CONSTRUCTION – PHASE 2

NEW CENTER FOR EMERGENCY SERVICES
25 ROCKY HOLLOW ROAD
NORTH STONINGTON, CT 06359

S/P+A PROJECT NO. 13.220

DATE: February 23, 2017

The following changes to the Drawings and Project Specifications shall become a part of the Drawings and Project Specifications; superseding previously issued Drawings and Project Specifications to the extent modified by Addendum No. 1.

General Information:

- The prebid sign-in sheet is attached for reference. (2)
- See attached RFIs. (1)
- See attached Substitution Requests. (2)
- The estimated construction budget for this project is $4,200,000.00.
- The size of the Drawings previously uploaded on the Town's website have been corrected.
- Contractor is responsible for checking the Owner's website for any and all addenda that are issued.
- Contractor is responsible for coordinating all local, state and federal requirements, where federal will take precedence unless otherwise noted.
- Contractor is responsible for providing the foundation, reinforcement, grounding, conduit, and all associated components for the Tower. The Tower itself is by others. Contractor is responsible for coordinating the position of the final anchor bolts before the concrete is poured. Note that the location of the Tower on the Drawings is approximate and may vary by 20 feet in either direction.

New Specifications:

- TOWER FOUNDATION STRUCTURAL CALCULATION PACKAGE has been added and is attached as part of this addendum. (9)

Changes to the Specifications:

- TABLE OF CONTENTS:
    - Page 2, Division 7 – Thermal and Moisture Protection, Section 072726, delete in its entirety.
    - Page 6, Division 32 – Exterior Improvements, add the following:

      "Tower Foundation Structural Calculation Package 9"

- AIA DOCUMENT A101-2007, STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, Page 5, Article 8.3, and Page 7, delete "Nicholas H. Mullane, II" in their entirety.

- SECTION 072726, FLUID-APPLIED MEMBRANE AIR BARRIERS, delete in its entirety.

New Drawings:

- The following CIVIL drawings (2) have been added and are attached as part of this addendum.^

  - SSK-1, FOUNDATION & DETAILS (TOWER)
  - ESK-1, SCHEMATIC & NOTES (TOWER)

- The following ARCHITECTURAL sketches (2) have been added and are attached as part of this addendum.

  - SKA1A, ADDENDUM #1 – DETAIL AT STONE BASE. This sketch revises Detail B on Drawing A9.0.
  - SKA1B, ADDENDUM #1 – STONE BASE DTL – END WALL. This sketch revises Detail C on Drawing A9.0.

Changes to the Drawings:

- DRAWING A9.0, PARTITION TYPES & ENLARGED DETAILS:

  - Stone Base/Impact Wall Detail – Apparatus Bay End Wall D, delete "5/8" exterior grade plywood sheathing" in its entirety and add "Two (2) layers" in front of "1/2" cement board…".
  - Add "Type 3C, STC Rating: 45 Minimum".

The bid date remains unchanged by this addendum.
The addendum consists of sixteen (16) pages of 8½" x 11" text, two (2) 8½" x 11" drawings and two (2) 11" x 17" drawings^.
End of Addendum '1'

North Stonington Emergency Services Building

Pre-Bid Walk-Thru - 2/21/17

Name	Company Representing	Phone	Email Address
Scott Wolynec	Lupachino Salvatore	860-243-1751	Swolynec@Lupsal.com
Dustin Dwyer	EJ Prescott	860-830-1328	Dustin.Dwyer@EJPrescott.com
Patrick Ptak	La Rosa Building Group	203-235-1770	pptak@larosabg.com
Roel Legaspi	Nosal Builders Inc	2034399320	roel@nosalbuilders.com
Mike Godino	Suchocki & Son	860-373-4333	mike.godince gmail.com
Mario DiNoto	Munger	2034833645	MD.Noto@mungerconstruction.com
Craig Sikora	Banton Construction	(203)619-3742	CSikora@bantonconstruction.com
Jeff Andruskiewicz	Nutmeg Companies	860-823-1780	BIDS@NUTMEGCOMPANIES.com
Ed D'Amato	D'Amato	860 5833489	EDamato@damatoconstruction.com
Randolph Netsch	Rudolph Netsch Const	860-526-9246	netschconst@snet.net
Michael Kirozik	Munger Construction	203-483-3645	MKirozik@mungerconstruction.com
Jon Adams	Annulli & Sons	860,644,2427	Jon@Annulli.com
Rick Eberl	Zlotnick Const	860-456-3221	REberl@zcinc.com
Craig Gilmour	G. Donovan Assoc.	860-642-0700	craig@gdonovan.com
Mike Knowles	7 Summits construction	860-471-0992	MKnowles@7summits.com

North Stonington Emergency Services Building			
Pre-Bid Walk-Thru - 2/21/17			
Name	**Company Representing**	**Phone**	**Email Address**
Shawn Murphy	Town of North Stonington	860-535-2877	Smurphy@northstoningtonct.gov
Bob Saunders	CREC	860-706-9859	rsaunders@crec.org
Michael Faenza	CREC	860-539-1946	mfaenza@crec.org
David Stein	Silver/Petrucelli + Assoc.	203-230-9007	dstein@silverpetrucelli.com

RFI #1

Rebecca Bouchard

From: Rebecca Bouchard
Sent: Thursday, February 23, 2017 1:35 PM
To: 'dan@totalinteriorsllc.com'
Subject: RE: RFI: North Stonington

Good afternoon Dan.
Please see response your RFI in 'red' below.
Thank you and good luck.

Rebecca Bouchard, CSI, CDT
Specifications Writer

CELEBRATING 25 years 1991 - 2016
SILVER/PETRUCELLI+ASSOCIATES
Architects / Engineers / Interior Designers

3190 Whitney Avenue Bldg 2 | Hamden, CT 06518 | silverpetrucelli.com | P: 203.230.9007 x202 | F: 203.230.8247

From: Brian Varano
Sent: Wednesday, February 22, 2017 10:47 AM
To: Dave Stein <dstein@silverpetrucelli.com>
Cc: Rebecca Bouchard <rbouchard@silverpetrucelli.com>
Subject: RE: RFI: North Stonington

Wall type 3C is simply 1 layer of 5/8" gyp board each side of 6" metal stud framing. Not rated.

From: Dave Stein
Sent: Wednesday, February 22, 2017 10:35 AM
To: Rebecca Bouchard <rbouchard@silverpetrucelli.com>; Brian Varano <bvarano@silverpetrucelli.com>
Subject: Fwd: RFI: North Stonington

From: Dan Smith <dan@totalinteriorsllc.com>
Sent: Wednesday, February 22, 2017 10:17:47 AM
To: Dave Stein
Subject: RFI: North Stonington

Dave,
Can you please provide clarification on the following RFI.
Per A 7.1 bottom wall of Laundry/Janitor room is labeled Type 3C. This wall type is not included on A9.0. I need clarification on what materials are included for this wall type.
Thanks,

Dan Smith
Project Manager
Total Interiors LLC
2290 Foxon Road

SR #1

SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: New Center for Emergency Services Phase 2 - Construction
25 Rocky Hollow Rd., North Stonington, CT 06359

Substitution Request Number:

From: Saniflow Corp. / Attn: Melissa Aguiar

Date: 02/16/17

To: Silver/Petrucelli + Associates

A/E Project Number: 13.220

Re: Substitution/Equal

Contract For:

Specification Title: Toilet, Bath & Laundry Accessories

Description: Warm-air Dryer

Section: 2.5 Page: 576

Article/Paragraph: B

Proposed Substitution: Speedflow
Manufacturer: Saniflow Corp. Address: 3325 NW 70th Ave ., Miami FL, 33122 Phone: 305-424-2433 ext.2021
Trade Name: Saniflow, a Mediclinics Company Model No.: M06ACS

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Melissa Aguiar

Signed by:

Firm: Saniflow Corp

Address: 3325 NW 70th Ave ., Miami FL, 33122

Telephone: 305-424-2433 ext.2021

A/E's REVIEW AND ACTION

☒ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: R. Bouchard Date: 02.21.17

Supporting Data Attached: ☐ Drawings ☑ Product Data ☐ Samples ☐ Tests ☑ Reports ☐ _____

SPEEDFLOW M06

(M06A, M06AF, M06AB, M06AC, M06ACS)

High-speed, energy-efficient, adjustable RPM, ADA compliant. Same warranty as competitor.

saniflow
a mediclinics company

dyson airblade

Comparison	Speedflow (M06ACS-UL)	V Model (AB12)
Electrical	100-120V, 208V, 220-240V	110-120V
Air Velocity	9,840 LFM	36,900 LFM
Power	1.080 - 1.150 W	1.400W
Motor type	1/3 HP Universal brush motor running at adjustable rpm (8,500 - 11,000 rpm)	V4 brushless DC motor, 92,000 rpm
Heater	Waved wire NiCr heating element includes safety thermal cut-off at 320ºF	None
Heating element (W)	900W	None
Standby power consumption (W)	1 W	0.5 W
Construction materials	Stainless Steel, Cast iron, Steel Cover	Polycarbonate casing
Air temperature (at 70F ambient)	108 ºF	104 ºF
Color finish	5 finishes: Stainless steel one-piece cover bright & satin finish, white epoxy or black graphite white porcelain in Cast iron.	AB12 Sprayed nickel (Silver) White molded plastic (White)
Dimensions	11-1/2" x 10-1/2" x 4"	9-1/4" x 15-1/2" x 4"
Operation	Touch free sensor. Auto 2 second shutoff after hands are removed	Touch free sensor. Auto 2 second shutoff after hands are removed
Price Comparison (List Price)	$560.00 (25% savings)	$749.00
Weight	8.4 Lbs (15.65 lbs Cast iron M06AF)	6.17 lbs
Safety shut off	Automatic disconnection after 60 seconds of continuous use.	Automatic disconnection after 30 seconds of continuous use.
Drying time	Approx.10-15 seconds	Approx.12-15 seconds
Limited Warranty	5 years	5 years
Noise Level	58-67 dBA	85 dBA
Sensor	Adjustable 2”-8” infrared	Proximity capacitive sensor
BuildingGreen Approved	✓	
ADA surfaced mounted	✓	✓

The Speedflow M06 is the perfect high speed ADA surfaced mounted dryer for all applications, ideal for the specifier due to its adjustable speed/noise level. Improved drying times, exceptional efficiency and versatility.
The Speedflow M06 “blows” the competition away.

CENTEK engineering

Centered on Solutions℠

Project

New Center for Emergency Services Tower Foundation
Structural Calculation Package

Town of North Stonington

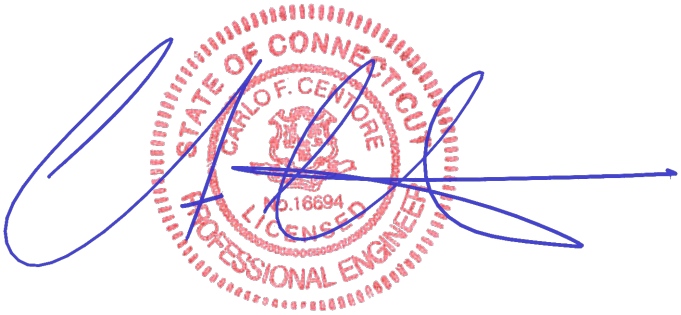
25 Rocky Hollow Road
North Stonington, CT 06359

Centek Project No. 17021.00

Prepared For

David Moffat
Tactical Communications, Inc.

29 Soundview Road
Guilford, CT 06437
T: 203.453.2389
F:203.458.9247
www.taccomm.com



Prepared By

Centek Engineering, Inc.

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Rev 0 ~ February 8, 2017

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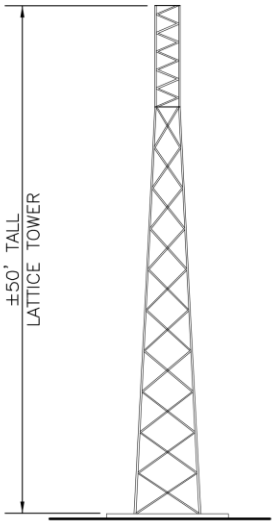
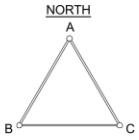
TACTICAL COMMUNICATIONS - TOWER DESIGN CRITERIA



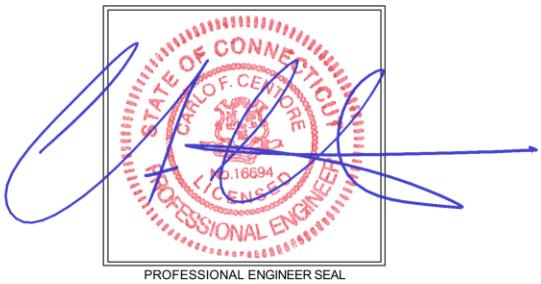
TOWER ELEVATION
SCALE: 1" = 15'



TOWER SECTION
SCALE: 1" = 10'

ANTENNA SCHEDULE

Antenna Mounting EL.	Leg	Antenna Make/Model	TX Line	Mount	Assigned Use
47	B	(1) 20' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	AMB VHF REPEATER
47	A	(1) 20' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	33.92MHz BASE STATION
47	C	(1) 20' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	FD VHF Repeater
30	C	(1) 25" x 18" SIREN	(1) 1/2" POWER LINE	ROHN 6' SIDE ARM	SIREN
22	B	(1) 8' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	AMBULANCE CONTROL STATION
22	A	(1) 8' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	SCANNER ANTENNA
22	C	(1) 8' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	FIRE DISPATCH CONTROL STATION
7	C	(1) 8' x 3" DIA. OMNI WHIP	(1) 7/8" COAX LINE	ROHN 6' SIDE ARM	FIRE DISPATCH STATION ALERT



PROFESSIONAL ENGINEER SEAL

TOWER COORDINATES AND GROUND ELEVATION

LATITUDE: 41°-26'-14.992"
LONGITUDE: 71°-52'-45.400"
PROPOSED GND ELEVATION: 195.2'± A.M.S.L.

CODE REFERENCES AND DESIGN CRITERIA

TIA-222-G-1996:

DESIGN WINDSPEED: 105 MPH (3 SEC. GUST)
50 MPH CONCURRENT WITH 3/4" RADIAL ICE (3 SEC. GUST)

ESSENTIAL STRUCTURES CRITERIA:
VER. "G" - CLASS III STRUCTURE, TOPOGRAPHIC CATEGORY 1, EXPOSURE CATEGORY C.

REFERENCE MATERIALS

GEOTECHNICAL EVALUATION:
GEOTECHNICAL ENGINEERING REPORT PREPARED BY CLARENCE WELTI ASSOC., INC., P/N: CENTER FOR EMERGENCY SERVICES, DATED NOVEMBER 4, 2014.

ANTENNA RADIO PLAN:
SEE ANTENNA SCHEDULE ON THIS SHEET. REFER TO PROPOSED TOWER ELEVATIONS PROVIDED BY TACTICAL COMMUNCATIONS, DATED 11/07/2016 FOR EQUIPMENT LOADING.

FOUNDATION DESIGN CRITERIA

FOUNDATION AND DETAILS:
REFER TO DRAWINGS SSK-1 & SKK-2 PREPARED BY CENTEK ENGINEERING, INC., P/N: 17021.00, DATED FEBRUARY 8, 2017.

REVISIONS		
0	02/08/17	TC USE FOR TOWER ORDERING

CENTEK engineering
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63-2 North Branford Road, Branford, CT 06405

NEW CENTER FOR EMERGENCY SERVICES TOWER FOUNDATION
25 ROCKY HOLLOW ROAD
NORTH STONINGTON, CT 06359

PROJECT NO:	17021.00
DRAWN BY:	CTP
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	02/08/17

TACTICAL COMMUNICATIONS

TC-1
DWG. 1 OF 1

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION ANALYSIS
Location:	50-ft ROHN Lattice Tower North Stonington, CT
Rev. 0: 2/7/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17021.00

Mat Foundation Analysis:

Refer to Town of North Stonington - New Center for Emergency Services Tower Foundation Design Drawings prepared by this office dated 2.8.17

Input Data:

Tower Data

Overturning Moment =	$OM := 176 \cdot 1.1 \cdot ft \cdot kips = 194 \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 6 \cdot kip \cdot 1.1 = 6.6 \cdot kips$	(User Input from tnxTower)	
Axial Force =	$WT_t := 3 \cdot kip \cdot 1.1 = 3.3 \cdot kips$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 32 \cdot kip \cdot 1.1 = 35.2 \cdot kips$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 29 \cdot kip \cdot 1.1 = 31.9 \cdot kips$	(User Input from tnxTower)	
Tower Height =	$H_t := 50 \cdot ft$	(User Input)	
Tower Width =	$W_t := 6.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 4 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 4.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 12 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_u := 12000 \cdot psf$		
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: FOUNDATION ANALYSIS

Location: 50-ft ROHN Lattice Tower
North Stonington, CT

Rev. 0: 2/7/17 Prepared by: T.J.L. Checked by: C.F.C.
Job No. 17021.00

Pier Reinforcement:

Bar Size =	$BS_{pier} := 0$	(User Input)	
Bar Diameter =	$d_{bpier} := 0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 0$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 3 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.00 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 14$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 0$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.0 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 14$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.785 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := 1 = 1$

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION ANALYSIS
Location:	50-ft ROHN Lattice Tower North Stonington, CT
Rev. 0: 2/7/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17021.00

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 100 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = -0.15 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.2 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.6 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 4$

$A_p := W_f \cdot T_p = 48$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 28.8 \cdot kip$

Weight of Concrete Pad = $WT_{pad} := \left(W_f^2 \cdot T_f\right) \cdot \gamma_c = 97.2 \cdot kip$

Weight of Concrete Piers = $WT_{pier} := 3 \cdot \left[\left(L_p \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot \gamma_c\right] = 0 \cdot kip$

Total Weight of Concrete = $WT_c := WT_{pad} + WT_{pier} = 97 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left(W_f^2 - 3 \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot (L_p - L_{pag}) \cdot \gamma_s = 0 \cdot kip$

Weight of Soil Back Face = $WT_{s2} := \left[\frac{\tan(\Phi_s) \cdot (D_f)^2}{2} \cdot W_f\right] \cdot \gamma_s = 6 \cdot kip$

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t, X_{t1}, X_{t2}) = 3.185$

$X_{off} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 0.938$

Resisting Moment = $M_r := (0.9 \cdot WT_c + 0.75 \cdot WT_{s1}) \cdot \frac{W_f}{2} + 0.75 \cdot S_u \cdot \frac{T_f}{3} + 0.75 \cdot WT_{s2} \cdot \left[W_f + \frac{\tan(\Phi_s) \cdot (L_p - L_{pag})}{3}\right] = 607 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 223.3 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.72$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION ANALYSIS
Location:	50-ft ROHN Lattice Tower North Stonington, CT
Rev. 0: 2/7/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17021.00

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 101 \cdot kip$

Area of the Mat = $A_{mat} := W_f^{\,2} = 144$

Section Modulus of Mat = $S := \frac{W_f^{\,3}}{6} = 288 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.473 \cdot ksf$

$Max\_Pressure\_Check := if\left(P_{max} < 0.75 \cdot q_u, "Okay", "No\ Good"\right)$

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.077 \cdot ksf$

$Min\_Pressure\_Check := if\left[\left(P_{min} \geq 0\right) \cdot \left(P_{min} < 0.75 \cdot q_u\right), "Okay", "No\ Good"\right]$

$Min\_Pressure\_Check = "No\ Good"$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 3.8$

Distance to Kern = $X_k := \frac{W_f}{6} = 2$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 2.222$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 1.478 \cdot ksf$

$q_{adj} := if\left(P_{min} < 0, P_a, P_{max}\right) = 1.478 \cdot ksf$

$Pressure\_Check := if\left(q_{adj} < 0.75 \cdot q_u, "Okay", "No\ Good"\right)$

$Pressure\_Check = "Okay"$

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Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

Design Moment = $M_n := \frac{M_{ot}}{\phi_m} = 248.11 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 \text{ if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 \text{ if } f_c > 8000 \cdot psi \\ \left[\left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right]\right] \text{ otherwise} \end{cases} = 0.85$$ (ACI-200810.2.7.3)

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 67.55 \cdot in$

$d := T_f - Cvr_{pad} - d_{bbot} = 50 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 0.992 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 0.259 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 0.995 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.00029$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 \text{ if } f_y \ge 60000 \cdot psi \\ .0020 \text{ otherwise} \end{cases} = 0.0018$$ (ACI -2008 7.12.2.1)

Check Bottom Bars:

$$As := \begin{cases} \left(\rho \cdot b_{eff} d\right) \text{ if } \left(\rho \cdot b_{eff} d\right) > \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d \\ \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d \text{ otherwise} \end{cases} = 3.04 \cdot in^2$$

$As_{prov} := A_{bbot} \cdot NB_{bot} = 11 \cdot in^2$

$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, "Okay", "No Good"\right)$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$As := if\left(\rho \ge \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 3 \cdot in^2$

$As_{prov} := A_{btop} \cdot NB_{top} = 11 \cdot in^2$

$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, "Okay", "No Good"\right)$

Pad_Reinforcement_Top = "Okay"

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Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 9.54 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$$k_{tr} := 0 \qquad \text{(ACI-2008 12.2.3)}$$

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 23.7 \cdot in$$

Minimum Development Length =

$$L_{dbmin} := 12 \cdot in \qquad \text{(ACI-2008 12.2.1)}$$

$$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, \text{"Use L.dbt"}, \text{"Use L.dbmin"}\right) = \text{"Use L.dbt"}$$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 30 \cdot in$$

$$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$$

$Lpad\_Check = \text{"Okay"}$

STRUCTURAL SPECIFICATIONS

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH TIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
2. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURES AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
3. CONTRACTOR TO MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH OWNER.
4. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN THEIR WORKSCOPE AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDENCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
7. TOWER INSTALLATION SHALLL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.
8. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A MINIMUM SLOPE OF 1:1 FROM THE TOE OF THE EXISTING BUILDING FOOTING DURING ALL PHASES OF TOWER FOUNDATION WORK.

SITE NOTES

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

EARTHWORK NOTES

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

SIEVE DESIGNATION	% PASSING
3"	100
NO. 4	35-75
NO. 100	5-35
NO. 200	0-5

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

SIEVE DESIGNATION	% PASSING
1"	100
3/4"	90-100
1/2"	5-15
3/8"	0-5

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

FOUNDATION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREEOF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.
2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABRORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10 INCHES BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIX YARDS OF COMPACTED FILL BUT NOT LESS THAN ONE (1) PER LAYER, TO ENSURE COMPACTION TO 95% OF MAXIMUM DRY DENSITY.
3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.
4. WHERE GROUND WATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STBILIZE FOOTING SUBGRADE.
5. ALL FOOTINGS ARE TO REST ON FIRM SOIL. REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.
6. FOUNDATION WATERPROOFING AND DAMPPROOFING (WHERE APPLICABLE) SHALL COMPLY WITH BUILDING CODE REQUIREMENT UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

CONCRETE NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:
   - ACI 211 - STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE
   - ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS
   - ACI 302 - GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION
   - ACI 304 - RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE
   - ACI 306.1 STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING
   - ACI 318 - BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE
2. CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

FOUNDATION	4,000 PSI
ALL OTHER CONCRETE	3,000 PSI

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

SURFACES NOT EXPOSED TO EARTH OR WEATHER	1 1/2 INCHES
BOTTOM OF FOOTING	3 INCHES
BARS BONDED TO GROUNDING SYSTEM	3 INCHES

7. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
8. ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL STAGGERED. ADDITIONAL BARS AND SPECIAL BENDING DETAILS ARE REQUIRED AT INTERSECTING WALLS AND AT JOINTS. SUCH DETAILS SHALL COMPLY WITH ACI 315 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.
9. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
10. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1 % CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
11. UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.

DESIGN BASIS

GOVERNING CODE: 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY 2016 CONNECTICUT STATE BUILDING CODE (CSBC).

1. DESIGN CRITERIA:
   - WIND SPEED OF 105 MPH (NOMINAL) PER CSBC APPENDIX "N".
   - WIND SPEED OF 50 MPH (NOMINAL) CONCURRENT WITH 3/4" ICE PER TIA-222-G.
   - STRUCTURE CLASS: III
   - TOPOGRAPHIC CATEGORY: I
   - EXPOSURE CATEGORY: C
   - SEISMIC LOAD PER TIA-222-G
   - ALLOWABLE BEARING PRESSUE: 6,000 PSF (PER GEOTECHNICAL REPORT)

GENERAL NOTES

1. FOUNDATION DESIGN IS BASED ON TOWER DESIGN CRITERIA SHEET PREPARED BY CENTEK ENGINEERING, INC DATED 02/08/2017.
2. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT PREPARED BY DR. CLARENCE WELTI, P.E. DATED 11/07/2014.
3. THE TOWER FOUNDATION MUST BEAR ON A 6" MINIMUM LAYER OF 3/4" CRUSHED STONE AND COMPACTED WITH A HAND OPERATED VIBRATORY ROLLER WEIGHING A MINIMUM OF 1000 POUNDS. PERFORM 6 PASSES EACH DIRECTION PER LAYER.
4. BEARING SURFACE SHALL BE LEVEL, CLEANED OF ANY SOIL, LOOSE ROCK FRAGMENTS AND ANY UNSUITABLE BEARING MATERIAL. THE FINISHED BEARING SURFACE IS TO BE VERIFIED BY THE DESIGN ENGINEER FOR PRIOR TO PROCEEDING WITH FOUNDATION WORK.
5. REFER TO SECTION 110 OF THE CONNECTICUT STATE BUILDING CODE FOR INSPECTIONS REQUIREMENTS. ALL WORK SHALL BE SUBJECT TO INSPECTION SERVICES TO BE RETAINED BY THE OWNER/CONTRACTOR.

FOUNDATION DESIGN REACTIONS

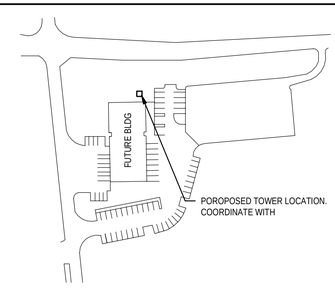
BASE REACTION TYPE	TIA-222-G	MAXIMUM BEARING PRESSURE
SHEAR (KIPS)	6.0	1,500 PSF
AXIAL (KIPS)	3.0	
BASE MOMENT (FT-KIPS)	176.0	

REBAR SCHEDULE

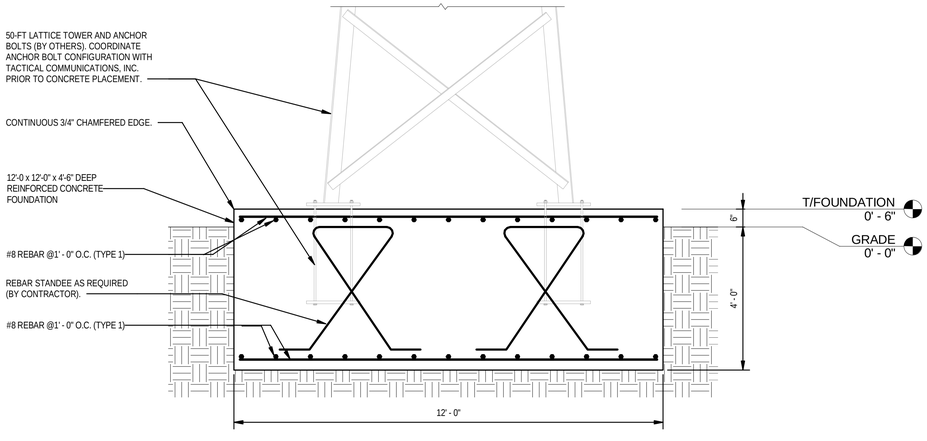
TYPE NUMBER	TYPE	QUANTITY	BAR LENGTH	SHAPE	SHAPE IMAGE	B
1	#8	52	11' - 8"	00	B	11' - 8"

CONCRETE SCHEDULE

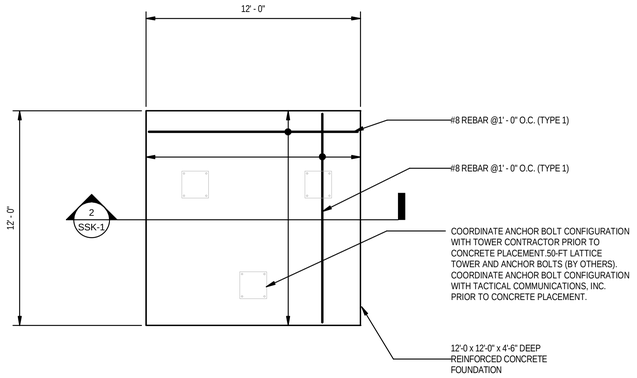
TYPE	STRUCTURAL MATERIAL	VOLUME
12'-0 x 12'-0" x 4'-6" DEEP REINFORCED CONCRETE FOUNDATION	Concrete, Normal Weight - 4 ksi	24.00 CY



SITE PLAN
SCALE: 1" = 160'-0"
NORTH



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



1 **PLAN - FOUNDATION REBAR LAYOUT**
SCALE: 1/4" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	02/08/2017	LVP	CFC	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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TOWN OF NORTH STONINGTON

NEW CENTER FOR EMERGENCY SERVICES TOWER FOUNDATION
25 ROCKY HOLLOW ROAD
NORTH STONINGTON, CONNECTICUT 06359

DATE:	02/08/2017
SCALE:	As indicated
JOB NO.	17021.00

FOUNDATION AND DETAILS

SSK-1

Sheet No. 1 of 2

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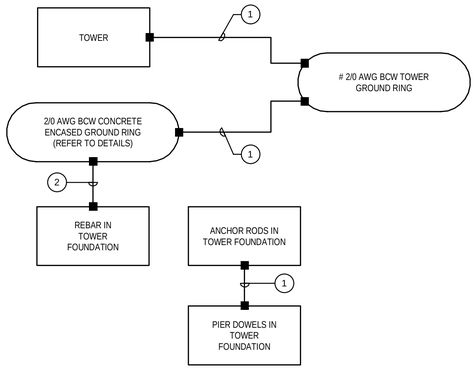
GROUNDING SCHEMATIC NOTES

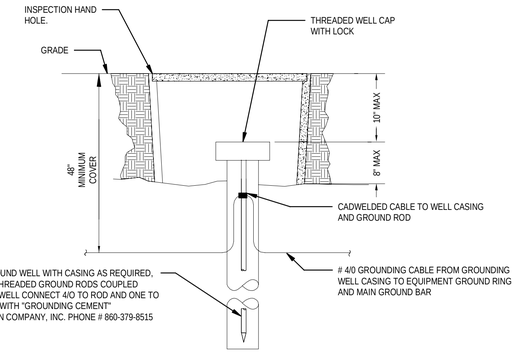
1. FOUR #2/0 GREEN INSULATED.
2. BOND WITH LISTED MECHANICAL CONNECTION.

GENERAL NOTES:

1. ALL CONDUCTORS SHOWN ARE TO #2/0 AWG STRANDED BARE COPPER WIRE.
2. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
3. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
4. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
5. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS.



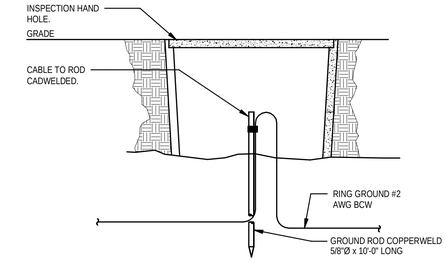
7 TOWER GROUNDING SCEMATIC RISER
SCALE: NONE



6 GROUNDING WELL DETAIL
SCALE: NONE

GROUNDING WELL NOTES:

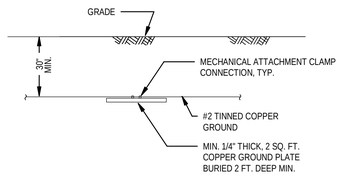
1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA X 18" DEEP.
2. TO BE INCORPORATED INTO PROJECT IF 5 OHMS CAN NOT BE ACHIEVED AT THE PROJECT SITE, PROVIDE COST TO OWNER AS REQUIRED.



5 GROUND ROD WITH ACCESS DETAIL
SCALE: NONE

GROUND ROD ACCESS NOTE:

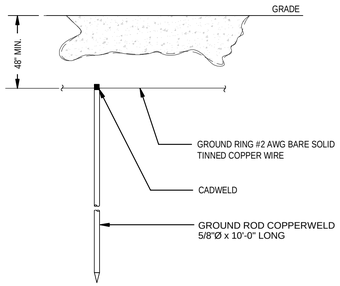
INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.



4 GROUND PLATE DETAIL
SCALE: NONE

GROUND PLATE NOTE:

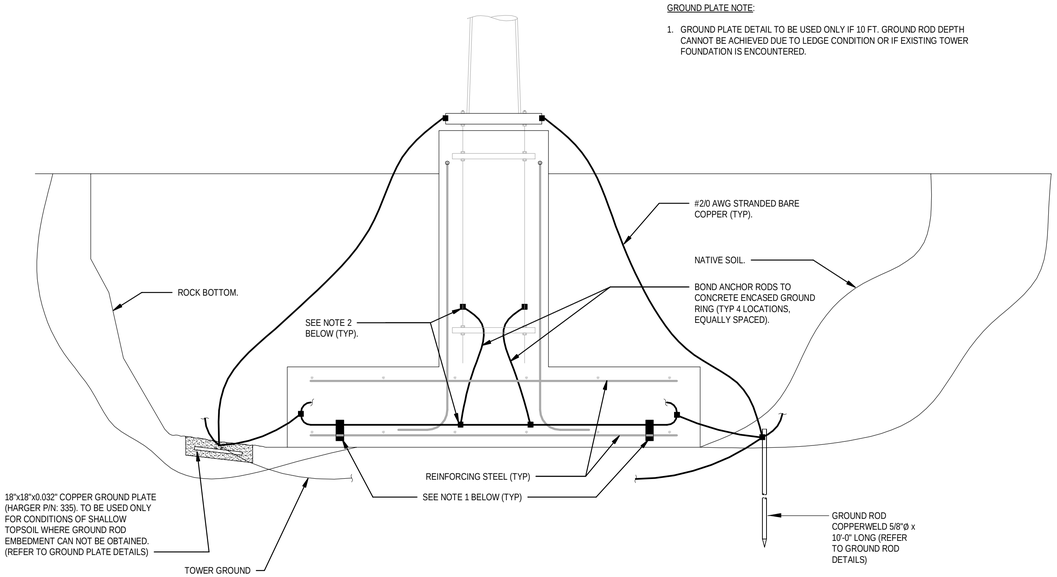
1. GROUND PLATE DETAIL TO BE USED ONLY IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.



3 GROUND ROD DETAIL
SCALE: NONE

GROUND ROD NOTE:

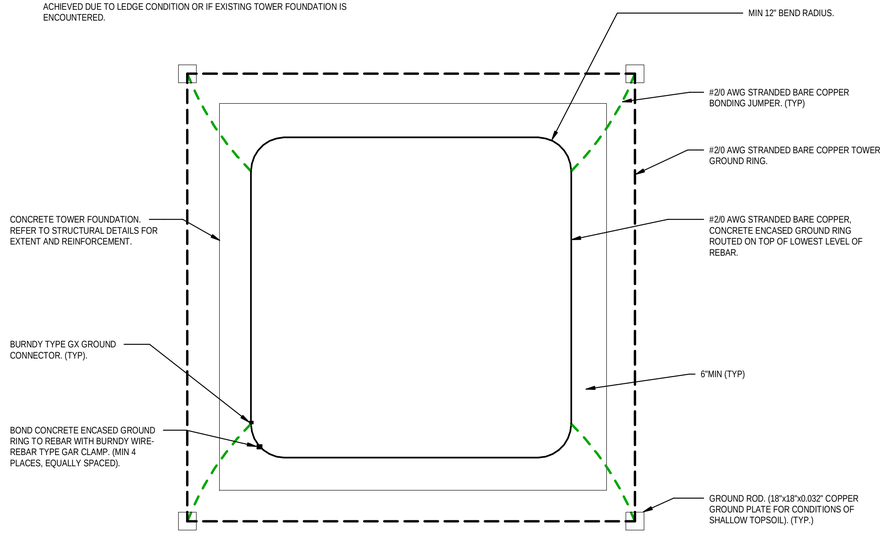
1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.



2 TOWER FOUNDATION GROUNDING DETAIL
SCALE: NONE

TOWER FOUNDATION GROUNDING NOTES:

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



1 CONCRETE ENCASED GROUND RING PLAN VIEW
SCALE: NONE

CELLULAR GROUNDING NOTES

OBJECTIVE

PROVIDE A GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND.

TESTING

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL. IF 5 OHM LIMIT IS EXCEEDED, CONTACT ENGINEER FOR ADDITIONAL INSTRUCTIONS TO ACHIEVE 5 OHMS OR LESS.

GROUNDING ELECTRODE

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

CONNECTIONS ABOVE GRADE (MECHANICAL)

COMPRESSION LUG CONNECTOR - 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V RATED. USE 1/4" DIAMETER BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.) EXOTHERMIC WELD LUG CONNECTOR - 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2" DIAMETER BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE)TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED. C-TAP COMPRESSION CONNECTOR - HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

MECHANICAL CONNECTIONS

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION. APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED. SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

WHEN BONDING #2/0 TO #2/0

USE EXOTHERMIC WELD CONNECTION

WHEN BONDING TO TOWER GROUND PLATE

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	02/08/2017	TJB	TGK	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

TACTICAL COMMUNICATIONS
23 Soundview Road
Guilford, CT 06437
(800) 553-5133 Toll Free
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TOWN OF NORTH STONINGTON

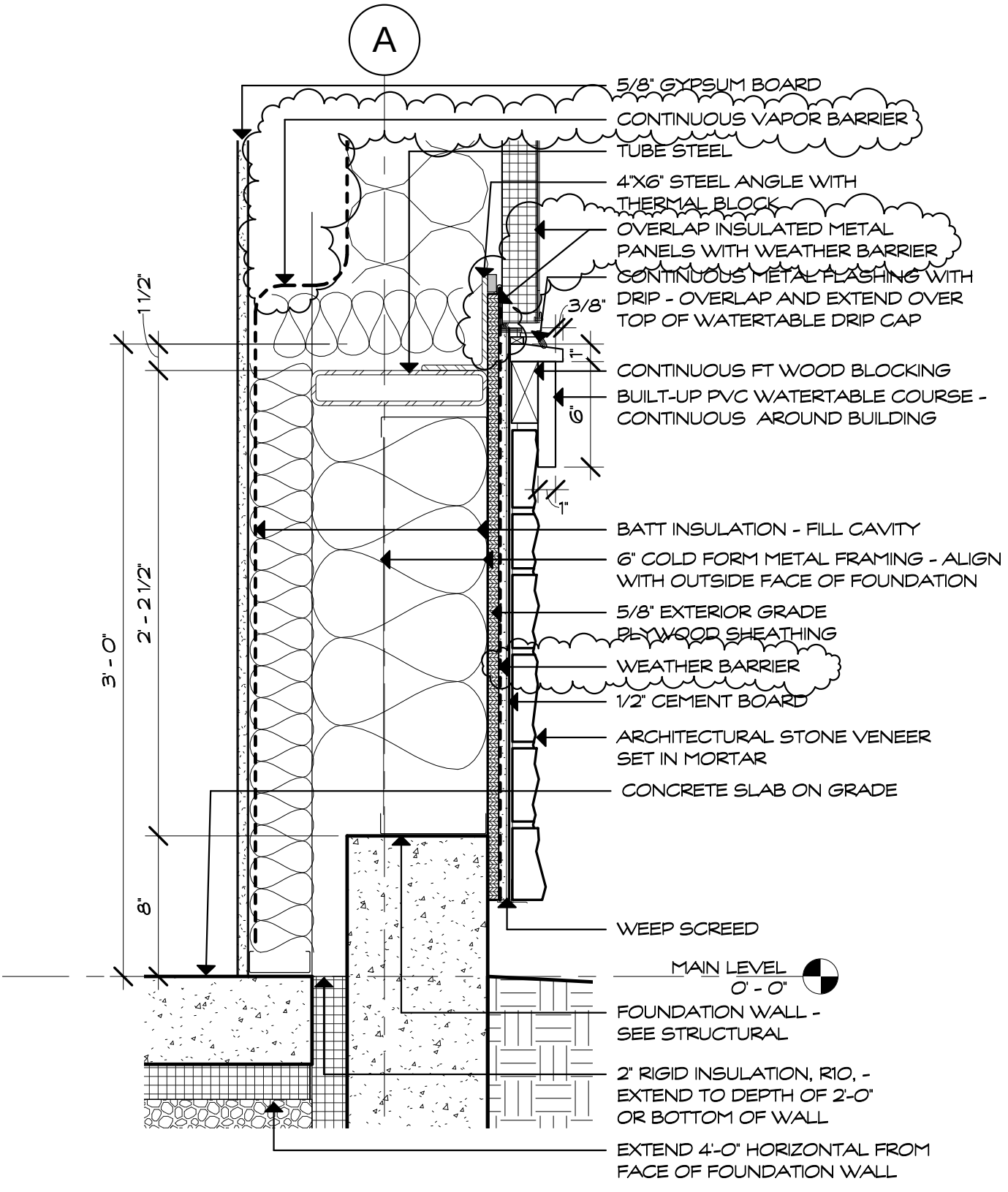
NEW CENTER FOR EMERGENCY SERVICES TOWER FOUNDATION
25 ROCKY HOLLOW ROAD
NORTH STONINGTON, CONNECTICUT 06359

DATE:	02/08/2017
SCALE:	As indicated
JOB NO.	17021.00

SCHEMATIC AND NOTES

ESK-1

Sheet No. 2 of 2

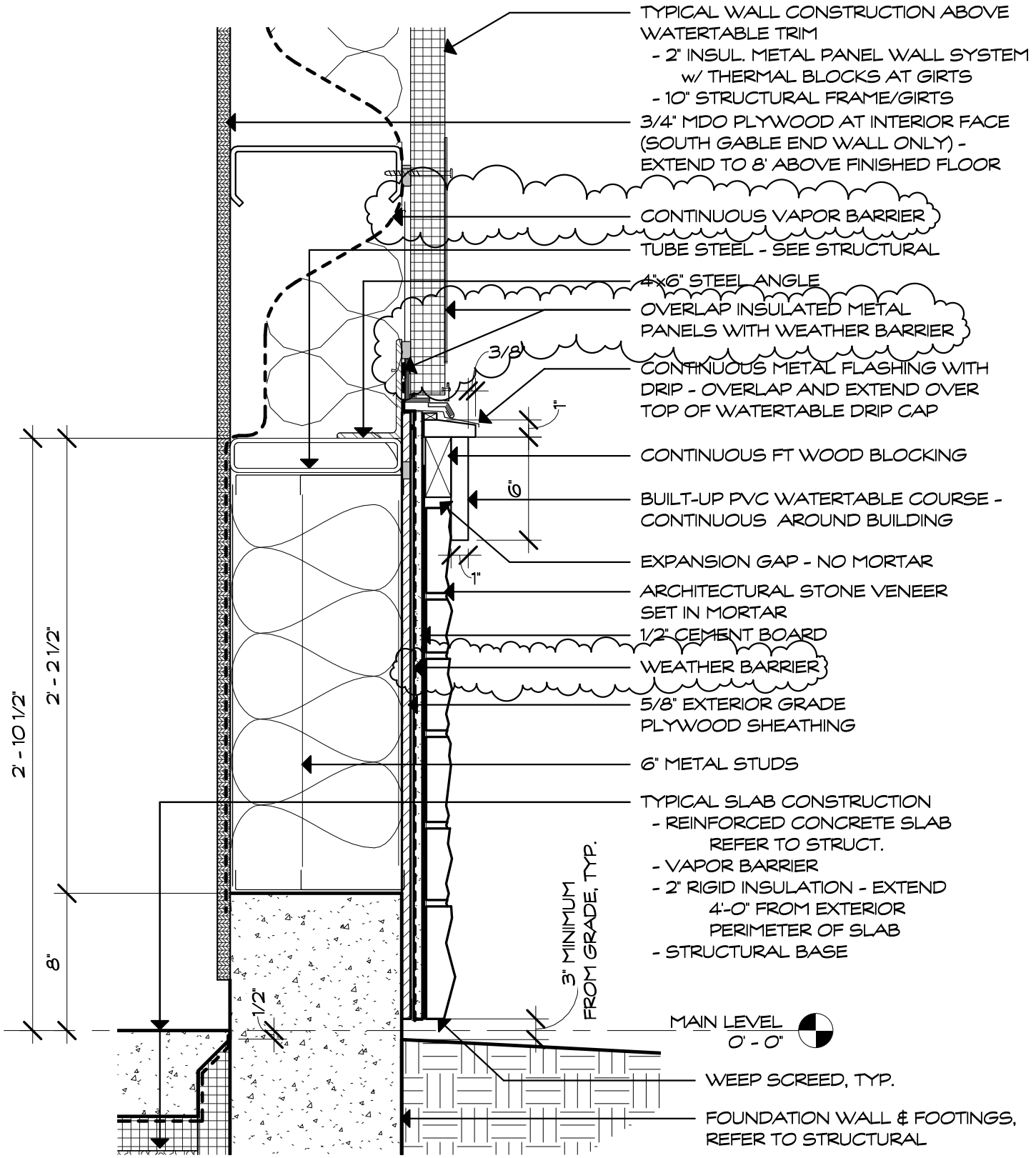


ADDENDUM 1 - DETAIL AT STONE BASE - B/A9.0

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

1
SKA 1A

Project Title: Town of North Stonington New Center for Emergency Services 25 Rocky Hollow Road North Stonington, Connecticut 06359	SILVER / PETRUCELLI + ASSOCIATES Architects / Engineers / Interior Designers 3190 Whitney Avenue, Hamden, CT 06518-2340 Tel. 203 230 9007 Fax. 203 230 8247 silverpetrucelli.com	Drawing Title: ADDENDUM 1 - DETAIL AT STONE BASE	Date: 02/23/17 Scale: 1 1/2" = 1'-0" Drawn By: BJV Project Number: 13.220	Drawing Number: SKA 1A



ADDENDUM 1 - STONE BASE DETAIL - APPARATUS BAY END WALL - C/A9.0

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

1
SKA 1B

Project Title: Town of North Stonington New Center for Emergency Services 25 Rocky Hollow Road North Stonington, Connecticut 06359	SILVER / PETRUCELLI + ASSOCIATES Architects / Engineers / Interior Designers 3190 Whitney Avenue, Hamden, CT 06518-2340 Tel. 203 230 9007 Fax. 203 230 8247 silverpetrucelli.com	Drawing Title: ADDENDUM 1 - STONE BASE DTL - END WALL	Date: 02/23/17 Scale: 1 1/2" = 1'-0" Drawn By: BJV Project Number: 13.220	Drawing Number: SKA 1B