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Napa County Communications Department
Information Technology Services Division
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Subject: Napa County Communications Public Safety Requirement for Emergency Responder Radio Communication Systems (ERRCS)

The Napa County Communications Department has listed the following requirements for the installation of an Emergency Responder Communication Enhancement System within Napa County's jurisdiction. Each system request is subject to review by the Napa County Fire Marshal's office and supersedes any additional requirements of the Radio License Authority (RLA):

Required Channels:

Channel Name	Rx Frequency	Rx PL/ NAC	Transmit Frequency	Transmit PL/NAC
Primary (Law)	155.430 MHz	131.8	158.970 MHz	Contact RLA
Red (Law P25)	151.070 MHz	2CC	159.045 MHz	Contact RLA
County Fire	154.415 MHz	131.8	154.860 MHz	Contact RLA

If use of directional donor antenna:

County Fire	Location	LAT	LONG	ERP
Tone 1	Mt. St. Helena	38°39'22.99"N	122°36'53.28"W	99W
Tone 2	Atlas Peak	38°27'10.23"N	122°16'0.29"W	99W
Tone 3	Mt. Vaca	38°23'43.44"N	122° 6'0.82"W	99W
Tone 4	Berryessa Peak	38°39'49.67"N	122°11'21.41"W	99W
Tone 5	Sugar Loaf Peak	38°15'51.15"N	122°12'58.98"W	99W

Tone 6	Oat Hill	38°11'4.36"N	122°15'49.54"W	99W
Tone 7	Napa Sanitation	38°14'6.08"N	122°17'0.58"W	99W

RSSI Requirements for donor antenna prior to installation:

Outside Building/Structure (Entrance and Exits)	Delivered Audio Quality (DAQ) of 3 or higher

Standby power requirements:

100% System Capacity	Not less than 12 hours

RF Engineering Requirements:

1. The design process must include a measurement of the signal at the outside of the building at the ground level as well as the projected height of the donor antenna. If line of sight is confirmed to the donor antenna, the design may utilize Free Space loss calculation to determine the path loss between the donor site and the donor antenna.

2. If a signal level of -80 dBm cannot be achieved at the donor antenna, the building owner must supply simulcast base stations, associated links, and other ancillary equipment in lieu of a BDA to the County and implement per the County's instructions.

3. Prior to activation, the building owner must obtain Napa County's authorization per FCC rule 90.219.

4. Design documentation, including but not limited to path calculations, schematics, antenna layout and drawings shall be provided to the County of Napa.

5. Design documents must be retained by both the building owner and the ERRCS engineer/contractor for the lifetime of the ERRCS.

6. The County will review the design and location of the ERRCS. If there is an existing ERRCS that may interact with the new ERRCS, the County will work with the Building Owner to modify the design.

7. The maximum horizontal beamwidth of the donor antenna shall be 82 degrees and the front-to back ration shall be > 25dB. The County reserves the right to further restrict this pattern based on the building's location in relationship to the County radio sites and other ERRCS systems. **Recommended antennas are Corner Reflectors and Log Periodic.**

8. Class B amplifiers shall be used. No Class A amplifiers are allowed. **All Class B amplifiers used must be registered with the FCC at https://signalboosters.fcc.gov/signal-boosters/**

9. Amplifiers shall meet or exceed the following specifications:

   a. Amplifier Gain ≤ 75 dB

   b. Amplifier Noise Figure 3.0 dB

   c. Third Order Intercept Point +50 dBm

10. Filtering/combining shall utilize cavity combiners with no active elements. Combiners are allowed to reside outside the NEMA-4 cabinet.

11. Survivability for cable per NFPA 72 may be met with the use of suitable metal conduit.

Recommendations for Guidelines CSI Telecommunications, Inc.

12. The County has both transmit/receive sites and receive only sites. In some cases, the uplink path and the downlink path may be required to be directed to different donor sites. Also, a Unidirectional Amplifier is encouraged if only the uplink or downlink direction requires amplification.

13. In many cases, there may be sufficient signal levels from the donor site(s) to preclude the use of an amplified DAS depending on the building penetration losses and distance to the donor site(s). The use of a passive DAS is strongly encouraged where appropriate.

14. Signal levels from the DAS should not exceed -100 dBm outside the building.

15. Care should be taken to avoid locating uplink antennas near sources of VHF noise.

16. Isolation between the donor antenna and distributed antennas shall be 20 dB greater than the amplifier gain or per the amplifier manufacturer's specification, whichever is greater.

17. The lead technician installing the ERRCS shall have a General Operators Radio License (GROL) with all work either performed or reviewed by.

18. The ERRCS shall be designed and specified by a Professional Electrical Engineer registered in the State of California, or an engineer working under his/her direction per California Code of Regulations, Title 16, Division 5 paragraph 404.1.

19. Upon commissioning, the County shall measure the baseline noise level(s) for any potentially affected sites prior to the ERRCS being activated. The County shall then repeat the measurement(s). If the ERRCS increases the noise at any site, the system will be turned off until corrections have been

made for retesting. The County reserves the right to measure noise levels near the building in a similar manner.

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