April 17, 2024

Mr. Glenn Clancy
Town Engineer
Town of Belmont
19 Moore Street
Belmont, MA 02478

Re: **Belmont Community Path Phase 2**
Design Services – Belmont Housing Authority Assessment
Belmont, MA
Pare Project No.: 23004.00

Dear Mr. Clancy:

Pare Corporation (Pare) has completed a preliminary investigation and conceptual design to advance the route the Pare Team has recommended to the Town for Phase 2 of the Belmont Community Path along the Belmont Housing Authority (BHA). A survey was conducted by WSP, a subconsultant to Pare, and completed on February 26, 2024, for the portion of the path that would extend along the southern edge of the Massachusetts Bay Transportation Authority (MBTA) Fitchburg Line tracks, abutting the eastern edge of the DPW and the majority of the BHA parcels. The limits for this segment of the path extend a total length of nearly 725 feet, from just west of the existing BHA parking lot easterly to and including the bridge crossing over the tracks that will land on the southern side of Pleasant Street just east of 750 Pleasant Street.

Existing Conditions

The land survey provided by WSP details the existing conditions along the proposed path alignment within the defined boundaries of the DPW (eastern end) and BHA parcels. The survey incorporates both aerial imagery and ground survey data referenced to the Massachusetts State Plane Coordinate System (NAD 1983 and NAVD 1988).

Photo 1 – Looking East over MBTA Tracks and BHA Parking Lot

The proposed path will traverse land along the MBTA and BHA ROWs, shown in Figure 1. The BHA parcel stretches 448 feet in length, with offsets ranging from 21 to 22.8 feet from the southernmost railroad track. Following the proposed alignment, the path would be in the location of the vegetated area and the chain-link fence currently delineating the northern boundary of the BHA parcel. The section of the parcel abutting the fence primarily serves as a parking lot, with the main BHA building located at its eastern terminus. The BHA parcel consisting of the parking lot and office is a total of 26,614 SF.

The MBTA property contains existing utilities setback from the railroad tracks. A pile of railroad ties are currently stored 7-10 feet away from

the tracks, while a dedicated service box for fiber optic cables is positioned 11 feet from the tracks. Utility poles, confirmed by the MBTA to be supporting fiber optic cables only, are located a minimum of 12 feet from the railroad tracks. For visual reference, Photo 2 depicts the MBTA utilities in this area.

Design Standards

The proposed path's conceptual design aligns with MassDOT criteria outlined in Chapter 11 of the Project Development and Design Guide (PDDG), MassDOT Separated Bike Lane Design, and AASHTO's Guide for the Development of Bicycle Facilities. Key design elements such as alignment, width, grade, surface, sightlines, and separation were influenced by a design speed limit of 18 mph, ensuring the path's safety and usability. Typically, the path will feature a 12-foot-wide paved surface with 3-foot grass buffers on either side. Structures are proposed to maintain the 12-foot path width with 2-foot offsets to railings/fences, wherever possible.

Photo 2 – View Towards BHA Parcel from MBTA Train

Given its proximity to the railroad, ongoing coordination with the MBTA is essential to ensure compliance with their safety regulations. As discussed previously, the path should maintain a minimum horizontal offset of 15 feet from the railroad tracks and vertical clearance of 22'-6" over the tracks. Due to the surveyed position of the MBTA's utilities, Pare held a follow-up meeting with MBTA on April 8, 2024 to discuss the required accommodations and/or offsets. As fiber optic lines do not pose a touch hazard, the MBTA does not have a set standard for a required offset and deferred to industry standards. As common practice during construction, the MBTA temporarily drops fiber optic cables to the ground and later remounts them. In this instance, the MBTA noted that the cable can be mounted directly to the wall/bridge abutment structure once the ramp elevates over the typical cable height, similar to Waverley Station. MBTA did express a concern in implementing safe installation practices to ensure the cables are positioned away from typical pedestrian reach and that the care be taken in any snow removal practices so as not to burden the cables with undue loads.

Following the MBTA meeting, Pare staff met with Verizon on April 11, 2024 to confirm if there was an industry standard that should be adhered to for an offset. They reiterated that the fiber optic lines themselves do not present a hazard; therefore, standards are related to protecting the lines from outside sources. They maintain a standard offset from electrical lines (not applicable to this assessment), and place poles at least 12 feet away from railroad tracks, six inches away from roadway edges and 3 feet away from other common objects including hydrants and signal poles. Based on these industry standards, Pare has advanced the path layout to maintain 3-foot offsets from the existing poles, except where the cable will be adhered to the structure.

Finally, the ramp design will comply with the Public Right-of-Way Accessibility Guidelines (PROWAG) specifications and the regulations and standards outlined in the Americans with Disabilities Act (ADA). To meet the latest PROWAG standards, ramps must adhere to specific slope requirements. The maximum allowable running grade is 12:1 (8.33%), with 8% commonly used in design to allow for construction tolerances. However, if the slope exceeds 20:1 (5%), each ramp run necessitates a 5-foot level landing, with a restriction of 30 inches in elevation change per run between subsequent level landings.

Design Considerations and Concepts

The proposed design for the shared-use path was developed through an iterative process to determine the required length of ramp transitions, aligning with PROWAG specifications. The goal was to minimize impacts on adjacent ROWs and existing infrastructure.

In accordance with the standards, there is a minimum horizontal clearance of 15 feet between the path structure and the nearest railroad track. The path is further separated by a 2-foot offset and a protective fence atop the retaining wall. The fiber optic cables will remain with a minimum clearance of 3 feet from the edge of the path structure. At the western limits of the ramp, a rest area or wayside facility could be integrated into the proposed path, featuring an 8- to 10-foot connecting path to the BHA and neighborhoods/amenities to the south.

For the construction of the ramp and ensuring structural integrity, mechanically stabilized earth (MSE) retaining walls with reinforced geotextile foundations approximately 6 feet deep are anticipated along the ramp parallel to the BHA parking lot. The construction of the proposed ramp leading to the bridge is projected to impact the periphery of the parking lot, primarily for wall construction. As the ramp transitions into a bridge, the affected utility poles and fiber optics will be relocated to pass beneath the superstructure. Notably, the placement of the proposed wall may necessitate the reconstruction of the concrete base foundation for the dedicated service box housing the fiber optic cables, located approximately 4 feet from the wall.

As the ramp continues to ascend parallel to the BHA parking lot, it transitions into a bridge structure that spans over the active railroad (MBTA Fitchburg Line). The bridge over the railroad is conceptualized as a truss bridge spanning approximately 250 feet, with a superstructure depth of up to 2'-3". Based on the proposed alignment and profile, the vertical clearance over the MBTA railroad is approximately 22'-8", which is in compliance with MBTA guidelines.

Two ramp grade concepts have been developed. Refer to the attachment for corresponding plan and profile sheets.

Concept A:
To achieve the Town's request to confirm that an ADA accessible path could be constructed within the confines of the BHA parcel, the ramp descends directly from the bridge transition to the existing ground elevation at the BHA/DPW parcel line with a total run of approximately 396 feet. The ramp would consist of 11 runs at a 7.75% grade, separated by 10 level landings until reaching the existing ground elevation.

Concept B:
This alternate ramp descends from the bridge transition to the area between the existing BHA and DPW parking lots, meets the elevation of the DPW lot, and is approximately 475 feet long. The ramp would consist of three runs at a 5.0% grade, separated by two level landings until reaching the DPW lot elevation. Although level landings are not technically required for running slopes up to and including 5%, they are incorporated to provide resting opportunities for path users.

Impacts and Recommendations:

Although technically feasible, locating a ramp descending to the current elevation at the BHA parcel presents challenges. This area currently sits below the adjacent track elevation. It will require the removal of BHA parking spaces, and reconstruction of portions of the BHA parking lot to establish user connectivity to the BHA and surrounding area. Further, if the path did descend from the bridge to the elevation of the BHA parking lot, it would need to immediately rise again to meet the grade of the DPW lot. Pare recommends Concept B due to its limited impacts and superior comfort and safety for path users. Concept B incorporates a 5% slope, reducing the need for

frequent level landings and resulting in a smoother traversable experience. By maintaining the path at a higher elevation above the tracks, Concept B enhances safety near the railroad. This elevated position offers improved visibility of approaching trains, mitigates the risk of flooding, and acts as a physical barrier, preventing direct access to the tracks. Furthermore, Concept B minimizes disruption to the BHA lot while offering the potential for an enhanced connection when the BHA parcel undergoes reconstruction. The recommended path would impact 1,800 square feet of the BHA parcel that contains the parking lot and office, 645 square feet of that being impact to the parking lot.

We are available to discuss this summary with you at your convenience. Please feel free to contact us if you have any questions or need additional information.

Sincerely,

Amy Archer, P.E.
Managing Engineer

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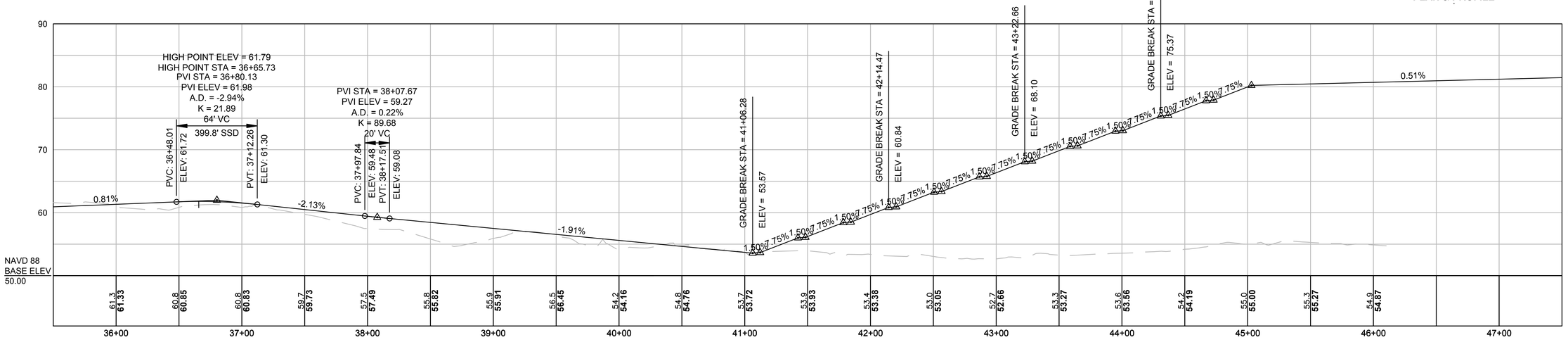
CONCEPT A

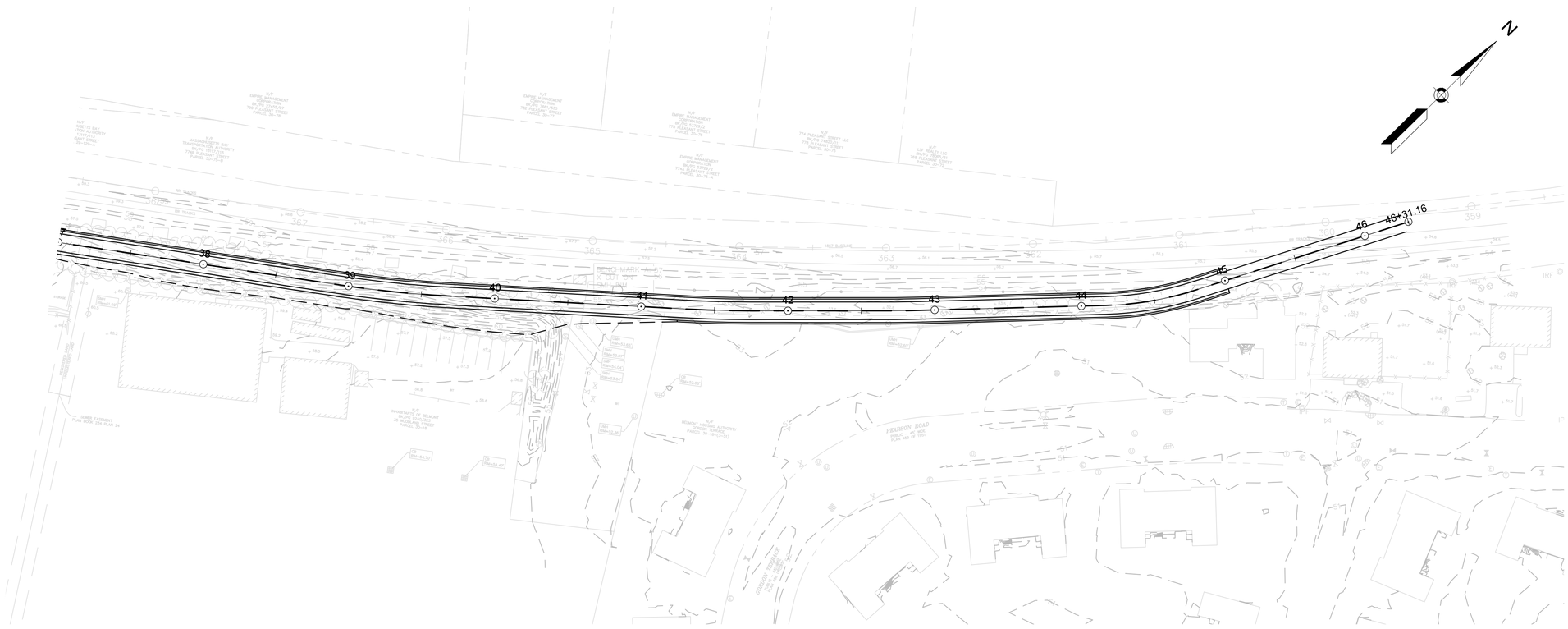
BELMONT
COMMUNITY PATH

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA			
PROJECT FILE NO.			

PLAN & PROFILE

HOR. SCALE IN FEET
40 0 40 80
VER. SCALE IN FEET
8 0 8 16





CONCEPT B

HOR. SCALE IN FEET
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VER. SCALE IN FEET

BELMONT COMMUNITY PATH

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA			
PROJECT FILE NO.			

PLAN & PROFILE