All signal booster installations require an 'interference test' performed by Williamson County Wireless Communication (WCWC) and contractor to verify compliance with items 7 and 8 of IFC 2021 Section 510.5.4. (Page 2 of this document). These two tests verify that (a) the signal booster installation does not interfere with the donor site and (b) two portable radios comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2 when transmitting simultaneously (Near/Far test).

To perform the interference tests, contractor will be issued two portable radios (Radio-1 and Radio-2) for testing in-building radio communications at each distributed antenna location in the building. WCWC technician will manage and monitor each test from the donor site location using a portable radio (Radio-3).

Each portable radio will be programmed with two talkgroups. Contractor Radio-1 will be affiliated to WMN BDA 1, and Contractor Radio-2 will be affiliated to WMN BDA 2, Radio-3 being assigned to the WCWC technician.

Test 1. Signal Booster Power-up.

This first test is powering up of the signal booster while monitoring the site receive frequency band using a spectrum analyzer at the donor site. This is to verify that there is no increase in noise floor when the signal booster is initially powered on.

Test 2. Ensuring spurious signals are not being generated by the subject signal booster.

Radio-1 will transmit within 5 to 10 ft. of each distributed antenna while the signal level is monitored on the spectrum analyzer at the donor site. The received signal should be clean with no spurs and a typical signal level of -90 to -80 dBm. This test will occur at each distributed antenna location.

Test 3. Two portable radios simultaneously keyed up on different frequencies within the same band – (Near/Far test).

There are two parts to this test. (a) references the signal booster installation downlink grid test document, submitted by contractor, and (b) is performed at each distributed antenna.

(a): Reference the downlink grid test document, identify the locations where the downlink signal was the strongest, and the weakest. Radio-2 will transmit on WMN BDA 2 at the location where the downlink signal was the weakest. While Radio-2 is transmitting, Radio-1 will transmit on WMN BDA 1 within 10 feet of the distributed antenna where the downlink signal was the strongest. The signal level being monitored at Radio-3 (WMN BDA 2) and on the spectrum analyzer at the donor site should not degrade, and Radio-2's Digital Audio Quality (DAQ) level being received should be no less than 3.0.

(b): Radio-2 will transmit on WMN BDA 2at a distance that represents the farthest distance from the distributed antenna. The signal level of the radio transmission from Radio-2 will be monitored at the donor site using Radio-3 and spectrum analyzer. While Radio-2 is transmitting, Radio-1 will transmit on WMN BDA 1 at a distance no greater than 10 feet from the distributed antenna. The signal level being monitored at Radio-3 (WMN BDA 2) and on the spectrum analyzer at the donor site should not degrade, and Radio-2's Digital Audio Quality (DAQ) level being received should be no less than 3.0.

Signal Booster interference Test

For each distributed antenna location, the contractor will document the Receive Signal Strength Indicator (RSSI) level on the attached form and upon completion of the interference test the contractor will sign the form, acknowledging that each test outlined above has been completed.

Reference 2021 IFC

510.4.2.8 Radio communication antenna density© Systems shall be engineered to minimize the near-far effect. In-building, two-way emergency responder communication coverage system designs shall include sufficient antenna density to address reduced gain conditions

510.5.4 Acceptance test procedure. Where an in-building, two-way emergency responder communication coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 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 or equipment approved by the fire code official.

3. Failure of more than one test area shall result in failure of the test.

4. In the event that two 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 not more than two 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 95-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 to be a 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 shall be conducted at the time of installation and at subsequent annual inspections.

8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

Signal Booster interference Test

Test 3 (a)

Strongest Ant #	Weakest Ant #	Notes

Test 3 (b)

Distributed Ant #	IN BUILDING RSSI	TOWER RECIEVE POWER	DAQ NEAR/FAR	Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
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14				
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37				

Signal Booster interference Test

Contractor Sign-off

Radio-1: Model No: _____ Serial No: _____

Radio-2: Model No: _____ Serial No: _____

I _____ hereby certify that the testing of the signal booster at address _____ was completed on date _____ in accordance with this document as outlined under Test 1, Test 2, and Test 3.

Signature: _____ Date: _____

Wilco Tower Site Addresses

	ASR NUMBER	SITE NAME	ADDRESS	LAT	LONG
1	1227257	**PRIME**	1058 RABBIT HILL ROAD GEORGETOWN	30 35 12.8 N	097 40 57.3 W
2	1224437	**CEDAR PARK**	1900 COUGAR COUNTRY DRIVE CEDAR PARK	30 31 38.0 N	097 51 44.5 W
3	1227235	**LIBERTY HILL**	5251-A COUNTY ROAD 200 LIBERTY HILL	30 44 49.85 N	097 56 36.30 W
4	1227845	**THRALL**	7800 COUNTY ROAD 424 THRALL	30 34 33.56 N	097 17 34.00 W
5	1306634	**FLORENCE**	1000 FM 970 FLORENCE	30 49 47.1 N	097 48 25.8 W
6		**HIGH COUNTRY**	2899 HIGH COUNTRY BLVD ROUND ROCK	30 29 27.1 N	097 37 09.0 W
7	1281853	**TOWER RD**	2141 TOWER RD LIBERTY HILL	30 40 33.6 N	097 48 47.5 W
8	1055006	**GRANGER**	5690 CR 327 GRANGER	30 43 10.2 N	097 30 26.9 W
9	1287855	**TAYLOR**	108 OLD COUPLAND RD TAYLOR	30 33 08.5 N	097 24 22.9 W
10	1293033	**CEDAR PARK SOUTH**	1302 FIRE LN CEDAR PARK	30 29 47.8 N	097 48 27.0 W

WILCO P25 TRUNKING	WPIR949 & WQLR565	
CHANNELS	TX FREQUENCIES	RX FREQUENCIES
Ch 1	859.5875	814.5875
Ch 2	859.9625	814.9625
Ch 3	858.9625	813.9625
Ch 4	857.9625	812.9625
Ch 5	858.9875	813.9875
Ch 6	857.9875	812.9875
Ch 7	856.9625	811.9625
Ch 8	855.7125	810.7125
Ch 9	855.2125	810.2125
Ch 10	854.9875	809.9875
Ch 11	856.6875	811.6875
Ch 12	859.9875	814.9875
Ch 13	856.9875	811.9875
Ch 14	855.9875	810.9875
Ch 15	854.9625	809.9625