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REPORT

October 2020

CITY OF
Beacon
New York

Hudson River Trail
Preliminary Design Report

Beacon Hudson River Trail – Preliminary Design Report

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1. Beacon City Council – For establishing the Beacon Greenway Trails Committee and for sponsoring the HVRG grant application that made this project possible.
2. Hudson River Valley Greenway – For championing the notion of a regional trail system that is free and open to the public and for providing funding that allowed the committee to hire a professional consultant to direct the planning and design process of this project.
3. Our committee members – For volunteering their time, commitment, and contributions to this project.
    - Andrew Bell
    - Matt Harle
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    - Thomas Wright - Chair

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GIS data provided by:

- Dutchess County Planning Department
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- US Fish and Wildlife Service

II - Executive Summary

The goal of the project is to fulfill the vision of the Beacon Hudson River Trail Master Plan for the planning, design, and construction of a multi-use scenic trail that provides a non-motorized link between the City of Beacon and surrounding communities by connecting the train station with the Newburgh-Beacon Bridge via the Trail of Two Cities and future trail networks within the Town of Fishkill.

This trail will improve access within the City of Beacon and become a valuable community amenity for residents and visitors. The trail will also improve the recreation and trail network, provide a non-motorized transportation connection to transit, and create an amenity with historical, cultural, and environmental education opportunities. Ultimately the trail will instill greater community investment and pride.

1 – Introduction

The Beacon-Hudson River Trail project area extends just over one mile from the Beacon Metro-North Railroad (MNR) passenger station north to the Newburgh-Beacon Bridge. The project area lies predominantly within the existing MNR right-of-way and adjacent to the railroad's maintenance road. The corridor terminates within the New York State Bridge Authority (NYSBA) Newburgh-Beacon Bridge right-of-way. In the vicinity of the bridge, the trail corridor extends east, parallel to the bridge's eastbound ramps up to the existing path (Trail of Two Cities) adjacent to the bridge service road.

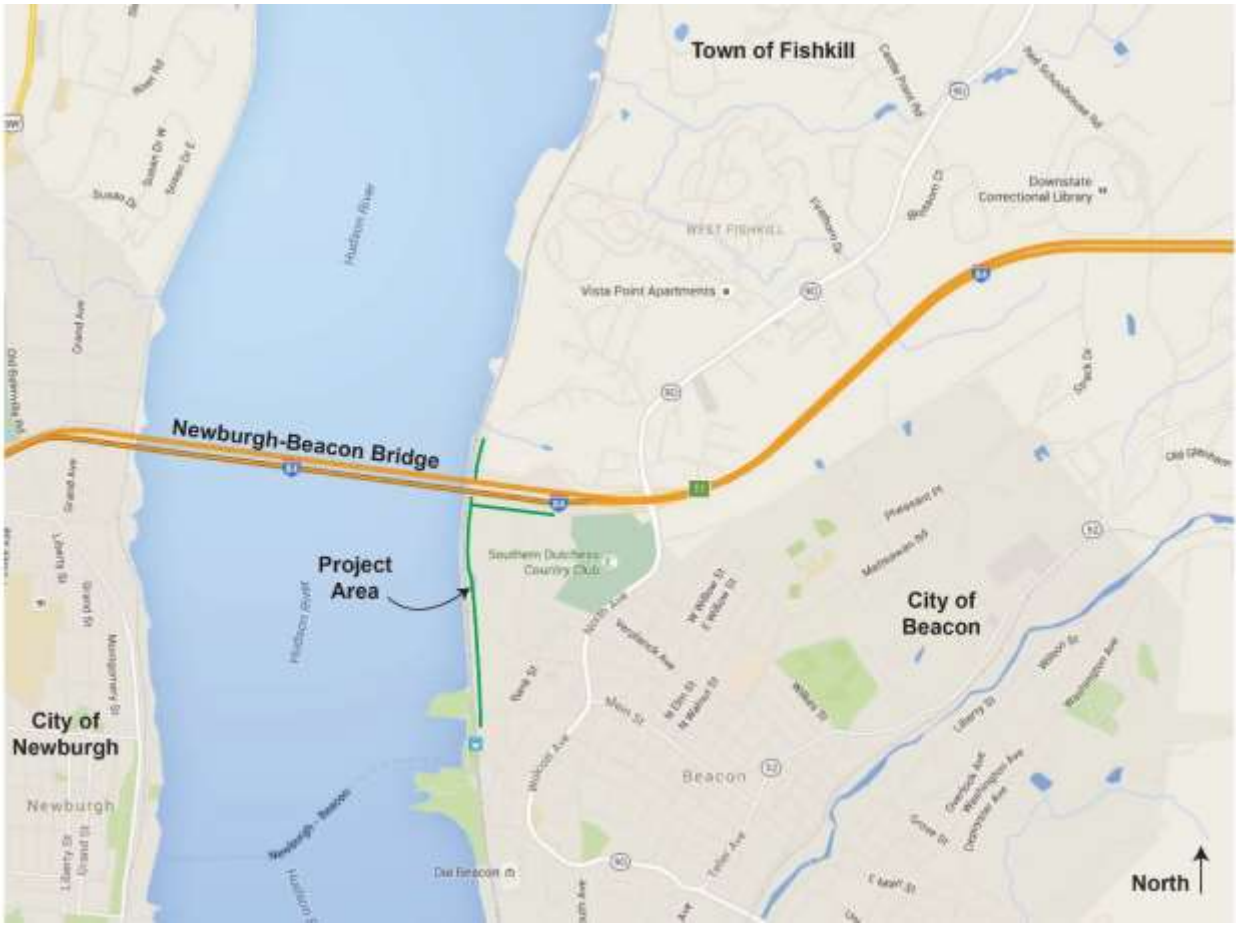


Figure 1.1: Project Area (Credit: Google)

1.1 – Project History

In 2015, the Beacon Greenway Trails Committee and the City of Beacon contracted Weston & Sampson PE, LS, LA, PC (Weston & Sampson) to develop a Master Plan for the Beacon section of the Hudson River Trail, a regional trail that seeks to connect communities and municipalities along the Hudson River for recreational and commuter use. There had been previous development and implementation of the Fishkill Creek Greenway Trail as well as the City's support of the Hudson Highlands Fjord Trail along the Hudson River waterfront and across Fishkill Creek. The Master Plan looked to address traffic challenging that the City experienced relating to the MNR passenger station, which was at full parking capacity and had waitlisted any future permit applications. By providing a bicycle/pedestrian connection to the Newburgh-Beacon Bridge, the trail would help relieve vehicle congestion while providing fitness, recreation, and economic benefits for the region.

In January 2017, Governor Cuomo announced the Empire State Trail, a new initiative placing New York State at the forefront of national efforts to enhance outdoor recreation, community vitality, and tourism development. When completed by the end of 2020, the Empire State Trail will be a continuous 750-mile route spanning the state from New York City to Canada and Buffalo to Albany, creating the longest multi-use state trail in the nation. As a result, the Beacon-Hudson River Trail would contribute to the north-south trail network along the Hudson River.

Upon completion and acceptance of the Master Plan, the City of Beacon contracted Weston & Sampson in 2018 to begin development of the Preliminary Design Documents for the project. A summary of the design process, decisions made, and work done to date is described in this report. Finally, copies of various support letters from elected officials, committee members and interested stakeholders.

2 – Project Summary

2.1 – Project Benefits

The four main benefits that the Hudson River Trail seeks to provide:

- Health – Trails and open spaces create opportunities for users of all ages and abilities to walk, run, bike, or hike within the City. As a result, by creating open space for these activities, they create opportunities for all to incorporate exercise, and healthy lifestyle habits into their daily routines.

- Transportation – Trails provide important non-motorized transportation connections within the urban network of roads, sidewalks, and transit facilities.

- Economic – One advantage of trails which is not always readily apparent are the financial benefits. Several studies indicate that trails and open spaces have a positive effect on property values. Similarly, a 2002 survey of home buyers sponsored by the National Association of Realtors and the National Association of Home Builders, noted that trails ranked as the second most important community amenity out of a list of 18 choices.

- Environmental – Trails provide multiple benefits to the environment, from improving air quality by encouraging non-motorized transportation and reducing automobile use, to cleaning up abandoned rail lines and creating green corridors within the urban fabric for protection of wildlife, aquatic and terrestrial resources.

2.2 – Existing Conditions

As part of the Master Plan, Weston & Sampson conducted a desktop review as well as a field reconnaissance on site to investigate existing resources and conditions. Resources reviewed included property ownership, topography, soils, floodplains, wetlands, streams, ponds, threatened & endangered species, and historic/ cultural resources. Below is a brief summary of specific site conditions analyzed during the Preliminary Design phase. Additional information regarding site resources may be found in the Master Plan Document.

Parcel & Right of Way:
There are currently two major landowners within this corridor, Metro-North Railroad (MNR) and New York State Bridge Authority (NYSBA). Private landowners own remaining sections of the corridor. Parcel owners are identified on the Preliminary Design plans included in Appendix A.

The majority of the areas under consideration are undeveloped, with the exception of the property immediately adjacent to the MNR tracks, parking areas, and adjacent to the Newburgh-Beacon Bridge Service Road.

Temporary construction and permanent easements will be required to allow for construction, and operations/maintenance of the trail. A 20 to 25-ft easement is proposed, with a varying width depending on adjacent land uses and constraints. The quantity and location of these easements will be dependent upon the final limits of work and construction. Ultimately a long-term maintenance agreement will needed between the City, MNR, and the NYSBA for maintenance, and operation of the trail. Adjacent to the railroad, security fencing, in compliance with MNR and NYSBA requirements, will be necessary along the railroad side of the trail denoting the limits of this easement and to protect workers and trail users from accessing the tracks.

Slopes & Sheer Rock Outcroppings:

Several areas as identified in the previous section contain steep slopes or sheer rock outcroppings along the trail alignment. A geotechnical analysis of the area was completed for the area between STA 33+50 and STA 42+14 to identify any potential concerns related to the rock outcroppings adjacent to the parking lot. Based on observations and an analysis of the Geologic Map of New York, this rock was identified as Austin Glen Formations composed of interbedded graywackes and shales. Most outcroppings consisted of blocky graywacke with complex bedding, often steeply bedded down in a south and west direction (downward in relation to the planned rock cuts). Towards the northern end of the area, the outcroppings are composed primarily of shale.

Steep slopes in the immediate project area were identified beneath the Newburgh-Beacon Bridge (±STA 3+00 to 6+00), in the forest area heading towards the Bridge Authority Access Road (±STA 105+00 to 111+00), and along the forest edge near the wetlands (STA±22+00 to STA 30+00). The forested area near the Bridge Authority Access Road is able to be graded with minimal need for retaining walls. To accommodate the other areas, retaining wall systems were developed to create an accessible pathway to the extent feasible. In addition, a ramp was constructed to allow for an ADA accessible decent from the top of the cliff in the wooded area near the Newburgh-Beacon Bridge down to grade near the wetland to the north of the railroad tracks (±STA 13+00 to 16+00).

A total of eight (8) test borings were completed throughout the project area to document subsurface conditions. The borings found that approximately 4 to 7 inches of topsoil was present at the location of the borings. The depth to bedrock ranged from 2.2 to 16.5 feet in most areas. Soil was found to be primarily composed of either silty-fine sand with a relatively loose density, compact silty sand and gravel, or glacio-lacustrine silt and clay. Bedrock cores were obtained in three locations, which found the bedrock to be composed primarily of gray shale which was generally medium hard – hard, weathered, thin bedded, and fractured to highly fractured.

A copy of the Geotechnical Report is included in Appendix B.

Stream Crossings:

Two ephemeral streams were identified along the project corridor, one at ±STA 6+50 and another at ± STA 9+00. Both flow west towards the Hudson River, discharging into a wetland to the south of the project area. In both locations, bottomless culverts are proposed to allow trail users to cross these streams and to minimize disturbance to the resources.

In addition, two unnamed wetlands were identified and mapped in the project area.
Quenzer Environmental performed a wetland delineation of the project area in July of 2018, which located the extents and limits of wetlands, streams, and waterbodies located within the project area. Resource areas were avoided or impacts were minimized to the extent feasible during the preliminary design process.

Security & Safety:
The proposed trail transverses land owned by the New York State Bridge Authority containing the bridge abutments for the Newburgh-Beacon Bridge. Due to the close proximity to an active railroad, roadway, and privately owned lands, a series of security & safety features have been developed.

Per the request of MNR and the NYSBA, 8-foot black coated chain link fencing has been designed to prevent access from the trail to the railroad and bridge authority lands and limit access to the site from an existing walkway located near the toll booths on the Beacon side of the bridge. The fencing will also prevent trail users from accessing the lands in the immediate area of the railroad tracks or the bridge abutments and will tie into existing fencing located along these properties.


Figure 2.1: Chain-link Fencing

Additional Note: The committee would like to point out that there are several local locations where there are no fences between a public trail and the MNR line. Two examples are Breakneck Ridge and the trail between the Beacon transfer station and the Dennings Point Bridge.

At the request of the NYSBA, security cameras will also be included in the area of the Newburgh-Beacon Bridge. This camera system will include a video server, four (4) thermal cameras, one (1) Axis HD PTZ Camera, a CCTV cabinet and related equipment, and associated conduit & cable required for installation.

Memoranda from the agencies and specifications for the security fencing and equipment is included in Appendix D.

3 – Alternatives Analysis

Several alternative layout options were developed and evaluated as a part of the project. A variety of trail slopes, alignments and widths were evaluated to determine the most cost-effective solution that minimized land disturbance while maintaining a comfortable and accessible trail for users of all interests. Below are descriptions and findings drawn from each layout option.

3.1 – Design Standards

For this project, the following design parameters were made to help guide the layout and alignment process.

Trail Longitudinal Slopes:

For each layout, accessibility was assumed to be held throughout the entirety of the alignment to ensure that the trail is as accessible to as many people as possible and to meet local, state, and federal accessibility requirements. Trail slope guidelines were taken from the American Association of State Highway and Transportation Officials (AASHTO). Generally, the maximum allowable slope to achieve accessibility is 5%, however slopes may exceed 5% for limited lengths and with exceptions, as described below:

- 5.1% to 8.33% - Maximum run of 200 ft.
- 8.34% to 10% - Maximum run of 30'
- 10.1% to 12.5% - Maximum run of 10 ft.
- Greater than 12.5% - Not Acceptable for ADA compliance

At the end of each maximum run, the slope must either be reduced to 5% or a level landing area must be provided before continuing the slope.

However, per the Shared Use Path Accessibility Guidelines Proposed Rule Making and Supplemental Notice of Proposed Rulemaking (Feb 2013) by the United States Access Board, grades greater than 5% will most likely be allowed if one of the following exceptions are met:

1. Compliance is not feasible due to terrain.
2. Compliance cannot be accomplished with the prevailing construction practices.
3. Compliance is precluded by the:

   ESA, NEPA, NHPA, Wilderness Act, and other laws which is to preserve threatened or endangered species; the environment; or archaeological, cultural, historical or other significant natural features.

In each scenario, no greater than 30% of the total path length can exceed 8.33%, and the maximum allowable cross slope in all instances is 2%. As a result, the alternatives evaluated looked at using 5%, 8.33%, 10%, and 12.5% as the maximum allowable slope throughout the corridor.

Trail Width:

AASHTO guidelines identify 10 feet as the minimum width, with 8 feet being acceptable in conditions where bicycle traffic is expected to be low, high pedestrian use is not expected, the trail alignment allows for safe and frequent passing opportunities, and when paths will not be subjected to regular maintenance vehicle loadings that can cause pavement edge damage. Trail widths of 8 and 10 feet were assessed as a part of the alternative analysis.

While the trail will likely not be subjected to regular maintenance vehicle loading, bicycle and pedestrian traffic is anticipated to be more frequent than recommended for the use of an 8-foot-wide path. In addition, a grading analysis was completed for both trail widths along the corridor which found that reducing the trail width to 8 feet did not result in any substantial decrease in grading impacts, heights and limits of retaining walls, or overall limits of disturbance. As a result, based on this analysis, a 10-foot-wide path was assumed for each of the design alternatives.

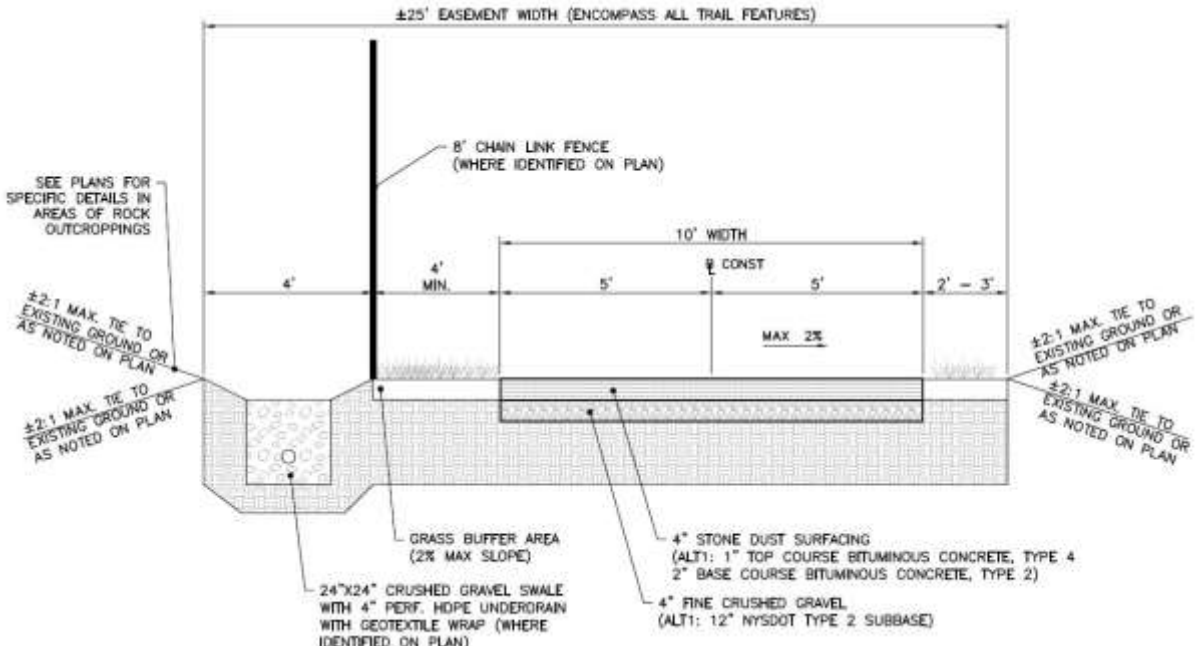


Figure 3.1: Proposed Trail Cross Section

Trail Setback:

Per MNR requirements, trail facilities are required to be set back at least 15 feet from any active railroad track, with a 25 foot setback preferred. The current trail alignment maintains a minimum of 25 feet between any proposed structure and the edge of the nearest track. In the area of the cliff descent between STA 13+00 and 16+50, minor grading will be required between the 25- and 15-foot setback area to allow for construction of a retaining wall system.

3.2 – Alternative Analysis Segments

As part of the overall alignment, several alternatives were evaluated, including:

1. Trail Segment – Steep Slope (13+50 to 16+50)
2. Trail Segment – Spur to Bridge Authority Building (8+39/100+00 to 115+63)
3. Trail Segment - Rock Outcropping (Station 33+50 to 42+14)
4. Trail Surfacing

Figure 3.2: Typical Trail Condition

3.2.1 – Trail Segment – Steep Slope (13+50 to 16+50)

A sheer cliff face is present along the trail alignment at approximately STA 13+00 to 16+50. The elevation difference between the top and bottom of bank is approximately 25 feet. This presented a challenge in how to allow trail users to navigate the cliff descent while maintain an ADA accessible facility. A combination of elevated structures supported by piers and a retaining wall system was developed to support the trail. Several slope options were explored for this system to determine which slope created the least amount of impact while maintaining user accessibility. While this was the steepest area of the trail with the most elevation difference, the slope parameters were used for the remaining areas of the main trail spur between the Bridge Authority lands and the train station parking lot.

Preferred Alternative - Alignment Option A: 8.33% Slope, 10' Width

Option A utilized a maximum trail slope of 8.33% along the main trail alignment. The main benefit of this alternative is that it allows for less extensive wall systems than Option A. Even with the necessary landings required every 200', ramp lengths are significantly shorter than those necessary in Option B. The steeper slopes allow for less extensive grading requirements beyond the trail centerline to tie back into the existing topography.

The primary challenge presented in this option is the landings and steeper ramps break up the travel flow of trail users, especially cyclists. The steep and level areas become more pronounced, and the landings make the construction process more complex than what would be needed in Option B.

Ultimately, it was determined that the reduced extents of grading, shorter ramp lengths, and less complex retaining wall systems required for this option were the most desirable of the alternatives and outweighed the constraint of having steeper slopes in some areas. For this reason, Option A was chosen as the preferred alternative that proceeded to design development.

Figure 3.3: Overall perspective of Trail Alignment

Alternatives Considered

Alignment Option B: 5% Slope, 10' Width

Alignment Option B utilized a maximum trail slope of 5% along the main trail alignment. The main benefit of this alternative is that it is the most accessible and easiest of the options to navigate for users of all skill levels.

The challenges presented by this option include increased lengths of ramps and the necessity of longer and taller retaining wall systems than the other alternatives. This results in increased construction costs and a less open feeling when navigating the trail. The more gradual slopes also contribute to extensive grading beyond trail centerline to tie back into the existing topography.

Due to the substantial increase in retaining wall extents and heights required, this option was ultimately not chosen as the preferred alternative for further development.

Alignment Option C: 10% Slope, 10' Width

Alignment Option C utilized a maximum trail slope of 10% along the main trail alignment. Despite having a steeper allowable slope than Option B, the maximum allowable run of 30 feet required significantly greater landing zones on any steeply sloped areas. This resulted in the areas that required the use of steep ramps to have approximately the same impact area and retaining wall extents as those required in Option B. In addition, the frequency of landing zones required at areas of substantial elevation change would lead to increased construction complexity and impact the travel flow of trail users, especially cyclists.

While there are a few areas in which utilizing a 10% slope reduced the overall grading impacts, the necessity of retaining walls of similar size and complexity as those needed in Option A did not result in any significant construction or cost savings. Such little savings in terms of cost and constructability did not offset the loss of accessibility and navigability of the trail. For this reason, Option C was not chosen as the preferred alternative for further development.

Alignment Option D: 12.5% Slope, 10' Width

Alignment Option D utilized a maximum trail slope of 12.5% along the main trail alignment. Like Option C, the reduced maximum allowable run of ramp areas (10') resulted in similar ramp lengths and retaining wall complexity as those found in Option B. In addition, the extreme frequency of landing zones required at areas of substantial elevation change would lead to increased construction complexity and dramatically impact the travel flow of trail users, especially cyclists.

Since 12.5% is the least desirable slope, and the extents of grading and retaining wall extents were not substantially different than those found in Option A, Option D was not chosen as the preferred alternative for further development.

3.2.2 - Trail Segment – Spur to Trail of Two Cities (8+39 / 100+00 to 115+63)

To allow additional prospective trail users to access the Hudson River Trail, an additional trail spur that connects to the Trail of Two Cities and the Bridge Authority Building is proposed. This spur would create an efficient spur connection for users who travel across the Newburgh-Beacon.

The topography in this area is relatively steep, with slopes averaging 12% across the 85 feet in elevation change. It is a densely forested area which will require tree removal, brush removal, clearing, and grubbing to allow for the new construction of the trail and accommodate the earthwork required to achieve accessibility. Due to this significant elevation difference between the Bridge Authority Building and the main trail alignment, it was determined that a 5% slope would be impractical from a construction and cost perspective. Multiple switchbacks with retaining walls more than 20 feet tall would be required to achieve a 5% maximum slope, making this connection cost prohibitive.

For this reason, each alternative utilized a single switchback layout option with a gradual radius that would accommodate cyclists and minimize the extents and heights of retaining walls required.

The path maintains a maximum slope of 8.33% with three landing areas to meet the AASHTO accessibility guidelines.

3.2.3 - Trail Segment - Rock Outcropping (33+50 to 42+14)

As the trail approaches the MNR Beacon Trail Station, the proposed alignment shifts to the east between the existing parking lot and a sheer rock outcropping. While most of this section is wide enough to allow for a 10' wide trail with adequate shoulder space, there are several areas where the rock outcropping extends closer to the parking lot resulting in a narrow corridor through which to align the trail.

Figure 3.4: Proposed Trail Adjacent to Rock Outcroppings and Parking Lot

A geotechnical analysis of the rock outcropping was complete by Terracon to determine the qualities of the rock faces and the most appropriate methods for removing portions of the outcroppings to allow for trail construction. The full geotechnical report is included in Appendix B.

Geotechnical Analysis

Per the NYSDOT Geotechnical Design Manual, rock cuts in the lower Hudson Valley are primarily made 3V on 2H, and all shale slopes are made 1V on 1H. These parameters were used to determine the extent of cutting & reinforced of the rock area adjacent to the parking lot.

If the amount of cut required extends further than initially planned, several stabilization techniques may be used, including scaling, rock bolts and dowels, wire mesh and cable net systems, and reinforced shotcrete. Based on evaluation of existing site conditions, scaling and rock dowels is recommended in conjunction with a catchment zone at the base of the slope.

Alternatives Considered:

Scaling - Scaling involves the removal of loose overhangs, weathered pockets, or unconnected rock from the slope. This technique is preferred because it can be done without blasting. Blasting may be used if deemed necessary due to site conditions.

Rock Dowels - Rock dowels are untensioned anchors installed to prevent movement in small blocks of rock. This technique may be used in conjunction with scaling depending upon the conditions encountered in the field.

Implementation of any rock removal or stabilization practices and techniques should be confirmed in the field prior to beginning work with a geotechnical engineer to determine specific areas where such techniques and practices are required.

3.2.4 – Trail Surfacing

Different surfaces offer various benefits and constraints including cost, accessibility, and maintenance requirements. Two surfaces were primarily investigated for use on this project: compacted stone dust and asphalt. Other surface options, such as shredded mulch and concrete, were discounted due to either maintenance/ accessibility or cost concerns.

Figure 3.5: Example of Stone Dust Surface Trail

Stone Dust:

The benefits of stone dust include lower initial material and installation costs and a more natural aesthetic than asphalt. Stone dust is considered a hard and stable surface material for accessibility, provided that it is maintained to ensure a level surface. Due to the steeper slopes located in some segments of the trail, a high level of maintenance would be needed to maintain accessibility and replenish material lost due to erosion, increasing the cost of long-term maintenance would be greater. Stone dust, while adequate for pedestrian use, is less desirable for bicycle use (particularly cyclists with road tires).

Asphalt:

Asphalt has a higher initial installation and material cost, but fewer long-term maintenance costs. A typical asphalt trail has a life span of approximately 10-15 years before needing to be resurfaced. Small cracks and settlement are able to be spot repaired as they arise and would be expected on a less frequent basis than replenishing and regrading stone dust. Asphalt is an accessible surface that required minimal maintenance to ensure accessibility, particularly in areas with steeper slopes.

Given the pros and cons, but also considering the quality of user experience, the committee has a strong preference for stone dust surface.

Alternative Scenarios:

Based on this analysis, three alternative surfacing scenario budgets were developed for the project.

The first scenario (preferred Base option) consists of a combination of stone dust and asphalt surfacing with stone dust being utilized for a majority of the alignment and asphalt being utilized in areas that exceed 5% slope.

The second scenario budget consist of stone dust for the entire length of the trail.

The third scenario budget consists of light duty asphalt surfacing adequate to support bicycle and pedestrian traffic for the entire trail.

Figure 3.6: Example of Asphalt Surface Trail

Ultimately, during the final design phase, one of the three scenarios will need to be selected to further the design.

4 – Preferred Alternative Summary

Through the Preliminary Design process, several specific site features were identified related to the implementation of the trail. These include:

- Sheer rock outcroppings and steep slopes throughout the project corridor
- Proximity to active railroad tracks
- Multiple parcel owners requiring safety precautions (fencing, etc.) to be implemented
- Proximity to wetlands
- Multiple stream crossings

Multiple concept alignments and grading schemes were developed, with Option A ultimately being selected as the preferred alternative. This option utilizes a maximum trail slope of 8.33%, and resulted in the least amount of retaining walls, grading, and earthwork while still achieving an accessible path throughout the length of the trail.

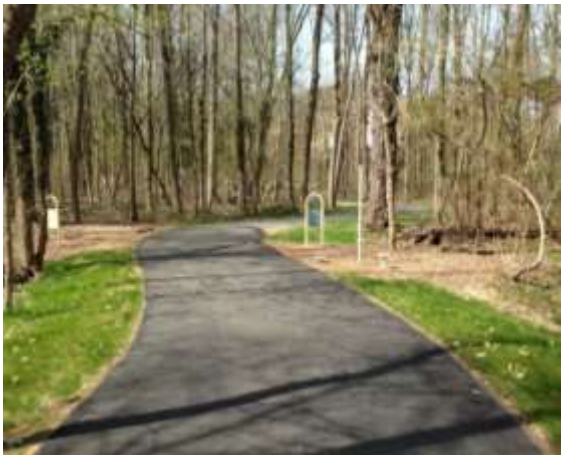


Figure 4.1: Example Trail through Woods

While this Preliminary Design Report identifies the preferred alignment and grading, specific construction elements will need to be addressed during Final Design, most notably the extent and methodology of rock removal and reinforcement at the area adjacent to the parking lot between STA 33+50 and 42+14. In addition, specific pedestrian bridge and culvert structures will also need to be designed to accommodate the surrounding grades and ephemeral streams.

Upon selection of Option A as the preferred alternative, Weston & Sampson proceeded with developing Preliminary Design Plans for the trail. The trail alignment was modified and refined to minimize grading impacts and earthwork disturbance, reduce the number of stream crossings, and optimize trail radii and elevation changes. Preliminary Design Plans are included in Appendix A of this report.

There are two proposed crossings over ephemeral streams along the trail alignment. Bottomless culverts have been proposed as part of the trail system to manage these crossings. Crossing 1A is approximately 40 feet long and located between STA 6+40 and 6+80. Crossing 2A is approximately 35 feet long and located between STA 8+75 and 9+10.

To accommodate the steep slopes and grading needed to cut the trail into the existing landscape, a retaining wall system was developed using the Redirock product. This block was chosen due to the extensive length and height of the walls, as the larger block is more cost effective and allows for the installation of guardrails along the top block. In the area adjacent to the parking lot (STA 33+50 to 42+14, the geotechnical analysis determined that the exposed sheer bedrock is suitable to use as a natural retaining wall, with some areas being cut and/or reinforced to allow the construction of the path. Additional geotechnical information is included in the following section, and a copy of the full Geotechnical Report is included in Appendix B of this report.

In the area of the sheer cliff face (±STA 13+00 to 16+25), a ramp structure will be constructed and cut into the existing rock outcropping to allow trail users to descend from the elevated forested area down to the area adjacent to the railroad tracks and wetland. The structure will be constructed of a combination of Redirock block retaining wall, retaining enough soil and subbase material to suitable support a 10-foot wide trail, and elevated superstructures supported by pier systems. Structures will be cut into the rock as necessary following guidance from the geotechnical engineer.

Trailheads and overlooks are proposed in several locations throughout the alignment, concentrated primarily in the elevated forested area and on the spur connecting to the New York State Bridge Authority building. These facilities will be constructed of concrete unit pavers, be supported by segmental block knee walls and retaining walls, and contain amenities such as benches, trash receptacles, dogi-pot stations, informative signage, and trail mapping.

Figure 4.2: Example of Trail Wayside

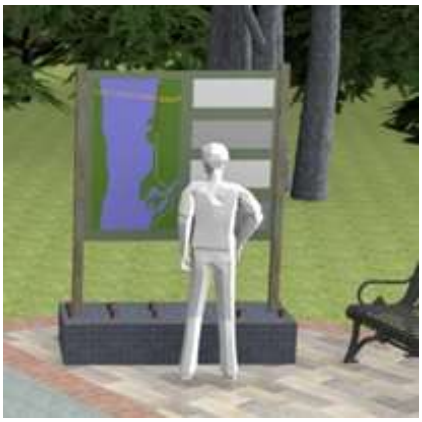


Figure 4.3: Example of Trail Information Kiosk

4.1 – Phasing Strategy

A multi-use trail requires multiple phases for development and construction. Several factors influence phasing, including but not limited to overall length of the trail project/segment, property acquisitions, level of regulatory permitting required, difficulty of construction, and most importantly the amount of available funding.

If feasible, to maximize cost and efficiency it is recommended that the project be implemented in one phase. However, in most cases, a single phase is not possible due to funding constraints or approval processes required for various sections of the project.

As a first phase, it would be beneficial to establish an informal soft surface trail alignment, set-up access agreements/easements with property owners, and therefore enabling access for interested trail users. The alignment would begin at the Newburgh-Beacon Bridge access road (STA 115+00) towards the proposed boardwalk structure at the MNR property boundary (STA 12+00). Within this first phase, the trail spur (STA 200+00 to STA 243+45) would also be established to create a viewing area overlooking the river.

5 – Conclusion

Upon approval of the Preliminary Design Documents, final Construction Documents (including contract drawings and specifications) shall be prepared for bidding. These plans shall address outstanding comments and concerns from project stakeholders. In addition, preparation of easements and agreements shall be prepared to clearly identify the limits of work and long-term responsibilities of all parties involved. A work safety plan will need to be prepared to ensure all parties involved in construction are adequately protected from the active railroad area and meet , NYSBA, MNR and OSHA guidelines for construction near active rail lines.

A Stormwater Pollution Prevention Plan (SWPPP) will be required to identify erosion and sediment control measures and potentially treat stormwater runoff generated by the new impervious area. This plan will be submitted to NYSDEC for acceptance and approval and will require the Contractor to maintain the erosion and sediment control practices throughout construction, including weekly inspection of protection devices.

A site survey should be completed in the areas of rock outcroppings which located the top and bottom of rock face, locates outcroppings along the rock faces, and maps profiles and sections of the existing rock face. This should be done to clearly establish the limits of rock removal needed and better identify which reinforcement measures are appropriate for specific areas along the trail.

At the request of the New York State Bridge Authority, security cameras should be installed in the immediate area of the Bridge Authority lands. Exact locations, models, and installation requirements should be coordinated with the Bridge Authority as part of the final design package. In addition to the security cameras, chain link security fence should be installed to enclose the trail system and separate trail users from Bride Authority and MNR lands. Exact height and locations of the fencing should be coordinated with each authority during the final design phase.

Additional subsurface utility mapping should be conducted in the area adjacent to the New York State Bridge Authority roadway and building to ensure any existing utilities are protected during construction. Subsurface utility locating should also be conducted in the area adjacent to the existing train station parking lots, and along West Main Street.

Appendix A – Preliminary Design Plans

Sheet List Table	
Sheet Number	Sheet Title
G001	COVER SHEET
C001	INDEX PLAN
C101	PLAN & PROFILE STA 0+00 – 9+00
C102	PLAN & PROFILE STA 9+00 – 18+00
C103	PLAN & PROFILE STA 18+00 – 27+00
C104	PLAN & PROFILE STA 27+00 – 36+00
C105	PLAN & PROFILE STA 36+00 – 42+14
C106	PLAN & PROFILE STA 100+00 – 105+00
C107	PLAN & PROFILE STA 105+00 – 112+00
C108	PLAN & PROFILE STA 112+00 – 115+63
C109	PLAN & PROFILE STA 200+00 – 203+45
C301	TRAIL CROSS SECTIONS
C302	TRAIL CROSS SECTIONS
C303	TRAIL CROSS SECTIONS
C304	TRAIL CROSS SECTIONS
C305	TRAIL CROSS SECTIONS
C501	TYPICAL DETAILS
C502	TYPICAL DETAILS
C503	TYPICAL DETAILS

CLIENT

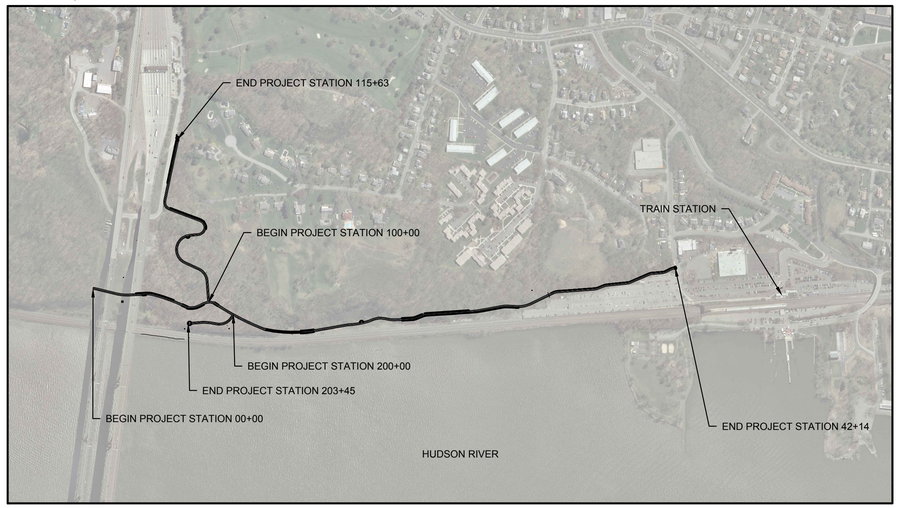
City of Beacon, New York
Recreation Department
23 West Center Street
Beacon, New York 12508
Contact: Mark Price, Director of Recreation
845.765.8440

HUDSON RIVER GREENWAY TRAIL

CITY OF BEACON, NEW YORK

JULY 15, 2020

LOCATION PLAN
N.T.S.



SCALE: 1" = 500'

LOCATION MAP

CONSULTANT

Weston & Sampson SM

1 Winner's Circle, Suite 130, Albany, NY
518.463.4400 800.SAMPSON
www.westonandsampson.com
Contact: Daniel Biggs, RLA

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

1 **INDEX PLAN**
SCALE: 1" = 200'

0 200 400

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No.	Date	Dr.By	Ck.By	App.By	Description
					APPROVED

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

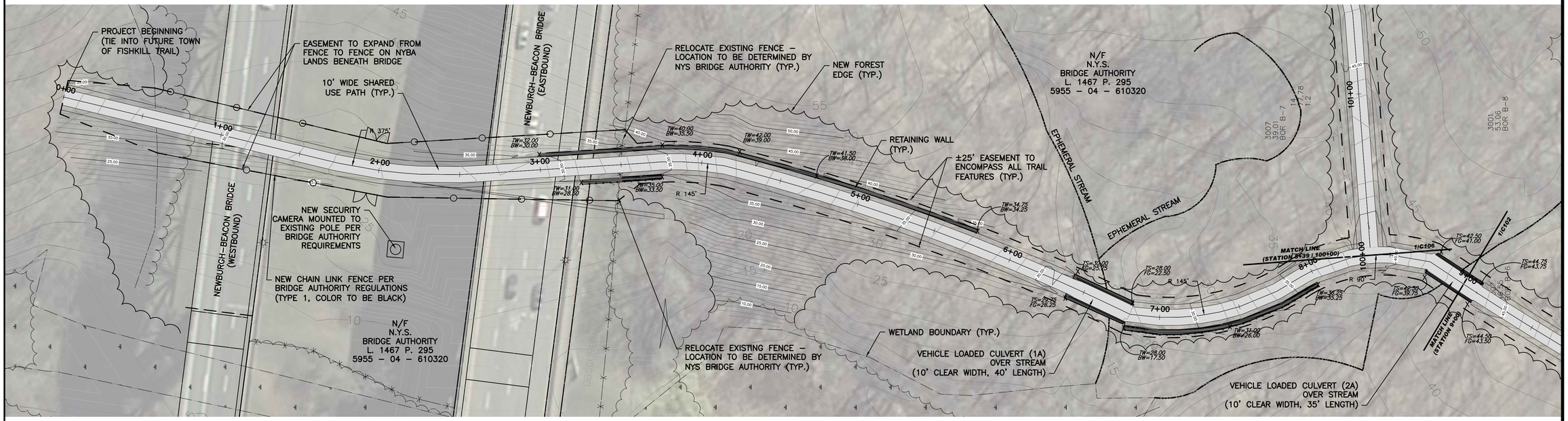
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

INDEX PLAN

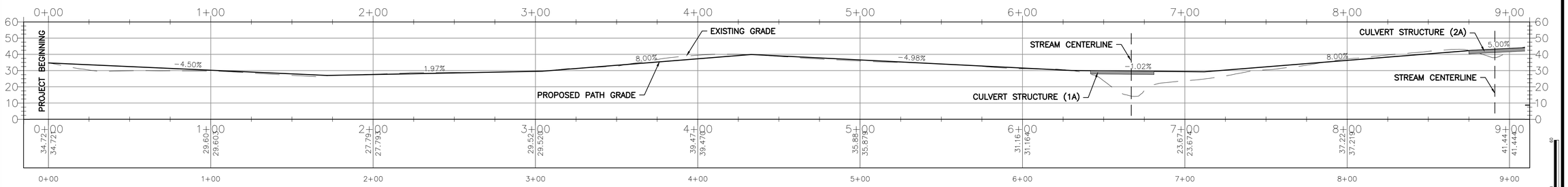
CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
	1" = 200'		N21800028	JWG	JWG	DPB	DPB

FILE NO.

C001



1 **SITE PLAN (STA 0+00 TO STA 9+00)**
SCALE:1" = 30'



PROFILE VIEW (STA 0+00 TO STA 9+00)
SCALE:HORIZ: 1" = 30' VERT: 1" = 30'

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No.	Date	Description	Dr.By	Ck.By	App.By
		APPROVED			

JULY 15, 2020
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CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

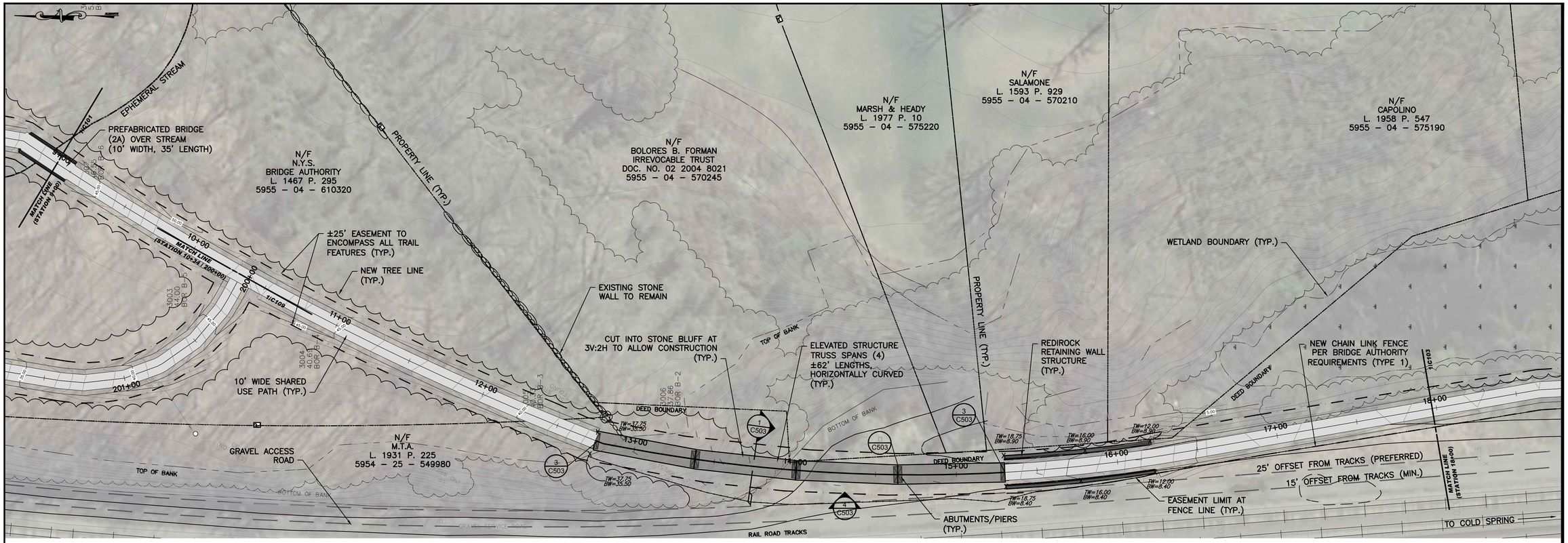
PLAN & PROFILE STA 0+00 – 9+00

SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
BAR SCALE		N2180028	JWG	JWG	DPB	DPB

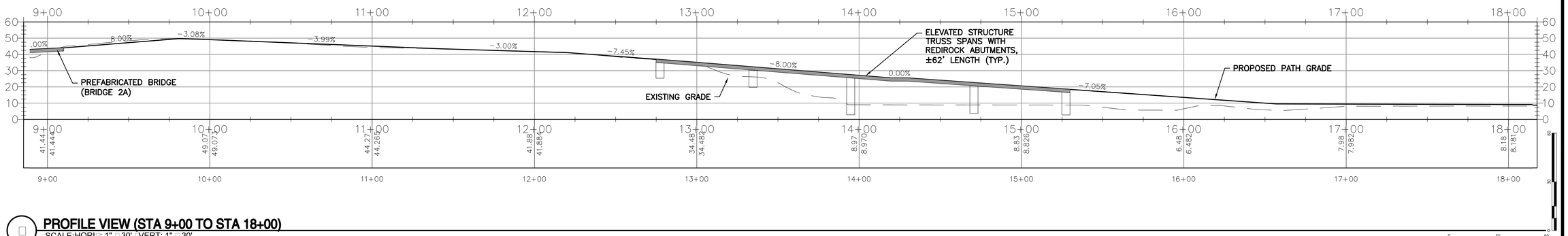
CADD NO.

C101
FILE NO.

SHEET 3 OF 19



1 **SITE PLAN (STA 9+00 TO STA 18+00)**
SCALE:1" = 30'



PROFILE VIEW (STA 9+00 TO STA 18+00)
SCALE:HORI. 1" = 30' VERT: 1" = 30'

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No.	Date	Dr.By	Ck.By	App.By	Description
					APPROVED

JULY 15, 2020
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CITY OF BEACON, NEW YORK

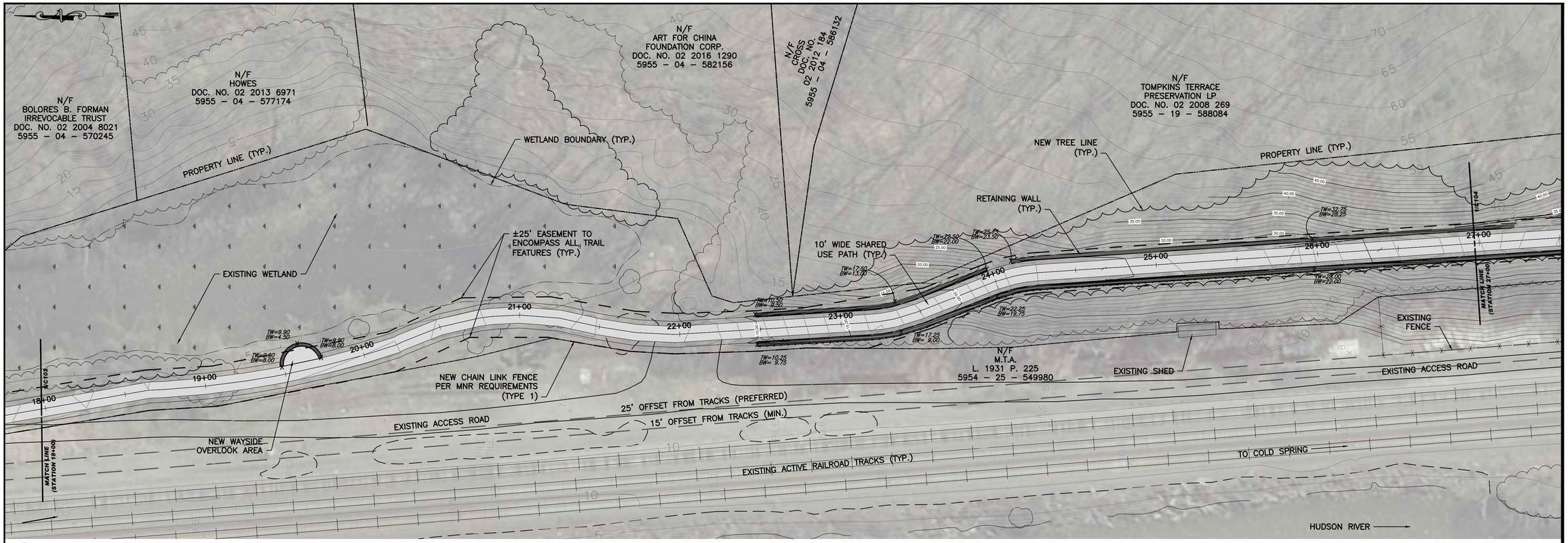
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

PLAN & PROFILE STA 9+00 – 18+00

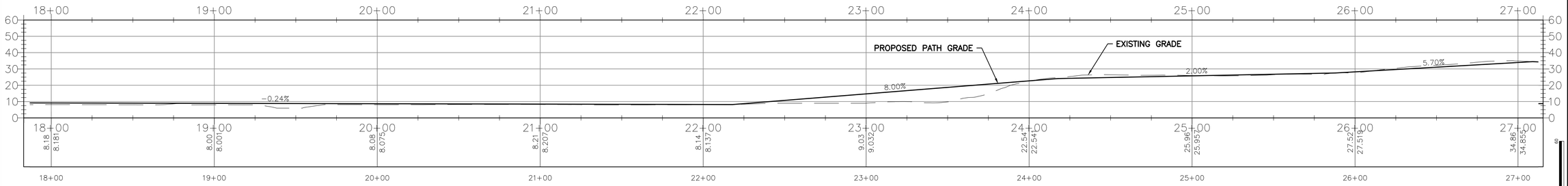
CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
	BAR SCALE		N21800028	JWG	JWG	DPB	DPB

C102
FILE NO.

SHEET 4 OF 19



1 **SITE PLAN (STA 18+00 TO STA 27+00)**
SCALE:1" = 30'



PROFILE VIEW (STA 18+00 TO STA 27+00)
SCALE:HORI: 1" = 30' VERT: 1" = 30'

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					APPROVED

JULY 15, 2020
DATE

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NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

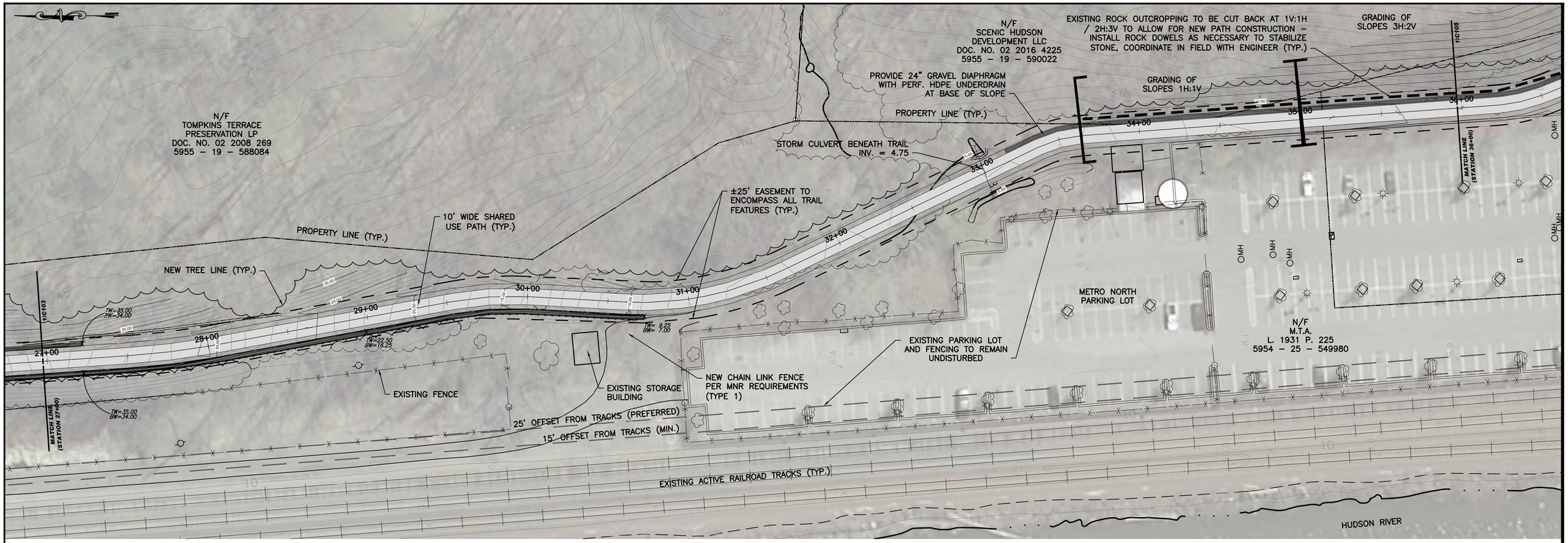
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

PLAN & PROFILE STA 18+00 – 27+00

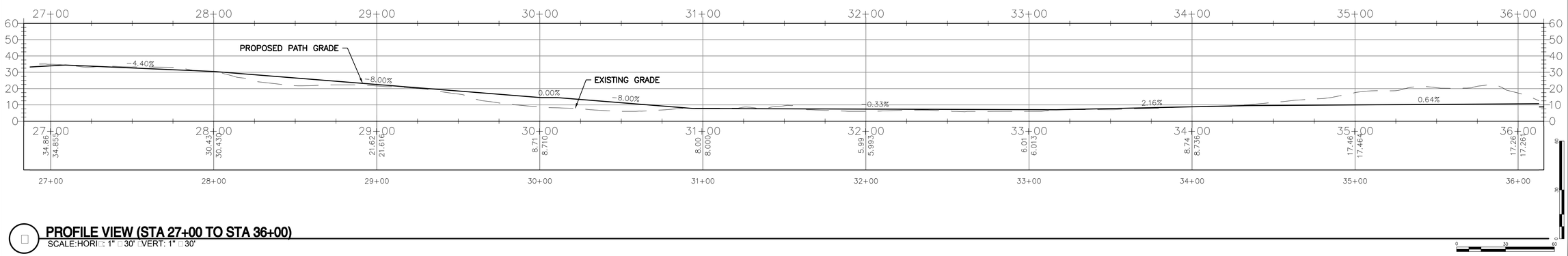
APP.BY	CHK.BY	DSN.BY	DR.BY	JOB NO.	CONTRACT:	SCALE:	CADD NO.
DPB	DPB	JWG	JWG	N21800028		BAR SCALE	

C103
FILE NO.

SHEET 5 OF 19



1 **SITE PLAN (STA 27+00 TO STA 36+00)**
SCALE:1" = 30'



PROFILE VIEW (STA 27+00 TO STA 36+00)
SCALE:HORI: 1" = 30' VERT: 1" = 30'

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No.	Date	Description	Dr.By	Ck.By	App.By
		APPROVED			

JULY 15, 2020
DATE

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PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

PLAN & PROFILE STA 27+00 – 36+00

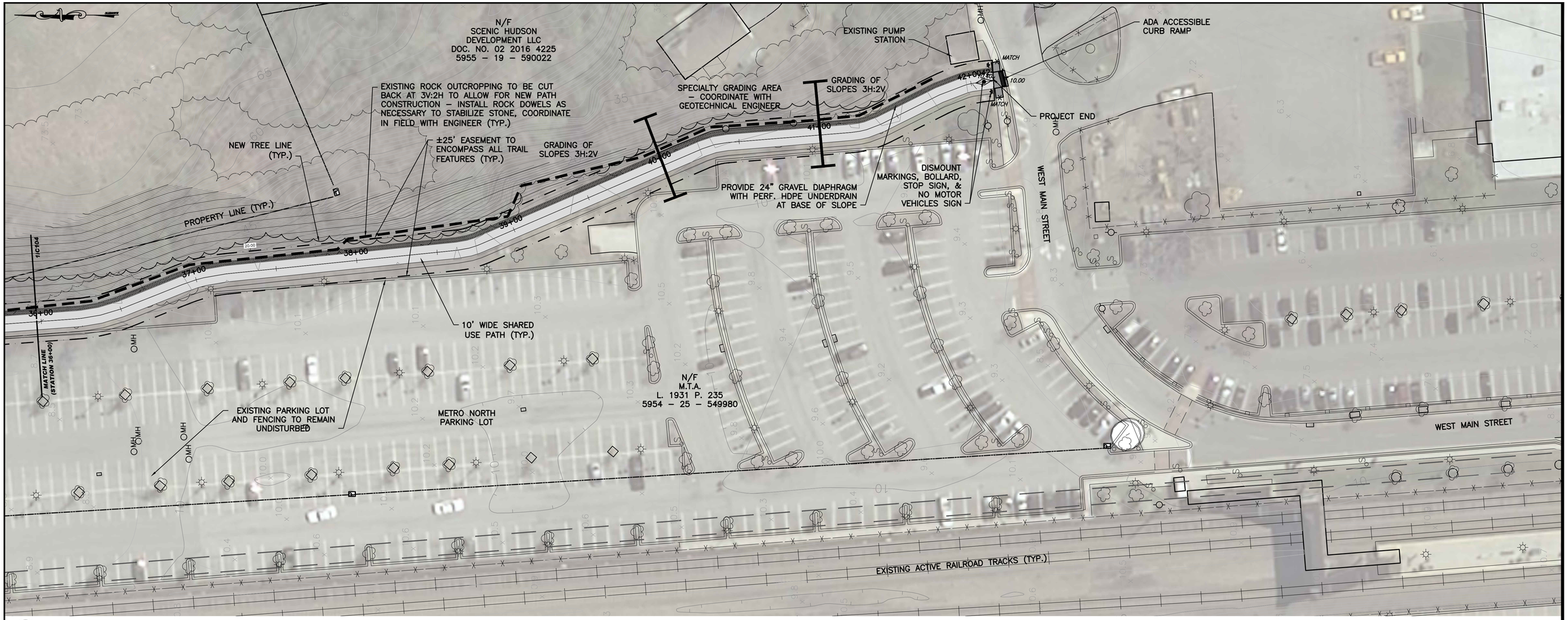
DSN.BY	DR.BY	JOB NO.	CONTRACT:	SCALE:	CADD NO.
JWG	JWG	N21B0028		BAR SCALE	

APP.BY	CHK.BY
DPB	DPB

C104

FILE NO.

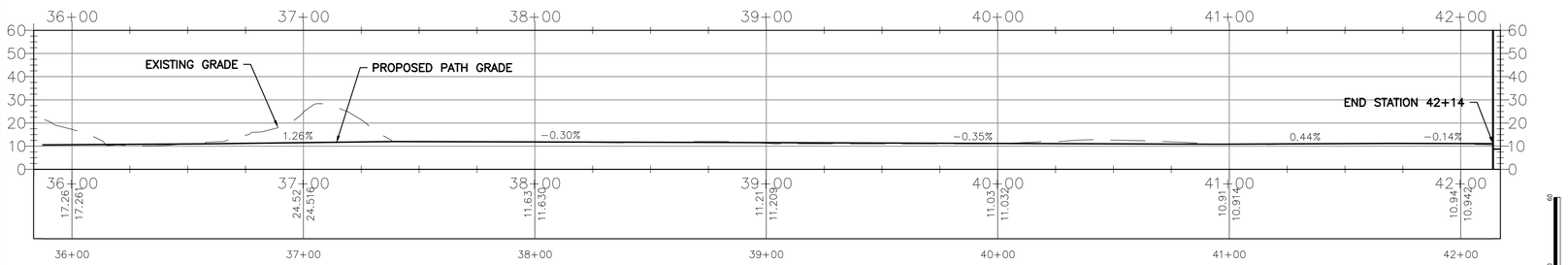
SHEET 6 OF 19



1 SITE PLAN (STA 36+00 TO STA 42+14)

SCALE: 1" = 30'

0 30 60



2 PROFILE VIEW (STA 36+00 TO STA 42+14)

SCALE: HORIZ: 1" = 30' I VERT: 1" = 30'

0 30 60

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		APPROVED			

JULY 15, 2020
DATE

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PRELIMINARY DESIGN
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CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

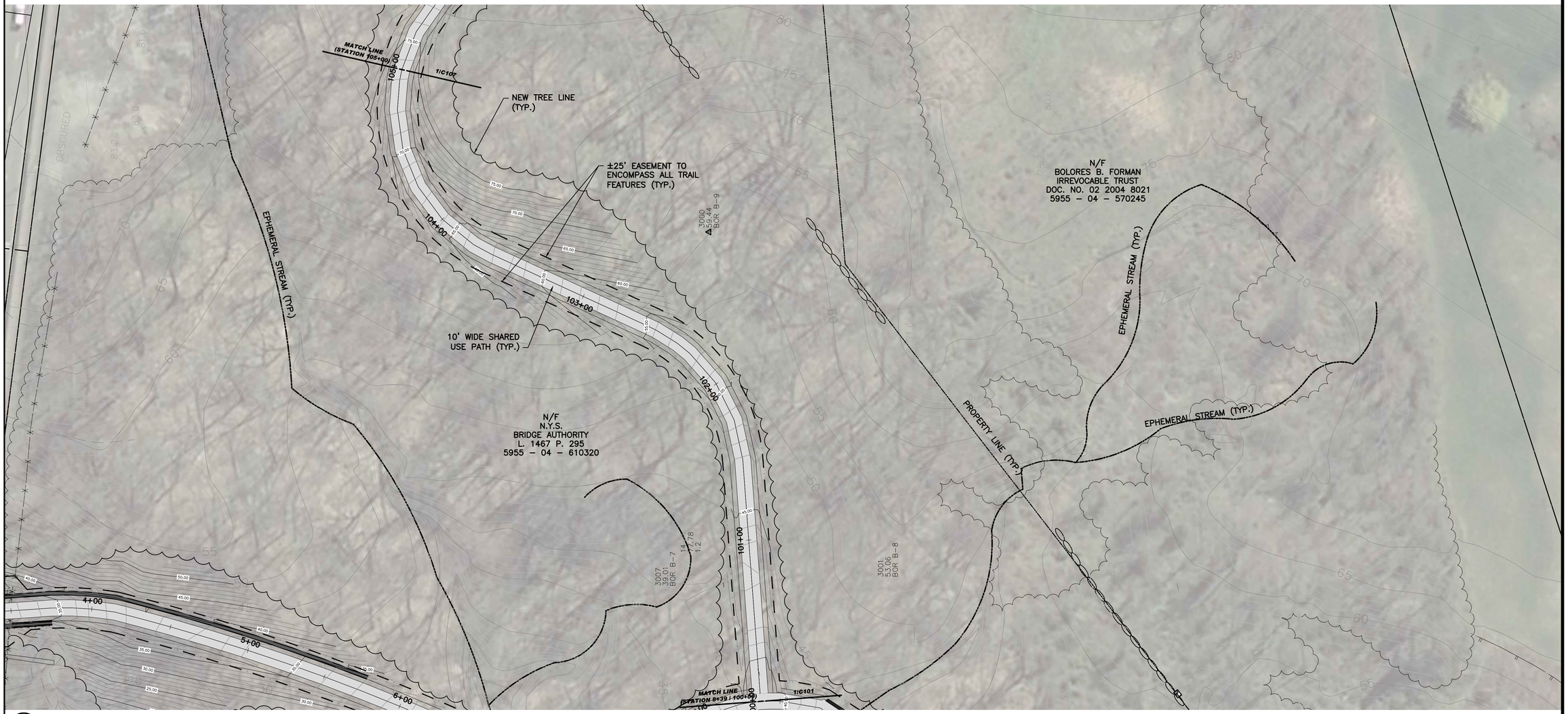
PLAN & PROFILE STA 36+00 – 42+14

CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21800028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

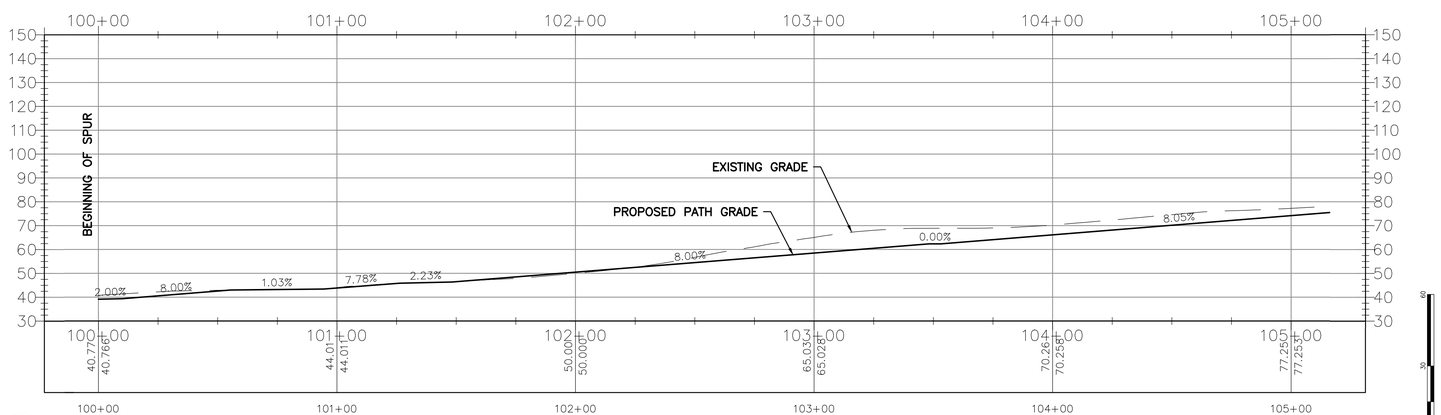
C105

FILE NO.

SHEET 7 OF 19



1 **SITE PLAN (STA 100+00 TO STA 105+00)**
SCALE: 1" = 30'



PROFILE VIEW (STA 100+00 TO STA 105+00)
SCALE: HORIZ: 1" = 30' VERT: 1" = 30'

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No.	Date	Description	Dr.By	Chk.By	App.By
		APPROVED			

JULY 15, 2020
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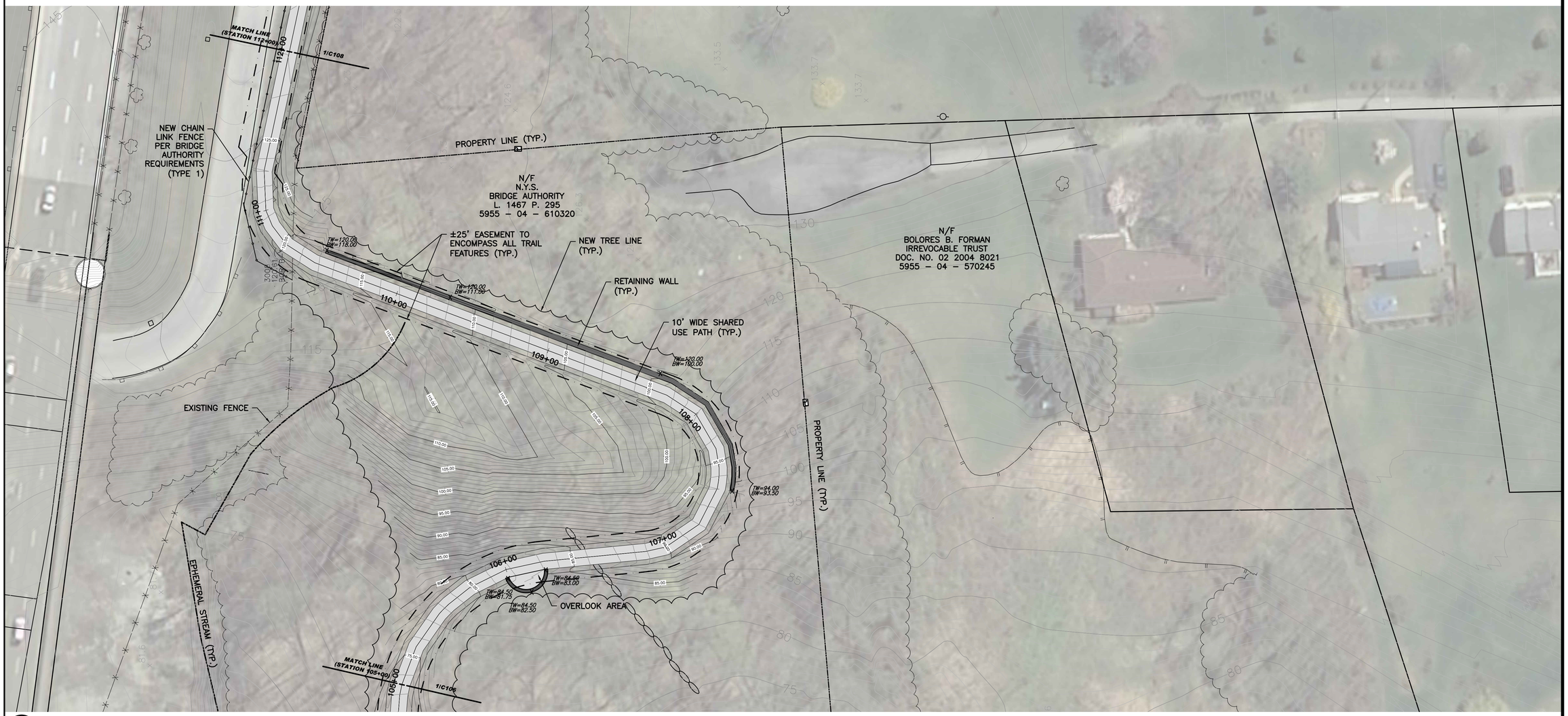
CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
PLAN & PROFILE STA 100+00 – 105+00

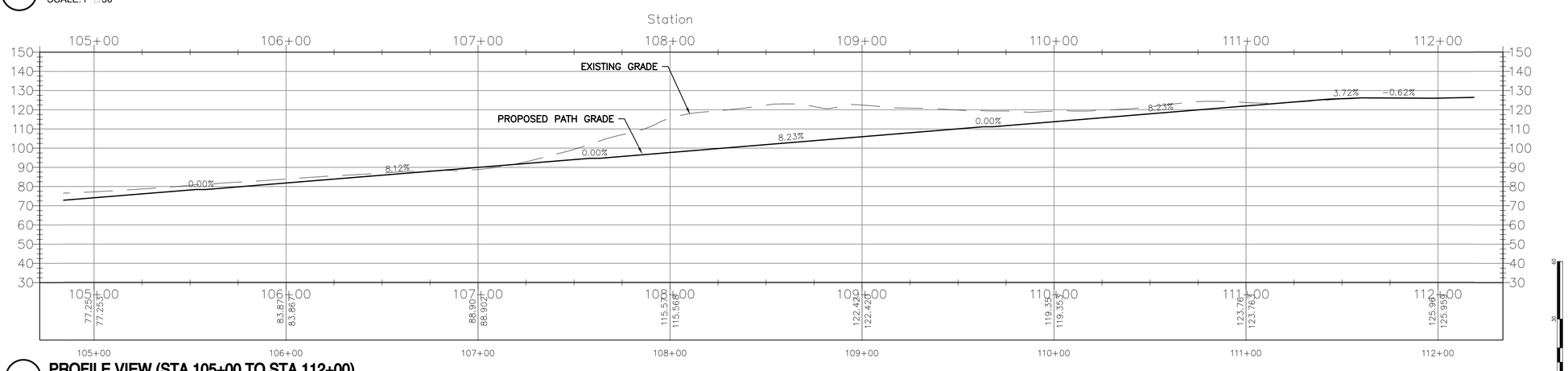
CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21800028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

C106
FILE NO.

SHEET 8 OF 19



1 **SITE PLAN (STA 105+00 TO STA 112+00)**
SCALE:1" □ 30'



□ **PROFILE VIEW (STA 105+00 TO STA 112+00)**
SCALE:HORI□ 1" □ 30' □VERT: 1" □ 30'

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		APPROVED			

JULY 15, 2020
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CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

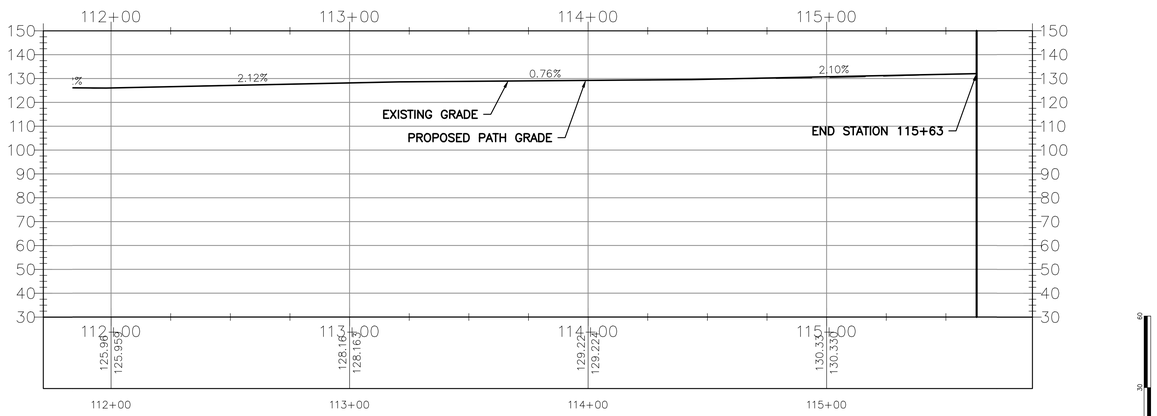
PLAN & PROFILE STA 105+00 – 112+00

CADD NO.	SCALE:	CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
	BAR SCALE		N21800028	JWG	JWG	DPB	DPB

C107
FILE NO.

SHEET 9 OF 19

1 **SITE PLAN (STA 112+00 TO STA 115+63)**
SCALE:1" = 30'



□ **PROFILE VIEW (STA 112+00 TO STA 115+63**
SCALE:HORI: 1" = 30' VERT: 1" = 30'

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					APPROVED

JULY 15, 2020
DATE

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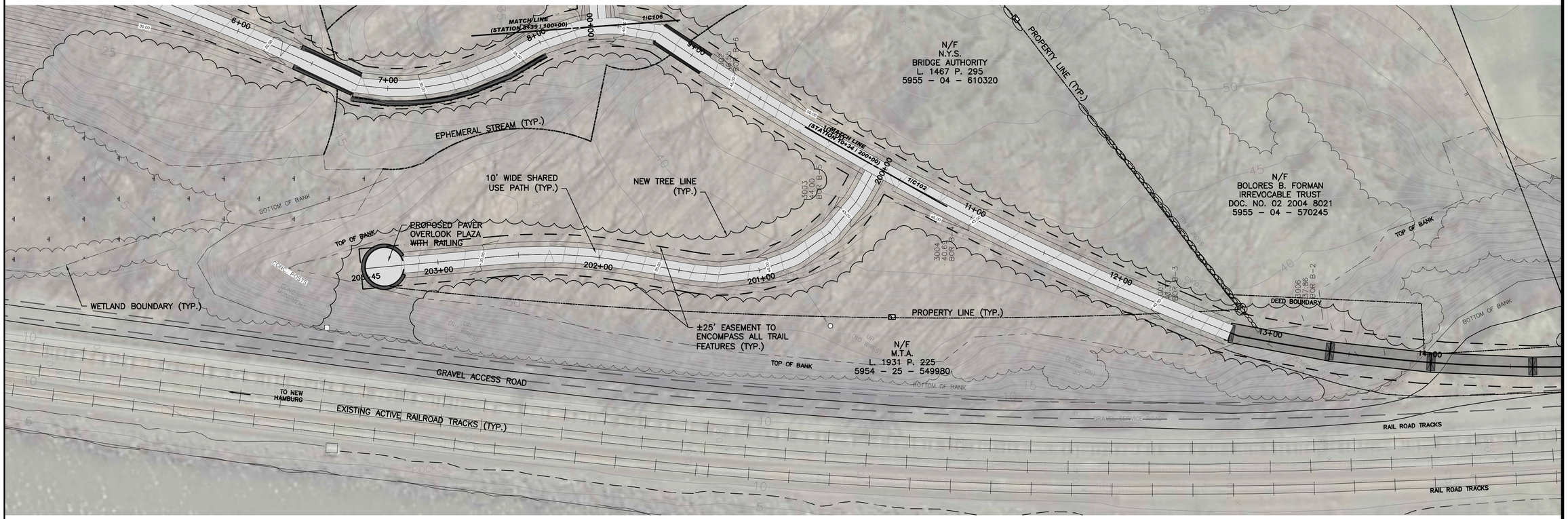
CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
PLAN & PROFILE STA 112+00 – 115+63

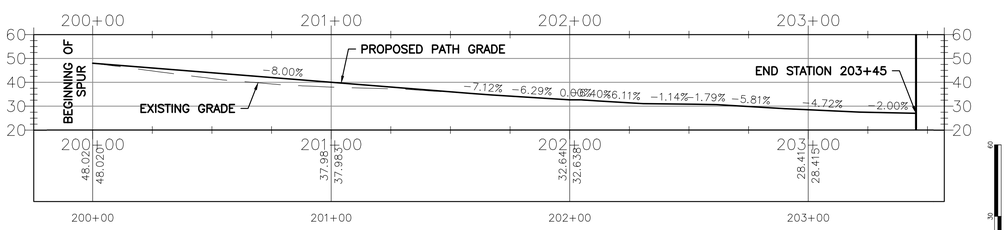
CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21800028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

C108
FILE NO.

SHEET 10 OF 19



1 **SITE PLAN (STA 200+00 TO STA 203+45)**
SCALE: 1" = 30'



PROFILE VIEW (STA 200+00 TO STA 203+45)
SCALE: HORI: 1" = 30' VERT: 1" = 30'

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		APPROVED			

JULY 15, 2020
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CITY OF BEACON, NEW YORK

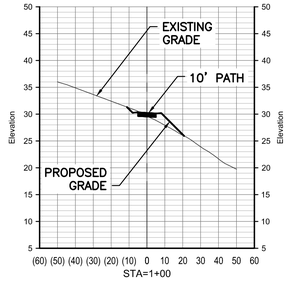
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

PLAN & PROFILE STA 200+00 – 203+45

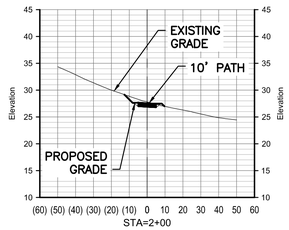
CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21B0028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

C109
FILE NO.

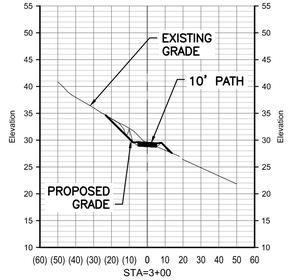
1
SCALE:
HORIZ = 40' VERT = 3'



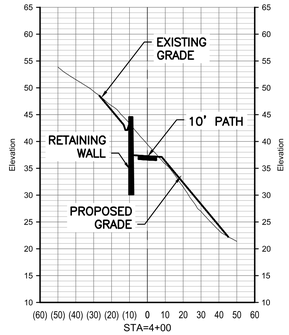
2
SCALE:
HORIZ = 40' VERT = 3'



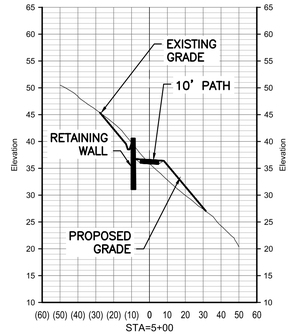
3
SCALE:
HORIZ = 40' VERT = 3'



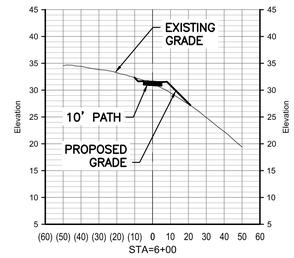
4
SCALE:
HORIZ = 40' VERT = 3'



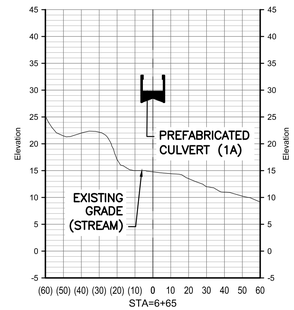
5
SCALE:
HORIZ = 40' VERT = 3'



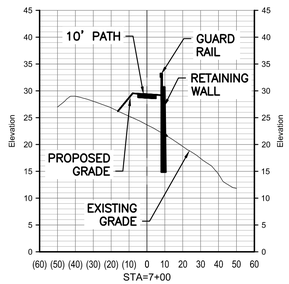
6
SCALE:
HORIZ = 40' VERT = 3'



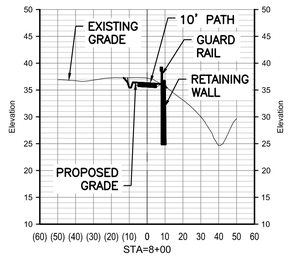
7
SCALE:
HORIZ = 40' VERT = 3'



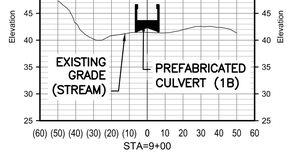
8
SCALE:
HORIZ = 40' VERT = 3'



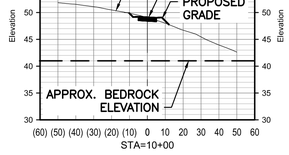
9
SCALE:
HORIZ = 40' VERT = 3'



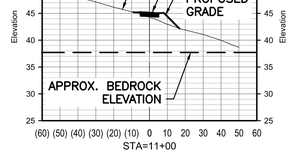
10
SCALE:
HORIZ = 40' VERT = 3'



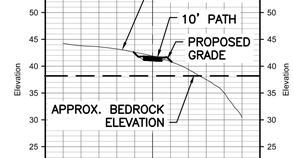
11
SCALE:
HORIZ = 40' VERT = 3'



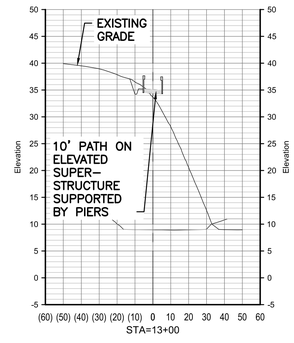
12
SCALE:
HORIZ = 40' VERT = 3'



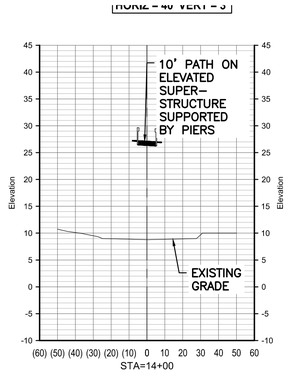
13
SCALE:
HORIZ = 40' VERT = 3'



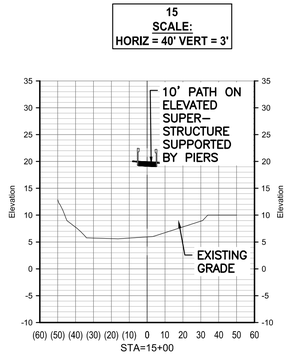
13
SCALE:
HORIZ = 40' VERT = 3'



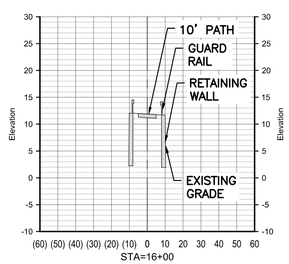
HORIZ = 40' VERT = 3'



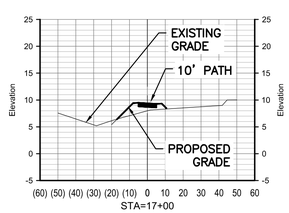
15
SCALE:
HORIZ = 40' VERT = 3'



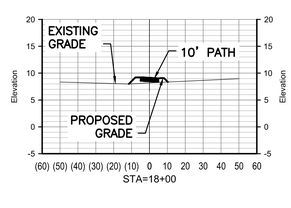
16
SCALE:
HORIZ = 40' VERT = 3'



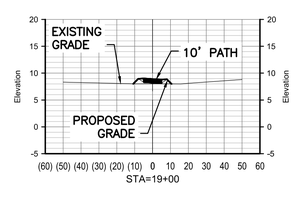
18
SCALE:
HORIZ = 40' VERT = 3'



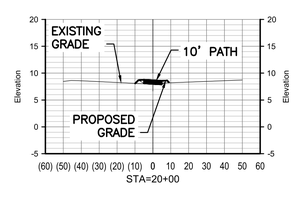
19
SCALE:
HORIZ = 40' VERT = 3'



20
SCALE:
HORIZ = 40' VERT = 3'



21
SCALE:
HORIZ = 40' VERT = 3'



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No.	Date	Description	Dr.By	Ck.By	App.By
		APPROVED			

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

TRAIL CROSS SECTIONS

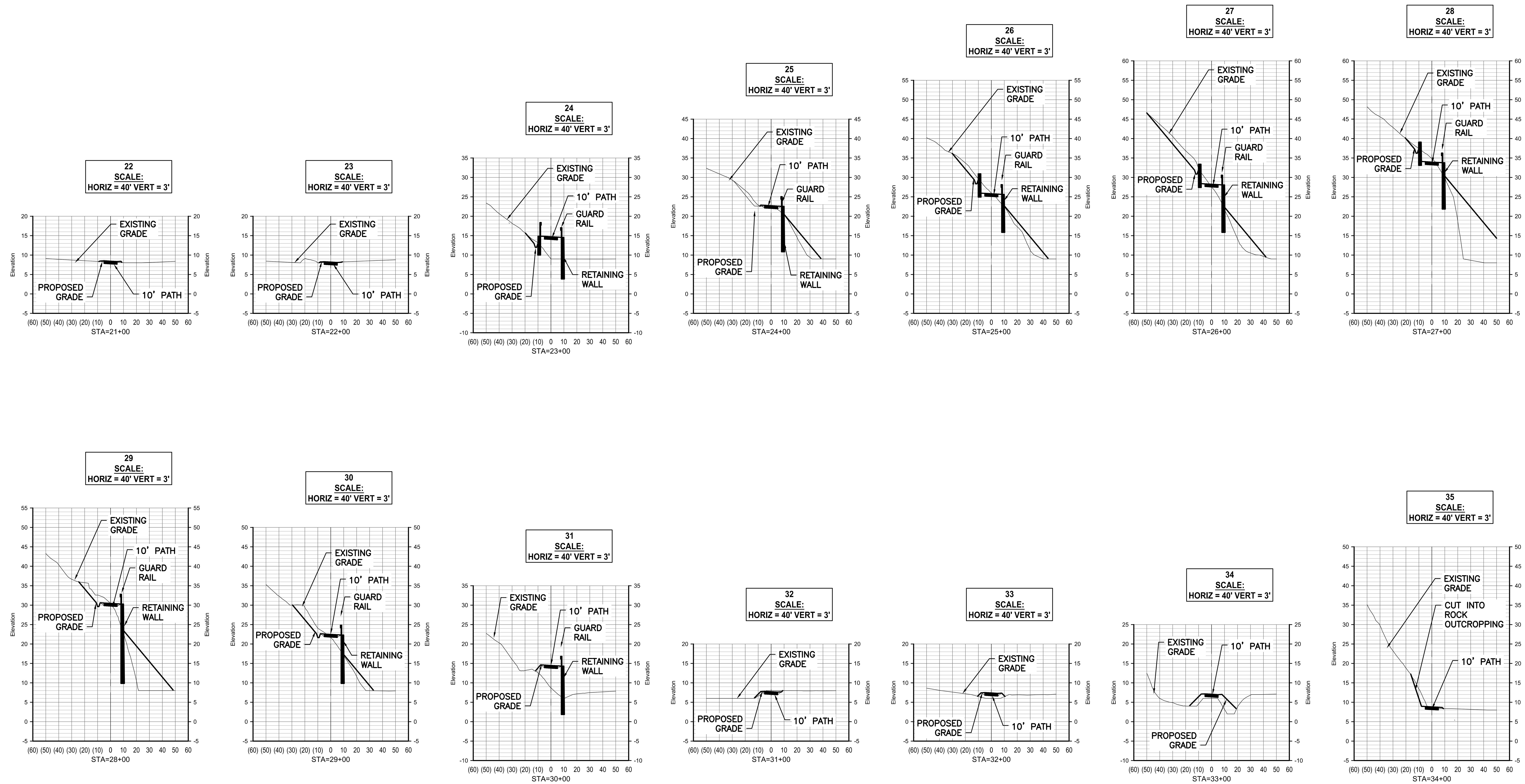
CONTRACT:	JOB NO.	DR.BY	DSN.BY	CHK.BY	APP.BY
	N2180028	JWG	JWG	DPB	DPB

SCALE: BAR SCALE

CADD NO.

C301

FILE NO.



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No.	Date	Dr.By	Ck.By	App.By	Description

A P P R O V E D

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

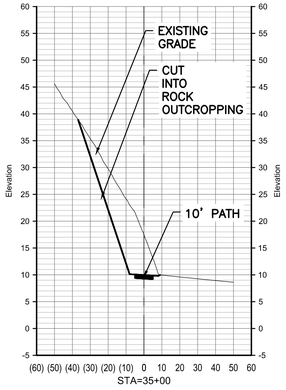
TRAIL CROSS SECTIONS

SCALE: BAR SCALE
CONTRACT:
JOB NO. N2180028
DR BY JWG
DSN BY JWG
CHK BY DPB
APP BY DPB
CADD NO.
FILE NO.

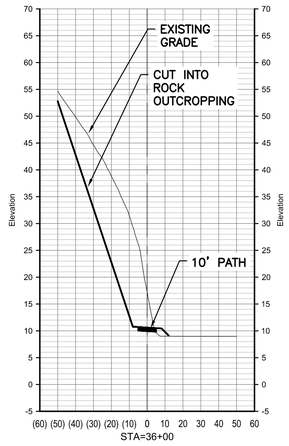
C302

SHEET 13 OF 19

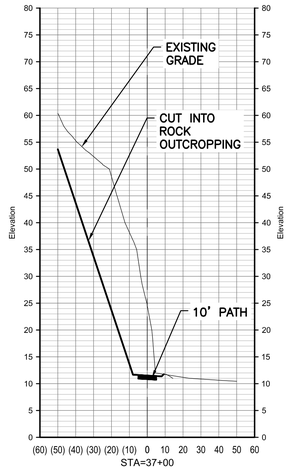
36
SCALE:
HORIZ = 40' VERT = 3'



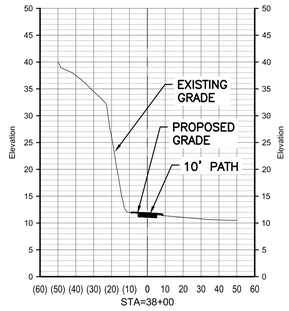
37
SCALE:
HORIZ = 40' VERT = 3'



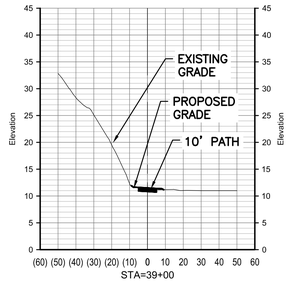
38
SCALE:
HORIZ = 40' VERT = 3'



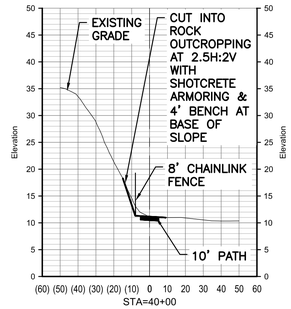
39
SCALE:
HORIZ = 40' VERT = 3'



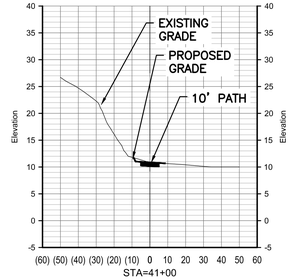
40
SCALE:
HORIZ = 40' VERT = 3'



41
SCALE:
HORIZ = 40' VERT = 3'



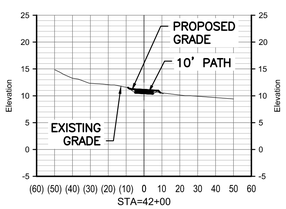
42
SCALE:
HORIZ = 40' VERT = 3'



NOTES:

1. SCALE EXISTING GRADE OF ALL LOOSE ROCK.
2. ARMOR UP TO ELEV. 20.0' WITH SHOTCRETE (WEEP BOTTOM).
3. 8' CHAIN LINK FENCE TO BE INSTALLED BETWEEN STA. 40+00 AND 41+00 – SEE PLANS.
4. DRAINAGE SWALE TO BE INSTALLED AT BASE OF SLOPE – SEE PLANS FOR LOCATION.

43
SCALE:
HORIZ = 40' VERT = 3'



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		APPROVED
	Dr.By	
	Ck.By	
	App.By	

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

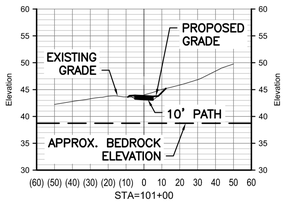
TRAIL CROSS SECTIONS

CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21B0028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

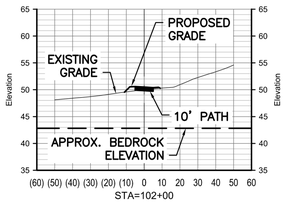
C303

FILE NO.

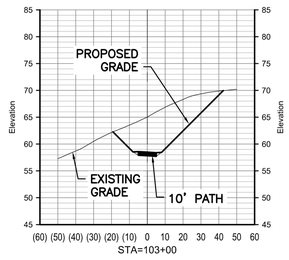
1
SCALE:
HORIZ = 40' VERT = 3'



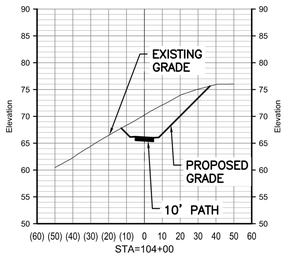
2
SCALE:
HORIZ = 40' VERT = 3'



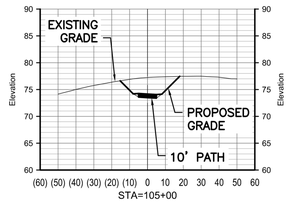
3
SCALE:
HORIZ = 40' VERT = 3'



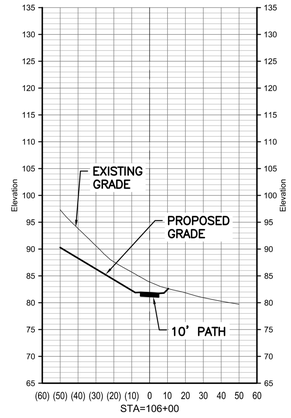
4
SCALE:
HORIZ = 40' VERT = 3'



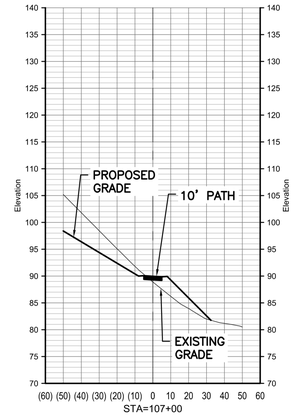
5
SCALE:
HORIZ = 40' VERT = 3'



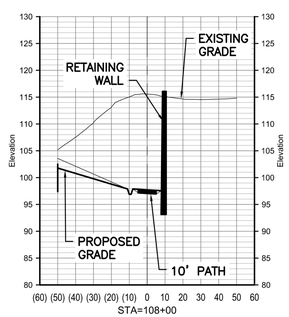
6
SCALE:
HORIZ = 40' VERT = 3'



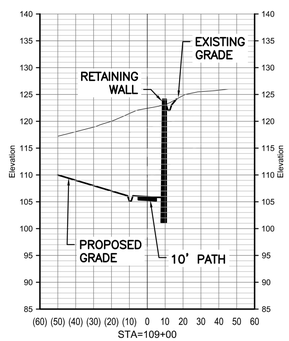
7
SCALE:
HORIZ = 40' VERT = 3'



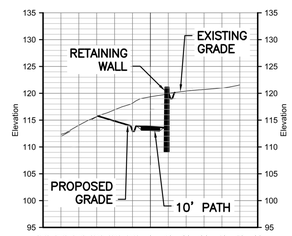
8
SCALE:
HORIZ = 40' VERT = 3'



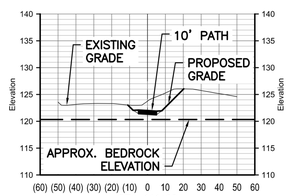
9
SCALE:
HORIZ = 40' VERT = 3'



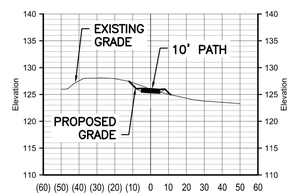
10
SCALE:
HORIZ = 40' VERT = 3'



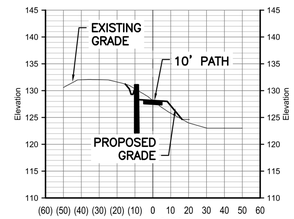
11
SCALE:
HORIZ = 40' VERT = 3'



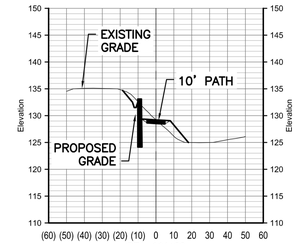
12
SCALE:
HORIZ = 40' VERT = 3'



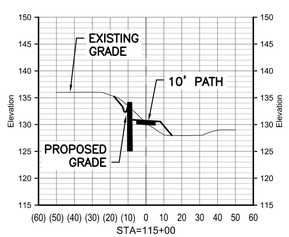
13
SCALE:
HORIZ = 40' VERT = 3'



14
SCALE:
HORIZ = 40' VERT = 3'



15
SCALE:
HORIZ = 40' VERT = 3'



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No.	Date	Dr.By	Ck.By	App.By	Description
					APPROVED

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

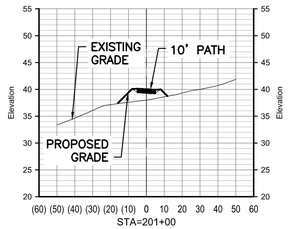
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

TRAIL CROSS SECTIONS

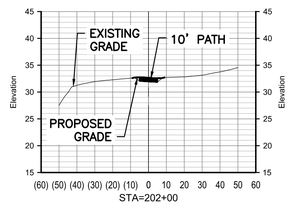
APP.BY	CHK.BY	DSN.BY	DR.BY	JOB NO.	CONTRACT:	SCALE:	CADD NO.
DPB	DPB	JWG	JWG	N21800028		BAR SCALE	

C304
FILE NO.

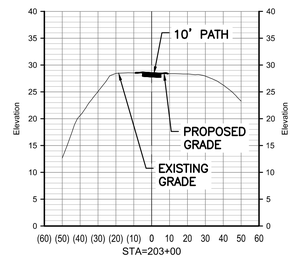
1
SCALE:
HORIZ = 40' VERT = 3'



2
SCALE:
HORIZ = 40' VERT = 3'



3
SCALE:
HORIZ = 40' VERT = 3'



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CITY OF BEACON, NEW YORK

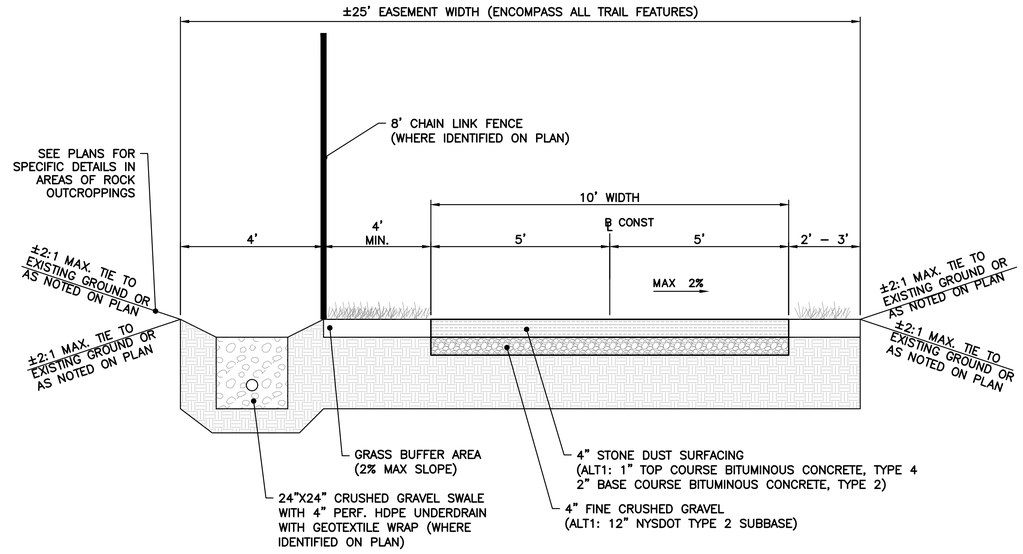
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

TRAIL CROSS SECTIONS

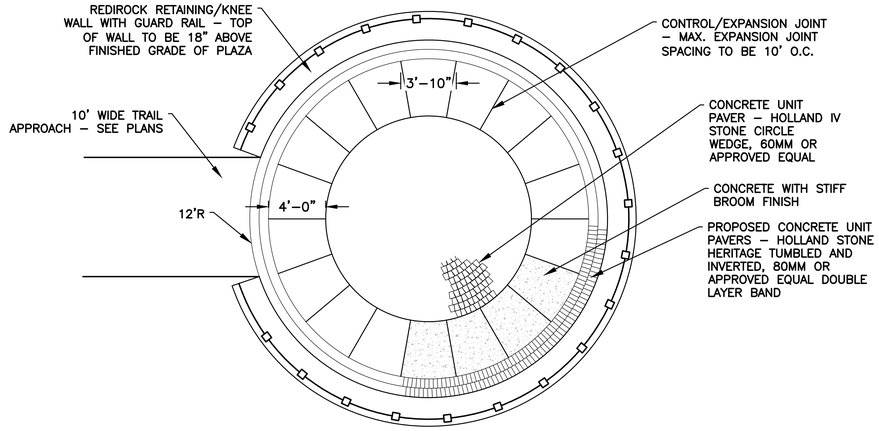
CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N21180028	DR.BY JWG	DSN.BY JWG	CHK.BY DPB	APP.BY DPB

C305

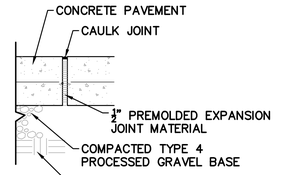
FILE NO.



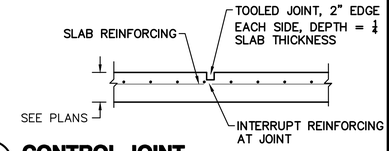
1 TYPICAL TRAIL SECTION
SCALE: N.T.S.



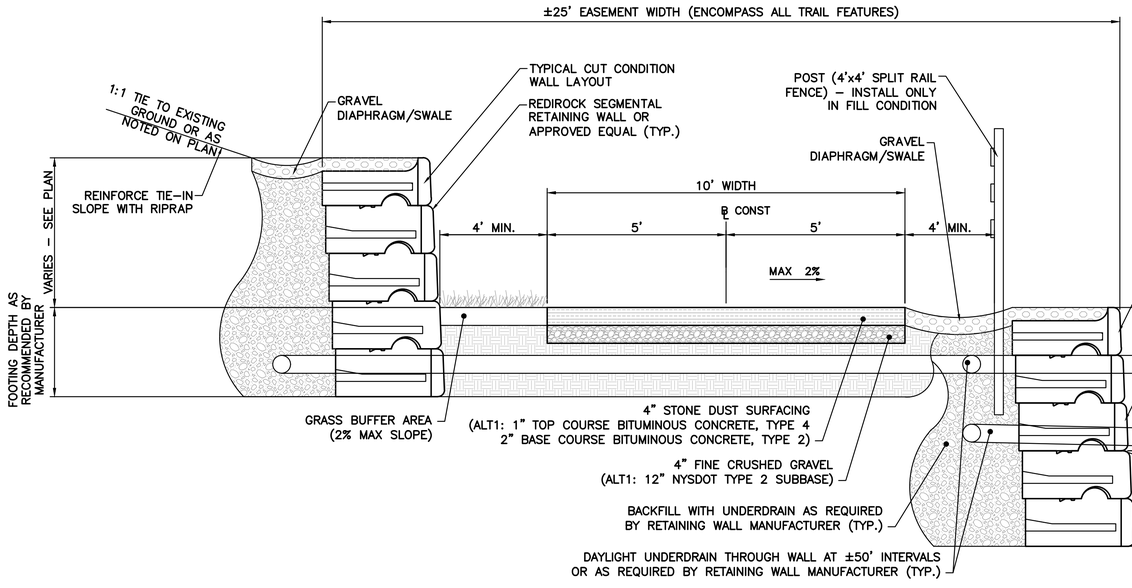
2 TYPICAL TRAILHEAD LAYOUT
SCALE: N.T.S.



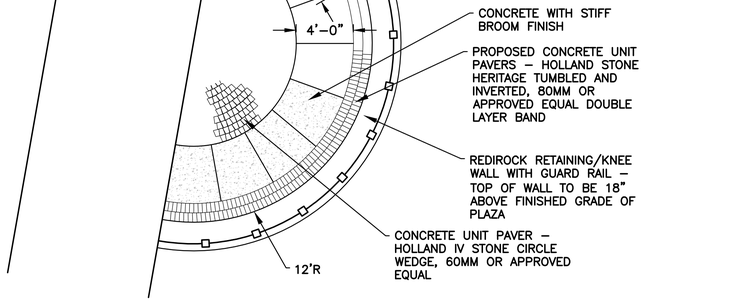
3 EXPANSION JOINT
SCALE: N.T.S.



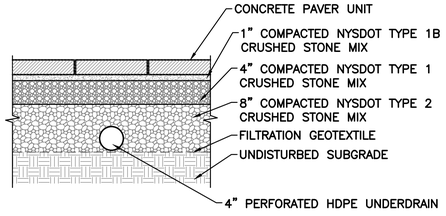
4 CONTROL JOINT
SCALE: N.T.S.



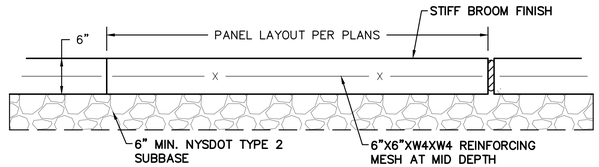
5 TYPICAL TRAIL SECTION WITH RETAINING WALLS
SCALE: N.T.S.



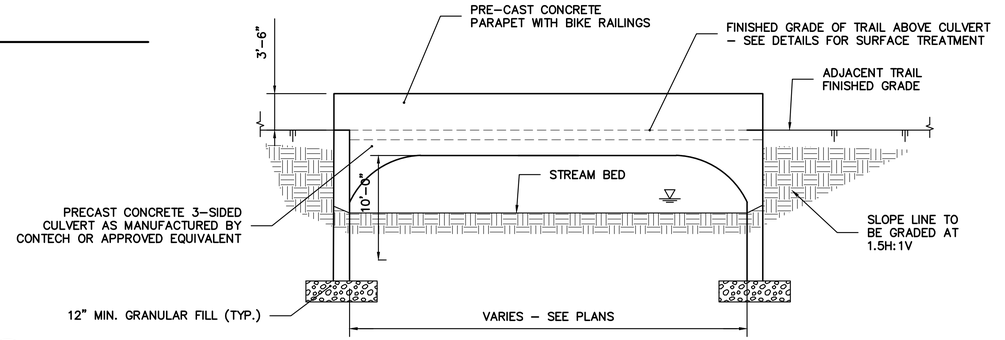
6 TYPICAL OVERLOOK LAYOUT
SCALE: N.T.S.



7 TYPICAL PAVER SECTION
SCALE: N.T.S.



8 TYPICAL CONCRETE SECTION
SCALE: N.T.S.



9 TYPICAL 3-SIDED CULVERT ELEVATION
SCALE: N.T.S.

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A	JULY 15, 2020	PROVED			

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK

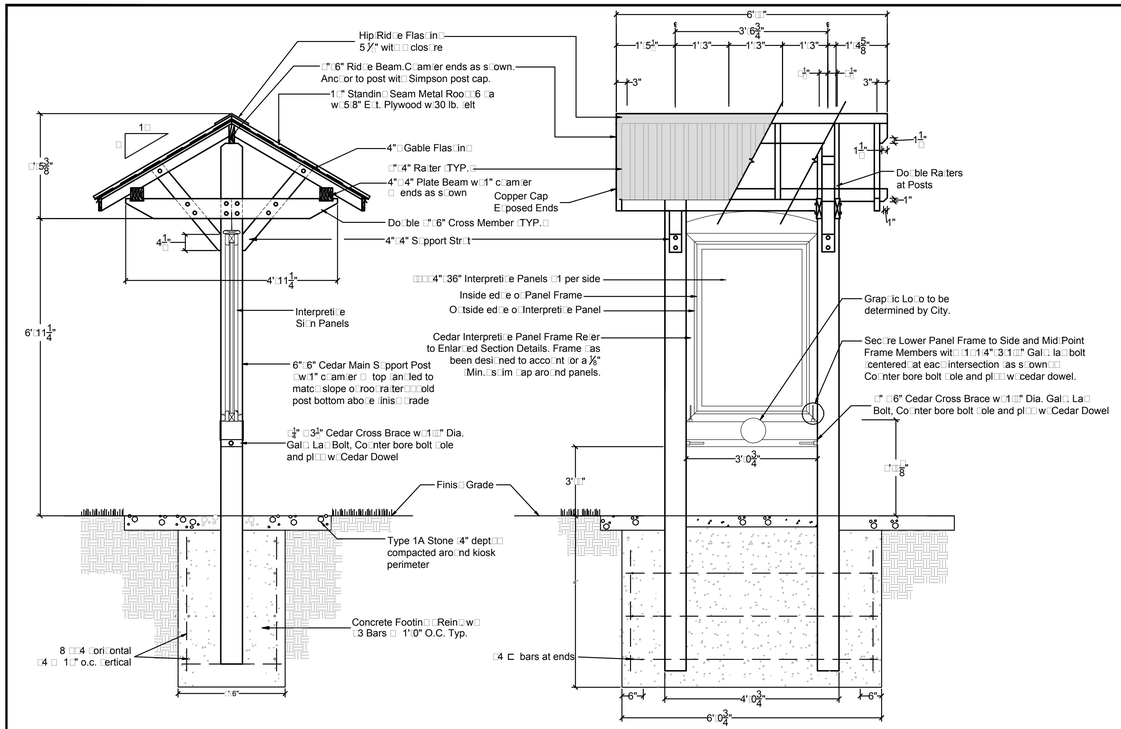
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN

TYPICAL DETAILS

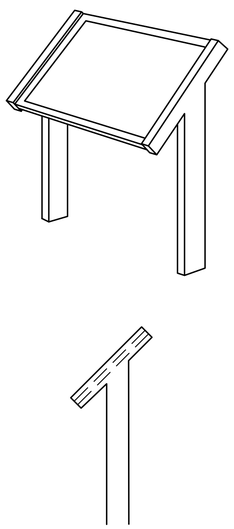
APP.BY	CHK.BY	DSN.BY	DR.BY	JOB NO.	CONTRACT:	SCALE:	CADD NO.
DPB	DPB	JWG	JWG	N21800028		N.T.S.	

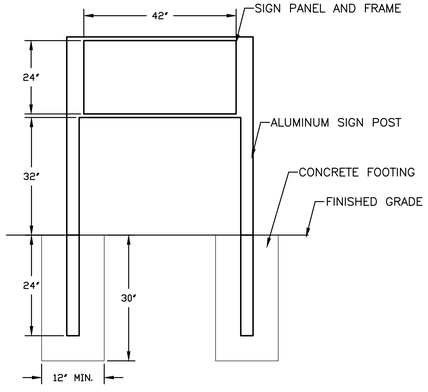
C501

FILE NO.



1 TYPICAL TRAILHEAD SIGN
SCALE: N.T.S.

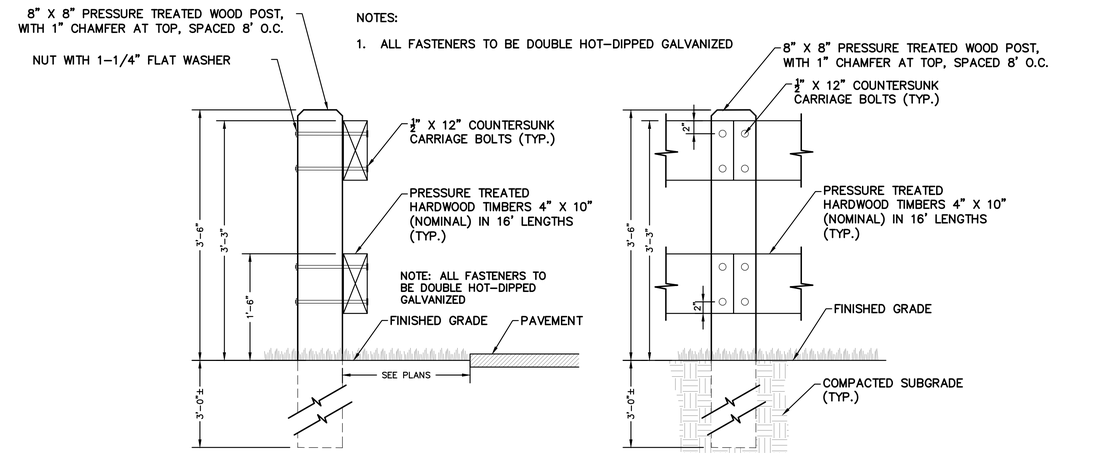




INFORMATIONAL SIGNAGE TYPE "B"

NOTES:
1. POSTS TO BE 2" X 6" RECTANGULAR ALUMINUM WITH STAINLESS STEEL HARDWARE.
2. SIGN FRAME TO ALLOW FOR A 24" BY 42" GRAPHIC PANEL.
3. POSTS TO BE INSTALLED A MINIMUM OF 24" BELOW GRADE IN CONCRETE FOOTING.
4. SIGN POST AND FRAME TO BE TEXTURE POWDER COATED "FOREST GREEN" IN COLOR.
5. SIGN FRAMES TO ALLOW FOR A PANEL THICKNESS OF .125".
6. SIGN FRAME WIDTH TO BE 3/4" AND PROVIDE A REMOVABLE TOP RAIL FOR PANEL INSTALLATION.
7. SIGNAGE TO BE AS MANUFACTURED BY VACKER INC., OR APPROVED EQUIVALENT.

4 TYPICAL INFORMATIONAL SIGN
SCALE: N.T.S.



2 SPLIT RAIL TIMBER FENCE
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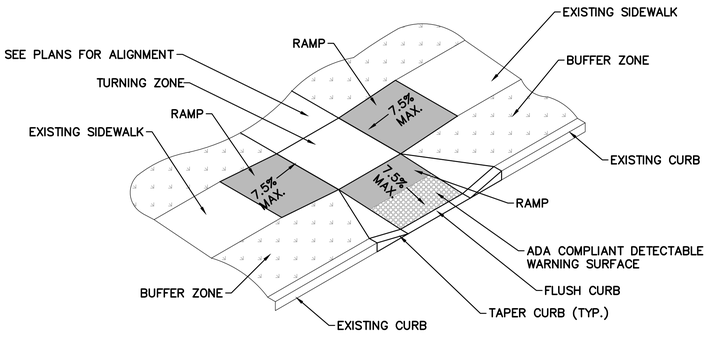

3 CURB RAMP
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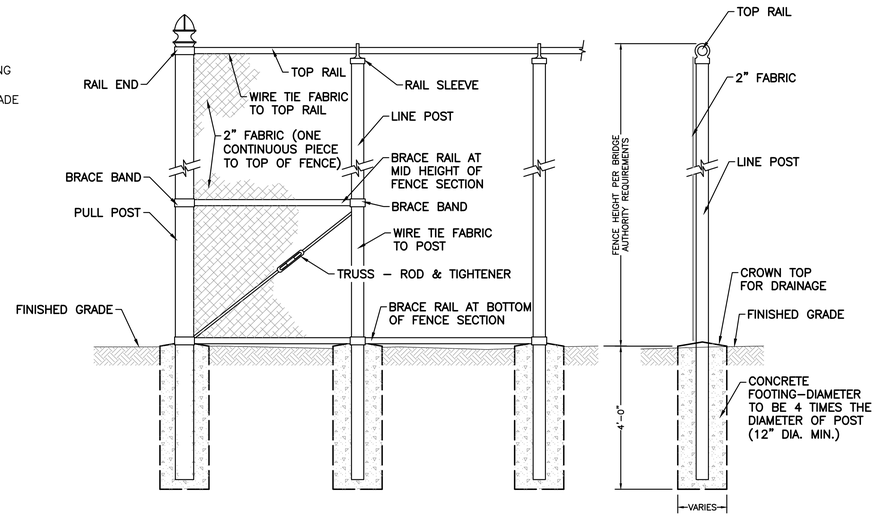
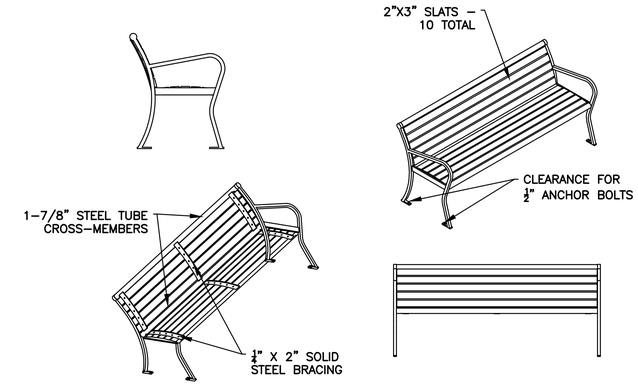


NOTE: FENCE POSTS, RAILS, & EQUIPMENT TO BE POWDER COATED BLACK. MESH TO BE VINYL COATED BLACK.

5 CHAIN LINK FENCE
SCALE: N.T.S.



NOTES:
1. BENCH TO BE MODEL PRS-10 AS MANUFACTURED BY VICTOR STANLEY OR APPROVED EQUIVALENT.
2. FRAME TO BE POWDER COATED BLACK.
3. SLATS TO BE IPE WOOD.
4. ALL FABRICATED METAL COMPONENTS TO BE STEEL SHOTBLASTED, ETCHED, PHOSPHATIZED, PREHEATED AND ELECTROSTATICALLY POWDER COATED.
5. BENCHES TO BE SURFACE MOUNTED PER MANUFACTURER'S RECOMMENDATIONS.

6 TYPICAL BENCH
SCALE: N.T.S.

Weston & Sampson
1 Winner's Circle, S 130, Albany, NY
518.463.4400
800.SAMPSON
www.westonandsampson.com

No.	Date	Description	Dr.By	Ck.By	App.By
		APPROVED			

JULY 15, 2020
DATE

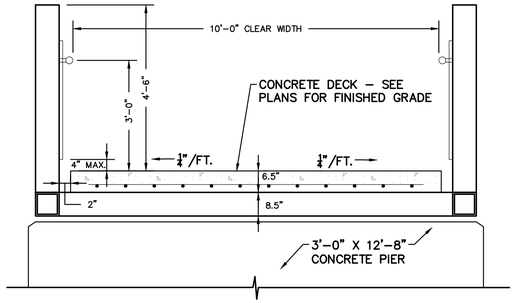
REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
TYPICAL DETAILS

DR.BY	DSN.BY	CHK.BY	APP.BY
JWG	JWG	DPB	DPB

JOB NO. N21800028
CONTRACT:
SCALE: N.T.S.
CADD NO.
FILE NO. C502



1 TYPICAL ELEVATED TRAIL SECTION
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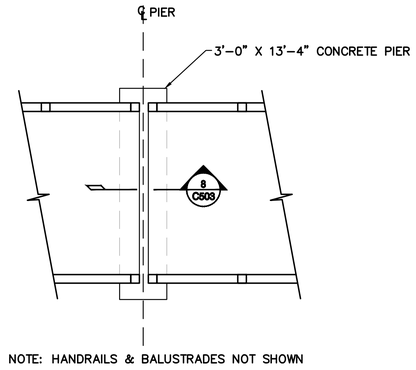
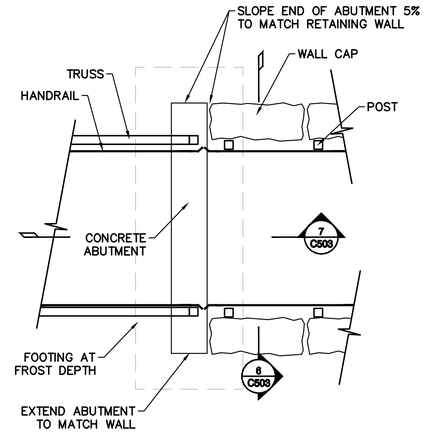


2 TYPICAL ELEVATED TRAIL PIER TRANSITION
SCALE: N.T.S.



3 TYPICAL ELEVATED TRAIL ABUTMENT TRANSITION
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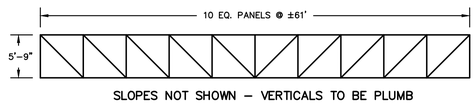

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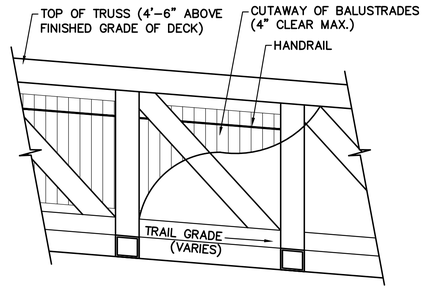
SCALE: N.T.S.



5 TYPICAL CROSS-SECTION THROUGH WALKWAY
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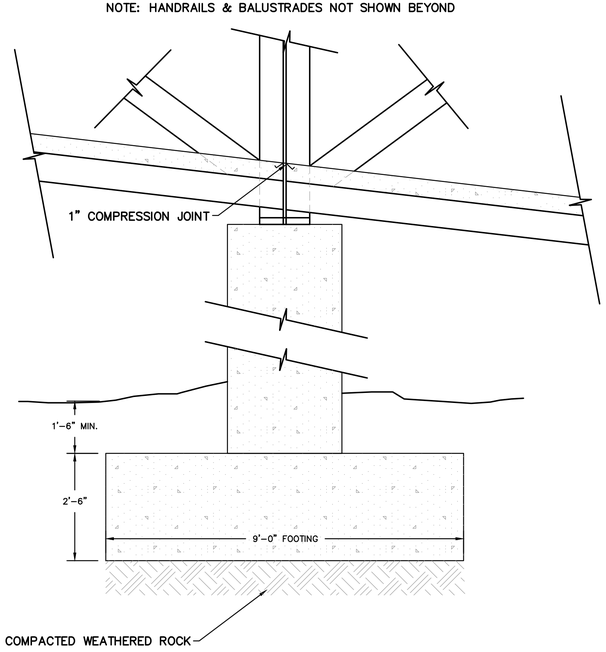

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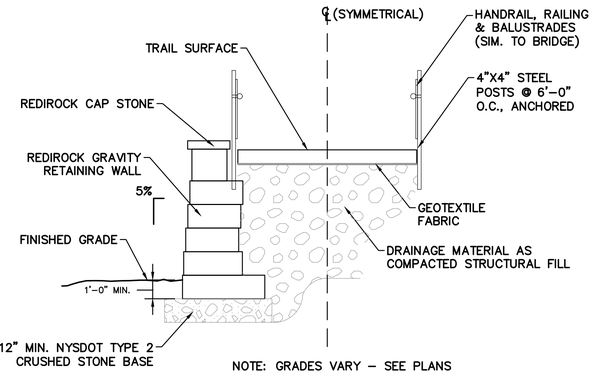

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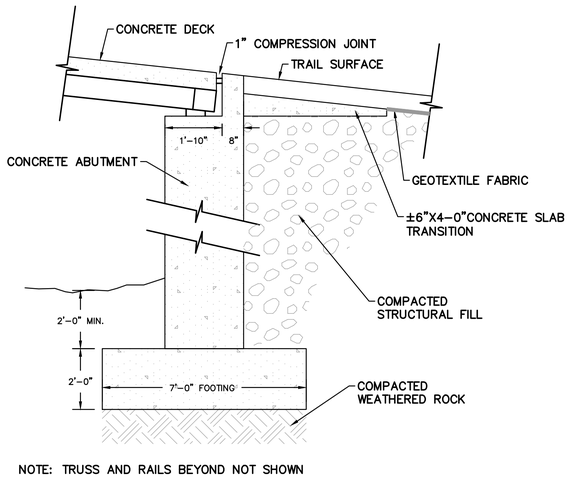

7 TYPICAL ELEVATED TRAIL ABUTMENT SECTION
SCALE: N.T.S.

Weston & Sampson
1 Winner's Circle, S 130, Albany, NY
518.463.4400 800.SAMPSON
www.westonandsampson.com

No.	Date	Description
		APPROVED
		Dr.By
		Ck.By
		App.By

JULY 15, 2020
DATE

REGISTERED PROFESSIONAL

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
TYPICAL DETAILS

DR.BY	DSN.BY	CHK.BY	APP.BY
JWG	JWG	DPB	DPB

JOB NO. N2180028
CONTRACT:
SCALE: N.T.S.
CADD NO.

C503
FILE NO.

Appendix B – Geotechnical Evaluations

GEOTECHNICAL EVALUATION
HUDSON RIVER TRAIL
BEACON, NEW YORK

DENTE FILE NO. JB185059

Prepared For:

WESTON & SAMPSON
1 Winners Circle, Suite 130
Albany, NY 12205

Prepared By:

DENTE GROUP
Watervliet, New York

August 28, 2018

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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GEOTECHNICAL EVALUATION
HUDSON RIVER TRAIL
CITY OF BEACON, NEW YORK

Dente File No. JB185059

I. INTRODUCTION

This report presents the results of a geotechnical evaluation completed by the Dente Group to assist in planning for an extension of the Hudson River Trail in the City of Beacon, New York. The evaluation was completed in general accord with our proposal number PJB185400 which was approved by Weston & Sampson of Albany, New York.

In general, our scope of services for this project consisted of the following:

- Site reconnaissance by a Geotechnical Engineer,
- Layout and completion of eight test borings,
- Preparation of this report, which summarizes the results of our explorations and presents recommendations to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, their grades, loads, etc. should be brought to our attention so that we may evaluate their effect upon the recommendations offered in this report.

It should be understood that this report was prepared, in part, on the basis of a limited field exploration. The borings were advanced at discrete locations and the overburden soils sampled at specific depths. Conditions are only known at the locations and through the depths investigated. Conditions at other locations and depths may be different, and these differences may impact upon the conclusions reached and the

recommendations offered. For this reason, we strongly recommend that we be retained to provide site observation services during construction.

This report was prepared for informational purposes only and should not be considered part of the contract documents. It should be made available to interested parties in its entirety only. Should the data contained in this report not be adequate for the contractors' bidding purposes, the contractors may make their own investigations, tests, and analyses for use in bid preparation.

The recommendations offered in this report concerning the control of surface and subsurface waters, moisture or vapor membranes address conventional Geotechnical Engineering aspects only and are not to be construed as recommendations for controlling or providing an environment that would prohibit or control infestations of the structures or its surroundings with mold or other biological agents.

II. SITE AND PROJECT DESCRIPTION

The project will entail construction of the Beacon Segment of the Hudson River Trail from the MTA Rail Station north to the Newburgh-Beacon Bridge. The scope of this investigation and evaluation was limited to the segment of the Main Trail Alignment A, beginning at the steep slope adjacent to the Forman property and extending north to Trail Spur B which will extend to a Potential Trailhead along the Newburgh-Beacon Bridge Service Road. This general project area is shown on the aerial photograph in Appendix A.

Grading plans for the trail were not developed at the time this report was prepared. It is our understanding that the main trail will leave the level area adjoining the railroad at the base of the steep slope adjacent to the Forman property. Cuts will be made into the slope to achieve an acceptable inclination for the new trail. At the top of the slope the Main Trail will cross a small drainage course over a proposed bridge. Trail Spur B will diverge from the Main Trail on the north side of the bridge and extend up to the Service Road as shown on Sheets 3 and 4 of the Master Plan prepared by Weston & Sampson. Reduced copies of these plans are presented in Appendix C with our test boring locations marked on them.

The area of study is a sloping woodland with two drainage courses directing flow from east to west and ultimately to the Hudson River. Rock outcrops are present along the existing steep slope that the new trail will need to climb to reach the Service Road and Trailhead. Photographs of the general site conditions, including the rock outcrops are presented in Appendix A.

III. SUBSURFACE CONDITIONS

The subsurface conditions at the project site were determined through a review of published USDA Soil Survey and State geologic information along with a site specific test boring investigation as detailed below.

A. Published Information

The surficial soils at the site have been mapped by the USDA Soil Survey of Dutchess County as belonging to the Dutchess-Cardigan complex, Nassau-Cardigan complex, and Udorthents. The Dutchess and Nassau soils cover a majority of the site, with the Udorthents present only as a thin sliver of land adjacent to the Newburgh-Beacon Bridge Service Road. General information and mapping of these soils obtained from the National Cooperative Web Soil Survey is attached and summarized below.

The Dutchess, Cardigan, and Nassua soils are generally described as silt loam, channery loam, channery silt loam, and very channery silt loam. Unweathered bedrock is listed at depths more than 80 inches in the Dutchess soil, 20 inches in the Cardigan soils and 10 inches in the Nassau soils. Udorthents are generally described as gravelly loam and very gravelly loam with bedrock deeper than 80 inches.

Bedrock at the project site is mapped on the Geologic Map of New York as the Austin Glen Formations composed of greywacke and shale.

B. Test Boring Investigation

The subsurface conditions at the site were investigated by us through the completion of eight test borings at the approximate locations shown on the plans in Appendix C. Nine borings were originally planned, however, boring B-7 was deleted due to access limitations with the drill rig. The test borings were completed using a standard ATV rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general accord with ASTM D1586 procedures. In three borings, rock was cored per ASTM D2113.

The rock cores and representative portions of the recovered soil samples were transported to our office for visual classification by a Geotechnical Engineer who prepared the individual subsurface logs presented in Appendix D. The surface elevations shown in the upper right hand corner of the logs were determined by Weston & Sampson.

The subsurface logs should be reviewed for a description of the conditions encountered at the specific test locations. It should be understood that conditions are only known at the depths and locations sampled. Conditions at other depths and locations may be different.

Soil Profile

About 4 to 7 inches of topsoil was present at the test boring locations. In test boring B-1 adjacent to the Service Road, the topsoil was directly underlain by weathered bedrock. In the remaining borings, the depth to bedrock ranged between 2.2 and 16.5 feet. The approximate bedrock depths and elevations are tabulated below.

Boring	Ground Surface El.	Rock Surface Depth	Rock Surface El.
B-1	120.6	0.4	120.2
B-2	37.9	15.4	22.5
B-3	40.3	2.2	38.1
B-4	40.7	4.0	36.7
B-5	44.0	3.0	41.0
B-6	46.6	5.0	41.6
B-7	NA – Boring Deleted	-	-
B-8	53.1	15.4	37.7
B-9	59.4	16.5	42.9

Note: Depths and Elevations are in feet.

The overburden soils in borings B-2 through B-6 was composed of silty fine sand of a loose relative density. This extended to the bedrock surface in all but test boring B-2 where a layer of compact to very compact silty sand and gravel was found between the upper sequence of silty fine sand and rock surface.

In test borings B-8 and B-9, the overburden was composed of glacio-lacustrine silt and clay which extended to bedrock in test boring B-9. In test boring B-8 a thin layer of compact silty sand and gravel, similar to that found in boring B-2, was present between the silt and clay and bedrock surface.

The bedrock cores obtained in test borings B-1, B-3, and B-4 revealed gray shale which was generally medium hard to hard, weathered, thin bedded, and fractured to highly fractured. Complete and/or partial loss of drilling water was lost into fractures in the rock as the coring was performed. Photographs of the rock cores are presented with the test boring logs. In some cases, it was possible to auger several feet into the weathered rock. For example, in borings B-5 and B-6, the augers were advanced 7 and 5 feet, respectively, below the rock surface.

Groundwater Conditions

Within the depths explored, groundwater was present only in test boring B-8 at a depth of 11.5 feet after leaving the augers in place overnight, and in boring B-9 at a depth of 13.2 feet at completion of drilling. Groundwater levels will fluctuate with seasonal variations in precipitation and runoff and at times it may be found perched in the shallow overburden soils and weathered upper layers of rock.

IV. GEOTECHNICAL RECOMMENDATIONS

A. General Site Evaluation

From a geotechnical standpoint, planning for design and construction will be impacted primarily by the variable and often shallow depths to bedrock. The rock was generally weathered and fractured within the depths explored and in this condition its excavation should be possible using an adequately sized track-mounted backhoe equipped with rock teeth. A pneumatic hammer may be employed as required to remove pinnacles of sound rock. If extensive deep rock excavation is expected, based on the grading plans yet to be developed, blasting may be considered if permitted in this location. If such deep rock excavations are planned, additional rock cores can be performed to assist in developing plans and costs for its removal.

The following report sections provide detailed recommendations to assist in planning for design and construction. We should review plans and specifications prior to their release for bidding to allow us to refine our recommendations, if required, and confirm that our recommendations were properly interpreted and applied.

B. Seismic Design Considerations

For seismic design purposes, we evaluated the site conditions in accord with Section 1613 of the International Building Code (2015) adopted by New York State. On this basis, it was determined that Seismic Site Class “C – Very Dense Soil and Soft Rock Profile” is applicable to this project. Based upon the composition and relative density of the site soils, their liquefaction should not occur in response to earthquake motions.

C. Temporary Excavations and Permanent Slopes

As previously discussed, bedrock was generally weathered and fractured within the depths explored and in this condition its excavation should be possible using an adequately sized track-mounted backhoe equipped with rock teeth. A pneumatic hammer may be employed as required to remove pinnacles of sound rock. If extensive deep rock excavation is expected, based on the grading plans yet to be developed, blasting may be considered if permitted in this location. If blasting is planned it should

be performed by experienced personnel only with the peak particle velocity monitored and limited to less than two inches per second at the nearest property line and new or existing structures. Standard track-mounted backhoes should be adequate for excavation of the overburden soils at this site.

If groundwater is encountered in the site excavations, the installation of interceptor trenches and/or standard sump and pump methods of dewatering should be adequate to lower the water levels temporarily as required for the new construction. If springs or continuous flows of groundwater are encountered, permanent drainage control should be designed and implemented accordingly based upon the conditions and locations encountered.

For planning purposes, it should be assumed that temporary excavations in the silty fine sand soils and weathered rock must be inclined no steeper than 1V:1.5H as required for OSHA Type C materials. In the silt and clay soils found in borings B-8 and B-9, the temporary slopes may be steepened to the 1V:1H allowable for an OSHA Type B material. It may be possible to steepen slopes in bedrock, but this should be based upon review of the excavations by a Geotechnical Engineer subject to the orientation of bedding plans and quality of the rock.

For preliminary planning purposes it should be assumed that permanent cut slopes in bedrock must be no steeper than 1V:2H. This relatively flat slope is recommended due to the weathered condition of the rock and the steep bedding planes observed in the outcrops and cores. Similar to temporary slopes, it may be possible to steepen the permanent slopes in bedrock, but this should be based upon review of the excavations by a Geotechnical Engineer subject to the orientation of bedding plans and quality of the rock.

For preliminary planning purposes fill slopes and cut slopes in the overburden should be made no steeper than 1V:2.5H. If steeper slopes are desired, they should be reviewed by a Geotechnical Engineer on a case by case basis. All final slopes should be thickly vegetated or provided with appropriate cover to inhibit erosion.

D. Site Fill and Backfill

The silty fine sand soils found in a large portion of the site should be suitable for reuse as fill and backfill for the trail construction. Likewise, excavated bedrock may be considered for reuse provided it is broken into a well graded mix of fine to coarse size particles. The maximum particle size should be limited to 2/3 the thickness of the fill layer being placed. For example, if the fills are placed in maximum 12 -inch thick layers

the maximum particle size should be 8-inches. The silt and clay soils found in test borings B-8 and B-9 are less suitable for reuse, and for planning purposes it is recommended that they be used in landscape areas only and not directly beneath the trail or new structures.

The fills and backfills should be placed in uniform loose layers no more than about one (1) foot in thickness where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to not less than 95 percent of the maximum dry density for the soil which is established by the Modified Proctor Compaction Test, ASTM D1557. In landscape areas, the compaction may be reduced to 90 percent of maximum dry density.

E. Bridge Foundations

The bridge foundations should be seated on weathered bedrock at a depth of at least four feet below final grade to provide frost protection. The bearing surfaces should be cleaned of loose soil and rock or, if the rock is very weathered, its surface should be thoroughly compacted with a mechanical tamper to densify the soils loosened by the excavation process. All final bearing grades should be relatively firm, stable, and free of loose soil, mud, water, and frost.

The foundations may be proportioned for a maximum net allowable bearing pressure equal to 6,000 pounds per square foot. Assuming standard care is used in preparing the bearing grades, we estimate that total foundation settlement should be less than one-half (1/2) inch. The settlements should occur quickly as construction is completed and each load increment is applied.

F. Retaining Walls

The design of site retaining walls where soils are level on both the retained and resisting sides of the walls, may proceed using the following unfactored parameters. The design parameters assume that the backfill consists of on-site silty fine sand or well graded excavated rock. Silt and clay should not be reused as wall backfill.

- Soils Angle of Internal Friction (φf) = 30 degrees
- Coefficient of At-Rest Earth Pressure = 0.50
- Coefficient of Active Earth Pressure = 0.33
- Coefficient of Passive Earth Pressure = 3.0
- Total Unit Weight of Compacted Soil = 120 pcf
- Coefficient of Sliding Friction Soil ($\tan\varphi f$) = 0.40

Foundation drains and/or weep holes should be installed as required to prevent surface infiltration and groundwater from becoming trapped in the wall backfill soils.

G. Plan Review and Construction Monitoring

The Dente Group should be retained to review plans and specifications related to site grading, foundations and earthwork prior to their release for bidding to confirm that the recommendations contained herein were properly interpreted and applied.

It should be understood that the actual subsurface conditions that exist across this site will only be known when the site is excavated. For this reason, we should be retained to monitor earthwork and bearing grade preparations. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report. We believe this construction sequence observation and testing should be provided by us as a consultant to the Owner, Architect or Construction Manager. We do not believe these services should be provided through the general or earthwork contractor.

V. CLOSURE

This report was prepared for specific application to the project site and the construction planned using methods and practices common to Geotechnical Engineering in the area and at the time of its preparation. No other warranty, either expressed or implied, is made. Should questions arise or if we may be of any other service, please contact us at your convenience.

Prepared by,
Dente Group, A Terracon Company

Edward C. Gravelle, P.E.
Senior Engineer

Fred A. Dente, P.E.
Principal

APPENDIX A

AERIAL AND SITE PHOTOGRAPHS

HUDSON RIVER TRAIL
City of Beacon, New York

HUDSON RIVER TRAIL - BEACON SEGMENT
CITY OF BEACON, NEW YORK

Looking north at slope to be traversed by new trail.

General view of elevated portion of site and drainage course east of railroad tracks.

View of slope with rock outcrops near the Newburgh-Beacon Bridge Service Road.

General view of elevated portion of site and drainage course east of railroad tracks.

Steep bedding in rock outcrop on slope near Newburgh-Beacon Bridge Service Road

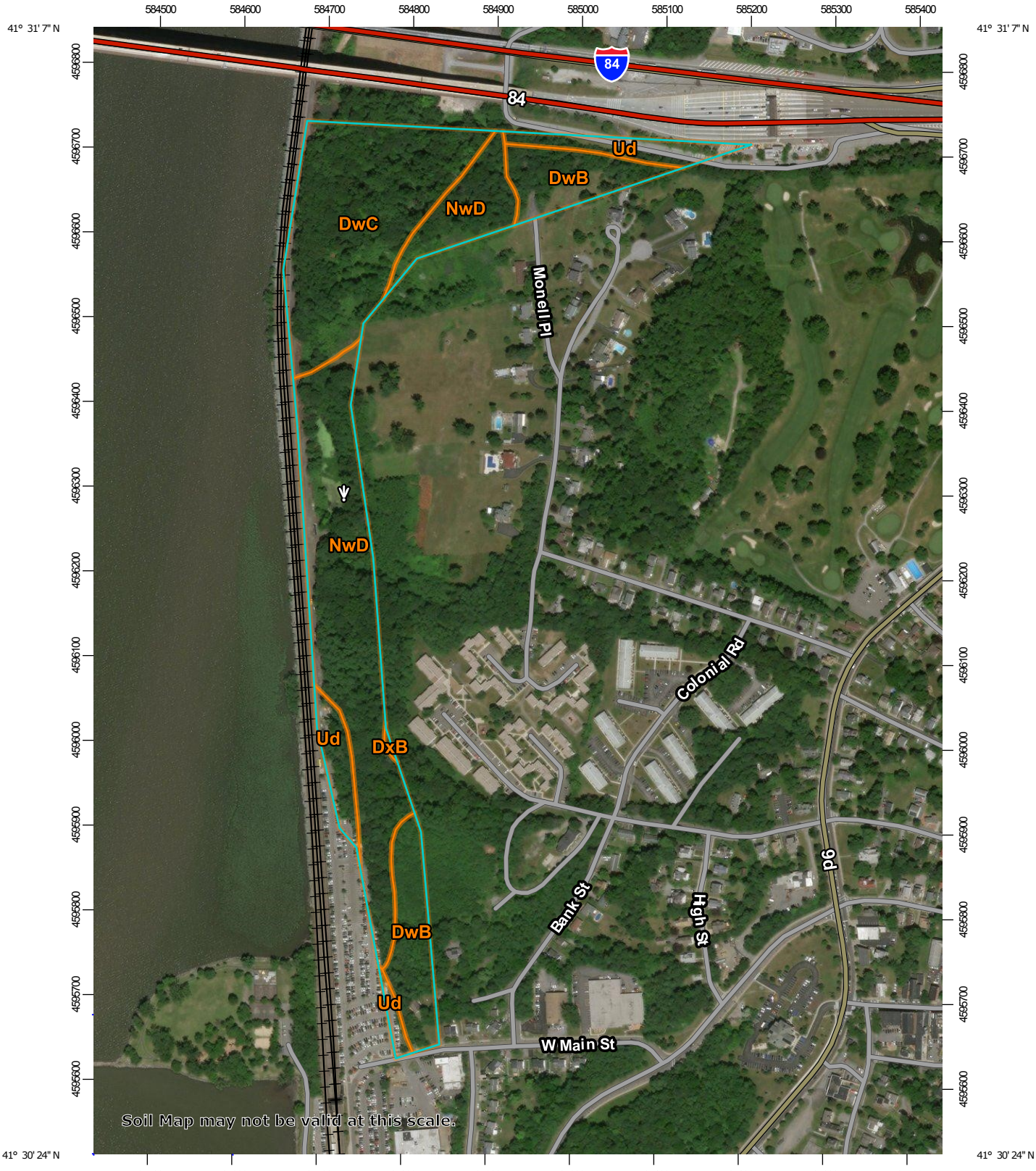
Rock outcrop on slope near Newburgh-Beacon Bridge Service Road

APPENDIX B

DUTCHESS COUNTY SOIL SURVEY INFORMATION

HUDSON RIVER TRAIL
City of Beacon, New York

Soil Map—Dutchess County, New York
(HUDSON RIVER TRAIL)



Map Scale: 1:6,480 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 14, Oct 8, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DwB	Dutchess-Cardigan complex, undulating, rocky	5.3	16.8%
DwC	Dutchess-Cardigan complex, rolling, rocky	10.1	31.9%
DxB	Dutchess-Cardigan-Urban land complex, undulating, rocky	0.1	0.2%
NwD	Nassau-Cardigan complex, hilly, very rocky	13.2	41.7%
Ud	Udorthents, smoothed	3.0	9.4%
Totals for Area of Interest		**31.8**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Dutchess County, New York

DwB—Dutchess-Cardigan complex, undulating, rocky

Map Unit Setting

National map unit symbol: 9rfn
Elevation: 50 to 1,000 feet

Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dutchess and similar soils: 40 percent
Cardigan and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 10 percent
Hydric soil rating: No

Massena

Percent of map unit: 9 percent
Hydric soil rating: No

Nassau

Percent of map unit: 9 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

DwC—Dutchess-Cardigan complex, rolling, rocky

Map Unit Setting

National map unit symbol: 9rfp
Elevation: 50 to 1,000 feet
Mean annual precipitation: 41 to 47 inches

Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dutchess and similar soils: 40 percent
Cardigan and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 5 to 16 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 5 to 16 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 10 percent
Hydric soil rating: No

Massena

Percent of map unit: 9 percent
Hydric soil rating: No

Nassau

Percent of map unit: 9 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

DxB—Dutchess-Cardigan-Urban land complex, undulating, rocky

Map Unit Setting

National map unit symbol: 9rfr
Elevation: 50 to 1,000 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Dutchess and similar soils: 25 percent
Cardigan and similar soils: 25 percent
Urban land: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 10 percent
Hydric soil rating: No

Georgia

Percent of map unit: 5 percent
Hydric soil rating: No

Nassau

Percent of map unit: 5 percent
Hydric soil rating: No

Massena

Percent of map unit: 4 percent
Hydric soil rating: No

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

NwD—Nassau-Cardigan complex, hilly, very rocky

Map Unit Setting

National map unit symbol: 9rhf
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 45 percent
Cardigan and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 5 inches: channery silt loam
H2 - 5 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Dutchess

Percent of map unit: 10 percent
Hydric soil rating: No

Sun

Percent of map unit: 10 percent
Landform: Depressions
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Ud—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9rj7

Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Urban land

Percent of map unit: 10 percent
Hydric soil rating: Unranked

Udorthents, wet substratum

Percent of map unit: 10 percent
Hydric soil rating: No

Unnamed soils, undisturbed

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Rock outcrop

Percent of map unit: 1 percent

Hydric soil rating: Unranked

Data Source Information

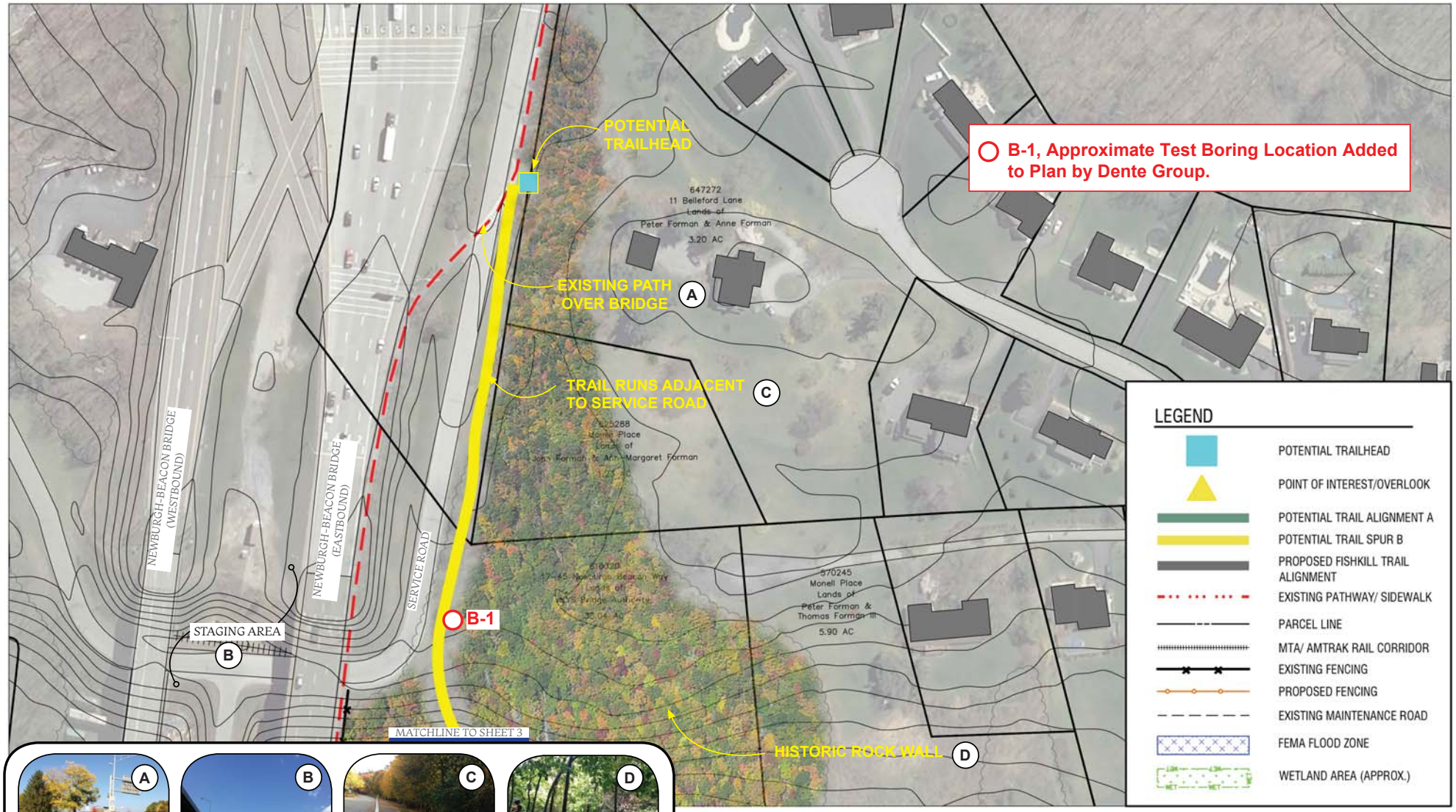
Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 14, Oct 8, 2017

APPENDIX C

BORING LOCATION PLAN

HUDSON RIVER TRAIL
City of Beacon, New York

SEGMENT D



REVISIONS

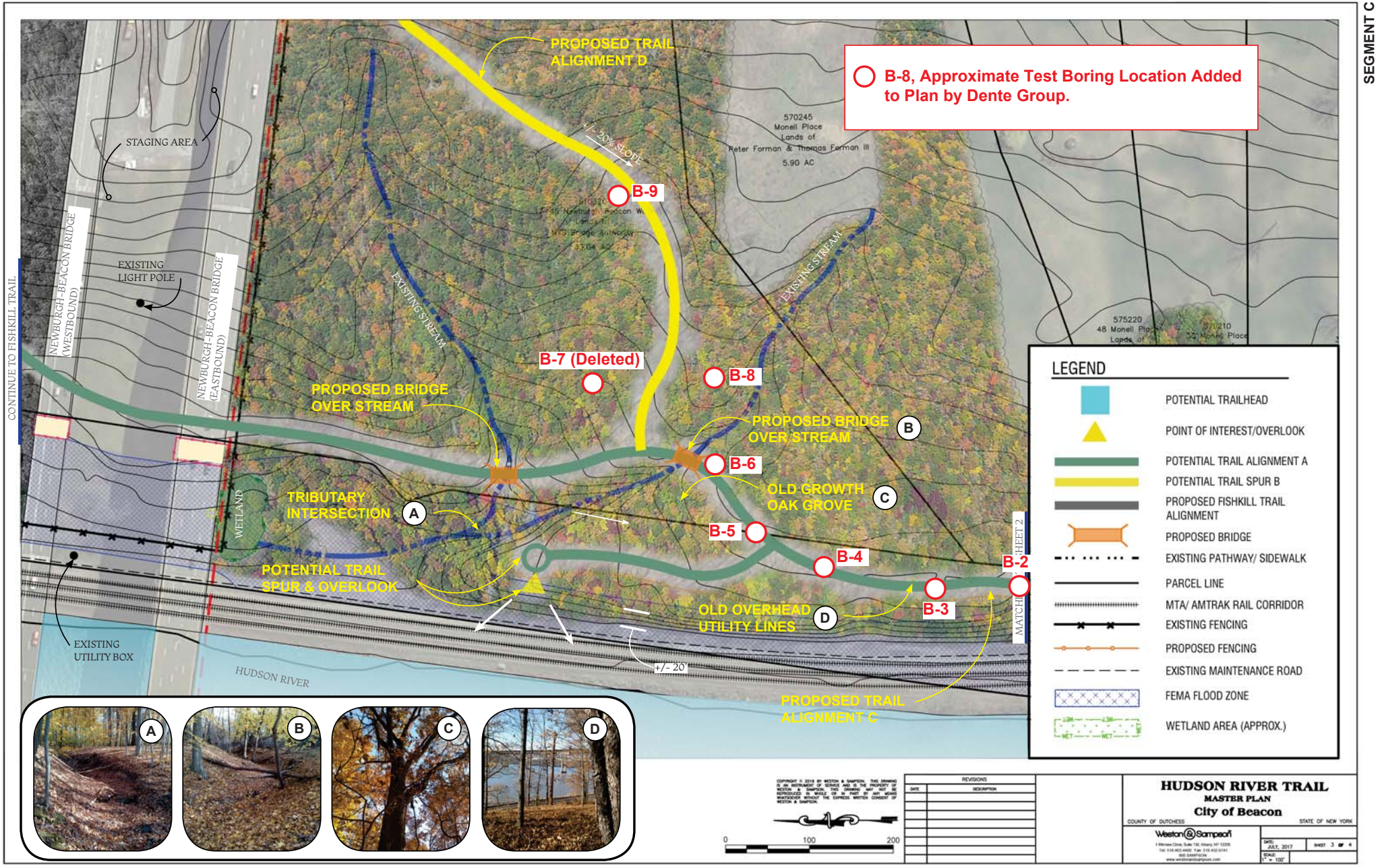
DATE	DESCRIPTION

0 100 200

HUDSON RIVER TRAIL
MASTER PLAN
City of Beacon
COUNTY OF DUTCHESS STATE OF NEW YORK

Weston & Sampson

DATE: JULY, 2017 SHEET 4 OF 4
SCALE: 1" = 100'


SEGMENT C
B-8, Approximate Test Boring Location Added to Plan by Dente Group.
PROPOSED TRAIL ALIGNMENT D
+/- 20% SLOPE
570245
Monell Place
Lands of
Peter Forman & Thomas Forman III
5.90 AC
B-9
STAGING AREA
EXISTING LIGHT POLE
NEWBURGH-BEACON BRIDGE (WESTBOUND)
NEWBURGH-BEACON BRIDGE (EASTBOUND)
EXISTING STREAM
EXISTING STREAM
575220
48 Monell Place
570210
CONTINUE TO FISHKILL TRAIL
B-7 (Deleted)
B-8
PROPOSED BRIDGE OVER STREAM
PROPOSED BRIDGE OVER STREAM
B
B-6
OLD GROWTH OAK GROVE
C
TRIBUTARY INTERSECTION
A
WETLAND
B-5
B-4
B-2
POTENTIAL TRAIL SPUR & OVERLOOK
OLD OVERHEAD UTILITY LINES
D
B-3
MATCH SHEET 2
EXISTING UTILITY BOX
HUDSON RIVER
+/- 20'
PROPOSED TRAIL ALIGNMENT C
LEGEND
POTENTIAL TRAILHEAD
POINT OF INTEREST/OVERLOOK
POTENTIAL TRAIL ALIGNMENT A
POTENTIAL TRAIL SPUR B
PROPOSED FISHKILL TRAIL ALIGNMENT
PROPOSED BRIDGE
EXISTING PATHWAY/ SIDEWALK
PARCEL LINE
MTA/ AMTRAK RAIL CORRIDOR
EXISTING FENCING
PROPOSED FENCING
EXISTING MAINTENANCE ROAD
FEMA FLOOD ZONE
WETLAND AREA (APPROX.)
A
B
C
D
0
100
200
REVISIONS
DATE
DESCRIPTION
HUDSON RIVER TRAIL
MASTER PLAN
City of Beacon
COUNTY OF DUTCHESS
STATE OF NEW YORK
Weston & Sampson
JULY, 2017
SHEET 3 OF 4
SCALE: 1" = 100'

APPENDIX D

SUBSURFACE LOGS AND CORE PHOTOGRAPHS

HUDSON RIVER TRAIL
City of Beacon, New York

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-1**

PROJECT: Hudson River Trail	**DATE**	START: 6/20/18	FINISH: 6/20/18
LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers		
CLIENT: Weston & Sampson	with ASTM D1586 and D2113 Sampling		
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 120.6’		
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	12	25				± 4” Topsoil over Brown/Gray Decomposed Bedrock
				50/.4’		REF	
		Core Run #1 – 1.7’ to 4.2’ Rec=56%, RQD=0%					Gray SHALE, Medium Hard, Weathered, Steeply Thin Bedded and Highly Fractured
5'		Core Run #2 – 4.2’ to 7.0’ Rec=100%, RQD=0%					
							Boring Ended at 7.0’
10'							Driller reports partial water loss when coring at 4.0’ depth and complete water loss in coring run #2.
15'							
20'							
25'							

ROCK CORES - BORING B-1

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-2**

PROJECT: Hudson River Trail	**DATE**	START: 6/21/18	FINISH: 6/21/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 37.9’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				± 5” Topsoil over Brown Fine SAND, Some
				2	2	4	Silt, Moist
5'	2	6	4				Grades Little Silt
				3	3	7	
10'	3	8	8				**(MOIST, LOOSE TO FIRM)**
				23	23	31	Brown Fine to Coarse SAND, Some Gravel,
	4	55	34				Some Silt, Moist
				20	22	54	
15'	5	30	24				Similar
				50/.4’		REF	**(MOIST, COMPACT TO VERY COMPACT)**
							Boring Ended at 15.4’ with Spoon Refusal
							No measurable groundwater in augers at
20'							completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-3**

PROJECT: Hudson River Trail	**DATE**	START: 6/21/18	FINISH: 6/21/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 and D2113 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 40.3’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				± 4” Topsoil over Brown Fine SAND, Some Silt
				2	2	3	**(MOIST, LOOSE)**
	2	50/.2’				REF	
5'		Core Run #1 2.7’ to 7.7’ Recovery = 92% RQD = 8%					Gray SHALE with Calcite Veins, Medium Hard to Hard, Weathered, Thin Bedded and Highly Fractured
10'							Boring Ended at 7.7’ Driller reports complete water loss when coring at 5.5’ depth.
15'							
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-4**

PROJECT: Hudson River Trail	**DATE**	START: 6/22/18	FINISH: 6/22/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 and D2113 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 40.7’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				± 4” Topsoil over Brown Fine SAND, Some to Little Silt, Little Gravel
				2	1	4	
							(MOIST, LOOSE)
5'							Gray SHALE, Medium Hard, Weathered to Slightly Weathered, Thin Bedded to Bedded with Highly Fractured Layer at 6.0 to 9.1 feet depth.
		Core Run #1 4.7’ to 9.7’ Recovery = 100% RQD = 23%					
10'							Boring Ended at 9.7’ Driller reports complete water loss when coring at 7.5’ depth.
15'							
20'							
25'							

ROCK CORES - BORINGS B-3 AND B-4

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-5**

PROJECT: Hudson River Trail	**DATE**	START: 6/21/18	FINISH: 6/21/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 44.0’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	1				± 4” Topsoil over Brown Fine SAND, Some Silt
				2	2	3	
							(MOIST, LOOSE)
5'							
	2	50/.2’				REF	Gray Weathered SHALE
10'							
	3	50/.2’				REF	**(MOIST TO DRY, VERY COMPACT)**
							Boring Ended at 10.2’ with Spoon Refusal
							No measurable groundwater in augers at
							completion of drilling and sampling.
15'							
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-6**

PROJECT: Hudson River Trail	**DATE**	START: 6/21/18	FINISH: 6/21/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 46.6’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	1				± 4” Topsoil over Brown Fine SAND, Some Silt
				2	2	3	
							(MOIST, LOOSE)
5'	2	6	12				Brown/Gray Very Weathered SHALE
				50/.4’		REF	
10'	3	50/.2’				REF	**(MOIST TO DRY, VERY COMPACT)**
							Boring Ended at 10.2’ with Spoon Refusal
							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-8**

PROJECT: Hudson River Trail	**DATE**	START: 6/20/18	FINISH: 6/20/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 53.1’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	3				± 3” Topsoil over Br. Varved SILT and CLAY
				4	8	7	
5'	2	15	15				Similar
				14	14	29	
10'	3	8	11				Similar
				13	13	24	
							(MOIST, MEDIUM TO HARD)
	4	-	8	16			Brown SAND and GRAVEL, Some Silt, Gray
				26	16	42	Rock Fragment at 15.4’ **(MOIST, COMPACT)**
15'							Boring Ended at 15.5’
							Groundwater at 11.5’ below grade after leaving the augers in overnight at 13.5’ depth.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-9**

PROJECT: Hudson River Trail	**DATE**	START: 6/20/18	FINISH: 6/20/18

LOCATION: City of Beacon, NY	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: Weston & Sampson	with ASTM D1586 Sampling
JOB NUMBER: JB185059	**SURFACE ELEVATION:** ± 59.4’
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	1				± 7” Topsoil over Brown SILT, Some Fine
				2	3	3	Sand, Little Clay **(MOIST, LOOSE)**
	2	4	8				Brown Varved SILT and CLAY, Moist
				10	10	18	
5'							
	3	4	8				Similar
				10	12	18	
10'							
	4	5	8				Similar
				8	12	16	
							(MOIST, STIFF)
15'							
	5	3	4				Becomes Brown and Gray **(WET)**
				15	35	19	Weathered Rock at 16.5’ **(WET)**
							Boring Ended at 17.0’
							Groundwater in augers at 13.2’ below grade at
20'							completion of drilling and sampling.
25'							

May 29, 2020

Mr. Daniel Biggs, RLA, ISA
Weston & Sampson
1 Winners Circle, Suite 130
Albany, NY 12205

Re: Rock Cut Evaluation
Hudson River Greenway Trail
Beacon, New York
Dente Group Project No. JB205091

Mr. Biggs,

In accordance with our Master Services Agreement Task Order dated April 6, 2020, the undersigned visited the Hudson River Greenway Trail project site to observe bedrock outcrops and evaluate the option for using unbraced rock cuts in cut areas versus retaining walls which are currently planned.

On April 30, 2020 we visited the site along with Jack Grieshober from your office. Our observations were focused in the area from about Station 33+50 to the project end at Station 42+14. Through this area the proposed trail is planned adjacent to the west side of the Beacon Railroad Station parking lots. Bedrock outcrops are present through this area and in some locations the outcrops extend close to the edge of the parking lot and beneath the proposed trail. As shown on the attached Plan & Profile sheets, preliminary planning calls for retaining walls with heights in the range of 4 to 35 feet in the rock cut areas.

Bedrock in the project area is identified on the Geologic Map of New York as Austin Glen Formation composed of interbedded graywackes and shales. This mapping is consistent with our observations as shown on the attached photographs. Most of the outcrops are composed of the blocky graywacke with complex bedding which is often steeply bedded down in a south and west direction, i.e., downward with respect to the planned rock cuts. At the north end of the area of concern, from about Station 35+00 to 33+75, the rock is composed of shale as shown in Photos No. 8 and 10.

In the NYSDOT Geotechnical Design Manual, Chapter 15, it is stated that most rock cuts in the lower Hudson Valley are made 3V on 2H and that all shale slopes are made 1V on 1H. These slopes can be assumed for planning purposes with the understanding the final slopes may be at risk of rockfalls due to the steep inclination and direction of the bedding planes. This risk can be reduced by flattening the slopes and adding a rockfall catchment area at the toe of the slope. This would require additional rock excavation and easements which may extend beyond those planned. Design of the catchment area would be required dependent upon the height and inclination of the cut slope and backslope.

If additional rock excavation and easements which may extend beyond those planned are not feasible, then rock slope stabilization techniques may be considered. These typically include scaling, rock bolts and dowels, wire mesh and cable net systems, and reinforced shotcrete. Of these, scaling and rock dowels would likely be the options best suited to the site conditions.

Scaling is the removal of loose overhangs, weathered pockets, or unconnected rock from the slope. This can be done with or without blasting based on the conditions encountered. Rock dowels are untensioned anchors that are installed to prevent a small block of rock from moving. The bedding of the rock at this site is highly variable and the final stabilization technique may be one or a combination of these techniques.

To summarize, unbraced cut slopes in the rock may be made subject to the following guidelines.

1. Shale slopes of 1V on 1H should be assumed from about Station 35+00 and north from that station.

2. Slopes south of Station 35+00 may be assumed as steep as 3H on 2V. Flatter slopes should be considered if space is available.

3. The rock cut slopes should include a catchment area at the toe which may require wider easements, or implementation of slope stabilization techniques such as scaling and/or rock dowels.

4. Slopes steeper than 1V on 1H and higher than 5 feet should be excavated by presplit blasting in accordance with NYSDOT Standard Specifications.

5. Slopes flatter than 1V on 1H or less than 5 feet in height may be excavated by other blasting techniques or by mechanical means.

The report was prepared to assist in preliminary planning for design and construction of the trail in areas requiring rock cuts from about Station 33+75 to the trail end at Station 42+14. Other useful information which can be referenced regarding design and construction of rock cuts can be found in Chapter 15, Rock Slope Design, in the NYSDOT Geotechnical Design Manual. This can be downloaded from the NYSDOT website.

We appreciate the opportunity to be of continuing service to you. If questions arise or if I may be of any assistance, please contact me at our Watervliet location.

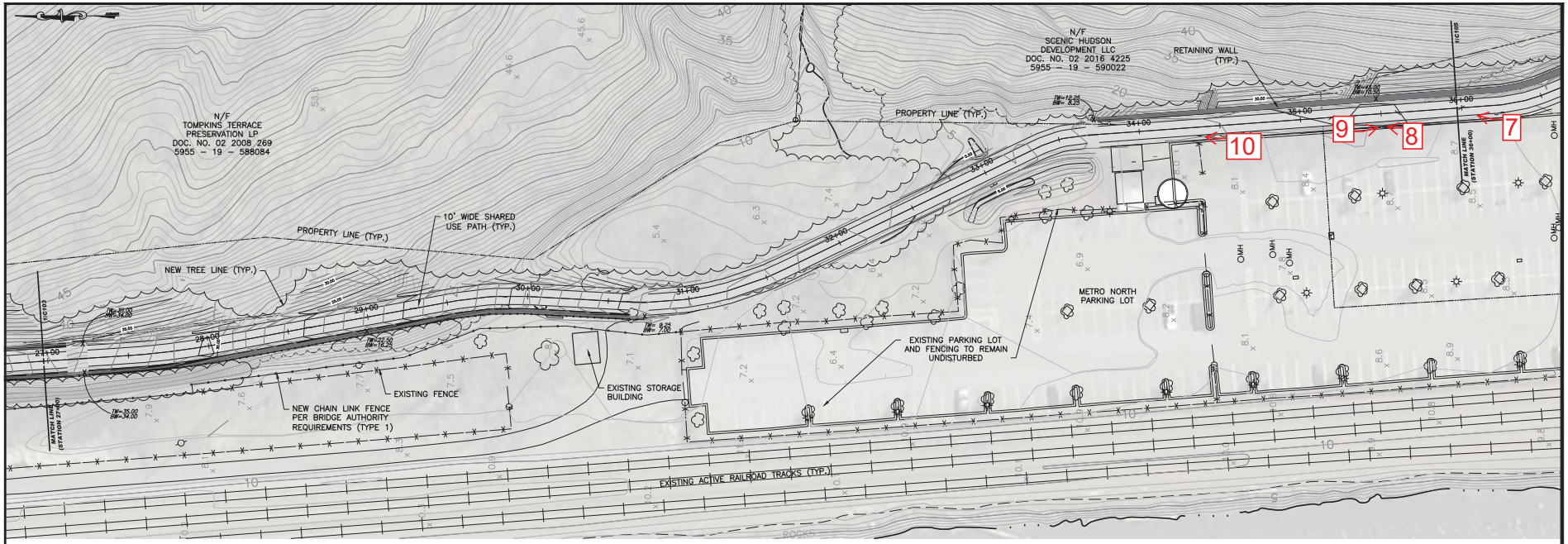
Yours truly,

Edward C. Gravelle, P.E.
Senior Engineer

Joseph Robichaud, Jr., P.E.
Sr. Associate / Office Manager

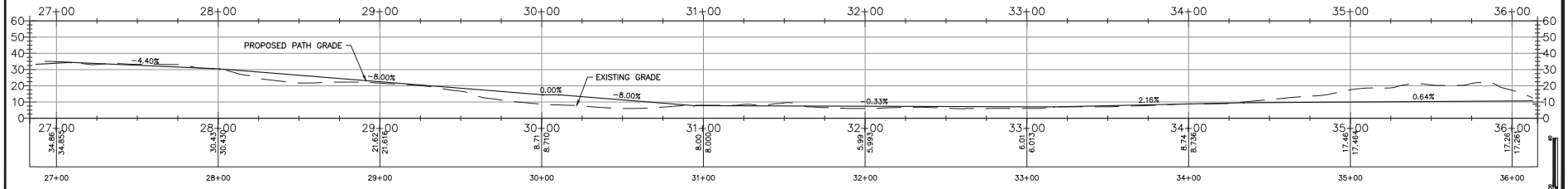
Attachments:

Photography Location Plan
Photographs



1 **SITE PLAN (STA 27+00 TO STA 36+00)**
SCALE:1" = 30'

PHOTOGRAPH LOCATION PLAN
Dente Project No. JB205091



2 **PROFILE VIEW (STA 27+00 TO STA 36+00)**
SCALE:HORIZ: 1" = 30' | VERT: 1" = 30'

Weston & Sampson
1 Winners Circle, S 130, Albany, NY
518.463.4400 800.SAMPSON
www.westonandsampson.com

No.	Date	Description
A	Dr.By	
P	Ch.By	
P	App.By	
R		
O		
V		
E		
D		

DECEMBER 03, 2018
DATE

REGISTERED PROFESSIONAL

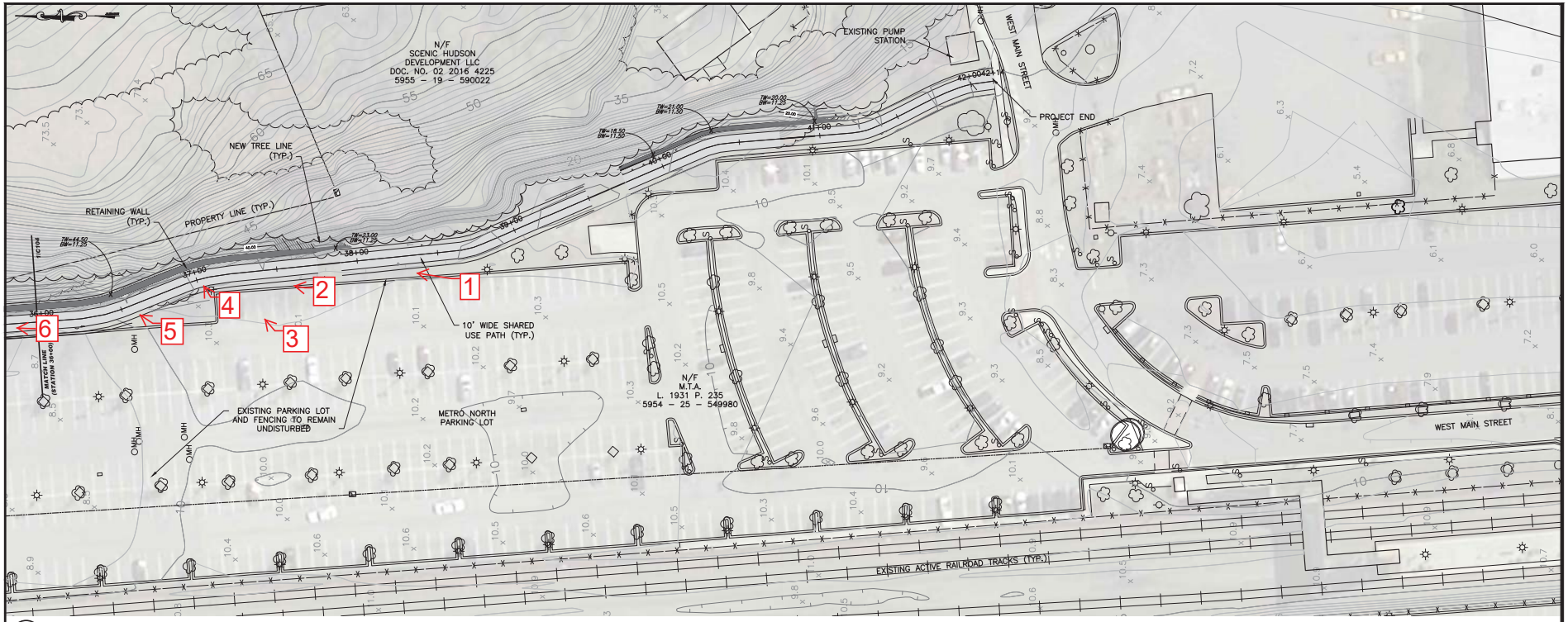
PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
PLAN & PROFILE STA 27+00 – 36+00

CADD NO.	SCALE: BAR SCALE	CONTRACT:	JOB NO. N2180028	DR.BY: JWG	DSN.BY: JWG	CHK.BY: DPB	APP.BY: DPB

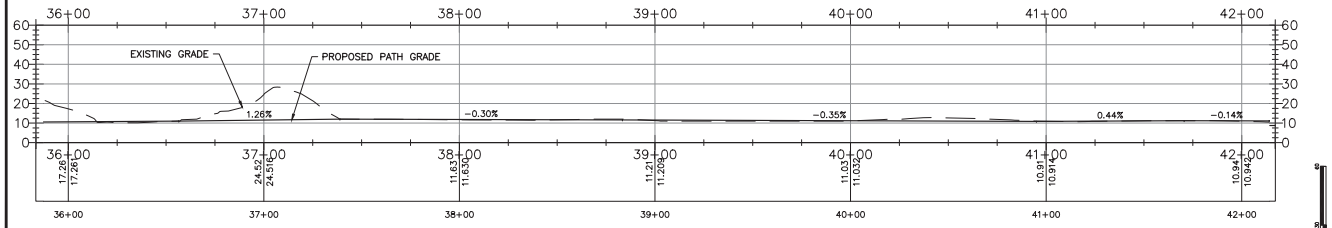
C104
FILE NO.

SHEET 6 OF 17



1 **SITE PLAN (STA 36+00 TO STA 42+14)**
SCALE: 1" = 30'

PHOTOGRAPH LOCATION PLAN
Dente Project No. JB205091



2 **PROFILE VIEW (STA 36+00 TO STA 42+14)**
SCALE: HORIZ: 1" = 30' | VERT: 1" = 30'

Weston & Sampson
1 Winners Circle, S 130 Albany, NY
518.463.4400 800.SAMPSON
www.westonandsampson.com

No.	Date	Description
A	DEC 03, 2018	PRELIMINARY

REGISTERED PROFESSIONAL

DATE: DECEMBER 03, 2018

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

CITY OF BEACON, NEW YORK
HUDSON RIVER GREENWAY TRAIL
PRELIMINARY DESIGN
PLAN & PROFILE STA 36+00 – 42+14

DR.BY	D.MN.BY	CHK.BY	APP.BY
JWG	JWG	DPB	DPB

JOB NO.	SCALE	CONTRACT	CADD NO.
NZ180028	BAR SCALE		

C105

FILE NO.

SHEET 7 OF 17

PHOTO NO. 2

PHOTO NO. 1

PHOTO NO. 4

PHOTO NO. 3

PHOTO NO. 6

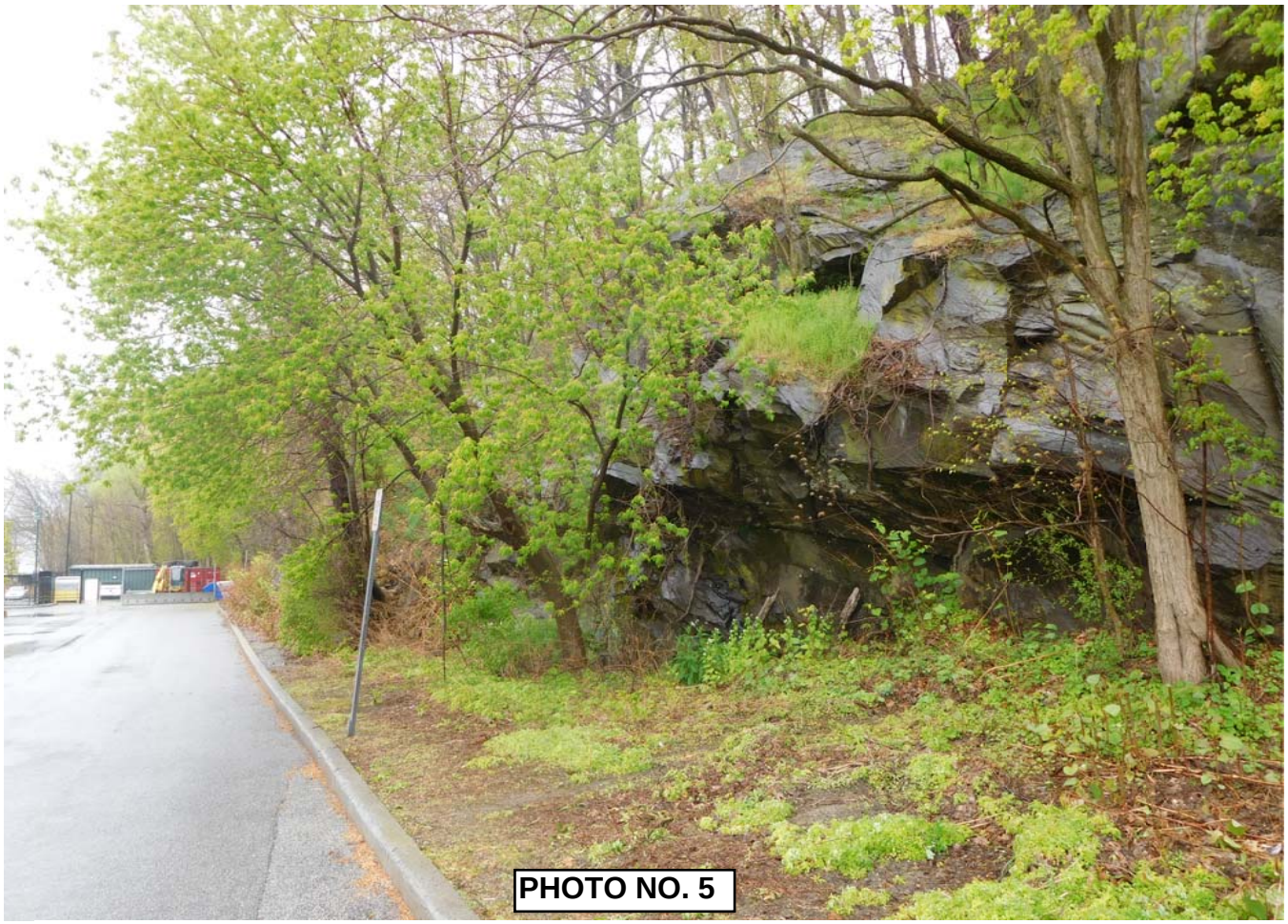


PHOTO NO. 5

PHOTO NO. 8

PHOTO NO. 7

PHOTO NO. 10

PHOTO NO. 9

Appendix C – MNR – Trail Guidelines

Specification	**Measured in Feet**	**Considerations**
Separation of recreational use from centerline of track	25’	Chain link fencing is required for the entire length of the trail. Fencing must be grounded in electrified territory. Fencing location will not restrict emergency rail operations or train evacuations. Right-of-way access gates may be necessary per Metro-North guidance or by distance. Access gates shall swing outward from track and will be locked by railroad lock.
Minimum fence height	8	The fencing must be a minimum of 8-feet in height due to proximity of active tracks. Fencing materials must meet the following minimum requirements: non-scalable, black vinyl/PVC coated, chain link fence. Fencing type/material shall be reviewed and approved by the railroad. Any gates in the fencing must swing away from the track or be sliding gates.
Minimum trail width	10	Trail width requirement is based on ability to accommodate emergency response vehicles. Access locations shall be shown during design plan review and comment process.
Minimum height of overhead structures from top of rail	23-29	Overhead bridge structures require a minimum of 23' feet from the top of rail. Where the physical conditions impose clearances less than 23’, the matter must be submitted to the Chief Engineer- Maintenance of Way for any modifications, review and approvals and to the Local and State Authorities. Where Railroad conductor cables (Power and Communication/Signal) exist, clearances must be an additional 6’-0. Railroad cables shall be constructed in compliance with Railroad requirements, AREA, and NESC. Based upon requirements of the New York State Department of Transportation, structure and height guidance will be contained in basic building code including, but not limited to, the building code of: ASCE 7 American Society of Civil Engineers - Loads for Buildings and Other Structures, AISC American Institute of Steel Construction, ACI American Concrete Institute, PCI Precast Prestressed Concrete, APA Wood Construction, NDS Timber Construction, AASHTO Guide Specifications for Design of Pedestrian Bridges, Americans with Disabilities Act, IBC International Building Code, and IFC International Fire Code.

Trails will not be considered along active corridors with operation of 90 mph or greater. Consideration is based on the area terrain and topography, speed and frequency of service.

No new at-grade crossings.
MNR will retain access to all maintenance roads.
New trail wearing surfaces (top of pavement) shall be a minimum of two inches (2") below the top of railroad ties. New trails must not prevent runoff, trapping of water, or result in the introduction of any runoff into the tracks and must provide for an independent system to handle water resulting from any impervious surfaces. Existing drainage facilities crossed by the trail must be protected during construction and repaired or replaced where damaged. Existing drainage structures and culverts shall be inspected and cleaned as to ensure proper functioning.
Railroad utilities will be protected during construction and must be fully accessible at all times to MNR crews for repair and inspection.
Power required for any electric devices must be provided by the municipality.
Entrances to the trails must be restricted so only pedestrians are allowed access. Physical barriers (e.g. bollards) will be designed so they may be unlocked or removed for entrance by emergency vehicles.
Trails must accommodate emergency response vehicle (not a fire truck) access. Safety plan is required to be put into place by sponsor and must be reviewed and approved by the railroad.
New structures are subject to review by MNR. Engineering plans and details submittal must meet all Local, State and Federal building specification code and approved drawings as certified, signed and sealed by a New York State Professional Engineer.
Minimum bearing load of trail is 8,000-12,000 pounds.
Waste materials generated by trail construction activities must be disposed of by the contractor in accordance with all applicable Local, State, and Federal laws and guidelines with complete chain of custody documentation provided to Metro-North.
If a trail does not meet above standards, and there is a constriction with no other reasonable option, then standards will be reviewed for an extremely limited distance and will be approved solely at Metro-North's discretion.

Appendix D – NYSBA – Fencing & Camera Specifications

NEW YORK STATE OF OPPORTUNITY. | Bridge Authority

ANDREW M. CUOMO
Governor

JOSEPH RUGGIERO
Executive Director

CARL G. WHITBECK, JR., ESQ.
General Counsel

April 13, 2018

Thomas Scaglione, Chief of Staff
New York State Bridge Authority
P.O. Box 1010
Highland, NY 12528

Re: Camera System Security for Trail Under Newburgh Beacon Bridge

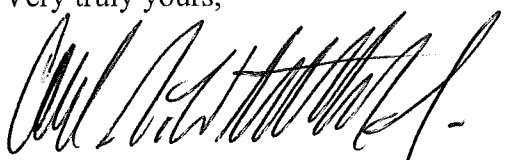
Dear Mr. Scaglione:

This letter is a follow-up to our telephone conversation and your request for my opinion concerning the authority of the New York State Bridge Authority ("NYSBA") to request camera coverage of a trail beneath the Newburgh Beacon Bridge ("NBB"). Incidentally, I believe we should also have a lease agreement with the towns and/or Dutchess County which will permit them to install and maintain the trail.

Please be advised that NYSBA entered into a Memorandum of Understanding with the United States Coast Guard for security grants and live video monitoring dated September 25, 2013. The grant provided Federal funds to NYSBA to install and maintain an authority-wide security camera system for the area beneath each of our five (5) bridges and the Walkway Over the Hudson. Since this new trail will pass under the NBB, it should be subjected to the same security as all other areas beneath our bridges. As you know, the security camera system connects to our Command Center in Highland, New York.

I would also make specific reference to Sections 528(15) and (16) of the Public Authorities Law of the State of New York. Section 528(10) authorizes NYSBA to enter into lease agreements which may not exceed ten (10) years.

Very truly yours,



CARL G. WHITBECK, JR.

CGW:af
Enclosure
cc: Joseph Ruggiero, Executive Director

NEW YORK STATE OF OPPORTUNITY. Bridge Authority

ANDREW M. CUOMO
Governor

JOSEPH RUGGIERO
Executive Director

RICHARD A. GERENTINE
Chairman

MEMORANDUM

To: Tom Scaglione

From: Chris Kelly

Date: April 25, 2018

Subject: Proposed NBB Pedestrian Walkway Surveillance

The following is a list of items that will provide surveillance coverage from the south approach from the train station, underneath both spans and the new pathway up to the existing pathway.

- (1) Video Server: $12,000
- (4) Thermal Cameras with licenses. $5,299 + $299 x 4 = $22,392
- (1) Axis HD PTZ Camera with mounting hardware. $2,238.40
- (1) CCTV Stainless Steel cabinet and equipment. $5,700
- Miscellaneous POE cabling, connectors and conduit for camera installation locations. $10,000

Project total for the hardware: $52,330.40

ITEM- 1 thru 4: Fences and Gates

DESCRIPTION:

Under these items the contractor shall furnish and install fences and gates at the bridge facilities in accordance with the contract plans. The fence shall be designated "Optional Chain Link Fence, Type 1 in accordance with the provisions of the NYSDOT Standard Specifications section 607-1.01 Fence types.

CONSTRUCTION DETAILS:

The provisions of the NYSDOT Standard Specifications, Sections 607-3.01 General; Section 607-3.02 Chain-Link Fencing with top rail and Section 607-3.07 Fence Gates shall apply. All fences and gates shall be 6ft. high except at the Mid-Hudson Bridge where they shall be 8ft high.

Anchor bolts holes shall be drilled and bolts grouted in accordance with the grout manufacturer's written instructions.

Prior to digging, the Contractor shall call for a utility mark-out. The proposed locations shall be inspected and approved by the Engineer before the Contractor may proceed with excavation.

METHOD OF MEASUREMENT:

Payment for all work under these items and as described on the plans will be made at the Lump Sum prices bid for the completed and accepted work described in this bid item.

BASIS OF PAYMENT:

Payment will include the cost of all materials, labor, equipment, insurance, and all costs incurred to satisfactorily complete the work. The lump sum price bid shall include the cost of furnishing and installing galvanized chain link fence, gates, hardware including the post foundation and anchor bolts in accordance with this specifications and the contract plans.

Partial Payment estimates will be made monthly during the progress of the work on a percentage of work completed basis as determined and agreed to by the Engineer.

606.8704	Corrugated Beam Guide Railing Transition Assembly Concrete Parapets, or Concrete Barrier	Each
606.8801	Box Beam Guide Rail Transition to Concrete Barrier (One or Two Way Operation)	Each
606.8802	Box Beam Guide Rail Transition to Concrete Barrier (One Way-Trailing End)	Each
606.8803	Transition Between Box Beam Guide Rail and Single Slope Half Section Concrete Barrier (One or Two Way Operation)	Each
606.8804	Transition Between Single Slope Half Section Concrete Barrier and Box Beam Guide Rail (One Way - Trailing End of Barrier)	Each
606.8805	Transition Between Box Beam Median Barrier and Single Slope Concrete Median Barrier	Each
606.8901	Transition: HPBO (Mod.) Corrugated Guide Railing to Beam Box Beam Guide Railing	Each
606.8902	Transition: HPBO (Mod.) Corrugated Beam Guide Railing to Weak Post Corrugated Beam Guide Railing	Each
606.8903	Transition: HPBO (Mod.) Corrugated Beam Guide Railing to Single Slope Concrete Half Section Barrier	Each
606.8904	Transition: HPBO (Mod.) Corrugated Beam Median Barrier to Beam Box Beam Median Barrier	Each
606.8905	Transition: HPBO (Mod.) Corrugated Beam Median Barrier to Weak Post Corrugated Beam Median Barrier	Each
606.8906	Transition: HPBO (Mod.) Corrugated Beam Median Barrier to Single Slope Concrete Median Barrier	Each
606.9001	Transition between Standard (NJ) Concrete Barrier and Single-Slope Concrete Barrier	Each
606.9002	Transition between Wide and Normal Single Slope Concrete Median Barrier	Each
606.9003	Transition between Half-Section and Full-Section Single Slope Concrete Barrier (Left Pocket)	Each
606.9004	Transition between Half-Section and Full-Section Single Slope Concrete Barrier (Right Pocket)	Each
606.9401	Pier Protection (One Way)	Foot
606.9402	Pier Protection (Two Way)	Foot

SECTION 607 - FENCES

607-1 DESCRIPTION. This work shall consist of furnishing and erecting fencing and metal fence gates of the type and size, and at the locations shown on the plans or as directed by the Engineer. Construction of fencing and gates shall be done in accordance with the specifications, the standard sheets, and the plans, and in reasonable close conformity with the lines and grades shown on the plans or established by the Engineer.

607-1.01 Fence Types. The fence shall be designated as follows:

→Optional Chain Link Fence Type I
Optional Chain Link Fence Type II
Vinyl Coated Chain Link Fence on Plastic Coated Frame
Right-of-Way Fencing

The options for Type I and Type II chain link fences shall be as follows:

→ **TYPE I**

Fabric Options	**Frame Options**
Coated Steel Fence Fabric (95% Zinc 5% Aluminum- Mischmetal Alloy)	Mischmetal Alloy Coating (95% Zinc 5% Aluminum)
Galvanized Steel	Galvanized Steel
Aluminum	Combined Coating on Steel
Aluminum Coated Steel	Aluminum
	Aluminum Coated Steel

TYPE II

Fabric Options	**Frame Options**
Coated Steel Fence Fabric (95% Zinc 5% Aluminum- Mischmetal Alloy)	Mischmetal Alloy Coating (95% Zinc 5% Aluminum)
Galvanized Steel	Galvanized Steel
Vinyl Coated Steel	Combined Coating on Steel
Aluminum	Plastic on Steel
Aluminum Coated Steel	Aluminum
	Aluminum Coated Steel

Fence gates for Type I and Type II optional fences shall be consistent with the fabric and frame option selected for the contract. Fence frame and fabric selected shall be consistent throughout the contract except where intermixing is permitted by the Engineer.

607-2 MATERIALS. Materials shall conform to the requirements specified in the following subsections of Section 700 - Materials and Manufacturing:

Zinc Chromate Primer	708-04
Aluminum Fence Fabric	710-01
Galvanized Steel Fence Fabric	710-02
Vinyl Coated Steel Fence Fabric	710-03
Aluminum Coated Steel Fence Fabric	710-04
Coated Steel Fence Fabric (95% Zinc 5% Aluminum-Mischmetal Alloy)	710-05
Steel and Iron Posts, Rails, Braces and Fittings for Chain-Link Fence	710-10
Aluminum Posts, Rails, Braces and Fittings for Chain-Link Fence	710-11
Plastic Coated Posts, Rails, Braces and Fittings for Chain-Link Fence	710-12
Right-of-Way Fencing	710-30

607-2.01 Portland Cement Concrete for Bases. Portland Cement concrete used for bases shall be Class A or C conforming to the requirements of Section 501 Portland Cement Concrete--General except that requirements for automated batching shall not apply.

607-2.02 Right-of-Way Fencing. The Contractor has the option of using posts and braces fabricated from either high carbon shapes of steel or pressure treated wood meeting the requirements of §710-30 Right-of-Way Fencing.

607-2.03 Fence Gates. Fence gates for Right-of-Way Fencing shall Conform to the requirements for Right-of-Way Fence Gates of §710-30. Fence gates for Chain-Link Fence shall conform to the following:

A. Gate Frames. Frames shall be constructed of tubular members welded at all corners or assembled with corner fittings. Where corner fittings are used gates shall have 3/8 inch nominal diameter truss rods to prevent sag or twist. Gate leaves shall have vertical intermediate bracing so that no vertical members are more than 8 feet apart. Gate leaves over 10 feet long shall have a horizontal brace or a 3/8 inch nominal diameter diagonal truss rod. Gate leaves over 16 feet shall have both a horizontal brace and a 3/8 inch nominal diameter truss rod.

B. Gate Fabric. Gate fabric shall conform to the requirements of the fabric used in the fence construction.

C. Gate Hinges. Hinges shall be weldable steel, cast steel or malleable iron 180° offset industrial type. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by one person. Hinges shall be galvanized in accordance with §719-01 Type I.

D. Gate Latches. Latches, stops and keepers shall be provided for all gates. Latches shall have a plungerbar arranged to engage the center stop, except that single left gate openings with an opening of less than 10 feet may use a forked latch. Latches shall be arranged for locking and the Contractor shall provide a lock with triplicate keys for each gate. Center stops shall consist of a device arranged to be set in concrete and to engage a plunger-bar of the latch of double leaf gates. No stop is required for single leaf gates. Keepers shall consist of a mechanical device for securing the free end of the gate when in the full open position.

607-3 CONSTRUCTION DETAILS

607-3.01 General. The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment.

At locations where breaks in a run of fencing are required, or at intersections with existing fences, appropriate adjustment in post spacing shall be made to conform to the requirements for the type of closure indicated.

When the plans require that the posts, braces, or anchors be embedded in concrete, the Contractor shall install temporary guys or braces as may be required to hold the posts in proper position until such time as the concrete has set sufficiently to hold the posts. Unless otherwise permitted, no materials shall be installed on posts or strain placed on guys and bracing set in concrete until seven days have elapsed from the time of placing the concrete.

All posts shall be set vertically and to the required grade and alignment. Cutting of the tops of the posts will be allowed only with the approval of the Engineer and under the Engineer's specified conditions.

Wire or fencing of the size and type required shall be firmly attached to the posts and braces in the manner indicated. All wire shall be stretched taut and be installed to the required elevations.

At each location where an electric transmission, distribution or secondary line crosses any of the types of fences covered by these specifications, the Contractor shall furnish and install a ground conforming to the requirements of Subsection 9 of the National Electric Safety Code.

Fence shall generally follow the contour of the ground, with the bottom of fence fabric no less than 1 inchnor more than 6 inch from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

Line posts shall be spaced equidistant in the fence line at the spacing shown on the plans, standard sheets or as directed by the Engineer. End, corner, and intermediate posts shall be placed at the locations

indicated on the plans, standard sheets or as directed by the Engineer, and shall be braced as shown on the plans or standard sheets. When chain link fence is on a long curve intermediate posts shall be evenly spaced so that the strain of the fence will not bend the line posts.

All end, corner, and intermediate posts shall be set plumb in concrete bases of the depth and diameter shown on the plans or standard sheets. The Contractor shall have the option of setting the line posts in concrete bases or using methods of driving and anchoring specified by the fence manufacturer and approved by the Engineer.

The concrete bases shall be rough cast in the ground around the posts. The top surfaces shall be domed to shed water and provide a neat workmanlike appearance when completed. Extensions of up 45 minutes for the allowed time for pouring the concrete will be permitted.

607-3.02 Chain-Link Fencing with Top Rail. Posts shall be set so they are equidistant with a maximum of 10 foot centers.

All top rails shall pass through the base of the post caps and shall form a continuous brace from end to end of each stretch of fence. Top rail lengths shall be joined with sleeve couplings with expansion sleeves provided at 100 foot intervals. Top rails shall be securely fastened to end posts by means of approved rail end connectors. Horizontal braces shall be provided at all intermediate posts, midway between the top rail and ground as shown on the plans or standard sheets.

Diagonal truss rods shall be installed with the horizontal braces as indicated on the plans or standard sheets.

Fence fabric shall be installed approximately 2 inch above the ground level and securely fastened along the bottom, and to all braces, top rails, line and pull posts, at the intervals indicated on the standard sheets by approved methods. The fabric shall be secured to all end, corner and gate posts with stretcher bars fastened to the posts, with stretcher bands spaced at a maximum of 14 inches and in a manner permitting adjustment of the fabric tension.

If the Contractor elects the option of using one piece roll-formed sections, the fence fabric shall be integrally woven into the fabric loops on the end, corner, pull and gate posts. The fabric shall be attached to the top braces and line posts as shown on the standard sheets.

607-3.03 Chain-Link Fencing with Top Tension Wire. The construction details specified in §607-3.02 Chain Link Fencing with Top Rail shall apply with the following modifications:

A. Top tension wire shall be installed as shown on the plans, standard sheets, or as directed by the Engineer.
B. All posts shall be spaced equidistant in the fence line on a maximum of 8 foot centers.
C. Additional pull posts shall be placed at locations indicated on the plans or standard sheets. Brace assemblies shall be installed at each intermediate post as indicated on the plans or standard sheets.

607-3.04 Vinyl Coated Chain-Link Fencing on Plastic Coated Frame. The construction details specified in §607-3.02 Chain-Link Fencing with Top Rail or §607-3.03 Chain-Link Fencing with Top Tension Wire shall apply with the following addition:

If any of the resin clad material specified under this item has the protective resin coating damaged so its effectiveness to prevent corrosion of the base material is impaired, the Contractor shall repair such parts by applying one coat of an approved compound of a color to match original material.

607-3.05 Aluminum Posts. Aluminum posts shall be set in accordance with requirements pertaining to fence posts of §607-3.01 General, and §607-3.02 Chain-Link Fencing with Top Rail or §607-3.03 Chain-Link Fencing with Top Tension Wire and with the following additional requirement: The portions of aluminum posts that will be in contact with the concrete bases shall be coated with Zinc Chromate Primer conforming to the requirements of §708-04. The primer shall be thoroughly dry before setting of the post in the concrete.

607-3.06 Right-of-Way. Fencing posts shall be set plumb and firm to the satisfaction of the Engineer in properly prepared post holes, as indicated on the plans or standard sheet. The concrete for post holes where required shall be placed in accordance with the requirements of §607-3.01 General.

All line posts of the type and size shown on the plans or standard sheets shall be placed equidistant in the fence line. Wood line posts shall be placed on a maximum of 15 foot centers and metal line posts shall be placed on a maximum of 10 foot centers.

Intermediate posts and post assemblies, end posts, corner posts, approach spans, and bracing shall be as shown on the plans or standard sheets.

The woven wire fencing shall be fastened to all steel line posts with at least 5 galvanized wire fasteners or clamps and to all steel end, intermediate and corner posts with aluminum wire not less than 5/32 inch diameter.

The woven wire fencing shall be fastened to all wood posts with either 1 1/2 inch galvanized or aluminum staples. The top and bottom wires and every other in-between wires shall be stapled, alternating the stapling of the in-between wires on successive posts.

607-3.07 Fence Gates. The Contractor shall construct metal fence gates of the type and size as indicated on the plans or standard sheets, and in the location shown or ordered by the Engineer.

607-4 METHOD OF MEASUREMENT

607-4.01 General. The quantity to be paid for all fencing exclusive of fence gates and fencing of the types listed in subsequent subsections, will be the number of linear feet of chain-link fencing measured along the top of fencing, center to center of end posts, properly furnished and installed in accordance with the plans, specifications, standard sheets and directions of the Engineer. An allowance of 10 feet will be added for each end post, corner post and pull post installed in accordance with the plans, specifications, standard sheets and directions of the Engineer.

607-4.02 Right-of-Way Fencing. Right-of-Way Fencing shall be measured as the number of feet along the top of the fencing from center to center of the end posts, properly furnished and installed in accordance with the plans, specifications, standard sheets and directions of the Engineer. An allowance of 20 feet will be added for each end post, corner post, intermediate post, and approach post installed in accordance with the plans, specifications, standard sheets and directions of the Engineer.

607-4.03 Fence Gates. Fence gates shall be measured as the number of complete gates furnished and erected in accordance with the specifications, plans, standard sheets and directions of the Engineer.

607-5 BASIS OF PAYMENT

607-5.01 General. The unit price bid per linear foot of fencing shall include the cost of furnishing all labor, materials, tools and equipment necessary to satisfactorily complete the work.

607-5.02 Fence Gates. The unit price bid for each size gate shall cover the cost of furnishing all labor, materials, tools and equipment necessary to satisfactorily complete the work and shall include all necessary clearing, grubbing, excavation and disposal, fill, concrete, gates, gate posts, lock, bracing and all other necessary materials.

Payment will be made under:

Item No.	Item	Pay Unit
607.051X	Vinyl Coated Steel Chain-Link Fencing on Plastic Coated Frame with Top Rail	Foot

607.052X	Vinyl Coated Steel Chain-Link Fencing on Plastic Coated Frame with Top Tension Wire	Foot
607.16xx	Fence Gate with Vinyl Coated Steel Chain-Link Fencing on Plastic Coated Frame	Each
607.19	Right-of Way Fencing	Foot
607.20xx	Right-of Way Fence Gates	Each
607.30xx	Optional Chain-Link Fence, Type I, with Top Rail	Foot
607.31xx	Optional Chain-Link Fence, Type I, with Top Tension Wire	Foot
607.32xx	Optional Chain-Link Fence, Type II, with Top Rail	Foot
607.33xx	Optional Chain-Link Fence, Type II with Top Tension Wire	Foot
607.40xx	Optional Fence Gates	Each

Refer to the Standard Contract Pay Item Catalog for full Item Number and full Description.

SECTION 608 - SIDEWALKS, DRIVEWAYS, BICYCLE PATHS, AND VEGETATION CONTROL STRIPS

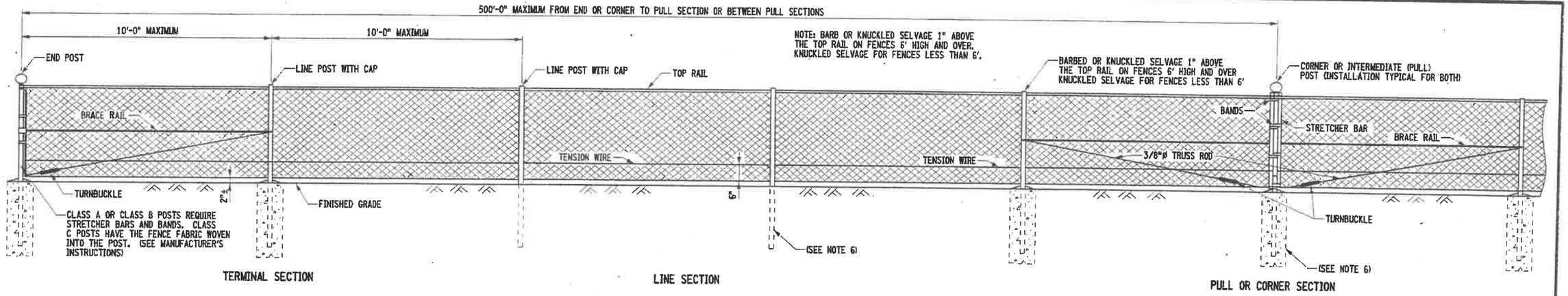
(Last Revision January, 2017)

608-1 DESCRIPTION. This work shall consist of the construction of portland cement concrete or hot mix asphalt sidewalks and driveways; hot mix asphalt bicycle paths and vegetation control strips; precast concrete paving, brick paving, grouted stone block paving, and detectable warnings on pedestrian facilities in accordance the contract documents and as directed by the Engineer.

608-2 MATERIALS. Provide materials meeting the requirements specified in the following subsections of Section 700 - *Materials and Manufacturing*:

Portland Cement	701-01
Bituminous Materials	702-00
Fine Aggregates	703-01
Coarse Aggregates	703-02
Mortar Sand	703-03
Cushion Sand	703-06
Concrete Sand	703-07
Mineral Filler	703-08
Brick Sidewalk and Driveway Pavers	704-08
Stone Blocks	704-09
Precast Concrete Driveway and Sidewalk Pavers	704-13
Caulking Compound for Structures	705-06
Premoulded Resilient Joint Filler	705-07
Masonry Mortar	705-21
Wire Fabric for Concrete Reinforcement	709-02
Fibers for Concrete Reinforcement	711-01
Membrane Curing Compound	711-05
Form Insulating Materials for Winter Concrete	711-07
Admixtures	711-08
Water	712-01
Surface-applied Detectable Warning Units	726-01
Embedded Detectable Warning Units	726-02

608-2.01 Portland Cement Concrete Sidewalks and Driveways.



TERMINAL SECTION

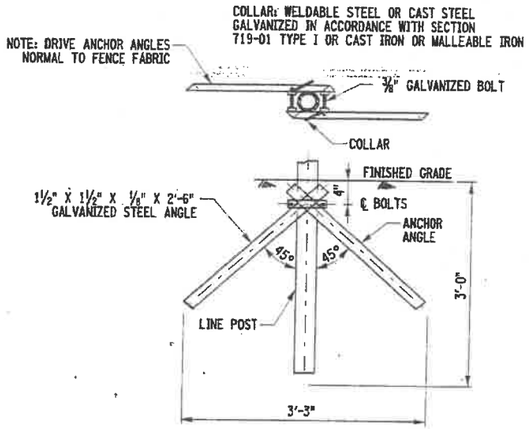
LINE SECTION

PULL OR CORNER SECTION

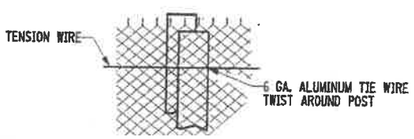
POST AND RAIL SECTION

USE	SECTION	STEEL				ALUMINUM			
		NPS DESIGNATOR	ROLLFORMED AND H POSTS	O.D.	WEIGHT LBS/FT	NPS DESIGNATOR	ROLLFORMED AND H POSTS	O.D.	WEIGHT LBS/FT
END, CORNER AND INTERMEDIATE POSTS FOR FENCES 6' AND UNDER	CLASS A SCHEDULE 40 PIPE	2		2 3/8"	3.65	2		2 3/8"	1.26
	CLASS B STEEL TUBING	2		2 3/8"	3.12				
	CLASS C ROLLFORMED		3 1/2" X 3 1/2"		5.10				
END, CORNER AND INTERMEDIATE POSTS FOR FENCES OVER 6'	CLASS A SCHEDULE 40 PIPE	2 1/2		2 7/8	5.79	2 1/2		2 3/8"	2.00
	CLASS B STEEL TUBING	2 1/2		2 7/8	4.64				
	CLASS C ROLLFORMED		3 1/2" X 3 1/2"		5.10				
BRACE RAILS FOR FENCES UNDER 6'	CLASS A SCHEDULE 40 PIPE					1 1/4		1 11/16	0.79
BRACE RAILS FOR FENCES 6' AND OVER	CLASS A SCHEDULE 40 PIPE	1 1/4		1 11/16	2.27	1 1/4		1 11/16	0.79
	CLASS B STEEL TUBING	1 1/4		1 11/16	1.84				
	CLASS C ROLLFORMED		1 5/8" X 1 1/4"		1.35				
TOP RAIL	CLASS A SCHEDULE 40 PIPE	1 1/4		1 11/16	2.27	1 1/4		1 11/16	0.79
	CLASS B STEEL TUBING	1 1/4		1 11/16	1.84				
	CLASS C ROLLFORMED		1 5/8" X 1 1/4"		1.35				
LINE POSTS FOR FENCES 6' AND UNDER	CLASS A SCHEDULE 40 PIPE	1 1/2		1 7/8"	2.72	1 1/2		1 7/8"	0.94
	CLASS B STEEL TUBING	1 1/2		1 7/8"	2.28				
	CLASS C ROLLFORMED		1 7/8" X 1 5/8"		1.85				
	H POSTS		2 1/4" X 1 3/4"		3.43		1 7/8" X 1 5/8"		0.90
	H POSTS						2 1/4" X 2"		1.22
LINE POSTS FOR FENCES GREATER THAN 6' AND EQUAL TO OR LESS THAN 8'	CLASS A SCHEDULE 40 PIPE	2		2 3/8"	3.65	2		2 3/8"	1.26
	CLASS B STEEL TUBING	2		2 3/8"	3.12				
	CLASS C ROLLFORMED		1 7/8" X 1 5/8"		2.40				
	H POSTS		2 1/4" X 1 3/4"		3.43		1 7/8" X 1 5/8"		0.90
							2 1/4" X 2"		1.22
LINE POSTS FOR FENCES GREATER THAN 8' AND EQUAL TO OR LESS THAN 10'	CLASS A SCHEDULE 40 PIPE	2		2 3/8"	3.65	2		2 3/8"	1.26
	CLASS B STEEL TUBING	2		2 3/8"	3.12				
	CLASS C ROLLFORMED		2 1/4" X 1 3/4"		2.78				
	H POSTS		2 1/4" X 1 3/4"		3.43		2 1/4" X 2"		1.22
LINE POSTS FOR FENCES OVER 10'	CLASS A SCHEDULE 40 PIPE	2 1/2		2 7/8	5.79	2 1/2		2 7/8"	2.00
	CLASS B STEEL TUBING	2 1/2		2 7/8	4.64				
	H POSTS		2 1/4" X 1 3/4"		3.43		2 1/4" X 2"		1.22

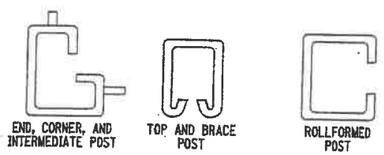
• DO NOT USE 3 1/2" X 3 1/2" ROLLFORMED POST ON FENCES OVER 8'



DRIVE ANCHOR



SUGGESTED METHOD OF TYING TENSION WIRE TO LINE POST



CLASS "C" ROLLFORMED SECTIONS (SEE POST AND RAIL SCHEDULE FOR DIMENSIONS)

NOTES:

1. POSTS, INCLUDING ENCASEMENT, SHALL BE SET INSIDE THE R.O.W. LINE SO THAT FENCING PLACED ON THE R.O.W. SIDE OF POSTS WILL BE AS NEARLY ON THE R.O.W. LINE AS POSSIBLE. WHEN DIRECTED BY THE ENGINEER. THE FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE POSTS SO THAT THE FABRIC CAN BE PULLED TIGHT AGAINST THE POST.
2. POSTS IN ROCK - WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE 1" LARGER IN DIAMETER THAN THE POST, AND OF 12" MIN. DEPTH FOR LINE POSTS, AND 18" MIN. DEPTH FOR ALL OTHER POSTS SHALL BE MADE. AFTER INSERTING THE POSTS. THE HOLES SHALL BE BACKFILLED WITH A HANDMIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT TWO PARTS FINE AGGREGATE MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGNS OF FREE WATER. THE HAND MIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PERFORMED IN A MANNER APPROVED BY THE ENGINEER.
3. CORNER POSTS SHALL BE USED AT SHARP BREAKS IN VERTICAL GRADE, AND CHANGES IN HORIZONTAL ALIGNMENT OF 15° AND OVER. PULL POSTS SHALL BE USED EVERY 500' ON STRAIGHT RUNS OF CHAINLINK FENCE OR AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL SUBMIT THE DETAILS FOR THE CHAIN LINK FENCE IT PLANS TO ERECT TO THE ENGINEER. NO FENCE SHALL BE ERECTED PRIOR TO THE APPROVAL OF THE VARIOUS DETAILS.
5. STEEL PIPES AND SHAPES SHALL WEIGH AT LEAST 95% OF THE WEIGHT SPECIFIED ON THIS SHEET. THEY MAY EXCEED THE SPECIFIED WEIGHT.
6. THE CONTRACTOR SHALL HAVE THE OPTION OF SETTING THE LINE POSTS IN 10"ø BY 3' DEEP CONCRETE BASES WITH THE POSTS EMBEDDED 2'-5" OR USING METHODS OF DRIVING AND ANCHORING SPECIFIED BY THE MANUFACTURER EXCEPT THAT THE LINE POSTS WITH TRUSS RODS ATTACHED AND ALL END, CORNER AND INTERMEDIATE POSTS SHALL BE SET IN CONCRETE BASES. THE CONCRETE BASES SHALL BE A MINIMUM OF 10"ø BY 3' DEEP WITH THE POST EMBEDDED 2'-6" FOR FENCES 6' HIGH OR LESS AND 12"ø BY 3'-6" DEEP WITH THE POST EMBEDDED 3' FOR FENCES OVER 6' HIGH. FOR GATE POSTS SEE THE CURRENT STANDARD SHEET TITLED "GATES AND CHAINLINK FENCE ADJACENT TO GATES".
7. CHAINLINK FENCE WITH TOP RAIL SHALL NOT BE USED WITHIN 29'-6" OF TRAVELED WAY.

ACCESSORY	STEEL	ALUMINUM
FABRIC TIES FOR TOP AND BRACE	6 GA. ALUMINUM WIRE AT 24" C.C. MAX.	3/16" ø ALUMINUM WIRE AT 24" C.C. MAX.
FABRIC TIES FOR LINE POSTS	6 GA. ALUMINUM WIRE AT 14" C.C. MAX.	3/16" ø ALUMINUM WIRE AT 14" MAX. OR 1/2" X .06" CLIPS AT 14" MAX.
FABRIC TIES FOR TENSION WIRE	11 GA. ALUMINUM WIRE AT 12" O.C.	3/16" ø ALUMINUM WIRE AT 12"
BOTTOM TENSION WIRE	7 GA. GALVANIZED STEEL	3/16" ø ALUMINUM WIRE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

CHAINLINK FENCE WITH TOP RAIL

ERRATA 1 EFF. 01/09/2014
ISSUED WITH EB 13-042

EFFECTIVE DATE: 01/08/09

APPROVED: NOVEMBER 4, 2013

/S/ RICHARD W. LEE, P.E.
DEPUTY CHIEF ENGINEER, DESIGN (ACTING)

ISSUED UNDER EB 08-036

607-04

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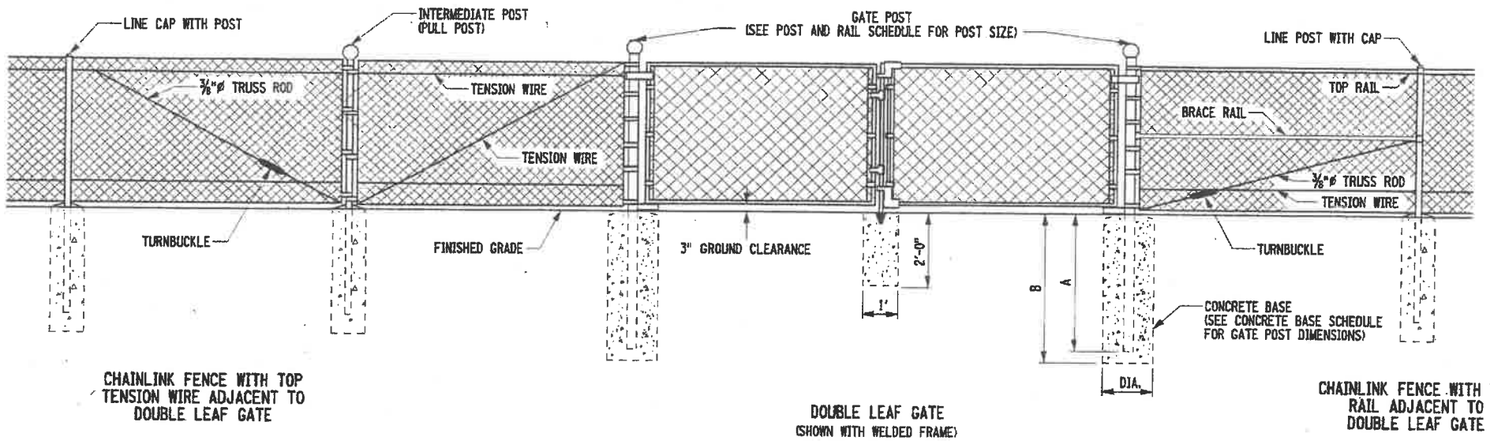


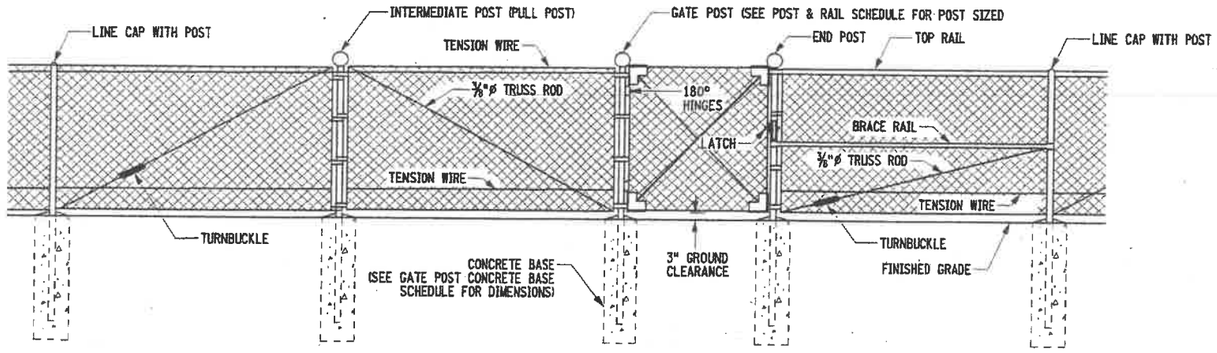
CHAINLINK FENCE WITH TOP TENSION WIRE ADJACENT TO DOUBLE LEAF GATE

DOUBLE LEAF GATE
(SHOWN WITH WELDED FRAME)

CHAINLINK FENCE WITH TOP RAIL ADJACENT TO DOUBLE LEAF GATE

NOTES:

1. GATES POSTS IN ROCK. WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE 1" LARGER THAN THE GATE POST AND A MINIMUM DEPTH OF 1'-6" FOR SINGLE LEAF GATES UP TO 12' SPAN AND DOUBLE LEAF GATES UP TO 36' SPAN, AND 2' IN DEPTH FOR DOUBLE LEAF GATES 40' SPAN TO 44' SPAN SHALL BE MADE. AFTER INSERTING THE POSTS, THE HOLES SHALL BE BACKFILLED WITH A HANDMIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT AND TWO PARTS FINE AGGREGATE MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGN OF FREE WATER. THE HANDMIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PREFORMED IN A MANNER APPROVED BY THE ENGINEER.
2. THE CONTRACTOR SHALL SUBMIT THE DETAILS FOR GATES AND CHAINLINK FENCE ADJACENT TO THEM TO THE ENGINEER. NO FENCE OR GATES SHALL BE ERECTED PRIOR TO THE APPROVAL OF THE VARIOUS DETAILS.
3. STEEL PIPES AND SHAPES SHALL WEIGH AT LEAST 95% OF THE WEIGHT SPECIFIED ON THIS SHEET. THEY MAY EXCEED THE SPECIFIED WEIGHT.



CHAINLINK FENCE WITH TOP TENSION WIRE ADJACENT TO SINGLE LEAF GATE

SINGLE LEAF GATE
(SHOWN WITH CORNER FITTINGS)

CHAINLINK FENCE WITH TOP RAIL ADJACENT TO SINGLE LEAF GATE

POST AND RAIL SCHEDULE								
		STEEL				ALUMINUM		
USE	SECTION	NPS DESIGNATOR	ROLLFORMED	O.D. SIZE	WEIGHT LBS/FT	NPS DESIGNATOR	O.D. NOM.	WEIGHT LBS/FT
GATE POSTS FOR SINGLE LEAF GATES LESS THAN 6' SPAN	SCHEDULE 40 PIPE	2½		2⅞"	5.79			
	CLASS B, STEEL	2½		2⅞"	4.64	3½	4"	3.15
	ROLLFORMED		3½ X 3½		5.10			
GATE POSTS FOR SINGLE LEAF GATES LESS THAN 6' - 12' SPAN	SCHEDULE 40 PIPE	3½		4"	9.11	3½	4"	3.15
	ROLLFORMED		3½ X 3½		5.10			
GATE POSTS FOR DOUBLE LEAF GATES, 10' - 24' SPAN	SCHEDULE 40 PIPE	3½		4"	9.11	3½	4"	3.15
	ROLLFORMED		3½ X 3½		5.10			
GATES POSTS FOR DOUBLE LEAF GATES, 28' - 36' SPAN	SCHEDULE 40 PIPE	6		6⅝"	18.97	6	6⅝"	6.56
GATE POSTS FOR DOUBLE LEAF GATES, 40' - 44' SPAN	SCHEDULE 40 PIPE	8		8⅝"	28.55	8	8⅝"	9.88
GATE FRAME FOR GATES 8' IN WIDTH OR LESS	SCHEDULE 40 PIPE	1½		1⅞"	2.72	1½	1⅞"	0.94
GATE FRAME FOR GATES GREATER THAN 8' IN WIDTH	SCHEDULE 40 PIPE	2		2⅜"	3.65	2	2⅜"	1.264

GATE POST CONCRETE BASE SCHEDULE			
USE	DIA.	A	B
GATE POST FOR SINGLE LEAF GATES UP TO 12' SPAN	14"	3'-0"	3'-6"
GATE POST FOR DOUBLE LEAF GATES UP TO 24' SPAN	14"	3'-0"	3'-6"
GATE POST FOR DOUBLE LEAF GATES 28' - 36' SPAN	24"	3'-0"	3'-6"
GATES POSTS FOR DOUBLE LEAF GATES 40'- 44'	24"	3'-6"	3'-8"

(SEE NOTE 1)

*FROM ANSI - H35.2(M)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

GATES AND CHAINLINK FENCE ADJACENT TO GATES

APPROVED SEPTEMBER 19, 2008

/S/ DANIEL D'ANGELO, P.E.
DEPUTY CHIEF ENGINEER (DESIGN)

ISSUED UNDER EB 08-036

607-06

EFFECTIVE DATE: 01/08/09

FILE NAME = JP_PWP:#0109553\607-06.dgn
DATE/TIME = 05-NOV-2008 15:03
USER = jturley

Appendix E – Preliminary Opinion of Probable Cost Estimate

City of Beacon
Preliminary Opinion of Probable Cost
Hudson River Trail - Preliminary Design Report

BASE (Combination Asphalt & Stone Dust Trail Surface) [6,125 lf]

Item No.	Item	Quantity	Units	Unit Cost	Total Cost
	E&S - Silt Fence	6000	LF	$ 3.50	$21,000
	E&S - Tree Protection	1	LS	$ 20,000.00	$20,000
	Demo - Clearing & Grubbing	9750	CY	$ 15.00	$146,250
	Demo - Tree Removal	1	LS	$ 100,000.00	$100,000
	Demo - Rock Removal/ Stabilization	1	LS	$ 100,000.00	$100,000
	Demo - Excavate / Backfill	900	CY	$ 25.00	$22,500
	Site - Grading & Earthwork	263500	SF	$ 2.00	$527,000
	Site - Concrete Pavers	820	SF	$ 15.00	$12,300
	Site - Redirock Retaining Wall (19,000 sf)	1	LS	$ 720,000.00	$720,000
	Site - Asphalt Pavement	2750	SY	$ 35.00	$96,250
	Site - Stone Dust	300	CY	$ 25.00	$7,500
	Site - Concrete Pavement	700	SF	$ 10.00	$7,000
	Site - Compacted Sub-Base (NYSDOT Type 2)	1400	CY	$ 40.00	$56,000
	Site - Structural Fill	300	CY	$ 50.00	$15,000
	Site - Seeding & Mulching	25000	SY	$ 1.00	$25,000
	Site - Timber Fencing	2500	LF	$ 45.00	$112,500
	Site - Chain Link Fencing (NYSBA Type 1) - 8ft ht	3000	LF	$ 75.00	$225,000
	Site - Miscellaneous (Pavement Markings)	1	LS	$ 50,000.00	$50,000
	Utility - Storm Drain (6" HDPE)	50	LF	$ 55.00	$2,750
	Utility - Storm Drain (4" Perf. HDPE)	3400	LF	$ 55.00	$187,000
	Utility - Cameras/Security Equipment (NYSBA)	1	LS	$ 80,000.00	$80,000
	Site Furnishing - Trail Kiosk	1	EA	$ 15,000.00	$15,000
	Site Furnishing - Information Signage	5	EA	$ 1,500.00	$7,500
	Site Furnishing - Bench	6	EA	$ 2,500.00	$15,000
	Site Furnishing - Bollards	2	EA	$ 1,500.00	$3,000
	Structural - Pre-Engineered Culvert Crossing	2	EA	$ 208,400.00	$416,800
	Structural - Elevated Trail Structure	4	EA	$ 130,000.00	$520,000
				Subtotal Cost	$3,510,350

CONTINGENCIES

	General Conditions & Mobilization (12%)		$421,242
	E&S and Misc. Drainage (Moderate - 5%)		$175,518
	Maintenance & Safety of Traffic Contingency [Rail] (High - 6%)	*Flagger = $1,500/day*	$210,621
	Utility Modifications (Low - 2%)		$70,207
	Project Permitting, Design & Inspection Services (15%)		$526,553
	Construction Contingency (20%)		$702,070
		Total Preliminary Cost	**$5,700,000**

Trail Surface Alternate 1 - STONE DUST PATH ENTIRE LENGTH

DEDUCT FROM BASE -$120,000

Trail Surface Alternate 2 - ASPHALT PATH ENTIRE LENGTH

ADD TO BASE $120,000

Appendix F – Project Support Letters

Randy Casale, Mayor
City of Beacon
One Municipal Plaza
Beacon, New York 12508
845-838-5010 - Office
845-838-5012 - Fax

www.cityofbeacon.org

September 4, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

The City of Beacon is pleased to submit an application to the Greenway Conservancy requesting $5,000 in funding to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon Metro North Railroad train station north to the Newburgh-Beacon Bridge and slightly beyond to the Fishkill Town line where it will connect with an envisioned trail along the Hudson River in Fishkill.

The Hudson Trail Master Plan will plan and design a more direct and natural route to the Hudson River away from busy Route 9D. The proposed Trail will complement ongoing efforts to promote public access to the Hudson River by enhancing plans already underway for the Hudson Fjord Hike/ Bike Trail (Beacon train station south to Cold Spring along the Hudson River) and the Fishkill Creek Greenway and Heritage Trail (Beacon train station first south along the Hudson River then north along the Fishkill Creek and Fishkill Town line). The Hudson Trail will also connect with the Beacon Loop Trail, which runs east through Beacon's vibrant and historic downtown and the Trail of Two Cities, which connects west with the City of Newburgh.

Beacon is a major anchor for economic development, tourism, arts and culture, recreational and natural resource initiatives in the Mid-Hudson Region; and the City's trails and bridges are the spokes to its central business district and waterfront development. I respectfully request your support for the Hudson Trail Master Plan, because it fills a gap in various local and regional trail plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River through this project.

Sincerely,

Randy Casale

Mayor Randy Casale
City of Beacon

Robert P. LaColla
Supervisor
E-mail: supervisor@fishkill-ny.gov
(845) 831-7800 Ext. 3309
(845) 831-6040 Fax

Fishkill Town Hall
807 Route 52
Fishkill, NY 12524-3110
website: www.fishkill-ny.gov

September 4, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

I am writing to express the support of the Town Board of Fishkill for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Fjord Hike/ Bike Trail. The Hudson Trail Master Plan will plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

The City of Beacon is a major anchor for economic development, tourism, arts and culture, recreational and natural resource initiatives in the Mid-Hudson Region. The City's trails and bridges are the spokes to its central business district and waterfront development. The new Hudson Trail will enhance current plans to develop the Hudson Fjord Trail along the Hudson River from Cold Spring to Fishkill, the Town of Fishkill's own River Trail initiative and beyond. The Master Plan will complement ongoing plans that provide direct public access to the different habitats and diversity of wildlife species along the Hudson River.

I respectfully request the Greenway Conservancy's positive consideration of this grant application to fund this much-needed project, which fills a gap in various local and regional development plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Sincerely,

Robert P. LaColla
Supervisor

19 S. Brett Street
Beacon, NY 12508
September 3, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

I am writing to voice my support for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program.

The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon Metro North Railroad station north to the Newburgh-Beacon Bridge and slightly beyond to City of Beacon / Fishkill Town line where it will connect with an envisioned trail along the Hudson River in Fishkill. The Hudson Trail Master Plan will plan and design a more direct and natural route away from busy Route 9D.

The Master Plan will complement ongoing efforts that provide direct public access to the different habitats and diversity of wildlife species enhancing plans already underway for the Fishkill Creek Greenway and Heritage Trail (Beacon Metro North Railroad Station first south along the Hudson River then north along Fishkill Creek to the Fishkill Town line) and the Hudson Highlands Fjord Trail (Beacon Metro North Railroad Station south to Cold Spring along the Hudson River). The Hudson Trail will also connect with the Beacon Loop Trail which runs east through Beacon's vibrant and historic downtown and Trail of Two Cities which connects west with Newburgh.

I respectfully request the Greenway Conservancy's positive consideration of this grant application to fund this much needed project, which fills a gap in various local and regional development plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Sincerely,

James Korn
Chariman
Beacon Greenway Trails Committee

Scenic Hudson, Inc.
One Civic Center Plaza, Suite 200
Poughkeepsie, NY 12601-3157
Tel: 845 473 4440
Fax: 845 473 2648
email: info@scenichudson.org
www.scenichudson.org

SCENIC HUDSON

August 28, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

Scenic Hudson is writing to voice its support for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Highlands Fjord Trail. The Hudson Trail Master Plan will plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

The City of Beacon is a major anchor for economic development, tourism, arts and culture, recreational and natural resource initiatives in the Mid-Hudson Region. The City's trails and bridges are the spokes to its central business district and waterfront development. The new Hudson Trail will enhance current plans to develop the Hudson Highlands Fjord Trail along the Hudson River from Cold Spring to Fishkill and beyond. The Master Plan will complement ongoing plans that provide direct public access to the different habitats and diversity of wildlife species along the Hudson River.

I respectfully request the Greenway Conservancy's positive consideration of this grant application to fund this much needed project, which fills a gap in various local and regional development plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Thank you for your consideration.

Sincerely,

Andy Bicking
Director of Public Policy

MARCUS J. MOLINARO
COUNTY EXECUTIVE

EOIN WRAFTER, AICP
ACTING COMMISSIONER

COUNTY OF DUTCHESS
DEPARTMENT OF PLANNING AND DEVELOPMENT

September 3, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

The Dutchess County Department of Planning and Development supports the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Fjord Hike/Bike Trail. The Hudson Trail Master Plan will plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

The Hudson Trail concept is a recommendation of *Walk Bike Dutchess*, the current Pedestrian & Bicycle Plan for Dutchess County, which was adopted in March 2014. The Plan focuses on access to centers and key destinations, which include the Beacon train station, waterfront, and the Newburgh-Beacon Bridge. The Plan notes that there is no pedestrian access to the Hudson River in Beacon or Fishkill north of Beacon's Riverfront Park. To address this, it recommends a shared-use Greenway Trail along the waterfront from the Beacon train station to the Newburgh-Beacon Bridge access road, if feasible, eventually continuing north into the Town of Fishkill (see Chapter 5.1, page 140).
http://www.co.dutchess.ny.us/CountyGov/Departments/TransportationCouncil/bppchapterfiveone.pdf)

We offer our enthusiastic support and encourage the Greenway Conservancy to consider the request for funds favorably, the Hudson Trail will fill a gap in various local and regional development plans.

Sincerely,

Eoin Wrafter
Acting Commissioner

c: Marcus J. Molinaro, County Executive

27 High Street, Poughkeepsie, New York 12601 • (845) 486-3600 • Fax (845) 486-3610
www.dutchessny.gov

FRANK K. SKARTADOS
Assemblyman 104th District

Dutchess, Orange, and
Ulster Counties

THE ASSEMBLY
STATE OF NEW YORK

COMMITTEES
Agriculture
Economic Development, Job Creation, Commerce and Industry
Local Governments
Small Business
Tourism, Parks, Arts & Sports Development
Transportation
SUB COMMITTEES
Chair – Subcommittee on Agriculture Economic Development and Farmland Protection

September 3, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

I am writing to voice my support for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Fjord Hike/ Bike Trail. The Hudson Trail Master Plan will plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

The City of Beacon is a major anchor for economic development, tourism, arts and culture, recreational and natural resource initiatives in the Mid-Hudson Region. The City's trails and bridges are the spokes to its central business district and waterfront development. The new Hudson Trail will enhance current plans to develop the Hudson Fjord Trail along the Hudson River from Cold Spring to Fishkill and beyond. The Master Plan will complement ongoing plans that provide direct public access to the different habitats and diversity of wildlife species along the Hudson River.

I respectfully request the Greenway Conservancy's positive consideration of this grant application to fund this much needed project, which fills a gap in various local and regional development plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Sincerely,

Frank Skartados

DISTRICT OFFICE: 154 North Plank Road, Suite #2, Newburgh, New York 12550 • 845-562-0888, FAX: 845-561-5218
ALBANY OFFICE: Room 435, Legislative Office Building, Albany, New York 12448 • 518-455-5762, FAX: 518-455-5593
EMAIL: Skartadosf@assembly.state.ny.us

RANKING MINORITY MEMBER
AGRICULTURE
LOCAL GOVERNMENT

COMMITTEES
BANKS
CONSUMER PROTECTION
CULTURAL AFFAIRS, TOURISM, PARKS & RECREATION
TRANSPORTATION
VETERANS, HOMELAND SECURITY & MILITARY AFFAIRS

THE SENATE
STATE OF NEW YORK

TERRY GIPSON
SENATOR, 41ST DISTRICT

ALBANY OFFICE:
ROOM 617, LOB
ALBANY, NEW YORK 12247
(518) 455-2303
FAX: (518) 426-6914

DISTRICT OFFICE:
3 NEPTUNE RD., SUITE A19B
POUGHKEEPSIE, NEW YORK 12601
(845) 463-0840
FAX: (845) 463-3438

GIPSON@NYSENATE.GOV
WWW.GIPSON.NYSENATE.GOV

September 5, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

I am writing to voice my support for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. The Hudson Trail will become an important segment of the Greenway Trail system that will provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Fjord Hike/ Bike Trail. The Hudson Trail Master Plan will plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

The City of Beacon is a major anchor for economic development, tourism, arts and culture, recreational and natural resource initiatives in the Mid-Hudson Region. The City's trails and bridges are the spokes to its central business district and waterfront development. The new Hudson Trail will enhance current plans to develop the Hudson Fjord Trail along the Hudson River from Cold Spring to Fishkill and beyond. The Master Plan will complement ongoing plans that provide direct public access to the different habitats and diversity of wildlife species along the Hudson River.

Improving the outdoor recreation opportunities for Hudson Valley residents has been among my major priorities in the Senate, whether through my work with the Regional Economic Development Council, on the Senate's Cultural Affairs, Tourism, Parks and Recreation Committee, or in securing funding for park repairs and enhancements in the 2014-15 state budget. This application fits well with this ongoing work, as it seeks to fill a gap in various local and regional development plans. Accordingly, I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Sincerely,

Terry Gipson
Senator, 41st District

347 Madison Avenue
New York, NY 10017-3739
www.mta.info

Joseph J. Giulietti
President

Metro-North Railroad

September 3, 2014

Ms. Sara Griffen, Acting Chair
Greenway Conservancy for the Hudson River Valley
625 Broadway, 4th Floor
Albany, New York 12207

RE: 2014 Conservancy Trail Grant Program—Hudson Trail Master Plan in Beacon

Dear Ms. Griffen:

I am writing to voice my support for the City of Beacon's application to the Greenway Conservancy to develop a Master Plan for the Hudson Trail through the 2014 Conservancy Trail Grant Program. Metro-North Railroad is interested in working with Beacon to explore the feasibility of developing the Hudson Trail provided there is no impact on access to and the current and future operations of the railroad that supports intercity passenger, regional passenger and freight operations.

The Hudson Trail would become an important segment of the Greenway Trail system that would provide public access along the Hudson River from the Beacon train station to the Newburgh-Beacon Bridge and further north to the Fishkill Town line. The proposed Trail will complement current efforts to connect the Beacon Loop Trail, the Trail of Two Cities (with Newburgh), the Fishkill Creek Greenway and Heritage Trail (FCGHT), and the Hudson Fjord Hike/ Bike Trail. The Hudson Trail Master Plan would plan and design a more direct and natural route to the Beacon waterfront from areas north, south and east of the city and away from busy Route 9D.

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I respectfully request the Greenway Conservancy's positive consideration of this grant application, which fills a gap in various local and regional development plans. I urge you to support the City's continued efforts to revitalize its waterfront, develop its extensive Greenway Trail system and promote public access to the Hudson River.

Sincerely,

Mark Mannix
Senior Director
Corporate & Public Affairs