TABLE OF CONTENTS

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

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 Contact Information

Name: _____

Address: _____

City: _____ State: ____ Zip: _____

Phone: _____

Email: _____

Facility Occupant Contact Information

Name: _____

Address: _____

City: _____ State: ____ Zip: _____

Phone: _____

Email: _____

Engineering Agent/Vendor Contact Information

Name: _____

Address: _____

City: _____ State: ____ Zip: _____

Phone: _____

Email: _____

Expected system activation date: _____

ERRCS System Latitude: _____

ERRCS System Longitude: _____

Donor Antenna Height Above Ground ___ Ft.

AHJ Contact Name: _____

Phone: _____

Email: _____

Items to include with application:

- ☐ Facility floor plan for all building levels including square footage of each floor.
- ☐ System design including block diagram and itemized list of system components including manufacturer and make/model numbers.
- ☐ Pre-treatment test report.

Submit Application and Attachments to (Completed by RWC):

Email to: rwcazerrcs@phoenix.gov CC Email to: _____

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
chris.arneson@phoenix.gov
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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ERRCS Specialist
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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	
		• To protect the integrity of the RWC Radio Network from interference sources. • To eliminate unapproved equipment or undesirable design decisions. • To better align RWC approval with AHJ requirements.	
2		Submittal Review	Comments
2.1	Submittals	☐ Qualifications ☐ Construction floor plans ☐ One-line diagram ☐ Equipment list ☐ Equipment cut sheets ☐ Riser Diagram ☐ Baseline pre-treatment signal level report with proper RWC donor site and channel data ☐ RWC Radio Amplification System Authorization Form	
2.2	Qualifications	☐ FCC GROL (Required by Fire) ☐ Certificate issued by the manufacturer of the active RF equipment being installed ☐ NICET IB-PSC certifications for both designer and qualified staff performing the commissioning	
2.3	Construction Floor Plans	☐ Show the location with unique labels of each cable, splitter, coupler, tapper, antenna, BDA, fiber-fed remote, and donor antenna	
2.4	One-line Diagram	☐ 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 lighting arrestors ☐ Must include unique labels for each component	

2.5	Equipment List	DAS equipment list shall include the following components, if present: ☐ BDA ☐ Fiber-fed remote ☐ Coaxial Cable ☐ Donor Antenna ☐ DAS/Service Antennas ☐ Lightning arrestor ☐ Splitters/Couplers/Tappers ☐ External Filters For each component in the equipment list, please provide: ☐ Manufacturer ☐ Model number	
2.6	Equipment Cut Sheets	☐ Manufacturer information sheets shall be provided for each item on the DAS equipment list	
2.7	Riser Diagram	☐ Riser diagram to include splitters and service antennas, donor antenna, BDA ☐ Riser diagram to show all floors of a project that is treated with DAS	
2.8	Baseline Signal Levels	☐ Pre-treatment grid test (if possible) including the proper frequencies for the project location	
2.9	RWC Form	☐ Page one of the RWC Radio Amplification System Authorization Form filled out *****The form can be found on page two of this packet.*****	

Simulcast A

700 MHz channels		
Chnl#	Freq (Mhz)	
1	771.68125	Control Channel
2	771.79375	Control Channel
3	772.18125	Control Channel
4	772.04375	Control Channel
5	771.93125	
6	772.29375	
7	772.48125	
8	772.54375	
9	772.73125	
10	772.79375	
11	772.93125	
12	774.73125	
13	773.18125	
14	773.43125	
15	774.23125	
16	774.48125	

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	
12	772.68125	
13	772.38125	
14	772.63125	
15	772.88125	
16	773.13125	
17	773.38125	
18	773.68125	

Simulcast A/B Site Info

Site Name	Address	Lat/Long	Call Sign	Donor site Antenna		ERRCS Location	
				ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
CTYH	200 W. Washington St	33-26-55.2 N, 112-04-38.5 W	WQSE305	30	338		
FS34	50 N. 51st Ave	33-26-57.1 N, 112-10-10.8 W	WQSE304	132	95		
GLEN	4020 W. Glenrosa Ave	33-29-56.2 N, 112-08-46.5 W	WQSE303	52	95		
AMTN	23060 N. 27th Ave	33-41-43.1 N, 112-07-09.0 W	WQSE288	58	55		
MGIL	701 W. Carefree Hwy	33-47-31.1 N, 112-05-08.5 W	WQSE280	112	105		
NMTN	10600 N. 7th St	33-35-08.1 N, 112-04-20.5 W	WQSE298	151	34		
SQPW	6202 N 24th St	33-31-54.2 N, 112-01-50.5 W	WQSE307	316	80@195°		
SAPT	3400 E. Sky Harbor Blvd	33-26-07.2 N, 112-00-34.5 W	WQSE309	29	104		
GNWY	15040 N. Tatum Blvd	33-37-25.3 N, 111-58-43.9 W	WQSE302	50	90		
DOVE	33003 N. 52nd St	33-47-09.0 N, 111-58-08.0 W	WQSE283	90	130		
ARCA	5220 E. Thomas Rd	33-28-49.8 N, 111-58-06.1 W	WQSF638	60	75		
ASUW	4450 W. Sweetwater Rd	33-36-18.8 N, 112-09-18.0 W	WQSE292	60	130		

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)

Simulcast C

700 MHz channels		
Chnl#	**Freq (Mhz)**	
1	**770.10625**	**CONTROL CHANNEL**
2	**772.10625**	**CONTROL CHANNEL**
3	**770.35625**	**CONTROL CHANNEL**
4	**772.35625**	**CONTROL CHANNEL**
5	769.60625	
6	771.60625	
7	769.85625	
8	771.85625	
9	769.10625	
10	772.60625	
11	769.35625	
12	772.85625	
13	770.60625	
14	770.85625	
15	771.10625	
16	771.35625	

Simulcast C Site Info

Site Name	Address	Lat/Long	Call Sign	Donor site Antenna		ERRCS Location	
				ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
HAMI	911 S. Hamilton	33-17-34.9 N, 111-49-55.6 W	WQSH547	90	178		
TFTC	1342 E. University Ave	33-25-24.3 N, 111-54-59.1 W	WQSH547	90	108		
DPSS	12717 S. Central Ave	33-19-57.2 N, 112-04-00.5 W	WQSH547	200	65@150°		
TPDS	8201 S. Hardy Dr	33-20-27.2 N, 111-57-10.5 W	WQSH547	90	130		
CFTC	3550 S. Dobson Rd	33-15-11.4 N, 111-53-17.1 W	WQSH547	320	75@160°		
MARC	45695 W. Edison Rd	33-03-55.7 N, 112-03-39.4 W	WQWW222	100	145@110°		

Simulcast D		
700 MHz channels		
Chnl#	Freq (Mhz)	
1	772.081250	CONTROL CHANNEL
2	772.331250	CONTROL CHANNEL
3	772.581250	CONTROL CHANNEL
4	772.831250	CONTROL CHANNEL
5	773.156250	
6	773.406250	

Simulcast D Site Info				Donor site Antenna		ERRCS Location	
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
OCTR	43240 N. Black Canyon Fwy	33-52-35.1 N, 112-08-51.0 W	WQSF641	100	100		
F141	43814 N. New River Rd	33-53-00.0 N, 112-04-23.2 W	WQRY628	50	125		
F146	3116 W. New River Rd	33-55-17.1 N, 112-07-41.5 W	WQRY628	50	125		

Simulcast F

700 MHz channels

Chnl#	Freq (Mhz)	
1	**774.41875**	**CONTROL CHANNEL**
2	**773.16875**	**CONTROL CHANNEL**
3	**771.91875**	**CONTROL CHANNEL**
4	**774.16875**	**CONTROL CHANNEL**
5	772.91875	
6	771.66875	
7	773.91875	
8	772.66875	
9	771.41875	
10	773.66875	
11	772.41875	
12	771.16875	
13	773.41875	
14	772.16875	
15	772.55625	
16	772.80625	

Simulcast F Site Info

Site Name	Address	Lat/Long	Call Sign	Donor site Antenna		ERRCS Location	
				ERP Watts	Ant Height AGL Ft	Miles	Azimuth degrees
TFTC	1342 E. University Dr	33-25-24.3 N, 111-54-59.1 W	WQJR969	55	134		
TPDS	8201 S. Hardy Dr	33-20-27.2 N, 111-57-10.5 W	WQJR969	50	100		
PGWT	245 E. Marigold Ln	33-26-43.3 N, 111-56-21.6 W	WQJR969	120	107@135°		
BBUT	1705 W. Broadway Rd	33-24-24.1 N, 111-58-02.5 W	WQJR969	55	35		
SMTN	12717 S. Central Ave	33-20-04.9 N, 112-03-35.4 W	WQJR969	110	96@075°		

Simulcast G

700 MHz channels		
Chnl#	Freq (Mhz)	
1	771.56875	Control Channel
2	771.61875	Control Channel
3	771.06875	Control Channel
4	771.86875	Control Channel
5	770.56875	
6	772.11875	
7	770.06875	
8	772.36875	
9	769.56875	
10	772.61875	
11	772.05625	
12	772.86875	
13	771.31875	
14	770.81875	
15	770.31875	
16	769.81875	
17	769.31875	
18	772.30625	

Simulcast G Site Info

Site Name	Address	Lat/Long	Call Sign	Donor site Antenna		ERRCS Location	
				ERP Watts	Ant Hgt AGL Ft	Miles	Azimuth degrees
GWTP	7300 W. Greenway Rd	33-37-34.9 N, 112-12-51.1 W	WQKP324 WQJY471	40	95		
TCTR	8343 W. Monroe St	33-34-37.4 N, 112-14-17.5 W	WQKP323 WQJY471	35	75		
AFWT	9510 W. Lone Mountain Pkwy	33-44-22.6 N, 112-15-51.8 W	WQKP323 WQJY471	40	75		
WADD	41835 N. Castle Hot Springs Rd	33-50-48.2 N, 112-16-38.1 W	WQKP323 WQJY471	18	60		
LAFB	969 Super Saber St Luke AFB	33-31-50.9 N, 112-22-00.6 W	WQKN967 WQKP324	38	250		
GLPD	6835 N. 57th Dr	33-32-14.6 N, 112-10-55.8 W	WQKN967 WQKP324	35	80		
F195	23100 N. Lake Pleasant Rd	33-41-33.9 N, 112-16-42.6 W	WQKN967 WQKP324	40	95		
TWTP	9501 W. Pima St	33-25-43.7 N, 112-15-41.9 W	WQKP324 WQJY471	90	155		
PYPK	28345 N. Pyramid Peak Pkwy	33-44-25.8 N, 112-11-39.0 W	WQZS652	37	118		
SPA2	15667 W. Planada Ln	33-41-35.9 N, 112-23-51.7 W	WROP432	32	130		

Simulcast H

700 MHz channels

Chnl#	Freq (Mhz)	
1	**771.84375**	**Control Channel**
2	**771.59375**	**Control Channel**
3	**771.34375**	**Control Channel**
4	**771.09375**	**Control Channel**
5	770.84375	
6	770.59375	
7	770.34375	
8	770.09375	
9	769.84375	
10	769.59375	
11	769.09375	
12	769.34375	

Simulcast H Site Info

Site Name	Address	Lat/Long	Call Sign	Donor Site Antenna ERP Watts	Donor Site Antenna Ant Height AGL Ft	ERRCS Location Distance Miles	ERRCS Location Azimuth degrees
SCIV	3700 N. 75th St	33-29-19.4 N, 111-55-15.9 W	WQJU870	500	110@180°		
S042	26906 N. Pima Rd	33-43-45.8 N, 111-53-36.5 W	WQJU870	85	65		
SDMH	12575 E. Via Linda	33-35-17.3 N, 111-48-28.8 W	WQJU870	100	65		
F610	16701 N. 100th St	33-38-08.0 N, 111-51-49.5 W	WQJU870	140	40		
F614	27775 N. Alma School Rd	33-44-13.2 N, 111-50-41.7 W	WQJU870	68	60		
S089	39205 N Alister Mckenzie Dr	33-50-32.2 N, 111-52-35.3 W	WQJU870	70	50@180°		
SCSE	12177 Calle Serena	33-41-26.9 N, 111-49-00.6 W	WQJU871	110	20@0°		
DOVE	33003 N 52nd St	33-47-09.5 N, 111-58-08.6 W	WQJU871	425	130@90°		
PVRF	6827 E. Highlands Dr	33-32-10.3 N, 111-59-19.6 W	WQJU871	95	24@180°		

Simulcast J		
700 MHz channels		
Chnl#	Freq (Mhz)	
1	769.11875	Control Channel
2	769.36875	Control Channel
3	769.61875	Control Channel
4	769.86875	Control Channel
5	770.11875	
6	770.36875	
7	772.78125	
8	774.18125	
9	773.93125	

Simulcast J Site Info				Donor Site Antenna		ERRCS Location	
Site Name	Address	Lat/Long	Call Sign	ERP Watts	Ant Height AGL Ft	Distance Miles	Azimuth degrees
ATWR	26596 W. Lower Buckeye	33-25-22.2 N, 112-38-04.4 W	WQJG713	56	185		
FEST	28016 W. Sun Valley Pkwy	33-39-34.5 N, 112-39-18.0 W	WQJG713	87	107		
ESTR	11461 S. 171st Ave	33-20-46.0 N, 112-25-20.0 W	WQJG713	45	150		
RBVW	16699 S. Rainbow Valley Rd	33-17-41.2 N, 112-26-56.1 W	WQJG713	80	105@170°		
GCOM	14455 W. Van Buren St	33-26-51.8 N, 112-22-09.4 W	WQJG713	100	105		
JRBT	2127 N. 199th Ave	33-28-14.3 N, 112-29-08.0 W	WQJG713	56	175		