

GENERAL

APPLICABILITY - SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE SHALL BE INTERPRETED TO MEAN ANY PORTION OF A NEW BUILDING CONSTRUCTED WHERE RADIO COVERAGE SIGNAL STRENGTH LEVELS ARE NOT CONSISTENT WITH SECTION 510 EMERGENCY RESPONDER COMMUNICATION COVERAGE / OF THE 2021 ARKANSAS FIRE PREVENTION CODE. ALSO CHECK THE CITY OF BENTONVILLE AMENDMENTS TO THE 2012 ARKANSAS FIRE PREVENTION CODE VOL. 1 (FIRE).

ADDITIONAL FREQUENCIES

ADDITIONAL FREQUENCIES - FREQUENCIES USED BY THE BENTONVILLE FIRE DEPARTMENT MAY CHANGE AS A RESULT OF FCC ORDER, OR OTHER OPERATIONAL REQUIREMENTS OF THE BENTONVILLE FIRE DEPARTMENT. IN THE EVENT OF SUCH FREQUENCY CHANGE, AND UPON NOTIFICATION BY THE BENTONVILLE FIRE DEPARTMENT, THE BUILDING OWNER SHALL MODIFY OR EXPAND THE EMERGENCY RESPONDER RADIO SYSTEM COVERAGE AT THEIR OWN EXPENSE. THE AHJ MAY REQUIRE COVERAGE IN THE FUTURE FOR FIRSTNET BROADBAND SERVICES AS NFPA 72, NFPA 1221 AND FIRE CODE 510 ARE AMENDED.

LABELING

- PROVIDE SIGN ON ALL DOORS PROVIDING ACCESS TO ERRS STATING: "EMERGENCY RESPONDER RADIO SYSTEM EQUIPMENT INSIDE"
- PROVIDE SIGN ON DONOR ANTENNAS STATING: "EMERGENCY RESPONDER RADIO SYSTEM."

SYSTEM COMPONENTS

SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE SHALL BE ENFORCED WITH THE FOLLOWING ADDITIONAL CLARIFICATIONS:

EQUIPMENT
ALL EQUIPMENT SHALL BE LISTED BY NATIONALLY RECOGNIZED TESTING LABORATORY FOR ITS INTENDED USE.

EXTERNAL FILTERS - PERMANENT EXTERNAL FILTERS AND ATTACHMENTS SHALL NOT BE PERMITTED.

SIGNAL BOOSTER COMPONENTS - IF USED, SIGNAL BOOSTERS SHALL MEET THE FOLLOWING REQUIREMENTS:
1. SIGNAL BOOSTERS SHALL HAVE FCC CERTIFICATION PRIOR TO INSTALLATION AND SHALL BE NFPA72 AND/OR IFC510.1 COMPLIANT.
2. ALL SIGNAL BOOSTERS SHALL BE COMPATIBLE WITH BOTH ANALOG AND DIGITAL COMMUNICATIONS SIMULTANEOUSLY AT THE TIME OF INSTALLATION.

POWER SOURCES - AT LEAST TWO INDEPENDENT AND RELIABLE POWER SOURCES SHALL BE PROVIDED FOR ALL REPEATER, TRANSMITTER, RECEIVER, AND SIGNAL BOOSTER COMPONENTS, ONE PRIMARY AND ONE SECONDARY.

ALL REPEATER, TRANSMITTER, RECEIVER, SIGNAL BOOSTER COMPONENTS, EXTERNAL FILTERS AND BATTERY SYSTEM COMPONENTS SHALL BE CONTAINED IN UL APPROVED TYPE 4 OR 4X.

- DONOR ANTENNA CABLING AND CONNECTIONS SHALL BE WEATHERPROOF, PROTECTED FROM PHYSICALLY DAMAGE AND PROPERLY SUPPORTED.

PATHWAY SURVIVABILITY - ALL SYSTEM RISER CABLES SHALL BE IN CONDUITS AND SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING:
1. BUILDINGS WHERE INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURE ARE REQUIRED TO HAVE FIRE-RESISTANCE RATING OF NO LESS THAN TWO HOURS:
> 2-HOUR FIRE-RATED CIRCUIT INTEGRITY (CI) CABLE
> 2-HOUR FIRE-RATED CABLE SYSTEM
> 2-HOUR FIRE-RATED ENCLOSURE OR PROTECTED AREA
> 2-HOUR PERFORMANCE ALTERNATIVE APPROVED BY THE AHJ
2. BUILDINGS WHERE INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURE ARE REQUIRED TO HAVE FIRE-RESISTANCE RATING OF NO LESS THAN ONE HOUR:
> 1-HOUR FIRE-RATED CI CABLE
> 1-HOUR FIRE-RATED CABLE SYSTEM
> 1-HOUR FIRE-RATED ENCLOSURE OR PROTECTED AREA
> 1-HOUR PERFORMANCE ALTERNATIVE APPROVED BY THE AHJ

POWER SOURCES

A) PRIMARY POWER SOURCE - THE PRIMARY POWER SOURCE SHALL BE SUPPLIED FROM A DEDICATED BRANCH CIRCUIT AND COMPLY WITH NFPA 72, 2016 EDITION, SECTION 10.6.5.1.

B) SECONDARY POWER SOURCE - IN THE EVENT OF A FAULT OR FAILURE OF THE PRIMARY POWER SUPPLY, ERRS SYSTEM SHALL AUTOMATICALLY AND IMMEDIATELY TRANSFER TO A SECONDARY POWER SOURCE, WHILE CONSTANTLY MAINTAINING ALL ERRS REQUIRED FUNCTIONS AND OPERATION AVAILABLE WITHOUT RESTARTING THE SYSTEM. ONE OF THE FOLLOWING SECONDARY POWER SOURCES CAN BE USED:
1. A STORAGE BATTERY DEDICATED TO THE SYSTEM WITH AT LEAST 24-HOURS AT 100% SYSTEM OPERATION CAPACITY AND ARRANGED IN ACCORDANCE WITH NFPA 72, 2016 EDITION, SECTION 10.6.10
2. A GENERATOR APPROVED BY THE AHJ

C) ALL ELECTRICAL BREAKERS FOR ERRS SHALL BE PROPERLY LABELED AND SHALL BE PROVIDED WITH AN APPROVED BREAKER LOCKING DEVICE.

SYSTEM MONITORING

THE PUBLIC SAFETY RADIO COMMUNICATIONS ENHANCEMENT SYSTEM SHALL INCLUDE AUTOMATIC SUPERVISORY AND TROUBLE REPORTING FOR MALFUNCTIONS OF THE SIGNAL BOOSTER AND POWER SUPPLIES THAT ARE ANNUNCIATED BY THE FIRE ALARM SYSTEM AND UL LISTED SUPERVISING STATION MONITORING COMPANY, OR SHALL BE MONITORED AT A CONSTANTLY ATTENDED LOCATION AT THE BUILDING AND COMPLY WITH THE FOLLOWING:
1. THE INTEGRITY OF CIRCUIT MONITORING SIGNAL BOOSTERS AND POWER SUPPLIES SHALL COMPLY WITH NFPA 72, 2016 EDITION, 10.6.9 AND 12.6
2. SYSTEM AND SIGNAL BOOSTER SUPERVISORY SIGNALS SHALL INCLUDE THE FOLLOWING:
> ANTENNA MALFUNCTION
> SIGNAL BOOSTER FAILURE
> LOW BATTERY INDICATION WHEN 70 PERCENT OF THE 24-HOUR OPERATION CAPACITY HAS BEEN DEPLETED
3. POWER SUPPLY SIGNALS SHALL INCLUDE THE FOLLOWING FOR EACH SIGNAL BOOSTER:
> LOSS OF NORMAL POWER
> FAILURE OF BATTERY CHARGER

ERRS SIGNALS ON FIRE ALARM ANNUNCIATOR PANEL SHALL BE LABELED "EMERGENCY RESPONDER RADIO SYSTEM." THERE SHALL BE ONE GREEN LED SIGNAL INDICATING ERRS IN NORMAL MODE AND ONE YELLOW LED INDICATING SYSTEM IS IN TROUBLE.

AUTOMATIC SMOKE DETECTION - SMOKE DETECTOR SHALL BE PROVIDED AT THE LOCATION OF EACH ERRS CONTROL UNIT(S), STORAGE BATTERY UNIT(S) AND MONITORING PANEL.

DEDICATED PANEL

A DEDICATED MONITORING PANEL SHALL BE PROVIDED IN AN AREA ACCEPTABLE AND APPROVED BY THE 2021 ARKANSAS FIRE PREVENTION CODE TO ANNUNCIATE THE STATUS OF ALL SIGNAL BOOSTER LOCATIONS. IN BUILDINGS WITH FIRE ALARM SYSTEMS, A SMOKE DETECTOR SHALL BE PROVIDED ABOVE MONITORING PANEL. THE MONITORING PANEL SHALL PROVIDE VISUAL AND LABELED INDICATION OF THE FOLLOWING FOR EACH SIGNAL BOOSTER:
*NORMAL 120VAC POWER
*SIGNAL BOOSTER TROUBLE
*LOSS OF NORMAL 120VAC POWER
*FAILURE OF BATTERY CHARGER
*LOW BATTERY CAPACITY
*DONOR ANTENNA FAILURE

IN SPECIAL CIRCUMSTANCES WHERE A DEDICATED PANEL CANNOT BE INSTALLED, A REQUEST FOR MODIFICATION MUST BE SUBMITTED AND APPROVED TO ANNUNCIATE ON FACP.

ACCEPTANCE TEST

ACCEPTANCE AND OPERATIONAL TESTING SHALL BE IN ACCORDANCE WITH SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE WITH THE FOLLOWING CLARIFICATIONS:
1. THE FIRE DEVELOPMENT SERVICES INSPECTOR(S) SHALL REVIEW THE AS-BUILT DRAWINGS AND LINK BUDGET TO ENSURE THE PHYSICAL INSTALLATION IS THE SAME AS THE AS-BUILT DRAWINGS DURING THE FINAL SYSTEM ACCEPTANCE TEST.
2. ERRS SHALL BE INSPECTED, APPROVED AND PRE-TEST SHEET SIGNED BY LADBS ELECTRICAL INSPECTION PRIOR TO REQUESTING AN ACCEPTANCE TEST.
3. THE FINAL SYSTEM ACCEPTANCE TEST SHALL BE WITNESSED BY A FIRE DEVELOPMENT SERVICES INSPECTOR OR SPECIFIC DESIGNER AND SHALL INCLUDE A VISUAL INSPECTION OF THE PHYSICAL INSTALLATION OF THE EMERGENCY RESPONDER RADIO SYSTEM. TWO FIRE DEVELOPMENT SERVICES INSPECTORS SHALL CONDUCT AN ON AIR TEST OF THE SUBJECT RADIO CHANNELS IN ALL CRITICAL AREAS AND SPOT TESTS IN NON-CRITICAL AREAS. A QUALIFIED ENGINEER OR TECHNICIAN FROM THE DESIGNING OR INSTALLING COMPANY SHALL BE PRESENT WITH THE APPROPRIATE TEST EQUIPMENT TO VERIFY ALL MEASUREMENTS ARE IN COMPLIANCE WITH SECTION 510.
4. AS PART OF THE ACCEPTANCE TEST, BACKUP BATTERIES AND POWER SUPPLIES SHALL BE TESTED IN ACCORDANCE WITH SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE.
5. 510.5.3(7) - AS PART OF THE INSTALLATION A SPECTRUM ANALYZER OR OTHER SUITABLE TEST EQUIPMENT SHALL BE UTILIZED TO EVALUATE THE SYSTEM FOR THE ENTIRE SPECTRUM RANGE OF FREQUENCIES USED BY THE 2021 ARKANSAS FIRE PREVENTION CODE (856.2375MHz-960.9375MHz AND 911.2375MHz-915.9375MHz, INCLUSIVE). TO ENSURE SPURIOUS OSCILLATIONS ARE NOT BEING GENERATED OR RECEIVED BY THE BUILDING SIGNAL BOOSTER(S), THIS TEST SHALL BE CONDUCTED AT TIME OF INSTALLATION AND SUBSEQUENT ANNUAL INSPECTIONS.

MAINTENANCE

THE EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES IN ACCORDANCE WITH SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE.
1. IN THE EVENT OF A SERVICE AFFECTING FAILURE OF ANY PORTION OF THE EMERGENCY RESPONDER RADIO SYSTEM, AN INITIAL EVALUATION SHALL BE MADE BY A QUALIFIED TECHNICIAN WITHIN 24 HOURS AND REPAIRS SHALL BE COMPLETE WITHIN 5 WORKING DAYS. BUILDING OWNER OR DESIGNER SHALL NOTIFY THE BENTONVILLE FIRE DEPARTMENT FORTHWITH OF ANY SERVICE AFFECTING OUTAGE.
2. IN THE EVENT OF A NON-SERVICE AFFECTING FAILURE OF ANY PORTION OF THE EMERGENCY RESPONDER RADIO SYSTEM, AN INITIAL EVALUATION SHALL BE COMPLETED BY A QUALIFIED TECHNICIAN ON THE NEXT BUSINESS DAY AND REPAIRS SHALL BE COMPLETE WITHIN 15 BUSINESS DAYS.

ANNUAL TESTING AND PROOF OF COMPLIANCE

ANNUAL TESTING AND PROOF OF COMPLIANCE SHALL BE IN ACCORDANCE WITH SECTION 510 OF THE 2021 ARKANSAS FIRE PREVENTION CODE WITH THE FOLLOWING CLARIFICATIONS:
1. A CHIEF'S REGULATION No. 4 TEST SHALL BE CONDUCTED BY A PERSON HOLDING A VALID REGULATION No. 4 CERTIFICATE OF FITNESS IN ACCORDANCE WITH SECTION 117 OF THE 2021 ARKANSAS FIRE PREVENTION CODE IN THE CATEGORY OF TWO WAY RADIO COMMUNICATIONS ENHANCEMENT SYSTEMS BI-DIRECTIONAL AMPLIFIER SYSTEMS FOR THE SPECIFIC MANUFACTURER AND TYPE OF SYSTEM BEING TESTED.
2. AT THE CONCLUSION OF THE TESTING, A REPORT, WHICH SHALL VERIFY COMPLIANCE SHALL BE SUBMITTED TO AN THE BENTONVILLE FIRE DEPARTMENT APPROVED F-348R FIRE PROTECTION SYSTEM PERFORMANCE REPORT.
3. INFORMATION ON OBTAINING A REGULATION No. 4 CERTIFICATE OF FITNESS CAN BE OBTAINED FROM THE "PROSPECTIVE APPLICANT LETTER" LINK WHICH IS FOUND ON THE 2021 ARKANSAS FIRE PREVENTION CODE CHIEF'S REGULATION.

BUILDING INFORMATION

BUILDING HEIGHT: APPROX. 77'.
BUILDING OCCUPANCY: BUSINESS.
BUILDING IS FULLY SPRINKLED.
AREA OF WORK: 421486 SQ. FT.
STORIES: 4.

SCOPE OF WORK

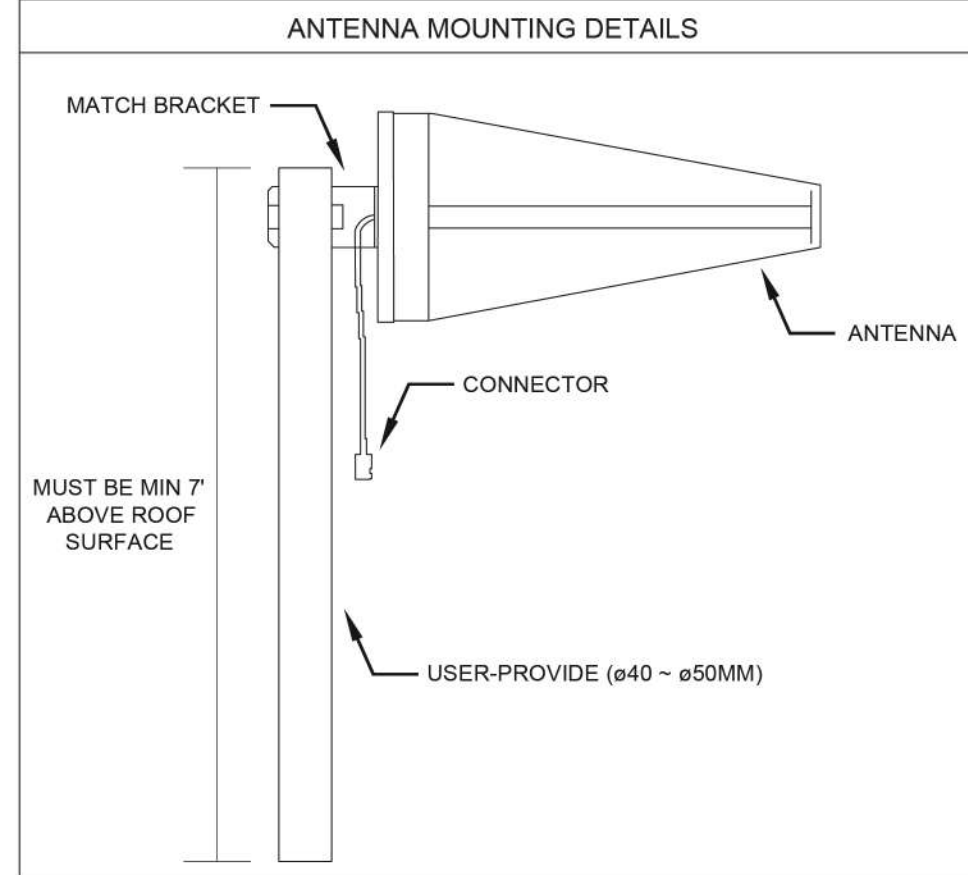
FURNISH AND INSTALL AN EMERGENCY RESPONDER RADIO COVERAGE SYSTEM CONSISTING OF SIGNAL BOOSTER(S), DONOR ANTENNA, IN-BUILDING ANTENNAS, DIRECTIONAL COUPLERS, POWER DIVIDERS, PLENUM RATED 1/2" COAXIAL CABLE, N-TYPE CONNECTORS AND JUMPERS. TOGETHER, THESE COMPONENTS FORM A DISTRIBUTED ANTENNA SYSTEM TO PROVIDE EMERGENCY RESPONDER RADIO COVERAGE. THE SYSTEM WILL ENHANCE SPECIFIC FREQUENCIES TO MEET ALL REQUIREMENTS AS NOTED IN THE FIRE PREVENTION AND PUBLIC SAFETY BUREAU REQUIREMENT FOR BENTONVILLE.

NOTES

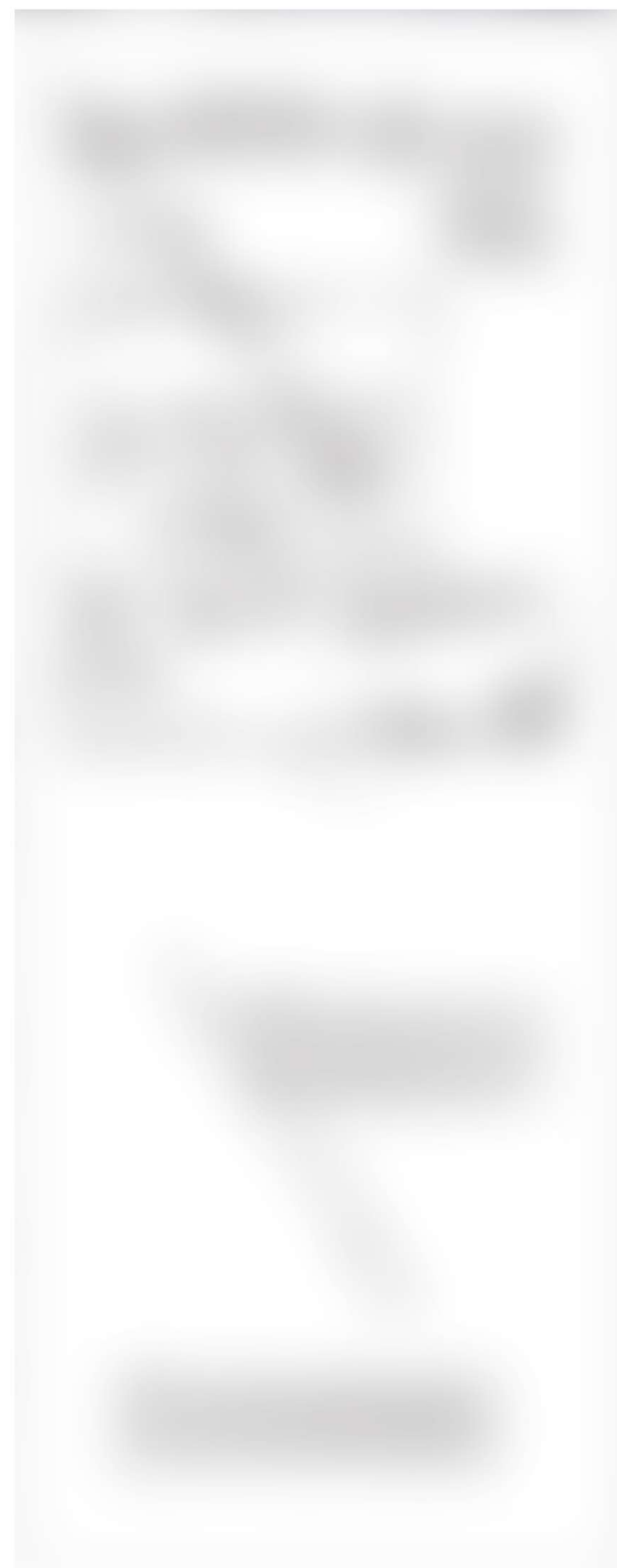
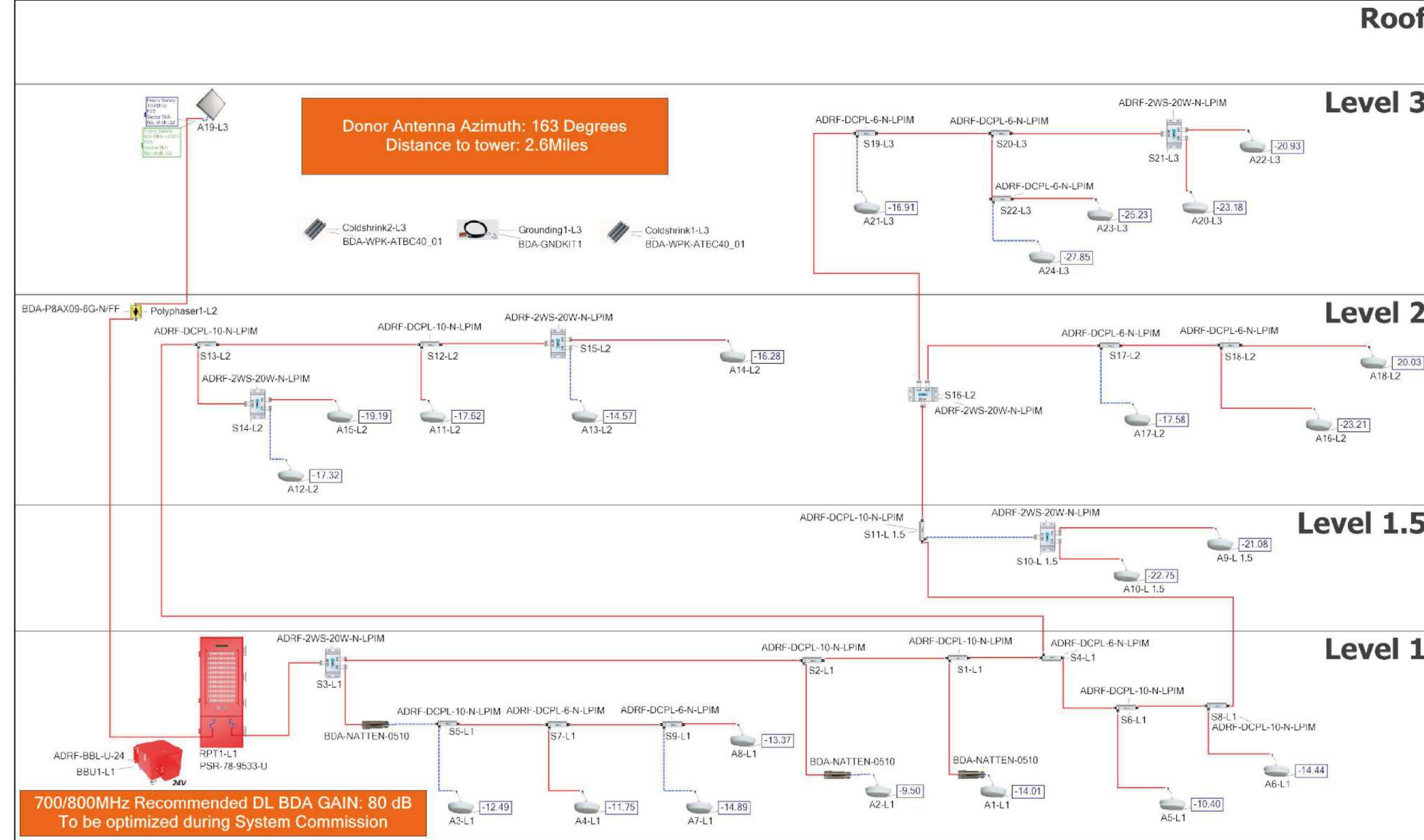
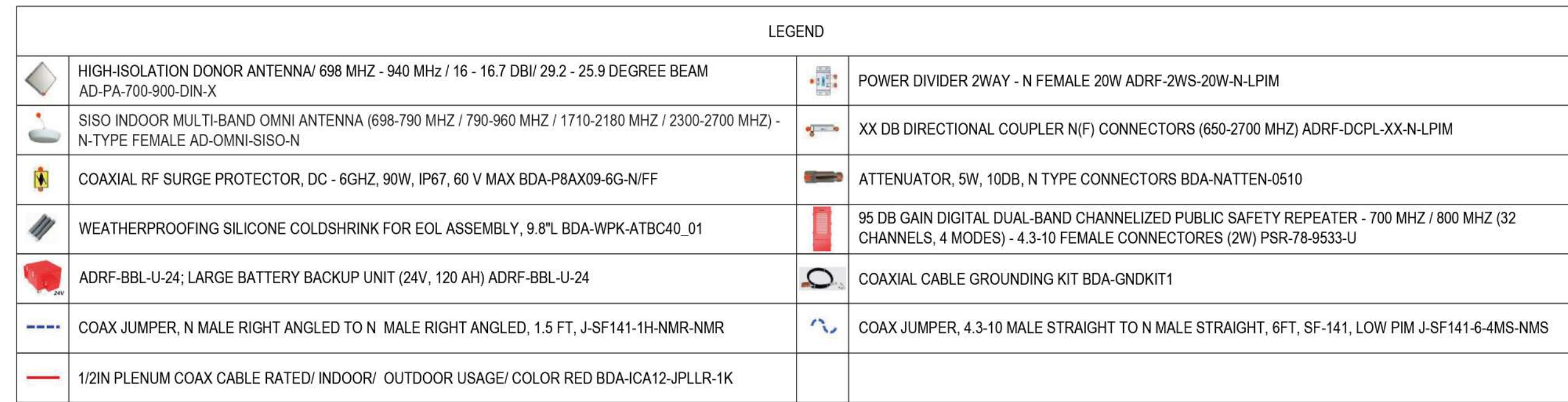
INSTALLATION SCOPE OF WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL CODES AND AHJ REQUIREMENTS.
INSTALLER SHALL VERIFY THE REQUIRED FIRE SURVIVABILITY OF THE RISER(S) AND EQUIPMENT LOCATION(S).
BATTERY BACKUP IS PROVIDED. REFER TO BATTERY CALCULATION SHEET.
ALL PASSIVE DEVICES (DIRECTIONAL COUPLERS, SPLITTERS) ARE INSTALLED INSIDE JUNCTION BOXES WITH PROPER SPACING FOR CONNECTIONS. IF CABLE IS REQUIRED TO BE INSTALLED IN A METAL RACEWAYS, DONOR ANTENNA AND ALL POWERED EQUIPMENT SHALL BE CONNECTED TO THE BUILDING GROUNDING SYSTEM.
DONOR ANTENNA SHALL BE CONNECTED TO LIGHTNING PROTECTION SYSTEM (IF EXISTING IN THE BUILDING). THE DESIGN WAS BASED ON SURVEY DATA (IF AVAILABLE) AND FAST RAY TRACING PREDICTION MODEL. THE DESIGN SHALL BE REVIEWED AND APPROVED BY A PROFESSIONAL ENGINEER, IF REQUIRED.
THE SYSTEM SHALL NOT BE POWERED UNTIL IT HAS BEEN APPROVED BY THE AHJ.

ASSUMPTIONS

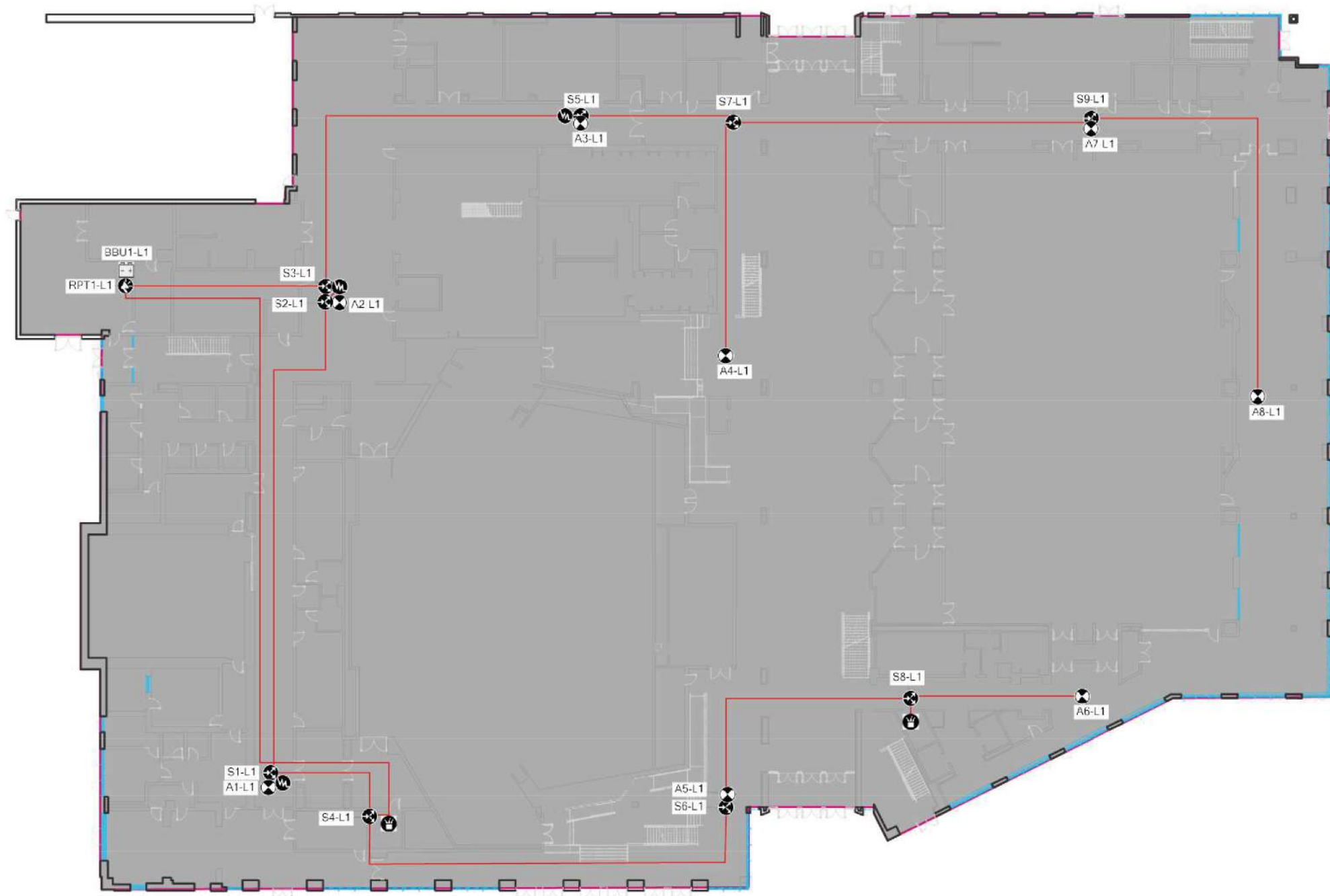
- 70 dBm SIGNAL AVAILABLE AT THE PROPOSED DONOR ANTENNA LOCATION.
- AT LEAST 20DB GREATER THAN THE MAX. BDA GAIN OF ISOLATION BETWEEN INDOOR AND OUTDOOR ANTENNAS.
- 32 CHANNELS FOR 700MHz SYSTEM.
- ALL EQUIPMENT AND CABLING CAN BE INSTALLED AS DESIGNED.
- FINAL ANTENNA LOCATIONS TO BE CONFIRMED BY SYSTEM INTEGRATOR.
- INSTALLER TO HAVE A VARIETY OF ATTENUATORS ON HAND TO BALANCE SYSTEM DURING COMMISSIONING STAGE.



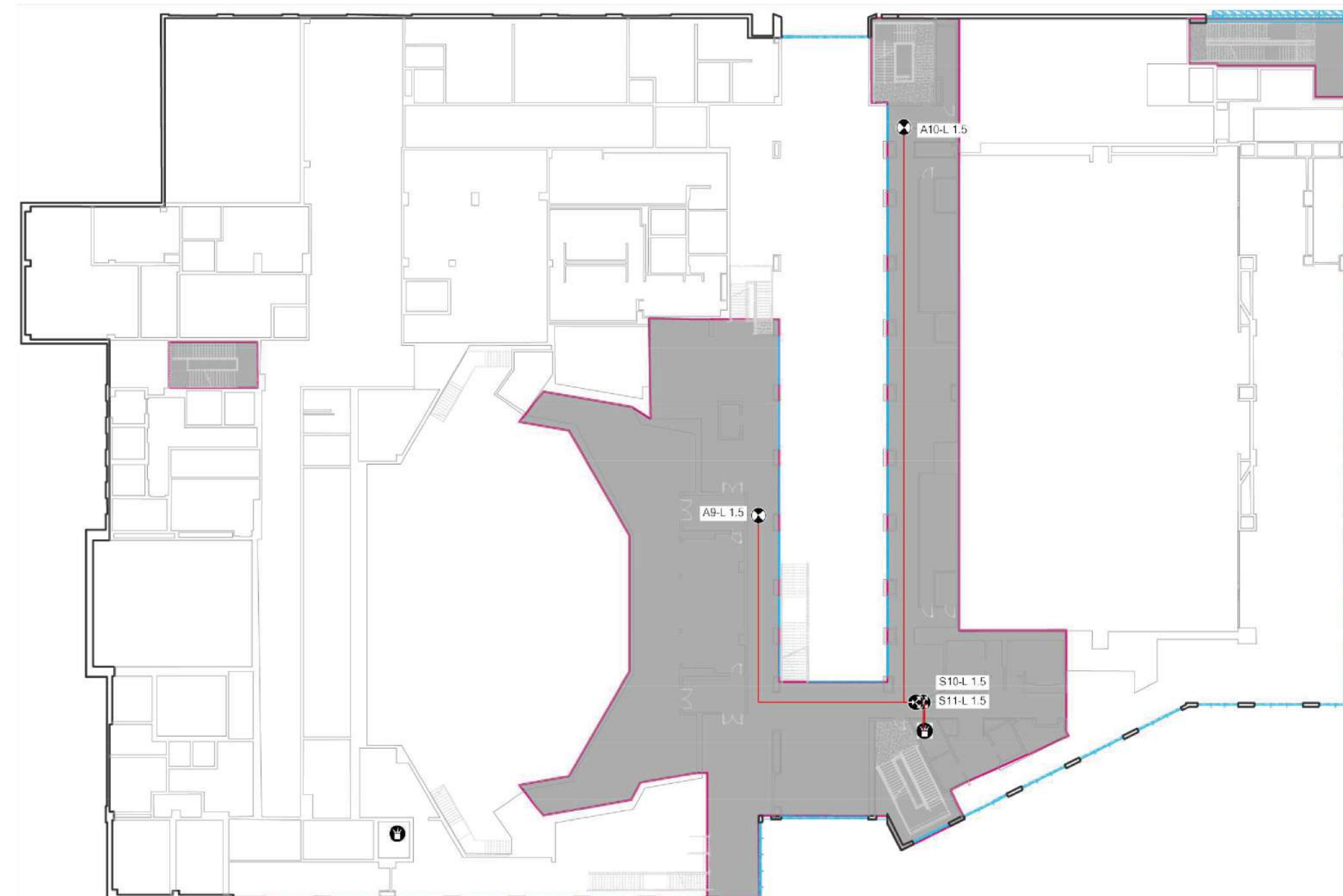
EQUIPMENT LIST					
TYPE	MANUFACTURER	MODEL	DESCRIPTION	INVENTORY#	QTY
ANTENNA	ADVANCED RF TECHNOLOGIES	AD-PA-700-900-DIN-X	HIGH-ISOLATION DONOR ANTENNA 698 MHz - 940MHz / 16-16.7 DBI / 29.2-25.9 DEGREE BEAM	AD-PA-700-900-DIN-X	01
ANTENNA	ADVANCED RF TECHNOLOGIES	AD-OMNI-SISO-N	SISO INDOOR MULTI-BAND OMNI ANTENNA (698-790 MHz / 790-960 MHz / 1710-2180 MHz / 2300-2700 MHz) - N-TYPE FEMALE	AD-OMNI-SISO-N	23
ATTENUATOR	HONEYWELL	BDA-NATTEN-0510	ATTENUATOR, 5W, 10DB, N TYPE CONNECTORS	N/A	03
BBU	ADVANCED RF TECHNOLOGIES	ADRF-BBL-U-24	ADRF-BBL-U-24; LARGE BATTERY BACKUP UNIT (24V, 120AH) (UL2524 LISTED)	ADRF-BBL-U-24	01
CABLE	HONEYWELL	BDA-ICA12-JPLLR-1K	CLEARFILLINE - 1/2IN LOW LOSS AIR DIALECTRIC CABLE - PLENUM RATED / INDOOR/ OUTDOOR USAGE COLOR RED LIV RATED TO ASTM G155 STEINER TUNNEL TEST METHOD UL 910 NEC 820-53 (A) CMP NFPA-262 NEC ARTICLE 800 COMMUNICATION CIRCUITS ETL LISTED TO UL444 CANADIAN CSA C.22.2/F76	N/A	3137.09 FEET
CABLE	ADVANCED RF TECHNOLOGIES	J-SF141-6-4MS-NMS	COAX JUMPER, 4.3-10 MALE STRAIGHT TO N MALE STRAIGHT, 6FT, SF-141, LOW PIM	J-SF141-6-4MS-NMS	02
CABLE	ADVANCED RF TECHNOLOGIES	J-SF141-1H-NMS-NMS	COAX JUMPER, N MALE RIGHT ANGLED TO N MALE RIGHT ANGLED, 1.5 FT, SF-141, LOW PIM USED WITH ADX-R-CHC	J-SF141-1H-NMS-NMS	11
CABLE	ADVANCED RF TECHNOLOGIES	J-SF141-6-DMS-NMS	COAX JUMPER, DIN MALE STRAIGHT TO N MALE STRAIGHT, 6FT, SF-141, LOW PIM	J-SF141-6-DMS-NMS	01
COLD SHRINK	HONEYWELL	BDA-WPK-ATBC40_01	WEATHERPROOFING SILICONE COLD SHRINK FOR EOL ASSEMBLY, 9.8"	N/A	02
CONNECTOR	HONEYWELL	BDA-NM-ICA12-JPLLR	N (M) CONNECTOR FOR RFS ICA12-50JPLLR	N/A	72
CONNECTOR	HONEYWELL	BDA-NFP01250	N-TYPE, FEMALE CONNECTOR FOR 1/2" AIRCELL PLENUM & IN-CONDUIT CABLES, 50 OHM	N/A	06
GROUNDING	HONEYWELL	BDA-GNDKIT1	GROUNDING KIT, COAX, 20" FOR 1/2" COAXIAL CABLE, ONE HOLE LUG	N/A	01
POLYPHASER	HONEYWELL	BDA-P8AX09-6G-NFF	COAXIAL SURGE PROTECTOR, UL LISTED	N/A	01
REPEATER	ADVANCED RF TECHNOLOGIES	PSR-78-9533-U	95 DB GAIN DIGITAL DUAL-BAND CHANNELIZED PUBLIC SAFETY REPEATER - 700 MHz / 800 MHz (32 CHANNELS, 4 MODES) - 4.3-10 FEMALE CONNECTORS (2W) (UL2524 LISTED)	PSR-78-9533-U	01
SPLITTER	ADVANCED RF TECHNOLOGIES	ADRF-2WS-20W-N-LPIM	POWER DIVIDER 2WAY - N FEMALE 20W	ADRF-2WS-20W-N-LPIM	06
SPLITTER	ADVANCED RF TECHNOLOGIES	ADRF-DCPL-10-N-LPIM	10 DB DIRECTIONAL COUPLER (N/F) CONNECTORS (650-2700 MHz) - LOW PIM	ADRF-DCPL-10-N-LPIM	08
SPLITTER	ADVANCED RF TECHNOLOGIES	ADRF-DCPL-6-N-LPIM	6 DB DIRECTIONAL COUPLER - 650-2700 MHz N CONNECTORS	ADRF-DCPL-6-N-LPIM	08



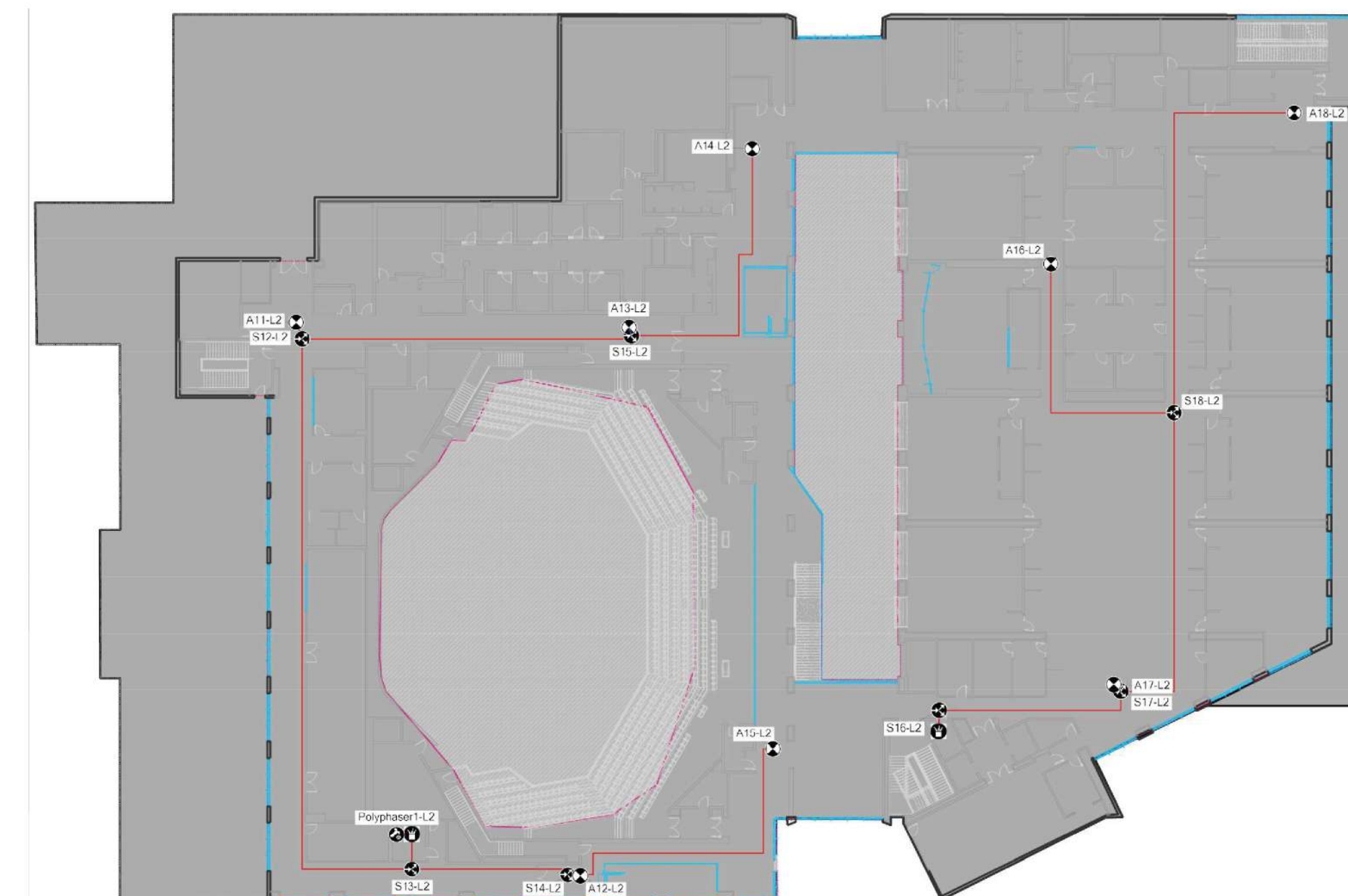
LEVEL 1



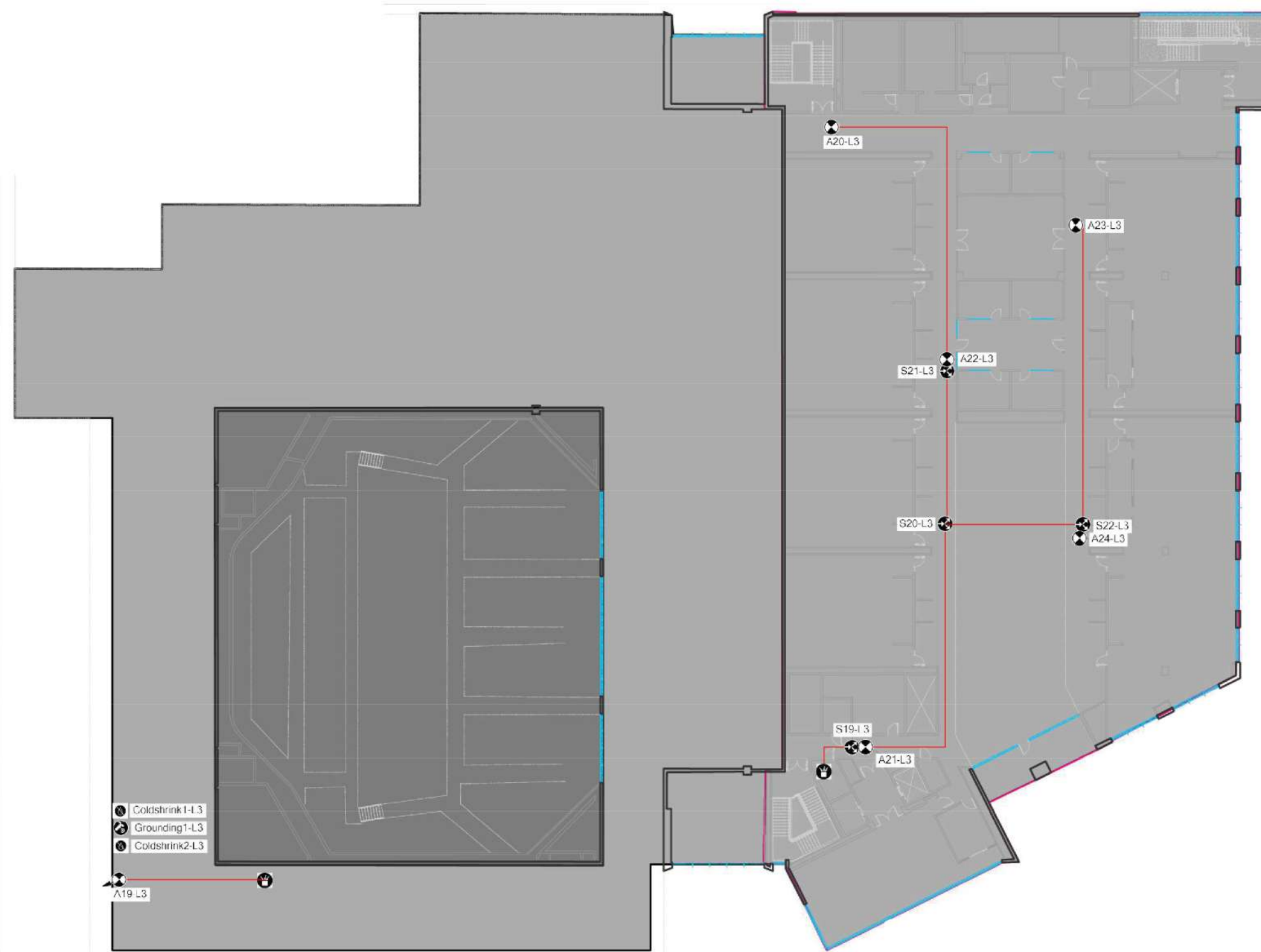
LEVEL 1.5



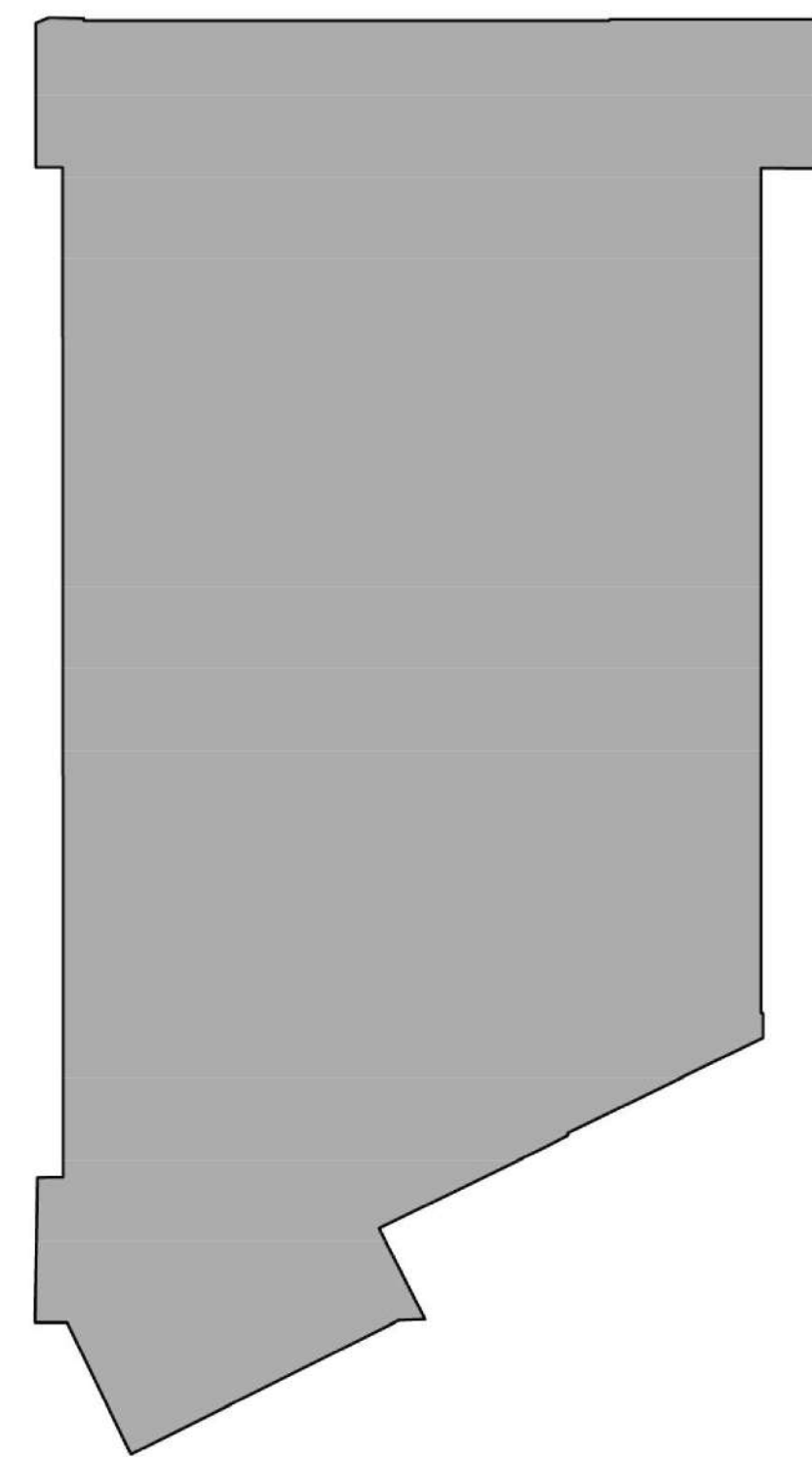
LEVEL 2



LEVEL 3



ROOF



PICTOGRAMS LEGEND	
	ANTENNA
	ATTENUATOR
	BBU
	REPEATER
	RISER
	SPLITTER
	POLYPHASER - CHECK IN PROJECT
	GROUNDING - CHECK IN PROJECT
	COLD SHRINK

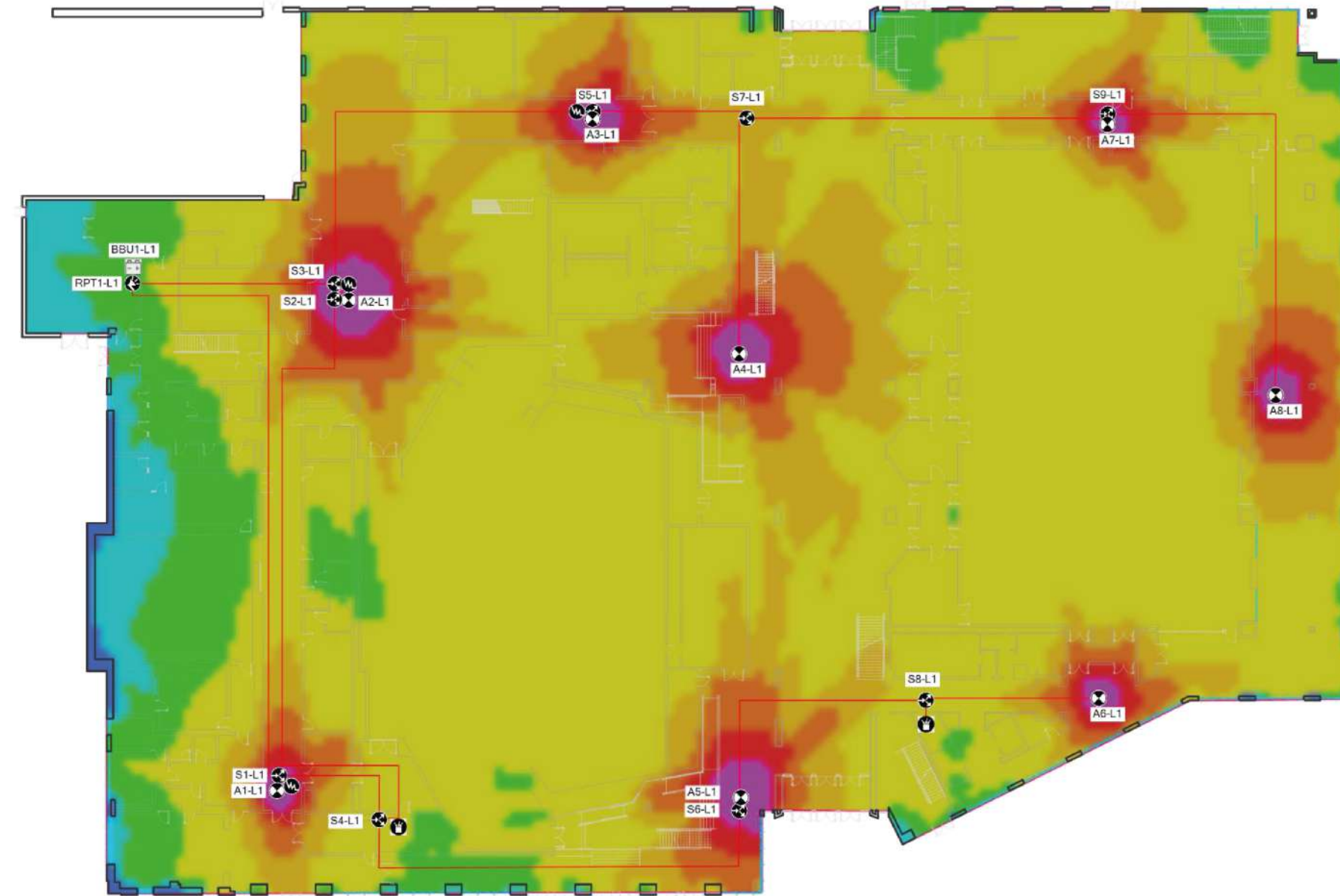
CABLES LEGEND	
	BDA-ICA12-JPLLR-1K
	J-SF141-1H-NMR-NMR

MATERIALS LEGEND	
	CONCRETE [DOUBLE_HEAVY]
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]
	PURE AIR



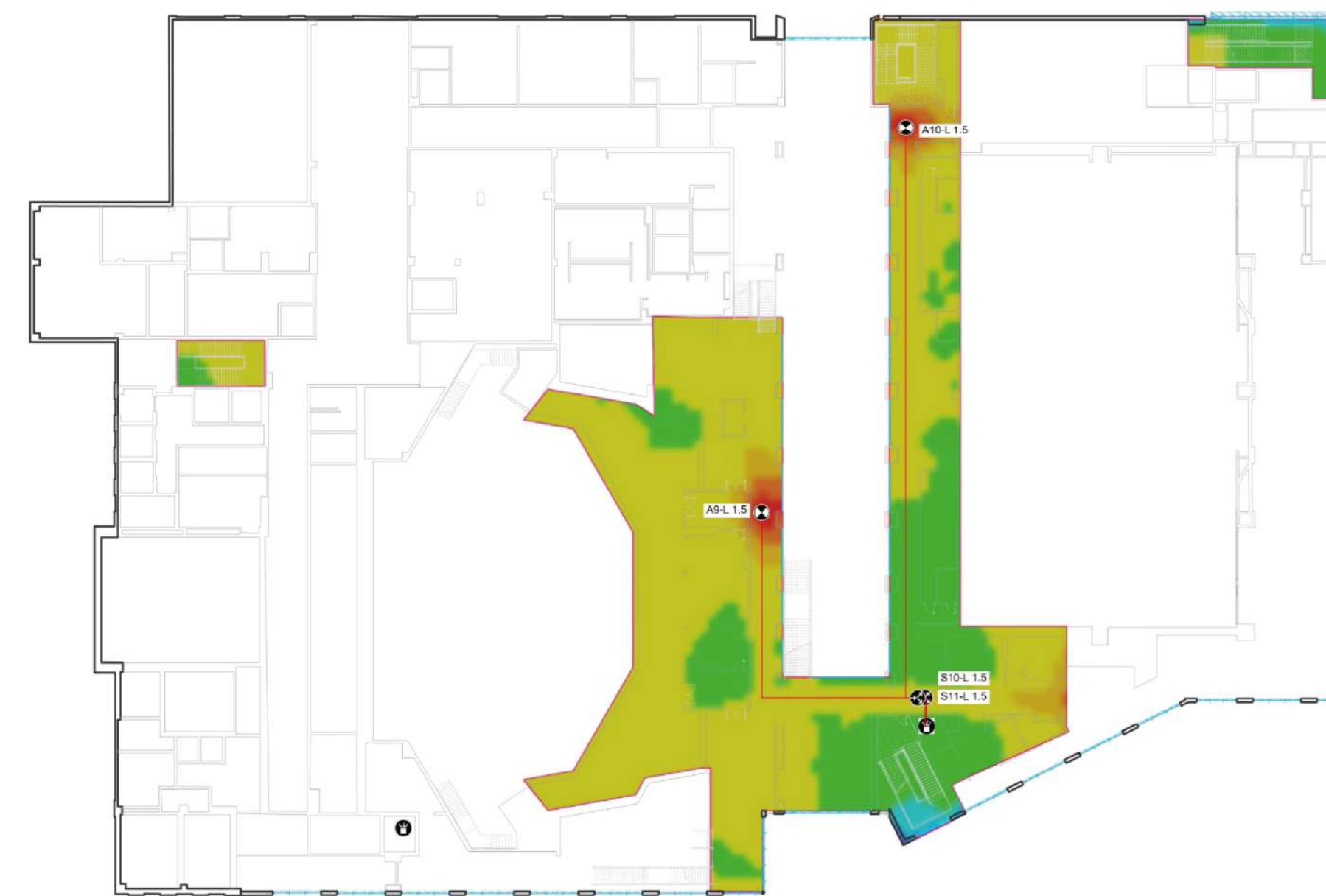
LEVEL 1 - PUBLIC SAFETY 700 MHZ - P25

MIN -95.00 DBM: 100.0% >= 95.0%



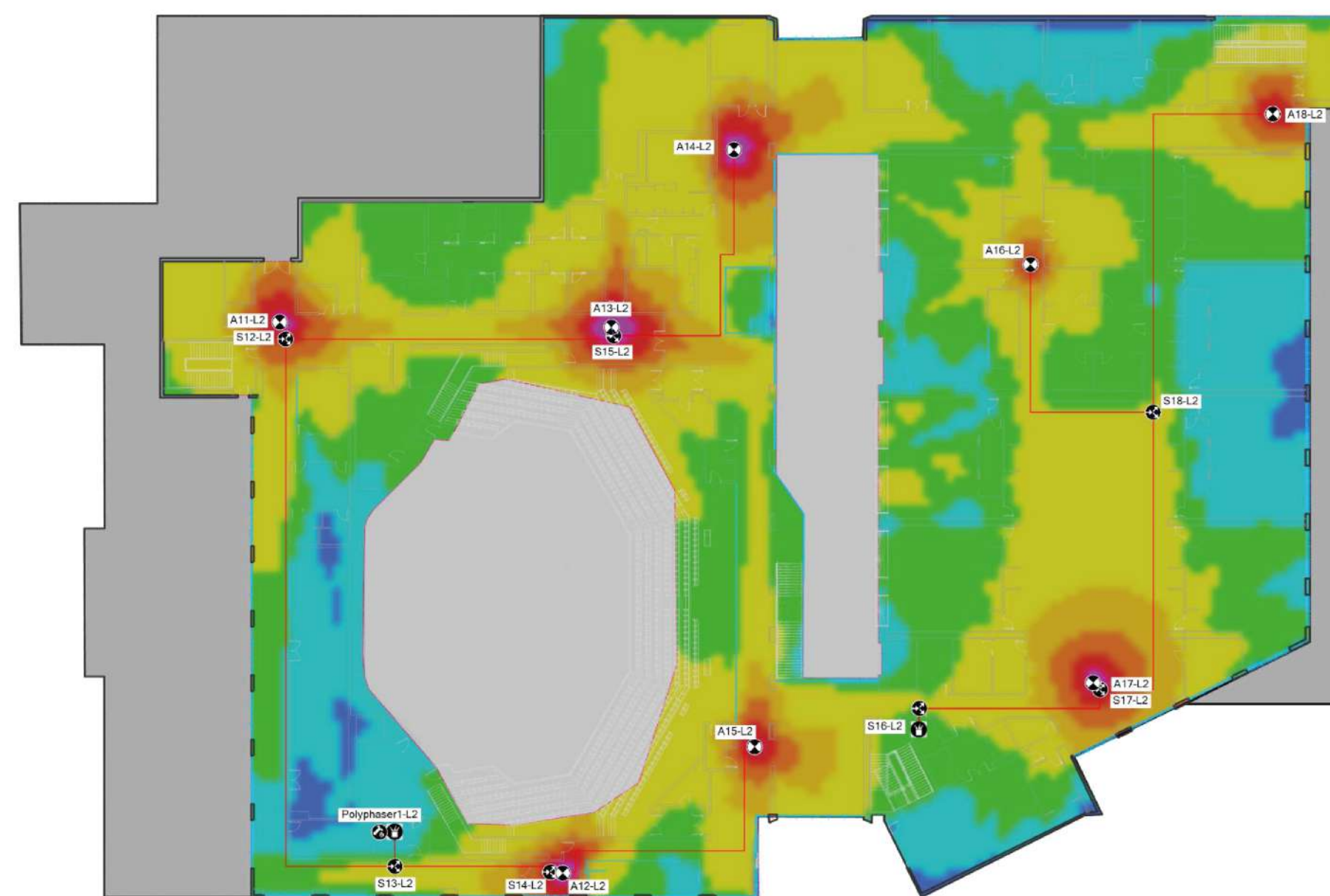
LEVEL 1.5 - PUBLIC SAFETY 700 MHZ - P25

MIN -95.00 DBM: 100.0% >= 95.0%



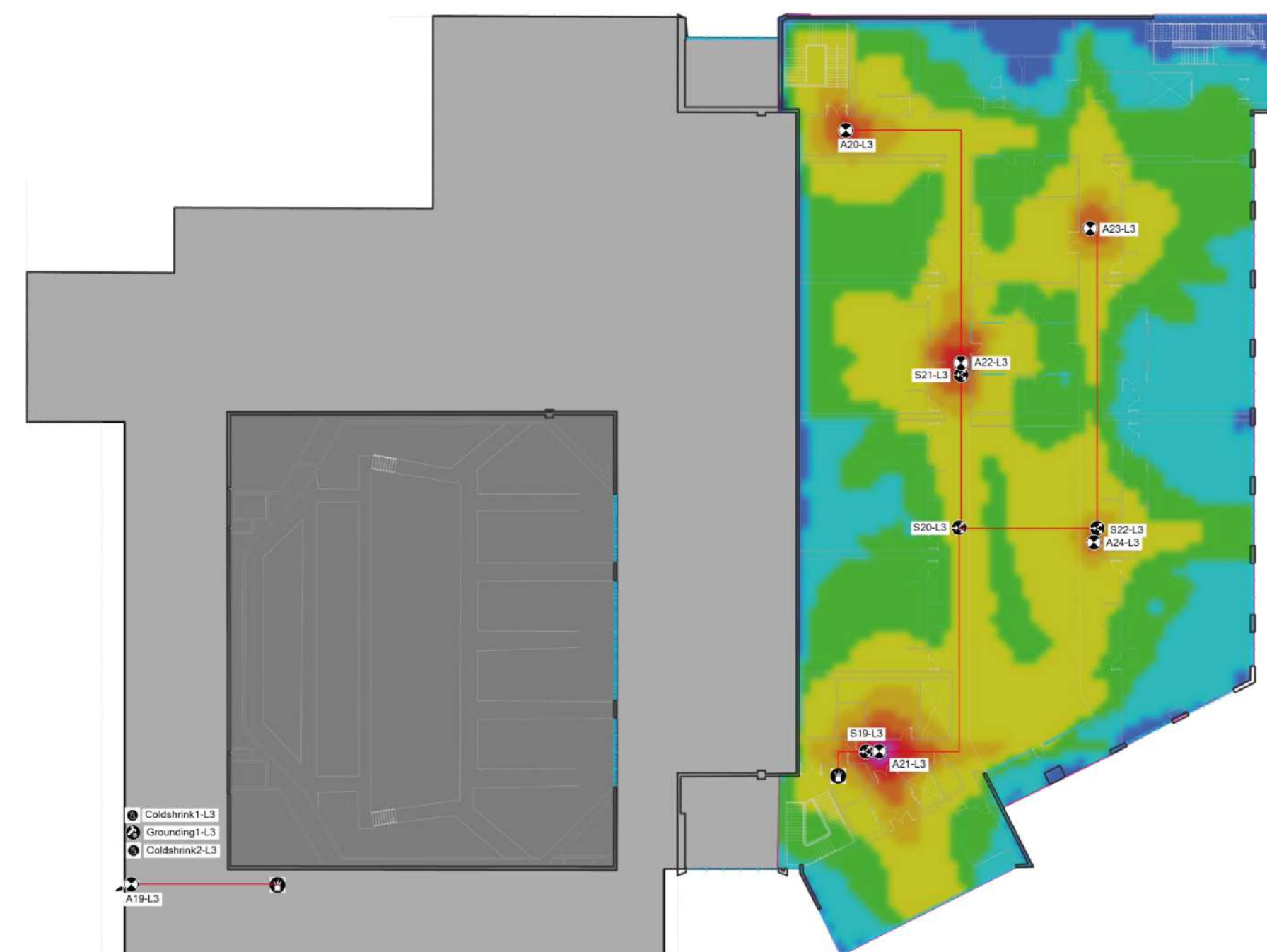
LEVEL 2 - PUBLIC SAFETY 700 MHZ - P25

MIN -95.00 DBM: 100.0% >= 95.0%



LEVEL 3 - PUBLIC SAFETY 700 MHZ - P25

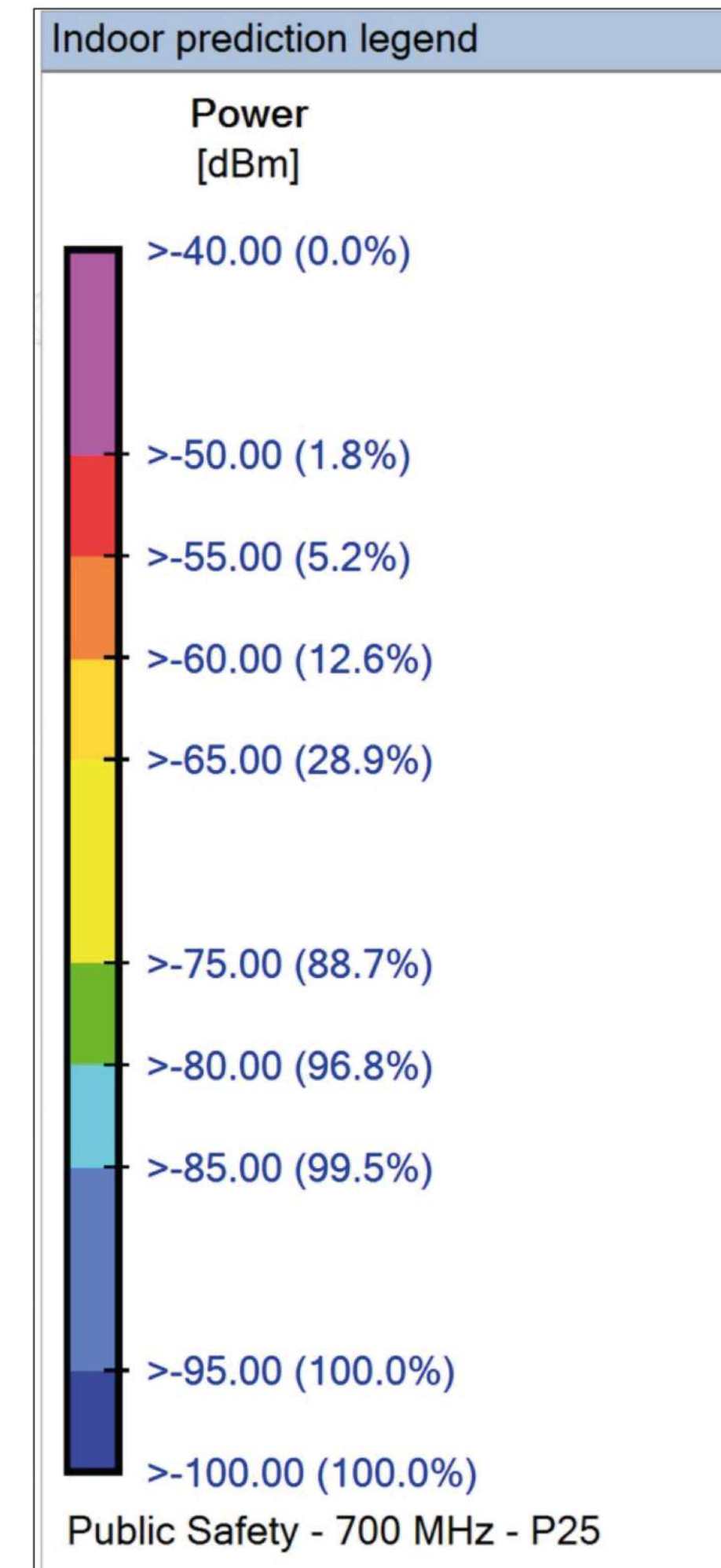
MIN -95.00 DBM: 100.0% >= 95.0%



PICTOGRAMS LEGEND	
	ANTENNA
	ATTENUATOR
	BBU
	REPEATER
	RISER
	SPLITTER
	POLYPHASER - CHECK IN PROJECT
	COLD SHRINK

CABLES LEGEND	
	BDA-ICA12-JPLLR-1K
	J-SF141-1H-NMR-NMR

MATERIALS LEGEND	
	CONCRETE [DOUBLE_HEAVY]
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]
	PURE AIR



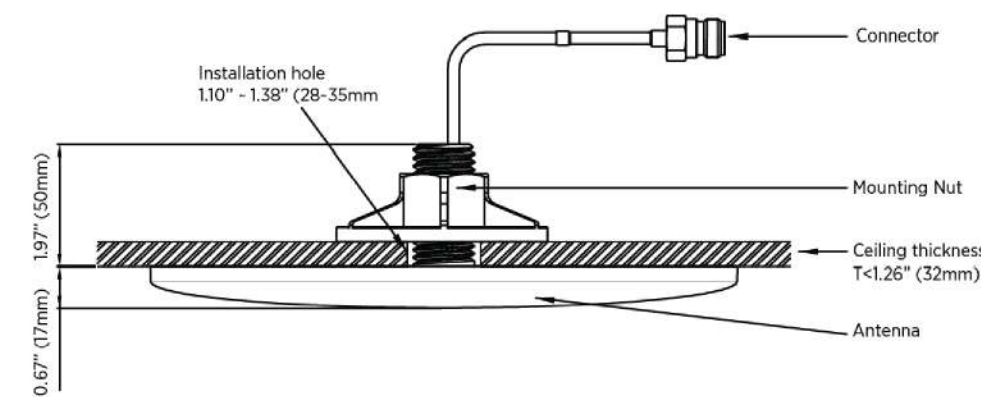
AD-OMNI-SISO-N-X

Omni-Directional SISO Antenna



Frequency Range	617 - 698 MHz	698 - 960 MHz	965 - 2200 MHz	2300 - 2700 MHz	3300 - 4200 MHz	4900 - 6000 MHz
Gain	2.9 dBi	3.5 dBi	4.0 dBi	4.3 dBi	4.6 dBi	5.6 dBi
Beamwidth	360°, Omni-directional					
Polarization	Linear Horizontal					
VSWR	1.8:1					
Intermodulation IM3	N/A	-150 dBc (2 x 43 dBm)				N/A
Impedance	50 Ω					
Power Rating	70 W (Max)					

Mechanical Specifications	
Dimension (D x H)	9.4 x 0.7 in (240 x 17 mm)
Color	White
Weight	13 lbs (5.9 kg)
RF Connector	N-Type (Female)
Mounting	Ceiling Tile
Operational Temperature	-40°F - +140°F (-40°C - +60°C)
Radome Material	PC / ABS



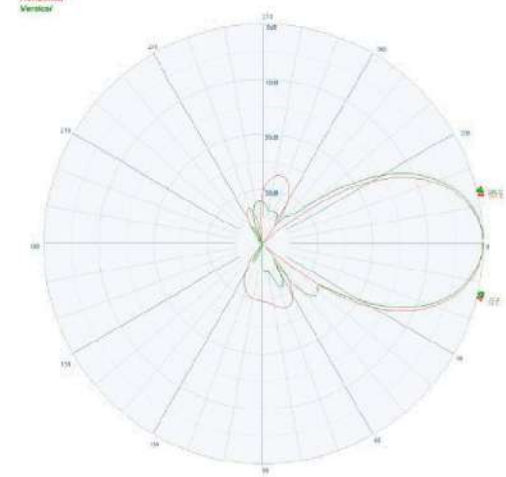
Web: www.adrftech.com
 Tel: +1 818.840.8131 Fax: +1 818.840.8138
 Technical/Customer Support: +1 800.313.9345
 3116 West Vanowen St, Burbank, CA 91505

FC UL T9090 Forbes

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Product Specification

AD-PA-700-900-DIN-X (700MHz / CELL / SMR800 / SMR900 Panel Antenna)



Electrical Specification	
Frequency	698 - 806 MHz 900 - 940 MHz
Gain	16.0 dBi 16.7 dBi
Horizontal Beamwidth	29.2° ± 1.8° 25.9° ± 1.6°
Vertical Beamwidth	29.9° ± 2.5° 26.5° ± 4.0°
Front to Back Ratio	> 31 dB
Intermodulation	> 153 dBc @ 2 tone x 43 dBm
VSWR	< 1.5:1
Impedance	50 Ω
Power Rating (max)	100 W
Polarization	Vertical

General Specification	
Dimension	27.6 x 27.6 x 5.4 in
Weight (including bracket)	19.8 lb
Connector	7/16 DIN Female
Tilt	Vertical: 20°
Supported Pole Diameter	Pole: Ø40 to Ø80mm (1.57 in to 3.14 in)
Radome	FRP (Grey)
Weather Resistance	IP65
Wind Survival Rating	150 mph
Wind Load @ 100 mph	Front (697N), Side (135N), Rear (697N)

Specifications are subject to change without notice. ©2021 Advanced RF Technologies, Inc.

ADRF THE SIGNAL FOR SUCCESS

TEL: +1 818. 840. 8131 | FAX: +1 818. 840. 8138
 TECHNICAL/CUSTOMER SUPPORT +1 800. 313. 9345
www.adrftech.com | 3116 West Vanowen Street, Burbank, CA 91505 USA

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Product Specification

ADRF-2WS/3WS/4WS-20W-4310
 PIM Rated 2-Way, 3-Way, and 4-Way Splitters



Electrical Specification			
	ADRF-2WS-20W-4310	ADRF-3WS-20W-4310	ADRF-4WS-20W-4310
Frequency Range	578 - 2700 MHz	578 - 2700 MHz	578 - 2700 MHz
Insertion Loss	3.6 dB (Max)	5.5 dB (Max)	7.0 dB (Max)
VSWR	1.25:1 (Max)	1.2:1 (Max)	1.3:1 (Max)
Amplitude Unbalance	0.4 dB (Max)	0.6 dB (Max)	0.6 dB (Max)
Isolation		20 dB (Min)	
Power Rating (Average)		20 W (Max)	
Power Rating (Peak)		200 W (Max)	
Impedance		50 Ω	
Operating Temperature		-40° - 185° F	
Passive Intermodulation		161 dBc @ 2 tone x 43 dBm	

Mechanical Specification			
	ADRF-2WS-20W-4310	ADRF-3WS-20W-4310	ADRF-4WS-20W-4310
Dimensions (W x H x D)	3.28 x 3.7 x 1.5 in	4.35 x 4.96 x 1.5 in	4.0 x 6.57 x 1.5 in
Weight	0.79 lbs	1.58 lbs	2.11 lbs
Connectors	4.3-10 Female	4.3-10 Female	4.3-10 Female
Weather Resistance	IP65	IP65	IP65

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Product Specification

ADRF-DCPL-x-N-LPIM
 Low PIM Directional Coupler



Electrical Specification		
	ADRF-DCPL-10-N	ADRF-DCPL-6-N
Frequency Range	690 - 2700 MHz	690 - 2700 MHz
Insertion Loss	0.8 dB (Max)	1.8 dB (Max)
VSWR	1.25:1 (Max)	1.25:1 (Max)
Isolation	30 dB (Min)	20 dB (Min)
Directivity	20 dB (Min)	14 dB (Min)
Power Rating (Average)	100 W	50 W
Power Rating (Peak)	1000 W	500 W
Impedance	50 Ω	50 Ω
Operating Temperature	-40° - 185° F	-40° - 185° F
Passive Intermodulation	153 dBc @ 2 tone x 43 dBm	153 dBc @ 2 tone x 43 dBm
Coupling Value	10 dB ± 1 dB	6 dB ± 1 dB

General Specification		
	ADRF-DCPL-10-N	ADRF-DCPL-6-N
Dimensions (W x H x D)	4.9 x 1.3 x 0.9 in	4.9 x 1.3 x 0.9 in
Weight	0.7 lbs	0.7 lbs
Connectors	N-Type Female (All Ports)	N-Type Female (All Ports)
Weather Resistance	NEMA4X (IP65)	NEMA4X (IP65)

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page 1 of 1

ADRF-BBS-U Series

(UL 2524 Listed 12V / 24V / 48V Battery Backup Solutions for ADRF Public Safety Repeaters / DAS)



- Product Features**
- Tested, approved, and listed to UL 2524, Second Edition by Underwriters Laboratories with PSR-78-9533-U, and PSR-78-9537-U
 - Includes single cable between battery and DAS / repeater
 - NFPA and IFC compliant
 - Increase runtime by adding unit using parallel cable (ADRF-BBX-U-CBL-21P)
 - Increase voltage by adding unit using series cable (ADRF-BBX-U-CBL-21S)
 - Available in 12V, 24V, 48V solutions
 - Optional wall mount kit available (ADRF-BBS-X-WMK)
 - New integrated wiring compartment with terminal blocks for easy installation

Electrical Specifications	ADRF-BBS-U-12	ADRF-BBS-U-24	ADRF-BBS-U-24 (x2)
Operating Voltage	12 V	24 V	48 V
Battery Capacity	96 Ah	48 Ah	48 Ah
Configuration	Parallel	Series	Series
Battery Type	Lead Acid	Lead Acid	Lead Acid

Mechanical Specifications	ADRF-BBS-U-12	ADRF-BBS-U-24	ADRF-BBS-U-24 (x2)
Dimension	16.15 x 17.34 x 12.14 in.	16.15 x 11.23 x 10.25 in.	16.15 x 10.25 in. (x2)
Weight (Enclosure)	30 lbs.	30 lbs.	30 lbs. (x2)
Weight (Batteries)	29.8 lbs. (x 2)	29.8 lbs. (x 2)	29.8 lbs. (x 4)
Weather Resistance	NEMA 4	NEMA 4	NEMA 4
Cooling	Air Convection	Air Convection	Air Convection
Mounting Type	Ground (with wheel locks) or Wall (optional brackets)		

Battery Runtime	ADRF-BBS-U-12	ADRF-BBS-U-24	ADRF-BBS-U-24 (x2)
PSR-78-8527-PKG (single / dual band)	-	13.2 / 12.5 hours	-
PSR-78-9533-U (single / dual band)	-	11.4 / 9.0 hours	-
PSR-78-9533-U (dual band @ 1W)	-	9.9 hours	-
PSR-78-9537-U (single / dual band)	-	8.4 / 5.8 hours	-
PSR-VU-9537-U (VHF / UHF)	-	-	13.9 / 13.5 hours

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FC UL T9090 Forbes

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N(f) CONNECTOR 0 - 3GHz BDA-NF-ICA12-JPLLR

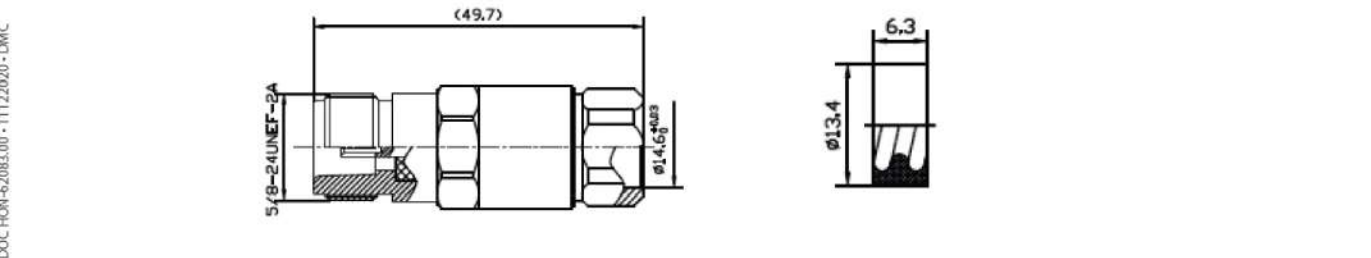


Product Features	
- N female connector	
- For 1/2" cable	

Electrical Specifications	Value
Impedance	50Ω
Frequency range	0~3GHz
Withstand Voltage	500V rms
VSWR	Straight ≤ 1.15 Right Angle ≤ 1.25
Contact resistance	center contact ≤ 1mΩ outer contact ≤ 1mΩ
Insulation resistance	≥ 5000MΩ

Mechanical Specifications	Value
Temperature range	-65°C ~ +165°C
Durability(matings)	> 500

Material Specifications	Value
Body	Brass Nickel Plated
Center conductor	Brass Gold or silver plated
Crimping suite	Copper alloy Nickel plated
O-ring sealing	6146 elastoc
Insulator	PTFE



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N (m) CONNECTOR 0 - 3GHz BDA-NM-ICA12-JPLLR

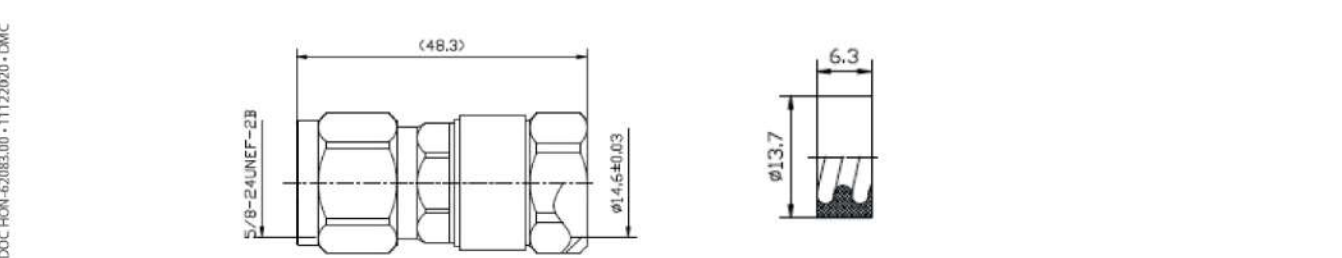


Product Features	
- N male connector	
- For 1/2" cable	

Electrical Specifications	Value
Impedance	50Ω
Frequency range	0~3GHz
Working Voltage	1500V max
Withstand Voltage	2500V rms
VSWR	Straight ≤ 1.2 Right Angle ≤ 1.3
Contact resistance	center contact ≤ 1mΩ outer contact ≤ 1mΩ
Insulation resistance	≥ 5000MΩ

Mechanical Specifications	Value
Temperature range	-35°C ~ +155°C
Durability(matings)	> 500

Material Specifications	Value
Body	Brass Tri-Metal or nickel
Center conductor	Phosphor Bronze Gold or silver plated
Coupling nut	Brass Nickel
Gasket	Silicone Rubber
Insulator	PTFE



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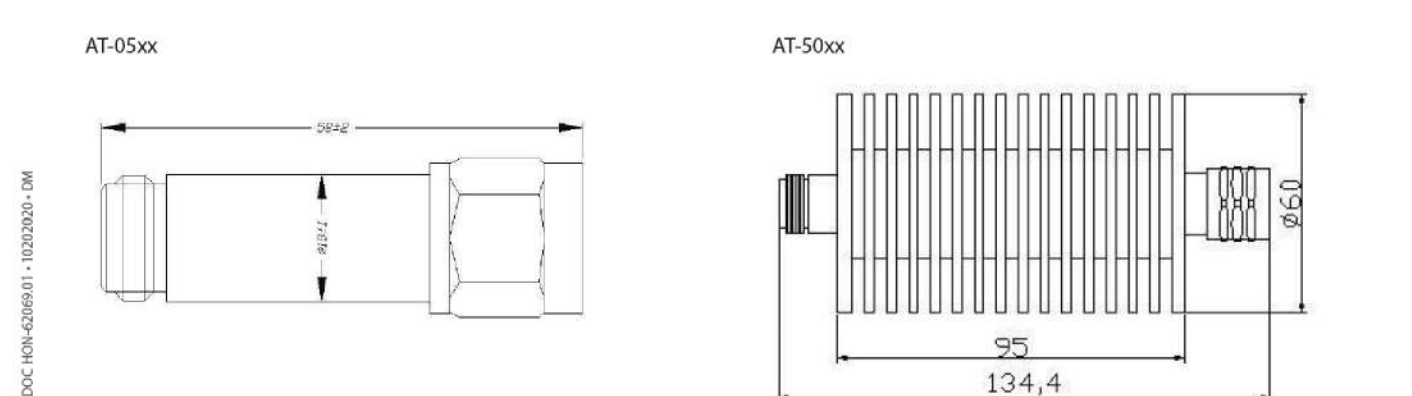
RF COAXIAL FIXED ATTENUATORS DC - 3000 MHz BDA-NATTEN-xxxx



Product Features

- Passive devices designed in a coaxial configuration
- Nominal impedance is 50 ohms
- Power level SW
- N male type connectors as standard, other types available upon request

Specification	0503	0505	0510	0515	0520	0530
Attenuation value	3	5	10	15	20	30
Frequency band	DC - 3000 MHz					
Input power	SW: replace "xx" with 05 50W: replace "xx" with 50					
Coolant	Natural convection			Natural convection		
Type	In-line, coaxial			In-line, coaxial		
Impedance	50 Ω					
VSWR	1.20:1 min					
Connector	N(m)			N(m)		
Temperature range	-22° to 149° F			-22° to 149° F		
MTBF	> 1,000,000 hours					
Weight	0.22 lbs - 0.10 kg			1.1lbs - 0.5 kg		
Environmental	IP60					
Operating position	Any					



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GROUNDING KIT FOR 1/2" COAXIAL CABLE, 500mm

BDA-GNDKIT1

- Product Features
- For 1/2" RF Cable
- Copper cable
- PVC Jacket



Product Structure Grounding Kit	Value
Cable Kit	Copper, for 1/2"
Wire	Copper
Locking End Material	Stainless steel
Grounding Cable	16 mm ² Copper wire & PVC, Black
Cable Lug	Tin-Plated Copper (1 Hole M8)
Product Structure Hardware	Value
Hexagon Screw	A2 Stainless Steel, M8x25mm
Nut	A2 Stainless Steel, M8
Spring Washer	A2 Stainless Steel, M8
Washer	A2 Stainless Steel, M8
General Specifications	Value
Cable Type	Coaxial
Cable Size	1/2" & 1/2" Low Loss
Lug Type	One-hole Lug
Lug Attachment	Factory attached
Cable Specifications	Value
Bonding Conductor Length	500mm
Bonding Conductor Material	Copper
Bonding Conductor Wire Size	16 mm ²
Bonding Conductor Jacketing Material	PVC
Electrical Specifications	Value
Current Handling	Tested to withstand 100,000 amps peak current surge
Current Handling Test Method	MIL-STD-137
Grounding, Bonding and Shielding Test Method	MIL-STD-188-124A
Lightning Protection Test Method	IEC 1024-1

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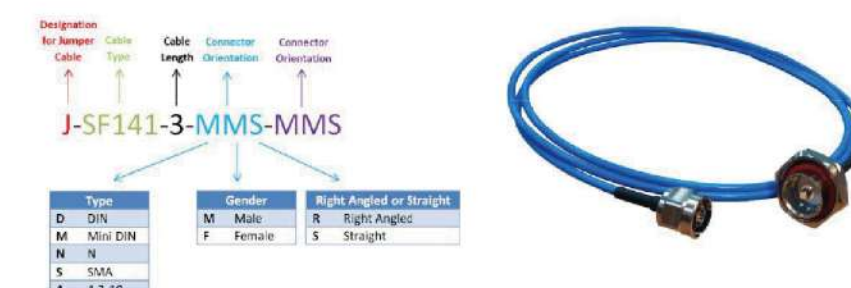
GROUNDING KIT FOR 1/2" COAXIAL CABLE, 500mm

BDA-GNDKIT1

Environment Specifications	Value
Operating Temperature	-40° to +85°C
Storage Temperature	-40° to +80°C
Impression Depth	1 m
Invention Test Method	Manual
Invention Test Method	IEC 60293:2001, IP68
Blowing Rain Test Method	MIL-STD-883, Method 506
Corrosion Test Method	MIL-STD-1344, Method 1001
Fencing Rain-Test Method	MIL-STD-883, Method 513
Humidity Test Method	MIL-STD-1344, Method 1002
UV Resistance Test Method	MIL-STD-883, Method 505
Vibration Test Method	IEC 60068-2-26:2007

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Product Specification: Low PIM Jumper Cables



Product Name	Length	Connector Orientation
J-SF141-3-MMS-MMS	3 ft	Mini DIN Male (Right Angled) to N Male (Right Angled)
J-SF141-6-MMS-MMS	6 ft	Mini DIN Male (Right Angled) to N Male (Right Angled)
J-SF141-6-MMS-MMS	6 ft	Mini DIN Male (Right Angled) to N Female (Straight)
J-SF141-6-DMS-DMS	6 ft	DIN Male (Straight) to DIN Male (Straight)
J-SF141-6-DMS-DMS	6 ft	DIN Male (Straight) to N Male (Straight)
J-SF141-6-DMS-SMS	6 ft	DIN Male (Straight) to N Female (Straight)
J-SF141-3H-4MM-4MM	1.5 ft	N Male (Right Angled) to N Male (Right Angled)
J-SF141-3-MMS-4MM	3 ft	N Male (Straight) to N Male (Straight)
J-SF141-3-MMS-SMS	3 ft	N Male (Straight) to N Female (Straight)
J-SF141-3-MMS-SMS	3 ft	N Female (Straight) to N Male (Straight)
J-SF141-3-MMS-SMS	6 ft	N Male (Straight) to N Male (Straight)
J-SF141-3-MMS-SMS	6 ft	N Male (Straight) to SMA Male (Straight)
J-SF141-3-SMS-SMS	3 ft	SMA Male (Straight) to SMA Male (Straight)
J-SF141-6-SMS-SMS	6 ft	SMA Male (Straight) to SMA Male (Straight)
J-SF141-3H-4MM-4MM	1.5 ft	4.3-10 Male (Right Angled) to 4.3-10 Male (Right Angled)
J-SF141-3H-4MM-SMS	3 ft	4.3-10 Male (Right Angled) to N Male (Right Angled)
J-SF141-3H-4MM-SMS	3 ft	4.3-10 Male (Right Angled) to N Female (Straight)
J-SF141-6-4MM-4MM	6 ft	4.3-10 Male (Straight) to 4.3-10 Male (Straight)
J-SF141-6-4MM-SMS	6 ft	4.3-10 Male (Straight) to N Male (Straight)
J-SF141-6-4MM-SMS	6 ft	4.3-10 Male (Straight) to N Female (Straight)

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Product Specification: Low PIM Jumper Cables



Electrical Specification	1.5 ft	3 ft	6 ft	10 ft
Operating Frequency	DC - 3,000 MHz			
VSWR @ 0.5 GHz	1.07	1.07	1.07	1.07
VSWR @ 1.0 GHz	1.10	1.10	1.10	1.10
VSWR @ 2.0 GHz	1.15	1.15	1.15	1.15
VSWR @ 3.0 GHz	1.20	1.20	1.20	1.20
Insertion Loss @ 0.5 GHz	0.18 dB	0.30 dB	0.50 dB	1.5 dB
Insertion Loss @ 1.0 GHz	0.20 dB	0.38 dB	0.68 dB	3.4 dB
Insertion Loss @ 2.0 GHz	0.25 dB	0.75 dB	1.20 dB	2.0 dB
Insertion Loss @ 3.0 GHz	0.30 dB	0.90 dB	1.50 dB	2.4 dB
PMD (Typ) @ 200 (p-p) dB	< -133 dB (Max) @ 1.0 GHz			
Operating Temperature	-40° - 170° F			
Impedance	50 Ω			

Material Specification	Value
Connector Body	STAIN PLATED BRASS
Insulator	PTFE
Coupling Nut	STAIN PLATED BRASS

Construction Specification	Material	Diameter
Center Conductor	SFC	0.92 mm (0.236 in)
Dielectric	PTFE	2.98 mm (0.217 in)
Braid	TC	3.58 mm (0.141 in)
Jacket	PEP	4.34 mm (0.163 in)

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COAXIAL SURGE PROTECTOR DC-7GHz

BDA-P8AX09-6G-N/FF

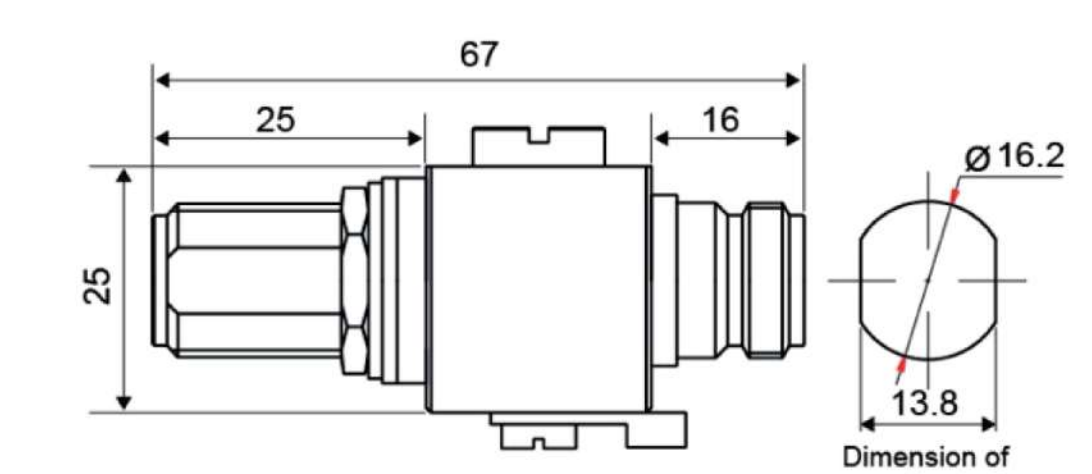
- Product Features
- RF coaxial surge protector
- DC 7 GHz
- 70 W
- Connectors: N
- Low Insertion Loss
- Removable GDT
- DC pass
- Bi-directional protection



Electric Specifications	Value
Frequency range	DC-7 GHz
Insertion loss	< 0.2 dB
Return loss	> 19 dB
Impedance	50 ohms
VSWR	< 1.25:1
Max. load current	10 A
Operating current / Continous current at 40V	None
Max. discharge current/min. withstand @ 20 μs by pulse	20 kA
Protection mode(s)	Common mode
Protection level (up to 20ps)	< 1100 V
Regular current @ 1000pps Test (D1 Category)	1.1 A
Normal discharge current @ 2ps Test 10 - C2 Category	3.5 A
Max Power	70 W
Typical let through energy 50 ohms input 4kV 1.250us - 2kA @ 20ps	2.2 mJ
DC Pass	Yes
Insulation resistance	> 10 GOhms
Mechanical Specifications	Value
Technology	Gas discharge tube
Connection to Network	connector N Female/Female
Mounting	Feedthrough
Receiving material	Brass/Surface plating: Cu, Zn, Sn
Operating temperature	-40+85°C
Protection rating	IP66
Outdoor application	Yes
Failure mode	Short circuit
Disconnection indicator	Transmission interrupt
Spine (module)	2 x BA RF - 8020
Contacts	Brass/Surface Au-Ag
Weight	0.165 kg

COAXIAL SURGE PROTECTOR DC-7GHz

BDA-P8AX09-6G-N/FF



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PSR-78-9533-X

Channelized Digital Repeater for Public Safety 700/800 MHz

The PSR-78-9533-X is a revolutionary digital public safety repeater designed to protect the lives of first responders and building occupants.

Through the use of digital signal processing (DSP) filtering technology, the PSR-78-9533-X helps eliminate adjacent channel interference to allow band selectivity and support for 700 MHz and 800 MHz Public Safety frequencies including FirstNet. Up to two non-contiguous wideband and thirty-two non-contiguous narrowband filters can be simultaneously supported in the 700 MHz and 800 MHz Public Safety frequencies via ADRF's celebrated web-based GUI, which provides versatility and total control to the user.



- Product Features
- Tested and approved under UL 2524, Second Edition by MET Laboratories, Inc. as comprehensive solution with an annunciator and ADRF BB Series battery backups
- NFPA 72 2016 code compliant and FirstNet compliant
- Alarming output to supervised circuits for antenna, amplifier, AC or DC power supply, battery, and charger failure including oscillation detection with automatic amplifier shutdown routine
- NEMA 4 enclosure for both indoor and outdoor environments
- Simultaneously supports FCC Part 90 Class A narrowband and Class B wideband repeater designations
- Up to 95 dB of gain and up to 33 dBm downlink and 30 dBm uplink output power per band
- Supports P25 Phase 1/Phase 2 analog and digital systems

Honeywell

Product Specifications PSR-78-9533-X (Public Safety 700/800 MHz Channelized Digital Repeater)

Electronic Specifications	Downlink	Uplink
Frequency Range	758 - 768 MHz 769 - 775 MHz 799 - 805 MHz	788 - 798 MHz 799 - 805 MHz
Composite Output Power	PS 800 FirstNet, PS 700 / FirstNet + PS 700 PS 800 FirstNet + PS 700 + PS 800	33 dBm 33 dBm 30 dBm 30 dBm
System Gain	Wideband Narrowband (N Mode)	95 dB 2 (non-contiguous) @ PS 700 Up to 16 (non-contiguous) @ PS 700
Filter Selection	Narrowband (S1 Mode) Narrowband (S2 Mode) Narrowband (S3 Mode) Narrowband (S4 Mode)	Up to 32 (non-contiguous) @ PS 700 Up to 20 (non-contiguous) @ PS 800 Up to 32 (non-contiguous) @ PS 700 Up to 32 (non-contiguous) @ PS 800
Filter Bandwidth	Wideband Narrowband	3.5, 10 MHz 12.5, 25, 75, 100, 200 kHz
Filter Roll-off	Wideband Narrowband	60 dB @ Filter Bandwidth Edge + 1 Hz 2.5 dB @ Filter BW
Spurious Emission	FCC Rule Compliant	
Passband Ripple	± 2 dB	
AFC Dynamic Range	± 60 dB	
Gain Dynamic Range	> 45 dB	
Noise Figure @ Max. Gain	Wideband Narrowband	± 6 μs ≤ 48 μs @ 12.5 kHz, ≤ 28 μs @ 25 kHz, ≤ 18 μs @ 75 kHz, ≤ 10 μs @ 100 kHz, ≤ 8 μs @ 150 kHz, ≤ 5 μs @ 200 kHz
Power Supply	110 - 240 VAC, 60 Hz (Free Voltage, w/ Battery backup function)	
Power Consumption	< 163 W	
Max RF Input Power without Over Drive	-20 dBm	
Enclosure Cooling	Convection	
Max RF Input Power without Damage	+10 dBm	
Impedance	50 Ω	
VSWR	< 1.5 : 1	
Dry Contacts	NFPA 1221 2016 Code Compliant	
Remote Alarming / Network Management	Dry Contacts, Web-GUI, SNMP (External Wireless Modem Required)	
Humidity	5% - 95% RH Condensed	
Operating Temperature	-40°F to +140°F (-40°C to +60°C)	
Certification	FCC Part 90 Class A / Class B	
Annunciator Decibel Level	100 dB @ 1m	
Uplink Squelch Control	Narrowband / Broadband -10 to -80 dB (5 dB step)	
Mechanical Specifications		
Dimension (Repeater / Annunciator)	11.0 x 9.0 x 21.3 in (w/o brackets) / 5.81 x 2.84 x 6.32 in (w/o brackets)	
Weight (Repeater / Annunciator)	55 lbs (w/o brackets) / 2.5 lbs (w/o brackets)	
RF Connector	4.3-70 (Female)	
Weather Resistance	NEMA 4	

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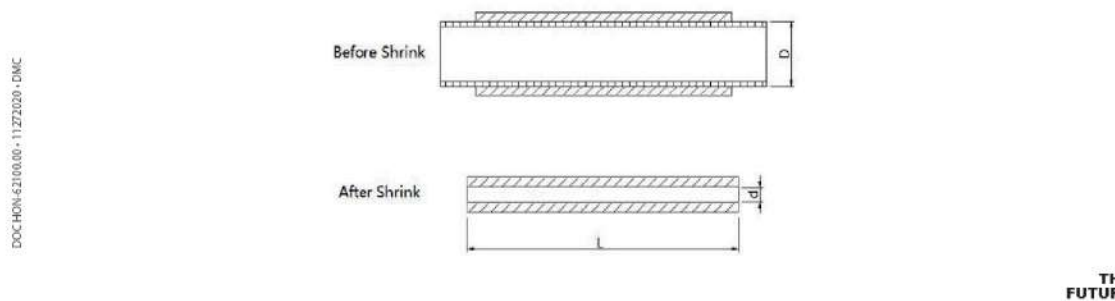
WEATHERPROOFING SILICONE COLDSHRINK FOR EOL ASSEMBLY, 9.8" L

BDA-WPK-ATBC40_01

- Product Features
- Silicone Rubber
- Flame Retardant UL94HB
- Extra duration
- Weatherproof Silicon Rubber



Specifications	Value
Material	Silicone Rubber
Hardness, Shore A	35 - 45
Specific Gravity (25 °C)	1.08 - 1.16
Color	Grey (Fluorene 431U)
Flame Retardant	UL94HB
Tensile Strength	≥ 7.0 MPa (23 °C ASTM D412)
Elongation	≥ 400% (23 °C ASTM D412)
Tear Strength	≥ 25 kN/m (23 °C ASTM D624)
Temperature Range	-60 °C - 200 °C
Chemical Resistance	70% ASTM D1511-A
UV Resistance	1000h, ISO4892.3 Cycle1
Mold Resistance	IEC60068-2-10, Class 1
How Clamp	Includes 2 (16-25 mm)
Life Time	20 Years
IP Grade	IP68 (IEC 60529)
Dimensions	40 x 10 x 230 mm



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AirCell® Connectors & Tools Connector Specification

NFP01250 AirCell® 50 Ohm Connectors

For use with AirCell® 1/2" 50 Ohm Plenum, Conduit and In-Conduit Cables

Description	NFP01250
General Specifications	
Interface	1 Female
Body Style	Stright
Electrical Specifications	
Impedance, Ohms	50
Operating Frequency Band	0.3 MHz to 6 GHz
Dielectric Withstand Voltage	2 kV DC
3rd Order IMD	-140 dBc minimum, -150 typical
3rd Order IMD Test Method	2 x 20 Watt carriers
Average Power	25.8 kW
Peak Power, maximum	10 kW
Insertion Loss, typical	0.25
Shielding Effectiveness	-130 dB
Return Loss (VSWR)	
DC to 1 GHz	30 dB (1.06)
1 GHz to 2 GHz	31 dB (1.06)
2 GHz to 3 GHz	33 dB (1.06)
3 GHz to 4 GHz	35 dB (1.12)
4 GHz to 6 GHz	20 dB (1.22)
5 GHz to 6 GHz	15 dB (1.43)
Mechanical Specifications	
Outer Contact Plating	Silver
Inner Contact Plating	Silver
Interface Durability Test Method	500 cycles
Interface Durability Test Method	IEC 16916
Minimum Connector Pull-Off Force	200 lbs
Environmental Specifications	
Operating Temperature, °F (°C)	-40° to 158° (-40° to 70°)
Storage Temperature, °F (°C)	-40° to 158° (-40° to 70°)
Insulation Temperature, °F (°C)	23° to 125° (5° to 50°)
Immersion Test Method	IEC60529:2001 IP68
Corrosion Test Method	MIL-STD-1344A
Thermal Shock Test Method	MIL-STD-202F
Vibration Test Method	MIL-STD-202F
Regulatory Compliance/Certifications	
RoHS 2011/65/EU Compliant	
TL 9000 H-V - All Cables designed and manufactured under the quality management system	
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1/2" ClearFill®Line Aluminum Plenum-Rated Air-Dielectric Coaxial Cable for In-Building Applications

ClearFill®Line 1/2" low-loss air dielectric cable, Plenum-rated, CMP

FEATURES / BENEFITS

- Supports Multiple RF Signals
- Complete Shielding
The solid outer conductor of the ClearFill®Line coaxial cable creates a continuous RFEM shield that minimizes signal interference.
- Outstanding Intermodulation Performance
RF connector cables, used where outer conductor usually derates intermodulation performance is also confirmed with state-of-the-art equipment at the RFS factory.
- Wide Range of Applications
Facilities of residential care facilities for plenum-space installations within occupied buildings or structures but also suitable for outdoor use due to jacket UV rating.



Technical Features

APPLICATIONS	
Applications	Substitue for plenum in building/public safety or outdoor usage
STRUCTURE	
Cable Type	Air Dielectric, Composite
Size	1/2"
Inner Conductor	mm (in) 4.8 (0.19) Copper Clad Aluminum Wire
Dielectric	mm (in) 11.8 (0.464) Extruded Polyethylene
Outer Conductor	mm (in) 13.8 (0.54) Composite Aluminum
Jacket	mm (in) 15.8 (0.62) Plenum Rated / Color Red UV rated to ASTM D255
ELECTRICAL SPECIFICATIONS	
Impedance	Ω 100 ± 1
Maximum Frequency	GHz 4.0
Velocity	% 91.9
Capacitance	pF/m (pF/ft) 25.0 (22.8)
Inductance	μH/m (μH/ft) 0.19 (0.056)
Peak Power Rating	Watt 40.0
RF Peak Voltage	Volts 2000.0
Jacket Break	N/A N/A 8000.0
Inner Conductor dc Resistance	Ω/1000 m (Ω/1000 ft) 1.48 (0.45)
Outer Conductor dc Resistance	Ω/1000 m (Ω/1000 ft) 2.29 (0.7)
Return Loss (VSWR) Performance	dB (dB) @ 400-500 MHz: 14.1 (20.0) @ 1000-1400 MHz: 19.1 (20.0) @ 1700-2100 MHz: 14.1 (20.0) @ 200-2500 MHz: High Power Rating
Temperature & Power	
MECHANICAL SPECIFICATIONS	
Cable Weight, Nominal	kg/m (lb/ft) 0.19 (0.13)
Minimum Bending Radius, Single Bend	mm (in) 76 (3)
Minimum Bending Radius, Repeated Bends	mm (in) 127 (5)
Bending Moment	Nm (ft-lb) 5.4
Tensile Strength	N (lb) 545 (125)
Recommended / Maximum Clamp Spacing	m (ft) 0.5 (0.1) / 1.7 (3)
Crush Strength	kg/mm (lb/in) 0.893 (0.0)

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ATTENUATION AND POWER RATING			TESTING AND ENVIRONMENTAL	
Frequency MHz	Attenuation dB/100m @ 20°C	Power @ 100m @ 20°C	RF Performance	Ham Radio
0.5	0.16	0.05	40.00	Ham Radio, Plenum-rated, CMP
1	0.33	0.011	32.80	CTE Listed to UL649
1.5	0.50	0.007	26.80	Canadian CSA C.22.2 #19
2	0.67	0.005	23.20	20 to 85 (+4 to 140) °C (F)
3	0.84	0.004	20.30	40 to 85 (+40 to 185) °C (F)
4	1.00	0.003	17.20	40 to 85 (+40 to 185) °C (F)
5	1.17	0.002	14.40	
6	1.34	0.002	11.80	
7	1.50	0.001	9.40	
8	1.67	0.001	7.20	
9	1.84	0.001	5.20	
10	2.00	0.001	3.40	
15	2.80	0.000	1.80	
20	3.60	0.000	1.00	
30	5.10	0.000	0.50	
40	6.70	0.000	0.30	
50	8.30	0.000	0.20	
60	10.00	0.000	0.15	
70	11.70	0.000	0.11	
80	13.40	0.000	0.08	
90	15.10	0.000	0.06	
100	16.80	0.000	0.05	
120	19.70	0.000	0.04	
140	22.60	0.000	0.03	
160	25.50	0.000	0.02	
180	28.40	0.000	0.02	
200	31.30	0.000	0.01	
250	39.20	0.000	0.01	
300	47.10	0.000	0.01	
350	55.00	0.000	0.01	
400	62.90	0.000	0.01	
450	70.80	0.000	0.01	
500	78.70	0.000	0.01	
550	86.60	0.000	0.01	
600	94.50	0.000	0.01	
650	102.40	0.000	0.01	
700	110.30	0.000	0.01	
750	118.20	0.000	0.01	
800	126.10	0.000	0.01	
850	134.00	0.000	0.01	
900	141.90	0.000	0.01	
950	149.80	0.000	0.01	
1000	157.70	0.000	0.01	
1200	189.60	0.000	0.01	
1400	221.50	0.000	0.01	
1600	253.40	0.000	0.01	
1800	285.30	0.000	0.01	
2000	317.20	0.000	0.01	
2500	396.10	0.000	0.01	
3000	475.00	0.000	0.01	
3500	553.90	0.000	0.01	
4000	632.80	0.000	0.01	
4500	711.70	0.000	0.01	
5000	790.60	0.000	0.01	
5500	869.50	0.000	0.01	
6000	948.40	0.000	0.01	
6500	1027.30	0.000	0.01	
7000	1106.20	0.000	0.01	
7500	1185.10	0.000	0.01	
8000	1264.00	0.000	0.01	
8500	1342.90	0.000	0.01	
9000	1421.80	0.000	0.01	

Attenuation at 20°C (68°F) cable temperature, tolerance ± 5% max. Mean power rating at 40°C (104°F) ambient temperature

External Document Links Notes

N Male Connector for 1/2" Coaxial Cable (includes DragonSkin), OMNI FIT™ Premium, Straight, Polymer claw and compression sealing

OMNI FIT™ high performance connectors are designed for use with both CELLFLEX® (copper) and CELLFLEX® Lite (aluminum) cables. They are designed specifically to provide the highest quality connector-cable interface while simplifying and speeding up connector attachment. All RFS connectors are fully tested for mechanical and electrical compliance to industry specifications.

The 7-16 connector is the most rugged RF connection meeting all requirements even under the most severe environmental conditions. Sealing against outer conductor and jacket by means of the polymer claw and 360° compression fit. Multifunctional, self-lubricating HighTech polymer assembly locks on cable corrugation, avoids electrochemical potential differences and compression-fits to the jacket. This connector can be used on RFS DragonSkin cable.



- FEATURES / BENEFITS**
- Ultra high VSWR performance i.e. reduced interference leading to high customer satisfaction
 - Two-piece design i.e. visual inspection of interlocking leads to improved installation security
 - OMNI FIT™ concept i.e. streamlined order management and reduced stock level
 - Watertight sealing in mated and unmated condition, i.e. reduced efforts during installation and improved security during operation
 - Unique NTR plating i.e. extreme resistance against corrosion even under hardest climatic and environmental circumstances
 - Multi-thread (tristar) design i.e. simplified and accelerated tightening process
 - RoHS (RE) and CB (China) compliant i.e. can be used on a global basis

Technical features

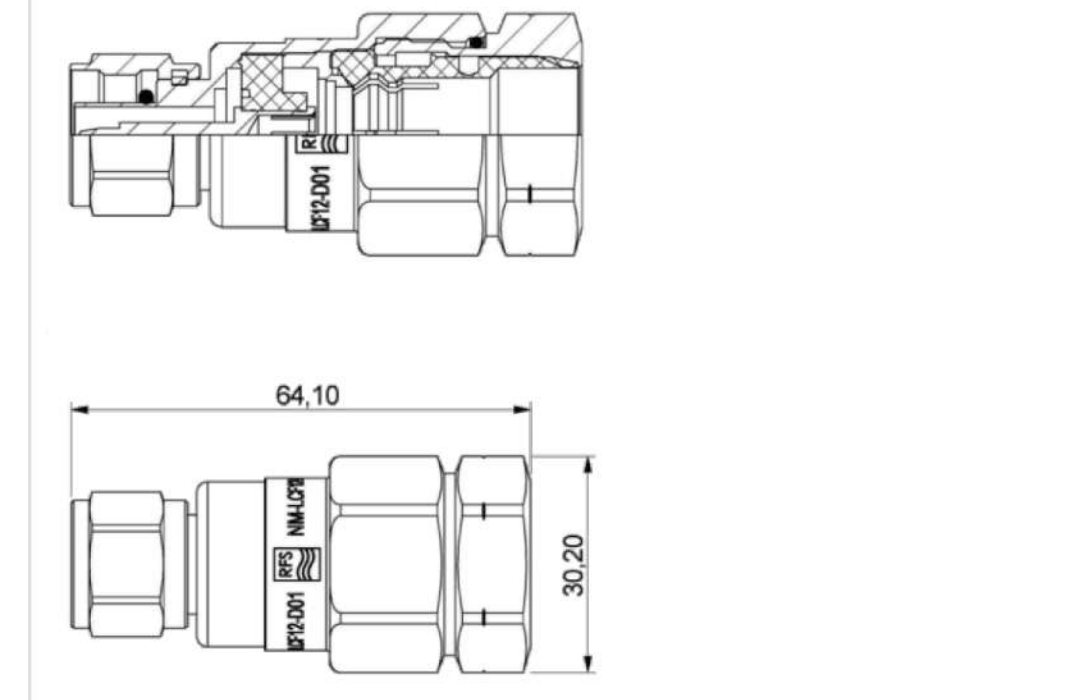
GENERAL SPECIFICATIONS	
Transmission Line Type	Coaxial Cable
Cable Size	1/2
Cable Type	Foam Dielectric
Model Series	LCF12-50 Series, ICA12-50 Series, RCF12-50 Series, DragonSkin
Connector Interface	N
Connector Type	OMNI FIT™ PREMIUM Straight
Sealing Method	Polymer claw + 360° Compression
Gender	Male
ELECTRICAL SPECIFICATIONS	
Nominal Impedance, ohms	Ohm 50
3rd Order Inter Product @ 2x20	dBc -156 ; typical -162
Maximum Frequency	GHz 3.7
VSWR, Return Loss	VSWR (dB) @ ALC f = 1.0 GHz: 1.02 (40) 1.0 ALC f = 2.7 GHz: 1.03 (36.6) 2.7 ALC f = 3.7 GHz: 1.06 (30.7)
MECHANICAL SPECIFICATIONS	
Plating Outer/Inner	NTR/Silver
Length	mm (in) 64.05 (2.52)
Outer Diameter	mm (in) 29 (1.14)
Weight	kg (lb) 0.11 (0.24)
Inner Contact Attachment	Basket
Outer Contact Attachment	360° clamping

N Male Connector for 1/2" Coaxial Cable (includes DragonSkin), OMNI FIT™ Premium, Straight, Polymer claw and compression sealing

ACCESSORIES	
Wrench size front	mm (in) 18
Wrench size rear	mm (in) 26
Trimming Tool	TRIM-MST-1-L12-D01 TRIM-L-CF12-D01-A

TESTING AND ENVIRONMENTAL

Waterproof Level	IP68
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External Document Links Notes

GENERAL

APPLICABILITY - THE INTERNATIONAL FIRE CODE SHALL BE INTERPRETED TO MEAN ANY PORTION OF A NEW BUILDING CONSTRUCTED WHERE RADIO COVERAGE SIGNAL STRENGTH LEVELS ARE NOT CONSISTENT WITH SECTION 510 EMERGENCY RESPONDER COMMUNICATION COVERAGE / INTERNATIONAL FIRE CODE.

ADDITIONAL FREQUENCIES

ADDITIONAL FREQUENCIES - INTERNATIONAL FIRE CODE MAY CHANGE AS A RESULT OF FCC ORDER, OR OTHER OPERATIONAL REQUIREMENTS OF WASHINGTON TOWNSHIP FIRE DEPARTMENT. IN THE EVENT OF SUCH FREQUENCY CHANGE, AND UPON NOTIFICATION BY WASHINGTON TOWNSHIP FIRE DEPARTMENT, THE BUILDING OWNER SHALL MODIFY OR EXPAND THE EMERGENCY RESPONDER RADIO SYSTEM COVERAGE AT THEIR OWN EXPENSE. THE AHJ MAY REQUIRE COVERAGE IN THE FUTURE FOR FIRSTNET BROADBAND SERVICES AS NFPA 72, NFPA 1221 AND FIRE CODE 510 ARE AMENDED.

LABELING

- PROVIDE SIGN ON ALL DOORS PROVIDING ACCESS TO ERRS STATING: "EMERGENCY RESPONDER RADIO SYSTEM EQUIPMENT INSIDE."
- PROVIDE SIGN ON DONOR ANTENNAS STATING: "EMERGENCY RESPONDER RADIO SYSTEM."

SYSTEM COMPONENTS

INTERNATIONAL FIRE CODE SHALL BE ENFORCED WITH THE FOLLOWING ADDITIONAL CLARIFICATIONS:

EQUIPMENT

ALL EQUIPMENT SHALL BE LISTED BY NATIONALLY RECOGNIZED TESTING LABORATORY FOR ITS INTENDED USE.

EXTERNAL FILTERS - PERMANENT EXTERNAL FILTERS AND ATTACHMENTS SHALL NOT BE PERMITTED.

SIGNAL BOOSTER COMPONENTS - IF USED, SIGNAL BOOSTERS SHALL MEET THE FOLLOWING REQUIREMENTS:

- SIGNAL BOOSTERS SHALL HAVE FCC CERTIFICATION PRIOR TO INSTALLATION AND SHALL BE NFPA72 AND/OR IFC510.1 COMPLIANT.
- ALL SIGNAL BOOSTERS SHALL BE COMPATIBLE WITH BOTH ANALOG AND DIGITAL COMMUNICATIONS SIMULTANEOUSLY AT THE TIME OF INSTALLATION.

POWER SOURCES - AT LEAST TWO INDEPENDENT AND RELIABLE POWER SOURCES SHALL BE PROVIDED FOR ALL REPEATER, TRANSMITTER, RECEIVER, AND SIGNAL BOOSTER COMPONENTS, ONE PRIMARY AND ONE SECONDARY.

- ALL REPEATER, TRANSMITTER, RECEIVER, SIGNAL BOOSTER COMPONENTS, EXTERNAL FILTERS AND BATTERY SYSTEM COMPONENTS SHALL BE CONTAINED IN UL APPROVED TYPE 4 OR 4X.
- DONOR ANTENNA CABLING AND CONNECTIONS SHALL BE WEATHERPROOF, PROTECTED FROM PHYSICALLY DAMAGE AND PROPERLY SUPPORTED.

PATHWAY SURVIVABILITY - ALL SYSTEM RISER CABLES SHALL BE IN CONDUITS AND SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING:

- BUILDINGS WHERE INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURE ARE REQUIRED TO HAVE FIRE-RESISTANCE RATING OF NO LESS THAN TWO HOURS:
 - > 2-HOUR FIRE-RATED CIRCUIT INTEGRITY (CI) CABLE
 - > 2-HOUR FIRE-RATED CABLE SYSTEM
 - > 2-HOUR FIRE-RATED ENCLOSURE OR PROTECTED AREA
 - > 2-HOUR PERFORMANCE ALTERNATIVE APPROVED BY THE AHJ
- BUILDINGS WHERE INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURE ARE REQUIRED TO HAVE FIRE-RESISTANCE RATING OF NO LESS THAN ONE HOUR:
 - > 1-HOUR FIRE-RATED CI CABLE
 - > 1-HOUR FIRE-RATED CABLE SYSTEM
 - > 1-HOUR FIRE-RATED ENCLOSURE OR PROTECTED AREA
 - > 1-HOUR PERFORMANCE ALTERNATIVE APPROVED BY THE AHJ

POWER SOURCES

A) PRIMARY POWER SOURCE - THE PRIMARY POWER SOURCE SHALL BE SUPPLIED FROM A DEDICATED BRANCH CIRCUIT AND COMPLY WITH NFPA 72, 2016 EDITION, SECTION 10.6.5.1

B) SECONDARY POWER SOURCE - IN THE EVENT OF A FAULT OR FAILURE OF THE PRIMARY POWER SUPPLY, ERRS SYSTEM SHALL AUTOMATICALLY AND IMMEDIATELY TRANSFER TO A SECONDARY POWER SOURCE, WHILE CONSTANTLY MAINTAINING ALL ERRS REQUIRED FUNCTIONS AND OPERATION AVAILABLE WITHOUT RESTARTING THE SYSTEM. ONE OF THE FOLLOWING SECONDARY POWER SOURCES CAN BE USED:

- A STORAGE BATTERY DEDICATED TO THE SYSTEM WITH AT LEAST 24-HOURS AT 100% SYSTEM OPERATION CAPACITY AND ARRANGED IN ACCORDANCE WITH NFPA 72, 2016 EDITION, SECTION 10.6.10
- ALL ELECTRICAL BREAKERS FOR ERRS SHALL BE PROPERLY LABELED AND SHALL BE PROVIDED WITH AN APPROVED BREAKER LOCKING DEVICE.

SYSTEM MONITORING

THE PUBLIC SAFETY RADIO COMMUNICATIONS ENHANCEMENT SYSTEM SHALL INCLUDE AUTOMATIC SUPERVISORY AND TROUBLE REPORTING FOR MALFUNCTIONS OF THE SIGNAL BOOSTER AND POWER SUPPLIES THAT ARE ANNUNCIATED BY THE FIRE ALARM SYSTEM AND UL LISTED SUPERVISING STATION MONITORING COMPANY, OR SHALL BE MONITORED AT A CONSTANTLY ATTENDED LOCATION AT THE BUILDING AND COMPLY WITH THE FOLLOWING:

- THE INTEGRITY OF CIRCUIT MONITORING SIGNAL BOOSTERS AND POWER SUPPLIES SHALL COMPLY WITH NFPA 72, 2016 EDITION, 10.6.9 AND 12.8
- SYSTEM AND SIGNAL BOOSTER SUPERVISORY SIGNALS SHALL INCLUDE THE FOLLOWING:
 - ANTENNA MALFUNCTION
 - SIGNAL BOOSTER FAILURE
 - LOW BATTERY INDICATION WHEN 70 PERCENT OF THE 24-HOUR OPERATION CAPACITY HAS BEEN DEPLETED
- POWER SUPPLY SIGNALS SHALL INCLUDE THE FOLLOWING FOR EACH SIGNAL BOOSTER:
 - LOSS OF NORMAL POWER
 - FAILURE OF BATTERY CHARGER

ERRS SIGNALS ON FIRE ALARM ANNUNCIATOR PANEL SHALL BE LABELED "EMERGENCY RESPONDER RADIO SYSTEM." THERE SHALL BE ONE GREEN LED SIGNAL INDICATING ERRS IN NORMAL MODE AND ONE YELLOW LED INDICATING SYSTEM IS IN TROUBLE.

AUTOMATIC SMOKE DETECTION - SMOKE DETECTOR SHALL BE PROVIDED AT THE LOCATION OF EACH ERRS CONTROL UNIT(S), STORAGE BATTERY UNIT(S) AND MONITORING PANEL.

DEDICATED PANEL

A DEDICATED MONITORING PANEL SHALL BE PROVIDED IN AN AREA ACCEPTABLE AND APPROVED BY THE INTERNATIONAL FIRE CODE TO ANNUNCIATE THE STATUS OF ALL SIGNAL BOOSTER LOCATIONS. IN BUILDINGS WITH FIRE ALARM SYSTEMS, A SMOKE DETECTOR SHALL BE PROVIDED ABOVE MONITORING PANEL. THE MONITORING PANEL SHALL PROVIDE VISUAL AND LABELED INDICATION OF THE FOLLOWING FOR EACH SIGNAL BOOSTER:

- *NORMAL 120VAC POWER
- *SIGNAL BOOSTER TROUBLE
- *LOSS OF NORMAL 120VAC POWER
- *FAILURE OF BATTERY CHARGER
- *LOW BATTERY CAPACITY
- *DONOR ANTENNA FAILURE

IN SPECIAL CIRCUMSTANCES WHERE A DEDICATED PANEL CANNOT BE INSTALLED, A REQUEST FOR MODIFICATION MUST BE SUBMITTED AND APPROVED TO ANNUNCIATE ON FAC.

ACCEPTANCE TEST

ACCEPTANCE AND OPERATIONAL TESTING SHALL BE IN ACCORDANCE THE INTERNATIONAL FIRE CODE WITH THE FOLLOWING CLARIFICATIONS:

- THE FIRE DEVELOPMENT SERVICES INSPECTOR(S) SHALL REVIEW THE AS-BUILT DRAWINGS AND LINK BUDGET TO ENSURE THE PHYSICAL INSTALLATION IS THE SAME AS THE AS-BUILT DRAWINGS DURING THE FINAL SYSTEM ACCEPTANCE TEST.
- ERRS SHALL BE INSPECTED, APPROVED AND PRE-TEST SHEET SIGNED BY LABDS ELECTRICAL INSPECTION PRIOR TO REQUESTING AN ACCEPTANCE TEST.
- THE FINAL SYSTEM ACCEPTANCE TEST SHALL BE WITNESSED BY A FIRE DEVELOPMENT SERVICES INSPECTOR OR SPECIFIC DESIGNEE AND SHALL INCLUDE A VISUAL INSPECTION OF THE PHYSICAL INSTALLATION OF THE EMERGENCY RESPONDER RADIO SYSTEM. TWO FIRE DEVELOPMENT SERVICES INSPECTORS SHALL CONDUCT AN ON AIR TEST OF THE SUBJECT RADIO CHANNELS IN ALL CRITICAL AREAS AND SPOT TESTS IN NON-CRITICAL AREAS. A QUALIFIED ENGINEER OR TECHNICIAN FROM THE DESIGNING OR INSTALLING COMPANY SHALL BE PRESENT WITH THE APPROPRIATE TEST EQUIPMENT TO VERIFY ALL MEASUREMENTS ARE IN COMPLIANCE WITH SECTION 510.
- AS PART OF THE ACCEPTANCE TEST, BACKUP BATTERIES AND POWER SUPPLIES SHALL BE TESTED IN ACCORDANCE THE INTERNATIONAL FIRE CODE.
- 510.5.3(7) - AS PART OF THE INSTALLATION A SPECTRUM ANALYZER OR OTHER SUITABLE TEST EQUIPMENT SHALL BE UTILIZED TO EVALUATE THE SYSTEM FOR THE ENTIRE SPECTRUM RANGE OF FREQUENCIES USED BY THE INTERNATIONAL FIRE CODE (856.2375MHz-860.9375MHz AND 811.2375MHz-815.9375MHz, INCLUSIVE) TO ENSURE SPURIOUS OSCILLATIONS ARE NOT BEING GENERATED OR RECEIVED BY THE BUILDING SIGNAL BOOSTER(S). THIS TEST SHALL BE CONDUCTED AT TIME OF INSTALLATION AND SUBSEQUENT ANNUAL INSPECTIONS.

MAINTENANCE

THE EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES IN ACCORDANCE THE INTERNATIONAL FIRE CODE.

- IN THE EVENT OF A SERVICE AFFECTING FAILURE OF ANY PORTION OF THE EMERGENCY RESPONDER RADIO SYSTEM, AN INITIAL EVALUATION SHALL BE MADE BY A QUALIFIED TECHNICIAN WITHIN 24 HOURS AND REPAIRS SHALL BE COMPLETE WITHIN 5 WORKING DAYS. BUILDING OWNER OR DESIGNEE SHALL NOTIFY THE FORTHWITH OF ANY SERVICE AFFECTING OUTAGE.
- IN THE EVENT OF A NON-SERVICE AFFECTING FAILURE OF ANY PORTION OF THE EMERGENCY RESPONDER RADIO SYSTEM, AN INITIAL EVALUATION SHALL BE COMPLETED BY A QUALIFIED TECHNICIAN ON THE NEXT BUSINESS DAY AND REPAIRS SHALL BE COMPLETE WITHIN 15 BUSINESS DAYS.

ANNUAL TESTING AND PROOF OF COMPLIANCE

ANNUAL TESTING AND PROOF OF COMPLIANCE SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE WITH THE FOLLOWING CLARIFICATIONS:

- A CHIEF'S REGULATION No. 4 TEST SHALL BE CONDUCTED BY A PERSON HOLDING A VALID REGULATION No. 4 CERTIFICATE OF FITNESS IN ACCORDANCE WITH SECTION 117 INTERNATIONAL FIRE CODE IN THE CATEGORY OF TWO WAY RADIO COMMUNICATIONS ENHANCEMENT SYSTEMS BI-DIRECTIONAL AMPLIFIER SYSTEMS FOR THE SPECIFIC MANUFACTURER AND TYPE OF SYSTEM BEING TESTED.
- AT THE CONCLUSION OF THE TESTING, A REPORT, WHICH SHALL VERIFY COMPLIANCE SHALL BE SUBMITTED ON AN THE OHIO FIRE DEPARTMENT APPROVED F-340R FIRE PROTECTION SYSTEM PERFORMANCE REPORT.
- INFORMATION ON OBTAINING A REGULATION No. 4 CERTIFICATE OF FITNESS CAN BE OBTAINED FROM THE "PROSPECTIVE APPLICANT LETTER" LINK WHICH IS FOUND ON INTERNATIONAL FIRE CODE CHIEF'S REGULATION.

BUILDING INFORMATION

BUILDING OCCUPANCY: B
BUILDING IS FULLY SPRINKLERED.
AREA OF WORK: 352,693 SQ. FT.
NUMBER OF STORIES: 5

SCOPE OF WORK

FURNISH AND INSTALL AN EMERGENCY RESPONDER RADIO COVERAGE SYSTEM CONSISTING OF SIGNAL BOOSTER(S), DONOR ANTENNA, IN-BUILDING ANTENNAS, DIRECTIONAL COUPLERS, POWER DIVIDERS, PLENUM RATED 1/2" COAXIAL CABLE, N-TYPE CONNECTORS AND JUMPERS. TOGETHER, THESE COMPONENTS FORM A DISTRIBUTED ANTENNA SYSTEM TO PROVIDE EMERGENCY RESPONDER RADIO COVERAGE. THE SYSTEM WILL ENHANCE SPECIFIC FREQUENCIES TO MEET ALL REQUIREMENTS AS NOTED IN THE FIRE PREVENTION AND PUBLIC SAFETY BUREAU REQUIREMENT THE INTERNATIONAL FIRE CODE.

NOTES

INSTALLATION SCOPE OF WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL CODES AND AHJ REQUIREMENTS.

INSTALLER SHALL VERIFY THE REQUIRED FIRE SURVIVABILITY OF THE RISER(S) AND EQUIPMENT LOCATION(S).

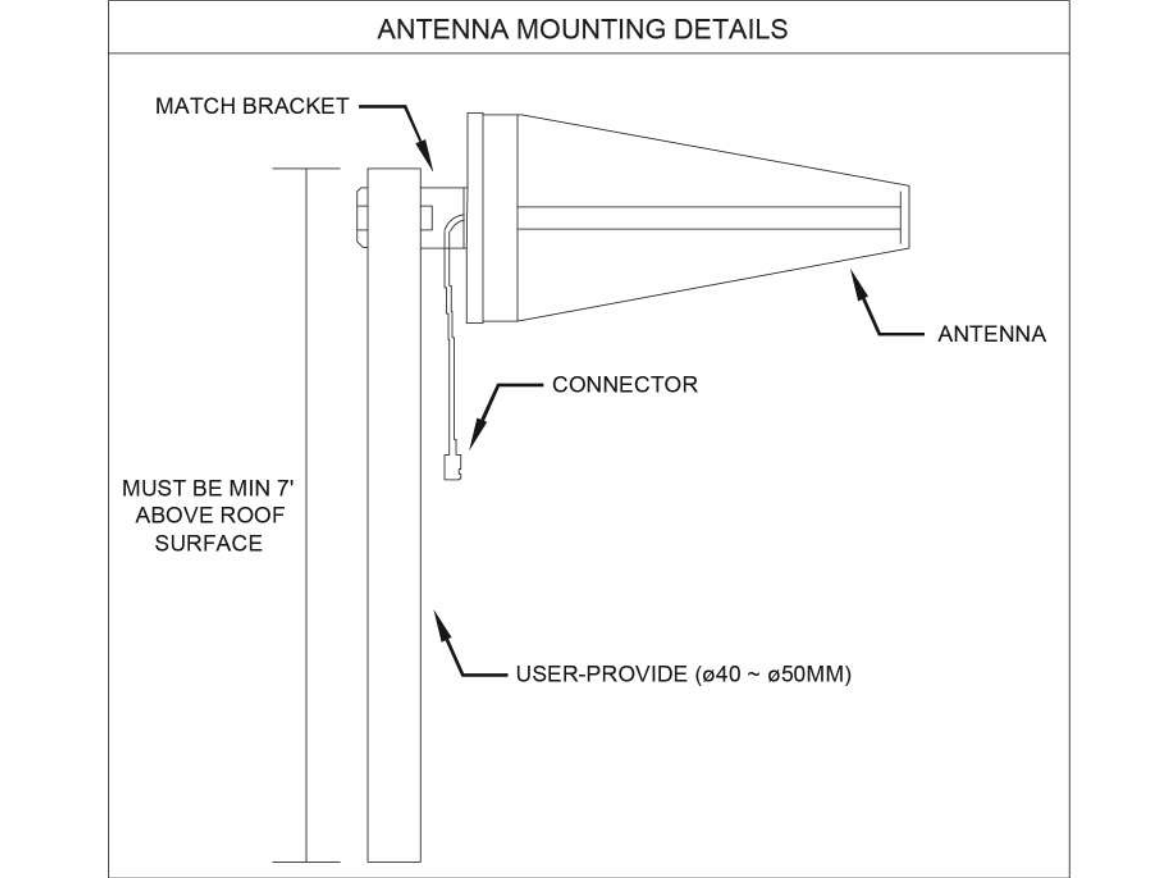
BATTERY BACKUP IS PROVIDED. REFER TO BATTERY CALCULATION SHEET.

ALL PASSIVE DEVICES (DIRECTIONAL COUPLERS, SPLITTERS) ARE INSTALLED INSIDE JUNCTION BOXES WITH PROPER SPACING FOR CONNECTIONS. IF CABLE IS REQUIRED TO BE INSTALLED IN A METAL RACEWAYS, DONOR ANTENNA AND ALL POWERED EQUIPMENT SHALL BE CONNECTED TO THE BUILDING GROUNDING SYSTEM.

DONOR ANTENNA SHALL BE CONNECTED TO LIGHTNING PROTECTION SYSTEM (IF EXISTING IN THE BUILDING). THE DESIGN WAS BASED ON SURVEY DATA (IF AVAILABLE) AND FAST RAY TRACING PREDICTION MODEL. THE DESIGN SHALL BE REVIEWED AND APPROVED BY A PROFESSIONAL ENGINEER, IF REQUIRED. THE SYSTEM SHALL NOT BE POWERED UNTIL IT HAS BEEN APPROVED BY THE AHJ.

ASSUMPTIONS

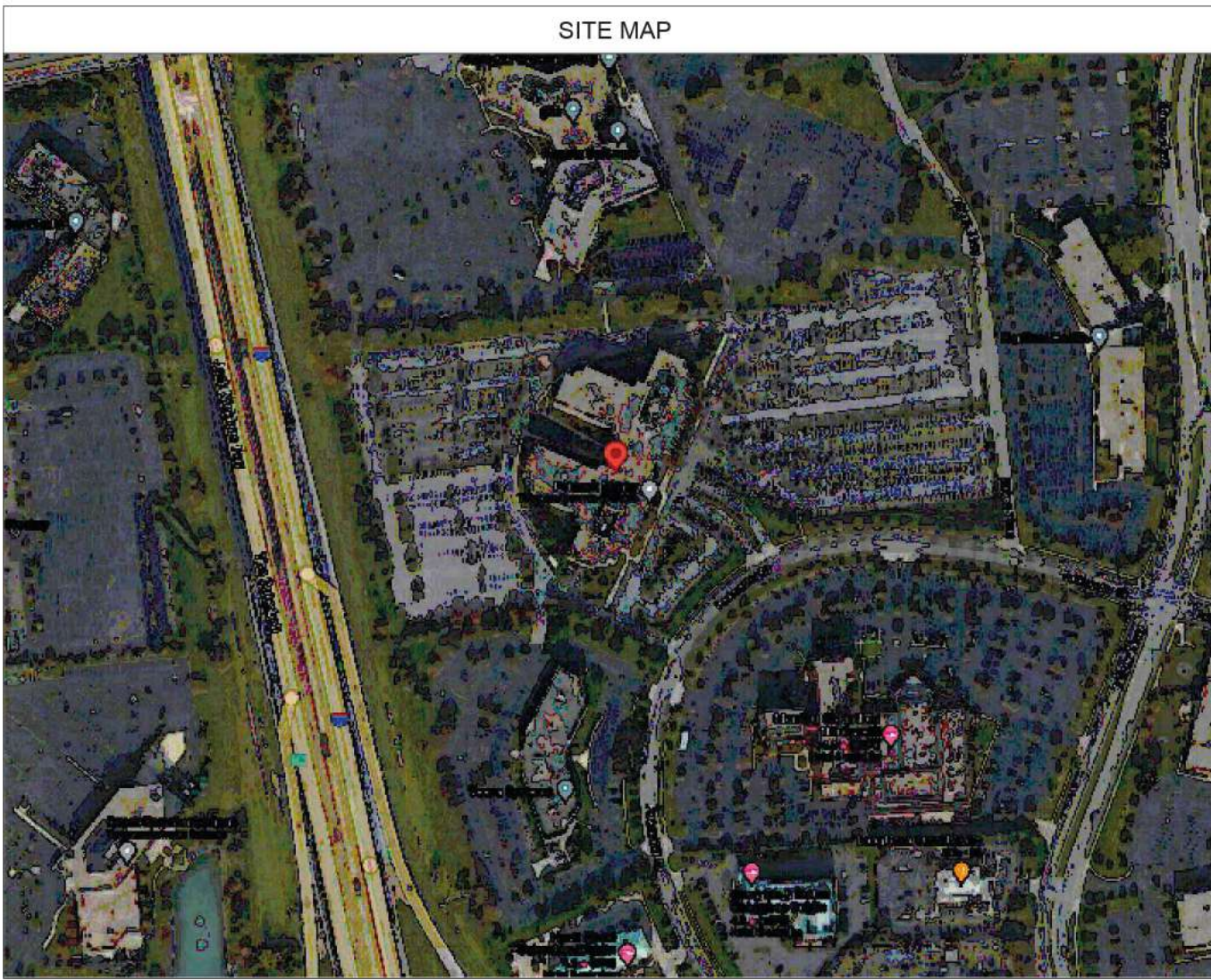
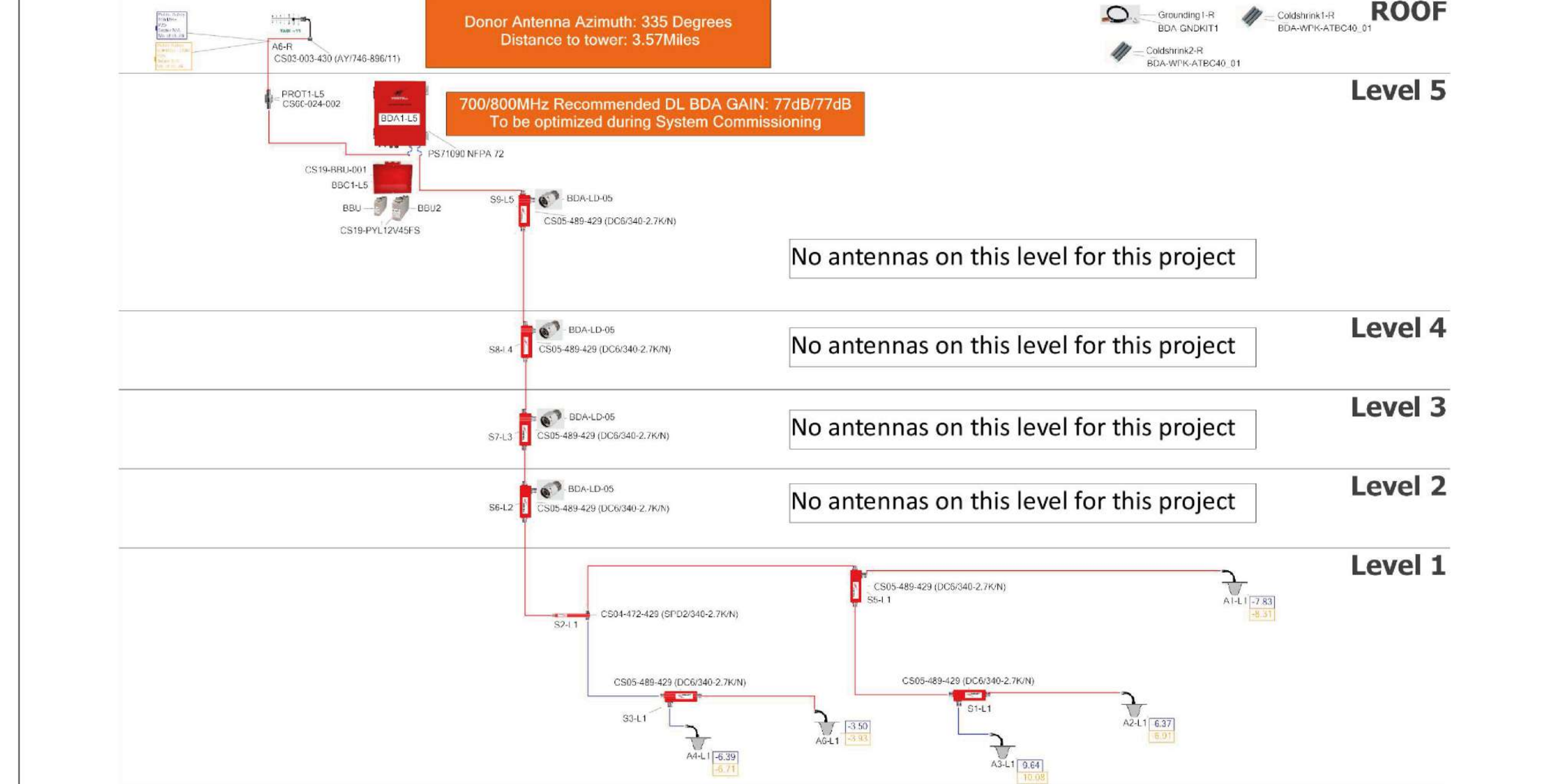
- 70 dBm SIGNAL AVAILABLE AT THE PROPOSED DONOR ANTENNA LOCATION
- AT LEAST 20DB GREATER THAN THE MAX. BDA GAIN OF ISOLATION BETWEEN INDOOR AND OUTDOOR ANTENNAS.
- 28 CHANNELS FOR 700MHz AND 28 CHANNELS FOR 800MHz SYSTEM.
- ALL EQUIPMENT AND CABLING CAN BE INSTALLED AS DESIGNED.
- FINAL ANTENNA LOCATIONS TO BE CONFIRMED BY SYSTEM INTEGRATOR.
- INSTALLER TO HAVE A VARIETY OF ATTENUATORS ON HAND TO BALANCE SYSTEM DURING COMMISSIONING STAGE.



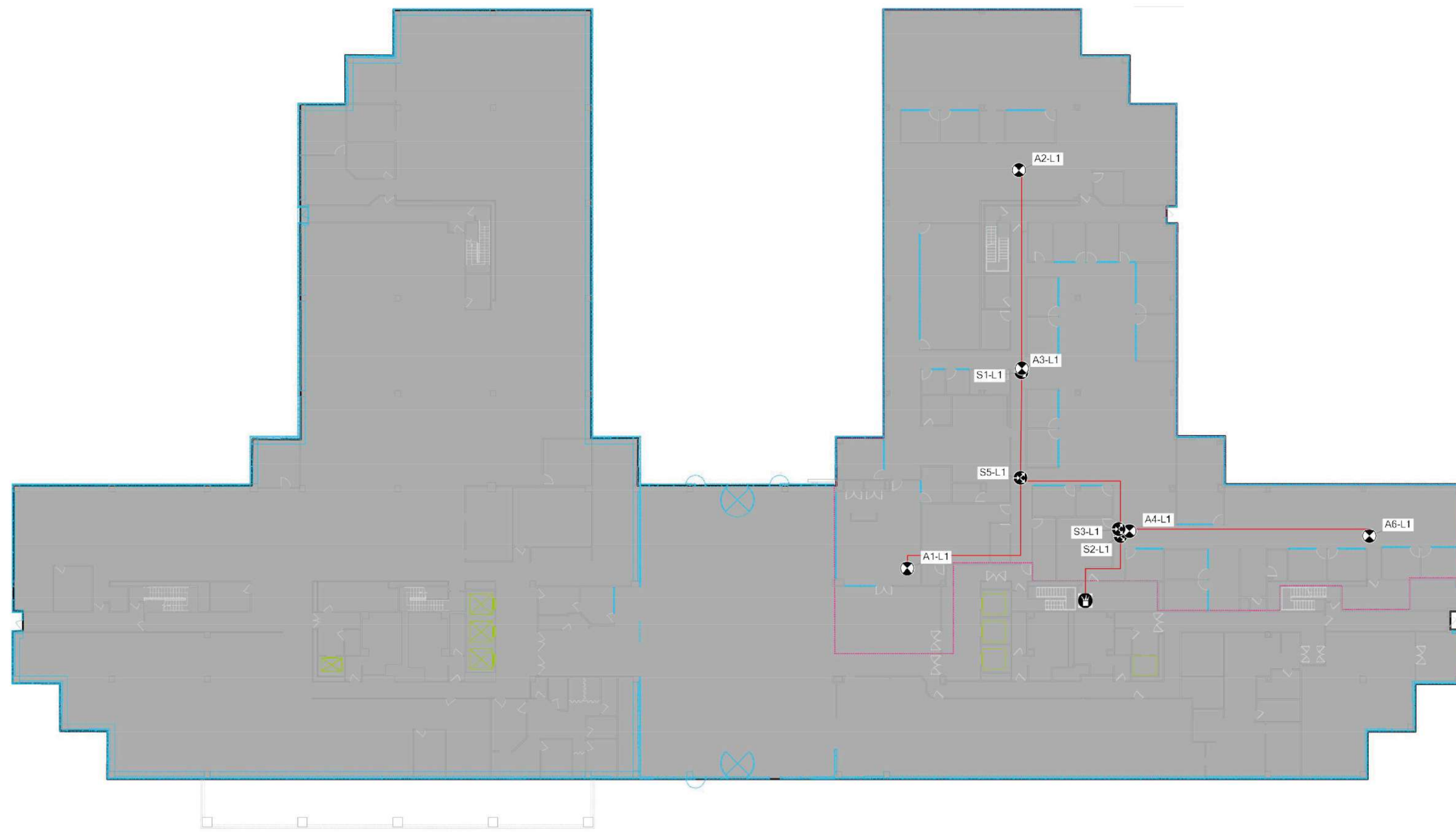
EQUIPMENT LIST					
TYPE	MANUFACTURER	MODEL	DESCRIPTION	INVENTORY#	QTY
ANTENNA	WESTELL	CS03-003-430 (AY/746-896/11)	YAGI ANTENNA PUBLIC SAFETY 700/800 (746-896MHZ) 11 DBI	CS03-003-430	01
ANTENNA	WESTELL	CS03-019-429 ANTI-O/698-2700IN ECON	ECONOMY OMNI ANTENNA QUAD-BAND (698-960, 1710-2690MHZ) , 1/5DBI	CS03-019-429	05
BBC	WESTELL	CS19-8BU-001	12/24 HOUR NFPA COMPLIANT NEMA4 BATTERY BACKUP UNIT FOR PSS1080/PST1090 OR SIMILAR BDAS	CS19-8BU-001	01
BBU	WESTELL	CS19-PYL12V45FS	12 VDC, 45AH LEAD ACID BATTERY	CS19-PYL12V45FS	02
BDA	WESTELL	PS71090 NFPA72	PUBLIC SAFETY 700/800 MHZ 2 WATT SIGNAL BOOSTER IN NEMA 4 ENCLOSURE	CS14-702-802	01
CABLE	ADVANCED RF TECHNOLOGIES	J-SF141-6-4MS-NMS	COAX JUMPER, 4.3-10 MALE STRAIGHT TO N MALE STRAIGHT, 6FT, SF-141, LOW PIM	J-SF141-6-4MS-NMS	02
CABLE	HONEYWELL	BDA-ICA12-JPLLR-1K	CLEARFILLLINE - 1/2IN LOW LOSS AIR DIALECTRIC CABLE - PLENUM RATED / INDOOR/ OUTDOOR USAGE COLOR RED UV RATED TO ASTM G155 STEINER TUNNEL TEST METHOD UL 910 NEC 820-53 (A) CMP NFPA-262 NEC ARTICLE 800 COMMUNICATION CIRCUITS ETL LISTED TO UL444 CANADIAN CSA C.22.2/FT6	N/A	560.10 FEET
CABLE	HONEYWELL	BDA-NM-RG8-13-NM	COAXIAL CABLE JUMPER NM-NM 1/4" SUPERFLEX, OUTDOOR UV, 51"	N/A	03
COLD SHRINK	HONEYWELL	BDA-WPK-ATBC40 01	WEATHERPROOFING SILICONE COLD SHRINK FOR EOL ASSEMBLY, 9.8"L	N/A	02
CONNECTOR	HONEYWELL	BDA-NFP01250	N TYPE, FEMALE CONNECTOR FOR 1/2" AIRCELL PLENUM & IN-CONDUIT CABLES, 50 OHM	N/A	02
CONNECTOR	HONEYWELL	BDA-NM-ICA12-JPLLR	N (M) CONNECTOR FOR RFS ICA12-50JPLLR	N/A	22
GROUNDING	HONEYWELL	BDA-GNDKIT1	GROUNDING KIT, COAX, 20" FOR 1/2" COAXIAL CABLE, ONE HOLE LUG	N/A	01
LOAD	HONEYWELL	BDA-LD-05	TERMINATION LOADS - 5W, 50 OHMS, N (M)	N/A	04
PROTECTOR	WESTELL	CS60-024-002	RF COAXIAL SURGE ARRESTOR, N FEMALE TO N FEMALE DC-3GHZ, IP67, GROUND LUG CONNECTOR 12 AWG MINIMUM, SURGE PROTECTION, TESTED PER UL 1449	CS60-024-002	01
SPLITTER	WESTELL	CS04-472-429 (SPD2/340-2.7KN)	2 WAY POWER DIVIDER, HIGH POWER 300W (340-2700MHZ), N (YF-PS-3427-2-NF)	CS04-472-429	01
SPLITTER	WESTELL	CS05-489-429 (DC6/340-2.7KN)	CLEARLINK - DC6/340-2.7KN, 6DB DIRECTIONAL COUPLER, 300W (340-2700 MHZ) N	CS05-489-429	07

LEGEND

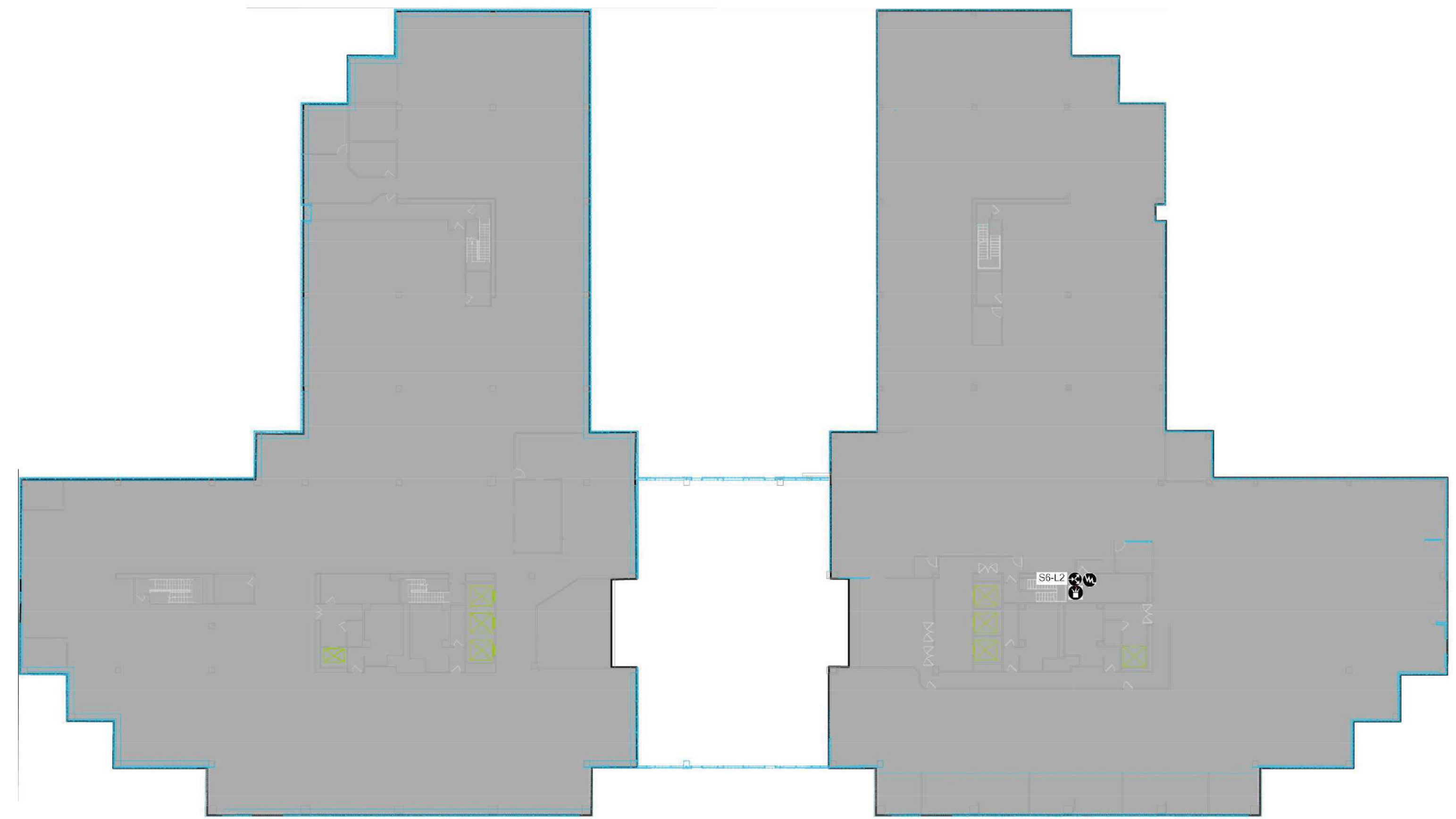
	YAGI ANTENNA PUBLIC SAFETY 700/800 (746-896 MHz) 11DBI CS03-003-430 (AY/746-896/11)		TERMINATION LOADS - 5W, 50 OHMS, (N/M) BDA-LD-05
	ECONOMY OMNI ANTENNA QUAD-BAND (698-960, 1710-2690 MHz), 1/5DBI CS03-019-429 ANTI-O/698-2700IN ECON		CLEARLINK-DC6/340-2.7KN, 6DB DIRECTIONAL COUPLER, 300W (340-2700 MHz) N CS-05-489-429(DC6/340-2.7KN)
	WEATHERPROOFING SILICONE COLD SHRINK FOR EOL ASSEMBLY, 9.8"L BDA-WPK-ATBC40_01		2 WAY POWER DIVIDER, HIGH POWER 300W (340-2700MHZ), N (YF-PS-3427-2-NF) CS04-472-429 (SPD2/340-2.7KN)
	RF COAXIAL SURGE ARRESTOR, N FEMALE TO N FEMALE DC-3GHZ, IP67, GROUND LUG CONNECTOR 12 AWG MINIMUM, SURGE PROTECTION CS60-024-002		PUBLIC SAFETY 700/800 MHZ 2 WATT SIGNAL BOOSTER IN NEMA4 ENCLOSURE PS71090 NFPA 72
	12/24 HOUR NFPA COMPLIANT NEMA 4 BATTERY BACKUP CS19-8BU-001		COAXIAL CABLE GROUNDING KIT BDA-GNDKIT1
	COAX JUMPER, N MALE RIGHT ANGLED TO N MALE RIGHT ANGLED, 1.5 FT, J-SF141-1H-NMS-NMS		COAX JUMPER, 4.3-10 MALE STRAIGHT TO N MALE STRAIGHT, 6FT, SF-141, J-SF141-6-4MS-NMS
	1/2IN PLENUM COAX CABLE RATED/ INDOOR/ OUTDOOR USAGE/ COLOR RED BDA-ICA12-JPLLR-1K		



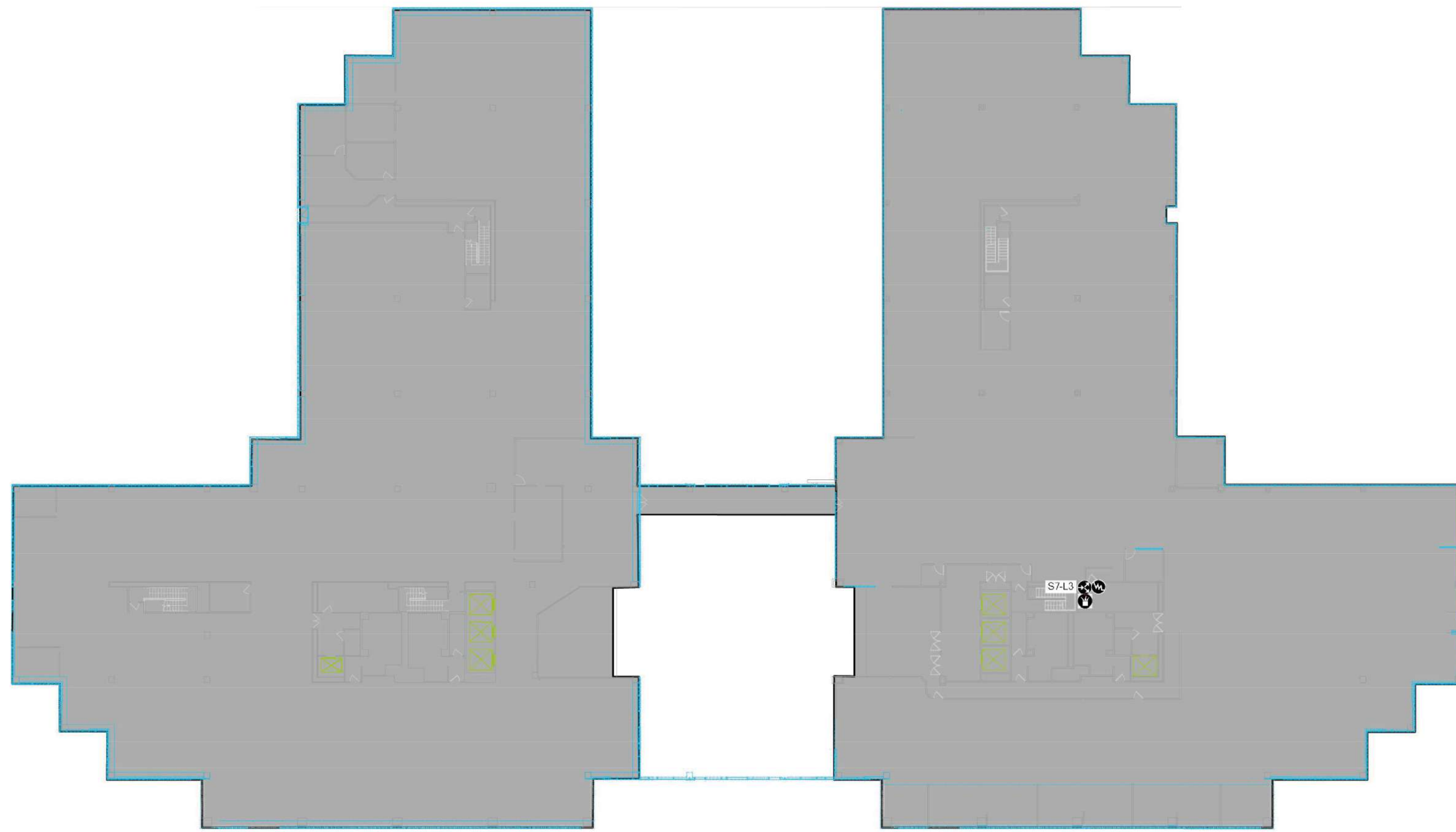
LEVEL 1



LEVEL 2



LEVEL 3



PICTOGRAMS LEGEND

	ANTENNA
	BBU
	RISER
	SPLITTER
	PROTECTOR - CHECK IN PROJECT GROUNDING - CHECK IN PROJECT
	COLDSHRINK
	LOAD
	BDA

CABLES LEGEND

	BDA-ICA12-JPLLR-1K
	BDA-NM-RG8-13-NM
	J-SF141-6-4MS-NMS

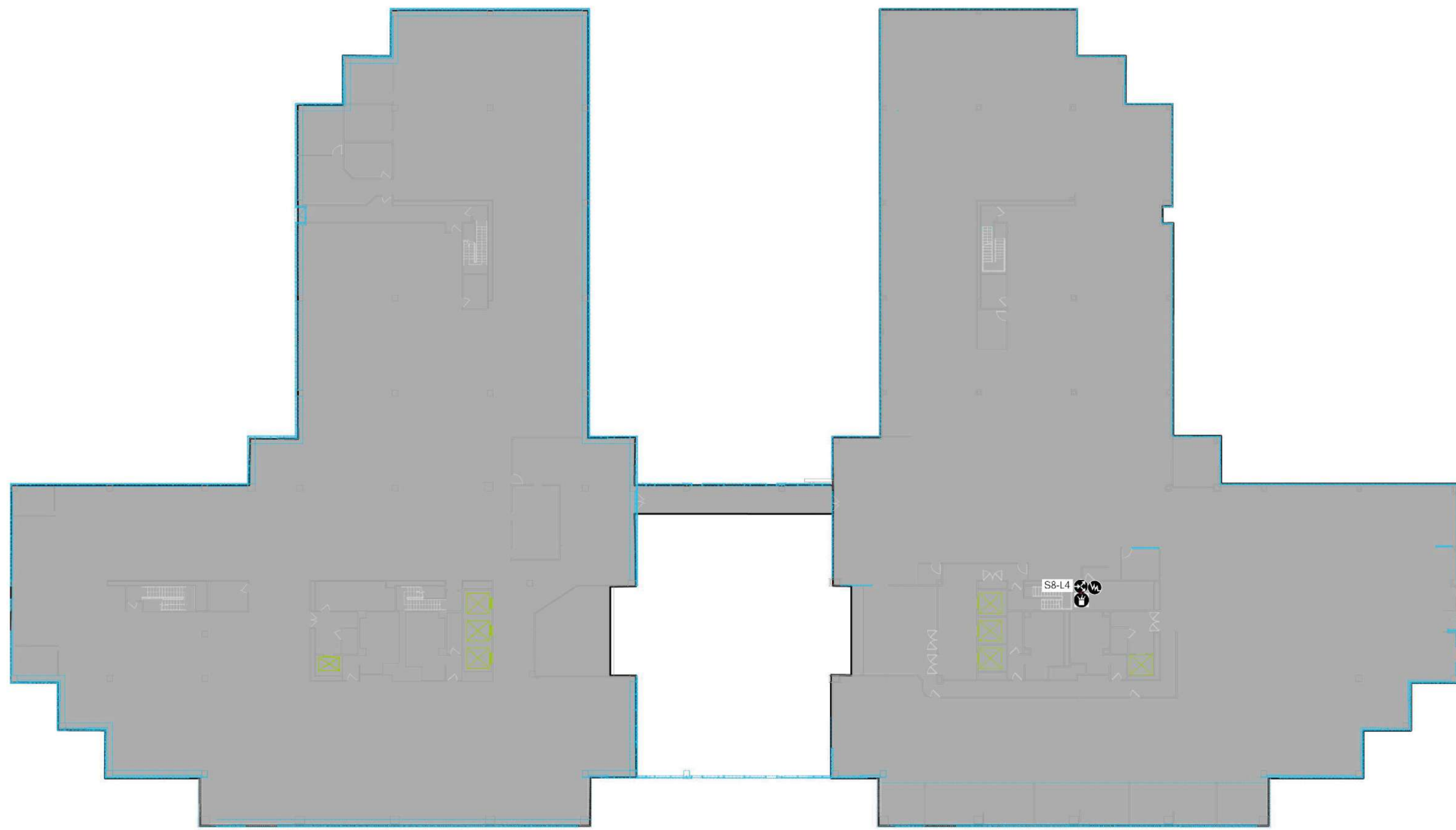
MATERIALS LEGEND

	ELEVATOR CAGE
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]

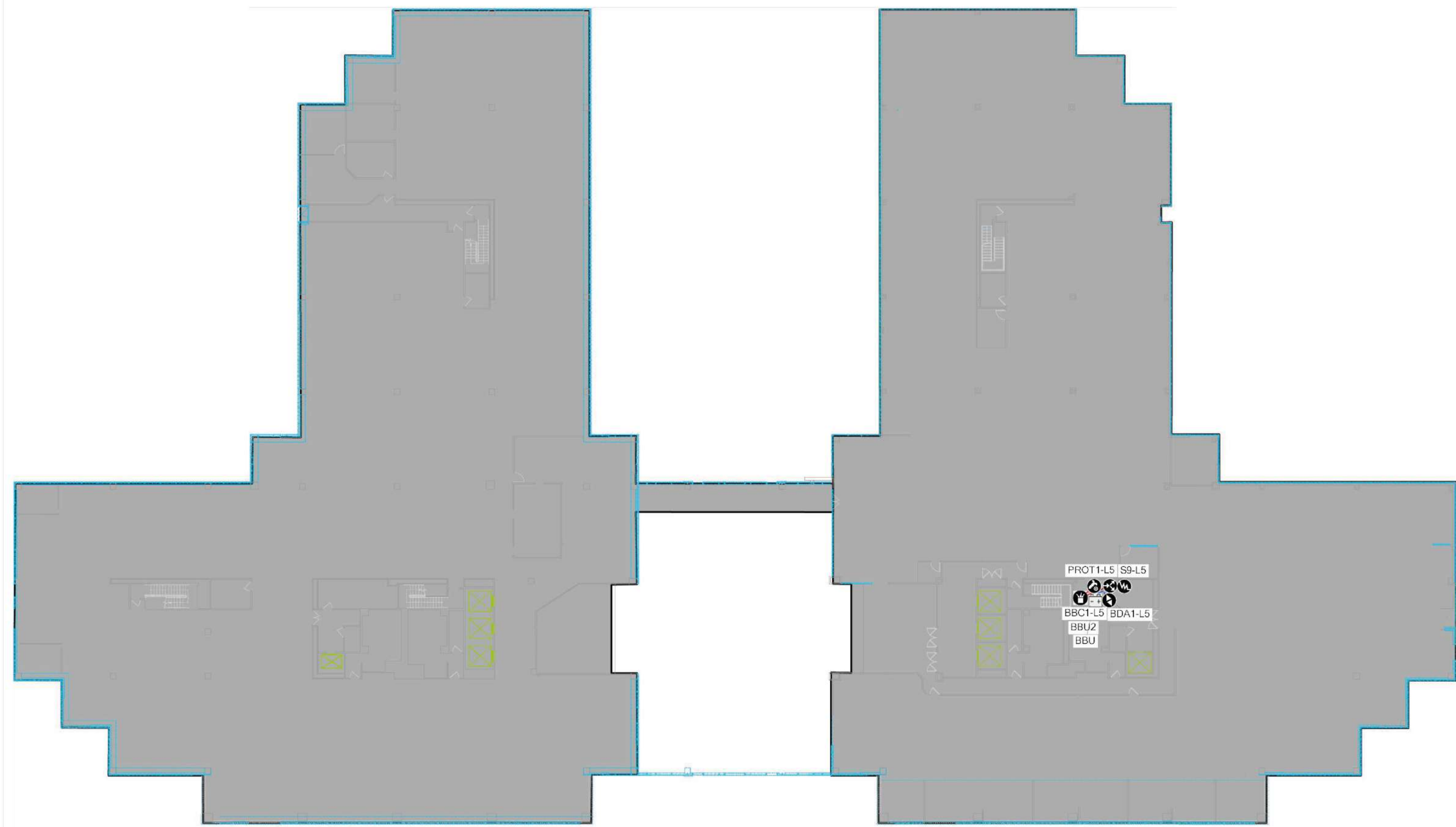


PLAN NORTH

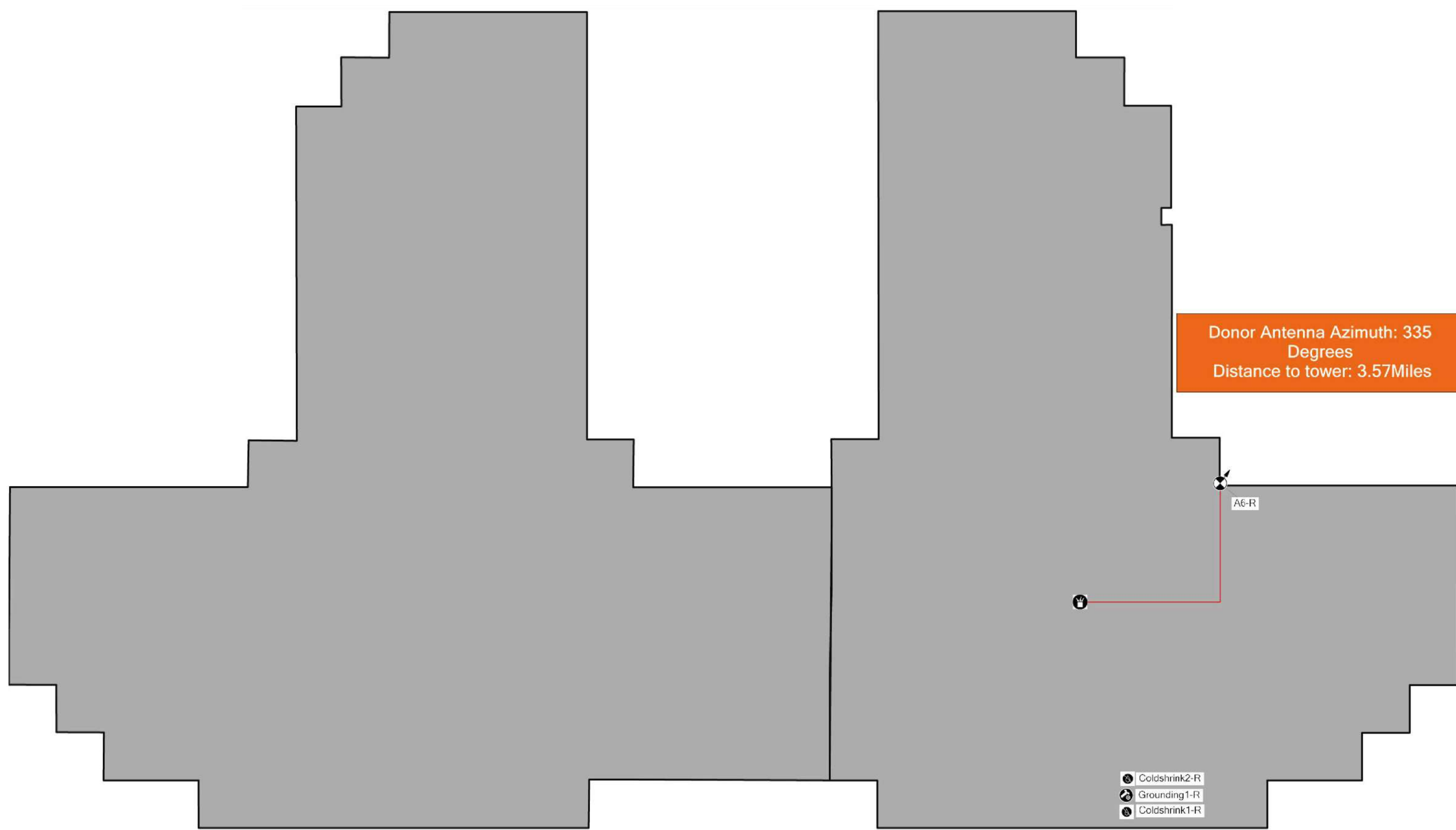
LEVEL 4



LEVEL 5



LEVEL 6



PICTOGRAMS LEGEND

	ANTENNA
	BBU
	RISER
	SPLITTER
	PROTECTOR - CHECK IN PROJECT
	GROUNDING - CHECK IN PROJECT
	COLD SHRINK
	LOAD
	BDA

CABLES LEGEND

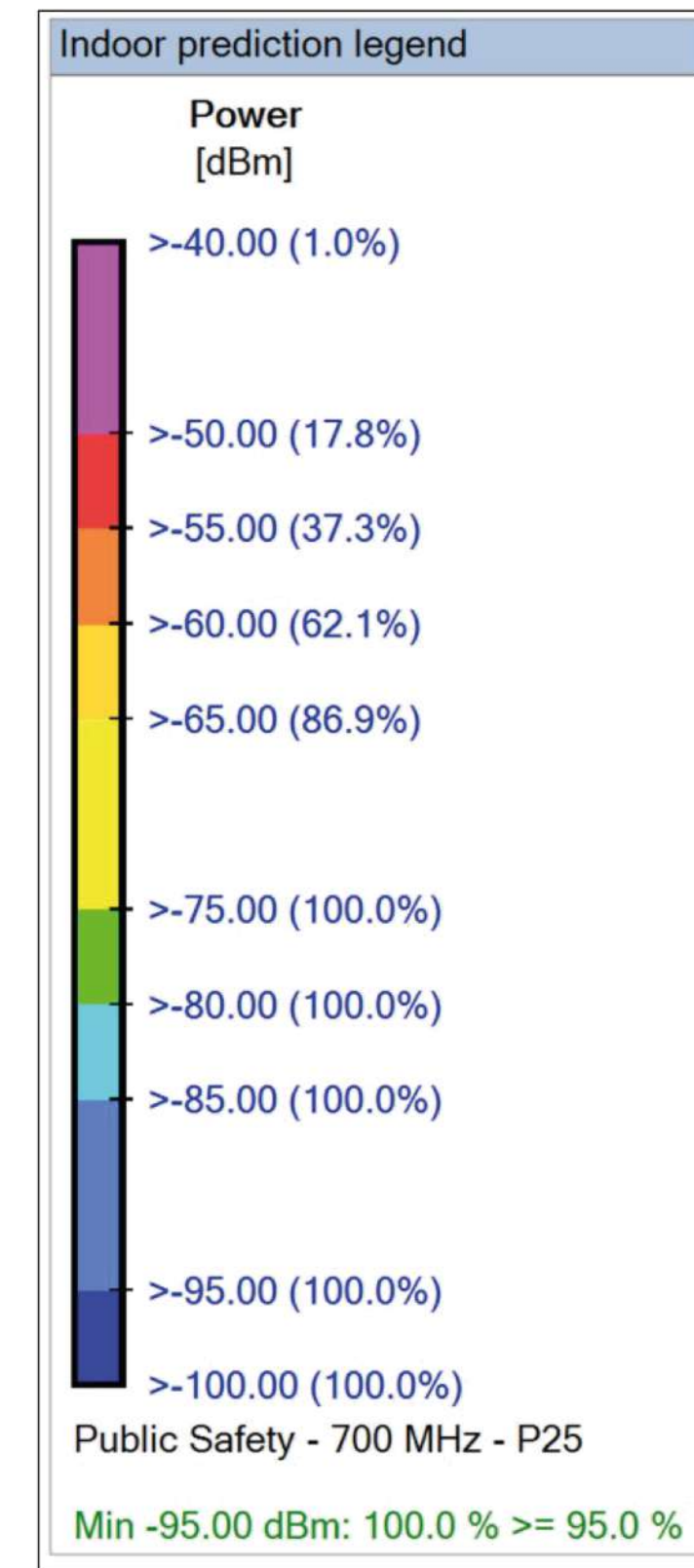
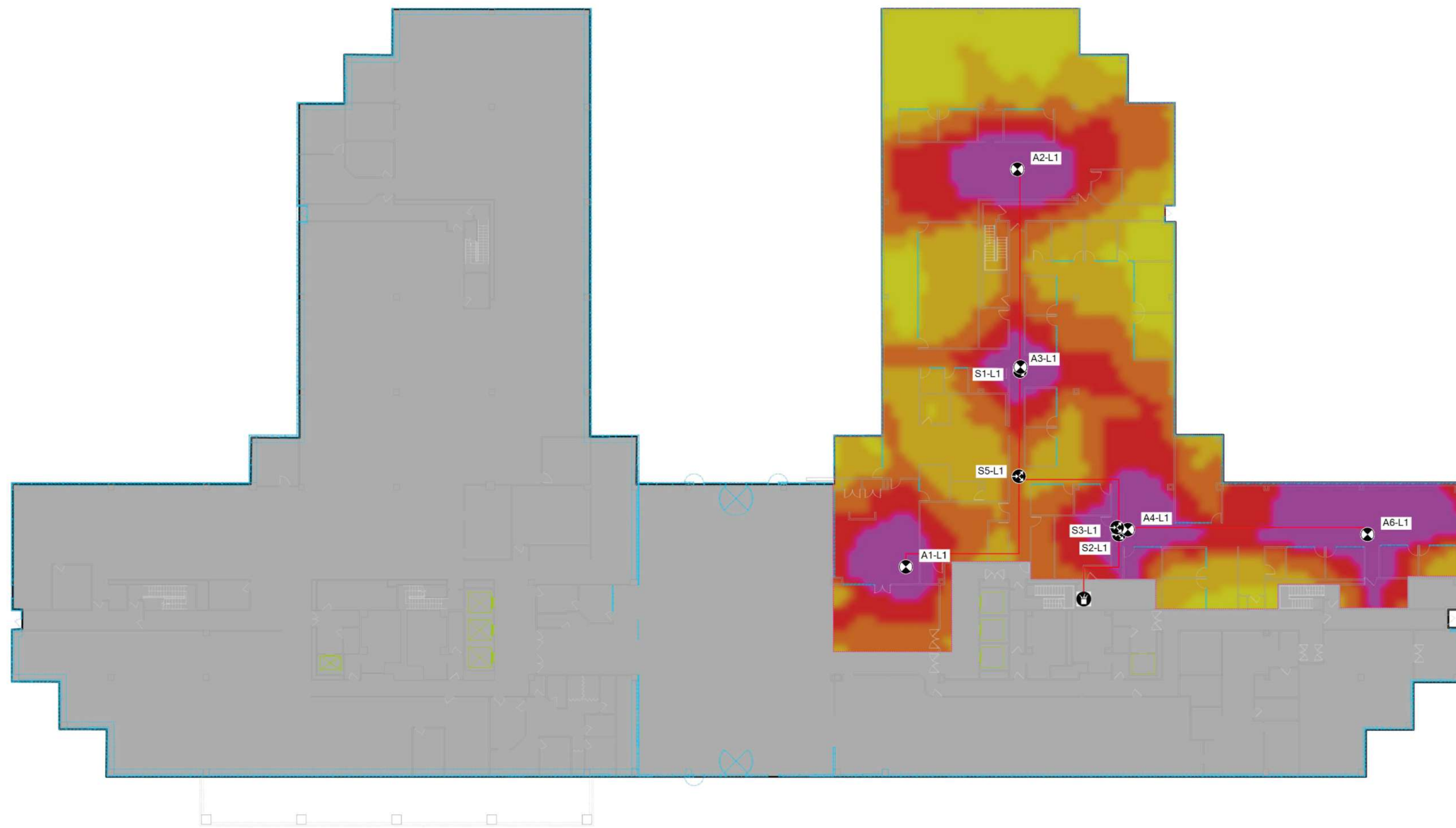
	BDA-ICA12-JPLLR-1K
	BDA-NM-RG8-13-NM
	J-SF141-6-4MS-NMS

MATERIALS LEGEND

	ELEVATOR CAGE
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]



LEVEL 1 - PUBLIC SAFETY 700 MHZ - P25 / SIGNAL STRENGTH



PICTOGRAMS LEGEND

	ANTENNA
	BBU
	RISER
	SPLITTER
	PROTECTOR - CHECK IN PROJECT
	COLD SHRINK
	LOAD
	BDA

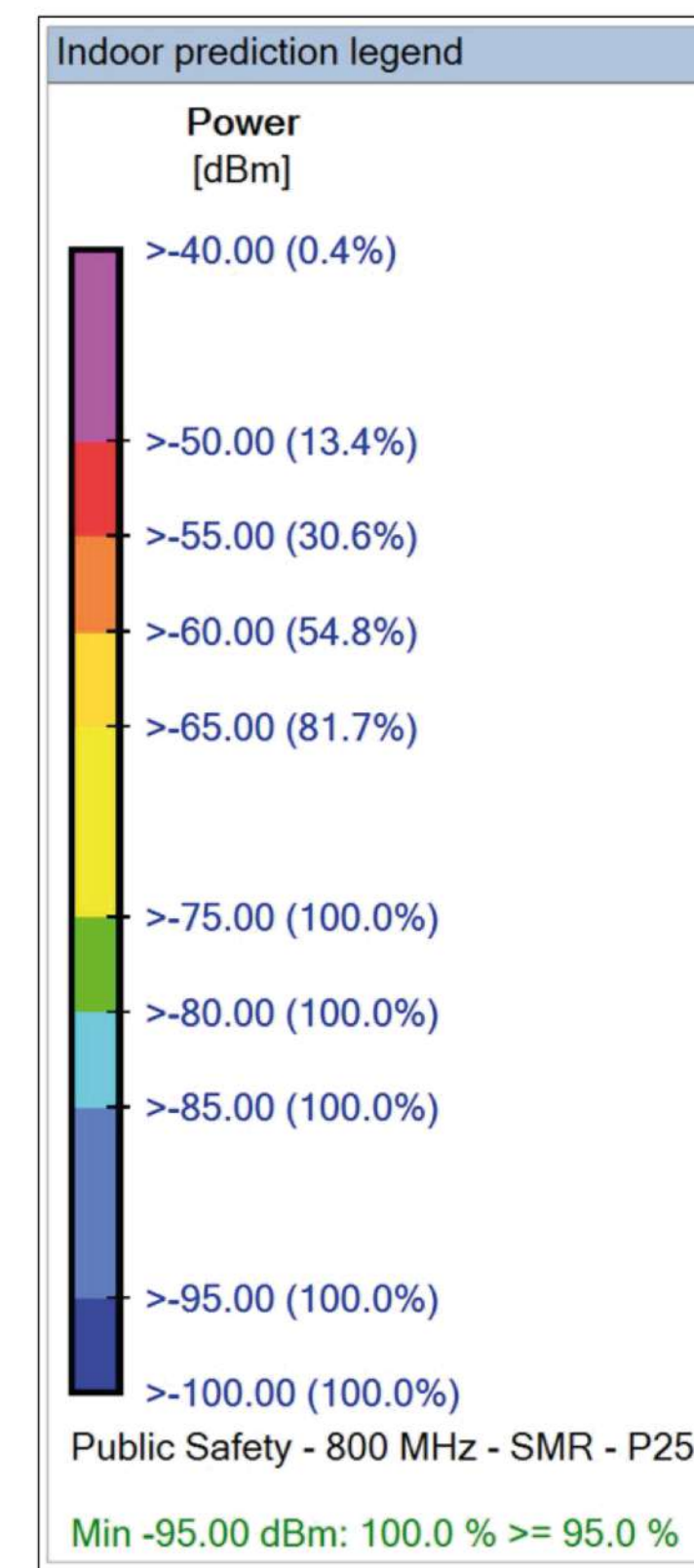
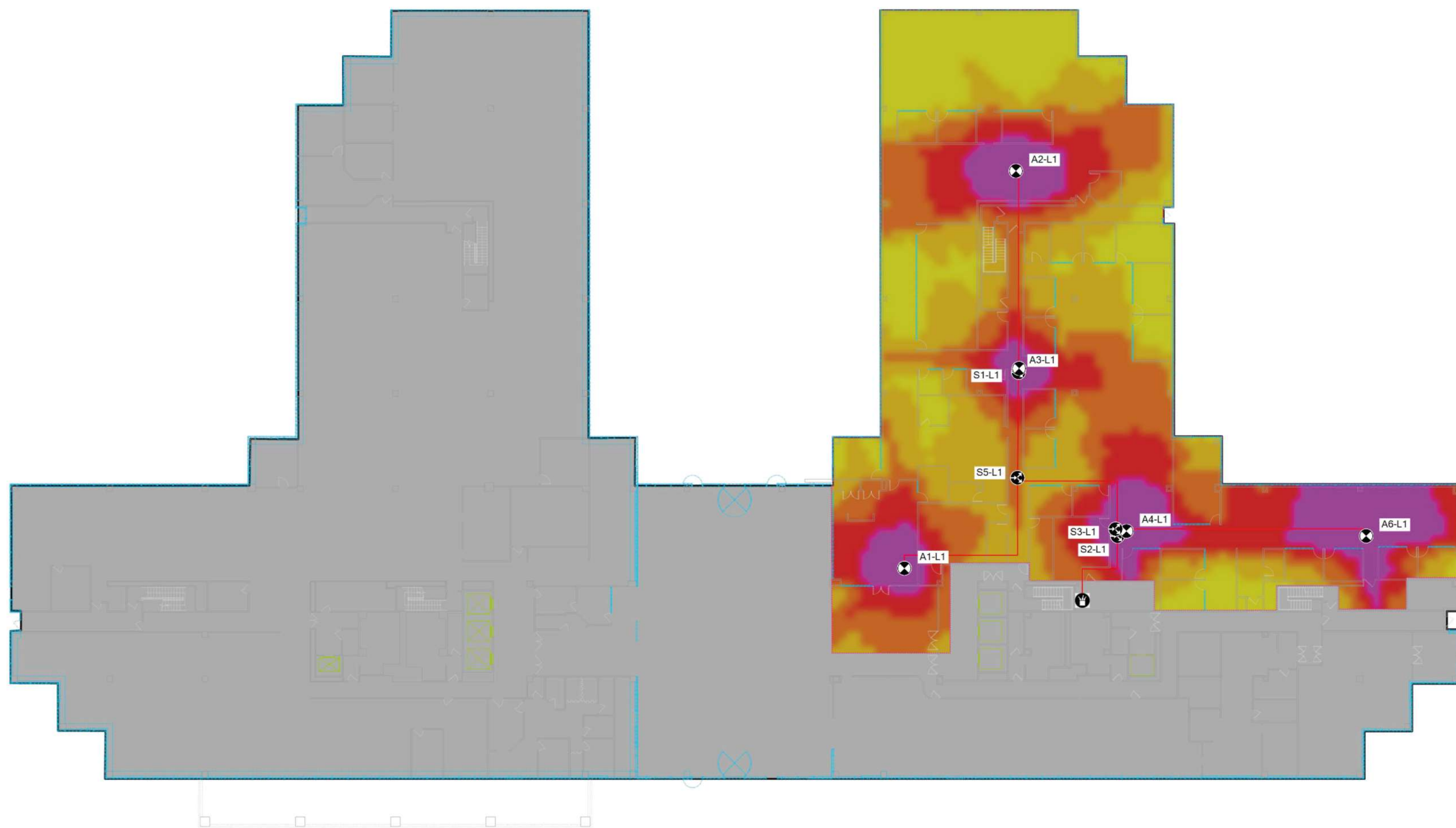
CABLES LEGEND

	BDA-ICA12-JPLLR-1K
	BDA-NM-RG8-13-NM
	J-SF141-6-4MS-NMS

MATERIALS LEGEND

	ELEVATOR CAGE
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]

LEVEL 1 - PUBLIC SAFETY 800 MHZ - SMR - P25 / SIGNAL STRENGTH



PICTOGRAMS LEGEND

	ANTENNA
	BBU
	RISER
	SPLITTER
	PROTECTOR - CHECK IN PROJECT
	COLD SHRINK
	LOAD
	BDA

CABLES LEGEND

	BDA-ICA12-JPLLR-1K
	BDA-NM-RG8-13-NM
	J-SF141-6-4MS-NMS

MATERIALS LEGEND

	ELEVATOR CAGE
	GLASS WINDOW
	PLASTER BOARD / DRYWALL [HEAVY]
	PURE AIR
	CONCRETE [DOUBLE_HEAVY]



Economy Multiband Omnidirectional Antenna

Model Numbers

- Ant. O/698 2.7k/760 Econ (CS03 019 429)
- Ant. O/698 2.7k/3 10 Econ (CS03 019 429 02)
- Frequency Range
- 698-960/1710-2700

Features & Benefits

- Low Cost
- Multiband Design
- Covers CDMA, GSM, DCS, 3G/UMTS, LTE
- In-building coverage

Electrical Specifications

Frequency Range	698-960/1710-2700
Polarization	Vertical
Gain (dB)	146.55±0.6
Half power Beam Width	Hor: 360°/Ver: 60/30
Impedance (Ω)	50
VSWR	<2.0/1.5
Maximum Input Power (W)	50

Mechanical Specifications

Connector	N (F) or 4.3-10 (F)
Size (in)	7.3x3.4
Weight (lb)	0.5
Wind Loading Area (in ²)	10.2
Rated Wind Velocity (mph)	82
Reflector Material	Aluminum
Radome Material	ABS
Radome Color	White
Operating Temperature (°C)	-40~131 (-40~55)

Specifications subject to change without notice.

Public Safety Power Dividers

General Information

Westell's Public Safety Power Dividers supports UHF, 700 and 800 MHz Public Safety frequencies (N11 rated for combining). Features low insertion loss and capable of handling 300 watts average power (500 watts for DIN models). Connector offerings include N (F), 4.3-10 (F) and 7/16 DIN (F).

Frequency Range

- 340-700 MHz

Features & Benefits

- Supports UHF, 700 & 800 MHz Public Safety
- Low Insertion Loss
- Low VSWR
- IP-65 Ingress Rating
- 300 W Average Power

Specifications

Channels	2	3	4
Insertion Loss (dB)	+3.3	+5.3	+6.5
Coupling Variation (dB)	+1.2	+1.3	+1.6
VSWR	±1.31		
Average Power (W)	300 (500 Watts for DIN Models)		
Operating Temperature	-30° C to +75° C		



ClearLink-SPD2/340-2.7K(N) 4-Port

Available Connector Style

- N (F) Type Connector
- 4.3-10 (F) Type Connector
- 7/16 DIN (F) Type Connector (Special Order)

Public Safety Directional Couplers

General Information

Westell's Public Safety Directional Couplers support UHF, 700 and 800 MHz Public Safety frequencies. Features low insertion loss and capable of handling 300 watts average power. Connector style offerings include: N (F), 4.3-10 (F) and 7/16 DIN (F).

Frequency Range

- 340-2700 MHz

Features & Benefits

- Supports UHF, 700 & 800 MHz Public Safety
- Low Insertion Loss
- Low VSWR
- IP-65 Ingress Rating
- 300 W Average Power

Specifications

Standard Coupling (dB)	5	6	10	15	20	30
Insertion Loss (dB)	±2.3	±1.85	±0.9	±0.5	±0.4	±0.35
Coupling Variation (dB)	±1.2	±1.3	±1.6	±1.7	±1.7	±1.8
Isolation (dB)	20	22	26	30	32	42
VSWR (1)	±1.351					
Average Power (W)	300					
Operating Temperature	-30° C to +75° C					



ClearLink-DC6/340-2.7K(N) 4-Port Directional Coupler (Left Hand)

Available Connector Style

- N (F) Type Connector
- 4.3-10 (F) Type Connector
- 7/16 DIN (F) Type Connector (Special Order)

RF Coaxial Surge Arrestor

Gas Discharge Coaxial Surge Protector, N Female to N Female

General Information

Westell's RF Coax Surge Protector utilizes gas tube discharge (GDT) technology, provides immediate response to a lightning surge, protecting critical hardware while maintaining the RF performance of radio equipment.

Applications

- Cellular Communications Systems
- ERCS Public Safety Systems
- Industrial Communications
- Wi-Fi (2.4 GHz ISM Band)

Frequency Range

- 0-3000 MHz

Product Highlights

- NFPA 780 Surge Protection, tested per UL 1449
- Surge (kA/KA) per IEEE 6000-4.5 @200kV
- N/F N Bulkhead Connectors with Ground Lug
- Low Insertion Loss < 0.2 dB
- 300 W Average Power

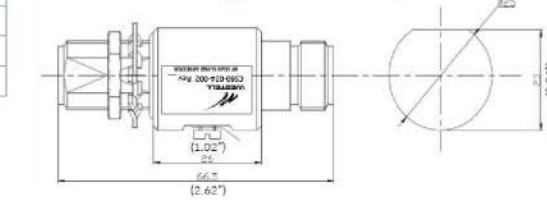
Electrical Specifications

Frequency Range Supported (MHz)	0-3000
Type: peak power (W)	300
Discharge capacity (KA, 8/20µs wave)	30
Discharge voltage (V)	90
Impedance (ohm)	50
AC(Volt) Pressure	2500V 1 min. No breakdown and no arcing phenomenon
Insulation Resistance (MΩ)	>5000
Insertion Loss (dB)	<0.20
VSWR	<1.20
Waterproof	IP67
Connector	N-Type (F) to N-Type (F)
Ground Lug Connector	#12 AWG Minimum

Mechanical Specifications

Part	Material	Plating
Shell and Nut	Brass (Br/109-3)	5µ Au Alloy Plated
Sealing	Silicone Rubber	N/A
Probe and Inserting Hole Insulator	Bronze (Cu65-S-0.1)	2µ Silver Plated
Insulator	PTFE (F4X-1)	N/A

Mechanical Drawing (Dimensions in Inches)



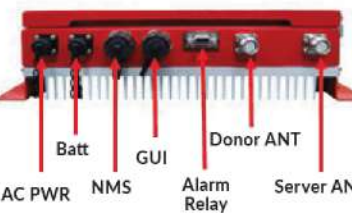
PS71090: 2W NFPA Public Safety Signal Booster

Electrical Specifications

Main Power Input	130 VAC
Battery Power Input	24 VDC to 30 VDC
Power Consumption	<112 W Max
Output Power (UL/DL)	+33 dBm (2W)
Gain	90 dB
Noise Figure @ Max Gain	<5 dB Typ.
AC/DC Dynamic Range	25 dB
Gain Adjustment Range	30 dB ±1 dB
VSWR	<2.1

Mechanical Specifications

Dimensions (H x W x D)	127 x 141 x 47 mm
Approximate Weight	37 lbs.
Mounting	Wall-mount
Weatherproofing	IP65/NEMA Type-4
Connectors	
Antenna Ports	4x3-10 (F)
User Interface: CLR & NMS	RJ-45
Alarm Relay	9P-D-SUB, Female
Operating Temperature	-30° to 50° C



Dry Contact Alarms

Alarm One	AC/DC Power / System
Alarm Two	Active RF Emitting Device Malfunction
Alarm Three	Donor / Server Antenna Malfunction

Economy Multiband Omnidirectional Antenna

Sample Antenna Patterns*



*Additional patterns with enlarged images are available upon request.

Public Safety Power Dividers

Ordering Information

Connector	Part Number	Model Number	Dimensions
5 (F)	CS04-472-429	ClearLink-SPD2/340-2.7K(N)	34.5 x 2.64 x 1.0 in.
10 (F)	CS04-473-429	ClearLink-SPD3/340-2.7K(N)	37.93 x 2.64 x 1.0 in.
15 (F)	CS04-474-429	ClearLink-SPD4/340-2.7K(N)	37.93 x 2.64 x 1.8 in.
Connector	Part Number	Model Number	Dimensions
4.3-10 (F)	CS04-400-429	ClearLink-SPD2/340-2.7K(N)4310	34.5 x 2.64 x 1.0 in.
4.3-10 (F)	CS04-401-429	ClearLink-SPD3/340-2.7K(N)4310	37.93 x 2.64 x 1.0 in.
4.3-10 (F)	CS04-402-429	ClearLink-SPD4/340-2.7K(N)4310	37.93 x 2.64 x 1.8 in.

*7/16 DIN Connectors are Special order

Public Safety Directional Couplers

Ordering Information

Coupling	Connector	Part Number	Model Number
5 dB	N (F)	CS05-488-429	ClearLink-DC3/340-2.7K(N)
6 dB	N (F)	CS05-489-429	ClearLink-DC4/340-2.7K(N)
10 dB	N (F)	CS05-490-429	ClearLink-DC10/340-2.7K(N)
15 dB	N (F)	CS05-491-429	ClearLink-DC15/340-2.7K(N)
20 dB	N (F)	CS05-492-429	ClearLink-DC20/340-2.7K(N)
30 dB	N (F)	CS05-493-429	ClearLink-DC30/340-2.7K(N)
Coupling	Connector	Part Number	Model Number
5 dB	4.3-10 (F)	CS05-414-429	ClearLink-DC5/340-2.7K(N)4310
6 dB	4.3-10 (F)	CS05-417-429	ClearLink-DC6/340-2.7K(N)4310
10 dB	4.3-10 (F)	CS05-418-429	ClearLink-DC10/340-2.7K(N)4310
15 dB	4.3-10 (F)	CS05-419-429	ClearLink-DC15/340-2.7K(N)4310
20 dB	4.3-10 (F)	CS05-420-429	ClearLink-DC20/340-2.7K(N)4310
30 dB	4.3-10 (F)	CS05-421-429	ClearLink-DC30/340-2.7K(N)4310

*7/16 DIN Connectors are Special order

Westell | 746-896 MHz Yagi Antenna

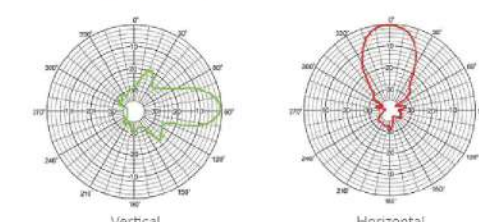
General Information

Westell's 746-896 MHz Yagi Antenna is excellent for Public Safety applications. The eight-element construction provides exceptional performance and durability and is useful for directional point-to-point, or point-to-multipoint applications.

Product Highlights

- 11 dB Gain
- 746-896 frequency range
- 8 elements
- Horizontally sealed driven element
- Rugged anodized aluminum lightweight design
- Stainless-steel mounting hardware

Radiation Patterns



Electrical Specifications

Gain	11 dB
VSWR	<1.71
Horizontal beamwidth	88°
Vertical beamwidth	42°
Polarization	Vertical
Maximum input power	300 Watts
Electrical downlink	IP
Front beam ratio	>18 dB

Specifications subject to change without notice.

Mechanical Specifications

Number of elements	8
Connector	N/Female
Lightning protection	Direct ground
Rated wind speed	134 mph
Frontal wind load	11.2 lbf
Lateral windload	8.2 lbf
Dimensions	58.3 x 8 x 2.2 in.
Antenna weight	1.36 lbs.
Mounting hardware	U-Bolt

Included mounting hardware fits 1.31"-2.34" inch OD pipe

Model PS71090 2W NFPA Public Safety Signal Booster

General Information

The PS71090 is an in-building repeater that will meet both the existing public safety communications regulations and future mandates for emergency and disaster preparedness communications.

Product Highlights

- Supports Dual-Band 700/800 MHz
- NFPA 72/1221 Compliant Class B Amplifier
- 33 dBm (2W) Power Output DL/UL
- 90 dB Gain
- UL Listed
- Fail-Safe Ready
- Low Power Consumption
- 700 and 800 MHz bands independently controlled
- Passband options - Can be turned on/off independently
- UL 788-805 / DL 758-775 MHz (17 MHz)
- UL 806-809 / DL 851-854 MHz (3 MHz)
- UL 806-816 / DL 851-861 MHz (30 MHz)
- UL 806-824 / DL 851-869 MHz (18 MHz)
- Independent Power and Gain Control per Band
- Sharp SAW filtering reduces interference from competing signals
- Easy to Install and Maintain
- Dry Contacts for Fine panel connection
- Supports digital and analog modulation including P25 phase 1 & 2



Oscillation Detection and Automatic Gain Control (AGC)

- Built in Oscillation and Self-healing
- Shutdown in the Event of Non-Correctable Conditions

Supported LED Status

- Power
- Isolation
- Oscillation (OSC)
- Alarm

Ordering Information

CS34-702-802	Class B, 700/800 Public Safety, 90 dB gain
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1/2" ClearFill® Line Aluminum Plenum-Rated Air-Dielectric Coaxial Cable for In-Building Applications

ClearFill® Line 1/2" inner-dia air dielectric cable, Plenum-rated, CMP

- FEATURES / BENEFITS**
- Supports Multiple RF Signals
 - Complete Shielding
 - Outstanding Intermodulation Performance
 - Wide Range of Applications

Technical Features

Applications	Suitable for plenum in buildings safety or outdoor usage
Structure	1/2"
Cable Type	Air dielectric, Coaxial
Inner Conductor	11.3 (0.44) Copper-Clad Aluminum Wire
Outer Conductor	13.0 (0.51) Corrugated Aluminum
Outer Jacket	13.95 (0.55) Plenum Rated / Color Red
Weight	1.2 (0.043) lbs/ft
Maximum Frequency	5 GHz
Velocity	86.9
Capacitance	75 (22.86) pF/m (8.0)
Inductance	119 (3.69) nH/m (0.91)
Peak Power Rating	43.9
RF Peak Voltage	2000 V
Jacket Depth	0.003
Outer Conductor Resistance	0.00001 mΩ/1000ft (1.00E-05)
Outer Conductor die Resistance	0.00001 mΩ/1000ft (1.00E-05)
Return Loss (VSWR) Performance	19.1 (2.8) @ 400-900 MHz 19.1 (2.8) @ 1700-3400 MHz 19.1 (2.8) @ 2000-2000 MHz
Temperature & Power	High Power Rating
Mechanical Specifications	
Cable Weight, Nominal	kg/m (lb/ft) (0.19 (0.13))
Minimum Bending Radius, Single Bend	mm (in) (75 (3))
Minimum Bending Radius, Repeated Bends	mm (in) (127 (5))
Bending Moment	Nm (ft-lb) (5.4)
Tensile Strength	N (lb) (549 (125))
Recommended Maximum Clamp Spacing	m (ft) (0.3 (0.9 (3.3))
Cinch Strength	kg/cm (lb/in) (0.03 (0.00))

GROUNDING KIT
FOR 1/2" COAXIAL CABLE, 500mm

BDA-GNDKIT1

- Product Features
- For 1/2" RF Cable
 - Copper cable
 - PVC jacket



Product Structure Grounding Kit	Value
Cable Kit	Copper for 1/2"
Rivet	Copper
Locking Ball Material	Stainless steel
Grounding Cable	16mm2 Copper wire & PVC, Black
Cable Lug	Tin Plated Copper 1 hole M6
Product Structure Hardware	Value
Nut	A2 Stainless Steel M6x2.5mm
Spring Washer	A2 Stainless Steel, M6
Washer	A2 Stainless Steel, M6
General Specifications	Value
Cable Type	Coaxial
Cable Size	1/2" & 1/2" Low Loss
Lug Type	One-hole lug
Lug Attachment	Factory attached
Cable Specifications	Value
Bonding Conductor Length	500mm
Bonding Conductor Material	Copper
Bonding Conductor Wire Size	16 mm2
Bonding Conductor Jacketing Material	PVC
Electrical Specifications	Value
Current Handling	Tested to withstand 100,000 amps peak current surge
Current Handling Test Method	ML-STD-1752
Grounding, Bonding and Shielding Test Method	ML-STD-188-124A
Lightning Protection Test Method	IEC 1024-1

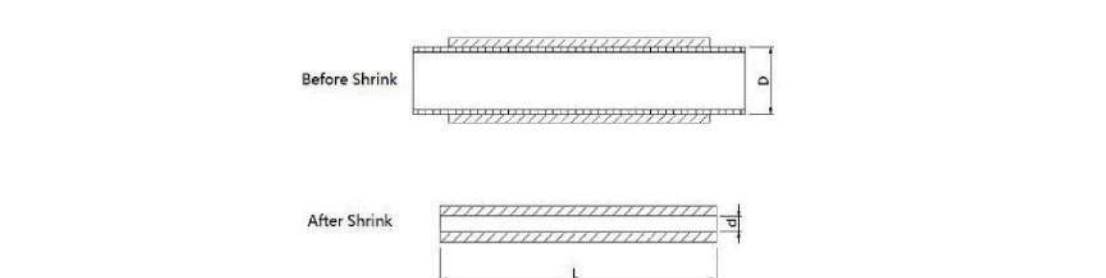
WEATHERPROOFING SILICONE COLDSHRINK
FOR EOL ASSEMBLY, 9.8" L

BDA-WPK-ATBC40_01

- Product Features
- Silicone Rubber
 - Flame Retardant UL94-HB
 - Extra duration
 - Weatherproof Silicon Rubber



Specifications	Value
Material	Silicone Rubber
Hardness, Shore A	35-45
Specific Gravity (25 °C)	1.08-1.16
Color	Gray (Pantone 4313)
Flame Retardant	UL94-HB
Tensile Strength	> 7.2 MPa (23 °C ASTM D412)
Elongation	> 650% (23 °C ASTM D412)
Tear Strength	> 25 kN/m (23 °C ASTM D424)
Temperature Range	-40 to 200 °C
Creep Resistance	70%, ASTM D518-A
UV Resistance	1000h, ISO4892-2 Cycle1
Moist Resistance	IEC60969-2-10, Class 1
RoHS Compliance	Includes 2 (14-21 mm)
Life Time	20 Years
RF Grade	IP68 IEC 60529
Dimensions	40 x 10 x 250 mm



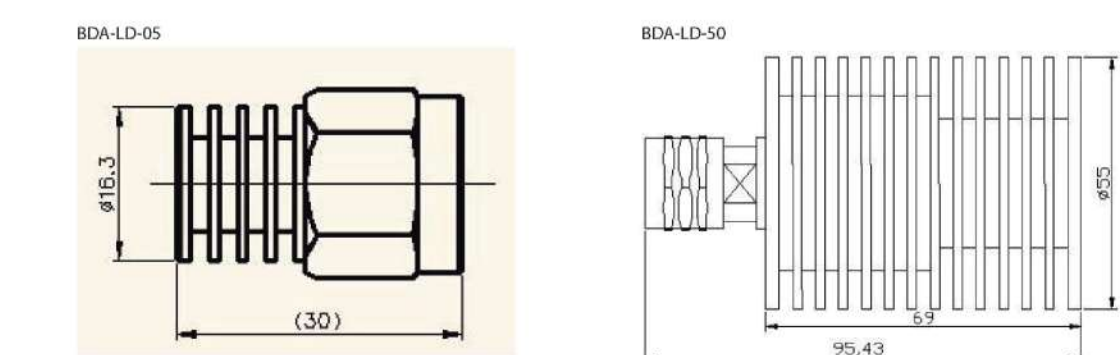
RF LOADS / TERMINATIONS
DC - 3000 MHz

BDA-LD-xx

- Product Features
- Passive devices designed in a coaxial configuration
 - Nominal Impedance is 50 Ohms
 - Power levels SW and SWW
 - N male type connectors as standard, other types available upon request



Specification	BDA-LD-05	BDA-LD-50
Frequency band	DC-3GHz	DC-3GHz
Input power	5W CW	50W CW
Coolant	Natural convection	Natural convection
Type	In-line, coaxial	In-line, coaxial
Impedance	50 Ω	50 Ω
VSWR	1.2:1 max	1.2:1 max
Connector	NONE	NONE
Temperature range	-22 to 149°F	-22 to 149°F
MTBF	>1,000,000 hours	>500,000 hours
Weight	0.17 lbs • 0.08 kg	1.3 lbs • 0.5 kg
Operating position	Any	Any



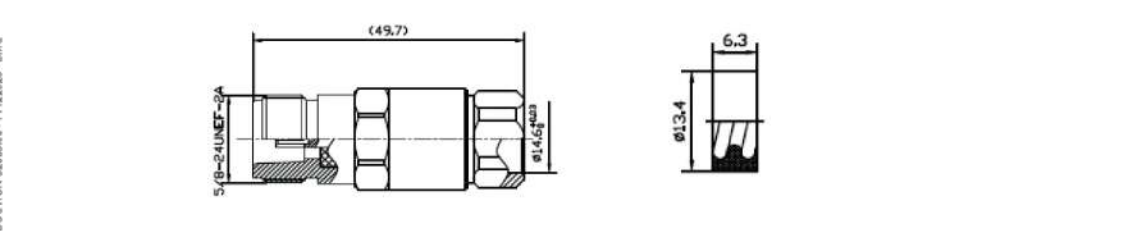
N(f) CONNECTOR
0 - 3GHz

BDA-NF-ICA12-JPLLR

- Product Features
- Female connector
 - For 1/2" cable



Electrical Specifications	Value
Impedance	50Ω
Frequency range	0~3GHz
Withstand voltage	500V rms
VSWR	Straight ≤ 1.15 Right Angle ≤ 1.25
Contact resistance	center contact $\leq 1m\Omega$ outer contact $\leq 1m\Omega$
Insulation resistance	>5000MΩ
Mechanical Specifications	Value
Temperature range	-35°C~+145°C
Durability(mating)	>500
Material Specifications	Value
Body	Brass Nickel Plated
Center conductor	Brass Gold or silver plated
Coupling nut	Copper alloy Nickel plated
O-ring sealing	6146 Ethanic
Insulator	PTFE



1/2" ClearFill® Line Aluminum Plenum-Rated Air-Dielectric Coaxial Cable for In-Building Applications

ClearFill® Line 1/2" inner-dia air dielectric cable, Plenum-rated, CMP

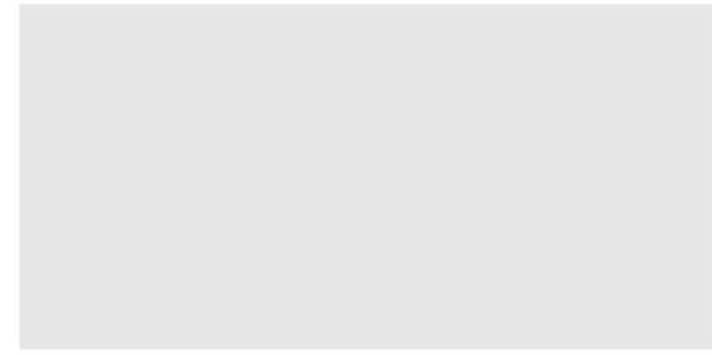
- ATTENUATION AND POWER RATING**
- | Attenuation | Power | TESTING AND ENVIRONMENTAL |
|-------------|------------------|---------------------------|
| dB/100m | dB/100ft | W |
| 0.5 | 0.16 | 40.50 |
| 1 | 0.32 | 20.25 |
| 1.5 | 0.48 | 13.50 |
| 2 | 0.64 | 9.00 |
| 3 | 0.96 | 6.00 |
| 4 | 1.28 | 4.50 |
| 5 | 1.60 | 3.38 |
| 6 | 2.00 | 2.50 |
| 7 | 2.56 | 1.88 |
| 8 | 3.20 | 1.41 |
| 9 | 4.00 | 1.06 |
| 10 | 5.12 | 0.79 |
| 12 | 7.68 | 0.53 |
| 14 | 11.00 | 0.38 |
| 16 | 15.36 | 0.28 |
| 18 | 21.12 | 0.20 |
| 20 | 28.44 | 0.15 |
| 22 | 38.02 | 0.11 |
| 24 | 50.00 | 0.08 |
| 26 | 66.00 | 0.06 |
| 28 | 87.00 | 0.04 |
| 30 | 114.00 | 0.03 |
| 32 | 150.00 | 0.02 |
| 34 | 198.00 | 0.01 |
| 36 | 261.00 | 0.01 |
| 38 | 345.00 | 0.01 |
| 40 | 456.00 | 0.01 |
| 42 | 600.00 | 0.01 |
| 44 | 792.00 | 0.01 |
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| 50 | 1800.00 | 0.01 |
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| 82 | 149400.00 | 0.01 |
| 84 | 197760.00 | 0.01 |
| 86 | 262560.00 | 0.01 |
| 88 | 349440.00 | 0.01 |
| 90 | 464640.00 | 0.01 |
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| 98 | 1408320.00 | 0.01 |
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| 176 | 22548000000.00 | 0.01 |
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**JUMPER RG8
N male and N male**

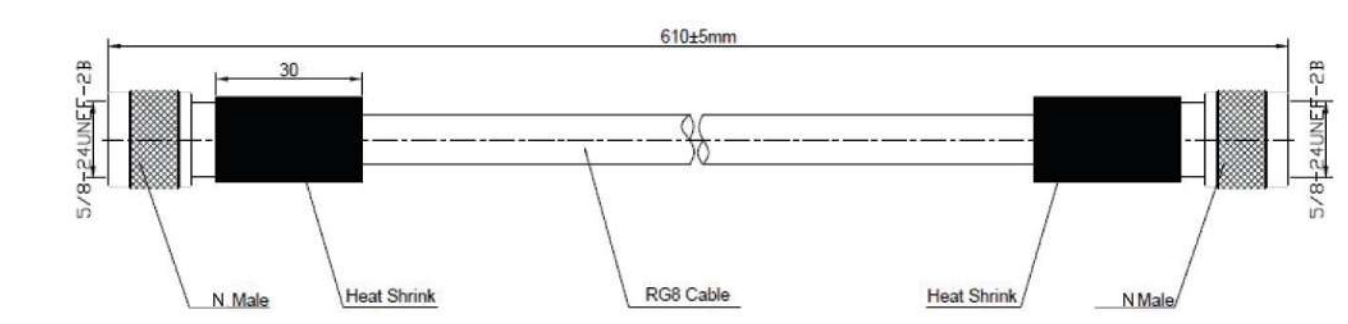
BDA-NM-RG8-08-NM

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design



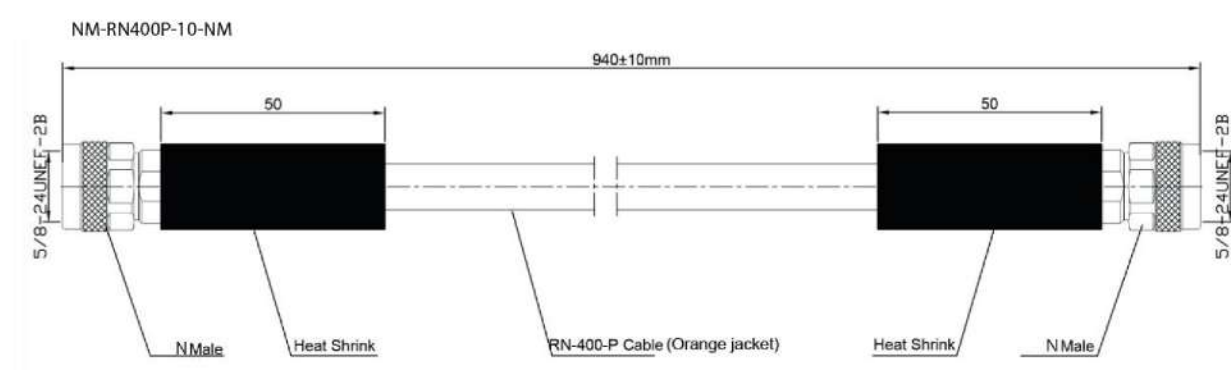
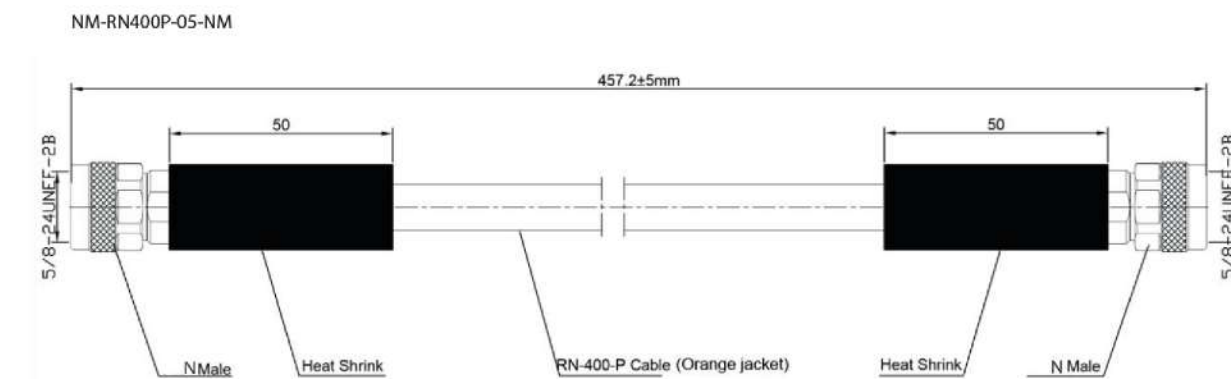
Specification	Value
Connector	N Male both ends
Type of Cable	RG8
Length of cable	24 Inch
Center conductor material	Brass - Gold Plating
Insulator material	PTFE
Body connector material	Brass - Nickel Plating
Impedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	< 1.15 (DC-1.5GHz); < 1.20 (1.5-3GHz)



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**JUMPER RN-400 CABLE
N female and N male**

**BDA-NM-RN4P-03-NM
BDA-NM-RN4P-05-NM
BDA-NM-RN4P-10-NM**



DOC:1674-0304-02-11/2020-1 - ENG

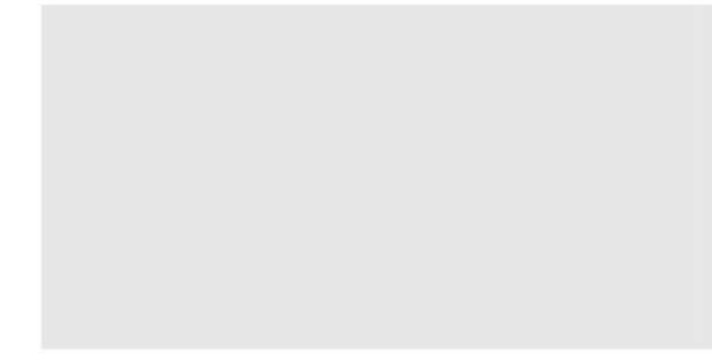
Honeywell

**JUMPER RG58 CABLE
N female and N male**

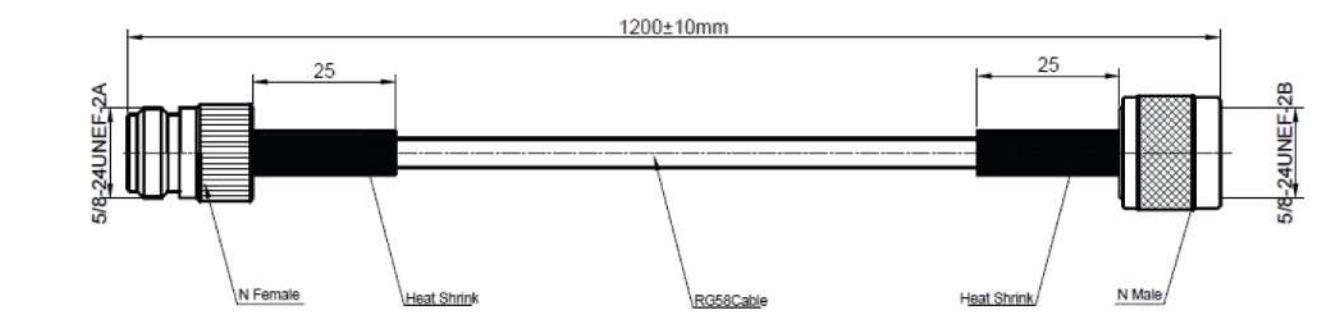
BDA-NM-RG58-12-NF

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design



Specification	Value
Connector	N Male - N Female
Type of Cable	RG58
Length of cable	48 Inch
Center conductor material	Phosphore bronze - Gold plating & Brass - Gold plating
Insulator material	PTFE
Body connector material	Brass - Nickel Plating
Impedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	< 1.15 (DC-1.5GHz); < 1.20 (1.5-3GHz)



DOC:1674-0304-02-11/2020-1 - ENG

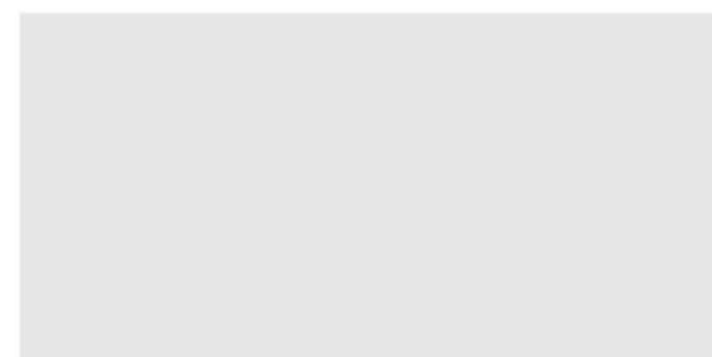
Honeywell

**JUMPER RG58
N male and N male**

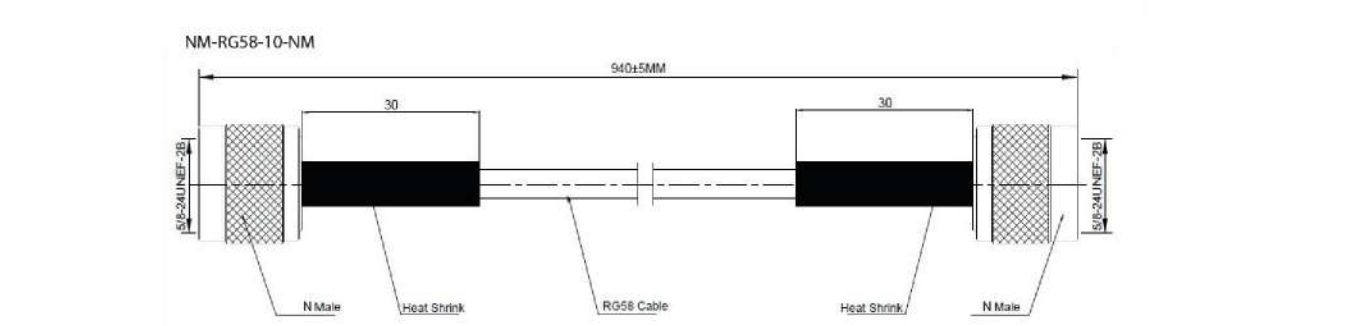
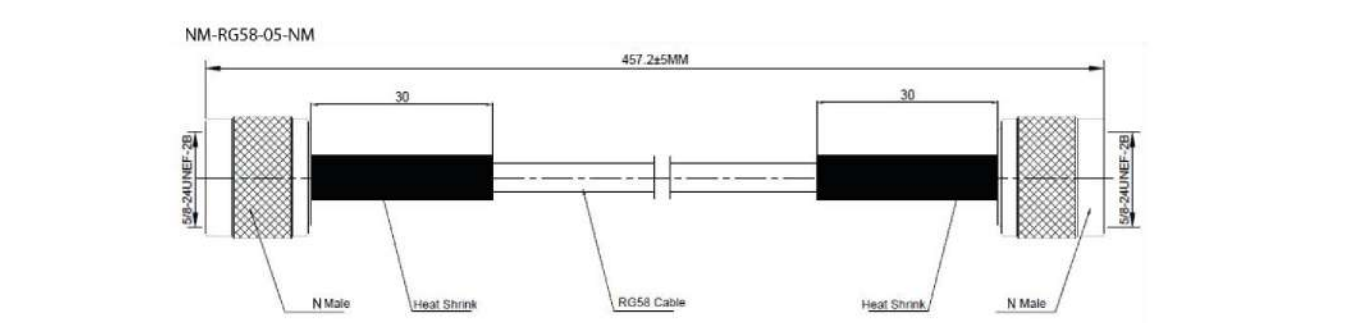
**BDA-NM-RG58-05-NM
BDA-NM-RG58-10-NM**

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design



Specification	05-NM	10-NM
Connector	N Male both ends	N Male both ends
Type of Cable	RG58	RG58
Length of cable	18 Inch	37 Inch
Center conductor material	Brass - Gold Plating	Brass - Gold Plating
Insulator material	PTFE	PTFE
Body connector material	Brass - Nickel Plating	Brass - Nickel Plat.
Impedance	50 Ohms	50 Ohms
Frequency range	0 - 6 GHz	0 - 6 GHz
VSWR	< 1.15 (DC-1.5GHz); < 1.20 (1.5-3GHz)	



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**JUMPER RN-400 CABLE
N female and N male**

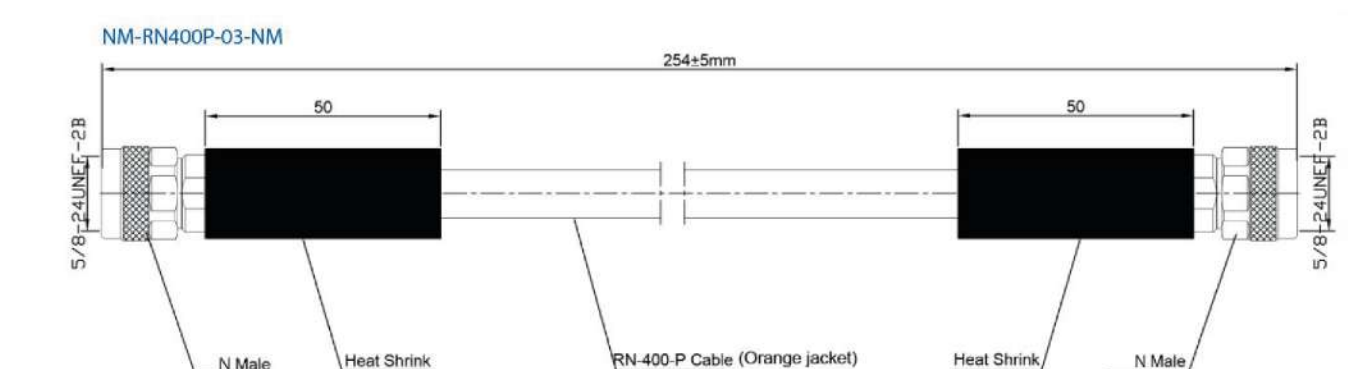
**BDA-NM-RN4P-03-NM
BDA-NM-RN4P-05-NM
BDA-NM-RN4P-10-NM**

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design



Specification	03-NM	05-NM	10-NM
Connector	N Male both ends	N Male both ends	N Male both ends
Type of Cable	RN-400-P	RN-400-P	RN-400-P
Length of cable	10 Inch	18 Inch	37 Inch
Center conductor material	Brass - Gold Plating	Brass - Gold Plating	Brass - Gold Plating
Insulator material	PTFE	PTFE	PTFE
Body connector material	Brass - Nickel Plating	Brass - Nickel Plating	Brass - Nickel Plat.
Impedance	50 Ohms	50 Ohms	50 Ohms
Frequency range	0 - 6 GHz	0 - 6 GHz	0 - 6 GHz
VSWR		< 1.15 (DC-1.5GHz); < 1.20 (1.5-3GHz)	



DOC:1674-0304-02-11/2020-1 - ENG

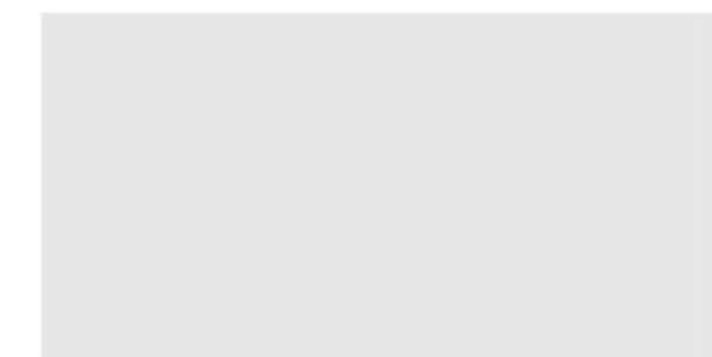
Honeywell

**JUMPER 1/4" S
N male and N male**

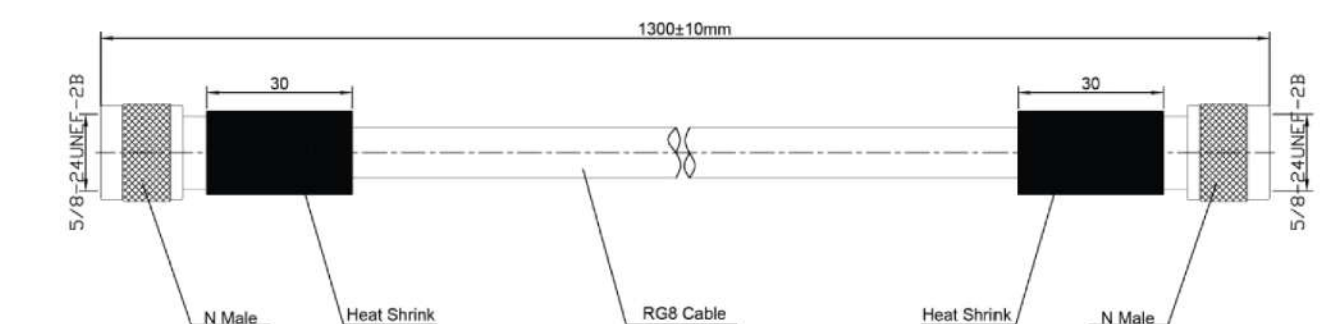
BDA-NM-RG8-13-NM

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design



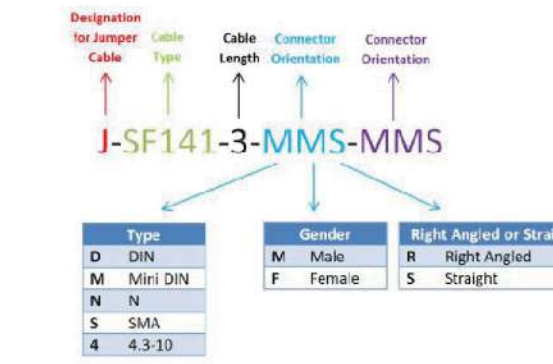
Specification	Value
Connector	N Male both ends
Type of Cable	RG8
Length of cable	51 Inch
Center conductor material	Brass - gold Plating
Insulator material	PTFE
Body	Brass - Nickel plating
Impedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	< 1.15 (DC-1.5GHz); < 1.20 (1.5-3GHz)
Insulation resistance	> = 5000M Ohms



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Honeywell

Product Specification: Low PIM Jumper Cables



Product Name	Length	Connector Orientation
J-SF141-3-MMS-NMR	3 ft	Mini DIN Male (Right Angled) to N Male (Right Angled)
J-SF141-6-MMS-NMR	6 ft	Mini DIN Male (Right Angled) to N Male (Right Angled)
J-SF141-6-MMS-NFS	6 ft	Mini DIN Male (Right Angled) to N Female (Straight)
J-SF141-6-DMS-DMS	6 ft	DIN Male (Straight) to DIN Male (Straight)
J-SF141-6-DMS-NMS	6 ft	DIN Male (Straight) to N Male (Straight)
J-SF141-10-DMS-NFS	10 ft	DIN Male (Straight) to N Female (Straight)
J-SF141-1H-NMR-NMR	1.5 ft	N Male (Right Angled) to N Male (Right Angled)
J-SF141-3-NMS-NMS	3 ft	N Male (Straight) to N Male (Straight)
J-SF141-3-NMS-NFS	3 ft	N Male (Straight) to N Female (Straight)
J-SF141-3-NMS-SMS	3 ft	N Male (Straight) to SMA Male (Straight)
J-SF141-3-NFS-NFS	3 ft	N Female (Straight) to N Female (Straight)
J-SF141-6-NMS-NMS	6 ft	N Male (Straight) to N Male (Straight)
J-SF141-6-NMS-SMS	6 ft	N Male (Straight) to SMA Male (Straight)
J-SF141-3-SMS-SMS	3 ft	SMA Male (Straight) to SMA Male (Straight)
J-SF141-6-SMS-SMS	6 ft	SMA Male (Straight) to SMA Male (Straight)
J-SF141-1H-4MR-4MR	1.5 ft	4.3-10 Male (Right Angled) to 4.3-10 Male (Right Angled)
J-SF141-1H-4MR-NMR	1.5 ft	4.3-10 Male (Right Angled) to N Male (Right Angled)
J-SF141-3-4MS-4MS	3 ft	4.3-10 Male (Straight) to 4.3-10 Male (Straight)
J-SF141-6-4MS-4MS	6 ft	4.3-10 Male (Straight) to 4.3-10 Male (Straight)
J-SF141-6-4MS-NMS	6 ft	4.3-10 Male (Straight) to N Male (Straight)

Specifications are subject to change without notice. ©2017 Advanced RF Technologies, Inc.



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www.adrftech.com | 3116 West Vanowen Street, Burbank, CA 91505 USA

Product Specification: Low PIM Jumper Cables



Electrical Specification	1.5 ft	3 ft	6 ft	10 ft
Operating Frequency	DC - 3000 MHz			
VSWR @ 0.9 GHz	1.07			
VSWR @ 1.9 GHz	1.10			
VSWR @ 2.2 GHz	1.15			
VSWR @ 3.0 GHz	1.2			
Insertion Loss @ 0.9 GHz	0.18 dB	0.50 dB	0.90 dB	1.5 dB
Insertion Loss @ 1.9 GHz	0.20 dB	0.60 dB	1.10 dB	1.8 dB
Insertion Loss @ 2.2 GHz	0.25 dB	0.70 dB	1.20 dB	2.0 dB
Insertion Loss @ 3.0 GHz	0.30 dB	0.90 dB	1.50 dB	2.4 dB
PIMD (1-dB) @ 20W (2-tone)	< -15.1 dBm (Max) @ 1.8 GHz			
Operating Temperature	-40° - 176° F			
Impedance	50 Ω			

Material Specification

Connector Body	STAIN-PLATED BRASS
Insulator	PTFE
Coupling Nut	STAIN PLATED BRASS

Construction Specification

Center Conductor	Material	Diameter
SFC	PTFE	0.92 mm (0.036 in)
Dielectric	PTFE	2.98 mm (0.117 in)
Braid	TC	3.58 mm (0.141 in)
Jacket	FEP	4.14 mm (0.163 in)

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