Sprint®

PROJECT:	SPRINT MASSIVE MIMO
SITE NAME:	HRT 094 943225
SITE CASCADE:	CT43XC805
CROWN CASTLE ID:	806369
SITE ADDRESS:	439-455 HOMESTEAD AVE HARTFORD, CT 06105
SITE TYPE:	140'-0" MONOPOLE

SITE INFORMATION

SITE MANAGER:

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CROWN PROJECT MANAGER:
SCOTT WIATROSKI: (201) 236-9228
SCOTT.WIATROSKI@CROWNCASTLE.COM

CROWN CONSTRUCTION MANAGER:
MAHENDRA PERSAUD: (917) 670-9360
MAHENDRA.PERSAUD@CROWNCASTLE.COM

SITE ADDRESS:

439-455 HOMESTEAD AVENUE
HARTFORD, CT 06105

GEOGRAPHIC COORDINATES:

LATITUDE: 41°-47'-01.61" N, (41.783781°)
LONGITUDE: 72°-42'-13.66" W, (-72.703794°)

COUNTY:

HARTFORD COUNTY

POWER COMPANY:

CONNECTICUT LIGHT & POWER CO
(800) 286-2000

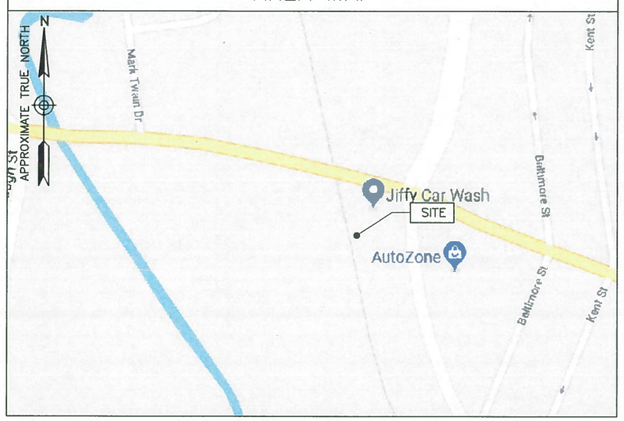
TELCO PROVIDER:

LIGHTOWER
(845) 458-7720

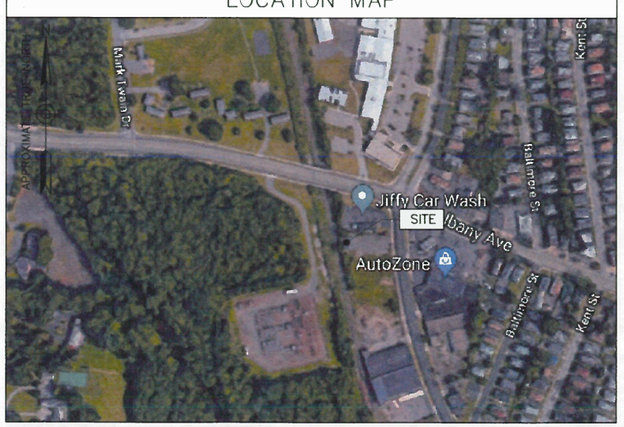
SPRINT CONSTRUCTION MANAGER:

NAME: MARC MASON
E-MAIL: MARC.MASON@SPRINT.COM

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

- REMOVE (3) 2.5 GHz PANEL ANTENNAS
- REMOVE (3) 2.5 GHz REMOTE RADIO HEADS
- INSTALL (3) 2.5 GHz MIMO ANTENNAS
- REMOVE (1) 1-1/4"ø HYBRID CABLE
- INSTALL (1) 1-1/2"ø HYBRID CABLE
- INSTALL (1) mMIMO AIRSCALE BBU IN MMBTS CABINET
- INSTALL (1) TOP HAT ON MMBTS CABINET
- INSTALL (2) AMOB UNITS ON BATTERY CABINET

APPLICABLE CODES

- ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. BUILDING CODE: 2016 CONNECTICUT STATE BUILDING CODE.
2. ANSI/TIA (TELECOMMUNICATIONS INDUSTRY ASSOCIATION) 222-G, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES.
3. LIGHTNING PROTECTION CODE: NFPA 780-2014 LIGHTNING PROTECTION CODE.
4. ELECTRICAL CODE: NATIONAL ELECTRICAL CODE 2017 (NEC 2017).
5. ALL STEEL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
6. ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION.

811

ONE CALL 811 OR
PHONE #: 1-800-922-4455
www.cbyd.com

SHEET INDEX

SHT NO:	SHEET TITLE:	REV:
T-1	TITLE SHEET	1
SP-1	SPRINT SPECIFICATIONS I	1
SP-2	SPRINT SPECIFICATIONS II	1
A-1	COMPOUND PLAN	1
A-2	ELEVATION & EQUIPMENT PLAN	1
A-3	EXISTING & PROPOSED ANTENNA PLANS	1
A-4	ANTENNA & EQUIPMENT DETAILS	1
A-5	PLUMBING DIAGRAM	1
A-6	CABLE ROUTING & COLOR CODING INFORMATION	1
E-1	ELECTRICAL ONE-LINE DIAGRAM & GROUNDING DETAILS	1
E-2	ELECTRICAL & GROUNDING NOTES	1

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS

1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®

Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 0023222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

THE WORK:
SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF. ALSO SEE SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:
CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE TO USE LATEST MOP's.

A. BASE BAND UNIT IN EXISTING UNIT
B. INSTALLATION OF BATTERIES
C. INSTALLATION OF FIBER CABLE
D. INSTALLATION OF RRU'S
E. CABLING
F. TS-0200 REV 5 – ANTENNA LINE ACCEPTANCE STANDARDS
G. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
H. COMMISSIONING MOPS

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS.

CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

CONTRACTOR RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

NOTICE TO PROCEED:
NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

SITE CLEANLINESS:
CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

SECTION 01 400 – SUBMITTALS & TESTS

ALTERNATES:
AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINTS CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED,

TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.

2. AGL, AZIMUTH AND DOWNTILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR THE PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA

3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;

1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS OR 3Z – ANTENNA ALIGN ALIGNMENT TOOL (AAT)

2. SWEEP AND FIBER TESTS

3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

4. ALL AVAILABLE JURISDICTIONAL INFORMATION

5. PDF SCAN OF REDLINES PRODUCED IN FIELD

6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE IN ELECTRONIC AS-BUILT DRAWING PRODUCTION

7. LIEN WAIVERS

8. FINAL PAYMENT APPLICATION

9. REQUIRED FINAL CONSTRUCTION PHOTOS

10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS

11. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

12. CLOSEOUT PHOTOGRAPHS:

D. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING LIST. ADDITIONAL PHOTOGRAPHS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCESSES

(i) BACK MAIN HYBRID CABLE ROUTE (MINIMUM TWO PHOTOS)

(ii) OF EACH ANTENNA AND RRU

(iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT

(iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRU'S AND MMBS (DOOR OPEN)

(v) MMBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS

(vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED

(vii) BREAK OUT CYLINDERS

(viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS

(ix) RADIATION EXPOSURE WARNING SIGNS

(x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY RAD CENTER OF ANY NEW ANTENNA AT HORIZON.

E. LOAD PHOTOS TO SITERRA PROJECT LIBRARY I5. IN I5 CREATE NEW CATEGORY; 2.5 DEPLOYMENT, AND SECTION; PERMANENT CONSTRUCTION. LABEL PHOTOS WITH SITE CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE PHOTOGRAPHS SHALL GPS ENABLED SUCH THAT THE GPS COORDINATES ARE INCLUDED IN THE PHOTO MEDIA-FILE INFORMATION.

COMMISSIONING:
PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:
PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

SECTION 11 700 – ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN LENGTH FOR JUMPER SHALL BE SO AS TO ALLOW FOR THE PROPER BEND RADIUS PER MANUFACTURER OR SPRINT SPECIFICATIONS.

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

FIBER CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:
ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.

b. MONOPOLE:
ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200 FEET (ONE HOISTING GRIP PER COAX). A HOISTING GRIP SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:

a. FIBER: SUPPORT FIBER BUNDLES USING ½" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

3. FASTENING JUMPERS: FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

4. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

SPRINT SPECIFICATIONS I

SHEET NUMBER

SP-1

CONTINUE FROM SP-1

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER LATEST VERSION OF TS 0200.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE.

SECTION 11 800 – INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI)

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBTS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED

SECTION 26 100 – BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MANUFACTURERS OF EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

MANUFACTURERS OF EQUIPMENT:
ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING.
   1. ALLIED TUBE AND CONDUIT
   2. B-LINE SYSTEM
   3. UNISTRUT DIVERSIFIED PRODUCTS
   4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
   1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
   2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
   3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
   4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
   5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
   6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
   7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
   8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
   9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PLANELOAD.

SECTION 26 200 – ELECTRICAL MATERIALS AND EQUIPMENT CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1. FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILING. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH ON FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT
   1. CABLE TERMINATIONS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROX TEC.
   2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COPPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGENTIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPTED AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

GENERAL NOTES:

A. CONTRACTOR, SUBCONTRACTORS AND ANY SITE SPECIFIC PART/ PRODUCT/ CONCEALMENT MANUFACTURER TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO MANUFACTURING, FABRICATION OR CONSTRUCTION.

B. THE APPLICANT, OR HIS REPRESENTATIVE, IS TO DESIGNATE AN INDIVIDUAL RESPONSIBLE FOR CONSTRUCTION SITE SAFETY DURING THE COURSE OF SITE IMPROVEMENTS PURSUANT TO N.J.A.C. 5:23-2.21 (E) OF THE N.J. UNIFORM CONSTRUCTION CODE AND CRT 1926.32 (F, OSHA COMPETENT PERSON).

CROWN CASTLE NOTE:

A. CROWN CASTLE REQUIRES CENTERLINE TAPE DROP PHOTOS FOR EACH NEW ANTENNA INSTALLED.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
NO. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

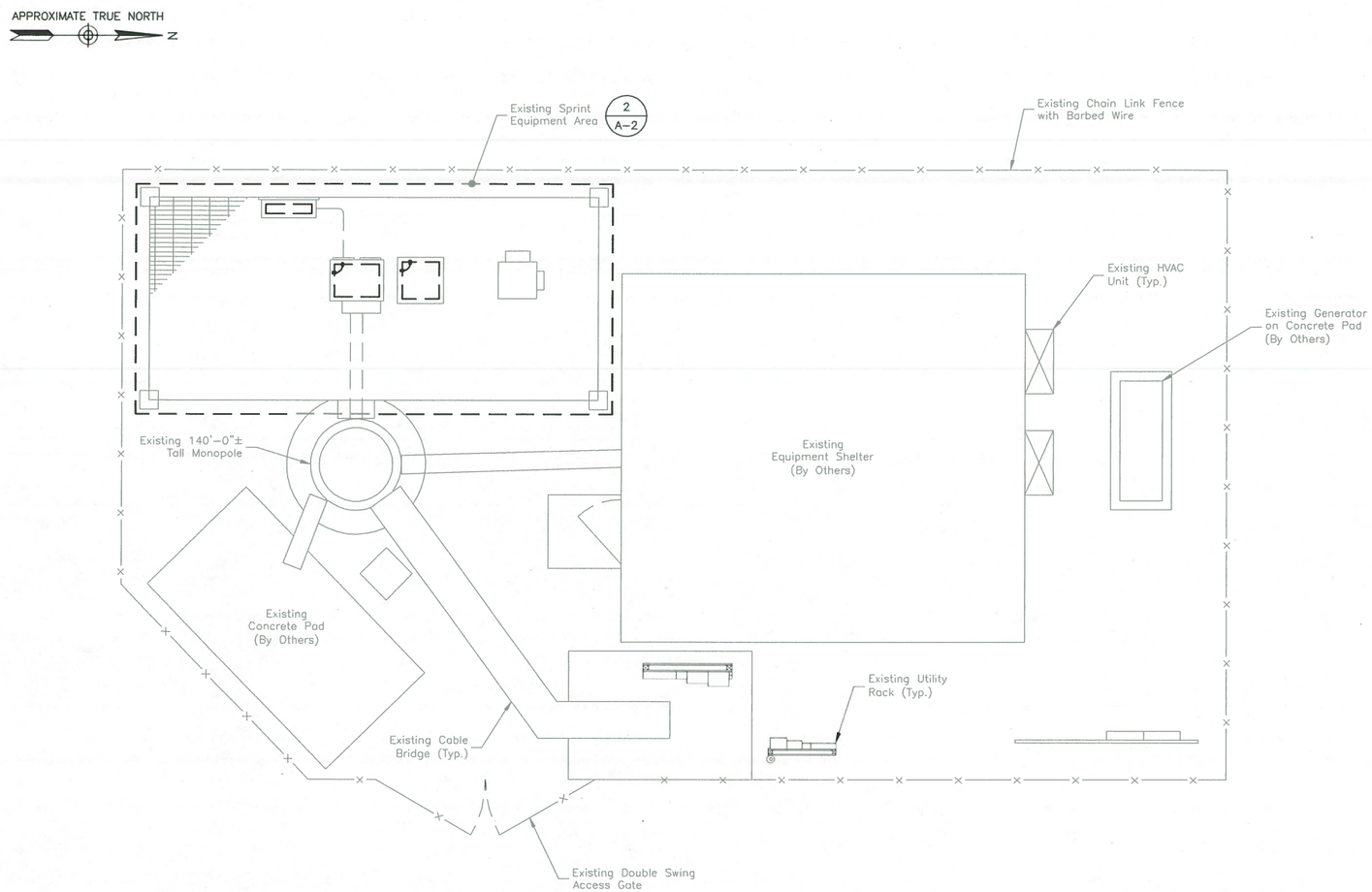
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

SPRINT SPECIFICATIONS II

SHEET NUMBER

SP-2



COMPOUND PLAN

1

SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"

0' 2' 4' 8'

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

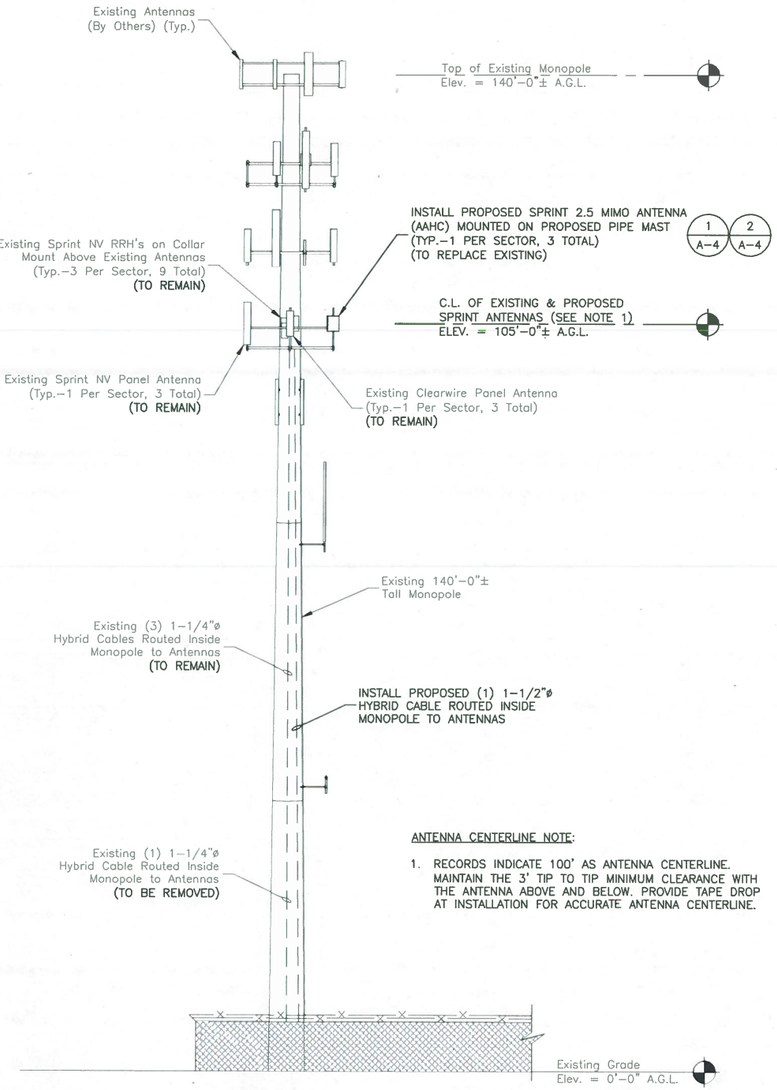
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

COMPOUND PLAN

SHEET NUMBER

A-1



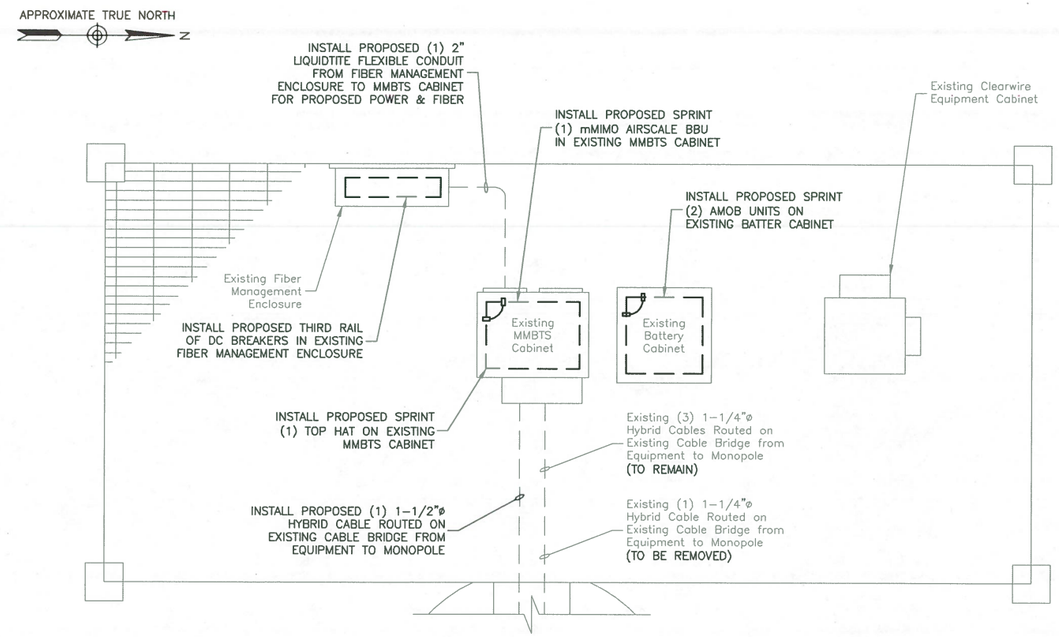
ANTENNA CENTERLINE NOTE:

1. RECORDS INDICATE 100' AS ANTENNA CENTERLINE. MAINTAIN THE 3' TIP TO TIP MINIMUM CLEARANCE WITH THE ANTENNA ABOVE AND BELOW. PROVIDE TAPE DROP AT INSTALLATION FOR ACCURATE ANTENNA CENTERLINE.

ELEVATION 1

SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"

0' 8' 16' 24'



EQUIPMENT PLAN 2

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

CABLE LENGTHS	
FIBER – JUNCTION BOX TO ANTENNA	±150'-0"
JUNCTION BOX TO BTS	±14'-0"

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.

NOTE:

ANALYSIS OF THE STRUCTURE HAS BEEN PERFORMED BY CROWN CASTLE (DATED: 10/29/18). STRUCTURAL ANALYSIS SUBJECT TO AMENDMENT AFTER ALL MODIFICATION WORK IS COMPLETED. THE ANTENNAS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND THE HEIGHT, LOCATION, AND MOUNTING SHOWN IN THE STRUCTURAL ANALYSES SHOULD SUPERSEDE THESE DRAWINGS. NO WORK IS TO BE PERFORMED PRIOR TO ANY AND ALL MODIFICATIONS BEING COMPLETED AS APPLICABLE. MOUNT ANALYSIS REPORT COMPLETED BY INFINIGY ENGINEERING, PLLC (DATED: 10/11/18). CONTRACTOR TO OBTAIN COPIES OF BOTH REPORTS PRIOR TO START OF WORK.

NOTE:

PROPOSED MIMO ANTENNAS MUST BE LOCATED AS SHOWN AND IN ACCORDANCE WITH THE ANTENNA MOUNT ANALYSIS BY INFINIGY ENGINEERING, PLLC (DATED: 10/11/18). ALL APPROPRIATE HARDWARE MUST BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®

Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

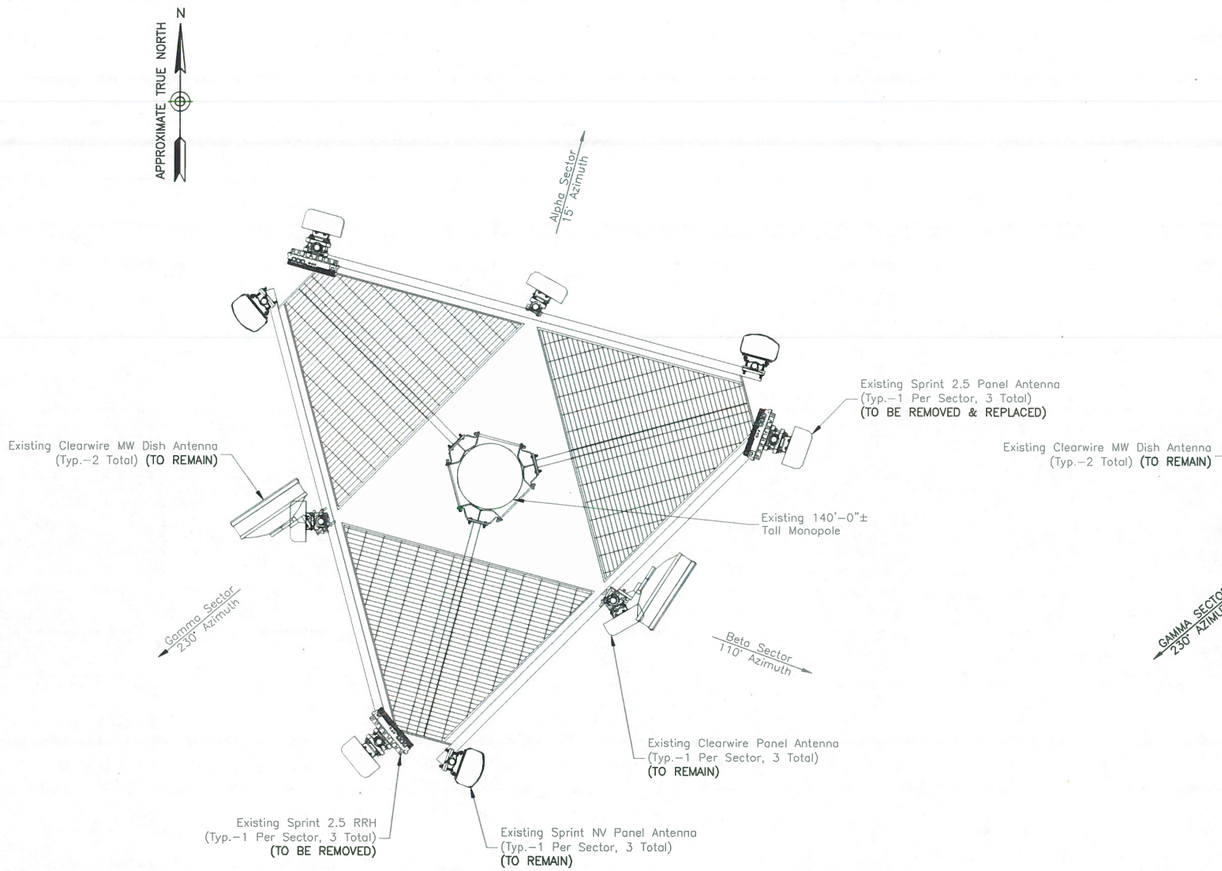
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

ELEVATION &
EQUIPMENT PLAN

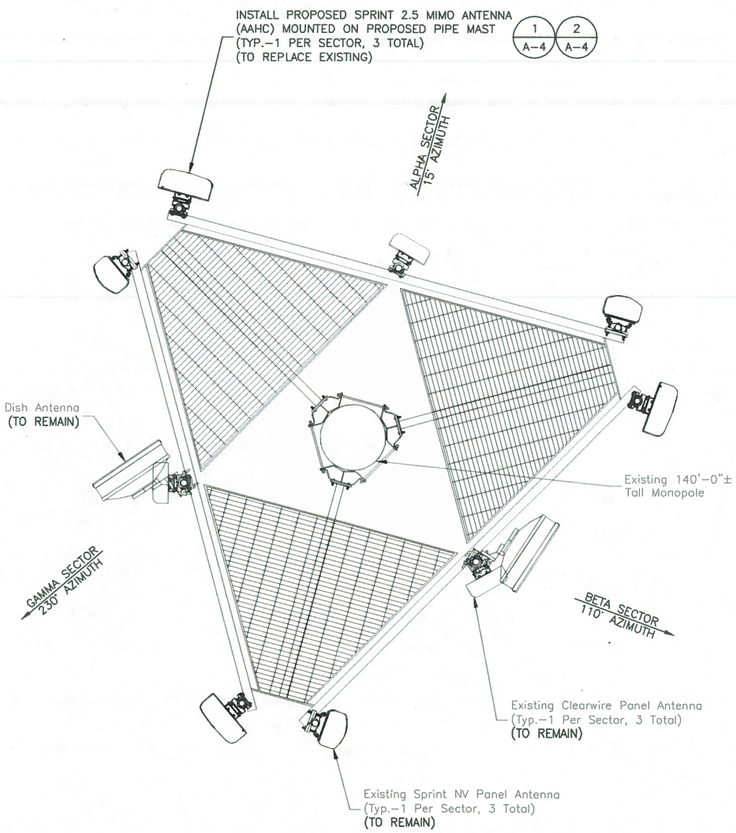
SHEET NUMBER

A-2



EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.

NOTE:

PROPOSED MIMO ANTENNAS MUST BE LOCATED AS SHOWN AND IN ACCORDANCE WITH THE ANTENNA MOUNT ANALYSIS BY INFINIGY ENGINEERING, PLLC (DATED: 10/11/18). ALL APPROPRIATE HARDWARE MUST BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS

1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®

Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

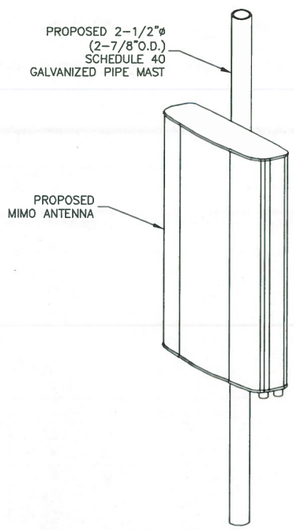
439–455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

EXISTING & PROPOSED ANTENNA PLANS

SHEET NUMBER

A–3



ANTENNA SPECIFICATIONS	
MANUFACTURER	NOKIA
MODEL NUMBER	AAHC
DIMENSIONS (HxWxD)	25.6" x 19.7" x 9.64"
WEIGHT	103.7 LBS

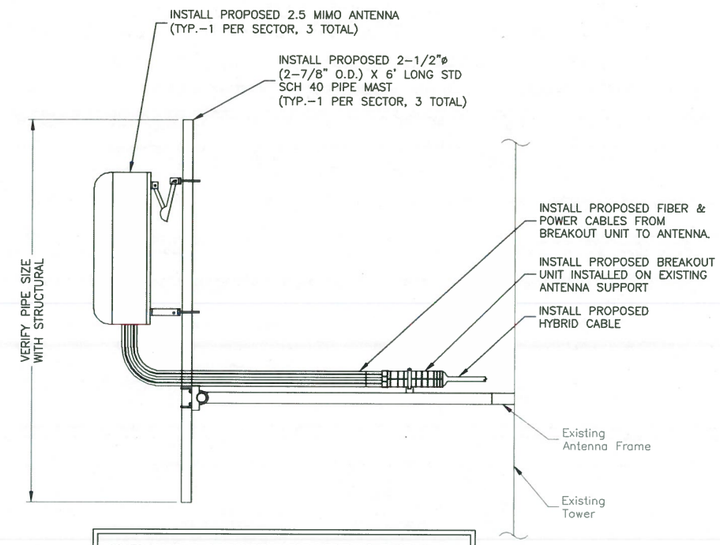
CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND IDENTIFYING ANY EXISTING CONFLICTS (INCLUDING BUT NOT LIMITED TO EXISTING COAXIAL CABLES, SAFETY CLIMBS, ETC) AND DETERMINING TEMPORARY BRACING OR RELOCATION REQUIRED FOR INSTALLATION OF THE PROPOSED EQUIPMENT. CONTRACTOR TO CONTACT ENGINEER AND SPRINT CM IMMEDIATELY IN CASE OF ANY CONFLICTS. THE CONTRACTOR SHALL RESTORE ALL RELOCATED ITEMS TO PREVIOUS CONDITIONS.

NOTES:

1. INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATIONS.
2. WEIGHT DOES NOT INCLUDE MOUNTING BRACKETS.

MIMO ANTENNA DETAIL (1)

SCALE: N.T.S.



CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND IDENTIFYING ANY EXISTING CONFLICTS (INCLUDING BUT NOT LIMITED TO EXISTING COAXIAL CABLES, SAFETY CLIMBS, ETC) AND DETERMINING TEMPORARY BRACING OR RELOCATION REQUIRED FOR INSTALLATION OF THE PROPOSED EQUIPMENT. CONTRACTOR TO CONTACT ENGINEER AND SPRINT CM IMMEDIATELY IN CASE OF ANY CONFLICTS. THE CONTRACTOR SHALL RESTORE ALL RELOCATED ITEMS TO PREVIOUS CONDITIONS.

NOTES:

1. MOUNT ANTENNA PER MANUFACTURER'S RECOMMENDATIONS.
2. WEIGHT DOES NOT INCLUDE MOUNTING BRACKETS.
3. DETAIL IS DIAGRAMMATICAL & FOR REFERENCE ONLY.

ANTENNA MOUNTING DETAIL (2)

SCALE: N.T.S.

ANTENNA SECTOR EQUIPMENT SCHEDULE

SECTOR	ANTENNA MODEL	TECHNOLOGY	AZIMUTH	RAD CENTER	RRH COUNT	RRH MODEL	CABLE FEEDER
ALPHA	(P) MIMO ANTENNA	2.5 GHz	15°	105'-0"	1	(P) INTEGRATED 2.5 RRH	(P) HYBRID
	(E) NV PANEL ANTENNA	800/1900 MHz	15°	105'-0"	1	(E) 800 RRH	(E) HYBRID
					2	(E) 1900 RRH	
BETA	(P) MIMO ANTENNA	2.5 GHz	110°	105'-0"	1	(P) INTEGRATED 2.5 RRH	(P) HYBRID
	(E) NV PANEL ANTENNA	800/1900 MHz	110°	105'-0"	1	(E) 800 RRH	(E) HYBRID
					2	(E) 1900 RRH	
GAMMA	(P) MIMO ANTENNA	2.5 GHz	230°	105'-0"	1	(P) INTEGRATED 2.5 RRH	(P) HYBRID
	(E) NV PANEL ANTENNA	800/1900 MHz	230°	105'-0"	1	(E) 800 RRH	(E) HYBRID
					2	(E) 1900 RRH	

ANTENNA SCHEDULE (3)

SCALE: N.T.S.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

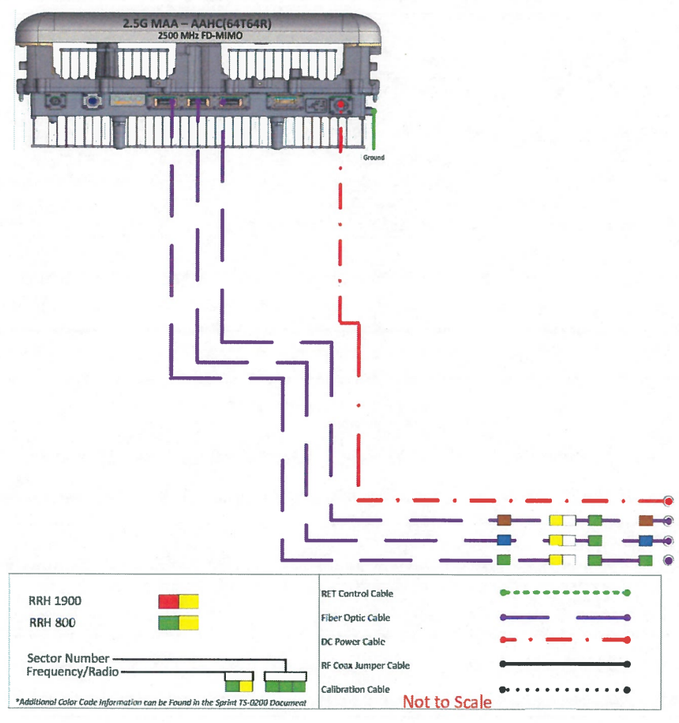
SHEET TITLE

ANTENNA &
EQUIPMENT DETAILS

SHEET NUMBER

A-4

ALU mMIMO



PLUMBING DIAGRAM (1)

SCALE: N.T.S.

NOTE:

1. PLUMBING DIAGRAM IS SHOWN AS CONCEPTUAL. CONFIRM FINAL PLUMBING DIAGRAM WITH THE LATEST RF DESIGN SHEET.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS

1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER

JIANG YU
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

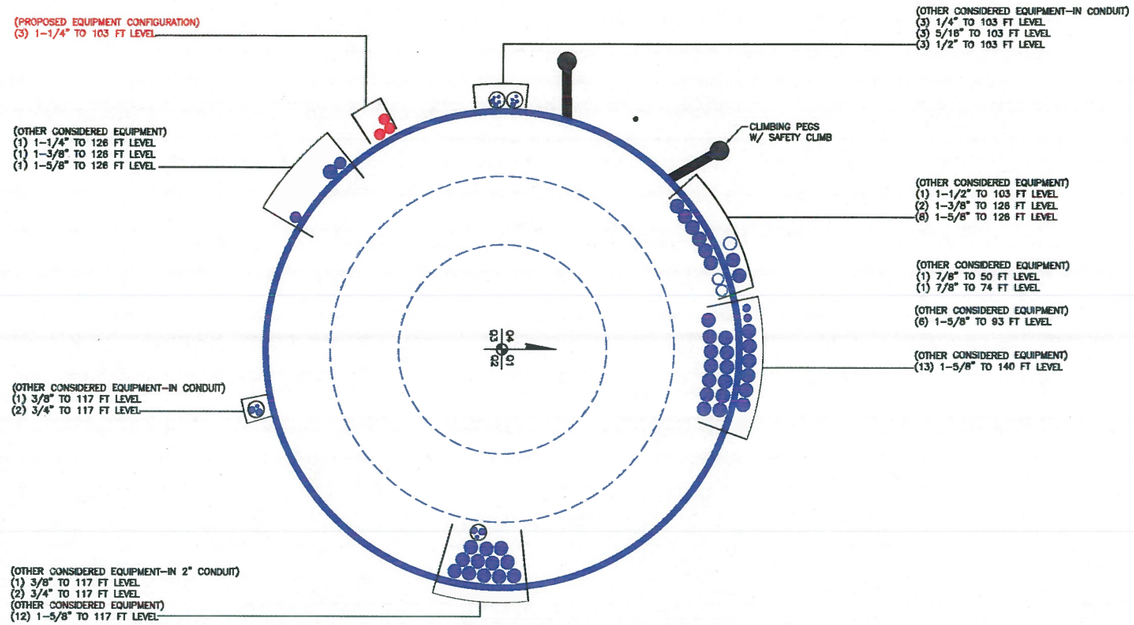
439–455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

PLUMBING DIAGRAM

SHEET NUMBER

A–5



BASE LEVEL DETAIL

SCALE: N.T.S.

1

POWER AND FIBER	
CABLE	ID
#1	GREEN
#2	RED
#3	BROWN
#4	BLUE
#5	GREY
#6	ORANGE
#7	WHITE
#8	PURPLE

2.5MM BAND			
2.5 FREQUENCY	2500 RADIO 1		ID
2500 #1	YELLOW	WHITE	GREEN
2500 #2	YELLOW	WHITE	RED
2500 #3	YELLOW	WHITE	BROWN
2500 #4	YELLOW	WHITE	BLUE
2500 #5	YELLOW	WHITE	GREY
2500 #6	YELLOW	WHITE	ORANGE
2500 #7	YELLOW	WHITE	WHITE
2500 #8	YELLOW	WHITE	PURPLE

FIGURE 1: ANTENNA ORIENTATION

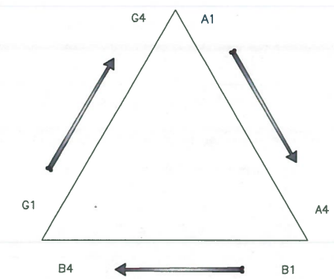


FIGURE 19.2: COLOR CODE

2.5 FREQUENCY	INDICATOR		ID
2500 #1	YELLOW	WHITE	GREEN
2500 #2	YELLOW	WHITE	RED
2500 #3	YELLOW	WHITE	BROWN
2500 #4	YELLOW	WHITE	BLUE
2500 #5	YELLOW	WHITE	GREY
2500 #6	YELLOW	WHITE	ORANGE
2500 #7	YELLOW	WHITE	WHITE
2500 #8	YELLOW	WHITE	PURPLE

FIGURE 19.1: CABLE COLOR CODE

NOTES:

1. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE, STENCIL TAG COLORED TAPE, OR COLORED HEAT SHRINK TUBING.
2. COLORED TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRIC. UV STABILIZED TAPE OR HEAT SHRINK ARE PREFERRED.
3. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE, AND THERE SHALL BE A 1" SPACE BETWEEN EACH RING.
4. THE CABLE COLOR CODE SHALL BE APPLIED IN ACCORDANCE TO TABLE 19-1

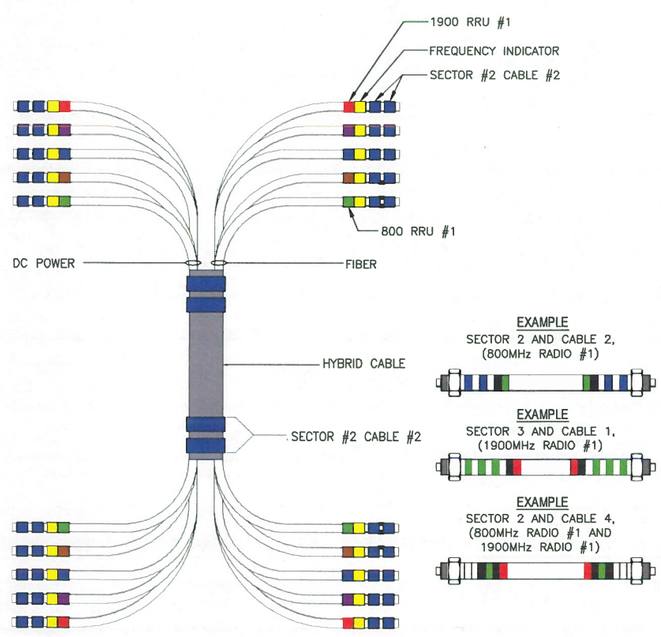
4.A. TABLE 19-1 ONLY SHOWS 3 SECTORS, BUT ADDITIONAL SECTORS ARE EASILY SUPPORTED BY ADDING THE APPROPRIATE NUMBER OF COLORED RINGS TO THE CABLE COLOR CODE.

5. AFTER THE CABLE COLOR CODE IS APPLIED, THE FREQUENCY COLOR CODE, TABLE 19-2, MUST BE APPLIED FOR THE SPECIFIC FREQUENCY BAND IN USE ON A GIVEN LINE.

5.A. 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.

5.B. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.

6. WRAP 2" COLORED TAPE A MINIMUM OF 3 TIMES AROUND THE COAX, AND KEEP THE TAPE IN THE SAME AREA AS MUCH AS POSSIBLE. THIS WILL ALLOW REMOVAL OF TAPE THAT FADES OR DISCOLORS DUE TO WEATHER.
7. EXAMPLES OF THE CABLE AND FREQUENCY COLOR CODES ARE SHOWN IN FIGURE 19-1 AND FIGURE 19-2



SPRINT CABLE COLOR CODE

SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING
1 ALPHA	1	GREEN	NO TAPE	NO TAPE
	2	BLUE	NO TAPE	NO TAPE
	3	BROWN	NO TAPE	NO TAPE
	4	WHITE	NO TAPE	NO TAPE
	5	RED	NO TAPE	NO TAPE
	6	GREY	NO TAPE	NO TAPE
	7	PURPLE	NO TAPE	NO TAPE
	8	ORANGE	NO TAPE	NO TAPE
2 BETA	1	GREEN	GREEN	NO TAPE
	2	BLUE	BLUE	NO TAPE
	3	BROWN	BROWN	NO TAPE
	4	WHITE	WHITE	NO TAPE
	5	RED	RED	NO TAPE
	6	GREY	GREY	NO TAPE
	7	PURPLE	PURPLE	NO TAPE
	8	ORANGE	ORANGE	NO TAPE
3 GAMMA	1	GREEN	GREEN	GREEN
	2	BLUE	BLUE	BLUE
	3	BROWN	BROWN	BROWN
	4	WHITE	WHITE	WHITE
	5	RED	RED	RED
	6	GREY	GREY	GREY
	7	PURPLE	PURPLE	PURPLE
	8	ORANGE	ORANGE	ORANGE

COLOR CODE INFORMATION

SCALE: N.T.S.

1

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS

1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

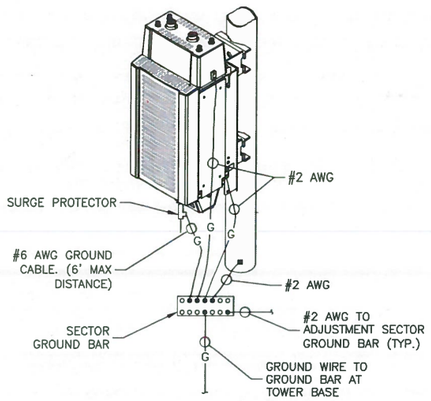
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

CABLE ROUTING & COLOR CODING INFORMATION

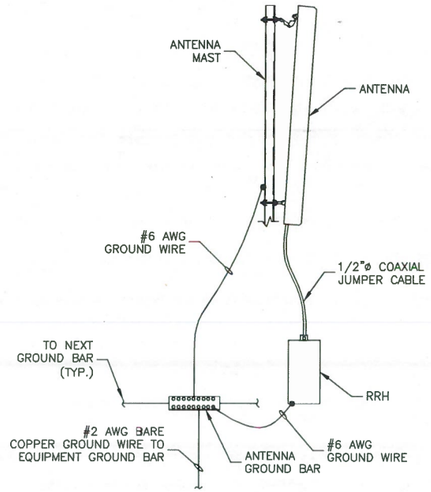
SHEET NUMBER

A-6



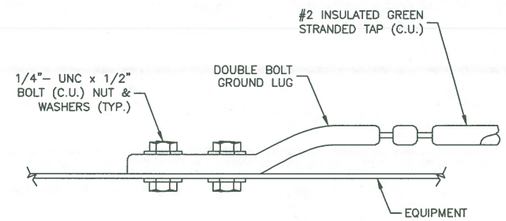
RRH POLE MOUNT GROUNDING DETAIL (1)

SCALE: N.T.S.



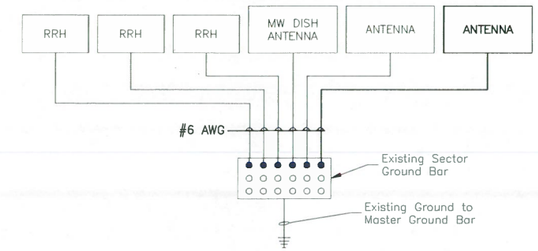
TYPICAL ANTENNA GROUNDING DETAIL (2)

SCALE: N.T.S.



CONNECTION TO EQUIPMENT DETAIL (3)

SCALE: N.T.S.



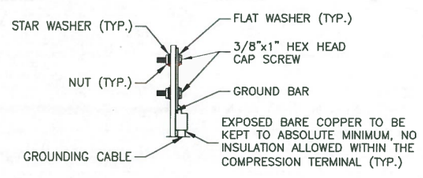
NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. TYPICAL FOR FOR ALL SECTORS.

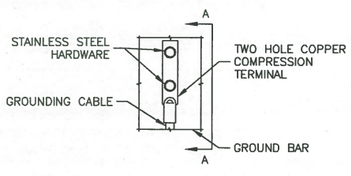
SCHEMATIC GROUNDING DIAGRAM (4)

SCALE: N.T.S.

CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER	EXISTING
2	METER	SERVICE DISCONNECT, TRANSFER & LOAD CENTER	EXISTING
3	SERVICE DISCONNECT, TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	SERVICE DISCONNECT, TRANSFER & LOAD CENTER	EXISTING SPRINT MMBTS CABINET	EXISTING
5	EXISTING SPRINT MMBTS CABINET	EXISTING SPRINT BATTERY CABINET	EXISTING



SECTION 'A–A'



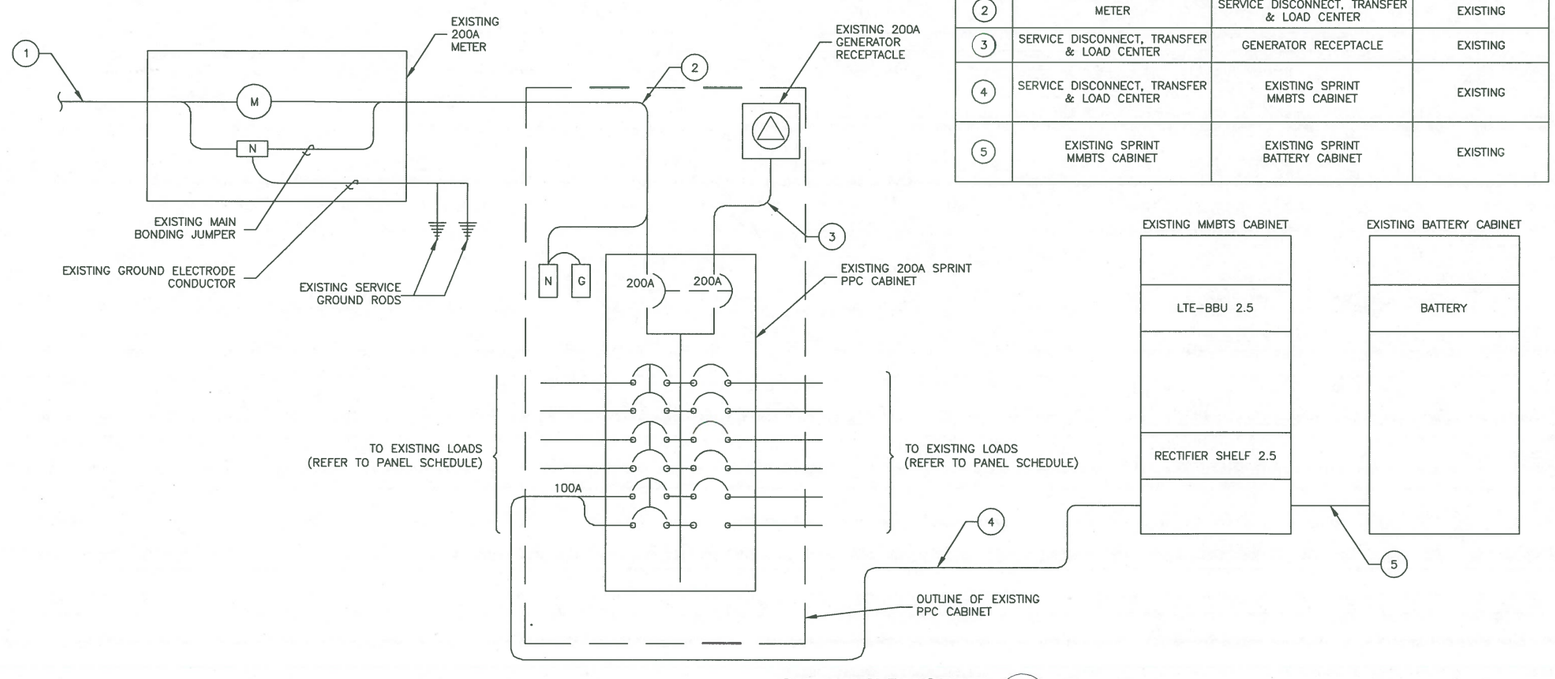
ELEVATION

NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL (5)

SCALE: N.T.S.



ONE-LINE DIAGRAM (6)

SCALE: N.T.S.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

439–455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

ELECTRICAL ONE–LINE DIAGRAM & GROUNDING DETAILS

SHEET NUMBER

E–1

ELECTRICAL INSTALLATION NOTES:

PART 1 GENERAL:

1. WORK INCLUDED

A. SECONDARY ELECTRICAL SERVICE INCLUDING UNDERGROUND CONDUIT BANK FROM POWER COMPANY TRANSFORMER AND SECONDARY SERVICE ENTRANCE SERVICE;

B. OUTDOOR SECONDARY DISTRIBUTION SYSTEM INCLUDING EXISTING EQUIPMENT TO BE RELOCATED AS SHOWN ON THE DRAWINGS AND PROPOSED RACEWAYS, CABLES, WIRING, JUNCTION BOXES, PULL BOXES AND OTHER COMPONENTS REQUIRED FOR COMPLETE INSTALLATION OF ELECTRICAL DISTRIBUTION SYSTEM.

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING ELECTRICAL SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, AND LATEST EDITION ALL APPLICABLE NATIONAL AND LOCAL CODES.

4. THE POWER COMPANY SERVING THIS PROJECT IS ORLANDO UTILITIES COMMISSION. SERVICE WILL BE OBTAINED 200 AMPERES AT 240/120 VOLTS, SINGLE PHASE, 3 WIRE. COORDINATE WITH POWER COMPANY TRENCHING REQUIREMENTS, INSTALLATION OF THE SECONDARY POWER CONDUITS AND CABLES, AND METERING.

5. THE DRAWINGS, WHICH CONSTITUTE AN INTEGRAL PART OF THIS CONTRACT, SHALL SERVE AS THE WORKING DRAWINGS. THEY INDICATE THE GENERAL LAYOUT OF THE EXISTING FACILITIES AND THE COMPLETE NEW ELECTRICAL SYSTEM OR SYSTEMS, ARRANGEMENT OF FEEDERS, CIRCUITS, OUTLETS, SWITCHES, CONTROLS, PANELBOARDS, SERVICE EQUIPMENT, AND OTHER WORK.

6. DISCONNECT POWER AND CONTROL AND MAKE SAFE FOR RELOCATION OR DEMOLITION FROM EQUIPMENT INDICATED FOR RELOCATION OR DEMOLITION. PROVIDE RELOCATION OR DEMOLITION IN ACCORDANCE WITH CONTRACT DRAWINGS. REMOVE ALL DEBRIS, DEMOLISHED WIRING, CONDUIT AND EQUIPMENT, UNLESS THESE SCHEDULED TO BE RETURN TO OWNER.

7. INSTALLATION OF ELECTRICAL EQUIPMENT, ACCESSORIES AND COMPONENTS SHALL BE IN ACCORDANCE WITH SEISMIC REQUIREMENTS IDENTIFIED IN THE LATEST EDITION OF THE APPLICABLE BUILDING CODES.

8. SUBMIT SHOP DRAWING FOR EQUIPMENT SPECIFIED IN THE PROJECT: SWITCHING DEVICES, WIRING DEVICES AND COVER PLATES, WIRING AND CABLES, CONDUITS, BOXES AND FITTINGS, SAFETY SWITCHES. THE SHOP DRAWINGS SHALL INCLUDE CATALOG NUMBERS, CUTS, DIAGRAMS, DETAILED DIMENSIONED SHOP DRAWINGS OF EQUIPMENT, BROCHURES OF LIGHTING FIXTURES, WIRING DIAGRAMS AS REQUIRED, DRAWINGS, SAMPLES AS REQUESTED, AND SUCH OTHER PERTINENT DESCRIPTIVE RATINGS AND DATA AS MAY BE REQUIRED BY THE ENGINEER.

9. THE ELECTRICAL CONTRACTOR BEFORE STARTING WORK SHALL CONFER WITH ALL OTHER TRADES INTERESTED IN THE LOCATION OF PIPES, PITS, TRENCHES OR ANY OTHER APPARATUS TO BE INSTALLED BY THEM AND SHALL SELECT HIS LOCATION SO AS NOT TO INTERFERE WITH THE WORK AND RIGHTS OF THE OTHER TRADES. ALL DIFFERENCES OR CONFLICTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR ADJUSTMENT BEFORE COMMENCING WORK, AND ANY SUCH WORK OR MATERIALS PLACED IN POSITION IN VIOLATION OF THIS CLAUSE SHALL BE READJUSTED AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.

10. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, AFTER CONSTRUCTION IS COMPLETED, A TEMPORARY POWER AND LIGHTING SYSTEM AS REQUIRED FOR CONSTRUCTION PURPOSES. THE SYSTEM SHALL CONSIST OF A POWER SERVICE, DISTRIBUTION SYSTEM, PANELBOARDS, GROUNDING, GROUND FAULT PROTECTIVE DEVICES, BRANCH CIRCUITS AND RECEPTACLE OUTLETS AS REQUIRED.

11. ELECTRICAL ENCLOSURE SHALL BE NEMA 3R FOR OUTDOOR LOCATION AND NEMA 4 FOR WET LOCATION WITH OPEN WATER.

12. THE ELECTRICAL SYSTEM OR SYSTEMS, TOGETHER WITH THE COMPONENT UNITS AS INCLUDED IN THIS SECTION OF THE SPECIFICATIONS, SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE THEREOF AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP.

PART 2 PRODUCT:

1. ALL EQUIPMENT AND MATERIALS EXCEPT RELOCATED FINISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND FIRST GRADE, AND AS APPROVED BY THE UNDERWRITERS' LABORATORIES, INC., AND/OR BY OTHER STANDARDS MENTIONED IN THESE SPECIFICATIONS. MATERIALS TO BE FURNISHED UNDER THIS SPECIFICATION SHALL BE THE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT AND SHALL BE OF THE LATEST STANDARD DESIGN. EQUIPMENT AND MATERIALS SHALL BE OF THE TYPE AND QUALITY LISTED BELOW.

2. PVC CONDUIT SHALL BE RIGID POLYVINYL CHLORIDE SCHEDULE 40. RIGID PVC CONDUIT AND FITTINGS TRADE SIZE SHALL BE AS SHOWN ON THE DRAWINGS. CONDUITS SHALL BE INSTALLED DIRECT BURIAL AND COMPLY WITH NEMA TC-8 AND ASTM F512. ACCEPTABLE MANUFACTURER: CARLON CORP. CERTAINED CORP., CONUX PIPE SYSTEMS, INC., OR EQUAL. CONNECTORS, COUPLINGS, FITTINGS AND ANCILLARY MATERIALS SHALL BE SUPPLIED BY THE CONDUIT MANUFACTURER.

3. GALVANIZED RIGID METAL CONDUIT (GRS), COUPLINGS, FACTORY ELBOWS AND FITTINGS SHALL BE HEAVY WALL STEEL TUBING WITH A HOT-DIPPED GALVANIZED FINISH INSIDE AND OUT AFTER THREADING AND SHALL COMPLY WITH ANSI C 80.1 AND UL/6. ACCEPTABLE MANUFACTURER: ALLIEN TUBE & CONDUIT CORP.; LTV STEEL TUBULAR PRODUCTS CORP. TRIANGLE PWC. CORP. OR EQUAL.

4. PULL AND JUNCTION BOXES FOR DRY LOCATION SHALL BE ZINC-GALVANIZED, EXTRA DEPTH, PRESSED STEEL WITH KNOCKOUTS AND OF SIZE AND TYPE SUITABLE FOR THE INTENDED APPLICATION. NEMA 3R TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE SHEET TYPE 316 STAINLESS STEEL. BOXES SHALL BE CONTINUOUSLY WELDED SEAAND MOUNTING FEET. WELDS SHALL BE GROUND SMOOTH BOXES SHALL BE FLANGED AND SHALL NOT HAVE HOLES AND KNOCKOUTS. ACCEPTABLE MANUFACTURERS: HOFFMAN STAHLIN - DIVISION OF ROBROY IND. ENGLISH ELECTRIC, OR EQUAL

5. WIRES AND CABLES SHALL BE OF ANNEALED, 98 PERCENT CONDUCTIVITY, SOFT DRAWN COPPER. ALL CONDUCTORS SHALL BE STRANDED, EXCEPT THAT CONTROL WIRING MAY BE SOLID. POWER WIRE SMALLER THAN NO. 12 AWG SHALL NOT BE USED. CONTROL AND SIGNAL WIRE SHALL BE NO.14 AWG NEC TYPE THHN/THWN, STRANDED. WIRE SHALL BE NEC TYPE THHN/THWN AS MANUFACTURED BY THE OKONITE CO.; CAROL CABLE CO. INC.; PIRELLI CABLE CORP. OR EQUAL.

6. RECEPTACLES INSTALLED OUTDOOR SHALL BE WEATHERPROOF WITH GFI PROTECTION. RECEPTACLES SHALL BE MADE BY THE FOLLOWING MANUFACTURER: HARVEY HUBBELL, INC.; PASS & SEYMOUR, INC. OR EQUAL. RECEPTACLES PLATES SHALL BE THE SAME MANUFACTURER AND SUITABLE FOR NEMA ENVIRONMENT.

7. DISCONNECT SWITCHES SHALL BE HEAVY_DUTY, QUICK_MAKE, QUICK_BREAK, VISIBLE BLADES, 600 VOLT, 3 POLE WITH FULL COVER INTERLOCK, INTERLOCK DEFEAT AND FLANGE MOUNTED OPERATING HANDLE. FUSED DISCONNECT SHALL BE EQUIPPED WITH FUSE SIZE AND TYPE AS SHOWN ON THE DRAWING. SWITCHES ALL CURRENT CARRYING PARTS SHALL BE COPPER. SWITCHES SHALL BE AS MANUFACTURED BY THE SQUARE D CO.; GENERAL ELECTRIC; CUTLER-HAMMER, OR EQUAL.

8. MOLDED CASE CIRCUIT BREAKER: 600 VOLT, 2 POLE FULLY RATED, INSULATED CASE, WITH INTEGRAL FULLY ADJUSTABLE SOLID STATE TRIP DEVICE. TRIP DEVICE SHALL BE TEMPERATURE INSENSITIVE AND HAVE THE FOLLOWING CHARACTERISTICS AND FUNCTIONS: INDEPENDENTLY ADJUSTABLE LONG TIME PICK_UP AND DELAY; INDEPENDENTLY ADJUSTABLE SHORT TIME PICK_UP AND DELAY WITH I2T IN AND OUT SWITCH, ADJUSTABLE INSTANTANEOUS; INDEPENDENTLY ADJUSTABLE GROUND FAULT PICK_UP AND DELAY; TRIP MODE TARGETS FOR OVER LOAD, SHORT CIRCUIT AND GROUND FAULT; LONG TIME PICK_UP LIGHT. CIRCUIT BREAKER SHALL BE SHALL HAVE A SHORT CIRCUIT RATING OF 42,000 RMS SYMMETRICAL AT RATED VOLTAGE. CIRCUIT BREAKER SHALL BE AS MANUFACTURED BY SQUARE D CO.; GENERAL ELECTRIC CO.; CUTLER- HAMMER, OR EQUAL.

PART 3 INSTALLATION:

12. ALL WIRE SHALL BE COLOR CODED OR CODED USING ELECTRICAL TAPE IN SITES WHERE COLORED INSULATION IS NOT AVAILABLE. WHERE TAPE IS USED AS THE IDENTIFICATION SYSTEM, IT SHALL BE APPLIED IN ALL JUNCTION BOXES, ND OTHER ACCESSIBLE INTERMEDIATE LOCATIONS AS WELL AS AT EACH TERMINATION.
EACH END OF EVERY POWER, POWER PHASE CONDUCTOR, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.

13. GALVANIZED RIGID STEEL CONDUIT (RGS) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

14. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED
UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

15. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE
VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

16. IN DAMP, WET OR WET/CORROSIVE AREAS INSTALL SURFACE MOUNTED DEVICES.

17. FIELD MOUNTED DISCONNECTS, PUSHBUTTON CONTROL STATIONS, ALARM PANELS, ENCLOSED STARTERS AND CIRCUIT BREAKERS, AUTOMATIC TRANSFER SWITCHES, POWER DISTRIBUTION PANELS, WIREWAYS, CONTACTORS, TERMINAL BOXES, JUNCTION AND PULL BOXES SHALL BE MOUNTED ON GALVANIZED OR STAINLESS STEEL STANDS UNLESS OTHERWISE NOTED OR ALLOWED BY ENGINEER.

18. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARDS AND CIRCUIT ID'S).

19. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABEL.

20. SUPPLEMENTAL GROUNDING CONDUCTOR LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.

21. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

22. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

23. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

24. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

25. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

26. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

26. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

SECTION 26 200 – ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

HRT 094 943225
CT43XC805

CONSTRUCTION DRAWINGS		
1	11/02/18	ISSUED AS FINAL
0	10/15/18	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50062961
JOB NUMBER:	50103803
SITE ADDRESS:	

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE

ELECTRICAL & GROUNDING NOTES

SHEET NUMBER

E-2