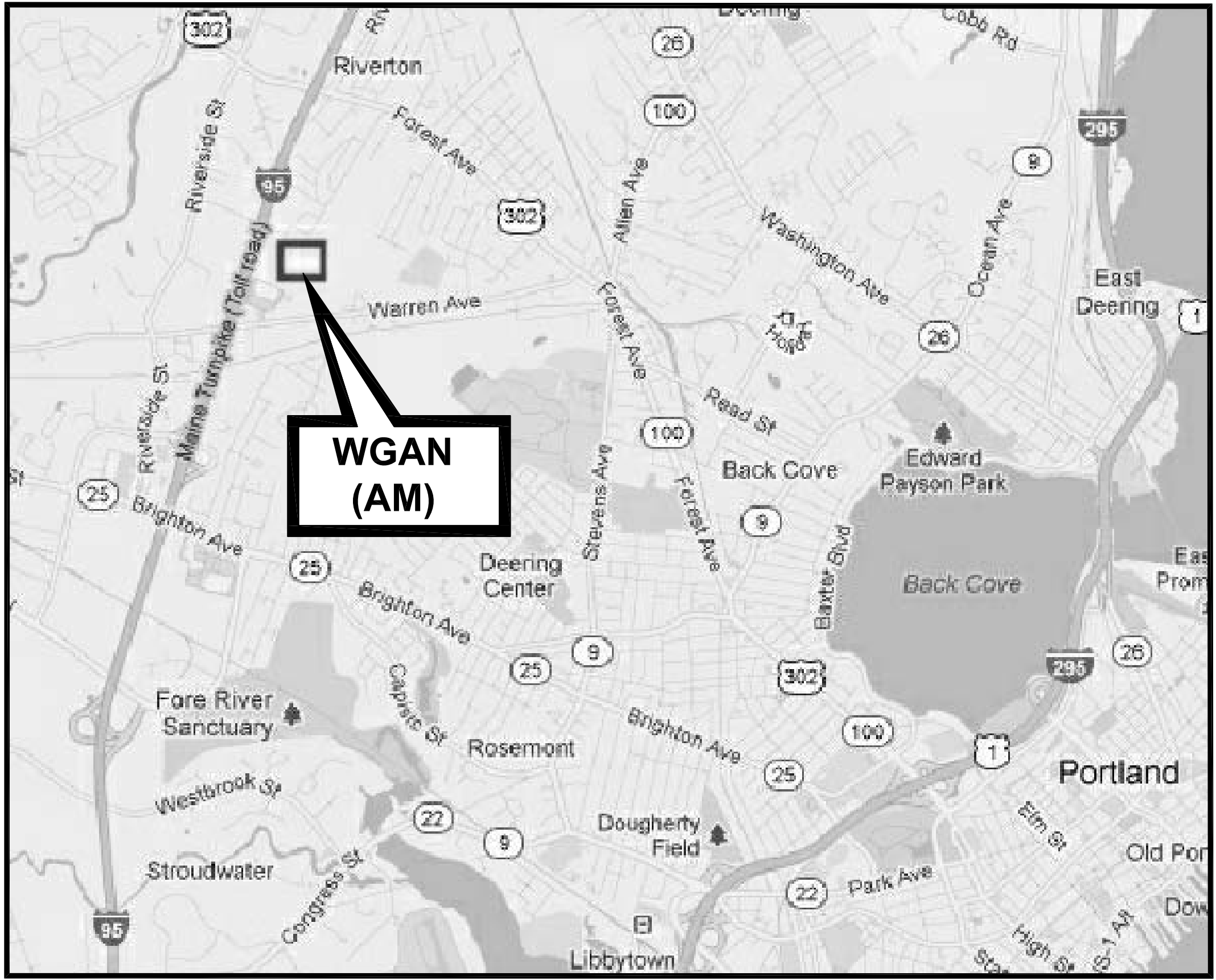


# FEMA EMERGENCY RADIO NETWORK WGAN PORTLAND, MAINE



VICINITY MAP

WGAN TRANSMITTER SITE  
236 LANE AVENUE  
PORTLAND, ME 04103  
CUMBERLAND COUNTY

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- E-404 TRANSMITTER / GENERATOR UPS / TIME DELAY DIAGRAM
  
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- E-502 INSTALLATION DETAILS
- E-503 INSTALLATION DETAILS
- E-504 INSTALLATION DETAILS

## REFERENCED BUILDING CODES

- CITY OF PORTLAND TECHNICAL MANUAL 2010
- MAINE UNIFORM BUILDING CODE 2010
- INTERNATIONAL BUILDING CODE 2009
- INTERNATIONAL MECHANICAL CODE 2009
- ASCE 7-05
- NFPA 30, 2008 EDITION
- NATIONAL ELECTRIC CODE, 2008 EDITION
- NFPA 101 LIFE SAFETY CODE, 2009 EDITION



PROJECT AERIAL VIEW  
SEE SITE PLAN, DWG G-101



PHASE REVIEW	Project Manager	DC Reviewer	Structural	Mechanical	Plumbing	Electrical	Civil

Mark	Date	Description
1	01/16/13	ADDED LANDSCAPING PLAN
0	11/17/12	ISSUED FOR CONSTRUCTION

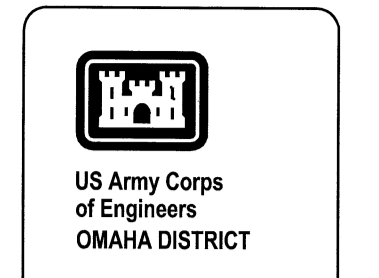
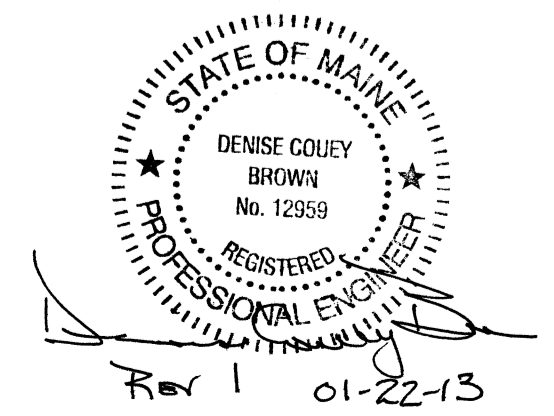
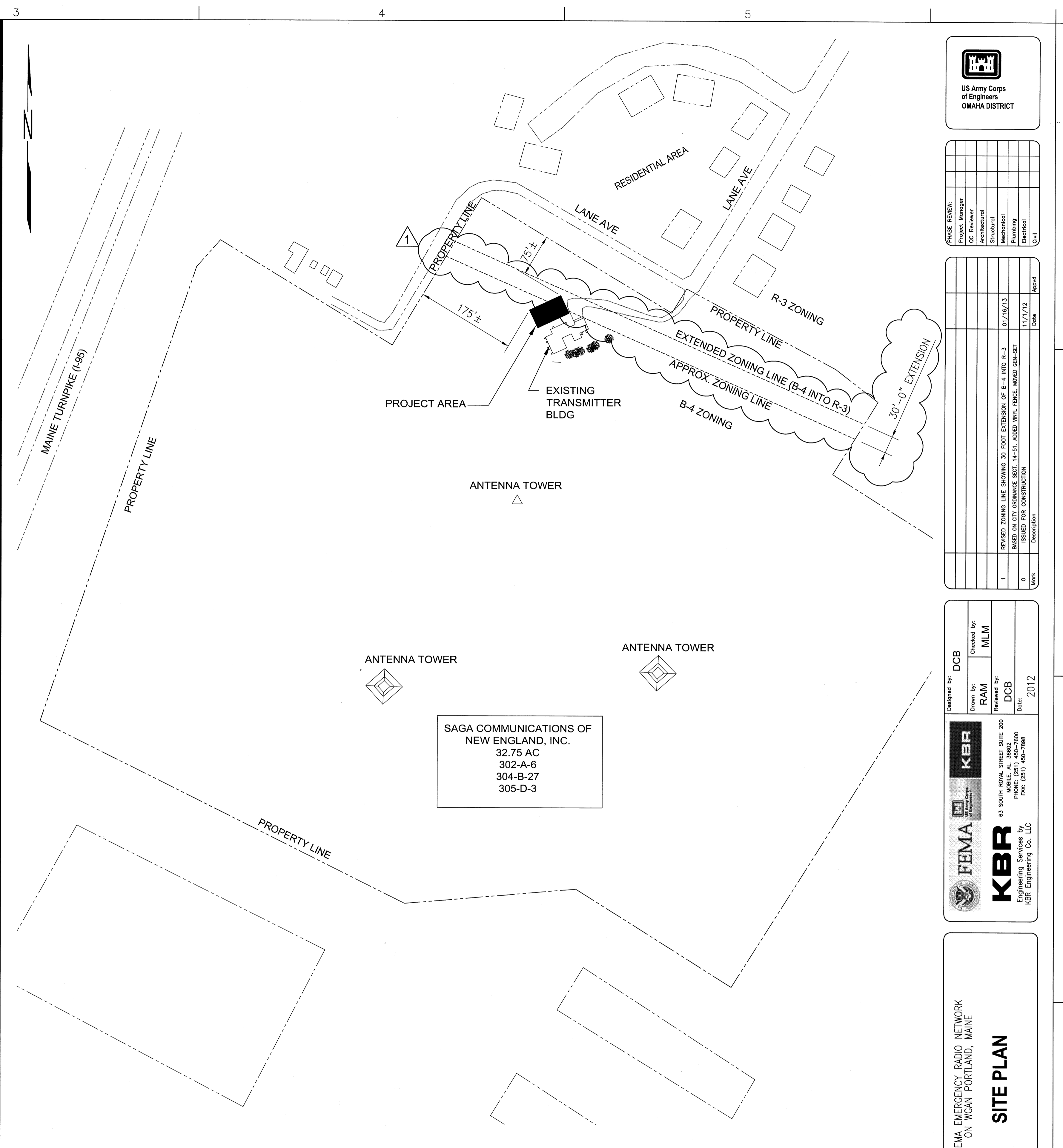
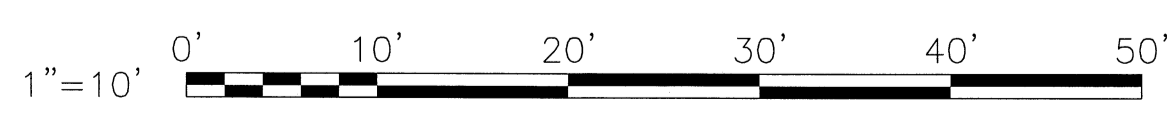
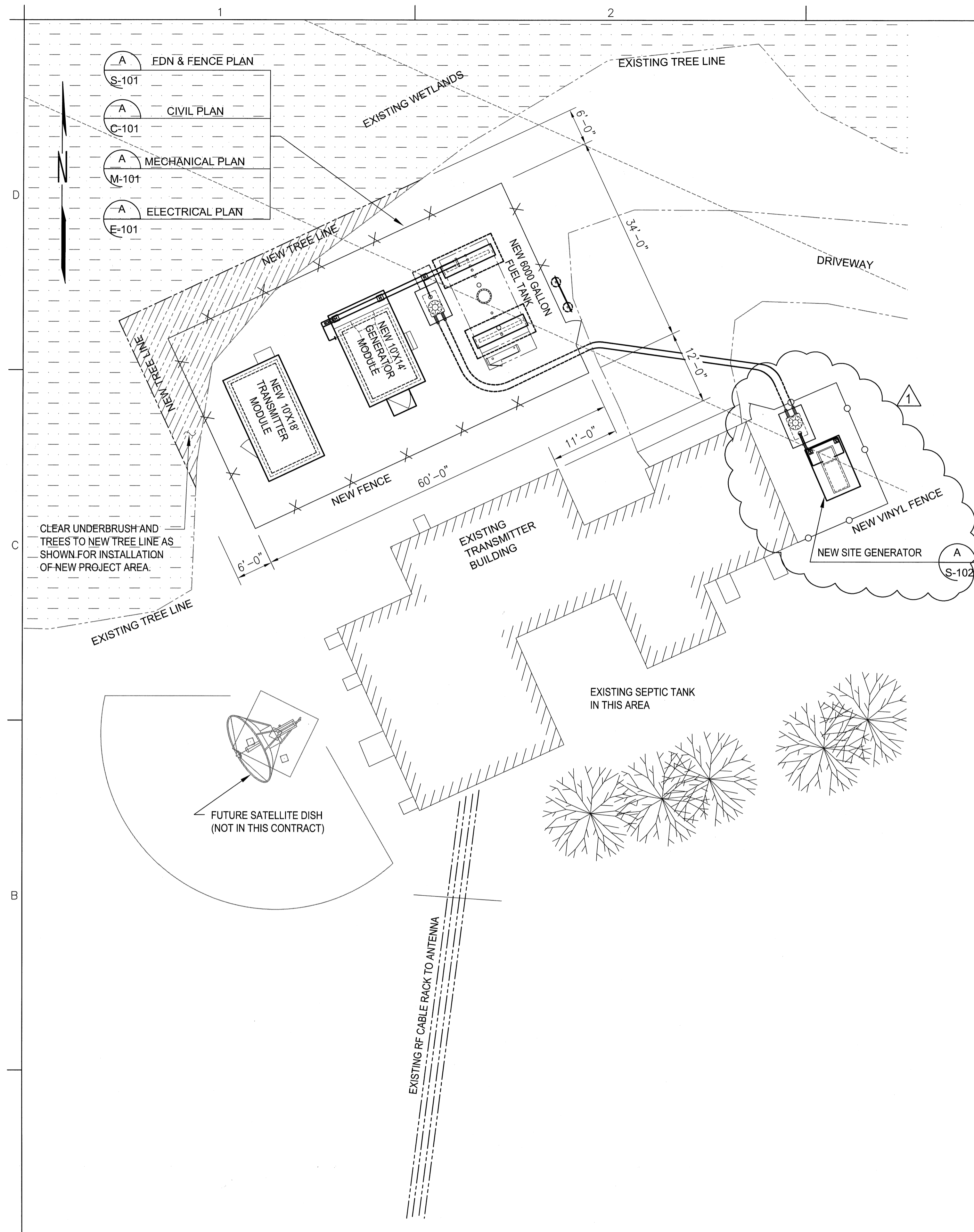
Designed by	DCB
Drawn by	RAM
Checked by	MLM
Reviewed by	DCB
Date	2012

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KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
ON WGAN PORTLAND, MAINE  
**COVER SHEET**  
VICINITY MAP AND INDEX

Drawing Number:  
**G-001**



Project Manager	DC Reviewer	Architectural	Mechanical	Plumbing	Electrical	Civil

Revised Zoning Line Showing 30 Foot Extension of B-4 into R-3 Based on City Ordinance Sect. 14-51, Added Vinyl Fence, Moved Generator Issued for Construction	Date	Mark	Description
1	01/16/13		
0	11/17/12		

Designed by:	DCB
Drawn by:	RAM
Checked by:	MLM
Reviewed by:	DCB
Date:	2/12

**KBR**  
 Engineering Services by  
 KBR Engineering Co., LLC

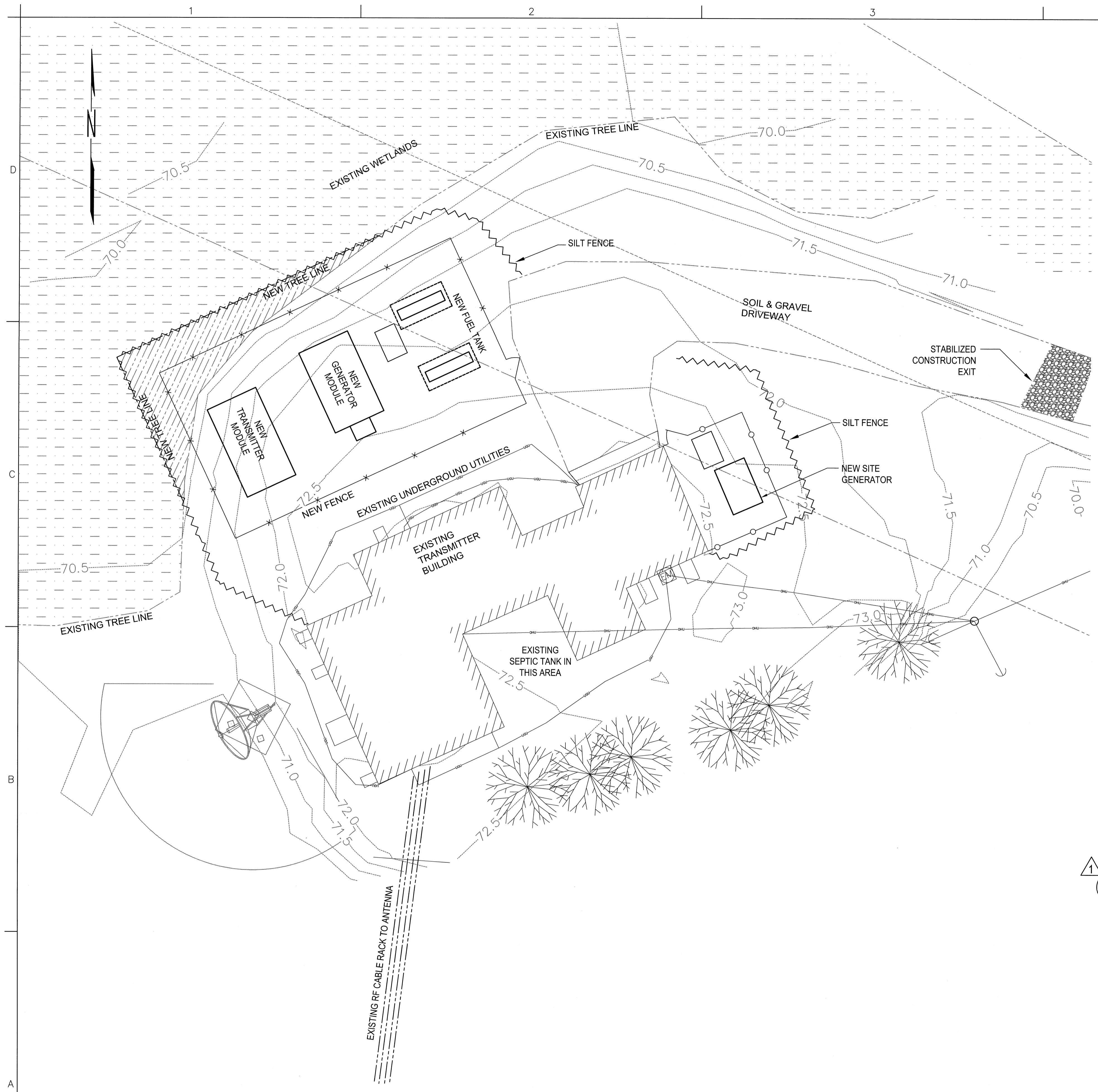
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**FEMA**  
 FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA EMERGENCY RADIO NETWORK  
 ON WGAN PORTLAND, MAINE

**SITE PLAN**

Drawing Number:  
**G-101**



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



**STORM WATER QUALITY NOTES - CONSTRUCTION BMP'S**

1. THIS PROJECT SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS.
2. SUFFICIENT BMP'S SHALL BE INSTALLED TO PREVENT SILT, MUD OR OTHER CONSTRUCTION DEBRIS FROM BEING TRACKED INTO THE ADJACENT STREET(S) OR STORM WATER CONVEYANCE SYSTEMS DUE TO CONSTRUCTION VEHICLES OR ANY OTHER CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING ANY SUCH DEBRIS THAT MAY BE IN THE STREET AT THE END OF EACH WORK DAY OR AFTER A STORM EVENT THAT CAUSES A BREACH IN THE INSTALLED CONSTRUCTION BMP'S.
3. ALL STOCK PILES OF UNCOMPACTED SOIL AND/OR BUILDING MATERIALS THAT ARE INTENDED TO BE LEFT UNPROTECTED FOR A PERIOD GREATER THAN SEVERAL CALENDAR DAYS ARE TO BE PROVIDED WITH EROSION AND SETTLEMENT CONTROLS. SUCH SOIL MUST BE PROTECTED EACH DAY WHEN THE PROBABILITY OF RAIN IS 40% OR GREATER.
4. CONTRACTOR SHALL FIELD ADJUST AND PROVIDE ADDITIONAL SEDIMENT CONTROL MEANS AT NO ADDITIONAL COST TO OWNER IF WARRANTED BY FIELD CONDITIONS.
5. ALL SLOPES THAT ARE CREATED OR DISTURBED BY CONSTRUCTION ACTIVITY MUST BE PROTECTED AGAINST EROSION AND SEDIMENT TRANSPORT AT ALL TIMES.
6. THE STORAGE OF ALL CONSTRUCTION MATERIALS AND EQUIPMENT MUST BE PROTECTED AGAINST ANY POTENTIAL RELEASE OF POLLUTANTS INTO THE ENVIRONMENT.
7. ALL GRADED, DISTURBED OR ERODED AREAS THAT WILL NOT BE PERMANENTLY PAVED, COVERED BY STRUCTURES OR COVERED BY WEED CONTROL FABRIC AND CRUSHED STONE, SHALL BE TREATED WITH HYDROSEED, SOD OR EQUIVALENT. ALL REQUIRED REVEGETATION AND EROSION CONTROL SHALL BE COMPLETED WITHIN 90 CALENDAR DAYS.
8. ALL EROSION / SETTLEMENT CONTROL FACILITIES SHALL BE MAINTAINED IN WORKING ORDER AND AS SPECIFIED BY THE STATE ENVIRONMENTAL AGENCY. THESE FACILITIES SHALL BE INSPECTED AFTER EVERY PRECIPITATION EVENT. ANY NECESSARY REPAIRS WILL BE MADE IMMEDIATELY. ACCUMULATED SEDIMENTS WILL BE REMOVED AS REQUIRED TO KEEP THE DEVICES FUNCTIONAL. IN ALL CASES, REMOVE DEPOSITS WHERE ACCUMULATIONS REACH 3" ABOVE GRADE. ALL UNDERCUTTING OR EROSION OF THE TOE ANCHOR WILL BE REPAIRED IMMEDIATELY WITH COMPACTED BACKFILL MATERIALS. ADHERE TO ANY MANUFACTURER'S RECOMMENDATIONS.
9. ANY CONTROL STRUCTURE DISTURBED DURING DAILY OPERATIONS SHALL BE REPAIRED, REPLACED OR RECONSTRUCTED AS REQUIRED UPON COMPLETION OF THE WORK DAY.
10. THE CONTRACTOR WILL BE RESPONSIBLE DURING CONSTRUCTION AND FOR ONE YEAR FOR MAINTAINING THE E&S MEASURES TO INSURE COMPLIANCE WITH THE APPROVED PLAN AND THE APPLICABLE REGULATIONS OF THE STATE.
11. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 13 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREA WILL BE MULCHED WITH STRAW OR EQUIVALENT MATERIAL, AT A RATE OF 2.5 TO 3 TONS PER ACRE. ANY STEEP SLOPES (GREATER THAN 3:1) SHALL BE STABILIZED DAILY.

**SITE AREA**

THE PROPOSED CONSTRUCTION PROJECT SHALL IMPACT APPROXIMATELY 0.09 ACRES (510 SF OF CONCRETE, 2250 SF OF GRAVEL GROUND COVER AND 1100 SF OF GRASS). GRADING PROPOSED ON THIS SITE AND POTENTIAL WETLAND IMPACT WILL BE IN ACCORDANCE WITH DWG C-102.

ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP 2300510006C, THE SITE IS OUTSIDE THE 500-YEAR FLOODPLAIN.

**PLANNING AND ORGANIZATION**

DURING CONSTRUCTION, THE KBR SITE MANAGER WILL OVERSEE THE IMPLEMENTATION AND MAINTENANCE OF THE STORMWATER PLAN.

**BEST MANAGEMENT PRACTICES**

1. SILT FENCE - THE CONSTRUCTION SITE WILL BE SURROUNDED BY A SILT FENCE TO PREVENT RUNOFF OF SEDIMENT.
2. STABILIZED CONSTRUCTION EXIT - A GRAVEL CONSTRUCTION EXIT WILL PREVENT DISPERSION OF SEDIMENT ONTO NEARBY ROADS.
3. WATER QUALITY TREATMENT - 4" LAYER OF CRUSHED STONE OVER AN 18" LAYER OF CLEAN GRANULAR GRAVEL (MDOT 703.06 TYPE A)

ALL BMP'S SHALL BE IN ACCORDANCE WITH THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION PUBLICATION "MAINE EROSION AND SEDIMENT CONTROL BMP'S".



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

Work	Description	Date	Appr
1	ADDED WATER QUALITY TREATMENT MEASURES	01/16/13	
0	ISSUED FOR CONSTRUCTION	11/7/12	

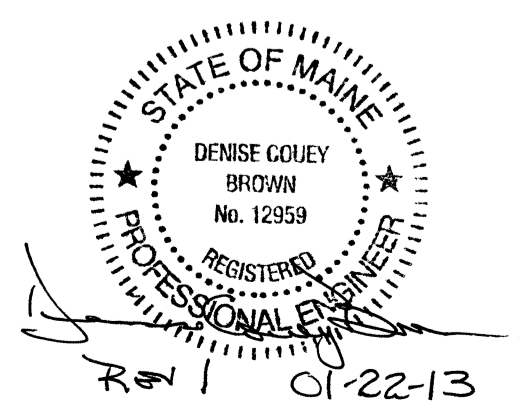
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Drawn by:	RAM
Checked by:	MLM
Reviewed by:	DCB
Date:	2012

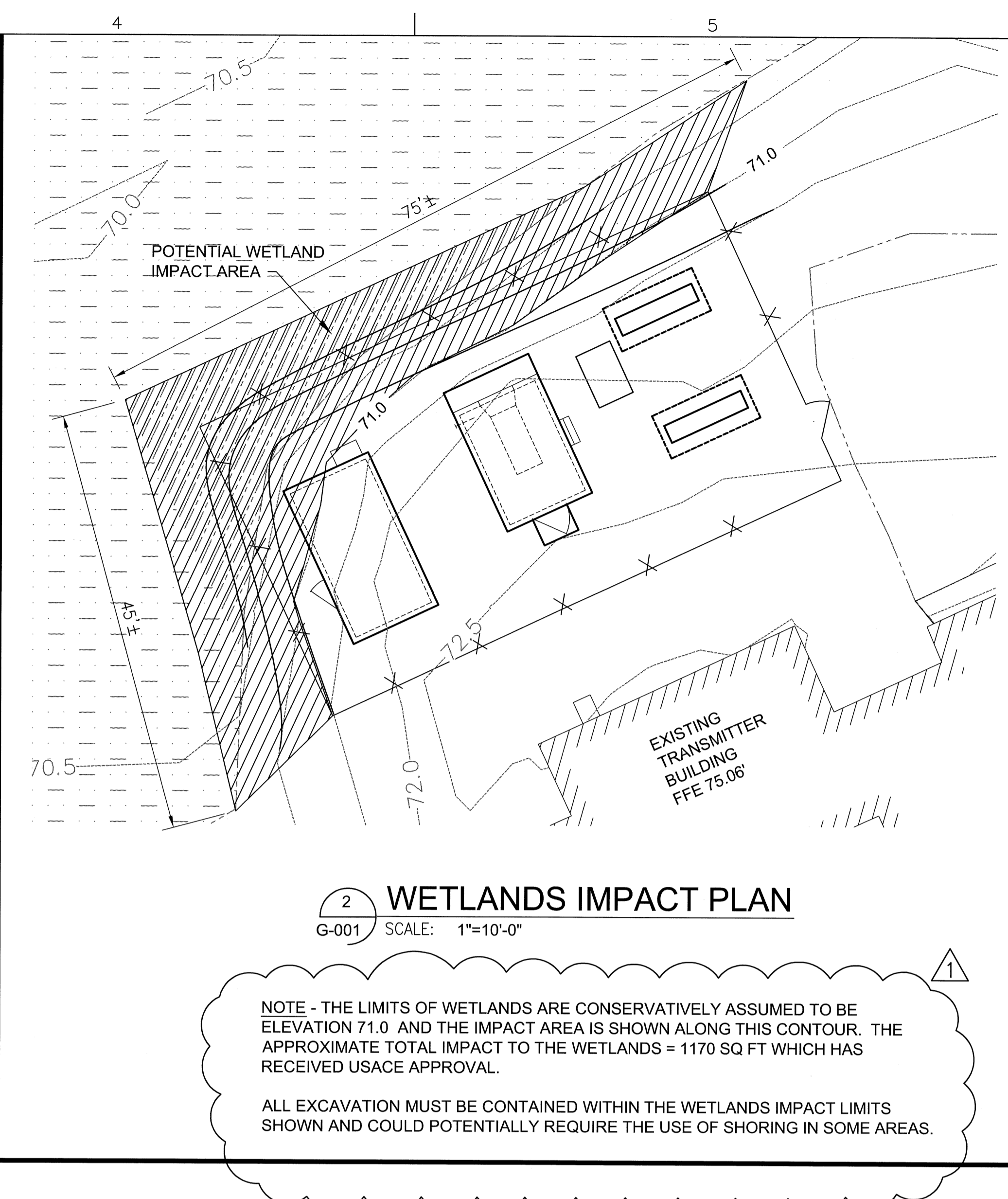
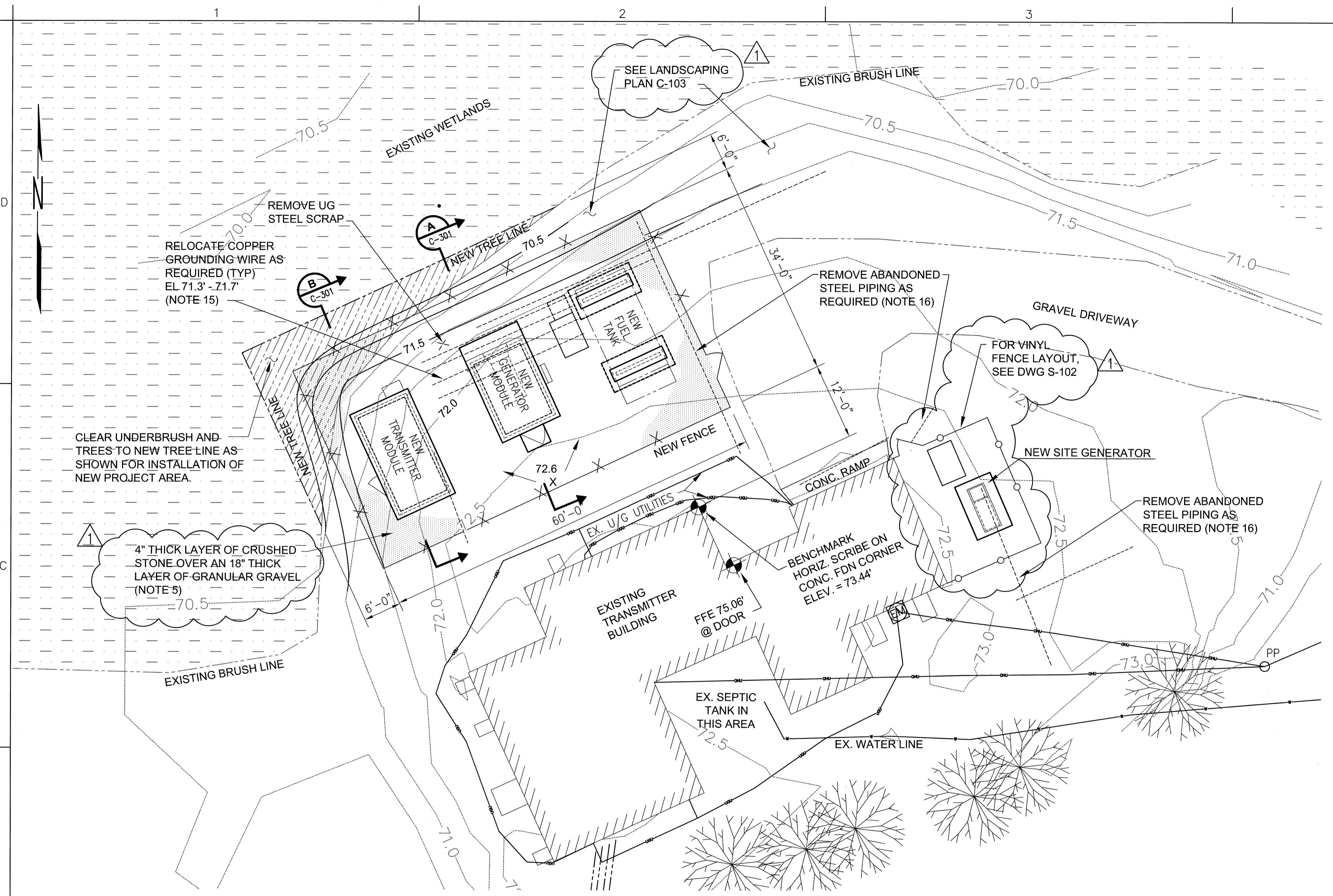
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KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
ON WGAN PORTLAND, MAINE  
**STORMWATER MANAGEMENT PLAN**

Drawing Number:  
**C-101**



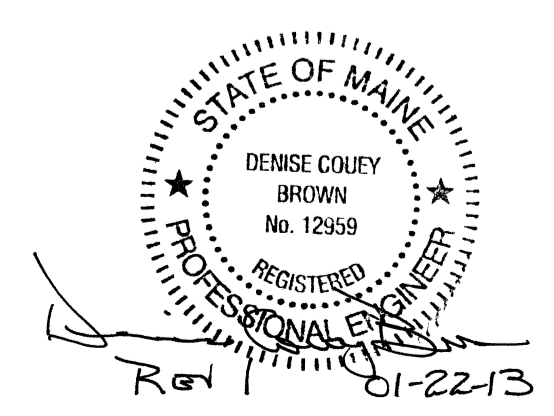
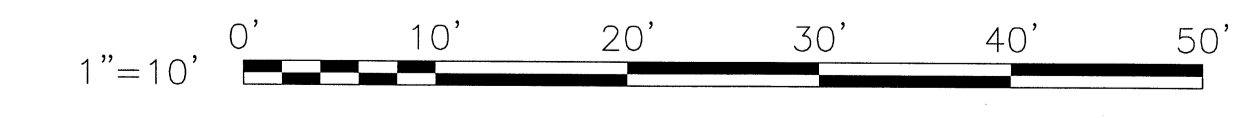
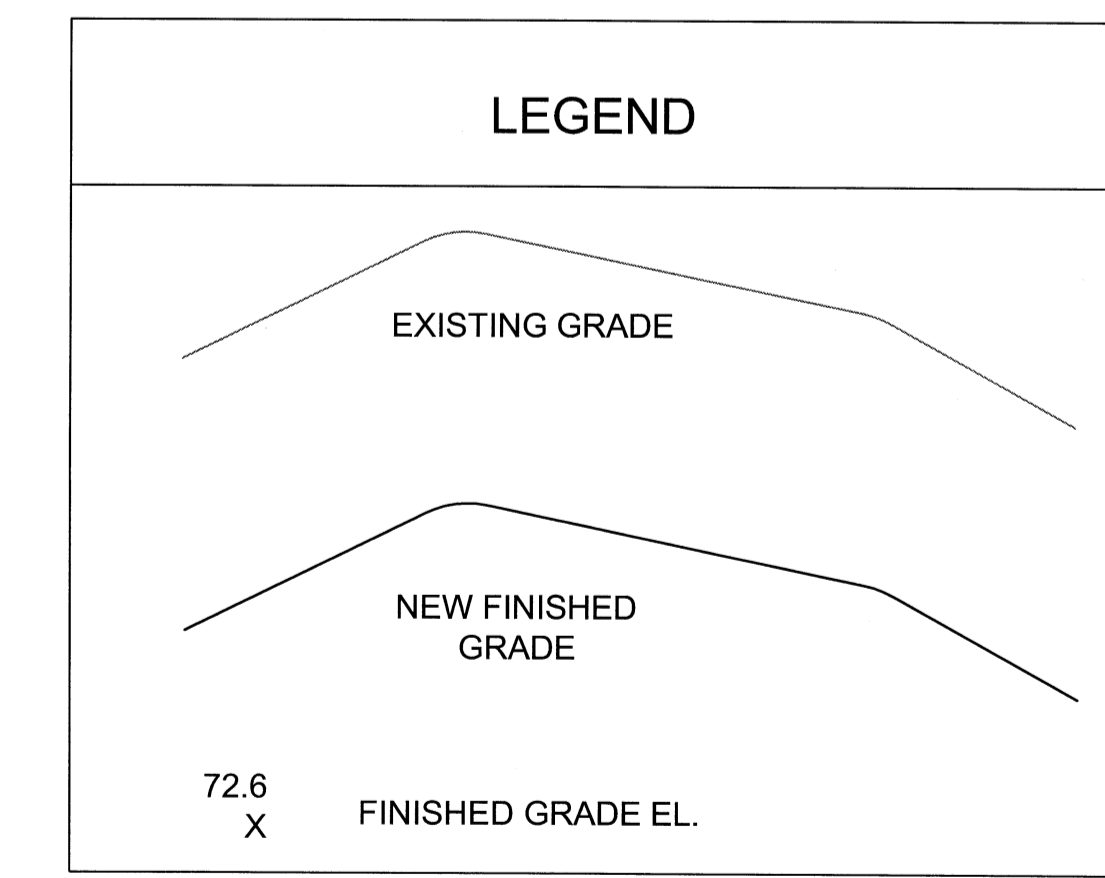


**NOTES:**

1. SITE PREPARATION, EXCAVATION, AND BACKFILLING SHALL BE ACCOMPLISHED PER THE PLANS, SPECIFICATION 31 23 00.00 20, AND RECOMMENDATIONS IN THE GEOTECHNICAL REPORT BY SCHONEWALD ENGINEERING ASSOCIATES INC. DATED AUGUST 2012. GEOTECHNICAL SERVICES DURING CONSTRUCTION INCLUDING OBSERVATION AND TESTING OF THE EXCAVATIONS, BACKFILL AND COMPACTION, SHALL BE PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD.
2. EXISTING SOILS SHOULD BE OVEREXCAVATED TO 2 FEET BELOW THE SPECIFIED BOTTOM OF FOOTING ELEVATION TO ACCOMMODATE FOR A LAYER OF 2 FEET THICK CRUSHED STONE BEDDING MATERIAL. THE STONE SHOULD BE WRAPPED IN A NON-WOVEN GEOTEXTILE FABRIC. SEE SPECIFICATION 31 23 00.00 20 FOR STONE AND FABRIC MATERIALS.
3. DURING DRILLING, GROUNDWATER WAS ENCOUNTERED AT AN APPROXIMATE DEPTH OF 9 FEET BELOW GRADE. POSITIVE DRAINAGE SHALL BE MAINTAINED DURING CONSTRUCTION. CONSTRUCTION DEWATERING MAY BE REQUIRED AND MUST BE PRESERVE THE UNDISTURBED CONDITION OF THE SUBGRADE.
4. MAINTAIN UNIFORM MOISTURE CONDITIONS IN THE EXPOSED SUBGRADE SOILS PRIOR TO CONSTRUCTION OF THE FOUNDATION. A 3 INCH THICK SEAL SLAB IS REQUIRED OVER THE BASE OF THE EXCAVATION IF FOUNDATIONS ARE NOT PLACED THE SAME DAY THE EXCAVATION IS COMPLETED.
5. 4 INCHES OF CRUSHED STONE OVER 18 INCHES (MINIMUM) OF GRANULAR GRAVEL SHALL BE PLACED WITHIN FENCED AREA AS SHOWN ON THE DRAWINGS. CRUSHED STONE SHALL BE CLEAN AND CONFORM TO ASTM C 33 COARSE AGGREGATE GRADING SIZE 4 (1 1/2" - 3/4"). GRANULAR GRAVEL (STRUCTURAL FILL) SHALL BE CLEAN AND CONFORM TO MDT 703.06 TYPE A. WEED CONTROL FABRIC SHALL BE PLACED BETWEEN THE CRUSHED STONE AND THE GRANULAR GRAVEL, AND EXTEND 1 FOOT BEYOND FENCE LINE TO ALLOW GRAVEL TO TAPER TO EXISTING GRADE.
6. WHERE THE PROPOSED DUCTBANK OR FUEL LINE CROSSES THE EXISTING DRIVEWAY/PARKING AREA, 4 INCHES OF CRUSHED STONE SHALL BE PLACED OVER THE BACKFILLED TRENCHES. WHERE THE DUCTBANK AND FUEL LINE CROSS AN EXISTING GRASSED AREA, TOPSOIL AND SEEDING SHALL BE PLACED OVER THE COMPACTED BACKFILL. DISTURBED AREAS AROUND THE PROPOSED GENSET AND SUMP SHALL BE SEEDED OR SODDED WITH 3" MINIMUM TOPSOIL. FOR DUCTBANK SECTION, SEE DWG E-504. FOR FUEL LINE TRENCH DETAIL, SEE DWG M-501. FOR TRENCH BACKFILL, SEE SPECIFICATION 31 23 00.00 20.
7. FOLLOWING CONSTRUCTION OF FOUNDATIONS, THE SITE ELEVATION SHALL BE REPLACED TO EXISTING GRADE EXCEPT WHERE NOTED ON DRAWINGS. AREA MUST BE GRADED TO DRAIN WITH NO AREAS OF STANDING WATER PRIOR TO INSTALLATION OF GRAVEL.
8. THE PROPOSED ELEVATIONS SHOWN ARE TOP OF GRADE. THE CRUSHED STONE WILL BE PLACED OVER THIS GRADE.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL DEVICES REQUIRED BY STATE AND LOCAL CODES, LAWS AND REGULATIONS. REFER TO DWG C-101.
10. WETLANDS ARE LOCATED ON THE SUBJECT PROPERTY. THE WETLANDS ARE NOT TO BE IMPACTED IN ANY WAY DURING CONSTRUCTION EXCEPT AS NOTED. THE WETLANDS SHOWN ARE NOT DELINEATED AND ARE BASED ON THE U.S. FISH AND WILDLIFE WETLANDS INVENTORY, ELEVATION AND THE EXISTING BRUSH LINE.
11. TOPOGRAPHIC SURVEY DATA FOR PROJECT SITE PROVIDED BY SEBAGO TECHNICS, INC. SEE SURVEY PLAN DATED JULY 2012. COORDINATES AND BEARINGS ARE REFERENCED TO GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802 (NAD 83). THE VERTICAL DATUM SHOWN IS NAVD 88.
12. GEOPHYSICAL DATA FOR THE PROJECT PROVIDED BY HAGER-RICHTER GEOSCIENCE, INC. SEE REPORT DATED JULY 2012 IN APPENDIX D OF THE GEOTECHNICAL REPORT.
13. FOR FOUNDATION ELEVATIONS, SEE DWG S-301.
14. FENCE TO BE IN ACCORDANCE WITH DETAIL ON DWG S-502 AND SPECIFICATION 32 31 13.53.
15. CONTRACTOR TO COORDINATE WITH STATION ENGINEER AND ON-SITE PROJECT MANAGER ON LOCATION OF EXISTING ANTENNA GROUNDING SYSTEMS IN ADDITION TO THOSE SHOWN ON THIS DRAWING. GROUNDING WIRES AND/OR CONDUCTORS TO BE RELOCATED AS SHOWN ON THE ELECTRICAL DRAWINGS PRIOR TO EXCAVATION ACTIVITIES.
16. CONTRACTOR RESPONSIBLE FOR VERIFYING EXISTING UNDERGROUND PIPING SHOWN IS NO LONGER IN SERVICE PRIOR TO REMOVAL.

NOTE - THE LIMITS OF WETLANDS ARE CONSERVATIVELY ASSUMED TO BE ELEVATION 71.0 AND THE IMPACT AREA IS SHOWN ALONG THIS CONTOUR. THE APPROXIMATE TOTAL IMPACT TO THE WETLANDS = 1170 SQ FT WHICH HAS RECEIVED USACE APPROVAL.

ALL EXCAVATION MUST BE CONTAINED WITHIN THE WETLANDS IMPACT LIMITS SHOWN AND COULD POTENTIALLY REQUIRE THE USE OF SHORING IN SOME AREAS.



Project Manager	
DC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS. DELETED BRILLES AND ADDED VINYL FENCE	01/16/13	11/7/12	Mark
0	ISSUED FOR CONSTRUCTION			

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

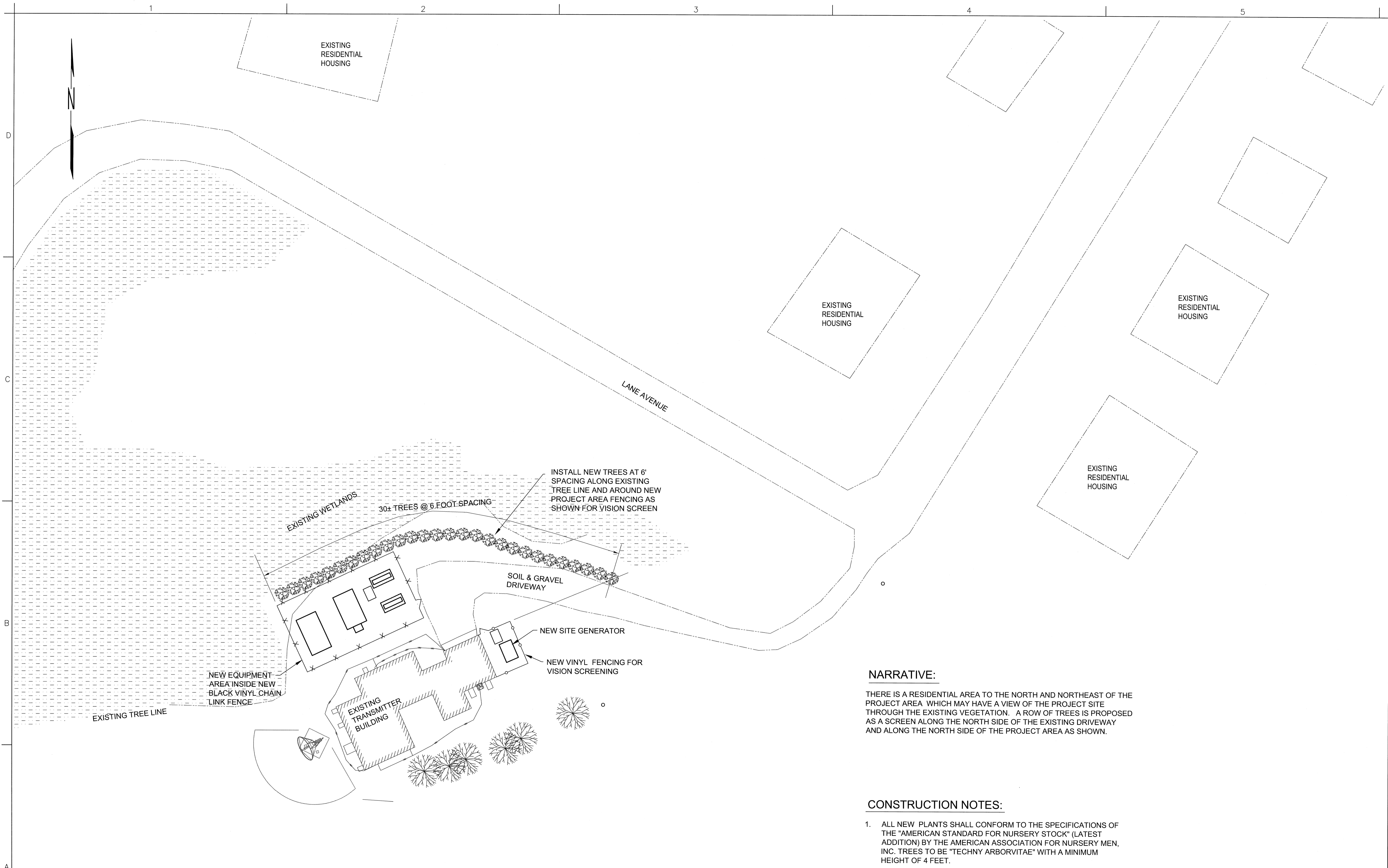
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**FEMA** KBR Engineering Services, LLC  
KBR Engineering Co., LLC

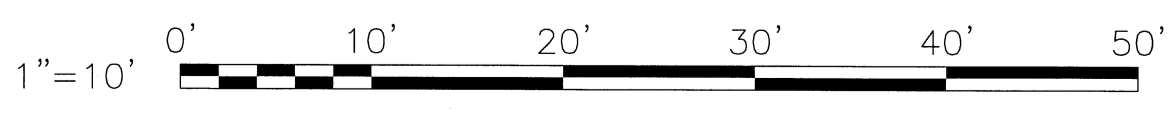
FEMA EMERGENCY RADIO NETWORK  
ON WGAN PORTLAND, MAINE

**CIVIL PLAN**

Drawing Number:  
**C-102**



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

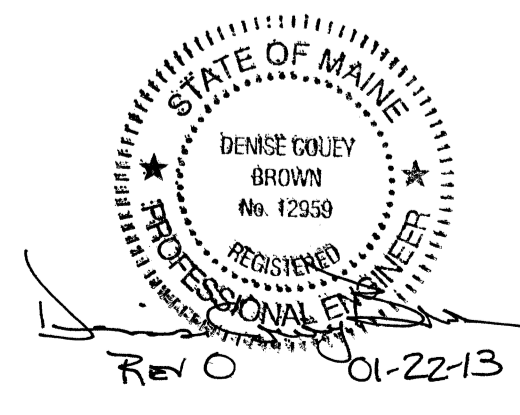


**NARRATIVE:**

THERE IS A RESIDENTIAL AREA TO THE NORTH AND NORTHEAST OF THE PROJECT AREA WHICH MAY HAVE A VIEW OF THE PROJECT SITE THROUGH THE EXISTING VEGETATION. A ROW OF TREES IS PROPOSED AS A SCREEN ALONG THE NORTH SIDE OF THE EXISTING DRIVEWAY AND ALONG THE NORTH SIDE OF THE PROJECT AREA AS SHOWN.

**CONSTRUCTION NOTES:**

1. ALL NEW PLANTS SHALL CONFORM TO THE SPECIFICATIONS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (LATEST ADDITION) BY THE AMERICAN ASSOCIATION FOR NURSERY MEN, INC. TREES TO BE "TECHNY ARBORVITAE" WITH A MINIMUM HEIGHT OF 4 FEET.
2. THE LAYOUT OF THE TREES SHALL BE APPROVED BY THE SITE MANAGER PRIOR TO PLANTING.
3. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING LOCATIONS OF ANY EXISTING UNDERGROUND UTILITY LINES PRIOR TO PLANTING.
4. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS AND LABOR FOR ONE YEAR.



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

ISSUED FOR CONSTRUCTION	Date	Approved
0	01/16/13	
Work	Description	

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

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FEMA EMERGENCY RADIO NETWORK  
 ON WGAN PORTLAND, MAINE  
**LANDSCAPING PLAN**

Drawing Number:  
**C-103**

**NOTES:**

1. FOR CIVIL GENERAL NOTES AND PLAN, SEE DWG C-102.
2. FOR EXCAVATION & BACKFILL REQUIREMENTS, SEE GEOTECHNICAL REPORT AND SPECIFICATION 31 23 00 .00 20.
3. FOR TOP OF CONCRETE ELEVATIONS, SEE DWG S-301.



US Army Corps  
of Engineers  
OMAHA DISTRICT

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

Mark	Description	Date	App'd
1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS, DELETED BARBED WIRE AND RAZOR WIRE	07/16/13	
0	ISSUED FOR CONSTRUCTION	11/7/12	

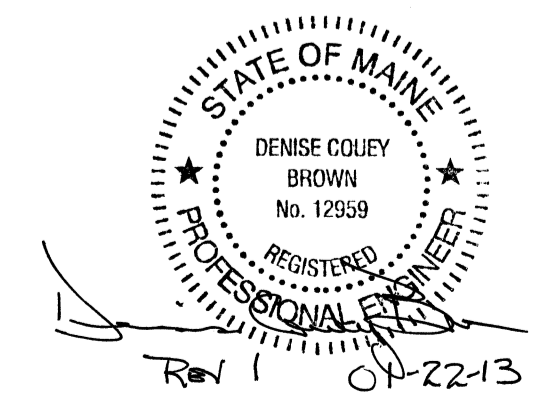
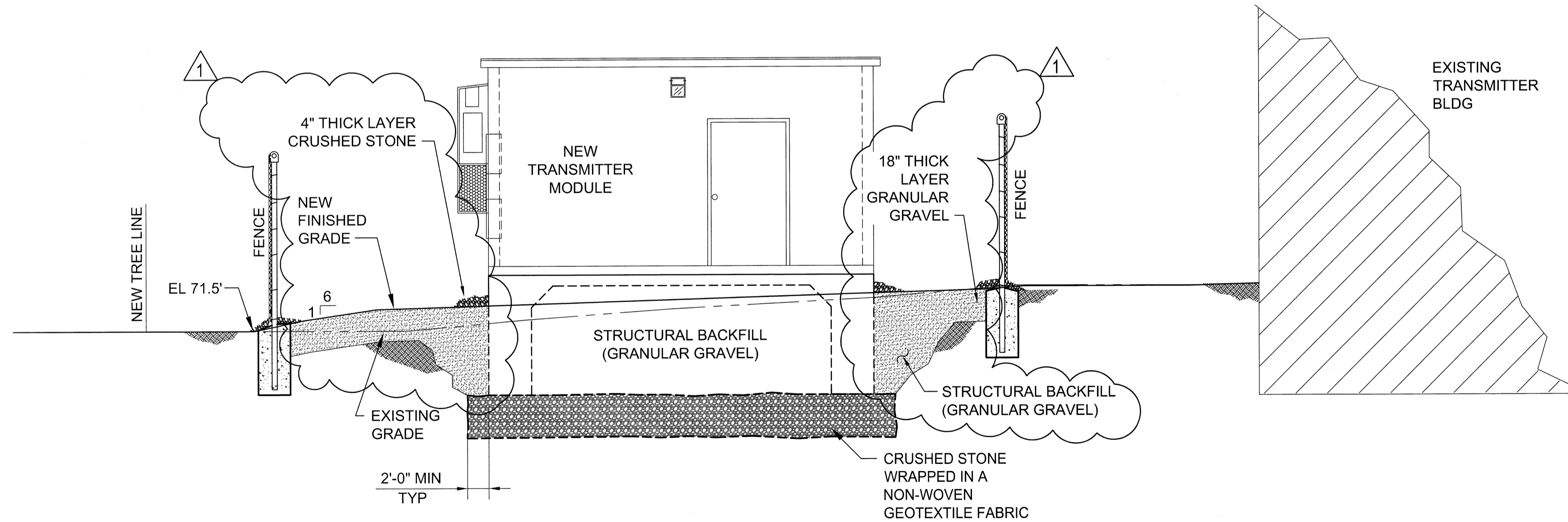
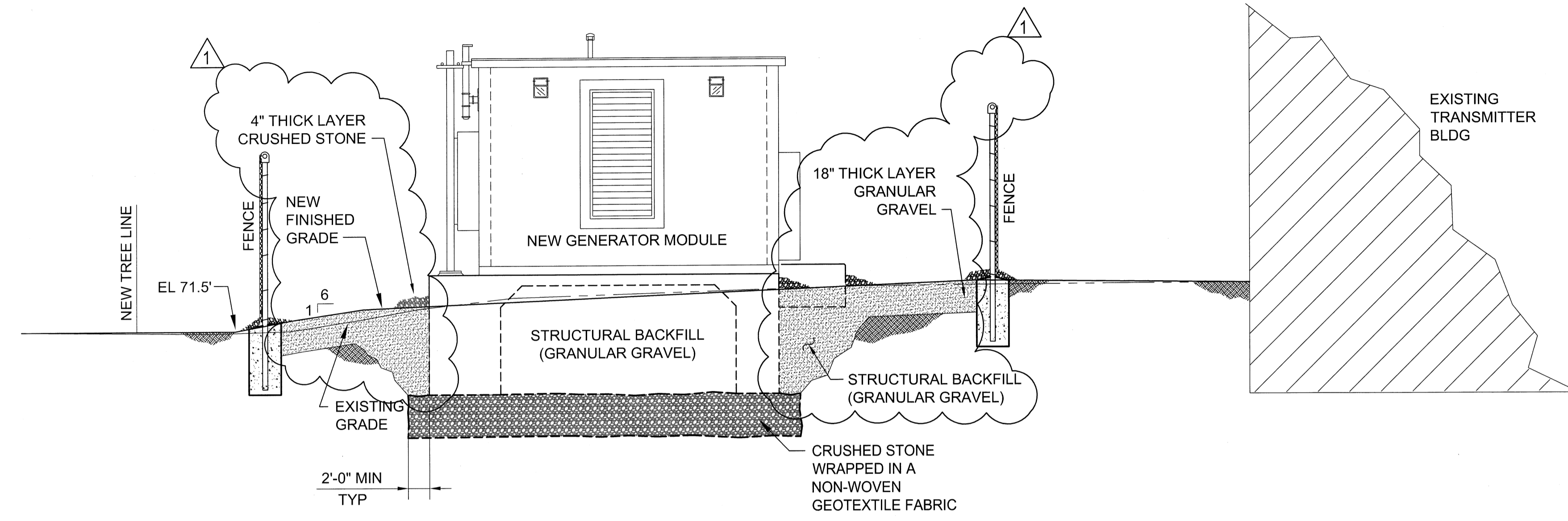
Designed by:	DCB
Drawn by:	RAM
Checked by:	DCB
Reviewed by:	CHB
Date:	2012

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Engineering Services by  
KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE  
**CIVIL SECTIONS**

Drawing Number:  
**C-301**



# GENERAL NOTES

## CONCRETE MATERIALS

- UNLESS OTHERWISE NOTED ON DRAWINGS, CAST-IN-PLACE CONCRETE MIXES SHALL BE AS SHOWN IN SPEC 03 30 53.
- REINFORCING BARS SHALL BE DEFORMED AND SHALL CONFORM TO ASTM A615, GRADE 60 AND SPECIFICATION 03 30 53.
- ANCHOR BOLT MATERIAL SHALL BE AS SHOWN ON THE DRAWINGS.
- EMBEDDED STEEL MATERIAL SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE ON DRAWINGS.
- EMBEDDED PIPE SLEEVES SHALL BE ASTM A53 GRADE B UNLESS OTHERWISE NOTED ON DRAWINGS.
- 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

- 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.
- COORDINATE CONCRETE WORK WITH PIPING, ELECTRICAL AND MECHANICAL WORK PRIOR TO PLACING CONCRETE.
- EXPOSED EDGES OF CONCRETE SHALL HAVE 3/4 INCH CHAMFER.
- ALL CONCRETE REINFORCEMENT DETAILING SHALL BE IN ACCORDANCE WITH ACI 318-08.
- 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.
- 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.
- SURFACE FINISHES ARE DESCRIBED IN THE CONCRETE CONSTRUCTION SPECIFICATIONS. FINISH FOR SLABS AND PADS SHALL BE BROOM FINISHED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- 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

- 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.
- 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.
- WELDING ELECTRODES SHALL CONFORM TO AWS A5.1, WITH A MINIMUM ELECTRODE TENSILE STRENGTH OF 70 KSI.
- 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.
- 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

### 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:

Ie = 1.5  
Ss = 1.25  
S1 = 0.40  
SITE CLASS = D  
S0s = 0.83  
S01 = 0.43  
SEISMIC DESIGN CATEGORY = D  
BASE SHEAR = 31,100 LBS  
Cs = 0.42  
R = 3  
ANALYSIS METHOD = EQUIVALENT  
LATERAL FORCE - NON BUILDING STRUCTURE

#### SEISMIC LOAD:

Ie = 1.5  
Ss = 1.25  
S1 = 0.40  
SITE CLASS = D  
S0s = 0.83  
S01 = 0.43  
SEISMIC DESIGN CATEGORY = D  
BASE SHEAR = 14,630 LBS  
Cs = 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:

Ie = 1.5  
Ss = 1.25  
S1 = 0.40  
SITE CLASS = D  
S0s = 0.83  
S01 = 0.43  
SEISMIC DESIGN CATEGORY = D  
BASE SHEAR = 12,000 LBS  
Cs = 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:

Ie = 1.5  
Ss = 1.40  
S1 = 0.42  
SITE CLASS = D  
S0s = 0.94  
S01 = 0.45  
SEISMIC DESIGN CATEGORY = D  
BASE SHEAR = 3,200 LBS  
Cs = 0.56  
R = 2.5  
ANALYSIS METHOD = EQUIVALENT  
LATERAL FORCE - NON BUILDING STRUCTURE

HOLD FOR GENSET VENDOR DATA



Project Manager	
QC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

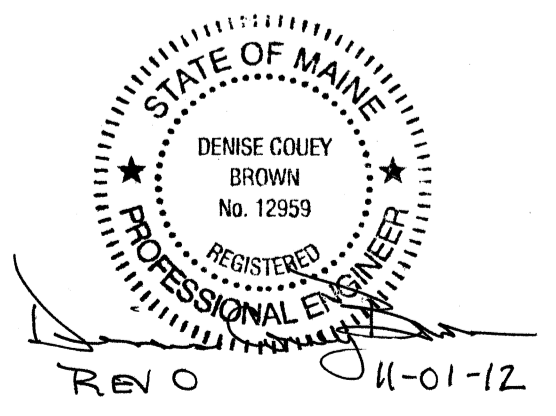
ISSUED FOR CONSTRUCTION	1/17/12	Date
Description		
Work		

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) 455-7000  
FAX: (251) 455-7496

**FEMA**  
FEDERAL EMERGENCY MANAGEMENT AGENCY

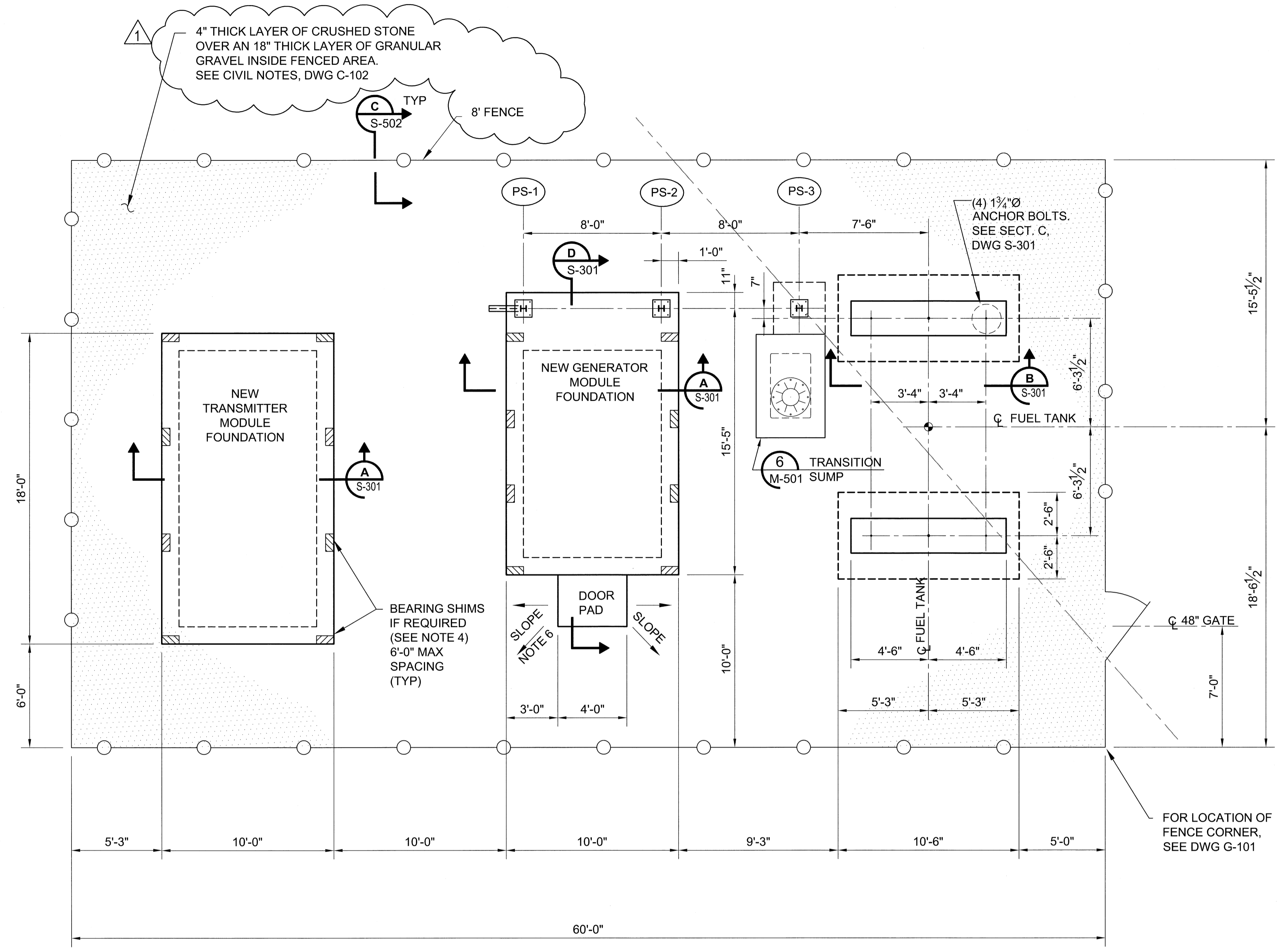
**KBR Engineering Services by KBR Engineering Co. LLC**



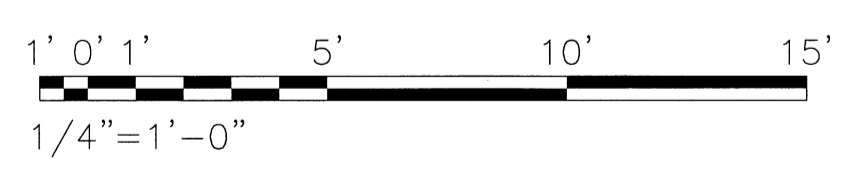
FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE

**STRUCTURAL GENERAL NOTES**

Drawing Number:  
**S-001**

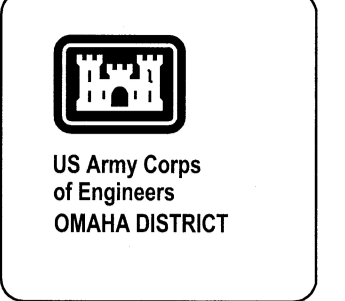


**A**  
**G-101 FOUNDATION AND FENCE PLAN**  
 SCALE: 1/4"=1'-0"



**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.



Project Manager	
DC Reviewer	
Architectural	
Structural	
Mechanical	
Electrical	
Civil	

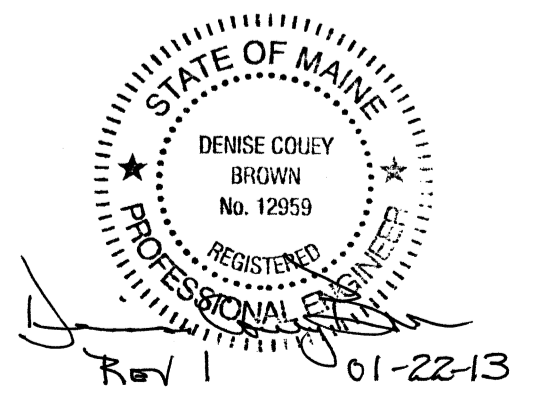
Mark	Description	Date	By
1	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS, DELETED	01/16/13	
0	BASED OFF OF AND RAN FOR WIRE	11/7/12	
0	BASED OFF OF CONSTRUCTION	11/7/12	

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

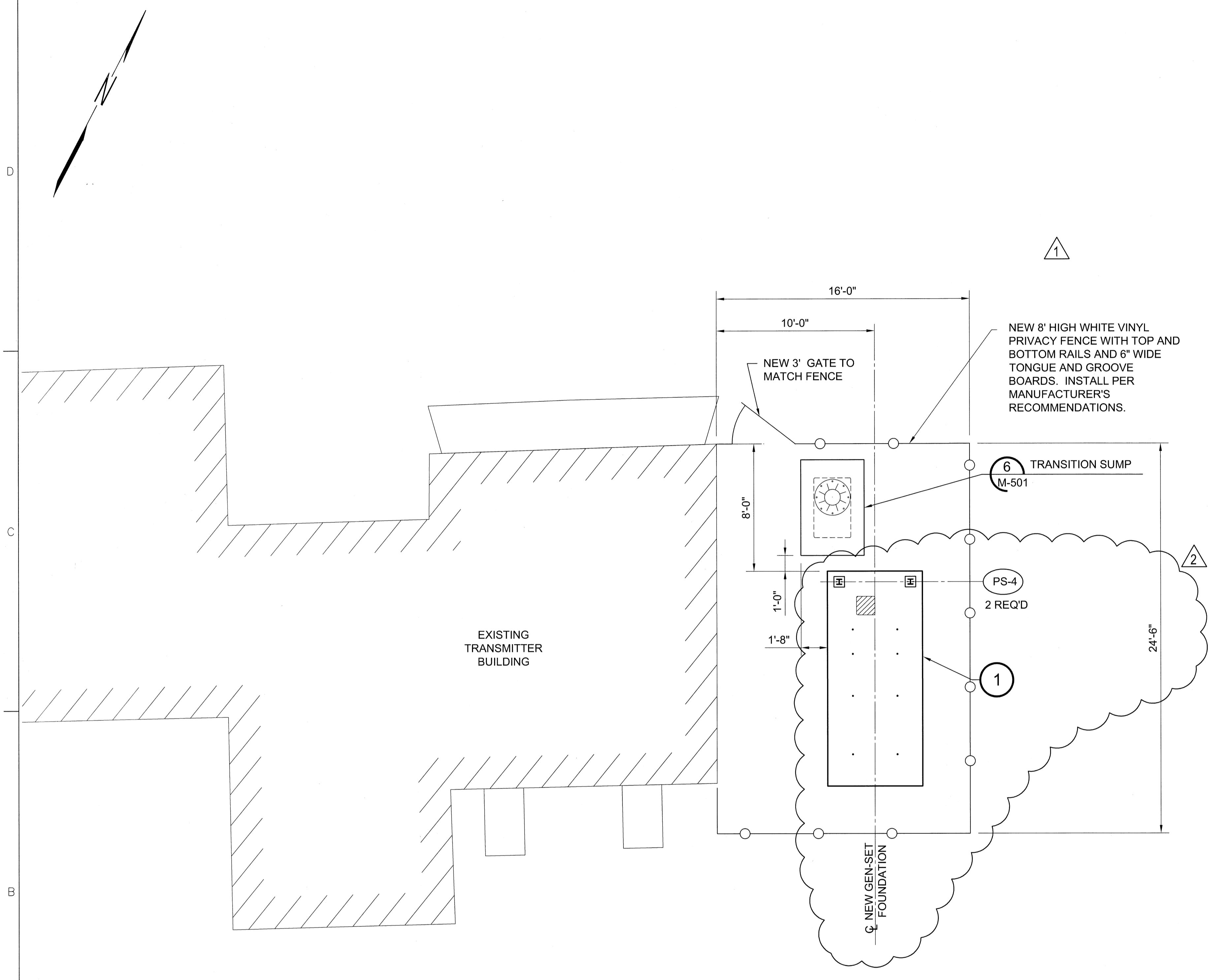
63 SOUTH ROYAL STREET SUITE 200  
 MOBILE, AL 36602  
 PHONE: (251) 400-7600  
 FAX: (251) 400-7686

FEMA EMERGENCY RADIO NETWORK  
 ON WGAN PORTLAND, MAINE  
**FOUNDATION AND FENCE  
 PLAN**

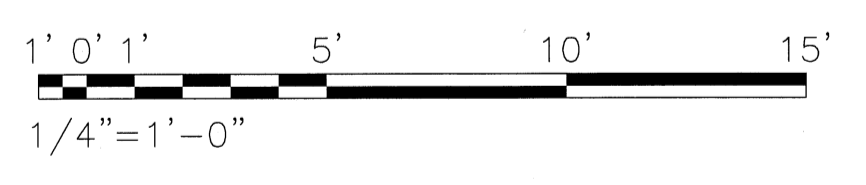
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**S-101**





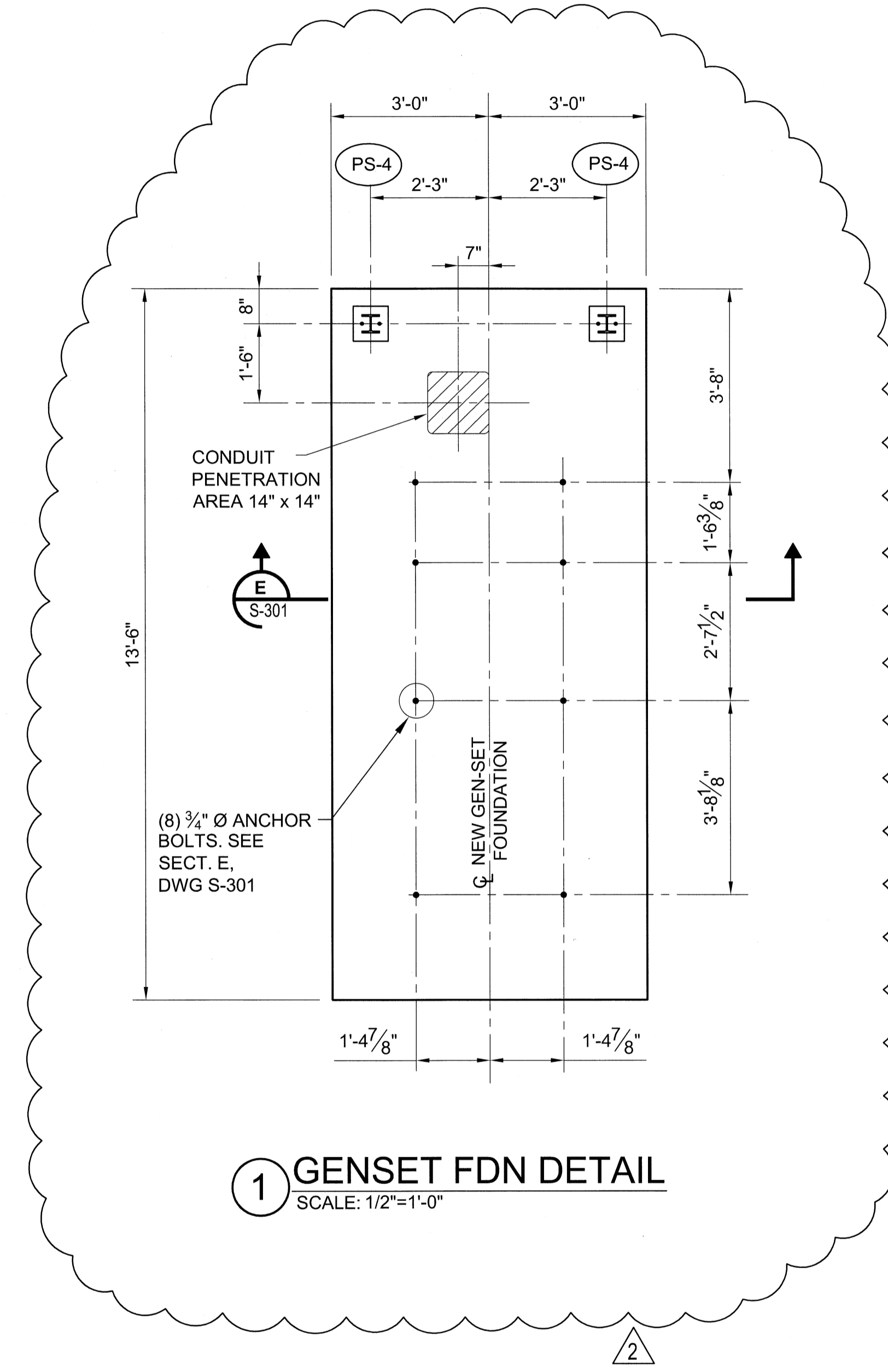


**A** SITE GENERATOR FOUNDATION PLAN  
 G-101 SCALE: 1/4"=1'-0"

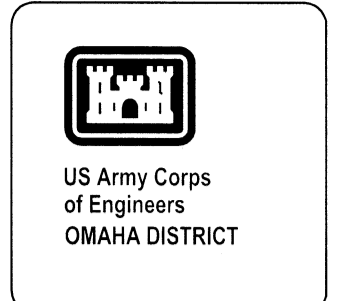


**NOTES:**

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.



**1** GENSET FDN DETAIL  
 SCALE: 1/2"=1'-0"



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

Work	Description	Date	Apprv
2	REVISED GEN-SET FOUNDATION AND REMOVED HOLD REVISED FENCE	5/7/13	
1	ADDED VINYL FENCING, RELOCATED GEN-SET, DELETED BOLLARDS	1/22/13	
0	ISSUED FOR CONSTRUCTION	11/7/12	

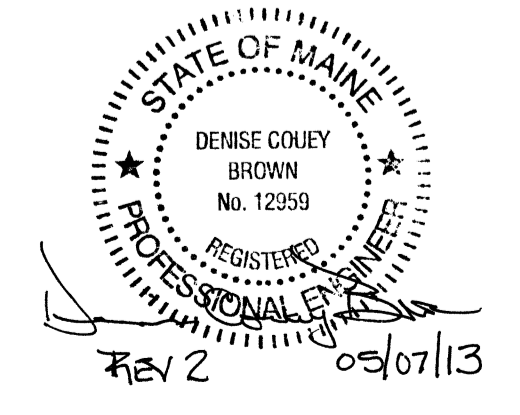
Designed by	DCB
Drawn by	RAM
Checked by	MLM
Reviewed by	CHB
Date	2012

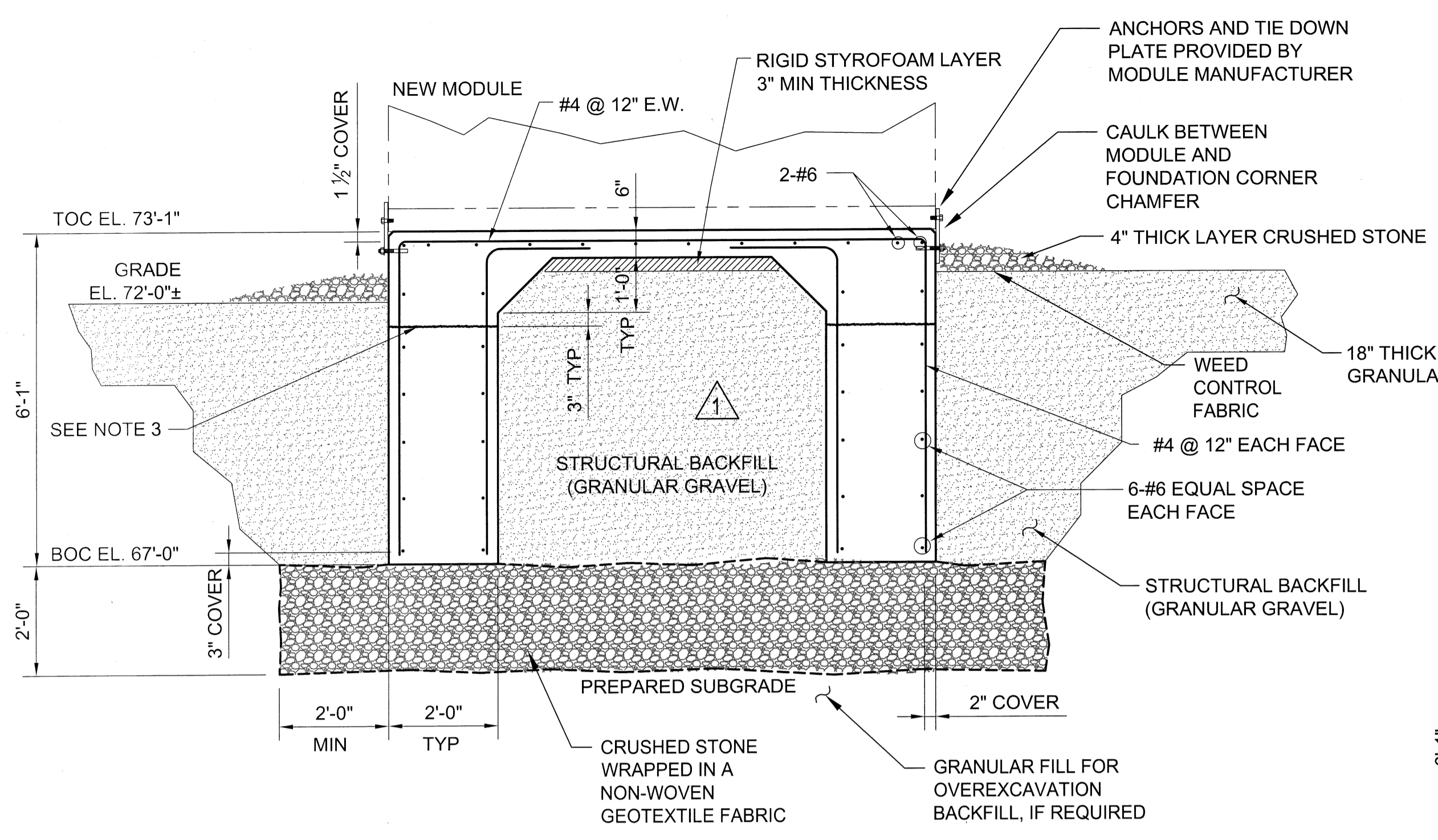
**FEMA** 63 SOUTH ROYAL STREET SUITE 200  
 PORTLAND, MAINE 04106  
 PHONE: (207) 452-7600  
 FAX: (207) 450-7898

**KBR** Engineering Services by  
 KBR Engineering Co., LLC

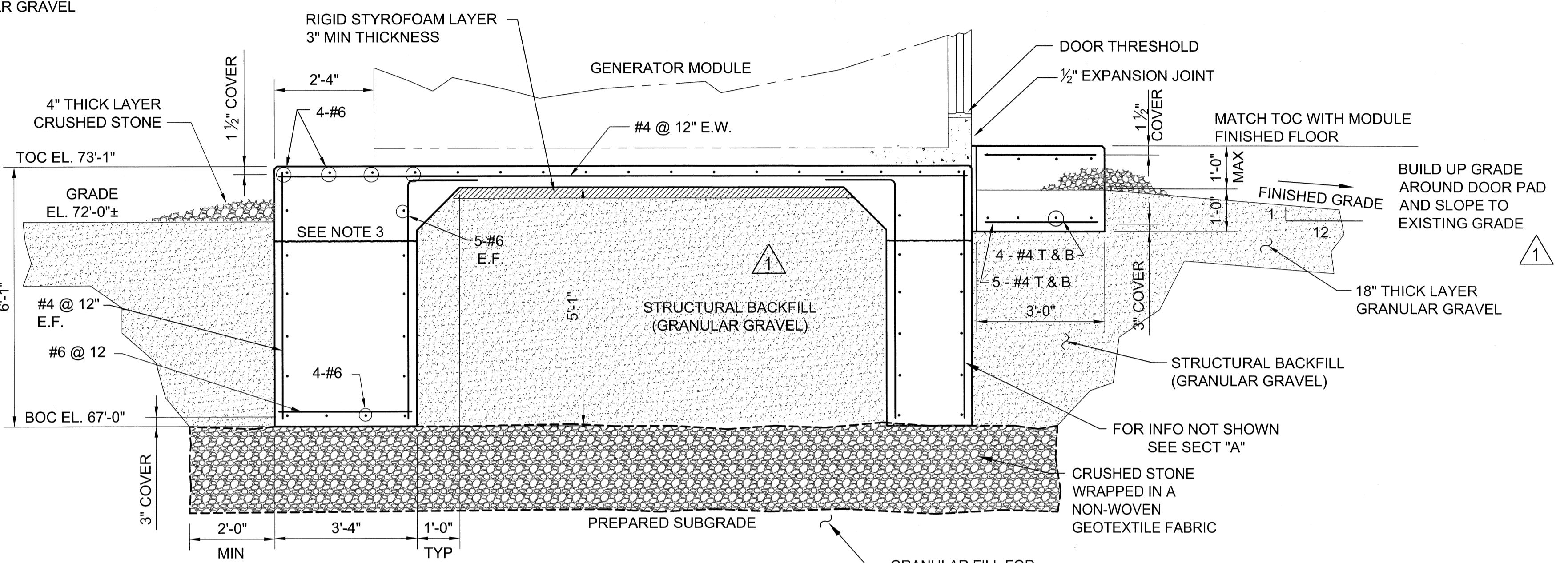
FEMA EMERGENCY RADIO NETWORK  
 ON WGAN PORTLAND, MAINE

**SITE GENERATOR  
 FOUNDATION PLAN**

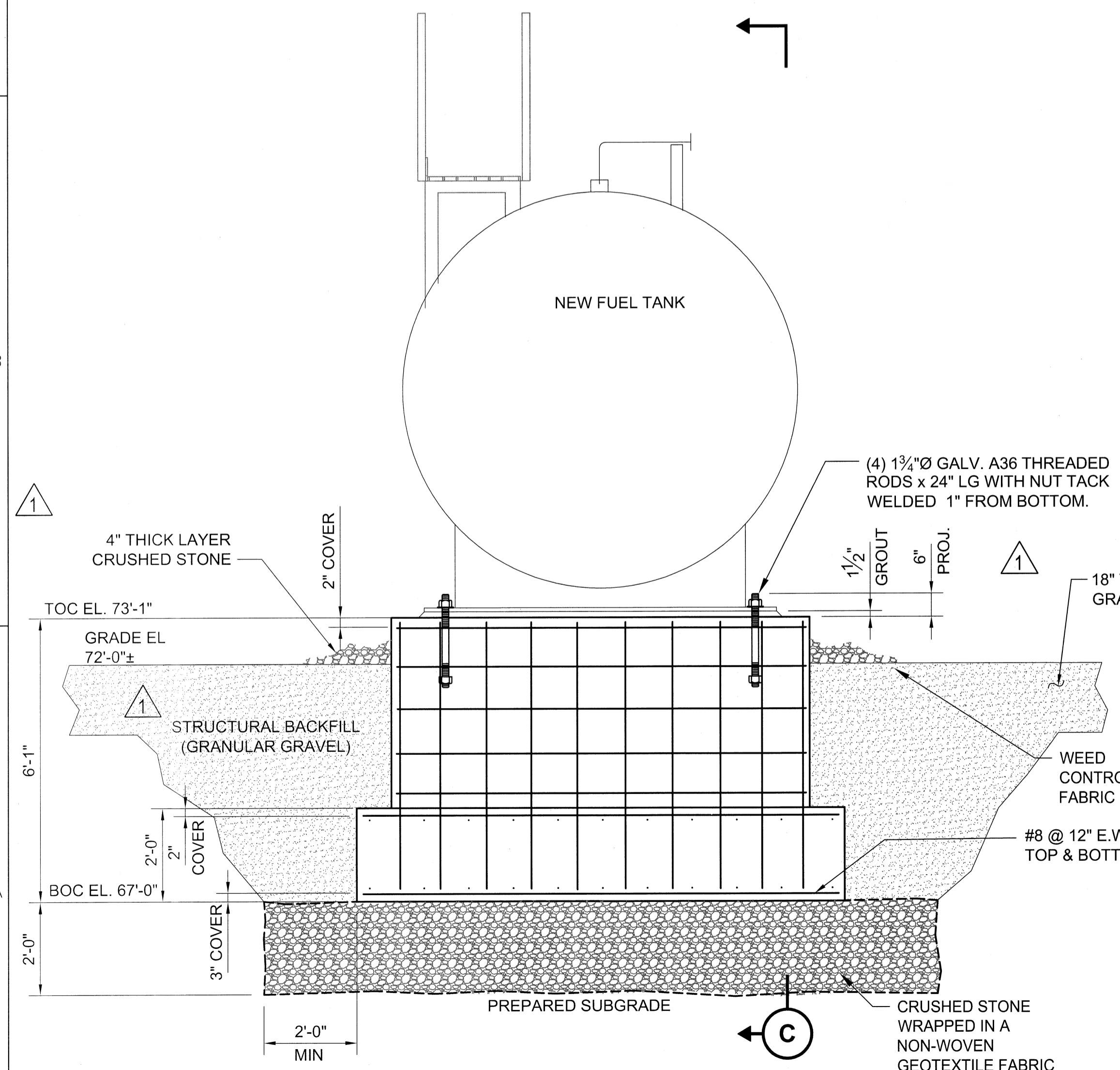




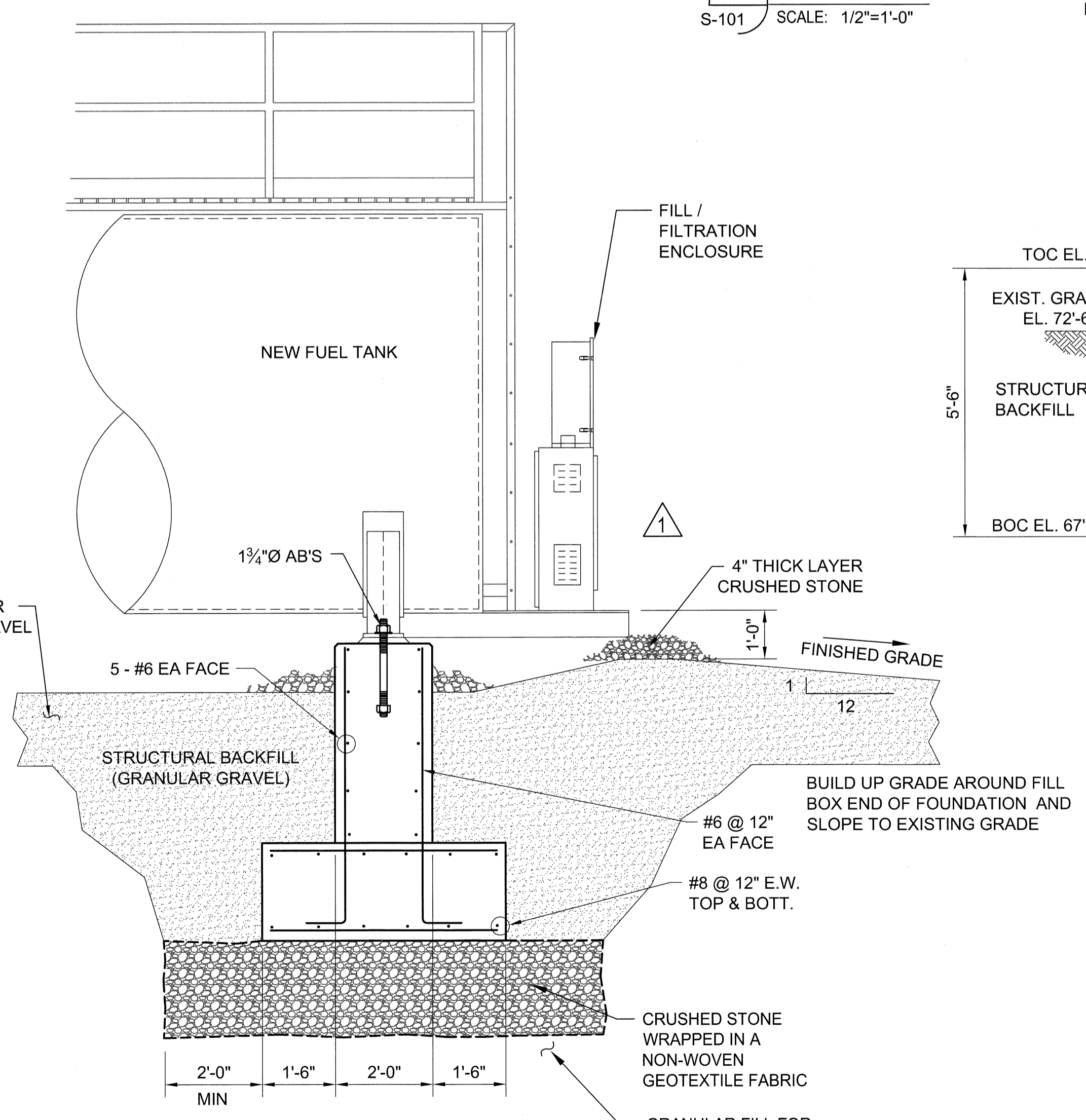
**A SECTION**  
S-101 SCALE: 1/2"=1'-0"



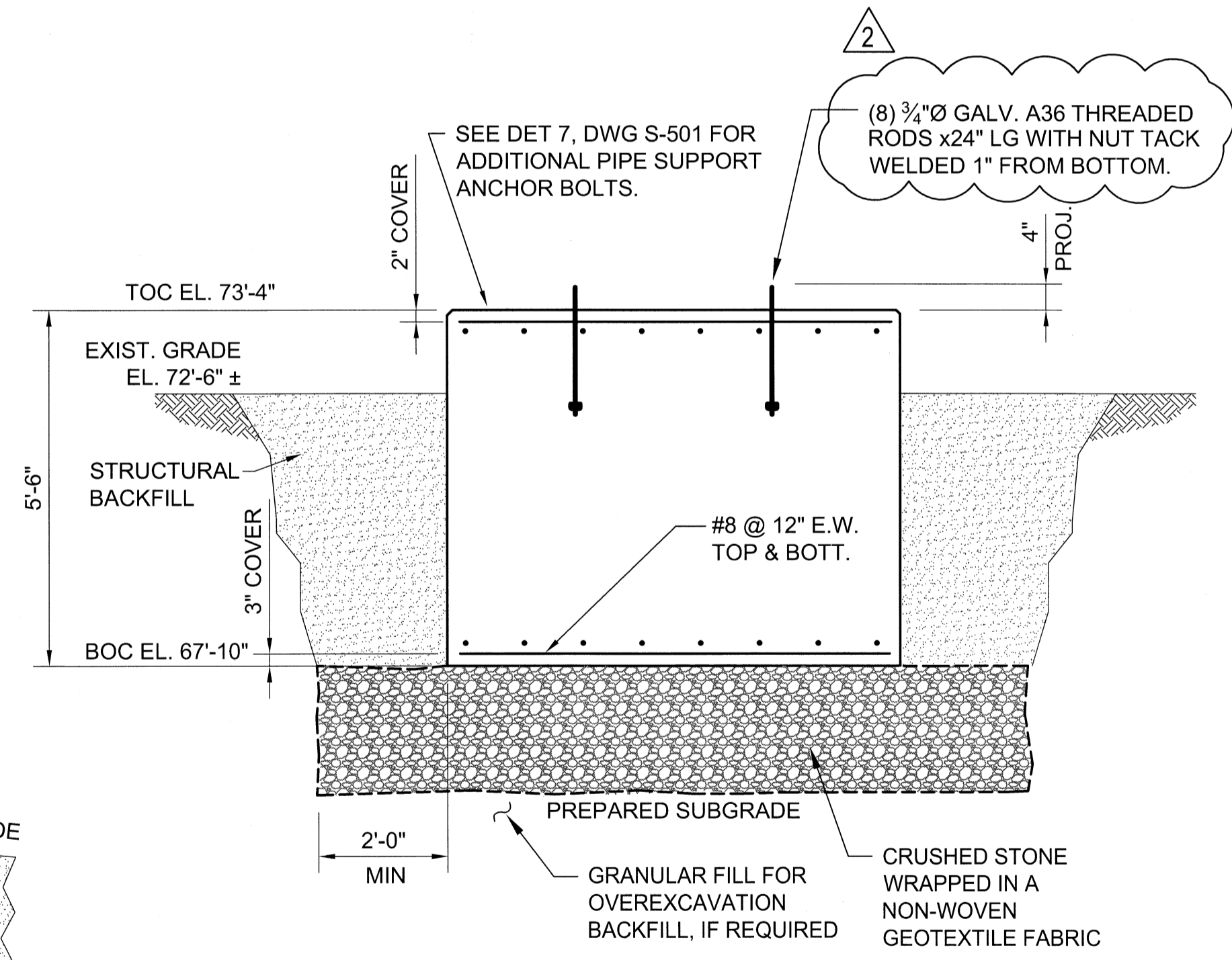
**D SECTION**  
S-101 SCALE: 1/2"=1'-0"



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



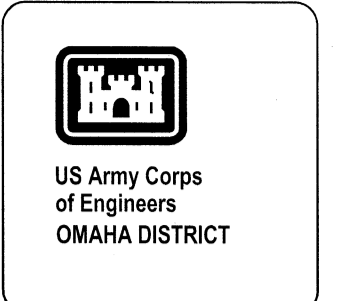
**C SECTION**  
S-101 SCALE: 1/2"=1'-0"



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

**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.



Project Manager	
QC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Revised	5/7/13	1/7/13	1/17/12
By			
Description	REMOVED HOLD ON GEN-SET FDN, REVISED BUILT LENGTH	ADDED CRUSHED STONE AND GRANULAR GRAVEL REQUIREMENTS	ISSUED FOR CONSTRUCTION
Date			
Appr'd			

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

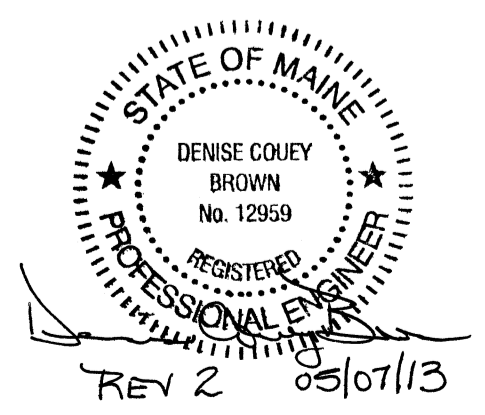
63 SOUTH MAIN STREET SUITE 200  
MAINE, N.H. 03602  
PHONE: (253) 450-7000  
FAX: (251) 650-7898

**KBR**  
Engineering Services by  
KBR Engineering Co., LLC

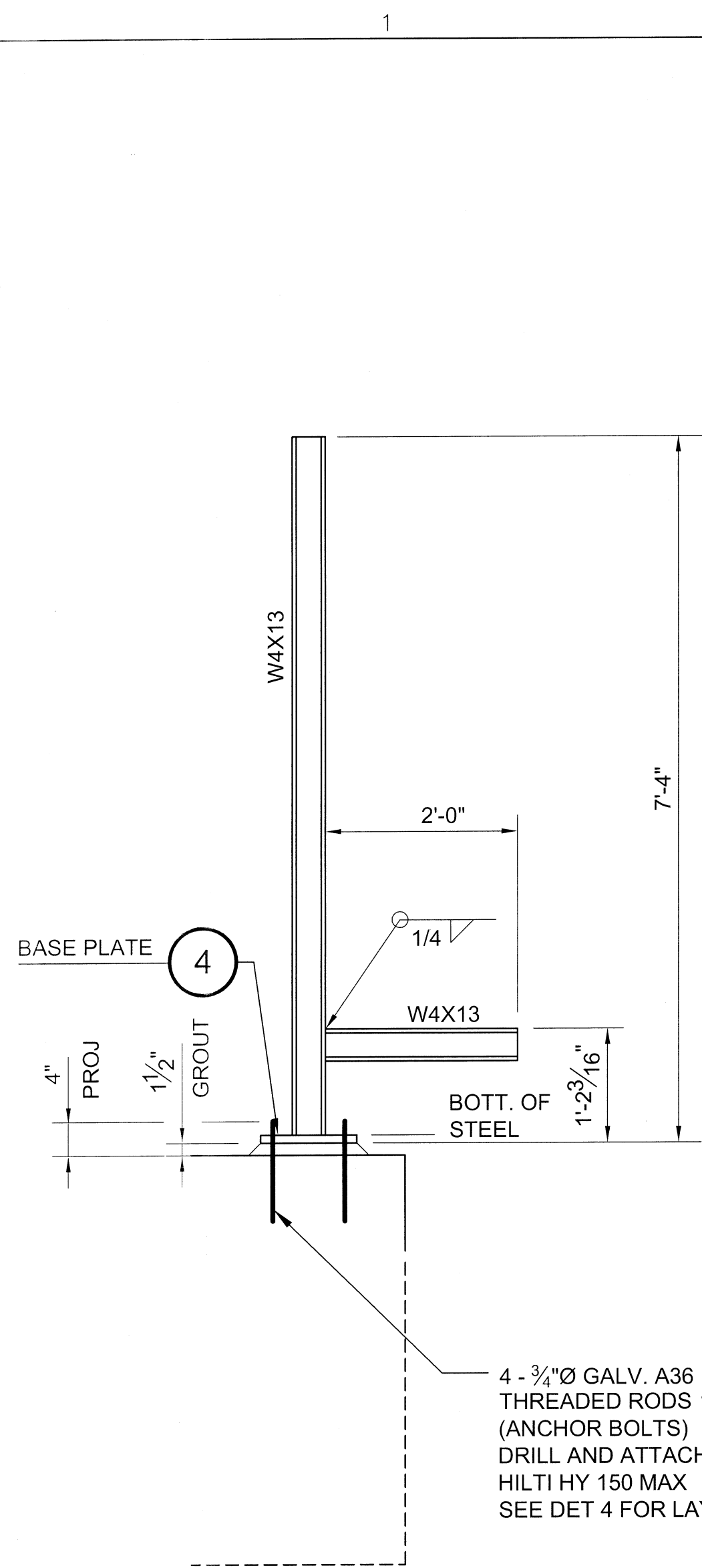
FEMA  
KBR

FEMA EMERGENCY RADIO NETWORK  
ON WGAN PORTLAND, MAINE

**MISCELLANEOUS SECTIONS**

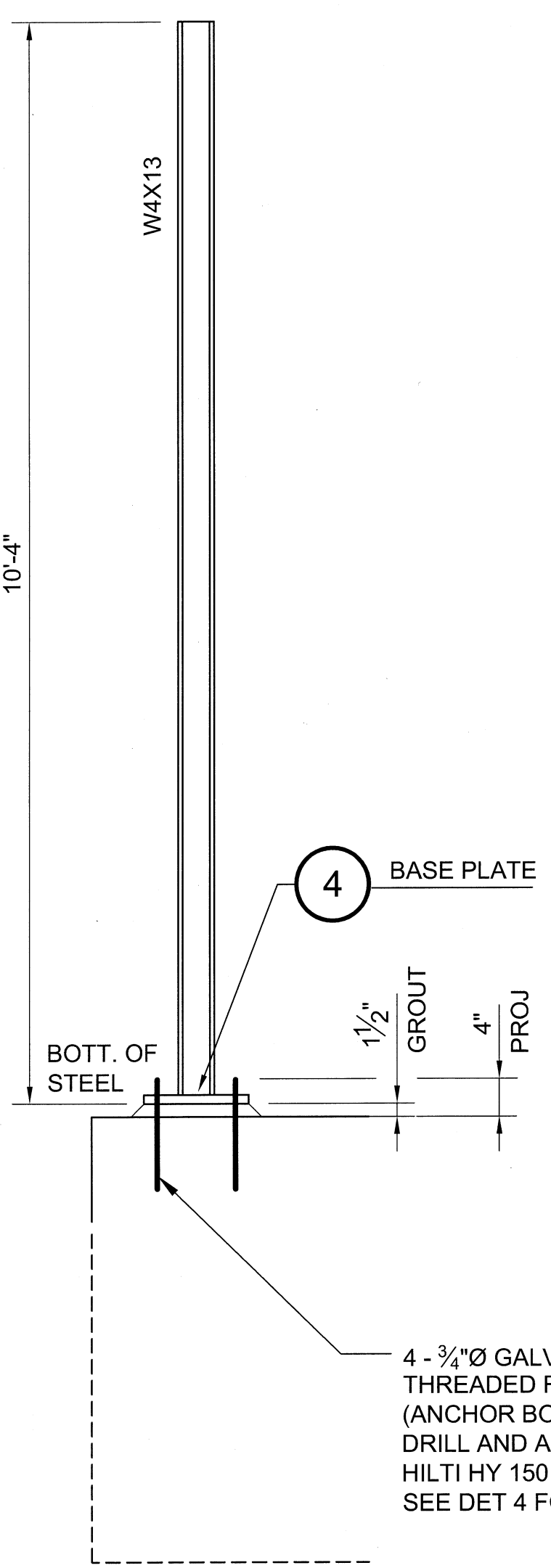


Drawing Number:  
**S-301**



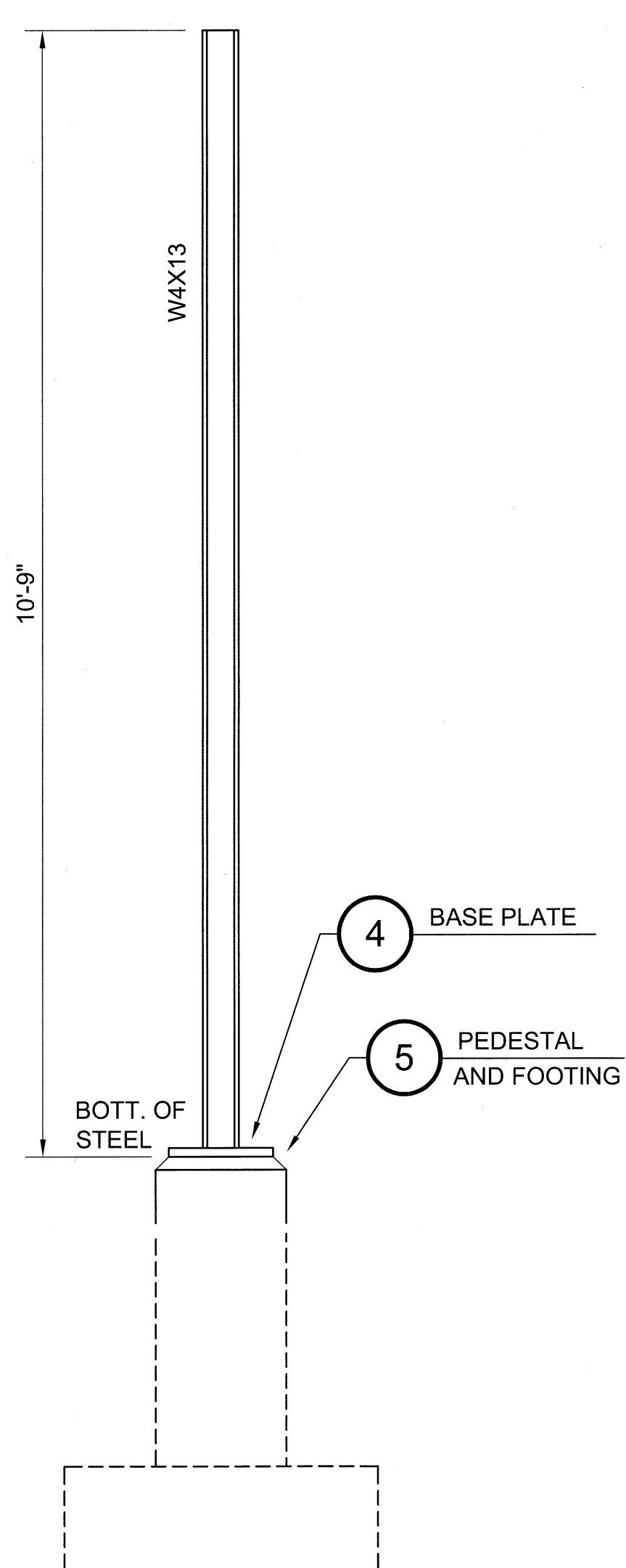
**1 PIPE SUPPORT PS-1**  
S-101 SCALE: 3/4"=1'-0"

4 - 3/4"Ø GALV. A36  
THREADED RODS 12" LG.  
(ANCHOR BOLTS)  
DRILL AND ATTACH WITH  
HILTI HY 150 MAX  
SEE DET 4 FOR LAYOUT

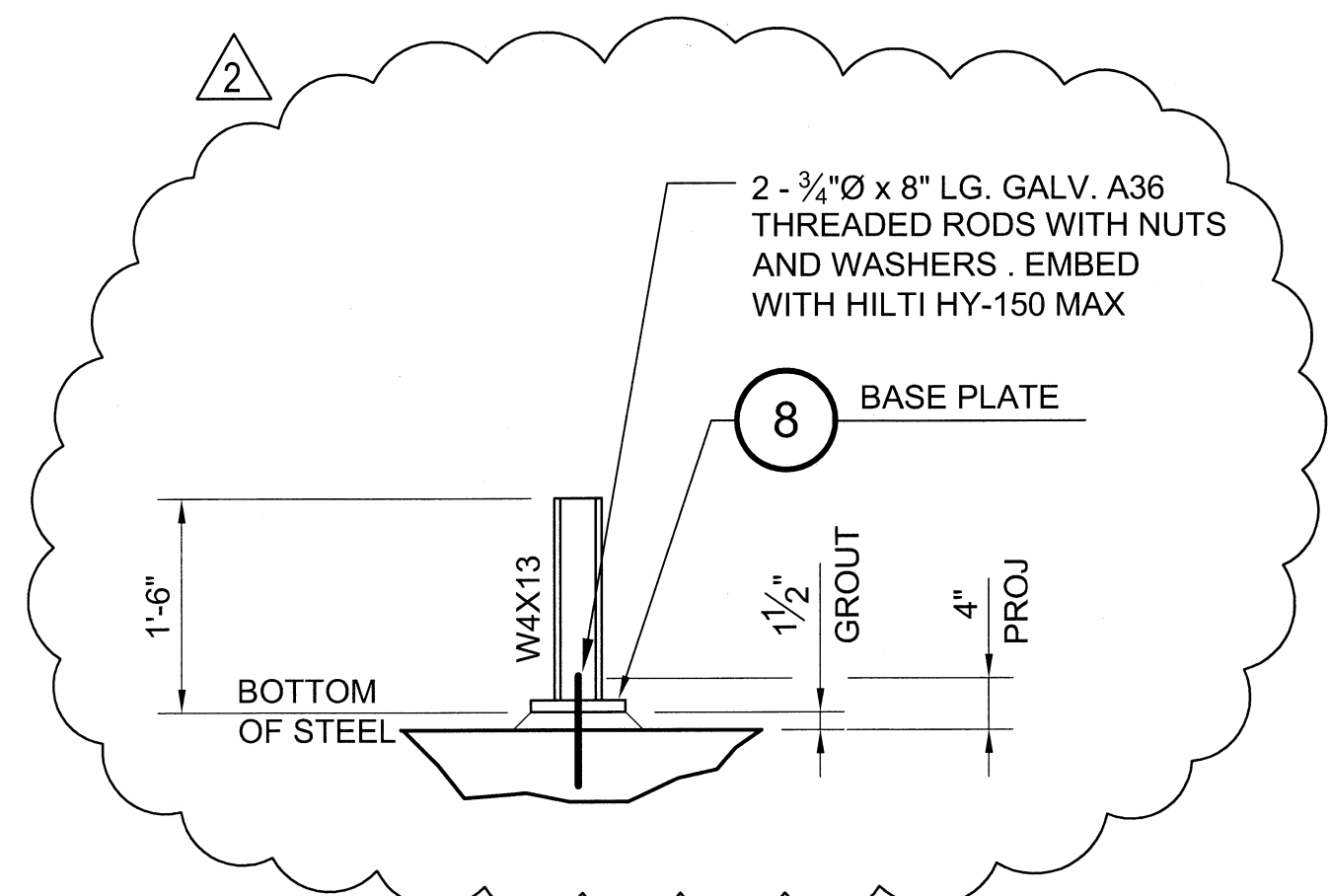


**2 PIPE SUPPORT PS-2**  
S-101 SCALE: 3/4"=1'-0"

4 - 3/4"Ø GALV. A36  
THREADED RODS 12" LG.  
(ANCHOR BOLTS)  
DRILL AND ATTACH WITH  
HILTI HY 150 MAX  
SEE DET 4 FOR LAYOUT

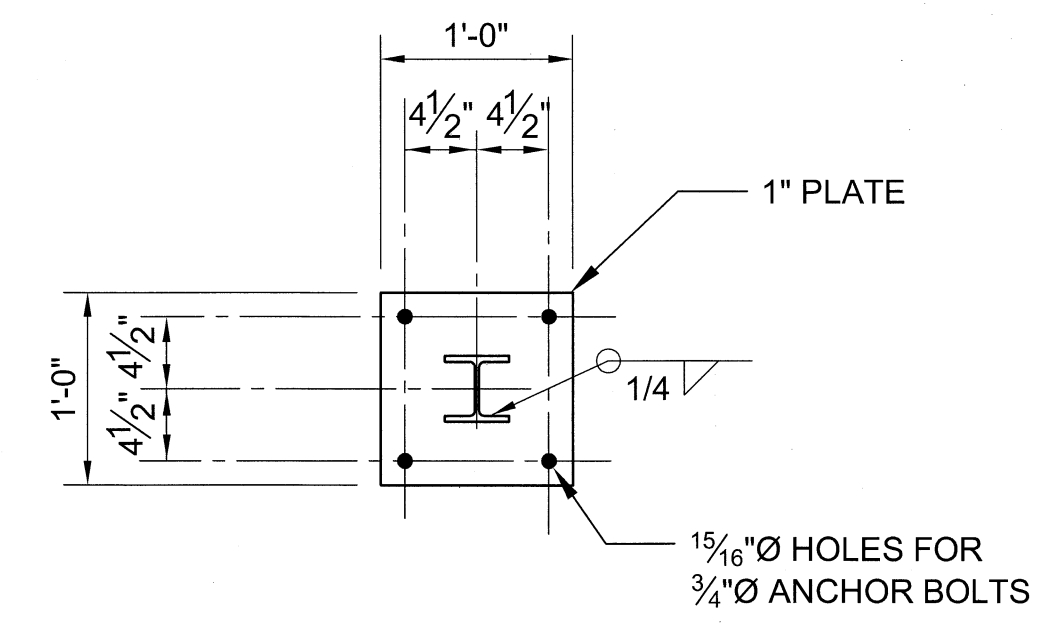


**3 PIPE SUPPORT PS-3**  
S-101 SCALE: 3/4"=1'-0"

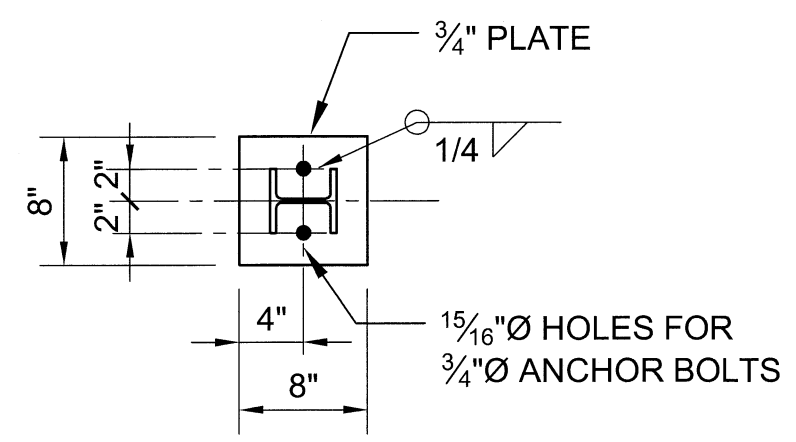
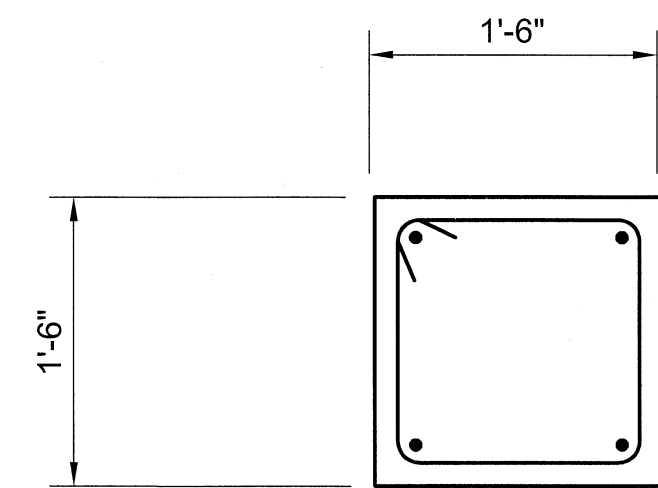


**7 PIPE SUPPORT PS-4**  
S-102 SCALE: 3/4"=1'-0" 2 REQUIRED

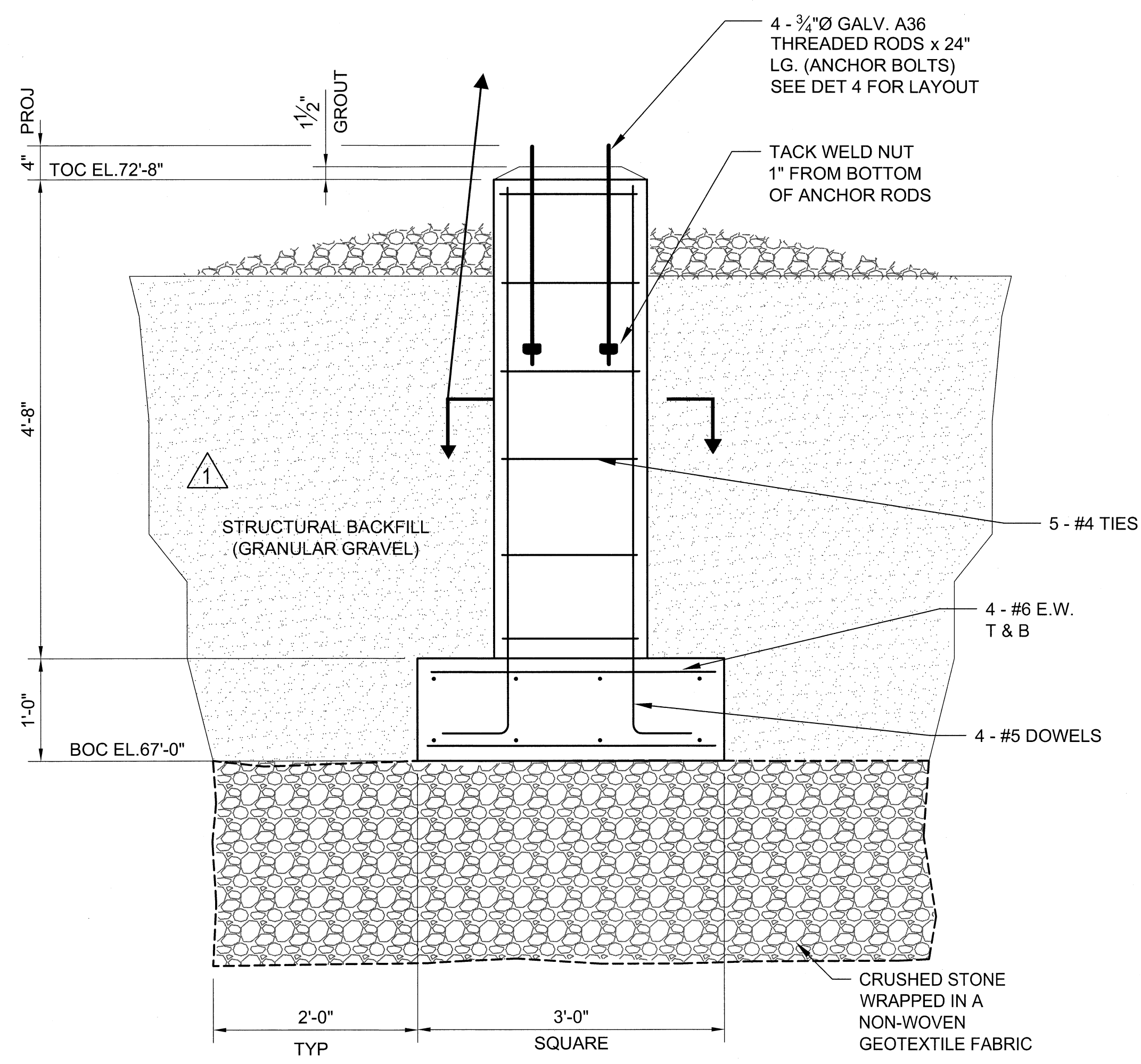
2 - 3/4"Ø x 8" LG. GALV. A36  
THREADED RODS WITH NUTS  
AND WASHERS. EMBED  
WITH HILTI HY-150 MAX



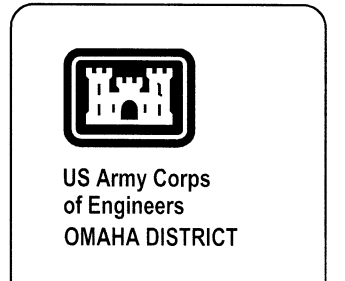
**4 DETAIL**  
SCALE: 1"=1'-0"



**8 DETAIL**  
SCALE: 1"=1'-0"



**5 DETAIL**  
SCALE: 1"=1'-0"



Project Manager	
DC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Revised	By	Date	Description
2		5/7/13	REMOVED HOLD AND LENGTHENED PIPE SUPPORT FOR DETAIL 7
1		01/15/13	ADDED HILT. ANCHORAGE & GRANULAR GRAVEL REQUIREMENTS. DEL. BOLLARD DET. 6
0		11/7/12	ISSUED FOR CONSTRUCTION

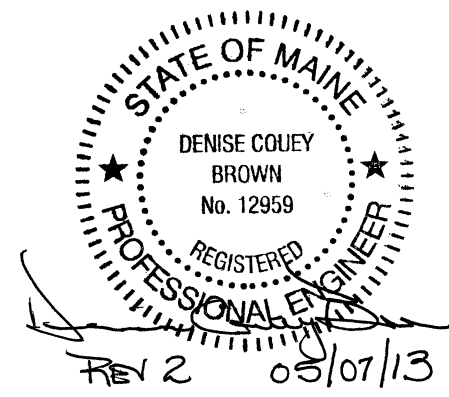
Designed by	DCB
Drawn by	RAM
Checked by	MLM
Reviewed by	DCB
Date	2012

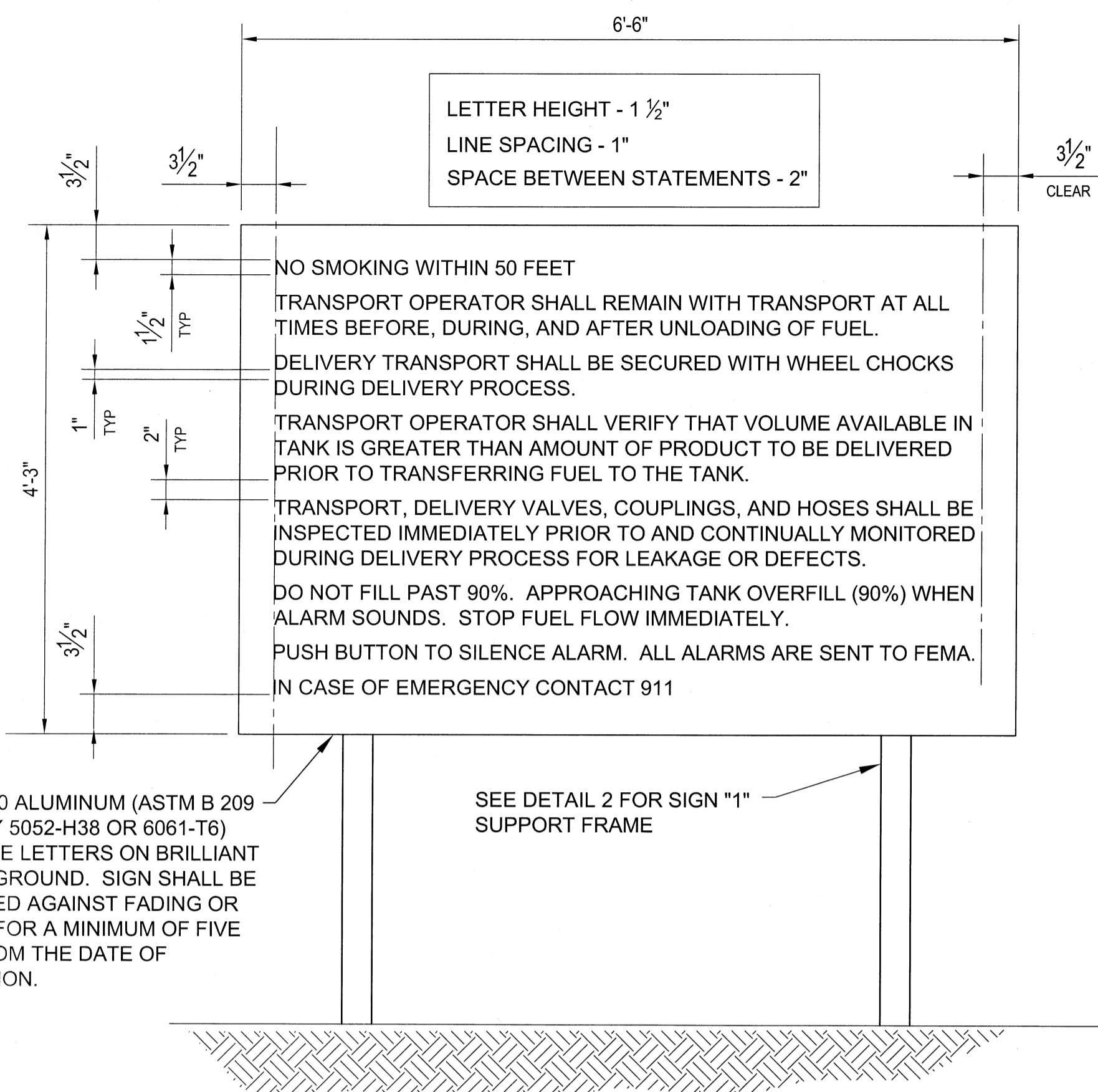
**KBR**  
63 SOUTH ROYAL STREET SUITE 200  
PORTLAND, MAINE 04101  
PHONE: (207) 450-7600  
FAX: (207) 450-7888

**FEMA**  
FEMA Emergency Radio Network  
ON WGAN PORTLAND, MAINE

**MISCELLANEOUS DETAILS**

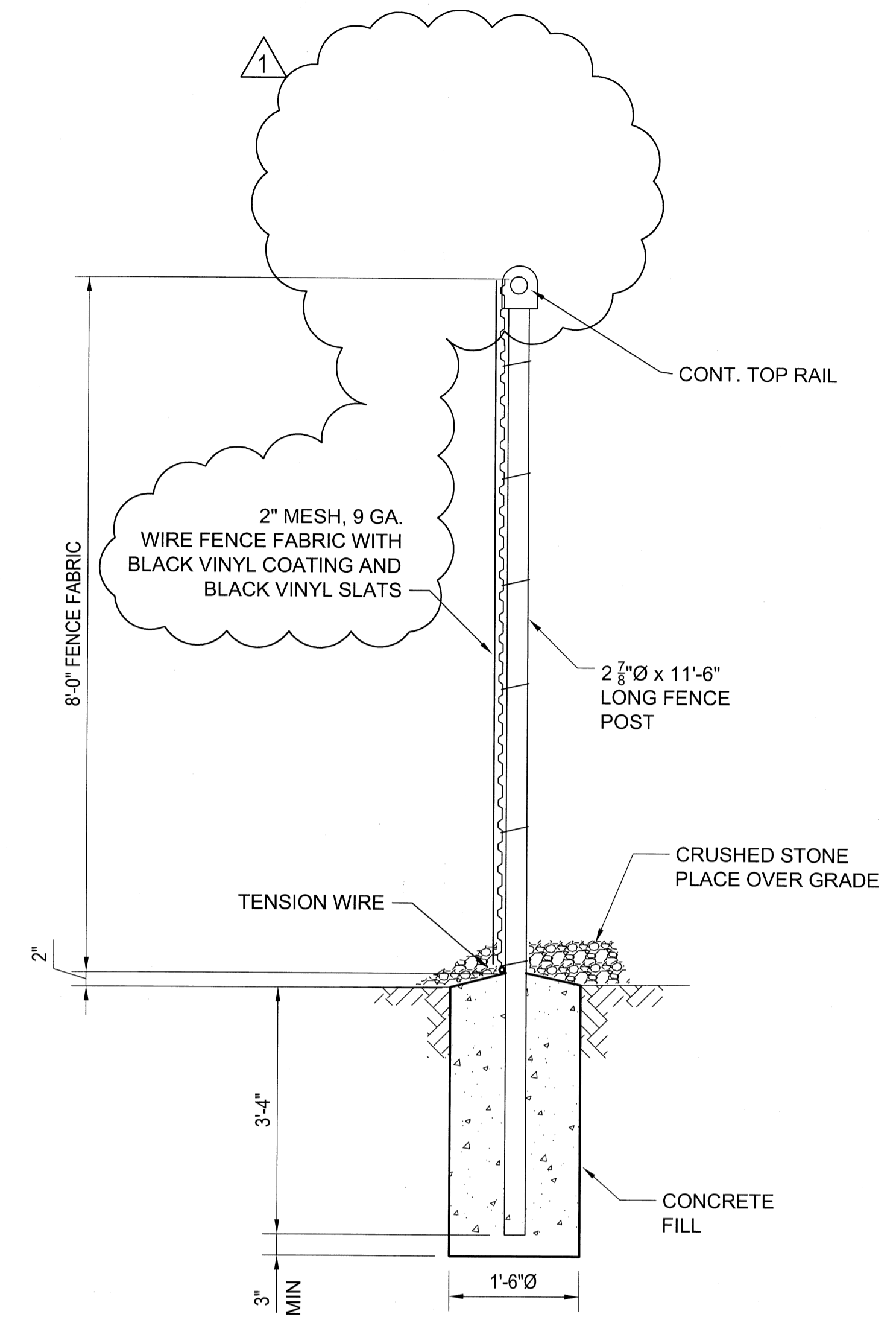
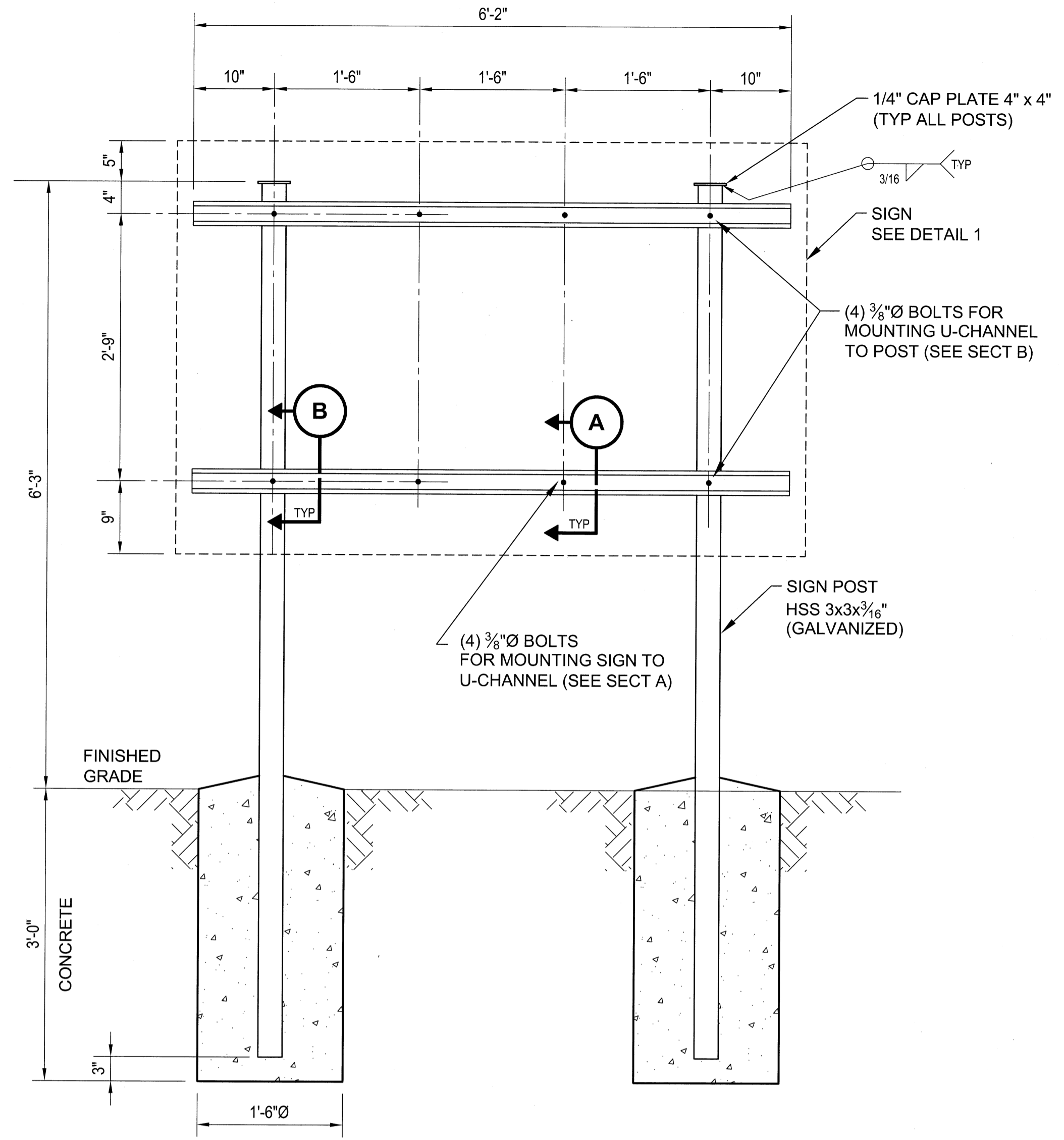
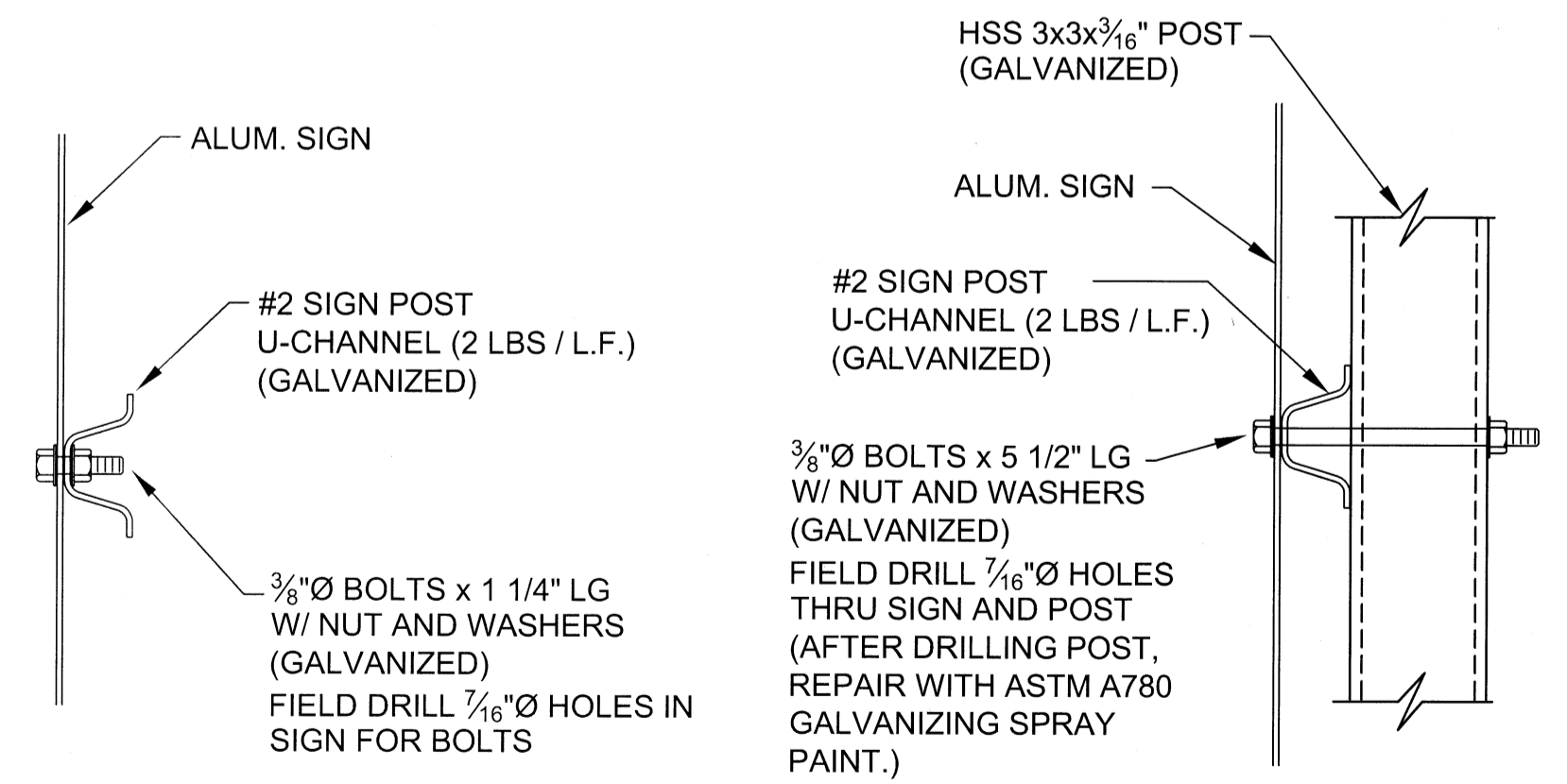
Drawing Number:  
**S-501**





**1 SIGN "1" DETAIL**  
M-101 SCALE: 1"=1'-0"

INSTALLATION CONTRACTOR TO TOUCH UP ALL DAMAGED GALVANIZING WITH ZRC COLD GALVANIZING COMPOUND, OR APPROVED EQUAL.



Project Manager	
DC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

Mark	Description	Date	By
1	REWORKED BARBED WIRE AND RAZOR WIRE, ADDED BLACK VINYL COATING AND BLACK VINYL SLATS	01/15/13	
0	ISSUED FOR CONSTRUCTION	11/17/12	

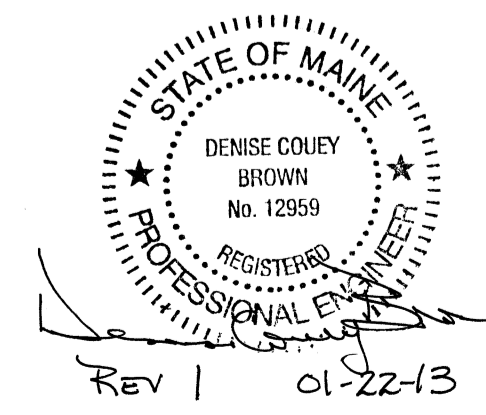
Designed by:	MLM
Drawn by:	RAM
Checked by:	DCB
Reviewed by:	CHB
Date:	2012

**KBR**  
63 SOUTH ROYAL STREET SUITE 200  
MOBILE, AL 36602  
Phone: (251) 452-7800  
Fax: (251) 452-7898

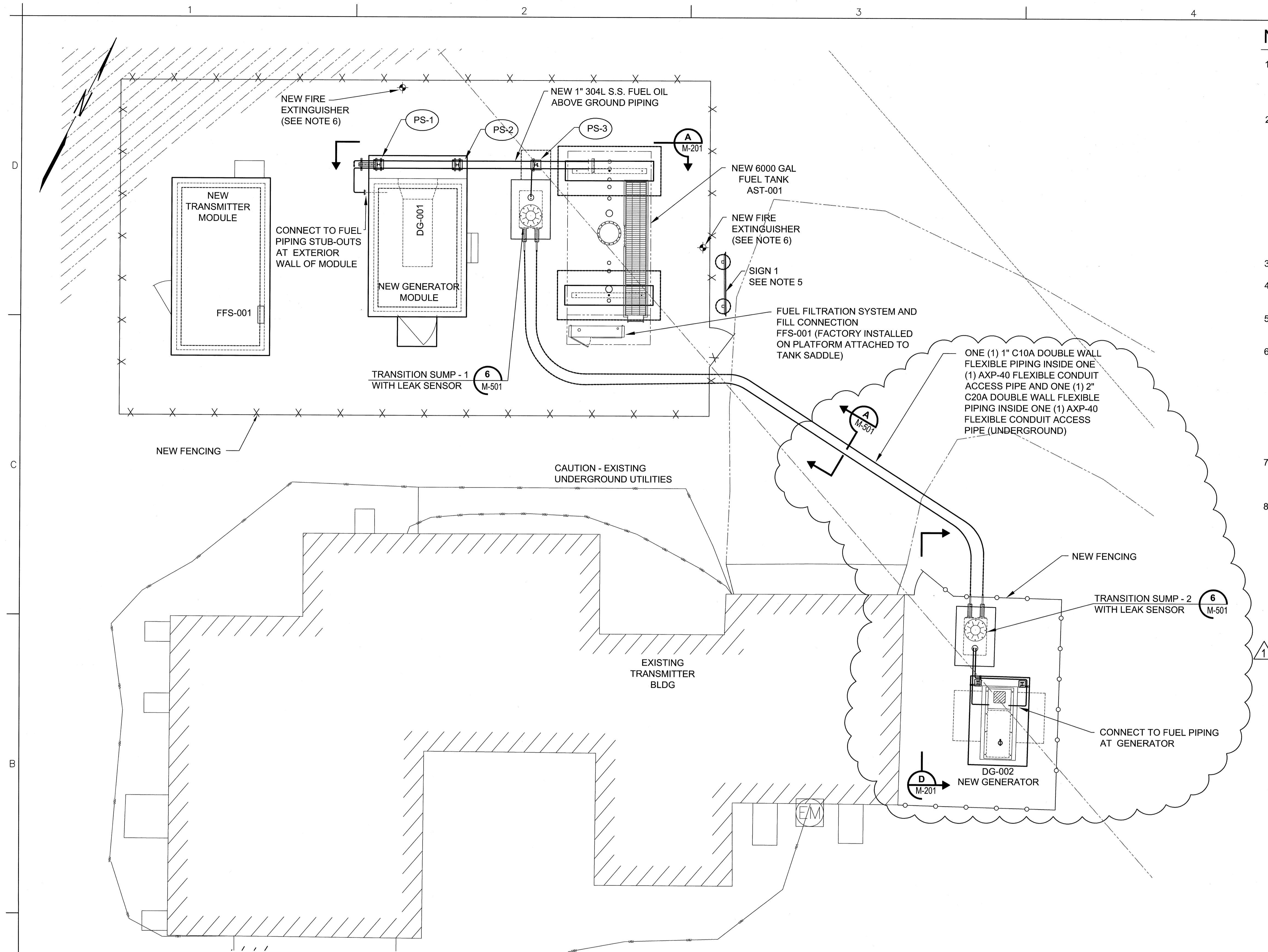
**FEMA**  
FEMA Emergency Radio Network  
ON WGAN PORTLAND, MAINE

**KBR Engineering Services by KBR Engineering Co., LLC**

**SIGN AND FENCE DETAILS**



Drawing Number:  
**S-502**

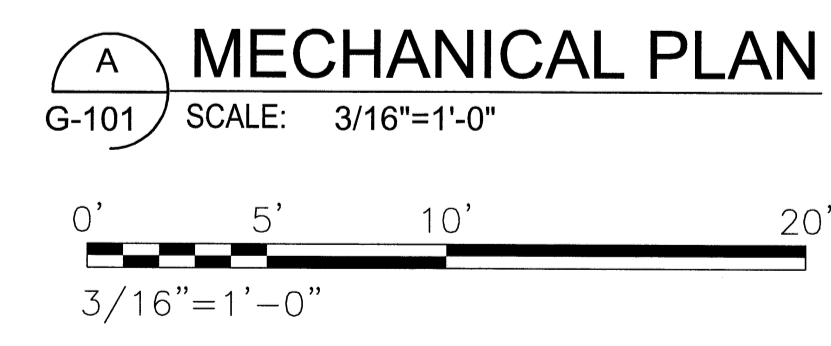


**NOTES:**

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)



Project Manager	
DC Reviewer	
Architectural	
Mechanical	
Plumbing	
Electrical	
Civil	

1	ADDED FENCING, RELOCATED GEN-SET AND PIPING, DEL. BOLLARDS	1/22/13	
0	ISSUED FOR CONSTRUCTION	11/7/12	
			Mark
			Date
			Approv

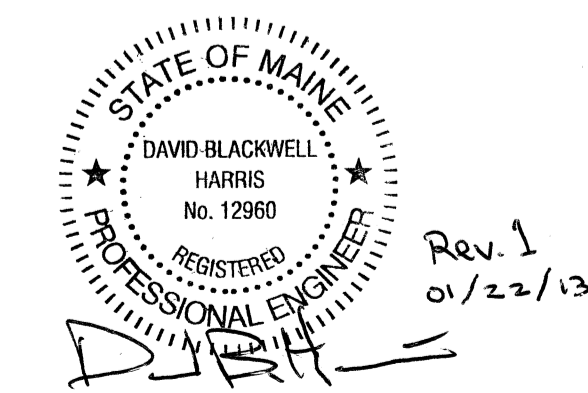
Designed by	DBH	Checked by	DBH
Drawn by	RAM	Reviewed by	CHB
Date	2012		

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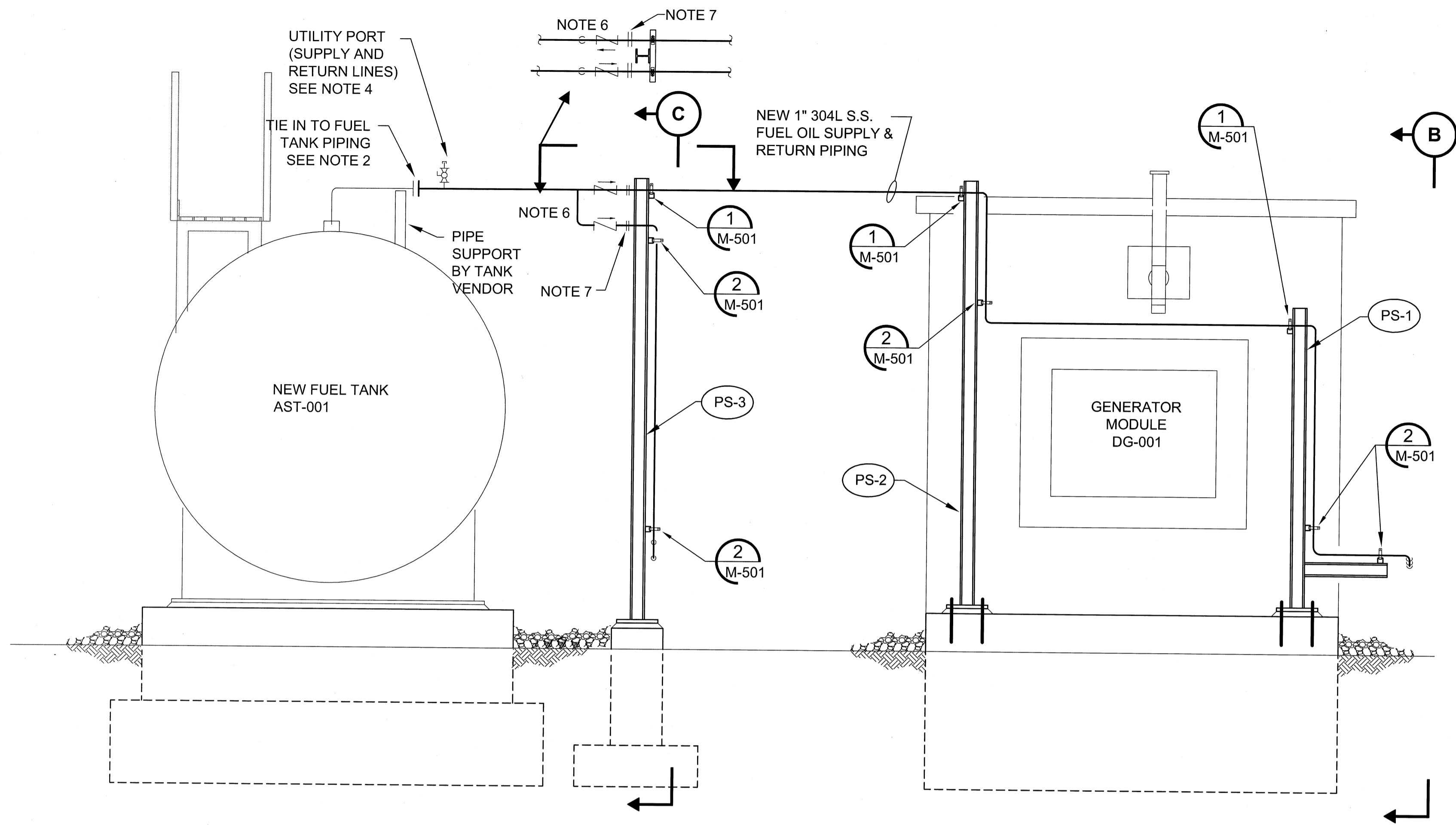
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 ON WGAN PORTLAND, MAINE

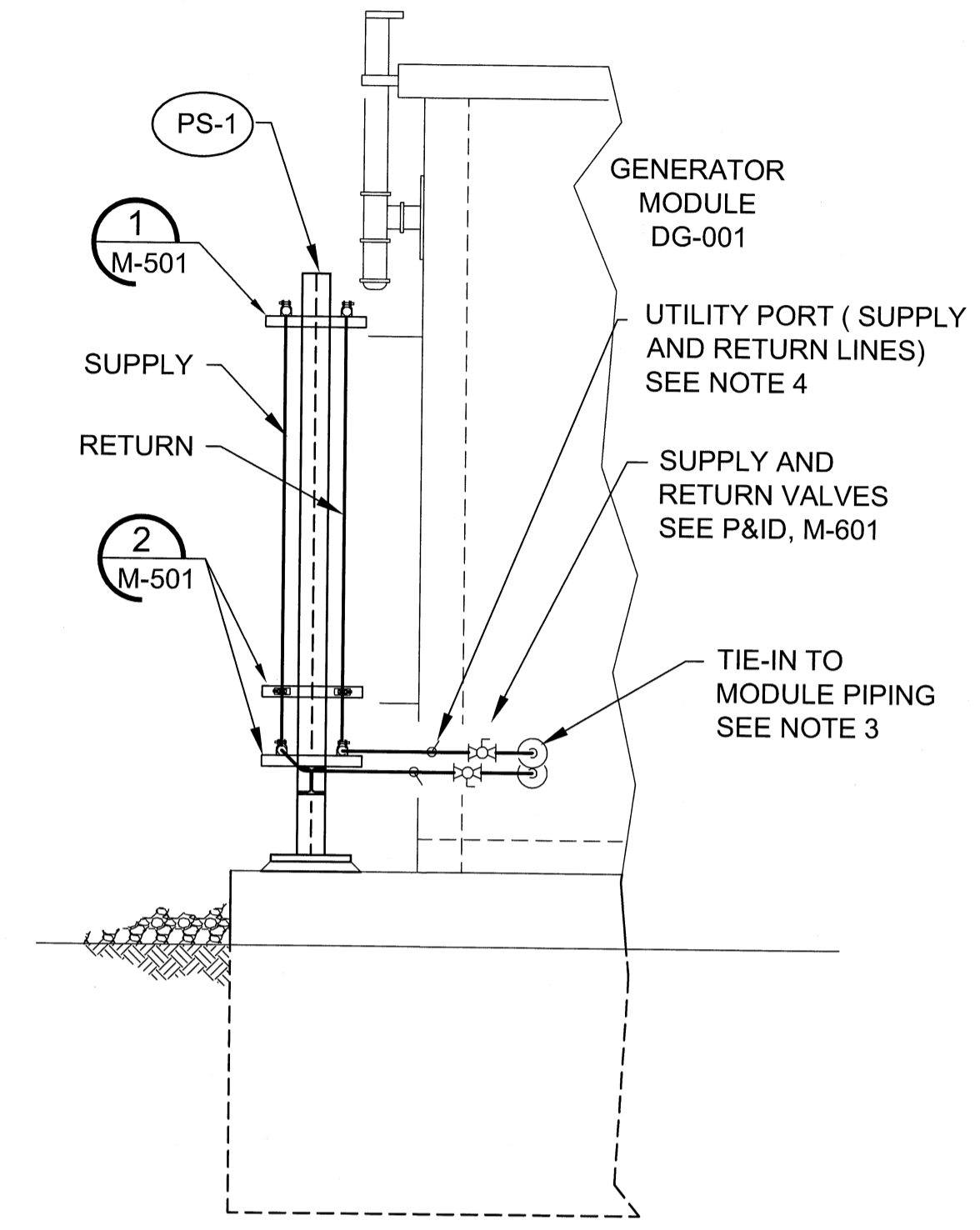
**MECHANICAL PLAN**



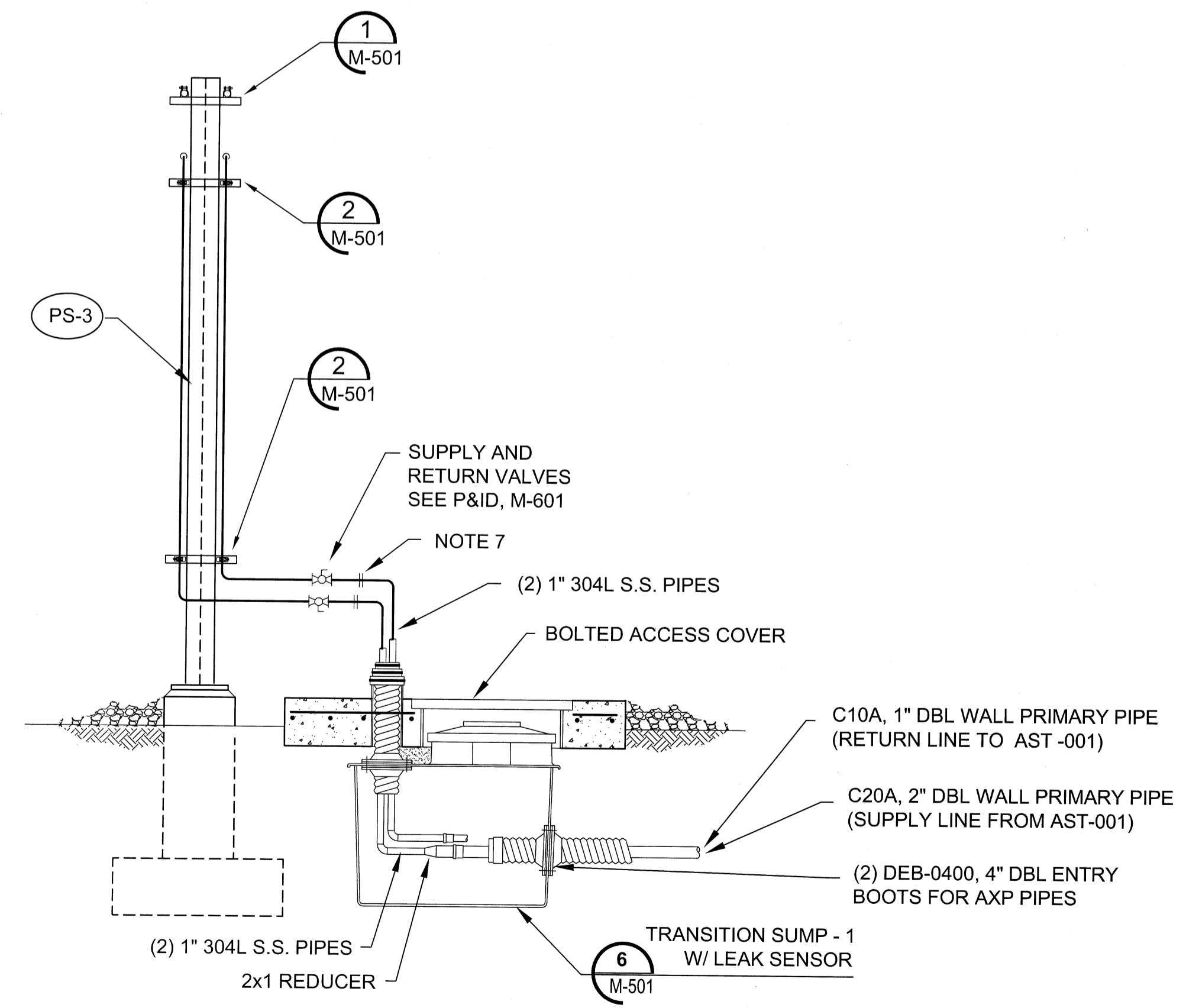
Drawing Number:  
**M-101**



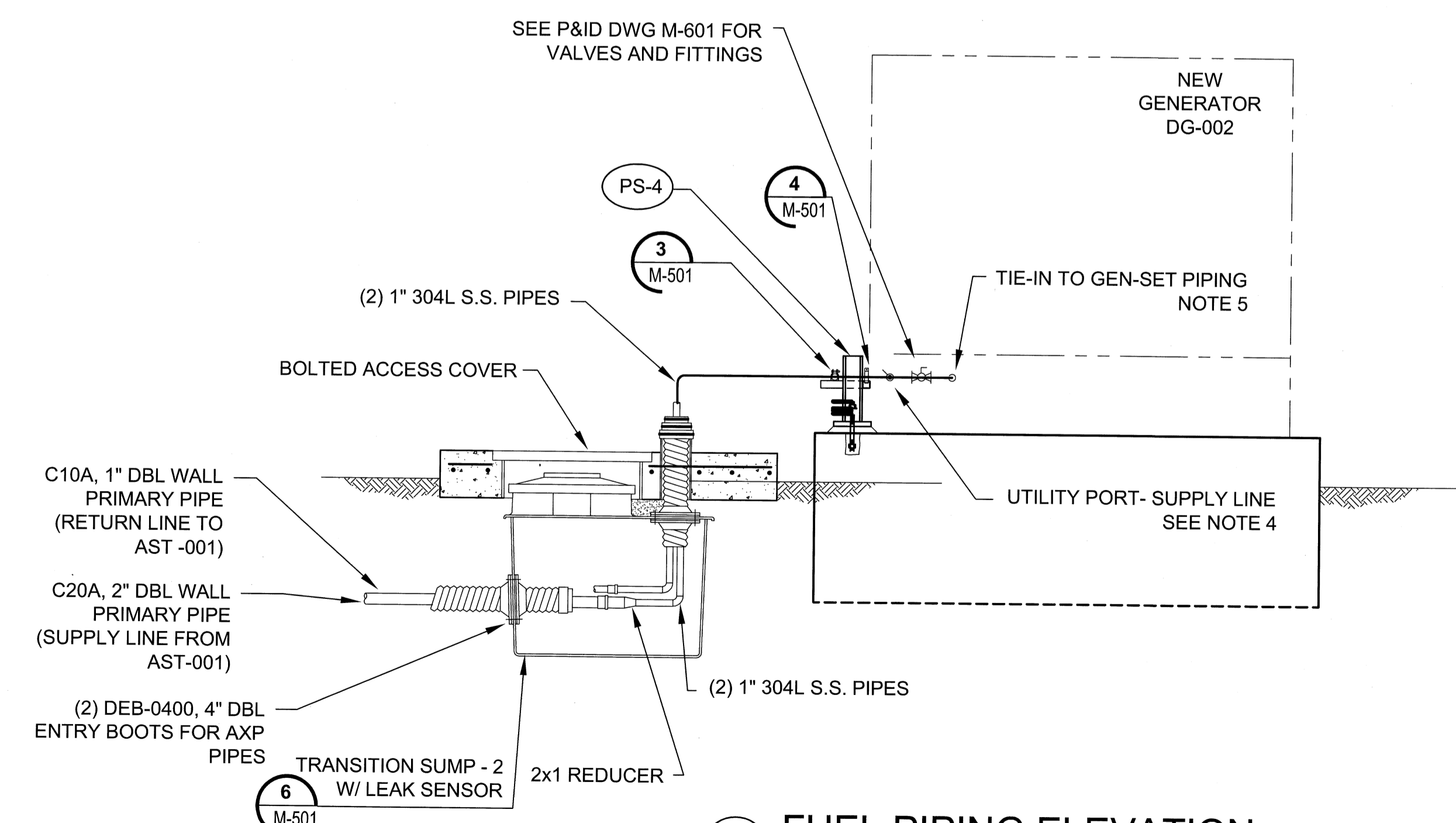
**A FUEL PIPING ELEVATION**  
M-101 SCALE: 1/2"=1'-0"



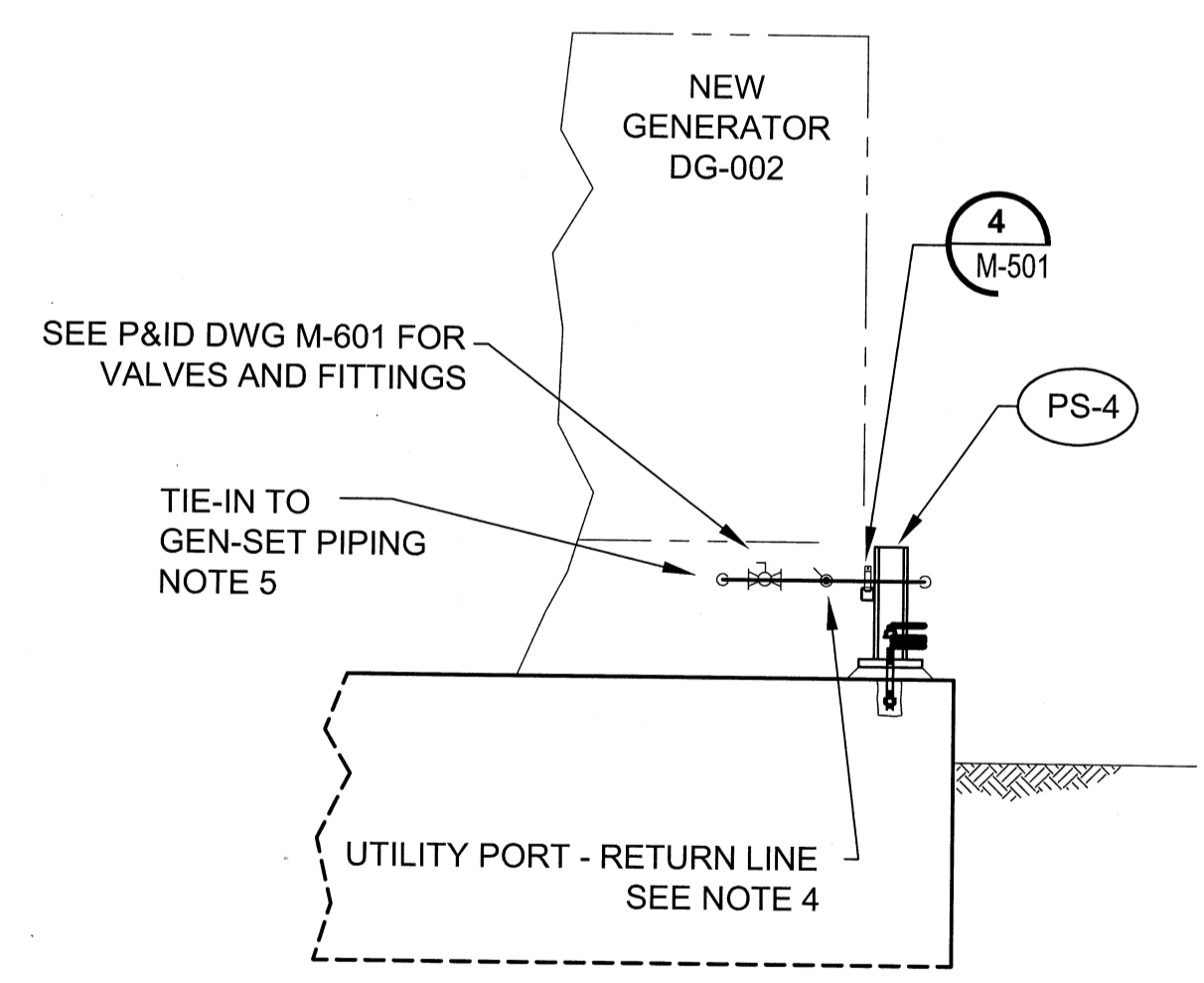
**B ELEVATION**  
SCALE: 1/2"=1'-0"



**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"

**NOTES:**

- SEE NOTES DRAWING M-101.
- 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.)
- 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.
- 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.
- 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.
- 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.
- FURNISH AND INSTALL SOCKET WELD STAINLESS STEEL FLANGES TO PROVIDE ACCESS FOR VALVE REMOVAL. ALSO SHOWN ON DRAWING M-601.



Project Manager	Architectural	Mechanical	Plumbing	Electrical	Civil
DC Reviewer					

Mark	Date	Approved
	11/7/12	
ISSUED FOR CONSTRUCTION		

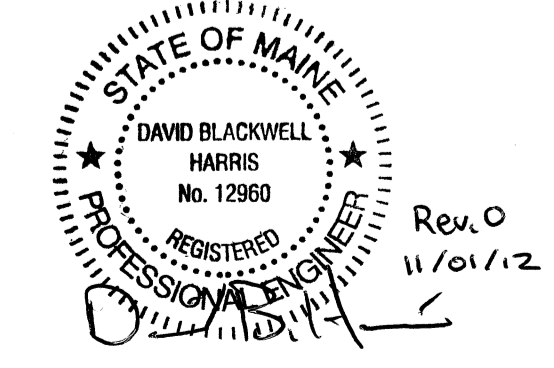
Designed by	DBH
Checked by	DBH
Drawn by	RAM
Reviewed by	CHB
Date	2012

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43 SOUTH WINDY STREET SUITE 200  
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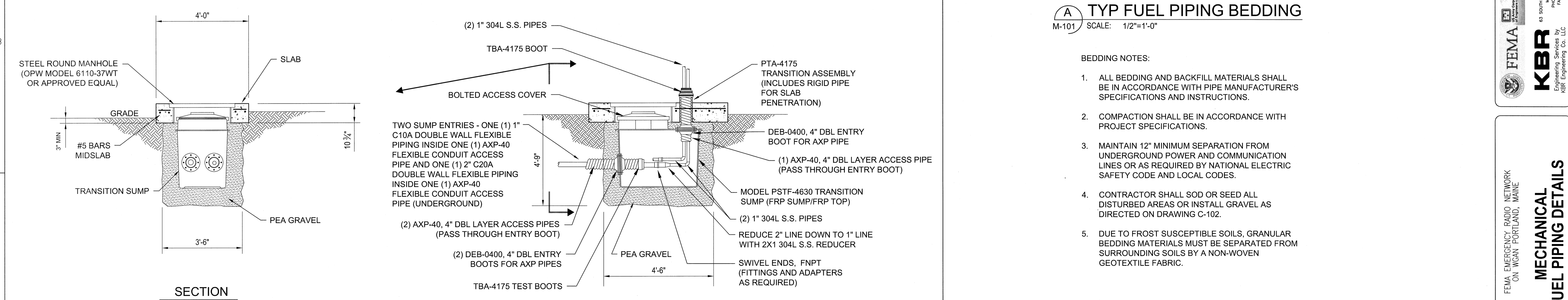
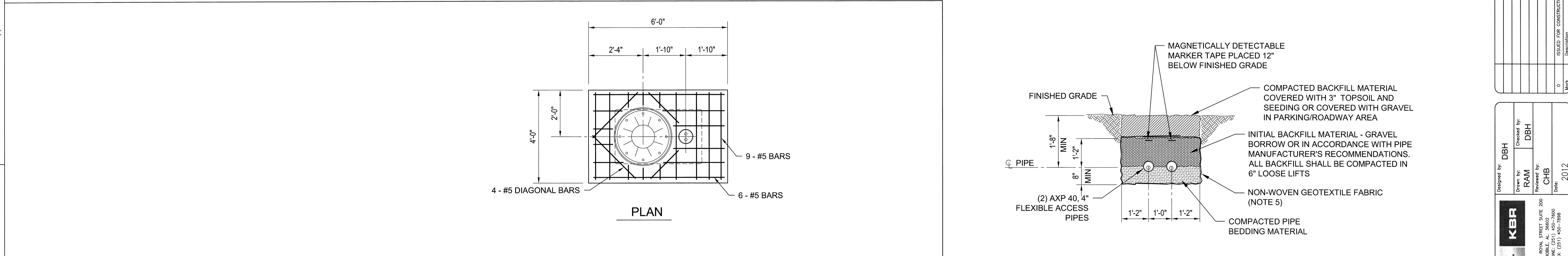
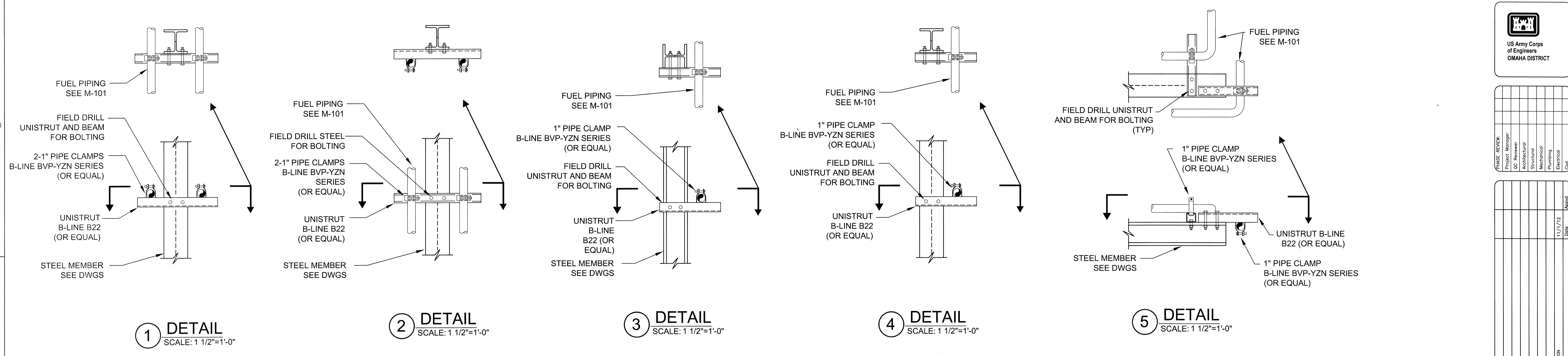
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**FUEL PIPING SYSTEM ELEVATIONS**



Drawing Number:  
**M-201**



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

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

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

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

**BEDDING NOTES:**

- ALL BEDDING AND BACKFILL MATERIALS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.
- COMPACTION SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- MAINTAIN 12" MINIMUM SEPARATION FROM UNDERGROUND POWER AND COMMUNICATION LINES OR AS REQUIRED BY NATIONAL ELECTRIC SAFETY CODE AND LOCAL CODES.
- CONTRACTOR SHALL SOD OR SEED ALL DISTURBED AREAS OR INSTALL GRAVEL AS DIRECTED ON DRAWING C-102.
- 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  
11/01/12

FEMA EMERGENCY RADIO NETWORK  
ON WGAN PORTLAND, MAINE  
**MECHANICAL FUEL PIPING DETAILS**

Drawing Number:  
**M-501**

US Army Corps of Engineers  
OMAHA DISTRICT

Project Manager	
QC Reviewer	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

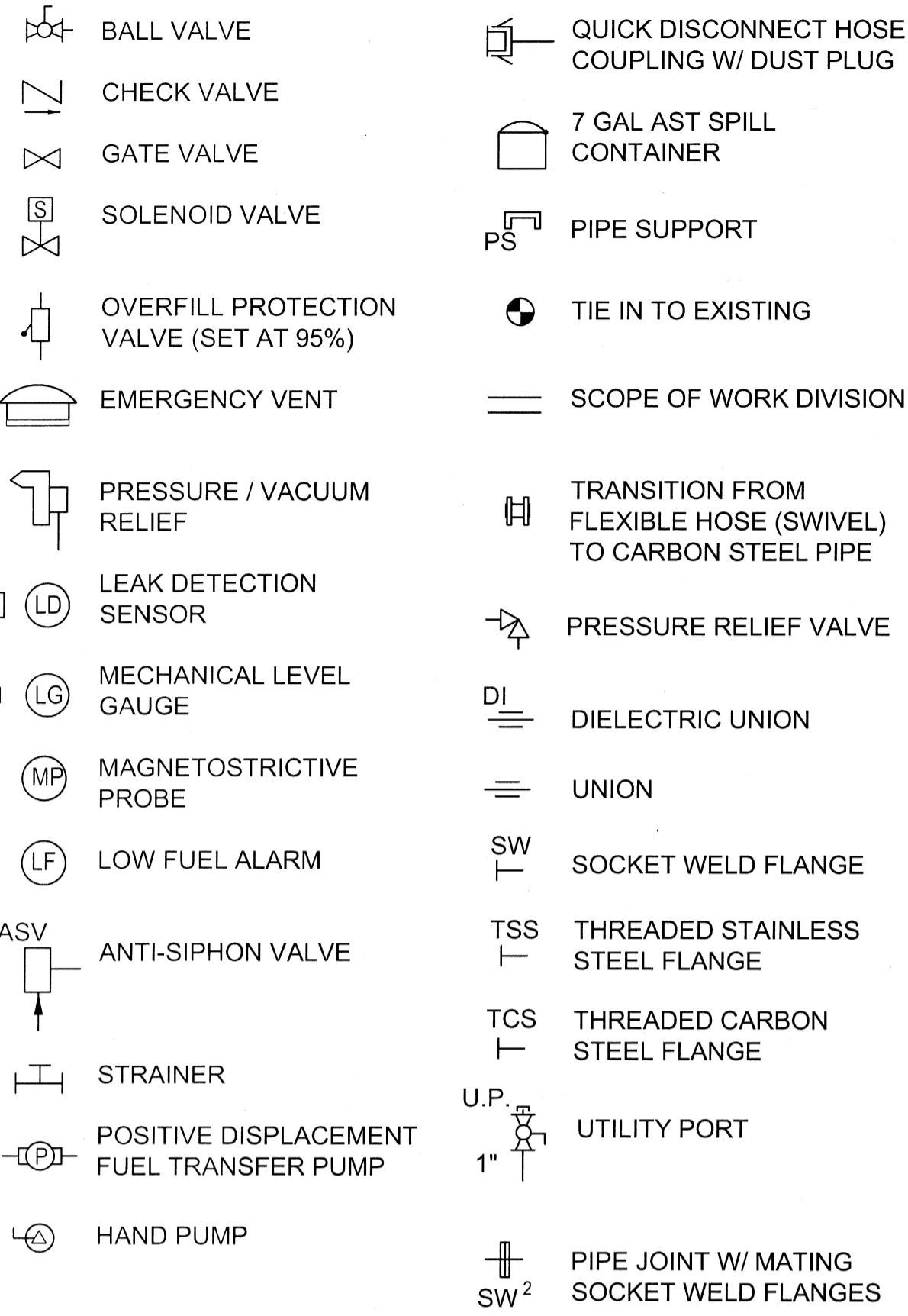
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0	Description	Date	Revised

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

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**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.

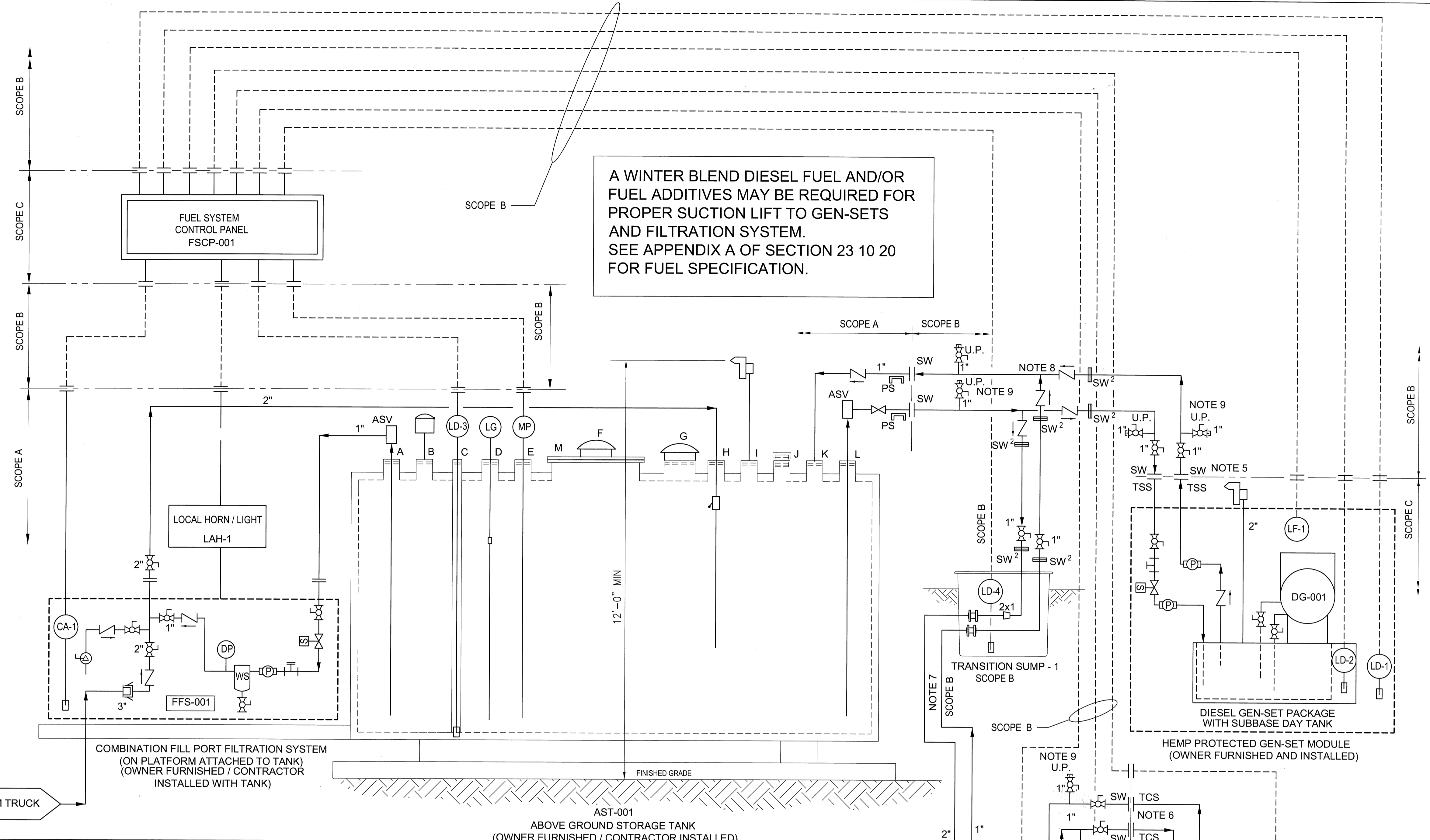
**FUEL MONITORING SYSTEM SCHEDULE**

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
CA-1	COMMON ALARM FUEL FILTRATION SYS. CABINET

**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

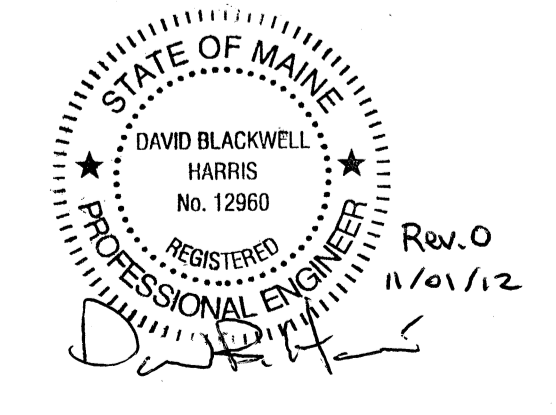
- NOTES:  
1. ALL NOZZLES SHALL BE FPT COUPLINGS EXCEPT FOR THE FLANGED MANWAY.



A WINTER BLEND DIESEL FUEL AND/OR FUEL ADDITIVES MAY BE REQUIRED FOR PROPER SUCTION LIFT TO GEN-SETS AND FILTRATION SYSTEM. SEE APPENDIX A OF SECTION 23 10 20 FOR FUEL SPECIFICATION.

**NOTES:**

- 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.
- 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.
- PROVIDE INTERCONNECTING FUEL OIL PIPING AND SIGNAL CABLES AS INDICATED. (SEE ELECTRICAL DRAWINGS)
- SEE DRAWING M-101 AND SPECIFICATION SECTION 23 10 20, FOR FULL SCOPE OF WORK FOR THE FUEL OIL SYSTEM.
- CONNECT FUEL PIPING TO HEMP PROTECTED GEN-SET USING FLANGES. FURNISH AND INSTALL THREADED STAINLESS STEEL FLANGES ON EQUIPMENT FUEL LINE STUB-OUTS.
- 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.
- 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)
- 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.
- 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.



Project Manager	OC	Reviewer	Architectural	Structural	Plumbing	Electrical	Civil
11/7/12							

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

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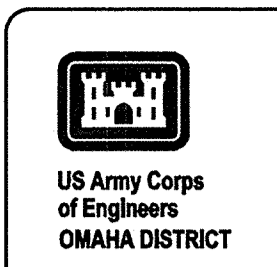
**FUEL SYSTEM P&ID**

Drawing Number:  
**M-601**



**NOTES:**

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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.
- 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.
- 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.
- INSTALL NEW 400 AMPERES ATS WITH INTERNAL TVS. INSTALL A NEW 400 AMPERE DISTRIBUTION POWER PANEL ON REAR WALL AS SHOWN INSURING PROPER CLEARANCES.
- 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



PHASE DESIGN	
Project Manager	
DC Designer	
Structural	
MECHANICAL	
PLUMBING	
ELECTRICAL	

REVISIONS	
0	ISSUED FOR CONSTRUCTION
11/7/12	Date
	Appr

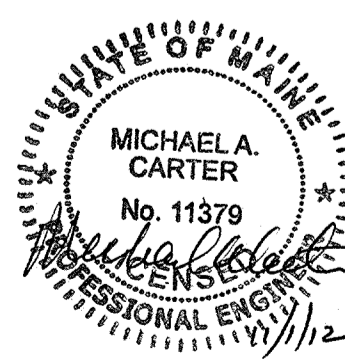
Designed by:	Drawn by:	Checked by:	Date:
			2012

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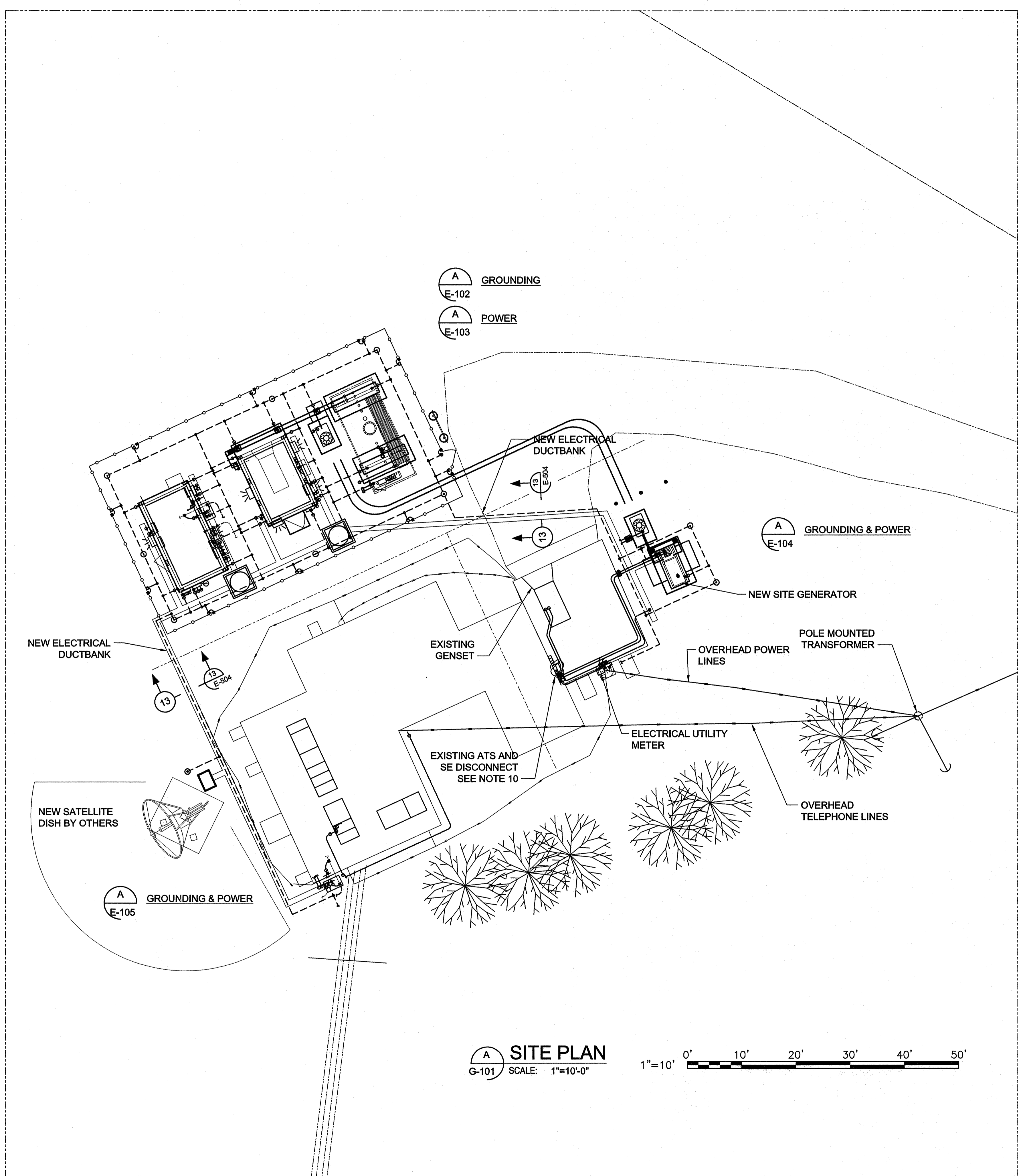
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ON WGAN PORTLAND, MAINE

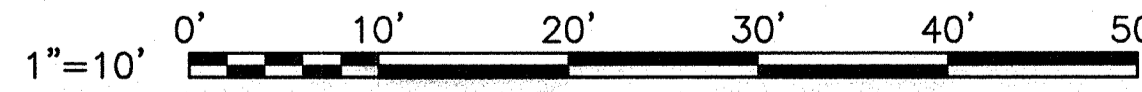
**ELECTRICAL  
SITE PLAN**



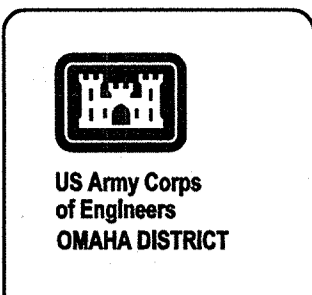
Drawing  
Number:  
**E-101**



**A SITE PLAN**  
G-101 SCALE: 1"=10'-0"



D  
C  
B  
A



Project Manager	
CE Designer	
Structural	
Mechanical	
Electrical	
Other	

Date	11/7/12
Mark	

Design by	
Drawn by	
Reviewed by	
Date	2012

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**ELECTRICAL**
  
**GROUNDING PLAN**

MICHAEL A. CARTER
   
 No. 11379

Drawing Number: **E-102**

**NOTES:**

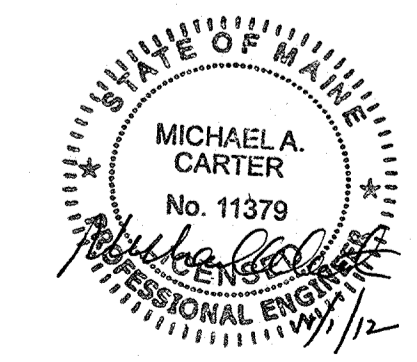
- ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
- GROUND CONDUCTORS / TOWER GROUND RADIALS DAMAGED OR CUT DURING CONSTRUCTION SHALL BE REPAIRED BEFORE CONTINUING CONSTRUCTION ACTIVITIES. REROUTING OF GROUND CONDUCTORS AROUND IMPACTED AREAS SHALL BE COMPLETED BEFORE CONTINUING.
- 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.
- 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.
- CONTRACTOR SHALL TIE INTO EXISTING GROUND LOOP TO ENSURE CONTINUITY OF THE OVERALL GROUNDING SYSTEM.
- 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.
- 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.
- 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
- CONTRACTOR SHALL CONNECT THE EXTERIOR RF GROUND BUS BAR TO THE GROUND LOOP UTILIZING A # 4/0 AWG INSULATED GROUNDING CONDUCTOR.
- 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:**

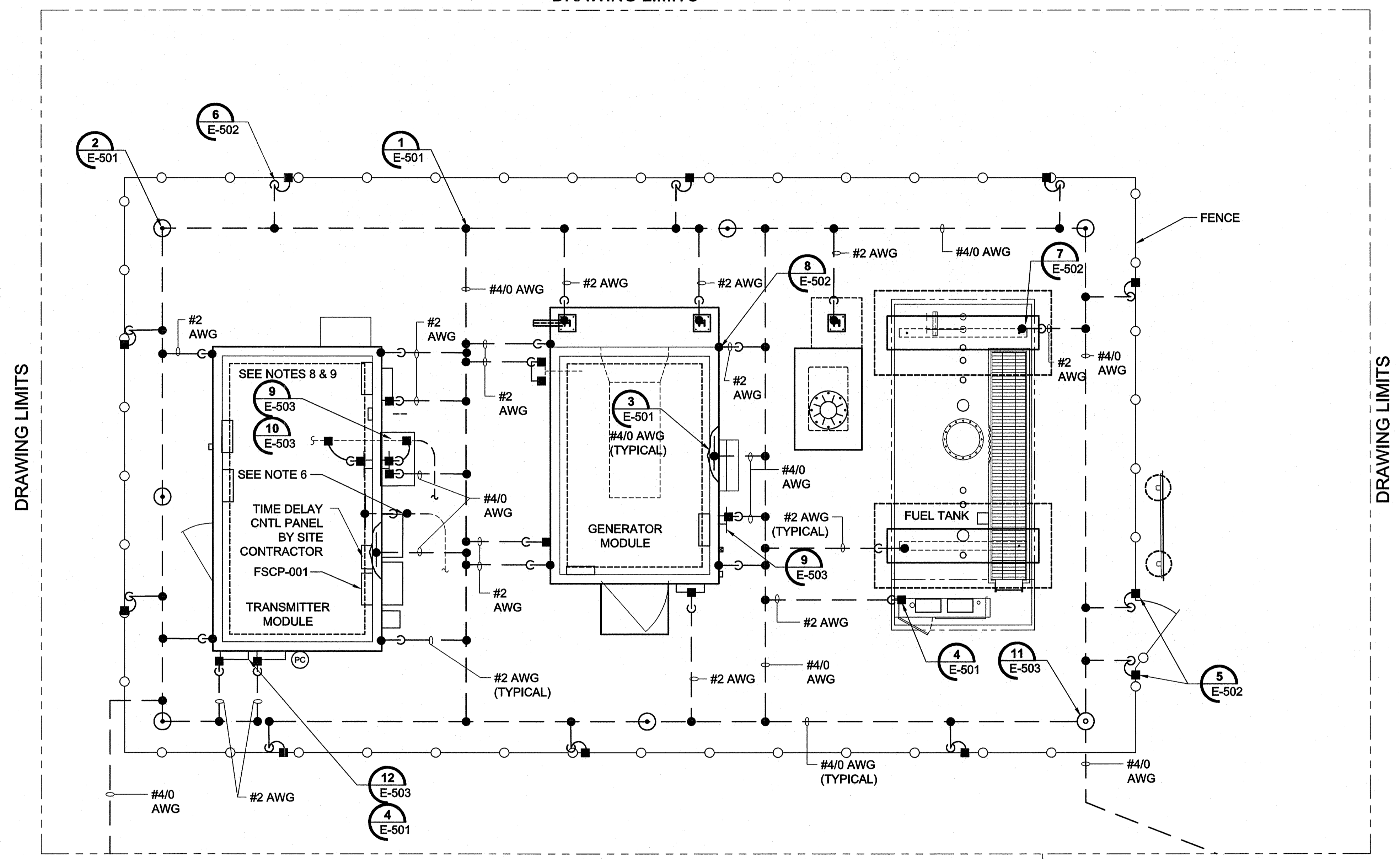
- UNDERGROUND CONDUIT
- ABOVE GROUND CONDUIT
- ⊙ GROUND ROD, 3/4" X 10' SECTIONAL COPPER CLAD
- EXOTHERMIC WELD, SEE DETAIL FOR TYPE
- MECHANICAL GROUND CONNECTION, SEE DETAIL FOR TYPE
- ⊙ GROUNDING TEST WELL
- GROUNDING CONDUCTOR (BURIAL DEPTH 30")
- 4" WIDE (.016" TO .022") COPPER RF BONDING TAPE
-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

XX E-5XX

DETAIL/SHEET #

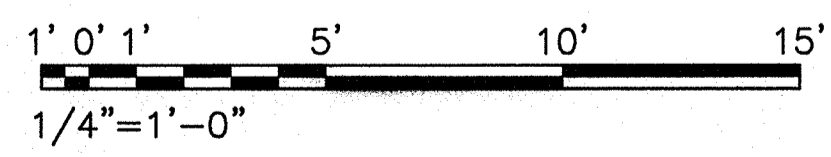


**DRAWING LIMITS**



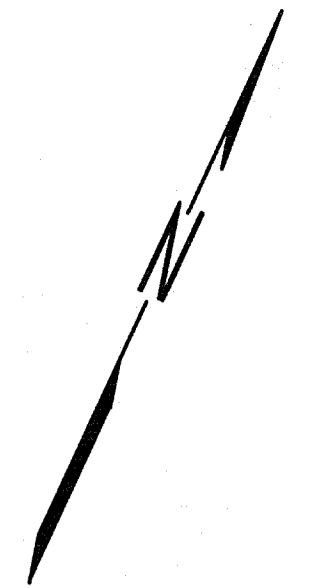
CONTINUED ON DRAWING E-105      CONTINUED ON DRAWING E-104

**GROUNDING PLAN**  
SCALE: 1/4"=1'-0"

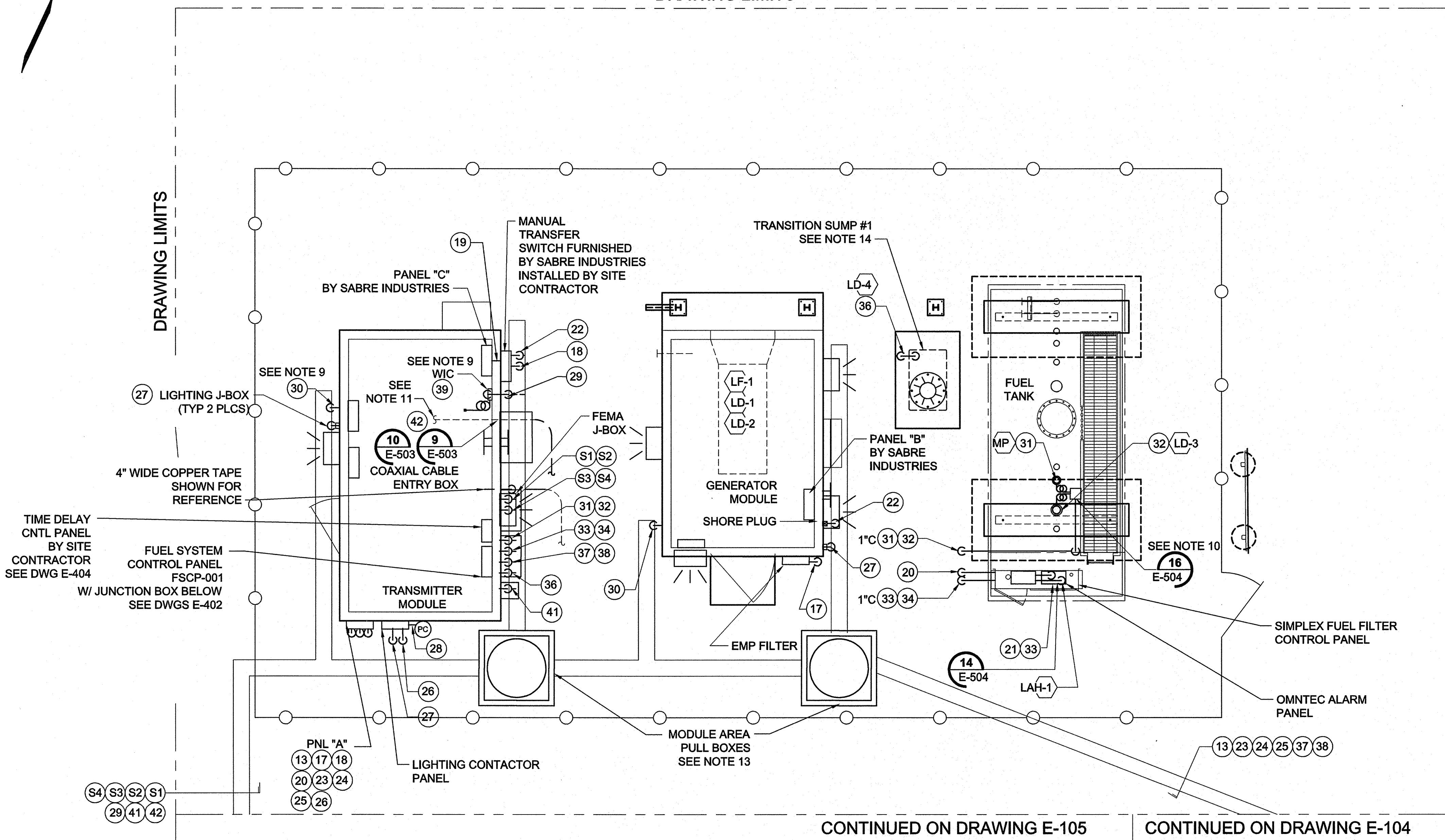


DRAWING LIMITS

DRAWING LIMITS

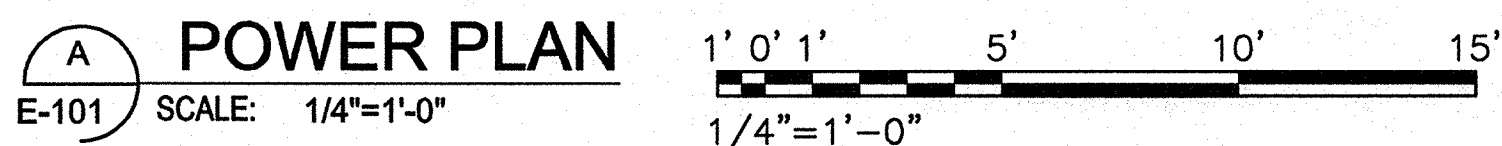


DRAWING LIMITS



CONTINUED ON DRAWING E-105

CONTINUED ON DRAWING E-104



NOTES:

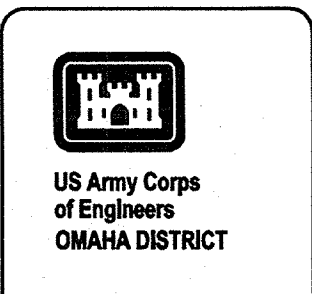
- ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND PROJECT SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
- ALL BUILDING PENETRATIONS SHALL BE SEALED WITH A FIRE BLOCK SEALANT TO PREVENT WATER FROM ENTERING THE INTERIOR. ALL PANEL ENTRY PENETRATIONS SHALL UTILIZE MYERS HUBS WITH GROUNDING BUSHINGS.
- 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.
- 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.
- 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.
- 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).
- 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.
- SEE CELLXION MODULE DRAWINGS SKBR01 & SKBR02 FOR BUILDING PENETRATION LOCATIONS TO COORDINATE CONDUITS STUB-UPS CONNECTIONS.
- 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.
- 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.

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 #

NOTES CONTINUED:

- 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.
- 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.
- 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.
- CONDUIT ENTERING THE TRANSITION SUMP SHALL BE MADE UTILIZING A STTB 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.



PHASE	REVIEW
Project Manager	
DC Reviewer	
Architectural	
Structural	
Mechanical	
Plumbing	
Electrical	
Other	

DATE	DESCRIPTION
11/7/12	Issue

ISSUED FOR CONSTRUCTION	DATE	APPROVAL
0	11/7/12	Mark

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

**KBR**  
 63 SOUTH BOWEN STREET SUITE 200  
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 FAX (251) 462-7801

**FEMA**  
 FEDERAL EMERGENCY MANAGEMENT AGENCY

**KBR Engineering Services**  
 KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
 ON WIGAN PORTLAND, MAINE

**ELECTRICAL POWER PLAN**

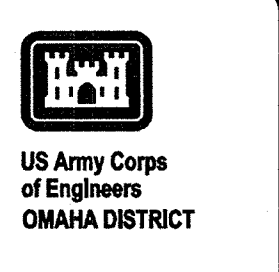


Drawing Number:  
**E-103**



**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.



Project Manager	
DC Designer	
Architectural	
Mechanical	
Plumbing	
Electrical	
Other	

Mark			
0	ISSUED FOR CONSTRUCTION	11/7/12	Approved

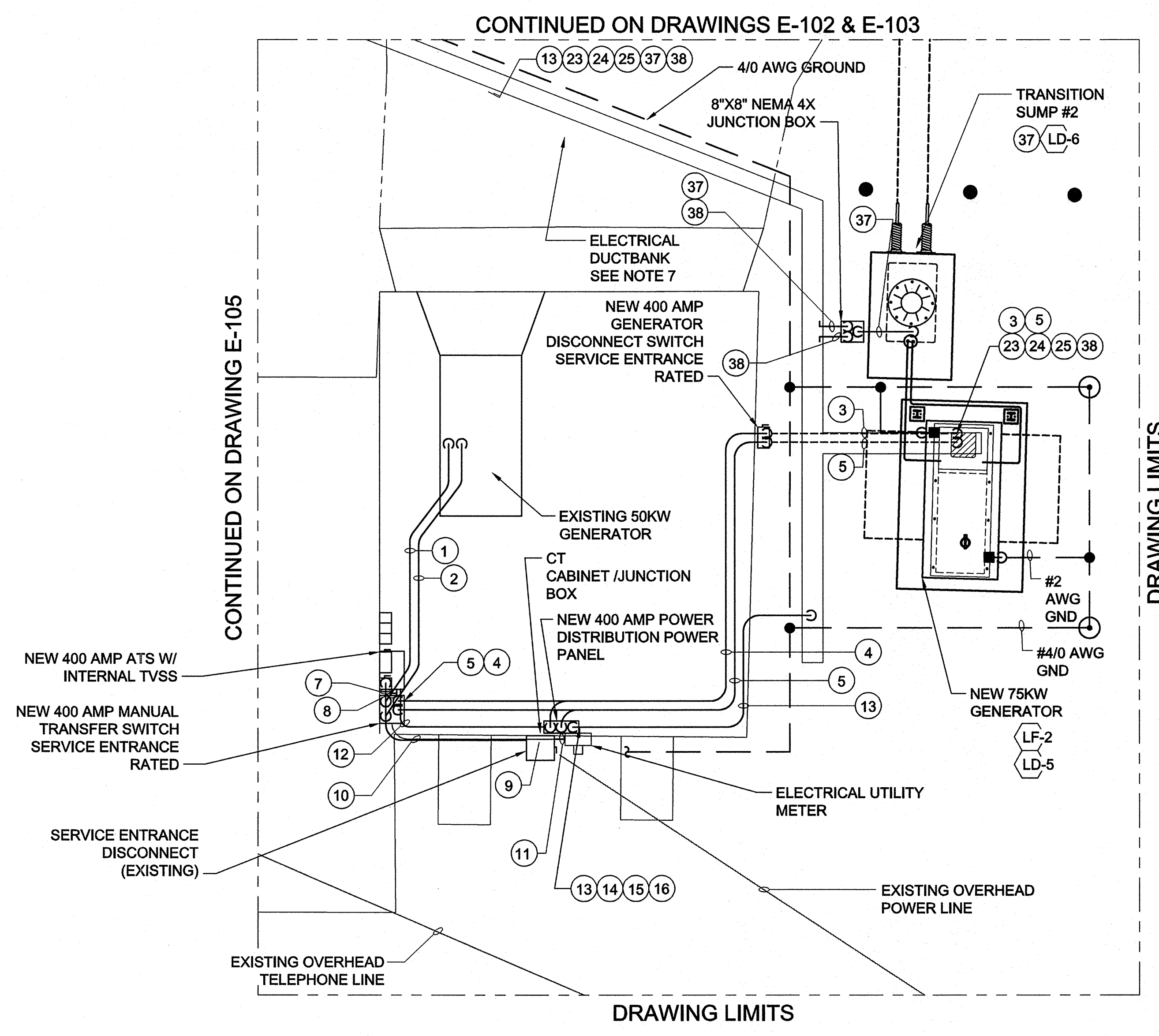
Designed by	Checked by	Reviewed by	Date
Drawn by			2012

63 SOUTH ROYAL STREET, SUITE 200
   
 PORTLAND, ME 04101
   
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 FAX (207) 462-7808
   
  
**KBR**
  
 Engineering Services by
   
 KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK ON WIGAN PORTLAND, MAINE

GROUNDING & POWER PLAN

Drawing Number:  
**E-104**

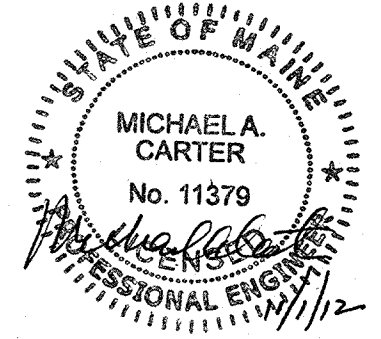


**LEGEND:**

- 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
- TT 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 #

**GROUNDING & POWER PLAN**

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

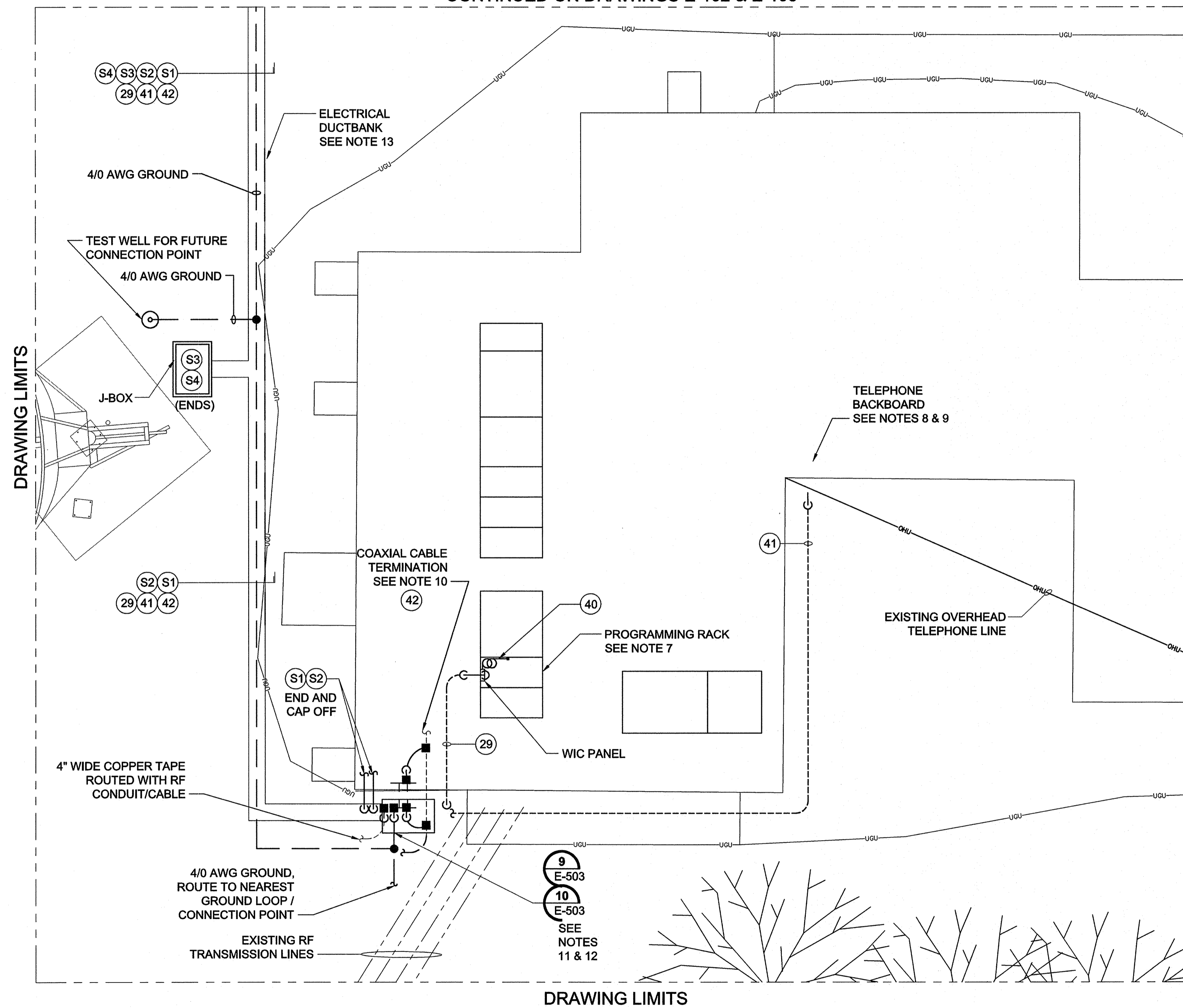


**NOTES:**

- 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.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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.
- 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 SHALL BE 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 ISNT IN PLACE THE CONTRACTOR SHALL ROUTE A INSULATED #4 AWG GROUND CONDUCTOR TO THE NEAREST GROUNDING POINT.
- CONTRACTOR SHALL ROUTE A 4-PAIR TELEPHONE CABLE IN THE EXISTING FLOOR TRENCH TO THE TELEPHONE DEMARCATION BOX.
- ROUTE COAX RF CABLE INTO PHASOR ROOM. STATION ENGINEER WILL TERMINATE CABLE.
- 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.
- CONTRACTOR SHALL CONNECT TO THE EXTERIOR GROUND BUS BAR TO THE GROUND LOOP WITH A #4/0 AWG INSULATED GROUND CONDUCTOR.
- DUE TO UNDERGROUND INSTALLATION OBSTRUCTIONS HAND EXCAVATION IS REQUIRED FOR AREA ADJACENT TO THE STATION BUILDING. NO EXCAVATORS OR POWERED EQUIPMENT SHALL BE UTILIZED.

CONTINUED ON DRAWINGS E-102 & E-103

CONTINUED ON DRAWING E-104

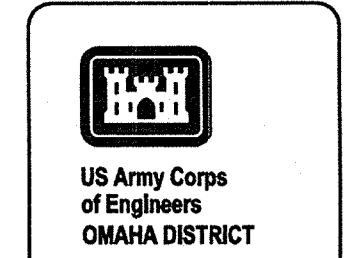


**LEGEND:**

- 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
- 4" WIDE (.016" TO .022") COPPER RF BONDING TAPE
- 3°C 7/8" RF COAXIAL CABLE
- G CONDUIT / CABLE TURNED DOWN
- CONDUIT / CABLE TURNED UP
- TT 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.
- ⊙ CABLE NUMBER (SEE E-403)
- ⊙XXX-X INSTRUMENT TAG
- ⊙XX E-5XX DETAIL/SHEET #

**A** GROUNDING & POWER PLAN  
E-101 SCALE: 3/8"=1'-0"

1' 0' 1' 5' 10'  
3/8"=1'-0"



Project Manager	OC Reviewer	Structural	Mechanical	Plumbing	Electrical	City

ISSUED FOR CONSTRUCTION	11/7/12	Approved
0	Mark	

Designed by	Checked by	Reviewed by	Date
			2012

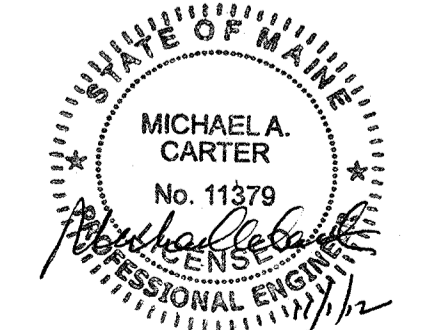
**KBR**  
63 SOUTH BOWEN STREET, SUITE 200  
MOBILE, AL 36602  
PHONE: (251) 465-7600  
FAX: (251) 465-7604

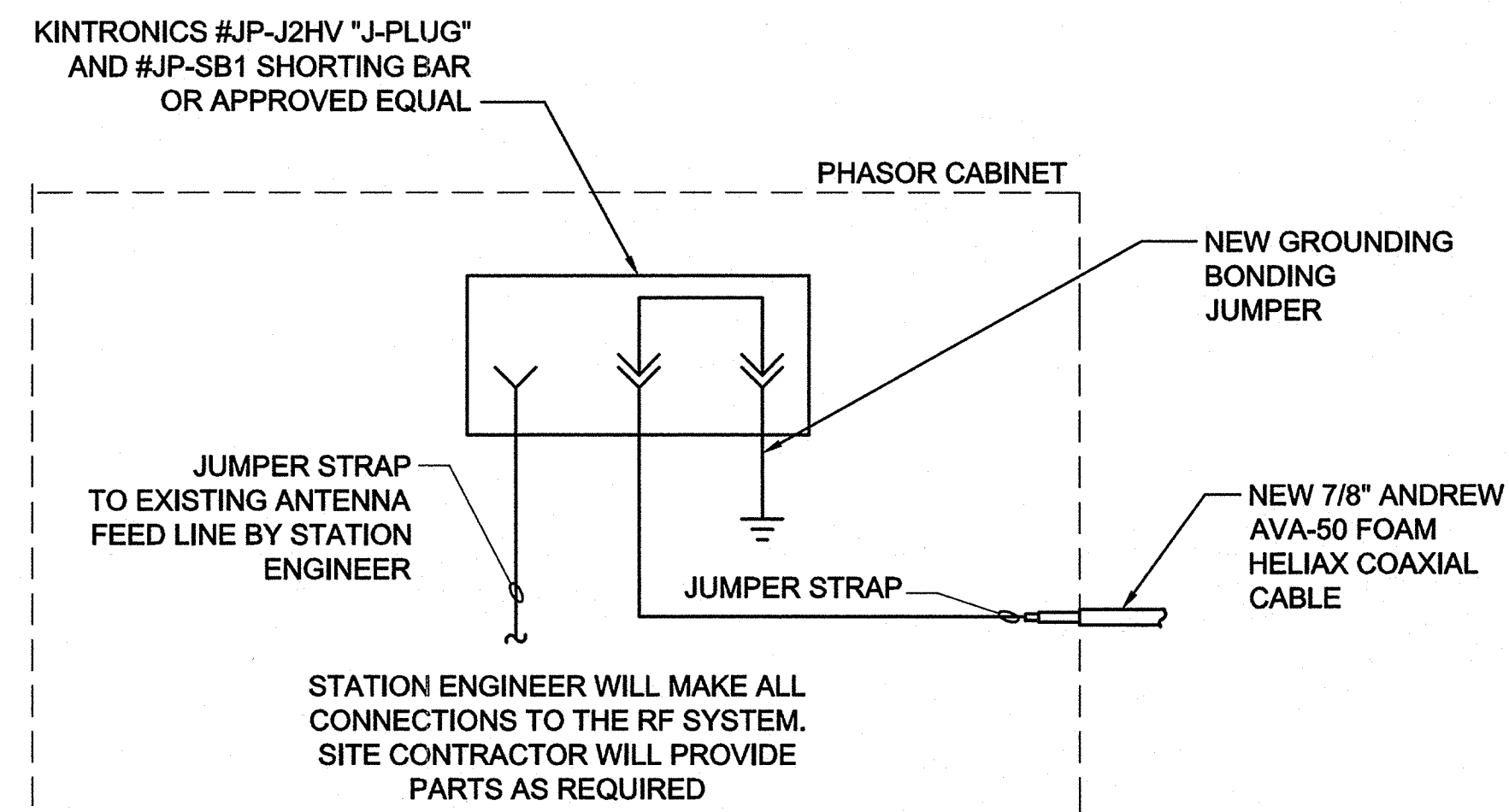
**FEMA**  
Engineering Services by  
KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE

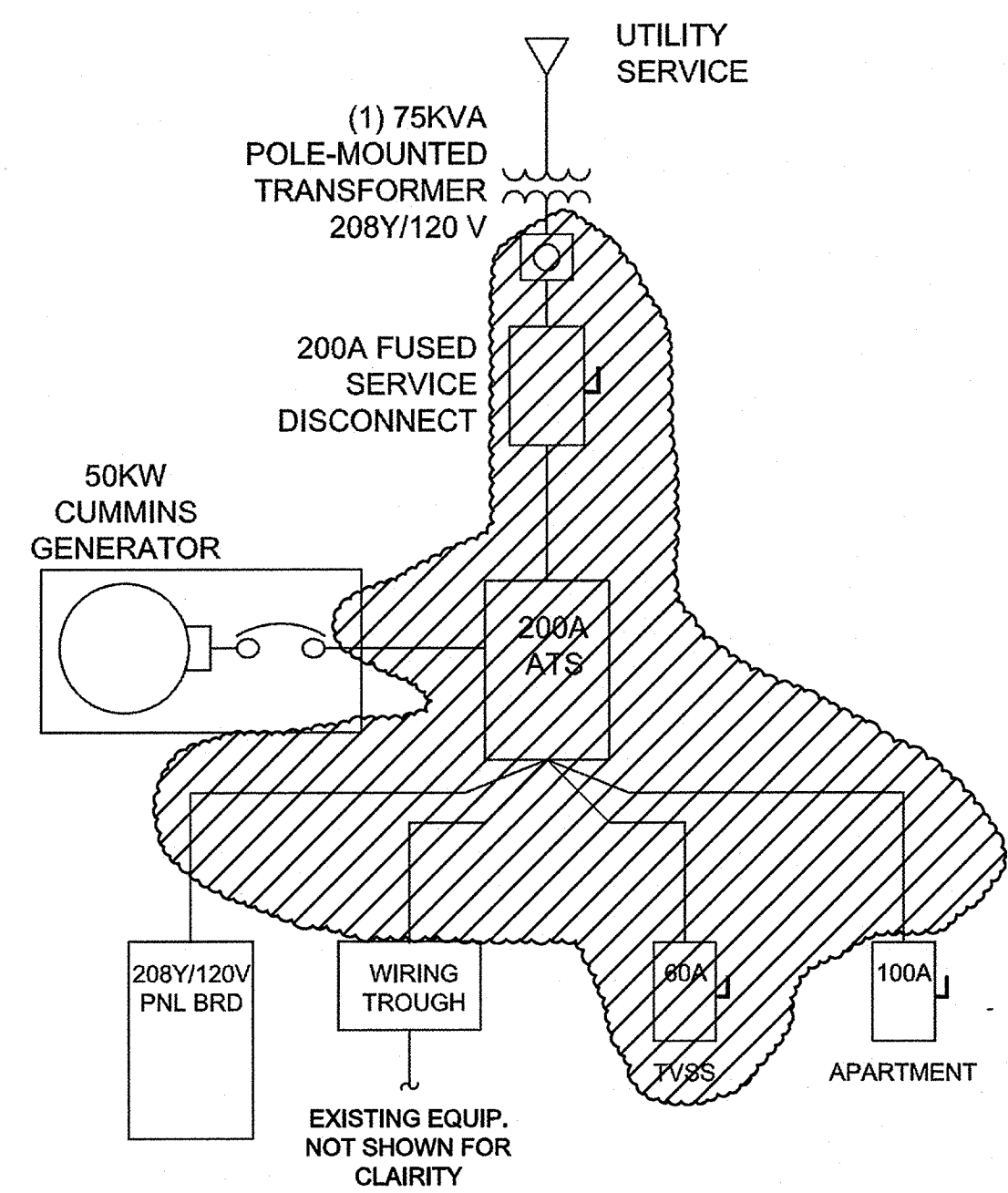
**GROUNDING & POWER PLAN**

Drawing Number:  
**E-105**

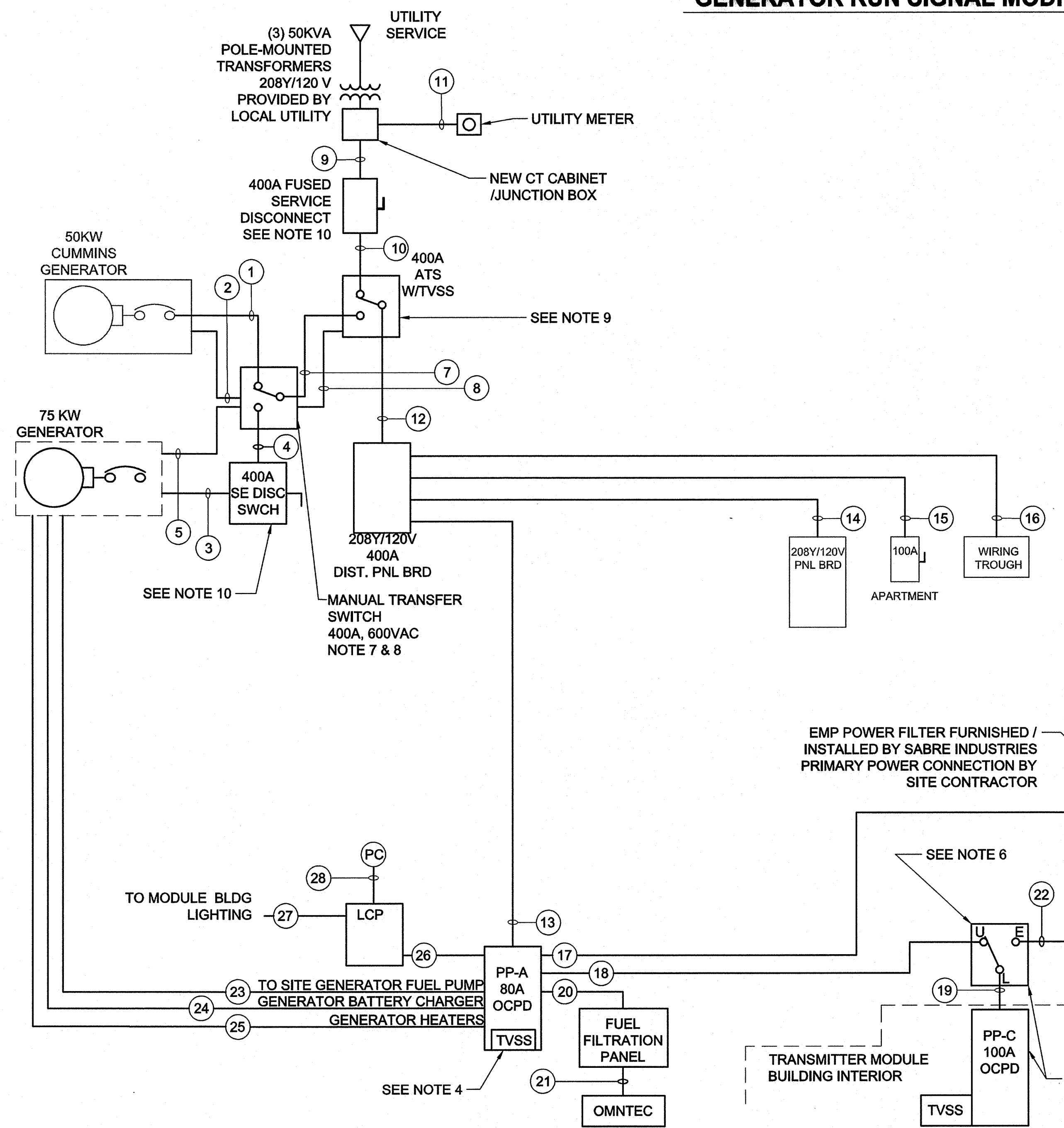




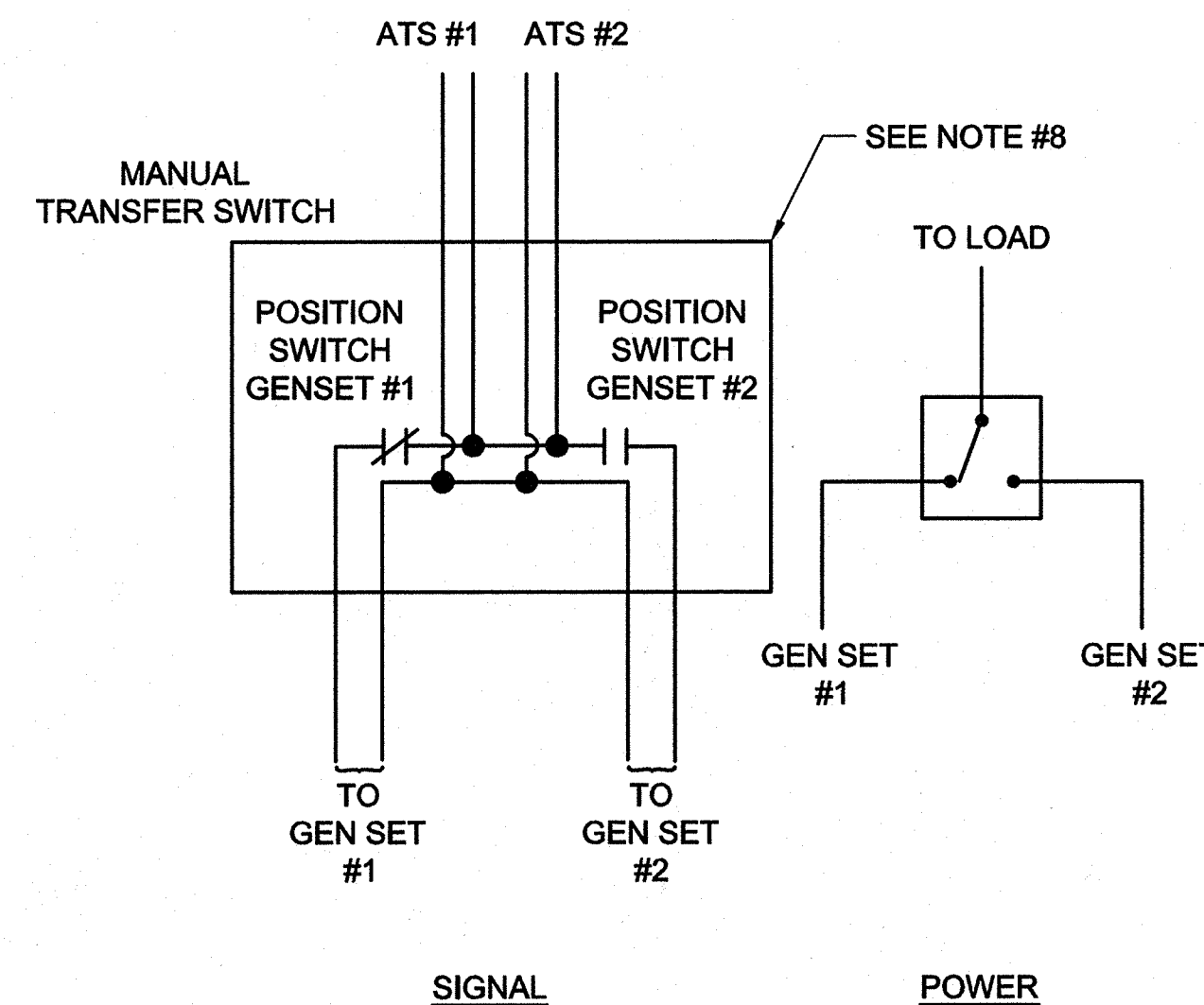
**RF CONNECTION DIAGRAM**



**EXISTING POWER RISER DIAGRAM**



**MODIFIED POWER RISER DIAGRAM**



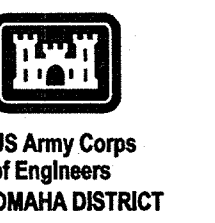
**GENERATOR RUN SIGNAL MODIFICATION**

**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 COMPATIBILITY 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 ENCLOSURES WITH 400 AMP FUSES. EATON CAT NO. DH325NR1-N OR APPROVED EQUAL.

**LEGEND:**

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



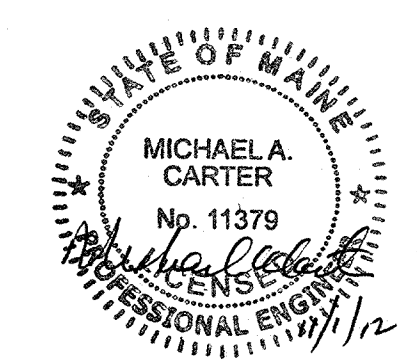
PHASE REVIEW				
Project Manager	QC Reviewer	Structural	Mechanical	Electrical

ISSUED FOR CONSTRUCTION				
0	11/7/12			Approved

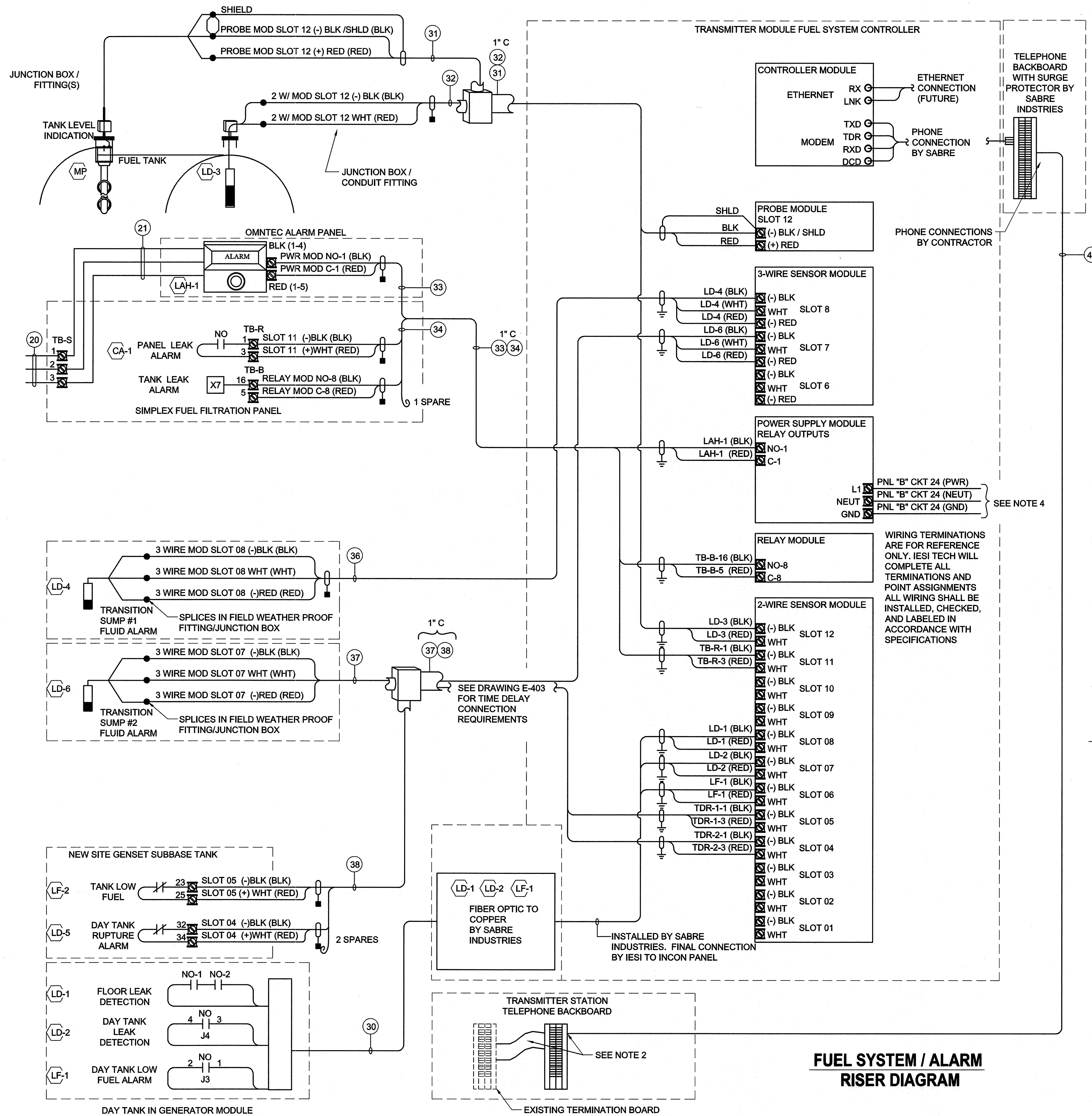

Designed by	SDJ	Checked by	TCG	Date	2012
Drawn by	SDJ	Reviewed by	TCG		

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 KBR Engineering Services by KBR Engineering Co. LLC

**TRANSMITTER / GENERATOR ELECTRICAL PANEL SCHEDULES**



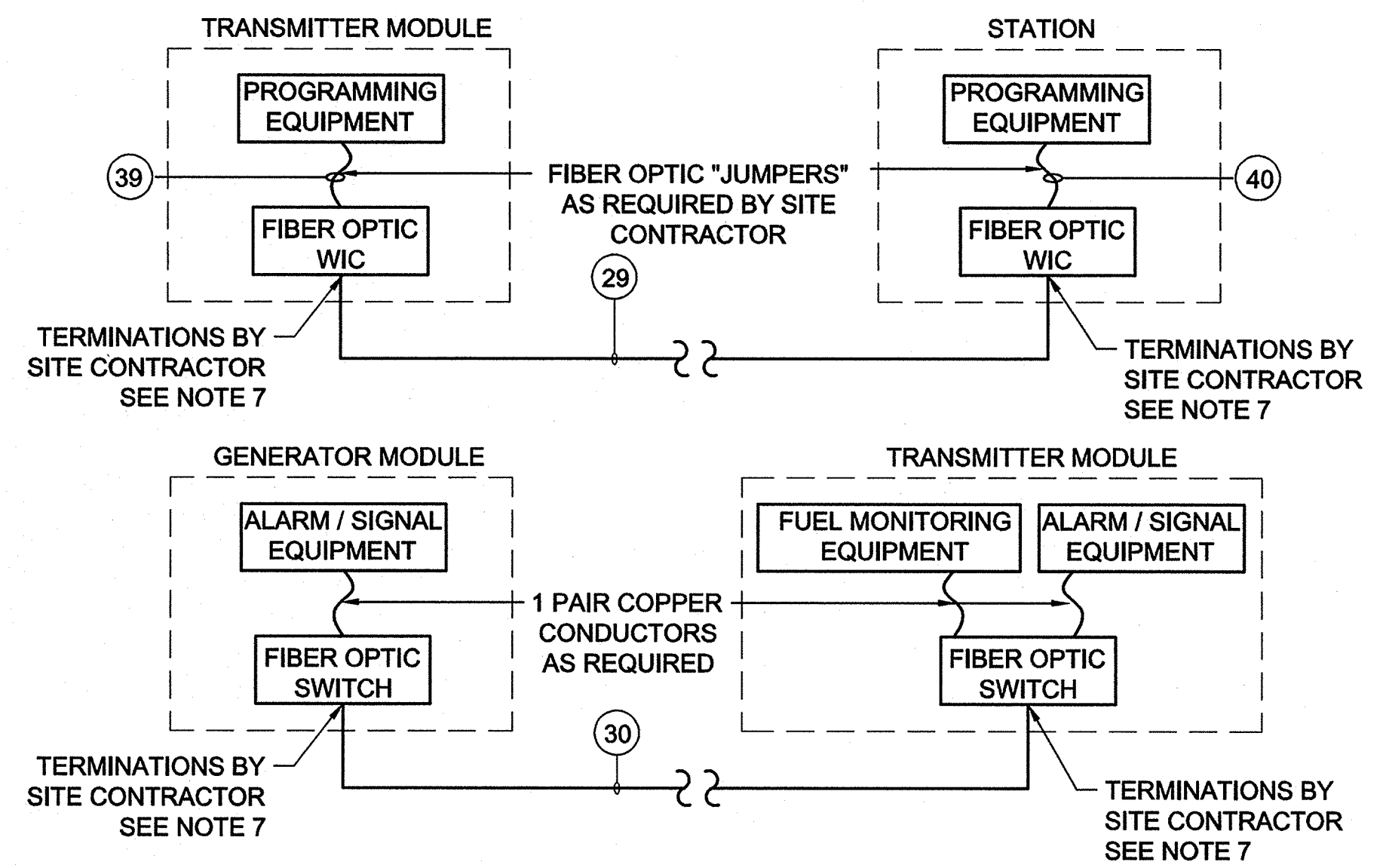
Drawing Number: **E-401**



**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
- [Symbol] CABLE SHIELD TERMINATED TO GROUNDING POINT
- [Symbol] CABLE SHIELD SHOWN CUT AND TAPED NOT TERMINATED

US Army Corps of Engineers OMAHA DISTRICT

Project Manager	
IC Reviewer	
Structural	
Mechanical	
Electrical	
Mark	
Date	

Designed by	SDU
Drawn by	SDU
Checked by	TCG
Reviewed by	
Date	2012

ISSUED FOR CONSTRUCTION

FEMA EMERGENCY RADIO NETWORK ON WIGAN PORTLAND, MAINE

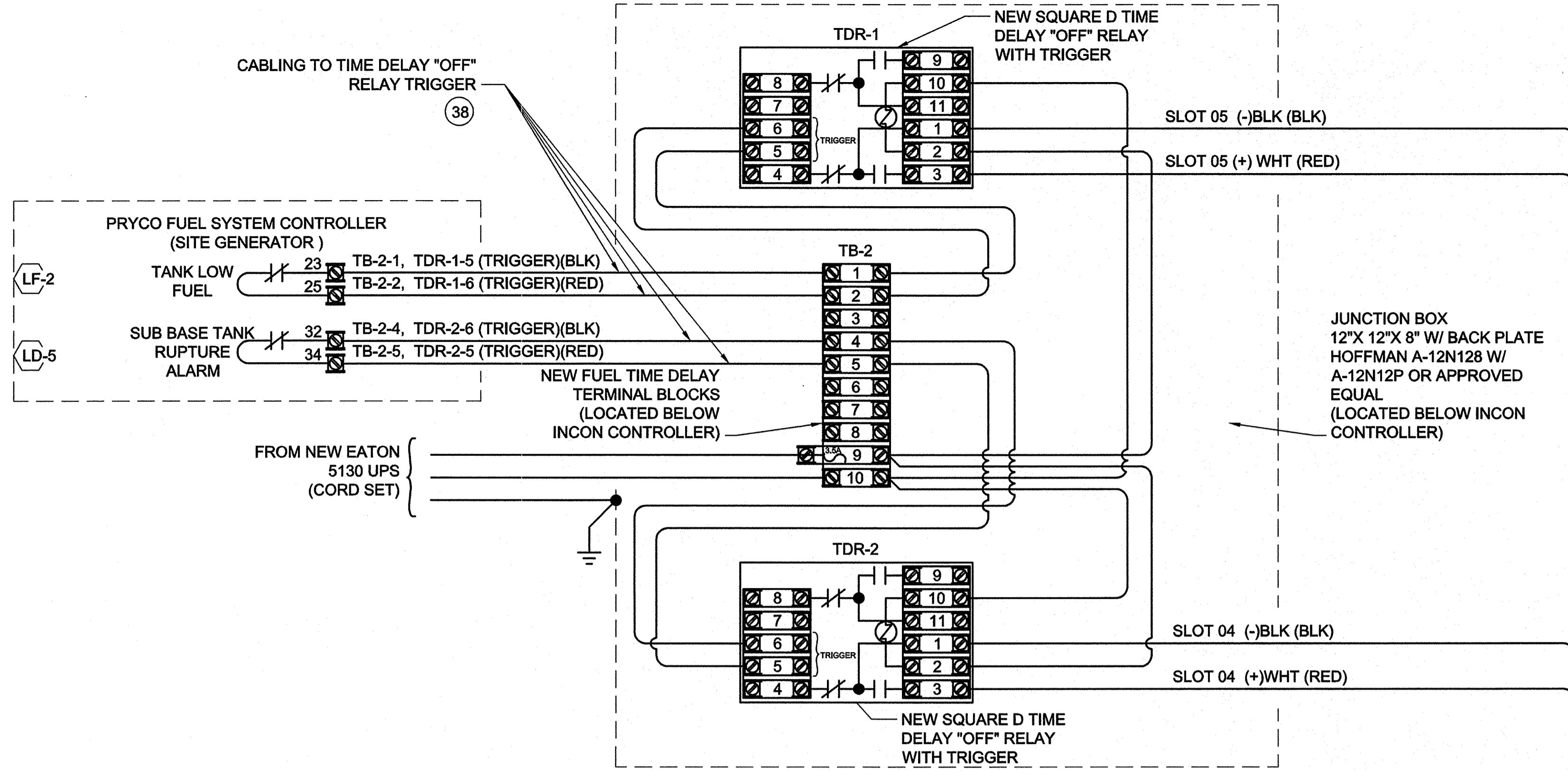
**TRANSMITTER / GENERATOR ELECTRICAL RISER DIAGRAMS**

Professional Engineer  
 MICHAEL A. CARTER  
 No. 11379

Drawing Number: **E-402**







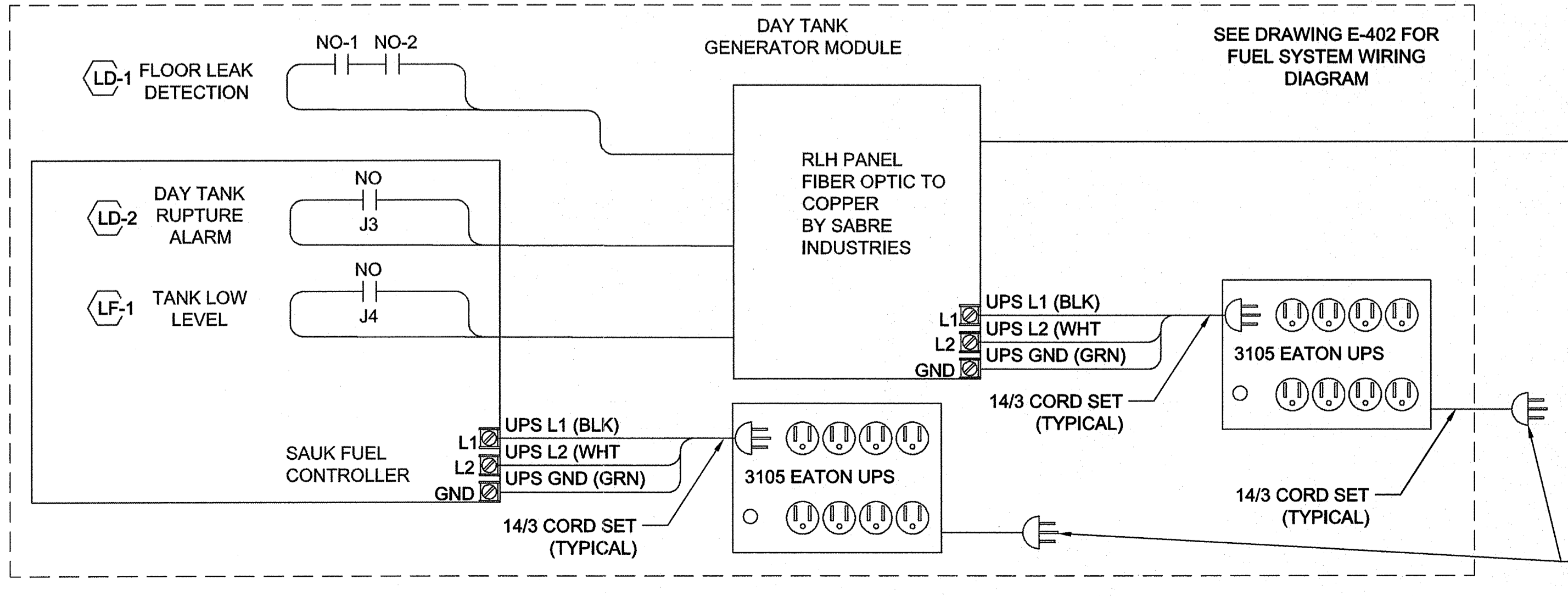
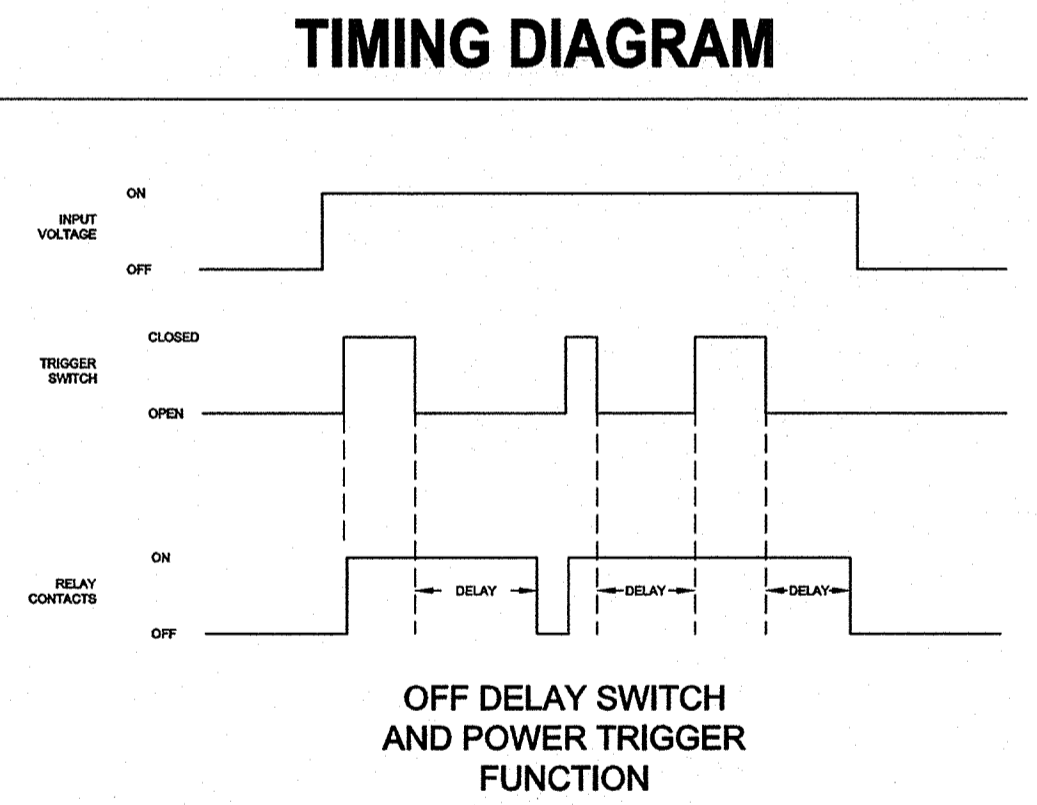
**FUEL SYSTEM / ALARM  
RELAY CONNECTION DIAGRAM**

**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.



**FUEL SYSTEM / ALARM  
RISER DIAGRAM**

**NOTES:**

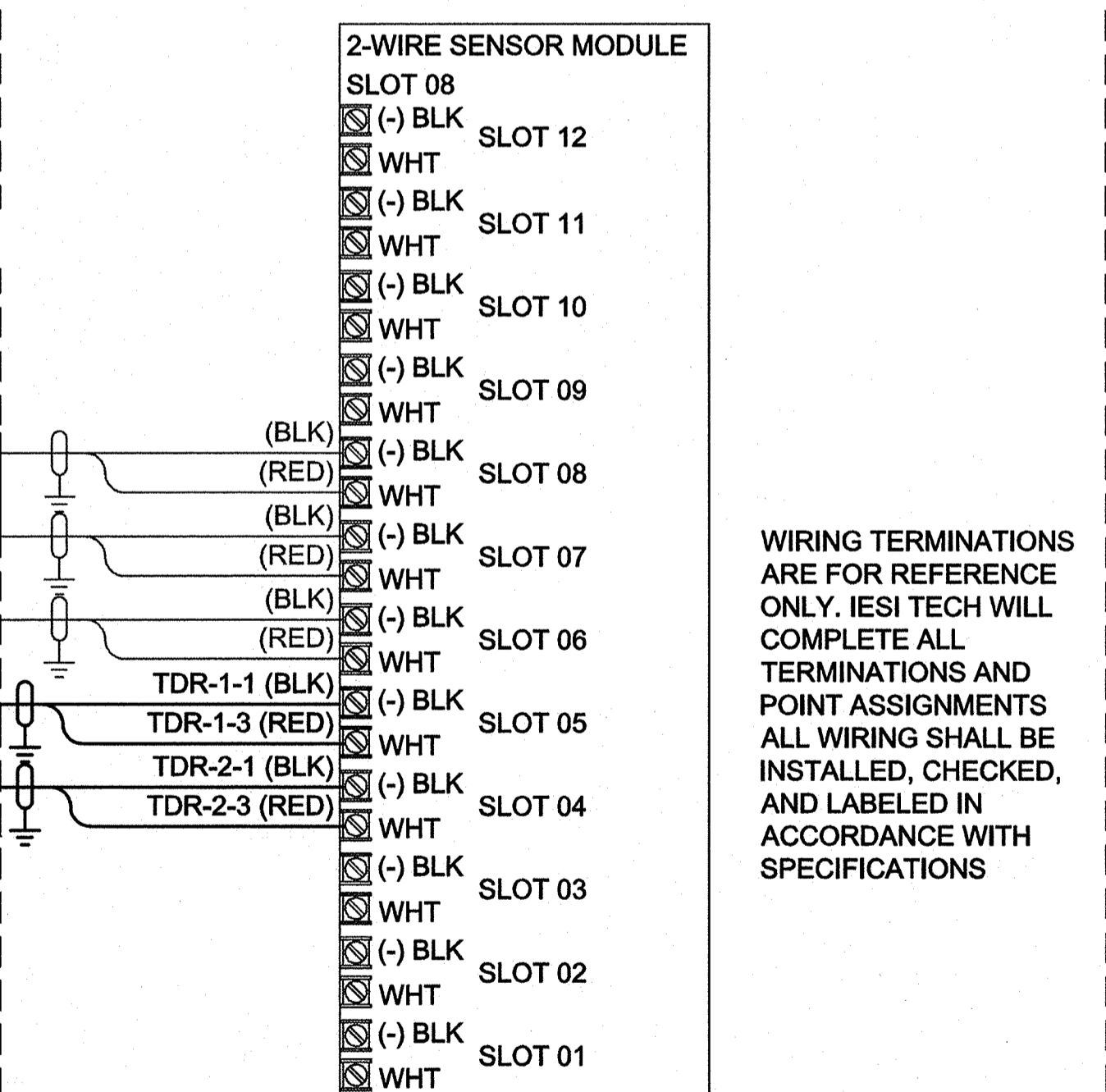
1. ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC NFPA 70) AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND ALL SPECIFICATIONS AND APPLICABLE CODES AND STANDARDS.
2. ALL INSTRUMENT / CONTROL CABLES SHALL BE INDIVIDUALLY SHIELDED DUE 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:**

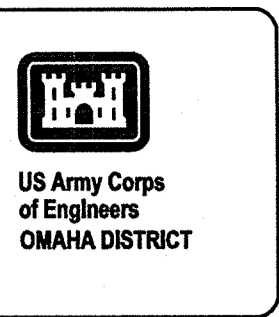
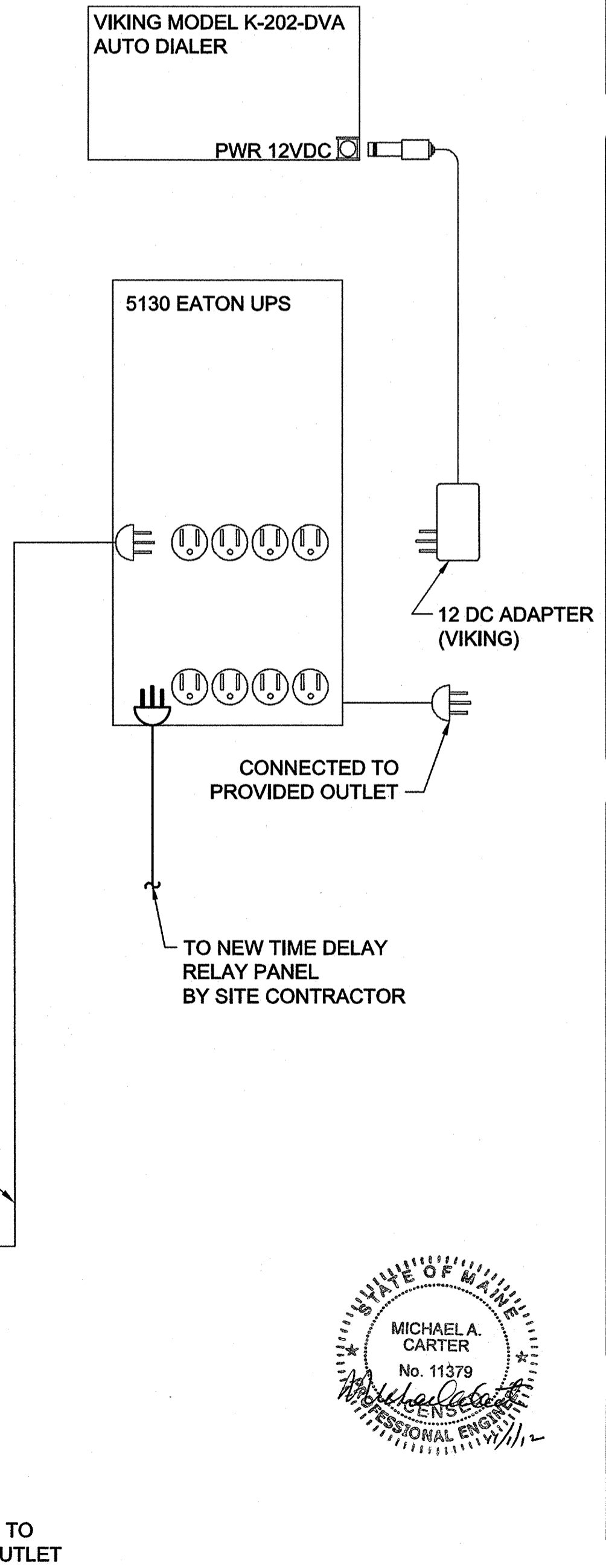
- \* DENOTES WIRE / CABLE ONLY WITHIN CONTROLLER / ENCLOSURE
- CABLE SHIELD TERMINATED TO GROUNDING POINT
- ⊥ CABLE SHIELD SHOWN CUT AND TAPED NOT TERMINATED
- INSTALLATION (BY SABRE INDUSTRIES)
- NEW INSTALLATION (BY SITE CONTRACTOR)

NEW CABLES ROUTED FROM RELAYS TO INCON TERMINALS SEE DRAWING E-402

**TRANSMITTER MODULE FUEL SYSTEM CONTROL PANEL FSCP-001  
PARTIAL CONNECTION DIAGRAM  
(SEE SUPPLIER DRAWING FOR COMPLETE WIRING CONNECTION)**



WIRING TERMINATIONS ARE FOR REFERENCE ONLY. IESI TECH WILL COMPLETE ALL TERMINATIONS AND POINT ASSIGNMENTS ALL WIRING SHALL BE INSTALLED, CHECKED, AND LABELED IN ACCORDANCE WITH SPECIFICATIONS

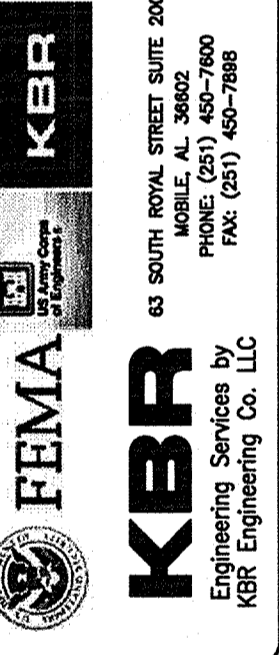


Project Manager	
QC Reviewer	
Architectural	
Mechanical	
Plumbing	
Electrical	
Mark	

Issued For Construction	11/1/12	Approved
Description		

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

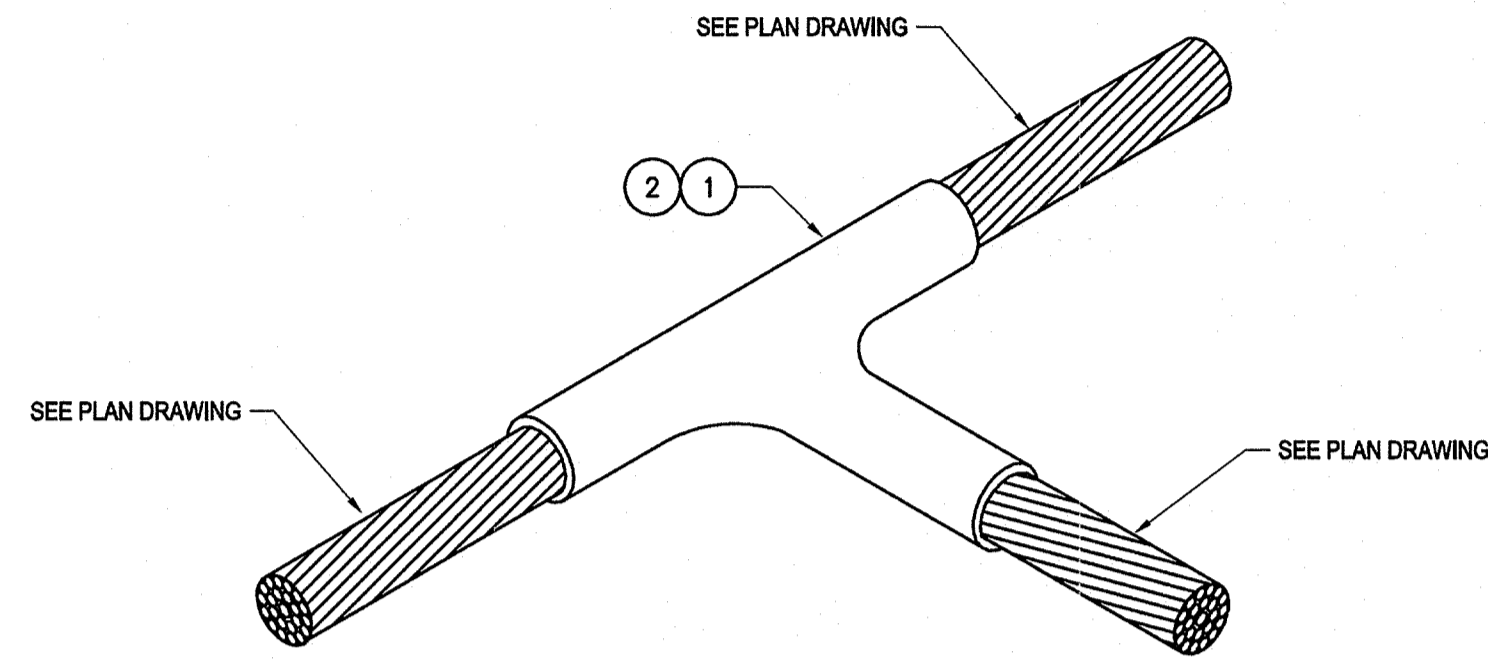
63 SOUTH ROYAL STREET SUITE 200 MOBILE, AL 36607 PHONE (251) 468-7888 FAX (251) 468-7888
---



**TRANSMITTER / GENERATOR  
UPS / TIME DELAY DIAGRAM**

Drawing Number:  
**E-404**

MATERIAL DESCRIPTION			
ITEM NO.	QTY.	UNIT	DESCRIPTION
1	1	EA	CABLE TO CABLE TAP, #4/0 TO #2/0, TAP CADWELD CAT. #TAC-202G
2	1	EA	WELD METAL CARTRIDGE #90
3	1	EA	CABLE TO CABLE TAP, #4/0 TO #2, TAP CADWELD CAT. #TAC-201V
4	1	EA	WELD METAL CARTRIDGE #90
5	1	EA	CABLE TO CABLE TAP, #4/0 TO #4/0, TAP CADWELD CAT. #TAC-202Q
6	1	EA	WELD METAL CARTRIDGE #150
7	1	EA	CABLE TO CABLE TAP, #2 TO #2, SPLICE CADWELD CAT. #SSC-2Q
8	1	EA	WELD METAL CARTRIDGE #90
9	1	EA	CABLE TO CABLE TAP, #4/0 TO #4/0, SPLICE CADWELD CAT. #TAC-202Q
10	1	EA	WELD METAL CARTRIDGE #90

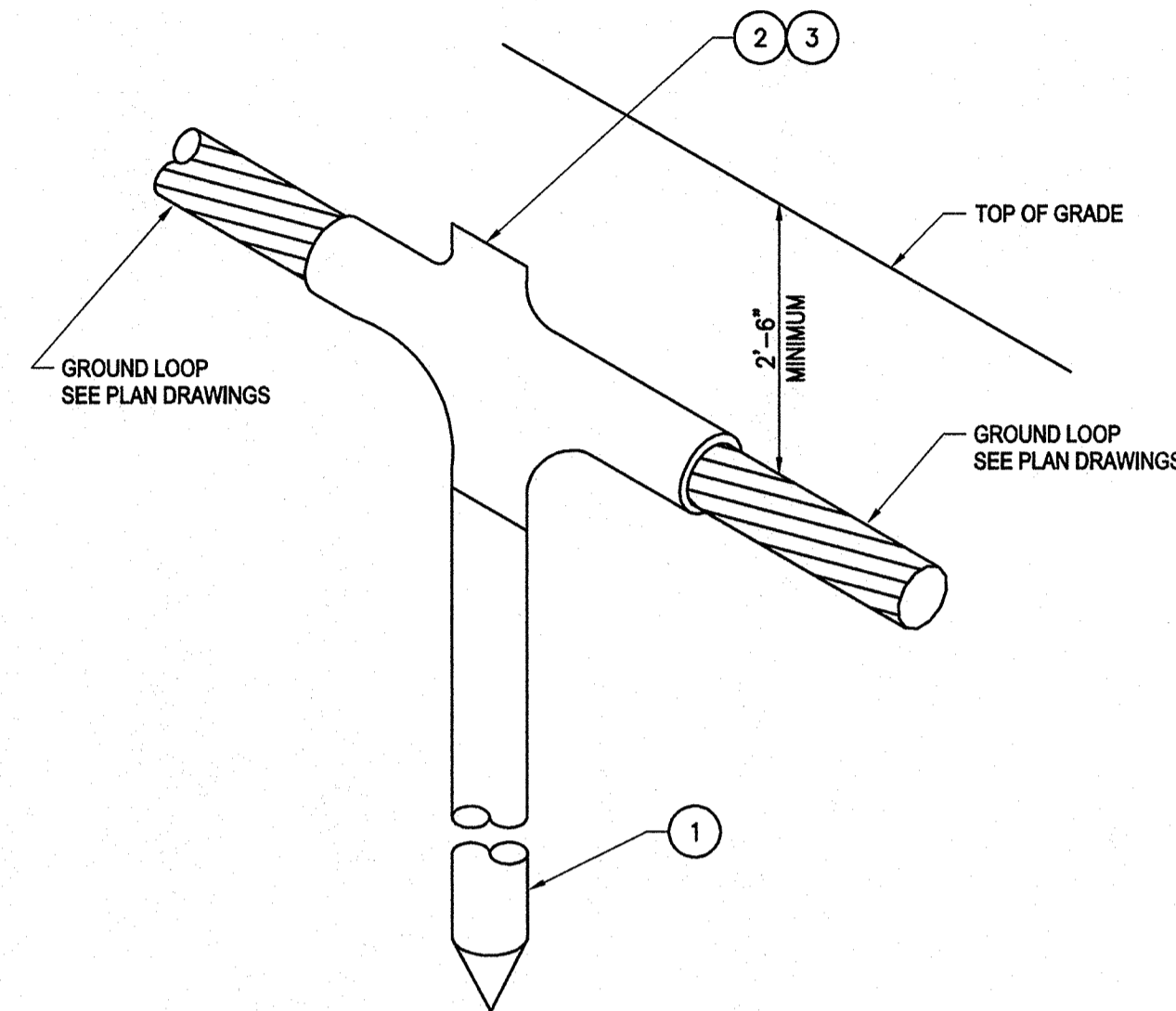


**1** GROUND CONNECTION - CABLE TO CABLE  
SCALE: NONE

MATERIAL DESCRIPTION			
ITEM NO.	QTY.	UNIT	DESCRIPTION
1	1	EA	3/4" COPPER CLAD GROUND ROD 10'-0" LONG BLACKBURN #75105
2	1	EA	#4/0 TO 3/4" GROUND ROD, THRU FEED, WELDED CADWELD CAT. #GTC-182Q
3	1	EA	WELD METAL CARTRIDGE #115 MODEL NO. #115
4	1	EA	GROUND ROD COUPLING BLACKBURN # 70C

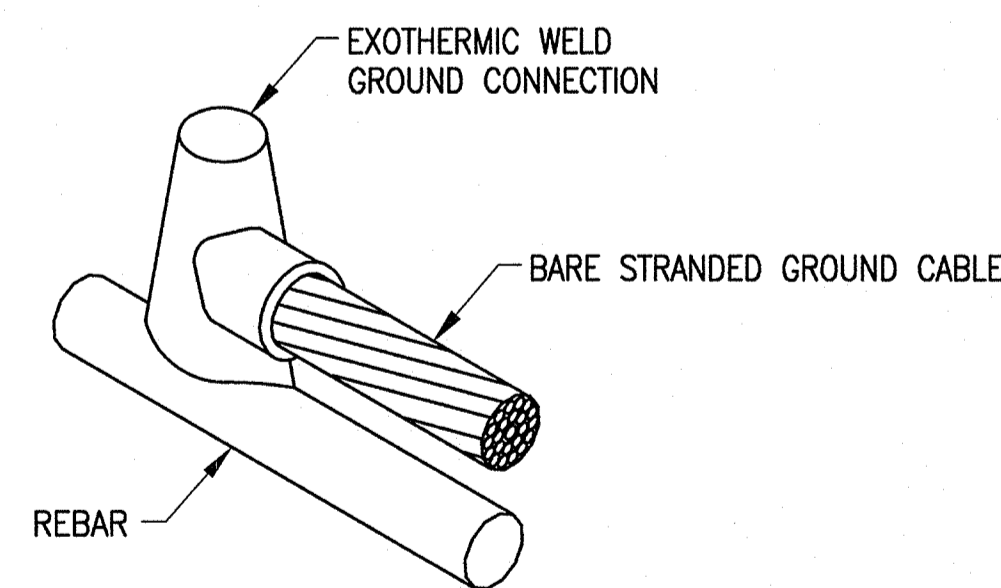
NOTE:

1. ALL MATERIALS CAN BE SUBSTITUTED WITH A CLIENT APPROVED EQUAL.



**2** GROUND CONNECTION - CABLE TO GROUND ROD  
SCALE: NONE

CADWELD MATERIAL DESCRIPTION				
REBAR TO BE WELDED TO	WELD SIZE	WELD PART NO.	WELD METAL	PACKING PART NO.
4	4	RRA-521L	32	B-143A
	2	RRA-521V	45	B-143A
	2/0	RRC-522G	90	B-141A
	4/0	RRC-522Q	115	B-141A
5	4	RRA-531L	32	B-143A
	2	RRA-531V	45	B-143A
	2/0	RRC-532G	90	B-141A
	4/0	RRC-532Q	115	B-141A
6	4	RRA-541L	32	B-143B
	2	RRA-541V	45	B-143B
	2/0	RRH-542G	90	B-144C
	4/0	RRH-542Q	115	B-144C
7	4	RRA-551L	32	B-143B
	2	RRA-551V	45	B-143B
	2/0	RRH-552G	90	B-144C
	4/0	RRH-552Q	115	B-144A
8	2	RRA-561V	45	B-143B
	2/0	RRH-562G	90	B-144C
	4/0	RRH-562Q	115	B-144A



NOTES:

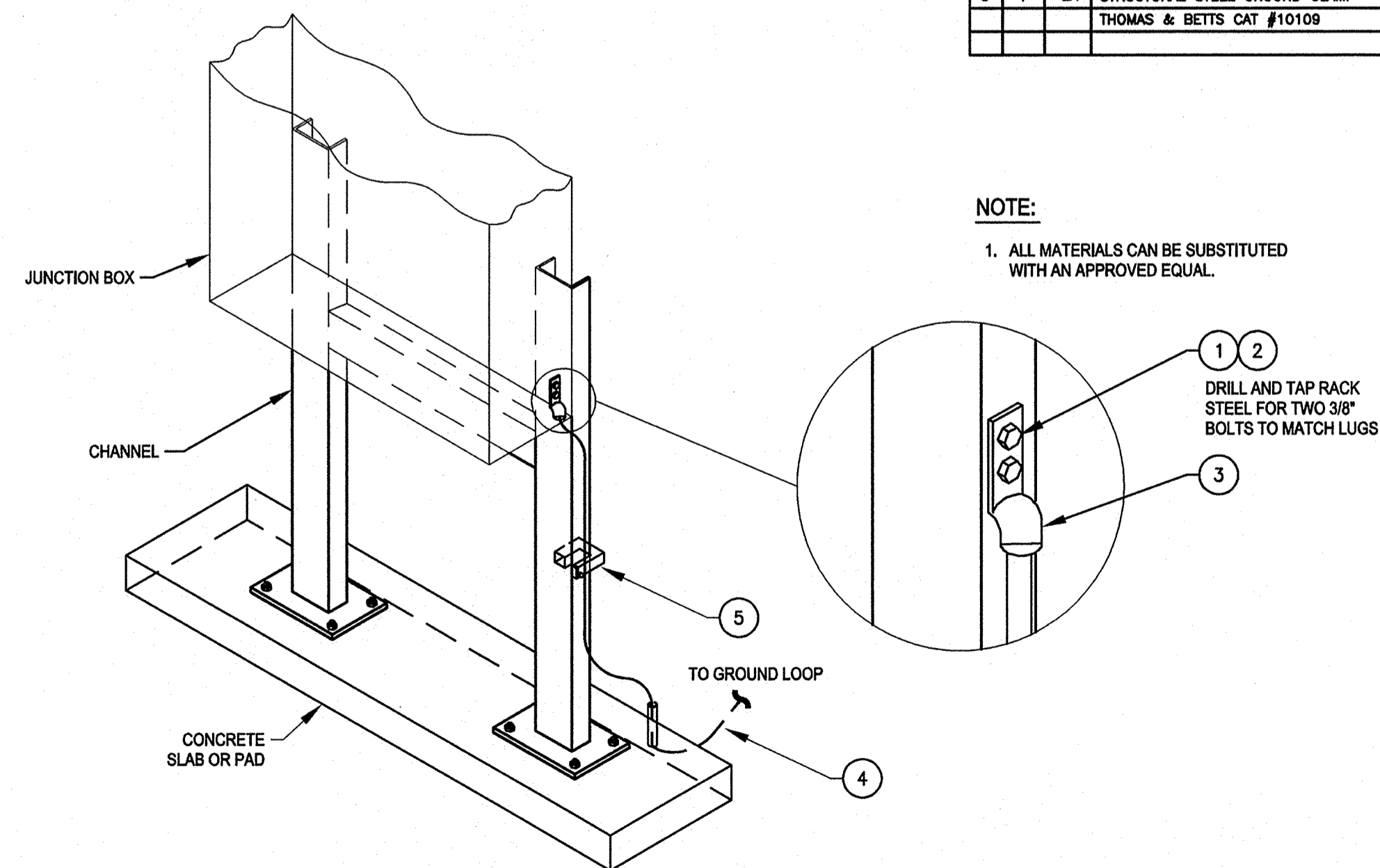
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.

**3** GROUND CONNECTION - CABLE TO REBAR  
SCALE: NONE

MATERIAL DESCRIPTION			
ITEM NO.	QTY.	UNIT	DESCRIPTION
1	2	EA	EVERDUR BOLT 3/8" x 1" LONG
2	2	EA	3/8" SHAKEPROOF OUTSIDE STAR LOCKWASHERS
3	1	EA	COMPRESSION LUG BURNDY TYPE CAT #YGH42C-2N
4	A/R	LF	#2 THIN GREEN COPPER GND. WIRE
5	1	EA	STRUCTURAL STEEL GROUND CLAMP THOMAS & BETTS CAT #10109

NOTE:

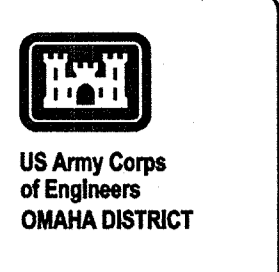
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.



**4** GROUND CABLE TO JUNCTION BOXES  
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.



Project Manager	
QC Reviewer	
Structural	
Mechanical	
Plumbing	
Electrical	
Civil	

0	Mark
11/1/12	Date
	App'd

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

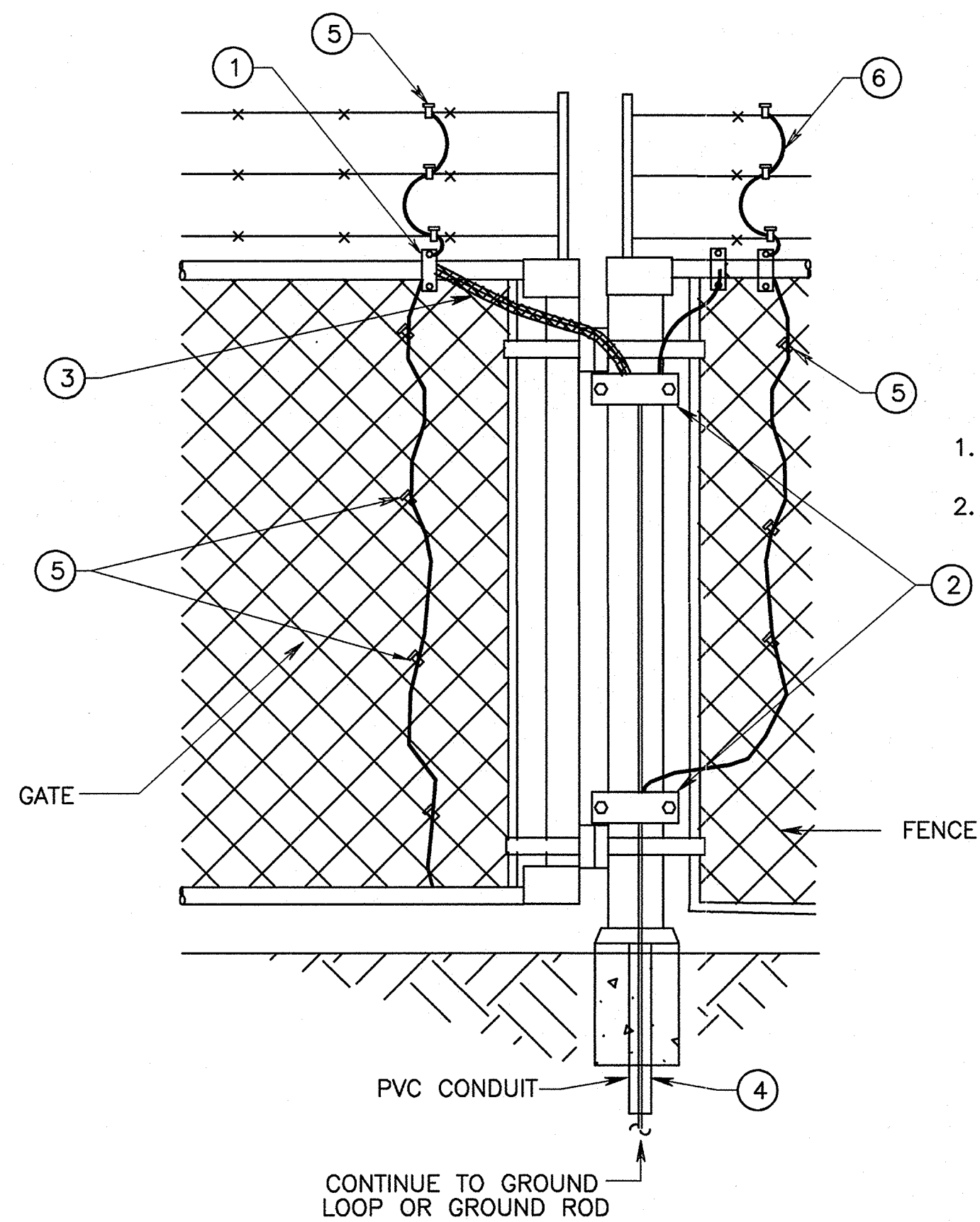
**FEMA**  
KBR  
63 SOUTH BOWAL STREET, SUITE 200  
MOBILE, AL 36602  
PHONE: (251) 457-7600  
FAX: (251) 457-7604

**KBR**  
Engineering Services by  
KBR Engineering Co., LLC

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

FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE  
**INSTALLATION  
DETAILS**

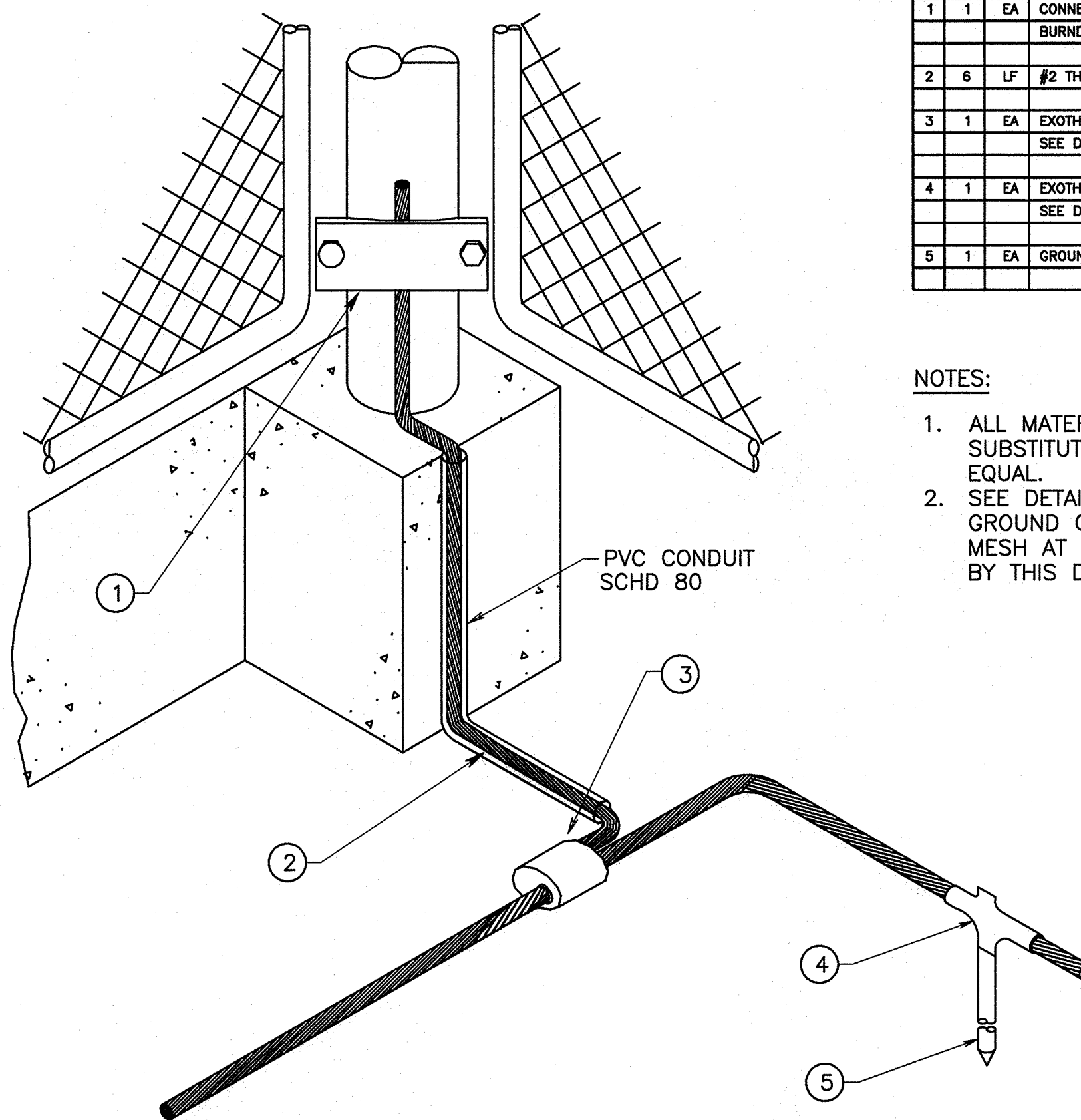
Drawing Number:  
**E-501**



ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION
1	1	EA	GROUND CONNECTOR SIZE TO FENCE TUBE O.D., BURNDY TYPE GD
2	2	EA	POST CLAMP SIZE TO POST O.D., BURNDY TYPE
3	1	EA	BURNDY TYPE BD18, COPPER BRAID JUMPER AT ALL GATES, INSTALL W/SKACK WHEN GATE IS FULLY CLOSED, 18" LONG
4	AR	LF	1" PVC CONDUIT, SCHD 80
5	AR	EA	SERVIT CONNECTOR (SPLIT BOLT)
6	AR	LF	WIRE, #2 AWG STRANDED COPPER BARE

- NOTES:
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.
  2. ALL WIRE & CONNECTIONS SHALL BE PAINTED WITH A GALVANIZE PAINT FOR CONCEALMENT

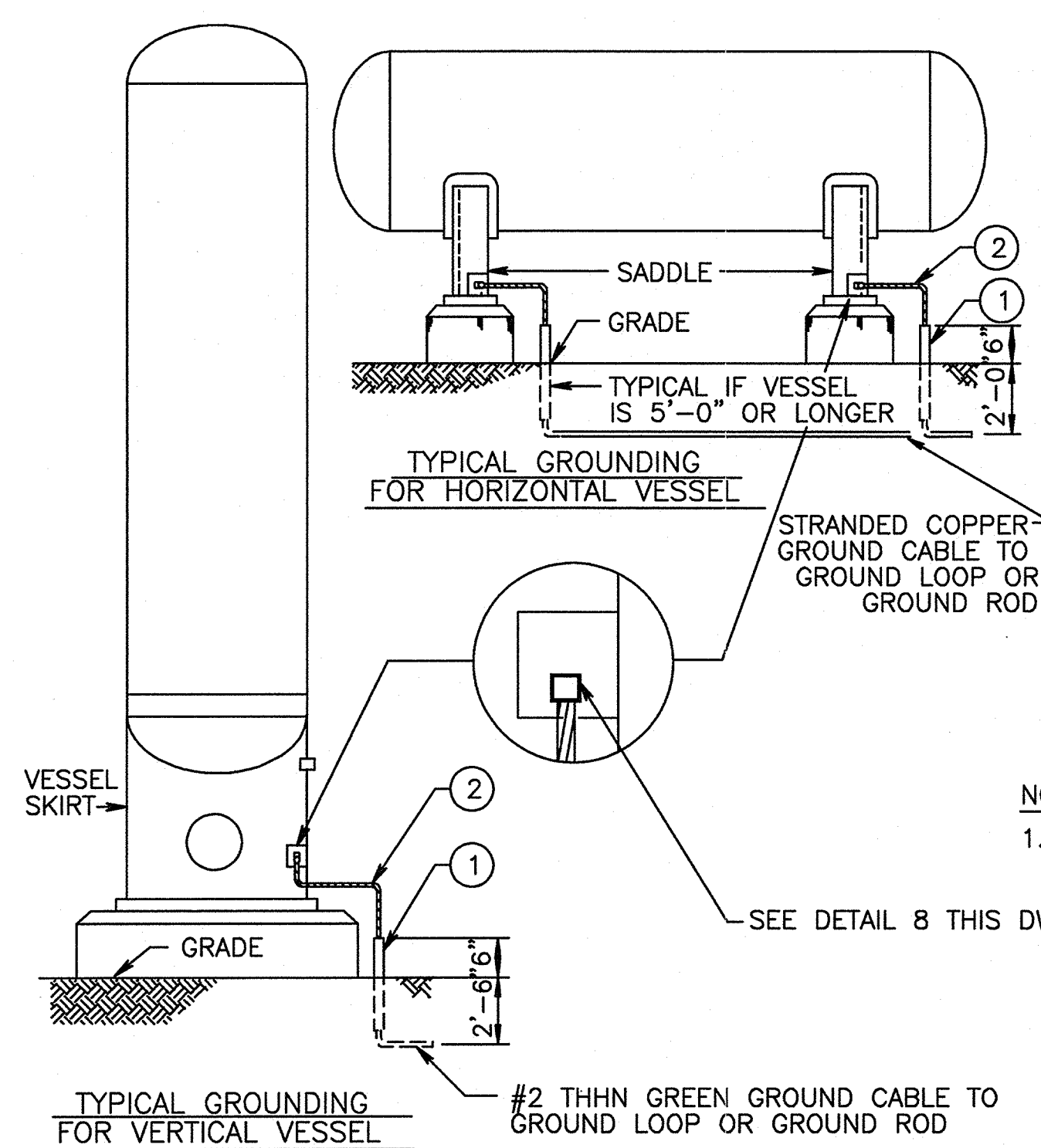
**5** GROUND CABLE TO GATE POST  
SCALE: NONE



ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION
1	1	EA	CONNECTOR-SIZE TO FIT FENCE POST O.D., BURNDY TYPE GD
2	6	LF	#2 THIN GREEN COPPER GND. WIRE
3	1	EA	EXOTHERMIC CONNECTION, SEE DETAIL 1
4	1	EA	EXOTHERMIC CONNECTION, SEE DETAIL 2
5	1	EA	GROUND ROD, COPPERWELD 10'-0" LONG

- NOTES:
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.
  2. SEE DETAIL 5 FOR WOVEN GROUND CONDUCTOR IN FENCING MESH AT LOCATIONS INDICATED BY THIS DETAIL

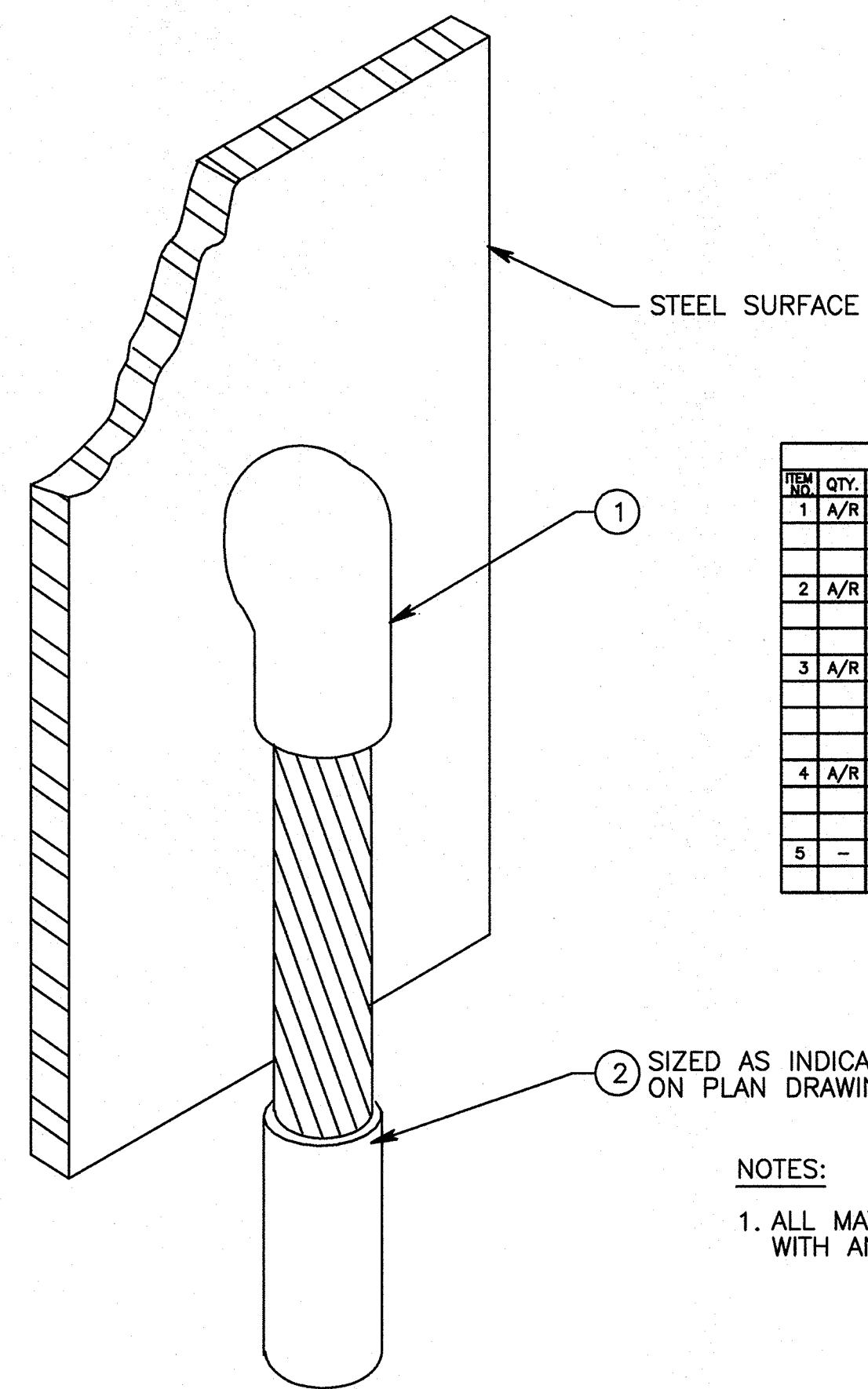
**6** GROUNDING FENCE POST  
SCALE: NONE



ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION
1	-	LF	1" PVC CONDUIT, SCHD 80
2	-	LF	#2 THIN STRANDED COPPER GROUND CABLE

- NOTE:
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.

**7** TYPICAL VESSEL GROUND FROM BELOW  
SCALE: NONE



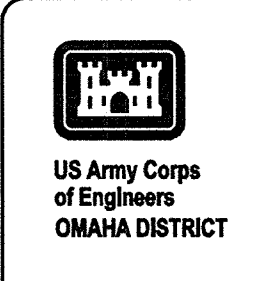
ITEM NO.	QTY.	UNIT	MATERIAL DESCRIPTION
1	A/R	EA	#2 AWG - CADWELD # VBC-1V WELD METAL # 65
2	A/R	EA	#1/0 AWG - CADWELD # VBC-2C WELD METAL 115
3	A/R	EA	#2/0 AWG - CADWELD # VBC-2G WELD METAL 115
4	A/R	EA	#4/0 AWG - CADWELD # VSB-2G WELD METAL 150
5	-	LF	THIN INSULATED GREEN GROUND WIRE

- NOTES:
1. ALL MATERIALS CAN BE SUBSTITUTED WITH AN APPROVED EQUAL.

**8** MISC. EQUIPMENT GROUND  
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.



Project Manager	
DC Designer	
Structural	
Mechanical	
Plumbing	
Electrical	
Other	

ISSUED FOR CONSTRUCTION	11/7/12	Date	Agreed
Mark			

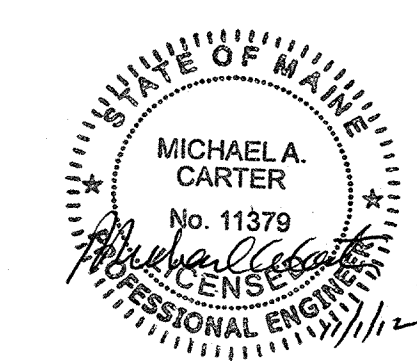
Designed by	SDJ
Drawn by	SDJ
Checked by	TCG
Reviewed by	MAC
Date	2012

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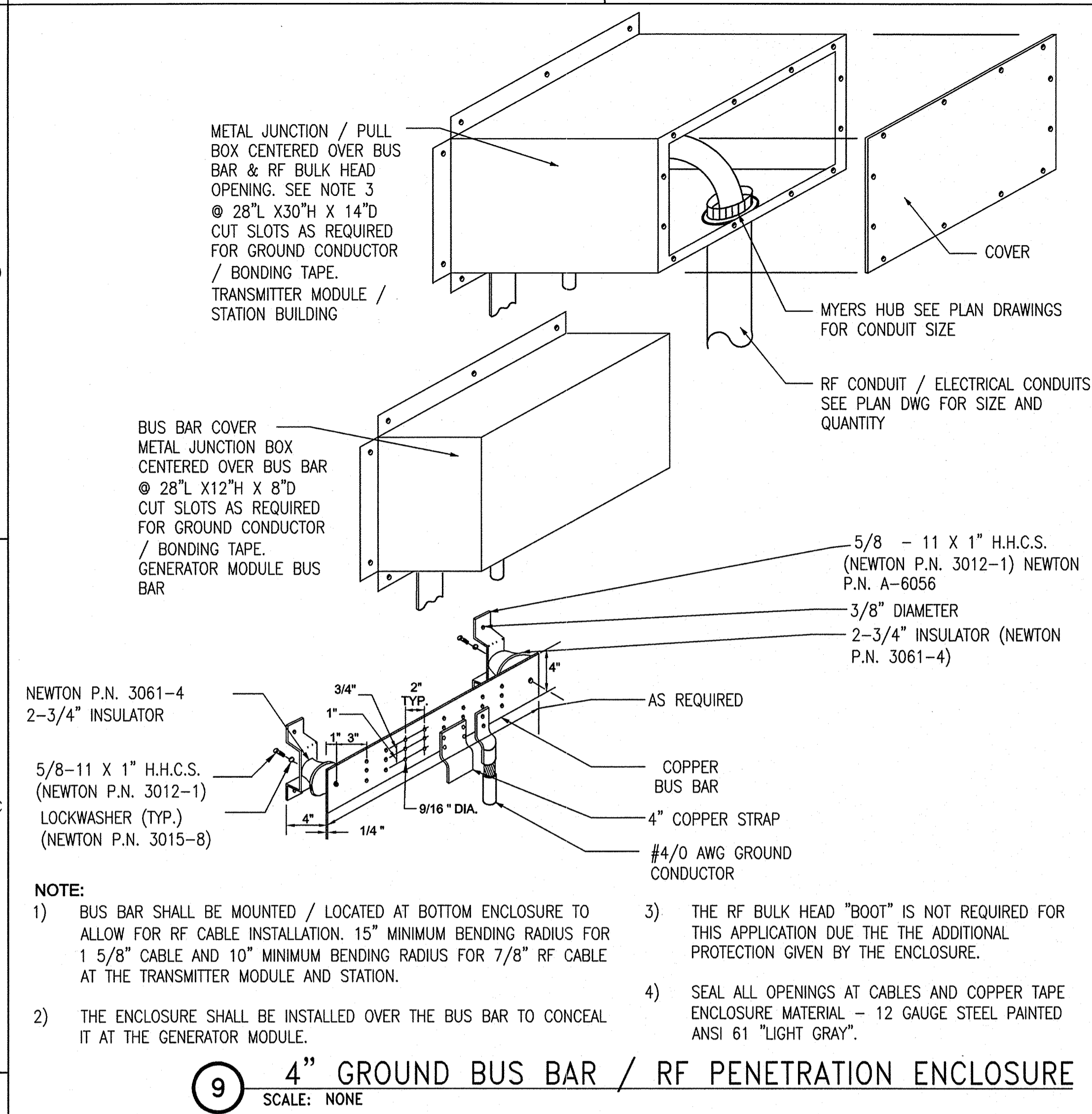
**FEMA**  
Engineering Services by  
KBR Engineering Co., LLC

FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE

**INSTALLATION  
DETAILS**

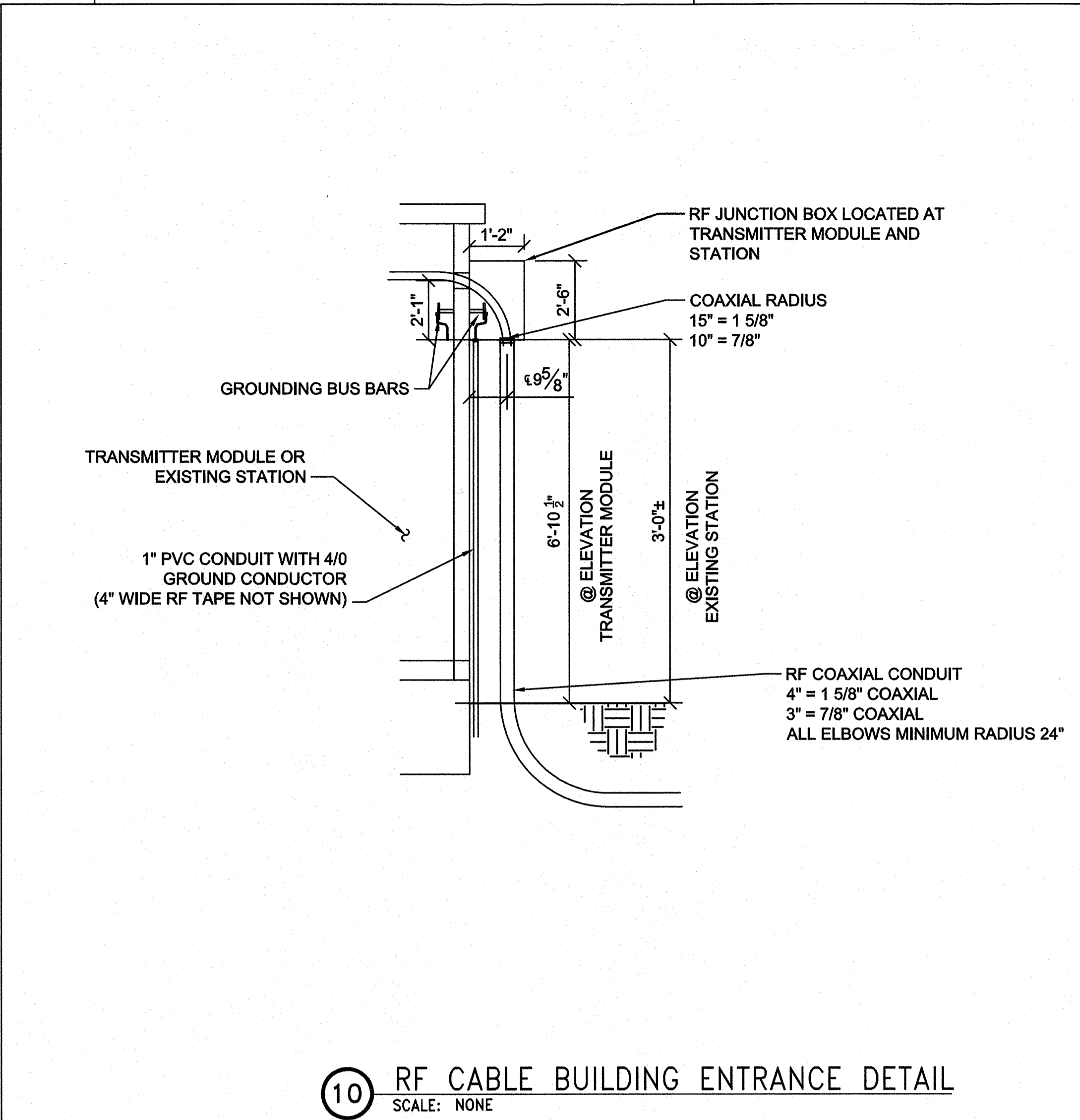


Drawing Number:  
**E-502**

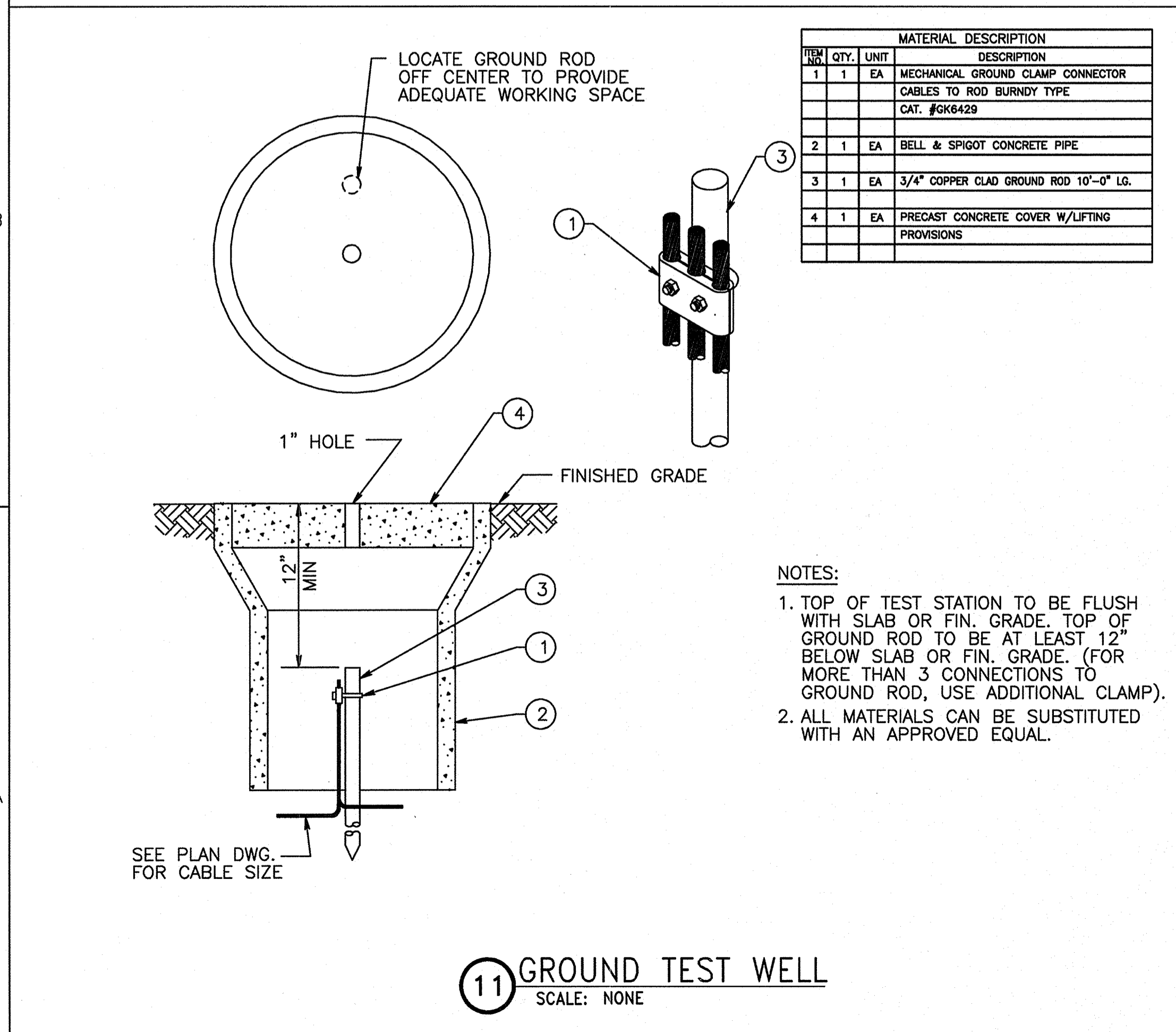


- NOTE:**
- BUS BAR SHALL BE MOUNTED / LOCATED AT BOTTOM ENCLOSURE TO ALLOW FOR RF CABLE INSTALLATION. 15" MINIMUM BENDING RADIUS FOR 1 5/8" CABLE AND 10" MINIMUM BENDING RADIUS FOR 7/8" RF CABLE AT THE TRANSMITTER MODULE AND STATION.
  - THE ENCLOSURE SHALL BE INSTALLED OVER THE BUS BAR TO CONCEAL IT AT THE GENERATOR MODULE.
  - THE RF BULK HEAD "BOOT" IS NOT REQUIRED FOR THIS APPLICATION DUE THE THE ADDITIONAL PROTECTION GIVEN BY THE ENCLOSURE.
  - SEAL ALL OPENINGS AT CABLES AND COPPER TAPE ENCLOSURE MATERIAL - 12 GAUGE STEEL PAINTED ANSI 61 "LIGHT GRAY".

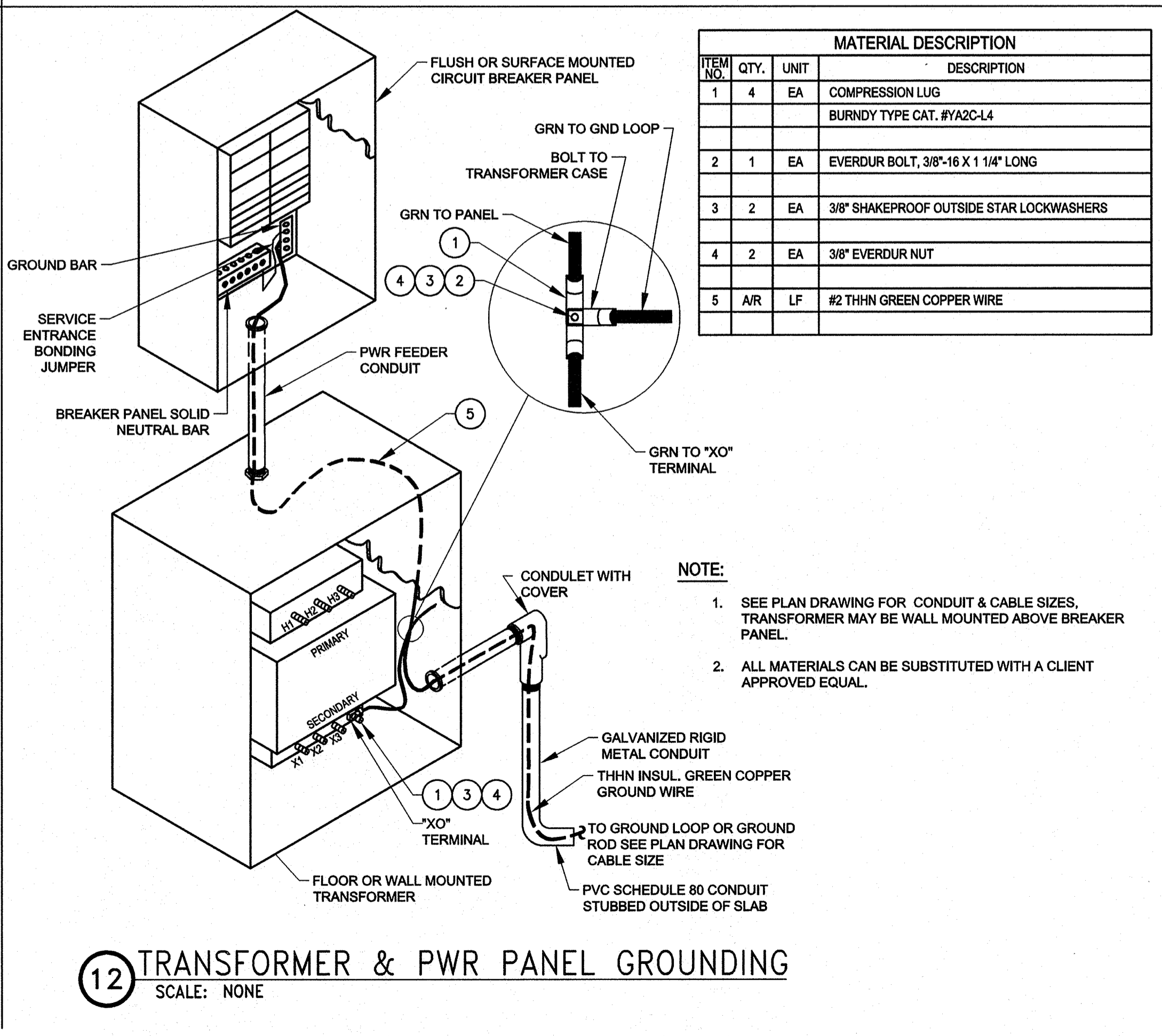
**9 4" GROUND BUS BAR / RF PENETRATION ENCLOSURE**  
SCALE: NONE



**10 RF CABLE BUILDING ENTRANCE DETAIL**  
SCALE: NONE



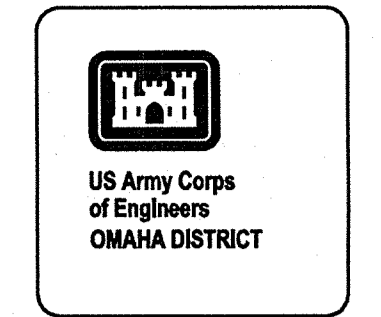
**11 GROUND TEST WELL**  
SCALE: NONE



**12 TRANSFORMER & PWR PANEL GROUNDING**  
SCALE: NONE

**NOTES:**

- 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.



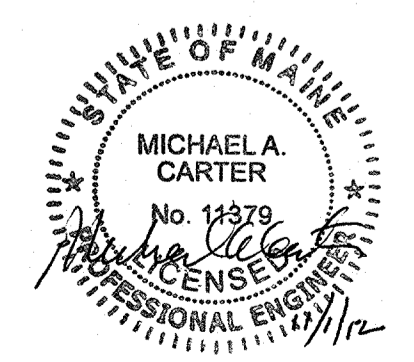
PROJECT MANAGER	
DC REVIEWER	
ARCHITECTURAL	
MECHANICAL	
PLUMBING	
ELECTRICAL	
MARK	

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Description		Date	Mark

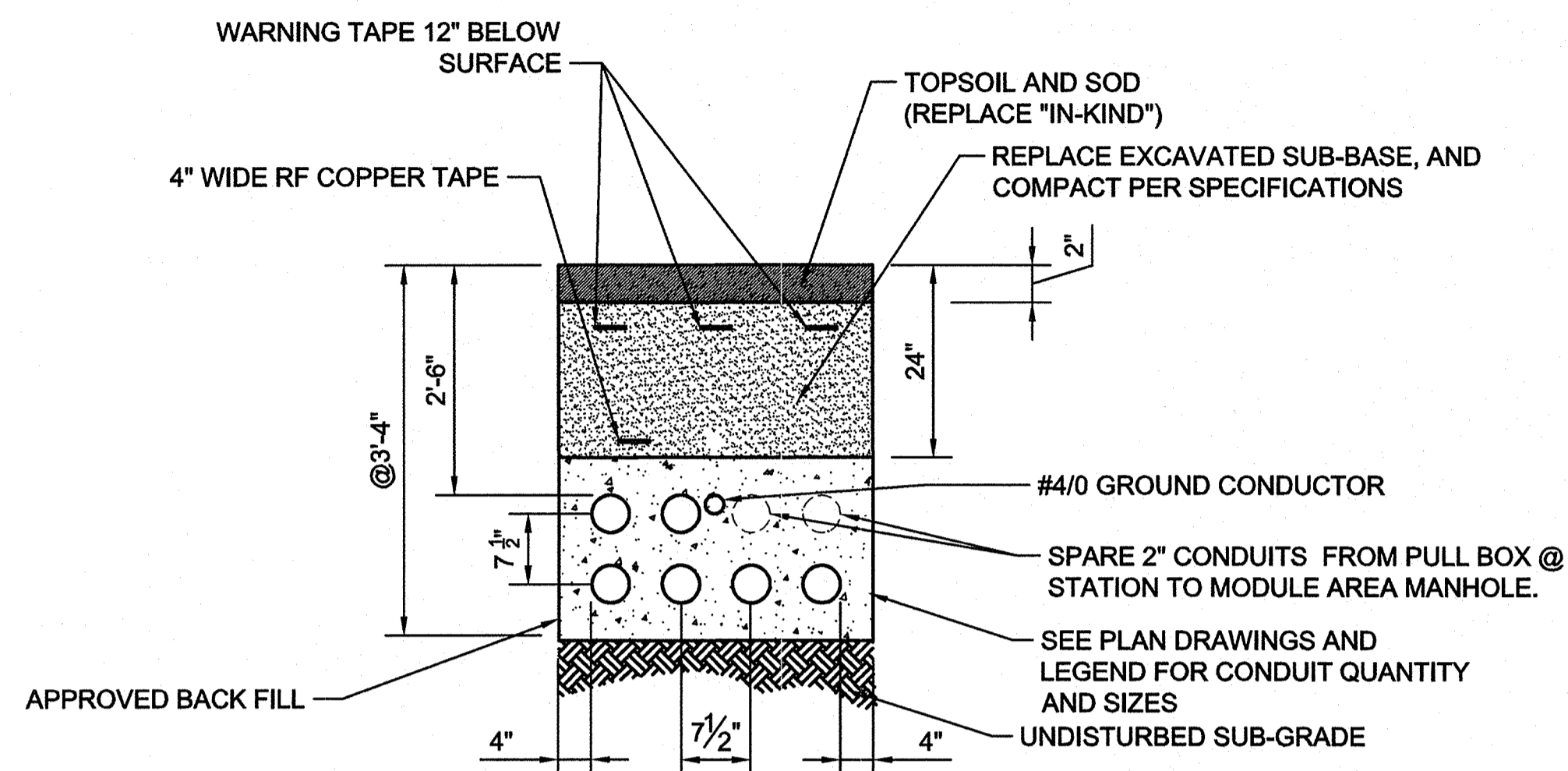
Designed by	SDJ	Checked by	TCG
Drawn by	SDJ	Reviewed by	TCG
Date:	2012		

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

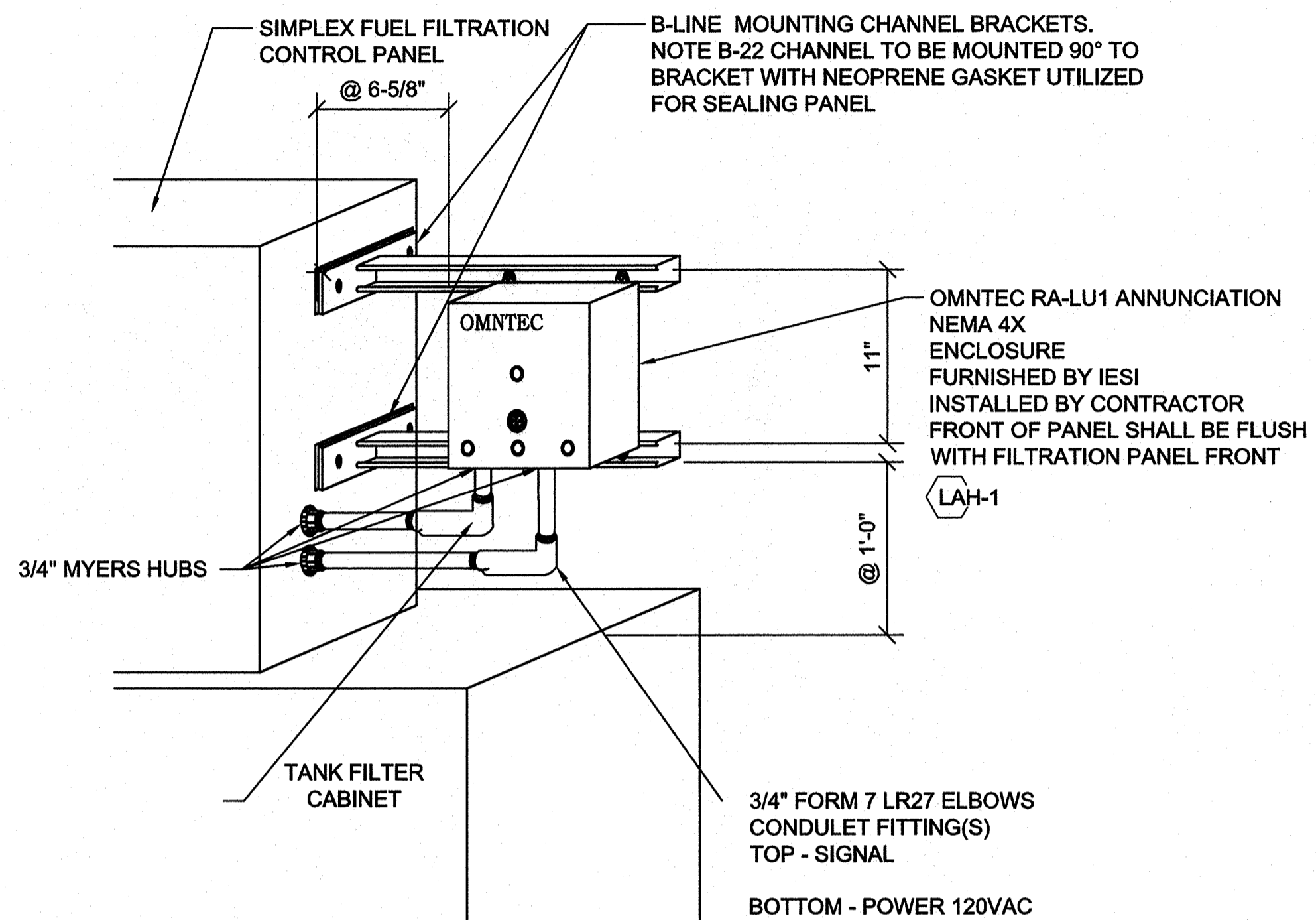
FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE  
**INSTALLATION  
DETAILS**



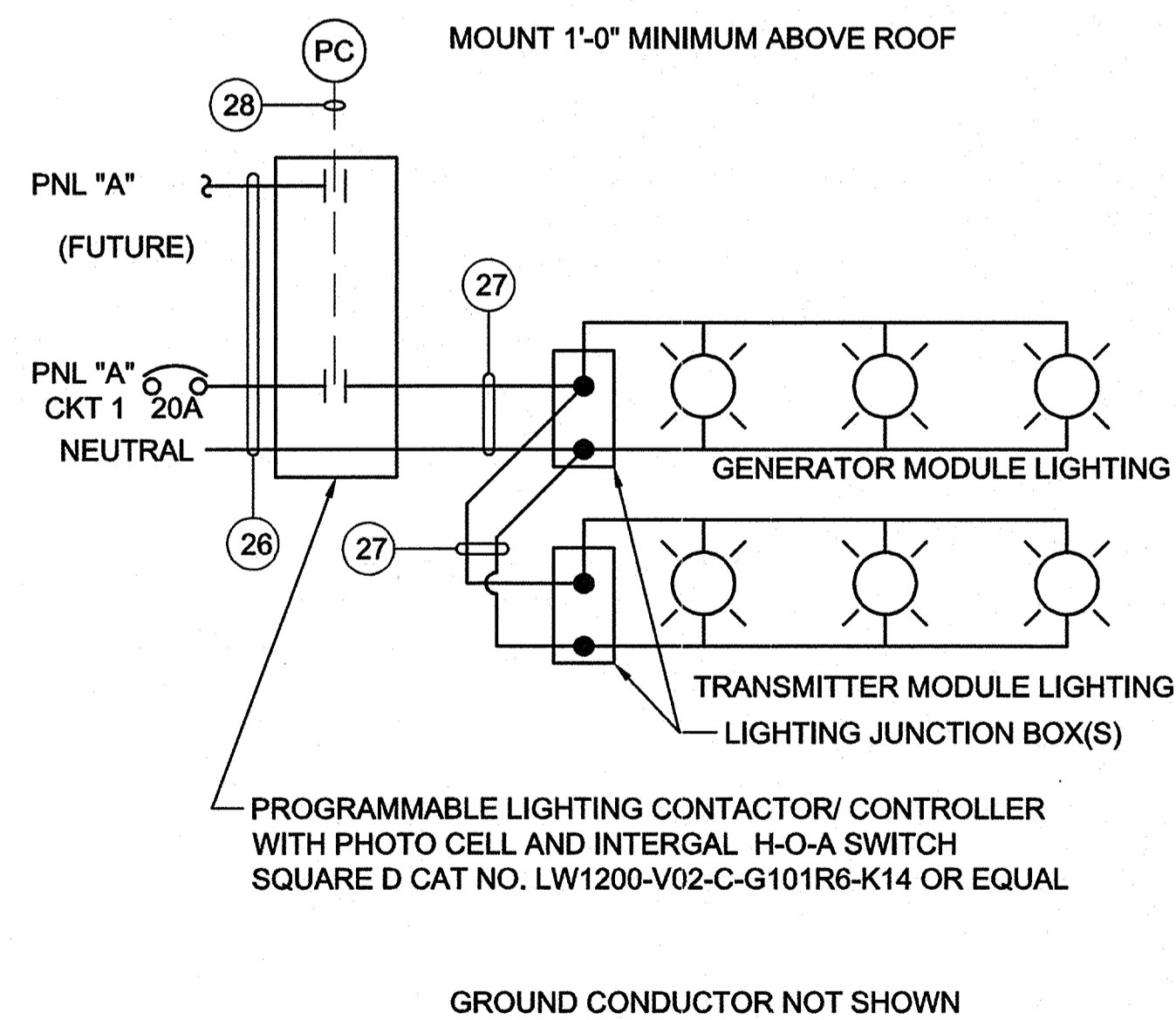
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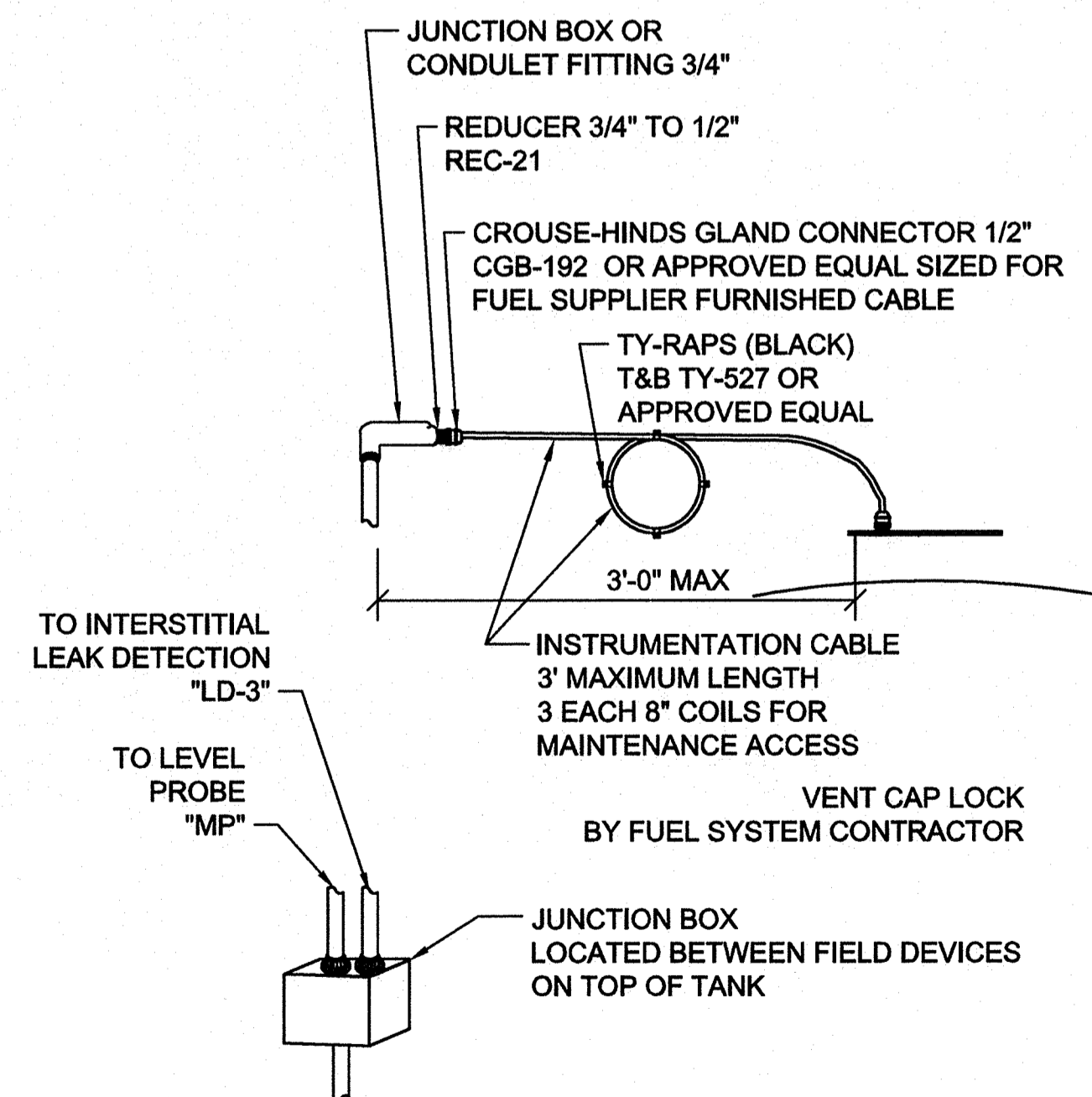
13 TYPICAL ELECTRICAL DUCT SECTION  
SCALE: NONE



14 LOCAL ANNUNCIATOR MOUNTING  
SCALE: NONE



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.



Project Manager	
DC Designer	
Structural	
Mechanical	
Electrical	
Mark	

ISSUED FOR CONSTRUCTION	11/7/12	Mark
Description	Date	Mark

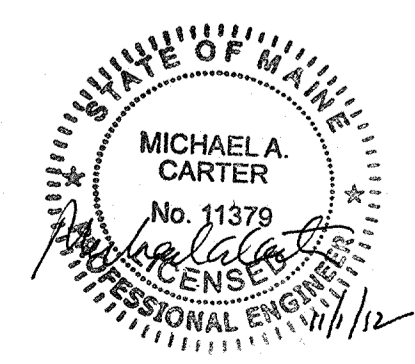
Designed by	SDJ
Checked by	TCG
Drawn by	SDJ
Reviewed by	MAC
Date	2012

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

FEMA EMERGENCY RADIO NETWORK  
ON WIGAN PORTLAND, MAINE

**INSTALLATION  
DETAILS**



Drawing Number:  
**E-504**