CUDDY&
FEDER LLP

445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
Tel 914.761.1300 Fax 914.761.5372
www.cuddyfeder.com

May 9, 2013

**BY EMAIL & FEDEX**
Robert Stein, Chairman
and Members of the Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051
Email: siting.council@ct.gov

Re: Docket 429
New Cingular Wireless (AT&T)
Application for Certificate of Environmental
Compatibility and Public Need in Willington, Connecticut

Dear Chairman Stein and Members of the Siting Council:

On behalf of New Cingular Wireless ("AT&T") please accept for review and Council approval this Development and Management Plan ("D&M Plan") filing for the captioned Facility as approved in Docket 429.

Tower, Compound & Other Equipment

Enclosed are fifteen (15) sets of 11" x 17" signed and stamped drawings prepared by Clough Harbour and Associates ("CHA") dated April 22, 2013 ("D&M Plan") being filed in accordance with the Council's Decision and Order dated February 7, 2013. Two full-sized sets of the construction drawings will follow to the Council under separate cover. The D&M Plan incorporates a 160' monopole as provided for in the Siting Council's Order No. 1 in this Docket. AT&T will mount twelve (12) panel antennas on a low profile platform at a centerline height of 156' AGL. The D&M Plan also includes construction plans for the site clearing, drainage, and erosion and sedimentation control measures consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended.

Attached to this letter please find a geotechnical study, structural design drawings for the tower and foundation, a drainage report ("Drainage Report") for the approved access drive (without Appendices) as well as a sample Erosion and Sedimentation Control Site Inspection Form to be used by AT&T's consultant APT in keeping with the public water supply protective measures developed for this site.[1] Finally, specifications for AT&T's antennas and backup emergency generator are also included.

Due to size considerations, four copies of the full structural and foundation calculations reports as well as the Drainage report *with* Appendices are being bulk filed with the Council. Should the Council or staff require additional copies please do not hesitate to contact me.

[1] See Sheet CO5 of the D&M Plan, "Compound Plan & Site Notes".

Required Notifications

In accordance with the provisions of RCSA Section 16-50j-77, AT&T hereby notifies the Council of its intention to begin site work after Council approval of the D&M Plan. Construction of the tower and other site improvements will commence upon issuance of a local building permit and after a pre-construction meeting.

The supervisor for all construction related matters on this project is Bryon Morawski of SAI. Mr. Morawski is located at 500 Enterprise Drive, Suite 3A, Rocky Hill, CT 06067 and can be reached by telephone at (860) 513-7223.

We respectfully request that this matter be included on the Council's next available agenda for review and approval.

Thank you for your consideration of the enclosed.

Very truly yours,

Daniel M. Laub

Enclosures

cc: Robert and Marissa Golden, Intervenors
Hon. Christina B. Mailhos, Willington First Selectman
Lawrence C. Becker, Property Owner
Michele Briggs, AT&T
David Vivian, SAI
Dean Gustafson, APT
Paul Lusitani, CHA
Christopher B. Fisher, Esq.

CUDDY & FEDER LLP



CERTIFICATE OF SERVICE

I hereby certify that on this day, a copy of the foregoing was sent electronically and by overnight delivery to the Connecticut Siting Council with copy to:

Robert and Marissa Golden
52 Old South Willington Road
Willington, CT 06279
marissakellner@aol.com

Lawrence C. Becker
PO Box 535
Willington, CT 06279
beckerace@aol.com

Dated: May 9th, 2013

Daniel M. Laub

ATTACHMENT 1

**DR. CLARENCE WELTI, P.E., P.C.**

GEOTECHNICAL ENGINEERING

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

May 7, 2013

Mr. David Vivian
New Cingular Wireless PCS, LLC
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

**Re: Geotechnical Study for Proposed AT&T Tower Site No. SR1107
Tolland Turnpike, Willington, CT**

Dear Mr. Vivian:

1.0 Herewith are the data from the test boring and probes taken at the above referenced site. One boring was drilled at the center of the proposed tower. Weathered rock was encountered at 3 feet and hard bedrock at 5 feet below the existing grade. The boring was augered to 5 feet and bedrock was the cored from 5 to 10 feet. Three probes were drilled to auger refusal at 2.5 to 5.5 feet below the existing grades. The boring and probe locations are shown on the attached plan. *The boring and probe were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.*

2.0 The **Subject Project** will include the construction of a 160 foot monopole type tower.

3.0 The **Soil/Rock Cross Section** from the boring and probes was generally as follows:

Topsoil to about 6"

Fine to medium SAND, some Silt, little Gravel to the top of rock at 2.5 to 5.5 feet below the existing grades

Locally; Weathered Rock to 0 to 2 feet below the top of rock

Bedrock; Gneiss and Schist - The rock core taken from 5.0 to 10.0 feet had an RQD value of 40%. The bedrock has a dip of about 60° to the west.

3.1 The **Ground Water Table** was not encountered above the bedrock.

4.0 In general the criteria for tower support is that the foundation capacity would exceed the loads, which might collapse the tower. **Movements from strains in the soils should be limited to differential settlement (or lateral movements of less than ½").**

5.0 The foundation system for the proposed towers would be as follows:

**1. A large mat, placed sufficiently deep to prevent overturning by gravity resistance of the pad. This may either require rock removal or construction above grade.**

**2. A mat with anchorage into the bedrock to provide the required resistance to overturning.**

5.1.1 In alternate (1) the mat would provide the required weight for resistance to over turning. The mat could be placed on a prepared blasted rock surface, or on hard bedrock. The bottom of the mat should be at least 3.5 feet below finished grades for frost protection. The allowable loading directly on the hard bedrock would be 6 Tons/sf. If bedrock removal is required, the pad area could be over blasted by 1 to 2 feet and the area could be leveled with a minimum 8" layer of 3/8" crushed stone, after removal of any large and loose pieces of rock. The allowable loading on the crushed stone over a blasted rock surface or on weathered/fractured rock can be 3 Tons/sf.

5.1.2 Regarding alternate (2) the same criteria for loading will apply. The resistance to uplift and overturning would be provided by rock anchors tied into the foundation. The allowable bond between the cement grout and the bedrock would be 50 psi, starting from 4 feet into the bedrock. The minimum anchor depth shall be 15 feet. For global stability the volume of rock should be that in truncated cone, 5 feet in diameter at the base and extending to the surface at 30° from axis of tie down. The weight of the rock is 165 pcf. Where rock anchors are used the foundation should be directly on the clean bedrock surface.

5.2 Summary of design parameters:

| Parameter | Value |
|---|---|
| Allowable Loading on Clean Sound Bedrock Surface | 6 Tons/sf |
| Allowable Loading on Crushed Stone over Blasted Rock Surface | 3 Tons/sf |
| **Tie Downs** | |
| Bond Rock to Cement Grout | 50 psi |
| Pull Out Angle (from Vertical) | 30° |

5.3 It should be noted that the rock surface may be irregular. Concrete fill (a sub-footing) may be required, when the rock is exposed.

6.0 This report has been prepared for specific a application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

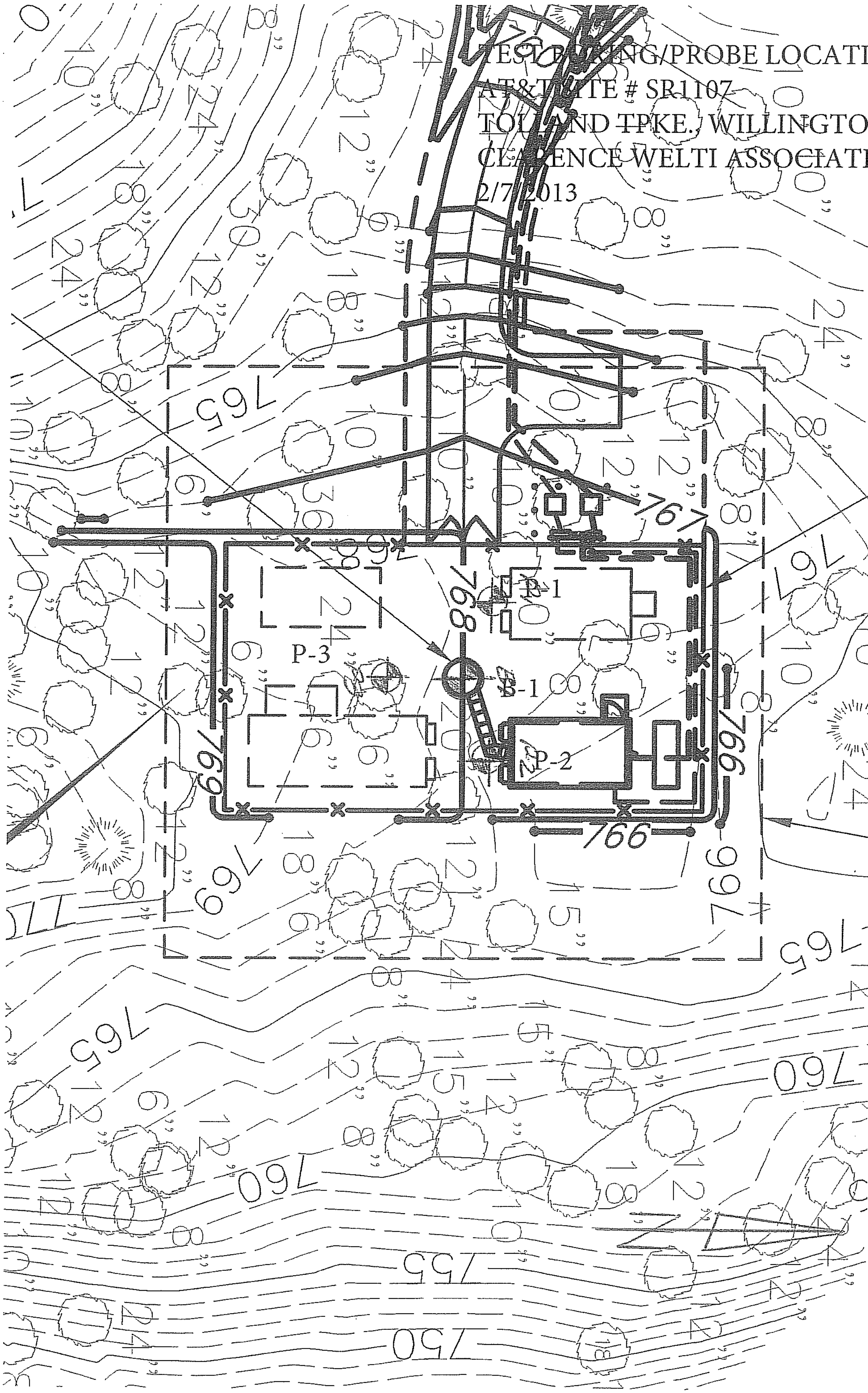
Dr. Clarence Welti, P.E., P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions please call me.

Very truly yours,

Max Welti

Max Welti, P. E.


TEST BORING/PROBE LOCATIONS
AT&T SITE # SR1107
TOLLAND TPKE., WILLINGTON, CT
CLARENCE WELTI ASSOCIATES, INC.
2/7/2013
P-1
P-2
P-3
B-1
765
767
768
766
769
760
755
750

| | | |
|---|---|---|
| **CLARENCE WELTI ASSOC., INC.**<br>P.O. BOX 397<br>GLASTONBURY, CONN 06033 | CLIENT<br>SAI COMMUNICATION, INC. | PROJECT NAME: AT&T SITE # SR1107<br>LOCATION: TOLLAND TURNPIKE, WILLINGTON, CT |

| | AUGER | CASING | SAMPLER | CORE BAR. |
|---|---|---|---|---|
| TYPE | HSA | | SS | NQ |
| SIZE I.D. | 3.75" | | 1.375" | 2.0" |
| HAMMER WT. | | | 140lbs | |
| HAMMER FALL | | | 30" | |

OFFSET:
LINE & STA.:
N. COORDINATE:
E. COORDINATE:

SURFACE ELEV.:
**HOLE NO.** B-1

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 2/7/13
FINISH DATE 2/7/13

| DEPTH | SAMPLE NO. | BLOWS/6" | SAMPLE DEPTH | A | STRATUM DESCRIPTION + REMARKS | ELEV. |
|---|---|---|---|---|---|---|
| 0 | 1 | 16-10-5-5 | 0.00'-2.00' | | BR.FINE-MED.SAND, SOME SILT, LITTLE GRAVEL | |
| | 2 | 16-60 | 2.00'-3.00' | | | |
| | | | | | WEATHERED ROCK | 3.0 |
| 5 | | | | | CORED BEDROCK - GNEISS AND SCHIST | 5.0 |
| | | | | | RUN #1 5.0' - 10.0' RECOVERED 59" RQD=40% | |
| 10 | | | | | BOTTOM OF BORING @ 10.0' | 10.0 |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |
| 35 | | | | | | |

**LEGEND: COL. A:**
**SAMPLE TYPE:** D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
**PROPORTIONS USED:** TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. B-1

| CLARENCE WELTI ASSOC., INC.<br>P.O. BOX 397<br>GLASTONBURY, CONN 06033 | CLIENT<br>SAI COMMUNICATION, INC. | PROJECT NAME<br>AT&T SITE # SR1107<br>LOCATION<br>TOLLAND TURNPIKE, WILLINGTON, CT |
|---|---|---|

| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | HOLE NO. PROBES |
|---|---|---|---|---|---|---|---|
| TYPE | SOLID | | | | LINE & STA. | GROUND WATER OBSERVATIONS | |
| SIZE I.D. | 4.0" | | | | N. COORDINATE | AT none FT. AFTER 0 HOURS | START DATE 2/7/13 |
| HAMMER WT. | | | | | | | |
| HAMMER FALL | | | | | E. COORDINATE | AT FT. AFTER HOURS | FINISH DATE 2/7/13 |

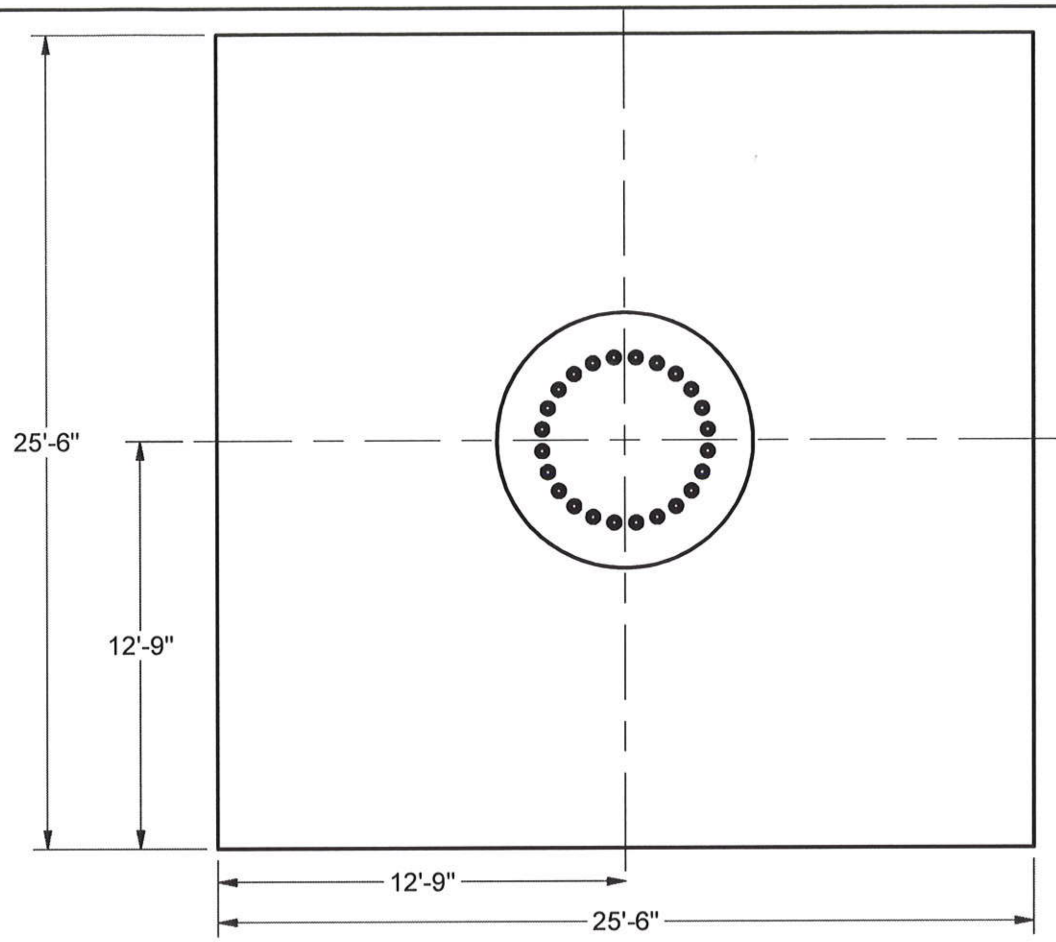
| DEPTH | SAMPLE NO. | SAMPLE BLOWS/6" | SAMPLE DEPTH | A | STRATUM DESCRIPTION + REMARKS | | ELEV. |
|---|---|---|---|---|---|---|---|
| 0 | | | | | PROBE # | DEPTH TO ROCK | |
| | | | | | P-1 | 4.5' | |
| | | | | | P-2 | 2.5' | |
| | | | | | P-3 | 5.5' | |
| 5 | | | | | | | |
| 10 | | | | | | | |
| 15 | | | | | | | |
| 20 | | | | | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |
| 35 | | | | | | | |

**LEGEND: COL. A:**
**SAMPLE TYPE:** D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
**PROPORTIONS USED:** TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

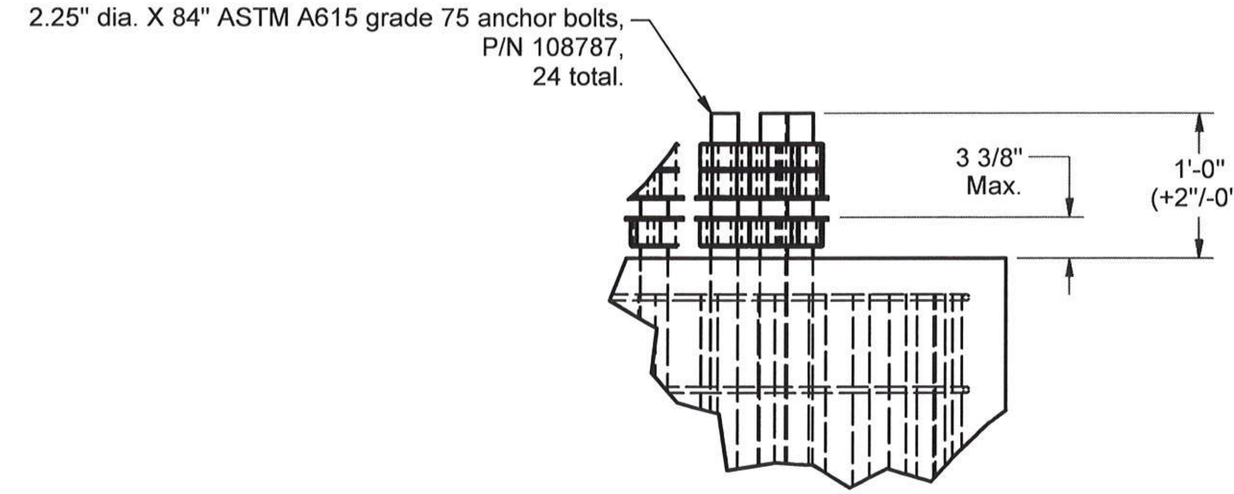
DRILLER: BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. PROBES

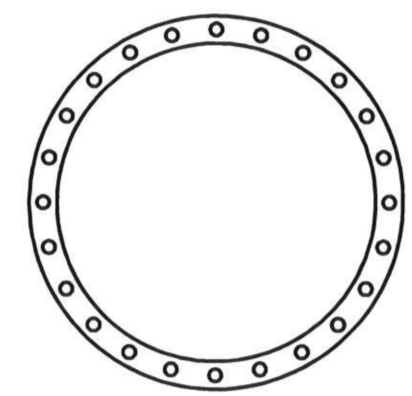
ATTACHMENT 2



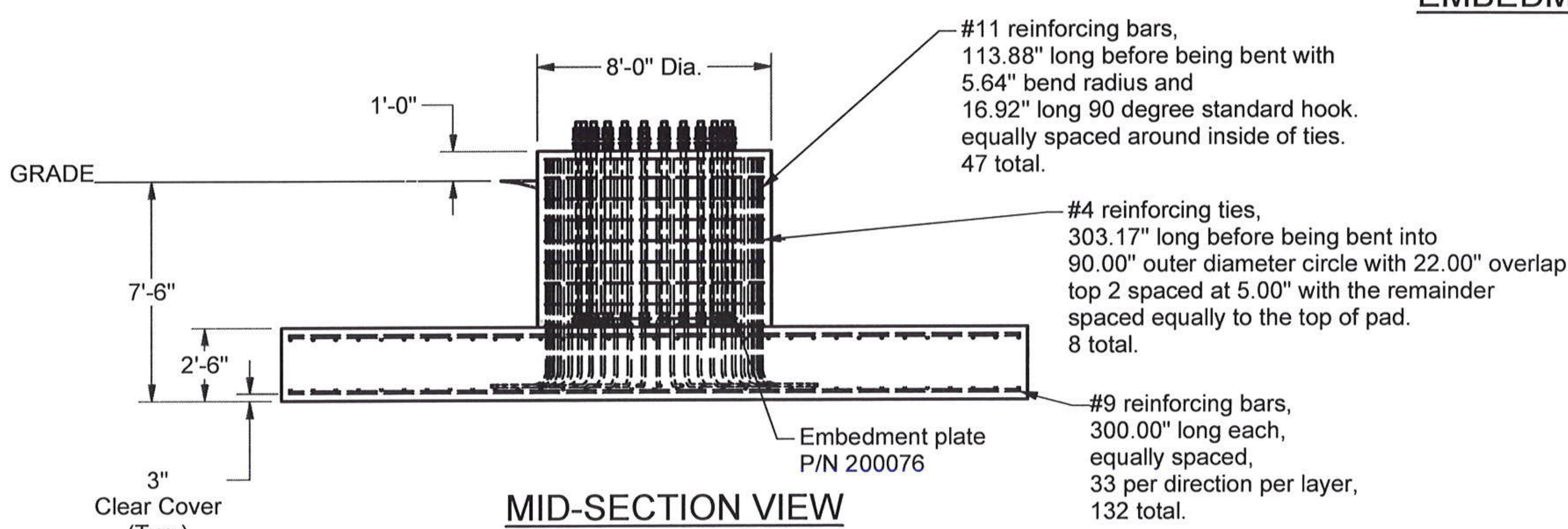

PLAN VIEW
(REINFORCEMENT NOT SHOWN FOR CLARITY)



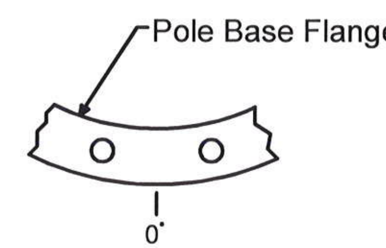

ANCHOR BOLT DETAIL




EMBEDMENT PLATE DETAIL

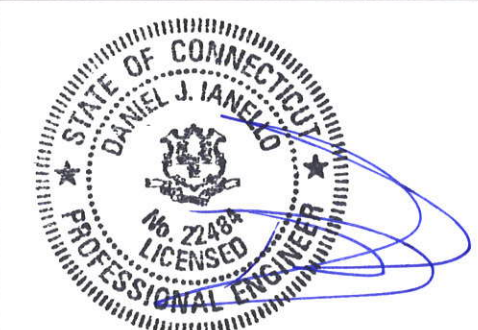



MID-SECTION VIEW
PIER AND PAD FOUNDATION
(CONCRETE VOLUME: 71.4 CU. YD.)




Anchor Bolt Holes
Are on Either Side of
the 0 Degree Azimuth

**Anchor Bolt Azimuth**




APR 29 2013

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |



| | |
|---|---|
| ORIG. DATE: 4/26/2013 | DWG NO: 198289 |
| DWG. PROG: v1.06 | SHEET: 1 OF 2 |

TITLE:
SAI Communications
NTP 55" X 160'
Willington/SR1107
Tolland Co., CT

NELLO CORPORATION
211 W. Washington St.,
Suite 2000
South Bend, IN 46601-1705
Bus: (574)288-3632
Fax: (574)288-5860

Foundation Notes

1. This foundation has been designed for the following reactions.

| | |
|---|---|
| Shear: | 54.2 kips |
| Moment: | 6728.7 ft-kips |
| Weight: | 68.1 kips |

2. Design based on geotechnical report dated 2/15/2013 by Clarence Welti Associates, Inc.; Project No. AT&T Site # SR1107.

3. A field inspection shall be performed in order to verify that the actual site soil parameters meet or exceed the assumed soil parameters and that the depth of standard foundations are adequate based on the frost penetration and groundwater depth. Local frost depth must be no deeper than the bottom of the base foundation.

4. Reinforcement shall be deformed and conform to the requirements of ASTM A615 Grade 60 unless otherwise noted. Splices in reinforcement shall not be allowed unless otherwise noted.

5. Welding is prohibited on reinforcing steel and anchorage.

6. Structural backfill placed below pad must be compacted in 8" loose lifts to a 97% of maximum dry density at optimum moisture content in accordance with ASTM D698. Backfill must be clean and free of organic and frozen soils and foreign materials.

7. Backfill above foundation should be compacted to 95% of maximum dry density at water content within 2 percent of optimum. Backfill must be clean and free of organic and frozen soils and foreign materials.

8. Foundation designs assume level ground at tower site.

9. Loose material shall be removed from bottom of excavation prior to concrete placement.

10. Concrete cover from exposed surface of concrete to surface of reinforcement shall not be less than 3".

11. Concrete and reinforcement installation must conform to ACI 318, "Building Code Requirements for Structual Concrete."

12. Concrete shall develop a minimum compressive strength of 4000 psi in 28 days.

13. Concrete shall be placed as soon as practical after excavating to avoid disturbance of bearing and side wall surfaces.

14. Concrete contractor shall be responsible for properly aligning anchor bolts and materials before and after placing concrete, regardless of whether an anchor bolt template is provided.

15. Positive drainage shall be maintained during construction and throughout the life of the facility to minimize the potential for surface water infiltration.

16. The sub-grade, if practical, should be proof-rolled with vibratory compaction prior to casting foundation or placing structural fill.

17. Overexcavation of unsuitable soils for compacted backfill placement below footings should extend laterally beyond all edges of the footings at least 12 inches per foot of overexcavation depth below footing base elevation.

18. It shall be the contractor's responsibility to locate and prevent damage to any existing underground utilities, foundations or other buried objects that might be damaged or interfered with during construction of the foundation.

19. It is permissible to utilize a cold joint during construction of a pier and pad type foundation. The cold joint must be located at the interface of the piers with the pad, and contractor shall use a bonding agent suitable for cold joints.

20. Foundation design assumes an ultimate bearing capacity value of 12,000 psf.

21. Weathered rock was encountered about 3 feet bgs and hard Gneiss/Schist bedrock was encountered about 5 feet bgs in the test boring. Difficult excavation should be anticipated and the contractor should be prepared to remove such materials. Ripping, jack-hammering or other mechanical means will be required to advance excavation into bedrock. The depth to rock material will vary across the foundation footprint.

22. Design assumes entire footing is bearing on bedrock or properly placed concrete/stone structural fill.

23. In preparing the rock bearing surface for the footing; loose or soft material and debris should be removed, any cracks or seams in the rock should be filled with lean concrete or grout and the rock surface should be leveled. A level bearing surface may be established with lean concrete or 3/8" crushed stone.

24. Construction and installation methods shall be in accordance with the geotechnical report.

STATE OF CONNECTICUT
DANIEL J. IANELLO
No. 22484
LICENSED
PROFESSIONAL ENGINEER

APR 29 2013

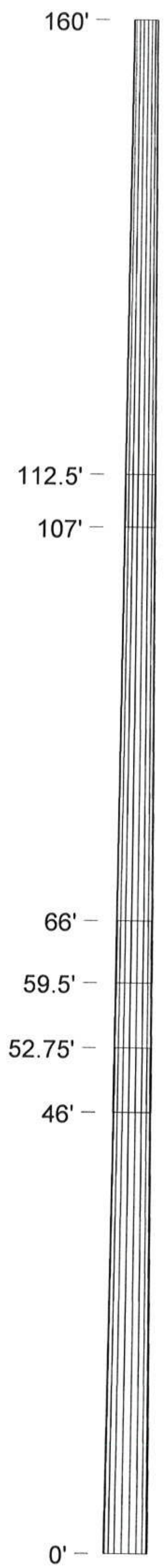
| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |



ORIG. DATE: 4/26/2013
DWG NO: 198289
DWG. PROG: v1.06
SHEET: 2 OF 2

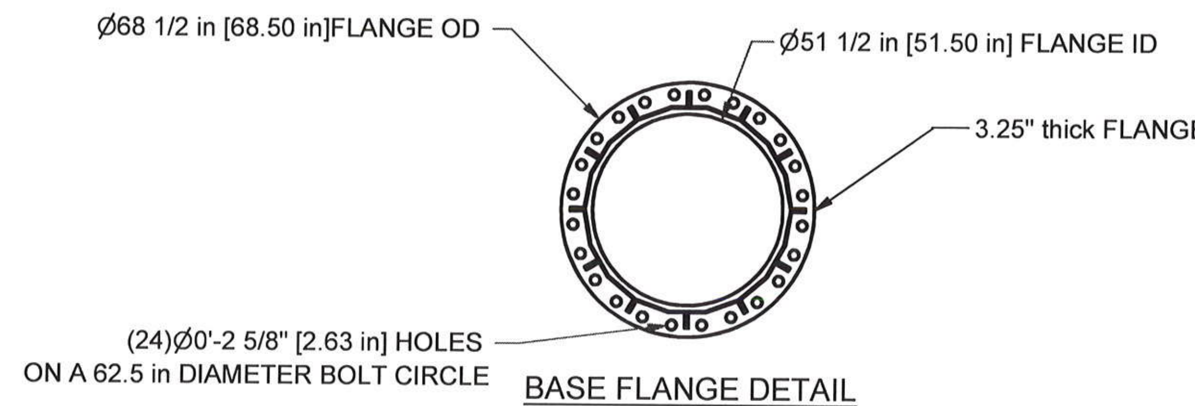
TITLE:
SAI Communications
NTP 55" X 160'
Willington/SR1107
Tolland Co., CT

NELLO CORPORATION
211 W. Washington St.,
Suite 2000
South Bend, IN 46601-1705
Bus: (574)288-3632
Fax: (574)288-5860

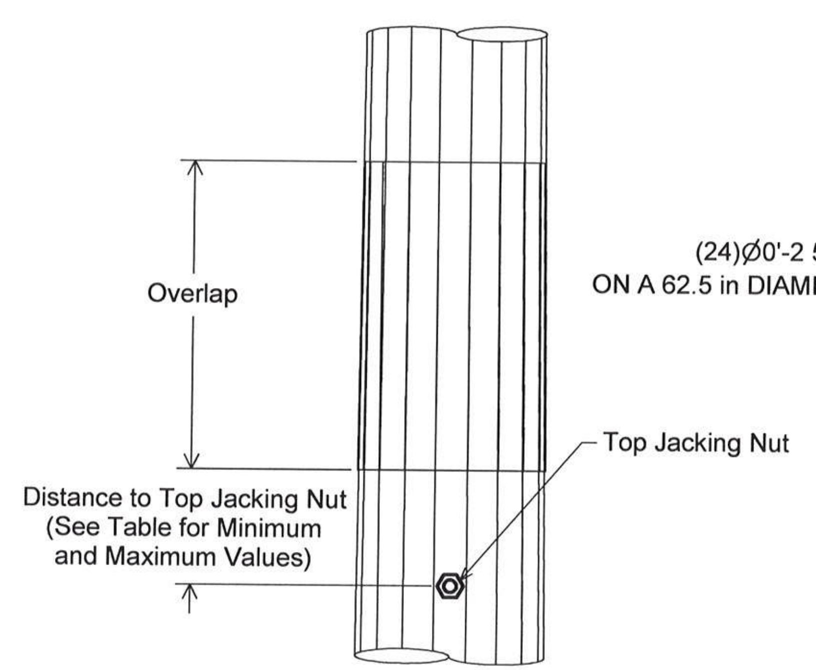



**Pole Section Data**

| Section | Bottom Height (ft) | Top Height (ft) | Length (ft) | Number of Sides | Bottom OD (in) | Top OD (in) | Wall Thickness (in) | Material | Approximate Weight (lb) | Design Overlap (in) | Minimum Overlap (in) | Maximum Overlap (in) | Design Distance to Top Jacking Nut (in) | Maximum Distance to Top Jacking Nut (in) | Minimum Distance to Top Jacking Nut (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 107 | 160 | 53 | 18 | 39.3213 | 30.0000 | 0.2500 | A572-65 | 5400 | 66 | 57 15/16 | 72 5/8 | 15 | 23 1/16 | 8 3/8 |
| 2 | 59.5 | 112.5 | 53 | 18 | 46.9879 | 37.6665 | 0.3750 | A572-65 | 9790 | 78 | 69 1/8 | 85 13/16 | 15 | 23 7/8 | 7 3/16 |
| 3 | 46 | 66 | 20 | 18 | 48.4247 | 44.9072 | 0.4375 | A572-65 | 4760 | 81 | 71 5/16 | 89 1/8 | 15 | 24 11/16 | 6 7/8 |
| 4 | 0 | 52.75 | 52.75 | 18 | 55.4524 | 46.1750 | 0.5000 | A572-65 | 17260 | | | 0 | | | |




BASE FLANGE DETAIL



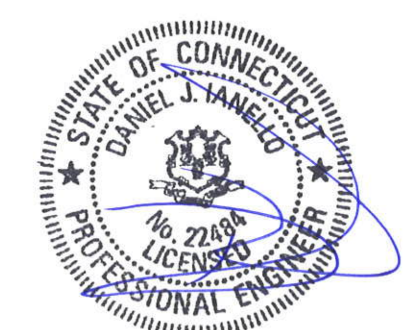

A jacking nut is placed near the top of each section which will have another section placed on top. The distance from this nut to the bottom of the next section must not exceed the value given in the column labeled "Maximum Distance to Top Jacking Nut."

Pole Splice Detail

**Tower Reactions**

No Ice
Shear: 54.2 kips
Moment: 6728.7 ft-kips
Weight: 68.1 kips

With Ice
Shear: 10.5 kips
Moment: 1433.6 ft-kips
Weight: 149.6 kips




APR 29 2013

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | BRG | 4/24/2013 | Revise tower loading per ECO3870 |



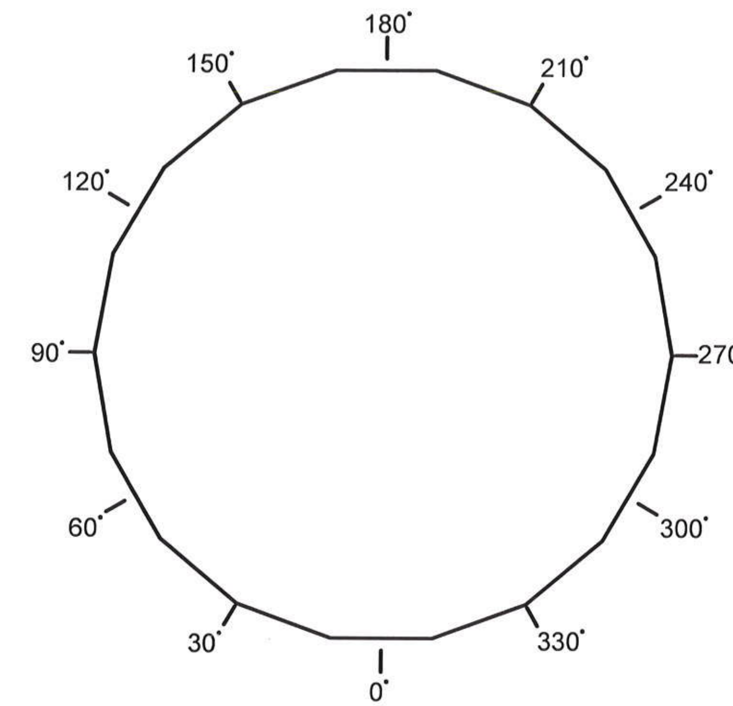
| | | | |
|---|---|---|---|
| ORIG. DATE: | 4/24/2013 | DWG NO: | 198288 |
| DWG. PROG: | v2.05 | SHEET: | 1 OF 4 |

TITLE:
SAI Communications
NTP 55" X 160'
Willington/SR1107
Tolland Co., CT


NELLO CORPORATION
211 W. Washington St., Suite 2000
South Bend, IN 46601-1705
Bus: (574)288-3632
Fax: (574)288-5860

**Portholes**

| Elevation (ft) | Qty | Size (in) | Azimuth (deg) |
|---|---|---|---|
| 152 | 3 | 6 x 12 | 60, 180, 300 |
| 152 | 3 | 8 x 16 | 60, 180, 300 |
| 142 | 3 | 6 x 12 | 60, 180, 300 |
| 132 | 3 | 6 x 12 | 60, 180, 300 |
| 122 | 3 | 6 x 12 | 60, 180, 300 |
| 7.5 | 1 | 9 x 24 | 0 |
| 7.5 | 1 | 10 x 30 | 90 |
| 7.5 | 1 | 9 x 24 | 180 |
| 7.5 | 1 | 9 x 24 | 270 |
| 3.5 | 1 | 9 x 24 | 0 |




Step Bolts on This Side of Pole

Note:
The azimuths referenced here are only to illustrate where the pole features are in relation to each other. The azimuths are not to indicate which cardinal direction the anchor bolts or the pole should be positioned.

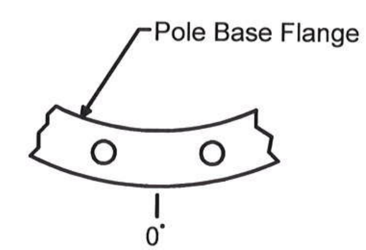
**Pole Reference Azimuths**

**Antenna Loading**

| Height | Qty. | Description |
|---|---|---|
| 160' | 1 | 6' Lightning Rod |
| 155' | 12 | SBNH-1D6565C |
| 155' | 4 | Raycap DC6-48-60-18-8F |
| 155' | 15 | Radio Remote Unit (RRU) |
| 155' | 1 | Low Profile Platform |
| 150' | 15 | RRUS-11 |
| 150' | 1 | Clamp Ring Assembly |
| 145' | 12 | SBNH-1D6565C |
| 145' | 4 | Raycap DC6-48-60-18-8F |
| 145' | 15 | Radio Remote Unit (RRU) |
| 145' | 1 | Low Profile Platform |
| 140' | 15 | RRUS-11 |
| 140' | 1 | Clamp Ring Assembly |
| 135' | 12 | SBNH-1D6565C |
| 135' | 4 | Raycap DC6-48-60-18-8F |
| 135' | 15 | Radio Remote Unit (RRU) |
| 135' | 1 | Low Profile Platform |
| 130' | 15 | RRUS-11 |
| 130' | 1 | Clamp Ring Assembly |
| 125' | 12 | SBNH-1D6565C |
| 125' | 4 | Raycap DC6-48-60-18-8F |
| 125' | 15 | Radio Remote Unit (RRU) |
| 125' | 1 | Low Profile Platform |
| 120' | 15 | RRUS-11 |
| 120' | 1 | Clamp Ring Assembly |

**Feedline Loading**

| Height | Qty. | Description |
|---|---|---|
| 0' - 155' | 8 | 1/2" |
| 0' - 155' | 36 | LDF5-50A (7/8 FOAM) |
| 0' - 145' | 12 | LDF7-50A (1-5/8 FOAM) |
| 0' - 135' | 12 | LDF7-50A (1-5/8 FOAM) |
| 0' - 125' | 12 | LDF7-50A (1-5/8 FOAM) |




Anchor Bolt Holes Are on Either Side of the 0 Degree Azimuth

**Anchor Bolt Azimuth**


APR 29 2013

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | BRG | 4/24/2013 | Revise tower loading per ECO3870 |



ORIG. DATE: 4/24/2013
DWG NO: 198288
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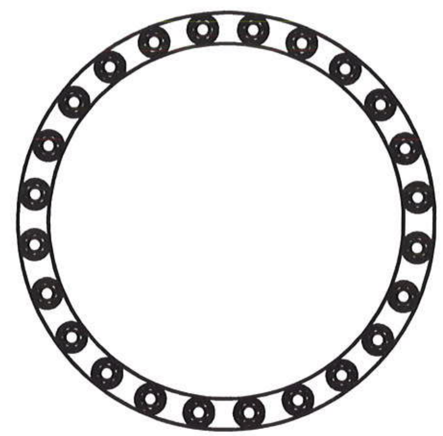
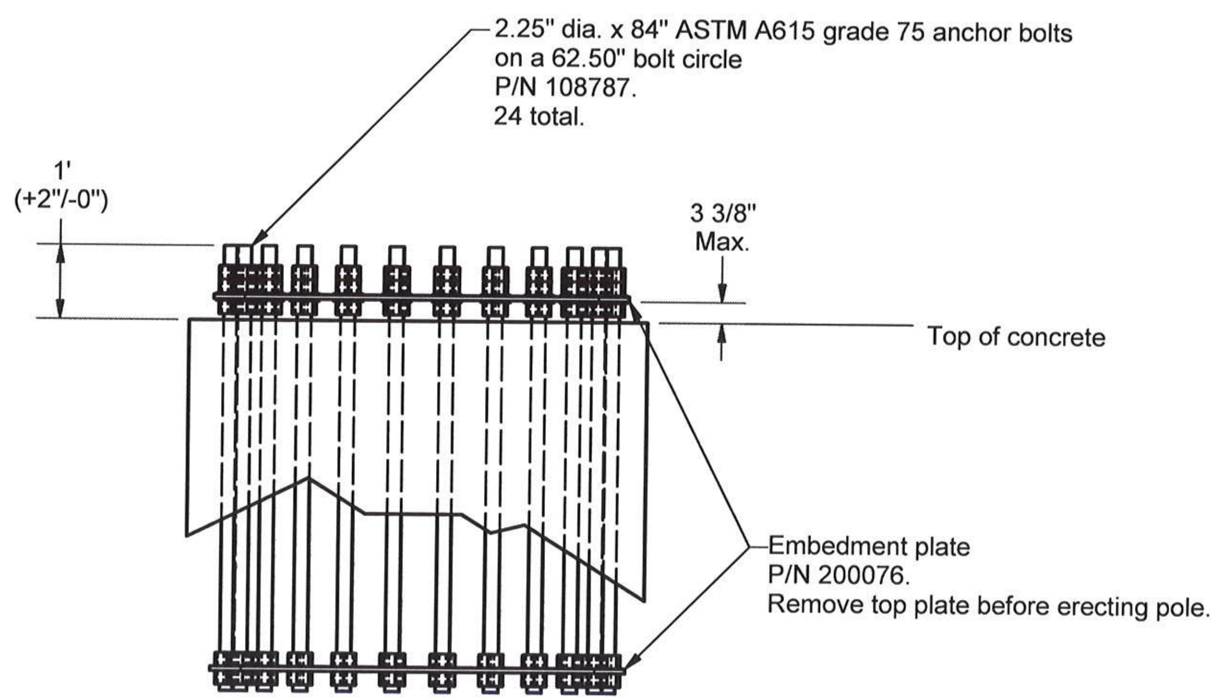
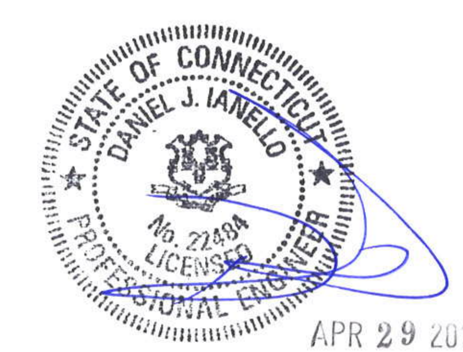
Bus: (574)288-3632
Fax: (574)288-5860



PLAN VIEW




ANCHOR BOLT DETAIL




| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | BRG | 4/24/2013 | Revise tower loading per ECO3870 |



| | | | |
|---|---|---|---|
| ORIG. DATE: | 4/24/2013 | DWG NO: | 198288 |
| DWG. PROG: | v2.05 | SHEET: | 3 OF 4 |

TITLE:
SAI Communications
NTP 55" X 160'
Willington/SR1107
Tolland Co., CT


NELLO CORPORATION
211 W. Washington St.,
Suite 2000
South Bend, IN 46601-1705
Bus: (574)288-3632
Fax: (574)288-5860

**Tower Notes:**

1. Tower is designed per TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas," for the following loading conditions:
   100 mph 3-second gust basic wind speed with no ice
   40 mph 3-second gust basic wind speed with 1-1/4 inch basic ice thickness
   Structure Class: II
   Exposure Category: C
   Topographic Category: 1
2. Tower design loading is assumed to be based on site-specific data and must be verified by others prior to installation.
3. Tower design includes the antennas, dishes, and/or lines listed in the appurtenance loading tables on sheet 2.
4. Antenna mounting pipes may need to be field cut to match the lengths listed in the appurtenance loading tables on sheet 2.
5. Tower member design does not include stresses due to erection since erection equipment and procedures are unknown. Tower installation shall be performed by competent and qualified erectors in accordance with TIA-222-G and OSHA standards and all applicable building codes.
6. Field connections shall be bolted. No field welds shall be allowed unless otherwise noted.
7. Structural bolts shall conform to ASTM A325, except for 1/2 inch diameter and smaller bolts, which shall conform to ASTM A449 or SAE J429 Grade 5.
8. Structural steel and connection bolts shall be galvanized after fabrication in accordance with TIA-222-G.
9. All high strength bolts shall be tightened to a "snug tight" condition as defined in the November 13, 1985, AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
10. Tower shall be marked and lighted in conformance with local building codes, FAA regulations, and TIA-222-G.
11. Tower shall be grounded in conformance with local building codes and TIA-222-G.
12. Allowable tolerance on as-built tower steel height is plus 1% or minus 1/2%.
13. Maintenance and inspection shall be performed over the life of the structure in accordance with TIA-222-G.
14. Material specifications:
    NTP 18-Sided Pole - ASTM A572 Grade 65
    Pole Flange - ASTM A572 Grade 50
    Pole Porthole Rim - ASTM A572 Grade 65
15. A jacking nut is placed near the top of each section which will have another section placed on top. The distance from this top jacking nut to the bottom of the next section must not exceed the value given in the column labeled "Maximum Distance to Top Jacking Nut." Jacking may be required to achieve the proper overlap.
16. The horizontal distance between the vertical centerlines at any two elevations shall not exceed 0.25 percent of the vertical distance between the two elevations. Measure early in the morning before the sunward side of the pole expands.
17. Sections must be erected with the 0 degree azimuth lined up to ensure proper fit.
18. Remove anchor bolt template before erecting pole. Non-shrink grout may be placed under base flange after leveling pole. Drain holes must be provided if grouting.
19. Concrete contractor shall be responsible for properly aligning anchor bolts and materials before and after placing concrete, regardless of whether an anchor bolt template is provided.

STATE OF CONNECTICUT
DANIEL J. IANELLO
No. 22484
LICENSED
PROFESSIONAL ENGINEER

APR 29 2013

TITLE:
SAI Communications
NTP 55" X 160'
Willington/SR1107
Tolland Co., CT

NELLO CORPORATION
211 W. Washington St., Suite 2000
South Bend, IN 46601-1705
Bus: (574)288-3632
Fax: (574)288-5860

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | BRG | 4/24/2013 | Revise tower loading per ECO3870 |



| | | | |
|---|---|---|---|
| ORIG. DATE: | 4/24/2013 | DWG NO: | 198288 |
| DWG. PROG: | v2.05 | SHEET: | 4 OF 4 |

ATTACHMENT 3

# SR 1107
# Access Road Drainage Report

# SAI Willington
# Tolland Turnpike
# Willington, CT 06279

*CHA Project Number: 18301.1028.43000*

***Prepared for:***
*SAI Communications*
*500 Enterprise Drive*
*Rocky Hill, CT 06067*

***Prepared by:***

CHA
*2139 Silas Deane Highway*
*Rocky Hill, Connecticut 06067*
*(860) 257-4557*

April 2013

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**TABLES**



**APPENDICES**



**FIGURES**

## 1.0 INTRODUCTION

The project site is located on Tolland Turnpike in the town of Willington, CT. The site is located on property owned by Lawrence Becker. The subject parcels are bounded by Tolland Turnpike to the North, residential parcels to the East and West, and a stone quarry and wooded areas to the South. Site access comes from an existing gravel access driveway on Tolland Turnpike.

The proposed work includes the installation of a fenced gravel compound for a telecommunications tower, construction of a gravel access drive to the tower site (910 linear feet), and installation of a stormwater collection system consisting of rock lined drainage swales, and storm drain culverts.

This report addresses the design of drainage swales, and storm drain culverts to protect the access road from washout, safely convey stormwater flows, and protect outfall locations from erosion. This report does not address the design of groundwater controls or slope stabilization, as site geotechnical information was not available at the time of this report.

Refer to the proposed D&M Drawings submission, dated 04-22-13 , under a separate cover, for specific site details.

# 2.0 HYDROLOGIC EVALUATION

**Existing Watershed Characteristics**

The Connecticut United States Geological Survey (USGS) Coventry Quandrangle Map indicates that the cellular tower and compound are located on a local high point, along an existing topographic ridge. Topography is varied and includes small topographic ridges, natural swales, flatlands, and wetlands in the surrounding area. Existing topography contributing to site drainage consists of elevations ranging from 777’ above mean sea level (AMSL) just south of the proposed cell tower location to 695’ AMSL at an existing depression adjacent to Tolland Turnpike on the east side of the existing access drive. Existing slopes vary from flat to very steep ranging (+/- 20%) (See Figure 1 – USGS Map).

Aerial photography and a site field visit indicate that the existing land use at the site consists primarily of forested area, with the exception of a few residential properties along Tolland Turnpike. There is also an existing stone quarry located to the south and west of the project site but it does not contribute to the site drainage areas (See Figure 2 – Aerial Map).

Project site soil characteristics were determined using the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey. The site is comprised entirely of soils belonging to Hydrologic Soil Groups (HSG) B (See Appendix A). Below is a brief description of hydrologic soil group B:

*Group B – Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.*

A summary of the soil composition is shown in Table 1 below.

**Table 1 - Soil Analysis Summary**

| Unit Symbol – Unit Name | Hydrologic Soil Group | Percent of Drainage Areas |
|---|---|---|
| 73C – Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky | B | 99.3 |
| 73E – Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky | B | 0.7 |

**Design Methodology**

In order to design the proposed swales and culverts, peak flows (Q) for the 10- and 25-year design storms were calculated using the Rational Method (Q=CIA). Composite runoff coefficients (C) were developed from an analysis of existing land use and typical C-values provided in Tables 6-3 and 6-5 of the Connecticut Department of Transportation (ConnDOT) Drainage Manual, dated October 2000 (See Appendix B). Times of concentration ($T_c$) were computed using standard NRCS TR-55 Methodology (See Appendix C). Rainfall intensities (I) were determined from Table B-2.1 of the ConnDOT Drainage Manual and the computed $T_c$ values. A frequency factor ($C_f$) was used to refine the calculated peak flow for the 25-year design storm as prescribed in Table 6-2 in Section 6.9.5 of the ConnDOT Drainage Manual.

**Proposed Condition Hydrology**

For the purposes of the proposed condition analysis, two (2) drainage areas (DA) and two (2) sub-drainage areas (SDA) were developed to quantify the peak stormwater runoff rates to the proposed design points (DP). Drainage areas were determined through review of the existing topographic survey of the site (See D&M Drawing submission), the Connecticut USGS Coventry Quadrangle Map and a field visit to the site.

A summary of the results for the proposed condition hydrologic analysis is shown in Table 2 below (See Figure 4 site drainage areas).

**Table 2 – Hydrologic Analysis Summary (Drainage Areas)**

| Drainage Area/ Design Point | Area (acres) | Runoff Coefficient (C) | Tc (min)[2] | Rainfall Intensity (I) (in/hr) | | Peak Discharge (Q) (cfs) | |
|---|---|---|---|---|---|---|---|
| | | | | 10 year | 25 year | 10 year | 25 year[1] |
| DA 1 | 1.70 | 0.23 | 10 | 4.8 | 5.5 | 1.9 | 2.4 |
| DA 2 | 4.15 | 0.28 | 13 | 4.3 | 5.0 | 5.0 | 6.4 |
| SDA 1.1 | 1.10 | 0.23 | 10 | 4.8 | 5.5 | 1.2 | 1.5 |
| SDA 2.1 | 2.28 | 0.28 | 13 | 4.3 | 5.0 | 2.8 | 3.5 |

[1]Frequency Factor for 25-year recurrence interval is 1.1. (Table 6-2 of ConnDOT Drainage Manual)
[2]Per section 6.9.6 of the ConnDOT Drainage Manual, the minimum $T_C$ used for design purposes shall be 10 minutes for grass areas.

# 3.0 HYDRAULIC EVALUATION

## 3.1 CULVERT

**Basis of Design**

In accordance with the design criteria and procedures set forth in Section 8.3 of the ConnDOT Drainage Manual, culverts shall be designed to:

- Allow for continuous flow and safe conveyance of the 25-year design storm peak flow.
- Have a HW/D ratio less than 1.5 (The hydraulic performance of a culvert is commonly expressed as a ratio of headwater depth (HW), which equals the depth of water measured from the invert of the culvert, to the culvert diameter (D) as HW/D).
- Have a minimum diameter of 18 inches.

**Design Methodology**

The proposed culverts were analyzed using Haestad Methods CulvertMaster Computer Software (Version 3.1). This program was utilized to compute the headwater elevation and discharge velocity of the culverts (evaluating both inlet and outlet control equations) (See Appendix D).

The pipe flow capacity was calculated using:

- Manning's Equation for velocity (V) using equation 7.6 of the ConnDOT Drainage Manual.
- The Continuity Equation for flow capacity (Q) using equation 7.5 of the ConnDOT Drainage Manual.

See Appendix E for culvert capacity calculations.

**Design Summary**

The access road design required one (1) culvert (at DP DA 1) for stormwater conveyance (See Figure 4 for location). The culvert at DP DA 1 will be an 18" diameter HDPE pipe culvert, 43feet in length, set at a slope of approximately 0.5 percent. (See Figure 5 for drainage details).

See Table 3 on the following page for a summary of the results of the culvert analysis

**Table 3 – Culvert Analysis**

| Culvert | Length (ft) | Slope (%) | Diameter (inches) | Manning's n[1] (unitless) | 25-year Peak Design Flow (cfs) | Provided Flow Capacity[2] (cfs) | Computed HW (in) | HW/D Ratio (in/in) |
|---|---|---|---|---|---|---|---|---|
| DP DA 1 | 43 | 0.5 | 18 | 0.012 | 2.4 | 8.0 | 6.8 | 0.38 |

[1]Manning's n referenced from CulvertMaster.
[2]See Appendix E for culvert capacity calculations.

Based on the analysis, a 18" HDPE pipe culvert at DP DA 1will allow for continuous passage of the 25-year frequency design storm, with a calculated HW/D ratio less than 1.5.

## 3.2 SWALES

**Basis of Design**

In accordance with the design criteria and procedures set forth in Sections 7.3 and 7.6 of the ConnDOT Drainage Manual, roadway swales shall be designed:

- To safely convey the 10-year frequency design storm peak flow without causing erosive damage.
- With a lining that is sufficient to resist the shear forces created from the transportation of storm flows (The permissible or critical shear stress in a swale defines the force required to initiate movement of the channel bed or lining).

Additionally, in accordance with Chapter 5, Section 6, Permanent Lined Waterway, of the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control by The Connecticut Council on Soil and Water Conservation in Cooperation with the Connecticut Department of Environmental Protection (CTDEP), swales shall be designed with a minimum freeboard of 0.25 feet (3 inches) if no out-of-bank damage would be expected.

**Design Methodology**

Flow capacity of the swales was determined from the following:

- Velocity (V) – Equation 7.6 of the ConnDOT Drainage Manual (Manning's Equation)
- Flow capacity (Q) – Equation 7.5 of the ConnDOT Drainage Manual (The Continuity Equation).

See Appendix G for swale sizing calculations.

Swale lining was determined by the following:

- Average Shear Stress ($\tau$) – Equation 7.11 of the ConnDOT Drainage Manual
- Maximum Shear Stress ($\tau_d$) – Equation 7.12 of the ConnDOT Drainage Manual
- Lining Category (Material) and Type– Table 7-4 of the ConnDOT Drainage Manual

See Appendix H for shear stress calculations.

**Design Summary**

For ease of construction, one swale type (size) was designed which meets the dimensional requirements at all swale locations. (See Figure 4 for proposed swale locations and Figure 5 for drainage details). The swale selected is a 1-foot deep, 1-foot wide flat bottom trapezoidal swale with 2:1 side slopes.

See Table 4 on the following page for a summary of the results of the swale analysis.

**Table 4 – Swale Hydraulic Analysis**

| Swale | Slope (ft/ft) | Manning's n[1] (unitless) | Velocity (ft/s) | 10-yr Peak Design Flow (cfs) | Provided Flow Capacity (cfs) | Depth of Flow (in) | Provided Freeboard @ 10-year Peak Flow (in) |
|---|---|---|---|---|---|---|---|
| DA 1 | 0.11 | 0.064 | 3.0 | 1.9 | 8.2 | 4.6 | 7.4 |
| SDA 1.1 | 0.20 | 0.078 | 2.9 | 1.2 | 9.1 | 3.4 | 8.6 |
| SDA 1.2 | 0.07 | 0.059 | 3.0 | 2.8 | 7.1 | 5.8 | 6.2 |

[1]Manning's n calculated using steep slope procedures in HEC-15, as prescribed in Section 7.6.9 of the ConnDOT Drainage Manual, as well as, the values listed in Table 7-4 of the ConnDOT Drainage Manual.

To determine the type of lining necessary to armor the swales and protect against erosive forces imparted by stormwater flows, shear stresses were calculated. Rock riprap lining was selected to armor the swales in order to withstand the calculated shear stresses. See Table 5 below for a summary of the results of the calculated shear stress and riprap sizing analysis.

**Table 5 – Shear Stress and Riprap Sizing Analysis**

| Swale | Calculated Shear Stress ($lb/ft^2$) | Required ConnDOT Riprap[1] | | |
|---|---|---|---|---|
| | | Permissible Shear Stress[2] ($lb/ft^2$) | Classification | $D_{50}$ Size (inches) |
| DA 1 | 2.61 | 2.68 | Intermediate | 8 |
| SDA 1.1 | 3.49 | 4.00 | Intermediate | 12 |
| SDA 2.1 | 2.10 | 2.68 | Intermediate | 8 |

[1]Determined by selecting riprap with a higher permissible shear stress than the calculated shear stress
[2]Permissible shear stress for lining materials is taken from Table 7-4 of the ConnDOT Drainage Manual

Based on the analyses, each of these swales will be capable of safely conveying the 10-year peak storm flows calculated for their respective Drainage Area, provide the required 3 inches of freeboard, and withstand calculated shear stresses.

## 3.3 OUTLET PROTECTION

**Basis of Design**

In accordance with the design criteria and procedures set forth in Section 11.13.3 of the ConnDOT Drainage Manual, riprap outlet protection shall be designed to reduce the erosive potential at all discharge points.

**Design Methodology**

The type and dimensions of rip rap protection was determined by the guidelines established in Sections 11.13.2 and 11.13.5 of the ConnDOT Drainage Manual, and the following:

- Length ($L_a$) – Tables 11-12.1 and 11-13.1 of the ConnDOT Drainage Manual
- Width of apron at pipe outlet ($W_1$) and width of apron at terminus ($W_2$) – Equation 11.33 of the ConnDOT Drainage Manual, as well as, Section 11.13.5 of the ConnDOT Drainage Manual.
- Riprap Specification – Table 11.11 of the ConnDOT Drainage Manual

See Appendix I for outlet protection calculations.

**Design Summary**

Based on recommended design procedures in Section 11.13.2 of the ConnDOT Drainage Manual, a Type A riprap apron shall be used at all of the discharge points. The selected riprap apron shall have a length ($L_a$) of 12 feet, a width of apron at outlet ($W_1$) of 5 feet, and a width of apron at terminus ($W_2$) of 15 feet . Type A riprap aprons shall utilize modified riprap for erosion protection. (See Figure 5 for drainage details).

Table 6 on the following page summarizes the minimum outlet protection requirements.

**Table 6 – Outlet Protection Requirements**

| Design Point | Structure | Diameter or Span (in) | Outlet Velocity (ft/sec) | 25-year Peak Discharge ($ft^3$/sec) | Outlet Type | Calculated Dimensions[6] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $L_a$[1] (ft) | $W_1$[2] (ft) | $W_2$[3] (ft) | Riprap Specification[4] |
| DA 1 | Culvert | 18 | 4.2 | 2.4 | Type A Riprap Apron | 12 | 4.5 | 12.9 | Modified |
| SDA 1.1 | Swale[5] | 12 | 3.1 | 1.5 | | 10 | 3 | 10 | Modified |
| SDA 2.1 | Swale[5] | 12 | 3.2 | 3.5 | | 10 | 3 | 10 | Modified |

[1]$L_a$ values determined using Table 11-12.1 and 11-13.1 of the ConnDOT Drainage Manual.

[2]$W_1$ = width of apron at pipe outlet

[3]$W_2$ = width of apron at terminus

[4]Riprap specification selected from Table 11.11 of the ConnDOT Drainage Manual

[5]Diameter used for swales is the bottom channel width

[6]Dimensions represent minimum acceptable parameters based on calculations. Actual dimensions selected for use may differ

Based on analysis of proposed outfall locations, discharge velocities meet the ConnDOT requirements for use of riprap aprons (outlet velocities are less than 14 fps). A Type A riprap aprong with dimensions of 12’ ($L_a$) x 5’ ($W_1$) x 15’ ($W_2$) is sufficient to reduce the erosive potential at all discharge points.

# 4.0 DRAINAGE AREA 2 DESIGN POINT

The design point for DA 2 is an existing topographic depression on the east side of the gravel access drive, adjacent to Tolland Turnpike. The gravel access drive (existing and proposed condition) forms a topographic ridge which isolates the depression and stops the flow of water to the east. To ensure the development of the access road does not create drainage issues at this design point, a pre-development versus post-development analysis was done for this design point (See Figure 3 for proposed DA 2 details; See Figure 6 for existing DA 2 details). Table 7 below shows the results of the pre- vs post- hydrologic analysis.

**Table 7 – Pre-Development versus Post Development Hydrology for DA 2**

| Drainage Area/ Design Point | Area (acres) | Runoff Coefficient (C) | Tc (min)[2] | Rainfall Intensity (I) (in/hr) | | Peak Discharge (Q) (cfs) | |
|---|---|---|---|---|---|---|---|
| | | | | 10 year | 25 year | 10 year | 25 year[1] |
| DA 2 - Existing | 3.09 | 0.25 | 12 | 4.5 | 5.1 | 3.5 | 4.4 |
| DA 2 - Proposed | 4.15 | 0.28 | 13 | 4.3 | 5.0 | 5.0 | 6.4 |

[1]Frequency Factor for 25-year recurrence interval is 1.1. (Table 6-2 of ConnDOT Drainage Manual)
[2]Per section 6.9.6 of the ConnDOT Drainage Manual, the minimum $T_C$ used for design purposes shall be 10 minutes for grass areas.

Table 8 shows that the 10- and 25-year design storm peak flows will increase about 25% for the proposed condition. However, there are mitigating factors which justify this increase as being insignificant. First, discussion with an adjacent property owner revealed that the existing topographic depressions on either side of the gravel access drive remain dry year-round. The property owner has never seen the depression at the DA 2 design point collect water and indicated that everything infiltrates. Second, groundwater infiltration has not been factored into the calculations for peak flows, which is a conservative design assumption at this site.

## 5.0 INSPECTION AND MAINTENANCE

Inspection and maintenance of the stormwater collection system (riprap lined swales, storm drain culverts, and riprap aprons) is critical to maintaining proper function. Normally, a visual inspection of all components should be completed annually and after major storm events. Due to steep gradients which produce high shear stresses in the proposed swales, an increased inspection and maintenance schedule is required. A visual inspection of the swale riprap lining should be completed semi-annually and after major storm events.

The following maintenance tasks should be completed during the inspection process:

- Removal of any organic matter, trash/debris, or obstructions found in swales or riprap aprons
- Removal of any accumulated sediment found in culvert, swales or riprap aprons
- Removal of any potential obstructions at culvert inlet/outlet points
- Replacement of any riprap material that may have washed away during large storm events

Careful inspection and proper maintenance on a regular basis will enable the system to safely convey stormwater flows and reduce the risk of system backup or overflow during major storm events.

## 6.0 CONCLUSION

All proposed drainage improvements (swales, culverts, outlet protection) have been designed in accordance with the engineering guidelines established in the ConnDOT Drainage Manual. Based on the analysis, the following design parameters are recommended:

- A culvert is required at DP DA 1 to convey flows underneath an existing gravel access drive. The culvert shall be an 18” diameter HDPE pipe culvert which is 43feet in length, and set at a slope of 0.5%. The culvert will be capable of safely conveying the 25-year design storm peak flow with an HW/D ratio less than 1.5.

- Swales shall be at minimum 1-foot wide flat bottom, 1-foot deep, riprap lined trapezoidal swales with 2:1 side slopes. The designed swales will meet the ConnDOT requirements for conveying the 10-year design storm peak flows while withstanding the calculated shear stresses. They will also meet the DEEP requirement of providing 0.25 feet of freeboard.

- Outlet protection for swales SDA 1.1, SDA 2.1 and Culvert 1 shall be Type A riprap aprons with the following minimum parameters:
    - Length ($L_a$) – 12 feet
    - Width of apron at pipe outlet ($W_1$) – 5 feet
    - Width of apron at terminus ($W_2$) – 15 feet
    - Utilize modified riprap for armoring.

  This will meet the ConnDOT requirements for use of riprap aprons (discharge velocities < 14 fps) to provide erosion protection at outfall locations.

ATTACHMENT 4

# APT Example Erosion and Sedimentation Control Site Inspection Form

# Project Name

APT Project #:

## Site E&S Inspection Form

Report No.________

Project Street Address
Project Town, State

| | |
|---|---|
| Date of Inspection: | Weather Conditions: |
| Time of Inspection: | Latest Precipitation Event: |

| Construction Activities Underway since last documented inspection: |
|---|
| |

| Check if NOT Functioning Properly | Erosion Control Measure |
|---|---|
| ☐ | Street Sweeping/ Construction Access |
| ☐ | Stabilized Construction Entrance |
| ☐ | Temporary/Permanent Check Dams |
| ☐ | Temporary/Permanent Sediment Basins/Traps |
| ☐ | Drainage Swales and Diversion Channels |
| ☐ | Perimeter Controls (i.e. hay bales, straw wattles, silt fencing etc.) |
| ☐ | Catch Basin Protection |
| ☐ | Temporary/Permanent Slope Stabilization |
| ☐ | Dewatering Basins and Filter Devices |
| ☐ | Outlet Protection (i.e. plunge pool, splash pad, level spreader, etc.) |
| ☐ | Active Treatment Systems |

*In the event of a spill refer to the Spill Response Procedure and contact appropriate agencies.
Refer to SWPPP for Spill Prevention Plan and Response Procedures.

| **Are sediment/pollution discharges from the site present?** | | |
|---|---|---|
| ☐ **No** | ☐ **Yes** | **If yes, describe:** |

| Immediate Action Items: | |
|---|---|
| **1.** | |
| **2.** | |
| **3.** | |
| **4.** | |

| Additional Action Items/Comments: | |
|---|---|
| **1.** | |
| **2.** | |
| **3.** | |
| **4** | |

| Items/Comments Addressed From Previous Report(s): | |
|---|---|
| **1.** | |
| **2.** | |
| **3.** | |
| **4.** | |

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Erosion Control Inspector: ______________________________ Date: ____________

Inspector Name

Qualifications: ____________________________________________________________

**A copy of this report should be placed in the Monitoring Section of the Stormwater Pollution Prevention Plan, if applicable.

ATTACHMENT 5

# Product Specifications

SBNH-1D6565C

## Mechanical Specifications

| | |
|---|---|
| Color | Light gray |
| Connector Interface | 7-16 DIN Female |
| Connector Location | Bottom |
| Connector Quantity | 4 |
| Radome Material | Fiberglass, UV resistant |
| Wind Loading, maximum | 879.0 N @ 150 km/h<br>197.6 lbf @ 150 km/h |
| Wind Speed, maximum | 241.0 km/h \| 149.8 mph |

## Dimensions

| | |
|---|---|
| Depth | 181.0 mm \| 7.1 in |
| Length | 2449.0 mm \| 96.4 in |
| Width | 301.0 mm \| 11.9 in |
| Net Weight | 27.6 kg \| 60.8 lb |

## Remote Electrical Tilt (RET) Information

| | |
|---|---|
| Adjustment Time, full range, maximum | 30 s |
| Annual Failure Rate, maximum | 0.01% |
| Power Consumption, during motor movements, maximum | 11.0 W |
| Power Consumption, idle state, maximum | 2.0 W |
| Power Input | 10–30 V |
| Protocol | 3GPP/AISG 2.0 Multi-RET |
| RET Interface | RS-485 Male (input port, 1) \| RS-485 Female (daisy chain port ,1) |
| RET System | Teletilt® |

## Regulatory Compliance/Certifications

| **Agency** | **Classification** |
|---|---|
| RoHS 2002/95/EC | Compliant by Exemption |
| China RoHS SJ/T 11364-2006 | Above Maximum Concentration Value (MCV) |

## INCLUDED PRODUCTS

# Product Specifications

ANDREW®
A CommScope Company

## SBNH-1D6565C

DualPol® Dual Band Antenna, 698–896 MHz and 1710–2170 MHz, 65° horizontal beamwidth, RET compatible variable electrical tilt


- Two DualPol® antennas under one radome
- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Each antenna is independently capable of field adjustable electrical tilt
- Internal next generation actuator eliminates field installation and defines new standards for reliability
- Fully compatible with Andrew Teletilt® remote control system

## CHARACTERISTICS

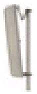
### General Specifications

| | |
|---|---|
| Antenna Type | SmartBeam® |
| Brand | DualPol® \| SmartBeam® \| Teletilt® |
| Operating Frequency Band | 1710 – 2170 MHz \| 698 – 896 MHz |

### Electrical Specifications

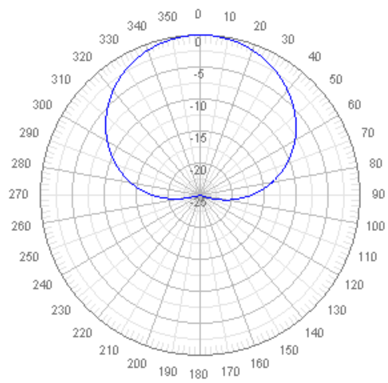
| **Frequency Band, MHz** | **698–806** | **806–896** | **1710–1880** | **1850–1990** | **1920–2170** |
|---|---|---|---|---|---|
| Beamwidth, Horizontal, degrees | 71 | 67 | 58 | 57 | 59 |
| Beamwidth, Horizontal Tolerance, degrees | ±3 | ±6 | ±3 | ±3 | ±3 |
| Gain, dBd | 13.6 | 14.3 | 15.9 | 15.9 | 15.9 |
| Gain, dBi | 15.7 | 16.4 | 18.0 | 18.0 | 18.0 |
| Beamwidth, Vertical, degrees | 8.6 | 7.8 | 5.5 | 5.1 | 4.8 |
| Beam Tilt, degrees | 0–11 | 0–11 | 0–7 | 0–7 | 0–7 |
| Upper Sidelobe Suppression (USLS), typical, dB | 15 | 15 | 16 | 16 | 16 |
| Front-to-Back Ratio at 180°, dB | 25 | 28 | 34 | 31 | 31 |
| Front-to-Back Total Power at 180° ± 20°, dB | 21 | 22 | 30 | 27 | 26 |
| Cross Polarization Ratio (CPR) at Boresight, dB | 24 | 21 | 17 | 17 | 17 |
| Cross Polarization Ratio (CPR) at Sector, dB | 11 | 8 | 9 | 8 | 9 |
| Isolation, dB | 30 | 30 | 30 | 30 | 30 |
| Isolation, Intersystem, dB | 35 | 35 | 35 | 35 | 35 |
| VSWR \| Return Loss, db | 1.5:1 \| 14.0 | 1.5:1 \| 14.0 | 1.5:1 \| 14.0 | 1.5:1 \| 14.0 | 1.5:1 \| 14.0 |
| Intermodulation Products, 3rd Order, 2 x 20 W, dBc | -150 | -150 | -150 | -150 | -150 |
| Input Power, maximum, watts | 400 | 400 | 300 | 300 | 300 |
| Polarization | ±45° | ±45° | ±45° | ±45° | ±45° |
| Impedance, ohms | 50 | 50 | 50 | 50 | 50 |
| Lightning Protection | dc Ground | dc Ground | dc Ground | dc Ground | dc Ground |

**DB380**
Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

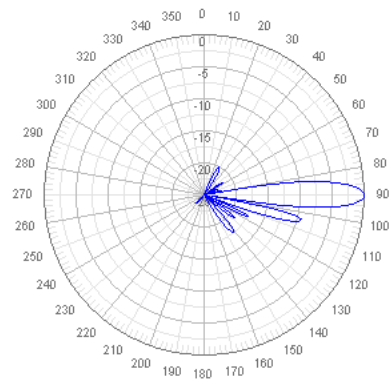


**DB5083**
Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

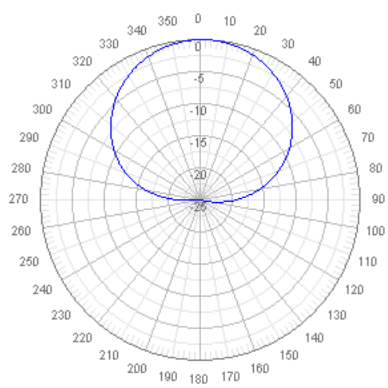
Horizontal Pattern | Vertical Pattern



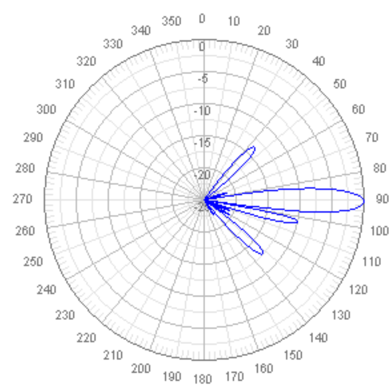
Freq: 725 MHz, Tilt: 0°



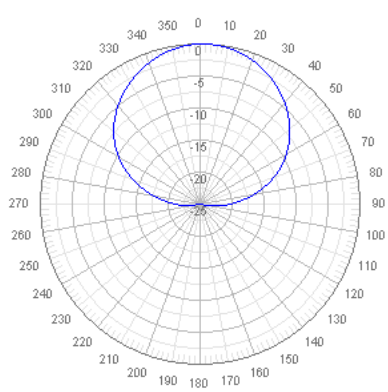
Freq: 725 MHz, Tilt: 0°



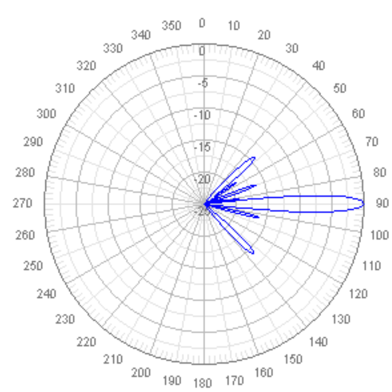
Freq: 850 MHz, Tilt: 0°



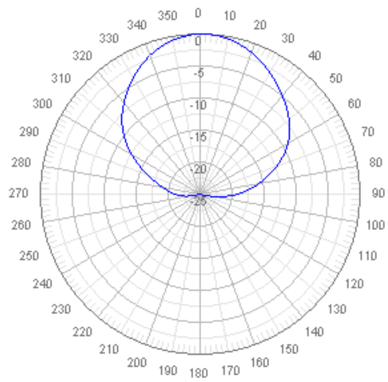
Freq: 850 MHz, Tilt: 0°



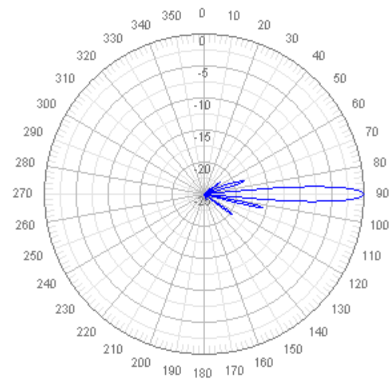
Freq: 1730 MHz, Tilt: 0°



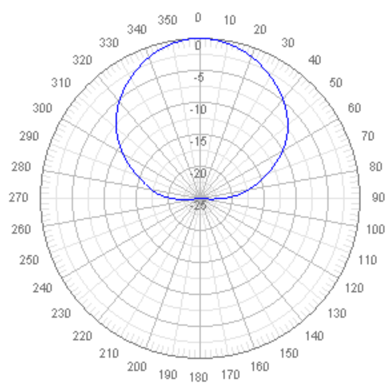
Freq: 1730 MHz, Tilt: 0°



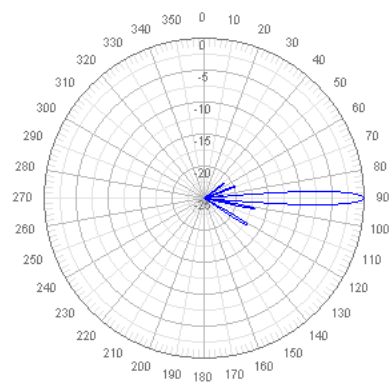

Freq: 1920 MHz, Tilt: 0°




Freq: 1920 MHz, Tilt: 0°




Freq: 2130 MHz, Tilt: 0°




Freq: 2130 MHz, Tilt: 0°

ATTACHMENT 6

GENERAC® | INDUSTRIAL POWER

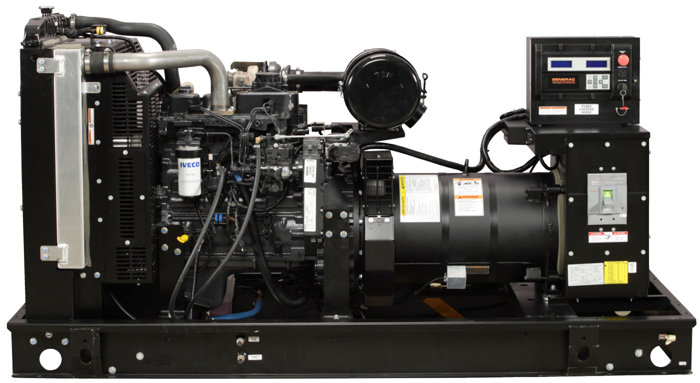
# SD050

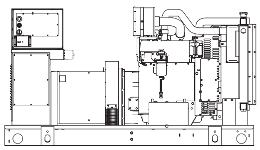
CUSTOM MODEL

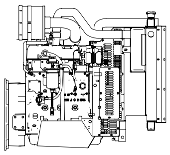
## Industrial Diesel Generator Set

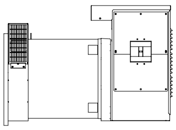
EPA Emissions Certification: Tier III

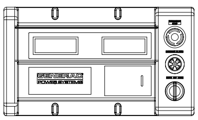
Standby Power Rating
**50KW 60 Hz**











| features | benefits |
|---|---|
| **Generator Set** | |
| PROTOTYPE & TORSIONALLY TESTED | PROVIDES A PROVEN UNIT |
| UL2200 TESTED | ENSURES A QUALITY PRODUCT |
| RHINOCOAT PAINT SYSTEM | IMPROVES RESISTANCE TO ELEMENTS |
| SOUND LEVEL 2 ENCLOSURE | 71dbA @ 7 METERS (23FT) |
| **Engine** | |
| EPA TIER CERTIFIED | ENVIRONMENTALLY FRIENDLY |
| INDUSTRIAL TESTED, GENERAC APPROVED | ENSURES INDUSTRIAL STANDARDS |
| POWER-MATCHED OUTPUT | ENGINEERED FOR PERFORMANCE |
| INDUSTRIAL GRADE | IMPROVES LONGEVITY AND RELIABILITY |
| **Alternator** | |
| TWO-THIRDS PITCH | ELIMINATES HARMFUL 3RD HARMONIC |
| LAYER WOUND ROTOR & STATOR | IMPROVES COOLING |
| CLASS H MATERIALS | HEAT TOLERANT DESIGN |
| DIGITAL 3-PHASE VOLTAGE CONTROL | FAST AND ACCURATE RESPONSE |
| **Controls** | |
| ENCAPSULATED BOARD W/ SEALED HARNESS | EASY, AFFORDABLE REPLACEMENT |
| 4-20mA VOLTAGE-TO-CURRENT SENSORS | NOISE RESISTANT 24/7 MONITORING |
| SURFACE-MOUNT TECHNOLOGY | PROVIDES VIBRATION RESISTANCE |
| ADVANCED DIAGNOSTICS & COMMUNICATIONS | HARDENED RELIABILITY |

## primary codes and standards

NEMA · cULus LISTED · NFPA · ASTM INTERNATIONAL · ISO

# SD050 application and engineering data

## ENGINE SPECIFICATIONS

**General**

| | |
|---|---|
| Make | Iveco / FPT |
| EPA Emissions Compliance | Tier III |
| EPA Emissions Reference | See Emissions Data Sheet |
| Cylinder # | 4 |
| Type | Diesel |
| Displacement - L (cu. in.) | 4.5 (274) |
| Bore - mm (in.) | 105 (4.1) |
| Stroke - mm (in.) | 132 (5.2) |
| Compression Ratio | 17.5:1 |
| Intake Air Method | Turbocharged |
| Cylinder Head Type | 2 Valve |
| Piston Type | Aluminum |
| Crankshaft Type | Forged Steel |
| Engine Block Type | Cast Iron / Wet Sleeve |

**Engine Governing**

| | |
|---|---|
| Governor | Electronic Isochronous |
| Frequency Regulation (Steady State) | +/- 0.25% |

**Lubrication System**

| | |
|---|---|
| Oil Pump Type | Gear |
| Oil Filter Type | Full Flow |
| Crankcase Capacity - L (gal)(qts) | 13.6 (3.6) (14.4) |

**Cooling System**

| | |
|---|---|
| Cooling System Type | Closed |
| Water Pump | Belt Driven Centrifugal |
| Fan Type | Pusher |
| Fan Blade Number | 2538 (10) |
| Fan Diameter (in.) | 26 |
| Coolant Heater Wattage | 1500 |
| Coolant Heater Standard Voltage | 120 |

**Fuel System**

| | |
|---|---|
| Fuel Type | Ultra Low Sulfur Diesel Fuel |
| Fuel Specifications | ASTM |
| Fuel Filtering (microns) | 5 |
| Fuel Inject Pump Make | Standyne |
| Fuel Pump Type | Engine Driven Gear |
| Injector Type | Mechanical |
| Engine Type | Direct Injection |
| Fuel Supply Line - mm (in.) | 1/4 inch Npt |
| Fuel Return Line - mm (in.) | 1/4 inch Npt |

**Engine Electrical System**

| | |
|---|---|
| System Voltage | 12VDC |
| Battery Charging Alternator | 90 Amp |
| Battery Size (at 0 oC) | Optima Redtop |
| Battery Group | 34 |
| Battery Voltage | 12VC |
| Ground Polarity | Negative |

## ALTERNATOR SPECIFICATIONS

| | |
|---|---|
| Standard Model | 390 |
| Poles | 4 |
| Field Type | Revolving |
| Insulation Class - Rotor | H |
| Insulation Class - Stator | H |
| Total Harmonic Distortion | < 3.5% |
| Telephone Interference Factor (TIF) | < 50 |
| Standard Excitation | PMG |
| Bearings | Single Sealed Cartridge |
| Coupling | Direct, Flexible Disc |
| Load Capacity - Standby | 100% |
| Load Capacity - Prime | 100% |
| Prototype Short Circuit Test | Y |

| | |
|---|---|
| Voltage Regulator Type | Digital |
| Number of Sensed Phases | All |
| Regulation Accuracy (Steady State) | +/- 0.25% |

## CODES AND STANDARDS COMPLIANCE (WHERE APPLICABLE)

NFPA 99
NFPA 110
ISO 8528-5
ISO 1708A.5
ISO 3046
BS5514
SAE J1349
DIN6271
IEEE C62.41 TESTING
NEMA ICS 1

Rating Definitions:
Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability. (Max. load factor = 70%)
Prime – Applicable for supplying power to a varying load in lieu of utility for an unlimited amount of running time. (Max. load factor = 80%) A 10% overload capacity is available for 1 out of every 12 hours.

# SD050

# operating data (60Hz)

## POWER RATINGS (kW)

| | STANDBY | | |
|---|---|---|---|
| Single-Phase 120/240VAC @1.0pf | 50 | Amps: | 208 |
| Three-Phase 120/208VAC @0.8pf | - | Amps: | - |
| Three-Phase 120/240VAC @0.8pf | - | Amps: | - |
| Three-Phase 277/480VAC @0.8pf | - | Amps: | - |
| Three-Phase 346/600VAC @0.8pf | - | Amps: | - |

NOTE: Generator output limited to 200A.

## STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

| | | 480VAC | | | | | | 208/240VAC | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alternator* | kW | *10%* | *15%* | *20%* | *25%* | *30%* | *35%* | *10%* | *15%* | *20%* | *25%* | *30%* | *35%* |
| Standard | 50 | - | - | - | - | - | - | 26 | 39 | 52 | 65 | 77 | 90 |
| Upsize 1 | | - | - | - | - | - | - | - | - | - | - | - | - |
| Upsize 2 | | - | - | - | - | - | - | - | - | - | - | - | - |

*All Generac industrial alternators utilize Class H insulation materials. Standard alternator provides less than or equal to Class B temperature rise. Upsize 1 provides less than or equal to Class B temperature rise. Upsize 2 provides less than or equal

## FUEL

Fuel Consumption Rates

| Fuel Pump Lift - in (m) |
|---|
| 36(.9) |

STANDBY

| Percent Load | gph | lph |
|---|---|---|
| 25% | 1.52 | 5.75 |
| 50% | 2.33 | 8.82 |
| 75% | 3.08 | 11.65 |
| 100% | 4.15 | 15.71 |

## COOLING

| Coolant System Capacity - Gal (L) |
|---|
| 4.5 (17.44) |

| Maximum Radiator Backpressure |
|---|
| 1.5" $H_2O$ Column |

| | | STANDBY |
|---|---|---|
| Coolant Flow per Minute | gpm (lpm) | 32.7(123.8) |
| Heat rejection to Coolant | BTU/min | 123,000 |
| Inlet Air | cfm (m3/min) | 6,360 (180.0) |
| Max. Operating Radiator Air Temp | $F^o$ ($C^o$) | 122(50) |
| Max. Operating Ambient Temperature | $F^o$ ($C^o$) | 122(50) |

## COMBUSTION AIR REQUIREMENTS

| | | STANDBY | |
|---|---|---|---|
| Intake Flow at Rated Power | cfm (m3/min) | 247 | (7.00) |

## EXHAUST

| Exhaust Outlet Size (Open Set) |
|---|
| 3.0" |

| Maximum Backpressure (Post-Silencer) |
|---|
| 1.5" Hg |

| | | STANDBY |
|---|---|---|
| Exhaust Flow (Rated Output) | cfm (m3/hr) | 534(906.7) |
| Maximum Backpressure | inHg (Kpa) | 1.5 (5.1) |
| Exhaust Temp (Rated Output) | $^oF$ ($^oC$) | 930(498.8) |

## ENGINE

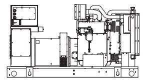
| | | STANDBY |
|---|---|---|
| Rated Engine Speed | rpm | 1800 |
| Horsepower at Rated kW | hp | 93 |
| Temperature Deration | | Consult Factory |
| Altitude Deration | | Consult Factory |

* CA units include aftertreatment

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions. Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards.

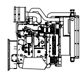
# SD050

## standard features and options



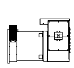
### GENERATOR SET

| | |
|---|---|
| Genset Vibration Isolation | Std |
| Factory Testing | Std |
| Extended warranty | Std |
| Padlockable Doors | Std |
| Steel Enclosure (Enclosed Models) | Std |
| Remote Emergency Shutdown | Opt |



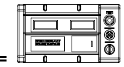
### ENGINE SYSTEM

| | |
|---|---|
| **General** | |
| Oil Drain Extension | Std |
| Air Cleaner | Std |
| Industrial Exhaust Silencer (Open Sets, ship loose) | Std |
| Critical Exhaust Silencer (Enclosed Sets) | Std |
| Stainless steel flexible exhaust connection | Std |
| **Fuel System** | |
| Primary Fuel Filter with Water Separator | Std |
| Flexible Fuel Lines | Std |
| UL142 Fuel Tank, 48 Hr Runtime | Std |
| 2 Gal Overflow Containment with Alarm | Std |
| **Cooling System** | |
| 120VAC Coolant Heater (3-wire connection cord) | Std |
| 50%/50% Coolant | Std |
| Level 1 Guarding (Open Sets) | Std |
| Closed Coolant Recovery System | Std |
| UV/Ozone resistant hoses | Std |
| Factory-Installed Radiator | Std |
| Radiator Drain Extension | Std |
| Fan guard | Std |
| Radiator duct adapter (Open Sets) | Std |
| **Engine Electrical System** | |
| Battery charging alternator | Std |
| Battery cables | Std |
| Battery tray | Std |
| 75W 120VAC Battery heater | Std |
| Solenoid activated starter motor | Std |
| 10A UL float/equalize battery charger | Std |
| Weather Resistant electrical connections | Std |
| Duplex GFCI Convenience Outlet | Std |



### ALTERNATOR SYSTEM

| | |
|---|---|
| UL2200 GENprotect™ | Std |
| 100% Rated 200A Main Line Circuit Breaker | Std |



### CONTROL SYSTEM

| | |
|---|---|
| **Control Panel** | |
| Digital H Control Panel - Dual 4x20 Display | Std |
| Programmable Crank Limiter | Std |
| 7-Day Programmable Exerciser (requires H-Transfer Switch) | Std |
| Special Applications Programmable PLC | Std |
| RS-232 | Std |
| RS-485 | Std |
| All-Phase Sensing DVR | Std |
| Full System Status | Std |
| Utility Monitoring (Req. H-Transfer Switch) | Std |
| 2-Wire Start Compatible | Std |
| Power Output (kW) | Std |
| Power Factor | Std |
| Reactive Power | Std |
| All phase AC Voltage | Std |
| All phase Currents | Std |
| Oil Pressure | Std |
| Coolant Temperature | Std |
| Coolant Level | Std |
| Low Fuel Pressure Indication | Std |
| Engine Speed | Std |
| Battery Voltage | Std |
| Frequency | Std |
| Date/Time Fault History (Event Log) | Std |
| UL2200 GENprotect™ | Std |
| Low-Speed Exercise | Opt |
| Isochronous Governor Control | Std |
| -40deg C - 70deg C Operation | Std |
| Weather Resistant Electrical Connections | Std |
| Audible Alarms and Shutdowns | Std |
| Not in Auto (Flashing Light) | Std |
| On/Off/Manual Switch | Std |
| E-Stop (Red Mushroom-Type) | Std |
| Remote E-Stop (Break Glass-Type, Surface Mount) | - |
| Remote E-Stop (Red Mushroom-Type, Surface Mount) | - |
| Remote E-Stop (Red Mushroom-Type, Flush Mount) | - |
| NFPA 110 Level I and II (Programmable) | Std |
| Remote Communication - RS232 | Std |
| **Alarms (Programmable Tolerances, Pre-Alarms and Shutdowns)** | |
| Low Fuel | Std |
| Oil Pressure (Pre-programmed Low Pressure Shutdown) | Std |
| Coolant Temperature (Pre-programmed High Temp Shutdo | Std |
| Coolant Level (Pre-programmed Low Level Shutdown) | Std |
| Engine Speed (Pre-programmed Overspeed Shutdown) | Std |
| Voltage (Pre-programmed Overvoltage Shutdown) | Std |
| Battery Voltage | Std |

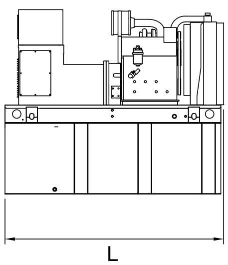
Other Options

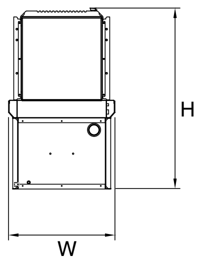
- Single Side Service

GENERAC | INDUSTRIAL POWER

# SD050

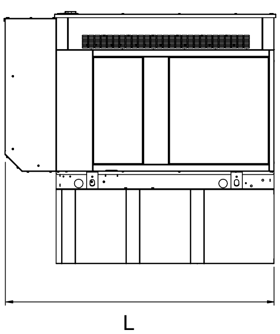
## dimensions, weights and sound levels

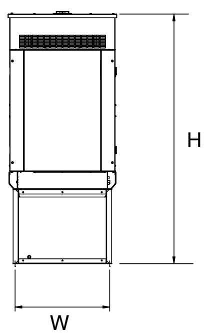



**OPEN SET**

| | TANK SIZE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RUNTIME HOURS | CAPACITY (GAL) | TANK VOLUME | L | W | H | WT | dBA* |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | 84 |
| ○ | - | - | - | - | - | - | - | |
| ● | 48 | 210 | 210 | 76 | 38 | 87 | 3400 | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |




**LEVEL 2 SOUND ENCLOSURE**

| | TANK SIZE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RUNTIME HOURS | CAPACITY (GAL) | TANK VOLUME | L | W | H | WT | dBA* |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | 71 |
| ○ | - | - | - | - | - | - | - | |
| ● | 48 | 210 | 210 | 94.8 | 38 | 99 | 3935 | |
| ○ | - | - | - | - | - | - | - | |
| ○ | - | - | - | - | - | - | - | |

*Required gallons based on 100% of standby rating. Weights consider steel enclosure and are without fuel in tank. Sound levels measured at 23ft (7m) and does not account for ambient site conditions.

| YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER |
|---|
| |

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

# NEW CINGULAR WIRELESS PCS, LLC
# WIRELESS COMMUNICATIONS FACILITY #SR1107
# WILLINGTON

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Main: (860) 257-4557 · www.chacompanies.com


CHA PROJECT NO:
18301 – 1028 – 43000

| NO. | SUBMITTAL | | |
|---|---|---|---|
| 0 | 03/22/13 | ISSUED FOR CSC CERTIFICATE | |
| | BY: JDM | CHK: PAL | APP'D: JPS |
| 1 | 04/22/13 | ISSUED FOR D&M | |
| | BY: JDM | CHK: PAL | APP'D: JPS |

### PROJECT SUMMARY

| | |
|---|---|
| SITE NUMBER: | SR1107 |
| SITE NAME: | WILLINGTON |
| SITE ADDRESS: | TOLLAND TURNPIKE<br>WILLINGTON, CT 06279 |
| PROPERTY OWNER: | LAWRENCE BECKER<br>TOLLAND TURNPIKE<br>WILLINGTON, CT 06279 |
| APPLICANT: | NEW CINGULAR WIRELESS PCS, LLC<br>500 ENTERPRISE DRIVE<br>ROCKY HILL, CT 06067 |
| CONTACT: | BRYON MORAWSKI<br>(860) 513-7223 |
| 1A COORDINATES: | 41° 52' 32.4"N<br>72° 16' 09.7"W |
| HORIZONTAL DATUM: | NAD 83 |
| GROUND ELEVATION: | 768' AMSL |
| SITE PARCEL NO.: | MAP 23, PARCEL 62 |
| CURRENT ZONING: | R80 |
| ENGINEER: | CLOUGH HARBOUR & ASSOCIATES LLP<br>2139 SILAS DEANE HIGHWAY<br>SUITE 212<br>ROCKY HILL, CT 06067 |
| CONTACT: | PAUL LUSITANI<br>(860) 257-4557 |

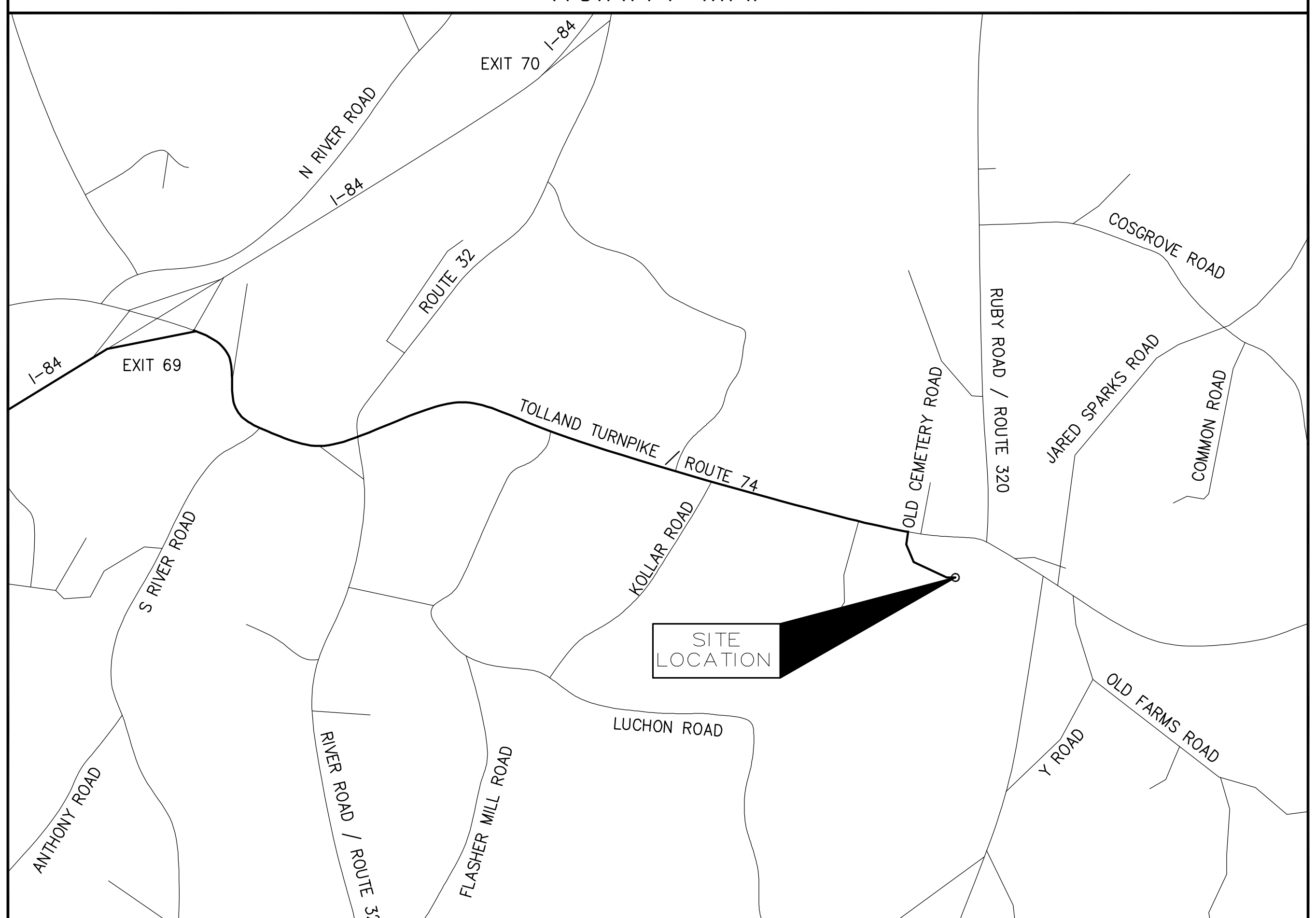
### DRIVING DIRECTIONS

FROM HARTFORD:
1. I-91 NORTH
2. TAKE EXIT 29 TOWARDS I-84 EAST.
3. TAKE EXIT 69, CT-74
4. TURN RIGHT ONTO TOLLAND TURNPIKE.
5. SITE WILL BE ON THE RIGHT ACROSS FROM OLD CEMETERY ROAD.

### PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF A 160' MONOPOLE TOWER WITH PANEL ANTENNAS AT AN ELEVATION OF 156' ON THE TOWER. TELECOMMUNICATIONS EQUIPMENT WILL BE PLACED WITHIN A 45' X 80' FENCED COMPOUND AREA AT THE TOWER BASE.

### VICINITY MAP




NO SCALE

NORTH

**APRIL 22, 2013**

### SHEET INDEX

| SHEET NO: | SHEET TITLE | REVISION HISTORY NO: | REVISION HISTORY DATE |
|---|---|---|---|
| T01 | TITLE SHEET | 1 | 04 / 22 / 13 |
| C01 | SITE PLAN | 1 | 04 / 22 / 13 |
| C02 | GRADING PLAN | 1 | 04 / 22 / 13 |
| C03 | SITE LAYOUT PLAN | 1 | 04 / 22 / 13 |
| C04 | ROAD PROFILE | 1 | 04 / 22 / 13 |
| C05 | COMPOUND PLAN & SITE NOTES | 1 | 04 / 22 / 13 |
| C06 | ELEVATION & DETAILS | 1 | 04 / 22 / 13 |
| C07 | SITE DETAILS | 1 | 04 / 22 / 13 |
| C08 | SITE DETAILS | 1 | 04 / 22 / 13 |
| C09 | SITE DETAILS | 1 | 04 / 22 / 13 |
| C10 | SITE DETAILS | 1 | 04 / 22 / 13 |
| C11 | STRUCTURAL DETAILS | 1 | 04 / 22 / 13 |
| C12 | STRUCTURAL DETAILS | 1 | 04 / 22 / 13 |
| C13 | STRUCTURAL NOTES | 1 | 04 / 22 / 13 |

### DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

CALL before you DIG
FOR CT 1-800-922-4455

STATE OF CONNECTICUT
JOHN P. SOBIECH
No. 17827
LICENSED
PROFESSIONAL ENGINEER

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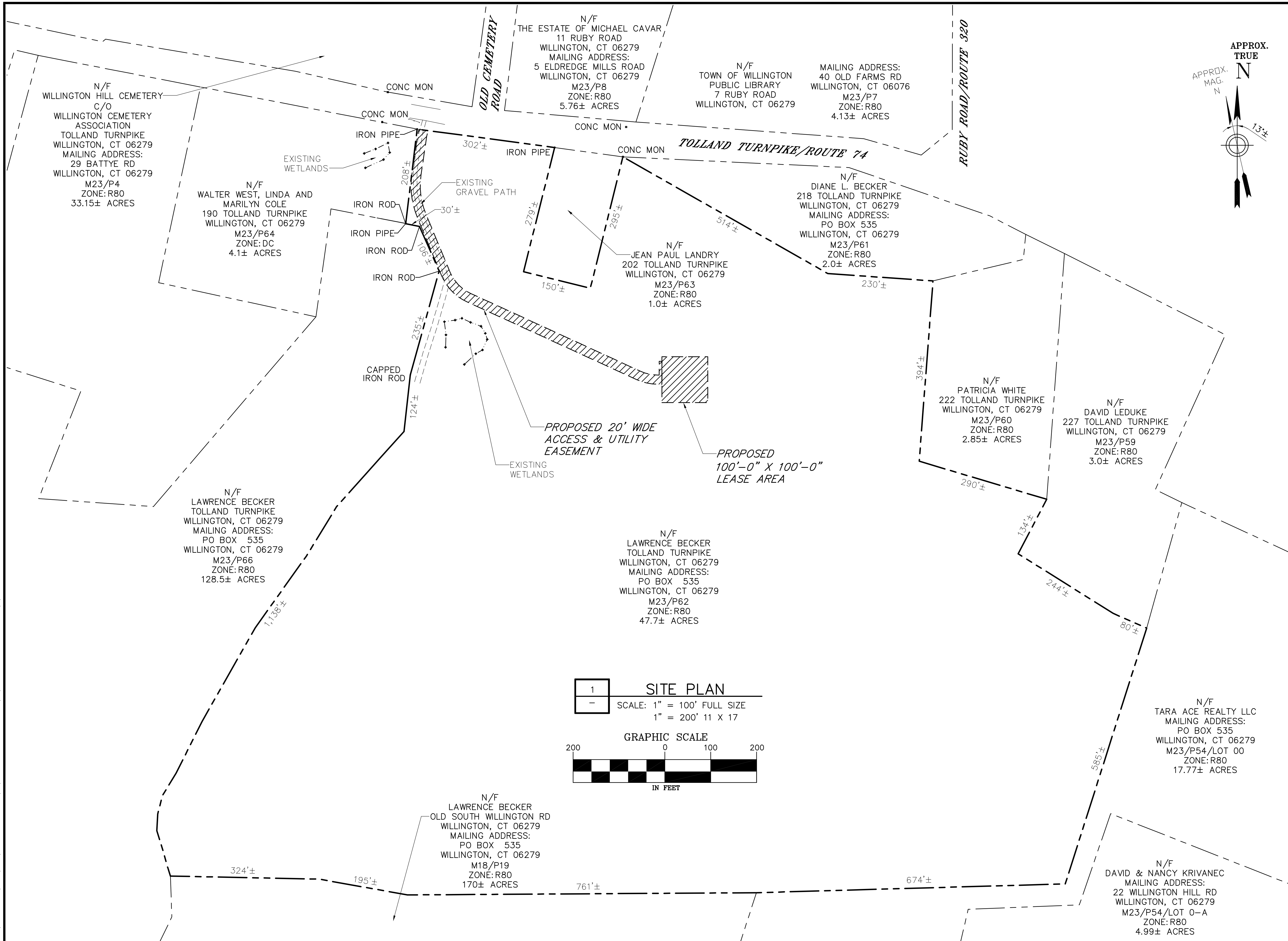
SHEET TITLE
TITLE SHEET

SHEET NUMBER
T01

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CHA PROJECT NO:
18301 – 1028 – 43000

| NO. | SUBMITTAL | | |
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SHEET TITLE
SITE PLAN

SHEET NUMBER
C01

File: W:\SAI CINGULAR\18301\SITES\1028 WILLINGTON 1107\CD\WILLINGTON-C01.DWG Saved: 4/22/2013 10:52:14 AM PLotted: 5/7/2013 1:16:31 PM User: Lusitani, Paul

SURVEY NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS INC. ON SEPTEMBER 26, 1996. THE BOUNDARY LINES SHOWN ON THIS PLAN WERE COMPILED FROM OTHER MAPS, RECORD RESEARCH OR OTHER SOURCES OF INFORMATION. IT IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD SURVEY, AND IS SUBJECT TO SUCH CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE.

TYPE OF SURVEY: COMPILATION PLAN

BOUNDARY DETERMINATION CATEGORY: NONE

CLASS OF ACCURACY: HORIZONTAL CLASS A-2
VERTICAL CLASS V-2
TOPOGRAPHIC CLASS T-2

2. PROPERTY LINE SHOWN HEREON ARE FROM RECORD DEEDS PLOTS AND TAX MAPS AS OVERLAID ON ANY MONUMENTATION OR OTHER EVIDENCE THAT MAY HAVE BEEN LOCATED DURING THE TOPOGRAPHIC SURVEY. A PROPERTY SURVEY WAS NOT PERFORMED BY CHA AND AS A RESULT THE PROPERTY LINES SHOWN ARE APPROXIMATE AND DO NOT PRESENT A PROPERTY/BOUNDARY OPINION.

3. BASE MAPPING PREPARED BY CHA FROM AN OCTOBER 2009 FIELD SURVEY.

4. NORTH ORIENTATION IS TRUE NORTH BASED ON GPS OBSERVATIONS TAKEN AT THE TIME OF THE FIELD SURVEY.

5. UNDERGROUND UTILITIES, STRUCTURES AND FACILITIES, IF ANY, HAVE BEEN SHOWN FROM SURFACE LOCATIONS AND MEASUREMENTS OBTAINED FROM A FIELD SURVEY, THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHER UTILITIES WHICH THE EXISTENCE OF ARE NOT KNOWN. SIZE, TYPE AND LOCATION OF ALL UTILITIES AND STRUCTURES MUST BE VERIFIED BY PROPER AUTHORITIES PRIOR TO ANY AND ALL CONSTRUCTION. CALL DIG SAFE PRIOR.

6. SUBJECT TO ANY STATEMENT OF FACTS THAT AN UP-TO-DATE ABSTRACT OF TITLE WOULD DISCLOSE.

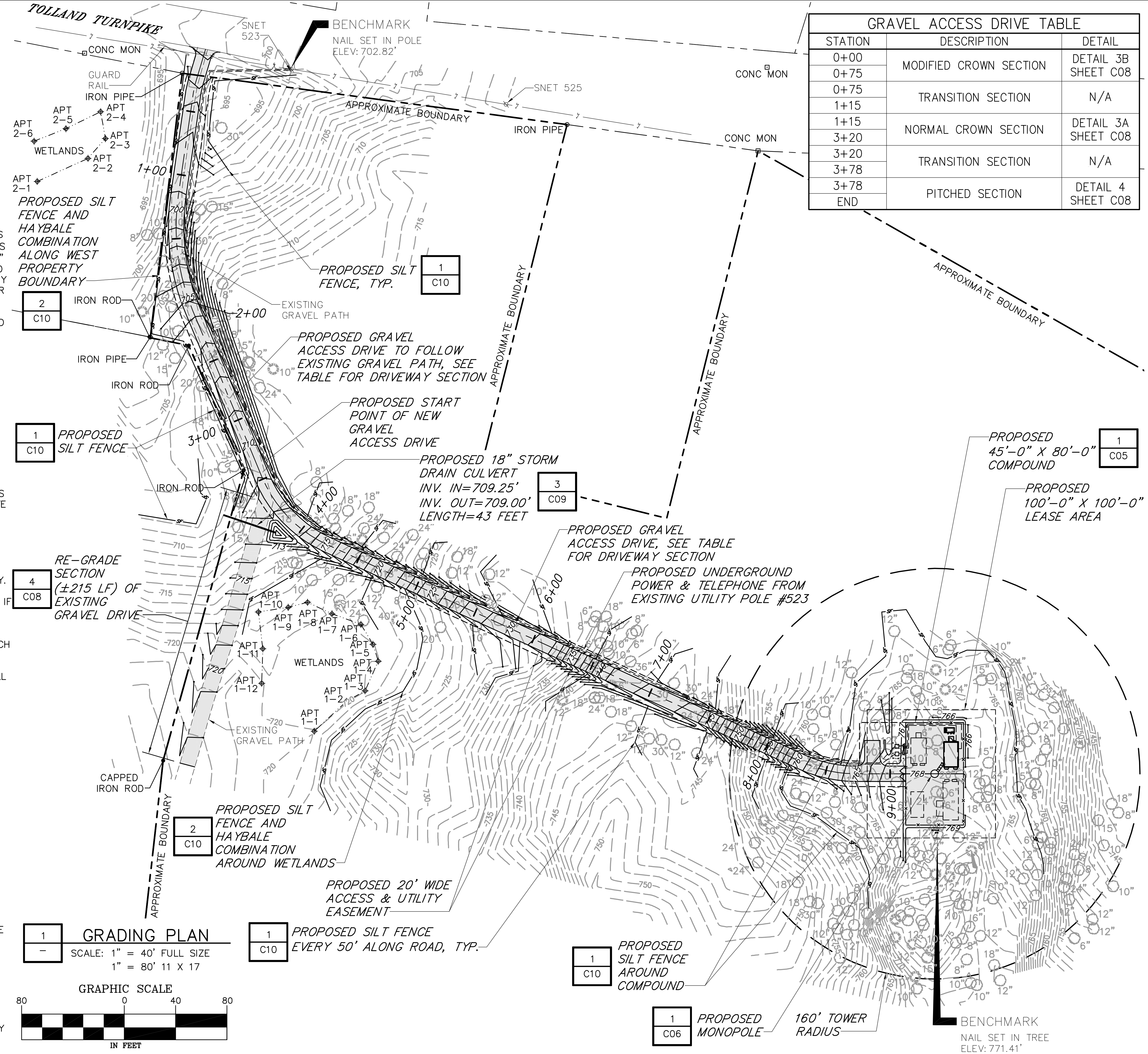
7. SUBJECT TO ALL RIGHTS, EASEMENTS, COVENANTS OR RESTRICTIONS OF RECORD.

8. LATITUDE/LONGITUDE/ELEVATIONS WERE OBTAINED UTILIZING NGS CORS BASE STATION NAMED "CTGE". LATITUDE/LONGITUDE ARE REFERENCED TO NAD83 CONNECTICUT ZONE. COORDINATES SHOWN, IF ANY, ARE EXPRESSED IN U.S. SURVEY FEET. ELEVATIONS ARE REFERENCED TO NAVD88. TOP OF STRUCTURE HEIGHT AS SHOWN, IF ANY, DETERMINED BY VERTICAL ANGLE OR BY ACTUAL LOCATION.
INFORMATION SHOWN BASED ON FAA 2C CERTIFICATION ACCURACY LEVEL DEFINED AS;
HORIZONTAL: ±20 FEET / 6 METERS
VERTICAL: ±3 FEET / 1 METERS

9. SITE FALLS WITHIN ZONE "C" DEFINED AS AREAS OF MINIMAL FLOODING AS SHOWN ON FLOOD INSURANCE RATE MAP, TOWN OF WILLINGTON, CONNECTICUT, TOLLAND COUNTY, PANEL 20 OF 20, COMMUNITY PANEL NUMBER 090159 0020 A, EFFECTIVE DATE JUNE 15, 1982.

MAP REFERENCES:

1. MAP ENTITLED "PLAN OF LAND OWNED BY THOMAS J. OWENS" AS PREPARED BY GILBERT F. PERRY, DATED JULY 12, 1967 AND FILED AS MAP BOOK 5 PAGE 25.




GRADING PLAN (1/–)
SCALE: 1" = 40' FULL SIZE
1" = 80' 11 X 17

GRAPHIC SCALE
80 0 40 80
IN FEET

GRAVEL ACCESS DRIVE TABLE

| STATION | DESCRIPTION | DETAIL |
|---|---|---|
| 0+00 – 0+75 | MODIFIED CROWN SECTION | DETAIL 3B SHEET C08 |
| 0+75 – 1+15 | TRANSITION SECTION | N/A |
| 1+15 – 3+20 | NORMAL CROWN SECTION | DETAIL 3A SHEET C08 |
| 3+20 – 3+78 | TRANSITION SECTION | N/A |
| 3+78 – END | PITCHED SECTION | DETAIL 4 SHEET C08 |

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STATE OF CONNECTICUT · JOHN P. SOBIECH · No. 17827 · LICENSED PROFESSIONAL ENGINEER

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WILLINGTON, CT
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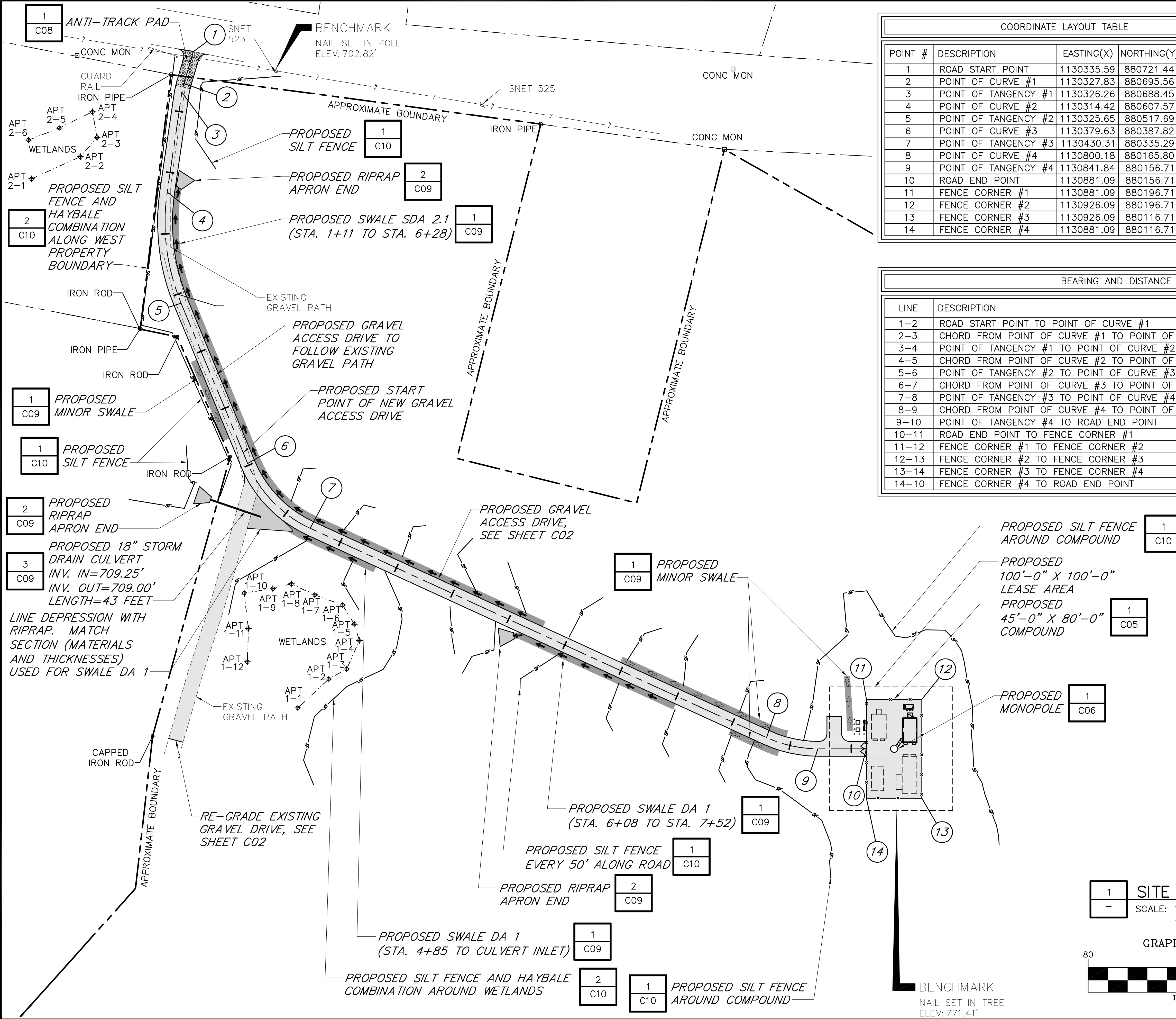
TOLLAND COUNTY

SHEET TITLE
GRADING PLAN

SHEET NUMBER
C02




| COORDINATE LAYOUT TABLE | | | | |
|---|---|---|---|---|
| POINT # | DESCRIPTION | EASTING(X) | NORTHING(Y) | STATION |
| 1 | ROAD START POINT | 1130335.59 | 880721.44 | 0+00 |
| 2 | POINT OF CURVE #1 | 1130327.83 | 880695.56 | 0+27.01 |
| 3 | POINT OF TANGENCY #1 | 1130326.26 | 880688.45 | 0+34.30 |
| 4 | POINT OF CURVE #2 | 1130314.42 | 880607.57 | 1+16.05 |
| 5 | POINT OF TANGENCY #2 | 1130325.65 | 880517.69 | 2+07.74 |
| 6 | POINT OF CURVE #3 | 1130379.63 | 880387.82 | 3+48.38 |
| 7 | POINT OF TANGENCY #3 | 1130430.31 | 880335.29 | 4+23.09 |
| 8 | POINT OF CURVE #4 | 1130800.18 | 880165.80 | 8+29.95 |
| 9 | POINT OF TANGENCY #4 | 1130841.84 | 880156.71 | 8+72.92 |
| 10 | ROAD END POINT | 1130881.09 | 880156.71 | 9+12.17 |
| 11 | FENCE CORNER #1 | 1130881.09 | 880196.71 | N/A |
| 12 | FENCE CORNER #2 | 1130926.09 | 880196.71 | N/A |
| 13 | FENCE CORNER #3 | 1130926.09 | 880116.71 | N/A |
| 14 | FENCE CORNER #4 | 1130881.09 | 880116.71 | N/A |

| BEARING AND DISTANCE TABLE | | | |
|---|---|---|---|
| LINE | DESCRIPTION | BEARING | DISTANCE |
| 1-2 | ROAD START POINT TO POINT OF CURVE #1 | S16-40-49W | 27.01 |
| 2-3 | CHORD FROM POINT OF CURVE #1 TO POINT OF TANGENCY #1 | S12-30-17W | 7.28 |
| 3-4 | POINT OF TANGENCY #1 TO POINT OF CURVE #2 | S08-19-44W | 81.75 |
| 4-5 | CHORD FROM POINT OF CURVE #2 TO POINT OF TANGENCY #2 | S07-07-17E | 90.58 |
| 5-6 | POINT OF TANGENCY #2 TO POINT OF CURVE #3 | S22-34-19E | 140.64 |
| 6-7 | CHORD FROM POINT OF CURVE #3 TO POINT OF TANGENCY #3 | S43-58-34E | 72.99 |
| 7-8 | POINT OF TANGENCY #3 TO POINT OF CURVE #4 | S65-22-49E | 406.85 |
| 8-9 | CHORD FROM POINT OF CURVE #4 TO POINT OF TANGENCY #4 | S77-41-25E | 42.64 |
| 9-10 | POINT OF TANGENCY #4 TO ROAD END POINT | EAST | 39.25 |
| 10-11 | ROAD END POINT TO FENCE CORNER #1 | NORTH | 40.00 |
| 11-12 | FENCE CORNER #1 TO FENCE CORNER #2 | EAST | 45.00 |
| 12-13 | FENCE CORNER #2 TO FENCE CORNER #3 | SOUTH | 80.00 |
| 13-14 | FENCE CORNER #3 TO FENCE CORNER #4 | WEST | 45.00 |
| 14-10 | FENCE CORNER #4 TO ROAD END POINT | NORTH | 40.00 |

APPROX. TRUE N
APPROX. MAG. N
13°±

1 – SITE LAYOUT PLAN
SCALE: 1" = 40' FULL SIZE
1" = 80' 11 X 17

GRAPHIC SCALE
80 0 40 80
IN FEET

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SHEET TITLE
SITE LAYOUT PLAN

SHEET NUMBER
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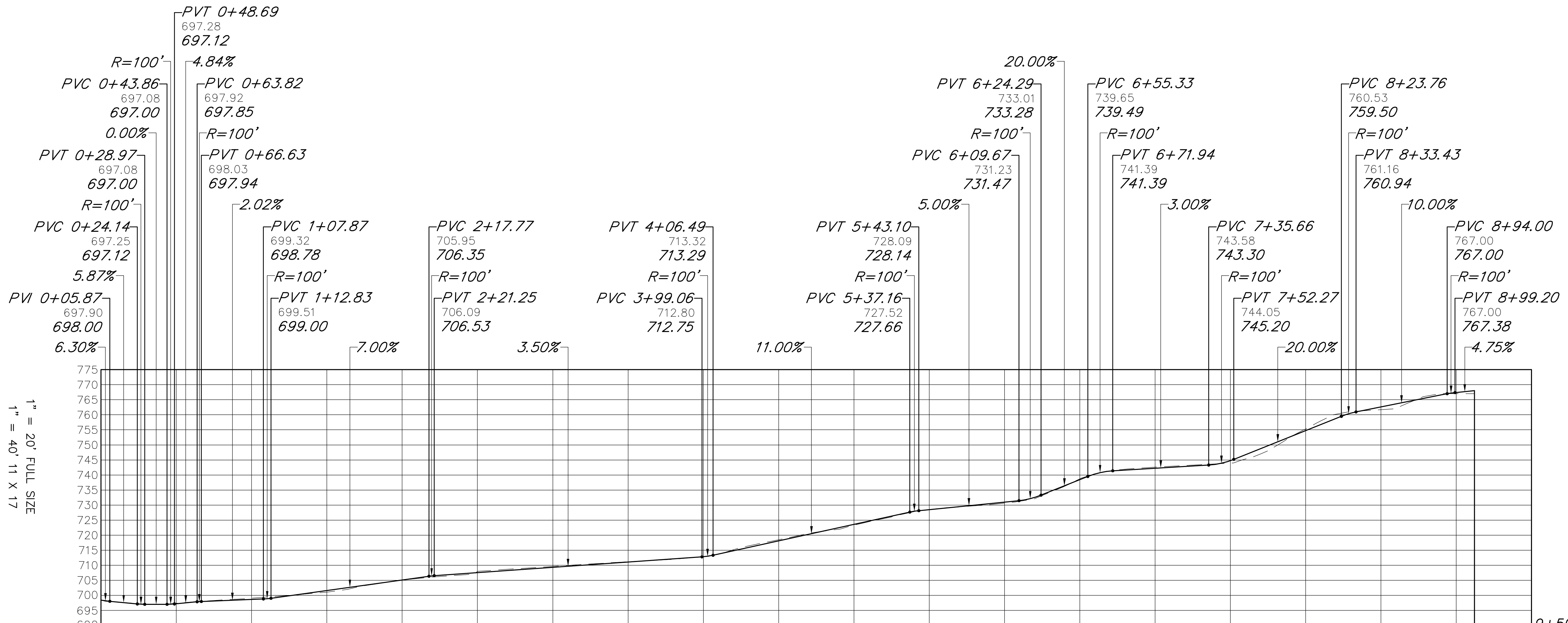


| STATION | 0+00 | 0+50 | 1+00 | 1+50 | 2+00 | 2+50 | 3+00 | 3+50 | 4+00 | 4+50 | 5+00 | 5+50 | 6+00 | 6+50 | 7+00 | 7+50 | 8+00 | 8+50 | 9+00 | 9+12.17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXISTING ELEVATION | 698.37 | 697.34 | 699.02 | 701.06 | 705.13 | 707.89 | 709.61 | 711.15 | 712.84 | 718.46 | 723.29 | 728.47 | 730.65 | 738.73 | 742.58 | 743.95 | 755.30 | 761.70 | 767.00 | 767.00 |
| PROPOSED ELEVATION | 698.37 | 697.18 | 698.62 | 701.60 | 705.10 | 707.53 | 709.28 | 711.03 | 712.79 | 718.08 | 723.58 | 728.48 | 730.98 | 738.43 | 742.23 | 744.77 | 754.74 | 762.60 | 767.42 | 768.00 |

1" = 20' FULL SIZE
1" = 40' 11 X 17
GRAPHIC SCALE
0 20 40 40
IN FEET

1" = 40' FULL SIZE
1" = 80' 11 X 17
GRAPHIC SCALE
80 0 40 80
IN FEET

1 / C04 ROAD PROFILE

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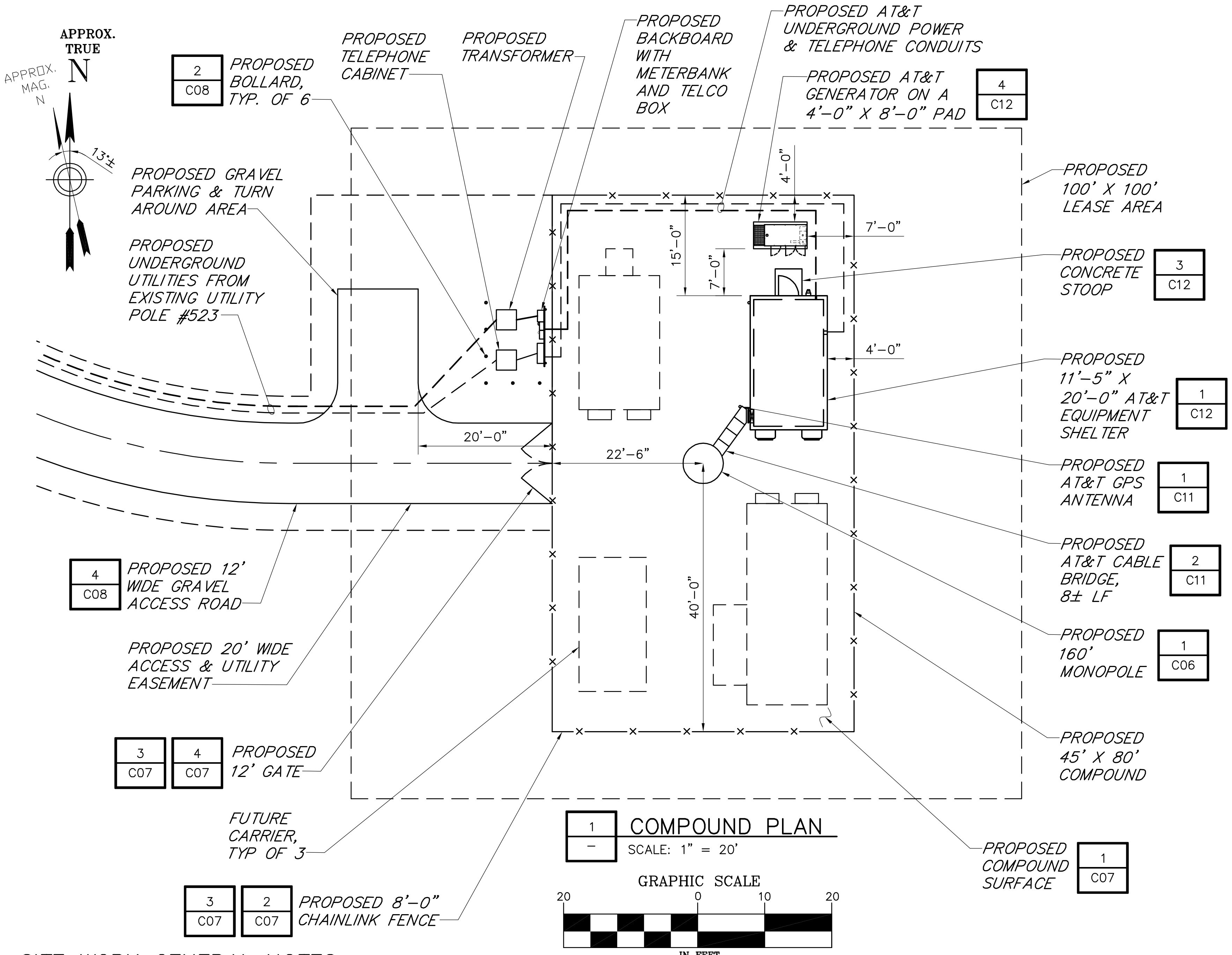

1 – COMPOUND PLAN
SCALE: 1" = 20'

## SITE WORK GENERAL NOTES:

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING AND AS STIPULATED HEREIN.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AREA.
4. 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.
5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
6. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.
7. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING.
8. CONTRACTOR IS TO SUPPLY COMBINATION LOCKS PER OWNER SPECIFICATIONS.
9. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES SHALL BE IN CONFORMANCE WITH STATE OF CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH THE TOWN/COUNTY CODE ENFORCEMENT OFFICE.
10. TEMPORARY SILT FENCE EROSION CONTROL BARRIER SHALL BE MAINTAINED THROUGHOUT SITE CONSTRUCTION. STOCK PILE ON SITE 100 FT. OF SILT FENCE FOR EMERGENCY USE. TEMPORARY EROSION BARRIERS SHALL REMAIN IN PLACE UNTIL PERMANENT VEGETATIVE GROUND COVER IS ESTABLISHED.
11. STILLING BASIN SHALL BE UTILIZED FOR ANY DE-WATERING DISCHARGE WHICH MAY OCCUR DURING CONSTRUCTION OPERATIONS.
12. CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO ANY GRADING ACTIVITIES IN LOCATIONS SHOWN ON THIS PLAN.
13. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
14. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
15. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATION.
16. NOT GREATER THAN 80,000 SQUARE FEET OF LAND SHALL BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME AND SHALL NOT EXCEED 90 DAYS. LAND SHOULD NOT BE LEFT EXPOSED DURING THE WINTER MONTHS.
17. ANY DISTURBED AREAS OUTSIDE LIMITS OF CONSTRUCTION SHALL BE TOPSOILED, SEEDED WITH RYE GRASS, AND MACHINE HAY MULCHED TO PREVENT EROSION. HAY OR STRAW MULCH SHALL BE APPLIED TO ALL FRESHLY SEEDED AREAS AT A RATE OF 2 TONS PER ACRES. BALES SHALL BE UNSPOILED, AIR-DRIED, AND FREE FROM WEED, SEEDS, AND ANY COARSE MATERIAL.

## PETROLEUM/HAZARDOUS MATERIALS STORAGE AND SPILL PREVENTION PLAN:

CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM AND HAZARDOUS 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 A PUBLIC WATER SUPPLY WATERSHED. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE SITE 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 DISPOSAL OFF SITE.

THE FOLLOWING RESTRICTIONS, PROTECTIVE MEASURES AND PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.

PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

- SERVICING OF MACHINERY SHOULD BE COMPLETED OUTSIDE OF THE PUBLIC WATER SUPPLY WATERSHED.
- REFUELING OF VEHICLES OR MACHINERY SHOULD TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.
- FUEL AND OTHER HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN THE PUBLIC WATER SUPPLY WATERSHED.
- ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT WITHIN THE PUBLIC WATER SUPPLY WATERSHED DURING WORKING HOURS SHOULD BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT.

IN THE EVENT OF SPILL:

INITIAL RESPONSE

- STOP OPERATIONS AND SHUT OFF EQUIPMENT.
- REMOVE ANY SOURCES OF SPARK OR FLAME.
- CONTAIN THE SOURCE OF THE SPILL.
- DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
- IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.
- ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

CLEAN UP & CONTAINMENT

- OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT.
- LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
- CONTACT WINDHAM WATER WORKS IMMEDIATELY AT (860) 465-3086, ALONG WITH OTHER APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.
- CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS.

FOLLOW-UP

- COMPLETE AN INCIDENT REPORT.
- SUBMIT A COMPLETED INCIDENT REPORT TO WINDHAM WATER WORKS.

THE WINDHAM WATER WORKS AND CONNECTICUT SITING COUNCIL WILL BE NOTICED AT LEAST 48 HOURS IN ADVANCE OF A PRE-CONSTRUCTION MEETING WITH AN INVITATION TO ATTEND. DURING THE PROJECT'S PRE-CONSTRUCTION MEETING, THE CONTRACTOR WILL BE MADE AWARE OF THE SPECIAL PROTECTIVE PRECAUTIONS THAT ARE REQUIRED DUE TO THE PROJECT'S LOCATION IN THE MANSFIELD HOLLOW RESERVOIR PUBLIC WATER SUPPLY WATERSHED.

## EROSION AND SEDIMENTATION CONTROLS

THE PROPOSED AT&T CONSTRUCTION PROJECT WILL FOLLOW AN APPROVED SOIL EROSION AND SEDIMENTATION CONTROL PLAN DESIGNED IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL. THE INSTALLED EROSION DEVICES WILL BE INSPECTED ONCE EVERY SEVEN DAYS AND AFTER SIGNIFICANT RAINFALL EVENTS OF GREATER THAN ONE HALF INCH OVER A 24-HOUR PERIOD TO ENSURE THAT PROPER PRECAUTIONS ARE TAKEN TO AVOID THE RELEASE OF SEDIMENT INTO NEARBY RESOURCE AREAS. THESE INSPECTIONS WILL BE DOCUMENTED ON AN EROSION AND SEDIMENTATION CONTROL SITE INSPECTION FORM (PLEASE REFER TO ATTACHED FORM). IN ADDITION TO THE SITE CONTRACTOR BEING RESPONSIBLE FOR THE PROPER INSTALLATION AND DAILY INSPECTION OF EROSION AND SEDIMENTATION (E&S) CONTROLS, STAFF FROM APT WILL INDEPENDENTLY INSPECT E&S CONTROLS AND DOCUMENT THEIR CONDITION AND RECOMMEND ANY ACTIONS NECESSARY TO BRING THE CONTROLS BACK INTO COMPLIANCE. THIS E&S CONTROL INSPECTION PROCEDURE WILL HELP AVOID EROSION AND SEDIMENTATION PROBLEMS BY ENSURING THAT THE EROSION CONTROL DEVICES ARE MAINTAINED AND FUNCTIONING PROPERLY. COPIES OF THE COMPLETED FORMS WILL BE SUBMITTED TO THE WINDHAM WATER WORKS AND CONNECTICUT SITING COUNCIL THROUGHOUT THE DURATION OF THE CONSTRUCTION PROJECT. IN ADDITION, WINDHAM WATER WORKS PERSONNEL WILL BE ALLOWED ACCESS TO THE PROJECT FOR PERIOD INSPECTIONS.

EROSION AND SEDIMENTATION CONTROL ITEMS SUBJECT TO INSPECTION INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- CONSTRUCTION ENTRANCE PAD
- SEDIMENT TRAPS
- SEDIMENT/ DETENTION BASINS
- TEMPORARY SOIL STOCKPILE AREAS
- SILT FENCING/HAY BALES
- SEEDING & MULCHING
- DRAINAGE SWALES
- DRAINAGE SWALE CHECK DAMS
- OTHER SITE-SPECIFIC EROSION CONTROL DEVICES


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CHA PROJECT NO:
18301 – 1028 – 43000

| NO. | SUBMITTAL | | |
|---|---|---|---|
| 0 | 03/22/13 | ISSUED FOR CSC CERTIFICATE | |
| | BY: JDM | CHK: PAL | APP'D: JPS |
| 1 | 04/22/13 | ISSUED FOR D&M | |
| | BY: JDM | CHK: PAL | APP'D: JPS |

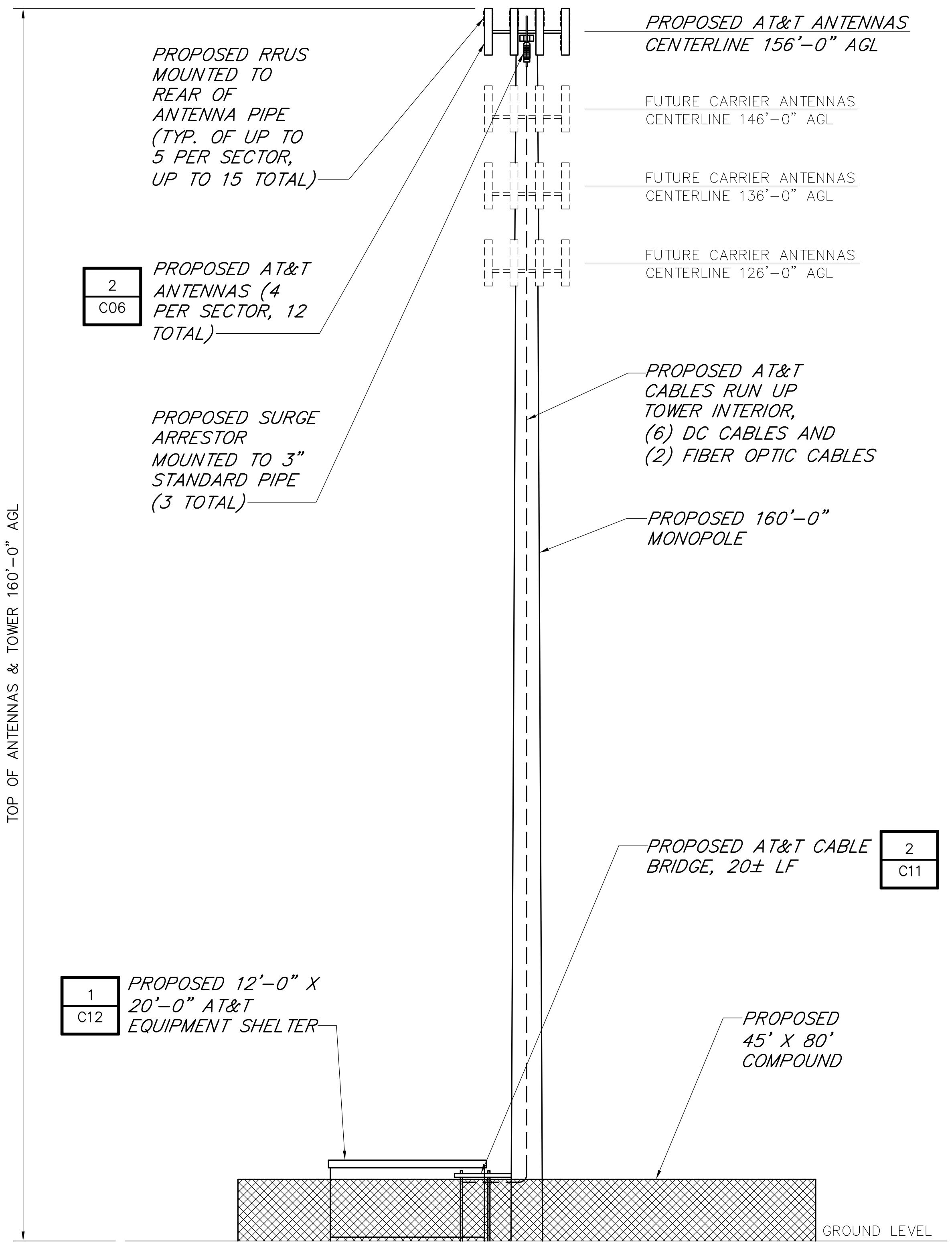
STATE OF CONNECTICUT
JOHN P. SOBIECH
No. 17827
LICENSED
PROFESSIONAL ENGINEER



SITE ID:
SR1107
SITE NAME:
WILLINGTON
SITE ADDRESS:
TOLLAND TURNPIKE
WILLINGTON, CT
06279
TOLLAND COUNTY

SHEET TITLE
COMPOUND PLAN & SITE NOTES

SHEET NUMBER
C05



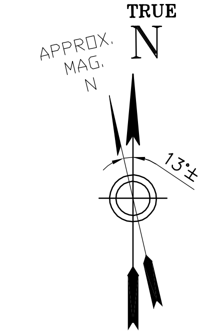

| 1 | TOWER ELEVATION |
|---|---|
| C06 | SCALE: 1" = 10' FULL SIZE<br>1" = 20' 11 X 17 |

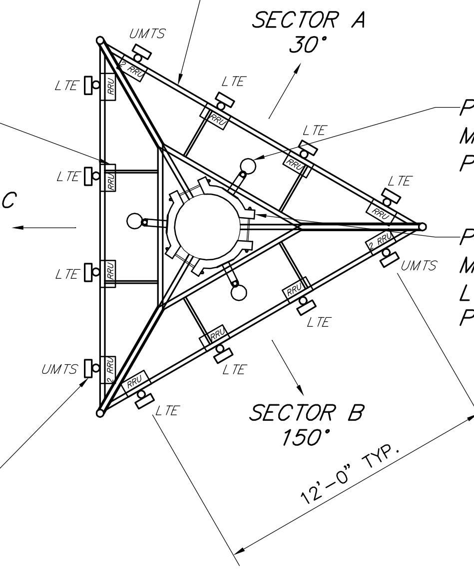
GRAPHIC SCALE

20 0 10 20

IN FEET

CONTRACTOR MUST CONFIRM EQUIPMENT CONFIGURATION WITH LATEST RFDS AND TOWER DESIGN




| 2 | ANTENNA ARRAY |
|---|---|
| C06 | NOT TO SCALE |

– BOTH THE TOWER STRUCTURE AND FOUNDATION WILL BE/HAVE BEEN DESIGNED BY OTHERS.
– PRIOR TO CONSTRUCTION, THE FINAL TOWER FOUNDATION DESIGN SHOULD BE COMPARED TO THE SITE PLAN TO AVOID POTENTIAL CONFLICTS.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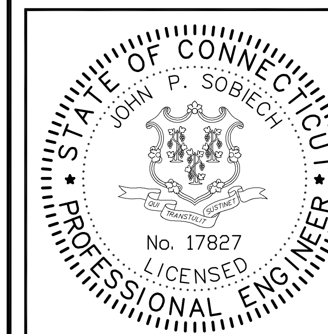


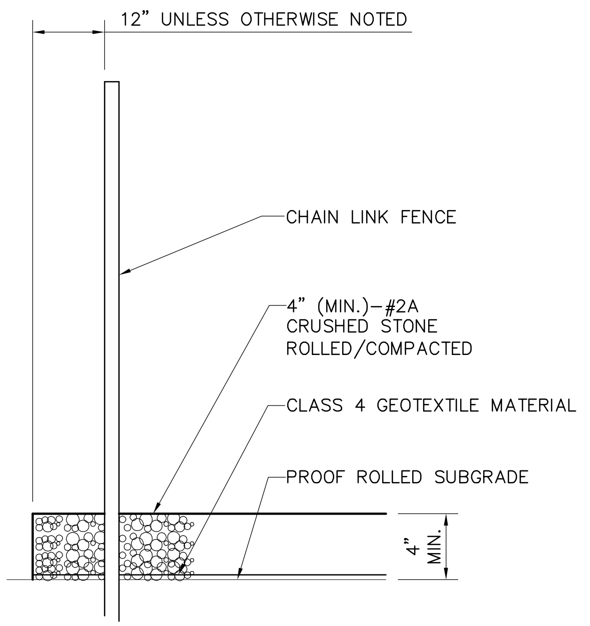



SITE ID:
SR1107
SITE NAME:
WILLINGTON
SITE ADDRESS:
TOLLAND TURNPIKE
WILLINGTON, CT
06279
TOLLAND COUNTY

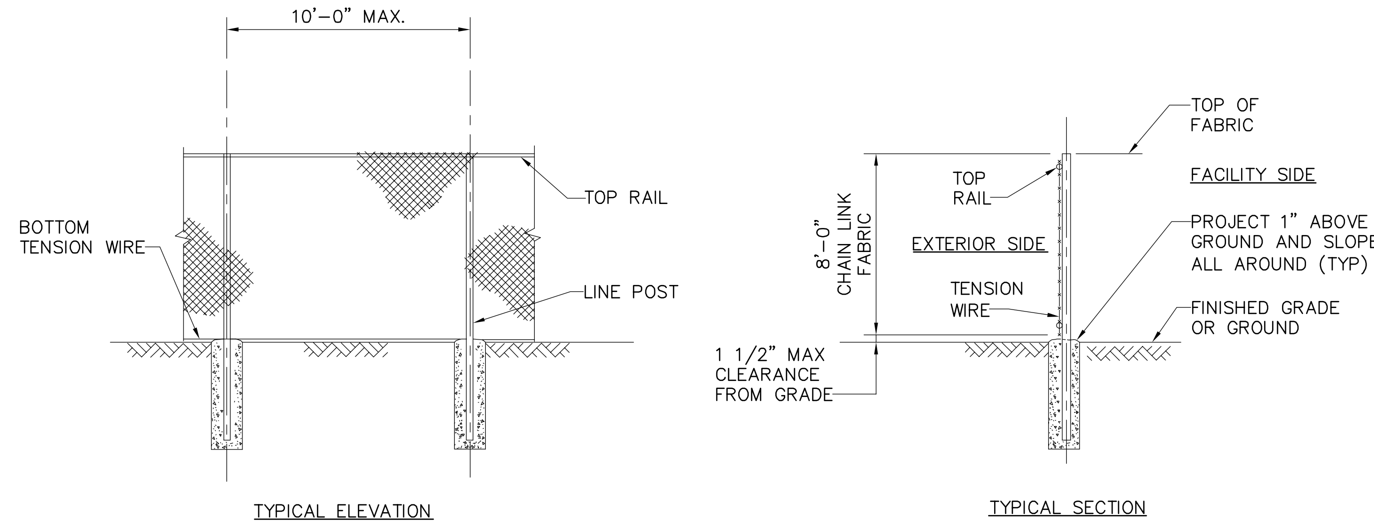
SHEET TITLE
ELEVATION & DETAILS

SHEET NUMBER
C06

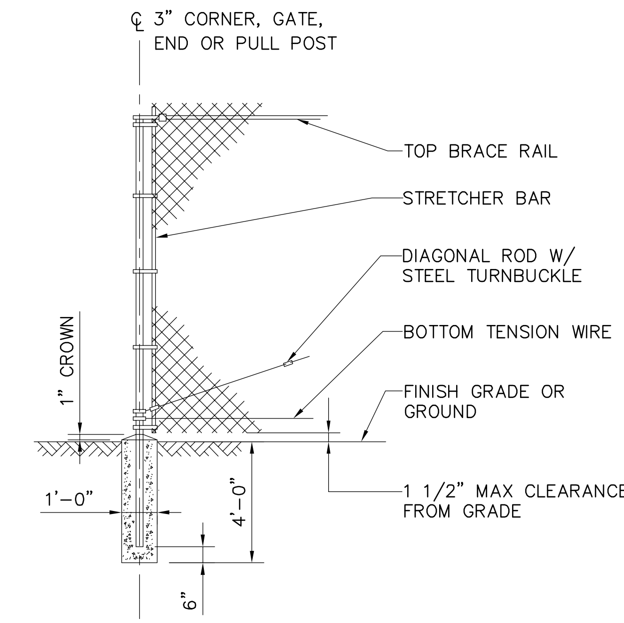
File: W:\SAI CINGULAR\18301\SITES\1028 WILLINGTON 1107\CD\WILLINGTON–C06.DWG Saved: 4/30/2013 10:20:54 AM PLotted: 5/7/2013 1:22:38 PM User: Lusitani, Paul



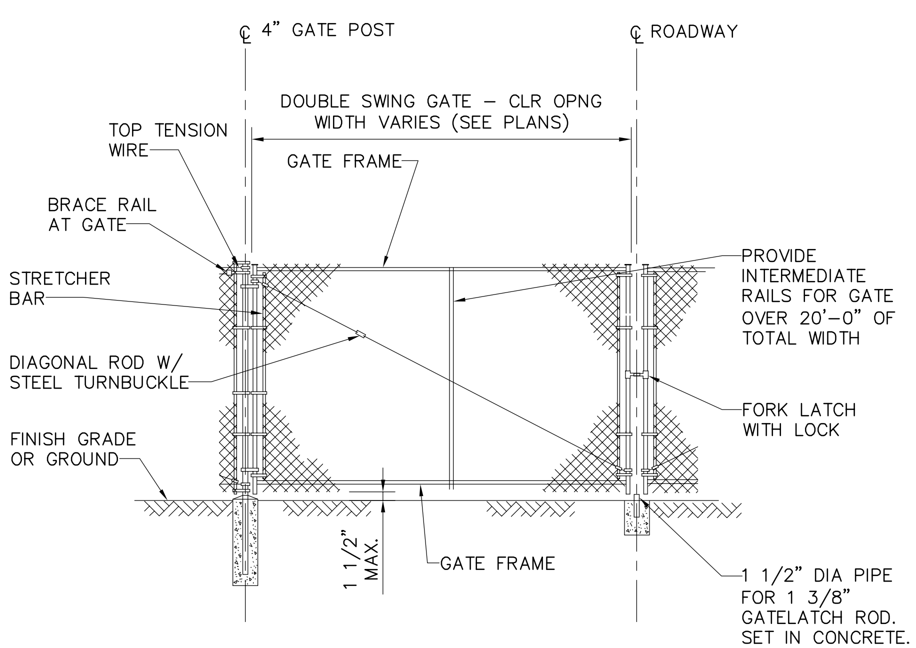

| 1 | SITE AREA SURFACING |
|---|---|
| C07 | NO SCALE |




| 2 | WOVEN WIRE FENCE |
|---|---|
| C07 | NO SCALE |




| 3 | CORNER, GATE, END OR PULL POST |
|---|---|
| C07 | NO SCALE |




| 4 | WOVEN WIRE SWING GATE, DOUBLE DETAIL |
|---|---|
| C07 | NO SCALE |



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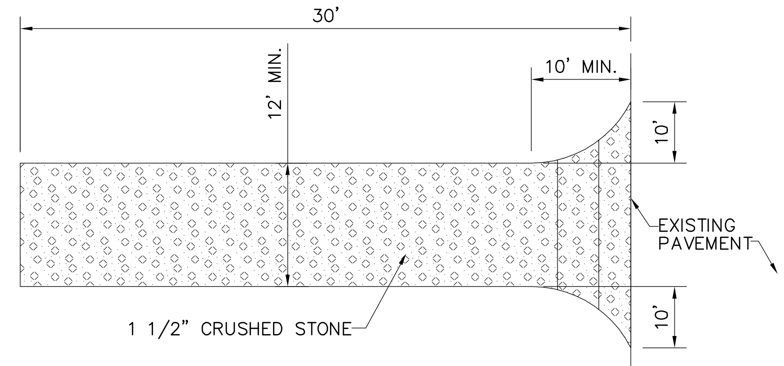
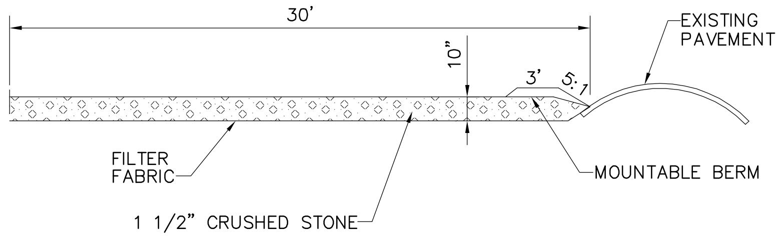
SITE ID:
SR1107
SITE NAME:
WILLINGTON
SITE ADDRESS:
TOLLAND TURNPIKE
WILLINGTON, CT
06279
TOLLAND COUNTY

SHEET TITLE
SITE DETAILS

SHEET NUMBER
C07




## PLAN VIEW

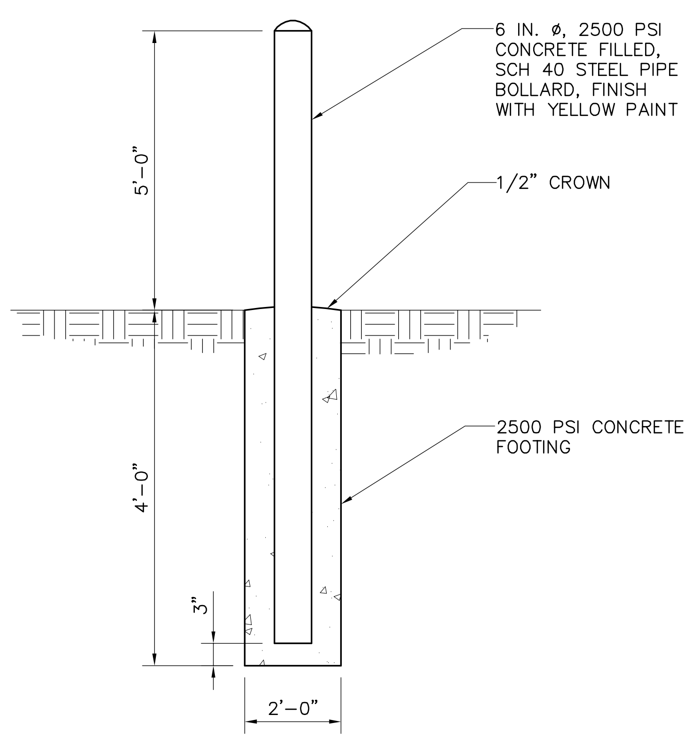



## CROSS-SECTION

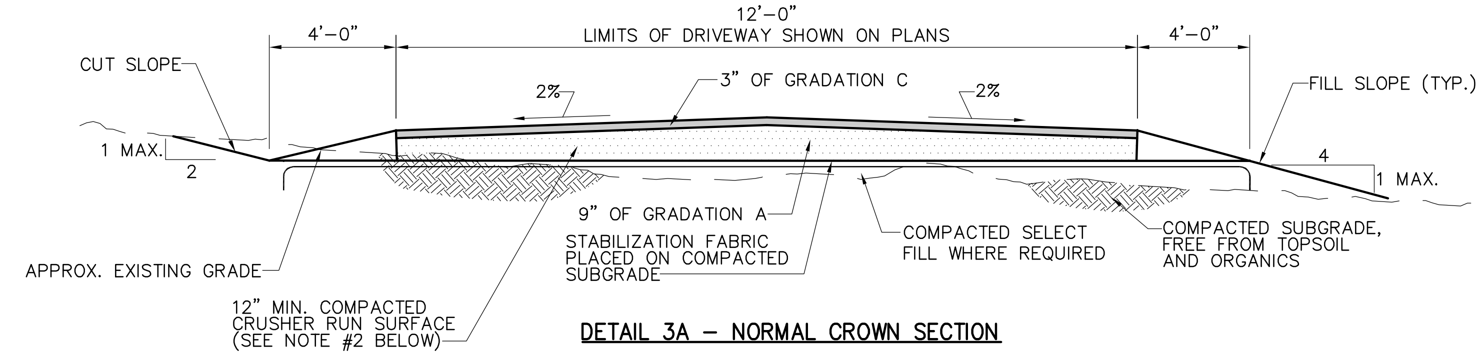
## NOTES:

1. ENTRANCE WIDTH SHALL BE A TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

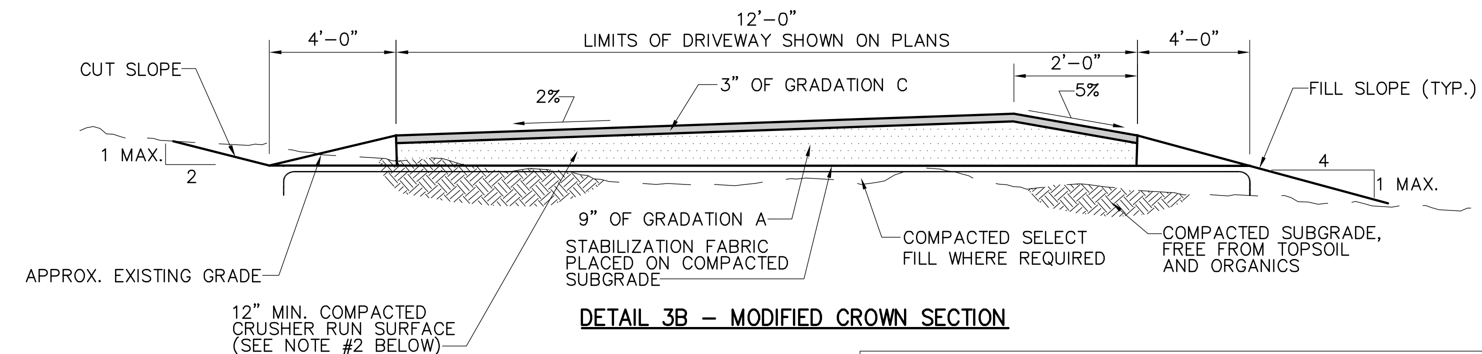
| 1 / C08 | CONSTRUCTION DEBRIS ANTI-TRACKING PAD |
|---|---|
| | NO SCALE |




| 2 / C08 | BOLLARD DETAIL |
|---|---|
| | NO SCALE |




## DETAIL 3A – NORMAL CROWN SECTION

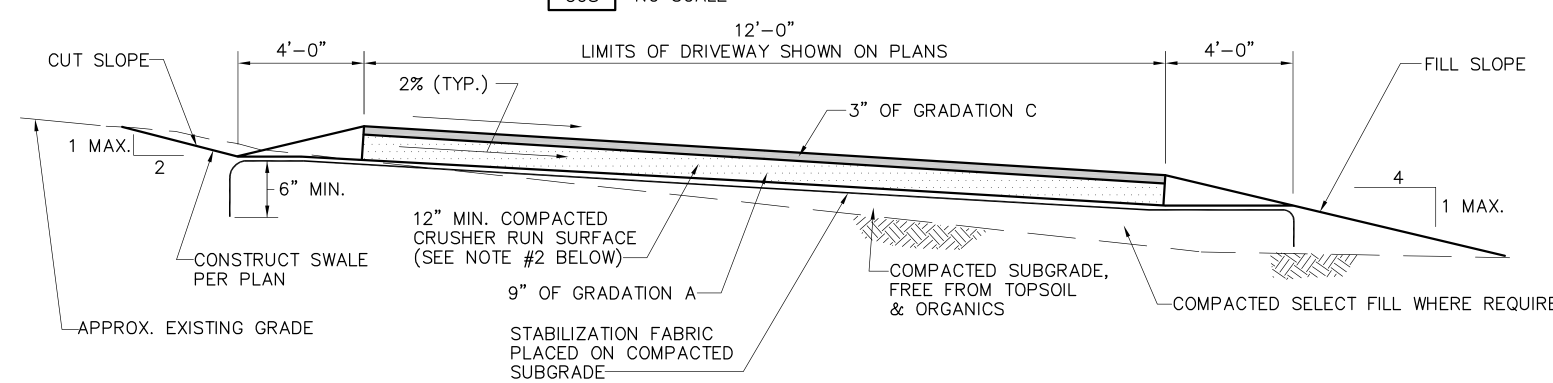



## DETAIL 3B – MODIFIED CROWN SECTION

NOTES:
1. WHERE REQUIRED BY THE ENGINEER, THE PROPOSED DRIVEWAY BED SHALL BE OVER-EXCAVATED AND FILLED WITH BANK RUN GRAVEL. THE MATERIAL USED SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE PAID EXTRA FOR OVER-EXCAVATION AND BACKFILL WITH BANK RUN GRAVEL, ON A UNIT PRICE BASIS.
2. THE MATERIALS FOR THE ROLLED BANK GRAVEL SURFACE AND TRAFFIC-BOUND GRAVEL SURFACE SHALL CONSIST OF SOUND, TOUGH, DURABLE PARTICLES OF BANK OR CRUSHED GRAVEL. ALL MATERIALS SHALL BE FREE FROM THIN OR ELONGATED PIECES, LUMPS OF CLAY, LOAM, VEGETABLE MATTER, OR SAND. BINDER MAY BE ADDED AND INCORPORATED BY APPROVED METHODS AS SPECIFIED ELSE WHERE. THE BOTTOM 9" SHALL MEET GRADING "A" AND THE TOP 3" SHALL CONFORM TO GRADING "C".

| | GRADATION A | GRADATION B | GRADATION C |
|---|---|---|---|
| SQUARE MESH SIEVES | PERCENT PASSING BY WEIGHT (MASS) | | |
| PASS 5" (125mm) | | 100 | |
| PASS 3.5" (90mm) | 100 | 90–100 | |
| PASS 1.5" (37.5mm) | 55–100 | 55–95 | 100 |
| PASS 0.75" (19mm) | | | 45–80 |
| PASS 0.25" (6.3mm) | 25–60 | 25–60 | 25–60 |
| PASS #10 (2.0mm) | 15–45 | 15–45 | 15–45 |
| PASS #40 (425um) | 5–25 | 5–25 | 5–25 |
| PASS #100 (150um) | 0–10 | 0–10 | 0–10 |
| PASS #200 (75um) | 0–5 | 0–5 | 0–5 |

| 3 / C08 | CROWNED DRIVEWAY SECTION |
|---|---|
| | NO SCALE |




NOTES:
1. WHERE REQUIRED BY THE ENGINEER, THE PROPOSED DRIVEWAY BED SHALL BE OVER-EXCAVATED AND FILLED WITH BANK RUN GRAVEL. THE MATERIAL USED SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE PAID EXTRA FOR OVER-EXCAVATION AND BACKFILL WITH BANK RUN GRAVEL, ON A UNIT PRICE BASIS.
2. THE MATERIALS FOR THE ROLLED BANK GRAVEL SURFACE AND TRAFFIC-BOUND GRAVEL SURFACE SHALL CONSIST OF SOUND, TOUGH, DURABLE PARTICLES OF BANK OR CRUSHED GRAVEL. ALL MATERIALS SHALL BE FREE FROM THIN OR ELONGATED PIECES, LUMPS OF CLAY, LOAM, VEGETABLE MATTER, OR SAND. BINDER MAY BE ADDED AND INCORPORATED BY APPROVED METHODS AS SPECIFIED ELSE WHERE. THE BOTTOM 9" SHALL MEET GRADING "A" AND THE TOP 3" SHALL CONFORM TO GRADING "C".

| | GRADATION A | GRADATION B | GRADATION C |
|---|---|---|---|
| SQUARE MESH SIEVES | PERCENT PASSING BY WEIGHT (MASS) | | |
| PASS 5" (125mm) | | 100 | |
| PASS 3.5" (90mm) | 100 | 90–100 | |
| PASS 1.5" (37.5mm) | 55–100 | 55–95 | 100 |
| PASS 0.75" (19mm) | | | 45–80 |
| PASS 0.25" (6.3mm) | 25–60 | 25–60 | 25–60 |
| PASS #10 (2.0mm) | 15–45 | 15–45 | 15–45 |
| PASS #40 (425um) | 5–25 | 5–25 | 5–25 |
| PASS #100 (150um) | 0–10 | 0–10 | 0–10 |
| PASS #200 (75um) | 0–5 | 0–5 | 0–5 |

| 4 / C08 | PITCHED DRIVEWAY SECTION |
|---|---|
| | NO SCALE |

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| 1 | 04/22/13 | ISSUED FOR D&M | |
| | BY: JDM | CHK: PAL | APP'D: JPS |

STATE OF CONNECTICUT
JOHN P. SOBIECH
No. 17827
LICENSED
PROFESSIONAL ENGINEER



SITE ID:
SR1107
SITE NAME:
WILLINGTON
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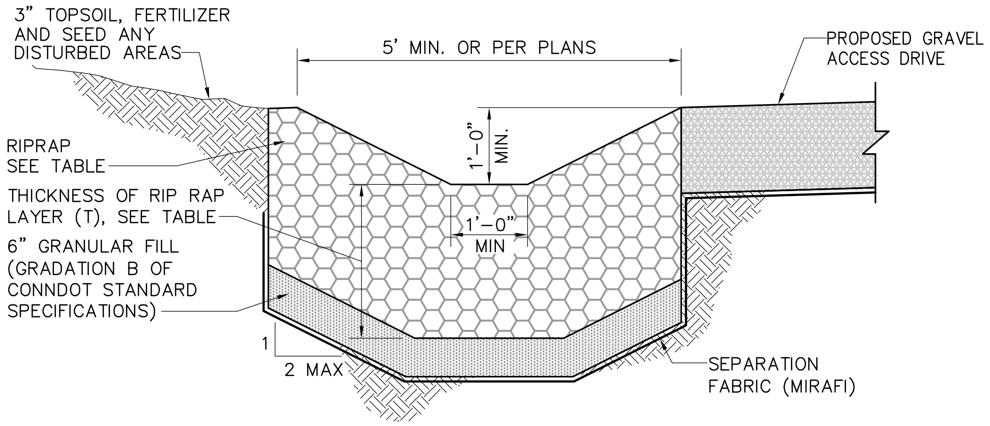
TOLLAND TURNPIKE
WILLINGTON, CT
06279
TOLLAND COUNTY

SHEET TITLE
SITE DETAILS

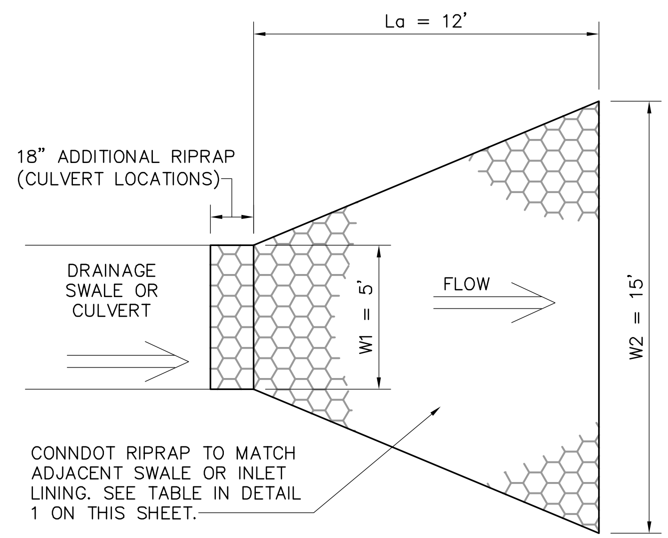
SHEET NUMBER
C08



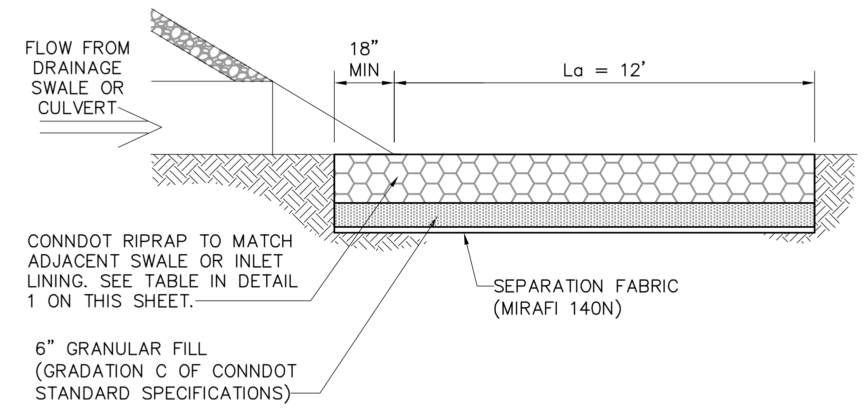

| SWALE | CONNDOT RIPRAP | | THICKNESS OF RIPRAP LINING |
|---|---|---|---|
| | D50 SIZE | CLASS | |
| DA 1 | 8" | INTERMEDIATE | 18" |
| SDA 1.1 | 12" | INTERMEDIATE* | 24" |
| SDA 2.1 | 8" | INTERMEDIATE | 18" |
| MINOR | 8" | INTERMEDIATE | 18" |

*TYPICAL CONNDOT INTERMEDIATE RIP RAP HAS A D50 SIZE OF 8". SWALE SDA 1.1 REQUIRES A CUSTOMIZED GRADATION OF INTERMEDIATE RIP RAP WITH A D50 SIZE OF 12".

1 / C09 STONE DRAINAGE SWALE
NO SCALE

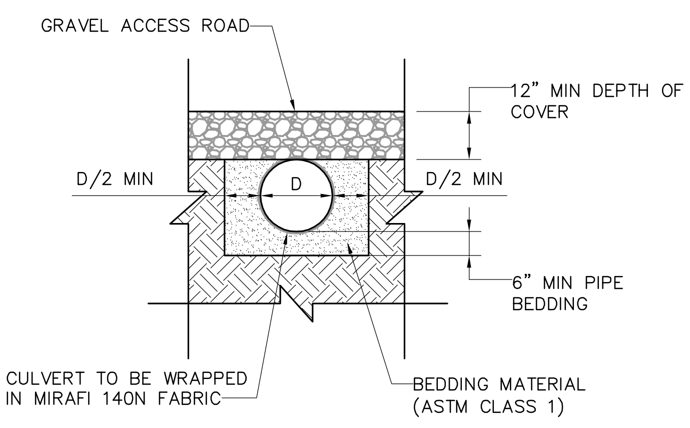



PLAN

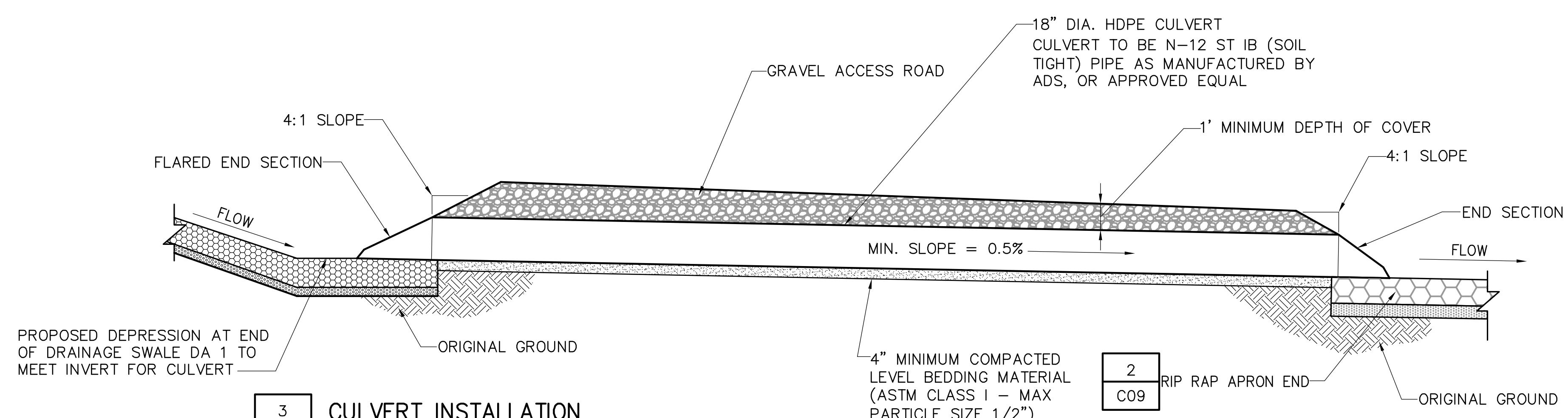



SECTION

2 / C09 RIPRAP APRON END
NO SCALE




CROSS SECTION




SECTION

3 / C09 CULVERT INSTALLATION
NO SCALE

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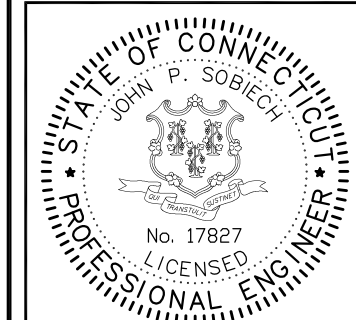


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SR1107
SITE NAME:
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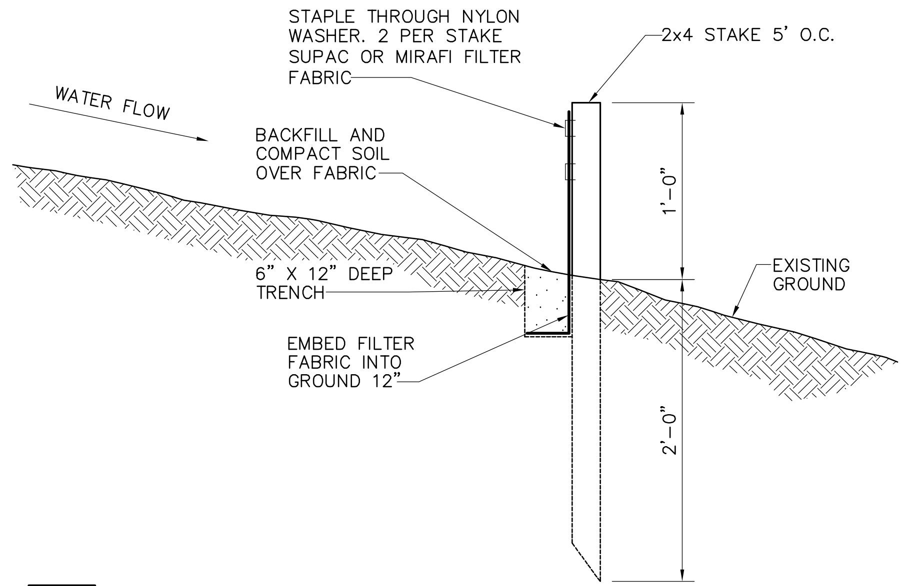
SITE ADDRESS:
TOLLAND TURNPIKE
WILLINGTON, CT
06279
TOLLAND COUNTY

SHEET TITLE
SITE DETAILS

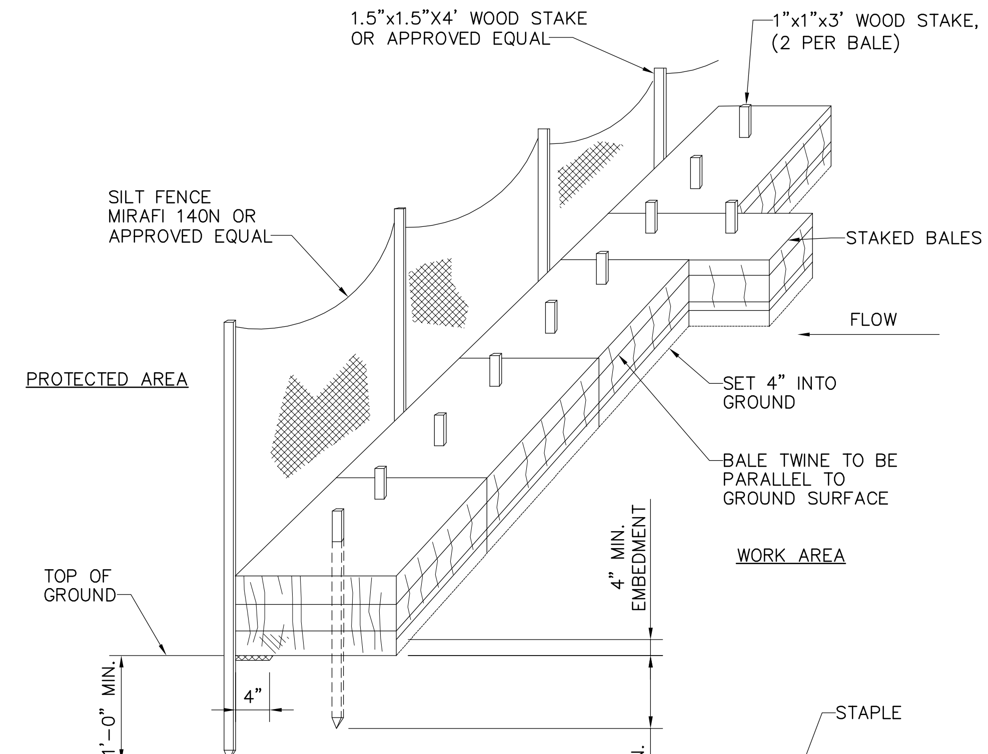
SHEET NUMBER
C09

NOTE:

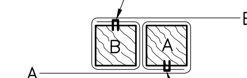
1. THE GOETEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 12" INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCES SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION, AND BOTTOM.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN ONE ANOTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36" LONG AND DRIVEN A MINIMUM OF 24" INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BULGES IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.




1 / C10 SILT FENCE DETAIL
NO SCALE




NOTE:
PLACE ONE HAY BALE PERPENDICULAR ALONG HAY BALE BARRIER (100' O.C.)




WOOD STAKE JOINT DETAIL

2 / C10 SILT FENCE/HAY BALE BARRIER
NO SCALE

## 1. STANDARD RIPRAP:

THE MATERIAL SHALL CONFORM, TO THE FOLLOWING REQUIREMENTS:

A. NOT MORE THAN 15% OF THE RIPRAP SHALL BE SCATTERED SPALLS AND STONES LESS THAN 6 INCHES (150 MILLIMETERS) IN SIZE.

B. NO STONE SHALL BE LARGER THAN 30 INCHES (760 MILLIMETERS) IN SIZE, AND AT LEAST 75% OF THE WEIGHT (MASS) SHALL BE STONES AT LEAST 15 INCHES (380 MILLIMETERS) IN SIZE.

## 2. INTERMEDIATE RIPRAP:

THE MATERIAL SHALL CONFORM, TO THE FOLLOWING GRADATION:

| STONE SIZE: | % OF THE WEIGHT (MASS) |
|---|---|
| 18 INCHES (460 MILLIMETERS OR OVER) | 0 |
| 10 INCHES TO 18 INCHES (255 MILLIMETERS TO 460 MILLIMETERS) | 30–50 |
| 6 INCHES TO 10 INCHES (150 MILLIMETERS TO 255 MILLIMETERS) | 30–50 |
| 4 INCHES TO 6 INCHES (100 MILLIMETERS TO 150 MILLIMETERS) | 20–30 |
| 2 INCHES TO 4 INCHES (50 MILLIMETERS TO 100 MILLIMETERS) | 10–20 |
| LESS THAN 2 INCHES (LESS THAN 50 MILLIMETERS) | 0–10 |

## 3. MODIFIED RIPRAP:

THE MATERIAL SHALL CONFORM, TO THE FOLLOWING GRADATION:

| STONE SIZE: | % OF THE WEIGHT (MASS) |
|---|---|
| 10 INCHES (255 MILLIMETERS OR OVER) | 0 |
| 6 INCHES TO 10 INCHES (150 MILLIMETERS TO 255 MILLIMETERS) | 20–50 |
| 4 INCHES TO 6 INCHES (100 MILLIMETERS TO 150 MILLIMETERS) | 30–60 |
| 2 INCHES TO 4 INCHES (50 MILLIMETERS TO 100 MILLIMETERS) | 30–40 |
| 1 INCHES TO 2 INCHES (25 MILLIMETERS TO 50 MILLIMETERS) | 10–20 |
| LESS THAN 1 INCH (LESS THAN 25 MILLIMETERS) | 0–10 |

RIPRAP SHALL CONSIST SOUND, TOUGH, DURABLE AND ANGULAR ROCK, FREE FROM DECOMPOSED STONES OR OTHER DEFECTS IMPAIRING ITS DURABILITY. THE SIZE OF A STONE AS HEREINAFTER SPECIFIED SHALL BE ITS LEAST DIMENSION. BROKEN CONCRETE OR ROUNDED STONES ARE NOT ACCEPTABLE. THE TYPE OF MATERIAL TO BE USED SHALL BE AS NOTED ON THE PLANS.

3 / C10 RIP RAP MATERIAL SPECIFICATION AND GRADATION
NO SCALE

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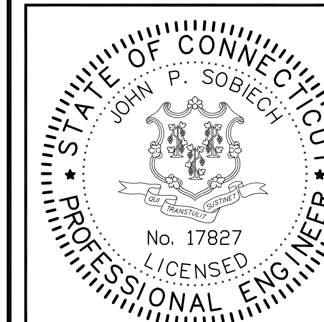


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SITE ADDRESS:
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WILLINGTON, CT
06279
TOLLAND COUNTY

SHEET TITLE
SITE DETAILS

SHEET NUMBER
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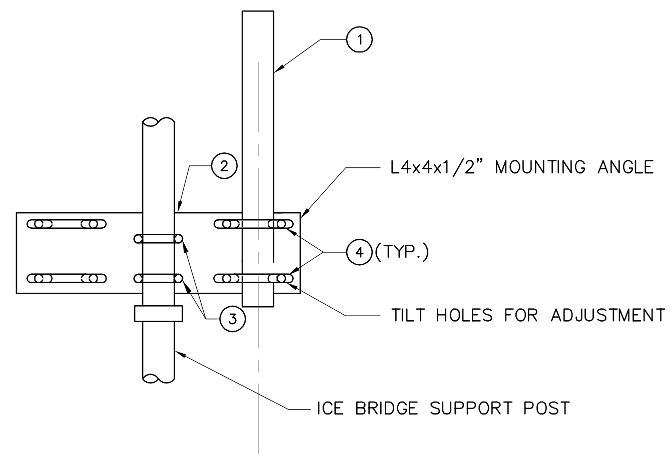
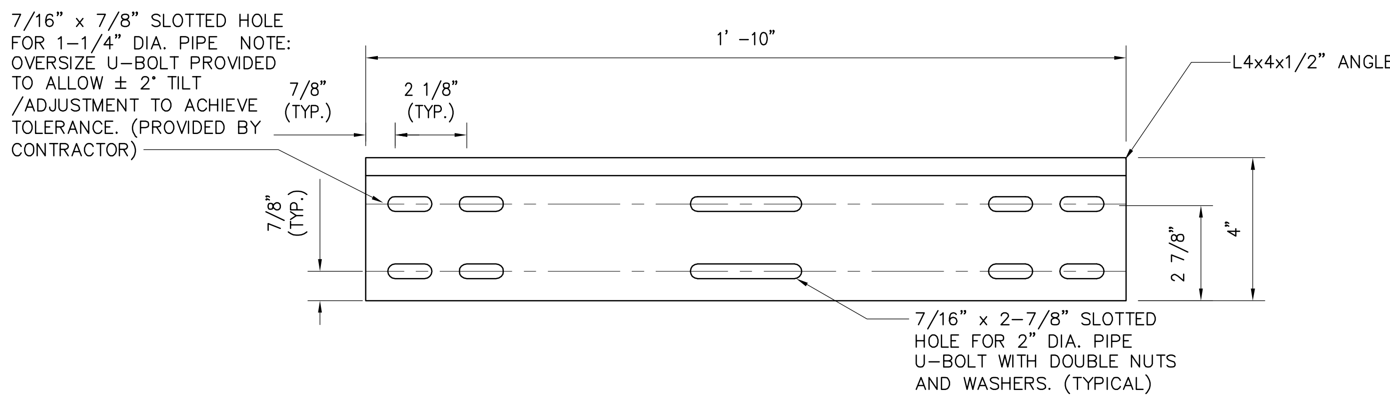



GPS ANTENNA MOUNTING BRACKET




MOUNTING BRACKET PLATE

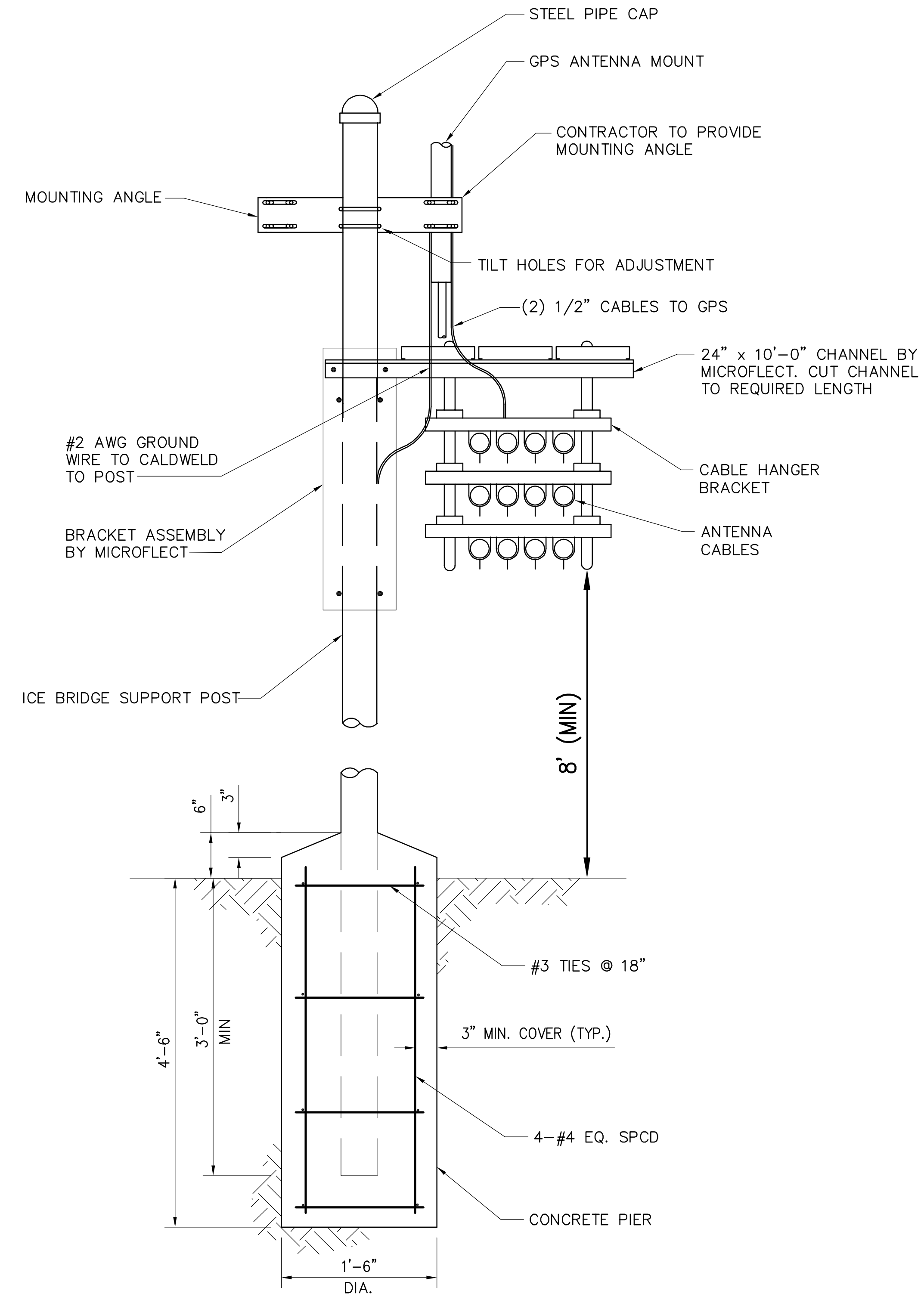
| ITEM # | DESCRIPTION | QUANTITY (EACH) |
|---|---|---|
| 1 | 1-1/2" SCH. 40 X 18" LG. MIN SS OR GALV. PIPE | 1 |
| 2 | ANGLE 4" X 4" X 1/2" GALV.(A-36) | 1 |
| 3 | STD. U-BOLT FOR 2" PIPE W/ DOUBLE HEX NUTS AND WASHER, GALV. | 2 |
| 4 | STD. U-BOLT FOR 2" PIPE W/ DOUBLE HEX NUTS AND WASHER, GALV. (SEE NOTE 2) | 2 |

BILL OF MATERIALS

NOTES:

1. THE MOUNTING PLATE SHALL BE FABRICATED AS SHOWN AND ATTACHED TO THE APPROPRIATE SUPPORT STRUCTURE USING U-BOLTS. THE SUPPORT PIPE SHALL THEN BE ATTACHED TO THE MOUNTING PLATE USING THE OVERSIZE U-BOLTS PROVIDED TO ALLOW ADJUSTMENT. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2 DEGREES OF LEVEL.

| 1 | GPS ANTENNA |
|---|---|
| – | NO SCALE |




| 2 | ICE BRIDGE SUPPORT POST W/GPS DETAIL |
|---|---|
| – | NO SCALE |

NOTES:

1. LOCATION OF ANTENNA MOUNTING PIPE MUST HAVE CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.

2. THE GPS ANTENNA LOCATION MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.

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STATE OF CONNECTICUT
JOHN P. SOBIECH
No. 17827
LICENSED
PROFESSIONAL ENGINEER

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STRUCTURAL DETAILS

SHEET NUMBER
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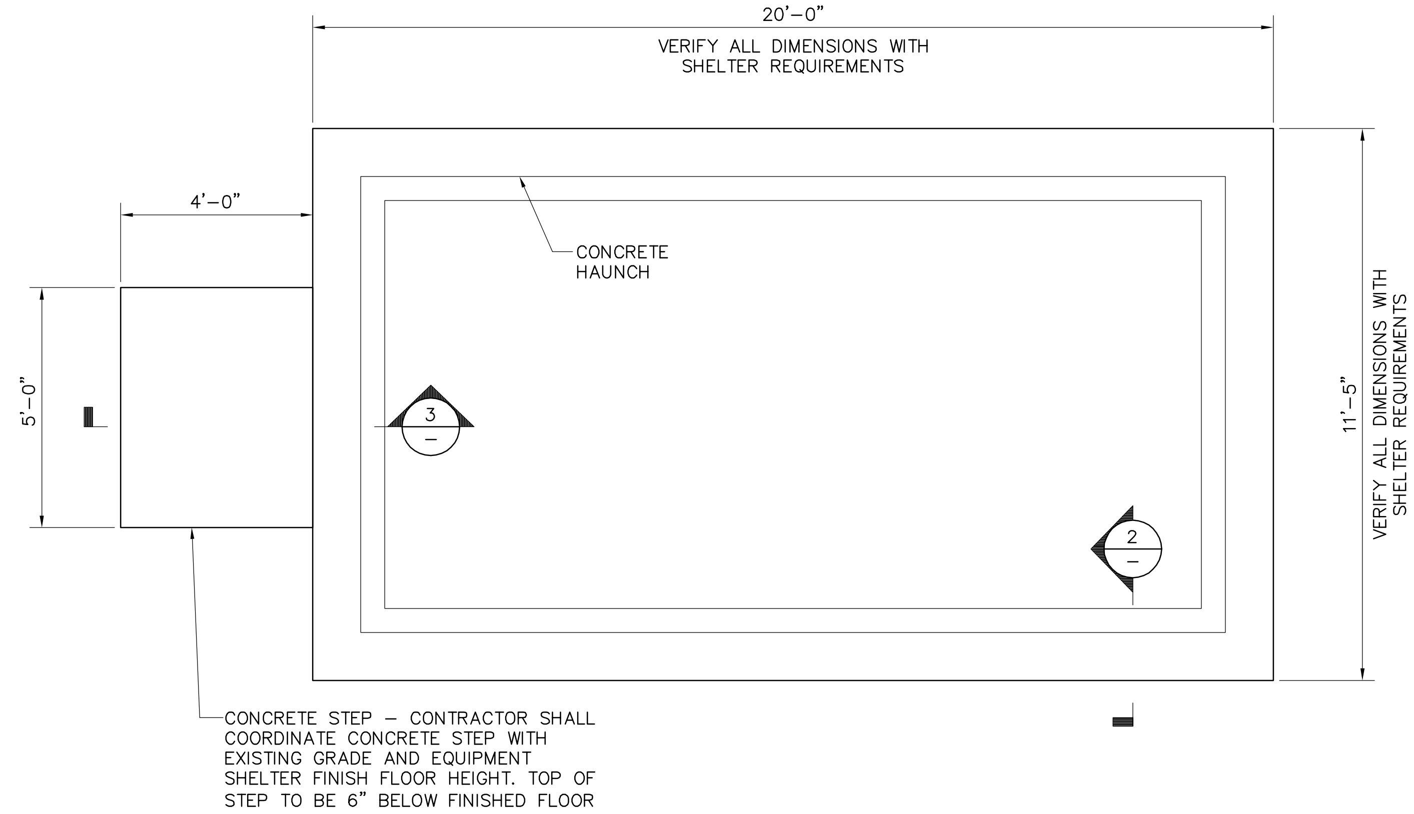
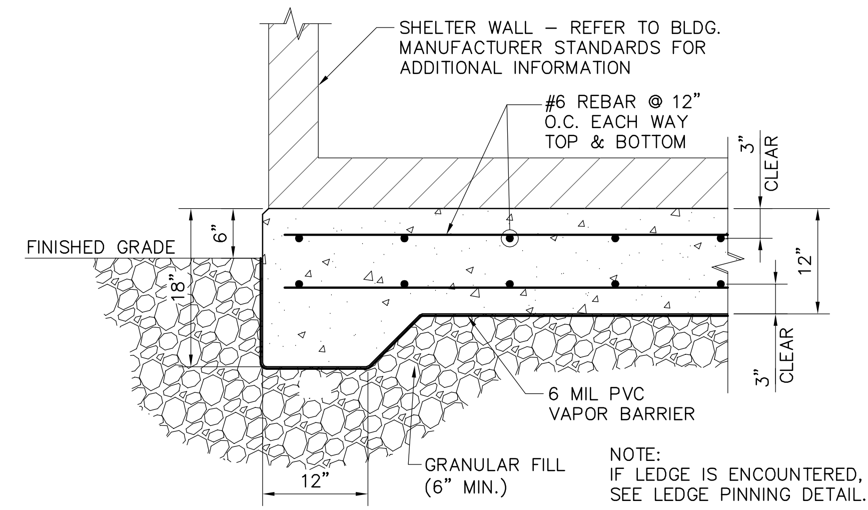
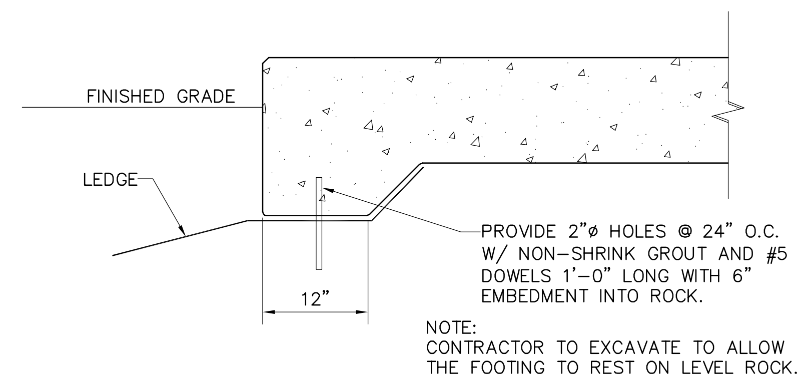



1 – FOUNDATION PLAN
NO SCALE

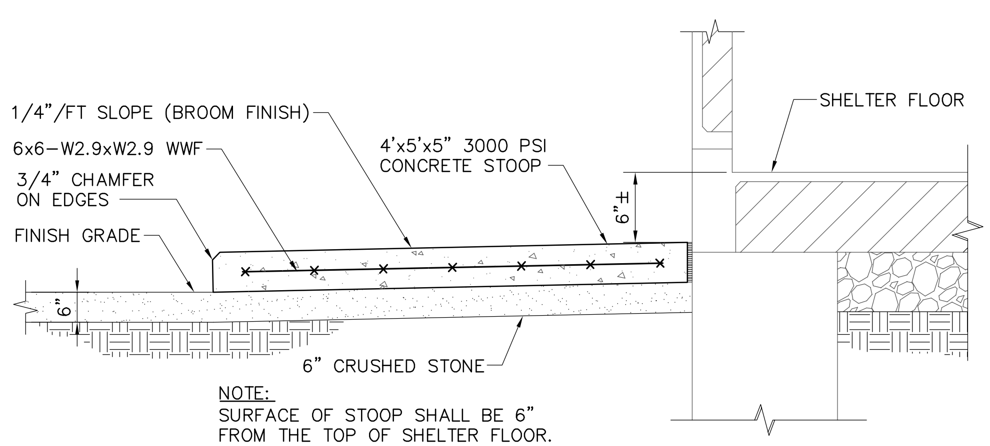



PAD FOUNDATION SECTION

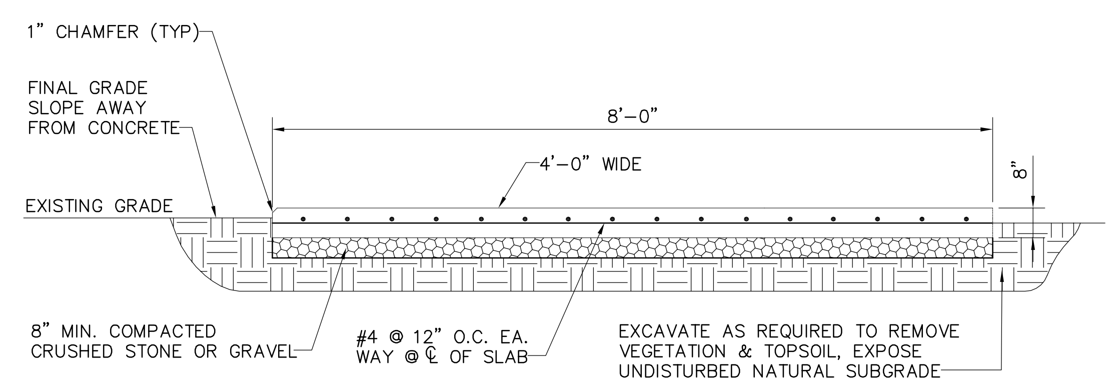



PAD LEDGE PINNING DETAIL

2 – PAD FOUNDATION




3 – CONCRETE STOOP




4 – GENERATOR PAD DETAIL
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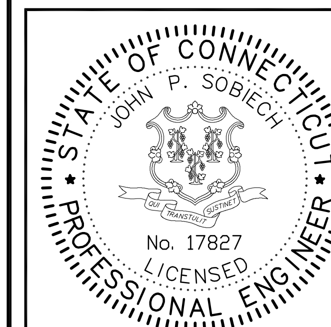


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## GENERAL NOTES

1. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
2. DO NOT CHANGE SIZE NOR SPACING OF STRUCTURAL ELEMENTS.
3. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
4. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
5. BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
6. DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
7. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE APPROVAL.
8. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
9. CONTRACTOR TO FOLLOW ALL STATE, LOCAL AND NATIONAL CODES AS APPLICABLE.

## DESIGN DATA

LIVE LOADS: PER INTERNATIONAL BUILDING CODE
WIND LOADS: PER INTERNATIONAL BUILDING CODE & TIA/EIA-222-F
ICE LOADS: 1/2" RADIAL ON ALL COMPONENTS & CABLE
SNOW LOAD: PER INTERNATIONAL BUILDING CODE
SEISMIC LOADS: PER INTERNATIONAL BUILDING CODE

## ANTENNA SUPPORT BRACKET NOTES

1. DESIGN RESPONSIBILITY OF ANTENNA MOUNTING BRACKETS AND POLES AND ALL COMPONENTS THERE OF AND ATTACHMENT THERE TO SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER. MFR. SHALL PROVIDE TO THE ENGINEER FOR APPROVAL, DRAWINGS DETAILING ALL COMPONENTS OF THE ASSEMBLY, INCLUDING CONNECTIONS, DESIGN LOADS, AND ALL OTHER PERTINENT DATA. ALL SUBMISSIONS SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE THE WORK IS BEING PERFORMED.
2. BRACKETS SHALL BE DESIGNED TO SUPPORT CURRENT AND FUTURE PANEL ANTENNAS AND COAXIAL CABLES AS SHOWN.

## STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. ALL INTERIOR STRUCTURAL STEEL USED SHALL BE, WHEN DELIVERED, FINISHED WITH ONE COAT FABRICATOR'S NON-LEAD, RED OXIDE PRIMER. PRIMING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE PRIMED AREAS SHALL BE REPAIRED BY FIELD TOUCHUP PRIOR TO COMPLETION OF THE WORK.
3. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123 UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED BY FIELD TOUCHUP PRIOR TO COMPLETION OF THE WORK USING ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL.
4. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
5. CONNECTIONS:
   A. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION ", 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
   B. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
   C. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
   D. CONNECTION DESIGN BY FABRICATOR WILL BE SUBJECT TO REVIEW AND APPROVAL BY ENGINEER.
   E. ALL BOLTED CONNECTIONS SHALL HAVE A FLAT WASHER & NUT TIGHTENED TO AISC "SNUGTIGHT" CRITERIA, UNLESS NOTED OTHERWISE.

## STRUCTURAL STEEL NOTES (CONT.)

6. STRUCTURAL STEEL GRATING SHALL BE 1 1/2" X 3/16" GALVANIZED STEEL BAR GRATING (IKG BORDEN TYPE-WB OR EQUAL) ATTACHED @ 1'-6" o.c. WITH GRATING CLAMPS, UNLESS OTHERWISE NOTED.
7. NEW STRUCTURAL STEEL LOCATED WITHIN A BUILDING OR ENCLOSURE SHALL BE FIRERATED PER LOCAL CODE.
8. REINFORCING BARS: ASTM A625, GRADE 60 DEFORMED BARS.
9. WELDED WIRE MESH: TO ASTM A185. PROVIDE IN FLAT SHEETS ONLY. VERTICAL PLACEMENT TOLERANCE TO BE 3/8 INCH.
10. THE CONTRACTOR SHALL FABRICATE ALL REINFORCEMENT AND FURNISH ALL ACCESSORIES, BOLSTERS, CHAIRS, SPACER BARS AND SUPPORTS NECESSARY TO SECURE THE REINFORCEMENT UNLESS INDICATED OTHERWISE.
11. IN SLABS WHERE REINFORCING IS SHOWN IN ONE DIRECTION ONLY, PROVIDE INDICATED TEMPERATURE REINFORCEMENT AT 90 DEGREES TO PRINCIPAL REINFORCEMENT.
12. LAP SPLICES:

    a) CONCRETE: PROVIDE CLASS B TENSION LAP SPLICES U.N.O.

    b) WELDED WIRE MESH: MINIMUM LAP 8 INCHES, MEASURED BETWEEN OUTERMOST CROSS-WIRES OF EACH SHEET.

## CONCRETE NOTES

1. DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING APPLICABLE CODES: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"; ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
2. MIX DESIGN SHALL BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO PLACING CONCRETE. PREPARE AND SUBMIT MIX DESIGNS FOR EACH TYPE AND STRENGTH OF CONCRETE IN ACCORDANCE WITH ACI 211, "PROPORTIONING CONCRETE MIXTURES, AND ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
3. CONCRETE (EXCEPT TREMIE MIX) SHALL BE NORMAL WEIGHT, 6% AIR ENTRAINED (±1.5%) WITH A MAXIMUM 4" SLUMP, AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI UNLESS OTHERWISE NOTED.
4. MAXIMUM AGGREGATE SIZE SHALL BE 3/4".
5. THE FOLLOWING MATERIALS SHALL BE USED:

| | |
|---|---|
| PORTLAND CEMENT: | ASTM C 150, TYPE I |
| REINFORCEMENT: | ASTM A 615, GRADE 60 |
| NORMAL WEIGHT AGGREGATE: | ASTM C 33 |
| WATER: | POTABLE |
| ADMIXTURES: | NON-CHLORIDE CONTAINING |

6. REINFORCING DETAILS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 315.
7. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
8. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH........3 IN.

   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER ..................................2 IN.
   #5 AND SMALLER & WWF ...................1 1/2 IN.

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .................................3/4 IN.
   BEAMS AND COLUMNS ........................1 1/2 IN.
9. A CHAMFER 1" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
10. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR SHALL BE PER MANUFACTURES WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE.
11. CURING COMPOUNDS SHALL CONFORM TO ASTM C-309.
12. ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN ACI-301.
13. DO NOT WELD OR TACKWELD REINFORCING STEEL.
14. ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.

## CONCRETE NOTES (CONT.)

15. LOCATE ADDITIONAL CONSTRUCTION JOINTS REQUIRED TO FACILITATE CONSTRUCTION AS ACCEPTABLE TO ENGINEER. PLACE REINFORCEMENT CONTINUOUSLY THROUGH JOINT.
16. REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
17. PLACE CONCRETE IN A UNIFORM MANNER TO PREVENT THE FORMATION OF COLD JOINTS AND OTHER PLANES OF WEAKNESS. VIBRATE THE CONCRETE TO FULLY EMBED REINFORCING. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE THROUGH CHUTES OR FORMWORK.
18. DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
19. DO NOT ALLOW CONCRETE SUBBASE TO FREEZE DURING CONCRETE CURING AND SETTING PERIOD, OR FOR A MINIMUM OF 14 DAYS AFTER PLACEMENT.
20. FOR COLD-WEATHER AND HOT-WEATHER CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS. IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC. SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS MINIMUM.
21. READY-MIX CONCRETE SUPPLIERS TO BE NRMCA-CERTIFIED.
22. NO ADDITIONAL WATER SHALL BE ADDED TO THE CONCRETE AT THE JOB SITE.
23. HOT WEATHER CONCRETE: COMPLY WITH ACI 305R.
24. NO PLASTIZISOR TO BE USED IN TREMIE MIX.

## EXCAVATIONS/FOUNDATION

1. FOUNDATION EXCAVATION SHALL BE HAND-TRIMMED TO REMOVE LOOSE MATERIALS.
2. DO NOT PLACE FOOTINGS IN WATER OR ON FROZEN GROUND.
3. SOIL BEARING SURFACES, PREVIOUSLY ACCEPTED BY GEOTECHNICAL ENGINEER, WHICH ARE ALLOWED TO BECOME SATURATED, FROZEN OR DISTURBED SHALL BE REWORKED TO SATISFACTION OF GEOTECHNICAL ENGINEER.
4. DO NOT ALLOW GROUND BENEATH FOOTINGS TO FREEZE.
5. ALL STRUCTURAL BACKFILL AND SUBBASE UNDER SLABS SHALL BE SELECT STRUCTURAL FILL MEETING THE GRADATION AND SOUNDNESS REQUIREMENTS IN ACCORDANCE WITH THE FOLLOWING GRADATION:
   A. GRADATION. THE MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

| SEIVE SIZE | PERCENT PASSING BY WEIGHT |
|---|---|
| 4 INCH | 100 |
| NO. 40 | 0 TO 70 |
| NO. 200 | 0 TO 15 |

   B. MATERIALS SHALL BE SUBSTANTIALLY FREE OF SHALE OR OTHER SOFT, POOR DURABILITY PARTICLES. IF TESTING IS ELECTED BY OWNER, MATERIAL WITH A MAGNESIUM SULFATE SOUNDNESS LOSS EXCEEDING 30% WILL BE REJECTED.
6. COMPACT TO 95% STANDARD PROCTOR DENSITY PER ASTM D-698.
7. SUBGRADE BELOW SLAB-ON-GRADE SHALL BE REVIEWED AND ACCEPTED BY GEOTECHNICAL ENGINEER BEFORE CONCRETE SLAB PLACEMENT.
8. ALL LOOSE AND/OR ORGANIC MATERIAL SHALL BE REMOVED PRIOR TO PREPARATION OF THE AREA FOR PLACEMENT OF STRUCTURAL BACKFILL. OVERALL PLAN AREA OF WORK SHALL EXTEND 3'-0" MINIMUM BEYOND THE FINAL DIMENSIONS.
9. SCARIFY THE EXISTING SOILS TO A DEPTH OF 6" AND RE-COMPACT USING A PLATE TAMPER. ANY SOFT AREAS SHALL BE OVEREXCAVATED 12" AND BACKFILLED WITH MATERIALS AND COMPACTION REQUIREMENTS SHOWN ON THE DRAWINGS.
10. PLACEMENT AND COMPACTION OF STRUCTURAL BACKFILL AND SUBBASE SHALL BE DONE IN 8" LIFTS. EXCAVATE FOR THE FOOTING EDGE AS SHOWN ON THE DRAWINGS.
11. CONTRACTOR TO GRADE SITE LEVEL WITH EXISTING, TWO FEET BEYOND PROPOSED EQUIPMENT PAD FOOTPRINT, THEN TAPER TO EXISTING GRADE IF REQUIRED AT A MAXIMUM OF 3:1 SLOPE.

## DESIGN NOTES

| | |
|---|---|
| MATERIALS: | |
| STRUCTURAL STEEL | A572 GRADE 50 |
| ANGLES AND PLATES | A36 |
| RECTANGULAR STRUCTURAL TUBING | A500 GRADE B (46 KSI) |
| STANDARD PIPE | A501 OR A53 GRADE B |
| HIGH STRENGTH BOLTS | A325 N OR SC CLASS A |
| ANCHOR BOLTS | A307 |
| WELDING ELECTRODES | E70XX |
| CONCRETE (28 DAYS): | |
| FOOTINGS | 4000 PSI |
| SLAB-ON-GRADE | 4000 PSI |
| ALL OTHER CONCRETE | 3000 PSI |
| REINFORCING STEEL | A615 GRADE GO |
| WELDED WIRE FABRIC | A185 |
| HEADED STUDS | A108 |

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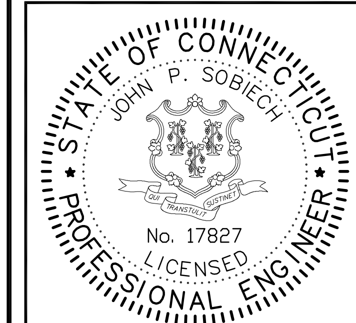


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