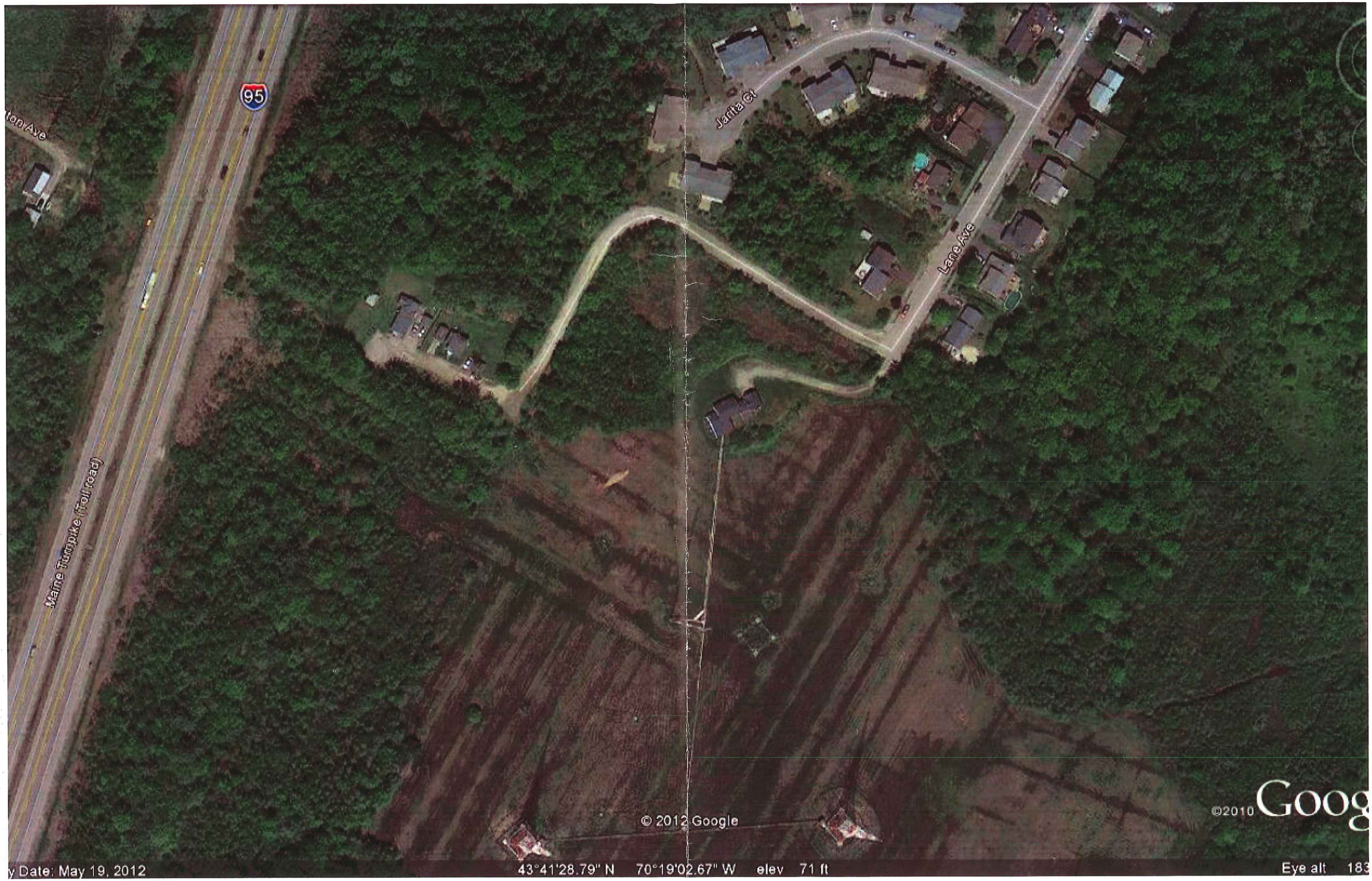
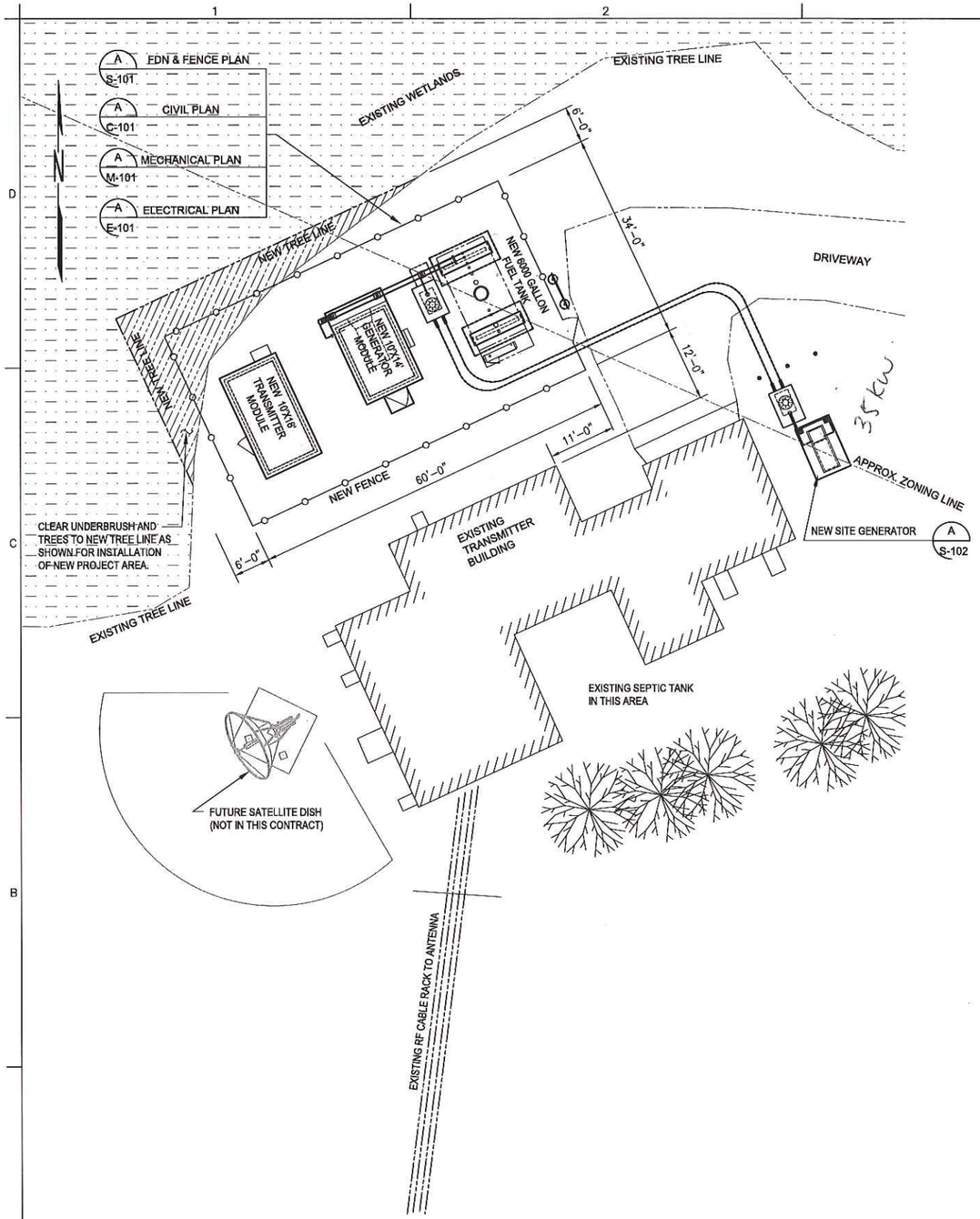
302-A-6
236 Lane Avenue
Site Alteration
FEMA (Darcy Bingham

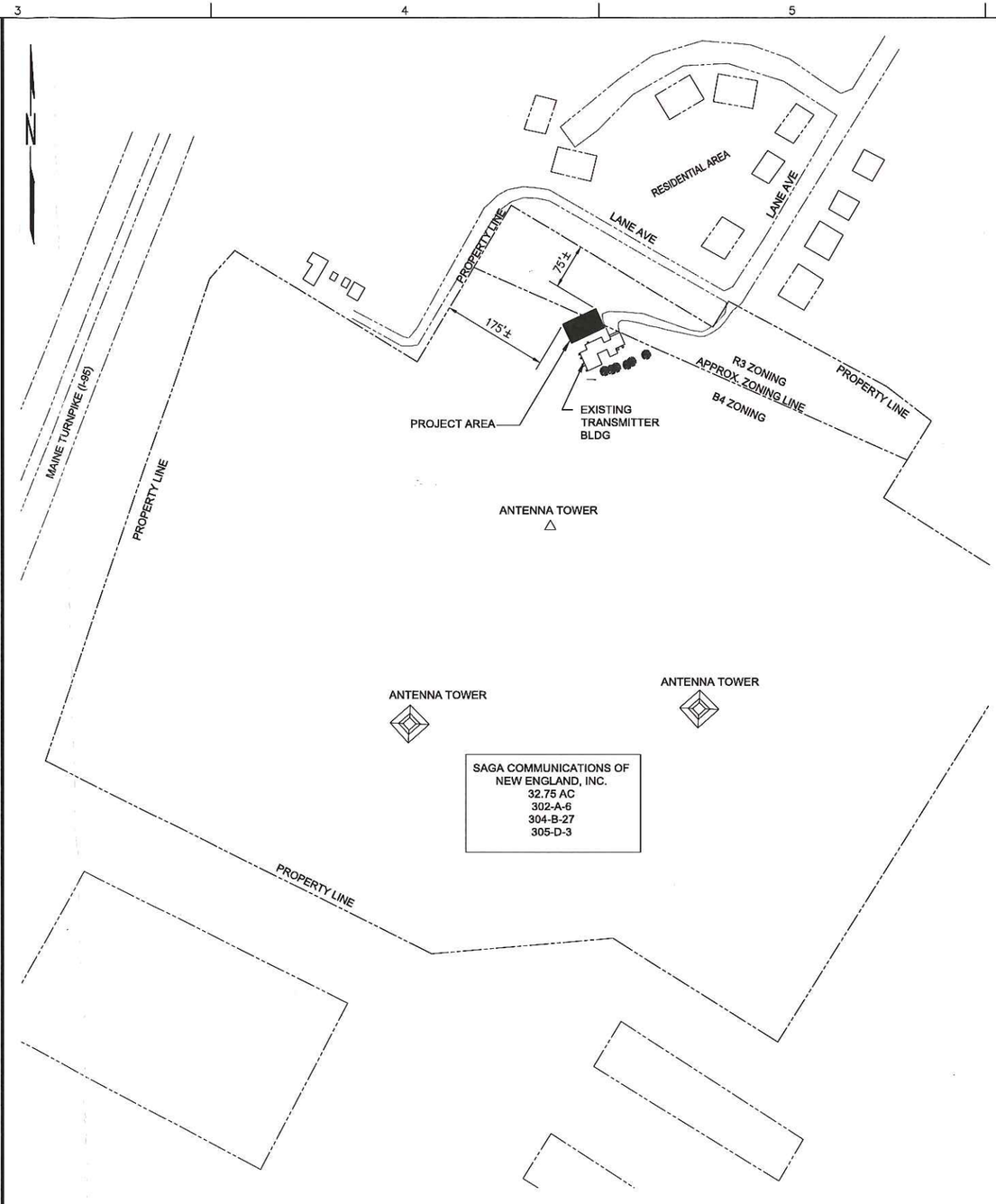
#2012-643


95
Maine Turnpike (Toll road)
Jarita Ct
Lane Ave
© 2012 Google
©2010 Goog
y Date: May 19, 2012
43°41'28.79" N 70°19'02.67" W elev 71 ft
Eye alt 183



1 G-001 **STATION WGAN - SITE PLAN**
SCALE: 1"=10'-0"

1"=10' 0' 10' 20' 30' 40' 50'



WGAN PROPERTY PLAN
SCALE: 1'=100'

1"=100' 0' 100' 200' 300' 400' 500'

REVISED WITH ZONING INFORMATION

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW
Project Manager
QC Reviewer
Architectural
Structural
Mechanical
Plumbing
Electrical
Civil

Mark	Description	Date	Appvd
1	ISSUED FOR PERMITTING	12/19/12	
0	ISSUED FOR CONSTRUCTION	11/1/13	

Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

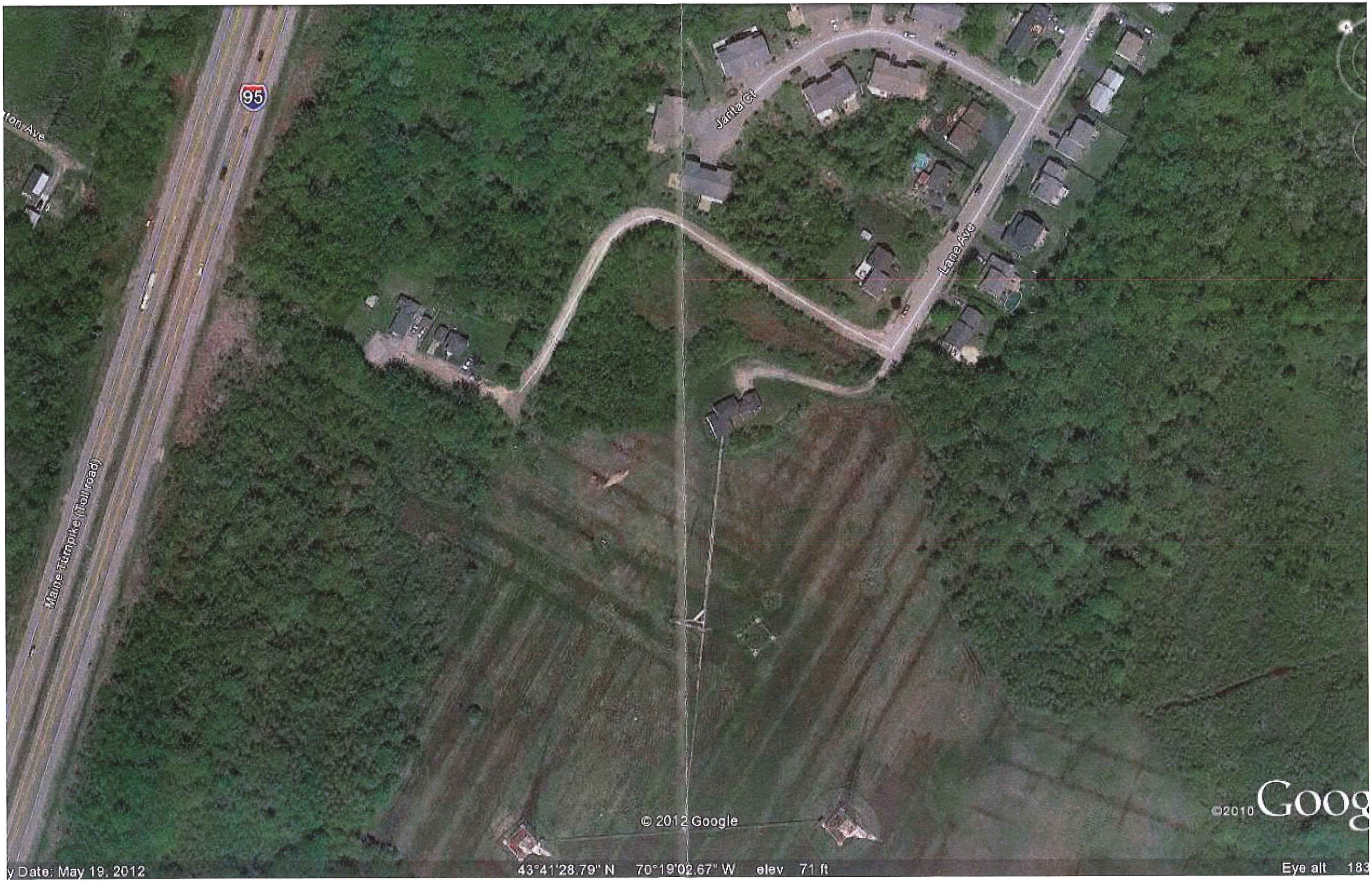
FEMA

KBR
63 SOUTH ROYAL STREET SUITE 500
MOBILE, AL 36602
PHONE: (251) 690-7600
FAX: (251) 690-7606
Engineering Services by
KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK
ON WGAN PORTLAND, MAINE

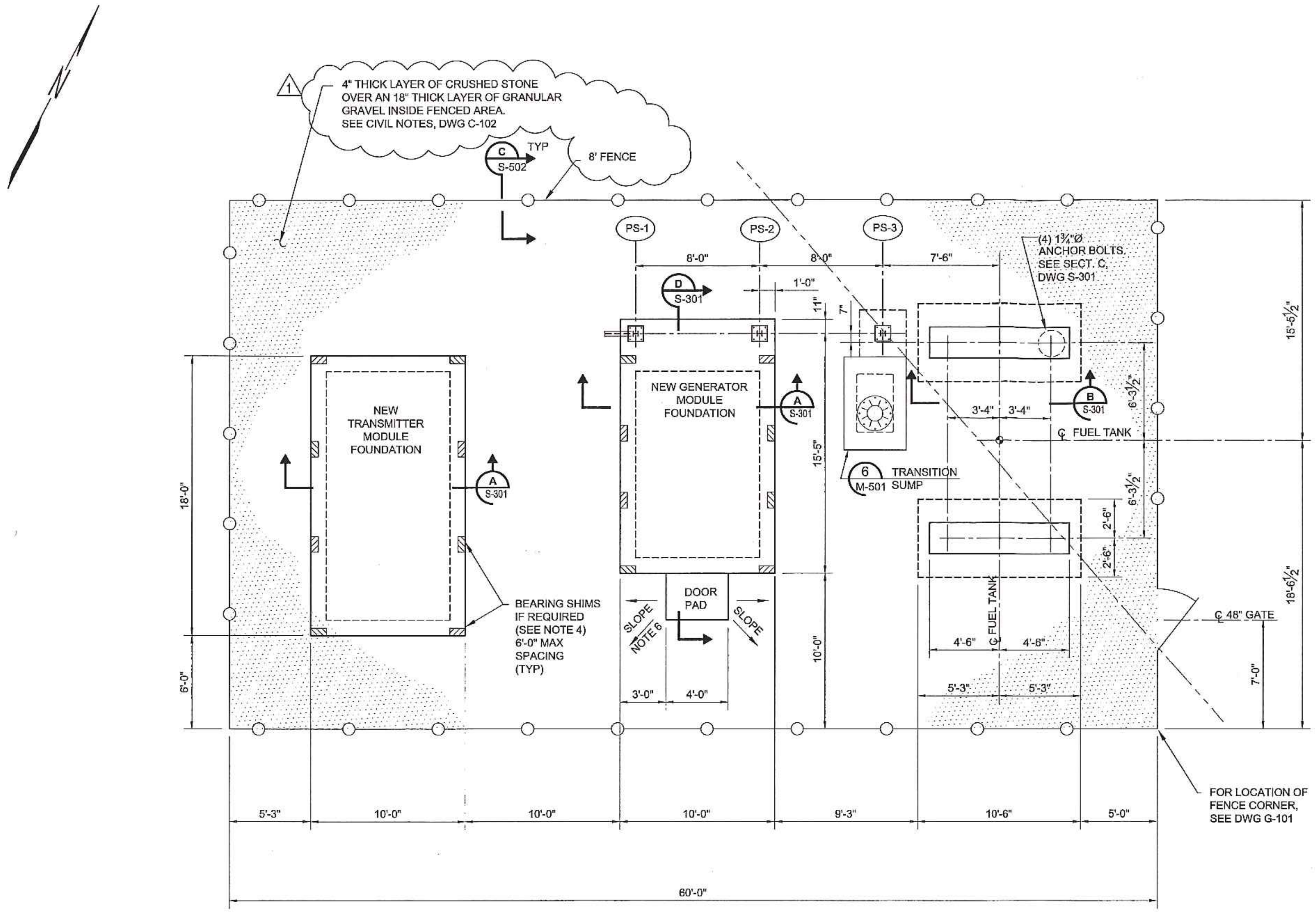
SITE PLAN

Drawing Number:
G-101


95
Janita Ct
Lane Ave
Maine Turnpike (Toll road)
© 2012 Google
©2010 Goog
y Date: May 19, 2012
43°41'28.79" N 70°19'02.67" W elev 71 ft
Eye alt 183

NOTES:

1. FOR STRUCTURAL GENERAL NOTES, SEE DWG S-001. FOR CIVIL NOTES, SEE DWG C-102.
2. (PS-1) PIPE SUPPORT DESIGNATOR. SEE DWG S-501.
3. SEE ELECTRICAL DRAWINGS FOR GROUNDING.
4. BEARING SHIMS SHALL BE USED AS REQUIRED TO ASSURE PERIMETER BEARING OF GENERATOR AND TRANSMITTER MODULES. BEARING SHIMS PROVIDED WITH MODULE.
5. CONTRACTOR TO CONTACT ENGINEER IF WEIGHT OF EQUIPMENT PURCHASED EXCEEDS THE DEAD AND FLUID LOADS SHOWN ON DWG S-001.
6. SLOPE FINISHED GRADE AND CRUSHED STONE AWAY FROM DOOR PAD AS SHOWN.



A G-101 FOUNDATION AND FENCE PLAN
SCALE: 1/4"=1'-0"

1' 0' 1' 5' 10' 15'
1/4"=1'-0"

US Army Corps of Engineers
OMAHA DISTRICT

Mark	Description	Date	Appvd
1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS, DELETED BARBED WIRE AND RAZOR WIRE	01/16/13	
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

FEMA
KBR
63 SOUTH ROYAL STREET SUITE 200
Engineering Services by KBR Engineering Co. LLC

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

FOUNDATION AND FENCE PLAN

STATE OF MAINE
DENISE COLEY BROWN
No. 12659
REGISTERED PROFESSIONAL ENGINEER
Rev 1 01-22-13

Drawing Number:
S-101

GENERAL NOTES

CONCRETE MATERIALS

1. UNLESS OTHERWISE NOTED ON DRAWINGS, CAST-IN-PLACE CONCRETE MIXES SHALL BE AS SHOWN IN SPEC 03 30 53.
2. REINFORCING BARS SHALL BE DEFORMED AND SHALL CONFORM TO ASTM A615, GRADE 60 AND SPECIFICATION 03 30 53.
3. ANCHOR BOLT MATERIAL SHALL BE AS SHOWN ON THE DRAWINGS.
4. EMBEDDED STEEL MATERIAL SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE ON DRAWINGS.
5. EMBEDDED PIPE SLEEVES SHALL BE ASTM A53 GRADE B UNLESS OTHERWISE NOTED ON DRAWINGS.
6. GROUT UNDER ALL STRUCTURAL COLUMNS, EQUIPMENT BASES AND AROUND ANCHOR BOLTS, SHALL BE PREPACKAGED, CEMENTITIOUS NON-SHRINK, NON-METALLIC. GROUT SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 PSI AND CONFORM TO ASTM C 1107.

CONCRETE CONSTRUCTION METHODS

1. SITE PREPARATION, EXCAVATION, AND BACKFILLING SHALL BE ACCOMPLISHED PER THE PLANS, SPECIFICATION 31 23 00.00 20, AND THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. GEOTECHNICAL SERVICES DURING CONSTRUCTION INCLUDING OBSERVATION AND TESTING OF THE EXCAVATIONS, BACKFILL AND COMPACTION, SHALL BE PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD. SEE CIVIL DRAWING C-102.
2. COORDINATE CONCRETE WORK WITH PIPING, ELECTRICAL AND MECHANICAL WORK PRIOR TO PLACING CONCRETE.
3. EXPOSED EDGES OF CONCRETE SHALL HAVE 3/4 INCH CHAMFER.
4. ALL CONCRETE REINFORCEMENT DETAILING SHALL BE IN ACCORDANCE WITH ACI 318-08.
5. CONCRETE COVER FOR REINFORCING BARS FOR CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE MINIMUM CONCRETE COVER SPECIFIED IN ACI 318-08, UNLESS SHOWN OTHERWISE ON DRAWINGS.
6. TENSION SPLICES IN REINFORCING BARS SHALL BE CLASS "B" (ACI 318-08) UNLESS SHOWN OTHERWISE ON THE DRAWINGS AND COMPRESSION SPLICES SHALL BE IN ACCORDANCE WITH ACI 318-08, SECTION 12.16, UNLESS OTHERWISE SHOWN ON DRAWINGS.
7. SURFACE FINISHES ARE DESCRIBED IN THE CONCRETE CONSTRUCTION SPECIFICATIONS. FINISH FOR SLABS AND PADS SHALL BE BROOM FINISHED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
8. CONCRETE INDICATED ON THE DRAWINGS TO BE "ROUGHENED" SHALL BE CLEAN, FREE OF LAITANCE AND ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.

STRUCTURAL STEEL

1. STRUCTURAL STEEL "W" SHAPES SHALL CONFORM TO ASTM A 992, GRADE 50. ALL CHANNELS, ANGLES, AND PLATES SHALL CONFORM TO ASTM A 36 UNLESS NOTED OTHERWISE.
2. HIGH STRENGTH BOLTS, NUTS, AND HARDENED WASHERS SHALL CONFORM TO ASTM A 325, ASTM A 563 DH, AND ASTM F 436 RESPECTIVELY. BOLTS, NUTS, AND WASHERS SHALL BE MECHANICALLY GALVANIZED.
3. WELDING ELECTRODES SHALL CONFORM TO AWS A5.1, WITH A MINIMUM ELECTRODE TENSILE STRENGTH OF 70 KSI.
4. ALL STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF ASTM A 123, A 143, A 384, AND A 385. ALL DAMAGED HOT-DIP GALVANIZED AREAS SHALL BE COATED WITH ZRC COLD GALVANIZING COMPOUND, OR APPROVED EQUAL.
5. STRUCTURAL STEEL FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH SPECIFICATION 05 12 00.

FOUNDATION DESIGN LOAD DATA:

DESIGN WIND, SNOW AND SEISMIC LOADING VALUES ARE GREATER THAN THE VALUES REQUIRED BY IBC SITE SPECIFIC DATA

GEOTECHNICAL:

ALLOWABLE SOIL BEARING LOAD = 3000 PSF

6,000 GALLON DOUBLE WALL FUEL TANK (UL-2085):
8'-0" DIAMETER, 16'-0" LENGTH

DEAD LOAD:

TANK, SADDLES, PLATFORM, ETC. = 22,900 LBS

FLUID LOAD:

DIESEL FUEL = 51,200 LBS

WIND LOAD:

V = 156 MPH
Iw = 1.15
EXPOSURE = C

SEISMIC LOAD:

I_E = 1.5
S_S = 1.25
S_1 = 0.40
SITE CLASS = D
S_{DS} = 0.83
S_{D1} = 0.43
SEISMIC DESIGN CATEGORY = D
BASE SHEAR = 31,100 LBS
C_S = 0.42
R = 3
ANALYSIS METHOD = EQUIVALENT LATERAL FORCE - NON BUILDING STRUCTURE

TRANSMITTER MODULE:
10'-0" WIDE, 18'-0" LONG

DEAD LOAD:

PRE-CAST BLDG AND CONTENTS = 45,000 LBS

LIVE LOAD:

9,000 LBS

WIND LOAD:

V = 156 MPH
Iw = 1.15
ENCLOSED BLDG.
EXPOSURE = C

SNOW LOAD:

Pg = 80 LB/SF
Pf = 72.6 LB/SF
Ce = 0.9
I = 1.2
Ct = 1.2

SEISMIC LOAD:

I_E = 1.5
S_S = 1.25
S_1 = 0.40
SITE CLASS = D
S_{DS} = 0.83
S_{D1} = 0.43
SEISMIC DESIGN CATEGORY = D
BASE SHEAR = 14,630 LBS
C_S = 0.25
R = 5
ANALYSIS METHOD = EQUIVALENT LATERAL FORCE - BUILDING STRUCTURE

GENERATOR MODULE:
10'-0" WIDE, 14'-0" LONG

DEAD LOAD:

PRE-CAST BLDG AND CONTENTS = 37,000 LBS

LIVE LOAD:

7,000 LBS

WIND LOAD:

V = 156 MPH
Iw = 1.15
ENCLOSED BLDG.
EXPOSURE = C

SNOW LOAD:

Pg = 80 LB/SF
Pf = 72.6 LB/SF
Ce = 0.9
I = 1.2
Ct = 1.2

SEISMIC LOAD:

I_E = 1.5
S_S = 1.25
S_1 = 0.40
SITE CLASS = D
S_{DS} = 0.83
S_{D1} = 0.43
SEISMIC DESIGN CATEGORY = D
BASE SHEAR = 12,000 LBS
C_S = 0.25
R = 5
ANALYSIS METHOD = EQUIVALENT LATERAL FORCE - BUILDING STRUCTURE

SITE GENERATOR, WEATHER ENCLOSURE & SUBBASE FUEL TANK:

DEAD LOAD:

GENSET, ENCLOSURE, AND TANK = 4,300 LBS

FLUID LOAD:

NOMINAL CAPACITY = 215 GALLONS
DIESEL FUEL = 1,800 LBS

WIND LOAD:

V = 156 MPH
Iw = 1.15
EXPOSURE = C

SEISMIC LOAD:

I_E = 1.5
S_S = 1.40
S_1 = 0.42
SITE CLASS = D
S_{DS} = 0.94
S_{D1} = 0.45
SEISMIC DESIGN CATEGORY = D
BASE SHEAR = 3,200 LBS
C_S = 0.56
R = 2.5
ANALYSIS METHOD = EQUIVALENT LATERAL FORCE - NON BUILDING STRUCTURE

HOLD FOR GENSET VENDOR DATA

STATE OF MAINE
DENISE COLEY BROWN
No. 12959
REGISTERED
PROFESSIONAL ENGINEER

REV 0 11-01-12

US Army Corps of Engineers
OMAHA DISTRICT

Mark	Description	Date	Appd
0	ISSUED FOR CONSTRUCTION	11/1/12	

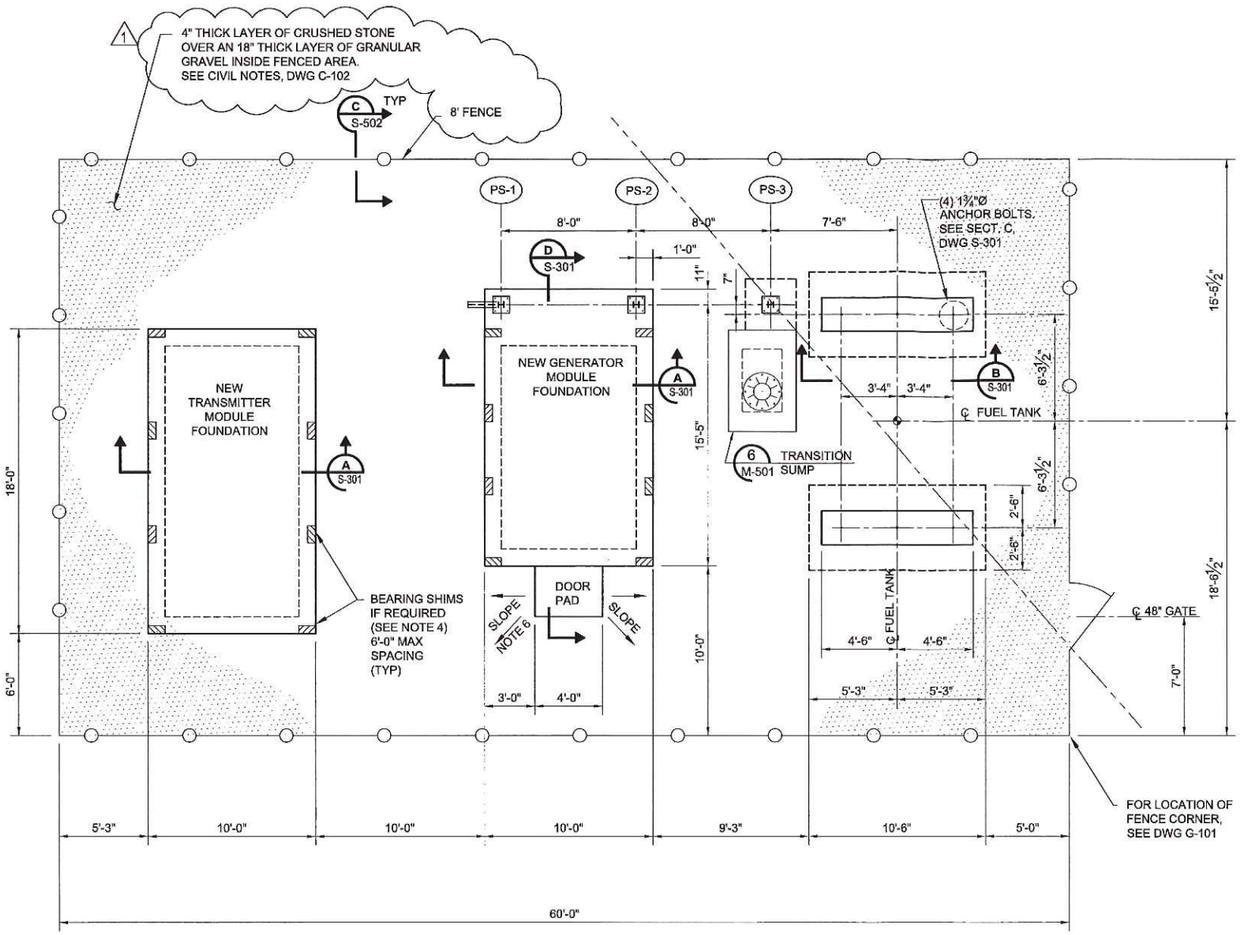
Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

FEMA | US Army Corps of Engineers | KBR
KBR Engineering Services by KBR Engineering Co. LLC
63 SOUTH ROYAL STREET SUITE 200
MOBILE, AL 36602
PHONE: (251) 450-7600
FAX: (251) 450-7898

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

STRUCTURAL GENERAL NOTES

Drawing Number: **S-001**



NOTES:

1. FOR STRUCTURAL GENERAL NOTES, SEE DWG S-001. FOR CIVIL NOTES, SEE DWG C-102.
2. (PS-1) PIPE SUPPORT DESIGNATOR. SEE DWG S-501.
3. SEE ELECTRICAL DRAWINGS FOR GROUNDING.
4. BEARING SHIMS SHALL BE USED AS REQUIRED TO ASSURE PERIMETER BEARING OF GENERATOR AND TRANSMITTER MODULES. BEARING SHIMS PROVIDED WITH MODULE.
5. CONTRACTOR TO CONTACT ENGINEER IF WEIGHT OF EQUIPMENT PURCHASED EXCEEDS THE DEAD AND FLUID LOADS SHOWN ON DWG S-001.
6. SLOPE FINISHED GRADE AND CRUSHED STONE AWAY FROM DOOR PAD AS SHOWN.

A G-101 FOUNDATION AND FENCE PLAN
SCALE: 1/4"=1'-0"

1' 0' 1' 5' 10' 15'
1/4"=1'-0"

STATE OF MAINE
DENISE COUEY BROWN
No. 12059
REGISTERED PROFESSIONAL ENGINEER
Rev 1 01-22-13

US Army Corps of Engineers
OMAHA DISTRICT

FINAL REVIEW: Project Manager, QC Reviewer, Architectural, Structural, Mechanical, Plumbing, Electrical, Civil

Mark	Description	Date	Approved
1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS, DELETED BARBED WIRE AND RAZOR WIRE	01/16/13	
0	ISSUED FOR CONSTRUCTION	11/1/12	

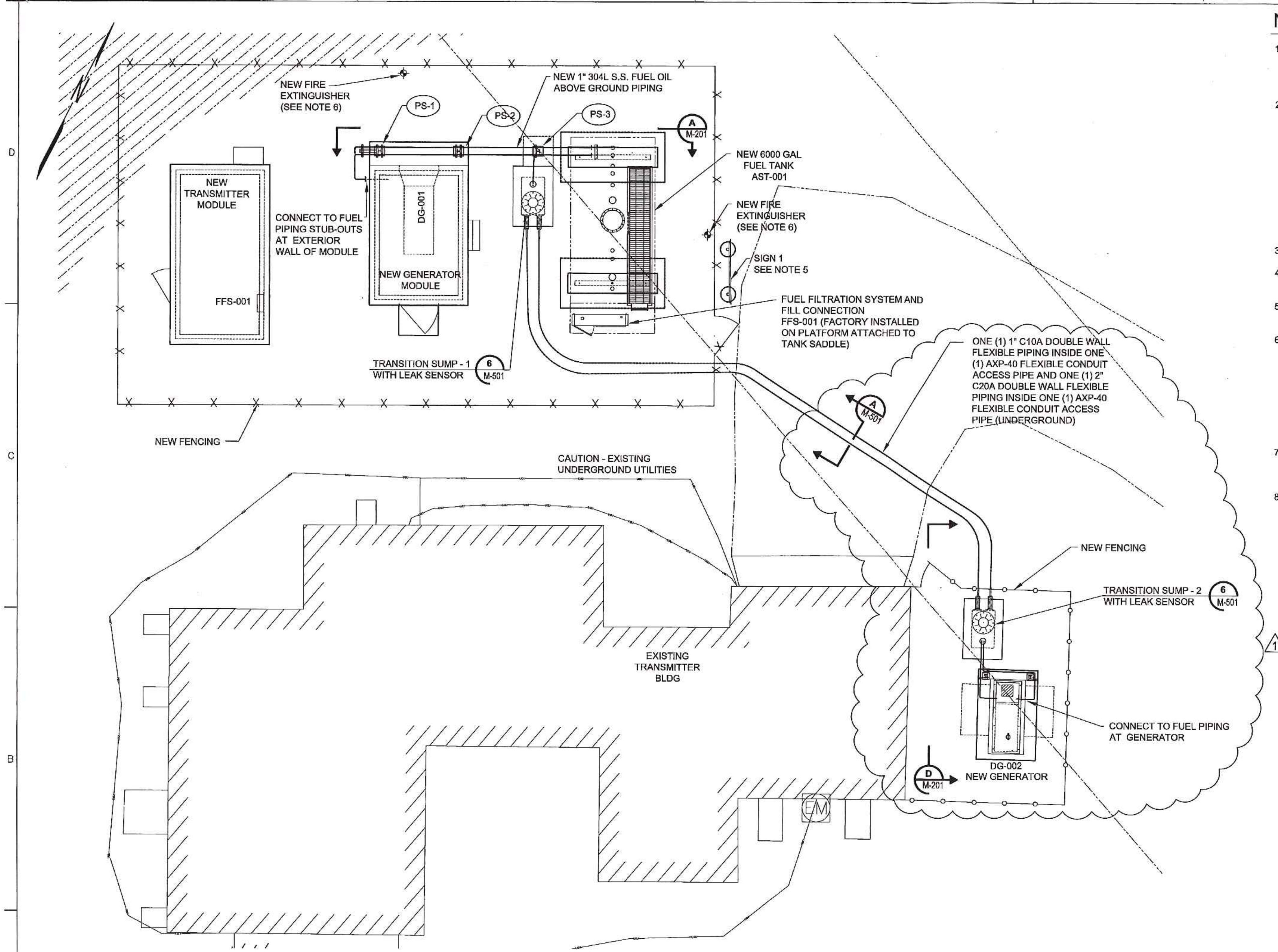
Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

KBR
63 SOUTH ROYAL STREET SUITE 200
MOBILE, AL 36602
PHONE: (251) 450-7600
FAX: (251) 450-7988
KBR
Engineering Services by KBR Engineering Co. LLC

FEMA EMERGENCY RADIO NETWORK ON WCAN PORTLAND, MAINE

FOUNDATION AND FENCE PLAN

Drawing Number:
S-101



EQUIPMENT SCHEDULE

TAG	ITEM	FURNISHED BY	INSTALLED BY	DESCRIPTION	REMARKS
AST-001	ABOVEGROUND STORAGE TANK	OWNER	CONTRACTOR	6,000 GAL. DBL-WALL, UL-2085	PART OF FUEL SYSTEM PACKAGE
DG-001	FEMA GEN-SET	OWNER	OWNER	35 KW IN HEMP SHLD MODULE	PART OF HEMP MODULE PACKAGE
DG-002	NEW GEN-SET	OWNER	CONTRACTOR	75 KW W/ ENCLOSURE & SUB BASE TANK	OWNER TO FURNISH CONTRACTOR TO INSTALL
FFS-001	FUEL FILL/FILTRATION SYSTEM	OWNER	CONTRACTOR	FILL PORT W/ FILTRATION	PART OF FUEL SYSTEM PACKAGE (ON PLATFORM ATTACHED TO TANK)
FSCP-001	FUEL SYSTEM CONTROL PANEL	OWNER	OWNER (SEE ELECTRICAL DWGS & SPECS)	FUEL MONITORING SYSTEM	PART OF FUEL SYSTEM PKG (INSTALLED INSIDE TRANSMITTER MODULE)

A
G-101
MECHANICAL PLAN
SCALE: 3/16"=1'-0"

0' 5' 10' 20'
3/16"=1'-0"

NOTES:

1. THE FUEL TANK, APPURTENANCES, AND ASSOCIATED PIPING SHALL MEET ALL U.S. EPA, STATE OF MAINE DEQ, STATE FIRE MARSHAL, NFPA, NEC, MANUFACTURER'S INSTRUCTIONS, LOCAL FIRE DEPARTMENT AND LOCAL REQUIREMENTS, CODES AND GUIDELINES.
2. ABOVEGROUND PIPING SHALL COMPLY WITH NFPA 30, "FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE" AND ASME B31.9, "BUILDING SERVICES PIPING," FOR FUEL OIL PIPING MATERIALS, INSTALLATION, INSPECTION, AND TESTING. STAINLESS STEEL PIPING SHALL CONFORM TO ASTM A312, PIPE, 304L, STAINLESS STEEL, SCHEDULE 40S. STAINLESS STEEL PIPING SHALL HAVE SOCKET WELD FITTINGS AND SOCKET WELD 150# RF FLANGES. ON GEN-SET FUEL LINE CONNECTIONS WITH MNPT STUB-OUTS, CONTRACTOR SHALL INSTALL A THREADED 150# RF FLANGE OF THE SAME MATERIAL AS THE PIPING THE FLANGE IS BEING THREADED TO. FLANGE INSULATING GASKET KITS SHALL BE USED IN CASES WHERE A CARBON STEEL FLANGE IS BEING MATED TO A STAINLESS STEEL FLANGE. ANY REMAINING CARBON STEEL PIPING THAT IS EXPOSED SHALL BE PAINTED AS PER THE SPECIFICATION. GALVANIZED PIPE IS NOT PERMITTED FOR USE FOR FUEL OIL PIPING OR VENT PIPING.
3. (PS-1) PIPE SUPPORT DESIGNATOR. SEE DWG S-501.
4. SEE DRAWING M-601 AND SPECIFICATION SECTION 23 10 20 FOR FULL SCOPE OF WORK FOR THE FUEL OIL SYSTEM.
5. SEE DRAWING S-502 FOR SIGN DETAILS. INSTALLATION CONTRACTOR SHALL DETERMINE EXACT LOCATION TO CLEAR UNDERGROUND ELECTRICAL.
6. PROVIDE A 4A-40BC (MINIMUM RATING) 10 LB FIRE EXTINGUISHER CONFORMING TO NFPA 10. AND APPLICABLE SECTIONS OF NFPA 1, 13.6. PROVIDE LOCKABLE OUTDOOR CABINET WITH BREAKER BAR, SIGNS AND ACCESSORIES AS REQUIRED. VERIFY LOCAL REQUIREMENTS WITH FIRE MARSHAL PRIOR TO PURCHASE. INSTALL FIRE EXTINGUISHERS WHERE INDICATED ON THE DRAWING. COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALL INSTALLATIONS. PROVIDE EXTINGUISHERS COMPLETE WITH MANUFACTURER'S WARRANTY WITH INSPECTION TAG ATTACHED. EXTINGUISHER SHALL BE INSTALLED, INSPECTED, AND TAGGED BY A LICENSED FIRE EXTINGUISHER COMPANY.
7. UNDERGROUND FLEXIBLE PIPING AND CONTAINMENT SYSTEM ARE IDENTIFIED WITH OPW FLEXWORKS MODEL NUMBERS. SYSTEM SHALL BE OPW FLEXWORKS OR APPROVED EQUAL.
8. UNDERGROUND DOUBLE CONTAINMENT SYSTEM SHALL BE PROVIDED BY CONTRACTOR AS A COMPLETE SYSTEM DESIGNED AND FABRICATED BY THE CONTAINMENT SYSTEM MANUFACTURER WITH RESPECT TO THE DRAWINGS, SPECIFICATIONS, AND THE CONDITIONS OF THE SITE. INSTALLATION OF UNDERGROUND DOUBLE CONTAINMENT SYSTEM SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

STATE OF MAINE
DAVID BLACKWELL HARRIS
No. 12960
REGISTERED
PROFESSIONAL ENGINEER
Rev. 1
01/22/13

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW:	
Project Manager	
QC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Mark	Description	Date	Appvd
1	ADDED FENCING, RELOCATED GEN-SET AND PIPING, DEL. BOLLARDS	1/22/13	
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: DBH
Drawn by: RAM
Checked by: DBH
Reviewed by: CHB
Date: 2012

FEMA
KBR
Engineering Services by KBR Engineering Co. LLC
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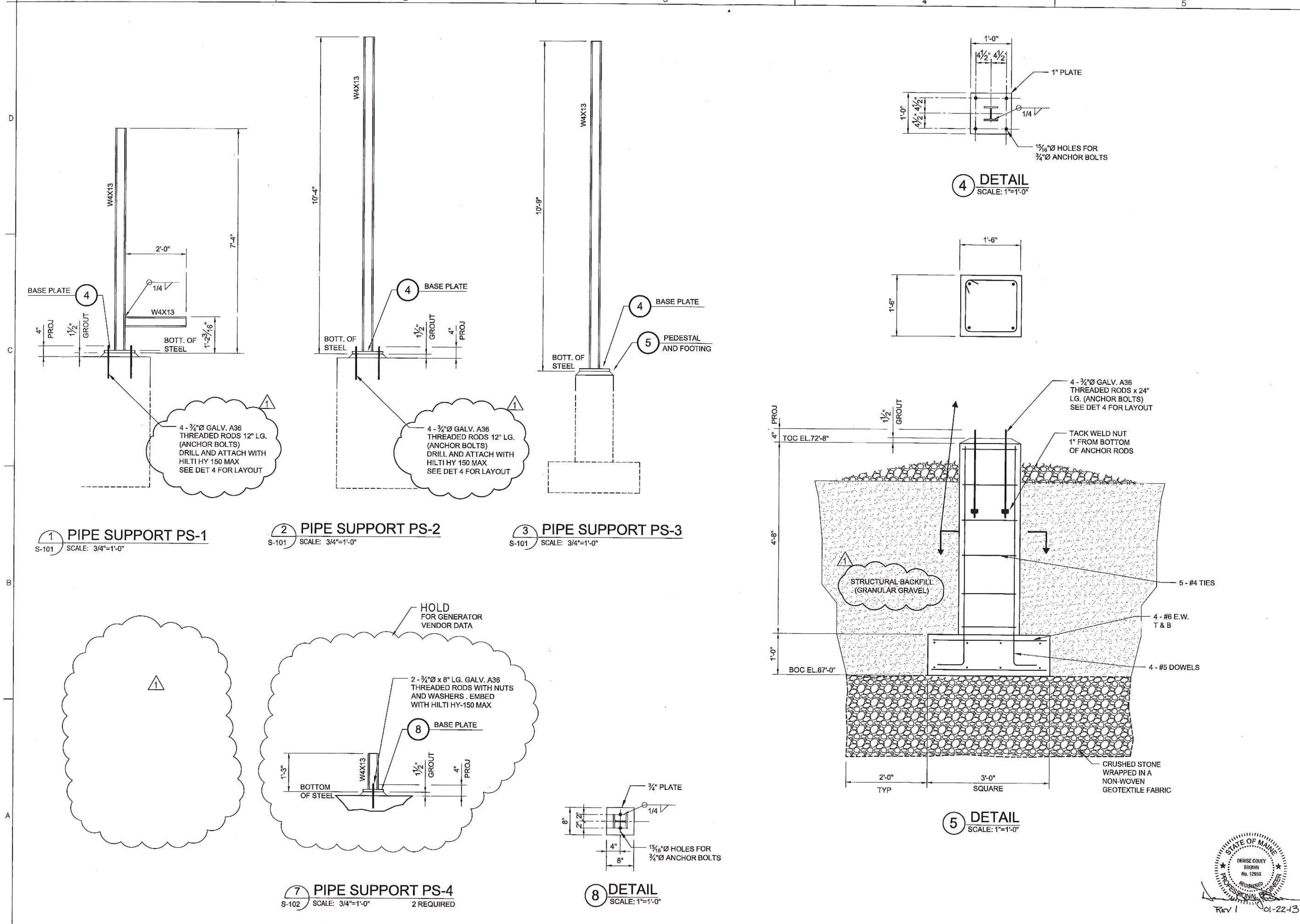
MOBILE, AL 36602
PHONE: (251) 450-7600
FAX: (251) 450-7898

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

MECHANICAL PLAN

Drawing Number:
M-101



US Army Corps of Engineers OMAHA DISTRICT

Mark	Description	Date	Appd
1	ADDED HILTI ANCHORAGE & GRANULAR GRAVEL REQUIREMENTS; DEL BOLLARD DET 6	01/16/13	
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

FEMA KBR
KBR Engineering Services by KBR Engineering Co. LLC
63 SOUTH ROYAL STREET SUITE 200 MOBILE, AL 36602

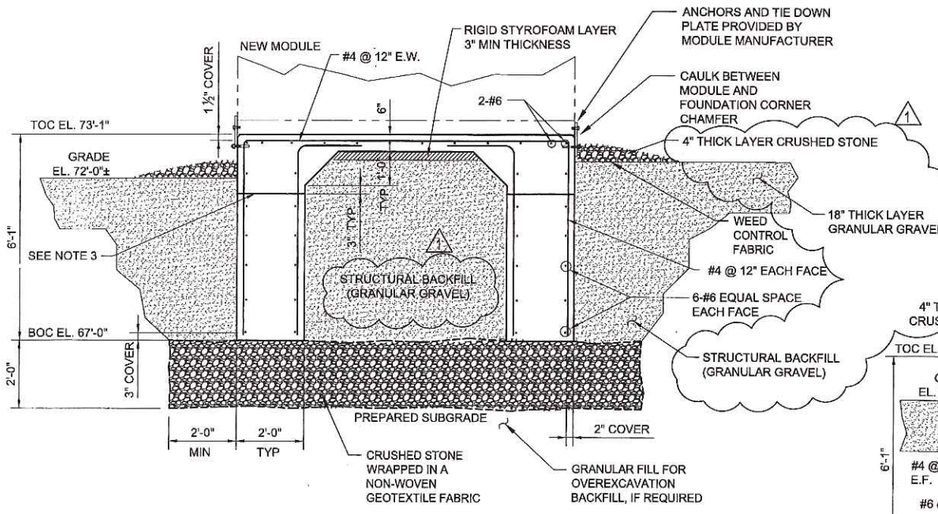
FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

MISCELLANEOUS DETAILS

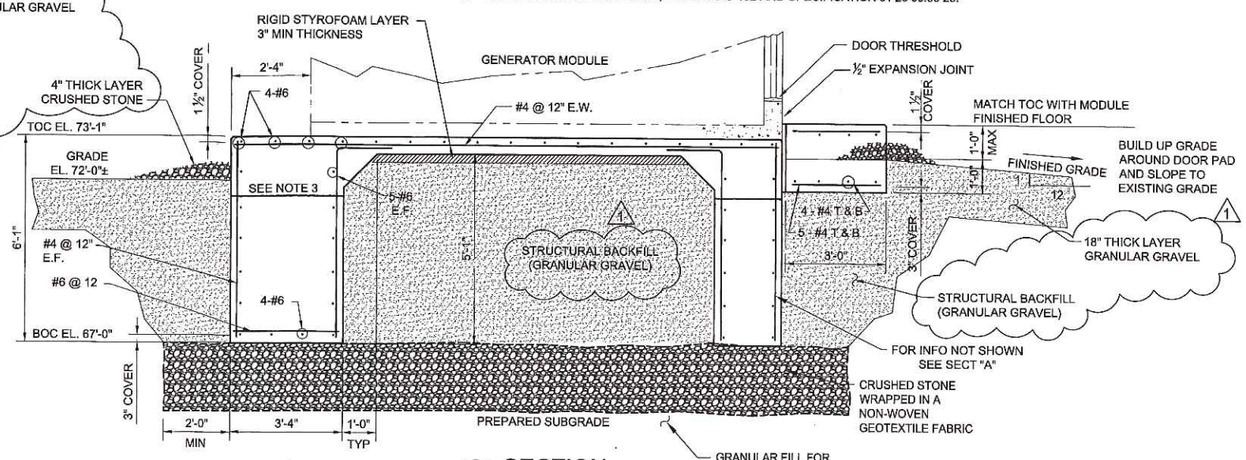
Drawing Number: **S-501**

NOTES:

1. CRUSHED STONE LIMITS SHOWN ON DWG C-102 (SEE NOTE 5).
2. WEED CONTROL TO EXTEND TO LIMITS OF CRUSHED STONE.
3. CONTRACTOR HAS THE OPTION TO BREAK FOUNDATION INTO TWO CONCRETE POURS. VERTICAL REBAR SHALL BE CONTINUOUS THROUGH JOINT. ROUGHEN AND APPLY EPOXY BONDING AGENT PER MANUFACTURER'S RECOMMENDATIONS PRIOR TO SECOND POUR.
4. FOR REBAR COVER, USE 2" WHEN CONCRETE POURED USING FORMS. USE 3" WHEN CONCRETE CAST AGAINST EARTH.
5. SEE ELECTRICAL DRAWINGS FOR GROUNDING ATTACHMENTS.
6. FOR EARTHWORK MATERIALS, SEE DWG C-102 AND SPECIFICATION 31 23 00.00 20.

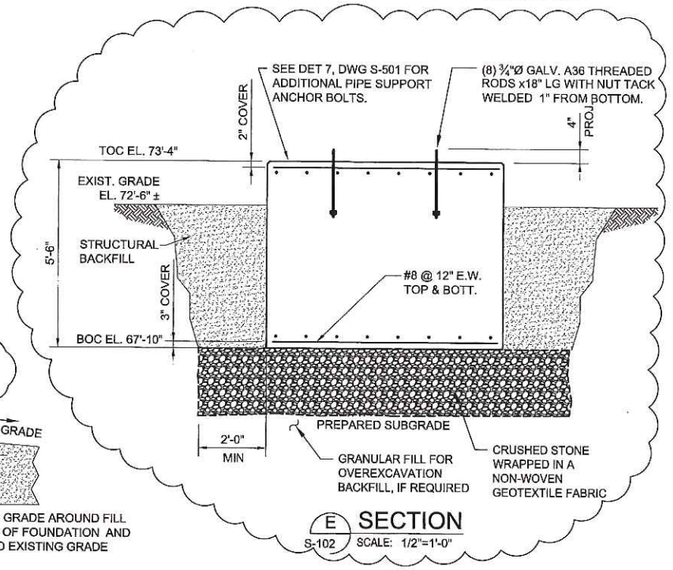


A SECTION
S-101 SCALE: 1/2"=1'-0"



D SECTION
S-101 SCALE: 1/2"=1'-0"

HOLD FOR GENERATOR VENDOR DATA



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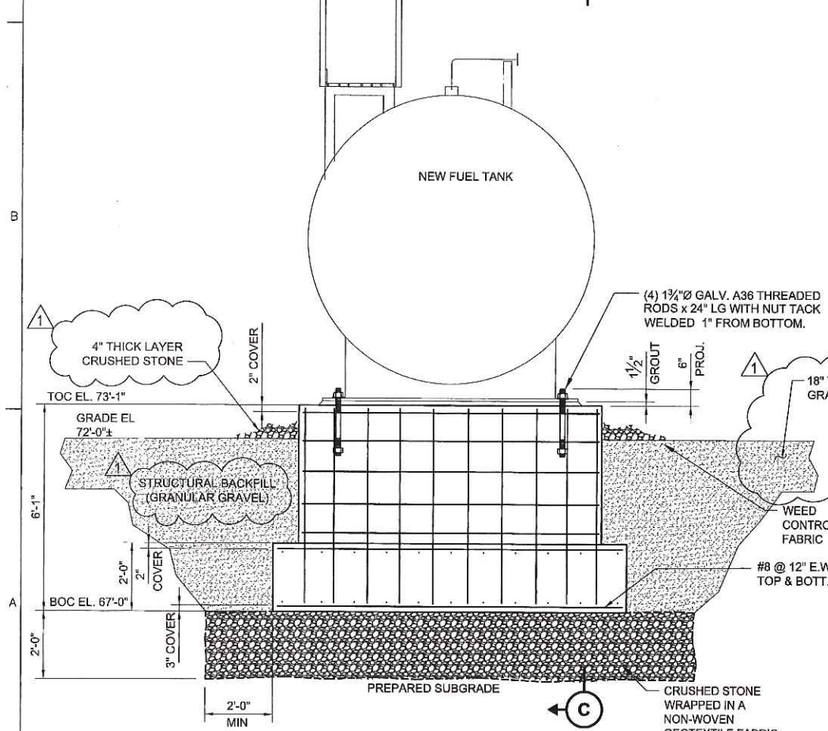
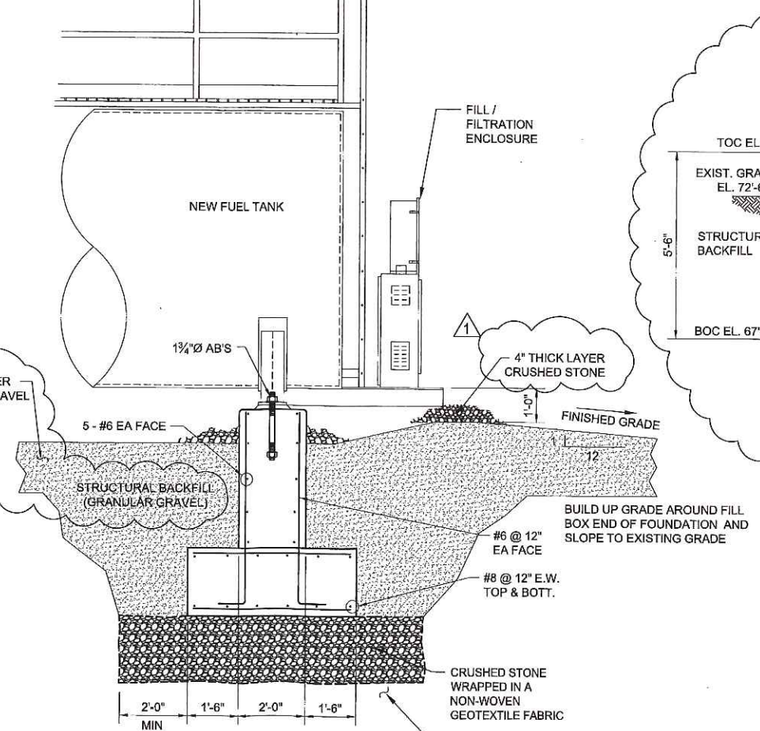
S-102 SCALE: 1/2"=1'-0"



B SECTION
S-101 SCALE: 1/2"=1'-0"



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

US Army Corps of Engineers
OMAHA DISTRICT

PROJ. REVIEW:	
Project Manager	
QC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Mark	Description	Date	Approved
1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS	01/16/13	
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: DCB
Drawn by: RAM
Checked by: MLM
Reviewed by: DCB
Date: 2012

FEMA

KBR
63 SOUTH NEW STREET, SUITE 200
DOVER, DE 19904
PHONE: (302) 430-7600
FAX: (302) 430-7638
Engineering Services by KBR Engineering Co., LLC

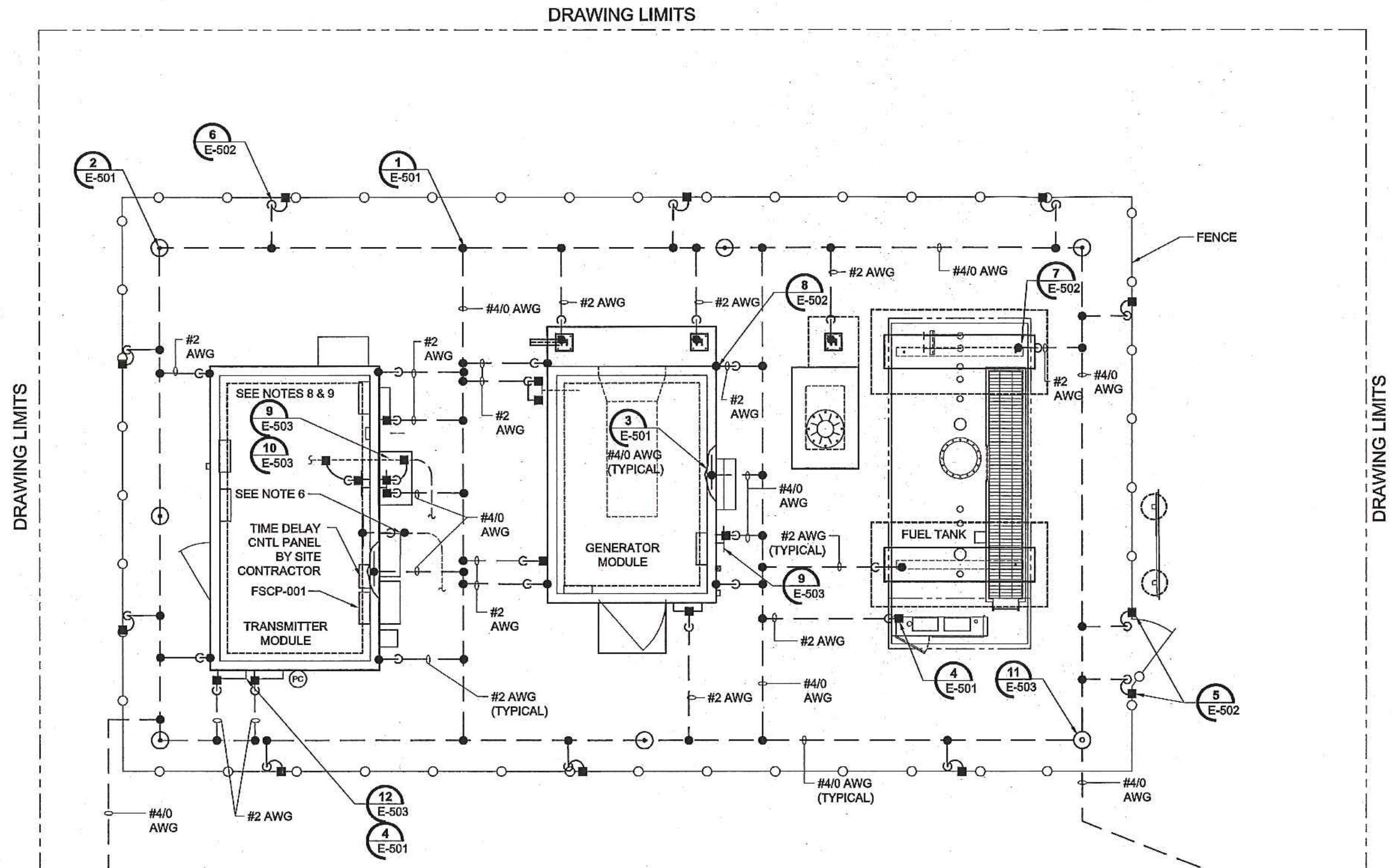
FEMA EMERGENCY RADIO NETWORK
ON WOAN PORTLAND, MAINE

MISCELLANEOUS SECTIONS

Drawing Number:
S-301

STATE OF MAINE
DENISE COLEY BROWN
No. 12959
REGISTERED PROFESSIONAL ENGINEER

Rev 1 01-22-13



CONTINUED ON DRAWING E-105

CONTINUED ON DRAWING E-104

A / E-101 GROUNDING PLAN

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

1' 0' 1' 5' 10' 15'
1/4"=1'-0"

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. GROUND CONDUCTORS / TOWER GROUND RADIALS DAMAGED OR CUT DURING CONSTRUCTION SHALL BE REPAIRED BEFORE CONTINUING CONSTRUCTION ACTIVITIES. REROUTING OF GROUND CONDUCTORS AROUND IMPACTED AREAS SHALL BE COMPLETED BEFORE CONTINUING.
3. ALL GROUNDING CONNECTIONS SHALL BE EXOTHERMIC, NO COMPRESSION CONNECTIONS PERMITTED. MECHANICAL CONNECTIONS SHALL BE PERMITTED FOR EQUIPMENT UTILIZING BOLTED TYPE CONNECTIONS WHICH MAY REQUIRE REMOVAL FOR MAINTENANCE.
4. MODULE GROUND CONNECTIONS SHALL BE LOCATED AT ALL PENETRATION AREAS IN ADDITION TO THE PROVIDED GROUNDING PADS AT THE GENERATOR MODULE CORNERS. A MECHANICAL CONNECTION SHALL BE ATTACHED TO THE CONDUIT / PIPING EXITING THE MODULE UTILIZING A BURNDY CONNECTOR TYPE GAR-BU OR APPROVED EQUAL. SIZE AS REQUIRED.
5. CONTRACTOR SHALL TIE INTO EXISTING GROUND LOOP TO ENSURE CONTINUITY OF THE OVERALL GROUNDING SYSTEM.
6. CONTRACTOR SHALL CONNECT THE INTERIOR RF 4" COPPER BONDING TAPE (PROVIDED BY SABRE INDUSTRIES) TO THE RF GROUND TAPE ROUTED WITH THE RF COAXIAL CABLE (PROVIDED BY SITE CONTRACTOR). SILVER SOLDER ALL RF 4" WIDE TAPE CONNECTIONS.
7. WHERE THE GROUNDING ELECTRODE CONDUCTOR EXITS FROM BELOW GRADE IT SHALL BE ROUTED IN A SCHEDULE 80 PVC CONDUIT FROM 18" BELOW GRADE UP TO 8'-0" ABOVE GRADE.
8. THE RF COAX CABLE SHALL BE BONDED TO THE GROUNDING BUS BARS BELOW THE BULK HEAD PENETRATION BOTH EXTERIOR AND INTERIOR. ANDREWS GROUNDING KIT(S) NO. 241088-2 OR APPROVED EQUAL
9. CONTRACTOR SHALL CONNECT THE EXTERIOR RF GROUND BUS BAR TO THE GROUND LOOP UTILIZING A # 4/0 AWG INSULATED GROUNDING CONDUCTOR.
10. MODULE GROUND CONNECTIONS ARE LOCATED ON THE SIDES OF THE MODULE BUILDING. SEE CELLXION DRAWINGS FOR EXACT LOCATIONS FOR GROUNDING STUB-UPS. TYPICAL BOTH MODULES

LEGEND:

- UNDERGROUND CONDUIT
- ABOVE GROUND CONDUIT
- GROUND ROD, 3/4" X 10' SECTIONAL COPPER CLAD
- EXOTHERMIC WELD, SEE DETAIL FOR TYPE
- MECHANICAL GROUND CONNECTION, SEE DETAIL FOR TYPE
- GROUNDING TEST WELL
- GROUNDING CONDUCTOR (BURIAL DEPTH 30")
- 4" WIDE (.016" TO .022") COPPER RF BONDING TAPE
- 3"C 7/8" RF COAXIAL CABLE
- CONDUIT / CABLE TURNED DOWN
- CONDUIT / CABLE TURNED UP
- GROUNDING BUS BAR
- GROUND CONNECTION TO FOUNDATION REBAR LOCATION AT LOWEST LEVEL (UFER GROUND)
- XX / E-5XX DETAIL/SHEET #

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
LICENSED PROFESSIONAL ENGINEER
11/1/12

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW:	Project Manager	QC Reviewer	Architectural	Structural	Mechanical	Plumbing	Electrical	Civil

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by:	Drawn by:	Checked by:	Reviewed by:	Date:
				2012

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KBR
Engineering Services by KBR Engineering Co. LLC
63 SOUTH ROYAL STREET SUITE 200
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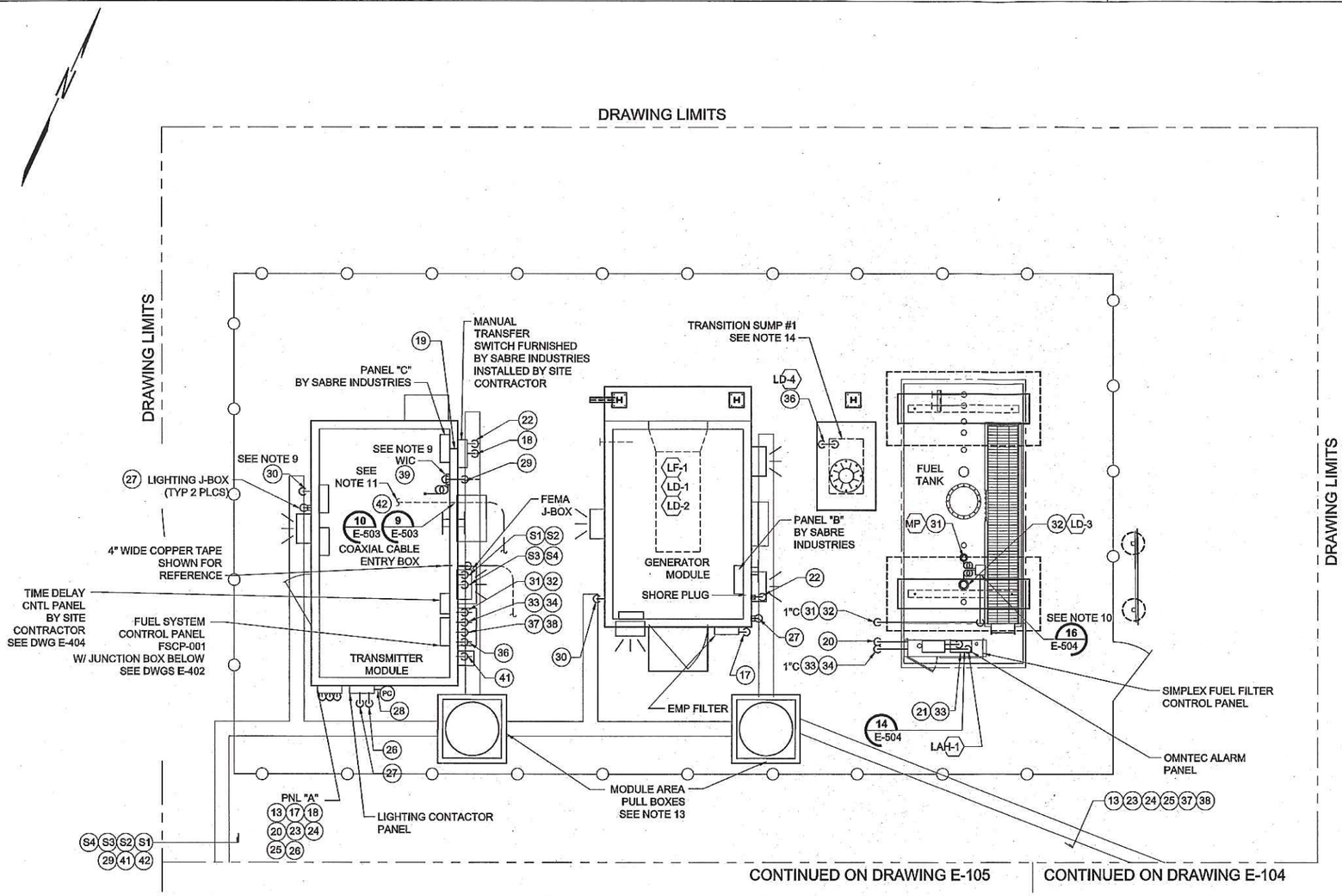
FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

ELECTRICAL GROUNDING PLAN

Drawing Number:

E-102



A POWER PLAN
E-101 SCALE: 1/4"=1'-0"

1' 0' 1' 5' 10' 15'
1/4"=1'-0"

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. ALL BUILDING PENETRATIONS SHALL BE SEALED WITH A FIRE BLOCK SEALANT TO PREVENT WATER FROM ENTERING THE INTERIOR. ALL PANEL ENTRY PENETRATIONS SHALL UTILIZE MYERS HUBS WITH GROUNDING BUSHINGS.
3. ALL CONDUIT/DUCTBANK ROUTING IS SHOWN DIAGRAMMATIC, CONTRACTOR SHALL VERIFY LOCATION, ROUTING, AND PULL BOX REQUIREMENTS BEFORE INSTALLATION. COORDINATE INSTALLATION WITH OTHER CRAFTS BEFORE INSTALLING CONDUITS, PULL BOXES AS REQUIRED, PANELS, AND DEVICES.
4. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED FOR ELECTRICAL POWER DURING SHUTDOWN PERIODS. INCLUDING TEMPORARY GENERATOR, DAY TANK, REQUIRED FUEL AND OPERATOR TECHNICIAN AS REQUIRED.
5. CONTRACTOR SHALL VERIFY ELECTRICAL PHASE ARRANGEMENTS / CONNECTIONS, MAKING ADJUSTMENTS AS REQUIRED, MATCHING THE NEW INSTALLED SYSTEM(S) TO THE EXISTING FACILITIES SYSTEM. NEW PANEL CONNECTIONS TO EXISTING EQUIPMENT SHALL BE VERIFIED BEFORE APPLICATION OF POWER. FACILITIES ENGINEER SHALL BE PRESENT UPON ENERGIZING EQUIPMENT.
6. CONDUITS INSTALLED UNDERGROUND SHALL BE PVC COATED RIGID GALVANIZED STEEL. ABOVE GRADE EXTERIOR CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS), INTERIOR CONDUITS MAY BE ELECTRICAL METALLIC TUBING (EMT).
7. CONTRACTOR SHALL INSTALL SURFACE MOUNTED CONDUIT AND WIRING FROM ALL EXTERIOR MODULE LIGHTING FIXTURES TO A SINGLE WIRING POINT PER MODULE. CONDUITS SHALL BE PAINTED TO MATCH THE MODULE COLOR. THE SINGLE POINT CONNECTION FOR THE GENERATOR MODULE SHALL NOT BE LOCATED BELOW THE EMP POWER FILTER ENCLOSURE. SEE CELLXION DRAWINGS FOR FIXTURE LOCATIONS.
8. SEE CELLXION MODULE DRAWINGS SKBR01 & SKBR02 FOR BUILDING PENETRATION LOCATIONS TO COORDINATE CONDUITS STUB-UPS CONNECTIONS.
9. CONTRACTOR SHALL PROVIDE FIBER OPTIC JUMPERS (PIGTAILS) AS REQUIRED FOR CONNECTION TO THE PROGRAMMING EQUIPMENT. CONNECTING TO THE OSP FIBER OPTIC CABLING TO THE FIBER OPTIC WALL MOUNT INTERCONNECTION CENTER BY SABRE INDUSTRIES. CONTRACTOR SHALL FURNISH ST STYLE CONNECTORS INSTALLING FAN OUT KITS AS REQUIRED FOR THE 6 FIBER 62.5 / 125 MULTI-MODE OUTSIDE PLANT RATED F/O CABLE.
10. CONTRACTOR SHALL INSTALL THE INSTRUMENT JUNCTION BOX ON TOP OF THE FUEL TANK BETWEEN THE FIELD DEVICES TO ALLOW FOR INSTALLATION / CHECKING OF INSTRUMENT CONNECTIONS. JUNCTION BOX SHOULD BE LOCATED ADJACENT TO THE CATWALK.

NOTES CONTINUED:

11. CONTRACTOR SHALL INSTALL A COAXIAL EIA FLANGE CONNECTOR (ANDREWS CAT NO. AL5E78-PS) ON THE NEW CABLE WITH THE CABLE END LOCATED ABOVE THE NEW TRANSMITTER CABINET. A MINIMUM OF 12 LF EXCESS CABLE SHALL BE PROVIDED TO FACILITATE CONNECTION WITH THE CABINET DOOR REMOVED.
12. CONTRACTOR SHALL TERMINATE ALL 25 PAIRS OF THE OSP COMMUNICATION CABLE IN THE TRANSMITTER MODULE TO THE PROVIDED PUNCH DOWN BLOCK. ALL WIRING FROM WITHIN THE MODULE TO THE PUNCH DOWN BLOCK IS BY OTHERS. TWO PAIRS OF THE 25 PAIR CABLE SHALL BE IDENTIFIED BY THE CONTRACTOR FOR SIGNALS FROM THE TRANSMITTER MODULE. THE FIRST PAIR IS FOR THE ENDEC PROGRAMMING EQUIPMENT. THE SECOND PAIR WILL SERVE ALL REMAINING DEVICES IN THE TRANSMITTER BUILDING; PHONE OUTLETS, INCON FUEL SYSTEM, AND VIKING AUTO DIALER.
13. CONTRACTOR SHALL PROVIDE PULL BOXES OR MANHOLES AS REQUIRED TO MEET NEC REQUIREMENTS FOR PULL POINTS. PULL BOX / MANHOLE SHALL HAVE A TRAFFIC RATING "H20" DUE TO GROUNDS MAINTENANCE EQUIPMENT. HUBBLE QUAZITE #PG4848BA48 W/ COVER #PG4848HH00 OR APPROVED EQUAL.
14. CONDUIT ENTERING THE TRANSITION SUMP SHALL BE MADE UTILIZING A STTTB TYPE BULK HEAD FITTING. A SEALED FITTING SHALL BE UTILIZED ABOVE THE CONCRETE CAP TO PREVENT THE ENTRANCE OF WATER INTO THE SUMP WHEN ENTERING THE TOP OF THE SUMP. COORDINATE CONDUIT PLACEMENT WITH MECHANICAL AND STRUCTURAL DRAWINGS.

LEGEND:

- UNDERGROUND CONDUIT
- ABOVE GROUND CONDUIT
- 3"C 7//8" RF COAXIAL CABLE
- CONDUIT / CABLE TURNED DOWN
- CONDUIT / CABLE TURNED UP
- HIGH PRESSURE SODIUM WALL MOUNTED FIXTURE,70 WATT, 120 VAC, FURNISHED WITH MODULES. CONTRACTOR SHALL MOUNT LIGHTS AND DISCONNECT THE INTERGAL PHOTO ELECTRIC CELL(S). T.O.F. ELEVATION 9'-0" A.F.G.
- (XX) CABLE NUMBER (SEE E-403)
- XXX-X INSTRUMENT TAG
- XX / E-5XX DETAIL/SHEET #

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
REGISTERED PROFESSIONAL ENGINEER

US Army Corps of Engineers
OMAHA DISTRICT

FENCE ROVER:	
Project Manager	
QC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by:
Drawn by:
Checked by:
Reviewed by:
Date: 2012

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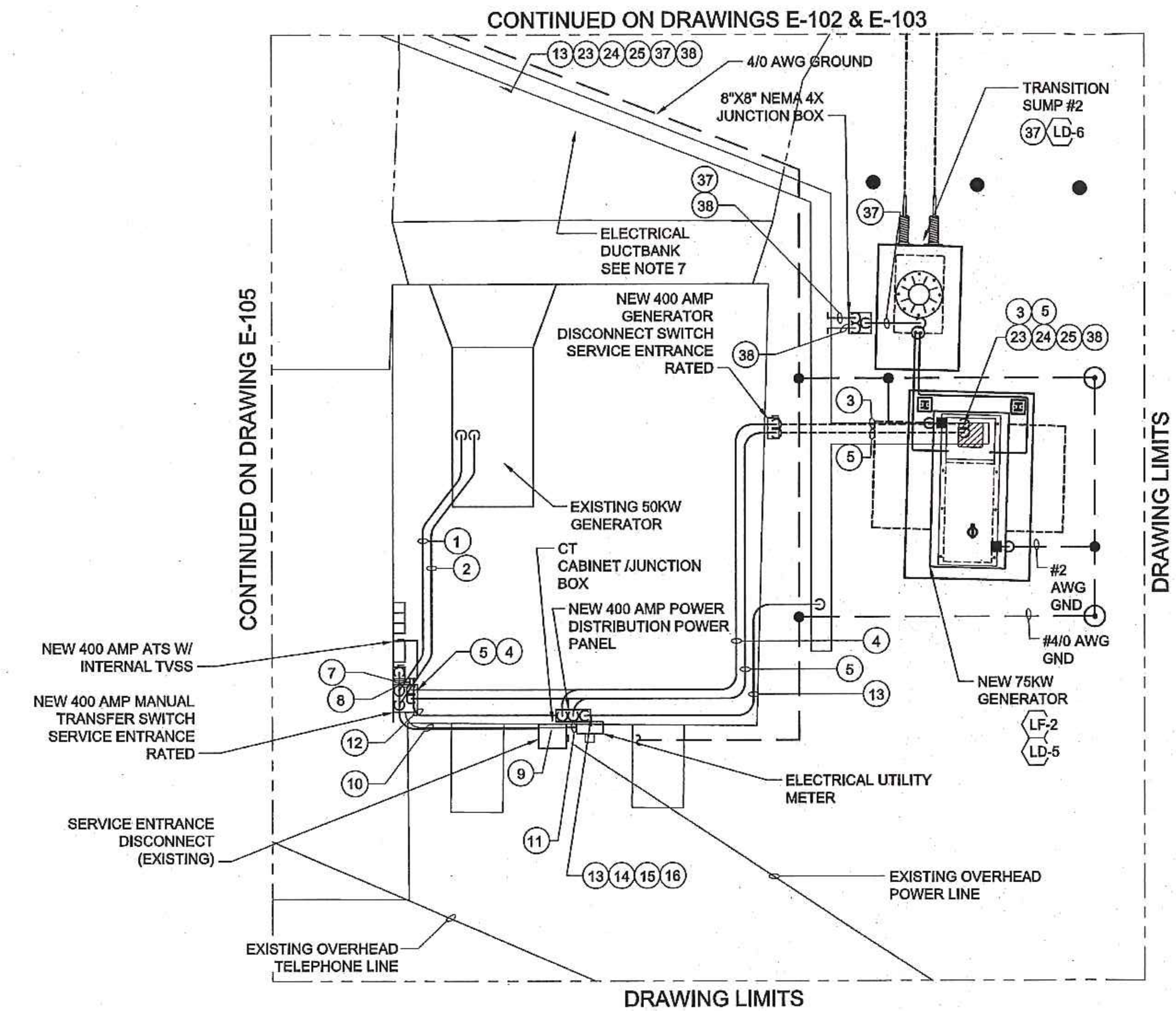
FEMA

FEMA EMERGENCY RADIO NETWORK
ON WGAN PORTLAND, MAINE

ELECTRICAL POWER PLAN

Drawing Number:
E-103



A E-101 **GROUNDING & POWER PLAN**

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

1' 0' 1' 5' 10' 15'
1/4"=1'-0"

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS..
2. ALL BUILDING PENETRATIONS SHALL BE SEALED WITH A FIRE BLOCK SEALANT TO PREVENT WATER FROM ENTERING THE INTERIOR. ALL PANEL ENTRY PENETRATIONS SHALL UTILIZE MYERS HUBS WITH GROUNDING BUSHINGS.
3. ALL CONDUIT ROUTING IS SHOWN DIAGRAMMATIC, CONTRACTOR SHALL VERIFY LOCATION AND ROUTING BEFORE INSTALLATION. COORDINATE INSTALLATION WITH OTHER CRAFTS BEFORE INSTALLING CONDUITS, PULL BOXES AS REQUIRED, PANELS, AND DEVICES.
4. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED TO MAINTAIN SERVICE DURING SHUTDOWN PERIODS.
5. CONTRACTOR SHALL VERIFY ELECTRICAL PHASE ARRANGEMENTS / CONNECTIONS, MAKING ADJUSTMENTS AS REQUIRED, MATCHING THE NEW INSTALLED SYSTEM(S) TO THE EXISTING FACILITIES SYSTEM. NEW PANEL CONNECTIONS TO EXISTING EQUIPMENT SHALL BE VERIFIED BEFORE APPLICATION OF POWER. FACILITIES ENGINEER SHALL BE PRESENT UPON ENERGIZING EQUIPMENT.
6. CONDUITS INSTALLED UNDERGROUND SHALL BE PVC COATED RIGID GALVANIZED STEEL. ABOVE GRADE EXTERIOR CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS), INTERIOR CONDUITS MAY BE ELECTRICAL METALLIC TUBING (EMT).
7. DUE TO UNDERGROUND INSTALLATION OBSTRUCTIONS HAND EXCAVATION IS REQUIRED FOR AREA ADJACENT TO THE STATION BUILDING. NO EXCAVATORS OR POWERED EQUIPMENT SHALL BE UTILIZED.

LEGEND:

- UNDERGROUND CONDUIT
- ABOVE GROUND CONDUIT
- GROUND ROD, 3/4" X 10' SECTIONAL COPPER CLAD
- EXOTHERMIC WELD, SEE DETAIL FOR TYPE
- MECHANICAL GROUND CONNECTION, SEE DETAIL FOR TYPE
- GROUNDING TEST WELL
- GROUNDING CONDUCTOR (BURIAL DEPTH 30")
- 4" WIDE (.016" TO .022") COPPER RF BONDING TAPE
- 3"C 7/8" RF COAXIAL CABLE
- CONDUIT / CABLE TURNED DOWN
- CONDUIT / CABLE TURNED UP
- GROUNDING BUS BAR
- GROUND CONNECTION TO FOUNDATION REBAR LOCATION AT LOWEST LEVEL (UFER GROUND)
- HIGH PRESSURE SODIUM WALL MOUNTED FIXTURE,70 WATT, 120 VAC, FURNISHED WITH MODULES. CONTRACTOR SHALL MOUNT LIGHTS AND DISCONNECT THE INTERGAL PHOTO ELECTRIC CELL(S). T.O.F. ELEVATION 9'-0" A.F.G.
- (XX) CABLE NUMBER (SEE E-403)
- XXX-X INSTRUMENT TAG
- XX / E-5XX DETAIL/SHEET #

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
PROFESSIONAL ENGINEER

US Army Corps of Engineers
OMAHA DISTRICT

ISSUED FOR CONSTRUCTION 11/1/12

FEMA

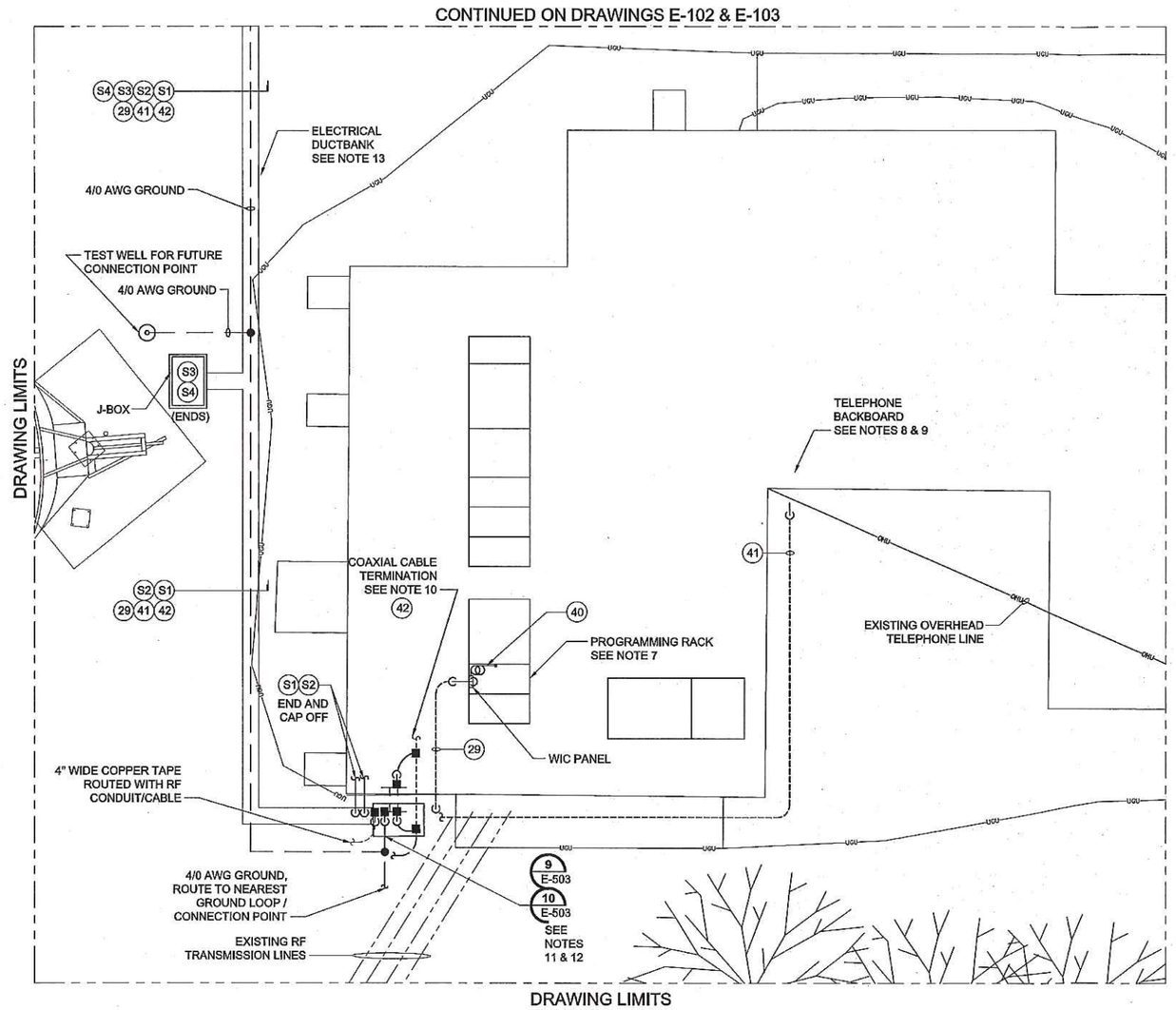
KBR
Engineering Services by KBR Engineering Co. LLC

Date: 2012

FEMA EMERGENCY RADIO NETWORK
ON WGAN PORTLAND, MAINE

GROUNDING & POWER PLAN

Drawing Number:
E-104



A E-101 GROUNDING & POWER PLAN

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

1' 0 1' 5' 10'

3/8"=1'-0"

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS..
2. ALL BUILDING PENETRATIONS SHALL BE SEALED WITH A FIRE BLOCK SEALANT TO PREVENT WATER FROM ENTERING THE INTERIOR. ALL PANEL ENTRY PENETRATIONS SHALL UTILIZE MYERS HUBS WITH GROUNDING BUSHINGS.
3. ALL CONDUIT ROUTING IS SHOWN DIAGRAMMATIC, CONTRACTOR SHALL VERIFY LOCATION AND ROUTING BEFORE INSTALLATION. COORDINATE INSTALLATION WITH OTHER CRAFTS BEFORE INSTALLING CONDUITS, PULL BOXES AS REQUIRED, PANELS, AND DEVICES.
4. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED FOR ELECTRICAL POWER DURING SHUTDOWN PERIODS, INCLUDING TEMPORARY GENERATOR, DAY TANK, REQUIRED FUEL AND OPERATOR TECHNICIAN AS REQUIRED.
5. CONTRACTOR SHALL VERIFY ELECTRICAL PHASE ARRANGEMENTS / CONNECTIONS, MAKING ADJUSTMENTS AS REQUIRED, MATCHING THE NEW INSTALLED SYSTEM(S) TO THE EXISTING FACILITIES SYSTEM. NEW PANEL CONNECTIONS TO EXISTING EQUIPMENT SHALL BE VERIFIED BEFORE APPLICATION OF POWER. FACILITIES ENGINEER SHALL BE PRESENT UPON ENERGIZING EQUIPMENT.
6. CONDUITS INSTALLED UNDERGROUND SHALL BE PVC COATED RIGID GALVANIZED STEEL. ABOVE GRADE EXTERIOR CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS), INTERIOR CONDUITS MAY BE ELECTRICAL METALLIC TUBING (EMT).
7. CONTRACTOR SHALL PROVIDE FIBER OPTIC JUMPERS (PIGTAILS) AS REQUIRED FOR CONNECTION TO THE PROGRAMMING EQUIPMENT. CONNECTING TO THE OSP FIBER OPTIC CABLING TO THE FIBER OPTIC WALL MOUNT INTERCONNECTION CENTER BY SABRE INDUSTRIES. CONTRACTOR SHALL FURNISH ST STYLE CONNECTORS INSTALLING FAN OUT KITS AS REQUIRED FOR THE 6 FIBER 62.5 / 125 MULTI-MODE OUTSIDE PLANT RATED F/O CABLE.
8. CONTRACTOR SHALL INSTALL A NEW COMMUNICATION BACKBOARD UTILIZING 3/4" PLYWOOD. ROUTE THE 25 PAIR OSP COMMUNICATION CABLE TO THE NEW COMMUNICATION BACKBOARD AND SHALL PROVIDE AND INSTALL A NEW SURGE PROTECTED 66 BLOCK (CIRCA TELECOM 2625QC-3B1E OR EQUAL) WITH ANALOG GAS TUBE SURGE PROTECTORS IN THE TELEPHONE CLOSET. ALL 25 PAIRS SHALLBE TERMINATED TO THE 66 BLOCK WITH THE (2) UTILIZED PAIRS IDENTIFIED/NOTED. CONTRACTOR SHALL INSTALL ALL JUMPERS /CROSS CONNECTION FOR THE TWO UTILIZED LINES AS REQUIRED FOR TERMINATION TO THE PHONE COMPANY DEMARCATION POINT. CONTRACTOR SHALL BOND THE 66 BLOCK TO THE EXISTING GROUNDING TERMINAL, WHERE THIS ISN'T IN PLACE THE CONTRACTOR SHALL ROUTE A INSULATED #4 AWG GROUND CONDUCTOR TO THE NEAREST GROUNDING POINT.
9. CONTRACTOR SHALL ROUTE A 4-PAIR TELEPHONE CABLE IN THE EXISTING FLOOR TRENCH TO THE TELEPHONE DEMARCATION BOX.
10. ROUTE COAX RF CABLE INTO PHASOR ROOM. STATION ENGINEER WILL TERMINATE CABLE.
11. THE RF COAX CABLE SHALL BE BONDED TO THE GROUNDING BUS BARS BELOW THE BULK HEAD PENETRATION BOTH EXTERIOR AND INTERIOR. ANDREWS GROUNDING KIT(S) NO. 241088-2 OR APPROVED EQUAL.
12. CONTRACTOR SHALL CONNECT TO THE EXTERIOR GROUND BUS BAR TO THE GROUND LOOP WITH A #4/0 AWG INSULATED GROUND CONDUCTOR.
13. DUE TO UNDERGROUND INSTALLATION OBSTRUCTIONS HAND EXCAVATION IS REQUIRED FOR AREA ADJACENT TO THE STATION BUILDING. NO EXCAVATORS OR POWERED EQUIPMENT SHALL BE UTILIZED.

LEGEND:

- UNDERGROUND CONDUIT
- ABOVE GROUND CONDUIT
- GROUND ROD, 3/4" X 10' SECTIONAL COPPER CLAD
- EXOTHERMIC WELD, SEE DETAIL FOR TYPE
- MECHANICAL GROUND CONNECTION, SEE DETAIL FOR TYPE
- GROUNDING TEST WELL
- GROUNDING CONDUCTOR (BURIAL DEPTH 30")
- 4" WIDE (.016" TO .022") COPPER RF BONDING TAPE
- 3"C 7/8" RF COAXIAL CABLE
- CONDUIT / CABLE TURNED DOWN
- CONDUIT / CABLE TURNED UP
- GROUNDING BUS BAR
- GROUND CONNECTION TO FOUNDATION REBAR LOCATION AT LOWEST LEVEL (UFER GROUND)
- HIGH PRESSURE SODIUM WALL MOUNTED FIXTURE,70 WATT, 120 VAC, FURNISHED WITH MODULES. CONTRACTOR SHALL MOUNT LIGHTS AND DISCONNECT THE INTERGAL PHOTO ELECTRIC CELL(S). T.O.F. ELEVATION 9'-0" A.F.G.
- (XX) CABLE NUMBER (SEE E-403)
- XXX-X INSTRUMENT TAG
- XX / E-5XX DETAIL/SHEET #

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
LICENSED PROFESSIONAL ENGINEER

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW:
Project Manager
QC Reviewer
Architectural
Structural
Mechanical
Plumbing
Electrical
Civil

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by:
Drawn by:
Reviewed by:
Checked by:
Date: 2012

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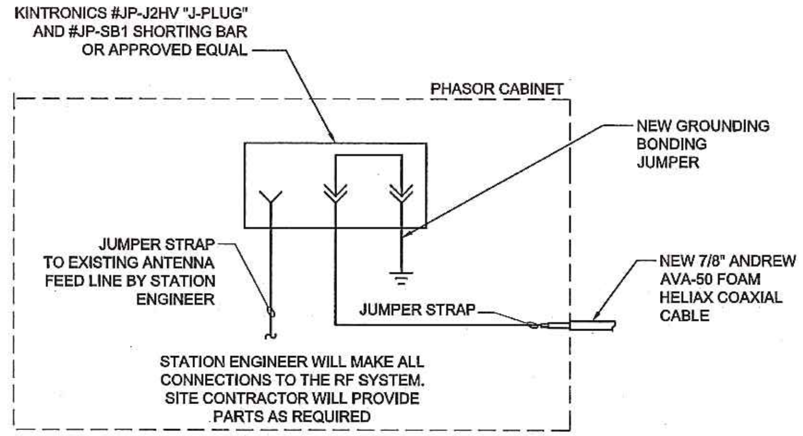
FEMA

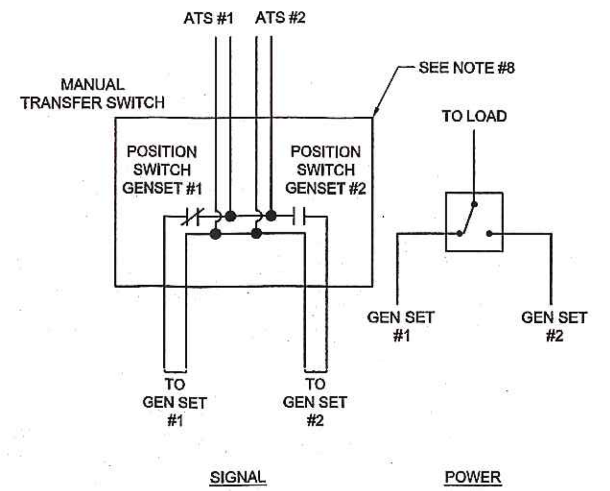
FEMA EMERGENCY RADIO NETWORK
ON WGAN PORTLAND, MAINE

GROUNDING & POWER PLAN

Drawing Number:
E-105



RF CONNECTION DIAGRAM



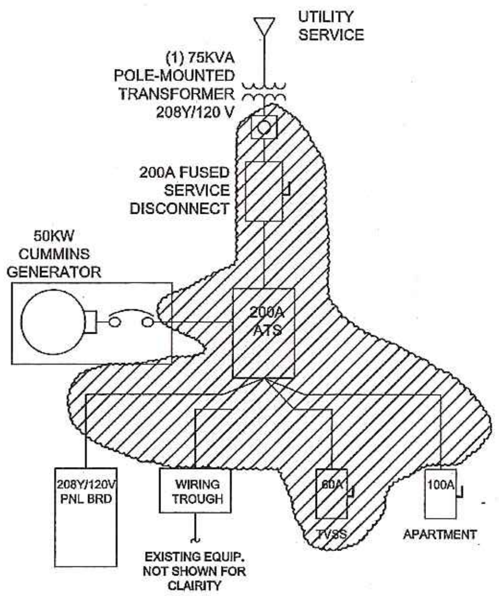
GENERATOR RUN SIGNAL MODIFICATION

NOTES:

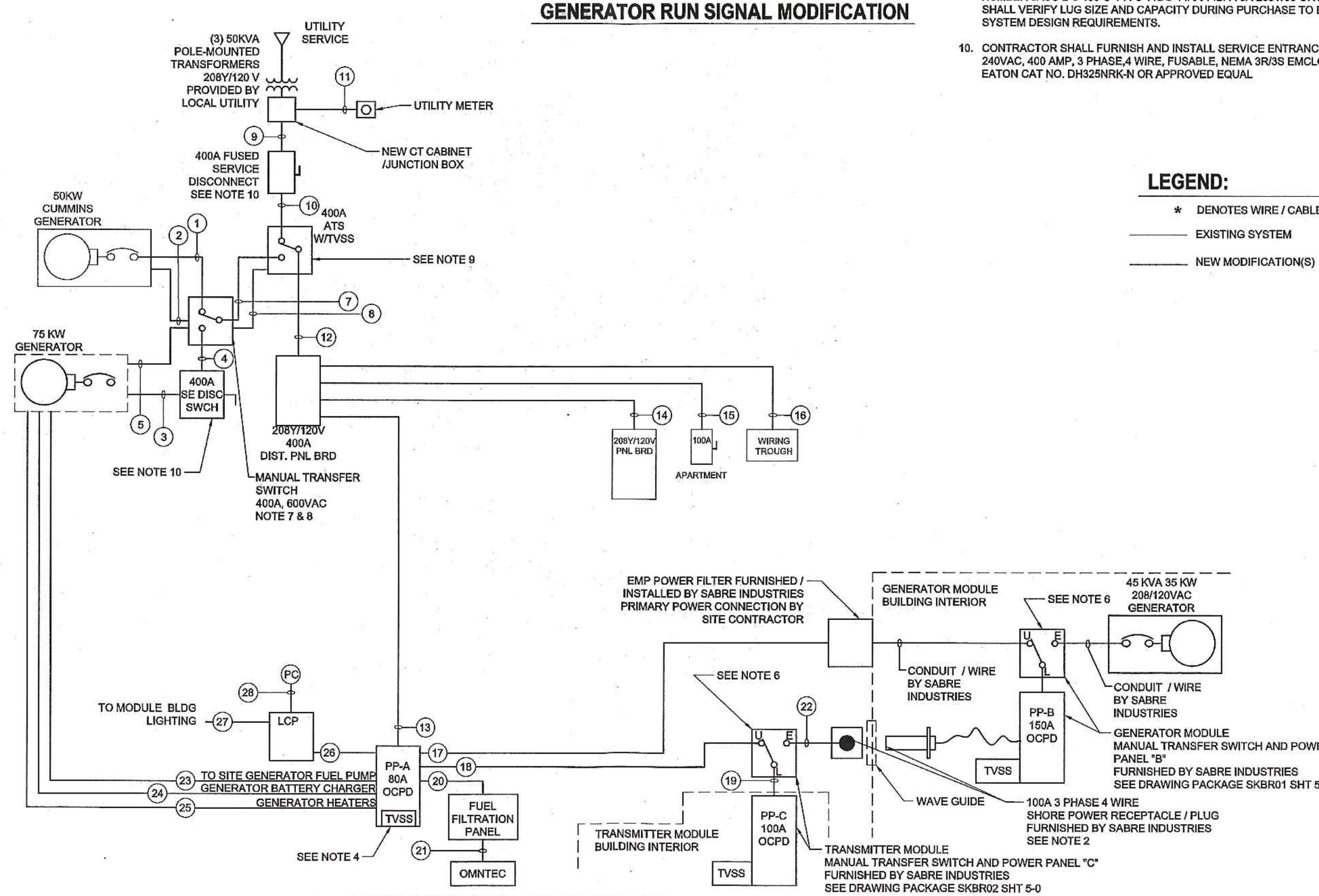
1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. POWER PLUG FED FROM GENERATOR MODULE POWER PANEL "B". SEE CELLXION DRAWINGS FOR SHORE PLUG /RECEPTACLE CIRCUIT AND CONNECTIONS.
3. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION ENGINEER BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED TO MAINTAIN SERVICE DURING SHUTDOWN PERIODS.
4. CONTRACTOR SHALL PROVIDE AND INSTALL TVSS-SURGE SUPPRESSOR INC. ADVANTAGE MODEL CDLA3Y1-XS OR APPROVED EQUAL.
5. THE NEUTRAL BONDING JUMPER FURNISHED WITH THE GENERATOR SHALL BE REMOVED. THE GENERATOR SHALL NOT BE CONSIDERED A SEPARATELY DERIVED SYSTEM.
6. CONTRACTOR SHALL VERIFY POSITION OF BY-PASS SWITCH HANDLE MATCHING POSITIONS WITH THE GENERATOR MODULE TRANSFER SWITCH.
7. THE AUTOMATIC START/RUN SIGNAL TO THE EXISTING GENERATOR SHALL BE MODIFIED AND ROUTED THROUGH THE NEW MANUAL TRANSFER SWITCH POSITION SWITCHES.
8. CONTRACTOR SHALL FURNISH AND INSTALL A DOUBLE THROW SWITCH 600 VAC 400 AMP NEMA 12 SIEMENS CAT NO. NF355HDTR WITH HN678 NEUTRAL KIT, HG656 GROUND KIT, AND 2 EACH HA165678 AUX CONTACTS. SWITCH SHALL BE SERVICE ENTRANCE RATED.
9. CONTRACTOR SHALL PROVIDE AND INSTALL A NEW 400 AMPERE AUTOMATIC TRANSFER SWITCH 208Y/120 VAC SERVICE ENTRANCE RATED WITH INTERNAL TVSS 3 PHASE 4 WIRE. ASCO CATALOG NUMBER 3AUS-B-3-400-C-1-X-C-11BG-14AA/14BA-73A-208V/60 OR APPROVED EQUAL. CONTRACTOR SHALL VERIFY LUG SIZE AND CAPACITY DURING PURCHASE TO ENSURE COMPATABILITY WITH SYSTEM DESIGN REQUIREMENTS.
10. CONTRACTOR SHALL FURNISH AND INSTALL SERVICE ENTRANCE RATED DISCONNECT SWITCHES, 240VAC, 400 AMP, 3 PHASE,4 WIRE, FUSABLE, NEMA 3R/3S EMCLOSURES WITH 400 AMP FUSES. EATON CAT NO. DH325NRK-N OR APPROVED EQUAL

LEGEND:

* DENOTES WIRE / CABLE ONLY (EXISTING CONDUIT)
EXISTING SYSTEM
NEW MODIFICATION(S)



EXISTING POWER RISER DIAGRAM



MODIFIED POWER RISER DIAGRAM

US Army Corps of Engineers
OMAHA DISTRICT

ISSUED FOR CONSTRUCTION 11/1/12

Designed by: SDJ
Drawn by: SDJ
Checked by: TCG
Reviewed by: TCG
Date: 2012

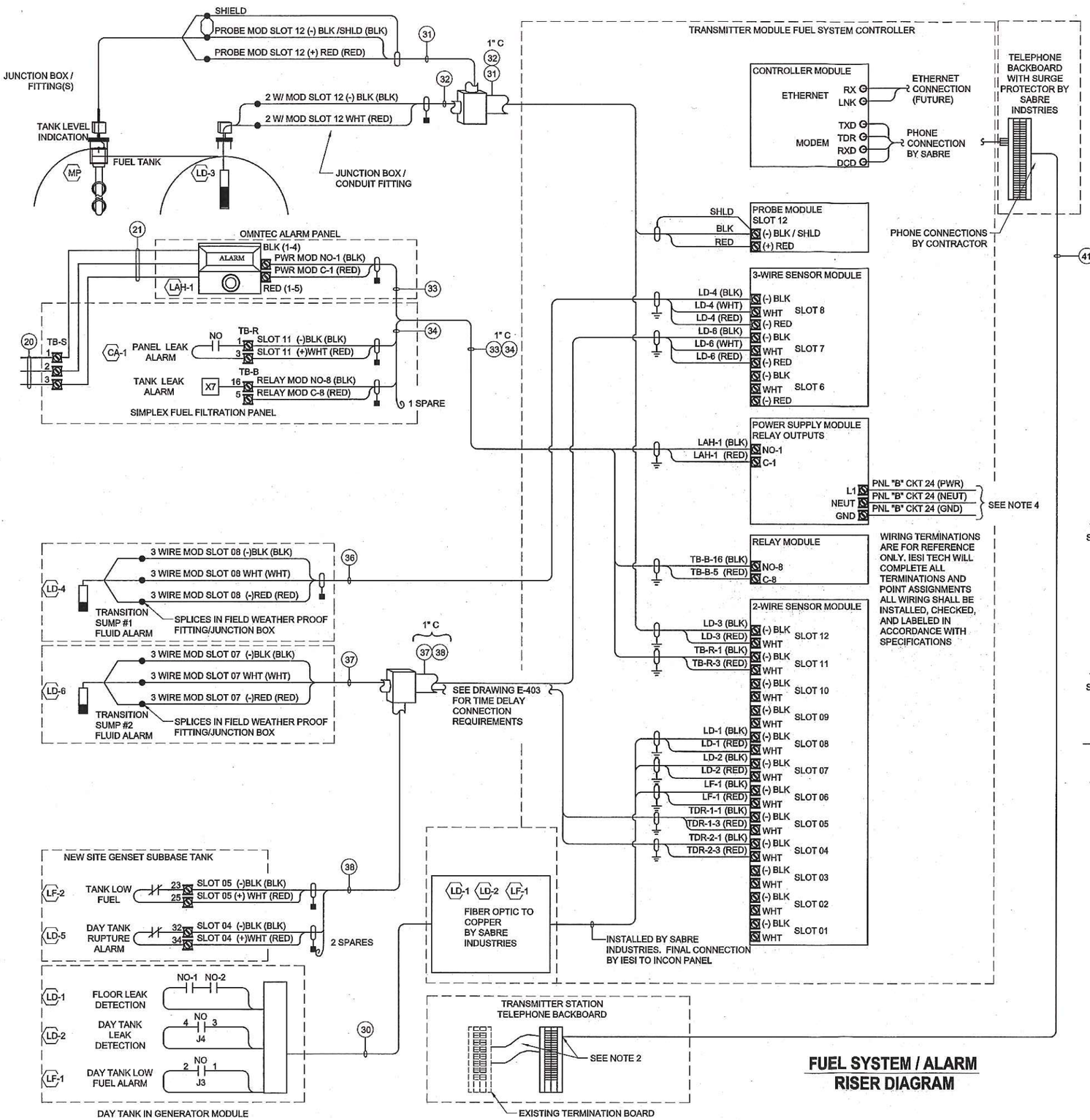
FEMA
KBR
Engineering Services by KBR Engineering Co. LLC

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

TRANSMITTER / GENERATOR ELECTRICAL PANEL SCHEDULES

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
LICENSED PROFESSIONAL ENGINEER

Drawing Number:
E-401

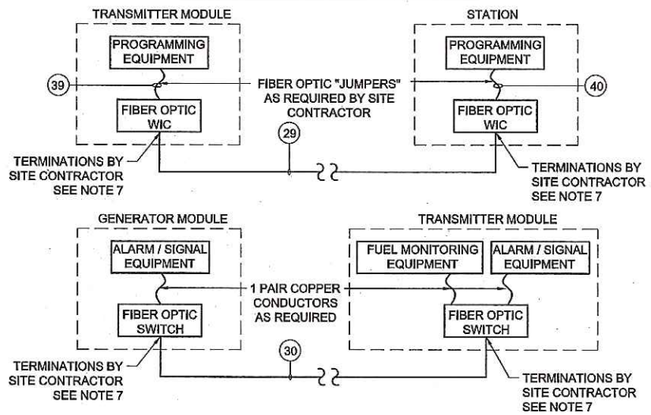


FUEL SYSTEM / ALARM RISER DIAGRAM

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. CONTRACTOR SHALL ROUTE A 25 PAIR OSP COMMUNICATION CABLE TO THE EXISTING COMMUNICATION BACKBOARD INSTALLING A NEW SURGE PROTECTED 66 BLOCK CIRCA TELECOM 2625QC-3B1E OR EQUAL WITH ANALOG GAS TUBE SURGE PROTECTORS IDENTIFYING CONDUCTORS TO BE UTILIZED FOR CROSS CONNECTION. ALL PAIRS SHALL BE TERMINATED TO THE 66 BLOCKS WITH UTILIZED PAIRS IDENTIFIED / NOTED. SEE NOTE 8 ON DRAWING E-105 AND SABRE INDUSTRIES DRAWING SKBR02 SHT 5-4 FOR UTILIZED PAIR NUMBERS.
3. ALL INSTRUMENT / CONTROL CABLES SHALL BE INDIVIDUALLY SHIELDED DUE TO HIGH RF SIGNALS. SHIELDS SHALL BE BONDED AT THE CONTROLLER AND TAPED AT THE DEVICES. UNLESS SHOWN DIFFERENTLY BY MANUFACTURER TERMINATION DRAWINGS.
4. SEE CONTROLLER SUPPLIER DRAWINGS FOR WIRING TERMINATIONS AND WIRING REQUIREMENTS. FUEL SYSTEM RISER DIAGRAM IS DIAGRAMMATIC CABLING SIZE AND QUANTITY MAY VARY DEPENDING ON FURNISHED EQUIPMENT REQUIREMENTS.
5. ALL CONTACTS ARE SHOWN IN DE-ENERGIZED POSITIONS CONSIDERED "FAIL SAFE" WHICH WILL ALSO INDICATED AN ALARM STATE OF THE DEVICE.
6. CONTRACTOR SHALL INSTALL WIRING FROM TERMINAL BLOCK TB-S IN THE SIMPLEX CONTROLLER TO THE OMNTEC ANNUNCIATOR.
7. FIBER OPTIC FAN OUT KITS SHALL BE INSTALLED AT TERMINATION POINTS FOR FIELD TERMINATIONS. TYE-RAPS SHALL BE LEFT LOOSE AND LONG RADIUS LOOPS FORMED FOR ROUTING THE FIBERS WITHIN THE PANELS. CONNECTOR SHALL BE INSTALLED ON ALL FIBERS AND OPTICAL LOSE TEST PREFORMED ON THE SYSTEM AT A MINIMUM .

FIBER OPTIC RISER DIAGRAM



LEGEND:

- * DENOTES WIRE / CABLE ONLY WITHIN CONTROLLER / ENCLOSURE
- CABLE SHIELD TERMINATED TO GROUNDING POINT
- CABLE SHIELD SHOWN CUT AND TAPED NOT TERMINATED

US Army Corps of Engineers OMAHA DISTRICT

PHASE REVIEW: Project Manager, CD Reviewer, Architectural, Structural, Mechanical, Plumbing, Electrical, Civil

Mark	Description	Date
0	ISSUED FOR CONSTRUCTION	11/1/12
		Amend

Designed by: SDJ
Drawn by: SDJ
Checked by: TCG
Reviewed by:
Date: 2012

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Engineering Services by KBR Engineering Co. LLC

FEMA

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

TRANSMITTER / GENERATOR ELECTRICAL RISER DIAGRAMS

STATE OF MAINE MICHAEL A. CARTER No. 11379 REGISTERED PROFESSIONAL ENGINEER

Drawing Number: **E-402**

CONDUIT AND CABLE SCHEDULE

	CABLE NUMBER	CONDUIT SIZE	WIRE & CABLE	FROM	TO	REMARKS
	1	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	EXISTING SITE GENERATOR	MANUAL TRANSFER SWITCH (STATION POWER)	PARALLEL FEEDERS
	2	1"	5/C #14 AWG CONTROL CONDUCTORS	EXISTING SITE GENERATOR	MANUAL TRANSFER SWITCH (STATION POWER)	CONTROLS-RUN CIRCUIT
	3	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	NEW SITE GENERATOR	SERVICE ENTRANCE DISCONNECT	PARALLEL FEEDERS
	4	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	SERVICE ENTRANCE DISCONNECT	MANUAL TRANSFER SWITCH (STATION POWER)	PARALLEL FEEDERS
	5	1"	5/C #14 AWG CONTROL CONDUCTORS	NEW SITE GENERATOR	MANUAL TRANSFER SWITCH (STATION POWER)	CONTROLS-RUN CIRCUIT
	6	1"	5/C #14 AWG CONTROL CONDUCTORS	NEW SITE GENERATOR	E-STOP	EMERGENCY STOP
	7	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	MANUAL TRANSFER SWITCH (STATION POWER)	ATS	PARALLEL FEEDERS
	8	1"	5/C #14 AWG CONTROL CONDUCTORS	MANUAL TRANSFER SWITCH (STATION POWER)	ATS	CONTROLS-RUN CIRCUIT
	9	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	SERVICE ENTRANCE FEEDER	FUSED DISCONNECT	PARALLEL FEEDERS
	10	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	FUSED DISCONNECT	ATS	PARALLEL FEEDERS
	11	1 1/2"	6-1/C # 14	CT CABINET /JUNCTION BOX	METER BOX	CT LEADS
	12	2-3"	2 EA 4-1/C #4/0AWG W/#2 AWG GND	ATS	400 A DISTRIBUTION POWER PANEL	
	13	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	400 A DISTRIBUTION POWER PANEL	POWER PANEL "A"	POWER PANEL "A" MOUNTED ON TRANSMITTER MODULE
	14	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	400 A DISTRIBUTION POWER PANEL	EXISTING PANELBOARD	
	15	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	400 A DISTRIBUTION POWER PANEL	EXISTING DISCONNECT	
	16	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	400 A DISTRIBUTION POWER PANEL	WIRING TROUGH	
	17	1"	4-1/C #8 AWG W/#10 AWG GND	POWER PANEL "A"	EMP FILTER	MOUNTED ON GENERATOR MODULE-FEED TO PANEL "B"
	18	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	POWER PANEL "A"	MANUAL TRANSFER SWITCH	MOUNTED ON TRANSMITTER MODULE-FEED TO PANEL "C"
	19	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	MANUAL TRANSFER SWITCH	POWER PANEL "C"	CONDUIT BY SABRE INDUSTRIES
	20	1"	2-1/C #10 AWG W/#10 AWG GND/	POWER PANEL "A"	SIMPLEX FUEL FILTRATION PANEL	FUEL FILTRATION PANEL POWER/ OMNTEC CONTROL POWER (LAH-1)
	21	3/4"	2-1/C #12 AWG W/#12 AWG GND	SIMPLEX FUEL FILTRATION PANEL	OMNTEC ALARM PANEL	LAH-1 CONTROL POWER
	22	1-1/2"	4-1/C #2 AWG W/#6 AWG GND	MANUAL TRANSFER SWITCH	SHORE PLUG RECEPTACLE ON GENERATOR MODULE	MOUNTED ON TRANSMITTER MODULE
	23	1"	2-1/C #10 AWG W/#10 AWG GND	POWER PANEL "A"	SITE GENERATOR FUEL CONTROLLER	GENSET FUEL PUMP /CONTROLLER
	24	1"	2-1/C #10 AWG W/#10 GND	POWER PANEL "A"	BATTERY CHARGER	NEW SITE GENSET
	25	1"	2-1/C #10 AWG W/#10 AWG GND	POWER PANEL "A"	BLOCK AND ALTERNATOR HEATERS	NEW SITE GENSET
	26	1"	2-1/C #10 AWG W/#10 AWG GND/ 2-1/C #12 AWG W/#12 AWG GND	POWER PANEL "A"	LIGHTING CONTACTOR	CONTROL POWER / AREA LTG CKTS
	27	1"	2-1/C #10 AWG W/#10 AWG GND	LIGHTING CONTACTOR	AREA LIGHTING AT MODULES	TO J-BOX ON EACH BLDG.
	28	3/4"	3-1/C #14 AWG	LIGHTING CONTACTOR	PHOTO ELECTRIC CELL	MOUNTED ON TRANSMITTER MODULE
	29	1"	6 FIBER, 62.5/125	W/C AT STATION PROGRAMMING RACK	W/C IN TRANSMITTER MODULE	FIBER TERMINATIONS BY CONTRACTOR
	30	1"	6 FIBER, 62.5/125	FIBER PANEL IN GENERATOR MODULE	FIBER PANEL IN TRANSMITTER MODULE	FIBER TERMINATIONS BY CONTRACTOR (LF-1,LD-1,LD-2)
1"C	31	3/4"	1/PR #18 SHLD (BELDEN 87760 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	FUEL TANK	TANK LEVEL (MP)
1"C	32	3/4"	1/PR #18 SHLD (BELDEN 87760 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	FUEL TANK	TANK LEAK DETECTOR (LD-3)
1"C	33	3/4"	1/PR #18 SHLD (BELDEN 87760 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	OMNTEC ALARM PANEL	HIGH LEVEL ALARM (LAH-1)
1"C	34	1"	3 EA-1/PR #18 SHLD (BELDEN 87760 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	SIMPLEX FUEL FILTRATION PANEL	COMMON ALARM (CA-1)
	35					
	36	1"	1 EA TRIAD #18 SHLD(BELDEN 9365 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	TRANSITION SUMP #1	LEAK DETECTOR (LD-4)
1"C	37	3/4"	1 EA TRIAD #18 SHLD(BELDEN 9365 OR EQUAL)	FUEL SYSTEM CONTROL PANEL FSCP-001	TRANSITION SUMP #2	LEAK DETECTOR (LD-6)
1"C	38	1"	4 EA 1/PR #18 SHLD	FUEL SYSTEM CONTROL PANEL FSCP-001	NEW OUTDOOR DAY TANK	LOW FUEL (LF-2), LEAK DETECTION (LD-5)
	39	1"	62.5/125 FIBER OPTIC "JUMPER"	TRANSMITTER MODULE W/C PANEL	EQUIPMENT RACK	JUMPERS WITH PRE-INSTALLED "ST" TYPE CONNECTORS
	40	1"	62.5/125 FIBER OPTIC "JUMPER"	STATION W/C PANEL	EQUIPMENT RACK	JUMPERS WITH PRE-INSTALLED "ST" TYPE CONNECTORS
	41	2"	25 PAIR OSP #22 AWG TELEPHONE CABLE	TRANSMITTER MODULE	STATION TELEPHONE DEMARK BACKBOARD	
	42	3"	7/8" COAXIAL CABLE (ANDREW AVA5-50)	TRANSMITTER MODULE	STATION RF TIE POINT	COAX CABLE-USE 24" RADIUS MINIMUM CONDUIT FITTINGS
	S1	2"	PULL STRING	FEMA SATELLITE JUNCTION BOX	STATION	JUNCTION BOX MOUNTED ON TRANSMITTER MODULE
	S2	2"	PULL STRING	FEMA SATELLITE JUNCTION BOX	STATION	JUNCTION BOX MOUNTED ON TRANSMITTER MODULE
	S3	2"	PULL STRING	FEMA SATELLITE JUNCTION BOX	SATELLITE AREA PULLBOX	JUNCTION BOX MOUNTED ON TRANSMITTER MODULE
	S4	2"	PULL STRING	FEMA SATELLITE JUNCTION BOX	SATELLITE AREA PULLBOX	JUNCTION BOX MOUNTED ON TRANSMITTER MODULE

PANEL NAME: PANEL "A"

	VOLTAGE: 208 / 120	MAIN BREAKER:	Y
SQUARE D PANEL BOARD	PHASE: 3	LUGS ONLY:	
TYPE NQOD	WIRE: 4	SURFACE:	Y
NEMA 3R /3S	BUS AMPS: 100 — 100 :MAIN CB AMPS	FLUSH:	
KEYED LOCKABLE DOOR	SUPPLY AMPS: 100	GROUND BUS:	Y
	MIN. SHORT CIRCUIT RATING: 10000	ISOLATED GROUND BUS:	
INCLUDE SPARE CAP. - Y / N: N		NEUTRAL BUS:	Y

NOTES	SERVES	LTG	RCPT	PWR	MOT	CB *	CKT	PH	CKT	CB *	LTG	RCPT	PWR	MOT	SERVES	NOTES
	EXTERIOR LIGHTING	704				20	1	A	2	20			782		FUEL FILTTRATION PUMP	
	DAYTANK FUEL SYSTEM PUMPS			2400		25	3	B	4	20			1200		SITE GENERATOR HEATERS	
	SUBBASE TANK FUEL SYSTEM PUMPS			2400		25	5	C	6							
	SITE GENSET BATTERY CHARGER			600		15	7	A	8	25			1760		GENERATOR MODULE POWER FILTER	2
	SPARE					15	9	B	10	[			1316		GENERATOR MODULE POWER FILTER	2
	TVSS			60		30	11	C	12	[			1506		GENERATOR MODULE POWER FILTER	2
	TVSS			60		[	13	A	14	15					SPARE	
	TVSS			60		[	15	B	16	50			4140		TRANSMITTER MODULE MTS	3
							17	C	18	[			4200		TRANSMITTER MODULE MTS	3
							19	A	20	[			4020		TRANSMITTER MODULE MTS	3
							21	B	22							
							23	C	24							
							25	A	26							
							27	B	28							
							29	C	30							

CONNECTED VA A: 7,926 B: 9,116 C: 8,166

		D.F.	DEMAND KVA:		AMPS	KVA	
CONNECTED KVA:					100.0	36.0	DESIGN (BASED ON SUPPLY)
LIGHTING LOAD:	0.7	1.25	0.9		70.0	25.2	CONNECTED
RECEPT. LOAD - FIRST 10 KVA:	0.0	1.00	0.0		70.5	25.4	DEMAND
RECEPT. LOAD - REMAINDER:	0.0	0.50	0.0		29.5	10.6	SPARE
POWER LOAD:	24.5	1.00	24.5	AVG			
MOTOR LOAD EXCEPT LARGEST:	0.0	1.00	0.0	KVA	AMPS	KVA	CONNECTED
LARGEST MOTOR:	0.0	1.25	0.0	8.4	66	7.9	PHASE A
20% SPARE CAPACITY:	0.0	1.00	0.0		76	9.1	PHASE B
TOTAL CONNECTED LOAD:	25.2	TOTAL DEMAND LOAD:	25.4		68	8.2	PHASE C

	PHASE LOAD		PHASE BALANCE
INSTRUCTIONS:			
* - ALL BRANCH CIRCUIT BREAKERS ARE 1P20 UNLESS OTHERWISE SHOWN			
[- DENOTES ADDITIONAL POLES OF MULTI-POLE CIRCUIT BREAKERS	66%	94%	PHASE A
NOTES:	76%	108%	PHASE B
1 LOADS SHOWN ARE PRE EMP, FED FROM UTILITY POWER SOURCE	68%	97%	PHASE C
This panel will not be on-line during Post EMP event.			
2 FED THROUGH THE EMP POWER FILTER ON THE MODULE EXTERIOR			
3 FED THROUGH THE TRANSFER SWITCH ON THE MODULE EXTERIOR			

PANEL NAME: DISTRIBUTION PANEL

	VOLTAGE: 208 / 120	MAIN BREAKER:	Y
POST HEMP LOADING	PHASE: 3	LUGS ONLY:	
	WIRE: 4	SURFACE:	Y
	BUS AMPS: 400 — 400 :MAIN CB AMPS	FLUSH:	
	SUPPLY AMPS: 400	GROUND BUS:	Y
	MIN. SHORT CIRCUIT RATING: 22000	ISOLATED GROUND BUS:	
INCLUDE SPARE CAP. - Y / N: N		NEUTRAL BUS:	Y

NOTES	SERVES	LTG	RCPT	PWR	MOT	CB *	CKT	PH	CKT	CB *	LTG	RCPT	PWR	MOT	SERVES	NOTES
1	EXISTING PANEL BOARD					100	1	A	2							
	EXISTING PANEL BOARD					[	3	B	4							
	EXISTING PANEL BOARD					[	5	C	6							
1	EXISTING 100A DISCONNECT					100	7	A	8							
	EXISTING 100A DISCONNECT					[	9	B	10							
	EXISTING 100A DISCONNECT					[	11	C	12							
1	WIRNG TROUGH					100	13	A	14							
	WIRNG TROUGH					[	15	B	16							
	WIRNG TROUGH					[	17	C	18							
	POWER PANEL "A"			7926		100	19	A	20							
	POWER PANEL "A"			9116		[	21	B	22							
	POWER PANEL "A"			8422		[	23	C	24							
							25	A	26							
							27	B	28							
							29	C	30							

CONNECTED VA A: 7,926 B: 9,116 C: 8,422

		D.F.	DEMAND KVA:		AMPS	KVA	
CONNECTED KVA:					400.0	144.1	DESIGN (BASED ON SUPPLY)
LIGHTING LOAD:	0.0	1.25	0.0		70.7	25.5	CONNECTED
RECEPT. LOAD - FIRST 10 KVA:	0.0	1.00	0.0		70.7	25.5	DEMAND
RECEPT. LOAD - REMAINDER:	0.0	0.50	0.0		329.3	118.6	SPARE
POWER LOAD:	25.5	1.00	25.5	AVG			
MOTOR LOAD EXCEPT LARGEST:	0.0	1.00	0.0	KVA	AMPS	KVA	CONNECTED
LARGEST MOTOR:	0.0	1.25	0.0	8.5	66	7.9	PHASE A
20% SPARE CAPACITY:	0.0	1.00	0.0		76	9.1	PHASE B
TOTAL CONNECTED LOAD:	25.5	TOTAL DEMAND LOAD:	25.5		70	8.4	PHASE C

	PHASE LOAD		PHASE BALANCE
INSTRUCTIONS:			
* - ALL BRANCH CIRCUIT BREAKERS ARE 1P20 UNLESS OTHERWISE SHOWN			
[- DENOTES ADDITIONAL POLES OF MULTI-POLE CIRCUIT BREAKERS	17%	93%	PHASE A
NOTES:	19%	107%	PHASE B
1 CONTRACTOR SHALL VERIFY EXISTING INSTALLATION AND ADJUST BREAKER AND CABLE SIZE TO MATCH	18%	99%	PHASE C

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. ALL CONDUIT / CABLE ROUTING IS SHOWN DIAGRAMMATIC, CONTRACTOR SHALL VERIFY LOCATION AND ROUTING BEFORE INSTALLATION. COORDINATE INSTALLATION WITH OTHER CRAFTS BEFORE INSTALLING CONDUITS, PULL BOXES AS REQUIRED, PANELS, AND DEVICES.
3. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED TO MAINTAIN SERVICE DURING SHUTDOWN PERIODS.
4. CONTRACTOR SHALL NOTE ELECTRICAL PHASE ARRANGEMENTS / CONNECTIONS. (ADJUSTING CONNECTIONS AS REQUIRED) NEW PANEL CONNECTIONS TO EXISTING EQUIPMENT SHALL BE VERIFIED BEFORE APPLICATION OF POWER. THE STATION ENGINEER SHALL BE PRESENT UPON ENERGIZING EQUIPMENT.

STATE OF MAINE — MICHAEL A. CARTER — No. 11379 — PROFESSIONAL ENGINEER

US Army Corps of Engineers
OMAHA DISTRICT

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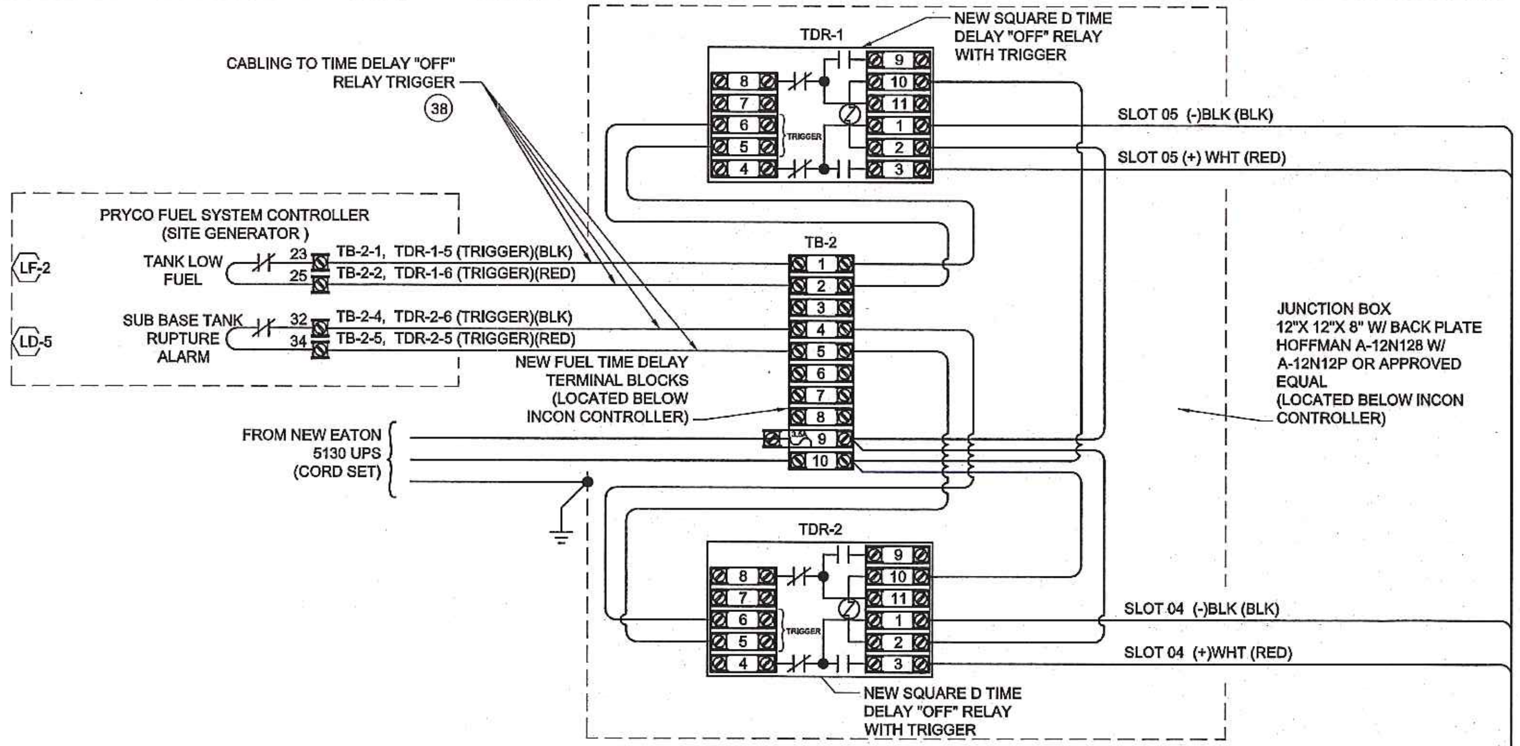
Designed by: | Drawn by: | Checked by: | Reviewed by: | Date: 2012

0 — ISSUED FOR CONSTRUCTION — 11/1/12

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

ELECTRICAL SCHEDULES

Drawing Number: **E-403**



FUEL SYSTEM / ALARM RELAY CONNECTION DIAGRAM

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND ALL SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. ALL INSTRUMENT / CONTROL CABLES SHALL BE INDIVIDUALLY SHIELDED DUE TO HIGH RF SIGNALS. SHIELDS SHALL BE BONDED AT THE CONTROLLER AND TAPED AT THE DEVICES UNLESS SHOWN DIFFERENTLY BY MANUFACTURER TERMINATION DRAWINGS.
3. SEE CONTROLLER SUPPLIER DRAWINGS FOR WIRING TERMINATIONS AND WIRING REQUIREMENTS. FUEL SYSTEM RISER DIAGRAM IS DIAGRAMMATIC. CABLING SIZE AND QUANTITY MAY VARY DEPENDING ON FURNISHED EQUIPMENT REQUIREMENTS.
4. ALL CONTACTS ARE SHOWN IN DE-ENERGIZED POSITIONS CONSIDERED "FAIL SAFE" WHICH WILL ALSO INDICATE AN ALARM STATE OF THE DEVICE.
5. REMOTE ALARM CIRCUITS WILL BE ROUTED THROUGH TIME DELAY RELAYS, THIS WILL ALLOW TIME FOR THE SITE GENERATOR TO COME ON LINE AND RESTORE POWER PREVENTING NUISANCE ALARMS DUE TO POWER OUTAGES. TIME DELAY OFF RELAYS SHALL BE SET AT 30 SECONDS TO ALLOW THE SITE POWER GENERATOR TO COME ON LINE AND PROVIDE POWER.
6. THE FOLLOWING PANELS WILL BE BACKED UP UTILIZING UPS:
   GENERATOR MODULE - RLH FIBER OPTIC TRANSMITTER PANEL
   - GENERATOR FUEL SYSTEM CONTROLLER "SAUK"
   TRANSMITTER MODULE - RLH FIBER OPTIC RECEIVER PANEL
   - INCON FUEL SYSTEM CONTROL PANEL FSCP-001
   - VIKING ALARM AUTO DIALER
7. UPS INSTALLATION IS BY SABRE INDUSTRIES AND IS SHOWN FOR REFERENCE.

LEGEND:

- * DENOTES WIRE / CABLE ONLY WITHIN CONTROLLER / ENCLOSURE
- CABLE SHIELD TERMINATED TO GROUNDING POINT
- CABLE SHIELD SHOWN CUT AND TAPED NOT TERMINATED
- INSTALLATION (BY SABRE INDUSTRIES)
- NEW INSTALLATION (BY SITE CONTRACTOR)

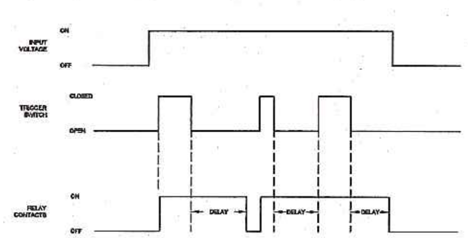
DEVICE DATA:

1. ELECTRONIC TIMING RELAY - OFF DELAY SWITCH - CLASS 9050 TYPE JCK2 2 V20 SQUARE D
2. SNAPMOUNT SOCKETS -SCREW TERMINAL - 11 PIN TUBULAR SINGLE TIER - 8501NR61 SQUARE D
3. 35 mm DIN 3 TRACK MOUNTING RAIL
4. TERMINAL BLOCKS - 300VAC RATED - #12AWG - #18AWG DIN RAIL MOUNTING
5. FUSED TERMINAL - 300VAC RATED - 10 AMP MAX RATING

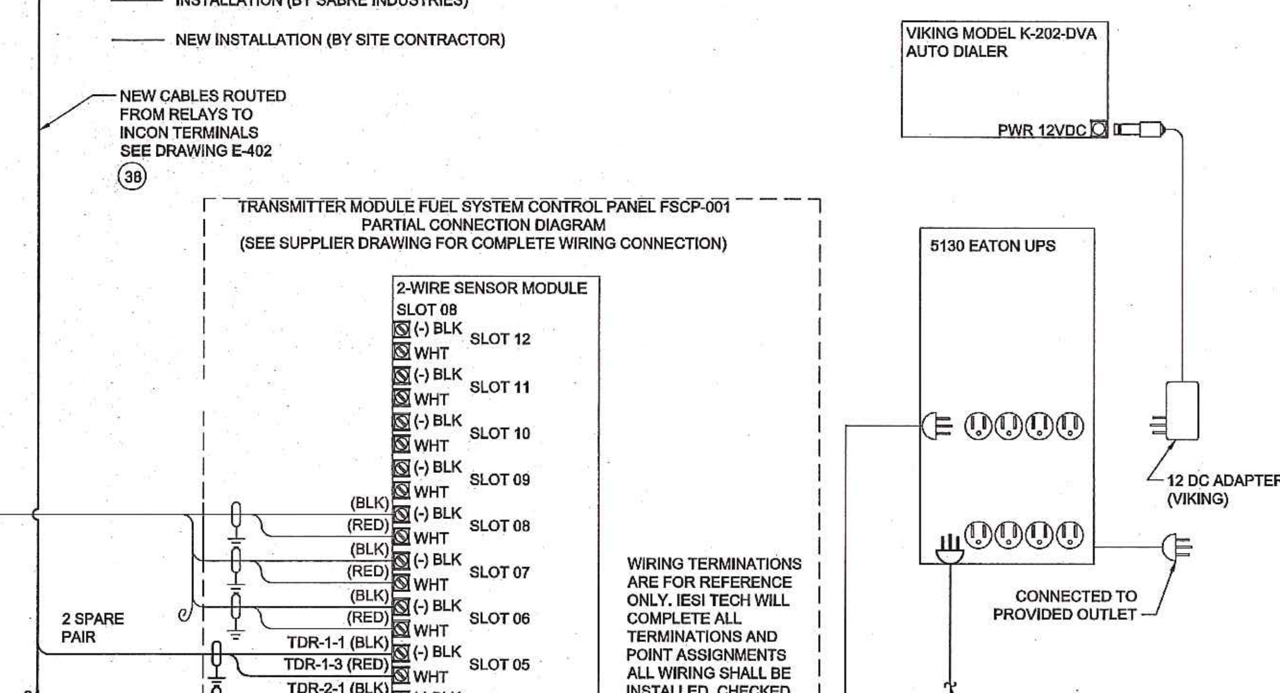
RELAY OPERATIONAL DATA:

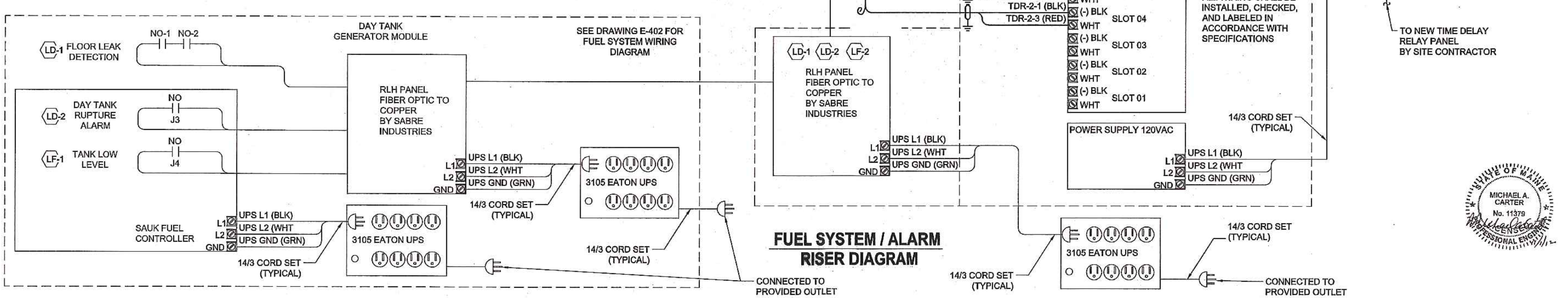
INPUT VOLTAGE MUST BE APPLIED CONTINUOUSLY. WHEN THE TRIGGER SWITCH CLOSES, THE RELAY CONTACTS CHANGE STATE. WHEN THE TRIGGER SWITCH OPENS, THE TIME DELAY BEGINS. WHEN THE DELAY IS COMPLETE, THE CONTACTS RETURN TO THEIR SHELF STATE. IF THE TRIGGER SWITCH CLOSES BEFORE THE TIME DELAY IS COMPLETE, THEN THE TIMING IS RESET. WHEN THE TRIGGER SWITCH OPENS, THE DELAY BEGINS AGAIN, AND THE RELAY CONTACTS REMAIN IN THE ENERGIZED STATE. IF THE INPUT VOLTAGE IS REMOVED, THE RELAY CONTACTS RETURN TO THEIR SHELF STATE.

TIMING DIAGRAM



OFF DELAY SWITCH AND POWER TRIGGER FUNCTION





FUEL SYSTEM / ALARM RISER DIAGRAM

US Army Corps of Engineers OMAHA DISTRICT

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: SDJ | Drawn by: SDJ | Checked by: | Reviewed by: | Date: 2012

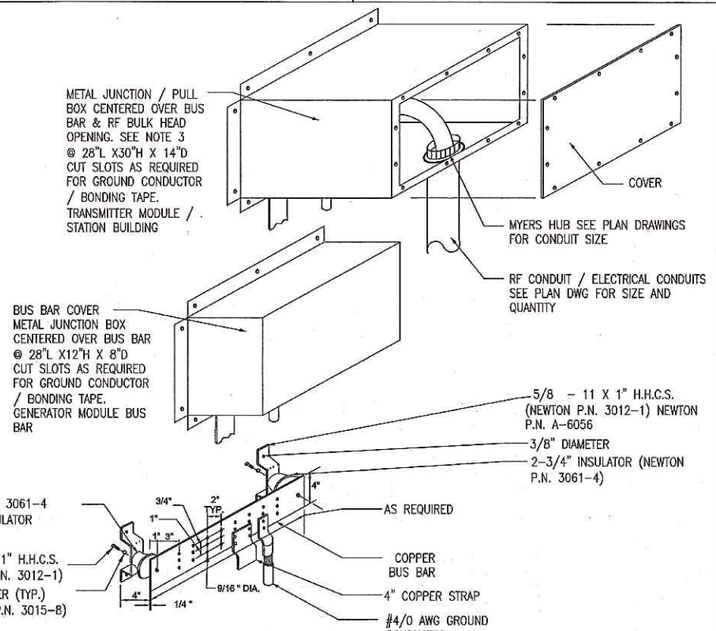
FEMA | KBR
KBR Engineering Services by KBR Engineering Co. LLC, 63 SOUTH ROYAL STREET SUITE 200, MOBILE, AL 36602

STATE OF MAINE — MICHAEL A. CARTER — No. 11379 — LICENSED PROFESSIONAL ENGINEER

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

TRANSMITTER / GENERATOR UPS /TIME DELAY DIAGRAM

Drawing Number: E-404



NOTE:

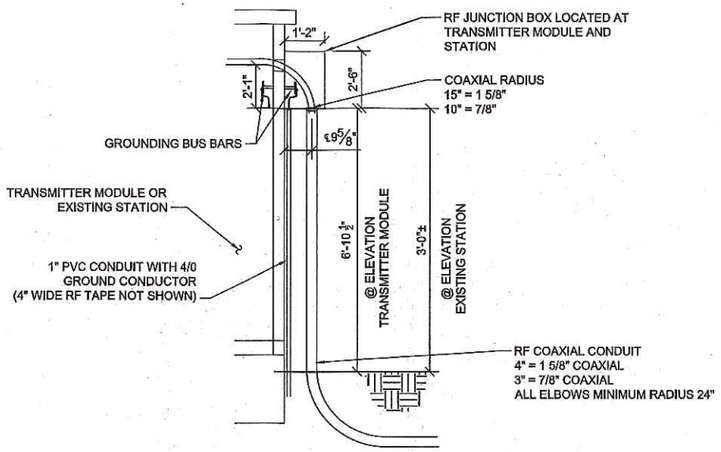
1) BUS BAR SHALL BE MOUNTED / LOCATED AT BOTTOM ENCLOSURE TO ALLOW FOR RF CABLE INSTALLATION. 15" MINIMUM BENDING RADIUS FOR 1 5/8" CABLE AND 10" MINIMUM BENDING RADIUS FOR 7/8" RF CABLE AT THE TRANSMITTER MODULE AND STATION.

2) THE ENCLOSURE SHALL BE INSTALLED OVER THE BUS BAR TO CONCEAL IT AT THE GENERATOR MODULE.

3) THE RF BULK HEAD "BOOT" IS NOT REQUIRED FOR THIS APPLICATION DUE THE THE ADDITIONAL PROTECTION GIVEN BY THE ENCLOSURE.

4) SEAL ALL OPENINGS AT CABLES AND COPPER TAPE ENCLOSURE MATERIAL – 12 GAUGE STEEL PAINTED ANSI 61 "LIGHT GRAY".

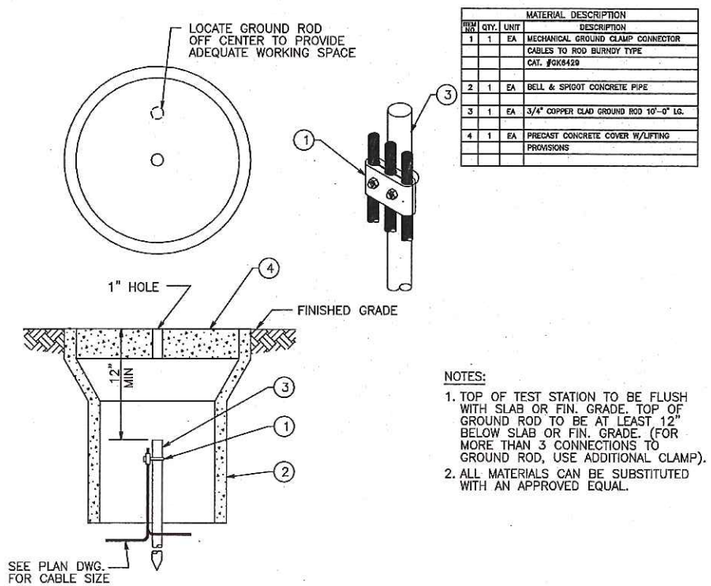
(9) 4" GROUND BUS BAR / RF PENETRATION ENCLOSURE
SCALE: NONE



(10) RF CABLE BUILDING ENTRANCE DETAIL
SCALE: NONE

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.

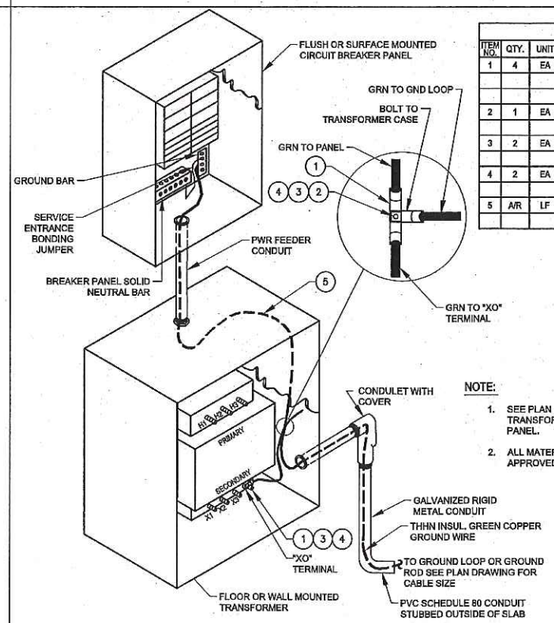


ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION DESCRIPTION
1	1	EA	MECHANICAL GROUND CLAMP CONNECTOR
			CABLES TO ROD BURNDY TYPE
			CAT. #GK6429
2	1	EA	BELL & SPIGOT CONCRETE PIPE
3	1	EA	3/4" COPPER CLAD GROUND ROD 10'-0" LG.
4	1	EA	PRECAST CONCRETE COVER W/LIFTING
			PROVISIONS

NOTES:

1. TOP OF TEST STATION TO BE FLUSH WITH SLAB OR FIN. GRADE. TOP OF GROUND ROD TO BE AT LEAST 12" BELOW SLAB OR FIN. GRADE. (FOR MORE THAN 3 CONNECTIONS TO GROUND ROD, USE ADDITIONAL CLAMP).
2. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.

(11) GROUND TEST WELL
SCALE: NONE



ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION DESCRIPTION
1	4	EA	COMPRESSION LUG
			BURNDY TYPE CAT. #YA2C-L4
2	1	EA	EVERDUR BOLT, 3/8"-16 X 1 1/4" LONG
3	2	EA	3/8" SHAKEPROOF OUTSIDE STAR LOCKWASHERS
4	2	EA	3/8" EVERDUR NUT
5	A/R	LF	#2 THHN GREEN COPPER WIRE

NOTE:

1. SEE PLAN DRAWING FOR CONDUIT & CABLE SIZES, TRANSFORMER MAY BE WALL MOUNTED ABOVE BREAKER PANEL.
2. ALL MATERIALS CAN BE SUBSTITUTED WITH A CLIENT APPROVED EQUAL.

(12) TRANSFORMER & PWR PANEL GROUNDING
SCALE: NONE

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW:
Project Manager
QC Reviewer
Architectural
Structural
Mechanical
Plumbing
Electrical
Civil

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: SDJ
Drawn by: SDJ
Checked by: TCG
Reviewed by: TCG
Date: 2012

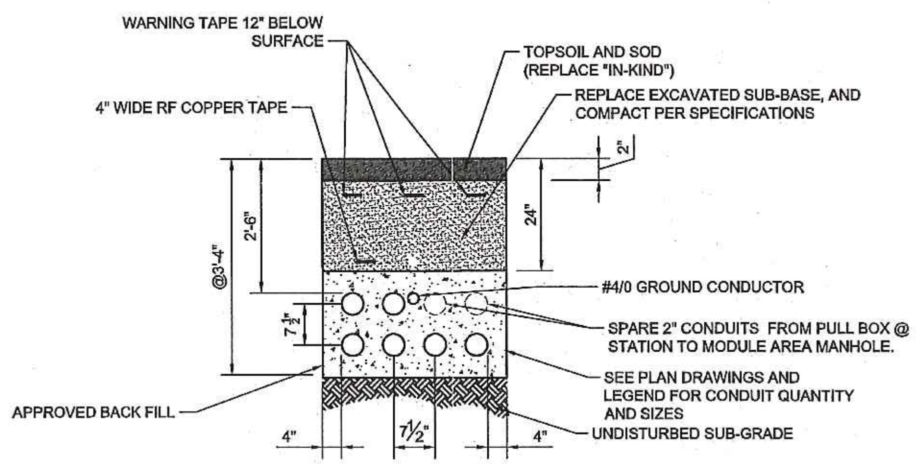
KBR
FEMA
KBR 63 SOUTH ROYAL STREET SUITE 200 MOBILE, AL 36602 PHONE: (251) 450-7900 FAX: (251) 450-7999
Engineering Services by KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK ON WOAN PORTLAND, MAINE

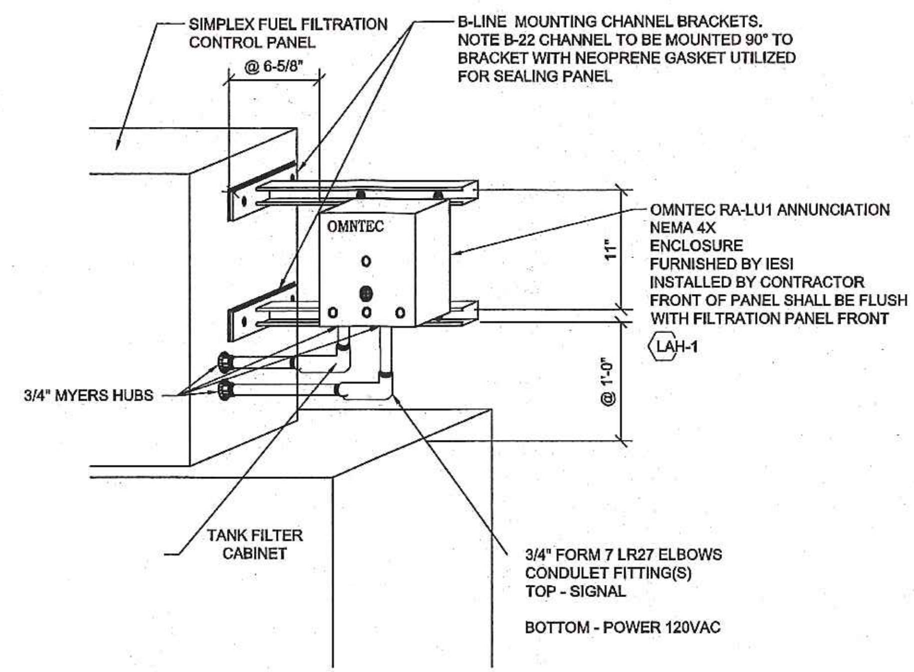
INSTALLATION DETAILS

STATE OF MAINE
MICHAELA. CARTER
No. 12379
LICENSED
PROFESSIONAL ENGINEER

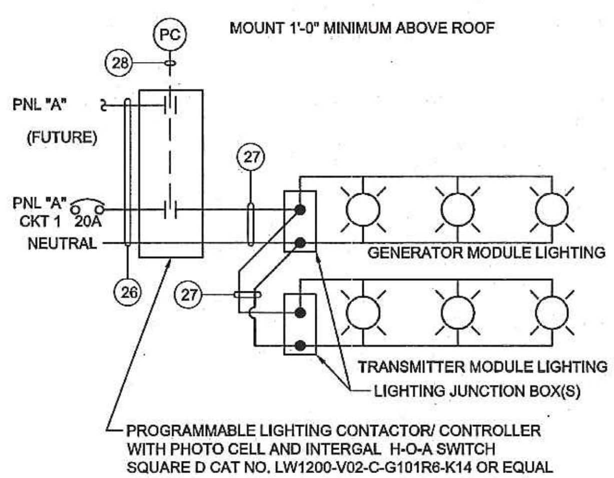
Drawing Number:
E-503



(13) TYPICAL ELECTRICAL DUCT SECTION
SCALE: NONE

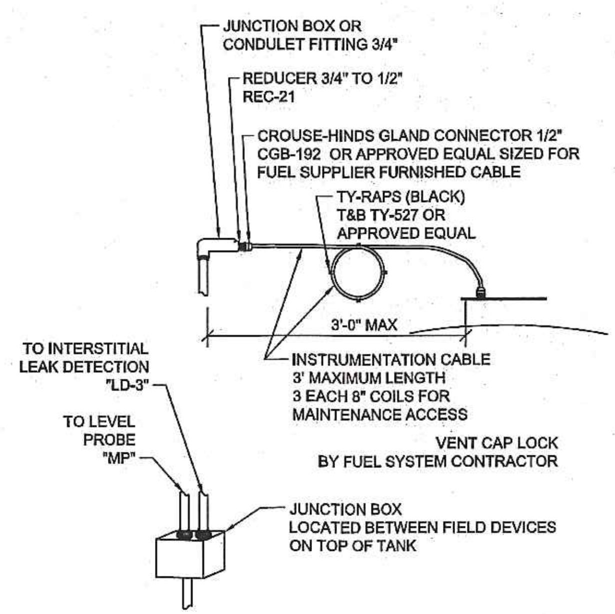


(14) LOCAL ANNUNCIATOR MOUNTING
SCALE: NONE



GROUND CONDUCTOR NOT SHOWN

(15) LIGHTING CONTACTOR DETAIL
SCALE: NONE



(16) TANK DEVICE CONNECTION
SCALE: NONE

NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.

US Army Corps of Engineers OMAHA DISTRICT

ISSUED FOR CONSTRUCTION

Designed by: SDJ
Checked by: TCG
Drawn by: SDJ
Reviewed by: MAC
Date: 2012

FEMA KBR

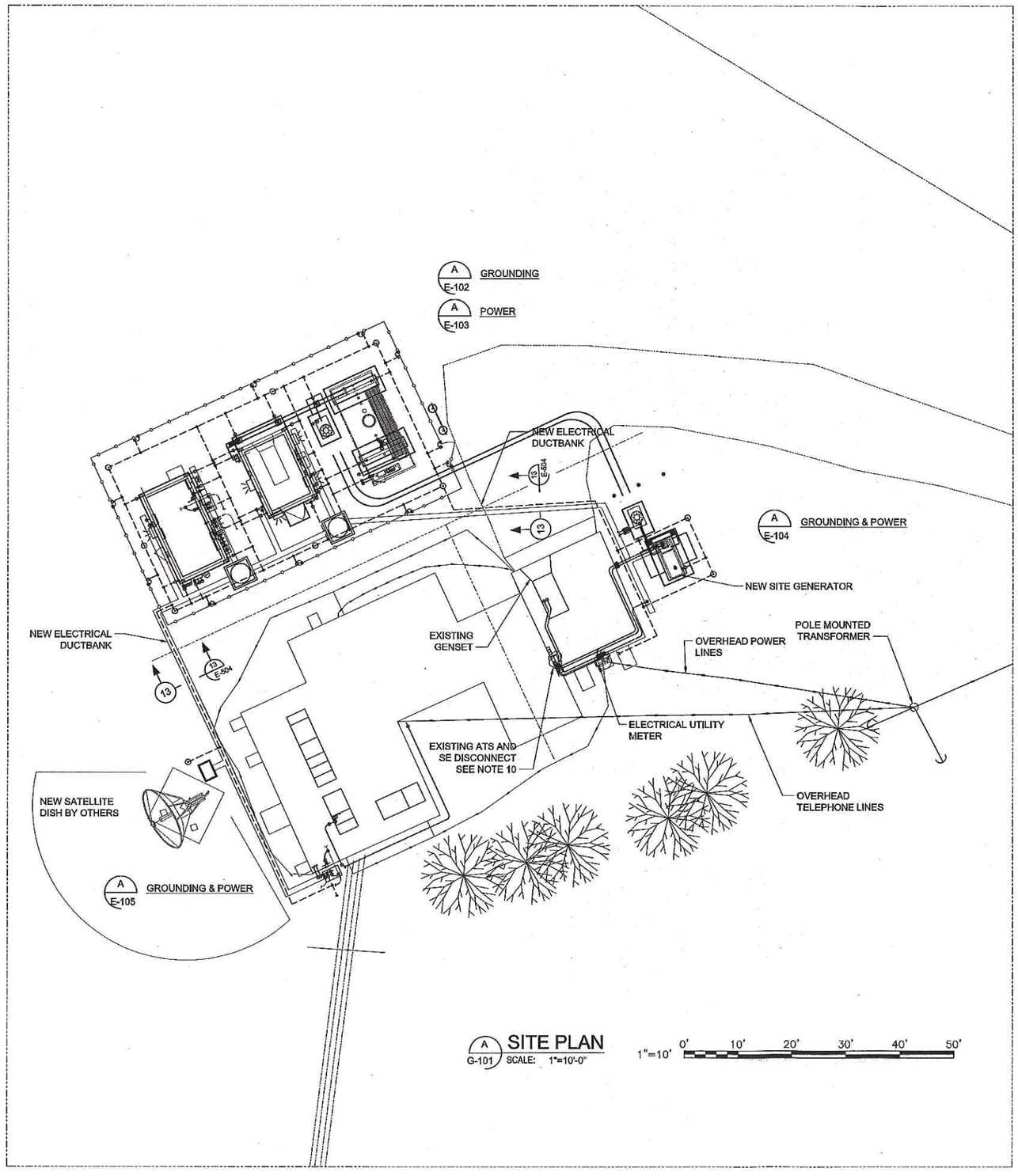
Engineering Services by KBR Engineering Co. LLC

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

INSTALLATION DETAILS

STATE OF MAINE MICHAEL A. CARTER No. 11379 LICENSED PROFESSIONAL ENGINEER

Drawing Number: **E-504**



NOTES:

1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. ALL BUILDING PENETRATIONS SHALL BE SEALED WITH A FIRE BLOCK SEALANT TO PREVENT WATER FROM ENTERING THE INTERIOR. ALL PANEL ENTRY PENETRATIONS SHALL UTILIZE MYERS HUBS WITH GROUNDING BUSHINGS.
3. ALL CONDUIT / CABLE ROUTING IS SHOWN DIAGRAMMATIC, CONTRACTOR SHALL VERIFY LOCATION AND ROUTING BEFORE INSTALLATION. COORDINATE INSTALLATION WITH OTHER CRAFTS BEFORE INSTALLING CONDUITS, PULL BOXES AS REQUIRED, PANELS, AND DEVICES.
4. ALL SHUT DOWN WORK REQUIRED SHALL BE PLANNED AND APPROVED BY THE STATION BEFORE PROCEEDING. PROVISIONS SHALL BE PROVIDED FOR ELECTRICAL POWER DURING SHUTDOWN PERIODS, INCLUDING TEMPORARY GENERATOR, DAY TANK, REQUIRED FUEL AND OPERATOR TECHNICIAN AS REQUIRED.
5. AFTER ALL TERMINATIONS, SOLDERING AND TESTING ALL EXPOSED COPPER CONDUCTORS SHALL BE PAINTED TO MATCH SURFACES ON WHICH THEY ARE INSTALLED. WHERE PAINT IS NOT PRACTICAL THE COPPER CONDUCTOR SHALL BE COVERED IN ELECTRICAL TAPE.
6. CONTRACTOR SHALL VERIFY ELECTRICAL PHASE ARRANGEMENTS / CONNECTIONS, MAKING ADJUSTMENTS AS REQUIRED, MATCHING THE NEW INSTALLED SYSTEM(S) TO THE EXISTING FACILITIES SYSTEM. NEW PANEL CONNECTIONS TO EXISTING EQUIPMENT SHALL BE VERIFIED BEFORE APPLICATION OF POWER. FACILITIES ENGINEER SHALL BE PRESENT UPON ENERGIZING EQUIPMENT.
7. CONDUITS INSTALLED UNDERGROUND SHALL BE PVC COATED RIGID GALVANIZED STEEL. ABOVE GRADE EXTERIOR CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS), INTERIOR CONDUITS MAY BE ELECTRICAL METALLIC TUBING (EMT).
8. CONTRACTOR SHALL COVER COPPER ELECTRICAL GROUNDING BUS BARS AND EXPOSED GROUNDING CABLES ON THE OUTSIDE OF PRECAST MODULES AND THE EXISTING TRANSMITTER BUILDING WITH FIELD FABRICATED SHROUDS. CONTRACTOR SHALL PAINT SHROUDS TO MATCH THE COLOR OF THE BUILDING ON WHICH IT IS MOUNTED. SEE DETAIL 9 ON SHEET E-503.
9. CONTRACTOR SHALL INSTALL SURFACE MOUNTED CONDUIT AND WIRING FROM ALL EXTERIOR MODULE LIGHTING FIXTURES TO A SINGLE WIRING POINT PER MODULE. CONDUITS SHALL BE PAINTED TO MATCH THE MODULE COLOR. THE SINGLE POINT CONNECTION FOR THE GENERATOR MODULE SHALL NOT BE LOCATED BELOW THE EMP POWER FILTER ENCLOSURE.
10. DEMO EXISTING AUTOMATIC TRANSFER SWITCH , SERVICE ENTRANCE DISCONNECT SWITCH, AND TVSS UNIT, SEE DRAWING E-401. REMOVE CONDUITS AND WIRE BACK TO SOURCE(S) INSTALLING NEW CONDUIT AND WIRE ARE SHOWN ON E-401 AND E-403.
11. INSTALL NEW 400 AMPERES ATS WITH INTERNAL TVS. INSTALL A NEW 400 AMPERE DISTRIBUTION POWER PANEL ON REAR WALL AS SHOWN INSURING PROPER CLEARANCES.
12. ON THE EXTERIOR REMOVE THE EXISTING SERVICE ENTRANCE CONDUIT BOXES AND CABLING. INSTALL A NEW RISER CONDUIT FOR A 400 AMPERE SERVICE INSTALLING A CT CABINET AND ADJOINING METER BASE. INSTALL A NEW 400 AMPERE SERVICE ENTRANCE DISCONNECT SWITCH

STATE OF MAINE
MICHAEL A. CARTER
No. 11379
LICENSED PROFESSIONAL ENGINEER

US Army Corps of Engineers
OMAHA DISTRICT

PHASE REVIEW:
Project Manager
QC Reviewer
Architectural
Structural
Mechanical
Plumbing
Electrical
Civil

Mark	Description	Date	Appvd
0	ISSUED FOR CONSTRUCTION	12/1/12	

Designed by:
Drawn by:
Checked by:
Reviewed by:
Date: 2012

KBR
63 SOUTH ROYAL STREET SUITE 800
MOBILE, AL 36602
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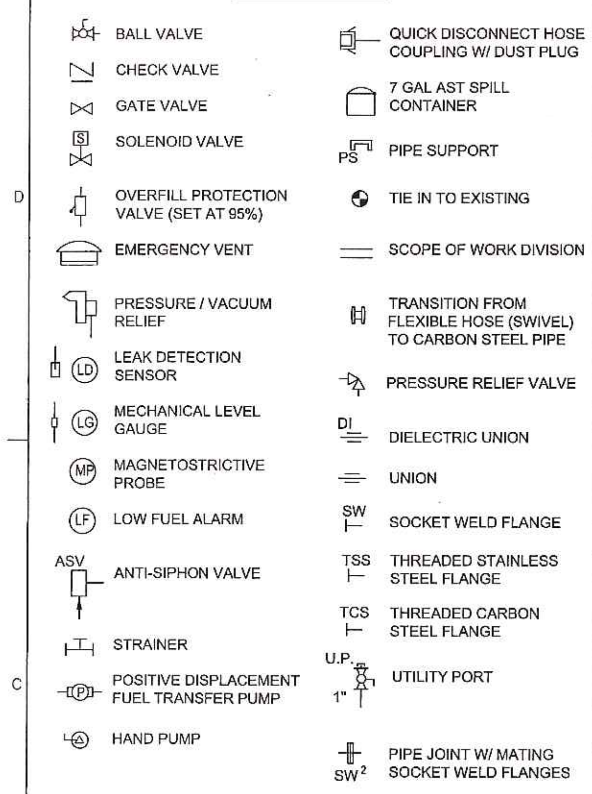
KBR Engineering Services by KBR Engineering Co. LLC

FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

ELECTRICAL SITE PLAN

Drawing Number:
E-101

LEGEND



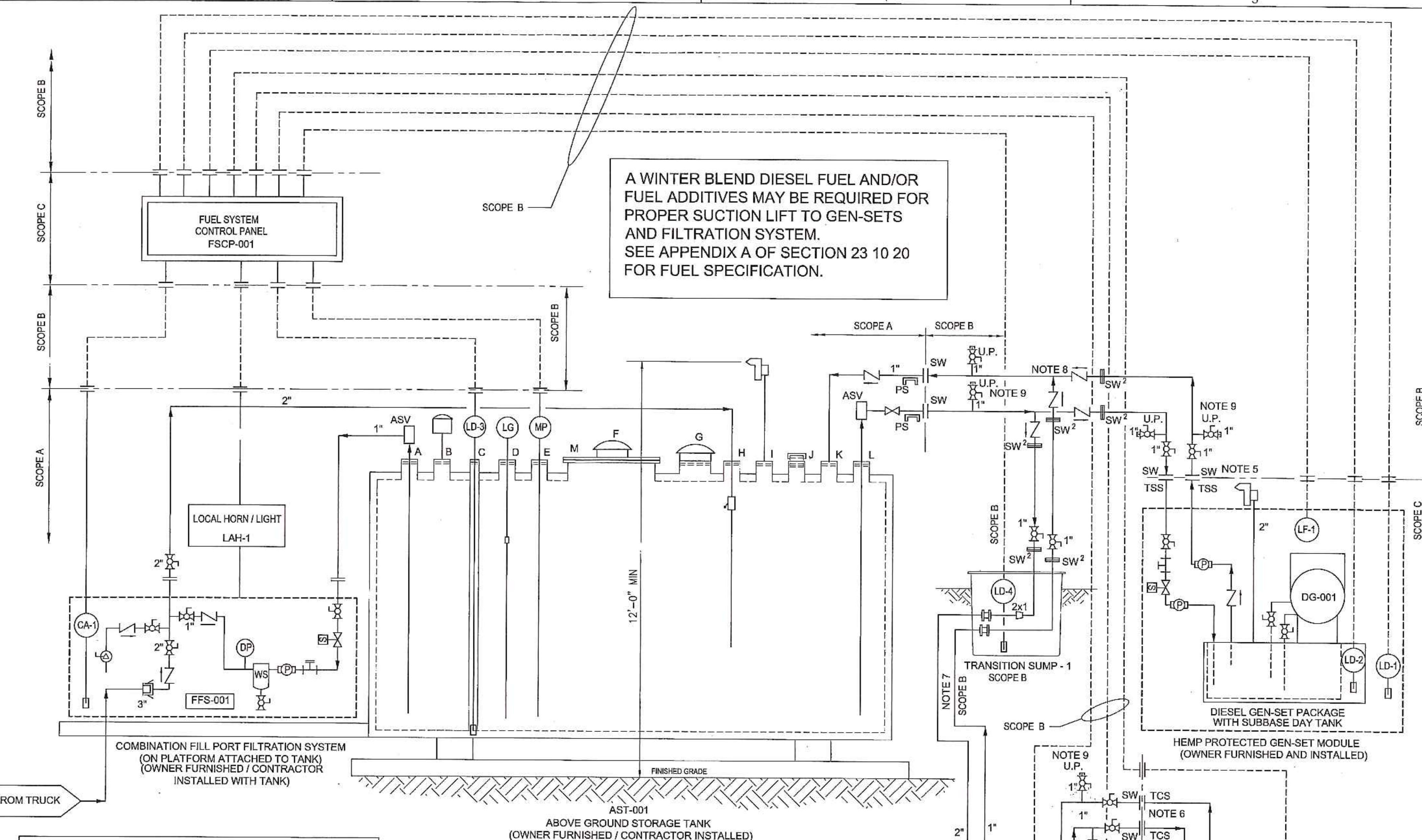
CONTRACTOR SCOPE OF WORK NOTES

A. FURNISHED UNDER FUEL STORAGE SYSTEM PACKAGE BY OWNER. RECEIVED AND INSTALLED BY SITE CONTRACTOR.

B. FURNISHED AND INSTALLED BY SITE CONTRACTOR.

C. FURNISHED AND INSTALLED UNDER HEMP SHIELDED MODULE PACKAGE BY OWNER.

D. FURNISHED BY OWNER. RECEIVED AND INSTALLED BY SITE CONTRACTOR.



AST NOZZLE SCHEDULE

NOZZLE TAG	SIZE (INCH)	DESCRIPTION
A	4"	SUPPLY TO FUEL PURIFIER WITH ANTI-SIPHON VALVE
B	4"	SERVICE POINT FOR MANUAL CLEANING AND FILTRATION WITH 7 GALLON SPILL CONTAINER WITH LOCKABLE HINGED COVER
C	2"	INTERSTITIAL LEAK DETECTION
D	4"	MECHANICAL LEVEL GAUGE
E	4"	ELECTRONIC LEVEL SENSOR
F	8"	PRIMARY - EMERGENCY RELIEF
G	8"	SECONDARY - EMERGENCY RELIEF (INTERSTITIAL)
H	4"	FUEL FILL / RETURN FROM FUEL PURIFIER DROP TUBE WITH ANTI-SYPHON BLEED HOLE AND OVERFILL PROTECTION VALVE
I	4"	PRIMARY - NORMAL VENT (PRESSURE / VACUUM RELIEF)
J	4"	SPARE WITH PIPE NIPPLE AND LOCKABLE INSPECTION CAP
K	4"	RETURN FROM DAY TANK
L	4"	SUPPLY TO DAY TANK
M	24"	MANWAY WITH COVER PLATE, BOLTS AND GASKET

NOTES:
1. ALL NOZZLES SHALL BE FPT COUPLINGS EXCEPT FOR THE FLANGED MANWAY.

FUEL MONITORING SYSTEM SCHEDULE

INPUT	REMOTE MONITOR REPORTING
LD-1	LEAK DETECTION GENERATOR MODULE FLOOR
LD-2	LEAK DETECTION MODULE SUBBASE TANK
LD-3	LEAK DETECTION PRIMARY TANK
LD-4	LEAK DETECTION UG PIPING SUMP - 1
LD-5	LEAK DETECTION SUB-BASE TANK - SITE GENSET
LD-6	LEAK DETECTION UG PIPING SUMP - 2
LF-1	LOW FUEL ALARM SUBBASE TANK - MODULE GEN-SET
LF-2	LOW FUEL ALARM SUB-BASE TANK - SITE GENSET
LAH-1	LEVEL ALARM HIGH - LOCAL
MP	TANK LOW -LOW FUEL LEVEL (50%)
	TANK LOW FUEL LEVEL (60% - ORDER FUEL)
	TANK HIGH FUEL LEVEL (90% - TANK FULL / STOP FILL)
	TANK HIGH-HIGH LEVEL (92.5% - ALARM MESSAGE SENT)
	TANK FUEL VOLUME
	TANK WATER VOLUME
	TANK FUEL VOLUME WITHDRAWAL
CA-1	COMMON ALARM FUEL FILTRATION SYS. CABINET

NOTES:

1. REFERENCE SUPPLIER SUBMITTAL DATA FOR INFORMATION REGARDING THE FUEL STORAGE SYSTEM, THE HEMP PROTECTED GEN-SET MODULE, AND THE SITE GEN-SET. THESE ITEMS WILL BE OWNER FURNISHED AS INDICATED.
2. THE FUEL STORAGE SYSTEM SHALL BE FACTORY ASSEMBLED BY SUPPLIER AND THEN SHIPPED TO SITE. SITE INSTALLATION CONTRACTOR SHALL INSTALL THE SYSTEM AT THE SITE IN ACCORDANCE WITH SYSTEM SUPPLIER'S INSTRUCTIONS.
3. PROVIDE INTERCONNECTING FUEL OIL PIPING AND SIGNAL CABLES AS INDICATED. (SEE ELECTRICAL DRAWINGS)
4. SEE DRAWING M-101 AND SPECIFICATION SECTION 23 10 20, FOR FULL SCOPE OF WORK FOR THE FUEL OIL SYSTEM.
5. CONNECT FUEL PIPING TO HEMP PROTECTED GEN-SET USING FLANGES. FURNISH AND INSTALL THREADED STAINLESS STEEL FLANGES ON EQUIPMENT FUEL LINE STUB-OUTS.
6. CONNECT FUEL PIPING TO SITE GEN-SET USING FLANGES. FURNISH AND INSTALL THREADED CARBON STEEL FLANGES ON EQUIPMENT FUEL LINE STUB-OUTS. USE FLANGE INSULATING GASKET KIT.
7. ONE (1) 1" C10A DOUBLE WALL FLEXIBLE PIPING INSIDE ONE (1) AXP-40 FLEXIBLE CONDUIT ACCESS PIPE AND ONE (1) 2" C20A DOUBLE WALL FLEXIBLE PIPING INSIDE ONE (1) AXP-40 FLEXIBLE CONDUIT ACCESS PIPE (UNDERGROUND)
8. LOCATE ALL FOUR OF THESE CHECK VALVES AS NEAR AS POSSIBLE TO TEES. CHECK VALVES TO BE OPW 175B WITH INTERNAL PRESSURE RELIEF, OR APPROVED EQUAL.
9. UTILITY PORT (U.P.) SHALL CONSIST OF A SOCKET WELD TEE, POE/TOE PIPE NIPPLE, THREADED BALL VALVE (LOCKABLE) AND PLUG. ALL 1" 304L STAINLESS STEEL. UTILITY PORT TO BE USED AS A UTILITY CONNECTION FOR TESTING, PRIMING, DRAINING, AND VENTING. THE HIGH POINT PORTS SHALL BE INSTALLED IN THE VERTICAL POSITION, AND THE LOW POINT PORTS SHALL BE INSTALLED IN THE HORIZONTAL POSITION.

STATE OF MAINE · DAVID BLACKWELL HARRIS · No. 12960 · REGISTERED PROFESSIONAL ENGINEER

Rev. 0 11/01/12

US Army Corps of Engineers OMAHA DISTRICT

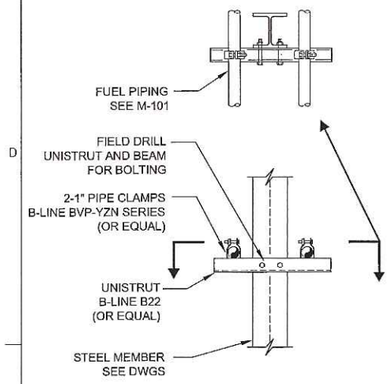
Designed by: DBH · Drawn by: RAM · Checked by: DBH · Reviewed by: CHB · Date: 2012

FEMA · KBR · Engineering Services by KBR Engineering Co. LLC · 63 SOUTH ROYAL STREET SUITE 200 MOBILE, AL 36602

FEMA EMERGENCY RADIO NETWORK ON WCAN PORTLAND, MAINE

FUEL SYSTEM P&ID

Drawing Number: **M-601**



1 DETAIL
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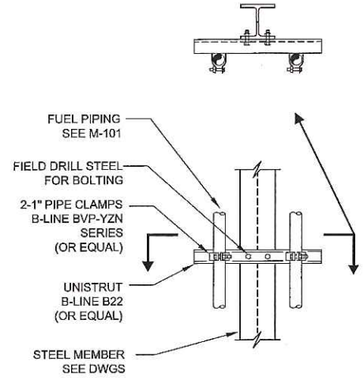
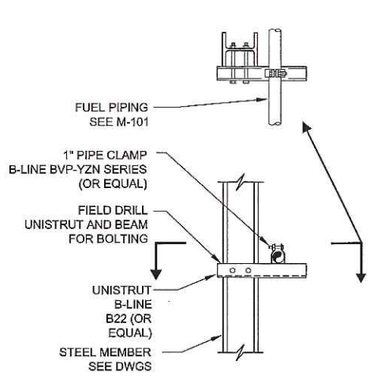


2 DETAIL
SCALE: 1 1/2"=1'-0"



3 DETAIL
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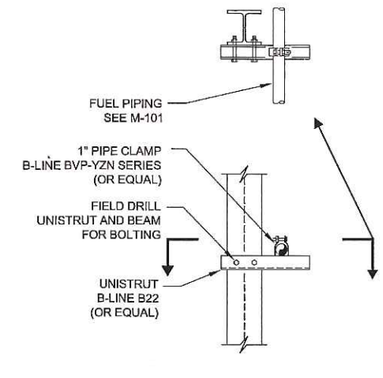
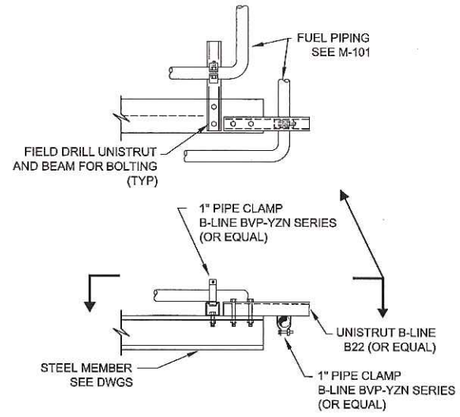
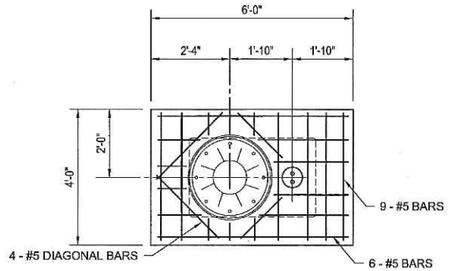


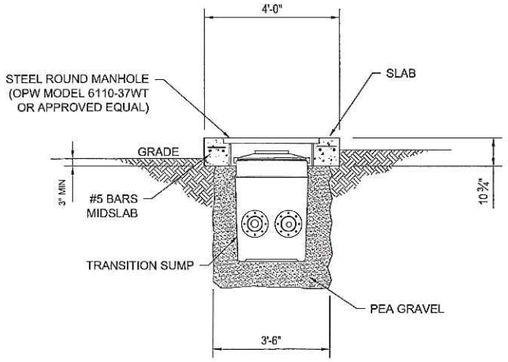
4 DETAIL
SCALE: 1 1/2"=1'-0"



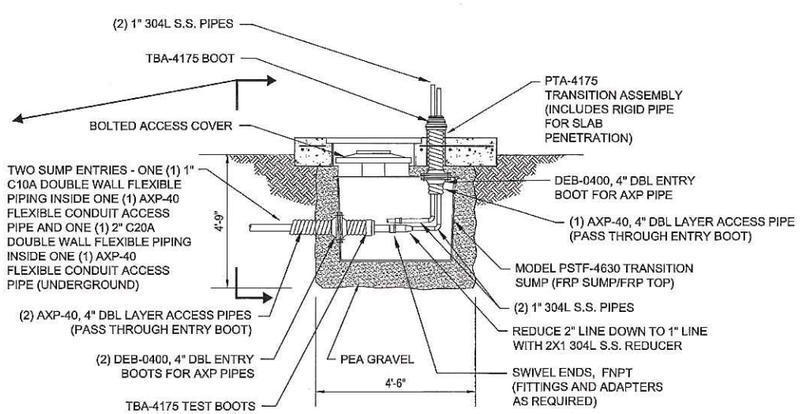
5 DETAIL
SCALE: 1 1/2"=1'-0"



PLAN

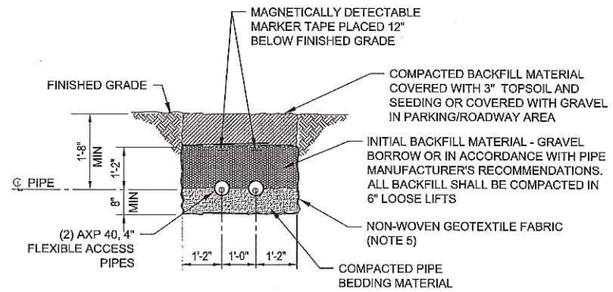


SECTION



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

TYPICAL TRANSITION SUMP INSTALLATION
PIPING MAY VARY FROM SITE TO SITE;
SEE DRAWINGS FOR ACTUAL PIPING



A TYP FUEL PIPING BEDDING
M-101 SCALE: 1/2"=1'-0"

BEDDING NOTES:

1. ALL BEDDING AND BACKFILL MATERIALS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.
2. COMPACTION SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
3. MAINTAIN 12" MINIMUM SEPARATION FROM UNDERGROUND POWER AND COMMUNICATION LINES OR AS REQUIRED BY NATIONAL ELECTRIC SAFETY CODE AND LOCAL CODES.
4. CONTRACTOR SHALL SOD OR SEED ALL DISTURBED AREAS OR INSTALL GRAVEL AS DIRECTED ON DRAWING C-102.
5. DUE TO FROST SUSCEPTIBLE SOILS, GRANULAR BEDDING MATERIALS MUST BE SEPARATED FROM SURROUNDING SOILS BY A NON-WOVEN GEOTEXTILE FABRIC.

STATE OF MAINE
DAVID BLACKWELL HARRIS
No. 12960
REGISTERED PROFESSIONAL ENGINEER
Rev. 0
11/21/12

US Army Corps of Engineers
OMAHA DISTRICT

FINAL REVIEW:
Project Manager
QC Reviewer
Architectural
Structural
Mechanical
Plumbing
Electrical
Civil

Mark	Description	Date	Approved
0	ISSUED FOR CONSTRUCTION	11/21/12	

Designed by: DBH
Drawn by: RAM
Checked by: DBH
Reviewed by: CHB
Date: 2012

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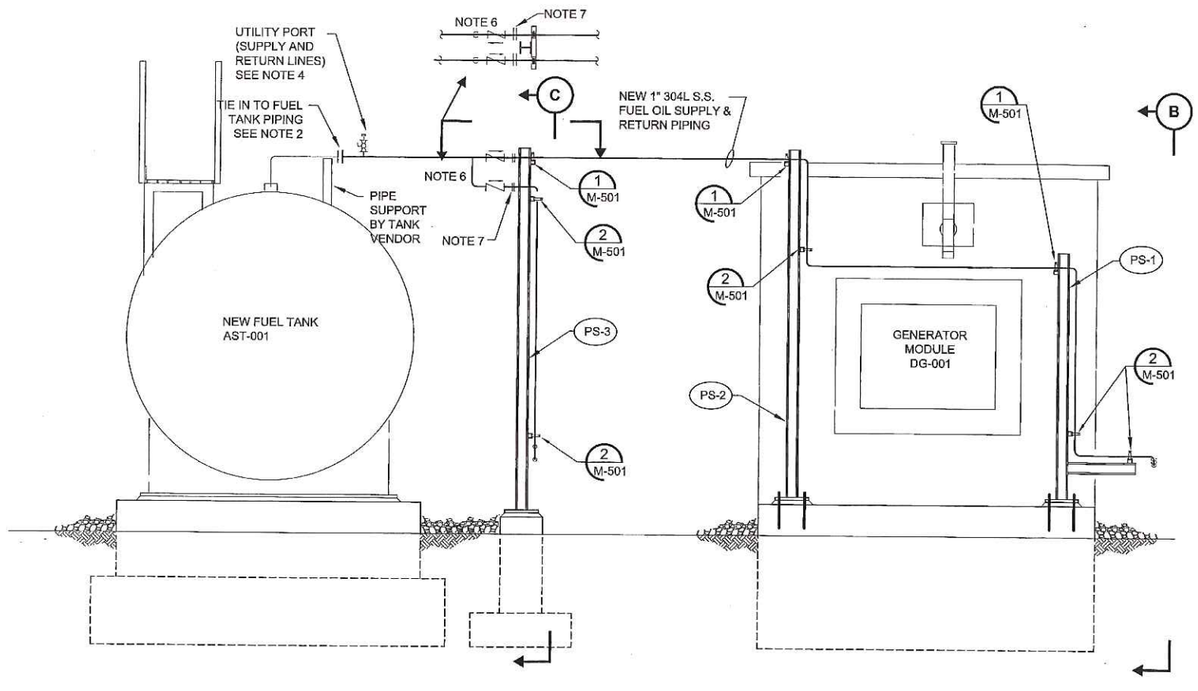
Engineering Services by:
KBR Engineering Co., LLC

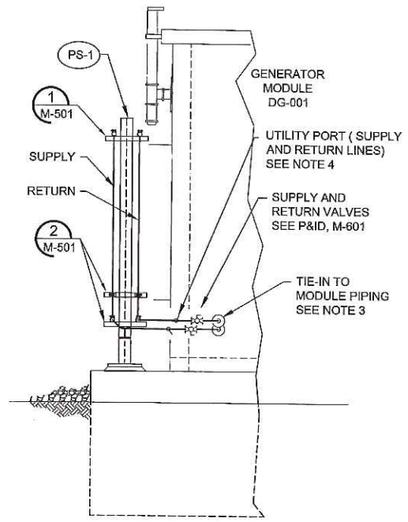
FEMA EMERGENCY RADIO NETWORK
ON WGAN PORTLAND, MAINE

MECHANICAL
FUEL PIPING DETAILS

Drawing Number:
M-501



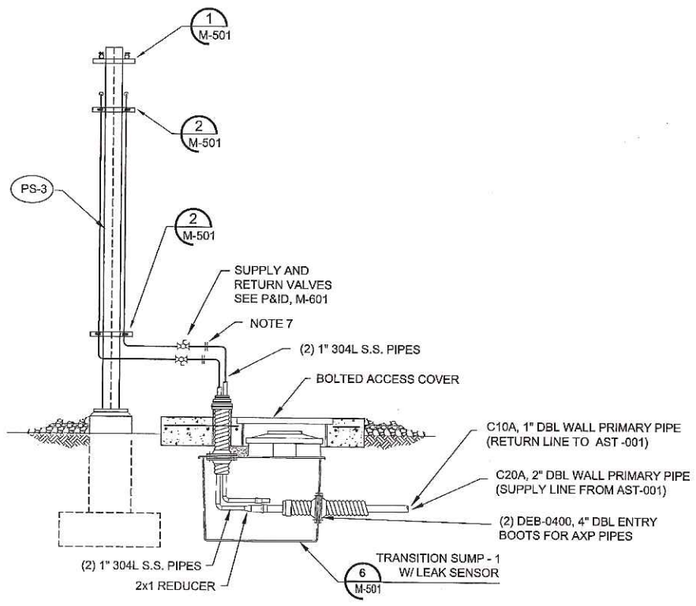
A FUEL PIPING ELEVATION
M-101 SCALE: 1/2"=1'-0"



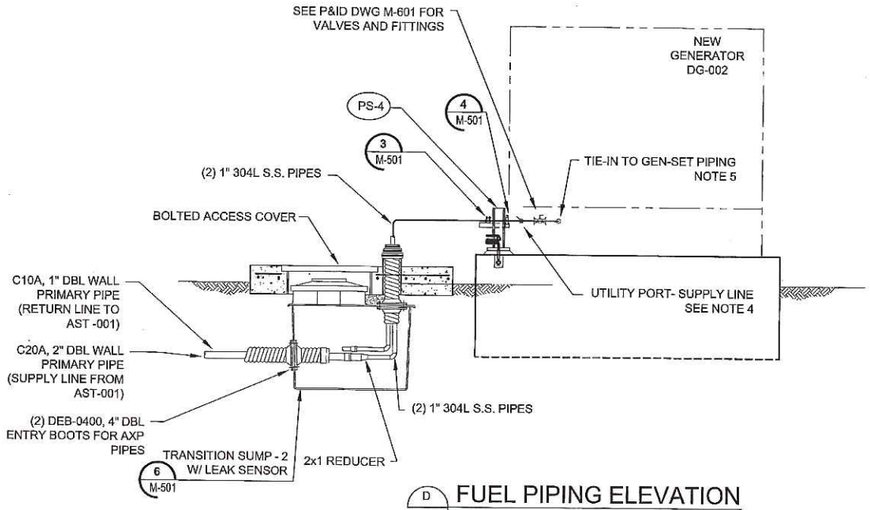
B ELEVATION
SCALE: 1/2"=1'-0"

NOTES:

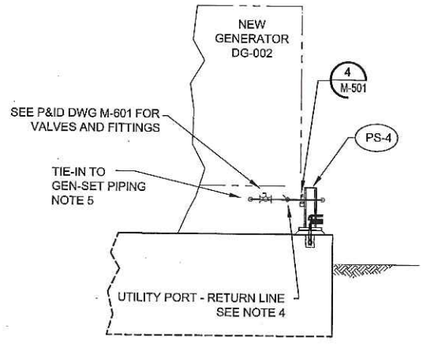
1. SEE NOTES DRAWING M-101.
2. MAKE STAINLESS STEEL FLANGE TO FLANGE CONNECTIONS. INSTALL SOCKET WELD STAINLESS STEEL FLANGES ON PIPING SYSTEM SIDE. (TANK FUEL LINES COME EQUIPPED WITH STAINLESS STEEL FLANGES.)
3. MAKE STAINLESS STEEL FLANGE TO FLANGE CONNECTIONS. INSTALL THREADED STAINLESS STEEL FLANGES ON THE MODULE GEN-SET FUEL LINE STUB-OUTS. IF NECESSARY TO ALLOW FOR PROPER CLEARANCES, INSTALL A COUPLING AND PIPE NIPPLE TO ONE OF THE STUB-OUTS TO STAGGER FLANGES. INSTALL SOCKET WELD STAINLESS STEEL FLANGES ON PIPING SYSTEM SIDE.
4. UTILITY PORT SHALL CONSIST OF A SOCKET WELD TEE, POE/TOE PIPE NIPPLE, THREADED BALL VALVE (LOCKABLE) AND PLUG. ALL 1" 304L STAINLESS STEEL. UTILITY PORT TO BE USED AS A UTILITY CONNECTION FOR TESTING, PRIMING, DRAINING, AND VENTING. THE HIGH POINT PORTS SHALL BE INSTALLED IN THE VERTICAL POSITION, AND THE LOW POINT PORTS SHALL BE INSTALLED IN THE HORIZONTAL POSITION.
5. MAKE FLANGE TO FLANGE CONNECTIONS. INSTALL THREADED CARBON STEEL FLANGES ON THE SITE GEN-SET FUEL LINE STUB-OUTS. IF NECESSARY TO ALLOW FOR PROPER CLEARANCES, INSTALL A COUPLING AND PIPE NIPPLE TO ONE OF THE STUB-OUTS TO STAGGER FLANGES . INSTALL SOCKET WELD STAINLESS STEEL FLANGES ON PIPING SYSTEM SIDE. USE FLANGE INSULATING GASKET KITS.
6. LOCATE THESE CHECK VALVES IN SUPPLY AND RETURN LINES AND AS NEAR AS POSSIBLE TO THE TEE. CHECK VALVES TO BE OPW 175B WITH INTERNAL PRESSURE RELIEF, OR APPROVED EQUAL. CONTRACTOR SHALL VERIFY PROPER DIRECTION OF CHECK VALVES PRIOR TO INSTALLATION
7. FURNISH AND INSTALL SOCKET WELD STAINLESS STEEL FLANGES TO PROVIDE ACCESS FOR VALVE REMOVAL. ALSO SHOWN ON DRAWING M-601.



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



D FUEL PIPING ELEVATION
M-101 SCALE: 1/2"=1'-0"



E FUEL PIPING ELEVATION
M-101 SCALE: 1/2"=1'-0"

US Army Corps of Engineers
OMAHA DISTRICT

PHASE	REVISION								
Project Manager									
Project Engineer									
Architectural									
Structural									
Mechanical									
Plumbing									
Electrical									
Civil									

No.	Description	Date	Approved
0	ISSUED FOR CONSTRUCTION	11/1/12	

Designed by: DBH
Drawn by: RAM
Checked by: DBH
Reviewed by: CHB
Date: 2012

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Engineering Services by KBR Engineering Co. LLC

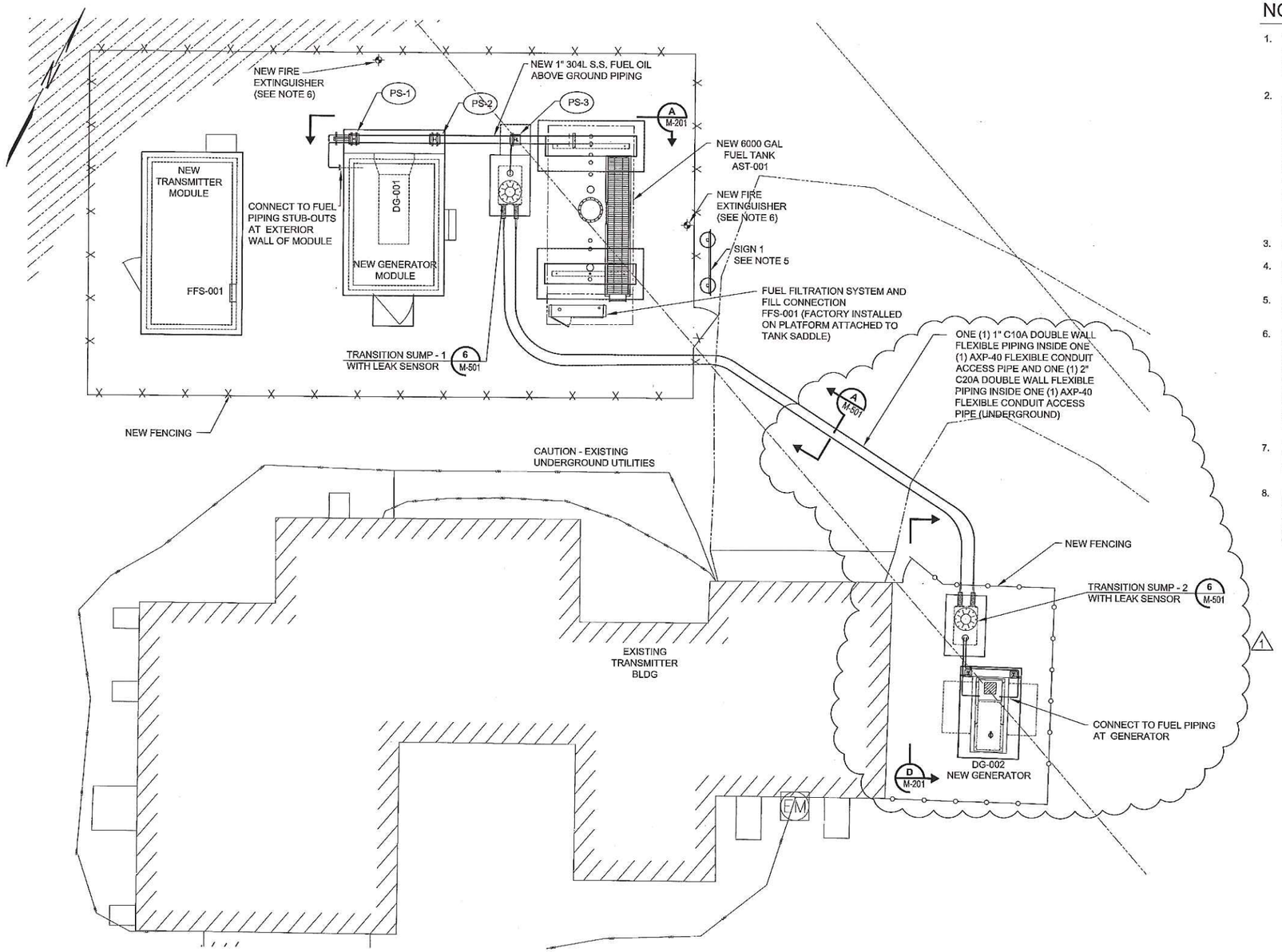
FEMA

FEMA EMERGENCY RADIO NETWORK
ON WGAN - PORTLAND, MAINE

FUEL PIPING SYSTEM ELEVATIONS

STATE OF MAINE
DAVID BLACKWELL HARRIS
No. 12960
REGISTERED PROFESSIONAL ENGINEER
Rev. 0 11/01/12

Drawing Number:
M-201



NOTES:

1. THE FUEL TANK, APPURTENANCES, AND ASSOCIATED PIPING SHALL MEET ALL U.S. EPA, STATE OF MAINE DEQ, STATE FIRE MARSHAL, NFPA, NEC, MANUFACTURER'S INSTRUCTIONS, LOCAL FIRE DEPARTMENT AND LOCAL REQUIREMENTS, CODES AND GUIDELINES.
2. ABOVEGROUND PIPING SHALL COMPLY WITH NFPA 30, "FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE" AND ASME B31.9, "BUILDING SERVICES PIPING," FOR FUEL OIL PIPING MATERIALS, INSTALLATION, INSPECTION, AND TESTING. STAINLESS STEEL PIPING SHALL CONFORM TO ASTM A312, PIPE, 304L, STAINLESS STEEL, SCHEDULE 40S. STAINLESS STEEL PIPING SHALL HAVE SOCKET WELD FITTINGS AND SOCKET WELD 150# RF FLANGES. ON GEN-SET FUEL LINE CONNECTIONS WITH MNPT STUB-OUTS, CONTRACTOR SHALL INSTALL A THREADED 150# RF FLANGE OF THE SAME MATERIAL AS THE PIPING THE FLANGE IS BEING THREADED TO. FLANGE INSULATING GASKET KITS SHALL BE USED IN CASES WHERE A CARBON STEEL FLANGE IS BEING MATED TO A STAINLESS STEEL FLANGE. ANY REMAINING CARBON STEEL PIPING THAT IS EXPOSED SHALL BE PAINTED AS PER THE SPECIFICATION. GALVANIZED PIPE IS NOT PERMITTED FOR USE FOR FUEL OIL PIPING OR VENT PIPING.
3. (PS-1) PIPE SUPPORT DESIGNATOR. SEE DWG S-501.
4. SEE DRAWING M-601 AND SPECIFICATION SECTION 23 10 20 FOR FULL SCOPE OF WORK FOR THE FUEL OIL SYSTEM.
5. SEE DRAWING S-502 FOR SIGN DETAILS. INSTALLATION CONTRACTOR SHALL DETERMINE EXACT LOCATION TO CLEAR UNDERGROUND ELECTRICAL.
6. PROVIDE A 4A-40BC (MINIMUM RATING) 10 LB FIRE EXTINGUISHER CONFORMING TO NFPA 10. AND APPLICABLE SECTIONS OF NFPA 1, 13.6. PROVIDE LOCKABLE OUTDOOR CABINET WITH BREAKER BAR, SIGNS AND ACCESSORIES AS REQUIRED. VERIFY LOCAL REQUIREMENTS WITH FIRE MARSHAL PRIOR TO PURCHASE. INSTALL FIRE EXTINGUISHERS WHERE INDICATED ON THE DRAWING. COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALL INSTALLATIONS. PROVIDE EXTINGUISHERS COMPLETE WITH MANUFACTURER'S WARRANTY WITH INSPECTION TAG ATTACHED. EXTINGUISHER SHALL BE INSTALLED, INSPECTED, AND TAGGED BY A LICENSED FIRE EXTINGUISHER COMPANY.
7. UNDERGROUND FLEXIBLE PIPING AND CONTAINMENT SYSTEM ARE IDENTIFIED WITH OPW FLEXWORKS MODEL NUMBERS. SYSTEM SHALL BE OPW FLEXWORKS OR APPROVED EQUAL.
8. UNDERGROUND DOUBLE CONTAINMENT SYSTEM SHALL BE PROVIDED BY CONTRACTOR AS A COMPLETE SYSTEM DESIGNED AND FABRICATED BY THE CONTAINMENT SYSTEM MANUFACTURER WITH RESPECT TO THE DRAWINGS, SPECIFICATIONS, AND THE CONDITIONS OF THE SITE. INSTALLATION OF UNDERGROUND DOUBLE CONTAINMENT SYSTEM SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

EQUIPMENT SCHEDULE

TAG	ITEM	FURNISHED BY	INSTALLED BY	DESCRIPTION	REMARKS
AST-001	ABOVEGROUND STORAGE TANK	OWNER	CONTRACTOR	6,000 GAL. DBL-WALL, UL-2085	PART OF FUEL SYSTEM PACKAGE
DG-001	FEMA GEN-SET	OWNER	OWNER	35 KW IN HEMP SHLD MODULE	PART OF HEMP MODULE PACKAGE
DG-002	NEW GEN-SET	OWNER	CONTRACTOR	75 KW W/ ENCLOSURE & SUB BASE TANK	OWNER TO FURNISH CONTRACTOR TO INSTALL
FFS-001	FUEL FILL/FILTRATION SYSTEM	OWNER	CONTRACTOR	FILL PORT W/ FILTRATION	PART OF FUEL SYSTEM PACKAGE (ON PLATFORM ATTACHED TO TANK)
FSCP-001	FUEL SYSTEM CONTROL PANEL	OWNER	OWNER (SEE ELECTRICAL DWGS & SPECS)	FUEL MONITORING SYSTEM	PART OF FUEL SYSTEM PKG (INSTALLED INSIDE TRANSMITTER MODULE)

A G-101 MECHANICAL PLAN
SCALE: 3/16"=1'-0"

0' 5' 10' 20'
3/16"=1'-0"

US Army Corps of Engineers OMAHA DISTRICT

PHASE REVIEW: Project Manager, QC Reviewer, Architectural, Structural, Mechanical, Plumbing, Electrical, Civil

Mark	Description	Date	Approved
1	ADDED ENGINE, RELOCATED GEN-SET AND PIPING, DEL ENGINE	1/22/13	
0	ISSUED FOR CONSTRUCTION	11/7/12	

Designed by: DBH
Drawn by: RAM
Checked by: DBH
Reviewed by: CHB
Date: 2012

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FEMA EMERGENCY RADIO NETWORK ON WGAN PORTLAND, MAINE

MECHANICAL PLAN

STATE OF MAINE
DAVID BLACKWELL HARRIS
No. 12560
REGISTERED PROFESSIONAL ENGINEER

Rev. 1 01/22/13

Drawing Number: M-101