2020 ANCHOR CONSTRUCTION DRAWINGS

SITE NAME:

SWEETEST HEART OF MARY

SITE NUMBER:

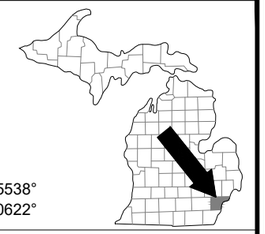
DE04229B

STREET ADDRESS:

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

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



LATITUDE: 42.35805538°
LONGITUDE: -83.0480622°

FAA INFORMATION

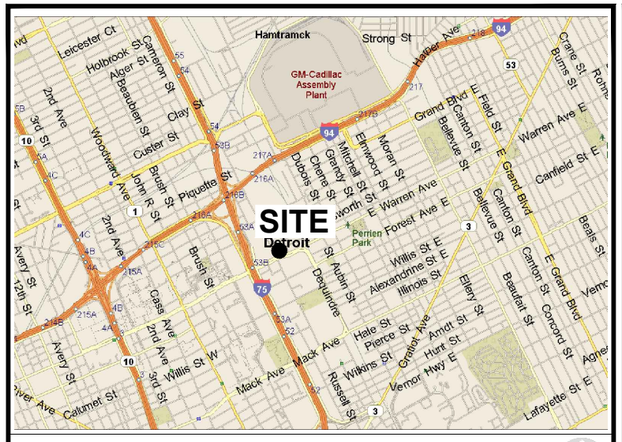
THE UTILITIES SHOWN ON THESE DRAWINGS ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. OTHER UTILITIES THAT ARE NOT SHOWN MAY BE PRESENT AT THE SITE. LANDTECH ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF THE UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL UTILITIES WITHIN THE LIMITS 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

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



LOCATION MAP

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: ADDRESS	CATHOLIC ARCHDIOCESE OF DETROIT 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

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:

1. 2015 MICHIGAN BUILDING CODE
2. 2015 MICHIGAN MECHANICAL CODE
3. ANSI / TIA-222-H
4. NATIONAL ELECTRIC CODE 2017
5. LOCAL BUILDING CODE
6. CITY/COUNTY ORDINANCES
7. 2015 MICHIGAN PLUMBING CODE
8. INTERNATIONAL FIRE CODE
9. 2015 MICHIGAN UNIFORM ENERGY CODE
10. MIOSHA RULES AND REGULATIONS
11. NFPA-101 LIFE SAFETY CODE

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

USE GROUP: A-3
CONSTRUCTION TYPE: 1A

CODE COMPLIANCE

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

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

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

STATE OF MICHIGAN
MATTHEW MOKANYK
ENGINEER
NO. 51424
LICENSED PROFESSIONAL ENGINEER

LANDTECH
Professional Surveying & Engineering
231.943.0050 www.landtechps.com 877.520.LAND

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

CATCH BASIN		IRON PIPE	
SQUARE CATCH BASIN		CONTROL IRON L.T.	
SANITARY MANHOLE	SNS	IRON FOUND	
TELCO. MANHOLE	T	IRON SET	
ELECTRIC METER	EM	P.K. NAIL FOUND	
LIGHT POLE		P.K. NAIL SET	
STORM MANHOLE	STS	NAIL LANDTECH	
WATER VALVE	WV	MONUMENT FOUND	
GAS METER	GM	RECORD	(R)
GAS VALVE	GV	MEASURED	(M)
HYDRANT		FIBER PEDESTAL	FB
TRANSFORMER	TR	FIBER VAULT	
GAS MANHOLE	G	POWER POLE	PP
BENCHMARK	BM	GUY	GUY
O/H TELCO	OT		
U/G TELCO	UT		
O/H ELEC	OE		
U/G ELEC	UE		
WATER	W		
GAS	G		
FIBER	F		
FENCE	X		

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.

SCALE: 1"=20'

0 20' 40'

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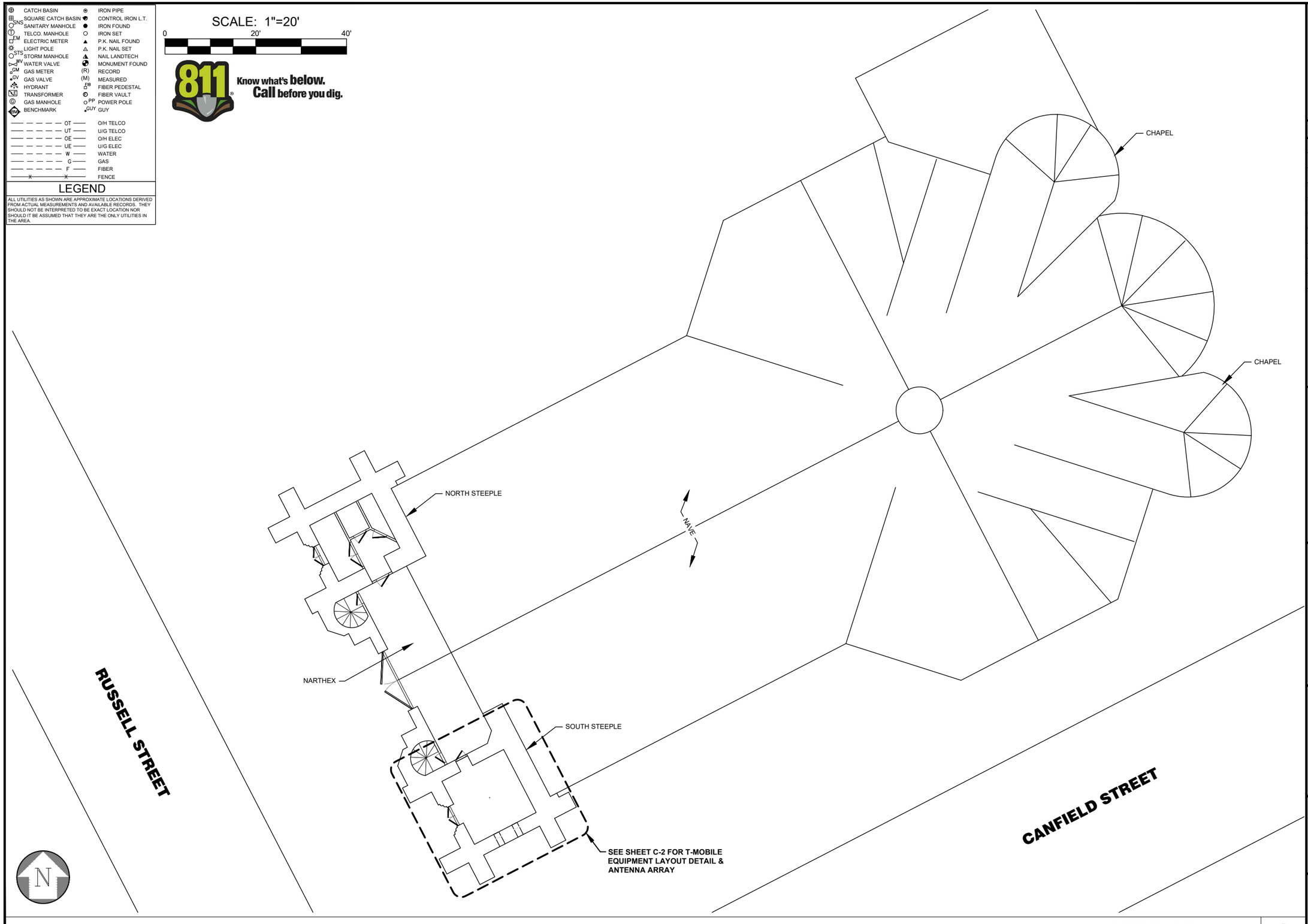

SITE PLAN 1"-20' | **1**

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SITE PLAN

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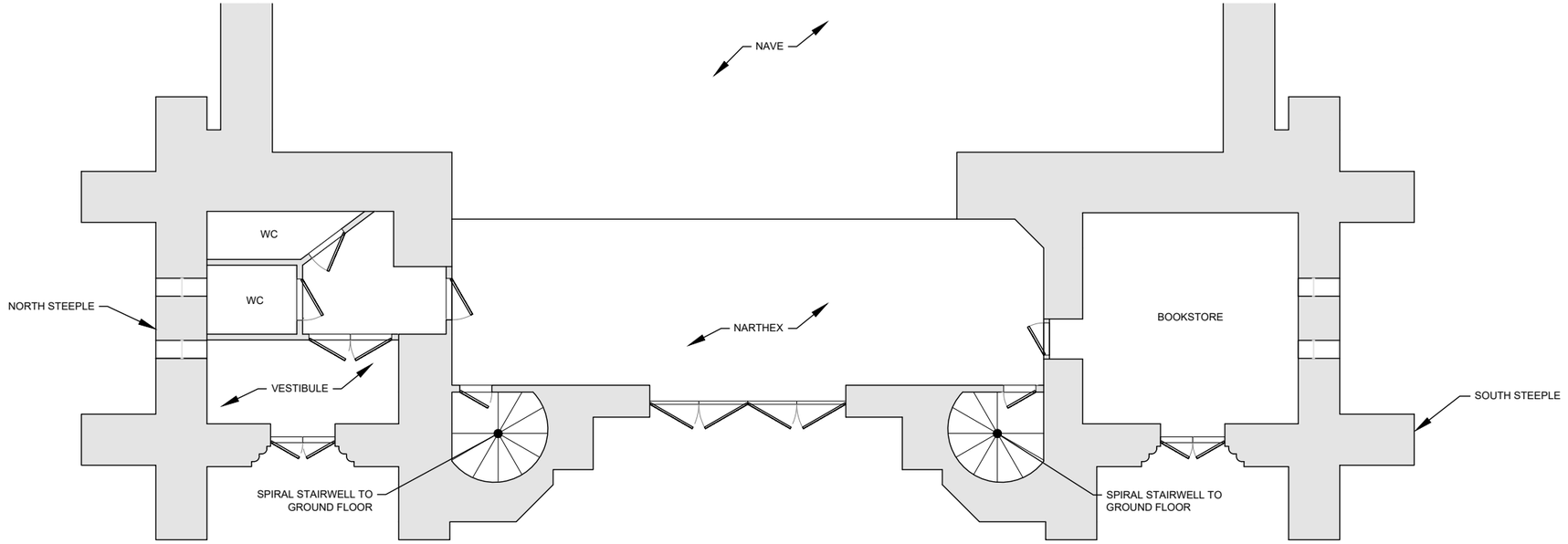
C-1



GROUND FLOOR 1"=10'

1

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

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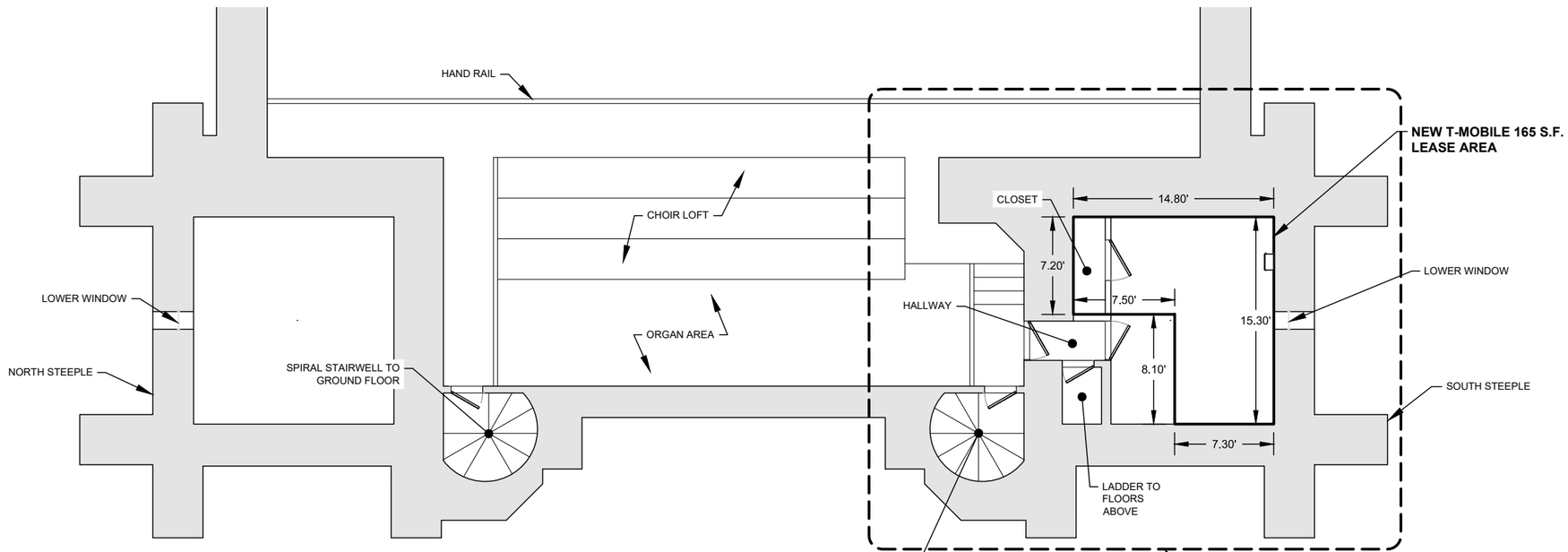

SCALE: 1"=10'

0 10' 20'

SECOND FLOOR LOFT AND STEEPLE PLAN 1"=10'

1

T-Mobile
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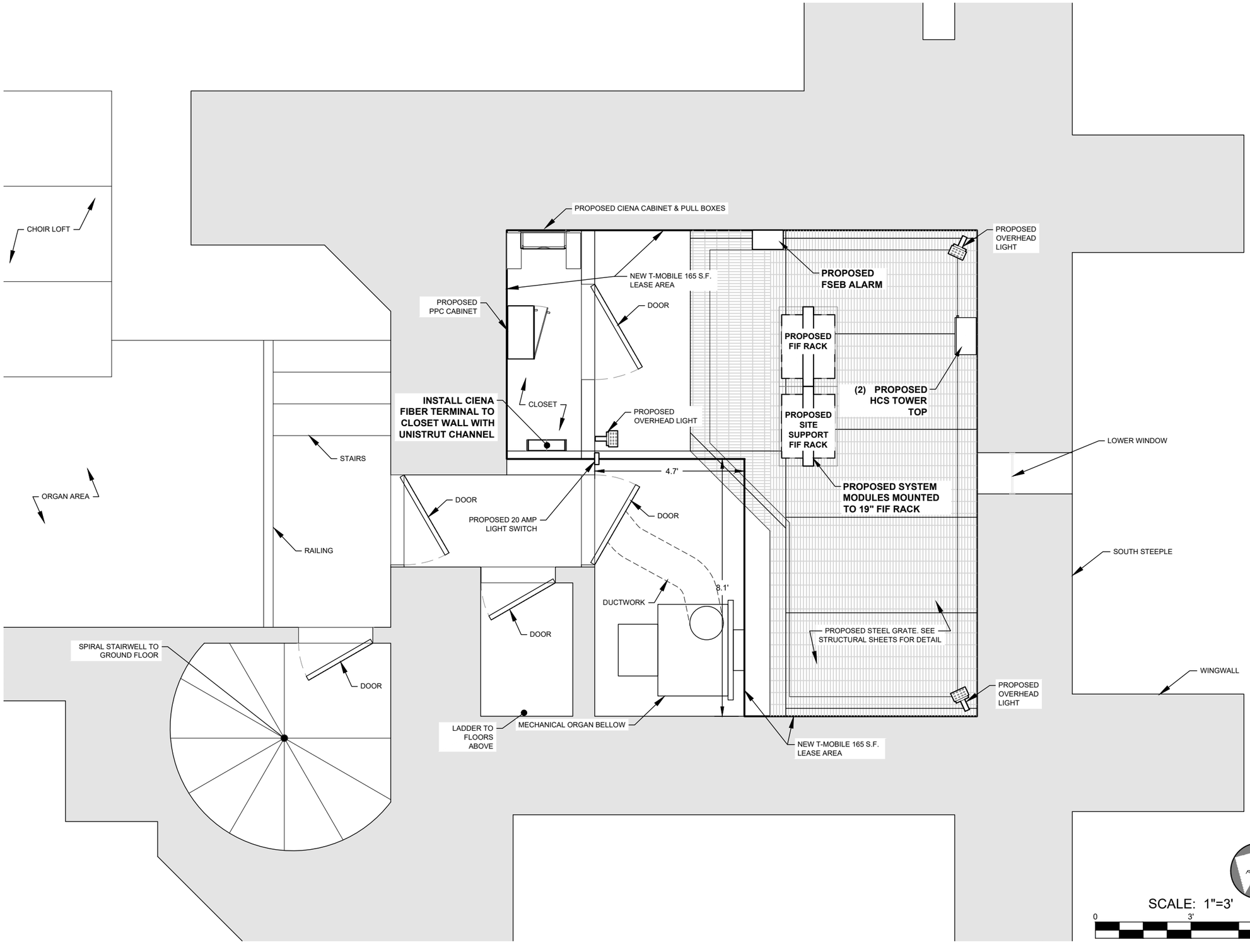
Sheet Title: SITE PLAN

Sheet Number: C-1.1



2nd FLOOR SOUTH STEEPLE NEW EQUIPMENT ROOM 1"=3'

1

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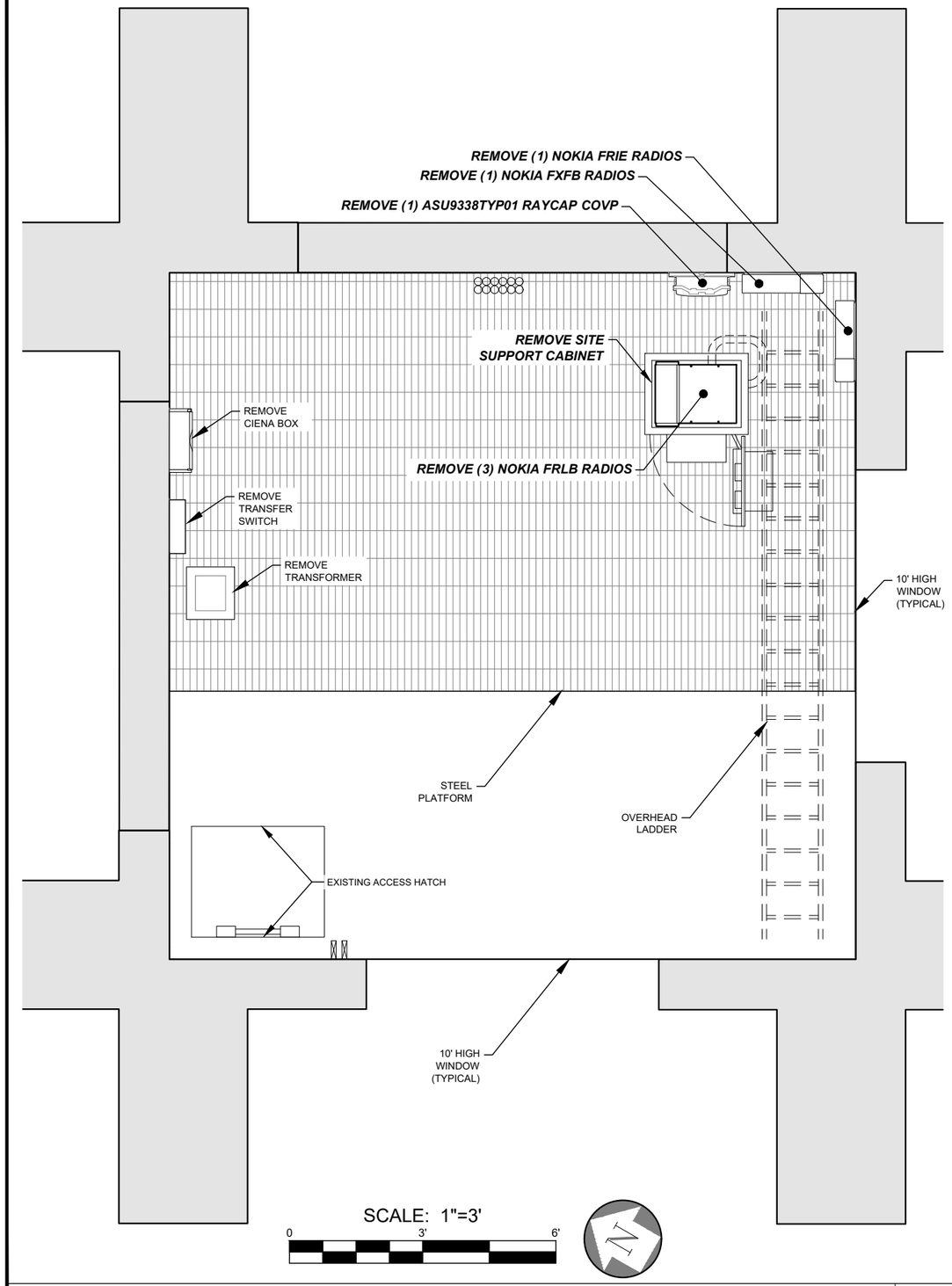
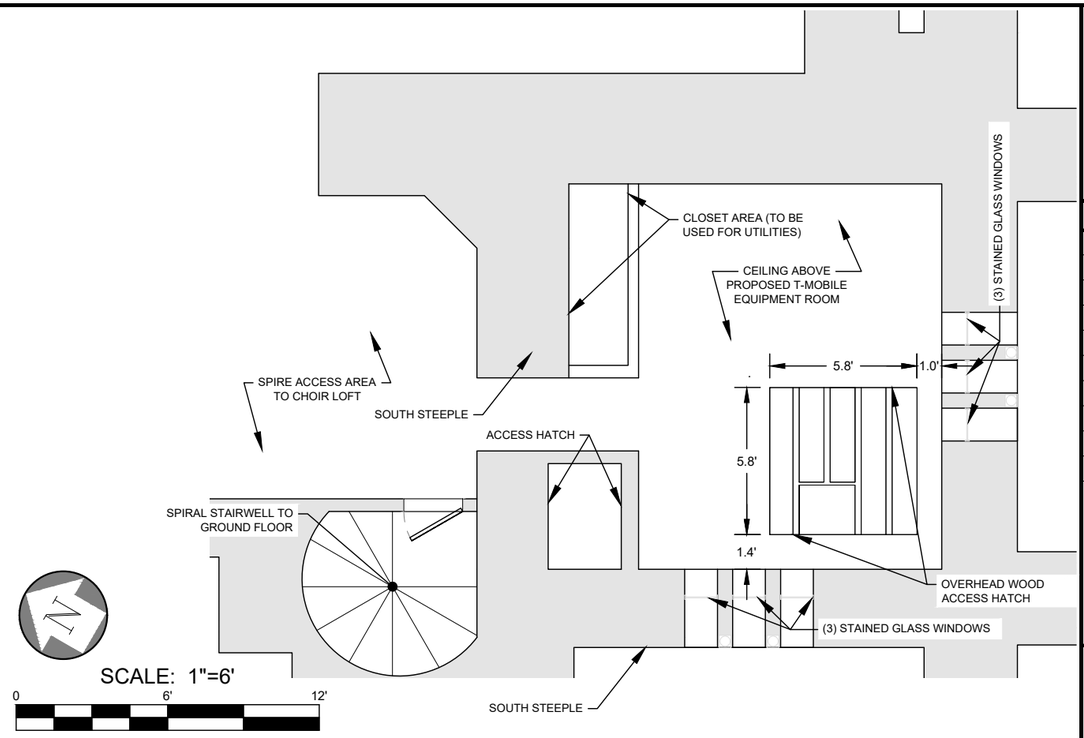
Sheet Title:
EQUIPMENT ROOM

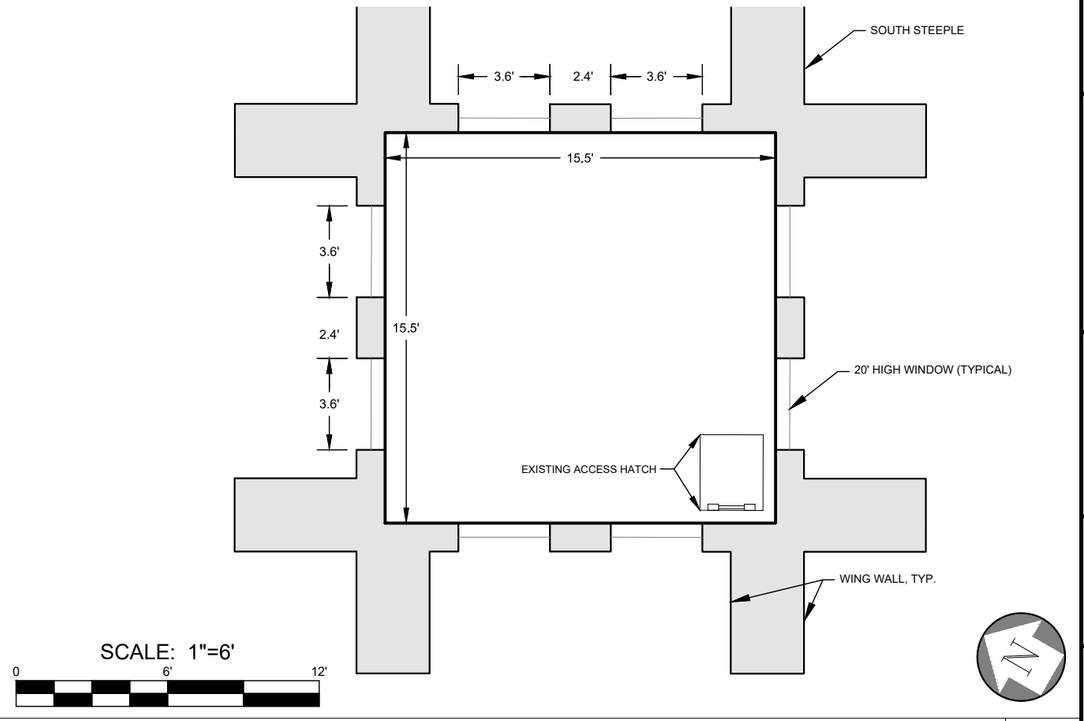
Sheet Number:
C-2



3rd FL. SOUTH STEEPLE - OLD EQUIPMENT ROOM DEMO PLAN 1"=3' | 1



2ND FLOOR SOUTH STEEPLE CEILING VIEW 1"=6' | 2



5th FLOOR SOUTH STEEPLE - ANTENNA ROOM 1"=6' | 3

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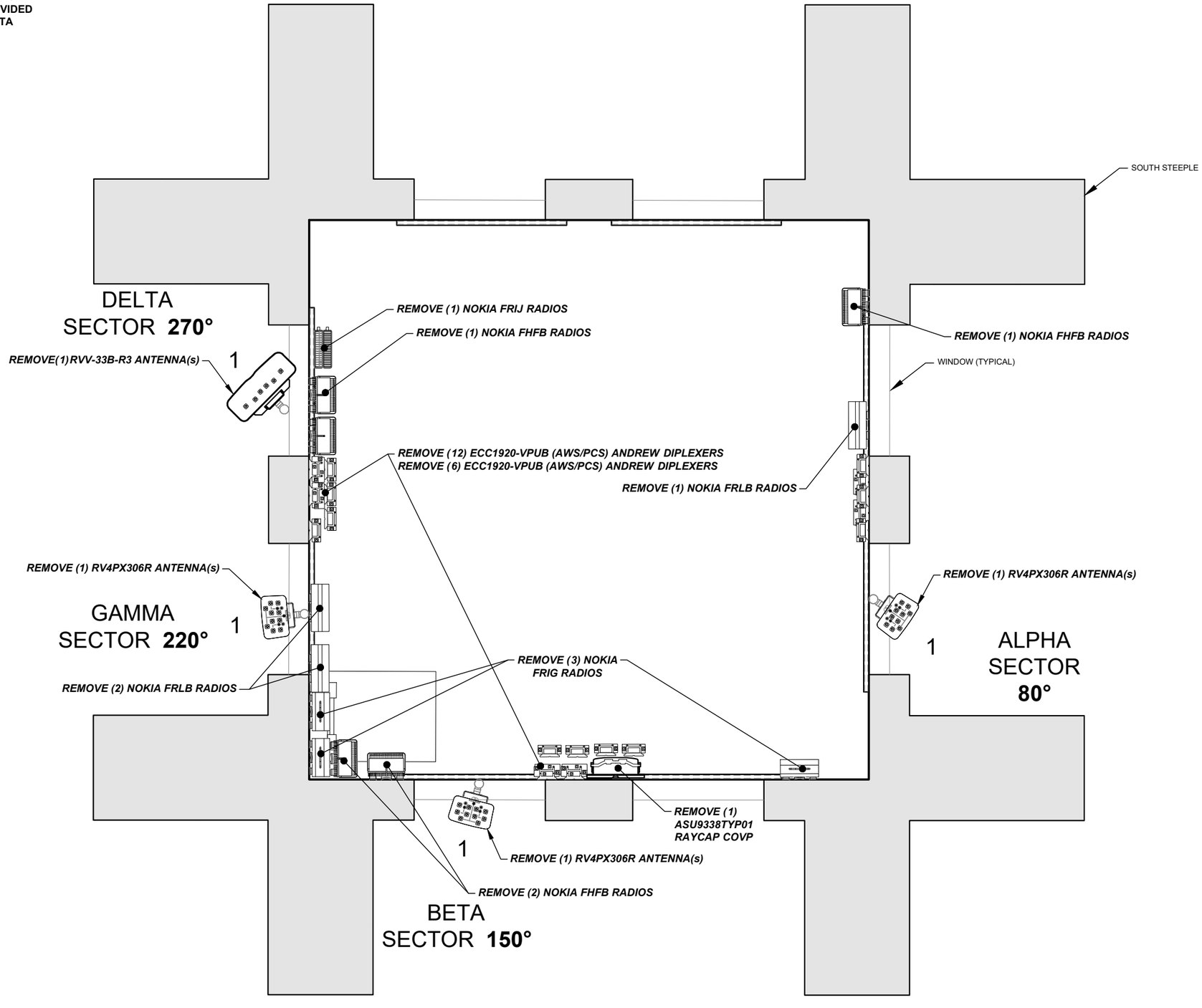
Sheet Title:
FLOOR PLANS

Sheet Number:
C-2.1

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



EXISTING ANTENNA PLAN N.T.S. | **1**

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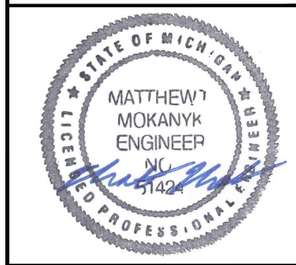

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Sheet Title:
EXISTING ANTENNA PLAN

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

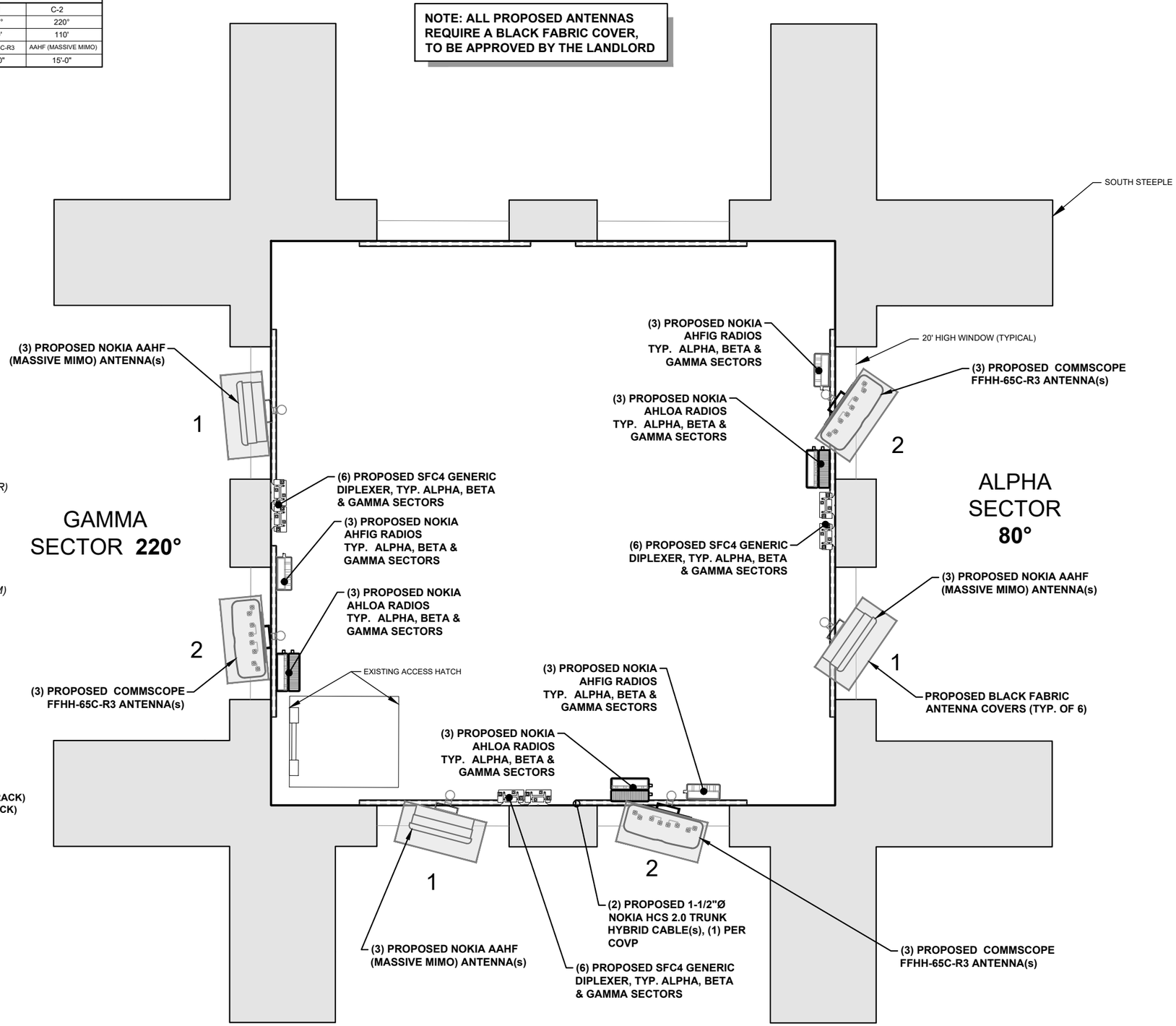
APPURTENANCE LIST

REMOVING

(3) COMMSCOPE RV4PX306R ANTENNA(s) [63"l x13.9"w x8.2"d 52.9lb(s)]
(1) COMMSCOPE RVV-33B-R3 ANTENNA(s) [72"l x25.2"w x9.3"d 94.8lb(s)]
(3) NOKIA FRLB RADIOS (@SECTOR) [15.75"l x15.75"w x5.2"d 52.5lb(s)]
(1) NOKIA FRIE RADIOS (@SECTOR) [5.2"l x5.2"w x22"d 55.1lb(s)]
(1) NOKIA FXFB RADIOS (@SECTOR) [5.2"l x19.4"w x22.1"d 55.1lb(s)]
(3) NOKIA FRIG RADIOS (@SECTOR) [18.1"l x15.2"w x6"d 57.32lb(s)]
(4) NOKIA FHFB RADIOS (@SECTOR) [34.3"l x12.6"w x7.8"d 52.9lb(s)]
(1) NOKIA FRIJ RADIOS (@SECTOR) [23.1"l x12.6"w x5.8"d 46.3lb(s)]
(6) ETM19V2S12UB (STYLE 4) COMMSCOPE AMPLIFIER (@SECTOR) [10"l x8.6"w x2.3"d 11.2lb(s)]
(1) ASU9338TYP01 RAYCAP COVP (@PLATFORM) [20.38"l x18.86"w x5.83"d 19lb(s)]
(1) ASU9338TYP01 RAYCAP COVP (@SECTOR) [20.38"l x18.86"w x5.83"d 19lb(s)]
(12) ECC1920-VPUB (AWS/PCS) ANDREW DIPLEXERS (@SECTOR) [7.6"l x7.3"w x2.6"d 7.9lb(s)]
(6) ECC1920-VPUB (AWS/PCS) ANDREW DIPLEXERS (@PLATFORM) [7.6"l x7.3"w x2.6"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 x25.2"w x9.3"d 127.6lb(s)]
(3) NOKIA AAHF (MASSIVE MIMO) ANTENNA(s) [35.4"l x21"w x8.3"d 104lb(s)]
(3) NOKIA AHLOA RADIOS (@SECTOR) [22.1"l x12.2"w x7.5"d 83.9lb(s)]
(3) NOKIA AHFIG RADIOS (@SECTOR) [27.4"l x12.1"w x5.2"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)**



PROPOSED ANTENNA PLAN N.T.S. | **4**

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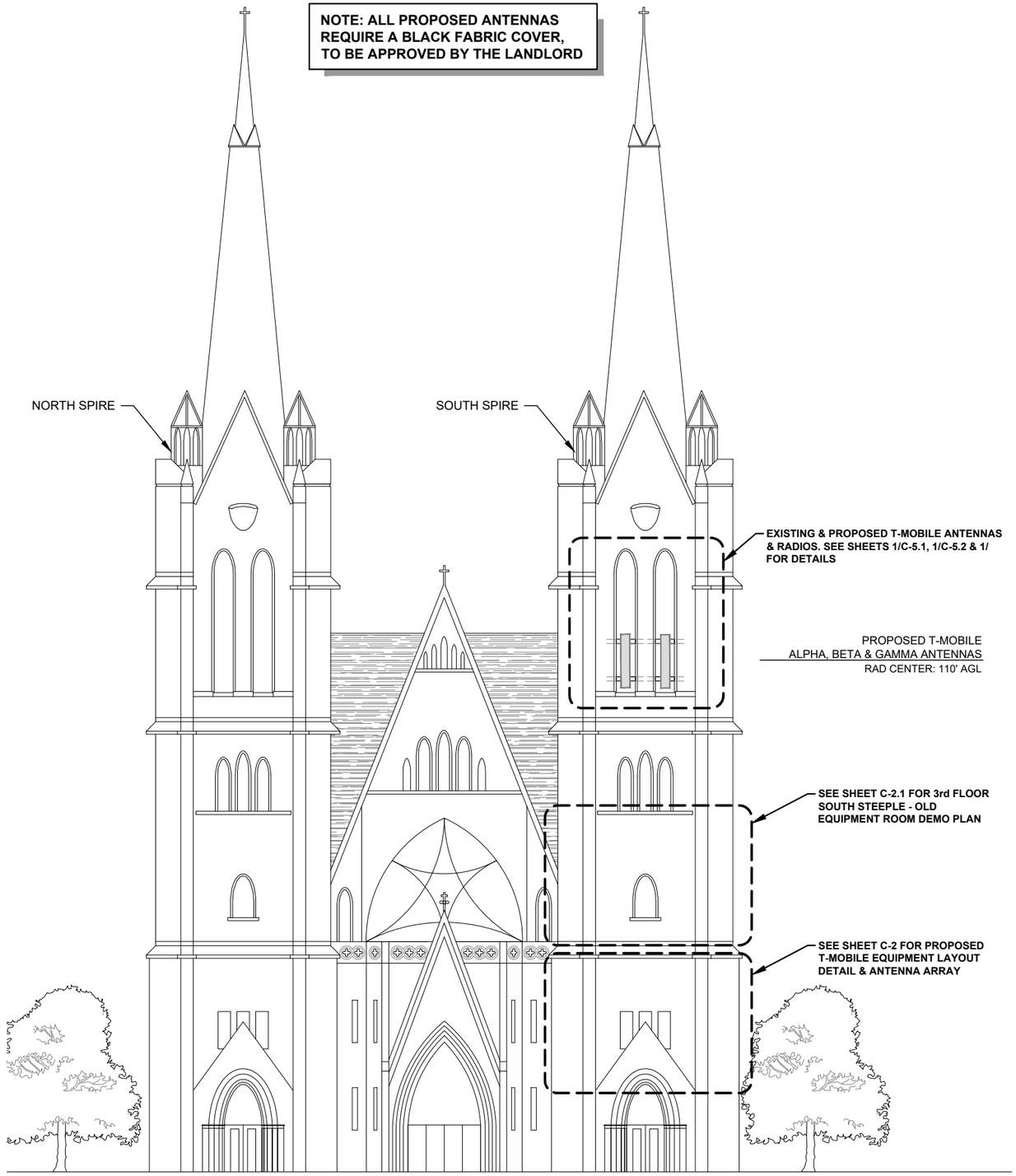
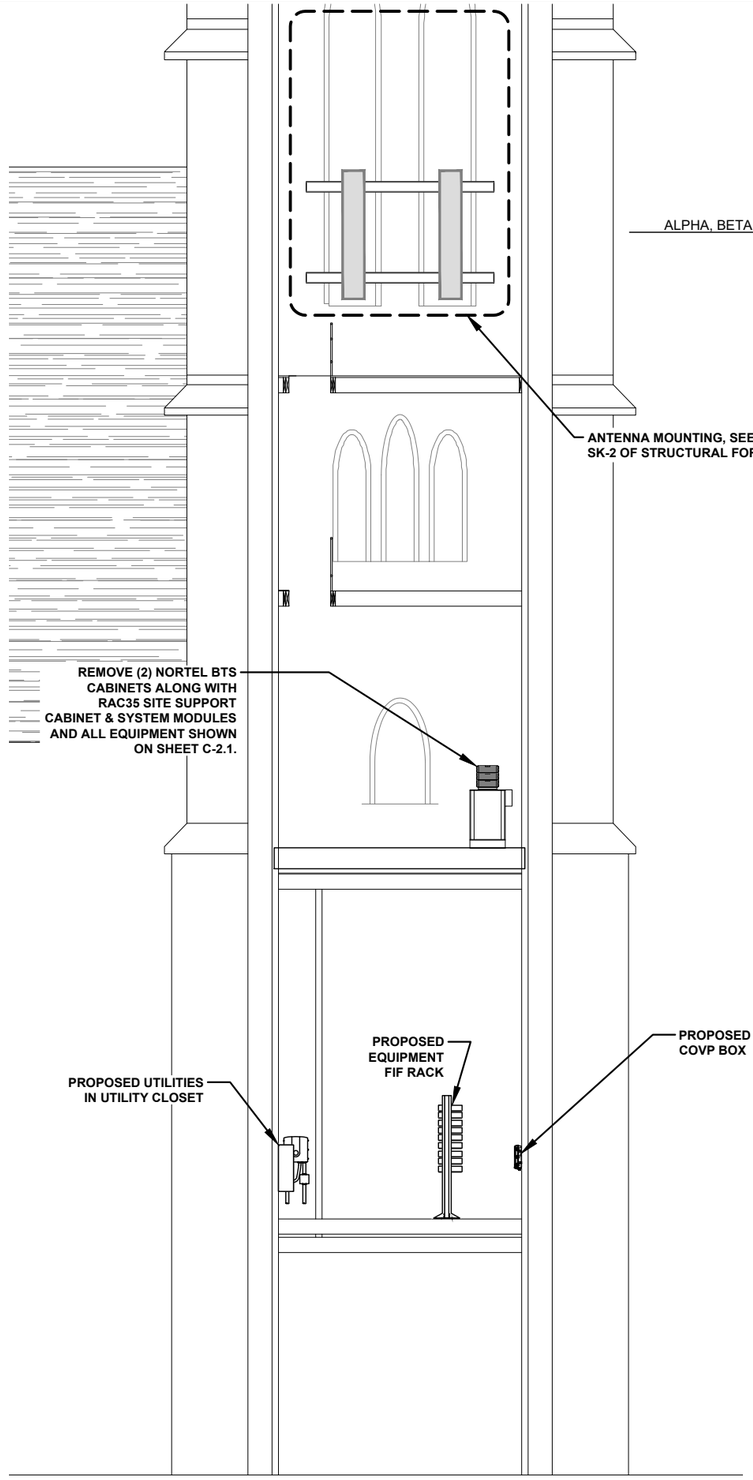
Sheet Title: PROPOSED ANTENNA PLAN

Sheet Number: C-4

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



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



NOTE: SOME EQUIPMENT OMITTED FROM ELEVATION VIEW FOR CLARITY

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

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

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

STATE OF MICHIGAN
MATTHEW J MOKANYK
ENGINEER
NO. 61424
LICENSED PROFESSIONAL ENGINEER

LANDTECH
Professional Surveying & Engineering
231.943.0050 www.landtechps.com 877.520.LAND

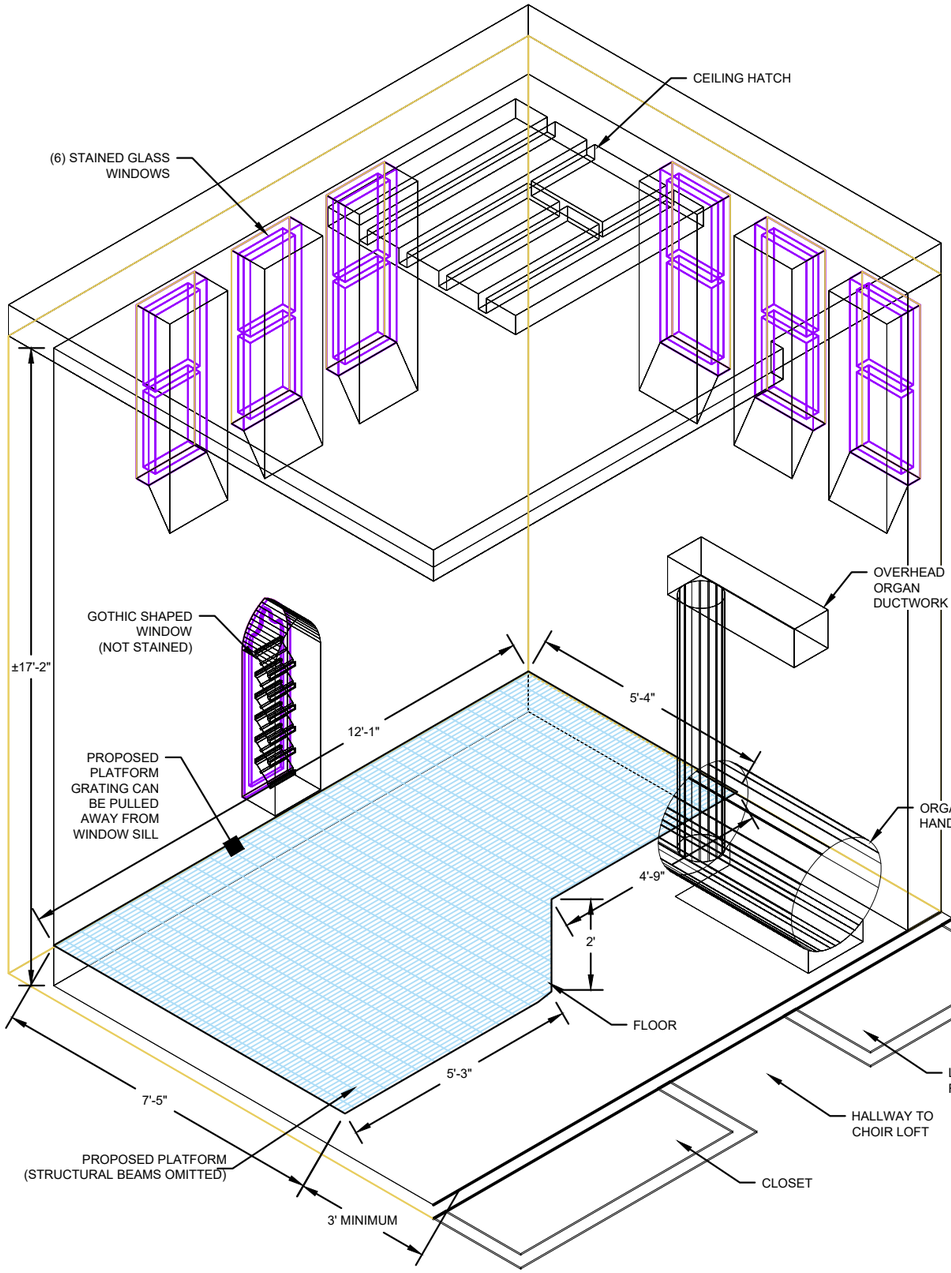
SITE #: DE04229B

SITE NAME:
SWEETEST
HEART OF MARY

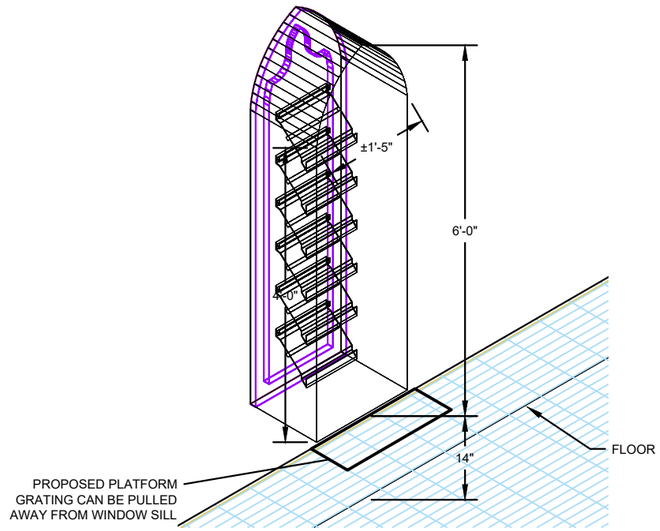
SITE ADDRESS:
4440 E. CANFIELD D/B/A 4440 RUSSELL ST.
DETROIT, MICHIGAN 48207

Sheet Title:
ELEVATION VIEW

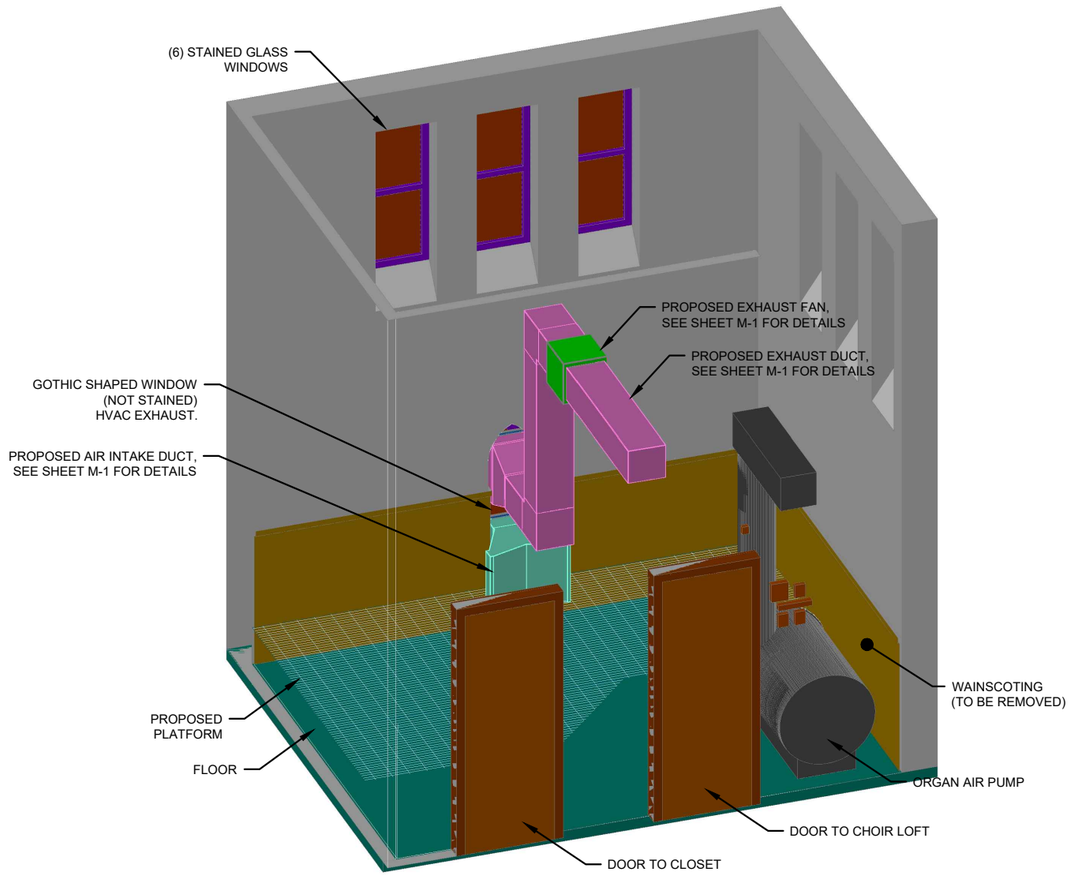
Sheet Number:
C-5



WIREFRAME VIEW N.T.S. | **1**



WINDOW DETAIL N.T.S. | **2**



ISOMETRIC VIEW N.T.S. | **3**

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SITE #: DE04229B

SITE NAME:
SWEETEST HEART OF MARY

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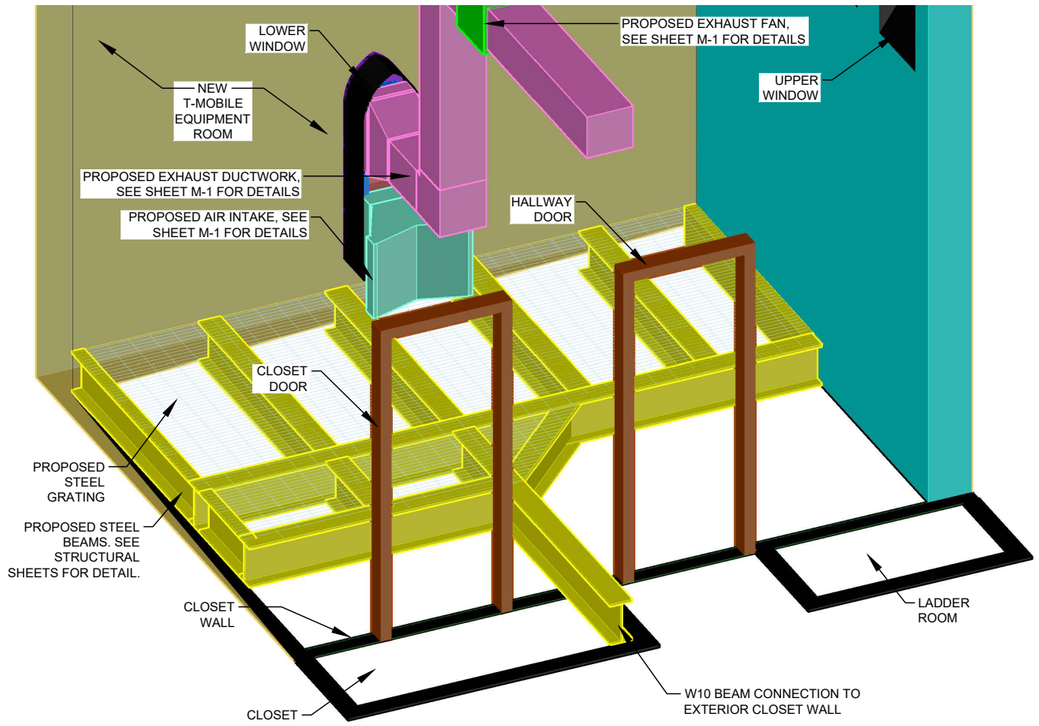
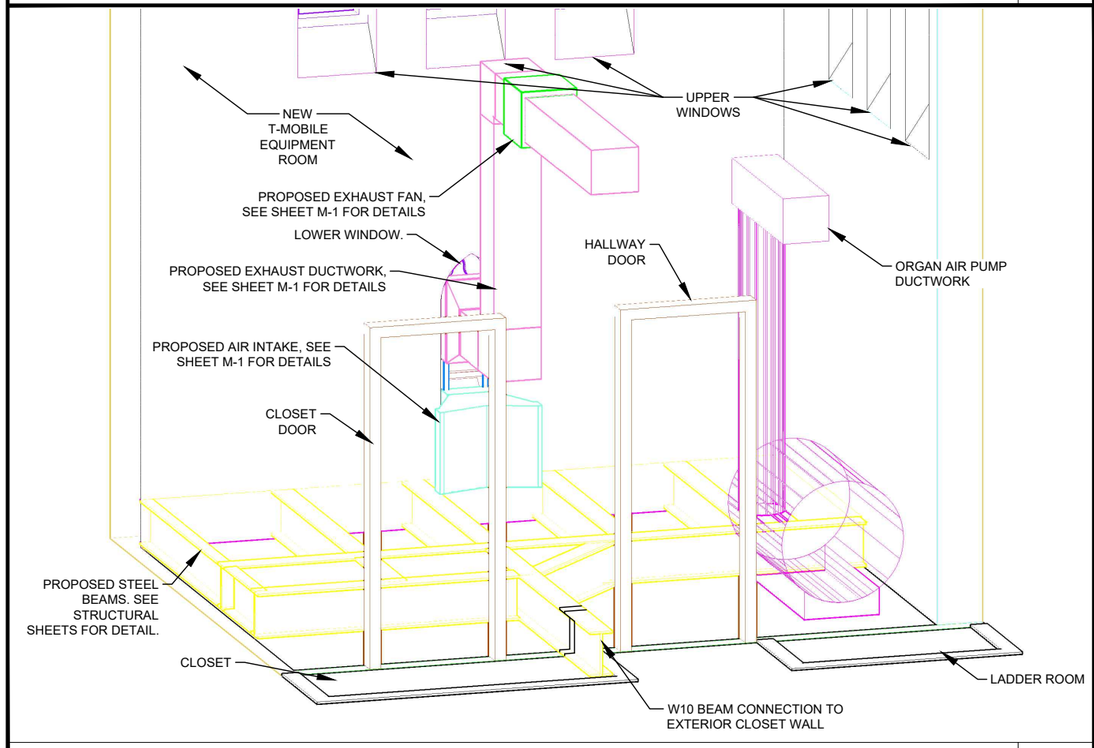
4440 E. CANFIELD D/B/A 4440 RUSSELL ST.
DETROIT, MICHIGAN 48207

Sheet Title:
PICTORIAL VIEWS

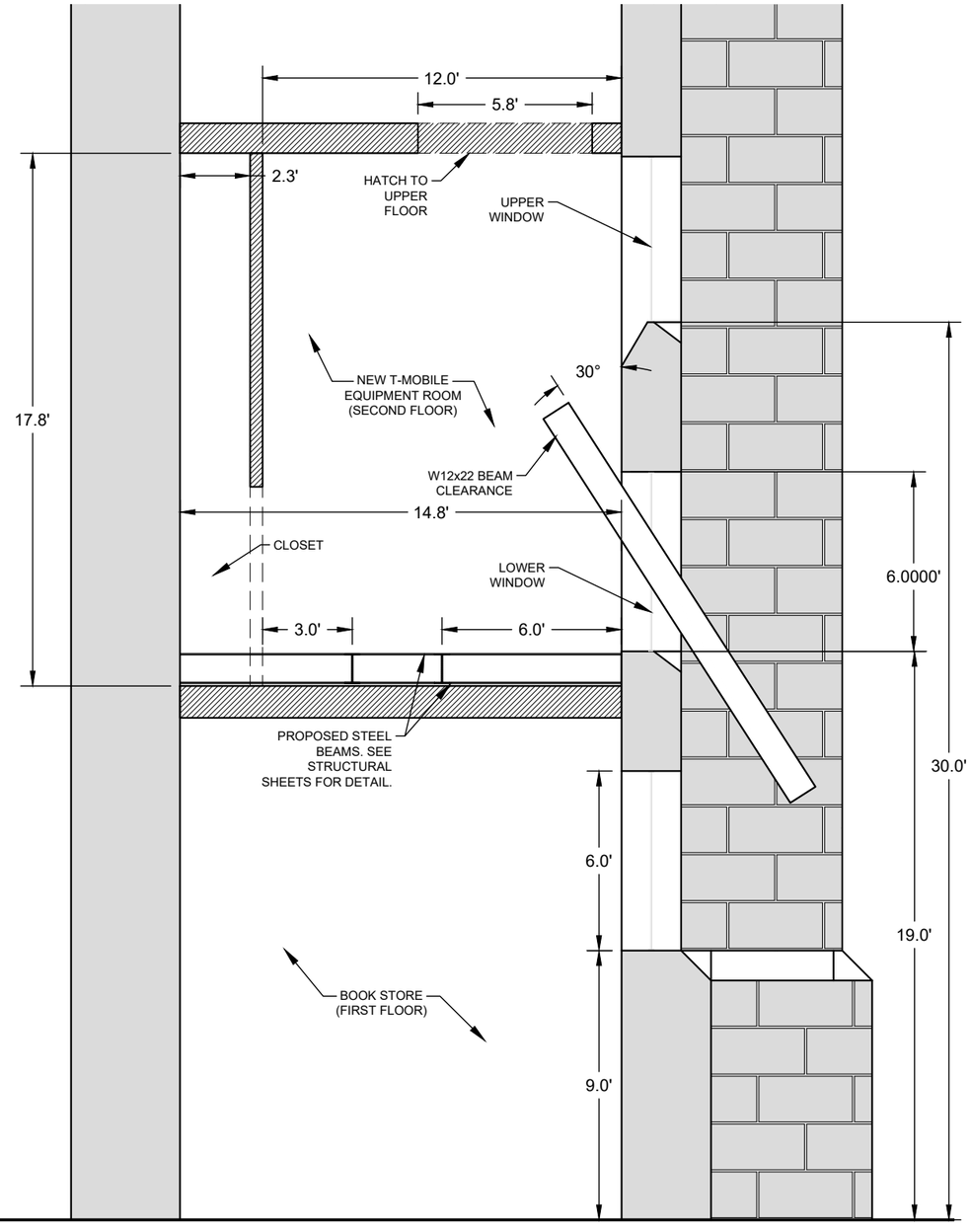
Sheet Number:
C-5.1



PLATFORM DETAIL N.T.S. | **1**



PLATFORM PICTORIAL N.T.S. | **2**



CROSS-SECTION DETAIL A-A 1"=5' | **3**

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SITE #: DE04229B

SITE NAME: SWEETEST HEART OF MARY

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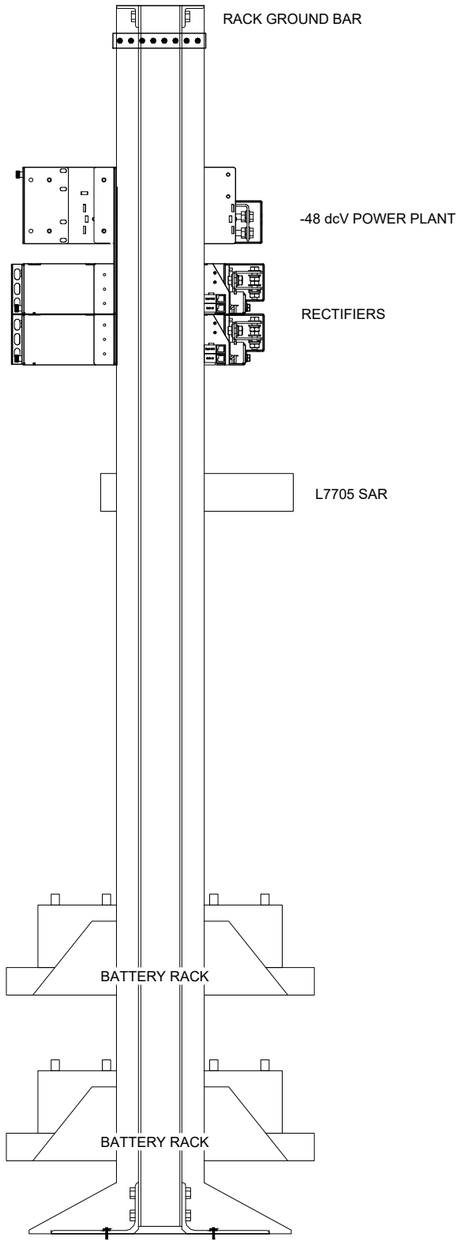
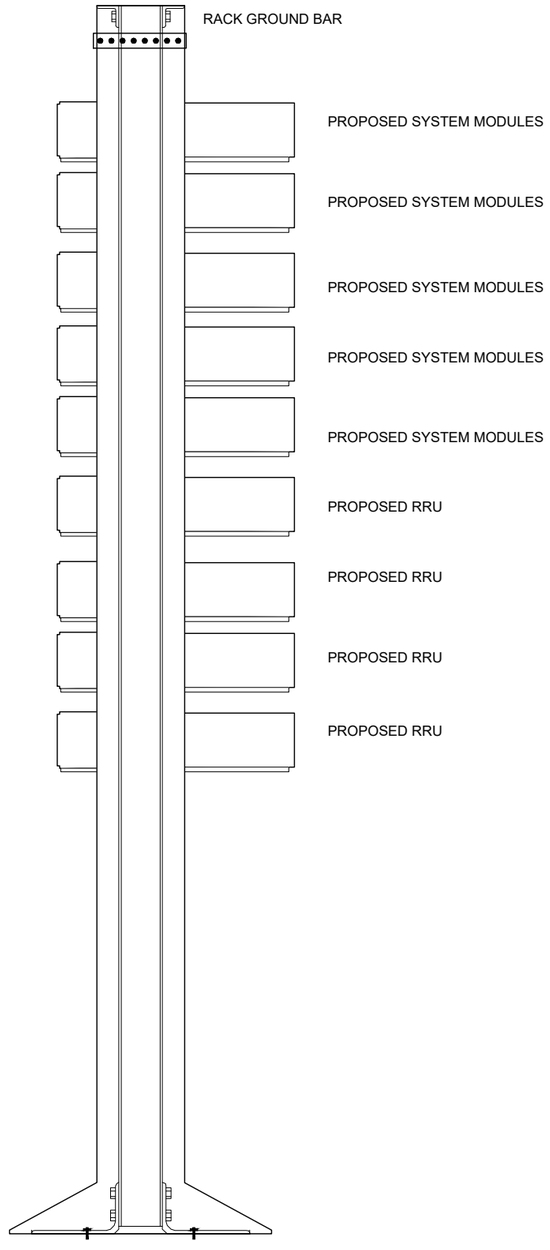
DETROIT, MICHIGAN 48207

Sheet Title: PICTORIAL VIEWS

Sheet Number: C-5.2

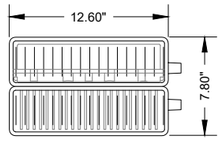
NOTE: GROUND ALL EQUIPMENT ON RACK TO RACK GROUND BAR PER MANUFACTURER'S REQUIREMENTS. MINIMUM 6 AWG SOLID TINNED CU

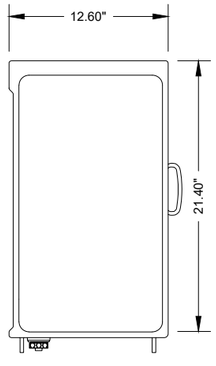


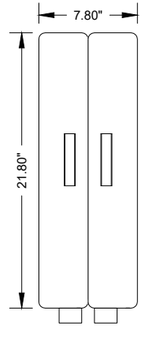


NOTE: NUMBER OF MODULES/RADIOS VARIES. CONSULT CURRENT RFDS FOR EXACT QUANTITIES.

19" WIDE FIF RACK DETAIL N.T.S. **1**







MANUFACTURER:	NOKIA
MODEL:	AHLOA
FREQUENCY:	600 MHz
DIMENSIONS w/ SOLAR SHIELD:	22.1" x 12.2" x 7.5"
WEIGHT w/ BRACKET & SOLAR SHIELD:	83.9 lbs
CONNECTORS:	(2) OPTICAL (1) DIN FEMALE (DC POWER)

AHLOA RADIO UNIT N.T.S. **3**

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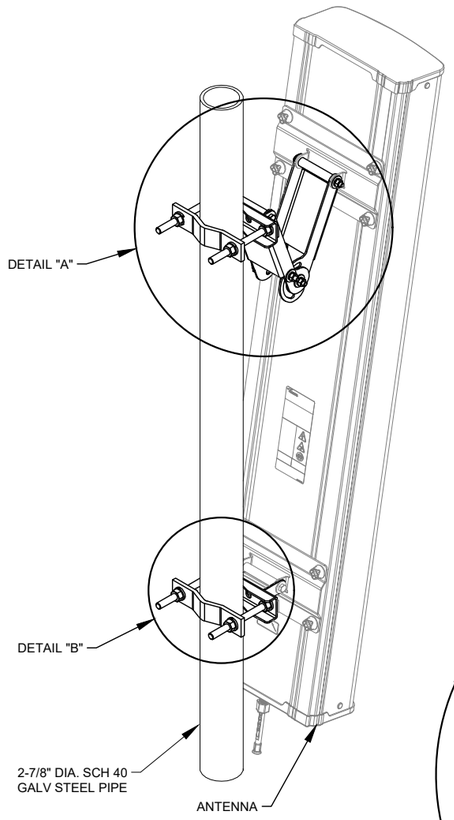
DETROIT, MICHIGAN 48207

Sheet Title:
EQUIPMENT DETAILS

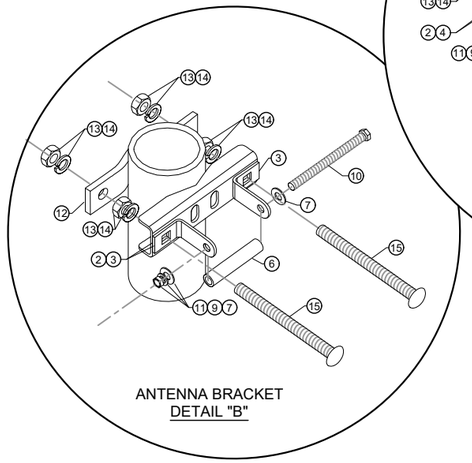
Sheet Number:
C-6

PARTS LIST

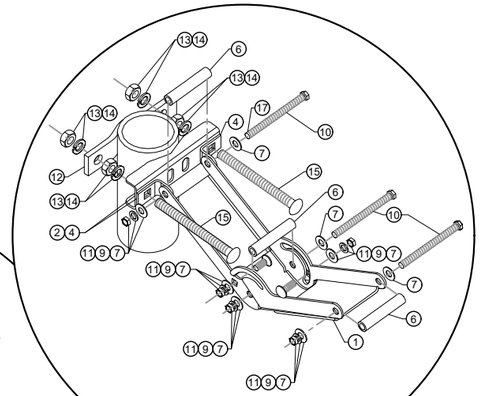
ITEM #	QUANTITY	PART NUMBER	DESCRIPTION
1	2	601257	ANGLE ARM
2	2	601256	MOUNTING CLAMP
3	2	601235-1	BRACKET
4	2	601235-2	BRACKET
5	1	601258	LABEL, ANGLE
6	4	600679-3	SPACER TUBE
7	14	100525-24	ME FLAT WASHER (STAINLESS STEEL)
8	2	600419-8	M8x1.25x25mm LARGE CARRIAGE BOLT (STAINLESS STEEL)
9	6	6/1/7395	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



ANTENNA ATTACHMENT DETAIL
NOT TO SCALE

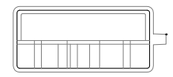


ANTENNA BRACKET
DETAIL "B"



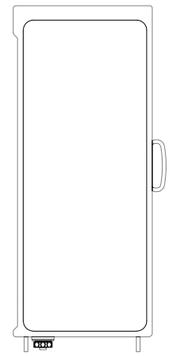
DOWN TILT ANGLE BRACKET
DETAIL "A"

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

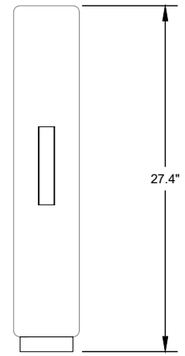


PLAN VIEW

MANUFACTURER:	NOKIA
MODEL:	AHFIG
BANDWITH:	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+

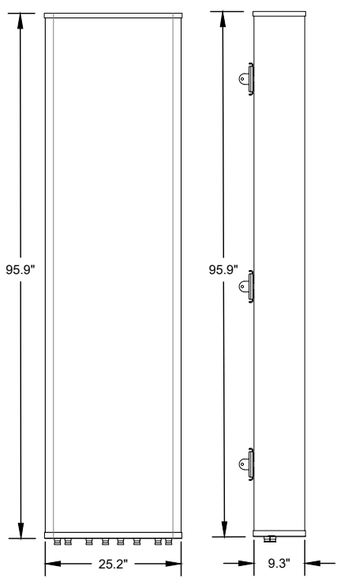


FRONT VIEW



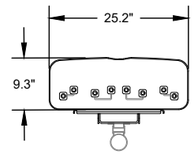
SIDE VIEW

NOKIA AHFIG RADIO
NOT TO SCALE



FRONT VIEW

SIDE VIEW



PLAN VIEW

FREQUENCY RANGE:	617-806 MHz 1695-2360 MHz
WEIGHT:	127.6 lbs

COMMSCOPE FFHH-65C-R3 ANTENNA
NOT TO SCALE

T-Mobile
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CONTACT: KEN KALOUSEK
(734) 444-0181

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DETROIT, MICHIGAN 48207

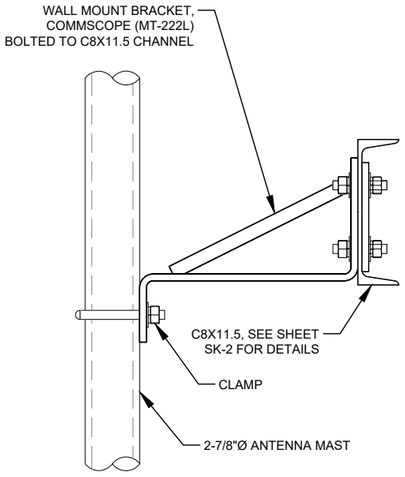
Sheet Title:

ANTENNA DETAILS

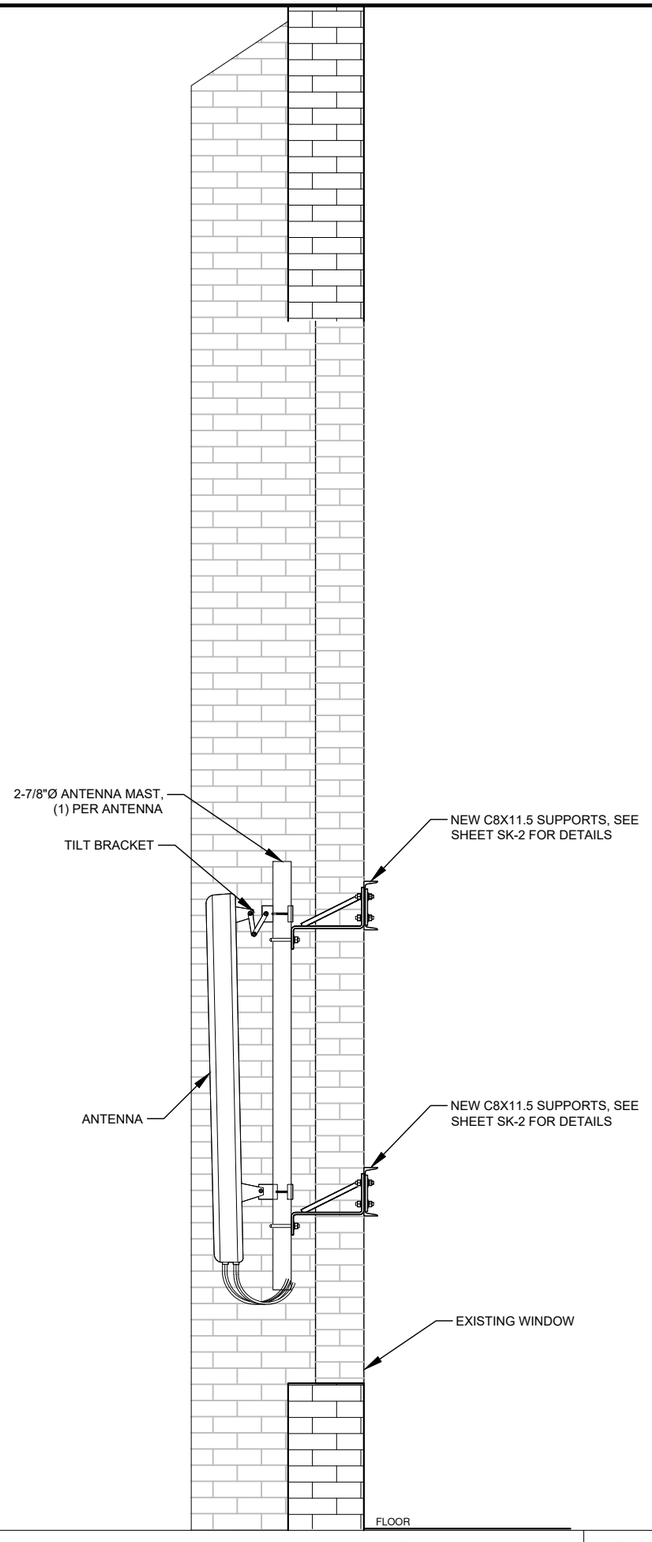
Sheet Number:

C-6.2

PAINT ALL ANTENNAS, CABLING & HARDWARE VISIBLE OUTSIDE BLACK.

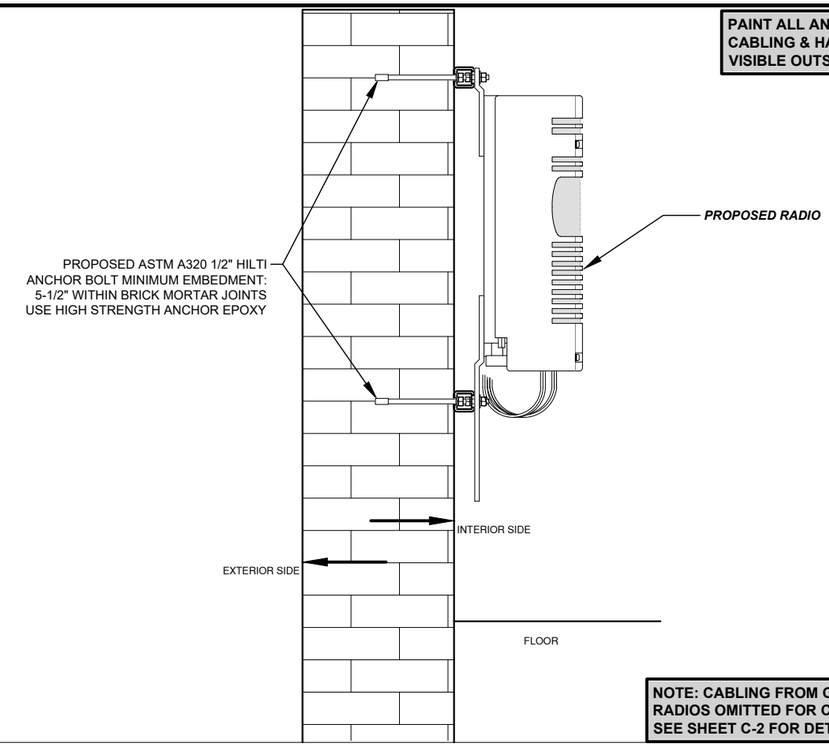


TYP. MAST BRACKET



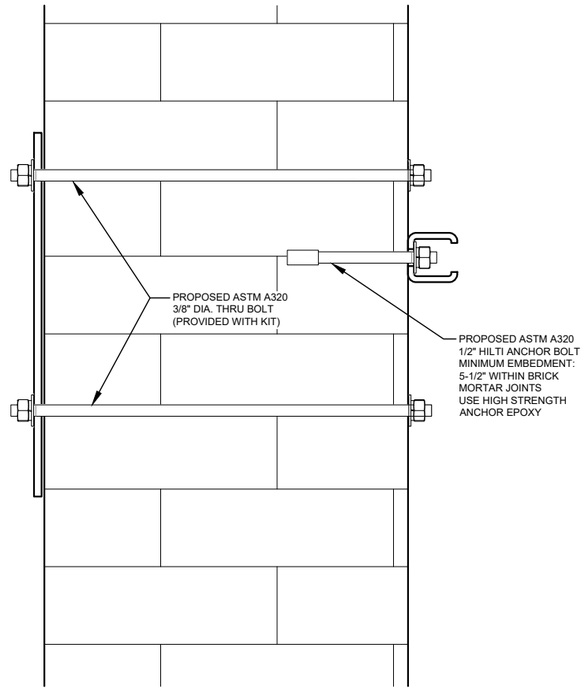
ANTENNA MOUNT N.T.S. **1**

PAINT ALL ANTENNAS, CABLING & HARDWARE VISIBLE OUTSIDE BLACK.



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**

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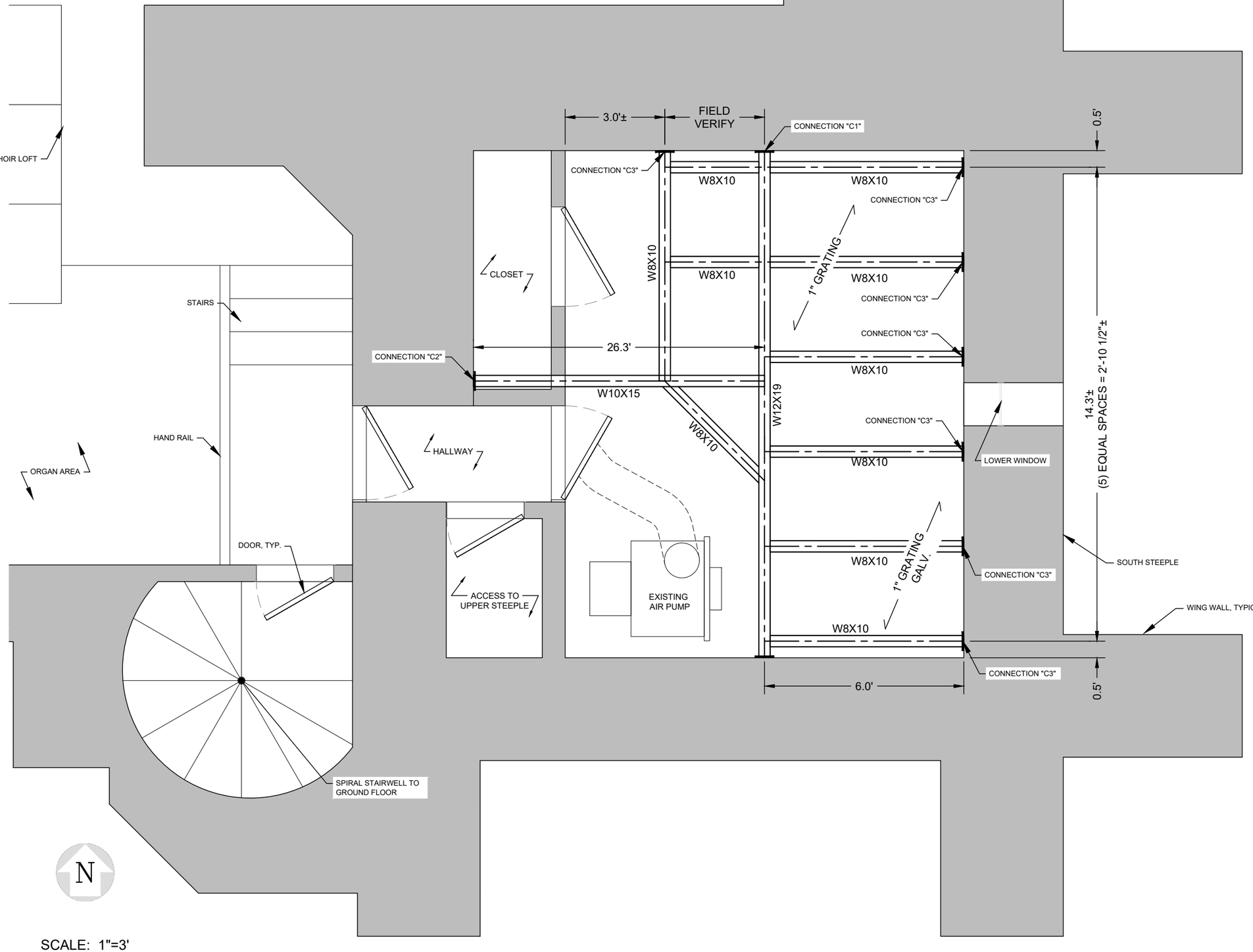
Sheet Title:
MOUNTING DETAILS

Sheet Number:
C-6.3



STRUCTURAL PLAN 1"=3'

1

T-Mobile
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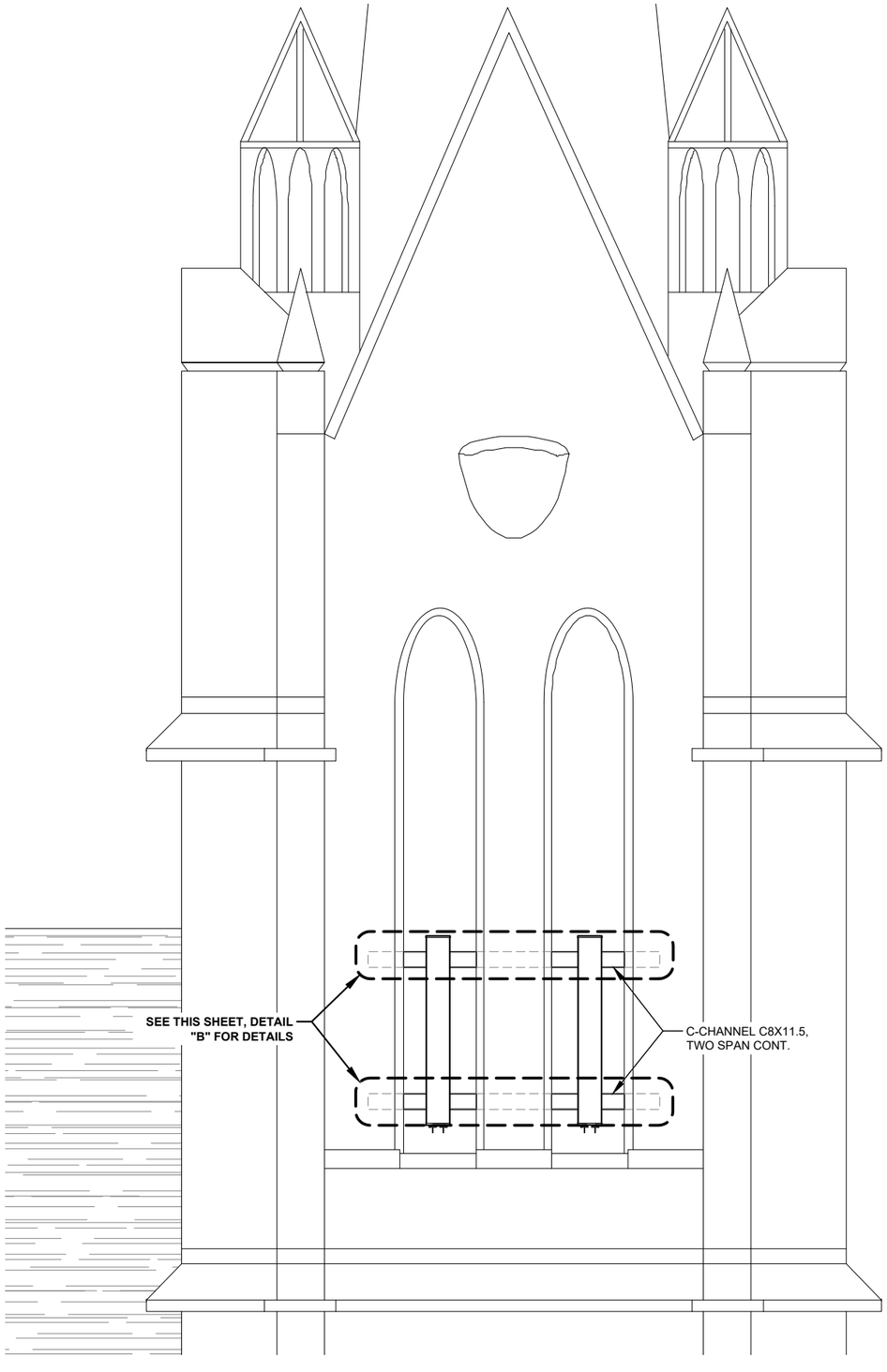
4440 E. CANFIELD D/B/A 4440 RUSSELL ST.
DETROIT, MICHIGAN 48207

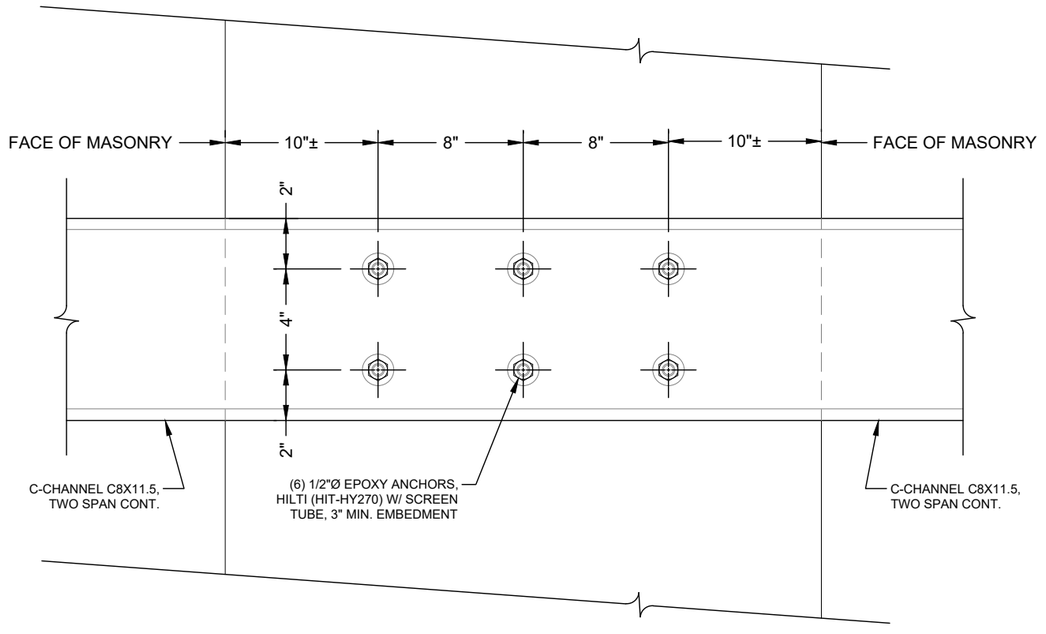
Sheet Title:
PLATFORM
STRUCTURAL PLAN

Sheet Number:
SK-1



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

OMITTED | **2**



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

T-Mobile
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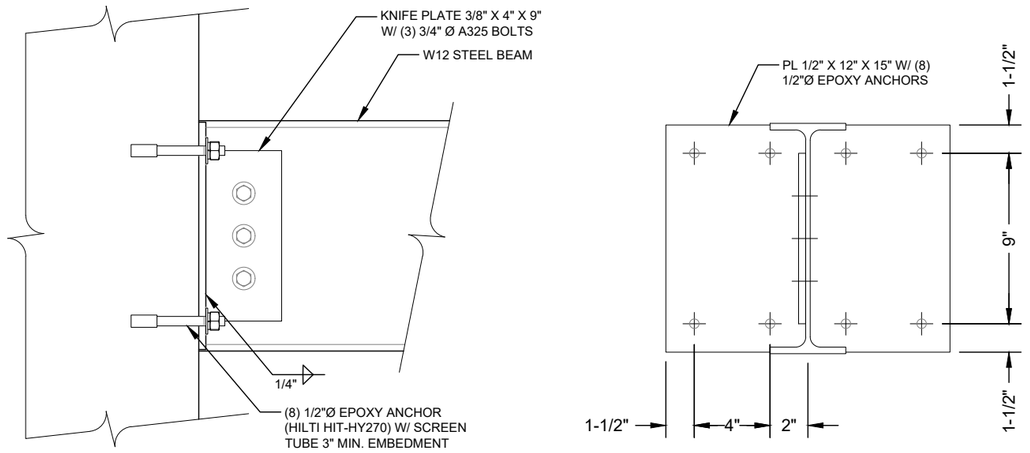
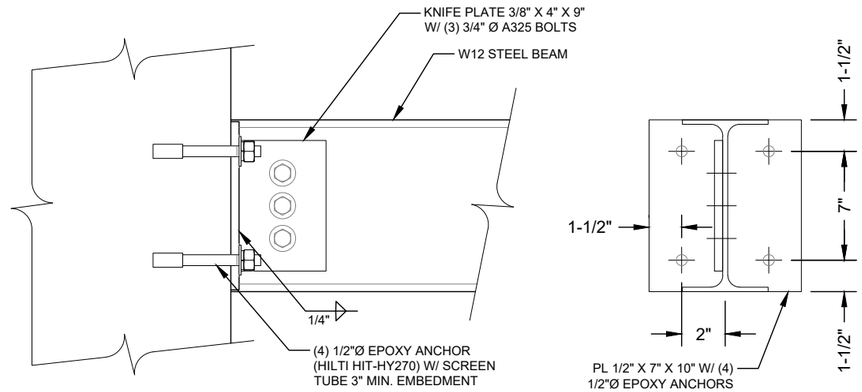
Sheet Title: ANTENNA STRUCTURAL DETAIL

Sheet Number: SK-2



CONNECTION "C1" N.T.S | **1**



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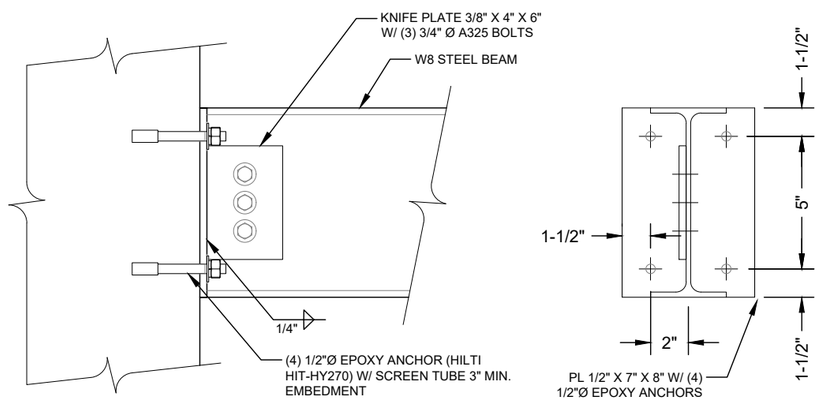

CONNECTION "C3" N.T.S | **3**

T-Mobile
28505 SCHOOLCRAFT RD, BLDG#6
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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.

STATE OF MICHIGAN
MATTHEW J MOKANYK
ENGINEER
NO. 51424
LICENSED PROFESSIONAL ENGINEER

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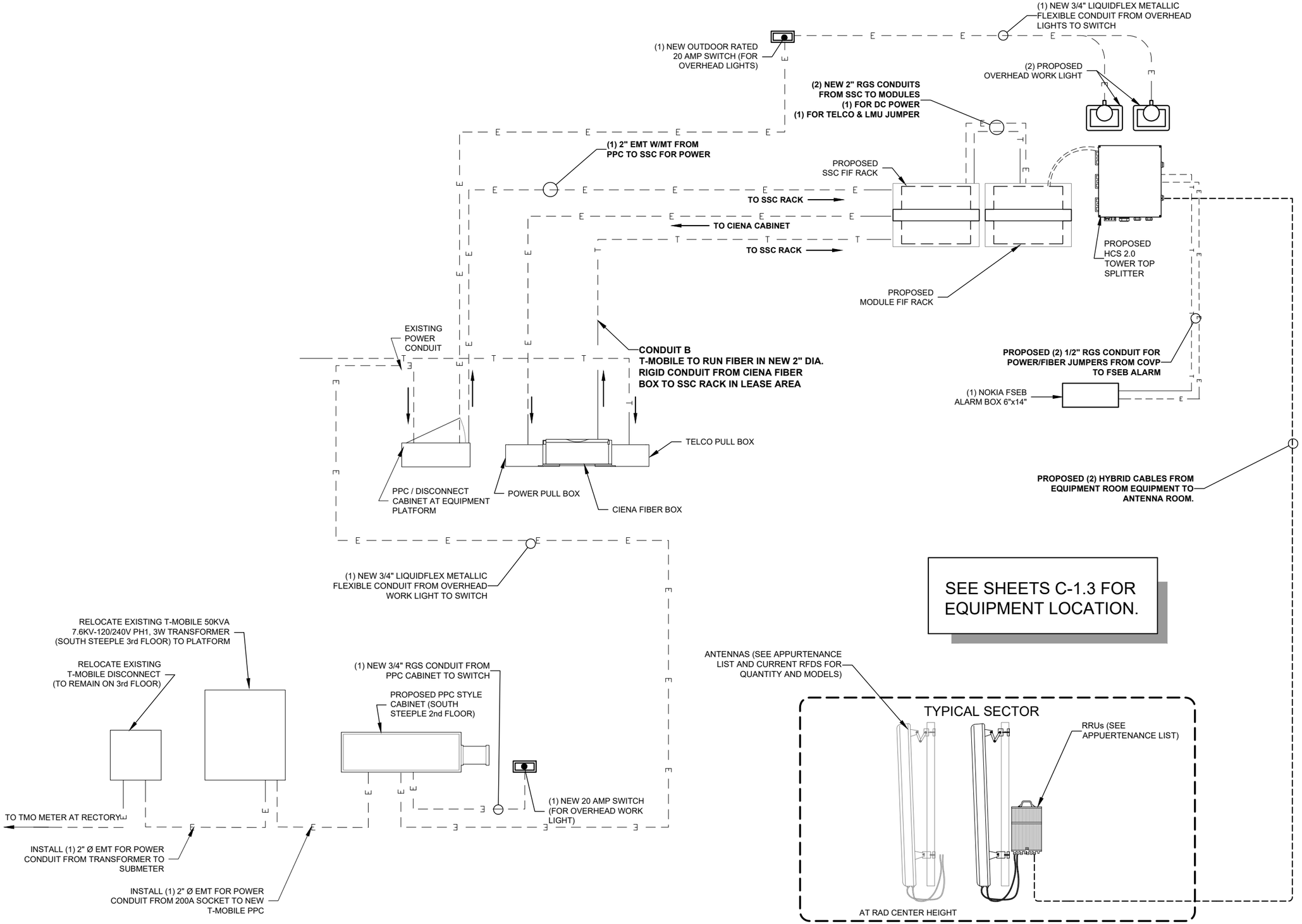
Professional Surveying & Engineering
231.943.0050 www.landtechps.com 877.520.LAND

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

Sheet Title:
PLATFORM
STRUCTURAL DETAIL

Sheet Number:
SK-3



CONDUIT CABLE SCHEMATIC N.T.S.

1

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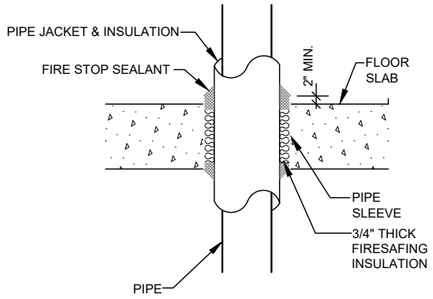
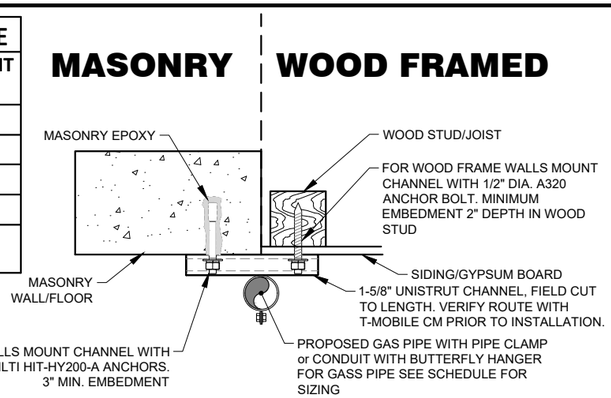
Sheet Title:
CONDUIT CABLE SCHEMATIC

Sheet Number:
E-1



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



CEILING/WALL CONDUIT HANGER DETAIL N.T.S. **2**

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28505 SCHOOLCRAFT RD, BLDG#6
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Phone: 734.367.7200
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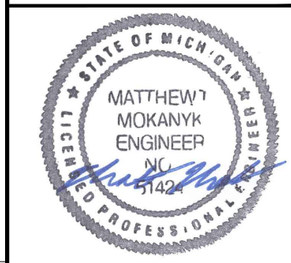
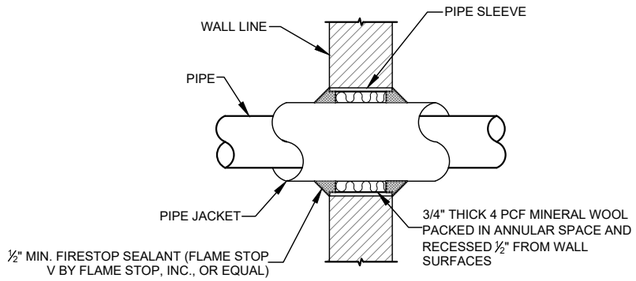
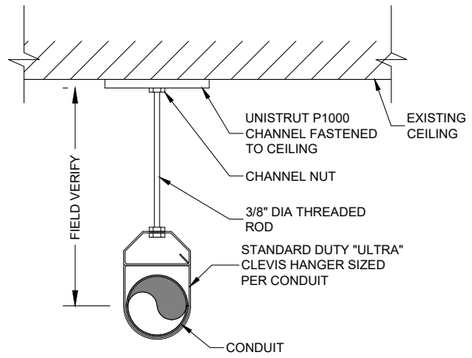
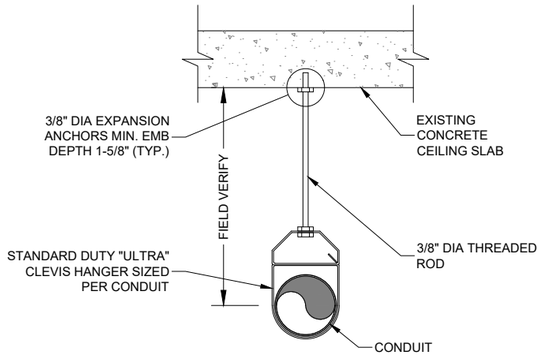




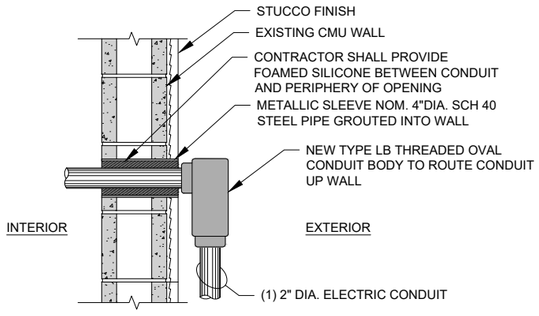
WALL PENETRATION DETAIL N.T.S. **3**



CEILING HANGER DETAIL N.T.S. **4**



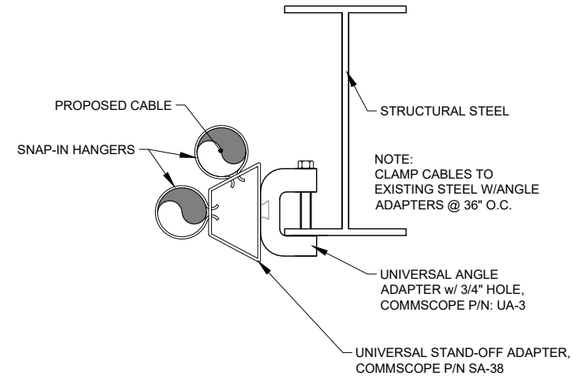
CEILING HANGER DETAIL N.T.S. **5**



THROUGH PENETRATION FIRESTOP SYSTEMS 2 HOUR
UL SYSTEM No. W-J-1001 (F-RATING - 2 HR.)
UL FIRE RESISTANCE DIRECTORY - 2000 Vol. 2, PG. 1804

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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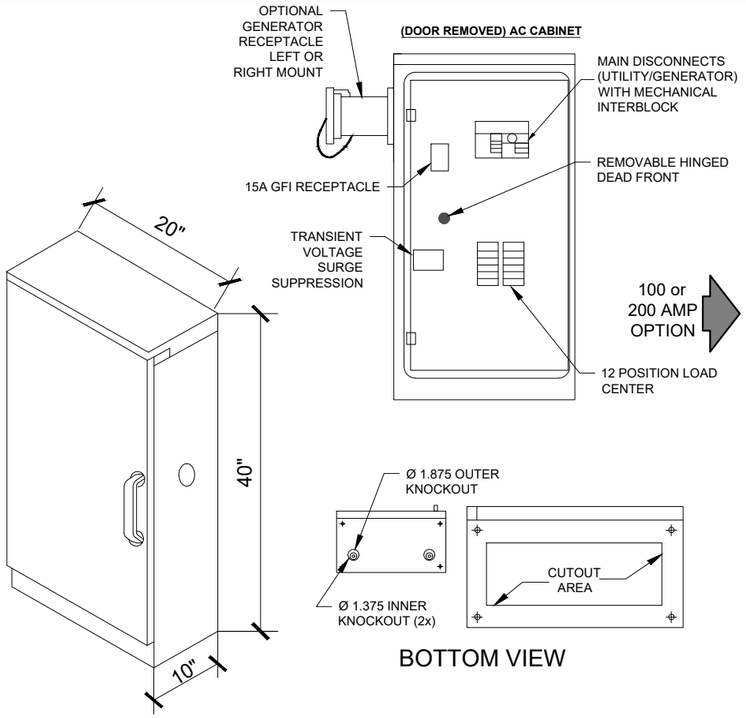
DETROIT, MICHIGAN 48207

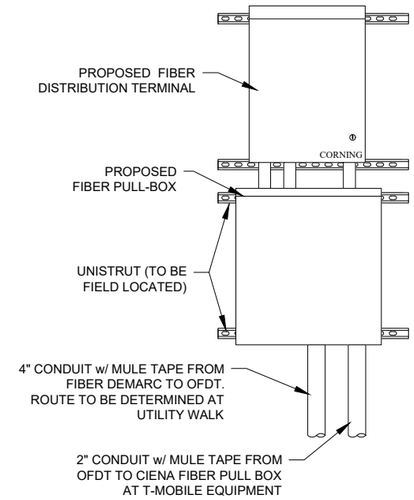
Sheet Title:
CABLE DETAILS

Sheet Number:
E-1.1



Specifications – CAC Model	
Enclosure	AC Cabinet
Cabinet Dimensions	39.00" H x 20.00" W x 10.00" D
Weight Approx.	75 lbs.
External Material	0.1" thick aluminum
Mounting	Wall or pad-mount (with optional pad-mounting base)
Cabinet Enclosure Type	One AC Power TVSS cabinet (NEMA 3R type enclosure)
Weather Protection	Rain/drip hood, rain tested per UL 891
Electrical	
Operating Voltage	120/240 VAC, single phase, 3 wire and ground
Service	100 Amp or 200 Amp. utility/standby
Disconnect	Slide bar mechanical interlock
AIC Rating	10kAIC, 22kAIC, 65kAIC
Load	Center 200 Amp, 24 position
	1-30 Amp double pole (AC TVSS)
	1-15 Amp single pole (GFI receptacles)
Bonding Jumper	Optional N-G bonding jumper
Standby Power Receptacle	Appleton AR20044RS Standard (100A or 200A), 10kAIC
TVSS with Indicator Lights	Metal Oxide Varistors (MOV) (160kA/Phase)
	Remote alarm contacts
Grounding	
Security (padlockable)	3-point door closure with 1/4 turn handle, SS hinge
Safety Compliance	UL 891, dead front switchboards
Options	10,000 or 22,000, 65,000 AIC series rated
	Pad-mounting base (8" thick)
	Various generator receptacles

POWER PEDESTAL CABINET N.T.S. **1**



FIBER DEMARCATION DETAIL N.T.S. **2**

1. FROM TAP BOX: THE TWO (2) FOUR-INCH (4") CONDUIT WILL RETURN TO THE LOCATION DETERMINED BY "DTE" AND EXTEND OUT OF THE FINISHED GRADE 12" AND 36" RESPECTIVELY (SEE DETAIL). BOTH CONDUITS SHALL BE INSTALLED WITH PULL-STRINGS AND WATERPROOF CAPS.

2. CABINET AND CONDUCTORS FURNISHED & INSTALLED BY CUSTOMER, 350 KCMIL SERVICE CONDUCTORS FURNISHED & INSTALLED BY UTILITY.

3. EQUIPMENT ASSEMBLY DRAWINGS AND RISER DIAGRAMS MUST BE SUBMITTED TO A UTILITY PLANNER FOR ACCEPTANCE PRIOR TO INSTALLATION.

4. CABINETS AND CONDUITS SHOWN SHALL CONTAIN ONLY UNMETERED LINE CONDUCTORS. CABINET SHALL BE SEALABLE WITH ACCEPTABLE SEALING HASP.

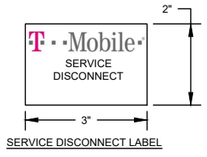
5. TRANSMISSION TOWER SERVICES WILL UTILIZE A STANDARD 200 AMP SERVICE W/ CONTINUOUS CONDUIT TO THE SOURCE.

6. SUBSTATION CELLULAR SERVICES WILL BE A SINGLE 200-AMP SERVICE OR BUILT TO THIS SPECIFICATION. NO SERVICE SHALL BE TAKEN OUT OF THE SUBSTATION HOUSE SERVICE.

7. ALL CONDUIT AND NIPPLE ENTRIES TO CABINET AND METER BOXES WILL BE MADE WITH WEATHERPROOF HUBS, CONNECTORS OR LOCKNUTS LISTED FOR THE APPLICATIONS. NON-METALLIC BUSHINGS.

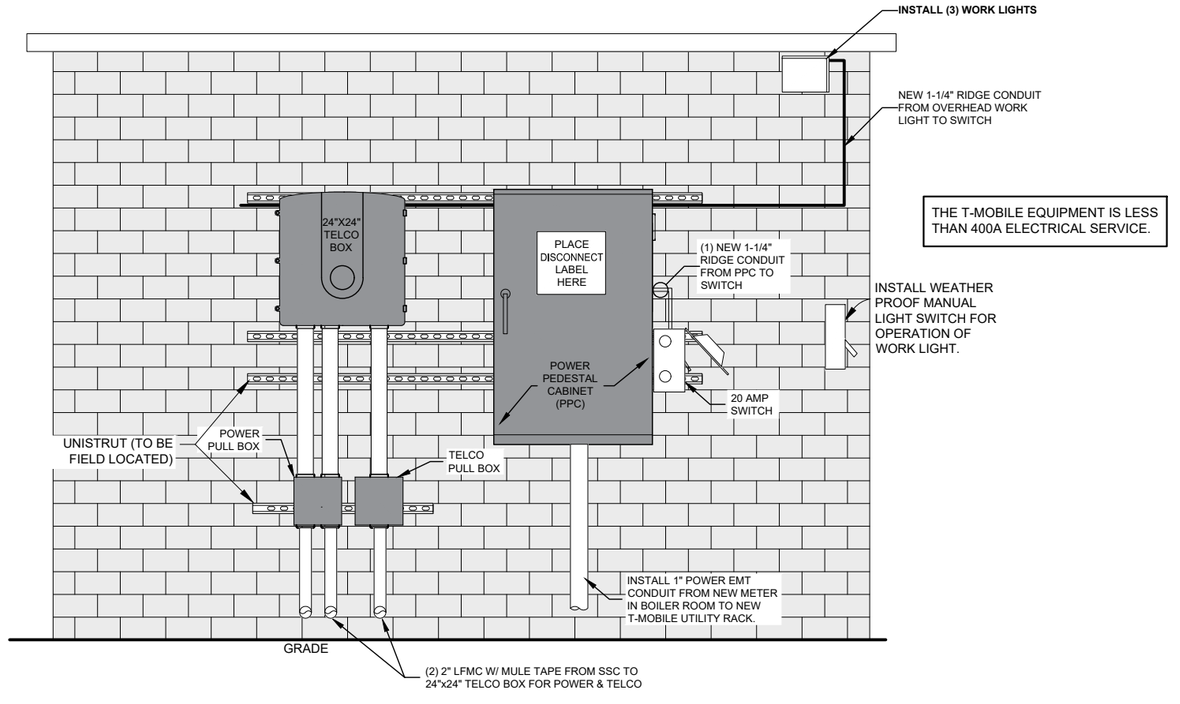
8. FOR INACCESSIBLE LOCATIONS CONSULT WITH METER ENGINEERING FOR POSSIBLE ERT METER INSTALLATION.

9. ONLY ONE SERVICE ALLOWED PER LUG. ALL GROUNDING AND BONDING MUST COMPLY WITH NEC 250 REQUIRED.



SERVICE DISCONNECT LABEL

- THE LFMC SHALL BE CONNECTED TO THE ICE BRIDGE WITH MANUFACTURER APPROVED METALLIC PIPE STRAPS OR "MINIS" USING STAINLESS STEEL BANDING, OUTDOOR RATED METALLIC PIPE CLAMPS, AND/OR MANUFACTURER APPROVED OUTDOOR RATED ROUTING PRODUCTS.
- THE LIGHT SWITCH AND ANY JUNCTION BOXES SHALL BE DIE-CAST METALLIC WEATHER RATED BOXES AND MOUNTED WITH 100% WEATHERPROOF INSTALLATION METHODS. THE MOUNTING CLIPS SHALL BE USED AND NO BOXES SHALL BE DRILLED WITH SELF-TAPPING SCREWS FOR INSTALLATION.
- EACH LIGHT SHALL BE AN LED FLOOD LIGHT (NOT SPOT) RATED AT A MINIMUM OF 1,200 LUMEN BRIGHTNESS FACTOR AND SHALL BE OUTDOOR RATED TO A MINIMUM OF -30 DEGREES FAHRENHEIT (BELOW ZERO) OPERATING RANGE.



THE T-MOBILE EQUIPMENT IS LESS THAN 400A ELECTRICAL SERVICE.

UTILITY EQUIPMENT N.T.S. **3**

T··Mobile·
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(734) 444-0181

LANDTECH PROJECT NUMBER: 20398031

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A	07/09/20	PRELIMINARY RELEASE	CJL
B	02/10/22	ADD'D ANT. COVER NOTE	TLR
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2020 ANCHOR CONSTRUCTION DRAWINGS

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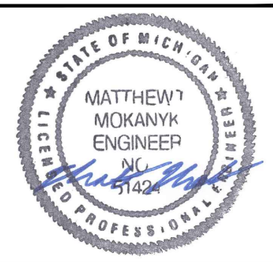

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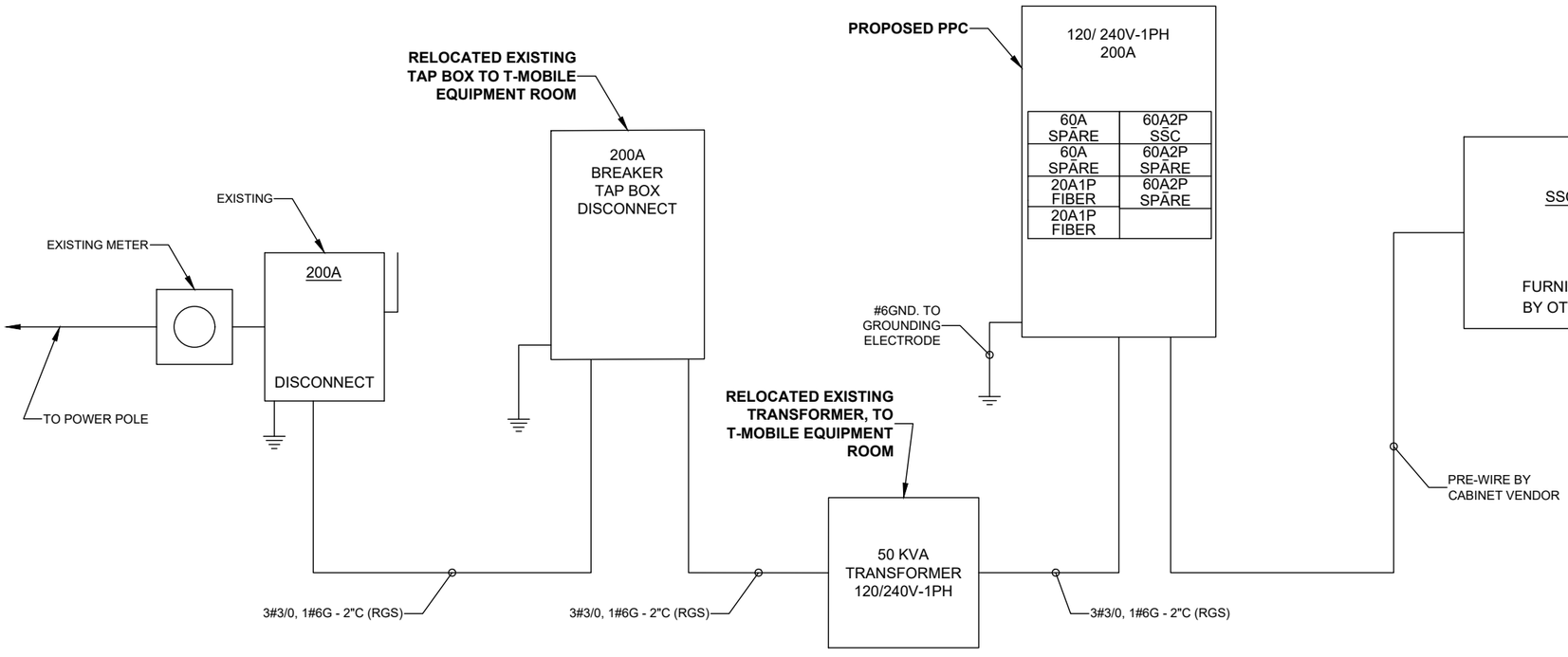
SITE #: DE04229B
SITE NAME: SWEETEST HEART OF MARY
SITE ADDRESS:
4440 E. CANFIELD D/B/A 4440 RUSSELL ST. DETROIT, MICHIGAN 48207

Sheet Title: ELECTRIC DETAILS

Sheet Number: E-1.2

THE T-MOBILE EQUIPMENT IS LESS THAN 400A ELECTRICAL SERVICE.



ONE LINE DIAGRAM | **1**

T-Mobile
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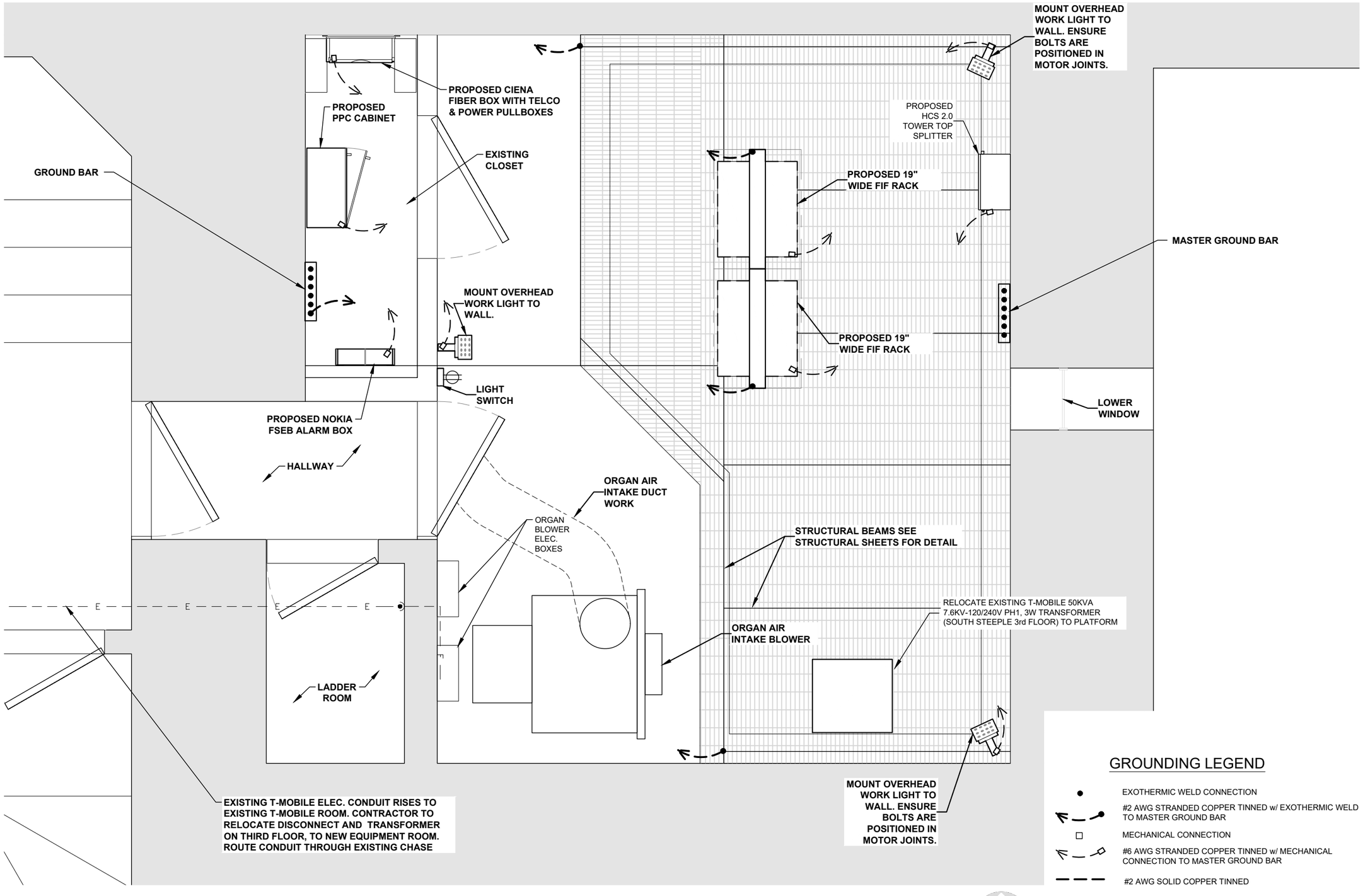
Sheet Title:
ONE-LINE DIAGRAM

Sheet Number:
E-2



SCALE: 1"=60'

0 60' 120'

GROUNDING LEGEND

- EXOTHERMIC WELD CONNECTION
- #2 AWG STRANDED COPPER TINNED w/ EXOTHERMIC WELD TO MASTER GROUND BAR
- MECHANICAL CONNECTION
- #6 AWG STRANDED COPPER TINNED w/ MECHANICAL CONNECTION TO MASTER GROUND BAR
- #2 AWG SOLID COPPER TINNED
- #6 AWG SOLID COPPER TINNED
- GROUND BUS BAR

N

GROUNDING PLAN SCALE: NTS | **1**

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Sheet Title: GROUNDING PLAN

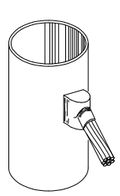
Sheet Number: E-3

IMPORTANT GROUNDING / CABLE NOTES:

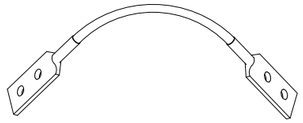
1. T-MOBILE IS ELIMINATING THE HOME RUN GROUND WIRE FROM TOP BUSS BAR AND THE BOTTOM BUSS BAR ON TOWER SITES. ROOFTOPS ARE STILL REQUIRED TO HAVE SECTORIZED GROUND AND #2 INSULTED GROUND WIRE. FROM SECTOR GROUNDS TO MAIN BUSS BARS AND BUILDING STEEL. 4 GROUND BARS, 3 ISOLATED ONE FOR EACH SECTOR, ONE AS COLLECTION POINT MOUNTED WITHOUT CHERRIES.
2. REMOVE INSULATORS (CHERRIES) FROM THE BUSS BARS AND GROUND TO TOWER, TOP AND BOTTOM ON TOWER SITES ONLY.
3. ALL EXPOSED GROUNDS TO BE DRESSED WITH SEAL TIGHT. (ONLY AT GRADE)
4. THE DISTANCE BETWEEN BUTTERFLIES AND CABLE STAND OFFS IS 36".
5. THE DISTANCE BETWEEN CONVENTIONAL AND/OR SNAP-HANGERS ON 1/2" JUMPERS SHALL BE NO MORE THAN 3 FEET AT THE TOP AND 2 FEET ON THE BOTTOM JUMPERS PER MANUFACTURER'S RECOMMENDATION.
6. NO HYBRID CABLES SHOULD TOUCH METAL OR STEEL. THE USE OF STANDOFF BRACKETS ARE REQUIRED. USE OF GROMMETS AS SUPPLIED BY T-MOBILE. (EXCEPT 1-5/8" SNAP-IN FOR CABLE MANAGEMENT)
7. HYBRID AND JUMPER LINES SHOULD BE DRESSED IN ON THE SIDE OR BOTTOM OF SECTOR FRAMES / MONOPOLES. NEVER ON TOP WERE SOMEONE WOULD WALK.
8. PARALLEL #2 TINNED PATH RUNS, WIDTH, DEPTH, BACKFILL, COMPACTION SPECS.
9. ALL MECHANICAL GROUND CONNECTIONS NEED TO BE SCRAPED IF PAINTED TO BARE METAL AND NO-OX APPLIED ON ALL CONNECTIONS ABOVE GROUND.
10. GROUND BARS NEED TO BE COPPER.
11. GROUNDING HARDWARE NEEDS TO BE STAINLESS STEEL.

GROUNDING / CABLE NOTES | 1

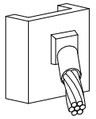
NOTE:
CADWELD "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC TYPES OF CADWELDS TO BE USED FOR THIS PROJECT.



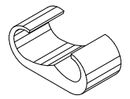
TYPE VS



TYPE 2-YA-2



TYPE VS



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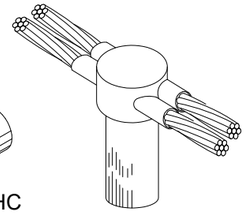
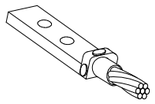


TYPE NX

TYPE HS

TYPE GT



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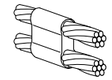
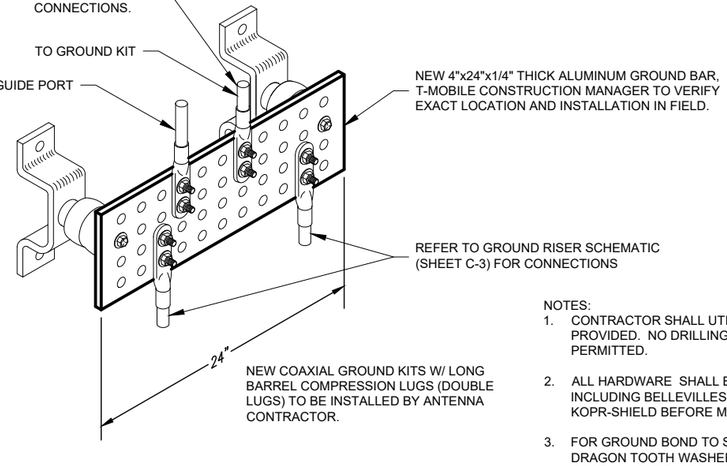


TYPE PT

CADWELD CONNECTION TYPES N.T.S. | 2



NOTES:
1. CONTRACTOR SHALL UTILIZE LUGGED HOLES PROVIDED. NO DRILLING OF THE BAR WILL BE PERMITTED.
2. ALL HARDWARE SHALL BE 18-8 STAINLESS STEEL INCLUDING BELLEVILLES. COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH KOPR-SHIELD.

GROUNDING BAR DETAIL N.T.S. | 3

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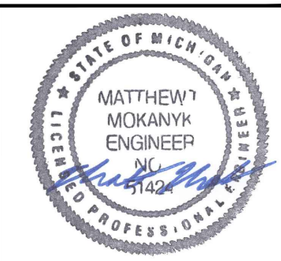

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SITE NAME:
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HEART OF MARY
SITE ADDRESS:
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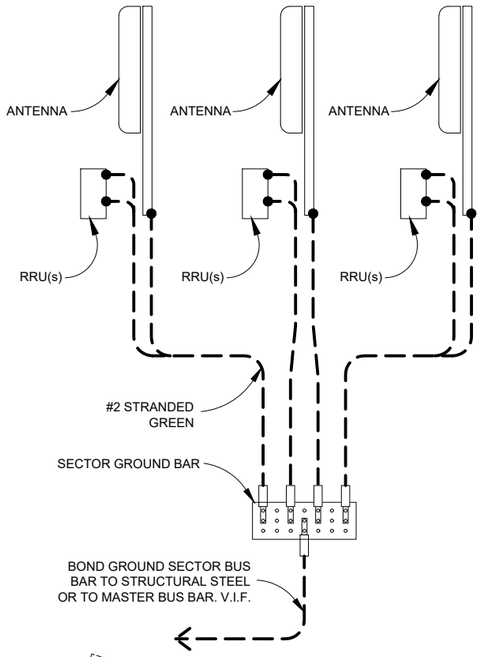
DETROIT, MICHIGAN 48207

Sheet Title:
GROUNDING DETAILS

Sheet Number:
E-3.1

SECTOR A



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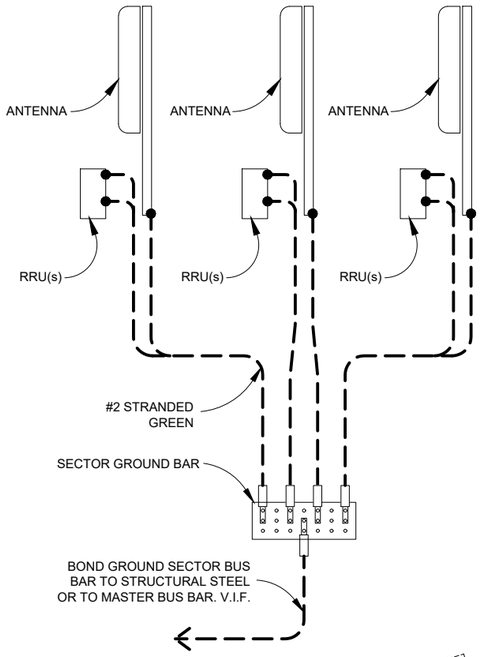
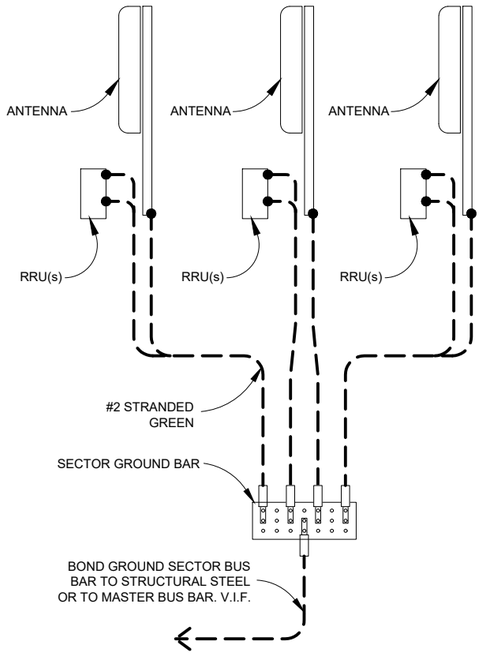
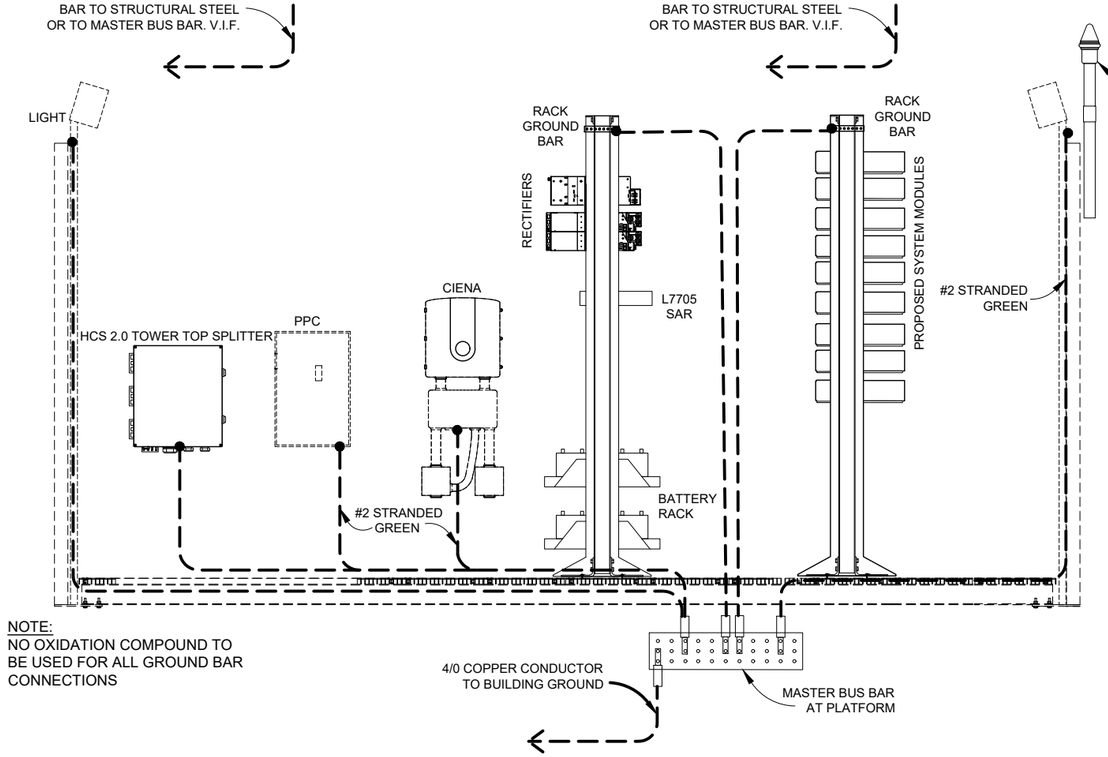


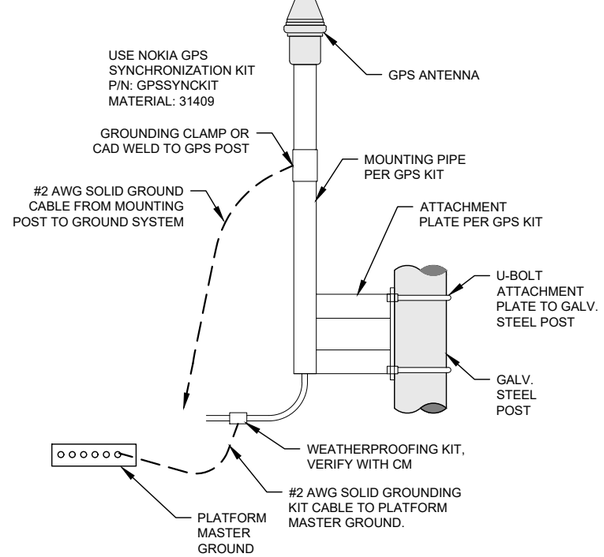
SECTOR C





NOTE:
NO OXIDATION COMPOUND TO BE USED FOR ALL GROUND BAR CONNECTIONS

● = MECHANICAL CONNECTION
■ = CAD WELD CONNECTION



GPS ANTENNA DETAIL

SCHEMATIC DIAGRAM EQUIPMENT & ANTENNA GROUNDING SYSTEM

1

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STATE OF MICHIGAN LICENSED PROFESSIONAL ENGINEER
MATTHEW J MOKANYK
ENGINEER
NO. 51424

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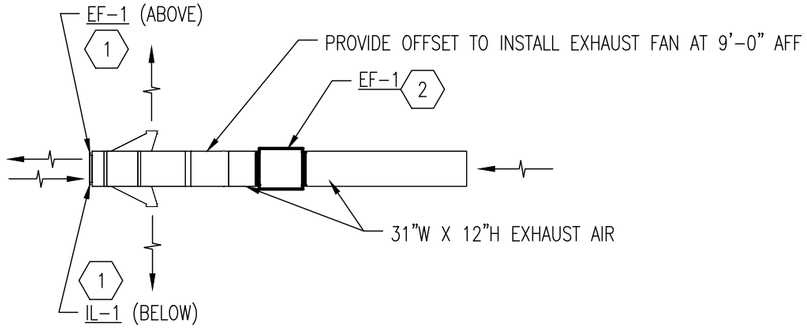
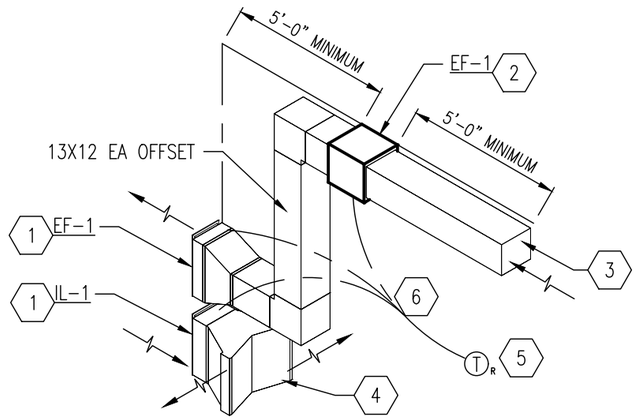
Sheet Title:
GROUNDING SCHEMATIC

Sheet Number:
E-3.2



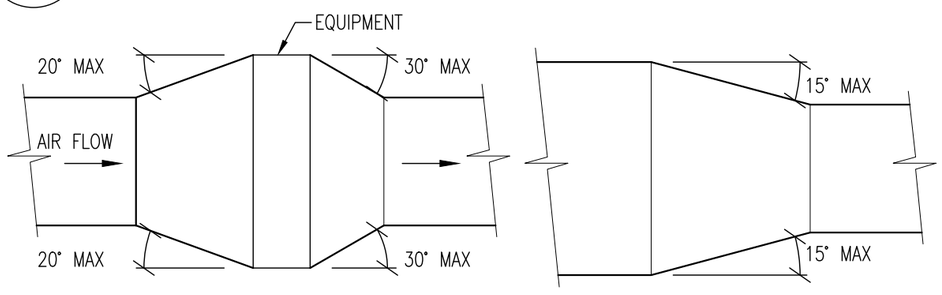
1 / M-1 FLOOR PLAN - HVAC

SCALE: NOT TO SCALE



2 / M-1 ISOMETRIC DETAIL - HVAC

SCALE: NOT TO SCALE



DUCT TRANSITION W/EQUIPMENT

DUCT TRANSITION

NOTES:

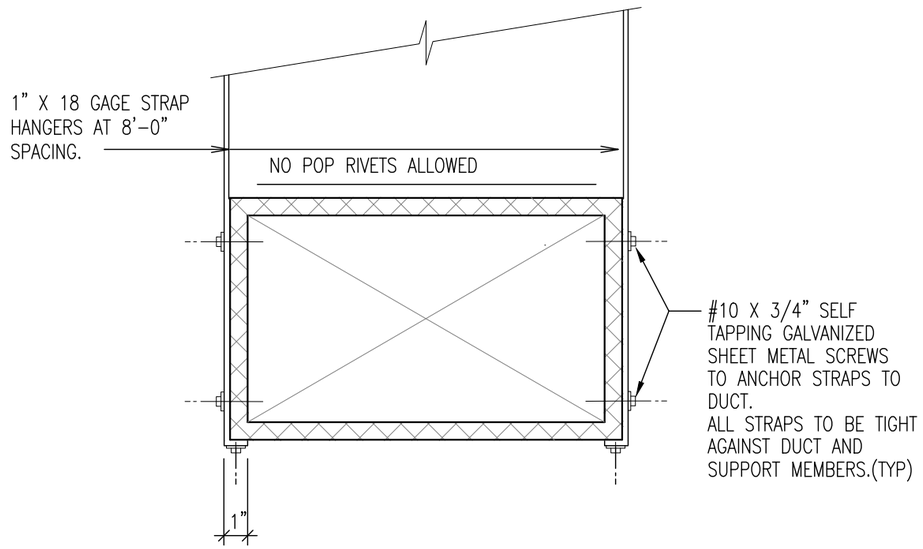
1. UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

3 / M-1 TYPICAL DUCT TRANSITION DETAIL

SCALE: NOT TO SCALE

HVAC KEY NOTES

1. PROVIDE INTAKE OR EXHAUST LOUVER WITH FACTORY OPTIONS/FINISH AS SCHEDULED.
2. PROVIDE EXHAUST FAN WITH FACTORY OPTIONS AS SCHEDULED. INSTALL AT 9'-0" ABOVE FINISH FLOOR.
3. EXTEND 13" WIDE X 12" HIGH EXHAUST DUCT 10'-0" INTO THE ROOM AND TERMINATE WITH GALVANIZED 16-GAUAGE 1x1 WIRE MESH GRILLE ON END.
4. PROVIDE A FIELD FABRICATED FITTING TO TRANSITION FROM THE INTAKE LOUVER TO TWO 22x4 OPENINGS TO DIRECT AIR INTO THE SPACE AT A 90° ANGLE.
5. PROVIDE A 120V REVERSE ACTING THERMOSTAT, INSTALL AT 4'-0" ABOVE FINISH FLOOR BETWEEN THE TWO DOORS.
6. INTERLOCK THE EXHAUST FAN WITH THE NORMALLY CLOSED INTAKE AND NORMALLY CLOSED EXHAUST LOUVER TO OPEN WHEN THE EXHAUST FAN IS ON.



4 / M-1 TYPICAL DUCT STRAP HANGER DETAIL

SCALE: NOT TO SCALE

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Sheet Title: HVAC DETAILS

Sheet Number: M-1

SECTION 23 0000 - HVAC

THE REQUIREMENTS OF THE "GENERAL CONDITIONS" AND "DIVISION 1" SECTIONS OF THE SPECIFICATIONS SHALL APPLY TO THIS SECTION OF THE SPECIFICATIONS.

PART 1 – GENERAL

1.01 SUMMARY

A. THE CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATIONAL HVAC SYSTEM AS SHOWN ON THE DRAWINGS INCLUDING EQUIPMENT, MATERIAL, LABOR, DUCTWORK, PIPING, DIFFUSERS, GRILLES AND REQUIRED ELECTRICAL. THE CONTRACTOR SHALL PROVIDE OPERATING AND MAINTENANCE INSTRUCTIONS TO THE OWNER FOR ALL EQUIPMENT. ALL COMPRESSORS SHALL BE PROVIDED WITH A FIVE (5) YEAR EXTENDED WRITTEN WARRANTY ON PARTS AND, WHERE APPLICABLE, ALL GAS FIRED HEAT EXCHANGERS SHALL BE PROVIDED WITH AN EXTENDED TEN (10) YEAR PARTS WARRANTY. THE CONTRACTOR SHALL PROVIDE AN UNCONDITIONAL WARRANTY OF ONE YEAR FOR ALL OTHER ASSOCIATED EQUIPMENT AND DEVICES.
B. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE LOCAL BUILDING, MECHANICAL, AND ENERGY CODES ASHRAE, SMACNA, AND ALL OTHER APPLICABLE STATE AND FEDERAL CODES.
C. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE EXECUTION OF THIS WORK.
D. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL DISPLAY A UL LABEL WHERE APPLICABLE.
E. ALL INTERIOR INSULATION MATERIALS, JACKETS, COVERINGS, SEALS AND MASTICS SHALL HAVE A FLAME SPREAD INDEX OF 25 OR LESS AND SMOKE DEVELOPED INDEX OF 50 OR LESS PER ASTM E84 (NFPA 255).

1.02 SUBMITTALS

A. PRODUCT DATA: INCLUDE MANUFACTURER'S TECHNICAL DATA FOR EACH MODEL INDICATED, INCLUDING RATED CAPACITIES, DIMENSIONS, REQUIRED CLEARANCES, CHARACTERISTICS, FURNISHED SPECIALTIES, ACCESSORIES, AND OPERATION AND MAINTENANCE DATA.

1.03 QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

PART 2 – PRODUCTS

2.01 DUCTWORK AND SPECIALTIES

A. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL OF GAUGES AND JOINT TYPES AS SPECIFIED IN THE SMACNA MANUAL FOR THE APPLICABLE SIZES. VOLUME DAMPERS SHALL BE MANUAL LOCKING, BLADE–TYPE, TWO GAUGES HEAVIER THAN DUCT. DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS FOR TWO–INCH STATIC PRESSURE. ALL DUCTWORK SHALL BE SEALED WITH MASTIC. ACCESS DOORS SHALL BE PROVIDED IN DUCTWORK AT FIRE DAMPERS OR OTHER CONTROL DEVICES AS REQUIRED FOR MAINTENANCE. DOUBLE–THICKNESS TURNING VANES SHALL BE PROVIDED AT ALL RECTANGULAR ELBOWS. FLEXIBLE CONNECTIONS TO AIR HANDLING UNITS SHALL BE PROVIDED.

2.02 INSULATION

A. ALL DUCTWORK SHALL BE WRAPPED WITH INSULATION WITH A MINIMUM R VALUE OF R–3.5.

2.03 EXHAUST FAN

A. EXHAUST FAN TO BE SUPPLIED AS INDICATED ON THE DRAWINGS.
B. FAN SPEED CONTROLLER INSTALLATION LOCATION SHALL BE COORDINATED WITH ELECTRICAL CONTRACTOR AND BE INSTALLED AT OR BY THE FAN FOR ADJUSTMENT BY BALANCE CONTRACTOR.

PART 3 – EXECUTION

3.01 INSTALLATION

A. INSTALL UNITS LEVEL AND PLUMB, MAINTAINING MANUFACTURER'S RECOMMENDED CLEARANCES. INSTALL ACCORDING TO ARI GUIDELINE B.
B. ALL DUCTWORK AND EXHAUST FANS SHALL BE SUPPORTED PROPERLY FROM THE TOP CHORD OF ROOF JOISTS. NO DUCTWORK OR DEVICES SHALL BE ATTACHED DIRECTLY TO ROOF DECK.
C. THE HVAC SYSTEM SHALL OPERATE WITHOUT OBJECTIONABLE VIBRATION, PULSATION, OR RATTLE. MOTORS SHALL BE MOUNTED ON RUBBER VIBRATION ISOLATORS OR THE COMPLETE UNIT SHALL BE ISOLATED FROM THE BUILDING WITH ISOLATION PADS. ALL DAMPERS, GRILLES, AND ACCESSORIES SHALL HAVE NO MOVEMENT UNDER OPERATING CONDITIONS AND SHALL OPERATE WITHOUT NOISE. ALL DUCTWORK INSTALLED EXTERNAL TO THE BUILDING SHALL BE COMPLETELY WEATHERPROOF AND INSULATED.

3.04 CONNECTIONS

A. ELECTRICAL SYSTEM CONNECTIONS: COMPLY WITH APPLICABLE REQUIREMENTS IN DIVISION 16 SECTIONS FOR POWER WIRING, SWITCHES, AND MOTOR CONTROLS.
B. GROUND EQUIPMENT ACCORDING TO DIVISION 16 SECTIONS "GROUNDING AND BONDING".
C. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE–TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.

3.05 TESTING ADJUSTING AND BALANCING

A. TEST, ADJUST, AND BALANCE THE EXHAUST AIR SYSTEMS:.
B. MAKE ADJUSTMENTS AND RE–TEST SYSTEM TO ACHIEVE THE REQUIRED FLOW WITHIN 10% OF SPECIFIED FLOW FOR AIR SYSTEMS.
C. WHEN DEFICIENCIES ARE IDENTIFIED, RE–TEST AND ADJUST FLOWS AFTER CORRECTIVE MEASURES ARE TAKEN.
D. PERMANENTLY IDENTIFY POSITION OF SPEED CONTROLLER AND DAMPERS FOR FUTURE REFERENCE.

END OF SECTION 23 0000

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DETROIT, MICHIGAN 48207

Sheet Title:
HVAC GENERAL NOTES

Sheet Number:
M-1.1

EXHAUST FAN SCHEDULE

TAG	BASIS OF DESIGN		FLOW RATE (CFM)	E.S.P.	FAN SPEED (RPM)	DRIVE TYPE	BLADE TYPE	WEIGHT (LBS)	SONES	ELECTRICAL DATA		DISCONNECT DATA		NOTES
	MANUFACTURER	MODEL								HP	VOLTAGE	M.T.C.	E.T.C.	
EF-1	GREENHECK	SQ-95-G	530	0.25	1,300	DIRECT	BACKWARDS INCLINED	49	6.4	1 / 15	115 / 1 / 60	√		①②③

① SUSPEND FROM STRUCTURE WITH UNISTRUT AND HANGING SPRING ISOLATORS
② PROVIDE WITH 120V REVERSE-ACTING THERMOSTAT, COORDINATE SET POINT WITH OWNER
③ INTERLOCK WITH LOUVERS, COORDINATE WITH LOUVER SCHEDULE AND FLOOR PLAN

LOUVER SCHEDULE

TAG	BASIS OF DESIGN		SERVICE	FLOW RATE (CFM)	LOUVER WIDTH	LOUVER HEIGHT	LOUVER DEPTH	FREE AREA (FT^2)	VELOCITY (FPM)	ELECTRIC ACUTATOR		DISCONNECT DATA		NOTES
	MANUFACTURER	MODEL								TYPE	VOLTAGE	M.T.C.	E.T.C.	
IL-1	GREENHECK	EAD-635	INTAKE LOUVER	530	13"	22"	6"	0.8	782	NORMALLY CLOSED	115 / 1 / 60	v		①②③
EL-1	GREENHECK	EAD-635	INTAKE LOUVER	530	13"	22"	6"	0.8	782	NORMALLY CLOSED	115 / 1 / 60	v		①②③

① PROVIDE WITH FACTORY GREENHECK 70% KYNAR 500 / HYLAR 5000 IN SIERRA TAN (COLOR CODE GF118)
② PROVIDE WITH FACTORY INSECT SCREEN
③ INTERLOCK TO OPEN WHEN THE EXHAUST FAN IS RUNNING

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Sheet Title:
EXHAUST FAN & LOUVER SCHEDULE

Sheet Number:
M-1.2

DIVISION 1 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 Intent

A. These specifications and construction drawings accompanying them describe the work to be done and the materials to be furnished for the construction of this project.
B. The drawings and specifications are intended to be fully explanatory and supplementary. However, should anything be shown, indicated or specified on one and not the other, it shall be done the same as if shown, indicated or specified in both.
C. The intention of the documents is to include all labor and materials reasonably necessary for the proper execution and completion of the work as stipulated in the contract.
D. The purpose of the specifications is to interpret the intent of the drawings and to designate the method of the procedure, type and quality of material required to complete the work.
E. Minor deviations from the design layout are anticipated and shall be considered as part of the work. No changes that alter the character of the work will be made or permitted by the Owner without issuing a change order.

1.2 Conflicts

A. The Contractor shall be responsible for verification of all measurements at the site before ordering any materials or doing any work. No extra charge or compensation shall be allowed due to difference between actual dimensions and dimensions indicated on the construction drawings. Any such discrepancy in dimension which may be found shall be submitted to the Owner for consideration before the Contractor proceeds with the work in the affected areas.

B. The Bidder, if awarded the contract, will not be allowed any extra compensation by reason of any matter or thing concerning the work which the Bidder might have fully discovered prior to the bidding.

C. No plea of ignorance of conditions that exist, or of difficulties or conditions that may be encountered or of any other related matter concerning the work to be performed in the execution of the work will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill every detail of all the requirements.

1.3 Contracts and Warranties

A. Each Contractor is responsible for obtaining the building permit at the local jurisdiction as the Contractor of record, and provide local jurisdiction with all proof required to operate as a Contractor in that jurisdiction. The Contractor shall be reimbursed only the amount of any fee paid as follows:

1. Plan review fee.
2. Building permit fee.
3. Connections and inspections fee.
4. Development fee.

B. Contractor is responsible for application and payment of Contractor licenses and bonds.

1.4 Storage

All materials must be stored in a level and dry fashion in a manner that does not necessarily obstruct the flow of other work. Any storage method must meet all recommendations of the associated manufacturer.

1.5 Clean Up

The Contractor shall at all times keep the site free from accumulation of waste, material or rubbish at the work site and, at completion of the work, shall remove all rubbish from and about the building area, including all tools, equipment, and surplus materials and shall leave the work area clean and ready for use.

1.6 Change Order Procedure

Change order may be initiated by the Owner and/or the Contractor involved. The Contractor, upon verbal request from the Owner shall prepare a written proposal describing the change in work or materials and any changes in the contract amount and present to the Owner for approval. Submit requests or substitutions in the form and in accordance with procedures required for change order proposals. Any changes in scope of work or materials which are performed by the Contractor without a written change order as described and approved by the Owner shall place full responsibility of these actions on the Contractor.

1.7 Related Documents And Coordination

General Carpentry, electrical, and antenna drawings are interrelated. In performance of the work, the Contractor must refer to all drawings. All coordination to be the responsibility of the Contractor.

1.8 Products And Substitutions

A. Submit 3 copies of each request for substitution. In each request identify the product or fabrication or installation method to be replaced by the substitution. Include related specification section and drawing numbers and complete documentation showing compliance with the requirements for substitutions.

B. Submit all necessary product data and cut sheets which properly indicate and describe the items, products, and materials being installed. The Contractor shall, if deemed necessary by the Owner, submit actual samples to the Owner for approval in lieu of cut sheets.

1.9 Quality Assurance

All work shall be in accordance with applicable local, state and federal regulations. These shall include but not be limited to the latest version of the following:

ANSI/EIA - 222 - E
International Building Code
National Electrical Code (NEC) with local Amendments
UnderWriter Laboratories Approved Electrical Products
American Institute of Steel Construction Specifications (AISC)
Life Safety Code NFPA - 101
Minimum design criteria for steel antenna towers and supporting structures will be TIA / EIA - 222 - F

1.10 Administration

A. Prior to the commencement of any work, the Contractor will assign a Project Manager who will act as a single point of Contact for all personnel involved in this project. This Project Manager will develop a master schedule for the project which will be submitted to the Owner prior to the commencement of any work.

B. Submit a bar chart type progress not more than 3 days after the date established for commencement of the work on the schedule. Indicate a time bar for each major category or unit of work to be performed at site, property sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of the work.

C. Prior to commencing construction, the Owner will schedule an "on-site" meeting with all major parties. This would include (though not limited to) the Owner, local telephone company, Tower Erection foreman (if subcontracted).

D. Contractor shall be equipped with some means of constant communications, such as a mobile phone or a pager. This equipment will NOT be supplied or paid for by the Owner nor will cellular service be arranged.

E. During construction, Contractor must ensure that employees and Subcontractors wear OSHA Level D personal protective equipment at all times. The Contractor must comply with all applicable OSHA requirements.

D. Contractor shall be equipped with some means of constant communications, such as a mobile phone or a pager. This equipment will NOT be supplied or paid for by the Owner nor will cellular service be arranged.

E. During construction, Contractor must ensure that employees and Subcontractors wear OSHA Level D personal protective equipment at all times. The Contractor must comply with all applicable OSHA requirements.

F. Contractor shall provide DAILY updates on site progress, either verbal or written.

G. A complete inventory of construction materials and equipment is required prior to start of construction.

1.11 Insurance And Bonds

A. Contractor shall at his own expense carry and maintain for the duration of the project all insurance as required and shall not commence with his work until he has presented a certificate of insurance stating all coverage to the Contractor who shall, in turn, forward a copy of all certificates to the Owner.

DIVISION 2 - SITE WORK

PART 1 - GENERAL

1.1 Work Included

Refer to the survey and architectural site plan for work included.

1.2 Related Work

A. Installation of antenna system
B. Erection of fence
C. Access road
D. Parking area

1.3 Descriptions

Access road, turnaround areas, and sites are constructed to provide a well drained, easily maintained, even surface for material and equipment deliveries and maintenance personnel access.

1.4 References

A. ASTM - American Society of Testing Materials, latest edition.

1.5 Quality Assurances

A. Contractor shall apply soil sterilizer in accordance with manufacturer's recommendations, as needed.
B. Vegetation and landscaping, if required within the contract, shall be placed and maintained as recommended by nursery industry standards.

1.6 Sequencing

A. Contractor shall confirm survey stakes and set elevation stakes prior to any construction.
B. The complete road and site area shall be cleared of heavy growth of grass, trees, shrub and topsoil prior to foundation construction or placement of backfill or subbase material.
C. Construct temporary construction zone along access drive.
D. The site area shall be brought to subbase course elevation and the access road to base course elevation prior to forming foundations.
E. Contractor shall apply soil herbicide prior to placing base materials.
F. If required, grade, seed, fertilize and mulch disturbed area immediately after bringing the site and access road to base course elevation. Water to ensure growth.
G. Remove gravel from temporary construction zone.
H. After applications of final surfaces, soil herbicide shall be applied to the stone surfaces.

1.7 Submittals

A. Prior to Construction
1. If landscaping is applicable to the contract, submit two copies of the landscaping plan under nursery letterhead. If a landscape allowance was included in the contract, submit an itemized listing of proposed costs under nursery letterhead (Refer to site plan for landscaping requirement).
2. Submit for approval 1/2 cubic feet of the proposed surface course material.
B. Following Construction
1. Manufacturer's description of product and warranty statement on soil herbicide treatment.
2. Manufacturer's description of product on grass seed and fertilizer, if needed.
3. Landscaping warranty statement, if required.

1.8 Warranty

A. In addition to the warranty on all construction covered in the contract documents, the Contractor shall repair all damage of surrounding property caused by construction.
B. Soil herbicide application will guarantee vegetation free road and site area for one year from the date of final inspection.
C. Disturbed areas shall reflect growth of new grass cover prior to final inspection.
D. Landscaping, if included within the scope of the contract, shall be guaranteed for one year from date of final inspection.

PART 2 - PRODUCTS

2.1 Material

A. Subbase: Granular material
B. Aggregate Base Course:
1. For bases to be surfaced with concrete or bituminous mixtures, use Aggregate 22A unless otherwise specified.
2. For bases to be surfaced with aggregate, use Aggregate 6A or 3-4" crushed concrete (no rerod).
C. Aggregate Surface Course: Use Aggregate 21AA when the Aggregate surface course is to be constructed without a bituminous surface.

2.2 Equipment

A. Compaction shall be accomplished by mechanical means.
1. Larger areas shall be compacted by sheeps foot, vibratory or rubber tired rollers weighing at least five tons.
2. Smaller areas shall be compacted by power-driver, hand held tampers.

PART 3 - EXECUTION

3.1 Preparation

A. Clear trees, brush and debris from site area and access road right of way (if required).

B. Prior to other excavation and construction efforts clear site of organic material to a minimum of six inches below original ground level.

C. Unless otherwise instructed by the Owner, remove trees, brush, and debris from the property to an authorized landfill.

D. Prior to placement of fill or base materials, proof roll the soil.

E. Where unstable soil conditions are encountered, cover cleared areas with stabilizer mat prior to placement of fill or base material.

3.2 Installation

A. The site and turnaround area shall be at the subbase course elevation prior to forming foundations. Grade or fill the site and access road as required such that there is an even distribution of spoils resulting from foundation excavations. The resulting grade shall correspond with said subbase course; elevations shall be calculated from finished grades or slopes indicated.

B. Excess spoils, if any, shall be cleared from job site and not spread beyond the limits of Owner/leased property unless authorized by project manager.

C. The access road shall be brought to base course elevation prior to foundation construction to permit use. Compaction shall be performed during construction of the site.

D. Avoid creating depressions where water may pond.

E. The Contract shall be assumed to include grading, banking, ditching and unless otherwise indicated, covering with two inches of surface course all roads or routes utilized for access to the Owner site, commencing at the point of intersection with the nearest public thoroughfare.

F. When improving an existing access road, the existing road shall be graded to remove any organic matter and smooth the surface before placing fill or stone.

G. Fill material or stone shall be placed in six-inch maximum lifts and compacted as described in Section 2.10 prior to placement of next lift.

H. The finish grade, including top surface course, shall extend a minimum of three feet beyond the site fence and shall cover the area as indicated.

I. Subbase:
1. Thickness: Conform to design cross section.
2. Construction method: Place in layers not exceeding 15 inches loose measure. Spread evenly and compact to not less than ninety-five percent (95%) maximum density

J. Aggregate Base Course:
1. Thickness: Compacted in place in two (2) equal courses.

K. Aggregate Surface Course:
1. Thickness: Compacted in place in two (2) equal courses.

O. Riprap shall be applied to the side slopes of all fenced site areas, parking areas and to all other slopes greater than 2:1.

P. Riprap shall be applied to the side of ditches or drainage swales.

Q. Riprap entire ditch for six feet in all directions at culvert openings.

R. Seed, fertilizer and straw cover shall be applied to all other disturbed areas and ditches, drainage, swales, not otherwise riprapped.

S. Under no circumstances will ditches, swales or culverts be placed such that they direct water towards, or permit standing water immediately adjacent to the site. If Owner designs or elevations conflict with this guidance the Owner should be advised immediately.

T. If any ditch lies with slopes greater than ten percent, mound diversionary headwalls in the ditch at the culvert entrances 45 degrees off the ditch line. Riprap the upstream side of the headwall as well as the ditch for six feet above the culvert entrance.

U. Seed and fertilizer shall be applied to surface conditions that will encourage rooting. Rake areas to be seeded to even the surface and loosen the soil.

V. Saw seed in two directions in twice the quantity recommended by the seed producer.

W. Contractor is responsible for the growth of seeded and landscaped areas by watering up to the point of release from the Contract. Continue to rework bare areas until complete coverage is obtained.

DIVISION 3 - CONCRETE

PART 1 - GENERAL

1.1 Inspections

A. LOCAL BUILDING INSPECTION SHALL RECEIVE ADEQUATE NOTIFICATION IN ADVANCE OF CONCRETE POURS.

1.2 Summary

A. The work includes all cast-in-place concrete.

1.3 References

ASTM - American Society Testing Materials, latest edition. ACI - American Concrete Institute, latest edition.
ACI 318. Building Code Requirements for Reinforced Concrete.
ACI 301. Specifications for Structural Concrete for Buildings.

1.4 Submittals

A. Proposed mix design prepared by an approved independent testing firm for each class of concrete. Select proportions according to ACI 301-05, Section 3.8, Method 1 or Method 2.

B. Shop drawings showing fabrication dimensions and locations for placing the reinforcing steel and accessories. Details of reinforcement and accessories shall be in accordance with ACI 315.

C. Certifications for the following:
1. Cement.
2. Aggregates.
3. Admixtures.
4. Reinforcement.

PART 2 - PRODUCTS

2.1 Materials

A. Concrete:
1. Cement: ASTM C150 or ASTM C595 (maximum fly ash content shall be 20% by weight). All cement used in exposed concrete shall be of the same brand from the same mill.
2. Course aggregates: ASTM C33.
3. Fine aggregate: ASTM C33.
4. Mixing water: Clean, fresh, and potable.
5. Admixtures: Air-entraining: ASTM C260. Water-reducing, retarding, and accelerating: ASTM C494. Calcium chloride will not be permitted as an admixture. Pozzolanic admixtures: ASTM C618, Type F, loss on ignition limited to 4 percent (4%).

B. Reinforcement: Refer to tower foundation design or tower manufacturer for type for material type and configuration of reinforcement bars.

C. Curing Compound, if needed: ASTM C309

2.15 Field Quality Control

A. Compaction shall be at least 95% of maximum density and within 2% of optimum moisture content in accordance with ASTM D-1557. Areas of settlement shall be excavated and refilled at Contractor's expense.
B. All trees placed in conjunction with a landscape contract will be wrapped, tied with hose protected wire and secured to 2- inch x 2-inch x 4-inch wooden stakes extending two feet into the ground on four sides of the tree.

C. All exposed areas shall be protected against washouts and soil erosion. Straw bales will be placed at the inlet approach to all new or existing culverts. Where the site or road areas have been elevated immediately adjacent to a rail line, erosion control fabric will be staked full length in the swale between the site and the rail bed to prevent contamination of the rail ballast.

D. Field inspection and testing is to be performed by a firm appointed and paid for by the Owner. When additional testing of materials or concrete is necessary because of their failure by test or inspection to meet specification requirements, the cost of the additional testing shall be paid for by the Contractor. Additional testing for early form removal shall also be paid for by the Contractor.

E. Acceptance Testing: If initial testing indicates failed or non-conformance to specification, perform additional test. If further testing verifies non-conformance, additional testing shall be paid by CONTRACTOR. Replace non-conforming material at no additional cost to OWNER.

1. Aggregates:
A. Sampling and Analysis: Michigan Testing Methods, Series 100.
B. Exception: Provide certification of approved stockpiled material.

2.2 Proportioning Concrete

A. Proportions and Materials:
Permissible Cement Types: I, IP, I-A, IP-A
Minimum Cement Content: 5.5 sacks/cu.yd. for 3500 psi, 6.0 sacks/cu.yd. for 4000 psi.
Maximum Water-Cement Ratio: 5.0 gal./sack
Entrained Air Content: five percent (5%) to eight percent (8%).
Maximum Slump:3½-inch for floors and slabs on grade, 4 inches otherwise (individual batches may be ± ½ inch as long as the average of all batches is at or below maximum).
Minimum Compressive Strength, fc' (28 day) 4000 psi floors and slabs on grade, all other 3500 psi.

B. Admixtures: Approval of ENGINEER required. Use in accordance with the manufacturer's instructions.

C. If the CONTRACTOR intends to place concrete by pumping, the mix design shall be prepared in accordance with these specifications and the recommendations of ACI 304.

2.3 Fabricating Reinforcement

Fabricate in accordance with approved shop drawings and ACI 315.

Reinforcing splices: Class B unless otherwise shown.

PART 3 - EXECUTION

3.1 Performance

In accordance with the requirements of ACI 301, Chapters 4 through 13, 17 and 18.

3.2 Concrete Work For Drilled Piers

All concrete piers shall be drilled and poured on the same day to prevent any migration of water into the hole and to prevent debris from collecting in the hole.

3.3 Field Quality Control

A. Provide access to all portions of the work and any necessary assistance in obtaining and handling samples at the project or other material sources. Three concrete test cylinders will be taken for every 50 cubic yards, or fraction thereof, for each class of concrete place in any one day. One additional cylinder will be taken during cold weather concreting and be cured on the project site under the same conditions as the concrete it represents. One slump test will be taken for each set of cylinders taken.

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.

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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.

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SITE NAME:
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HEART OF MARY
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DETROIT, MICHIGAN 48207

Sheet Title:
GENERAL NOTES

Sheet Number:
N-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 contractors 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 were 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:

1. EIA - Electrical Industries Association RE - 222, structural standards for steel antenna towers and antenna supporting structures.
2. FAA - Federal Aviation Administration advisory circular AC 70/7460-IH, obstruction marking and lighting.
3. 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".
4. DISC - American Institute of Steel Construction specifications for structural joints using ASST. A325 or A490 bolts.
5. NECK - National Electrical Code - on tower lighting kits.
6. UL - Underwriter's Laboratories approved.
7. 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

1. Submittal of bid indicates Contractor is cognizant of all job site conditions and work to be performed under this contract.
2. 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.
3. Heights shall be verified with Owner prior to installation.
4. These plans are diagrammatic only.
5. Electrical Service 120/240 V.A.C. single phase 3-wire 100 AMP service.
6. Contractor shall provide all labor, materials, insurance, equipment, installation, construction tools, transportation, etc. for a complete and properly operative system energized throughout and as indicated on drawings, as specified herein and/or as otherwise required.
7. Contractor shall carry out all work in accordance with all governing state, county, and local codes and O.S.H.A.
8. Contractor shall secure all necessary building permits and pay all required fees.
9. 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.
10. Provide project manager with one set of complete electrical "as installed" drawings at the completion of the job, showing actual dimensions, routings and circuits.
11. The entire electrical installation shall be grounded as required by all applicable codes.
12. 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 biddle 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:
1. 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.
2. 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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N-2