



September 8, 2022

Via Federal Express

Honorable John Morissette, Presiding Officer
And Members of the Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Docket No. 507 – Homeland Towers LLC (HT) and Cellco Partnership d/b/a Verizon Wireless
Development & Management Plan- Tower Facility at 222 Clintonville Road, North Branford, CT (CT021).

Dear Honorable Morissette and Members of the Siting Council,

Homeland Towers (“HT”) respectfully requests that you please accept for review and Council approval this Development & Management Plan (“D&M Plan”) filing for the Facility as approved in Docket No. 507.

Tower, Compound & Other Equipment

Enclosed are fifteen (15) sets of 11”x17” Development & Management Plans dated September 7, 2022 prepared by All Points Technology Corporation. These plans are being filed in accordance with the Council’s Decision and Order dated May 26, 2022 (“Decision and Order”). Two full-sized sets of the Development & Management Plans are also enclosed. The D&M Plan incorporates a 110’ brown monopole as provided for in the Siting Council’s Decision and Order in this Docket. Verizon will install twelve (12) panel antennas and six (6) RRH’s at a centerline of 96’. The Town of North Branford also plans on installing two (2) omni-directional antennas off the top of the tower. All of Verizon’s and future carrier antennas and mounts will be painted brown to match the color of the monopole. As previously submitted into the record, the Town’s omni-directional antennas extending above the tower will be “Horizon Blue” in color and the Town’s mounts will be painted “White Smoke” as depicted in the Visual Resource Assessment dated September 1, 2021 prepared by Saratoga Associates. Attachment **Exhibit A** contains antenna specification sheets for Verizon and the Town of North Branford’s public safety equipment along with the specifications for the generator that Verizon and the Town intend to share. Attached as **Exhibit B** is a geotechnical study dated July 26, 2022 prepared by Tectonic Engineering as well as a structural design report for the tower and tower foundation dated September 4, 2022 prepared by TAPP. Attachment **Exhibit C** contains the color swatches for the brown monopole, carrier antennas and all mounts and Attachment **Exhibit D** contains Verizon’s Commitment Letter.

Conditions of Decision and Order to be submitted and approved by Council prior to the commencement of facility construction:

- Per Condition 1, Homeland shall comply.
- Per Condition 2(a), a copy of certified letter from Verizon with a firm commitment to install is attached as Exhibit D.
- Per Condition 2(b), Homeland shall comply.
- Per Condition 2(c), as shown on Sheet SP-2 two (2) rows of erosion and sedimentation controls are shown in the area of the pond. The proposed D&M Plan 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.



HOMELAND TOWERS


- Per Condition 2(d), Homeland shall limit tree clearing from April 1 to October 1.
- Per Condition 2(e), the tower, antenna mounting equipment and antennas shall be painted brown. The Town's omni antennas will be "Horizon Blue" and mounts will be "white smoke" as shown on the Visual Resource Assessment dated September 1, 2021 prepared by Saratoga Associates and previously submitted to the Council.
- Per Condition 2(f), as shown on Sheet CP-1 the tower is designed with a yield point at 80' AGL to ensure that the tower setback radius remains within the property boundaries.
- Per Condition 2(g), as shown on Sheet CP-1, a 1,000-gallon propane tank will be installed. Please note that the generator was changed from a 50-kilowatt propane generator to an 80 kW propane generator to accommodate additional loading for the Town of North Branford.
- Per Condition 2(h), examine area of pipe crossing to potentially reduce amount of disturbance. This area was re-examined and the amount of disturbance was reduced from 42,000 sf to 40,500 sf, net excavation was reduced from 2,050 CY to 1300 CY and the number of trees being removed was reduced from 105 to 92.
- Per Condition 2(i), as shown on Sheet SP-2, additional landscaping was added between the facility and the northern abutting property line to offer additional screening of the access drive and tower. At the time of construction, any diseased trees within the boundaries of the facility site will be identified and shall be removed.
- Per Condition 2(j), as shown as Sheet EC-1, construction of the facility will take place between the hours of 8:00am and 5:00pm, Monday through Friday.
- Per Condition 2(k), as shown on Sheet N-1, Fuel Response Plan notes have been added.
- Per Conditions 3- 16, Homeland shall comply

Required Notifications

In accordance with the provisions of RCSA Section 16-50j-77, Homeland Towers hereby notifies the Council of its intention to begin site work immediately 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. The supervisor for all construction related matters on this project is David Weinpahl with On-Air Engineering, located at 88 Foundry Pond Road, Cold Spring, NY 10516 and can be reached by telephone at 201-456-4624.

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.

Sincerely,


Raymond Vergati

rv@homelandtowers.us

Enclosures

cc: Honorable Michael Downes, Town Manager, Town of North Branford
Manny Vicente, Homeland Towers LLC
Tim Parks, Verizon
Scott Chasse, P.E., APT
Kenneth Baldwin, Esq., Robinson & Cole



HOMELAND TOWERS, LLC
WIRELESS TELECOMMUNICATIONS FACILITY
NORTH BRANFORD
222 CLINTONVILLE ROAD
NORTHFORD, CT 06472

HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2nd FLOOR
 DANBURY, CT 06810
 (203) 297-6345

Cellco Partnership d/b/a
verizon
 WIRELESS

20 ALEXANDER DRIVE
 WALLINGFORD, CT 06492

ALL-POINTS
 TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
 WATERFORD, CT 06395 PHONE: (860) 463-1697
 WWW.ALLPOINTSTECH.COM FAX: (860) 463-0935

D&M DOCUMENTS		
NO	DATE	REVISION
0	09/07/22	FOR REVIEW: RCB
1		
2		
3		
4		
5		
6		



DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
 COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
 ADDR: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06395

DEVELOPER: HOMELAND TOWERS, LLC
 ADDRESS: 9 HARMONY STREET 2ND FLOOR DANBURY, CT 06810

ENGINEER CONTACT: ROBERT C. BURNS, P.E. (860) 552-2036

LATITUDE: 41° 23' 44.9168"N
 LONGITUDE: 72° 47' 35.0815"W
 ELEVATION: 277.7' ± AMSL

MAP: 67D
 LOT: 6
 ZONE: R40

HOMELAND TOWERS NORTH BRANFORD

SITE 222 CLINTONVILLE ROAD
 ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990

DATE: 09/07/22 DRAWN BY: CSH

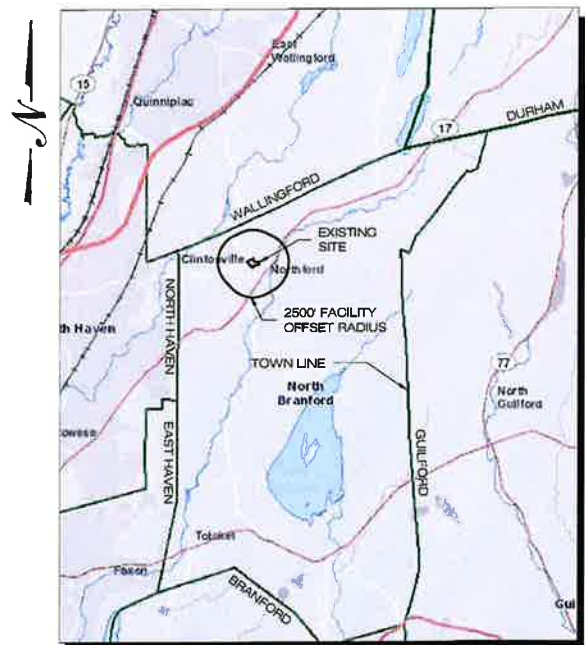
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SHEET TITLE:

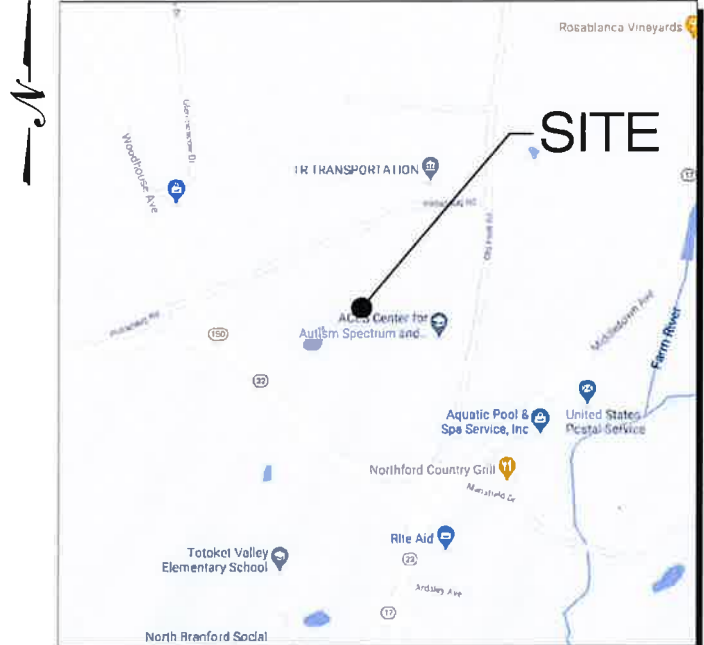
TITLE SHEET

SHEET NUMBER:

T-1



MUNICIPAL NOTIFICATION LIMIT MAP
 SCALE: 1" = 1.5 Miles



VICINITY MAP
 SCALE: 1" = 500'

DRAWING INDEX

- T-1 TITLE SHEET
- 1 OF 1 PROPERTY & TOPOGRAPHIC SURVEY
- SP-1 SITE PLAN & ABUTTERS MAP
- SP-2 PARTIAL SITE PLAN
- SP-3 ACCESS DRIVEWAY PROFILE
- GD-1 GRADING & DRAINAGE PLAN
- CP-1 COMPOUND PLAN & TOWER ELEVATION
- C-1 SITE DETAILS
- C-2 EROSION CONTROL & LANDSCAPING DETAILS
- C-3 VERIZON EQUIPMENT PLAN & DETAILS
- C-4 VERIZON ANTENNA PLAN & DETAILS
- C-5 MUNICIPAL ANTENNA PLAN & DETAILS
- EC-1 EROSION CONTROL NOTES
- N-1 NOTES, SPECIFICATIONS & ENVIRONMENTAL NOTES

SITE INFORMATION

PROJECT LOCATION: 222 CLINTONVILLE ROAD
 NORTHFORD, CT 06472

PROJECT DESCRIPTION: RAWLAND SITE W/ GROUND EQUIPMENT WITHIN 4,061 ± SF TELECOMMUNICATIONS EQUIPMENT COMPOUND W/ NEW 110' ± AGL MONOPOLE.

PROPERTY DEVELOPER: HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2ND FLOOR
 DANBURY, CT 06810

DEVELOPER CONTACT: RAY VERGATI
 (203) 297-6345

ENGINEER CONTACT: ROBERT C. BURNS, P.E.
 (860) 552-2036

LATITUDE: 41° 23' 44.9168"N
 LONGITUDE: 72° 47' 35.0815"W
 ELEVATION: 277.7' ± AMSL

MAP: 67D
 LOT: 6
 ZONE: R40

OWNER:
 GAIL & MICHAEL MONACO
 222 CLINTONVILLE ROAD
 NORTHFORD, CT 06472

APPLICANTS:
 HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2ND FLOOR
 DANBURY, CT 06810
 RAY VERGATI
 (203) 297-6345
 CELCO PARTNERSHIP
 d/b/a VERIZON WIRELESS
 20 ALEXANDER DRIVE
 WALLINGFORD, CT 06492

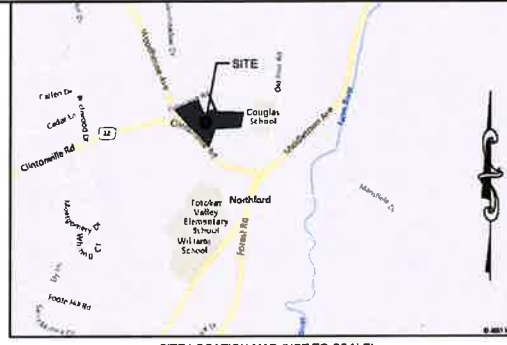
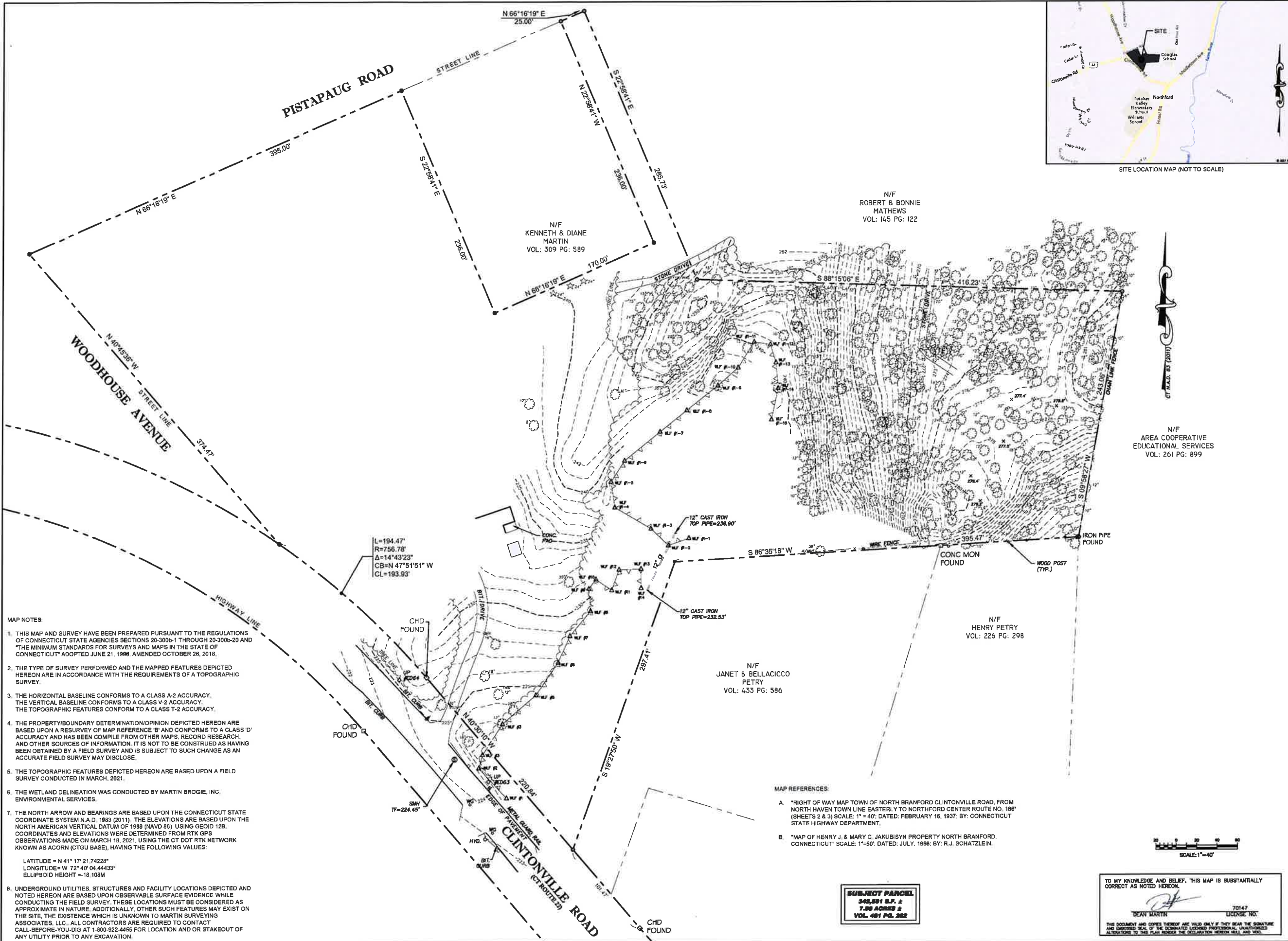
HOMELAND PROJECT ATTORNEY:
 ROBINSON & COLE
 280 TRUMBULL STREET
 HARTFORD, CT 06103
 (800) 826-3579

POWER PROVIDER:
 WALLINGFORD ELECTRIC: (203) 294-2020

TELCO PROVIDER:
 FRONTIER (800) 921-8102

CALL BEFORE YOU DIG:
 (800) 922-4455

GOVERNING CODES:
 CONNECTICUT STATE BUILDING CODE, LATEST EDITION
 NATIONAL ELECTRIC CODE, LATEST EDITION
 TIA-222-H



LEGEND:

● IRON PIN (FOUND)	△ SIGN
● Rebar/Drill Hole (To Be Set)	○ POST
□ MONUMENT (FOUND)	✱ GUY ANCHOR
● MANHOLE	○ UTILITY POLE
⊙ DRAINAGE MANHOLE	⊙ WATER GATE
⊙ SANITARY MANHOLE	⊙ WATER METER
⊙ ELEC. MANHOLE	⊙ GAS VALVE
⊙ TELE. MANHOLE	⊙ GAS METER
⊙ "C" CATCH BASIN	⊙ TRANSFORMER
⊙ "C-L" CATCH BASIN	⊙ ELEC. METER
⊙ DECIDUOUS TREES	⊙ MAIL BOX
⊙ EVERGREEN TREES	⊙ HAND HOLE
● SHRUB/BUSH	⊙ BUTTON BOX
○ FLAG POLE	⊙ A.C. UNIT
⊙ TRAFFIC CONTROL BOX	⊙ TRAFFIC LIGHT POLE

---	BOUNDARY LINE
---	GUARD RAIL
---	UNDERGROUND PIPING (San., Strm.)
---	U/G GAS LINE
---	U/G ELEC. LINE
---	WATER LINE
---	OVERHEAD UTILITIES
---	U/G TELE. LINE
---	CHAIN LINK FENCE
---	TREE LINE

MAP NOTES:

- THIS MAP AND SURVEY HAVE BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND "THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED JUNE 21, 1998, AMENDED OCTOBER 26, 2018.
- THE TYPE OF SURVEY PERFORMED AND THE MAPPED FEATURES DEPICTED HEREON ARE IN ACCORDANCE WITH THE REQUIREMENTS OF A TOPOGRAPHIC SURVEY.
- THE HORIZONTAL BASELINE CONFORMS TO A CLASS A-2 ACCURACY. THE VERTICAL BASELINE CONFORMS TO A CLASS V-2 ACCURACY. THE TOPOGRAPHIC FEATURES CONFORM TO A CLASS T-2 ACCURACY.
- THE PROPERTY BOUNDARY DETERMINATION/OPINION DEPICTED HEREON ARE BASED UPON A RESURVEY OF MAP REFERENCE 'B' AND CONFORMS TO A CLASS 'D' ACCURACY AND HAS BEEN COMPILED FROM OTHER MAPS, RECORD RESEARCH, AND OTHER SOURCES OF INFORMATION. IT IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED BY A FIELD SURVEY AND IS SUBJECT TO SUCH CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE.
- THE TOPOGRAPHIC FEATURES DEPICTED HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED IN MARCH, 2021.
- THE WETLAND DELINEATION WAS CONDUCTED BY MARTIN BROGIE, INC. ENVIRONMENTAL SERVICES.
- THE NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT STATE COORDINATE SYSTEM N.A.D. 1983 (2011). THE ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING GEOID 12B. COORDINATES AND ELEVATIONS WERE DETERMINED FROM RTK GPS OBSERVATIONS MADE ON MARCH 18, 2021, USING THE CT DOT RTK NETWORK KNOWN AS ACORN (CTGU BASE), HAVING THE FOLLOWING VALUES:
 LATITUDE = N 41° 17' 21.74228"
 LONGITUDE = W 72° 40' 04.44433"
 ELLIPSOID HEIGHT = -18.108M
- UNDERGROUND UTILITIES, STRUCTURES AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON ARE BASED UPON OBSERVABLE SURFACE EVIDENCE WHILE CONDUCTING THE FIELD SURVEY. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE WHICH IS UNKNOWN TO MARTIN SURVEYING ASSOCIATES, LLC. ALL CONTRACTORS ARE REQUIRED TO CONTACT CALL-BEFORE-YOU-DIG AT 1-800-922-4455 FOR LOCATION AND OR STAKEOUT OF ANY UTILITY PRIOR TO ANY EXCAVATION.

L=194.47'
 R=756.78'
 Δ=14°43'23"
 CB=N 47°51'51" W
 CL=193.93'

MAP REFERENCES:

- "RIGHT OF WAY MAP TOWN OF NORTH BRANFORD CLINTONVILLE ROAD, FROM NORTH HAVEN TOWN LINE EASTERLY TO NORTHFORD CENTER ROUTE NO. 188" (SHEETS 2 & 3) SCALE: 1" = 40'; DATED: FEBRUARY 16, 1937; BY: CONNECTICUT STATE HIGHWAY DEPARTMENT.
- "MAP OF HENRY J. & MARY C. JAKUBISYN PROPERTY NORTH BRANFORD, CONNECTICUT" SCALE: 1"=50'; DATED: JULY, 1986; BY: R.J. SCHATZLEIN.

SUBJECT PARCEL
 348,881 S.F. ±
 7.88 ACRES ±
 VOL. 401 PG. 282

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

DEAN MARTIN 70147
 LICENSE NO.

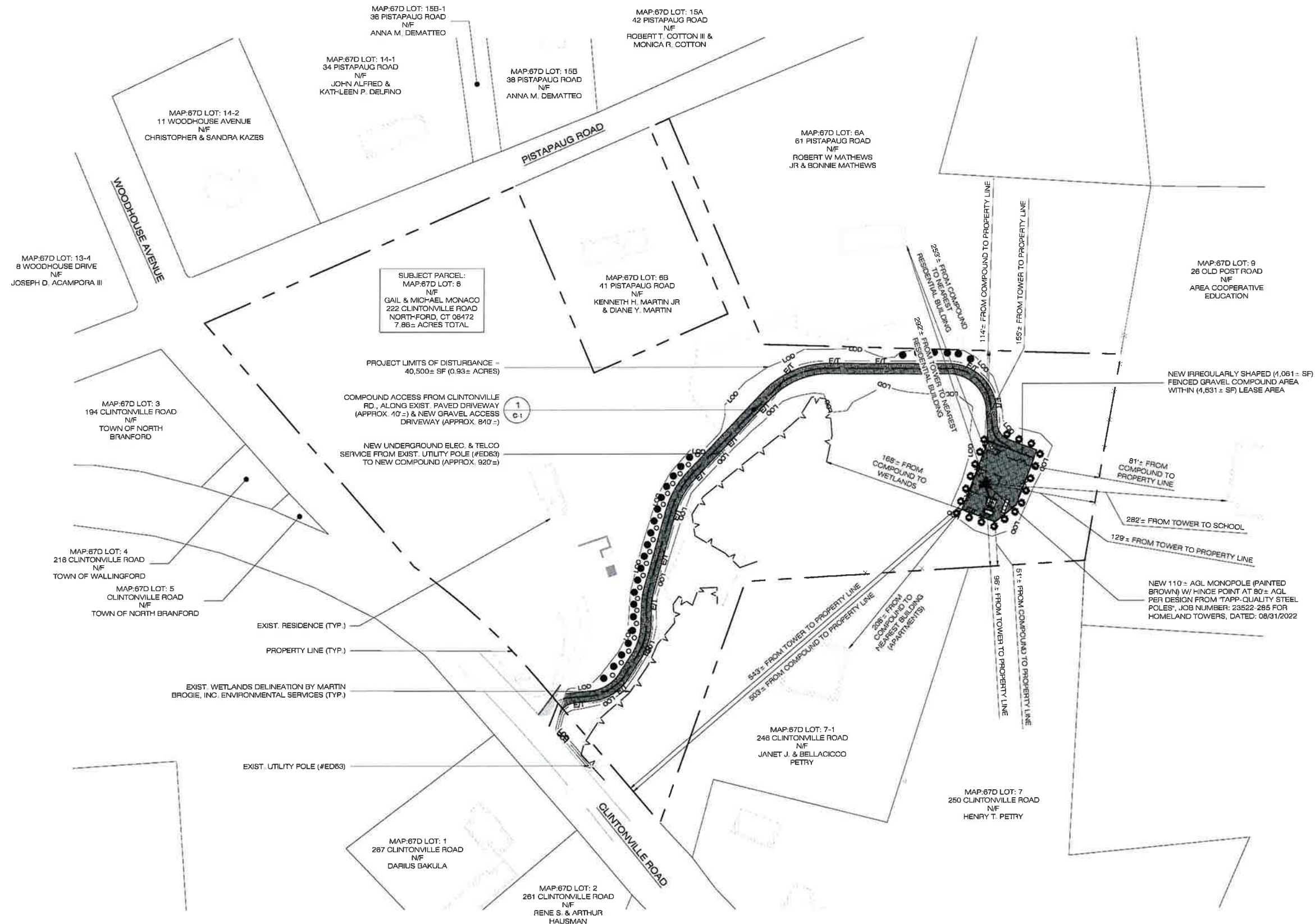
THIS DOCUMENT AND COPIES THEREOF ARE VALID ONLY IF THEY BEAR THE SIGNATURE AND LIMITED SEAL OF THE DESIGNATED LICENSED PROFESSIONAL, UNAUTHORIZED ALTERATIONS TO THIS PLAN RENDER THE DECLARATION HEREON NULL AND VOID.

Martin
 Surveying Associates, LLC
 201 CHRISTIAN LANE BERLIN, CT 06037
 860-832-8328 860-357-4604 (FAX)

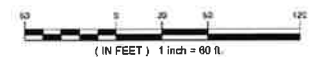
PROPERTY & TOPOGRAPHIC
 SURVEY
 LAND OF
 GAIL & MICHAEL MONACO
 222 CLINTONVILLE ROAD
 NORTHFORD, CONNECTICUT

MSA PROJECT NO: 21-023


SCALE: 1"=40'	DRAWN BY: G.S.D.
DATE: 03/23/2021	CHECKED BY:
SHEET:	
1 OF 1	



1 SITE PLAN
SP-1 SCALE: 1" = 60'-0"




MAP REFERENCES:
1. "PROPERTY & TOPOGRAPHIC SURVEY LAND OF GAIL & MICHAEL MONACO, 222 CLINTONVILLE ROAD, NORTHFORD, CT, 1 OF 1; PREPARED BY MARTIN SURVEYING ASSOCIATES, LLC, 201 CHRISTIAN LANE, BERLIN, CT 06037, DATED: MARCH 23, 2021.




HOMELAND TOWERS, LLC
9 HARMONY STREET
2nd FLOOR
DANBURY, CT 06810
(203) 297-6345

Celco Partnership d/b/a




20 ALEXANDER DRIVE
WALLINGFORD, CT 06492



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D&M DOCUMENTS	
NO	DATE REVISION
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4	
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6	



DESIGN PROFESSIONALS OF RECORD

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**HOMELAND TOWERS
NORTH BRANFORD**

SITE 222 CLINTONVILLE ROAD
ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990

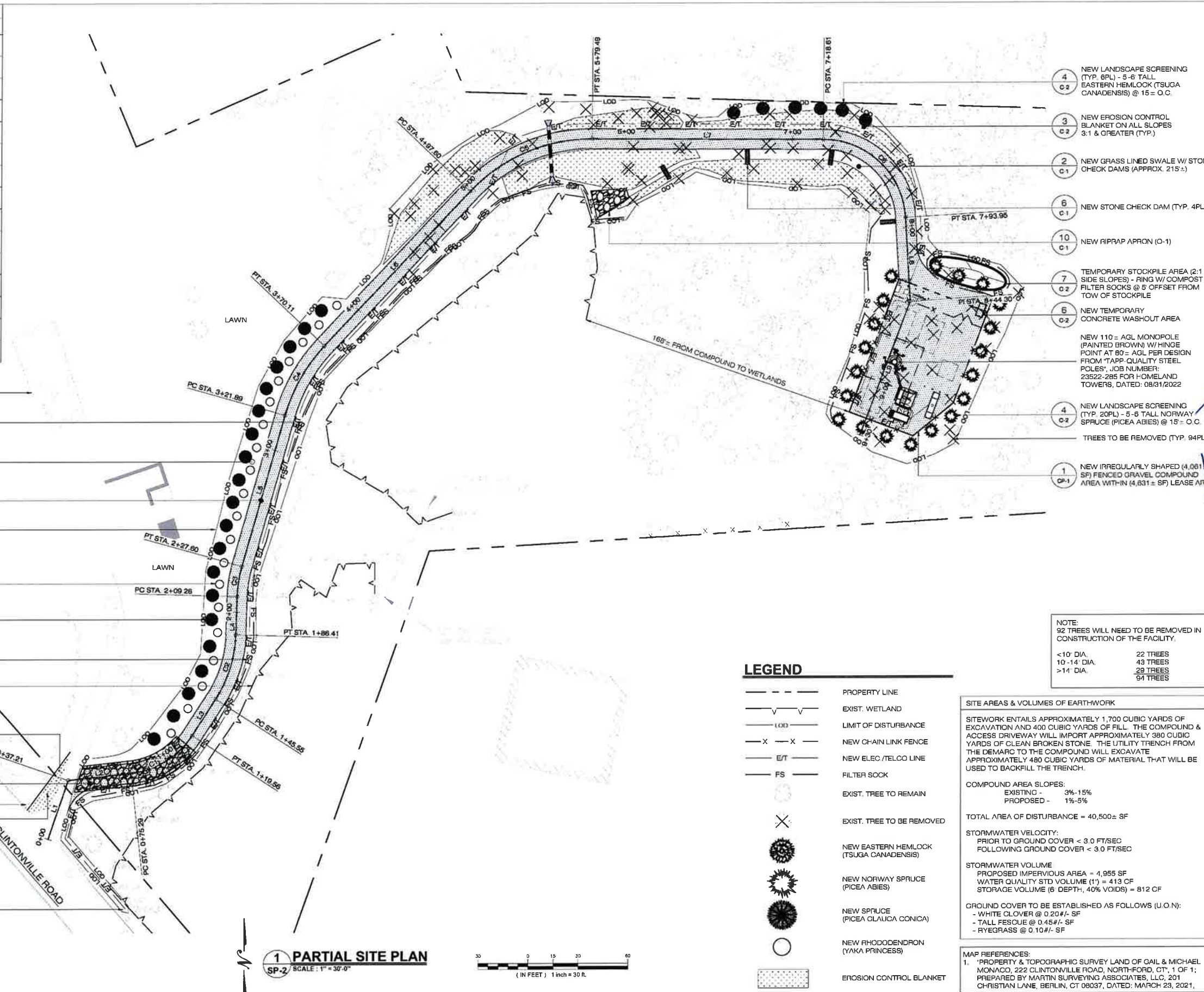
DATE: 09/07/22 DRAWN BY: CSH
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SHEET TITLE:
**SITE PLAN &
ABUTTERS MAP**

SHEET NUMBER:
SP-1

ACCESS DRIVE				
NO.	BEARING	DELTA(A)	LENGTH	TANGENT RADIUS
L1	N19°02'02.59"E		37.21	
L2	N83°38'47.85"E		38.08	
C1		50°43'29"	44.27	23.70 50.0'
L3	N32°55'19.26"E		26.00	
C2		31°12'53"	40.86	20.95 75.0'
L4	N1°42'26.05"E		22.855	
C3		14°00'25"	18.33	9.21 75.0'
L5	N15°42'50.60"E		94.29	
C4		27°37'45"	48.22	24.59 100.0'
L6	N43°20'35.77"E		127.49	
C5		48°55'04"	81.89	43.40 100.0'
L7	S89°44'19.86"E		139.12	
C6		86°19'58"	75.34	46.90 50.0'
L8	S3°24'22.32"E		50.36	
L9	S20°32'22.47"W		111.52	

- EXIST. RESIDENCE (TYP.)
- NEW DOUBLE ROW COMPOST FILTER SOCK WITHIN THE AREA UPHILL OF THE EXIST. POND (TYP.)
- NEW UNDERGROUND ELEC. & TELCO SERVICE FROM EXIST. UTILITY POLE (#EDB3) TO NEW COMPOUND (APPROX. 920'±)
- NEW 12' WIDE GRAVEL ACCESS DRIVE (APPROX. 840'± LF)
- PROJECT LIMITS OF DISTURBANCE = 40,500± SF (0.93± ACRES)
- NEW 24" HIGH RHODODENDRON (YAKA PRINCESS) @ 15'± O.C. (TYP. 20PL)
- NEW ACCESS DRIVE LANDSCAPE SCREENING (TYP. 20PL) - 2-3 TALL SPRUCE (PICEA GLAUCA CONICA) @ 15'± O.C.
- NEW COMPOST FILTER SOCK (TYP.)
- EXIST. WETLANDS DELINEATION BY MARTIN BROCK, INC ENVIRONMENTAL SERVICES (TYP.)
- PROPERTY LINE (TYP.)
- WIDEN PAVED DRIVEWAY ENTRANCE (TYP.)
- NEW CONSTRUCTION ENTRANCE
- EXIST. MAILBOX TO REMAIN
- REMOVE EXIST. STUMP
- EXIST. UTILITY POLE (#EDB3)



- 4 NEW LANDSCAPE SCREENING (TYP. 6PL) - 5-6 TALL EASTERN HEMLOCK (TSUGA CANADENSIS) @ 15'± O.C.
- 3 NEW EROSION CONTROL BLANKET ON ALL SLOPES 3:1 & GREATER (TYP.)
- 2 NEW GRASS LINED SWALE W/ STONE CHECK DAMS (APPROX. 215'±)
- 6 NEW STONE CHECK DAM (TYP. 4PL)
- 10 NEW RIPRAP APRON (O-1)
- 7 TEMPORARY STOCKPILE AREA (2:1 SIDE SLOPES) - RING W/ COMPOST FILTER SOCKS @ 5' OFFSET FROM TOW OF STOCKPILE
- 6 NEW TEMPORARY CONCRETE WASHOUT AREA
- NEW 110'± AGL MONOPOLE (PAINTED BROWN) W/ HINGE POINT AT 80'± AGL PER DESIGN FROM "TAPP QUALITY STEEL POLES", JOB NUMBER: 23522-285 FOR HOMELAND TOWERS, DATED: 08/31/2022
- 4 NEW LANDSCAPE SCREENING (TYP. 20PL) - 5-6 TALL NORWAY SPRUCE (PICEA ABIES) @ 15'± O.C.
- TREES TO BE REMOVED (TYP. 94PL)
- 1 NEW IRREGULARLY SHAPED (4,081 SF) FENCED GRAVEL COMPOUND AREA WITHIN (4,831± SF) LEASE AREA

NOTE:
92 TREES WILL NEED TO BE REMOVED IN CONSTRUCTION OF THE FACILITY.

<10" DIA.	22 TREES
10"-14" DIA.	43 TREES
>14" DIA.	29 TREES
	94 TREES

LEGEND

- PROPERTY LINE
- V-V- EXIST. WETLAND
- LOO- LIMIT OF DISTURBANCE
- X-X- NEW CHAIN LINK FENCE
- E/T- NEW ELEC./TELCO LINE
- FS- FILTER SOCK
- EXIST. TREE TO REMAIN
- ⊗ EXIST. TREE TO BE REMOVED
- NEW EASTERN HEMLOCK (TSUGA CANADENSIS)
- NEW NORWAY SPRUCE (PICEA ABIES)
- NEW SPRUCE (PICEA GLAUCA CONICA)
- NEW RHODODENDRON (YAKA PRINCESS)
- ▨ EROSION CONTROL BLANKET

SITE AREAS & VOLUMES OF EARTHWORK

SITEWORK ENTAILS APPROXIMATELY 1,700 CUBIC YARDS OF EXCAVATION AND 400 CUBIC YARDS OF FILL. THE COMPOUND & ACCESS DRIVEWAY WILL IMPORT APPROXIMATELY 380 CUBIC YARDS OF CLEAN BROKEN STONE. THE UTILITY TRENCH FROM THE DEMARG TO THE COMPOUND WILL EXCAVATE APPROXIMATELY 480 CUBIC YARDS OF MATERIAL THAT WILL BE USED TO BACKFILL THE TRENCH.

COMPOUND AREA SLOPES:
EXISTING - 3%-15%
PROPOSED - 1%-5%

TOTAL AREA OF DISTURBANCE = 40,500± SF

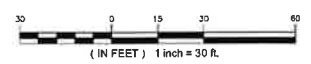
STORMWATER VELOCITY:
PRIOR TO GROUND COVER < 3.0 FT/SEC
FOLLOWING GROUND COVER < 3.0 FT/SEC

STORMWATER VOLUME
PROPOSED IMPERVIOUS AREA = 4,955 SF
WATER QUALITY STD VOLUME (1") = 413 CF
STORAGE VOLUME (6" DEPTH, 40% VOIDS) = 812 CF

GROUND COVER TO BE ESTABLISHED AS FOLLOWS (U.O.N.):
- WHITE CLOVER @ 0.20#/- SF
- TALL FESCUE @ 0.45#/- SF
- RYEGRASS @ 0.10#/- SF

MAP REFERENCES:
1. "PROPERTY & TOPOGRAPHIC SURVEY LAND OF GAIL & MICHAEL MONACO, 222 CLINTONVILLE ROAD, NORTHFORD, CT, 1 OF 1; PREPARED BY MARTIN SURVEYING ASSOCIATES, LLC, 201 CHRISTIAN LANE, BERLIN, CT 06037, DATED: MARCH 23, 2021.

1 PARTIAL SITE PLAN
SP-2 SCALE: 1" = 30'-0"



HOMELAND TOWERS, LLC
9 HARMONY STREET
2nd FLOOR
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Cellco Partnership d/b/a

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ALL-POINTS
TECHNOLOGY CORPORATION

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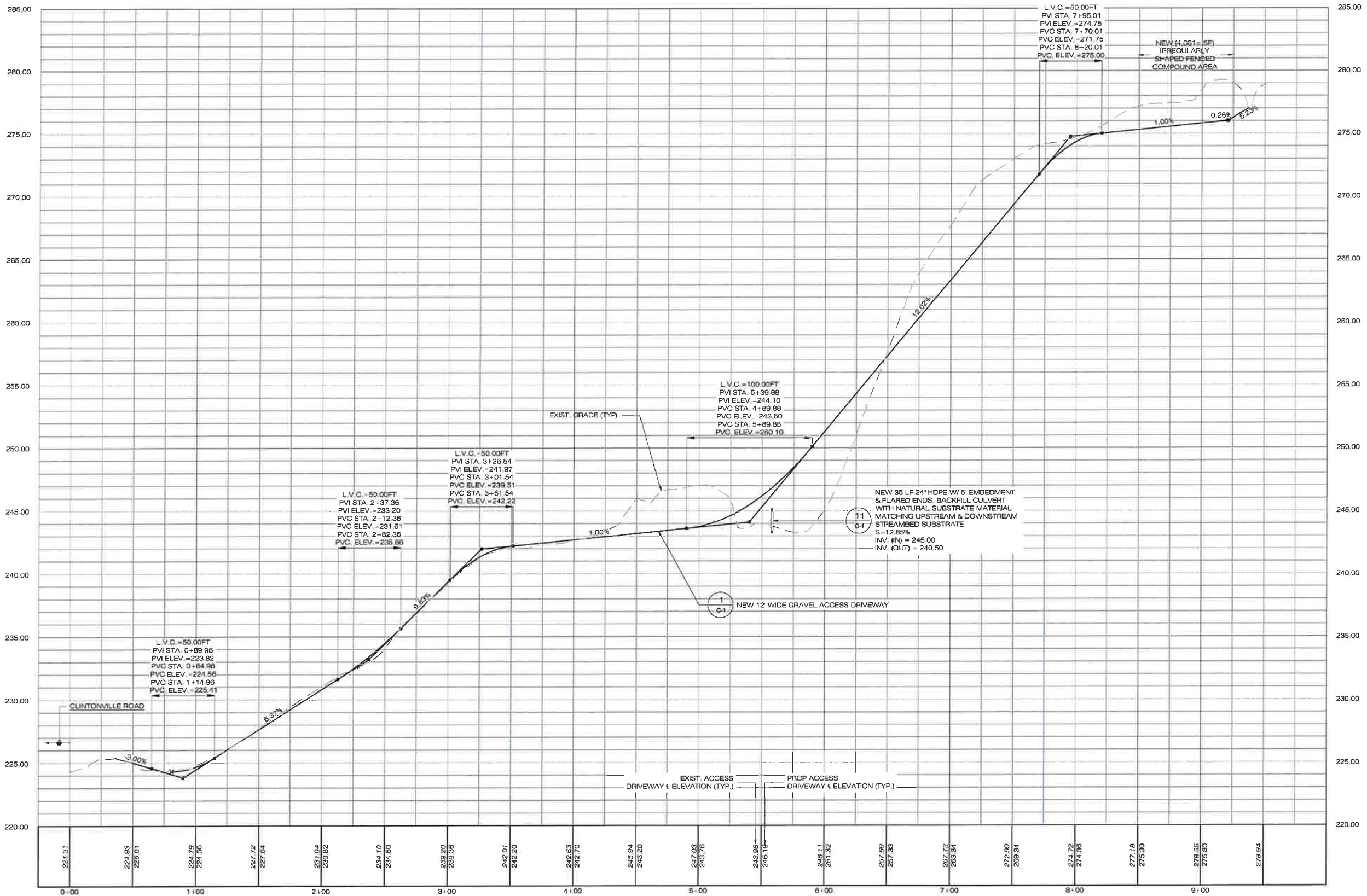
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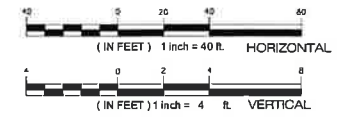
CHECKED BY: RCB

SHEET TITLE:
**PARTIAL
SITE PLAN**

SHEET NUMBER:
SP-2



1 ACCESS DRIVEWAY PROFILE
 SP-3 SCALE HORIZONTAL: 1" = 40'-0"
 VERTICAL: 1" = 4'-0"



HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2nd FLOOR
 DANBURY, CT 06810
 (203) 297-6345

Cellco Partnership d/b/a
verizon
 WIRELESS

20 ALEXANDER DRIVE
 WALLINGFORD, CT 06492

ALL-POINTS
 TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
 WATERFORD, CT 06305 PHONE: (860)463-1697
 WWW.ALLPOINTSTECH.COM FAX: (860)463-0935

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NO	DATE	REVISION
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
 COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
 ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

DEVELOPER: HOMELAND TOWERS, LLC
 ADDRESS: 9 HARMONY STREET 2ND FLOOR DANBURY, CT 06810

HOMELAND TOWERS NORTH BRANFORD

SITE 222 CLINTONVILLE ROAD
 ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990
 DATE: 09/07/22 DRAWN BY: CSH
 CHECKED BY: RCB

SHEET TITLE:
ACCESS DRIVEWAY PROFILE

SHEET NUMBER:
SP-3

NEW 35 LF 24" HOPE W/ 6" EMBEDMENT
& FLARED ENDS, BACKFILL CULVERT
WITH NATURAL SUBSTRATE MATERIAL
MATCHING UPSTREAM & DOWNSTREAM
STREAMBED SUBSTRATE
S=12.85%
INV. (IN) = 245.00
INV. (OUT) = 240.50

11
C-1

- 2
C-1 NEW GRASS LINED SWALE W/ STONE
CHECK DAMS (APPROX. 215'-)
- 6
C-1 NEW STONE CHECK DAM (TYP. 4PL)
- 10
C-1 NEW RIPRAP APRON (C-1)

EXIST. RESIDENCE (TYP.)

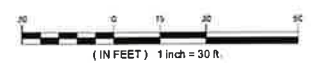
PROJECT LIMITS OF DISTURBANCE -
40,600 ± SF (0.93 ± ACRES)

EXIST. WETLANDS DELINEATION
BY MARTIN BROGIE, INC.
ENVIRONMENTAL SERVICES (TYP.)

PROPERTY LINE (TYP.)

CLINTONVILLE ROAD

1 PARTIAL SITE PLAN
SP-2 SCALE: 1" = 30'-0"



LEGEND

- PROPERTY LINE
- V --- EXIST. WETLAND
- LOD --- LIMIT OF DISTURBANCE
- X --- X --- NEW CHAIN LINK FENCE
- --- EXIST. MINOR CONTOUR
- --- EXIST. MAJOR CONTOUR
- --- NEW MINOR CONTOUR
- --- NEW MAJOR CONTOUR

MAP REFERENCES:
1. "PROPERTY & TOPOGRAPHIC SURVEY LAND OF GAIL & MICHAEL
MONACO, 222 CLINTONVILLE ROAD, NORTHFORD, CT, 1 OF 1;
PREPARED BY MARTIN SURVEYING ASSOCIATES, LLC, 201
CHRISTIAN LANE, BERLIN, CT 06037, DATED: MARCH 23, 2021.

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9 HARMONY STREET
2nd FLOOR
DANBURY, CT 06810
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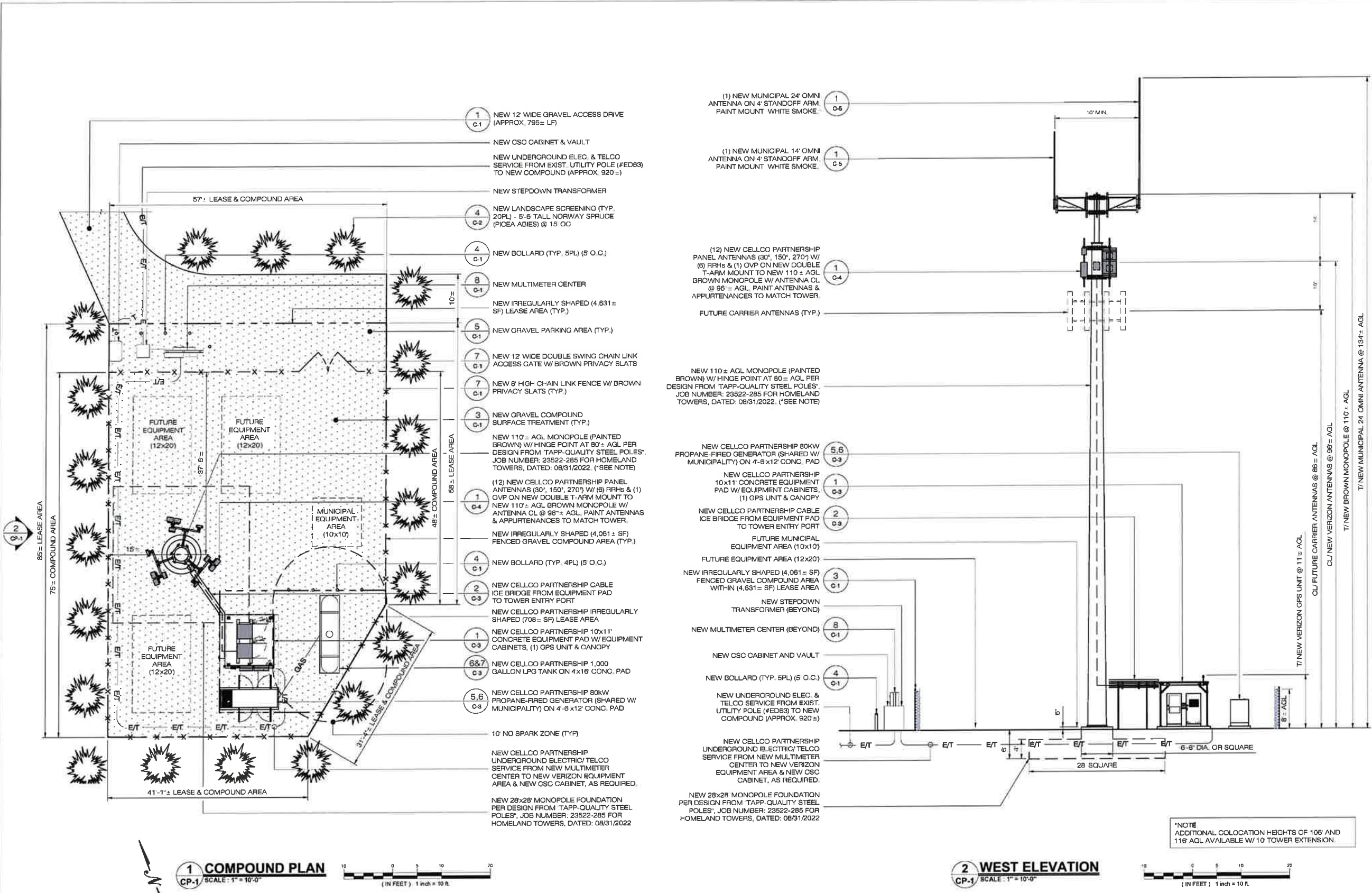


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SHEET TITLE:
GRADING & DRAINAGE PLAN

SHEET NUMBER:
GD-1



1 COMPOUND PLAN
 CP-1 SCALE: 1" = 10'-0"
 (IN FEET) 1 inch = 10 ft.

2 WEST ELEVATION
 CP-1 SCALE: 1" = 10'-0"
 (IN FEET) 1 inch = 10 ft.

*NOTE
 ADDITIONAL COLOCATION HEIGHTS OF 105' AND
 116' AGL AVAILABLE W/ 10' TOWER EXTENSION.

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HOMELAND TOWERS NORTH BRANFORD

SITE 222 CLINTONVILLE ROAD
 ADDRESS: NORTHBRAND, CT 06472

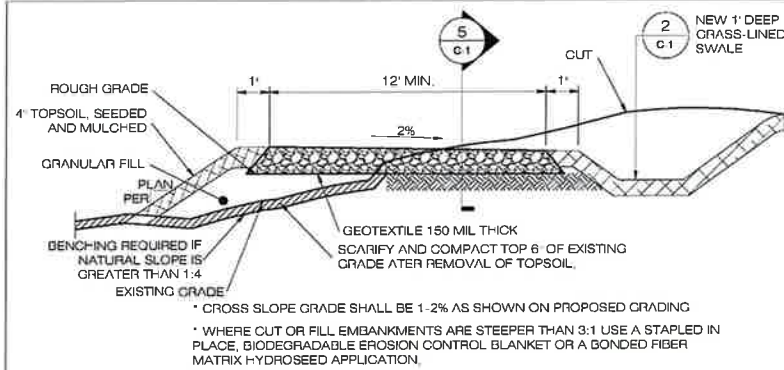
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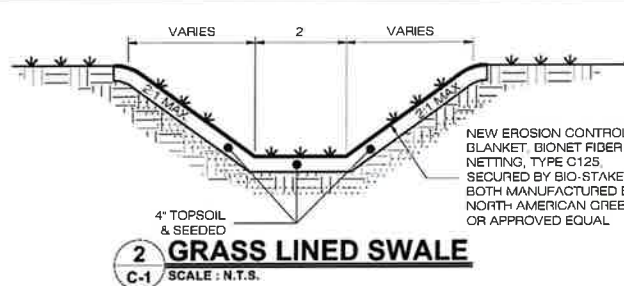
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SHEET TITLE:
COMPOUND PLAN & TOWER ELEVATION

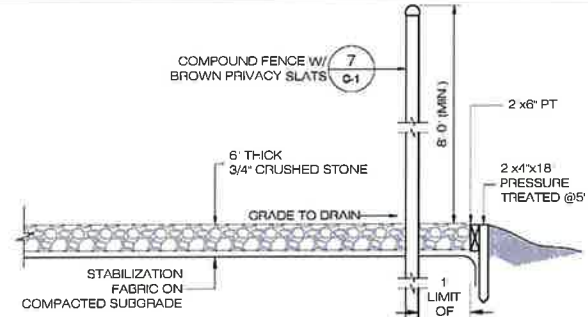
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CP-1



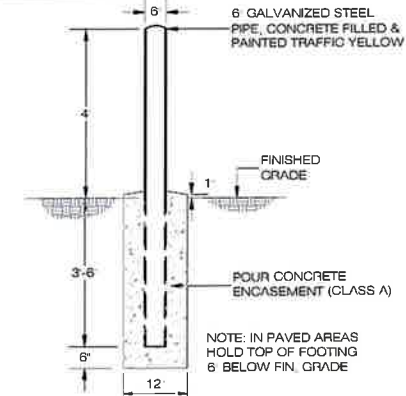
1 TYPICAL ROAD CROSS SECTION
C-1 SCALE: N.T.S.



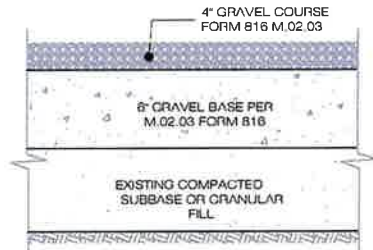
2 GRASS LINED SWALE
C-1 SCALE: N.T.S.



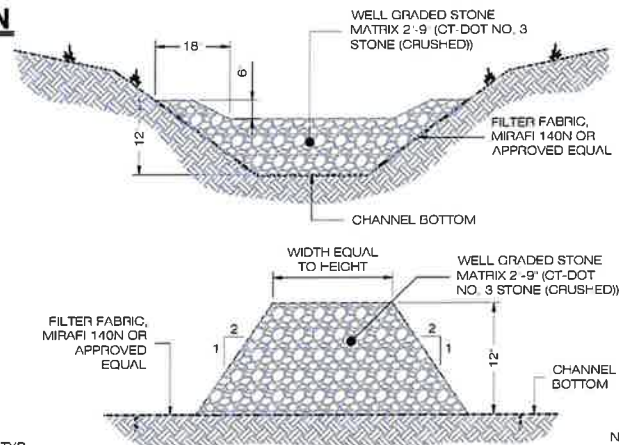
3 COMPOUND DETAIL
C-1 SCALE: N.T.S.



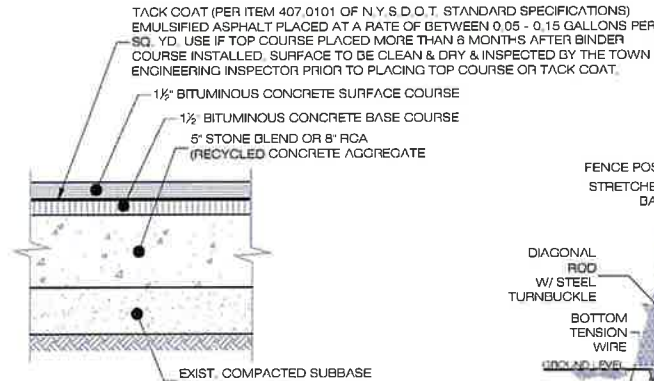
4 BOLLARD DETAIL
C-1 SCALE: N.T.S.



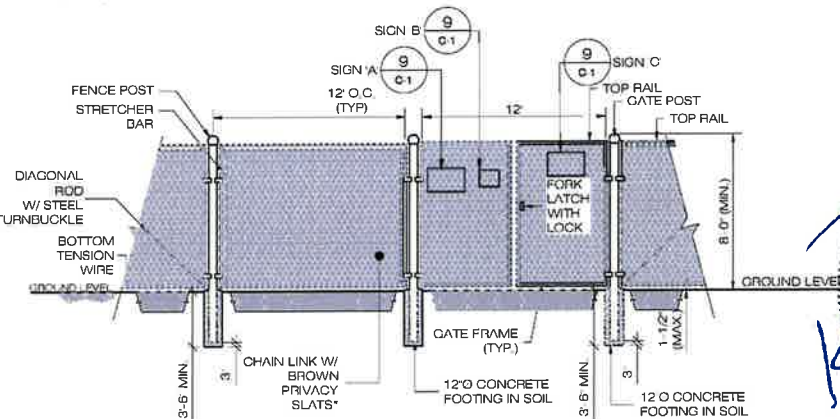
5 GRAVEL ROAD/PARKING SECTION
C-1 SCALE: N.T.S.



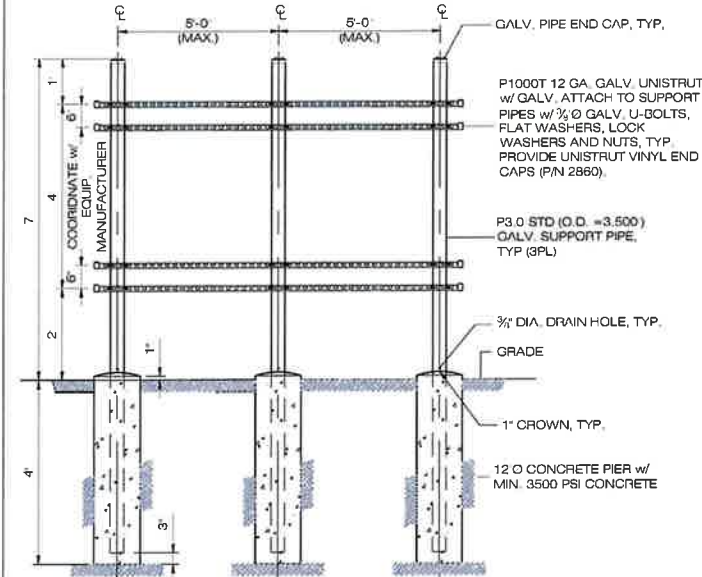
6 STONE CHECK DAM
C-1 SCALE: N.T.S.



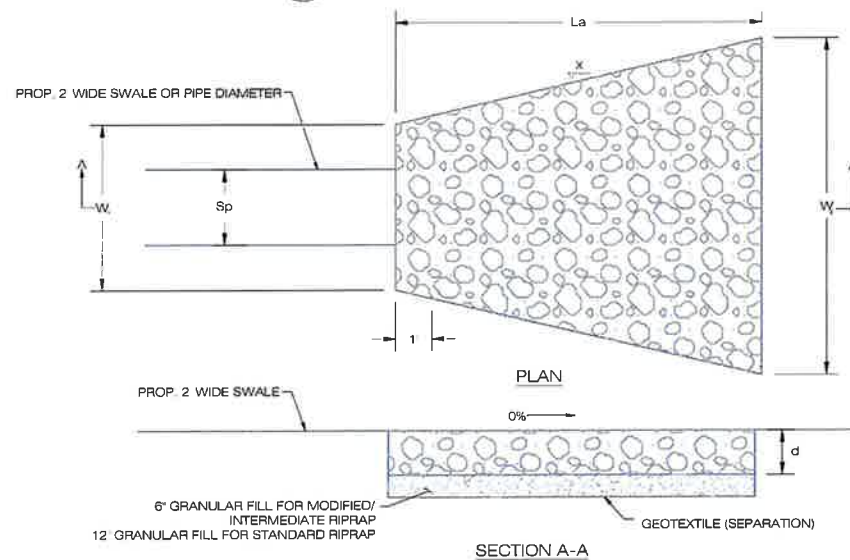
12 PAVED ROAD SECTION
C-1 SCALE: N.T.S.



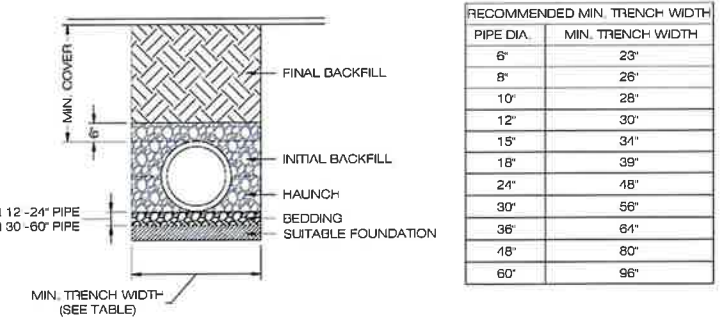
7 CHAIN-LINK FENCING & FENCE GATE DETAIL
C-1 SCALE: N.T.S.



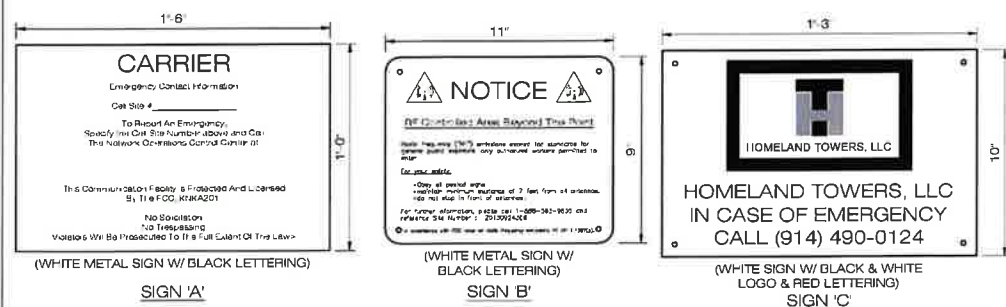
8 UTILITY BACKBOARD FRAME DETAIL
C-1 SCALE: N.T.S.



10 RIPRAP APRON
C-1 SCALE: N.T.S.



11 HDPE STORM DRAINAGE TRENCH DETAIL
C-1 SCALE: N.T.S.



9 TYPICAL SIGNAGE
C-1 SCALE: N.T.S.

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HOMELAND TOWERS NORTH BRANFORD

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ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990

DATE: 09/07/22 DRAWN BY: CSH
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SHEET TITLE:

SITE DETAILS

SHEET NUMBER:

C-1

LEGEND

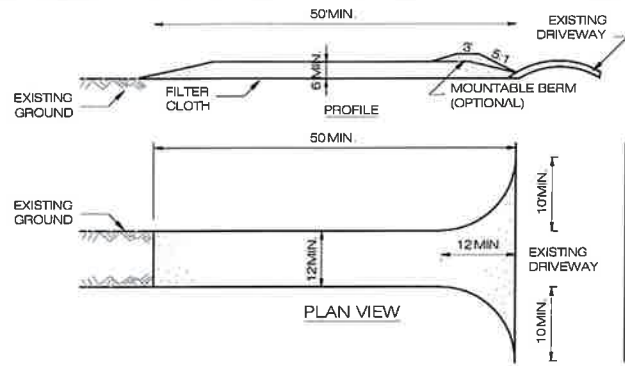
Sp = INSIDE PIPE DIAMETER
La = LENGTH OF RIPRAP APRON
d = 12" MODIFIED RIPRAP
18" INTERMEDIATE RIPRAP
36" STANDARD RIPRAP

	X	W1	W2
TYPE A RIPRAP APRON	3	3Sp	3Sp + 0.7 La
TYPE B RIPRAP APRON	5	3Sp	3Sp + 0.4 La

OUTLET	SWALE WIDTH/PIPE DIAMETER Sp (FT)	APRON LENGTH La (FT)	APRON INITIAL WIDTH W1 (FT)	APRON TERMINAL WIDTH W2 (FT)	RIPRAP SPECIFICATION
C-1	1	5	3	6.5	MODIFIED

RECOMMENDED MIN. TRENCH WIDTH

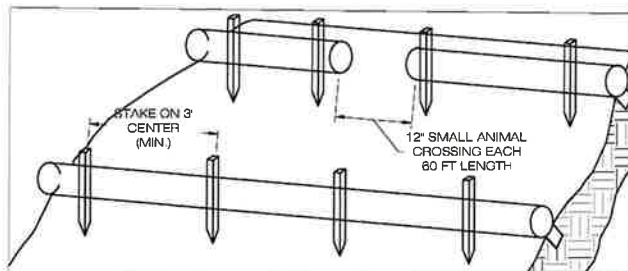
PIPE DIA.	MIN. TRENCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"



CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

1 CONSTRUCTION ENTRANCE DETAIL
C-2 SCALE: N.T.S.



1. BEGIN AT THE LOCATION WHERE THE SOCK IS TO BE INSTALLED BY EXCAVATING A 2-3' (5-7.5 CM) DEEP X 9 (22.9 CM) WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHOULD BE PLACED UP SLOPE FROM THE ANCHOR TRENCH.
2. PLACE THE SOCK IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE SOCK ON THE UP-HILL SIDE. SOCKS SHALL BE INSTALLED IN 60 FT CONTINUOUS LENGTHS WITH ADJACENT SOCKS TIGHTLY ADJUT. EVERY 60 FT THE SOCK ROW SHALL BE SPACED 12 INCHES CLEAR, END TO END, FOR AMPHIBIAN AND REPTILE TRAVEL. THE OPEN SPACES SHALL BE STAGGERED MID LENGTH OF THE NEXT DOWN GRADIENT SOCK.
3. SECURE THE SOCK WITH 18-24 (45.7-61 CM) STAKES EVERY 3-4' (0.9-1.2 M) AND WITH A STAKE ON EACH END. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE SOCK LEAVING AT LEAST 2-3' (5-7.5 CM) OF STAKE EXTENDING ABOVE THE SOCK. STAKES SHOULD BE DRIVEN PERPENDICULAR TO THE SLOPE FACE.

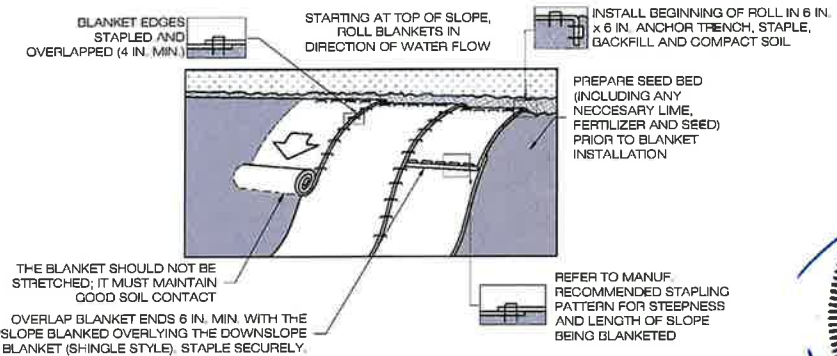
2 COMPOST FILTER SOCK SEDIMENTATION CONTROL BARRIER
C-2 SCALE: N.T.S.

EROSION CONTROL BLANKET INSTALLATION

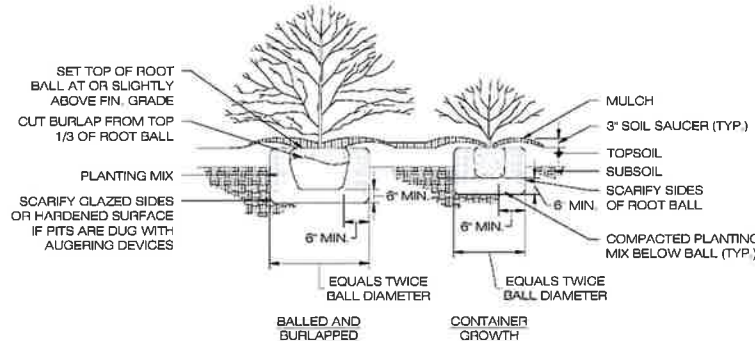
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (REPCS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE REPCS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12' OF REPCS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE REPCS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12' APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12' PORTION OF REPCS BACK OVER THE SEED AND COMPACTED SOIL. SECURE REPCS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12' APART ACROSS THE WIDTH OF THE REPCS.
3. ROLL THE REPCS DOWN HORIZONTALLY ACROSS THE SLOPE. REPCS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL REPCS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL REPCS MUST BE STAPLED WITH APPROXIMATELY 2 - 5' OVERLAP DEPENDING ON THE REPCS TYPE.
5. CONSECUTIVE REPCS SPICED DOWN THE SLOPE MUST BE END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3' OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12' APART ACROSS ENTIRE REPCS WIDTH.

NOTES:

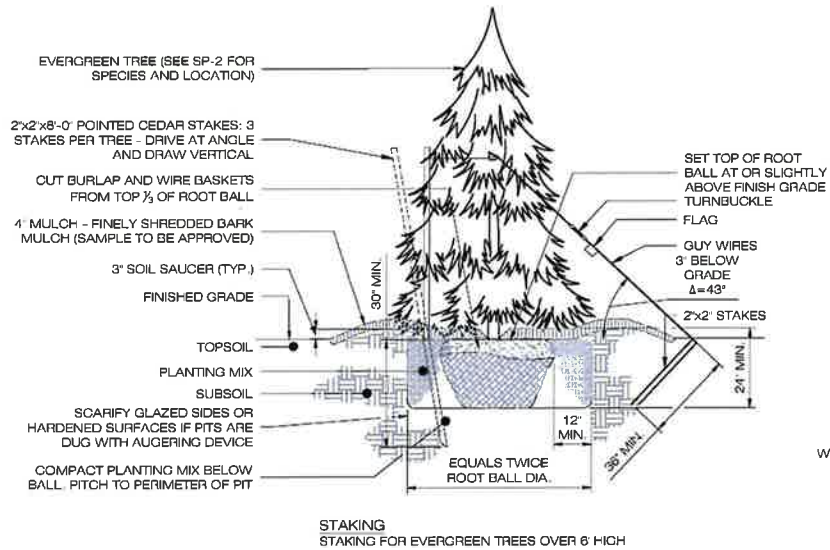
1. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.
3. BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
4. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
5. BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.



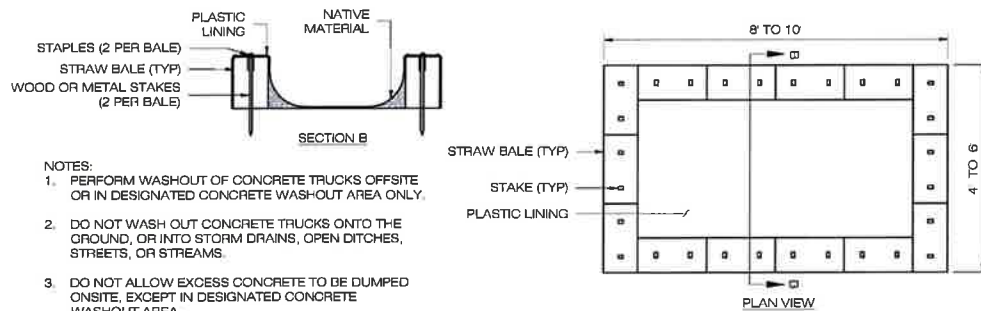
3 EROSION CONTROL BLANKET STEEP SLOPES
C-2 SCALE: N.T.S.



5 RHODODENDRON PLANTING DETAIL
C-2 SCALE: N.T.S.



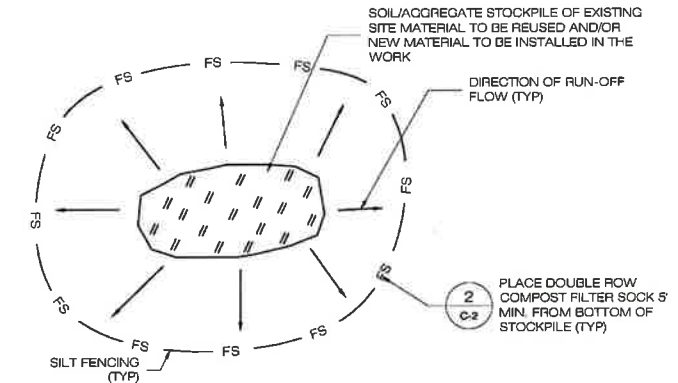
4 EVERGREEN TREE PLANTING
C-2 SCALE: N.T.S.



NOTES:

1. PERFORM WASHOUT OF CONCRETE TRUCKS OFFSITE OR IN DESIGNATED CONCRETE WASH-OUT AREA ONLY.
2. DO NOT WASH OUT CONCRETE TRUCKS ONTO THE GROUND, OR INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.
3. DO NOT ALLOW EXCESS CONCRETE TO BE DUMPED ONSITE, EXCEPT IN DESIGNATED CONCRETE WASHOUT AREA.

6 CONCRETE WASHOUT DETAIL
C-2 SCALE: N.T.S.



NOTES:

1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.
3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.
4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
5. ANY SOIL IN STOCKPILES IN EXCESS OF SEVEN (7) DAYS SHALL BE SEEDDED AND MULCHED OR COVERED.

7 TEMPORARY STOCKPILE DETAIL
C-2 SCALE: N.T.S.

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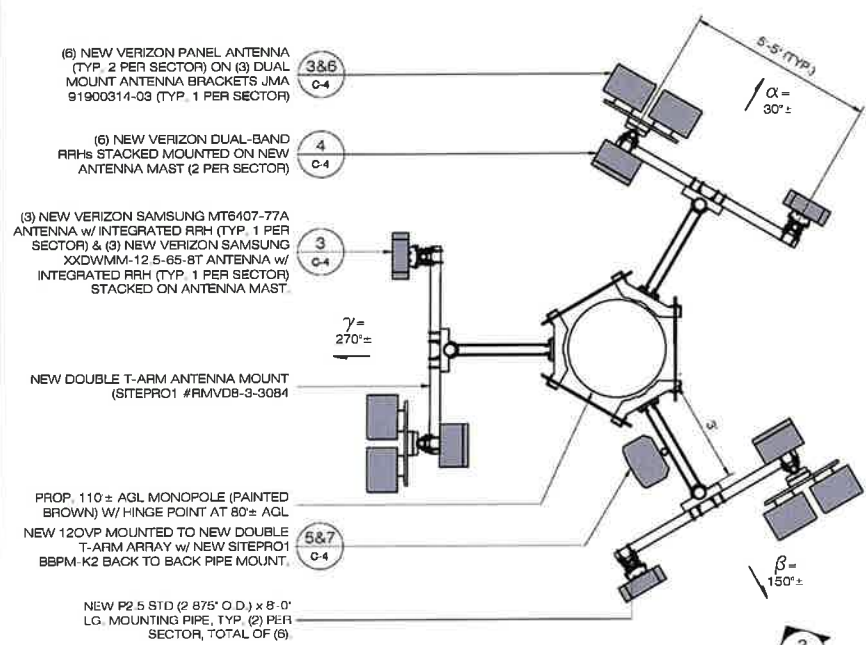
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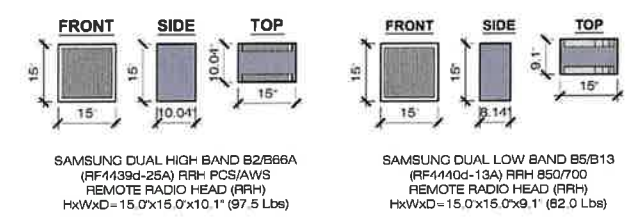
EROSION CONTROL & LANDSCAPING DETAILS

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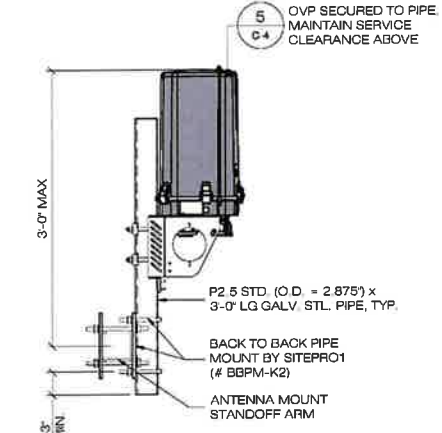
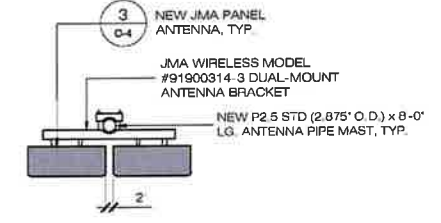
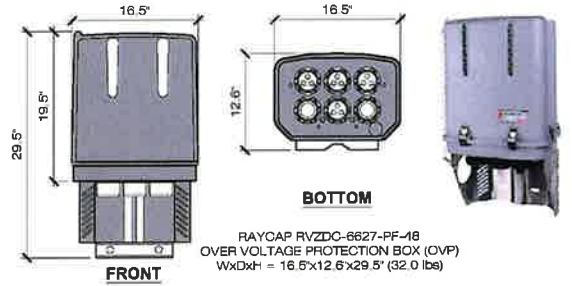
C-2



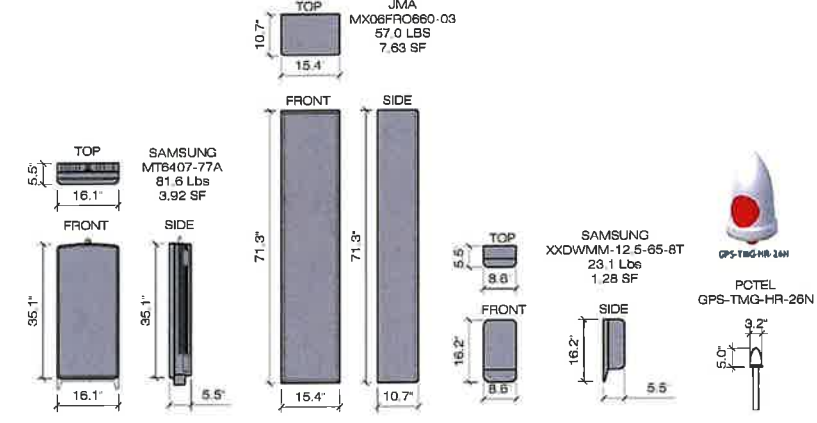
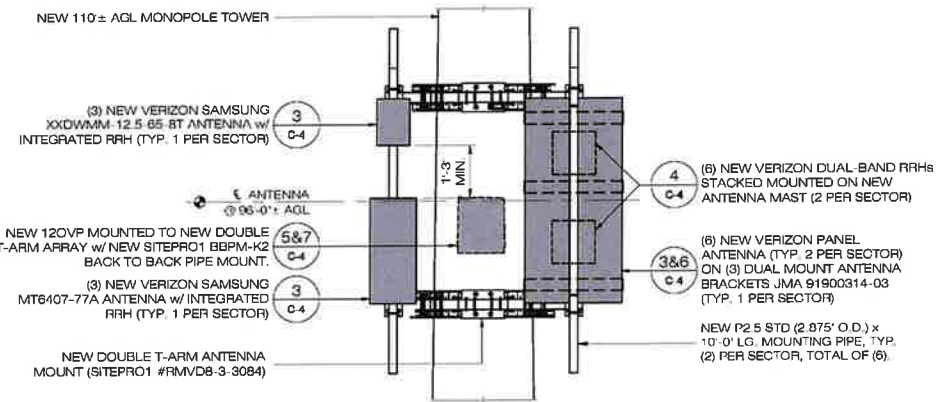
1 ANTENNA MOUNT PLAN
C-4 SCALE: 3/4" = 1'-0"



NOTE: WEIGHTS INCLUDE SOLAR SHIELD & MOUNTING BRACKET



NOTES:
1. PAINT MOUNTS, ANTENNAS, CABLING & APPURTENANCES TO MATCH TOWER. PAINT LSUBS ANTENNAS IN ACCORDANCE w/ MANUFACTURERS INSTALLATION REQUIREMENTS, VERIZON CONSTRUCTION MANAGER & OWNER.



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ALL-POINTS
TECHNOLOGY CORPORATION

567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860) 463-1697
WWW.ALLPOINTSTECH.COM FAX: (860) 463-6935

D&M DOCUMENTS

NO	DATE	REVISION
0	09/07/22	FOR REVIEW: RCB
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

DEVELOPER: HOMELAND TOWERS, LLC
ADDRESS: 9 HARMONY STREET 2ND FLOOR DANBURY, CT 06810

HOMELAND TOWERS NORTH BRANFORD

SITE: 222 CLINTONVILLE ROAD
ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990

DATE: 09/07/22 DRAWN BY: CSH
CHECKED BY: RCB

SHEET TITLE:
VERIZON ANTENNA PLAN & DETAILS

SHEET NUMBER:
C-4

T/ OMNI ANTENNA
 @ 134 = AGL MAX.

(1) NEW MUNICIPAL 24 OMNI ANTENNA (dbSpectra MODEL DS7C09P36D-D, AS7C09P36D2D & DS7C09P36D6D) ON 4' STANDOFF ARM. ANTENNA IS NOT TO BE PAINTED.

3
C-5

T/ OMNI ANTENNA
 @ 124 = AGL MAX.

(1) NEW MUNICIPAL 14' OMNI ANTENNA (dbSpectra MODELS DS7C09P36U-SERIES) ON 4' STANDOFF ARM. ANTENNA IS NOT TO BE PAINTED.

2
C-5

(2) NEW 8' STANDOFF ARM (SITEPRO1 P/N MM01 - PAINTED WHITE SMOKE) (TYP.)

NEW P2.5 STD. (O.D. = 2.875) x 5'-0" LG MAST (PAINTED "WHITE SMOKE") (TYP., 4PL)

NEW WELDED PIPE CLAMP SET (SITEPRO1 P/N SCP10W - PAINTED WHITE SMOKE) (TYP.)

NEW 6' SIDE ARM (SITEPRO1 P/N HS6-K - PAINTED WHITE SMOKE) (TYP.)

(2) NEW QUAD UNIVERSAL RING MOUNT (SITEPRO1 P/N UQB4 - PAINTED WHITE SMOKE)

NEW 110 = ACL TOWER W/ HINGE POINT AT 80 = AGL (PAINTED BROWN)

1 MUNICIPAL ANTENNA MOUNT
 C-5 SCALE: 1/2" = 1'-0"

CL/ NEW ANTENNA MOUNT
 @ 108 = AGL

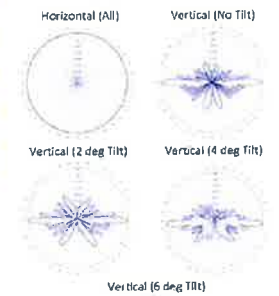
dbSpectra
 Always a Better Value

700/800 MHz Antenna - Omnidirectional, Low-PIM/Hi-PIP, 8.8 dBd
 Models DS7C09P36U-Series Antennas

Specifications	
Design Type	True Corporate Feed
Frequency Range	764-869 MHz
Passive Intermodulation - PIM (2 x 20W sources)	-150 dBc, 3 rd Order
Bandwidth	105 MHz
Gain (average over BW)	8.8 dBd
Configuration	Single antenna
Beam Tilt (electrical downtilt)	(α) = . . 2, 3, 4, or 6 degrees
Vertical Beamwidth (E-Plane) typ.	6.2°
Impedance	50 ohms
VSWR / Return Loss	1.5:1 / 14 dB (min.)
Average Power Rating	500 W
Peak Instantaneous Power	25 kW
Polarization	Vertical
Lightning Protection	Direct Ground
Connector	DS7C09P36U(x)D 7/16 DIN (F)
DS7C09P36U(x)M 4.3-10 (F)	
Equivalent Flat-Plate Area	2.35 sq. ft.
Lateral Windload Thrust @100mph	95 lbf.
Rated Wind Speed	175 mph (without ice) 140 mph (with 1/2" radial ice)
Total Length	14.2 feet
Mounting Mast Length	35 inches
Mounting Hardware (included)	DSH3V3N
Mast O.D.	2.5 inches
Radome color	Horizon Blue
Radome O.D.	3.0 inches
Weight, antenna, and hardware	68 lbs.
Shipping Weight	84 lbs.
Invertibility	Antennas are not invertible. For invertible tilt options contact dbSpectra at tech@dbSpectra.com
Ordering Information	1. Replace (x) in model number with beam tilt options.
DS7C09P36U(x)D - 7/16 DIN Connector	2. " " in the beam tilt options represents 0° down-tilt.
DS7C09P36U(x)M - 4.3-10 Connector	



Features and Benefits
 Tested to stringent Peak Instantaneous Power (PIP) levels of 25 kW using dbSpectra's multi-channel P25 PIP test bed. High PIP level is demanded by today's digital systems.
 PIM-rated Design - 3rd-Order performance better than -150 dBc!
 Sturdy Construction - Heavy wall fiberglass radome minimizes tip deflection.
 Excellent Lightning Protection - heavy internal conductor DC ground.



2 14' OMNI ANTENNA
 C-5 SCALE: NTS

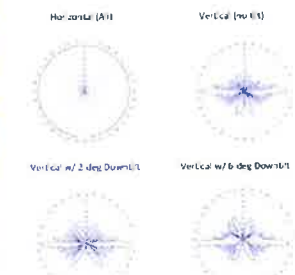
dbSpectra
 Always a Better Value

700/800 MHz DUAL Antenna, Low-PIM, Hi-PIP, 9 dBd
 Models DS7C09P36D-D, DS7C09P36D2D, and DS7C09P36D6D

Specifications	
Design Type	True Corporate Feed/Dual
Frequency Range	764-869 MHz
Passive Intermodulation - PIM (2 x 20W)	-150 dBc, 3 rd Order
Bandwidth	105 MHz
Gain - dBd (average over BW)	9.0 dBd (lower antenna) 8.7 dBd (top antenna)
Isolation (typical)	45 dB
Beam Tilt (electrical downtilt)	0° (none), 2°, or 6°
Vertical Beamwidth (E-Plane) typ.	6°
Impedance - Ohms	50
VSWR / Return Loss - dB	1.5:1 / 14 dB (min.)
Average Power Rating	500 W (each antenna)
Peak Instantaneous Power	25 kW (each antenna)
Polarization	Vertical
Lightning Protection	Direct Ground
Connector	7/16 DIN female (x2)
Equivalent Flat-Plate Area	4.8 sq. ft.
Lateral Windload Thrust @100mph	179 lbf.
Rated Wind Speed	125 mph (without ice)
Total Length	24 feet
Mounting Mast Length	35 inches
Mounting Hardware (included)	DSH-3V4N (No Torsion)
Mast O.D.	3.5 inches
Radome color	Horizon Blue
Weight (approx.)	82 lbs.
Shipping Weight (approx.)	105 lbs.
Configuration: Dual	"Two antennas in one"



Features and Benefits
 Dual-antenna configuration saves overall cost - allows two antennas in one tower slot!
 High RF isolation between the independent antennas provides greater system performance and interference protection.
 Tested to stringent Peak Instantaneous Power (PIP) levels of 25 kW using dbSpectra's 12-channel P25 PIP test bed. High PIP level is demanded by today's digital systems.
 PIM Rated Design - better than -150 dBc.



3 24' OMNI ANTENNA
 C-5 SCALE: NTS

HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2nd FLOOR
 DANBURY, CT 06810
 (203) 297-6345

Celco Partnership d/b/a
verizon
 WIRELESS

20 ALEXANDER DRIVE
 WALLINGFORD, CT 06492

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MUNICIPAL ANTENNA
 PLAN & DETAILS

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C-5

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

- THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF NORTH BRANFORD AND/OR PERMITTEE. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.
- THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONSTRUCTED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPPP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.
- A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.
- THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANNER.
- THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.
- ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN). SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.
- PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.
- CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI-TRACKING PADS PRIOR TO EXITING.
- ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, BARRIERS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.
- NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.
- DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAN AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.
- THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUDDISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.
- MINIMIZE LAND DISTURBANCE. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKLIFIER.
- SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.
- VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION. IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.
- MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.
- SEEDING MIXTURES SHALL BE NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX, OR APPROVED EQUAL BY OWNER.

SEDIMENT & EROSION CONTROL NARRATIVE

- THE PROJECT INCLUDES THE INSTALLATION OF A 110 ± AGL MONOPOLE WITH ASSOCIATED GROUND MOUNTED EQUIPMENT. ALL DISTURBED AREAS ARE TO BE SEEDED AND STABILIZED PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT.

THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

 - CONSTRUCTION OF 110 ± AGL MONOPOLE.
 - CONSTRUCTION OF IRREGULARLY SHAPED (4,061 ± SF) FENCED EQUIPMENT COMPOUND W/ GRAVEL SURFACE TREATMENT AND ASSOCIATED UTILITIES.
 - CONSTRUCTION OF 840 ± 12' WIDE GRAVEL ACCESS DRIVE.
 - CONSTRUCTION OF 10x11' CONCRETE EQUIPMENT PAD, 4x16' CONCRETE EQUIPMENT PAD WITH 1,000 GALLON PROPANE TANK.
 - THE STABILIZATION OF PERVIOUSLY DISTURBED AREAS WITH PERMANENT GRASS TREATMENTS.
- FOR THIS PROJECT, THERE ARE APPROXIMATELY 40,500 ± SF OF THE SITE BEING DISTURBED.
- A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED FOR THIS PROJECT AND WILL BE AVAILABLE UNDER SEPARATE COVER.
- IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 12 WEEKS.
- TREE CLEARING WILL NOT BE ALLOWED BETWEEN APRIL 1 AND OCTOBER 1.
- REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.
- MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.
- DETAILS FOR THE TEMPORARY EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON PLAN SHEET C-2 OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.
- CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION ARE:
 - STAGED CONSTRUCTION;
 - MINIMIZE THE DISTURBED AREAS DURING CONSTRUCTION;
 - STABILIZE DISTURBED AREAS AS SOON AS POSSIBLE WITH TEMPORARY OR PERMANENT MEASURES;
 - MINIMIZE IMPETUOUS AREAS;
 - UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

SUGGESTED CONSTRUCTION SEQUENCE

THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE. THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS, CONTRACTOR TO HIRE SURVEYOR FOR PROJECT STAKEOUT AS NEEDED THROUGHOUT CONSTRUCTION ACTIVITIES. CONSTRUCTION OF THE FACILITY WILL ONLY TAKE PLACE BETWEEN THE HOURS OF 8:00 A.M. AND 5:00 P.M., MONDAY THROUGH FRIDAY.

- CONTACT THE OWNER TO SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE TREES TO BE REMOVED IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.
- CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNER REPRESENTATIVES, THE GENERAL CONTRACTOR, DESIGNATED SUB CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.
- NOTIFY THE OWNER AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT, NOTIFY CALL BEFORE YOU DIG CONNECTICUT AT (800) 922-4455.
- CLEAR AND GRUB AS REQUIRED, TO INSTALL THE PERIMETER EROSION AND SEDIMENTATION CONTROL MEASURES AND, IF APPLICABLE, TREE PROTECTION.
- INSTALL CONSTRUCTION ENTRANCE.
- PERFORM THE REMAINING CLEARING AND GRUBBING AS NECESSARY. REMOVE CUT WOOD AND STUMPS, CHIP DRUSH AND STOCKPILE FOR FUTURE USE OR REMOVE OFF-SITE. REMOVE AND DISPOSE OF DEMOLITION DEBRIS OFF-SITE. TREE CLEARING IS PROHIBITED BETWEEN APRIL 1 AND OCTOBER 1.
- TEMPORARILY SEED DISTURBED AREAS NOT UNDER CONSTRUCTION FOR THIRTY (30) DAYS OR MORE.
- EXCAVATE AND GRADE NEW ACCESS DRIVE & DRAINAGE PIPE.
- EXCAVATE AND ROUGH GRADE EQUIPMENT COMPOUND.
- EXCAVATE FOR TOWER FOUNDATION & EQUIPMENT PADS.
- FINALIZE ACCESS ROAD GRADE.
- PREPARE SUBGRADE AND INSTALL FORWS, STEEL REINFORCING, & CONCRETE FOR TOWER FOUNDATION & EQUIPMENT PADS.
- INSTALL BURIED GROUND RINGS, GROUND RODS, GROUND LEADS, UTILITY CONDUITS & UTILITY EQUIPMENT.
- BACKFILL TOWER FOUNDATION.
- ERECT MONOPOLE.
- INSTALL TELECOMMUNICATIONS EQUIPMENT ON TOWER & COMPOUND.
- INSTALL COMPOUND GRAVEL SURFACES.
- FINALIZE GRADES, INSTALL GRAVEL SURFACES.
- INSTALL FENCING.
- CONNECT GROUNDING LEADS & LIGHTNING PROTECTION.
- FINAL GRADE AROUND COMPOUND.
- LOAM & SEED DISTURBED AREAS OUTSIDE COMPOUND, AS REQUIRED.
- TEST ALL NEW EQUIPMENT.
- AFTER THE SITE IS STABILIZED AND WITH THE APPROVAL OF THE OWNER, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS.
- PERFORM FINAL PROJECT CLEANUP.

THE ESTIMATED TIME FOR THE COMPLETION OF THE WORK IS APPROXIMATELY TWELVE (12) WEEKS. THE EXACT PROCESS MAY VARY DEPENDING ON THE CONTRACTORS & SUBCONTRACTORS AVAILABILITY TO COMPLETE WORK & WEATHER DELAYS.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

EAS MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
CONSTRUCTION ENTRANCE	DAILY	PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT.
HAY BALES	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE BALE.
SILT FENCE/FILTER SOCKS	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
SILT SACKS	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE SACK.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
WATER BARS	DAILY	REPAIR/RESHAPE AS NECESSARY. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE WATER BAR.
TEMPORARY DIVERSION DITCHES	DAILY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/RESHAPE AS NECESSARY. REVIEW CONDITIONS IF REPETITIVE FAILURES OCCUR.
TEMPORARY SEDIMENT TRAPS/BASINS	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REMOVE SEDIMENT WHEN IT REACHES 1/2 OF THE MINIMUM REQUIRED WET STORAGE VOLUME.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002
 PHONE: 413-548-8000 FAX 413-549-4000
 EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM
 New England Semi-Shade Grass and Forbs Mix

Botanical Name	Common Name	Indicator
<i>Elymus virginicus</i>	Virginia Wild Rye	FACW-
<i>Elymus canadensis</i>	Canada Wild Rye	FACU+
<i>Festuca rubra</i>	Red Fescue	FACU
<i>Chamaecrista fasciculata</i>	Partridge Pea	FACU
<i>Latris spicata</i>	Spiked Gayfeather/Marsh Blazing Star	FAC+
<i>Onoclea sensibilis</i>	Sensitive Fern	FACW
<i>Aster prenanthoides (Symphytrichum prenanthoides)</i>	Zigzag Aster	FAC
<i>Eupatorium fistulosum (Erechtium fistulosum)</i>	Hollow-Stem Joe Pye Weed	FACW
<i>Eupatorium perfoliatum</i>	Boneset	FACW
<i>Juncus tenuis</i>	Path Rush	FAC

PRICE PER LB. \$87.00 MIN QUANTITY 1 LBS. TOTAL: \$87.00 APPLY: 30 LBS/ACRE -1450 sq ft/lb
 The New England Semi Shade Grass & Forb Mix contains a broad spectrum of native grasses and forbs that will tolerate semi-shade and edge conditions. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a Spring seeding. Late Spring and early Summer seeding will benefit with a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering will be required. Late Fall and Winter dormant seeding require an increase in the seeding rate. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free seed bed is necessary for optimal results.
 New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability, the design criteria and ecological function of the mix will remain unchanged. Price is 5/bulk pound, FOB warehouse, Plus SH and applicable taxes.

HOMELAND TOWERS, LLC
 9 HARMONY STREET
 2nd FLOOR
 DANBURY, CT 06810
 (203) 297-6345

Cellco Partnership d/b/a
verizon
 WIRELESS

20 ALEXANDER DRIVE
 WALLINGFORD, CT 06492

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567 VALUXHALL STREET EXTENSION - SUITE 311
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
 COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
 ADDR: 587 VALUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06395

DEVELOPER: HOMELAND TOWERS, LLC
 ADDRESS: 9 HARMONY STREET 2ND FLOOR DANBURY, CT 06810

HOMELAND TOWERS
 NORTH BRANFORD

SITE 222 CLINTONVILLE ROAD
 ADDRESS: NORTHFORD, CT 06472

APT FILING NUMBER: CT283990

DATE: 09/07/22 DRAWN BY: CSB
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SHEET TITLE:
EROSION CONTROL NOTES

SHEET NUMBER:
EC-1



HOMELAND TOWERS

EXHIBIT A

(Verizon and Town of North Branford antenna and generator specifications)

MX06FRO660-03

NWAV™ X-Pol Hex-Port Antenna

X-Pol Hex-Port 6 ft 60° Fast Roll Off antenna with independent tilt on 700 & 850 MHz:

2 ports 698-798, 824-894 MHz and 4 ports 1695-2180 MHz

- Fast Roll Off (FRO™) azimuth beam pattern improves Intra- and Inter-cell SINR
- Compatible with dual band 700/850 MHz radios with independent low band EDT without external diplexers
- Fully integrated (iRETs) with independent RET control for low and high bands for ease of network optimization
- SON-Ready array spacing supports beamforming capabilities
- Suitable for LTE/CDMA/PCS/UMTS/GSM air interface technologies
- Integrated Smart Bias-Ts reduce leasing costs



Fast Roll-Off antennas increase data throughput without compromising coverage

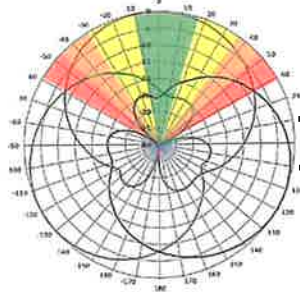
The horizontal beam produced by Fast Roll-Off (FRO) technology increases the Signal to Interference & Noise Ratio (SINR) by eliminating overlap between sectors.

Non-FRO antenna

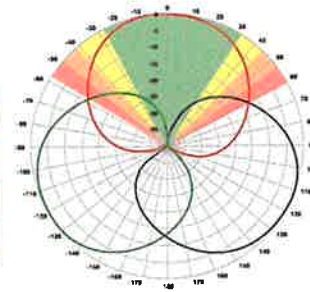
Large traditional antenna pattern overlap creates harmful interference.

JMA FRO antenna

JMA's FRO antenna pattern minimizes overlap, thereby minimizing interference.



LTE throughput	SINR	Speed (bps/Hz)	Speed increase	CQI
Excellent	>18	>4.5	333+%	8-10
Good	15-18	3.3-4.5	277%	6-7
Fair	10-15	2-3.3	163%	4-6
Poor	<10	<2	0%	1-3

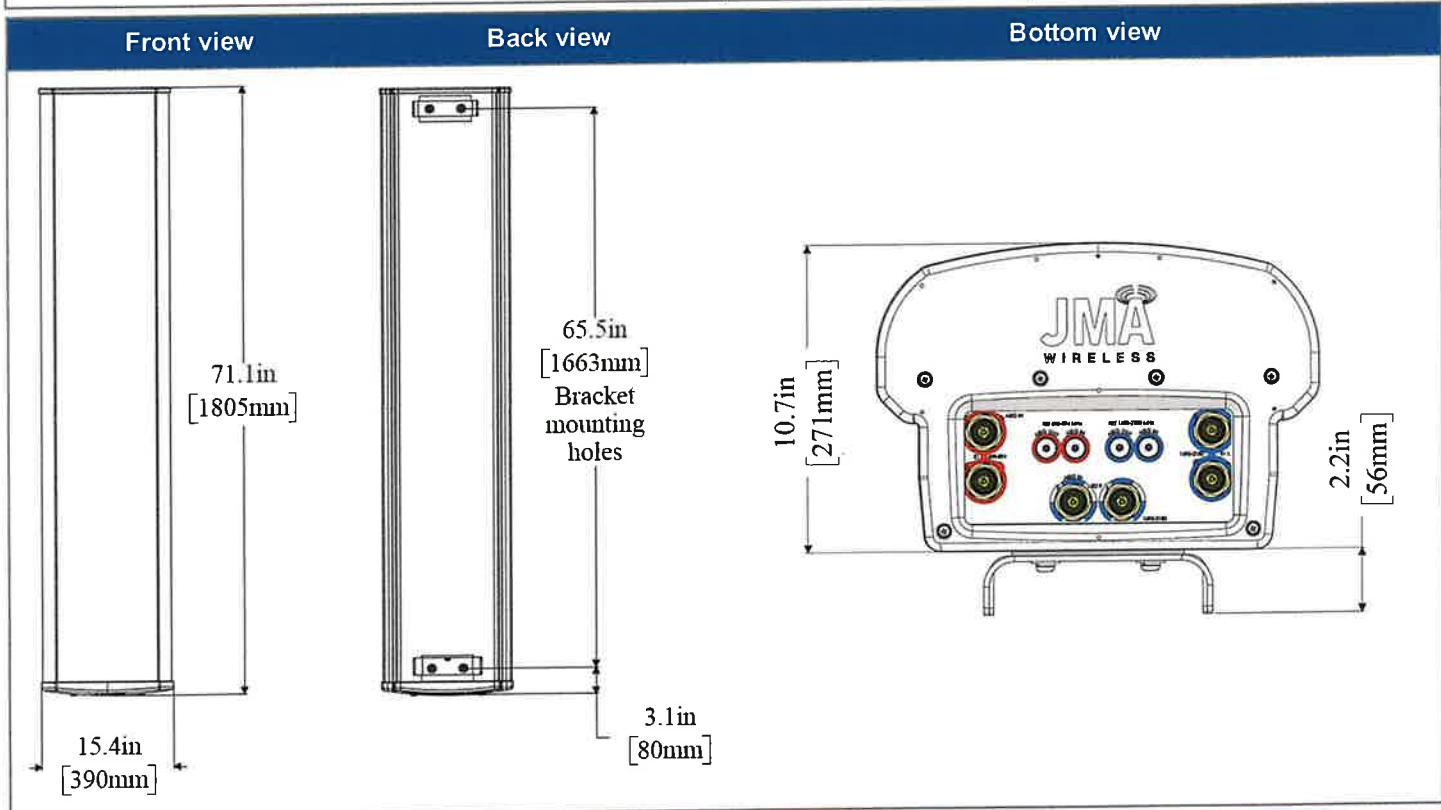


The LTE radio automatically selects the best throughput based on measured SINR.

Electrical specification (minimum/maximum)	Ports 1, 2		Ports 3, 4, 5, 6		
	698-798	824-894	1695-1880	1850-1990	1920-2180
Frequency bands, MHz	698-798	824-894	1695-1880	1850-1990	1920-2180
Polarization	± 45°		± 45°		
Average gain over all tilts, dBi	14.4	14.0	17.6	18.0	18.2
Horizontal beamwidth (HBW), degrees	60.5	53.0	55.0	55.0	55.5
Front-to-back ratio, co-polar power @180°± 30°, dB	>24	>24.0	>25.0	>25.0	>25.0
X-Pol discrimination (CPR) at boresight, dB	>15.0	>14.2	>18	>18	>15
Sector power ratio, percent	<3.5	<3.0	<3.7	<3.8	<3.6
Vertical beamwidth (VBW), degrees ¹	13.1	11.8	6.0	5.5	5.5
Electrical downtilt (EDT) range, degrees	2-14	2-14	0-9		
First upper side lobe (USLS) suppression, dB ¹	≤-15.0	≤-16.5	≤-16.0	≤-16.0	≤-16.0
Cross-polar isolation, port-to-port, dB ¹	25	25	25	25	25
Max VSWR / return loss, dB	1.5:1 / -14.0		1.5:1 / -14.0		
Max passive intermodulation (PIM), 2x20W carrier, dBc	-153		-153		
Max input power per any port, watts	300		250		
Total composite power all ports, watts	1500				

¹ Typical value over frequency and tilt

Mechanical specifications	
Dimensions height/width/depth, inches (mm)	71.3/ 15.4/ 10.7 (1811/ 392/ 273)
Shipping dimensions length/width/height, inches (mm)	82/ 20/ 15 (2083/ 508/ 381)
No. of RF input ports, connector type, and location	6 x 4.3-10 female, bottom
RF connector torque	96 lbf-in (10.85 N·m or 8 lbf-ft)
Net antenna weight, lb (kg)	60 (27.0)
Shipping weight, lb (kg)	90 (41.0)
Antenna mounting and downtilt kit included with antenna	91900318
Net weight of the mounting and downtilt kit, lb (kg)	18 (8.18)
Range of mechanical up/down tilt	-2° to 14°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal, lateral, and rear wind loading @ 150 km/h, lbf (N)	154 (685), 73 (325), 158 (703)
Equivalent flat plate @ 100 mph and Cd=2, sq ft	2.6



Ordering information	
Antenna model	Description
MX06FRO660-03	6F X-Pol HEX FRO 60° independent tilt 700/850 RET, 4.3-10 & SBT
Optional accessories	
AISG cables	M/F cables for AISG connections
PCU-1000 RET controller	Stand-alone controller for RET control and configurations

Remote electrical tilt (RET 1000) information

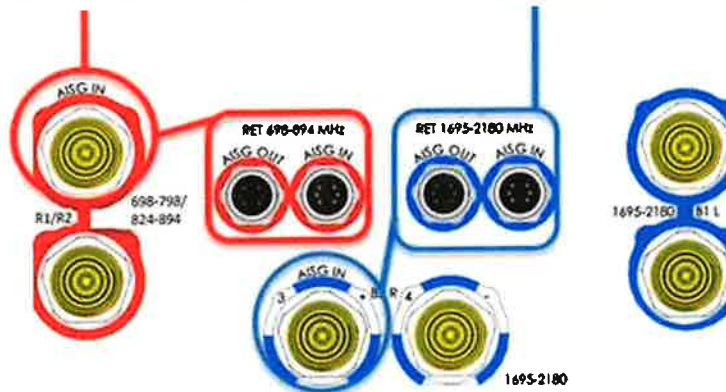
RET location	Integrated into antenna
RET interface connector type	8-pin AISG connector per IEC 60130-9
RET connector torque	Min 0.5 N·m to max 1.0 N·m (hand pressure & finger tight)
RET interface connector quantity	2 pairs of AISG male/female connectors
RET interface connector location	Bottom of the antenna
Total no. of internal RETs (low bands)	2
Total no. of internal RETs (high bands)	1
RET input operating voltage, vdc	10-30
RET max power consumption, idle state, W	≤ 2.0
RET max power consumption, normal operating conditions, W	≤ 13.0
RET communication protocol	AISG 2.0 / 3GPP

RET and RF connector topology

Each RET device can be controlled either via the designated external AISG connector or RF port as shown below:

RET device	Band	RF port
R1	698-798	1-2
R2	824-894	1-2

RET device	Band	RF port
B1/B2	1695-2180	3-6

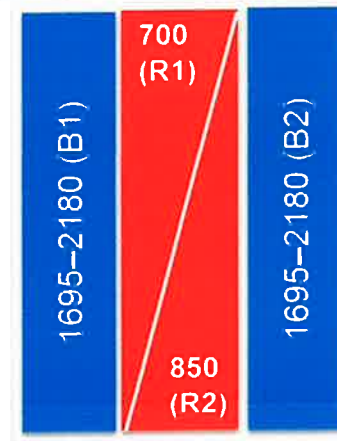


Array topology

3 sets of radiating arrays

R1/R2: 698-894 MHz
 B1: 1695-2180 MHz
 B2: 1695-2180 MHz

Band	RF port
1695-2180	3-4
698-894	1-2
1695-2180	5-6



700/800 MHz Antenna - Omnidirectional, Low-PIM/Hi-PIP, 8.8 dBd

Models DS7C09P36U-Series Antennas

Specifications	
Design Type	True Corporate Feed
Frequency Range	764-869 MHz
Passive Intermodulation – PIM (2 x 20W sources)	-150 dBc, 3 rd Order
Bandwidth	105 MHz
Gain (average over BW)	8.8 dBd
Configuration	Single antenna
Beam Tilt (electrical downtilt)	(x) = -, 2, 3, 4, or 6 degrees
Vertical Beamwidth (E-Plane) typ.	6.2°
Impedance	50 ohms
VSWR / Return Loss	1.5:1 / 14 dB (min.)
Average Power Rating	500 W
Peak Instantaneous Power	25 kW
Polarization	Vertical
Lightning Protection	Direct Ground
Connector	
DS7C09P36U(x)D	7/16 DIN (F)
DS7C09P36U(x)M	4.3-10 (F)
Equivalent Flat-Plate Area	2.35 sq. ft.
Lateral Windload Thrust @100mph	99 lbf.
Rated Wind Speed	175 mph (without ice) 149 mph (with ½" radial ice)
Total Length	14.2 feet
Mounting Mast Length	35 inches
Mounting Hardware (included)	DSH3V3N
Mast O.D.	2.5 inches
Radome color	Horizon Blue
Radome O.D.	3.0 inches
Weight, antenna, and hardware	68 lbs.
Shipping Weight	84 lbs.
Invertibility	Antennas are not invertible. For invertible tilt options contact dbSpectra at tech@dbspectra.com
Ordering Information	
DS7C09P36U(x)D – 7/16 DIN Connector	1. Replace (x) in model number with Beam Tilt options.
DS7C09P36U(x)M – 4.3-10 Connector	2. "-" in the beam-tilt options represents 0° down-tilt.



Features and Benefits

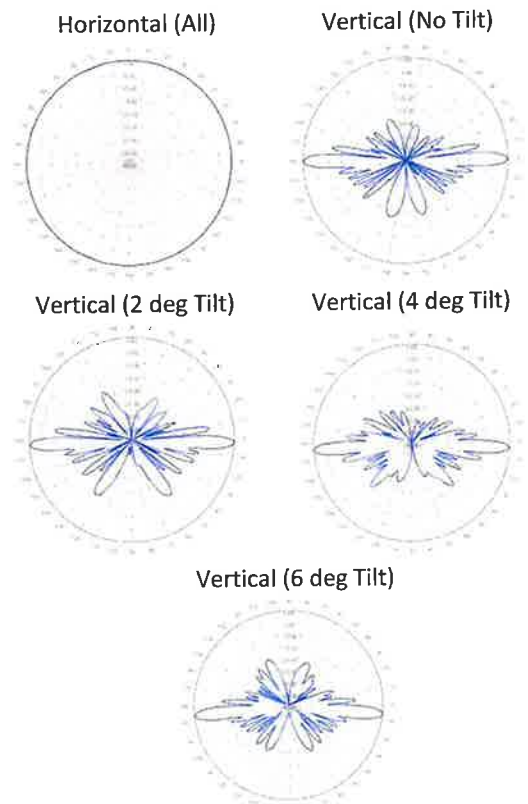
Tested to stringent Peak Instantaneous Power (PIP) levels of 25 KW using dbSpectra's multi-channel P25 PIP test bed. High PIP level is demanded by today's digital systems.

PIM-rated Design – 3rd-Order performance better than -150 dBc!

Sturdy Construction – Heavy-wall fiberglass radome minimizes tip deflection.

Excellent Lightning Protection – heavy internal conductor DC ground.

Radiation Patterns:



700/800 MHz DUAL Antenna, Low-PIM, Hi-PIP, 9 dBd Models DS7C09P36D-D, DS7C09P36D2D, and DS7C09P36D6D

Specifications	
Design Type	True Corporate Feed/Dual
Frequency Range	764-869 MHz
Passive Intermodulation – PIM (2 x 20W)	-150 dBc, 3 rd Order
Bandwidth	105 MHz
Gain - dBd (average over BW)	9.0 dBd (lower antenna) 8.7 dBd (top antenna)
Isolation (typical)	45 dB
Beam Tilt (electrical downtilt)	0° (none), 2°, or 6°
Vertical Beamwidth (E-Plane) typ.	6°
Impedance -- Ohms	50
VSWR / Return Loss -- dB	1.5:1 / 14 dB (min.)
Average Power Rating	500 W (each antenna)
Peak Instantaneous Power	25 kW (each antenna)
Polarization	Vertical
Lightning Protection	Direct Ground
Connector	7/16 DIN female (x2)
Equivalent Flat-Plate Area	4.8 sq. ft.
Lateral Windload Thrust @100mph	179 lbf.
Rated Wind Speed	125 mph (without ice)
Total Length	24 feet
Mounting Mast Length	35 inches
Mounting Hardware (included)	DSH-3V4N (No Torsion)
Mast O.D.	3.5 inches
Radome color	Horizon Blue
Weight (approx.)	82 lbs.
Shipping Weight (approx.)	105 lbs.
Configuration: Dual, "Two antennas in one"	



Features and Benefits

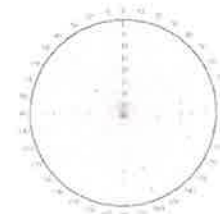
Dual-antenna configuration saves overall cost – allows two antennas in one tower slot!

High RF isolation between the independent antennas provides greater system performance and interference protection.

Tested to stringent Peak Instantaneous Power (PIP) levels of 25 KW using dbSpectra's 12-channel P25 PIP test bed. High PIP level is demanded by today's digital systems.

PIM Rated Design – better than -150 dBc.

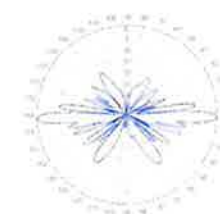
Horizontal (All)



Vertical (no tilt)



Vertical w/ 2-deg Downtilt



Vertical w/ 6-deg Downtilt



SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER
FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4440d-13A



Homepage
samsungnetworks.com

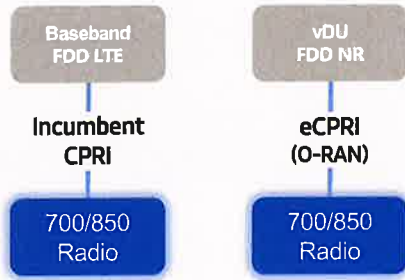


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

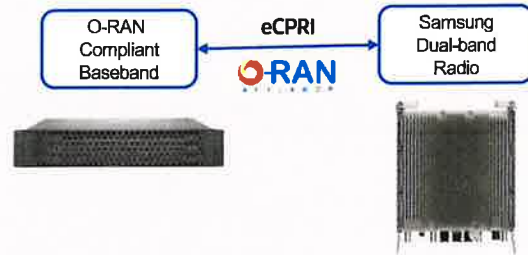
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

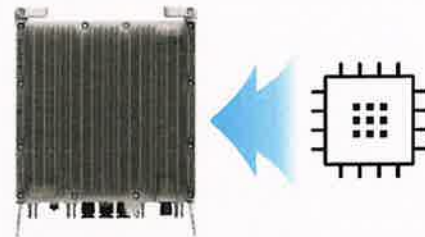
The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.



Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb

SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER
FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4439d-25A



Homepage
samsungnetworks.com

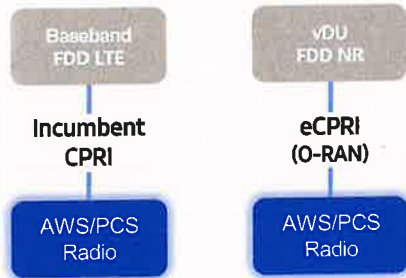


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

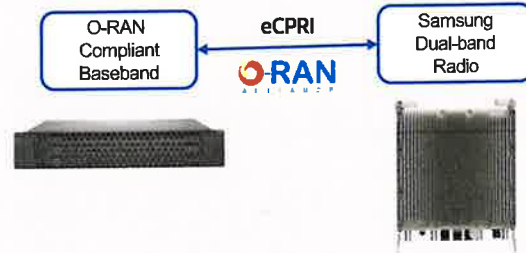
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

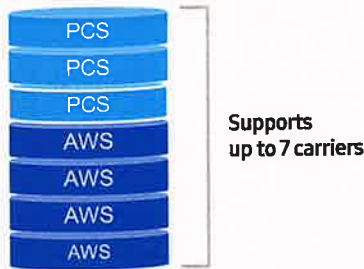
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



+

- 2 FH connectivity
- O-RAN capability
- More carriers and spectrum

Same as an incumbent radio volume

Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

KOHLER.

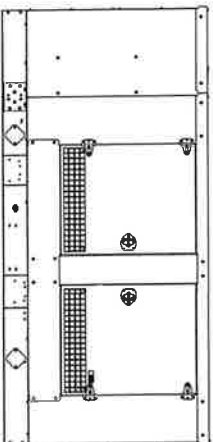
Model: KG80R

208-480 V Gas

09001 EPA-Certified for Stationary
KOHLER Emergency Applications
NATIONALLY REGISTERED

Ratings Range

Standby: 60 Hz
KW 63-80
KVA 63-100



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- CSA approval is available.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The generator set accepts rated load in one step.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
 - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator.
 - The brushless, rotating-field alternator has broadrange reconneability.
- Other features:
 - Kohler® APM402 controller. See controller features on page 3.
 - The electronic, isochronous governor incorporates an integrated drive-by-wire throttle body actuator delivering precise frequency regulation.
- Quick-ship (QS) models with selected features and a five-year basic limited warranty are available. See your Kohler distributor for details.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	Natural Gas 130° C Rise		LP Gas 130° C Rise	
				Standby Rating kW/kVA	Amps	Standby Rating kW/kVA	Amps
4P10X	120/208	3	60	77/96	267	77/96	267
	127/220	3	60	80/100	263	80/100	263
	120/240	3	60	77/96	231	77/96	231
	120/240	1	60	63/63	263	63/63	263
	139/240*	3	60	80/100	241	80/100	241
	220/380*	3	60	70/88	134	70/88	134
4R9X	277/480	3	60	80/100	121	80/100	121
	120/208	3	60	80/100	278	80/100	278
	127/220	3	60	80/100	263	80/100	263
	120/240	3	60	80/100	241	80/100	241
	120/240	1	60	77/77	321	77/77	321
	139/240*	3	60	80/100	241	80/100	241
4T9X	220/380*	3	60	80/100	152	80/100	152
	270/480	3	60	80/100	121	80/100	121
	120/240	1	60	80/80	334	80/80	334

* Voltage configuration not available from the factory. Field-adjustable by an authorized service technician.

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Ratings: The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO 8528-1 and ISO 3046-1. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition details. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. For dual fuel engines, use the natural gas ratings for both the primary and secondary fuels.

Alternator Specifications

Specifications		Alternator
Manufacturer		Kohler
Type		4-Pole, Rotating-Field
Exciter type		Brushless, Rare-Earth Permanent Magnet
Leads: quantity, type		12, Reconnectable
4PX, 4PX		4, 120/240 V
4TX		Solid State, Volts/Hz
Voltage regulator		NEMA MG1
Insulation:		Class H
Material		130°C, Standby
Temperature rise		1, Sealed
Bearing: quantity, type		Flexible Disc
Coupling		Full
Amortisseur windings		±0.5%
Voltage regulation, no-load to full-load		100% of Rating
One-step load acceptance		100% of Rated Standby Current
Unbalanced load capability		(35% dip for voltages below)
Peak motor starting kVA:		275 (60 Hz)
480 V		4P10X (12 lead)
490 V		4R9X (12 lead)
240 V		237 (60 Hz)
		4T9X (4 lead)

- Total harmonic distortion (THD) from no load to full load with a linear load is less than 3.2%.
- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and drip-proof construction.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.

Application Data

Engine

Engine Specifications		60 Hz
Manufacturer		Kohler
Engine: model, type		KG6208TSD 6.2L Turbocharged, Aftercooled KG6208TSC* 6.2 L Turbocharged, Aftercooled V-8
Cylinder arrangement		8.2 (378)
Displacement, L (cu. in.)		101.6 x 95.25 (4.00 x 3.75)
Bore and stroke, mm (in.)		9.8:1
Compression ratio		1800
Rated rpm		99.6 (126)
Max. power at rated rpm, kW (HP)		94.6 (127)
Natural Gas		Cast Aluminum
LP Gas		Cast Iron
Cylinder head material		Forged Steel
Piston type and material		Electronic
Crankshaft material		Isotchronous
Valve (exhaust) material		±1.0%
Governor type		Fixed
Frequency regulation, no-load to full-load		Dry
Frequency regulation, steady state		
Air cleaner type, all models		
* KG6208TSC includes catalyst (60 Hz only).		

Exhaust

Exhaust System		60 Hz
Exhaust manifold type		Dry
Exhaust flow at rated kW, m ³ /min. (cfm)		18 (636)
Exhaust temperature at rated kW, dry exhaust, °C (°F)		715 (1319)
Maximum allowable back pressure, kPa (in. Hg)		12.5 (3.7)
Exhaust outlet size at engine hookup, mm (in.)		88.9 (3.5)

Engine Electrical

Engine Electrical System		60 Hz
Ignition system		Coil Pack
Battery charging alternator:		Negative
Ground (negative/positive)		12
Volts (DC)		130
Amperre rating		12
Starter motor rated voltage (DC)		
Battery, recommended cold cranking amps (CCA):		One, 650
Qty., rating for -18°C (0°F)		12
Battery voltage (DC)		

Fuel

Fuel System		60 Hz
Fuel type		Natural Gas, LP Gas, or Dual Fuel
Fuel supply line inlet:		1.25 NPT
Natural gas and LP gas vapor fuel supply pressure, kPa (in. H ₂ O)		1.74-2.74 (7-11)

Fuel Composition Limits *		Nat. Gas	LP Gas
Methane, % by volume		90 min.	—
Ethane, % by volume		4.0 max.	—
Propane, % by volume		1.0 max.	85 min.
Propene, % by volume		0.1 max.	5.0 max.
C ₄ and higher, % by volume		0.3 max.	2.5 max.
Sulfur, ppm mass		25 max.	
Lower heating value, MJ/m ³ (Btu/ft ³), min.		33.2 (890)	84.2 (2260)

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

Lubrication

Lubricating System		60 Hz
Type		Full Pressure
Oil pan capacity, L (qt.)		5.7 (6.0)
Oil pan capacity with filter and oil cooler, L (qt.)		8.0 (8.5)
Oil filter: quantity, type §		1. Cartridge
§ Kohler recommends the use of Kohler Genuine oil and filters.		

Cooling

Radiator System		60 Hz
Ambient temperature, °C (°F)		45 (113)
Engine jacket water capacity, L (gal.)		7.3 (1.93)
Radiator system capacity, including engine, L (gal.)		22.7 (6.0)
Engine jacket water flow, Lpm (gpm)		112.5 (29.7)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)		86.5 (3785)
Heat rejected to charge air cooler at rated kW, dry exhaust, kW (Btu/min.)		9 (512)
Water pump type		Centrifugal
Fan diameter, including blades, mm (in.)		711 (28)
Fan, kWm (HP)		7.0 (9.4)
Max. restriction of cooling air intake and discharge side of radiator, kPa (in. H ₂ O)		0.12 (0.5)

Operation Requirements

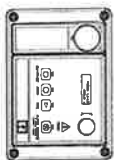
Air Requirements		60 Hz
Radiator-cooled cooling air, m ³ /min. (cfm) †		230 (8122)
Combustion air, m ³ /min. (cfm)		5.3 (187)
Heat rejected to ambient air: Engine, kW (Btu/min.) Alternator, kW (Btu/min.)		24 (1366) 8.8 (500)
† Air density = 1.20 kg/m ³ (0.075 lbm/ft ³)		

Fuel Consumption ‡		60 Hz
Natural Gas, m³/hr. (cfh) at % load		
100%		34.0 (1202)
75%		29.2 (1032)
50%		22.7 (803)
25%		14.9 (527)
LP Gas, m³/hr. (cfh) at % load		
100%		14.7 (521)
75%		11.7 (413)
50%		7.7 (272)
25%		5.2 (183)

‡ Nominal fuel ratings: Natural gas, 37 MJ/m³ (1000 Btu/ft.³)
LP vapor, 93 MJ/m³ (2500 Btu/ft.³)

LP vapor conversion factors:
8.58 ft.³ = 1 lb.
0.535 m³ = 1 kg.
36.39 ft.³ = 1 gal.

Controllers



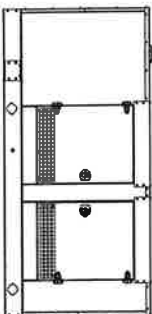
APM402 Controller

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to GE-161 for additional controller features and accessories.

Sound Enclosure



- Sound level (8 point logarithmic average) at 7 m (23 ft.), with full load: 69 dB(A).*
- Sound level compared to competitor ratings with no load: 68 dB(A).*
- Sound attenuating enclosure uses acoustic insulation that meets UL 94 HF-1 flammability classification and repels moisture absorption.
- Vertical air inlet and outlet discharge with 90 degree bends to redirect air and reduce noise.
- Internal-mounted critical silencer and flexible exhaust connector.
- Skid-mounted, steel (standard) or aluminum (optional) construction with hinged doors.
- Fade-, scratch-, and corrosion-resistant Kohler® Castlmore Power Armor™ textured E-coat paint.
- Lockable, flush-mounted door latches.
- Certified to withstand 299 kph (186 mph) wind load rating (aluminum enclosures only).
- * Lowest of 8 points measured around the generator. Sound levels at other points around generator may be higher depending on installation parameters.



KOHLER CO., Kohler, Wisconsin 53044 USA
 Phone 920-457-4441, Fax 920-459-1646
 For the nearest sales and service outlet in the
 US and Canada, phone 1-800-544-2444
 KOHLERPower.com

Standard Features

- Air Cleaner Restrictor Indicator
- Alternator Protection
- Battery Rack and Cables
- Electronic Isochronous Governor
- Gas Fuel System (includes fuel mixer, electronic secondary gas regulator, gas solenoid valve, and flexible fuel line between the engine and the skid-mounted fuel system components)
- Flexible Fuel Line (for fuel supply connection)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature
- Steel Sound Enclosure

Available Options

Approvals and Listings

- CSA Approval
- UL 2200 Listing

Enclosure

- Aluminum Sound Enclosure
- Steel or Aluminum Sound Enclosure (with enclosed critical silencer and three-way catalyst)

Fuel System

- Dual Fuel NG/LPG (automatic changeover)
- Fuel Filter Kit
- Secondary Gas Solenoid Valve (NFPA Fuel System)

Controller

- Four Input/Fifteen Output Module
- Lockable Emergency Stop
- Manual Speed Adjust
- Remote Emergency Stop
- Run Relay
- Remote Annunciator panel
- Two Input/Five Output Module

Cooling System

- Block Heater, 1500 W, 110-120 V
 - Block Heater, 1500 W, 190-240 V
- Recommended for ambient temperatures below 10°C (50°F)

Electrical System

- Battery
- Battery Charger
- Battery Charger Temperature Compensation
- Battery Heater
- Alternator Strip Heater
- Line Circuit Breaker (NEMA1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)

Miscellaneous

- Certified Test Report
- Engine Fluids (oil and coolant) Added
- Rated Power Factor Testing
- Rodent Guards

Literature

- General Maintenance
- Overhaul
- Production

Warranty

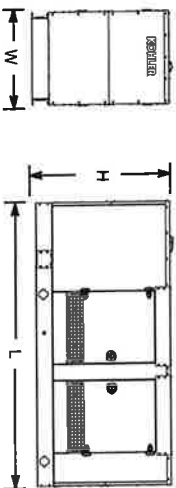
- 2-Year Basic Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty

Other Options

-
-
-
-
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-
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-
-
-

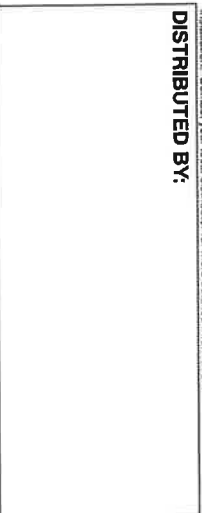
Dimensions and Weights

Overall Size, L x W x H, mm (in.) : 3525 x 1154 x 1665 (138.8 x 45.4 x 65.5)
 Weight, wet, kg (lb.): 1427 (3146)
 With steel sound enclosure
 With aluminum sound enclosure 1337 (2948)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:



KOHLER

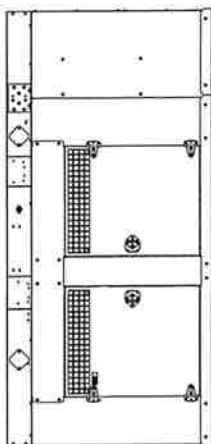
Model: KG80R

208-480 V Gas

99001 EPA-Certified for Stationary
5 KOHLER Emergency Applications
NATIONALITY REGISTERED

Ratings Range

Standby: 60 Hz
KW 63- 80
KVA 63- 100



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- CSA approval is available.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The generator set accepts rated load in one step.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
 - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator.
 - The brushless, rotating-field alternator has broadrange re-connectability.
- Other features:
 - Kohler® APM402 controller. See controller features on page 3.
 - The electronic, isochronous governor incorporates an integrated drive-by-wire throttle body actuator delivering precise frequency regulation.
- Quick-ship (QS) models with selected features and a five-year basic limited warranty are available. See your Kohler distributor for details.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	Natural Gas 130° C Rise		LP Gas 130° C Rise	
				Standby Rating kW/KVA	Amps	Standby Rating kW/KVA	Amps
4P10X	120/208	3	60	77/96	267	77/96	267
	127/220	3	60	80/100	263	80/100	263
	120/240	3	60	77/96	231	77/96	231
	120/240	1	60	63/63	263	63/63	263
	139/240*	3	60	80/100	241	80/100	241
	220/380*	3	60	70/88	134	70/88	134
4R9X	277/480	3	60	80/100	121	80/100	121
	120/208	3	60	80/100	278	80/100	278
	127/220	3	60	80/100	263	80/100	263
	120/240	3	60	80/100	241	80/100	241
	120/240	1	60	77/77	321	77/77	321
	139/240*	3	60	80/100	241	80/100	241
4T9X	220/380*	3	60	80/100	152	80/100	152
	270/480	3	60	80/100	121	80/100	121
	120/240	1	60	80/80	334	80/80	334

* Voltage configuration not available from the factory. Field-adjustable by an authorized service technician.

NOTES: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Rating: The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. Obtain technical information bulletin (TB-101) for ratings guidelines, complete ratings definitions, and site condition details. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. For dual fuel engines, use the natural gas ratings for both the primary and secondary fuels.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Rare-Earth Permanent Magnet
Leads: quantity, type	12, Reconnectable
4PX, 4FX	4, 120/240 V
4TX	Solid State, Volts/Hz
Voltage regulator	NEMA MG1
Insulation:	Class H
Material	130°C, Standby
Temperature rise	1, Sealed
Bearing: quantity, type	Flexible Disc
Coupling	Full
Amortisseur windings	±0.5%
Voltage regulation, no-load to full-load	100% of Rating
One-step load acceptance	100% of Rated Standby
Unbalanced load capability	Current
Peak motor starting kVA:	(35% dip for voltages below)
480 V	275 (60 Hz)
480 V	385 (60 Hz)
240 V	237 (60 Hz)

- Total harmonic distortion (THD) from no load to full load with a linear load is less than 3.2%.
- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and drip-proof construction.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.

Application Data

Engine

Engine Specifications	60 Hz
Manufacturer	Kohler
Engine: model, type	KG6208TSD 6.2L Turbocharged, Aftercooled KG6208TSC* 6.2L Turbocharged, Aftercooled
Cylinder arrangement	V-8
Displacement, L (cu. in.)	6.2 (378)
Bore and stroke, mm (in.)	101.6 x 95.25 (4.00 x 3.75)
Compression ratio	9.8:1
Rated rpm	1800
Max. power at rated rpm, kW (HP)	93.6 (126)
Natural Gas	94.6 (127)
LP-G	94.6 (127)
Cylinder head material	Cast Aluminum
Piston type and material	Cast Aluminum
Crankshaft material	Cast Iron
Valve (exhaust) material	Forged Steel
Governor type	Electronic
Frequency regulation, no-load to full-load	Ischronous
Frequency regulation, steady state	±1.0%
Frequency	Fixed
Air cleaner type, all models	Dry
* KG6208TSC Includes catalyst (60 Hz only).	

Exhaust

Exhaust System	60 Hz
Exhaust manifold type	Dry
Exhaust flow at rated kW, m ³ /min. (cfm)	18 (636)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	715 (1319)
Maximum allowable back pressure, kPa (in. Hg)	12.5 (3.7)
Exhaust outlet size at engine hookup, mm (in.)	88.9 (3.5)

Engine Electrical

Engine Electrical System	60 Hz
Ignition system	Coil Pack
Battery charging alternator:	Negative
Ground (negative/positive)	12
Volts (DC)	130
Amperes rating	12
Starter motor rated voltage (DC)	One, 650
Battery, recommended cold cranking amps (CCA):	12
Oil, rating for -18°C (0°F)	
Battery voltage (DC)	12

Fuel

Fuel System	60 Hz
Fuel type	Natural Gas, LP Gas, or Dual Fuel
Fuel supply line inlet	1.25 NPT
Natural gas and LP-G vapor fuel supply pressure, kPa (in. H ₂ O)	1.74-2.74 (7-11)
Fuel Composition Limits *	
Methane, % by volume	90 min.
Ethane, % by volume	4.0 max.
Propane, % by volume	1.0 max.
Propene, % by volume	0.1 max.
C ₄ and higher, % by volume	0.3 max.
Sulfur, ppm mass	25 max.
Lower heating value, MJ/m ³ (Btu/ft ³), min.	33.2 (890)
	84.2 (2260)

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

Lubrication

Lubricating System	60 Hz
Type	Full Pressure
Oil pan capacity, L (qt.)	5.7 (6.0)
Oil pan capacity with filter and oil cooler, L (qt.)	8.0 (8.5)
Oil filter: quantity, type §	1, Cartridge

§ Kohler recommends the use of Kohler Genuine oil and filters.

Cooling

Radiator System	60 Hz
Ambient temperature, °C (°F)	45 (113)
Engine jacket water capacity, L (gal.)	7.3 (1.93)
Radiator system capacity, including engine, L (gal.)	22.7 (6.0)
Engine jacket water flow, Lpm (gpm)	112.5 (29.7)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	66.5 (3785)
Heat rejected to charge air cooler at rated kW, dry exhaust, kW (Btu/min.)	9 (512)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	711 (28)
Fan, kWm (HP)	7.0 (9.4)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.12 (0.5)

Operation Requirements

Air Requirements

	60 Hz
Radiator-cooler cooling air, m ³ /min. (scfm) †	230 (8122)
Combustion air, m ³ /min. (cfm)	5.3 (187)
Heat rejected to ambient air: Engine, kW (Btu/min.)	24 (1366)
Alternator, kW (Btu/min.)	8.8 (500)
† Air density = 1.20 kg/m ³ (0.075 lbm/ft ³)	

Fuel Consumption ‡

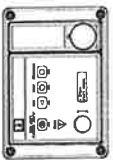
Natural Gas, m ³ /hr. (cfh) at % load	Standby Ratings	60 Hz
100%		34.0 (1202)
75%		29.2 (1032)
50%		22.7 (803)
25%		14.9 (527)
LP Gas, m ³ /hr. (cfh) at % load	Standby Ratings	
100%		14.7 (521)
75%		11.7 (413)
50%		7.7 (272)
25%		5.2 (183)

‡ Nominal fuel rating: Natural gas, 37 MJ/m³ (1000 Btu/ft³)
LP vapor, 93 MJ/m³ (2500 Btu/ft.³)

LP vapor conversion factors:

8.58 ft.³ = 1 lb.
0.535 m³ = 1 kg.
36.39 ft.³ = 1 gal.

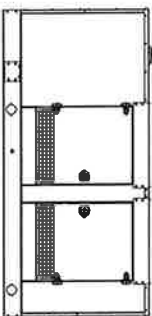
Controllers



AP4402 Controller

- Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.
- Digital display and menu control provide easy local data access
 - Measurements are selectable in metric or English units
 - Remote communication thru a PC via network or serial configuration
 - Controller supports Modbus® protocol
 - Integrated hybrid voltage regulator with ±0.5% regulation
 - Built-in alternator thermal overload protection
 - NFPA 110 Level 1 capability
- Refer to G6-161 for additional controller features and accessories.

Sound Enclosure



- Sound level (8 point logarithmic average) at 7 m (23 ft.) with full load: 69 dB(A).
 - Sound level compared to competitor ratings with no load: 68 dB(A).*
 - Sound attenuating enclosure uses acoustic insulation that meets UL 94 HF1 flammability classification and repels moisture absorption.
 - Vertical air inlet and outlet discharge with 90 degree bends to redirect air and reduce noise.
 - Internal-mounted critical silencer and flexible exhaust connector.
 - Skid-mounted, steel (standard) or aluminum (optional) construction with hinged doors.
 - Fader- scratch- and corrosion-resistant Kohler® Castmeire Power Armor™ textured e-coat paint.
 - Lockable, flush-mounted door latches.
 - Certified to withstand 299 kph (186 mph) wind load rating (aluminum enclosures only).
- * Lowest of 8 points measured around the generator. Sound levels at other points around generator may be higher depending on installation parameters.



HOMELAND TOWERS

EXHIBIT B

(Geotech and Tower/Foundation Structural)

Homeland Towers, LLC
9 Harmony Street, 2nd Floor
Danbury, Connecticut 06810

Attention: Mr. Raymond Vergati - Regional Manager
(Via email: rv@homelandtowers.us)

July 26, 2022

RE: W.O. 11542.01
GEOTECHNICAL INVESTIGATION
SITE NAME: NORTH BRANFORD
PROPOSED 110-FOOT-HIGH MONOPOLE TOWER
222 CLINTONVILLE ROAD
NORTHFORD, NEW HAVEN COUNTY, CONNECTICUT

Dear Mr. Vergati:

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. (Tectonic) has performed a subsurface investigation and geotechnical engineering analyses for the proposed monopine (monopole) tower, and RF equipment and cabinets on concrete pads, at the above referenced site. This report presents our findings and recommendations for the design and construction of the foundations for the proposed tower and appurtenances.

1.0 DESIGN CONSIDERATIONS

The proposed tower is a monopole tower structure that will be used to mount communication antennas. It is expected that the monopole tower foundation will be subjected to relatively high overturning loads, whereas static compressive loads will be modest, in comparison. The actual loads from the monopole tower are to be determined by others.

In accordance with the publication entitled “Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures” (TIA-222-H), it shall be permissible to determine seismic design parameters from the ASCE 7 online Hazard Tool based on ASCE 7-16. Additionally, it is our understanding that the monopole tower is categorized as Risk Category II.

2.0 SITE DESCRIPTION

The proposed project site (site) is a 4,631 square foot (sf) lease area, located at 222 Clintonville Road, Northford, Town of North Branford, New Haven County, Connecticut, and is generally bound by heavily wooded, undeveloped land, on all sides. Per our review of a topographic survey prepared by Martin Surveying Associates, LLC. (MSA), the general topography of the site slopes downward from south to north across the proposed lease area, with existing lease area slopes ranging from 3 percent to 15 percent. Site grades across the lease area range from approximately +279.5 feet (southern edge) to +276.5 feet (northwestern edge). All elevations listed herein are in reference to the North American Vertical Datum of 1988 (NAVD88).

Newburgh Office

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

The proposed construction will include the monopole tower, equipment cabinets containing telecommunications equipment, a generator, and associated appurtenances, in a proposed, irregularly shaped, 4,061 sf fenced gravel compound area, within a 4,631 sf lease area. The proposed tower will be located toward the southwestern portion of the lease area, with the equipment cabinets further to the southeast. The finished grade elevation at the base of the proposed tower is reported to be at approximately +277.7 feet and is located at 41° 23' 44.9168"N, 72° 47' 35.0815"W. Access to the site will be provided on a proposed 12-foot-wide, 795 foot long, gravel access driveway that connects directly to Clintonville Road.

Per the provided partial site plan drawing, approximately 2,450 cubic yards of excavation, and 400 cubic yards of fill (primarily imported clean broken stone for construction of the access driveway), will be required to construct the tower, access driveway, and associated appurtenances.

3.0 SUBSURFACE INVESTIGATION

The subsurface investigation consisted of advancing two (2) test borings, designated as B-1 and B-1a, located within the general footprint area of the proposed tower. Additionally, three (3) rock probes, designated as P-1 through P-3, were advanced around the general perimeter of the lease area. The boring and rock probe locations are shown on the attached Boring and Rock Probe Location Plan, Figure 1.

The boring and rock probes were performed by Core Down Drilling, LLC on July 11, 2022 using a CME 55 ATV-mounted drill rig, equipped with an automatic hammer. The borings and rock probes were advanced to depths up to approximately 5 feet bgs using 3-1/4 inch diameter hollow stem augers, and all borings and probes were advanced to auger refusal. In boring B-1, Standard Penetration Testing (SPT) was performed using standard 2-inch diameter split-spoon samplers. SPT sampling was performed in general accordance with the requirements of ASTM **Standard D1586 "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"**. Field SPT N-values were recorded for each soil sample taken. Samples of the soil obtained during the investigation were collected and retained in glass jars and are currently stored at our material testing laboratory. Upon completion, the boring was backfilled with drill cuttings. SPT sampling was not completed in boring B-1a, or any of the rock probes. Groundwater conditions were monitored during and upon completion of drilling. When bedrock was encountered within boring B-1a, an NX (2-inch inside diameter) double-tube core barrel, equipped with a diamond-impregnated core bit, was used to collect samples of the bedrock from the boring. A total of 10 feet of rock core was sampled in the boring. Logs of the borings and probes are attached.

All boring and rock probe inspection was performed by an engineering geologist, working under the supervision of a Connecticut State licensed Professional Engineer. The boring and rock probes were field located by Tectonic, and the logs are attached.

4.0 SUBSURFACE CONDITIONS

The subsurface conditions encountered within the boring generally consisted of native silty sand soils, with varying amounts of coarse to fine gravel, overlying relatively shallow bedrock. The following is a general description of the encountered subsurface conditions. Detailed descriptions can be found on the attached boring log.

As noted in Section 3 above, an automatic hammer was used by the driller to perform the standard penetration tests. An energy correction is typically applied to convert the field N-values measured with the automatic hammer to those of a safety hammer (N_{60} -values) – the standard used for most geotechnical engineering analyses. An automatic hammer typically applies approximately 1.3 times the energy to the soils that a safety hammer (because of its

improved efficiency), and subsequently, a correction factor of 1.3 has been applied to the field N-values reported on the boring logs, to calculate the N_{60} -values reported herein.

Boring B-1 was advanced through overburden soils approximately 3-feet northeast of the tower center where apparent bedrock was encountered at approximately 3.5 feet below existing grade (bgs). The soils encountered within this boring generally consisted of native silty sand soils, with varying amounts of coarse to fine gravel. The field SPT N-value within these silty sand layers ranged from 3 to 7 blows per foot (bpf), with a corresponding N_{60} -value of approximately 4 to 9 bpf, indicating a loose condition. Split spoon sampler refusal, which is defined as less than 6 inches of sampler penetration for 50 blows of the hammer, was encountered at approximately 3.5 feet bgs.

Boring B-1a, located approximately 3-feet northeast of boring B-1, was advanced through overburden soils where auger refusal was encountered at approximately 5 feet bgs. Bedrock was cored in boring B-1a from approximate depths ranging from 5 to 15 feet bgs. Red-gray-green, highly fractured, medium to coarse grained, slightly to completely weathered, very soft to medium hard ARKOSE (interbedded with conglomerate) bedrock was encountered, with fractures approximately 0 to 65 degrees from the horizontal. (Arkose (New Haven Arkose parent formation) is a feldspar-rich sandstone, locally conglomeratic, commonly coarse-grained and pink or reddish, that is typically interbedded with brick-red micaceous, locally shaly siltstone and fine-grained feldspathic clayey sandstone.) Recovery (REC) ranged from approximately 60 to 92 percent with Rock Quality Designation (RQD) values ranging from approximately 10 to 42 percent, indicating very poor to poor rock quality. More detailed information can be found on the attached boring and rock probe logs, and approximate locations of the boring and rock probes can be found on the attached Boring and Rock Probe Location Plan.

The table below summarizes the approximate depths and elevations to bedrock/auger refusal in the borings and rock probes.

Boring (B) or Rock Probe (P) Designation	Total Depth Explored BGS (ft.) ⁽¹⁾	Approximate Bedrock/Auger Refusal Elevation (NAVD88) ⁽¹⁾
B-1	3.5	+274.5
B-1a	15 ⁽²⁾	+273
P-1	3	+276.5
P-2	3	+275
P-3	4	+272

(1) Depths and elevations are approximate. Elevations are based on the MSA survey.

(2) Bedrock was cored in this boring from approximate depths ranging from 5 to 15 feet bgs (~ El. +273 to +263)

Saturated soil conditions were not encountered during drilling activities. Groundwater levels will fluctuate with variations in rainfall and with season and may be encountered in a perched condition overlying the weathered bedrock.

5.0 SITE CLASS AND SEISMIC SITE COEFFICIENTS

Based on the results of the subsurface investigation and the criteria outlined in the current edition of the Connecticut State Building Code and TIA-222-H, the subsurface conditions underlying the site should be considered Class B. The associated seismic design parameters from the ASCE 7 are attached.

6.0 TOWER FOUNDATION RECOMMENDATIONS

Due to the presence of relatively shallow bedrock, it is recommended that the proposed tower be supported on a mat foundation (pad and pier). Recommendations for the mat foundation are provided below:

6.1 Mat Foundation Design Recommendations:

A single mat foundation, bearing directly on competent bedrock, should be sized using a net ultimate bearing capacity of 10 tons per square foot (tsf). Per the requirements of TIA-222-H, this ultimate capacity should be reduced by at least 0.25 when designing the foundation to obtain the design capacity. The maximum compressive pressure at the edges of the foundation that occur because of overturning loads should not exceed this recommended value. The dimensions and depth of embedment of the foundation should be established by the design engineer to provide sufficient resistance to the design loads. Bedrock was encountered within the general area of the tower footprint at an average depth of approximately 4 feet bgs, corresponding to an approximate elevation of +274 feet. Based on the subsurface conditions encountered, and our conversations with members of the design team, the mat should be designed to bear directly on competent bedrock. *Note should be taken that to provide the net ultimate bearing capacity of 10 tsf listed above, a geotechnical engineer representing Tectonic should be present at the project site during excavation of the foundations to confirm the minimum bearing depth and competent bedrock.* The depth of embedment for the proposed mat is to be determined by the foundation design engineer, however, based on conversations with the design team, it is expected to be a minimum depth of 6 to 7 feet below existing grade on competent bedrock. Recommendations for rock anchor design, if required, can be found in Section 6.3 of this report.

Variations in the bedrock surface should be anticipated during excavation for the mat. The rock subgrade should be confirmed by the Tectonic geotechnical engineer prior to placing any steel or concrete, and prior to performing any other construction activities, other than excavation. The calculation of sliding resistance at the base of the mat should incorporate a sliding (friction) coefficient of 0.6 for concrete cast directly against competent bedrock. The passive earth pressure resistance along the sides of the foundation can be calculated using the following properties.

Lateral Parameters	Soil Backfill ⁽¹⁾	Bedrock
γ	115	150
K_p	3.00	4.60
ϕ	30°	40°

Where,

- γ = design unit weight of soil (pounds per cubic foot).
- ϕ = angle of internal friction (degrees).
- K_p = passive earth pressure coefficient.

Based on the information gathered during drilling activities, groundwater is not anticipated to impact the design of the mat; however, may be encountered in a perched condition during excavation.

6.2 Mat Foundation Construction Considerations

The foundation subgrade should be prepared by excavating to the bearing depth using hydraulic excavation equipment and using hand equipment to remove all soil and broken rock materials loosened by excavation. The subgrade should then be inspected by the geotechnical engineer to verify that the materials are consistent with those described in this report. Any unsuitable materials (soil or rock other than those recommended for bearing) should be removed as directed by the geotechnical engineer. The area of removal should be within the zone of influence of the foundation, which is defined by imaginary lines sloping downward and outward from the bottom edge of the foundation at a 1 to 1 (Horizontal to Vertical) slope.

Bedrock is anticipated to be encountered above the subgrade elevation, and it should be removed to create a level bearing surface. Contractors involved in the excavation for the foundation should anticipate the need for rock removal.

Any new fill slopes should be constructed on a slope inclination no steeper than 3 to 1 (Horizontal to Vertical) unless a detailed slope stability evaluation is performed. The sides of the excavation should be sloped back for safety unless a sheeting or bracing system is used. OSHA and other applicable agency requirements pertaining to worker safety should be met during the excavation activities.

6.3 Rock Anchor Design Recommendations

If required, rock anchor materials and installation procedures should conform to the recommendations of the **Post-Tensioning Institute as contained in the publication "Recommendations for Prestressed Rock and Soil Anchors" (Post Tensioning Institute, 1717 W. Northern Avenue, Suite 114, Phoenix, Arizona 85021)** except as modified in this report. Rock anchors should consist of minimum Grade 150 prestressing steel thread bars conforming to ASTM A722. Rock anchors should have a minimum 15 feet long free stressing length for steel strands, and 10 feet for bars. The free stressing length of the anchor should be greased and encased in a plastic sheath to prohibit bonding of the bar and rock during grouting.

The bond length, diameter, and capacity of the rock anchors should be determined in accordance with the following criteria, based on a factor of safety of 2.0:

Anchor Bond Length (D) (feet)	Minimum Drill Hole Diameter (inches)	Allowable Anchor Capacity ⁽¹⁾ (kips)
10	4	105
15	4	160
20	4	210

(1) Geotechnical capacity only. Structural capacity to be determined by others.

The rock anchors should be installed in a drilled hole, having a minimum diameter of 4 inches. Anchor holes should be drilled 1-foot longer than the total anchor length (free stressing length plus anchor bond length). Centralizers should be provided to ensure a minimum ½ inch grout cover around the anchor. If lean concrete is used to level the foundation subgrade, this should be placed prior to anchor installation and allowed to cure so as to have sufficient strength to resist the prestress loads.

The water tightness of the fractured rock should be determined by in-situ testing at each anchor hole location prior to installation. This testing is required to control loss of grout which could affect corrosion protection and bonding of the anchor. Constant head permeability testing should be employed. Testing should consist of maintaining a water pressure of 5 psi (11.5 feet head) in the holes for a minimum of 10 minutes. Pre-grouting should be employed to waterproof holes prior to anchor installation if the rate of water loss exceeds 0.5 gallons per minute. The grout should be allowed to set for a minimum of 24 hours prior to redrilling the holes and retesting. The process should be repeated until the rate of water loss is less than 0.5 gallons per minute.

On acceptance of the hole, the anchor assembly should be installed in the drilled hole (through the leveling pad, if used) and grouted for the full length with neat cement grout. The grout should be a non-shrink grout with a minimum 28-day compressive strength of 6,000 psi.

All rock anchors should be proof tested to 120 percent of the design load under the observation of the geotechnical engineer. The proof testing should be performed by means of a hydraulic jack capable of tensioning the anchor under the observation of the geotechnical engineer. The proof load should be held for a minimum period of 5 minutes. If the bolt shows no sign of yielding during the 5-minute hold period, the anchor should be locked off at the design load with a stop type coupling against a bearing plate bearing on the lean concrete leveling pad or the bedrock surface. Load transfer to the foundation(s) should be made using a coupled length of anchor with plates embedded in the foundation(s).

Spacing of rock anchors should not be less than $\frac{1}{2} D$ where D is the bonded length of anchor. Should site restrictions or design require anchor spacing less than $\frac{1}{2} D$, the specific anchor layout should be analyzed to determine the group capacity.

7.0 EARTHWORK CONSTRUCTION CRITERIA

The following sections present our recommendations regarding earthwork and construction monitoring.

7.1 General Site Preparation

Initially, the site should be stripped of all topsoil-like material and organics, debris, and vegetation. Debris and vegetation from the clearing operations should be removed from the site and disposed of at a legal dump site. All soft or unsuitable native materials, and subsurface obstructions, should be removed from the mat foundation footprint.

If encountered, any existing utilities within the project limits should be excavated and re-routed or removed. The resulting excavations should be backfilled with structural fill in accordance with the procedures outlined in Section 7.4. Trench excavations should be properly benched to allow for adequate compaction.

7.2 Rock Excavations

Bedrock is present at relatively shallow depths at the project site. Excavation of rock is expected and should be performed in a manner that will minimize damage to underlying bedrock. Bedrock is anticipated to be encountered above the subgrade elevation, and it should be removed to create a level bearing surface. Contractors involved in the excavation for the foundation should anticipate the need for

rock removal. The feasibility and methodology for rock removal should be developed by an experienced qualified contractor or a specialist and it should be performed in a manner that will minimize damage to underlying bedrock that will serve as foundation subgrades.

Where feasible, rock excavation should be performed by ripping techniques. Other methods, including controlled blasting, hydraulic hoe-ramming, rock trenching, or expansive chemical grout, should also be considered as potential means for the rock excavation. It should be noted that blasting of the rock is feasible, if required. If blasting is selected, it should be performed by a qualified contractor in accordance with all applicable standards. In addition, local permits will likely be required for blasting. Rock removal should also be conducted in a manner that will minimize ground vibrations at adjacent structures. Final and temporary cuts in bedrock should be thoroughly scaled to remove any loose rock blocks.

7.3 Foundation and Rock Subgrade Preparation

All rock subgrades should be inspected by the Tectonic geotechnical engineer prior to the placement of structural fill, steel, or concrete. The foundation subgrade should be prepared by excavating to the bearing depth using hydraulic excavation equipment and using hand equipment to remove all soil and broken rock materials loosened by excavation. Rock subgrades should be prepared approximately level and they should be cleaned of all soil materials and rock fragments. The subgrade should then be inspected by the Tectonic geotechnical engineer to verify that the materials are consistent with those described in this report. Any unsuitable materials (other than those recommended for bearing) should be removed as directed by the Tectonic geotechnical engineer. Over-excavated or uneven areas within the subgrade can be filled with lean concrete having a minimum 28-day compressive strength of 2,000 pounds per square inch (psi). If lean concrete is used to provide a level subgrade, the Tectonic geotechnical engineer should evaluate the degree and direction of the slope of the rock surface and their variation over the area of the leveling pad to determine the stability of the leveling pad relative to sliding failure along the concrete-bedrock interface. If it is determined that the leveling pad is unstable due to shear forces resulting from a sloping rock surface, the bedrock surface should be stepped or dowels should be installed to resist the sliding forces.

7.4 Fill and Backfill Materials

The existing native soils, due to their high fines content, are not suitable for structural or backfill material, but may be used as general fill in landscape areas. Imported structural fill for construction of the proposed gravel access driveway should consist of clean imported on-site sand, gravel, crushed stone, crushed gravel, or a mixture of these, and should contain no organic matter. Structural fill materials should meet the gradation for as specified in the Connecticut State Department of Transportation (CTDOT) Standard Specifications Section M.02, **Grading "B" material**, and as recommended below.

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5-inch	100
3-1/2-inch	90-100
1-1/2-inch	55-95
1/4-inch	25-60
No. 10	15-45
No. 40	5-25
No. 100	0 - 10
No. 200	0 - 5

All structural fill should be compacted to at least 95 percent of the maximum dry density at near optimum moisture contents as determined by ASTM Standard D1557, *“Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))”*. The lift thickness for the fill soils will vary depending on the type of compaction equipment used. Fills should generally be placed in uniform horizontal lifts not exceeding 8 inches in loose thickness in open areas. In confined areas, the loose lift thickness should be reduced to 4 inches or less and each lift should be compacted with sufficient passes of hand operated vibratory or impact compaction equipment.

A geotechnical engineer with appropriate field and laboratory support should approve materials for use as fill, and test backfill materials for compliance with the recommended compaction. Each lift of fill placed at the site should be tested for compaction.

If required, free draining crushed stone placed below concrete pads should be CTDOT Standard **Specifications Section M.02, Grading “C” material, and as recommended below** and as follows:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1-1/2-inch	100
3/4-inch	45-80
1/4-inch	25-60
No. 10	15-45
No. 40	5-25
No. 100	0 - 10
No. 200	0 - 5

7.5 Construction Dewatering and Protection of Subgrades

Approved subgrades should be protected from the effects of frost, construction traffic, perched groundwater, surface water, and precipitation. The necessary protection should be provided as soon after acceptance, as is practicable, and should be maintained until coverage with compacted fill or concrete. It is recommended that temporary surface drainage measures be installed to divert runoff away from the proposed construction limits.

If water is encountered in excavations, dewatering should be performed in a manner that will prevent loosening or migration of the subgrade soils. The operation of sumps directly in the footing excavations should not be allowed. Sump pits should be placed at least 1 foot outside of foundation excavations for every foot below the foundation subgrade elevation that they excavated. As per our field observations, the on-site soils were observed to contain significant amounts of silt, which make them moisture sensitive. They will readily soften and experience a reduction in load-carrying capacity when exposed to moisture. These soils are also frost susceptible and will experience expansion and contraction during freeze-thaw cycles.

7.6 Excavations and Shoring

Temporary excavation slopes, if required, should conform to the latest OSHA standards, including slopes permitted for specified heights and soil conditions encountered. OSHA and other applicable agency requirements pertaining to worker safety should be met during the excavation activities. Excavations into the native soil should be feasible utilizing standard construction equipment (i.e., hydraulic excavator).

Design of dewatering and excavation support, if required, should conform to the latest OSHA and other applicable agency requirements.

8.0 LIMITATIONS

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The recommendations contained in this report are for design purposes only. Contractors and others involved in this project are advised to make an independent assessment of the subsurface conditions for the purpose of estimating quantities and scheduling. No warranty, express or implied, is made as to the advice provided in this report.

This report has been prepared for the exclusive use of Homeland Towers, LLC for the specific application to the proposed monopole installation detailed in this report. If any changes in the design or location of the proposed monopole is planned, the conclusions and recommendations contained in this report shall not be considered valid unless reviewed and verified in writing by Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. It is recommended that Tectonic be retained to provide construction monitoring and inspection services to ensure proper implementation of the recommendations contained herein, which would otherwise limit our professional liability.

We trust this report will allow you to proceed with design of the proposed foundations.

Sincerely,

TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C.


Mark A. Stier, P.E., PG
Executive Vice President



CDF/MAS: "G:\Newburgh\Geotechnical\1500\11542.01\Homeland Towers North Branford\Report\11542.01.Geo.Report.docx"

Attachments: Figure 1 – Boring and Rock Probe Location Plan
 Boring and Rock Probe Logs
 Soil Legend Sheet

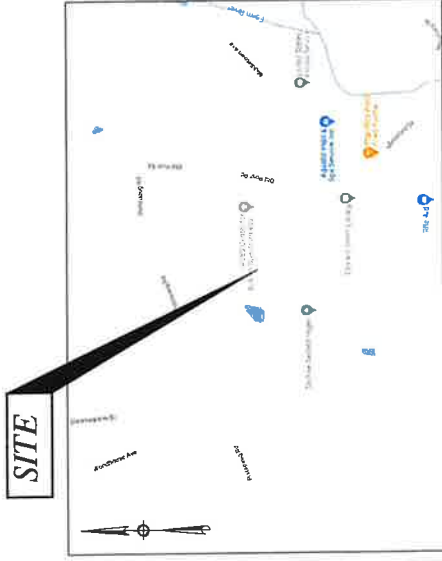
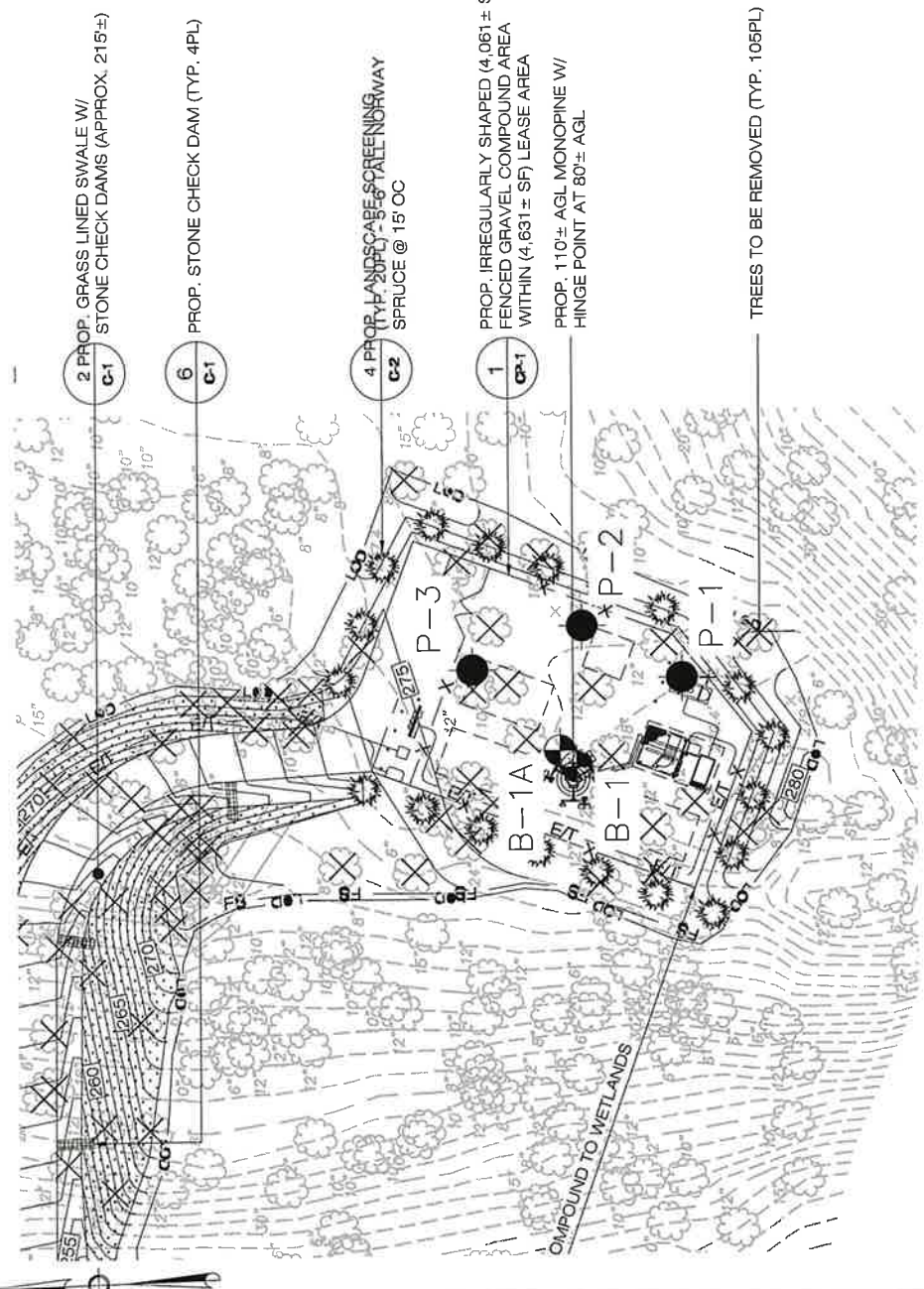
LEGEND

APPROXIMATE BORING LOCATION

 APPROXIMATE PROBE LOCATION

NOTES

1. PLAN BASED ON A DRAWING BY ALL-POINTS TECHNOLOGY CORPORATION, P.C., TITLED PARTIAL SITE PLAN, SHEET NUMBER SP-2, DATED 07/23/2021.
2. THE BORING AND PROBE LOCATIONS WERE FIELD LOCATED BY TECTONIC AND SHOULD BE CONSIDERED APPROXIMATE.



Tectonic
 PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
 Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.
 70 Pleasant Hill Road
 P.O. Box 37
 Mount Airy, NC 27030
 Phone: (843) 534-5959
 (800) 829-6531
 www.tectonicengineering.com

BORING AND PROBE LOCATION PLAN

PROPOSED MONOPINE TOWER
222 CLINTONVILLE ROAD
NORTHFORD, NEW HAVEN COUNTY, CONNECTICUT

Date: 07/18/2022
 Work Order: 11542.01
 Drawing No: **FIGURE 1**
 Rev: 0





PROJECT No. 11542.01

PROJECT: North Branford

LOCATION: Northford, CT

BORING No. B-1

SHEET No. 1 of 1

CLIENT: Homeland Towers, LLC

CONTRACTOR: Core Down Drilling LLC

GROUND WATER

DATE

TIME

DEPTH

INSPECTOR: Daniela Parrino

DRILLER: Andrew Bellucci

SURFACE ELEVATION: 278.0

METHOD OF ADVANCING BORING

DIA.

DEPTH

POWER AUGER: 3 1/4" 0 TO 3.5'

MON. WELL YES NO

DATUM: See Remarks

ROT. DRILL: TO

SCREEN DEPTH: - TO -

DATE START: 7/11/22

CASING: TO

WEATHER: Clear TEMP: 75° F

DATE FINISH: 7/11/22

DIAMOND CORE: TO

DEPTH TO ROCK: 3.5'

UNCONFINED COMPRESS. STRENGTH (TONS/FT)

CME 55 with Automatic Hammer

*CHANGES IN STRATA ARE INFERRED

1 2 3 4 5

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
 X --- ○ --- △
 10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.)
 10 20 30 40 50

ELEVATION (FT.)

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES				UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT)					ELEVATION (FT.)
			SAMPLE NUMBER	RECOV.		MOISTURE				PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION (BLOWS/FT.)		
				LENGTH (IN.)	RQD (%)										
1	3	1	S-1	9	M	SM	Bwn m-f SAND, some Silt, trace c-f Gravel								
2		2													
3	7	3	S-2	15	M	SM	Bwn m-f SAND, some Silt, little c-f Gravel Auger refusal @ 3.5' on apparent bedrock								
4		50/3					End of Boring at 3.5'								
5														273.0	
6															
7															
8															
9															
10														268.0	
11															
12															
13															
14															
15														263.0	
16															
17															
18															
19															
20														258.0	
21															
22															
23															
24															
25														253.0	

REMARKS: Surface elevations estimated based on the MSA survey.

BORING LOG 11542.01.GPJ TECTONIC ENG.GDT 7/25/22



PROJECT No. 11542.01

PROJECT: North Branford

LOCATION: Northford, CT

BORING No. B-1a

SHEET No. 1 of 1

CLIENT: Homeland Towers, LLC

CONTRACTOR: Core Down Drilling LLC

GROUND WATER

DATE

TIME

DEPTH

INSPECTOR: Daniela Parrino

DRILLER: Andrew Bellucci

SURFACE ELEVATION: 278.0

METHOD OF ADVANCING BORING

DIA.

DEPTH

POWER AUGER:

3 1/4"

0 TO 5'

MON. WELL

YES

NO

DATUM: See Remarks

ROT. DRILL:

TO

SCREEN DEPTH: -- TO --

DATE START: 7/11/22

CASING:

TO

WEATHER: Clear

TEMP: 75° F

DATE FINISH: 7/11/22

DIAMOND CORE:

NX

5 TO 15'

DEPTH TO ROCK: 5'

UNCONFINED COMPRESS. STRENGTH (TONS/FT)

CME 55 with Automatic Hammer

*CHANGES IN STRATA ARE INFERRED

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES			UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT)					ELEVATION (FT.)	
			SAMPLE NUMBER	RECOV.					MOISTURE	1	2	3	4		5
				LENGTH (IN.)	ROD (%)										
1															
2															
3															
4															
5							Auger refusal @ 5'								273.0
6	4.5														
7	3						Rd-gy-gn fine to medium grained, very soft to medium hard, slightly to completely weathered, moderately to highly fractured, interbedded ARKOSE, fractures 0- 45 degrees from horizontal								
8	1.4		C-1	55/60	42										
9	1.5														
10	1.5														268.0
11	1.5														
12	2.5														
13	3.5		C-2	36/60	10		Rd-gy-blk fine to medium grained, very soft to medium hard, completely to moderately weathered, highly fractured, interbedded ARKOSE, fractures 0 - 65 degrees								
14	5.5														
15	4														263.0
16							End of Boring at 15'								
17															
18															
19															
20															258.0
21															
22															
23															
24															
25															253.0

REMARKS: Surface elevations estimated based on the MSA survey.



PROJECT No. **11542.01**
 PROJECT: **North Branford**
 LOCATION: **Northford, CT**

BORING No. P-1

SHEET No. 1 of 1

CLIENT: Homeland Towers, LLC			GROUND WATER	DATE	TIME	DEPTH	INSPECTOR: Daniela Parrino
CONTRACTOR: Core Down Drilling LLC							DRILLER: Andrew Bellucci
METHOD OF ADVANCING BORING	DIA.	DEPTH					SURFACE ELEVATION: 279.5
POWER AUGER:	3 1/4"	0 TO 3'		MON. WELL <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			DATUM: See Remarks
ROT. DRILL:		TO	SCREEN DEPTH: - TO -			DATE START: 7/11/22	
CASING:		TO	WEATHER: Clear TEMP: 75° F			DATE FINISH: 7/11/22	
DIAMOND CORE:		TO	DEPTH TO ROCK: 3'			UNCONFINED COMPRESS. STRENGTH (TONS/FT) ●	
CME 55 with Automatic Hammer			*CHANGES IN STRATA ARE INFERRED				

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES			UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT)					ELEVATION (FT.)	
			SAMPLE NUMBER	RECOV.					MOISTURE	1	2	3	4		5
				LENGTH (IN.)	RQD (%)										
1						M	Bwn c-f SAND, some Silt, little c-f Gravel Auger refusal @ 3' on apparent bedrock	[Pattern]							
2															
3															
4							End of Boring at 3'								
5														274.5	
6															
7															
8															
9															
10														269.5	
11															
12															
13															
14															
15														264.5	
16															
17															
18															
19															
20														259.5	
21															
22															
23															
24															
25														254.5	

REMARKS: Surface elevations estimated based on the MSA survey.



PROJECT No. **11542.01**
 PROJECT: **North Branford**
 LOCATION: **Northford, CT**

BORING No. P-2
 SHEET No. 1 of 1

CLIENT: Homeland Towers, LLC			GROUND WATER	DATE	TIME	DEPTH	INSPECTOR: Daniela Parrino
CONTRACTOR: Core Down Drilling LLC							DRILLER: Andrew Bellucci
METHOD OF ADVANCING BORING	DIA.	DEPTH					SURFACE ELEVATION: 278.0
POWER AUGER:	3 1/4"	0 TO 3'	MON. WELL	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	DATUM: See Remarks	
ROT. DRILL:		TO	SCREEN DEPTH:	—	TO —	DATE START: 7/11/22	
CASING:		TO	WEATHER: Clear	TEMP: 75° F	DATE FINISH: 7/11/22		
DIAMOND CORE:		TO	DEPTH TO ROCK: 3'	UNCONFINED COMPRESS. STRENGTH (TONS/FT)			ELEVATION (FT.)
CME 55 with Automatic Hammer			*CHANGES IN STRATA ARE INFERRED				

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BLU6 IN.)	SAMPLES			UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	UNCONFINED COMPRESS. STRENGTH (TONS/FT)					ELEVATION (FT.)				
			SAMPLE NUMBER	RECOV.					MOISTURE	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION (BLOWS/FT.)					
LENGTH (IN.)	RQD (%)				1	2	3	4					5	10	20	30	40	50
1						M SM	Bwn c-f SAND, some silt, little c-f Gravel Auger refusal @ 3' on apparent bedrock											
2																		
3																		
4							End of Boring at 3'											
5																		273.0
6																		
7																		
8																		
9																		
10																		268.0
11																		
12																		
13																		
14																		
15																		263.0
16																		
17																		
18																		
19																		
20																		258.0
21																		
22																		
23																		
24																		
25																		253.0

REMARKS: Surface elevations estimated based on the MSA survey.

BORING LOG 11542.01.GPJ TECTONIC ENG.GDT 7/25/22



PROJECT No. **11542.01**
 PROJECT: **North Branford**
 LOCATION: **Northford, CT**

BORING No. P-3

SHEET No. 1 of 1

CLIENT: Homeland Towers, LLC			GROUND WATER	DATE	TIME	DEPTH	INSPECTOR: Daniela Parrino
CONTRACTOR: Core Down Drilling LLC							DRILLER: Andrew Bellucci
METHOD OF ADVANCING BORING	DIA.	DEPTH					SURFACE ELEVATION: 276.0
POWER AUGER:	3 1/4"	0 TO 4'		MON. WELL <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			DATUM: See Remarks
ROT. DRILL:		TO	SCREEN DEPTH: - TO -			DATE START: 7/11/22	
CASING:		TO	WEATHER: Clear TEMP: 75° F			DATE FINISH: 7/11/22	
DIAMOND CORE:		TO	DEPTH TO ROCK: 4'			UNCONFINED COMPRESS. STRENGTH (TONS/FT)	
CME 55 with Automatic Hammer			*CHANGES IN STRATA ARE INFERRED			1 2 3 4 5 PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT % X --- O --- A 10 20 30 40 50 STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50	

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES			UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	ELEVATION (FT.)	
			SAMPLE NUMBER	RECOV.						MOISTURE
				LENGTH (IN.)	RQD (%)					
1										
2					M	SM	Bwn c-f SAND, some Silt, little c-f Gravel Auger refusal @ 4' on apparent bedrock			
3										
4										
5							End of Boring at 4'	271.0		
6										
7										
8										
9										
10								266.0		
11										
12										
13										
14										
15								261.0		
16										
17										
18										
19										
20								256.0		
21										
22										
23										
24										
25								251.0		

REMARKS: Surface elevations estimated based on the MSA survey.

LEGEND FOR SOIL DESCRIPTION

<u>COARSE GRAINED SOIL</u>		(Coarser than No. 200 Sieve)	
<u>DESCRIPTIVE TERM & GRAIN SIZE</u>			
<u>TERM</u>	<u>SAND</u>		<u>GRAVEL</u>
coarse - c	No. 4 Sieve to No.	10 Sieve	3" to 3/4"
medium - m	No. 10 Sieve to No.	40 Sieve	3/4" to 3/16"
fine - f	No. 40 Sieve to No.	200 Sieve	
<u>COBBLES</u>	3" to 10"	<u>BOULDERS</u>	10" +
<u>GRADATION DESIGNATIONS</u>		<u>PROPORTIONS OF COMPONENT</u>	
fine, f		Less than 10% coarse to medium	
medium to fine, m-f		Less than 10% coarse	
medium, m		Less than 10% coarse and fine	
coarse to medium, c-m		Less than 10% fine	
coarse, c		Less than 10% medium and fine	
coarse to fine, c-f		All greater than 10%	
<u>FINE GRAINED SOIL</u>		(Finer than No. 200 Sieve)	
<u>DESCRIPTION</u>	<u>PLASTICITY INDEX</u>	<u>PLASTICITY</u>	
Silt	0 - 1	none	
Clayey Silt	2 - 5	slight	
Silt & Clay	6 - 10	low	
Clay & Silt	11 - 20	medium	
Silty Clay	21 - 40	high	
Clay	greater than 40	very high	
<u>PROPORTION</u>			
<u>DESCRIPTIVE TERM</u>	<u>PERCENT OF SAMPLE WEIGHT</u>		
trace	1 - 10		
little	10 - 20		
some	20 - 35		
and	35 - 50		
The primary component is fully capitalized			
<u>COLOR</u>			
Blue - blue	Gy - gray	Wh - white	
Blk - black	Or - orange	Yl - yellow	
Bwn - brown	Rd - red	Lgt - light	
Gn - green	Tn - tan	Dk - dark	
<u>SAMPLE NOTATION</u>			
S - Split Spoon Soil Sample	WOC - Weight of Casing		
U - Undisturbed Tube Sample	WOR - Weight of Rods		
C - Core Sample	WOH - Weight of Hammer		
B - Bulk Soil Sample	PPR - Compressive Strength based on Pocket Penetrometer		
NR - No Recovery of Sample	TV - Shear Strength (tsf) based on Torvane		
<u>ADDITIONAL CLASSIFICATIONS</u>			
New York City Building Code soil classifications are given in parentheses at the end of each description of material, if applicable. See sections 1804.2 of the 2008 Building Code for further details.			

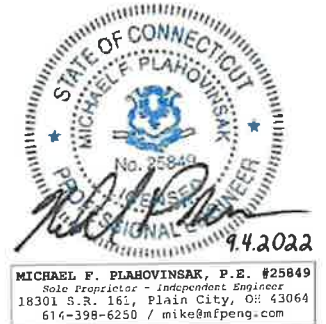
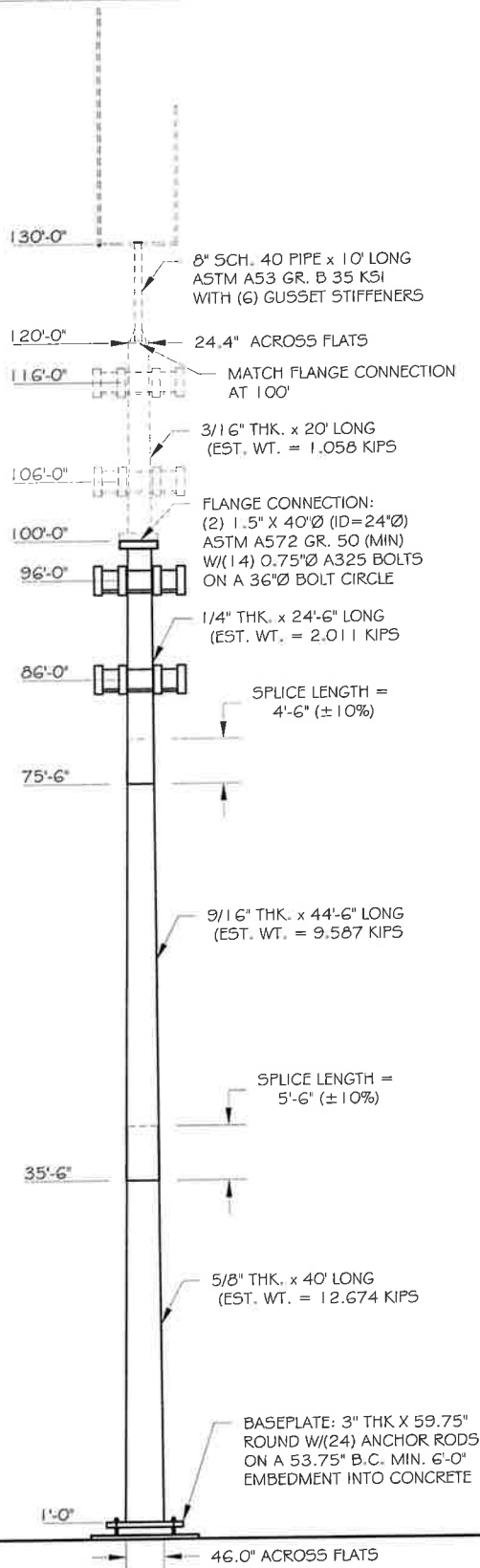
Page 1 of 2	Job Number: 23522-285
Eng: MFP	Customer Ref: TP-21250
	Date: 9/4/2022
Structure: 110-FT POLE (FUT. 130-FT)	
Site: CTO21 NORTH BRANFORD	
Location: NEW HAVEN CO., CT / 41°23'44.9", -72°47'35.1"	
Owner: HOMELAND TOWERS	
Revision No.:	Revision Date:

DESIGN			
Building Code: 2018 CONNECTICUT BUILDING CODE			
Design Standard: TIA-222-H			
Wind Speed Load Cases: ASCE-7-16 WIND SPEED			
Load Case #1: 120 MPH Design Wind Speed			
Load Case #2: 50 MPH Wind with 1" Ice Accumulation			
Load Case #3: 60 MPH Service Wind Speed			
Structure Class Risk Category: II	Exposure Cat.: C	Topography Cat.: 5	Crest Height: 187'

EQUIPMENT LIST	
Elev.	Description
142	(1) Ø3" x 24' OMNI AT 142' CL + (1) Ø2.5" x 14' OMNI AT 137' CL
130	5' SIDE ARM MOUNTS
116	ANTENNAS + MOUNT (EPA 200 FT2)
116	GENERIC ANTENNA MOUNT
106	ANTENNAS + MOUNT (EPA 200 FT2)
106	GENERIC ANTENNA MOUNT
96	ANTENNAS + MOUNT (EPA 200 FT2)
96	GENERIC ANTENNA MOUNT
86	ANTENNAS + MOUNT (EPA 200 FT2)
86	GENERIC ANTENNA MOUNT

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE
POLE FAIL POINT AT 80' ENABLED AFTER POLE IS EXTENDED AND FULLY LOADED

STRUCTURE PROPERTIES					
Cross-Section: 18-Sided			Taper: 0.19559 in/ft		
Shaft Steel: ASTM A572 GR 65			Baseplate Steel: ASTM A572 GR 50		
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0"					
Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	20.00	0.1875	0.00	24.35	28.26
2	24.50	0.2500	4.50	28.26	33.05
3	44.50	0.5625	5.50	31.67	40.38
4	40.00	0.6250	0.00	38.18	46.00



BASE REACTIONS FOR FOUNDATION DESIGN

Moment: 6122 ft-kip
Shear: 67 kip
Axial: 54 kip

Page 2 of 2	Job Number: 23522-285
Eng: MFP	Customer Ref: TP-21250
	Date: 9/4/2022
Structure:	110-FT POLE (FUT. 130-FT)
Site:	CT021 NORTH BRANFORD
Location:	NEW HAVEN CO., CT / 41°23'44.9", -72°47'35.1"
Owner:	HOMELAND TOWERS
Revision No.:	Revision Date:

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45 AND SHALL BE AIR ENTRAINED 6% (± 1.5%). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.

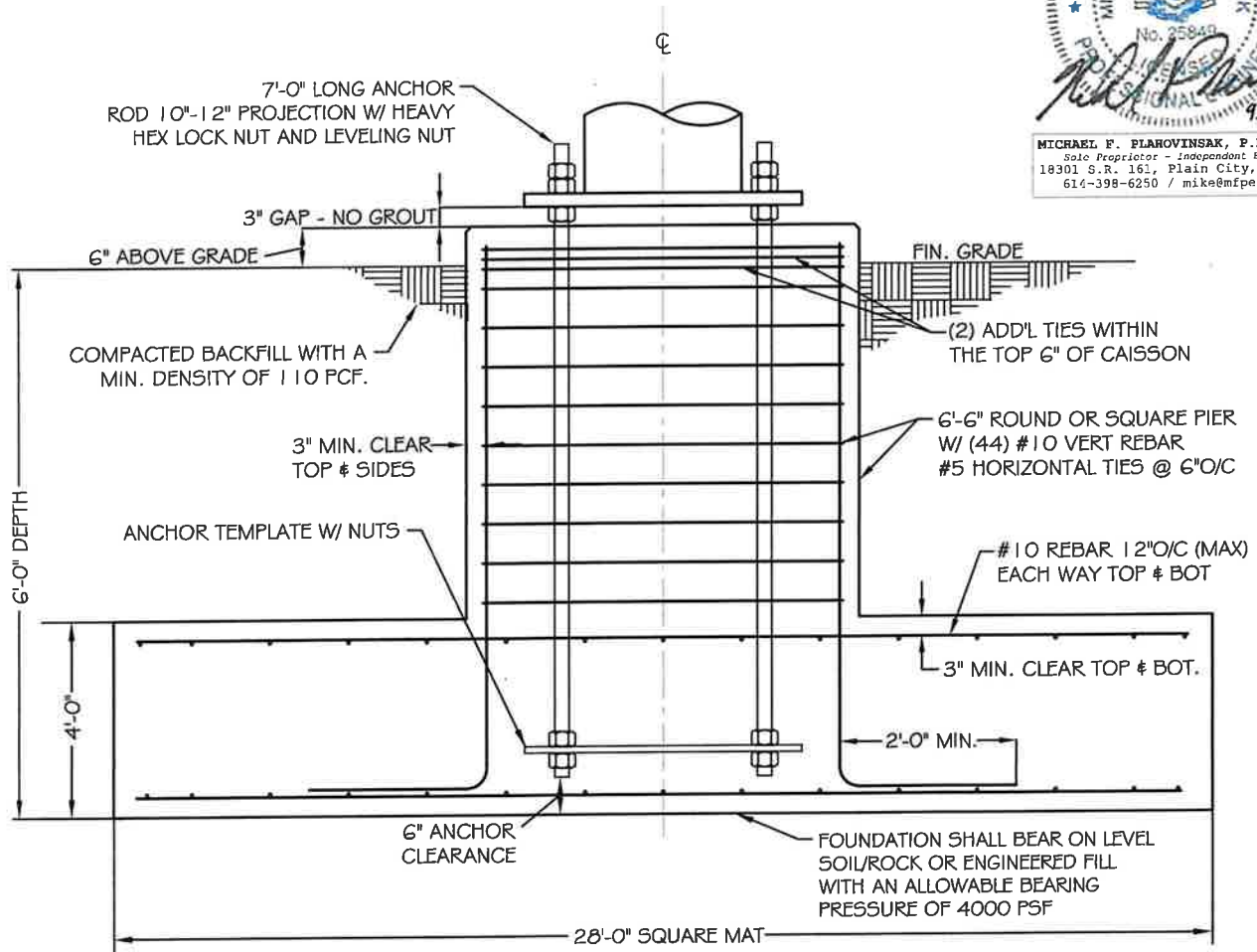
2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

3. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

4. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: TECTONIC
REPORT NO.: 11542.01 (DATED 7/26/21)

5. ESTIMATED CONCRETE VOLUME = 120.1 CUBIC YARDS.

6. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 6122 FT*KIPS
SHEAR: 67 KIPS
AXIAL: 54 KIPS



SPREAD FOOTING
NOT TO SCALE

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 110-ft Pole (Fut. 130-ft) - MFP #23522-285	Page 1 of 7
	Project CT021 North Branford	Date 11:43:44 09/04/22
	Client TP-21250	Designed by JC

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower base elevation above sea level: 282.00 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category C.

Crest Height: 187.00 ft.

Rigorous Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Feature: Hill.

Slope Distance L: 964.00 ft.

Distance from Crest x: 108.00 ft.

Horizontal Distance Downwind: No.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	130.00-120.50	9.50	0.00	Round	8.6250	8.6250	0.3220		A53-B-35 (35 ksi)
L2	120.50-120.00	0.50	0.00	Round	8.6250	24.3500	0.3220		A53-B-35 (35 ksi)
L3	120.00-100.00	20.00	0.00	18	24.3500	28.2618	0.1875	0.7500	A572-65 (65 ksi)
L4	100.00-75.50	24.50	4.50	18	28.2618	33.0537	0.2500	1.0000	A572-65 (65 ksi)
L5	75.50-35.50	44.50	5.50	18	31.6735	40.3772	0.5625	2.2500	A572-65 (65 ksi)
L6	35.50-1.00	40.00		18	38.1765	46.0000	0.6250	2.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	8.6250	8.3993	72.4892	2.9378	4.3125	16.8091	144.9785	4.1971	0.0000	0
	8.6250	8.3993	72.4892	2.9378	4.3125	16.8091	144.9785	4.1971	0.0000	0
L2	8.6250	8.3993	72.4892	2.9378	4.3125	16.8091	144.9785	4.1971	0.0000	0
	24.3500	24.3066	1754.4727	8.4959	12.1750	144.1045	3508.9454	12.1460	0.0000	0
L3	24.6967	14.3797	1060.6479	8.5777	12.3698	85.7450	2122.6915	7.1912	3.9556	21.097
	28.6688	16.7077	1663.6840	9.9664	14.3570	115.8798	3329.5570	8.3554	4.6441	24.768
L4	28.6592	22.2273	2203.4632	9.9442	14.3570	153.4768	4409.8258	11.1158	4.5341	18.136

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Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L5	33.5250	26.0297	3538.7666	11.6453	16.7913	210.7504	7082.1896	13.0173	5.3774	21.51
	32.9691	55.5449	6792.1931	11.0444	16.0902	422.1335	13593.3236	27.7777	4.5845	8.15
	40.9133	71.0842	14236.3101	14.1342	20.5116	694.0607	28491.3527	35.5488	6.1164	10.874
L6	39.7613	74.4927	13271.0490	13.3308	19.3936	684.2988	26559.5604	37.2534	5.6191	8.99
	46.6132	90.0127	23413.9294	16.1081	23.3680	1001.9655	46858.6674	45.0149	6.9960	11.194

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1				1	1	1			
130.00-120.50				1	1	1			
L2				1	1	1			
120.50-120.00				1	1	1			
L3				1	1	1			
120.00-100.00				1	1	1			
L4				1	1	1			
100.00-75.50				1	1	1			
L5 75.50-35.50				1	1	1			
L6 35.50-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA}	Weight plf	
							ft ² /ft	plf	
7/8"	C	No	Yes	Inside Pole	120.00 - 1.00	2	No Ice	0.00	0.35
							1/2" Ice	0.00	0.35
							1" Ice	0.00	0.35
** 1 5/8"	C	No	Yes	Inside Pole	116.00 - 1.00	12	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	106.00 - 1.00	12	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	96.00 - 1.00	12	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	86.00 - 1.00	12	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	130.00-120.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	120.50-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L4	100.00-75.50	C	0.000	0.000	0.000	0.000	0.26
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L5	75.50-35.50	C	0.000	0.000	0.000	0.000	0.90
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L6	35.50-1.00	C	0.000	0.000	0.000	0.000	1.79
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.54

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	130.00-120.50	A	1.240	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	120.50-120.00	A	1.239	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	120.00-100.00	A	1.237	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.26
L4	100.00-75.50	A	1.230	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.90
L5	75.50-35.50	A	1.211	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.79
L6	35.50-1.00	A	1.132	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.54

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
Ø3" x 24' Omni Antenna	A	From Face	1.00	0.0000	142.00	No Ice	7.20	7.20	0.08
			0.00			1/2" Ice	9.63	9.63	0.13
			0.00			1" Ice	12.08	12.08	0.19
Ø2.5" x 14' Omni	B	From Face	1.00	0.0000	137.00	No Ice	3.50	3.50	0.05
			0.00			1/2" Ice	4.93	4.93	0.08
			0.00			1" Ice	6.38	6.38	0.11
(2) 3' Side Arm Mount	C	None		0.0000	130.00	No Ice	0.70	0.70	0.03
						1/2" Ice	0.96	0.96	0.04
						1" Ice	1.16	1.16	0.05
** Antennas + Mount (EPA 200 ft2)	C	None		0.0000	116.00	No Ice	200.00	200.00	4.00
						1/2" Ice	225.00	225.00	6.00
						1" Ice	250.00	250.00	8.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAs Front ft ²	CAAs Side ft ²	Weight K
Antennas + Mount (EPA 200 ft2)	C	None		0.0000	106.00	No Ice	200.00	4.00
						1/2" Ice	225.00	6.00
						1" Ice	250.00	8.00
Antennas + Mount (EPA 200 ft2)	C	None		0.0000	96.00	No Ice	200.00	4.00
						1/2" Ice	225.00	6.00
						1" Ice	250.00	8.00
Antennas + Mount (EPA 200 ft2)	C	None		0.0000	86.00	No Ice	200.00	4.00
						1/2" Ice	225.00	6.00
						1" Ice	250.00	8.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 120.5	Pole	Max Tension	6	0.00	-0.00	0.00
			Max. Compression	8	-0.99	0.13	0.27
			Max. Mx	4	-0.44	-15.66	0.06
			Max. My	2	-0.44	0.01	15.81
			Max. Vy	4	1.02	-15.66	0.06
			Max. Vx	2	-1.02	0.01	15.81
			Max. Torque	4			0.47
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-1.04	0.13	0.27
			Max. Mx	4	-0.48	-16.17	0.06
L2	120.5 - 120	Pole	Max. My	2	-0.48	0.02	16.32
			Max. Vy	4	1.05	-16.17	0.06
			Max. Vx	2	-1.05	0.02	16.32
			Max. Torque	4			0.47
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-1.04	0.13	0.27
			Max. Mx	4	-0.48	-16.17	0.06
			Max. My	2	-0.48	0.02	16.32
			Max. Vy	4	1.05	-16.17	0.06
			Max. Vx	2	-1.05	0.02	16.32
L3	120 - 100	Pole	Max. Torque	4			0.47
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-22.96	0.13	0.27
			Max. Mx	4	-9.34	-291.24	0.07
			Max. My	2	-9.34	0.02	291.39
			Max. Vy	4	24.35	-291.24	0.07

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	100 - 75.5	Pole	Max. Vx	2	-24.35	0.02	291.39
			Max. Torque	4			0.47
			Max. Tension	1	0.00	0.00	0.00
			Max. Compression	8	-46.22	0.13	0.27
			Max. Mx	4	-20.43	-1032.98	0.09
			Max. My	2	-20.43	0.03	1033.13
			Max. Vy	4	47.65	-1032.98	0.09
			Max. Vx	2	-47.65	0.03	1033.13
L5	75.5 - 35.5	Pole	Max. Torque	4			0.47
			Max. Tension	1	0.00	0.00	0.00
			Max. Compression	8	-61.09	0.13	0.27
			Max. Mx	4	-34.45	-2978.39	0.11
			Max. My	2	-34.45	0.04	2978.55
			Max. Vy	4	52.06	-2978.39	0.11
			Max. Vx	2	-52.06	0.04	2978.55
			Max. Torque	4			0.47
L6	35.5 - 1	Pole	Max. Tension	1	0.00	0.00	0.00
			Max. Compression	8	-81.00	0.13	0.27
			Max. Mx	4	-53.73	-5142.09	0.11
			Max. My	2	-53.73	0.04	5142.24
			Max. Vy	4	55.88	-5142.09	0.11
			Max. Vx	2	-55.88	0.04	5142.24
			Max. Torque	4			0.47

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	22.577	12	1.4984	0.0037
L2	120.5 - 120	19.681	12	1.4000	0.0007
L3	120 - 100	19.534	12	1.3996	0.0007
L4	100 - 75.5	13.803	12	1.3011	0.0003
L5	80 - 35.5	8.867	12	1.0167	0.0001
L6	41 - 1	2.364	12	0.5327	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
142.00	Ø3" x 24' Omni Antenna	12	22.577	1.4984	0.0061	6528
137.00	Ø2.5" x 14' Omni	12	22.577	1.4984	0.0061	6528
130.00	(2) 3' Side Arm Mount	12	22.577	1.4984	0.0061	6528
116.00	Antennas + Mount (EPA 200 ft2)	12	18.362	1.3950	0.0010	36952
106.00	Antennas + Mount (EPA 200 ft2)	12	15.470	1.3528	0.0007	7452
96.00	Antennas + Mount (EPA 200 ft2)	12	12.738	1.2541	0.0004	4939
86.00	Antennas + Mount (EPA 200 ft2)	12	10.244	1.1086	0.0003	4829

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 110-ft Pole (Fut. 130-ft) - MFP #23522-285	Page 6 of 7
	Project CT021 North Branford	Date 11:43:44 09/04/22
	Client TP-21250	Designed by JC

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	100.767	2	6.6705	0.0164
L2	120.5 - 120	87.889	2	6.2488	0.0030
L3	120 - 100	87.236	2	6.2475	0.0029
L4	100 - 75.5	61.689	2	5.8140	0.0014
L5	80 - 35.5	39.648	2	4.5474	0.0006
L6	41 - 1	10.575	2	2.3838	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
142.00	Ø3" x 24' Omni Antenna	2	100.767	6.6705	0.0274	1564
137.00	Ø2.5" x 14' Omni	2	100.767	6.6705	0.0274	1564
130.00	(2) 3' Side Arm Mount	2	100.767	6.6705	0.0274	1564
116.00	Antennas + Mount (EPA 200 ft2)	2	82.013	6.2276	0.0046	8878
106.00	Antennas + Mount (EPA 200 ft2)	2	69.121	6.0426	0.0032	1719
96.00	Antennas + Mount (EPA 200 ft2)	2	56.933	5.6052	0.0019	1132
86.00	Antennas + Mount (EPA 200 ft2)	2	45.800	4.9574	0.0012	1100

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	130 - 120.5 (1)	TP8.625x8.625x0.322	9.50	0.00	0.0	8.3993	-0.44	264.58	0.002
L2	120.5 - 120 (2)	TP24.35x8.625x0.322	0.50	0.00	0.0	8.3993	-0.45	264.58	0.002
L3	120 - 100 (3)	TP28.2618x24.35x0.1875	20.00	0.00	0.0	16.7077	-9.34	977.40	0.010
L4	100 - 75.5 (4)	TP33.0537x28.2618x0.25	24.50	0.00	0.0	25.3313	-20.43	1481.88	0.014
L5	75.5 - 35.5 (5)	TP40.3772x31.6735x0.5625	44.50	0.00	0.0	69.1636	-34.45	4046.07	0.009
L6	35.5 - 1 (6)	TP46x38.1765x0.625	40.00	0.00	0.0	90.0127	-53.73	5265.74	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	130 - 120.5 (1)	TP8.625x8.625x0.322	15.81	58.30	0.271	0.00	58.30	0.000
L2	120.5 - 120 (2)	TP24.35x8.625x0.322	15.81	58.30	0.271	0.00	58.30	0.000
L3	120 - 100 (3)	TP28.2618x24.35x0.1875	291.39	619.09	0.471	0.00	619.09	0.000
L4	100 - 75.5 (4)	TP33.0537x28.2618x0.25	1033.13	1134.38	0.911	0.00	1134.38	0.000
L5	75.5 - 35.5 (5)	TP40.3772x31.6735x0.5625	2978.55	4066.47	0.732	0.00	4066.47	0.000
L6	35.5 - 1 (6)	TP46x38.1765x0.625	5142.24	6203.42	0.829	0.00	6203.42	0.000

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mjpeng.com	Job 110-ft Pole (Fut. 130-ft) - MFP #23522-285	Page 7 of 7
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	Client TP-21250	Designed by JC

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	130 - 120.5 (1)	TP8.625x8.625x0.322	1.02	79.37	0.013	0.28	57.94	0.005
L2	120.5 - 120 (2)	TP24.35x8.625x0.322	1.05	229.70	0.005	0.28	57.94	0.005
L3	120 - 100 (3)	TP28.2618x24.35x0.1875	24.35	293.22	0.083	0.28	720.91	0.000
L4	100 - 75.5 (4)	TP33.0537x28.2618x0.25	47.65	444.57	0.107	0.28	1242.87	0.000
L5	75.5 - 35.5 (5)	TP40.3772x31.6735x0.5625	52.06	1213.82	0.043	0.28	4117.97	0.000
L6	35.5 - 1 (6)	TP46x38.1765x0.625	55.88	1579.72	0.035	0.28	6277.37	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 120.5 (1)	0.002	0.271	0.000	0.013	0.005	0.273	1.000	4.8.2 ✓
L2	120.5 - 120 (2)	0.002	0.271	0.000	0.005	0.005	0.273	1.000	4.8.2 ✓
L3	120 - 100 (3)	0.010	0.471	0.000	0.083	0.000	0.487	1.000	4.8.2 ✓
L4	100 - 75.5 (4)	0.014	0.911	0.000	0.107	0.000	0.936	1.000	4.8.2 ✓
L5	75.5 - 35.5 (5)	0.009	0.732	0.000	0.043	0.000	0.743	1.000	4.8.2 ✓
L6	35.5 - 1 (6)	0.010	0.829	0.000	0.035	0.000	0.840	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	130 - 120.5	Pole	TP8.625x8.625x0.322	1	-0.44	264.58	27.3	Pass
L2	120.5 - 120	Pole	TP24.35x8.625x0.322	2	-0.45	264.58	27.3	Pass
L3	120 - 100	Pole	TP28.2618x24.35x0.1875	3	-9.34	977.40	48.7	Pass
L4	100 - 75.5	Pole	TP33.0537x28.2618x0.25	4	-20.43	1481.88	93.6	Pass
L5	75.5 - 35.5	Pole	TP40.3772x31.6735x0.5625	5	-34.45	4046.07	74.3	Pass
L6	35.5 - 1	Pole	TP46x38.1765x0.625	6	-53.73	5265.74	84.0	Pass
Summary								
Pole (L4)							93.6	Pass
RATING =							93.6	Pass

Monopole Flange Connection Calculation

TIA-222

Factored Connection Reactions:	Pole Shape:	Bolts:	Flange Plate:
Moment: 291 ft-kips	18-Sided	(14) 0.75 dia. A325 Bolts	1.5 in. x 40 in. Round
Shear: 24 kips	Pole Dia. (D_p):	On a 36 in Bolt Circle	f _y = 50 ksi
Axial: 9 kips	28.26 in		Inner Dia = 26 in

Bolt Calculation TIA 4.9.6.4 (Combined Shear and Tension)

The following Interaction Equation Shall Be Satisfied:

$$\begin{aligned} \phi &= 0.75 \text{ TIA 4.9.9} \\ I_{\text{bolts}} &= 2268.00 \text{ in}^2 \text{ Moment of Inertia} \\ T_u &= 27.71 \text{ kips Tension Force} \\ P_u &= 28.36 \text{ kips Compressive Force} \\ V_u &= 1.71 \text{ kips Shear Force} \\ \phi R_{nv} &= 15.90 \text{ kips From AISC 7-1} \\ \phi R_{nt} &= 29.80 \text{ kips From AISC 7-2} \end{aligned}$$

$$\left(\frac{V_{ub}}{\phi R_{nv}} \right)^2 + \left(\frac{T_{ub}}{\phi R_{nt}} \right)^2 \leq 1.0$$

$$0.877 < 1.0 \rightarrow \text{OK}$$

Base Plate Calculation According to TIA-222

$$\begin{aligned} \phi &= 0.90 \text{ TIA 4.7} \\ M_{PL} &= 109.72 \text{ in-kip Plate Moment} \\ L &= 6.34 \text{ in Section Length} \\ Z &= 3.57 \text{ Plastic Section Modulus} \\ M_p &= 178.37 \text{ in-kip Plastic Moment} \\ \phi M_n &= 160.5298 \text{ in-kip Factored Resistance} \end{aligned}$$

Calculated Moment vs Factored Resistance

$$109.7171 \text{ in-kip} \leq 161 \text{ in-kip}$$

Bolts Are Adequate	87.7%
Plate is Adequate	68.3%

Michael F. Plahovinsak, P.E. 18301 State Route 161 W Plain City, OH 43064 Phone: 614-398-6250 email: mike@mfpeng.com	Job 120-ft monopole - MFP #23522-285	Page BP & AB Calc
	Project CT021 North Branford	Date 9/4/2022
	Client TAPP TP-21250	Designed by Mike

Anchor Rod and Base Plate Calculation

TIA-222-H

Factored Base Reactions:	Pole Shape:	Anchor Rods:	Base Plate:
Moment: 5142 ft-kips	18-Sided	(24) 2.25 in. A615 GR. 75	3 in. x 59.75 in. Round
Shear: 56 kips	Pole Dia. (D_f): 46.00 in	Anchor Rods Evenly Spaced	fy = 50 ksi
Axial: 54 kips		On a 53.75 in Bolt Circle	

Anchor Rod Calculation According to TIA-222-H section 4.9.9

$\phi_t, \phi_v = 0.75$ TIA 4.9.6
 $I_{bolts} = 8667.19 \text{ in}^2$ Moment of Inertia
 $P_u = 194 \text{ kips}$ Compr Force
 $V_u = 2.3 \text{ kips}$ Shear Force
 $R_{nt} = 325.00 \text{ kips}$ Nominal Tensile Strength
 $R_{nv} = 198.80 \text{ kips}$ (0.5 x fu x ag)
Stress Rating = 80.3% Satisfies TIA-H 4.9.9

Base Plate Calculation According to TIA-222-H

$\phi = 0.90$ TIA 4.7
 $M_{PL} = 444.9 \text{ in-kip}$ Plate Moment
 $L = 6.0 \text{ in}$ Section Length
 $Z = 13.5$ Plastic Section Modulus
 $M_P = 677.4 \text{ in-kip}$ Plastic Moment
 $\phi M_n = 609.7 \text{ in-kip}$ Factored Resistance

Calculated Moment vs Factored Resistance

$444.88 \text{ in-kip} \leq 610 \text{ in-kip}$

Stress Rating = 73.0%

Anchor Rods Are Adequate	80.3% <input checked="" type="checkbox"/>
Base Plate is Adequate	73.0% <input checked="" type="checkbox"/>

Monopole Spread Footing Calculation

TIA-222-H

Factored Base Reactions:	Footing Dimensions:		Concrete:
Moment: 6122 ft-kips	28 ft x 28 ft	6.5 ft Square Pier	$f_c = 4500$ psi
Shear: 67 kips	x 4 ft thick	w/6 in Reveal	Steel $f_y = 60$ ksi
Axial: 54 kips	Bearing 6 ft B.G.	120.1 Yd3 Concrete	$f = 0.75$
Soil Backfill 100 pcf	Ultimate Bearing:	8000 psf	Water Table n/a

Foundation Weight

Weight of Pole	54.0 kips
Weight of Concrete	486.24375 kips
Weight of Soil	148.35 kips
Bouyancy of Water	0.0 kips
Total	688.6 kips

Overturning Resistance:

Overturning Moment (M_u)	6557.5 ft-kips	6122 ft-kips + (67 kips x 6.5 ft)
Resisting Moment (R_s)	9640.3125 ft-kips	688.59375 kips x 28 ft / 2
$\phi \times R_s > M_u$	$M_{\text{overturning}} / f M_{\text{resist}}$	90.7% OK

Soil Bearing Pressure:

Eccentricity (e)	9.52 ft	6557.5 ft-kips / 688.59375 kips
$6(e)$	57.1 ft >	28.0 ft $6e > 28$
Maximum Soil Bearing	3634.3868 psf	Calculated across corners
Soil Overburden	-600 psf	
Net Soil Bearing	3034.3868 psf	
Resisting Soil Bearing (R_s)	8000 psf	
Net Soil Bearing $< \phi \times R_s$	Net Bearing / $f R_s$	50.6% OK

Bending Moment in Pier:

Bending Moment	6289.5 ft-kips	6122 ft-kips + (67 kips x 2.5 ft)
Min. Pier Steel	30.42 in ²	1/2% (Based on Square Pier)

Bending Moment in Footing:

Max Bending Moment	4344.0878 ft-kips	Σ Moments about pier face
Footing Steel Req'd (Loads)	1.25 in ² /ft	
Min. Footing Steel	1.04 in ² /ft	0.18%



HOMELAND TOWERS

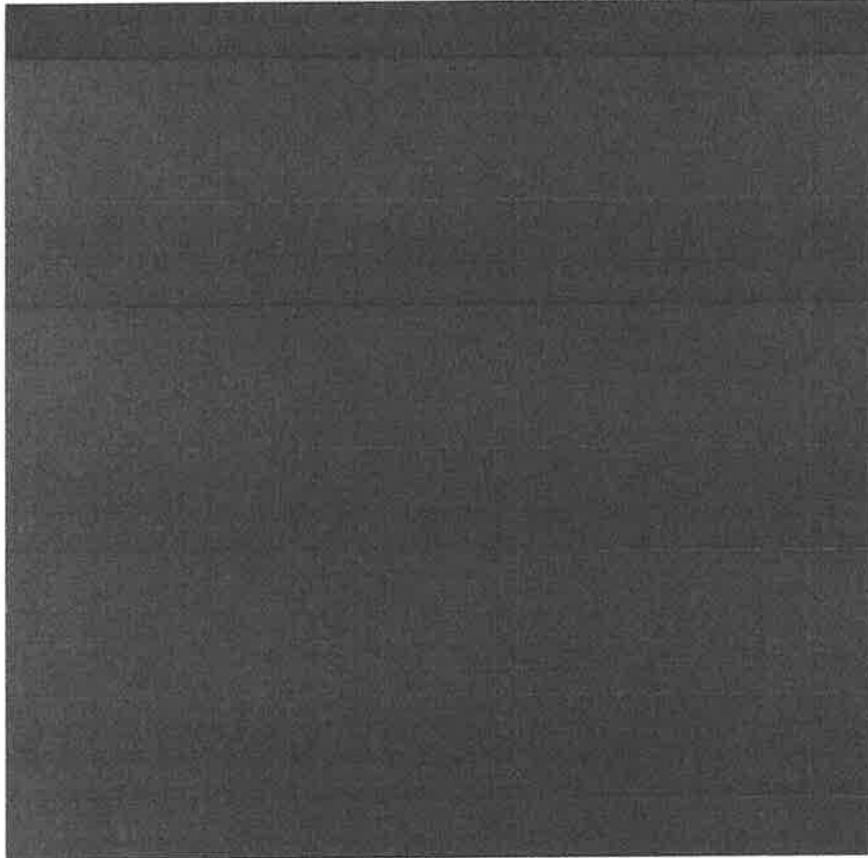
EXHIBIT C

(Color Swatch of brown monopole, carrier antennas and mounts – Sherwin Williams Thunder Grey SW7645
Color Swatch of Town's mounts – PL 1201 White Smoke/Sherwin Williams)

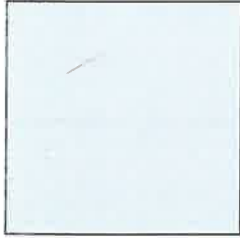
SW7645 - Thunder Gray



Color Name: Thunder Gray **RGB Value:**
Color Number: SW 7645 **R:** 88
G: 85
B: 78
Collection(s):
Violet **Hex Value:**
Color Information: 58554e
Color Family: Cool Neutral
Store Strip Location: null



PL1201 - White Smoke



Color Name: White Smoke

Color Number: 26-02

Color Collection (s):

Clean Colors

Color Information:

Pratt & Lambert (1201)

RGB Value:

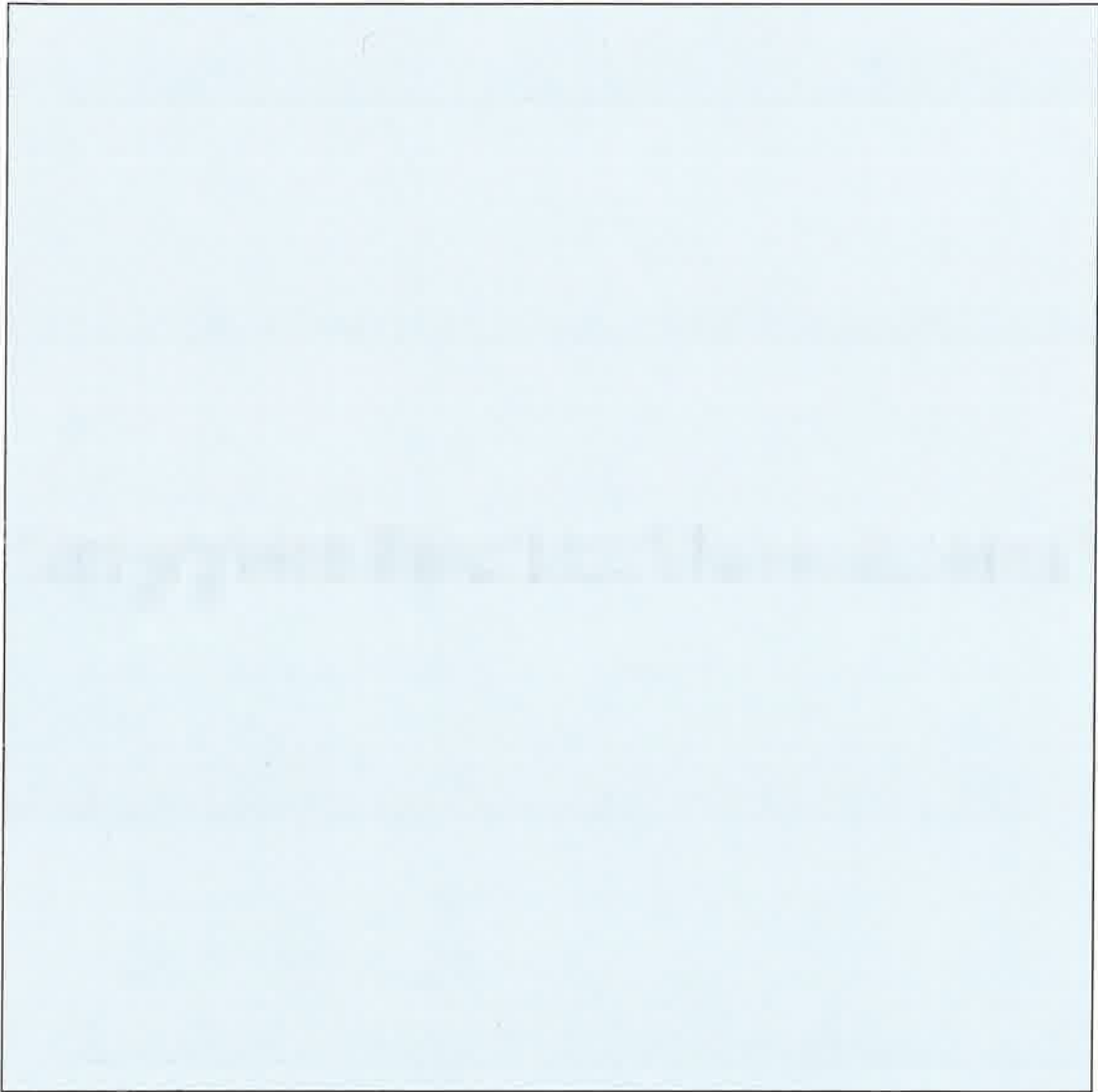
R: 218

G: 229

B: 235

Hex Value:

dae5eb





HOMELAND TOWERS

EXHIBIT D
(Verizon Commitment Letter)



August 23, 2022

Re: Connecticut Siting Council Docket No. 507
Homeland Towers, LLC and Cellco Partnership d/b/a Verizon Wireless
Certificate of Environmental Compatibility and Public Need for the construction,
maintenance, and operation of a wireless telecommunications facility located at 222
Clintonville Road, North Branford, Connecticut
Verizon Wireless's Use of the Approved Facility

Dear Ms. Bachman:

In accordance with condition 2a of the Siting Council's Decision and Order ("D&O") in Docket No. 507, this letter serves as Verizon Wireless's commitment to install and operate its wireless facility on the approved monopole facility upon completion of construction by Homeland Towers, LLC. Verizon Wireless anticipates that its North Branford facility will be operational within the eighteen-month timeframe included in the D&O.

Thank you for your consideration of this information.

Sincerely,


Andrew Candiello (Aug 23, 2022 14:30 EDT)

Andrew Candiello

Verizon Wireless

Sr. Manager - RE/Regulatory
New England - Network Real Estate
Cellco Partnership d/b/a Verizon Wireless