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*\*\*Please read the Technical & Submittal Requirements before completing/submitting your application.\*\**

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**REGIONAL WIRELESS COOPERATIVE**  
Radio Amplification System  
Rebroadcast Authorization Application

Pursuant to the Regional Wireless Cooperative (RWC) Radio Amplification Systems Policy, Section 5.1; and 47CFR 90.219, entities desiring to operate radio amplification systems on the RWC's licensed frequencies and within the service area of the RWC network must obtain written consent and approval from the licensee. Upon successful initial review of this document the RWC will provide a separate written acceptance of plans for construction. Following the successful completion of a field test by the RWC this signed document shall serve as written consent and approval to rebroadcast on RWC Spectrum.

**PAGE 1 – APPLICANT INFORMATION (To be completed by applicant)**

**Proposed ERRCS Site Information:**

**Date Submitted:** \_\_\_\_\_

Location Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

**Facility Owner/Occupant Contact Information**

**Vendor/Integrator Contact Information**

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Email: \_\_\_\_\_

**Project Information**

Expected Activation Date: \_\_\_\_\_

Building Type (High-Rise, Multi-Family, Warehouse, Etc.): \_\_\_\_\_

Will this project be expanded in the future?: \_\_\_\_\_

**AHJ Contact Name:** \_\_\_\_\_

**AHJ Phone No.:** \_\_\_\_\_

**AHJ Email:** \_\_\_\_\_

**Submit Application and Attachments to (Completed by RWC):** Email to: [rwcazerrcs@phoenix.gov](mailto:rwcazerrcs@phoenix.gov)



**REGIONAL WIRELESS COOPERATIVE**  
Radio Amplification System  
Rebroadcast Authorization Application

**PAGE 2 - LICENSEE AUTHORIZATION (To be completed by licensee)**

**Donor Site Information:**

Donor Site: \_\_\_\_\_ Simulcast: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ FCC Call Sign: \_\_\_\_\_

Donor Site Lat/Long: ° \_\_\_\_\_

Donor Antenna Site Distance \_\_\_\_\_ Miles. Donor Antenna Site Azimuth \_\_\_\_\_ Degrees

**LICENSEE AUTHORIZATION**

In consideration of review of the information and requirements provided on this application, the authorized agent of the licensee operating on a RWC Member's licensed frequencies and within the service area of the RWC network hereby consents and approves activation of the radio amplification system as documented herein.

This authorization shall remain in effect as long as the ERRC system described in this document is properly maintained in accordance with RWC policy. Changes to the RWC P-25 network may require alterations to this ERRC system. RWC policy requires a current local point of contact to facilitate access in the event of radio interference caused by this device.

Current fire codes governing ERRC's deployments require annual inspections to be completed. Scheduling of annual inspections is the sole responsibility of the system owner or their designated representative. System owners should consult with their local Authority Having Jurisdiction (AHJ) for questions regarding annual inspection requirements.

For questions about the RWC, its policies and donor site info see: <https://rwcaz.org>

Authorized Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Print Name: \_\_\_\_\_

Entity: \_\_\_\_\_

Date: \_\_\_\_\_



**Chris Arneson**  
ERRCS Specialist  
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602-534-8226 – Office  
602-856-1531 – Cell

### **National Institute for Certification in Engineering Technologies (NICET) Requirements**

- As of 8/01/2024 installation technicians who are servicing any ERRCS projects must have a minimum NICET IB-PSC Level 1 certification. Technicians which have 6 months or less of in-building experience, must be overseen by a NICET IB-PSC Level 2 certified technician. Project leads are required to possess a minimum NICET IB-PSC Level 2 certification. Project leads must be on site during commissioning and testing of the system. All ERRCS project designers are required to have the NICET IB-PSC Design certification.

### **RWC Technical Requirements for ERRCS**

For new BDA's either due to new construction or retrofits/repairs:

- Class A amplifiers (see FCC 47 CFR 90.219 (a)) must be used for any ERRCS installed to operate on the RWC 700 MHz P25 network.
- Existing Class B amplifiers must continue to be maintained on an annual basis. If an existing Class B amplifier fails, it must be replaced with a Class A amplifier.
- The BDA shall support uplink squelch.
- The BDA must have manually controllable AGC - Automatic Gain Control and/or manually controllable ALC - Automatic Level Control.

### **BDA Configuration**

- BDA maximum uplink and downlink gain settings shall be 20dB less than isolation measured between donor antenna and the DAS.
- All appropriate RWC frequencies shall be programmed into the BDA.
- Typical filter configuration shall be 12.5 Khz unless approved by the RWC.
- Uplink Squelch should be enabled.

### **Donor Antenna**

- The donor antenna shall be a directional antenna.
- The donor antenna frequency range shall support 700 MHz public safety band, 769-775 MHz (downlink) and 799-805Mhz (uplink).
- For DAS projects requesting design approval after August 1, 2024, the donor antenna shall support:
  - A horizontal beamwidth of 30 degrees or less
  - A vertical beamwidth of 30 degrees or less
  - A front-to-back ratio of 27db or greater

Antennas that meet this requirement listed below. If other antennas are discovered that meet these requirements, please feel free to update us.

- 1) ADRF: AD-PA-617-960-D
- 2) Gamma Nu: F16V28DHFB
- 3) Ventev: VHG-VL3015-ODNF
- 4) Comba: ODP-030V14MN
- 5) Westell - CS03-717-999
- 6) Potter - Donor-698-960-15



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- The donor antenna must be placed and oriented with an unobstructed view of the donor site. This criterion is concerned principally with near field obstructions such as parapets, HVAC units, ducting, screen walls, etc. Antennas need to be secured clearly above any near field obstacles. Wind loading should be considered when installing and securing antennas. Line of sight buildings or other obstructions will be considered by the RWC during uplink testing.
- The donor antenna must be oriented at the pre-approved donor site mentioned in the plan's acceptance document given with plans approval.

#### **RWC DAS Technical Requirements**

- Filtration to remove nearby saturating cellular noise or other signals may be required.

#### **Fiber DAS Policy (Excerpts from RWC Policy O.12-12)**

- 6.5.2. Multiple building campuses with more than one (1) building require a single campus wide solution if an ERRCS is needed. A campus is defined as any of the following criteria:
- 6.5.2.1. An ERRCS fiber DAS system would be required for all buildings located on the same parcel as identified by the county assessor's office.
- 6.5.2.2. The grounds and buildings that resemble a campus, i.e. college or university campus, hospital campus, or landscaped corporate campus, data center campus, and multi-tenant occupancies.
- 6.5.2.3. Buildings are connected or within 1000' and are of same ownership.
- 6.5.2.4. As deemed by the RWC, buildings or structures within a campus setting may cause radio frequency interference.
- 6.5.2.5. If a building requires more than a single BDA, per the manufacturers installation recommendations, an ERRCS fiber DAS system installation would be required.

#### **Emergency Power Off (EPO) Switches**

- For data centers, large manufacturing facilities, and other sites with access restrictions, an EPO switch will need to be installed to allow for prompt amp shut off in the event of interference.
- Configuration shall be included in the system design documents to be submitted as part of the RWC Radio Amplification System Rebroadcast Authorization Application.
- EPO's shall be installed at the head end unless an alternative location is approved by the RWC.

# Regional Wireless Cooperative (RWC)

## Plan Submittal Requirements (**\*\*for RWC use only\*\***)

1		Purpose of Requirements	
		<ul style="list-style-type: none"> <li>• To protect the integrity of the RWC Radio Network from interference sources.</li> <li>• To eliminate unapproved equipment or undesirable design decisions.</li> <li>• To better align RWC approval with AHJ requirements.</li> </ul>	
2		Submittal Review	Comments
2.1	Submittals	<ul style="list-style-type: none"> <li><input type="checkbox"/> Qualifications</li> <li><input type="checkbox"/> Construction floor plans</li> <li><input type="checkbox"/> One-line diagram</li> <li><input type="checkbox"/> Equipment list</li> <li><input type="checkbox"/> Equipment cut sheets</li> <li><input type="checkbox"/> Riser Diagram</li> <li><input type="checkbox"/> Baseline pre-treatment signal level report with proper RWC donor site and channel data</li> <li><input type="checkbox"/> RWC Radio Amplification System Authorization Form</li> </ul>	
2.2	Qualifications	<ul style="list-style-type: none"> <li><input type="checkbox"/> FCC GROL (Required by Fire)</li> <li><input type="checkbox"/> Certificate issued by the manufacturer of the active RF equipment being installed</li> <li><input type="checkbox"/> NICET IB-PSC certifications for both designer and qualified staff performing the commissioning</li> </ul>	
2.3	Construction Floor Plans	<ul style="list-style-type: none"> <li><input type="checkbox"/> Show the location with unique labels of each cable, splitter, coupler, tapper, antenna, BDA, fiber-fed remote, and donor antenna</li> </ul>	
2.4	One-line Diagram	<ul style="list-style-type: none"> <li><input type="checkbox"/> Must present the cable connections between all DAS antennas and the donor antenna, including connections to external filters, splitters, directional couplers, tappers, fiber-fed remotes, the BDA, and lightning arrestors</li> <li><input type="checkbox"/> Must include unique labels for each component</li> </ul>	

2.5	Equipment List	<p>DAS equipment list shall include the following components, if present:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> BDA</li> <li><input type="checkbox"/> Fiber-fed remote</li> <li><input type="checkbox"/> Coaxial Cable</li> <li><input type="checkbox"/> Donor Antenna</li> <li><input type="checkbox"/> DAS/Service Antennas</li> <li><input type="checkbox"/> Lightning arrestor</li> <li><input type="checkbox"/> Splitters/Couplers/Tappers</li> <li><input type="checkbox"/> External Filters</li> </ul> <p>For each component in the equipment list, please provide:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Manufacturer</li> <li><input type="checkbox"/> Model number</li> </ul>	
2.6	Equipment Cut Sheets	<ul style="list-style-type: none"> <li><input type="checkbox"/> Manufacturer information sheets shall be provided for each item on the DAS equipment list</li> </ul>	
2.7	Riser Diagram	<ul style="list-style-type: none"> <li><input type="checkbox"/> Riser diagram to include splitters and service antennas, donor antenna, BDA</li> <li><input type="checkbox"/> Riser diagram to show all floors of a project that is treated with DAS</li> </ul>	
2.8	Baseline Signal Levels	<ul style="list-style-type: none"> <li><input type="checkbox"/> Pre-treatment grid test (if possible) including the proper frequencies for the project location</li> </ul>	
2.9	RWC Form	<ul style="list-style-type: none"> <li><input type="checkbox"/> Page one of the RWC Radio Amplification System Authorization Form filled out</li> </ul> <p><b><i>**The form can be found on page two of this packet.**</i></b></p>	

Simulcast A			Simulcast A/B Site Info				Donor site Antenna		ERRCS Location																																																																																																							
700 MHz channels			Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees																																																																																																						
Chnl#	Freq (Mhz)		CTYH	200 W. Washington St	33-26-55.2 N, 112-04-38.5 W	WQSE305	30	338																																																																																																								
1	771.68125	Control Channel	FS34	50 N. 51st Ave	33-26-57.1 N, 112-10-10.8 W	WQSE304	132	95																																																																																																								
2	771.79375	Control Channel	GLEN	4020 W. Glenrosa Ave	33-29-56.2 N, 112-08-46.5 W	WQSE303	52	95																																																																																																								
3	772.18125	Control Channel	AMTN	23060 N. 27th Ave	33-41-43.1 N, 112-07-09.0 W	WQSE288	58	55																																																																																																								
4	772.04375	Control Channel	MGIL	701 W. Carefree Hwy	33-47-31.1 N, 112-05-08.5 W	WQSE280	112	105																																																																																																								
5	771.93125		NMTN	10600 N. 7th St	33-35-08.1 N, 112-04-20.5 W	WQSE298	151	34																																																																																																								
6	772.29375		SQPW	6202 N 24th St	33-31-54.2 N, 112-01-50.5 W	WQSE307	316	80@195°																																																																																																								
7	772.48125		SAPT	3400 E. Sky Harbor Blvd	33-26-07.2 N, 112-00-34.5 W	WQSE309	29	104																																																																																																								
8	772.54375		GNWY	15040 N. Tatum Blvd	33-37-25.3 N, 111-58-43.9 W	WQSE302	50	90																																																																																																								
9	772.73125		DOVE	33003 N. 52nd St	33-47-09.0 N, 111-58-08.0 W	WQSE283	90	130																																																																																																								
10	772.79375		ARCA	5220 E. Thomas Rd	33-28-49.8 N, 111-58-06.1 W	WQSF638	60	75																																																																																																								
11	772.93125		ASUW	4450 W. Sweetwater Rd	33-36-18.8 N, 112-09-18.0 W	WQSE292	60	130																																																																																																								
12	774.73125		<table border="1"> <thead> <tr> <th colspan="3">Special Frequency Programming Plan to fit 32 Filters</th> </tr> <tr> <th>#</th> <th>Freq (Mhz)</th> <th>Filter</th> </tr> </thead> <tbody> <tr><td>1</td><td>770.83125</td><td>12.5 Khz (Chnl B1)</td></tr> <tr><td>2</td><td>771.13125</td><td>12.5 Khz (Chnl B3)</td></tr> <tr><td>3</td><td>771.18125</td><td>12.5 Khz (Chnl B2)</td></tr> <tr><td>4</td><td>771.38125</td><td>12.5 Khz (Chnl B5)</td></tr> <tr><td>5</td><td>771.43125</td><td>12.5 Khz (Chnl B4)</td></tr> <tr><td>6</td><td>771.63125</td><td>12.5 Khz (Chnl B7)</td></tr> <tr><td>7</td><td>771.68125</td><td>12.5 Khz (Chnl A1)</td></tr> <tr><td>8</td><td>771.79375</td><td>12.5 Khz (Chnl A2)</td></tr> <tr><td>9</td><td>771.88125</td><td>12.5 Khz (Chnl B9)</td></tr> <tr><td>10</td><td>771.93125</td><td>12.5 Khz (Chnl A5)</td></tr> <tr><td>11</td><td>771.98125</td><td>12.5 Khz (Chnl B6)</td></tr> <tr><td>12</td><td>772.04375</td><td>12.5 Khz (Chnl A4)</td></tr> <tr><td>13</td><td>772.13125</td><td>12.5 Khz (Chnl B11)</td></tr> <tr><td>14</td><td>772.18125</td><td>12.5 Khz (Chnl A3)</td></tr> <tr><td>15</td><td>772.23125</td><td>12.5 Khz (Chnl B8)</td></tr> <tr><td>16</td><td>772.29375</td><td>12.5 Khz (Chnl A6)</td></tr> <tr><td>17</td><td>772.38125</td><td>12.5 Khz (Chnl B13)</td></tr> <tr><td>18</td><td>772.45625</td><td>75 Khz (A7 &amp; B10)</td></tr> <tr><td>19</td><td>772.54375</td><td>12.5 Khz (Chnl A8)</td></tr> <tr><td>20</td><td>772.63125</td><td>12.5 Khz (Chnl B14)</td></tr> <tr><td>21</td><td>772.68125</td><td>12.5 Khz (Chnl B12)</td></tr> <tr><td>22</td><td>772.73125</td><td>12.5 Khz (Chnl A9)</td></tr> <tr><td>23</td><td>772.79375</td><td>12.5 Khz (Chnl A10)</td></tr> <tr><td>24</td><td>772.88125</td><td>12.5 Khz (Chnl B15)</td></tr> <tr><td>25</td><td>772.93125</td><td>12.5 Khz (Chnl A11)</td></tr> <tr><td>26</td><td>773.15625</td><td>75 Khz (A13 &amp; B16)</td></tr> <tr><td>27</td><td>773.38125</td><td>12.5 Khz (Chnl B17)</td></tr> <tr><td>28</td><td>773.43125</td><td>12.5 Khz (Chnl A14)</td></tr> <tr><td>29</td><td>773.68125</td><td>12.5 Khz (Chnl B18)</td></tr> <tr><td>30</td><td>774.23125</td><td>12.5 Khz (Chnl A15)</td></tr> <tr><td>31</td><td>774.48125</td><td>12.5 Khz (Chnl A16)</td></tr> <tr><td>32</td><td>774.73125</td><td>12.5 Khz (Chnl A12)</td></tr> </tbody> </table>								Special Frequency Programming Plan to fit 32 Filters			#	Freq (Mhz)	Filter	1	770.83125	12.5 Khz (Chnl B1)	2	771.13125	12.5 Khz (Chnl B3)	3	771.18125	12.5 Khz (Chnl B2)	4	771.38125	12.5 Khz (Chnl B5)	5	771.43125	12.5 Khz (Chnl B4)	6	771.63125	12.5 Khz (Chnl B7)	7	771.68125	12.5 Khz (Chnl A1)	8	771.79375	12.5 Khz (Chnl A2)	9	771.88125	12.5 Khz (Chnl B9)	10	771.93125	12.5 Khz (Chnl A5)	11	771.98125	12.5 Khz (Chnl B6)	12	772.04375	12.5 Khz (Chnl A4)	13	772.13125	12.5 Khz (Chnl B11)	14	772.18125	12.5 Khz (Chnl A3)	15	772.23125	12.5 Khz (Chnl B8)	16	772.29375	12.5 Khz (Chnl A6)	17	772.38125	12.5 Khz (Chnl B13)	18	772.45625	75 Khz (A7 & B10)	19	772.54375	12.5 Khz (Chnl A8)	20	772.63125	12.5 Khz (Chnl B14)	21	772.68125	12.5 Khz (Chnl B12)	22	772.73125	12.5 Khz (Chnl A9)	23	772.79375	12.5 Khz (Chnl A10)	24	772.88125	12.5 Khz (Chnl B15)	25	772.93125	12.5 Khz (Chnl A11)	26	773.15625	75 Khz (A13 & B16)	27	773.38125	12.5 Khz (Chnl B17)	28	773.43125	12.5 Khz (Chnl A14)	29	773.68125	12.5 Khz (Chnl B18)	30	774.23125	12.5 Khz (Chnl A15)	31	774.48125	12.5 Khz (Chnl A16)	32	774.73125	12.5 Khz (Chnl A12)
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Simulcast B		
700 MHz channels		
Chnl#	Freq (Mhz)	
1	770.83125	Control Channel
2	771.18125	Control Channel
3	771.13125	Control Channel
4	771.43125	Control Channel
5	771.38125	
6	771.98125	
7	771.63125	
8	772.23125	
9	771.88125	
10	772.43125	
11	772.13125	
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