

App No: 2018080452

Applicant Name	<u>Julie Arnold Erb</u>	Site Link Wireless	Antenna Compliance	Yes
Application Type	Colocated	Updated	9/13/2018	Compliance Desc
Carrier	Sprint/Nextel	6409?	No	Antenna Location
Solution Type	Macro	Ann. Plan?	Yes	Antenna Loc. Desc.
Existing	New	Equipment Gvt Us	No	Env. Assessment
		Gvt. Use Desc.		Cat. Excluded?
				checked
Application Description				Routine Env. Evaluation

Sprint is proposing to install (6) antennas, (6) remote head radios and (3) hybrid cables on the rooftop. The antennas include (3) Nokia 2.5 GMAA-AACH antennas and (3) RFS APXVBBLL15X-43-C-210 and will be mounted on the existing penthouse structure. The remote head radios include (3) RRH 4x45-1900 and (3) RRH 2x50-800 attached to the RFS APXVBB antenna. Sprint will propose (1) steel frame equipment platform measuring 13' x 11'8" to place (2) cabinets, (1) transformer and (1) fiber distribution box. The Sprint antennas are flush mounted to the penthouse wall and are not the highest structural on the rooftop. The Sprint antennas are less visible than the existing T-Mobile and AT&T antennas that are on Sled mounts. Also, the Sprint steel frame equipment platform is set back on the roof and not visible from the ground.

Site Id	561	Zoning	CR CR-30
Structure Type	Building	Latitude	38.99127
Address	8120 Wisconsin Ave, Bethesda	Longitude	-77.09607
County Site Name	Double Tree Hotel	Ground Elevation	348
Carrier Site Name	WA90XCI34A	City	Bethesda
Site Owner	A TBC BETHESDA OWNER LLC	Lease Status	In Process
Structure Owner	A TBC BETHESDA OWNER LLC	PROW	No
Structure Height	162.6 135'4"		

Justification

The site is the best rooftop to provide coverage to this populated area of Bethesda. The rooftop has existing antenna sites including AT&T and T-Mobile. Evaluated other rooftops in the area but none of the owners were interested in leasing to Sprint.

NearbySites (New Apps Only):

Screeningconsiderations(New Apps Only):

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Antenna Model APXVBBLL15X-43-C-120

Frequency ~~694-790-790-894-880-960~~

1910-1915 / 1990-1995

806-824 / 851-869, 896-901 / 935-940, 1850-1865 / 1930-1945 MHz

RAD Center 155 Max ERP 300

Antenna Dimensions 66.7" x 19.6" x 8.5"

Quantity

3

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Antenna Model Nokia 2.5 GMAA-AACH

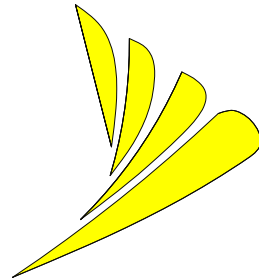
Frequency ~~2500~~ 2496-2690 / 2496-2690

RAD Center 157 Max ERP ~~1400~~ 1000W Antenna Dimensions 25.6" x 19.7" x 9.6" Quantity 3

Thursday, September 13, 2018

12:24:26 PM

Sprint



SITE NAME: BETEHSDA HILTON
SITE NUMBER: WA90XCI34A
8120 WISCONSIN AVE
BETHESDA, MD 20814

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

entrex
communication services, inc.
6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961

SITE LINK
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

SITE INFORMATION

SCOPE OF WORK: (6) PROPOSED ANTENNAS, 2 PER SECTOR
(6) PROPOSED RRU, 2 PER SECTOR
(3) PROPOSED 6X12 HYBRID CABLES
(1) PROPOSED LMR-400 COAX CABLE
(1) PROPOSED ELITEC CABINET
(1) PROPOSED ELITEK BATTERY CABINET
(1) PROPOSED TRANSFORMER
(1) PROPOSED FIBER DISTRIBUTION BOX

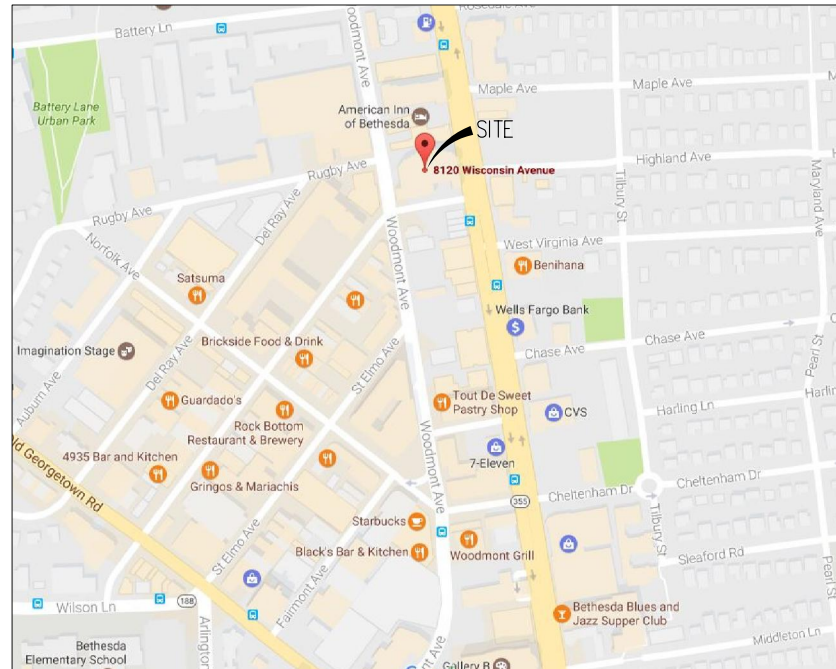
JURISDICTION: MONTGOMERY COUNTY
ZONING: CR-3.0 C-1.0 R2.75 H-90T

PARCEL OWNER: A TBC BETHESDA OWNER LLC
ADDRESS: 3299 K STREET
WASHINGTON DC 20007

STRUCTURE TYPE: ROOFTOP
GROUND ELEVATION: ± 348.1
LATITUDE: N 38.991263°
LONGITUDE: W 77.096162°

NOTE TO GENERAL CONTRACTOR
NO WORK IS TO BE PERFORMED ON THIS SITE WITHOUT REVIEW OF THE APPROVED STRUCTURAL ANALYSIS. IF ANY DISCREPANCIES ARE FOUND THE GENERAL CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING. AT NO TIME WILL ANY ADDITIONAL ANTENNAS BE INSTALLED WITHOUT WRITTEN CONSENT FROM TOWER ENGINEER.

VICINITY MAP



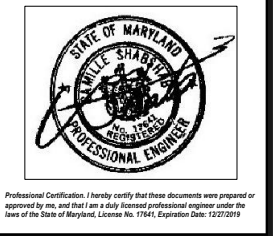
SCALE: 1" = 2,000'

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WA90XCI34A
BETHESDA HILTON
8120 WISCONSIN AVE
BETHESDA, MD 20814

SEAL:



SUBMITTALS

DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A
09-25-18	CONSTRUCTION	0

PROJECT TEAM

APPLICANT: SPRINT
APC REALTY AND EQUIPMENT COMPANY,
LLC a/b/c SPRINT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

ARCHITECT/ENGINEER: ENTREX COMMUNICATION SERVICES, INC.
6600 ROCKLEDGE DRIVE, SUITE 550
BETHESDA, MD 20817
CAMILLE SHABSHAB (202) 408-0960

SITE LINK
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

CODE COMPLIANCE

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

- 2013 DISTRICT OF COLUMBIA BUILDING CODE
- 2011 NATIONAL ELECTRICAL CODE
- 2015 NFPA 101, LIFE SAFETY CODE
- 2012 DISTRICT OF COLUMBIA FIRE CODE
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	REVISE & RESUBMIT
OWNER REPRESENTATIVE	DATE	☐	☐	☐
SITE AQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
ZONING	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"
0 1/2 1
GRAPHIC SCALE IN INCHES

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.

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.

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 JOB SITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOB SITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILED 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 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:

- A. COAX COLOR CODING SWEEPS AND FIBER TESTING TS-0200 AND EL-0568.
- B. CABLE LABELING EN-2012-00.
- C. APPLICABLE INSTALLATION MOPS IDENTIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS.

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 IS 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.

SECTION 01 300 - CELL SITE CONSTRUCTION:

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 LATEST VERSION OF TS-0200 ANTENNA LINE ACCEPTANCE STANDARDS.
 - 2. AGL, AZIMUTH AND DOWN TILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR THE PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWN TILT T 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 CLOSE OUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
 - 1. AZIMUTH, DOWN TILT T, AGL FROM SUNSIGHT INSTRUMENTS – ANTENNA ALIGN ALIGNMENT TOOL (AAT).
 - 2. SWEEP AND FIBER TESTS.
 - 3. SCALEABLE BAR CODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT.
 - 4. ALL AVAILABLE JURISDICTIONAL PERMIT AND OCCUPANCY INFORMATION.
 - 5. PDF SCAN OF RED LINES PRODUCED IN FIELD.
 - 6. A PDF SCAN OF RED LINE MARKUPS 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. APPLICABLE POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).
 - 12. CLOSE OUT PHOTOGRAPHS AND CLOSE OUT CHECKLIST: SPRINT WILL PROVIDE. SEPARATE GUIDANCE.

SECTION 01 700 - 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 ½ INCH COAX JUMPER CABLES BETWEEN THE RRU’S AND ANTENNAS, JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, OR 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 10’-0”.

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 ON SITE 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.

HYBRID 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 RADIUS.
- C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
- 1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
- 2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
 - a. FIBER I SUPPORT FIBER BUNDLES USING 1/2" 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: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
- 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 ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSEOVERS.
 - c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURERS’ RECOMMENDED MAXIMUM BEND RADIUS.

- 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 IN CURRENT VERSION OF TS0200.
- 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.



6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251



6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961



Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

WA90XC134A
BETHESDA HILTON
8120 WISCONSIN AVE
BETHESDA, MD 20814

SEAL:



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 17461, Expiration Date: 12/31/2019

SUBMITTALS		
DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A
09-25-18	CONSTRUCTION	0

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"

0 1/2 1
GRAPHIC SCALE IN INCHES

TITLE:

SPECIFICATIONS

SHEET NUMBER:

SP-1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

WEATHERPROOF USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. 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.

2. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT:

SUMMARY:

A. THIS SECTION SPECIFIES MMBS 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 DR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED 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 AND SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS:

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FDR 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. MATERIALS AND 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.

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. MATERIALS AND 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 SYSTEMS.

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 PANELBOARD.

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 POLYVINYL CHLORIDE (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 REQUIRED 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 LOCK NUT 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 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, COOPER, 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–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 EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH EXOTHERMIC 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 DR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCK NUT ON OUTSIDE AND INSIDE.

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



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entrex
communication services, Inc.

6600 Rockledge Drive, Suite 550
Bethesda, MD 20817

PHONE: (202) 408-0960
FAX: (202) 408-0961



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Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.siteinfolinkwireless.com
410-308-4848

WA90XC134A

BETHESDA HILTON

8120 WISCONSIN AVE

BETHESDA, MD 20814

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SUBMITTALS		
DATE	DESCRIPTION	REV.
07–06–18	CONSTRUCTION REVIEW	A
09–25–18	CONSTRUCTION	0

PROJECT NO: 1015.897

DESIGNER: L.P.

ENGINEER: C.S.

THESE DRAWINGS ARE FORMATTED TO BE FULL–SIZE AT 22”X34”

0 1/2 1

GRAPHIC SCALE IN INCHES

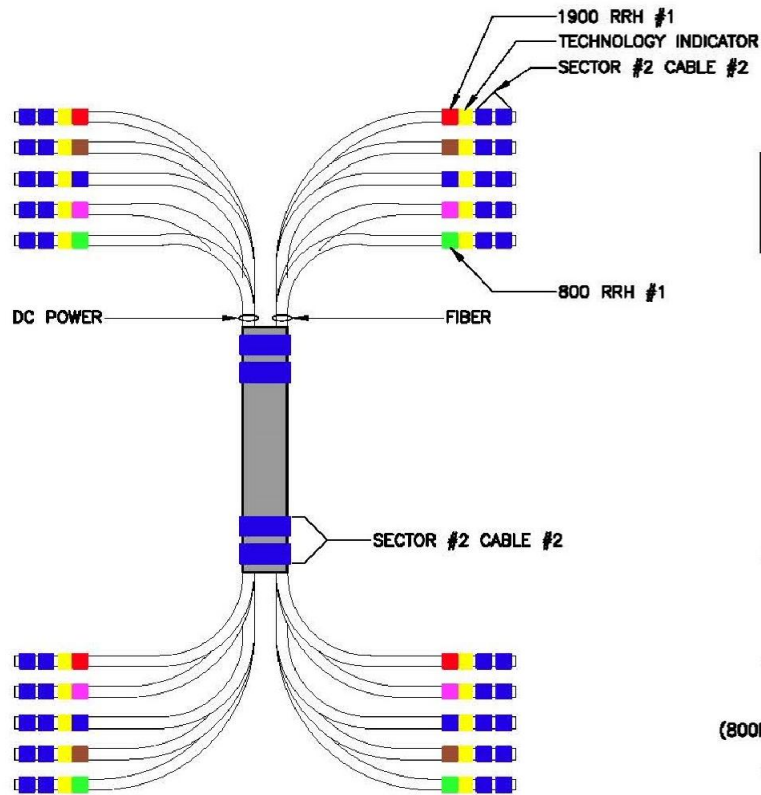
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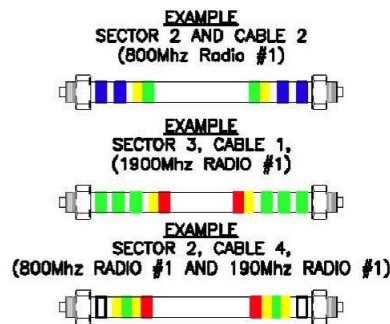
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SP-2

TECHNOLOGY COLOR CODE	FIRST RING	SECOND RING
800 #1	YELLOW	GREEN
1900 #1	YELLOW	RED
1900 #2	YELLOW	BROWN
1900 #3	YELLOW	BLUE
1900 #4	YELLOW	GREY
800 #1	YELLOW	ORANGE
2500 #1	YELLOW	WHITE
2500 #2	YELLOW	PURPLE



COLOR BANDING AT
UPPER TERMINATION
TO BE 3" WIDE



2500MHz RADIO CALIBRATION CABLE COLOR CODE

2500MHz #1 CAL CABLE - SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW		YELLOW	WHITE		
2 BETA	2	YELLOW	YELLOW		YELLOW	WHITE	
3 GAMMA	3	YELLOW	YELLOW	YELLOW		YELLOW	WHITE
2500MHz #2 CAL CABLE - SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW		YELLOW	PURPLE		
2 BETA	2	YELLOW	YELLOW		YELLOW	PURPLE	
3 GAMMA	3	YELLOW	YELLOW	YELLOW		YELLOW	PURPLE

INFORMATION TAKEN FROM SPRINT'S TECHNICAL SPECIFICATIONS "ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS,
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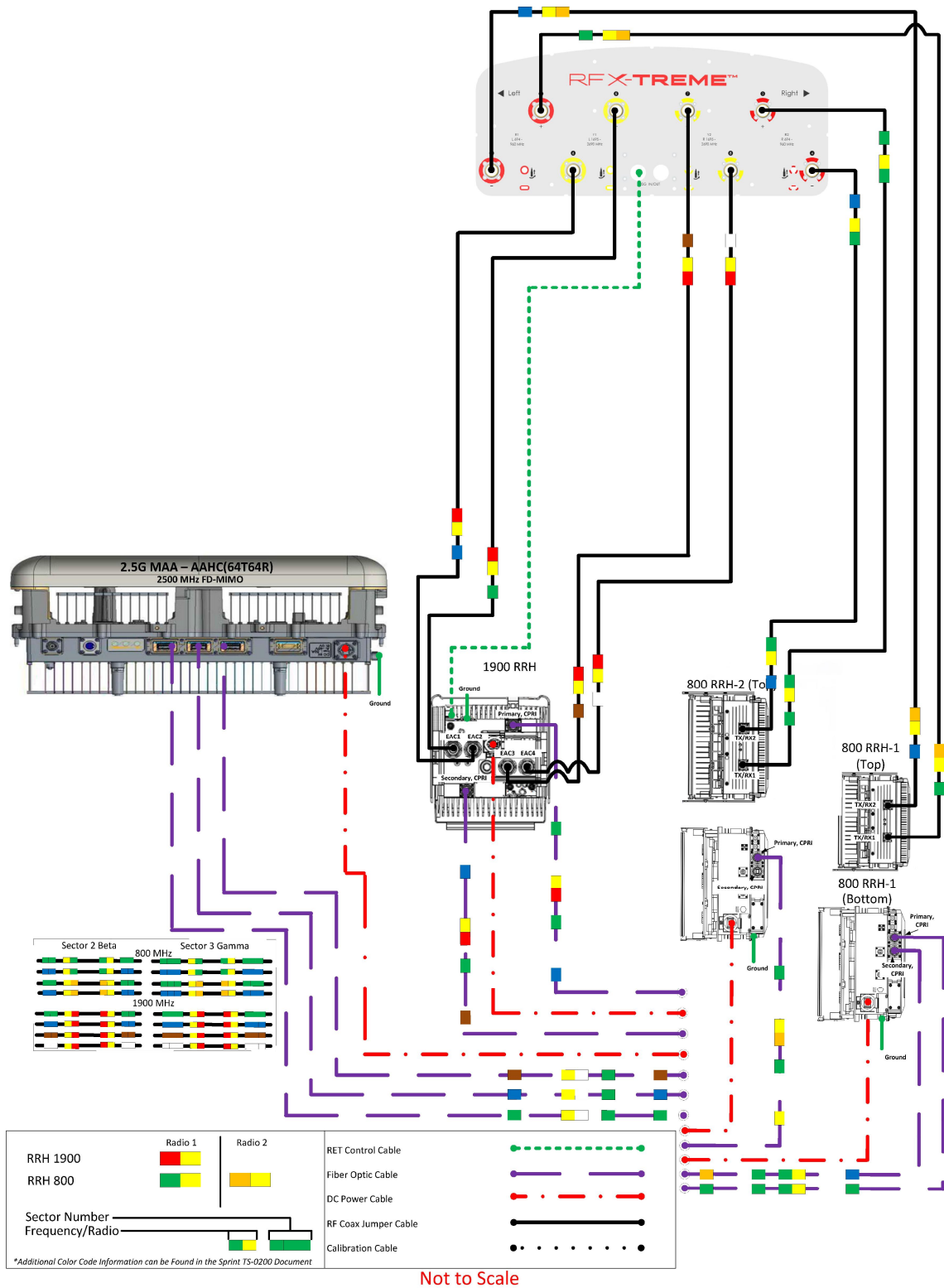
FIBER CABLE COLOR CODING 2.5 GHz
SCALE: N.T.S

1
SP-3

Prepared By Mark Elliott	Revision Date March 6, 2018	Revision Number R1
Approved By RAN Hardware & Antenna Teams	Approval Date Final-Macro Generated	

Sprint

ALU 21-MIMO APXVBBLL15X_43-C-I20 wo Filters



ANTENNA CABLING DIAGRAM
SCALE: N.T.S

2
SP-3

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communication services, Inc.
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Bethesda, MD 20817
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FAX: (202) 408-0961

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Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

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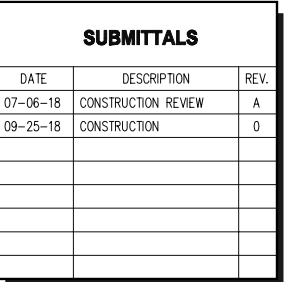
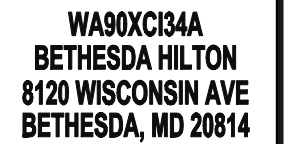
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09-25-18	CONSTRUCTION	0

PROJECT NO: 1015.897
DESIGNER: N.B.
ENGINEER: C.G.

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TITLE:
CABLING DIAGRAM
AND COLOR
CODING DETAILS

SHEET NUMBER:
SP-3



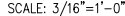
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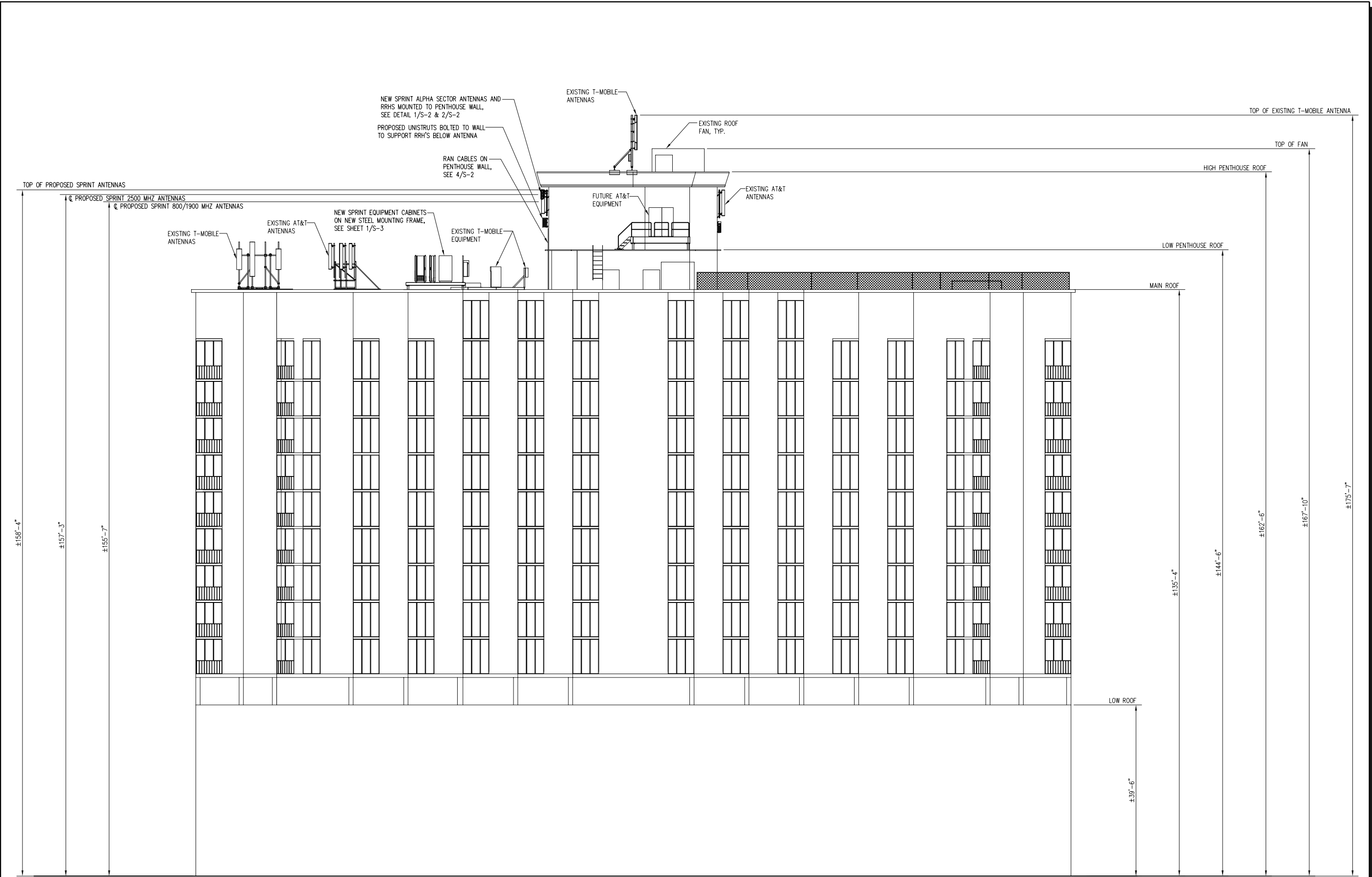
C-1





SCALE: 1/16"=1'-0"

PROJECT NO:	1015.897
DESIGNER:	L.P.
ENGINEER:	C.S.
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GRAPHIC SCALE IN INCHES	
TITLE:	
ROOF AND EQUIPMENT LOCATION PLAN	
SHEET NUMBER:	
A-1	



NOTE: PAINT ANTENNAS TO MATCH EXISTING PENTHOUSE WALL

NORTH BUILDING ELEVATION
SCALE: 3/32"=1'-0"

1
A-2

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entrex
communication service, Inc.
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Bethesda, MD 20817
PHONE: (202) 408-0960
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PROJECT NO: 1015.897
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ENGINEER: C.S.

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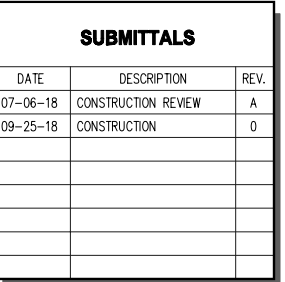
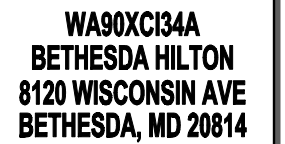
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GRAPHIC SCALE IN INCHES

TITLE:

NORTH BUILDING ELEVATION

SHEET NUMBER:

A-2



PROJECT NO:	1015.897
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ENGINEER:	C.S.
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TITLE: SOUTH BUILDING ELEVATION	
SHEET NUMBER: A-3	

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PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

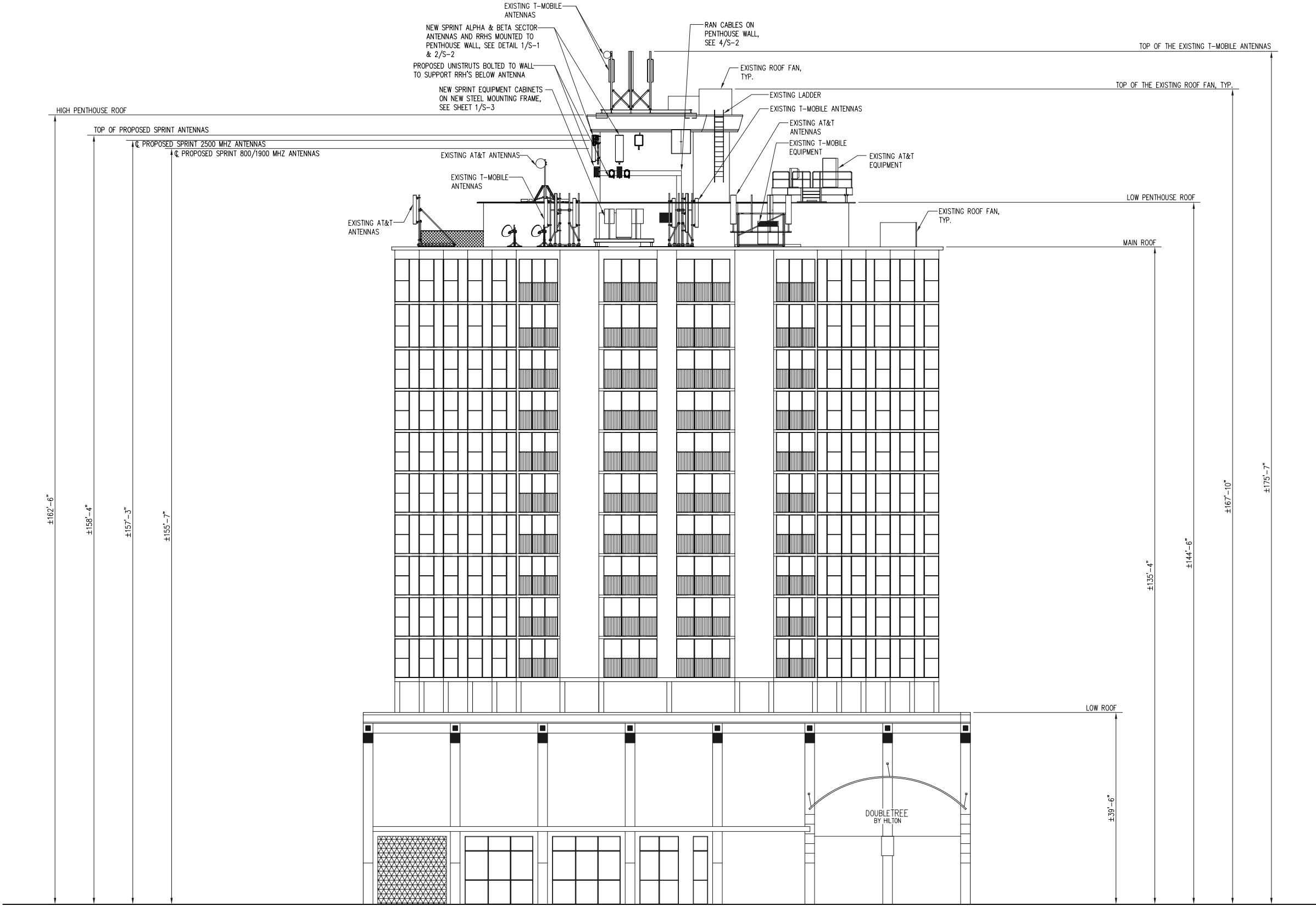
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GRAPHIC SCALE IN INCHES

TITLE:

**EAST BUILDING
ELEVATION**

SHEET NUMBER:

A-4

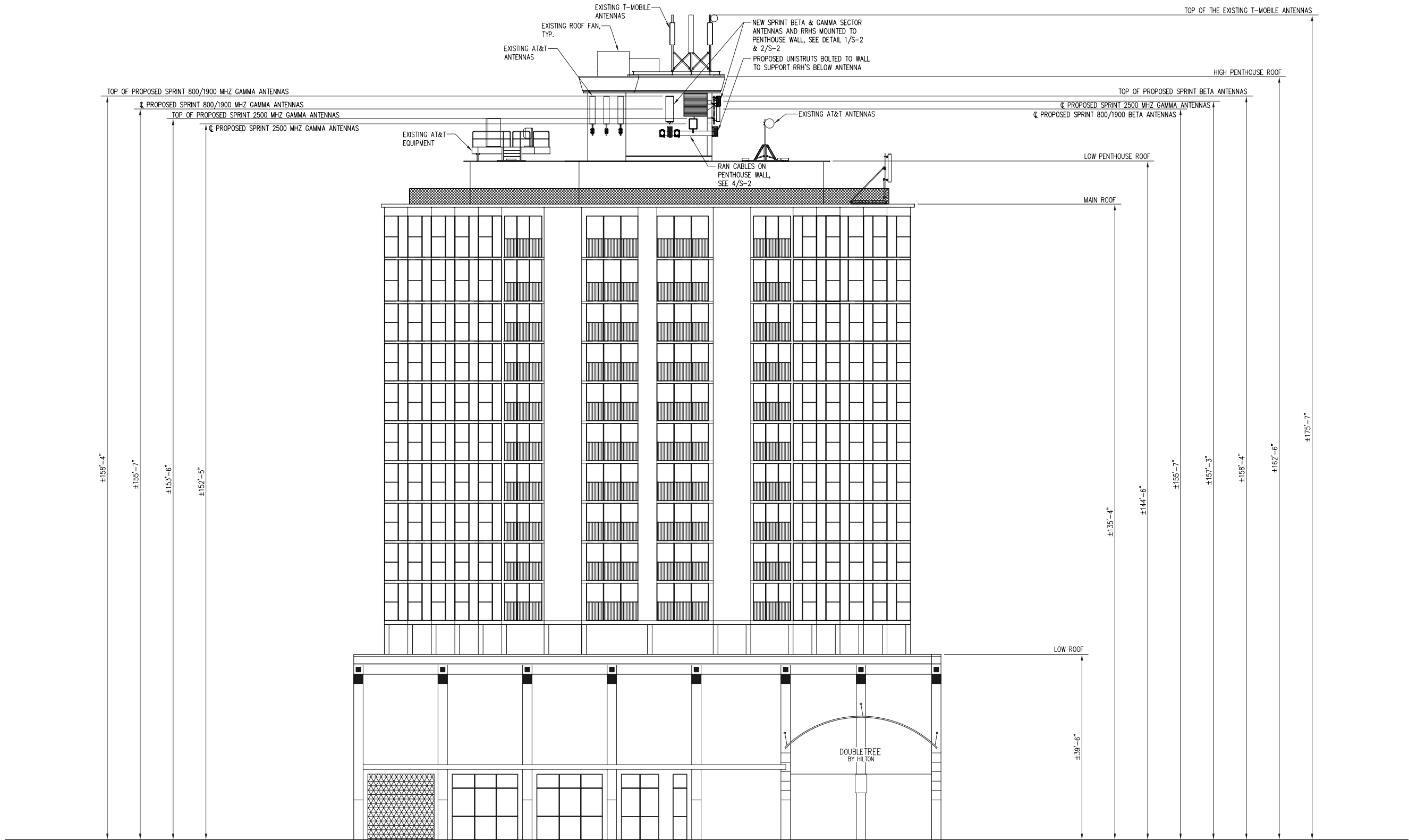


NOTE: PAINT ANTENNAS TO MATCH EXISTING PENTHOUSE WALL

EAST BUILDING ELEVATION

SCALE: 3/32"=1'-0"

1
A-4



NOTE: PAINT ANTENNAS TO MATCH EXISTING PENTHOUSE WALL

WEST BUILDING ELEVATION

SCALE: 3/32"=1'-0"

1
A-5

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PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

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0 1/2 1
GRAPHIC SCALE IN INCHES

TITLE:

**WEST BUILDING
ELEVATION**

SHEET NUMBER:

A-5

ANTENNA AND COAXIAL CABLE SCHEDULE (NO FINAL RFDS)														
SECTOR		AZIMUTH	RAD CENTER	TECHNOLOGY	ANTENNA MODEL #	MECHANICAL DOWN-TILT	ELECTRICAL DOWN-TILT	RRH	FILTER	COMBINER MODEL #	COAXIAL CABLE SIZE	CABLE LENGTH	JUMPER LENGTH	COLOR CODE
ALPHA	A-1	45°	157°-3°	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.630"H x 19.724"W x 9.645"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-5/8 HYBRID 4 AWG/5 PAIR 290F	65'	10'-0" (LCF12-50J)	SEE NOTE 9.
	A-2	45°	155°-7°	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
BETA	B-1	160°	157°-3°	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.630"H x 19.724"W x 9.645"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-1/4 HYBRID 6 AWG/4 PAIR 80F	75'	10'-0" (LCF12-50J)	SEE NOTE 9.
	B-2	160°	155°-7°	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
GAMMA	C-1	280°	152°-5°	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.630"H x 19.724"W x 9.645"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-1/4 HYBRID 4 AWG/4 PAIR 120F	110'	10'-0" (LCF12-50J)	SEE NOTE 9.
	C-2	280°	155°-7°	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
GPS	-	-	-	1575 MHZ	PCTEL TMG-HR-26N	-	-	-	-	-	1/2"ø	155'	-	-

CABLE MINIMUM BEND RADIUS	
1/2"ø JUMPER	HYBRIFLEX
5"	20"

COLOR CODE	
W	WHITE
Br	BROWN
G	GREEN
R	RED
Bl	BLUE
P	PURPLE
	YELLOW

ANTENNA AND RF CABLE NOTES

- ANTENNAS SHALL BE FURNISHED WITH MOUNTING BRACKETS.
- PROVIDE 1/2" DIAMETER JUMPER CABLE 10'-0" MAXIMUM LENGTH FROM ANTENNA TO RRH.
- ANTENNA CENTERLINE HEIGHT IS IN REFERENCE TO ELEVATION 0.0'.
- CONTRACTOR SHALL INSTALL COLOR CODE RINGS ON EACH END OF JUMPER CABLES AND JUMPER CABLES WITH UV RESISTANT TAPE. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLOR TAPE OR STENCIL TAG. COLOR TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRONIC, THE FIRST RING IS THE CLOSEST TO THE END OF THE CABLE. WRAP 2" COLORED TAPE A MINIMUM OF 3 TIMES AROUND THE CIRCUMFERENCE OF THE COAX, KEEPING THE TAPE IN THE SAME AREA AS MUCH AS POSSIBLE. THIS WILL ALLOW THE REMOVAL OF THE TAPE THAT WILL FADE OR DISCOLOR DUE TO WEATHER.
- PROVIDE PHOTOGRAPHS SHOWING COMPLETE INSTALLATION OF THE ANTENNA MOUNTS, WEATHERPROOFING AND CABLE CODING.
- THE NORTH ARROW ON THE PLANS REFERS TO TRUE NORTH. THE CONTRACTOR SHALL VERIFY THE NORTH REFERENCE PRIOR TO CONSTRUCTION AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCY.
- THE CONTRACTOR SHALL SUPPLY ALL CONNECTION HARDWARE TO SECURE THE RF CABLES. ALL CONNECTION HARDWARE SHALL BE STAINLESS STEEL.
- THE OWNER SHALL FURNISH THE ANTENNAS, THE RF RADIO EQUIPMENT AND OTHER MATERIALS FOR THE PROJECT. THE CONTRACTOR SHALL VERIFY WITH THE OWNER THE MATERIALS TO BE FURNISHED PRIOR TO SUBMITTING A BID.
- REFER TO SPRINT STANDARD CABLE COLOR CODING DETAILS.
- THE CABLE LENGTHS ARE MEASURED FROM THE FIBER DISTRIBUTION CABINET THE THE RADIO HEADS. THE CONTRACTOR SHOULD VERIFY LENGTHS PRIOR TO ORDERING CABLES.



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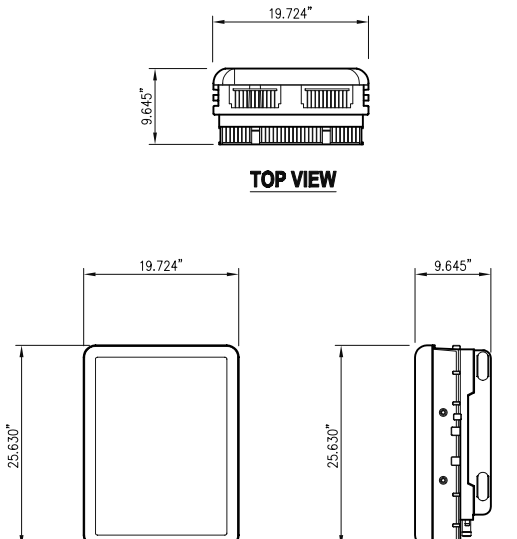


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Bethesda, MD 20817
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TOP VIEW

FRONT VIEW

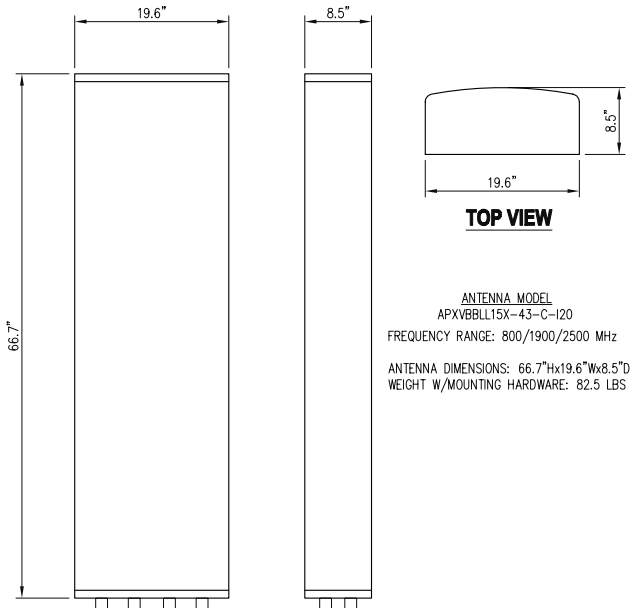
SIDE VIEW

ANTENNA MANUF.: NOKIA
MODEL: 2.5 GMAA-AAHC(64T64R)
FREQUENCY RANGE: 2490-2600 MHz
2600-2690 MHz
ANTENNA DIMENSIONS: 25.630" H x 19.724" W x 9.645" D
WEIGHT WITH MOUNTING HARDWARE: 103.6 LBS

NOTE: PAINT ANTENNAS TO MATCH EXISTING PENTHOUSE WALL

NOKIA MIMO DETAILS
SCALE: 1"=1'-0"

1
S-1



TOP VIEW

FRONT VIEW

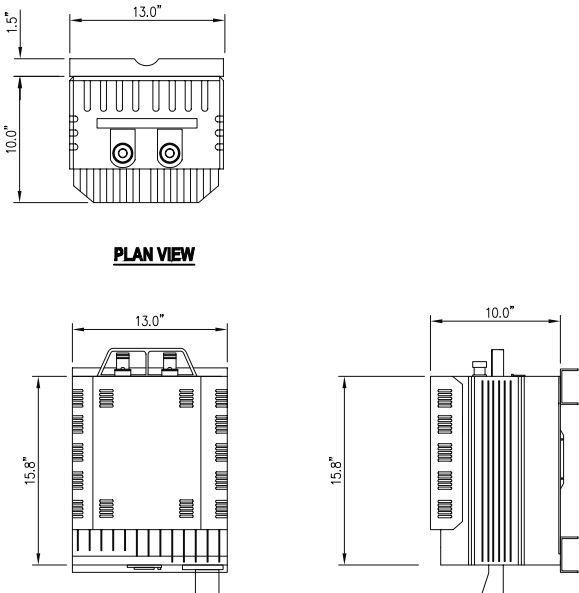
SIDE VIEW

ANTENNA MODEL
APXVBBLL15X-43-C-I20
FREQUENCY RANGE: 800/1900/2500 MHz
ANTENNA DIMENSIONS: 66.7"Hx19.6"Wx8.5"D
WEIGHT W/MOUNTING HARDWARE: 82.5 LBS

NOTE: PAINT ANTENNAS TO MATCH EXISTING PENTHOUSE WALL

APXVBBLL15X_43-C-I20 DETAIL
SCALE: 1"=1'-0"

2
S-1



PLAN VIEW

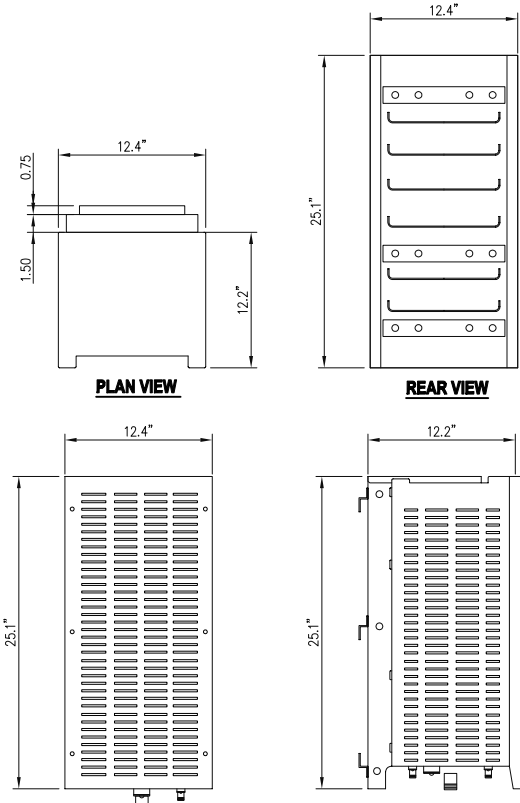
FRONT VIEW

SIDE VIEW

MODEL: ALU 800 2X45
DIMENSIONS: 15.8"Hx13"Wx10"D
RRH WEIGHT W/MOUNTS: ±60 LBS

800 MHz RRH DETAIL
SCALE: 1-1/2"=1'-0"

3
S-1



PLAN VIEW

FRONT VIEW

REAR VIEW

SIDE VIEW

MODEL: ALU 1900 4X45
DIMENSIONS: 25.1"Hx12.4"Wx12.2"D
RRH WEIGHT W/MOUNTS: ±75 LBS

1900 MHz RRH DETAIL
SCALE: 1-1/2"=1'-0"

4
S-1

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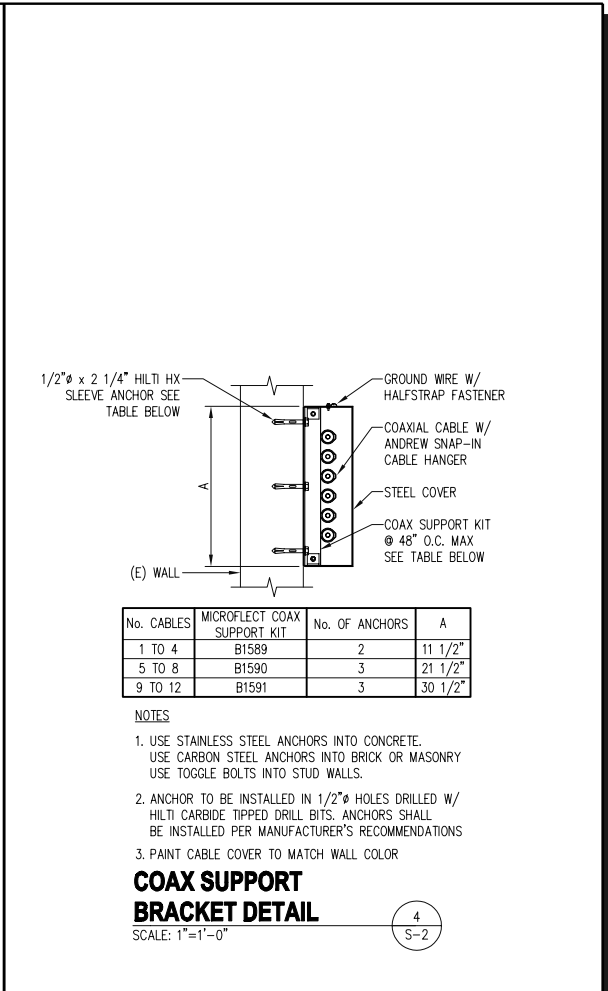
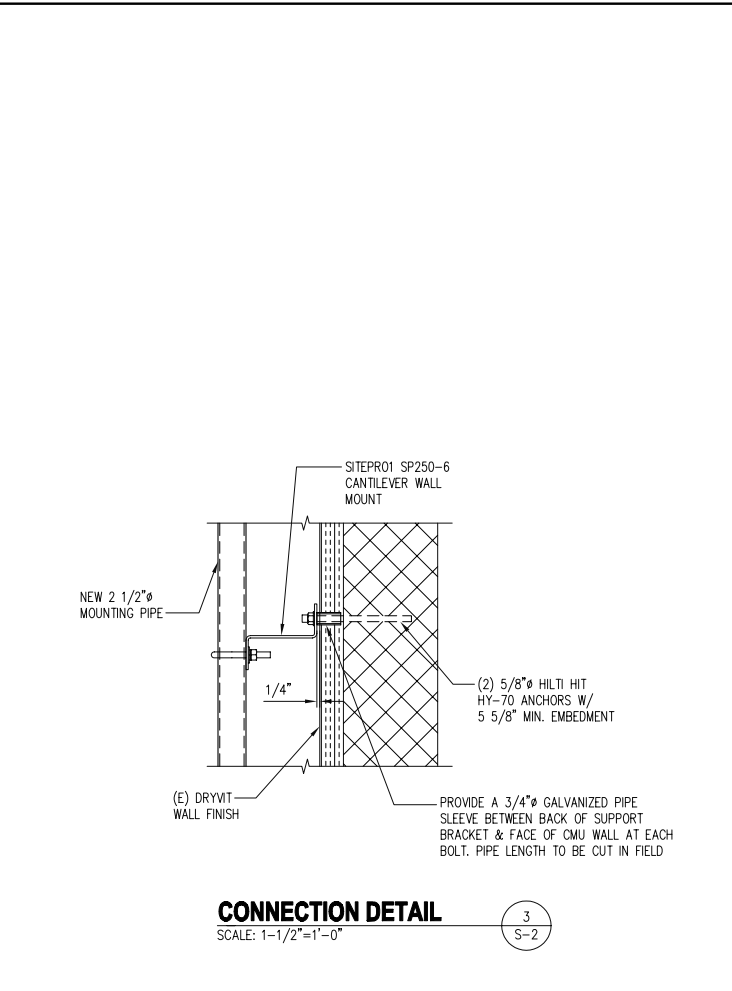
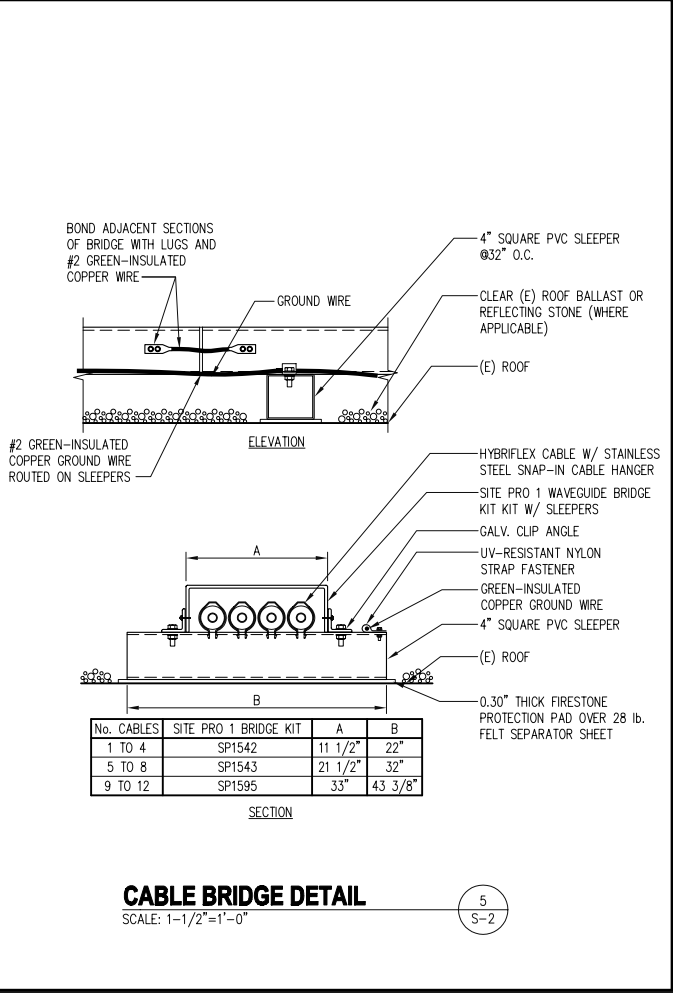
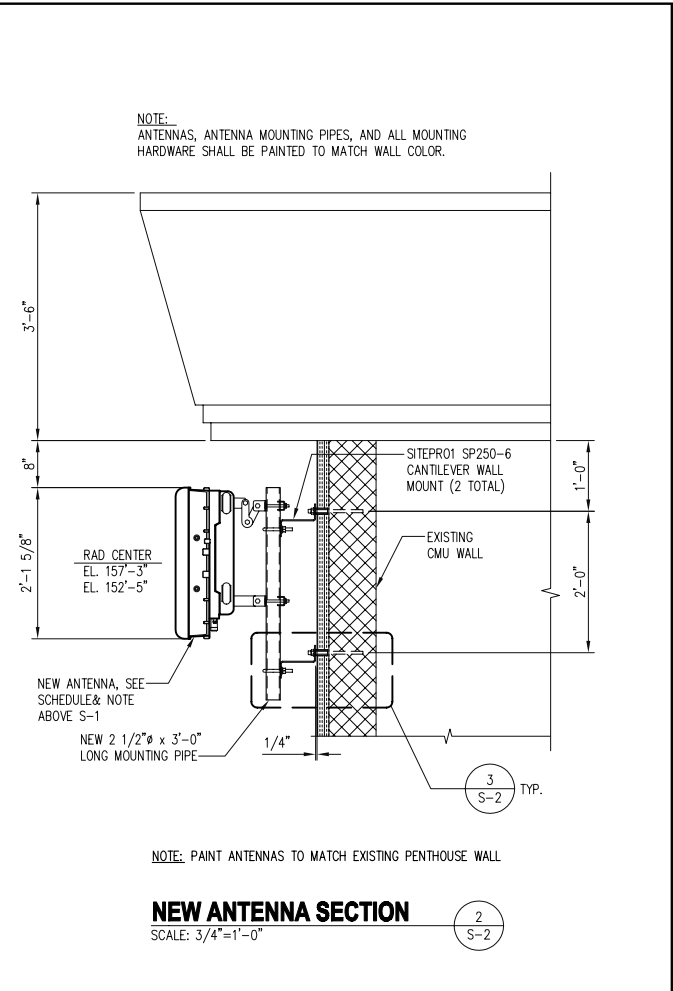
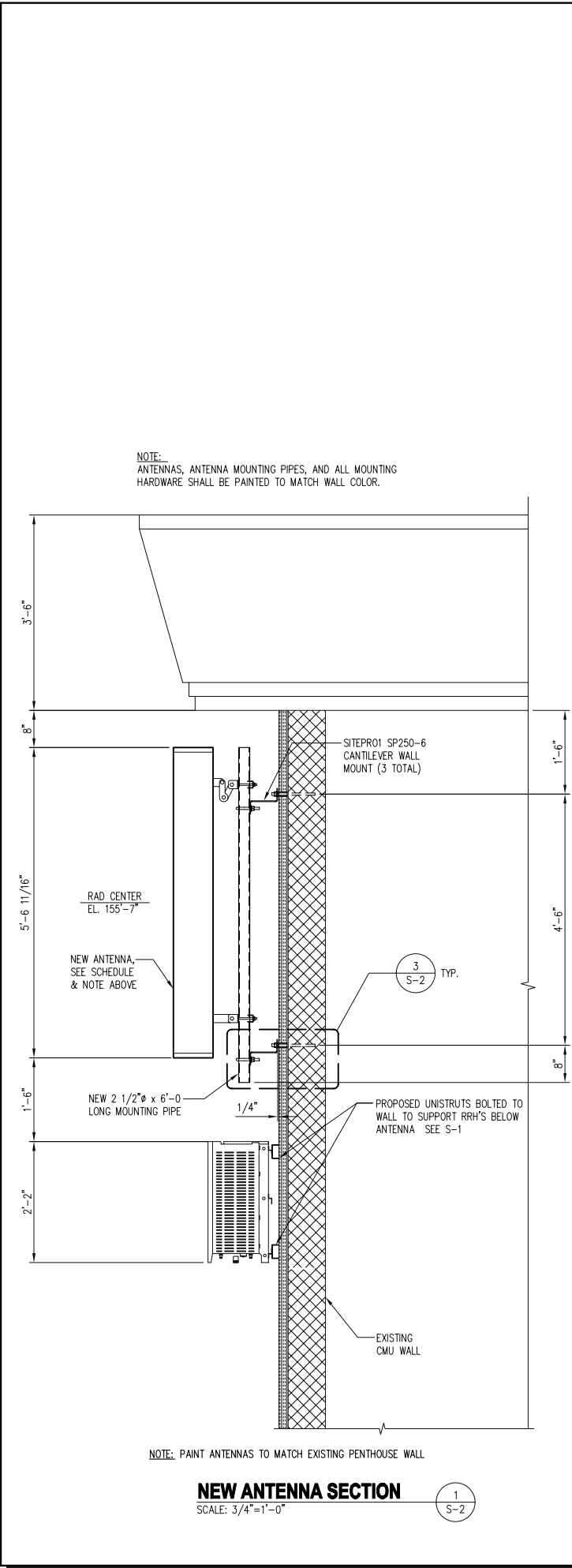
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TITLE:

ANTENNA SCHEDULE AND ANTENNA, DETAILS

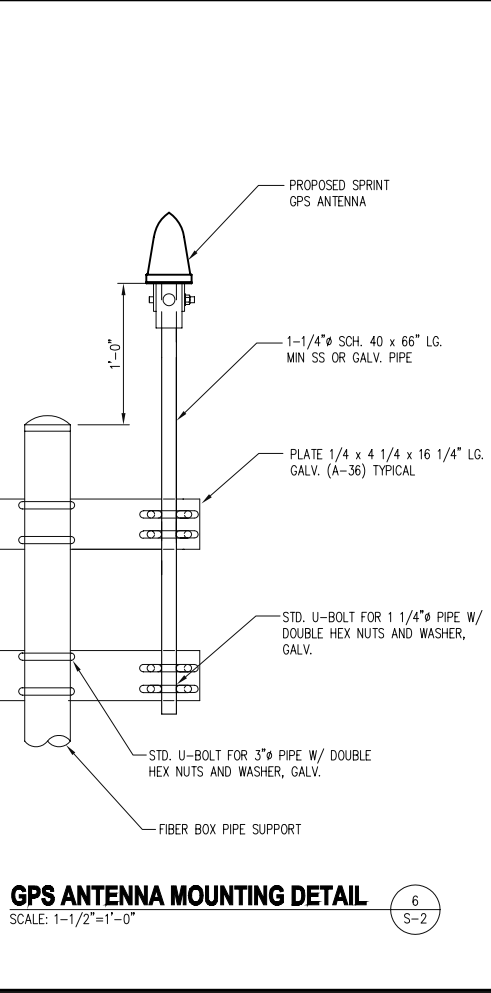
SHEET NUMBER:

S-1



STRUCTURAL NOTES

- THE DESIGN REQUIREMENTS FOR THE PROJECT ARE PER THE INTERNATIONAL BUILDING CODE 2015. THE WIND SPEED UTILIZED FOR DESIGN IS 115 MPH (RISK CATEGORY 2). THE DESIGN REQUIREMENTS FOR THE ANTENNA SUPPORT STRUCTURES ARE PER THE TIA/EIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES. THE DESIGN LIVE LOAD ON THE PLATFORM IS 30 PSF.
- THE INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED BY FIELD MEASUREMENT. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH CONSTRUCTION.
- THE GENERAL CONTRACTOR AND HIS SUB CONSULTANTS SHALL BE RESPONSIBLE FOR OBTAINING ALL BUILDING AND OR TRADE PERMITS AND INSPECTIONS THAT MAY BE REQUIRED FOR THE WORK.
- STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN INCLUDING THE COMMENTARY AND THE AISC CODE OF STANDARD PRACTICE.
- STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A36. STRUCTURAL STEEL PIPES SHALL CONFORM TO ASTM A53 GRADE B. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GRADE B. ALL STRUCTURAL STEEL COMPONENTS AND FABRICATED ASSEMBLIES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. COLD GALVANIZE ALL FIELD PUNCHED HOLES, FIELD CUT SURFACES OR SURFACES WHERE GALVANIZE SURFACE IS DAMAGED.
- WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.1 STRUCTURAL WELDING CODE - STEEL (LATEST EDITION). WELD ELECTRODES SHALL BE E70XX UNLESS NOTED OTHERWISE.
- STRUCTURAL THREADED FASTENERS FOR STEEL ANTENNA MOUNTING ASSEMBLIES SHALL CONFORM TO ASTM A307 OR ASTM A36. STRUCTURAL FASTENERS FOR STRUCTURAL STEEL FRAMING SHALL CONFORM TO ASTM A325. STRUCTURAL FASTENERS SHALL BE 5/8" DIAMETER BEARING TYPE CONNECTIONS WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE FOR ANGLES. STRUCTURAL FASTENERS SHALL BE 3/4" DIAMETER BEARING TYPE CONNECTIONS WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE FOR ALL OTHER STRUCTURAL SHAPES. ALL EXPOSED STRUCTURAL FASTENERS, NUTS AND WASHERS SHALL BE HOT DIP GALVANIZED UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE EQUIPMENT FRAME FOR REVIEW AND APPROVAL OF THE ENGINEER PRIOR TO FABRICATION.



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communication services, Inc.

6600 Rockledge Drive, Suite 550
Bethesda, MD 20817

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FAX: (202) 408-0961

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 17461, Expire Date: 12/31/2019.

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09-25-18	CONSTRUCTION	0

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"

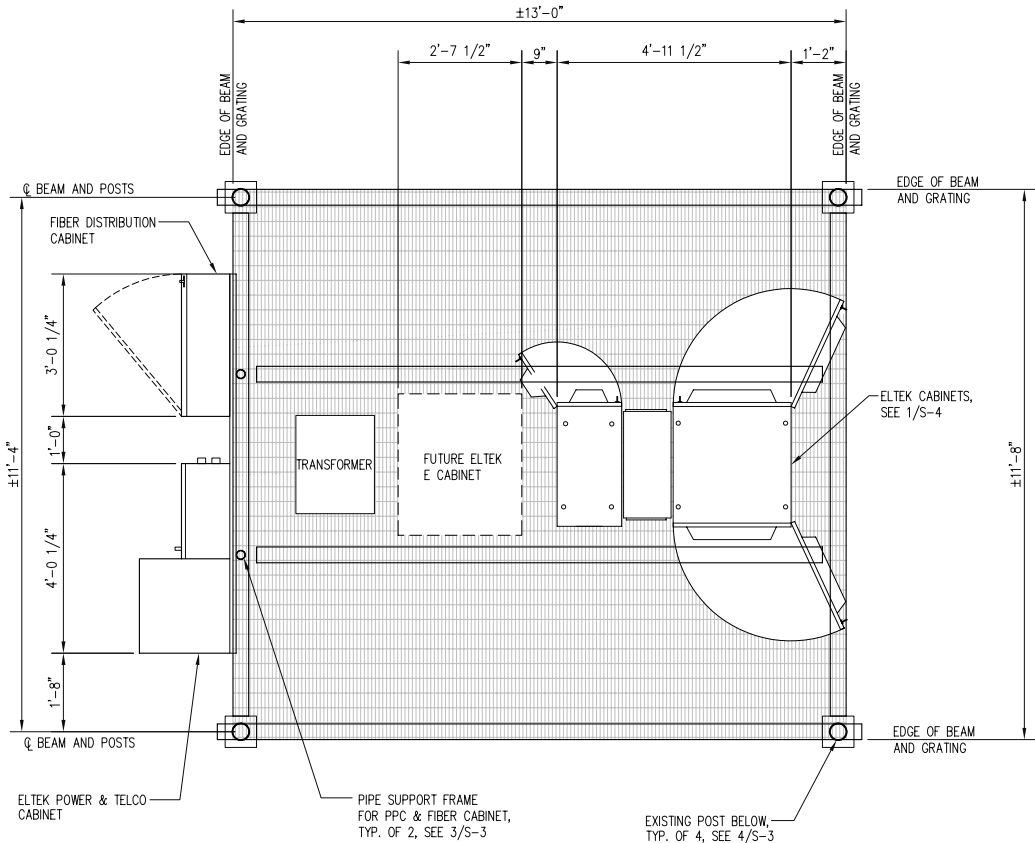
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TITLE:

ANTENNA MOUNTING AND CABLE DETAILS

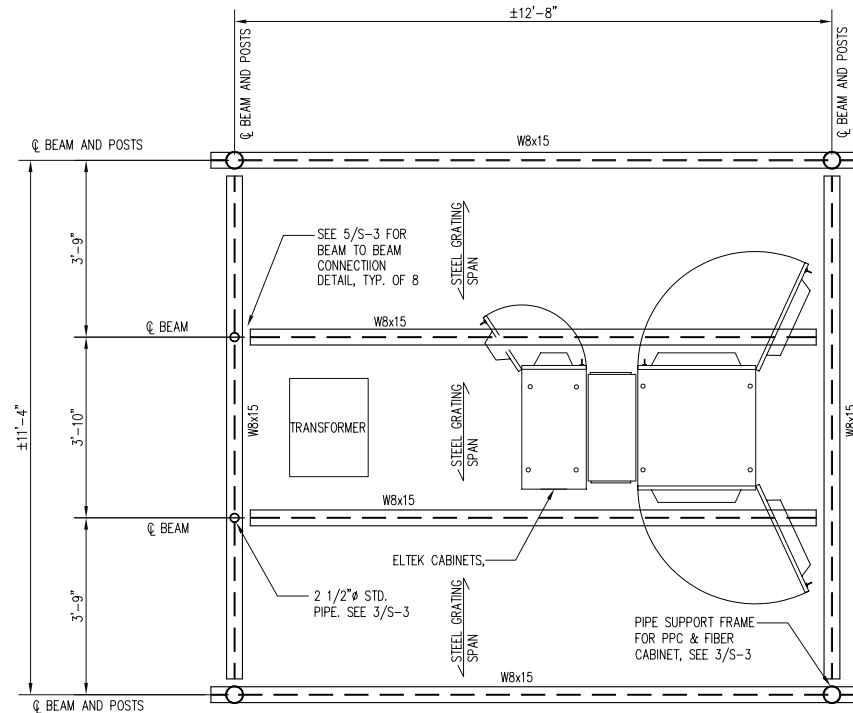
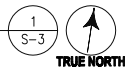
SHEET NUMBER:

S-2



EQUIPMENT CABINET LAYOUT PLAN

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

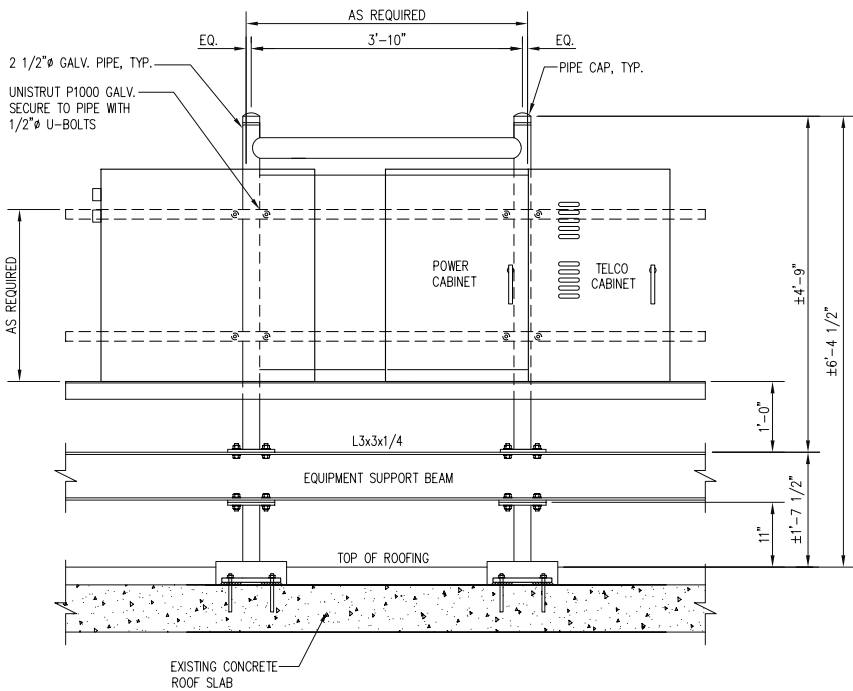
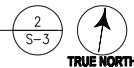


NOTES:

1. GRATING SHALL BE 1 1/2" X 3/16" BEARING BARS 1 3/16" O.C. AND 1/8" X 3/4" CROSS BARS 4" O.C. SECURE GRATING TO STEEL FRAMING WITH GRATING CLAMPS 18" O.C. GRATING SHALL BE HOT DIP GALVANIZED AND ALL EDGES AND OPENINGS SHALL BE BANDED
2. ALL STEEL SHALL BE HOT-DIPPED GALVANIZED. CLEAN WELDED AREAS WITH POWER TOOL. PAINT WELDED AREAS WITH TWO LAYERS OF GALVANIC PAINT.

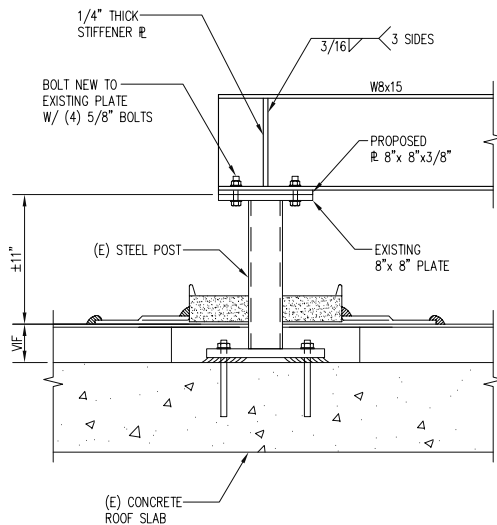
EQUIPMENT SUPPORT FRAMING PLAN

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



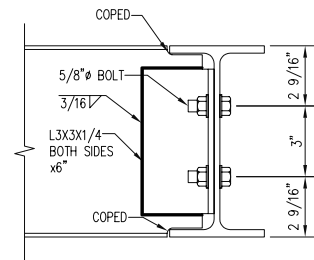
POWER TELCO CABINET MOUNTING DETAILS

SCALE: 3/4"=1'-0"



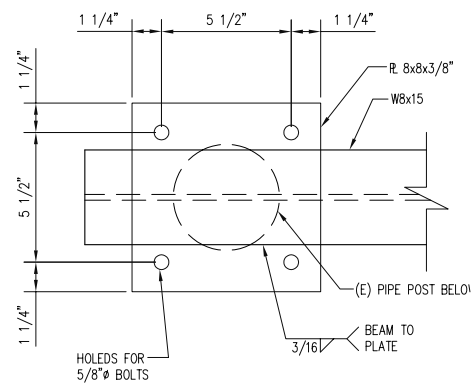
BEAM TO POST CONNECTION DETAIL

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



TYPICAL W12 TO W12 CONNECTION DETAIL

SCALE: 3"=1'-0"



TYPICAL DETAIL

SCALE: 3"=1'-0"

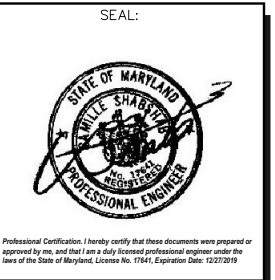


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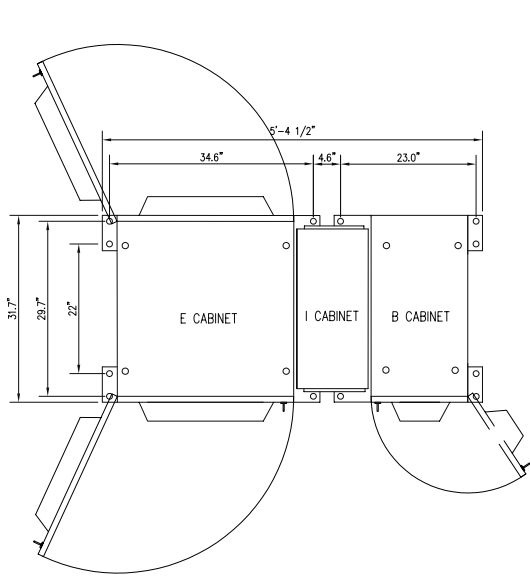
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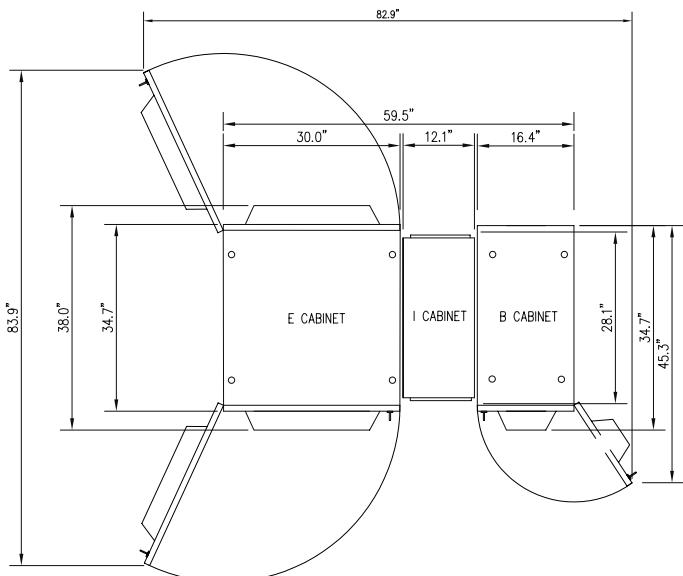
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09-25-18	CONSTRUCTION	0

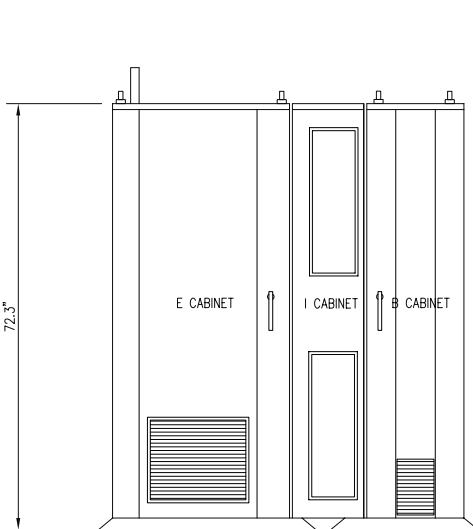
PROJECT NO: 1015.897
DESIGNER:
ENGINEER:
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GRAPHIC SCALE IN INCHES
TITLE:
EQUIPMENT SUPPORT FRAME PLANS AND DETAILS
SHEET NUMBER:
S-3



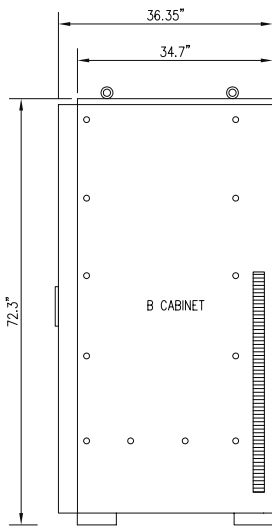
MOUNTING PLAN



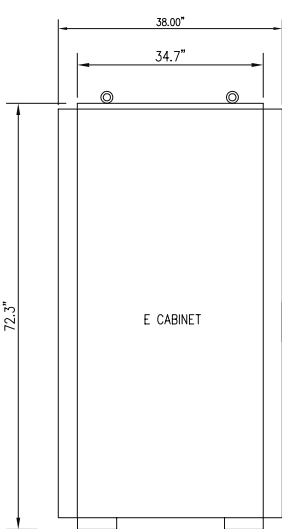
TOP PLAN VIEW



FRONT VIEW



RIGHT SIDE VIEW

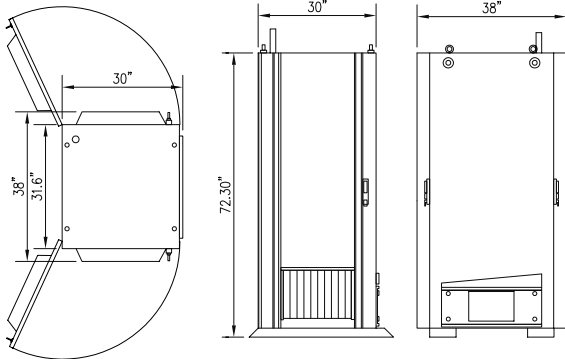


LEFT SIDE VIEW

ELTEK E, I AND B CABINET DETAILS

SCALE: 3/4" = 1'-0"

1
S-4



TOP PLAN VIEW

FRONT VIEW

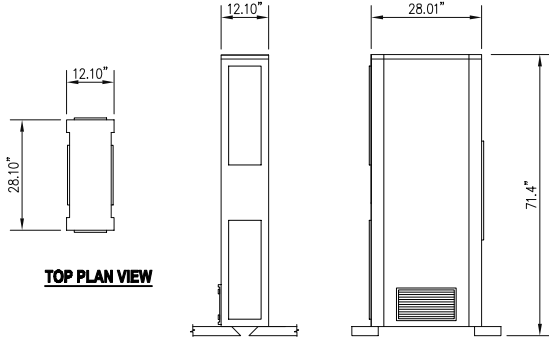
RIGHT SIDE VIEW

- NOTES:
1. ELTEK E-CABINET MODEL NUMBER: ES0A220-SCA02
 2. THE CABINET DESIGN WEIGHT IS 1,400 LBS
 3. SECURE THE CABINET TO THE GRATING WITH (4) 1/2" STAINLESS STEEL THRU BOLTS WITH 1/8" X 1"x1" PLATE WASHERS AND NUTS

ELTEK E CABINET DETAILS

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

2
S-4



TOP PLAN VIEW

FRONT VIEW

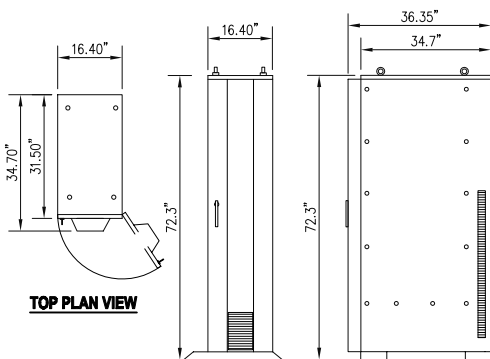
RIGHT SIDE VIEW

- NOTES:
1. ELTEK I-CABINET MODEL NUMBER: N/A
 2. THE CABINET DESIGN WEIGHT IS 250 LBS

ELTEK I CABINET DETAILS

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

3
S-4



TOP PLAN VIEW

FRONT VIEW

RIGHT SIDE VIEW

- NOTES:
1. ELTEK B CABINET MODEL NUMBER: ES0F020-ECV02
 2. THE CABINET DESIGN WEIGHT IS 1,400 LBS
 3. SECURE THE CABINET TO THE GRATING WITH (4) 1/2" STAINLESS STEEL THRU BOLTS WITH 1/8"x1"x1" PLATE WASHERS AND NUTS

ELTEK B CABINET DETAILS

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

4
S-4

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6600 Rockledge Drive, Suite 550
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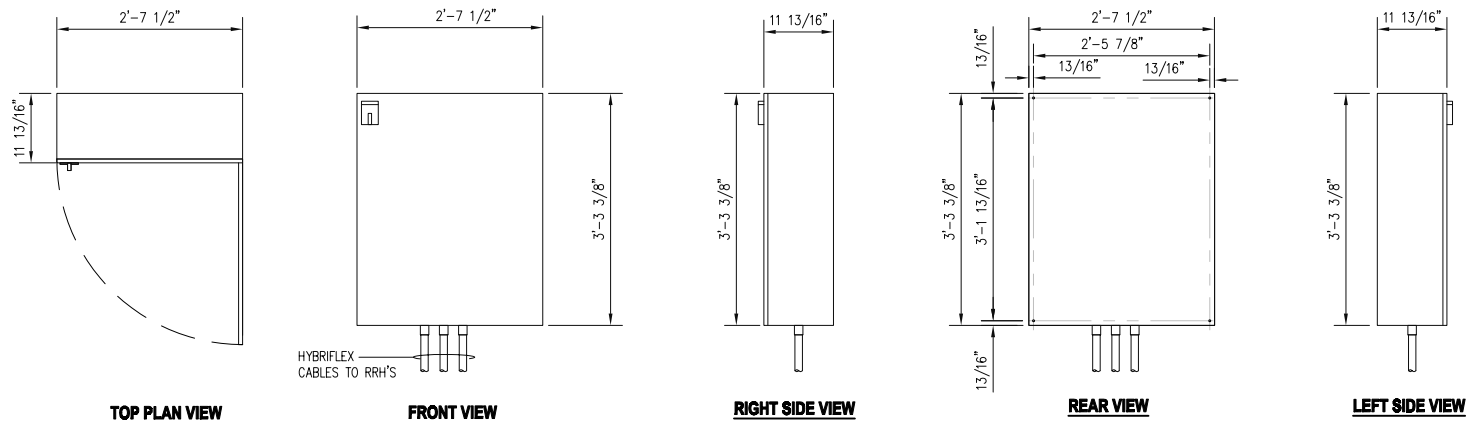
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GRAPHIC SCALE IN INCHES

TITLE:

**ELTEK CABINET
DETAILS**

SHEET NUMBER:

S-4

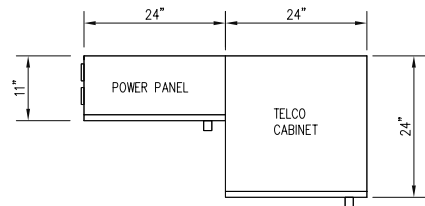


- NOTES:
1. SECURE THE CABINET PER MANUFACTURE'S INSTRUCTIONS
 2. THE CABINET DESIGN WEIGHT = 150 LBS

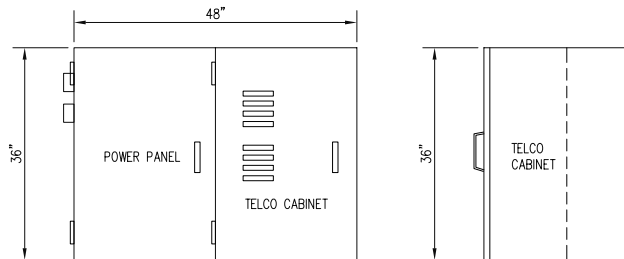
FIBER DISTRIBUTION CABINET DETAILS

SCALE: 3/4" = 1'-0"

1
S-5



TOP PLAN VIEW



FRONT VIEW

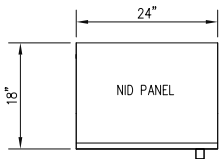
RIGHT SIDE VIEW

- NOTES:
1. SECURE THE CABINETS PER MANUFACTURE'S INSTRUCTIONS
 2. THE POWER PANEL DESIGN WEIGHT = 100 LBS
 3. THE TELCO CABINET DESIGN WEIGHT = 100 LBS

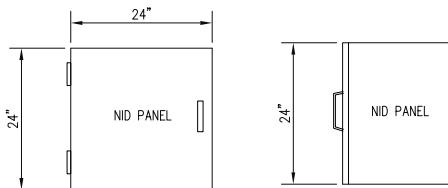
ELTEK POWER AND TELCO CABINET DETAILS

SCALE: 3/4"=1'-0"

2
S-5



TOP PLAN VIEW



FRONT VIEW

RIGHT SIDE VIEW

- NOTES:
1. SECURE THE CABINET PER MANUFACTURE'S INSTRUCTIONS
 2. THE CABINET DESIGN WEIGHT = 125 LBS

NID CABINET DETAILS

SCALE: 3/4"=1'-0"

3
S-5

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ENGINEER: C.S.

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0 1/2 1
GRAPHIC SCALE IN INCHES

TITLE:

**POWER, TELCO,
FIBER AND NID
CABINET DETAILS**

SHEET NUMBER:

S-5

ELECTRICAL NOTES

THE ELECTRICAL CONTRACT FOR CONSTRUCTING THIS PROJECT SHALL INCLUDE PROVISION OF ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL INSTALLATION SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, BUT NOT LIMITED TO, THE FOLLOWING:

1. OBTAIN AND PAY FOR PERMITS ASSOCIATED WITH THE ELECTRICAL PORTION OF THIS CONSTRUCTION.
2. TEST, BALANCE, CLEAN, ADJUST, AND GUARANTEE ALL ELECTRICAL WORK IN THIS CONTRACT TO OPERATE SAFETY, PROPERLY AND CONTINUOUSLY.

GENERAL REQUIREMENTS

PRIOR TO SUBMITTING BID, VISIT THE SITE TO DETERMINE THE EXTENT OF WORK REQUIRED TO COMPLETE THE PROJECT AS SHOWN ON THE PLANS. IDENTIFY POSSIBLE CONFLICTS OBSERVED DURING VISIT AND SUBMIT, IN WRITING PRIOR TO SUBMITTING BID, CONDITIONS WHICH MAY PREVENT CONSTRUCTION OF ELECTRICAL WORK AS SHOWN ON THESE PLANS. NO ADDITIONAL CHARGE WILL BE ALLOWED FOR REMEDIATION OF FIELD CONDITIONS NOT IDENTIFIED THROUGH THIS PROCESS.

REGULATORY REQUIREMENTS

WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (ARTICLE 70 OF THE NFPA), 2014 EDITION

2. QUALITY ASSURANCE

- a. ALL WORK SHALL BE PERFORMED WITH A MINIMUM OF DISTURBANCE TO EXISTING STRUCTURES AND SURROUNDING AREAS. THE DEVICES INSTALLED SHALL BE PLUMB, EDGES PARALLEL TO WALLS, AND HAVING NO SCRATCHES OR DENTS. TAKE ALL MEASURES NECESSARY TO PROTECT NEW EQUIPMENT DURING THE COURSE OF CONSTRUCTION.
- b. MATERIALS SHALL BE NEW AND APPROVED FOR THE INTENDED USE. DEFECTIVE OR DAMAGED MATERIALS SHALL BE REPLACED OR REPAIRED AS ACCEPTABLE TO SPRINT.

3. SUBMITTALS

PROVIDE RED-LINED AS-BUILT DRAWINGS DOCUMENTING EXACT ROUTING OF ALL CONDUITS.

4. WARRANTY

THE ELECTRICAL CONTRACTOR SHALL REMEDY, AT HIS OWN EXPENSE, ANY FAILURE OF THE WORK (INCLUDING EQUIPMENT) FOR A PERIOD OF ONE YEAR, TO CONFORM TO CONTRACT SPECIFICATIONS AND DRAWINGS. THIS SHALL INCLUDE ANY DEFECT OF MATERIAL OR WORKMANSHIP, AND ANY ADJUSTMENTS REQUIRED TO BE MADE FOR PROPER FUNCTIONING OF THE EQUIPMENT AND SYSTEMS.

PRODUCTS

1. RACEWAYS

- a. ALL WIRING SHALL BE INSTALLED IN CONDUIT EXCEPT WHERE NOTED OTHERWISE.
- b. CONDUIT INSTALLED OUTDOORS SHALL BE GALVANIZED RIGID METAL CONDUIT WITH GALVANIZED STEEL COUPLINGS AND CONNECTORS.
- c. CONDUITS INSTALLED INSIDE BUILDING SHALL BE ELECTRICAL METALLIC TUBING WITH STEEL COMPRESSION FITTINGS.
- d. JUNCTION AND PULL BOXES SHALL BE PROVIDED WHERE SHOWN AND WHERE REQUIRED TO FACILITATE THE PULLING AND SUPPORT OF CONDUCTORS AND CABLES.
- RACEWAY INSTALLATION
- e. CONDUITS ENTERING HEATED SPACES FROM OUTDOORS SHALL BE PROVIDED WITH SEALED FITTINGS TO PREVENT CONDENSATION.
- f. USE PIPE STRAPS OR INDIVIDUAL HANGERS FOR SUPPORTING INDIVIDUAL CONDUITS. CHAIN, WIRE, OR PERFORATED STRAP SHALL NOT BE USED TO SUPPORT OR FASTEN CONDUITS.
- g. THE TOTAL DEGREES OF BENDS IN A CONDUIT SHALL NOT EXCEED 360°.
- h. STENCIL "SPRINT" ON CONDUITS EVERY 20' HORIZONTALLY AND WHERE THEY PENETRATE WALLS OR FLOORS.

2. CONDUCTORS

- a. SHALL BE AWG COPPER
- b. SHALL HAVE 600 VOLT THWN INSULATION.

3. PANELBOARD

- a. SHALL BE 240/120V 1 PHASE 3 WIRE 200 AMP

4. KILOWATT HOUR METER SHALL BE SUITABLE FOR 208 VOLT 4 WIRE 200 AMPS AND SHALL BE APPROVED BY BUILDING OWNER.

5. ANTI-OXIDATION COMPOUND

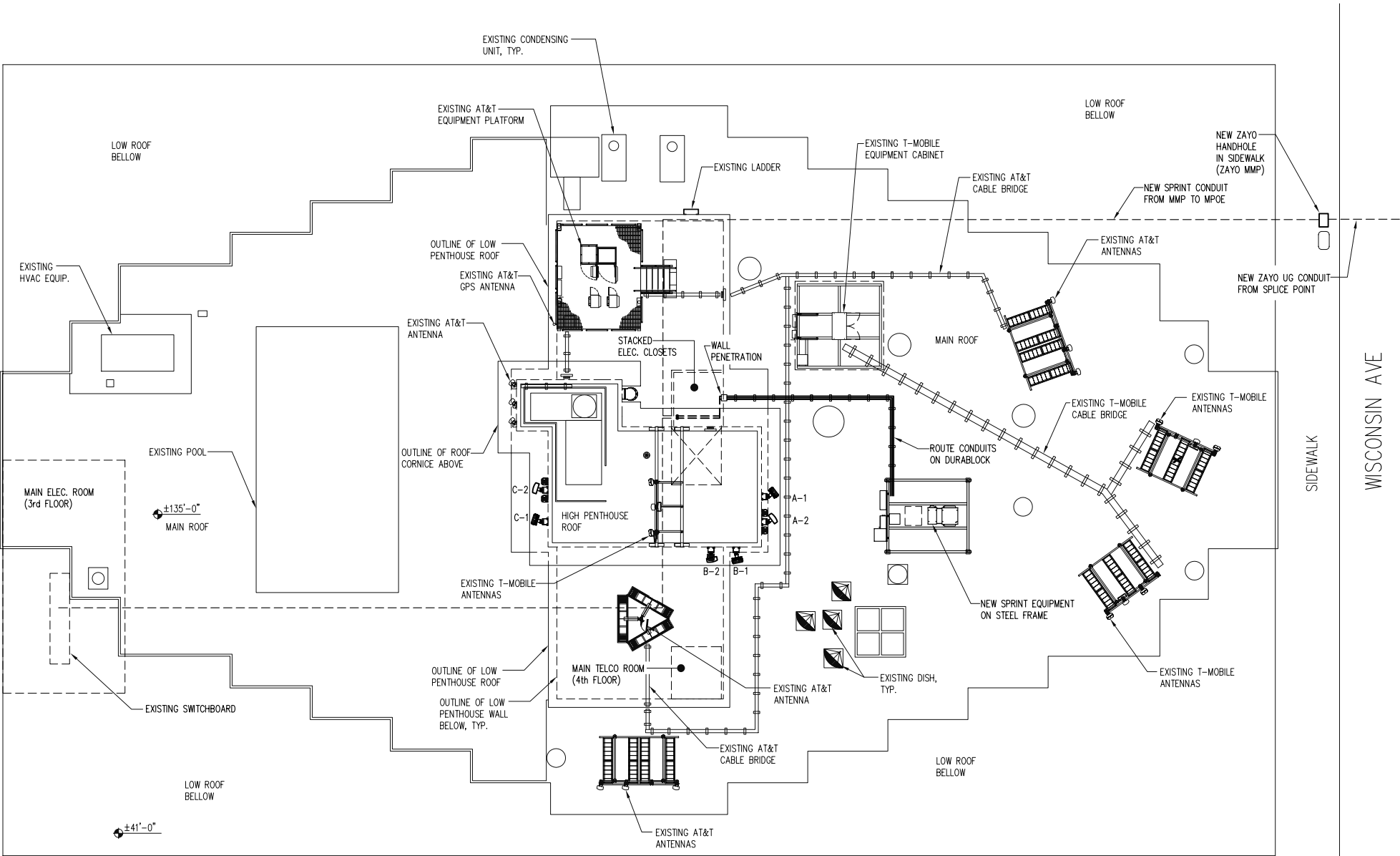
SHALL BE BURNDY "PENETROX-E" OR THOMAS & BETTS KOPR-SHIELD.

6. LABELS

SHALL BE ENGRAVED LAMACOID PLASTIC HAVING 1/2" HIGH LETTERS SECURED WITH STAINLESS STEEL SCREWS

ABBREVIATIONS

A	AMPERE
AIC	ASYMMETRICAL INTERRUPT CURRENT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
EMT	ELECTRICAL METALLIC TUBING
GFI	GROUND FAULT INTERRUPTING
G	GROUND
kVA	KILOVOLT-AMPERE
KW	KILOWATT
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
MCB	MAIN CIRCUIT BREAKER
NEC	NATIONAL ELECTRICAL CODE
NFSS	NON-FUSIBLE SAFETY SWITCH
NTS	NOT TO SCALE
P	POLE
ø	PHASE
RMC	RIGID METAL CONDUIT
S/N	SOLID NEUTRAL
V	VOLT
VA	VOLT-AMPERE
W	WIRE



KEY PLAN - ELECTRICAL

SCALE: 3/32"=1'-0"



EXISTING PARK METAL PROD CO. SWITCHBOARD				480V 3ø 4W
100A SPRINT	30A SUMP PUMP			
60A BOOSTER PUMP	60A PANEL GH			
100A DISCOTECH				
100A PANEL EMSF				
100A FIRE PUMP	100A PANEL G			
100A ELEV 5	100A ELEV 4			
200A PANEL LP-LA (LOBBY)				

NOTE: INSTALL 100A BREAKER IN AVAILABLE SPACE FOR SPRINT AND UPDATE LABEL

SPRINT PTC PANEL BOARD									
VOLTAGE: 120/240 SINGLE PHASE 3 WIRE 200 AMP MAIN CIRCUIT BREAKER									
LOAD DESCRIPTION	AMPS	B K R	C K T	L1	L2	C K T	B K R	AMPS	LOAD DESCRIPTION
BTS. CIRCUIT 1	54	100	1	54		2	60	0	SURGE PROTECTION DEVICE
	54		3		54	4		0	
BTS HEATER	6.6	20	5	8.6		6	15	2	TELCO MODULE FAN
	6.6		7		8.6	8	20	2	FLUORESCENT LIGHTS
			9	2		10	20	2	TELCO GFI RECEPTACLE
			11		-	12	20		SPARE
			13			14			
			15			16			
			17			18			
			19			20			
			21			22			
			23			24			
TOTAL # A			65	57	TOTAL # B		TOTAL KVA: 15		

PANEL PTC CAPACITY: 48 kVA
PANEL PTC CONNECTED LOAD: 15 kVA
15 kVA x 1.25 = 19 kVA
THE CONNECTED LOAD DOES NOT EXCEED THE PANEL'S CAPACITY.



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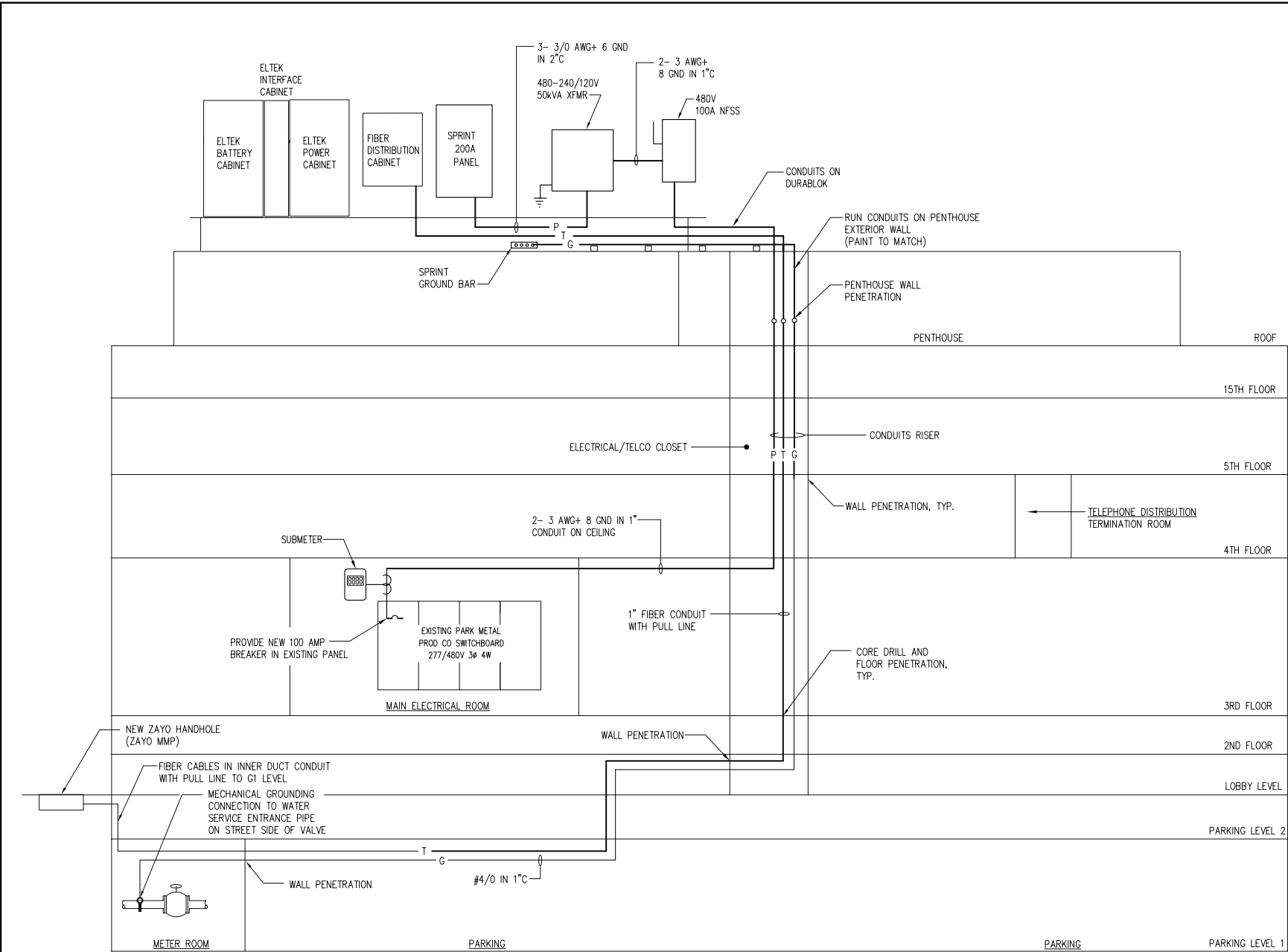
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ENGINEER: C.S.

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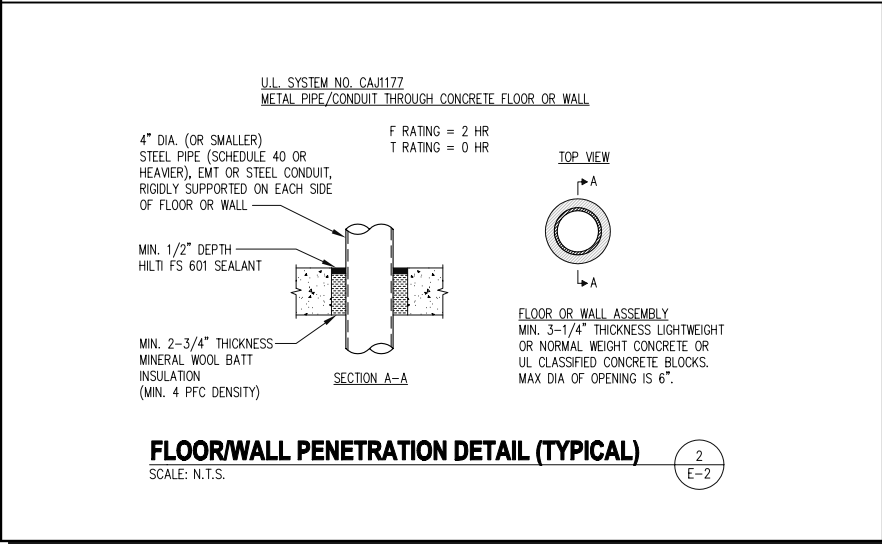
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GRAPHIC SCALE IN INCHES

TITLE:
**ELECTRICAL NOTES,
PLAN AND
PANEL SCHEDULES**

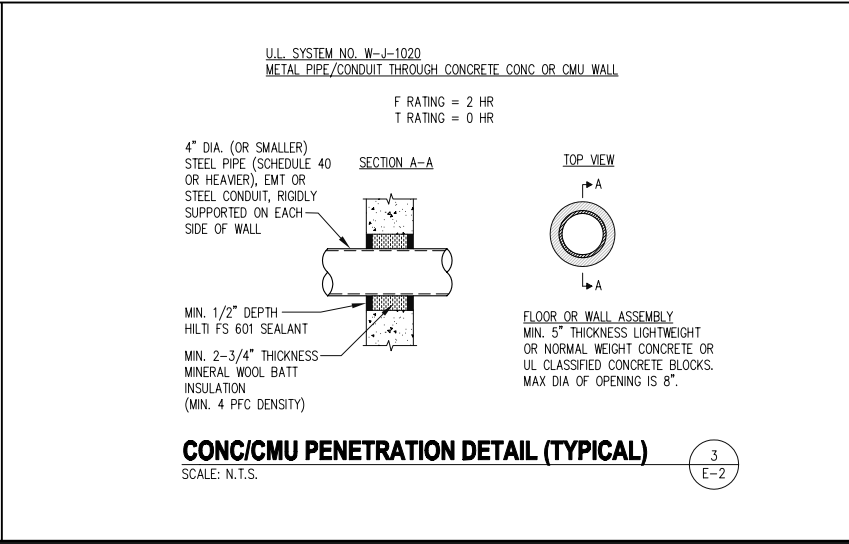
SHEET NUMBER:
E-1



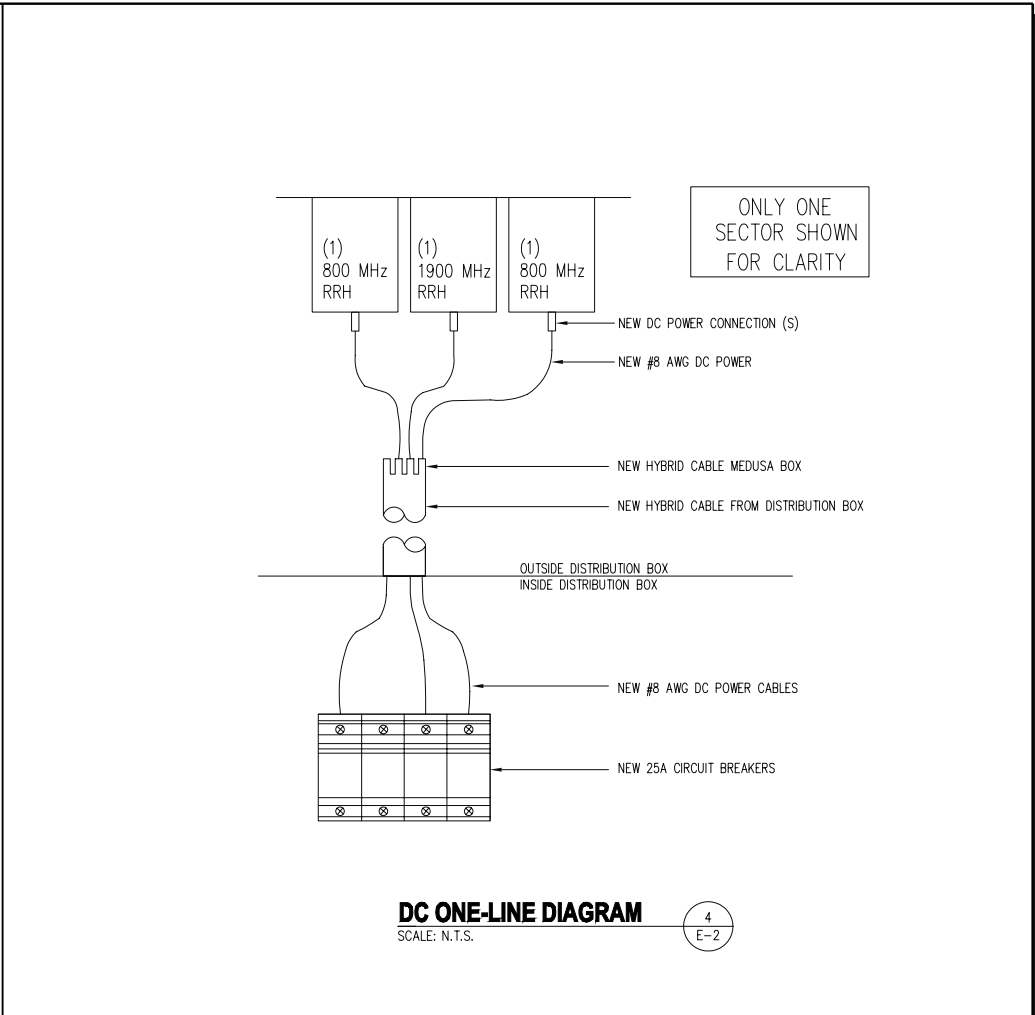
POWER RISER DIAGRAM
SCALE: N.T.S.



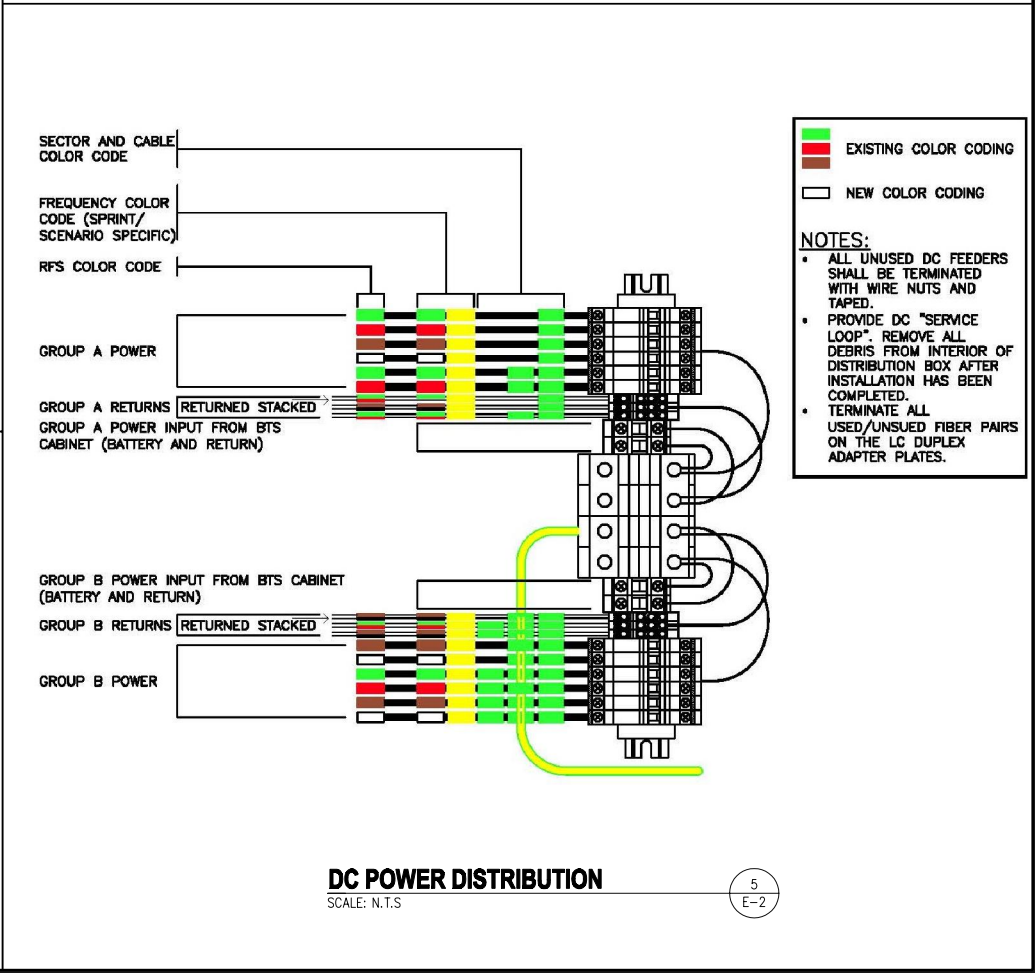
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SCALE: N.T.S.



CONC/CMU PENETRATION DETAIL (TYPICAL)
SCALE: N.T.S.



DC ONE-LINE DIAGRAM
SCALE: N.T.S.



DC POWER DISTRIBUTION
SCALE: N.T.S.

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

entrex
communication services, Inc.
6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961

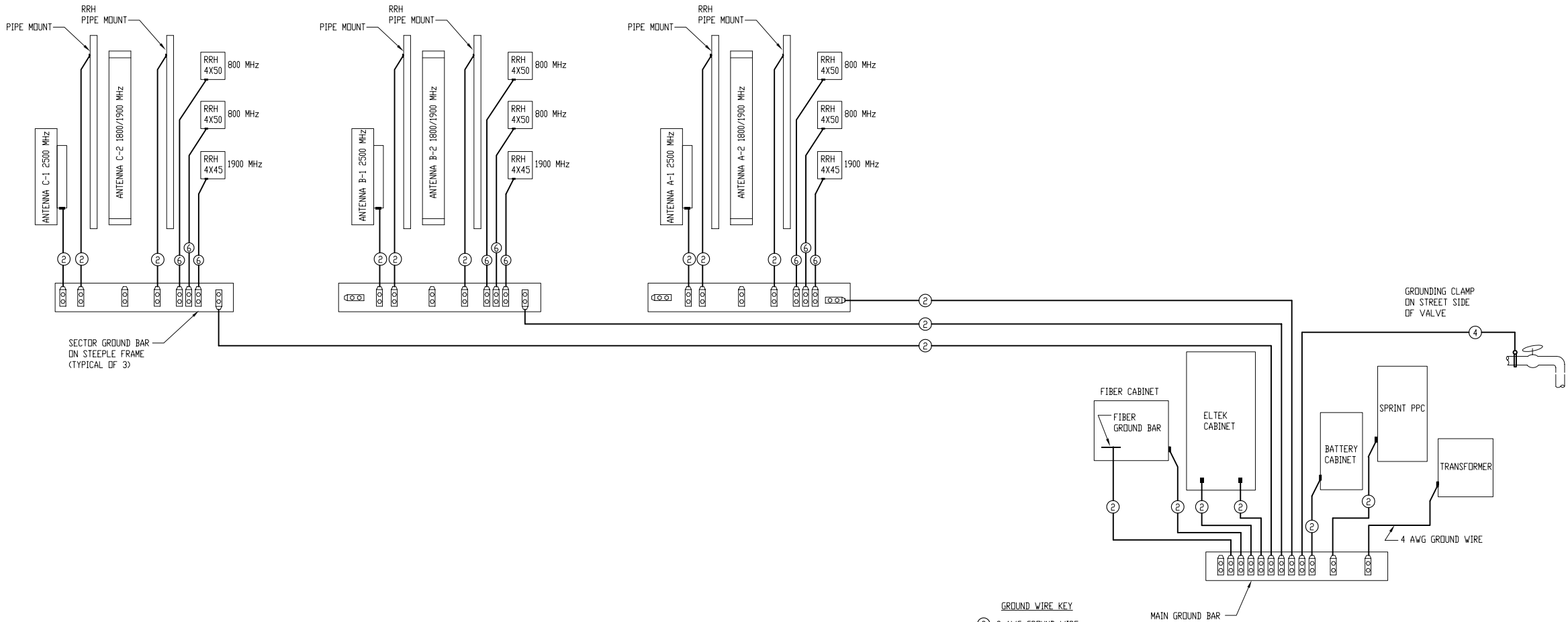
SITE LINK
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

WA90XC134A
BETHESA HILTON
8120 WISCONSIN AVE
BETHESA, MD 20814

SEAL:

SUBMITTALS		
DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A
09-25-18	CONSTRUCTION	0

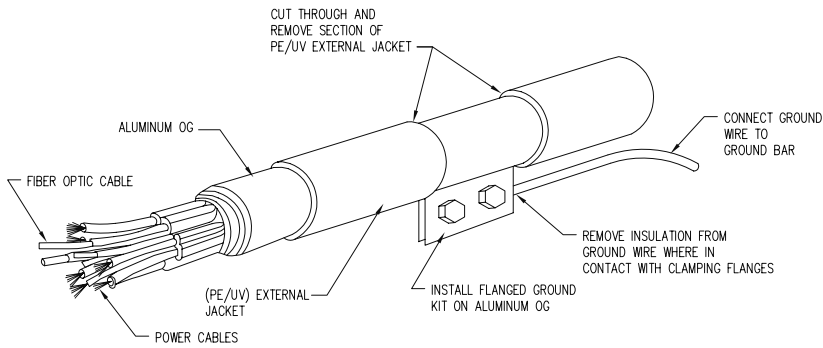
PROJECT NO: 1015.897
DESIGNER: N.B.
ENGINEER: C.S.
THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"
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GRAPHIC SCALE IN INCHES
TITLE:
RISER DIAGRAM AND DETAILS
SHEET NUMBER:
E-2



GROUNDING DIAGRAM
SCALE: N.T.S.

1
E-3

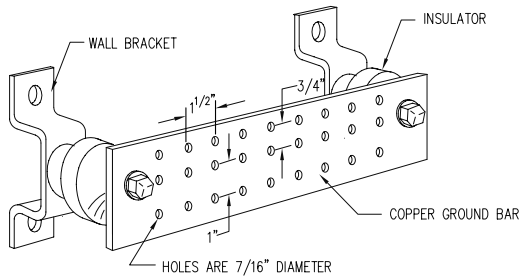
- GROUND WIRE KEY
- ② 2 AWG GROUND WIRE
 - ⑥ 6 AWG GROUND WIRE
 - ④ 4/0 AWG GROUND WIRE



- NOTES:
- CLAMP #6 GROUND WIRE BETWEEN FLANGES AND FORM BOND WITH COMPRESSION HARDWARE PROVIDED WITH KIT.
 - FOLLOWING INSTALLATION OF GROUND KIT, WATERPROOF ASSEMBLY WITH WATERPROOFING KIT AND TAPE.

HYBRIFLEX GROUNDING KIT DETAIL
SCALE: N.T.S.

2
E-3



LEGEND

- COPPER GROUND BAR, MANUFACTURED BY HARGER
- MASTER GROUND BAR AND CABLE ENTRY GROUND BAR SHALL BE CAT. NO. GBI-14420-J
- ANTENNA SECTOR GROUND BARS SHALL BE CAT. NO. GBI-14412-J
GBI INDICATES GROUND BAR INCLUDING WALL MOUNTING BRACKETS AND INSULATORS
14420 INDICATES DIMENSIONS OF 1/4" THICK X 4" HIGH X 20" LONG
14412 INDICATES DIMENSIONS OF 1/4" THICK X 4" HIGH X 12" LONG
J INDICATES FACTORY-DRILLED HOLE PATTERN SHOWN ABOVE

GROUND BAR ISOMETRIC
SCALE: N.T.S.

3
E-3

GROUNDING NOTES

- GROUND WIRES SHALL BE 2 AWG GREEN-INSULATED COPPER UNLESS NOTED OTHERWISE.
- GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURER'S GROUNDING KITS.
- GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDING SCREW SET.) CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, APPLY PROTECTIVE ANTI-OXIDIZATION COMPOUND.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
- PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.) PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
- GROUND KITS ARE PROVIDED WITH GROUND WIRES. IN THE EVENT THAT THE SECTOR GROUND BAR IS LOCATED BEYOND THE GROUND WIRE LENGTH, PROVIDE NEW LENGTH OF GREEN-INSULATED 6 AWG COPPER GROUND WIRE.

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

entrex
communication services, inc.
6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961

SITE LINK
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4949

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BETHSDA HILTON
8120 WISCONSIN AVE
BETHSDA, MD 20814

SEAL:



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 17461, Expire Date: 12/31/2019.

SUBMITTALS

DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A
09-25-18	CONSTRUCTION	0

PROJECT NO: 1015.897
DESIGNER: N.B.
ENGINEER: C.S.

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0 1/2 1
GRAPHIC SCALE IN INCHES

TITLE:
**GROUNDING
DIAGRAM
AND DETAILS**

SHEET NUMBER:
E-3

App No:	2018080452				
Applicant Name	Julie Arnold Erb		Antenna Compliance	Yes	
Application Type	Colocated	Updated	9/13/2018	Compliance Desc	
Carrier	Sprint/Nextel	6409?	No	Antenna Location	Yes
Solution Type	Macro	Ann. Plan?	Yes	Antenna Loc. Desc.	
Existing	New	Equipment Gvt Us	No	Env. Assessment	
Application Description		Gvt. Use Desc.		Routine Env. Evaluation	

Sprint is proposing to install (6) antennas, (6) remote head radios and (3) hybrid cables on the rooftop. The antennas include (3) Nokia 2.5 GMAA-AACH antennas and (3) RFS APXVBBLL15X-43-C-210 and will be mounted on the existing penthouse structure. The remote head radios include (3) RRH 4x45-1900 and (3) RRH 2x50-800 attached to the RFS APXVBB antenna. Sprint will propose (1) steel frame equipment platform measuring 13’ x 11’8” to place (2) cabinets, (1) transformer and (1) fiber distribution box. The Sprint antennas are flush mounted to the penthouse wall and are not the highest structural on the rooftop. The Sprint antennas are less visible than the existing T-Mobile and AT&T antennas that are on Sled mounts. Also, the Sprint steel frame equipment platform is set back on the roof and not visible from the ground.

Site Id	561	Zoning	CR
Structure Type	Building	Latitude	38.99127
Address	8120 Wisconsin Ave, Bethesda	Longitude	-77.09607
County Site Name	Double Tree Hotel	Ground Elevation	348
Carrier Site Name	WA90XCI34A	City	Bethesda
Site Owner	A TBC BETHESDA OWNER LLC	Lease Status	In Process
Structure Owner	A TBC BETHESDA OWNER LLC	PROW	No
Structure Height	162.6		

Justification

The site is the best rooftop to provide coverage to this populated area of Bethesda. The rooftop has existing antenna sites including AT&T and T-Mobile. Evaluated other rooftops in the area but none of the owners were interested in leasing to Sprint.

NearbySites (New Apps Only):

Screeningconsiderations(New Apps Only):

App No:

2018080452

Antenna Model

APXVBBLL15X-43-C-120

Frequency

694-790 790-894 880-960

RAD Center

155

Max ERP

300

Antenna Dimensions

66.7" x 19.6" x 8.5"

Quantity

3

Thursday, September 13, 2018

12:24:26 PM

App No:

2018080452

Antenna Model

Nokia 2.5 GMAA-AACH

Frequency

2500

RAD Center

157

Max ERP

1400

Antenna Dimensions

25.6" x 19.7" x 9.6"

Quantity

3

Thursday, September 13, 2018

12:24:26 PM

1900MHz 4X40W Remote Radio Head (RRH)

Capacity & Features

CDMA / LTE Multi technology RRH 65MHz bandwidth (PCS A-G Band)

- Sprint is free to deploy any combination of CDMA (1XRTT or EVDO) and LTE carriers in Sprint's spectrum up to 160 Watts of RF power.
- E.g. "A block" and "G block" both with 4 branch MIMO (4Tx & 4Rx)

2 CPRI Optical Connections for multi-carrier LTE and CDMA (1X & DO)

Power Supply: -48 VDC

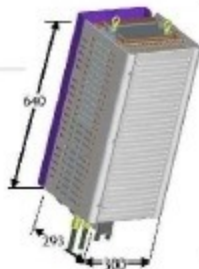
Power Consumption: 700W Typical

Dimensions:

- Size: 282 x 271.5 x 637mm (11.1" x 10.69" x 25.1")
- Volume: 49 Liter
- 56 liters with solar shield & mounting OD

Weight: 27 kg (59.5 lbs)

Operating Temp range -40°C/+55°C



800MHz 2X50W Remote Radio Head (RRH)

Simultaneous CDMA & LTE Multi technology RRH 862-869 MHz

- Any combination of CDMA and LTE carriers supported by 100W RF Power

2 CPRI-like Optical Connections for daisy chaining

Software Switchable External Filter for use before Public Safety is cleared

Dimensions: w/o Filter w/ Filter

- Height: 480 mm (19") 480 mm (19")
- Width: 330 mm (13") 330 mm (13")
- Depth: 218 mm (8.6") 310 (12.2")
- Weight: 24 kg (53 lbs) 29 kg (64 lbs)
- 49 liters, <29kg

Power Supply: -48 VDC

Power Consumption: <400W Typical

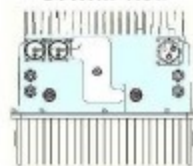
Operating Temp range -40°C to +55°C

Option to mount on Ground at tower base

Front/Top View



Bottom View



Alcatel-Lucent's 65MHz RRH satisfies Sprint's requirements.

Alcatel-Lucent's 800 RRH satisfies Sprint's requirements.



TD LTE 2.5G Massive MIMO Adaptive Antenna (MAA) – AAHC

Description	2.5G MAA – AAHC(64T64R)
Operating band	2496 – 2690 MHz (Band 41)
Number of channels	64
Antenna	Dual polarized 128 antenna elements
Occupied Bandwidth OBW	60MHz (LTE 3X20MHz, HW capable to NR by SW upgrade)
Output Power	1.875W per antenna
Volume (L) (Height x width x depth)	80L (h651mm x w501mm x d245mm)
Weight (kg)	47
Mounting	Wall or Pole
Optical Ports	3x40G QSFP
Max Power Consumption	1400W at 75% Duty Cycle
Operational Temperature	-40°C to 131°F (-40°C to 55°C)
Supply Voltage / Voltage Range	-48V DC voltage (-40.5V~-57V)
Ingress protection class	IP65 (Outdoor rated)





RF X-TREME™ 8-port Antenna, 1.5m, 694-960/694-960/1695-2690/1695-2690MHz, 65deg, 14.7/14.8/19.3/19.1dBi, VET, 2-12°/2-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides an 8-port multi-band flexible platform for advanced use in both low and high bands

- ➔ 4 ports / 2 systems in low band
- ➔ 4 ports / 2 systems in high band
- ➔ Integrated RET platform
- ➔ Slim radome design
- ➔ MIMO 4x4 for LTE 700 & 2600



Technical Features

LOW BAND LEFT ARRAY (694-960 MHZ) [R1]

Frequency Band	MHz	694-790	790-894	880-960
Gain	dBi	13.6	14.6	14.7
Horizontal Beamwidth @3dB	Deg	69.3 +/- 9.5	61.8 +/- 5.3	58.2 +/- 2.9
Vertical Beamwidth @3dB	Deg	16.1 +/- 1.7	14 +/- 1.1	12.7 +/- 0.6
Front-to-Back, at +/-30°, Total Power	dB	17.4	21.6	23
First Upper Side Lobe Suppression	dB	15.4	17.3	16.3
Electrical Downtilt Range	Deg	2 to 12		
3rd Order PIM 2 x 43dBm	dBc	-153		
VSWR	-	1.5		
Return Loss	dB	14		
Cross Polar Isolation	dB	25		
Inter Band Isolation	dB	R1//R2 Typical 26 R1//Y1 Typical 25 R1//Y2 Typical 35		
Maximum Effective Power per Port	Watt	300		

LOW BAND RIGHT ARRAY (694-960 MHZ) [R2]

Frequency Band	MHz	694-790	790-894	880-960
Gain	dBi	13.9	14.7	14.8
Horizontal Beamwidth @3dB	Deg	69.9 +/- 10.2	62.5 +/- 5.7	58.7 +/- 3.1
Vertical Beamwidth @3dB	Deg	16 +/- 1.7	13.9 +/- 1.1	12.7 +/- 0.6
Front-to-Back, at +/-30°, Total Power	dB	17.3	20.9	24.3
First Upper Side Lobe Suppression	dB	17	17.4	16.5
Electrical Downtilt Range	Deg	2 to 12		
3rd Order PIM 2 x 43dBm	dBc	-153		
VSWR	-	1.5		
Return Loss	dB	14		
Cross Polar Isolation	dB	25		
Inter Band Isolation	dB	R2//R1 Typical 26 R2//Y1 Typical 35 R2//Y2 Typical 25		
Maximum Effective Power per Port	Watt	300		



RF X-TREME™ 8-port Antenna, 1.5m, 694-960/694-960/1695-2690/1695-2690MHz, 65deg, 14.7/14.8/19.3/19.1dBi, VET, 2-12°/2-12°/2-12°/2-12°

HIGH BAND LEFT ARRAY (1695-2690 MHZ) [Y1]

Frequency Band	MHz	1695-1880	1850-2010	1900-2170	2300-2500	2500-2690
Gain	dBi	17.9	18.1	18.3	18.6	19.3
Horizontal Beamwidth @3dB	Deg	63.7 +/- 10	58.3 +/- 3	59.7 +/- 4.7	61.2 +/- 3.7	54 +/- 5.6
Vertical Beamwidth @3dB	Deg	6.4 +/- 0.2	6 +/- 0.5	5.7 +/- 0.5	4.9 +/- 0.4	4.5 +/- 0.3
Front-to-Back, at +/-30°, Total Power	dB	24.2	25.2	25.8	24.6	24.5
First Upper Side Lobe Suppression	dB	15.9	15.1	13.9	14.8	11.5
Electrical Downtilt Range	Deg	2 to 12				
3rd Order PIM 2 x 43dBm	dBc	-153				
VSWR	-	1.5				
Return Loss	dB	14				
Cross Polar Isolation	dB	25				
Inter Band Isolation	dB	Y1//R1 Typical 25 Y1//R2 Typical 35 Y1//Y2 Typical 33				
Maximum Effective Power per Port	Watt	300				

HIGH BAND RIGHT ARRAY (1695-2690 MHZ) [Y2]

Frequency Band	MHz	1695-1880	1850-2010	1900-2170	2300-2500	2500-2690
Gain	dBi	17.7	17.8	18.2	18.3	19.1
Horizontal Beamwidth @3dB	Deg	63.9 +/- 8.5	59.2 +/- 3.2	59.9 +/- 4.5	60 +/- 4.2	53.4 +/- 4.1
Vertical Beamwidth @3dB	Deg	6.4 +/- 0.3	6 +/- 0.5	5.7 +/- 0.5	4.8 +/- 0.4	4.4 +/- 0.3
Front-to-Back, at +/-30°, Total Power	dB	23.4	24.3	26.1	25.7	25.6
First Upper Side Lobe Suppression	dB	15.3	14.8	13.7	16.1	15.6
Electrical Downtilt Range	Deg	2 to 12				
3rd Order PIM 2 x 43dBm	dBc	-153				
VSWR	-	1.5				
Return Loss	dB	14				
Cross Polar Isolation	dB	25				
Inter Band Isolation	dB	Y2//R1 Typical 35 Y2//R2 Typical 25 Y2//Y1 Typical 33				
Maximum Effective Power per Port	Watt	300				



RF X-TREME™ 8-port Antenna, 1.5m, 694-960/694-960/1695-2690/1695-2690MHz, 65deg, 14.7/14.8/19.3/19.1dBi, VET, 2-12°/2-12°/2-12°/2-12°

ELECTRICAL SPECIFICATIONS

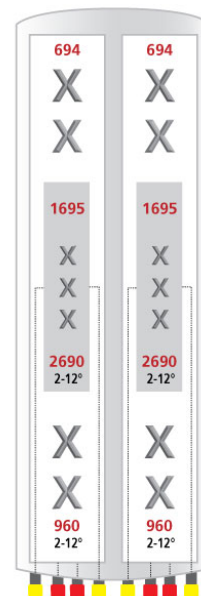
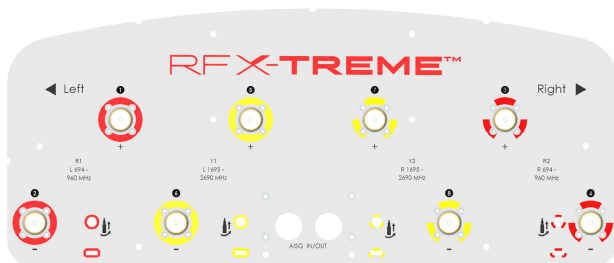
Impedance	Ohm	50.0
Polarization	Deg	±45°

MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	1694 x 499 x 215 (66.7 x 19.6 x 8.5)
Weight (Antenna Only)	kg (lb)	34 (75)
Weight (Mounting Hardware only)	kg (lb)	3.4 (7.5)
Packing size- HxWxD	mm (in)	1830 x 560 x 411 (72 x 22 x 16.2)
Shipping Weight	kg (lb)	43.4 (95.7)
Connector type		8 x 4.3-10 female at bottom + 2 AISG connectors (1 male, 1 female)
Adjustment mechanism		M RET solution AISG 2.0
Mounting Hardware Material		Diecast Aluminium and Galvanized steel
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		IEC 61000-4-5
Survival/Rated Wind Velocity	km/h	240 (150)
Wind Load @Rated Wind Front	N	564.0
Wind Load @Rated Wind Side	N	275.0
Wind Load @Rated Wind Rear	N	723.0
Environmental		ETSI 300-019-2-4 Class 4.1E



Antenna Array



RF X-TREME™ 8-port Antenna, 1.5m, 694-960/694-960/1695-2690/1695-2690MHz, 65deg, 14.7/14.8/19.3/19.1dBi, VET, 2-12°/2-12°/2-12°/2-12°

ORDERING INFORMATION

Order No.	Configuration	Mounting Hardware	Mounting pipe Diameter	Weight
APXVBBLL15X_43-C	Manual tilt control	APM40-2 Beam tilt kit	60-120mm	35.7 Kg
APXVBBLL15X_43-C-I20	Internal RET included	APM40-2 Beam tilt kit	60-120mm	37.4 kg

External Document Links

APM40_Series_Installation_Instructions
Manual_Overdrive_Instructions
Global RFS Website

Notes

NOTE1: All electrical parameters are compliant with BASTA NGMN 9.6 requirements.
NOTE2: RET upgrade is not available for APXVBBLL15X_43-C. Please order the APXVBBLL15X_43-C-I20.

Available Configurations

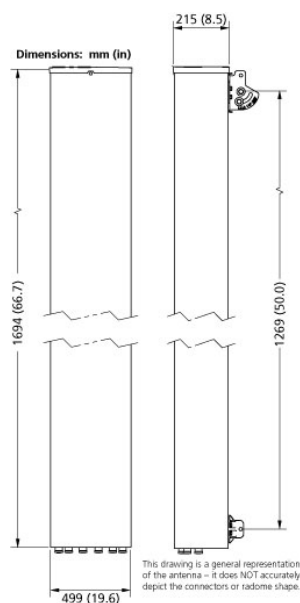
- ➡ APXVBBLL15X_43-C - No RET included - weight 35.7 Kg
- ➡ APXVBBLL15X_43-C-I20 - M RET included - weight 37.4 Kg

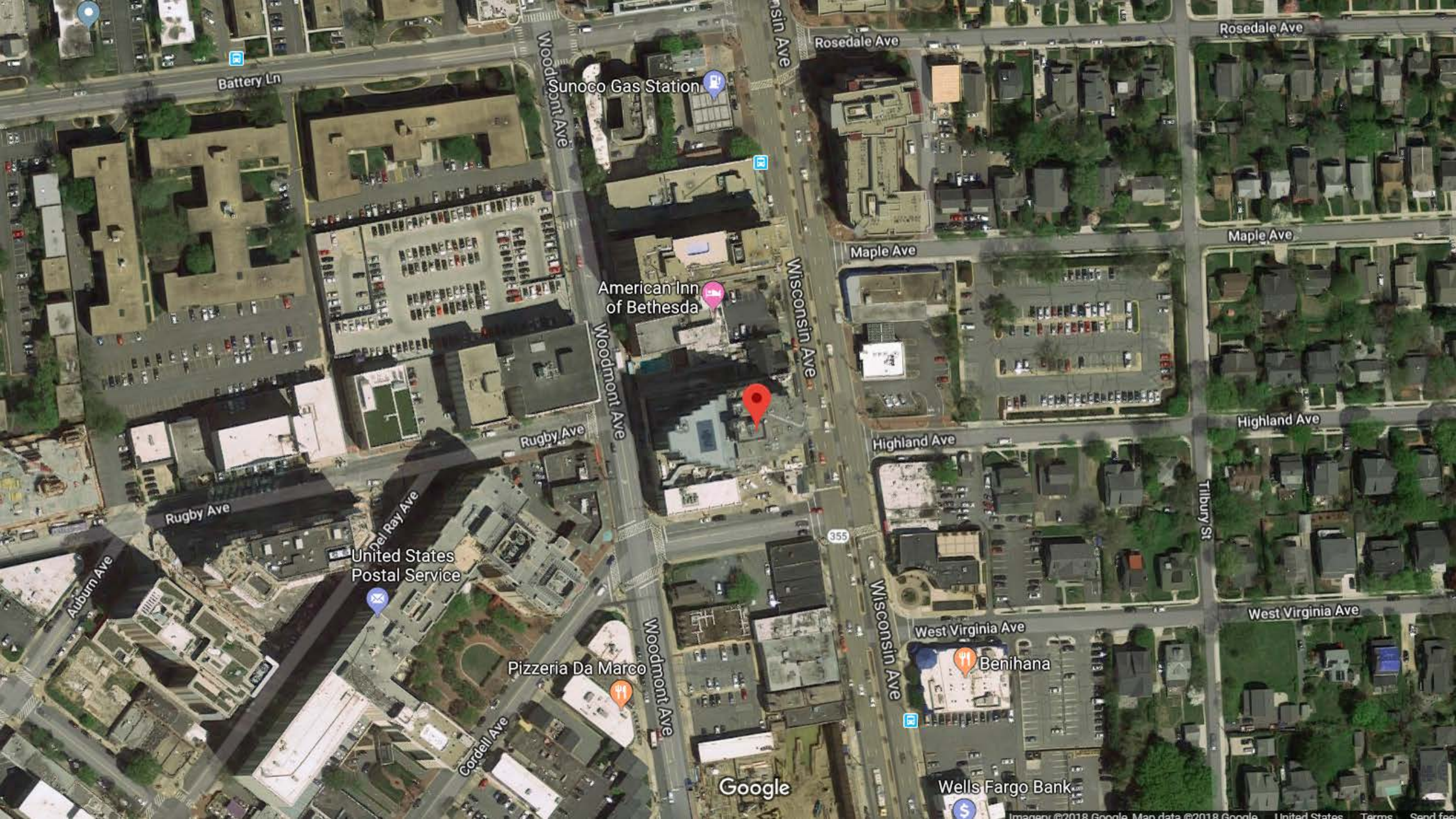
For additional mounting information please click "External Document Links".

*This data is provisional and subject to changes

External Link Reference

Global RFS Website <http://www.rfsworld.com>





Battery Ln

Woodmont Ave

Sunoco Gas Station

Rosedale Ave

Rosedale Ave

Wisconsin Ave

Maple Ave

Maple Ave

Woodmont Ave

American Inn of Bethesda

Rugby Ave

Highland Ave

Highland Ave

Rugby Ave

United States Postal Service

355

Wisconsin Ave

Tibury St

West Virginia Ave

West Virginia Ave

Benihana

Pizzeria Da Marco

Woodmont Ave

Google

Wells Fargo Bank

Entrex Project Number:	1015.897	Calculated By:	RMC	Page:	1 of 37
Client:	Sprint			Date:	7/9/2018
Site Name:	Bethesda Hilton			Date:	
Site Number:	WA90XC134A			Date:	

STRUCTURAL NARRATIVE & CALCULATIONS

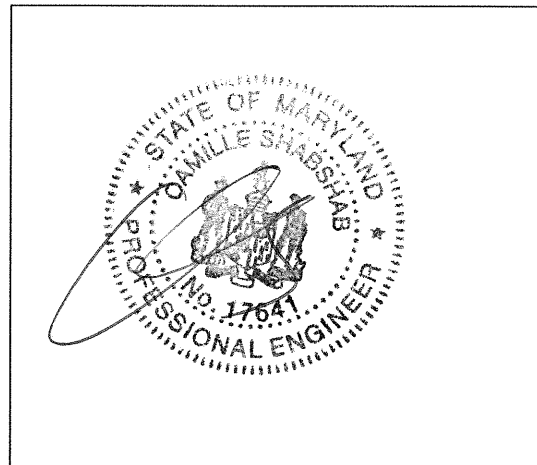
BETHESDA HILTON

WA90XC134A

8120 WISCONSIN AVENUE

BETHESDA, MARYLAND 20814

Engineer: R Crumrine
Checked By: C Shabshab



Engineer's Seal & Signature

PREPARED BY:
ENTREX COMMUNICATION SERVICES, INC.
6600 ROCKLEDGE DRIVE, SUITE 550
BETHESDA, MARYLAND 20817
TEL: (202) 408-0960



Entrex Project Number:	1015.897	Calculated By:	RMC	Page:	2
Client:	Sprint			Date:	7/9/2018
Site Name:				Date:	
Site Number:	WA90XC134A			Date:	

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4.0 Conclusion	4
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b. Design Antenna Mount	12
6.0 Attachments	
a. Equipment Support Beams Calculation	15

0	Original Report	RMC	CS	CS	7/3/2018
No.	Reason for Revision	Engr	Checked	Approved	Date
Records of Revision Block					

Entrex Project Number:	1015.897	Calculated By:	RMC	Page:	3
Client:	Sprint			Date:	7/9/2018
Site Name:				Date:	
Site Number:	WA90XC134A			Date:	

1.0 Introduction

This calculation was prepared to design a Sprint equipment platform with cabinets located on the roof and to design new antenna mounts located on the penthouse wall at 8120 Wisconsin Avenue, Bethesda, Maryland 20814.

2.0 Criteria

The existing structure was analyzed and the new support frame was designed in accordance of the codes and standards listed below:

- | | |
|----------------|--|
| a. 2015 IBC | 2015 International Building Code, International Code Council |
| b. ASCE 7-10 | Minimum Design Loads for Building and Other Structure |
| c. AISC 360-10 | Specification for Structural Steel Building Allowable Stress Design 14th Edition, AISC |
| d. ACI 318-14 | Building Code Requirement for Structural Concrete |

3.0 Assumptions

- This analysis assumes that the original building structure members were properly designed and installed in accordance with the original drawings.
- This analysis assumes that the as-built members are load-rated designed and constructed in accordance with accepted industry-wide standards.
- This analysis assumes that the as-built conditions are structurally sound and properly maintained in accordance with the referenced standard and manufacturer's requirements.
- Structural member sizes, building geometry, connection designs or steel/concrete/masonry material yield strengths, contrary to those assumed for the purpose of preparing this report could alter the findings and conclusions as stated.
- The investigation of the structure or design of the structure analysis uses STAAD Pro finite element structural analysis computer program. In this analysis a finite element mathematical model of the structure was prepared based upon the exact structure geometry. The overall finite element model was loaded with live, dead & wind loading and weight associated with the structure itself.
- For any structural components that were found to be rated up to 105% of its design capacity may be deemed acceptable. Overstressed percentages of 5% or less are considered to be within the accuracy limits of the calculations and are not consider to be critical.

**Entrex Project Number:**

1015.897

Calculated By:

RMC

Page:

4

Client:

Sprint

Date:

7/9/2018

Site Name:**Date:****Site Number:**

WA90XC134A

Date:

4.0 Conclusions

Proposed Equipment Platform:

The proposed equipment platform with four cabinets (3 proposed and 1 future) was designed in accordance with the IBC 2015. The proposed platform steel members were found to be structurally adequate and the platform loads are transferred to the existing concrete columns.

Proposed Antenna Mount:

The proposed antenna pipe and the proposed connections were found to be structurally adequate.



Entrex Project Number:	1015.897	Calculated By:	RMC	Page:	5
Client:	Sprint			Date:	7/9/2018
Site Name:				Date:	
Site Number:	WA90XC134A			Date:	
Engineering Objective:	Design proposed equipment platform				

5.0 Structural Calculations

a. Design Proposed Equipment Platform

Problem Statement: Sprint proposes to install four cabinets (3 proposed and 1 future) on an elevated platform beams located on the roof. The purpose of this calculation is to design the proposed equipment platform beams.

Design Code: The structural analysis is in accordance with the requirements of the International Building Code 2015 (IBC 2015).

IBC 2015 Design Code Per Chapter 16 - Structural Design

Risk Category = II
 Wind Exposure Category = B
 V_{ult} = 115 mph (3-sec gust Ultimate Design Wind Speed - See Figure 1609B)

Structural Loads:

Equipment Platform Dead Loads

Proposed Grating DL Parameters

Grating Area = 143.6 sf
 Grating DL = 10 psf
 Total Grating DL = 1436 lbs (total)

Equipment Platform Live Loads

Eltek "E" Cabinet Parameters

Number of Cabinets 2 (1 Proposed & 1 Future)
 Cabinet Width = 2.50 ft
 Cabinet Depth = 3.17 ft
 Cabinet Height = 6.03 ft
 Cabinet Weight = 1400 lbs each cabinet
 Total Cabinet Wt, LL = 2800 lbs (total)

Eltek "I" Cabinet Parameters

Number of Cabinets 1
 Cabinet Width = 1.01 ft
 Cabinet Depth = 2.34 ft
 Cabinet Height = 6.03 ft
 Cabinet Weight = 250 lbs each cabinet
 Total Cabinet Wt, LL = 250 lbs (total)

Eltek "B" Cabinet Parameters

Number of Cabinets 1
 Cabinet Width = 1.37 ft
 Cabinet Depth = 2.89 ft
 Cabinet Height = 6.03 ft
 Cabinet Weight = 1400 lbs each cabinet
 Total Cabinet Wt, LL = 1400 lbs (total)

Telco Cabinet Parameters

Number of Cabinets 1
 Cabinet Width = 2.00 ft
 Cabinet Depth = 2.00 ft
 Cabinet Height = 3.00 ft
 Cabinet Weight = 100 lbs each cabinet
 Total Cabinet Wt, LL = 100 lbs (total)



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Engineering Objective:	Design proposed equipment platform				

Eltek Power Cabinet Parameters

Number of Cabinets	1	
Cabinet Width =	0.92	ft
Cabinet Depth =	2.00	ft
Cabinet Height =	3.00	ft
Cabinet Weight =	100	lbs each cabinet
Total Cabinet Wt, LL=	100	lbs (total)

Fiber Cabinet Parameters

Number of Cabinets	1	
Cabinet Width =	0.98	ft
Cabinet Depth =	2.63	ft
Cabinet Height =	3.28	ft
Cabinet Weight =	150	lbs each cabinet
Total Cabinet Wt, LL=	150	lbs (total)

Proposed Grating LL Parameters

Grating Area =	143.6	sf
Grating LL =	60	psf
Total Grating LL=	8613	lbs (total)

(Additional Services Live Load in excess of Service Equipment Live Load)
--

Equipment Platform LL =	13413	lbs
-------------------------	-------	-----

Wind Load

Compute wind load per ASCE 7-10 (Section 29 Wind Loads on Other Structures)

Bldg Elev. Roof =	135.33	ft
Top of Cabinet Elev. =	143.37	ft

ASCE7-10 (29.3 Velocity Pressure)

$$\text{Velocity Pressure} = qz = (0.00256) (Kz) (Kzt) (Kd) (V)^2 \quad \text{Eq 29.3-1}$$

Kz =	1.10	Table 29.3-1 Exposure B
Kzt =	1.00	Section 26.8.2
Kd =	0.85	Table 26.6-1
V =	115	mph 3 second gust (Category II)

$$qz = 31.52 \quad \text{psf}$$

ASCE7-10 (29.5)

$$F = qz G Cf Af \quad \text{Eq. 29.5-1}$$

qz =	31.52	psf
G =	0.85	Section 26.9



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Engineering Objective:	Design proposed equipment platform				

Wind Load Calculations (Long Side)

Eltek "B" Cabinet Parameters (Future)

Number of Cabinet =	1	
Wind Area =	15.06	sf
Ca =	1.30	
Wind Horiz. Load =	525	lbs (each)
Total Wind Horiz. Load =	525	lbs

Eltek "E, I & B" Cabinet Parameters

Number of Cabinet =	1	(Combined as one unit)
Wind Area =	29.37	sf
Ca =	1.30	
Wind Horiz. Load =	1023	lbs (each)
Total Wind Horiz. Load =	1023	lbs

Telco / Power Cabinet Parameters

Number of Cabinet =	1	(Combined as one unit)
Wind Area =	6.00	sf
Ca =	1.30	
Wind Horiz. Load =	209	lbs (each)
Total Wind Horiz. Load =	209	lbs

Utility Pipe Parameters

Number of Pipes =	2	
Wind Area =	1.39	sf
Ca =	1.20	
Wind Horiz. Load =	45	lbs (each)
Total Wind Horiz. Load =	89	lbs

Fiber Cabinet Parameters

Number of Cabinet =	1	
Wind Area =	3.23	sf
Ca =	1.30	
Wind Horiz. Load =	113	lbs (each)
Total Wind Horiz. Load =	113	lbs

Total Wind Load (Long Side) =	1958	lbs
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Engineering Objective:	Design proposed equipment platform				

Wind Load Calculations (Short Side)

Eltek "E, I & B" Cabinet Parameters (Including Future)

Number of Cabinet =	1	(Combined as one unit)
Wind Area =	19.08	sf
Ca =	1.30	
Wind Horiz. Load =	665	lbs (each)
Total Wind Horiz. Load =	665	lbs

Telco / Power Cabinet Parameters

Number of Cabinet =	1	(Combined as one unit)
Wind Area =	12.00	sf
Ca =	1.30	
Wind Horiz. Load =	418	lbs (each)
Total Wind Horiz. Load =	418	lbs

Utility Pipe Parameters

Number of Pipes =	2	
Wind Area =	1.39	sf
Ca =	1.20	
Wind Horiz. Load =	45	lbs (each)
Total Wind Horiz. Load =	89	lbs

Fiber Cabinet Parameters

Number of Cabinet =	1	(Combined as one unit)
Wind Area =	8.61	sf
Ca =	1.30	
Wind Horiz. Load =	300	lbs (each)
Total Wind Horiz. Load =	300	lbs

Total Wind Load (Short Side) =	1472	lbs
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Engineering Objective:	Design proposed equipment platform				

STAAD Analysis:

See attached STAAD output sheets for engineering calculations for results.
The structural load combination using allowable stress design shall be as follows in accordance with the IBC 2015.

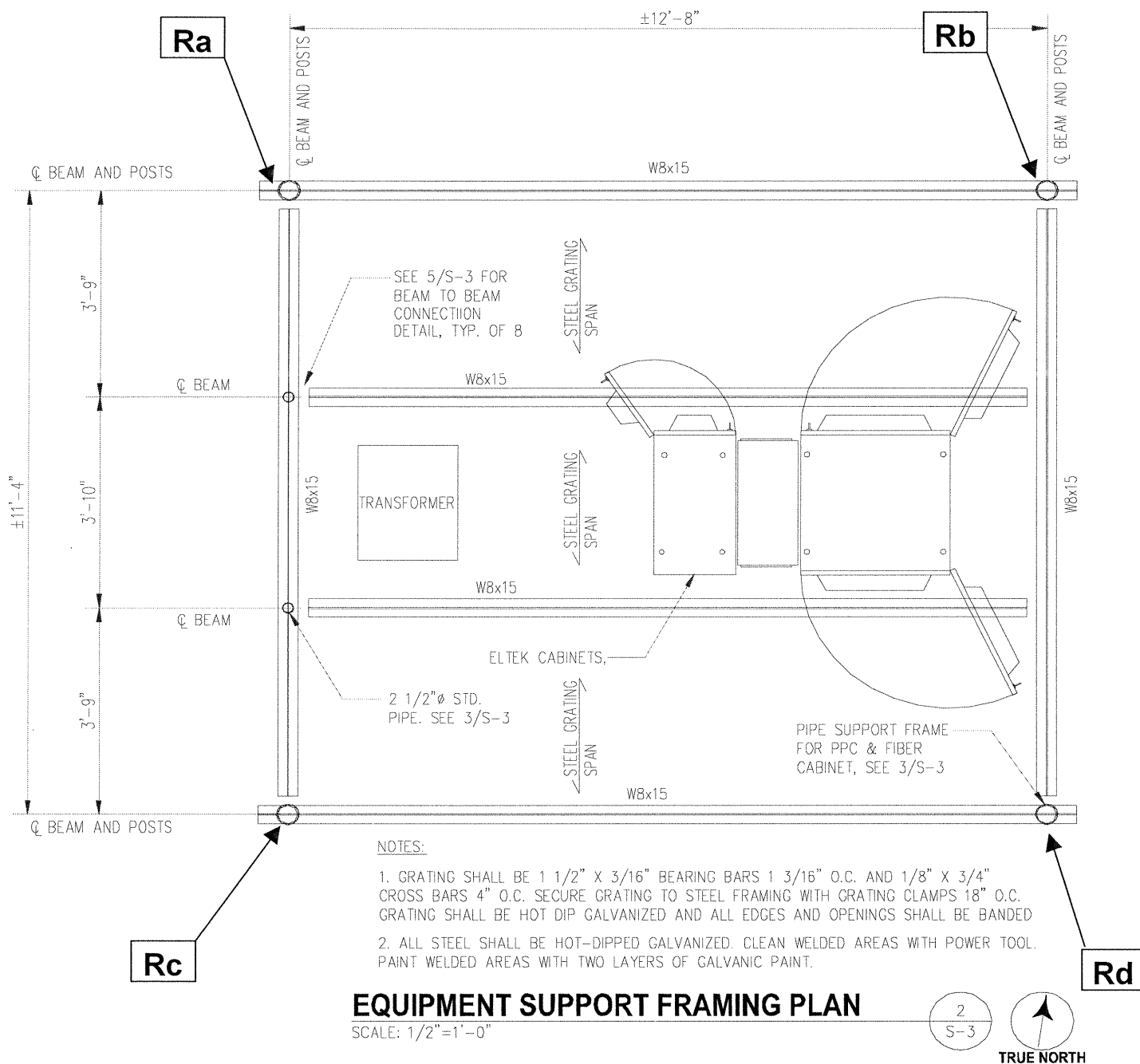
Allowable Stress Design

D
D + L
D + 0.75 L + 0.75 S
D + 0.6 W
D + (Lr or S)
D + 0.75 (0.6 W) + 0.75 L + 0.75 S
0.6 D + 0.6 W

Note: Structural steel W shapes shall conform to ASTM A992 with minimum yield strength of 50,000 psi.
Structural steel pipes shall conform to ASTM A53 Grade B with minimum yield strength of 35,000 psi.
Structural steel plates and all other steel members shall conform to ASTM A36 with minimum yield strength of 36,000 psi.

Note: STAAD calculates beam self weight.

Load Case	Loading Description
1	Self Weight of Beams + Grating DL + Equipment DL
2	Live Load & Equipment Weight
3	Wind Load
4	Wind Load
5	Wind Load
6	Wind Load
7	Load Case Combination DL + LL (Load Case 1 + 2)
8	Load Case Combination DL + (0.6) WL (Load Case 1 + 3)
9	Load Case Combination DL + (0.6) WL (Load Case 1 + 4)
10	Load Case Combination DL + (0.6) WL (Load Case 1 + 5)
11	Load Case Combination DL + (0.6) WL (Load Case 1 + 6)
12	Load Case Combination DL + 0.75 (0.6) WL + 0.75 LL (Load Case 1 + 2 + 3)
13	Load Case Combination DL + 0.75 (0.6) WL + 0.75 LL (Load Case 1 + 2 + 4)
14	Load Case Combination DL + 0.75 (0.6) WL + 0.75 LL (Load Case 1 + 2 + 5)
15	Load Case Combination DL + 0.75 (0.6) WL + 0.75 LL (Load Case 1 + 2 + 6)
16	Load Case Combination 0.6 DL + (0.6) WL (Load Case 1 + 3)
17	Load Case Combination 0.6 DL + (0.6) WL (Load Case 1 + 4)
18	Load Case Combination 0.6 DL + (0.6) WL (Load Case 1 + 5)
19	Load Case Combination 0.6 DL + (0.6) WL (Load Case 1 + 6)





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Engineering Objective:	Design proposed equipment platform				

STAAD Analysis Support Reactions Results Maximum Load As Follows:

Load Case	Equipment Platform Post			
	Ra (kips)	Rb (kips)	Rc (kips)	Rd (kips)
1 GRATING DL + SELF WEIGHT	0.70	0.65	0.70	0.65
2 CABINET & PLATFORM LL	3.37	3.31	3.42	3.31
3 WIND LOAD	0.30	0.22	-0.30	-0.22
4 WIND LOAD	-0.30	-0.22	0.30	0.22
5 WIND LOAD	0.14	-0.14	0.13	-0.13
6 WIND LOAD	-0.14	0.14	-0.13	0.13
7 DL + LL	4.07	3.96	4.12	3.96
8 DL + 0.6 W	0.88	0.78	0.52	0.52
9 DL + 0.6 W	0.52	0.52	0.88	0.78
10 DL + 0.6 W	0.78	0.57	0.78	0.57
11 DL + 0.6 W	0.61	0.73	0.62	0.73
12 DL + 0.75 LL + 0.75+ 0.45 W	3.36	3.23	3.13	3.03
13 DL + 0.75 LL + 0.75+ 0.45 W	3.09	3.03	3.40	3.23
14 DL + 0.75 LL + 0.75+ 0.45 W	3.29	3.07	3.32	3.07
15 DL + 0.75 LL + 0.75+ 0.45 W	3.16	3.20	3.21	3.19
16 0.6 DL + 0.6 W	0.60	0.52	0.24	0.26
17 0.6 DL + 0.6 W	0.24	0.26	0.60	0.52
18 0.6 DL + 0.6 W	0.50	0.31	0.50	0.31
19 0.6 DL + 0.6 W	0.34	0.47	0.34	0.47

Platform Post Base Reactions

Maximum Comp = 4.12 kips
Maximum Uplift = N/A kips
Maximum Shear = 1.11 kips

Maximum Moment. M = 6.9 kips-in (Rb Load Case 15 only)
Axial = 3.20 kips (Rb Load Case 15 only)
Shear = 1.10 kips (Rb Load Case 15 only)

Conclusion:

The proposed platform beams are adequate and the platform loads will be transferred to the existing concrete columns.



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Engineering Objective:	Design Antenna Mount				

5.0 Structural Calculations

b. Design Antenna Mount

Problem Statement: Sprint proposes to install a new antenna on a proposed mount attached to the building penthouse wall. The purpose of this calculation is to investigate the pipe and check the connections to the penthouse wall.

Design Code: The structural system analysis is in accordance with the requirements of the International Building Code 2012 (IBC 2012).

IBC 2012 Design Code Per Chapter 16 - Structural Design
 Risk Category = II
 Wind Exposure Category = B
 $V_{ult} = 115$ mph (3-sec gust Ultimate Design Wind Speed - See Figure 1609B)

Wind Load Calc: Compute wind load per ASCE 7-10 (Section 29 Wind Loads on Other Structures)

Antenna Centerline Elev. = 157.3 ft Nokia 2.5 GMAA-AAHC(64T64R)
 Antenna Centerline Elev. = 155.6 ft APXVBBLL15X-43-C-I20

ASCE7-10 (29.3 Velocity Pressure)

Velocity Pressure = $q_z = (0.00256) (K_z) (K_{zt}) (K_d) (V)^2$ Eq 29.3-1

$K_z = 1.12$ Table 29.3-1 Exposure B

$K_{zt} = 1.00$ Section 26.8.2

$K_d = 0.85$ Table 26.6-1

$V = 115$ mph 3 second gust (Category II)

$q_z = 32.37$ psf

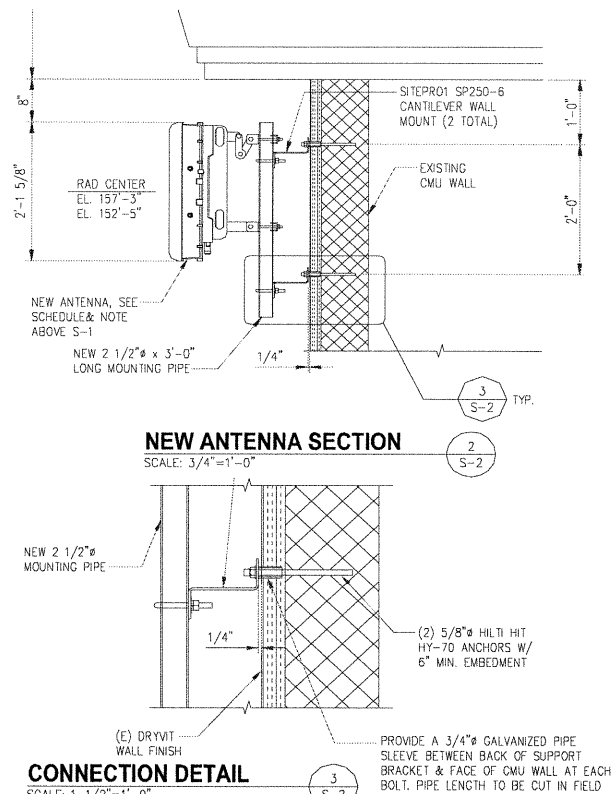
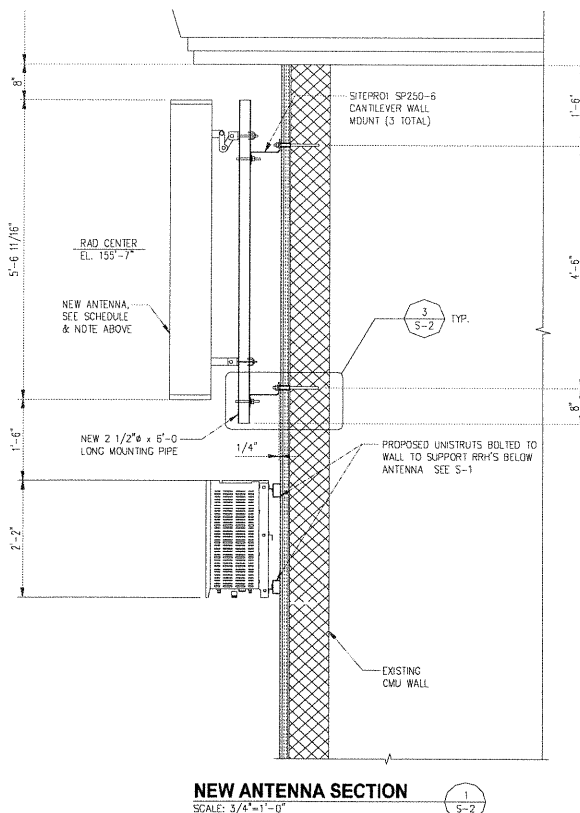
ASCE7-10 (29.5)

Design Wind Loads On Open Building & Other Structures

$F = q_z G C_f A_f$ Eq. 29.5-1

$q_z = 32.37$ psf

$G = 0.85$ Section 26.9

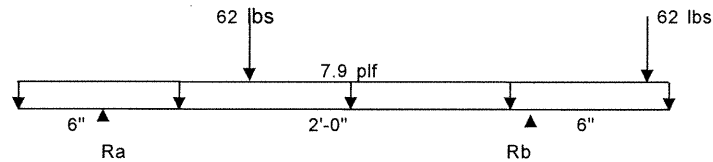


Proposed Loads (Nokia 2.5 GMAA-AAHC(64T64R):

WIND LOAD ON ANTENNAS & ANCILLARY ITEMS ; $F = qz Gh Cf A$

ANTENNA/ANCILLARY DESCRIPTION	ELEV (FT)	qzGh	Cf	WIND AREA (sf)	F (lbs)	wt (lbs)	MOMENT ARM (FT)	OTM (LBS-FT)	COAX SIZE
Nokia 2.5 GMAA-AAHC(64T64R)	155.6	27.51	1.30	3.45	123	104	-	-	-
2.5" Std Pipe x 3 ft long	155.6	27.51	1.20	0.72	24	-	-	-	-

Design Proposed Pipe



$$\begin{aligned}
 R_a &= 35 \text{ lbs} \\
 R_b &= 113 \text{ lbs} \\
 M_{\max} &= 32 \text{ lbs-ft}
 \end{aligned}$$

$$\begin{aligned}
 0.6 R_a &= 21 \text{ lbs (Allowable)} \\
 0.6 R_b &= 68 \text{ lbs (Allowable)} \\
 0.6 M_{\max} &= 19 \text{ lbs-ft (Allowable)}
 \end{aligned}$$

Pipe Parameters	Allowable Stress	Actual Stress
O.D Pipe = 2.875 in	$\sigma_{\text{all}} = F_y / \Omega$	$\sigma_{\text{act}} = M / S$
Design Wall Thk = 0.189 in	$\Omega = 1.67$	$\sigma_{\text{act}} = 0.2 \text{ ksi}$
A = 1.595 in ²	$\sigma_{\text{all}} = 21.0$	
S = 1.005 in ³		
I = 1.445 in ⁴		
Fy = 35 ksi		
0.6 Max OTM = 19 lbs ft (Allowable)	The 2.5" Std pipe is adequate for the applied load.	

Bolt Parameters	Computed Bolt Load
Type = Hilti HY-70	Computed Shear = 0.07 kips
Size = 5/8 in	Computed Tension = 0.07 kips
Total Bolts = 4 bolts	
Embedment = 6 in	
Bolt Shear = 1405 lbs/bolt (Allowable)	
Bolt Tension = 1025 lbs/bolt (Allowable)	
Bolt Capacity = 5.62 kips (4 bolts Shear)	Computed Shear = 0.07 kips
Bolt Capacity = 4.10 kips (4 bolts Tension)	Computed Tension = 0.07 kips

5/8" diameter bolts are adequate

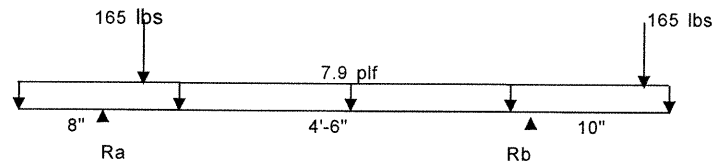
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Engineering Objective:	Design Antenna Mount				

Proposed Loads (APXVBLL15X-43-C-I20):

WIND LOAD ON ANTENNAS & ANCILLARY ITEMS ; $F = qz Gh Cf A$

ANTENNA/ANCILLARY DESCRIPTION	ELEV (FT)	qzGh	Cf	WIND AREA (sf)	F (lbs)	wt (lbs)	MOMENT ARM (FT)	OTM (LBS-FT)	COAX SIZE
APXVBLL15X-43-C-I20	155.6	27.51	1.32	9.08	330	83	-	-	-
2" Std Pipe x 6 ft long	155.6	27.51	1.20	1.44	47	-	-	-	-

Design Proposed Pipe



$$\begin{aligned}
 R_a &= 139 \text{ lbs} \\
 R_b &= 238 \text{ lbs} \\
 M_{\max} &= 140 \text{ lbs-ft} \\
 0.6 R_a &= 83 \text{ lbs (Allowable)} \\
 0.6 R_b &= 143 \text{ lbs (Allowable)} \\
 0.6 M_{\max} &= 84 \text{ lbs-ft (Allowable)}
 \end{aligned}$$

Pipe Parameters	Allowable Stress	Actual Stress
O.D Pipe = 2.875 in	$\sigma_{\text{all}} = F_y / \Omega$	$\sigma_{\text{act}} = M / S$
Design Wall Thk = 0.189 in	$\Omega = 1.67$	$\sigma_{\text{act}} = 1.0 \text{ ksi}$
A = 1.595 in ²	$\sigma_{\text{all}} = 21.0$	
S = 1.005 in ³		
I = 1.445 in ⁴		
Fy = 35 ksi		
0.6 Max OTM = 84 lbs ft (Allowable)	The 2.5" Std pipe is adequate for the applied load.	

Bolt Parameters	Computed Bolt Load
Type = Hilti HY-70	Computed Shear = 0.14 kips
Size = 5/8 in	Computed Tension = 0.14 kips
Total Bolts = 4 bolts	
Embedment = 6 in	
Bolt Shear = 1405 lbs/bolt (Allowable)	
Bolt Tension = 1025 lbs/bolt (Allowable)	
Bolt Capacity = 5.62 kips (4 bolts Shear)	Computed Shear = 0.14 kips
Bolt Capacity = 4.10 kips (4 bolts Tension)	Computed Tension = 0.14 kips

5/8" diameter bolts are adequate

Conclusion:

The proposed antenna pipe and the proposed connections were found to be adequately designed.



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6.0 Attachments

a. Equipment Support Beams Calculation



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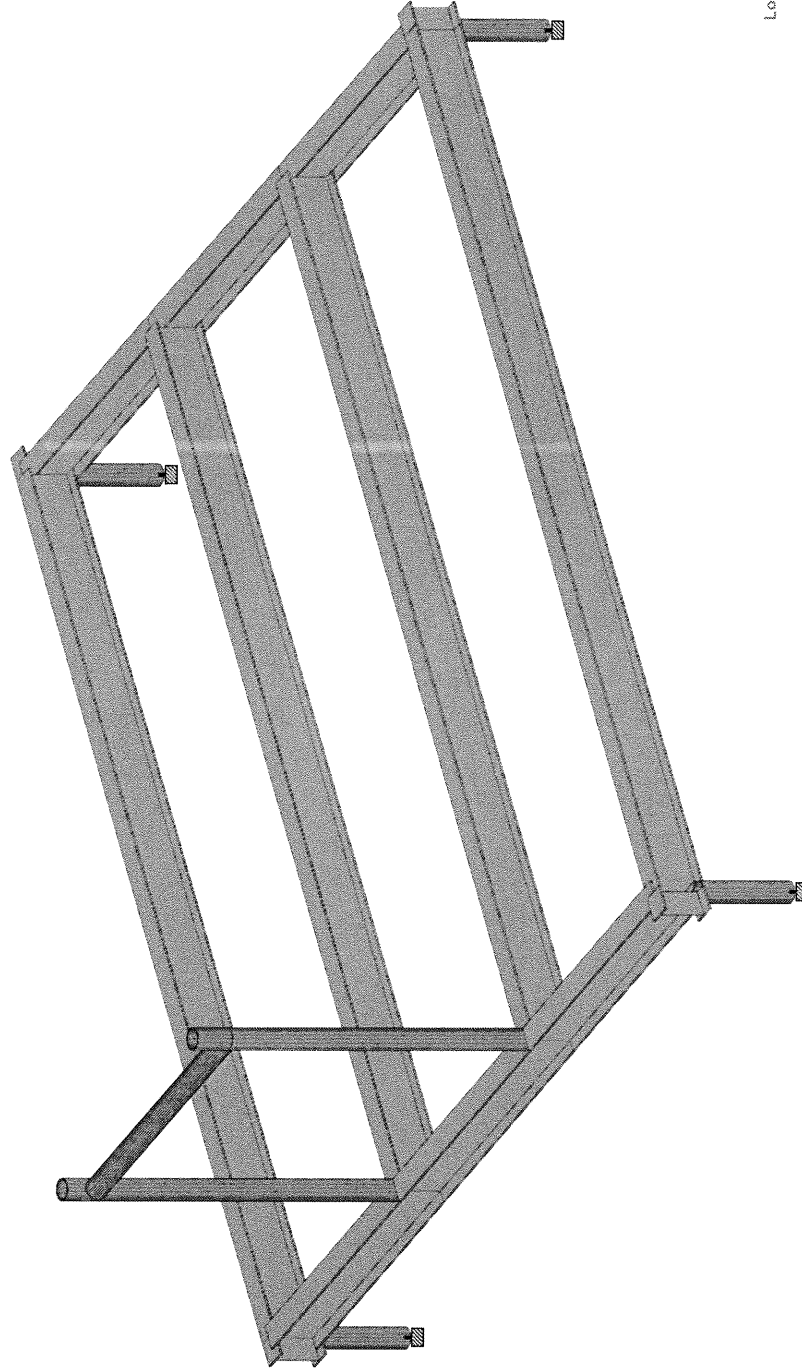
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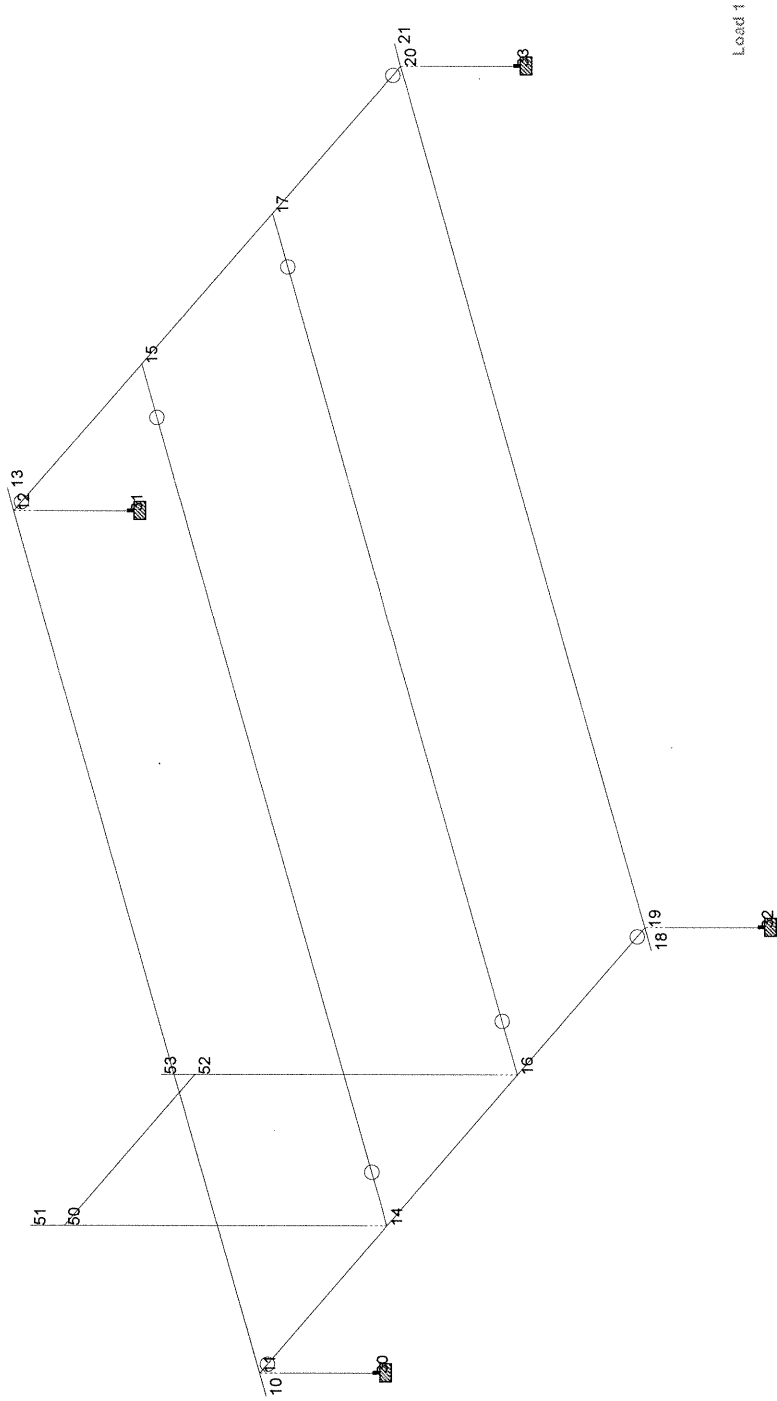


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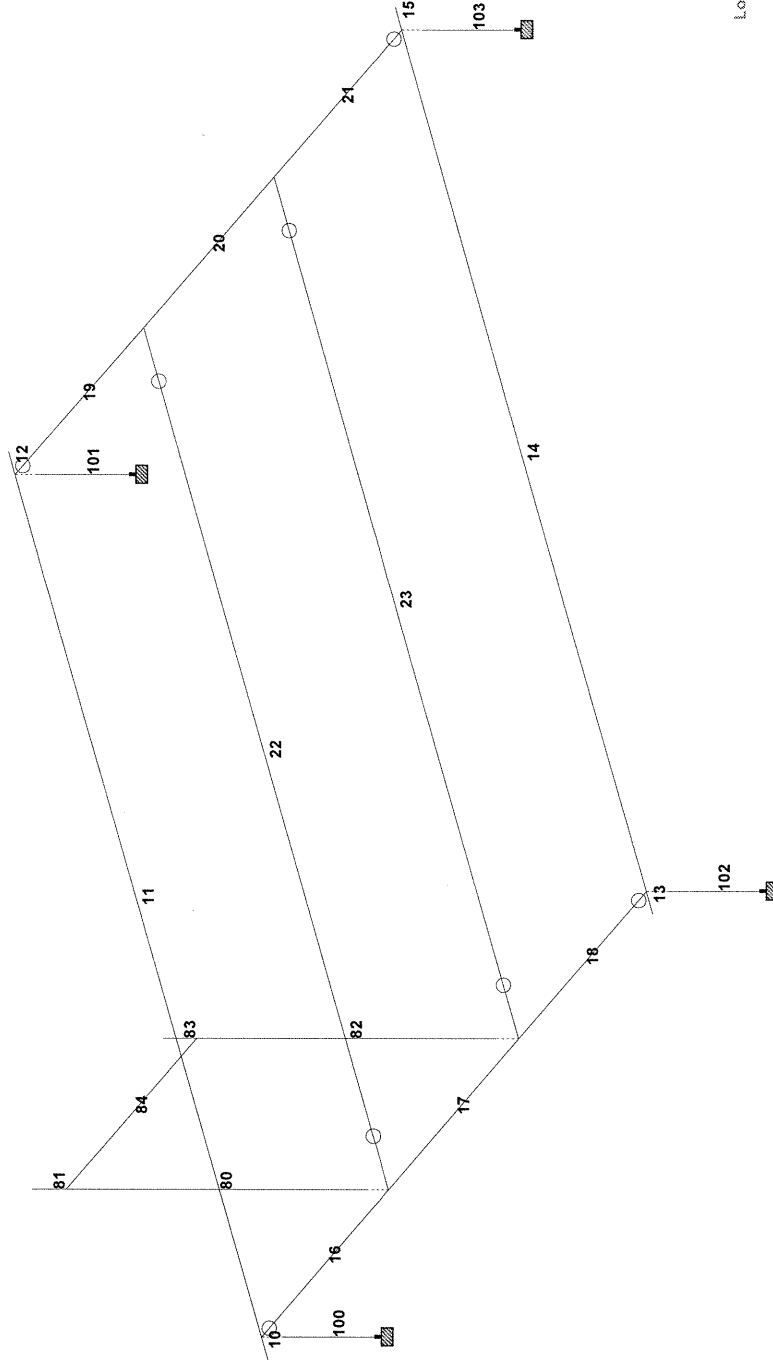
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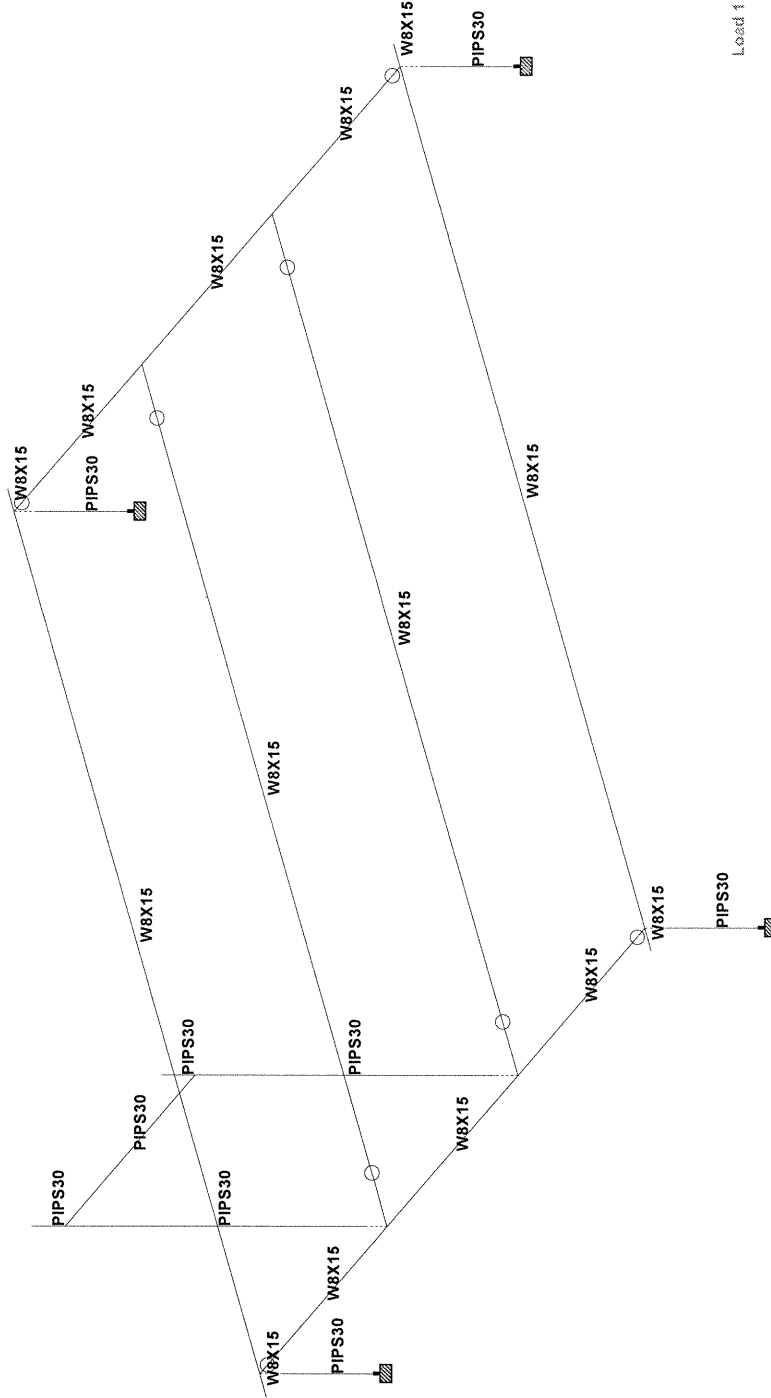
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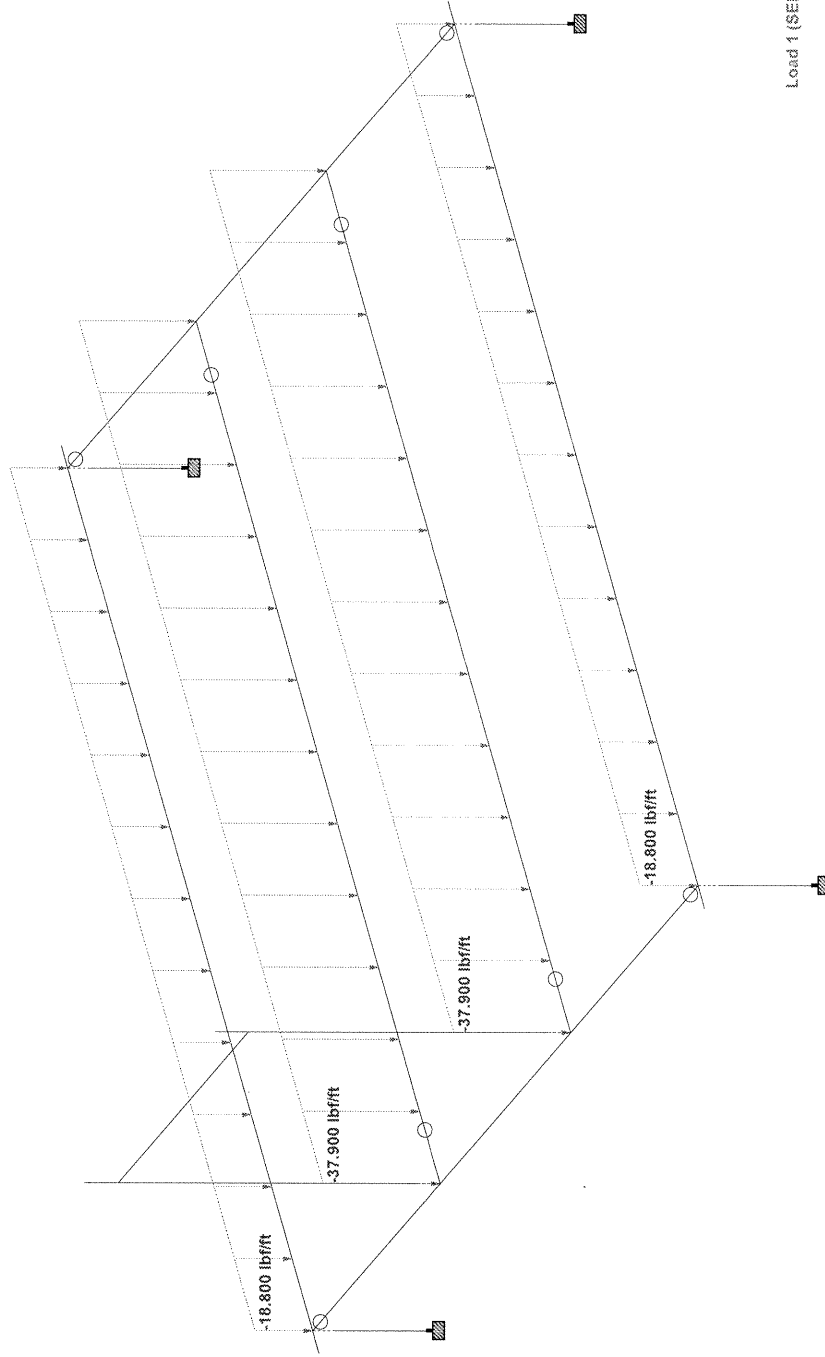
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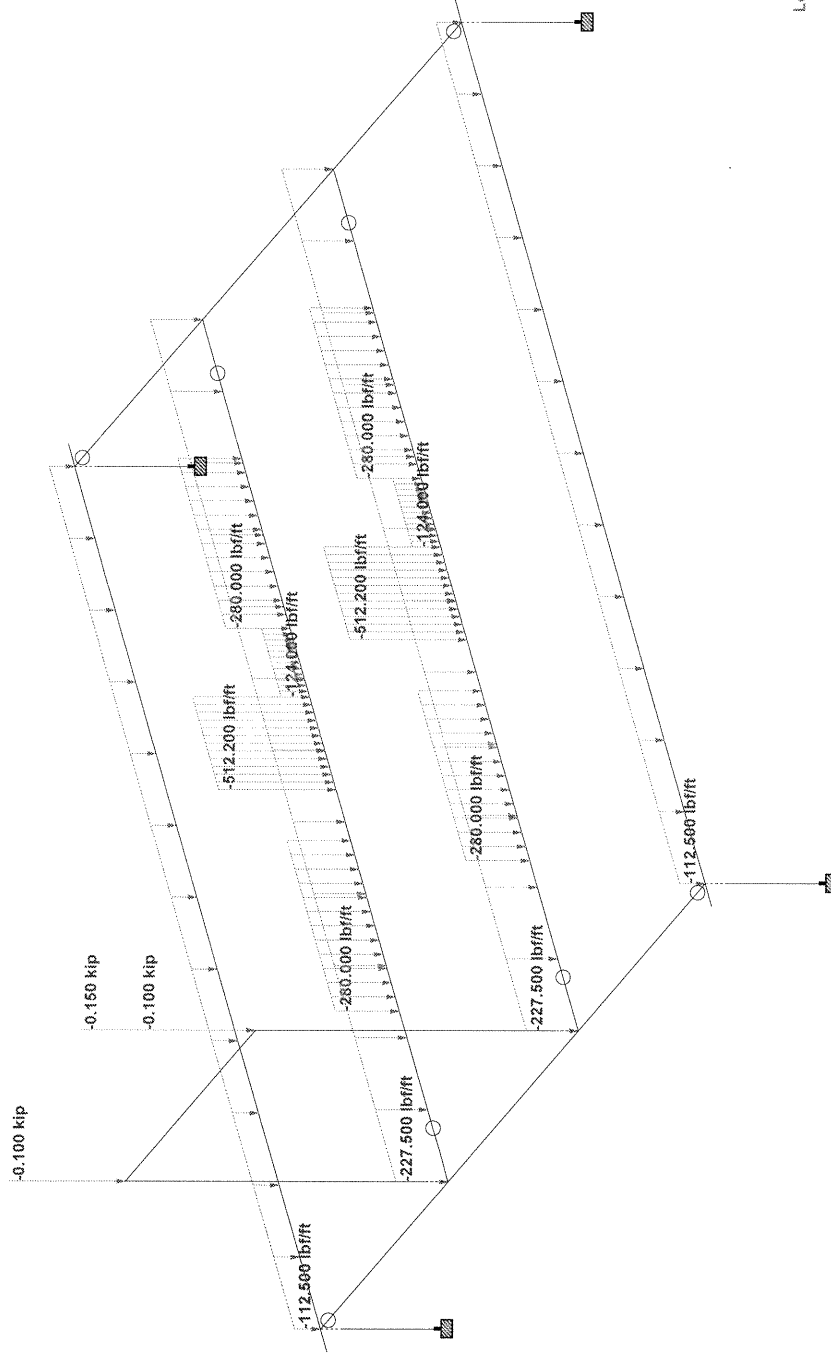
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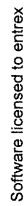
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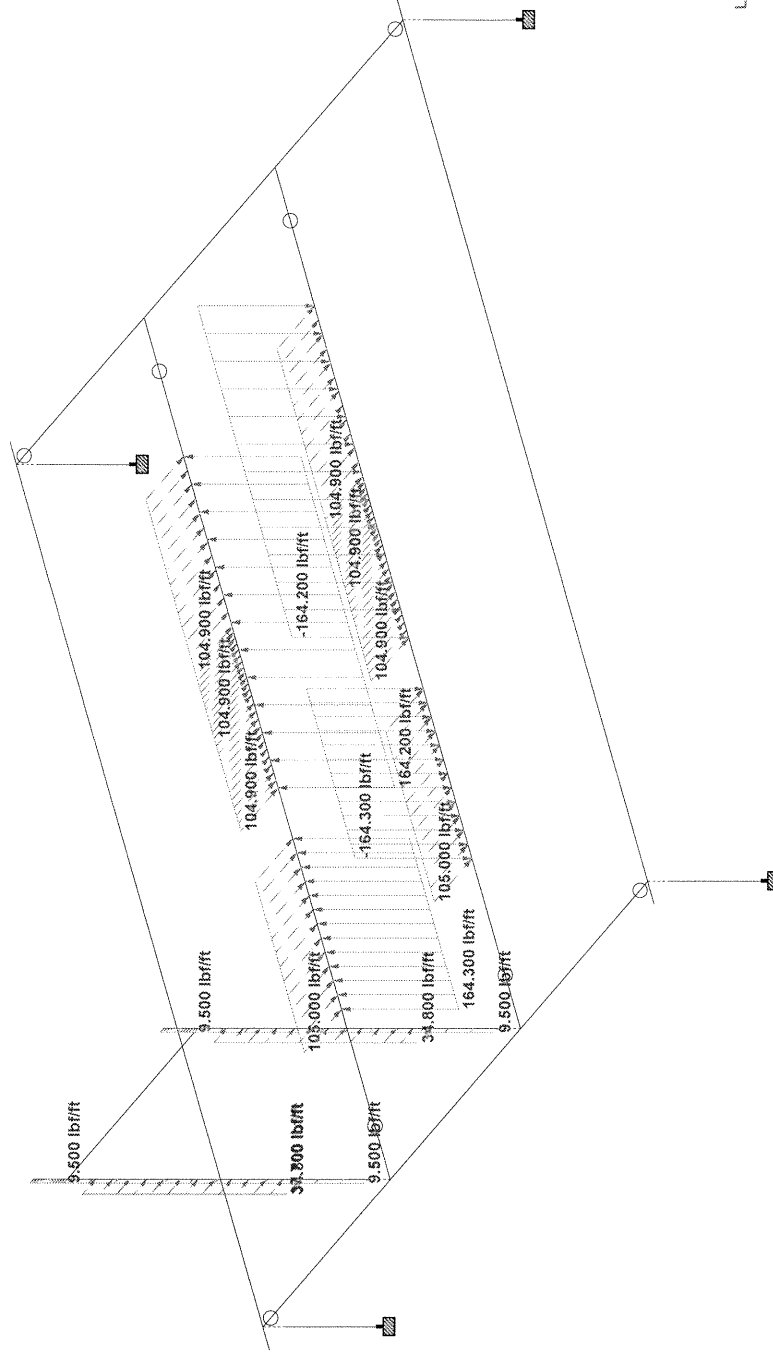
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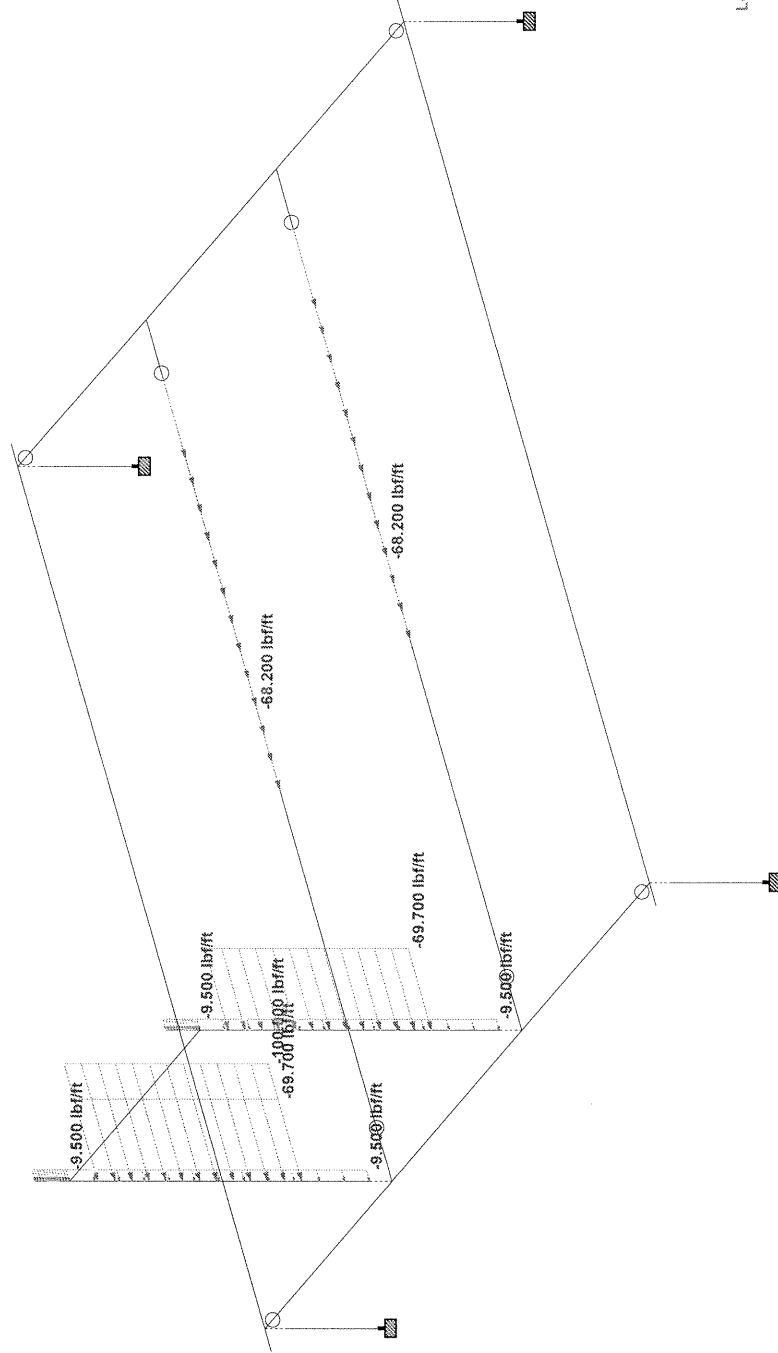
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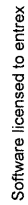
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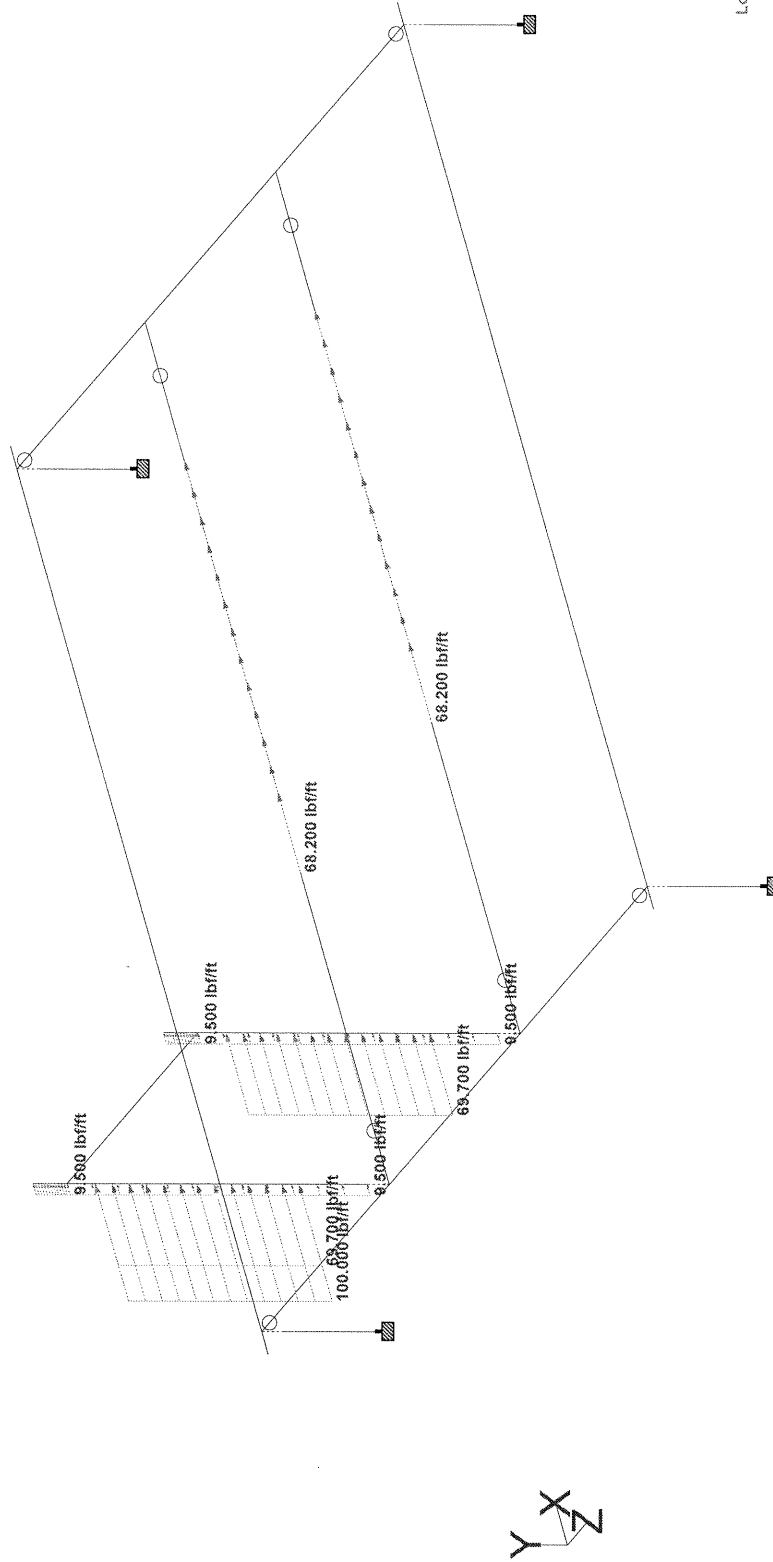
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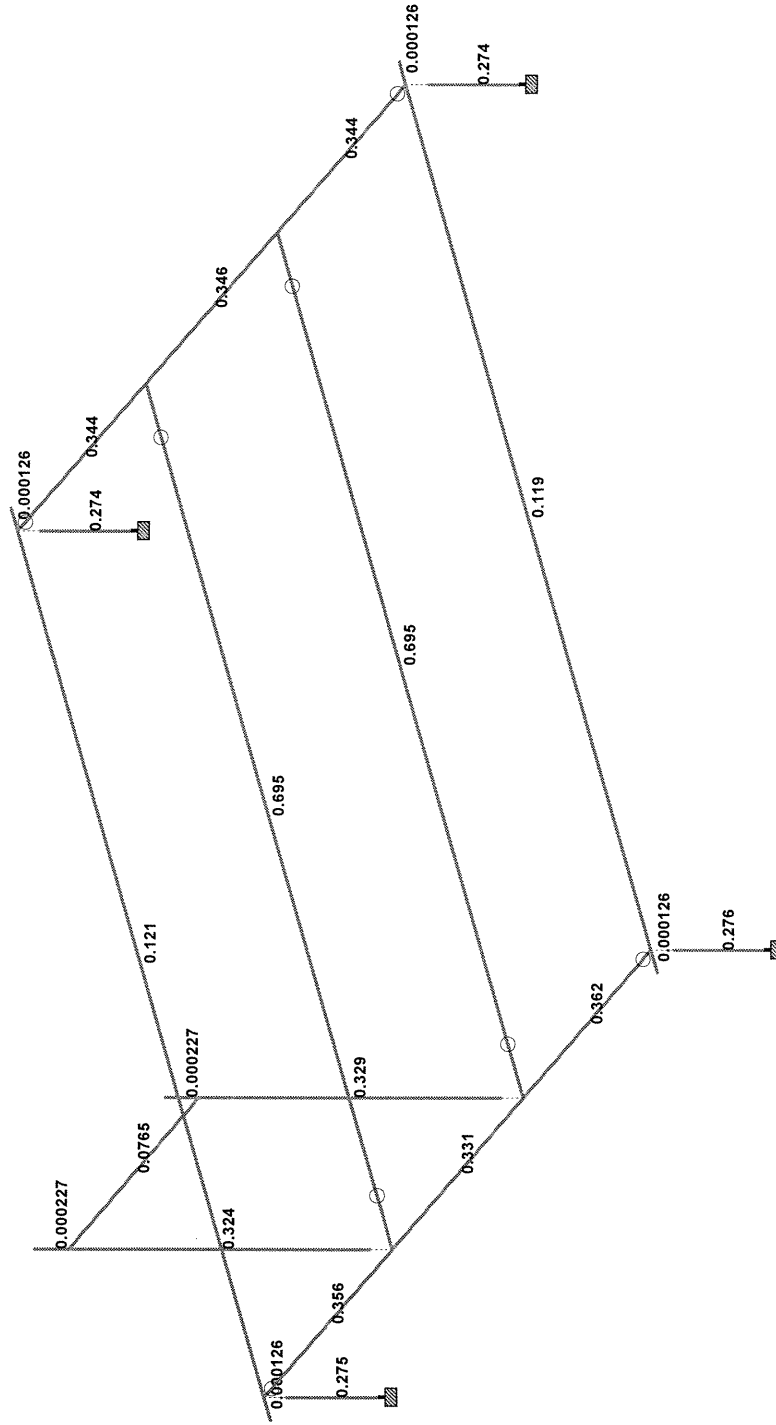
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Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
Max FX	30	7:DL + LL	0.988	4.070	0.001	0.030	0.037	-5.347
Min FX	31	15:DL + 0.75 L	-1.107	3.195	0.000	0.001	-1.930	6.913
Max FY	32	7:DL + LL	0.988	4.121	-0.001	-0.030	-0.037	-5.348
Min FY	32	16:0.6 DL + (0.	0.140	0.241	0.338	6.763	0.415	-0.762
Max FZ	30	8:DL + (0.6) W	0.225	0.875	0.339	6.774	0.429	-1.216
Min FZ	32	9:DL + (0.6) W	0.225	0.875	-0.339	-6.770	-0.429	-1.216
Max MX	30	8:DL + (0.6) W	0.225	0.875	0.339	6.774	0.429	-1.216
Min MX	32	9:DL + (0.6) W	0.225	0.875	-0.339	-6.770	-0.429	-1.216
Max MY	30	10:DL + (0.6) V	0.292	0.782	0.000	0.006	2.647	-2.819
Min MY	30	19:0.6 DL + (0.	0.073	0.335	0.000	0.001	-2.634	0.841
Max MZ	31	15:DL + 0.75 L	-1.107	3.195	0.000	0.001	-1.930	6.913
Min MZ	30	14:DL + 0.75 L	0.846	3.290	0.001	0.025	2.009	-5.507

```
*****
*
*      STAAD.Pro V8i SELECTseries6
*      Version  20.07.11.70
*      Proprietary Program of
*      Bentley Systems, Inc.
*      Date=    JUL 10, 2018
*      Time=    14:53:28
*
*      USER ID: entrex
*****
```

```
1. STAAD SPACE
INPUT FILE: K:\Sprint\1015-897\Calc\1015897.STD
2. *FILENAME: 1015897.STD
3. START JOB INFORMATION
4. ENGINEER NAME CRUMRINE
5. ENGINEER DATE JULY 9, 2018
6. END JOB INFORMATION
7. UNIT FEET KIP
8. JOINT COORDINATES
9. * PLATFORM
10. 10 0.0000      0.0000      0.0000
11. 11 0.3333      0.0000      0.0000
12. 12 13.0000     0.0000      0.0000
13. 13 13.3333     0.0000      0.0000
14. 14 0.3333      0.0000      3.7500
15. 15 13.0000     0.0000      3.7500
16. 16 0.3333      0.0000      7.5833
17. 17 13.0000     0.0000      7.5833
18. 18 0.0000      0.0000     11.3333
19. 19 0.3333      0.0000     11.3333
20. 20 13.0000     0.0000     11.3333
21. 21 13.3333     0.0000     11.3333
23. 30 0.3333      -1.6667      0.0000
24. 31 13.0000     -1.6667      0.0000
25. 32 0.3333      -1.6667     11.3333
26. 33 13.0000     -1.6667     11.3333
28. 50 0.3333      4.7500      3.7500
29. 51 0.3333      5.2500      3.7500
30. 52 0.3333      4.7500      7.5833
31. 53 0.3333      5.2500      7.5833
```

```
36. MEMBER INCIDENCES
38. *W8X15
```

```
39. 10      10      11
40. 11      11      12
41. 12      12      13
42. 13      18      19
43. 14      19      20
44. 15      20      21
45. 16      11      14
```

STAAD SPACE

*FILENAME: 1015897.STD

```
46. 17      14      16
47. 18      16      19
48. 19      12      15
49. 20      15      17
50. 21      17      20
51. 22      14      15
52. 23      16      17
```

58. *UTILITY POST

```
59. 80      14      50
60. 81      50      51
61. 82      16      52
62. 83      52      53
63. 84      50      52
```

72. *PLATFORM POST

```
73. 100     11      30
74. 101     12      31
75. 102     19      32
76. 103     20      33
```

79. UNIT INCHES KIP

80. MEMBER PROPERTY AMERICAN

```
81. 10 TO 23 TABLE ST W8X15
82. 80 TO 84 TABLE ST PIPS30
84. 100 TO 103 TABLE ST PIPS30
```

87. CONSTANTS

```
89. E STEEL ALL
90. DENSITY STEEL ALL
91. POISSON 0.3 ALL
92. ALPHA 6.00E-06 ALL
```

98. SUPPORTS

99. 30 31 32 33 FIXED

104. MEMBER RELEASE

105. 16 19 22 23 START MZ

106. 18 21 22 23 END MZ

110. MEMBER OFFSET

111. 80 82 START 0 4 0

113. 100 TO 103 START 0 -4 0

117. UNIT FEET KIP

119. LOAD 1 PLATFORM LOAD + SELF WEIGHT

120. SELFWEIGHT Y -1

122. MEMBER LOAD

123. *GRATING DEAD LOAD

124. 11 UNI GY -0.0188

125. 22 UNI GY -0.0379

126. 23 UNI GY -0.0379

127. 14 UNI GY -0.0188

133. LOAD 2 CABINET & PLATFORM LL

```

135. MEMBER LOAD
136. *ELTEK "E" CABINET
137. 22 UNI GY -0.2800 2.5000 5.0000
138. 23 UNI GY -0.2800 2.5000 5.0000
140. *ELTEK "B" CABINET
141. 22 UNI GY -0.5122 5.7500 7.1167
142. 23 UNI GY -0.5122 5.7500 7.1167
144. *ELTEK "I" CABINET
145. 22 UNI GY -0.1240 7.1167 8.1250
146. 23 UNI GY -0.1240 7.1167 8.1250
STAAD SPACE -- PAGE NO. 3
*FILENAME: 1015897.STD
148. *ELTEK "E" CABINET
149. 22 UNI GY -0.2800 8.1250 10.6250
150. 23 UNI GY -0.2800 8.1250 10.6250
152. *GRATING LIVE LOAD
153. 11 UNI GY -0.1125
154. 22 UNI GY -0.2275
155. 23 UNI GY -0.2275
156. 14 UNI GY -0.1125
158. JOINT LOAD
159. 50 FY -0.1000
160. 52 FY -0.1000
161. 52 FY -0.1500
164. LOAD 3 WIND LOAD
166. MEMBER LOAD
167. *SHEAR LOAD
169. *ELTEK "B, I , & E" CABINET
170. 22 UNI GZ -0.1050 2.5000 5.0000
171. 23 UNI GZ -0.1050 2.5000 5.0000
173. 22 UNI GY -0.1643 2.5000 5.0000
174. 23 UNI GY 0.1643 2.5000 5.0000
176. 22 UNI GZ -0.1049 5.7500 7.1167
177. 23 UNI GZ -0.1049 5.7500 7.1167
179. 22 UNI GZ -0.1049 7.1167 8.1250
180. 23 UNI GZ -0.1049 7.1167 8.1250
182. 22 UNI GZ -0.1049 8.1250 10.6250
183. 23 UNI GZ -0.1049 8.1250 10.6250
185. 22 UNI GY -0.1642 5.7500 10.6250
186. 23 UNI GY 0.1642 5.7500 10.6250
188. *TELCO / POWER / FIBER
189. 80 TO 81 UNI GZ -0.0095
190. 82 TO 83 UNI GZ -0.0095
192. 80 UNI GZ -0.0348 1.0000 4.0000
193. 82 UNI GZ -0.0348 1.0000 4.0000
195. 80 UNI GZ -0.0377 1.0000 4.0000
200. LOAD 4 WIND LOAD
202. MEMBER LOAD
203. *SHEAR LOAD
205. *ELTEK "B, I , & E" CABINET
206. 22 UNI GZ 0.1050 2.5000 5.0000
207. 23 UNI GZ 0.1050 2.5000 5.0000
209. 22 UNI GY 0.1643 2.5000 5.0000
210. 23 UNI GY -0.1643 2.5000 5.0000
212. 22 UNI GZ 0.1049 5.7500 7.1167
213. 23 UNI GZ 0.1049 5.7500 7.1167
215. 22 UNI GZ 0.1049 7.1167 8.1250
216. 23 UNI GZ 0.1049 7.1167 8.1250
218. 22 UNI GZ 0.1049 8.1250 10.6250
219. 23 UNI GZ 0.1049 8.1250 10.6250
221. 22 UNI GY 0.1642 5.7500 10.6250
222. 23 UNI GY -0.1642 5.7500 10.6250
224. *TELCO / POWER / FIBER
225. 80 TO 81 UNI GZ 0.0095
226. 82 TO 83 UNI GZ 0.0095
228. 80 UNI GZ 0.0348 1.0000 4.0000
229. 82 UNI GZ 0.0348 1.0000 4.0000
231. 80 UNI GZ 0.0377 1.0000 4.0000
STAAD SPACE -- PAGE NO. 4
*FILENAME: 1015897.STD
235. LOAD 5 WIND LOAD
237. MEMBER LOAD
238. *SHEAR LOAD
240. *ELTEK "B, I , & E" CABINET
241. 22 UNI GX -0.0682 5.7500 10.6250
242. 23 UNI GX -0.0682 5.7500 10.6250
244. *TELCO / POWER / FIBER
245. 80 TO 81 UNI GX -0.0095
246. 82 TO 83 UNI GX -0.0095
248. 80 UNI GX -0.0697 1.0000 4.0000
249. 82 UNI GX -0.0697 1.0000 4.0000
251. 80 UNI GX -0.1000 1.0000 4.0000
256. LOAD 6 WIND LOAD
258. MEMBER LOAD
259. *SHEAR LOAD
261. *ELTEK "B, I , & E" CABINET
262. 22 UNI GX 0.0682 5.7500 10.6250
263. 23 UNI GX 0.0682 5.7500 10.6250
265. *TELCO / POWER / FIBER
266. 80 TO 81 UNI GX 0.0095
267. 82 TO 83 UNI GX 0.0095
269. 80 UNI GX 0.0697 1.0000 4.0000
270. 82 UNI GX 0.0697 1.0000 4.0000
272. 80 UNI GX 0.1000 1.0000 4.0000
275. LOAD COMBINATION 7 DL + LL
276. 1 1 2 1
278. LOAD COMBINATION 8 DL + (0.6) WL
279. 1 1 3 0.6
281. LOAD COMBINATION 9 DL + (0.6) WL
282. 1 1 4 0.6
284. LOAD COMBINATION 10 DL + (0.6) WL
285. 1 1 5 0.6
287. LOAD COMBINATION 11 DL + (0.6) WL
288. 1 1 6 0.6
290. LOAD COMBINATION 12 DL + 0.75 LL + 0.75 (0.6) W

```

291. 1 1 2 0.75 3 0.45
293. LOAD COMBINATION 13 DL + 0.75 LL + 0.75 (0.6) W
294. 1 1 2 0.75 4 0.45
296. LOAD COMBINATION 14 DL + 0.75 LL + 0.75 (0.6) W
297. 1 1 2 0.75 5 0.45
299. LOAD COMBINATION 15 DL + 0.75 LL + 0.75 (0.6) W
300. 1 1 2 0.75 6 0.45
302. LOAD COMBINATION 16 0.6 DL + (0.6) W
303. 1 0.6 3 0.6
305. LOAD COMBINATION 17 0.6 DL + (0.6) W
306. 1 0.6 4 0.6
308. LOAD COMBINATION 18 0.6 DL + (0.6) W
309. 1 0.6 5 0.6
311. LOAD COMBINATION 19 0.6 DL + (0.6) W
312. 1 0.6 6 0.6
320. UNIT KIP INCH
321. PERFORM ANALYSIS
STAAD SPACE
*FILENAME: 1015897.STD

-- PAGE NO. 5

PROBLEM STATISTICS

NUMBER OF JOINTS 20 NUMBER OF MEMBERS 23
NUMBER OF PLATES 0 NUMBER OF SOLIDS 0
NUMBER OF SURFACES 0 NUMBER OF SUPPORTS 4

SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

ORIGINAL/FINAL BAND-WIDTH= 12/ 5/ 30 DOF
TOTAL PRIMARY LOAD CASES = 6, TOTAL DEGREES OF FREEDOM = 96
TOTAL LOAD COMBINATION CASES = 13 SO FAR.
SIZE OF STIFFNESS MATRIX = 3 DOUBLE KILO-WORDS
REQRD/AVAIL. DISK SPACE = 12.1/1513175.0 MB

322. PRINT SUPPORT REACTION ALL

SUPPORT REACTION ALL
STAAD SPACE
*FILENAME: 1015897.STD

-- PAGE NO. 6

SUPPORT REACTIONS -UNIT KIP INCH STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
30	1	0.23	0.70	0.00	0.00	0.01	-1.24
	2	0.76	3.37	0.00	0.03	0.03	-4.11
	3	-0.00	0.30	0.56	11.28	0.70	0.03
	4	0.00	-0.30	-0.56	-11.28	-0.70	-0.03
	5	0.11	0.14	0.00	0.00	4.40	-2.64
	6	-0.11	-0.14	-0.00	-0.00	-4.40	2.64
	7	0.99	4.07	0.00	0.03	0.04	-5.35
	8	0.23	0.88	0.34	6.77	0.43	-1.22
	9	0.23	0.52	-0.34	-6.77	-0.41	-1.26
	10	0.29	0.78	0.00	0.01	2.65	-2.82
	11	0.16	0.61	0.00	0.00	-2.63	0.35
	12	0.80	3.36	0.26	5.10	0.35	-4.30
	13	0.80	3.09	-0.25	-5.05	-0.29	-4.33
	14	0.85	3.29	0.00	0.02	2.01	-5.51
	15	0.75	3.16	0.00	0.02	-1.95	-3.13
	16	0.13	0.60	0.34	6.77	0.43	-0.72
	17	0.14	0.24	-0.34	-6.77	-0.42	-0.76
	18	0.20	0.50	0.00	0.00	2.64	-2.32
	19	0.07	0.33	0.00	0.00	-2.63	0.84
31	1	-0.23	0.65	-0.00	-0.00	-0.01	1.24
	2	-0.76	3.31	-0.00	-0.00	-0.03	4.11
	3	-0.02	0.22	0.42	8.35	-0.73	0.15
	4	0.02	-0.22	-0.42	-8.35	0.73	-0.15
	5	0.69	-0.14	-0.00	-0.00	4.22	-5.77
	6	-0.69	0.14	0.00	0.00	-4.22	5.77
	7	-0.99	3.96	-0.00	-0.00	-0.04	5.35
	8	-0.24	0.78	0.25	5.01	-0.45	1.33
	9	-0.22	0.52	-0.25	-5.01	0.43	1.14
	10	0.18	0.57	-0.00	-0.00	2.53	-2.23
	11	-0.64	0.73	0.00	0.00	-2.54	4.70
	12	-0.81	3.23	0.19	3.76	-0.36	4.39
	13	-0.79	3.03	-0.19	-3.76	0.30	4.25
	14	-0.49	3.07	-0.00	-0.00	1.87	1.72
	15	-1.11	3.19	0.00	0.00	-1.93	6.91
	16	-0.15	0.52	0.25	5.01	-0.44	0.83
	17	-0.13	0.26	-0.25	-5.01	0.43	0.65
	18	0.27	0.31	-0.00	-0.00	2.53	-2.72
	19	-0.55	0.47	0.00	0.00	-2.54	4.20
32	1	0.23	0.70	-0.00	-0.00	-0.01	-1.24
	2	0.76	3.42	-0.00	-0.03	-0.03	-4.11
	3	0.00	-0.30	0.56	11.28	0.70	-0.03
	4	-0.00	0.30	-0.56	-11.28	-0.70	0.03
	5	0.05	0.13	-0.00	-0.04	-3.93	-2.15
	6	-0.05	-0.13	0.00	0.04	3.93	2.15
	7	0.99	4.12	-0.00	-0.03	-0.04	-5.35
	8	0.23	0.52	0.34	6.76	0.41	-1.26

STAAD SPACE
*FILENAME: 1015897.STD

-- PAGE NO. 7

SUPPORT REACTIONS -UNIT KIP INCH STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
33	9	0.23	0.88	-0.34	-6.77	-0.43	-1.22
	10	0.26	0.78	-0.00	-0.03	-2.37	-2.52
	11	0.20	0.62	0.00	0.02	2.35	0.05
	12	0.80	3.13	0.25	5.05	0.29	-4.34
	13	0.80	3.40	-0.25	-5.10	-0.35	-4.30
	14	0.82	3.32	-0.00	-0.04	-1.80	-5.29
	15	0.77	3.21	-0.00	-0.00	1.74	-3.35
	16	0.14	0.24	0.34	6.76	0.42	-0.76
	17	0.13	0.60	-0.34	-6.77	-0.43	-0.72
	18	0.17	0.50	-0.00	-0.03	-2.36	-2.03
	19	0.11	0.34	0.00	0.02	2.35	0.55
	1	-0.23	0.65	0.00	0.00	0.01	1.24
	2	-0.76	3.31	0.00	-0.00	0.03	4.11
	3	0.02	-0.22	0.42	8.35	-0.73	-0.15
	4	-0.02	0.22	-0.42	-8.35	0.73	0.15
	5	0.63	-0.13	0.00	0.04	-3.97	-5.28
	6	-0.63	0.13	-0.00	-0.04	3.97	5.28
	7	-0.99	3.96	0.00	-0.00	0.04	5.35
	8	-0.22	0.52	0.25	5.01	-0.43	1.14
	9	-0.24	0.78	-0.25	-5.01	0.45	1.33
	10	0.15	0.57	0.00	0.02	-2.37	-1.93
	11	-0.61	0.73	-0.00	-0.02	2.39	4.40
	12	-0.79	3.03	0.19	3.76	-0.30	4.25
	13	-0.81	3.23	-0.19	-3.76	0.36	4.39
	14	-0.51	3.07	0.00	0.02	-1.75	1.94
	15	-1.08	3.19	-0.00	-0.02	1.81	6.69
	16	-0.13	0.26	0.25	5.01	-0.43	0.65
	17	-0.15	0.52	-0.25	-5.01	0.44	0.83
	18	0.24	0.31	0.00	0.02	-2.37	-2.42
	19	-0.52	0.47	-0.00	-0.02	2.38	3.91

***** END OF LATEST ANALYSIS RESULT *****

323. PRINT JOINT DISPLACEMENT ALL
JOINT DISPLACE ALL
STAAD SPACE -- PAGE NO. 8
*FILENAME: 1015897.STD

JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
10	1	0.00013	0.00027	-0.00002	-0.00000	-0.00000	-0.00011
	2	0.00045	0.00062	-0.00007	-0.00000	-0.00001	-0.00038
	3	0.00001	-0.00008	-0.01949	-0.00131	-0.00018	0.00000
	4	-0.00001	0.00008	0.01949	0.00131	0.00018	-0.00000
	5	-0.00473	-0.00142	-0.00443	-0.00000	-0.00111	0.00035
	6	0.00473	0.00142	0.00443	0.00000	0.00111	-0.00035
	7	0.00058	0.00089	-0.00009	-0.00000	-0.00001	-0.00049
	8	0.00014	0.00022	-0.01171	-0.00079	-0.00011	-0.00011
	9	0.00013	0.00032	0.01168	0.00079	0.00010	-0.00011
	10	-0.00270	-0.00058	-0.00267	-0.00000	-0.00067	0.00009
	11	0.00297	0.00112	0.00264	-0.00000	0.00066	-0.00032
	12	0.00047	0.00070	-0.00884	-0.00059	-0.00009	-0.00040
	13	0.00046	0.00078	0.00870	0.00059	0.00007	-0.00040
	14	-0.00166	0.00010	-0.00206	-0.00000	-0.00051	-0.00024
	15	0.00260	0.00138	0.00193	-0.00000	0.00049	-0.00056
	16	0.00009	0.00011	-0.01170	-0.00079	-0.00011	-0.00007
	17	0.00007	0.00021	0.01168	0.00079	0.00010	-0.00007
	18	-0.00276	-0.00069	-0.00267	-0.00000	-0.00067	0.00014
	19	0.00292	0.00102	0.00265	-0.00000	0.00066	-0.00028
11	1	0.00013	-0.00018	-0.00001	-0.00000	-0.00000	-0.00011
	2	0.00045	-0.00090	-0.00004	-0.00000	-0.00001	-0.00038
	3	0.00001	-0.00008	-0.01878	-0.00131	-0.00018	0.00000
	4	-0.00001	0.00008	0.01878	0.00131	0.00018	-0.00000
	5	-0.00473	-0.00004	-0.00000	-0.00000	-0.00111	0.00035
	6	0.00473	0.00004	0.00000	0.00000	0.00111	-0.00035
	7	0.00058	-0.00108	-0.00005	-0.00000	-0.00001	-0.00049
	8	0.00014	-0.00023	-0.01128	-0.00079	-0.00011	-0.00011
	9	0.00013	-0.00014	0.01126	0.00079	0.00010	-0.00011
	10	-0.00270	-0.00021	-0.00001	-0.00000	-0.00067	0.00009
	11	0.00297	-0.00016	-0.00000	-0.00000	0.00066	-0.00032
	12	0.00047	-0.00089	-0.00849	-0.00059	-0.00009	-0.00040
	13	0.00046	-0.00082	0.00841	0.00059	0.00007	-0.00040
	14	-0.00166	-0.00088	-0.00004	-0.00000	-0.00051	-0.00024
	15	0.00260	-0.00084	-0.00004	-0.00000	0.00049	-0.00056
	16	0.00009	-0.00016	-0.01127	-0.00079	-0.00011	-0.00007
	17	0.00007	-0.00006	0.01127	0.00079	0.00010	-0.00007
	18	-0.00276	-0.00013	-0.00001	-0.00000	-0.00067	0.00014
	19	0.00292	-0.00009	-0.00000	-0.00000	0.00066	-0.00028
12	1	-0.00014	-0.00017	-0.00000	-0.00000	0.00000	0.00011
	2	-0.00045	-0.00088	0.00000	-0.00000	0.00001	0.00038
	3	0.00015	-0.00006	-0.01391	-0.00097	0.00018	-0.00000
	4	-0.00015	0.00006	0.01391	0.00097	-0.00018	0.00000
	5	-0.00437	0.00004	0.00000	0.00000	-0.00106	0.00005
	6	0.00437	-0.00004	-0.00000	-0.00000	0.00106	-0.00005
	7	-0.00058	-0.00105	0.00000	-0.00000	0.00001	0.00050
	8	-0.00005	-0.00021	-0.00834	-0.00058	0.00011	0.00011

STAAD SPACE -- PAGE NO. 9
*FILENAME: 1015897.STD

JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
13	9	-0.00022	-0.00014	0.00834	0.00058	-0.00011	0.00012
	10	-0.00276	-0.00015	0.00000	0.00000	-0.00064	0.00015
	11	0.00249	-0.00019	-0.00000	-0.00000	0.00064	0.00008
	12	-0.00041	-0.00086	-0.00626	-0.00044	0.00009	0.00040
	13	-0.00054	-0.00081	0.00626	0.00044	-0.00008	0.00040
	14	-0.00244	-0.00082	0.00000	0.00000	-0.00047	0.00042
	15	0.00149	-0.00085	-0.00000	-0.00000	0.00049	0.00038
	16	0.00001	-0.00014	-0.00834	-0.00058	0.00011	0.00007
	17	-0.00017	-0.00007	0.00834	0.00058	-0.00011	0.00007
	18	-0.00270	-0.00008	0.00000	0.00000	-0.00064	0.00010
	19	0.00254	-0.00013	-0.00000	-0.00000	0.00064	0.00004
	1	-0.00014	0.00029	-0.00001	-0.00000	0.00000	0.00011
	2	-0.00045	0.00064	-0.00003	-0.00000	0.00001	0.00038
	3	0.00015	-0.00008	-0.01464	-0.00097	0.00018	-0.00000
	4	-0.00015	0.00008	0.01464	0.00097	-0.00018	0.00000
	5	-0.00437	0.00025	0.00426	0.00000	-0.00106	0.00005
14	6	0.00437	-0.00025	-0.00426	-0.00000	0.00106	-0.00005
	7	-0.00058	0.00093	-0.00004	-0.00000	0.00001	0.00050
	8	-0.00005	0.00024	-0.00879	-0.00058	0.00011	0.00011
	9	-0.00022	0.00033	0.00878	0.00058	-0.00011	0.00012
	10	-0.00276	0.00044	0.00255	0.00000	-0.00064	0.00015
	11	0.00249	0.00013	-0.00256	-0.00000	0.00064	0.00008
	12	-0.00041	0.00073	-0.00662	-0.00044	0.00009	0.00040
	13	-0.00054	0.00080	0.00656	0.00044	-0.00008	0.00040
	14	-0.00244	0.00088	0.00189	0.00000	-0.00047	0.00042
	15	0.00149	0.00065	-0.00195	-0.00000	0.00049	0.00038
	16	0.00001	0.00012	-0.00879	-0.00058	0.00011	0.00007
	17	-0.00017	0.00022	0.00878	0.00058	-0.00011	0.00007
	18	-0.00270	0.00032	0.00255	0.00000	-0.00064	0.00010
	19	0.00254	0.00002	-0.00256	-0.00000	0.00064	0.00004
	1	0.00000	-0.02435	-0.00001	0.00030	-0.00000	-0.00011
	2	0.00000	-0.14611	-0.00004	0.00182	-0.00001	-0.00038

STAAD SPACE

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
15	17	-0.00006	-0.01282	0.01138	0.00024	-0.00034	-0.00019
	18	-0.04859	-0.01464	0.00000	0.00018	-0.00050	0.24412
	19	0.04859	-0.01459	-0.00001	0.00018	0.00050	-0.24426
	1	0.00000	-0.02300	-0.00000	0.00030	0.00000	0.00011
	2	-0.00000	-0.14971	0.00000	0.00193	0.00001	0.00038
	3	0.00034	-0.00287	-0.01405	-0.00005	-0.00062	-0.00000
	4	-0.00034	0.00287	0.01405	0.00005	0.00062	0.00000
	5	-0.08075	0.00004	-0.00001	0.00000	-0.00099	0.00005
	6	0.08075	-0.00004	0.00001	-0.00000	0.00099	-0.00005
	7	-0.00000	-0.17271	0.00000	0.00223	0.00001	0.00050
	8	0.00020	-0.02472	-0.00843	0.00026	-0.00037	0.00011
	9	-0.00020	-0.02128	0.00843	0.00033	0.00038	0.00012
	10	-0.04845	-0.02297	-0.00001	0.00030	-0.00059	0.00014
	11	0.04845	-0.02302	0.00001	0.00030	0.00060	0.00008
	12	0.00015	-0.13657	-0.00632	0.00172	-0.00027	0.00040
	13	-0.00015	-0.13399	0.00632	0.00177	0.00029	0.00040
16	14	-0.03634	-0.13526	-0.00001	0.00174	-0.00044	0.00042
	15	0.03634	-0.13530	0.00001	0.00174	0.00045	0.00038
	16	0.00020	-0.01552	-0.00843	0.00015	-0.00037	0.00007
	17	-0.00020	-0.01208	0.00843	0.00021	0.00038	0.00007
	18	-0.04845	-0.01378	-0.00001	0.00018	-0.00059	0.00010
	19	0.04845	-0.01382	0.00001	0.00018	0.00059	0.00004
	1	0.00000	-0.02435	0.00001	-0.00030	0.00000	-0.00011
	2	0.00000	-0.14678	0.00004	-0.00181	0.00001	-0.00038
	3	-0.00010	0.00368	-0.01897	-0.00008	0.00056	-0.00021
	4	0.00010	-0.00368	0.01897	0.00008	-0.00056	0.00021
	5	-0.07710	-0.00004	0.00005	-0.00000	0.00105	0.40496
	6	0.07710	0.00004	-0.00005	0.00000	-0.00105	-0.40496
	7	0.00000	-0.17114	0.00005	-0.00211	0.00001	-0.00049
	8	-0.00006	-0.02215	-0.01138	-0.00035	0.00034	-0.00024
	9	0.00006	-0.02656	0.01139	-0.00025	-0.00033	0.00001
	10	-0.04626	-0.02438	0.00004	-0.00030	0.00063	0.24286
17	11	0.04626	-0.02433	-0.00002	-0.00030	-0.00063	-0.24309
	12	-0.00004	-0.13279	-0.00850	-0.00169	0.00026	-0.00049
	13	0.00005	-0.13610	0.00858	-0.00162	-0.00024	-0.00031
	14	-0.03470	-0.13446	0.00006	-0.00165	0.00048	0.18183
	15	0.03470	-0.13442	0.00002	-0.00165	-0.00047	-0.18263
	16	-0.00006	-0.01241	-0.01138	-0.00023	0.00034	-0.00019
	17	0.00006	-0.01682	0.01139	-0.00013	-0.00033	0.00006
	18	-0.04626	-0.01464	0.00004	-0.00018	0.00063	0.24291
	19	0.04626	-0.01459	-0.00003	-0.00018	-0.00063	-0.24305
	1	0.00000	-0.02300	0.00000	-0.00030	-0.00000	0.00011

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2 -0.00000 -0.14971 0.00000 -0.00193 -0.00001 0.00038
3 -0.00034 0.00287 -0.01405 -0.00005 -0.00062 0.00000
4 0.00034 -0.00287 0.01405 0.00005 0.00062 -0.00000
5 -0.07699 0.00004 -0.00005 0.00000 0.00104 0.00005

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
6	0.07699	-0.00004	0.00005	-0.00000	-0.00104	-0.00005	
7	-0.00000	-0.17271	0.00000	-0.00223	-0.00001	0.00050	
8	-0.00020	-0.02128	-0.00843	-0.00033	-0.00038	0.00012	
9	0.00021	-0.02472	0.00843	-0.00026	0.00037	0.00011	
10	-0.04619	-0.02298	-0.00003	-0.00030	0.00062	0.00014	
11	0.04619	-0.02302	0.00003	-0.00030	-0.00062	0.00009	
12	-0.00015	-0.13399	-0.00632	-0.00177	-0.00029	0.00040	
13	0.00015	-0.13657	0.00632	-0.00172	0.00027	0.00040	
14	-0.03465	-0.13526	-0.00002	-0.00174	0.00046	0.00042	
15	0.03464	-0.13530	0.00002	-0.00174	-0.00047	0.00038	
16	-0.00020	-0.01208	-0.00843	-0.00021	-0.00038	0.00007	
17	0.00021	-0.01552	0.00843	-0.00015	0.00037	0.00007	
18	-0.04619	-0.01378	-0.00003	-0.00018	0.00062	0.00010	
19	0.04619	-0.01382	0.00003	-0.00018	-0.00062	0.00004	
18	1	0.00013	0.00027	0.00002	0.00000	0.00000	-0.00011
2	0.00045	0.00061	0.00007	0.00000	0.00001	-0.00038	
3	-0.00001	0.00008	-0.01948	-0.00131	-0.00018	-0.00000	
4	0.00001	-0.00008	0.01948	0.00131	0.00018	0.00000	
5	-0.00429	-0.00137	0.00402	0.00000	0.00099	0.00033	
6	0.00429	0.00137	-0.00402	-0.00000	-0.00099	-0.00033	
7	0.00058	0.00088	0.00009	0.00000	0.00001	-0.00049	
8	0.00013	0.00032	-0.01167	-0.00079	-0.00010	-0.00011	
9	0.00014	0.00022	0.01170	0.00079	0.00011	-0.00011	
10	-0.00244	-0.00055	0.00243	0.00000	0.00060	0.00009	
11	0.00271	0.00109	-0.00240	-0.00000	-0.00059	-0.00031	
12	0.00046	0.00077	-0.00870	-0.00059	-0.00007	-0.00040	
13	0.00047	0.00069	0.00883	0.00059	0.00009	-0.00040	
14	-0.00146	0.00011	0.00188	0.00000	0.00045	-0.00025	
15	0.00240	0.00134	-0.00174	0.00000	-0.00044	-0.00055	
16	0.00007	0.00021	-0.01168	-0.00079	-0.00010	-0.00007	
17	0.00009	0.00011	0.01170	0.00079	0.00011	-0.00007	
18	-0.00249	-0.00066	0.00242	0.00000	0.00059	0.00013	
19	0.00265	0.00098	-0.00240	-0.00000	-0.00059	-0.00027	
19	1	0.00013	-0.00018	0.00001	0.00000	0.00000	-0.00011
2	0.00045	-0.00091	0.00004	0.00000	0.00001	-0.00038	
3	-0.00001	0.00008	-0.01877	-0.00131	-0.00018	-0.00000	
4	0.00001	-0.00008	0.01877	0.00131	0.00018	0.00000	
5	-0.00429	-0.00004	0.00007	0.00000	0.00099	0.00033	
6	0.00429	0.00004	-0.00007	-0.00000	-0.00099	-0.00033	
7	0.00058	-0.00110	0.00005	0.00000	0.00001	-0.00049	
8	0.00013	-0.00014	-0.01126	-0.00079	-0.00010	-0.00011	
9	0.00014	-0.00023	0.01127	0.00079	0.00011	-0.00011	
10	-0.00244	-0.00021	0.00005	0.00000	0.00060	0.00009	
11	0.00271	-0.00016	-0.00003	-0.00000	-0.00059	-0.00031	
12	0.00046	-0.00083	-0.00841	-0.00059	-0.00007	-0.00040	
13	0.00047	-0.00090	0.00849	0.00059	0.00009	-0.00040	

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
14	-0.00146	-0.00088	0.00007	0.00000	0.00045	-0.00025	
15	0.00240	-0.00085	0.00001	0.00000	-0.00044	-0.00055	
16	0.00007	-0.00006	-0.01126	-0.00079	-0.00010	-0.00007	
17	0.00009	-0.00016	0.01127	0.00079	0.00011	-0.00007	
18	-0.00249	-0.00013	0.00005	0.00000	0.00059	0.00013	
19	0.00265	-0.00009	-0.00004	-0.00000	-0.00059	-0.00027	
20	1	-0.00014	-0.00017	0.00000	0.00000	-0.00000	0.00011
2	-0.00045	-0.00088	0.00000	0.00000	-0.00001	0.00038	
3	-0.00015	0.00006	-0.01391	-0.00097	0.00018	0.00000	
4	0.00015	-0.00006	0.01391	0.00097	-0.00018	-0.00000	
5	-0.00395	0.00004	-0.00007	-0.00000	0.00100	0.00004	
6	0.00395	-0.00004	0.00007	0.00000	-0.00100	-0.00004	
7	-0.00058	-0.00105	0.00000	0.00000	-0.00001	0.00050	
8	-0.00022	-0.00014	-0.00834	-0.00058	0.00011	0.00012	
9	-0.00005	-0.00021	0.00834	0.00058	-0.00011	0.00011	
10	-0.00250	-0.00015	-0.00004	-0.00000	0.00060	0.00014	
11	0.00223	-0.00019	0.00004	0.00000	-0.00060	0.00009	
12	-0.00054	-0.00081	-0.00626	-0.00044	0.00008	0.00040	
13	-0.00041	-0.00086	0.00626	0.00044	-0.00009	0.00040	
14	-0.00225	-0.00082	-0.00003	-0.00000	0.00044	0.00042	
15	0.00130	-0.00085	0.00003	0.00000	-0.00046	0.00038	
16	-0.00017	-0.00007	-0.00834	-0.00058	0.00011	0.00007	
17	0.00001	-0.00014	0.00834	0.00058	-0.00011	0.00007	
18	-0.00245	-0.00008	-0.00004	-0.00000	0.00060	0.00009	
19	0.00229	-0.00012	0.00004	0.00000	-0.00060	0.00004	
21	1	-0.00014	0.00029	0.00001	0.00000	-0.00000	0.00011
2	-0.00045	0.00064	0.00003	0.00000	-0.00001	0.00038	
3	-0.00015	0.00008	-0.01464	-0.00097	0.00018	0.00000	
4	0.00015	-0.00008	0.01464	0.00097	-0.00018	-0.00000	
5	-0.00395	0.00021	-0.00406	-0.00000	0.00100	0.00004	
6	0.00395	-0.00021	0.00406	0.00000	-0.00100	-0.00004	
7	-0.00058	0.00093	0.00004	0.00000	-0.00001	0.00050	
8	-0.00022	0.00033	-0.00878	-0.00058	0.00011	0.00012	


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16 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
17 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
18 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
19 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
50 1 0.00652 -0.02438 0.00002 -0.00010 -0.00000 -0.00011
2 0.02168 -0.14620 0.00070 -0.00067 -0.00000 -0.00038
3 -0.01001 -0.00306 -0.04828 -0.00027 0.00045 0.00011
4 0.01001 0.00306 0.04828 0.00027 -0.00045 -0.00011
5 -23.36271 -0.00004 0.00003 0.00000 0.00135 0.40871
6 23.36271 0.00004 -0.00003 -0.00000 -0.00135 -0.40871
7 0.02820 -0.17058 0.00072 -0.00077 -0.00000 -0.00049
8 0.00051 -0.02622 -0.02895 -0.00027 0.00027 -0.00005
9 0.01252 -0.02255 0.02898 0.00006 -0.00027 -0.00018
10 -14.01111 -0.02441 0.00004 -0.00010 0.00081 0.24511
11 14.02414 -0.02436 -0.00000 -0.00010 -0.00081 -0.24534
12 0.01828 -0.13541 -0.02118 -0.00073 0.00020 -0.00035
13 0.02728 -0.13266 0.02227 -0.00048 -0.00020 -0.00045
14 -10.49044 -0.13405 0.00056 -0.00060 0.00060 0.18352
15 10.53600 -0.13402 0.00053 -0.00060 -0.00061 -0.18432
16 -0.00209 -0.01646 -0.02896 -0.00023 0.00027 -0.00000
17 0.00991 -0.01280 0.02897 0.00010 -0.00027 -0.00013
18 -14.01371 -0.01465 0.00003 -0.00006 0.00081 0.24516
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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

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JOINT LOAD X-TRANS Y-TRANS Z-TRANS X-ROTAN Y-ROTAN Z-ROTAN
|
51 19 14.02153 -0.01461 -0.00001 -0.00006 -0.00081 -0.24530
1 0.00720 -0.02438 -0.00060 -0.00010 -0.00000 -0.00011
2 0.02397 -0.14620 -0.00331 -0.00067 -0.00000 -0.00038
3 -0.01066 -0.00306 -0.04992 -0.00027 0.00045 0.00011
4 0.01066 0.00306 0.04992 0.00027 -0.00045 -0.00011
5 -25.81498 -0.00004 0.00003 0.00000 0.00135 0.40871
6 25.81498 0.00004 -0.00003 -0.00000 -0.00135 -0.40871
7 0.03117 -0.17058 -0.00391 -0.00077 -0.00000 -0.00049
8 0.00080 -0.02622 -0.03055 -0.00027 0.00027 -0.00005
9 0.01360 -0.02255 0.02935 0.00006 -0.00027 -0.00018
10 -15.48178 -0.02441 -0.00058 -0.00010 0.00081 0.24511
11 15.49619 -0.02436 -0.00062 -0.00010 -0.00081 -0.24534
12 0.02038 -0.13541 -0.02554 -0.00073 0.00020 -0.00035
13 0.02998 -0.13266 0.01938 -0.00048 -0.00020 -0.00045
14 -11.59156 -0.13405 -0.00306 -0.00060 0.00060 0.18352
15 11.64192 -0.13402 -0.00309 -0.00060 -0.00061 -0.18432
16 -0.00208 -0.01646 -0.03031 -0.00023 0.00027 -0.00000
17 0.01072 -0.01280 0.02959 0.00010 -0.00027 -0.00013
18 -15.48466 -0.01465 -0.00034 -0.00006 0.00081 0.24516
19 15.49331 -0.01461 -0.00038 -0.00006 -0.00081 -0.24530
52 1 0.00652 -0.02438 -0.00002 0.00010 0.00000 -0.00011
2 0.02168 -0.14700 0.00052 0.00070 0.00000 -0.00038
3 0.01000 0.00374 -0.04825 -0.00035 0.00045 -0.00011
4 -0.01000 -0.00374 0.04825 0.00035 -0.00045 0.00011
5 -23.28211 -0.00004 0.00003 -0.00000 0.00182 0.40827
6 23.28211 0.00004 -0.00003 0.00000 -0.00182 -0.40827
7 0.02820 -0.17139 0.00050 0.00080 0.00000 -0.00049
8 0.01252 -0.02214 -0.02897 -0.00011 0.00027 -0.00018
9 0.00051 -0.02663 0.02894 0.00031 -0.00027 -0.00005
10 -13.96275 -0.02441 0.00000 0.00010 0.00109 0.24484
11 13.97578 -0.02436 -0.00004 0.00010 0.00109 -0.24507
12 0.02728 -0.13295 -0.02134 0.00047 0.00020 -0.00045
13 0.01828 -0.13632 0.02209 0.00078 -0.00020 -0.00035
14 -10.45417 -0.13465 0.00039 0.00063 0.00082 0.18332
15 10.49973 -0.13462 0.00036 0.00063 -0.00082 -0.18412
16 0.00991 -0.01238 -0.02896 -0.00015 0.00027 -0.00013
17 -0.00209 -0.01687 0.02894 0.00027 -0.00027 -0.00000
18 -13.96535 -0.01465 0.00001 0.00006 0.00109 0.24489
19 13.97317 -0.01461 -0.00003 0.00006 -0.00109 -0.24503
53 1 0.00720 -0.02438 0.00060 0.00010 0.00000 -0.00011
2 0.02397 -0.14700 0.00472 0.00070 0.00000 -0.00038
3 0.01066 0.00374 -0.05034 -0.00035 0.00045 -0.00011
4 -0.01066 -0.00374 0.05034 0.00035 -0.00045 0.00011
5 -25.73170 -0.00004 0.00003 -0.00000 0.00182 0.40827
6 25.73170 0.00004 -0.00003 0.00000 -0.00182 -0.40827
7 0.03117 -0.17139 0.00532 0.00080 0.00000 -0.00049
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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

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JOINT LOAD X-TRANS Y-TRANS Z-TRANS X-ROTAN Y-ROTAN Z-ROTAN
|
8 0.01360 -0.02214 -0.02961 -0.00011 0.00027 -0.00018
9 0.00080 -0.02663 0.03081 0.00031 -0.00027 -0.00005
10 -15.43182 -0.02441 0.00062 0.00010 0.00109 0.24485
11 15.44622 -0.02436 0.00058 0.00010 -0.00109 -0.24507
12 0.02997 -0.13295 -0.01852 0.00047 0.00020 -0.00045
13 0.02038 -0.13632 0.02679 0.00078 -0.00020 -0.00035
14 -11.55409 -0.13465 0.00415 0.00063 0.00082 0.18332
15 11.60444 -0.13462 0.00412 0.00063 -0.00082 -0.18412
16 0.01072 -0.01239 -0.02985 -0.00015 0.00027 -0.00013
17 -0.00208 -0.01687 0.03057 0.00027 -0.00027 -0.00000
18 -15.43470 -0.01465 0.00038 0.00006 0.00109 0.24489
19 15.44334 -0.01461 0.00034 0.00006 -0.00109 -0.24503

```

***** END OF LATEST ANALYSIS RESULT *****

326. LOAD LIST 1 7 TO 19
 330. PARAMETERS
 331. CODE AISC UNIFIED 2010
 332. METHOD ASD
 334. UNIT KIP INCH
 336. *SUPPRESS SLENDERNESS CHECK
 338. *MAIN 1.0
 339. RATIO 1.00 ALL
 340. TRACK 0 ALL
 342. FYLD 50 MEMB 10 TO 23
 344. FYLD 35 MEMB 80 TO 84 100 TO 103
 346. CHECK CODE ALL
 STEEL DESIGN

STAAD SPACE -- PAGE NO. 17
 *FILENAME: 1015897.STD
 7
 STAAD.PRO CODE CHECKING - (AISC-360-10-ASD) v1.4a

 |
 7

ALL UNITS ARE - KIP INCH (UNLESS OTHERWISE NOTED)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
=====					
10 ST	W8X15	(AISC SECTIONS)			
		PASS	Sec. G2.1(a)	0.000	1
		0.00 T	0.00	0.01	4.00
11 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.121	14
		0.66 C	-1.92	17.63	0.00
12 ST	W8X15	(AISC SECTIONS)			
		PASS	Sec. G2.1(a)	0.000	1
		0.00 T	0.00	0.01	0.00
13 ST	W8X15	(AISC SECTIONS)			
		PASS	Sec. G2.1(a)	0.000	1
		0.00 T	0.00	0.01	4.00
14 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.119	7
		0.99 C	0.01	-20.81	76.00
15 ST	W8X15	(AISC SECTIONS)			
		PASS	Sec. G2.1(a)	0.000	1
		0.00 T	0.00	0.01	0.00

STAAD SPACE -- PAGE NO. 18
 *FILENAME: 1015897.STD

16 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.356	7
		0.00 C	-0.05	-139.51	45.00
17 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.331	7
		0.28 T	-0.04	-128.69	46.00
18 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.362	7
		0.00 C	-0.05	-141.79	0.00
19 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.344	7
		0.00 T	0.05	-134.53	45.00
20 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.346	7
		0.00 T	0.04	-134.86	23.00
21 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.344	7
		0.00 T	0.05	-134.53	0.00
22 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.695	7
		0.00 C	-0.01	-126.00	76.00

STAAD SPACE -- PAGE NO. 19
 *FILENAME: 1015897.STD

23 ST	W8X15	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.695	7
		0.00 C	0.01	-126.00	76.00
80 ST	PIPS30	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.324	15
		0.12 C	-9.40	5.38	0.00
81 ST	PIPS30	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.000	8
		0.00 C	-0.01	0.00	0.00
82 ST	PIPS30	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.329	15
		0.24 C	9.42	5.55	0.00
83 ST	PIPS30	(AISC SECTIONS)			

		PASS	Eq. H1-1b	0.000	10
		0.00 C	0.00	-0.01	0.00
84 ST	PIPS30		(AISC SECTIONS)		
		PASS	Eq. H1-1b	0.076	14
		0.22 C	-1.18	2.33	0.00
100 ST	PIPS30		(AISC SECTIONS)		
		PASS	Eq. H1-1b	0.275	7
		4.06 C	-0.01	-10.46	0.00
STAAD SPACE				-- PAGE NO.	20
*FILENAME: 1015897.STD					
101 ST	PIPS30		(AISC SECTIONS)		
		PASS	Eq. H1-1b	0.274	7
		3.95 C	-0.00	10.46	0.00
102 ST	PIPS30		(AISC SECTIONS)		
		PASS	Eq. H1-1b	0.276	7
		4.11 C	0.01	-10.46	0.00
103 ST	PIPS30		(AISC SECTIONS)		
		PASS	Eq. H1-1b	0.274	7
		3.95 C	0.00	10.46	0.00

349. FINISH

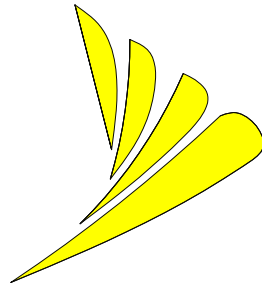
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**** DATE= JUL 10,2018 TIME= 14:53:34 ****

STAAD SPACE -- PAGE NO. 21
*FILENAME: 1015897.STD

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* For technical assistance on STAAD.Pro, please visit *
* http://selectservices.bentley.com/en-US/ *
* *
* Details about additional assistance from *
* Bentley and Partners can be found at program menu *
* Help->Technical Support *
* *
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* http://www.bentley.com *
*****
```

Sprint



SITE NAME: BETEHSDA HILTON
SITE NUMBER: WA90XCI34A
8120 WISCONSIN AVE
BETHESDA, MD 20814

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

entrex
communication services, inc.
6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961

SITE LINK
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-309-4949

SITE INFORMATION

SCOPE OF WORK: (6) PROPOSED ANTENNAS, 2 PER SECTOR
(6) PROPOSED RRU, 2 PER SECTOR
(3) PROPOSED 6X12 HYBRID CABLES
(1) PROPOSED LMR-400 COAX CABLE
(1) PROPOSED ELTEC CABINET
(1) PROPOSED ELTEK BATTERY CABINET
(1) PROPOSED TRANSFORMER
(1) PROPOSED FIBER DISTRIBUTION BOX

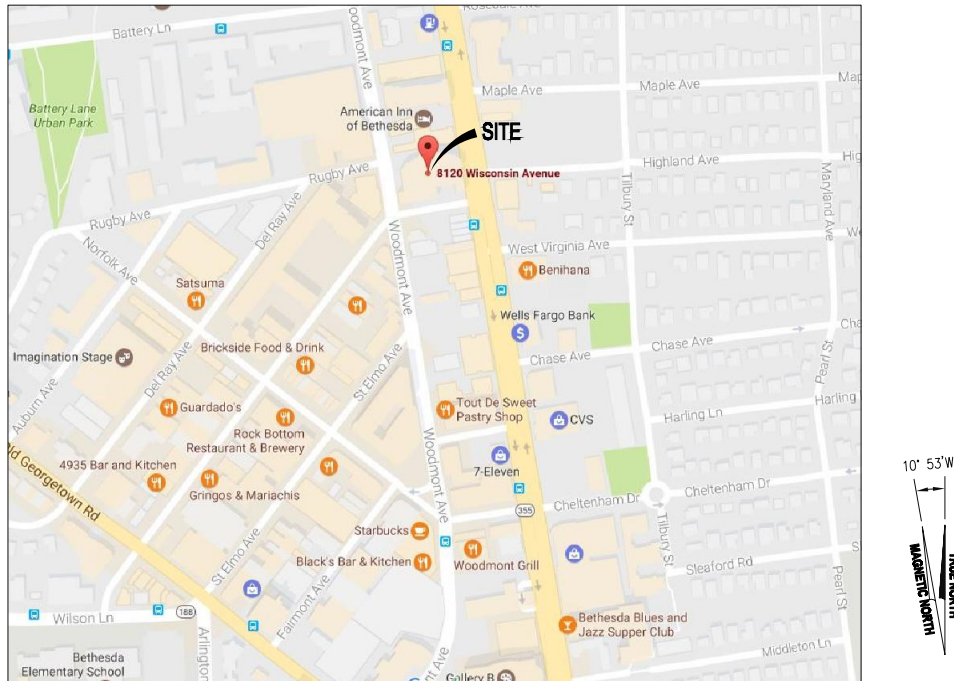
JURISDICTION: MONTGOMERY COUNTY
ZONING: CR-3.0 C-1.0 R2.75 H-90T

PARCEL OWNER: A TBC BETHESDA OWNER LLC
ADDRESS: 3299 K STREET
WASHINGTON DC 20007

STRUCTURE TYPE: ROOFTOP
GROUND ELEVATION: ± 348.1
LATITUDE: N 38° 59' 28.547"
LONGITUDE: W 77° 05' 46.184"

NOTE TO GENERAL CONTRACTOR
NO WORK IS TO BE PERFORMED ON THIS SITE WITHOUT REVIEW OF THE APPROVED STRUCTURAL ANALYSIS. IF ANY DISCREPANCIES ARE FOUND THE GENERAL CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING. AT NO TIME WILL ANY ADDITIONAL ANTENNAS BE INSTALLED WITHOUT WRITTEN CONSENT FROM TOWER ENGINEER.

VICINITY MAP



SCALE: 1" = 2,000'

SHEET INDEX

- T-1 TITLE SHEET
- SP-1 SPECIFICATIONS
- SP-2 SPECIFICATIONS
- SP-3 FIBER DISTRIBUTION CABINET SPECIFICATION
- SP-4 EQUIPMENT CABLING SCHEMATIC
- SP-5 2.5 GHz CABLE COLOR CODING DETAILS
- SP-6 ANTENNA CABLING DIAGRAM
- C-1 SITE PLAN
- A-1 ROOF AND EQUIPMENT LOCATION PLAN
- A-2 NORTH BUILDING ELEVATION
- A-3 SOUTH BUILDING ELEVATION
- A-4 EAST BUILDING ELEVATION
- A-5 WEST BUILDING ELEVATION
- S-1 ANTENNA SCHEDULE AND ANTENNA DETAILS
- S-2 ANTENNA MOUNTING AND CABLE DETAILS
- S-3 EQUIPMENT SUPPORT FRAME PLAN AND DETAILS
- S-4 ELTEX CABINET DETAILS
- S-5 POWER, TELCO AND NID PANEL DETAILS
- E-1 ROOF AND EQUIPMENT LAYOUT PLANS
- E-2 UTILITY AND DC POWER DIAGRAMS
- E-3 ELECTRICAL DETAILS
- E-4 GROUNDING PLAN, DIAGRAM AND DETAILS

WA90XCI34A
BETHESDA HILTON
8120 WISCONSIN AVE
BETHESDA, MD 20814

SEAL:

SUBMITTALS

DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A

PROJECT TEAM

APPLICANT: SPRINT
APC REALTY AND EQUIPMENT COMPANY,
LLC a/b/c SPRINT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

ARCHITECT/ENGINEER: ENTREX COMMUNICATION SERVICES, INC.
6600 ROCKLEDGE DRIVE, SUITE 550
BETHESDA, MD 20817
CAMILLE SHABSHAB (202) 408-0960

SITE LINK: Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-309-4949

CODE COMPLIANCE

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

- 2013 DISTRICT OF COLUMBIA BUILDING CODE
- 2011 NATIONAL ELECTRICAL CODE
- 2015 NFPA 101, LIFE SAFETY CODE
- 2012 DISTRICT OF COLUMBIA FIRE CODE
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	REVISE & RESUBMIT
OWNER REPRESENTATIVE	DATE	☐	☐	☐
SITE ACQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
ZONING	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.
THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"
0 1/2 1
GRAPHIC SCALE IN INCHES
TITLE:
TITLE SHEET
SHEET NUMBER:
T-1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

WEATHERPROOF USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE PERFORMED 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 DR 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 (MMBS) AND RELATED EQUIPMENT:

SUMMARY:

A. THIS SECTION SPECIFIES MMBS 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 DR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED 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 AND 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. MATERIALS AND 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.

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. MATERIALS AND 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 SYSTEMS.

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 PANELBOARD.

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 POLYVINYL CHLORIDE (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 REQUIRED 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 LOCK NUT 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 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, COOPER, 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-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 EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH EXOTHERMIC 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 LOCK NUT ON OUTSIDE AND INSIDE.

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



6391 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251



6600 Rockledge Drive, Suite 550
Bethesda, MD 20817
PHONE: (202) 408-0960
FAX: (202) 408-0961



Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, MD 21227
www.sitelinkwireless.com
410-308-4849

WA90XC134A
BETHESDA HILTON
8120 WISCONSIN AVE
BETHESDA, MD 20814

SEAL:

SUBMITTALS		
DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.
THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"

01/21

GRAPHIC SCALE IN INCHES

TITLE:

SPECIFICATIONS

SHEET NUMBER:

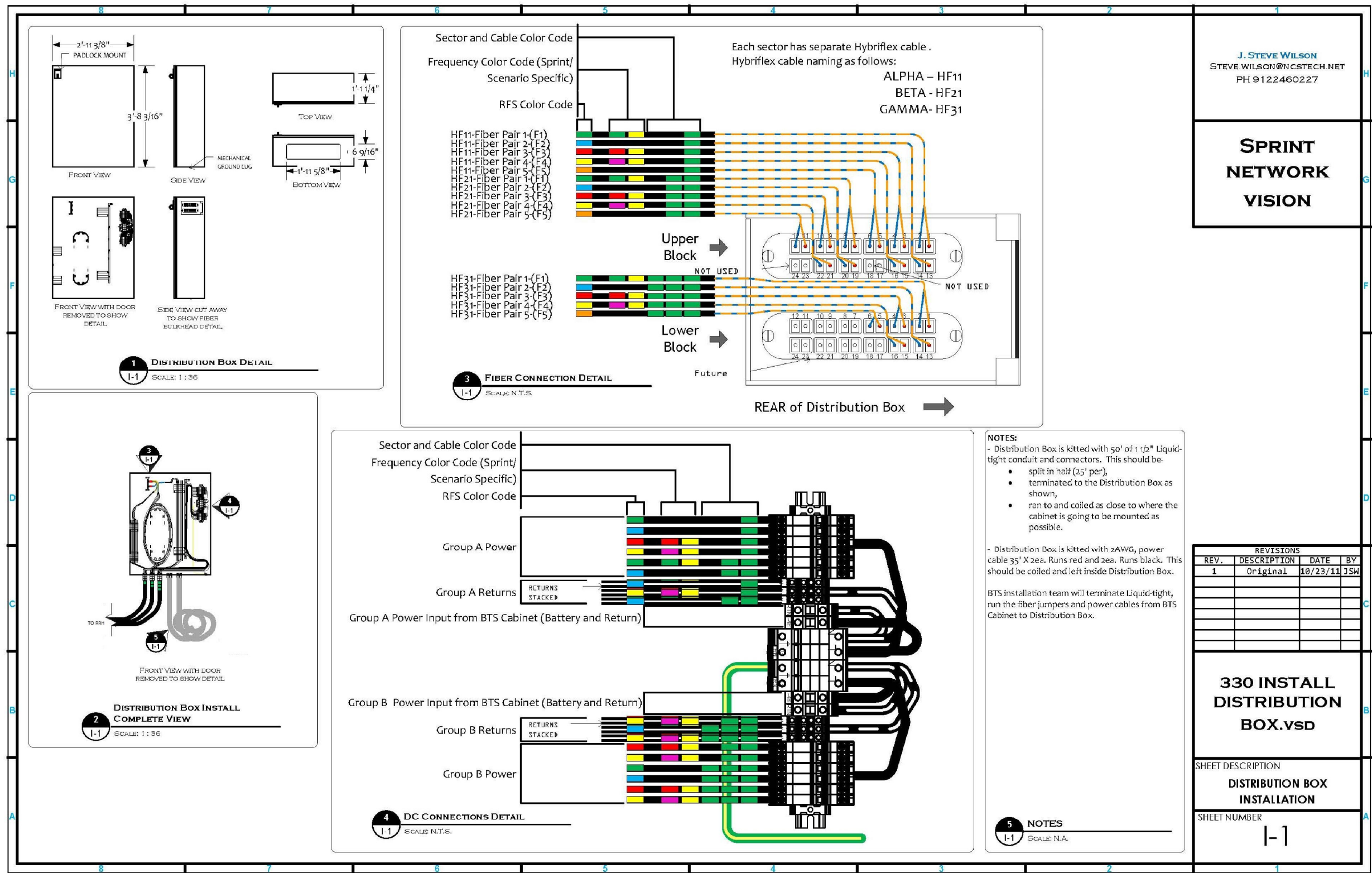
SP-2

SEAL:

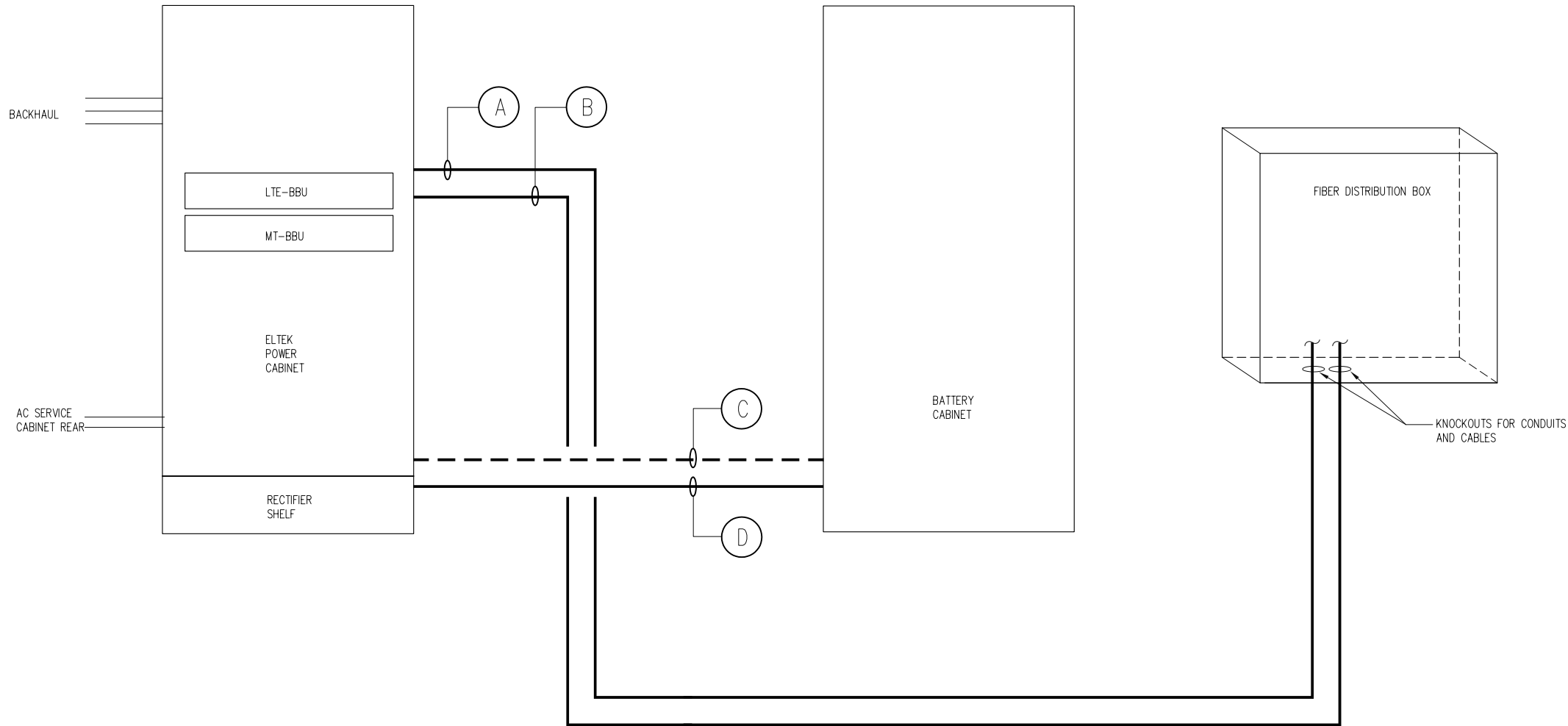
SUBMITTALS

DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A

PROJECT NO:	1015.897
DESIGNER:	L.P.
ENGINEER:	C.S.
THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"x34"	
0 1/2 1 GRAPHIC SCALE IN INCHES	
TITLE:	
FIBER DISTRIBUTION CABINET SPECIFICATION	
SHEET NUMBER:	
SP-3	



- A- (1) 1-1/2" LFMC FOR DC POWER FROM POWER CABINET
TO FIBER DISTRIBUTION BOX
B- (1) 1-1/2" LFMC FOR NV FIBER FROM POWER CABINET
TO FIBER DISTRIBUTION BOX
C- (1) 1-1/2" GALVANIZED RMC FOR BATTERY ALARM CABLES
D- (1) 2" GALVANIZED RMC DC POWER CONDUIT WITH
4- 1 AWG CONDUCTORS



EQUIPMENT CABLING SCHEMATIC
SCALE: N.T.S.

1
SP-4

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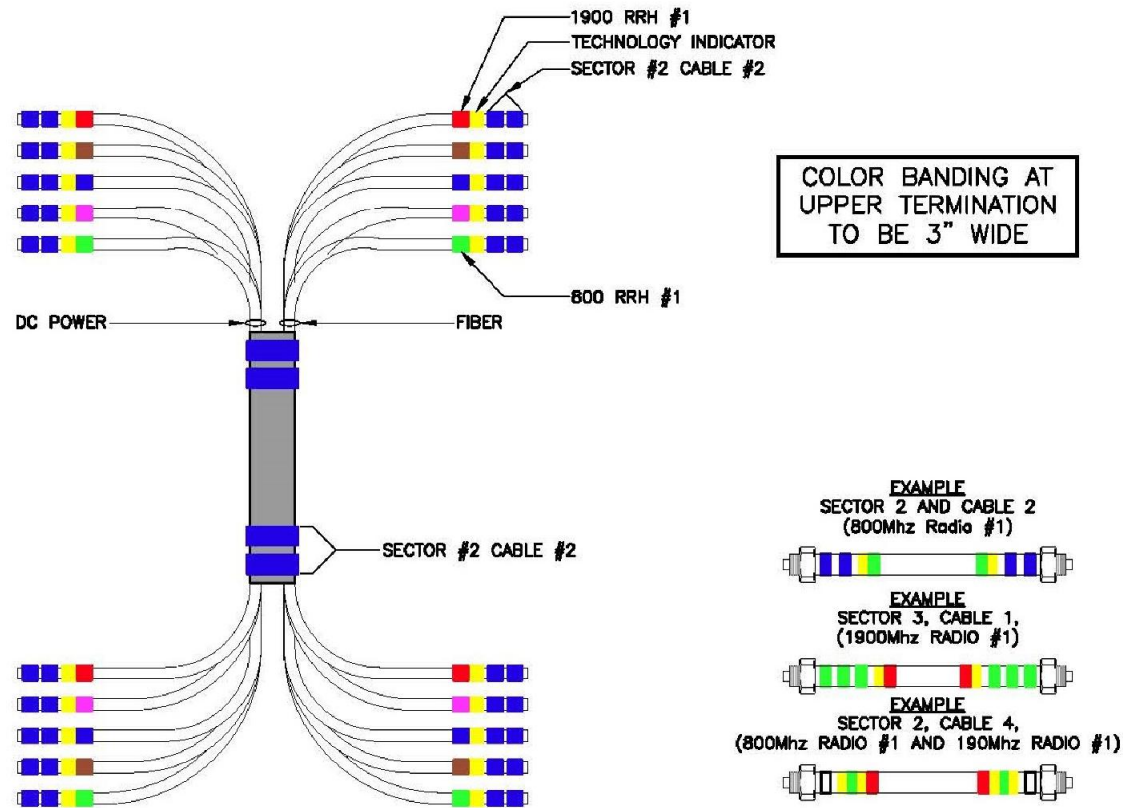
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BETHESDA, MD 20814

SEAL:

SUBMITTALS		
DATE	DESCRIPTION	REV.
07-06-18	CONSTRUCTION REVIEW	A

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.
THESE DRAWINGS ARE FORMATTED
TO BE FULL-SIZE AT 22"x34"
0 1/2 1
GRAPHIC SCALE IN INCHES
TITLE:
**EQUIPMENT
CABLING
SCHEMATICS**
SHEET NUMBER:
SP-4

TECHNOLOGY COLOR CODE	FIRST RING	SECOND RING
800 #1	YELLOW	GREEN
1900 #1	YELLOW	RED
1900 #2	YELLOW	BROWN
1900 #3	YELLOW	BLUE
1900 #4	YELLOW	GREY
800 #1	YELLOW	ORANGE
2500 #1	YELLOW	WHITE
2500 #2	YELLOW	PURPLE



2500MHz RADIO CALIBRATION CABLE COLOR CODE

2500MHz #1 CAL CABLE - SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW		YELLOW	WHITE		
2 BETA	2	YELLOW	YELLOW		YELLOW	WHITE	
3 GAMMA	3	YELLOW	YELLOW	YELLOW		YELLOW	WHITE

2500MHz #2 CAL CABLE - SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW		YELLOW	PURPLE		
2 BETA	2	YELLOW	YELLOW		YELLOW	PURPLE	
3 GAMMA	3	YELLOW	YELLOW	YELLOW		YELLOW	PURPLE

INFORMATION TAKEN FROM SPRINT'S TECHNICAL SPECIFICATIONS "ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS."
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FIBER CABLE COLOR CODING 2.5 GHz

SCALE: N.T.S

1
SP-5

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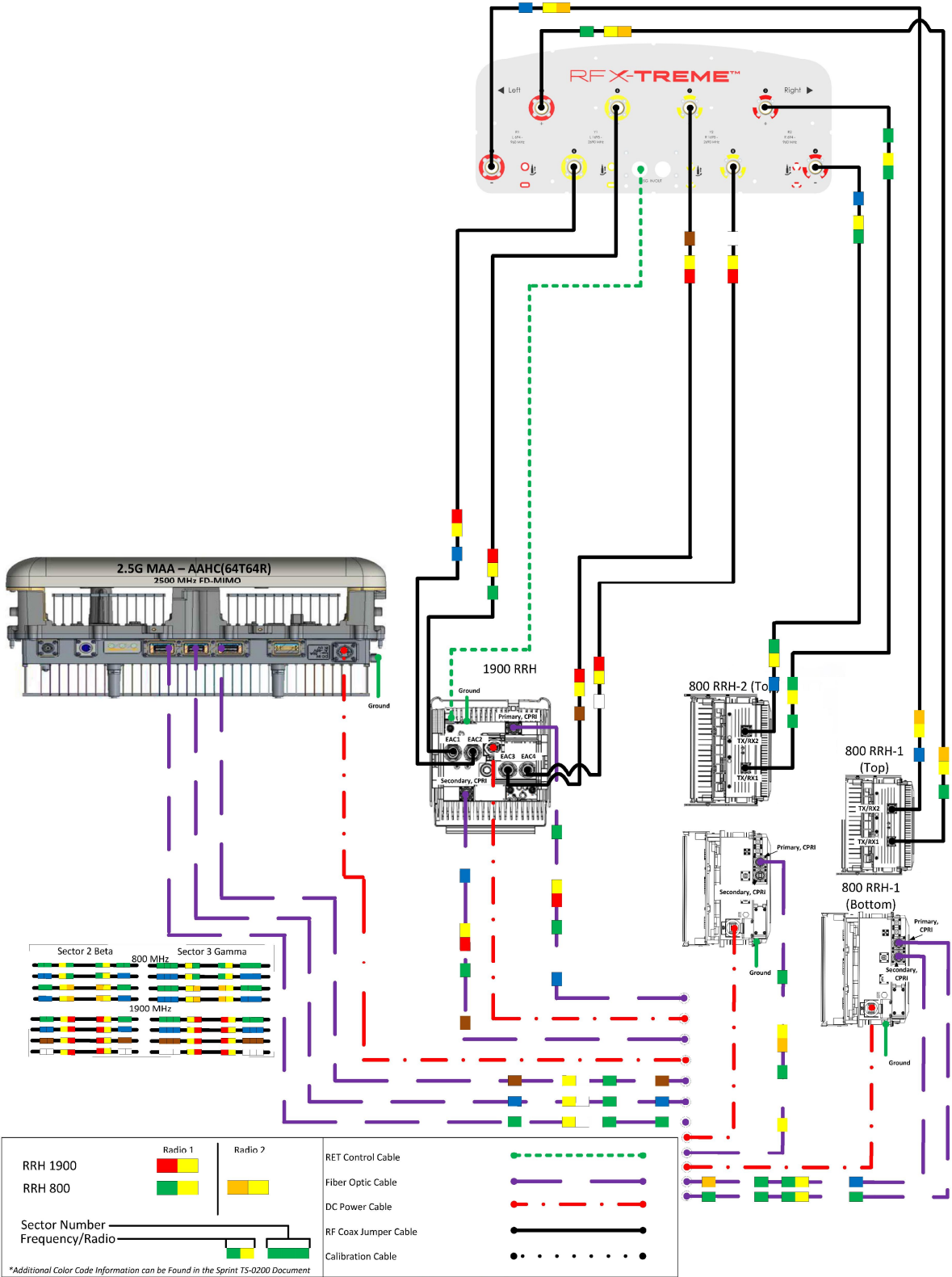
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GRAPHIC SCALE IN INCHES

TITLE:
**2.5 GHz CABLE
COLOR CODING
DETAILS**

SHEET NUMBER:
SP-5



ALU 21-MIMO APXVBLL15X_43-C-I20 wo Filters



ANTENNA CABLING DIAGRAM
SCALE: N.T.S

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GRAPHIC SCALE IN INCHES
TITLE:

ANTENNA CABLING
DIAGRAM

SHEET NUMBER:

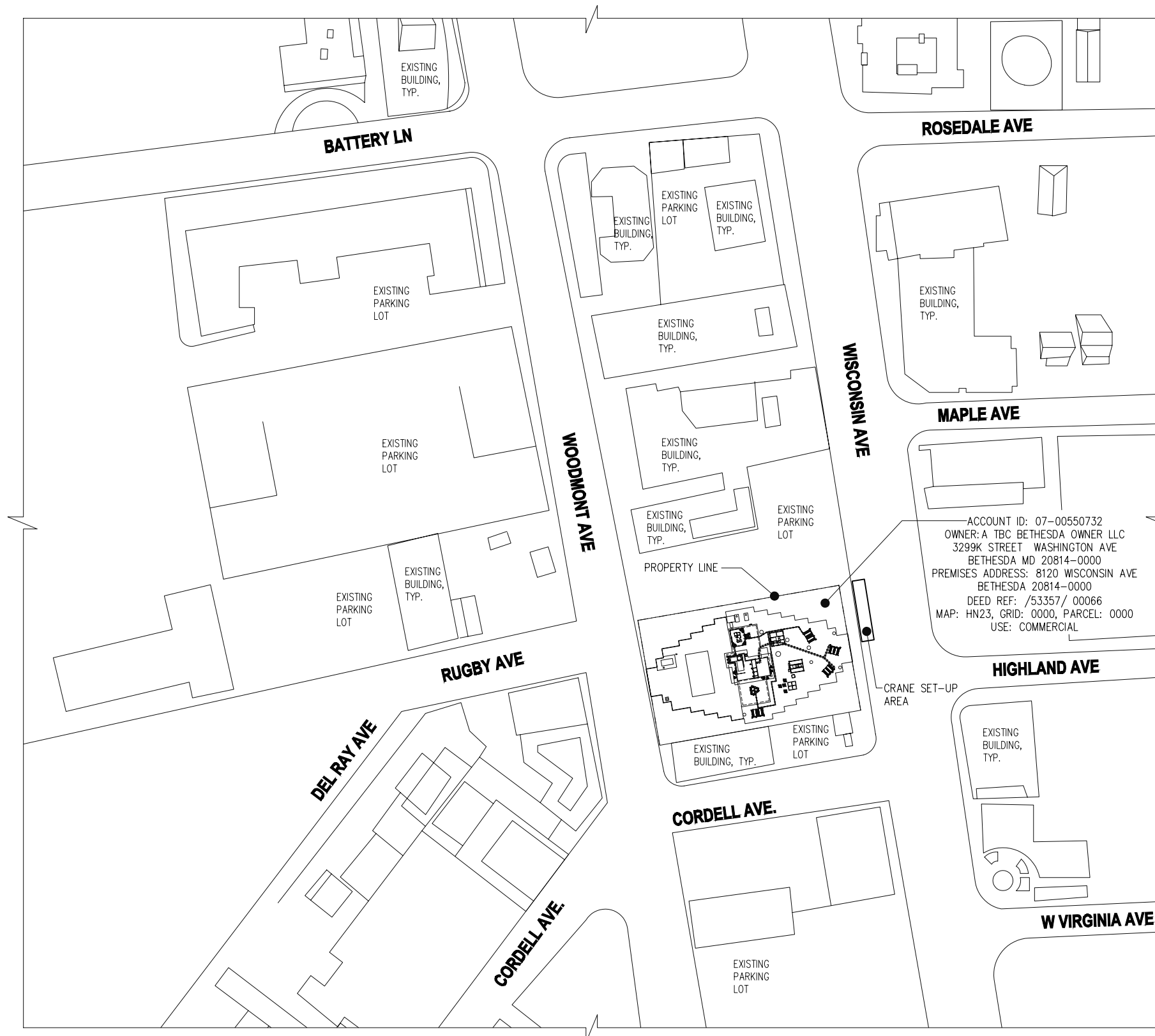
SP-6



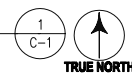
SEAL:

[illegible]

C-1



SCALE: 1" = 60'





- 

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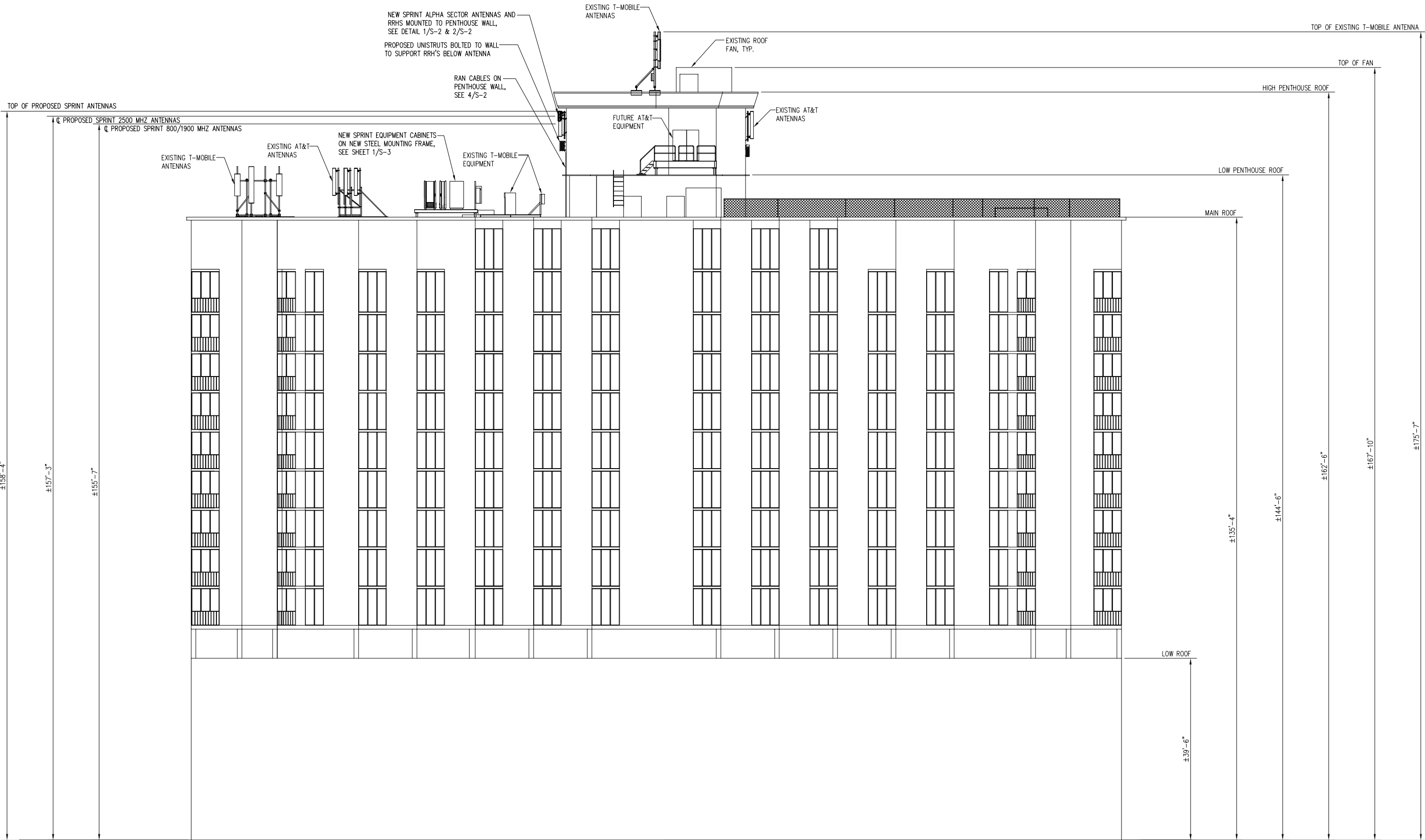


TITLE:

ROOF AND EQUIPMENT LOCATION PLAN

SHEET NUMBER:

A-1



NORTH BUILDING ELEVATION
SCALE: 3/32"=1'-0"



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01/21

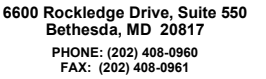
GRAPHIC SCALE IN INCHES

TITLE:

NORTH BUILDING
ELEVATION

SHEET NUMBER:

A-2

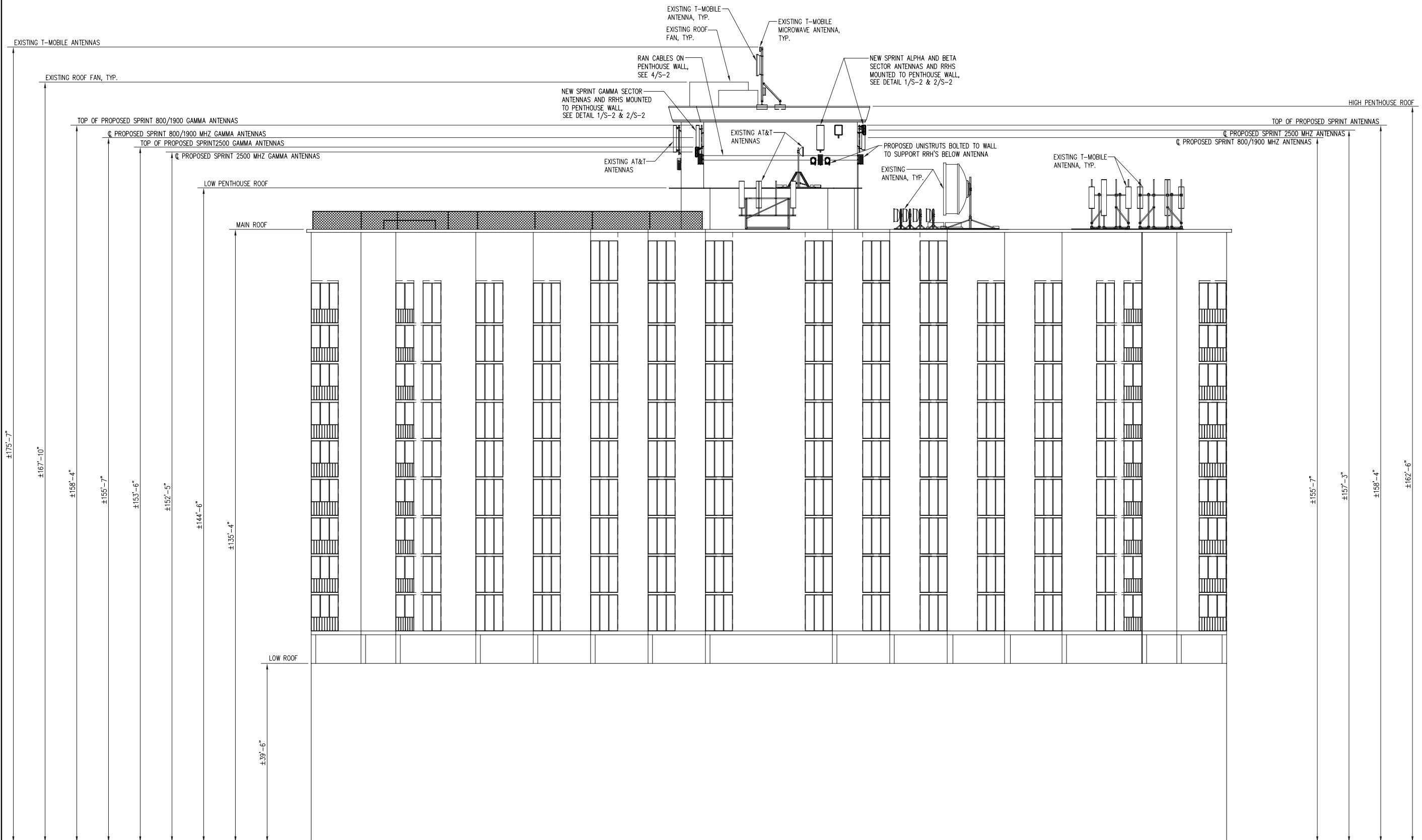


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DATE	DESCRIPTION	REV.
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0 1/2 1
GRAPHIC SCALE IN INCHES

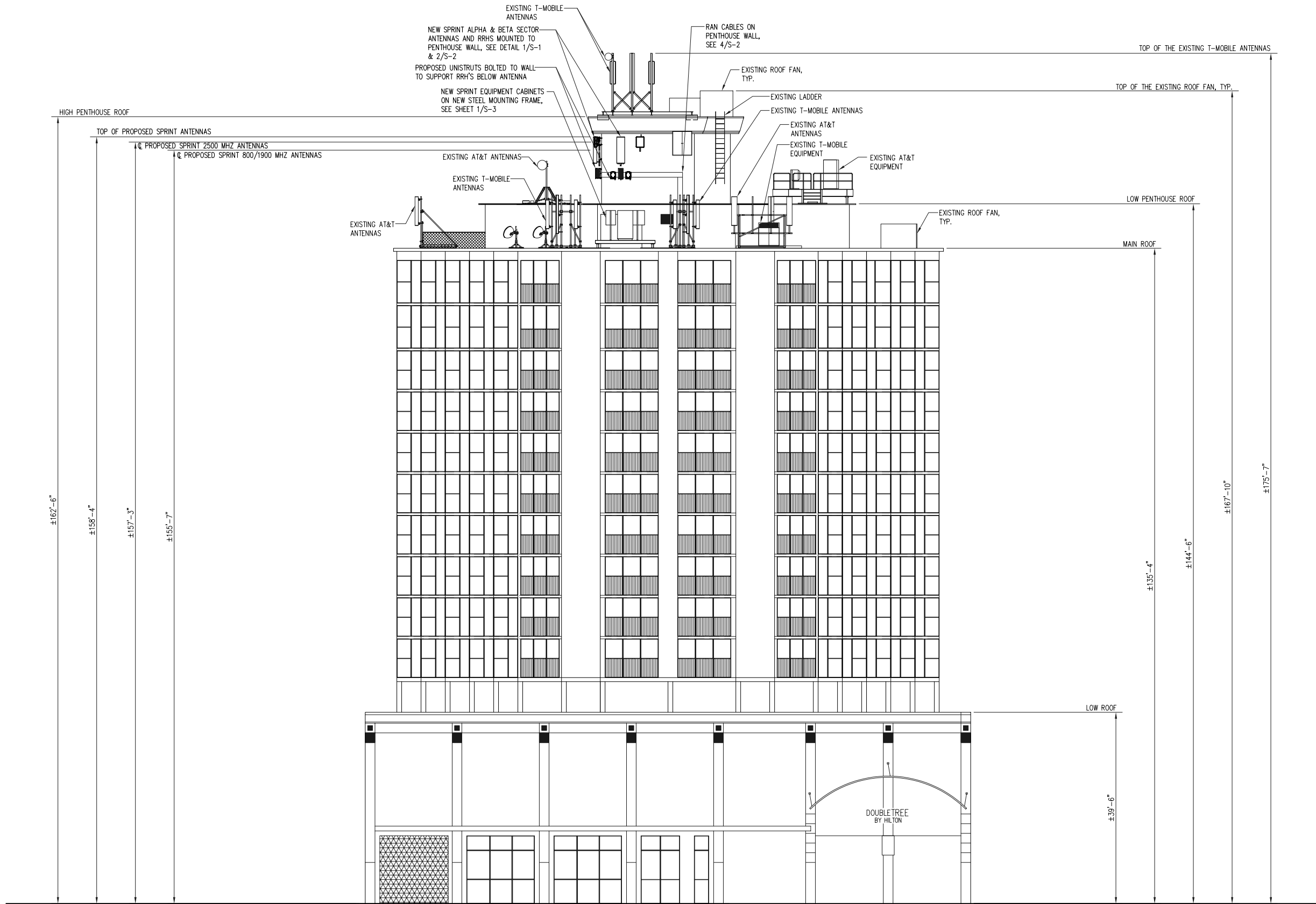
A-3



SCALE: $3/32"=1'-0"$

1

A—



EAST BUILDING ELEVATION

SCALE: 3/32"=1'-0"

1
A-4



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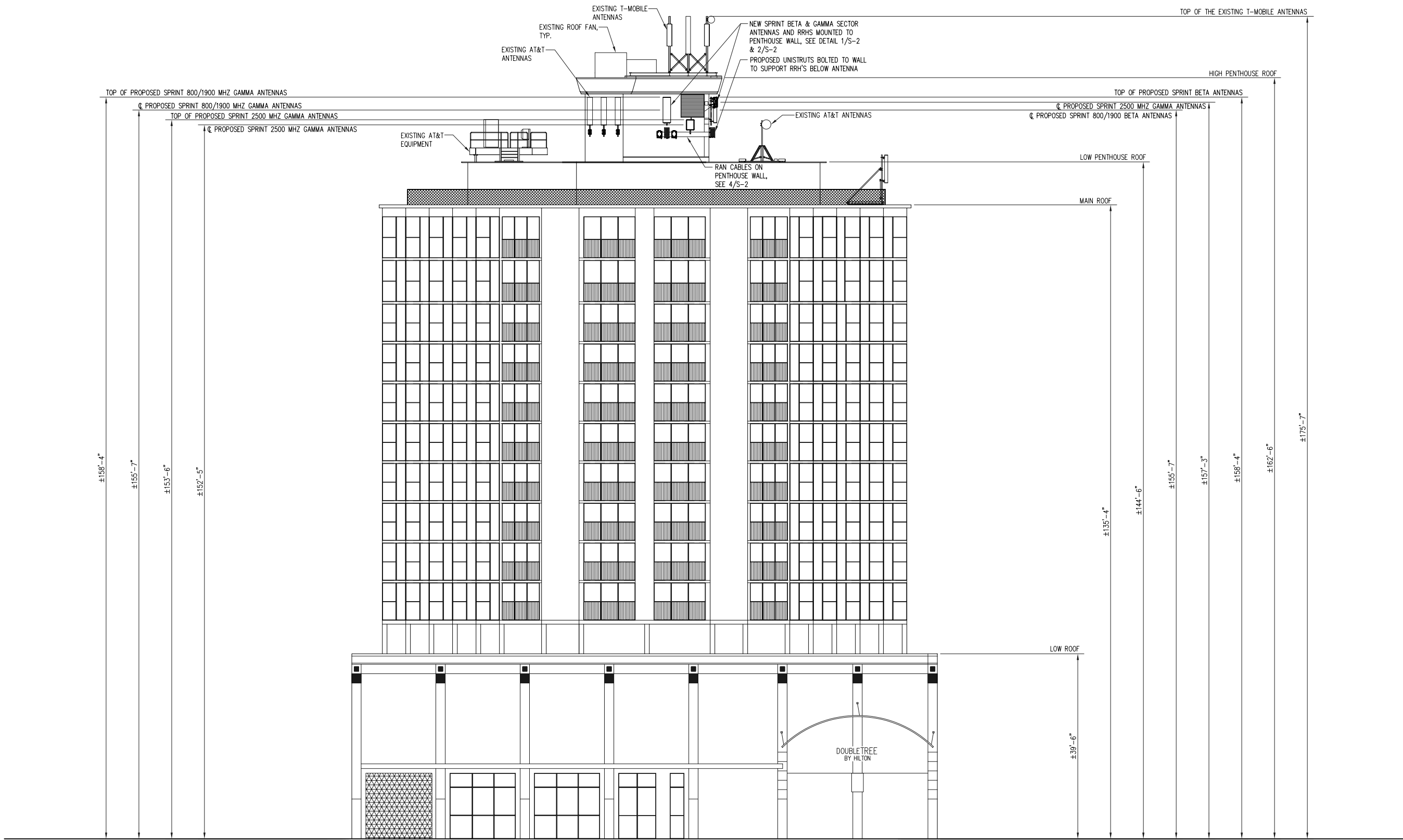
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TITLE:
EAST BUILDING
ELEVATION
SHEET NUMBER:
A-4



WEST BUILDING ELEVATION

SCALE: 3/32"=1'-0"

1
A-5

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ENGINEER: C.S.

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TITLE:

WEST BUILDING
ELEVATION

SHEET NUMBER:

A-5

ANTENNA AND COAXIAL CABLE SCHEDULE (NO FINAL RFDS)														
SECTOR		AZIMUTH	RAD CENTER	TECHNOLOGY	ANTENNA MODEL #	MECHANICAL DOWN-TILT	ELECTRICAL DOWN-TILT	RRH	FILTER	COMBINER MODEL #	COAXIAL CABLE SIZE	CABLE LENGTH	JUMPER LENGTH	COLOR CODE
AP/PA	A-1	45°	157°-3"	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.625"H x 19.375"W x 9.875"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-5/8 HYBRID 4 AWG/5 PAIR 290F	65'	10'-0" (LCF12-50J)	SEE NOTE 9.
	A-2	45°	155°-7"	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
BETA	B-1	160°	157°-3"	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.625"H x 19.375"W x 9.875"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-1/4 HYBRID 6 AWG/4 PAIR 80F	75'	10'-0" (LCF12-50J)	SEE NOTE 9.
	B-2	160°	155°-7"	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
GAMMA	C-1	280°	152°-5"	2.5 GHz	NOKIA 2.5 GMAA-AAHC(64T64R) (25.625"H x 19.375"W x 9.875"D)	0°	0°	INTEGRATED RRH IN ANTENNA	-	-	(1) 1-1/4 HYBRID 4 AWG/4 PAIR 120F	110'	10'-0" (LCF12-50J)	SEE NOTE 9.
	C-2	280°	155°-7"	800/1900 MHz	APXVBLL15X-43-C-I20 (66.7"H x 19.6" W x 8.5"D)	0°	0°	(1) RRH 4x45-1900 (2) RRH 2x50-800	-	-	SHARED HYBRID CABLE	-	-	-
GPS	-	-	-	1575 MHZ	PCTEL TMG-HR-26N	-	-	-	-	-	1/2"Ø	155'	-	-

CABLE MINIMUM BEND RADIUS	
1/2"Ø JUMPER	HYBRIFLEX
5"	20"

COLOR CODE	
W	WHITE
Br	BROWN
G	GREEN
R	RED
Bl	BLUE
P	PURPLE
	YELLOW

ANTENNA AND RF CABLE NOTES

1. ANTENNAS SHALL BE FURNISHED WITH MOUNTING BRACKETS.
2. PROVIDE 1/2" DIAMETER JUMPER CABLE 10'-0" MAXIMUM LENGTH FROM ANTENNA TO RRH.
3. ANTENNA CENTERLINE HEIGHT IS IN REFERENCE TO ELEVATION 0.0'.
4. CONTRACTOR SHALL INSTALL COLOR CODE RINGS ON EACH END OF JUMPER CABLES AND JUMPER CABLES WITH UV RESISTANT TAPE. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLOR TAPE OR STENCIL TAG. COLOR TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRONIC. THE FIRST RING IS THE CLOSEST TO THE END OF THE CABLE. WRAP 2" COLORED TAPE A MINIMUM OF 3 TIMES AROUND THE CIRCUMFERENCE OF THE COAX, KEEPING THE TAPE IN THE SAME AREA AS MUCH AS POSSIBLE. THIS WILL ALLOW THE REMOVAL OF THE TAPE THAT WILL FADE OR DISCOLOR DUE TO WEATHER.
5. PROVIDE PHOTOGRAPHS SHOWING COMPLETE INSTALLATION OF THE ANTENNA MOUNTS, WEATHERPROOFING AND CABLE CODING.
6. THE NORTH ARROW ON THE PLANS REFERS TO TRUE NORTH. THE CONTRACTOR SHALL VERIFY THE NORTH REFERENCE PRIOR TO CONSTRUCTION AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCY.
7. THE CONTRACTOR SHALL SUPPLY ALL CONNECTION HARDWARE TO SECURE THE RF CABLES. ALL CONNECTION HARDWARE SHALL BE STAINLESS STEEL.
8. THE OWNER SHALL FURNISH THE ANTENNAS, THE RF RADIO EQUIPMENT AND OTHER MATERIALS FOR THE PROJECT. THE CONTRACTOR SHALL VERIFY WITH THE OWNER THE MATERIALS TO BE FURNISHED PRIOR TO SUBMITTING A BID.
9. REFER TO SPRINT STANDARD CABLE COLOR CODING DETAILS.
10. THE CABLE LENGTHS ARE MEASURED FROM THE FIBER DISTRIBUTION CABINET THE THE RADIO HEADS. THE CONTRACTOR SHOULD VERIFY LENGTHS PRIOR TO ORDERING CABLES.



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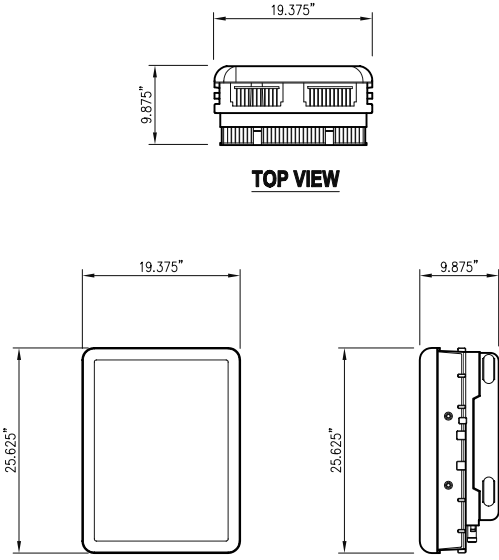
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GRAPHIC SCALE IN INCHES

ANTENNA SCHEDULE AND ANTENNA, DETAILS

SHEET NUMBER:

S-1



TOP VIEW

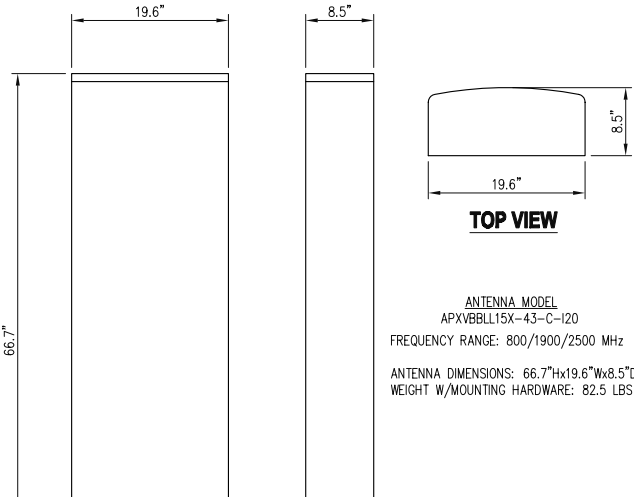
FRONT VIEW

SIDE VIEW

ANTENNA MANUF.: NOKIA
MODEL: 2.5 GMAA-AAHC(64T64R)
FREQUENCY RANGE: 2490-2600 MHz
2600-2690 MHz
ANTENNA DIMENSIONS: 25.625" H x 19.375" W x 9.875" D
WEIGHT WITH MOUNTING HARDWARE: 103.5 LBS

NOKIA MIMO DETAILS
SCALE: 1"=1'-0"

1
S-1



TOP VIEW

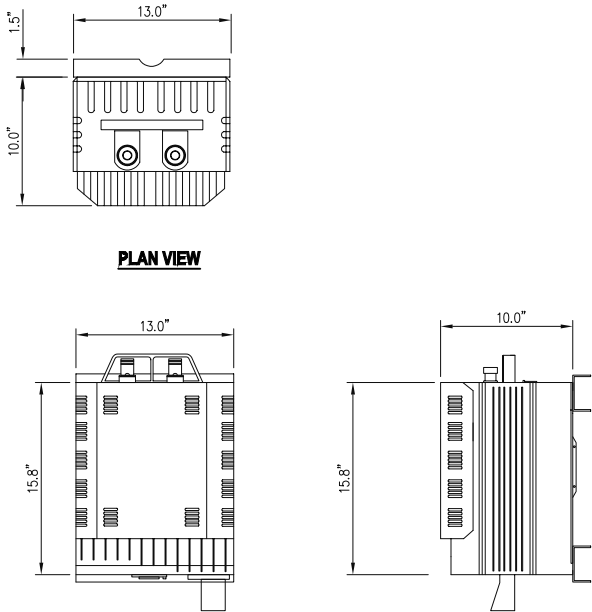
FRONT VIEW

SIDE VIEW

ANTENNA MODEL
APXVBLL15X-43-C-I20
FREQUENCY RANGE: 800/1900/2500 MHz
ANTENNA DIMENSIONS: 66.7"Hx19.6"Wx8.5"D
WEIGHT W/MOUNTING HARDWARE: 82.5 LBS

APXVBLL15X_43-C-I20 DETAIL
SCALE: 1"=1'-0"

2
S-1



PLAN VIEW

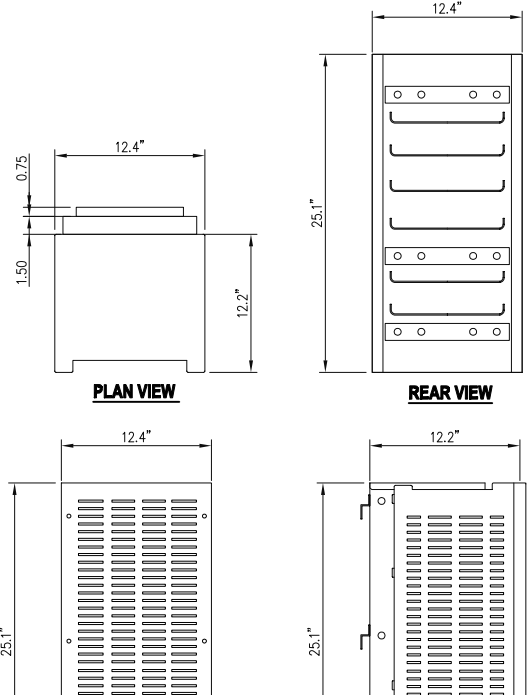
FRONT VIEW

SIDE VIEW

MODEL: ALU 800_2X45
DIMENSIONS: 15.8"Hx13"Wx10"D
RRH WEIGHT W/MOUNTS: ±60 LBS

800 MHz RRH DETAIL
SCALE: 1-1/2"=1'-0"

3
S-2



PLAN VIEW

FRONT VIEW

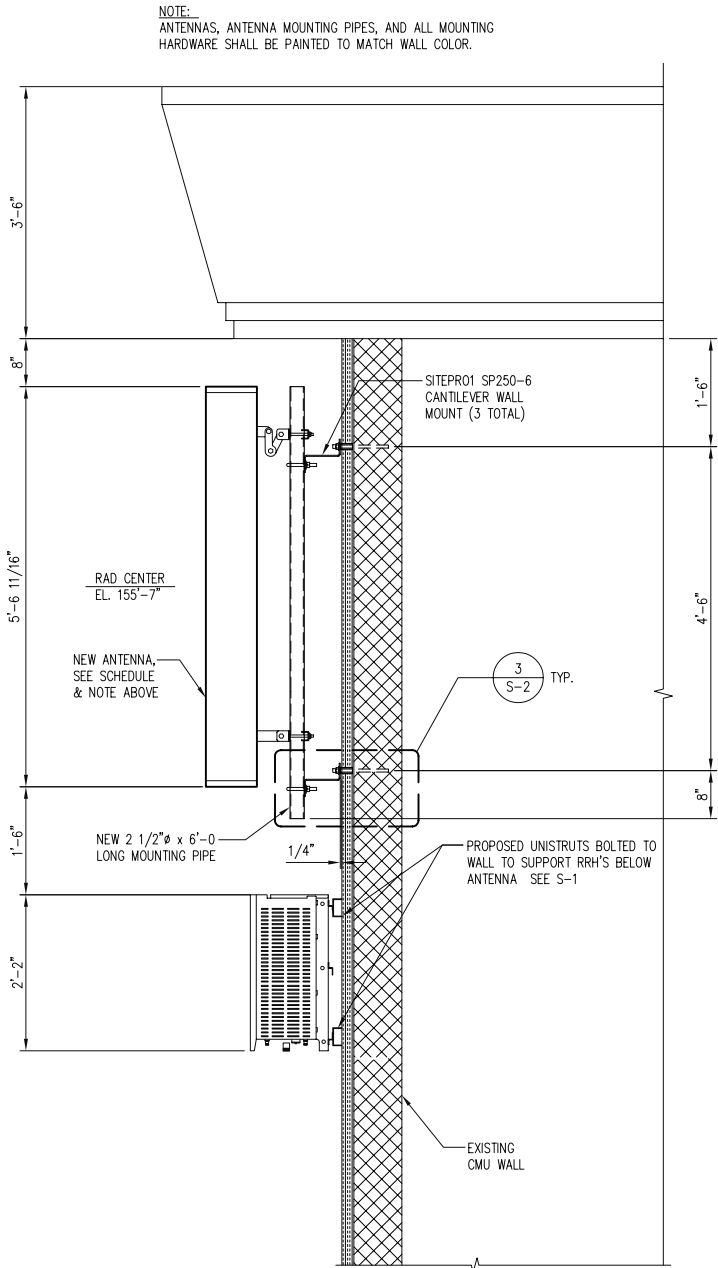
REAR VIEW

SIDE VIEW

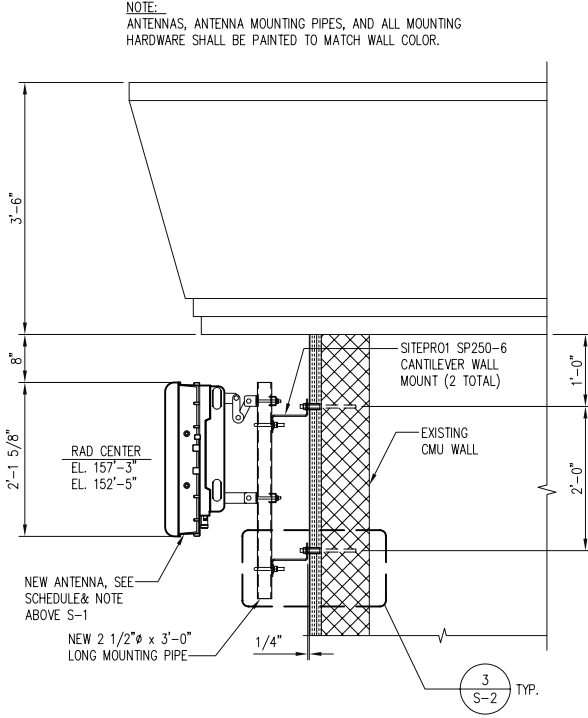
MODEL: ALU 1900 4X45
DIMENSIONS: 25.1"Hx12.4"Wx12.2"D
RRH WEIGHT W/MOUNTS: ±75 LBS

1900 MHz RRH DETAIL
SCALE: 1-1/2"=1'-0"

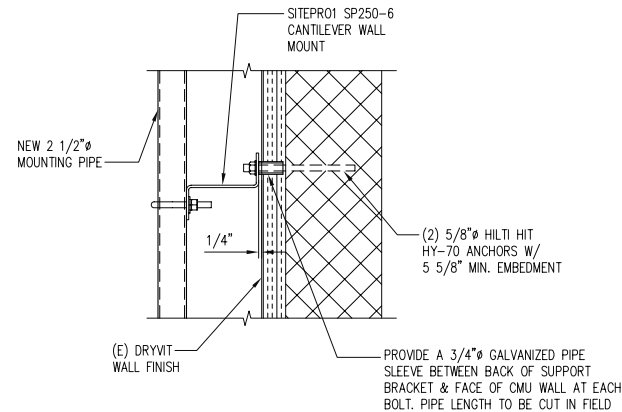
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S-2



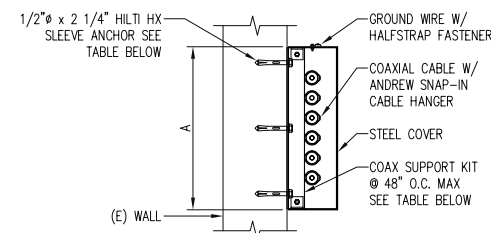
NEW ANTENNA SECTION
SCALE: 3/4"=1'-0"



NEW ANTENNA SECTION
SCALE: 3/4"=1'-0"



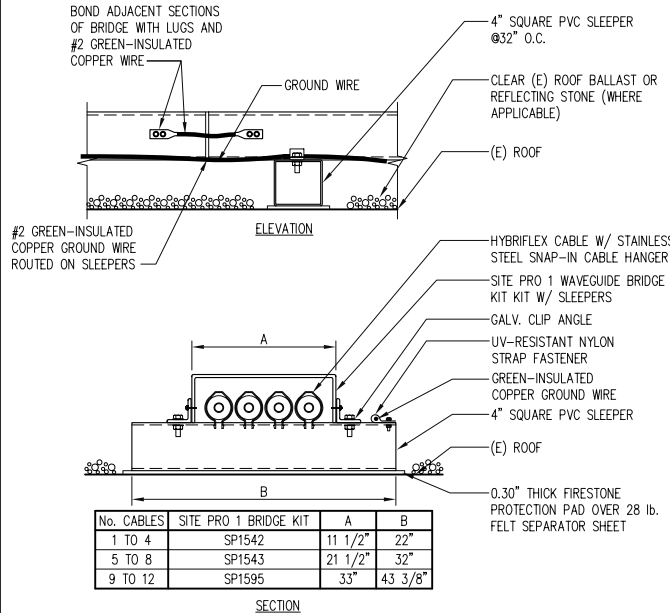
CONNECTION DETAIL
SCALE: 1-1/2"=1'-0"



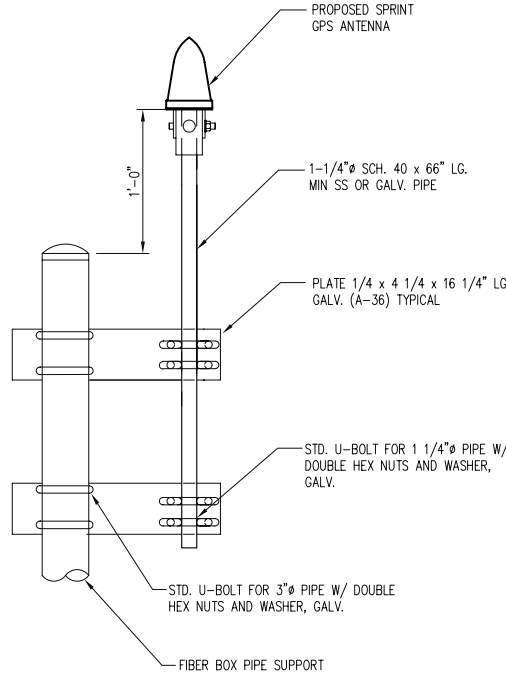
No. CABLES	MICROFLECT COAX SUPPORT KIT	No. OF ANCHORS	A
1 TO 4	B1589	2	11 1/2"
5 TO 8	B1590	3	21 1/2"
9 TO 12	B1591	3	30 1/2"

- NOTES
1. USE STAINLESS STEEL ANCHORS INTO CONCRETE. USE CARBON STEEL ANCHORS INTO BRICK OR MASONRY. USE TOGGLE BOLTS INTO STUD WALLS.
 2. ANCHOR TO BE INSTALLED IN 1/2" Ø HOLES DRILLED W/ HILTI CARBIDE TIPPED DRILL BITS. ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
 3. PAINT CABLE COVER TO MATCH WALL COLOR.

COAX SUPPORT BRACKET DETAIL
SCALE: 1"=1'-0"



CABLE BRIDGE DETAIL
SCALE: 1-1/2"=1'-0"



GPS ANTENNA MOUNTING DETAIL
SCALE: 1-1/2"=1'-0"

STRUCTURAL NOTES

1. THE DESIGN REQUIREMENTS FOR THE PROJECT ARE PER THE INTERNATIONAL BUILDING CODE 2015. THE WIND SPEED UTILIZED FOR DESIGN IS 115 MPH (RISK CATEGORY 2). THE DESIGN REQUIREMENTS FOR THE ANTENNA SUPPORT STRUCTURES ARE PER THE TIA/EIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES. THE DESIGN LIVE LOAD ON THE PLATFORM IS 30 PSF.
2. THE INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED BY FIELD MEASUREMENT. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH CONSTRUCTION.
3. THE GENERAL CONTRACTOR AND HIS SUB CONSULTANTS SHALL BE RESPONSIBLE FOR OBTAINING ALL BUILDING AND OR TRADE PERMITS AND INSPECTIONS THAT MAY BE REQUIRED FOR THE WORK.
4. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS – ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN INCLUDING THE COMMENTARY AND THE AISC CODE OF STANDARD PRACTICE.
5. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A36. STRUCTURAL STEEL PIPES SHALL CONFORM TO ASTM A53 GRADE B. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GRADE B. ALL STRUCTURAL STEEL COMPONENTS AND FABRICATED ASSEMBLIES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. COLD GALVANIZE ALL FIELD PUNCHED HOLES, FIELD CUT SURFACES OR SURFACES WHERE GALVANIZE SURFACE IS DAMAGED.
6. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.1 STRUCTURAL WELDING CODE – STEEL (LATEST EDITION). WELD ELECTRODES SHALL BE E70XX UNLESS NOTED OTHERWISE.
7. STRUCTURAL THREADED FASTENERS FOR STEEL ANTENNA MOUNTING ASSEMBLIES SHALL CONFORM TO ASTM A307 OR ASTM A36. STRUCTURAL FASTENERS FOR STRUCTURAL STEEL FRAMING SHALL CONFORM TO ASTM A325. STRUCTURAL FASTENERS SHALL BE 5/8" DIAMETER BEARING TYPE CONNECTIONS WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE FOR ANGLES. STRUCTURAL FASTENERS SHALL BE 3/4" DIAMETER BEARING TYPE CONNECTIONS WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE FOR ALL OTHER STRUCTURAL SHAPES. ALL EXPOSED STRUCTURAL FASTENERS, NUTS AND WASHERS SHALL BE HOT DIP GALVANIZED UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE EQUIPMENT FRAME FOR REVIEW AND APPROVAL OF THE ENGINEER PRIOR TO FABRICATION.

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communication services, inc.

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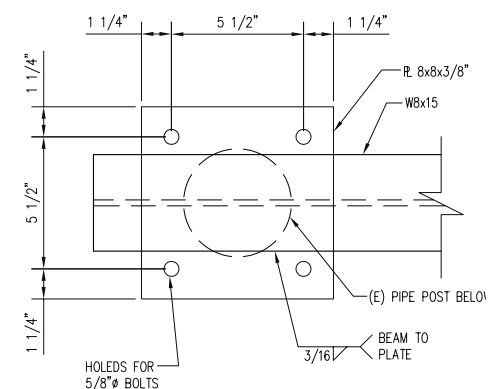
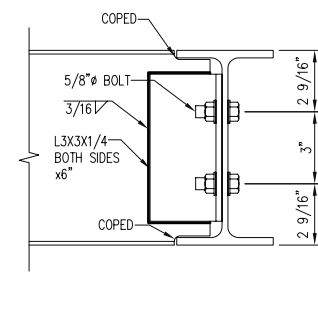
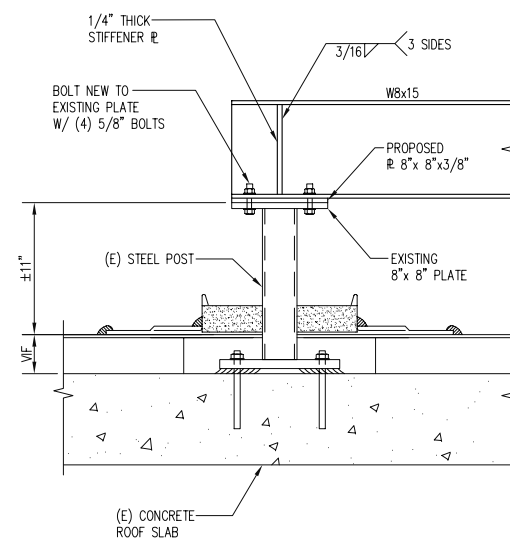
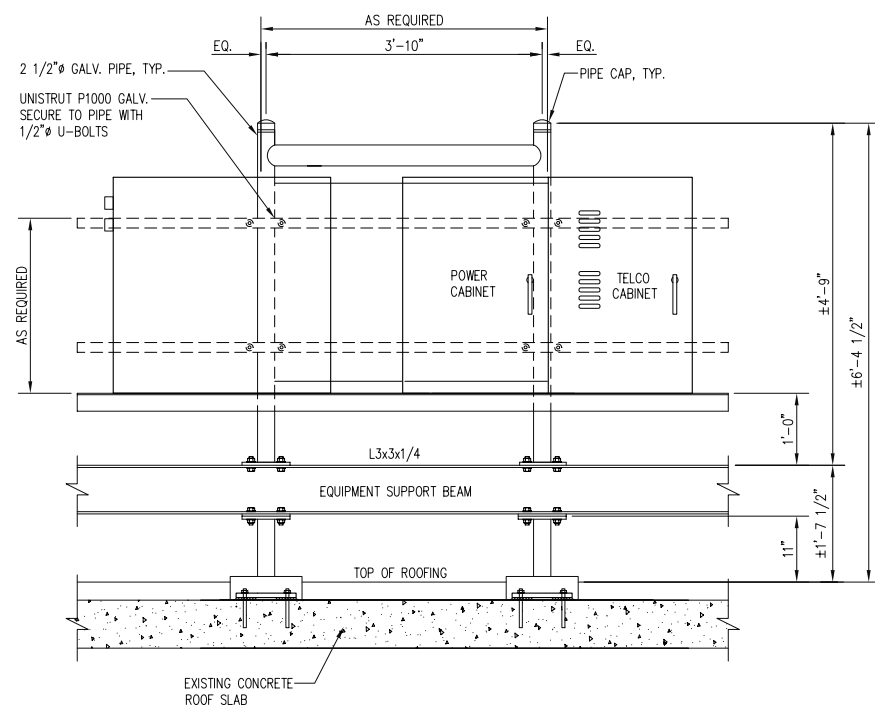
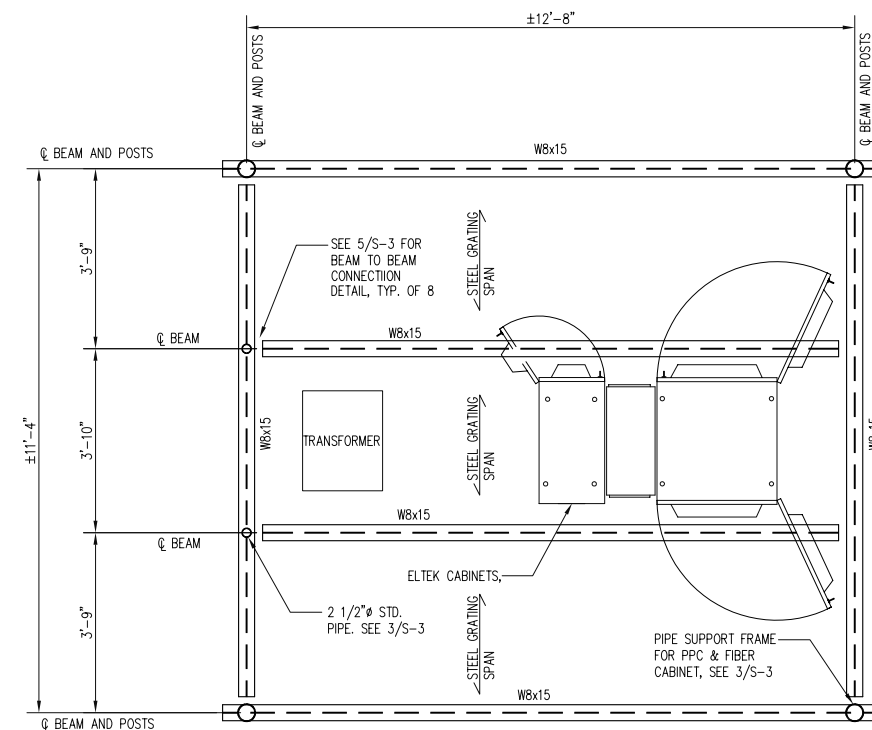
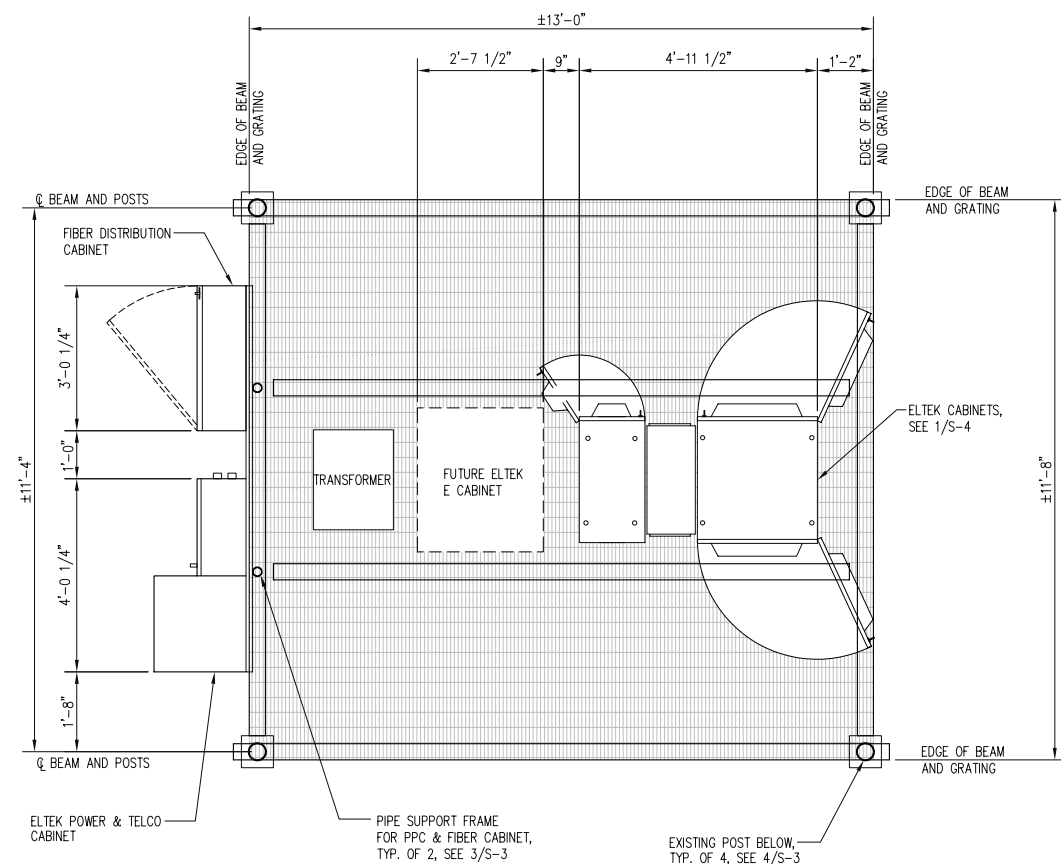
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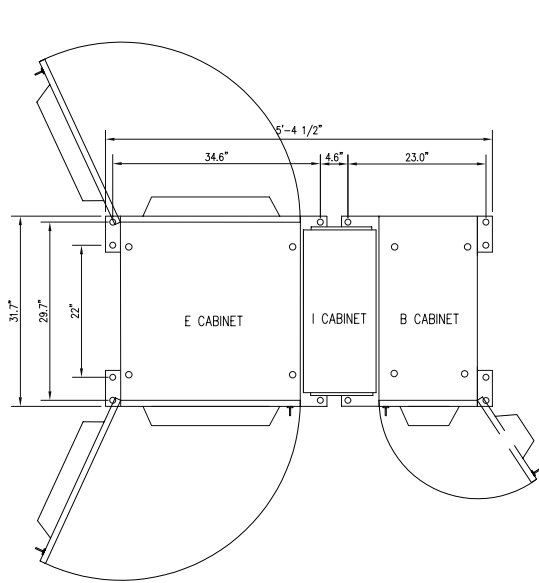
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**ANTENNA MOUNTING
AND CABLE DETAILS**

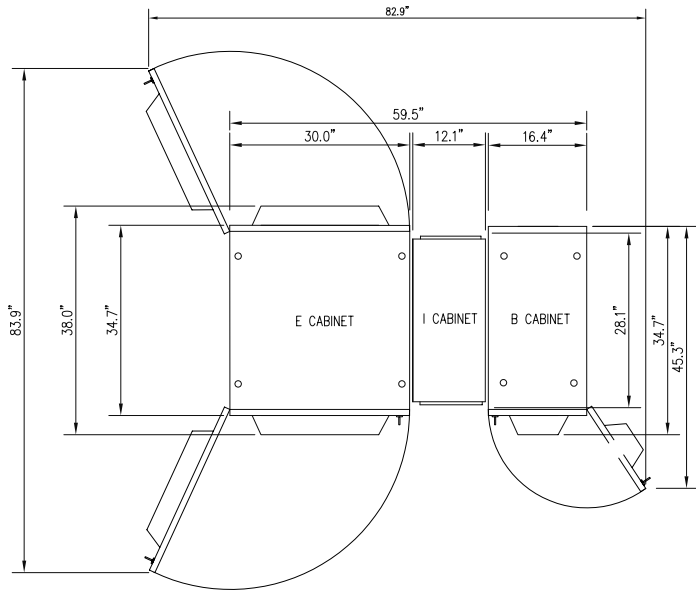
SHEET NUMBER:

S-2

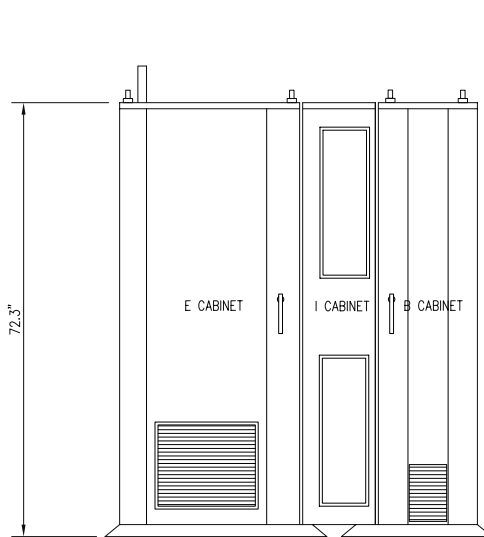
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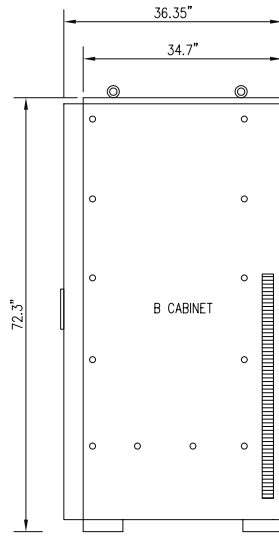
MOUNTING PLAN



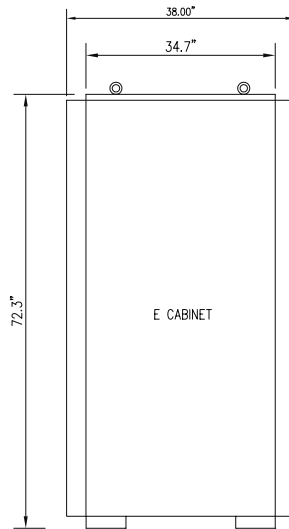
TOP PLAN VIEW



FRONT VIEW



RIGHT SIDE VIEW

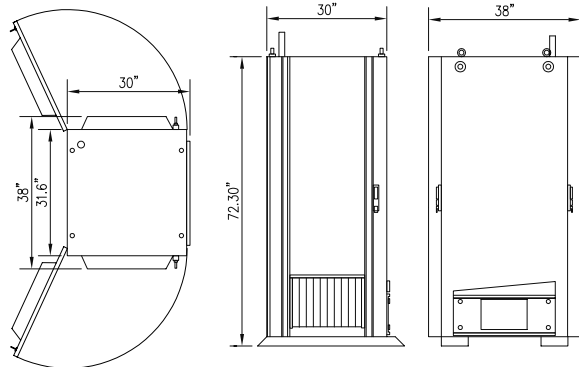


LEFT SIDE VIEW

ELTEK E, I AND B CABINET DETAILS

SCALE: 3/4" = 1'-0"

1
S-4



TOP PLAN VIEW

FRONT VIEW

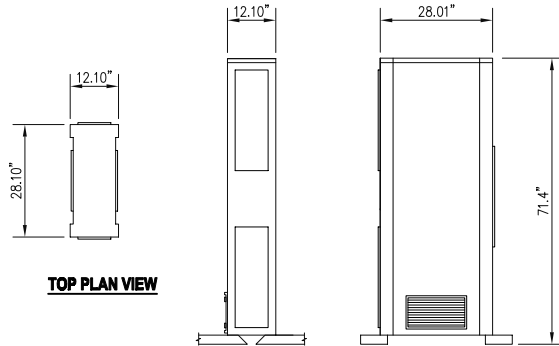
RIGHT SIDE VIEW

- NOTES:
1. ELTEK E-CABINET MODEL NUMBER: ES0A220-SCA02
 2. THE CABINET DESIGN WEIGHT IS 1,400 LBS
 3. SECURE THE CABINET TO THE GRATING WITH (4) 1/2" STAINLESS STEEL THRU BOLTS WITH 1/8" X 1"X1" PLATE WASHERS AND NUTS

ELTEK E CABINET DETAILS

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

2
S-4



TOP PLAN VIEW

FRONT VIEW

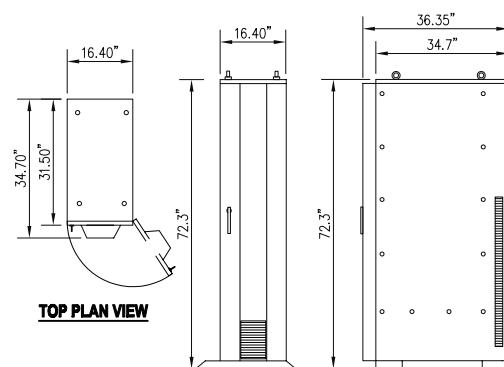
RIGHT SIDE VIEW

- NOTES:
1. ELTEK I-CABINET MODEL NUMBER: N/A
 2. THE CABINET DESIGN WEIGHT IS 250 LBS

ELTEK I CABINET DETAILS

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

3
S-4



TOP PLAN VIEW

FRONT VIEW

RIGHT SIDE VIEW

- NOTES:
1. ELTEK B CABINET MODEL NUMBER: ES0F020-ECV02
 2. THE CABINET DESIGN WEIGHT IS 1,400 LBS
 3. SECURE THE CABINET TO THE GRATING WITH (4) 1/2" STAINLESS STEEL THRU BOLTS WITH 1/8"X1"X1" PLATE WASHERS AND NUTS

ELTEK B CABINET DETAILS

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

4
S-4

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07-06-18	CONSTRUCTION REVIEW	A

PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

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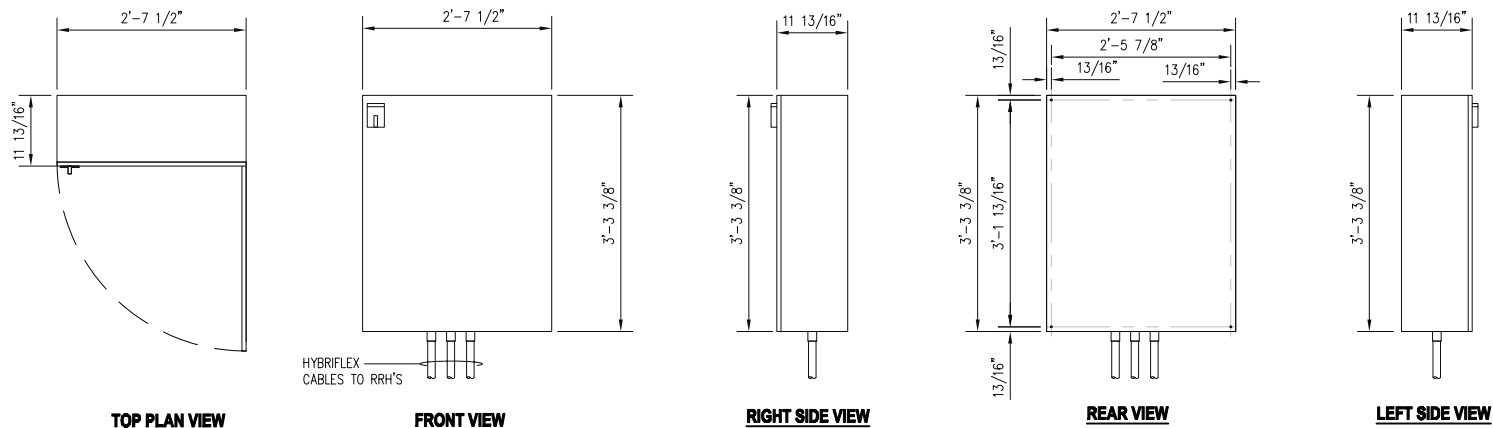
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GRAPHIC SCALE IN INCHES

TITLE:

**ELTEK CABINET
DETAILS**

SHEET NUMBER:

S-4

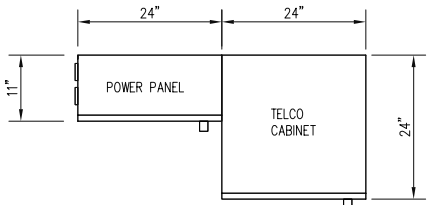


- NOTES:
1. SECURE THE CABINET PER MANUFACTURE'S INSTRUCTIONS
 2. THE CABINET DESIGN WEIGHT = 150 LBS

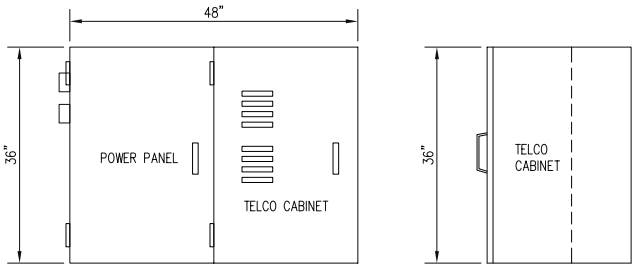
FIBER DISTRIBUTION CABINET DETAILS

SCALE: 3/4" = 1'-0"

1
S-5



TOP PLAN VIEW



FRONT VIEW

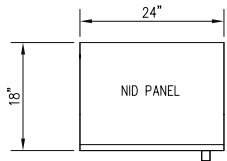
RIGHT SIDE VIEW

- NOTES:
1. SECURE THE CABINETS PER MANUFACTURE'S INSTRUCTIONS
 2. THE POWER PANEL DESIGN WEIGHT = 100 LBS
 3. THE TELCO CABINET DESIGN WEIGHT = 100 LBS

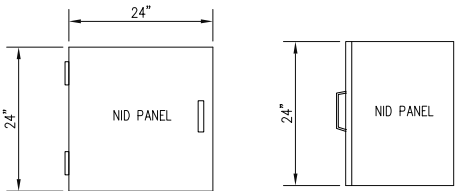
ELTEK POWER AND TELCO CABINET DETAILS

SCALE: 3/4" = 1'-0"

2
S-5



TOP PLAN VIEW



FRONT VIEW

RIGHT SIDE VIEW

- NOTES:
1. SECURE THE CABINET PER MANUFACTURE'S INSTRUCTIONS
 2. THE CABINET DESIGN WEIGHT = 125 LBS

NID CABINET DETAILS

SCALE: 3/4" = 1'-0"

3
S-5

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SEAL:

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PROJECT NO: 1015.897
DESIGNER: L.P.
ENGINEER: C.S.

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0 1/2 1
GRAPHIC SCALE IN INCHES

TITLE:

**POWER, TELCO,
FIBER AND NID
CABINET DETAILS**

SHEET NUMBER:

S-5

ELECTRICAL NOTES

THE ELECTRICAL CONTRACT FOR CONSTRUCTING THIS PROJECT SHALL INCLUDE PROVISION OF ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL INSTALLATION SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, BUT NOT LIMITED TO, THE FOLLOWING:

1. OBTAIN AND PAY FOR PERMITS ASSOCIATED WITH THE ELECTRICAL PORTION OF THIS CONSTRUCTION.
2. TEST, BALANCE, CLEAN, ADJUST, AND GUARANTEE ALL ELECTRICAL WORK IN THIS CONTRACT TO OPERATE SAFETY, PROPERLY AND CONTINUOUSLY.

GENERAL REQUIREMENTS
PRIOR TO SUBMITTING BID, VISIT THE SITE TO DETERMINE THE EXTENT OF WORK REQUIRED TO COMPLETE THE PROJECT AS SHOWN ON THE PLANS. IDENTIFY POSSIBLE CONFLICTS OBSERVED DURING VISIT AND SUBMIT, IN WRITING PRIOR TO SUBMITTING BID, CONDITIONS WHICH MAY PREVENT CONSTRUCTION OF ELECTRICAL WORK AS SHOWN ON THESE PLANS. NO ADDITIONAL CHARGE WILL BE ALLOWED FOR REMEDIATION OF FIELD CONDITIONS NOT IDENTIFIED THROUGH THIS PROCESS.

REGULATORY REQUIREMENTS

WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (ARTICLE 70 OF THE NFPA), 2014 EDITION

2. QUALITY ASSURANCE
- a.

ALL WORK SHALL BE PERFORMED WITH A MINIMUM OF DISTURBANCE TO EXISTING STRUCTURES AND SURROUNDING AREAS. THE DEVICES INSTALLED SHALL BE PLUMB, EDGES PARALLEL TO WALLS, AND HAVING NO SCRATCHES OR DENTS. TAKE ALL MEASURES NECESSARY TO PROTECT NEW EQUIPMENT DURING THE COURSE OF CONSTRUCTION.
- b.

MATERIALS SHALL BE NEW AND APPROVED FOR THE INTENDED USE. DEFECTIVE OR DAMAGED MATERIALS SHALL BE REPLACED OR REPAIRED AS ACCEPTABLE TO SPRINT.
3. SUBMITTALS
- PROVIDE RED-LINED AS-BUILT DRAWINGS DOCUMENTING EXACT ROUTING OF ALL CONDUITS.
4. WARRANTY

THE ELECTRICAL CONTRACTOR SHALL REMEDY, AT HIS OWN EXPENSE, ANY FAILURE OF THE WORK (INCLUDING EQUIPMENT) FOR A PERIOD OF ONE YEAR, TO CONFORM TO CONTRACT SPECIFICATIONS AND DRAWINGS. THIS SHALL INCLUDE ANY DEFECT OF MATERIAL OR WORKMANSHIP, AND ANY ADJUSTMENTS REQUIRED TO BE MADE FOR PROPER FUNCTIONING OF THE EQUIPMENT AND SYSTEMS.

PRODUCTS

1. RACEWAYS
- a.

ALL WIRING SHALL BE INSTALLED IN CONDUIT EXCEPT WHERE NOTED OTHERWISE.
- b.

CONDUIT INSTALLED OUTDOORS SHALL BE GALVANIZED RIGID METAL CONDUIT WITH GALVANIZED STEEL COUPLINGS AND CONNECTORS.
- c.

CONDUITS INSTALLED INSIDE BUILDING SHALL BE ELECTRICAL METALLIC TUBING WITH STEEL COMPRESSION FITTINGS.
- d.

JUNCTION AND PULL BOXES SHALL BE PROVIDED WHERE SHOWN AND WHERE REQUIRED TO FACILITATE THE PULLING AND SUPPORT OF CONDUCTORS AND CABLES.
- RACEWAY INSTALLATION
- e.

CONDUITS ENTERING HEATED SPACES FROM OUTDOORS SHALL BE PROVIDED WITH SEALED FITTINGS TO PREVENT CONDENSATION.
- f.

USE PIPE STRAPS OR INDIVIDUAL HANGERS FOR SUPPORTING INDIVIDUAL CONDUITS. CHAIN, WIRE, OR PERFORATED STRAP SHALL NOT BE USED TO SUPPORT OR FASTEN CONDUITS.
- g.

THE TOTAL DEGREES OF BENDS IN A CONDUIT SHALL NOT EXCEED 360°.
- h.

STENCIL "SPRINT" ON CONDUITS EVERY 20' HORIZONTALLY AND WHERE THEY PENETRATE WALLS OR FLOORS.

2. CONDUCTORS
- a.

SHALL BE AWG COPPER
- b.

SHALL HAVE 600 VOLT THWN INSULATION.
3. PANELBOARD
- a.

SHALL BE 240/120V 1 PHASE 3 WIRE 200 AMP
4. KILOWATT HOUR METER SHALL BE SUITABLE FOR 208 VOLT 4 WIRE 200 AMPS AND SHALL BE APPROVED BY BUILDING OWNER.
5. ANTI-OXIDATION COMPOUND
- SHALL BE BURNDY "PENETROX-E" OR THOMAS & BETTS KOPR-SHIELD.
6. LABELS
- SHALL BE ENGRAVED LAMACOID PLASTIC HAVING 1/2" HIGH LETTERS SECURED WITH STAINLESS STEEL SCREWS

ABBREVIATIONS

A	AMPERE
AIC	ASYMMETRICAL INTERRUPT CURRENT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
EMT	ELECTRICAL METALLIC TUBING
GFI	GROUND FAULT INTERRUPTING
G	GROUND
kVA	KILOVOLT-AMPERE
KW	KILOWATT
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
MCB	MAIN CIRCUIT BREAKER
NEC	NATIONAL ELECTRICAL CODE
NFSS	NON-FUSIBLE SAFETY SWITCH
NTS	NOT TO SCALE
P	POLE
Ø	PHASE
RMC	RIGID METAL CONDUIT
S/N	SOLID NEUTRAL
V	VOLT
VA	VOLT-AMPERE
W	WIRE

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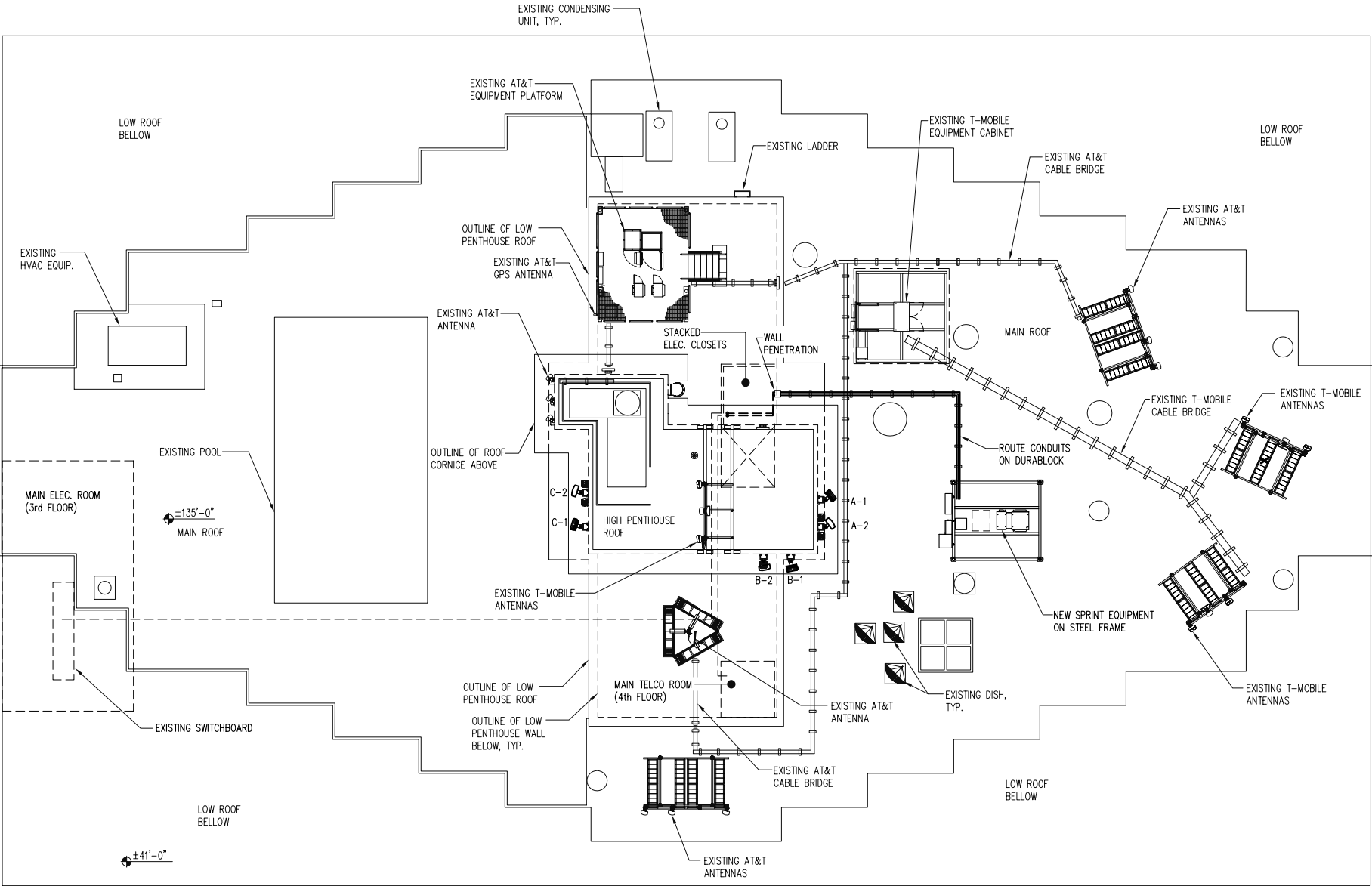
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PROJECT NO: 1015.897
DESIGNER: N.B.
ENGINEER: C.S.
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TO BE FULL-SIZE AT 22"x34"
0 1/2 1
GRAPHIC SCALE IN INCHES
TITLE:
ELECTRICAL NOTES,
PLAN AND
PANEL SCHEDULES
SHEET NUMBER:
E-1



KEY PLAN - ELECTRICAL

SCALE: 3/32"=1'-0"

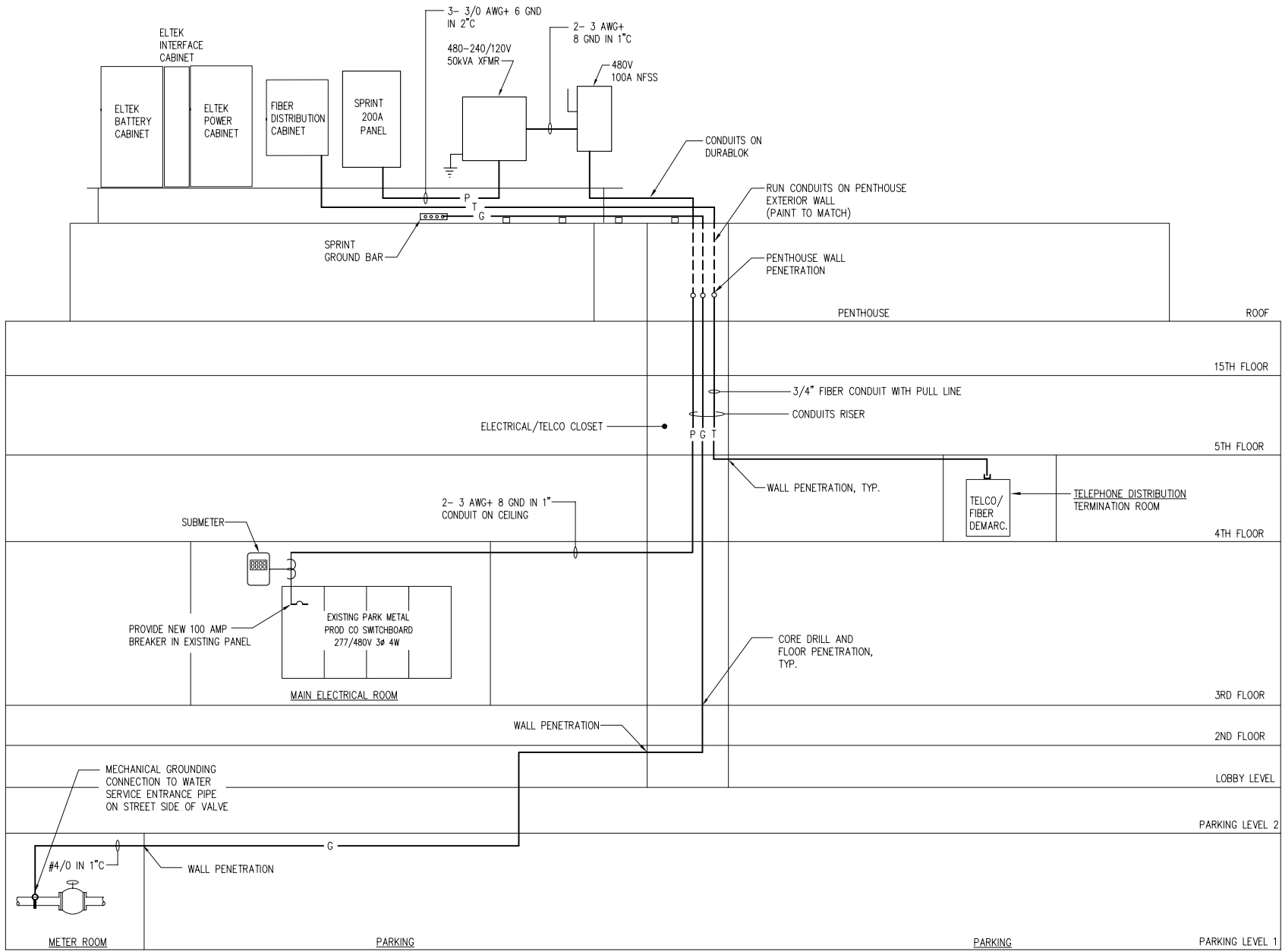


EXISTING PARK METAL PROD CO. SWITCHBOARD				480V 3Ø 4W
100A SPRINT	30A SUMP PUMP			
60A BOOSTER PUMP	60A PANEL GH			
100A DISCOTECH				
100A PANEL EMSF				
100A FIRE PUMP	100A PANEL G			
100A ELEV 5	100A ELEV 4			
200A PANEL LP-LA (LOBBY)				

NOTE: INSTALL 100A BREAKER IN AVAILABLE SPACE FOR SPRINT AND UPDATE LABLE

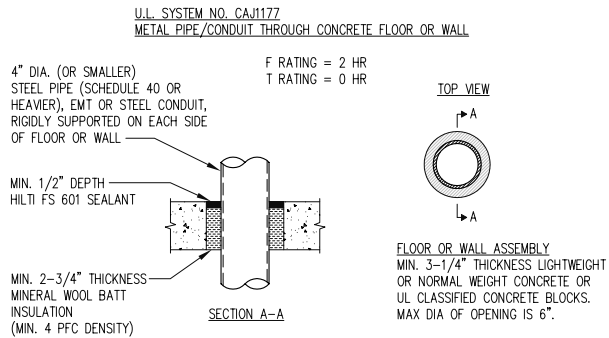
SPRINT PTC PANEL BOARD											
VOLTAGE: 120/240 SINGLE PHASE 3 WIRE 200 AMP MAIN CIRCUIT BREAKER											
LOAD DESCRIPTION	AMPS	B K R	C K T	L1	L2	C K T	B K R	AMPS	LOAD DESCRIPTION		
BTS. CIRCUIT 1	54	100	1	54		2		0	SURGE PROTECTION DEVICE		
	54		3		54	4	60	0			
BTS HEATER	6.6	20	5	8.6		6	15	2	TELCO MODULE FAN		
	6.6		7		8.6	8	20	2			
			9	2		10	20	2	TELCO GFI RECEPTACLE		
			11			12	20				
			13			14			SPARE		
			15			16					
			17			18					
			19			20					
			21			22					
			23			24					
TOTAL Ø A			65	57		TOTAL Ø B		TOTAL kVA: 15			

PANEL PTC CAPACITY: 48 kVA
PANEL PTC CONNECTED LOAD: 15 kVA
15 kVA x 1.25 = 19 kVA
THE CONNECTED LOAD DOES NOT EXCEED THE PANEL'S CAPACITY.



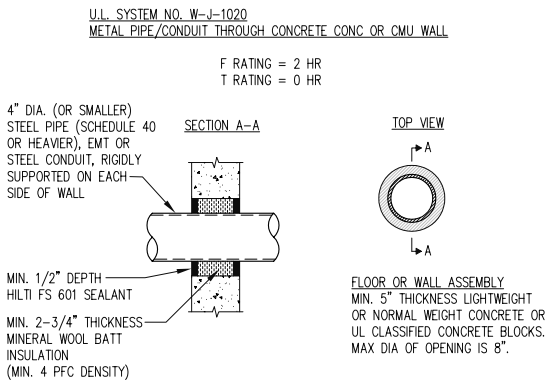
POWER RISER DIAGRAM
SCALE: N.T.S.

1
E-2



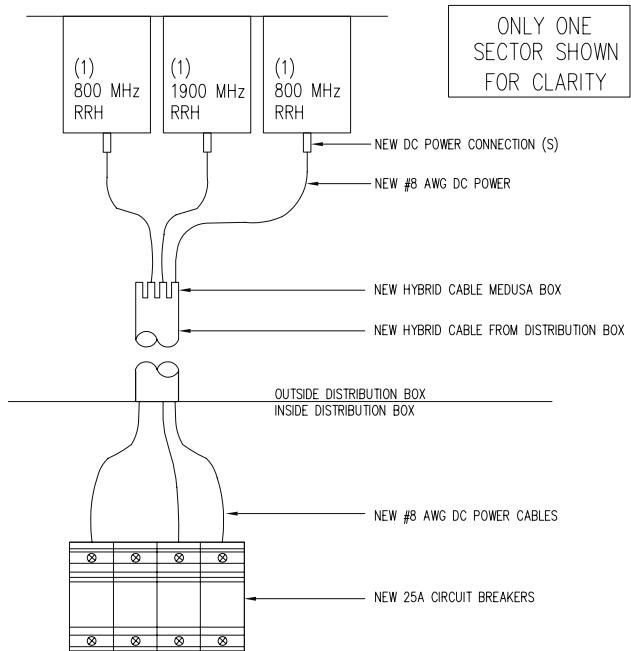
FLOOR/WALL PENETRATION DETAIL (TYPICAL)
SCALE: N.T.S.

2
E-2



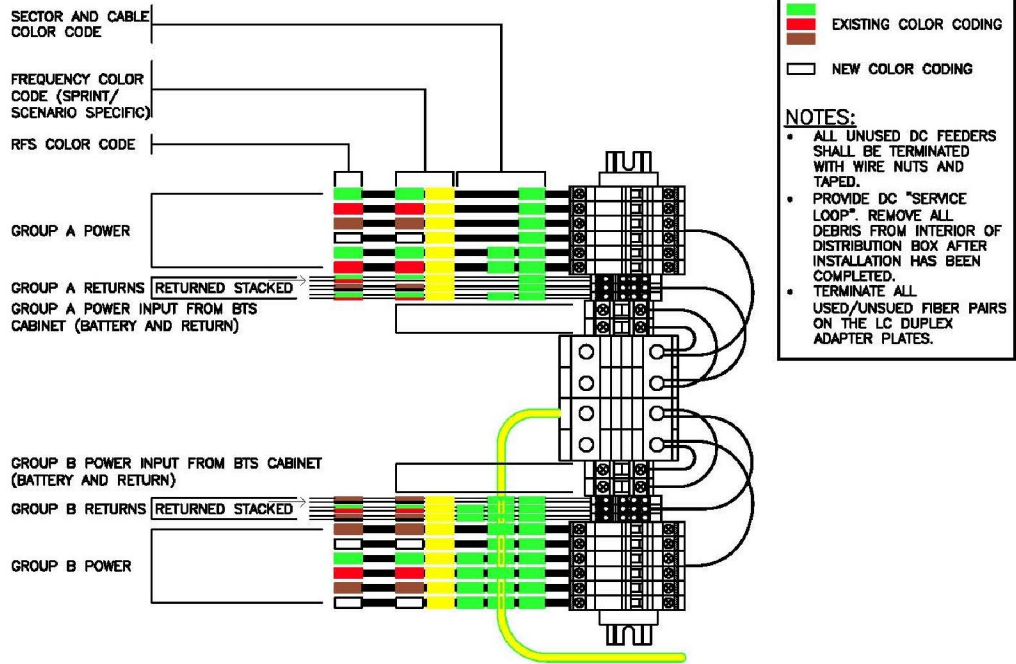
CONC/CMU PENETRATION DETAIL (TYPICAL)
SCALE: N.T.S.

3
E-2



DC ONE-LINE DIAGRAM
SCALE: N.T.S.

4
E-2



DC POWER DISTRIBUTION
SCALE: N.T.S.

5
E-2

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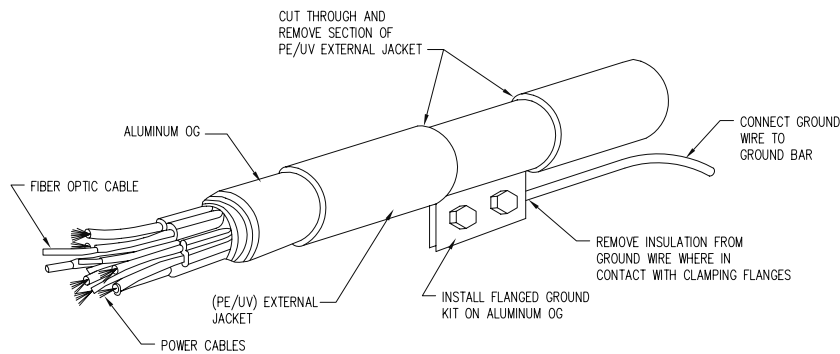
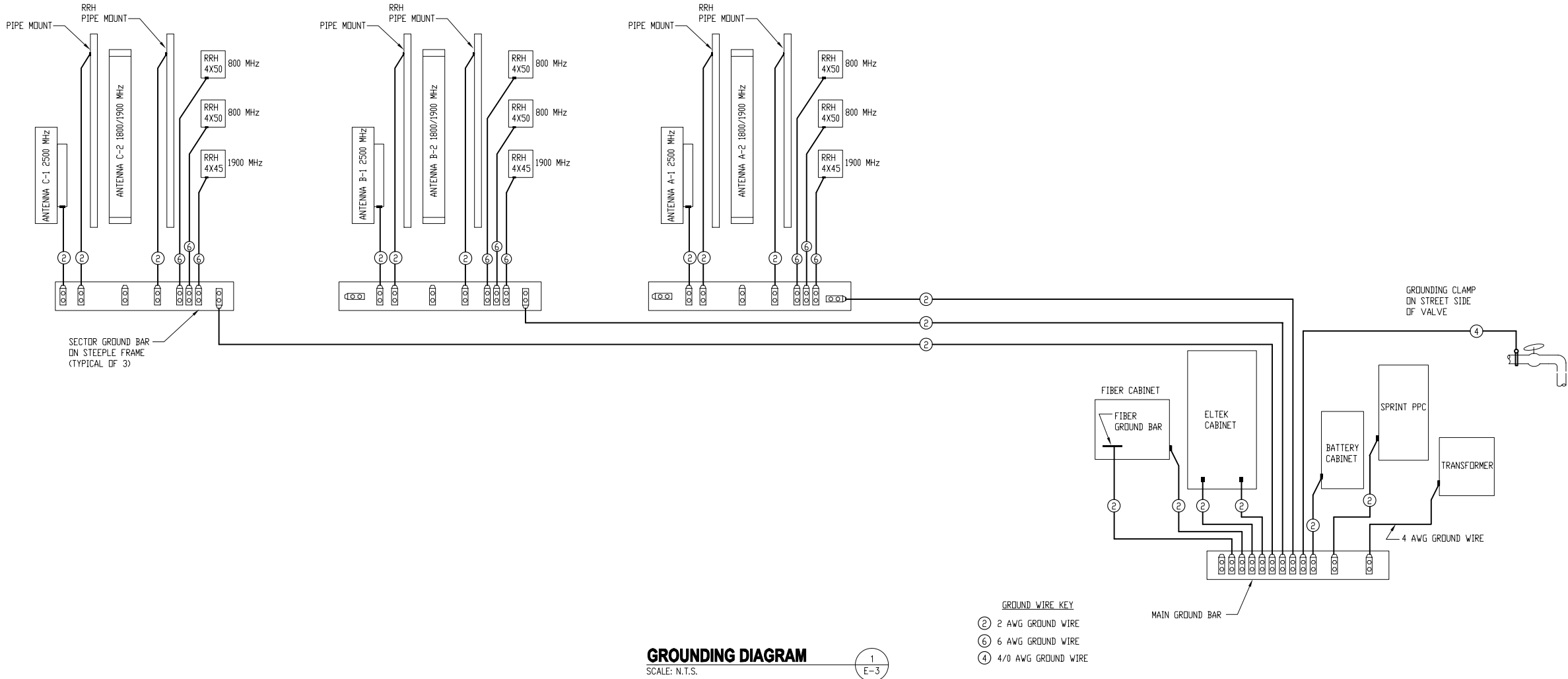
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ENGINEER: C.S.
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GRAPHIC SCALE IN INCHES
TITLE:
**RISER DIAGRAM
AND DETAILS**
SHEET NUMBER:
E-2

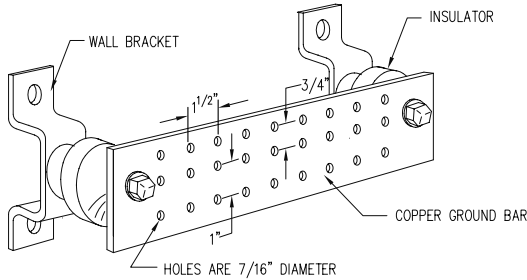


NOTES:

1. CLAMP #6 GROUND WIRE BETWEEN FLANGES AND FORM BOND WITH COMPRESSION HARDWARE PROVIDED WITH KIT.
2. FOLLOWING INSTALLATION OF GROUND KIT, WATERPROOF ASSEMBLY WITH WATERPROOFING KIT AND TAPE.

HYBRIFLEX GROUNDING KIT DETAIL

SCALE: N.T.S.



LEGEND

1. COPPER GROUND BAR, MANUFACTURED BY HARGER
 2. MASTER GROUND BAR AND CABLE ENTRY GROUND BAR SHALL BE CAT. NO. GBI-14420-J
 3. ANTENNA SECTOR GROUND BARS SHALL BE CAT. NO. GBI-14412-J
- GBI INDICATES GROUND BAR INCLUDING WALL MOUNTING BRACKETS AND INSULATORS
14420 INDICATES DIMENSIONS OF 1/4\"/>

GROUND BAR ISOMETRIC

SCALE: N.T.S.

GROUNDING NOTES

1. GROUND WIRES SHALL BE 2 AWG GREEN-INSULATED COPPER UNLESS NOTED OTHERWISE.
2. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURER'S GROUNDING KITS.
3. GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDING SCREW SET.) CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, APPLY PROTECTIVE ANTI-OXIDIZATION COMPOUND.
4. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8\"/>
5. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.). PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
6. GROUND KITS ARE PROVIDED WITH GROUND WIRES. IN THE EVENT THAT THE SECTOR GROUND BAR IS LOCATED BEYOND THE GROUND WIRE LENGTH, PROVIDE NEW LENGTH OF GREEN-INSULATED 6 AWG COPPER GROUND WIRE.

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GRAPHIC SCALE IN INCHES

TITLE:

**GROUNDING
DIAGRAM
AND DETAILS**

SHEET NUMBER:

E-3