

**NOROTON HEIGHTS RAILROAD STATION
PLATFORM REPLACEMENT
METRO-NORTH RAILROAD - NEW HAVEN MAIN LINE**

**DARIEN, CT
STATE PROJECT NO. 0301-0170**

FINAL DESIGN REPORT



May 2016

Submitted to:
Connecticut Department of Transportation
Newington, Connecticut



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1. INTRODUCTION

This Final Design Report is presented in support of the Final Design Contract Plans for the Noroton Heights Railroad Station Platform Replacement Project along the Metro-North Railroad (MNR) New Haven Main Line. The Connecticut Department of Transportation (CTDOT) has retained Parsons Brinckerhoff to develop the Final Design for the replacement of platform sections and associated platform access structures under the Task Based Contract. The Final Design represents 100% design completion.

The Contract Package includes the design and suggested constructability methods for the replacement of platforms, landings, ramps, stairways, and platform shelter at Noroton Heights Railroad Station. Additionally there will be a doorway with associated stairway, landing, ramp and sidewalk constructed at the existing station building located to the north. All guardrails and handrails located on platform and access structures will be replaced. Platform appurtenances including, but not limited to, platform benches, signage, and lighting, will be removed, stored, and re-installed subject to determination of condition. Recycling centers will be removed and given to MNR, new recycling centers meeting current MNR standards will be installed on the replaced platforms. The existing light poles and light fixtures located on the platform and platform canopy will be retrofitted with LED luminaries. A complete new grounding and bonding system will be installed; currently one does not exist. An uninterrupted power supply (UPS) will be installed at both eastbound and westbound platforms for the platform lighting.

The removal and installation of the existing/proposed platform sections at the Noroton Heights Railroad Station will be performed within scheduled track outages, and will utilize accelerated construction methods. Regulatory function of the station, station building, and station overpass will be maintained during construction.

2. GENERAL DESCRIPTION

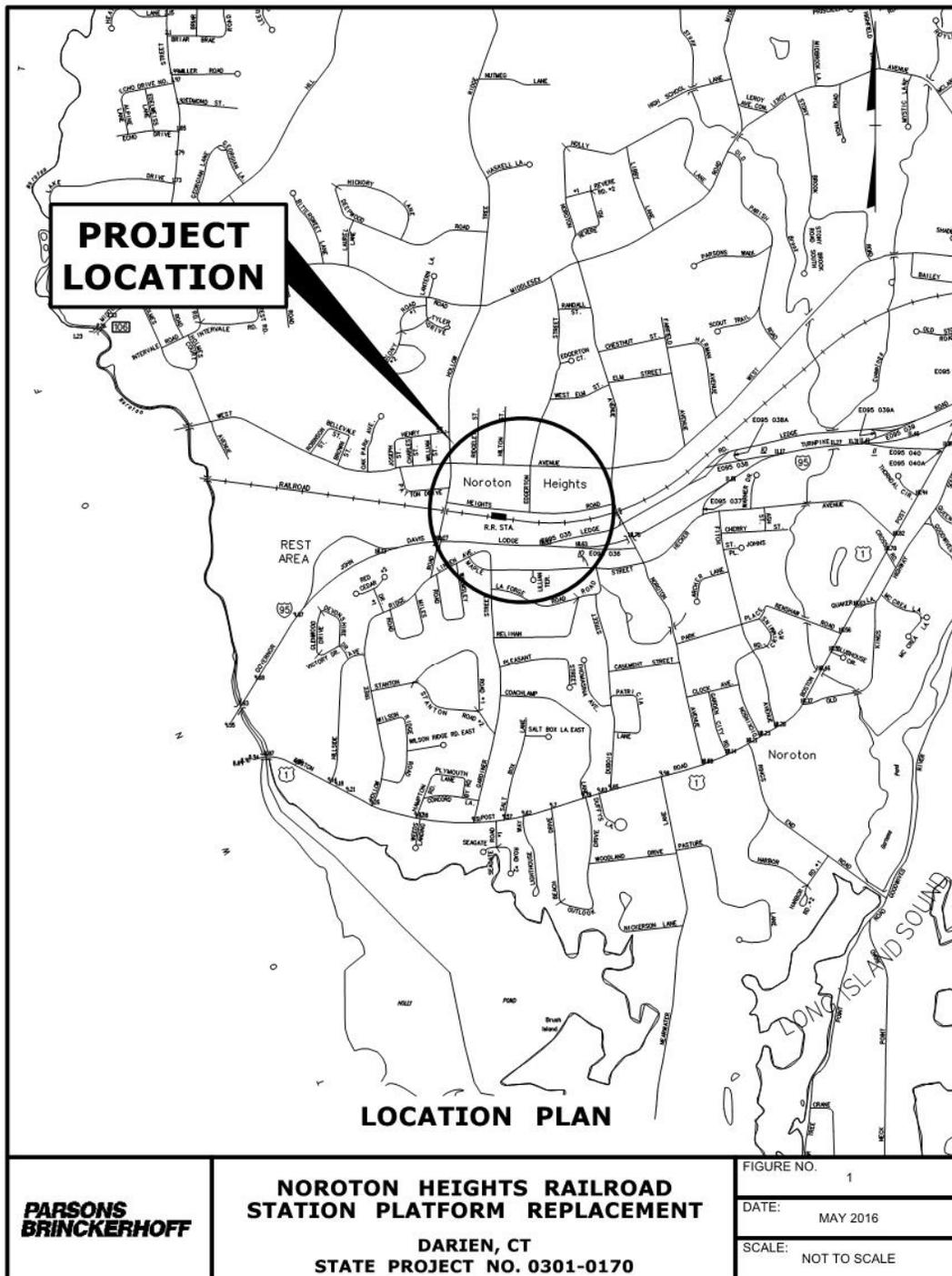
Noroton Heights Railroad Station is a mainline commuter train station located in Darien, CT. It is bound to the north and south by Heights Street and Interstate 95 respectively and to the east and west by Noroton Avenue and Hollow Tree Ridge Road respectively. The station consists of: 1) two platforms (eastbound and westbound) that are located directly opposite each other to the south and north of the four (4) mainline tracks; 2) a small Station Building to the North; 3) north and south parking with access to the eastbound and westbound platforms. Platform to platform access is obtained via a pedestrian overpass, for which rehabilitation/replacement/condition assessment is not included within the scope of this project. The eastbound platform (EB) is serviced by Track 4 and the westbound platform (WB) is serviced by Track 3.

Complete replacement of all platform double tee sections along with replacement of various other platform access structures is proposed. *(For limits of platform stairways, ramps and landings to be replaced, see contract plans)*. The proposed platform sections will be constructed of steel girders with precast platform panels that will be fastened to the top flange of girder via galvanized steel clamps. There will be a concrete overlay cast in place for the full limits of proposed platforms. Proposed access

stairways and landings will be precast (*except where noted in the contract plans*); proposed ramps, pier stem modifications and proposed substructures will be cast in place. All proposed platform access structures will be constructed to meet current ADA standards except as specifically noted where full ADA compliance is not feasible as a result of existing elements being retained in service. Existing piers supporting the existing platform will remain, modifications will be made to support the proposed platform sections and access structures; all existing bearings will be replaced.

The existing WB platform canopy structure and pedestrian overpass will not be impacted by the proposed rehabilitation and will remain in use during construction. The EB platform shelter and landing I will be replaced. Commuter access to a platform shelter is required at all times during construction, a temporary shelter will be installed during stage 1 to ensure this requirement is maintained. (*See contract plans for temporary shelter location.*)

All platform guardrails and handrails, including those located on stairs, ramps and landings will be replaced. Platform signage lighting and benches will be removed and re-installed and/or replaced in kind dependent upon condition assessment. Recycling centers will be removed by contractor and provided to MNR for disposal. Due to age of platform lighting it is anticipated that the majority if not all of the existing light poles will be reused. The existing light poles will be retrofitted with LED luminaire. The control panel for the EB platform lighting is currently located within the eastbound platform shelter; a new panel will be installed at a new location independent of the new shelter (*for location see contract plans*).



3. SITE WORK

Minimal site work is required for this project. No significant additions or alterations are anticipated; post-construction site conditions will closely match existing conditions. Permanent modifications to the site will include:

- A section of temporary concrete sidewalk north of the tracks.
- A new section of concrete sidewalk providing access to the north side of the station building.
- Concrete landings at the base of all stairs and ramps leading to the platforms.
- Reconstruction of the traffic island at the southeast corner of the site leading to Heights Street.
- Re-striping of a limited number of parking spaces in the southern lot.

The majority of the planned site work will be required to maintain safe pedestrian and vehicular access to various locations during construction with minimum inconvenience to the commuting public. There will be two small sections of sidewalk constructed on the northern half of the station. The first being to allow platform access during staged construction and the second to provide access to the proposed doorway located on the north side of the station building (*For locations of proposed sidewalks, see contract plans.*). In addition, temporary safety measures such as fencing, barricades and/or Temporary Precast Concrete Barriers will be utilized to separate pedestrians from the work site and vehicular traffic. To provide temporary construction staging areas for the structural work, specific locations as shown in the contract plans of the existing paved parking lot and driveway areas adjacent to both platforms will be reserved for contractor use. Existing grass areas adjacent to the west end of both platforms will also be utilized for construction staging and equipment areas. The one way drive from Heights Road for passenger drop-off and pick-up will require temporary closure and reconfiguration of traffic flow within the parking lot to the north of the tracks to allow for construction equipment during critical stages of construction.

It is the contractor's responsibility to prepare the stage area for construction, this may include but not limited to crane mats, timber cribbing, re-grading, etc.

Once stage construction is complete, the utilized construction equipment areas will be restored. It is anticipated that this will require milling and paving of pavement sections as well as placing top soil and turf establishment of grassed areas. Any areas utilized for equipment laydown shall be restored to, at a minimum, the existing conditions.

4. PLATFORM REPLACEMENT

4.1 PLATFORM DEMOLITION

The existing platforms, ramps, landings, stairways and existing substructures with associated platform appurtenances will be removed utilizing stage construction. (*See contract plans for stage construction limits.*) All existing ramps, landings and stairways can be removed from the 'field side' of the platforms, and will not require track mounted equipment.

Prior to start of stage construction pedestrian access to stage limits of platform must be restricted. No metallic fencing shall be allowed on the platform or within the track foul envelope. All barricades utilized on the platforms will need to be fastened with tamper proof screws. The existing platform lighting was replaced in 2010, the light poles are currently in satisfactory condition and therefore will be removed, stored and re-installed with LED retrofit. All conduit runs, junction boxes and cables associated with the platform lighting will be replaced. The removed platform lighting will be inspected after removal; findings will be submitted to engineer at which time it will be decided if condition has changed and replacement of select light poles is required. Special care should be taken not to damage the existing platform light poles during removal and storage. All benches and station signage will be removed prior to existing platform removal, and will be stored for reinstallation. Upon removal a condition assessment shall be performed and submitted to engineer, if any appurtenances are deemed to need replacement they will be discarded and replaced. Existing recycling centers will be removed and handed over to MNR for disposal.

Noroton Heights Station platforms will require removal during scheduled nighttime track outages. For much of the station, access for removal of the platforms can be obtained from the 'field side' of the platforms. At these locations the existing platforms can be removed using low clearance equipment. At locations where access is restricted, track mounted equipment shall be utilized (*for locations of restricted access see contract plans*). The existing platform canopy is to remain; care shall be taken during construction so as not to damage the canopy during removal activities. During removal of platforms there will be no debris allowed on the tracks. Measures shall be taken to protect the tracks during removal of platform sections.

4.2 PIER MODIFICATION AND BEARING REPLACEMENT

The proposed concrete/steel platform sections will be less in weight than the existing platform concrete double tees, therefore analysis of the existing pier bents for proposed loading is not required.

During design the existing piers were found to be in satisfactory condition and are suitable for re-use with minimal repairs. It is possible that the condition of existing piers at time of construction is different from current assessment. The contractor shall submit an assessment to the engineer for review. At each existing pier there is a 1" concrete pedestal and 1" bearing plate for each existing platform double tee stem. Many of the bearings and bearing connections exhibit high levels of rust and will require replacement.

The existing bearing assembly will be removed to allow placement of proposed bearing assembly for the proposed platform sections which utilize a shallower steel girder. The existing pier bents will be cleaned of all debris and contaminants and any necessary repairs made. It is proposed that there will be fixed and expansion piers, the bearing assembly varies at each location (*see contract plans for locations and further details*). A bearing pedestal with embedded angles and guide angle is proposed for expansion locations, at fixed locations there will be anchor rods and no guide angle. Steel laminated elastomeric bearing pads will be provided to support the proposed platform sections at all locations. Proposed

reinforcing and anchor rods will require drill and grout to achieve proper embedment into the existing pier stems.

4.3 PLATFORM REPLACEMENT

The proposed platforms consist of two (2) galvanized steel girders with precast platform units attached to the top flange of girders via galvanized steel clamps. There will be a concrete overlay and waterproofing sealant applied to the top of the precast platform panels. The steel and precast platform panels will be placed separately. *(See structural contract plans for further details.)* Proposed platform sections will be erected during scheduled track outages. For a large majority of the proposed platform sections there is direct access from the 'field side'. At these locations the proposed platform sections can be placed with low clearance equipment. At locations where direct access does not exist, track mounted equipment shall be required. *(See contract plans for further designation of platform sections requiring track mounted removal.)* Care should be taken while determining the sequence of proposed platform placement to ensure that placement of one platform section does not restrict the placement of future sequential platform sections. Sequence and means/methodology of proposed platform placement must be finalized by the contractor and submitted to the engineer for approval in the form of platform removal/replacement working drawings prior to the start of platform replacement construction activities.

5. ACCESS STRUCTURES

5.1 STAIRWAYS/LANDINGS

All of the platforms stairways and landings will be replaced except for Landing A and stairway A/F/J *(see contract plans for location)*. The proposed stairways and landings will be similar to existing and shall be precast except for specific locations. Stairways and landings will be fabricated to match existing elevations and shall meet current ADA standards for maximum slope, riser and tread. The stairs shall be armored with metal stair treads. The existing substructure for the stairway is unknown and shall be removed and replaced. The landings utilize existing piers that extend from the platform, these will remain. The pier stem will be extended to support the precast landing *(see contract plans for details)*.

5.2 RAMPS

Currently there are two (2) non-ADA ramps accessing the platforms at the Noroton Heights Railroad Station, through coordination with the Connecticut Department of Transportation it was decided that there will be a minimum of two ADA accessible access points to each platform. This requires an additional ramp to be added to the eastbound platform. There is a fourth ramp proposed to provide access to the new access doorway located on the north side of the existing station building. The two (2) existing ramps do not meet current ADA standards, are in poor condition and will require replacement. All new ramps will comply with current ADA standards and have a maximum slope of 12H:1V. Existing substructures will need to be replaced to align with proposed ramps. *(See contract plans for ramp locations.)*

A temporary ramp will be required during Stage 1, and shall be removed prior to start of Stage 2. Proposed temporary ramp shall comply with current ADA and MNR standards. The contractor shall submit the chosen temporary ramp plans and all details to engineer for review prior to construction.

6. ARCHITECTURAL CONSTRUCTION AND FINISH ELEMENTS

6.1 ARCHITECTURAL MATERIALS LIST

A. Eastbound and westbound platforms.

- Platform Guardrails: The existing guardrail system does not meet current state code requirements for opening limitations. The code states that a 4 inch sphere cannot pass through the guardrail to a height of 34 inches. All guardrails will be replaced with a system meeting current state code requirements and MNR station standards. Guardrails shall be constructed of galvanized structural steel finished with a powder coat system.
 - Color - Black
- Advertising Panels: Existing advertising panels will be removed by Out Front Media prior to the commencement of contractor work. Out Front Media is responsible for re-installation after construction is completed.
- Recycling Centers: The station is currently provided with standard MNR recycling centers painted blue. All recycling centers have chipped paint and rust present in various quantities and corrosive stages. All recycling centers will be replaced with current MNR standard 3-bin Stainless Steel recycling centers. Existing recycling centers will be handed over to MNR after removal. MNR will install new recycling centers provided by the contractor.
- Platform Benches: Existing aluminum benches will be removed, salvaged and stored during construction. Upon completion of the platform panel replacement benches will be reinstalled in their previous locations unless otherwise directed.
- Platform Shelter: The existing shelter located on the eastbound platform will be removed. A 20' x 10' temporary shelter will be provided during construction and removed upon final installation of the permanent shelter. A 30' x 10' permanent shelter will be provided upon completion of platform construction. The shelters will be a standard off the shelf items from a shelter manufacturer. The permanent shelter will be provided with the following
 - Anodized aluminum framing with anti-graffiti finish
 - Color - black
 - Glazing with anti-scratch film
 - Raised on an 8" concrete curb
 - Lighting
 - Sloped roof with standing seam roofing
 - Factory finished aluminum flashing at the base to block wind.
- TVM shelter: A shelter will be provided for the relocated Ticket vending machines. The shelter will be a standard off the shelf item from a shelter manufacturer.
 - Anodized aluminum framing with anti-graffiti finish
 - Color - black
 - Glazing with anti-scratch film
 - Flat roof with metal roof panels

- Signage: Existing signage will be removed and salvaged for reinstallation upon completion of the platform panel replacement. Existing handicapped parking signs will be replaced with signs providing language for fines associated with violations

B. ADA Ramps, Landings, and Stairs:

- Guardrails: The existing guardrail system does not meet current state code requirements for opening limitations. The code states that a 4 inch sphere cannot pass through the guardrail to a height of 34 inches. All guardrails will be replaced with a system meeting current state code requirements and MNR station standards. Guardrails will be constructed of galvanized structural steel finished with a powder coat system. Design of the guardrail will match that of Darien Station.
 - Color - Black
- Handrails: All existing handrails will be removed and replaced with clear anodized aluminum handrails meeting current state building codes, ADA requirements, and MNR station Standards.
- East stair handrail: the existing handrail will be modified to accommodate the removal and re-installation of the precast platform panels. The existing handrail exceeds the code requirement for handrail extension at the bottom of stairs which permits a portion of the handrail to be removed and modified.
- Stair treads: new stairs will be provided with cast aluminum treads with nosing. Cast treads will have a long wearing, slip resistant surface, with a wet-slip coefficient of 0.5 or greater

C. Station Building - Additional entry

- An entry will be added on the north station building wall to provide additional egress capacity and ADA access during construction, but will also serve as an additional permanent entrance for the station building.
- The entry will be provided with aluminum storefront framing and laminated safety glazing at the door, transom, and sidelight.
 - Color – match existing
- A permanent landing with ramp and stairs will be located at the exterior to provide an exit meeting ADA requirements. Clear anodized aluminum handrails meeting current state building codes, ADA requirements, and MNR station Standards with a powder coat system, color – black, will be provided.
- Guardrails: The landing will be located no more than 30” from grade, which by code does not require guardrail protection. The ADA ramp will be provided with toe protection per ADA code requirements.

6.2 BUILDING CODE AND STANDARDS

- ADA Standards
 - Department of Transportation ADA Standards for Transportation Facilities (2006)
 - DOT Regulation for Transportation Services

- DOT rule adopting the 2006 ADA Standards for Transportation Facilities
- 2005 State of Connecticut Building Code (IBC-CT) with 2009, 2011, and 2013 Amendments to the IBC-CT
 - Occupancy Class: A-3 Assembly, Waiting areas in Transportation Terminals
 - Allowable Height and area: Table 503 - 9,500 S.F. / 2 Stories
 - Construction type: Table 601 - 2B Non-combustible
 - Egress width required: Table 1005.1
 - Stairway - .3" per occupant
 - Other egress components - .2" per occupant
 - Stairs
 - Width: Section 1009.1 – Minimum clear width 44"
 - Maximum stair riser height: Section 1009.3 – 7"
 - Minimum stair tread depth: Section 1009.3 – 11"
 - Ramps
 - Width: Section 1010.5.1 - Minimum clear width at handrails 36"
 - Slope: Section 1010.2 – Maximum slope 1:12
 - Landing: Section 1010.6.3 - Minimum length 5'-0"
 - Guardrail
 - Height: Section 1012.2 – Minimum 42"
 - Exit travel distance Table 1015.1
 - 200 ft. without sprinkler
 - Dead End: Section 1016.3 – 20'-0"
 - Common path of travel: Section 1013.3 – 75'-0"
- MNR standards
 - MNR station standards, current version
 - MNR signage manual, current version

7. BUILDING SYSTEMS

7.1 ELECTRICAL

There are existing conduits that run along the 'field side' stems of the existing platform double tee sections. Prior to removal of existing platform sections existing utilities and power feed cables must be disconnected, insulated and secured for reconnection at a later stage of construction. Existing panels and utilities that feed existing platform sections outside of stage limits that are affected by stage limit removal must be redirected appropriately for the eastbound platform and adjacent area lighting and VMS so as to maintain power to the 'in use' temporary lighting arrangement for the 'in-use' section of platform. The temporary arrangement and its live energization should be completed prior to removal of existing power feed cables and or removal of existing power panels. Electrical utilities must be placed back onto proposed platform sections once stage construction work is completed. There shall be no exposed live electrical wires during construction. Power to 'in use' sections of platform and station building must be maintained.

7.2 LIGHTING AND COMMUNICATION

Existing platform lighting and attached communication system elements such as poles and fixtures will be removed prior to demolition and removal of platform sections. The existing lighting was replaced in 2010 under a different project and is still found to be in satisfactory condition, and therefore will be reused with LED retrofit. Care shall be taken during removal so as not to damage the existing lighting and communication system elements and components. The removed system elements should be stored until reinstallation occurs. The contractor shall coordinate removal of TVMs and PA system with MNR during construction. MNR shall be responsible for the disconnect and reconnect of the communication systems, the contractor shall be responsible for the removal, storage and reinstallation of the communication systems. The existing variable message signs will be reused, whereas the existing public announcement speakers will be replaced. The VMS and PA systems shall remain functioning at locations of the station and platform that are not within stage construction; all temporary conduit runs necessary shall be placed and located per the contractor's plans and shall be approved by the engineer. A UPS emergency backup system will be installed for the platform lighting at both the eastbound and westbound platforms. *(See contract plans for details.)*

7.3 GROUNDING AND BONDING

The existing grounding and bonding is missing from the platforms and other station structures. Coordination with MNR will be required to maintain proper grounding and bonding during stage construction. MNR will be responsible for the final tie in of the proposed grounding and bonding.

7.4 TVM RELOCATION

Access to ticket vending machines (TVM) shall be maintained at all times, except during approved window to perform relocation. To assure that access to the TVMs during all stages of construction the TVMs will be temporarily be relocated to the north side of the station building *(for location see contract plans)*. The TVMs require a concrete slab and a shelter. The contractor will be responsible for placing the concrete slab and shelter; MNR will be responsible for running all conduit and cables for power and communication, disconnecting existing conduits, and relocating TVMs to temporary location and final location.

7.5 HVAC SYSTEM

There will be a doorway installed at an existing window location of the station building. The installation of the doorway will require removal of the existing window, bench located inside building and electric baseboard heater. The electric baseboard heater will be replaced *(see contract plans for details)*.

8. DRAINAGE

With the exception of the temporary sidewalk section totaling 630 square feet in area, all permanent modifications to the site (landings) replace existing bituminous impervious areas with concrete

impervious area. The temporary net increase in impervious area is insignificant and will have a negligible impact on the drainage characteristics of the site. Proposed conditions will closely match existing conditions and no measurable increase in runoff will occur. The project site is outside of the 500 year flood plain with elevations between 63 and 86 feet. See figure 2 for further information of flood plain.

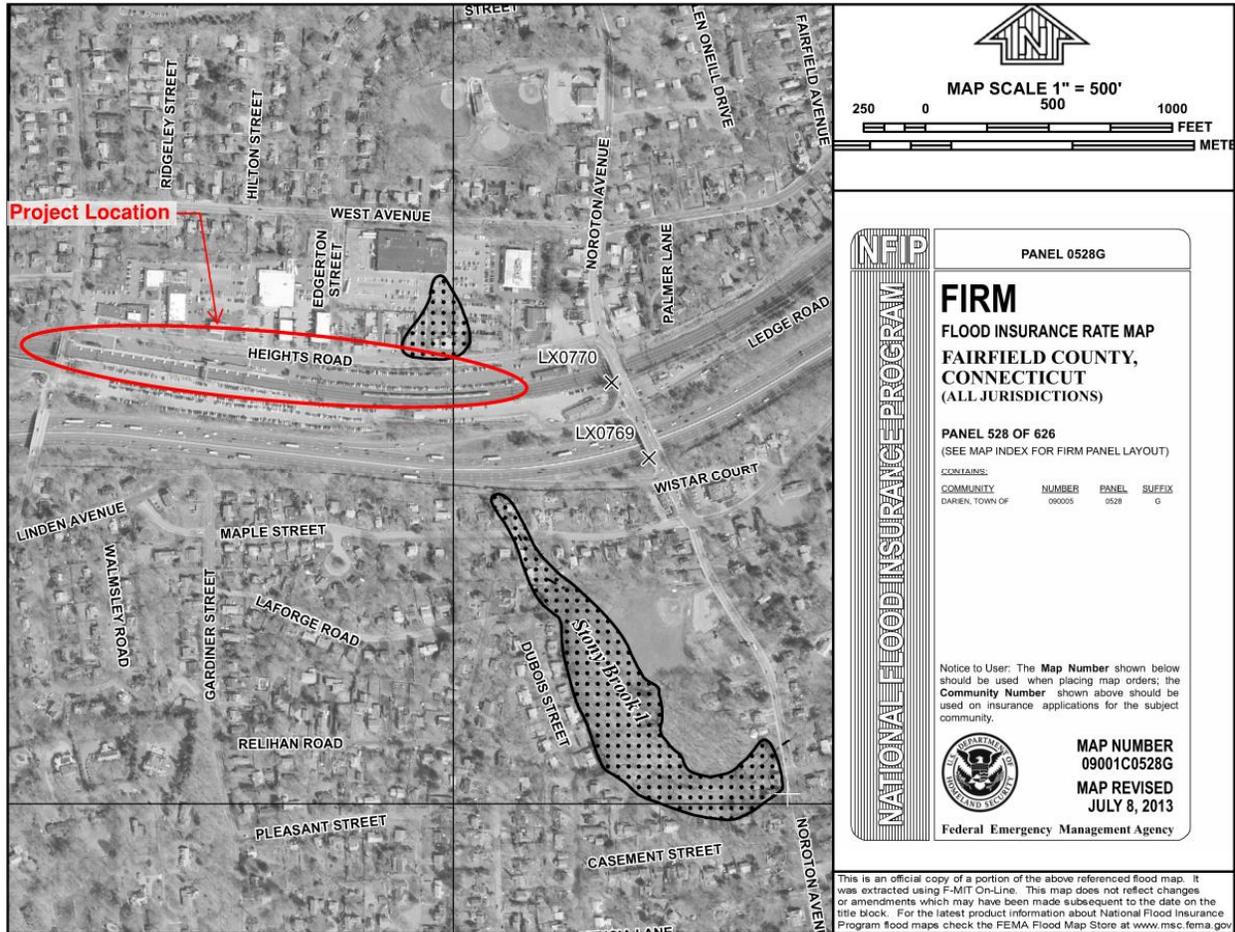


FIGURE 2

9. UTILITIES

Impacts to utilities will be limited to those required for construction. No improvements to site lighting, water and fire protection, storm drainage or telecommunications are included in the project. Minimum utility impact is anticipated.

Existing overhead utilities shall be located prior to construction, care shall be taken during construction so as not to disturb or damage existing overhead utility wires. If temporary de-energizing of overhead wires is required for construction activities coordination shall be done with corresponding utility companies prior to construction.

10. SEDIMENTATION AND EROSION CONTROL

Minimal disturbance of erodible surfaces is required for the project. Sediment control systems are proposed at two existing catch basins in the northern drive and a sediment control system will be installed north and south of the tracks. Due to the passage of express trains through the station and their potential to dislodge standard silt fencing, silt socks are recommended for the project. Proper erosion control measures and following the Best Management Practices will be followed along the tracks during the removal of the platforms and at catch basins.

11. CONSTRUCTION STAGING

The construction activities for the removal and replacement of Noroton Heights Railroad Station platforms are constrained by the existing station building, westbound platform canopy, pedestrian bridge, overhead catenary wires and overhead utility wires. Pedestrian and roadway traffic will be maintained throughout the station building, platforms (*not within stage construction*), Heights Road driveway, north and south parking lots and pedestrian overpass during peak periods. Stairway access from Hollow Tree Ridge Road will be restricted during stage construction of adjacent platforms. During approved off-peak periods the station building will be temporarily closed and Heights Road driveway access will be restricted. A drop-off area will be maintained at all peak periods during construction.

Construction staging, protection of Contractor personnel, protection of rail traffic, and/or outages will be coordinated with Metro North Railroad and will be maintained throughout construction operations.

General outline of a suggested sequence of operations for the construction of the station platforms, ramps, landings, stairways and shelter is provided on the Final Design Review drawings. Upon completion of construction activities within pavement areas the contractor will be responsible for milling and paving any area where conditions are not, at a minimum, equivalent to existing conditions. Once the construction activities are completed at the existing grass-surfaced areas adjacent to the west end of both platforms the contractor shall restore with topsoil, loam and seeding.

12. SCHEDULE

For construction schedule see Appendix A.

APPENDIX A

DETAILED CONSTRUCTION SCHEDULE

