

## Information Sheet

# Emergency Responder Radio Coverage System

An Emergency Responder Radio Coverage System (ERRCS) is required in accordance with the direction set forth by the Philadelphia Fire Department and Department of Licenses and Inspections in [Code Bulletin F-1602](#).

The system must be designed in accordance with Section 510 of the 2018 Philadelphia Fire Code, NFPA 70-16 National Electrical Code, NFPA 72-16 National Fire Alarm and Signaling Code and NFPA 1221-16 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.

The system must be installed and accepted by the Philadelphia Fire Department prior to the issuance of a Certificate of Occupancy. The system shall NOT be activated until final acceptance.

This information sheet establishes application and testing requirements for new systems.

### Design Criteria

The in-building wireless system shall provide coverage throughout the entire building and must be designed utilizing signal propagation analysis software.

The radio operating frequencies and radio sites for the 800MHz City Wide Simulcast System are listed in Exhibit A.

### Application Requirements

Installation of an ERRCS shall require an Electrical Permit.

#### Permit Application

Permit application shall be submitted through the online portal.

A separate electrical permit application is required for this work and the combination permit application may not be utilized.

#### Designer

The application shall include proof of the following for the system designer:

- Valid FCC general radio operators license
- Certification of in-building system training issued by a nationally recognized agency, or a certificate issued by equipment manufacturer.

#### Plan

Design plans must be sealed by a licensed PA Professional Engineer and comply with [Electrical Permit Plan requirements](#) and include the following information:

- Layout of Communication Equipment
- Radio Signal Strength Evaluation
- Amplification System Configuration
- Signal Booster Location(s)



- Standby Power Configuration
- Detailed single line plan with device settings, equipment and device specifications, and circuiting conductor sizes and types for fire alarm systems.
- Component cut sheets

A copy of design files shall be furnished upon request.

### **Contract**

A copy of the executed contract for system installation must be submitted before the billing statement is generated.

### **Contractor**

The licensed Philadelphia Electrical Contractor must be named on the permit application.

The lead installer of the wireless system must also possess the following credentials:

- Valid FCC general radio operators license
- Certification of in-building system training issued by a nationally recognized agency, or a certificate issued by equipment manufacturer.

### **Permit Processing**

L&I will review permit documents for compliance with NFPA 70 and NPFA 72. Permit application will also be forwarded to the City of Philadelphia Office of Information and Technology (OIT), Emergency Operations Division for review of wireless network.

Applications are reviewed by L&I within 20 business days. Additional time may be required for OIT review.

### **Permit Fees**

The permit fee is \$25 for each \$1000 or fraction thereof of estimated construction cost. Minimum fee of \$51 and maximum fee of **\$15,525**.

Additional permit fees: \$4.50 State surcharge; \$3.50 City surcharge.

### **Inspection**

The licensed Electrical Inspection Agency named on the electrical permit shall be responsible to inspect and certify compliance with NFPA 70 and NFPA 72.

The Electrical Permit and associated Building Permit shall not be released until the ERRCS has been tested and accepted by the Philadelphia Fire Department as set forth below. The approval letter must be uploaded to the Hold Permit Completion on the Building Permit.

### **Testing and Acceptance**

Upon completion of installation and after building is permanently enclosed, the installer shall certify that two-way coverage is not less than 99 percent in critical areas, including fire command centers, fire pump rooms, exit stairs, exist passageways, elevator lobbies, standpipe cabinets, and sprinkler sectional valve locations, and coverage is not less than 95 percent in all other areas of the building.

Testing shall be performed in accordance with Section 510 of the Philadelphia Fire Code, including the following:



- Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
- Test shall be conducted using a calibrated Motorola APX 6000 800 MHz portable radio, in accordance the Philadelphia Fire Department specifications.
- All signal measurements shall be conducted using a spectrum analyzer.

The installer shall submit the 20-grid floor plan for each floor with signal levels annotated on each grid of the floor plan to the Philadelphia Fire Department, Fire Code Unit.

The Fire Department shall perform on-site functional testing to verify:

- Delivered Audio Quality (DAQ) of 3.0 or greater or an equivalent Signal-to-Interference-Pulse-Noise-Ratio (SINR).
- DAQ 3.0 or greater, or equivalent, signal strength measured within a minimum of 95 percent of all areas of all floors within the building.
- The installer shall submit the 20-grid floor plan for each floor with signal levels annotated on each grid of the floor plan to the Fire Department.

Upon satisfactory testing, the Fire Department shall issue a letter of approval which must be uploaded to the Building Permit.

## EXHIBIT A

### System

The Philadelphia Public Safety Radio System is a P25 Phase II simulcast system using ten radio sites geographically spaced about the city.

### Operating Frequencies

The simulcast system uses 42 frequency pairs in the 800Mhz Public Safety band. The details are in the table below:

	<b>TX</b>	<b>RX</b>
<b>1</b>	851.0125	806.0125
<b>2</b>	851.1000	806.1000
<b>3</b>	851.2875	806.2875
<b>4</b>	851.3375	806.3375
<b>5</b>	851.3625	806.3625
<b>6</b>	851.5125	806.5125
<b>7</b>	851.5875	806.5875
<b>8</b>	851.6875	806.6875
<b>9</b>	851.7875	806.7875
<b>10</b>	851.8000	806.8000
<b>11</b>	851.8125	806.8125
<b>12</b>	851.8375	806.8375
<b>13</b>	852.0125	807.0125
<b>14</b>	852.0625	807.0625
<b>15</b>	852.0875	807.0875
<b>16</b>	852.1000	807.1000
<b>17</b>	852.1125	807.1125
<b>18</b>	852.3500	807.3500
<b>19</b>	852.5125	807.5125
<b>20</b>	852.5625	807.5625
<b>21</b>	852.5750	807.5750

	<b>TX</b>	<b>RX</b>
<b>22</b>	852.5875	807.5875
<b>23</b>	852.8125	807.8125
<b>24</b>	852.8375	807.8375
<b>25</b>	852.8625	807.8625
<b>26</b>	852.9375	807.9375
<b>27</b>	853.0125	808.0125
<b>28</b>	853.0500	808.0500
<b>29</b>	853.0625	808.0625
<b>30</b>	853.0875	808.0875
<b>31</b>	853.2875	808.2875
<b>32</b>	853.3125	808.3125
<b>33</b>	853.3375	808.3375
<b>34</b>	853.5375	808.5375
<b>35</b>	853.5500	808.5500
<b>36</b>	853.5625	808.5625
<b>37</b>	853.5875	808.5875
<b>38</b>	853.7875	808.7875
<b>39</b>	853.8125	808.8125
<b>40</b>	853.8375	808.8375
<b>41</b>	857.7375	812.7375
<b>42</b>	858.7375	813.7375

## Site Information

The ten radio sites that could be assessed as donors are listed in the table below along with coordinates and ERP for each site.

Site Address	LAT	LON	ERP (Watts)		
			Antenna 1	Antenna 2	Antenna 3
Phila City Hall, 1400 JFK Blvd.	39-57-08.0 N	75-09-49.0 W	19	16	16
329 Domino Lane	40-02-30.9 N	75-14-21.9 W	16	16	16
4040 Whitaker Avenue	40-00-41.3 N	75-07-16.8 W	205	205	204.2
2689 Southampton Road	40-06-53.8 N	74-59-23.0 W	44	44	44
8501 State Road	40-02-12.1 N	75-00-23.9 W	182	182	182
3059 Grays Ferry Avenue	39-56-22.7 N	75-11-41.3 W	204	204.2	204.2
4925 Fort Mifflin Road	39-53-34.6 N	75-12-27.2 W	115	115	115
6900 Germantown Avenue	40-03-16.0 N	75-11-14.0 W	115	115	114.8
4300 Ford Road	40-00-04.9 N	75-13-06.0 W	155	155	154.9
8225 Bustleton Avenue	40-03-53.1 N	75-03-05.4 W	188	188	186.2