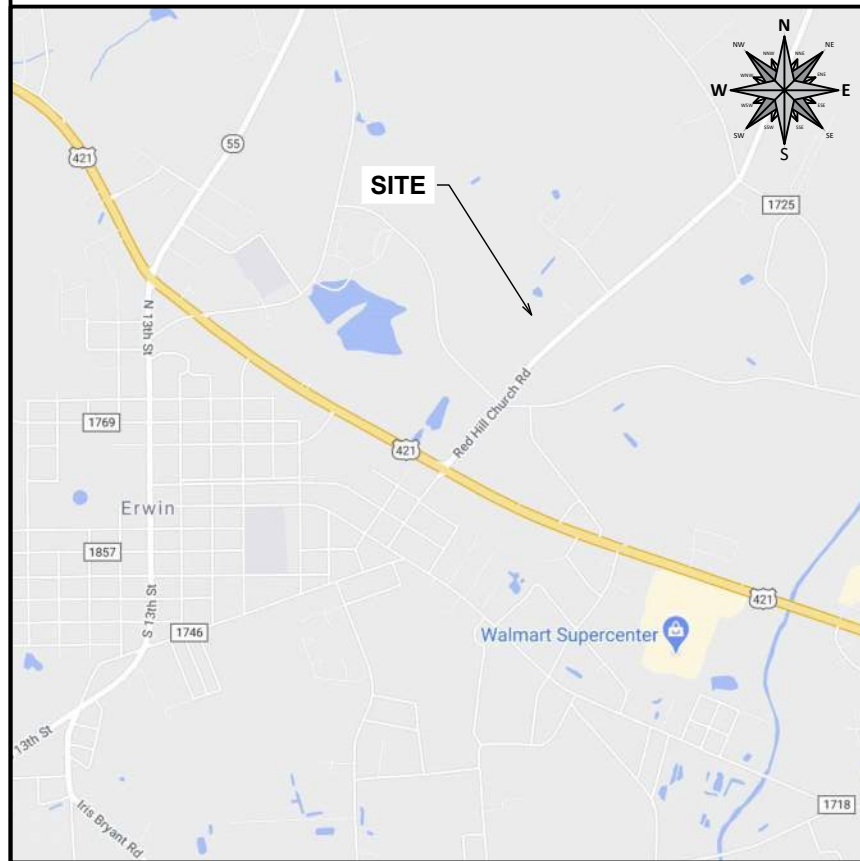


**REGIONAL MAP**



**GENERAL NOTES**

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE HANDICAP ACCESS IS NOT REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

**SCOPE OF WORK**

PROPOSED SCOPE OF WORK INCLUDES INSTALLATION OF A NEW 65'X55' COMPOUND WITH A NEW 300' SELF SUPPORT TOWER, NEW 13'X25' PREFABRICATED SHELTER, A NEW GENERATOR AND A NEW FUEL TANK.

**CODE COMPLIANCE**

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE FOLLOWING CODES:

- 2018 N.C BUILDING CODE (2015 IBC WITH N.C. AMENDMENTS)
- 2018 N.C FIRE CODE (2015 IFC WITH N.C. AMENDMENTS)
- 2018 N.C FUEL GAS CODE (2015 IFGC WITH N.C. AMENDMENTS)
- 2018 N.C MECHANICAL CODE (2015 IMC WITH N.C. AMENDMENTS)
- 2018 INTERNATIONAL PLUMBING CODE (2015 IPC WITH N.C. AMENDMENTS)
- 2018 INTERNATIONAL EXISTING BUILDING CODE (2015 IEBC WITH N.C. AMENDMENTS)
- 2017 N.C ELECTRICAL CODE (2017 NEC)



**SITE NAME:**  
ERWIN RADIO BLDG  
**SITE NUMBER:**  
NCDUN017  
**SITE ADDRESS:**  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334  
**LATITUDE & LONGITUDE:**  
N 35° 20' 06.22", W 78° 39' 20.77"

**INDEX OF SHEETS**

SHEET #'S	SHEET TITLES
T-1	TITLE PAGE
1 OF 1	SURVEY
GN-1 : GN-3	GENERAL NOTES SHEETS
GN-4 : GN-7	NC APPENDIX B SHEETS
C-1.0	OVERALL SITE PLAN
C-1.1	TEMPORARY SITE PLAN
C-1.2	FINAL SITE PLAN
C-1.3	DETAILED SITE PLAN
C-1.4	DIMENSIONED SITE PLAN
C-2	TOWER ELEVATION
C-3.1	ANTENNA SCHEDULE
C-3.2	TRANSMISSION LINE SCHEDULE
C-3.3	ANTENNA LAYOUTS
C-3.4	ANTENNA LAYOUTS
C-4.1	SHELTER DETAILS
C-4.2	SHELTER FOUNDATION DETAILS
C-4.3	GENERATOR DETAILS
C-4.4	PROPANE TANK DETAILS
C-4.5	ICE BRIDGE DETAILS
C-4.6	FENCE DETAILS
E-1	ELECTRICAL NOTES
E-2	SHELTER PANEL SCHEDULE
E-3	ELECTRICAL PLAN
E-4	ONE-LINE DIAGRAM
E-5	ALARM WIRING DETAILS
E-6	FIBER ROUTING PLAN
G-1	GROUNDING PLANS
G-2	GROUNDING DETAILS I
G-3	GROUNDING DETAILS II
G-4	GROUNDING DETAILS III

**SITE PHOTO**



**SITE SUMMARY**

SITE TYPE:	NEW CONSTRUCTION
STRUCTURE TYPE:	SELF SUPPORT
STRUCTURE OWNER:	DUKE ENERGY
ANTENNA SITE REG. NO.:	1310171
STRUCTURE HEIGHT (AGL):	308' ±
OCCUPANCY TYPE:	UTILITY & MISCELLANEOUS (U)
STRUCTURE LATITUDE:	N 35° 20' 06.22" (35.335061)
STRUCTURE LONGITUDE:	W 78° 39' 20.77" (-78.655769)
JURISDICTION:	HARNETT COUNTY
COUNTY:	HARNETT
PARCEL ID:	021507 9002
GROUND ELEV. (AMSL):	204'
POWER PROVIDER:	DUKE ENERGY
TELCO PROVIDER	TBD

PREPARED BY:

PREPARED FOR:

**SITE NAME:**  
ERWIN RADIO BLDG  
**SITE NUMBER:**  
NCDUN017  
**SITE ADDRESS:**  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334  
**LATITUDE/LONGITUDE:**  
35.335061, -78.655769

SEAL: FIRM #: P-1016

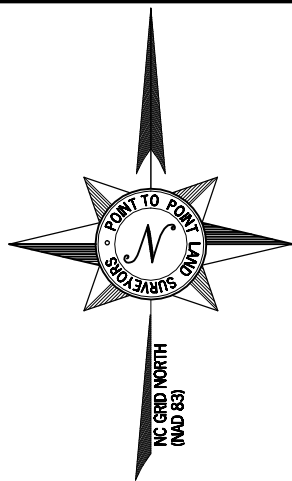
REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA CHECKED BY: AD

SHEET TITLE:

**TITLE PAGE**

SHEET # **T-1** CURRENT REV #: 1  
ETS #: 204581.AE.02



**PARENT PARCEL**

OWNER: CAROLINA POWER AND LIGHT COMPANY (PER TAX ASSESSOR)  
 SITE ADDRESS: 465 RED HILL CHURCH RD, DUNN, NC 28334  
 PARCEL ID: 021507 9002  
 AREA: 38.63 ACRES (PER TAX ASSESSOR)  
 ZONED: M1 - INDUSTRIAL  
 ALL ZONING INFORMATION SHOULD BE VERIFIED WITH THE PROPER ZONING OFFICIALS

**GPS NOTES**

THE FOLLOWING GPS STATISTICS UPON WHICH THIS SURVEY IS BASED HAVE BEEN PRODUCED AT THE 95% CONFIDENCE LEVEL:  
 POSITIONAL ACCURACY: 0.00 FEET (HORZ) 0.20 FEET (VERT)  
 TYPE OF EQUIPMENT: GEOMAX ZENITH35 PRO BASE AND ROVER, DUAL FREQUENCY  
 TYPE OF GPS FIELD PROCEDURE: ONLINE POSITION USER INTERFACE  
 DATES OF SURVEY: 10/30/2020  
 DATUM / EPOCH: NAD\_83(2011)EPOCH:2010.0000  
 PUBLISHED / FIXED CONTROL USE: N/A  
 GEOID MODEL: 18  
 COMBINED GRID FACTOR(S): 0.99986935  
 CONVERGENCE ANGLE: 0.19912500"  
 BENCHMARKS USED: DR4334, DK5550, AM7024

**SITE INFORMATION**

LATITUDE = 35°20'06.32" (NAD 83) (35.335089°)  
 LONGITUDE = -78°39'20.74" (NAD 83) (-78.655761°)  
 AT CENTER PROPOSED TOWER  
 ELEVATION AT CENTER OF PROPOSED TOWER = 204.6' A.M.S.L.



**VICINITY MAP**  
 NOT TO SCALE

**GENERAL NOTES**

\* THIS SPECIFIC PURPOSE SURVEY WAS PREPARED FOR THE EXCLUSIVE USE OF ENGINEERED TOWER SOLUTIONS, PLLC. BOUNDARY INFORMATION SHOWN HEREON HAS BEEN COMPILED FROM TAX MAPS AND DEED DESCRIPTIONS ONLY. NO BOUNDARY SURVEY OF THE PARENT PARCEL WAS PERFORMED.

THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY.

THIS SPECIFIC PURPOSE SURVEY WAS PREPARED WITHOUT BENEFIT OF A TITLE REPORT WHICH MAY REVEAL ADDITIONAL CONVEYANCES, EASEMENTS, OR RIGHTS-OF-WAY NOT SHOWN HEREON.

EQUIPMENT USED FOR ANGULAR & LINEAR MEASUREMENTS: LEICA TPS 1200 ROBOTIC & GEOMAX ZENITH 35. (DATE OF LAST FIELD VISIT: 10/30/2020)

THE 1' CONTOURS AND SPOT ELEVATIONS SHOWN ON THIS SPECIFIC PURPOSE SURVEY ARE ADJUSTED TO NAVD 88 DATUM (COMPUTED USING GEOID18) AND HAVE A VERTICAL ACCURACY OF ± 0.5'. CONTOURS OUTSIDE THE IMMEDIATE SITE AREA ARE APPROXIMATE.

BEARINGS SHOWN ON THIS SPECIFIC PURPOSE SURVEY ARE BASED ON NC GRID NORTH (NAD 83) NORTH CAROLINA ZONE.

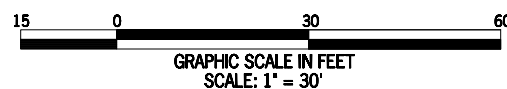
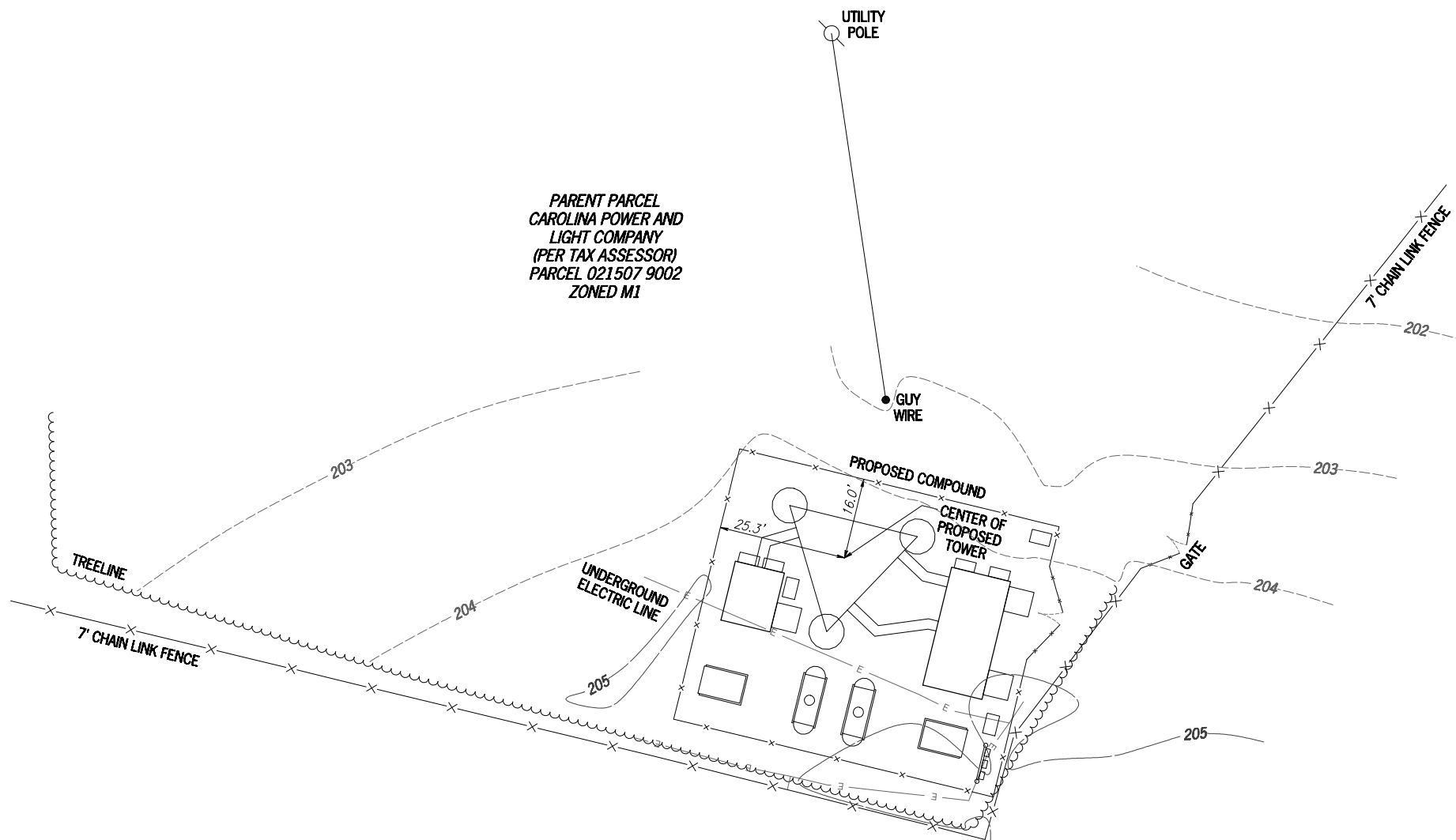
PER THE FEMA FLOODPLAIN MAPS, THE SITE IS LOCATED IN AN AREA DESIGNATED AS ZONE X (AREA OF MINIMAL FLOOD HAZARD). COMMUNITY PANEL NO. : 3720150600J DATED: 10/03/2006

NO WETLAND AREAS HAVE BEEN INVESTIGATED BY THIS SPECIFIC PURPOSE SURVEY.

ALL ZONING INFORMATION SHOULD BE VERIFIED WITH THE PROPER ZONING OFFICIALS.

ANY UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM ABOVE GROUND FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEES THAT ANY UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT ANY UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED ANY UNDERGROUND UTILITIES.

PARENT PARCEL  
 CAROLINA POWER AND  
 LIGHT COMPANY  
 (PER TAX ASSESSOR)  
 PARCEL 021507 9002  
 ZONED M1



**SURVEYOR CERTIFICATION**

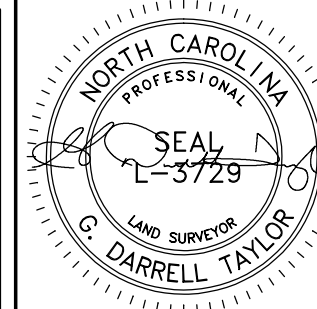
I HEREBY CERTIFY THAT THIS MAP IS CORRECT AND WAS DRAWN UNDER MY DIRECT SUPERVISION. ANY VISIBLE ENCROACHMENTS ARE SHOWN HEREON.

*G. Darrell Taylor* DATE: 11/05/2020  
 G. DARRELL TAYLOR, NORTH CAROLINA PROFESSIONAL LAND SURVEYOR #L-3729  
 POINT TO POINT LAND SURVEYORS, INC.

THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.

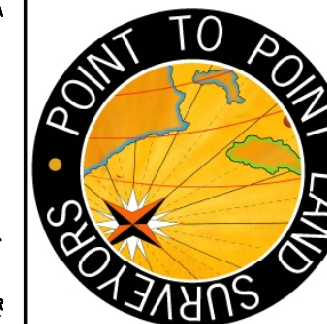


**Know what's below.  
 Call before you dig.**



NO.	DATE	REVISION

\* SPECIFIC PURPOSE SURVEY PREPARED BY:  
**POINT TO POINT LAND SURVEYORS**  
 Firm License Number: C-4145  
 100 Governors' Trace, Ste. 103  
 Peachtree City, GA 30269  
 (p) 678.565.4440 (f) 678.565.4497  
 (w) p2pls.com



SPECIFIC PURPOSE SURVEY PREPARED FOR:



ENGINEERED TOWER SOLUTIONS, PLLC  
 8774 YATES DRIVE, SUITE 150  
 WESTMINSTER, CO 80031

ERWIN

TOWNSHIP OF DUKE,  
 HARNETT COUNTY, NORTH CAROLINA

DRAWN BY: AJT

CHECKED BY: JKL

APPROVED: D. MILLER

DATE: NOVEMBER 5, 2020

P2P JOB #: 201892NC

SHEET:

**1**

OF 1















**Floors over unconditioned space** (each assembly)

Description of assembly  
U-Value of total assembly  
R-Value of insulation

**Floors slab on grade**

Description of assembly **CONCRETE + TILE**  
U-Value of total assembly **0.191**  
R-Value of insulation **5.237**  
Horizontal/vertical requirement  
slab heated

**ELECTRICAL SUMMARY**

**ELECTRICAL SYSTEM AND EQUIPMENT**

**Method of Compliance:**

Prescriptive     Performance     Energy Cost Budget

**Lighting schedule**

lamp type required in fixture    32W FL  
number of lamps in fixture    2  
ballast type used in the fixture    ELEC  
number of ballasts in fixture    2  
total wattage per fixture    60  
total interior wattage specified vs allowed    600 VS 331 (ONLY LIT WHEN OCCUPIED)  
total exterior wattage specified vs allowed

**Equipment schedules with motors** (not used for mechanical systems)

motor horsepower  
number of phases  
minimum efficiency  
motor type  
# of poles

**MECHANICAL SUMMARY**

**MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT**

**Method of Compliance**

Prescriptive     Energy Cost Budget

**Thermal Zone**

winter dry bulb  
summer dry bulb

**Interior design conditions**

winter dry bulb  
summer dry bulb  
relative humidity

NC Administration and E forceme

35

**Building heating load**

**Building cooling load**

**Mechanical Spacing Conditioning System**

Unitary  
description of unit    MARVAIR: AVPA48ACA050NU-100  
heating efficiency  
cooling efficiency    11.75 EER  
heat output of unit  
cooling output of unit    11,000-72,000 BTUH  
Boiler  
total boiler output. If oversized, state reason.  
Chiller  
total chiller capacity. If oversized, state reason.

**List equipment efficiencies**

**Equipment schedules with motors (mechanical systems)**

motor horsepower  
number of phases    SINGLE  
minimum efficiency  
motor type    RECIPROCATING  
# of poles    2

NC Administration and Enforcement

36

PREPARED BY:



PREPARED FOR:



SITE NAME:

**ERWIN RADIO BLDG**

SITE NUMBER:

**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.665769°

SEAL:

FIRM #: P-1016

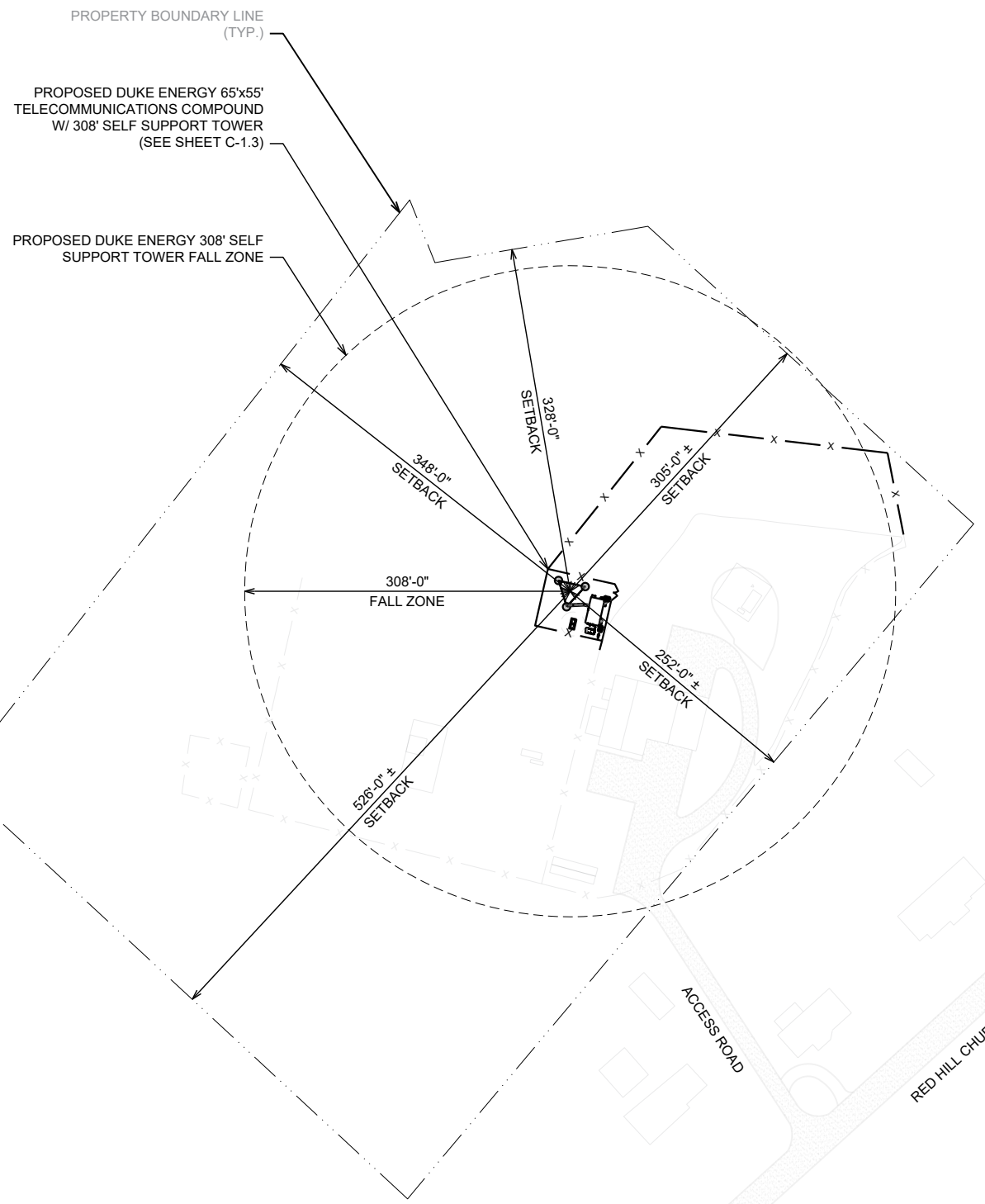
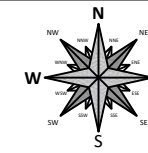


REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA    CHECKED BY: AD

SHEET TITLE:  
**NC APPENDIX B IV**

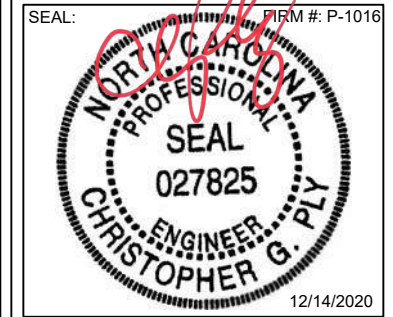
SHEET # **GN-7**    CURRENT REV #: 1  
ETS #: 204581.AE.02



PREPARED BY:  
  
**ETS**  
 ENGINEERED TOWER SOLUTIONS, PLLC  
 3227 WELLINGTON COURT  
 RALEIGH, NC 27615  
 o: 919-782-2710, f: 919-435-0631  
 www.engineeredtowersolutions.com



SITE NAME:  
**ERWIN RADIO BLDG**  
 SITE NUMBER:  
**NCDUN017**  
 SITE ADDRESS:  
 465 RED HILL CHURCH ROAD  
 DUNN, NC 28334  
 LATITUDE/LONGITUDE:  
 35.335061°, -78.595769°



REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**OVERALL SITE PLAN**

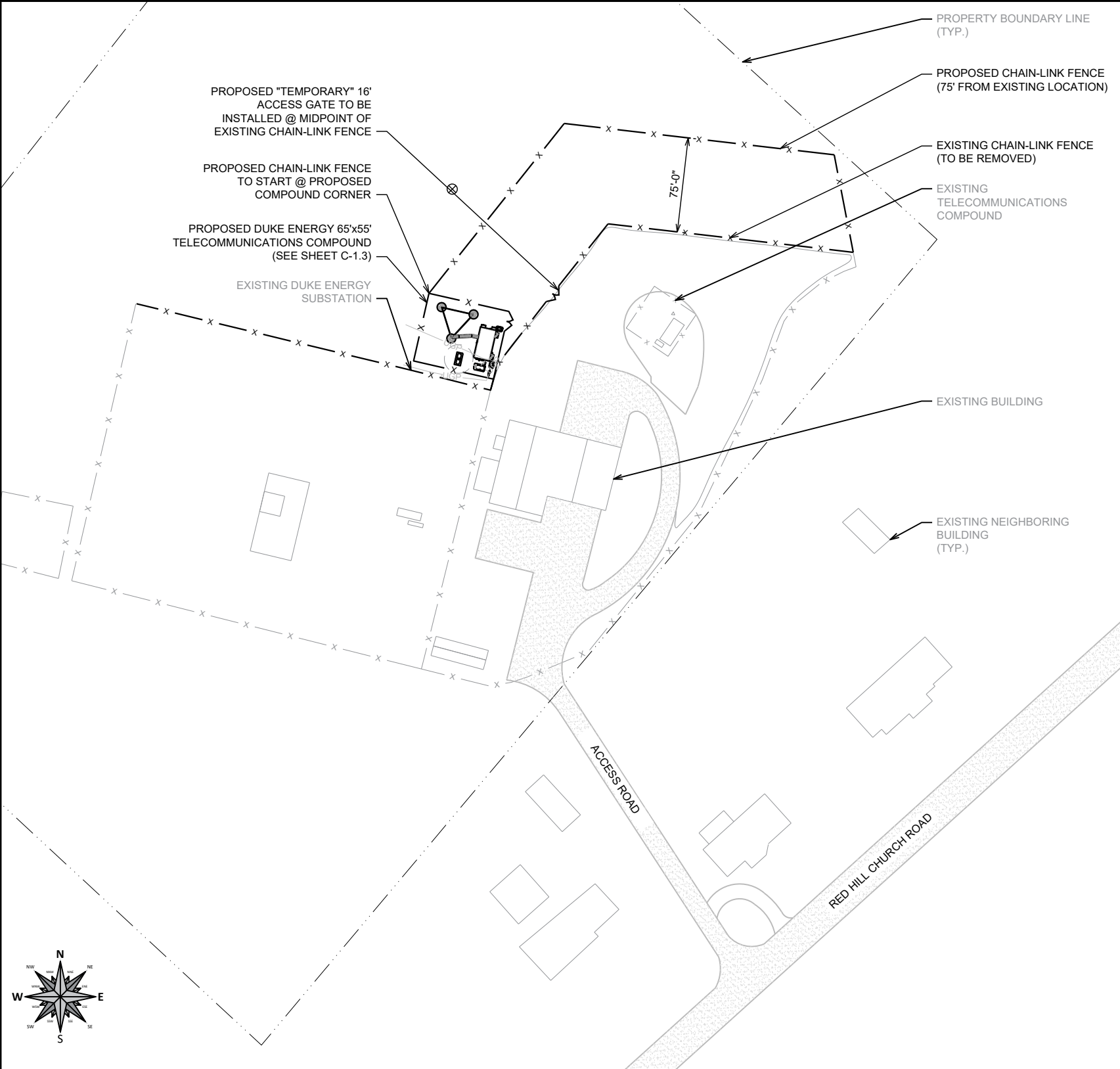
PROPOSED TOWER SETBACKS	
PROPERTY BOUNDARY LINE	DISTANCE
NORTH	328'-0" ±
NORTHEAST	305'-0" ±
SOUTHEAST	252'-0" ±
SOUTHWEST	526'-0" ±
NORTHWEST	348'-0" ±

**OVERALL SITE PLAN**  
 1" = 150'-0"

SHEET # **C-1.0**      CURRENT REV #: 1  
 ETS #: 204581.AE.02

### CONTRACTOR NOTES

- CONTRACTOR SHALL MAINTAIN UNINTERRUPTED ACCESS TO ALL DRIVEWAYS, SIDE STREETS, AND WALKWAYS AT ALL TIMES UNLESS OTHERWISE PERMITTED.
- CONTRACTOR SHALL PREPARE A MAINTENANCE OF TRAFFIC (M.O.T.) PLAN FOR PEDESTRIAN TRAFFIC AND WORK WITHIN THE PUBLIC RIGHT-OF-WAY, INCLUDING VEHICLE PARKING AND EQUIPMENT STAGING.
- CONTRACTOR SHALL RESTORE ANY DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER.
- PRIOR TO INSTALLATION THE CONTRACTOR SHALL VERIFY THE PROPOSED WORK IS LOCATED WITHIN THE PUBLIC RIGHT-OF-WAY. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR RESOLUTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RELOCATION AND REPAIR OF ANY CONSTRUCTION PERFORMED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
- UNDERGROUND LOCATION AND FIELD VERIFICATION OF EXISTING UTILITIES SHALL BE COMPLETED PRIOR TO STARTING CONSTRUCTION.



### SITE MAP



### LEGEND

---	EASEMENT	⊗	MAN-HOLE
---	PROPERTY LINE	⊕	HYDRANT
---	GAS UNDERGROUND GAS LINE	⊗	EXISTING UTILITY POLE
---	UGP UNDERGROUND POWER	●	PROPOSED UTILITY POLE
---	UGF UNDERGROUND FIBER	Ⓣ	EXISTING TRAFFIC LIGHT
---	WOODEN FENCE	Ⓛ	EXISTING LIGHT POLE
---	METAL FENCE		

### NOTES

SITE PLAN BASED ON SURVEY COMPLETED BY POINT TO POINT LAND SURVEYING.

### TEMPORARY SITE PLAN

1" = 100'-0"

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

**DUKE ENERGY**

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.3350617° -78.655769°

SEAL: FIRM #: P-1016  
12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

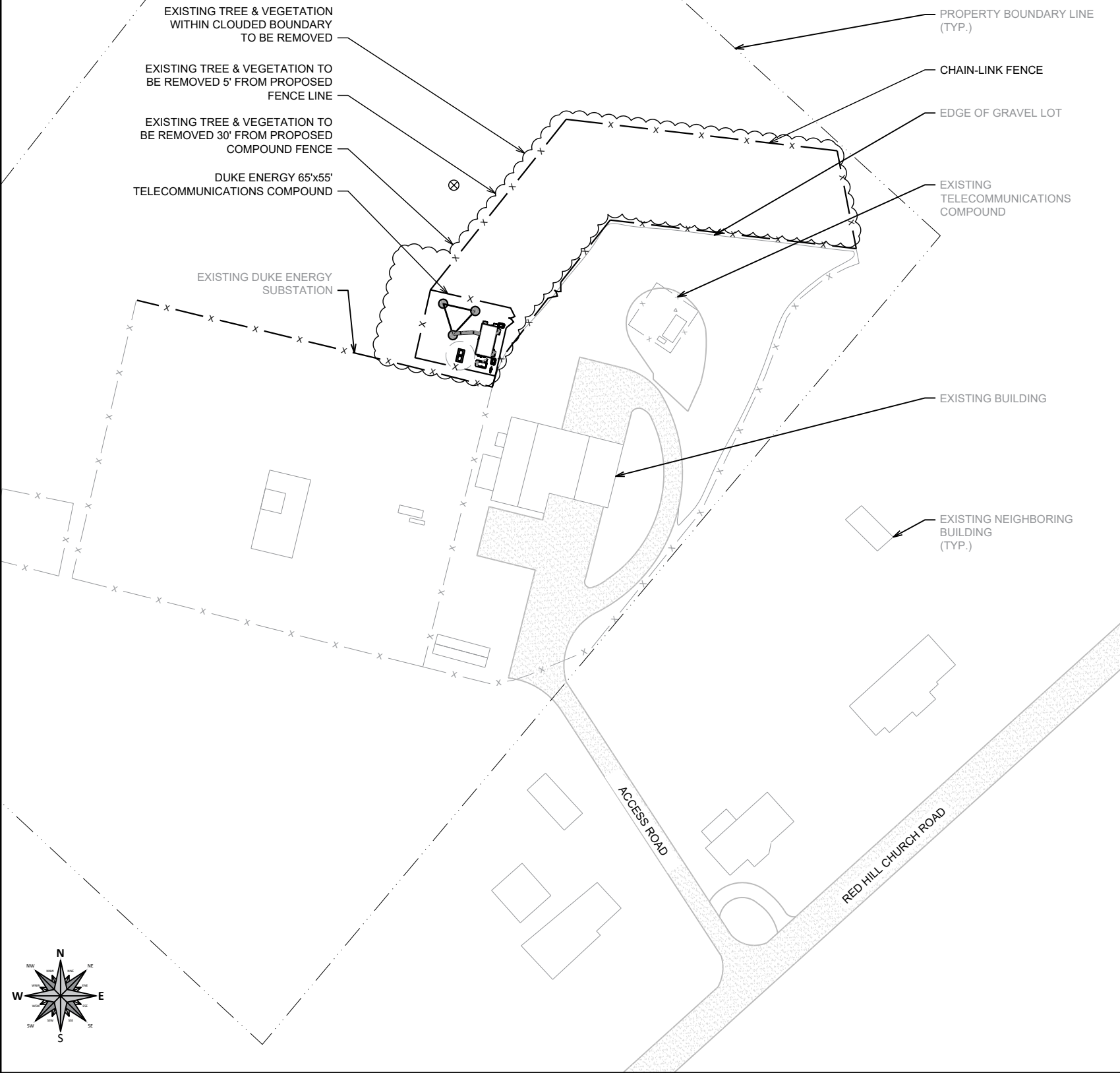
DRAWN BY: HA | CHECKED BY: AD

SHEET TITLE:  
**TEMPORARY SITE PLAN**

SHEET # **C-1.1** | CURRENT REV #: 1  
ETS #: 204581.AE.02

**CONTRACTOR NOTES**

- CONTRACTOR SHALL MAINTAIN UNINTERRUPTED ACCESS TO ALL DRIVEWAYS, SIDE STREETS, AND WALKWAYS AT ALL TIMES UNLESS OTHERWISE PERMITTED.
- CONTRACTOR SHALL PREPARE A MAINTENANCE OF TRAFFIC (M.O.T.) PLAN FOR PEDESTRIAN TRAFFIC AND WORK WITHIN THE PUBLIC RIGHT-OF-WAY, INCLUDING VEHICLE PARKING AND EQUIPMENT STAGING.
- CONTRACTOR SHALL RESTORE ANY DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER.
- PRIOR TO INSTALLATION THE CONTRACTOR SHALL VERIFY THE PROPOSED WORK IS LOCATED WITHIN THE PUBLIC RIGHT-OF-WAY. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR RESOLUTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RELOCATION AND REPAIR OF ANY CONSTRUCTION PERFORMED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
- UNDERGROUND LOCATION AND FIELD VERIFICATION OF EXISTING UTILITIES SHALL BE COMPLETED PRIOR TO STARTING CONSTRUCTION.



**SITE MAP**



**LEGEND**

- EASEMENT
- ..... PROPERTY LINE
- GAS — UNDERGROUND GAS LINE
- UGP— UNDERGROUND POWER
- UGF— UNDERGROUND FIBER
- WOODEN FENCE
- x — METAL FENCE
- ⊗ MAN-HOLE
- ⊕ HYDRANT
- ⊗ EXISTING UTILITY POLE
- PROPOSED UTILITY POLE
- Ⓣ EXISTING TRAFFIC LIGHT
- Ⓛ EXISTING LIGHT POLE

**NOTES**

SITE PLAN BASED ON SURVEY COMPLETED BY POINT TO POINT LAND SURVEYING.

**FINAL SITE PLAN**

1" = 100'-0"

PREPARED BY:



PREPARED FOR:



SITE NAME:

**ERWIN RADIO BLDG**

SITE NUMBER:

**NCDUN017**

SITE ADDRESS:

465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:

35.335061°, 78.635769°

SEAL:

FIRM #: P-1016



REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

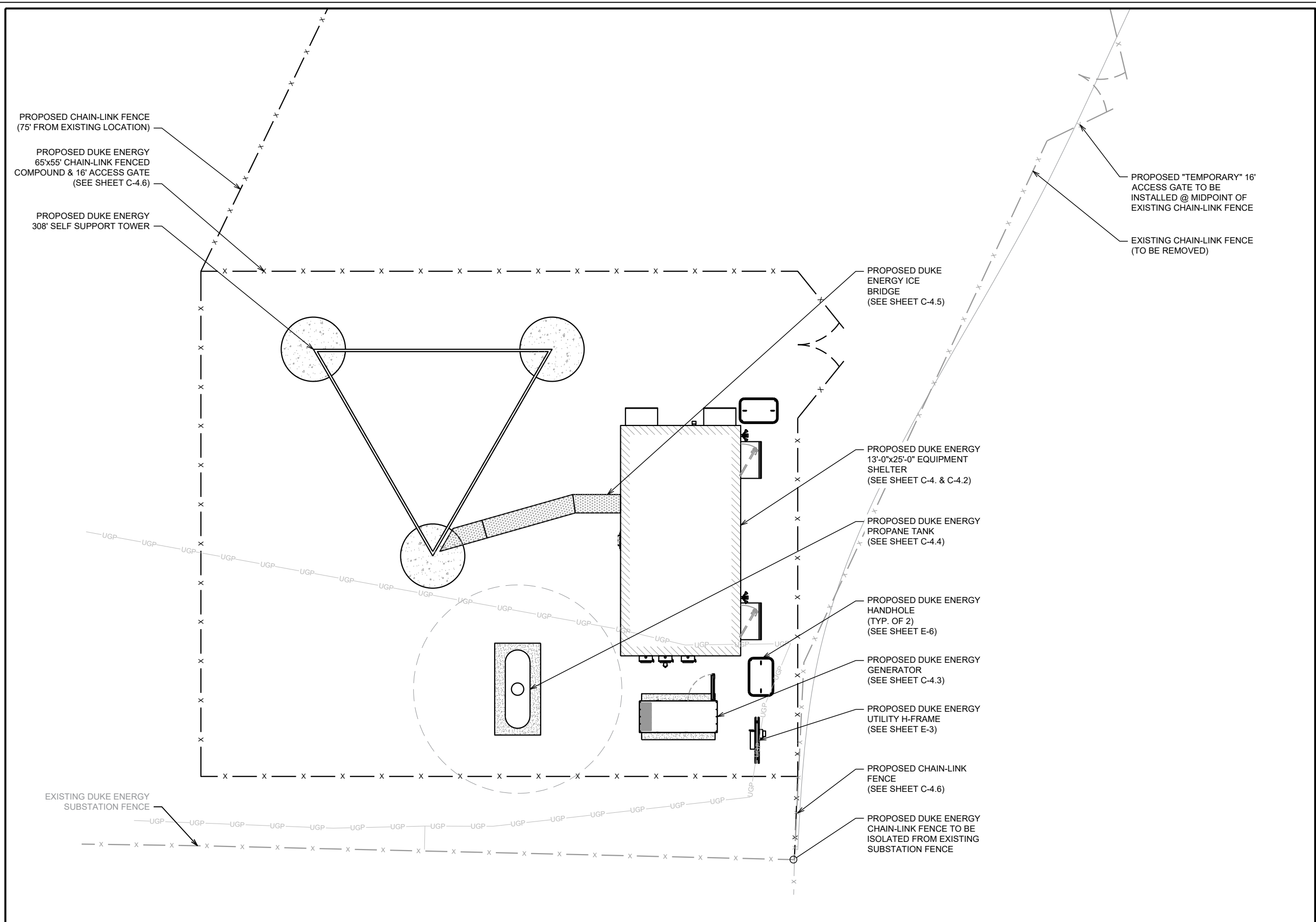
DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:

**FINAL SITE PLAN**

SHEET # **C-1.2**

CURRENT REV #: 1  
ETS #: 204581.AE.02



**DETAILED SITE PLAN**

3/32" = 1'-0"

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:




SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -79.655769°

SEAL: FIRM #: P-1016



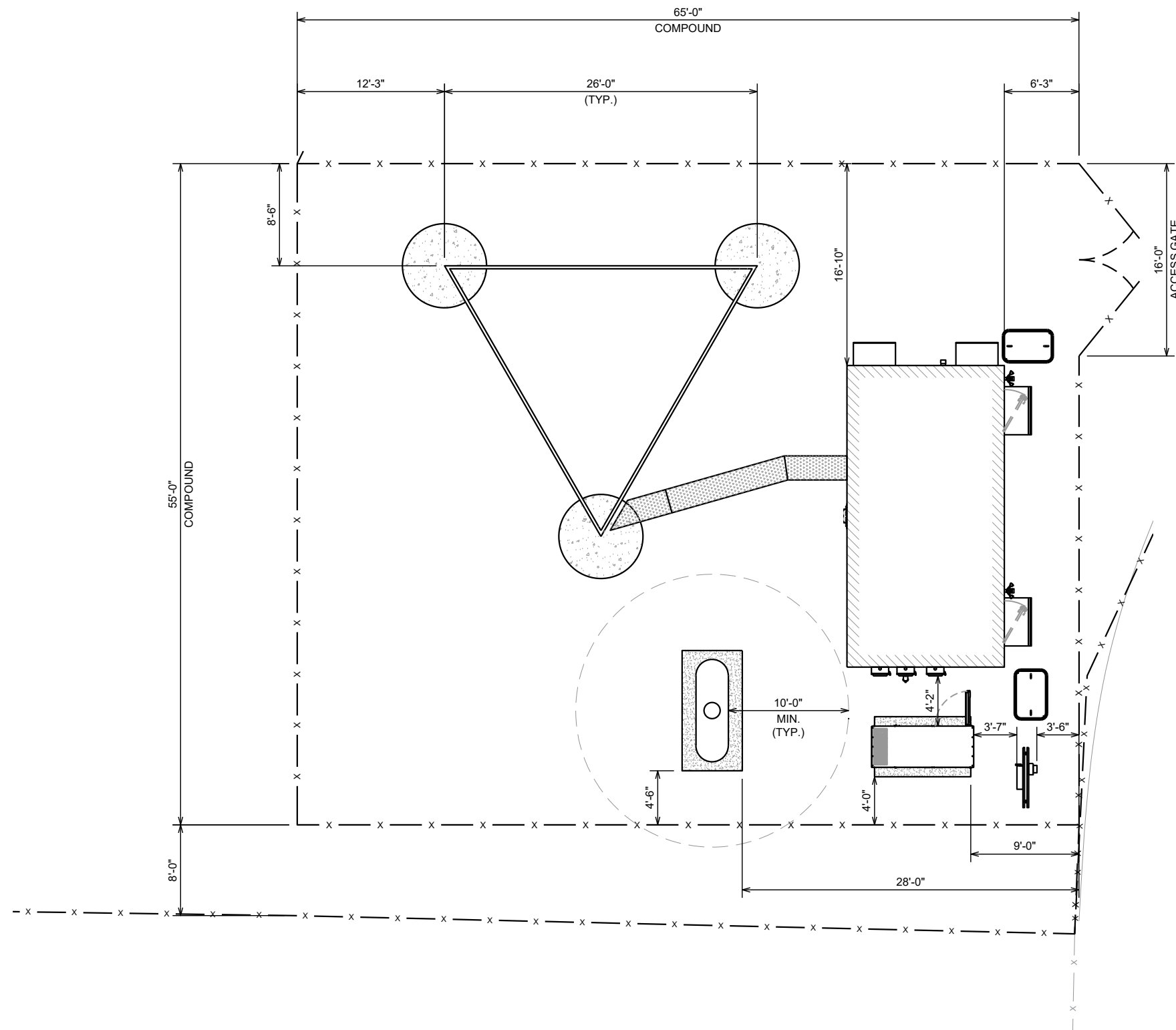
12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**DETAILED SITE PLAN**

SHEET # **C-1.3**      CURRENT REV #: 1  
ETS #: 204581.AE.02



**DIMENSIONED SITE PLAN**

3/32" = 1'-0"

PREPARED BY:  
  
**ETS**  
 ENGINEERED TOWER SOLUTIONS, PLLC  
 3227 WELLINGTON COURT  
 RALEIGH, NC 27615  
 o: 919-782-2710, f: 919-435-0631  
 www.engineeredtowersolutions.com

PREPARED FOR:  


SITE NAME:  
**ERWIN RADIO BLDG**  
 SITE NUMBER:  
**NCDUN017**  
 SITE ADDRESS:  
 465 RED HILL CHURCH ROAD  
 DUNN, NC 28334  
 LATITUDE/LONGITUDE:  
 35.335061°, -76.655769°

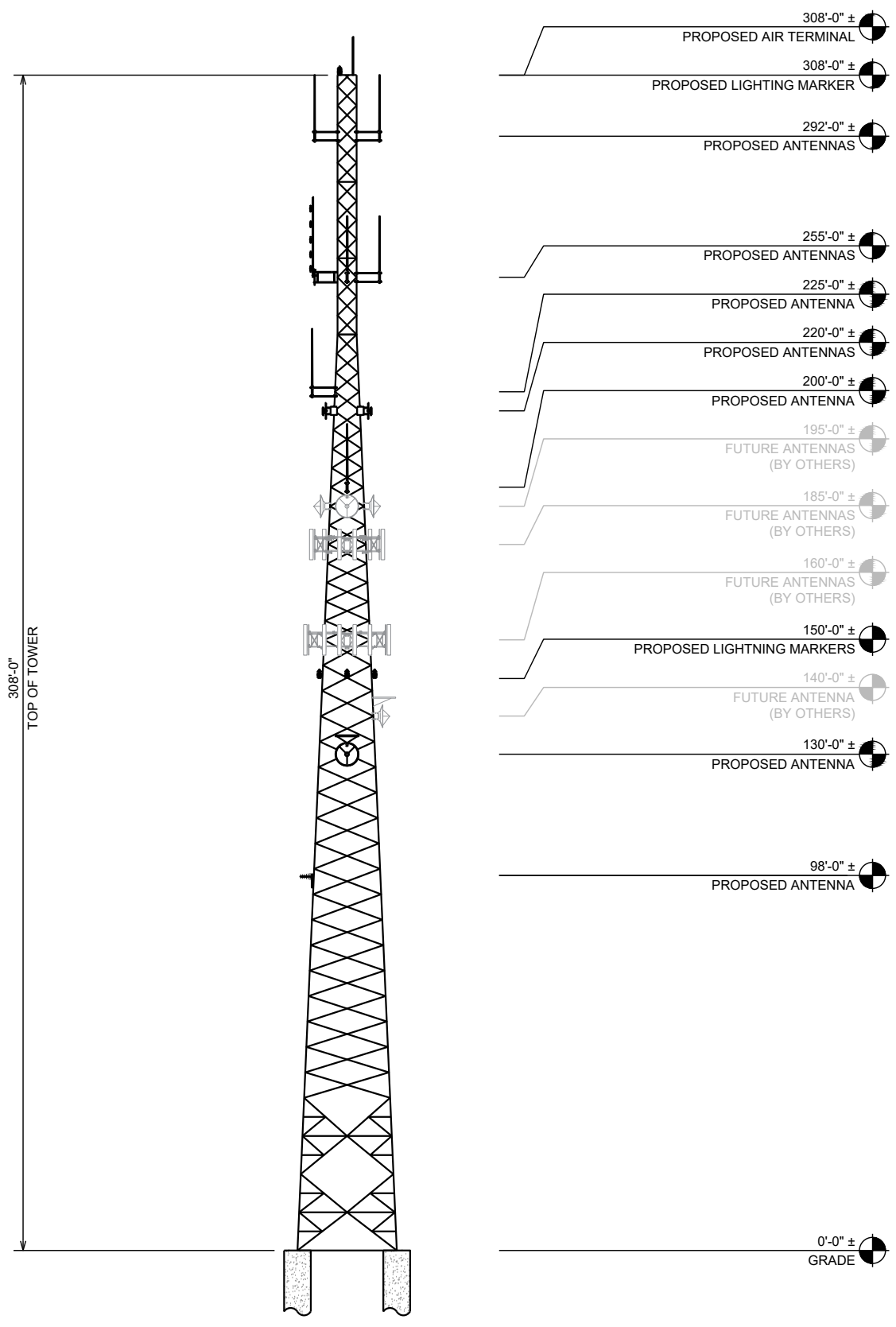
SEAL:  FIRM #: P-1016  
 12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA | CHECKED BY: AD

SHEET TITLE:  
**DIMENSIONED SITE PLAN**

SHEET # **C-1.4** | CURRENT REV #: 1  
 ETS #: 204581.AE.02



**TOWER ELEVATION**

1" = 40'

PREPARED BY:



3227 WELLINGTON COURT  
 RALEIGH, NC 27615  
 o: 919-782-2710, f: 919-435-0631  
 www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
 465 RED HILL CHURCH ROAD  
 DUNN, NC 28334

LATITUDE/LONGITUDE:  
 35.335061°, -78.655769°

SEAL:  FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA | CHECKED BY: AD

SHEET TITLE:  
**TOWER ELEVATION**

SHEET # **C-2** | CURRENT REV #: 1  
 ETS #: 204581.AE.02

**PROPOSED ANTENNA SCHEDULE**

OWNER	SYSTEM	SIZE (FT)	TYPE	MANUFACTURE	PART #	ELEV. (FT)	LOC.	AZ.	FREQ.	FCC LICENSE	TRANSMIT POWER	MOUNT
DUKE	AIR TERMINAL	10	--	--	--	308	--	--	--	--	--	PIPE
DUKE	LIGHTING	--	FLASHHEAD	FLASH TECH.	FH370D	308	TOP	--	--	--	--	--
DUKE	800 MHz P25 (RX)	14.5	OMNI	DBSPECTRA	DS8A10P36U-D	292	B	--	806-869	NEW	--	6' SIDE ARM
DUKE	800 MHz P25	2	TTA	DBSPECTRA	DS7TMD17C	292	B	--	--	--	--	LEG
DUKE	900 MHz WAN TRUNKING (RX)	14.7	OMNI	DBSPECTRA	DS9A10P36U-D	292	C	--	896-900	--	--	6' SIDE ARM
DUKE	900MHz WAN TRUNKING (RX)	2	TTA	DBSPECTRA	DS9TMD5C	292	C	--	--	--	--	LEG
DUKE	VHF PAGING	21	FOLDED DIPOLE	COMMSCOPE	DB224-A	255	A	--	150-160	--	--	6' SIDE ARM
DUKE	800 MHz P25 (TX)	14.5	OMNI	DBSPECTRA	DS8A10P36U-D	255	B	--	806-869	NEW	--	6' SIDE ARM
DUKE	900 MHz WAN TRUNKING (TX)	14.7	OMNI	DBSPECTRA	DS9A10P36U-D	255	C	--	935-939	-	100	6' SIDE ARM
NCSHP	PUBLIC SAFETY 800MHz (RX)	15	OMNI	RFI	CC807-11	225	B	--	--	--	--	6' SIDE ARM
NCSHP	PUBLIC SAFETY 800MHz (TTA)	2	TTA	TXRX	--	225	B	--	--	--	--	LEG
DUKE	CAMBIUM RADIO	2	INTEGRATED HIGH GAIN	CAMBIUM	(2) PMP 450m	220	A	90°, 180°	5 GHz	--	--	2' STANDOFF
DUKE	CAMBIUM RADIO	2	INTEGRATED HIGH GAIN	CAMBIUM	(2) PMP 450m	220	C	0°, 270°	5 GHz	--	--	2' STANDOFF
NCSHP	PUBLIC SAFETY 800MHz (TX)	15	OMNI	RFI	CC807-11	200	B	--	--	--	--	6' SIDE ARM
--	FUTURE	6	DISH	RFS	PADX6-W57AC	195	A	--	6	--	--	PIPE
--	FUTURE	6	DISH	RFS	PADX6-W57AC	195	B	--	6	--	--	PIPE
--	FUTURE	6	DISH	RFS	PADX6-W57AC	195	C	--	6	--	--	PIPE
--	FUTURE LTE	8	4 PANEL, 3 SEC	CSS	VARIOUS	185	A,B,C	--	--	--	--	--
--	FUTURE LTE	8	4 PANEL, 3 SEC	CSS	VARIOUS	160	A,B,C	--	--	--	--	--
DUKE	LIGHTING	--	MARKER	FLASH TECH.	L-810 MARKER	150	A	--	--	--	--	--
DUKE	LIGHTING	--	MARKER	FLASH TECH.	L-810 MARKER	150	B	--	--	--	--	--
DUKE	LIGHTING	--	MARKER	FLASH TECH.	L-810 MARKER	150	C	--	--	--	--	--
NCSHP	FUTURE MW	6	DISH	RFS	PAD6-65B	140	A	63.32	--	--	--	--
NCSHP	PUBLIC SAFETY MICROWAVE	6	DISH	ANDREW	PL6-65-PXA	130	B	234.8	--	--	--	--
DUKE	MOSCAD HARRIS SIREN CONTROL	2	YAGI	DECIBEL	DB436	98	C	303	451-457	--	5	LEG

- NOTES:
- VERIFY FINAL DESIGN AND LOADING WITH DUKE ENERGY PRIOR TO CONSTRUCTION
  - VERIFY FINAL DESIGN AND LOADING WITH STRUCTURAL ANALYSIS PRIOR TO CONSTRUCTION

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061, -78.655769

SEAL:  FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**ANTENNA SCHEDULE**

SHEET # **C-3.1**      CURRENT REV #: 1  
ETS #: 204581.AE.02



**PROPOSED TRANSMISSION LINE SCHEDULE**

OWNER	LOCATION	SIZE	DIELECTRIC	MANUFACTURE	PART #
DUKE	--	--	--	--	--
DUKE	--	2/C #6 AWG	--	FLASH TECH.	TEK90
DUKE	--	(1) 1/2" JUMPER TO TTA	FOAM	EUPEN	EC4-50
DUKE	--	(1) 7/8" (1) 1/2"	FOAM	EUPEN	EC5-50A EC4-50
DUKE	AB	(1) 1/2" JUMPER TO TTA	FOAM	EUPEN	EC4-50A
DUKE	AB	(1) 7/8" (1) 1/2"	FOAM	EUPEN	EC5-50A EC4-50
DUKE	--	(1) 7/8"	FOAM	EUPEN	EC5-50A
DUKE	--	(1) 1-5/8"	FOAM	EUPEN	EC7-50A
DUKE	AB	(1) 1-5/8"	FOAM	EUPEN	EC7-50A
NCSHP	--	(1) 7/8"	FOAM	EUPEN	EC5-50A
NCSHP	--	(1) 7/8" (1) 1/2"	FOAM	EUPEN	EC5-50A EC4-50A
DUKE	--	(2) CAT 5E	COPPER	SUPERIOR ESSEX	CAT5E
DUKE	--	(2) CAT 5E	COPPER	SUPERIOR ESSEX	CAT5E
NCSHP	--	(1) 1-5/8"	FOAM	EUPEN	EC7-50A
FUTURE	--	(2) EU63	AIR	EUPEN	EU63
FUTURE	--	(2) EU63	AIR	EUPEN	EU63
FUTURE	--	(2) EU63	AIR	EUPEN	EU63
FUTURE	--	(15) 1-5/8"	FOAM	EUPEN	EC7-50A
FUTURE	--	(15) 1-5/8"	FOAM	EUPEN	EC7-50A
DUKE	--	2/C #6 AWG	--	FLASH TECH.	TEK90
DUKE	--	2/C #6 AWG	--	FLASH TECH.	TEK90
DUKE	--	2/C #6 AWG	--	FLASH TECH.	TEK90
NCSHP - FUTURE	--	--	--	--	--
NCSHP	--	(1) EW63	AIR	ANDREW	EW63
DUKE	--	(1) 1/2"	FOAM	EUPEN	EC4-50A

- NOTES:**
- VERIFY FINAL DESIGN AND LOADING WITH DUKE ENERGY PRIOR TO CONSTRUCTION
  - VERIFY FINAL DESIGN AND LOADING WITH STRUCTURAL ANALYSIS PRIOR TO CONSTRUCTION

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL:  FIRM #: P-1016

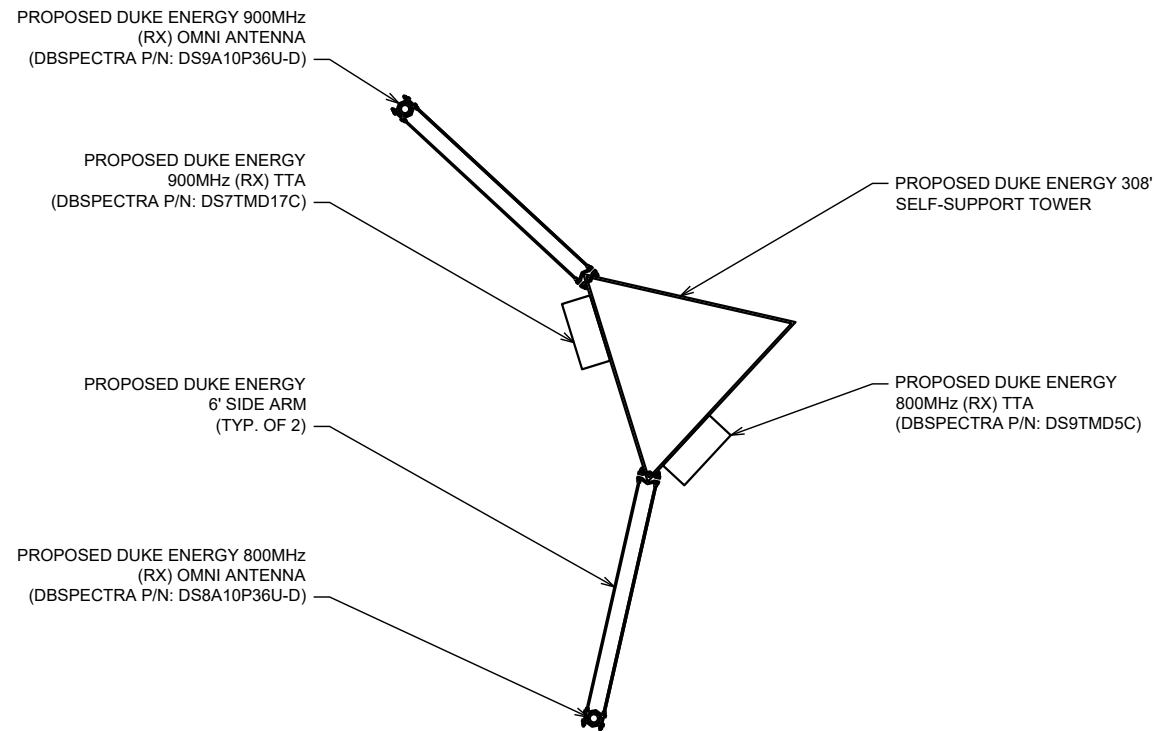
12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

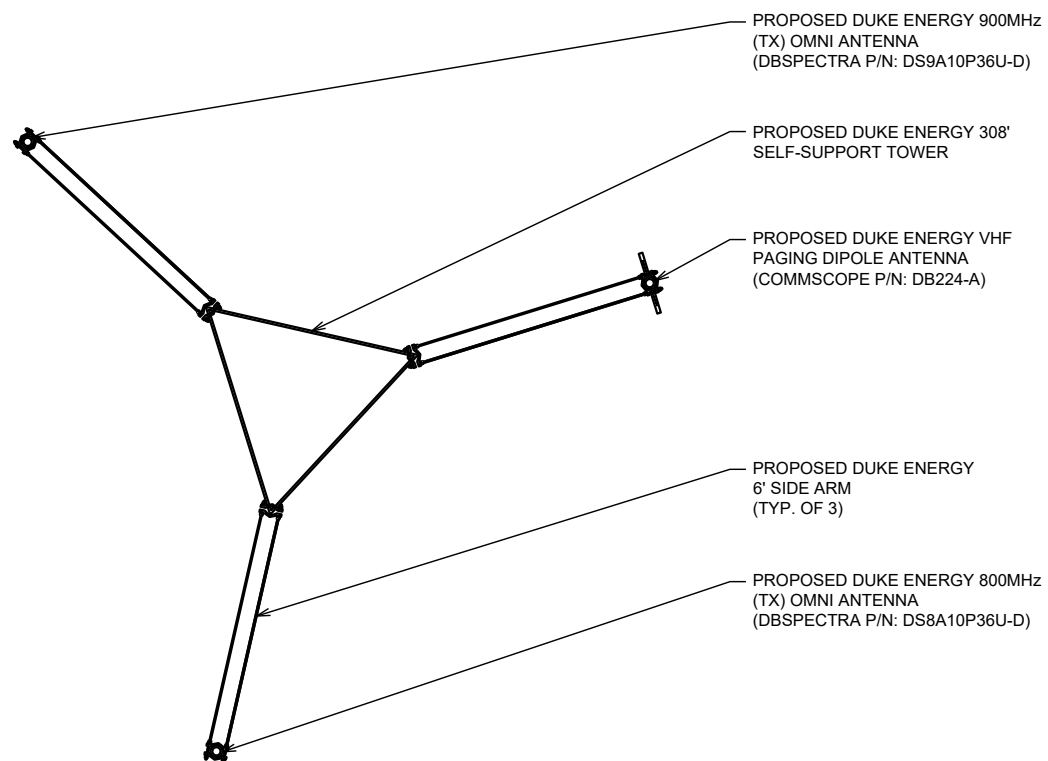
SHEET TITLE:  
**TRANSMISSION LINE SCHEDULE**

SHEET # **C-3.2**      CURRENT REV #: 1  
ETS #: 204581.AE.02



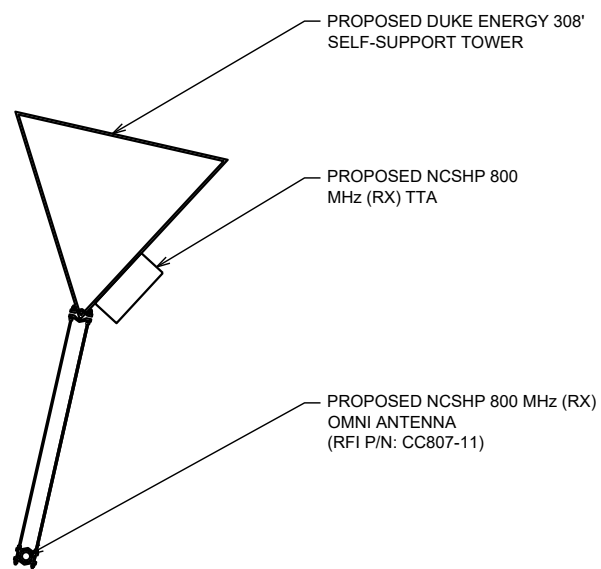
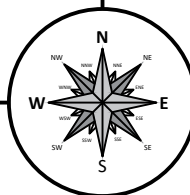
**ANTENNA LAYOUT @ 292'**

1/4" = 1'-0"



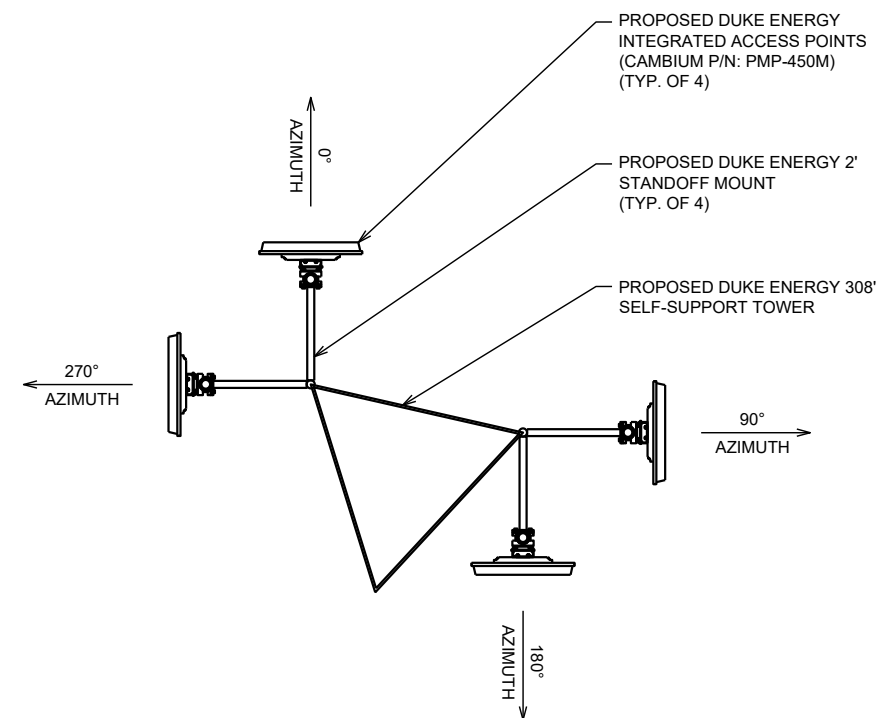
**ANTENNA LAYOUT @ 255'**

1/4" = 1'-0"



**ANTENNA LAYOUT @ 225'**

1/4" = 1'-0"



**ANTENNA LAYOUT @ 220'**

1/4" = 1'-0"

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, 78.665769°

SEAL: FIRM #: P-1016

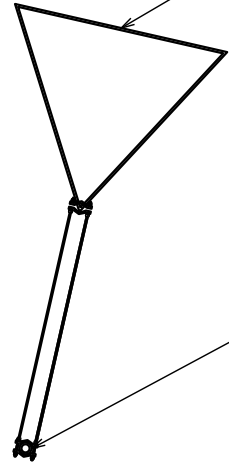
REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA CHECKED BY: AD

SHEET TITLE:  
**ANTENNA LAYOUTS**

SHEET # **C-3.3** CURRENT REV #: 1  
ETS #: 204581.AE.02

PROPOSED DUKE ENERGY 308'  
SELF-SUPPORT TOWER

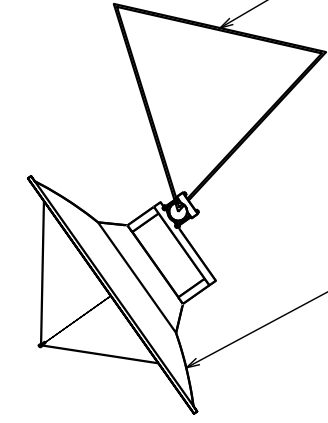


PROPOSED NCSHP 800 MHz (TX)  
OMNI ANTENNA  
(RFI P/N: CC807-11)

**ANTENNA LAYOUT @ 200'**

1/4" = 1'-0"

PROPOSED DUKE ENERGY 308'  
SELF-SUPPORT TOWER

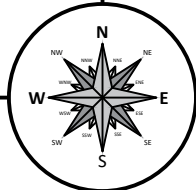


PROPOSED NCSHP PUBLIC  
SAFETY DISH ANTENNA  
(ANDREW P/N: PL6-65-PXA)

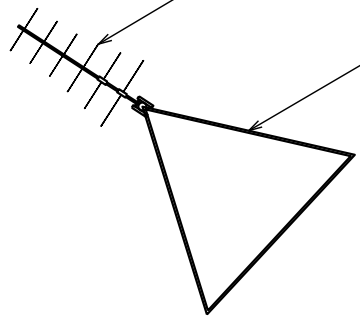
234.8°  
AZIMUTH

**ANTENNA LAYOUT @ 130'**

1/4" = 1'-0"



PROPOSED DUKE ENERGY  
MOSCAD HARRIS SIREN CONTROL  
YAGI ANTENNA  
(DECIBEL P/N: DB436)



PROPOSED DUKE ENERGY 308'  
SELF-SUPPORT TOWER

**ANTENNA LAYOUT @ 98'**

1/4" = 1'-0"

**NOT USED**

N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER  
SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL:  FIRM #: P-1016

12/14/2020

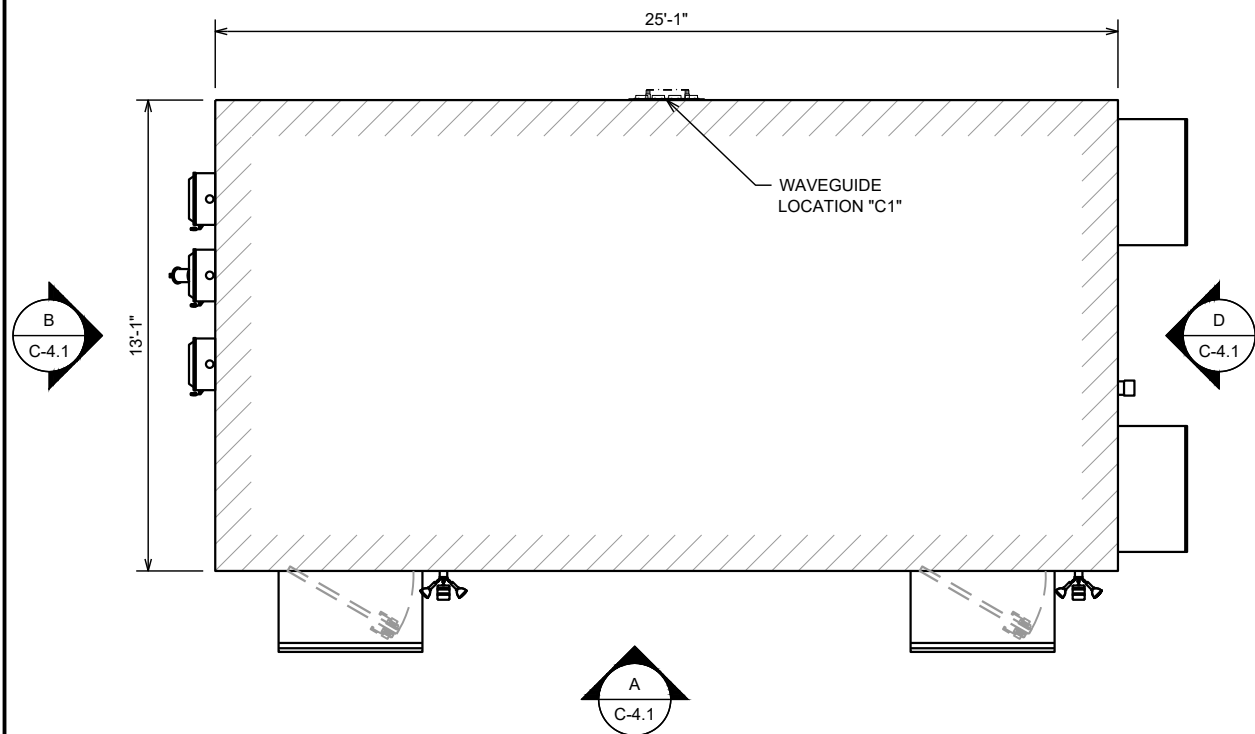
REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA | CHECKED BY: AD

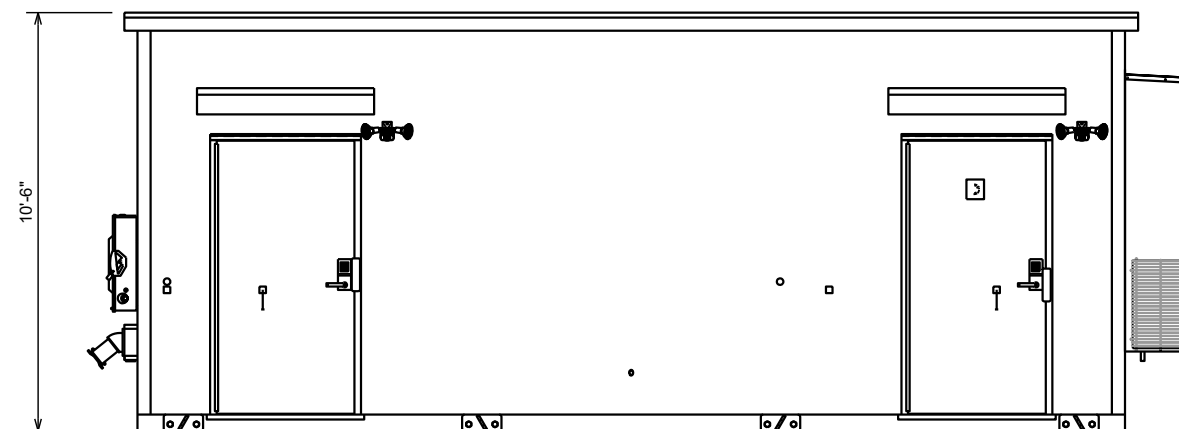
SHEET TITLE:  
**ANTENNA LAYOUTS**

SHEET # **C-3.4** | CURRENT REV #: 1  
ETS #: 204581.AE.02

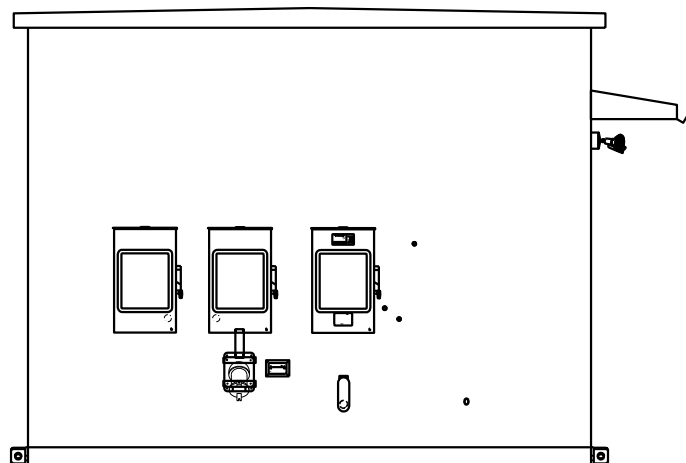
SABRE INDUSTRIES - SDUK13  
 • PREFABRICATED SHELTER  
 • WAVEGUIDE LOCATION "C1"



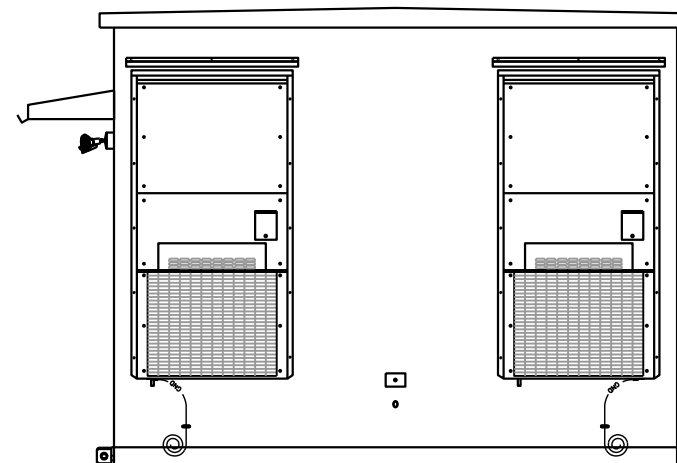
**PLAN VIEW**  
N.T.S.



**ELEVATION A**  
N.T.S.



**ELEVATION B**  
N.T.S.



**ELEVATION D**  
N.T.S.

PREPARED BY:  
  
**ETS**  
 ENGINEERED TOWER SOLUTIONS, PLLC  
 3227 WELLINGTON COURT  
 RALEIGH, NC 27615  
 o: 919-782-2710, f: 919-435-0631  
 www.engineeredtowersolutions.com

PREPARED FOR:  
  
**DUKE ENERGY**

SITE NAME:  
**ERWIN RADIO BLDG**  
 SITE NUMBER:  
**NCDUN017**  
 SITE ADDRESS:  
 465 RED HILL CHURCH ROAD  
 DUNN, NC 28334  
 LATITUDE/LONGITUDE:  
 35.335061° - 78.635769°

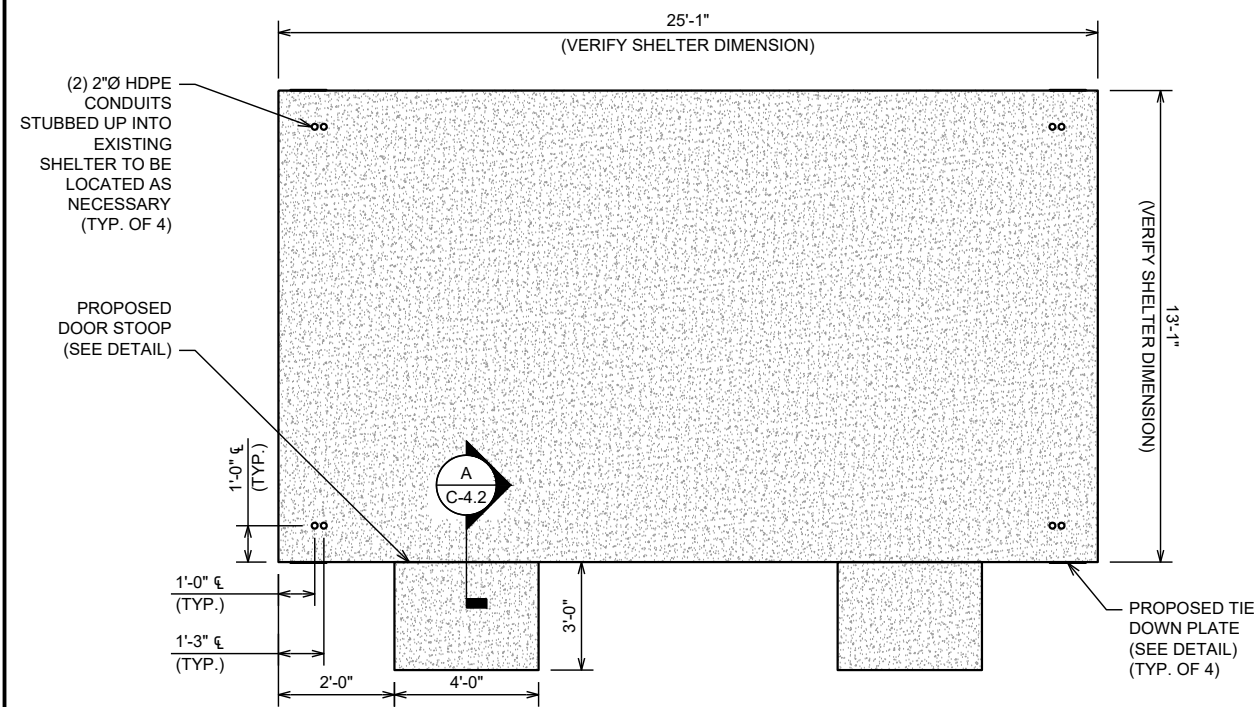
SEAL:  FIRM #: P-1016  
**SEAL**  
 027825  
 ENGINEER G. PLY  
 CHRISTOPHER G. PLY  
 12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA | CHECKED BY: AD  
 SHEET TITLE:  
**SHELTER DETAILS**  
 SHEET # **C-4.1** | CURRENT REV #: 1  
 ETS #: 204581.AE.02

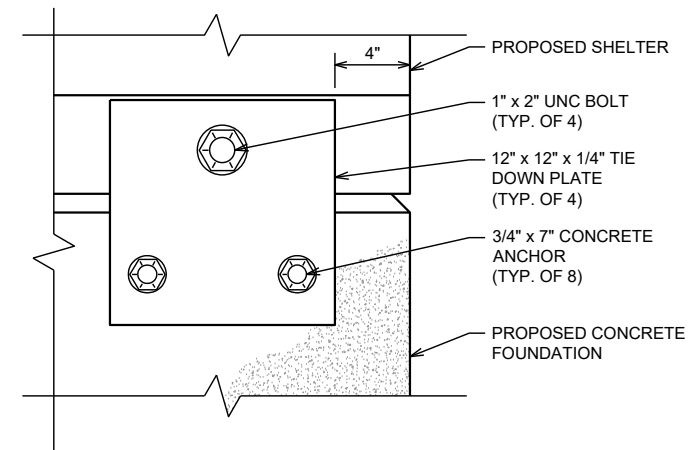
**NOTES**

- SURFACE OF FINISHED SLAB SHALL BE LEVEL AND FLAT WITHIN 1/4"
- CONTRACTOR TO VERIFY WITH MANUFACTURER ACTUAL DIMENSIONS OF SHELTER PRIOR TO LAYING FOUNDATION
- SEE SHEET GN-3 FOR CONCRETE AND FOUNDATION NOTES



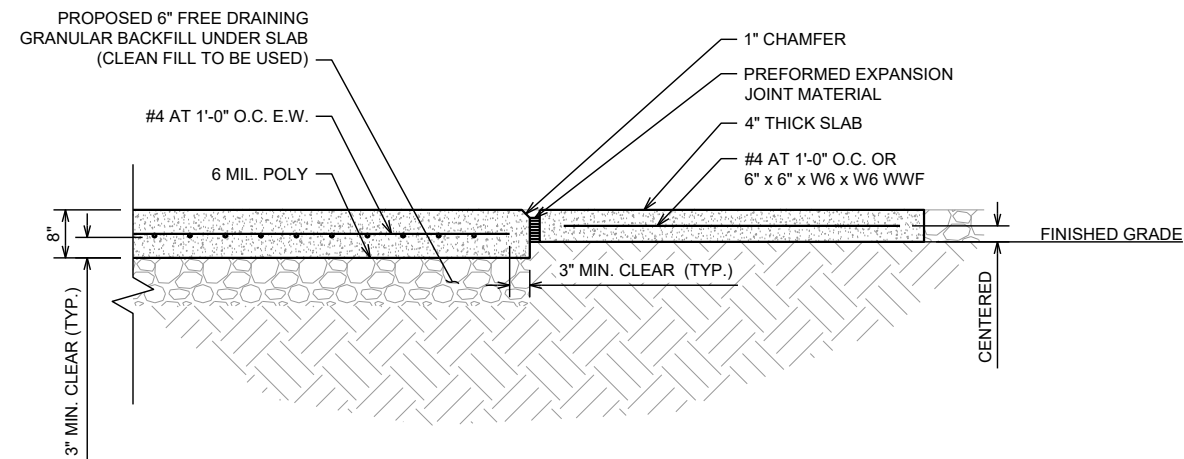
**SHELTER CONCRETE FOUNDATION PLAN**

N.T.S.



**SHELTER TIE DOWN PLATE DETAIL**

N.T.S.



**SECTION A DETAIL**

N.T.S.

PREPARED BY:



ENGINEERED TOWER SOLUTIONS, PLLC  
 3227 WELLINGTON COURT  
 RALEIGH, NC 27615  
 o: 919-782-2710, f: 919-435-0631  
 www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
 465 RED HILL CHURCH ROAD  
 DUNN, NC 28334

LATITUDE/LONGITUDE:  
 35.335061° -78.655769°

SEAL:  FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA CHECKED BY: AD

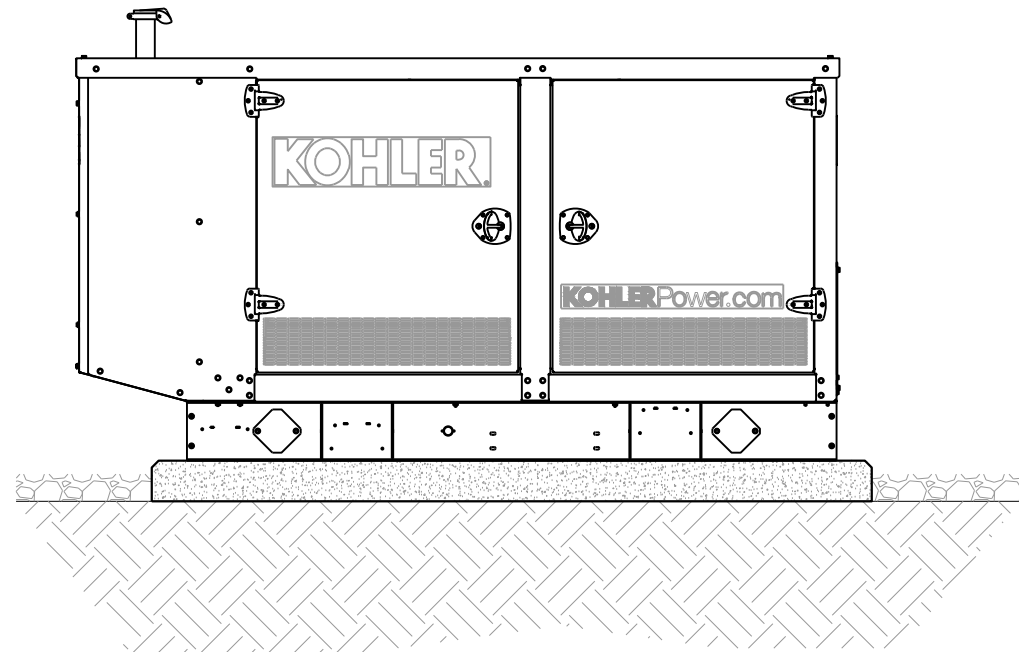
SHEET TITLE:  
**SHELTER FOUNDATION DETAILS**

SHEET # **C-4.2** CURRENT REV #: 1  
 ETS #: 204581.AE.02

**KOHLER MODEL - KG50**

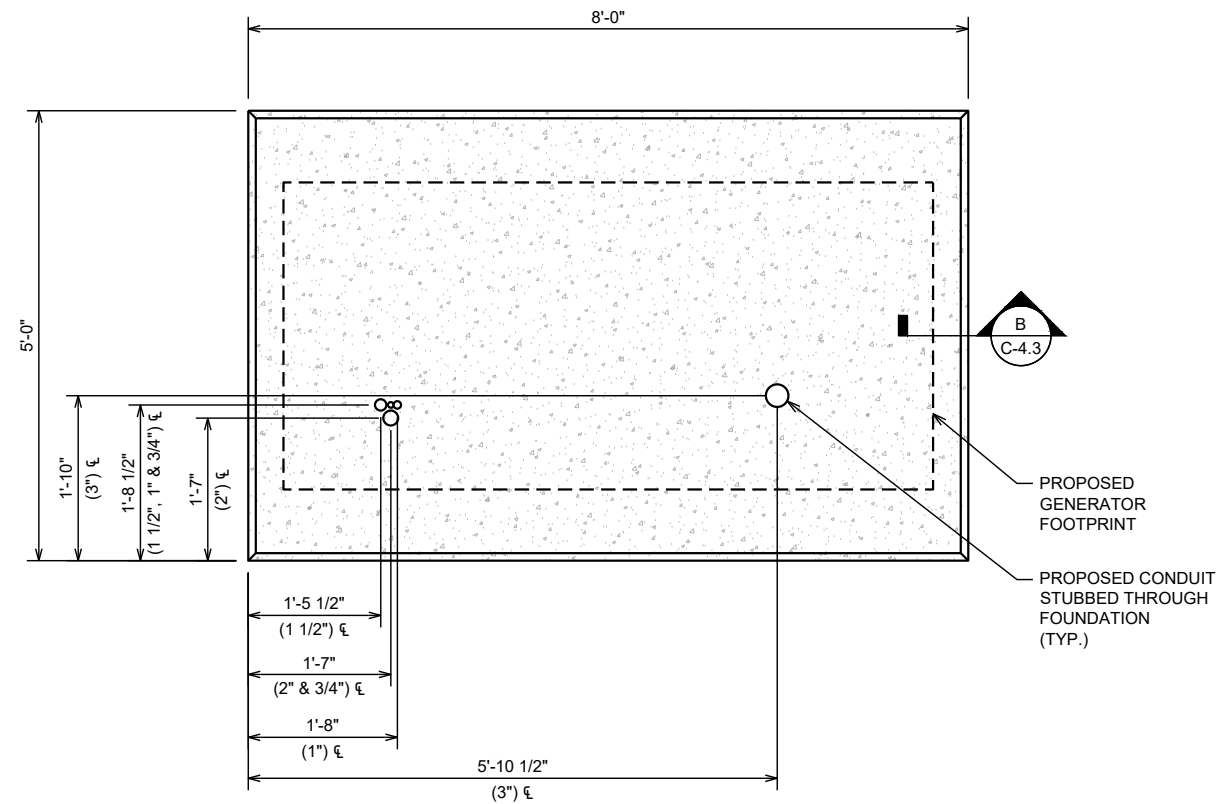
- LP GENERATOR
- 4P8X ALTERNATOR

HEIGHT	WIDTH	DEPTH	WEIGHT
46.1"	40.9"	86.6"	1900 LBS



**GENERATOR PAD ELEVATION**

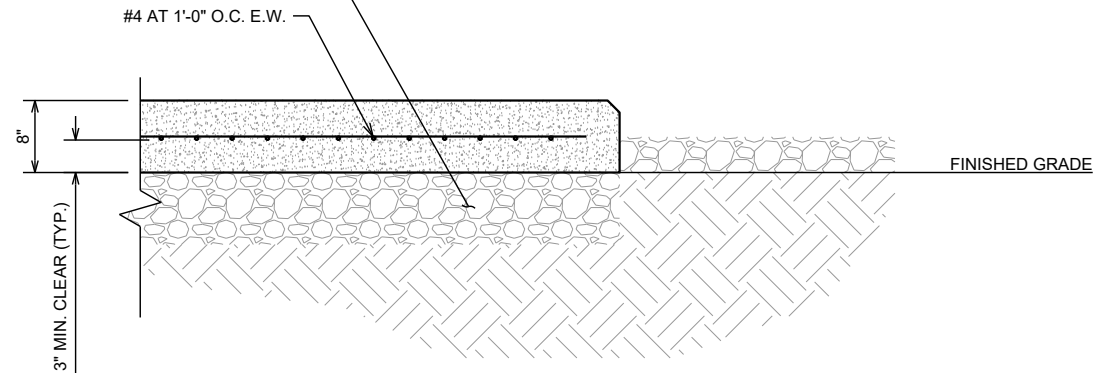
N.T.S.



**GENERATOR PAD PLAN**

N.T.S.

PROPOSED 6" FREE DRAINING  
GRANULAR BACKFILL UNDER SLAB  
(CLEAN FILL TO BE USED)



**SECTION B DETAIL**

N.T.S.

**NOT USED**

N.T.S.

PREPARED BY:



PREPARED FOR:



SITE NAME:

**ERWIN RADIO BLDG**

SITE NUMBER:

**NCDUN017**

SITE ADDRESS:

465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL:

FIRM #: P-1016



REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

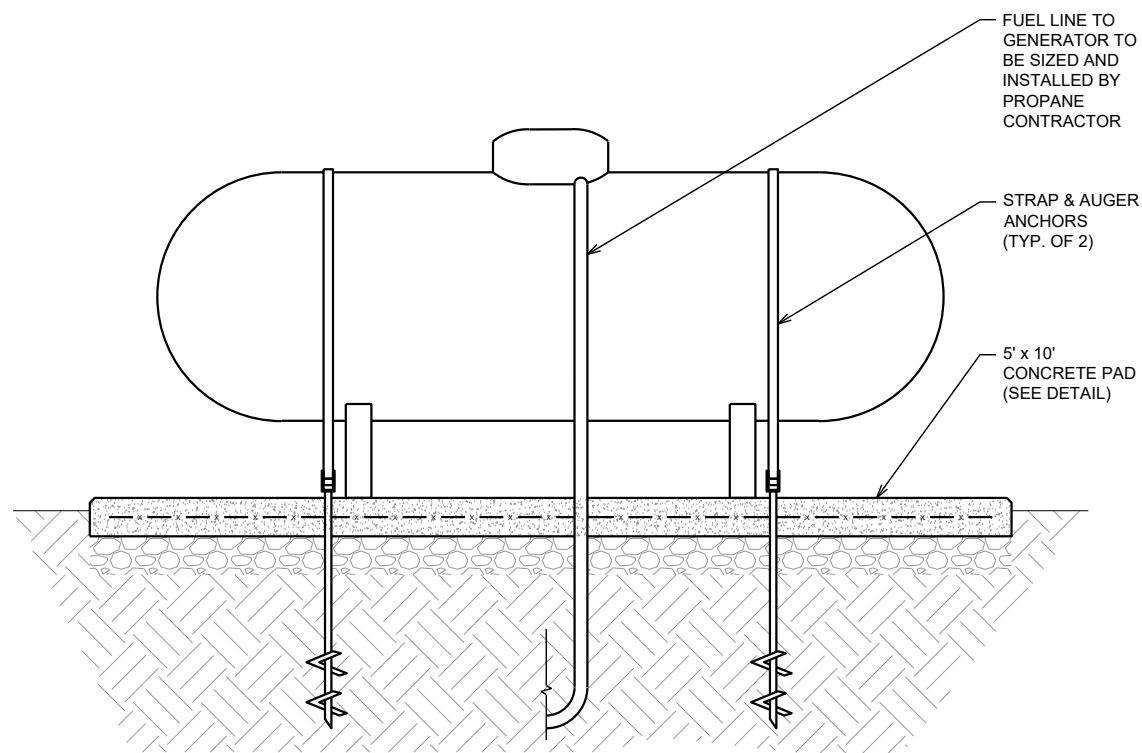
SHEET TITLE:

**GENERATOR  
DETAILS**

SHEET # **C-4.3**      CURRENT REV #: 1  
ETS #: 204581.AE.02

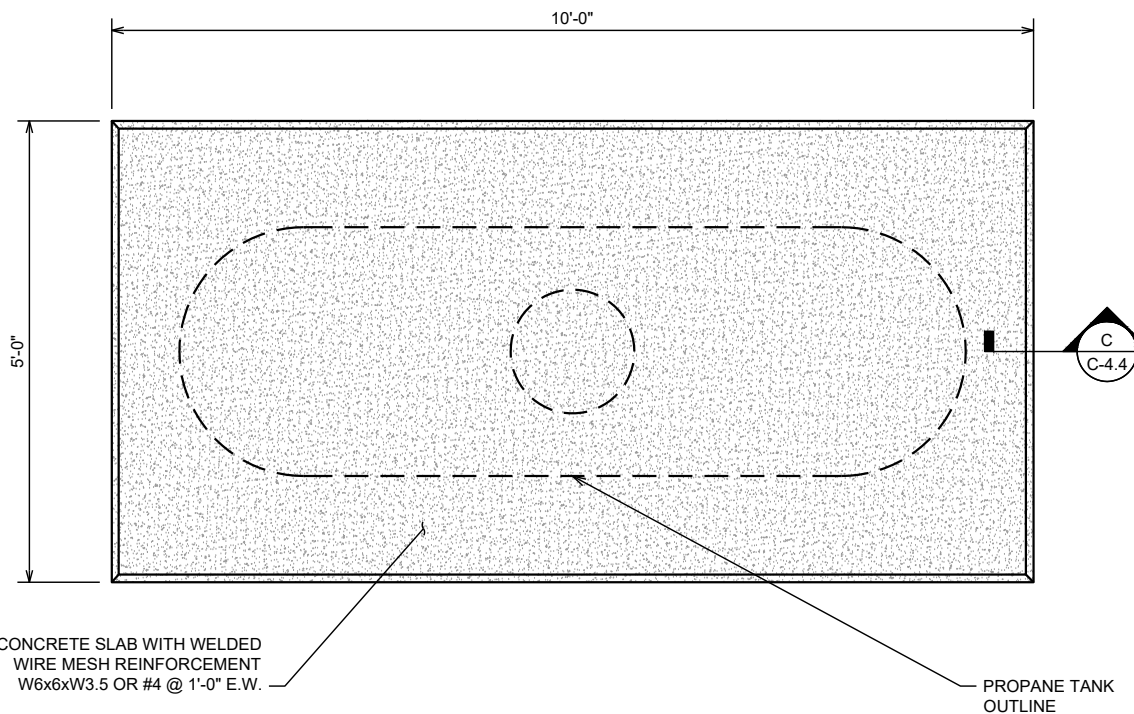
**NOTES**

- INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA-58 LP GAS CODE
- CONNECT GROUNDING CONDUCTOR TO FUEL TANK BY CLAMPING IT TO THE FILLER PIPE.



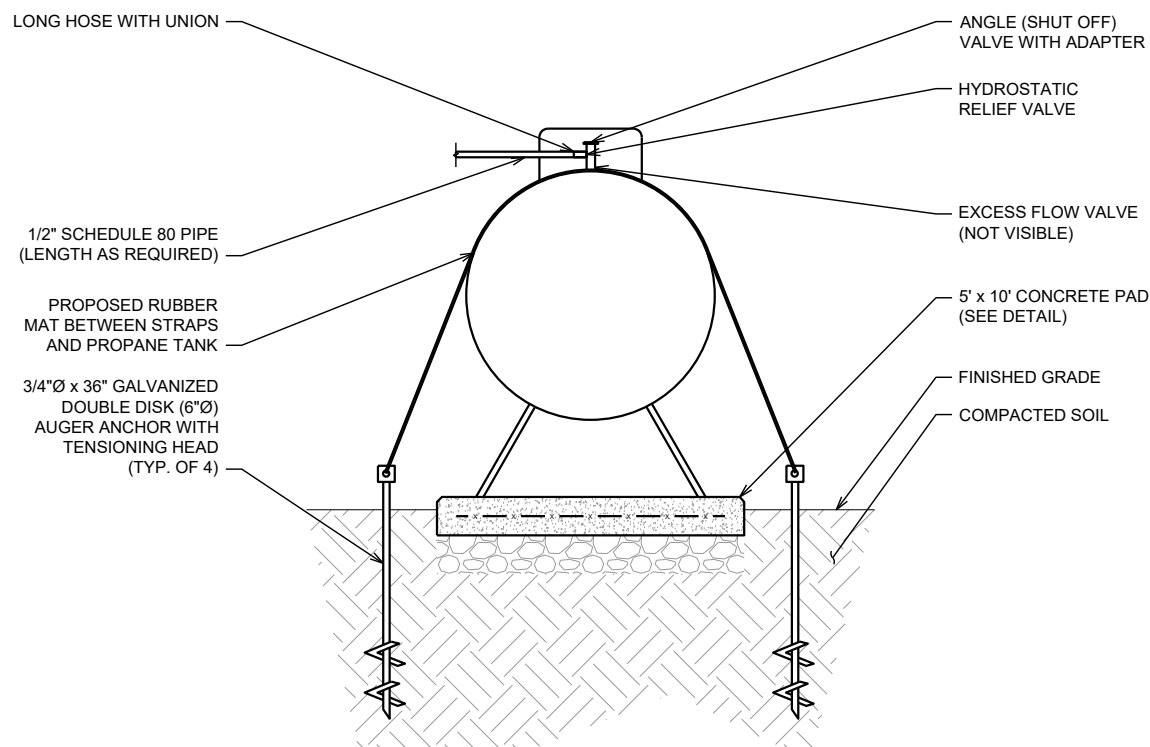
**PROPANE TANK PAD ELEVATION**

N.T.S.



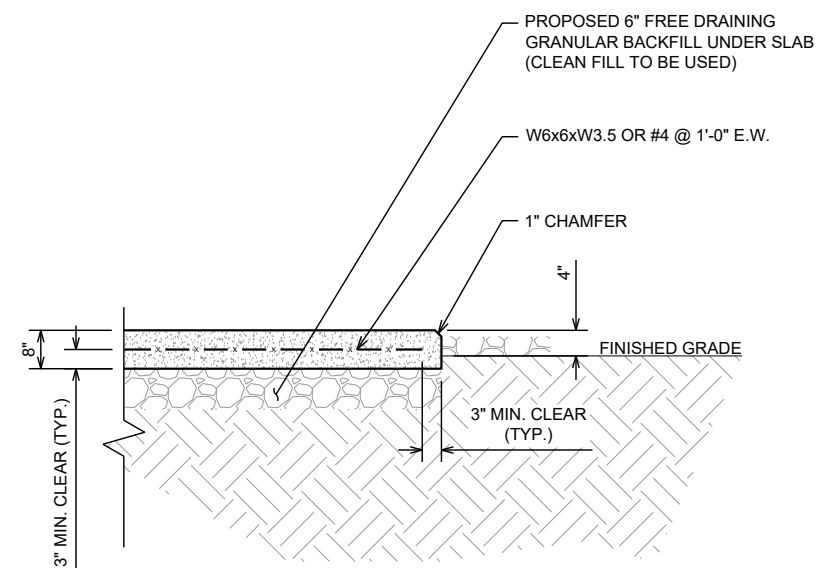
**PROPANE TANK PAD PLAN**

N.T.S.



**PROPANE TANK PAD ELEVATION**

N.T.S.



**SECTION C DETAIL**

N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL:  FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

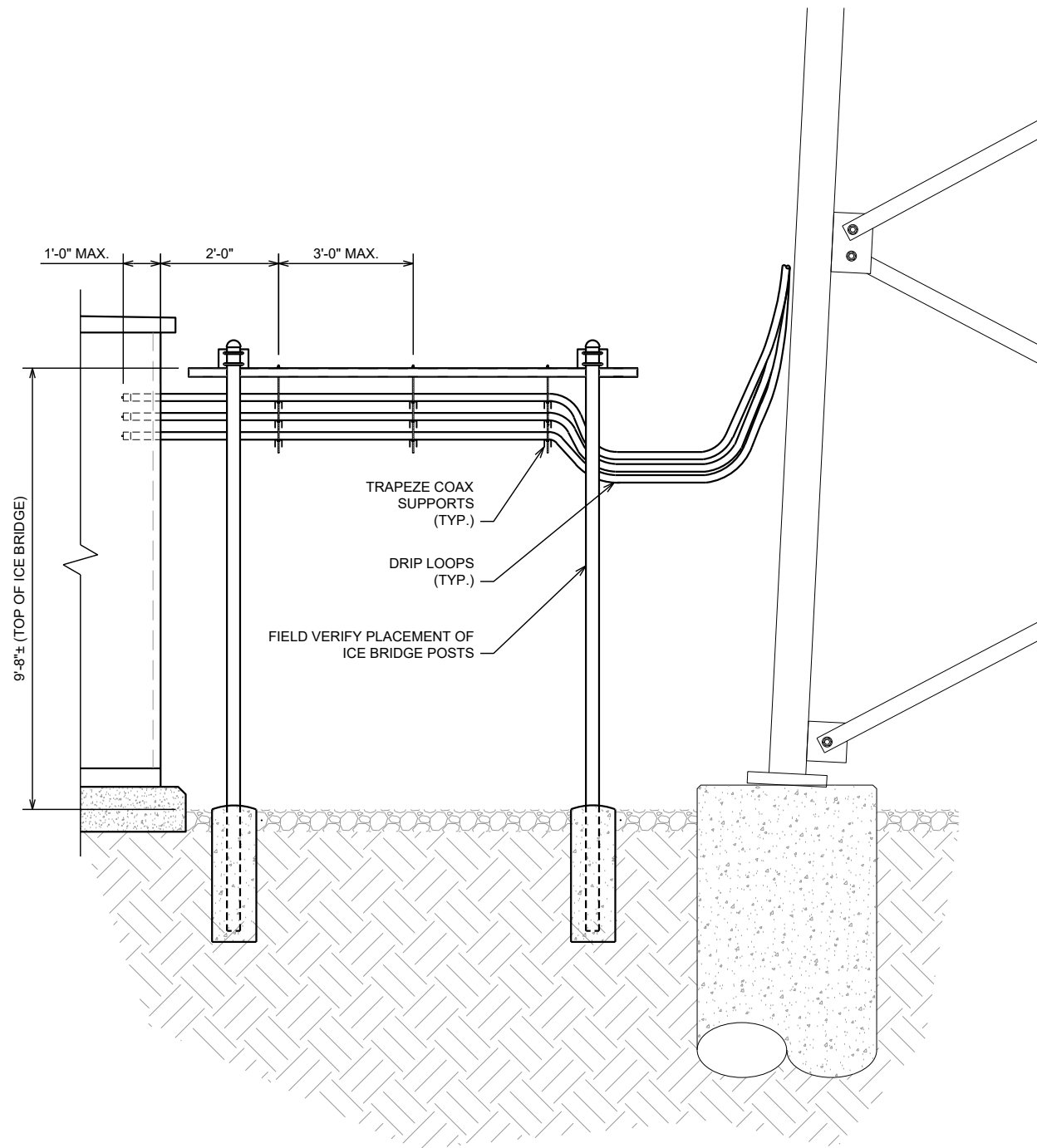
DRAWN BY: HA | CHECKED BY: AD

SHEET TITLE:  
**PROPANE TANK DETAILS**

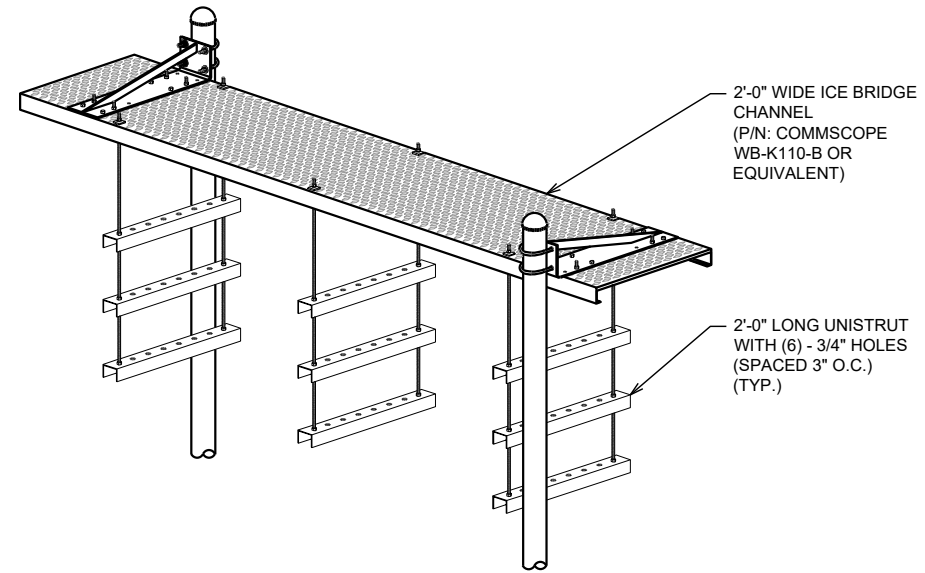
SHEET # **C-4.4** | CURRENT REV #: 1  
ETS #: 204581.AE.02

**NOTES:**

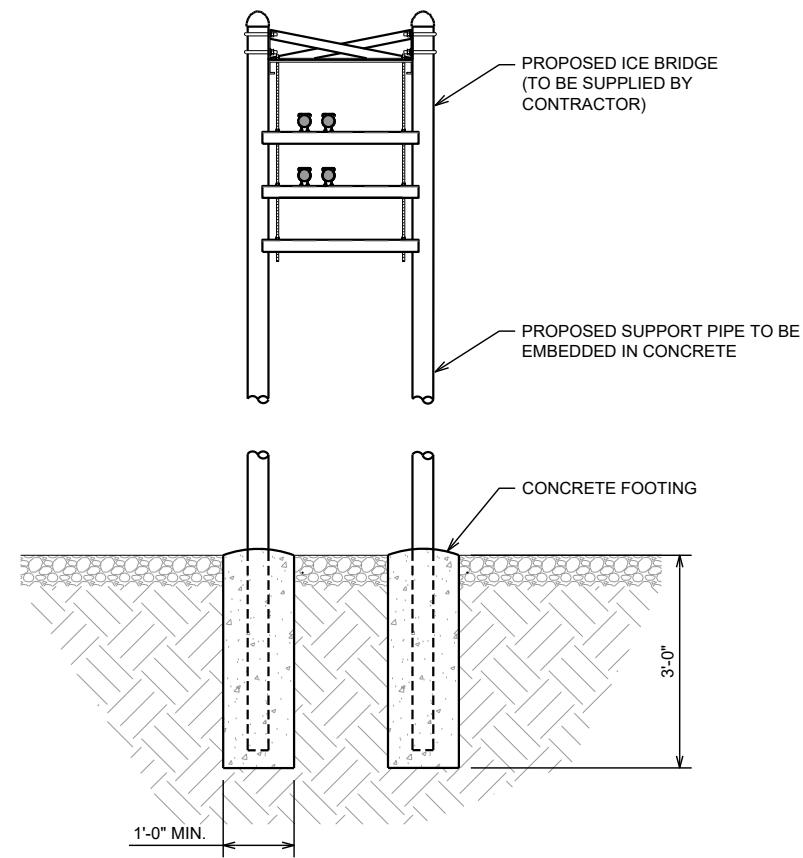
- COAX MUST COME OFF TOWER AT AN ELEVATION LOWER THAN RF ENTRY PORT TO PREVENT WATER MIGRATING TOWARDS SHELTER
- ZIP TIES ARE NOT TO BE PERMANENT BUT MAY BE USED FOR TEMPORARY CONSTRUCTION



**ICE BRIDGE DETAIL**  
N.T.S.



**ISOMETRIC VIEW**  
N.T.S.



**SIDE VIEW**  
N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.665769°

SEAL: FIRM #: P-1016



12/14/2020

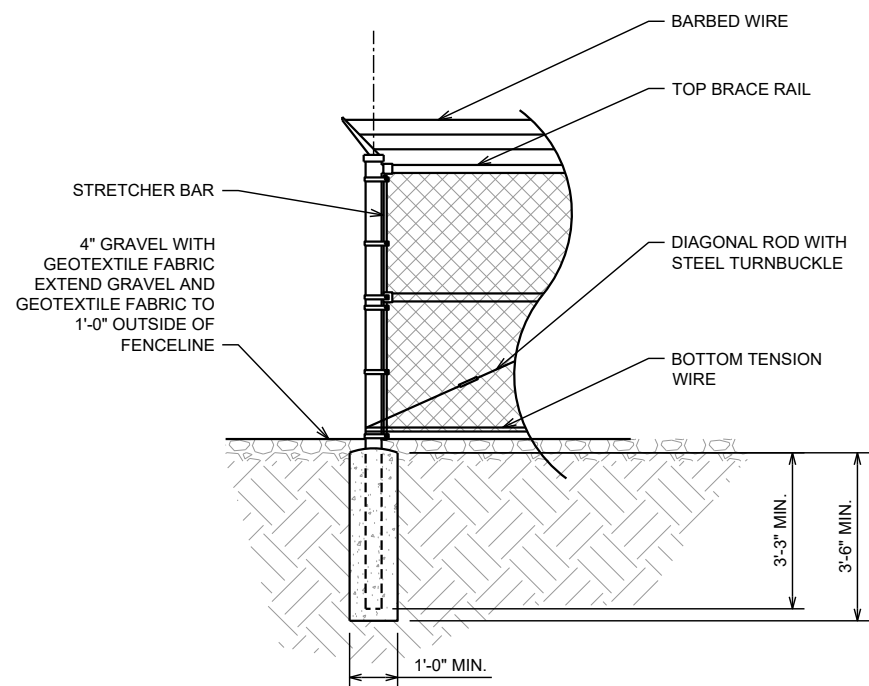
REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**ICE BRIDGE DETAILS**

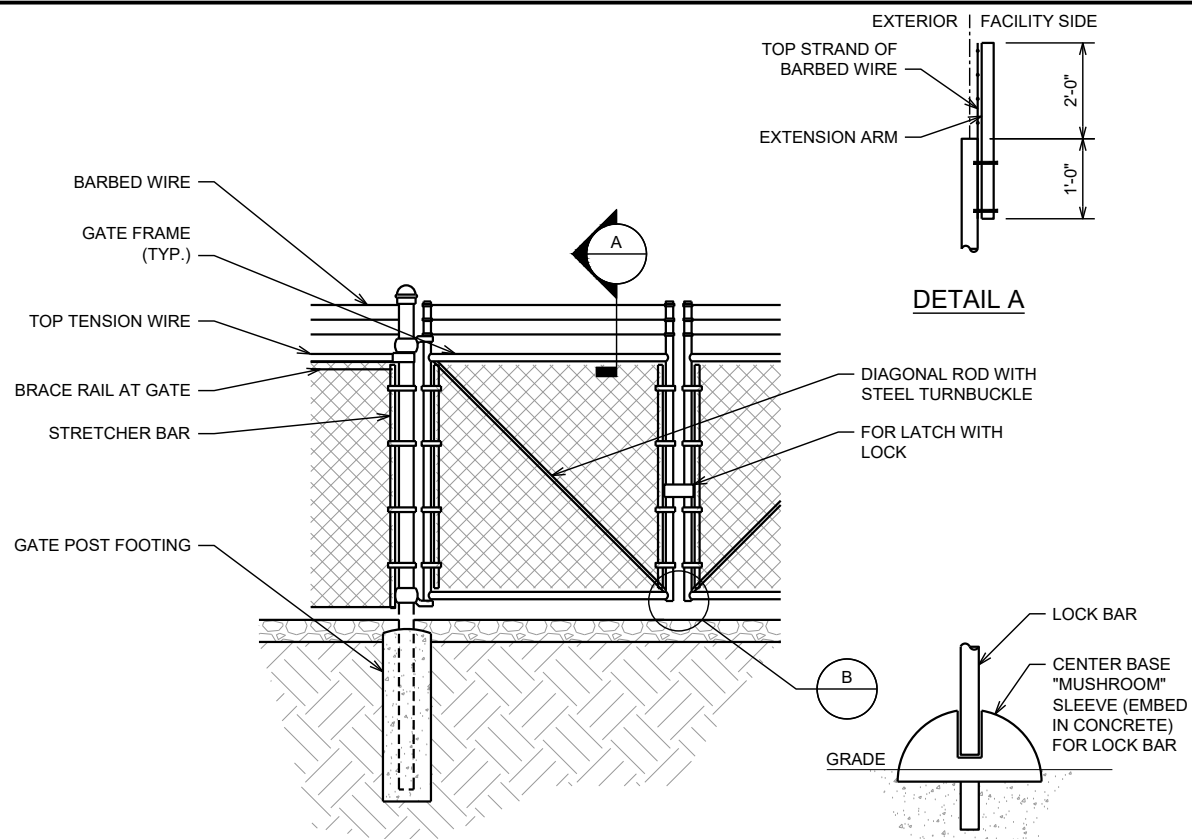
SHEET # **C-4.5**      CURRENT REV #: 1  
ETS #: 204581.AE.02





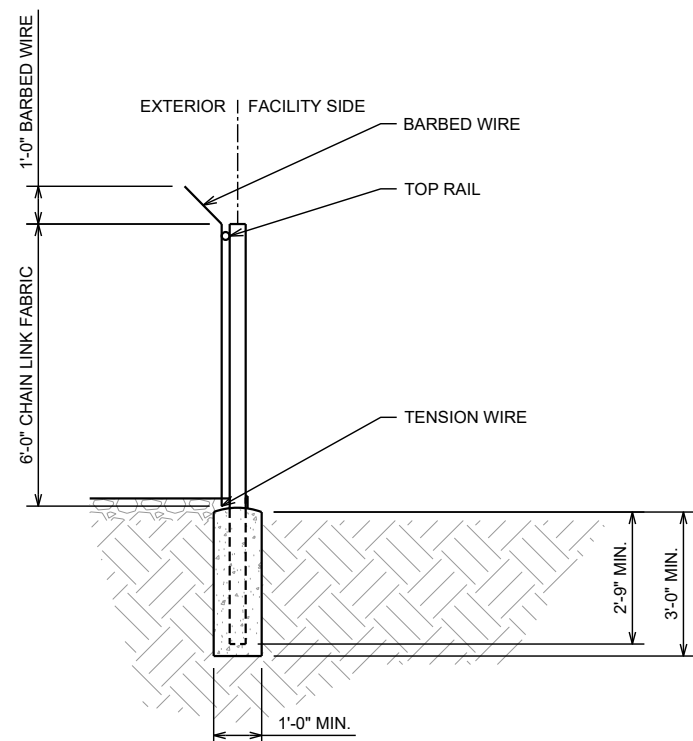
**CORNER, GATE, END OR PULL POST DETAIL**

N.T.S.



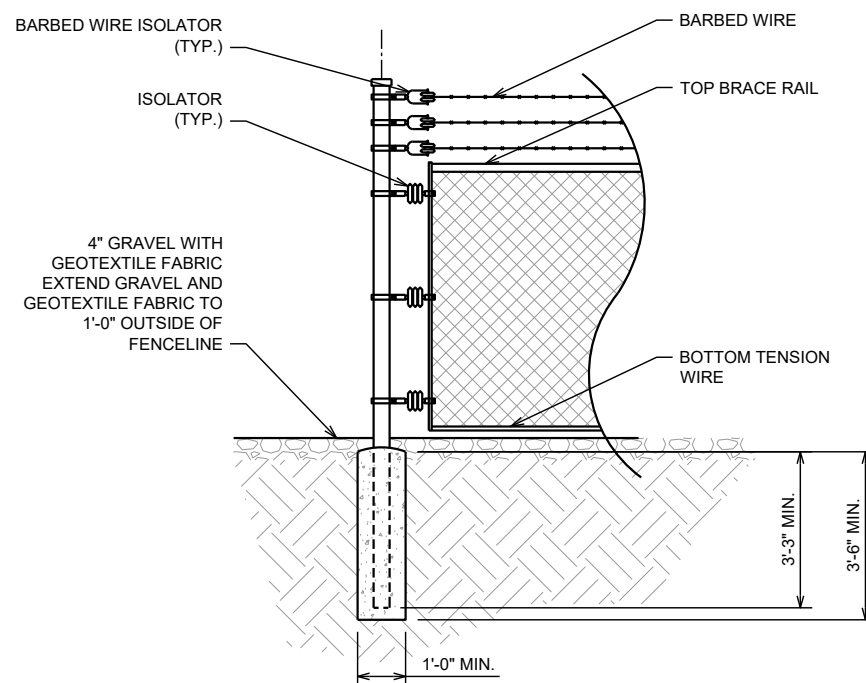
**SWING GATE DETAIL**

N.T.S.



**FENCE POST DETAIL**

N.T.S.



**CORNER, GATE, END OR PULL POST DETAIL**

N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL: FIRM #: P-1016



REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA CHECKED BY: AD

SHEET TITLE:  
**FENCE DETAILS**

SHEET # **C-4.6** CURRENT REV #: 1  
ETS #: 204581.AE.02

### ELECTRICAL NOTES

**SCOPE**

- SHALL INCLUDE ALL LABOR, MATERIALS AND APPLIANCES REQUIRED FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR OPERATION OF ALL WORK SHOWN ON THE DRAWING AS SPECIFIED HEREIN:
  - ELECTRIC SERVICE
  - CONDUIT AND RACEWAY
  - CONDUCTORS
  - MISCELLANEOUS MATERIALS
  - TELEPHONE CONDUITS
  - LIGHTNING ARRESTING SYSTEM

**CODES**

- THE INSTALLATION SHALL COMPLY WITH ALL LAWS APPLYING TO ELECTRICAL INSTALLATION IN EFFECT WITH THE REGULATIONS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL SAFETY CODE AND THE ICC 2012, ADMINISTRATIVE RULES WITH THE NATIONAL ELECTRIC CODE, AND ANY LOCAL CODES AND ORDINANCES WITH THE REGULATION OF THE SERVING UTILITY COMPANY. ALL PERMITS REQUIRED SHALL BE OBTAINED AND, AFTER COMPLETION OF WORK, THE OWNER SHALL BE FURNISHED A CERTIFICATE OF FINAL INSPECTION AND APPROVAL.

**TESTING**

- UPON COMPLETION OF THE INSTALLATION, OPERATE AND ADJUST ALL EQUIPMENT AND SYSTEMS TO MEET SPECIFIED PERFORMANCE REQUIREMENTS. ALL TESTING SHALL BE DONE BY QUALIFIED PERSONNEL.

**GURANTEE**

- IN ADDITION TO THE GUARANTEE OF THE EQUIPMENT BY THE MANUFACTURER, EACH PIECE OF EQUIPMENT SPECIFIED HEREIN SHALL ALSO BE GUARANTEED FOR DEFECTS OF MATERIAL OR WORKMANSHIP OCCURRING DURING A PERIOD OF ONE (1) YEAR FROM FINAL ACCEPTANCE OF THE WORK BY THE OWNER. WITHOUT EXPENSE TO THE OWNER ALL WARRANTIES, CERTIFICATES & GUARANTEES FURNISHED BY THE MANUFACTURERS SHALL BE TURNED OVER TO THE OWNER.

**COORDINATION**

- CONTRACTOR SHALL COORDINATE ALL WORK WITH THE POWER AND TELEPHONE COMPANIES AND SHALL COMPLY WITH ALL SERVICE REQUIREMENTS OF EACH UTILITY COMPANY, IF REQUIRED.

**EXAMINATION OF SITE**

- PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE JOB AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED ELECTRICAL INSTALLATION AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FAILURE TO COMPLY WITH THE INTENT OF THIS PARAGRAPH WILL IN NO WAY RELIEVE THE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM OR SYSTEMS.

**CUTTING, PATCHING AND EXCAVATION**

- COORDINATION OF ALL SLEEVES, CHASES, ETC., WILL BE REQUIRED PRIOR TO THE CONSTRUCTION OF ANY PORTION OF THE WORK. ALL CUTTING AND PATCHING OF WALLS, PARTITIONS, FLOORS, AND CHASES IN CONCRETE, WOOD, STEEL OR MASONRY SHALL BE DONE AS PROVIDED ON THE DRAWINGS.
- ALL NECESSARY EXCAVATIONS AND BACKFILLING INCIDENTAL TO THE WORK UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWING SHALL BE PROVIDED BY THIS CONTRACTOR.
- SEAL ALL PENETRATION THROUGH WALL AND FLOORS WITH APPROVED GROUT.

**RACEWAYS**

- ALL CONDUCTORS SHALL BE INSTALLED IN CONDUIT. ALL CONDUIT SHALL BE RIGID STEEL EMT OR SCH40 PVC. AS INDICATED ON THE DRAWINGS.
- WHERE INSTALLED ON EXTERIORS AND EXPOSED TO DAMAGE, ALL CONDUIT SHALL BE RIGID STEEL. ALUMINUM CONDUIT SHALL NOT BE ALLOWED.
- CONCEALED CONDUIT IN WALLS OR INTERIOR SPACES ABOVE GRADE MAY BE EMT.
- UNDERGROUND CONDUITS SHALL BE RIGID STEEL OR SCHEDULE 40 PVC AS INDICATED ON THE DRAWINGS.
- ALL CONDUIT RUNS SHALL USE APPROVED COUPLINGS AND CONNECTORS. PROVIDE INSULATED BUSHING FOR ALL CONDUIT TERMINATIONS. ALL CONDUIT RUNS IN A WET LOCATION SHALL HAVE WATERPROOF FITTINGS.
- PROVIDE SUPPORTS FOR ALL CONDUITS IN ACCORDANCE WITH NEC REQUIREMENTS. ALL CONDUITS SHALL BE SIZED AS REQUIRED BY NEC.
- BURIAL DEPTH OF ALL CONDUITS SHALL BE AS REQUIRED BY CODE FOR EACH SPECIFIC CONDUIT TYPE AND APPLICATION.
- CONDUIT ROUTES ARE SCHEMATIC. CONTRACTOR SHALL FIELD VERIFY BEFORE BID. COORDINATE ROUTE WITH WIRELESS CARRIER AND BUILDING OWNER.

### ELECTRICAL NOTES

**EXTERIOR CONDUIT**

- ALL EXPOSED CONDUIT SHALL BE NEATLY INSTALLED AND RUN PARALLEL OR PERPENDICULAR TO STRUCTURAL ELEMENTS. SUPPORTS AND MOUNTING HARDWARE SHALL BE HOT DIPPED GALVANIZED STEEL.

**EQUIPMENT**

- ALL DISCONNECT SWITCHES SHALL BE SERVICE ENTRANCE RATED, HEAVY DUTY TYPE.
- NEW CIRCUIT BREAKERS SHALL BE RATED TO WITHSTAND THE MAXIMUM AVAILABLE FAULT CURRENT AS DETERMINED BY THE LOCAL UTILITY. CONTRACTOR SHALL VERIFY MAXIMUM AVAILABLE FAULT CURRENT, AND COORDINATE INSTALLATION WITH THE LOCAL UTILITY BEFORE STARTING WORK.

**CONDUCTORS**

- FURNISH AND INSTALL CONDUCTORS CALLED FOR IN THE DRAWINGS. ALL CONDUCTORS SHALL HAVE TYPE THWN (MIN) (75 DEGREE) INSULATION, RATED FOR 600 VOLTS.
- ALL CONDUCTORS SHALL BE UL LISTED AND SHALL BE PROVIDED AND INSTALLED AS FOLLOWS:
  - MINIMUM WIRE SIZE SHALL BE #12 AWG.
  - ALL CONDUCTORS SIZE #8 AND LARGER SHALL BE STRANDED. CONDUCTORS SIZED #10 AND SMALLER MAY BE SOLID OR STRANDED.
  - CONNECTION FOR #10 AWG AND SMALLER SHALL BE BY TWISTING TIGHT AND INSTALLING INSULATED PRESSURE OR WIRE NUT CONNECTIONS.
  - CONNECTION FOR #8 AWG AND LARGER SHALL BE BY USE OF STEEL CRIMP-ON SLEEVES WITH NYLON INSULATOR.
- ALL CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NEC STANDARDS.
- THE RACEWAY SYSTEM SHALL BE COMPLETE BEFORE INSTALLING CONDUCTORS

**PENETRATIONS**

- CONTRACTOR SHALL COMPLY WITH UL PENETRATION DETAILS FOR PENETRATIONS OF ALL RATED WALLS, ROOF, ETC.

**GROUNDING**

- ALL ELECTRICAL NEUTRALS, RACEWAYS AND NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND ASSOCIATED ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250. THIS SHALL INCLUDE NEUTRAL CONDUCTORS, CONDUITS, SUPPORTS, CABINETS, BOXES, GROUND BUSSES, ETC. THE NEUTRAL CONDUCTOR FOR EACH SYSTEM SHALL BE GROUNDED BY ONE POINT ONLY.
- PROVIDE GROUND CONDUCTOR IN ALL RACEWAYS.
- PROVIDE BONDING AND GROUND TO MEET NFPA 780 - LIGHTNING PROTECTION AS A MINIMUM.
- ALL GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH MOTOROLA R-56 GUIDELINES, SECTION 4.

### ABBREVIATIONS

A	AMPERE	NEC	NATIONAL ELECTRIC CODE
AFG	ABOVE FINISHED GRADE	PH	PHASE
ATS	AUTOMATIC TRANSFER SWITCH	PNL	PANEL
AWG	AMERICAN WIRE GAUGE	PNLBD	PANELBOARD
BCW	BARE COPPER WIRE	PVC	SCH 40 RIGID NON-METALLIC CONDUIT
BFG	BELOW FINISHED GRADE	RGS	RIGID GALVANIZED STEEL CONDUIT
BKR	BREAKER	SW	SWITCH
C	CONDUIT	TGB	TOWER GROUND BAR
CKT	CIRCUIT	UL	UNDERWRITERS LABORATORIES
DISC	DISCONNECT	V	VOLTAGE
EGR	EXTERNAL GROUND RING	W	WATTS
EMT	ELECTRIC METALLIC TUBING	XFMR	TRANSFORMER
FSC	FLEXIBLE STEEL CONDUIT	XMTR	TRANSMITTER
GEN	GENERATOR		
GPS	GLOBAL POSITIONING SYSTEM		
GRD	GROUND		
IGB	ISOLATED GROUND BAR		
IGR	INTERIOR GROUND RING (HALO)		
KW	KILOWATTS		

— E —	UNDERGROUND ELECTRICAL CONDUIT
— T —	UNDERGROUND TELEPHONE CONDUIT
	KILOWATT-HOUR METER
-----	UNDERGROUND BONDING AND GROUNDING CONDUCTOR
	GROUND ROD
	GROUND ROD WITH INSPECTION WELL
●	CADWELD (EXOTHERMIC)
■	MECHANICAL

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061° -78.655769°

SEAL: FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**ELECTRICAL NOTES**

SHEET # **E-1**      CURRENT REV #: 1  
ETS #: 204581.AE.02

**200A, 120/240V, POWER PANEL SCHEDULE, MCB.**

LOAD SERVED	VA (WATTS)		WIRE	BREAKER		CKT #	PHASE	CKT #	BREAKER		WIRE	VA (WATTS)		LOAD SERVED
	L1	L2		P	TRIP				P	TRIP		L1	L2	
HVAC #1	2940		--	2	50A	1	A	2	2	50A	--	2940		HVAC #2
		2940				3	B	4			--		2940	
LIGHTS	320		--	1	20A	5	A	6	1	20A	--	180		TWIST REC
QUAD REC		720	--	1	20A	7	B	8	1	20A	--		180	TWIST REC
QUAD REC	1080		--	1	20A	9	A	10	1	20A	--	180		TWIST REC
SMOKE		9.6	--	1	20A	11	B	12	1	20A	--		180	TWIST REC
DEHYDRATOR	55		--	1	20A	13	A	14	1	20A	--	180		TWIST REC
TOWER LIGHT		386.1	--	1	20A	15	B	16	1	20A	--		180	TWIST REC
--			--	--	--	17	A	18	1	20A	--	180		TWIST REC
TWIST REC		1750	--	1	20A	19	B	20	--	--	--		--	SPARE
TWISTLOCK REC	1750		--	2	20A	21	A	22	--	--	--			SPARE
		1750				23	B	24	2	60A	--		4	SURGE ARRESTOR
TWISTLOCK REC	1750		--	2	20A	25	A	26	--	--	--	4		SPARE
		1750				27	B	28	--	--	--			SPARE
TWISTLOCK REC	1750		--	2	20A	29	A	30	--	--	--			SPARE
		1750				31	B	32	--	--	--			SPARE
TWISTLOCK REC	1750		--	2	20A	33	A	34	--	--	--			SPARE
		1750				35	B	36	--	--	--			SPARE
TWISTLOCK REC	1750		--	2	20A	37	A	38	--	--	--			SPARE
		1750				39	B	40	--	--	--			SPARE
GFCI REC	180		--	1	20A	41	A	42	--	--	--			SPARE

VOLT AMPS	13,325	14,556
-----------	--------	--------

3,664	3,484	VOLT AMPS
-------	-------	-----------

16,989	18,040	TOTAL VOLT AMPERES
142	150	TOTAL AMPS PER LEG
152.50		CONNECTED
163.70		DEMAND
36.30		SPARE

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:




SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, 78.655769°

SEAL: FIRM #: P-1016



12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

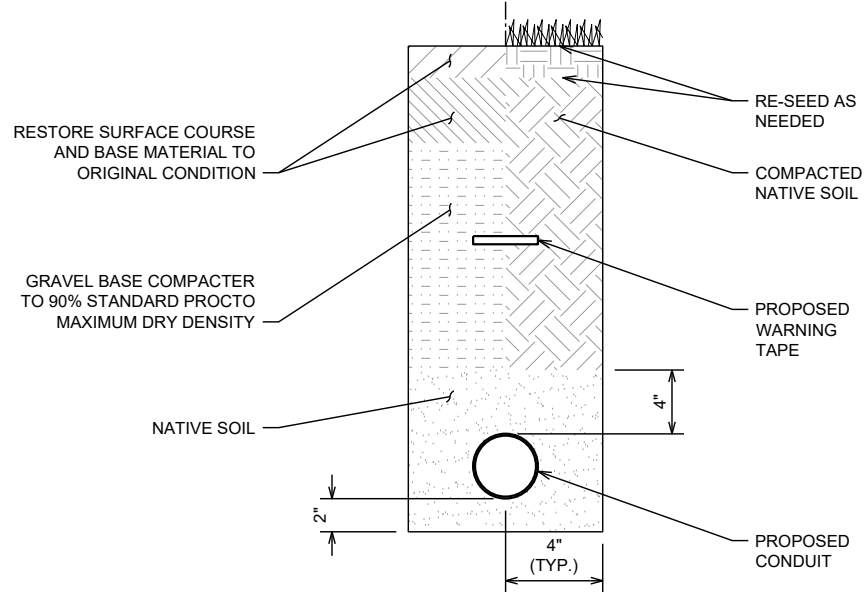
DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**SHELTER PANEL SCHEDULE**

SHEET # **E-2**      CURRENT REV #: 1  
ETS #: 204581.AE.02

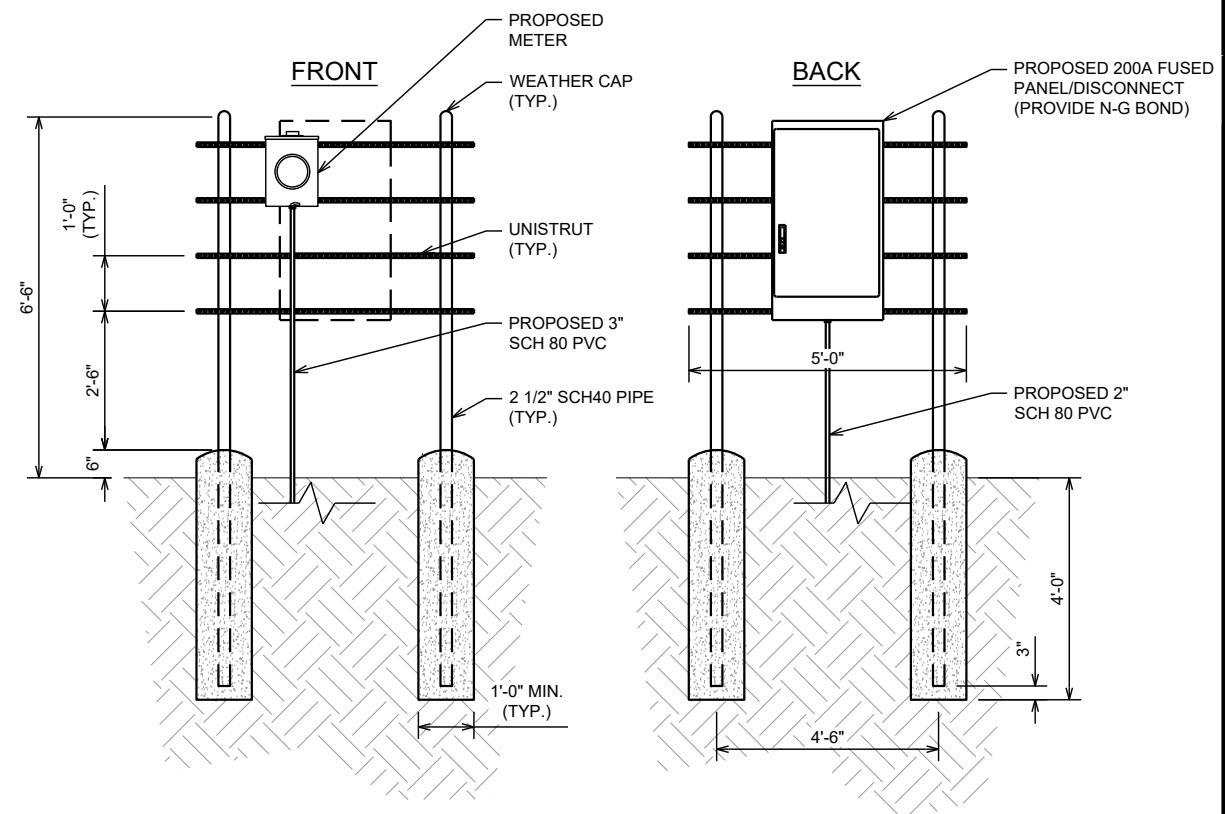
SECTION FOR USE  
UNDER PAVEMENT OR  
VEHICLE TRAFFIC AREAS

SECTION FOR USE  
UNDER GRASS OR BARE  
GROUND AREAS



**TRENCH DETAIL**

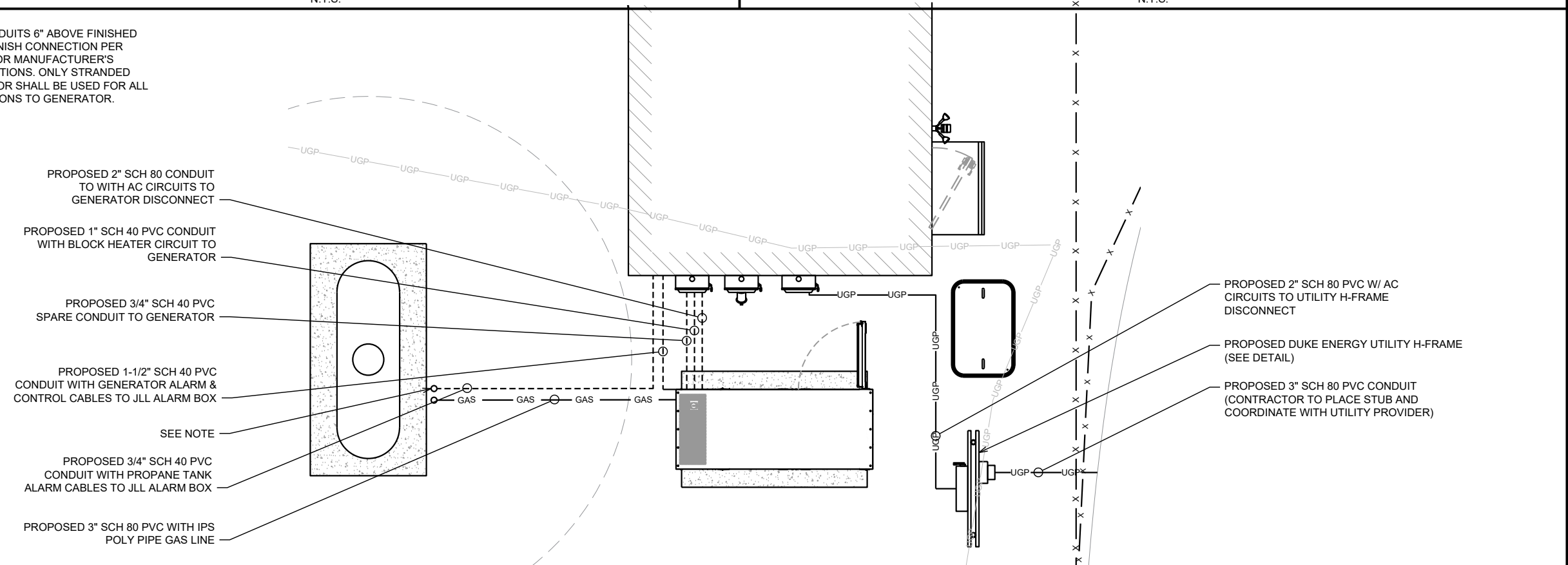
N.T.S.



**UTILITY H-FRAME DETAIL**

N.T.S.

**NOTE**  
1. STUB CONDUITS 6" ABOVE FINISHED GRADE. FINISH CONNECTION PER GENERATOR MANUFACTURER'S SPECIFICATIONS. ONLY STRANDED CONDUCTOR SHALL BE USED FOR ALL CONNECTIONS TO GENERATOR.



**ELECTRICAL PLAN**

3/16" = 1'-0"

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

**DUKE ENERGY**

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -79.655769°

SEAL: FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

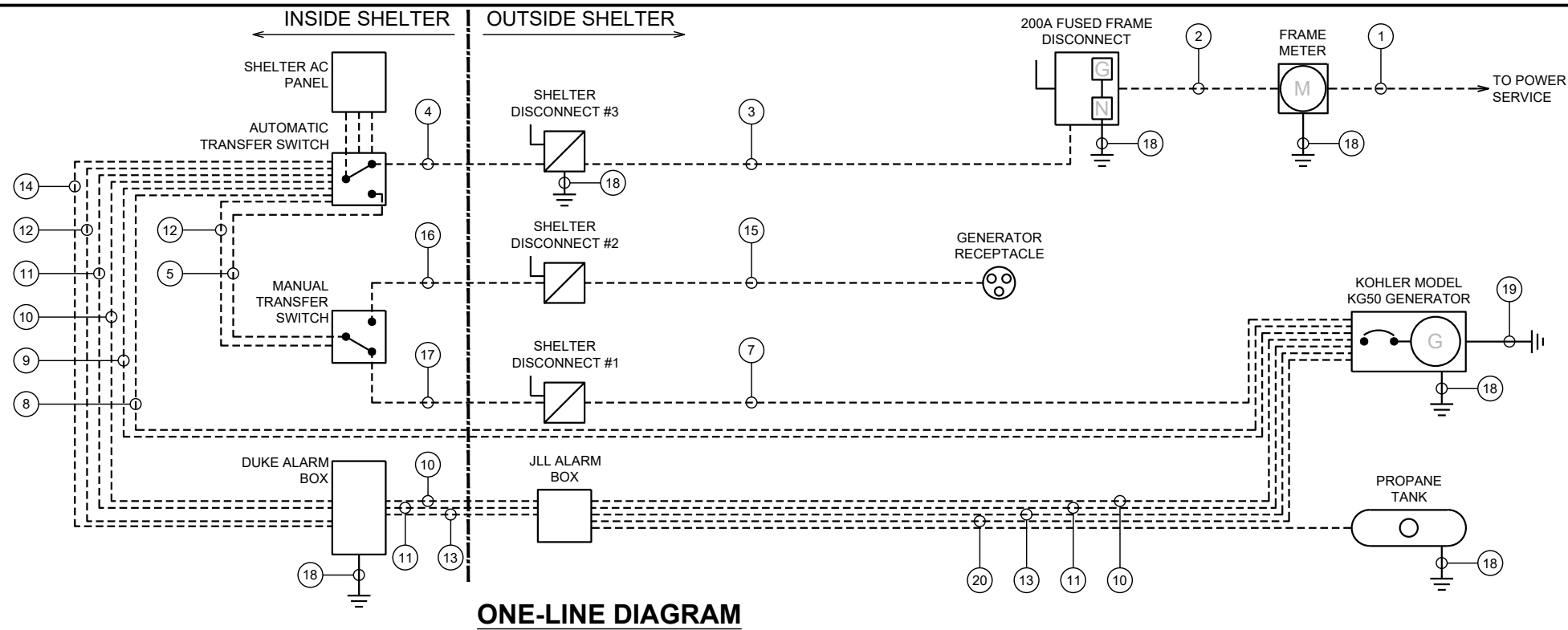
DRAWN BY: HA CHECKED BY: AD

SHEET TITLE:  
**ELECTRICAL PLAN**

SHEET # **E-3** CURRENT REV #: 1  
ETS #: 204581.AE.02

**NOTES:**

- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE
- ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES, AND EQUIPMENT SHALL BE LABELED/LISTED BY UL OR A NORTH CAROLINA APPROVED THIRD PARTY TESTING AGENCY
- SUBCONTRACTOR TO LEAVE EXTRA PULL TAPE FOR FUTURE CABLE INSTALL BY OTHERS
- OTHERS WILL BE ROUTING CABLE FROM THE JLL BOX THROUGH CONDUIT TO THE PROPANE TANK FOR LPG LEVEL MONITORING ONLY CONTROL AND ALARM CABLES (ITEMS #10-13) WITH EITHER PASS THROUGH OR LAND IN THE DUKE ENERGY ALARM BOX. AC CABLES (ITEMS #8-9) WILL BE ROUTED FROM AUTOMATIC TRANSFER SWITCH TO GENERATOR IN ITS OWN DEDICATED 1" CONDUIT
- SEE SHEET E-2 FOR SHELTER PANEL SCHEDULE
- SEE SHEET E-3 FOR ROUTE DETAILS



**ONE-LINE DIAGRAM**

**CIRCUIT SCHEDULE**

	FROM	TO	CONDUCTOR	RACEWAY	BY	FUNCTION	NOTES
1	SOURCE	METER	(3) 3/0 (1) #4 G	3" SCH 80 PVC	LOCAL UTILITY	POWER SOURCE	2 1/2" SCH 80 PVC RISER TO METER, 3" SCH 80 PVC UNDERGROUND
2	METER	FRAME DISCONNECT SWITCH	(3) 3/0 (1) #4 G	2" SCH 80 PVC	SUBCONTRACTOR	METER DISCONNECT	
3	FRAME DISCONNECT SWITCH	#3 SHELTER DISCONNECT SWITCH	(3) 3/0 (1) #4 G	2" SCH 80 PVC	SUBCONTRACTOR	MAIN DISCONNECT	
4	#3 SHELTER DISCONNECT SWITCH	AUTOMATIC TRANSFER SWITCH	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	SERVICE ENTRANCE	
5	AUTOMATIC TRANSFER SWITCH	MANUAL TRANSFER SWITCH	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	TEMPORARY EMERGENCY POWER	
6	AUTOMATIC TRANSFER SWITCH	AC POWER PANEL	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	AC POWER TO BREAKERS	
7	STANDBY GENERATOR	#1 SHELTER DISCONNECT SWITCH	(3) 3/0 (1) #4 G	2" SCH 80 PVC	SUBCONTRACTOR	AUTO EMERGENCY POWER	
8	AC POWER PANEL	STANDBY GENERATOR CONTROL BOARD	(2) #12	1" SCH 40 PVC	SUBCONTRACTOR	BATTERY CHARGER	ROUTE CABLES THROUGH AUTOMATIC TRANSFER SWITCH TO GENERATOR USING DEDICATED 1" CONDUITS
9	AC POWER PANEL	STANDBY GENERATOR CONTROL BOARD	(2) #12 (1) #12 G	1" SCH 40 PVC	SUBCONTRACTOR	ENGINE HTR/COOLANT	
10	STANDBY GENERATOR CONTROL BOARD	AUTOMATIC TRANSFER SWITCH	(2) #14 (DC)	1-1/2" SCH 40 PVC	SUBCONTRACTOR	CONTROL	ROUTE VIA DUKE ENERGY ALARM BOX. CABLE WILL BE ROUTED THROUGH 2 SEPARATE CONDUITS. AUTOMATIC TRANSFER SWITCH TO DUKE ENERGY ALARM BOX AND THEN JLL ALARM BOX TO GENERATOR
11	STANDBY GENERATOR CONTROL BOARD	AUTOMATIC TRANSFER SWITCH	2-WIRE RS485	1-1/2" SCH 40 PVC	SUBCONTRACTOR	CONTROL	
12	MANUAL TRANSFER SWITCH	DUKE ENERGY ALARM BOX	(4) #18	1" PVC	SUBCONTRACTOR	MANUAL TRANSFER SWITCH ALARM	ROUTE VIA AUTOMATIC TRANSFER SWITCH. SEE E-## ON WHERE TO LAND CABLES IN DUKE ENERGY ALARM BOX. CABLE PART #: BELDEN 83351E
13	STANDBY GENERATOR CONTROL BOARD	DUKE ENERGY ALARM BOX	(15) #18	1-1/2" SCH 40 PVC	SUBCONTRACTOR	GENERATOR ALARMS	SEE E-5 ON WHERE TO TERMINATE CABLES WITHIN DUKE ENERGY ALARM BOX CABLE PART #: BELDEN 8874MN
14	AUTOMATIC TRANSFER SWITCH	DUKE ENERGY ALARM BOX	(8) #18	1" PVC	SUBCONTRACTOR	AUTOMATIC TRANSFER SWITCH ALARMS	SEE E-5 ON WHERE TO TERMINATE CABLES WITHIN DUKE ENERGY ALARM BOX CABLE PART #: BELDEN 8448
15	PORTABLE GENERATOR RECEPTACLE	#2 SHELTER DISCONNECT SWITCH	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	PORTABLE EMERGENCY POWER	
16	#2 SHELTER DISCONNECT SWITCH	MANUAL TRANSFER SWITCH	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	PORTABLE EMERGENCY POWER	
17	#1 SHELTER DISCONNECT SWITCH	MANUAL TRANSFER SWITCH	(3) 3/0 (1) #4 G	2" RGSC	SHELTER MANUFACTURER	AUTO EMERGENCY POWER	
18	EQUIPMENT	GROUND RING	#2 THHN	NONE	SUBCONTRACTOR	GROUND CONNECTION	
19	GENERATOR	GROUND RING	2/0 BCW	NONE	SUBCONTRACTOR	GROUND CONNECTION	
20	STANDBY GENERATOR CONTROL BOARD	JLL ALARM BOX	(10) #18	1-1/2" SCH 40 PVC	SUBCONTRACTOR	GENERATOR ALARMS	LEAVE CABLE 20 IN JLL ALARM BOX, CABLE PART #: BELDEN 5308UE

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

SEAL: FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:  
**ONE-LINE DIAGRAM**

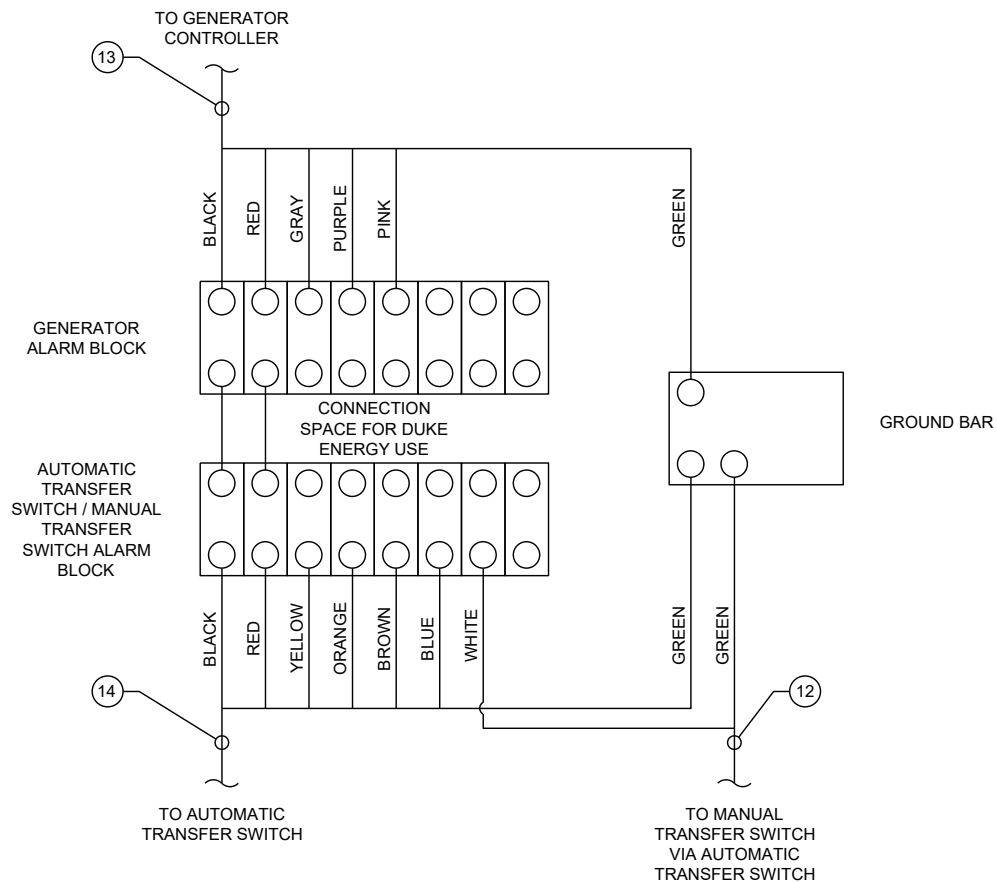
SHEET # **E-4**      CURRENT REV #: 1  
ETS #: 204581.AE.02

**AUTOMATIC TRANSFER SWITCH AND MANUAL TRANSFER SWITCH BLOCK ALARM ASSIGNMENT (CABLE COLOR)**

1. START (BLACK)
2. STOP (RED)
3. ACPF (YELLOW)
4. ENGR (ORANGE)
5. TVSJ (BROWN)
6. EPOT (BLUE)
7. MTSN (WHITE)
8. FUTURE (UNASSIGNED)

**GENERATOR ALARM TERMINAL BLOCK ALARM ASSIGNMENT (CABLE COLOR)**

9. START (BLACK)
10. STOP (RED)
11. ENGN (GRAY)
12. ENJ (PURPLE)
13. EETA (PINK)
14. FUTURE (TAN)
15. FUTURE (AQUA)
16. FUTURE (LIGHT BLUE)



**NOTES**

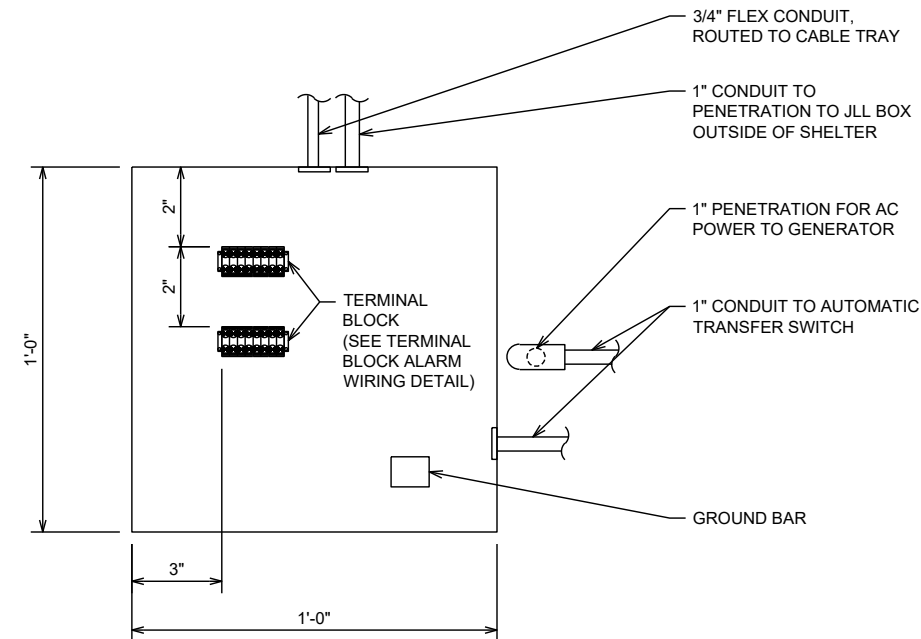
1. SEE REFERENCE DOCUMENT (ENGINE CONTROL & ALARM DIAGRAMS) FOR EQUIPMENT SIDE TERMINATIONS
2. NUMBERING TO FOLLOW WHAT IS DEPICTED IN TERMINAL BLOCK ALARM WIRING DETAIL. SUBCONTRACTOR TO LABEL BLOCK POSITIONS FOR EACH TERMINAL BLOCK (P/N: UTILITECH GTB-408-UT)
3. SEE SHEET E-3 FOR CABLE TYPE AND DESTINATION ROUTING
4. ITEM 12 (P/N: BELDEN 83351E) 4 CONDUCTOR #18 AWG SHIELDED. SUBCONTRACTOR TO CUT TO LENGTH AND COIL EXTRA CONDUCTORS. THIS CABLE WILL TERMINATE ON THE AUTOMATIC TRANSFER SWITCH/MANUAL TRANSFER SWITCH ALARM BLOCK AND LAND IN THE MANUAL TRANSFER SWITCH VIA THE AUTOMATIC TRANSFER SWITCH.
5. ITEM 13 (P/N: BELDEN 8874MN) 15 CONDUCTOR #18 AWG SHIELDED. SUBCONTRACTOR TO CUT TO LENGTH AND COIL EXTRA CONDUCTORS. THIS CABLE WILL TERMINATE ON THE GENERATOR ALARM BLOCK AND LAND INSIDE THE GENERATOR.
6. ITEM 14 (P/N: BELDEN 8448) 8 CONDUCTOR #18 AWG. SUBCONTRACTOR TO CUT TO LENGTH AND COIL EXTRA CONDUCTORS. THIS CABLE WILL TERMINATE ON THE AUTOMATIC TRANSFER SWITCH/MANUAL TRANSFER SWITCH ALARM BLOCK AND LAND INSIDE THE AUTOMATIC TRANSFER SWITCH. SUBCONTRACTOR TO FOLLOW DUKE ENERGY ALARM WIRING DIAGRAM TO TERMINATE ALARM WIRING WITHIN THE AUTOMATIC TRANSFER SWITCH.

**TERMINAL BLOCK ALARM WIRING**

N.T.S.

**NOTES**

1. DETAIL SHOWING JUNCTION BOX WITH COVER REMOVED (P/N: EATON 12126HC)
2. SUBCONTRACTOR TO GROUND JUNCTION BOX TO SHELTER GROUND



**DUKE ENERGY ALARM BOX INSTALLATION**

N.T.S.

PREPARED BY:



PREPARED FOR:



SITE NAME:

**ERWIN RADIO BLDG**

SITE NUMBER:

**NCDUN017**

SITE ADDRESS:

465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061° - 78.655769°

SEAL:

FIRM #: P-1016



12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

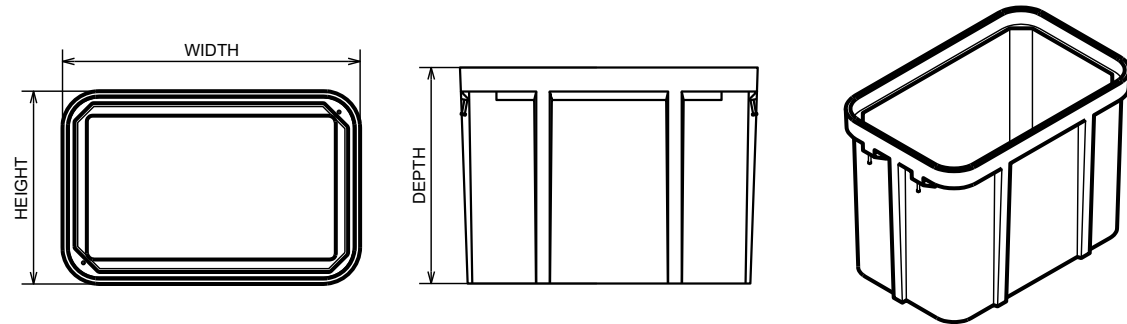
DRAWN BY: HA CHECKED BY: AD

SHEET TITLE:

**ALARM WIRING  
DETAILS**

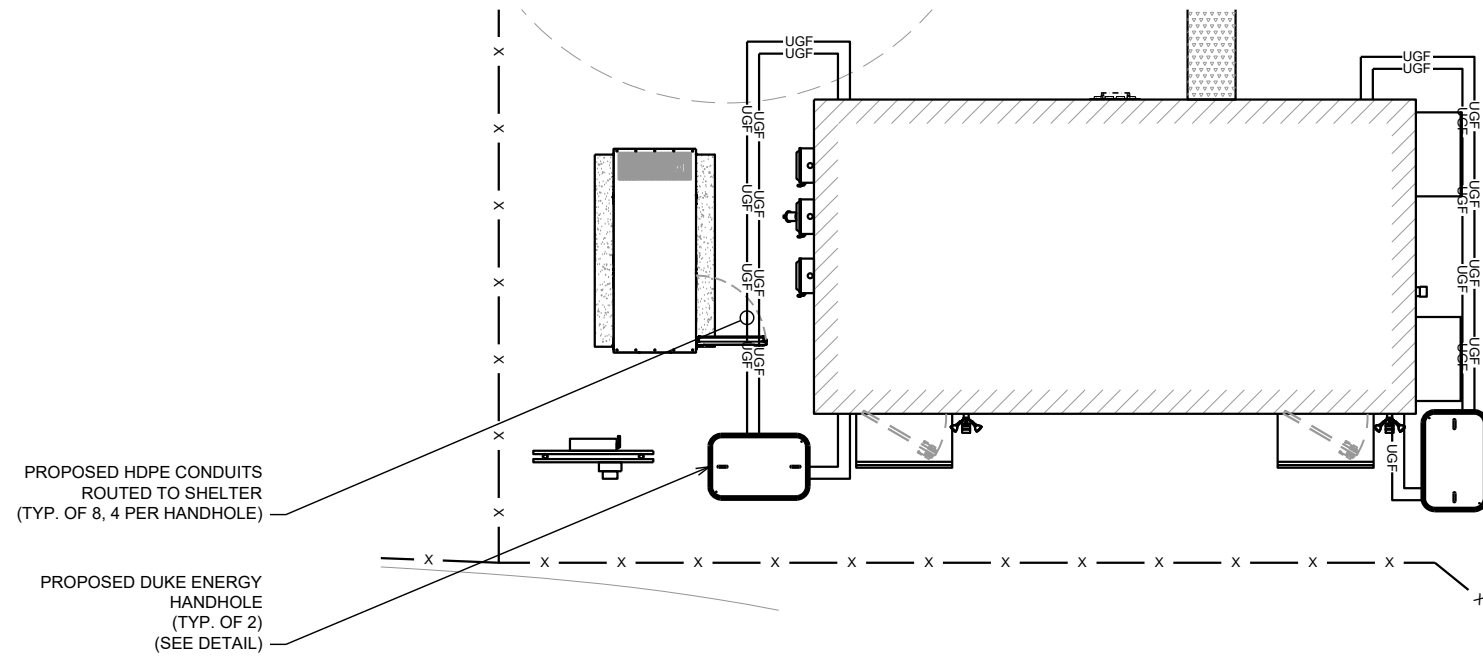
SHEET # **E-5** CURRENT REV #: 1  
ETS #: 204581.AE.02

HEIGHT	WIDTH	DEPTH	WEIGHT
34.125"	49.625"	36.000"	376.95 LBS



**SERVICE BOX DETAIL**  
N.T.S.

**NOT USED**  
N.T.S.



**FIBER ROUTING PLAN**  
1/8" = 1'-0"

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -78.655769°

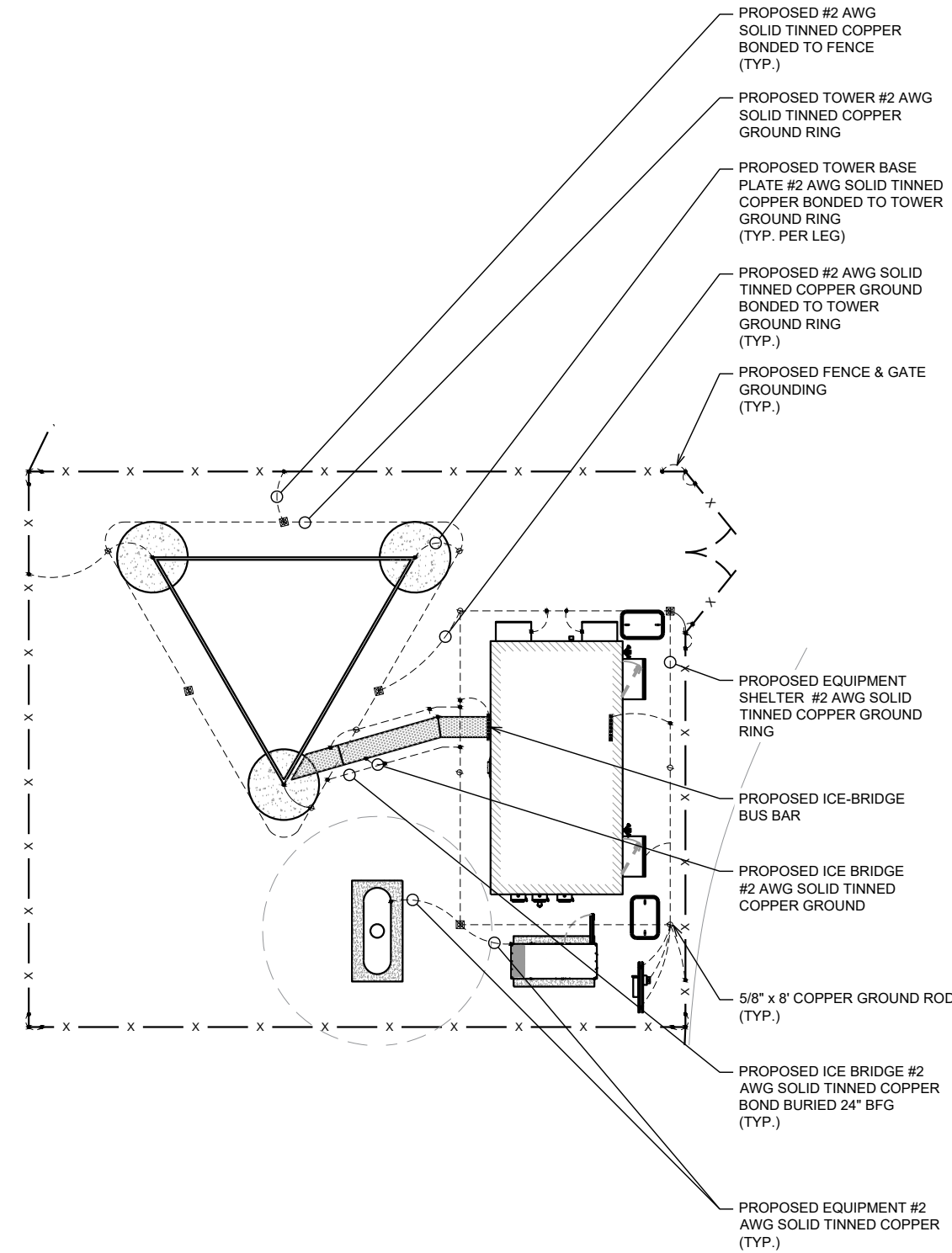
SEAL:  FIRM #: P-1016  
12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA | CHECKED BY: AD

SHEET TITLE:  
**FIBER ROUTING PLAN**

SHEET # **E-6** | CURRENT REV #: 1  
ETS #: 204581.AE.02

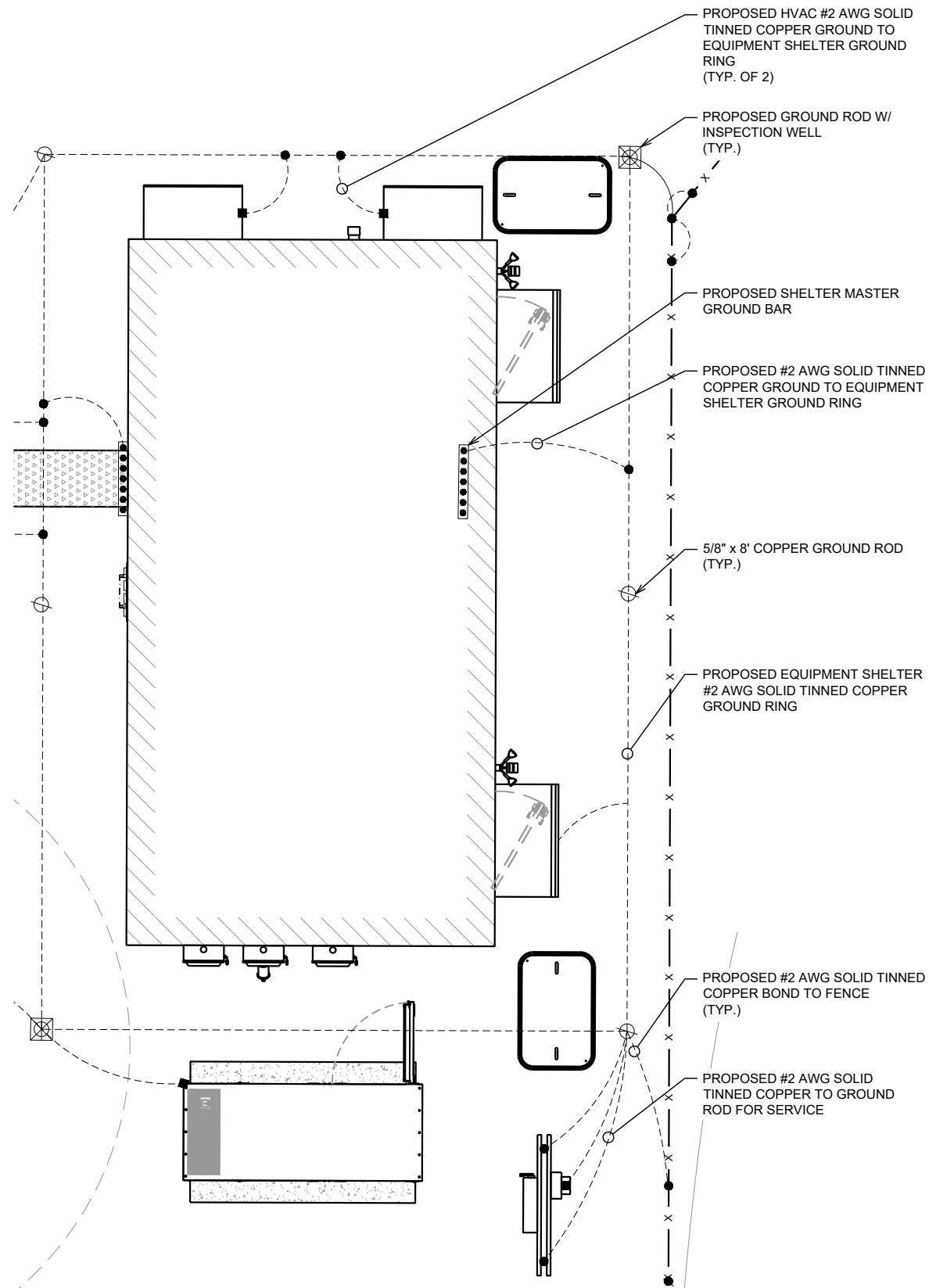


GROUNDING SYMBOLS:

	GROUND ROD
	GROUND ROD W/ INSPECTION WELL
	CADWELD
	MECHANICAL

**GROUNDING PLAN**

1/16" = 1'-0"



**PROPOSED SHELTER GROUNDING PLAN**

3/16" = 1'-0"

PREPARED BY:

**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:

SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061°, -76.655769°

SEAL: FIRM #: P-1016

12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

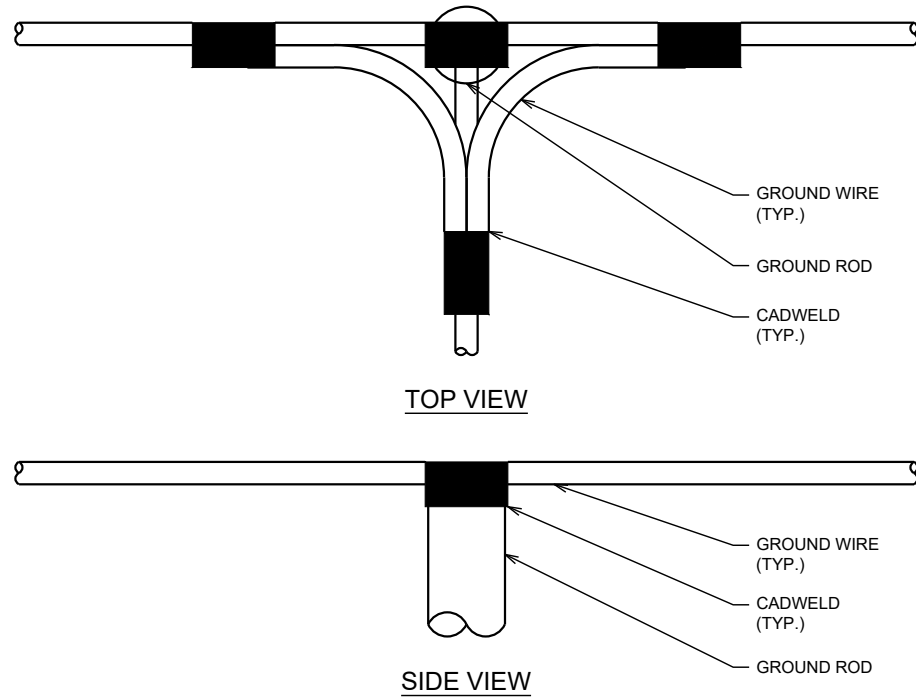
SHEET TITLE:  
**GROUNDING PLANS**

SHEET # **G-1**      CURRENT REV #: 1  
ETS #: 204581.AE.02



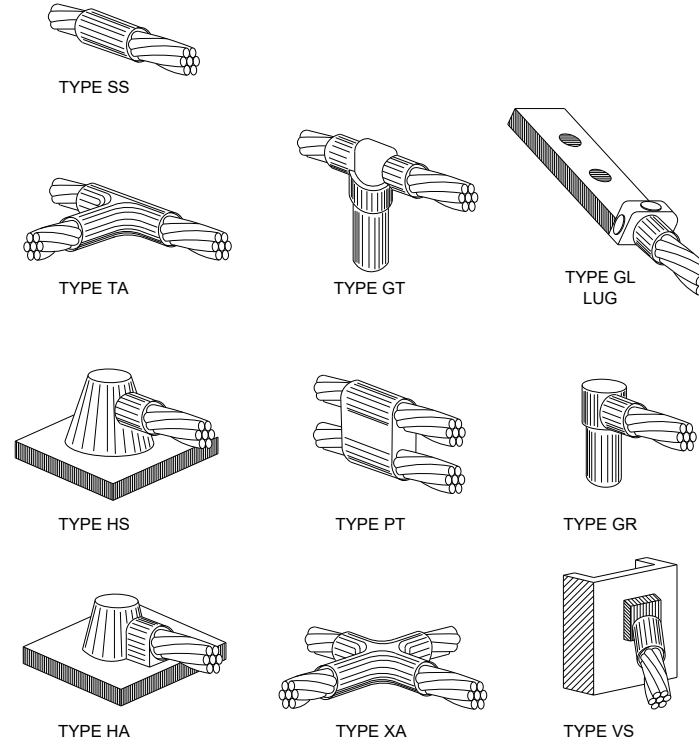
**NOTES:**

- MINIMUM SPACING OF 1'-0" BETWEEN ALL CADWELDS



**CADWELD GROUNDING DETAIL**

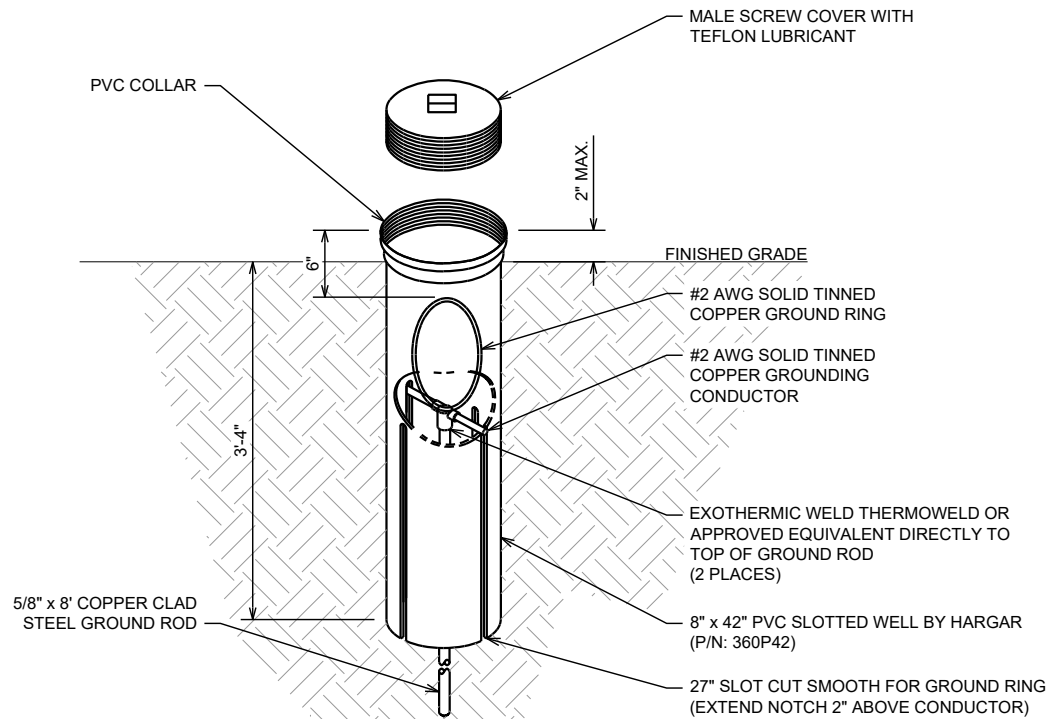
N.T.S.



**STANDARD CADWELD DETAILS**

N.T.S.

- GROUNDING ELECTRODES SHALL BE CONNECTED IN A RING USING #2 AWG SOLID TINNED BARE WIRE. THE TOP OF THE GROUND RODS AND THE RING CONDUCTOR SHALL BE 30 INCHES BELOW FINISHED GRADE OR BELOW FROST LINE; WHICHEVER IS GREATER. GROUNDING ELECTRODES SHALL BE INSTALLED A MINIMUM SPACING OF 16'-0"
- BONDING OF THE GROUNDED CONDUCTOR (NEUTRAL) AND THE GROUNDING CONDUCTOR SHALL BE AT THE SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER N.E.C. ARTICLE 250.30
- CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING SYSTEM IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.
- GROUND RINGS SHALL BE INSTALLED IN DIRECT CONTACT WITH THE EARTH AT A DEPTH OF 30 INCHES BELOW THE EARTH'S SURFACE WHEREVER POSSIBLE, OR BELOW THE FROST LINE, WHICHEVER IS DEEPER (ANSI T1.334-2002, SECTION 5.3.1 AND NFPA 70-2005, ARTICLE 250.53)
  - BUILDING GROUND RINGS SHALL BE INSTALLED AT LEAST 3 FEET FROM THE BUILDING FOUNDATION AND SHOULD BE INSTALLED BEYOND THE DRIP LINE OF THE ROOF. IT IS RECOMMENDED THAT THE BUILDING GROUND RING AND GROUND RODS BE POSITIONED 2 FEET TO 6 FEET OUTSIDE OF THE DRIP LINE OF THE BUILDING OR STRUCTURE TO ENSURE THAT PRECIPITATION WETS THE EARTH AROUND THE GROUND RING AND RODS (MIL-HDBK-419A AND MIL-STD-188-124B)
  - TOWER GROUND RINGS SHALL BE INSTALLED AT LEAST 2 FEET FROM THE TOWER FOUNDATION (ANSI T1.334-2002, SECTION 5.3.1)
- BOND PPC AND EQUIPMENT ENCLOSURES TO BURIED GROUNDING CONDUCTOR. USE A NEMA DRILLED TWO-HOLE CONNECTOR FOR BONDS TO EQUIPMENT ENCLOSURES; USE AN APPROVED CONDUIT CLAMP FOR CONNECTIONS TO SERVICE CONDUITS. EXOTHERMICALLY WELD CONNECTIONS TO GROUNDING CONDUCTOR.
- 5/8" x 8'-0" LONG GROUND ROD. SPACING BETWEEN RODS, AS SHOWN (NON-LINEAR). PROVIDE TEE TYPE EXOTHERMIC WELD TO BOND GROUND ROD TO BURIED GROUND RING. TYPICAL FOR ALL GROUND RODS SHOWN AROUND TOWER. SEE GROUND ROD INSPECTION SLEEVE DETAIL.
- BOND ALL EXTERIOR CONDUITS, PIPES AND CYLINDRICAL METALLIC OBJECTS WITH A PENN-UNION GT SERIES CLAMP, BLACKBURN GUV SERIES CLAMP OR A BURNDY GAR 3900BU SERIES CLAMP.
- BEFORE AND AFTER INSTALLATION IS COMPLETED IN CONFORMANCE WITH THESE DRAWINGS AND THE STANDARD SPECIFICATIONS, THE CONTRACTOR SHALL CONFIRM THE IMPEDANCE (GROUND RESISTANCE) TO EARTH AND BETWEEN GROUNDING CIRCUITS. THE GROUNDING SYSTEM IS EXPECTED TO PROVIDE FOR A MAXIMUM EARTH RESISTANCE OF 5 OHMS. THE CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO ALL TESTING AND SHALL FURTHER NOTIFY THE OWNER IN THE EVENT THE EARTH RESISTANCE IS GREATER THAN 10 OHMS. USE 3 POINT FALL OF POTENTIAL METHOD.
- ALL GROUNDING CONNECTIONS SHALL BE MADE WITH CADWELDS U.N.O.
- CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES. HAND DIG IN THIS VICINITY TO PROTECT FROM DAMAGE.
- ALL BENDS ON THE GROUND CONDUCTOR TO BE MADE WITH A MINIMUM 8" RADIUS. BENDS ARE NOT TO EXCEED 90° PER NFPA 780-2004, SECTION 4.9.5 AND ANSI T1.313-2003.
- GROUNDING SHALL BE IN ACCORDANCE WITH THE FOLLOWING MOTOROLA R56 STANDARD PRACTICES (AS REQUIRED): (GENERAL CONTRACTOR SHALL CONFIRM LATEST STANDARDS)
  - SSEO 3.018.02.004 BONDING, GROUNDING AND TRANSIENT PROTECTION
  - SSEO 3.018.10.002 SITE RESISTANCE TO EARTH TESTING
  - REFER TO DETAILS FOR ADDITIONAL INFORMATION AND REQUIREMENTS
- CONTRACTOR SHALL TEST EXISTING GROUND RING FOR TOWER BEFORE START OF AND AFTER COMPLETION OF CONSTRUCTION TO VERIFY LESS THAN 5 OHMS RESISTANCE.



**GROUND ROD WITH INSPECTION WELL**

N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



SITE NAME:  
**ERWIN RADIO BLDG**

SITE NUMBER:  
**NCDUN017**

SITE ADDRESS:  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:  
35.335061, -78.655769

SEAL: FIRM #: P-1016

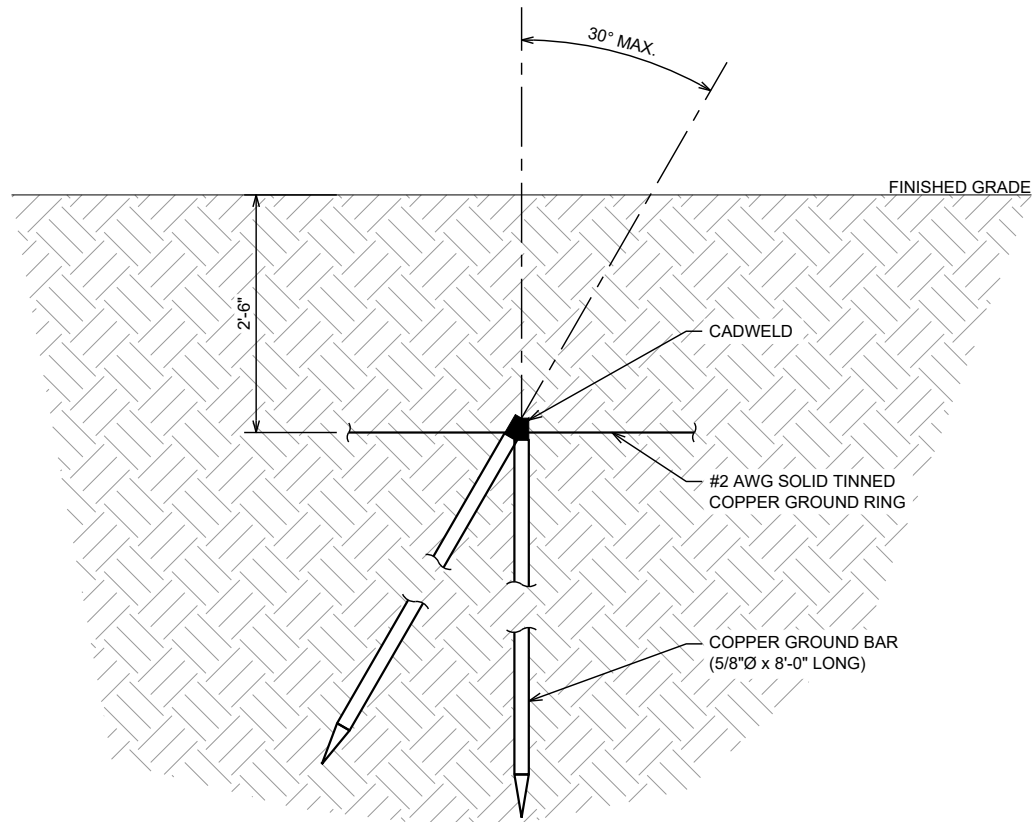


REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA CHECKED BY: AD

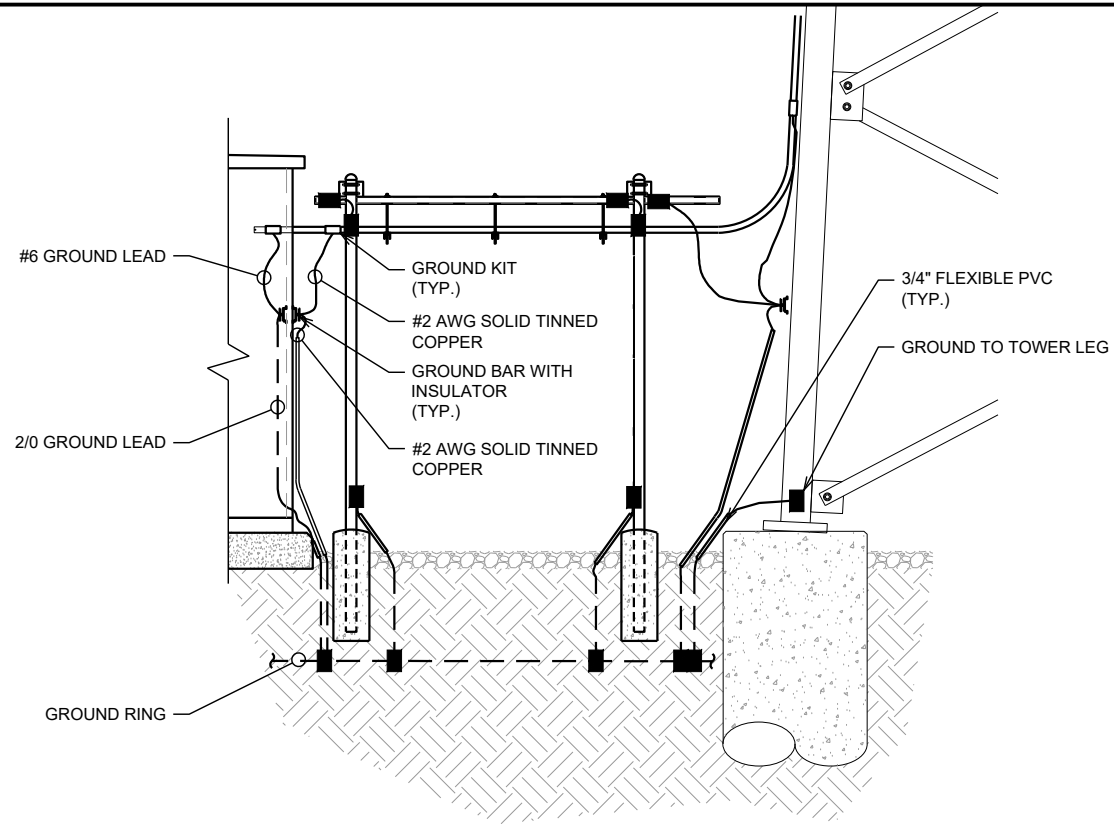
SHEET TITLE:  
**GROUNDING DETAILS I**

SHEET # **G-2** CURRENT REV #: 1  
ETS #: 204581.AE.02



**COPPER-CLAD STEEL GROUND ROD**

N.T.S.

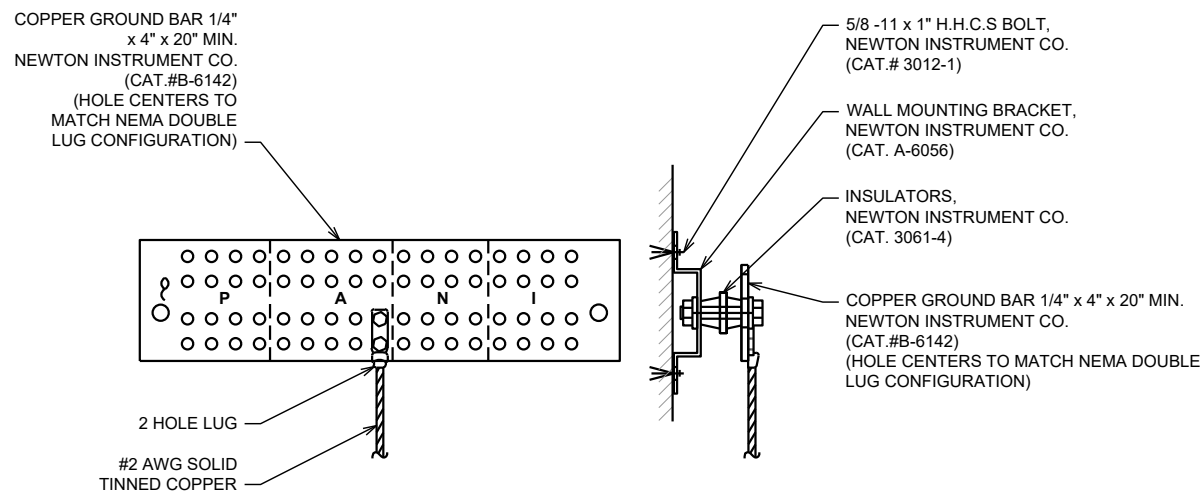


**ICE BRIDGE/COAX/GROUNDING BAR ELEVATION**

N.T.S.

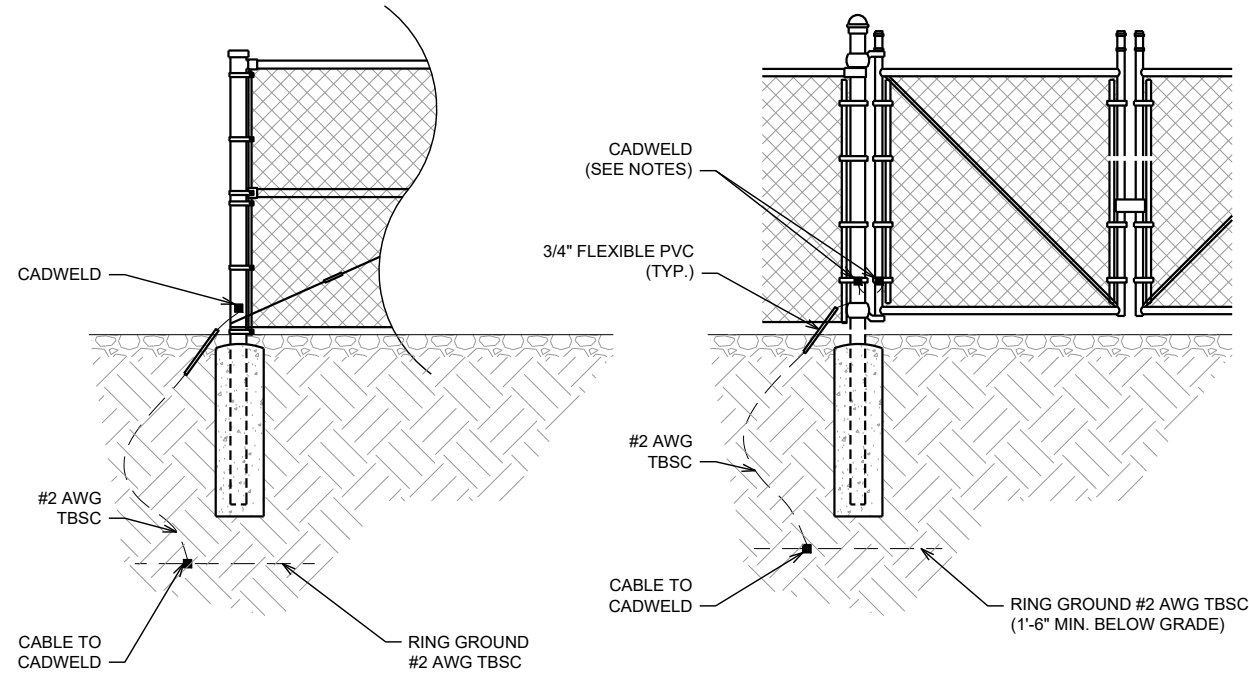
- NOTES:**
- COPPER BUS BAR (17 RUNS, 0.75", 0.815" OR 1" VARIABLE SPACING) WITH 2 HOLE LUG AND #2 AWG SOLID TINNED COPPER PIGTAIL
  - TWO HOLE LUGS SHALL BE USED
  - FOR MASTER GROUND BAR (INSIDE SHELTER), USE #2 AWG SOLID TINNED COPPER (GREEN) CONDUCTOR
  - ALL EXTERNAL GROUND BARS SHALL BE TINNED
  - PANI SCHEME ONLY APPLIES TO MASTER GROUND BAR

- NOTES:**
- VERTICAL POSTS SHALL BE BONDED TO THE GROUND RING AT EACH CORNER AND AT EACH GATE POST. AT MINIMUM, ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 - FOOT STRAIGHT RUN OF FENCE.
  - THE #2 AWG TBSC, FROM THE GROUND RING SHALL BE CADWELDED TO THE POST ABOVE GROUND.
  - GATE JUMPER SHALL BE #4/0 AWG WELDING CABLE OR FLEXIBLE COPPER BRAIDED FLAT STRAP WITH SLEEVES ON EACH END DESIGNED FOR EXOTHERMIC WELDING
  - GATE JUMPER SHALL BE INSTALLED SO THAT IT WILL NOT BE SUBJECTED TO DAMAGING STRAIN WHEN GATE IS FULL OPEN IN EITHER DIRECTION



**STANDARD GROUND BAR DETAIL**

N.T.S.



**FENCE GROUNDING DETAILS**

N.T.S.

PREPARED BY:



**ETS**  
ENGINEERED TOWER SOLUTIONS, PLLC  
3227 WELLINGTON COURT  
RALEIGH, NC 27615  
o: 919-782-2710, f: 919-435-0631  
www.engineeredtowersolutions.com

PREPARED FOR:



**SITE NAME:**  
ERWIN RADIO BLDG

**SITE NUMBER:**  
NCDUN017

**SITE ADDRESS:**  
465 RED HILL CHURCH ROAD  
DUNN, NC 28334

**LATITUDE/LONGITUDE:**  
35.33506° -78.655769°

SEAL:  FIRM #: P-1016

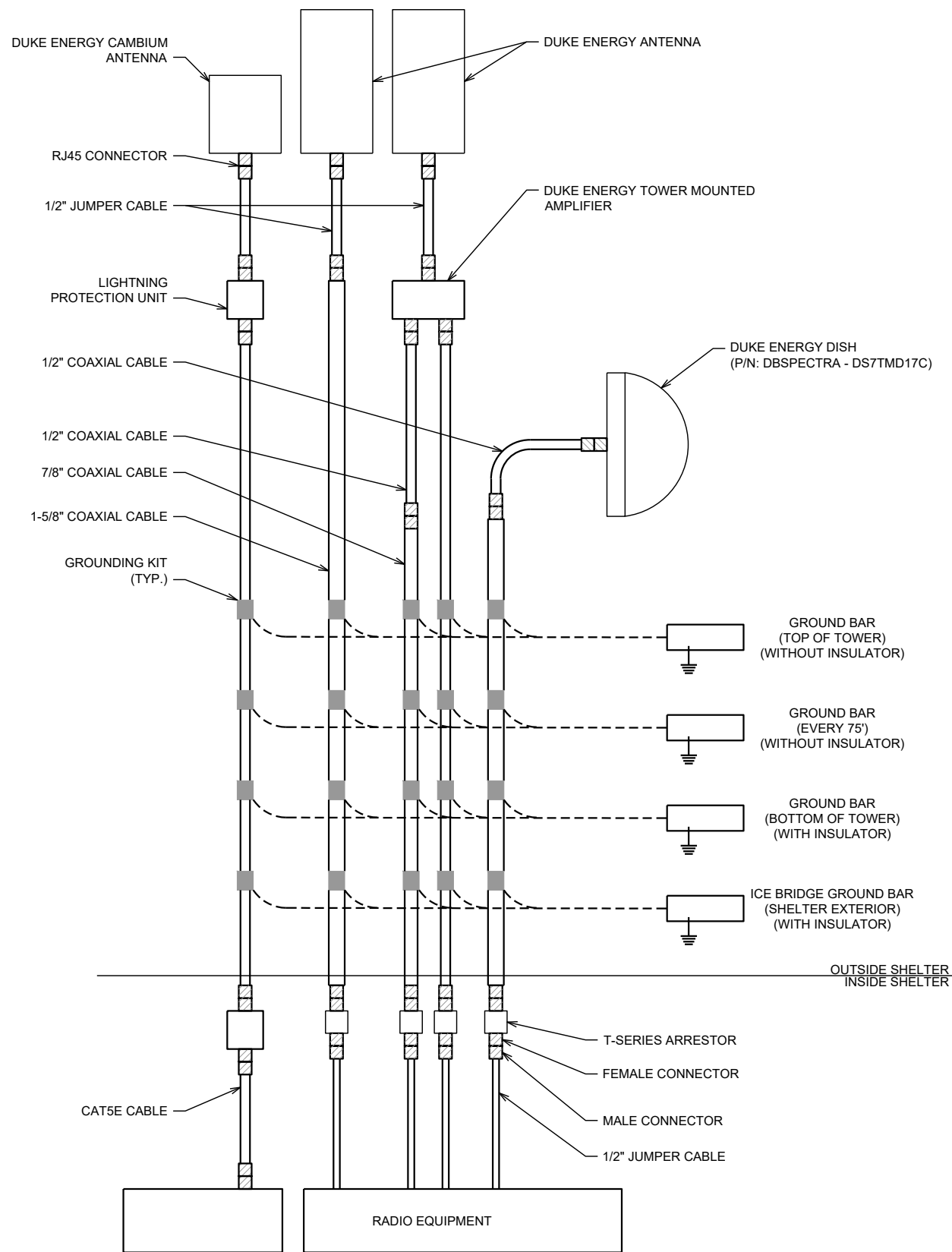
12/14/2020

REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

**SHEET TITLE:**  
GROUNDING DETAILS II

SHEET # **G-3**      CURRENT REV #: 1  
ETS #: 204581.AE.02

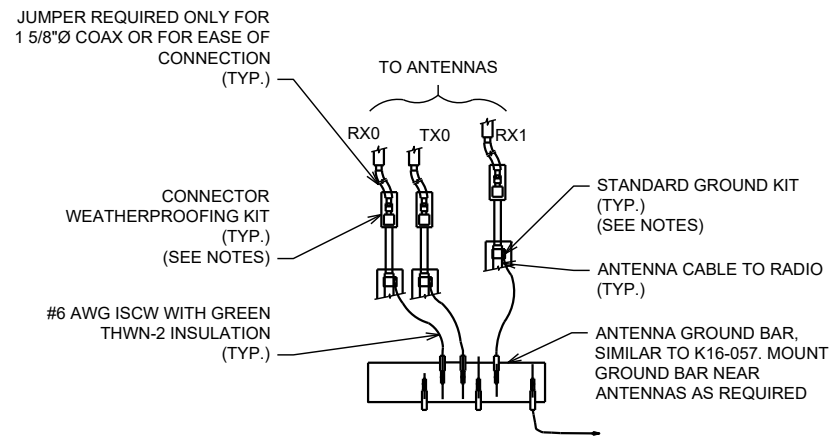


**TYPICAL ANTENNA CABLE AND GROUNDING SCHEMATIC**

N.T.S.

**NOTES:**

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
- WEATHER PROOFING SHALL BE ANDREWS (TYPE & PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER).

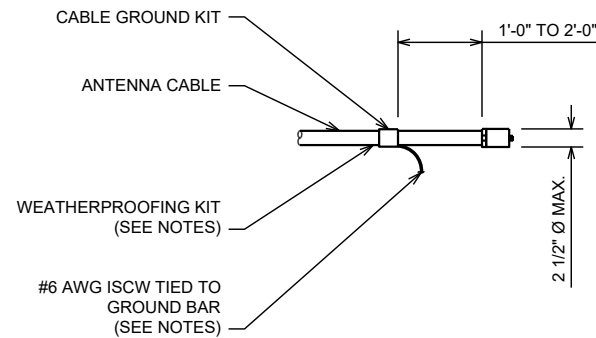


**GROUND WIRE TO GROUND BAR CONNECTION AT ANTENNAS**

N.T.S.

**NOTES:**

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR
- GROUNDING KIT SHALL BE ANDREW SUREGROUND TYPE KIT WITH TWO-HOLE LUG
- WEATHER PROOFING SHALL INCORPORATE PPC WEATHERPROOFING TAPE KIT; COLD SHRINK SHALL NOT BE USED



**CABLE GROUNDING DETAIL**

N.T.S.

PREPARED BY:



PREPARED FOR:



SITE NAME:

**ERWIN RADIO BLDG**

SITE NUMBER:

**NCDUN017**

SITE ADDRESS:

465 RED HILL CHURCH ROAD  
DUNN, NC 28334

LATITUDE/LONGITUDE:

35.335061°, -78.655769°

SEAL:

FIRM #: P-1016



REV	DATE	DETAILS
0	11/05/2020	CONSTRUCTION
1	12/14/2020	CLIENT COMMENTS

DRAWN BY: HA      CHECKED BY: AD

SHEET TITLE:

**GROUNDING  
DETAILS III**

SHEET # **G-4**

CURRENT REV #: 1  
ETS #: 204581.AE.02