Robinson+Cole

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Also admitted in Massachusetts

May 6, 2015

Via Electronic and U.S. Mail

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Docket No. 446 – Application of Cellco Partnership d/b/a Verizon Wireless for the Construction, Maintenance and Operation of a Wireless Telecommunications Facility at 60 Commerce Drive, Trumbull, Connecticut**

Dear Ms. Bachman:

On November 13, 2014, the Siting Council approved the Development and Management ("D&M") Plan for the above-referenced tower site. As you may recall, during the course of the Siting Council's hearing, the applicant mentioned that the 60 Commerce Drive property was, at that time, up for sale. The property has now been sold and the new owner has reviewed the approved facility plans.

To accommodate the proposed future use of the building, the owner has asked Cellco to relocate its equipment shelter to the west of the proposed tower site, still within the approved facility compound. The approved D&M Plan shows Cellco's shelter to the east of the tower. Cellco has agreed to this change provided that the Council has no objection. In addition, there has been a minor change in the location of the UI electric easement due to UI's recent placement of a new pole on the property. Both of these changes are illustrated on the revised D&M Plans enclosed.

Robinson+Cole

If you have any questions or need any additional information regarding this proposed D&M Plan modification please contact me. Thank you in advance for your assistance and cooperation.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Enclosures
Copy to:
Brian Paul
Carlo F. Centore, PE
Aleksey Tyurin

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

TRUMBULL SE 4

60 COMMERCE DRIVE

TRUMBULL, CT 06611

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

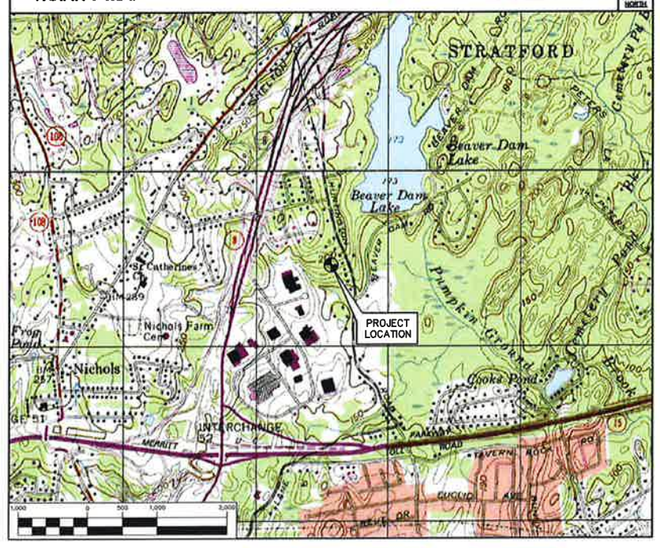
FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CT

TO: 60 COMMERCE DRIVE, TRUMBULL, CT

1.	START OUT GOING SOUTHWEST ON E RIVER DRIVE TOWARD PITKIN ST.	1.3 MI.
2.	MERGE ONTO US-5 S/CT-15 S TOWARD 1-91 S / NEW HAVEN.	1.1 MI.
3.	MERGE ONTO I-91 A VIA EXIT 86 TOWARD NEW HAVEN / NEW YORK CITY.	17.1 MI.
4.	MERGE ONTO CT-15 S VIA EXIT 17.	30.2 MI.
5.	MERGE ONTO CT-8 N VIA EXIT 52 TOWARD WATERBURY	1.4 MI.
6.	TAKE THE HUNTINGTON ROAD EXIT, EXIT 11	0.1 MI.
7.	TAKE THE RAMP TOWARD STRATFORD / TRUMBULL.	0.04 MI.
8.	TURN SLIGHT RIGHT ONTO HUNTINGTON ROAD.	0.03 MI.
9.	TAKE THE 1ST RIGHT ONTO MERRITT BLVD.	0.8 MI.
10.	TAKE THE 1ST LEFT ONTO COMMERCE DRIVE	0.07 MI.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. THE INSTALLATION OF A PRE-FABRICATED 12'x30' EQUIPMENT SHELTER (WITH SHELTER-HOUSED DIESEL FUELED BACKUP POWER GENERATOR) WITHIN A 29'x77' GRAVEL FENCED COMPOUND.
2. A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE TO BE MOUNTED AT A CENTERLINE ELEVATION OF ±80' A.G.L. ON A ±80' TALL MONOPOLE TOWER.
3. POWER AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND FROM THEIR RESPECTIVE DEMARCS. ALL UTILITY WORK AND ROUTING TO BE COORDINATED AND APPROVED BY THE LOCAL UTILITY COMPANIES AND LAND OWNER.

PROJECT INFORMATION

SITE NAME:	TRUMBULL SE 4
SITE ADDRESS:	60 COMMERCE DRIVE TRUMBULL, CT 06611
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	BRIAN PAUL (CONSTRUCTION MANAGER) VERIZON WIRELESS (860) 305-8446
TOWER COORDINATES:	LATITUDE 41°-14'-44.160" LONGITUDE 73°-08'-44.014" GROUND ELEVATION: 170.0'± A.M.S.L. COORDINATES AND GROUND ELEVATION BASED ON FAA 2-C SURVEY CERTIFICATION AS PREPARED FOR VERIZON WIRELESS, BY MARTINEZ COUCH AND ASSOCIATES DATED NOVEMBER 14, 2013

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	04/30/15	HMR	DMD	CONSTRUCTION DOCUMENTS - UPDATED SHEET INDEX
2	04/28/15	HMR	DMD	CONSTRUCTION DOCUMENTS - UPDATED SHEET INDEX
1	04/24/15	HMR	DMD	CONSTRUCTION DOCUMENTS - UPDATED SHEET INDEX
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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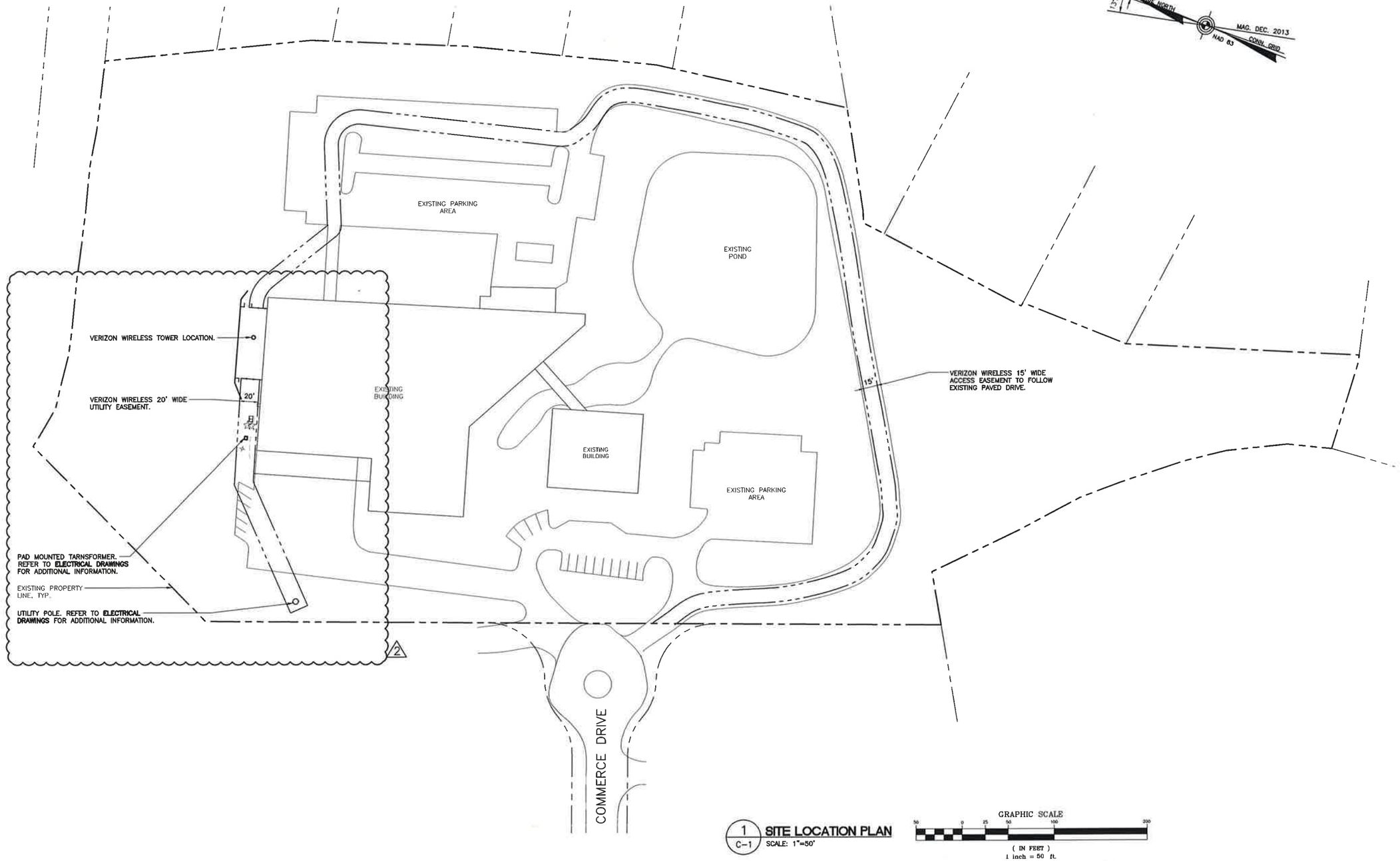
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
TRUMBULL SE 4
60 COMMERCE DRIVE
TRUMBULL, CT 06611

DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13209.000

TITLE SHEET

T-1

Sheet No. 1 of 19



1 / C-1 **SITE LOCATION PLAN**
SCALE: 1"=50'

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	04/30/15	HMR	DMD	CONSTRUCTION DOCUMENTS – REVISED PER PRE-CON MEETING ON 4/30/15
1	04/24/15	HMR	DMD	CONSTRUCTION DOCUMENTS – LESSOR REQUESTED REVISIONS
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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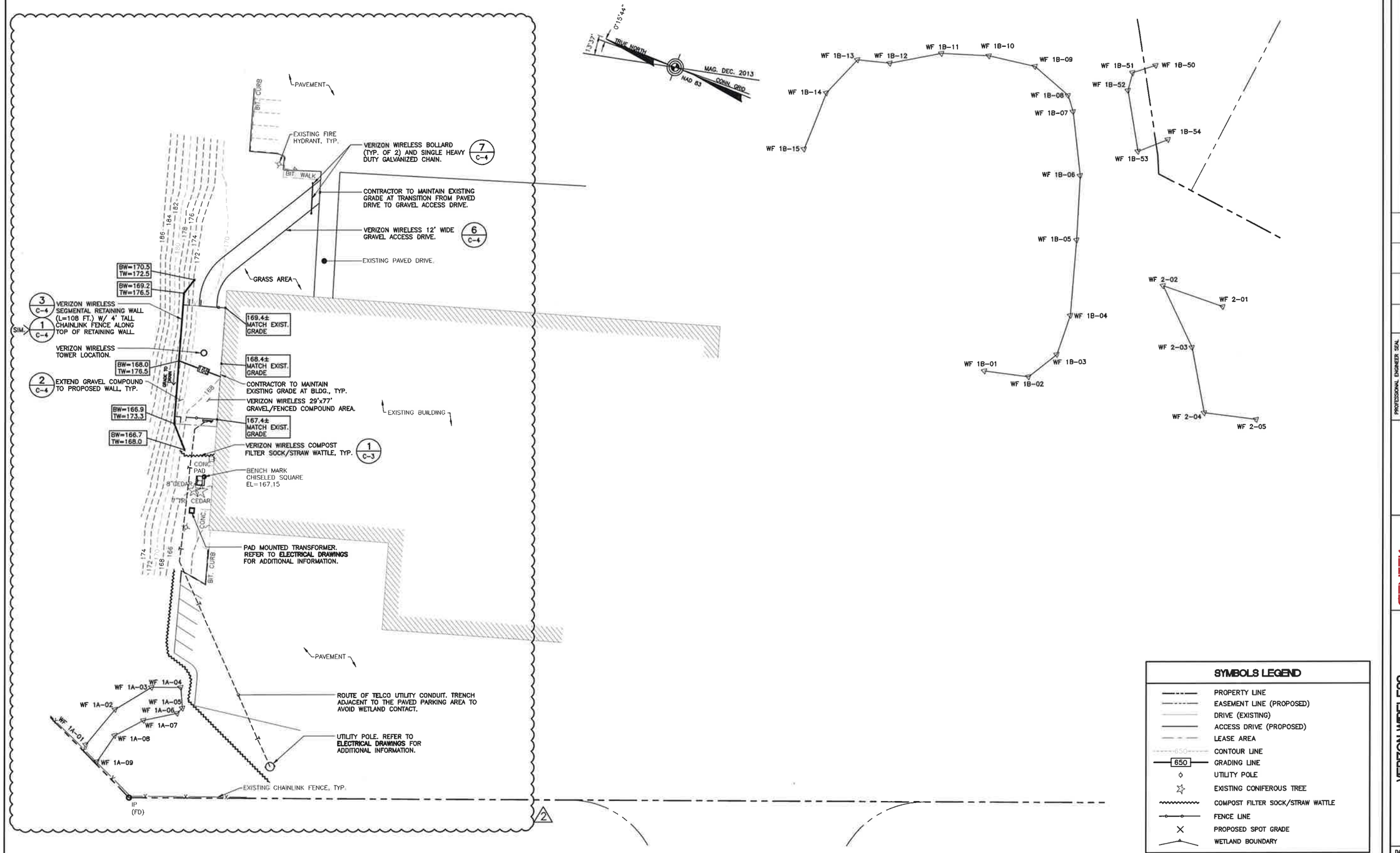
SITE LOCATION PLAN

C-1

Sheet No. 2 of 19



SYMBOLS LEGEND

- PROPERTY LINE
- EASEMENT LINE (PROPOSED)
- DRIVE (EXISTING)
- ACCESS DRIVE (PROPOSED)
- LEASE AREA
- 650 CONTOUR LINE
- 650 GRADING LINE
- UTILITY POLE
- EXISTING CONIFEROUS TREE
- COMPOST FILTER SOCK/STRAW WATTLE
- FENCE LINE
- PROPOSED SPOT GRADE
- WETLAND BOUNDARY

ESTIMATED TREE REMOVAL SUMMARY

TREES PROPOSED TO BE REMOVED IN LOCATION ALONG VERIZON WIRELESS ACCESS OR UTILITY EASEMENT	= 0
TREES PROPOSED TO BE REMOVED WITHIN AND AROUND THE VERIZON WIRELESS LEASE AREA	= 0
TOTAL TREES PROPOSED TO BE REMOVED	= 0

1 C-1.1 **PARTIAL SITE PLAN**
SCALE: 1"=30'

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	04/30/15	HMR	DMD	CONSTRUCTION DOCUMENTS - REVISED PER PRE-CON MEETING ON 4/30/15
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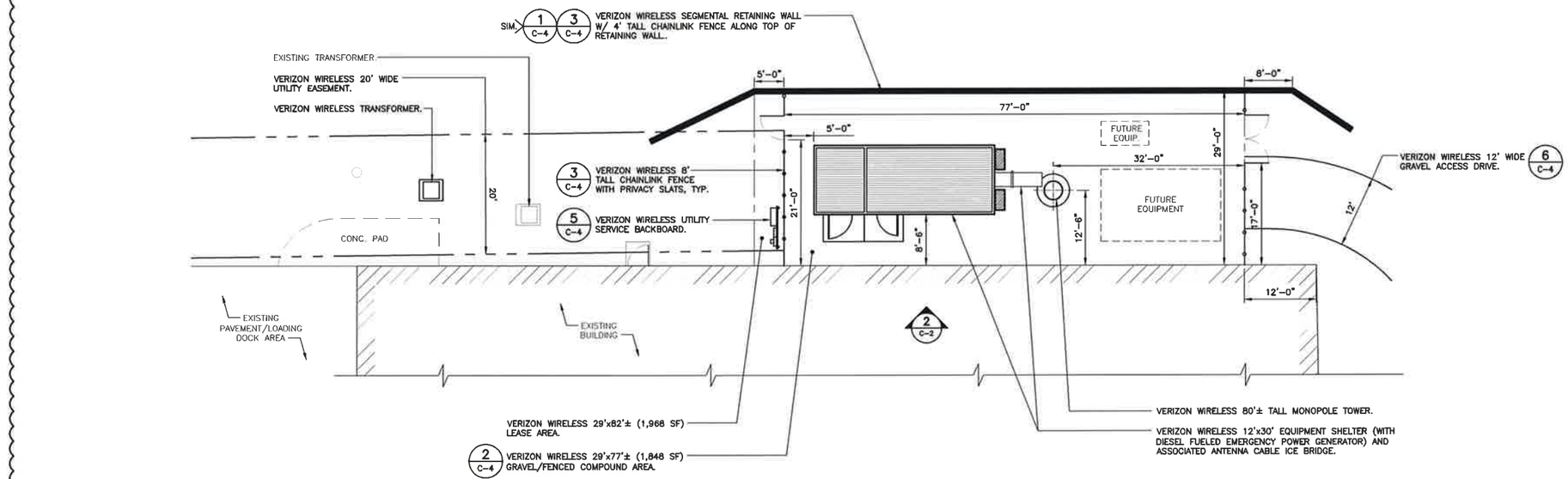
TRUMBULL, CT 06611

DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13209.000

PARTIAL SITE PLAN

C-1.1

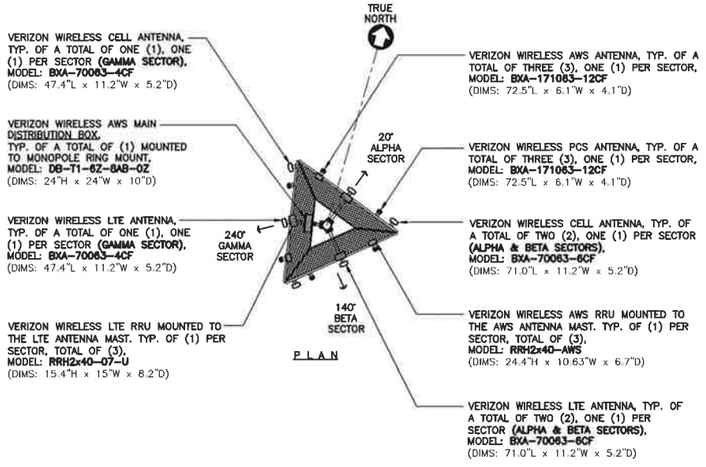


1/C-2 **COMPOUND PLAN**
SCALE: 1" = 10'

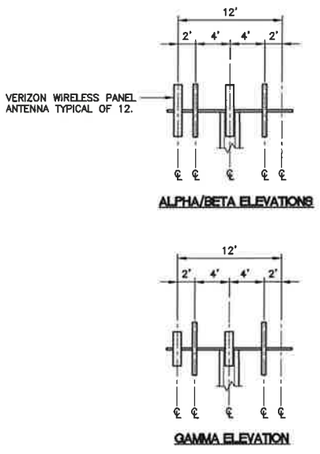
APPROXIMATE NORTH

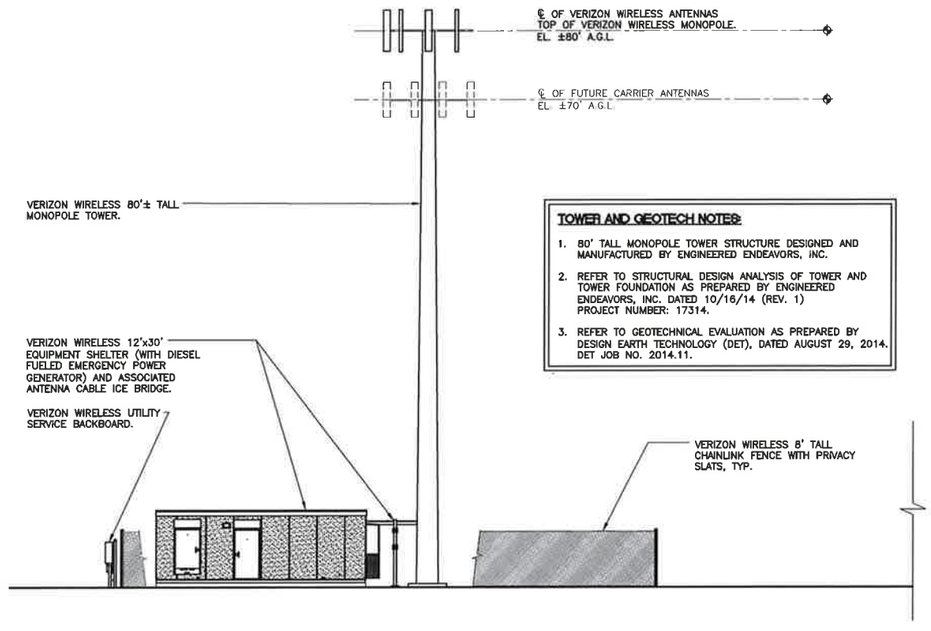
GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

3



3/C-2 **ANTENNA MOUNTING CONFIGURATION**
NOT TO SCALE





TOWER AND GEOTECH NOTES:

1. 80' TALL MONOPOLE TOWER STRUCTURE DESIGNED AND MANUFACTURED BY ENGINEERED ENDEAVORS, INC.
2. REFER TO STRUCTURAL DESIGN ANALYSIS OF TOWER AND TOWER FOUNDATION AS PREPARED BY ENGINEERED ENDEAVORS, INC. DATED 10/16/14 (REV. 1) PROJECT NUMBER: 17314.
3. REFER TO GEOTECHNICAL EVALUATION AS PREPARED BY DESIGN EARTH TECHNOLOGY (DET), DATED AUGUST 29, 2014. DET JOB NO. 2014.11.

2/C-2 **NORTH ELEVATION**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

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2	04/28/15	HMR	DMD	CONSTRUCTION DOCUMENTS - UPDATED WITH COMPOUND LAYOUT DIMENSIONS
1	04/24/15	HMR	DMD	CONSTRUCTION DOCUMENTS - LESSOR REQUESTED REVISIONS
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING CONFIG.

C-2

Sheet No. 4 of 19

GENERAL CONSTRUCTION / PRE-CONSTRUCTION NOTES

1. PRIOR TO COMMENCEMNENT OF ANY CONSTRUCTION ACTIVITIES, A MANDITORY ON-SITE PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED WITH THE VERIZON WIRELESS CONSTRUCTION MANAGER, CONTRACTOR'S CONSTRUCTION MANAGER, THE PROJECT EROSION AND SEDIMENTATION CONTROL/ENVIRONMENTAL MONITOR AND THE ENGINEER OF RECORD.

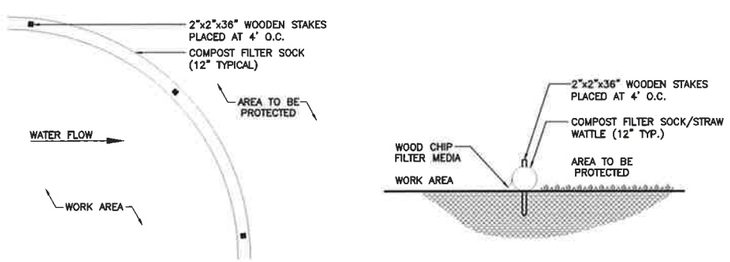
GENERAL CONSTRUCTION SEQUENCE

THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.

1. CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
2. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
3. REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
4. CONSTRUCT CLOSED DRAINAGE SYSTEM. PRECEPT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS.
5. CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILITATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
6. INSTALL UNDERGROUND UTILITIES.
7. BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
8. DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
9. BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
10. FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
12. NO FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGARDED AREAS.
13. AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

SOIL EROSION AND SEDIMENT CONTROL SEQUENCE

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS CONSTRUCTION ENTRANCE / ANTI TRACKING PAD, SILTATION FENCE, AND SILTATION FENCE / HAY BALE SHALL BE IN PLACE PRIOR TO ANY GRADING ACTIVITY. INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES. MEASURES SHALL BE LEFT IN PLACE AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND/OR AREA IS STABILIZED.
2. THE ENTRANCE TO THE PROJECT SITE IS TO BE PROTECTED BY STONE ANTI TRACKING PAD OF ASTM C-33, SIZE NO. 2 OR 3, OR D.O.T. 2" CRUSHED GRAVEL. THE STONE ANTI TRACKING PAD IS TO BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
3. LAND DISTURBANCE WILL BE KEPT TO A MINIMUM AND RESTABILIZATIONS WILL BE SCHEDULED AS SOON AS PRACTICAL.
4. ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL INCLUDING THE LATEST DATE FROM THE COUNCIL ON SOIL AND WATER CONSERVATION.
5. ANY ADDITIONAL EROSION/SEDIMENTATION CONTROL DEEMED NECESSARY BY TOWN STAFF DURING CONSTRUCTION, SHALL BE INSTALLED BY THE DEVELOPER. IN ADDITION, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE REPAIR/REPLACEMENT/MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE TOWN STAFF.
6. IN ALL AREAS, REMOVAL OF TREES, BUSHES AND OTHER VEGETATION AS WELL AS DISTURBANCE OF THE SOIL IS TO BE KEPT TO AN ABSOLUTE MINIMUM WHILE ALLOWING PROPER DEVELOPMENT OF THE SITE. DURING CONSTRUCTION, EXPOSE AS SMALL AN AREA OF SOIL AS POSSIBLE FOR AS SHORT A TIME AS POSSIBLE.
7. SILTATION FENCE SHALL BE PLACED AS INDICATED BEFORE A CUT SLOPE HAS BEEN CREATED. SEDIMENT DEPOSITS SHOULD BE PERIODICALLY REMOVED FROM THE UPSTREAM SIDES OF SILTATION FENCE. THIS MATERIAL IS TO BE SPREAD AND STABILIZED IN AREAS NOT SUBJECT TO EROSION, OR TO BE USED IN AREAS WHICH ARE NOT TO BE PAVED OR BUILT ON. SILTATION FENCE IS TO BE REPLACED AS NECESSARY TO PROVIDE PROPER FILTERING ACTION. THE FENCE IS TO REMAIN IN PLACE AND BE MAINTAINED TO INSURE EFFICIENT SILTATION CONTROL UNTIL ALL AREAS ABOVE THE EROSION CHECKS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED.
8. SWALE DISCHARGE AREA WILL BE PROTECTED WITH RIP RAP SPLASH PAD/ ENERGY DISSIPATER.
9. ALL FILL AREAS SHALL BE COMPACTED SUFFICIENTLY FOR THEIR INTENDED PURPOSE AND AS REQUIRED TO REDUCE SLIPPING, EROSION OR EXCESS SATURATION.
10. THE SOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
11. AFTER CONSTRUCTION IS COMPLETE AND GROUND IS STABLE, REMOVE SILTS IN THE RIP RAP ENERGY DISSIPATERS. REMOVE OTHER EROSION AND SEDIMENT DEVICES.



1 / C-3 TYP. COMPOST FILTER SOCK/ STRAW WATTLE DETAIL
NOT TO SCALE

ENVIRONMENTAL NOTES

EASTERN BOX TURTLE AND WETLAND PROTECTION PROGRAM

STATE SPECIAL CONCERN EASTERN BOX TURTLE (TERRAPENE CAROLINA CAROLINA), AFFORDED PROTECTION UNDER THE CONNECTICUT ENDANGERED SPECIES ACTS, ARE KNOWN TO OCCUR IN THE VICINITY OF THIS PROJECT. THE FOLLOWING PROTECTIVE MEASURES SHALL BE FOLLOWED TO HELP AVOID DEGRADATION OF HABITAT OR UNINTENTIONAL MORTALITY AS A RESULT OF CONSTRUCTION ACTIVITIES FOR THE SITE IMPROVEMENTS PROPOSED. THESE PROTECTIVE MEASURES SATISFY RECOMMENDATIONS FROM THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION ("CTDEEP") WILDLIFE DIVISION AS SPECIFIED IN A FEBRUARY 10, 2014 LETTER AND FOLLOW PROTOCOLS DEVELOPED FROM PREVIOUS RARE SPECIES CONSULTATIONS AND STATE-APPROVED PROTECTION PLANS. THIS PROTECTION PLAN IS VALID UNTIL FEBRUARY 10, 2015, AT WHICH POINT IF CONSTRUCTION HAS NOT BEEN INITIATED, A NEW NATURAL DIVERSITY DATA BASE REVIEW REQUEST FROM CTDEEP IS REQUIRED.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR THE INSTALLATION OF PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. THESE MEASURES WILL ALSO PROVIDE PROTECTION TO A NEARBY WETLANDS. THIS PROTECTION PROGRAM SHALL BE IMPLEMENTED REGARDLESS OF TIME OF YEAR THE CONSTRUCTION ACTIVITIES OCCUR. HOWEVER, SECTIONS OF THIS PROTECTION PLAN SPECIFIC TO PROTECTION OF EASTERN BOX TURTLE SHALL BE IMPLEMENTED DURING THE TURTLE'S ACTIVE PERIOD OF APRIL 1 TO NOVEMBER 15. ALL-POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT EASTERN BOX TURTLE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY AND WILL PROVIDE AN EDUCATION SESSION ON EASTERN BOX TURTLE PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR ENVIRONMENTAL SCIENTIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 663-1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE PROPOSED PROJECT WILL NOT RESULT IN DIRECT IMPACT TO WETLANDS OR WATERCOURSES. THE CONTRACTOR IS STRICTLY PROHIBITED FROM PLACING FILL IN WETLANDS OR WATERCOURSE OR TEMPORARILY STORING EQUIPMENT OR MATERIALS IN WETLANDS OR WATERCOURSES OR IN AREAS THAT COULD RESULT IN A DISCHARGE INTO NEARBY WETLANDS.

THE EASTERN BOX TURTLE AND WETLAND PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: ISOLATION OF THE PROJECT PERIMETER; USE OF APPROPRIATE EROSION CONTROL MEASURES TO CONTROL AND CONTAIN EROSION WHILE AVOIDING/MINIMIZING WILDLIFE ENTANGLEMENT; PERIODIC INSPECTION AND MAINTENANCE OF ISOLATION STRUCTURES AND EROSION CONTROL MEASURES; EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; AND, REPORTING.

1. ISOLATION MEASURES & EROSION AND SEDIMENTATION CONTROLS
   a. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS [WATTLES], REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS AND SMALL MAMMALS. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE PROJECT. TEMPORARY EROSION CONTROL PRODUCTS WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NET LESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.
   b. INSTALLATION OF EROSION AND SEDIMENTATION CONTROLS, REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TO POSSIBLE MIGRATING/DISPERSING HERPETOFAUNA, SHALL BE PERFORMED BY THE CONTRACTOR FOLLOWING CLEARING ACTIVITIES AND PRIOR TO ANY EARTHWORK. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF HERPETOFAUNA AND SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE FROM MIGRATING/DISPERSING HERPETOFAUNA. OFTENTIMES COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. IN THOSE CIRCUMSTANCES, THE BARRIERS WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH HERPETOFAUNA.
   c. THE FENCING WILL CONSIST OF NON-REINFORCED CONVENTIONAL EROSION CONTROL WOVEN FABRIC, INSTALLED APPROXIMATELY SIX INCHES BELOW SURFACE GRADE AND STAKED AT SEVEN TO TEN-FOOT INTERVALS USING FOUR-FOOT OAK STAKES OR APPROVED EQUIVALENT. IN ADDITION TO REQUIRED DAILY INSPECTION BY THE CONTRACTOR, THE FENCING WILL BE PERIODICALLY INSPECTED FOR TEARS OR BREECHES IN THE FABRIC FOLLOWING INSTALLATION BY APT THROUGHOUT THE COURSE OF THE CONSTRUCTION PROJECT.
   d. THE EXTENT OF THE BARRIER FENCING WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL BARRIER FENCING SHOULD FIELD CONDITIONS WARRANT EXTENDING THE FENCING AS DIRECTED BY APT.
   e. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED OUTSIDE OF BARRIER FENCING.
   f. ALL SILT FENCING AND OTHER EROSION CONTROL DEVICES SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED. IF FIBER ROLLS/WATTLES, STRAW BALES, OR OTHER NATURAL MATERIAL EROSION CONTROL PRODUCTS ARE USED, SUCH DEVICES WILL NOT BE LEFT IN PLACE TO BIODEGRADE AND SHALL BE PROMPTLY REMOVED AFTER SOILS ARE STABLE SO AS NOT TO CREATE A BARRIER TO MIGRATING WILDLIFE. SEED FROM SEEDING OF SOILS SHOULD NOT SPREAD OVER FIBER ROLLS/WATTLES AS IT MAKES THEM HARDER TO REMOVE ONCE SOILS ARE STABILIZED BY VEGETATION.
2. CONTRACTOR EDUCATION
   a. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT PROVIDING PHOTOS OF EASTERN BOX TURTLES AND EMPHASIZING THE NON-AGGRESSIVE NATURE OF EASTERN BOX TURTLES, THE ABSENCE OF NEED TO DESTROY ANIMALS THAT MIGHT BE ENCOUNTERED AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN SECTION 4 BELOW. THE ENVIRONMENTAL SENSITIVITY OF THE PROJECT DUE TO ITS PROXIMITY TO WETLAND RESOURCES WILL ALSO BE STRESSED. WORKERS WILL ALSO BE PROVIDED INFORMATION REGARDING THE IDENTIFICATION OF OTHER TURTLE SPECIES THAT COULD BE ENCOUNTERED.
   b. THE EDUCATION SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF TURTLES WILL BE DOCUMENTED.
   c. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH EASTERN BOX TURTLE OR OTHER TURTLE SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.
3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION
   a. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL DUE TO THE PROJECT'S LOCATION IN PROXIMITY TO SENSITIVE WETLANDS.
   b. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS.
   c. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.
      c.a. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING
         c.a.a. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.
         c.a.b. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT ON SITE SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.
      c.b. INITIAL SPILL RESPONSE PROCEDURES
         c.b.a. STOP OPERATIONS AND SHUT OFF EQUIPMENT.
         c.b.b. REMOVE ANY SOURCES OF SPARK OR FLAME.
         c.b.c. CONTAIN THE SOURCE OF THE SPILL.
         c.b.d. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
         c.b.e. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.
         c.b.f. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.
      c.c. SPILL CLEAN UP & CONTAINMENT
         c.c.a. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.
         c.c.b. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
         c.c.c. ISOLATE AND ELIMINATE THE SPILL SOURCE.
         c.c.d. CONTACT THE APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.
         c.c.e. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS.
      c.d. REPORTING
         c.d.a. COMPLETE AN INCIDENT REPORT.
         c.d.b. SUBMIT A COMPLETED INCIDENT REPORT TO THE CONNECTICUT SITING COUNCIL.
4. TURTLE PROTECTIVE MEASURES
   a. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR TURTLES.
   b. IF A TURTLE IS FOUND, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, BY CAREFULLY GRASPED IN BOTH HANDS, ONE ON EACH SIDE OF THE SHELL, BETWEEN THE TURTLE'S FORELIMBS AND THE HIND LIMBS, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE APPROXIMATE DIRECTION IT WAS WALKING.
   c. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING TURTLES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.
5. HERBICIDE AND PESTICIDE RESTRICTIONS
   a. THE USE OF HERBICIDES AND PESTICIDES AT THE PROPOSED WIRELESS TELECOMMUNICATIONS FACILITY AND ALONG THE PROPOSED ACCESS DRIVE ARE STRICTLY PROHIBITED.
6. REPORTING
   a. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A SUMMARY REPORT TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION DOCUMENTING ANY OBSERVATIONS OF EASTERN BOX TURTLE AND THE MONITORING AND MAINTENANCE OF THE BARRIER FENCE AND EROSION CONTROL MEASURES.
   b. ANY OBSERVATIONS OF EASTERN BOX TURTLE WILL BE REPORTED TO CTDEEP BY APT, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND WITH SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13209.000

SITE CONSTRUCTION S&E CONTROL NOTES & DETAILS

C-3

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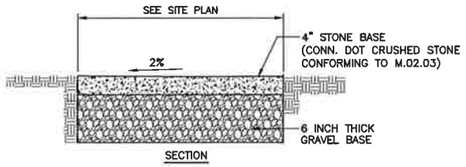
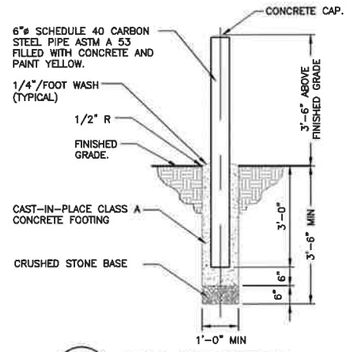


6 C-4 **GRAVEL SURFACE ACCESS DRIVE**
NOT TO SCALE



7 C-4 **BOLLARD DETAIL**
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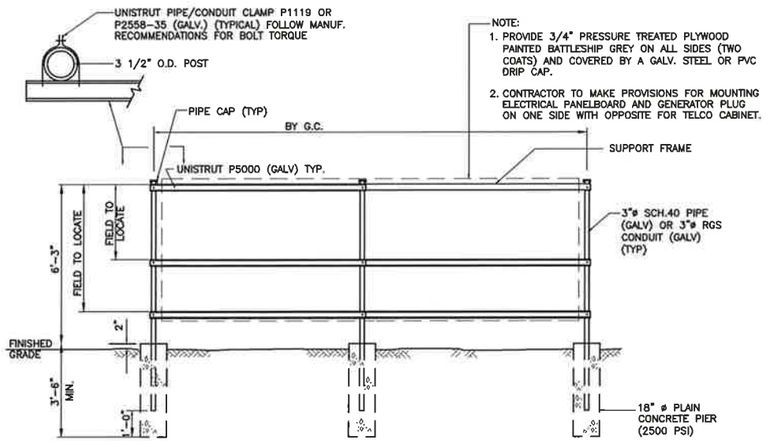

5 C-4 **UTILITY SUPPORT FRAME (TYP)**
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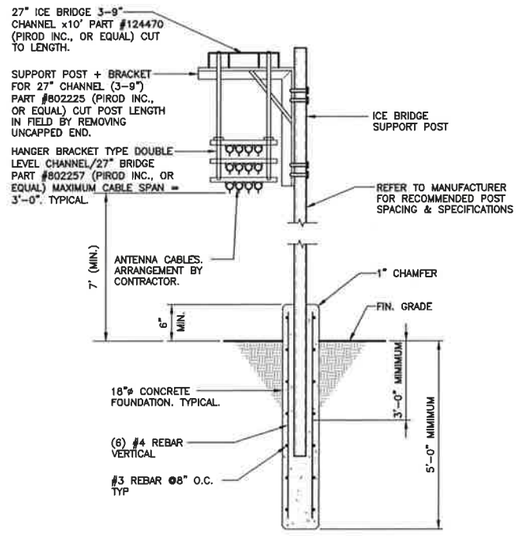

4 C-4 **ICE BRIDGE DETAIL**
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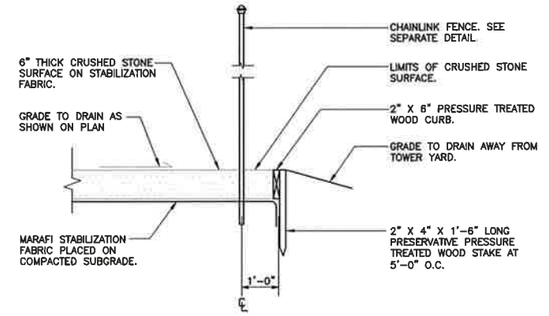
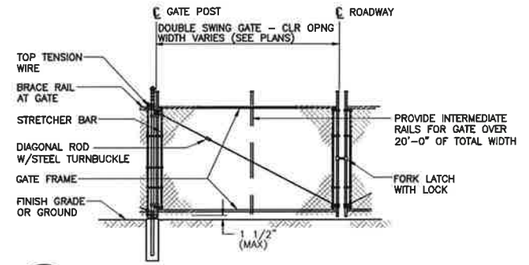


2 C-4 **COMPOUND SURFACING DETAIL**
NOT TO SCALE

WOVEN WIRE FENCE NOTES

1. GATE POST, CORNER, TERMINAL OR PULL POST 2 1/2" ø SCHEDULE 40 FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING GATE PER ASTM-F1083.
2. LINE POST: 2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
3. GATE FRAME: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
4. TOP RAIL & BRACE RAIL: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
5. FABRIC: 12 GA. CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM-A392.
6. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL AT POSTS AND RAILS A SINGLE WRAP OF FABRIC TIE AND AT TENSION WIRE BY HOG RINGS SPACED MAX 24" INTERVALS.
7. TENSION WIRE: 7 GA. GALVANIZED STEEL.
8. GATE LATCH: DROP DOWN LOCKABLE FORK LATCH AND LOCK, KEYED ALIKE FOR ALL SITES IN A GIVEN MTA.
9. COMPOUND FENCE HEIGHT = 8' VERTICAL.
10. VINYL PRIVACY SLATS TO BE INSTALLED ON ALL FENCE AND GATE SECTIONS. COLOR: GREEN



1A C-4 **WOVEN WIRE SWING GATE-DOUBLE**
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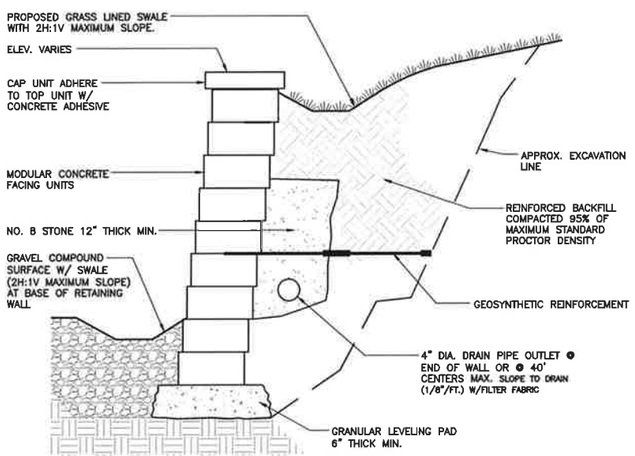
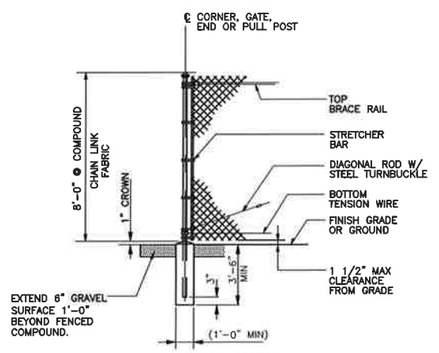


3 C-4 **SEGMENTAL RETAINING WALL DETAIL**
NOT TO SCALE

MODULAR RETAINING WALL NOTES:

1. STRIP VEGETATION AND ORGANIC SOIL FROM WALL AND GEOSYNTHETIC ALIGNMENT.
2. BENCH CUT ALL EXCAVATED SLOPES.
3. DO NOT OVER EXCAVATE UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.
4. SITE SOIL ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
5. BASE SHALL CONSIST OF COMPACTED GRAVEL, 6" THICK MIN.
6. CONTRACTOR MAY OPT FOR A LEAN CONCRETE PAD. CONCRETE PAD SHALL BE UNREINFORCED, 4" THICK.
7. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE 2 COURSES OF BLOCK".
8. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
9. NO. 8 CRUSHED STONE SHALL BE INSTALLED BEHIND THE WALL UP TO 18" FROM THE TOP OF THE WALL. CRUSHED STONE SHALL NOT EXTEND BELOW FINISHED GRADE IN FRONT OF WALL.
10. WHERE DRAIN PIPE IS USED, PROVIDE OUTLETS @ MAX. 40 FT C-C.
11. FOR UNITS TO BE EMBEDDED, COMPACT FILL IN FRONT OF UNITS AT THE SAME TIME BACKFILL BEHIND UNITS IS COMPACTED.
12. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE ENGINEER.
13. COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY. (ASTM D-698)
14. SEE SHOP DRAWINGS FOR GEOSYNTHETIC TYPE, LENGTH AND LOCATION REQUIRED.
15. GEOSYNTHETIC SHALL BE THE TYPE AND LENGTH AS SHOWN ON SHOP DRAWINGS. PULL GEOSYNTHETIC TIGHT PRIOR TO BACKFILLING.
16. GEOSYNTHETIC SHALL BE PLACED WITH STRONGEST DIRECTION PERPENDICULAR TO WALL. FOLLOW GEOSYNTHETIC MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
17. THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING SHOWING THE COMPLETE WALL SYSTEM AND ALL DETAILS BASED ON THE ACTUAL SOILS IN THE FIELD THESE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT
18. IF CONDITIONS ARE DIFFERENT THAN THOSE STATED IN THESE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR MUST CONTACT ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.
19. IF WALL LEVELING PAD REQUIRES FILL IT SHALL BE COMPACTED GRAVEL FROM BOTTOM OF EXCAVATION TO SUITABLE SOIL TO BOTTOM OF WALL.



1 C-4 **WOVEN WIRE FENCE DETAIL**
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0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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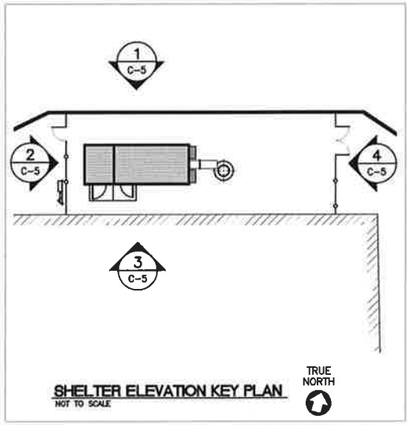
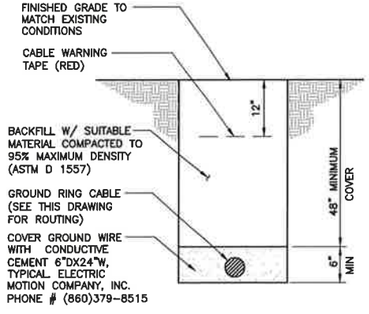
SITE DETAILS AND NOTES

C-4

Sheet No. 8 of 19

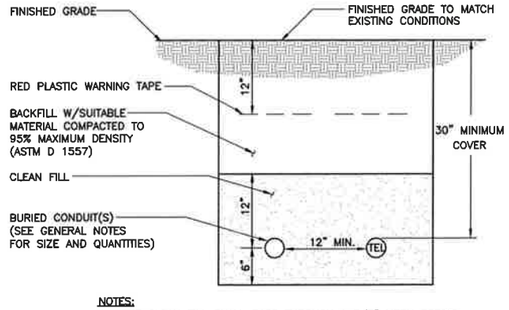


SHELTER ELEVATION KEY PLAN
NOT TO SCALE



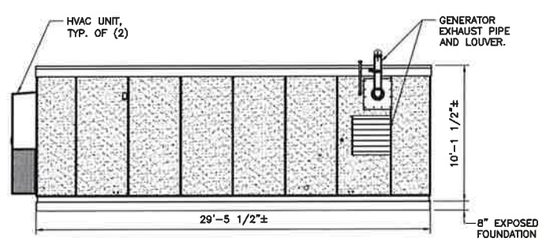
NOTES:
1. BACK FILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

6 C-5 TYPICAL BURIAL GROUND CABLE DETAIL
NOT TO SCALE

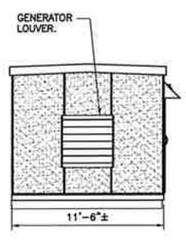


NOTES:
1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

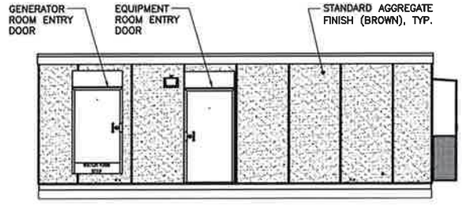
5 C-5 TYPICAL ELECTRICAL/TEL TRENCH DETAIL
NOT TO SCALE



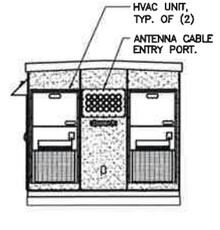
1 C-5 SOUTHERN SHELTER ELEVATION
SCALE: 3/16" = 1'-0"



2 C-5 EASTERN SHELTER ELEVATION
SCALE: 3/16" = 1'-0"



3 C-5 NORTHERN SHELTER ELEVATION
SCALE: 3/16" = 1'-0"



4 C-5 WESTERN SHELTER ELEVATION
SCALE: 3/16" = 1'-0"

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1	04/24/15	HMR	DMD	CONSTRUCTION DOCUMENTS – LESSOR REQUESTED REVISIONS
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. Verizon Wireless

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TRUMBULL, CT 06611

DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13209.000

SITE DETAILS AND SHELTER ELEVATIONS

C-5

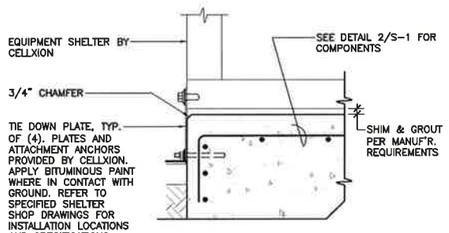
Sheet No. 7 of 19

SLAB ON GRADE FOUNDATION DESIGN CONFORMS TO THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE SUPPLEMENT SECTION 1805.2.1 'FROST PROTECTION' AND SEI/ASCE STANDARD 32-01 SECTION 7.1 'SLAB ON GRADE CONSTRUCTION'.

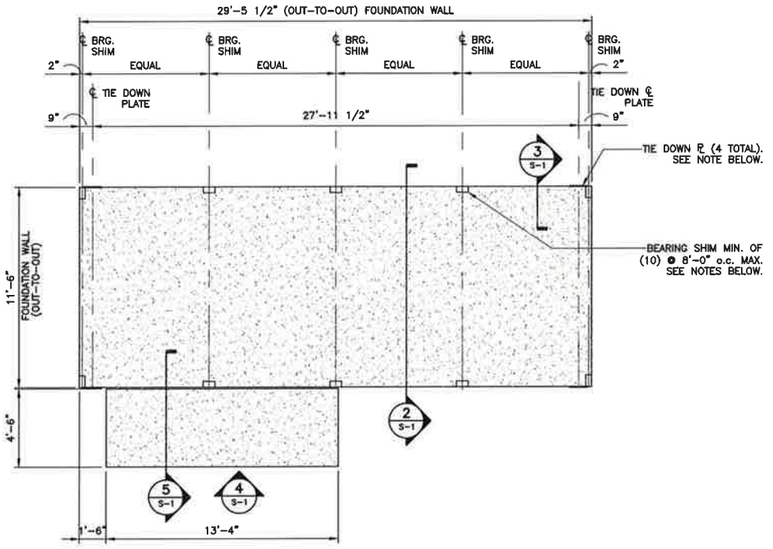
EQUIPMENT SHELTER BY CELLXION. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.

FOUNDATION PLAN NOTES:

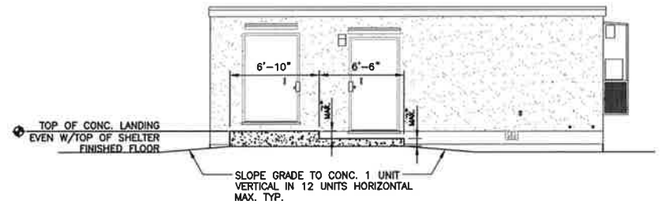
1. BEARING SHIMS, TIE-DOWN PLATES AND ASSOCIATED INSTALLATION ANCHORS PROVIDED BY CELLXION. CONTRACTOR SHALL VERIFY ALL SHIM & TIE-DOWN QUANTITIES AND LOCATIONS WITH CELLXION PRIOR TO PERFORMING FOUNDATION WORK.
2. SLAB TOLERANCE IS 1/4"±
3. TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.
4. PER NEC REQUIREMENTS, THE REBAR IN FOUNDATION AND FOOTING SHALL BE BONDED TO GROUND RING WITH A #2 AWG SOLID CONDUCTOR USING LISTED AND APPROVED METHODS.
5. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH FOUNDATION OR CAST CONDUITS IN PLACE.



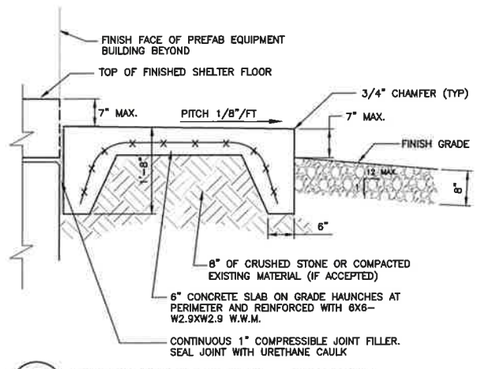
3/S-1 **BUILDING TIE DOWN**
SCALE: 1"=1'-0"



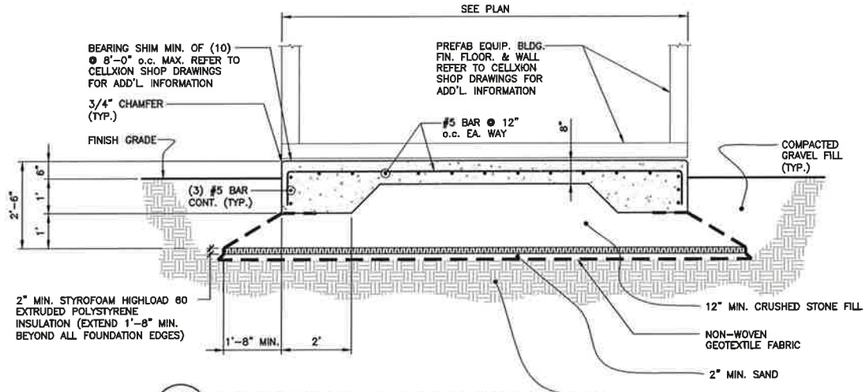
1/S-1 **FOUNDATION PLAN** (APPROX. GRID NORTH)
SCALE: 1/4"=1'-0"



4/S-1 **ENTRY STOOP DETAIL - ELEVATION**
SCALE: 3/16"=1'-0"



5/S-1 **ENTRY STOOP DETAIL - SECTION**
SCALE: 3/16"=1'-0"



2/S-1 **FOUNDATION PLAN SLAB ON GRADE**
SCALE: 1/2"=1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/14/14	HMR	DMD	CONSTRUCTION DOCUMENTS

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SHELTER FOUND. PLAN, DETAILS AND NOTES

S-1

Sheet No. 8 of 19

STRUCTURAL SPECIFICATIONS

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD (ANTENNA MOUNTS):
     TIA/EIA-222-F-1996
     BASIC WIND SPEED (V) = 85 MPH (FASTEST MILE)

     2009 CT BUILDING CODE AMENDMENT APPENDIX K
     BASIC WIND SPEED (V) = 105 MPH (3-SECOND GUST)
     EQUIVALENT TO (V) = 85 MPH (FASTEST MILE)
     TIA/EIA/APPENDIX K WIND SPEEDS EQUAL
   - SEISMIC LOAD (DOES NOT CONTROL):
     PER ASCE 7-02 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

GENERAL NOTES

1. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
2. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
4. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAQSSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90-100
½"	0-15
⅜"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

FOUNDATION CONSTRUCTION:

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED. BOTTOM OF ALL FOOTINGS SHALL BE AT LEAST 2'-0" BELOW EXISTING GRADE. BOTTOM OF EXTERIOR WALL FOOTINGS SHALL BE AT LEAST 4'-0" BELOW FINISHED GRADE.
2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.
3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.
4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.
5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.
6. FOUNDATION DRAINAGE: CONTINUOUS PERIMETER FOOTING DRAINS SHALL BE PROVIDED AROUND ALL BELOW GRADE HABITABLE OR USABLE SPACES. FOUNDATION DRAINAGE SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.
7. FOUNDATION WATERPROOFING AND DAMPPROOFING SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

CONCRETE CONSTRUCTION

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:

   ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.

   ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

   ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION

   ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.

   ACI 306.1 STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING

   ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

2. CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

SLABS ON GRADE	4,000 PSI
ALL OTHER CONCRETE	3,000 PSI

3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM- A-185.
5. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
6. CONCRETE COVER OVER REINFORCING SHALL CONFORM TO THE FOLLOWING, UNLESS OTHERWISE SHOWN:

SURFACES EXPOSED TO THE WEATHER	1-1/2 INCHES
FORMED SURFACES EXPOSED TO EARTH	1-1/2 INCHES
BOTTOM OF FOOTINGS	3 INCHES
SURFACES NOT EXPOSED TO EARTH OR WEATHER	1-1/2 INCHES

7. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
8. ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL STAGGERED. ADDITIONAL BARS AND SPECIAL BENDING DETAILS ARE REQUIRED AT INTERSECTING WALLS AND AT JOINTS. SUCH DETAILS SHALL COMPLY WITH ACI 315 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.
9. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
10. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1 % CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
11. UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.
12. SHEAR KEYS (2" X 4"), SEPARATING CONCRETE POURS, SHALL BE PROVIDED IN ALL CONCRETE WALLS AND BETWEEN FOOTINGS AND WALLS.
13. AT ALL OPENINGS IN CONCRETE WALLS AND SUSPENDED SLABS, UNLESS OTHERWISE DETAILED, PROVIDE THE FOLLOWING ADDITIONAL REINFORCING:
    1 – #4 EACH FACE AT EACH SIDE OF OPENING. EXTEND 2'-0" BEYOND OPENING.
    1 – #4 x 4'-0" LONG EACH FACE DIAGONALLY AT EACH CORNER.
14. INSPECTION AND TESTING OF CONCRETE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, PAID BY THE OWNER, AND APPROVED BY THE ENGINEER. THE INSPECTOR SHALL OBSERVE CONDITION OF SOILS AND FORMWORK BEFORE FOOTINGS ARE PLACED, SIZE, SPACING AND LOCATION OF REINFORCEMENT, AND PLACEMENT OF CONCRETE.
15. THE TESTING COMPANY SHALL ALSO OBTAIN A MINIMUM OF THREE (3) COMPRESSIVE STRENGTH TEST SPECIMENS FOR EACH CONCRETE MIX DESIGN. ONE SPECIMEN TESTED AT 7 DAYS, ONE AT 28 DAYS, AND ONE HELD IN RESERVE FOR FUTURE TESTING, IF NEEDED.
16. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

SLAB ON GRADE CONSTRUCTION:

1. PLACE AND COMPACT GRAVEL FILL IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL, BUT NOT LESS THAN ONE (1) PER LAYER, TO ENSURE COMPACTION TO 95% OF MAXIMUM DRY DENSITY.
2. SAW CUT CONTROL JOINTS 1 /8" WIDE AND TO A DEPTH EQUAL TO 1 /4 OF THE SLAB THICKNESS. CONSTRUCTION JOINTS AS REQUIRED SHALL BE KEYED AND LOCATED AT CONTROL JOINT INTERVALS. ALL CONTROL JOINTS SHALL BE FILLED WITH EUCO EPOXY #600 EPOXY JOINT FILLER AS MANUFACTURED BY EUCLID CHEMICAL CO. OR APPROVED EQUAL.
3. SAW CUT CONTROL JOINTS AT 20'-0" ON CENTER MAXIMUM WITHIN 12 HOURS OF CONCRETE PLACEMENT.
4. SLABS ON GRADE FINISHES: STEEL TROWEL FINISH AS DEFINED IN ACI 301. CURE SLAB WITH SONNEBORN KURE-N-SEAL WB OR APPROVED EQUAL, APPLIED AS RECOMMENDED BY MANUFACTURER.
5. CONSTRUCTION JOINT SPACING IN FOUNDATION WALLS SHALL NOT EXCEED 40 FEET NOR 20 FEET FROM ANY CORNER. JOINTS SHALL BE KEYED AND HORIZONTAL BARS SHALL EXTEND THRU JOINT AND BE 48 BAR DIAMETER SPLICED.
6. IN REINFORCED CONCRETE WALLS AND FOOTINGS, PROVIDE CORNER DOWELS OF THE SAME SIZE AND AT THE SAME SPACING AS HORIZONTAL REINFORCING. DOWELS SHALL HAVE A 48 BAR DIAMETER SPLICE WITH HORIZONTAL REINFORCING EACH DIRECTION.
7. WHERE FOOTINGS ARE IN CLOSE PROXIMITY TO SUBSURFACE PIPING, TOP OF FOOTING SHALL BE LOWERED TO PROVIDE A MINIMUM OF 8" BELOW INVERT ELEVATION OF PIPING.
8. CONCRETE PIERS (IF PROVIDED): PLACE CONCRETE PIERS AND WALLS TOGETHER, SET PIER STEEL AND EXTEND WALL STEEL THROUGH PIER VERTICAL BARS. PROVIDE DOWELS WITH STANDARD HOOK FROM FOOTINGS AT ALL PIERS. SIZE AND QUANTITY OF DOWELS TO MATCH VERTICAL PIER REINFORCING.
9. PROVIDE CORROSION RESISTANT ACCESSORIES IN ALL EXPOSED CONCRETE.
10. RUB ALL EXPOSED CONCRETE SURFACES SMOOTH AND FINISH WITH CEMENT GROUT.
11. PROVIDE AIR ENTRAINMENT IN ALL EXTERIOR CONCRETE AS WELL AS GARAGE AND PORCH SLABS THAT WILL BE EXPOSED TO DEICING SALTS.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD):

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992, (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36, (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   C. CONNECTION BOLTS----ASTM A325-N
   D. ANCHOR RODS---ASTM F 1554
   E. WELDING ELECTRODE---ASTM E 70XX

2. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE PLANS ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR REVIEW TO THE ENGINEER.
3. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
4. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
5. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
6. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
7. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
8. FABRICATE BEAMS WITH MILL CAMBER UP.
9. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE WORK IS FULLY COMPLETED.
10. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
11. BOLT HOLES SHALL BE PUNCHED OR DRILLED, FLAME CUT HOLES ARE NOT ACCEPTABLE.
12. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
13. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325-N. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
16. ALL BOLTED JOINTS SHALL BE SNUG TIGHT (ST) UNLESS OTHERWISE DESIGNATED AS PRETENSIONED (PT) OR SLIP CRITICAL (SC) ON THE DRAWINGS.
17. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
18. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
19. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS STANDARDS.
20. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
21. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
22. NOTIFY THE ENGINEER PRIOR TO FIELD CUTTING OR MODIFYING APPROVED FABRICATIONS.
23. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
24. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

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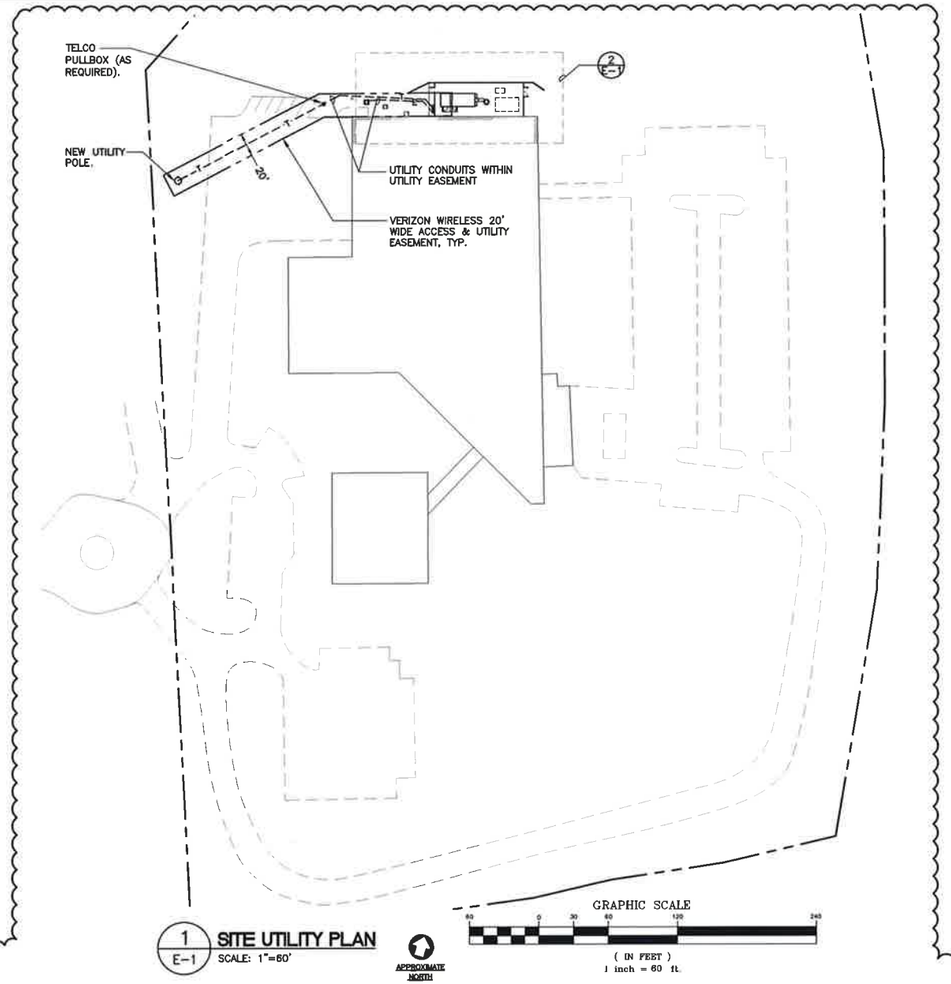
DESIGN BASIS AND STRUCTURAL SPECIFICATIONS

S-2



1 E-1 **SITE UTILITY PLAN**
SCALE: 1"=60'

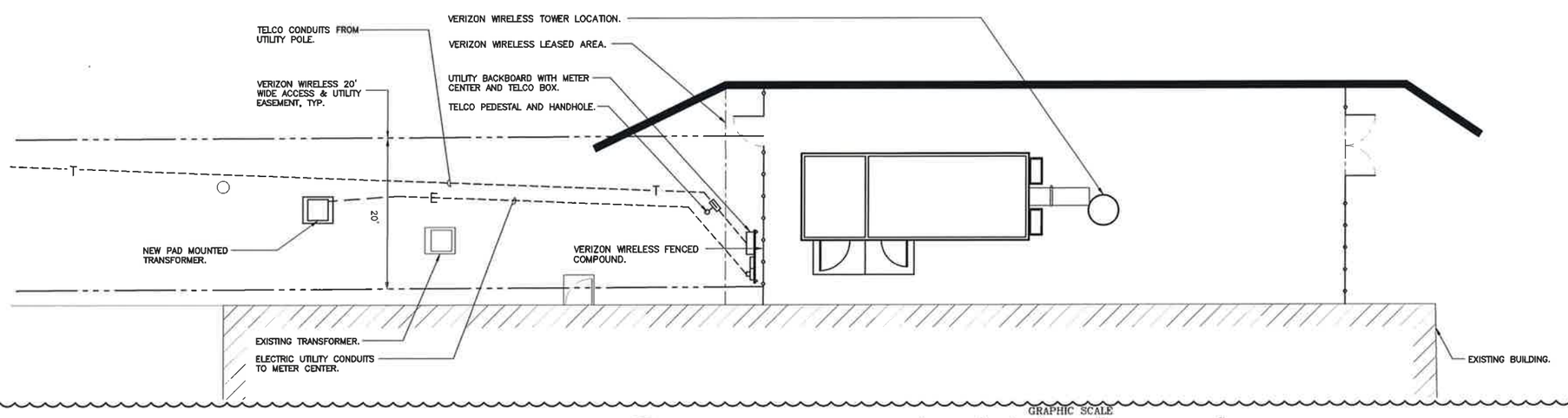
APPROXIMATE NORTH

UTILITY NOTES

1. COORDINATE WITH OWNER FOR ALL EASEMENT DOCUMENTS.
2. UTILITY ROUTING SHOWN ON THIS PLAN IS SCHEMATIC. CONTRACTOR SHALL COORDINATE FINAL ROUTING WITH RESPECTIVE UTILITY COMPANIES PRIOR TO PERFORMING ANY UTILITY TRENCH WORK. ALL UTILITY CONDUITS AND PULL BOXES SHALL BE LOCATED WITHIN THE PROPOSED ACCESS/UTILITY EASEMENT.
3. UTILITY PULL BOXES/SILOS TO BE TRAFFIC RATED AND INSTALLED IN APPROXIMATE LOCATIONS SHOWN ON THIS PLAN, BUT NOT TO EXCEED 450' INTERVALS. CONTRACTOR TO COORDINATE FINAL PULL BOX LOCATIONS WITH RESPECTIVE LOCAL UTILITY COMPANIES.
4. CONTRACTOR SHALL COORDINATE ALL PERMITS AND PROCEDURES FOR CONDUIT INSTALLATION ALONG STREET.
5. PLAN IS FOR UTILITY ROUTING INFORMATION ONLY. SOME OTHER ELEMENTS NOT SHOWN FOR CLARITY. REFER TO CIVIL DRAWINGS FOR ALL OTHER EXISTING AND PROPOSED SITE INFORMATION.
6. FINAL LOCATION OF EQUIPMENT TO BE CONFIRMED WITH UTILITY COMPANY.

LEGEND

- PROPERTY LINE
- ACCESS/ UTILITY EASEMENT LINE (PROPOSED)
- E/T — ELECTRICAL/TELCO CONDUIT RUN (UNDERGROUND)
- O/H — UTILITY LINES (OVERHEAD BY UTILITY CO.)
- UTILITY PULL BOX/SILO
- UTILITY POLE



2 E-1 **PARTIAL SITE UTILITY PLAN**
SCALE: 1"=8'

APPROXIMATE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	04/30/15	HMR	DMD	CONSTRUCTION DOCUMENTS – REVISED PER PRE-CON MEETING ON 4/30/15
1	04/24/15	TJB	CKD	CONSTRUCTION DOCUMENTS – LESSOR REQUESTED REVISIONS
0	11/14/14	TJB	CKD	CONSTRUCTION DOCUMENTS

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SITE UTILITY PLAN

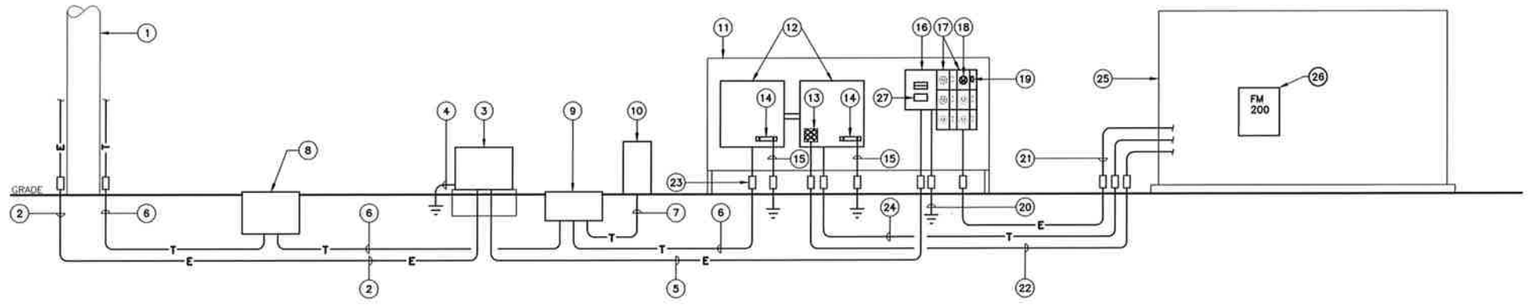
E-1

GENERAL NOTES

1. CONTRACTOR TO VERIFY ALL CONDUIT ROUTING AND INSTALLATION REQUIREMENTS WITH LOCAL UTILITIES PRIOR TO INSTALLATION.
2. ALL CONDUITS SHALL HAVE EXPANSION COUPLINGS WHERE EXTENDING ABOVE GRADE.
3. ALL UTILITY SUPPLY CONDUITS, CONDUCTORS AND ASSOCIATED EQUIPMENT MUST BE LOCATED WITHIN THE LIMITS OF THE UTILITY EASEMENT. COORDINATE WITH OWNER FOR ALL EASEMENT DOCUMENTATION.
4. REFER TO SITE UTILITY PLAN.
5. TELEPHONE EQUIPMENT SHOWN APPROXIMATE. COORDINATE WITH TELEPHONE UTILITY COMPANY AND PROVIDE ALL SPECIFIED EQUIPMENT.
6. COORDINATE SERVICE EQUIPMENT INTERRUPTING RATING WITH AVAILABLE FAULT CURRENT FROM UTILITY COMPANY. EQUIPMENT SHALL NOT BE RATED LESS THAN 65 KAIC.
7. ALL TELEPHONE AND ELECTRIC UTILITY WORK MUST BE COORDINATED WITH UTILITY COMPANY, AND ALL EQUIPMENT MUST BE UTILITY COMPANY APPROVED. CONTRACTOR SHALL PROVIDE ALL ELEMENTS NOT PROVIDED BY UTILITY COMPANIES.
8. CONDUCTOR SIZES SHALL NOT BE REDUCED OR SUBSTITUTED WITHOUT ENGINEERS APPROVAL.
9. ALL CONDUCTORS AND CONDUCTOR TERMINATIONS SHALL BE RATED FOR 75° C OPERATION.

RISER NOTES

1. NEW UTILITY POLE TO BE USED. REFER TO SITE SURVEY AND UTILITY PLAN.
2. 3" CONDUIT FOR PRIMARY ELECTRIC CONDUCTORS. CONDUCTORS PROVIDED BY UTILITY COMPANY FROM UTILITY POLE TO TRANSFORMER. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER UTILITY COMPANY SPECIFICATIONS.
3. TRANSFORMER PROVIDED BY UTILITY COMPANY. TRANSFORMER VAULT, HOUSING, AND GROUND GRID BY ELECTRICAL CONTRACTOR, PER UTILITY COMPANY SPECIFICATIONS.
4. PROVIDE TRANSFORMER GROUNDING PER NEC AND UTILITY COMPANY SPECIFICATIONS.
5. TWO SETS OF: (3) 600 KCMIL, (1) 1/0 AWG GROUND, 4"C.
6. TWO 4" CONDUITS WITH PULL ROPES FOR TELEPHONE COMPANY CONDUCTORS. CONDUCTORS PROVIDED BY TELEPHONE COMPANY FROM UTILITY POLE TO UTILITY BOARD. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER TELEPHONE COMPANY SPECIFICATIONS.
7. PROVIDE CONDUIT WITH PULL ROPE BETWEEN HANDHOLE AND PEDESTAL. EXPECT TWO 4" CONDUITS, BUT FINAL SIZE AND QUANTITY PER TELEPHONE COMPANY.
8. TELEPHONE SPLICE BOX. MUST BE TRAFFIC RATED. QUANTITY AND LOCATION PER UTILITY COMPANY SPECIFICATIONS.
9. TELEPHONE COMPANY HANDHOLE. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
10. TELEPHONE COMPANY PEDESTAL. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
11. UTILITY BACKBOARD. REFER TO CIVIL DRAWINGS.
12. TWO 3'x4'x1' NEMA-3R TELEPHONE ENCLOSURES INSTALLED NEXT TO EACH OTHER ON UTILITY BACKBOARD. MAINTAIN APPROXIMATELY 1' SEPARATION BETWEEN AND INSTALL A SECTION OF 4" CONDUIT CONNECTING BOTH BOXES.
13. PROVIDE DOUBLE DUPLEX, GFI RECEPTACLE IN WEATHERPROOF ENCLOSURE INSIDE OF TELEPHONE ENCLOSURE. CONNECT TO DEDICATED 20A/1P CIRCUIT IN VERIZON WIRELESS ELECTRIC PANEL IN SHELTER.
14. PROVIDE GROUND BAR AS REQUIRED BY TELEPHONE COMPANY.
15. #2 AWG GROUNDING CONDUCTOR IN 3/4" PVC CONDUIT, UNLESS OTHERWISE SPECIFIED BY TELEPHONE COMPANY. BOND TO GROUNDING TRIAD.
16. 800A, 240/120V, 1P, 65 KAIC RATED, NEMA-3R, MAIN CIRCUIT BREAKER MODULE WITH 800A/2P MAIN CIRCUIT BREAKER. (SQUARE-D: EZM1800CBU OR APPROVED EQUIVALENT.) MUST BE UTILITY COMPANY APPROVED.
17. TWO 3-GANG MULTI-METER BRANCH DEVICES WITH 240V, 1P, 3W, 225A RATED METER SOCKETS. (SQUARE-D: EZML113225 OR APPROVED EQUIVALENT). MUST BE UTILITY COMPANY APPROVED.
18. UTILITY COMPANY APPROVED METER FOR VERIZON WIRELESS IN AVAILABLE SOCKET. PROVIDE LABEL STATING "VERIZON WIRELESS" ALSO PROVIDE LABEL INDICATING TYPE AND LOCATION OF GENERATOR PER NEC REQUIREMENTS.
19. 200A/2P MAIN CIRCUIT BREAKER IN AVAILABLE POSITION CORRESPONDING TO METER FOR VERIZON WIRELESS.
20. 3/0 AWG GROUNDING ELECTRODE CONDUCTOR IN 3/4 PVC CONDUIT BONDED TO GROUNDING TRIAD LOCATED AT UTILITY BACKBOARD. GROUNDING TRIAD SHALL BE BONDED TO COMPOUND GROUND RING WITH #2 AWG SOLID TINNED BARE COPPER WIRE.
21. (3) # 3/0 AWG, (1) # 6 AWG GROUND, 2-1/2"C. FROM METER TO VERIZON WIRELESS TRANSFER SWITCH IN EQUIPMENT ROOM.
22. (2) # 12 AWG, #12 AWG GROUND, 3/4"C. FROM DEDICATED 20A/1P CIRCUIT BREAKER IN VERIZON WIRELESS POWER PANEL TO RECEPTACLE IN TELCO BOXES.
23. EXPANSION COUPLING, TYPICAL.
24. (2) 4" PVC CONDUITS FOR TELEPHONE SERVICE. PROVIDE TELEPHONE CABLES AS REQUIRED BY TELEPHONE COMPANY AND OWNER. ONE CONDUIT SHALL REMAIN AS OWNERS SPARE, AND SHALL BE CAPPED AND LABELED AT BOTH ENDS. INSTALL PULL ROPE IN SPARE CONDUIT.
25. VERIZON WIRELESS EQUIPMENT SHELTER.
26. PROVIDE 20A CIRCUIT AND WIRING REQUIRED FOR FM-200 SYSTEM. SEE FIRE PROTECTION DRAWING FOR MORE INFORMATION.
27. PROVIDE FAULT CURRENT STUDY AND LABEL PER NEC.



1 / E-2 **RISER DIAGRAM**
NOT TO SCALE

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ELECTRICAL RISER DIAGRAM

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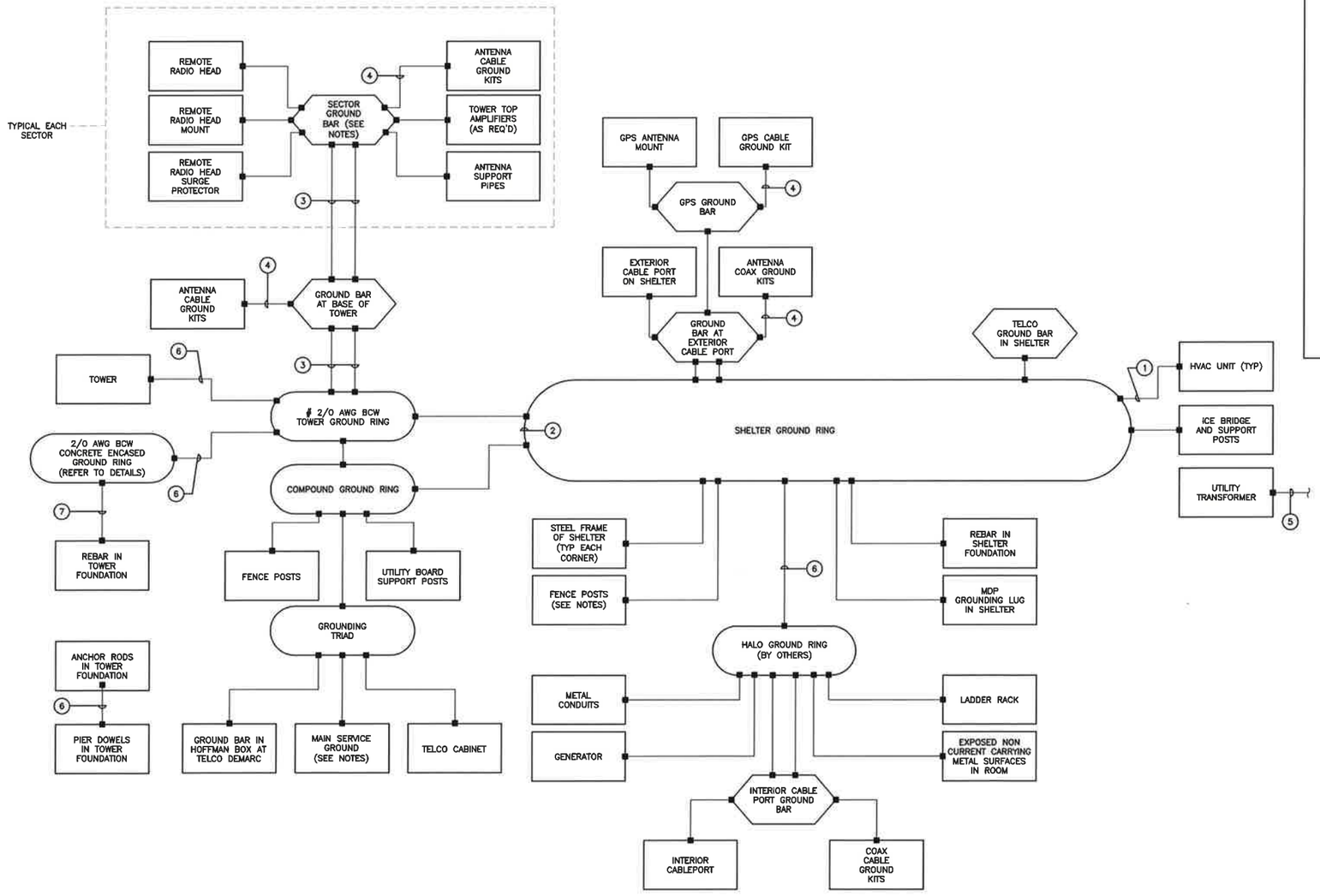

GROUNDING SCHEMATIC NOTES

1. #2 AWG GREEN INSULATED.
2. #2 AWG BCW.
3. #2/0 GREEN INSULATED.
4. #6 AWG.
5. REFER TO RISER DIAGRAM FOR SPECIFICATIONS.
6. FOUR #2/0 GREEN INSULATED.
7. BOND WITH LISTED MECHANICAL CONNECTION.

GENERAL NOTES:

1. ALL SURGE SUPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. GROUND CONDUCTORS SHOWN SHALL BE #2 AWG SOLID TINNED BCW UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
7. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
8. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
9. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
10. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
11. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
12. ALL EXPOSED METAL OBJECTS IN SHELTER SHALL BE BONDED TO THE HALO GROUND WITHIN THAT ROOM.
13. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS
14. REFER TO RISER DIAGRAM FOR SPECIFICATIONS OF SERVICE GROUND AND TRANSFORMER GROUND.
15. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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GROUNDING SCHEMATIC

E-3

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CELLULAR GROUNDING NOTES

OBJECTIVE

PROVIDE A CELLULAR GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. PROVIDE EXTERIOR GROUNDING SCHEME WITH OWNER'S ENGINEER APPROVAL AS REQUIRED TO ACHIEVE DESIRED MAXIMUM AC RESISTANCE TO GROUND.

TESTING

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL. TEST TO BE PERFORMED PRIOR TO CONNECTION OF POWER SUPPLY TO THE CELL SITE AND CONNECTION OF THE GROUNDING SYSTEM TO THE WATER MAIN OR AC SUPPLY AS APPLICABLE.

CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM

EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER
IGR – #2 AWG ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION
INTER-BUS EXTENSION (FROM IGR TO EGR) – SEE DETAILS
EXTERNAL BOND CONNECTIONS TO EGR – #2 ANNEALED SOLID TINNED BARE COPPER
INTERIOR BOND CONNECTIONS TO IGR – #6 ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION

MINIMUM BENDING RADIUS

IGR #2 : 1'-0" NOMINAL AND 8" MINIMUM
EGR #2 : 2'-0" NOMINAL AND 8" MINIMUM
CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 6" BENDING RADIUS.

FASTENER FOR CELLULAR GROUNDING CONDUCTOR

USE NON-METALLIC FASTENER AND STANDOFF 'CLIC' (AVAIL. FROM NEFCO 203-289-0285) TO SURFACE SUPPORT CONDUCTOR 3" AWAY FROM SURFACES.

SPACING OF FASTENERS: 2'-0" O.C. OUTSIDE BUILDING
3'-0" O.C. INSIDE BUILDING

GROUNDING ELECTRODE

GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 10'-0" L COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACE GROUNDING ELECTRODES 20'-0" APART (SPACING MAY BE REDUCED WHERE REQUIRED TO ACCOMMODATE FIELD CONDITIONS BUT SHALL NOT BE LESS THAN 10'-0"). ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'-6" BELOW FINISH GRADE.

CONNECTIONS ABOVE GRADE (MECHANICAL)

COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V RATED. USE 1/4" ø BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.)

EXOTHERMIC WELD LUG CONNECTOR – 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2"ø BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED.

C-TAP COMPRESSION CONNECTOR – HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

MECHANICAL CONNECTIONS

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION.

APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED.

SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

WHEN BONDING #2 TO #2

EXTERIOR OF BUILDING – USE EXOTHERMIC WELD CONNECTION
INTERIOR OF BUILDING – USE COMPRESSION CONNECTION ON STRANDED CONDUCTORS ONLY.
– USE EXOTHERMIC WELD CONNECTION ON SOLID CONDUCTOR.

WHEN BONDING #2 TO FENCE POST

USE EXOTHERMIC WELD 'CADWELD TYPE VS' CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THRU. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS

GROUNDING SYSTEM INTERCONNECTION

BOND THE EGR DOWN CONDUCTORS, AND/OR BURIED GROUND RING TO ANY METALLIC OBJECT OR EXISTING GROUNDING SYSTEM WITHIN 6'.

WHEN BONDING #2 TO TOWER GROUND PLATE

TOWER GROUND PLATE SHALL BE 6" x 8" x 1/4" COPPER AND BE MADE AVAILABLE TO TOWER CONTRACTOR TO BE INSTALLED DURING TOWER CONSTRUCTION. USE EXOTHERMIC WELD 'CADWELD TYPE HS' TO TOWER GROUND PLATE TEST WELD FOR POSSIBLE BURN THRU. COORDINATE THE SIZE OF THE MOUNTING HOLE WITH TOWER CONTRACTOR.

METALLIC CONDUITS

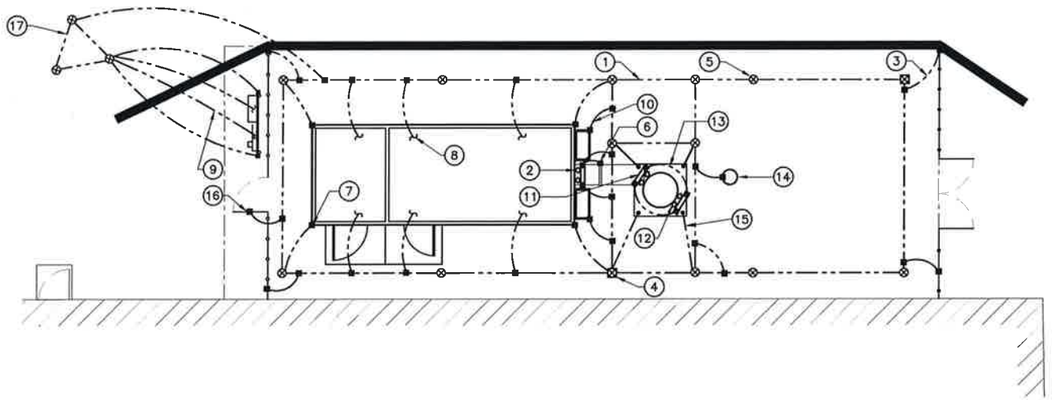
BOND ALL STEEL CONDUITS TO PANELS AT POINT OF CONTACT WITH APPROVED GROUNDING BUSHING.

GROUNDING PLAN NOTES

1. #2 SOLID TINNED BCW GROUND RING (2'-0" FROM OUTSIDE EDGE OF EQUIPMENT SHELTER FOUNDATION WHEN ROUTED ALONG SHELTER PERIMETER.) (TYP.).
2. WAVEPORT GROUND BAR PER DETAIL.
3. CONNECT FENCE TO COMPOUND GROUNDING RING PER FENCE DETAILS (TYP.)
4. GROUNDING ROD WITH ACCESS (TYP.) PER DETAIL.
5. GROUNDING ROD (TYP.) PER DETAIL.
6. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING PER DETAIL.
7. CADWELD EQUIPMENT SHELTER TO GROUND RING (TYP. EACH CORNER).
8. EXTEND GROUND RING PIGTAIL THROUGH SHELTER AND BOND TO HALO GROUND DOWNLEAD. (TYP. 6 PLACES)
9. MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR. REFER TO RISER DIAGRAM.
10. BOND HVAC EQUIPMENT TO EQUIPMENT SHELTER GND RING WITH #2 AWG BCW.
11. UPPER TOWER MOUNTED GROUND BAR PER DETAIL.
12. LOWER TOWER MOUNTED GROUND BAR PER DETAIL.
13. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR (2 GROUND LEADS) PER DETAIL.
14. 6"ø x 200' GROUND WELL REFER TO DETAILS.
15. CONNECT TOWER BASE TO GROUND ROD IN TOWER GROUND RING WITH #2/0 BCW. TYPICAL FOUR PLACES. CADWELD TO TOWER BASE PLATE OR GROUNDING LUG PROVIDE BY TOWER MANUFACTURER. DO NOT CADWELD TO TOWER.
16. GROUND FENCE AND FENCE GATES PER DETAILS.
17. GROUNDING TRIAD. BOND TO GROUND RING.

NOTES

1. COORDINATE WITH RISER DIAGRAM, GROUNDING SYSTEM SCHEMATIC DIAGRAM, AND ALL GROUNDING DETAILS.
2. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
3. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY TOWER OWNER PRIOR TO INSTALLATION.
4. PROVIDE ANY ADDITIONAL GROUNDING ELEMENTS REQUIRED BY TOWER OWNER.



1 / E-4 GROUNDING PLAN
SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 8 ft.

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GROUNDING PLAN

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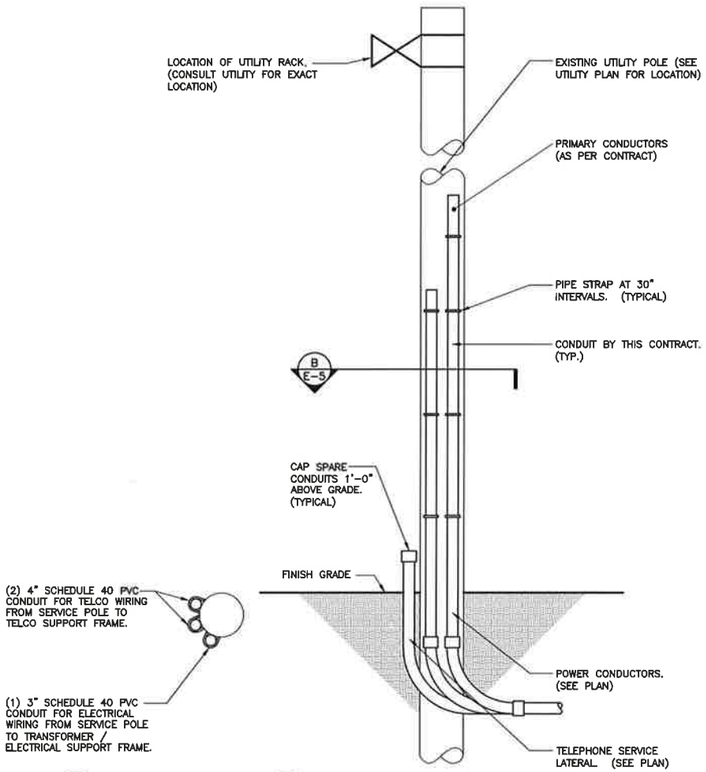
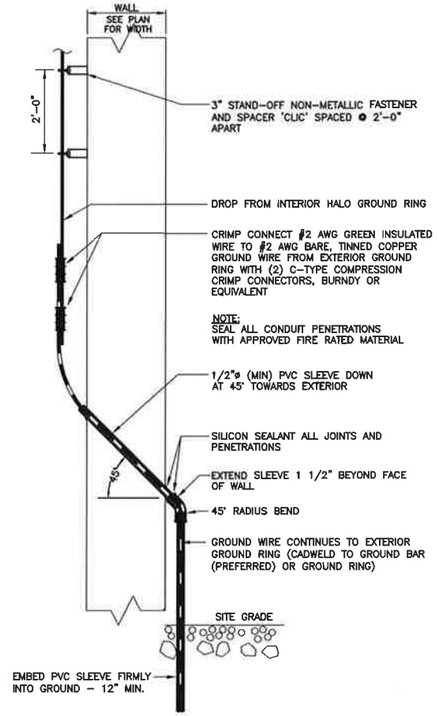


B / E-5 **DETAIL** NOT TO SCALE

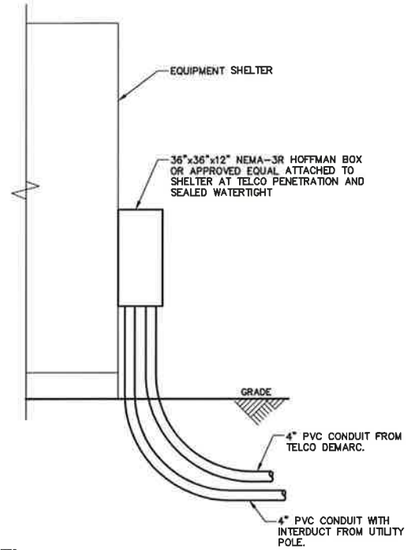
1 / E-5 **INCOMING SERVICE POLE RISER** NOT TO SCALE

SERVICE RISER NOTES:

1. THE LOCATION SHOWN FOR THE CONNECTION TO UTILITIES, AND INCOMING POWER AND TELEPHONE SERVICES IS FOR CONCEPT ONLY. THE CONTRACTOR SHALL COORDINATE THE ACTUAL LOCATION WITH LOCAL TELEPHONE COMPANY, THE OWNER AND LOCAL ELECTRIC UTILITY COMPANY.
2. CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS WITH LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY FOR A TIMELY INSTALLATION OF THE INCOMING POWER AND TELEPHONE SERVICE. CONTRACTOR WILL OBTAIN AN ELECTRIC SERVICE ORDER (ESO) FOR THE SITE FROM LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY PRIOR TO CONSTRUCTION.
3. THE INCOMING ELECTRIC SERVICE WILL BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION AND A CERTIFICATE OF SUCH INSPECTION SHALL BE FURNISHED TO THE OWNER AND A COPY FORWARDED TO LOCAL UTILITY COMPANY.
4. FOR INCOMING UNDERGROUND TELEPHONE SERVICE, THE CONTRACTOR SHALL INSTALL CONDUIT AND PULL WIRES BETWEEN THE RISER POLE AND THE TELCO SERVICE CABINET. THE CONTRACTOR SHALL PROVIDE PRE CAST PULL-BOXES INCLUSIVE OF THE PRE CAST COVERS OF THE TYPE AND AS REQUIRED BY LOCAL TELEPHONE COMPANY THE MAXIMUM DISTANCE BETWEEN PULL-BOXES CAN NOT EXCEED 750' (CONTRACTOR TO CONFIRM WITH LOCAL UTILITY). AT THE PROPOSED RISER POLE EXTEND THE TELEPHONE CONDUIT UP THE POLE APPROXIMATELY 8' AND SEAL.
5. THE CONTRACTOR SHALL COORDINATE THE METER REQUIREMENTS WITH LOCAL UTILITY COMPANY.
6. THE INCOMING ELECTRICAL SERVICE SHALL BE INSTALLED IN CONFORMANCE WITH LOCAL UTILITY COMPANY STANDARDS (LATEST EDITION).
7. THIS SITE MAY CONTAIN CRITICAL UNDERGROUND ELECTRIC AND TELEPHONE SERVICES IN THE VICINITY OF THE NEW UNDERGROUND SERVICE AND THE EQUIPMENT SUPPORTS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DISRUPTION OF THESE EXISTING FACILITIES. THE CONTRACTOR SHALL ALSO CONTACT LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY AND ALL THE APPROPRIATE AGENCIES PRIOR TO EXCAVATION AT THIS SITE.



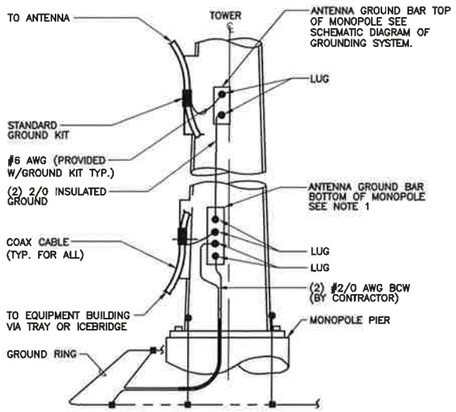
2 / E-5 **CELLULAR GROUNDING CONDUCTOR SECURED ON WALL** N.T.S.



NOTES:

1. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF CONDUITS, PULL ROPES, AND SUPPORT ASSEMBLY.
2. COORDINATE EXACT LOCATION AND CONDUIT SIZE WITH TELEPHONE COMPANY.

3 / E-5 **HOFFMAN BOX DETAIL** NOT TO SCALE



NOTES:

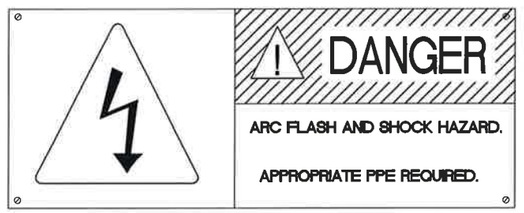
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

4 / E-5 **ANTENNA CABLE GROUNDING** NOT TO SCALE

NOTES:

1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SERVICE EQUIPMENT IN ACCORDANCE WITH 2011 NEC 110.24.

5 / E-6 **DETAIL OF TYPICAL FAULT CURRENT SIGN** NOT TO SCALE



NOTES:

1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS IN ACCORDANCE WITH 2005 NEC 110.16.

6 / E-5 **DETAIL OF TYPICAL FLASH PROTECTION WARNING SIGN** NOT TO SCALE

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DETAILS

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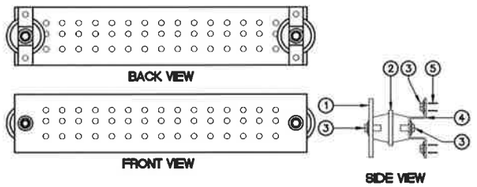
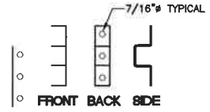


TYPICAL GROUND BAR ASSEMBLY
N.T.S.

TYPICAL GROUND BAR - DIMENSIONS
N.T.S.

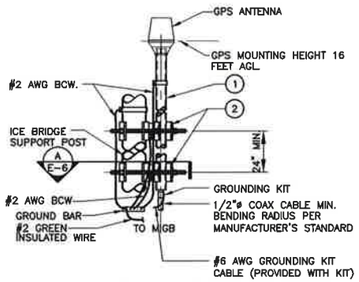
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE - 3/8"ø EXPANSION BOLT FOR CONCRETE.



BRACKET FOR GROUND BAR-DIMENSIONS
N.T.S.

1 / E-6 MASTER/EQUIPMENT GROUND BAR DETAILS
N.T.S.



GPS ANTENNA MOUNTING BRACKET

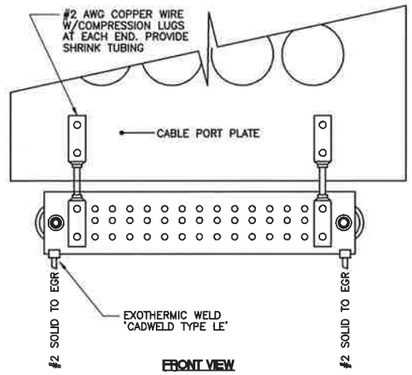
A / E-6 SECTION
NOT TO SCALE

NOTES

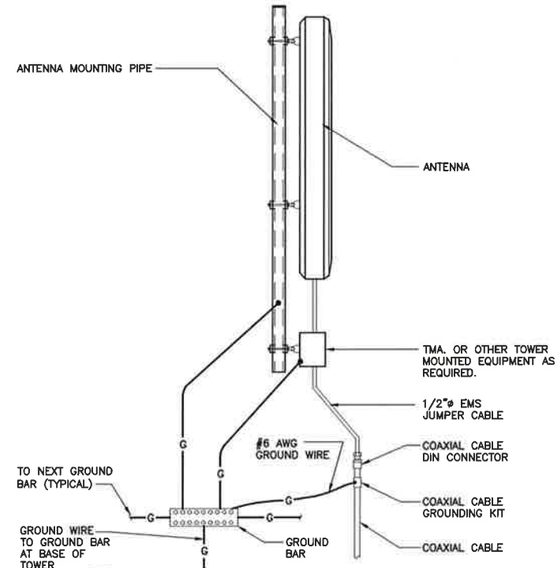
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.

BILL OF MATERIALS

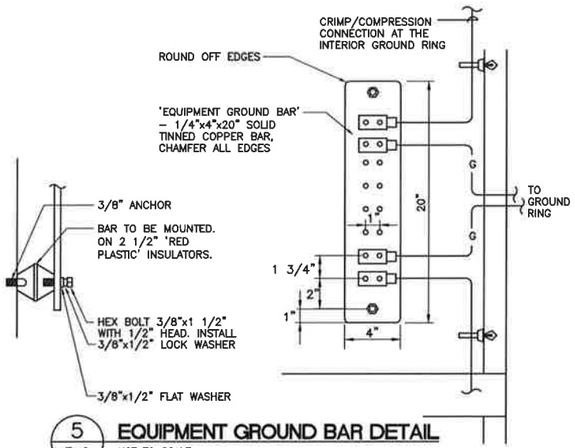
ITEM	DESCRIPTION	QUANTITY
1	2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE	1
2	UNIVERSAL CLAMP SET.	2



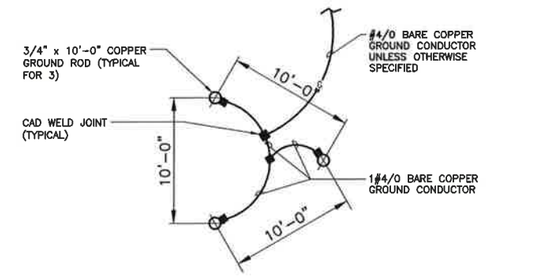
2 / E-6 CABLEPORT GROUND BAR LUG CONNECTION
NOT TO SCALE



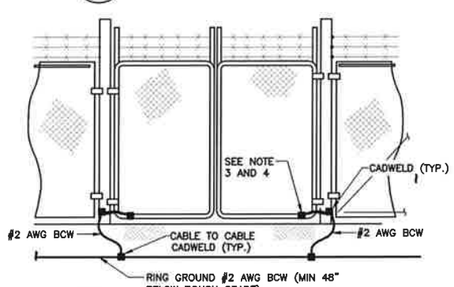
3 / E-6 TYPICAL ANTENNA GROUNDING DETAIL
NOT TO SCALE



5 / E-6 EQUIPMENT GROUND BAR DETAIL
NOT TO SCALE



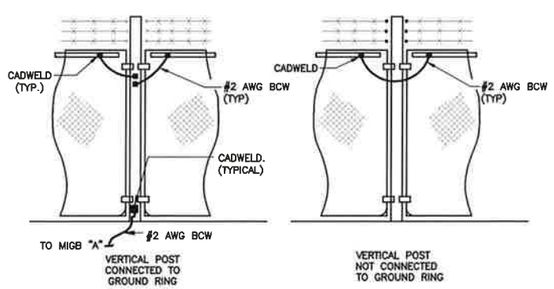
6 / E-6 GROUND TRIAD DETAIL
NOT TO SCALE



NOTE:

1. THE #2 AWG, BCW, FROM THE RING GROUND SHALL BE CADWELDED TO THE POST, ABOVE GRADE.
2. BOND EACH HORIZONTAL POLE/BRACE TO EACH OTHER AND TO EACH VERTICAL POLE BONDED TO THE EXTERIOR GROUND RING.
3. GATE JUMPER SHALL BE #4/0 AWG WELDING CABLE OR FLEXIBLE COPPER BRAID BURNDY TYPE B WITH SLEEVES ON EACH END DESIGNED FOR EXOTHERMIC WELDING.
4. GATE JUMPER SHALL BE INSTALLED SO THAT IT WILL NOT BE SUBJECTED TO DAMAGING STRAIN WHEN GATE IS FULLY OPEN IN EITHER DIRECTION.

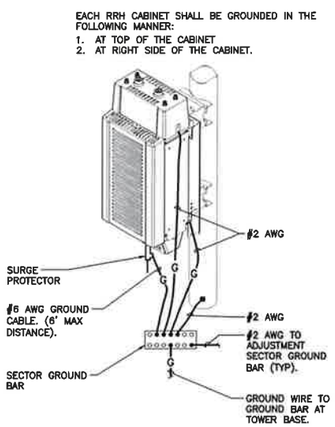
7 / E-6 FENCE GATE GROUNDING
NOT TO SCALE



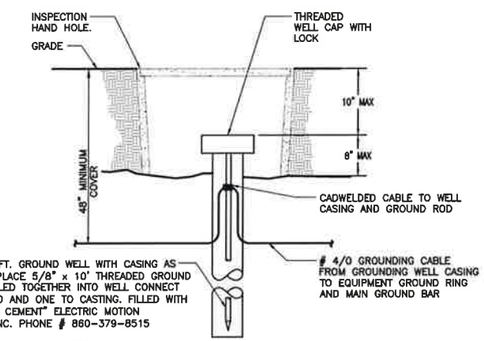
NOTE:

1. VERTICAL POSTS SHALL BE BONDED TO THE RING AT EACH CORNER AND AT EACH GATE POST. AS A MINIMUM ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 FOOT STRAIGHT RUN OF FENCE.
2. HORIZONTAL POLES SHALL BE BONDED TO EACH OTHER.
3. BOND EACH HORIZONTAL POLE / BRACE TO EACH OTHER AND TO EACH VERTICAL POST THAT IS BONDED TO THE EXTERIOR GROUND RING.

8 / E-6 GROUND-STD. DETAIL FENCE GROUNDING
NOT TO SCALE



9 / E-6 RRH POLE MOUNT GROUNDING
NOT TO SCALE



NOTE:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA X 18" DEEP.
2. TO BE INCORPORATED INTO PROJECT IF 5 OHMS CAN NOT BE ACHIEVED AT THE PROJECT SITE

10 / E-6 GROUNDING WELL DETAIL
NOT TO SCALE

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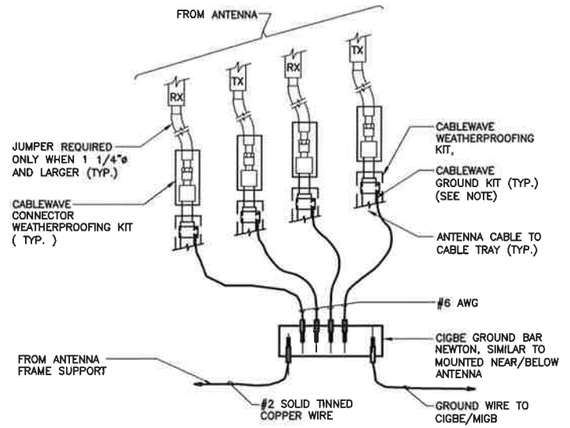
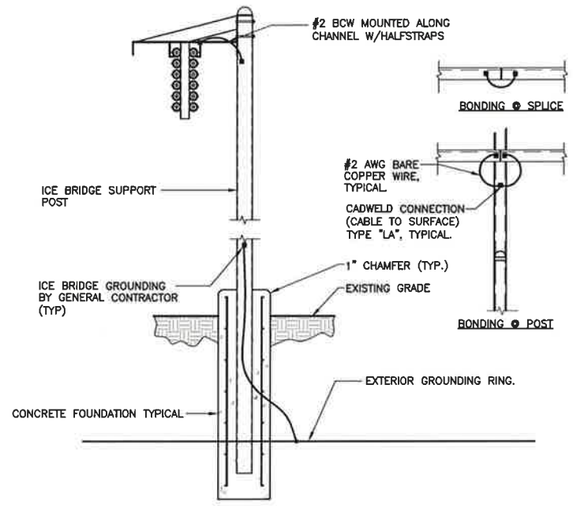


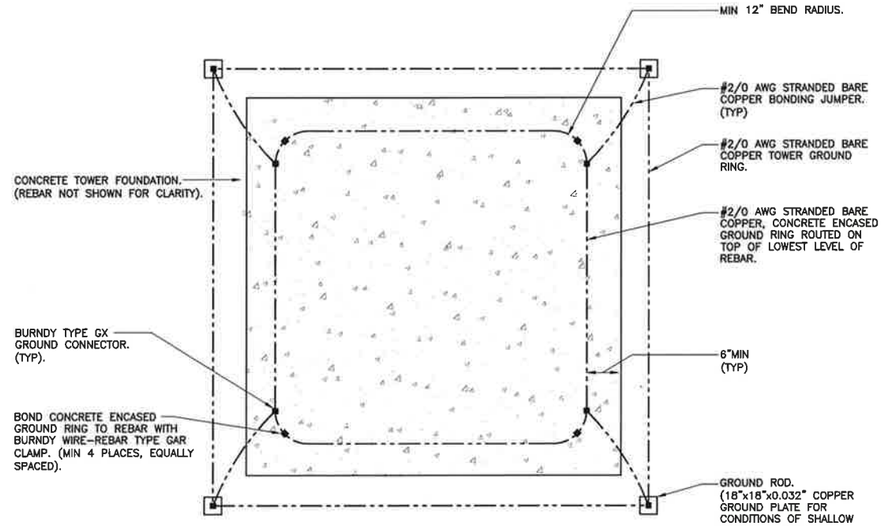
NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

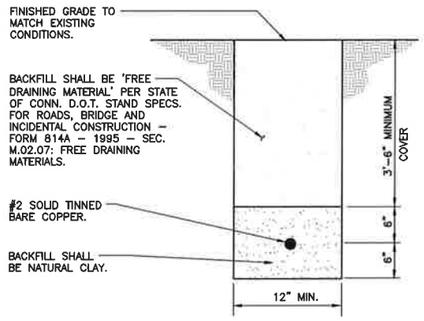
1 / E-7 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE



2 / E-7 **ICE BRIDGE BONDING DETAIL**
NOT TO SCALE



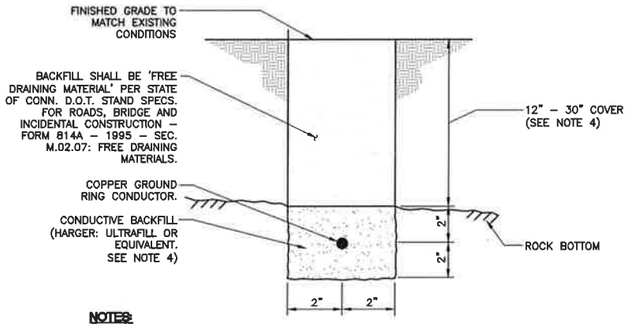
3 / E-7 **CONCRETE ENCASED GROUND RING PLAN VIEW**
NOT TO SCALE



NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN NATURAL CLAY BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.

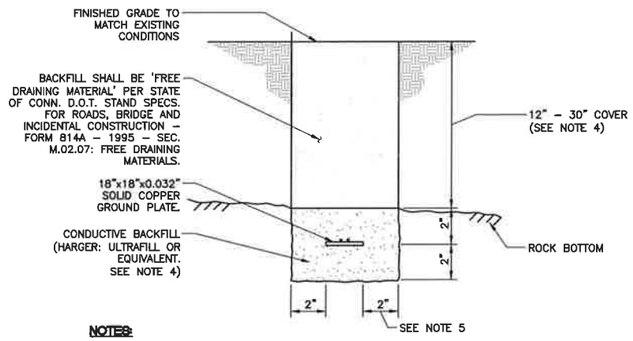
4 / E-7 **EGR TRENCH/BACKFILL DETAIL**
NOT TO SCALE



NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.

5 / E-7 **EGR TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)**
NOT TO SCALE



NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.
5. PROVIDE MIN 2" CLEARANCE ON ALL SIDES OF GROUND PLATE.

6 / E-7 **GROUND PLATE TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)**
NOT TO SCALE

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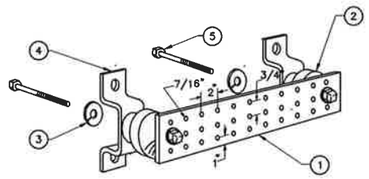
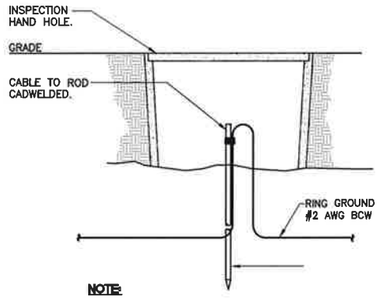


NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

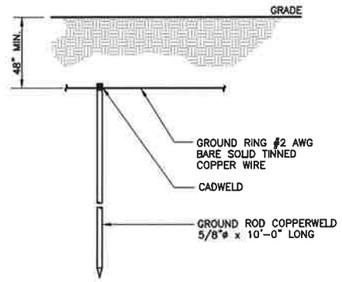
1 / E-8 **GROUND BAR DETAIL**
NOT TO SCALE



NOTE:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

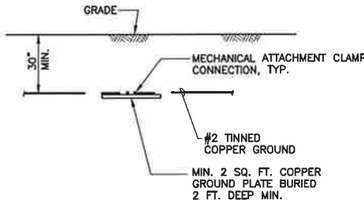
2 / E-8 **GROUND ROD WITH ACCESS DETAIL**
NOT TO SCALE



NOTE:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

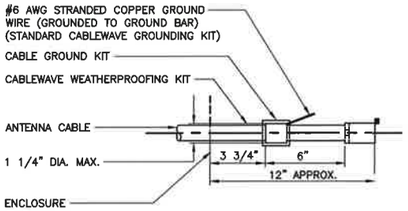
3 / E-8 **GROUND ROD DETAIL**
NOT TO SCALE



NOTE:

1. GROUND PLATE DETAIL TO BE USED ONLY IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

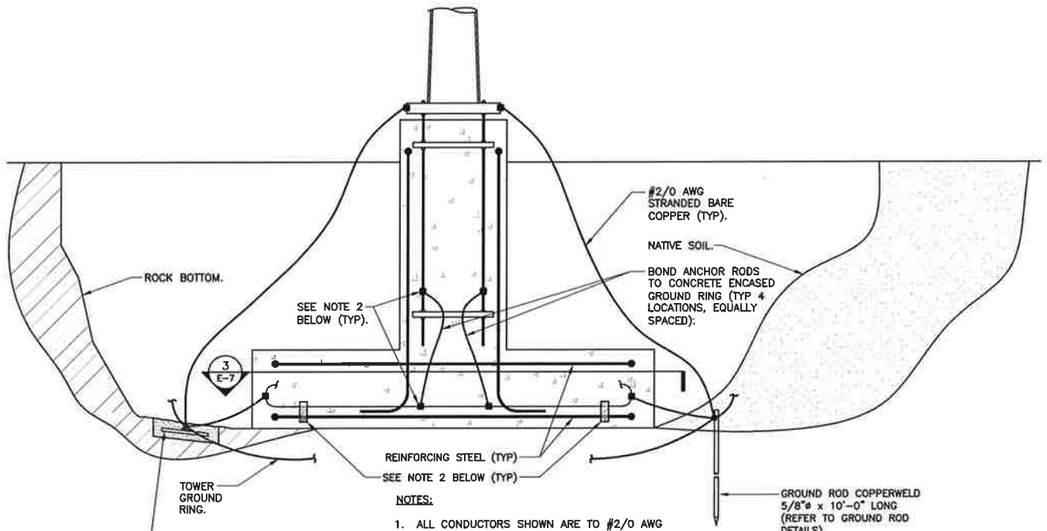
3A / E-8 **GROUND PLATE DETAIL**
NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

4 / E-8 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE



NOTES:

1. ALL CONDUCTORS SHOWN ARE TO #2/0 AWG STRANDED BARE COPPER WIRE.
2. COPPER CONDUCTORS SHALL BE BONDED TO REINFORCING STEEL INSTALLED ON TOP OF LOWEST LAYER OF REBAR AND AT EACH CORNER USING BURNDY TYPE GAR WIRE-REBAR CLAMPS.
3. REFER TO ALL OTHER GROUNDING DETAILS FOR ADDITIONAL INFORMATION.
4. DESIGN IS BASED ON BARE STEEL REBAR FASTENED TOGETHER WITH THE USUAL STEEL TIE WIRES. CONTACT ENGINEER IF CONDITIONS VARY.

5 / E-8 **TOWER FOUNDATION GROUNDING DETAIL**
NOT TO SCALE

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL UTILITY POLES, PRIMARY METER, TRANSFORMER AND NEW 6-GANG MULTI METER CENTER, 800A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
3. GENERATOR/TRANSFER SWITCH.
4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.
5. POWER AND TEMPERATURE CONTROL WIRING FOR HVAC EQUIPMENT.
   a. FURNISH AND INSTALL ALL POWER WIRING FOR ALL HEATING, VENTILATING, AIR CONDITIONING, MOTORS AND DEVICES, AND FIRE PROTECTION EQUIPMENT INDICATED ON THE PLANS OR CALLED FOR IN THIS SPECIFICATION, EITHER ELECTRICAL OR MECHANICAL INCLUDING ALL CONTROL WIRING. ALL MAGNETIC STARTERS SHALL BE FURNISHED UNDER DIVISION 15 AND HAVE INSTALLED THEREIN A PROPER OVERLOAD HEATER FOR EACH MOTOR.
   b. ALL WIRING, BOTH POWER AND CONTROL, FOR SUCH ITEMS AS UNIT HEATERS, EXHAUST FANS, ETC., NOT SPECIFICALLY CALLED FOR IN THE TEMPERATURE CONTROL SPECIFICATIONS, SHALL BE WIRED UNDER DIVISION 16.
   c. ALL CONTROLS WHICH ARE TO BE WIRED BY THIS CONTRACTOR SHALL BE DELIVERED TO HIM BY THE CONTRACTOR/VENDOR FURNISHING THEM.
6. CELLULAR SITE ALARMS, ASSOCIATED WIRING AND DEVICES.
7. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.
8. FURNISH AND INSTALL 3/4" PLYWOOD BACKBOARD OF SIZE INDICATED ON DRAWINGS FOR MOUNTING OF POWER/SERVICE EQUIPMENT AND TELEPHONE/ALARM EQUIPMENT. BACKBOARDS SHALL BE PAINTED WITH TWO (2) COATS OF SEMI-GLOSS GRAY FIRE RETARDANT PAINT.
9. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
10. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.
2. SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

E. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". ALL CONDUIT RUNS LOCATED WITHIN THE OWNER'S EQUIPMENT ROOM SHALL ORIGINATE FROM THE WIREWAY AND RUN VERTICALLY TO ITS DESTINATION. NO BENDS WILL BE ACCEPTED. CONDUITS SHALL BE PROPERLY FASTENED TO THE WALLS AND CEILINGS AS REQUIRED BY THE N.E.C.

CONDUIT MATERIAL SHALL BE AS FOLLOWS:

1. ELECTRIC METALLIC TUBING (EMT) – BRANCH CIRCUITS INSIDE WIRELESS ROOM
2. GALVANIZED RIGID CONDUIT (GRC) – FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.
3. LIQUID TIGHT FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.
4. FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.
5. PVC CONDUIT – WHERE SHOWN ON GROUNDING DETAILS.

SECTION 16113

1.01. WIREWAYS

A. THE 4" X 4" WIREWAY LOCATED IN THE OWNER'S EQUIPMENT ROOM SHALL BE INSTALLED ALONG THE TOP OF THE INTERIOR WALL AND SHALL HAVE ONE VERTICAL DROP CONNECTED TO PANELBOARD. MANUFACTURER SHALL BE HOFFMAN ENGINEERING COMPANY OR APPROVED EQUAL.

SECTION 16114

1.01. CABLE TRAY

A. CABLE TRAY SHALL BE SOLID SIDE BAR, 18" WIDE (NEWTON INSTRUMENT COMPANY, INC.). TRAY SHALL BE INSTALLED AS SHOWN ON CONTRACT DOCUMENTS.

B. CROSSWISE RUNS SHALL BE COORDINATED WITH THE SPECIFIC EQUIPMENT THE TRAY SHALL SERVE.

C. ALL PROTRUDING CABLE TRAY SUPPORT RODS SHALL BE FILED SMOOTH WITH NO SHARP EDGES. ALL SUPPORT RODS SHALL BE CAD-PLATED FOR RUST RESISTANCE AND A MINIMUM 1/2" DIAMETER.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

F. PROVIDE A NAMEPLATE AT THE SERVICE EQUIPMENT INDICATING THE TYPE AND LOCATION OF THE ON SITE GENERATOR.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.
4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16980).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. INTERIOR GROUND RING
3. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
4. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16620
(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/14/14	TJB	CND	CONSTRUCTION DOCUMENTS

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

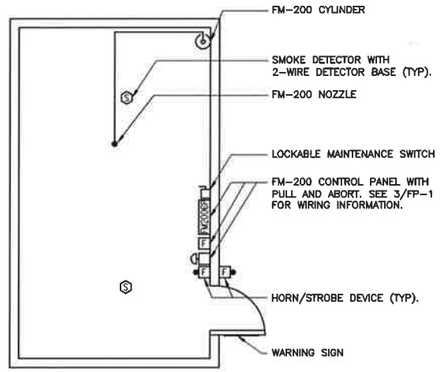
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
TRUMBULL SE 4
60 COMMERCE DRIVE
TRUMBULL, CT 06611

DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13208.000

ELECTRICAL SPECIFICATIONS

E-9

Sheet No. 19 of 19

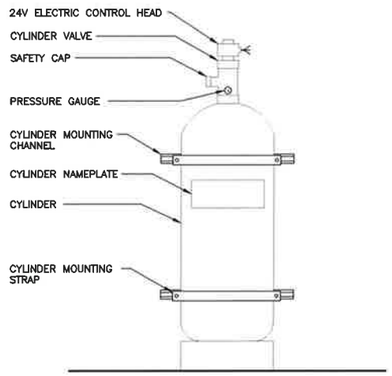


1. FIRE PROTECTION FLOOR PLAN SHOWN IS A TYPICAL LAYOUT, AND MAY NEED TO BE REVISED AS REQUIRED BY FIELD CONDITIONS ON A CASE-TO-CASE BASIS.
2. WATERLESS FIRE SUPPRESSION SYSTEM (FM-200) AGENT TANK TO BE FLOOR MOUNTED. CONTRACTOR TO COORDINATE WITH FIRE SUPPRESSION SYSTEM VENDOR TO PROVIDE ALL PARTS AND ACCESSORIES REQUIRED FOR PROPER INSTALLATION.
3. PIPE SHALL BE SUPPORTED BY U.L. LISTED HANGERS, PAYING ATTENTION TO BRACING AT NOZZLES.
4. AN ANTI-RECOIL PLUG MUST BE INSTALLED IN THE VALVE OUTLET AT ALL TIMES EXCEPT WHEN CONNECTING TO THE SYSTEM, OR WHEN FILLING THE SYSTEM. DO NOT ATTEMPT TO REMOVE THE CYLINDER FROM INSTALLATION IF THE ANTI-RECOIL PLUG AND PROTECTION CAP ARE NOT AVAILABLE FOR THE SAFE HANDLING OF THE CYLINDER.
5. POWER SHALL BE PROVIDED FROM DEDICATED SERVICE.
6. BE SURE ALL WIRING IS FREE OF SHORTS AND GROUND FAULTS BEFORE SUPPLYING POWER TO CONTROL PANEL.
7. NO PARALLEL BRANCHES OR SPLICE TAPS ARE PERMITTED ON SUPERVISED LINES.
8. SYSTEM LOW VOLTAGE WIRING SHALL NOT BE RUN IN THE SAME CONDUIT AS AC CONDUCTORS.

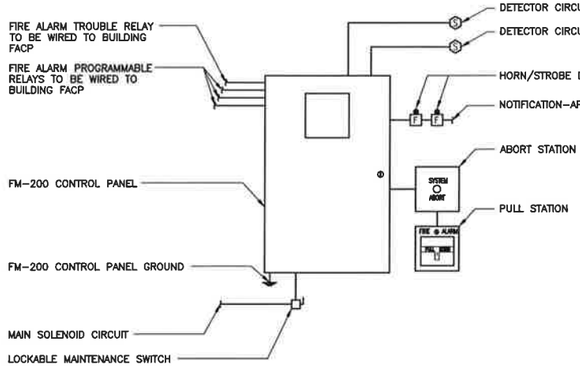
SYMBOL LIST

S	SMOKE DETECTOR	F	HORN/STROBE DEVICE
F	PULL STATION	FM200CP	FM-200 CONTROL PANEL
	LOCKABLE MAINTENANCE SWITCH		ABORT STATION

1 / FP-1 **TYP. FIRE PROTECTION FLOOR PLAN**
NOT TO SCALE



2 / FP-1 **CYLINDER DETAIL**
NOT TO SCALE



3 / FP-1 **WIRING DIAGRAM**
NOT TO SCALE

FM-200 SPECIFICATIONS

CLEAN EXTINGUISHING AGENT FM-200 SYSTEMS

A. SCOPE
1. THIS SPECIFICATION OUTLINES THE REQUIREMENTS FOR A FIRE DETECTION AND TOTAL FLOODING FM-200 CLEAN EXTINGUISHING AGENT FIRE SUPPRESSION SYSTEM.
2. THE WORK DESCRIBED IN THIS SPECIFICATION CONSISTS OF ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY AND REQUIRED, TO COMPLETE AND TEST THE FIRE DETECTOR AND TOTAL FLOODING (FM-200) FIRE SUPPRESSION SYSTEM.

B. WORK SPECIFIED ELSEWHERE
1. THE WORK ITEMS AND/OR WORK SHALL BE INCLUDED, BUT NOT IN THIS CONTRACTOR'S SCOPE OF WORK:
   a. ONE 120 VAC POWER SOURCE FOR THE FM-200 CONTROL PANEL (5 AMP DEDICATED FUSED CIRCUIT PROVIDED).
   b. POWER INTERRUPTION CIRCUITS FOR HVAC UNITS, PURGE EXHAUST EQUIPMENT AND MAKE-UP AIR EQUIPMENT. FM-200 FIRE CONTROL PANEL SHALL PROVIDE NECESSARY CONTACTS FOR POWER INTERRUPTING CIRCUITS. WIRE AND CONDUIT, J-BOXES, ETC., INSTALLED BY THE ELECTRICAL CONTRACTOR.
   c. AUTOMATIC DOOR CLOSURES SHALL BE PROVIDED WHEREVER NECESSARY.
   d. SEALING OF OPENINGS, CRACKS, PENETRATIONS, ETC.
   e. WALL SHALL HAVE 16 O.C. SUPPORT STUDS OR SUITABLE ANCHORING FOR AGENT THRUST.

C. REQUIREMENTS
1. THIS INSTALLATION SHALL BE MADE IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, AND APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS. ALL EQUIPMENT AND DEVICES USED SHALL CONFORM TO THE REQUIREMENTS OF THE U.L. FIRE PROTECTION EQUIPMENT LIST AND THE FACTORY MUTUAL APPROVAL GUIDE.
2. THIS INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH THE 2004 EDITION OF THE NFPA 2001 STANDARD.
3. ALL EQUIPMENT SHALL INCORPORATE DESIGNS WHICH FOLLOW THE 2004 EDITION OF THE NFPA 2001 STANDARD.

D. GENERAL
1. THE CONTRACTOR SHALL FURNISH AND INSTALL A FM-200 FIRE SUPPRESSION SYSTEM COMPLETE AND READY FOR OPERATION INCLUDING CHARGED STORAGE CONTAINERS, PIPING NETWORK, NOZZLES, CONTROL UNITS, DETECTORS, MANUAL RELEASE STATIONS, ABORT STATIONS, AUDIBLE AND VISUAL ALARMS, SOLENOID, INSTRUCTIONAL SIGNS, 24 VDC WIRING, AND ANY AND ALL OTHER EQUIPMENT NECESSARY FOR A COMPLETE, OPERATIONAL SYSTEM.
2. THE SYSTEM SHALL BE PRODUCED BY ONE MANUFACTURER OF ESTABLISHED REPUTATION AND EXPERIENCE WHO SHALL HAVE PRODUCED SIMILAR APPARATUS FOR A PERIOD OF AT LEAST FIVE (5) YEARS.
3. THE SYSTEM SHALL BE INSTALLED BY FACTORY AUTHORIZED PERSONNEL IN ACCORDANCE WITH MANUFACTURER'S GUIDANCE AND INSTRUCTION IN THE INSTALLATION OF FM-200 FIRE SUPPRESSION SYSTEMS.
4. THE INSTALLING CONTRACTOR SHALL BE AUTHORIZED, WITH AVAILABLE SPARE PARTS FROM THE MANUFACTURER FOR THE EQUIPMENT INCLUDED IN THE SYSTEM SO THAT IMMEDIATE REPLACEMENT OF COMPONENTS CAN BE MADE FROM INVENTORY, AND IF NEEDED, ON AN EMERGENCY BASIS.

E. SUBMITTALS
1. THE FOLLOWING SHALL BE SUBMITTED FOR APPROVAL PRIOR TO THE START OF THE INSTALLATION.
   a. DRAWINGS SHOWING SYSTEM AND REMOTE COMPONENT LOCATIONS, PIPING ISOMETRICS, ELECTRICAL DIAGRAMS, ELEVATIONS AND COMPONENT DETAIL.
   b. SYSTEM SIZING CALCULATIONS STAMPED BY A PROFESSIONAL ENGINEER IN THE STATE OF INSTALLATION, A LICENSED AUTOMATIC SPRINKLER DESIGNER, OR BY A NICET LEVEL IV DESIGNER.
   c. MANUFACTURER'S DATA SHEETS ON ALL COMPONENTS INCLUDED IN THE SYSTEM.
   d. MANUFACTURER'S TRAINING INSTRUCTION MANUALS FOR THE INSTALLING CONTRACTOR'S PERSONNEL ASSIGNED TO INSTALL THIS SYSTEM.
   e. AS-BUILT DRAWINGS SUBMITTED FOR REVIEW AND APPROVAL, PRIOR TO PROJECT COMPLETION.

F. SYSTEM DESCRIPTION AND OPERATION
1. THE SYSTEM SHALL BE A TOTAL FLOODING FM-200 FIRE SUPPRESSION SYSTEM DESIGNED TO PROVIDE A UNIFORM CONCENTRATION IN THE PROTECTED AREA.
2. EACH PROTECTED ZONE SHALL HAVE ITS OWN FM-200 NOZZLE(S) WITH PIPING NETWORKS. SYSTEMS UTILIZING EXPLOSIVE INITIATORS HAVING LIMITED SHELL LIFE ARE NOT ACCEPTABLE.
3. THE FM-200 SHALL BE STORED IN CONTAINERS AND SUPER PRESSURIZED WITH NITROGEN TO 360 PSI AT 70 DEGREES FAHRENHEIT. THE CONTAINER SHALL BE CONSTRUCTED OF HIGH STRENGTH ALLOY STEEL, MEETING THE REQUIREMENTS OF THE DEPARTMENT OF TRANSPORTATION FOR REFILLABLE PRESSURE VESSELS AND MUST CONFORM TO NFPA 2001 STANDARDS. THE CONTAINER SHALL HAVE A PRESSURE GAUGE FOR VISUAL INSPECTION, AND SHALL BE ELECTRICALLY SUPERVISED THROUGH THE USE OF A PRESSURE SWITCH. THE CONTAINER SHALL BE DESIGNED TO SAFELY VENT OVER-PRESSURIZATION DUE TO HIGH TEMPERATURES.
4. THE FM-200 CONTAINER SHALL BE SECURELY MOUNTED TO THE STRUCTURAL FRAME. THE MOUNTING BRACKET SURFACE SHALL BE CAPABLE OF WITHSTANDING A THRUST OF 1,000 POUNDS FOR FIVE SECONDS.
5. FM-200 DISCHARGE NOZZLES SHALL BE ONE PIECE CONSTRUCTION AND ORIFICE SIZES SHALL BE DRILLED. MANUFACTURERS PART NUMBERS ARE TO BE PERMANENTLY MARKED.
6. DISTRIBUTION PIPING SHALL BE SCHEDULE 40 STEEL PIPE, ASTM, A53, GRADE A, ERW IN SIZES UP TO EIGHT (8) INCHES. FITTING SHALL BE THREADED, 300# MALLEABLE IRON CONFORMING TO ASTM A197. ALL PIPING MUST BE REAMED, BLOWN CLEAR AND SWABBED WITH APPROPRIATE SOLVENTS TO REMOVE BURRS, MILL VARNISH, AND CUTTING OIL BEFORE ASSEMBLY. THE PIPING NETWORK SHALL BE FREE OF PARTICULATE MATTER AND OIL RESIDUE BEFORE INSTALLATION OF NOZZLES. TEFLON TAPE DOPE SHALL BE USED, AND SHALL BE APPLIED TO MALE THREADS. ALL PIPING MUST BE SOLIDLY ANCHORED TO WALLS, BUILDING STRUCTURE, ETC., FOR SUPPORT AND THRUST BLOCK.
7. FM-200 DISCHARGE TIME SHALL NOT EXCEED TEN (10) SECONDS.
8. ALL SYSTEM FUNCTIONS SHALL BE CONTROLLED AND SUPERVISED BY THE FM-200 SUPPRESSION CONTROL PANEL.
9. ALL CONTROL EQUIPMENT MUST COMPLY WITH PART 15 OF FCC RULES.
11. SEQUENCE OF OPERATION
   a. ACTUATION OF ONE DETECTOR SHALL:
      - INITIATE 1ST ZONE ALARM LED ON CONTROL PANEL AND SOUND SOLID TONE ALERT
      - SOUND HORN/STROBE (SLOW PULSE) IN PROTECTED SPACE
      - TRANSFER ALARM RELAY CONTACTS
      - CONTROL PANEL MUST PROVIDE ALARM SILENCE SWITCH FOR SILENCING ALARM
      - INITIATE LED ON DETECTOR
   b. ACTUATION OF SECOND DETECTOR SHALL:
      - INITIATE 2ND ZONE LED ON CONTROL PANEL
      - SOUND HORN/STROBE (STEADY) IN PROTECTED AREA. HORN TO PULSE DURING TIME DELAY COUNTDOWN OR ABORT HOLD
      - START 0-30 SECOND ADJUSTABLE TIME DELAY
      - TRANSFER PRE-DISCHARGE RELAY CONTACTS
   c. EXPIRATION OF ADJUSTABLE TIME DELAY SHALL:
      - SIGNAL STROBE/HORN. HORN TO SOUND IN STEADY MODE
      - TRANSFER DISCHARGE RELAY CONTACTS
      - RELEASE CIRCUIT IS ENERGIZED, WHICH OPENS FM-200 CONTAINER AND RELEASES AGENT
   d. WHEN A MANUAL PULL STATION IS ACTUATED, THE FM-200 FIRE CONTROL PANEL WILL IMMEDIATELY SOUND ALL ALARMS, ILLUMINATE APPROPRIATE LEDS, TRANSFER RELAY CONTACTS AND DISCHARGE THE FM-200.
   e. WHEN AN ABORT STATION IS ACTUATED, THE FM-200 DISCHARGE WILL BE CANCELED AS LONG AS THE ABORT BUTTON IS DEPRESSED. UPON RELEASE OF THE ABORT BUTTON, TIME DELAY WILL ELAPSE BEFORE FM-200 DISCHARGE. HOWEVER, THE MANUAL PULL STATION SHALL OVERRIDE THE ABORT STATION.
   f. IF TROUBLE OCCURS, THE FM-200 FIRE CONTROL PANEL SHALL:
      - ILLUMINATE TROUBLE LED ON THE CONTROL PANEL
      - SOUND A PULSING ALERT IN CONTROL PANEL
      - TROUBLE RELAY CONTRACTS WILL TRANSFER
12. THE FM-200 FIRE CONTROL PANEL SHALL PROVIDE, BUT NOT BE LIMITED TO:
   a. IN-LINE SUPERVISORY DEVICE
   b. SUPERVISED WIRING OF INITIATING SOLENOID(S)
   c. CLASS A WIRING CAPABILITY OF DETECTION AND REMOTE ALARM CIRCUITS
   d. LED DISPLAY SHOWING SYSTEM STATUS
   e. EMERGENCY BATTERY POWER SUPPLY CAPABLE OF POWERING THE SYSTEM FOR A MINIMUM OF 24 HOURS
   f. TROUBLE, ALARM SILENCE SWITCHES
   g. SUPERVISION OF:
      - AC POWER SOURCE
      - DC POWER SOURCE (BATTERY NOT CHARGED OR IS DISCONNECTED)
      - ALARM CIRCUIT
      - PRE-DISCHARGE ALARM CIRCUIT
      - DISCHARGE ALARM CIRCUIT
      - DETECTOR CIRCUITS
      - DISCHARGE CIRCUIT
      - MANUAL PULL CIRCUIT
      - ABORT CIRCUIT
   h. 0-30 SECOND ADJUSTABLE TIME DELAY
13. IONIZATION, OR A COMBINATION OF IONIZATION AND PHOTO-ELECTRIC DETECTORS, SHALL BE USED FOR AUTOMATIC DETECTION. THE IONIZATION DETECTOR SHALL USE SOLID STATE CIRCUITRY AND BE OF THE DUAL CHAMBER CONFIGURATION. THE PHOTO-ELECTRIC DETECTOR SHALL UTILIZE SOLID STATE CIRCUITRY, A PULSED INFRARED LED LIGHT SOURCE, AND A SILICON PHOTO DIODE RECEIVING ELEMENT. DETECTOR SPACING SHALL BE BASED ON NFPA 72E SPACING REQUIREMENTS, BUT IN NO CASE SHALL EXCEED 500 SQUARE FEET PER PAIR OF DETECTORS.
14. INSTRUCTION SIGNS SHALL BE SUPPLIED TO PROVIDE A SYSTEM IN WHICH THE FUNCTION OF EACH DEVICE IS EASY TO UNDERSTAND.
   a. CAUTION SIGNS
      - CAUTION LABEL: "CAUTION - WHEN ALARM SOUNDS - VACATE ROOM - SUPPRESSION SYSTEM BEING DISCHARGED"
      - CAUTION LABEL: "WARNING - THIS AREA IS PROTECTED BY - A FM-200 EXTINGUISHING - SYSTEM. DO NOT ENTER WITHOUT - AUTHORIZATION DURING OR - AFTER DISCHARGE"
      - CAUTION LABEL: "CAUTION - OPERATION OF MANUAL STATION WILL RESULT IN IMMEDIATE SYSTEM DISCHARGE"

G. SYSTEM INSTALLATION
1. THE FM-200 FIRE SUPPRESSION SYSTEM WILL BE INSTALLED IN STRICT ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATION, ALL APPLICABLE CODES AND IN A PROFESSIONAL, WORKMANLIKE MANNER. ALL SYSTEM WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC).

H. PRELIMINARY SYSTEM CHECKOUT
1. AFTER THE INSTALLATION IS COMPLETE, THE SYSTEM SHALL BE THOROUGHLY CHECKED FOR PROPER FUNCTIONING, PROPER CONTAINER AND PIPING SUPPORT, AND PROPER GROUND, RESISTANCE, AND DETECTOR SENSITIVITY. EACH CIRCUIT SHALL BE FUNCTIONALLY TESTED, INCLUDING AUXILIARY CIRCUITS (HVAC SHUTDOWN, SHUNT TRIP POWER INTERRUPTION, ETC.).

I. TRAINING REQUIREMENTS
1. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL PROVIDE OPERATION TRAINING FOR PERSONNEL SELECTED BY THE OWNER. EACH TRAINING SESSION SHALL INCLUDE EMERGENCY PROCEDURES, ABORT FUNCTIONS, SYSTEM CONTROL PANEL OPERATION, TROUBLE PROCEDURES, AND SAFETY REQUIREMENTS. TRAINING SESSIONS SHALL BE FOR TWO (2) DAYS.

J. OPERATION AND MAINTENANCE MANUALS
1. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL PROVIDE COMPLETE OPERATION AND MAINTENANCE INSTRUCTION MANUALS TO THE OWNER. ALL ASPECTS OF SYSTEM OPERATION AND MAINTENANCE SHALL BE DETAILED, INCLUDING ELECTRICAL SCHEMATICS OF ALL CIRCUITS, A WRITTEN DESCRIPTION OF THE SYSTEM DESIGN, DRAWINGS ILLUSTRATING EQUIPMENT LOCATION, AND TECHNICAL BULLETINS DESCRIBING EACH COMPONENT.

K. (FM-200) SYSTEM SERVICE/MAINTENANCE
1. THE MANUFACTURER SHALL PROVIDE A SUPPLEMENTAL SERVICE/MAINTENANCE/INSPECTIONS TRAINING SEMINAR PROPOSAL FOR PROVIDING CERTIFICATION FOR OWNER'S TECHNICAL PERSONNEL.

L. WARRANTY
1. ALL FM-200 SYSTEM COMPONENTS FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED AGAINST DEFECTIVE DESIGN, MATERIALS, AND WORKMANSHIP FOR THE FULL WARRANTY PERIOD WHICH IS STANDARD WITH THE MANUFACTURER AND/OR SUPPLIER, BUT IN NO CASE LESS THAN ONE (1) YEAR FROM THE DATE OF THE SYSTEM ACCEPTANCE.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/14/14	KNL	FRC	CONSTRUCTION DOCUMENTS

PROFESSIONAL ENGINEER SEAL

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DATE: 10/07/14
SCALE: AS NOTED
JOB NO. 13209.000

FPRO FLOOR PLAN, NOTES, DETAILS & SPECS

FP-1

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