

# Memorandum

To: Belmont Select Board

From: Belmont Light Department

Date: October 23, 2023

**Re: # 73 - # 89 Leonard Street Electric Utility Transformer Modifications**

## **Background**

Addresses # 73 through # 89 Leonard Street, currently spanning from CW CambridgeWear through CVS Pharmacy, have their electric utility service supplied via underground cables that enter the building's basement near the Leonard Street entrance of # 85. The service voltage is a higher voltage (277/480 Volts) that is unique to the building when compared to the other storefronts on Leonard Street and is the only instance in town with this voltage that is supplied with underground transformers. For reference, other buildings that are supplied with this voltage in town are all served by above-ground pad-mounted transformers such as the BMHS building and the Concord Avenue Ice Rink. Due to this unique configuration, Belmont Light must maintain transformers, including spares, for the sole purpose of supplying # 73 through # 89 Leonard Street. These transformers were first energized in late 2016 following the building's redesign.

## **Complications**

On February 21, 2023, one of the three underground transformers powering # 73 through # 89 Leonard Street failed due to corrosion at the low voltage (277/480 Volts) connection point, likely due to salt and water flowing down Leonard Street and entering the underground electrical vault through its necessary grated cover. The result of this transformer failure was an electrical outage to the customers at # 73 to # 89 Leonard Street which was unable to be field repaired. The remaining two of the three submersible transformers had no other visible indications of imminent failure, which resulted in Belmont Light replacing the failed transformer with its only on-hand spare transformer and power was restored after approximately a three-hour electrical outage.

On March 2, 2023, # 73 through # 89 Leonard Street again lost power due to one of the remaining two original underground transformers failing due to corrosion at the high-voltage connection point, again likely due to the issue with salt and water, and was unable to be field repaired. At this point, Belmont Light had no on-hand spare underground transformers able to supply the required 277/480 Volts service. Requests were sent to multiple municipal electric utilities throughout New England, Eversource, and National Grid to obtain an available submersible spare transformer for replacement but none were available due to the unique nature of the construction. This prompted Belmont Light to remove all three (3) of the previously existing underground transformers and replace them with a single typical 3-phase above ground pad-mounted spare transformer over the vault to provide electrical service to the building. This work required an approximately fourteen-hour outage for the affected customers. This pad-mounted transformer is still in-use today and can be seen near the Leonard Street entrance to # 85. A picture of the existing temporary installation can be seen in the attached slides.



## **Proposed Solutions**

### **Option # 1 – Permanent Above Ground Pad-Mounted Transformer on Leonard Street**

This option would entail Belmont Light installing underground conduits and cables from the existing underground vault that provides electrical service to # 73 through # 89 Leonard Street along the gutter line to a new above ground pad-mounted transformer, essentially relocating the existing above ground pad-mounted transformer that is currently serving the building to a permanent location near the intersection with Alexander Avenue. The specific location was chosen as it is in close proximity to the existing service entrance conductors, can be installed at a lower cost, requires no utilities to be crossed or to be re-located, provides line-workers sufficient space to safely maintain and operate the equipment, can be constructed while the existing temporary configuration is in-service negating a lengthy power outage, is not directly in-front of any store front, doesn't encroach on the existing sidewalk width, requires no additional drainage and subsequent ongoing town maintenance, will only require the removal of one parking space, and creates no new difficulties with regards to snow plowing and street sweeping efforts. As part of the work for this option, Belmont Light would "bump-out" the existing curbing on Leonard Street near the intersection of Alexander Avenue while matching the existing aesthetics and install bollards for motor vehicle protection of the transformer.

Option # 1 would allow Belmont Light to normalize the electrical construction for this building by utilizing a typical above ground pad-mounted transformer with a 277/480 Volts output that is more readily available and is currently in-use for all other structures in town that require this voltage. A construction sketch and associated renderings of the proposed option # 1 can be seen in the attached slides.

### **Option # 2 – Maintain Underground Transformers and Raise the Local Curbing**

This option would entail Belmont Light procuring new underground transformers, including a spare, to be installed in the previously utilized underground vault located in front of # 85 Leonard Street. To help minimize the risk of future transformer failures due to salt and water flowing into the vault, the curbing in the local area around the vault would need to be "bumped-out" to prevent roadway runoff water from entering the vault via its necessary grated cover. The sidewalk "bump-out" would match the existing aesthetics of the area. Additionally, a new drain catch basin would need to be installed on the uphill side of the "bump-out" to prevent pooling of roadway runoff water and would need to be connected to the existing drainage pipes, currently located in the center of Leonard Street, with additional drainage piping. This option would require the removal of two parking spaces and may create new difficulties with regards to snow plowing and street sweeping efforts.

Option # 2 would require Belmont Light to continue to maintain transformers that are not readily available for replacement and repair purposes. Additionally, during the construction it is likely that # 73 through # 89 Leonard Street will require extended electrical outages while the sidewalk is being raised at the location of the existing temporary pad-mounted transformer. Should these transformers fail again in the future, it is likely that temporary fixes may require the temporary installation of an above ground pad-mounted transformer over the vault until replacement parts can be procured, similar to what occurred during the March 2, 2023, outage. A construction sketch and associated renderings of the proposed option # 2 can be seen in the attached slides.