Berks County Public Safety Radio System
Signal Booster Technical Requirements
June 2022

1.0 Introduction

These requirements are not intended to mandate the installation of a signal booster/BDA (terms used interchangeably throughout) in any structure. They are also not intended to define the enhancement in coverage that the signal booster will achieve. It is expected that these requirements will be defined in law or regulation by the Authority Having Jurisdiction (AHJ) using prevailing codes and standards. Additionally, the issuance of a Letter of Authorization (LoA) by the County of Berks is a single step in the process of Signal Booster/BDA implementation. It does not replace permitting and/or reviews that may be required by the AHJ and the applicant must be in close contact with the designated agent of the AHJ to ensure that the implementation is comporting with local requirements. As such, these guidelines cannot be used alone in directing a building owner installing a signal booster.

The intent of these requirements is to limit the risk of unanticipated negative impacts to the public safety radio system that could result from the installation of a signal booster, and to provide reasonable protections to ensure such impacts can be mitigated if they become known. As such, it is the intent that these requirements will be used in conjunction with published requirements of the AHJ in which the signal booster is operated. If such AHJ requirements are in conflict with this document, and if the conflict defines conditions less restrictive or less stringent, or less protective of the County's radio system, this document shall prevail, or no Letter of Authorization (LOA) shall be issued.

The County assumes no liability for design or construction costs related to the implementation of a signal booster, including those incurred as a result of errors made by its employees or agents.

2.0 Preparation

A building owner, or contractor working for a building owner, shall perform due diligence as might be required by the local AHJ to determine if a signal booster is needed in a proposed or existing structure. Attention should be paid to the requirements in section 3.4 as they relate to the documentation that will ultimately be required by the County should a BDA be needed.

3.0 Application

Upon determining that a building requires a signal booster, an application package shall be submitted to the Berks County Department of Emergency Services following the process below.

3.1 In order for the owner/operator of a Class B signal booster to receive approval from Berks DES, the owner/operator must possess a Federal Communications Commission File Reference Number. This is not a requirement for an owner/operator of a proposed Class A device.

3.2 An Application for Authorization to Operate a Signal Booster as published by DES

must be completed.

3.3 A non-refundable review fee of $1000.00 payable to the "County of Berks" shall be included.

3.4 Documentation demonstrating the need for a signal booster, including a statement of requirement from an authorized official of the AHJ requiring the implementation which states which aspects of the County's channel package must be included in the system to be installed, shall be submitted with the application.

3.4.1 Any calculations used in establishing the need for a BDA (such as calculated outbound signal from the building location inclusive of structure attenuation) must incorporate the Rx antenna system gain values provided in Appendix C in demonstrating signal inadequacy at the receiver.

No attenuation for transient environmental variables shall be added.

This documentation must include either:

3.4.1.1 Testing results (grided drawings with signal measurements in the grids) for existing structures.

3.4.1.2 Engineering design information for structures being evaluated pre-construction that adequately demonstrates the predictive need for a signal booster.

3.4.2 This documentation must include design calculations demonstrating the effective radiated power ("ERP") from the antennas used in the design, both donor and server. These calculations must demonstrate that the ERP from the uplink antenna is the minimum necessary power to permit the BDA to communicate with the intended macro site at an appropriate signal level. Under no circumstances shall the signal inbound to the macro site arrive at the Rx antennas at a level that exceeds the values indicated in Appendix C column 2. The design must also demonstrate (through power, antenna placement, and antenna design selections) that the downlink side of the system provides DAS dominance over the macro site in all areas of intended coverage while constraining Rf from areas not intended for coverage from the BDA.

3.4.2.1 Link budgets must be clearly detailed in a table form, with each row showing a component of loss or gain mathematically contributing to the final power. Any values not derived from County requirements (as below) or equipment data sheets (eg. line/connector losses) provided with the submittal must have the determination of the value fully explained.

3.4.2.1.1 In calculating link budgets, the following values must be used:

3.4.2.1.1.1 Portable radio ERP – 22.7 dBm

3.4.2.1.1.2 Total Receiver Antenna System Gain and Rx Antenna Gain – derived from the attached

Appendix C site matrix column 1 and note.

3.4.2.1.1.3 Site Tx Signal Level and Tx Antenna Gain – derived from the attached Appendix C site matrix columns 3 & 4. The applicant must demonstrate their methodology for determining the free space path loss component of the link budget using these values.

3.4.2.2 Visual representations of the proposed installation must be included. These representations shall superimpose a "heat map" type of presentation on top of the testing grid (for existing construction) or grided floorplans (for proposed construction) that demonstrates how the internal antennas will provide coverage throughout the design area and constrain coverage in areas intended in the design to be covered by the macro system. This representation shall use coloration (commonly, a heat map) to visually represent the power radiated from the antennas at intervals of distance.

3.4.2.3 The link budgets shall be demonstrated in two different conditions:

3.4.2.3.1 With the transmitting portable radio directly under a DAS antenna.

3.4.2.3.2 With the portable radio at a representative location best described as "between two DAS antennas." It is understood that there are many variables that could be in play in this calculation (interior partitions, intermittent sources of attenuation, etc.) and the County seeks a best effort by the applicant in showing the values of a "far" radio

3.5 Design drawings of all aspects of the system including donor antenna, amplifier and DAS network locations must be provided.

3.5.1 All technical design aspects of the signal booster system must conform to the requirements set forth in Title 47 of the Code of Federal Regulations, as well as the most currently referenced versions of NFPA 72 and NFPA 1221 (or 1225 once consolidated) as may be referenced explicitly or by further reference of laws, codes or standards by the local jurisdiction at the time of application, and any other prevailing local requirements. Except, in cases where this document is more restrictive as it relates to the ability of the signal booster system to negatively impact the macro system, in such cases, this document shall prevail. The County of Berks reserves the right to make the sole determination whether its requirement or the requirement of another is more restrictive.

3.5.2 Drawings must include:

3.5.2.1 The location of emergency power off ("EPO") switches including a circuit breaker to break the utility/emergency power and a switch to

break the DC feed from any UPS. Alternative methodologies shall be considered, but the intent is to ensure that the unit is able to be fully powered down without any special skills or tools. Any such EPO devices must be clearly labeled as serving the "Berks County Public Safety Radio System Signal Booster."

3.5.2.2 The location and azimuth (where directional) of all antennas intended to provide uplink signal to the radio system.

3.5.2.3 Any points of interconnection between the DAS serving the booster, and any other signal boosters for systems apart from the Berks County Public Safety Radio System. An intermodulation study for any proposed installation shall be required, and the study must include all frequencies planned to be combined through the DAS. Such shared usage is discouraged and may be a cause for refusal of a LOA.

3.6 Technical specifications must be included. As a minimum, these must include:

3.6.1 All antennas proposed to be used in the system demonstrating that any gain inherent in the antenna is calculated into the ERPs. Visual representations of the antenna patterns shall be included.

3.6.2 Line and connector specifications demonstrating the accuracy of any loss values calculated into the ERPs.

3.6.3 BDA chassis (booster) specifications including:

3.6.3.1 Indication whether the booster is a Class A or Class B device and demonstration that it possesses the following characteristics:

3.6.3.1.1 System must be capable of operating with analog or digital (both FDMA and TDMA) modulation.

3.6.3.1.2 Maximum signal propagation delay of 15 us.

3.6.3.1.3 Uplink noise suppression circuitry that eliminates any measurable uplink noise when idle. The implementation may not generate any discernable change in the noise floor as measured at the County's macro system (donor) site when the BDA is powered on irrespective of whether or not the device is passing intended traffic.

3.6.3.1.4 Oscillation prevention circuitry that will disable the unit if a malfunction is detected.

3.6.3.1.5 If the proposed booster is Class B, a statement indicating why a Class A booster is not possible. The County will only authorize a Class B device if adequate justification is offered. It is the County's position that Class B boosters shall be the exception, not the standard. Cost is not an acceptable justification. Sole determination of adequacy in this justification shall rest with the County.

3.6.3.2 Internal filters/channel plan to be used in the booster that supports the requirements set forth by the AHJ for which channel packages are being implemented.

3.6.3.3 Calculations demonstrating that the isolation between the donor and the closest server (DAS) antenna provides at least 20 dBm of isolation above the gain of the amplifier

3.6.3.4 Statements of conformance with the most currently referenced versions of NFPA 72 and NFPA 1221 (or 1225 once consolidated), and the International Fire Code, as may be required explicitly or by further reference of laws, codes or standards, by the local jurisdiction at the time of application.

3.6.3.5 Operation and installation manuals for the unit.

3.6.3.6 Any programming parameters intended for use in the installation.

3.7 A signed statement granting DES permission to access the signal booster for the purpose of ensuring compliance with these requirements and/or whether the signal booster is or will cause interference with the public safety radio system in substantially the same form as attached in Appendix D must be included. NOTE – the applicant need not use the exact document provided but the language must provide same rights and it must be legally signed and witnessed.

The submittal must be clearly marked in a way that directs the reviewer to the data that supports compliance with each section defined above. Failure to mark the necessary data as pertinent to the section may result in the reviewer marking the submittal non-compliant for the section.

4.0 Preliminary Review

Upon receipt of a complete application package, DES will complete a structural review of the package. The intent of this step is to affirm whether the applicant has submitted a complete application package with all necessary components. If the submittal is found to be structurally deficient, it will be denied and returned to the applicant without further review.

If the submittal is structurally complete, DES will then conduct a technical review. At this review, DES may approve, deny, or request further details on the package. A request for further information could include additional written documentation or a meeting with the applicant, the AHJ, and/or the design team.

If the application package is denied twice for any combination of structural or technical deficiencies, the plan review fee will be required to be paid again with the next submission.

5.0 Preliminary LOA

If the application is approved in preliminary review, a temporary LOA shall be issued. This LOA will authorize the applicant to operate the booster for installation and testing purposes only. When the applicant is prepared to test the BDA, they shall coordinate a mutually agreeable time with the County's technical consultant. The technical consultant will deploy to the macro site that is the designed donor site and evaluate impact to the County's system

when the BDA is being operated.

This coordination shall be made by contacting:

Radio Maintenance Incorporated

610-898-1211

There is no additional cost to the applicant for the first 2 consecutive hours (or any portion thereof) for the radio system technician engagement. Any need to revisit, or time in excess of two hours necessary to properly demonstrate system operation to the satisfaction of the County, shall result in additional fees being assessed in the amount of $150/hr or portion thereof.

During testing, an agent of the AHJ must be present at the site and have a system capable radio available to be used during the testing.

The radio system technician will coordinate with the applicant's technician by telephone to confirm signal levels and receiver sensitivity impacts at the macro site when the BDA is operating. This condition will be tested both while the BDA is passing traffic, as well as while not passing traffic. This will be performed by evaluating the noise floor at the macro site and verifying receiver sensitivity during the testing scenarios. The technician shall direct the applicant's technician during the testing. Documentation of the testing outcome shall be provided to the applicant and the County following the conclusion of testing. Reasonable efforts shall be made to permit the applicant to correct unsatisfactory conditions at the time of testing to avoid the need for retesting.

While operating under the preliminary LOA, the booster must be attended. The applicant or applicant's agent must contact the County's 9-1-1 Center [(610) 655-4921] and notify the on-duty watch officer before powering on the device and again at the conclusion of testing. This individual will be expected to provide a means of telephone contact to the watch officer and disable the BDA immediately upon demand of the watch officer. Conditions in the 9-1-1 Center with respect to call volume or severe incidents underway at the time of a request for activation may be grounds for refusal. At the discretion of the radio system technician involved during testing, this responsibility may be assumed by that individual.

6.0 Post-Testing Submittals

Following installation and successful testing, the applicant shall finalize the submittals to the County by:

6.1 Registering the booster in the FCCs signal booster database and providing a screenshot evidencing such registration (Class B devices only).

6.2 Submitting updates to all drawings and design documents required at the time of application with as built marks and highlighting any changes from the design submittals.

6.2.1 The as-built submittals must be in essentially the same form as the design submittals so that changes are easily discernable. As-built submittals that are not easily correlated to the design drawings, and/or that do not clearly call-out changes/addition as through tracked changes or a similar means, will be rejected without further review.

6.3 Providing a written statement from the AHJ that the installation and testing meets all requirements set forth buy the AHJ.

6.4 Providing a copy of the preliminary testing results.

6.5 Providing a copy of the original site testing grid document that demonstrated the macro signal levels in each area. This document must be amended to include the measured signal level at these same locations throughout the entire structure (irrespective of whether the BDA is intended to serve/enhance the area). This document shall be prepared in a way that allows the reviewer to see the before and after measurements "at a glance" and without having to refer to multiple pages for a single area.

6.6 Adding a single page data sheet that provides the below information irrespective of whether it is provided elsewhere in the package:

6.6.1 Donor antenna RSSI measured at the BDA input.

6.6.2 Downlink transmitter gain value

6.6.3 Uplink transmitter gain value

6.6.4 Antenna azimuth(s)

6.6.5 AGC setpoint

6.6.6 Uplink noise power (measured at the output from the BDA donor antenna port with DAS fully connected)

6.6.7 Final calculation of isolation between donor and closest server antenna based of final transmitter setpoints

This submittal must be by provision of a single pdf inclusive of all noted sections above and shall accompany payment for any additional technician costs incurred during testing.

Upon receipt of a complete final submittal package, and payment of any fees, DES will complete a structural review of the package. The intent of this step is to affirm whether the applicant has submitted a complete application package with all necessary components. If the submittal is found to be structurally deficient, it will be denied and returned to the applicant without further review.

If the submittal is structurally complete, DES will then conduct a final technical review. At this review, DES may approve, deny, or request further details on the package. A request for further information could include additional written documentation or a meeting with the applicant, the AHJ, and/or the design team.

Upon proper receipt of the final submittals, DES shall issue a final LOA authorizing operation of the signal booster.

If the final submittal package is denied twice for any combination of structural or technical deficiencies, the plan review fee will be required to be paid again with the next submission. The two opportunities for an approval of the final submittal shall be separate from the two opportunities for approval in the preliminary review.

7.0 Notification of Trouble

The operator of a signal booster shall make immediate notification to the County of Berks Department of Emergency Services, any receipt of a trouble alarm or other indication of malfunction of the signal booster. Such notice shall be to the published "alarm line" of the County's 9-1-1 Center and shall include a characterization of the nature of the problem.

The operator shall ensure a prompt (not more than two hours from time of receipt of trouble to arrival on site) response by a person qualified to evaluate and troubleshoot the issue.

Failure to make proper notification of trouble and/or respond to the trouble as required shall be reason for recension of the LOA.

8.0 Resolution of Trouble

In addition to any reinspection required by the AHJ, any failure/defect that causes the system to be taken offline/deactivated shall require a notification to the on-duty watch officer in the County's 9-1-1 Center [(610] 655-4921] before powering on the device. This notification shall be by an individual on location with the booster, and they shall immediately disable the system upon demand of the watch officer.

9.0 On-going Authorization

Irrespective of any obligations set forth by the AHJ, or other prevailing codes or standards for maintenance and testing, as a condition of authorization, the County requires the operator of a signal booster to, not less than annually, submit, without demand:

1. Updated contact/access information for the signal booster; and
2. A statement signed by the BDA owner, certifying that the system was properly maintained as per design requirements and the requirements of the AHJ. This statement must also be signed by a representative of the AHJ.

This submittal must contain, as a minimum, the information described in the sample in Appendix E and Appendix D. Failure to submit same within 400 days of the date of the LOA (or the last submittal of an annual update) invalidates the LOA and the owner/operator must disable the booster. In the event that the owner/operator does not disable the booster in a timely manner as determined by DES, DES may, in its sole discretion, power down the booster.

Upon verbal or written notice to the owner/operator or an agent of same, the County may suspend or rescind the LOA when, in its sole discretion, it determines the installation is a threat to the public safety radio system.

The owner/operator must promptly notify the AHJ of any recension of the LOA.

The owner/operator of a signal booster for which the LOA is rescinded for any reason shall be required to begin the application process with a new application filing.

10.0Transfer of LOA

The LOA shall not be transferable due to change in owner or change in system.

A change in ownership of the property shall require the filing of a new application package. If there are to be no technical changes to the system as a result of the change, these sections

of the package may be omitted, and substituted by a signed statement of the applicant stating same.

A change in the design of the system, including a replacement of the BDA shall require a new application filing.

Appendix A
Channel Plans

One or both of the packages below must be transmitted in full as dictated by the local jurisdiction

PACKAGE 1 (South w/ or wo/ Tacticals as defined by AHJ)

Call Sign: WQSK886 & WQPJ427

South Site		
Chan #	**TX (MHz)**	**RX (MHz)**
1	773.96875	803.96875
2	772.56875	802.56875
3	774.21875	804.21875
4	773.19375	803.19375
5	774.88125	804.88125
6	769.79375	799.79375
7	769.78125	799.78125
8	770.09375	800.09375
9	770.08125	800.08125
10	771.79375	801.79375
11	770.64375	800.64375
12	772.29375	802.29375
13	771.78125	801.78125
14	772.28125	802.28125
15	772.55625	802.55625
16	773.18125	803.18125

Tactical Channels		
Chan	**Tx/Rx**	
Berks7TAC1	769.00625	769.00625
Berks7TAC2	769.01875	769.01875
Berks7TAC3	769.03125	769.03125
Berks7TAC4	769.04375	769.04375
Berks7TAC5	769.05625	769.05625
Berks7TAC6	769.06875	769.06875
Berks7TAC7	774.93125	774.93125
Berks7TAC8	774.94375	774.94375
Berks7TAC9	774.95625	774.95625
Berks7TAC10	774.96875	774.96875
Brks7TAC9ED	774.95625	774.95625
Brks7TAC10ED	774.96875	774.96875
Brks7TAC10ER	774.96875	804.96875
Brks7TAC11ED	774.98125	774.98125
Brks7TAC11ER	774.98125	804.98125
Brks7TAC12ED	774.99375	774.99375

PACKAGE 2 (North w/ or wo/ Tacticals as defined by AHJ)

Call Sign: WQSK890 &WQPJ427

North Site		
Chan #	**TX**	**RX**
1	772.25625	802.25625
2	771.93125	801.93125
3	774.45625	804.45625
4	774.46875	804.46875
5	769.28125	799.28125
6	769.29375	799.29375
7	770.50625	800.50625
8	770.51875	800.51875
9	771.35625	801.35625
10	771.36875	801.36875
11	772.88125	802.88125
12	772.89375	802.89375

Tactical Channels		
Chan	**Tx/Rx**	
Berks7TAC1	769.00625	769.00625
Berks7TAC2	769.01875	769.01875
Berks7TAC3	769.03125	769.03125
Berks7TAC4	769.04375	769.04375
Berks7TAC5	769.05625	769.05625
Berks7TAC6	769.06875	769.06875
Berks7TAC7	774.93125	774.93125
Berks7TAC8	774.94375	774.94375
Berks7TAC9	774.95625	774.95625
Berks7TAC10	774.96875	774.96875
Brks7TAC9ED	774.95625	774.95625
Brks7TAC10ED	774.96875	774.96875
Brks7TAC10ER	774.96875	804.96875
Brks7TAC11ED	774.98125	774.98125
Brks7TAC11ER	774.98125	804.98125
Brks7TAC12ED	774.99375	774.99375

Appendix B
System Sub-Site Locations

NORTH SITE

SUB-SITE	LAT (DD)	LONG (DD)	LAT (DMS)	LONG (DMS)
ALBANY	40.59688767310	-75.93376949650	40° 35' 48.8" N	75° 56' 01.6" W
BETHEL	40.51433333340	-76.32788888900	40° 30' 51.6" N	76° 19' 40.4" W
BLUE MTN	40.53113798080	-76.20022271280	40° 31' 52.1" N	76° 12' 00.8" W
HAMBURG	40.55219444570	-75.97641666820	40° 33' 07.9" N	75° 58' 35.1" W
KUTZTOWN	40.52891666670	-75.78827777760	40° 31' 44.1" N	75° 47' 17.8" W
LONGSWAMP	40.47738889070	-75.68394444670	40° 28' 38.6" N	75° 41' 2.2" W
N HEIDELBERG	40.40508333330	-76.15183333340	40° 24' 18.3" N	76° 9' 6.6" W
NORTH CAMPUS	40.38555555630	-76.01561111070	40° 23' 8.0" N	76° 0' 56.2" W
WEST PENN	40.69480555560	-75.84736111110	40° 41' 41.3" N	75° 50' 50.5" W

SOUTH SITE

SUB-SITE	LAT (DD)	LONG (DD)	LAT (DMS)	LONG (DMS)
ALSACE	40.40597222220	-75.85522222200	40° 24' 21.50" N	75° 51' 18.8" W
BALLY	40.42966666550	-75.59436111270	40° 25' 46.8" N	75° 35' 39.7" W
COURTHOUSE	40.33636111230	-75.92536111100	40° 20' 10.9" N	75° 55' 31.3" W
CUMRU	40.27002777790	-75.99077777780	40° 16' 12.1" N	75° 59' 26.8" W
EARL	40.35070519560	-75.68640425360	40° 21' 02.5" N	75° 41' 11.1" W
MT PENN II	40.34863519670	-75.90171098820	40° 20' 55.1" N	75° 54' 06.1" W
ONTELAUNEE	40.42072222250	-75.94005555600	40° 25' 14.6" N	75° 56' 24.2" W
ROBESON	40.28638888770	-75.89436111270	40° 17' 11.0" N	75° 53' 39.7" W
TURNPIKE	40.13387046120	-75.86581993250	40° 08' 01.9" N	75° 51' 57.0" W
UNION	40.22908333390	-75.80650000010	40° 13' 44.7" N	75° 48' 23.4" W

Appendix C
System Sub-Site Technical Information

NORTH SITE

	Column 1	Column 2	Column 3	Column 4
SUB-SITE	Total Receiver Antenna System Gain* (Gain)(Ant. Model)(Azimuth)	Max Signal Level Accepted at Site Antennas	Site TX Signal Level ERP	Tx Antenna (Model)(Azimuth)**
ALBANY	19 dB (1)	-79 dBm	50.9 dBm	1 (174º)
BETHEL	19 dB (1)	-79 dBm	47.0 dBm	4 (183º)
BLUE MTN	19 dB (1)	-79 dBm	50.0 dBm	5 (159º)
HAMBURG	21.5 dB (3)	-81.5 dBm	52.9 dBm	7
KUTZTOWN	19 dB (1)	-79 dBm	53.0 dBm	8 (43º)
LONGSWAMP	19 dB (1)	-79 dBm	46.8 dBm	9 (178º)
N HEIDELBERG	23.4 dB (4) (250º)	-83.4 dBm	52.4 dBm	1 (45º)
NORTH CAMPUS	23.4 dB (4) (330º)	-83.4 dBm	52.8 dBm	2
WEST PENN	19 dB (1)	-79 dBm	48.7 dBm	6 (160º)

SOUTH SITE

ALSACE	19 dB (1)	-79 dBm	50.5 dBm	2
BALLY	19 dB (1)	-79 dBm	49.9 dBm	3 (347º)
COURTHOUSE	21.5 dB (3)	-81.5 dBm	51.9 dBm	2
CUMRU	21.5 dB (3)	-81.5 dBm	51.1 dBm	2
EARL	19 dB (1)	-79 dBm	53.0 dBm	6 (11º)
MT PENN II	21.5 dB (3)	-81.5 dBm	53.3 dBm	1 (289º)
ONTELAUNEE	23.4 dB (4) (60º)	-83.4 dBm	54.9 dBm	10
ROBESON	21.5 dB (3)	-81.5 dBm	54.0 dBm	11 (52º)
TURNPIKE	22.3 dB (2) (0º)	-82.3 dBm	46.0 dBm	12 (0º)
UNION	19 dB (1)	-79 dBm	51.5 dBm	2

*** Antenna gains and models are as below:**

(1) Amphenol BCD-7509-EDIN-3-25 (Gain 9 dB dbD)
(2) RFS BPS10-A-B1(Gain 12.3 dB dbD)
(3) Sinclair SC412-HF2LDF(Gain 11.5 dB dbD)
(4) RFS BPS10-H-B1 (Gain 13.4 dB dbD)

****These values are the main lobe Tx gains based on the antenna at the site. Models are as below:**

(1) RFS BPS10-A-B1 (Gain 12.3 dBD)
(2) Amphenol BCD-7509-EDIN-3-25 (Gain 9 dB dbD)
(3) Amphenol WPA-700120-8CF-EDIN (Gain 10.0 dBD)
(4) Amphenol WPA-700102-4CF-EDIN-3-25 (Gain 10.3 dBD)
(5) Amphenol LPA-70040-4CF-EDIN-3 (Gain 15.5 dBD)
(6) Amphenol WPA-70080-4CF-EDIN-4 (Gain 11.5 dBD)
(7) Amphenol BCD-7509-EDIN-0-25 (Gain 9 dB dbD)
(8) RFS BPS10-H-B1 (Gain 13.4 dBD)
(9) Amphenol LPA-70063-4CF-EDIN-2 (Gain 12.5 dBD)
(10) Sinclair SC412-HF2LDF (Gain 11.5 dBD)
(11) WPA-70090-6CF-EDIN-0 (Gain 12.5 dBD)
(12) Amphenol WPA-70090-4CF-EDIN-9 (Gain 11.5 dBD)

Appendix D
Grant of Access Rights

I, _____, am the owner/operator of a signal booster located at _____ and hereby expressly grant the Berks County Department of Emergency Services, its employees, contractors and agents (collectively, "DES") permission to enter my property for the purpose of accessing the above-reference signal booster in order to 1) ensure that this signal booster is in compliance with the requirements set forth in Berks County Public Safety Radio System Signal Booster Technical Requirements; 2) ensure that this signal booster will not cause interference with the public safety radio system; and 3) power down this signal booster if it is not in compliance with the Technical Requirements or is causing interference. This grant of access to my property shall continue until I expressly revoke, in writing, DES's permission to access my property, at which time I acknowledge that I will no longer be permitted to use the above-referenced signal booster.

Below executed by the property owner or an individual legally permitted to bind the property owner in a contract: Name: _____ Address: _____ _____ _____ Phone: _____ Signature: _____ Date: _____	Witnessed: Name: _____ Signature: _____ Date: _____

Appendix E

Example Annual Recertification

Name of Property (if applicable): _____

Address Where Booster Is Installed: _____

Municipality Where Booster Is Installed: _____

Date Prevailing LoA Was Issued: _____

Does the information below represent a change since last submittal? ____Yes ____ No
If yes, please refer to published regulations as a new application package may be required.

Owner Information

Applicant Name: _____

Applicant Address: _____

CONTACT INFORMATION

Applicant Point of Contact:

Name: _____Email: _____ Phone: _____

By my signature below, I attest that I am legally authorized to encumber the applicant named above by engaging in contracts/relationships with other parties, and I affirm:

- The public safety BDA at the named location has been properly maintained and/or tested in accordance with any applicable codes, mfg recommendations, and the requirements of the AHJ; and the design/operating parameters of the unit remain unchanged since the last submittal.

_____

Signature Printed Name Date

Authority Having Jurisdiction (Municipality) Review:

Name: _____Email: _____ Phone: _____

_____

Signature Date