



2020 ANCHOR CONSTRUCTION DRAWINGS

**SITE NAME:
SWEETEST HEART OF MARY**

**SITE NUMBER:
DE04229B**

**STREET ADDRESS:
4440 E. CANFIELD D/B/A 4440 RUSSELL ST.
DETROIT, MICHIGAN 48207**



28505 SCHOOLCRAFT RD, BLDG#6
LIVONIA, MICHIGAN 48150
Phone: 734.367.7200
Fax: 734.367.7242

CONTACT: KEN KALOUSEK
(734) 444-0181

LANDTECH PROJECT NUMBER: 20398031

REV.	DATE	DESCRIPTION	BY
A	07/09/20	PRELIMINARY RELEASE	CJL
B	02/10/22	ADD'D ANT. COVER NOTE	TLR
C	03/30/22	RELOC PROP ANTENNAS	TLR

2020 ANCHOR CONSTRUCTION DRAWINGS

NOTE: THESE DRAWINGS ARE TO SCALE WHEN PLOTTED ON 11"x17" SHEETS. REFER TO GRAPHIC SCALES ON REPRODUCTIONS.



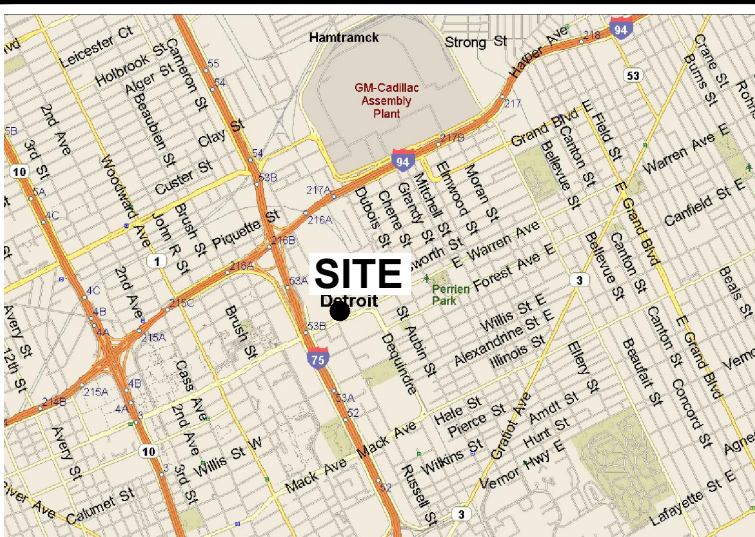
SITE #: DE04229B
SITE NAME: SWEETEST HEART OF MARY
SITE ADDRESS: 4440 E. CANFIELD D/B/A 4440 RUSSELL ST. DETROIT, MICHIGAN 48207

Sheet Title: TITLE SHEET

Sheet Number: T-1

FROM T-MOBILE OFFICE HEAD NORTH ON MERRIMAN ROAD TO I-96; TURN EAST ON I-96 AND CONTINUE TO I-75; TURN SOUTH ON I-75 AND PROCEED TO WARREN AVENUE; TURN EAST ON WARREN AVENUE AND CONTINUE TO RUSSELL STREET; TURN SOUTH ON RUSSELL STREET AND PROCEED TO CANFIELD STREET; SITE IS LOCATED AT THE NORTHEAST CORNER OF RUSSELL STREET AND CANFIELD STREET.

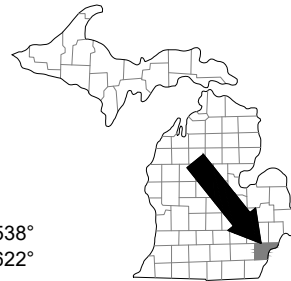
DRIVING DIRECTIONS



LOCATION MAP



**Know what's below.
Call before you dig.**



LATITUDE: 42.35805538°
LONGITUDE: -83.0480622°

FAA INFORMATION

THE UTILITIES SHOWN ON THESE DRAWINGS ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. OTHER UTILITIES THAT ARE NOT SHOWN MAY BE PRESENT AT THE SITE. LANDTECH ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF THE UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THIS SEAL CERTIFIES ONLY THE CIVIL ENGINEERING DESIGN AND RELATED DETAILS SHOWN ON THESE PLANS. THIS SEAL DOES NOT CERTIFY ANY ARCHITECTURAL, ELECTRICAL, MECHANICAL, STRUCTURAL DESIGN, AND RELATED DETAILS INCLUDED IN THESE PLANS.

UTILITY NOTICE

APPLICANT/LESSEE
NAME: T-MOBILE
ADDRESS: 28505 SCHOOLCRAFT ROAD, BLDG #6 LIVONIA, MI 48150
CONTACT: KEN KALOUSEK
PHONE: (734) 444-0181

PROPERTY INFORMATION
PROPERTY OWNER: CATHOLIC ARCHDIOCESE OF DETROIT
ADDRESS: 12 STATE STREET, DETROIT, MI 48226

CONTACT: PHONE:
AREA OF CONSTRUCTION: 165 SQ. FT.
PRESENT OCCUPANCY TYPE: ASSEMBLY
PROPOSED OCCUPANCY TYPE: ASSEMBLY
CURRENT ZONING:
PARCEL NUMBER: WARD 7, ITEM 001241
HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.

CIVIL ENGINEER & SURVEYOR:
NAME: LANDTECH PROFESSIONAL SURVEYING & ENGINEERING
ADDRESS: 1275 MCGREGOR WAY GRAWN, MI 49637
CONTACT: MATTHEW MOKANYK, P.S., P.E.
PHONE: (231) 943-0050

PROJECT SUMMARY

ATTENTION GC: THESE DRAWINGS ARE PREPARED BASED ON RFDS DATED: 06/03/20
GENERAL CONTRACTOR TO CHECK WITH CONSTRUCTION TO VERIFY THAT THE RFDS IS CORRECT.

RFDS DESIGN

TITLE	NAME	DATE
OPERATIONS		
RF ENGINEER		
ZONING ADMINISTRATOR		
CONSTRUCTION MANAGER		
POWER APPROVAL		
FIBER/AAV APPROVAL		

T-MOBILE APPROVALS

SIGNATURE _____ DATE _____
PRINTED NAME _____
 NO CHANGES CHANGES NEEDED SEE COMMENTS

LESSOR APPROVAL

SHEET	DESCRIPTION
T-1	TITLE SHEET
C-1	SITE PLAN
C-1.1	SITE PLAN
C-2	EQUIPMENT ROOM
C-2.1	FLOOR PLANS
C-3	EXISTING ANTENNA PLAN
C-4	PROPOSED ANTENNA PLAN
C-5	ELEVATION VIEW
C-5.1	PICTORIAL VIEWS
C-5.2	PICTORIAL VIEWS
C-6	EQUIPMENT DETAILS
C-6.1	EQUIPMENT DETAILS
C-6.2	ANTENNA DETAILS
C-6.3	MOUNTING DETAILS
SK-1	PLATFORM STRUCTURAL PLAN
SK-2	ANTENNA STRUCTURAL DETAIL
SK-3	PLATFORM STRUCTURAL DETAIL
E-1	CONDUIT CABLE SCHEMATIC
E-1.1	CABLE DETAILS
E-1.2	ELECTRIC DETAILS
E-2	ONE-LINE DIAGRAM
E-3	GROUNDING PLAN
E-3.1	GROUNDING DETAILS
E-3.2	GROUNDING SCHEMATIC
M-1	HVAC DETAILS
M-1.1	HVAC GENERAL NOTES
M-1.2	EXHAUST FAN & LOUVER SCHEDULE
N-1	GENERAL NOTES
N-2	GENERAL NOTES

SHEET INDEX

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:

- 2015 MICHIGAN BUILDING CODE
- 2015 MICHIGAN MECHANICAL CODE
- ANSI / TIA-222-H
- NATIONAL ELECTRIC CODE 2017
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES
- 2015 MICHIGAN PLUMBING CODE
- INTERNATIONAL FIRE CODE
- 2015 MICHIGAN UNIFORM ENERGY CODE
- MIOSHA RULES AND REGULATIONS
- NFPA-101 LIFE SAFETY CODE

CITY OF DETROIT HAD ADOPTED MICHIGAN BUILDING CODE 2015 AND MICHIGAN REHABILITATION, PL FOLLOW.

USE GROUP: A-3
CONSTRUCTION TYPE: 1A

CODE COMPLIANCE

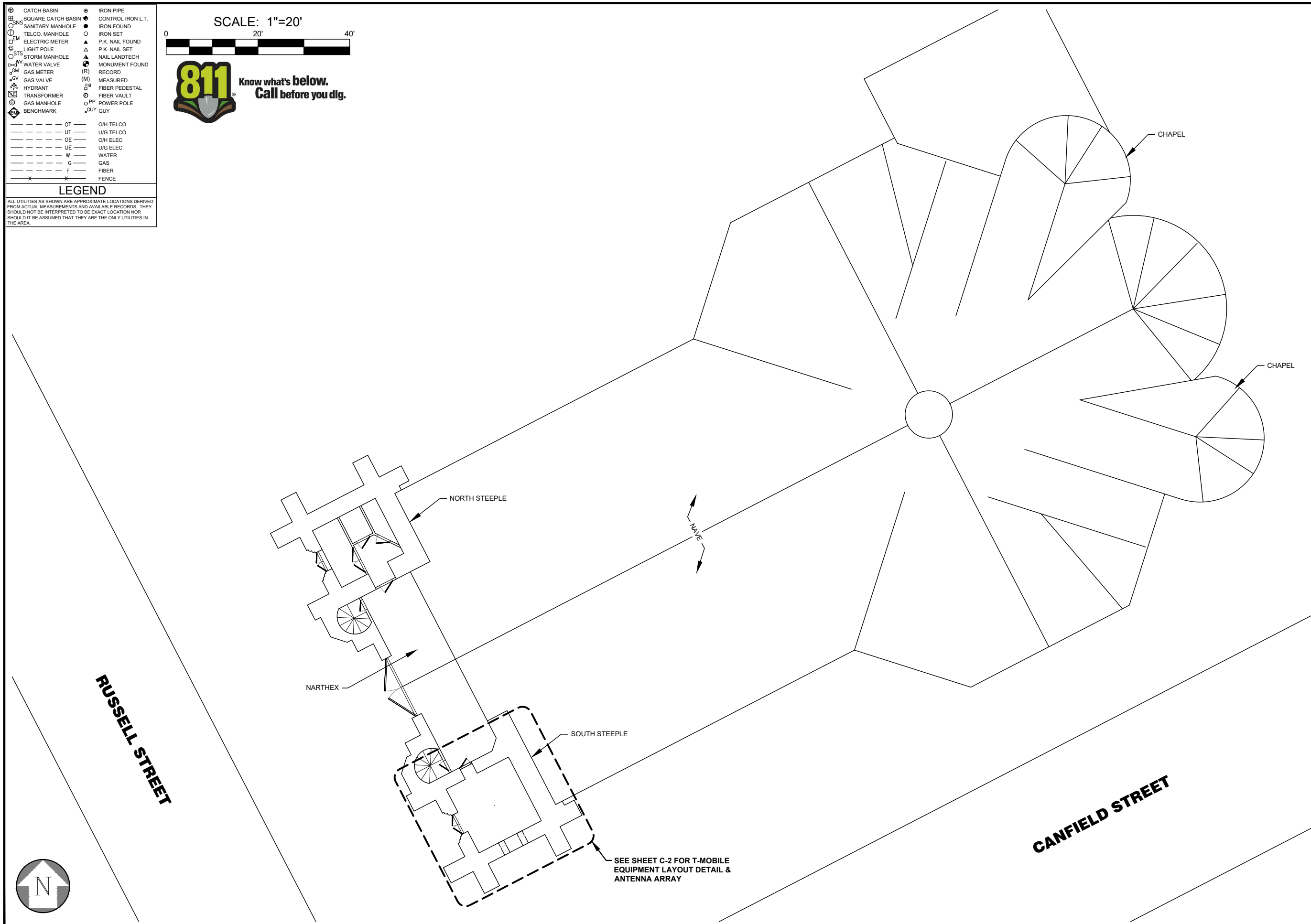
CATCH BASIN
 SQUARE CATCH BASIN
 SANITARY MANHOLE
 TELCO. MANHOLE
 ELECTRIC METER
 LIGHT POLE
 STORM MANHOLE
 WATER VALVE
 GAS METER
 GAS VALVE
 HYDRANT
 TRANSFORMER
 GAS MANHOLE
 BENCHMARK
 IRON PIPE
 CONTROL IRON L.T.
 IRON FOUND
 IRON SET
 P.K. NAIL FOUND
 P.K. NAIL SET
 NAIL LANDTECH
 MONUMENT FOUND
 RECORD
 MEASURED
 FIBER PEDESTAL
 FIBER VAULT
 POWER POLE
 GUY
 O/H TELCO
 U/G TELCO
 O/H ELEC
 U/G ELEC
 WATER
 GAS
 FIBER
 FENCE

SCALE: 1"=20'

811 Know what's below. Call before you dig.

LEGEND

ALL UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.



T-Mobile
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Sheet Title:
SITE PLAN

Sheet Number:
C-1

NOTE: ANTENNA AND RADIO LAYOUT AS OBSERVED DURING SITE VISIT DOES NOT MATCH RFDS PROVIDED BY T-MOBILE. FIELD VISIT DATA SHOWN HEREON.

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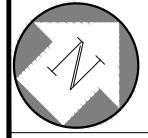
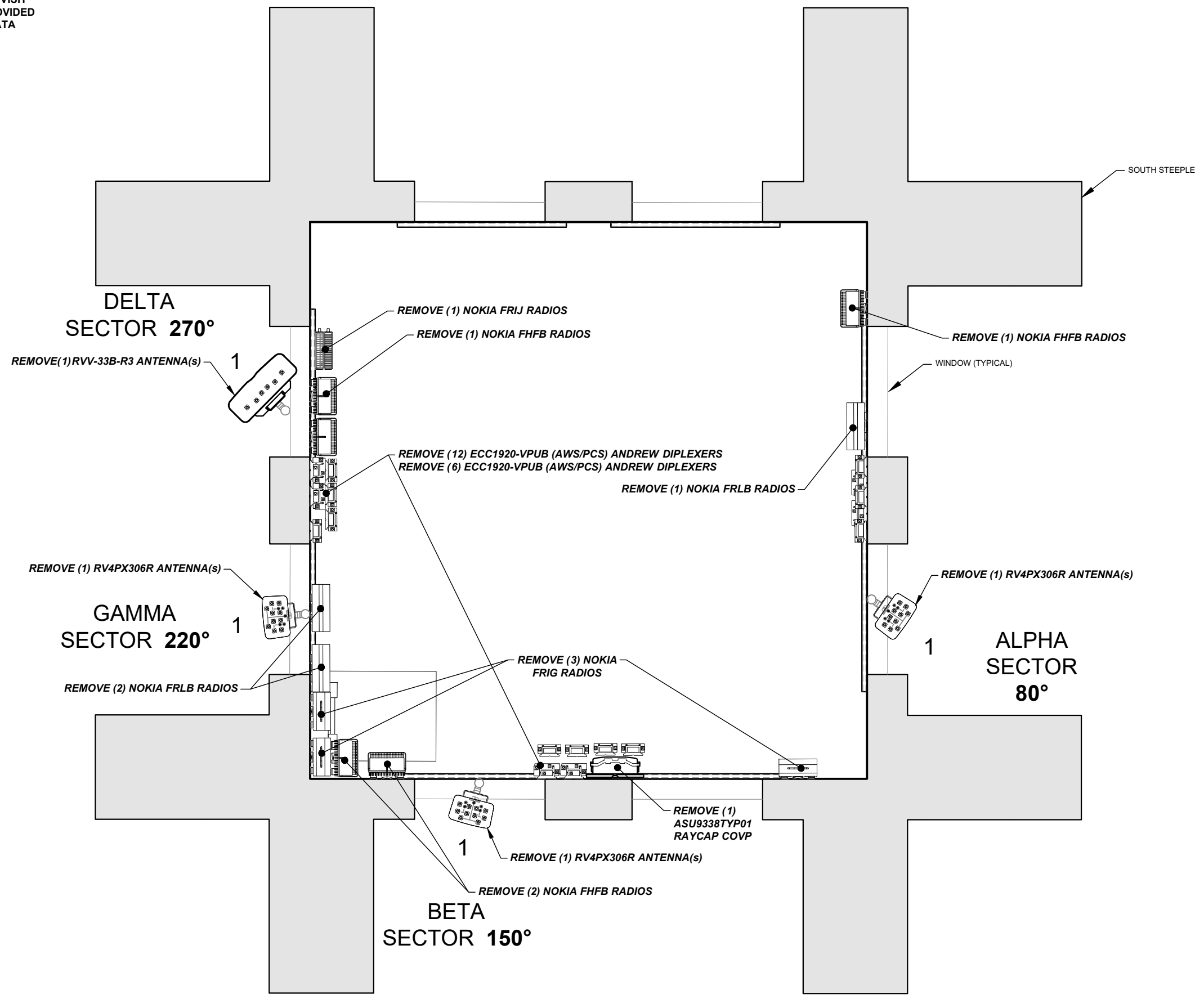
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Sheet Title: EXISTING ANTENNA PLAN

Sheet Number: C-3



ANTENNA SCHEDULE						
SECTOR	ALPHA		BETA		GAMMA	
ANTENNA POSITION	A-1	A-2	B-1	B-2	C-1	C-2
AZIMUTH	80°	80°	150°	150°	220°	220°
RAD CENTER (AGL)	110'	110'	110'	110'	110'	110'
MODEL	FFHH-65C-R3	AAHF (MASSIVE MIMO)	FFHH-65C-R3	AAHF (MASSIVE MIMO)	FFHH-65C-R3	AAHF (MASSIVE MIMO)
FEEDER LENGTH	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"

NOTE: ALL PROPOSED ANTENNAS REQUIRE A BLACK FABRIC COVER, TO BE APPROVED BY THE LANDLORD

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Sheet Title: PROPOSED ANTENNA PLAN

Sheet Number: C-4

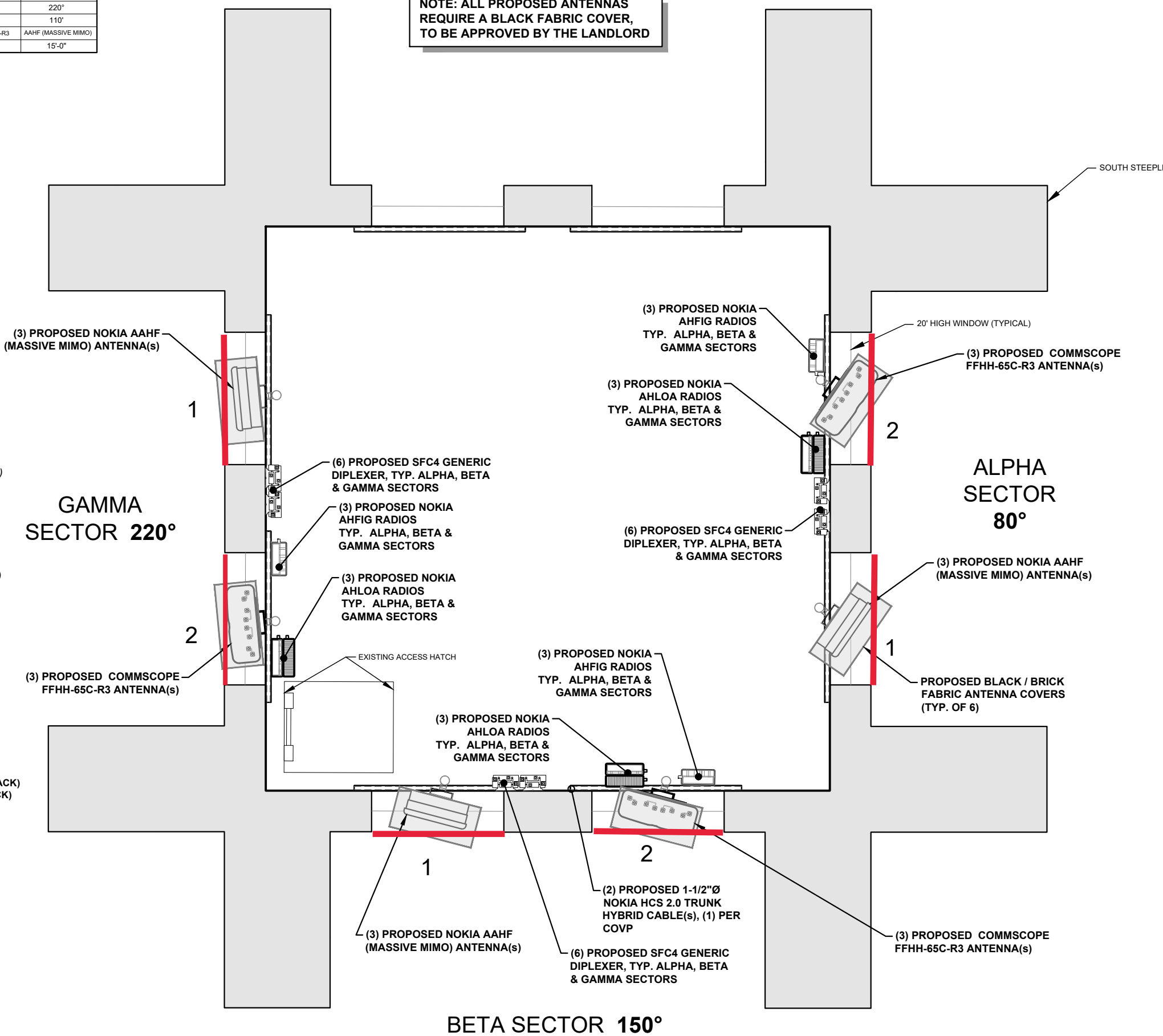
APPURTENANCE LIST

REMOVING

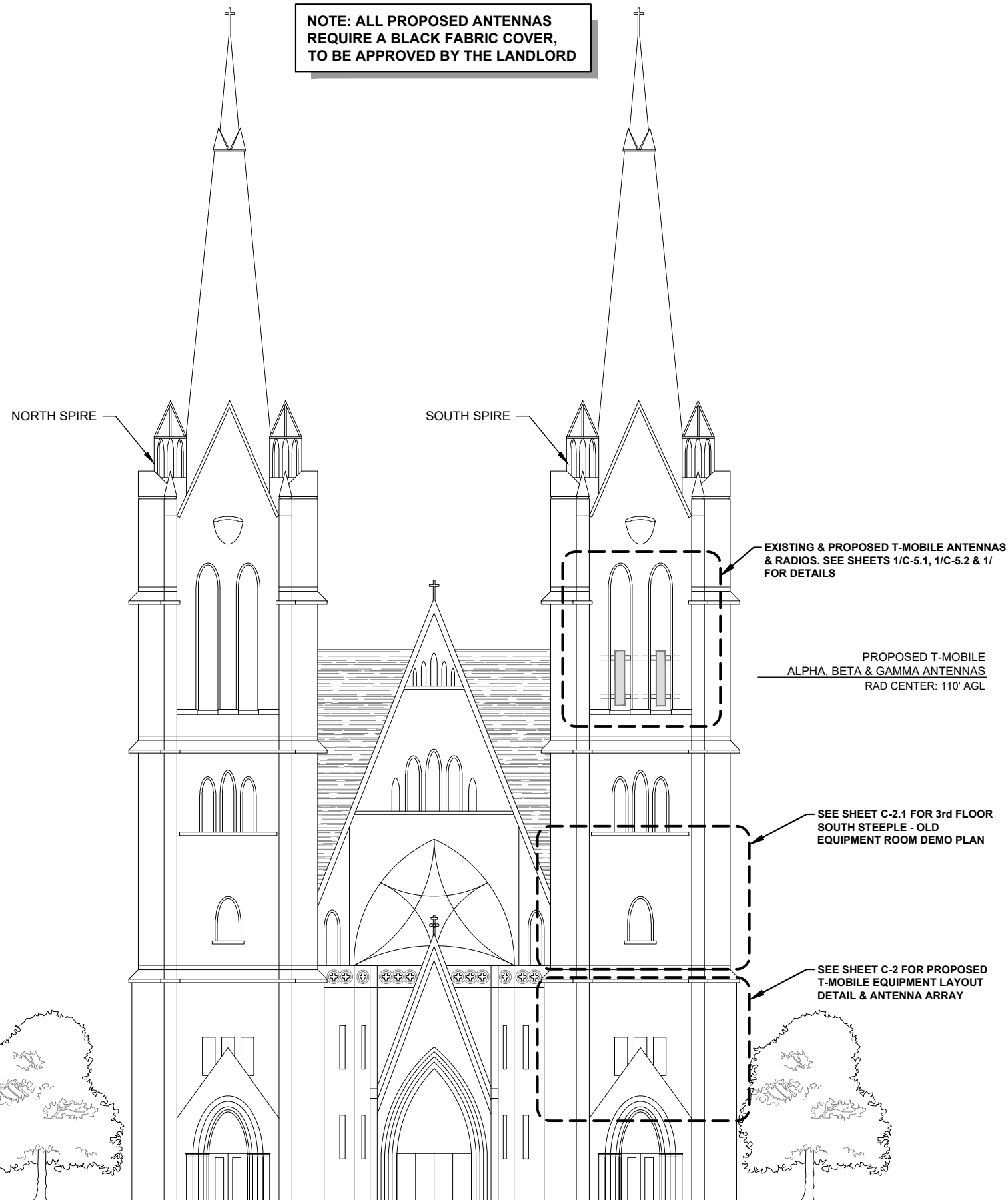
- (3) COMMSCOPE RV4PX306R ANTENNA(s) [63"l x 13.9"w x 8.2"d 52.9lb(s)]
- (1) COMMSCOPE RVV-33B-R3 ANTENNA(s) [72"l x 25.2"w x 9.3"d 94.8lb(s)]
- (3) NOKIA FRLB RADIOS (@SECTOR) [15.75"l x 15.75"w x 5.2"d 52.5lb(s)]
- (1) NOKIA FRIE RADIOS (@SECTOR) [5.2"l x 5.2"w x 22"d 55.1lb(s)]
- (1) NOKIA FXFB RADIOS (@SECTOR) [5.2"l x 19.4"w x 22.1"d 55.1lb(s)]
- (3) NOKIA FRIG RADIOS (@SECTOR) [18.1"l x 15.2"w x 6"d 57.32lb(s)]
- (4) NOKIA FHFB RADIOS (@SECTOR) [34.3"l x 12.6"w x 7.8"d 52.9lb(s)]
- (1) NOKIA FRIJ RADIOS (@SECTOR) [23.1"l x 12.6"w x 5.8"d 46.3lb(s)]
- (6) ETM19V2S12UB (STYLE 4) COMMSCOPE AMPLIFIER (@SECTOR) [10"l x 8.6"w x 2.3"d 11.2lb(s)]
- (1) ASU9338TYP01 RAYCAP COVP (@PLATFORM) [20.38"l x 18.86"w x 5.83"d 19lb(s)]
- (1) ASU9338TYP01 RAYCAP COVP (@SECTOR) [20.38"l x 18.86"w x 5.83"d 19lb(s)]
- (12) ECC1920-VPUB (AWS/PCS) ANDREW DIPLEXERS (@SECTOR) [7.6"l x 7.3"w x 2.6"d 7.9lb(s)]
- (6) ECC1920-VPUB (AWS/PCS) ANDREW DIPLEXERS (@PLATFORM) [7.6"l x 7.3"w x 2.6"d 7.9lb(s)]
- (1) 1-1/4"Ø [1.24"OD] NOKIA MID CAP HCS HYBRID CABLE(s)
- (2) 7/8"Ø [7/8"OD] NOKIA LOW CAP HCS HYBRID CABLE(s)
- (6) 7/8"Ø [1.03"OD] ANDREW LDF5-50A COAX CABLE(s)

INSTALLING

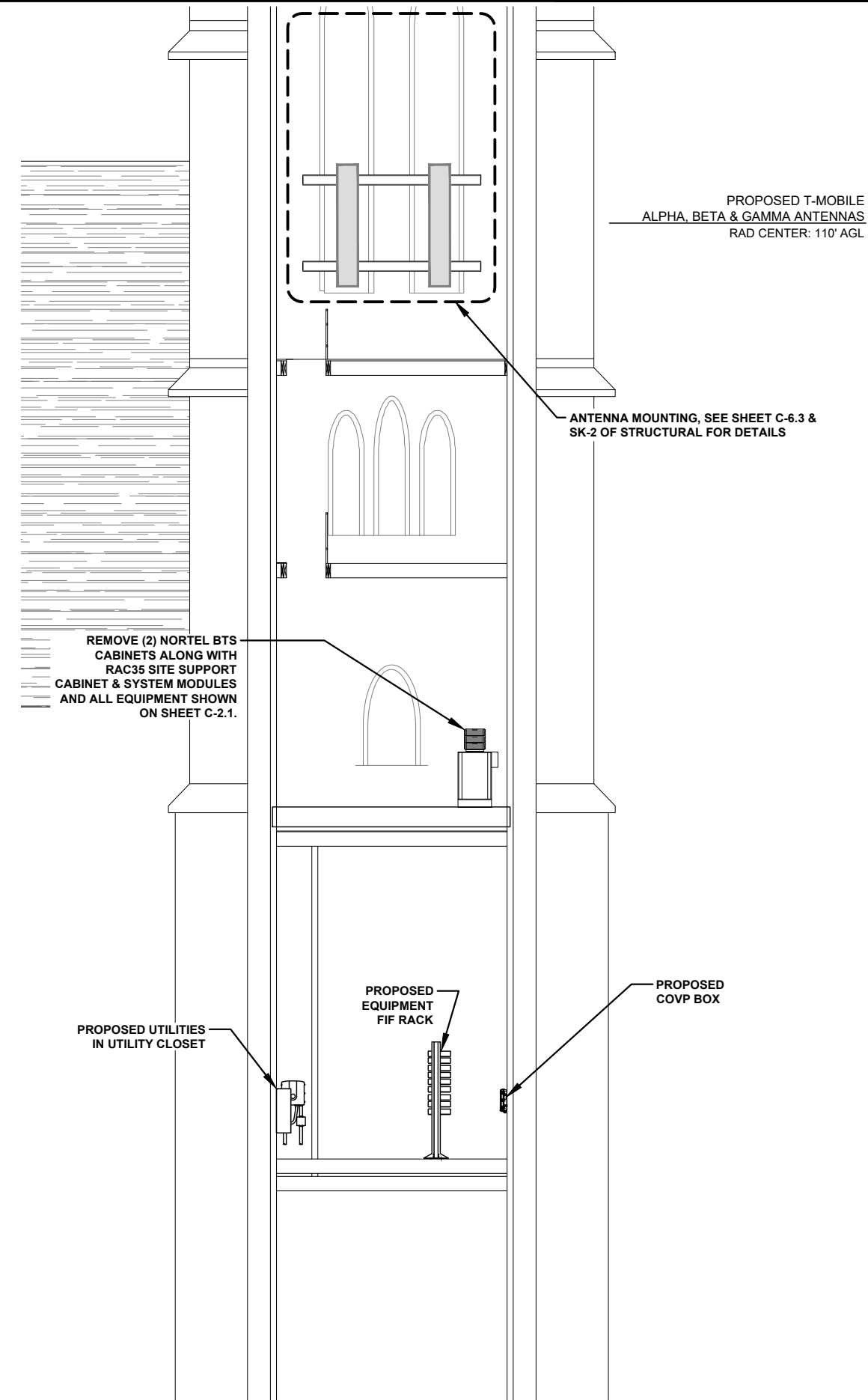
- (3) COMMSCOPE FFHH-65C-R3 ANTENNA(s) [95.9"l x 25.2"w x 9.3"d 127.6lb(s)]
- (3) NOKIA AAHF (MASSIVE MIMO) ANTENNA(s) [35.4"l x 21"w x 8.3"d 104lb(s)]
- (3) NOKIA AHLOA RADIOS (@SECTOR) [22.1"l x 12.2"w x 7.5"d 83.9lb(s)]
- (3) NOKIA AHFIG RADIOS (@SECTOR) [27.4"l x 12.1"w x 5.2"d 79.3lb(s)]
- (6) SFC4 GENERIC DIPLEXER (@SECTOR)
- (1) VOLTAGE BOOSTER POWERPLUS W/ 2 AMPLIFIER RAYCAP (@FIF RACK)
- (1) EXTRA AMPLIFIER FOR POWERPLUS VOLTAGE BOOSTER (@FIF RACK)
- (2) 1-1/2"Ø [1.55"OD] NOKIA HCS 2.0 TRUNK HYBRID CABLE(s)



NOTE: ALL PROPOSED ANTENNAS REQUIRE A BLACK FABRIC COVER, TO BE APPROVED BY THE LANDLORD



WEST ELEVATION VIEW N.T.S. **1**



INTERIOR SOUTH SPIRE ELEVATION N.T.S. **2**

NOTE: SOME EQUIPMENT OMITTED FROM ELEVATION VIEW FOR CLARITY

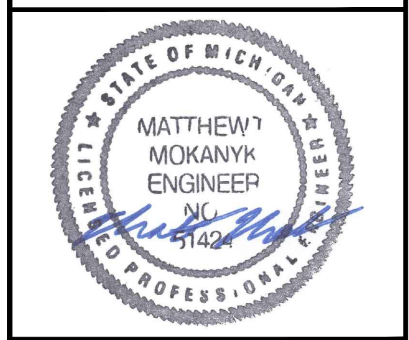
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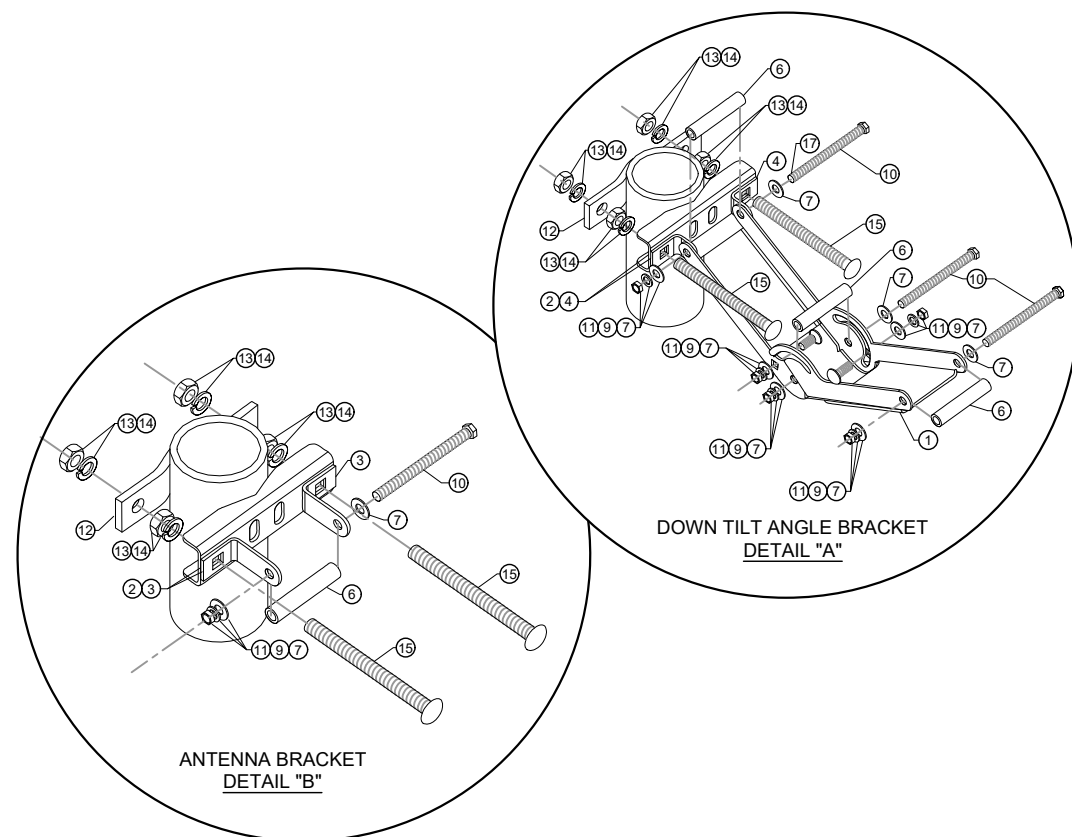
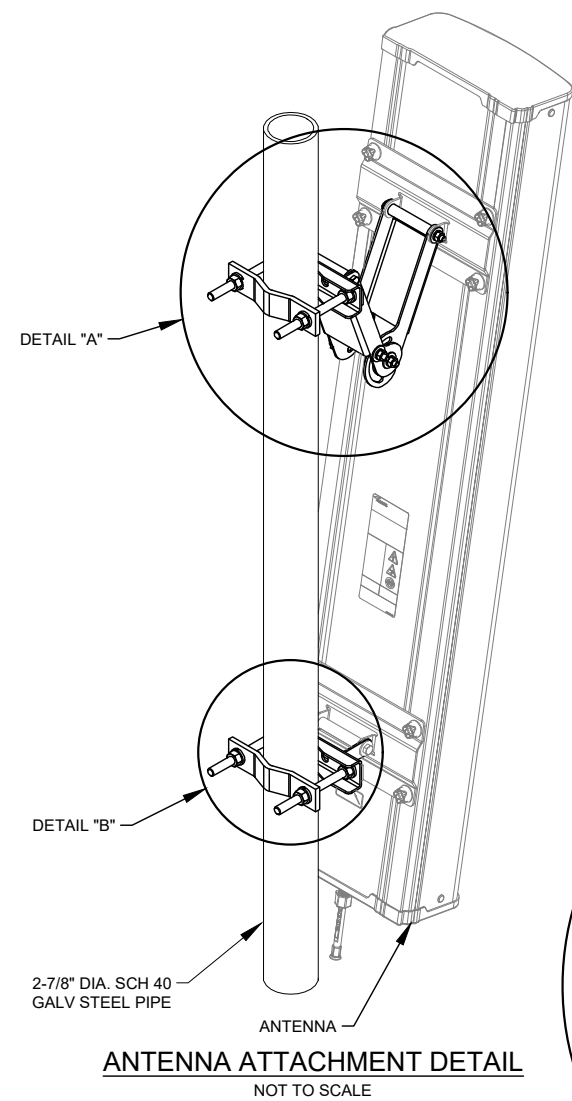


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Sheet Title:
ELEVATION VIEW

Sheet Number:
C-5

PARTS LIST			
ITEM #	QUANTITY	PART NUMBER	DESCRIPTION
1	2	601257	ANGLE ARM
2	2	601256	MOUNTING CLAMP
3	2	601235-1	BRACKET
4	2	601235-2	BRACKET
5	1	601258	LABEL, ANGLE
6	4	600679-3	SPACER TUBE
7	14	100525-24	ME FLAT WASHER (STAINLESS STEEL)
8	2	600419-8	M8x1.25x25mm LARGE CARRIAGE BOLT (STAINLESS STEEL)
9	6	6/1/7395	M8 LOCK WASHER (STAINLESS STEEL)
10	4	600419-10	M8x1.25x110mm LARGE HEX HEAD SCREW (STAINLESS STEEL)
11	6	204001-15	M8x1.25 HEX NUT (STAINLESS STEEL)
12	2	225244	CLAMP PLATE
13	8	600419-24	LARGE LOCK WASHER (STAINLESS STEEL)
14	8	204001-21	M12x1.75 HEX NUT (STAINLESS STEEL)
15	4	600419-12	M12x1.75x150mm LARGE CARRIAGE BOLT (STAINLESS STEEL)
17	1	601584	MOLYBDENUM DISULFIDE GREASE

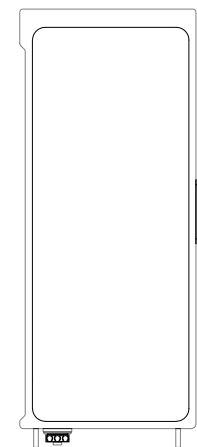


NOTE: TORQUE ALL HARDWARE
M8 HARDWARE: 18 Nm (160 lbf-in.)
M12 HARDWARE: 30 Nm (266 lbf-in.)

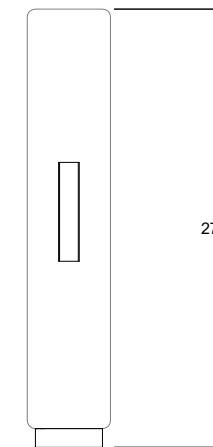


PLAN VIEW

MANUFACTURER: NOKIA
MODEL: AHFIG
BANDWIDTH: 65 MHz & 80 MHz
DIMENSIONS: 27.4" x 12.1" x 5.2"
WEIGHT: 79.3 lbs
NO. OF PORTS: 4T4R
FIBER PORTS: 2 X 9.8 Gbps CPRI
RF CONNECTORS: 4.3-10+



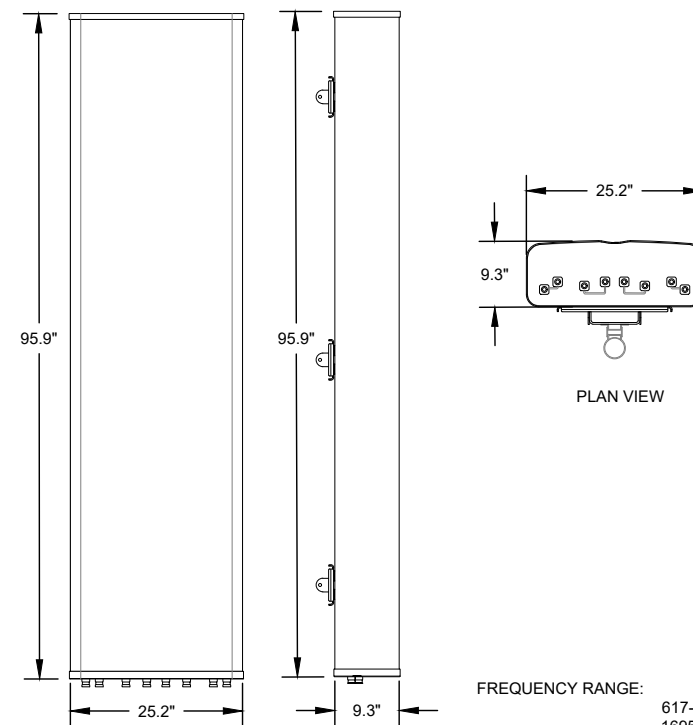
FRONT VIEW



SIDE VIEW

NOKIA AHFIG RADIO

NOT TO SCALE



COMMSCOPE FFHH-65C-R3 ANTENNA

NOT TO SCALE



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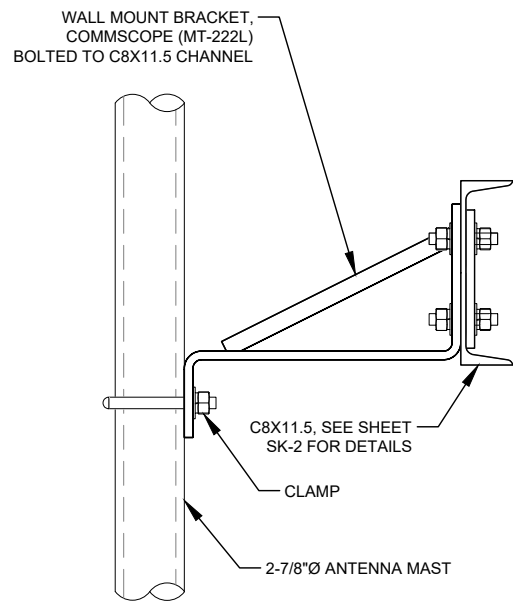
Sheet Title:

ANTENNA DETAILS

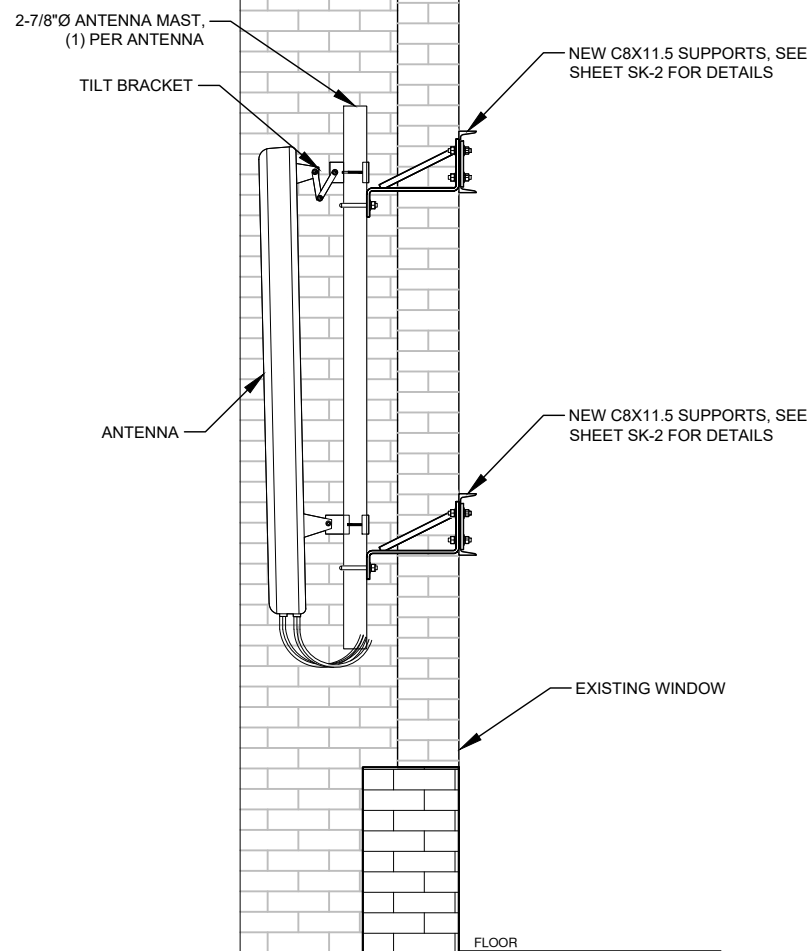
Sheet Number:

C-6.2

**PAIN T ALL ANTENNAS,
CABLING & HARDWARE
VISIB LE OUTSID E BLACK.**



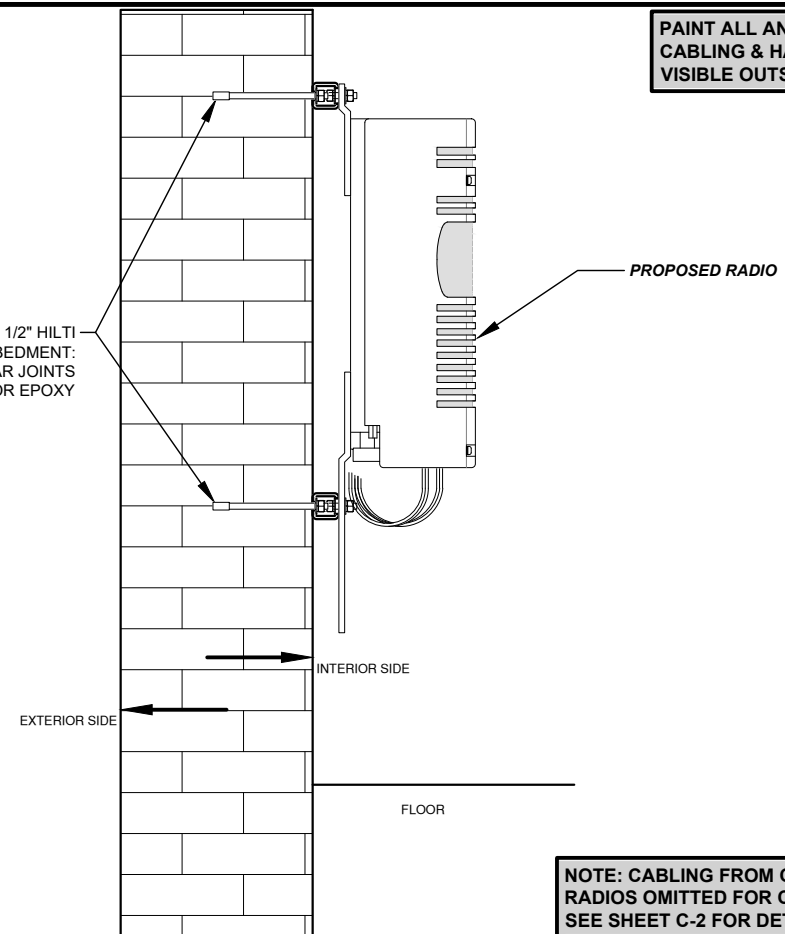
TYP. MAST BRACKET



ANTENNA MOUNT N.T.S.

1

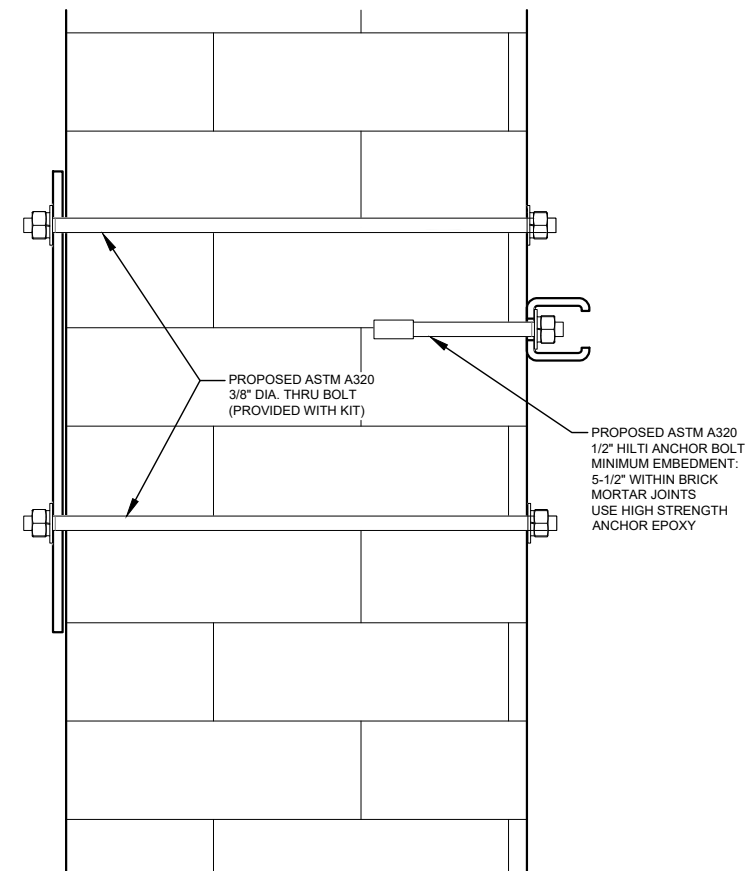
PROPOSED ASTM A320 1/2" HILTI
ANCHOR BOLT MINIMUM EMBEDMENT:
5-1/2" WITHIN BRICK MORTAR JOINTS
USE HIGH STRENGTH ANCHOR EPOXY



**NOTE: CABLING FROM COVP TO
RADIOS OMITTED FOR CLARITY.
SEE SHEET C-2 FOR DETAILS.**

HYBRID CABLE ELEV. N.T.S.

2



MORTOR JOINT DETAIL N.T.S.

3

T-Mobile

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Sheet Title:
MOUNTING DETAILS

Sheet Number:
C-6.3

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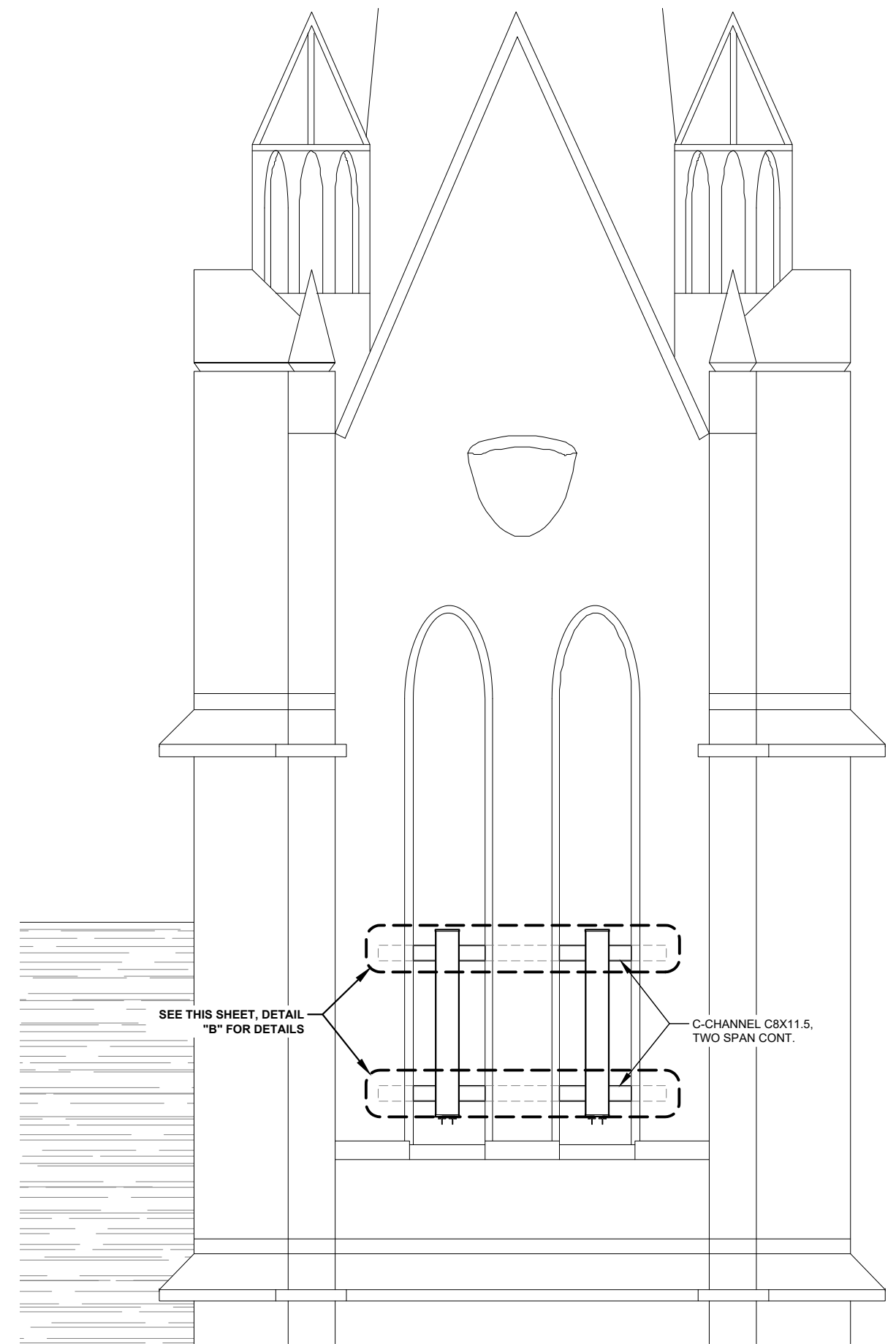
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SITE ADDRESS: 4440 E. CANFIELD D/B/A 4440 RUSSELL ST. DETROIT, MICHIGAN 48207

Sheet Title: ANTENNA STRUCTURAL DETAIL

Sheet Number: SK-2

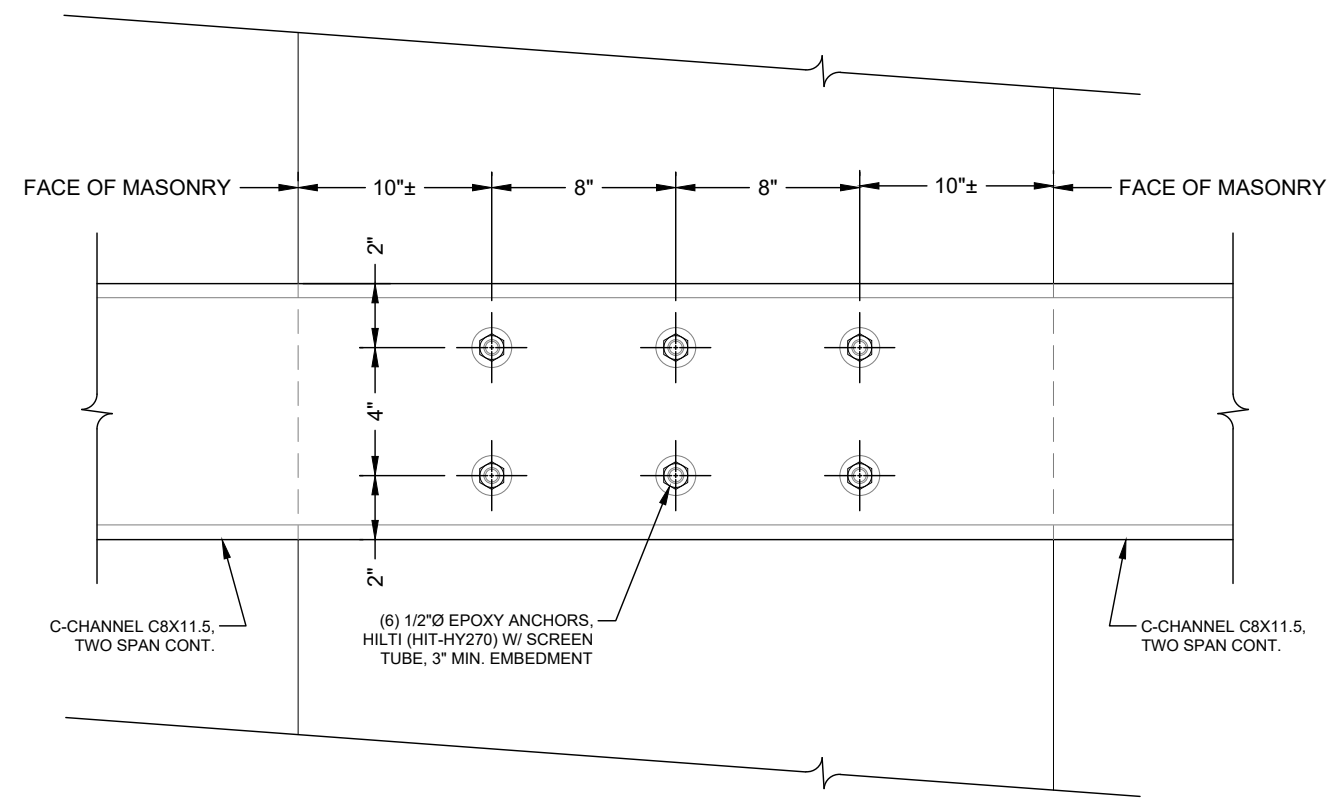


SEE THIS SHEET, DETAIL "B" FOR DETAILS

C-CHANNEL C8X11.5, TWO SPAN CONT.

PLATFORM DETAILS N.T.S. **1**

OMITTED **2**

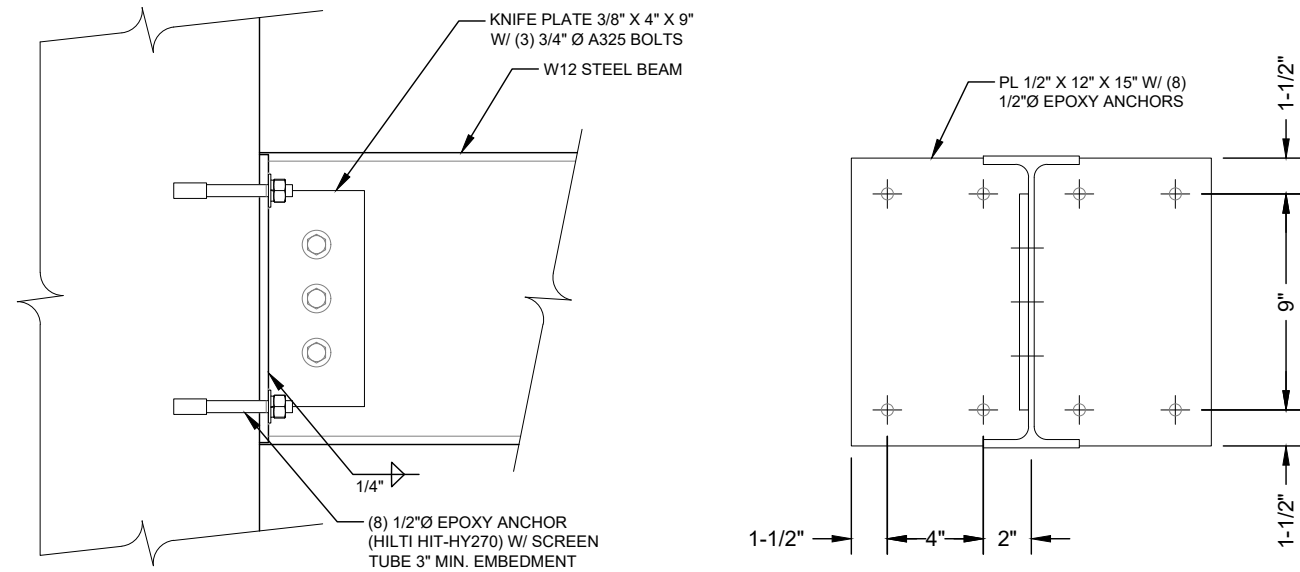


C-CHANNEL C8X11.5, TWO SPAN CONT.

(6) 1/2"Ø EPOXY ANCHORS, HILTI (HIT-HY270) W/ SCREEN TUBE, 3" MIN. EMBEDMENT

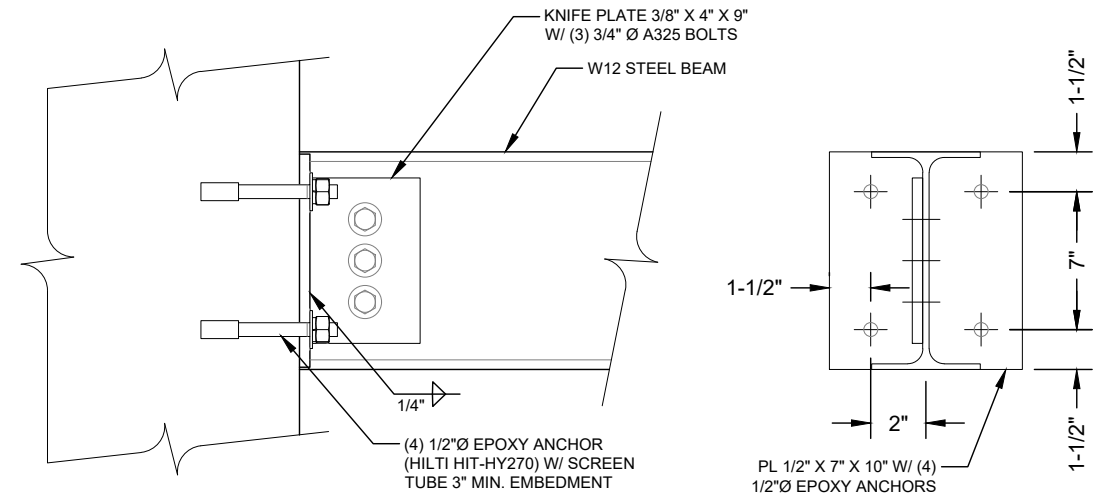
C-CHANNEL C8X11.5, TWO SPAN CONT.

DETAIL "B" N.T.S. **3**



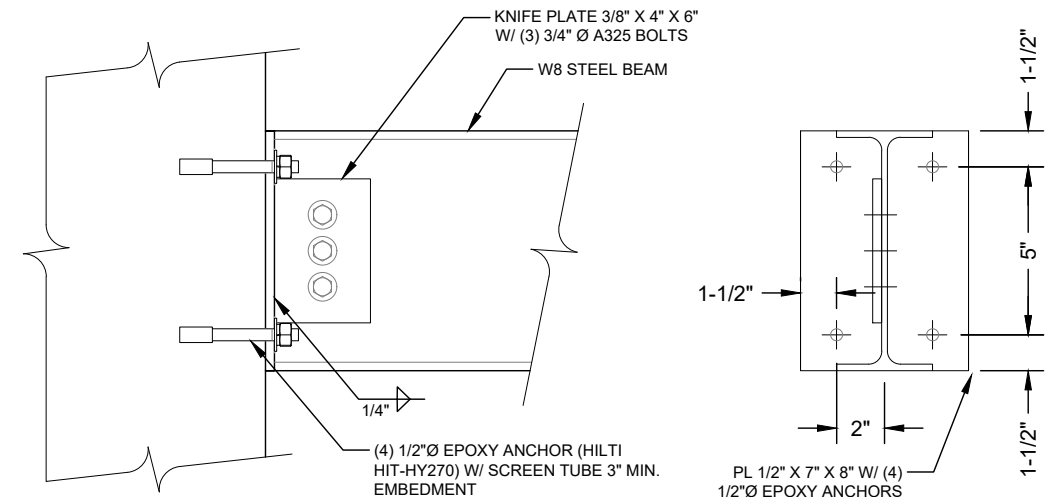
CONNECTION "C1" N.T.S

1



CONNECTION "C2" N.T.S

2



CONNECTION "C3" N.T.S

3

T-Mobile
 28505 SCHOOLCRAFT RD, BLDG#6
 LIVONIA, MICHIGAN 48150
 Phone: 734.367.7200
 Fax: 734.367.7242
 CONTACT: KEN KALOUSEK
 (734) 444-0181

LANDTECH PROJECT NUMBER: 20398031

REV.	DATE	DESCRIPTION	BY
A	07/09/20	PRELIMINARY RELEASE	CJL
B	02/10/22	ADD'D ANT. COVER NOTE	TLR
C	03/30/22	RELOC PROP ANTENNAS	TLR

2020 ANCHOR CONSTRUCTION DRAWINGS

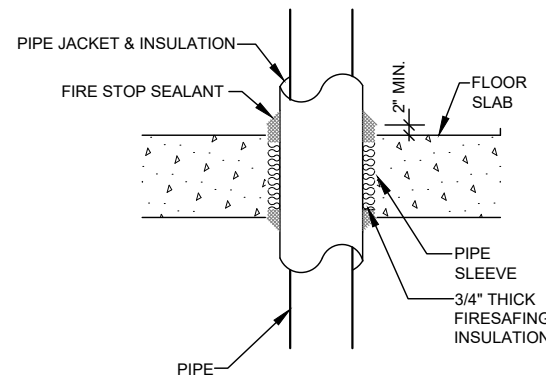
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Sheet Title: PLATFORM STRUCTURAL DETAIL

Sheet Number: SK-3

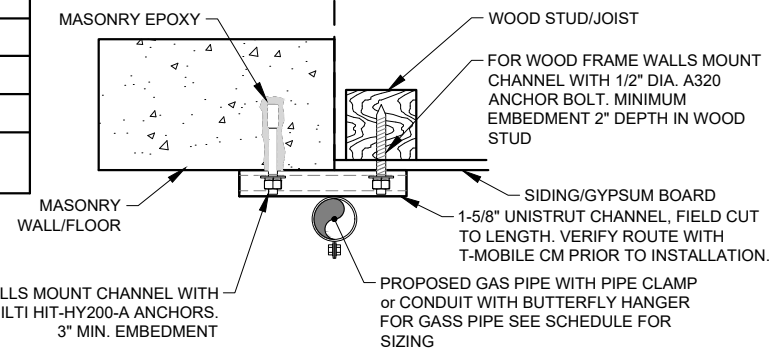


FLOOR PENETRATION DETAIL N.T.S.

1

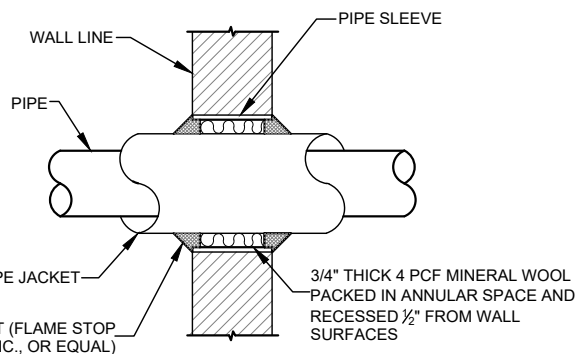
RIGID STEEL CLAMP SIZING SCHEDULE	
PIPE SIZE	UNISTRUT RIGID STEEL CONDUIT CLAMP P/N
3/4"	P1112
1"	P1113
1-1/4"	P1114
1-1/2"	P1115
2" AND GREATER	CONTACT ENGINEER

MASONRY WOOD FRAMED



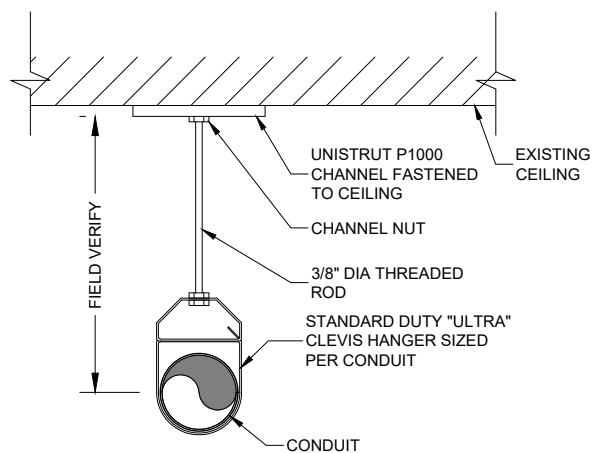
CEILING/WALL CONDUIT HANGER DETAIL N.T.S.

2



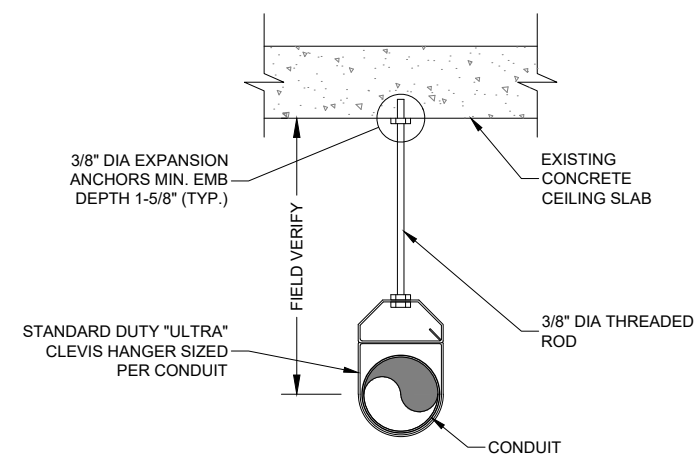
WALL PENETRATION DETAIL N.T.S.

3



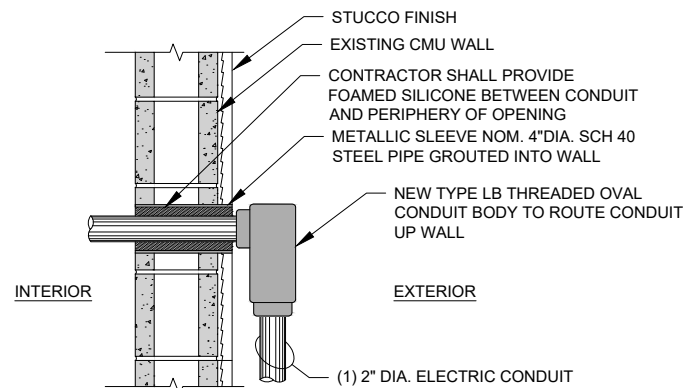
CEILING HANGER DETAIL N.T.S.

4



CEILING HANGER DETAIL N.T.S.

5

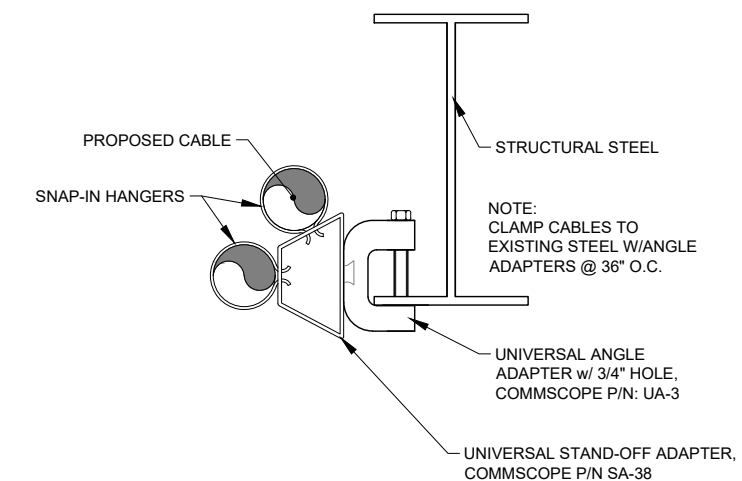


CONDUIT WALL PENETRATION DETAIL N.T.S.

6

INTENTIONALLY OMITTED N.T.S.

7



CABLE HANGER DETAIL N.T.S.

8

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Sheet Title:

CABLE DETAILS

Sheet Number:

E-1.1

Division 15 - MECHANICAL

PART 1 - GENERAL

1. Included - Work of this section generally includes provisions of labor, materials, equipment, accessories, necessary for installation of mechanical systems shown on the contract drawings and specified in the General Notes. Intent of construction documents is to provide the Owner with a complete and operating facility, and any minor items omitted but obviously necessary to accomplish intent shall be provided whether or not shown or specified.

2. Related - The General Requirements division of the General Notes is hereby made a part of the work of this specification. The requirements of this specification apply to the work of all sections of division 15.

A. Work performed by others includes installation of electrical equipment, except as noted otherwise on drawings or in specification.
B. Electrical division 16

3. Ordinances and Codes

A. All work shall be executed and inspected in accordance with all underwriter's, public utilities, local and state codes and regulations applicable to the trade affected. Recommendations of AFA, NFPA, OSHA and ASHRAE and applicable state energy code compliance shall be rigidly followed.
B. Should any change in the plans and specifications be required to comply with these regulations, the contractor shall notify the Owner before submitting his bid. After entering into contract with the Owner, the contractor will be held accountable to complete all work necessary to meet these requirements at his own expense.
C. Where the work required by the drawings and specifications is above the standard required, it shall be done as shown or specified.

4. Permits - The contractor shall arrange and pay for all permits in connection with the work hereinafter specified and at completion of the work furnish the Owner with the final certificate of inspection.

5. Drawings - The drawings indicate the general arrangement of the proposed work. Details of proposed departures due to actual field conditions or other causes shall be provided for. No extras will be paid for correcting faulty, poorly arranged, or poorly coordinated work.

6. Site Examination - The contractor shall visit the premises so as to ascertain the existing conditions before submitting his bid. No extras will be allowed for his lack of knowledge of these conditions.

7. Complete Installation - The contractor shall furnish and install all incidental parts, valves, fittings, pumps, control valves and control wiring required for the proper function of all component parts. The complete installation shall function smoothly and noiselessly to the full extent of the plans and specifications. The contractor shall complete his installation as rapidly as general construction permits. All filters, strainers, and safety devices shall be properly installed before starting equipment. The Owner shall be left with a new set of filters at final acceptance.

8. Coordination - Before any equipment is purchased or fabricated and before running and/or fabricating any lines of piping or ductwork, the mechanical contractor and his subcontractors shall assure themselves that they can be run as contemplated. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The mechanical contractor and his subcontractors shall carefully investigate all other mechanical, and electrical and structural drawings and finish conditions affecting all of their work accordingly, furnishing such fittings, valves, duct transitions, offsets and accessories as may be required to meet such conditions, at no additional cost.

9. Temporary Heat - Arrangements for usage of system for temporary heat shall be coordinated with general contractor. System shall not be used for temporary heat unless all temporary filters are installed. Temporary filters and operation of units shall be provided by the general contractor.

10. Submittals - Within 5 days after proposal acceptance the contractor shall submit to the Owner for approval two (2) copies of shop drawings on each item of equipment whether as specified or substituted. Shop drawings shall give overall dimensions, weights, metal gauges, materials, certified capacities, brake HP, motor HP, tube diameters friction drop and nameplate data. The contractor shall be responsible for checking shop drawings before submitting for approval. The Owner's check shall be general and does not relieve the contractor of final responsibility for a complete job to the intent of plans and specifications. All control diagrams and equipment should be assembled in one submittal.

11. Substitution of Equipment

A. Bids shall be based on providing all equipment mentioned by brand name in plans and specifications. No substitutions shall be considered before bidding.
B. The contractor shall attach a list of proposed substitutions, giving the amount to be added or deducted to contract price for each item. Complete engineering data shall be submitted on each request for substitution item. Substitute items shall be equal or better than items mentioned in regard to all accessories, capacities, durability and appearance. Contractor shall pay all costs incurred to make substitute items fit required space with maintenance clearances - piping, sheet metal, electrical or building alteration shall be included in said costs.
C. All standard accessories as well as specified extras shall be provided with equipment.

12. Guarantee - All material and workmanship installed and/or furnished under this section of work shall be guaranteed against defects for a period of one year from date of acceptance by Owner. Any defects or faulty workmanship shall be the contractor's responsibility and shall be corrected entirely at his expense.

PART 2 - PRODUCTS

1. Approved manufacturers - approval by name listed in this specification does not imply that the manufacturer standard product meets the intent of the drawings and specification. It is the contractor's responsibility to provide all necessary alterations, materials, labor, etc., as approved by the Owner to meet the full intent of the drawings and specifications. This is to include, but not necessarily be limited to electrical, structural, mechanical, and architectural alterations and revisions necessary to provide a complete and operating facility at no additional costs to the Owner.

2. Materials - Materials throughout shall be new and of the best grades specified. They shall be standard catalog items and manufactured by nationally known manufacturers of the items specified. Contractor shall receive and be responsible for all Owner furnished equipment and provide rough-in and final connections for all mechanical equipment furnished under this contract or by others. The contractors shall provide a suitable shed for the storage of all materials during progress of the job.

3. Solder - All solder used on sweat fittings shall be 95-5 hard solder unless brazing or silver solder is specified. All buried copper piping shall be silver soldered.

4. Floor, Ceiling Plates, Flanges - Provide tight fitting floor and ceiling plates on pipes passing through walls, ceilings, floors, nickel or chrome plate in finished areas. Provide wall and ceiling flanges for ducts in finished areas.

5. Pipe Hangers, Supports - Provide hangers, supports, braces by Grinnell, Fee and Mason, Grabler, Elcen, Unistrut, Basin Engineers, Inc. to prevent undue strain, stresses, noise, vibration.

PART 3 - EXECUTION

1. Workmanship

A. Work throughout shall be performed by men skilled in the installation of the various trades of the work herein specified.
B. All piping and ductwork shall be run concealed in finished areas except where noted otherwise or as chrome plated plumbing fixture connections.
2. Curbs, Bases, Supports - Major curbs, openings, and equipment supports will be provided under the general section of this contract only where shown on engineering or structural plans. All other supports, anchors, and bases shall be provided by mechanical contractor for all mechanical equipment. Equipment shall be supported per manufacturer's written recommendations for noise-free installation.
3. Removal of Existing Work - All existing mechanical equipment, piping, etc., removed by the contractor shall be the property of the building. Such items will be disposed of at the building owner's direction.
4. Removal of Rubbish - On completion of his work, the contractor shall remove all of his tools, scaffolding, debris, etc., from the grounds and leave the premises perfectly clean.
5. Operating and Maintenance Instructions - Upon completion, the contractors shall make up a set of operating and maintenance instructions covering all mechanical equipment with moving or moveable parts including general operating or heating, plumbing and cooling systems and shall give the Owner four (4) copies of these instructions. Manufacturer's printed operations and maintenance instructions shall also be provided for each piece of equipment.

A. Name, address, and telephone number of party to be contacted for 24 hour service for each item of equipment.

B. Starting, stopping, lubrication, and adjustment shall be clearly indicated for each piece of equipment.

C. Prepare 8-1/2"x11" blueprints with binding edge of appropriate scale to indicate all equipment, respective switches, and valve locations. Bind in instruction book.

DIVISION 5 - FENCE

PART 1 - GENERAL

3.1 Work Included

A. Refer to the site plans for size and location of fence and gates to be installed.

3.2 Related Work

A. Coordinate fence grounding with Electrical Contractor.
B. Refer to Fence Detail Plan - concrete for specification of concrete and grout.
C. Refer to Fence Detail Plan for applicable locations of access road gates.

3.3 Description

A. A security fence is provided in order to inhibit unauthorized access to the site area.

3.4 Quality Assurance

Refer to Fence Detail Plan.

3.5 Sequencing

A. If the site area has been brought up to surface course elevation prior to fence construction, fence post excavation spoils must be controlled to preclude contamination of surface course.

3.6 Submittals

A. Manufacturer's descriptive literature.
B. Certificate of compliance that specifications have been met.

3.7 Fence Material

Refer to Fence Detail Plan.

DIVISION 7 - ANTENNA SYSTEM

PART 1 - GENERAL

1.1 Work Included

A. Erect furnished tower as indicated in the drawings.
B. Install antennas as indicated on drawings and Owner specifications.
C. Install antenna platform as indicated on drawings.
D. Install furnished galvanized steel waveguide ladder.
E. Install waveguide bridge as indicated on drawings.
F. Install coax cable, connectors, jumpers, grounding kits as indicated in drawings.
G. Sweep test result.

1.2 Requirements of Regulatory Agencies

A. Furnish U.L. listed equipment where such label is available, install in conformance with U.L. standards where applicable.

B. Install antenna, antenna cables, grounding system in accordance with drawings and specification in effect at project location and recommendations of state and local building codes, special codes having jurisdiction over specific portions of work. This includes, but is not limited to, the following:

- EIA - Electrical Industries Association RE - 222, structural standards for steel antenna towers and antenna supporting structures.
- FAA - Federal Aviation Administration advisory circular AC 70/7460-IH, obstruction marking and lighting.
- FCC - Federal Communications Commission rules and regulations form 715 "obstruction marking and lighting specifications for antenna structures", and form 715A, "high intensity obstruction lighting specification for antenna structures"
- DISC - American Institute of Steel Construction specifications for structural joints using ASST. A325 or A490 bolts.
- NECK - National Electrical Code - on tower lighting kits.
- UL - Underwriter's Laboratories approved.
- In all cases part 77 or the FAA rules and parts 17 and 22 of the FCC rules are applicable and in the event of conflict, supersede any other standards or specifications. 1990 Life Safety code NAPA - 101.

DIVISION 16 - GENERAL ELECTRIC

PART 1 - GENERAL ELECTRICAL PROVISION

- Submittal of bid indicates Contractor is cognizant of all job site conditions and work to be performed under this contract.
- Contractor shall perform all verification, observations, tests, and examination work prior to the ordering of the electrical equipment and the actual construction. Contractor shall issue a written notice of all findings to the architect listing all malfunctions, faulty equipment and discrepancies.
- Heights shall be verified with Owner prior to installation.
- These plans are diagrammatic only.
- Electrical Service 120/240 V.A.C. single phase 3-wire 100 AMP service.
- Contractor shall provide all labor, materials, insurance, equipment, installation, construction tools, transportation, etc. for a complete and properly operative system energized throughout and as indicated on drawings, as specified herein and/or as otherwise required.
- Contractor shall carry out all work in accordance with all governing state, county, and local codes and O.S.H.A.
- Contractor shall secure all necessary building permits and pay all required fees.
- Complete job shall be guaranteed by the Contractor for a period of one (1) year after the date of job acceptance by Owner. Any work, material, or equipment found to be faulty during that period shall be corrected at once, upon written notification, at the expense of the Contractor.
- Provide project manager with one set of complete electrical "as installed" drawings at the completion of the job, showing actual dimensions, routings and circuits.
- The entire electrical installation shall be grounded as required by all applicable codes.
- Upon completion of work, conduct continuity, short circuit and fall potential ground tests for approval. Submit test reports to project manager. Clean premises or all debris resulting from work and leave work in a complete and undamaged condition.

PART 2 - PRODUCTS

A. All materials and equipment shall be new and in perfect condition when installed and shall be of the best grade and of the same manufacturer throughout for each class or group of equipment. Material shall be listed "J" where subject to such approval. Materials shall meet with approval of the division of industrial safety and all governing bodies having jurisdiction. Materials shall be manufactured in accordance with applicable standards established by ANSI, NEMA and NBFU.
B. All conduit only (C.O.) shall have a pull wire or rope.
C. All conductors shall be copper.
D. All circuit breakers, fuses and electrical equipment shall have an interrupting short circuit to which they may be subjected, and a minimum of 10,000 A.I.C.
E. Wire and cable conductors shall be copper 12 AWG Minimum unless specifically noted otherwise on drawings.
F. Grounding conductors shall be solid tinned copper and annealed +2.
G. Meter socket amperes, voltage, number of phases shall be as noted on the drawings, manufactured by Square D Company or approved equal.
H. All material shall be U.L. listed.
I. All underground conduit shall be PVC schedule 40 (unless noted otherwise) at a minimum depth of 24" below grade.
J. Cables
1. All ground cable shall be standard TND solid bare copper plate and of size indicated on drawings.
2. When the direction of the conductor must change it shall be done gradually. The curvature of the turn shall be done in accordance with the following table:

Grounding Conductor Size	
Min Bending Radius to Inside Edge:	
No. 6 awg. to no. 4 awg	3"
No. 6 awg to no. 1/0 awg	8"
No. 2/0 awg. to 750 mcrn	1"
Bus Bar	No Restrictions

PART 3 - UNDERGROUND ELECTRICAL SERVICE

A. Coordinate the electrical service with the utility company.
B. Contractor to coordinate with utility company connection of temporary and permanent power to the site. The temporary power and all hookup costs to be paid by contractor.
C. The service shall be installed in accordance with all applicable codes and standards to be acceptable to the governing authorities exercising legal jurisdiction over electrical installations.

PART 4 - GROUNDING CONNECTIONS

A. External Connections:
1. All external grounding connections shall be made by the "cadweld" process. Connections shall include all cable to cable splices, Tees, Xs, etc. All cable to ground rods, ground rod splices and lightning protection system as indicated. All materials used (molds, welding, metal, tools, etc.) shall be by "cadweld" and installed per manufacturer's recommendation and procedures.
2. All interior grounding and bonding conductors shall be connected by two holes crimp type (compression) connections (except for the ACEG and ground rod) mechanical connections, fitting or connections that depend solely on solder shall not be used.

B. Ground Rods:
All ground rods shall be 5/8" diameter x 10'-0" long "Copperweld" or approved equal of the number and at locations indicated. Ground rods shall be driven full length vertical in undisturbed earth. All ground rods to be 10' apart unless otherwise

C. Ground Bars:
All ground bars shall be 1/4" thick bare copper plate and of size indicated on drawings.

D. Ground Ring:
1. The ground ring encircling the building shall be minimum size of no. 2 awg bare copper conductor in direct contact with the earth at a depth of not less than 42 inches (min) conductor bends shall have a minimum radius of 8 inches.

2. All external ground rings shall be joined together and all connections shall be "cadweld". NO LUGS OR CLAMPS WILL BE ACCEPTED.

E. Fence/Gate All sections of fence and gate shall be grounded as indicated on drawings. Ground each gate post and corner post. All other connections for the ground grid system shall be made by the "cadweld" process, and installed per manufacturer's recommendations and procedures.

F. Ground test pit A ground test pit shall consist of 6" diameter SCH 40 PVC with 6" cleanout plug & cleanout adapter fitting. Plug threads shall be coated with anti-seize lubricant prior to installation. 6" PVC will be 18" long, buried 12" underground with 6" above finished grade. Top of Ground rod cadwelded to ground ring will be 12" from top of cleanout adapter.

PART 5 - ASTM Fall Potential Tests

A. Ground tests shall be performed as indicated on drawings. A middle ground ohm meter or the method of using two auxiliary ground rods (as described in I.E.E.E. standard no. 81-1983, part 1) may be used. The I.E.E.E. method requires the use of an a.c. test current. The auxiliary test rods must be sufficiently far away from the rod under test so that the regions in which their resistance is localized do not overlap.

B. Contractor to conduct ground resistance test in the format as follows:

- Equipment Building
A. First test - shall be with four ground rods installed, one at each corner of the building but not connected to the main grounding bus. Furnish wire to connect (temporary clamp) all four ground rods together to make a system test after each rod is individually tested. If any individual rod tests 25 OHMS or more, the electrical contractor and owner's representative should be notified so that the rod can be driven deeper until all four rods have a resistance of 10 OHMS or less on a dry day.
B. Second test - shall be with the ground rods connected with dry soil and when no standing water has been present for the past ten days. The maximum allowable reading is 5 OHMS to ground. If the resistance of the entire system exceeds 5 OHMS, the electrical contractor and owner's representative should be notified so that either additional and/or deeper rods can be installed.
- Tower

A. First test - shall be with nine (9) ground rods installed (min.) equally spaced around the tower foundation, but not connected to the equipment building external ground ring. Furnish wire to connect (temporary clamp) all three ground rods together to make a system test after each rod is OHMS or more, the electrical engineer and the owner's representative should be notified so that the rod can be driven deeper until all three rods have a resistance of 10 OHMS or less on a dry day.
B. Second test - shall be with the grounds connected, with dry soil and when no standing water has been present for the past ten days, the maximum allowable reading is 5 OHMS to ground. If the resistance of the entire system exceeds 5 OHMS the electrical contractor and owner's representative should be notified so that either additional and/or deeper rods can be installed.

3. Equipment Building and Tower
A. After the equipment building and tower ground resistance test is completed, electrical contractor shall tie equipment building external ground ring together. After first and second test, all connections shall be "cadweld". No lugs or clamps will be accepted.
B. After all the external ground rings are tied together but before the equipment building is tied down, a megger check of the ground system should be done. The maximum allowable reading is 5 OHMS to ground.

C. Ground Resistance Test Report
Upon completion of the testing for each site, Contractor shall submit a test report showing resistance in OHMS with auxiliary potential electrodes at 5-foot and 10-foot intervals until the average resistance starts increasing; 10-15 photos must be taken to proof entire external ground ring system before backfill or project manager must be notified no less than 48 hours in advance of backfill. Testing shall be completed by general contractor and two (2) sets of test documents are to be bound and submitted within one week of work of completion.

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GENERAL NOTES

Sheet Number:

N-2

NOTE: THESE NOTES ARE OF A GENERAL NATURE AND ARE NOT SITE-SPECIFIC. SOME NOTES MAY NOT APPLY TO THIS SITE. CROSS-REFERENCE NOTES WITH OTHER SHEETS AND T-MOBILE SCOPE OF WORK TO VERIFY WORK TO BE COMPLETED.