



MEMORANDUM

DATE: August 6, 2019
Amended October 9, 2019
Amended October 23, 2019

TO: Rhode Island Division of Public Utilities and Carriers (RIDPUC)

CC: Linda George

FROM: Amy Archer, PE

RE: **NBC RR Crossing Review – Traffic Consulting Services**
(Pare Project No. 19075.00)

As requested by the Rhode Island Division of Public Utilities and Carriers (RIDPUC), Pare Corporation (Pare) has completed a review of plans prepared by Waterman Engineering Company (Waterman) and the Genesee & Wyoming Railroad Company (G&W) for a proposed at-grade rail crossing by a service road of the Narragansett Bay Commission (NBC) currently located in Providence, Rhode Island. The plans have been reviewed with attention given to items agreed to at the previous site visit meeting conducted on June 18, 2019 and compared to the requirements established by the Federal Highway Administration (FHWA), as documented in the Manual on Uniform Traffic Control Devices (MUTCD), and by the American Railway Engineering and Maintenance-of-Way Association (AREMA). The following is submitted as a summary of this review. This memo serves as a supplement to initial feedback provided via email on June 10, 2019.

Field Review and Data Collection

Prior to the formal submission of plans provided for the proposed at-grade crossing, Pare performed a site visit to review elements that may affect the design. The site visit was conducted on June 18, 2019. Two primary observations were made during the site visit. The first pertains to available sight distance for the proposed crossing in each direction along the rail. In both directions, visibility is significantly limited by the curvature of the rail line combined with overgrowth of vegetation. Visibility to the west from the northern approach along the service road is also limited by the edge of the existing building. The second observation pertains to the southbound approach along the service road. This approach has a substantial grade, which may cause difficulty in braking for the heavy vehicles that traverse the roadway in wet or icy conditions.

Plan Review

The plans prepared by Waterman and G&W, dated July 2019 indicate a proposed railroad crossing for use by NBC vehicles within a private-way of their facilities. This crossing is proposed to have flashing signals with a bell on both approaches. Additionally, the plans show a stop sign (R1-1) at

the approach to the bend in the service road north of the rail crossing and advance railroad warning signs (W10-1) for both approaches. Finally, railroad crossing pavement markings are proposed on both approaches, according to the plans.

The rail crossing plan does not indicate anticipated train speeds or volumes, though prior documentation submitted via email on May 30, 2019 indicated an anticipated speed of 10 miles per hour.

While the proposed railroad crossing is intended for internal circulation and operations by NBC, it should be noted that it will make a connection between Shipyard Street and New York Avenue/Fields Point Drive. This has the potential to draw some public traffic across the rail crossing.

National Guidelines

The FHWA has many roles in relation to at-grade rail crossings including: the determination of factors that warrant passive or active crossing control; the establishment of best practices for safe passive and active crossing design, as outlined in the MUTCD; and the procedures for safety review, reporting and mitigation of crossings following initial construction.

The following criteria from the FHWA/MUTCD apply to the proposed at-grade crossing:

- Passive and/or active control guidelines apply to all public crossings and all privately owned crossings that are open to the public.
- Passive control refers to measures that alert crossing traffic of the location of a crossing, but do not specifically indicate an approaching train, such as signing and markings.
- Active control refers to measures that specifically indicate an approaching train, such as signals, bells and gate arms.
- Active controls are recommended at crossings of rail lines with high speed trains, high frequency of trains and/or vehicular/pedestrian traffic, crossings with limited sight lines and/or crossings located in urban settings where the density of the roadway network and slow moving traffic increase the likelihood of queues extending through track crossing areas.
- High speeds are defined as freight trains with operating speeds of 40 miles per hour or greater and/or passenger trains with operating speeds of 60 miles per hour or greater.
- A crossbuck (R15-1) sign shall be provided on the right-hand side of all approaches to an at-grade crossing with low volumes.
- Grade crossing advance warning (W10-1) signs shall be installed on all low-volume roads in advance of every crossing.
- Yield (R1-2) or stop (R1-1) signs should be used in combination with crossbuck signs at passive crossings.
- Yield control shall be the default for crossbuck assemblies unless an engineering study performed by the regulatory agency or highway authority having jurisdiction over the roadway approach determines that a stop is necessary (unusual conditions and/or poor sight lines).
- Yield or stop signs shall be mounted next to the crossbuck, rather than below on the same post, when adjacent to pedestrian travel or parking, requiring a 7-foot vertical clearance.
- Operating a flashing signal is equivalent to a stop control as part of the crossbuck assembly.

- Railroad crossing pavement markings should be applied to each approach to an at-grade crossing when a centerline is present.

While the AREMA references signal guidelines in their *Manual for Railway Engineering*, they identify and defer to the MUTCD as the primary standard for implementation and design of at-grade crossings.

Summary of Findings

Based on the above, Pare concludes that limited sight lines associated with this at-grade crossing warrant the use of an automated gate system. The proposed traffic control system, however, is somewhat contradictory to the applications provided within the MUTCD. Pare recommends the following be considered by the designer:

- The plan references to other sheets would be more easily understood if all sheets were labeled X of 15 and referenced as such.
- Details ES6005.1 and ES6005.2 are included in the set, however, no reference is made to them. If these details will not be implemented on this installation, they should be removed from the plan set.
- Notes on sheet SC600.1 make reference to sign FTP-38, with distance requirements. This sign is not defined. If intended for use, its legend and proposed location should be indicated on the plans.
- The anticipated vehicular approach speed should be indicated on the plans so the appropriate distance "A" is defined in detail SC600.1.
- Tree trimming, which was previously identified as a component of the project, is not included in the plans. The extent of tree trimming should be defined for review.
- *Sensors must be placed along each active approaching track spur at a distance equivalent to a 30 second warning. Train speeds and volumes must be confirmed by G&W and should be noted in the plans. The sensor locations and type must be added to the plans for review.*

A train detection/circuit plan shall be designed for approval by G&W to conform with the standards for advance warning of an approaching train along any of the active track spurs. The approved detection shall be installed as part of the crossing system.

- The location of the proposed controller cabinet should be identified on the plans.
- *The northern Type 1 warning device should be replaced with a Type III device, as discussed at the field meeting, due to the steep slope of the southbound approach to the rail. In conjunction, railroad crossing striping should be placed in advance of the device. Installation of a W10-3 (or W10-3 Mod if the service road access is limited) should be considered.*

Based on further coordination with G&W on September 27, 2019, it is understood that the location atop the hill is outside the standard rail envelope of a crossing device application. Additionally, per discussions via email, the service road pavement on the west side of the

intersection must be maintained for certain operations as well as emergency egress. However, the steep slope and vehicle weight conditions of the southbound approach to the rail still warrant additional warning from a roadway safety perspective. As such, the following considerations are recommended:

- *Removal of the Service Road pavement and/or addition of barricades west of the approach to the rail crossing, creating a single-movement turn from the east side of the Service Road to the rail crossing.*
 - Installation of an R1-1 sign and corresponding stop bar on the northbound approach to the "T" intersection.
 - Installation of W10-3mod signs facing eastbound and westbound traffic prior to the turn indicating the location of the rail crossing.
 - Installation of a stop line combined with an R8-10 or R10-6 sign and red light(s), to be interconnected with the crossing warning devices, located on both the eastbound and westbound approach. The red light(s) shall be installed and connected by G&W but will become the responsibility of NBC to maintain following installation.
 - Installation of a Type IV gate (rather than a Type III) at the crossing approach at the base of the hill with a 19' high cantilever for maximum advance visibility.
- Signs R8-10 or R8-10a are recommended to be added at the stop bar in advance of each Type III warning device.

If you have any questions regarding this information, please do not hesitate to contact me at (401) 334-4100.

Sincerely,



Amy Archer, PE
Project Engineer