

Sprint
VISION

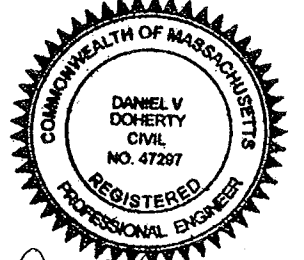


331 BROADWAY BS60XC010

331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

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Daniel V. Doherty

ENGINEER STAMP/SIGNATURE

PREPARED FOR:



1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
PHONE: (800) 357-7641

PROJECT COORDINATION & MANAGEMENT:

Alcatel-Lucent

1 ROBBINS ROAD
WESTFORD, MA 01886
(978) 952-1600

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SUBMITTALS

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1	3/26/12	REVISED PER COMMENTS	MF
2	04/17/12	REVISED PER COMMENTS	KW
3	06/01/12	FINAL CD	JT
4	6/29/12	FINAL CD	SS

EBI JOB NO:
81110245

SITE INFO:

331 BROADWAY

BS60XC010

331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:

TITLE SHEET

DRAWN BY:

SM

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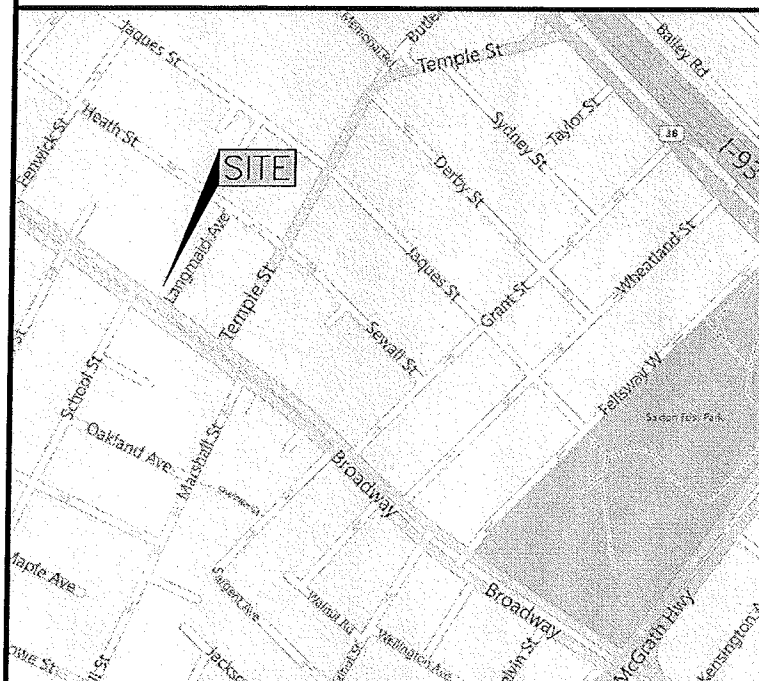
DD

DATE:

SHEET NO:

T-1

VICINITY MAP (NOT TO SCALE)



GENERAL NOTES

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY CONSISTING OF BTS EQUIPMENT AND ANTENNAS.
- SIGNALS FROM THE ANTENNA SHALL NOT INTERFERE WITH ANY EXISTING COMMUNICATION SITES. ALL ITEMS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED.
- THIS IS AN UNMANNED FACILITY - NO SOLID WASTE. THE SITE WILL CREATE NO TRASH, THUS REQUIRES NO DUMPSTER.
- DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQ'D.
- OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND
INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS
OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL
GOVERNING AUTHORITIES.

- MASSACHUSETTS STATE BUILDING CODE 780 CMR
- 8TH EDITION
- NATIONAL ELECTRIC CODE 2011

SCOPE OF WORK

- INSTALL (3) 1900/800 MHZ PANEL ANTENNAS & (6)
REMOTE RADIO HEADS (RRH), ON EXISTING PENTHOUSE.
- EXISTING MODCELL CABINET TO BE RETROFITTED IN PLACE.
- INSTALL (1) EQUIPMENT CABINET ON EXISTING RAISED
EQUIPMENT PLATFORM IN COURTYARD.
- ROUTE (3) HYBRID CABLES FROM PROPOSED EQUIPMENT
TO PROPOSED REMOTE RADIO HEADS.
- REMOVE (3) EXISTING CDMA ANTENNAS & COAX.
- REPLACE EXISTING GPS ANTENNA WITH NEW GPS ANTENNA.
- FIBER UPGRADE WITH BACKHAUL INSTALLATION TO EXISTING
SPRINT WIRELESS TELECOMMUNICATIONS CELL SITE.

PROJECT INFORMATION

SITE NAME: 331 BROADWAY
SITE NUMBER: BS60XC010
SITE ADDRESS: 331-333 BROADWAY
SOMERVILLE, MA 02143
COUNTY: MIDDLESEX COUNTY
ZONING DISTRICT: CCD55 (CORRIDOR COMMERCIAL
DISTRICT)
TAX ID: MAP: 58 BLOCK: D LOT: 14
PROPERTY OWNER: ANTHONY K PAONE SR,
TRUSTEE
331-333 BROADWAY
SOMERVILLE, MA 02143
STRUCTURE TYPE: ROOFTOP
STRUCTURE HEIGHT: 56'-0"± AGL
PANEL ANTENNA RAD CENTER: 52'-0"± AGL
COORDINATES: LATITUDE: 42°23'36.00"N
LONGITUDE: 71°05'38.56"W
GROUND ELEVATION: 61'± A.M.S.L.

PROJECT TEAM

APPLICANT:
SPRINT
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495
PHONE: (800) 357-7641

LEASING/SITE ACQUISITION
HPC DEVELOPMENT, LLC
400 TRADE CENTER
SUITE 5900
WOBBURN, MA 01801
PHONE: (781) 569-5877

AAV FIBER VENDOR:
COMCAST CABLE
25 INDUSTRIAL DRIVE
CHELMSFORD, MA 01824
PHONE: 1-800-COMCAST (1800-266-2278)

CONSULTANTS:
EBI CONSULTING
21 B STREET
BURLINGTON, MA 01803
PHONE: 781-273-2500
FAX: 781-273-3311

DIG SAFE SYSTEMS, INC.
1-888-DIG-SAFE (344-7233)



SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
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A-2	ELEVATIONS
A-3	ANTENNA SCENARIO & RF SYSTEM SCHEDULE
A-4	EQUIPMENT DETAILS
A-5	CONSTRUCTION DETAILS
AAV-1	SITE PHOTOS
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AAV-3	DETAILS
E-1	ELECTRICAL NOTES & RISER DIAGRAM
E-2	GROUNDING DETAILS & NOTES
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APPROVALS

NAME	SIGNATURE	DATE
LEASING/SITE ACQUISITION		
RF ENGINEER		
SITE OWNER/LANDLORD		
CONSTRUCTION		

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING
DIMENSIONS AND CONDITIONS ON THE JOB SITE AND
SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF
ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

PART 2 - PRODUCTS

2.01 WELDING

- A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHOULD BE MADE AVAILABLE FOR ENGINEER'S AND/OR WIRELESS CARRIER'S REVIEW IF REQUESTED.
- B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC PROCESS 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. INSPECTION AND TESTING OF WELDING: FIELD WELDING SHALL BE DONE UNDER INSPECTION IN ACCORDANCE WITH THE AWS D1.1. REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE WHEN FILLET SIZES ARE NOT SHOWN.

2.02 BOLTING

- A. BOLTS SHALL BE 3/4" (MINIMUM) CONFORMING TO ASTM A325. HOT DIP GALVANIZED PER ASTM A153 NUTS SHALL BE HEAVY HEX TYPE.
- B. ALL BOLTS SHALL BE INSTALLED IN SLIP CRITICAL CONNECTIONS CONFORMING TO AISC, USING THE 1/4" TURN METHOD.

2.03 FABRICATION

- A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES.

2.04 FINISH

- A. ALL STRUCTURAL STEEL SHALL, BEFORE LEAVING THE SHOP OR FABRICATING PLANT, BE CLEANED OF ALL SCALE, RUST, GREASE AND OTHER FOREIGN MATTER, AND SHALL BE GIVEN ONE (1) THOROUGH SHOP COAT, ON ALL SURFACES, OF AN APPROVED PRIMER.

THE MINIMUM DRY FILM THICKNESS OF PRIME COATS SHALL BE NOT LESS THAN TWO (2) MILS PER COAT.

2.06 PROTECTION

- A. UPON COMPLETION OF ERECTION INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS OR GALVANIZATION BREAKS WITH ZINC BASED PAINT. COLOR TO MATCH THE GALVANIZED PROCESS.

PART 3 - EXECUTION

3.01 ERECTION OF STEEL

- A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.
- B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISH LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.
- C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

DIVISION 13 00 00 - SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. ANTENNAS AND COAXIAL CABLES ARE FURNISHED BY THE WIRELESS CARRIER'S UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST THE ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL PROPERTY.
- B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND THE WIRELESS CARRIER'S 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. INSTALL COAXIAL CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND THE EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
- F. ANTENNA AND COAXIAL CABLE GROUNDING:

1. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

2. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS).

1.02 RELATED WORK (ROOF TOP SITES)

FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH THE OTHER TRADES PRIOR TO BID:

1. FLASHING OF OPENING INTO OUTSIDE WALLS
2. SEALED AND CAULKING ALL OPENINGS
3. PAINTING
4. CUTTING AND PATCHING

1.03 REQUIREMENTS OF REGULATOR AGENCIES

FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF THE STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

EIA - ELECTRONIC INDUSTRIES ASSOCIATION RS - 22. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.

FCC - FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

NEC - NATIONAL ELECTRIC CODE - ON TOWER LIGHTING KITS.

UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDES ANY OTHER STANDARDS OR SPECIFICATIONS.

2006 LIFE SAFETY CODE NFPA - 101.

STRUCTURAL DESIGN PARAMETERS

BUILDING CODE AND SPECIFICATIONS:

MASSACHUSETTS BUILDING CODE 8TH EDITION
ASCE7-05 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES
TIA/EIA 222G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES

OCCUPANCY CATEGORY:

II (EXISTING BUILDING)
III (TELECOMMUNICATION EQUIPMENT)

LIVE LOADS:

FLOORS:

ROOFS:

20 PSF

SNOW LOADS:

GROUND SNOW LOAD, Pg:

45 PSF

FLAT ROOF SNOW LOAD, Pf:

0.7

SNOW EXPOSURE FACTOR, Ce:

1.0

THERMAL FACTOR, Ct:

1.1

WIND LOADS:

BASIC WIND SPEED, V:

(3-SECOND GUST):

105 MPH

IMPORTANCE FACTOR, Iw:

1.0 (EXISTING BUILDING)
1.1 (TELECOMMUNICATION EQUIPMENT)

EXPOSURE CATEGORY:

C

INTERNAL PRESSURE COEFFICIENT:

±0.18

SEISMIC LOADS:

COMPONENT IMPORTANCE FACTOR, Ie :

1.25

SPECTRAL ACCELERATION SHORT PERIOD, SS <

0.28

SPECTRAL ACCELERATION 1-SECOND PERIOD, S1 <

0.069

SITE CLASS:

D

SPECTRAL RESPONSE COEFFICIENT, SDS :

0.31

SPECTRAL RESPONSE COEFFICIENT, SD1 :

0.109

SEISMIC DESIGN CATEGORY, SDC :

B

BASE SHEAR, V:

SEISMIC RESPONSE COEFFICIENTS, CS:

RESPONSE MODIFICATION FACTORS, R:

ANALYSIS PROCEDURE USED:

EQUIVALENT LATERAL FORCE PROCEDURE

SYMBOLS & ABBREVIATIONS

— G — GROUND WIRE

— E — ELECTRIC

— F — FIBER

— T — TELEPHONE

— OH — OVER HEAD UTILITY

— P — POWER SUPPLY

--- COAX CABLE

— — — PROPERTY LINE

— X — CHAIN LINK FENCE

(E) EXISTING

(P) PROPOSED

RRH REMOTE RADIO HEAD

DET SHT DETAIL REFERENCE

DET SHT DETAIL SECTION REFERENCE

ELEV. 350'-0" SURFACE ELEVATION

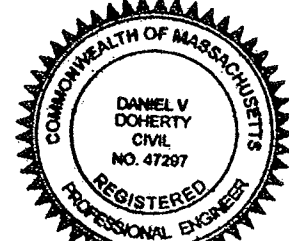
SECT SHT SECTION REFERENCE

SECT SHT ELEVATION REFERENCE

ANY DISCREPANCIES BETWEEN THIS
DRAWING PACKAGE AND EXISTING FIELD
CONDITIONS MUST BE REPORTED TO THE
ENGINEER OF RECORD PRIOR TO THE
COMMENCEMENT OF CONSTRUCTION.



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PREPARED FOR:



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HAUWAH, HI 07435
PHONE: (800) 357-7641

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331-333 BROADWAY
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SHEET TITLE:

GENERAL NOTES &
STRUCTURAL DESIGN
PARAMETERS

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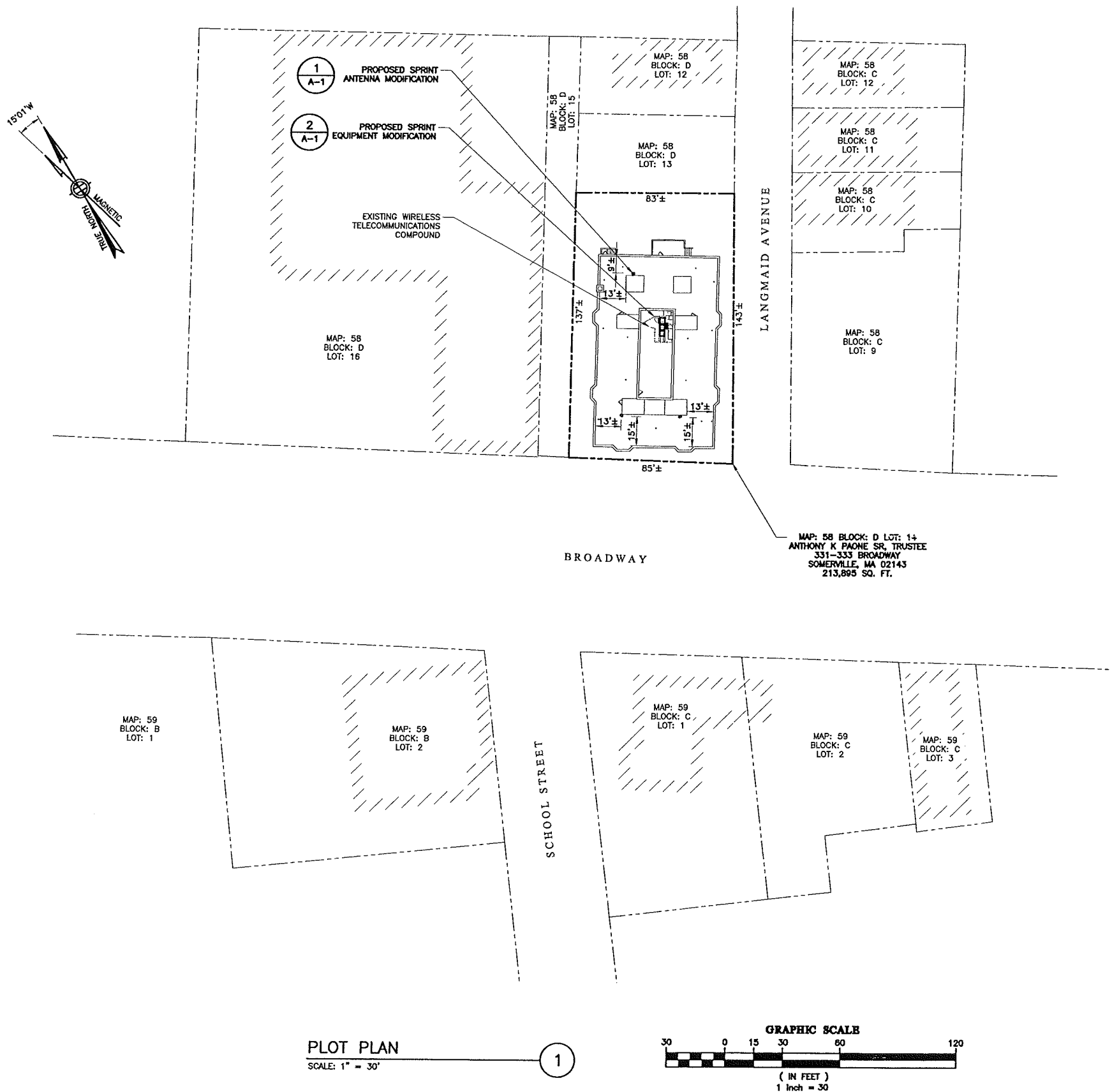
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DATE:

SHEET NO:

GN-2



NOTES: 1. PLOT PLAN IS NOT THE RESULT OF A SURVEY. IT IS BASED ON EXISTING PARCEL MAPS AVAILABLE FROM THE TOWN GIS DATABASE. ALL INFORMATION SHOWN IS APPROXIMATE ONLY AND SUBJECT TO ANY CONDITION THAT A SURVEY MAY REVEAL. 2. ALL SETBACKS SHOWN ARE FROM PROPOSED ANTENNAS & EQUIPMENT TO EXISTING EDGE OF ROOF.		
ZONING INFORMATION		
ZONING DISTRICT: CCD55 (CORRIDOR COMMERCIAL DISTRICT)		
TAX ID: MAP: 58 BLOCK: D LOT: 14		
ANTENNAS:		
DIMENSION REQUIREMENTS:	REQUIRED	PROPOSED±
FRONT YARD SETBACK:	10' FROM ROOF EDGE	15' FROM ROOF EDGE
REAR YARD SETBACK:	10' FROM ROOF EDGE	9' FROM ROOF EDGE
SIDE YARD SETBACK:	10' FROM ROOF EDGE	13' FROM ROOF EDGE
MAXIMUM ZONING HEIGHT:	10' ABOVE ROOF MAX	ANTENNA TIP: 2' FROM HIGHEST POINT
EQUIPMENT:		
DIMENSION REQUIREMENTS:	REQUIRED	PROPOSED±
FRONT YARD SETBACK:	N/A	N/C IN COURTYARD
REAR YARD SETBACK:	N/A	N/C IN COURTYARD
SIDE YARD SETBACK:	N/A	N/C IN COURTYARD
MAXIMUM ZONING HEIGHT:	N/A	N/C IN COURTYARD
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. SUITE 800 MAHWAH, NJ 07495	
PROPERTY OWNER:	ANTHONY K. PAONE SR, TRUSTEE 331-333 BROADWAY SOMERVILLE, MA 02143	
LEGEND		
-----	PROPERTY LINE - SUBJECT PARCEL	
-----	PROPERTY LINE - ABUTTERS	
-----	ZONING DISTRICT BOUNDARY LINE	

EBI CONSULTING

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DANIEL V. DOHERTY

CIVIL

NO. 47297

REGISTERED PROFESSIONAL ENGINEER

ENGINEER STAMP/SIGNATURE

PREPARED FOR:

Sprint

VISION

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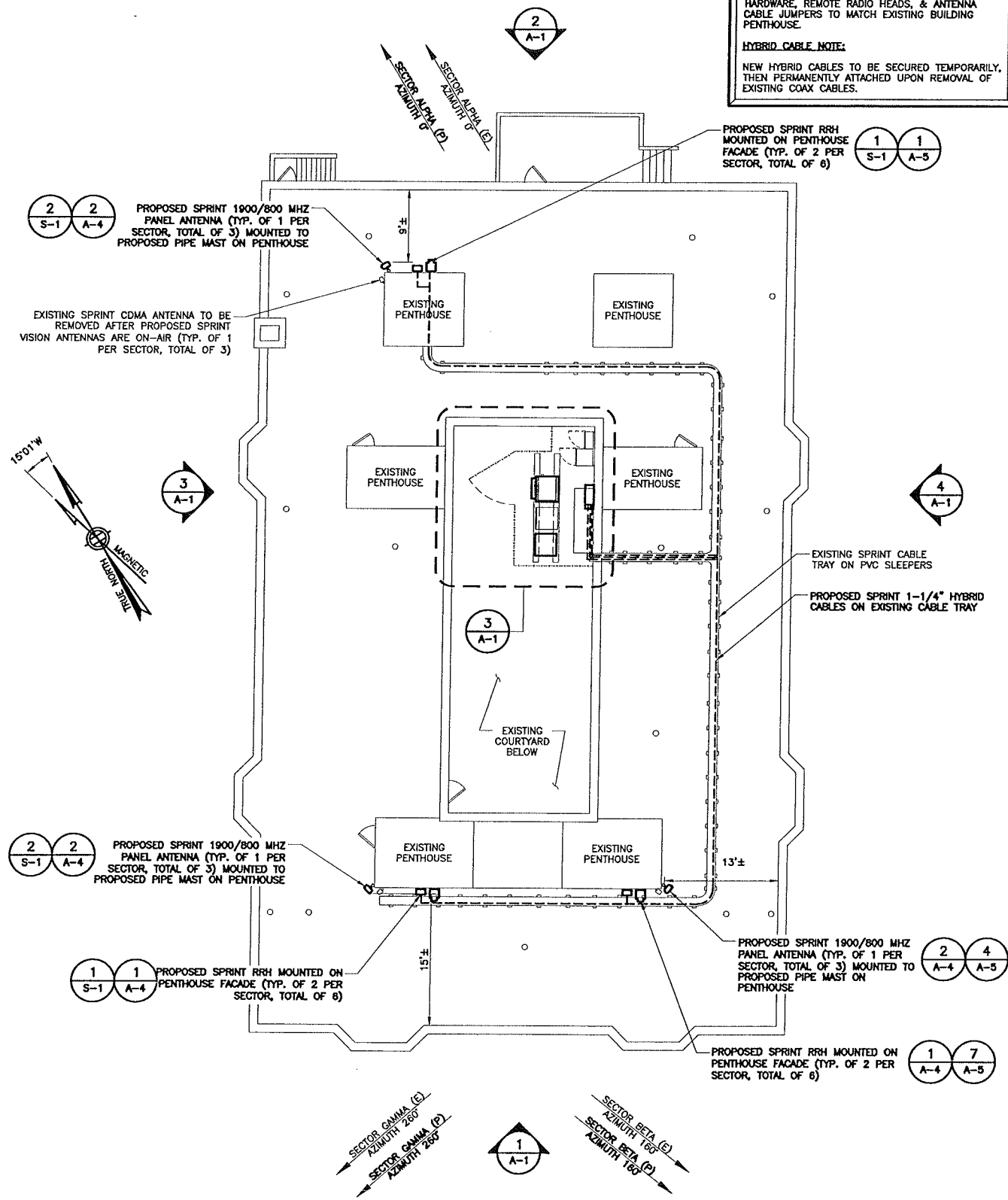
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DRAWN BY:	SM	C-1
CHECKED BY:	DD	
DATE:	06/29/12	

NAME	SIGNATURE	DATE
SITE OWNER/LANDLORD		

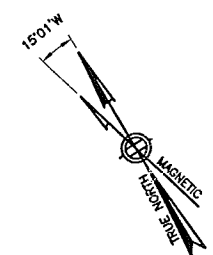
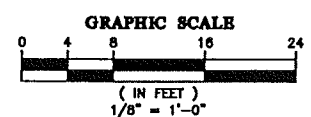
STRUCTURAL ASSESSMENT PREPARED BY EBI CONSULTING, ENTITLED
STRUCTURAL ASSESSMENT REVISION 1 DATED FEBRUARY 9, 2012.
STRUCTURAL ANALYSIS PREPARED BY EBI CONSULTING, ENTITLED
STRUCTURAL ANALYSIS DATED FEBRUARY 10, 2012.

ANTENNA NOTE:
PAINT PROPOSED ANTENNAS, ALL MOUNTING
HARDWARE, REMOTE RADIO HEADS, & ANTENNA
CABLE JUMPERS TO MATCH EXISTING BUILDING
PENTHOUSE.

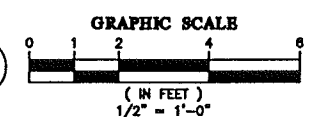
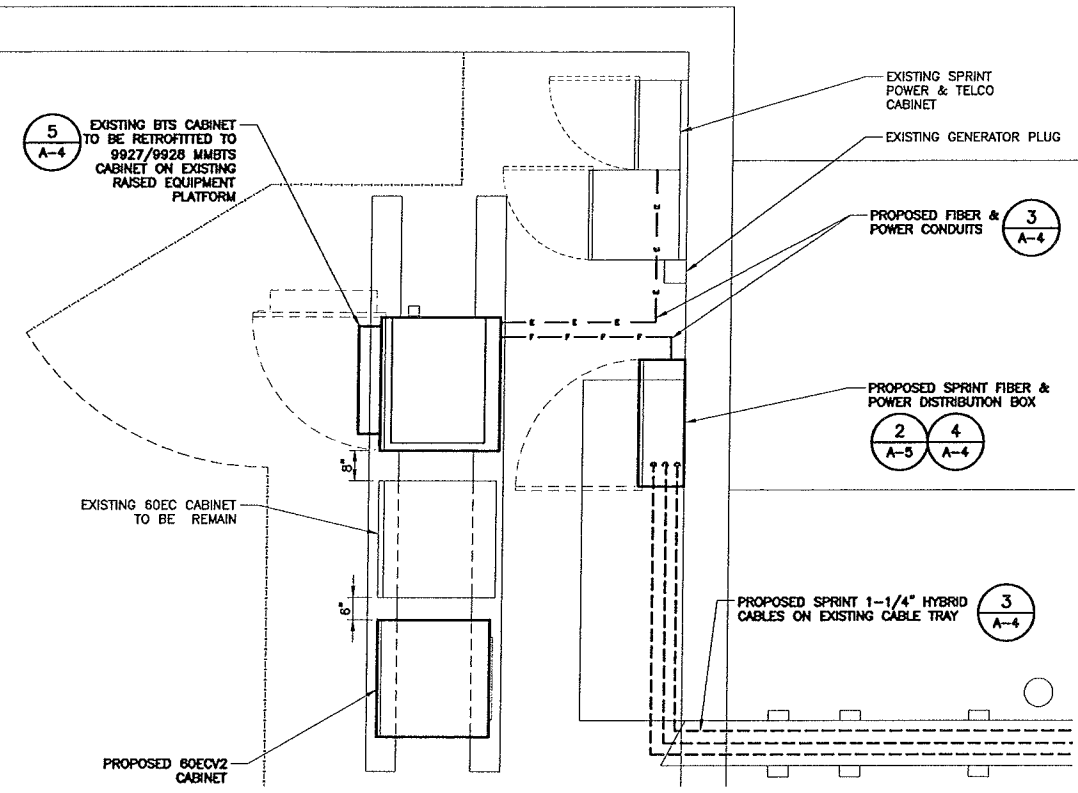
HYBRID CABLE NOTE:
NEW HYBRID CABLES TO BE SECURED TEMPORARILY,
THEN PERMANENTLY ATTACHED UPON REMOVAL OF
EXISTING COAX CABLES.



ROOFTOP PLAN
SCALE: 1/8" = 1'-0"

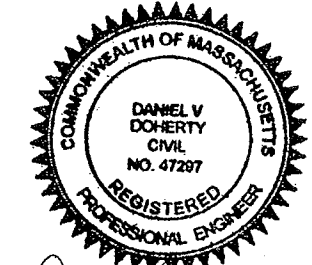


EQUIPMENT LAYOUT
SCALE: 1/2" = 1'-0"



EQUIPMENT CABINET LAYOUT
EXISTING CABINET COUNT: 2
PROPOSED CABINET COUNT: 3

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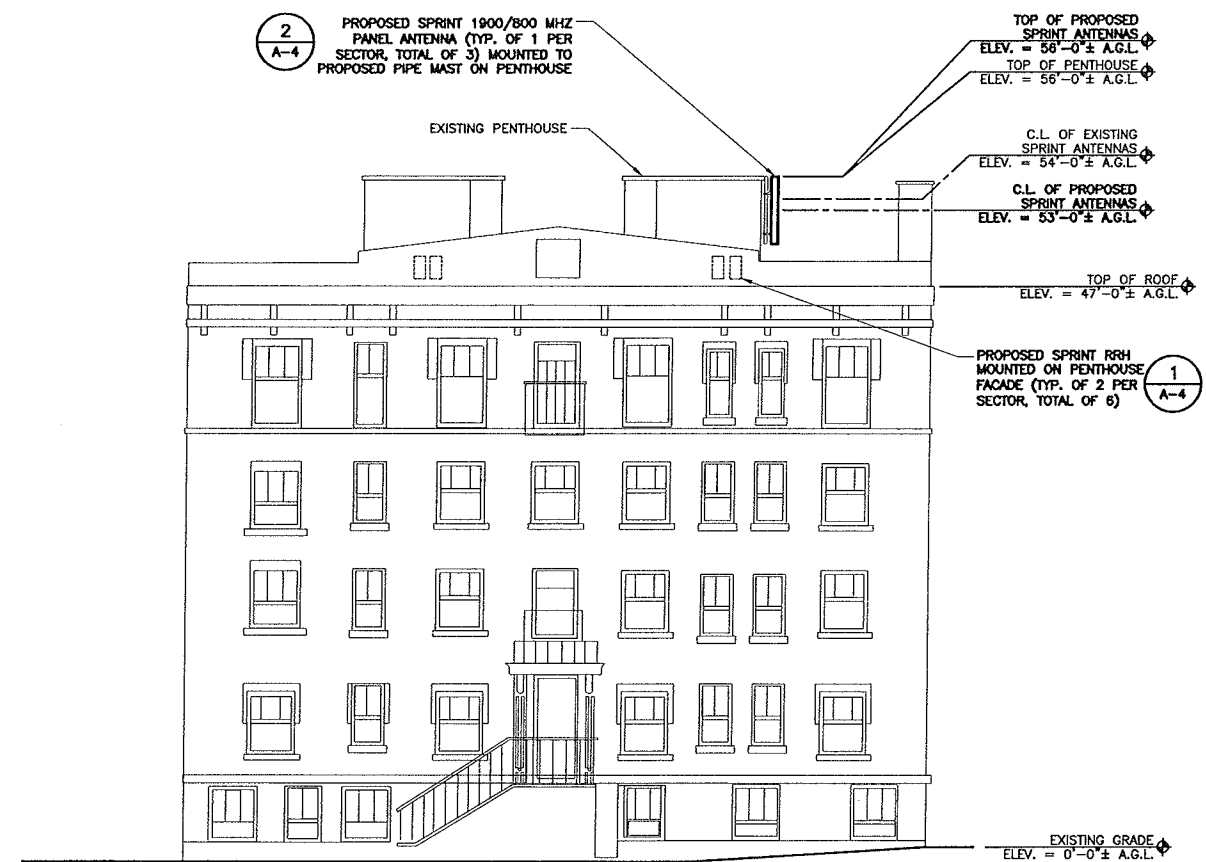
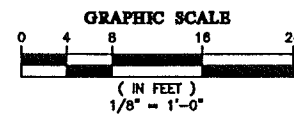
SHEET TITLE:
**ROOFTOP PLAN &
EQUIPMENT LAYOUT**

DRAWN BY: SM	SHEET NO: A-1
CHECKED BY: DD	
DATE: 06/29/12	



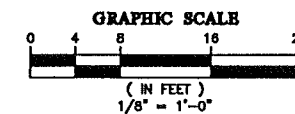
SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



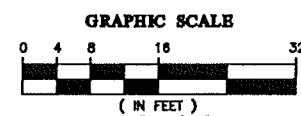
NORTH ELEVATION

SCALE: 1/8" = 1'-0"



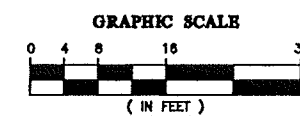
WEST ELEVATION

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

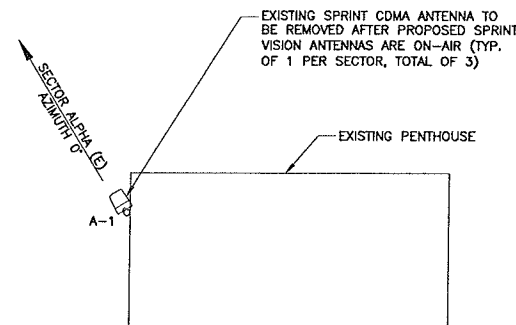
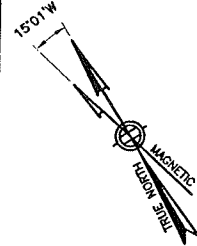


EAST ELEVATION

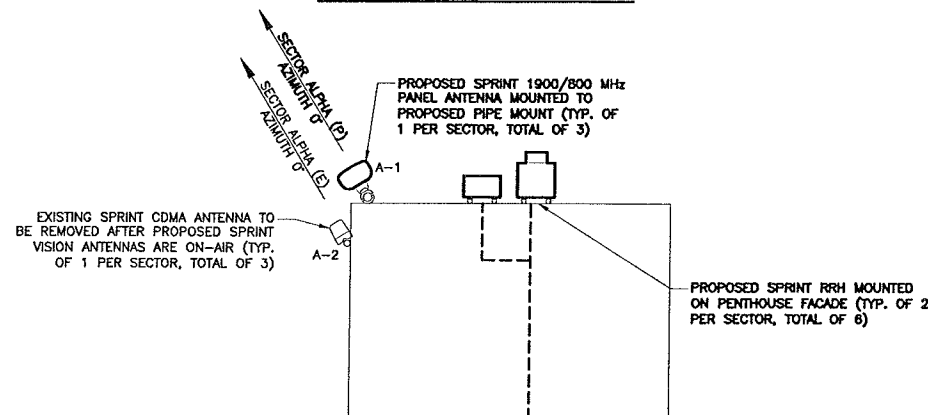
SCALE: 3/32" = 1'-0"



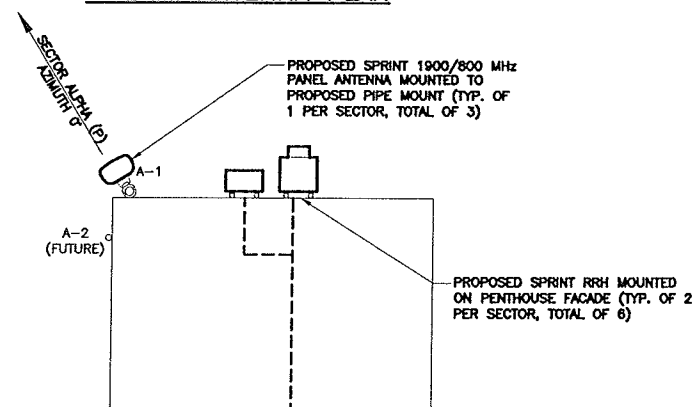
NO.	DATE	DESCRIPTION	BY
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2	04/17/12	REVISED PER COMMENTS	KW
3	06/01/12	FINAL CD	JT
4	6/29/12	FINAL CD	SS



EXISTING ANTENNA PLAN



INTERIM ANTENNA PLAN

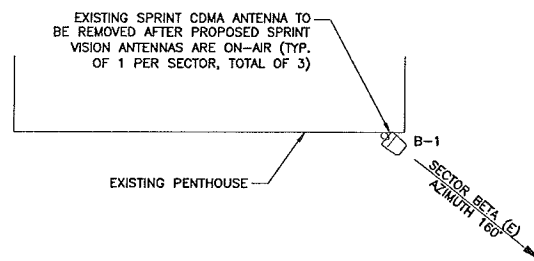


FINAL ANTENNA PLAN

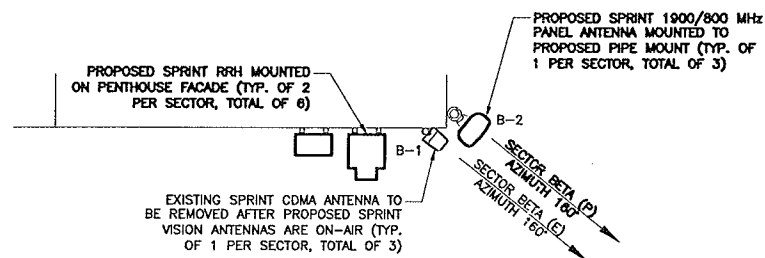
ALPHA SECTOR
ANTENNA SCENARIO

SCALE: N.T.S.

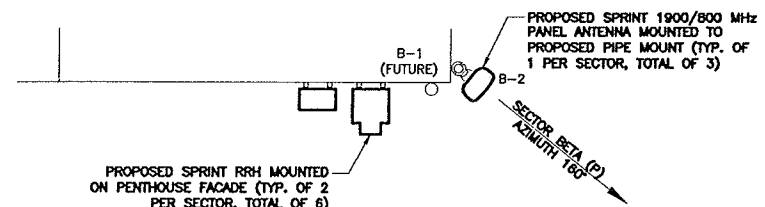
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EXISTING ANTENNA PLAN



INTERIM ANTENNA PLAN

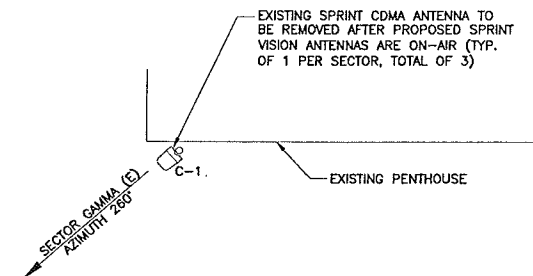


FINAL ANTENNA PLAN

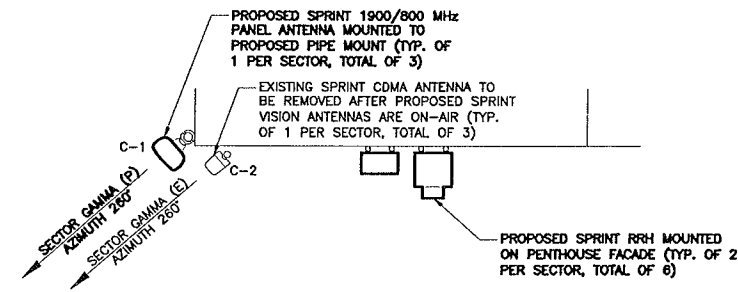
BETA SECTOR
ANTENNA SCENARIO

SCALE: N.T.S.

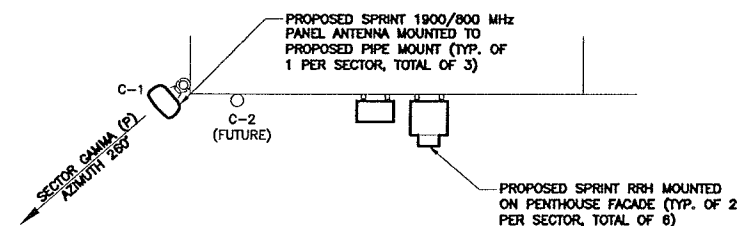
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EXISTING ANTENNA PLAN



INTERIM ANTENNA PLAN



FINAL ANTENNA PLAN

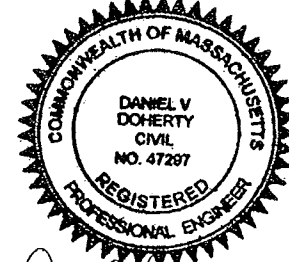
GAMMA SECTOR
ANTENNA SCENARIO

SCALE: N.T.S.

3

RF SYSTEM SCHEDULE - PANEL ANTENNAS																		
ALPHA	POSITION	ANTENNA STATUS	FREQUENCY (MHz)	ANTENNA MAKE	ANTENNA MODEL	AZIMUTH		DOWN TILT M	DOWN TILT E	RAD CENTER (A.G.L.)	*HYBRID CABLE LENGTH	REMOTE RADIO HEAD	JUMPER SIZE (IN.)	*JUMPER LENGTH (FT.)	JUMPER QUANTITY	JUMPER MAKE	JUMPER MODEL	ANTENNA COLOR CODING
						EXISTING (per reference)	PROPOSED											
A-1	PROPOSED	1900	RFS	APXVSP-18-C-A20	0°	0°	0°	-4°	52°-0°±	140'	1900 MHZ	1/2	10	4	RFS	LCF12-50J	TBD	
		800							-7°			800 MHZ	1/2	10	2	RFS	LCF12-50J	TBD
A-2	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
BETA	POSITION	ANTENNA STATUS	FREQUENCY (MHz)	ANTENNA MAKE	ANTENNA MODEL	AZIMUTH		DOWN TILT M	DOWN TILT E	RAD CENTER (A.G.L.)	HYBRID CABLE LENGTH	REMOTE RADIO HEAD	JUMPER SIZE (IN.)	JUMPER LENGTH (FT.)	JUMPER QUANTITY	JUMPER MAKE	JUMPER MODEL	ANTENNA COLOR CODING
						EXISTING (per reference)	PROPOSED											
B-1	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
		1900	RFS	APXVSP-18-C-A20	160°	160°	0°	-1°	52°-0°±	120'	1900 MHZ	1/2	10	4	RFS	LCF12-50J	TBD	
B-2	PROPOSED	800							-2°			800 MHZ	1/2	10	2	RFS	LCF12-50J	TBD
GAMMA	POSITION	ANTENNA STATUS	FREQUENCY (MHz)	ANTENNA MAKE	ANTENNA MODEL	AZIMUTH		DOWN TILT M	DOWN TILT E	RAD CENTER (A.G.L.)	HYBRID CABLE LENGTH	REMOTE RADIO HEAD	JUMPER SIZE (IN.)	JUMPER LENGTH (FT.)	JUMPER QUANTITY	JUMPER MAKE	JUMPER MODEL	ANTENNA COLOR CODING
						EXISTING (per reference)	PROPOSED											
C-1	PROPOSED	1900	RFS	APXVSP-18-C-A20	260°	260°	0°	0°	52°-0°±	155'	1900 MHZ	1/2	10	4	RFS	LCF12-50J	TBD	
		800							0°			800 MHZ	1/2	10	2	RFS	LCF12-50J	TBD
C-2	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
* CONTRACTOR TO FIELD VERIFY ALL CABLE/JUMPER LENGTHS AGAINST ALL CURRENT B.O.M.																		

* CONTRACTOR TO FIELD VERIFY ALL CABLE/JUMPER LENGTHS AGAINST ALL CURRENT B.O.M.



Daniel V. Doherty

ENGINEER STAMP/SIGNATURE

PREPARED FOR:



1 INTERNATIONAL BLVD., SUITE 800
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PHONE: (800) 357-7641

PROJECT COORDINATION & MANAGEMENT:

Alcatel-Lucent

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4	6/29/12	FINAL CD	SS

EBI JOB NO:

81110245

SITE INFO:

331 BROADWAY

BS60XC010

331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:

ANTENNA SCENARIO & RF
SYSTEM SCHEDULE

DRAWN BY:

SM

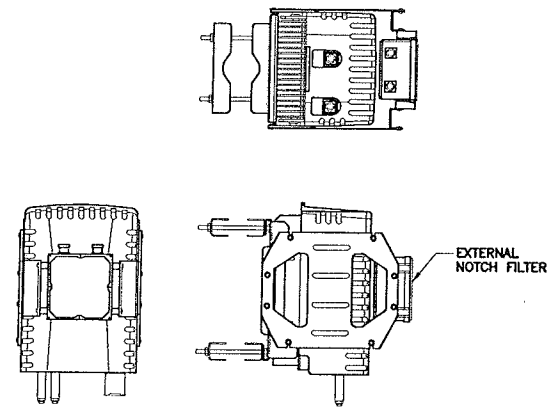
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DD

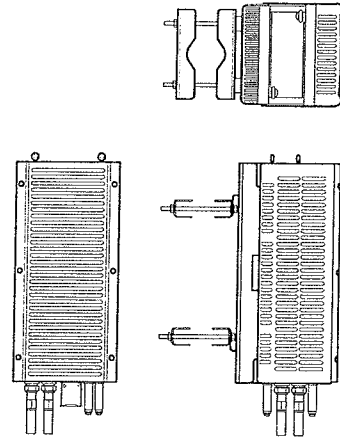
DATE:

SHEET NO:

A-3



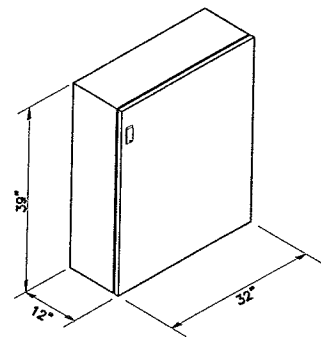
800 MHz RRH
19.4"Hx13"Wx10.7"D
WEIGHT (WITHOUT PIPE MOUNT BRACKETS): 82 LBS.



1900 MHz RRH
25.2"Hx11.8"Wx11.5"D
WEIGHT (WITHOUT PIPE MOUNT BRACKETS): 68 LBS.

REMOTE RADIO HEAD SPEC.
SCALE: N.T.S.

1



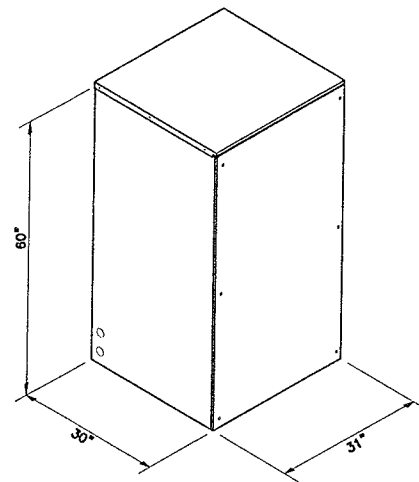
FIBER & POWER DISTRIBUTION BOX SPEC
SCALE: N.T.S.

4

SPRINT TO PROVIDE EQUIPMENT

9927/9928 MMBTS CABINET SPEC.
SCALE: N.T.S.

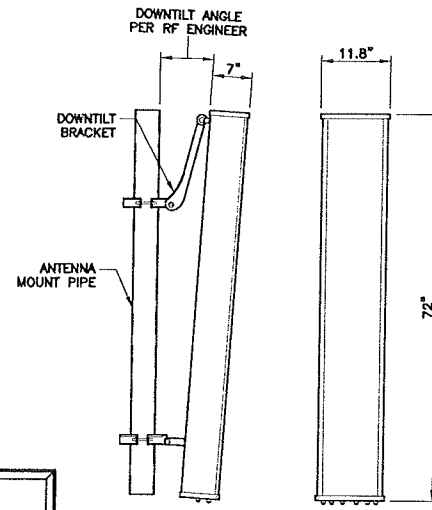
5



BATTERY BACKUP CABINET
1625 LBS.

BATTERY BACKUP CABINET SPEC.
SCALE: N.T.S.

6

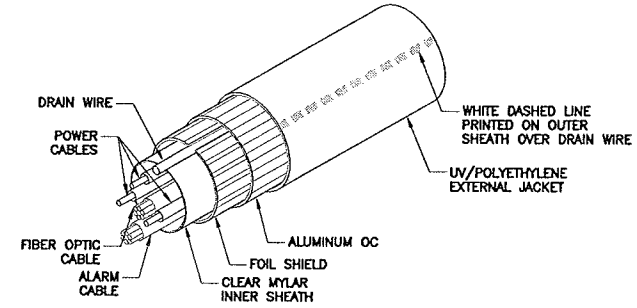


1900/800 MHz ANTENNA
RFS - APXVSP-18-C-A20

PANEL ANTENNA SPEC.
SCALE: N.T.S.

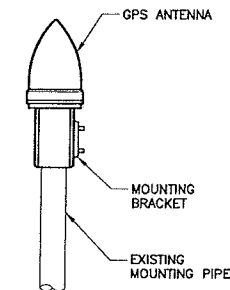
2

ANTENNA INSTALLATION NOTE:
1. REPLACE EXISTING PIPE MASTS AT NEW ANTENNA LOCATIONS WITH NEW 2-7/8" O.D. 6'-0" (MAX.) SCHEDULE 40 PIPE.



HYBRIFLEX CABLE SPEC.
SCALE: N.T.S.

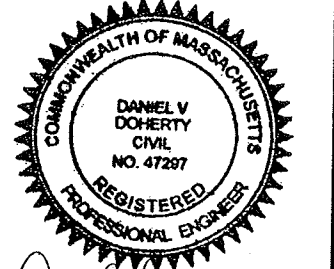
3



PC TEL GPS-TMG-26NCM GPS ANTENNA	
ANTENNA DIMENSIONS	5.0" H x 3.2" D
WEIGHT	0.6 LBS.
RADOME COLOR	WHITE

GPS ANTENNA SPEC.
SCALE: N.T.S.

7



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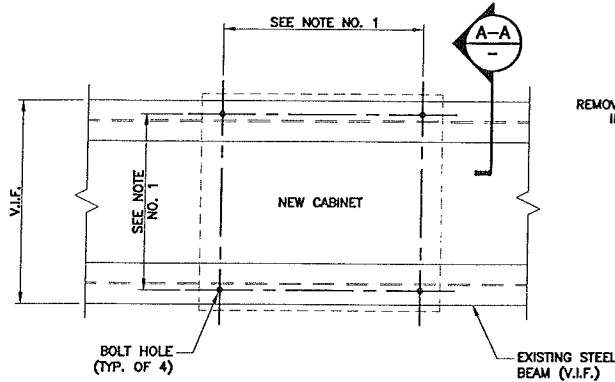
EBI JOB NO: 81110245

SITE INFO:
331 BROADWAY
BS60XC010
331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:
EQUIPMENT DETAILS

DRAWN BY: SM
CHECKED BY: DD
DATE: 11/15/12
SHEET NO: A-4

STRUCTURAL ASSESSMENT PREPARED BY EBI CONSULTING, ENTITLED
STRUCTURAL ASSESSMENT REVISION DATED FEBRUARY 9, 2012.
STRUCTURAL ANALYSIS PREPARED BY EBI CONSULTING, ENTITLED
STRUCTURAL ANALYSIS DATED FEBRUARY 10, 2012.

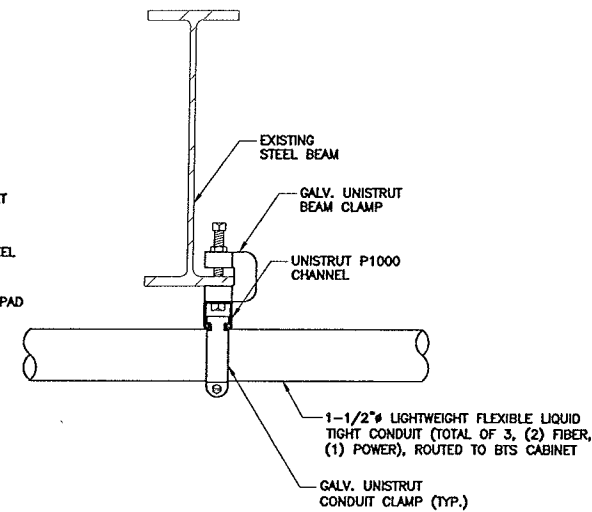
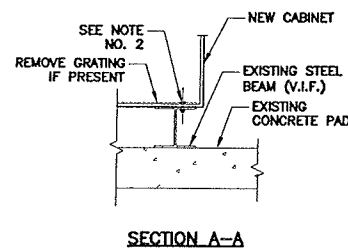


NOTE:

1. SEE EQUIPMENT CUT SHEETS FOR BOLT HOLE SPACING.
2. NEW EQUIPMENT CABINET TO BE MOUNTED TO EXISTING SUPPORT SURFACE WITH BOLT-DOWN SYSTEM PER MANUFACTURER'S SPECIFICATION AND FIELD DRILL HOLES THROUGH EXISTING STEEL BEAMS AS REQUIRED.

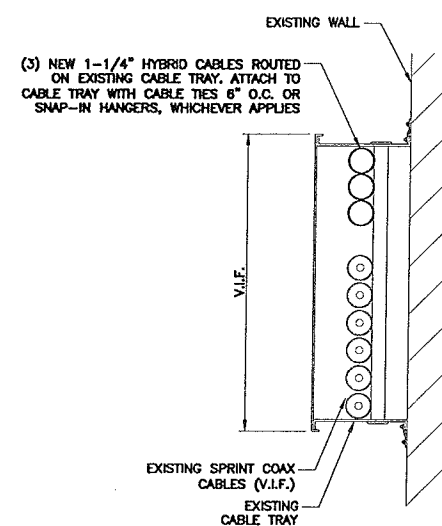
BOLT HOLE PATTERN

SCALE: N.T.S.



CONDUIT SUPPORT DETAIL

SCALE: N.T.S.

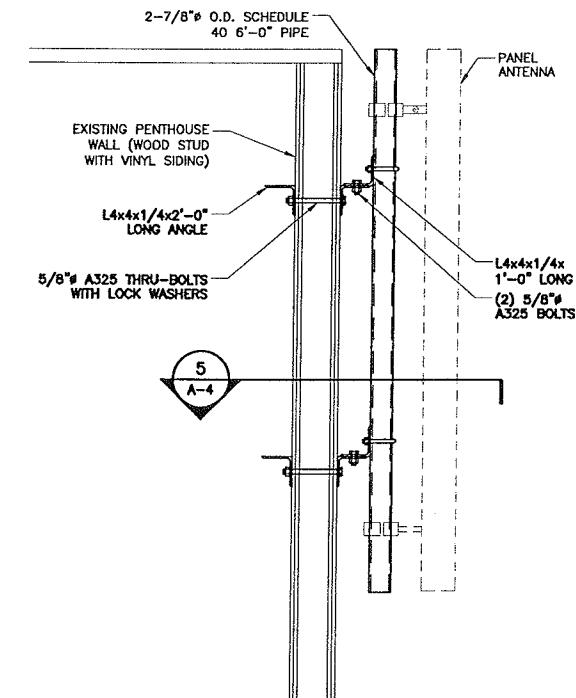


**CABLE SUPPORT DETAIL
WALL MOUNTED CABLE TRAY**

SCALE: N.T.S.

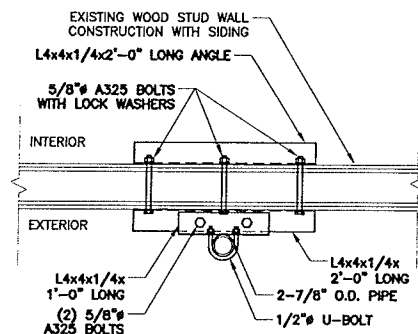
NOTE:

- ALL STRUCTURAL STEEL IS TO BE GALVANIZED.
- ALL BOLTS TO BE FURNISHED W/ WASHERS AND NUTS.



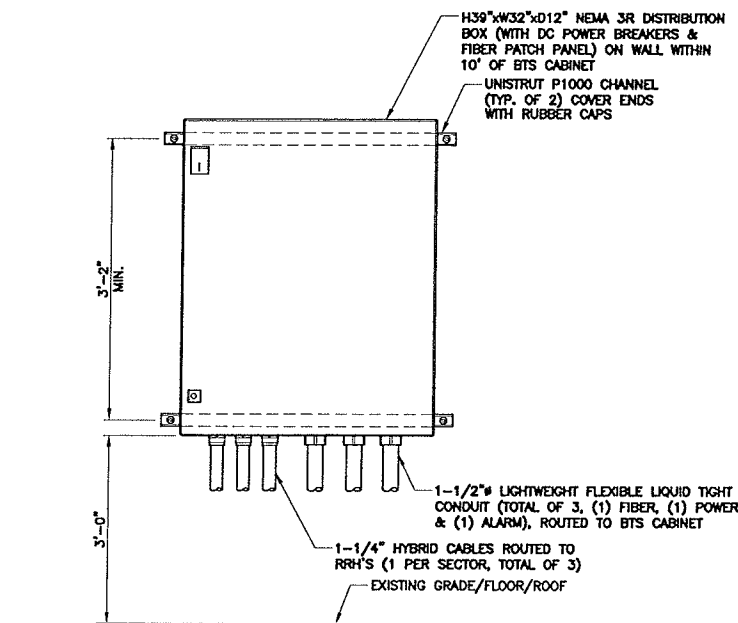
ANTENNA MOUNT DETAIL

SCALE: 1" = 1'-0"



**ANTENNA MOUNTING DETAIL
PLAN VIEW**

SCALE: 1" = 1'-0"

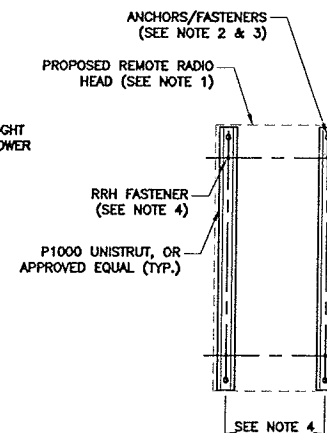


NOTES:

1. INSTALL ANCHORS/FASTENERS A MAXIMUM OF 1'-0" O.C.
- WOOD STUDS - 3/8" LAG BOLT WITH 1" EMBEDMENT IN WOOD
- CONCRETE - 3/8" HILTI KWIK BOLT III WITH 1-1/2" EMBEDMENT
- THROUGH BOLT - 3/8" A36 THREADED ROD WITH NUTS & WASHERS
ANCHORS & UNISTRUT CHANNEL SHALL BE HOT-DIPPED GALV.
2. MOUNT DISTRIBUTION BOX TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE & SPRING NUTS. TYPICAL OF (4).

**FIBER & POWER
DISTRIBUTION BOX DETAIL**

SCALE: N.T.S.



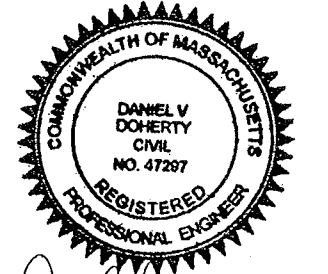
RRH MOUNTING DETAIL

SCALE: N.T.S.

1. SEE PLANS FOR REMOTE RADIO HEAD LOCATION & QUANTITY
2. A SUPPORT FOR A SINGLE RRH SHALL HAVE A MINIMUM OF (2) ANCHORS/FASTENERS FOR EACH UNISTRUT CHANNEL
3. INSTALL ANCHORS/FASTENERS A MAXIMUM OF 1'-0" O.C.
- WOOD STUDS - 3/8" LAG BOLT WITH 1" EMBEDMENT IN WOOD
- CONCRETE - 3/8" HILTI KWIK BOLT III WITH 1-1/2" EMBEDMENT
- THROUGH BOLT - 3/8" A36 THREADED ROD WITH NUTS & WASHERS
ANCHORS, CONNECTORS & UNISTRUT CHANNEL SHALL BE HOT-DIPPED GALV.
- MASONRY - 3/8" HILTI HIT-HY 20 ANCHORING SYSTEM WITH 3-3/8" EMBEDMENT
4. MOUNT RRH TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE & SPRING NUTS. TYPICAL OF (4) PER BRACKET. REFER TO EQUIPMENT CUT SHEET FOR BOLT HOLE SPACING.
5. REFER TO EQUIPMENT CUT SHEET FOR RRH SIDE & FRONT CLEARANCES.

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EBI JOB NO: 81110245

SITE INFO:
331 BROADWAY
BS60XC010
331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

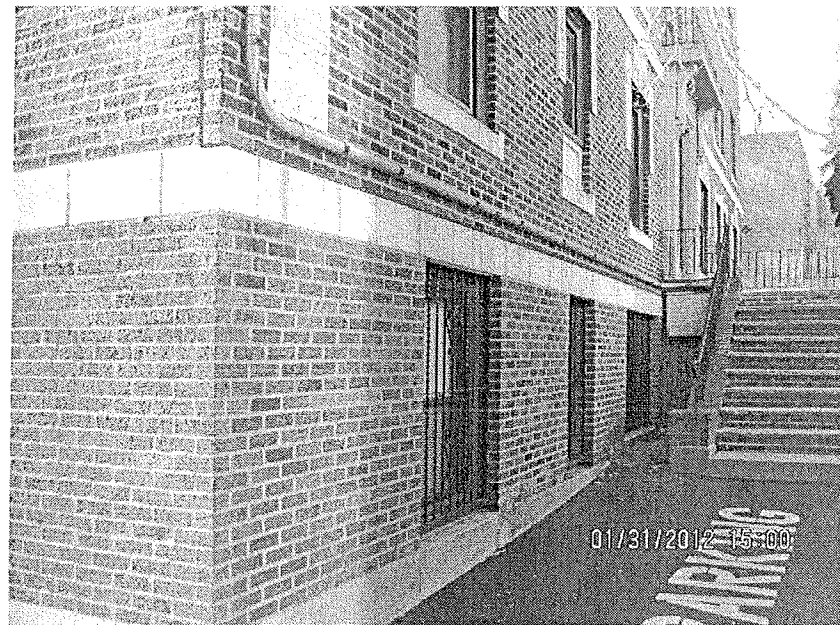
SHEET TITLE:
CONSTRUCTION DETAILS

DRAWN BY: SM
CHECKED BY: DD
DATE: 06/29/12
SHEET NO: A-5



MEET POINT
SCALE: N.T.S.

1



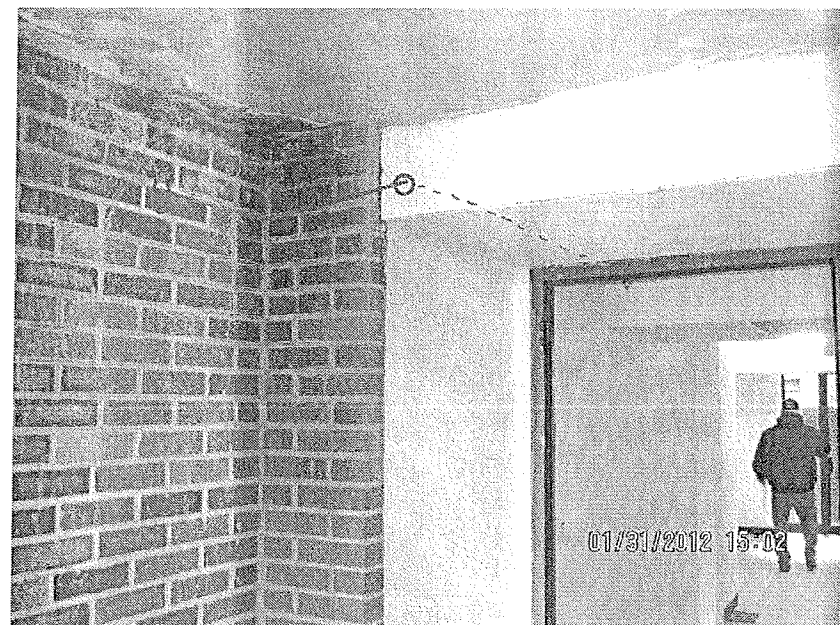
CONDUIT RUN
SCALE: N.T.S.

2



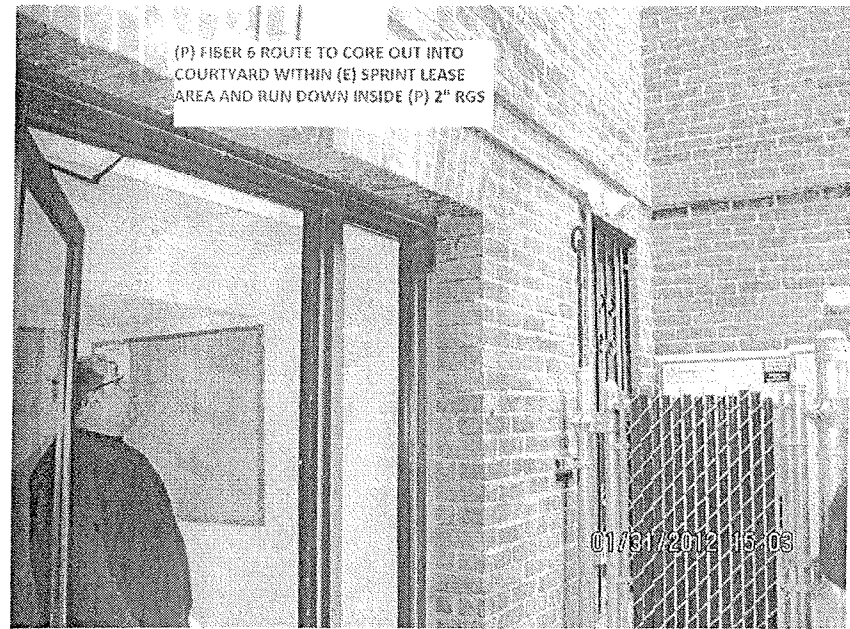
CONDUIT ENTRY
SCALE: N.T.S.

3



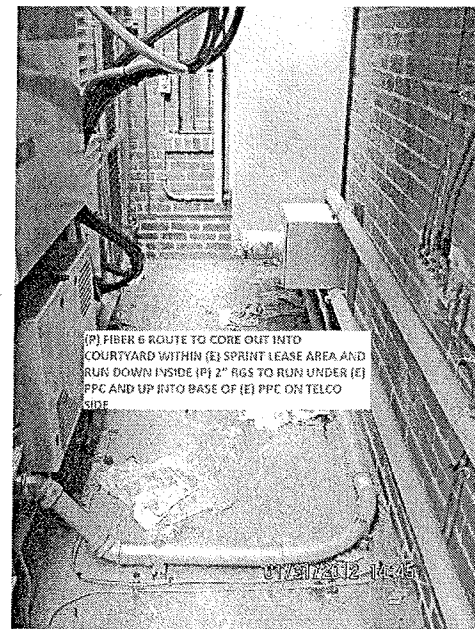
CONDUIT EXIT/ENTRY
SCALE: N.T.S.

4



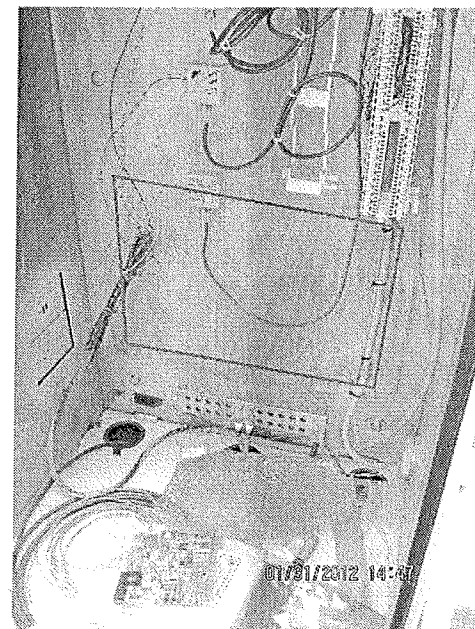
CONDUIT EXIT/RUN
SCALE: N.T.S.

5



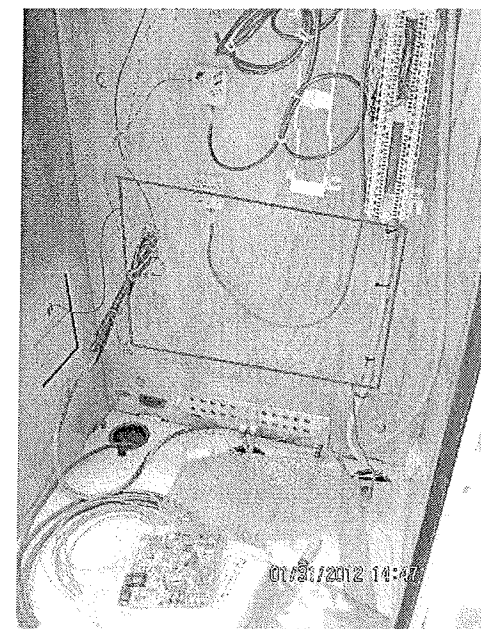
CONDUIT RUN
SCALE: N.T.S.

6



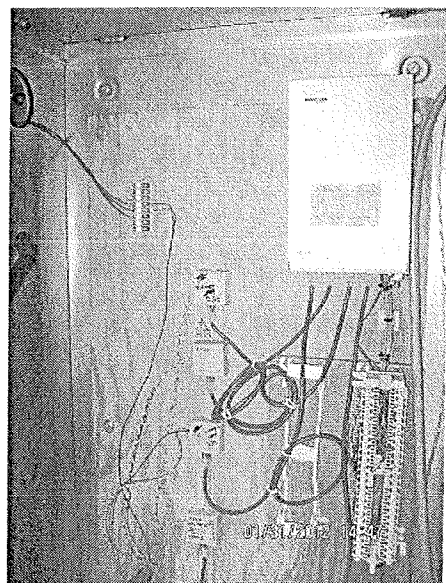
CIENA UNIT LOCATION
SCALE: N.T.S.

7



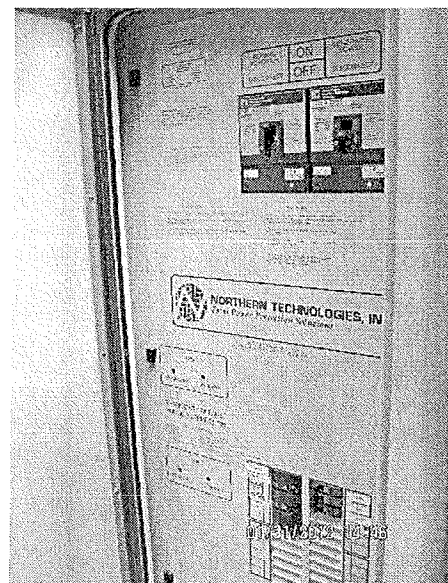
CIENA UNIT CONNECTIONS
SCALE: N.T.S.

8



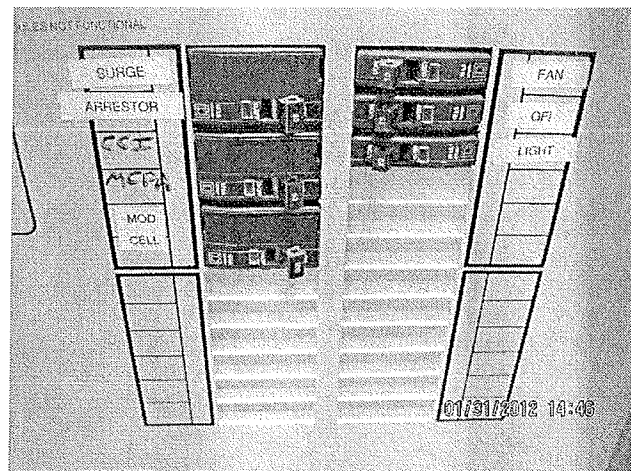
TELCO CABINET
SCALE: N.T.S.

9



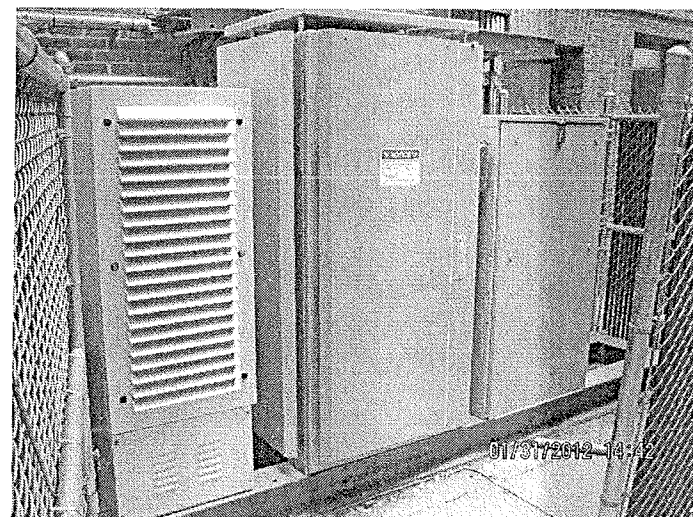
POWER CABINET
SCALE: N.T.S.

10



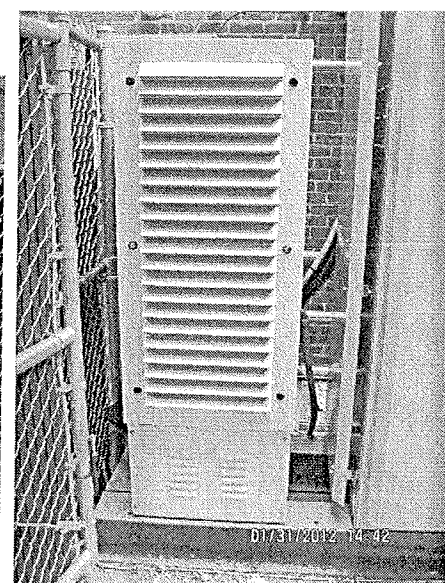
CIRCUIT BREAKERS
SCALE: N.T.S.

11



EQUIPMENT CABINETS
SCALE: N.T.S.

12



MMBTS LOCATION
SCALE: N.T.S.

13

SUBMITTALS			
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0	09/05/11	FOR CONSTRUCTION	SM
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4	6/29/12	FINAL CD	SS

EBI JOB NO: 81110245

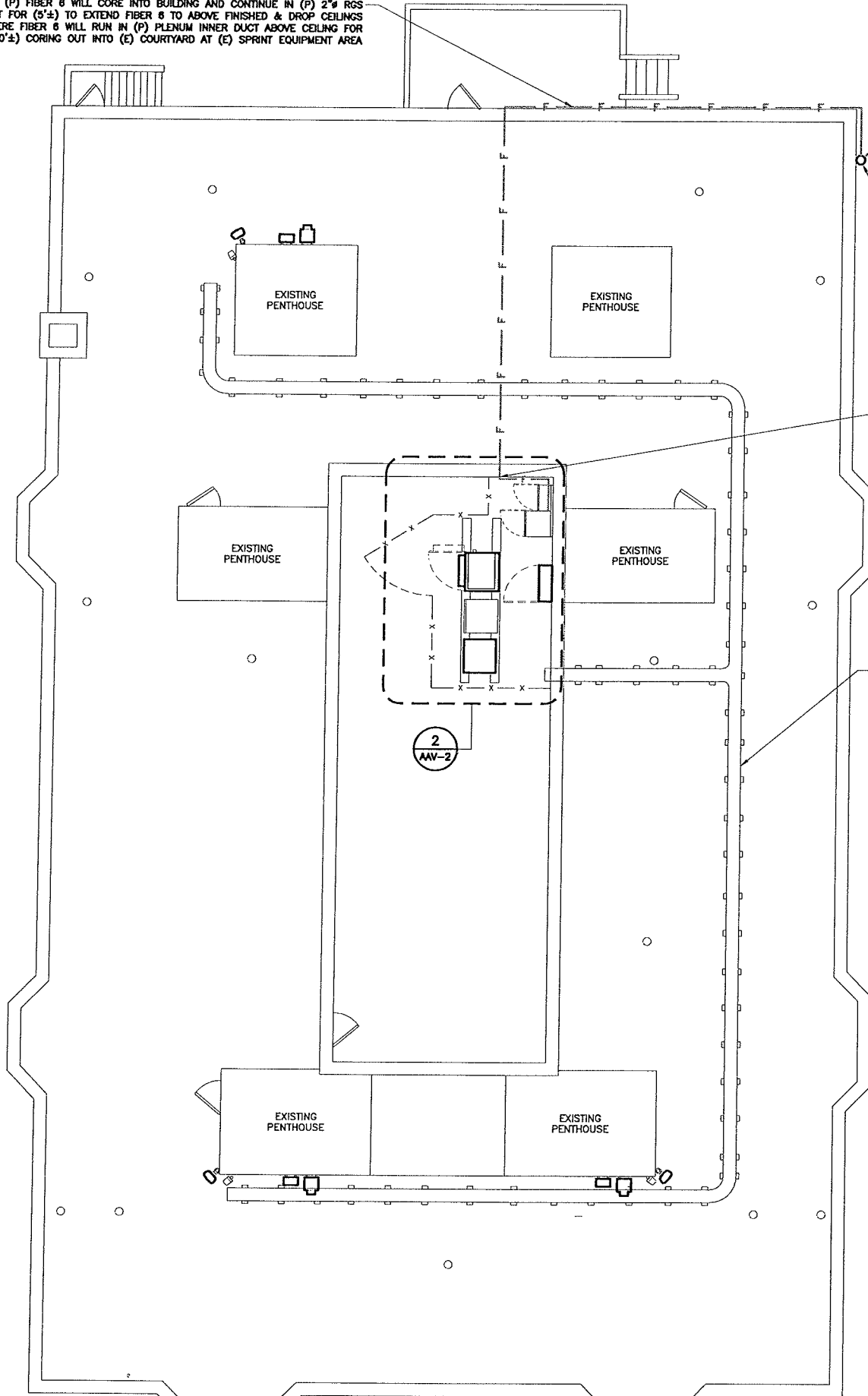
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331 BROADWAY
BS60XC010
331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:
PHOTO SITES

DRAWN BY: SM
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DATE: 01/31/2012
SHEET NO: AAV-1

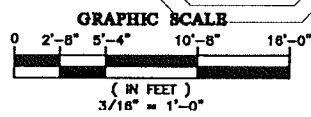
5
AAV-3

(P) FIBER 8 WILL CORE INTO BUILDING AND CONTINUE IN (P) 2" RGS CONDUIT FOR (5'±) TO EXTEND FIBER 8 TO ABOVE FINISHED & DROP CEILINGS WHERE FIBER 8 WILL RUN IN (P) PLENUM INNER DUCT ABOVE CEILING FOR (40'±) CORING OUT INTO (E) COURTYARD AT (E) SPRINT EQUIPMENT AREA



ROOFTOP PLAN
SCALE: 3/16" = 1'-0"

1

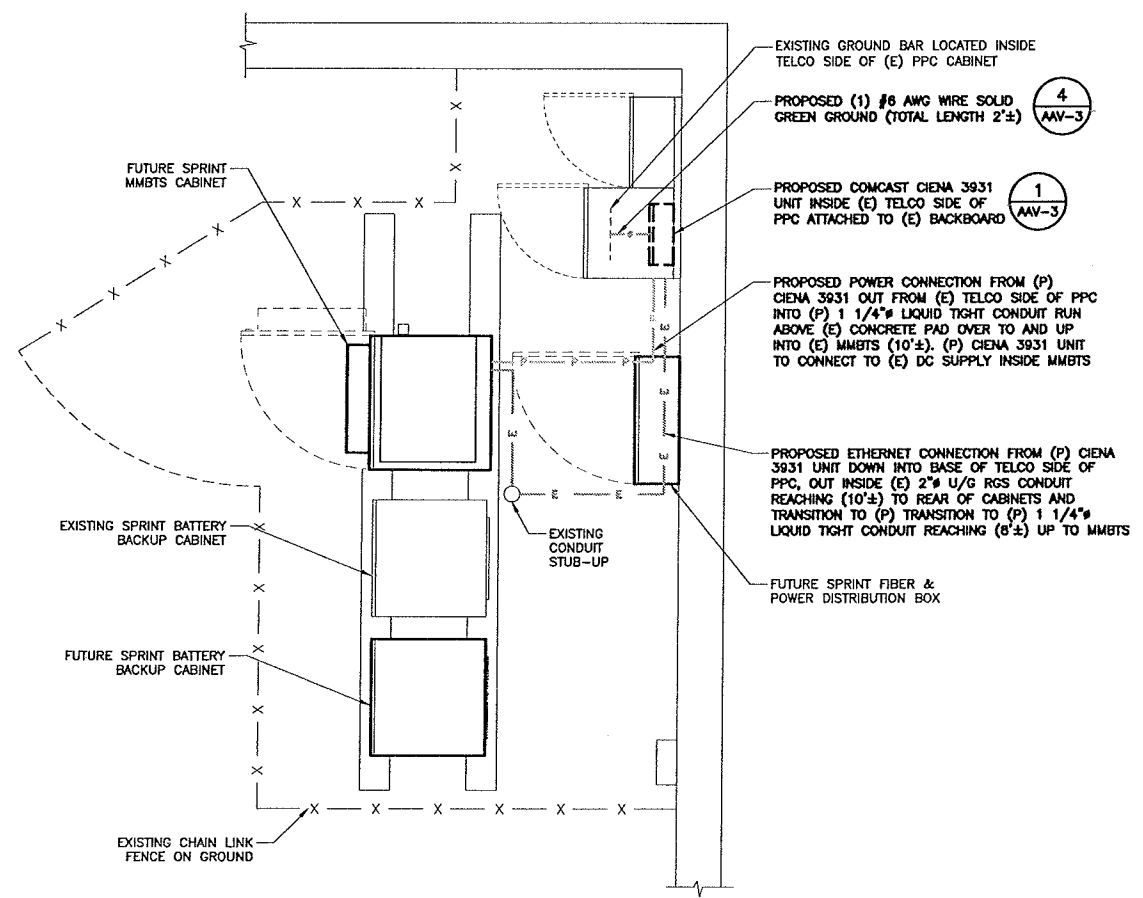


PROPOSED MEET POINT WILL BE AT WESTERN CORNER OF BUILDING AT TOP OF (P) BUILDING ATTACHMENT, (P) WEATHERHEAD AND (P) RISER. (P) FIBER 8 WILL ROUTE DOWN (20'±) IN (P) RISER THEN AROUND CORNER OF BUILDING AND FOLLOW BELOW (E) RCH ROUTE ALONG BUILDING FACE INSIDE (P) 2" RGS CONDUIT FOR (40'±) TO SPACE AT LEFT OF THE STAIRS (LEAVE 200' LOOP AT TOP OF (P) WEATHERHEAD)

(P) FIBER 8 WILL RUN IN COURTYARD INSIDE (P) 2" RGS CONDUIT FOR (15'±) DOWN BUILDING FACE, UNDER AND UP INTO (E) PPC ON TELCO SIDE TO JOIN (P) CIENA 3931 UNIT

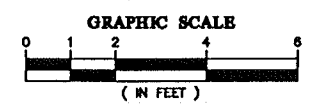
2
AAV-3

5
AAV-3



EQUIPMENT CABINET LAYOUT
SCALE: 1/2" = 1'-0"

2



NAME	SIGNATURE	DATE
SITE OWNER/LANDLORD		

NOTES:

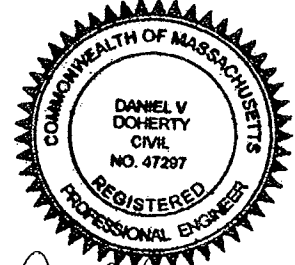
- CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72 HOURS PRIOR TO ANY EXCAVATION ACTIVITY:
A: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233
B: CALL BEFORE YOU DIG (CT): 1-800-922-4455
- PLANS ARE NOT TO BE SCALED.
- CONTRACTOR TO FIELD VERIFY DESIGN AND NOTIFY THE EBI CONSULTING A/E MANAGER OF ANY DESCEPENCES AND/OR IF EXISTING CONDUIT CANNOT BE UTILIZED.
- SPRINT TO PROVIDE POWER AS NECESSARY.

LEGEND:

PROPOSED POWER CONDUIT	----- P ----- P -----
PROPOSED FIBER CONDUIT	----- F ----- F -----
PROPOSED GROUND CONDUIT	----- G ----- G -----
PROPOSED ETHERNET CABLE	----- E -----



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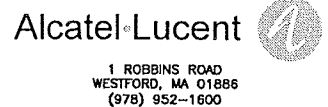


Daniel V. Doherty
ENGINEER STAMP/SIGNATURE

PREPARED FOR:



PROJECT COORDINATION & MANAGEMENT:



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SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
0	09/06/11	FOR CONSTRUCTION	SM
1	3/26/12	REVISED PER COMMENTS	MF
2	04/17/12	REVISED PER COMMENTS	KW
3	06/01/12	FINAL CD	JT
4	6/29/12	FINAL CD	SS

EBI JOB NO: 81110245

SITE INFO:

331 BROADWAY

BS60XC010

331-333 BROADWAY
SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:

ROOFTOP PLAN AND
EQUIPMENT CABINET
LAYOUT

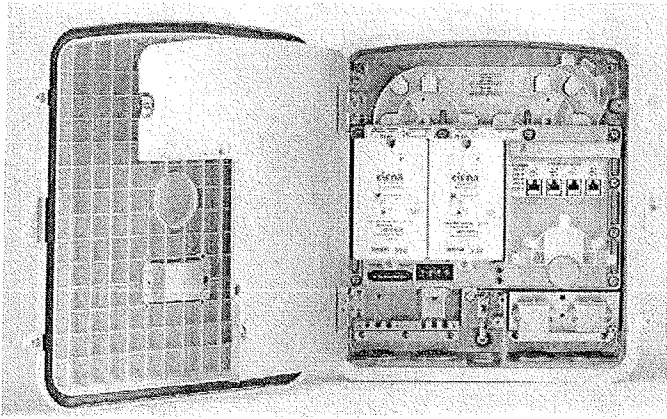
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DATE: 6/29/12
SHEET NO: AAV-2

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
4. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
7. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
8. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
10. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
11. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
12. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
13. THE CONTRACTOR SHALL NOTIFY THE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE REPRESENTATIVE.
14. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
15. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD OR VIA A REPRESENTATIVE. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. SEE UNDERGROUND UTILITY COMPANY SHEET T-1 (DIG SAFE, MISS UTILITY, ETC.).
16. IF ASSUMED EXISTING CONDITION DIFFERS, ENGINEER MUST BE INFORMED OF ACTUAL FIELD CONDITION.
17. REFER TO THE SITE PLAN FOR APPROXIMATE LENGTH OF ALL U/G WORK AND LOCATION. FINAL LOCATION TO BE DETERMINED BY CLIENT. ALL MATERIALS TO BE USED AS ACCORDING TO DETAIL INSTRUCTIONS. ALL MATERIALS NOT INCLUDED IN THE DETAILS SHALL BE USED ACCORDING TO CODE AND/OR LOCAL JURISDICTION REGULATIONS INCLUDING MATERIALS, PREPARATION, EXCAVATION, EQUIPMENT AND INSTALLATION FOR UNDERGROUND WORK.
21. CONTRACTOR TO COORDINATE WITH SPRINT & PROVIDE GROUND BOND PER NEC--250 & T-MOBILE STANDARDS FOR CLIENT EQUIPMENT AS REQUIRED.
22. ALL ELECTRICAL SPECIFICATIONS SHALL BE IN STRICT ACCORDANCE TO SECTIONS 16010, 16075, 16110, 16120, 16410, AND 16450 OF THE N.E.C.

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. PROVISION OF AC/DC POWER IS UNDER SEPARATE SCOPE OF WORK.
5. GROUNDING SHALL COMPLY WITH NEC ART. 250. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION FITTINGS. TEST COMPLETED GROUND SYSTEM AND ENSURE ADEQUACY.
8. CONTRACTOR TO PROVIDE GALV. P1000 UNISTRUT FRAMING AND 3/8" GALV. U-BOLTS/BOLTS AS NECESSARY FOR EXISTING CONDITIONS AND TO VERIFY SPACE IS APPROVED BY ALL NECESSARY PARTIES.

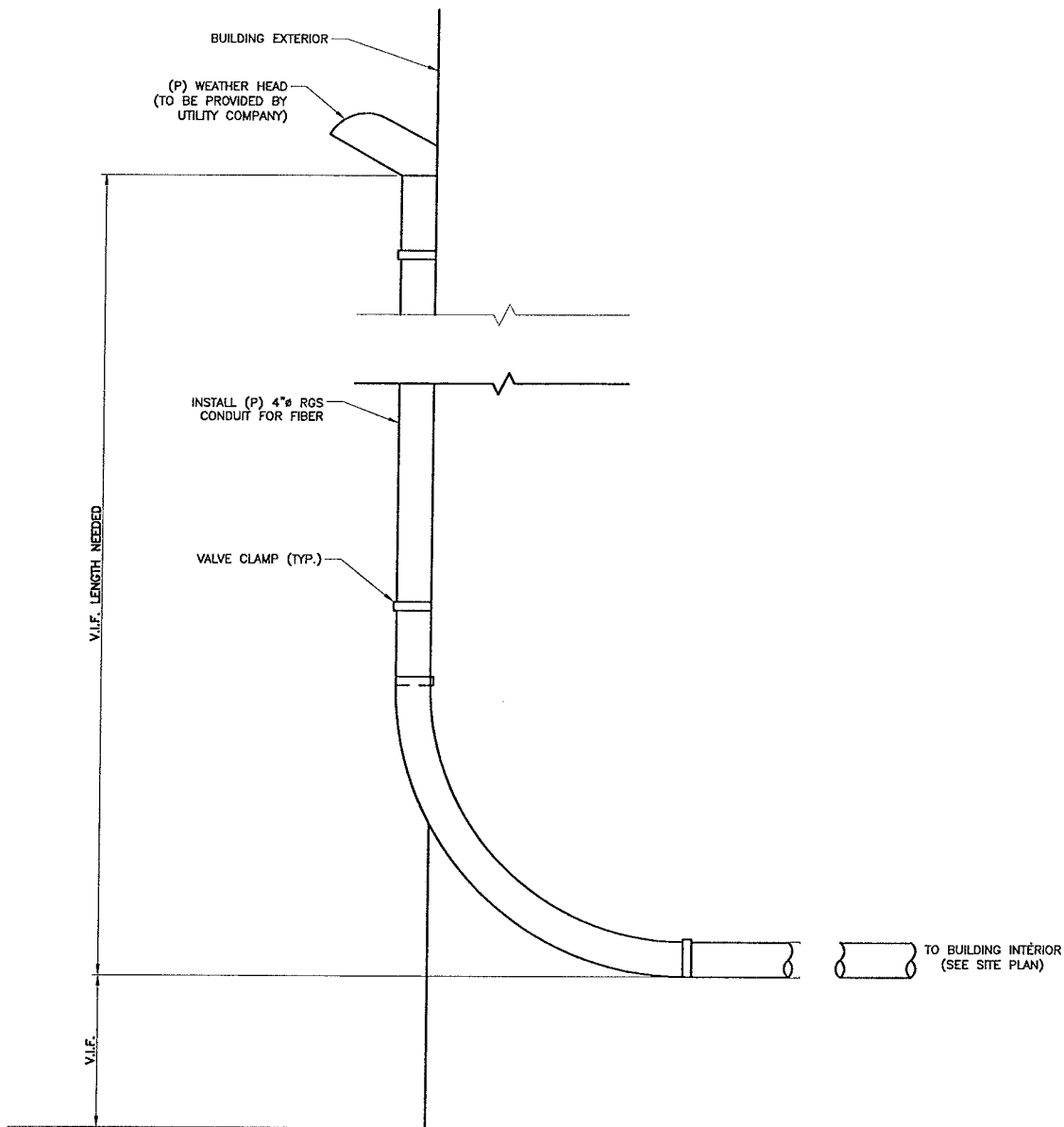


3931
17.0"(H) x 16.8"(W) x 7.0"(D),
WEIGHT: 28.6 LBS

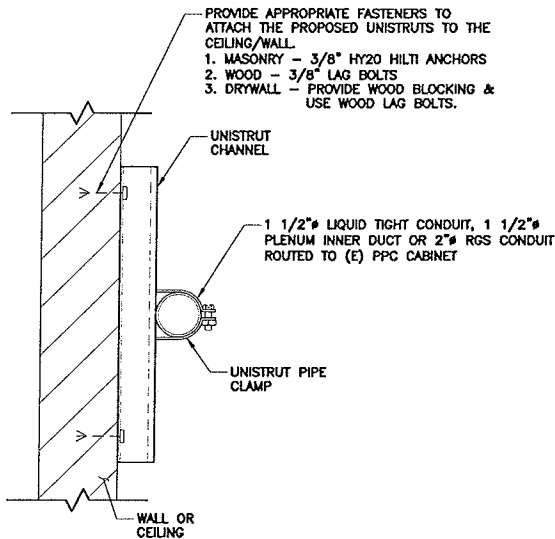
NOTES:

1. PROVIDE A MINIMUM DOOR CLEARANCE OF 17.5".
2. PROVIDE A MINIMUM ABOVE GRADE HEIGHT TO THE BOTTOM OF THE CHASSIS OF 2'-6".
3. REFER TO CIENA'S ACTIVEEDGE 3931 HARDWARE INSTALLATION MANUAL FOR ADDITIONAL INFORMATION.

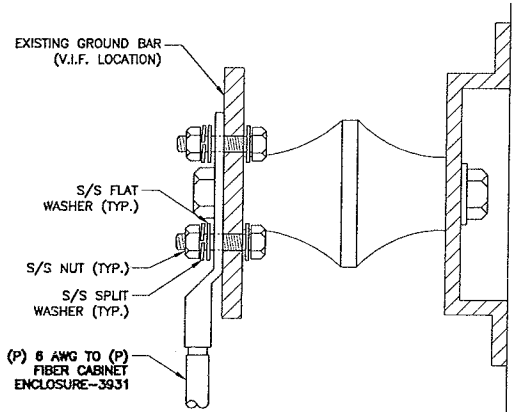
COMCAST CABLE
CIENA UNIT - 3931
SCALE: N.T.S.



RISER DETAIL
SCALE: N.T.S.

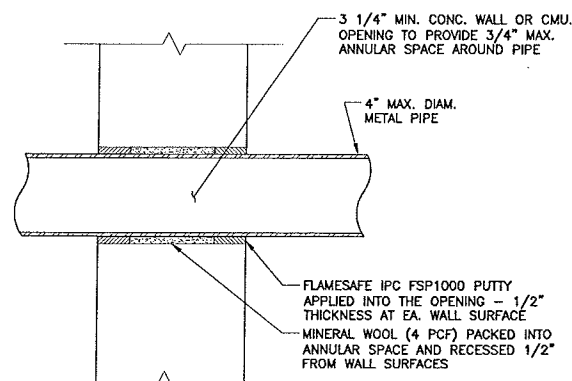


CONDUIT SUPPORT DETAIL
SCALE: N.T.S.



- NOTES:
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
 2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION LUG BARREL AND CRIMPING.
 3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

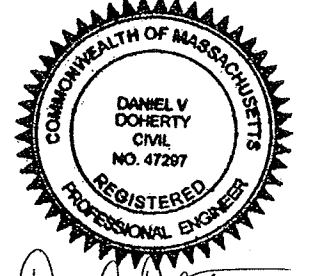
GROUND BAR DETAIL
SCALE: N.T.S.



TYPICAL WALL PENETRATION
SCALE: N.T.S.



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MAHWAH, NJ 07495
PHONE: (800) 357-7641

PROJECT COORDINATION & MANAGEMENT:
Alcatel-Lucent
1 ROBBINS ROAD
WESTFORD, MA 01886
(978) 952-1600

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SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:
DETAILS

DRAWN BY: SM
CHECKED BY: DD
DATE: 06/29/12
SHEET NO: AAV-3

NOTES TO CONTRACTOR

- ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL AND ENGINEERING DRAWINGS AND SPECIFICATIONS.
- ALL ELECTRICAL WORK SHALL COMPLY WITH THE WIRELESS CARRIERS INSTALLATION GUIDE.
- THE ELECTRICAL CONTRACTOR SHALL INITIATE AND COORDINATE EXACT UTILITY SERVICES WITH LOCAL UTILITY COMPANIES IN ADVANCE OF CONSTRUCTION TO CONFIRM CAPACITIES, CONNECTION POINT, ROUTING AND ASSOCIATED WORK REQUIREMENTS TO COMPLETE THE INSTALLATION AND MEET CONSTRUCTION SCHEDULE. IF SITE CONDITIONS REQUIRE, THE CONTRACTOR IS TO PROVIDE AND INSTALL ALL UNDERGROUND CABLES AND DUCT BANKS AS REQUIRED BY THE UTILITY COMPANY. COORDINATE CONDUIT ROUTE OF UNDERGROUND SERVICE IN THE FIELD WITH THE WIRELESS CARRIERS CONSTRUCTION MANAGER AND RESPECTIVE UTILITY COMPANIES.
- THE CONTRACTOR SHALL PROVIDE TEMPORARY LIGHTING AND POWER AS REQUIRED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND OSHA REQUIREMENTS AND TO COMPLETE WORK WITHOUT INTERRUPTION OF EXISTING SERVICE TO BUILDING AND/OR EQUIPMENT UNLESS OTHERWISE AGREED TO 48-HOURS IN ADVANCE WITH THE WIRELESS CARRIERS CONSTRUCTION MANAGER.
- THE LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE PLANS ARE DIAGRAMMATIC. EXACT LOCATION AND ROUTING SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD PRIOR TO INSTALLATION WITH THE APPROVAL OF THE WIRELESS CARRIERS CONSTRUCTION MANAGER OR OTHERWISE BE REROUTED AT THE EXPENSES OF THE CONTRACTOR.
- ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUITS. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN DRAWINGS). LOCATION OF OUTLETS, BOXES, ETC. AND THE TYPE OF CONNECTION (PLUG OR DIRECT), SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
- THE CONTRACTOR SHALL PERFORM IEEE "THREE POINT FALL OF POTENTIAL" RESISTANCE TO EARTH TEST FOR GROUND ELECTRODE SYSTEM AT EXTERIOR LOCATED SITES. THE CONTRACTOR SHALL INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. REFER TO THE WIRELESS CARRIERS INSTALLATION GUIDE FOR COMPLETE TESTING AND RECORDING REQUIREMENTS.
- PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDINGS. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTION MANAGERS APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- PENETRATION OF THE ROOF MEMBRANE IS PROHIBITED EXCEPT WITH THE APPROVAL OF BUILDING OWNER/MANAGEMENT AND HIS ROOFING CONTRACTOR. CONTRACTOR TO COORDINATE WITH THE BUILDING ROOFING CONTRACTOR AND FLASH ALL PENETRATIONS TO THE SATISFACTION OF THE BUILDING OWNER/MANAGEMENT TO MAINTAIN THE ROOFING WARRANTY, IF ANY.
- ELECTRICAL EQUIPMENT SHALL BE FIRMLY SECURED TO THE SURFACE ON WHICH IT IS MOUNTED.
- COMMUNICATION EQUIPMENT AND RACEWAYS SHALL COMPLY WITH REQUIREMENTS OF NEC CHAPTER 8 AND ARTICLE 480 WHERE APPLICABLE.

ELECTRICAL SPECIFICATIONS

SECTION 16010 - GENERAL PROVISIONS

- ALL APPLICABLE PROVISIONS OF DIVISION 01 GOVERN WORK UNDER THIS DIVISION. REFER TO THIS ARTICLE ON THE DRAWINGS FOR ADDITIONAL INFORMATION.
- THIS CONTRACTOR SHALL GUARANTY FULLY ALL WORKMANSHIP, MATERIAL, EQUIPMENT, SYSTEMS, ETC., PROVIDED BY HIM FOR A PERIOD OF ONE YEAR AFTER SUBSTANTIAL COMPLETION OF THE PROJECT.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE APPLICABLE STATE, NATIONAL AND LOCAL ORDINANCES, BUILDING CODES AND THE NATIONAL ELECTRIC CODE, AND THE TERMS AND THE CONDITIONS OF THE AUTHORITIES HAVING LAWFUL JURISDICTION PERTAINING TO THE WORK REQUIRED. ALL MODIFICATIONS REQUIRED BY THESE CODES, RULES, REGULATIONS, AND AUTHORITIES SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL CHARGE TO THE OWNER.
- ALL MATERIALS, APPLIANCES, EQUIPMENT, OR DEVICES SHALL BE NEW AND SHALL BE SPECIFICATION GRADE AND LISTED, LABELED AND CERTIFIED BY UNDERWRITER'S LABORATORIES INC. FOR THE USE. ALL OUTDOOR ELECTRICAL ENCLOSURES SHALL BE WEATHERPROOF AND BE NEMA 250, TYPE 3R RATED, OR BETTER.

SECTION 16075 - ELECTRICAL IDENTIFICATION

- PROVIDE AND INSTALL WARNING, CAUTION AND INSTRUCTION SIGNS WHERE REQUIRED TO COMPLY WITH N.E.C. AND OSHA REGULATIONS AND WHERE NEEDED TO ENSURE SAFE OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS TO WHICH THEY CONNECT. ALL LABELS SHALL BE SUITABLE FOR EXTERIOR USE WHEN INSTALLED OUTDOORS.
- ALL ELECTRICAL EQUIPMENT SHALL BE MARKED AND LABELED FOR IDENTIFICATION PURPOSES WITH PHENOLIC NAMEPLATES SIZED IN RELATION TO THE APPARATUS AND ATTACHED ON THE EXTERIOR SURFACES INDICATING THE EQUIPMENT DESIGNATION, OPERATING VOLTAGE AND THE SOURCE SUPPLYING THE EQUIPMENT. ENGRAVED LABEL SHALL BE PROVIDED ON THE WIRELESS CARRIERS METER SOCKET ENCLOSURE.
- ALL CABLES OR CONDUCTORS SHALL BE IDENTIFIED WITH CIRCUIT IDENTIFICATION MARKERS IN EACH PULL BOX. J-BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS OR APPROVED EQUAL.
- ALL DIRECT BURIED CONDUITS SHALL BE PROVIDED WITH 6" WIDE 5 MIL THICK ALUMINIZED PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.
- ALL LABELS AND PANEL DIRECTORIES SHALL BE TYPEWRITTEN, NOT HAND WRITTEN.
- INSTALL LABEL ON EACH ACCESSIBLE SIDE OF ENERGIZED EQUIPMENT TO READ: MAINTAIN 30"(MIN)W X 36"D X 78"H CLEAR WORKING SPACE.

SECTION 16110 - RACEWAYS, BOXES AND FITTINGS

- INSTALL ALL CONDUIT AS REQUIRED FOR THIS CONTRACT PER NEC BY TYPE AND USE, UNLESS NOTED OTHERWISE WITHIN THIS SPECIFICATION.
- EXERCISE PARTICULAR CARE IN ROUTING AND GROUPING EXPOSED CONDUIT TO PRESENT NEAT AND WORKMANLIKE APPEARANCE WITH ALL LINES RUNNING PARALLEL WITH OR PERPENDICULAR TO SITE LINES AND EQUIPMENT.
- CUT ALL CONDUITS WITH AN APPROVED CUTTING MACHINE AND REAM AFTER THREADING TO REMOVE ALL BURRS.
- WHERE SIZE IS NOT SPECIFIED ON DRAWINGS, THE CONTRACTOR SHALL SIZE CONDUIT, JUNCTION BOX AND/OR PULL BOXES PER N.E.C. BASED ON WIRING REQUIREMENT. THE CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS OR NOT SHOWN, AND AS REQUIRED BY N.E.C. TO LIMITED BENDS IN CONDUITS TO AN EQUIVALENT OF (4) 90-DEGREE BENDS.

E. INSTALL FACTORY ELBOWS ON 2" AND ABOVE CONDUIT. FIELD BENDS AND OFFSETS SHALL BE MADE WITH AN APPROVED BENDING MACHINE. USE CONDUIT BODIES ASSEMBLY TO FACILITATE PULLING OF CONDUCTORS OR TO MAKE CHANGES IN CONDUIT DIRECTION TO AVOID CONFLICT IN CONFINED SPACE.

F. BURIED ELECTRICAL DUCTS SHALL USE SCHEDULE 80 RIGID PVC PLASTIC CONDUIT WITH WATERTIGHT JOINTS. ALL UNDERGROUND/BURIED 90° ELLS SHALL BE RIGID TYPE FITTINGS. USE RIGID GALVANIZED CONDUIT ELBOWS TO TRANSITION FROM PVC TO RIGID GALVANIZED STEEL CONDUIT INSTALLED FROM 18" BELOW GRADE AND ABOVE GRADE. ALL PVC CONDUITS BURIED LESS THAN 18" BELOW GRADE SHALL BE SCHEDULE 80.

G. EXPOSED OUTDOOR LOCATIONS SHALL USE RIGID GALVANIZED STEEL (RGS) CONDUIT, U.O.N. WITH THREADED OR RAIN TIGHT FITTINGS. EXPOSED THREADS SHALL BE PROTECTED WITH ZINC-RICH PAINT. USE SUN RESISTANT LIQUID TIGHT FLEXIBLE METALLIC CONDUIT AND WATERTIGHT CONNECTIONS WHERE REQUIRED TO MAKE FINAL CONNECTIONS TO EQUIPMENT IF IT IS NOT EXPOSED TO PHYSICAL DAMAGE, EXTREME HEAT OR COLD. ENSURE CONTINUITY OF THE BONDING AND GROUNDING SYSTEM WHEN CONDUITS TRANSITION TO NON METALLIC CONDUITS OR WHEN EXPANSION TYPE FITTINGS ARE USED.

H. DRY INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING (EMT) WITH STEEL COMPRESSION TYPE FITTINGS. THE USE OF SET SCREW FITTING IS NOT PERMITTED - NO EXCEPTION.

I. PROVIDE INSULATED BUSHINGS TO PREVENT ABRASION OF WIRES AND DOUBLE LOCKNUTS ON CONDUITS ENTERING OR LEAVING JUNCTION BOXES, PULL BOXES, ELECTRICAL DEVICES AND EQUIPMENT CABINETS. EQUIP ALL RGS CONDUIT WITH GROUND BUSHINGS AND GROUND IT TO THE COMMON GROUNDING ELECTRODE SYSTEM.

J. AVOID CONDENSATION POCKETS IN INSTALLATIONS. KEEP CONDUIT, FITTINGS AND BOXES FREE FROM FOREIGN MATTER BEFORE, DURING AND AFTER INSTALLATION.

K. ALL CONDUITS, INCLUDING THOSE WITH NEW CABLES INSTALLED, SHALL HAVE A NYLON PULL ROPE INSTALLED TO FACILITATE FUTURE PULL.

L. THE MINIMUM SIZE OF CONDUIT SHALL BE 3/4".

SECTION 16120 - CONDUCTORS

A. ALL POWER WIRE SHALL BE TYPE THHN/THWN INSULATED SINGLE COPPER CONDUCTOR, RATED AT 600 VOLTS 90°C TO COMPLY WITH UL & NEMA WC 70. MINIMUM WIRE SIZE FOR CURRENTS UP TO 20 AMPERE SHALL BE #12 AWG. BE SOLID COPPER UP TO SIZE #10 AWG AND SMALLER; STRANDED COPPER FOR #8 AWG AND LARGER. USE OF ALUMINUM CONDUCTORS WILL NOT BE PERMITTED.

B. USE MANUFACTURER-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.

C. USE PULLING MEANS; INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS THAT WILL NOT DAMAGE CABLES OR RACEWAY.

D. CONDUCTOR LENGTHS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION WITHOUT SPLICES AS MUCH AS POSSIBLE. SPLICES, JOINTS AND CONNECTIONS IN CABLE SHALL BE MADE ONLY IN PULL BOXES, JUNCTION BOXES OR MANHOLES. CABLE SHALL BE LOOPED IN ALL JUNCTION BOXES AND PULL BOXES, AND RACKED IN MANHOLES.

E. 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.

F. CONNECTORS AND LUGS FOR COPPER CONDUCTORS #8 AND SMALLER: 3M SCOTCHLOK SERIES 61 SNAP SPADE, OR ACCEPTABLE EQUAL OR T & B STA-KON COMPRESSION OR INDENT TYPE CONNECTORS WITH INTEGRAL OR SEPARATE INSULATING CAPS. FOR COPPER CONDUCTORS LARGER THAN #8: SOLDERLESS, INDENT, HEX SCREW OR BOLT TYPE PRESSURE CONNECTORS, PROPERLY TAPED OR INSULATED.

G. PROVIDE ADEQUATE LENGTH OF CONDUCTORS WITHIN ELECTRICAL ENCLOSURES AND TRAIN THE CONDUCTORS TO TERMINATION POINTS WITH NO EXCESS. MAKE TERMINATIONS SO THERE IS NO BARE CONDUCTOR AT THE TERMINAL.

H. COLOR CODE, PHASE, NEUTRAL, AND GROUND CONDUCTORS COLOR-CODED IN ACCORDANCE WITH NEC. IDENTIFY ALL CONDUCTORS OF THE SAME PHASE CONDUCTOR TO THE SAME COLOR CODE. SUGGESTED COLOR CODING FOR 120/208V, SHOULD BE BLACK, RED, BLUE, WHITE, AND 277/480V, SHOULD BE BROWN, ORANGE, YELLOW, GRAY WITH GREEN FOR ALL EQUIPMENT GROUND CONDUCTORS.

I. EACH CONDUIT OR RACEWAY THAT HAS A PHASE CONDUCTOR SHALL ALSO CONTAIN A GREEN INSULATED GROUNDING CONDUCTOR SIZED PER N.E.C., UNLESS OTHERWISE INDICATED.

J. AFTER THE ELECTRICAL EQUIPMENT AND THE WIRING IS INSTALLED, BUT BEFORE ELECTRICAL CONNECTIONS TO EQUIPMENT, TEST PHASE-TO-PHASE AND PHASE-TO-GROUND INSULATION ON SERVICE ENTRANCE AND FEEDERS TO ENSURE THAT THEY HAVE THE PROPER INSULATION AND ARE FREE OF GROUND FAULT. SYSTEMS RATED ABOVE 250 VOLTS SHALL BE TESTED WITH A 1000 VOLT MEGGER. CIRCUITS RATED AT OR BELOW 250 VOLTS SHALL BE TESTED WITH A 500 VOLT MEGGER.

K. CORRECT MALFUNCTIONING CONDUCTORS AND CABLES, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REMOVE AND REPLACE WITH NEW UNITS AND RETEST AS SPECIFIED. PER NEC770.3(A), THE REQUIREMENTS OF 300.21 FOR ELECTRICAL INSTALLATIONS SHALL ALSO APPLY TO INSTALLATIONS OF OPTICAL FIBER CABLES AND RACEWAYS. THE ACCESSIBLE PORTION OF ABANDONED OPTICAL FIBER CABLES SHALL BE REMOVED.

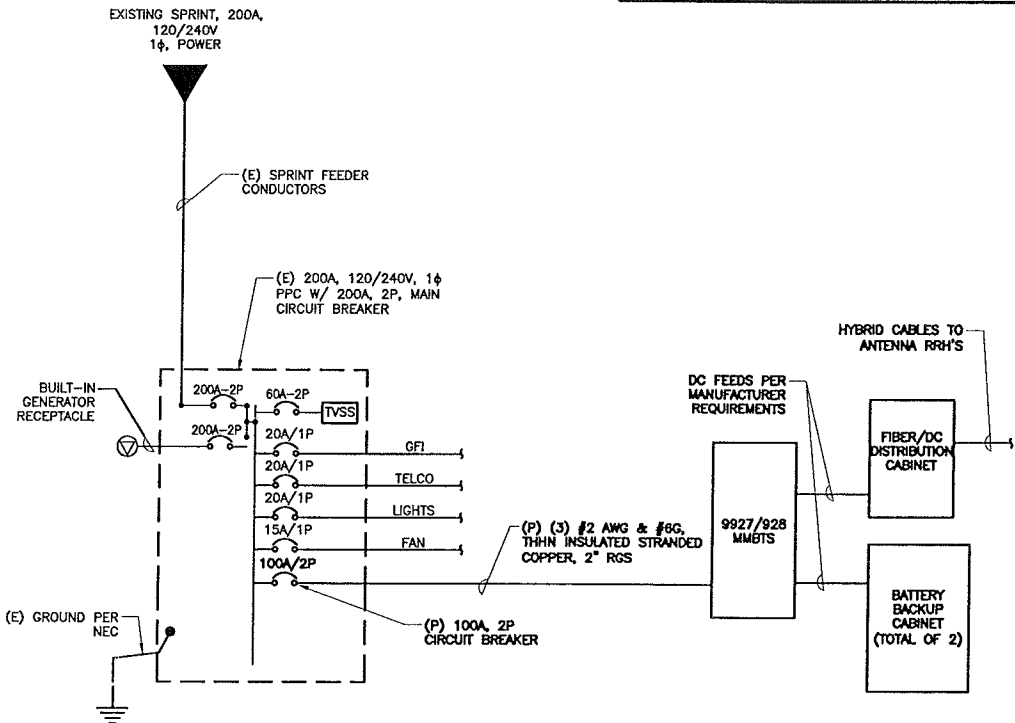
SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

A. MOLDED-CASE CIRCUIT BREAKER TO COMPLY WITH NEMA AB 1, WITH INTERRUPTING CAPACITY TO MEET RATING TO MATCH EXISTING OR AS REQUIRED FOR AVAILABLE FAULT CURRENTS. DO NOT USE SERIES RATING FOR NEW EQUIPMENT. IF EXISTING SERIES RATED EQUIPMENT IS SPECIFIED FOR USE IN THIS PROJECT, THEN PROVIDE CAUTION MARKING ON THE EXISTING EQUIPMENT ENCLOSURE THAT ARE SERIES RATED AS DESCRIBED IN NEC 110-22.

B. PROVIDE MOLDED CASE, BOLT-ON, THERMAL MAGNETIC TRIP, SINGLE, TWO OR THREE POLE BRANCH CIRCUIT BREAKERS AS SHOWN ON DRAWINGS. MULTIPLE POLE BREAKERS SHALL BE SINGLE HANDLE, COMMON TRIP AND MADE BY EQUIPMENT MANUFACTURER.

C. PROVIDE ENCLOSURE TO COMPLY WITH NEMA AB 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION. OUTDOOR LOCATIONS SHALL BE NEMA 250, TYPE 3R.

D. VERIFY EXISTENCE OF NEC 110.26 REQUIRED CLEAR WORKING SPACE AT THE FRONT OF ELECTRICAL EQUIPMENT PRIOR TO INSTALLATION.



SINGLE LINE DIAGRAM

SCALE: N.T.S.

ELECTRICAL LEGEND

SYMBOLS	ABBREVIATIONS
—○—	CONDUIT TURNING UP
—●—	CONDUIT TURNING DOWN
---	CONDUIT RUN UNDERGROUND
---	CONDUIT RUN ABOVE GROUND
⊗	METER ON METER/BREAKER UNIT
⊗	5/8" x 10'-0" COPPER CLAD GROUND ROD
⊗	5/8" x 10'-0" COPPER CLAD GROUND ROD WITH TEST WELL
⊗	EXOTHERMIC TYPE CONNECTION
⊗	COMPRESSION TYPE CONNECTION
⊗	GROUND RING. #2 AWG SOLID TINNED BARE COPPER GROUND CONDUCTOR 6" BELOW FROST LINE AND 24" OFF CONCRETE PLATFORM
⊗	REPRESENTS DETAIL NUMBER
⊗	REF. DRAWINGS NUMBER
⊗	DETAIL NUMBER
⊗	NON-FUSED DISCONNECT SWITCH
⊗	FUSED DISCONNECT SWITCH
⊗	CIRCUIT BREAKER
⊗	GROUNDING ELECTRODE
AWG	AMERICAN WIRE GAUGE
BTWC	BARE TINNED COPPER WIRE
BTS	BASE TRANSMISSION
CIGBE	COPPER ISOLATED GROUND BAR EXTERNAL
DWG	DRAWINGS
EIGB	EQUIPMENT ISOLATED GROUND BAR
EMT	ELECTRICAL METALLIC TUBING
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
IGR	INTERIOR GROUND RING (HALO)
LAGB	LOWER ANTENNA COPPER GROUND BAR
MGB	MASTER ISOLATED GROUND BAR
PPC	POWER PROTECTION CABINET
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
TYP	TYPICAL
(E)	EXISTING
(P)	PROPOSED

DISCLAIMER NOTE:
1. PROVIDING RADIOFREQUENCY HAZARD WARNING SIGNS, AWARENESS OF THE POTENTIAL FOR RF EXPOSURE IN A WORKPLACE OR SIMILAR ENVIRONMENT, SPECIFIC TRAINING AS PART OF AN RF SAFETY PROGRAM, OTHER FCC REQUIRED MEASURES REGARDING THE EFFECT OF RADIO FREQUENCY ON THE HUMAN ENVIRONMENT WITH REGARD TO EXPOSURE OF THE GENERAL PUBLIC, REPORTING STORAGE BATTERIES, AND DESIGN OF FAA REQUIRED OBSTRUCTION LIGHTING ARE NOT PART OF THE EBI CONSULTING A&E DEPARTMENT'S SCOPE OF WORK.

NOTE: (APPLY TO SINGLE LINE DIAGRAM)

- CONTRACTOR SHALL PROVIDE 100A, 240V, 2P CIRCUIT BREAKER AS NECESSARY IN THE EXISTING SPRINT PPC (MATCH EXISTING CIRCUIT BREAKERS) FOR THE (P) 9927/928 MMBTS.
- ELECTRICAL CONTRACTOR TO VERIFY IN THE FIELD THAT THE EXISTING CONDUCTORS SERVICING THE EXISTING BTS CABINET FROM THE EXISTING POWER PANEL IS RATED, EQUAL TO OR GREATER THAN, #2 AWG, THHN/THWN, SPECIFIED FOR THE PROPOSED 9927/928 MMBTS REPLACEMENT CABINET. UPGRADE CONDUCTORS AND OR CONDUIT AS NEEDED TO ENSURE COMPLIANCE WITH THE NEC.



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81110245

SITE INFO:

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BS60XC010

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SOMERVILLE, MA 02143
MIDDLESEX COUNTY

SHEET TITLE:

ELECTRICAL NOTES
& RISER DIAGRAM

DRAWN BY:

SM

SHEET NO:

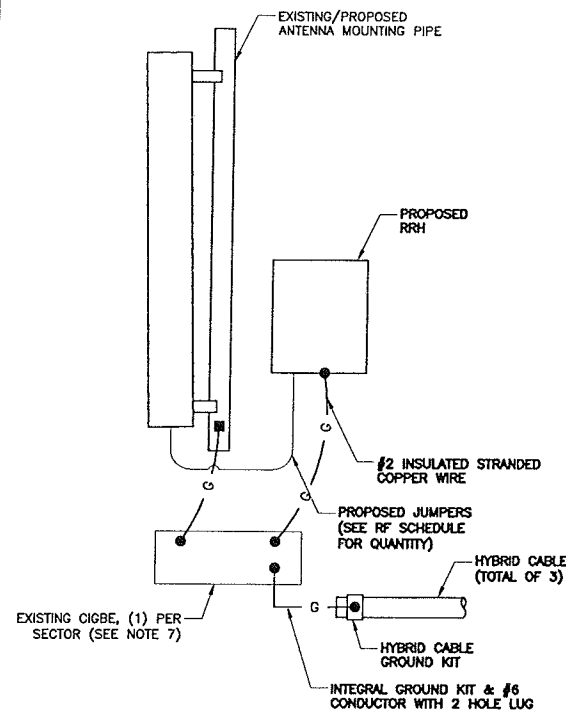
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DATE:

09/06/11

E-1

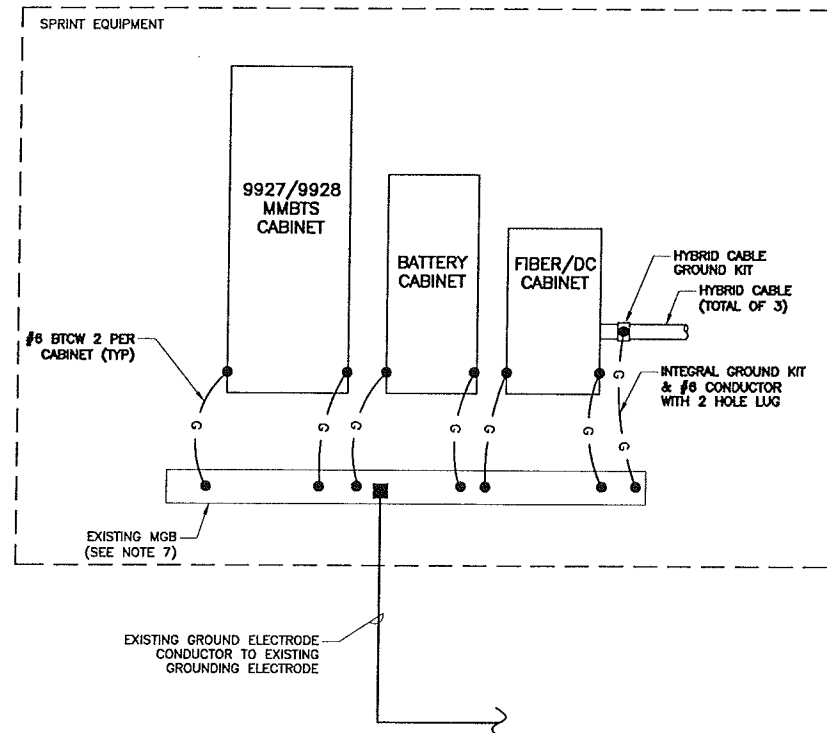


1. TYPICAL FOR ALL SECTORS.
2. REFER TO PLANS FOR QUANTITY & LOCATION OF NEW ANTENNAS, EQUIPMENT & ANTENNA MOUNTING PIPES.

ANTENNA
GROUNDING DIAGRAM

SCALE: N.T.S.

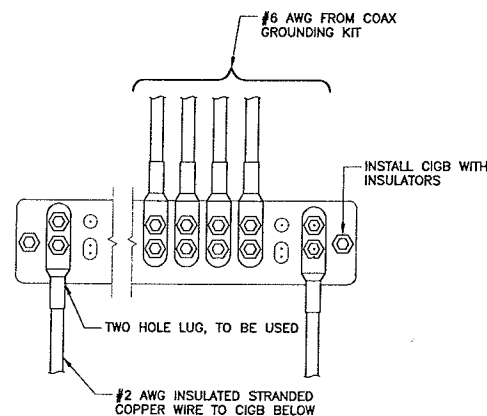
1



NEW EQUIPMENT
GROUNDING PLAN

SCALE: N.T.S.

2



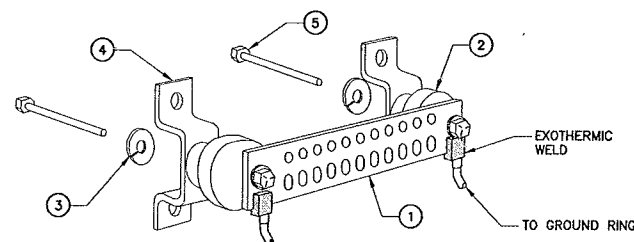
NOTE:

1. CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS.

ANTENNA
GROUND BAR DETAIL

SCALE: N.T.S.

3

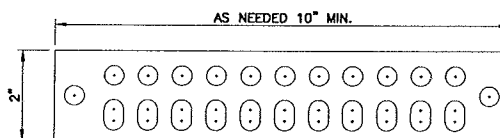


LEGEND

1. ZINC COATED TINNED COPPER HARGER GROUND BAR, 1/4"X 2"X 10", HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2. STANDOFF INSULATORS, HARGER LIGHTNING PROTECTION, INC. CAT. NO. 5263-A8
3. 1/2" LOCKWASHERS, HARGER CO. CAT. NO. LW85
4. WALL MOUNTING STAINLESS STEEL MOUNTING BRACKET, HARGER CAT NO. WBKT-1
5. 1/2-13 X 1" HEX HEAD CAP SCREW, HARGER. CAT NO. CS885

NOTES:

ALL HOLES ARE 7/16" UNLESS SPECIFIED DIFFERENTLY.



GROUND BAR DETAIL

SCALE: N.T.S.

4

GROUNDING NOTES

1. SEE DRAWING E-1 FOR LEGEND AND ABBREVIATIONS
2. ALL GROUND WIRES SHALL BE BARE #2 AWG BCW UNLESS NOTED OTHERWISE
3. ALL GROUND WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF GROUND RODS AND GROUND RING WITH FOUNDATION AND UNDERGROUND CONDUIT.
5. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS SHALL HAVE (2) CONNECTIONS.
6. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
7. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
8. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
9. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
10. WHEN CABLE LENGTH IS OVER 20', THE MANUFACTURER'S GROUND KIT MUST BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS
11. GROUND SYSTEM SHALL BE TESTED AND SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS.

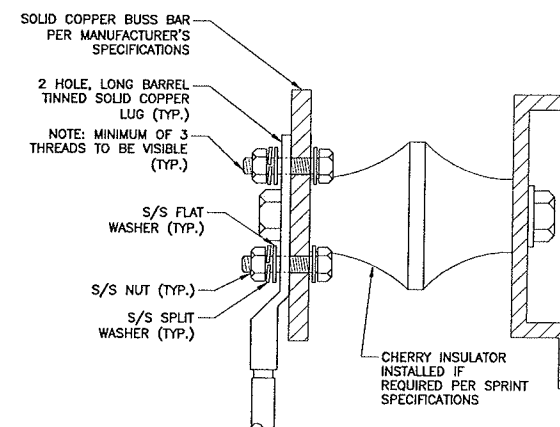
ELECTRICAL SPECIFICATIONS

SECTION 16450 - GROUNDING

1. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER'S REQUIREMENTS.
2. THE AC PANEL IN THE POWER CABINET IS WIRED AS A SERVICE ENTRANCE, IF IT IS USED AS SERVICE PANEL THE NEC-250.66 REQUIRED GROUNDING ELECTRODE CONDUCTOR SHALL BE INSTALLED IN THE AC POWER CONDUIT. THE INSTALLATION SHALL BE PER LOCAL AND NATIONAL ELECTRIC CODE (NFPA-70). IN THE CASE THAT MAIN SERVICE DISCONNECT IS SUPPLIED AT THE MAIN METER LOCATION, THE BOND BETWEEN NEUTRAL AND EQUIPMENT GROUNDING CONDUCTOR IN THE AC PANEL SHALL BE REMOVED BY CONTRACTOR.
3. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHIELD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
4. THE ANTENNA CABLES SHALL BE GROUNDED AT THE TOP AND BOTTOM OF THE VERTICAL RUN FOR LIGHTNING PROTECTION. THE ANTENNA CABLE SHIELD SHALL BE BONDED TO A COPPER GROUND BUS AT THE LOWERMOST POINT OF A VERTICAL RUN JUST BEFORE IT BEGINS TO BEND TOWARD THE HORIZONTAL PLANE. WIRE RUNS TO GROUND SHALL BE KEPT AS STRAIGHT AND SHORT AS POSSIBLE. ANY ANTENNA CABLES OVER 200 FEET IN LENGTH SHALL ALSO BE EQUIPPED WITH ADDITIONAL GROUNDING AT MID-POINT.
5. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICALLY INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
6. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX", OR EQUAL.

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES

- A. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANELS, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
- B. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
- C. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH LIGHTSQUARED PROJECT MANAGER.
- D. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
- E. INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
- F. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
- G. GROUND COAXIAL SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.



NOTES:

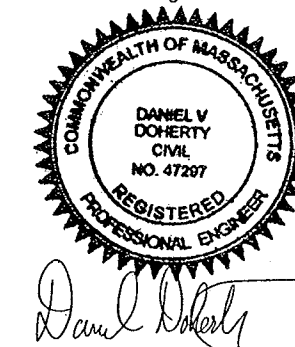
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

GROUND LUG DETAIL

SCALE: N.T.S.

5

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MIDDLESEX COUNTY

SHEET TITLE:

GROUNDING
DETAILS & NOTES

DRAWN BY:

SM

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DD

DATE:

SHEET NO:

E-2

TOWER TOP SCENARIO 2

800 AND SINGLE 1900 RRH PAIR WITH SINGLE 800/1900 RADOME ANTENNA
(800 HOSTING 1900 RET)

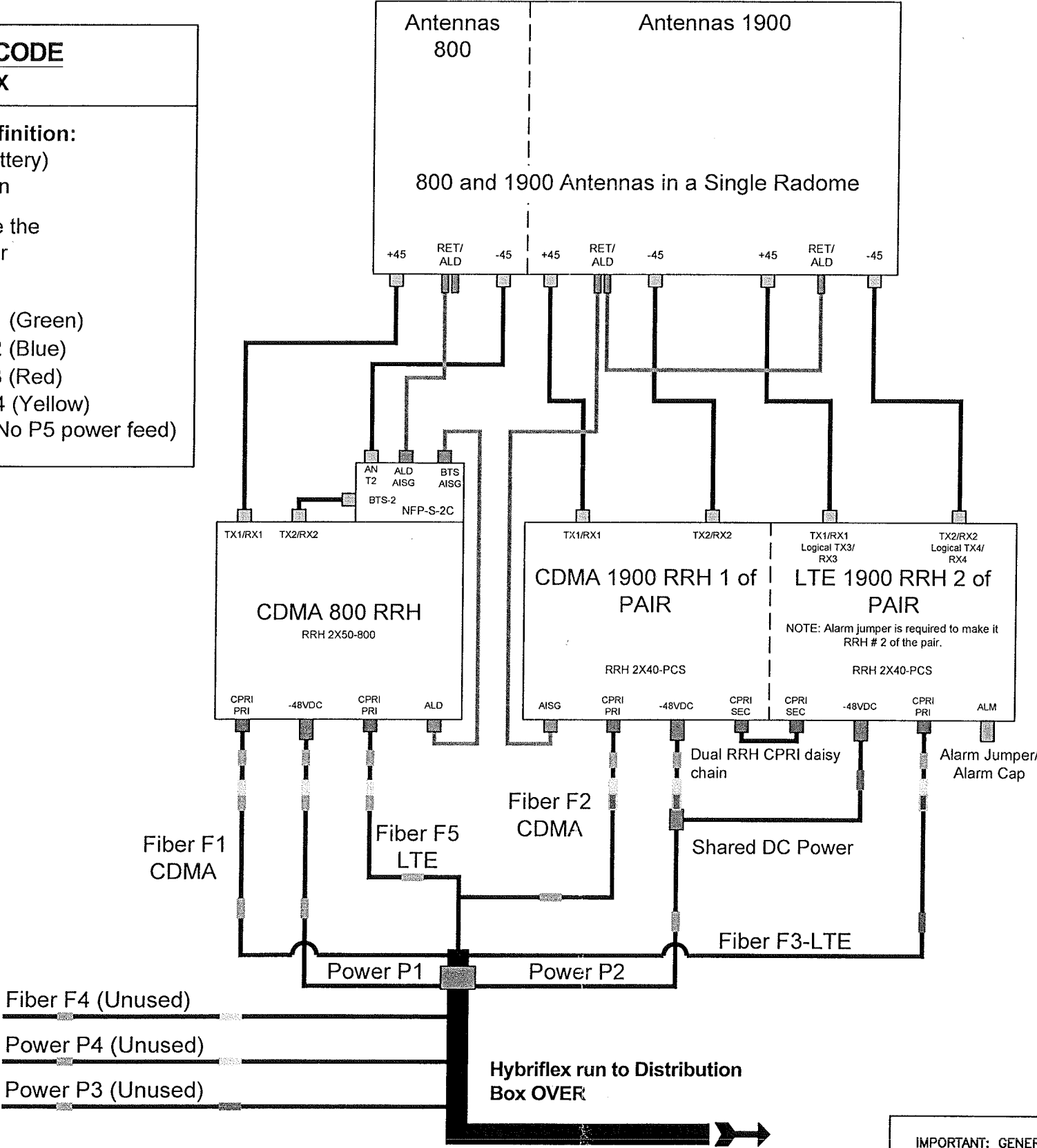
OEM COLOR CODE
HYBRIFLEX

Power Feed Polarity Definition:

- Black= -48VDC Feed (Battery)
- Black/White Stripe=Return

Note: For power feed use the same Hybriflex OEM color designator as the fiber.

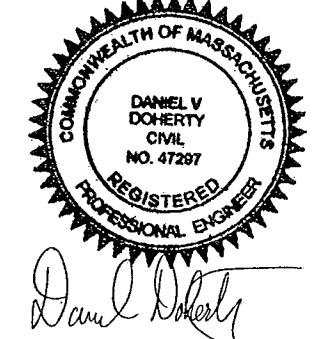
- MM Pair 1=F1=Green=P1 (Green)
- MM Pair 2=F2=Green=P2 (Blue)
- MM Pair 3=F3=Green=P3 (Red)
- MM Pair 4=F4=Yellow=P4 (Yellow)
- MM Pair 5=F5=Orange=(No P5 power feed)



IMPORTANT: GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST NETWORK VISION RAN CONNECT DIAGRAMS ARE USED FOR EQUIPMENT INSTALLATIONS



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ANTENNA WIRING DIAGRAM

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