DEPARTMENT OF EMERGENCY COMMUNICATIONS, PREPAREDNESS AND RESPONSE, CITY OF RICHMOND, VIRGINIA
PUBLIC SAFETY BI-DIRECTIONAL AMPLIFIER FINAL SYSTEM INSPECTION AND ACCEPTANCE TESTING

INSTRUCTIONS:
Complete all items on this page before starting the test. Confirm that a valid calibration certificate or sticker is available for any spectrum analyzers or other measurement equipment used for the test. Provide the manufacturer, model numbers and serial numbers for the portable radios used in the test. On the following pages, for each test or inspection item requirement, indicate if the item passes or fails by writing "**P**" or "**F**" in the **Pass/Fail** column. If an item fails, describe the deficiency in the **Comments** column. Retest or reinspect failed items once they are remediated, during the same visit if practical. Schedule a retest date if necessary. For items that successfully pass the retest, write "**P**" in the **Retest Pass** column. For any items that cannot be inspected or tested, write **"CNI"** in the **Pass/Fail** column and document the reason in the **Comments** column. DECPR representative to sign this form once all tests and inspections are successfully completed.

Site Name:	**Selected Donor Sites:**
Site Address:	
City: **State:** **Zip:**	
DECPR Inspector(s) witnessing the inspection and testing: (PRINT names and phone numbers)	
System Integrator and Representative(s): (PRINT company name(s), representative name(s), phone numbers)	
Owner Representative(s): (PRINT company name, representative names, phone numbers)	

Initial System Test Date:	**System Retest Date (if applicable):**

Test Equipment Manufacturer/Model:	**Test Equipment Serial Number:**	**Last Annual Calibration Date:**

Test Radio 1 Manufacturer, Model # and Serial #:	**Test Radio 2 Manufacturer, Model # and Serial #:**
Test Radio 3 Manufacturer, Model # and Serial #:	**Test Radio 4 Manufacturer, Model # and Serial #:**

Site Name:				Page 2 of 5
Req. Ref.	**Test/Inspection Description**	**Pass/ Fail**	**Comments**	**Retest Pass**
City of Richmond	Inspect donor antenna installation first. Verify proper donor antenna azimuth visually or with a compass if donor site is not visible. Donor antenna shall be properly oriented towards the selected donor site. If necessary, correct donor antenna orientation. While at donor antenna location, inspect donor antenna installation workmanship and grounding.			
City of Richmond NFPA	Inspect installation workmanship for compliance with NFPA 1221 2019 (BDA and battery backup comply with NFPA [12-hour battery], NEMA-4 or 4X enclosures, BDA enclosure painted red, alarm annunciator provided, power and control wiring in EMT, plenum rated coax as required by code, transmission lines properly and professionally secured throughout the building, any fiber in dedicated innerduct, cables, indoor antennas labeled, no splices, etc.).			
City of Richmond NFPA	Measure donor/distribution antenna isolation, system gain plus 20 dB or greater as required by manufacturer.			
City of Richmond NFPA	Conduct donor site desense testing (no measurable or observable increase to donor site noise floor or reduction in effective receiver sensitivity) by monitoring effective receiver sensitivity at the donor site with the BDA system powered off, then on.			
City of Richmond NFPA	Test battery backup functionality by disconnecting AC power and observing uninterrupted operation of the BDA system.			
City of Richmond NFPA NEC	Inspect and test grounding components. Donor antenna and system components shall be grounded in accordance with NFPA/NEC (bonded to single point ground reference or building steel, coaxial SPD installed near coax entry point, AC powered equipment equipped with AC SPD, ground wires separated from other conductors and mounted on standoffs, active electronic equipment bonded to single point grounding system or building steel.) All paint must be removed from painted grounding points. Ground connections shall be protected with anti-oxidation compound.			
City of Richmond NFPA	Verify BDA alarm functionality at FACP: ❑ Donor antenna malfunction ❑ RF device failure ❑ Low [70% depleted] battery capacity ❑ Active system component failure (if appl.) ❑ Loss of normal power ❑ Battery charger failure			

Site Name:				Page 3 of 5
Req. Ref.	**Test/Inspection Description**	**Pass/ Fail**	**Comments**	**Retest Pass**
City of Richmond NFPA	Confirm BDA propagation delay meets City specification of 8.0 µs or less. Check overlap areas near windows and outside perimeter of occupancy for multipath distortion.			
City of Richmond NFPA	For locations with a SCIF, confirm automatic and manual activation of SCIF coverage. SCIF coverage shall automatically activate in the event of a building fire alarm smoke or heat detection event, manual pull station alarm, sprinkler system water flow detection, clean agent suppression discharge or any other fire alarm condition. Additionally, there shall be a clearly marked manual activation switch located at the fire alarm annunciator or fire alarm control panel at the building's main entrance.			

Site Name:				Page 4 of 5
Req. Ref.	**Test/Inspection Description**	**Pass / Fail**	**Comments**	**Retest Pass**
City of Richmond NFPA	Conduct 700/800 MHz grid testing per NFPA 1221 2019 A.11.3.9 to confirm commissioning coverage testing. Each floor of the occupancy shall be gridded according to the requirements of A.11.3.9 (20'-80' grids depending on floor area to be tested, at least 20 grid cells). Measure and record downlink signal strength and roundtrip DAQ from the center of each grid. Critical areas (fire command centers, fire alarm control panel locations, fire pump rooms, exit stairs, exit passageways, elevators, elevator lobbies, standpipe cabinets, sprinkler valve locations, areas of refuge and other areas deemed critical by the City must pass with 99% area reliability. Other general areas of occupancy must pass with 90% area reliability. A grid must exhibit both 3.4 or greater DAQ and -90 dBm or greater downlink RSSI to pass. DAQ ratings shall be according to the following: **DAQ 1:** Unusable; speech present but unreadable **DAQ 2:** Understandable with considerable effort; frequent repetition due to noise/distortion **DAQ 3:** Speech understandable with slight effort; occasional repetition required due to noise/distortion **DAQ 3.4:** Speech understandable with repetition only rarely required; some noise/distortion **DAQ 4:** Speech easily understood; occasional noise/distortion **DAQ 4.5:** Speech easily understood; infrequent noise/distortion **DAQ 5:** Speech easily understood See A.11.3.9 for further instructions regarding adjacent grid failures, etc. Attach grid test results to this test documentation upon successful grid test completion.			

Site Name:				Page 5 of 5
Req. Ref.	**Test/Inspection Description**	**Pass/ Fail**	**Comments**	**Retest Pass**
City of Richmond System Tech Info	Confirm correct BDA programming for current and future City of Richmond System Downlink frequencies. Class B: 851-860 MHz 857.0875 853.2375 852.0500 857.5375 853.3125 852.0875 856.5375 853.0750 851.7875 859.5375 853.4125 852.1875 856.0875 853.1250 851.9125 853.8250 852.7250 851.2375 853.9500 852.8625 851.3875 853.5125 852.3375 851.0375 853.9750 852.9625 851.6625 853.7000 852.6125 851.1375 (Includes -45 MHz uplink channels)			
City of Richmond	"In Case Of Problems" label and Retransmission Authorization posted at the headend and active equipment			

DECPR SIGNATURE

The signature below confirms that the undersigned City of Richmond Department of Emergency Communications, Preparedness and Response representative has witnessed and/or conducted successful testing and inspection of the Public Safety Bi-Directional Amplifier System at the above captioned occupancy.

Print Name: Signed: Date: