



MEMO

Date: June 5, 2017
To: Jeff Lundstrom, P.E.
From: Chris Cunningham, P.E., Ron Leimkuhler, P.E.
Subject: Madison Street Bus Rapid Transit
Traction Power System Substation
EMF and Noise Measurement Results

Background

The City of Seattle's Department of Transportation (SDOT) is planning to implement a Bus Rapid Transit (BRT) system on Madison Street from First Avenue to Martin Luther King Way. Buses will run every six minutes during peak hours and service is expected to begin in the fall of 2019. King County METRO will operate the service with electric trolley buses, and it will require extension of the existing overhead wire system. Electrical power to energize the overhead wire extension will be provided from a new Traction Power System Substation (TPSS) located on the corner of Madison and E John Street. This TPSS will be similar to other TPSS facilities located in the area. A site plan of the proposed TPSS facility is attached.

In response to concerns raised by local residents, SDOT hired consultants to measure the Electrical Magnetic Field (EMF) and noise generated by similar facilities. EMF and noise measurements were also collected at the proposed TPSS site. This memo summarizes the results of those measurements. The complete EMF and Noise Measurement Reports are attached.

Measurement Overview

The existing TPSS sites where measurements were taken are located in Seattle, Washington at: 210 Bellevue Avenue East (Capitol Hill) and 3406 East Denny Way (Madrona). These facilities provide power for similar King County Metro trolley-bus overhead catenary applications, and are the same size as the proposed TPSS. The proposed TPSS site for the Madison Street Bus Rapid Transit (Madison BRT) project is located at 2401 East Madison Street.

Noise

The two existing sites where noise measurements were taken have similar type of electrical equipment but with different levels of enclosure. The Bellevue Avenue site is surrounded by a chain link fence with wood slats while the East Denny Way site is fully enclosed inside a building structure.

Electric and Magnetic Fields (EMF)

Measurements for EMF were performed at the Bellevue Avenue site. This site was chosen over the Madrona site since it provides the least amount of EMF shielding. The proposed TPSS will have a similar metal enclosure with the same shielding characteristics. The metal exterior of the enclosure will be treated to make it appear similar to other small structures in the area.

Results and Conclusion

The following results and conclusions are summarized from the attached measurement results. Attachment A is the Madison Bus Rapid Transit TPSS – Sound Survey and Attachment B is the City of Seattle Trolley-Bus TPSS Magnetic Field Measurements.

Noise

The measurements indicate that noise from a fully enclosed TPSS, such as the one proposed, is expected to be minimally audible outdoors when standing at the edge of the site during the quietest periods of the night. Audibility would be greatly reduced and in many cases non-existent when local ambient noise events such as a passing car happen.

Electric and Magnetic Fields (EMF)

The EMF measurement results include two results; AC fields and DC fields. AC fields from the proposed TPSS will be lower than the existing levels that are at the site today, and the DC fields are within five percent of the Seattle area geomagnetic fields that occur naturally. The result of the measurements for AC and DC fields produced by the TPPS conclude that there is no impact to human health, residential units, or medical implants. See Attachment B for full results of the EMF measurements.

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