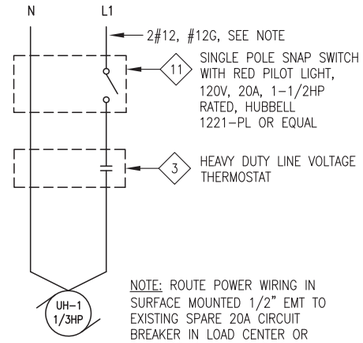
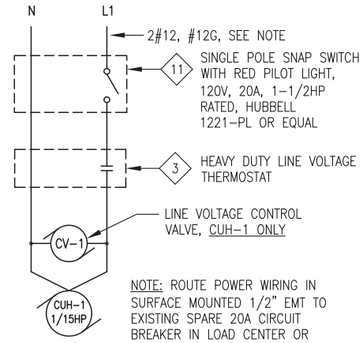


1 E1.5 OLD POWER PLANT BUILDING NEW WORK PLAN
1"=4'



NOTE: ROUTE POWER WIRING IN SURFACE MOUNTED 1/2" EMT TO EXISTING SPARE 20A CIRCUIT BREAKER IN LOAD CENTER OR TO EXISTING 20A LIGHTING RECPTACLE CIRCUIT.

2 E1.5 UH-1 HEATER WIRING
NO SCALE



NOTE: ROUTE POWER WIRING IN SURFACE MOUNTED 1/2" EMT TO EXISTING SPARE 20A CIRCUIT BREAKER IN LOAD CENTER OR TO EXISTING 20A LIGHTING RECPTACLE CIRCUIT.

3 E1.5 CUH-1 HEATER WIRING
NO SCALE

ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
3		
4		
5		

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ALASKA ENERGY AUTHORITY

KAKE RPSU PROJECT

KAKE, ALASKA

SHEET TITLE
OLD POWER PLANT NEW WORK PLAN & DETAILS

SHEET
E1.5

DRAWN BY:	CHECKED BY:
JTD	CWV/BCG
DATE:	SCALE:
6/15/16	AS SHOWN

JOB NUMBER:

** 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 IPEC.

** 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 TYPE 304 STAINLESS STEEL.

** 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 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 BELOW GRADE JOINTS WITH HEAT SHRINK TAPE.

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, 480V FEEDERS, 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 INTERIOR CONDUCTORS – CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE THHN INSULATION, 600V AND 75C RATED.

CONDUCTORS INSTALLED IN EXTERIOR LOCATIONS (EXCEPT 480V 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 CATERPILLAR 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 GOVERNOR, 24VDC STARTING SYSTEM, INSTRUMENT PANEL, CONTROLS, VOLTAGE REGULATOR, 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 FOUR GENERATORS, MASTER CONTROL, ONE FEEDER, FOUR CHARGE AIR COOLER VFDS, AND TWO RADIATOR VFDS AS INDICATED. EQUIPMENT ARRANGEMENT AND SIZES SHALL CONFORM TO THE LAYOUT ELEVATIONS 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 FULL MANUAL CONTROL FUNCTIONS.

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 A FEEDER SECTION COMPLETE WITH: STATIONARY-MOUNT ELECTRICALLY OPERATED CIRCUIT BREAKER FOR THE COMMUNITY FEEDER; FEEDER PROTECTION RELAY; MOLDED CASE CIRCUIT BREAKERS FOR THE STATION SERVICE AND VARIABLE FREQUENCY DRIVES. 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. THE OPERATOR SHALL PLACE THE UNIT IN MANUAL OR AUTOMATIC MODE USING THE GCP.

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, THE LOW COOLANT LEVEL SWITCH, 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 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.

** 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. VERIFY PROPER ROTATION OF ALL MOTORS. ON MOTORS WITH VFD SERVICE CHECK ROTATION IN VFD AND BYPASS MODES.

UPON SUCCESSFUL COMPLETION OF TESTING, THE PLANT SHALL BE PLACED IN SERVICE BY AEA AND IPEC. AEA WILL ASSIST IPEC WITH SYSTEM PERFORMANCE MONITORING AND LOCAL OPERATOR TRAINING.

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 WITH A19 SOCKET, NEMA 3R, PHOTOCELL CONTROL, REMOVE BALLAST & 120V A19 LED LAMP RATED FOR TOTALLY ENCLOSED INSTALLATION, 5,000K COLOR, 100W EQUIVALENT	HUBBELL NRG-307B-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 LIGHT COMBO, UNIVERSAL MOUNT, WHITE 20 GA STEEL ENCLOSURE, RED EXIT SIGN, 277/120V INPUT, NI-CAD BATTERY, 6VDC, 12W, DUAL 3.6W LED LAMPS	EXITRONICS VEX-U-S-6-12-REN-2-2-WH
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, IVORY.	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 2.08 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 HU361SB
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.	4' TANK PROBE: TSP-LL2-53-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
25	OLD POWER PLANT STATION SERVICE TRANSFORMER – ENERGY STAR COMPLIANT, ENCLOSURE TYPE 1, 45kVA, HV 480 DELTA, LV 208Y/120	EGS ELECTRICAL GROUP CAT. NO. ET2H45S
26	OLD POWER PLANT SERVICE NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 100A, 60HP RATED	SIEMENS HNF363R

ISSUED FOR CONSTRUCTION JUNE 2016

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
3		
4		
5		

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

HDL ENGINEERING Consultants
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ANC, AK 99511
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KAKE RPSU PROJECT
ALASKA ENERGY AUTHORITY
ALASKA ENERGY AUTHORITY
KAKE, ALASKA

SHEET TITLE: ELECTRICAL SPECIFICATIONS & EQUIPMENT SCHEDULE

SHEET: E2

DRAWN BY: JTD
CHECKED BY: CWV/BCG
DATE: 6/15/16
SCALE: NO SCALE
JOB NUMBER: