CALL DIGGER - CHICAGO UTILITY ALERT NETWORK FOR UNDERGROUND UTILITIES PRIOR TO DIGGING
1-312-744-7000

T · · Mobile ·

ANCHOR PROJECT

T-MOBILE Site #	T-MOBILE Site Name	Site Address
CH41799A	CPS THORP SCHOOL	6024 W. WARWICK AVE. CHICAGO, IL 60634

SCOPE OF WORK

THE SCOPE OF WORK CONSISTS OF:

1. REPLACEMENT OF (3) EXISTING ANTENNAS W/ (6) NEW ANTENNAS
2. INSTALLATION OF (6) NEW RF MODULES (AHFIG'S) & NEW RF JUMPERS
3. INSTALLATION OF (1) NEW AIRSCALE SM INDOOR AMIA W/ (1) NEW ASIK, (3) NEW ABIL, (1) NEW ASIB & (3) NEW ABIC MODULES
4. INSTALLATION OF (2) NEW TOWER OVP/ FIBER JUNCTION BOXES, (3) NEW HYBRID BREAKOUT BOXES, (3) NEW HYBRID TRUNK CABLES & NEW FIBER JUMPERS
5. RELOCATION OF (1) EXISTING TOWER OVP/FIBER JUNCTION BOX
6. REMOVAL OF (6) EXISTING AHFIB MODULES
7. RELOCATION OF (2) EXISTING ANTENNAS
8. REMOVAL OF (1) EXISTING BASE COVP & (3) EXISTING SECTOR COVP'S
9. PAINTING OF ALL ANTENNAS & EQUIPMENT TO MATCH THE ADJACENT MASONRY
10. UTILIZE EXISTING 200AMP BREAKER INSIDE PPC
11. INSTALLATION OF (3) STEP OVER PLATFORM

STATEMENT THAT COMPLIANCE WITH THE ENERGY IS NOT REQUIRED

I CERTIFY THAT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND BELIEF, THE ATTACHED PLANS FOR:
6024 W. WARWICK AVE.
CHICAGO, IL 60634

DO NOT NEED TO COMPLY WITH THE REQUIREMENTS OF CHAPTER 18-13, ENERGY CONSERVATION, OF THE MUNICIPAL CODE OF CHICAGO. PROJECT NEED NOT COMPLY BECAUSE: *SCOPE OF WORK DOES NOT INVOLVE MODIFICATION OF EXTERIOR ENVELOPE OF A BUILDING, HVAC SYSTEMS OR ELECTRICAL LIGHTING SYSTEMS.*

SIGNED: [signature] DATE: 03-19-21
ILLINOIS LICENSE NUMBER: 3377

STATE OF ILLINOIS NABI R. FAKRODDIN 3377 ST. CHARLES LICENSED STRUCTURAL ENGINEER

PROFESSIONAL LICENSURE

I CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF THE GOVERNING LOCAL BUILDING CODE.

STATE OF ILLINOIS NABI R. FAKRODDIN 3377 ST. CHARLES LICENSED STRUCTURAL ENGINEER

LICENSED PROFESSIONAL
EXPIRES: 11/30/22 SIGNED:03/19/21

AERIAL MAP

GENERAL NOTES:
GC SHALL CONTACT THE A&E FIRM PRIOR TO SIDWALK AND CONSTRUCTION START TO CONFIRM THAT DRAWINGS ARE THE MOST RECENT SET. CONTRACTOR SHALL HAVE THE SITE MANNED WITH A SUPERVISOR AND CREW FOR EVERY DAY OF THE BUILD.

ENVIRONMENTAL NOTE:
THE DRAWINGS AND SPECIFICATIONS HAVE NOT BEEN REVIEWED FOR ENVIRONMENTAL SCOPE OF WORK. DISTURBANCE OF LEAD AND ASBESTOS ARE REGULATED FOR SCHOOLS. STATE AND FEDERAL REGULATIONS REQUIRE THAT ALL MATERIALS IN SCHOOLS MUST BE ASSUMED TO BE ASBESTOS CONTAINING BUILDING MATERIALS (ACBM). ANYONE WHO DRILLS CUTS OR OTHERWISE DISTURBS ANY SURFACE KNOWN OR ASSUMED TO BE ASBESTOS MUST BE AN ASBESTOS LICENSED CONTRACTOR. THEREFORE ANY DISTURBANCE TO ANY SURFACE (LEAD OR ASBESTOS) MUST BE DONE BY LICENSED CONTRACTORS AND CPS MUST HAVE ENVIRONMENTAL REVIEW. CONTACT RICHARD SCHLEYER, CPS DIRECTOR OF ENVIRONMENTAL HEALTH AND SAFETY, FOR ANY WORK THAT MAY INVOLVE ENVIRONMENTAL REMEDIATION AT RJSCHLEYER@CPS.EDU OR 773-251-7074.

CITY OF CHICAGO SUMMARY

HANDICAPPED REQUIREMENTS:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS REQUIREMENTS NOT REQUIRED.

PLUMBING REQUIREMENTS
FACILITY HAS NO PLUMBING

REFRIGERATION NOTE
NO REFRIGERANTS ARE USED FOR COOLING THE EQUIPMENT.

EXIST. STRUCTURAL CONDITION
EXISTING CONDITIONS WILL BE CHECKED AND VERIFIED IN FIELD. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, A REPAIR PERMIT SHALL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.

DRIVING DIRECTIONS

DRIVING DIRECTIONS FROM T-MOBILE OFFICE AT: 1400 OPUS PLACE, DOWNERS GROVE, IL 60515

1. HEAD EAST 374 FT
2. TURN RIGHT 02 FT
3. TURN LEFT 436 FT
4. TURN RIGHT TO MERGE ONTO I-88 W 0.2 MI
5. MERGE ONTO I-88 W 0.1 MI
6. TAKE EXIT 131B TO MERGE ONTO I-355 N TOWARD NW SUBURBS 10.6 MI
7. MERGE ONTO I-290 W 5.7 MI
8. USE THE RIGHT LANE TO TAKE THE I-90/IL-62 EXIT TOWARD ALGONQUIN RD/IL-53 N 0.8 MI
9. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-90 E/CHICAGO AND MERGE ONTO I-90 E 5.1 MI
10. KEEP LEFT TO STAY ON I-90 E 4.9 MI
11. KEEP RIGHT AT THE FORK TO STAY ON I-90 E 0.5 MI
12. TAKE THE ILLINOIS 171 S EXIT 1.0 MI
13. KEEP LEFT, FOLLOW SIGNS FOR STATE HWY 191 154 FT
14. TURN RIGHT ONTO IL-171 S/N CUMBERLAND AVE 0.2 MI
15. TURN LEFT ONTO W BRYN MAWR AVE 0.6 MI
16. TURN RIGHT ONTO N CANFIELD AVE 0.5 MI
17. TURN LEFT ONTO W FOSTER AVE 0.9 MI
18. TURN RIGHT ONTO IL-43 S/HARLEM AVE 0.3 MI
19. TURN LEFT ONTO W STRONG ST 0.1 MI
20. TURN RIGHT ONTO N MONT CLARE AVE 0.1 MI
21. TURN LEFT ONTO W GUNNISON ST 0.0 MI
22. TURN RIGHT ONTO N NAGLE AVE 0.4 MI
23. CONTINUE ONTO N NARRAGANSETT AVE 0.7 MI
24. TURN LEFT ONTO W IRVING PARK RD 0.4 MI
25. TURN RIGHT ONTO N MEADE AVE 0.3 MI
26. TURN LEFT ONTO W GRACE ST 367 FT

DESTINATION WILL BE ON THE RIGHT

TOTAL TRAVEL ESTIMATE: 34.4 MI, 58 MINUTES

SHEET INDEX

NO.	SHEET DESCRIPTION
T-1	TITLE SHEET (D, VG, 03-19-21)
T-2	CODE MATRIX/SCHEDULE
A-1	ROOF PLAN (D, VG, 03-19-21)
A-1A	EXISTING & PROPOSED ENLARGED EQUIPMENT LAYOUT
A-2	BUILDING ELEVATION & DETAILS
A-2A	EXISTING & PROPOSED ANTENNA PLANS
A-3	ANTENNA & CABLE SCHEDULE
A-3A	RFDS DIAGRAM
A-4	NEW EQUIPMENT SPECIFICATIONS
A-4A	NEW EQUIPMENT SPECIFICATIONS
A-4B	NEW EQUIPMENT SPECIFICATIONS
A-4C	NEW EQUIPMENT SPECIFICATIONS
A-4D	NEW EQUIPMENT SPECIFICATIONS
E-1	PROPOSED UTILITY PLAN
E-2	UTILITY DETAILS
EG-1	PROPOSED SITE GROUNDING DIAGRAM
SP-1	GENERAL NOTES AND SPECIFICATIONS

PROJECT INFORMATION

(D, VG, 03-19-21)

SITE INFORMATION:

LATITUDE:	N 41° 56' 57.80" (NAD 83)
LONGITUDE:	W 87° 46' 39.70" (NAD 83)
SITE TYPE:	ROOFTOP
JURISDICTION:	CITY OF CHICAGO
COUNTY:	COOK

APPLICANT: T-MOBILE, 1400 OPUS PLACE, DOWNERS GROVE, IL 60515, PHONE: (773) 444-5400

ENGINEERING CONTACT: CONCORDIA WIRELESS, INC. CONTACT: GM SADAT, PE, PHONE: (847) 981-0801, FAX: (847) 589-0643

SITE ACQUISITION: LCC TELECOM, CONTACT: ERIC LAUGESEN, PHONE: (847) 630-2142

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: CHICAGO BUILDING CODE (CBC), 2019 EDITION
ELECTRICAL CODE: CHICAGO ELECTRICAL CODE (CEC), 2018 EDITION

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.

- AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
- TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES
- TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OD A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING ELECTRONIC EQUIPMENT
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, FIFTEENTH EDITION
- IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")
- LIGHTNING PROTECTION CODE: NFPA 780-2008, LIGHTNING PROTECTION CODE
- TELECORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS
- TELECORDIA GR-1503, COAXIAL CABLE CONNECTIONS
- ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION
- FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
- EQUIPMENT AREAS UNMANNED AND NOT FOR HUMAN HABITATION, HANDICAPPED ACCESS REQUIREMENTS AND PLUMBING FACILITIES ARE NOT REQUIRED.

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DRAWN BY: KC	CHECKED BY: GMS
CHECKED BY: RH	APPROVED BY: GMS

NO.	REVISION/ISSUE	DATE	INITIAL
A	PCD'S	10/09/20	FS
B	PCD'S REV B	12/08/20	DR
C	FCD'S	01/11/21	SK
D	FCD'S REV 1 CPS COMMENTS	03/19/21	VG

CH41799A
CPS THORP SCHOOL
6024 W. WARWICK AVE.
CHICAGO, IL 60634

TITLE SHEET

T-1 (D, VG, 03-19-21)

CITY OF CHICAGO DEPARTMENT OF CONSTRUCTION AND PERMITS

GENERAL BUILDING REQUIREMENTS Per Chicago Zoning Ordinance(CZO) and Chicago Building Code (CBC) 2019 Edition

ITEM	ISSUE	CHAPTER/ARTICLE	Ordinance Requirement	Actual	Requirement N/A	Location/ Sheet No.	Agency/ Test No.	REMARKS
ZONING REQUIREMENTS								
1.01	Zoning District	CHAPTER 17-1-800	N/A	RS-2	N/A	N/A	N/A	
1.02	Lot Area	N/A	N/A	N/A	N/A	N/A	N/A	
1.03	Maximum Floor Area Ratio	N/A	N/A	N/A	N/A	N/A	N/A	
1.04	Total Building Area	N/A	N/A	N/A	N/A	N/A	N/A	
1.05	Building Height - No. of Floors	N/A	N/A	N/A	N/A	N/A	N/A	
1.06	Minimum Yards	N/A	N/A	N/A	N/A	N/A	N/A	
1.07	Grade Elevation (CCD)	N/A	N/A	N/A	N/A	N/A	N/A	
1.08	Off Street Loading	CHAPTER 17-10-1101	N/A	N/A	N/A	N/A	N/A	
1.09	Off Street Parking	CHAPTER 17-10-0207	N/A	N/A	N/A	N/A	N/A	
1.10	Landscaping	CHAPTER 17-1-0050	N/A	N/A	N/A	N/A	N/A	
BUILDING REQUIREMENTS								
2.01	Occupancy Classification (s)	3 (13-56) page 115	N/A	N/A	N/A	N/A	N/A	
2.02	Height and Area Limitations	5 (13-48) page 323	N/A	N/A	N/A	N/A	N/A	
	a) Exceptions to Area Limitations	5(13-48-090)pg.325	N/A	N/A	N/A	N/A	N/A	
	b)Mixed Occupancy Buildings	5(13-48-100)pg. 326	N/A	N/A	N/A	N/A	N/A	
2.03	Types of Construction	6 (13-60) page 329	N/A	N/A	N/A	N/A	N/A	
2.04	Mixed Occupancy Separations	3 (13-56-280)pg.118	N/A	N/A	N/A	N/A	N/A	
2.05	Req.Hrs of Fire Resistance	6(13-60-100)pg. 330	N/A	N/A	N/A	N/A	N/A	
	Exterior Bearing Walls	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Exterior -Nonbearing Walls	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Interior Bearing Walls	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Interior Nonbearing Walls	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Columns	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Columns Supporting Roofs Only	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Beams	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Beams Supporting Roofs Only	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Floor Construction	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
	Roof Construction	Table 6(13-60-100)	N/A	N/A	N/A	N/A	N/A	
2.06	Elevator Framing	6(13-60-130)pg. 331	N/A	N/A	N/A	N/A	N/A	
2.07	Mezzanine Floors	6(13-60-160)pg. 332	N/A	N/A	N/A	N/A	N/A	
2.08	Basement Construction	6(13-60-170)pg. 332	N/A	N/A	N/A	N/A	N/A	
2.09	Driveways and Loading Spaces	6(13-60-210)pg. 332	N/A	N/A	N/A	N/A	N/A	
2.10	Fire - Resistive Requirements	7(15-8) page 335	N/A	N/A	N/A	N/A	N/A	
	a)Fire Walls - Construction	7(15-8-010)page 335	N/A	N/A	N/A	N/A	N/A	
	b)Parapets	7(15-8-100)p335&336	N/A	N/A	N/A	N/A	N/A	
	c)Stairway Enclosures	7(15-8-140)pg.337	N/A	N/A	N/A	N/A	N/A	
	d)Elevator Enclosures	7(15-8-150)pg. 337	N/A	N/A	N/A	N/A	N/A	
	e)Enclosures of Heating Rooms	7(15-8-190)pg. 338	N/A	N/A	N/A	N/A	N/A	
	f)Enclosures of Wells & Chutes	7(15-8-170)pg. 338	N/A	N/A	N/A	N/A	N/A	
	g)Other Enclosures	7(15-8-240)pg. 339	N/A	N/A	N/A	N/A	N/A	
	h)Interior Wall and Clg.Finishes	7(15-8-380)pg.341	N/A	N/A	N/A	N/A	N/A	
	i)Storage Rooms over 100sq.ft	7(15-8-240)(b)pg.339	N/A	N/A	N/A	N/A	N/A	
2.11	Fire - Resistive Materials and Construction	7(15-12)page 346	N/A	N/A	N/A	N/A	N/A	
2.12	Accepted Engineering Practice. Recognized Agencies	7(15-12-050)	N/A	N/A	N/A	N/A	N/A	
2.13	Fire Protection Equipment	9(15-16) page 361	N/A	N/A	N/A	N/A	N/A	
	a)Sprinkler Systems	9(15-16-010)pg 362	N/A	N/A	N/A	N/A	N/A	
	b)Special Requirements	9(15-16-030)pg 362	N/A	N/A	N/A	N/A	N/A	
EXIT REQUIREMENTS								
3.01	Types of Exits	10(13-160-040)pg. 388	N/A	N/A	N/A	N/A	N/A	
3.02	Minimum Number of Exits	10(13-160-050)pg. 388	N/A	N/A	N/A	N/A	N/A	
3.03	Travel Distance to Exits	10(13-160-110)pg. 389	N/A	N/A	N/A	N/A	N/A	
	a)Increases Permitted	10(13-160-150)pg. 390	N/A	N/A	N/A	N/A	N/A	
	b)Dead End Corridor	10(13-160-160)pg.390	N/A	N/A	N/A	N/A	N/A	
3.04	Capacity of Exits	10(13-160-210)pg. 390	N/A	N/A	N/A	N/A	N/A	
3.05	Minimum Width of Exits	10(13-160-220)pg. 391	N/A	N/A	N/A	N/A	N/A	
3.06	Swing of Exit Doors	10(13-160-250)pg. 391	N/A	N/A	N/A	N/A	N/A	
3.07	Hardware	10(13-160-260)pg. 392	N/A	N/A	N/A	N/A	N/A	
3.08	Revolving Doors	10(13-160-270)pg. 393	N/A	N/A	N/A	N/A	N/A	
3.09	Landings	10(13-160-310)pg. 394	N/A	N/A	N/A	N/A	N/A	
3.10	Handrails	10(13-160-320)pg. 394	N/A	N/A	N/A	N/A	N/A	
3.11	Construction	10(13-160-330)pg. 394	N/A	N/A	N/A	N/A	N/A	
3.12	Enclosures	7(15-8-140)pg. 337	N/A	N/A	N/A	N/A	N/A	
3.13	Head Room	10(13-160-350)pg. 394	N/A	N/A	N/A	N/A	N/A	

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CHECKED BY: RH	APPROVED BY: GMS

STATE OF ILLINOIS
NABI R. FAKRODDIN
3377
ST. CHARLES
LICENSED STRUCTURAL ENGINEER

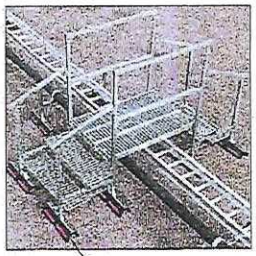
CH41799A
CPS THORP SCHOOL
6024 W. WARWICK AVE.
CHICAGO, IL 60634

CODE MATRIX SCHEDULE

T-2

LEGEND & SYMBOLS

UTILITY POLE
SIGN
TELCO PEDESTAL
FIRE HYDRANT
LIGHT STANDARD
INLET
CATCH BASIN
MANHOLE
TRAFFIC SIGNAL
ROW MARKER
IRON PIPE SET
IRON PIPE FOUND
BUFFALO BOX
VALVE BOX
HORIZONTAL CONTROL POINT
HANDICAPPED PARKING SPACE
DECIDUOUS TREE W/SIZE
CONIFEROUS TREE W/SIZE
BRUSH
TREE LINE
CONTOUR W/ELEVATION
EXISTING GUARDRAIL
CHAIN LINK FENCE
IRON FENCE
WOOD FENCE
OVERHEAD WIRES
LOT LINE
PROPERTY LINE
LEASE AREA LINE
UTILITY EASEMENT LINE
CENTER LINE
UNDERGROUND ELECTRIC LINE
UNDERGROUND GAS LINE
UNDERGROUND FIBER LINE
UNDERGROUND TELCO LINE
UNDERGROUND STORM/SANITARY SEWER LINE
UNDERGROUND WATER LINE
UNDERGROUND COMMUNICATIONS/MONITORING LINE
CONCRETE
ASPHALT
GRAVEL
CULTIVATED FIELD
GRASS AREA
ICE BRIDGE
STEEL PLATFORM



NEW DURA-BLOCK SUPPORTS INCLUDED WITH NEW B-LINE STEP-OVER PLATFORM

03-19-21 D VG

3 STEP-OVER PLATFORM DETAILS
SCALE: N.T.S.

GC TO PAINT ALL ANTENNAS, EQUIPMENT, FRAMES, VERTICAL CABLE TRAYS, CONDUITS, ETC. THAT IS VISIBLE FROM THE GROUND TO MATCH THE ADJACENT MASONRY

ALPHA/DELTA SECTOR

EXISTING CHIMNEY

EXISTING T-MOBILE PARAPET WALL PENETRATING ANTENNA FRAME TO REMAIN FOR ALPHA/DELTA SECTOR

RF WARNING SIGN TO BE MOUNTED ON ANTENNA FRAME (TYP.)

EXISTING T-MOBILE ANTENNA FRAME WITH EXISTING & NEW T-MOBILE ANTENNAS (TYP.); SEE SHEET A-2A FOR DETAILS

EXISTING VENT (TYP.)

EXISTING ROOF HATCH (TYP.)

EXISTING DRAIN (TYP.)

EXISTING T-MOBILE STEEL PLATFORM W/EXISTING AND NEW EQUIPMENT; SEE SHEET A-1A FOR MORE DETAILS

NEW T-MOBILE STEP-OVER PLATFORM PART# RWS223424H BY B-LINE GRATEWALK ROOFTOP WALKWAYS OR APPROVED EQUIVALENT (TYP.); SEE DETAIL 3 ON THIS SHEET

EXISTING SKYLIGHT (TYP.)

EXISTING MAIN ROOF LEVEL

EXISTING LOWER ROOF LEVEL

EXISTING UPPER ROOF LEVEL

EXISTING T-MOBILE ROOF PENETRATING ANTENNA FRAME TO REMAIN (TYP. FOR BETA/EPSILON & GAMMA/ZETA SECTORS)

RF WARNING SIGN TO BE MOUNTED ON ANTENNA FRAME (TYP.)

RF WARNING SIGN TO BE MOUNTED ON ANTENNA FRAME (TYP.)

GAMMA/ZETA SECTOR

BETA/EPSILON SECTOR

EXISTING ACCESS HATCH (TYP.)

03-19-21 D VG

NEW 24"X24"X1/2" NEOPRENE PAD TO BE INSTALLED BELOW EACH CONCRETE PAVER

NEW 18"X18"X3" THICK CONCRETE PAVER

PVC FLANGE W/ (4) 3/8" ANCHORS W/ 2" EMBEDMENT

2"X 40" LONG PVC PIPE WITH CAP

PLASTIC BARRIER CHAIN PART# H-3364Y BY ULINE OR APPROVED EQUIVALENT

GC TO FASTEN AND SUPPORT PVC/PLASTIC BASED YELLOW COLORED SAFETY CHAIN-BARRIER TO THE ANTENNA FRAME (TYP. FOR BETA & GAMMA SECTORS)

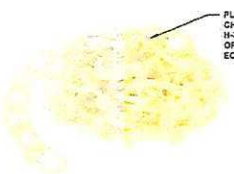
NEW T-MOBILE STEP-OVER PLATFORM PART# RWS223424H BY B-LINE GRATEWALK ROOFTOP WALKWAYS OR APPROVED EQUIVALENT (TYP.); SEE DETAIL 3 ON THIS SHEET

GC TO FASTEN AND SUPPORT PVC/PLASTIC BASED YELLOW COLORED SAFETY CHAIN-BARRIER TO THE ANTENNA FRAME (TYP. FOR BETA & GAMMA SECTORS)

1 ROOF PLAN
SCALE: 1/16"=1'-0" (1/16"=2'-0" IF 11 X 17 SHEET SIZE)

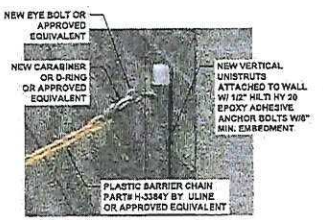
N

Plastic Barrier Chain Yellow



PLASTIC BARRIER CHAIN PART# H-3364Y BY ULINE OR APPROVED EQUIVALENT

MODEL NO.	DESCRIPTION
H-3364Y	100' Box of Chain - 2" Links



2 PLASTIC CHAIN BARRIER
SCALE: N.T.S.

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T-MOBILE
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DOWNERS GROVE, IL 60515
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Concordia
301 RANDY RD, UNIT 131
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PROFESSIONAL DESIGN FIRM LICENSE # 184-004902

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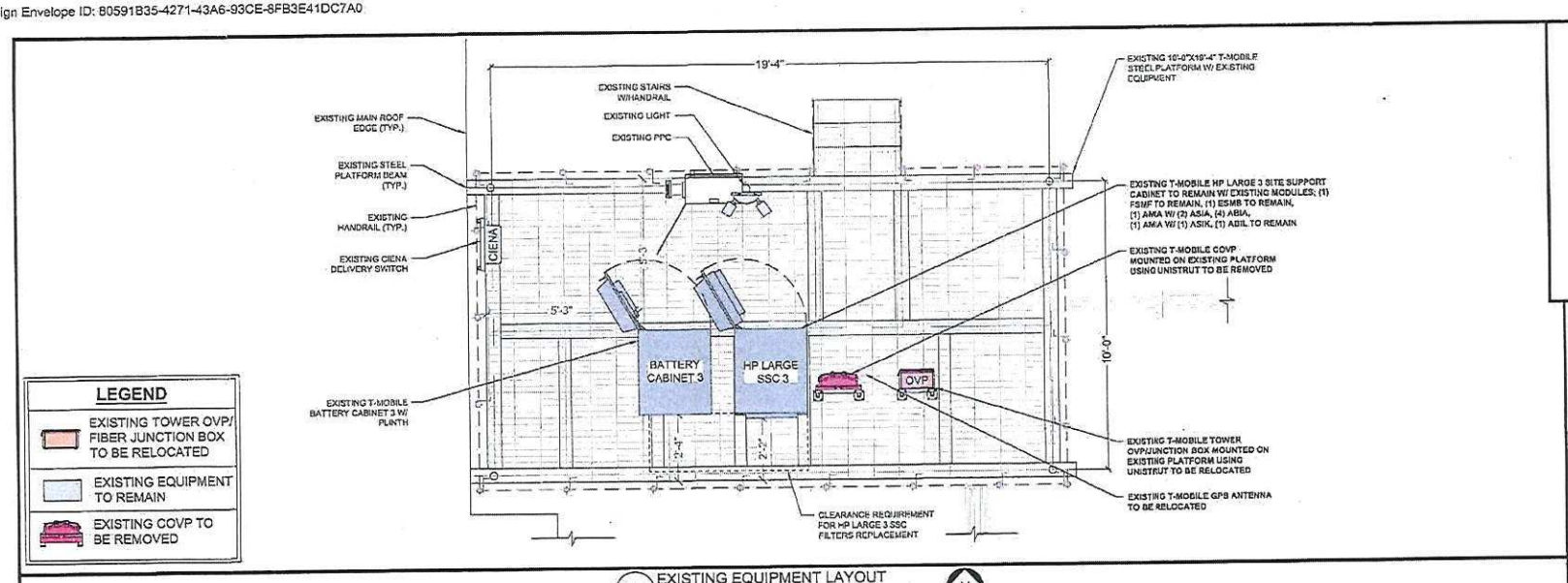
ROOF PLAN

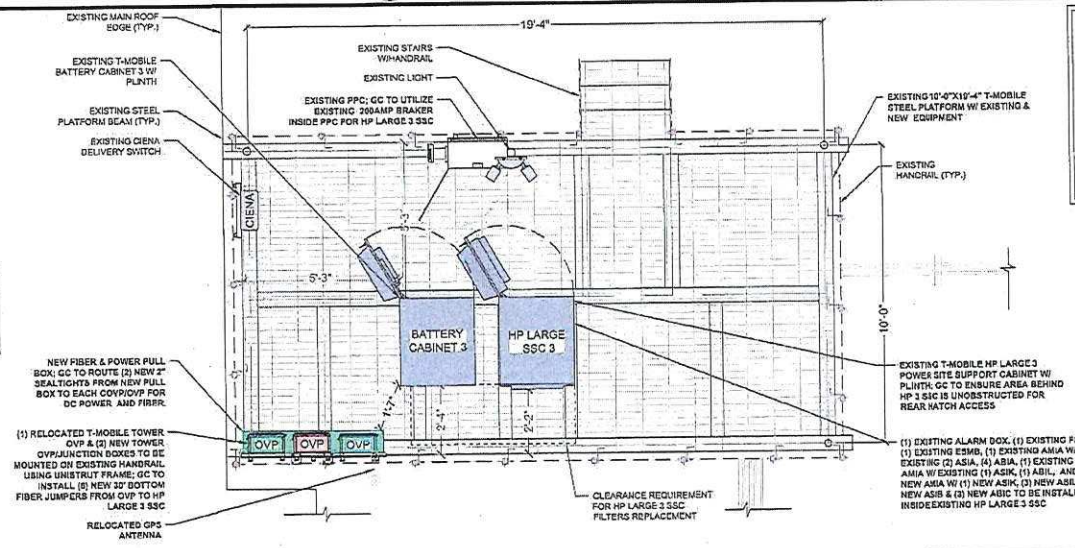
A-1 03-19-21 D VG



LEGEND

- EXISTING TOWER OVP/ FIBER JUNCTION BOX TO BE RELOCATED
- EXISTING EQUIPMENT TO REMAIN
- EXISTING COVP TO BE REMOVED

1 EXISTING EQUIPMENT LAYOUT
SCALE: 1/2"=1'-0" (1/2"=2'-0" IF 11 X 17 SHEET SIZE)



LEGEND

- RELOCATED TOWER OVP/ FIBER JUNCTION BOX
- EXISTING EQUIPMENT TO REMAIN
- NEW TOWER OVP/ FIBER JUNCTION BOX TO BE INSTALLED

LEGEND

- FO — FIBER OPTIC CONDUIT
- E — ELECTRIC CONDUIT

2 PROPOSED EQUIPMENT LAYOUT
SCALE: 1/2"=1'-0" (1/2"=2'-0" IF 11 X 17 SHEET SIZE)

IMPORTANT NOTES:

1. GC TO INSTALL NEW 25 AMP DC BREAKER FOR EACH AIRSCALE CONTROL CARD (ASIA, ASIK, ASIB, ETC). GC TO REMOVE POWER BRIDGE FROM REAR OF AMIA.
2. GC TO INSTALL NEW VOLTAGE BOOSTER POWER PLUS W/ (2) AMPLIFIER RAYCAP
3. GC TO INSTALL NEW CSR-IXRe V1 (GEN 1) INSIDE SITE SUPPORT CABINET.
4. ALL NEW AND EXISTING CONDUITS, GROUNDS OR FIBER NEED TO BE SECURED TIGHTLY TO BOTTOM OF PLATFORM TO ALLOW FOR ROOFING CLEARANCE.

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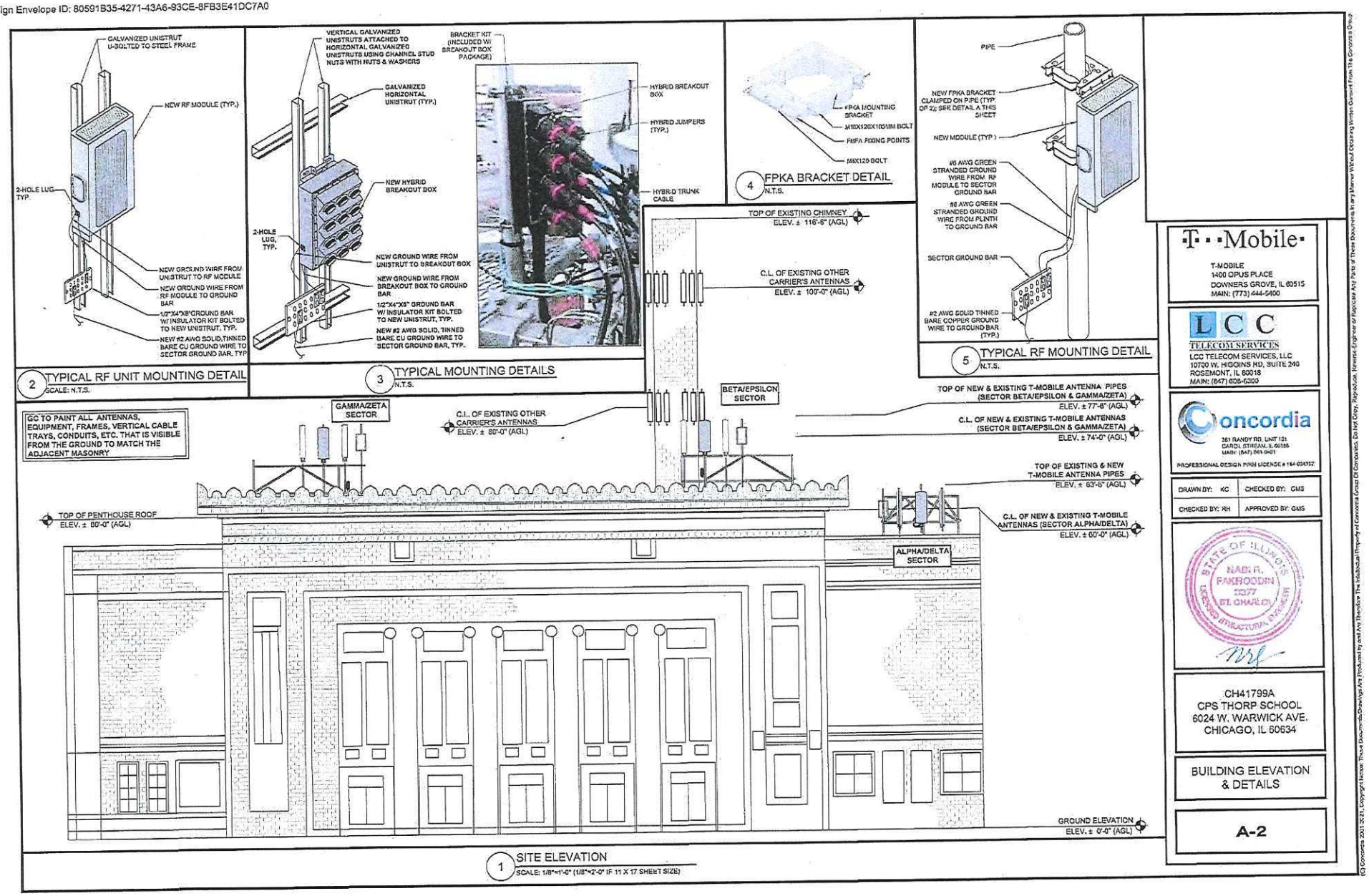
EXISTING & PROPOSED ENLARGED EQUIPMENT LAYOUT

A-1A



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CAROL STREAM, IL 60188
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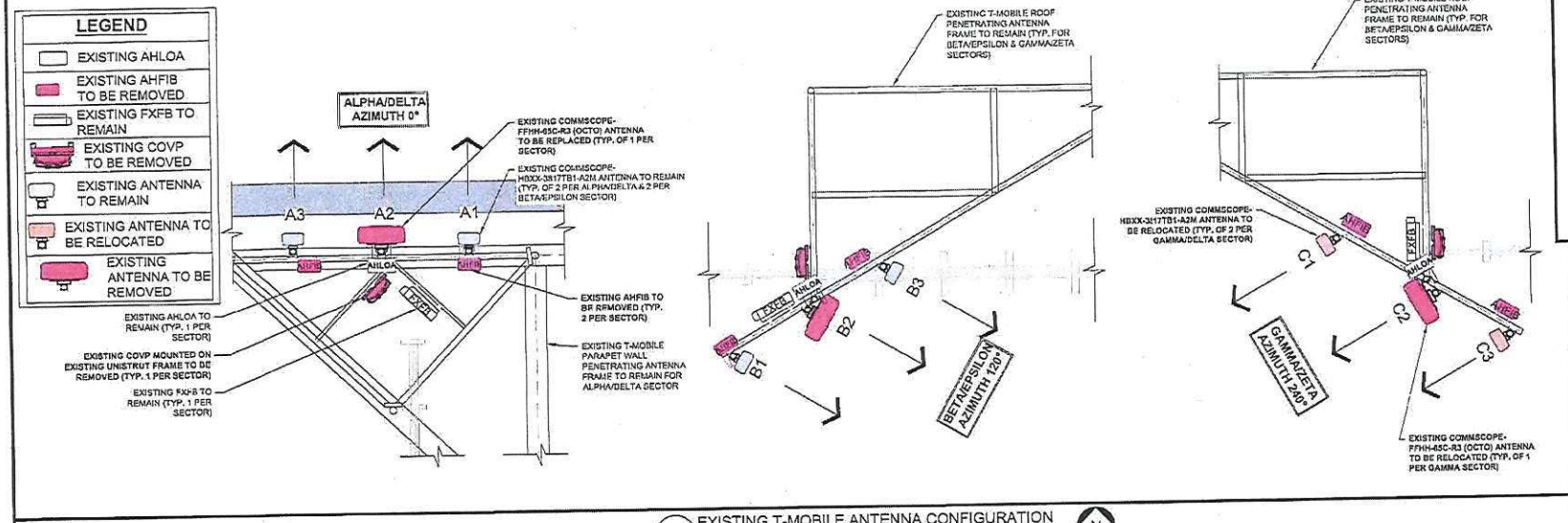
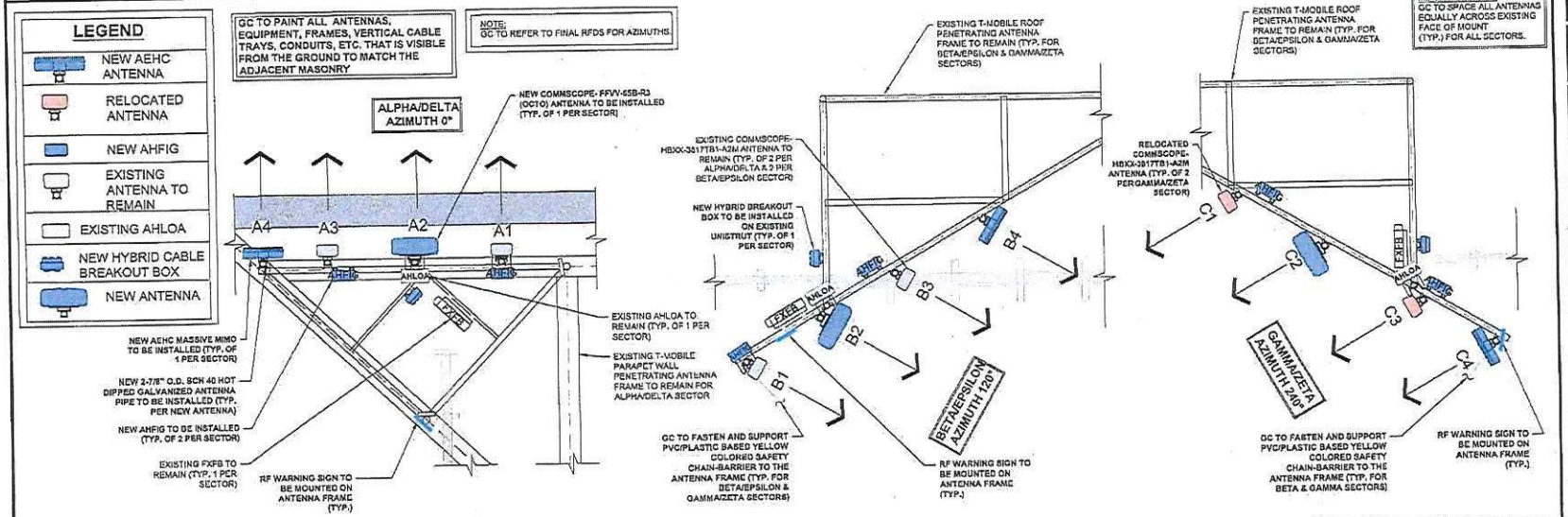
BUILDING ELEVATION & DETAILS

A-2



1 EXISTING T-MOBILE ANTENNA CONFIGURATION
SCALE: N.T.S.



2 PROPOSED T-MOBILE ANTENNA CONFIGURATION
SCALE: 3/8"=1'-0" (3/8"=2'-0" IF 11 X 17 SHEET SIZE)

T-MOBILE
1400 OPUS PLACE
DOWNERS GROVE, IL 60515
MAIN: (773) 444-5400

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Concordia
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MAIN: (847) 261-0501
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EXISTING & PROPOSED ANTENNA PLANS

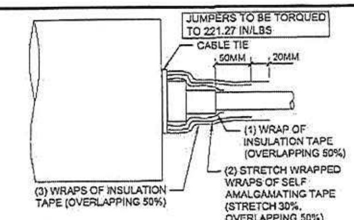
A-2A

FINAL ANTENNA AND CABLE SCHEDULE

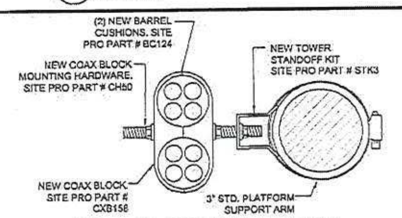
SECTOR	POS.	AZIMUTH	RAD CENTER	TECHNOLOGY	MECHANICAL TILT	ELECTRICAL TILT	ANTENNA	STATUS	RRU TYPE	RRU RF JUMPER LENGTHS	SECTOR FIBER JUNCTION BOXES	HCS FACTORY LENGTH	BASE FIBER JUNCTION BOXES	FIBER JUMPERS FACTORY LENGTH
ALPHA/ DELTA	A4	0°	60'	L2500/ N2500	0°	T.B.D.	AEHC (ACTIVE ANTENNA - MASSIVE MIMO)	NEW	-	-	(1) NEW BREAKOUT BOX TO BE INSTALLED	(1) NEW 100' HCS 2.0 HYBRID TRUNK CABLE TO BE INSTALLED	(1) EXISTING TOWER OVP/ JUNCTION BOX	15'
	A3/D3	0°	60'	L1900/ L2100	0°	3°/3°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	REUSE EXISTING	(1) NEW AHFIG	≤ 15'-0"				15'
	A2	0°	60'	L700/ L600/ N600/L1900/ G1900/ U1900	0°	3°/3°/2°/2°	COMMSCOPE FFVV-65B-R3 (OCTO)	NEW	(1) EXISTING AHLOA & (1) EXISTING FXFB	≤ 15'-0"				(2) 15'
	A1/D1	0°	60'	L1900/ L2100	0°	3°/3°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	REUSE EXISTING	(1) NEW AHFIG	≤ 15'-0"				15'
BETA/* EPSILON	B4	120°	74'	L2500/ N2500	0°	T.B.D.	AEHC (ACTIVE ANTENNA - MASSIVE MIMO)	NEW	-	-	(1) NEW BREAKOUT BOX TO BE INSTALLED	(1) NEW 175' HCS 2.0 HYBRID TRUNK CABLE TO BE INSTALLED	(1) NEW TOWER OVP/ JUNCTION BOX TO BE INSTALLED	15'
	B3/E3	120°	74'	L1900/ L2100	0°	3°/3°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	REUSE EXISTING	(1) NEW AHFIG	≤ 15'-0"				15'
	B2	120°	74'	L700/ L600/ N600/L1900/ G1900/ U1900	2°	3°/3°/2°/2°	COMMSCOPE FFVV-65B-R3 (OCTO)	NEW	(1) EXISTING AHLOA & (1) EXISTING FXFB	≤ 15'-0"				(2) 15'
	B1/E1	120°	74'	L1900/ L2100	0°	3°/3°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	REUSE EXISTING	(1) NEW AHFIG	≤ 15'-0"				15'
GAMMA/ ZETA	C4	240°	74'	L2500/ N2500	0°	T.B.D.	AEHC (ACTIVE ANTENNA - MASSIVE MIMO)	NEW	-	-	(1) NEW BREAKOUT BOX TO BE INSTALLED	(1) NEW 250' HCS 2.0 HYBRID TRUNK CABLE TO BE INSTALLED	(1) NEW TOWER OVP/ JUNCTION BOX TO BE INSTALLED	15'
	C3/Z3	240°	74'	L1900/ L2100	0°	3°/1°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	RELOCATED	(1) NEW AHFIG	≤ 15'-0"				15'
	C2	240°	74'	L700/ L600/ N600/L1900/ G1900/ U1900	2°	3°/3°/2°/2°	COMMSCOPE FFVV-65B-R3 (OCTO)	NEW	(1) RELOCATED AHLOA & (1) EXISTING FXFB	≤ 15'-0"				(2) 15'
	C1/Z1	240°	74'	L1900/ L2100	0°	3°/1°	COMMSCOPE HBXX-3817TB1-A2M (-27°) (MULTI-BEAM)	RELOCATED	(1) NEW AHFIG	≤ 15'-0"				15'

(*) SHARED WITH ALL SECTORS

IMPORTANT NOTE: PLEASE REFER TO LATEST RFDS SHEET FOR NSN CONFIGURATION. GC TO CAP ALL UNUSED PORTS.



1 RF JUMPER CONNECTION DETAIL
SCALE: N.T.S.



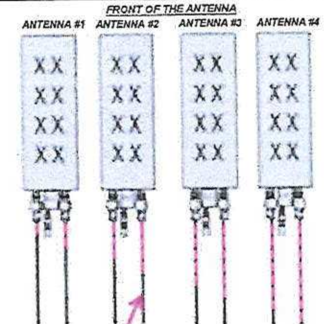
2 RF JUMPER MOUNTING DETAIL
SCALE: N.T.S.

COAX COLOR CODING
- ANTENNAS WILL BE LABELED (BACK OF ANTENNA VIEW) RIGHT TO LEFT 1-X PORTS
- COAX/JUMPER LINES WILL BE IDENTIFIED BY SECTOR COLOR AND BY NUMBER OF BANDS AROUND THE COAX/JUMPER

SECTOR A	RED
SECTOR B	GREEN
SECTOR C	BLUE
SECTOR D	YELLOW
SECTOR E	WHITE
SECTOR F	PURPLE
LMU	BROWN + SECTOR COLOR BANDS (1 & 2)
FIBER ID	GRAY
UNUSED COAX	PINK
MICROWAVE	ORANGE
DWE T-1'S + GPS DOWNLINK CABLE	ID W/LABEL MAKER

ANTENNA AND COAXIAL CABLE SCHEDULE
1. ALL ANTENNAS SHALL BE FURNISHED WITH DOWNTILT BRACKETS. CONTRACTOR SHALL COORDINATE REQUIRED MECHANICAL DOWNTILT FOR EACH ANTENNA WITH RF ENGINEER. ANTENNA DOWNTILT SHALL BE SET AND VERIFIED BY A SMART LEVEL.
2. CONTRACTOR SHALL INSTALL COLOR CODE RINGS ON EACH OF THE HYBRID CABLES AND JUMPER CABLES WITH UV RESISTANT TAPE. ALL CABLE SHALL BE MARKED AT TOP AND BOTTOM WITH 2" COLOR TAPE OR STENCIL TAG. COLOR TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRONICS.

FRONT OF THE ANTENNA



EXAMPLE: COAX WITH FOUR BANDS OF RED TAPE WILL REPRESENT ALPHA SECTOR AND THE 4TH PORT OF ANTENNA

3 TAGGING COLOR AND NOTES
SCALE: N.T.S.

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CAROL STREAM, IL 60188
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PROFESSIONAL DESIGN FIRM LICENSE # 184-004052

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3377
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LICENSED STRUCTURAL ENGINEER

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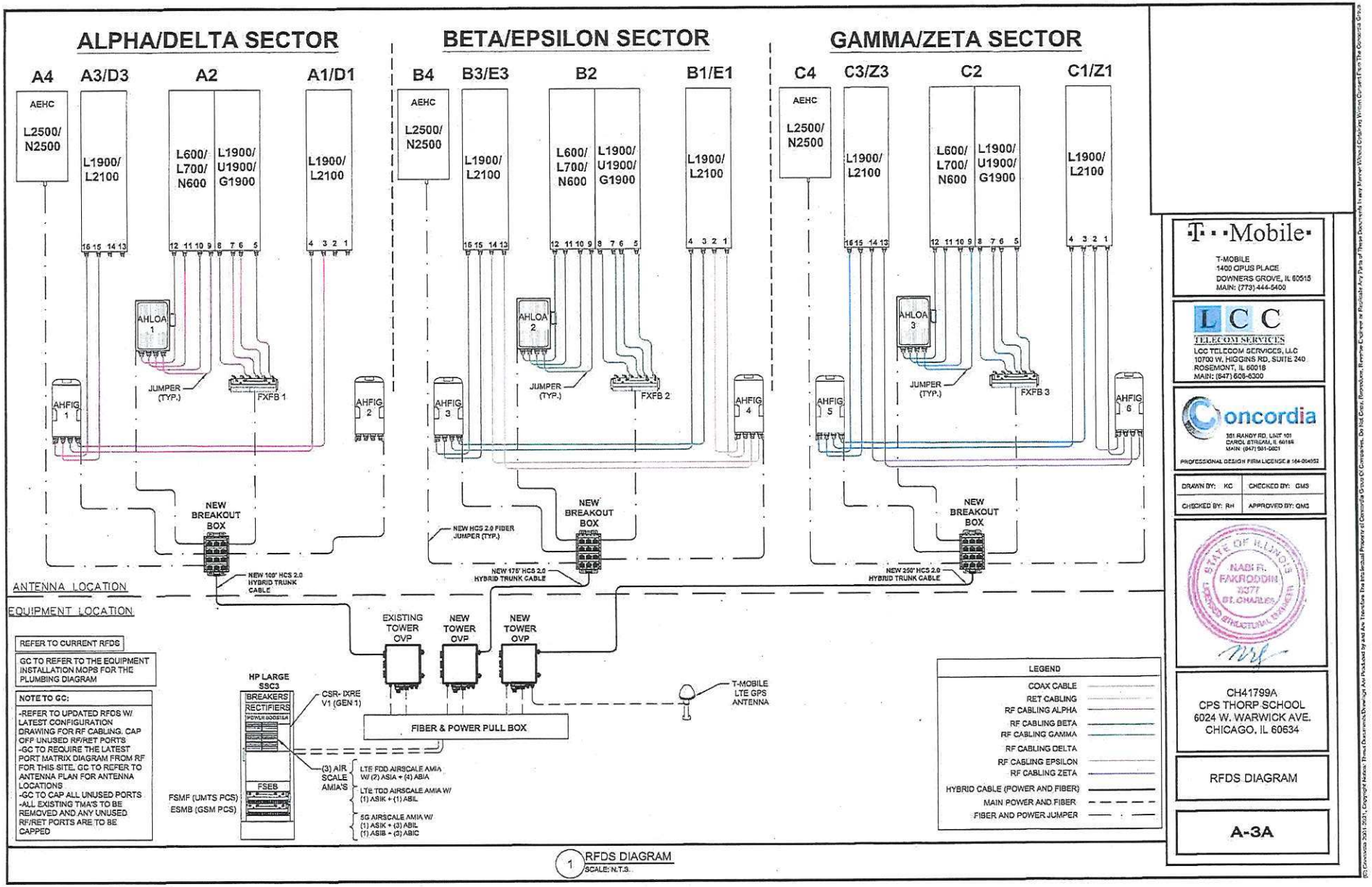
ANTENNA & CABLE SCHEDULE

A-3



1 RFDS DIAGRAM
SCALE: N.T.S.

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Concordia
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CAROL STREAM, IL 60188
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62377
ST. CHARLES, IL
LICENSED STRUCTURAL ENGINEER

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CPS THORP SCHOOL
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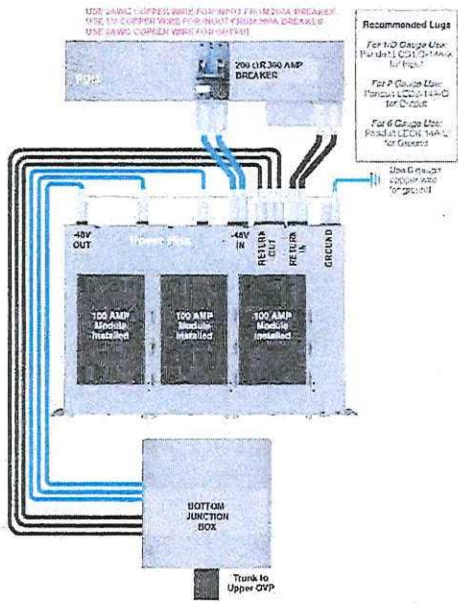
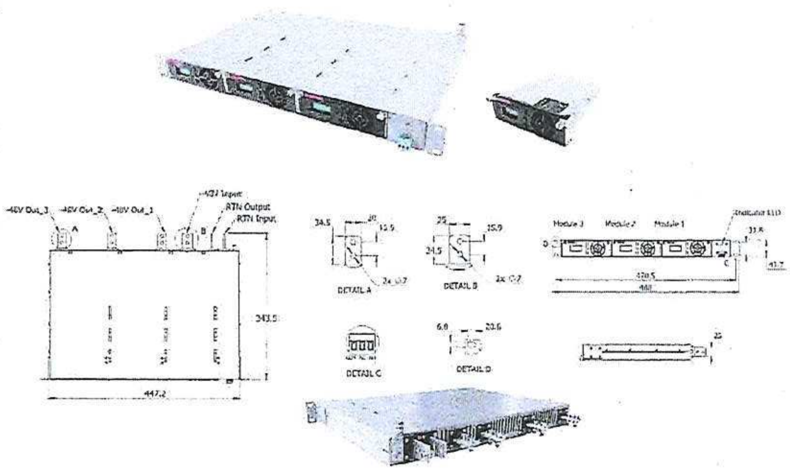
CHICAGO, IL 60634

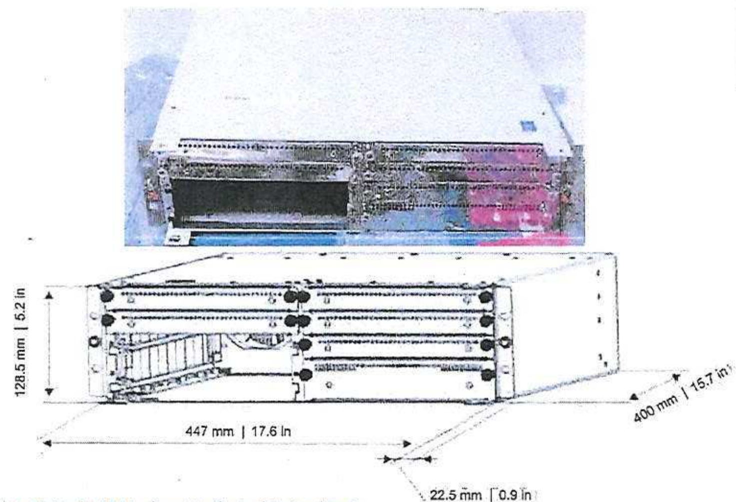
RFDS DIAGRAM

A-3A





NEW POWER BOOSTER



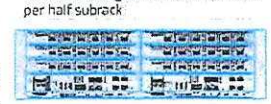
Nokia AirScale SM Indoor Technical Datasheet

[illegible]	
Capacity Multi-RAT capable platform	Per Capacity plug-in unit in LTE16A 8 LTE cells (FDD)
Minimum configuration	1 Common PIU (transport and control), 1 Capacity PIU (baseband processing)
Maximum configuration	2 Common PIU, 6 Capacity PIU
Installation options	19 inch standard rack, pole and wall (with mounting plate), inside Outdoor Enclosure
[illegible]	
Dimensions	[illegible] H 128 mm x W 447 mm x D 400 mm [illegible]
Installation Depth	400mm + cooling air space 50mm (1.97")
Weight	Minimum (Common PIU + Capacity PIU): 10.1 kg (22.27 lbs) Maximum (2 Common PIU + 6 Capacity PIU): 23.5 kg (51.81 lbs)
Ingress protection	IP20
Operational Temperature Range	-5°C to 55°C
[illegible]	
Supply Voltage / Voltage Range	Nominal -48V DC / -40.5V to -57V
Power consumption	1 Common PIU & 1 Capacity PIU typ [illegible]W 1 Common PIU & 1 Capacity PIU typ 420W 2 Common PIU & 6 Capacity PIU typ 840W

AIRSCALE SM INDOOR AMIA

Minimum configuration (1x BTS)

Minimum configuration (2x BTS, 1 BTS per half subrack)



Maximum AirScale SM Indoor configuration (FL16A: 1 BTS per half subrack)

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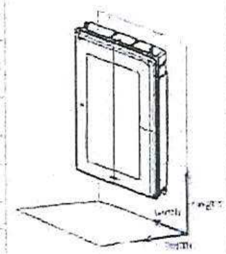
CHICAGO, IL 60634

NEW EQUIPMENT SPECIFICATIONS

A-4

PRODUCT DESCRIPTION

Band	B41 – 2496-2690 MHz
Supported Modulation schemes	(DL) BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM (UL) BPSK, QPSK, 16 QAM, 64 QAM
No. of TX/RX	64TX64RX
MIMO Streams	16
Instantaneous IBW	194 MHz
Occupied Bandwidth OBW	190 MHz
Total Avg EIRP	74.8 dBm
Supported bandwidths	LTE: 5x20 MHz 5G: 40/60/80/100MHz
Output Power	5 W / TRX (320 W total), 2 W/MHz up to 160 MHz)
Power Consumption	≤1330 W typical (75% DL duty cycle, 30% RF load) ≤1827 W max (75% DL duty cycle, 100% RF load)
Optical Ports	4 x SFP28 (OCTIS), 25 Gbps, eCPRI
Connector Type	APPG DC Pole connector
Dimensions (H x W x D)	58.2 in x 21.5 in x 5.9 in
Weight lbs	108.0 lb
HW/SW Availability	SRAN20C/5G20B
5G NR Support	Yes
Material Description	Nokia AirScale MAA 64T64R 192AE B41 320W AEHC

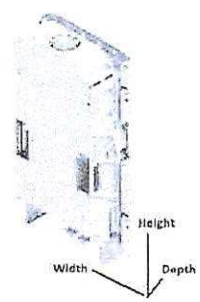


AEHC 475124A

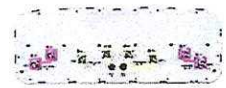
NOKIA AIRSCALE MAA 64T64R 192AE B41 320W AEHC ANTENNA

PRODUCT DESCRIPTION

Band	B25 + B66
Instantaneous BW (DL/UL)	65MHz on Band 25, 80MHz on Band 66
Supported Modulation schemes	up to 64QAM (UL) and up to 256QAM (DL)
Supported bandwidths	LTE 1.4,3,5,10,15,20 MHz
No. of ports	4T4R
Output Power	80 W for Band 25 and 40 W for Band 66 (Total Power is 480W)
DC connector	Terminal block
Optical Fiber connector	2 x 9.8Gbps CPRI, R2CT IP seal
RF Connector	4.3-10+
AISG	AISG on all ports, DC on ANT1 and ANT3
Dimensions (H x W x D) in	27.3 x 12.1 x 5.2
Weight lbs	70.5 without cover
HW/SW Availability	Available now – SRAN19A
5G NR Support	YES
NB-IoT Support	YES (In band, guardband, standalone)



AHFIG



FFVV-65B-R3-V1

8-port sector antenna, 4x 617-894 and 4x 1695–2690 MHz, 65° HPBW, 3x RET

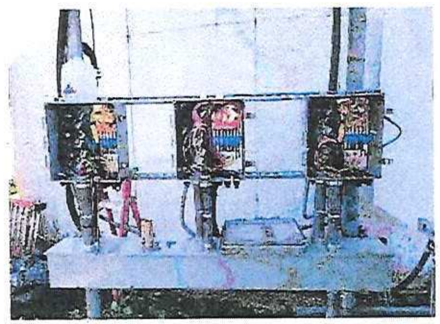
General Specifications

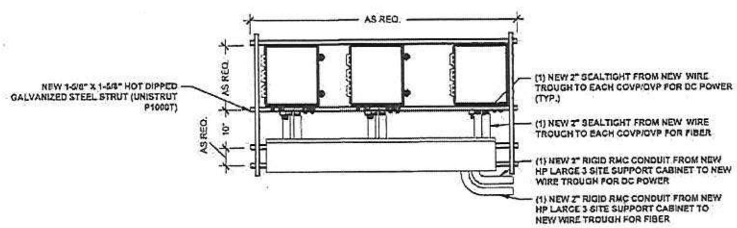
Operating Frequency Band	1695 – 2690 MHz | 617 – 894 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage
Total Input Power, maximum	900 W @ 50 °C

Dimensions

Length	1828.0 mm | 72.0 in
Width	640.0 mm | 25.2 in
Depth	235.0 mm | 9.3 in
Net Weight, without mounting kit	45.5 kg | 100.3 lb

NEW ANTENNA (COMMSCOPE- FFVV-65B-R3-V1)





COVP/OVP UNISTRUTS FRAME ELEVATION DETAIL

T-Mobile

T-MOBILE
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CHECKED BY: RH	APPROVED BY: GMS

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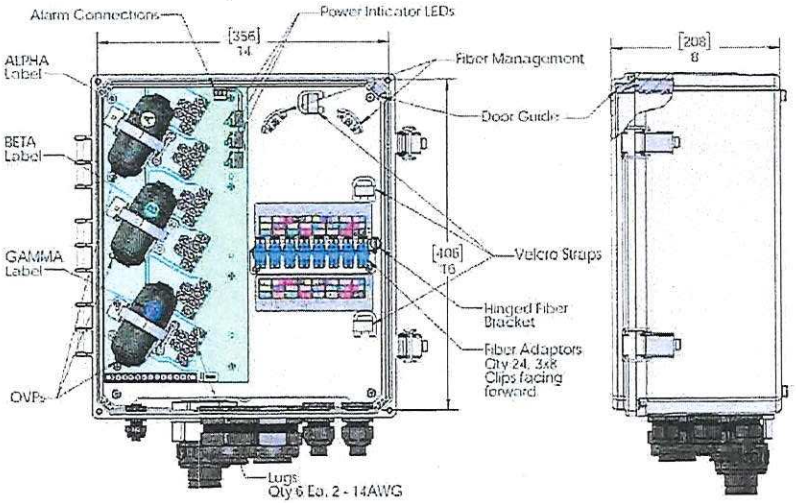
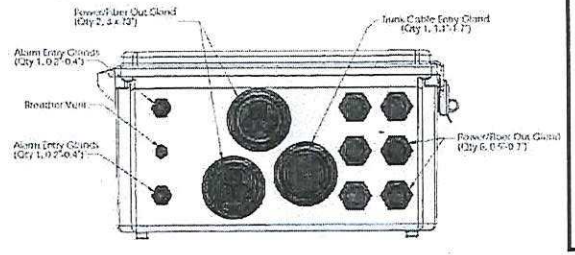
NEW EQUIPMENT SPECIFICATIONS

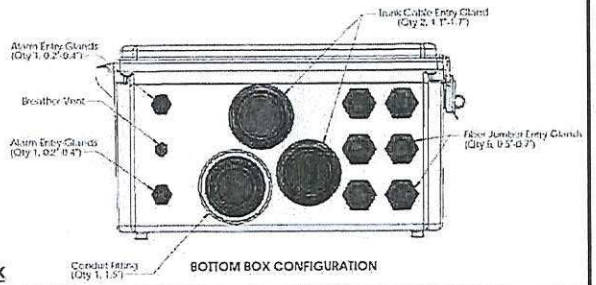
A-4A



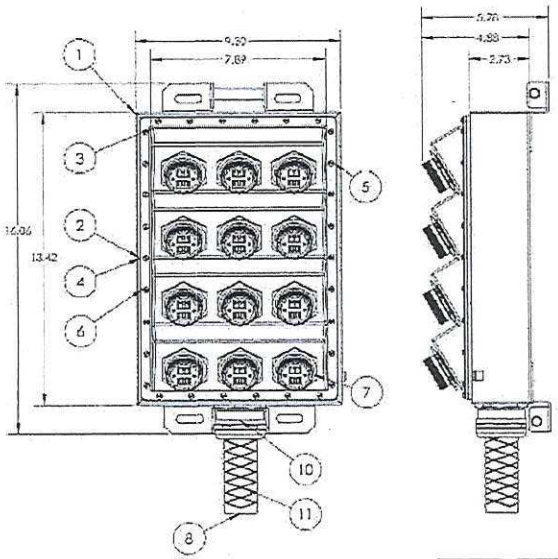
RTMDC-5634-PF-48 TOWER OVP/FIBER JUNCTION BOX



ALTERNATE TOP BOX CONFIGURATION



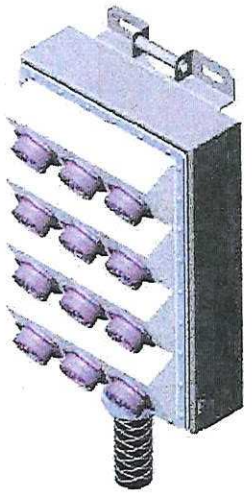
BOTTOM BOX CONFIGURATION



NOTE:
1. TOTAL VOLUME IS Max 480.6 CUBIC INCH.

ITEM NO.	PART NUMBER	DESCRIPTION	AC-DIST05-6IP-SHR/QTY.
1	AC-DIST05-24IP-DC	IP SHEETMETAL BOX	1
2	AC-GKT05-PB-HICAP	GASKET EPDM	1
3	AC-FB-FRONT-4STEP-3CON	HYBRID MODULE INCLINE MOUNT THERMO SHELL	1
4	AC-STR05-HICAP	METAL O-RING	1
5	Regular LW 0.125	WASHER	30
6	3GMR906058	TAMPERED PROOF #6-32 SCREW	30
7	CF-970850-101_106_W/LC	JAM NUT RECEPTACLE	12
8	ASU9325TYP02	HYBRID CABLE HI-CAP	1
9	6000428	LOCKNUT FOR CABLE GLAND	1
10	4220342	CABLE GLAND	1
11	HOIST GRIP	CABLE HOIST GRIP	1

HYBRID CABLE HIGH-CAP BREAKOUT BOX



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CHECKED BY: RH	APPROVED BY: GMS

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CPS THORP SCHOOL
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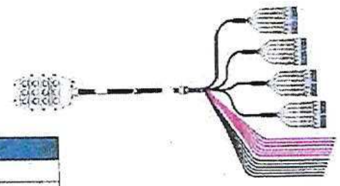
NEW EQUIPMENT SPECIFICATIONS

A-4B

HybridConnect

NWS-HCS2-HC4-XXX

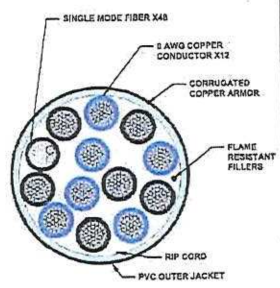
HCS 2.0 Trunk HiCap 12 RRU 12X4AWG



General Specifications	
Nominal OD	1.790 in (45.21 mm)
Cable Weight	2430 lb/mft (3620 kg/km)
Jacket Color	Black
Minimum Bend Radius: Installed	16.25"
DC Cable Specifications	
DC Pairs	6
DC Conductor Size	4 AWG
DC Resistance: Maximum	0.284 Ohms / 1000 ft
Breakout Length: End 1	31 in (775 mm)
Breakout Length: End 2	Molded Enclosure

Product Ordering

Part Number	Description	T-Mobile SKU
NWS-HCS2-HC4-250	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 250 FT	TBD
NWS-HCS2-HC4-275	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 275 FT	TBD
NWS-HCS2-HC4-300	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 300 FT	TBD
NWS-HCS2-HC4-325	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 325 FT	TBD
NWS-HCS2-HC4-350	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 350 FT	TBD
NWS-HCS2-HC4-375	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 375 FT	TBD
NWS-HCS2-HC4-400	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 400 FT	TBD
NWS-HCS2-HC4-425	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 425 FT	TBD
NWS-HCS2-HC4-450	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 450 FT	TBD



1 NEW HCS 2.0 TRUNK
N.T.S.

COMMSCOPE

HFT410-ASNOK2-150

HELIAX® FiberFeed®
Hybrid Cable Assembly, HQLC

End 1: 4 fibers terminated DLC for Nokia RRU with flush cut power cord(red/black conductors). End 2: 4 fibers terminated LC and 4X10 AWG conductors terminated at hybrid trunk connector. 15 ft

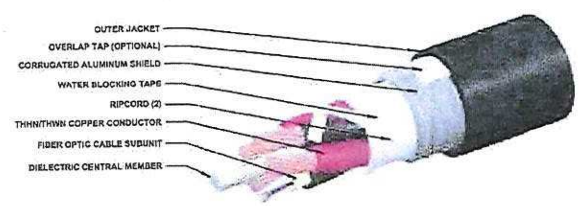
Dimensions

Property	Value
Cord Length	4.57m (14.993 ft)
Diameter Over Jacket	18.31mm (0.721 in)
Center Conductor Gauge	10 AWG
Minimum Bend Radius	221mm (8.701 in)

COMMSCOPE

HTC-4SM-410-APVA

HELIAX® FiberFeed®
Hybrid Cable, UL Type TC-OF-ER



Properties

Description	Value
Buffer Tube/Subunit Diameter	3.556 mm (0.14 in)
Diameter Over Jacket	18.288 mm (0.72 in)
Center Conductor Gauge	10 AWG
Minimum Bend Radius, multiple bends loaded	365.76 mm (14.4 in)
Minimum Bend Radius, multiple bends loaded	220.98 mm (8.7 in)
Minimum Bend Radius, multiple bends loaded	127 mm (5 in)
Cable weight	456.122kg/km (306.5/kft)

2 NEW HYBRID JUMPER
N.T.S.

T-Mobile

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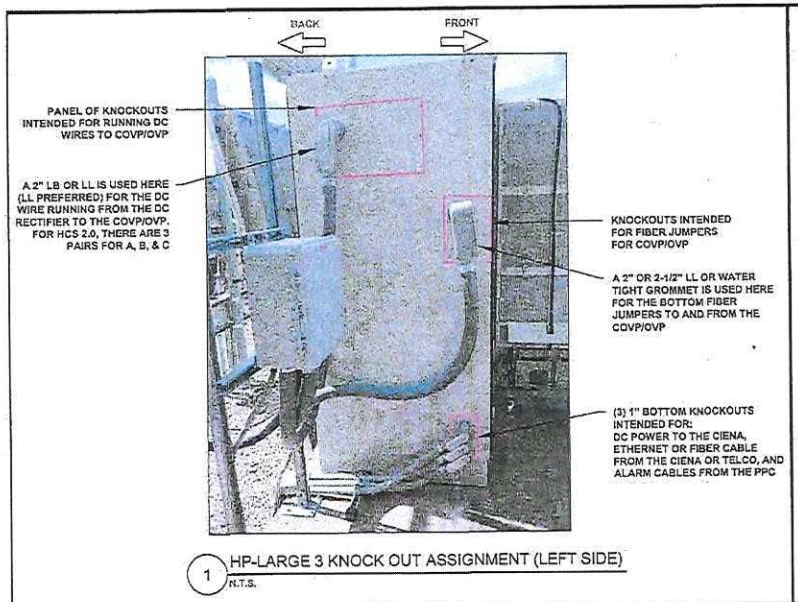
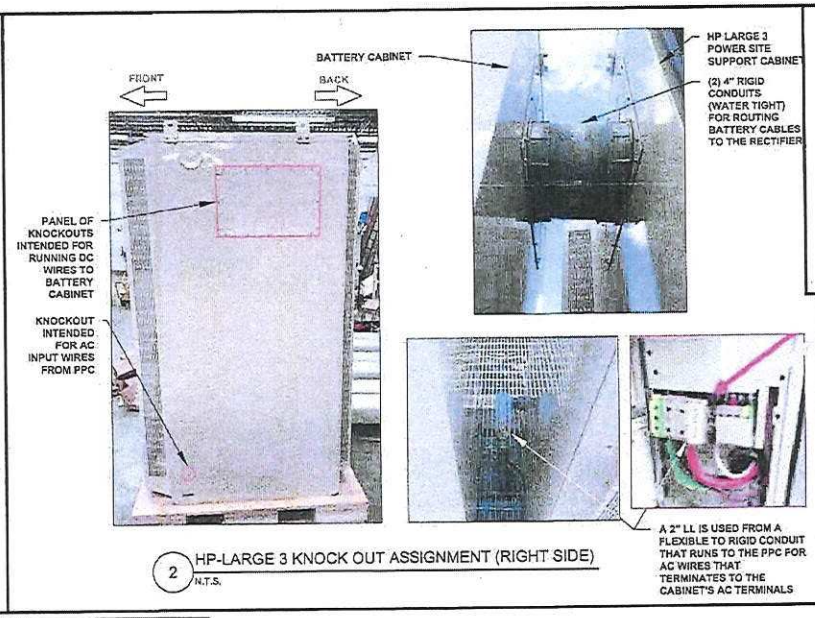
EQUIPMENT SPECIFICATIONS

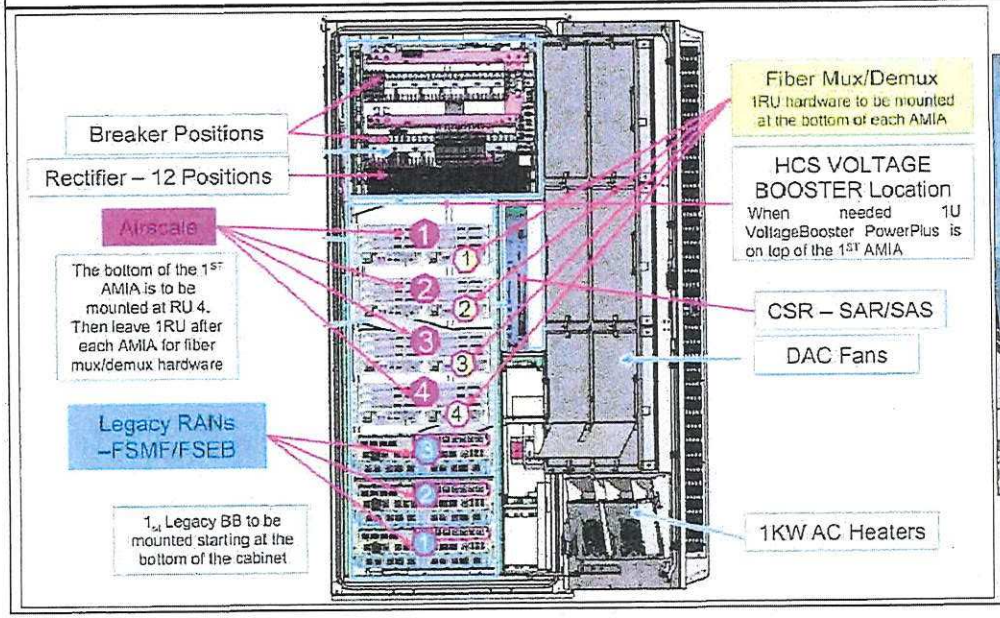
A-4C

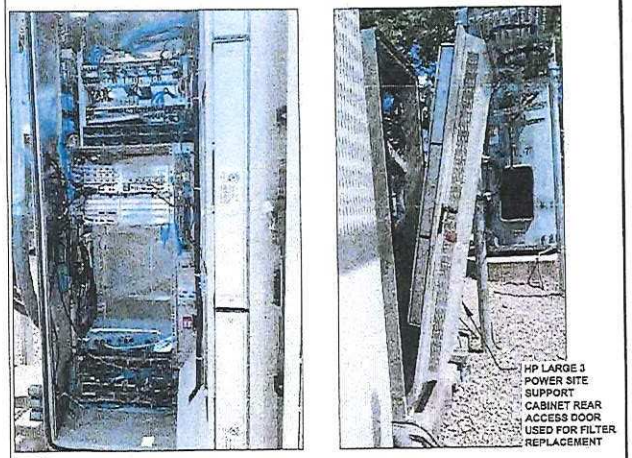


1 HP-LARGE 3 KNOCK OUT ASSIGNMENT (LEFT SIDE)
N.T.S.



2 HP-LARGE 3 KNOCK OUT ASSIGNMENT (RIGHT SIDE)
N.T.S.





3 DELTA HP-LARGE 3 POWER CABINET LAYOUT
N.T.S.

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CHECKED BY: RH	APPROVED BY: GMS

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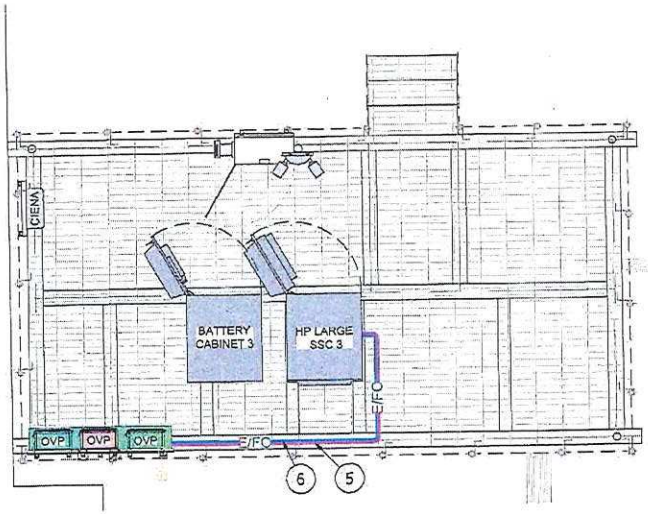
NEW EQUIPMENT SPECIFICATIONS

A-4D

CONDUIT LEGEND

—FO— FIBER OPTIC CONDUIT

—E— ELECTRIC CONDUIT



UTILITY LEGEND

NO.	FROM	TO	WIRE QTY. & TYPE	GROUND	CONDUIT SIZE	FUNCTION	APPROXIMATE CONDUIT LENGTH
1	PPC	HP LARGE 3 SSC	(3) 3/0 & (2) #12	(1) #4 & (1) #12	2" RIGID RMC W/ 2" THREADED LL TYPE RIGID CONDUIT BODY TO BE CONNECTED ON FRONT 2" KNOCKOUT OF SSC	ELECTRIC CONDUIT (POWER FOR SSC & FOR GFI OUTLET)	N/A
2	PPC	HP LARGE 3 SSC (FOR FSEE)	1 PAIR OF BELDEN 27615A #18 AWG	N/A	1" RIGID RMC	ELECTRIC CONDUIT	N/A
3	FIBER RAC24	HP LARGE 3 SSC	(1) CAT-6 CABLE	N/A	1" RIGID RMC	FIBER CONDUIT	N/A
4	FIBER RAC24	HP LARGE 3 SSC	(2) #12	(1) #6	1" RIGID RMC	ELECTRIC CONDUIT	N/A
5	HP LARGE 3 SSC	FIBER & POWER PULL BOX	3 PAIRS OF #2	N/A	2" RIGID RMC	ELECTRIC CONDUIT	±21'
6	HP LARGE 3 SSC	FIBER & POWER PULL BOX	GPS CABLE, OVP ALARM WIRE & FIBER	N/A	2" RIGID RMC	TELCO CONDUIT	±21'
7	HP LARGE 3 SSC	BATTERY 3 CABINET	(2) CAT-5 CABLES	N/A	4" RIGID RMC	TELCO CONDUIT (FOR BATTERY ALARM)	N/A
8	HP LARGE 3 SSC	BATTERY 3 CABINET	4 PAIRS OF 40 TELCO FLEX POWER CABLES, (3) #12 & (3) #12	(1) #10	4" RIGID RMC	ELECTRIC CONDUIT	N/A

NOTE: * THE CONDUIT LENGTH GIVEN IS BASED ON THE DRAWING +15%. THE EXACT LENGTH TO BE VERIFIED IN FIELD. GC TO VERIFY LENGTHS AFTER COORDINATING W/ SERVICE UTILITY COMPANIES.

EQUIPMENT LEGEND

- NEW EQUIPMENT
- EXISTING EQUIPMENT TO BE REMOVED
- EXISTING EQUIPMENT TO BE RELOCATED
- EXISTING EQUIPMENT TO REMAIN

1 PROPOSED EQUIPMENT LAYOUT

SCALE: 1/2"=1'-0" (1/2"=2'-0" IF 11 X 17 SHEET SIZE)

IMPORTANT NOTE:

ALL UNISTRUT, FASTENERS, HARDWARE, ETC: ARE TO BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL. GENERAL CONTRACTOR SHALL NOT USE ZINC-PLATED OR PRE-GALVANIZED

FIBER & POWER ROUTES TO BE CONFIRMED WITH T-MOBILE PRIOR TO CONSTRUCTION START

BIDDING & CONSTRUCTION NOTE:

WIRE SIZES SHOWN ARE ESTIMATED MINIMUMS. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND COMPLY WITH THE APPLICABLE LOCAL ELECTRICAL AND BUILDING CODES IN ADDITION TO NEC 2011 AND FOLLOW WHICHEVER IS MORE CONSERVATIVE. CONTRACTOR SHALL ESTIMATE PHASE CONDUCTOR SIZE & UTILIZE THE APPROPRIATE WIRE SIZE AND TYPE ASSUMING A 2% VOLTAGE DROP. CONTRACTOR TO CONFIRM WITH LOCAL ELECTRICAL INSPECTOR PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO CONSTRUCTION START.

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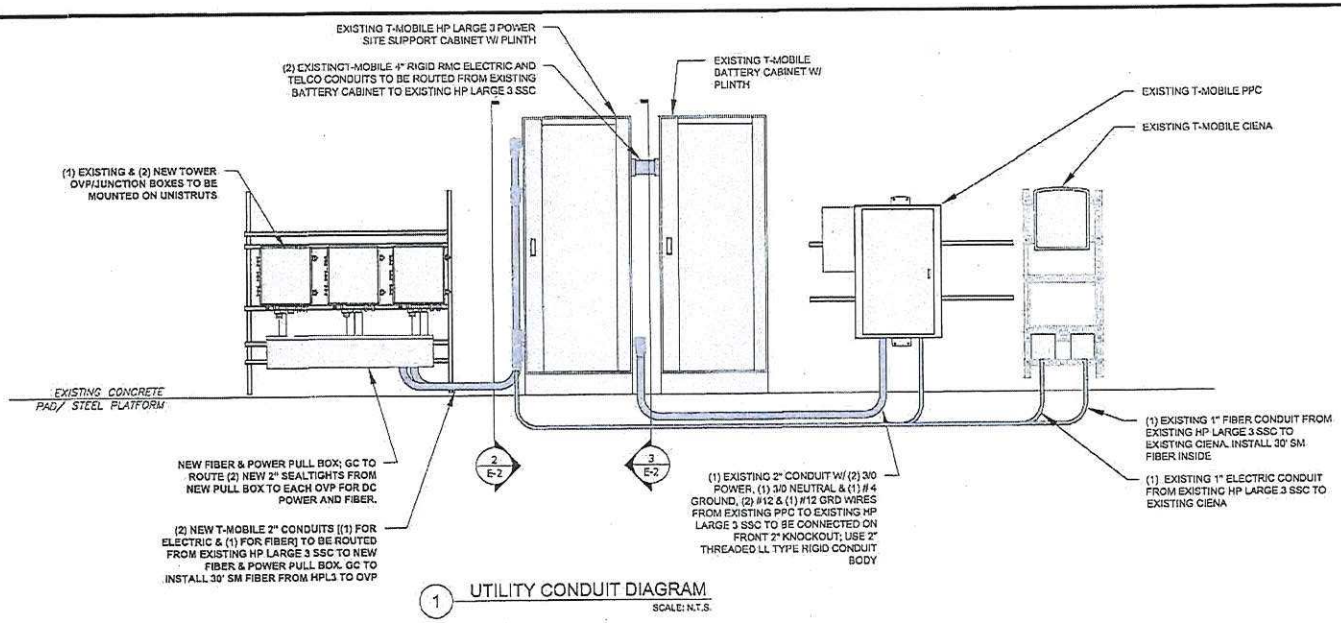
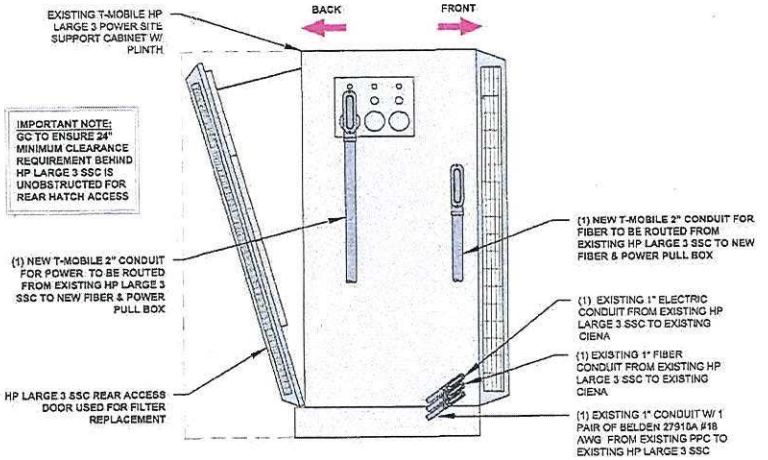
PROPOSED UTILITY PLAN

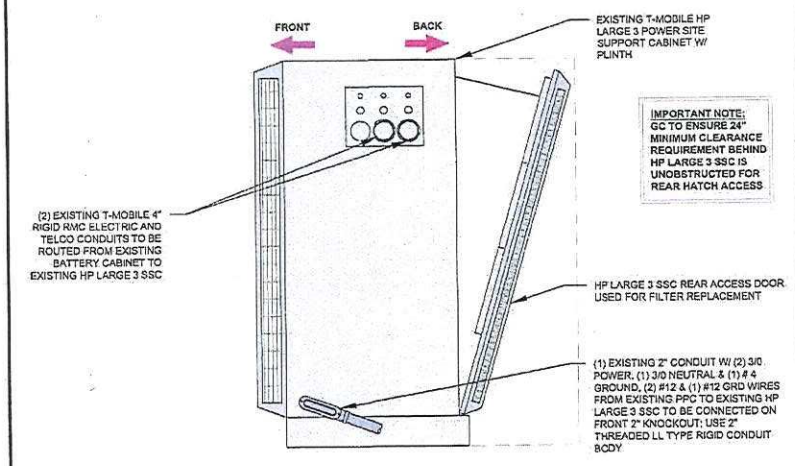
E-1



1 UTILITY CONDUIT DIAGRAM
SCALE: N.T.S.



2 HP LARGE 3 SSC UTILITY ROUTING (LEFT SIDE)
SCALE: N.T.S.



3 HP LARGE 3 SSC UTILITY ROUTING (RIGHT SIDE)
SCALE: N.T.S.

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UTILITY DETAILS

E-2

CADWELD CONNECTIONS OR APPROVED EQUAL		BURNDY CONNECTIONS OR APPROVED EQUAL
PARALLEL HORIZONTAL CONDUCTORS PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES TYPE PT	HORIZONTAL STEEL SURFACE TO FLAT STEEL SURFACE OR HORIZONTAL PIPE TYPE HS	TC CONNECTOR HYPRESS TYPE YGHC
THROUGH CABLE TO GROUND ROD THROUGH CABLE TO TOP OF GROUND ROD TYPE GT	VERTICAL STEEL SURFACE CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE TYPE VS	BOND JUMPER FIELD FABRICATED GREEN STRANDED INSULATED TYPE 2-YA-2
HORIZONTAL SPLICE SPLICE OF HORIZONTAL CABLES	VERTICAL PIPE CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES TYPE VS	COPPER LUGS TWO HOLE - LONG BARREL LENGTH TYPE YA-2

CADWELD DETAILS

GROUNDING NOTES:

1.) UNDERGROUND AND OVERHEAD UTILITY LENGTHS TO BE DETERMINED FROM SITE PLAN.
2.) SEE ELECTRICAL SPECIFICATIONS SECTION 16000 FOR ALL ELECTRICAL AND GROUNDING INSTALLATION REQUIREMENTS.
3.) FOR ORIENTATION OF SITE LAYOUT SEE SITE PLAN, DRAWING.
4.) UDA CABINET FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
5.) GROUND KITS PROVIDED BY OWNER SHALL BE RETROFITTED TO ACCOMMODATE 2 HOLE LUG CONNECTION AND APPROPRIATE LENGTH.
6.) CONTRACTOR RESPONSIBLE TO PROVIDE OWNER CERTIFICATION OF RESISTIVITY TESTING.
7.) GROUND RODS TO BE INSTALLED AT 10' CENTERS.
8.) ALL GROUND LEADS TO BE SLEEVED IN 3/4"Ø SCHEDULE 40 PVC CONDUIT AND SEALED W/ SILICON.
9.) GROUND BARS SUPPLIED BY OWNER AND INSTALLED BY CONTRACTOR.
10.) ALL BENDS IN GROUNDING SYSTEM MUST BE SMOOTH AND WELL ROUNDED AND MAINTAIN BENDING RADIUS.
11.) SEE SITE PLAN FOR COAXIAL ROUTING THIS SHEET IS INTENDED FOR GROUNDING CLARITY ONLY AND IS SCHEMATIC IN DETAIL.
12.) GROUND KITS SHALL BE INSTALLED BETWEEN 8"-18" OF ALL CONNECTORS.
13.) TOWER FOUNDATION DESIGN BY OWNER, INSTALLED BY CONTRACTOR.
14.) ADDITIONAL GROUND KITS TO BE PLACED AT 100' WHEN ANTENNA CENTERLINE IS 200' OR ABOVE.
15.) ALL CONDUITS TO BE SEALED W/ SILICONE TO PROVIDE A WATER TIGHT SEAL.

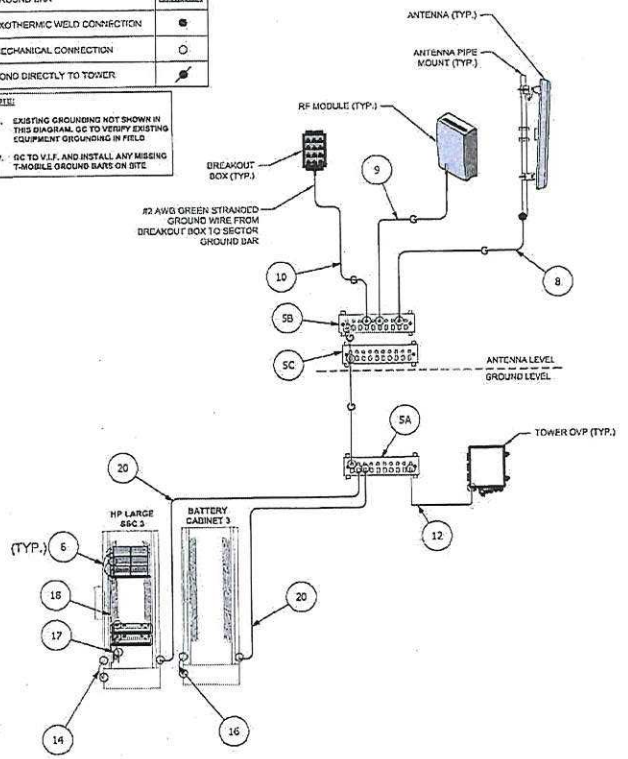
KEY NOTES:

1. #2 SOLID, TINNED BARE COPPER GROUND WIRE FROM ICE BRIDGE TO ICE BRIDGE POST
2. #2 SOLID, TINNED BARE COPPER GROUND WIRE, BOND ICE BRIDGE POST W/ VS TYPE CADWELD. (1 PER POST REQUIRED)
3. #2 SOLID, TINNED BARE COPPER GROUND WIRE FROM GROUND BAR TO GROUND RING (2 REQUIRED)
4. #2 SOLID, TINNED BARE COPPER GROUND WIRE FROM NEW POST TO GROUND RING
5. NEW GROUND BAR
5A. MASTER GROUND BAR
5B. SECTOR GROUND BAR
5C. MASTER GROUND BAR ON TOWER
6. #6 AWG GREEN STRANDED GROUND CU WIRE FROM MODULES TO PLINTH
7. #2 AWG SOLID TINNED BARE GROUND CU WIRE FROM STEEL CUBE/UNISTRUT RACK W/ MODULES TO GROUND RING
7A. #2 AWG SOLID TINNED BARE GROUND CU WIRE FROM MODULES PLINTH TO GROUND RING
8. #2 AWG SOLID, TINNED BARE COPPER GROUND WIRE FROM NEW ANTENNA PIPE TO SECTOR GROUND BAR
9. #2 AWG GREEN STRANDED GROUND CU WIRE FROM NEW MODULE PLINTH TO NEW SECTOR GROUND BAR
10. #2 AWG GREEN STRANDED GROUND CU WIRE FROM TOP COVP/ BREAKOUT BOX TO NEW SECTOR GROUND BAR
11. #2 AWG GREEN STRANDED GROUND CU WIRE FROM TMA/DIPLEXER TO MASTER GROUND RING
12. #2 AWG GREEN STRANDED CU GROUND WIRE FROM COVP/OVP TO GROUND BAR
13. #2 AWG SOLID TINNED BARE GROUND CU WIRE FROM SSC TO GROUND RING
14. #2 AWG GREEN STRANDED GROUND CU WIRE FROM SSC TO SSC PLINTH
15. #2 AWG SOLID TINNED BARE GROUND CU WIRE FROM BATTERY CABINET TO GROUND RING
16. #2 AWG GREEN STRANDED GROUND CU WIRE FROM NEW BATTERY CABINET TO BATTERY CABINET PLINTH
17. NEW CABINET GROUND BAR
18. #2 AWG GREEN STRANDED CU GROUND WIRE FROM SYSTEM MODULE PLINTH TO CABINET GROUND BAR
19. #2 AWG SOLID, TINNED BARE CU GROUND WIRE FROM UNISTRUT TO GROUND RING
20. #2 AWG GREEN STRANDED GROUND CU WIRE FROM MASTER GROUND BAR TO CABINET
21. #2 AWG GREEN STRANDED CU GROUND WIRE FROM SYSTEM MODULE PLINTH TO MASTER GROUND BAR
22. #6 AWG GREEN STRANDED CU GROUND WIRE FROM NEW SYSTEM MODULE PLINTH TO NEW SYSTEM MODULE
23. #2 AWG GREEN STRANDED CU GROUND WIRE FROM NEW MASTER GROUND BAR TO NEW RACK

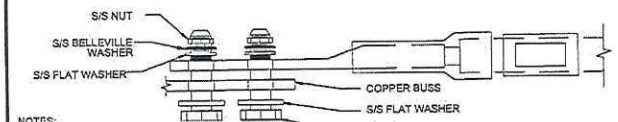
SYMBOLS LEGEND:

GROUND BAR	
EXOTHERMIC WELD CONNECTION	●
MECHANICAL CONNECTION	○
BOND DIRECTLY TO TOWER	

NOTE:
1. EXISTING GROUNDING NOT SHOWN IN THIS DIAGRAM. GC TO VERIFY EXISTING EQUIPMENT GROUNDING IN FIELD
2. GC TO V.I.F. AND INSTALL ANY MISSING T-MOBILE GROUND BARS ON SITE

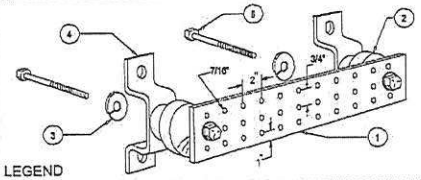


1 TYPICAL GROUNDING DIAGRAM
SCALE: NTS



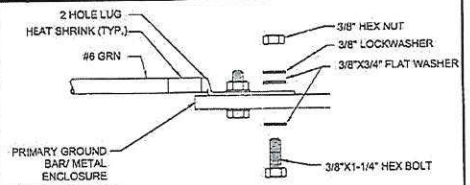
NOTES:
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING BELLEVILLES. COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH KOPR-SHEILD.

2 STANDARD LUG CONNECTION OF GROUND LEADS TO GROUND BAR DETAIL
SCALE: N.T.S.



LEGEND
1- GROUND BAR, 4"X 20"X1/4", CONFIRM w/T-MOBILE PROJECT MANAGER THE APPROVED BUSS MFR. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2- INSULATORS, CONFIRM THE APPROVED BUSS MFR. w/T-MOBILE
3- 5/8" LOCKWASHERS, CONFIRM w/T-MOBILE THE APPROVED BUSS MFR. (NEWTON INSTRUMENT CO. CAT. NO. 3013-5 OR EQUIVALENT)
4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR APPROVED EQUIVALENT (CONFIRM w/T-MOBILE THE APPROVED BUSS MFR.)
5- 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR APPROVED EQUIVALENT (CONFIRM w/T-MOBILE THE APPROVED BUSS MFR.)

3 GROUNDING - STANDARD GROUND BAR DETAIL
SCALE: N.T.S.



INSTALLATION NOTES:
1. SELECT BOLT LENGTH TO PROVIDE A MINIMUM OF TWO EXPOSED THREADS.
2. BURNISH MOUNTING SURFACE TO REMOVE PAINT IN THE AREA OF LUG CONTACT AND REMOVE OXIDATION FROM OUTDOOR WEATHERED BARS.
3. APPLY ANTI-OXIDANT COMPOUND TO MATING SURFACE OF LUG AND WIPE CLEAN EXCESS COMPOUND.
4. USE SOLID COPPER WIRE AND MECHANICAL 2-HOLE LUG FOR ALL EXTERIOR GROUNDING.

4 MECHANICAL GROUND CONNECTION
SCALE: N.T.S.

T-Mobile
T-MOBILE
1400 OPUS PLACE
DOWNERS GROVE, IL 60515
MAIN: (773) 444-5400

LCC
TELECOM SERVICES
LCC TELECOM SERVICES, LLC
10700 W. HIGGINS RD, SUITE 240
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361 RANDY RD, UNIT 121
CAROL STREAM, IL 60188
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PROFESSIONAL DESIGN FIRM LICENSE # 184-004952

DRAWN BY: MC	CHECKED BY: GMS
CHECKED BY: RH	APPROVED BY: GMS

STATE OF ILLINOIS
HABIB R. FAKRODDIN
3377
ST. CHARLES
REGISTERED STRUCTURAL ENGINEER

CH41799A
CPS THORP SCHOOL
6024 W. WARWICK AVE.
CHICAGO, IL 60634

PROPOSED SITE GROUNDING DIAGRAM

EG-1

GENERAL NOTES:

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL:
   - A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE
   - SHELTER (GROUND BUILDICO-LOCATE ONLY)
   - B. AC/TELCO INTERFACE BOX(PPC)
   - C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILDICO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION
   - D. TOWERS, MONOPOLE
   - E. TOWER LIGHTING
   - F. GENERATORS & LIQUID PROPANE TANK
   - G. ANTENNA STANDARD BRACKETS, FRAMES, AND PIPES FOR MOUNTING.
   - H. ANTENNAS (INSTALLED BY OTHERS)
   - I. TRANSMISSION LINE
   - J. TRANSMISSION LINE JUMPERS
   - K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
   - L. TRANSMISSION LINE GROUND KITS
   - M. HANGERS
   - N. HOISTING GRIPS
   - O. BTS EQUIPMENT
2. CONTRACTOR TO FURNISH AND INSTALL THE FOLLOWING:

   THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR KIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS.
   IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.
3. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATED, PROTECTED AND INSTALLED BY THE

   CONTRACTOR WITH ALL APPURTENCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING UP.
4. ALL EQUIPMENT FURNISHED AND WORK PERFORMED UNDER THE CONTRACT DOCUMENTS SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE, UNLESS NOTED OTHERWISE. ANY FAILURE OF EQUIPMENT OR WORK DUE TO DEFECTS IN MATERIALS OR WORKMANSHIP SHALL BE CORRECTED BY THE CONTRACTOR AT NO COST TO THE OWNER.
5. ALL WORK, MATERIAL AND EQUIPMENT SHALL COMPLY WITH ALL REQUIREMENTS OF THE LATEST EDITIONS AND INTERIM AMENDMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) NATIONAL ELECTRICAL SAFETY CODE, OSHA, AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES. ALL ELECTRICAL EQUIPMENT PROVIDED UNDER THIS CONTRACT SHALL BE NEW (EXCEPT WHERE OTHERWISE NOTED) AND SHALL COMPLY WITH THE REQUIREMENTS OF THE UNDERWRITERS' LABORATORIES (U.L.) AND BEAR THE U.L. LABEL.
6. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO THE OWNER OR HIS ARCHITECT/ENGINEER.
7. THE CONTRACTOR SHALL SUPPORT, BRACE AND SECURE EXISTING STRUCTURE AS REQUIRED. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF ANY EXISTING STRUCTURES DURING CONSTRUCTION. FIELD VERIFY ALL EXISTING DIMENSIONS WHICH AFFECT THE NEW CONSTRUCTION.
8. THE CONTRACTOR SHALL NOT ALLOW OR CAUSE ANY OF THE WORK TO BE COVERED UP OR ENCLOSED UNTIL IT HAS BEEN INSPECTED BY THE GOVERNING AUTHORITIES. ANY WORK THAT IS ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST SHALL BE UNCOVERED AT THE CONTRACTOR'S EXPENSE; AFTER IT HAS BEEN INSPECTED, THE CONTRACTOR SHALL RESTORE THE WORK TO ITS ORIGINAL CONDITION AT HIS OWN EXPENSE.
9. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS, AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT/ENGINEER AND OWNER (T-MOBILE) ASSUME NO RESPONSIBILITY WHATEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL SAID UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING AFFECTED UTILITIES.

GENERAL NOTES (CONT):

10. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHOULD BE IMMEDIATELY REPORTED TO THE PROJECT MANAGER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS OWN RISK AND EXPENSE.
11. CONTRACTORS SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, DEBRIS, WEEDS, DEBRIS, OR ANY OTHER DEBRIS REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE PROPERLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.
12. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY THE CONTRACTOR WITH LOCAL GAS, ELECTRIC, TELEPHONE, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.
13. DURING CONSTRUCTION, THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN THE UTILITIES OF THE BUILDING/SITE WITHOUT INTERRUPTION. SHOULD IT BE NECESSARY TO INTERRUPT ANY SERVICE OR UTILITY, THE CONTRACTOR SHALL SECURE PERMISSION IN WRITING FROM THE BUILDING/PROPERTY OWNER FOR SUCH INTERRUPTION, AT LEAST 72 HOURS IN ADVANCE. ANY INTERRUPTION SHALL BE MADE WITH A MINIMUM AMOUNT OF INCONVENIENCE TO THE BUILDING/PROPERTY OWNER AND ANY SUCH SHUTDOWN TIME SHALL BE COORDINATED WITH THE BUILDING/PROPERTY OWNER.
14. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION.
15. CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS BUILT DRAWINGS TO T-MOBILE'S PROJECT ENGINEER.
16. GC WILL NOT START THE CONSTRUCTION UNTIL AFTER THEY RECEIVE THE PRE CON PACKAGE AND HAVE A PRE CON WALK WITH THE PROJECT MANAGER.

DIVISION 2 - SITE WORK:

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.

   ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE PROJECT MANAGER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO:
   - A. FALL PROTECTION
   - B. CONFINED SPACE
   - C. ELECTRICAL SAFETY
   - D. TRENCHING AND EXCAVATION
2. REMOVE FROM SITE/OWNER'S PROPERTY ALL WASTE MATERIALS, UNUSED, EXCAVATED MATERIAL, INCLUDING MATERIAL CLASIFIED UNSATISFACTORY, CONTAMINATED OR DANGEROUS TRASH AND DEBRIS, AND DISPOSE OF IN A LEGAL MANNER.
3. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEER/G.C.
4. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE BUILDING OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH
5. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, AS REQUIRED DURING CONSTRUCTION.

   CONTRACTOR IS RESPONSIBLE FOR LAYOUT AND CONSTRUCTION STAKING. CONTRACTOR SHALL ESTABLISH GRADE AND LINE STAKES PRIOR TO CONSTRUCTION.

   CONCORDIA DOES NOT GUARANTEE OR WARRANT THAT THE AFOREMENTIONED EASEMENTS ARE SUFFICIENT FOR CONSTRUCTION TRAFFIC. GC SHALL CONSULT WITH A T-MOBILE REPRESENTATIVE AND LANDLORD WITH EXACT LOGISTICS TO FACILITATE CONTRACTIBILITY OF THE SITE AND DELIVERY OF CRITICAL MATERIALS SUCH AS THE TOWER, STEEL, CONCRETE AND CRANES TO THE PROPOSED LEASE AREA. GC SHALL RESTORE SITE TO ORIGINAL CONDITIONS AND REPLACE ANY AND ALL DISTURBED TREES OR LANDSCAPING.

   CONCORDIA IS NOT RESPONSIBLE FOR THE MAINTENANCE AND/OR OPERATIONAL FEASIBILITY.

   SCOPE OF WORK FOR THESE PLANS DOES NOT INVOLVE VALUE ENGINEERING AS WELL AS MAINTAINABILITY OPERATIONS OF THE SITE, ACCESS OR UTILITIES.

DIVISION 3 - CONCRETE:

1. MINIMUM ALLOWABLE CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI AT 28 DAYS WHEN TESTED IN ACCORDANCE WITH THE AMERICAN SOCIETY FOR TESTING AND MATERIALS METHODS STANDARDS ASTM C172, ASTM C31 AND ASTM C39 UNLESS OTHERWISE NOTED.
2. CONCRETE FOR ALL FOUNDATIONS: 5AB LBS PER CUBIC YARD OF CONCRETE MINIMUM CEMENT CONTENT FOR 1-INCH MAXIMUM SIZE AGGREGATE, SLUMP RANGE 3 INCHES TO 5 INCHES, TOTAL AIR CONTENT 4 PERCENT TO 7 PERCENT BY VOLUME. AIR ENTRAINING ADMIXTURE REQUIRED TO CONTROL TOTAL AIR CONTENT, WATER REDUCING ADMIXTURES PERMITTED TO OBTAIN SLUMP OVER 5INCHES.
3. ALL CONCRETE CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE (ACI 318) BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND (ACI 301) STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE.
4. REBARS SHALL BE ASTM A-615 DEFORMED TYPE WITH MINIMUM YIELD STRENGTH OF 60,000 PSI (40,000 PSI GRADE MAY BE USED FOR TIES & STIRRUPS).

   WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185.
5. DETAILING SHALL BE IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE OF DETAILING REINFORCED CONCRETE STRUCTURES (ACI STD-315 LATEST EDITION).
6. CHAMFER ALL EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.
7. REINFORCING STEEL SHALL BE ACCURATELY PLACED AND ADEQUATELY SECURED IN POSITION. LOCATION OF REINFORCEMENT SHALL BE INDICATED ON THE DRAWINGS. THE FOLLOWING MINIMUM COVER (INCHES) FOR REINFORCEMENT SHALL BE PROVIDED, EXCEPT AS NOTED ON DRAWINGS.

   MINIMUM COVER (INCHES)
   CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ... 3"
   EXPOSED TO EARTH OR WEATHER:
   #6 THROUGH #18 ... 2"
   #5 BAR AND SMALLER ... 1-1/2"
8. TESTS
   CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER AS THE WORK PROGRESSES. FAILURE TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER REJECTION WHEN SUCH DEFECT IS DISCOVERED NOR SHALL IT OBLIGATE THE ENGINEER FOR FINAL ACCEPTANCE.

   A. FIVE CONCRETE TEST CYLINDERS SHALL BE TAKEN OF THE TOWER PIER FOUNDATION, TWO SHALL BE TESTED @ THREE DAYS, TWO @ TWENTY-EIGHT DAYS, THE FIFTH CYLINDER SHALL BE KEPT SEPARATELY, IF REQUIRED TO BE USED IN THE FUTURE.

   B. ONE ADDITIONAL TEST CYLINDER SHALL BE TAKEN DURING COLD WEATHER AND CURED ON SITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS

   C. ONE SLUMP TEST SHALL BE TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN.
9. PLACING CONCRETE
   A. THE ENGINEER SHALL BE NOTIFIED NOT LESS THAT 24 HOURS IN ADVANCE OF CONCRETE PLACEMENT, UNLESS INSPECTION IS WAIVED IN EACH CASE, PLACING OF CONCRETE SHALL BE PERFORMED ONLY IN THE PRESENCE OF THE ENGINEER. CONCRETE SHALL NOT BE PLACED UNTIL ALL FORMWORK, EMBEDDED PARTS, STEEL REINFORCEMENT, FOUNDATION SURFACES AND JOINTS INVOLVED IN THE PLACING HAVE BEEN APPROVED, AND UNTIL FACILITIES ACCEPTABLE TO THE T-MOBILE REPRESENTATIVE HAVE BEEN PROVIDED AND MADE READY FOR ACCOMPLISHMENT OF THE WORK AS SPECIFIED. CONCRETE MAY NOT BE ORDERED FOR PLACEMENT UNTIL ALL ITEMS HAVE BEEN APPROVED AND T-MOBILE HAS PERFORMED A FINAL INSPECTION AND GIVEN APPROVAL TO START PLACEMENT IN WRITING.

   B. PLACEMENT OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 304.
10. PROTECTION
    A. IMMEDIATELY AFTER PLACEMENT, THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.

    B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

    C. ALL CONCRETE SHALL BE WATER CURED BY CONTINUOUS (NOT PERIODIC) FINE MIST SPRAYING OR SPRINKLING ALL EXPOSED SURFACES. WATER SHALL BE CLEAN AND FREE FROM ACID, ALKALI SALTS, OIL SEDIMENT, AND ORGANIC MATTER SUCCESSFUL CURING SHALL BE OBTAINED BY USE OF AN AMPLE WATER SUPPLY UNDER PRESSURE IN PIPES, WITH ALL NECESSARY APPLIANCES OF SPRINKLERS, AND SPRAYING DEVICES.

ELECTRICAL NOTES:

1. ELECTRICAL DESIGN SHALL BE PERFORMED BY ELECTRICAL CONTRACTOR. STRUCTURAL DESIGN SHALL BE PERFORMED BY GENERAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL WORK COMPLIES WITH ALL APPLICABLE LOCAL AND STATE CODES AND NATIONAL ELECTRICAL CODE.

2. ALL SUGGESTED ELECTRICAL ELEMENTS (SUCH AS BREAKER SIZES, WIRE SIZES, CONDUITS SIZES ARE FOR ZONING PURPOSES ONLY. IT IS THE RESPONSIBILITY TO OF THE ELECTRICAL CONTRACTOR TO CONFIRM COMPLIANCE WITH LOCAL ELECTRICAL CODES AND PASS ALL APPLICABLE AND NECESSARY INSPECTIONS. IN SOME EVENTS, IT MAY BE NECESSARY TO PERFORM AN ELECTRICAL LOAD STUDY TO VERIFY THE CAPACITY OF THE EXISTING SERVICE. THIS IS NOT THE RESPONSIBILITY OF CONCORDIA. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

3. CONTRACTOR SHALL FIELD LOCATE ALL BELOW GRADE GROUND LINES AND UTILITY LINES PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF ALL UTILITIES AND GROUND LINES THAT MAY BECOME DISTURBED OR CONFLICTING IN THE COURSE OF CONSTRUCTION.

DIVISION 5 - STRUCTURAL STEEL:

1. DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE LATEST AISC MANUAL OF STEEL CONSTRUCTION (ASD) AWG D1.1, AND THE BASIC BUILDING CODE. STRUCTURAL STEEL SHALL BE AS FOLLOWS
   - A. ASTM A36, GRADE 36; ROLLED STEEL, RODS, PLATES, U-BOLTS AND ANCHOR BOLTS.
   - B. ASTM A325 BOLTS, BEARING TYPE
   - C. ALL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
2. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.
3. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND T- MOBILE PROJECT MANAGER IN WRITING
4. TIGHTEN HIGH STRENGTH BOLTS TO A SNUG TIGHT CONDITION WHERE ALL PLIES IN A JOINT ARE IN FIRM CONTACT BY EITHER
   - A. A FEW IMPACTS OF A IMPACT WRENCH
   - B. THE FULL EFFORT OF A PERSON USING A SPUD WRENCH
5. WELDING
   - A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.
   - B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM A-233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.
   - C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.
6. PROTECTION
   - A. UPON COMPLETION OF ERECTION INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS, OR GALVANIZED BREAKS WITH ZINC BASED PAINT. COLOR TO MATCH THE GALVANIZING PROCESS.

DIVISION 13 - SPECIAL CONSTRUCTION ANTENNA INSTALLATION

1. WORK INCLUDED.
   - A. ANTENNAS AND COAXIAL CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND PROPERTY.
   - B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND T-MOBILE SPECIFICATIONS.
   - C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.
   - D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT TEST.
   - E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITSU-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBNIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/30/03. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.
   - F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
   - G. ANTENNA AND COAXIAL CABLE GROUNDING:
     1. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORSPLICE WEATHERPROOFING KIT #221213 OR EQUAL
     2. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS).

ROOF PROTECTION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE A MINIMUM OF SEVEN (7) DAYS PRIOR TO THE BEGINNING OF WORK THAT INVOLVES ACTIVITY ON THE ROOF.
2. THE CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL INSPECT THE EXPOSED ROOFING MEMBRANE SYSTEM PRIOR TO THE START OF CONSTRUCTION. ANY PRE-WORK DAMAGE OR DEFECTS OF THE ROOFING SYSTEM SHALL BE DOCUMENTED BY WRITING AND/OR PHOTOGRAPHS.
3. THE CONTRACTOR SHALL PLACE A MINIMUM OF 4FT WIDE, 1/2" THICK APPROVED PROTECTION BOARD (1 LAYER) MADE OF CONSTRUCTION GRADE PLYWOOD (CREATED STRONG BOARD WILL BE ACCEPTABLE) OVER ALL MEMBRANE ROOFING THAT WILL HAVE CONSTRUCT ON TRAFFIC. THE ROOF PROTECTION SHALL BE PROVIDED FOR THE ENTIRE AREA WITHIN LIMITS OF THE WORK. SUCH PROTECTION SHALL ALSO BE PROVIDED IN THE FORM OF A WALKWAY FROM THE ROOF ACCESS DOOR TO THE PROTECTED CONSTRUCTION AREA.
4. STORAGE OF MATERIALS ON EXISTING ROOF WILL NOT BE ALLOWED.
5. THE CONTRACTOR SHALL REMOVE DAILY ALL PROJECT DEBRIS FROM ALL ROOFING SURFACES.
6. THE CONTRACTOR SHALL ADVISE THE OWNER'S REPRESENTATIVE WHEN WORK ON THE ROOF IS COMPLETE AND THE PROTECTION BOARDS HAVE BEEN REMOVED. THE CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL EXAMINE ALL ROOF SURFACES WHERE WORK HAS OCCURRED AND WILL REPAIR ALL DEFECTS NOT PREVIOUSLY DOCUMENTED.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING, ROOF, STRUCTURAL FRAMING, ETC. INCURRED DURING CONSTRUCTION.
8. CONTRACTOR SHALL UTILIZE A LICENSED APPLICATOR OF THE EXISTING ROOFING SYSTEM TO REPAIR ANY AND ALL DAMAGES INCURRED THE COURSE OF CONSTRUCTION
9. THE CONTRACTOR TO VERIFY WARRANTY ON THE EXISTING MEMBRANE ROOFING SYSTEM. THE CONTRACTOR SHALL UTILIZE A LICENSED APPLICATOR OF THE EXISTING ROOFING SYSTEM TO PERFORM ALL ROOFING WORK AND TO THE REPAIR ANY AND ALL DAMAGE, UPON COMPLETION, THE CONTRACTOR SHALL OBTAIN A LETTER FROM T-P ROOFING MFR. STATING THAT ANY EXISTING WARRANTY REMAINS IN FULL FORCE AND EFFECT.

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DRAWN BY: KC	CHECKED BY: GMS
CHECKED BY: RH	APPROVED BY: GMS

STATE OF ILLINOIS — NABIL R. FAKHOODIN — 62177 — ST. CHARLES — LICENSED STRUCTURAL ENGINEER

CH41799A
CPS THORP SCHOOL
6024 W. WARWICK AVE.
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GENERAL NOTES & SPECIFICATIONS

SP-1

EXHIBIT "B"

PAYMENTS

TERM	ANNUAL LICENSE PAYMENTS
1 September 1, 2023 – August 31, 2024 September 1, 2024 – August 31, 2025 September 1, 2025 – August 31, 2026 September 1, 2026 – August 31, 2027 September 1, 2027 – August 31, 2028	 60,000.00 61,800.00 63,654.00 65,564.00 67,531.00
2 September 1, 2028 – August 31, 2029 September 1, 2029 – August 31, 2030 September 1, 2030 – August 31, 2031 September 1, 2031 – August 31, 2032 September 1, 2032 – August 31, 2033	 69,557.00 71,644.00 73,793.00 76,007.00 78,287.00
3 September 1, 2033 – August 31, 2034 September 1, 2034 – August 31, 2035 September 1, 2035 – August 31, 2036 September 1, 2036 – August 31, 2037 September 1, 2037 – August 31, 2038	 80,636.00 83,055.00 85,547.00 88,113.00 90,756.00
4 September 1, 2038 – August 31, 2039 September 1, 2039 – August 31, 2040 September 1, 2040 – August 31, 2041 September 1, 2041 – August 31, 2042 September 1, 2042 – August 31, 2043	 93,479.00 96,283.00 99,171.00 102,146.00 105,210.00