

September 29, 2016

City of Pittsburgh

Public Works Division

Attn: Mike Gable, Director

RE: Washington Boulevard Flood Warning System Investigation Report

Mr. Gable,

Bronder Technical Services has completed their investigation of the existing Washington Blvd Flood Warning System to determine the status of the equipment/operation and would like to offer the following:

General Conditions –

- Upon arrival all of the load centers for each of the sites within the system were in an “OFF” condition

Site Specific Conditions –

- Butler Street Advance Warning Sign (AWS)
 - All of the equipment at this site is still functional
 - Operation of this site was verified
- Allegheny River Blvd AWS
 - All of the equipment at this site is still functional
 - Operation of this site was verified
- Washington Blvd/Allegheny River Blvd Gate
 - There is a deficient lower gate controller which causes the audible gate alarm to be in a “ON” status all the time.
 - The alarm was disabled upon arrival and left disabled when we left site
 - Operation of this site was verified with the exception of the gate motor.
- Washington Blvd/Allegheny River Blvd Signal Preemption
 - The 242 card in the signal controller used to preempt the Washington Blvd Approach of the signal during an activation was removed from the rack.
 - Further discussion with Steve Simmons stated that this was due to signal being preempted too many times in the past couple of months (see Zone 5 Button explanation)
 - The 242 card was placed back in the rack upon leaving site
 - The 900 MHz radio appeared to be working properly

- Master Controller/Sensor Site
 - This site had NO power upon arrival due to a 120 VAC power issue from the Highway Lighting Circuit
 - Allegheny City Electric was on site to replace a fuse within the base of the light pole
 - This site's battery was completely dead and would not take a charge due to power being out over an extended period of time
 - This battery was replaced with one of the batteries from the Negley Run AWS to ensure its continued operation, even in the event of a short power outage
 - It is unable to determine if the power loss/battery outage happened before or after the rain event on August 28, 2016.
 - Even if all of the sites would NOT have been in the "OFF" position, the system may not have worked because the Master Controller may not have had power at the time
 - Sensor #1 and #2 were both found to trigger the system effectively when tested in a bottle of water
 - Both sensor locations were cleaned up and mud and debris removed from the locations while on site.
- Zone 5
 - When we arrived on site, the pushbutton at Zone 5 was still in the "ACTIVE" position, though the RED LED indication on the button was NOT lit.
 - We asked the Officer On Duty to turn the button "OFF"
 - We ran several tests of the system using the button and the RED LED indication did work while testing. It is our conclusion that the indication went out after being in the "ACTIVE" position for an extended period of time.
 - Because the button was "ACTIVE", we can conclude this was causing the signal to preempt at Washington Blvd/Allegheny River Blvd
 - Radio communications worked properly between Zone 5 and the Master Controller
- Highland Dr AWS
 - All of the equipment at this site is still functional
 - Operation of this site was verified
- Highland Dr Gate
 - There was a bad controller at this location within the main flasher cabinet.
 - This controller was replaced with the controller from the SR 8 NB flasher cabinet.
 - This site operation was verified after the controller was replaced
- Negley Run/Washington Blvd Gate
 - There was a bad radio at this location within the main flasher cabinet
 - The radio was replaced with the radio from the SR 8 NB flasher cabinet
 - The lights for the gate arm were never reconnected to the arm when the arm was fixed by the City of Pittsburgh.
 - The lights are still connected to the gate housing and functional, but are not connected to the gate arm.
 - This site operation was verified after the radio was replaced

- Negley Run AWS
 - Upon arrival, this site was narrowly missed by a fallen tree. The remains of the fallen tree prevented immediate access to the cabinet, so some of the limbs were broken and moved to allow access to the site.
 - Upon arrival, this site did not have 120 VAC power.
 - Allegheny City Electric was on site to fix a bad neutral wire in the line which fed this site.
 - All of the equipment at this site was functional
 - As stated above, one of the two batteries from the site was relocated to the Master Controller site, so one of these batteries will need to be replaced
 - Operation of this site was verified
- SR 8 NB AWS
 - This site was damaged by a vehicle before arrival to site
 - The following equipment will need to be replaced at this site
 - Pole
 - Bottom Beacon may need to be replaced. It was tested with inconsistent results.
 - The Bottom Beacon may also need a new Visor
 - Power Supply will need to be completely rewired
 - Batteries should be replaced
 - New High Sierra Controller due to using that part at Highland Ave Gate
 - New High Sierra Radio due to using that part at Negley Run Gate
 - Wiring at this Site will need to be completely replaced

Site Recommendations –

- Although all Radio communications was verified, it is recommended that trees are trimmed along Washington Blvd to prevent interference in the future with any of the equipment
- All batteries should be replaced at each of the cabinets as they are beyond the 3 year expected life of the batteries, to include:
 - 2 High Sierra 5600 Series Batteries at each Gate - Total of 6
 - 2 100Ah Interstate Sealed Lead-Acid Batteries at every Gate Site Flasher Cabinet – Total of 6
 - 2 100Ah Interstate Batteries at every AWS Flasher Cabinet – Total of 10
 - 1 100Ah Interstate Battery at the Master Controller
- We recommend upgrading the BGO Lower Gate controllers at each gate site. In discussion with High Sierra, the current BGO can be fixed, but are no longer made. Upgrading will ensure continued compatibility and serviceability of the lower gate control.
- A definitive spare parts inventory should be maintained by the City of Pittsburgh to ensure continued operation of the system. At minimum, this would include:
 - 1 – High Sierra 6600 Series Submersible Pressure Transducer
 - 1 – High Sierra 5315-01 Solar Charger & Load Control
 - 1 – High Sierra 3350 ALERT Controller

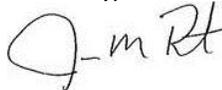
- 1 – High Sierra 3701 Data Transeiver (VHF)
- 1 – High Sierra 7110 Omni-Directional Antenna
- 1 – High Sierra Upper Gate Controller
- 1 – High Sierra BGO Lower Gate Controller
- ASAP availability to the 100Ah Batteries

In total, we would anticipate the cost of repair, including parts to not exceed \$50,000. This would include our time in repairing the missing/faulty equipment, replacing the batteries at each site and preparing the site for a final test with the City of Pittsburgh. In addition to this cost, the spare parts recommended for the City of Pittsburgh would be no greater than \$4,000 if the recommendations are followed as stated above.

We would be able to begin work once given a formal work authorization from the City of Pittsburgh through Allegheny City Electric. The lead time on parts is 6-8 weeks (from the date of formal authorization) because this is specialty equipment which is solely used for these types of systems. As a result, we are competing with other states/municipalities which are also installing/repairing/upgrading their sites, which makes the lead time greater.

We will provide a detailed estimate of all material costs once we have all of the pricing from the vendors. Should you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "J-m Rt". The signature is written in a cursive, somewhat stylized font.

Jason M. Previte

cc: Rob Wojciechowski, Allegheny City Electric