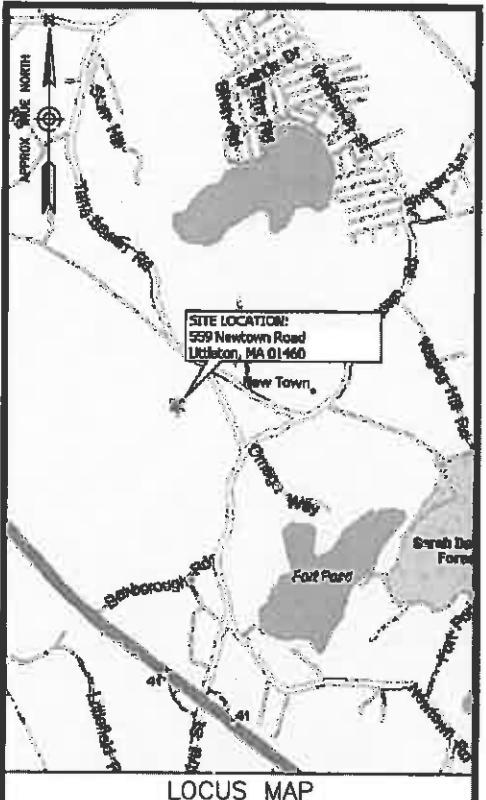




# at&t Mobility

## CROWN NEWTOWN ROAD LITTLETON SITE NO.: MA3570A 559A NEWTOWN ROAD LITTLETON, MA 01460



FROM FRAMINGHAM, MA: TAKE MA-9 W/ WORCESTER ROAD. MERGE ONTO I-495 N TOWARD LOWELL. TAKE EXIT 28A TO MERGE ONTO MA-2 E TOWARD BOSTON. TAKE EXIT 41 TOWARD LITTLETON. TURN LEFT ONTO CENTRAL STREET. CONTINUE ONTO NEWTOWN ROAD. THE SITE WILL BE ON THE LEFT.

**ENGINEER**  
DEWBERRY ENGINEERS INC.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE # (617) 695-3400  
FAX # (617) 695-3310  
CONTACT: BENJAMIN REVETTE, P.E.

**SITE ACQUISITION**  
N.P.M.I.  
328 WEST SHORE DRIVE  
SUITE 1-A  
MARBLEHEAD, MA 01945  
PHONE # (781) 727-8516  
CONTACT: JOHN NESTOR

**CONSTRUCTION**  
N.P.M.I.  
328 WEST SHORE DRIVE  
SUITE 1-A  
MARBLEHEAD, MA 01945  
PHONE # (781) 727-8516  
CONTACT: JOHN NESTOR

**SITE NAME:**  
NEWTOWN ROAD LITTLETON  
**SITE NUMBER:**  
MA3570A

**TOWER OWNER:**  
CROWN CASTLE USA, INC.  
200 CORPORATE DRIVE  
CANONSBURG, PA 15317  
CROWN CASTLE ID: 875050

**APPLICANT/DEVELOPER:**  
AT&T MOBILITY  
550 COCHITIUTE ROAD  
SUITES 13 & 14  
FRAMINGHAM, MA 01701

**ELECTRIC UTILITY:**  
NSTAR  
(800) 592-2000

**TELEPHONE UTILITY:**  
VERIZON  
(800) 837-4968

**COORDINATES\***  
LATITUDE: 42° 31' 0.8" N (NAD83)  
LONGITUDE: 71° 28' 39.0" W (NAD83)  
\*PER HANDHELD GPS

**SITE ADDRESS:**  
559A NEWTOWN ROAD  
LITTLETON, MA 01460  
**ZONING DISTRICT:**  
RESIDENTIAL

### PROJECT DIRECTORY

NPMI CM	DATE
AT&T CM	DATE
NPMI RF	DATE
AT&T RF	DATE

### APPROVALS

AN EXISTING 100' TALL A.G.L. LATTICE TOWER WILL BE EXTENDED TO 115' TALL A.G.L. TWELVE (12) PANEL ANTENNAS (4/SECTOR) AND ASSOCIATED EQUIPMENT WILL BE INSTALLED AT 109' A.G.L. AN EQUIPMENT SHELTER WITH AN EXTERNAL DIESEL GENERATOR WILL BE INSTALLED AT GRADE. POWER AND TELCO WILL COME FROM EXISTING SOURCES LOCATED ON SITE.

### PROJECT DESCRIPTION

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

**A.D.A. COMPLIANCE:**  
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

### CONSULTANT TEAM

### PROJECT SUMMARY

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
Z-1	ABUTTERS PLAN
Z-2	KEY PLAN
Z-3	PROFILES 1, 2, & 3
Z-4	PROFILES 4, 5, & 6
Z-5	PROFILES 7 & 8
C-1	PROPOSED SITE PLAN & ELEVATION
C-2	CONSTRUCTION DETAILS
C-3	ANTENNA MOUNTING DETAILS & RF SCHEDULE
E-1	ELECTRICAL RISER DIAGRAM
E-2	SCHEMATIC GROUNDING PLAN
E-3	GROUNDING DETAILS

### SHEET INDEX

CONSTRUCTION DRAWINGS	
2	03/11/15 FOR CONSTRUCTION
1	02/11/15 FOR CONSTRUCTION
0	10/02/14 FOR CONSTRUCTION
A	09/04/14 FOR COMMENT

**Dewberry®**

Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.495.3400  
FAX: 617.495.3310



DRAWN BY: SCA  
REVIEWED BY: GMT  
CHECKED BY: BBR  
PROJECT NUMBER: 50037672  
JOB NUMBER: 50061274  
SITE ADDRESS: 559A NEWTOWN ROAD LITTLETON, MA 01460  
SHEET TITLE: TITLE SHEET  
SHEET NUMBER: T-1

T-1

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FRAMINGHAM, MA 01701

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Project Management Services  
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MARBLEHEAD, MA 01945

**CROWN NEWTOWN ROAD LITTLETON**  
SITE NO.: MA3570A  
CROWN ID: 875050

## GENERAL CONSTRUCTION NOTES:

- ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH AT&T MOBILITY SPECIFICATIONS.
- CONTRACTOR SHALL CONTACT "DIG SAFE 1888 DIG SAFE" (888-344-7233) FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
- ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
- DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
- DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
- THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
- CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, ETC. BEFORE COMMENCING WORK.
- INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE ILL-FITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.
- EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
- CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE AT&T MOBILITY CONSTRUCTION MANAGER.
- ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
- WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY ENGINEER, AT&T MOBILITY PROJECT CONSTRUCTION MANAGER, AND LANDLORD IMMEDIATELY.
- CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
- CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
- CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
- CONTRACTOR SHALL FURNISH AT&T MOBILITY WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
- ANTENNAS AND CABLES ARE TYPICALLY PROVIDED BY AT&T MOBILITY. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH AT&T MOBILITY PROJECT MANAGER TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED BY AT&T MOBILITY WIRELESS. ALL ITEMS NOT PROVIDED BY AT&T MOBILITY SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED BY AT&T MOBILITY.
- PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH AT&T MOBILITY PROJECT MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY AT&T MOBILITY. ALL REQUIRED PERMITS NOT OBTAINED BY AT&T MOBILITY MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
- CONTRACTOR SHALL START UP HVAC UNITS AND SYNCHRONIZE THE THERMOSTATS.
- CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH AT&T MOBILITY SPECIFICATIONS AND REQUIREMENTS.
- CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- UNLESS OTHERWISE NOTED AT&T MOBILITY SHALL PROVIDE ALL REQUIRED RF MATERIAL FOR CONTRACTOR TO INSTALL, INCLUDING ANTENNAS, TMA'S, BIAS-T'S, COMBINERS, PDU, DC BLOCKS, SURGE ARRESTORS, GPS ANTENNA, GPS SURGE ARRESTOR, COAXIAL CABLE.
- PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO BE PROVIDED BY AT&T MOBILITY FOR INSTALLATION BY CONTRACTOR.
- ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO AT&T MOBILITY SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- EQUIPMENT SHELTER SHALL HAVE ONE (1) EXTERIOR MOTION DETECTOR OPERATED BY A 100-WATT LIGHT WITH DOWNWARD REFLECTOR SHIELD.
- CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

## GENERAL FOUNDATION NOTES:

(APPLICABLE FOR EQUIPMENT SHELTER ONLY)

- THOROUGHLY COMPACT BOTTOM OF EXCAVATIONS PRIOR TO PLACING RIGID INSULATION BARRIER. BACKFILL AND COMPACTION PROCEDURES SHALL BE DONE PER INDUSTRY STANDARDS.
- ALL REINFORCING STEEL SHALL BE ASTM A615 - GRADE 60. SECURE REINFORCING IN PLACE TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT.
- PROVIDE A CLEAR COVER OF 3" FOR ALL REINFORCING STEEL. THIS REQUIREMENT SHALL BE CONSIDERED ACTUAL AND SHOULD NOT BE ADJUSTED IN THE FIELD.
- VERIFY DETAILS AND DIMENSIONS WITH SHELTER DRAWINGS. NOTIFY AT&T MOBILITY OF ANY DISCREPANCIES.
- ALL WORK SHALL COMPLY WITH THE LOCAL AND THE MASSACHUSETTS STATE BUILDING CODES.
- INSULATION BARRIER PROVIDED IS FOR FROST PROTECTION IN LIEU OF STANDARD FOUNDATIONS WITH BEARING AT CODE REQUIRED FROST DEPTH.
- SHELTER MUST BE ANCHORED TO ITS FOUNDATION. ANCHOR IN ACCORDANCE WITH SHELTER MANUFACTURER'S SPECIFICATIONS.

## CONCRETE AND REINFORCING STEEL NOTES:

- DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF ALL APPLICABLE CODES INCLUDING: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", AND ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
- MIX DESIGN SHALL BE APPROVED BY OWNER'S REPRESENTATIVE AND SUBMITTED TO ENGINEER PRIOR TO PLACING CONCRETE.
- CONCRETE SHALL BE NORMAL WEIGHT, 6 % AIR ENTRAINED (+/- 1.5%) WITH A MAXIMUM 4" SLUMP AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE NOTED.
- THE FOLLOWING MATERIALS SHALL BE USED:  
PORTLAND CEMENT: ASTM C-150, TYPE 1 OR 2  
REINFORCEMENT: ASTM A-185, PLAIN STEEL WELDED WIRE FABRIC  
REINFORCEMENT BARS: ASTM A515, GRADE 60, DEFORMED  
NORMAL WEIGHT AGGREGATE: ASTM C-33  
WATER: DRINKABLE  
ADMIXTURES: NON-CHLORIDE CONTAINING
- MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS (UNLESS OTHERWISE NOTED):  
A. CONCRETE CAST AGAINST EARTH: 3"  
B. ALL OTHER CONCRETE: 2"
- A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE IN ACCORDANCE WITH ACI 301 SECTION 4.2.4, UNLESS NOTED OTHERWISE.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE.
- ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN ACI 301.
- DO NOT WELD OR TACK WELD REINFORCING STEEL.
- ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.
- REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
- DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
- DO NOT ALLOW REINFORCEMENT, CONCRETE OR SUBBASE TO FREEZE DURING CONCRETE CURING AND SETTING PERIOD, OR FOR A MINIMUM OF 3 DAYS AFTER PLACEMENT.
- FOR COLD-WEATHER AND HOT-WEATHER CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS. IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC. SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS, MINIMUM.
- CONCRETE SHALL BE RUBBED TO A ROUGH GROUT FINISH. PADS SHALL BE SEALED BY STEEL TROWEL.
- UNLESS OTHERWISE NOTED:  
A. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.  
B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- SPlicing OF REINFORCEMENT IS PERMITTED ONLY AT LOCATIONS SHOWN IN THE CONTRACT DRAWINGS OR AS ACCEPTED BY THE ENGINEER. UNLESS OTHERWISE SHOWN OR NOTED REINFORCING STEEL SHALL BE SPLICED TO DEVELOP ITS FULL TENSILE CAPACITY (CLASS A) IN ACCORDANCE WITH ACI 318.
- REINFORCING BAR DEVELOPMENT LENGTHS, AS COMPUTED IN ACCORDANCE WITH ACI 318, FORM THE BASIS FOR BAR EMBEDMENT LENGTHS AND BAR SPLICED LENGTHS SHOWN IN THE DRAWINGS. APPLY APPROPRIATE MODIFICATION FACTORS FOR TOP STEEL, BAR SPACING, COVER AND THE LIKE.
- DETAILING OF REINFORCING STEEL SHALL CONFORM TO "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
- ALL SLAB CONSTRUCTION SHALL BE CAST MONOLITHICALLY WITHOUT HORIZONTAL CONSTRUCTION JOINTS, UNLESS SHOWN IN THE CONTRACT DRAWINGS.
- LOCATION OF ALL CONSTRUCTION JOINTS ARE SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, CONFORMANCE WITH ACI 318, AND ACCEPTANCE OF THE ENGINEER. DRAWINGS SHOWING LOCATION OF DETAILS OF THE PROPOSED CONSTRUCTION JOINTS SHALL BE SUBMITTED WITH REINFORCING STEEL PLACEMENT DRAWINGS.
- SPLICES OF WWF, AT ALL SPLICED EDGES, SHALL BE SUCH THAT THE OVERLAP MEASURED BETWEEN OUTERMOST CROSS WIRES OF EACH FABRIC SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRE PLUS 2 INCHES, NOR LESS THAN 8".
- BAR SUPPORTS SHALL BE ALL-GALVANIZED METAL WITH PLASTIC TIPS.
- ALL REINFORCEMENT SHALL BE SECURELY TIED IN PLACE TO PREVENT DISPLACEMENT BY CONSTRUCTION TRAFFIC OR CONCRETE. TIE WIRE SHALL BE 16 GAUGE CONFORMING TO ASTM A62.
- SLAB ON GROUND  
A. COMPACT STRUCTURAL FILL TO 95% DENSITY AND THEN PLACE 8" GRAVEL BENEATH SLAB.  
B. PROVIDE VAPOR BARRIER BENEATH SLAB ON GROUND.

## STRUCTURAL NOTES:

- AS REQUIRED UNDER THE STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNA, ANSI/TIA-222-G, AT&T MOBILITY SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED MASSACHUSETTS STRUCTURAL ENGINEER CERTIFYING THAT THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS AND APPURTENANCES AND COMPLIES WITH THE CURRENT MASSACHUSETTS STATE BUILDING CODE AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.
- FOR STRUCTURAL MODIFICATIONS REQUIRING FIELD WELDING; THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND IMPLEMENTING ALL INDUSTRY STANDARDS FOR PROTECTION OF ALL EXISTING PROPERTY AND PERSONNEL FOR DAMAGE OR HARM. ALL PROPERTY DAMAGED DURING CONSTRUCTION OF THIS PROJECT SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION OF THE OWNER.

**at&t**  
Mobility  
550 COCHITIATE ROAD  
SUITES 13 & 14  
FRAMINGHAM, MA 01701

**npimi**  
NANEPASHMET  
Project Management Services  
781-727-6516

328 WEST SHORE DRIVE  
SUITE 1-A  
MARBLEHEAD, MA 01945

**CROWN NEWTOWN**  
**ROAD LITTLETON**  
**SITE NO.: MA3570A**  
**CROWN ID: 875050**

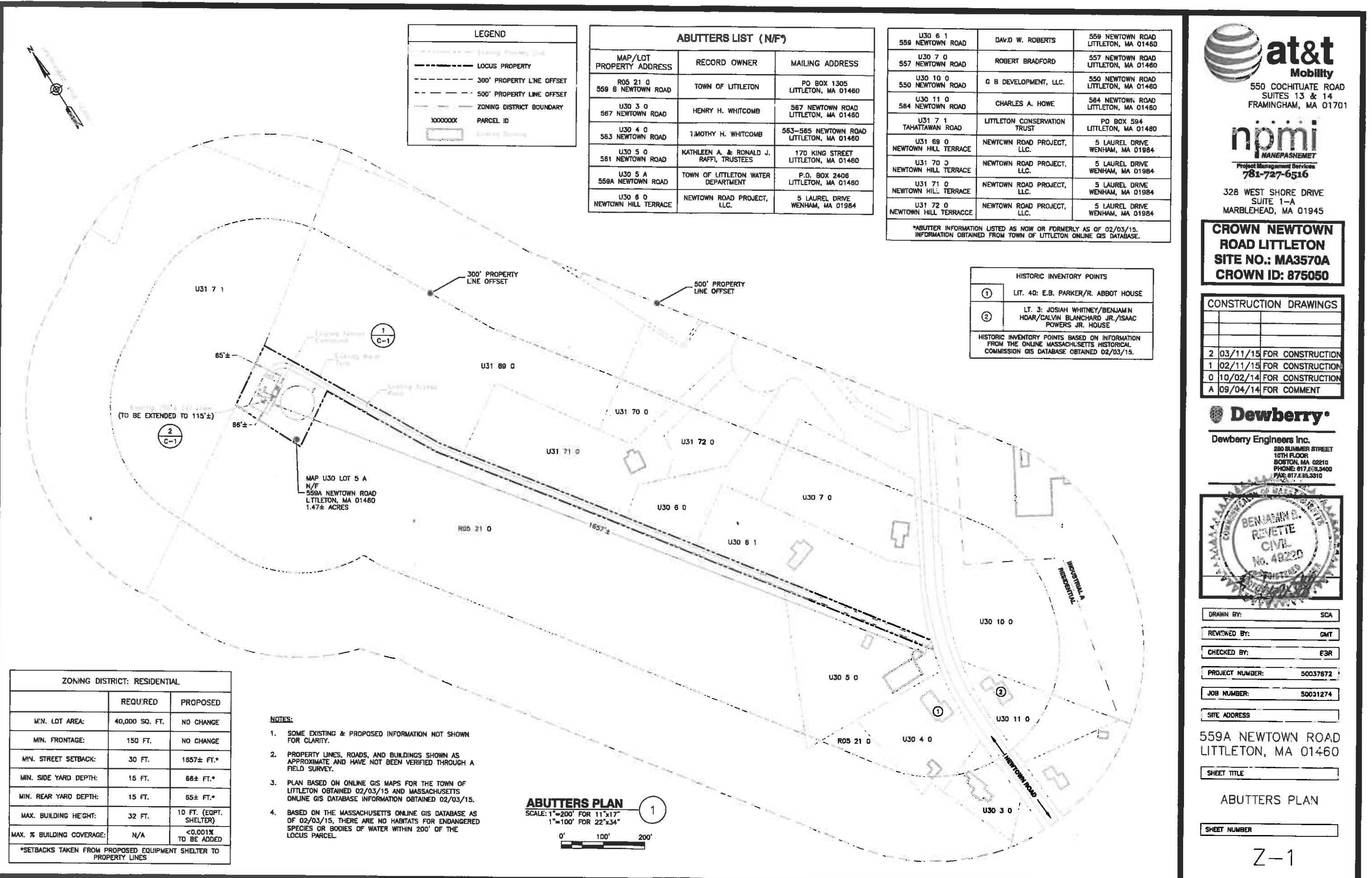
CONSTRUCTION DRAWINGS	
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2	03/11/15 FOR CONSTRUCTION
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A	09/04/14 FOR COMMENT

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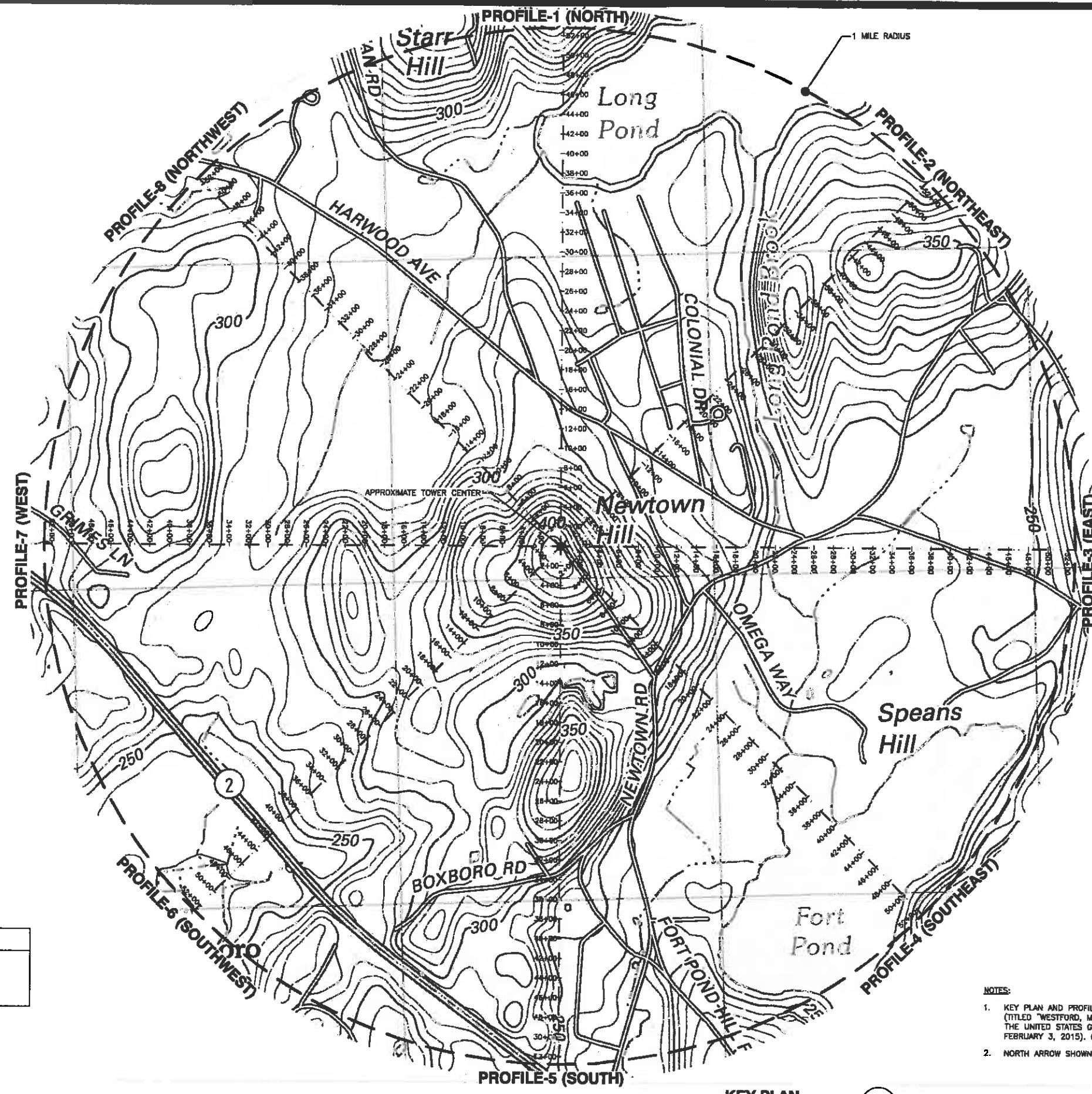
Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.595.3400  
FAX: 617.595.3310



DRAWN BY:	SCA
REVIEWED BY:	GMT
CHECKED BY:	BBR
PROJECT NUMBER:	50037672
JOB NUMBER:	50061274
SITE ADDRESS:	559A NEWTOWN ROAD LITTLETON, MA 01460
SHEET TITLE:	GENERAL NOTES
SHEET NUMBER:	G-1



APPROXIMATE TRUE NORTH



KEY PLAN  
SCALE: N.T.S.

1

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280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.635.3400  
FAX: 617.635.3310



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JOB NUMBER: 50061274  
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LITTLETON, MA 01460  
SHEET TITLE: KEY PLAN  
SHEET NUMBER: 1

Z-2

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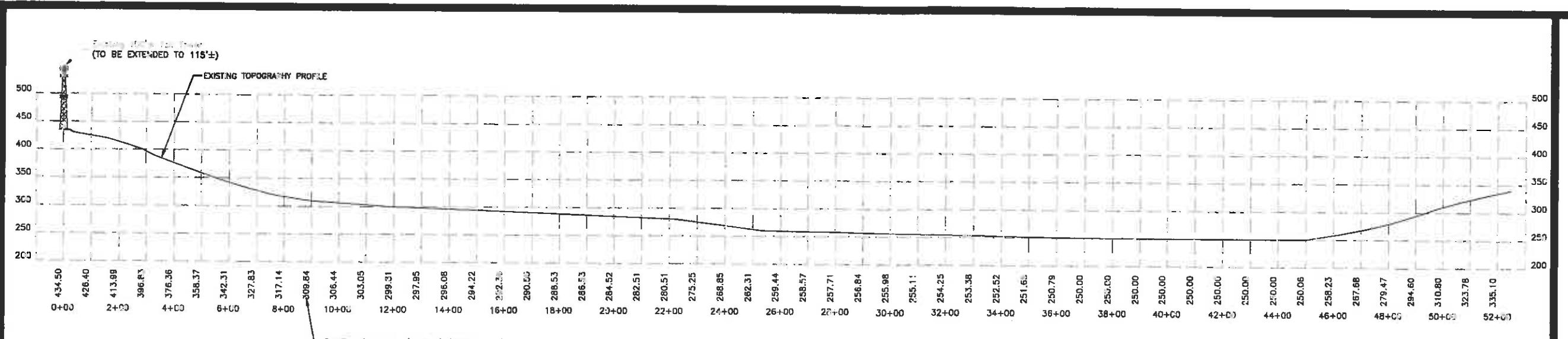
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Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.493.3400  
FAX: 617.495.3310



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SITE ADDRESS: 559A NEWTOWN ROAD LITTLETON, MA 01460  
SHEET TITLE: PROFILES 1, 2 & 3  
SHEET NUMBER:

Z-3



**CONSTRUCTION DRAWINGS**

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A 09/04/14 FOR COMMENT

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Dewberry Engineers Inc.  
280 SUMNER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.265.3400  
FAX 617.265.3310



DRAWN BY: *REVETTE* SK

REVIEWED BY: MFT

CHECKED BY: BBR

PROJECT NUMBER: 50037672

JOB NUMBER: 50061274

SITE ADDRESS

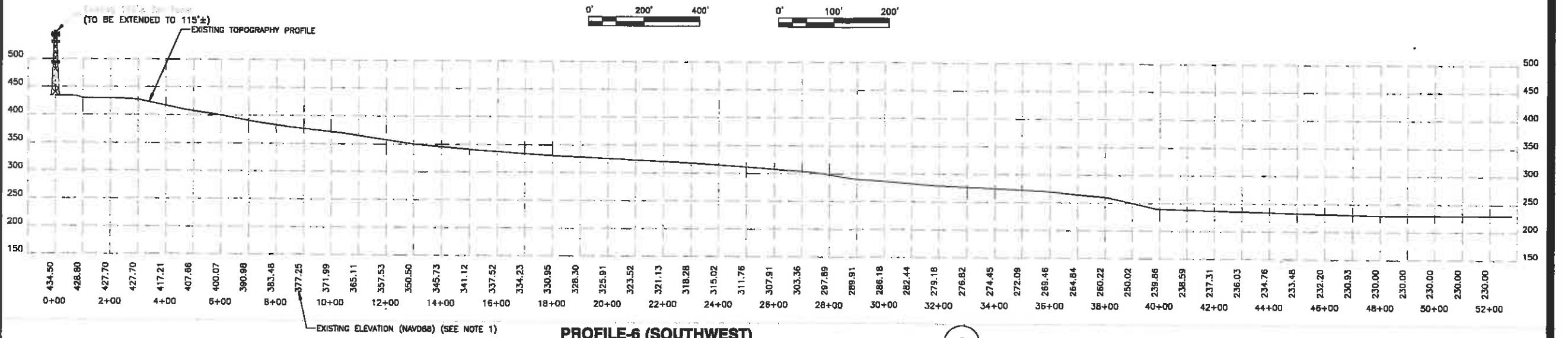
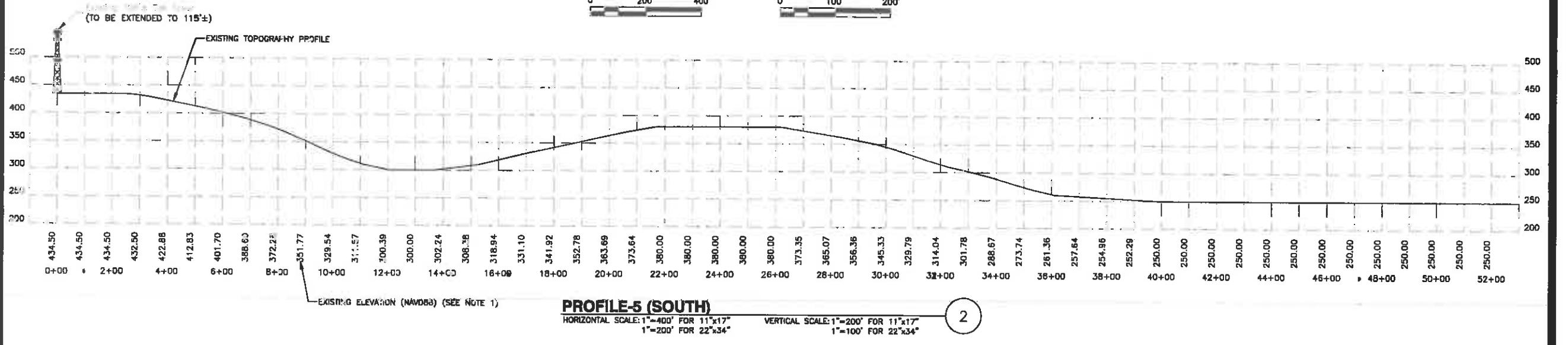
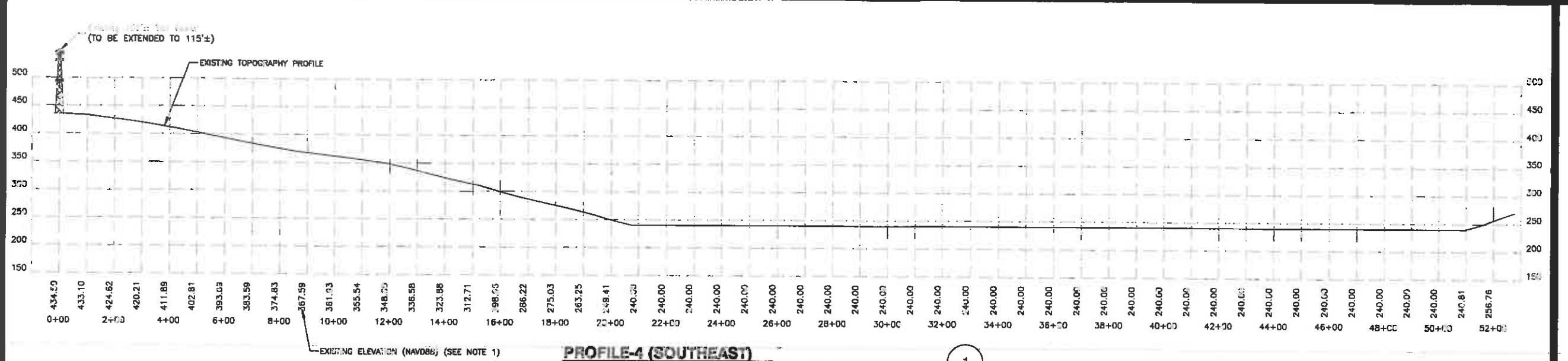
559A NEWTOWN ROAD  
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SHEET TITLE

PROFILES 4, 5 & 6

SHEET NUMBER

Z-4



NOTE:  
1. PROFILE BASED ON TOPOGRAPHICAL MAPS (TITLED "WESTFORD, MA", DATED 2012) MADE AVAILABLE BY THE UNITED STATES GEOLOGICAL SURVEY (OBTAINED FEBRUARY 3, 2015). CONTOUR INTERVAL IS 10 FEET.

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**CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050**

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FAX: 617.695.3310



DRAFTER: SK  
REVIEWED BY: MFT  
CHECKED BY: BBR  
PROJECT NUMBER: 50037672  
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SITE ADDRESS

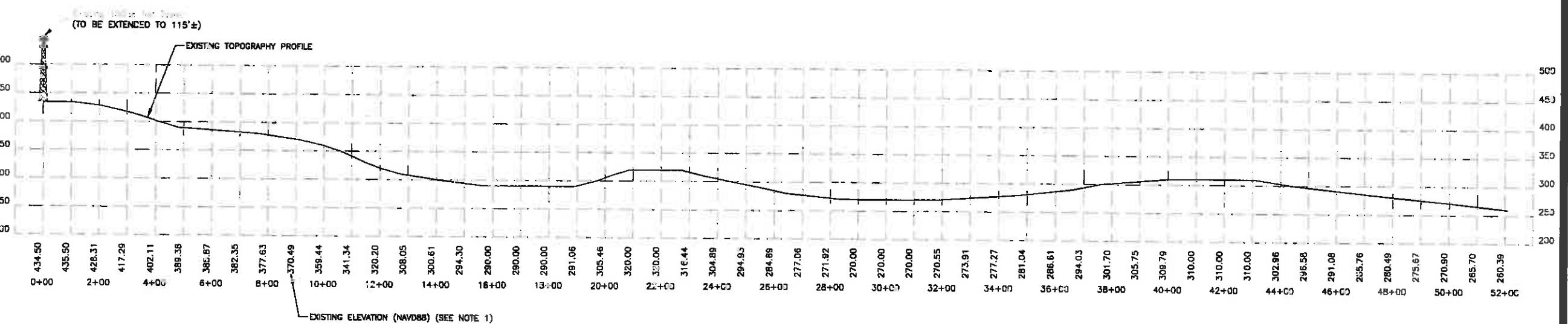
559A NEWTOWN ROAD  
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SHEET TITLE

PROFILES 7 & 8

SHEET NUMBER

Z-5



**PROFILE-7 (WEST)**

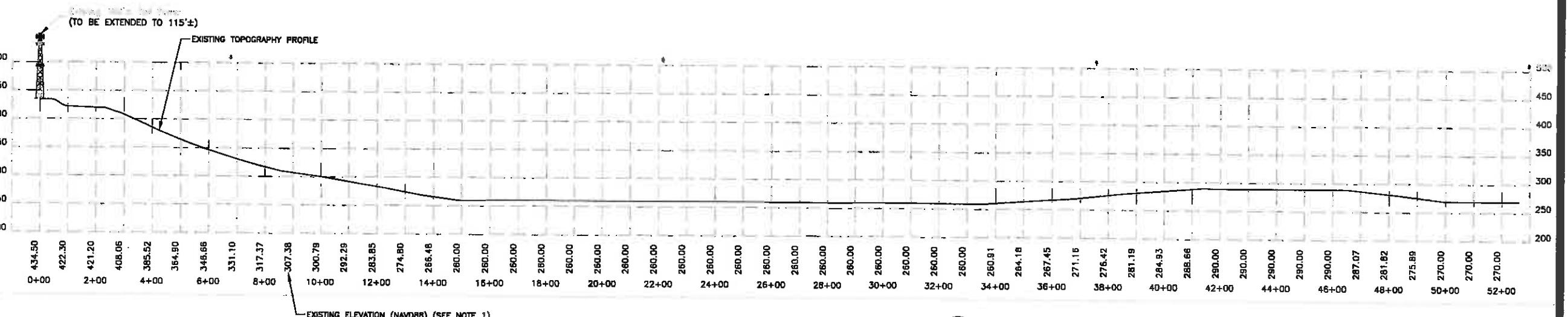
HORIZONTAL SCALE: 1"=400' FOR 11"x17"  
1"=200' FOR 22"x34"

VERTICAL SCALE: 1"=200' FOR 11"x17"  
1"=100' FOR 22"x34"

0' 200' 400'

0' 100' 200'

1



**PROFILE-8 (NORTHWEST)**

HORIZONTAL SCALE: 1"=400' FOR 11"x17"  
1"=200' FOR 22"x34"

VERTICAL SCALE: 1"=200' FOR 11"x17"  
1"=100' FOR 22"x34"

0' 200' 400'

0' 100' 200'

2

NOTE:

1. PROFILE BASED ON TOPOGRAPHICAL MAPS (TITLED "WESTFORD, MA", DATED 2012) MADE AVAILABLE BY THE UNITED STATES GEOLOGICAL SURVEY (OBTAINED FEBRUARY 3, 2015). CONTOUR INTERVAL IS 10 FEET.

**CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050**

**CONSTRUCTION DRAWINGS**

2 03/11/15 FOR CONSTRUCTION  
1 02/11/15 FOR CONSTRUCTION  
0 10/02/14 FOR CONSTRUCTION  
A 09/04/14 FOR COMMENT

**Dewberry®**

Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.593.5400  
FAX: 617.593.3310

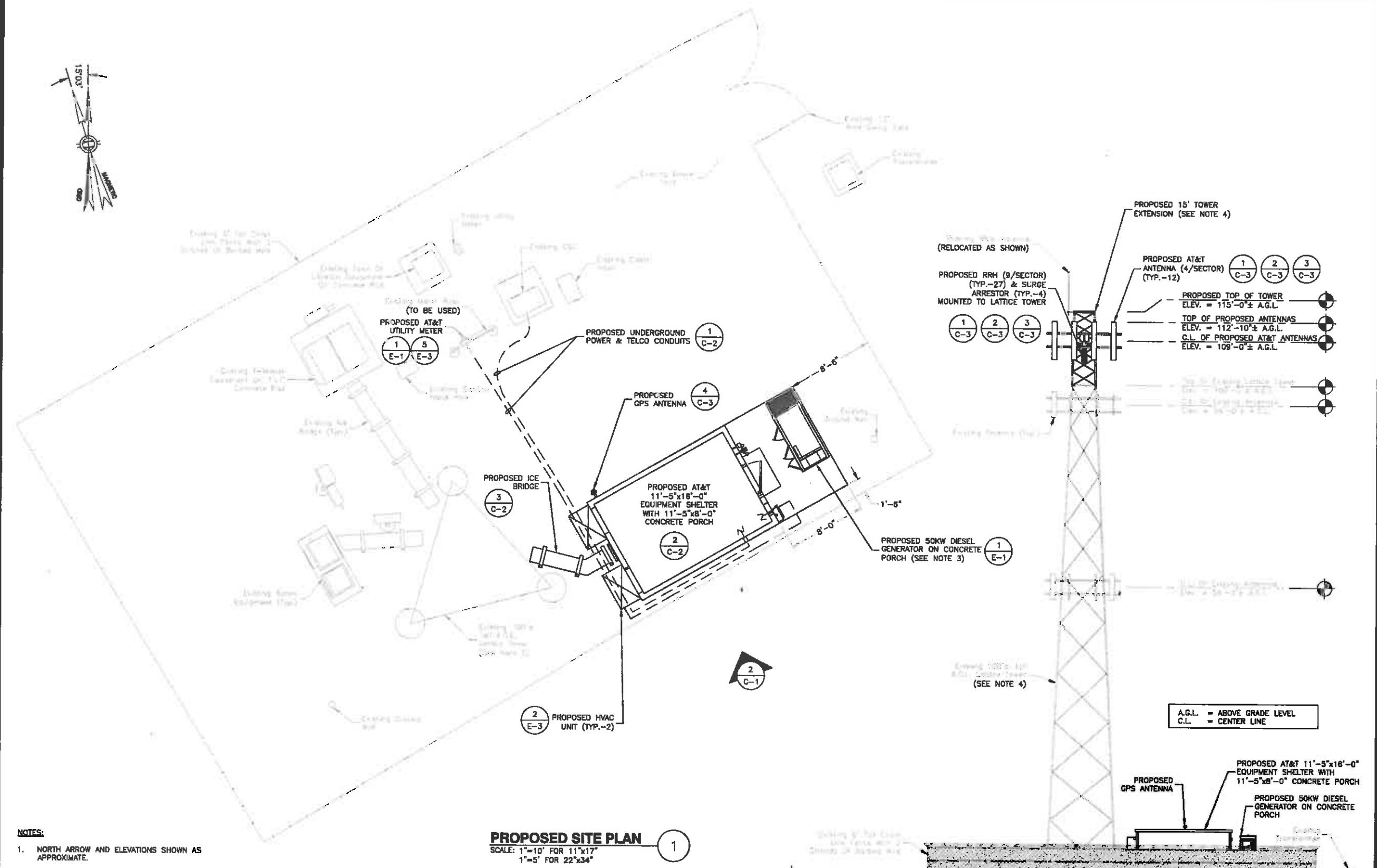


DRAWN BY: SCA  
REVIEWED BY: GMT  
CHECKED BY: BBR  
PROJECT NUMBER: 50037672  
JOB NUMBER: 50061274  
SITE ADDRESS

559A NEWTOWN ROAD  
LITTLETON, MA 01460  
SHEET TITLE

PROPOSED  
SITE PLAN & ELEVATION  
SHEET NUMBER

C-1



CONSTRUCTION DRAWINGS	
1	03/11/15 FOR CONSTRUCTION
2	02/11/15 FOR CONSTRUCTION
3	10/02/14 FOR CONSTRUCTION
4	09/04/14 FOR COMMENT

**Dewberry**

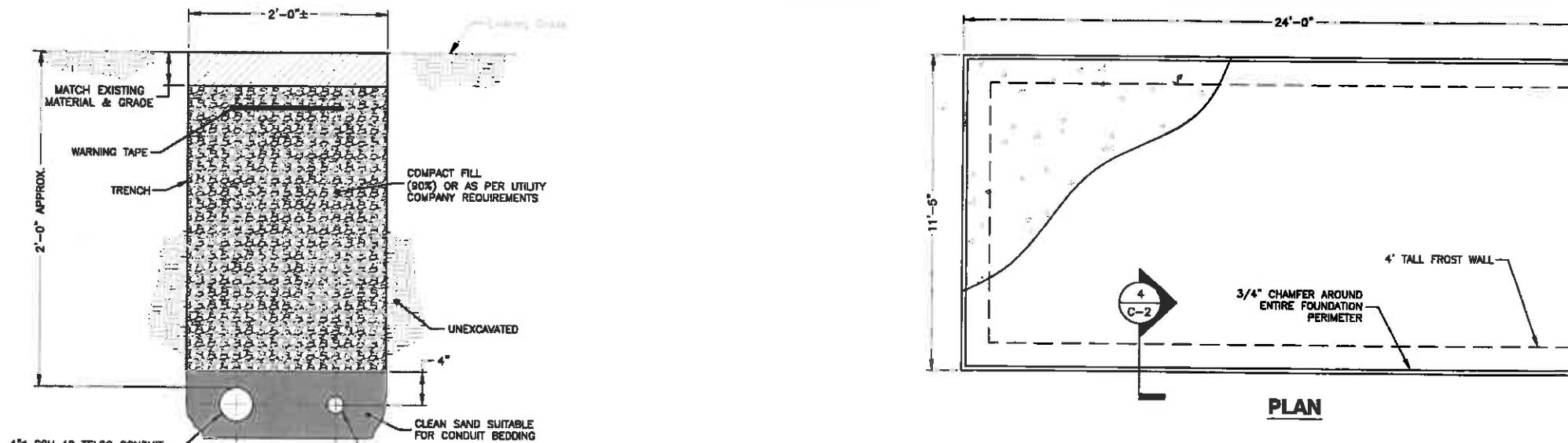
Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.525.5400  
FAX: 617.525.3310



DRAWN BY: SCA  
REVIEWED BY: CMT  
CHECKED BY: BBR  
PROJECT NUMBER: 50037672  
JOB NUMBER: 50061274  
SITE ADDRESS: 559A NEWTOWN ROAD  
LITTLETON, MA 01460  
SHEET TITLE  
CONSTRUCTION DETAILS

SHEET NUMBER

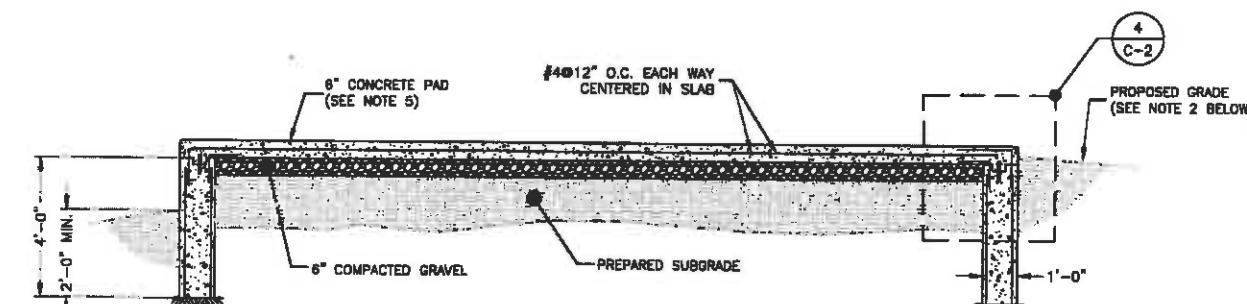
C-2



**JOINT SERVICE TRENCH BURIED CONDUIT  
(ELECTRIC/TELEPHONE)**

SCALE: N.T.S.

1



**SECTION**

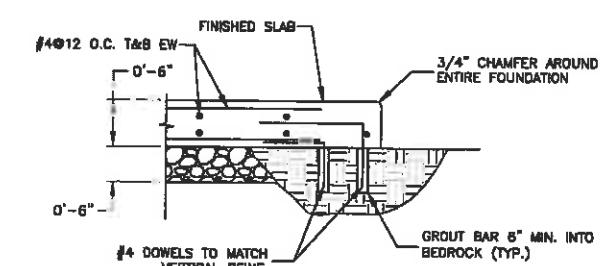
NOTES:

1. FOUNDATION TO BE PLACED IN SUITABLE SOIL WITH A MINIMUM ALLOWABLE DESIGN BEARING CAPACITY OF 3000 P.S.F. IF SITE CONDITIONS VARY FROM THOSE STATED ABOVE CONTRACTOR TO NOTIFY THE CONSTRUCTION MANAGER AND THE ENGINEER.
2. GRADE SHALL SLOPE AWAY FROM THE CONCRETE PAD TO ALLOW FOR PROPER WATER RUN OFF.
3. BEARING STRATA MEDIUM TO DENSE INSET GRANULAR MATERIAL OR COMPACTED GRAVEL FILL, 95% COMPACTION.
4. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL NO DELETERIOUS MATERIALS OR ORGANICS TO BE USED.
5. IF BEDROCK IS ENCOUNTERED AT A SHALLOW DEPTH, SEE DETAIL 5 THIS SHEET.
6. COLD WEATHER/HOT WEATHER CONCRETE PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 305 AND 308.
7. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
8. REINFORCING BARS SHALL CONFORM TO ASTM-A815 GRADE 60 SPECIFICATIONS AND BE DETAILED IN ACCORDANCE WITH ACI-318.
9. REMOVE ALL ORGANIC MATERIAL PRIOR TO PLACEMENT OF STONE. IF FILLING IS REQUIRED, BACKFILL AND COMPACT WITH WELL-DRAINING GRAVEL.
10. SEE CONCRETE FOUNDATION & SHELTER NOTES ON SHEET G-1.

**CONCRETE PAD FOUNDATION**

SCALE: 3/16"-1'-0" FOR 11"x17"  
3/8"-1'-0" FOR 22"x34"

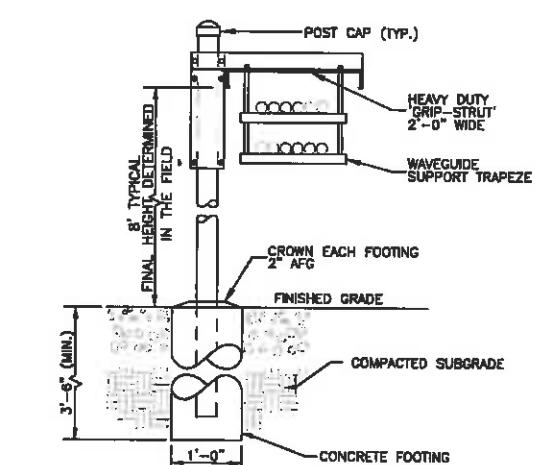
0' 2' 4' 6'



**FOUNDATION SLAB DETAIL @ BEDROCK**

SCALE: 3/8"-1'-0" FOR 11"x17"  
3/4"-1'-0" FOR 22"x34"

0' 1' 2' 3'



ICE BRIDGE NOTES:

1. ICE BRIDGE SHALL BE SITE PRO GRIP STRUT TRANSMISSION LINE BRIDGE KIT (P/N: B2734) OR APPROVED EQUAL.
2. CABLE SUPPORT SHALL BE SITE PRO DOUBLE LEVEL CHANNEL (P/N: B02284) OR APPROVED EQUAL.
3. ALL COMPONENTS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
4. CONTRACTOR SHALL DETERMINE REQUIRED QUANTITY OF ALL ICE BRIDGE COMPONENTS.
5. SNAP-IN HANGERS, SPLICE KITS, HINGE KITS, EXTENSION KITS, STIFFENERS, AND OTHER MISCELLANEOUS HARDWARE SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.
6. ICE BRIDGE SHALL BE ROUTED TO ACCOMMODATE THE MINIMUM BENDING RADIUS OF THE COAXIAL CABLE.
7. ICE BRIDGE COMPONENTS SHOWN ARE SCHEMATIC, CONSULT MANUFACTURER FOR EXACT AND CURRENT SPECIFICATIONS.

**ICE BRIDGE DETAIL**

SCALE: N.T.S.

3

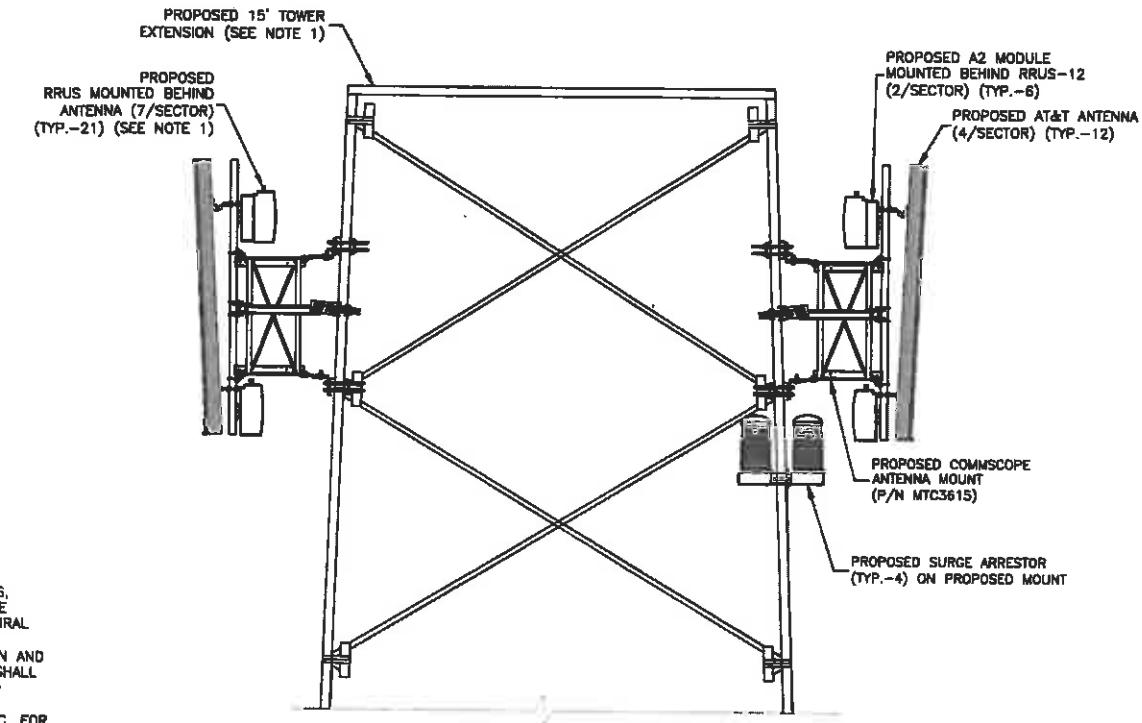
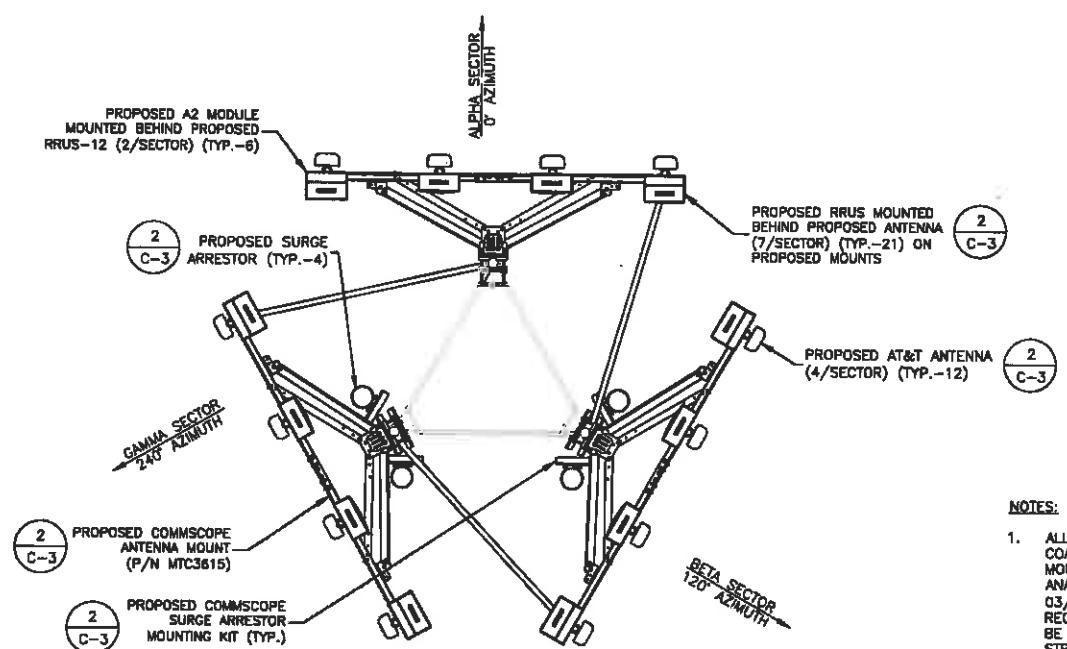
**FOUNDATION**

**WALL & SLAB DETAIL**

SCALE: 3/8"-1'-0" FOR 11"x17"  
3/4"-1'-0" FOR 22"x34"

0' 1' 2' 3'

4



NOTES:

1. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRUS, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS BY FDH ENGINEERING, INC., DATED 03/25/14, AND TOWER MANUFACTURER'S DESIGN AND RECOMMENDATIONS. ALL TOWER MODIFICATIONS SHALL BE DONE IN STRICT CONFORMANCE WITH REV. 0 STRUCTURAL MODIFICATION DRAWINGS, DATED 03/25/14, PREPARED BY FDH ENGINEERING, INC. FOR CROWN CASTLE.
2. ALL SPACING REQUIREMENTS FOR PROPOSED RRUS MOUNTS SHALL BE CONFIRMED AND SHALL NOT IMPEDE TOWER CLIMBING PEGS, TIE OFF LINES, OR OTHER EXISTING SAFETY FEATURES. ALL MOUNTS SHALL MAINTAIN EXISTING/PROPOSED MANUFACTURER SPACING REQUIREMENTS.
3. PLEASE SEE LATEST RFDS FOR RRUS MODEL NUMBER & FREQUENCY. INSTALL ACCORDING TO CORRESPONDING MANUFACTURER SPECIFICATIONS AND MAINTAIN ALL REQUIRED CLEARANCES.

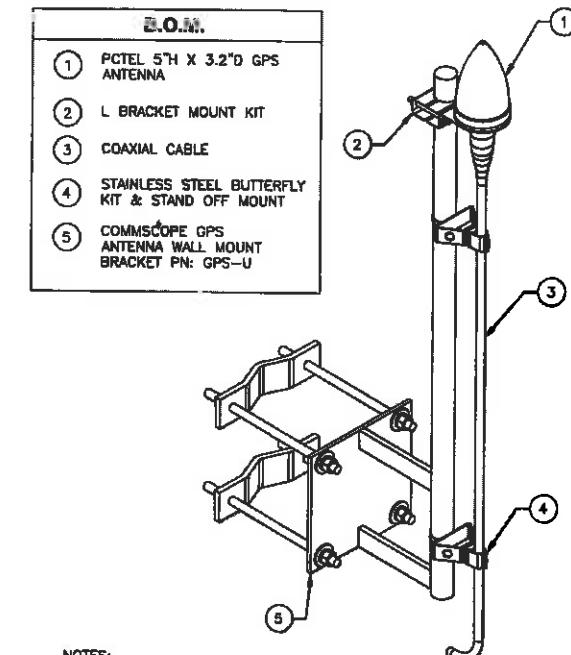
RF SCHEDULE & B.O.M.*											
SECTOR	ANTENNA	AZIMUTH (TRUE NORTH)	RAD CENTER	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	RRUS	ADDITIONAL COMPONENTS	RET CABLES	FIBER	DC LINES	SURGE
IA	CCI HPA-65R-BUU-H8	0°	109°	0°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				
IIA	CCI HPA-65R-BUU-H8	0°	109°	2°	6°/6°	(1) RRUS-E2 (1) RRUS-32	-				
IIIA	CCI HPA-65R-BUU-H8	0°	109°	2°	6°/6°	(1) RRUS 11	-				
IVA	CCI HPA-65R-BUU-H8	0°	109°	2°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				
IB	CCI HPA-65R-BUU-H8	120°	109°	0°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				
IIIB	CCI HPA-65R-BUU-H8	120°	109°	2°	6°/6°	(1) RRUS-E2 (1) RRUS-32	-				
IIIC	CCI HPA-65R-BUU-H8	120°	109°	2°	6°/6°	(1) RRUS 11	-				
IVB	CCI HPA-65R-BUU-H8	120°	109°	2°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				
IG	CCI HPA-65R-BUU-H8	240°	109°	0°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				
IIG	CCI HPA-65R-BUU-H8	240°	109°	0°	6°/6°	(1) RRUS-E2 (1) RRUS-32	-				
IIIG	CCI HPA-65R-BUU-H8	240°	109°	0°	6°/6°	(1) RRUS 11	-				
IVG	CCI HPA-65R-BUU-H8	240°	109°	0°	6°/6°	(1) RRUS-11 (1) RRUS-12	(1) A2 MODULE				

\*RF SCHEDULE BASED ON V05 RFDS MA3570S DATED 9/30/14. CONTRACTOR TO VERIFY FINAL RFDS AND CABLE LENGTHS PRIOR TO CONSTRUCTION.

ANTENNA AND FEEDER B.O.M.

SCALE: N.T.S.

3



NOTES:

1. GPS TO BE THROUGH BOLTED TO EQUIPMENT SHELTER WALL. DO NOT ATTACH TO ROOF LIP OF SHELTER. FINAL MOUNT LOCATION TO BE VERIFIED WITH AT&T CM.
2. WEATHER SEAL AROUND MOUNT WITH SILICONE SEALANT.
3. INSTALL GPS, COAX & MOUNT PER MANUFACTURER'S RECOMMENDATIONS.
4. TIE MOUNT INTO GROUNDING SYSTEM.
5. WEATHER SEAL CONNECTORS PER AT&T STANDARDS.

SHELTER MOUNTED GPS DETAIL

SCALE: N.T.S.

4

at&t  
Mobility

550 COCHITIUTE ROAD  
SUITES 13 & 14  
FRAMINGHAM, MA 01701

npmi  
NANEPASHEMET  
Project Management Services  
781-727-6516

328 WEST SHORE DRIVE  
SUITE 1-A  
MARBLEHEAD, MA 01945

CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050

CONSTRUCTION DRAWINGS

2 03/11/15 FOR CONSTRUCTION  
1 02/11/15 FOR CONSTRUCTION  
0 10/02/14 FOR CONSTRUCTION  
A 09/04/14 FOR COMMENT

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Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617-566-3400  
FAX: 617-566-3310



DRAWN BY: SCA  
REVIEWED BY: GMT  
CHECKED BY: BBR  
PROJECT NUMBER: 50037672  
JOB NUMBER: 50061274  
SITE ADDRESS  
559A NEWTOWN ROAD  
LITTLETON, MA 01460

SHEET TITLE  
ANTENNA MOUNTING  
DETAILS & RF  
SCHEDULE  
SHEET NUMBER

C-3

**CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050**

**CONSTRUCTION DRAWINGS**

2	03/11/15	FOR CONSTRUCTION
1	02/11/15	FOR CONSTRUCTION
0	10/02/14	FOR CONSTRUCTION
A	09/04/14	FOR COMMENT

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FAX: 617.495.3310



DRAWN BY: SCA

REVIEWED BY: GMT

CHECKED BY: BBR

PROJECT NUMBER: 50037672

JOB NUMBER: 50061274

SITE ADDRESS:

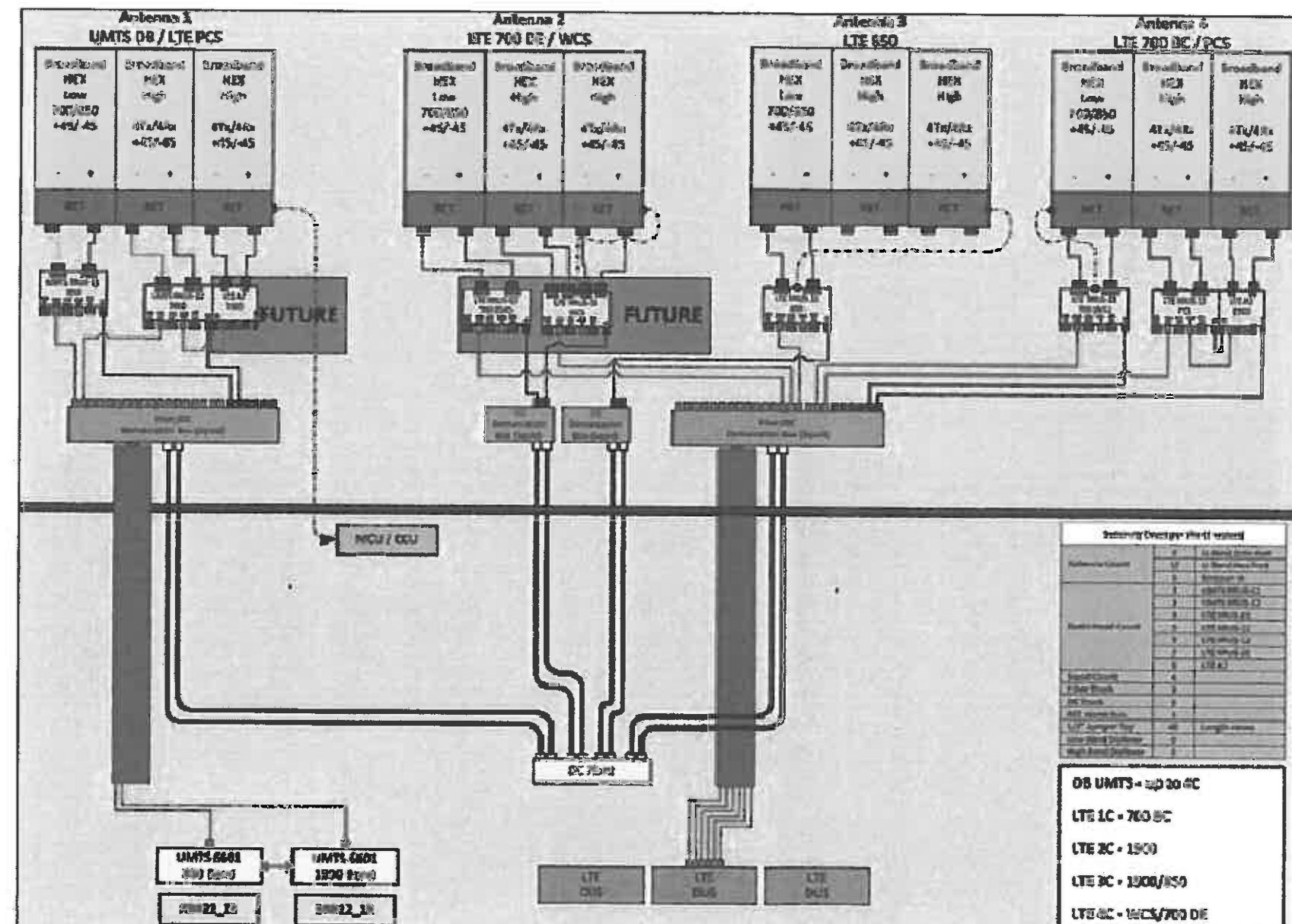
559A NEWTOWN ROAD  
LITTLETON, MA 01460

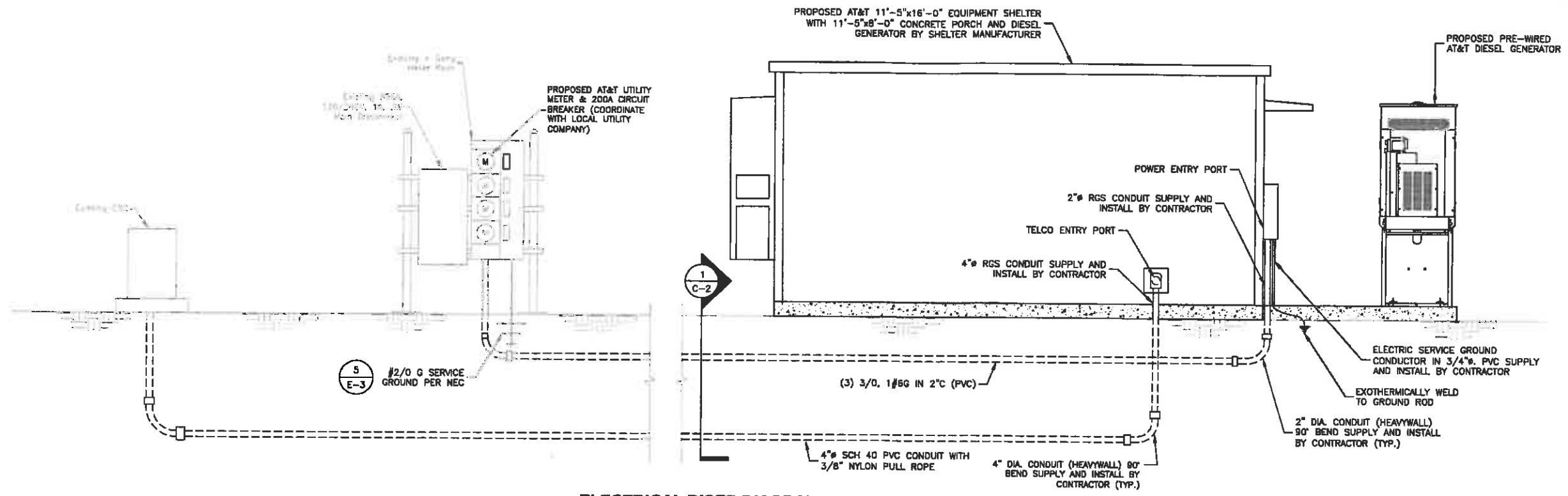
SHEET TITLE:

PLUMBING DIAGRAM

SHEET NUMBER:

C-4





## **GENERAL ELECTRICAL NOTES**

1. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES, O.S.H.A., NEC, AT&T MOBILITY SPECIFICATIONS, AND THE SPECIFICATIONS DETAILED IN THESE PLANS.
2. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
3. CONTRACTOR SHALL PERFORM ALL VERIFICATION, OBSERVATION, TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE PROJECT MANAGER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT, AND DISCREPANCIES.
4. THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE. CONTRACTOR SHALL ENSURE THAT ACCESS TO EQUIPMENT IS MAINTAINED IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND ALL APPLICABLE CODES.
5. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANELBOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)
6. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM, ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
7. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "U" WHERE SUBJECT TO SUCH APPROVAL MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, IEEE, AND NFPA.
8. ALL CONDUIT INSTALLED MAY BE SURFACE MOUNTED UNLESS OTHERWISE NOTED.
9. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL, OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
10. ALL "CONDUIT ONLY" (C.O.) INSTALLATIONS SHALL HAVE A # PULL WIRE OR ROPE.
11. CONTRACTOR SHALL PROVIDE AT&T MOBILITY PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
12. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
13. POWER WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.
14. ALL CONDUCTORS LARGER THAN #10 AWG SHALL BE STRANDED COPPER WITH THHN 600V INSULATION, UNLESS NOTED OTHERWISE.
15. ALL MATING SURFACES OF GROUND CONNECTIONS SHALL BE CLEANED SMOOTH AND COATED WITH ANTIODANT PRIOR TO ATTACHMENT.
16. ALL GROUND CONNECTIONS BELOW GRADE MUST BE EXOTHERMICALLY WELDED (CAD WELD OR APPROVED EQUAL)
17. ALL EXTERIOR GROUNDING CONDUCTORS SHALL BE # 2 AWG SOLID TINNED BARE COPPER WIRE UNLESS NOTED OTHERWISE.
18. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C. COORDINATE SHORT CIRCUIT REQUIREMENTS WITH UTILITY COMPANY.
19. CONTRACTOR SHALL PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.

## **ELECTRICAL RISER DIAGRAM & SERVICE ENTRANCES**

SCALE: N.T.S.

1

ELECTRICAL AND TELEPHONE CONTACTS	
POWER COMPANY: NSTAR	TELEPHONE COMPANY: VERIZON
PHONE NUMBER: (800) 592-2000	PHONE NUMBER: (800) 837-4966

**ELECTRICAL AND TELEPHONE GENERAL NOTES:**

1. FOLLOWING COMPLETION OF WORK, PROVIDE OWNER WITH AS-BUILT DRAWINGS SHOWING TELEPHONE AND ELECTRIC LOCATIONS.
2. WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE, NEC 2014.
3. COORDINATE WITH UTILITY AND LOCAL ELECTRICAL INSPECTOR FOR FINAL POWER CONNECTION.
4. UTILITY WILL SUPPLY METER. COORDINATE WITH UTILITY FOR METER TYPE AND INTERCONNECTION. \*
5. ALL EXISTING UNDERGROUND LINES ON SITE TO BE LOCATED PRIOR TO CONSTRUCTION. CALL 1-888-DIG-SAFE PRIOR TO CONSTRUCTION.
6. SEAL ALL SERVICE ENTRANCES INTO SHELTER FOLLOWING INSTALLATION.
7. SEE PAGE E-2 FOR GENERAL GROUNDING NOTES.
8. COORDINATE WITH LOCAL TELEPHONE COMPANY FOR ALL ROUTING AND DESIGN.
9. CONTRACTOR TO VERIFY CONTROL WIRING SIZE WITH GENERATOR MANUFACTURER PRIOR TO CONSTRUCTION.



328 WEST SHORE DRIVE  
SUITE 1-A  
MARBLEHEAD, MA 01945

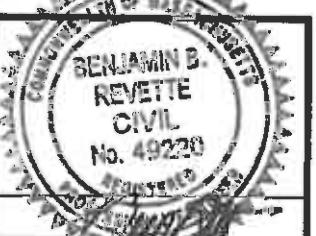
**CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050**

**CONSTRUCTION DRAWINGS**

CONSTRUCTION DRAWINGS		
2	03/11/15	FOR CONSTRUCTION
1	02/11/15	FOR CONSTRUCTION
0	10/02/14	FOR CONSTRUCTION
A	09/04/14	FOR COMMENT

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**Dewberry Engineers Inc.**  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.665.3400  
FAX: 617.665.3401



DRAWN BY: SCA

REVIEWED BY: **SMF**

**CHECKED BY:** **BBB**

PROJECT NUMBER: 60033522

100-REINFORCED 70001074

559A NEWTOWN ROAD  
WITTELTON, MA 01462

## ELECTRICAL RISER DIAGRAM

**CROWN NEWTOWN  
ROAD LITTLETON  
SITE NO.: MA3570A  
CROWN ID: 875050**

CONSTRUCTION DRAWINGS	
2	03/11/15 FOR CONSTRUCTION
1	02/11/15 FOR CONSTRUCTION
0	10/02/14 FOR CONSTRUCTION
A	09/04/14 FOR COMMENT

**Dewberry®**

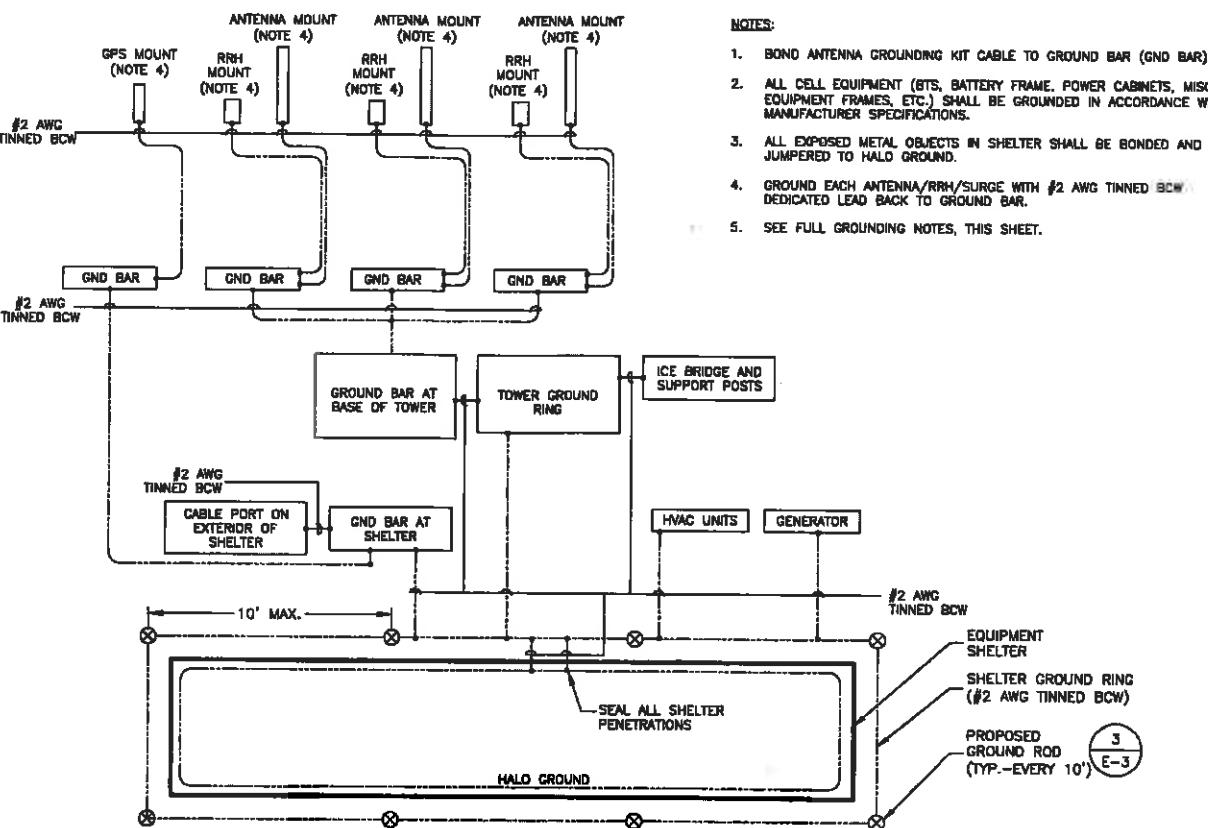
Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE: 617.695.3400  
FAX: 617.695.3310



DRAWN BY:	SCA
REVIEWED BY:	GMT
CHECKED BY:	BBR
PROJECT NUMBER:	50037672
JOB NUMBER:	50061274
SITE ADDRESS:	559A NEWTOWN ROAD LITTLETON, MA 01460
SHEET TITLE:	SCHEMATIC GROUNDING PLAN
SHEET NUMBER:	

## GROUNDING GENERAL NOTES

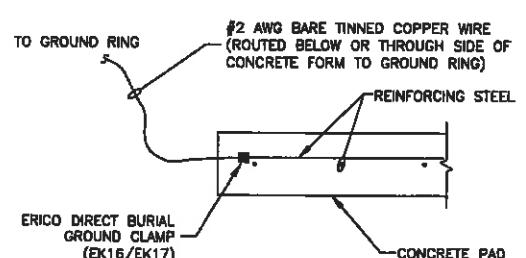
- ALL DOWN CONDUCTORS AND THE GROUND RING CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNLESS OTHERWISE NOTED. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE AT A MINIMUM DEPTH BELOW GRADE OF 18 INCHES OR TO LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNLESS OTHERWISE NOTED.
- GROUND RODS SHALL BE 5/8" DIAMETER COPPER CLAD, HARDER, T&B, ERICO, OR EQUIVALENT. TOP OF ROD SHALL BE A MINIMUM OF 18" BELOW GRADE. IF LEDGE IS ENCOUNTERED, INSTALL GROUND ROD AT AN ANGLE. ELECTRICAL METER GROUND ROD EXCEPTED.
- WHERE MECHANICAL CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE, CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
- GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6" ABOVE GRADE OR FOUNDATION, WHICHEVER IS HIGHER. COLD-GALV AFTER. EXOTHERMICALLY WELD OTHER END TO GROUND RING.
- INSTALL GROUNDING KITS AT ANTENNA CENTERLINE, AND TOWER EXIT POINTS. GROUND COAX LINES. EXOTHERMICALLY WELD #2 DOWN CONDUCTOR TO PLATES, RUN DOWN TOWER, AND TIE INTO GROUNDING SYSTEM.
- ALL GROUNDING WORK SHALL COMPLY WITH AT&T CONSTRUCTION CONTRACT STANDARDS. FOLLOWING COMPLETION OF WORK, GROUND SYSTEM MUST BE TESTED AND SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS SUBMIT AN INDEPENDENT "FALL POTENTIAL" TESTING REPORT.
- ALL GROUNDING CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE INSTALLED IN 3/4" SCH 40 PVC CONDUIT TO 12" BELOW GRADE. ATTACH PVC WITH GALVANIZED "C" CLAMPS.
- CONTRACTOR SHALL HAND-DIG IN AREAS AROUND EXISTING UTILITIES.
- NOTIFY CONSTRUCTION ENGINEER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
- GROUNDING RING IS SHOWN AS SCHEMATIC ONLY. IT IS DESIGNED WITHOUT BENEFIT OF RESISTIVITY TESTING AND DOES NOT NECESSARILY REPRESENT A GROUNDING SYSTEM TO MEET ANY SPECIFIC GROUND RESISTANCE.
- PRIOR TO POURING CONCRETE, ALL REBAR LOCATED NEAR THE BOTTOM OF THE FOUNDATION SHALL BE BONDED TOGETHER TO FORM A SINGLE GROUNDING ELECTRODE, BY STEEL TIES OR OTHER EFFECTIVE MEANS APPROVED BY NEC 2011 AND STRUCTURAL ENGINEER, AND BONDED TO THE GROUND RING AS DETAILED IN THESE PLANS. (INSPECTION MAY BE REQUIRED PRIOR TO POURING CONCRETE AND MUST BE COORDINATED BY CONTRACTOR.)
- IN ACCORDANCE WITH NEC 2011 REQUIREMENTS, ALL GROUNDING ELECTRODES PRESENT ON SITE SHALL BE BONDED TOGETHER (REFERENCE 2011 NEC ARTICLE 250.50).
- CAULK AND SEAL ALL NON-FACTORY SHELTER PENETRATIONS.



SCHEMATIC GROUNDING DIAGRAM

SCALE: N.T.S.

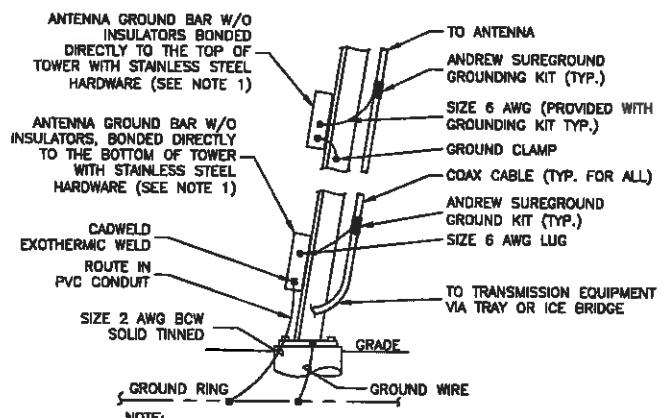
1



REBAR GROUNDING DETAIL

SCALE: N.T.S.

2



- NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED. GROUND BAR IS NOT REQUIRED FOR SITES WITH ONE COAX CABLE.

TOWER - ANTENNA CABLE  
GROUNDING DETAIL

SCALE: N.T.S.

3

**CROWN NEWTON**  
**ROAD LITTLETON**  
**SITE NO.: MA3570A**  
**CROWN ID: 875050**

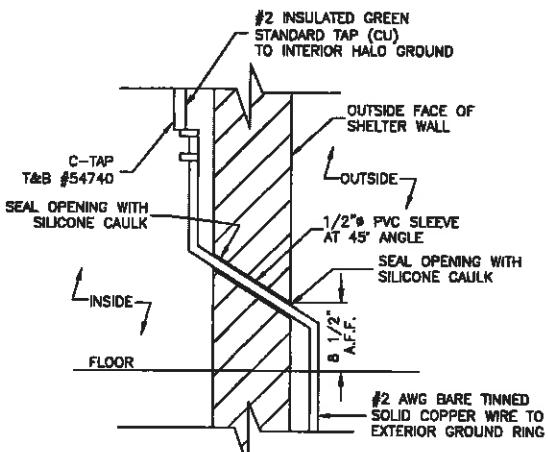
CONSTRUCTION DRAWINGS	
1	
2	
3	
4	
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6	
7	
8	
9	
10	

**Dewberry**  
Dewberry Engineers Inc.  
280 SUMMER STREET  
10TH FLOOR  
BOSTON, MA 02210  
PHONE 617.423.3400  
FAX 617.423.3310



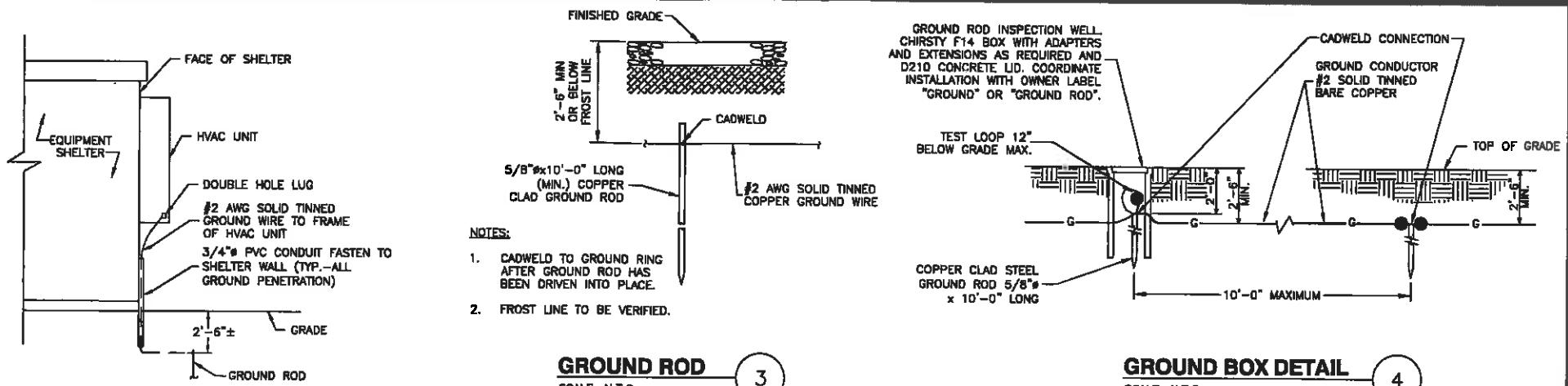
DRAWN BY:	SCA
REVIEWED BY:	GMT
CHECKED BY:	BBR
PROJECT NUMBER:	50037672
JOB NUMBER:	50061274
SITE ADDRESS:	559A NEWTON ROAD LITTLETON, MA 01460
SHEET TITLE:	
GROUNDING DETAILS	
SHEET NUMBER:	

E-3



**WALL GROUND PENETRATION**

SCALE: N.T.S.



**HVAC UNIT GROUND**

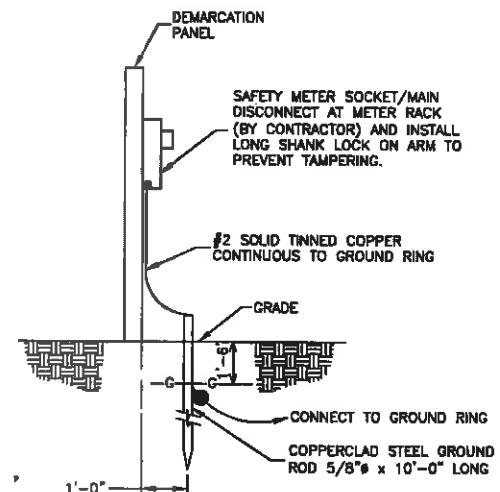
SCALE: N.T.S.

**GROUND ROD**

SCALE: N.T.S.

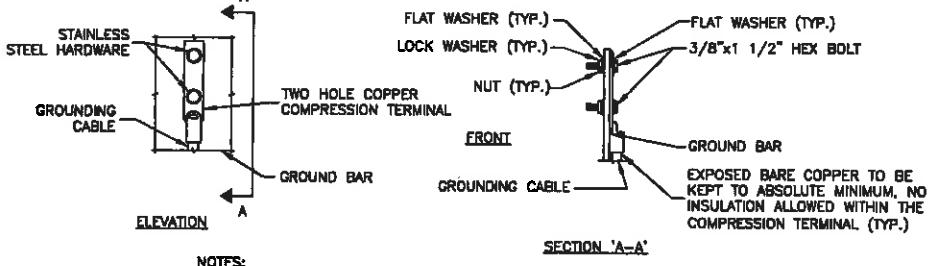
**GROUND BOX DETAIL**

SCALE: N.T.S.



**METER SOCKET GROUNDING**

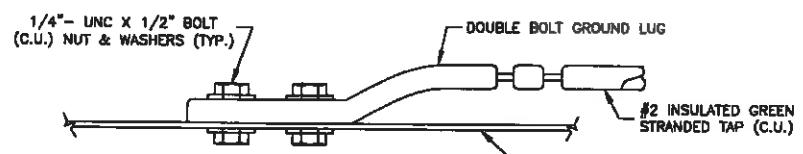
SCALE: N.T.S.



**TYPICAL GROUND BAR  
MECHANICAL CONNECTION DETAIL**

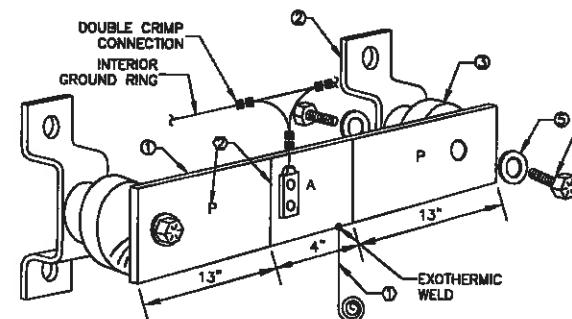
SCALE: N.T.S.

SECTION 'A-A'



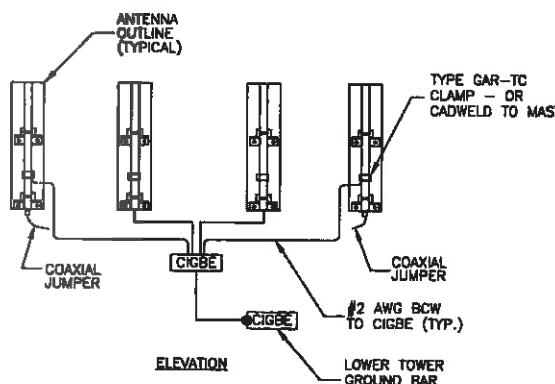
**CONNECTION TO EQUIPMENT DETAIL**

SCALE: N.T.S.



**TYPICAL ANTENNA  
GROUNDING DETAIL**

SCALE: N.T.S.



**ANTENNA MOUNT  
GROUNDING DETAIL**

SCALE: N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

**SECTION "P" - SURGE PROTECTORS**

CABLE ENTRY PORTS (HATCH PLATES) (2 AWG)  
GENERATOR FRAMEWORK (IF AVAILABLE) (2 AWG)  
TELCO GROUND BAR (2 AWG)  
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (2 AWG)  
+24V POWER SUPPLY RETURN BAR (2 AWG)  
-48V POWER SUPPLY RETURN BAR (2 AWG)  
RECTIFIER FRAMES.  
COAX SUPPRESSION

**SECTION "A" - SURGE ABSORBERS**

INTERIOR GROUND RING (2 AWG)  
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (2 AWG)  
METALLIC COLD WATER PIPE (IF AVAILABLE) (2 AWG)  
BUILDING STEEL (IF AVAILABLE) (2 AWG)

**SECTION "I" - ISOLATED GROUND ZONE**

ALL COMMUNICATIONS EQUIPMENT FRAMES.  
ISOLATED GROUND BAR - IGB (2 AWG)

**DETAIL NOTES:**

1. EXOTHERMICALLY WELD 2 AWG BARE TINNED SOLID COPPER CONDUCTOR TO GROUND BAR. ROUTE CONDUCTOR TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "I") WITH 1" HIGH LETTERS.

**GROUND BAR PLATE (TYP.)**

SCALE: N.T.S.

NEWTON INSTRUMENT COMPANY, INC. BUTNER, N.C. DR APPROVED EQUAL		
NO.	REQ. PART NO.	DESCRIPTION
①	1 1/4"x4"x30"	SOLID GND. BAR
②	2 A-5056	WALL MTG. BRKT.
③	2 3061-4	INSULATORS
④	3 3012-1	5/8"-11x1" H.H.C.S.
⑤	4 3015-8	5/8 LOCKWASHER

559A NEWTON ROAD  
LITTLETON, MA 01460

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER