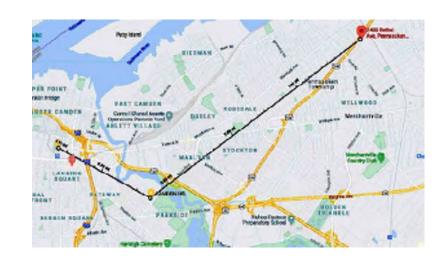
# HIGH SCHOOL EMERGENCY RESPONDER RADIO COVERAGE SYSTEM

1700 PARK BOULEVARD CAMDEN, NEW JERSEY 08103

#### PROJECT RENDER



#### AREA MAP



### LOCAL MAP



## 2018 - IFC SECTION 510:

#### SECTION 510 EMERGENCY RESPONDER RADIO COVERAGE

- 510.1 Emergency responder radio coverage in new buildings. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.
- 1. Where approved by the building official and the fire code official, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu

  1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet. 2. Where it is determined by the fire code official that the radio coverage system is not needed.
- 3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.
- 510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with approved radio coverage for emergency responders as required in Chapter 11.
- A construction permit for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.5. Maintenance
- Systems, components, and equipment required to provide emergency responder radio coverage system shall comply with Sections 511.4.1 through 511.4.2.5.
- The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 and 510.4.1.2.
- 510.4.1.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm shall be receivable within the building.
- 510.4.1.2 Minimum signal strength out of the building.
  A minimum signal strength of -95 dBm shall be received by the agency's radio system when transmitted from within the building.
- The emergency responder radio coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.5.
- Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications
- The fire code official shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

- Emergency responder radio coverage systems shall be provided with an approved secondary source of power. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least 24 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.
- 510.4.2.4 Signal booster requirements.
  If used, signal boosters shall meet the following requirements:

510.4.2.5 Additional frequencies and change of frequencies.

- 2. Battery systems used for the emergency power source shall be contained in a NEMA 4-type waterproof cabinet.
- 3. The signal booster system and battery system shall be electrically supervised and monitored by a supervisory service, or when approved by the fire code official, shall sound an audible 4. Equipment shall have FCC certification prior to installation.
- The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.
- The installation of the public safety radio coverage system shall be in accordance with Sections 510.5.1 through 510.5.5.
- Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC shall not be installed without prior coordination and approval of the fire code official.
- 510.5.2 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include:
- 1. A valid FCC-issued general radio operators license; and
- 2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed. These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the fire code official is provided.
- When an emergency responder radio coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows: 1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas
- 2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system. 3. Failure of a maximum of two nonadjacent test areas shall not result in failure of the test. 4. In the event that three of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of a maximum of four

#### SHEET INDEX

DAS 1.10	INFORMATION SHEET 1 (THIS SHEET)
DAS 1.20	INFORMATION SHEET 2
DAS 1.40	RISER DIAGRAM
DAS 2.01	LEVEL 1
DAS 2.02	LEVEL 2
DAS 2.03	ROOF
DAS 3.18	HEADEND LAYOUT
DAS 3.30	INDOOR ANTENNA EXAMPLES
DAS 3.40	DONOR ANTENNA EXAMPLES
DAS 4.00	FIRE ALARM INTERCONNECT
DAS-5.01	HEAT MAP, LEVEL 1
DAS 5.02	HEAT MAP, LEVEL 2

#### **GENERAL NOTES**

- 1. THIS SYSTEM HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEW JERSEY

- SYSTEM SHALL BE POWERED BY DUAL SOURCES.
  PRIMARY POWER SHALL BE FROM A DEDICATED 120V/20A CIRCUIT. SECONDARY POWER SHALL BE FROM UPS WITH 24 HOUR RUNTIME MOUNTED IN
- 4. BIDIRECTIONAL AMPLIFIER (BDA) AND ASSOCIATED EQUIPMENT SHALL BE WALL OR FLOOR MOUNTED IN A NEMA 4 EQUIVALENT ENCLOSURE.
- 6. SYSTEM HEADEND EQUIPMENT AND UPS TO BE CONNECTED TO A DEDICATED FIRE
- **UPS SYSTEM FAILURE**
- 7. MINIMUM BEND RADIUS ON ALL COAX IS 12".
- 8. ALL PASSIVE DEVICES (SPLITTERS, ETC.) IN CEILING OR WALL MOUNTED 12X12X4
- 9. ALL ANTENNAS MOUNTED ON 12X12X4 JUNCTION BOXES.
- nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement 5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered failure of that test area. Additional test locations shall not be permitted.
- 6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual
- tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values. 7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test
- The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.
- The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.3.
- The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the
- original field performance tests. Testing shall consist of the following: In-building coverage test as described in Section 510.5.4.
- 3. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.

- 4. All other active components shall be checked to verify operation within the manufacturer's specifications.
- 5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.4, shall be submitted to the fire code official.
- The building owner shall modify or expand the emergency responder radio coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section
- Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.

SHOP DRAWING HIGH SCHOOL

**EMERGENCY RESPONDER** RADIO COVERAGE SYSTEM

Revisions Date Revision/Issue

Date: 08/01/2019 Dwn By: MM Size: E1 - 30x42 Scale: Do Not Scale Drawing

> **N HIGH SCHOOL ERRCS PLAN** Rev:

DAS-1.20 HS-042721.DWG

AE-1407

# LEGENDS / EQUIPMENT LIST

#	•	Antenna - Directional Omni	PC-Tel	MXRMFBW7463	Omni Donor Antenna - 746-869 Mhz.
	•	Antenna - Indoor Omnidirectional	DAS Connexion	OMNI	Omnidirectional In-Building Antenna System - 140-960z MHz and 1710–2700 MHz - KSR-195 Pigtail - N-Female
1( <u>1)</u>	<del>•</del>	Directional Coupler / Tapper	DAS Connexion	DN-x1FN	Directional Coupler or Tapper, 140-960 MHz, 3-Type N Female connectors, 500 watt max. power, indoor. Specify db coupling
To Comp.	<b>⊗</b>	Splitter	DAS Connexion	D2-67FN	Splitter, 140-960 MHz, 3-Type N Female connectors, 500 watt max. power, indoor. Specify db coupling
	=	Bi-Directional Amplifier	DAS Connexion	Elite 7837	Multi-Band, Multi-Service, Software-Based Repeater Platform
		UPS / Power Supply	DAS Connexion	BBU-48-24	Uninterruptible Power Supply
B. Section 19	(SA)	Surge Arrestor	DAS Connexion	CSP1NB90	Lightning and Surge Protector
	DAS	Status Panel	DAS Connexion	ANN-000-04	Status Monitoring Panel
		Cable	DAS Connexion	LDF4RK-50A	HELIAX® Low Density Foam Coaxial Cable, corrugated copper, 1/2 in, black PE jacket
		Cable	DAS Connexion	AL4RPV-50	HELIAX® Plenum Rated Air Dielectric Coaxial Cable, corrugated aluminum, 1/2 in, off white PVC jacket
		Cable	DAS Connexion	CNT-400	CNT-400P, CNT® 50 Ohm Plenum Rated Braided Coaxial Cable, white PVC jacket

# **EQUIPMENT LICENSING**

FCC ID: U88PSELITE78A(B)
Full Company Details: DAS Connexion, LLC
Address: DAS Connexion 22415 SE 231 Street Maple Valley, WA 98038 United States

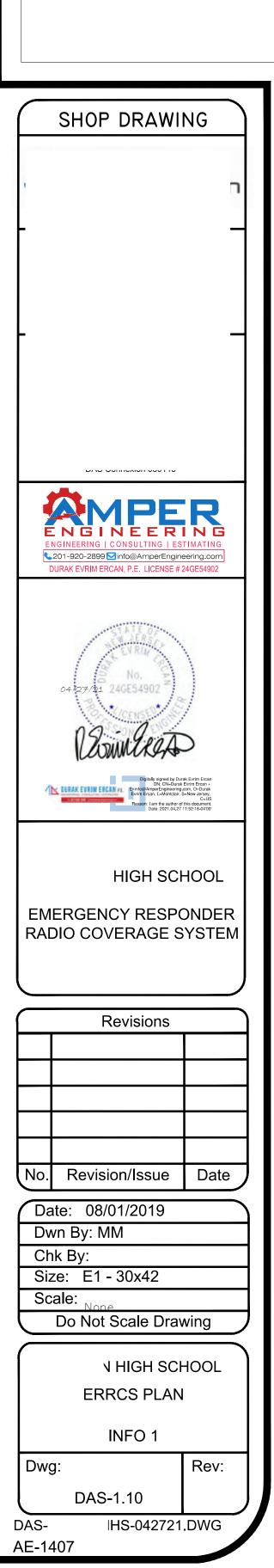
		SYSTEM BATTERY STANDBY CALCULATION 48V DC	
QTY	MODEL	DESCRIPTION	IGE AMPS @ 48V
	NO.		
1	£L:TE 7837	DAS CONNEXION BI DRIRECTIONAL AMPLIER	170 3.54
$\overline{}$		TOTAL CURRENT DURING AC POWER LO.	3.54
Ī		(INCLUDES ALL HEADEN D EQUIP) 10%	
		DESCIPTION	CURRENT
	•	TOTAL CURRENT DIVING AL OWER LOSS	3.54
		X 24 HOUR STANL Y	85.00
		TOTAL BATTERY "EQL "F" ENT	85.00
1	PS-BBU-48-24	BATTERY SUPPL. 3 (Amp-Hours)	100.00
		EXCESS B/ IF CBALKUP	15.00

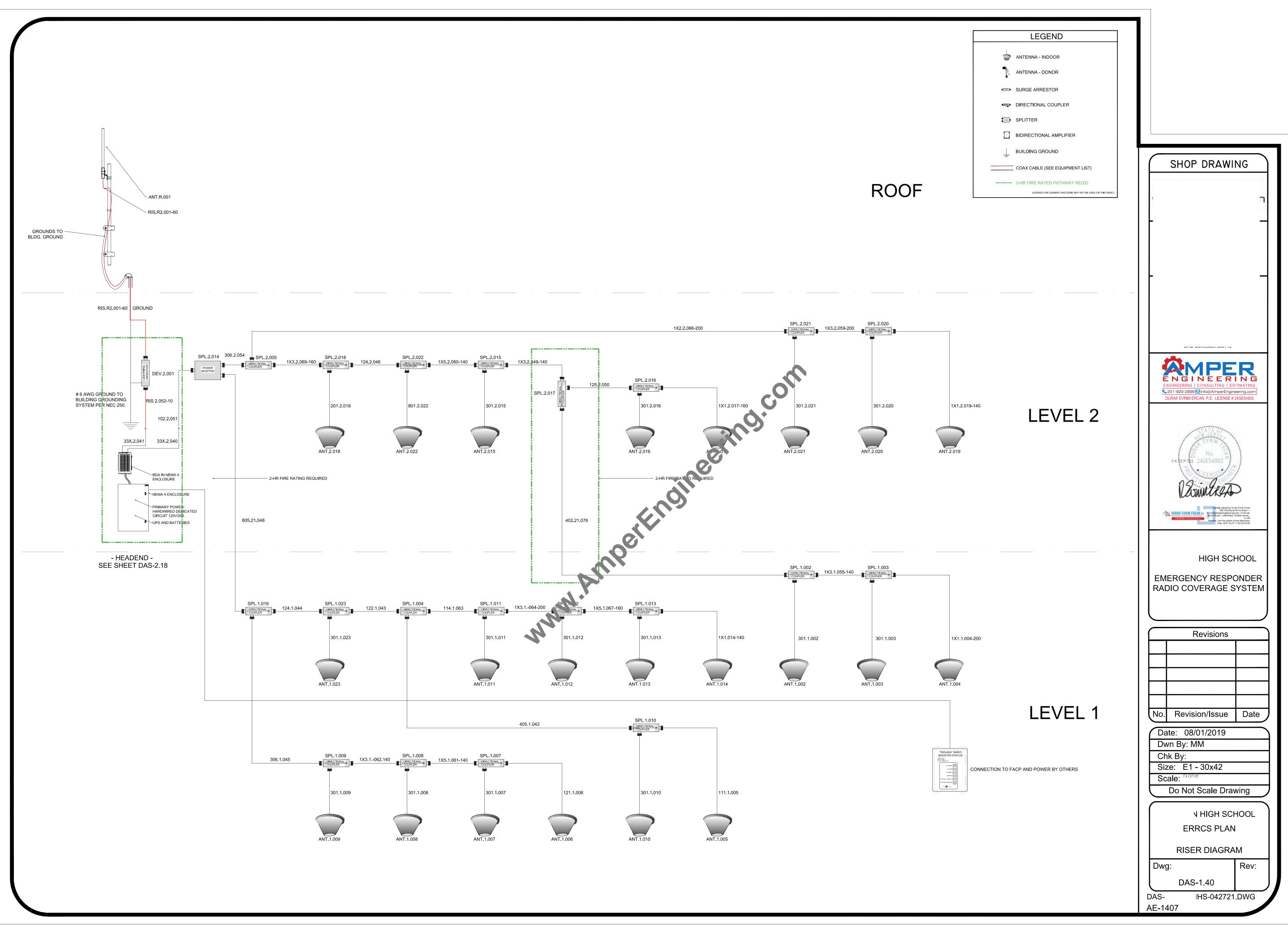
## CAMDEN COUNTY FREQUENCY LIST

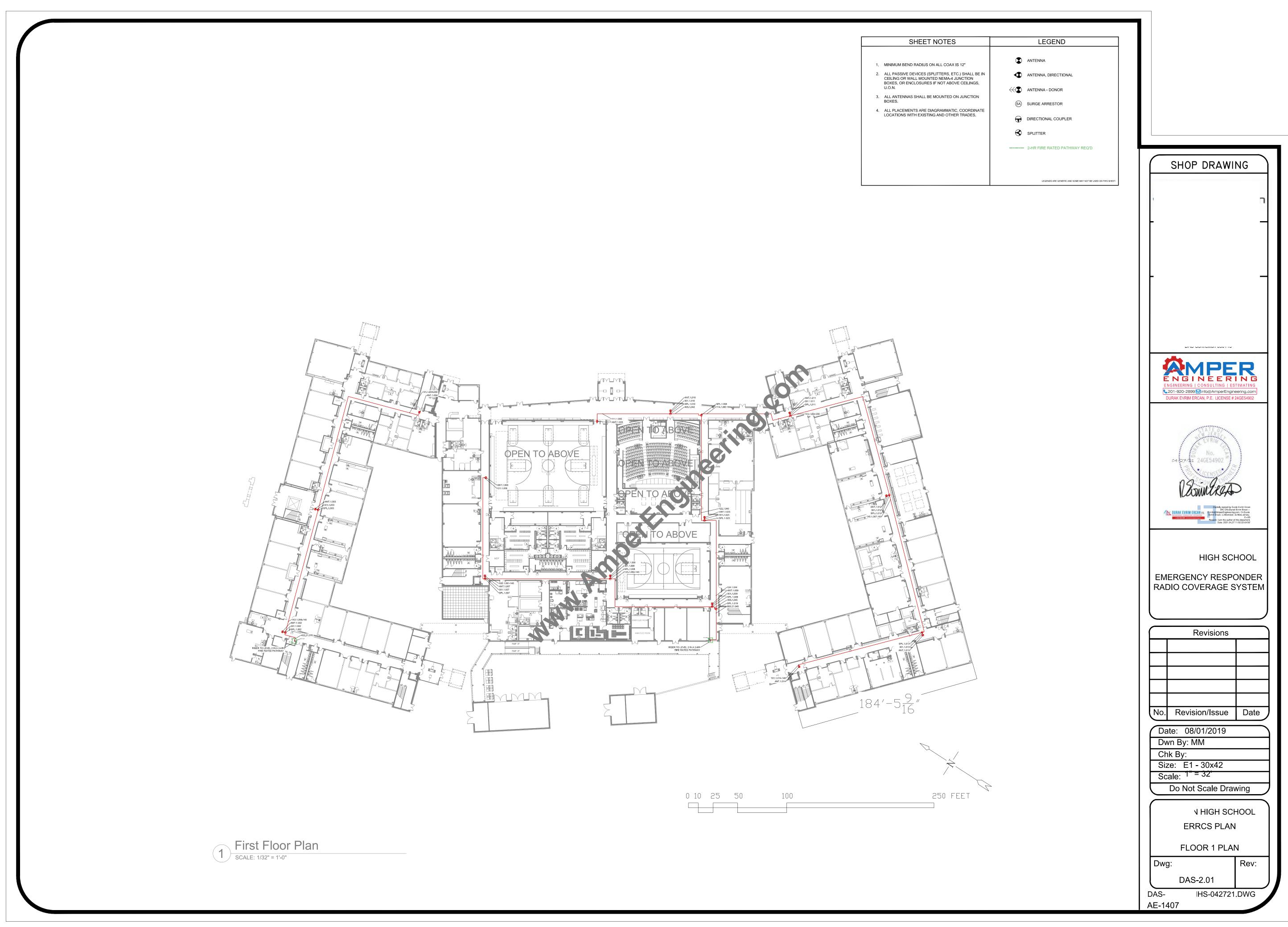
12-SITE SIMULCAST SYSTEM (FIRE & EMS)

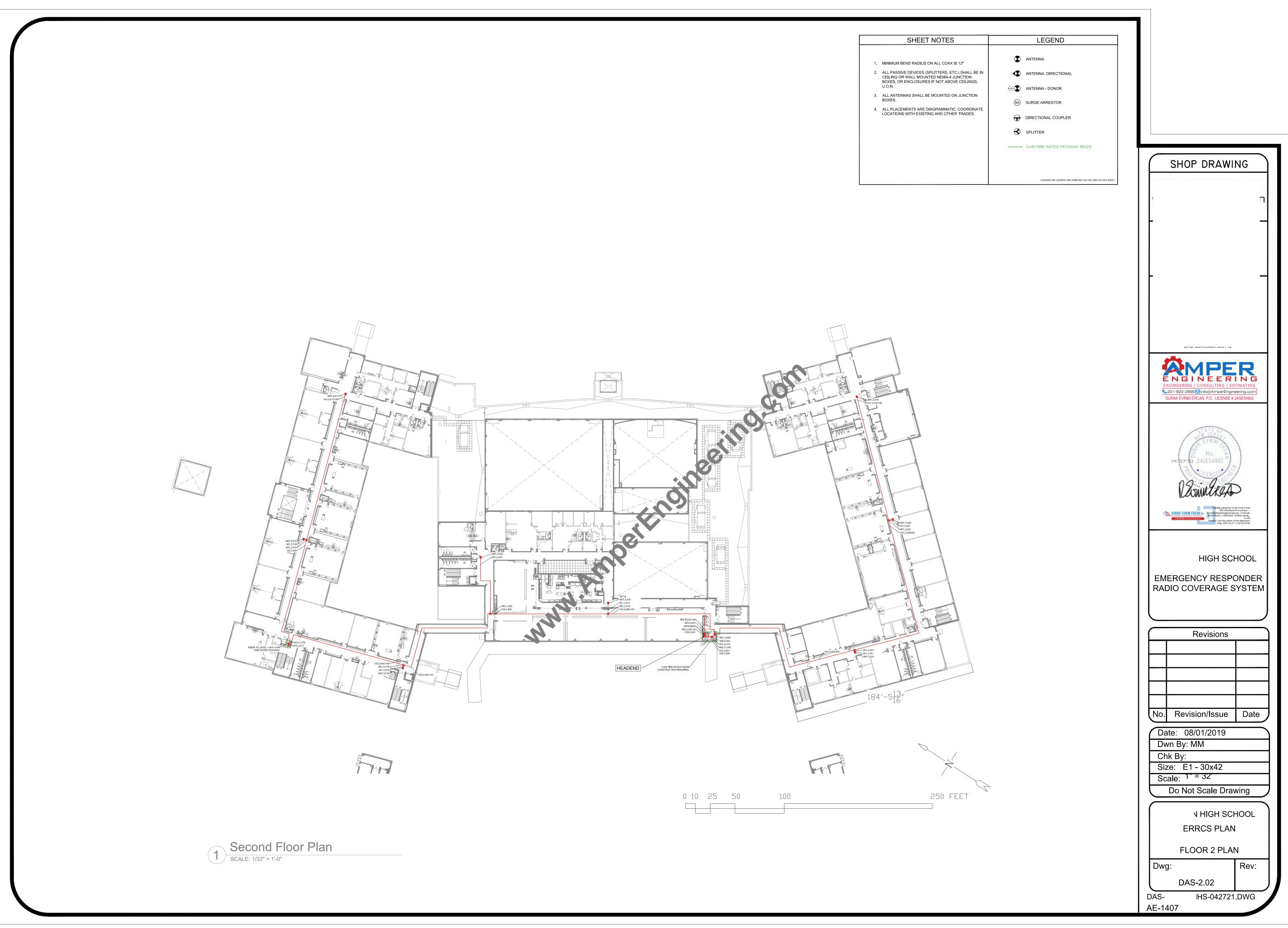
22415 SE 231 Street Maple Valley, WA 98038				SYSTEM CHANNEL	BASE TRANSMIT MHZ	BASE RECEIVE MHZ
				1	774.19375	804.19375
				2	773.46875	803.46875
	Inited States			3	772.11875	802.11875
SSI	ued 06/16/18	8		4	770.86875	800.86875
				5	769.81875	799.81875
				6	854.18750	809.18750
			U	7	773.94375	803.94375
			A .	8	772.89375	802.89375
			. —	9	771.21875	801.21875
Uł	28 RU	NTIME CALCULA	AHCN	10	770.26875	800.26875
				11	854.36250	809.36250
		SYSTEM BATTERY STANDBY CALCULATION 4	8V DC	12	854.13750	809.13750
QTY	MODEL	DESCRIPTION	AT AGE AMPS @ 48V	13	859.03750	814.03750
QII	NO.	DESCRIPTION	NGE NIVIPS @ 48V	14	858.68750	813.68750
				15	857.66250	812.66250
1	ELITE 7837	DAS CONNEXION BI DRIRECTIONAL AMPL. FR.	170 3.54	16	857.13750	812.13750
+		TOTAL CURRENT DURING AC POWER LO.	3.54			
		(Interest to Machine Interest to Machine Inter		METRO PD ASR (CAME	DEN METRO POLICE)	
İ		DESCIPTION	CURRENT	1	851.16250	806.16250
		TOTAL CURRENT DV .NG AL OWER LOSS	3.54	2	851.73750	806.73750
		X 24 HOUR STANL Y	85.00	_		000.70700
İ			1 1	2	0E9 707EN	007 707 <i>E</i> 0
	25 BBH 45 24	TOTAL BATTERY FOL SE LENT	85.00	3	852.78750	807.78750
1	25-BBU-48-24	TOTAL BATTERY FOL F LENT BATTERY SUPPLY (Amp-Hours)	100.00	3 4	852.78750 853.18750	807.78750 808.18750
1	25-BBU-48-24	TOTAL BATTERY FOL SE LENT	<del> </del>	3 4 5		

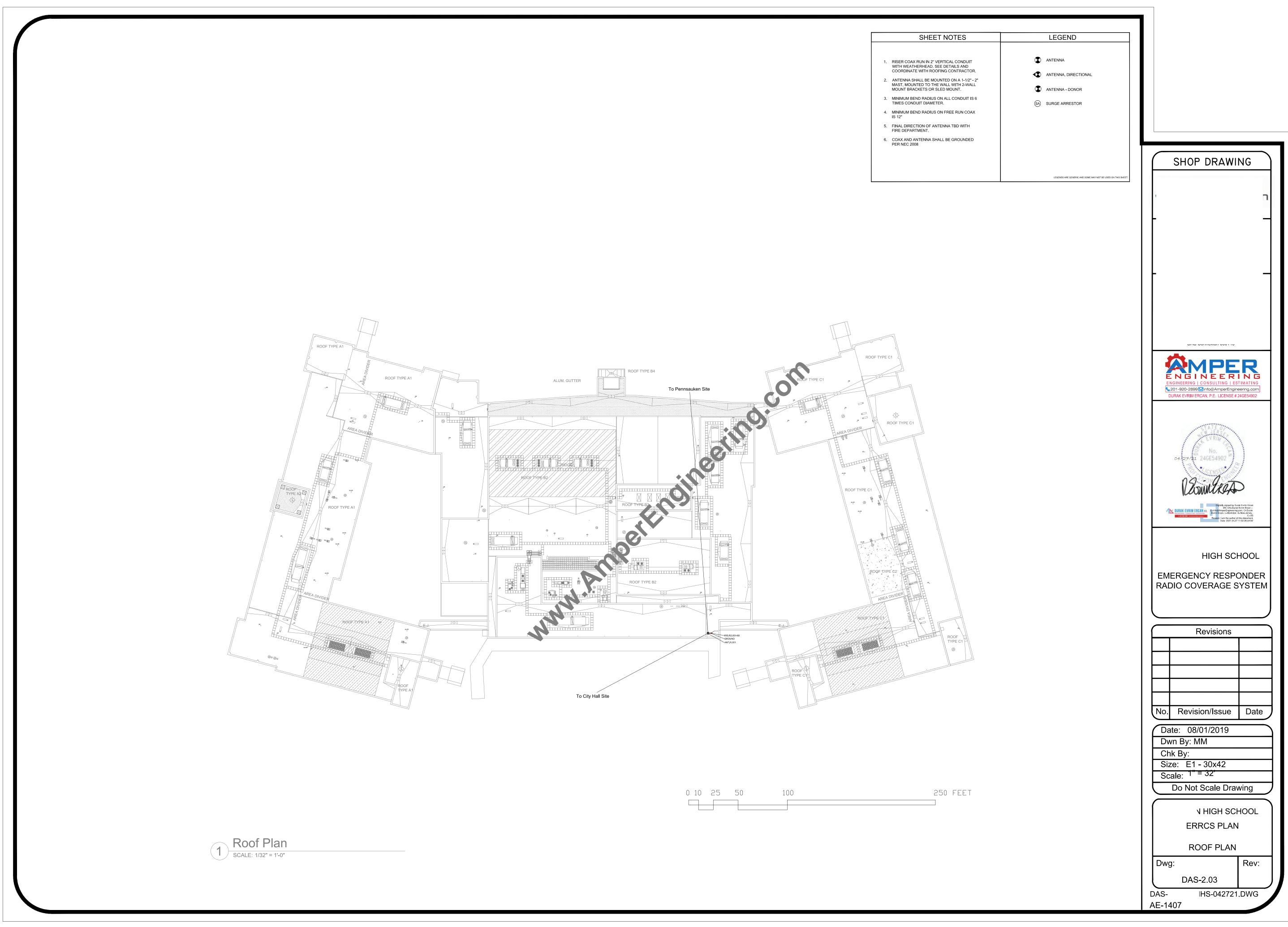
FREQUENCIES IN RED INDICATE UPPER & LOWER SYSTEM LIMITS

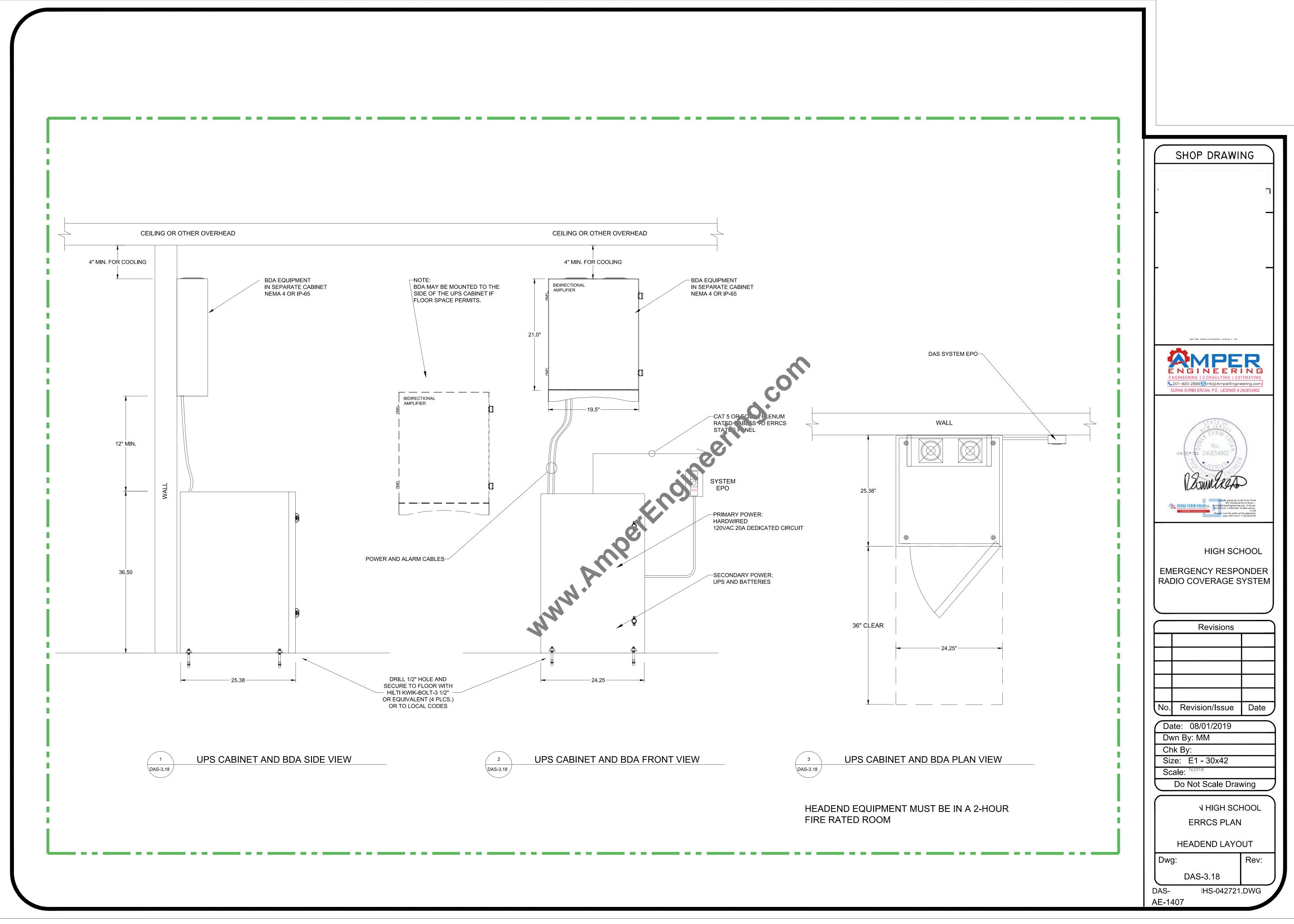


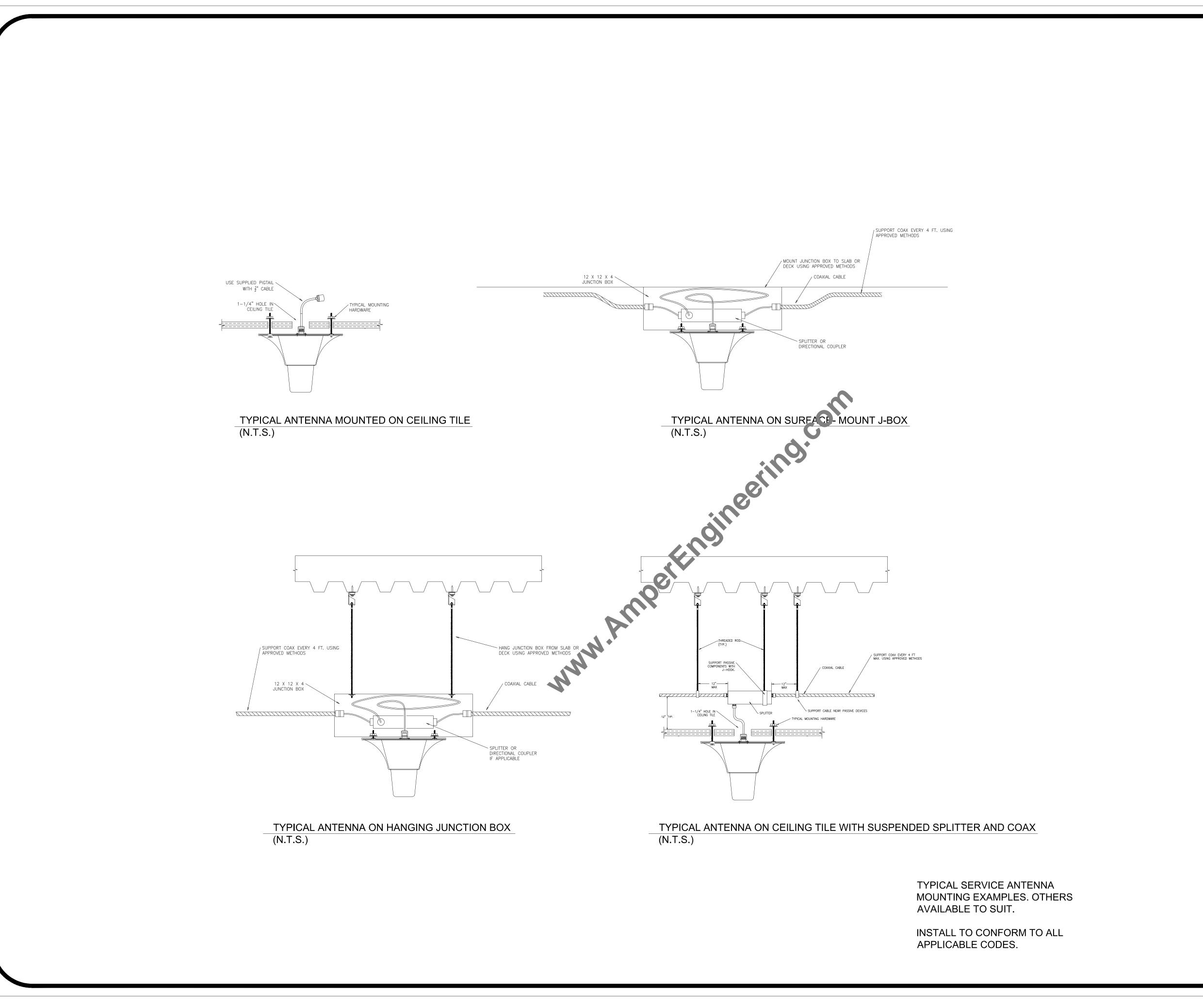


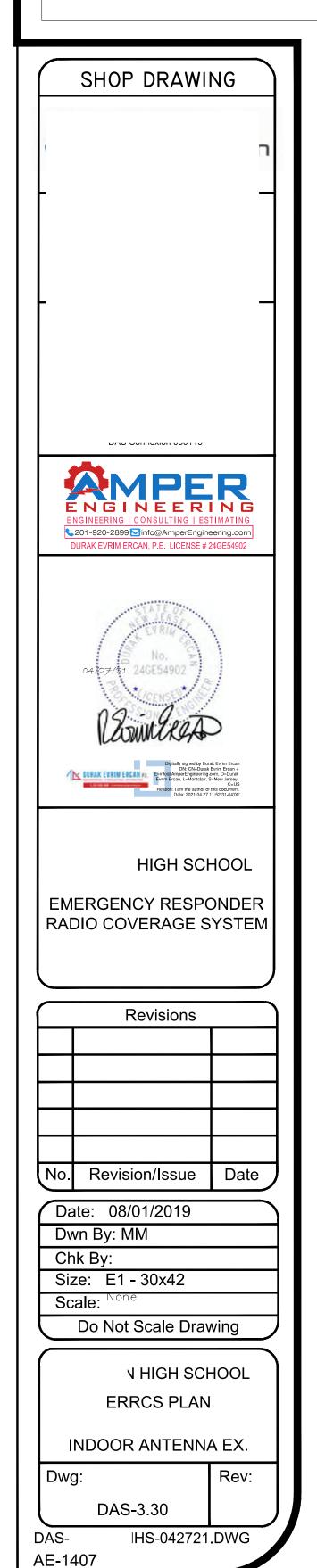


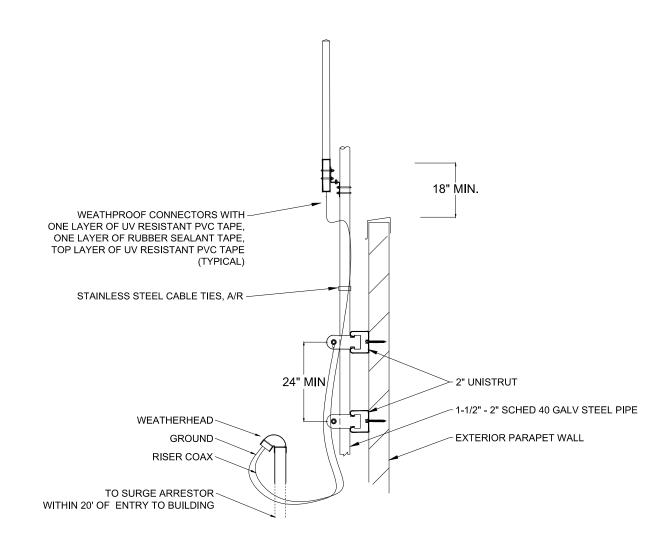




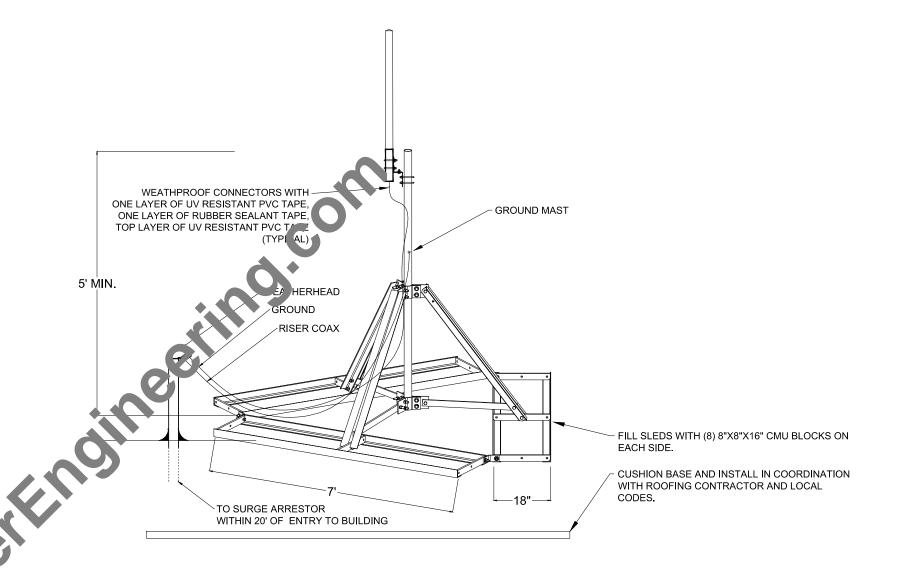








DONOR ANTENNA MOUNTING ON PARAPET OR STRAIGHT WALL (NTS)



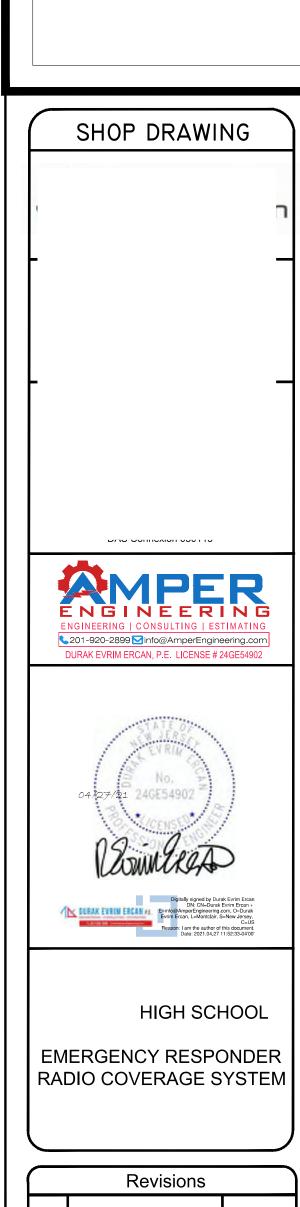
DONOR ANTENNA MOUNTING ON SLED MOUNT (NTS)

TYPICAL DONOR ANTENNA MOUNTING EXAMPLES. OTHERS AVAILABLE TO SUIT.

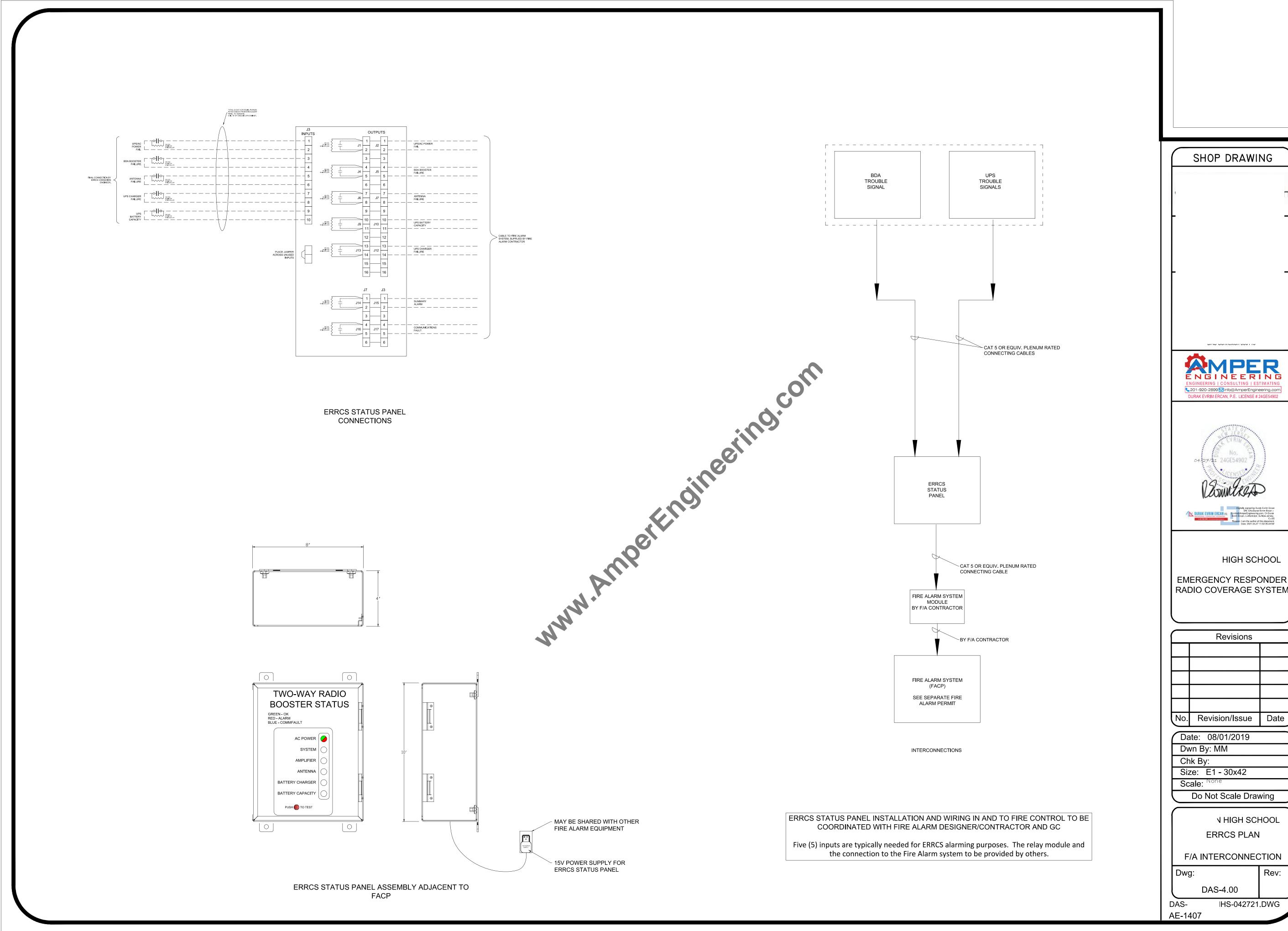
COORDINATE WITH ROOFING OR BUILDING ENGINEER.

INSTALL TO CONFORM TO ALL APPLICABLE CODES.

GROUND TO NEC 250.



No. Revision/Issue Date Date: 08/01/2019 Dwn By: MM Chk By: Size: E1 - 30x42 Scale: None Do Not Scale Drawing N HIGH SCHOOL **ERRCS PLAN** DONOR ANTENNA EXAMPLES Rev: Dwg: DAS-3.40 IHS-042721.DWG DAS-AE-1407

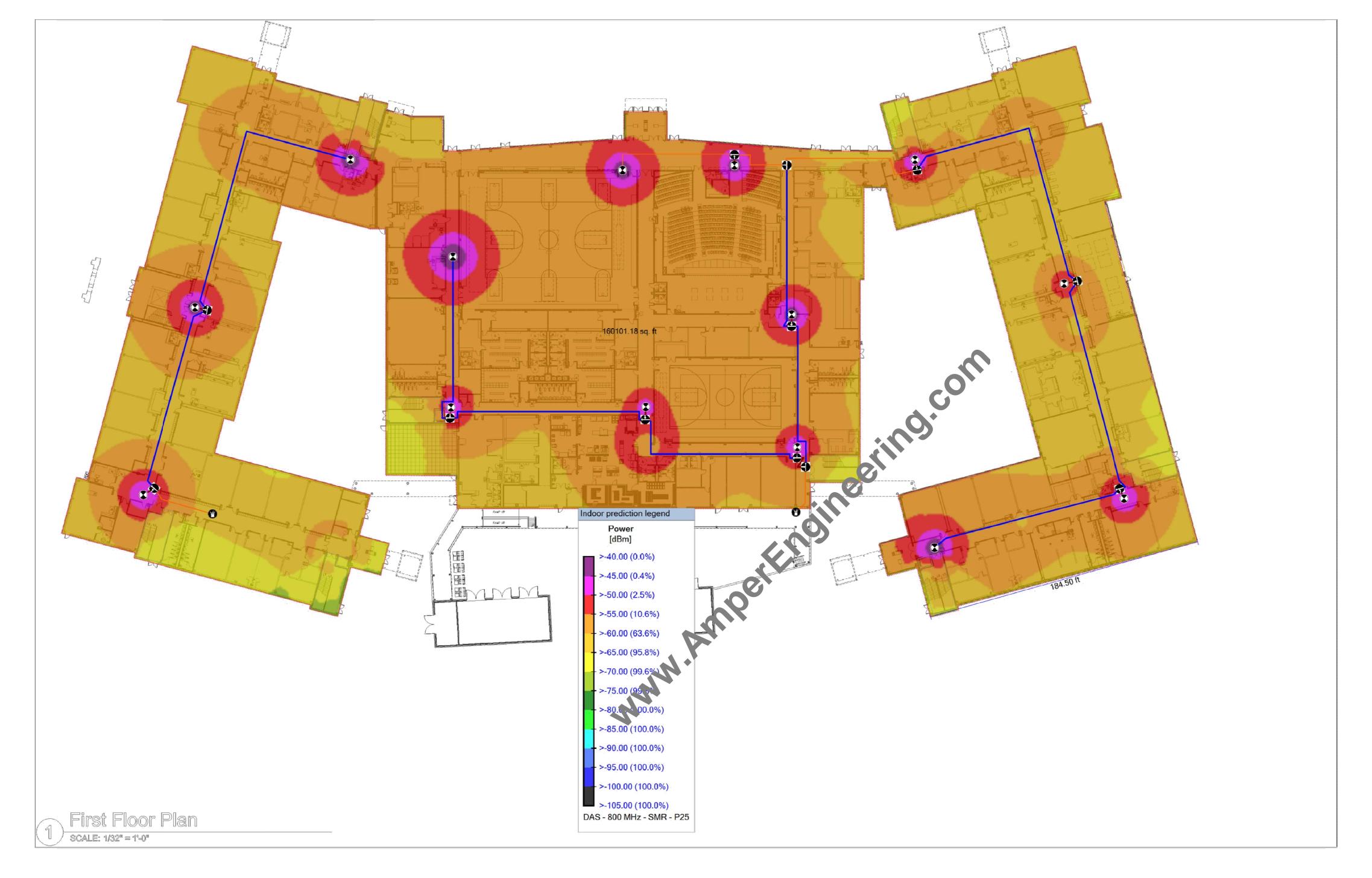


HIGH SCHOOL

Rev:

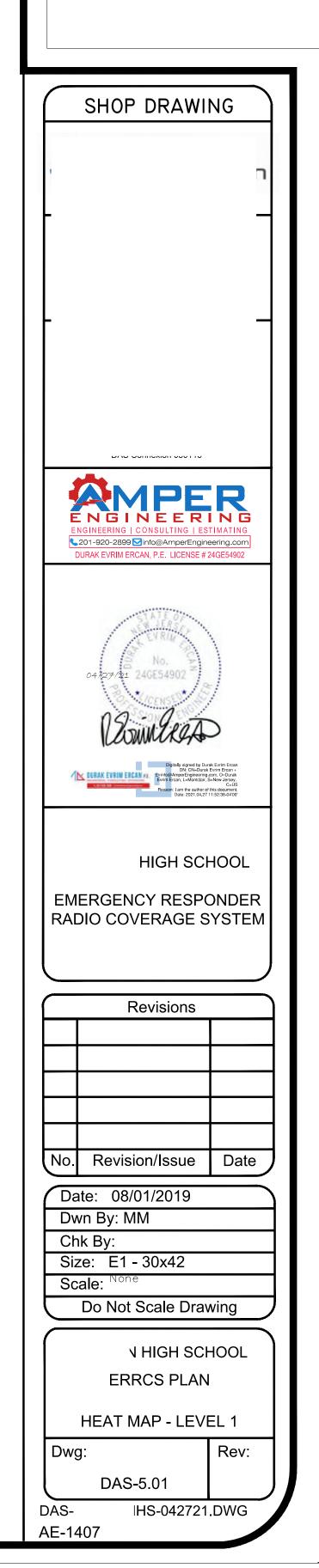
# DAS - 800 MHz - SMR - P25 / Signal strength

# Floor 1



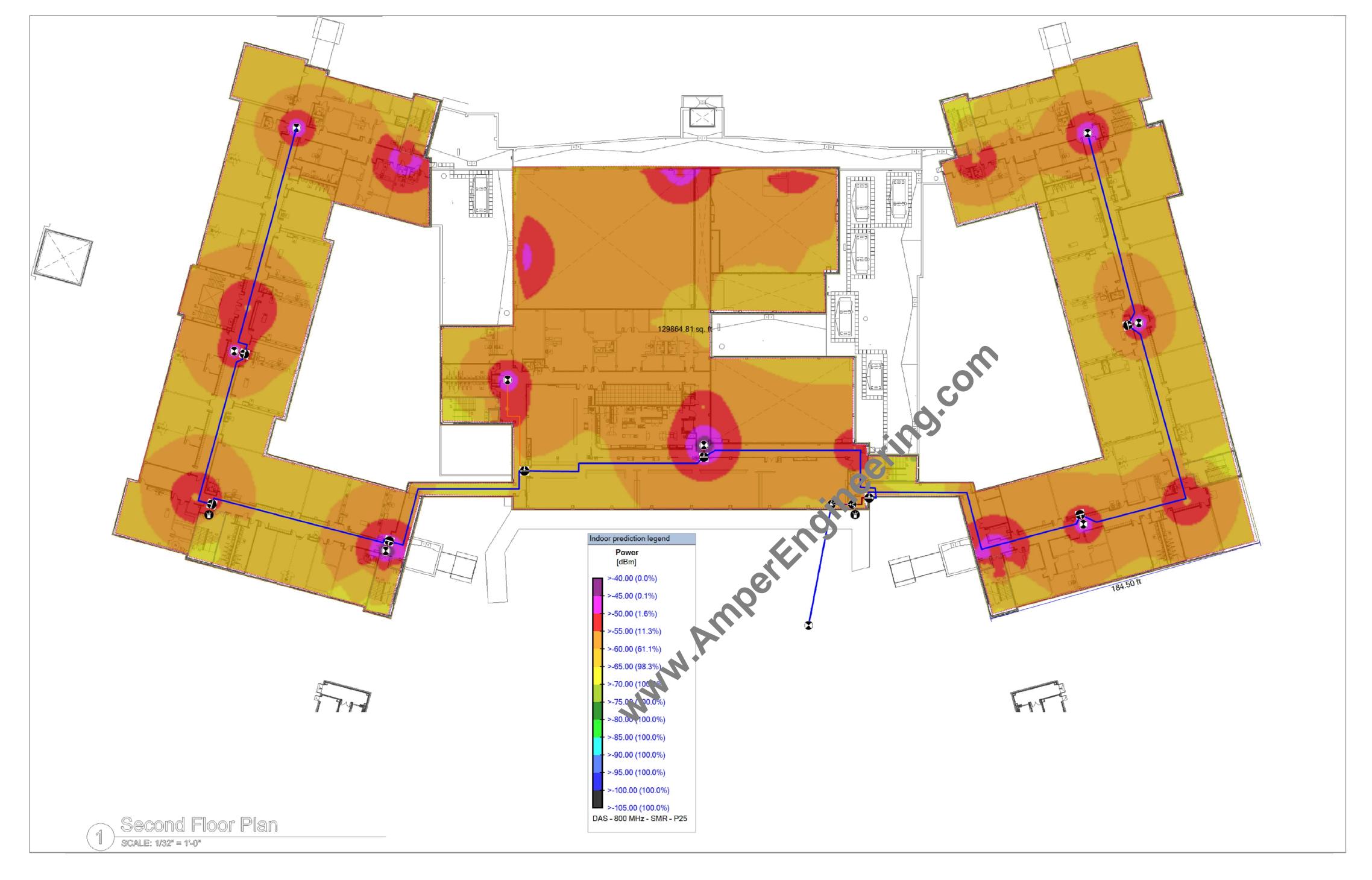
Camden High School DAS Connexion

Created on 4/23/2021



# DAS - 800 MHz - SMR - P25 / Signal strength

# Floor 2



Camden High School DAS Connexion

Created on 4/23/2021

