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Via Electronic Mail

September 21, 2026

Mr. Alexander Carli-Dorsey
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**Re: GE-Pittsfield/Housatonic River Site
Rest of River (GECD850)
Final Design Plan for Rail Transload Areas in Reaches 5 and 6**

Dear Mr. Carli-Dorsey:

As discussed with EPA, I am submitting herewith for EPA's review and approval GE's *Final Design Plan for Rail Transload Areas in Reaches 5 and 6*, which presents the final design for the planned rail transload areas at Utility Drive and Woods Pond Spur to support rail transport of removed sediments and soil for disposal.

Please let us know of any comments or questions about this design plan.

Very truly yours,

Matthew Calacone
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Enclosure

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General Electric Company

Final Design Plan for Rail Transload Areas in Reaches 5 and 6

**Housatonic River – Rest of River
Pittsfield, Massachusetts**

September 2026

Final Design Plan for Rail Transload Areas in Reaches 5 and 6

Housatonic River – Rest of River Pittsfield, Massachusetts

September 2026

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Table of Contents

Abbreviations	iii
1 Introduction and Background	1
2 Summary of Pre-Design Investigations and Supplemental Data Collection Activities	3
2.1 Baseline Restoration Assessment	3
2.1.1 Utility Drive Rail Transload Area	4
2.1.2 Woods Pond Spur Rail Transload Area	5
2.2 Phase IB Cultural Resources Survey	6
2.3 Consultations with Relevant Parties	7
3 Applicable or Relevant and Appropriate Requirements	9
4 Design Summary and Considerations	10
4.1 Property Access	11
4.2 Site Preparation and Support Area Development	11
4.2.1 Construction-Phase Controls and Monitoring	12
4.2.2 Utility Clearances	14
4.2.3 Site Security	14
4.2.4 Erosion Controls	14
4.2.5 Site Clearing	15
4.3 Utility Drive Temporary Rail Transload Area	15
4.3.1 Operational Requirements	16
4.3.2 Property Use During Construction and Operation	17
4.3.3 Overhead Electric Utility Line Easement	17
4.3.4 Site Preparation and Stormwater Management	18
4.3.5 Rail Transload Area Design and Construction	19
4.3.6 Consideration of Cultural Resources	20
4.3.7 Habitat Impacts, Measures to Address Them, and Restoration	20
4.4 Woods Pond Spur Rail Transload Area	24
4.4.1 Operational Requirements	24
4.4.2 Property Use During Construction and Operation	25
4.4.3 Overhead Electric Utility Line Easement	26
4.4.4 Site Preparation and Stormwater Management	26
4.4.5 Rail Transload Area Design and Construction	28

4.4.6 Consideration of Cultural Resources 28

4.4.7 Habitat Impacts, Measures to Address Them, and Restoration 29

5 Schedule and Next Steps..... 31

6 References 32

Figures

Figure 1-1 Housatonic River: Reaches 5A through 8

Figure 1-2 Utility Drive Proposed Temporary Rail Transload Area

Figure 1-3 Woods Pond Spur Proposed Rail Transload Area

Tables

Table 3-1 Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6

Table 4-1 Approximate Material Volume to be Moved by Rail

Table 4-2 Rail Transload Area Design Criteria

Table 4-3 Summary of Preliminary Flood Storage Assessment Results for Woods Pond Spur

Appendices

Appendix A Design Drawings

Appendix B Technical Specifications

Appendix C Revised Baseline Restoration Assessment Report for Rail Transload Area Properties in Reaches 5 and 6

Appendix D Cultural Resources Survey Report Addendum for Rail Transload Areas in Reaches 5 and 6

Appendix E Basis of Design Report for Access Road Asphalt and Loading/Unloading Area Concrete

Appendix F Cultural Resources Unanticipated Discovery Plan (previously submitted with Reach 5A Final Design Plan)

Appendix G Wood Turtle Management Plan

Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
BRA	baseline restoration assessment
BSRM	Berkshire Scenic Railway Museum
CD	Consent Decree
CRS	cultural resources survey
CSX	CSX Transportation, Inc.
C.T. Male	C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology D.P.C.
cy	cubic yards
cy/day	cy per day
cy/yr	cy per year
Darey WMA	George Darey Wildlife Management Area
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FSP/QAPP	<i>Field Sampling Plan/Quality Assurance Project Plan</i>
GE	General Electric Company
HRRC	Housatonic Railroad Corporation, Inc.
IPaC	Information for Planning and Consultation
MassDFG	Massachusetts Department of Fish and Game
MassDFW	Massachusetts Division of Fisheries and Wildlife
MassDOT	Massachusetts Department of Transportation
MESA	Massachusetts Endangered Species Act
MIPAG	Massachusetts Invasive Plant Advisory Group
MNHESP	Massachusetts Natural Heritage and Endangered Species Program
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NRHP	National Register of Historic Places
PDI	pre-design investigation
Phase IB CRS Report for Reach 6	<i>Phase IB Cultural Resources Survey Report for Reach 6</i>
PM ₁₀	particulate matter smaller than 10 micrometers in diameter

Final Design Plan for Rail Transload Areas in Reaches 5 and 6

POP	<i>Project Operations Plan</i>
QOL Compliance Plan	<i>Quality of Life Compliance Plan</i>
RA	Remedial Action
Rail Conceptual Design Plan	<i>Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6</i>
Rail Final Design Plan	<i>Final Design Plan for Rail Transload Areas in Reaches 5 and 6</i>
Rail PDI Work Plan	<i>Pre-Design Investigation Work Plan for Rail Transload Areas in Reaches 5 and 6</i>
RCRA	Resource Conservation and Recovery Act
Revised Final Permit	GE's Resource Conservation and Recovery Act Corrective Action Permit
Revised T&D Plan	<i>Revised On-Site and Off-Site Transportation and Disposal Plan</i>
ROR	Rest of River
SOP	Standard Operating Procedure
STP	shovel test pit
UDF	Upland Disposal Facility
USFWS	U.S. Fish and Wildlife Service
Woods Pond Spur SDC Work Plan	<i>Supplemental Data Collection Work Plan for Woods Pond Spur Rail Transload Area</i>

1 Introduction and Background

On December 16, 2020, pursuant to the 2000 Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site (EPA and GE 2000), the United States Environmental Protection Agency (EPA) issued to General Electric Company (GE) a final revised modification of GE's Resource Conservation and Recovery Act (RCRA) Corrective Action Permit (Revised Final Permit) for the Housatonic Rest of River (ROR) (EPA 2020), which required GE to implement the Remedial Action (RA) selected by the EPA to address polychlorinated biphenyls (PCBs) in the ROR. The ROR RA also includes construction and operation of an on-site Upland Disposal Facility (UDF) for the disposal of a portion of the materials removed from the ROR area.

On October 15, 2024, GE submitted a *Revised On-Site and Off-Site Transportation and Disposal Plan* (Revised T&D Plan; Arcadis 2024), which described GE's plans for the transportation and disposal of excavated material from the ROR. In that Revised T&D Plan, GE proposed to use rail transport for some of the materials removed during the RA; and to support that mode of transport, it proposed the construction of rail spurs or sidings and associated support/operational loading and/or unloading areas (referred to herein as rail transload areas) at the following three locations:

- **Utility Drive**, located adjacent to Reach 5A in the City of Pittsfield, near the Pittsfield Wastewater Treatment Plant;
- **Woods Pond Spur**, located adjacent to Reach 6 in the Town of Lenox, at a railway museum property; and
- **Rising Pond Property**, located adjacent to Reach 8 in the Town of Great Barrington.

These three locations are illustrated on Figure 1-1, which also shows the extent of the ROR RA activities and the separate remediation areas within the ROR.

On April 29, 2025, the EPA issued a conditional approval letter for the Revised T&D Plan. That letter approved the three above-described locations for rail transload areas. It also directed GE to submit pre-design investigation (PDI) work plans to describe the investigations necessary to support the design of these rail transload areas, with the initial work plan to address the Utility Drive and Woods Pond Spur locations and a later plan to address the Rising Pond Property location. In response to that directive, on May 15, 2025, GE submitted a *Pre-Design Investigation Work Plan for Rail Transload Areas in Reaches 5 and 6* (Rail PDI Work Plan; Arcadis and AECOM 2025) to present the proposed PDI activities for the Utility Drive and Woods Pond Spur rail transload areas.¹ EPA conditionally approved the Rail PDI Work Plan on July 24, 2025. In accordance with the Rail PDI Work Plan, the following PDI activities were conducted in 2025:

- Topographic field survey;
- Soil geotechnical investigation;
- Baseline restoration assessment (BRA), including a wetland survey (where appropriate) and a survey of potential habitat for federally and/or state-listed threatened, endangered, and special concern species; and
- Cultural resources surveys (CRSs).

¹ In accordance with the EPA's April 29, 2025 letter, the PDI activities for the Rising Pond Property rail transload area will be presented in a later PDI work plan as part of the pre-design or design documents for Reach 7 and/or Reach 8 of the ROR.

Some of these PDI activities, including topographic survey and the BRA, were conducted at the overall properties that will contain the rail transload areas (referred to herein as the rail transload area properties), and others (e.g. soil geotechnical investigations and CRS activities) were focused on the specific proposed footprints of the rail transload areas themselves (i.e., the proposed locations of the rail transload infrastructure). A *Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6* (Rail Conceptual Design Plan; Arcadis 2026a) was submitted to EPA on February 20, 2026 to describe the PDI activities completed in 2025 and present the resulting conceptual design for the Utility Drive and Woods Pond Spur rail transload areas. In that Rail Conceptual Design Plan, GE proposed to conduct certain supplemental BRA and/or CRS data collection activities in 2026 at or near the rail transload area properties, in part due to adjustment of the conceptual design alignment of the rail transload areas since approval of the Rail PDI Work Plan. On June 17, 2026, EPA conditionally approved the Rail Conceptual Design Plan and associated proposal for supplemental data collection activities.²

This *Final Design Plan for Rail Transload Areas in Reaches 5 and 6* (Rail Final Design Plan) and its appendices include a description of the supplemental data collection activities conducted in 2026 and present the final design for the Utility Drive and Woods Pond Spur rail transload areas. They address the conditions in EPA's June 17, 2026 conditional approval letter as appropriate. A summary of the results of the PDI and/or supplemental data collection activities are presented in Section 2, Section 4 presents the design, and Section 5 outlines the overall project schedule and next steps.

The properties on which the Utility Drive and Woods Pond Spur rail transload areas will be constructed are shown on Figures 1-2 and 1-3, respectively, including the footprint of the rail spur and associated operational area on those properties. A detailed layout of the rail transload areas, including grading plans and supporting design features, is provided on the Final Design Drawings in Appendix A. Additional details of the design for the Utility Drive and Woods Pond Spur rail transload areas are presented in the Technical Specifications included in Appendix B. Appendices C and D are revised versions of the BRA and CRS reports that were previously included with the Rail Conceptual Design Plan and have been modified to address EPA's comments on those plans and other updating. Appendices E and G are new, and Appendix F is a copy of a plan that was previously submitted with the Final Design Plan for Reach 5A in April 2026.

The design of the rail transload areas is subject to further modification as consultation with the relevant parties (e.g., property owners, the local rail operator, relevant municipalities) progresses and based on EPA's review and the public input period following submittal of this Rail Final Design Plan. In addition, following selection of a contractor for construction of the rail transload areas, GE will incorporate additional design details related to means and methods of construction, based on input from the selected contractor, as part of a Supplemental Information Package (SIP) for the rail transload areas in Reaches 5 and 6.

² In the meantime, in accordance with a proposal by GE on August 8, 2025 (AECOM 2025) and a conditional approval letter issued by EPA for it on November 25, 2025, GE had initiated the supplemental BRA activities – namely, a survey for certain state-listed rare species within and adjacent to the Woods Pond Spur rail transload area property – in early 2026.

2 Summary of Pre-Design Investigations and Supplemental Data Collection Activities

The 2025 PDI activities were performed at each rail transload area property in accordance with the Rail PDI Work Plan and EPA's July 24, 2025 conditional approval letter, based on the preliminary transload area layouts presented in that document. The 2026 supplemental data collection activities were performed at each rail transload area property as described in the Rail Conceptual Design Plan and in accordance with EPA's November 25, 2025 and June 17, 2026 conditional approval letters, based on the conceptual transload area layouts presented in that document. The procedures used during the PDI activities were in accordance with the applicable provisions of the December 21, 2023 revised *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP; Arcadis 2023), which was conditionally approved by EPA on March 21, 2024, or other Standard Operating Procedures (SOPs) approved by EPA.

The results of the topographic field survey performed in 2025 and the 2025 soil geotechnical investigations were presented in the Rail Conceptual Design Plan and incorporated into the design presented herein. The remainder of this section presents a summary of the BRA and CRS PDI and/or supplemental data collection activities used to supplement the existing data and provide additional information to support the final design for the rail transload areas. Most of the information in this section was previously provided in the Rail Conceptual Design Plan, but is repeated for completeness.

2.1 Baseline Restoration Assessment

A BRA was conducted at the Utility Drive and Woods Pond Spur rail transload area properties to document existing ecological conditions at those properties. The BRA was informed by background reviews of available mapping and previous ecological characterizations and was implemented through field investigations conducted during the 2025 growing season. The assessment focused on identification and documentation of vegetated habitat cover types, wetlands (where present), soils (at the Utility Drive property only), invasive species, wildlife habitat, and the presence or potential presence of federal- and state-listed species and their habitats.

Identification of state-listed species habitats was based on species habitat mapping provided by the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) in March 2025, and habitats for federally listed (or proposed) species were identified through review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool (USFWS 2026); an IPaC review was first conducted in 2025, and was updated in July of 2026. Species Habitat mapping provided by MNHESP in March 2025 indicates that the Utility Drive rail transload area overlaps with mapped habitats for three state-listed species – wood turtle (*Glyptemys insculpta*), American bittern (*Botaurus lentiginosus*), and mustard white butterfly (*Pieris oleracea*) – and that mapped habitat for the state-listed common gallinule (*Gallinula galeata*) occurs in portions of the property east of the rail transload area. The Woods Pond Spur rail transload area property does not include any mapped state-listed species habitats, although there is nearby mapped habitat for the common gallinule. The USFWS on-line IPaC tool (USFWS 2026) indicates that the Utility Drive rail transload area property could provide habitats for two federally proposed species – the tricolored bat (*Perimyotis subflavus*) and the monarch butterfly (*Danaus plexippus*) – and that the Woods Pond Spur rail transload area property could provide habitat for those two species plus the northern long-eared bat (*Myotis septentrionalis*) (federally listed as endangered). Field surveys for these state- and federally listed species at the Utility Drive rail transload area property took place in 2025 and were incorporated into the BRA. As noted above, additional surveys for such rare species were

conducted at and adjacent to the Woods Pond Spur transload area property in 2026 in accordance with a conditional approval letter issued by EPA on November 25, 2025 and consistent with SOPs for such rare species surveys approved by EPA. Further, based on discussions with EPA, 2026 surveys also evaluated the presence of the bald eagle (*Haliaeetus leucocephalus*), a state-listed species, in areas near the Woods Pond Spur transload area property.

The 2025 field survey work at the Utility Drive rail transload area property also included the identification, delineation, and verification of any wetlands identified. The verification included completing the USACE Wetland Determination Data Forms for the Northeast Region for any wetlands identified at that property. No wetlands were identified at the Woods Pond Spur rail transload area property.

The results of the BRA are summarized below for each rail transload area property. More detailed information on the methods and results of the BRA is provided in the revised BRA Report in Appendix C.

2.1.1 Utility Drive Rail Transload Area

The BRA activities for the Utility Drive rail transload area property occurred for a contiguous area bounded by the rail line to the west, a wooded area to the north, the limits of the previous Reach 5A BRA to the east (as identified in the *Conceptual Remedial Design/Remedial Action Work Plan for Reach 5A* [Anchor QEA et al. 2023]), and Utility Drive to the south, so that the entire area was adequately covered. This approach ensured that the adjustments/expansion of the rail transload area design since submittal of the Rail PDI Work Plan were adequately assessed.

BRA field investigations conducted at the Utility Drive rail transload area property in 2025 documented a range of upland and wetland habitat cover types within the assessment area. Habitat cover types identified at the site included upland field (grass/forbs and shrub/old field), northern hardwood forest, palustrine shallow marsh, palustrine deep marsh, palustrine shrub swamp, and swamp hardwood. In addition, limited areas associated with paved access roads and existing rail infrastructure were classified as non-vegetated, diminished habitat. Wetlands were identified and delineated in accordance with federal and state criteria, and U.S. Army Corps of Engineers Wetland Determination Data Forms were completed for identified wetland areas. However, it was found that only one such wetland area, an intermittent stream, will be impacted by the construction and operation of the transload area, which will require a crossing of that stream; that stream is considered a Bank resource area under the Massachusetts Wetlands Protection Act regulations. No vernal pools or potential vernal pool habitats were identified within the Utility Drive rail transload area property, and no vernal pool-dependent species were identified at that property.

Invasive plant species were documented throughout the Utility Drive rail transload area property through a combination of qualitative meander surveys, GPS survey, and quantitative vegetation plot sampling. Invasive species were recorded regardless of relative cover, and multiple species listed by the Massachusetts Invasive Plant Advisory Group (MIPAG) were observed within upland and wetland cover types.

The majority of the Utility Drive rail transload area property is mapped by the MNHESP as Priority Habitat of rare species. As noted above, Species Habitat mapping provided by MNHESP indicates that this rail transload area overlaps with mapped habitats for three state-listed species – wood turtle, American bittern, and mustard white butterfly – and the USFWS IPaC tool (updated in July 2026) indicates that this area could provide habitats for two federally proposed species – the tricolored bat (also state-listed) and the monarch butterfly (not state-listed). As noted above, an additional state-listed species (the common gallinule) is also mapped on the Utility Drive property to the east of the rail transload area.

Targeted surveys conducted during the 2025 growing season did not document the presence of any state-listed species within the Utility Drive rail transload area property. The wood turtle survey did not document the presence of that species within the Utility Drive property, although one individual was documented near the property. The rare bird surveys conducted during the 2025 breeding season did not document the presence of American bittern or common gallinule within or adjacent to the Utility Drive rail transload area property, including the mapped floodplain habitat east of the rail transload area. The rare butterfly surveys confirmed the presence of host plants for both the mustard white and the monarch butterfly within the Utility Drive rail transload area property, but no adult rare butterflies were observed. Finally, an acoustic survey of rare bat species confirmed the occurrence of five state-listed bat species, including one that is federally proposed, within Reach 5A, including areas proximal to the Utility Drive rail transload area property. The species identified within the Reach 5A area were the tricolored, little brown, eastern red, silver-haired, and hoary bats. The northern long-eared bat was not confirmed as occurring anywhere within Reach 5A, including the Utility Drive property.

2.1.2 Woods Pond Spur Rail Transload Area

The BRA activities for the Woods Pond Spur rail transload area property occurred for a contiguous area bounded by the rail line to the east, the property boundary to the north and west, and the existing buildings on the south end of the property, so that the entire area was adequately covered. This approach ensured that the adjustments/expansion of the rail transload area design since submittal of the Rail PDI Work Plan were adequately assessed.

At the Woods Pond Spur rail transload area property, the BRA documented that the assessment area consists largely of previously disturbed upland habitats associated with historical industrial and commercial use, including non-vegetated areas, gravel surfaces, and areas of sparse herbaceous and shrub cover. No wetlands or vernal pools were identified within or immediately adjacent to the site. Vegetated cover types and invasive plant species present at the Woods Pond Spur rail transload area property were documented through field investigations. Multiple invasive species listed by the MIPAG were observed within upland field and disturbed areas.

The current MNHESP Priority Habitat mapping does not include the Woods Pond Spur rail transload area footprint or the overall property, but instead is confined to the area to the east (encompassing the northern part of Woods Pond and its floodplain on the eastern side of the existing rail line). MNHESP has included a small section of the transload area limits within Core Area 2, but this small overlap between the transload area boundary and Core Area 2 may be a mapping/delineation issue rather than reflecting actual habitat conditions for Core Area 2 species on the rail transload area property. This area does not appear to provide habitat suitable for any of the Core Area 2 designated species (American bittern, common gallinule, mustard white butterfly, and wood turtle), considering both the existing habitat conditions and the long-term industrial use of the site along the railway.

As noted above, the USFWS IPaC on-line mapping tool (updated in 2026) indicated potential habitat for the northern long-eared bat (federally listed), as well as the tricolored bat and the monarch butterfly (both proposed for federal listing), in areas encompassing the Woods Pond Spur rail transload area property. As also noted above, the Species Habitat mapping provided by MNHESP did not include any state-listed species at the Woods Pond Spur transload area property, although there is mapped habitat for the common gallinule near that property. On August 8, 2025, as directed by EPA, GE submitted a proposal to conduct a rare marsh bird species survey, focused on the common gallinule, within and adjacent to the Woods Pond Spur transload area property (AECOM 2025). In its November 24, 2025 conditional approval letter for that proposal, EPA directed GE to expand the surveys in that area to also cover the northern long-eared bat, the tricolored bat, and the monarch butterfly; and it noted that these surveys could be conducted at the same time as the rare species surveys for Reach 6.

Accordingly, surveys were undertaken in 2026 to assess the potential presence of those species on and in proximity to the Woods Pond Spur rail transload area property, and surveys were also conducted in 2026 to assess the potential presence and nesting of bald eagles (another state-listed species) in the area.

Surveys for common gallinule occurred from May 12 to June 25, 2026, encompassing all of Reach 6, including the northwestern shoreline of Woods Pond and the adjacent marshes, as well as southern portions of Reach 5C. No observations of common gallinule were recorded during these surveys. Based upon these observations, no impacts to common gallinule are anticipated from construction and operation of the Woods Pond Spur transload area.

Acoustic monitors used for detecting bats were deployed from July 17 through July 25, 2026 adjacent to Woods Pond, with the closest monitor roughly 1,200 feet from the Woods Pond Spur rail transload area property. This survey did not find any evidence of the northern long-eared bat in this area, but indicated that the following five state-listed bat species could use the habitat in the vicinity of Woods Pond for roosting, traveling, drinking, and foraging: the tricolored, little brown, silver-haired, eastern red, and hoary bats.

With respect to the monarch butterfly, during the habitat evaluations and natural community classification for this property in 2025, two small patches each containing between eight and ten host plants for the monarch butterfly were observed. However, no eggs, larvae, or adult monarchs were observed. An additional site inspection was conducted in August of 2026 to further evaluate habitat and host plant presence for the monarch butterfly. During the 2026 inspection, the two separate patches appear to have merged into one larger patch consisting of approximately 50 individual common milkweed plants. No adult monarch butterflies or monarch eggs were observed, but one monarch caterpillar was observed feeding on the milkweed plants.

The bald eagle survey documented the presence of bald eagles in the area of this property in winter and spring of 2026, focused on Woods Pond itself and the lower Reach 5C of the Housatonic River. As described in the revised BRA Report in Appendix C, a pair of bald eagles attempted to establish a nest in a white pine tree along the western side of Willow Creek Road, across from and within 600 feet of the Woods Pond Spur transload area property. This nesting activity continued for roughly one month (observed from March 10 to April 17, 2026); however, by early May the nesting activity was no longer observed during surveys and the nest site itself was no longer visited by bald eagles. Potential impacts to bald eagles associated with the construction and operation of the rail transload area will be evaluated further by determining whether nesting activities re-commence in 2027. This is further discussed in Section 4.4.7. As also noted in Section 4.4.7, a similar evaluation may be needed in future years to assess the potential for nesting activity relative to the schedule and nature of rail transload operations if use of the nest is re-established in 2028 and beyond.

2.2 Phase IB Cultural Resources Survey

The Phase IB CRS for the rail transload areas in Reaches 5 and 6 was originally conducted in July 2025 and consisted of archaeological surveys and historic architectural surveys of the transload areas using the layouts shown in the Rail PDI Work Plan. The results of these CRS activities were presented in the Phase IB CRS Report provided in Appendix D of the Rail Conceptual Design Plan. The configurations of both rail transload areas were expanded after those activities were completed, so additional archaeological surveys were completed in both transload locations in 2026 to address the expanded areas. Those additional surveys were conducted in June and July of 2026, and the results are presented in the Addendum to Phase IB CRS Report, provided in Appendix D hereto.

The original 2025 archaeological surveys included systematic pedestrian inspections and subsurface testing of the Utility Drive and Woods Pond Spur rail transload areas as shown in the approved work plan. The archaeological survey of the Utility Drive rail transload area encompassed a total of 1.65 hectares (4.08 acres) and involved the excavation of 159 shovel test pits (STPs); 24 proposed STPs were excluded due to disturbance or slope. No archaeological sites were identified during this survey. Three post-contact artifacts were recovered from this area, but these were classified as isolated field scatter and not designated as an archaeological artifact. The archaeological survey of the Woods Pond Spur rail transload area was conducted as part of the Reach 6 CRS and was previously described in the January 2026 *Phase IB Cultural Resources Survey Report for Reach 6* (Phase IB CRS Report for Reach 6), which was conditionally approved on June 4, 2026 and then revised and resubmitted on August 3, 2026 (AECOM 2026a). It did not identify any archaeological sites or artifacts.

The historical architectural surveys included a background review and field surveys of the Utility Drive and Woods Pond Spur rail transload areas. The survey at the Utility Drive area did not identify any resources listed in or eligible for the National Register of Historic Places (NRHP) or any other previously identified or new historical architectural resources. The historical architectural survey of the Woods Pond Spur rail transload area, which was also part of the Reach 6 CRS and described in the Phase IB CRS Report for Reach 6, resulted in the identification of one previously identified NRHP-listed resource (the Lenox Railroad Station) and four newly identified resources. It was determined that the NRHP-listed resource would not be adversely affected by the remediation project, including rail transload activities, and that the four newly identified resources do not meet the eligibility criteria for the NRHP.

The subsequent 2026 archaeological surveys included systematic pedestrian inspections and subsurface testing in the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas. The additional archaeological survey of the Utility Drive rail transload area encompassed a total of 0.4 hectares (1.1 acres) and involved the excavation of 159 additional STPs; 41 proposed STPs were excluded due to disturbance or slope. No archaeological sites were identified during this survey. One post-contact artifact (a nail) was recovered from this area, but it was classified as isolated field scatter and not designated as an archaeological site. The archaeological survey of the Woods Pond Spur rail transload area included a site walkover, which documented extensive prior disturbance associated with rail road infrastructure, roads, parking areas, and other improved surfaces. No additional STPs were excavated within the expanded Woods Pond Spur rail transload area because they were located within the disturbed or developed areas. In addition, an updated review of any historical architectural resources in the revised historic architectural areas did not identify any such resources apart from the previously identified NRHP-listed Lenox Railroad Station at the Woods Pond Spur area.

Based on the results of these Phase IB CRS activities, no additional archaeological or historical architectural investigations are recommended for rail transload area configurations presented in this Rail Final Design Plan.

2.3 Consultations with Relevant Parties

In addition to the results from the field PDI activities described above, information has been obtained from relevant parties to inform and further the design for each rail transload area, including the design layout of necessary infrastructure and desired restoration design. The following relevant parties have been and will continue to be consulted on a routine schedule throughout the design process:

- Massachusetts Division of Fisheries and Wildlife (MassDFW), a division of the Massachusetts Department of Fish and Game (MassDFG), owner of the Utility Drive rail transload area property: Since summer 2025, GE and MassDFW have met routinely, including through multiple teleconference meetings, to discuss MassDFW

concerns related to recreational impacts at the George Darey Wildlife Management Area (Darey WMA) during construction and use of the Utility Drive rail transload area, and potential ways to mitigate impacts on recreational opportunities at that WMA, to the extent practicable, with consideration for the use of the area for rail transload operations. The results of this coordination are discussed further in Section 4.3.2. GE is continuing to consult and coordinate with the MassDFW regarding the use of its property during the ROR RA, including for construction and operation of the Utility Drive rail transload area.

- Berkshire Scenic Railway Museum (BSRM), owner of the Woods Pond Spur rail transload area property: Since summer 2025, GE and BSRM have met routinely to review the progression of the design for the rail transload areas so as to ensure that the redesign of the property will be sufficient for both ROR RA operations and BSRM use. The results of this coordination are discussed further in Section 4.4.2. The design for the Woods Pond Spur rail transload area submitted in this Rail Final Design Plan was found to be generally acceptable to BSRM before submittal of this document. GE is continuing to consult and coordinate with BSRM regarding design and operation of the southern portion of its property, outside of the grading limits of the rail transload area (i.e., the portion of the property segregated from the ROR operations and to remain available for BSRM use during the ROR RA).
- Massachusetts Department of Transportation (MassDOT), owner of the railroad mainline: Since summer 2025, GE and MassDOT have met routinely to review the progression of the design for the rail transload areas, review overlapping interests (e.g., connection to the mainline), and discuss the schedule and plan for MassDOT's ongoing capital improvement project for the railroad mainline between the Woods Pond Spur and the City of Pittsfield. The design for each rail transload area submitted in this Rail Final Design Plan was found to be generally acceptable to MassDOT before submittal of this document.
- Housatonic Railroad Corporation (HRRC), the operator of the railroad mainline: Since 2024, GE and HRRC have met routinely to discuss use of rail to support the ROR RA and to ensure that the design for the rail transload areas will be sufficient to accommodate HRRC operations between the two rail transload areas (for material to be disposed of in the UDF) and from either rail transload area to the interchange with CSX Transportation, Inc. (CSX) in the City of Pittsfield (for materials to be disposed of off-site). GE and HRRC have also discussed the anticipated methods and schedule for when rail cars will be moved to and from each rail transload area. The results of this coordination are discussed further in Section 4. The design for each rail transload area submitted in this Rail Final Design Plan was found to be generally acceptable to HRRC before submittal of this document.
- The Town of Lenox, the municipality in which the Woods Pond Spur property is located: GE has met with Town of Lenox officials to present the restoration design for potential future use of the Woods Pond Spur rail transload area. The Town has indicated its support for leaving the rail infrastructure in place at this property for the benefit of BSRM after its use as a rail transload area.

Input received from each relevant party has been incorporated into the design presented herein. In addition, the above-listed entities will receive copies of this Rail Final Design Plan for review.

As appropriate, GE will schedule additional meetings with the relevant parties during the ongoing activities for the construction and operation of the rail transload areas.

3 Applicable or Relevant and Appropriate Requirements

The applicable or relevant and appropriate requirements (ARARs) that are pertinent to and were considered for the design of the rail transload areas are presented in Table 3-1. That table also specifies the actions to be taken during construction and use of the rail transload areas to comply with these ARARs (where not waived by EPA). This table has been revised from the ARARs table in the Rail Conceptual Design Plan to reflect inputs from EPA and updated evaluations.

The ARARs presented in Table 3-1 include, but are not limited to, the substantive requirements of the federal Endangered Species Act and the Massachusetts Endangered Species Act (MESA) related to federally and state-listed rare species. In accordance with these requirements, GE has evaluated the potential direct, indirect, and both short-term impacts and potential long-term impacts (if any) to federally and state-listed rare species and their habitats (if present in the subject transload area), including whether construction and operation of the rail transload areas would result in a “take” of state-listed species. That evaluation is presented in Sections 4.3.7 and 4.4.7 of this Rail Final Design Plan.

In addition, GE has evaluated the potential long-term impacts that would be caused by the overall Reach 5A remediation (which includes the Utility Drive rail transload area construction and operation) to state-listed species and their habitats, including whether that project will result in a take of state-listed species. This evaluation included an assessment of potential mitigation measures for any unavoidable takes of state-listed species. This evaluation was presented by GE in a Rare Species Conservation and Management Plan (CMP), which was an appendix to the Reach 5A Restoration Plan submitted to EPA on April 29, 2026 (AECOM 2026b). The CMP provides GE’s assessment of how each species subject to a take pursuant to MESA will have mitigation measures implemented to provide a long-term net benefit to the affected species. Similar evaluations will be conducted at a later date for Reach 6. Although it is anticipated that the measures to be undertaken to address rare species in the rail transload areas (as described in Sections 4.3.7 and 4.4.7) will avoid or minimize adverse impact to the identified rare species so that a take does not occur, it is also anticipated that if an unavoidable take should occur, the mitigation measures specified in the Reach 5A CMP and similar measures to be specified for Reach 6 will be adequate to mitigate for such takes.

4 Design Summary and Considerations

As stated in the Revised T&D Plan, the primary purpose of the rail transload areas is to support the disposal of materials removed during the ROR RA, both for on-site disposal at the UDF and for off-site disposal at an approved facility outside Massachusetts. This section outlines the key requirements considered during development of the design for each rail transload area, including the project/operational requirements, the requirements stated by relevant parties during ongoing consultations, industry standard railroad design requirements, and incorporation of the results from the PDI and supplemental data collection activities presented in Section 2 above (e.g., consideration measures to address habitat impacts). This section has been revised from the similar section in the Rail Conceptual Design Plan, but it includes some of the same information. Specific assumptions used when evaluating operational capacity and activities at each rail transload area are summarized below.

- The construction season will run from mid-April through November and include approximately 140 days of rail service within that time.
- Railcars will be up to six-axle cars that require approximately 90 feet of transload track; each rail spur is designed with an operational length of at least 450 feet and can fit five railcars.
- There will be up to six full intermodal containers per railcar, with approximately 22 tons (15 cubic yards [cy]) of material per container and up to eight empty containers per railcar.
- All full intermodal containers per railcar will be designated for the same disposal location, either all for disposal at the UDF or all for off-site disposal.
- Based on discussions with HRRC, travel on site between the Utility Drive and Woods Pond Spur rail transload areas can occur one to two times during each operational day. Although HRRC currently performs its operations at night, HRRC anticipates that by 2028, when rail services are required for the ROR RA, service between the two transload areas will occur between 7 a.m. and 4 p.m.
- Based on discussions with HRRC, travel to the interchange with CSX in the City of Pittsfield can occur up to once per day to transfer the railcars with material for off-site disposal. Although HRRC currently performs its operations at night, HRRC anticipates that by 2028, when rail services are required for the ROR RA, daily service to the interchange with CSX in the City of Pittsfield will occur between noon and 8 p.m.
- The times that HRRC may transport ROR RA rail cars or other private customer rail cars are subject to change based on factors beyond GE's control including but not limited to rail maintenance activities which typically occur during daytime hours.
- Based on discussions with HRRC, when railcars with full intermodal containers are removed from a rail transload area, an equal number of railcars with an equal number of empty intermodal containers will be deposited at that rail transload area.
- At both rail transload areas, container loading/unloading equipment will be able to reach both rail spur tracks from the transload support area and, except when HRRC is moving railcars, one track at a time will be designated for only empty railcars while the other track will be designated at that same time for only full railcars.
- Each rail transload area will have additional space for a temporary container storage location that can be used for full or empty containers that are waiting to be loaded onto train cars or trucks, as appropriate. These

areas will provide a buffer capacity of at least 72 containers (equivalent to 12 railcars) at Utility Drive rail transload area and at least 20 containers (equivalent to three to four railcars) at Woods Pond Spur rail transload area.

- Travel out of state to the off-site disposal facilities that will receive the material removed during the ROR RA could take four to six weeks round-trip.
- Because all intermodal containers will be lined with polyethylene, it is anticipated that empty containers will be interchangeably used, without decontamination, for either waste designated for on-site disposal or waste designated for off-site disposal. Before each use, each container will be visually inspected to verify that it is empty and in good working condition. A new six-mil disposable polyethylene liner will be installed in each intermodal container. At the disposal location, the liner will be removed and disposed of with the contained soil.

Estimated material volumes that will be moved through both rail transload areas, based on current RU-specific preliminary estimates, are presented in Table 4-1.

The design of each rail transload area includes a layout of tracks, switches, staging areas, areas to be disturbed (i.e., limits of work), and infrastructure necessary to perform the required operations. The layout is based on a review of the site topography identified during the field survey and the results of the other PDI activities and considers input from the relevant parties as described above. The design for the Utility Drive and Woods Pond Spur rail transload areas is presented in the Final Design Drawings included in Appendix A and in the Technical Specifications included in Appendix B. Additional details regarding the design process and considerations for each rail transload area are provided in the remainder of this section.

4.1 Property Access

Access to the two properties identified for the Reach 5 and 6 rail transload areas will be required to construct and operate the rail transload areas. Earthwork (i.e., soil removal and/or fill), construction of temporary access roads, construction of support areas at several locations, construction of the railroad bed and track, and operation of the rail transload area will occur on MassDFW property for the Utility Drive rail transload area and private (BSRM) property for the Woods Pond Spur rail transload area. In addition, access to the Utility Drive rail transload area will require travel on existing paved areas through the City of Pittsfield Wastewater Treatment Plant. Accordingly, it will be necessary to obtain access agreements with the property owners. GE has continued discussions with those property owners regarding such agreements. In the event that GE is unable to obtain such agreements despite its best efforts to do so GE will notify EPA and provide support for any attempts by EPA to obtain access permission.

4.2 Site Preparation and Support Area Development

This section describes the general preparation of each rail transload area site to protect existing structures and non-work areas from being impacted by construction activities, construction of temporary access roads and staging areas to facilitate the construction and operation of the rail transload areas, and other ancillary support tasks. Immediately prior to or following mobilization to the work area at each rail transload area, the selected construction contractor will perform several site preparation activities to prepare for subsequent rail transload area construction activities. General information regarding various site preparation activities (e.g., coordinating with local utilities, survey control, verifying existing conditions, and establishing work areas) is provided in the CQAP, which is Attachment E of GE's revised *Project Operations Plan* (POP) for the GE-Pittsfield/Housatonic River Site

(Arcadis 2025). The information provided in the following subsections supplements the CQAP by providing additional site-specific details associated with certain of these activities. Site preparation at each rail transload area is discussed more specifically in Sections 4.3.4 and 4.4.4.

GE will work closely with the City of Pittsfield (for the Utility Drive rail transload area) and the Town of Lenox (for the Woods Pond Spur rail transload area) to coordinate traffic control at work zone entrances. In addition, GE will work closely with MassDOT and HRRC to ensure that flaggers are in place to support construction work near the railroad mainline.

4.2.1 Construction-Phase Controls and Monitoring

During construction and operation of each rail transload area, construction-phase controls and monitoring will be implemented, including oversight, implementation of quality assurance/quality control measures, typical site controls (e.g., erosion controls, as described in see Section 4.2.4), and routine inspections and maintenance. As part of those construction-phase controls, imported material will be characterized in accordance with GE's Soil Cover/Backfill Characterization Plan, which is Appendix B of GE's revised POP, as modified by the procedures proposed in Addendum 1 to the POP (Arcadis 2026c), submitted on August 31, 2026, if approved by EPA. In addition, during construction and operation of each rail transload area, monitoring and controls will be implemented in accordance with the *Revised Quality of Life Compliance Plan* (QOL Compliance Plan; Anchor QEA and Arcadis 2024) and the Ambient Air Monitoring Plan, which is Appendix G of GE's revised POP. This will include monitoring for airborne particulate matter (and meteorological conditions),³ noise, and (where necessary) lighting and odor. GE will also construct and operate the rail transload areas in such a manner as to minimize or mitigate impacts of the rail transload areas on recreational areas on each property (if any), where practicable.

The remainder of this section briefly summarizes the QOL standards, discusses compliance with those standards generally, and describes the related monitoring activities to be conducted during construction. The construction contractor will implement methods, controls, and other mitigation measures, as needed, to maintain compliance with the QOL standards in accordance with Specification Section 01572 – Construction Environmental Controls (Appendix B). Details on the proposed methods and control measures to be implemented by the contractor will be provided in the SIP for the rail transload areas.

- **Particulate Monitoring** – Particulate monitoring will be for particulate matter smaller than 10 micrometers in diameter (PM₁₀). Particulate monitoring and compliance will be conducted in accordance with the QOL Compliance Plan and the Ambient Air Monitoring Plan. Specific procedures for ambient air sampling are provided in Appendix G (Standard Operating Procedure for Ambient Air Monitoring for Particulate Matter and Polychlorinated Biphenyls) to GE's FSP/QAPP. The approximate locations for monitoring particulates at each rail transload area property are shown on the Design Drawings (Appendix A). Adjustments to these locations may be made based on contractor input; therefore, final air monitoring locations will be provided in the SIP. The compliance point for attainment of the ambient air standards will be at the closest downwind receptor, and wind direction will be determined based upon the meteorological monitoring at the on-site meteorological stations established at the GE Pittsfield Facility and at the UDF property. Ambient air monitoring of PM₁₀ will be conducted daily for a minimum of 10 hours when construction that may generate particulate matter emissions is ongoing and throughout the duration of daily construction activities. If construction activities are ongoing for longer than 10 hours, particulate monitoring will continue until daily activities are complete. As described in the

³ No activities that may result in generation of PCB emissions will be performed during construction of the rail transload areas, and therefore ambient air monitoring will include only monitoring for particulate matter.

QOL Compliance Plan and Ambient Air Monitoring Plan, particulate monitoring will be performed using real-time meters with dataloggers to obtain continuous readings for determining the 10-hour average, which will be compared with the PM₁₀ Notification and Action Levels established in those documents.

- **Noise Monitoring** – Noise monitoring will be conducted in accordance with Section 4.4.3 of the QOL Compliance Plan. This includes initial monitoring that will be conducted at the start of a new type of construction activity to assess representative noise levels and confirm that the noise levels do not exceed the designated standards. If the initial monitoring indicates that noise levels are acceptable, subsequent monitoring will occur as follows: (1) bi-weekly for each type of construction activity to verify noise levels; (2) when a new construction activity, equipment, or reduced distance to receptors has the potential to increase noise levels; (3) in the unlikely event that work hours are extended to the nighttime period (i.e., between 9:00 p.m. and 7:00 a.m.) with EPA approval;⁴ and (4) in response to noise complaints. If the bi-weekly monitoring indicates that noise levels are acceptable, GE will propose for EPA approval that subsequent monitoring will occur monthly for each type of construction activity to verify noise levels. The locations for monitoring noise at each rail transload area property will be co-located with the monitoring locations for particulate, as shown on the Design Drawings (Appendix A). Actual monitoring locations may be adjusted in the field in consultation with EPA and the contractor in response to site conditions, property access, property owner request, or the locations of active operations. Additional details regarding the noise monitoring equipment and procedures for the initial monitoring are presented in the Construction Monitoring Plan (Appendix G of GE's revised POP).
- **Odor Monitoring** – The odor standard to be applied during construction, in accordance with Section 4.5.1 of the QOL Compliance Plan, is to mitigate the presence of uncomfortable project-related odors identified by project workers, GE, or EPA, or via an odor complaint from the public. Although each odor complaint will be investigated, the standard will be considered to be not met if uncomfortable project-related odors are identified frequently and recurrently or if such objectionable odors are not mitigated in a timely manner. If project workers, GE, or EPA identify an objectionable odor or if an odor complaint is received from the public, GE will investigate the presence and source of the odor to determine whether the odor is related to the remediation project. If multiple odor reports or complaints are received regarding the same potential odor source, they will be investigated together. If an odor complaint or report is received that relates to the distinct rotten-egg smell of hydrogen sulfide, GE will conduct air monitoring for that constituent at the work area perimeter for approximately one hour. The hydrogen sulfide monitoring equipment and procedures are described in the Construction Monitoring Plan in the revised POP.
- **Lighting Monitoring** – The lighting standard to be applied during construction, in accordance with Section 4.6.1 of the QOL Compliance Plan, is to mitigate nuisance project-related lighting impacts based on any complaints from nearby receptors. Although each lighting complaint will be investigated, the standard will be considered to be not met if frequent, recurrent lighting complaints related to project activities occur or if project-related nuisance lighting impacts are not mitigated in a timely manner. Evaluation of compliance with the lighting QOL standard will be triggered by complaints from nearby receptors. If a lighting complaint is received from the public, GE will investigate the complaint to determine whether the lighting issue is related to the remediation project. If multiple complaints are received regarding the same potential lighting source, they will be investigated together. It is anticipated that construction of the rail transload areas will generally occur during daylight hours and that therefore supplemental lighting will not be used at that area.

⁴ This situation is unlikely because it is anticipated that construction of the rail transload areas will occur during daylight hours except potentially in unusual situations when limited nighttime work is conducted with EPA approval.

In addition, the condition of the local municipal roads (and associated infrastructure) that will be used for delivery of materials and equipment to the rail transload area properties during construction of the rail transload areas will be inspected before and during construction and documented to confirm usability throughout the ROR RA, as discussed in Section 6 of GE's QOL Compliance Plan. The majority of the roads to be used were already surveyed in 2025, as documented in GE's *2025 Road Assessment Report* submitted in February 2026 (Arcadis 2026b). Additional surveys were performed in spring 2026 and/or will be performed in fall 2026 before construction of the rail transload areas commences.

As described in Section 4.7 of the QOL Compliance Plan, monthly QOL summary reports will be prepared to document QOL monitoring results, complaints received during the period, exceedances of QOL standards, and actions taken in response to monitoring or complaints. GE has initiated the preparation and submittal of these monthly reports, and the monitoring data collected during construction of the rail transload areas will be added to those monthly reports.

4.2.2 Utility Clearances

Aboveground and underground utilities that could potentially be affected by the construction activities will be identified prior to initiating any intrusive subsurface activities (e.g., site grading). As indicated on the Design Drawings provided in Appendix A, certain aboveground and/or subsurface utilities are known to be present at each of the rail transload area properties. At the Utility Drive rail transload area, overhead electric utility lines run parallel to the railroad mainline and cross the active work area. Overhead electric utility lines are also present at the Woods Pond Spur rail transload area, and subsurface utilities include drainage lines, a septic system and associated leach field, and electric and communication lines. The construction contractor will be responsible for coordinating with Dig Safe to determine the locations of utilities at the start of the work and coordinating with the utility owners regarding protection, offsets, relocation, and/or termination of any utilities, as necessary to complete the work.

Additional information regarding the rail transload area design considerations related to the overhead electric utility lines is included in Section 4.3.3 (for the Utility Drive transload area) and Section 4.4.3 (for the Woods Pond Spur transload area).

4.2.3 Site Security

Temporary chain-link fencing and gates will be installed, as needed, to delineate and secure work areas during construction activities. This fencing may overlap with or be in addition to the permanent fencing to be installed during construction, as shown on the Design Drawings and discussed in Sections 4.3.2 and 4.4.2. The configuration of the temporary fencing will be determined by the construction contractor and will be constructed to restrict access to the work areas. Access into the fenced area will be provided at discrete locations via locking gates. These gate locations are anticipated to coincide at crossings with existing and proposed roads within each rail transload area property. Signs stating "No Trespassing" will be posted on the chain-link security fence at designated locations and on the access gate(s).

4.2.4 Erosion Controls

Erosion control measures (e.g., staked silt fence, filter socks) will be implemented to minimize the potential for erosion of exposed soils and subsequent accumulation of materials in site drainage pathways. In addition, these

measures will be used to divert rainfall runoff from entering work areas. The proposed layout of the erosion controls is indicated on the Design Drawings (Appendix A). The erosion controls will be placed at the start of the site work activities and will be maintained until the work area has been restored and vegetation is established. In addition to the erosion controls indicated on the Design Drawings, other erosion control measures will be implemented as needed. Erosion control requirements are provided in Specification Section 31 25 00 – Erosion and Sediment Controls (Appendix B).

4.2.5 Site Clearing

To prepare the surface prior to or in conjunction with the initial site preparation activities, discussed in Sections 4.3.4 and 4.4.4, clearing of above-grade portions of vegetation will be required within or immediately adjacent to the limits of work. As discussed in Section 2.1, the rail transload area properties could provide habitat for certain rare species of bats. As such, any tree cutting required at either rail transload area property will be conducted between November 1 and March 30, if possible, to avoid any direct impact to rare bat roosting habitat. It is likely that the site clearing work will be performed in fall 2026 to prepare the surface for construction in spring 2027. However, if tree removal needs to occur outside of the November to March window, surveys and assessment of bat roosting activity will be conducted and coordinated with tree removal work to ensure that no roosting is occurring at the time of tree removal.

The aboveground portions of cleared vegetation will be directly placed in piles or spread within approved areas to provide habitat, chipped and used for erosion control, taken off-site to a recycling facility, or disposed of off-site as a non-regulated material. Aboveground materials will be reused wherever practicable, with disposal of this material only as necessary.

4.3 Utility Drive Temporary Rail Transload Area

The Utility Drive rail transload area is designed as two parallel spurs, with a tail connecting the end of each (Figure 1-2). Based on discussions with HRRC, the methods for railcar movement at this rail transload areas will likely include railroad engine operations pulling empty cars into one spur, disconnecting, traversing around the tail, and connecting to and pushing out full cars (backwards) from the other spur. Construction of the Utility Drive rail transload area will require installation of a new switch off the existing railroad mainline.

As stated in the Rail Conceptual Design Plan, and based on discussions with the property owner, MassDFW, the restoration plan for the Utility Drive rail transload area assumes that the rail transload area at that location will be temporary and will be removed after use for the ROR RA. After operations at the Utility Drive rail transload area cease and before commencing restoration, to rule out potential contamination to the property from ROR RA operations, GE will conduct post-use sampling for PCB analysis of surfaces within the transload operational areas (e.g., loading/unloading area, container storage area) and within representative areas of disturbance that receive rainwater run-off from the operational area during the ROR RA. The specific locations for post-use sampling will be selected during a joint field review by GE and EPA representatives, after operations at the Utility Drive rail transload area cease.

4.3.1 Operational Requirements

Railcars with containers full of removed material will only depart from the Utility Drive rail transload area; no material will travel by rail to and be offloaded at this location. In this situation, the required Utility Drive rail transload area operational activities are anticipated to include the following steps:

- Receipt of trucks and unloading from such trucks sealed intermodal containers full of dewatered soil and sediment removed from Reach 5A;
- Temporary storage of those full intermodal containers in a designated area, as needed based on production and as possible based on space availability, until an empty railcar is available (some containers may be transferred directly from the truck to the railcar); and
- Loading of the full intermodal containers to the railcars for transport by rail by HRRC to the appropriate disposal facility (i.e., either south to the Woods Pond Spur rail transload area for on-site disposal at the UDF [see Section 4.4.1 for operational activities at that location] or north to the interchange with CSX in the City of Pittsfield for off-site disposal at an appropriate out-of-state disposal facility).

In addition, operational activities for the Utility Drive rail transloading area will include the opposite process to return empty intermodal containers to trucks for travel back to the Reach 5A staging areas for refilling. This return process will include the following steps:

- Receipt of railcars from the disposal facility and unloading the empty intermodal containers from such railcars;
- Temporary storage of those empty intermodal containers in a designated area, as needed based on production and as possible based on space availability, until an empty truck is available (some containers may be transferred directly from the railcar to the truck); and
- Loading of the empty intermodal containers to the truck for transport to the Reach 5A staging area for refilling.

The Utility Drive rail transload area will be in operation only for the duration of the Reach 5A remedial activities, which are expected to occur over five years (see Table 4-1 for anticipated schedule).

Based on the assumptions stated in Section 4 and the volumes and schedule presented in Table 4-1, an average of 16 containers per day (i.e., two to three full railcars) will be required to handle the on-site volume of material expected to be removed from Reach 5A in 2028, and an average of one to two containers per day will be required to handle the off-site volume that same year. For years two through five of the Reach 5A remedial activities, an average of 19 on-site containers (i.e., three to four full railcars) and less than one off-site container are expected each operational day. Accordingly, based on discussions with HRRC, it is likely that travel on site between the Utility Drive and Woods Pond Spur rail transload areas will occur an average of one to two times during each operational day to move the daily average of two to four railcars, and that travel to the interchange with CSX in the City of Pittsfield will occur once every one to two weeks (assuming that one railcar is moved at a time) or less (if more than one railcar is moved at a time).⁵

⁵ If needed to meet increased project productivity, HRRC can interchange with CSX up to five days per week to transfer material for off-site disposal.

4.3.2 Property Use During Construction and Operation

During development of the design for the Utility Drive rail transload area, GE considered potential ways to mitigate impacts on recreational opportunities at the Darey WMA to the extent practicable and consistent with the use of the area for rail transload operations. In addition, in accordance with EPA's June 2026 conditional approval letter, GE coordinated with MassDFW to evaluate whether there is a reasonable and safe way to allow public access to the remainder of the Darey WMA that will not be utilized for rail transload activities or Reach 5A operations and to facilitate parking for such access. As shown on Design Drawings RT-110 through RT-113, the Utility Drive rail transload area will be isolated by physical barriers (e.g., fencing) from the remainder of the Darey WMA.

In accordance with EPA's June 2026 conditional approval letter for the Rail Conceptual Design Plan, GE has evaluated whether there is a reasonable and safe way to allow public access to the remainder of the Darey WMA that will not be utilized for rail transload activities or Reach 5A operations and to facilitate parking for such access. Due to significant truck and rail traffic expected daily during operation of the rail transload activities as well as additional traffic and activities during the years in which Reach 5A operations will occur at the Darey WMA, it is expected at this time that access to the property will be managed during the duration of active operations. Specifically, it is anticipated that the pedestrian access tunnel underneath the railroad mainline will be open to public access during the project. Signage and other management techniques will be used to guide pedestrians around site activities and will be proposed in the SIP. Additionally, as no designated parking area for access to the Darey WMA currently exists, GE does not plan to modify the public roads or adjacent private property to create parking for access to the Darey WMA.

GE will continue to consult with the property owner, MassDFW, as the design, construction preparations, and project continue to progress, to evaluate the feasibility of safe access to the Darey WMA. There may be periods of temporary closure during earthwork or periods of high intensity construction and/or truck traffic.

4.3.3 Overhead Electric Utility Line Easement

An existing Eversource utility line easement is located on the western side of the property along the railroad mainline, as shown on Design Drawing RT-104. A system of overhead electric wires, utility poles, and guy wires are located within the easement. The planimetric layout of the rail transload area has been developed to accommodate the easement and the utilities therein. Specifically, the rail transload area has been designed to avoid interference with the utility poles and guy wires; however, the railroad track connecting the mainline to the Utility Drive rail transload area track does cross the easement. The fill placement under the utility lines will be limited to the extent practicable, and GE is coordinating with Eversource to ensure adherence to National Electrical Safety Code and other vertical clearance requirements for travel of railcars underneath the overhead wires.

The access road is located completely outside of the easement so that vehicle traffic on the access road will not be required to travel beneath the overhead wires and will not be restricted by overhead clearance to the wires. The rail loading area is also located completely outside of the easement. Design grading and locations of other rail transload area-related features, including stormwater management system components, are shown on Design Drawings RT-106 through RT-113.

GE initiated communications with Eversource early in the design process, commencing with providing Eversource with a copy of the relevant Conceptual Design Drawings from the Rail Conceptual Design Plan in April 2026. On September 1, 2026, GE transmitted to Eversource for its review a Permitted Use Application for the Utility Drive

rail transload area, which included the proposed grading within portions of the Eversource rights-of way that is necessary to support the construction and operation of the rail transload area. In fall 2026, GE anticipates having a meeting with Eversource to review the proposed rail transload area design grading depicted in the Permitted Use Application, observe site conditions in the areas of the proposed grading, and discuss how the proposed rail transload area design will allow for continued access by Eversource to its equipment. Eversource and GE are continuing to coordinate closely to finalize an access agreement for grading work into the easement area.

4.3.4 Site Preparation and Stormwater Management

A significant amount of earthwork will be required to create a level and usable area for the Utility Drive rail transload area, with both cut and fill activities to be performed across portions of that site. During earthwork operations, care will be taken to reduce disturbance to areas not directly identified for disturbance to construct the rail transload area. Design Drawing RT-104 illustrates and georeferences anticipated disturbances to Priority Habitat within the Utility Drive rail transload area; in the unlikely event that deviations are proposed from the disturbances shown within Priority Habitat at this transload area (as approved by EPA as part of this Rail Final Design Plan), GE will seek EPA approval for the changes and, following EPA approval, will notify or provide documentation of the approved change to MassDFW.

Before substantive earthwork is started, the top approximate six-inch layer of topsoil will be scraped across the construction area and staged on site for reuse as topsoil during restoration. The area available for staging the topsoil is illustrated on Design Drawing RT-107. As specified on that drawing, a geotextile demarcation layer will be placed between the existing ground and the stockpiled topsoil to avoid disturbance of the existing surface due to placing or removing the stockpile. As specified in Specification Section 31 23 00 – Excavation and Fill, additional soil cuts may be required to establish the sub-grade elevation. The native soil surface exposed after removal of the topsoil and/or additional soil cuts will be evaluated by a qualified geotechnical engineer to confirm that the exposed soil subgrade is firm, dry, and undisturbed to provide for adequate bearing capacity for the rail transload area. Where evidence of weak, unsuitable material exists or where water collects at the surface with no drainage or dissipation, such soils will be further cut (i.e., undercut) and replaced with compacted fill, as appropriate, to provide for adequate bearing capacity for the rail transload area.

Additional cut materials, other than the scraped and staged topsoil, will either be used as fill in areas currently lower than the design elevations or be staged on site as a stormwater diversion berm west of the rail transload area and then reused after construction to support site stabilization and restoration. The area available for constructing such a stormwater diversion berm to stage the surplus cut materials is illustrated on Design Drawing RT-107. As specified on that drawing, in areas within this footprint that were not previously investigated for cultural resources (as described in Section 4.3.6), a geotextile demarcation layer will be placed between the existing ground and the stockpiled topsoil to avoid disturbance of the existing surface and any subsurface features due to placing or removing the stockpile. Stockpiled materials will be covered with an appropriate erosion control seed mix and will be protected and monitored for the duration of use of the Utility Drive rail transload area. Because the full extent of potential disturbances is subject to appropriate CRS, BRA, and future restoration considerations, no activities will be conducted outside the work limits designated on the Design Drawings without prior review by and approval from EPA.

Due to the soft nature of the existing materials at the Utility Drive property, compacted structural fill will be required in some areas to support the rail transload area infrastructure (e.g., railroad bed, support area). The designed cut and fill grades illustrated on the Design Drawings account for the required structural fill (or other stabilization technique), as well as standard railroad ballast required underneath the railroad tracks. See Appendix

B (Technical Specifications) for other construction considerations regarding site preparation, including subgrade preparation and fill placement.

As illustrated on Design Drawing RT-104, two visible (yet partially silted in) culverts currently extend under the railroad mainline and discharge onto the Utility Drive rail transload area property, and the existing drainage pattern is generally west to east and towards the wetland observed on the property. Additionally, as shown on Design Drawing RT-104, a silted and buried culvert exists under the railroad mainline; however, based on field review, surface water is not conveyed through this culvert for discharge onto the Utility Drive rail transload area property. As shown on Design Drawing RT-107, the two visible culverts will be extended such that the discharge will be east and downgradient from the rail transload area, and site grading will ensure that other surface flow and stormwater, including from the low-lying area downgradient from the silted culvert, are diverted away from the existing railroad mainline and the rail transload area. Additionally, a culvert pipe will be installed beneath the rail transload area, as shown on Design Drawing RT-107, to convey surface flow away from the low-lying area downgradient of the silted culvert and away from the existing railroad mainline and the rail transload area. The grading and drainage plan is illustrated on Design Drawing RT-108. Existing drainage patterns will be restored during restoration of the property after conclusion of use of the rail transload area, as discussed in Section 4.3.7.

The proposed railroad bed and track and nearly all of the proposed supporting area are located outside of the 100-year floodplain; however, a portion of the access road and supporting/loading area is within the footprint of the 100-year floodplain defined by the Federal Emergency Management Agency (FEMA) (Figure 1-2 and Design Drawing RT-104). In this area, the design elevation of the rail transload area is higher than that of the 100-year floodplain at the overlapping area. Specifically, the 100-year flood elevation in the area of the rail transload area is reported to be 966.8 feet North American Vertical Datum of 1988 (NAVD88) (FEMA 1982a), and the design elevation of the rail transload area within the planimetric extent of the 100-year flood is expected to be at or above approximately 975 feet NAVD88 (Design Drawings RT-108).⁶ Therefore, all portions of the rail transload area and access road will be outside of or above the elevation of the 100-year floodplain during use. Given this situation, there will be no sealed containers with removed material stored at this rail transload area within areas at or below the 100-year floodplain elevation.

4.3.5 Rail Transload Area Design and Construction

After the site preparation activities, including placement and compaction of the required fill materials, the railroad bed (i.e., track subgrade/ballast) and track/ties and the access road and staging/loading area will be constructed. The railroad design criteria used in developing this Rail Final Design Plan are presented in Table 4-2.

The staging and support area will be constructed of concrete to support the weight and movement of the heavy equipment required to lift, move, and load/unload the intermodal containers (e.g., top-pick lifts). Typical asphalt/pavement is designed for the access road and general storage areas where trucks will drive to transport the intermodal containers between the Reach 5A staging areas and the Utility Drive rail transload area. The basis of design calculation package for the concrete staging and support area and asphalt/pavement road and storage areas is provided as Appendix E.

The plan view and cross-sections for the Utility Drive rail transload area design are presented on Design Drawings RT-105 through RT-113 and RT-115 through RT-116.

⁶ The elevations in the flood map are reported in National Geodetic Vertical Datum of 1929 (NGVD29) and were converted to NAVD88 for consistency with the design.

4.3.6 Consideration of Cultural Resources

As noted in Section 2.2, the Phase IB CRS activities at the Utility Drive transload area did not identify any archeological or historical resources that would require specific avoidance measures. However, if the contractor proposes to drive heavy equipment over the land in areas not previously investigated (shown on Design Drawing RT-104), the contractor will be required to first install matting or some other suitable protection over such areas, as stated in Specification Section 01353 – Cultural Resources, to avoid impacts to any potential subsurface cultural features or resources. For contractor reference, the areas previously investigated are illustrated on Design Drawing RT-104.

An Unanticipated Discoveries Plan has been developed for the ROR to address the potential discovery of previously unidentified cultural resources or human remains during construction activities. That plan was submitted to EPA as Appendix D to the *Final Remedial Design/Remedial Action Work Plan for Reach 5A* (Anchor QEA et al. 2026), and a copy is provided in Appendix F hereto. That plan applies to the rail transload area properties, including the Utility Drive transload area. In addition, Specification Section 01353 – Cultural Resources presents the training program for on-site workers to identify potential cultural resources during construction of the rail transload areas.

4.3.7 Habitat Impacts, Measures to Address Them, and Restoration

Construction and operation of the Utility Drive rail transload area, including grading, cut-and-fill activities, and soil staging, will result in temporary disturbance to existing upland and wetland-adjacent habitats. Efforts will be made prior to and during the performance of those activities to avoid or minimize those temporary impacts, as described below.

The layout and grading approach for the Utility Drive rail transload area have been developed to minimize direct impacts to delineated wetlands and to limit disturbance within the mapped 100-year floodplain, to the extent practicable, as described in Section 4.3.4. In particular, the construction and operation of the transload area will not affect any wetlands with the exception of the crossing of an intermittent stream considered a Bank resource under the Massachusetts Wetlands Protection Act regulations. The drainage that is currently conveyed in that intermittent channel will be temporarily conveyed via culverts during the rail transload operation, and the surface water channel will be restored after site use.

The total limit of disturbance associated with the rail transload area is approximately 7.1 acres, which includes approximately 6.6 acres of operational area and 0.5 acres for stockpiling of topsoil that will be removed from within the construction area footprint and stored for future restoration. This includes approximately 4.9 acres of upland field habitats dominated by grasses and forbs, 1.3 acres of upland field habitats dominated by shrubs (i.e., old field habitats), and 0.9 acres of northern hardwoods and approximately 174 linear feet of an intermittent stream. In addition, there are two existing patches of milkweed mapped on the Utility Drive rail transload property – one that is approximately 0.28 acres and one approximately 340 square foot in size. Approximately 46 percent of the larger 0.28-acre patch of milkweed (0.13 acres) and all of the 340 square foot patch of milkweed are located within the limits of disturbance. These features are illustrated on Design Drawing RT-104 and on Figure 2 of the Baseline Restoration Assessment Report provided in Appendix C.⁷

⁷ In addition, there is an approximately 4.3-acre staging area is proposed east of the rail transload area for support to the Reach 5A remediation work. That proposed staging area is positioned within existing areas of upland field dominated by herbaceous grasses and forbs (four acres), with a few small areas of shrub/old field habitat totaling approximately 0.3 acre.

The restoration plan for the property is illustrated on Design Drawing RT-114 and other restoration requirements are specified in Specification Section 32 30 00 – Restoration Planting and Seeding. The restoration plan for this area is discussed in detail later in this section.

GE also plans to address invasive plant species at the rail transload area. This will include a multifaceted approach of pre-treatment, prevention, monitoring, and control that will reduce the prevalence and vigor of invasive plant species prior to construction activities, minimize the introduction and expansion of invasive plant species during construction and operation of the transload area, and ultimately establish plant communities in identified areas dominated by native species following operation and restoration of the property. These activities are described further in the following paragraphs.

A total of 17 plant species at the Utility Drive transload area property are listed as invasive and three are listed as likely invasive by MIPAG. Invasive plants on the property and within 25 feet of areas that will be disturbed by construction of the rail spur, access roads and staging areas will be pre-treated with herbicides and/or mechanically removed. During construction, GE's contractor will implement best management practices to prevent the introduction and spread of invasive plant species, including cleaning of equipment prior to entering and leaving the transload area, use of weed-free materials, and proper handling and disposal of soils that may contain seeds or vegetative material from invasive plants. In addition, GE will monitor for the introduction of invasive plant species at the transload area and will implement appropriate measures to prevent their establishment within the footprint of the rail transload area property while construction activities are ongoing. Invasive species management will continue at the transload area during the years of rail transload operations at that area, focusing on areas within 25 feet of the limit of disturbance, and will also be continued for seven years after restoration of the transload area site has been completed.

Disturbed areas associated with construction will be stabilized using a native seed mix appropriate for regional conditions (for example, a New England Showy Wildflower mix or similar native stabilization mix). GE is currently working with regional plant nurseries to develop habitat-specific seed mixes for use in habitat restoration in Reach 5A that are also ecotypic to western Massachusetts.⁸ Regional and habitat-specific seed mixes will be used as availability allows. These seeded areas will be monitored during rail operations for the presence of invasive plant species, with control measures implemented as necessary to minimize the colonization and spread of invasive species during operational activities. If newly established invasive plants are observed at or adjacent to the transload area, eradication measures will be implemented using a combination of mechanical and, where necessary, chemical controls. Invasive plant control may require the use of herbicides, which will be applied using targeted, direct-contact methods to minimize effects on non-target vegetation. Monitoring and invasive species control measures will continue during rail transload area use and until the site has been restored.

As described in the revised BRA Report (Appendix C) and summarized in Section 2.1.1, the Utility Drive rail transload area overlaps with the MNHESP-mapped species habitat for the state-listed wood turtle and mustard

Approximately 2.4 acres of the upland field habitat within the proposed staging area are dominated by the invasive plant spotted knapweed. Additional details related to this staging area are provided in the *Final Remedial Design/Remedial Action Work Plan for Reach 5A*.

⁸ Based on comments from EPA and MassDFW, GE is working with regional nurseries to determine the feasibility of producing seed mixes that are sourced from EPA Ecoregion 58/Massachusetts. In addition, the U.S. Department of Agriculture Forest Service Reforestation, Nurseries, and Genetic Resources team (<https://easternseedzones.com/>) has developed seed zones for the eastern region that includes Berkshire County and portions of the Connecticut River Valley located in Franklin and Hampshire counties (i.e., Seed Zone 95). Therefore, Seed Zone 95 may provide an ecologically appropriate alternative to Eco 58/MA, and GE may pursue plant material from Seed Zone 95 should availability of suitable plant material from Eco 58/MA be unavailable at the required quantities.

white butterfly, and it is possible that construction and operations of the transload area could affect those species.⁹ As also discussed in Section 2.1, the USFWS IPaC tool and GE's acoustic survey indicated the potential presence of a number of state-listed bat species (including one species proposed for federal listing), as well as the monarch butterfly (proposed for federal listing), in or near this area. As also described in the BRA Report and summarized in Section 2.1.1, no mustard white butterflies or monarch butterflies were observed during the BRA at the Utility Drive rail transload area property, although some host plants for such butterflies were observed (e.g., milkweed, dame's rocket, mustards). Potential impacts on the host plants and associated habitat for the mustard white butterfly as well as monarch butterflies are anticipated to be minimal and not result in a take of those species. In any case, such potential impacts were considered as part of the evaluation of the potential impacts of the overall Reach 5A remediation on state-listed species and their habitats, which was presented in the Restoration Plan for Reach 5A. Further, host plants for these butterfly species have been incorporated into the site restoration plan for the Utility Drive Rail transload area, as discussed further below. Potential impacts on the state-listed bat species will be avoided by limiting tree removal, if possible, to the November through March period, when any bats present will be hibernating and not using trees in the transload area for roosting or, if that is not possible, conducting the tree removal when no roosting is occurring at the time of the removal. Finally, potential impacts to wood turtles will be avoided or minimized through various actions as described in the wood turtle management plan for this rail transload area, provided in Appendix G, and through training of contractors and site managers to aid in identification and protection of wood turtles as the project is implemented, as also described in the wood turtle management plan in Appendix G.¹⁰

The restoration plan for the Utility Drive rail transload area assumes that this transload area will be temporary and will be removed after use for the ROR RA, subject to ongoing coordination with MassDFW. As noted above in Section 4.3, after operations at the Utility Drive rail transload area cease and before commencing restoration, to rule out potential contamination to the property from ROR RA operations, GE will conduct post-use PCB sampling of surfaces within the transload operational areas (e.g., loading/unloading area, container storage area) and within representative areas of disturbance that receive rainwater run-off from the operational area during the ROR RA. This will include sampling of concrete areas used for handling PCB-impacted materials in accordance with Appendix A (Waste Characterization Plan) of GE's POP to determine the appropriate disposal of such materials. The specific locations for post-use sampling will be selected during a joint field review by GE and EPA representatives after operations at the Utility Drive rail transload area have ceased.

Restoration measures for this transload area are intended to address the temporary impacts following decommissioning of the rail transload facility and to return disturbed areas to stable habitat conditions generally consistent with baseline cover types and ecological functions documented in the BRA. Under this plan, following completion of Reach 5A material removal activities, the rail transload area infrastructure (i.e., railroad spur and operational support area) and imported fill material will be removed from the property. In areas where the imported fill was compacted during construction of the rail transload areas, native soil in the top six inches will be scarified and loosened after removal of the infrastructure and imported fill so as to reverse impacts from the

⁹ As also noted in Section 2.1, although this rail transload area also overlaps with mapped species habitat for the state-listed American bittern and although mapped habitat for the state-listed common gallinule is present on the property to the east of the rail transload area, the 2025 rare bird survey found no evidence of American bitterns or common gallinules in this transload area property or elsewhere in Reach 5A. Thus, it is not expected that the construction or operation of this transload area will have any impact on those bird species.

¹⁰ To the extent that the construction or operation of the Utility Drive rail transload area would result in an unavoidable take of wood turtles or another state-listed species, the mitigation measures proposed generally for Reach 5A in GE's Rare Species CMP submitted as Appendix B to the Reach 5A Restoration Plan are adequate to mitigate for such takes.

overlying (and now removed) rail transload area. The disturbed areas will be regraded to stable conditions that restore existing drainage patterns to support reestablishment of current habitat functions. This restoration grading plan also ensures no loss of flood storage capacity within the 100-year floodplain.

The restoration planting plan provides for replacement of the existing habitat. Restoration of upland areas will focus on re-establishing forested, scrub-shrub, and open field conditions using native grasses and forbs appropriate for these upland settings. The restoration planting plan showing the proposed restoration for these cover types at the Utility Drive transload area and the planting tables for each is provided as Design Drawing RT-114. As shown on that plan, restoration of open field habitats will require approximately 148 pounds of native seed mix, and restoration of forested and upland scrub-shrub habitats will include planting of approximately 590 woody shrubs from six different species, 246 trees from five different species, and an additional 29 pounds of native seed mix. As previously noted, GE is currently working with regional plant nurseries to develop habitat-specific seed mixes that are also ecotypic to western Massachusetts, and those mixes will be used as availability allows. The proposed shrub and tree plantings are designed, where appropriate, to reestablish habitat structure consistent with baseline conditions. In addition, existing drainageways will be restored, including restoration of the affected intermittent stream to an open channel that drains into the existing wetland. Additional or different restoration efforts may be discussed with the property owner (MassDFW) at the conclusion of the Reach 5A remediation and prior to implementation of restoration activities. Any resulting changes to the restoration plan will be presented to EPA for review and approval.

Restoration measures will be implemented with consideration of the affected rare species, as shown by the following.

- For the wood turtle, restored conditions will maintain open upland habitats with areas of dense herbaceous and shrub cover that may be used seasonally for movement or foraging, and will avoid creating barriers to wood turtle movement, particularly in areas adjacent to wetlands.
- For the mustard white butterfly, restoration will include incorporation of four species of mustard white host plants, as shown on Design Drawing RT-114. Restored open field and meadow areas will include incorporation of approximately 420 herbaceous plugs from two species of mustard white host plants, planted within 12 randomly distributed habitat patches, with each patch containing approximately 35 plugs planted two feet on center. Restored forested upland areas will also be planted with approximately 150 herbaceous plugs from two additional species of mustard white host plants.
- For the monarch butterfly, the existing 0.13 acre of milkweed plants located within the limits of disturbance will be transplanted to an undisturbed location on the rail transload property at the commencement of site earthwork, as shown on Design Drawing RT-114, and those plants will be monitored for a period of five years. In addition, during restoration, the former location of the 0.13 acre of milkweed will be replanted with approximately three pounds of seed mix along with approximately 696 herbaceous plugs of common milkweed, as also shown on that planting plan.
- Restoration of the pre-existing plant communities and preservation of forest-field edges will provide suitable forage habitats for rare bat species.

Finally, it should be noted that no invasive plant species have been included in the proposed restoration plantings.

4.4 Woods Pond Spur Rail Transload Area

The Woods Pond Spur rail transload area is designed as two parallel spurs (Figure 1-3). Based on discussions with HRRC, the methods for railcar movement at this rail transload area will likely include railroad engine operations pushing empty cars into one spur, disconnecting, traversing to the parallel spur, and connecting to and pulling out full cars forward from the other spur. Construction of the Woods Pond Spur rail transload area will utilize the existing switch off the existing Lenox Team Track, which is a siding that runs parallel to the railroad mainline in this area (Figure 1-3).

In addition, as required by the property owner, BSRM, GE will construct on the same property three additional rail spurs and an inspection pit for use by BSRM to replace the existing rail spurs and inspection pit currently used for storage and maintenance of the 20 existing railroad cars that BSRM expects to be on site at the start of construction of the Woods Pond Spur rail transload area. GE will also construct additional rail track to allow for six additional railroad cars that BSRM currently stores elsewhere but would like to store at the property after construction of the Woods Pond Spur rail transload area is completed. These three additional rail spurs are illustrated on Figure 1-3 closest to the railroad mainline and will be isolated by physical barriers (e.g., fencing) from the two transload tracks during active rail transloading operations.

The rail and other property enhancements made for the Woods Pond Spur rail transload area are expected to be left in place and made permanent at the end of the project, subject to ongoing coordination with BSRM.

4.4.1 Operational Requirements

In addition to loading departing railcars with containers full of removed material, as is planned for the Utility Drive rail transload area, the Woods Pond Spur rail transload area will receive railcars with containers full of removed material for offloading and transport for disposal in the UDF. During the first year of operation, the required Woods Pond Spur rail transload area operational activities are anticipated to include the following steps:

- Receipt of railcars loaded at the Utility Drive rail transload area (see Section 4.3.1) and unloading from such railcars the sealed intermodal containers full of dewatered material removed from Reach 5A for disposal in the UDF;
- Temporary storage of those full intermodal containers in a designated area, as needed based on production and as possible based on space availability, until an empty truck is available (some containers may be transferred directly from the railcar to the truck); and
- Loading of the full intermodal containers to a truck for transport to the UDF for disposal of the material.

In addition, the operational activities for the Woods Pond Spur rail transload area in the first year will include the opposite process to return empty intermodal containers to their prior location for refilling.

In subsequent years, the Woods Pond Spur rail transload area will continue to receive, via the railroad, material removed from Reach 5A and bound for the UDF for disposal. In addition, likely starting with the second year of the ROR RA (see Table 4-1 for anticipated schedule), the Woods Pond Spur rail transload area operational activities will include the following steps:

- Receipt of trucks and unloading from such trucks sealed intermodal containers full of dewatered soil and sediment removed from Reaches 5B, 5C, and/or 6;
- Temporary storage of those full intermodal containers in a designated area, as needed based on production and as possible based on space availability, until an empty railcar is available (some containers may be transferred directly from the truck to the railcar); and
- Loading of the full intermodal containers to the railcars for transport, by rail by HRRC, north to the interchange with CSX in the City of Pittsfield for further transport by rail to the appropriate out-of-state disposal facility.

In addition, similar to the process described for the Utility Drive rail transload area, the operational activities at the Woods Pond Spur rail transloading area will include the opposite process to return empty intermodal containers to trucks for travel back to the Reach 5B, 5C, or 6 staging areas for filling.

The Woods Pond Spur rail transload area will be in operation starting with the Reach 5A remedial activities and throughout the remainder of the ROR RA (see Table 4-1 for anticipated schedule).

As stated in Section 4.3.1, for years one through five, it is likely that travel on site between the Utility Drive and Woods Pond Spur rail transload areas will occur an average of one to two times during each operational day to move the daily average of two to four railcars between the two rail transload areas. Additionally, based on the assumptions stated in Section 4 and the volumes and schedule presented in Table 4-1, an average of four containers per day (one railcar every day and a half on average) will be required to handle the off-site volume of material expected to be removed from Reach 6 in 2029, an average of two to three containers per day (one railcar every two and a half days on average) will be required to handle the off-site volume of material expected to be removed from Reach 5C between 2030 and 2034, and an average of one container per day (one railcar every six days on average) is anticipated to be required to handle the off-site volume of material expected to be removed from Reach 5B in 2031. Further, the design capacity for receiving material from the Utility Drive rail transload area is anticipated to be more than sufficient to handle the later annual volume of material expected to be removed from Reach 8 for on-site disposal.¹¹ Given these volumes, based on discussions with HRRC, it is likely that travel to the interchange with CSX in the City of Pittsfield will occur once every two to three days (assuming that one railcar is moved at a time) or less (if more than one railcar is moved at a time). It is anticipated that railcars for off-site disposal will be transported only on days with three or less full railcars arriving from the Utility Drive rail transload area.

4.4.2 Property Use During Construction and Operation

As discussed in Section 2.3, during development of the design for the Woods Pond Spur rail transload area, GE consulted with the owner of the property, BSRM, regarding the design and use of the transload area during the ROR RA. As a result of this consultation, the design for this transload area includes over 2,000 linear feet of railroad track in excess of what is required for ROR RA operational requirements, to be used for storage of existing BSRM equipment (i.e., BSRM Tracks #1 through #3 on Figure 1-3). In addition, the design includes additional infrastructure (e.g., parking, fencing, access roads) to support ongoing use of the property by BSRM during the ROR RA. GE will continue to consult with BSRM as the design, construction preparations, and project continue to minimize impacts to BSRM's ongoing use of the property during the ROR RA.

¹¹ At this time, it is anticipated that the material from Reach 7 will be transported off-site for disposal.

4.4.3 Overhead Electric Utility Line Easement

An existing Eversource utility line easement is located diagonally across the property, as shown on Design Drawing RT-204. A system of overhead electric wires, towers, and guy wires are located within the easement. The planimetric layout of the rail transload area has been developed to accommodate the easement and the utilities on it. Specifically, the rail transload area has been designed to avoid interference with the towers and guy wires. Although the railroad track connecting the mainline to the Woods Pond Spur transload area track does cross the easement, the fill placement under the utility lines will be limited to the extent practicable, such that travel and loading of railcars will not be restricted by overhead clearance to the wires. The majority of the rail transload area support area is located completely outside of the easement, and vehicle traffic on the access road is not expected to be restricted by overhead clearance to the wires. Design grading and location of other rail transload area-related features are shown on Design Drawings RT-205 through RT-224.

As described in Section 4.3.3, GE initiated communications with Eversource early in the design process, and provided Eversource with a copy of the relevant Conceptual Design Drawings from the Rail Conceptual Design Plan in April 2026. On September 1, 2026, GE transmitted to Eversource for its review a Permitted Use Application for the Woods Pond Spur rail transload area, which included the proposed grading within portions of the Eversource rights-of way that is necessary to support the construction and operation of the rail transload area. In fall 2026, GE anticipates having a meeting with Eversource to review the proposed rail transload area design grading depicted in the Permitted Use Application, observe site conditions in the areas of the proposed grading, and discuss how the proposed rail transload area design will allow for continued access by Eversource to their equipment. Eversource and GE are continuing to coordinate closely to finalize an access agreement for grading work into the easement area.

4.4.4 Site Preparation and Stormwater Management

A significant amount of earthwork will be required to create a level and usable area for the Woods Pond Spur rail transload area, with cut activities to be performed across the majority of the area – namely, the filled area between the current rail yard and parking lot and Willow Creek Road (see Design Drawing RT-204) – and fill activities to be performed predominantly in areas of the existing rail yard to flatten and align the new tracks to be constructed for use by the property owner (BSRM). During earthwork operations, care will be taken to reduce disturbance to areas not directly identified for disturbance to construct the rail transload area.

Because of the significant amount of fill material that will require removal for construction of the rail transload area and tracks/areas for use by BSRM, GE will sample and characterize the material *in situ*, as to be proposed in the *Supplemental Data Collection Work Plan for Woods Pond Spur Rail Transload Area* (Woods Pond Spur SDC Work Plan), which will be submitted shortly. That work plan will propose to conduct this *in-situ* sampling in the fall of 2026, subject to EPA approval, in order to allow time to review results with EPA before development of additional design-related documents, notably the SIP for the rail transload areas.

Based on the results of the *in-situ* characterization sampling and associated discussions with EPA, it is anticipated that cut materials will be handled in one of the following ways: used as fill in areas currently lower than the design elevations, reused for fill in other areas at the BSRM property outside of the footprint of the rail transload area, removed from the property and transported for disposal at the UDF or (if necessary) an off-site disposal facility, or removed from the property and transported for reuse elsewhere. Any excess material to be disposed of at the UDF will comply with Attachment E to the Revised Final Permit. For excess material identified for transport and reuse elsewhere based on the *in-situ* characterization, GE will propose to EPA for approval the

purpose and reuse locations for such material prior to transport from the rail transload area property. This Rail Final Design Plan assumes that all or most material can be disposed of in the UDF and/or reused. If the results of *in-situ* characterization sampling indicate that is not the case, GE will discuss with EPA the appropriate next steps for constructing the Woods Pond Spur rail transload area.

Due to the nature of the existing materials at the Woods Pond Spur rail transload area property, compacted structural fill or use of another stabilization technique (e.g., geogrid) will be required in some areas to support the rail transload area infrastructure (e.g., railroad bed, support area), and the designed cut and fill grades illustrated on the Design Drawings account for the required structural fill (or other stabilization technique) as well as standard railroad ballast required underneath the railroad tracks. The cut and fill earthwork requirements are included in Specification Section 31 23 00 – Excavation and Fill. In addition, the portion of this rail transload area where PCB-containing materials will be handled (i.e., the loading/unloading area, container storage area, and driveways) will be covered with a demarcation layer and a minimum of six inches of hardscape (in this case, concrete or asphalt) so that all such loading and unloading operations are conducted on the top of that new clean layer. See Appendix B (Technical Specifications) for other construction considerations regarding site preparation, including subgrade preparation and fill placement.

To manage stormwater from this transload area, a drainage system will be installed upgradient from and throughout the new rail transload area. Drainage ditches have been designed to convey surface water to catch basins and underdrain systems to divert water away from the loading/unloading area, railroad tracks, and the BSRM buildings. The grading and drainage plan is illustrated on Design Drawing RT-213.

All of the proposed supporting area and nearly all of the proposed railroad bed and track are located outside of the 100-year floodplain; however, a portion of the proposed (and existing) railroad track are within the footprint of the 100-year floodplain defined by FEMA (Figure 1-2 and Design Drawing RT-213). In this area, the 100-year flood elevation in the area of the rail transload area is reported to be 956.4 feet NAVD88 (FEMA 1982b), which is slightly higher in elevation than the mainline track in this area (between approximately 955 and 956 feet NAVD88).¹² The portion of the rail transload area within the planimetric mapping of the 100-year floodplain, which will not be part of the rail loading/unloading area and will not include the two transload tracks, is designed to be similar to the existing conditions such that drainage and flood storage in this area will not be significantly impacted; however, some fill at lower elevations will be required to flatten and align the new tracks to be constructed for use by BSRM.

A flood storage assessment has been performed to assess the overall changes in flood storage capacity resulting from topographic modifications made for construction of the BSRM storage tracks and grading of the site for installation of the rail transload area. For this assessment, gains or losses in flood storage capacity were calculated on a foot-by-foot basis by comparing the existing and proposed terrain elevations within the 100-year floodplain in the limits of disturbance for the Woods Pond Spur rail transload area. This evaluation shows net losses of flood storage capacity of approximately 433 cy at lower elevations (i.e., between elevations 954 feet and 955 feet). However, those losses are lower than and behind the berm created by the railroad mainline and are unlikely to have a recognizable impact on flood storage capacity below 955 feet, given that this area would not be inundated until flood waters are already higher than 955 feet. On the other hand, the evaluation shows net gains of flood storage capacity of approximately 10 cy at higher elevations (between elevations 955 feet and 957 feet). The results of the flood storage assessment are summarized in Table 4-3.

¹² The elevations in the flood map are reported in NGVD29 and were converted to NAVD88 for consistency with the design.

The overall net loss in flood storage capacity will be offset in the final design for Reach 6, which is the remediation area adjacent to the Woods Pond Spur rail transload area, to be compliant with the requirements of the Final Revised Permit. Specifically, an evaluation of the impacts of the constructed transload area (which is intended to remain in place after completion of the ROR RA) on flood storage capacity in the floodplain will be conducted after construction is complete, which will occur before construction starts for Reach 6. If that post-construction evaluation continues to indicate a loss of flood storage capacity in the 100-year floodplain in this area, such loss will be offset in the restoration design for Reach 6, so that there will be no loss of flood storage capacity in or near Reach 6 due to the construction of the rail transload area.

4.4.5 Rail Transload Area Design and Construction

The design for the Woods Pond Spur rail transload area is similar to that described in Section 4.3.5 for the Utility Drive rail transload area. After the site preparation activities, including placement and compaction of the required fill materials, the railroad bed and track/ties and the access road and staging/loading area will be constructed. The railroad design criteria used in developing this Rail Final Design Plan are presented in Table 4-2.

Because existing railroad tracks, infrastructure, and railcars are present at this area, construction of the Woods Pond Spur rail transload area will be performed in a phased approach, as shown on Design Drawings RT-201 and RT-207 through RT-212. During this phased approach, sufficient active railroad tracks will be available at all times to store the 20 existing railroad cars that BSRM expects to be on site at the start of construction. Depending on the condition of the existing rail materials (e.g., track, ties, switches) removed during construction, the material will either be staged for potential reuse during construction of the new tracks, staged for future use by BSRM, or transported from the site for appropriate reuse, recycling, or disposal by others.

The staging and support area will be constructed of concrete to support the weight and movement of the heavy equipment required to lift, move, and load/unload the intermodal containers. Typical asphalt/pavement will be used for the access road and general storage areas where trucks will drive to transport the intermodal containers between the Reach 5B, 5C, and 6 staging areas and the Woods Pond Spur rail transload area and between that transload area and the UDF. The basis of design calculation package for the concrete staging and support area and asphalt/pavement road and storage areas is provided as Appendix E.

The plan view and cross-sections for the Woods Pond Spur rail transload area design are presented in Design Drawings RT-205 through RT-224.

4.4.6 Consideration of Cultural Resources

As noted in Section 2.2, the Phase IB CRS activities at the Woods Pond Spur transload area did not identify any archeological or historical resources that would require specific avoidance measures.¹³ In the event of discovery of previously unidentified cultural resources or human remains during construction activities, the Unanticipated Discoveries Plan developed for the ROR and provided in Appendix F will be followed. In addition, the specification described in Section 4.3.6 relating to training for construction workers will also be implemented at the Woods Pond Spur rail transload area.

¹³ As noted in that section, the historical architectural survey of this rail transload area did identify one NRHP-listed resource (the Lenox Railroad Station), but it was determined that that resource would not be adversely affected by the remediation project, including rail transload activities.

4.4.7 Habitat Impacts, Measures to Address Them, and Restoration

The Woods Pond Spur rail transload area property differs substantially from the Utility Drive property in baseline habitat conditions and ecological function. As documented in Appendix C, the Woods Pond Spur rail transload area property consists primarily of previously disturbed industrial surfaces with limited vegetative cover and no wetland resources within the property boundaries. In terms of potential impacts on rare species, as discussed in Section 2.1.2, the USFWS IPaC tool indicated potential habitat for the northern long-eared bat, the tricolored bat, and the monarch butterfly in areas encompassing this property. As also noted there, however, the 2026 acoustic bat surveys in the Woods Pond area did not find evidence of the northern long-eared bat in this area, although it did find evidence of the tricolored bat (as discussed in the next paragraph). With respect to the monarch butterfly (which has been proposed for federal listing), no observations of adult monarch butterflies or monarch eggs have been recorded, but a patch of common milkweed (host plant for monarch butterfly) was observed and one monarch caterpillar was observed feeding on the milkweed plants during the 2026 survey.

As also noted above, the Species Habitat mapping provided by MNHESP did not include any state-listed species at the Woods Pond Spur transload area property. Surveys in 2025 confirmed that no state-listed plant species occur on the site. Surveys in 2026 likewise did not record any common gallinules using habitats within 1,000 feet of this property. Thus, the construction and operation of the rail transload area will not result in a take of such state-listed species. However, as discussed in Section 2.1.2, the 2026 acoustic bat surveys in the Woods Pond area indicated that five state-listed bat species (the tricolored, little brown, silver-haired, eastern red, and hoary bats) could use the habitat in the vicinity of Woods Pond for roosting, traveling, drinking, and foraging. As stated in Section 4.2.5, any tree removal in or near this property will be limited to the November through March period, if possible, to avoid potential impacts to roosting bats or, if that is not possible, will be conducted to ensure that no roosting is occurring at the time of tree removal.

In addition, as also discussed in Section 2.1.2, a survey in 2026 recorded bald eagles (another state-listed species) using habitats in proximity to the site, including a nest-building attempt southwest of the rail transload property; this nest-building effort was discontinued by early May, and the potential nest site itself was no longer visited by bald eagles. Given that this potential nest site is within 660 feet of the Woods Pond Spur rail transload area, GE will evaluate whether use of this potential nest is re-established in 2027; and if so, whether it would result in a take of bald eagles, particularly in comparison to ongoing commercial activity along Willow Creek Road.¹⁴ If it would, construction of the rail transload area at this location may need to be avoided. This evaluation and any proposed measures to avoid impacts to bald eagles will be presented in the SIP for the rail transload areas or, depending on the time of year during which the SIP is scheduled to be submitted to EPA for review, a separate submittal. A similar evaluation may be needed in future years to assess the potential for nesting activity relative to the schedule and nature of rail transload operational activities, if use of the nest is re-established in 2028 and beyond.

For these reasons, based on current information, it is not expected that the construction and operation of this transload area will have any significant adverse impact on any federally or state-listed rare species.

As previously discussed, after consultation with the relevant parties described in Section 2.3, it is anticipated that nearly all infrastructure installed by GE at the Woods Pond Spur rail transload area during the ROR RA (i.e., railroad track, parking, access roads) will remain in place after use for the ROR RA, with the exception of

¹⁴ The 2026 nest site was in similar juxtaposition to existing commercial activity along Willow Creek Road as it would be to the Woods Pond Spur rail transload area, and the construction and operation of the Woods Pond Spur rail transload area are not anticipated to impose a different land use activity within proximity to the 2026 nest site.

appurtenances like fencing installed to separate the ROR RA from the BSRM use areas during the ROR RA. In addition, the surface cover placed over the portion of the transload area where PCB-containing materials were handled (i.e., the loading/unloading area) will be sampled for PCBs after completion of use to ensure that it was not contaminated by the handling of such materials during transload operations. Before completion of operations at the Woods Pond Spur rail transload area, a representative sampling plan will be developed and submitted to EPA for approval so that sampling can be performed after completion of operations and prior to completion of restoration of this transload area. Assuming that such sampling does not show unacceptable levels of PCBs, the constructed surface cover placed over the loading/unloading area will remain in place.

In these circumstances, decommissioning of the rail transload area is not anticipated to require any habitat restoration, and restoration will be limited to stabilization and re-establishment of the native vegetative cover in vegetated areas, as appropriate and in coordination with the property owner (BSRM). The seed mix requirements are specified in Specification Section 32 30 00 – Restoration Planting and Seeding. Hardscape areas will remain and thus re-establishment of vegetative cover in those areas is unnecessary.

5 Schedule and Next Steps

Based on further design evaluations, EPA's comments on this Rail Final Design Plan, input from the selected construction contractor, and ongoing consultations with relevant parties, GE will prepare and submit to EPA a SIP for the rail transload areas in Reaches 5 and 6. It is anticipated that the package will be submitted to EPA in the second quarter of 2027; however, the precise timing is dependent on the timing of comments on and/or approval of this Rail Final Design Plan, as well as the Woods Pond Spur SDC Work Plan (mentioned in Section 4.4.4), and the timing of procurement of the contractor to construct the rail transload areas. Similar to the distribution list for this Rail Final Design Plan, copies of the SIP will be provided to the relevant property owners, the owner and operator of the railroad, and the local municipalities.

It is anticipated that the rail transload areas will be constructed and operational before remediation activities in Reach 5A begin; however, the construction schedule is dependent on a number of factors outside of GE's control. Specifically, the schedule is dependent on the following assumptions, which, if not met, may delay the schedule for construction and operation of the rail transload areas:

- *In-situ* characterization sampling proposed in fall 2026 for the BSRM property indicates that all or most of the excess material can be disposed of in the UDF and/or reused;
- Property owner agreement with the Rail Final Design Plan for the Utility Drive and the Woods Pond Spur rail transload areas is received by the end of 2026;
- EPA approval of the Rail Final Design Plan for these rail transload areas is received by the end of 2026;
- Access agreements with the property owners are executed by the end of 2026;
- Agreement is reached by the end of 2026 with MassDOT for MassDOT to construct the tie-in of the Utility Drive rail transload area track to the railroad mainline;
- Bald eagles will not establish a nest within 600 feet of the Woods Pond Spur rail transload area in 2027 or future years;
- Agreement is reached with HRRC by the end of 2027 on an operations plan for movement of ROR RA-related trains as necessary support the ROR RA project schedule;
- The MassDOT capital improvement project for the railroad mainline between the Woods Pond Spur and the City of Pittsfield is completed before the spring of 2028;
- No unexpectedly long lead times are required for materials necessary for construction of the rail transload areas (generally greater than six months, except for switches, which can take up to nine months);¹⁵ and
- Weather conditions are appropriate for construction of the rail transload areas by spring 2028.

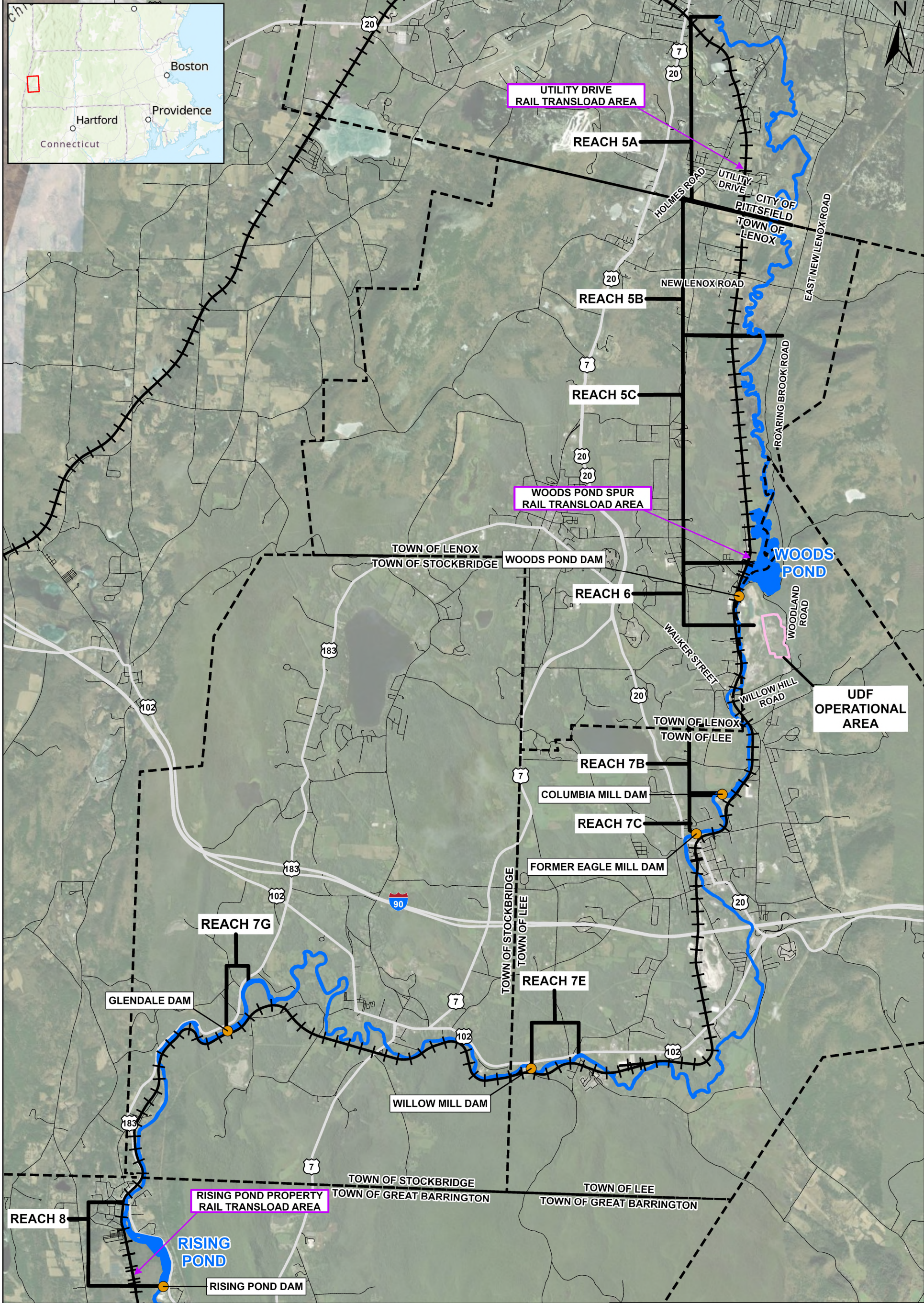
As described in the Revised T&D Plan, if at any time during the ROR RA use of rail transport for material disposal cannot match target production rates for sediment and soil removal (i.e., if material is being removed and stockpiled faster than it can be transported for disposal, with the risk of running out of room, eagles successfully establish a nest adjacent to the Woods Pond Rail Spur property, HRRC has major mechanical breakdowns, etc.), truck transport will be utilized to supplement rail transport and convey removed materials for disposal.

¹⁵ In accordance with EPA's June 2026 conditional approval letter, GE has actively monitored the lead times for switches. GE continues to work with suppliers and contractors to order components as soon as possible after approval of the design by EPA.

6 References

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- FEMA. 1982b. Flood Insurance Rate Map, Town of Lenox, Massachusetts. Panel 4 of 5, Community-Panel Number 2500229 0004 B. July 5.
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Figures

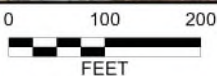


LEGEND ● DAM LOCATION TOWNSHIP BOUNDARY ROAD RAILROAD HOUSATONIC RIVER	NOTES: - ALL LOCATIONS ARE APPROXIMATE. - COORDINATE SYSTEM: NAD83 STATE PLANE MASSACHUSETTS MAINLAND FIPS 2001 - BASEMAP SOURCE: VIVID IMAGERY PROVIDED BY MAXAR, ACCESSED 7/6/2026 - UDF = UPLAND DISPOSAL FACILITY 0 5,000 10,000 GRAPHIC SCALE IN FEET	GENERAL ELECTRIC COMPANY HOUSATONIC RIVER - REST OF RIVER FINAL DESIGN PLAN FOR RAIL TRANSLOAD AREAS IN REACHES 5 AND 6 HOUSATONIC RIVER: REACHES 5A THROUGH 8  FIGURE 1-1	
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LEGEND

- RAILROAD
- PROPOSED LOCATION OF RAIL SPUR FOR LOADING/OFF-LOADING CONTAINERS
- PROPOSED LOCATION OF RAIL LOADING/OFF-LOADING OPERATIONAL AREA
- CONTOURS (5 FOOT)
- TOWNSHIP BOUNDARY
- 100-YEAR FLOODPLAIN
- PROPERTY BOUNDARY
- REACH 5A STAGING AREA 2



NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. COORDINATE SYSTEM: WGS84
3. BASEMAP SOURCE: IMAGERY CAPTURED BY BLUESKY GEOSPATIAL LTD OF NORTH ADAMS, MASSACHUSETTS, ON BEHALF OF GE, ON APRIL 25, 2025.
4. TOPOGRAPHIC INFORMATION COLLECTED BY C.T. MALE ASSOCIATES ENGINEERING, SURVEYING, ARCHITECTURE, LANDSCAPE ARCHITECTURE & GEOLOGY D.P.C. DURING THE MONTH OF JULY, 2025. VERTICAL DATUM NAVD88.
5. REACH 5A STAGING AREA 6 WILL BE CONSTRUCTED AT A FUTURE DATE TO SUPPORT REMEDIATION OF REACH 5A AND IS SHOWN FOR REFERENCE PURPOSES ONLY.

GENERAL ELECTRIC COMPANY
HOUSATONIC RIVER - REST OF RIVER
FINAL DESIGN PLAN FOR
RAIL TRANSLOAD AREAS IN REACHES 5 AND 6

UTILITY DRIVE PROPOSED TEMPORARY RAIL TRANSLOAD AREA



FIGURE
1-2

Path: T:\ENV\GEOG - Housatonic\ArcPro Projects\BORD\Engineering\Report\FinalDesignRailArea_Reaches5_6.aprx\Fig-1-3 WP Spur Transload Area Last Saved By: kinsbaugh 9/15/2026



LEGEND

- RAILROAD
- PROPOSED LOCATION OF RAIL SPUR FOR LOADING/OFF-LOADING CONTAINERS
- PROPOSED LOCATION OF RAIL SPUR FOR BSRM STORAGE
- PROPOSED LOCATION OF RAIL LOADING/OFF-LOADING OPERATIONAL AREA
- CONTOURS (5 FOOT)
- TOWNSHIP BOUNDARY
- 100-YEAR FLOODPLAIN
- PROPERTY BOUNDARY

0 75 150
FEET

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. COORDINATE SYSTEM: WGS84
3. BASEMAP SOURCE: IMAGERY CAPTURED BY BLUESKY GEOSPATIAL LTD OF NORTH ADAMS, MASSACHUSETTS, ON BEHALF OF GE, ON APRIL 25, 2025.
4. TOPOGRAPHIC INFORMATION COLLECTED BY C.T. MALE ASSOCIATES ENGINEERING, SURVEYING, ARCHITECTURE, LANDSCAPE ARCHITECTURE & GEOLOGY D.P.C. DURING THE MONTH OF JULY, 2025. VERTICAL DATUM NAVD88.

GENERAL ELECTRIC COMPANY
HOUSATONIC RIVER - REST OF RIVER
FINAL DESIGN PLAN FOR
RAIL TRANSLOAD AREAS IN REACHES 5 AND 6

**WOODS POND SPUR
PROPOSED RAIL TRANSLOAD
AREA**

ARCADIS

FIGURE
1-3

Tables

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Chemical-Specific ARARs				
Federal ARARs				
None				
State ARARs				
Massachusetts Contingency Plan	310 CMR 40.0361 – Reportable Concentrations of Oil and Hazardous Material in Soil	This regulation defines reportable concentrations in soils for chemical constituents that are listed on 105 CMR, § 670.010 (Massachusetts Substance List) to determine whether the soil contains hazardous materials.	Relevant and appropriate	Soil and aggregates to be obtained from licensed borrow sources for construction of the rail transload areas will be sampled to confirm that earthwork and railbed materials meet specifications and are not above background soil concentrations.
To Be Considered				
Location-Specific ARARs				
Federal ARARs				
Clean Water Act – Section 404 and implementing regulations	33 USC 1344 33 CFR Parts 320-323, 325, and 332 (ACOE) 40 CFR 120.2 and Part 230 (EPA)	For the discharge of dredged or fill material into waters of the United State (as defined in 2023 in 40 CFR 120.2), there must be no practicable alternative with less adverse effect on the aquatic ecosystem; the discharge cannot cause or contribute, after consideration of disposal site dilution and dispersion, to violation of any applicable water quality standard, violate an applicable toxic effluent standard, jeopardize existence of endangered or threatened species, or contribute to significant degradation of waters of the U.S. The discharger must take appropriate and practicable steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem. The discharger must evaluate impacts on flood level, flood velocity, and flood storage capacity. Mitigation/restoration is required for unavoidable impacts on resources.	Applicable to the extent that construction activities for the rail transload areas would involve a discharge of dredged or fill material to a water of the United States	It is not anticipated that construction of the Woods Pond Spur rail transload area will involve the discharge of dredged or fill material into a water of the U.S. The same is true for construction of the Utility Drive rail transload area except that construction of that area will require the crossing of an intermittent stream channel which could be considered a water of the U.S. The drainage that is currently conveyed in that intermittent channel will be temporarily conveyed via culverts during the rail transload operation, and then a surface water channel will be restored after use of the rail transload area has been completed. To the extent that construction activities associated with the development of the rail transload areas (including the crossing of the intermittent stream) should result in a discharge of dredged or fill material to a water of the U.S., the substantive requirements of these regulations will be met. EPA has determined that there is no practicable alternative with less adverse impact on the aquatic ecosystem, and these construction activities will include appropriate and practicable steps (e.g., appropriate soil erosion controls) to minimize potential adverse impacts of such discharge on the waters of the U.S. In particular, excavation, filling, grading, and construction activities will be managed in a manner that limits impacts to adjacent areas and avoids the uncontrolled discharge of stormwater runoff beyond designated areas, and will provide for management of construction-based stormwater. If necessary, mitigation/restoration will be conducted consistent with the substantive requirements of these regulations. See also next entry regarding potential impacts on flood storage capacity. Dewatering of materials will not occur at the rail transload areas.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Floodplain Management and Protection of Wetlands	44 CFR Part 9	Regulation sets forth policy, procedures, and responsibilities to implement and enforce Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.	Relevant and appropriate	The construction and operation of the rail transload areas will be conducted in accordance with the substantive requirements of this regulation. There will be no significant impact on the floodplains. The Utility Drive rail transload area will be located largely outside of the 100-year floodplain, and in the portion within the planimetric extent of that floodplain (which will not be used for loading operations), the design elevation of the rail transload area is higher than that of the 100-year floodplain at the overlapping area. Thus, all portions of this rail transload area will be outside of or above the elevation of the 100-year floodplain during use. In addition, this area will be restored so that flood storage capacity will not be reduced. The Woods Pond Spur rail transload area will also be located largely outside of the elevation of the 100-year floodplain; however, a small portion of the railroad tracks (which will not be used for loading operations) is within the planimetric extent of that floodplain and a foot-by-foot evaluation of the design grades indicates a net loss of flood storage. A post-construction evaluation will be conducted at the Woods Pond Spur rail transload area to evaluate the post-construction change in flood storage capacity in the 100-year floodplain in this area. If that post-construction evaluation continues to indicate a loss of flood storage capacity in the 100-year floodplain in this area, such loss will be offset in the restoration design for Reach 6 so that there will be no loss of flood storage capacity in or near Reach 6 due to the construction of the rail transload area. In addition, the work to construct and operate these rail transload areas is not expected to adversely affect any wetlands with the exception of the intermittent stream at the Utility Drive rail transload area, which will be restored as described above.
RCRA requirements for hazardous waste facilities in floodplains	40 CFR 264.1(j)(7) 40 CFR 264.18(b)	Remediation waste management sites must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless procedures are in effect to have waste removed safely before flood waters reach the facility or there will be no adverse effects on human health or the environment if washout occurs.	Potentially relevant and appropriate	It is not anticipated that the rail transload areas will manage any hazardous waste under RCRA. Even if they did, the substantive requirements of these regulations would be met. The areas at both the Woods Pond Spur and Utility Drive transload areas where removed materials will be staged have been designed to be located outside of or higher in elevation than the 100-year floodplain and material will be containerized (i.e., not in an exposed stockpile).
National Historic Preservation Act (NHPA) and regulations	54 USC 300101 et seq., including Section 306108 (Section 106 of NHPA) 36 CFR Part 800	A federal agency must take into account the project’s effect on properties or resources included or eligible for inclusion in the National Register of Historic Places (NRHP).	Applicable to EPA; relevant and appropriate to work that could affect properties or resources included or eligible for inclusion in the NRHP	One NRHP-listed resource, the Lenox Railroad Station, was identified at the Woods Pond Spur rail transload area; however, it was determined that there would be no adverse effect on this resource. Cultural resource surveys have not identified any other properties or resources at either transload area that are included or eligible for inclusion in the NRHP.
Archaeological and Historic Preservation Act	54 USC 312501 et seq.	When a federal agency finds, or is notified, that its activities in connection with a federal construction project may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, such agency shall notify the U.S. Department of the Interior. If the U.S. Department of the Interior determines the data are significant and may be irrevocably lost or destroyed, it is to conduct a survey and other investigation of the affected area and recover and preserve such data as necessary in the public interest.	Applicable to EPA; relevant and appropriate to work in areas where archaeological or historic data may be present	One historical structure, the Lenox Railroad Station, was identified at the Woods Pond Spur rail transload area; however, it was determined that there would be no adverse effect on this resource. Cultural resource surveys have not identified any other significant scientific, prehistorical, historical, or archeological data at either of the rail transload area properties.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Endangered Species Act and Regulations	16 USC 1536(a)-(d) 50 CFR Part 402, Subparts A&B 50 CFR 17	A federal agency must determine whether a federally authorized project is likely to jeopardize the continued existence of a listed threatened or endangered (T&E) species or result in destruction or adverse modification of its critical habitat. If so, “reasonable and prudent” measures must be taken to avoid and/or minimize such effects.	Applicable to EPA; relevant and appropriate to work that could affect T&E species or their habitat	GE’s baseline restoration assessment (BRA) activities for the rail transload area properties identified habitat for and the potential presence of one federally listed T&E species, the northern long-eared bat (NLEB), as well as two species proposed for listing, the tricolored bat (TCB) and monarch butterfly, within the Woods Pond Spur transload area property and the latter two species at the Utility Drive transload area property. A bat acoustic survey conducted in Reach 5A detected the presence of the TCB (but not the NLEB), which could forage at or near the Utility Drive transload area property. Although a rare butterfly survey in Reach 5A did not observe any monarch butterflies in the Utility Drive transload area property, that property contains suitable habitat for them (i.e., their host plant species). Surveys for the two bat species and the monarch butterfly at and near the Woods Pond Spur transload area property were conducted in 2026. The bat acoustic survey showed no presence of NLEB in the Woods Pond area but did indicate that TCB is potentially present in this area. For monarch butterflies, the presence of host plants has been documented, and one monarch caterpillar (larva) was observed on a milkweed plant on August 27, 2026, but no monarch butterfly adults or eggs have been observed. GE will conduct reasonable and prudent measures to avoid or minimize adverse impacts to these species. Notably, any tree cutting required at either rail transload area property will be conducted between November 1 and March 30, if possible, to avoid any direct impact to rare bat roosting habitat or, if that is not possible, will be conducted to ensure that no roosting is occurring at the time of tree removal. Habitat restoration after rail use will mitigate any long-term impacts to rare bat use of these areas. Potential impacts on monarch butterflies will be addressed through restoration measures that include planting their host plants.
Bald and Golden Eagle Protection Act	16 USC 668-668c 50 CFR 22	These requirements prohibit a “take” of bald or golden eagles. A “take” is defined to include “disturb;” and “disturb” is defined as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause” injury to an eagle, a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior: or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.	Potentially relevant and appropriate	Bald and golden eagles have not been observed in the vicinity of the Utility Drive transload area property. Bald eagles were observed near the Woods Pond Spur rail transload area in spring 2026. While a nesting attempt by bald eagles occurred within 600 feet of that area in 2026, that effort was abandoned without evidence of egg laying. GE will evaluate whether use of this nest or another nest in the area is established in 2027 and future years; and if so, whether it would result in a take of bald eagles, particularly in comparison to ongoing commercial activity along Willow Creek Road. If it would, construction of the rail transload area at this location may need to be scheduled outside the eagle nesting season to avoid impacts to bald eagles.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
State ARARs				
Massachusetts Clean Water Act – Water Quality Certification Regulations	314 CMR 9.00 et seq., including 9.06-9.07	For discharge of fill material to waters of the U.S. within Massachusetts, the criteria in Section 9.06 include, without limitation, the following: (a) no discharge is permitted for the impoundment or detention of stormwater for purposes of controlling sedimentation or other pollutant attenuation; (b) stormwater is to be controlled with BMPs; and (c) no discharge shall be permitted in rare circumstances where the activity will result in substantial adverse impacts to the physical, chemical, or biological integrity of surface waters. For management of dredged material, the criteria in Section 9.07 include, without limitation, the following: (a) dredged material management must be conducted to ensure protection of human health, public safety, public welfare and the environment; and (b) placement of dredged material in an intermediate facility for sediment management (handling of sealed containers containing dewatered materials) prior to disposal or reuse must meet certain requirements in Section 9.07(4), including requirements governing method of placement/storage of dredged material and siting criteria.	Applicable to work involving discharge of dredged or fill material to waters of the U.S.; relevant and appropriate to management of dredged material	As noted above, it is not anticipated that construction of the Utility Drive or Woods Pond Spur rail transload area will involve the discharge of dredged or fill material into waters of the U.S., with the exception that the Utility Drive transload area construction will require the crossing of an intermittent stream channel that could be considered a water of the U.S. That crossing is discussed above under the entry for Section 404 of the Clean Water Act. To the extent that the rail transload area construction activities would involve the discharge of fill material to a water of the U.S., the substantive provisions of these regulations relating to such discharge will be met. In particular, without limitation, the rail transload area construction and use will not involve impoundment or detention of stormwater to control sedimentation or pollutant attenuation, will use BMPs to control stormwater, and will not include activities that result in substantial adverse impacts to the physical, chemical, or biological integrity of surface waters. The management of dredged material at these rail transload areas will be conducted in accordance with the substantive provisions of these regulations relating to such management. In particular, without limitation: • Dredged material management (handling of sealed containers containing dewatered materials) will be conducted in a manner that ensures protection of human health, public safety, public welfare, and the environment. Dewatering of materials will not occur at the rail transload areas. • Temporary staging areas at the rail transload areas will meet the requirements for an intermediate facility in 314 CMR 9.07(4) except as otherwise approved by EPA.
Massachusetts Wetlands Protection Act and Regulations	MGL c. 131, Section 40 310 CMR 10.00, including 10.53	These requirements govern removal, dredging, filling, or altering of “Resource Areas,” including Riverfront Areas, inland wetlands, land subject to flooding and certain other areas. Provisions include Section 10.53(3), which authorizes certain projects as “limited projects,” including, in 10.53(3)(q), actions responding to a release or threat of release of oil and/or hazardous materials in accordance with the MCP, where (a) there is no practicable alternative consistent with the MCP that would be less damaging to Resource Areas, and (b) steps are taken to avoid or minimize impacts to Resource Areas, including meeting specific standards to the maximum extent practicable. Further, under 310 CMR 10.59, the action must have no adverse effect on estimated habitat of state-listed rare wildlife species.	Applicable to work in defined Resource Areas	The construction and operation of the two rail transload areas will not affect any Resource Areas under this Act with one exception: The construction of the Utility Drive transload area will require minor and temporary work in an intermittent stream, which is considered a Bank resource under these regulations. Such work, as part of a CERCLA response actions and thus considered adequately regulated under the MCP, will be considered a limited project under these regulations; and it will meet the substantive requirements of these regulations for such projects. There is no practicable alternative that would be less damaging to this stream, and steps will be taken to avoid or minimize impacts to this stream to the maximum extent practicable. In particular, BMPs will be used in construction of the stream crossing, the drainage that is currently conveyed in the intermittent channel will be temporarily conveyed via culverts during the rail transload operation to avoid hydrological changes, and the intermittent stream channel will be restored after use of the rail transload area has been completed. With respect to the potential impacts on the estimated habitat of state-listed rare species, see the entry below for the Massachusetts Endangered Species Act.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Massachusetts Site Suitability Criteria	310 CMR 16.40(3),(4)	Site suitability criteria for solid waste handling facilities, including facility-specific and general site suitability criteria.	Potentially applicable to the temporary management of excavated materials at rail transload areas	To the extent that these siting criteria apply to solid waste handling facilities at the rail transload areas these criteria will be met except as follows: For any such requirements that would prohibit or restrict temporary solid waste management at these transload areas – including the prohibition on the location of such management facilities within an Area of Critical Environmental Concern (ACEC) – EPA, in consultation with the Commonwealth, has waived those requirements pursuant to CERCLA 121(d)(4)(B) on the ground that compliance with them would create a greater risk to human health and the environment than implementation of the selected remedy.
Massachusetts Facility Location Standards	310 CMR 30.700-708	Location standards for hazardous waste management facilities, including temporary storage units for waste defined by the state regulations as hazardous waste. They include, but are not limited to, a prohibition on the location of any such facility in the 100-year floodplain or in an ACEC, as well as various other locational requirements for the active portion of the facility. Note that waste containing PCBs at a concentration equal to or greater 50 mg/kg constitutes hazardous waste under the Massachusetts regulations. Note further that these regulations exempt: (a) temporary storage of dredged materials at an intermediate facility when managed under a state water quality certification and under Section 404 of the federal Clean Water Act; or (b) facilities for wastes with a PCB concentration equal to or greater than 50 mg/kg if such facilities comply with EPA's TSCA regulations (40 CFR Part 761) except with respect to a facility located in an ACEC (see 310 CMR 30.501(3)(a)).	Potentially applicable to the temporary management of excavated materials at rail transload areas	To the extent that the location standards of these regulations apply to the temporary management of materials at the rail transload areas (assuming that those materials constitute hazardous waste under these regulations and that their temporary management is not subject to any regulatory exemption), these location requirements will be met except as follows: For any such requirements that would prohibit or restrict temporary hazardous waste management at these rail transload areas – including the prohibition on the location of such management facilities within the ACEC – EPA, in consultation with the Commonwealth, has waived those requirements pursuant to CERCLA 121(d)(4)(B) on the ground that compliance with them would create a greater risk to human health and the environment than implementation of the selected remedy.
Massachusetts Historical Commission (MHC) Act and regulations	MGL c. 9, Section 27C 950 CMR 71.07	If the MHC determines that a state-authorized project could cause a change in the historical, architectural, archaeological, or cultural qualities of a property on the State Register of Historic Places (SRHP), these provisions establish a process for notification, determination of adverse impact, and evaluation of alternatives to avoid, minimize, or mitigate such impacts.	Relevant and appropriate to work that could affect properties included on the SRHP	Cultural resource surveys have not identified any property listed on the SRHP at either of the rail transload area properties. As noted above, GE has identified one historical structure, the Lenox Railroad Station, at the Woods Pond Spur rail transload area; but it has been determined that there would be no adverse effect on this structure.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Massachusetts Endangered Species Act (MESA) and regulations	MGL c. 131A 321 CMR 10.00, Parts I, II, and V 321 CMR 10.00, Part IV	Under Parts I, II, and V, a proposed activity in mapped Priority Habitat for a state-listed threatened or endangered species or species of special concern, or other area where such a species has occurred may not result in a “take” of such species, unless it has been authorized by a conservation and management permit. A conservation and management permit may be issued provided that an adequate assessment of alternatives to both temporary and permanent impacts to state-listed species has taken place, an insignificant portion of the local population would be impacted by the project or activity, and the project proponent agrees to carry out a conservation and management plan is carried out that provides a long-term net benefit to the conservation of the state-listed species. Under Part IV, projects that will alter a designated Significant Habitat must be reviewed to ensure that they will not reduce the viability of the habitat to sustain an endangered or threatened species.	Applicable	The Utility Drive rail transload area property is located within a Priority Habitat designated by the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) for state-listed species. This transload area overlaps with mapped habitat provided by MNHESP for three state-listed species – the wood turtle, the American bittern, and the mustard white butterfly – but no evidence of the American bittern was found at this area in a 2025 survey and potential impacts on the host plants and associated habitat for the mustard white butterfly are anticipated to be minimal. This property also contains potential habitat for several state-listed bat species (TCB, little brown bat, silver-haired bat, eastern red bat, and hoary bat). The Woods Pond Spur rail transload area property does not include any Priority Habitat or mapped MNHESP habitat for any state-listed species. Although these is nearby mapped habitat for one such species (the common gallinule),a survey of that species within and adjacent to this property in 2026 showed no observation of this species within 1,000 feet of this property. However, a bat acoustic survey in 2026 did indicate the potential presence of five state-listed bat species (TCB, little brown, silver-haired, eastern red, and hoary bats). Finally a survey for bald eagles (another state-listed species) in 2026 recorded bald eagles using habitats near the Woods Pond Spur rail transload property, including a nest-building attempt southwest of the property; this nest-building effort was discontinued by early May and the nest site itself was no longer visited by bald eagles. For both rail transload areas, efforts will be made to avoid or minimize a take of the state-listed species that could be impacted. For state-listed bat species, tree removal will be limited (if possible) to the November through March period, when any bats present will be hibernating and not using trees in the transload area for roosting, or, if that is not possible, GE will ensure that no bats are roosting in the trees at the time of their removal. Additionally, for the Utility Drive transload area, a specific wood turtle management plan will be implemented to avoid or minimize any takes of these turtles. To the extent that the construction or operation of this rail transload area would result in an unavoidable take of wood turtles or another state-listed species, the mitigation measures proposed generally for Reach 5A in GE’s Rare Species Conservation and Management Plan submitted as appendix to the Reach 5A Restoration Plan are adequate to mitigate for such takes. The Woods Pond Spur rail transload area is not expected to result in a take of any state-listed species with two qualifications: State-listed bats will be addressed as described above; and for bald eagles, as noted above under the Bald and Golden Eagle Protection Act, GE will evaluate whether use of the nest observed in 2026 or another nest in the area is established in 2027 and future years; and if so, whether it would result in a take of bald eagles, particularly in comparison to ongoing commercial activity along Willow Creek Road. If it would, construction of the rail transload area at this location may need to be scheduled outside the eagle nesting season to avoid impacts to bald eagles. There are no designated Significant Habitats in either of the rail transload area properties.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
Massachusetts ACEC	301 CMR 12.11(1)(c)	Provides for establishment of ACEC in the state, which includes the rail transload areas. ACEC designation affects other state laws and regulations.	Relevant and appropriate	The ACEC regulations pertain to state agency actions and are not applicable to the federal EPA action. However, the rail transload area construction and use will comply with the substantive requirements of 301 CMR 12.11(1)(c), which may be relevant and appropriate, by contributing to a project that will advance the values of 301 CMR 12.11(1)(c), while avoiding adverse effects on identified values in Section 12.11(1)(c) to the extent practicable.
Action-Specific ARARs				
Federal ARARs				
TSCA Regulations on Cleanup of PCB Remediation Waste	40 CFR 761.61(c)	Provides for risk-based approval of PCB sampling, cleanup, storage, and disposal methods through an EPA determination that such method(s) will not pose an unreasonable risk of injury to health or the environment.	Applicable	Attachment D to the Revised Final Permit contains a risk-based determination by EPA under this provision that the remedy specified in the Revised Final Permit will not pose an unreasonable risk of injury to health or the environment as long as it complies with the conditions set out in that determination, which the Housatonic ROR remedy will do. This determination covers the storage of PCB-containing materials at the rail transload areas.
TSCA Regulations on Storage of PCB Remediation Waste	40 CFR 761.50 40 CFR 761.65 40 CFR 761.61(c)	General and specific requirements for storage of PCB Remediation Waste. Regulations include specific provisions for storage of PCB Remediation Waste in piles at the cleanup site or site of generation for up to 180 days (761.65(c)(9)). Also allows for risk-based approval by EPA of alternate storage method (761.61(c)), based on demonstration that it will not pose an unreasonable risk of injury to health or the environment.	Applicable	The storage of PCB Remediation Waste at the rail transload areas will comply with these provisions. EPA's risk-based approval contained in Attachment D to the Revised Final Permit covers the storage of such materials in accordance with the requirements of the Revised Final Permit. The temporary storage of PCB-containing sediments and soils at the rail transload areas will meet the applicable requirements established under the Revised Final Permit for such storage. Materials containing PCBs will be stored only in sealed containers.
TSCA Regulations on Decontamination	40 CFR 761.79	Establishes decontamination standards and procedures for removing PCBs from water, organic liquids, and various types of surfaces.	Applicable	Although not anticipated to be necessary at the rail transload areas, if decontamination activities are conducted at the rail transload areas as part of the Housatonic ROR remedy, they will comply with these requirements.
Clean Water Act – NPDES Regulations (stormwater discharges)	40 CFR 122.26(c)(1)(ii)(C) 40 CFR 122.44(k)	Best management practices (BMPs) must be employed to control pollutants in stormwater discharges during construction activities.	Applicable	Erosion and sedimentation control measures and BMPs will be implemented during construction activities at the rail transload areas to comply with these stormwater requirements.
RCRA Regulations on Identification of Hazardous Waste	40 CFR 261	Establishes standards for determining whether a waste constitutes hazardous waste under RCRA.	Potentially applicable	If necessary to determine whether materials present at rail transload areas or to be removed from those areas during restoration constitute hazardous waste under RCRA, waste characterization sampling of such materials will be conducted consistent with these requirements to make that determination.
RCRA Regulations for Hazardous Waste Management Facilities – General	40 CFR 264.1(j)	General requirements for hazardous waste management facilities (waste analysis, security, precautions regarding ignition or reaction of wastes, preventing washout of units).	Potentially applicable	If it is determined that materials managed at the rail transload areas constitute RCRA hazardous wastes and that those areas are outside the overall Area of Contamination, these requirements will be met.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
State ARARs				
Massachusetts Clean Waters Act – Water Quality Certification Regulations	314 CMR 9.01-9.08	See synopsis of requirements in the location-specific entry for this ARAR.	Applicable	See the location-specific entry for this ARAR.
Massachusetts Clean Water Act and Wetlands Protection Act – Stormwater Management Standards	310 CMR 10.05(6)(k) 314 CMR 9.06(6)(a)	Projects subject to regulation under the Wetlands Protection Act (WPA) or that involve discharge of fill material into a water of the U.S. must incorporate stormwater BMPs to attenuate pollutants in stormwater discharges, as well as to provide a setback from receiving waters and wetlands, in accordance with 10 specified stormwater management standards.	Applicable to the extent that rail transload areas would affect a Resource Area under the WPA and/or a water of the U.S.	The construction and operation of the rail transload areas are not anticipated to affect a Resource Area under the WPA or involve a discharge of dredged or fill material to a water of the U.S., with one exception – the crossing of an intermittent stream channel at the Utility Drive transload area. For that work, erosion and sedimentation control measures and BMPs will be implemented to comply with these stormwater requirements. Similarly, if any other construction activities at the rail transload areas are subject to these regulations, erosion and sedimentation control measures and BMPs will be implemented during those construction activities to comply with these stormwater requirements.
Massachusetts Hazardous Waste Regulations on Identification and Listing of Hazardous Waste	310 CMR 30.100	Establishes criteria and lists for determining whether a waste is a hazardous waste under state law. Note: Waste containing PCBs at a concentration equal to or greater 50 mg/kg constitutes a listed hazardous waste under the Massachusetts regulations, but the Massachusetts hazardous waste regulations do not apply to facilities for such waste that comply with EPA's TSCA regulations (40 CFR Part 761) except with respect to a facility located in an ACEC (see 310 CMR 30.501(3)(a)).	Applicable	If necessary to determine whether materials present at the rail transload areas or to be removed from those areas during restoration constitute hazardous waste under state law on a basis other than containing PCB concentrations at or above 50 mg/kg, waste characterization sampling of such materials will be conducted consistent with these regulations to make that determination. <u>Note:</u> With respect to waste containing PCB concentrations at or above 50 mg/kg, any facilities for the storage of such waste as part of the Housatonic ROR remedy, including the rail transload areas, will comply with the TSCA regulations (by virtue of EPA's risk-based determination in Attachment D to the Revised Final Permit), and the prohibition on the location of such a facility in an ACEC has been waived by EPA, after consultation with the Commonwealth, pursuant to CERCLA 121(d)(4)(B).
Massachusetts hazardous waste management – general requirements	310 CMR 30.513, 514, 524, 560	General requirements for hazardous waste management facilities.	Potentially applicable	If it is determined that materials managed at the rail transload areas constitute non-PCB hazardous wastes under state law and that those areas are outside the overall Area of Contamination, the substantive provisions of these general regulations will be met.
Massachusetts hazardous waste regulations – technical requirements for storage	310 CMR 602, 640, 580, 660.	Requirements related to storage of hazardous waste.	Potentially applicable	If it is determined that materials managed at the rail transload areas constitute non-PCB hazardous wastes under state law and that those areas are outside the overall Area of Contamination, the substantive requirements of these regulations will be met.
Massachusetts Air Pollution Control Regulations	310 CMR 7.00, 7.01, 7.06, 7.09, 7.10, and 7.11	These provisions regulate air emissions, dust, odor, and noise, among other things.	Applicable	The rail transload area construction, use, and restoration will comply with the substantive provisions of these regulations. Specifically, those activities will comply with the air monitoring and air emission control requirements set forth in the Quality of Life Compliance Plan and in the Ambient Air Monitoring Plan included in GE's Project Operations Plan, and will comply with the noise and odor monitoring and control requirements set forth in the Quality of Life Compliance Plan. In addition, control and mitigation of dust emissions will be implemented, as needed, during construction, operation, and restoration of the rail transload areas.

Table 3-1
Applicable or Relevant and Appropriate Requirements for Rail Transload Areas in Reaches 5 and 6¹

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River

Statute/Regulation	Citation	Synopsis of Requirements	Status	Action(s) to Be Taken to Comply with ARARs ²
To Be Considered				
TSCA PCB Spill Cleanup Policy	40 CFR Part 761, Subpart G	Policy used to determine adequacy of cleanup of spills resulting from the release of materials containing PCBs at concentration of 50 mg/kg or greater.	To be considered for any new PCB spills that occur during work at the rail transload areas	This policy will be considered in the event of any new spill that results in the release of PCBs at a concentration of 50 mg/kg or greater during the operation of the rail transload areas.

- Notes:**
1. This table has been adapted from Attachment C of the Revised Final Permit with a number of modifications relevant to the rail transload areas.
 2. Compliance with ARARs refers to compliance with the substantive requirements, criteria, or limitations of each provision, not any administrative, procedural, or permitting requirements included therein.

- Acronyms:**
- ACEC: Area of Critical Environmental Concern
ARAR: applicable or relevant and appropriate requirement
BMP: best management practice
BRA: Baseline Restoration Assessment
CFR: Code of Federal Regulations
CMR: Code of Massachusetts Regulations
CRS: Cultural Resource Survey
EPA: U.S. Environmental Protection Agency
GE: General Electric Company
MCP: Massachusetts Contingency Plan
MESA: Massachusetts Endangered Species Act
mg/kg: milligram per kilogram
NLEB: northern long-eared bat

MGL: Massachusetts General Law
MHC: Massachusetts Historical Commission
NHPA: National Historic Preservation Act
NPDES: National Pollutant Discharge Elimination System
NRHP: National Register of Historic Places
PCB: polychlorinated biphenyl
RCRA: Resource Conservation and Recovery Act
ROR: Rest of River
SRHP: State Register of Historic Places
T&E: threatened or endangered
TCB: tricolored bat
TSCA: Toxic Substances Control Act
USC: United States Code

Table 4-1
Approximate Material Volume to be Moved by Rail

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River
Pittsfield, Massachusetts

Reach	Anticipated Start Year (Spring)	Anticipated End Year (Fall)	Estimated Years of Rail Operation	Onsite Disposal Volume to be Transported by Rail (cubic yards) ^a	Offsite Disposal Volume to be Transported by Rail (cubic yards)
Reach 5A (Year 1) ^b	2028	2028	1	32,800	3,000
Reach 5A (Years 2 to 5) ^b	2029	2032	4	154,200	5,000
Reach 6 ^{c,d}	2029	2034	1	0	8,600
Reach 5C ^c	2030	2034	5	0	26,000
Reach 5B ^c	2031	2031	1	0	2,000
Reach 7 ^{e,f}	2035	2036	1	0	14,500
Reach 8 ^e	2036	2037	2	9,100	40,900
Total:	2028	2037		196,100	100,000

Notes:

1. All volumes and anticipated schedule subject to change during each Reach-specific design process.
2. Transportation by rail will require transportation by truck to move containers to/from the rail transload area.

Footnotes:

- ^a Material to be unloaded at Woods Pond Spur Rail Transload Area.
^b Material to be loaded to rail at Utility Drive Rail Transload Area.
^c Material to be loaded to rail at Woods Pond Spur Rail Transload Area.
^d Offsite material will likely be removed within one of the years of Reach 6 remediation.
^e Material to be loaded to rail at Rising Pond Spur Rail Transload Area.
^f Offsite material will likely be removed within the second year of Reach 7 remediation.

Table 4-2
Rail Transload Area Design Criteria

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River
Pittsfield, Massachusetts

Design Element		Design Criteria		Comments/Remarks
		Criteria	Reference	
Design Speeds	HRRC Main Line	25 MPH	General Practice	Class II track
	Industrial Leads	10 MPH	General Practice	Class I track
	HRRC Main Line - Turnouts	15 MPH	General Practice	#10 switches
	GE Industrial Lead - Turnouts	10 MPH	General Practice	#8 switches
	BRSM Industrial Tracks - Turnouts	5 MPH	General Practice	#6 switches
Horizontal Alignment	Maximum Curvature	10D Max., 7.5D Preferred	General Practice	
	Tangent Between Reverse Curves	100'	CSX	
	Distance between PS to curve	10' Min.	NS	for diverging leg direction in same direction as curve
	Distance between PS to curve to reverse curve	70' Min.	NS	for diverging leg direction opposite direction from curve
		100' Min.	CSX	
Vertical Alignment	Length of Vertical Curves	$L = \frac{D * V^2 * K}{A}$ 100' Min. Preferred	AREMA Section 5.3.6	Speed based criteria may be used with permission of HRRC Engineering
	L = Length of Vertical Curve (ft) D = Absolute Difference in Grade V = Speed in MPH K = 2.15 A = 0.1 Freight	$r = \frac{G_2 - G_1}{LVC} \times 100$ (Stations)		To be used for design when possible r max (crest) = 0.2 (mains), 0.4 (sec.) r max (sag) = 0.1 (mains), 0.2 (sec.)
	Maximum Track Grade	1.0%	HAZMAT Requirement	Curve Compensation Required
	Compensated Curve Slope (max)	0.04 x degree of curve	AREMA	Standard for tractive effort
	Minimum Distance Between Vertical Curves	100' Preferred	CSX	
Track Section	Rail Section	Jointed		Existing HRRC
	HRRC	#136	AREMA	
	GE ROR	#115/#107	AREMA	#107 supplied by HRRC
	BSRM	#105/#107	AREMA	#107 supplied by HRRC
	Ties	Timber	AREMA	8'-6" x 7" x 9"
Turnouts	Tie Spacing	20"	AREMA	
	Fasteners	12" Plates, 5 1/2" Rail Base	AREMA	Applies to #105, #107, and #115 rail
		Spiked	AREMA	
		Anchors Every Other Tie	AREMA	
Roadbed	Mainline Crossover	#10	MassDOT MW-1	
	Mainline Turnout	#10	MassDOT MW-1	
	Industrial	#8	CSX	
	BRSM Industrial	#6 Min.	AREMA	
	Switch Operations	Hand Throw	AREMA	Switch stands outside regulated clearance envelope
Roadbed	Roadbed Shoulders - No Access Road	12'	CSX	C/L Track to Top Edge of Subballast
	Roadbed Shoulders - With Access Road	20'	CSX	C/L Track to Top Edge of Subballast
	Ballast Depth	6"	CSX	Minimum below tie ⁴
	Subballast Depth	6"	CSX	Minimum below tie - 40:1 slope ⁴

Table 4-2
Rail Transload Area Design Criteria

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River
Pittsfield, Massachusetts

Design Element		Design Criteria		Comments/Remarks
		Criteria	Reference	
Roadbed (cont.)	T/R to T/Subgrade (7"x9" Tie, 115RE Rail) (Crest under CL Track)	26.38" = 2.20'		Curves up to 8 degrees
	Ballast Shoulder	12"		Tangent or curve
	Ballast Size - Main Track	AREMA No. 4A		2 1/2" minus (Granite)
	Ballast Size - Industrial	AREMA No. 5		
	Subballast Type	AREMA 1.2.2.11	CSX Subballast gradation	
	Embankment Slopes (BSRM Adjacent)	4:1	General Practice	Safe for pedestrian traffic
	Embankment Slopes (Roadway Adjacent)	3:1	General Practice	Safe for vehicular traffic
	Embankment Slopes (Minimum)	2:1	General Practice	Safe for ground stability
Construction Clearances	Horizontal	15' 8'-6" 9'-0" Increase Clearance 1 1/2" per Degree of Curve	CSX CSX State of Massachusetts AREMA	Fixed Structures General horizontal clearance from CL track Regulated horizontal clearance from CL track 1" allowed for Industrial clearance
	Minimum Cover Between tie and culvert	2' - 6"	AREMA	2-1/2' from bottom of tie to top of pipe.
	Roadway Under Railroad Vertical not applicable	14' - 6"	General Practice	Maintain or better existing clearance
	Power Lines and Aerial Cables Vertical above T/R - Electric	30' Min.	NESC	Overhead power lines, increase with voltage above 750V
	Other Horizontal - To Buildings	27' Min. 8'-6"	NESC State of Massachusetts	Guys, messenger and communication spans Increase for curvature
	Track Centers Main Tracks - CSX Standard	15'	CSX	CL Track to CL track
	New Construction - Track to Track	14'	General Practice	CL to CL
	Other Railroads	25'	General Practice	CL to CL
	Offset Between Track Centerline GE ROR	14' Min.	General Practice, industrial traffic	Only between GE ROR Tracks (Transload Tracks)
	BSRM	12' Min.	General Practice, infrequent traffic	Only between BSRM tracks
Operational Clearances	HRRC	20' Min.	CSX	CSX Minimum offset near any main track

References:

1. CSX. 2023. Standard Specifications for the Design and Construction of Private Sidetracks. August 23.
2. AREMA. 2025. 2025 Manual for Railway Engineering. April. Available online at: https://publications.arena.org/Publication/MRE_2025.
3. NESC. 2023. IEEE SA National Electrical Safety Code, ANSI C2.
4. Ballast depth for industrial siding construction only, not main line work.

Abbreviations:

AREMA = American Railway Engineering and Maintenance-of-Way Association
BSRM = Berkshire Scenic Railway Museum
Max. = maximum
Min. = minimum
MPH = miles per hour

ROR = Rest of River
TBD = to be determined
MassDOT = Massachusetts Department of Transportation
NESC = National Electrical Safety Code
CL = centerline

Table 4-3
Summary of Preliminary Flood Storage Assessment Results for Woods Pond Spur

Final Design Plan for Rail Transload Areas in Reaches 5 and 6
Housatonic River – Rest of River
Pittsfield, Massachusetts

Datum	Pre Construction Flood Storage Volume (cy)	Post Construction Flood Storage Volume (cy)	Changes in Flood Storage Volume by Datum (cy)	Change in Flood Storage Volume by Incremental Foot (cy)
957	2,303.6	1,851.9	-451.8	
				1.2
956	1,451.3	998.3	-453.0	
				8.6
955	611.6	150.0	-461.6	
				-432.6
954	32.7	3.8	-28.9	
TOTAL:				-422.8

Notes:

1. The pre- and post-construction flood storage volumes indicated above are based on a comparison of pre-construction and anticipated post-construction conditions.
2. The approximate limit of grading is represented on the Design Drawings prepared by Arcadis included in the Final Design Plan for Rail Transload Areas in Reaches 5 and 6.
3. Pre-construction flood storage volumes are determined using the existing topographic conditions shown on Design Drawing RT-204.
4. Post-construction flood storage volumes for are determined based on the designed grading configuration as shown on Design Drawing RT-213.
5. The pre- and post-construction flood storage volumes presented represent the flood storage volume at and below the datum elevation.
6. A negative (-) value indicates a loss in flood storage volume. A positive value indicates a gain in flood storage volume.
7. Change In Flood Storage Volume by Incremental Foot volumes rounded to the nearest whole cubic yard (cy).
8. Although the 100-year flood elevation in the area of the rail transload area is reported to be 956.4 feet NAVD88, the mainline track in this area is between approximately 955 and 956 feet NAVD88, indicating all loss of flood storage is behind an elevated berm. See the Final Design Plan for Rail Transload Areas in Reaches 5 and 6 for details.

Appendix A

Design Drawings

DESIGN DRAWINGS

GE-PITTSFIELD/HOUSATONIC RIVER SITE

CONTRACT 20 - RAIL TRANSLOAD AREA CONSTRUCTION

RAIL TRANSLOAD (RT)

TRACK/CIVIL PLANS

NOT FOR CONSTRUCTION



DATE ISSUED / DATE REVISED
SEPTEMBER 2026

**CITY OF PITTSFIELD AND
TOWN OF LENOX, MASSACHUSETTS
BERKSHIRE COUNTY**



**GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS**



ARCADIS U.S., INC

INDEX TO DRAWINGS

RT-001 - RT-002	COVER PAGE
RT-003	GENERAL NOTES
RT-004	GLOBAL LEGEND AND ABBREVIATIONS
RT-101	SUMMARY OF GENERAL REQUIREMENTS
RT-102 - RT-103	UTILITY DRIVE - TRACK ALIGNMENT DATA
RT-104	UTILITY DRIVE - TRACK TYPICAL SECTIONS
RT-105	UTILITY DRIVE - EXISTING PLAN
RT-106 - RT-107	UTILITY DRIVE - REMOVAL PLAN
RT-108	UTILITY DRIVE - EROSION AND ENVIRONMENTAL CONTROL PLANS
RT-109	UTILITY DRIVE - GRADING AND DRAINAGE PLAN
RT-110 - RT-111	UTILITY DRIVE - SURFACE PLAN
RT-112	UTILITY DRIVE - TRACK PLANS AND PROFILES
RT-113	UTILITY DRIVE - ACCESS ROADWAY PLAN AND PROFILE
RT-114	UTILITY DRIVE - OVERHEAD WIRE
RT-115 - RT-116	UTILITY DRIVE - RESTORATION PLANTING PLAN
RT-117	UTILITY DRIVE - CROSS SECTIONS
RT-201	UTILITY DRIVE - CONCRETE SLAB PLAN
RT-202	WOODS POND SPUR - TRACK STAGING SCHEMATICS
RT-203	WOODS POND SPUR - TRACK ALIGNMENT DATA
RT-204	WOODS POND SPUR - TRACK TYPICAL SECTIONS
RT-205 - RT-206	WOODS POND SPUR - EXISTING PLAN
RT-207 - RT-212	WOODS POND SPUR - EROSION AND ENVIRONMENTAL CONTROL PLANS
RT-213	WOODS POND SPUR - STAGING PLANS
RT-214	WOODS POND SPUR - GRADING AND DRAINAGE PLANS
RT-215 - RT-219	WOODS POND SPUR - SURFACE PLAN
RT-220	WOODS POND SPUR - TRACK PLANS AND PROFILES
RT-221 - RT-222	WOODS POND SPUR - ACCESS ROADWAY PLAN AND PROFILE
RT-223 - RT-224	WOODS POND SPUR - OVERHEAD WIRE
RT-225	WOODS POND SPUR - CROSS SECTIONS
RT-301 - RT-302	WOODS POND SPUR - CONCRETE SLAB PLAN
RT-303	CULVERT SECTIONS
RT-304	EROSION CONTROL DETAILS
RT-305	UTILITY DRIVE - DRAINAGE TABLES AND DETAILS
RT-306	WOODS POND SPUR - DRAINAGE TABLES AND DETAILS
RT-307	TRACK DETAILS
RT-308 - RT-309	TYPICAL DETAILS - FENCING
RT-310 - RT-311	CONCRETE STRUCTURAL NOTES AND DETAILS
RT-312 - RT-313	INSPECTION PIT EXISTING CONDITIONS AND REMOVAL PLANS
	INSPECTION PIT INSTALLATION PLANS

GENERAL NOTES

1. IN PERFORMING THE WORK, UNDER THIS CONTRACT, THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH ALL FEDERAL, STATE AND LOCAL STATUTES, ORDINANCES AND DIRECTIVES WITH RESPECT TO THE ELIMINATION OF EXCESSIVE NOISE AND POLLUTION OF AIR AND WATER DUE TO HIS CONSTRUCTION EQUIPMENT AND OTHER OPERATIONS. ATTENTION SHALL BE GIVEN TO REDUCE THE NOISE OF HEAVY CONSTRUCTION EQUIPMENT AND TO THE CONTROL OF DUST, SMOKE AND FUMES FROM CONSTRUCTION EQUIPMENT AND OTHER OPERATIONS ON THE WORK SITE, AND THE DIRT AND NOISE CREATED BY HEAVY TRUCK OPERATION AREAS AND ADJACENT EXISTING PAVED AREAS. THESE AREAS SHALL BE KEPT FREE FROM DEBRIS AT ALL TIMES. THE DISCHARGE OF OILY, GREASY OR CHEMICAL WASTES INTO WATERWAYS AND SEWERS WILL NOT BE PERMITTED.

2. THE PLAN NOTES AND DETAILS WILL HOLD OVER PLAN DRAWING INFORMATION AND THE PLANS WILL HOLD OVER THE GENERAL SPECIFICATIONS. OTHER APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS AND REQUIREMENTS ARE TO BE INCORPORATED IN THE CONSTRUCTION, WHEN IN CONFLICT WITH THE PLANS OR SPECIFICATIONS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN.

3. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION MANAGEMENT SERVICES WITH EXPERIENCED PERSONNEL. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS, METHODS AND SAFETY OF THE CONSTRUCTION OPERATIONS.

4. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND CONDITIONS EXISTING IN THE FIELD PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION.

5. THE CONTRACTOR SHALL INSPECT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS, TRAFFIC AND OTHER ITEMS, THAT EFFECT THE CONTRACT AND THE DETAILED REQUIREMENTS OF CONSTRUCTION.

6. ALL CATCH BASINS, MANHOLES, INLETS AND SIMILAR STRUCTURES NEWLY CONSTRUCTED, ADJUSTED OR RECONSTRUCTED UNDER THE CONTRACT SHALL BE CLEANED OF ANY ACCUMULATION OF SILT, DEBRIS OR ANY FOREIGN MATTER OF ANY KIND AND SHALL BE FREE OF SUCH ACCUMULATION AT THE TIME OF FINAL INSPECTION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS CONTRACT.

7. LOCATION OF CONSTRUCTION STAGING AREA IS TO BE COORDINATED WITH THE CONSTRUCTION MANAGER PRIOR TO BEGINNING CONSTRUCTION.

8. ALL CONSTRUCTION TRAFFIC SHALL ENTER AND EXIT WORK AREAS FROM A LOCATION DESIGNATED BY THE CONSTRUCTION MANAGER.

9. DURING ALL STAGES OF CONSTRUCTION, THE OWNER OR CONTRACTOR SHALL ENSURE THAT STORMWATER RUNOFF IS EFFECTIVELY MANAGED THROUGH COLLECTION AND CONVEYANCE THROUGH ON SITE STORMWATER AND EROSION AND SEDIMENT POLLUTION CONTROL FACILITIES.

10. PROPOSED DRAINAGE STRUCTURES TO BE EXTENDED AND/OR INSTALLED MUST MEET A.R.E.M.A. PART 5 SPECIFICATIONS.

11. EXISTING AND/OR PROPOSED UTILITIES ARE TO BE RELOCATED, ADJUSTED, AND/OR PROTECTED BY THE CONTRACTOR AT THEIR EXPENSE.

12. DETAIL PLANS OF THE PROPOSED LOADING AND/OR UNLOADING FACILITIES, INCLUDING HORIZONTAL AND VERTICAL CLEARANCES, ARE TO BE APPROVED BY THE CONSTRUCTION MANAGER BEFORE CONSTRUCTION.

13. THIS PLAN WAS NOT PREPARED OR INTENDED FOR USE AS A REAL ESTATE TITLE MAP.

14. TIE AND RAIL AT CLEAR POINTS WITHOUT A DERAIL ARE TO BE PAINTED FLUORESCENT GREEN.

15. ALL RAIL SHALL BE JOINTED.

16. EROSION CONTROL MEASURE LOCATIONS SHOWN ARE APPROXIMATE ONLY. ACTUAL LOCATIONS MAY VARY BASED ON FIELD CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION.

17. EROSION CONTROL MEASURES INCLUDE SILT FENCE INSTALLED AROUND STRIPPED SOIL STAGING AREA AND STRAW WATTLES INSTALLED AT ALL OTHER SITE LOCATIONS WHERE SHOWN TO MITIGATE SEDIMENT TRANSPORT TO SENSITIVE SITE AREAS AND/OR OFFSITE LOCATIONS. ADDITIONAL LOCATIONS MAY BE REQUIRED BASED ON SITE CONDITIONS IDENTIFIED AT TIME OF CONSTRUCTION AS DETERMINED BY THE CONTRACTOR AND/OR CONSTRUCTION MANAGER. SEE DETAILS ON DRAWINGS RT-106, RT-107, RT-205, AND RT-206.

18. TREE AND BRUSH CLEARING SHALL BE CONDUCTED WITHIN THE LIMITS OF WORK SHOWN ONLY. NO CLEARING WILL BE ALLOWED OUTSIDE OF THE LIMITS OF WORK WITHOUT CONSTRUCTION MANAGER APPROVAL. TREE AND BRUSH CLEARING LIMITS TO BE ESTABLISHED BY THE CONTRACTOR THEN JOINTLY REVIEWED IN THE FIELD BY THE CONTRACTOR AND CONSTRUCTION MANAGER PRIOR TO COMMENCING ANY CLEARING WORK. CLEARING LIMITS MAY BE ADJUSTED BY CONSTRUCTION MANAGER IN CONSIDERATION OF EXISTING AND PROPOSED SITE CONDITIONS. VEGETATION CLEARING SHALL NOT BE CONDUCTED BEFORE NOVEMBER 1 OR LATER THAN MARCH 31, UNLESS OTHERWISE APPROVED BY CONSTRUCTION MANAGER IN ADVANCE OF CLEARING.

19. EXCEPT WHERE RELOCATION IS REQUIRED BY THE CONTRACT, ALL EXISTING UTILITIES SHALL REMAIN IN CONTINUOUS OPERATION DURING THE PROSECUTION OF THE WORK. THESE UTILITIES INCLUDE, BUT ARE NOT LIMITED TO WATER, SEWER, COMMUNICATIONS, POWER, AND GAS LINES.

20. EXISTING CONDITIONS WERE TAKEN FROM THE BEST MAPPING, INFORMATION SHOWN CONCERNING FEATURES AND UTILITIES IS NOT GUARANTEED, ALL INCLUSIVE OR CORRECT. THE CONTRACTOR SHALL VERIFY THE FEATURES PRIOR TO CONSTRUCTION. EXISTING UTILITIES SHALL BE MAINTAINED IN SERVICE AT ALL TIMES, UNLESS NOTED OTHERWISE ON THE PLANS. THE LOCATION, MATERIAL AND DIMENSIONS OF EXISTING FACILITIES AND OBSTRUCTIONS ARE BASED UPON AVAILABLE RECORDS AND ARE SHOWN ON THE PLANS STRICTLY AS AN AID TO THE CONTRACTOR, BUT MUST NOT BE CONSTRUED AS BEING ACCURATE, CORRECT OR COMPLETE. ALL STRUCTURES ABOVE OR BELOW GROUND THAT ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE PROPERLY SUPPORTED AND MAINTAINED. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH THE CONSTRUCTION MANAGER FOR THE PROTECTION, RELOCATION, RECONSTRUCTION OR ADJUSTMENT OF SUCH STRUCTURES AS REQUIRED IN FIELD. IF DAMAGED DURING CONSTRUCTION THE CONTRACTOR SHALL MAKE REPAIRS OR PAY FOR REPAIRS TO THE STRUCTURE TO THE SATISFACTION OF THE CONSTRUCTION MANAGER.

21. IF THE WORK MAY IMPACT PUBLIC UTILITIES, THE CONTRACTOR IS TO NOTIFY THE UTILITY OWNER SUFFICIENTLY IN ADVANCE OF THE SCHEDULE FOR SUCH REMOVALS AND OF RELOCATIONS AND COORDINATE FOR THE UTILITY OWNER TO MOVE SUCH UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREMIUM COSTS WHICH BECOME NECESSARY AS A RESULT OF THE CONTRACTOR'S FAILURE TO NOTIFY THE UTILITY OWNER. ALL OTHER UTILITIES NOTED ON THE PLANS TO BE RELOCATED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL ITEMS PROPOSED FOR ABANDONMENT, RELOCATION OR DEMOLITION SHALL BE MARKED BY THE CONTRACTOR FOR REVIEW BY THE CONSTRUCTION MANAGER. NO ITEM SHALL BE ABANDONED, RELOCATED OR DEMOLISHED UNTIL APPROVED BY THE CONSTRUCTION MANAGER.

22. THE CONTRACTOR SHALL NOT START ANY WORK WHICH MAY AFFECT EXISTING WATER, SEWER, COMMUNICATIONS, POWER, GAS, OR OTHER UTILITY CABLES, PIPELINES, OR SEWERS UNTIL THE CONSTRUCTION MANAGER HAS REVIEWED AND APPROVED THE SHOP DRAWINGS AND PROCEDURES FOR PROTECTION OF THE UTILITY.

23. IN THE EVENT THE CONTRACTOR ENCOUNTER EXISTING SUBSURFACE DRAINAGE SYSTEMS THAT WERE NOT SHOWN ON THE PLANS, THE CONTRACTOR SHALL MAINTAIN AND PRESERVE THE SUBSURFACE DRAINAGE SYSTEMS OR CONNECT THE SYSTEMS TO THE NEAREST DRAINAGE SYSTEMS AS DIRECTED BY THE CONSTRUCTION MANAGER.

24. COUNTERPOISE GROUNDING WIRES ARE PRESENT BETWEEN EVERSOURCE TRANSMISSION STRUCTURES (I.E., TOWERS) AT THE WOODS POND SPUR PROPERTY, EXACT LOCATION UNKNOWN. CONTRACTOR SHALL COORDINATE WITH EVERSOURCE FOR SUBGRADE EARTHWORK WITHIN EVERSOURCE RIGHT-OF-WAY.

25. FOR UTILITY DRIVE RAIL TRANSLOAD AREA, ALL WORK CONDUCTED WITHIN AND ADJACENT TO THE EVERSOURCE ENERGY POWERLINE UTILITY RIGHT-OF-WAY AND/OR EASEMENT TO BE CONDUCTED IN ACCORDANCE WITH PERMITTED USE LICENSE AGREEMENTS ISSUED BY EVERSOURCE ENERGY ON [DATE; TO BE COMPLETED ONCE ISSUED].

26. FOR WOODS POND SPUR RAIL TRANSLOAD AREA, ALL WORK CONDUCTED WITHIN AND ADJACENT TO THE EVERSOURCE ENERGY POWERLINE UTILITY RIGHT-OF-WAY AND/OR EASEMENT TO BE CONDUCTED IN ACCORDANCE WITH PERMITTED USE LICENSE AGREEMENTS ISSUED BY EVERSOURCE ENERGY ON [DATE; TO BE COMPLETED ONCE ISSUED].

27. AS NEEDED, CONTRACTOR TO DETERMINE REQUIREMENTS FOR AND IMPLEMENT RELOCATION OF UTILITY POLE AND OVERHEAD WIRES IN COORDINATION WITH UTILITY OWNER AND CONSTRUCTION MANAGER. SELECTED LOCATION FOR NEW POLE(S) AND OVERHEAD WIRES TO BE ACCEPTABLE TO UTILITY OWNER AND CONSTRUCTION MANAGER.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE				Professional Engineer's Name	NOT FOR CONSTRUCTION			 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION GENERAL NOTES SHEET 1 OF 2 TRACK	RT-001	ARCADIS Project No. 30318691.3000		
														Date SEPTEMBER 2026
		2	09/2026	FINAL DESIGN	EJC							ESB		
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB								
		No.	Date	Revisions	By	Ckd	MA							
		THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.										Designed by ESB	Drawn by EJC	Checked by WAJ

GENERAL SURVEY

1. TOPOGRAPHIC AND BASEMAP SURVEY INFORMATION COLLECTED BY C.T. MALE ASSOCIATES ENGINEERING, SURVEYING, ARCHITECTURE, LANDSCAPE ARCHITECTURE & GEOLOGY D.P.C. DURING THE MONTH OF JULY, 2025 AND FOR OVERHEAD WIRES, DURING THE MONTHS OF SEPTEMBER AND OCTOBER, 2025.

2. COORDINATE SYSTEM NSRS11(NAD83/2011) MASSACHUSETTS, MAINLAND
ZONE, US FOOT. VERTICAL DATUM NAVD88.

3. 100-YEAR FLOODPLAIN BOUNDARY BASED ON THE FEMA FLOOD INSURANCE RATE MAPS (FIRM). UTILITY DRIVE RAIL TRANSLOAD AREA PROPERTY (966.8 FEET NAVD88 FLOOD ELEVATION) BASED ON FIRM FOR CITY OF PITTSFIELD, MASSACHUSETTS; PANEL 20 OF 20, COMMUNITY-PANEL NUMBER 250037 0020 C; FEBRUARY 19, 1982. WOODS POND SPUR RAIL TRANSLOAD AREA PROPERTY (956.4 FEET NAVD88) BASED ON TOWN OF LENOX, MASSACHUSETTS; PANEL 4 OF 5, COMMUNITY-PANEL NUMBER 2500229 0004 B; JULY 5, 1982.

4. ADDITIONAL INFORMATION FOR THE WOODS POND SPUR PROPERTY GATHERED BY BSRM FIELD SURVEY AND PROVIDED TO ARCADIS BY BSRM ON APRIL 15, 2026 AND GATHERED BY GROUND PENETRATING RADAR ON BEHALF OF ARCADIS ON JULY 27, 2026.

RAILROAD OPERATIONS

1. THE CONTRACTOR SHALL NOT PERFORM ANY WORK ON ACTIVE HRRR TRACKS, UTILITIES OR FACILITIES UNLESS DIRECTED IN WRITING BY THE CONSTRUCTION MANAGER.

2. THE CONTRACTOR'S WORK SHALL NOT INTERRUPT THE OPERATIONS OF THE RAILROAD WITHOUT PRIOR APPROVAL OF THE CONSTRUCTION MANAGER.

3. THE CONTRACTOR SHALL NOT FOUL LIVE TRACKS WITHOUT PERMISSION AND WITHOUT AN APPOINTED FLAGMAN ON DUTY.

4. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT EVERY EMPLOYEE OR SUBCONTRACTOR IS TRAINED & KNOWLEDGEABLE OF F.R.A. ON TRACK SAFETY REQUIREMENTS AND CARRIES PROPER CREDENTIALS WHILE WORKING NEAR OR ON LIVE TRACKS.

SURVEY BENCHMARKS - UTILITY DRIVE

<u>Point Number</u>	<u>Easting</u>	<u>Northing</u>	<u>Point Elevation</u>	<u>Full Description</u>
1091	185,766.4480'	2,979,081.3770'	967.67'	XNAIL IN CONCRETE

SURVEY BENCHMARKS - WOODS POND

<u>Point Number</u>	<u>Easting</u>	<u>Northing</u>	<u>Point Elevation</u>	<u>Full Description</u>
93003	184,647.2600'	2,957,397.4980'	956.002'	BM SET GR POST WOOD
93004	184,902.2810'	2,958,125.8020'	957.072'	BMF UPOLE ER NET&CO-02

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE					Professional Engineer's Name	Professional Engineer's No.			NOT FOR CONSTRUCTION	 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION GENERAL NOTES SHEET 2 OF 2 TRACK	RT-002	ARCADIS Project No. 30318691.3000
		2	09/2026	FINAL DESIGN	EJC	ESB	42983							
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB		State	Date Signed					Project Mgr.
		No.	Date	Revisions	By	Ckd	MA							LP
		THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.					Designed by ESB	Drawn by EJC	Checked by WAJ					

ABBREVIATIONS

BSRM	BERKSHIRE SCENIC RAILWAY MUSEUM
CL	CENTERLINE
CONC	CONCRETE
CP	CONTROL POINT
CY	CUBIC YARDS
Dc	DEGREE OF CURVE
DWG	DRAWING
E	EASTING
Ea	ACTUAL SUPER ELEVATION
EL./ELEV.	ELEVATION
EX./EXIST.	EXISTING
FT	FEET
GE	GENERAL ELECTRIC
HP	HIGH POINT
HRRC	HOUSATONIC RAILROAD
HT	HANDTHROW
IFC	ISSUED FOR CONSTRUCTION
IFT	ISSUED FOR TENDER
INV.	INVERT (PIPE OR DITCH)
K	RATE OF CHANGE
L	LENGTH OF CURVE, VERTICAL
Lc	LENGTH OF CURVE, HORIZONTAL
LF	LINEAR FEET
LH	LEFT HAND
LLT	LAST LONG TIE
MA	MASSACHUSEETS
MH	MANHOLE
MAX	MAXIMUM
MI/Mi.	MILEAGE
MIN	MINIMUM
MP	MILE POST
MPH	MILES PER HOUR
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
N	NORTHING
No.	NUMBER
N.T.S.	NOT TO SCALE
O/HW OR OHW	OVERHEAD WIRE
PC	POINT OF CURVE
PI	POINT OF INTERSECTION
POB	POINT OF BEGINNING
POE	POINT OF ENDING
PS	POINT OF SWITCH
PT	POINT
PROP./PR.	PROPOSED
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
r	RATE OF CHANGE OF VERTICAL CURVE
R	RADIUS
RH	RIGHT HAND
R/W OR ROW	RIGHT OF WAY

STA.	STATION
SY	SQUARE YARDS
T	TANGENT
TBD	TO BE DETERMINED
TF	TRACK FEET
T/RAIL	TOP OF RAIL
TO	RAILWAY TURNOUT
TYP	TYPICAL
XS	CROSS SECTION
V	VELOCITY

GENERAL LEGEND

	5-FT CONTOUR
	EXISTING MAINLINE TRACK
	EXISTING BSRM TRACK
	ROW
	OHW
	100-YEAR FLOODPLAIN EXTENT
	EXISTING UNDERGROUND ELECTRIC
	EASEMENT
	EXISTING DRAINAGE PIPE
	EXISTING TREE (APPROX. DIAMETER BREAST HEIGHT)
	LIMITS OF CONSTRUCTION
	EXISTING TREE TO BE REMOVED
	SILT FENCE
	RIPRAP OUTLET PROTECTION
	CONSTRUCTION FENCE
	CHAIN LINK FENCE
	PROPOSED RAIL CROSSING
	PROPOSED DRAINAGE PIPE
	PROPOSED DRAINAGE STRUCTURE
	AIR AND POTENTIAL NOISE MONITORING LOCATION
	EDGE OF PROPOSED ROAD/OPERATIONAL SUPPORT AREA
	EXISTING TRACK ALIGNMENT TO BE REUSED
	PROPOSED NEW TRACK ALIGNMENT
	EXISTING TRACK TO BE REMOVED
	HANDTHROW POINT OF SWITCH
	LH TURNOUT
	RH TURNOUT
	EARTHEN MOUND
	BUMPING POST

SUMMARY OF GENERAL REQUIREMENTS

1. REMOVE TRACK

FEET OF TRACK COMPRISED OF RAILS, TIES, TIE PLATES, SPIKES, ANCHORS, JOINT BARS AND BALLAST TO DIMENSIONS SHOWN IN TYPICAL SECTIONS. STEEL PRODUCTS MAY BE REUSED, TO THE EXTENT PRACTICABLE, FOR WOODS POND SPUR BSRM TRACKS (ONLY). IF THE CONSTRUCTION MANAGER QUALIFIES IT AS ONLY PARTIALLY WORN. TIES AND BALLAST TO BE DISCARDED.

2. INSTALL #115 RE TRACK, 8'-6" TIMBER TIES

INSTALLATION, PER PLANS, COMPRISED OF RAILS, TIES, TIE PLATES, SPIKES, ANCHORS, JOINT BARS AND BALLAST.

3. INSTALL #105 RE TRACK, 8'-6" TIMBER TIES

INSTALLATION, PER PLANS, COMPRISED OF RAILS, TIES, TIE PLATES, SPIKES, ANCHORS, JOINT BARS AND BALLAST. APPROVED PARTIALLY WORN RAILS, TIE PLATES, SPIKES, ANCHORS AND JOINT BARS FROM TRACK REMOVAL SECTIONS MAY BE USED.

4. REMOVE TURNOUTS

EACH TURNOUT FROM POINT OF SWITCH THROUGH THE LAST LONG TIE, COMPRISED OF RAIL, TIES, TIE PLATES, SPIKES, ANCHORS, JOINT BARS, SWITCH POINTS, FROGS, GUARDRAILS, AND BALLAST TO DIMENSIONS SHOWN IN TYPICAL SECTIONS. REMOVE SWITCH MACHINE. NO PARTS MAY BE REUSED. TIES AND BALLAST TO BE DISCARDED.

5. INSTALL #6 TURNOUTS, #115 RE, TIMBER TIES

INSTALLATION PER PLANS. INCLUDES BALLAST, WELDING, SWITCH MACHINES, AND ALL APPURTANCES BETWEEN THE POINT OF SWITCH AND LAST LONG TIES.

6. INSTALL #8 TURNOUTS, #115 RE, TIMBER TIES

INSTALLATION PER PLANS. INCLUDES BALLAST, WELDING, SWITCH MACHINES, AND ALL APPURTANCES BETWEEN THE POINT OF SWITCH AND LAST LONG TIES.

7. SURFACE TRACK

ALL NEW TRACK, REHABILITATED TRACK, AND TURNOUTS TO BE HORIZONTALLY AND VERTICALLY ADJUSTED BASED TRACK DESIGN PLANS. BASED ON TRACK LENGTH, INCLUDES ALL LABOR, EQUIPMENT AND BALLAST MATERIAL IN ORDER TO SATISFY THE TRACK DESIGN. INSTALL GRANULAR BASE, TYPE A (SUB-BALLAST). INSTALLATION, PER CIVIL PLANS, COMPRISED OF WELL-GRADED VIRGIN QUARRIED MATERIAL TO MDOT SPECIFICATIONS FOR ROAD BASE AGGREGATE. COMPACTED DENSITY TO ACHIEVE 95% PROCTOR.

8. INSTALL CONCRETE PAVEMENT

INSTALLATION, PER CIVIL PLANS, COORDINATED WITH REMAINDER OF SITE PAVING, SLAB SPACING, WIDTH, DEPTH, JOINTS, AND OTHER REQUIREMENTS FOR SMOOTH SURFACE.

9. INSTALL ASPHALT PAVEMENT

INSTALLATION, PER PLANS, MDOT STANDARDS.

10. INSTALL GEOTEXTILE FABRIC

INSTALLATION, PER PLANS, COMPRISED OF ENGINEERING APPROVED GEOTEXTILE CLOTH ATOP BASE OF REMOVALS. MEASUREMENT BASED ON SURFACE AREA AND DOES NOT INCLUDE OVERLAPPING FABRIC SEGMENTS.

					NOT FOR CONSTRUCTION	Professional Engineer's Name			ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	ARCADIS Project No. 30318691.3000	RT-004					
						MARK O. GRAVELDING										
						Professional Engineer's No.										
						42983										
						State										
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE	2	09/2026	FINAL DESIGN		EJC	ESB	Date Signed		Project Mgr.						
		1	02/20/2026	CONCEPTUAL DESIGN		EJC	ESB	MA		LP						
		No.	Date	Revisions		By	Ckd	Designed by		Checked by						
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						ESB		Drawn by		WAJ						
TRACK																

TRANSLOAD TRACK 1

		Station	Northing	Easting
Element: Linear				
START (START)		0+00.00	2,979,406.861	184,842.949
HPI (HPI)		1+00.00	2,979,506.733	184,848.007
Tangential Direction:		N02°53'56.63"E		
Tangential Length:		100		
Element: Linear				
HPI (HPI)		1+00.00	2,979,506.733	184,848.007
HPI (HPI)		1+31.27	2,979,537.967	184,849.589
Tangential Direction:		N02°53'56.63"E		
Tangential Length:		31.274		
Element: Linear				
HPI (HPI)		1+31.27	2,979,537.967	184,849.589
PC (PC)		3+95.46	2,979,799.166	184,889.203
Tangential Direction:		N08°37'26.12"E		
Tangential Length:		264.187		
Element: Circular				
PC (PC)		3+95.46	2,979,799.166	184,889.203
HPI (HPI)		5+74.61	2,979,976.291	184,916.066
CC (CC)			2,979,684.532	185,645.049
PT (PT)		7+47.16	2,980,123.040	185,018.826
Radius:		764.489		
Delta:		26.38	Right	
Degree of Curvature (Chord):		7.5		
Length:		351.949		
Chorded Length:		351.698		
Tangent:		179.15		
Chord:		348.85		
Middle Ordinate:		20.164		
External:		20.71		
Back Tangent Direction:		N08°37'26.12"E		
Back Radial Direction:		S81°22'33.88"E		
Chord Direction:		N21°48'45.40"E		
Ahead Radial Direction:		S54°59'55.32"E		
Ahead Tangent Direction:		N35°00'04.68"E		
Element: Linear				
PT (PT)		7+47.16	2,980,123.040	185,018.826
END (END)		17+34.84	2,980,932.091	185,585.357
Tangential Direction:		N35°00'04.68"E		
Tangential Length:		987.686		

TRANSLOAD TRACK 2

		Station	Northing	Easting
Element: Linear				
START (START)		0+00.00	2,980,131.231	185,024.562
HPI (HPI)		0+30.00	2,980,155.805	185,041.770
Tangential Direction:		N35°00'04.68"E		
Tangential Length:		30		
Element: Linear				
HPI (HPI)		0+30.00	2,980,155.805	185,041.770
PC (PC)		0+94.66	2,980,203.738	185,085.162
Tangential Direction:		N42°09'14.40"E		
Tangential Length:		64.656		
Element: Circular				
PC (PC)		0+94.66	2,980,203.738	185,085.162
HPI (HPI)		1+42.44	2,980,239.160	185,117.229
CC (CC)			2,980,716.806	184,518.413
PT (PT)		1+90.03	2,980,278.299	185,144.636
Radius:		764.489		
Delta:		7.15	Left	
Degree of Curvature (Chord):		7.5		
Length:		95.437		
Chorded Length:		95.375		
Tangent:		47.781		
Chord:		95.375		
Middle Ordinate:		1.489		
External:		1.492		
Back Tangent Direction:		N42°09'14.40"E		
Back Radial Direction:		S47°50'45.60"E		
Chord Direction:		N38°34'39.54"E		
Ahead Radial Direction:		S54°59'55.32"E		
Ahead Tangent Direction:		N35°00'04.68"E		
Element: Linear				
PT (PT)		1+90.03	2,980,278.299	185,144.636
PC (PC)		6+40.03	2,980,646.911	185,402.754
Tangential Direction:		N35°00'04.68"E		
Tangential Length:		450		
Element: Circular				
PC (PC)		6+40.03	2,980,646.911	185,402.754
HPI (HPI)		6+87.81	2,980,686.050	185,430.160
CC (CC)			2,981,085.418	184,776.531
PT (PT)		7+35.41	2,980,728.297	185,452.481
Radius:		764.489		
Delta:		7.15	Left	
Degree of Curvature (Chord):		7.5		
Length:		95.437		
Chorded Length:		95.375		
Tangent:		47.781		
Chord:		95.375		
Middle Ordinate:		1.489		
External:		1.492		
Back Tangent Direction:		N35°00'04.68"E		
Back Radial Direction:		S54°59'55.32"E		
Chord Direction:		N31°25'29.82"E		
Ahead Radial Direction:		S62°09'05.04"E		
Ahead Tangent Direction:		N27°50'54.96"E		
Element: Linear				
PT (PT)		7+35.41	2,980,728.297	185,452.481
HPI (HPI)		8+00.06	2,980,785.465	185,482.684
Tangential Direction:		N27°50'54.96"E		
Tangential Length:		64.656		
Element: Linear				
HPI (HPI)		8+00.06	2,980,785.465	185,482.684
END (END)		8+30.06	2,980,810.040	185,499.892
Tangential Direction:		N35°00'04.68"E		
Tangential Length:		30		

TURNOUT TABLE

Turnout Number	Through Track	To Track	Size	Hand	PS			PI		
					Northing	Easting	Station	Northing	Easting	Station
1	Ex. Mainline	Transload Track 1	10	RH	2,979,506.715	184,848.006	0+99.98	2,979,537.967	184,849.589	1+31.27
2	Transload Track 1	Transload Track 2	8	RH	2,980,131.231	185,024.562	7+57.16	2,980,155.805	185,041.770	7+87.16
3	Transload Track 1	Transload Track 2	8	LH	2,980,810.040	185,499.892	15+85.84	2,980,785.465	185,482.684	15+55.58

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USE TO VERIFY FIGURE REPRODUCTION SCALE

2

09/2026

FINAL DESIGN

1

02/20/2026

CONCEPTUAL DESIGN

No.

Date

Revisions

Professional Engineer's Name

MARK O. GRAVELDING

Professional Engineer's No.

42983

State

MA

Designed by

ESB

Date Signed

Drawn by

EJC

Project Mgr.

LP

Checked by

WAJ

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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION

UTILITY DRIVE - TRACK ALIGNMENT DATA

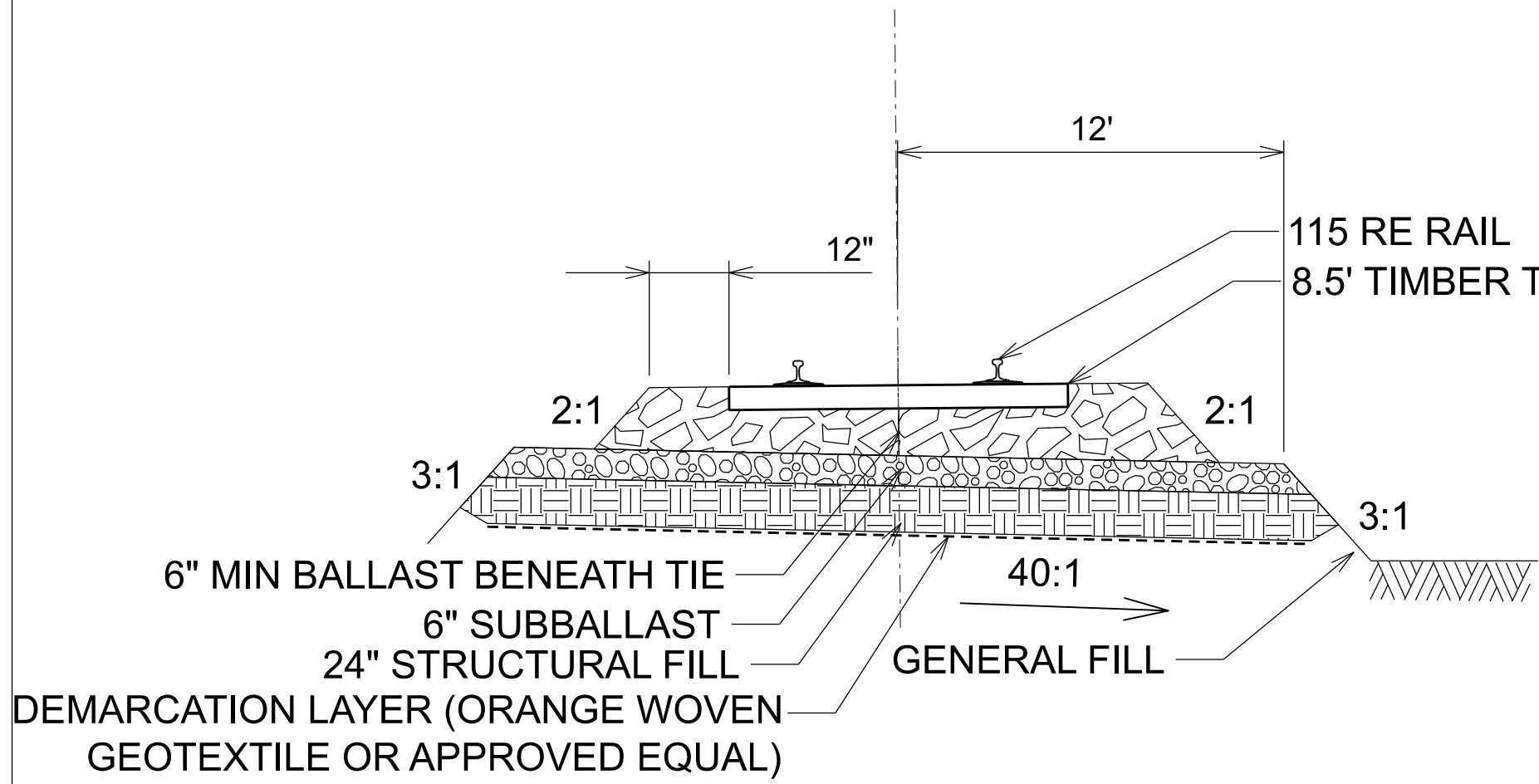
TRACK

ARCADIS Project No.
30318691.3000

Date
SEPTEMBER 2026

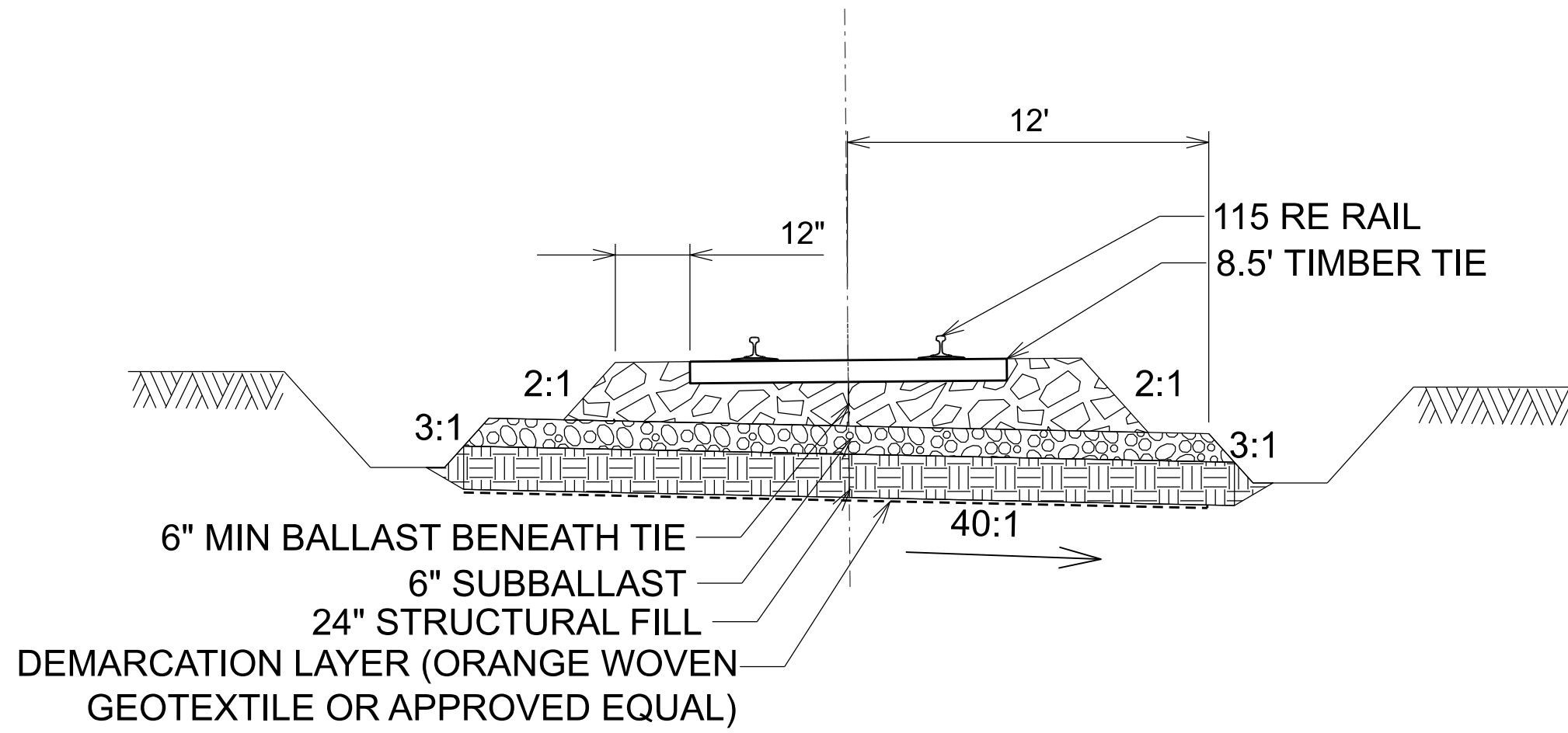
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ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

RT-101



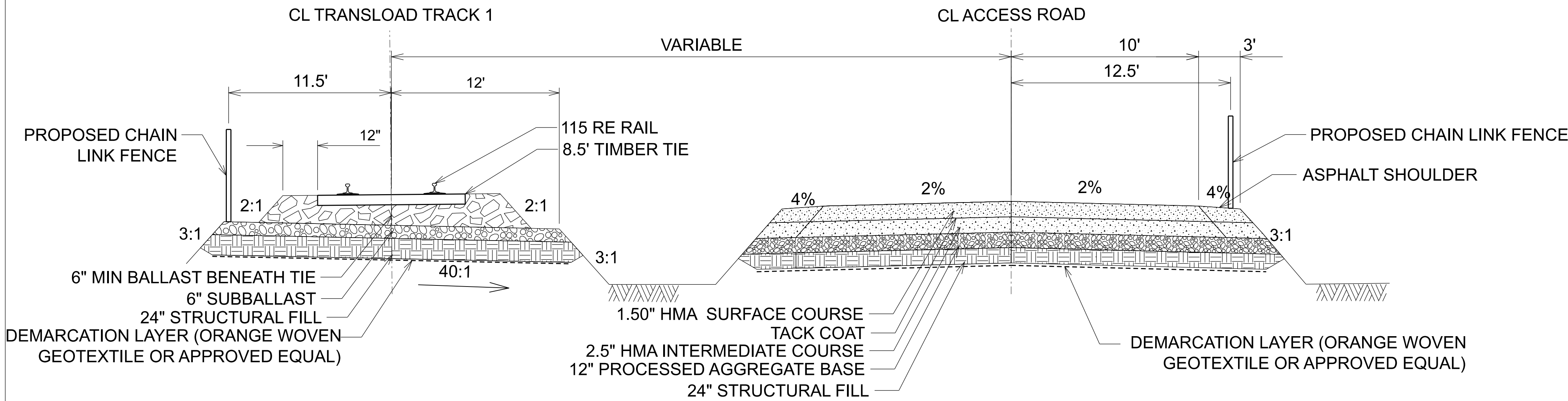
SINGLE TRACK TYPICAL SECTION (FILL)
LOOKING NORTH, N.T.S.

1a



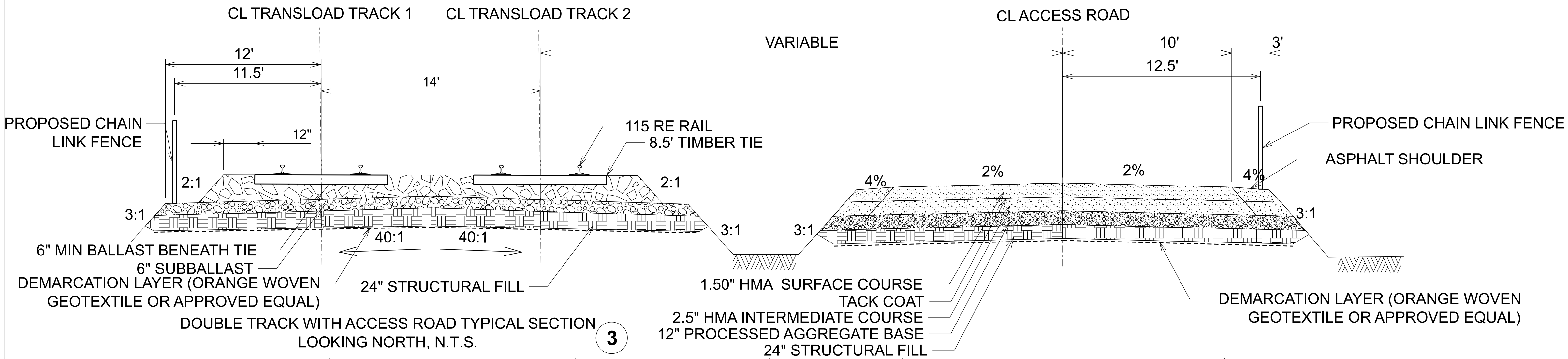
SINGLE TRACK TYPICAL SECTION (CUT)
LOOKING NORTH, N.T.S.

1b



SINGLE TRACK WITH ACCESS ROAD TYPICAL SECTION
LOOKING NORTH, N.T.S.

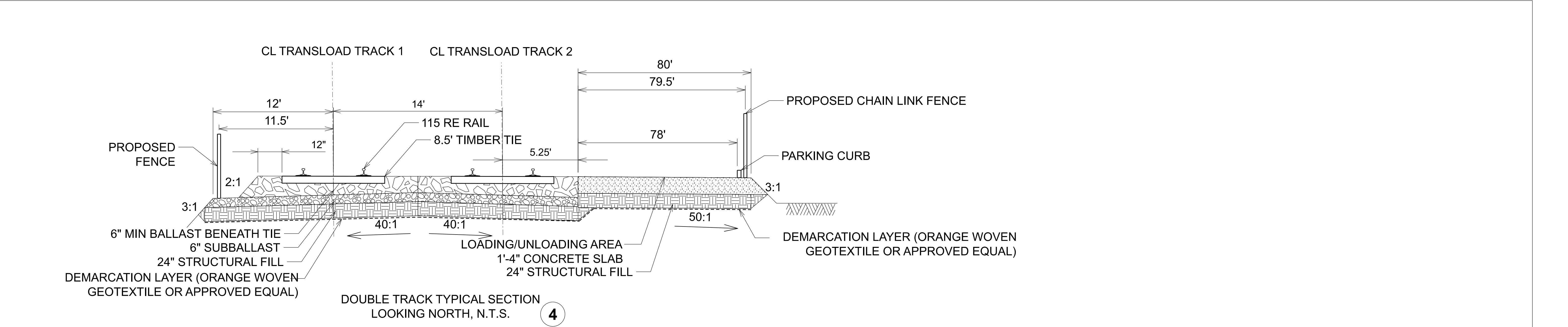
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DOUBLE TRACK WITH ACCESS ROAD TYPICAL SECTION
LOOKING NORTH, N.T.S.

3

TRANSLOAD TRACKS COMPONENT DEPTHS	
COMPONENT	COMPONENT DEPTH (FT)
SUBBALLAST	0.5
BALLAST	0.5
SLOPE BALLAST	0.11
TIMBER TIE	0.58
12" PLATE 5.5" RAIL BASE	0.06
115 RE RAIL	0.55
TOTAL	2.3



TRANSLOAD TRACKS COMPONENT DEPTHS	
COMPONENT	COMPONENT DEPTH (FT)
SUBBALLAST	0.5
BALLAST	0.5
SLOPE BALLAST	0.11
TIMBER TIE	0.58
12" PLATE 5.5" RAIL BASE	0.06
115 RE RAIL	0.55
TOTAL	2.3



LEGEND

PRIORITY HABITAT AREA

CULTURAL RESOURCE INVESTIGATION AREA

STATE
COUNTY
TOWN
RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

MASSACHUSETTS
BERKSHIRE
LENOX
HOUSATONIC
BERKSHIRE LINE
526179L

THIS BAR
REPRESENTS ONE
INCH ON THE
ORIGINAL DRAWING:

USE TO VERIFY
FIGURE
REPRODUCTION
SCALE

2	09/2026	FINAL DESIGN	EJC	ESB
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No.	Date	Revisions	By	Ckd
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Professional Engineer's Name	MARK O. GRAVELDING			
Professional Engineer's No.	42983			
State	Date Signed	Project Mgr.		
MA		LP		
Designed by	Drawn by	Checked by		
ESB	EJC	WAJ		

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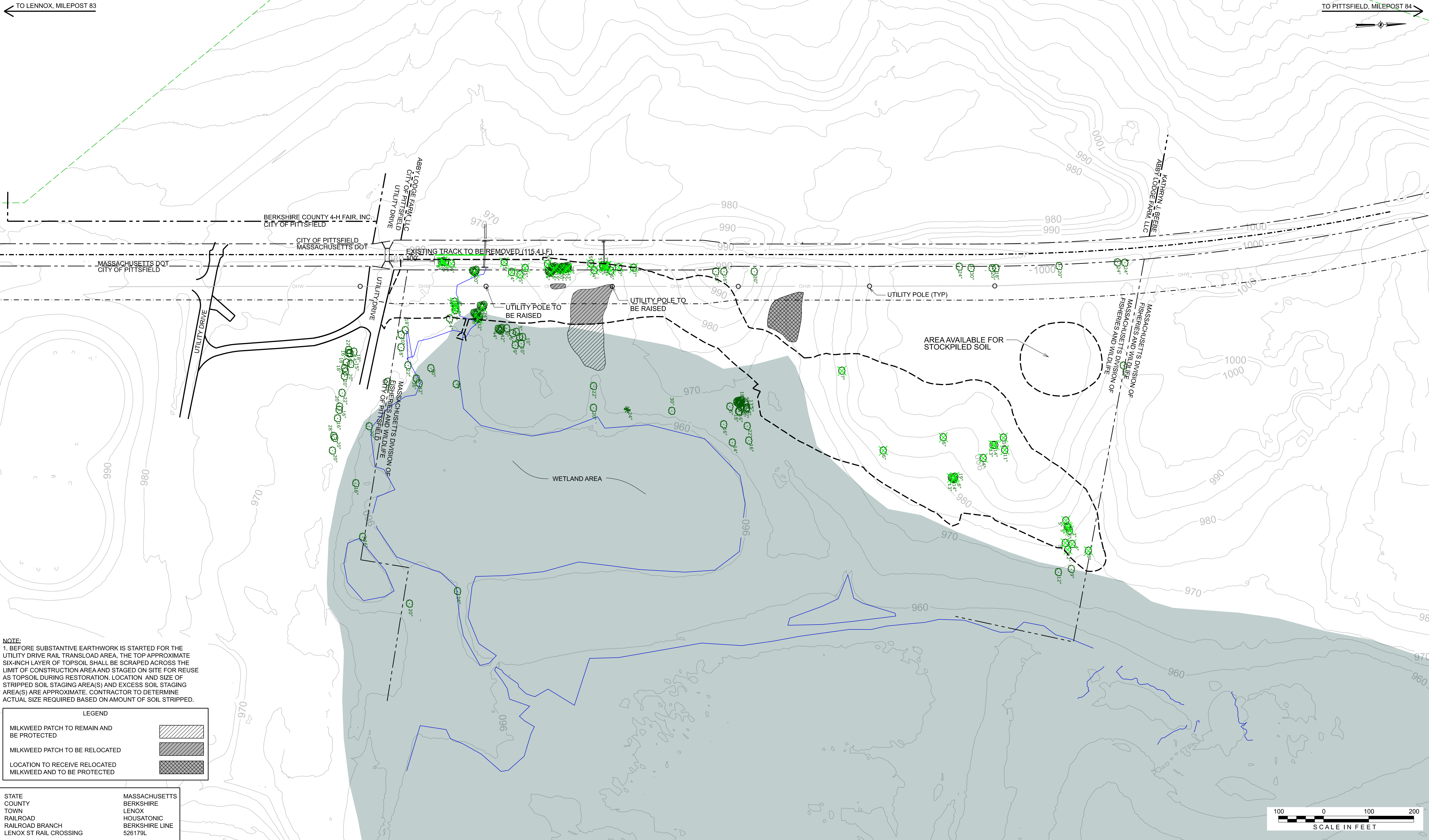
GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION
UTILITY DRIVE - EXISTING PLAN

TRACK



ARCADIS Project No.
30318691.3000
Date
SEPTEMBER 2026
ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

RT-104



NOTE:
1. BEFORE SUBSTANTIVE EARTHWORK IS STARTED FOR THE UTILITY DRIVE RAIL TRANSLOAD AREA, THE TOP APPROXIMATE SIX-INCH LAYER OF TOPSOIL SHALL BE SCRAPPED ACROSS THE LIMIT OF CONSTRUCTION AREA AND STAGED ON SITE FOR REUSE AS TOPSOIL DURING RESTORATION. LOCATION AND SIZE OF STRIPPED SOIL STAGING AREA(S) AND EXCESS SOIL STAGING AREA(S) ARE APPROXIMATE. CONTRACTOR TO DETERMINE ACTUAL SIZE REQUIRED BASED ON AMOUNT OF SOIL STRIPPED.

LEGEND

MILKWEED PATCH TO REMAIN AND BE PROTECTED

MILKWEED PATCH TO BE RELOCATED

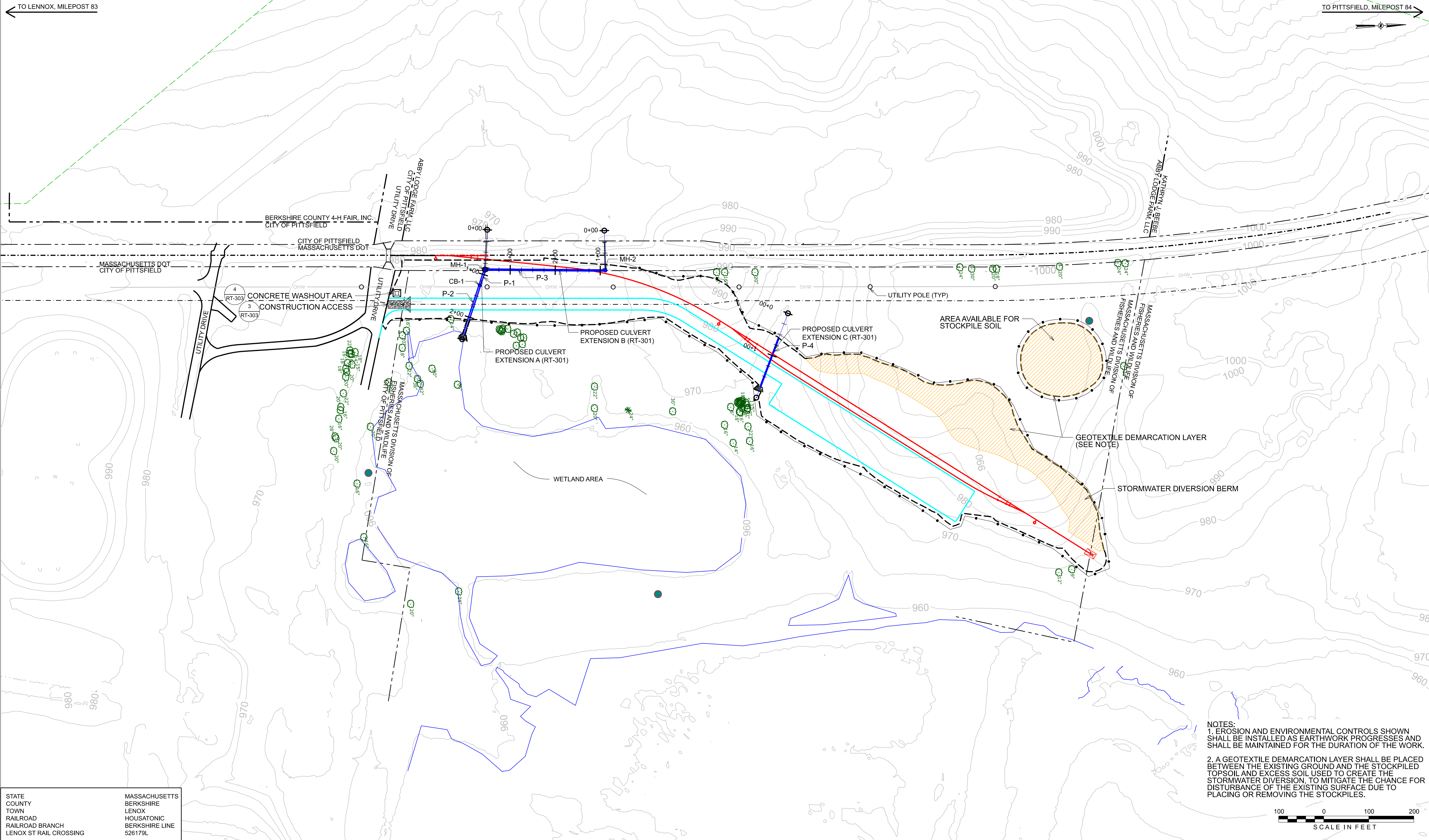
LOCATION TO RECEIVE RELOCATED MILKWEED AND TO BE PROTECTED

STATE
COUNTY
TOWN
RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

MASSACHUSETTS
BERKSHIRE
LENOX
HOUSATONIC
BERKSHIRE LINE
526179L



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		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB							Date SEPTEMBER 2026	
		No.	Date	Revisions	By	Ckd							ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	
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NOTES:
1. EROSION AND ENVIRONMENTAL CONTROLS SHOWN SHALL BE INSTALLED AS EARTHWORK PROGRESSES AND SHALL BE MAINTAINED FOR THE DURATION OF THE WORK.
2. A GEOTEXTILE DEMARCATION LAYER SHALL BE PLACED BETWEEN THE EXISTING GROUND AND THE STOCKPILED TOPSOIL AND EXCESS SOIL USED TO CREATE THE STORMWATER DIVERSION. TO MITIGATE THE CHANCE FOR DISTURBANCE OF THE EXISTING SURFACE DUE TO PLACING OR REMOVING THE STOCKPILES.



STATE
COUNTY
TOWN
RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

MASSACHUSETTS
BERKSHIRE
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BERKSHIRE LINE
526179L

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Professional Engineer's Name
MARK O. GRAVELDING
Professional Engineer's No.
42983
State
MA
Date Signed
Designed by
EJC
Drawn by
EJC
Project Mgr.
LP
Checked by
WAJ

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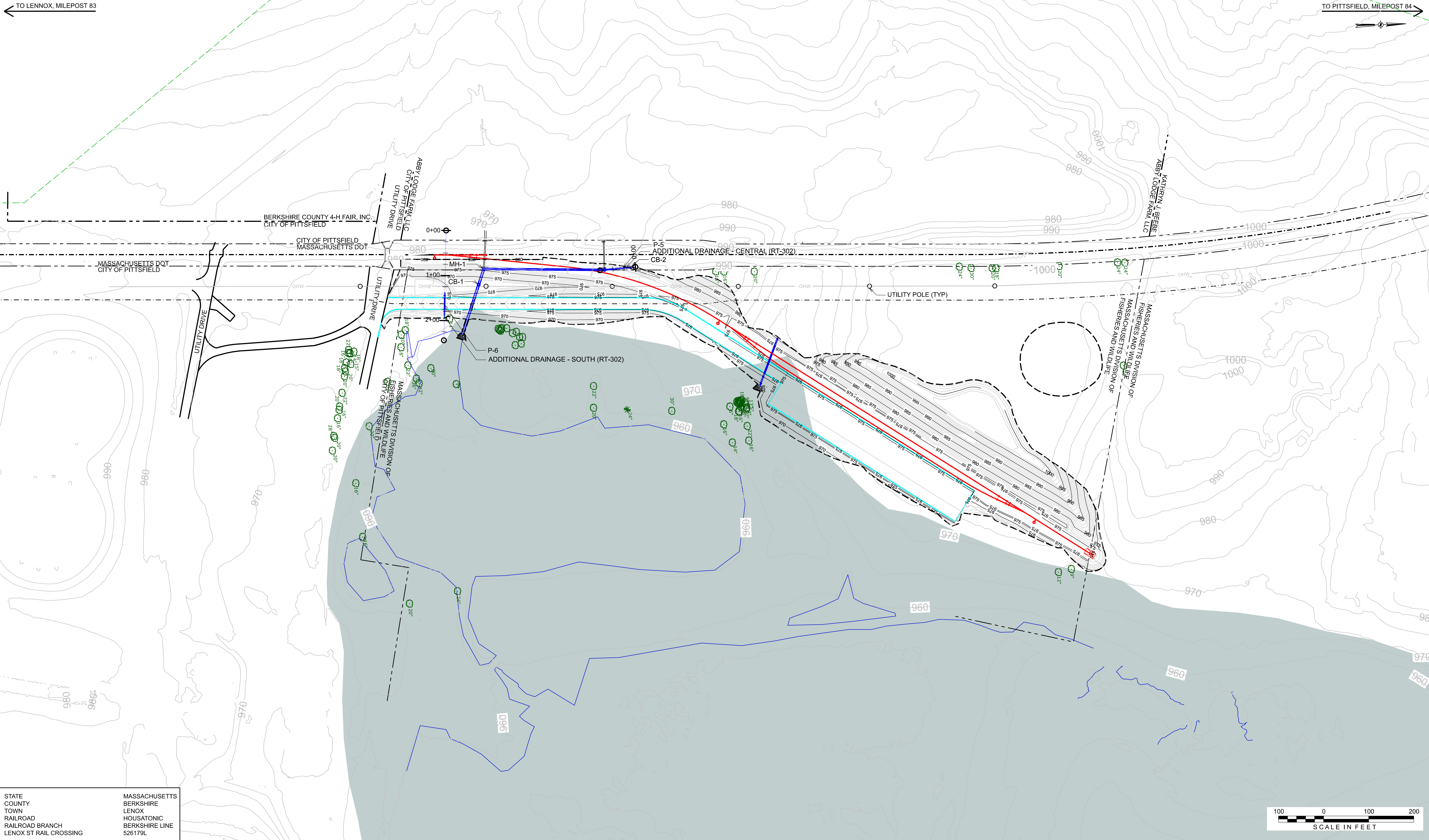
ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION
**UTILITY DRIVE - EROSION AND ENVIRONMENTAL
CONTROL PLAN - SHEET 2 OF 2**

TRACK

ARCADIS Project No.
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RT-107



STATE
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TOWN
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RAILROAD BRANCH
LENOX ST RAIL CROSSING

MASSACHUSETTS
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LENOX
HOUSATONIC
BERKSHIRE LINE
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Professional Engineer's No.
42983
State
MA
Date Signed
Designed by
ESB
Drawn by
EJC
Project Mgr.
LP
Checked by
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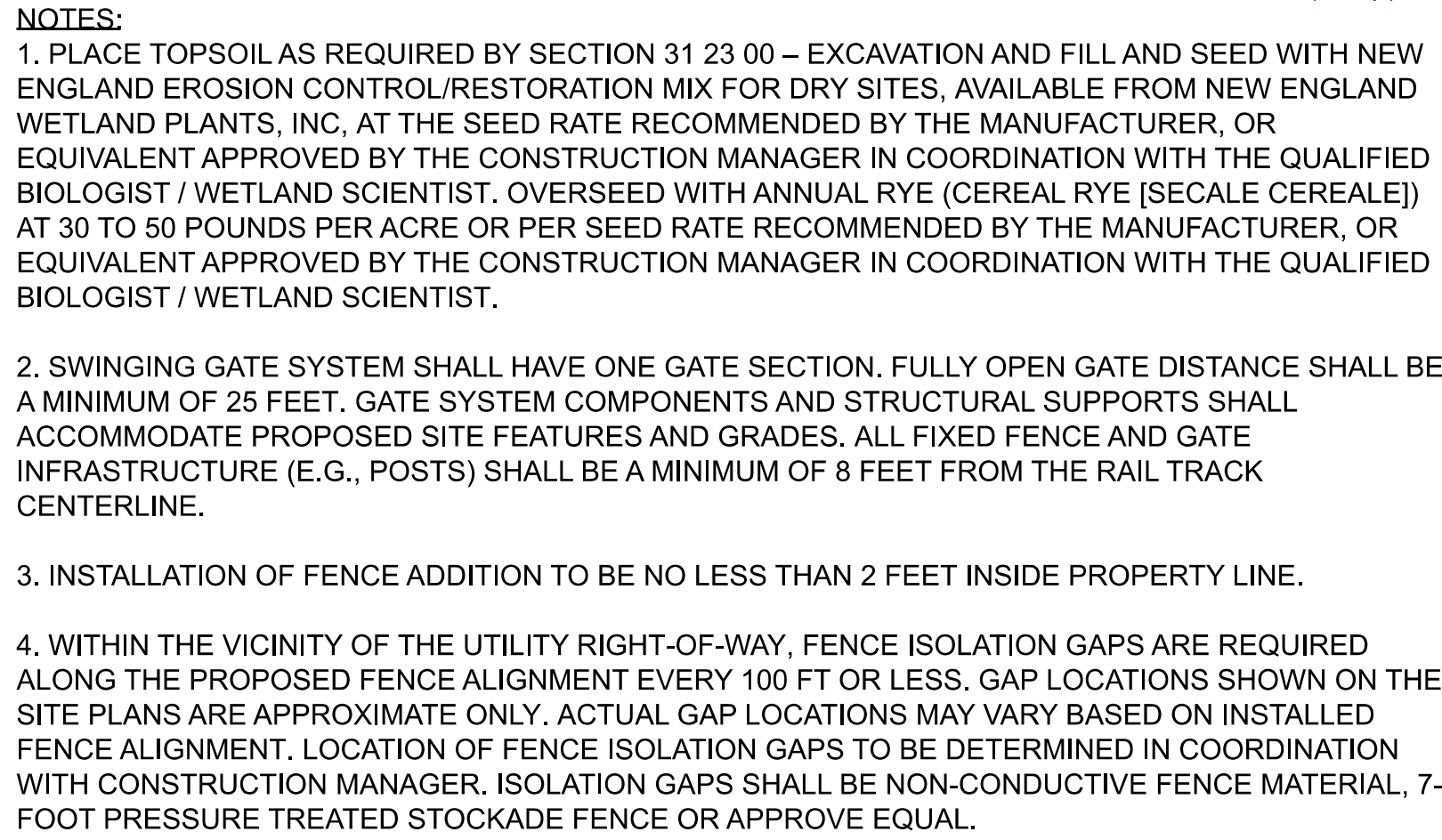
GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION
UTILITY DRIVE - GRADING AND DRAINAGE PLAN

TRACK



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RT-108



						Professional Engineer's Name MARK O. GRAVELDING	
						Professional Engineer's No. 42983	
2	09/2026	FINAL DESIGN		EJC	ESB	State	Date Signed
1	02/20/2026	CONCEPTUAL DESIGN		EJC	ESB	MA	Project Mgr. LP
No.	Date	Revisions		By	Ckd	Designed by	Checked by
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ARCADIS U.S., INC.

UTILITY DRIVE - SURFACE PLAN

TRACK

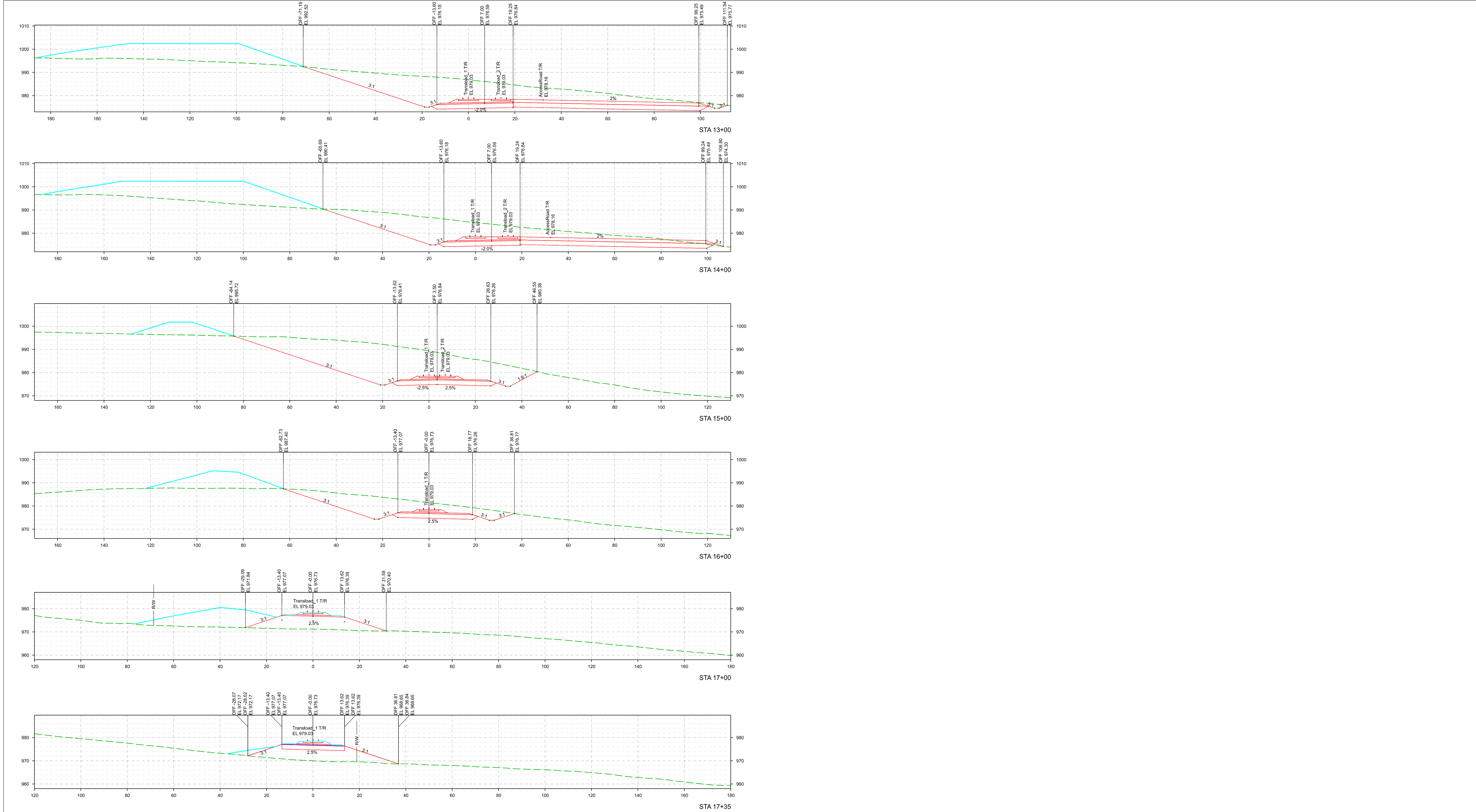


ARCADIS Project No.
30318691.3000

Date
SEPTEMBER 2026

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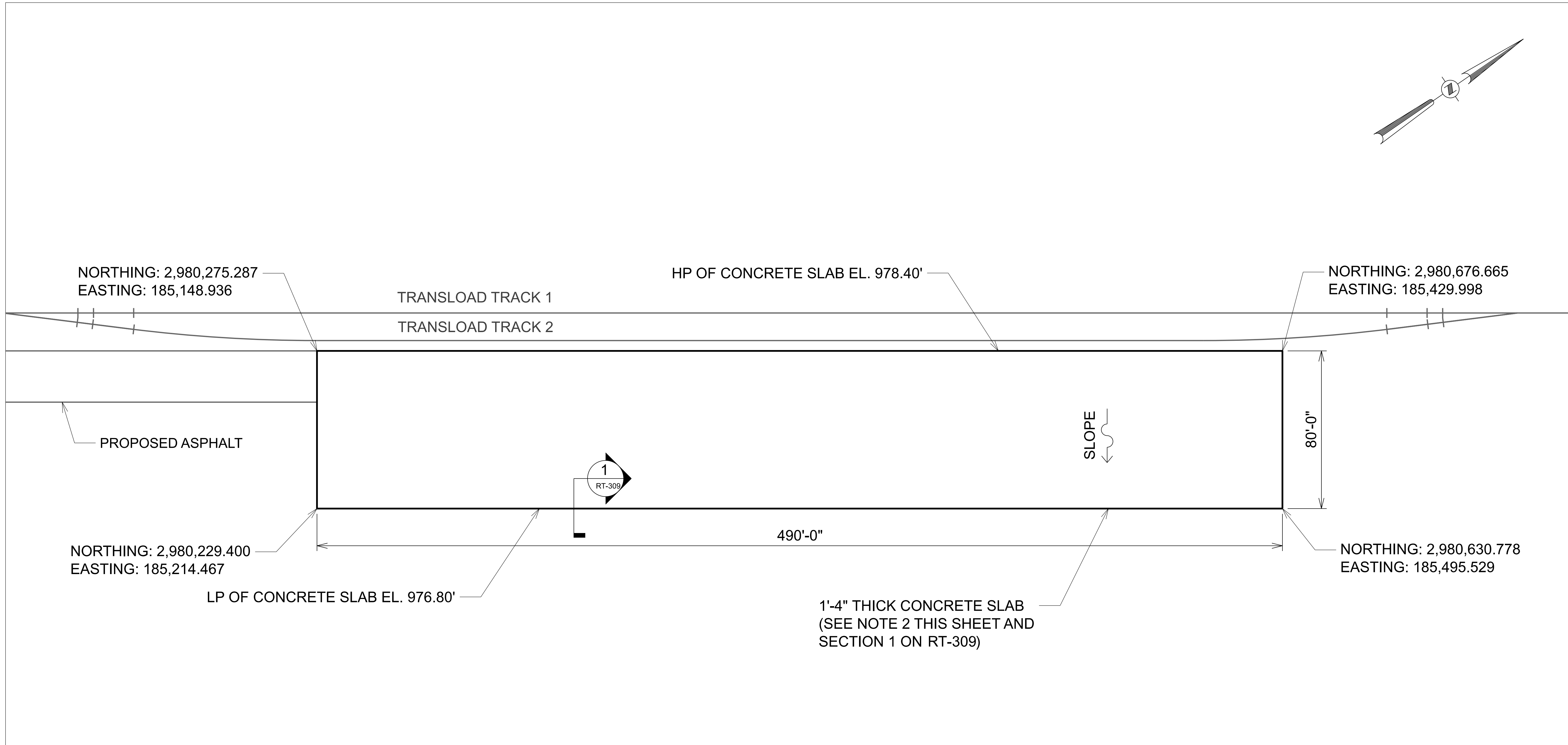
RT-109



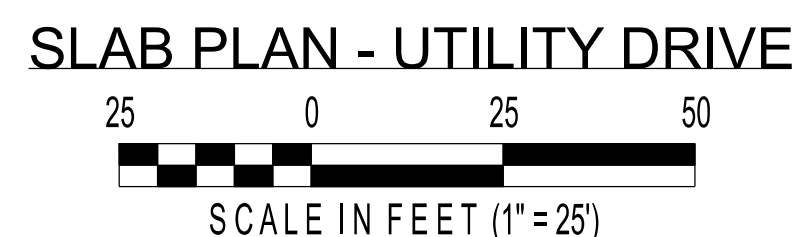
NOTE:
1. CROSS SECTION STATIONING RELATIVE TO PLAN VIEW STATIONING
PROVIDED ON RT-110



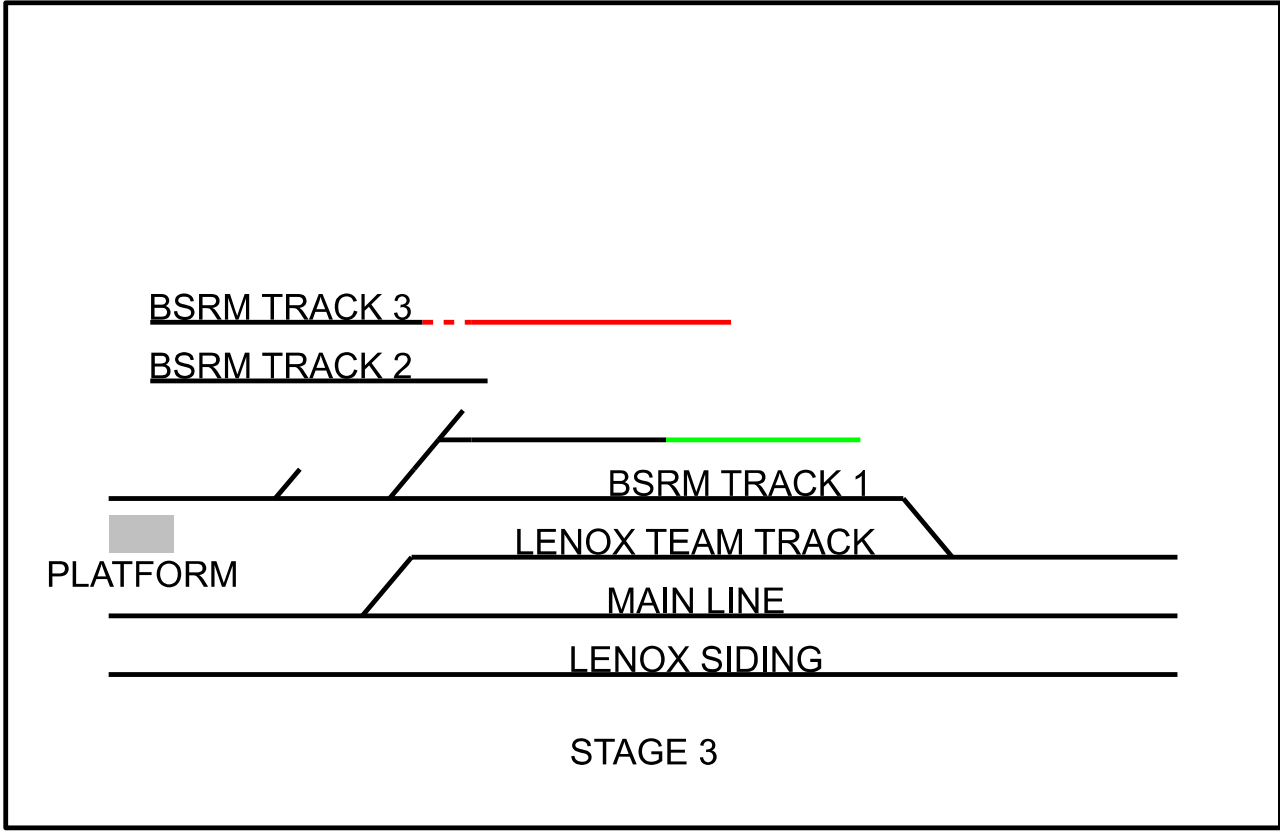
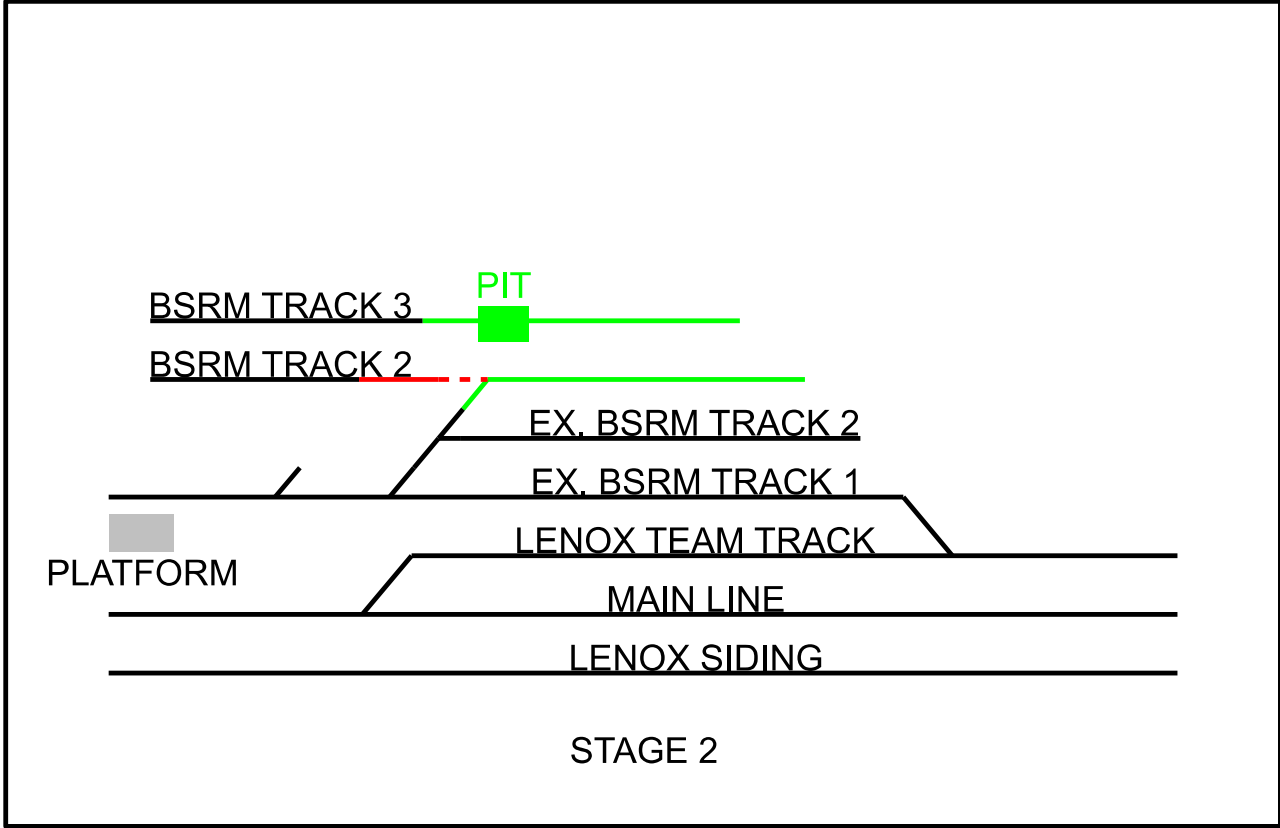
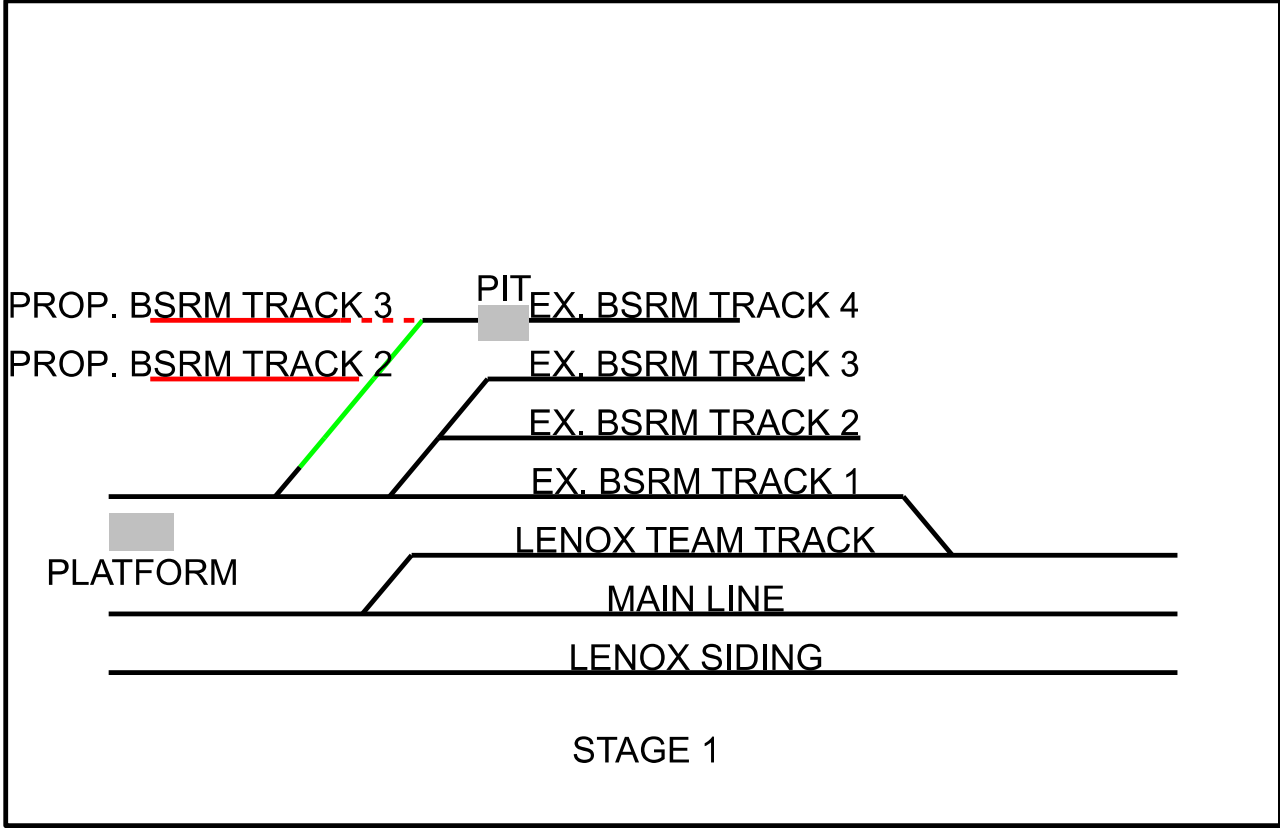
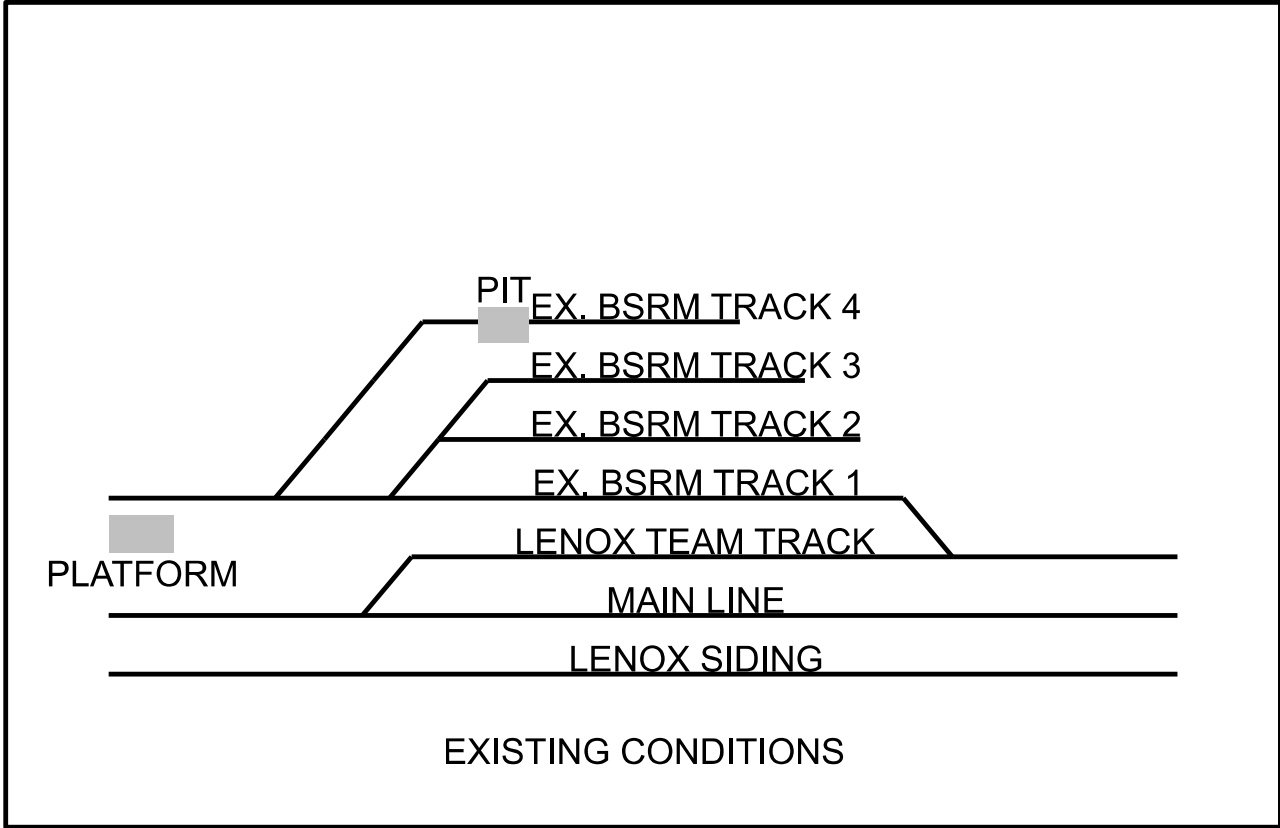
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					Professional Engineer's No.								Date SEPTEMBER 2026		
					42983										
					State MA								Project Mgr. LP		
					Designed by ESB								Checked by WAJ		
				Date Signed											
				By		Ckd									



1. REFER TO RT-308 FOR STRUCTURAL NOTES RELATED TO CONSTRUCTION OF THE CONCRETE SLAB.
2. PROVIDE CONCRETE CONSTRUCTION JOINTS @ 40'-0" C/C MAX SPACING (SEE CONSTRUCTION JOINT DETAIL ON RT-309).
3. PROVIDE EXPANSION JOINTS @ 100' C/C MAX SPACING (SEE EXPANSION JOINT DETAIL ON RT-309).
4. PROPOSED GRADE EL. VARIES.



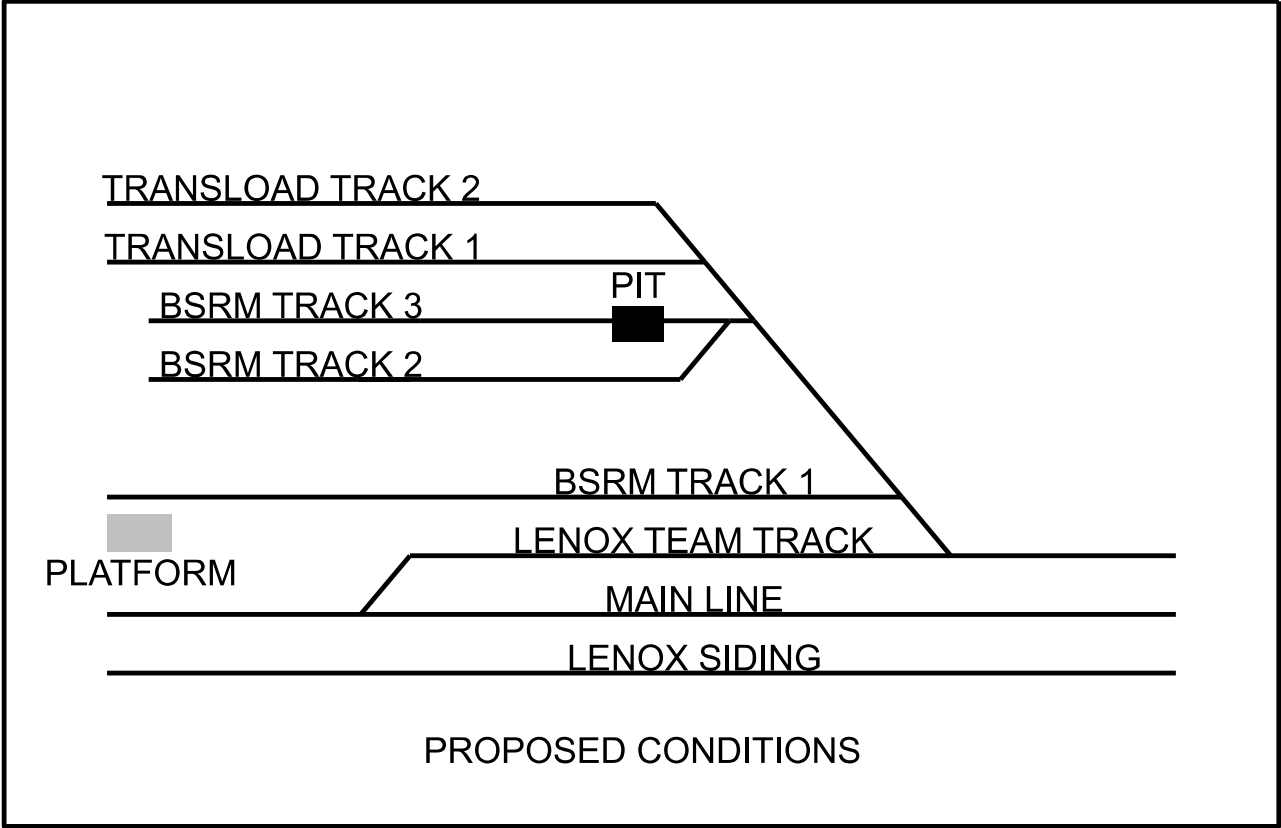
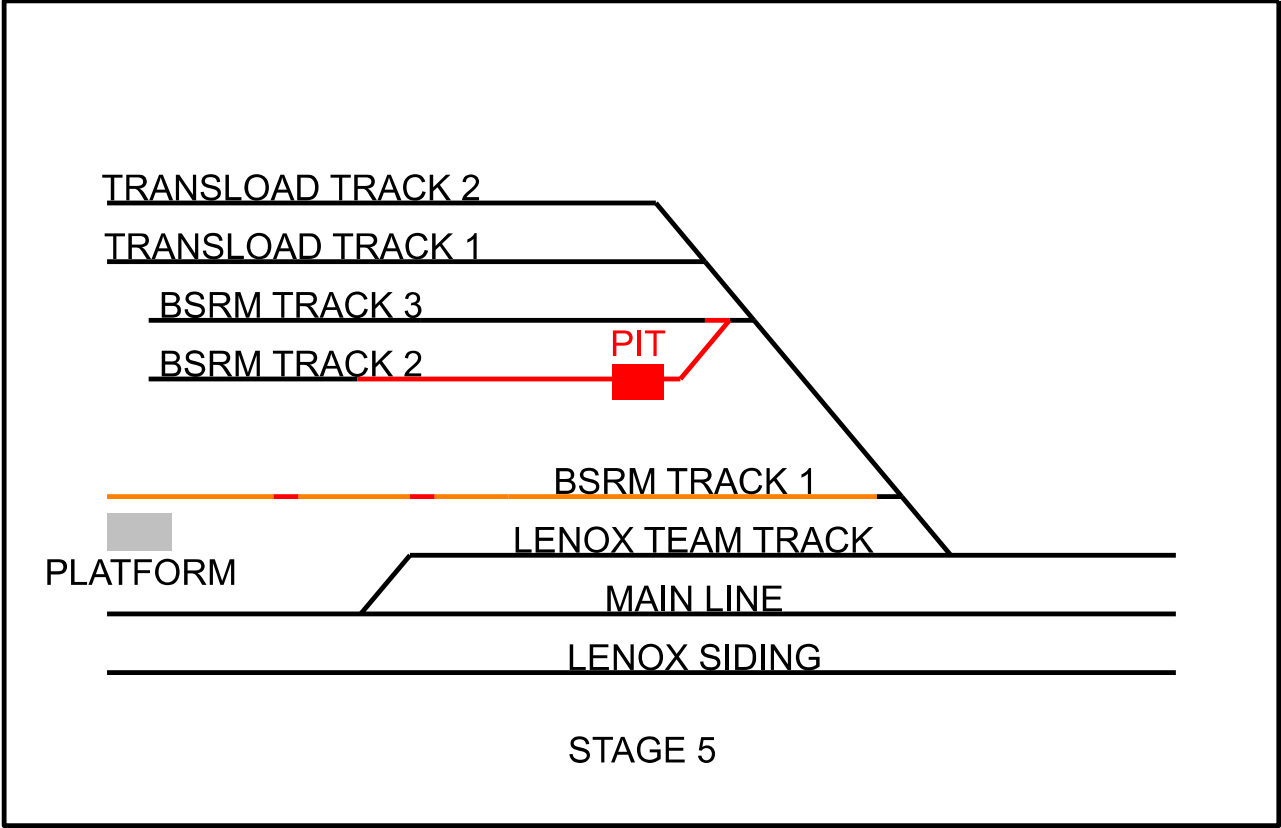
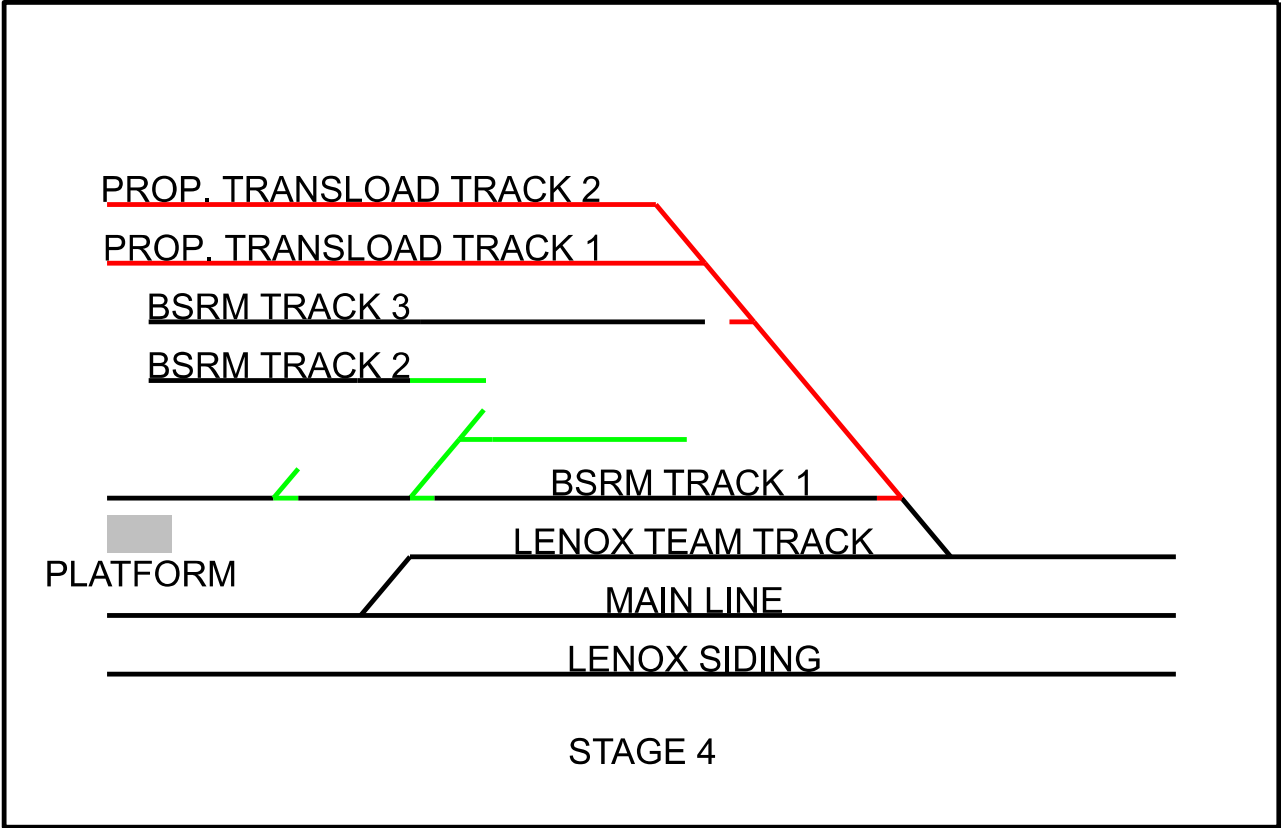
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								Professional Engineer's No. 42983						Date SEPTEMBER 2026	
		2	09/2026	FINAL DESIGN	EJC	ESB	State MA	Date Signed						Project Mgr. LP	
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB									
		No.	Date	Revisions	By	Ckd	Designed by ESB	Drawn by EJC						Checked by WAJ	
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Stage 1	Substage	Work description
	a	Grade out south end BSRM Tracks 2 and 3
	b	South End BSRM Tracks 2 and 3 constructed
	c	Cut and throw Pit Track to BSRM Track 3
	d	Remove south end of Pit Track
	>>	Move BSRM Railcars to the south on BSRM 3
	=	

Stage 2	Substage	Work description
	a	Grade out mid section BSRM Track 2
	b	Mid Section BSRM Track 2 constructed
	c	Cut and throw inside storage Track to BSRM 2
	d	Remove north ends of Pit Track and Storage Track
	e	Remove Storage Track turnout
	=	

Stage 3	Substage	Work description
	a	Build track between remaining storage track and existing tail track turnout
	>>	Move BSRM railcars off remaining storage track
	b	Remove remaining storage track
	c	Grade out for ladder track on north end
	d	Cut and throw BSRM 3 onto final alignment. Construct remainder BSRM 3.
	=	



Stage 4	Substage	Work description
	a	Construct and install BSRM 3 Ladder turnout
	b	Grade out Transload Tracks 1 and 2 (plus transload pads)
	c	Remove north end of remaining BSRM tracks up to proposed cut/throw
	d	Construct and Install two north ladder turnouts
	e	Construct Transload Tracks
	>>	Move BSRM railcars off BSRM 1 and 2 onto Transload Tracks
	=	

Stage 5	Substage	Work description
	1	Build new Inspection Pit
	a	Rehab and reprofile BSRM Track 1, removing two turnouts and installing new track panels
	b	Install new turnout to BSRM Track 2
	c	Construct remaining BSRM Track 2
	>>	Move BSRM railcars off Transload 1 and 2 back onto BSRM Tracks 1 and 2
	=	

- NOTES:**
1. STAGING ASSUMES SIX BSRM RAILCARS CURRENTLY STORED OFFSITE WILL REMAIN OFFSITE FOR THE DURATION OF CONSTRUCTION.
 2. MOVEMENT OF BSRM RAILCARS TO BE PERFORMED BY BSRM.
 3. CONTRACTOR MAY PROPOSE AN ALTERNATE STAGING APPROACH, FOR REVIEW AND APPROVAL BY THE CONSTRUCTION MANAGER. STAGING MUST ACCOUNT FOR ROLLING STORAGE OF ALL BSRM EQUIPMENT STORED ON EXISTING TRACKS.

TRANSLOAD TRACK 1

		Station	Northing	Easting
Element: Linear				
START	(START)	0+00.00	2,958,412.01	184,977.98
HPI	(HPI)	0+30.00	2,958,385.58	184,963.80
Tangential Direction:		S28°13'03.21"W		
Tangential Length:		30		
Element: Linear				
HPI	(HPI)	0+30.00	2,958,385.58	184,963.80
END	(END)	7+39.18	2,957,723.78	184,708.90
Tangential Direction:		S21°03'53.49"W		
Tangential Length:		709.185		

TRANSLOAD TRACK 2

		Station	Northing	Easting
Element: Linear				
START	START)	0+00.00	2,958,732.90	185,095.14
HPI	(HPI)	0+30.00	2,958,703.06	185,092.05
Tangential Direction:		S05°55'36.49"W		
Tangential Length:		30		
Element: Linear				
HPI	(HPI)	0+30.00	2,958,703.06	185,092.05
HPI	(HPI)	1+29.85	2,958,606.14	185,068.04
Tangential Direction:		S13°54'43.46"W		
Tangential Length:		99.854		
Element: Linear				
HPI	(HPI)	1+29.85	2,958,606.14	185,068.04
HPI	(HPI)	2+29.71	2,958,512.96	185,032.15
Tangential Direction:		S21°03'53.49"W		
Tangential Length:		99.854		
Element: Linear				
HPI	(HPI)	2+29.71	2,958,512.96	185,032.15
PC	(PC)	4+38.92	2,958,328.61	184,933.23
Tangential Direction:		S28°13'03.52"W		
Tangential Length:		209.214		
Element: Circular				
PC	(PC)	4+38.92	2,958,328.61	184,933.23
HPI	(HPI)	4+86.70	2,958,286.50	184,910.63
CC	(CC)		2,957,967.14	185,606.86
PT	(PT)	5+34.30	2,958,241.91	184,893.46
Radius:		764.489		
Delta:		7.15	Left	
Degree of Curvature (Chord):		7.5		
Length:		95.439		
Chord Length:		95.377		
Tangent:		47.781		
Chord:		95.377		
Middle Ordinate:		1.489		
External:		1.492		
Back Tangent Direction:		S28°13'03.52"W		
Back Radial Direction:		N61°46'56.48"W		
Chord Direction:		S24°38'28.50"W		
Ahead Radial Direction:		N68°56'06.51"W		
Ahead Tangent Direction:		S21°03'53.49"W		
Element: Linear				
PT	(PT)	5+34.30	2,958,241.91	184,893.46
END	(END)	10+84.14	2,957,728.82	184,695.83
Tangential Direction:		S21°03'53.49"W		
Tangential Length:		549.843		

BSRM TRACK 1

		Station	Northing	Easting
Element: Linear				
START	(START)	0+00.00	2,958,635.26	185,075.25
PC	(PC)	2+15.43	2,958,426.15	185,023.46
Tangential Direction:		S13°54'43.46"W		
Tangential Length:		215.427		
Element: Circular				
PC	(PC)	2+15.43	2,958,426.15	185,023.46
HPI	(HPI)	3+01.08	2,958,343.01	185,002.86
CC	(CC)		2,958,770.61	183,632.80
PT	(PT)	3+86.50	2,958,262.91	184,972.51
Radius:		1432.685		
Delta:		6.84	Right	
Degree of Curvature (Chord):		4		
Length:		171.107		
Chord Length:		171.072		
Tangent:		85.655		
Chord:		171.005		
Middle Ordinate:		2.554		
External:		2.558		
Back Tangent Direction:		S13°54'43.46"W		
Back Radial Direction:		N76°05'16.54"W		
Chord Direction:		S17°20'00.63"W		
Ahead Radial Direction:		N69°14'42.20"W		
Ahead Tangent Direction:		S20°45'17.80"W		
Element: Linear				
PT	(PT)	3+86.50	2,958,262.91	184,972.51
END	(END)	9+81.87	2,957,706.18	184,761.53
Tangential Direction:		S20°45'17.80"W		
Tangential Length:		595.367		

BSRM TRACK 2

		Station	Northing	Easting
Element: Linear				
START	(START)	0+00.00	2,958,253.56	184,968.96
HPI	(HPI)	0+19.00	2,958,235.79	184,962.23
Tangential Direction:		S20°45'17.80"W		
Tangential Length:		19		
Element: Linear				
HPI	(HPI)	0+19.00	2,958,235.79	184,962.23
PC	(PC)	0+84.57	2,958,179.17	184,929.17
Tangential Direction:		S30°16'55.80"W		
Tangential Length:		65.57		
Element: Circular				
PC	(PC)	0+84.57	2,958,179.17	184,929.17
HPI	(HPI)	1+46.20	2,958,125.95	184,898.09
CC	(CC)		2,957,793.67	185,589.34
PT	(PT)	2+07.47	2,958,068.45	184,875.94
Radius:		764.489		
Delta:		9.22	Left	
Degree of Curvature (Chord):		7.5		
Length:		122.985		
Chord Length:		122.897		
Tangent:		61.626		
Chord:		122.853		
Middle Ordinate:		2.472		
External:		2.48		
Back Tangent Direction:		S30°16'55.80"W		
Back Radial Direction:		N59°43'04.20"W		
Chord Direction:		S25°40'24.64"W		
Ahead Radial Direction:		N68°56'06.51"W		
Ahead Tangent Direction:		S21°03'53.49"W		
Element: Linear				
PT	(PT)	2+07.47	2,958,068.45	184,875.94
END	(END)	5+40.87	2,957,757.32	184,756.11
Tangential Direction:		S21°03'53.49"W		
Tangential Length:		333.405		

BSRM TRACK 3

		Station	Northing	Easting
Element: Linear				
START	(START)	0+00.00	2,958,540.95	185,042.93
END	(END)	8+34.36	2,957,762.35	184,743.04
Tangential Direction:		S21°03'53.49"W		
Tangential Length:		834.355		

TURNOUT TABLE

Turnout Number	Through Track	To Track	Size	Hand	PS			PI		
					Northing	Easting	Station	Northing	Easting	Station
1	Lenox Team Track	Transload Track 2	8	RH	2,958,732.902	185,095.143	0+00.00	2,958,703.062	185,092.045	0+30.00
2	BSRM Track 1	Transload Track 2	8	RH	2,958,606.137	185,075.250	0+00.00	2,958,606.137	185,068.037	0+30.00
3	BSRM Track 3	Transload Track 2	8	RH	2,958,540.952	185,042.930	0+00.00	2,958,512.957	185,032.147	0+30.00
4	Transload Track 2	Transload Track 1	8	LH	2,958,412.011	184,977.981	3+44.27	2,958,385.576	184,963.796	3+74.27
5	BSRM Track 3	BSRM Track 2	6	LH	2,958,441.259	185,004.532	1+06.83	2,958,423.528	184,997.703	1+25.83

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USE TO VERIFY FIGURE REPRODUCTION SCALE

2	09/2026	FINAL DESIGN	EJC	ESB
1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB
No.	Date	Revisions	By	Ckd

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Professional Engineer's Name
MARK O. GRAVELDING

Professional Engineer's No.
42983

State	Date Signed	Project Mgr.
MA		LP
Designed by	Drawn by	Checked by
ESB	EJC	WAJ

NOT FOR CONSTRUCTION

ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION

WOODS POND SPUR - TRACK ALIGNMENT DATA

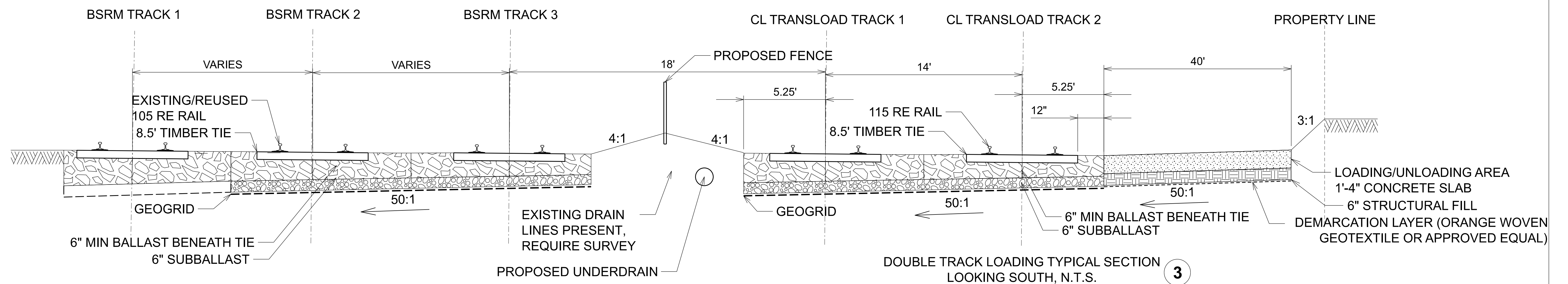
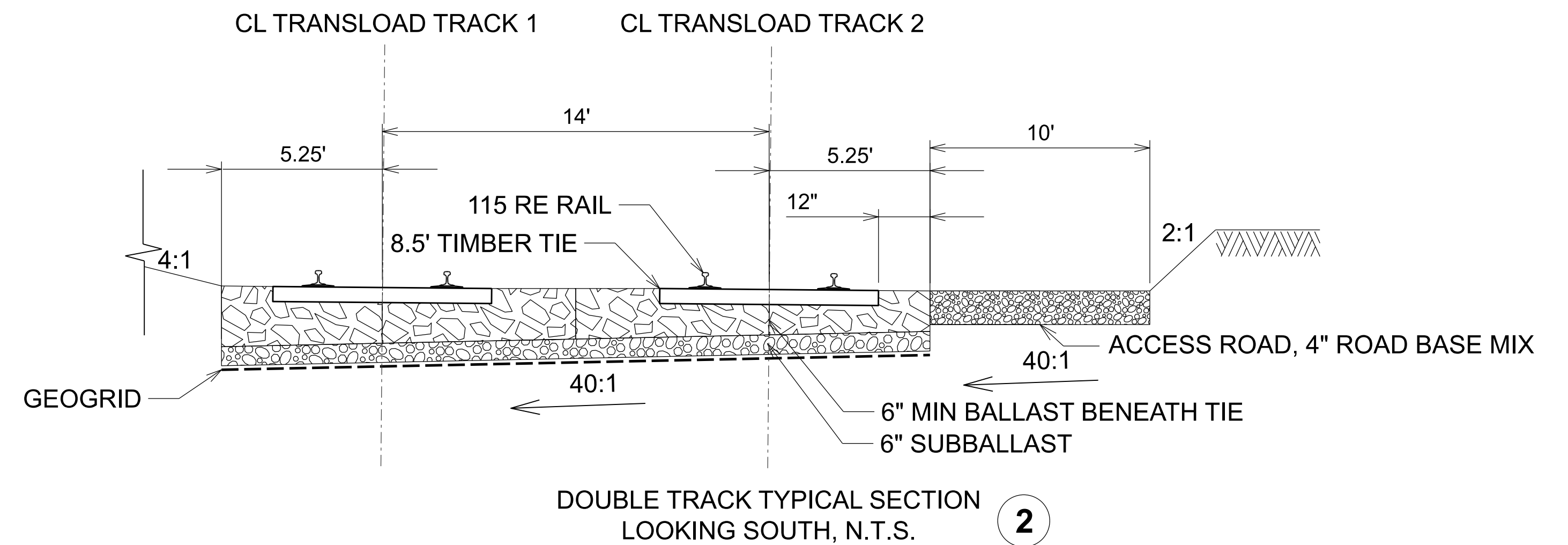
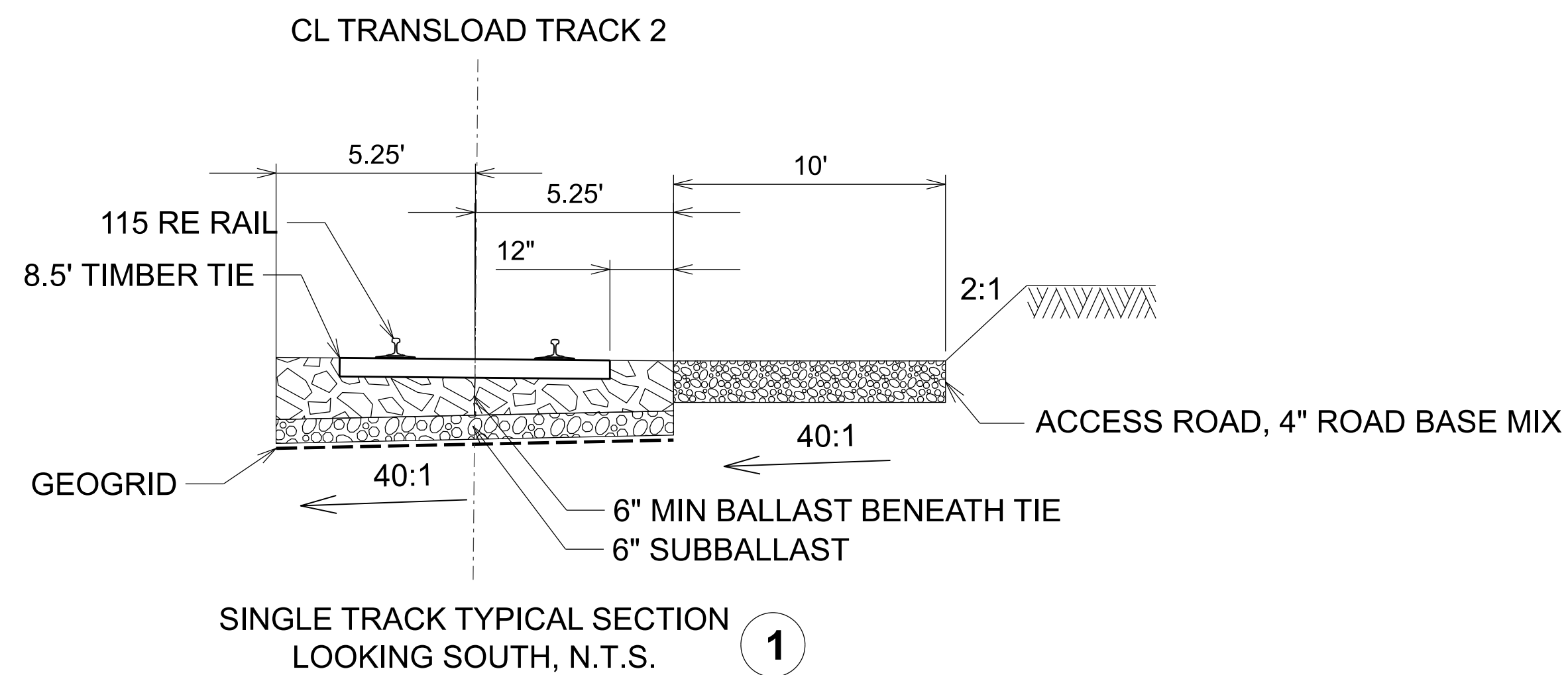
TRACK

ARCADIS Project No.
30318691.3000

Date
SEPTEMBER 2026

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

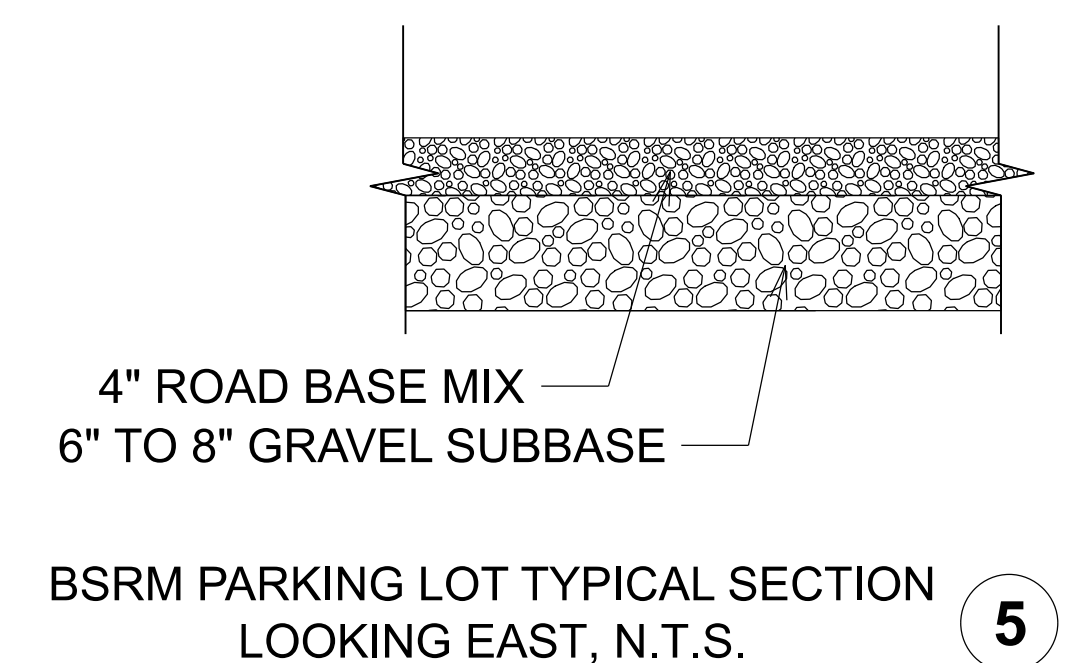
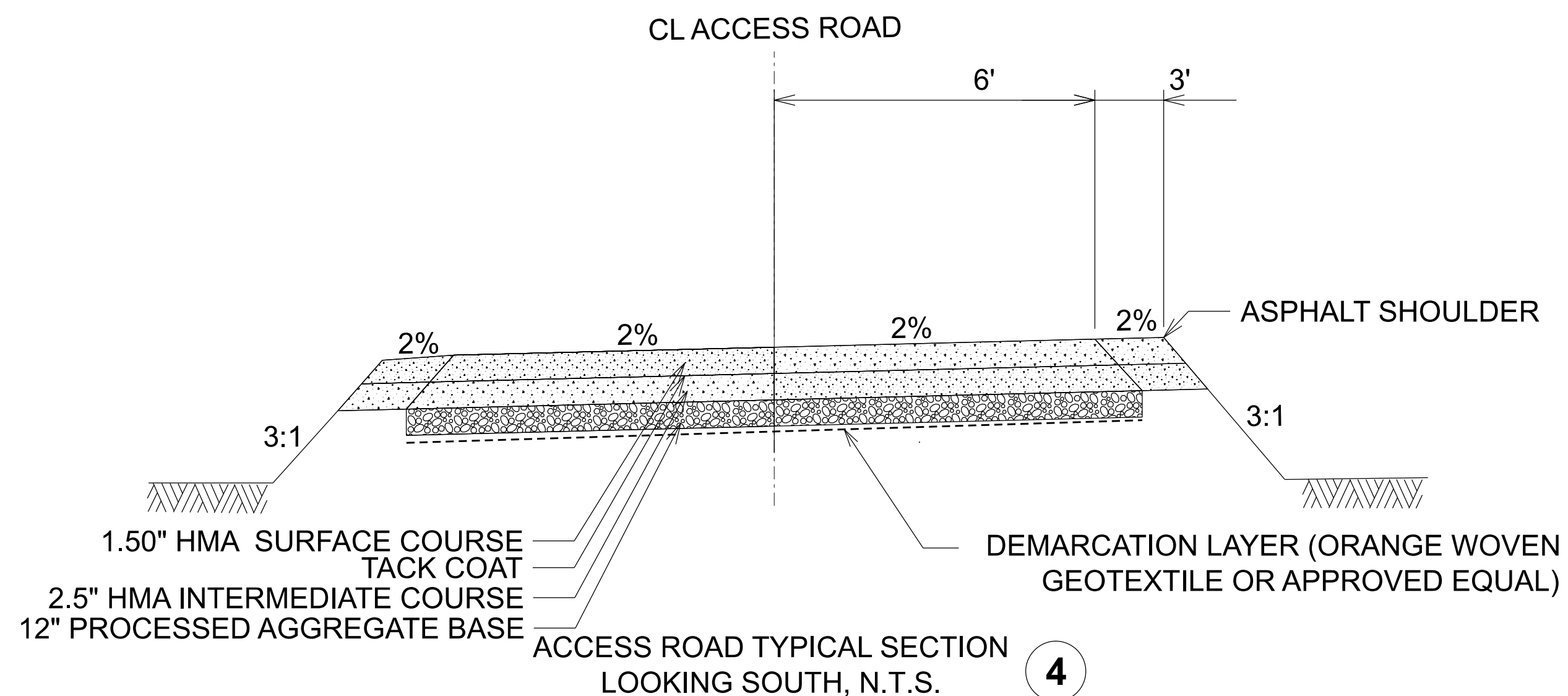
RT-202

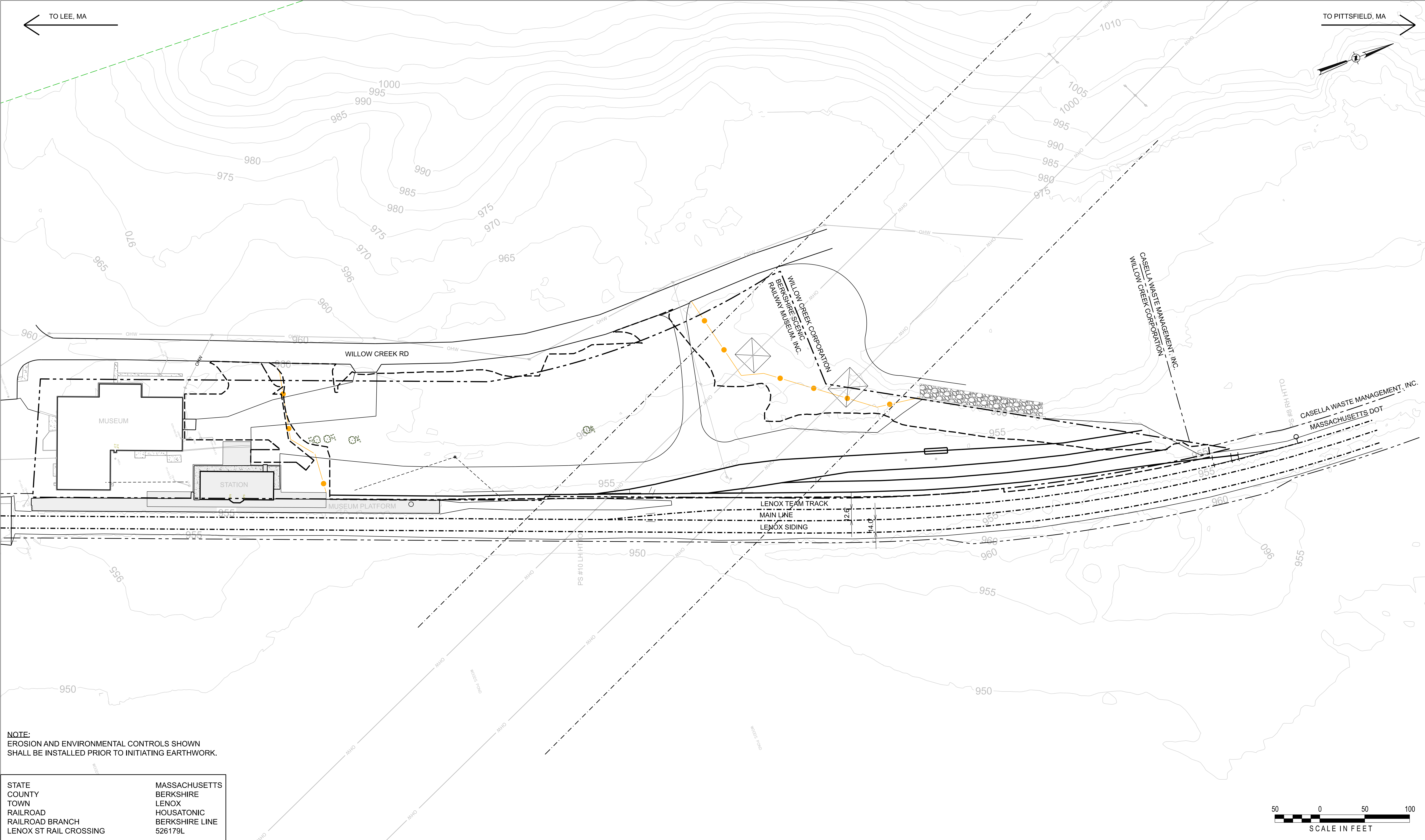


NOTE:
1. GEOGRID FOR GROUND IMPROVEMENT TO BE BIAXIAL, TENSAR BX1200-CLASS OR EQUIVALENT.

TRANSLOAD TRACKS COMPONENT DEPTHS	
COMPONENT	COMPONENT DEPTH (FT)
SUBBALLAST	0.5
BALLAST	0.5
SLOPE BALLAST	0.11
TIMBER TIE	0.58
12" PLATE 5.5" RAIL BASE	0.06
115 RE RAIL	0.55
TOTAL	2.3

BSRM TRACKS COMPONENT DEPTHS	
COMPONENT	COMPONENT DEPTH (FT)
SUBBALLAST	0.5
BALLAST	0.5
SLOPE BALLAST	0.11
TIMBER TIE	0.58
12" PLATE 5.125" RAIL BASE	0.06
105 RE RAIL	0.43
TOTAL	2.18

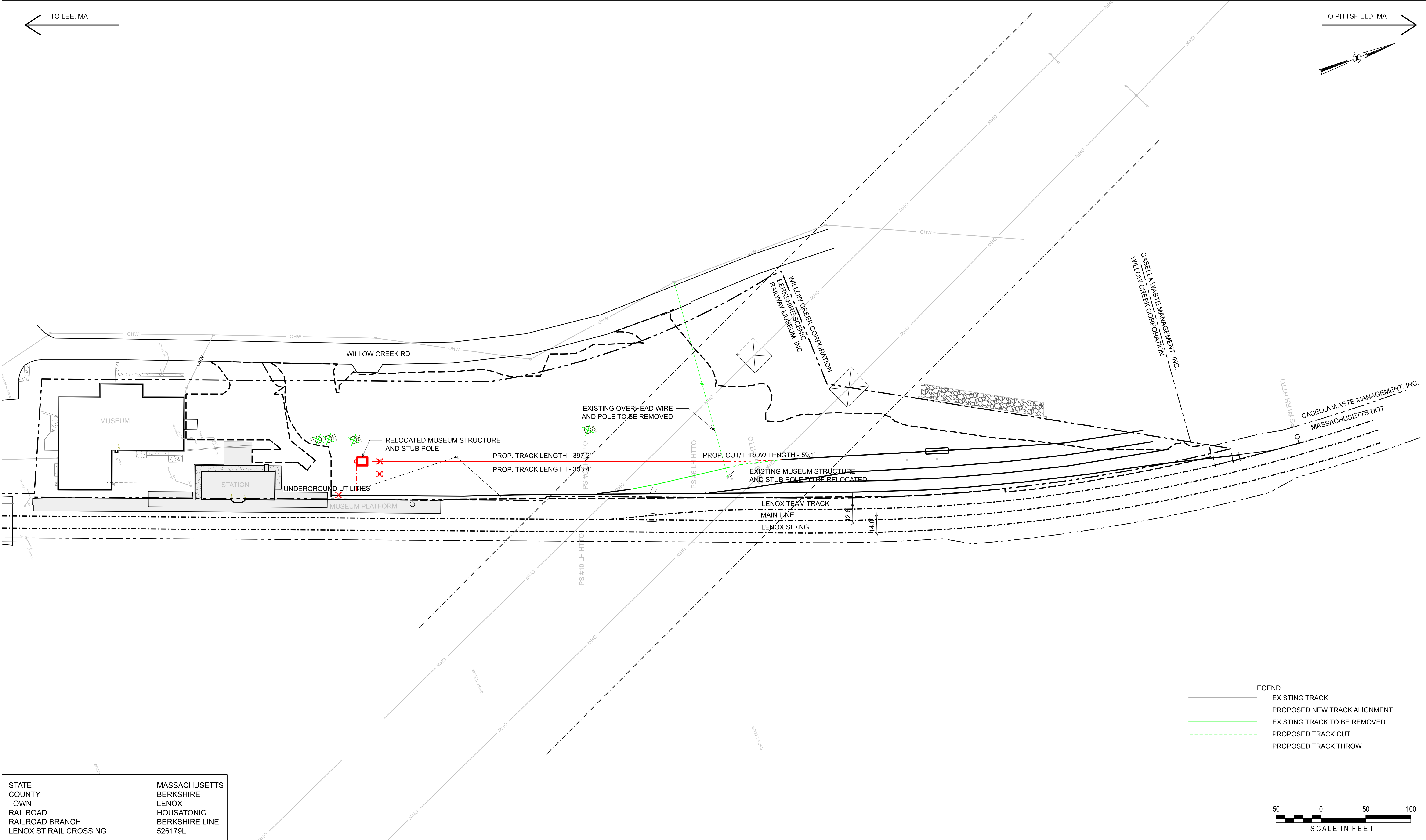
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STATE
COUNTY
TOWN
RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

MASSACHUSETTS
BERKSHIRE
LENOX
HOUSATONIC
BERKSHIRE LINE
526179L

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		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB		
		No.	Date	Revisions	By	Ckd		
		THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.						
Professional Engineer's Name MARK O. GRAVELDING		Professional Engineer's No. 42983		NOT FOR CONSTRUCTION	 ARCADIS ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - EROSION AND ENVIRONMENTAL CONTROL PLAN SHEET 1 OF 2	ARCADIS Project No. 30318691.3000	RT-205
State MA	Date Signed	Project Mgr. LP	Date SEPTEMBER 2026					
Designed by ESB	Drawn by EJC	Checked by WAJ	ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120					



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RAILROAD BRANCH
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2	09/2026	FINAL DESIGN	EJC	ESB
1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB
No.	Date	Revisions	By	Ckd

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Professional Engineer's Name MARK O. GRAVELDING		
Professional Engineer's No. 42983		
State MA	Date Signed	Project Mgr. LP
Designed by ESB	Drawn by EJC	Checked by WAJ

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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION

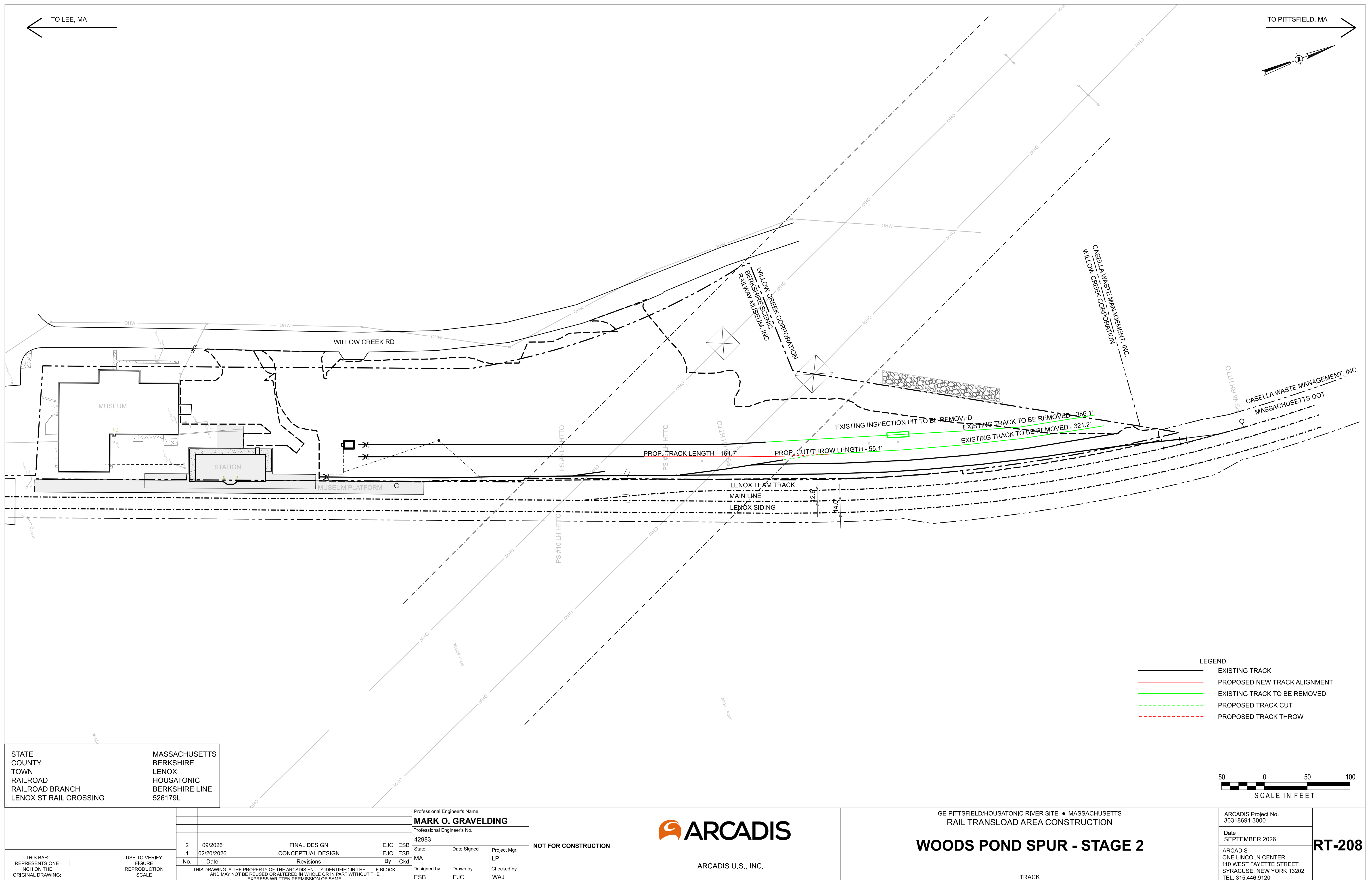
WOODS POND SPUR - STAGE 1

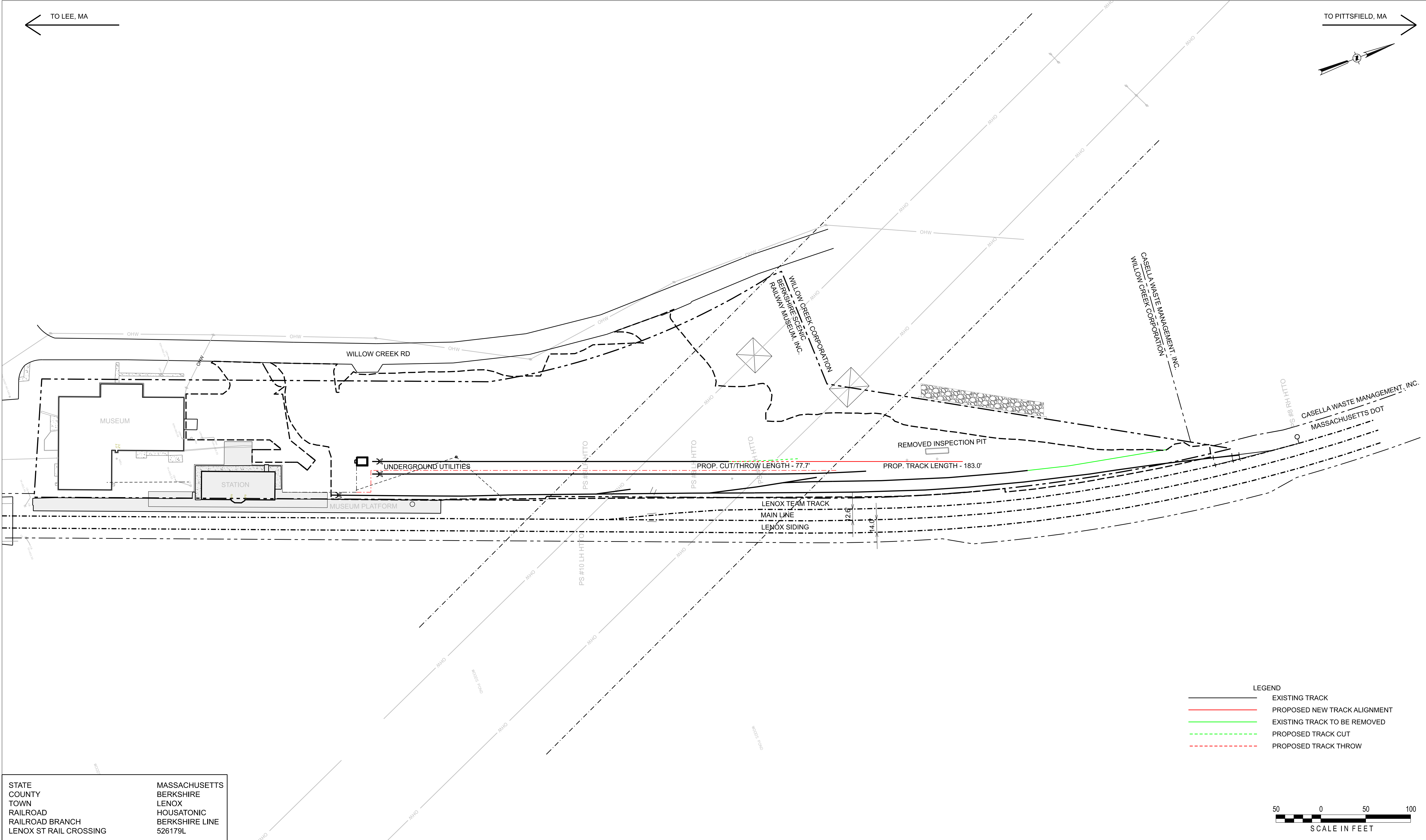
TRACK

ARCADIS Project No. 30318691.3000
Date SEPTEMBER 2026
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RT-207







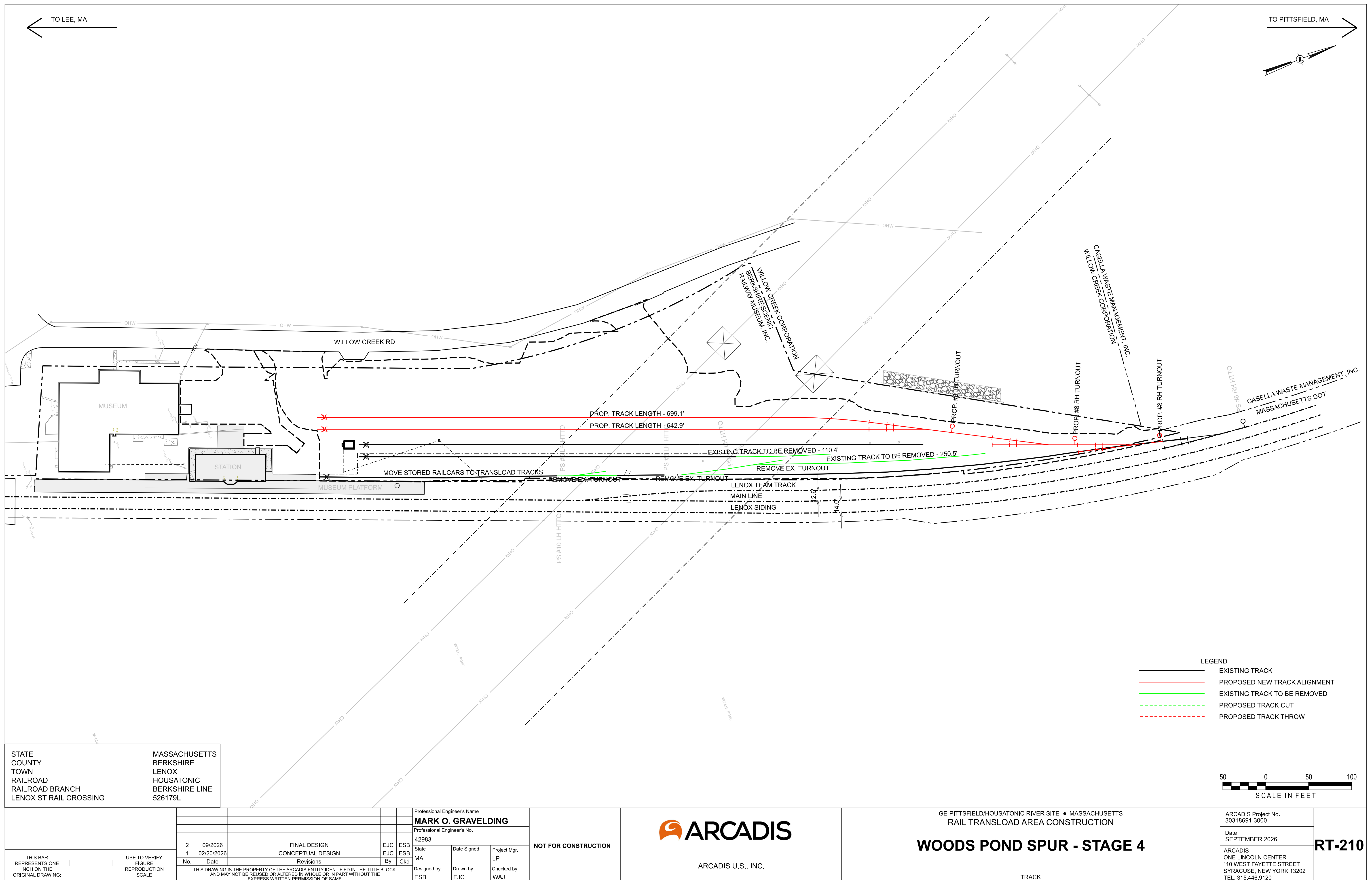
STATE
COUNTY
TOWN
RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

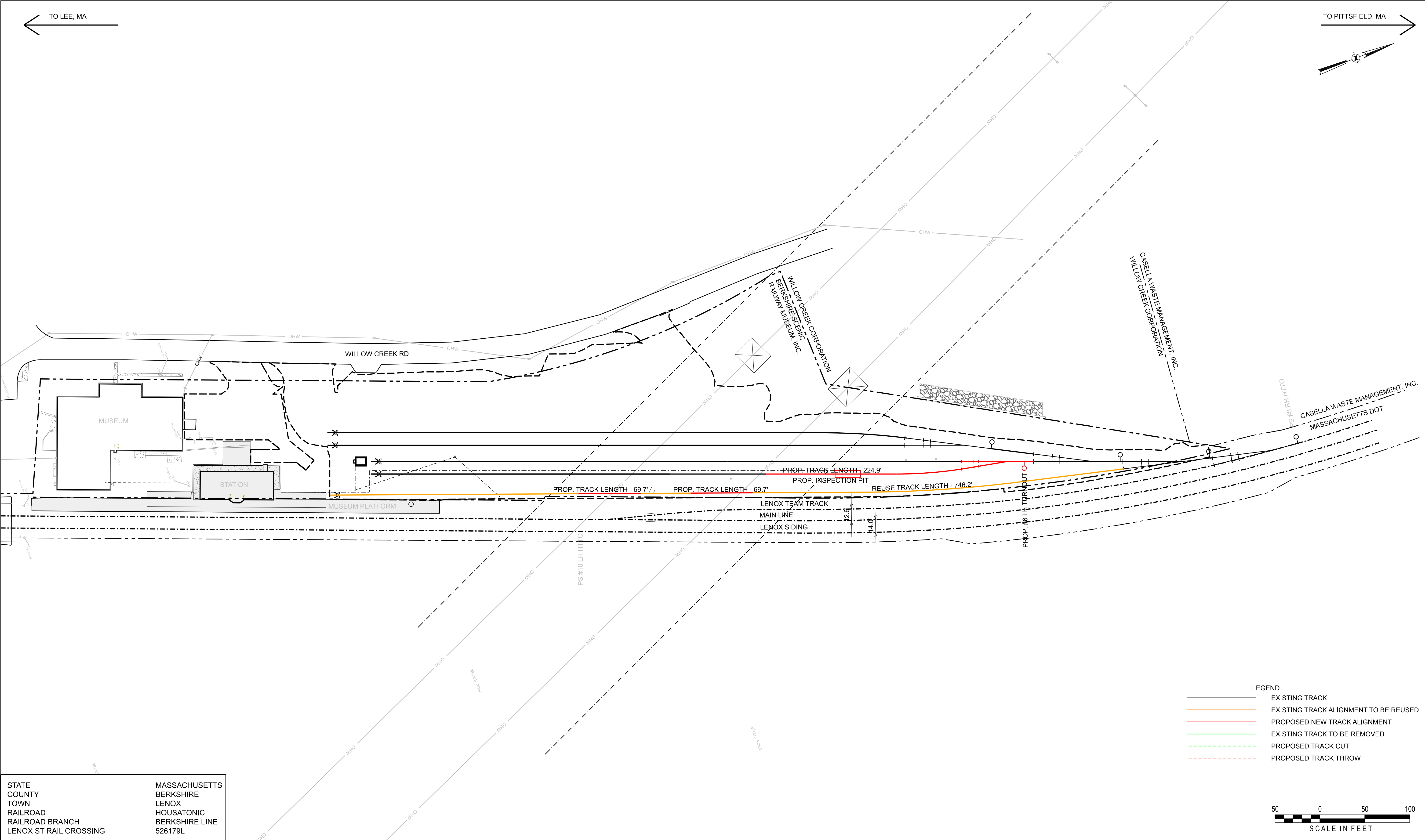
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BERKSHIRE
LENOX
HOUSATONIC
BERKSHIRE LINE
526179L

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				2		09/2026		FINAL DESIGN		EJC ESB							
				1		02/20/2026		CONCEPTUAL DESIGN		EJC ESB							
		No.		Date		Revisions		By		Ckd		State MA		Date Signed		Project Mgr. LP	
												Designed by ESB		Drawn by EJC		Checked by WAJ	

- LEGEND
- EXISTING TRACK
 - PROPOSED NEW TRACK ALIGNMENT
 - EXISTING TRACK TO BE REMOVED
 - PROPOSED TRACK CUT
 - PROPOSED TRACK THROW



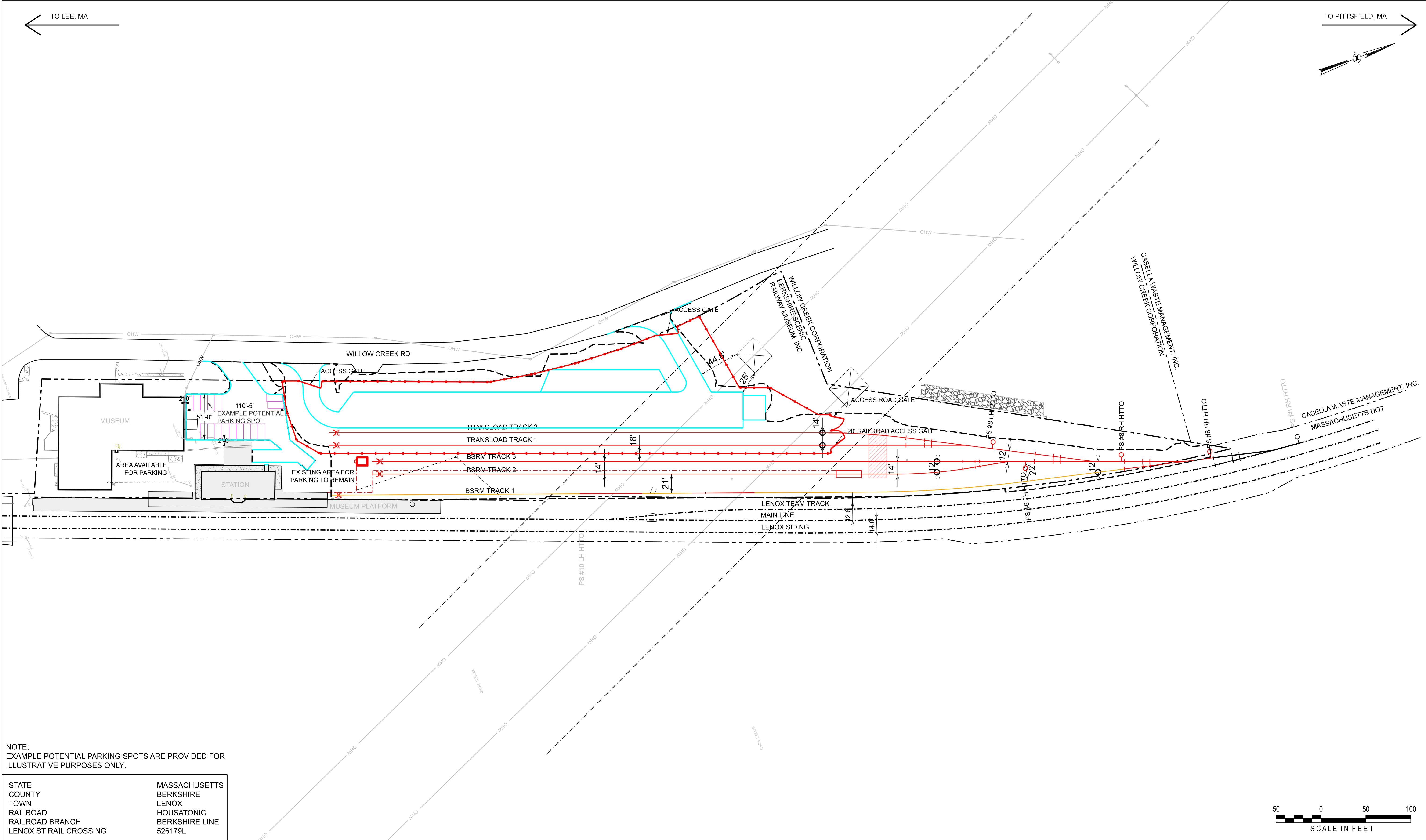




STATE
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RAILROAD
RAILROAD BRANCH
LENOX ST RAIL CROSSING

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BERKSHIRE
LENOX
HOUSATONIC
BERKSHIRE LINE
526179L

								Professional Engineer's Name MARK O. GRAVELDING			
								Professional Engineer's No. 42983			
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				1 02/20/2026		CONCEPTUAL DESIGN		EJC	ESB		
				No. Date		Revisions		By	Ckd		
								State		Date Signed	Project Mgr.
								MA			LP
								Designed by ESB		Drawn by EJC	Checked by WAJ

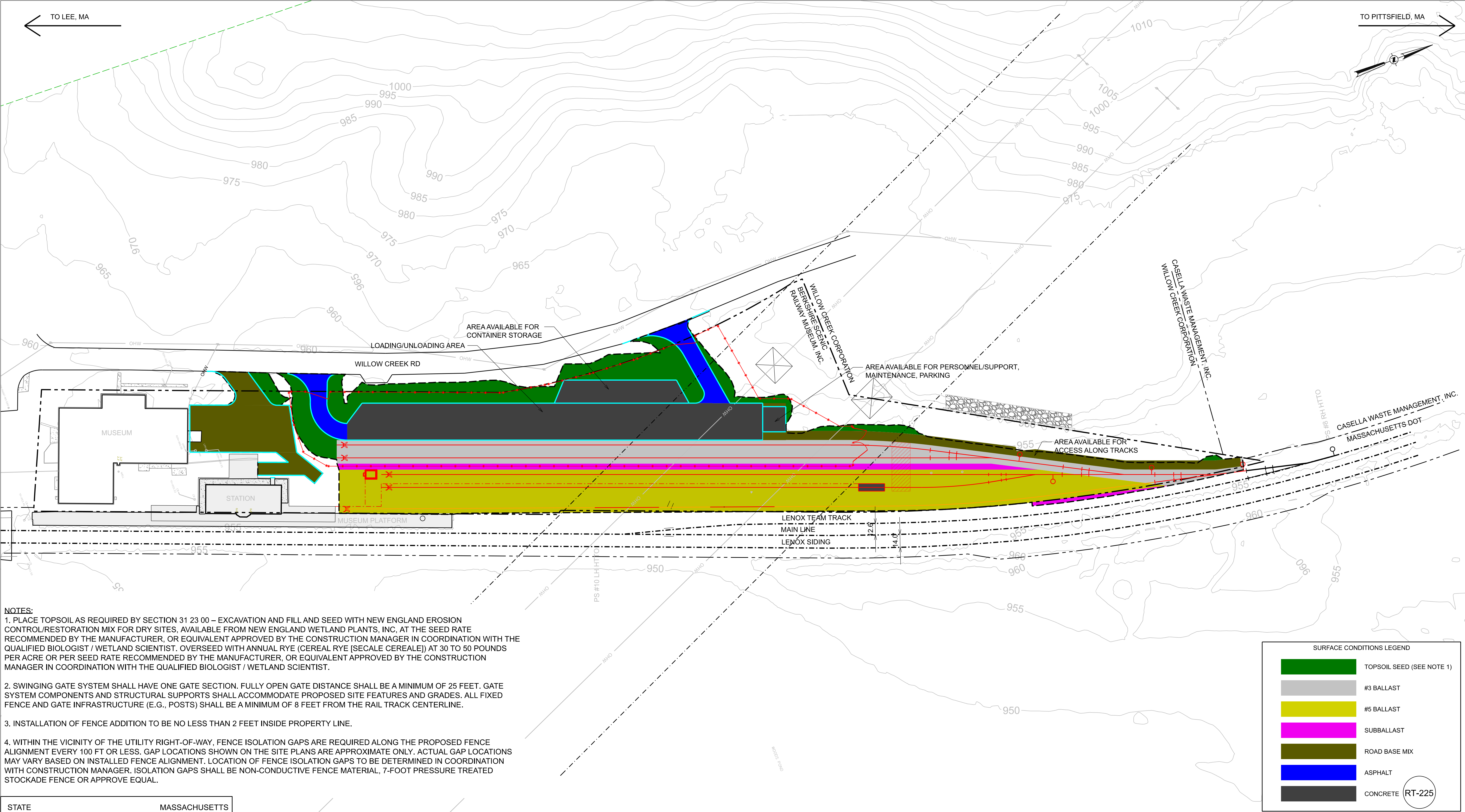


NOTE:
EXAMPLE POTENTIAL PARKING SPOTS ARE PROVIDED FOR
ILLUSTRATIVE PURPOSES ONLY.

STATE	MASSACHUSETTS
COUNTY	BERKSHIRE
TOWN	LENOX
RAILROAD	HOUSATONIC
RAILROAD BRANCH	BERKSHIRE LINE
LENOX ST RAIL CROSSING	526179L



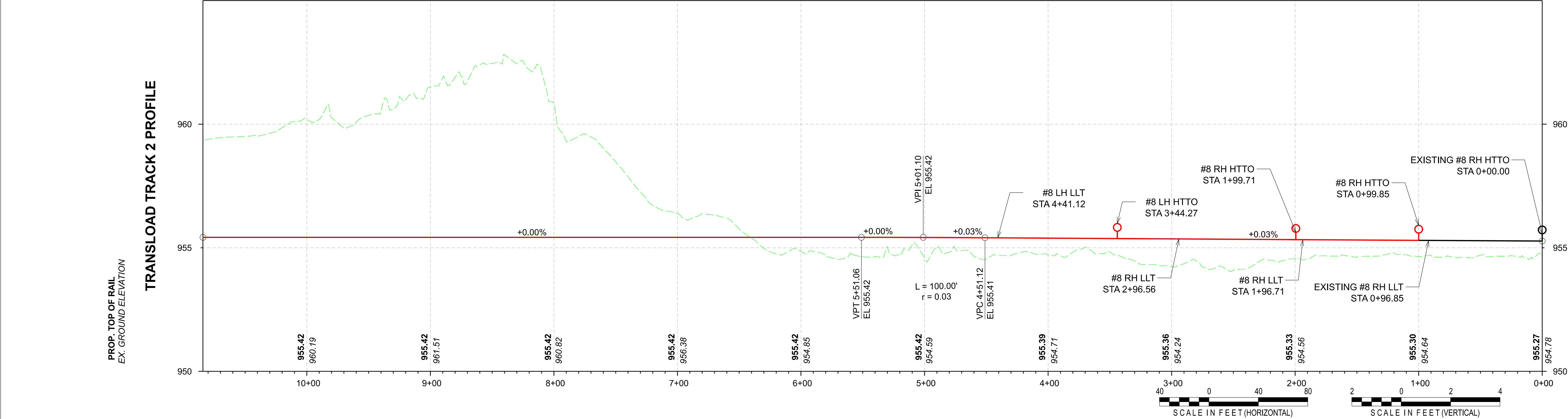
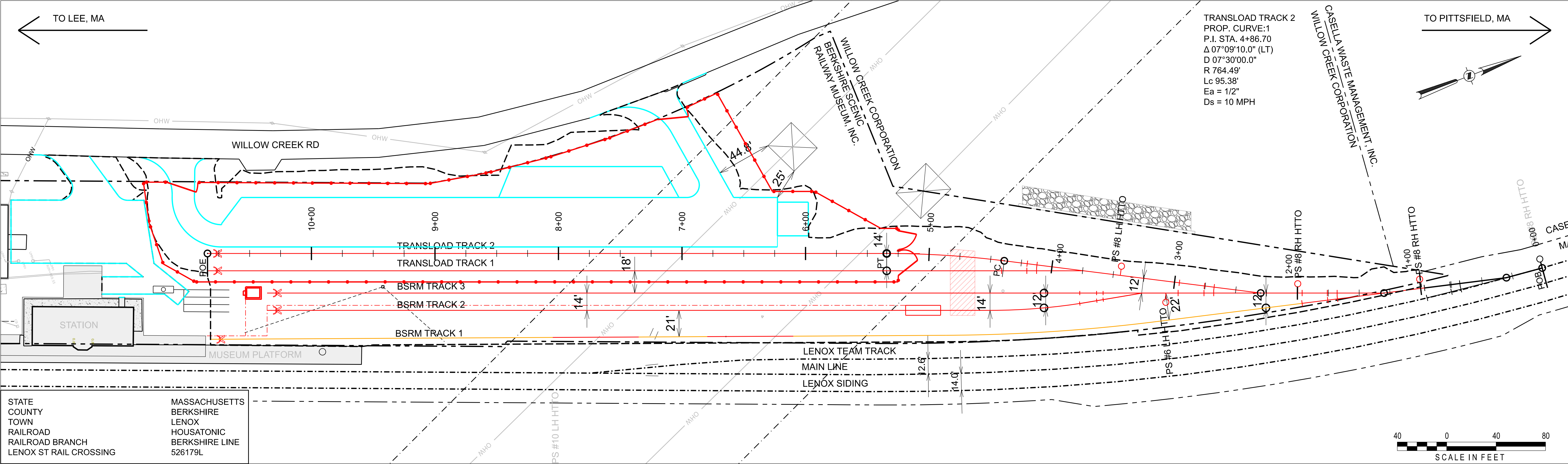
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									Professional Engineer's No. 42983					
		2	09/2026	FINAL DESIGN	EJC	ESB	State	Date Signed	Project Mgr.					
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	MA		LP					
		No.	Date	Revisions	By	Ckd	Designed by	Drawn by	Checked by					
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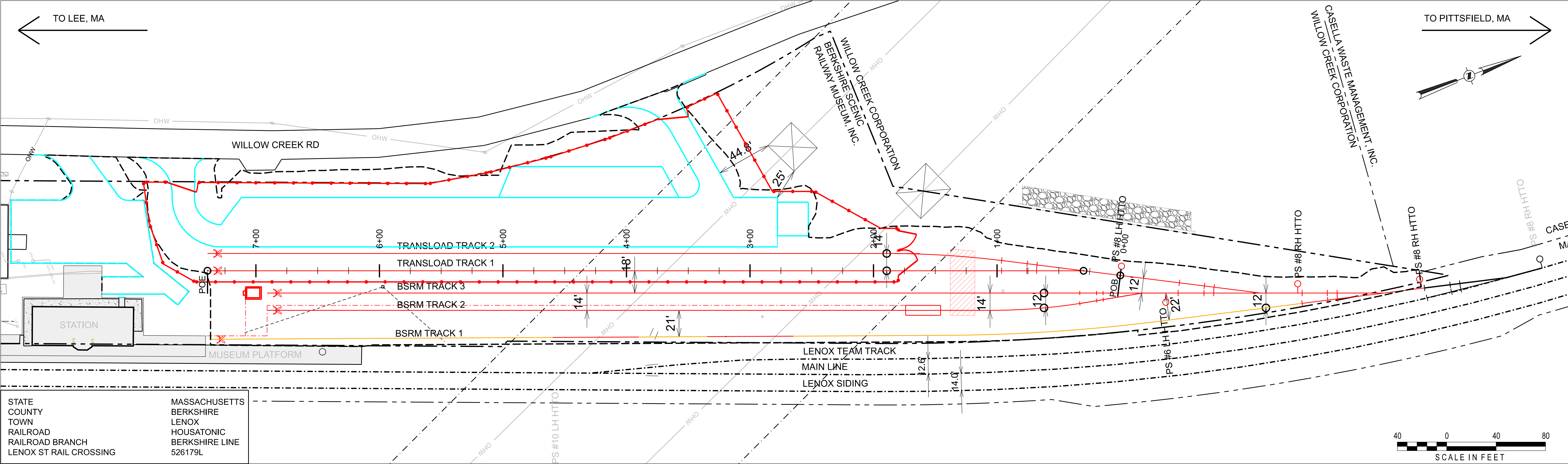
- NOTES:**
1. PLACE TOPSOIL AS REQUIRED BY SECTION 31 23 00 – EXCAVATION AND FILL AND SEED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES, AVAILABLE FROM NEW ENGLAND WETLAND PLANTS, INC. AT THE SEED RATE RECOMMENDED BY THE MANUFACTURER, OR EQUIVALENT APPROVED BY THE CONSTRUCTION MANAGER IN COORDINATION WITH THE QUALIFIED BIOLOGIST / WETLAND SCIENTIST. OVERSEED WITH ANNUAL RYE (CEREAL RYE [SECALE CEREALE]) AT 30 TO 50 POUNDS PER ACRE OR PER SEED RATE RECOMMENDED BY THE MANUFACTURER, OR EQUIVALENT APPROVED BY THE CONSTRUCTION MANAGER IN COORDINATION WITH THE QUALIFIED BIOLOGIST / WETLAND SCIENTIST.
 2. SWINGING GATE SYSTEM SHALL HAVE ONE GATE SECTION. FULLY OPEN GATE DISTANCE SHALL BE A MINIMUM OF 25 FEET. GATE SYSTEM COMPONENTS AND STRUCTURAL SUPPORTS SHALL ACCOMMODATE PROPOSED SITE FEATURES AND GRADES. ALL FIXED FENCE AND GATE INFRASTRUCTURE (E.G., POSTS) SHALL BE A MINIMUM OF 8 FEET FROM THE RAIL TRACK CENTERLINE.
 3. INSTALLATION OF FENCE ADDITION TO BE NO LESS THAN 2 FEET INSIDE PROPERTY LINE.
 4. WITHIN THE VICINITY OF THE UTILITY RIGHT-OF-WAY, FENCE ISOLATION GAPS ARE REQUIRED ALONG THE PROPOSED FENCE ALIGNMENT EVERY 100 FT OR LESS. GAP LOCATIONS SHOWN ON THE SITE PLANS ARE APPROXIMATE ONLY. ACTUAL GAP LOCATIONS MAY VARY BASED ON INSTALLED FENCE ALIGNMENT. LOCATION OF FENCE ISOLATION GAPS TO BE DETERMINED IN COORDINATION WITH CONSTRUCTION MANAGER. ISOLATION GAPS SHALL BE NON-CONDUCTIVE FENCE MATERIAL, 7-FOOT PRESSURE TREATED STOCKADE FENCE OR APPROVE EQUAL.

STATE	MASSACHUSETTS
COUNTY	BERKSHIRE
TOWN	LENOX
RAILROAD	HOUSATONIC
RAILROAD BRANCH	BERKSHIRE LINE
LENOX ST RAIL CROSSING	526179L

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE	2	09/2026	FINAL DESIGN	EJC	ESB	Professional Engineer's Name MARK O. GRAVELDING	NOT FOR CONSTRUCTION	ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - SURFACE PLAN	ARCADIS Project No. 30318691.3000	RT-214	
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB							Professional Engineer's No. 42983
		No.	Date	Revisions	By	Ckd							State MA
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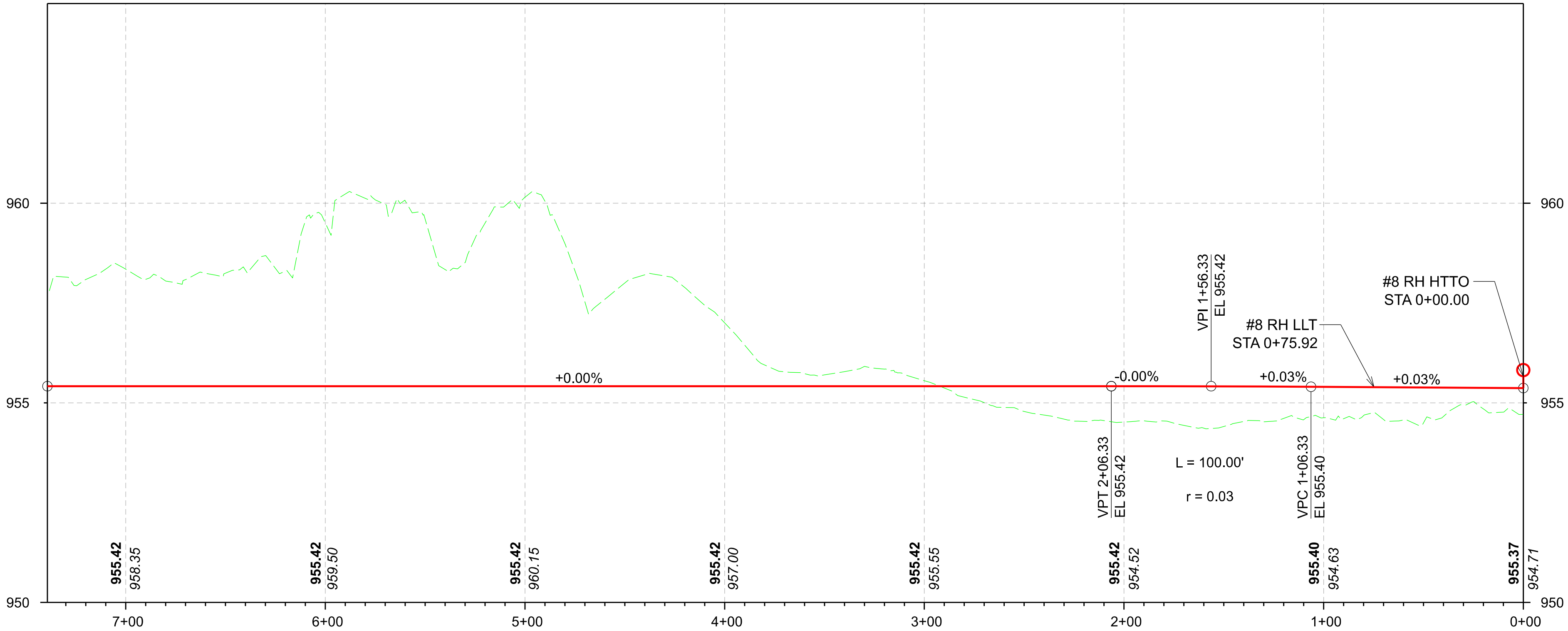
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE						Professional Engineer's Name MARK O. GRAVELDING			NOT FOR CONSTRUCTION	 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - TRACK PLAN - PROPOSED SHEET 1 OF 5 TRACK	ARCADIS Project No. 30318691.3000	RT-215
							Professional Engineer's No. 42983							
		2	09/2026	FINAL DESIGN	EJC	ESB	State	Date Signed	Project Mgr.					
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	MA		LP					
		No.	Date	Revisions	By	Ckd	Designed by	Drawn by	Checked by					
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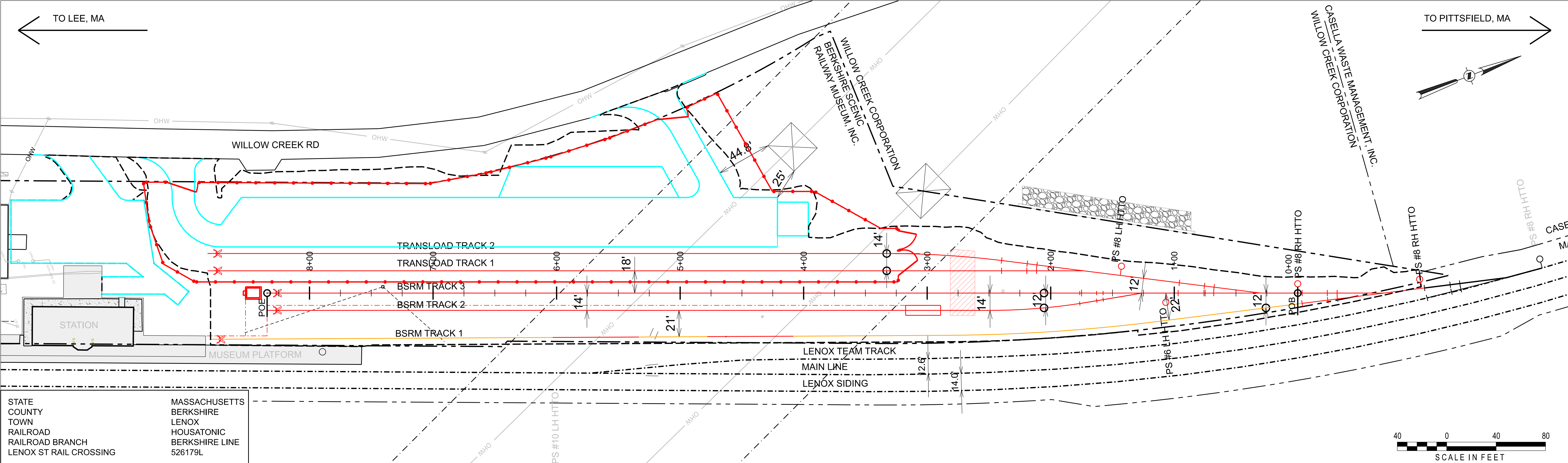
TRANSLOAD TRACK 1 PROFILE

PROP. TOP OF RAIL

EX. GROUND ELEVATION



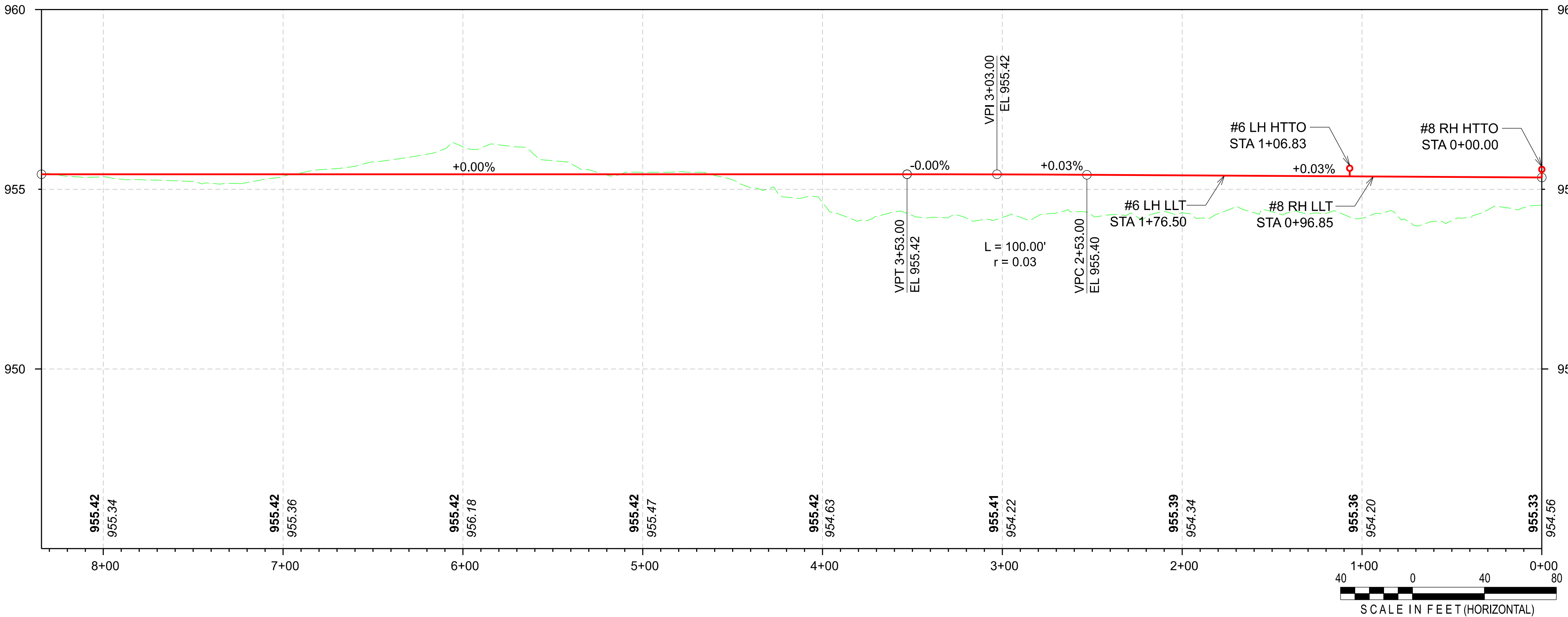
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE					Professional Engineer's Name MARK O. GRAVELDING			NOT FOR CONSTRUCTION	 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - TRACK PLAN - PROPOSED SHEET 2 OF 5 TRACK	ARCADIS Project No. 30318691.3000	RT-216	
						Professional Engineer's No. 42983								
		2	09/2026	FINAL DESIGN	EJC	ESB	State	Date Signed						Project Mgr. LP
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	MA							
		No.	Date	Revisions	By	Ckd	Designed by ESB	Drawn by EJC						Checked by WAJ
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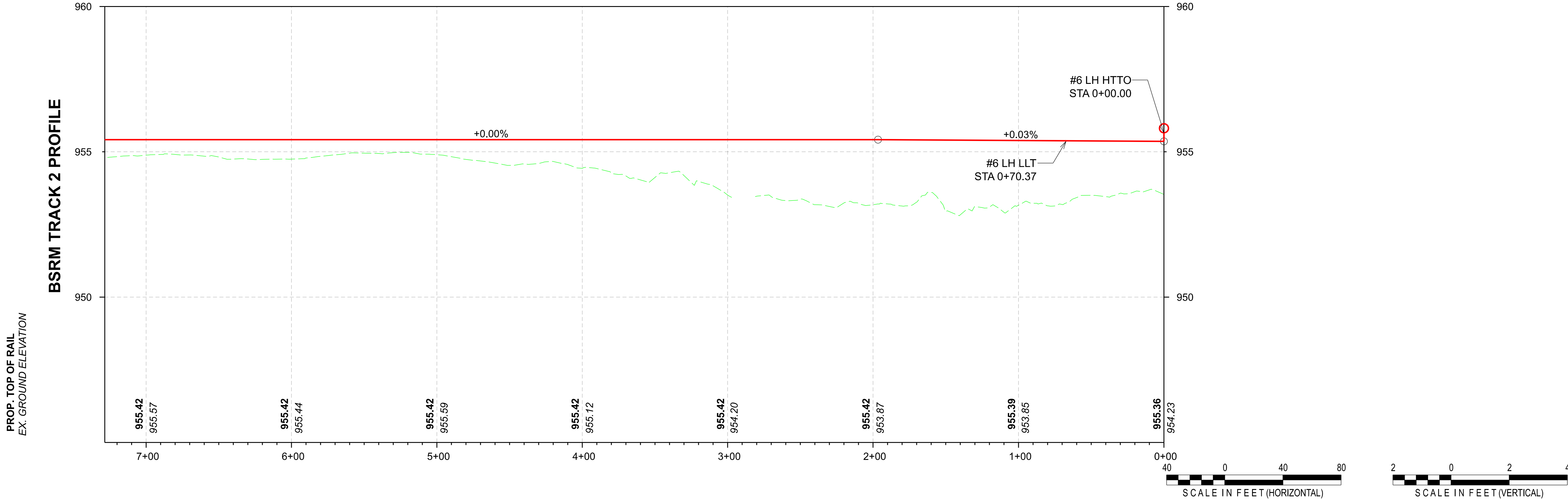
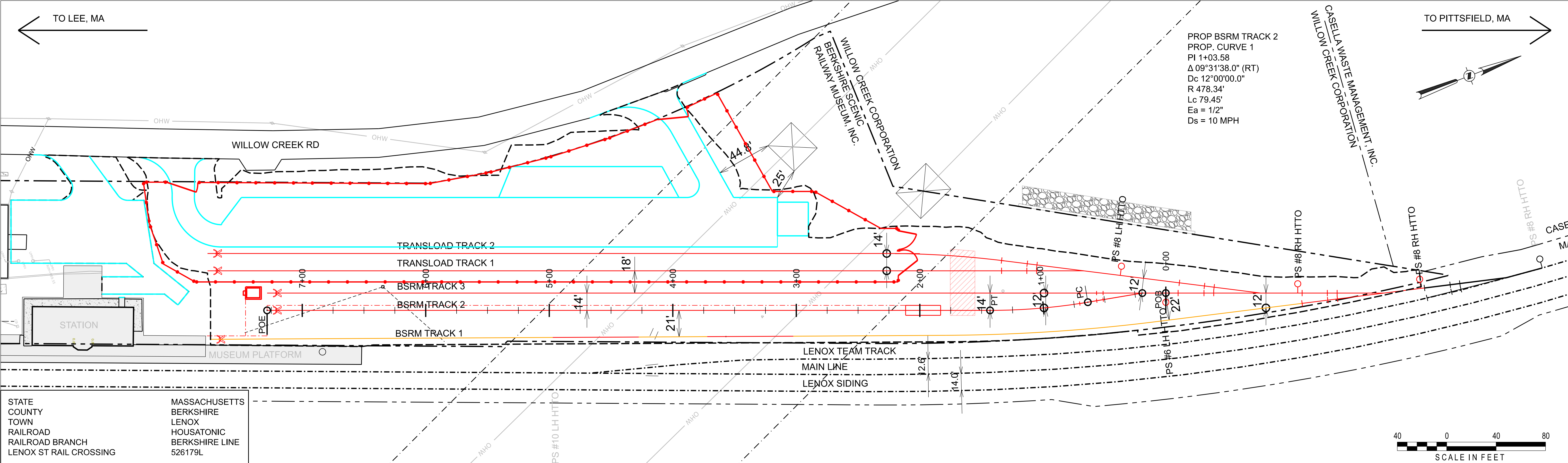
BSRM TRACK 3 PROFILE

PROP. TOP OF RAIL

EX. GROUND ELEVATION

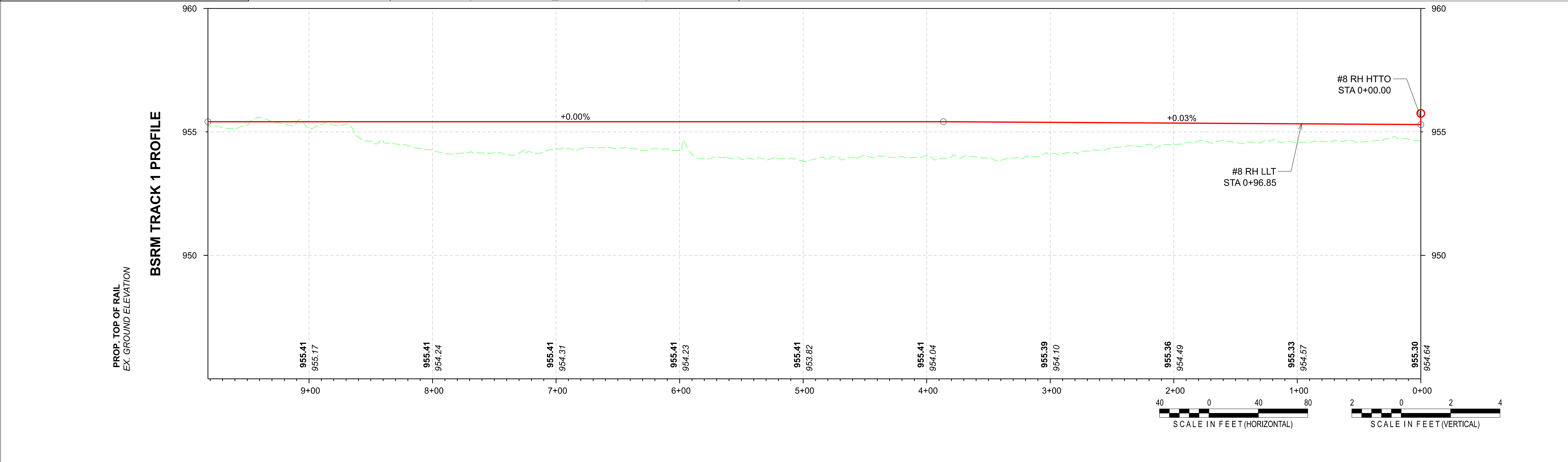
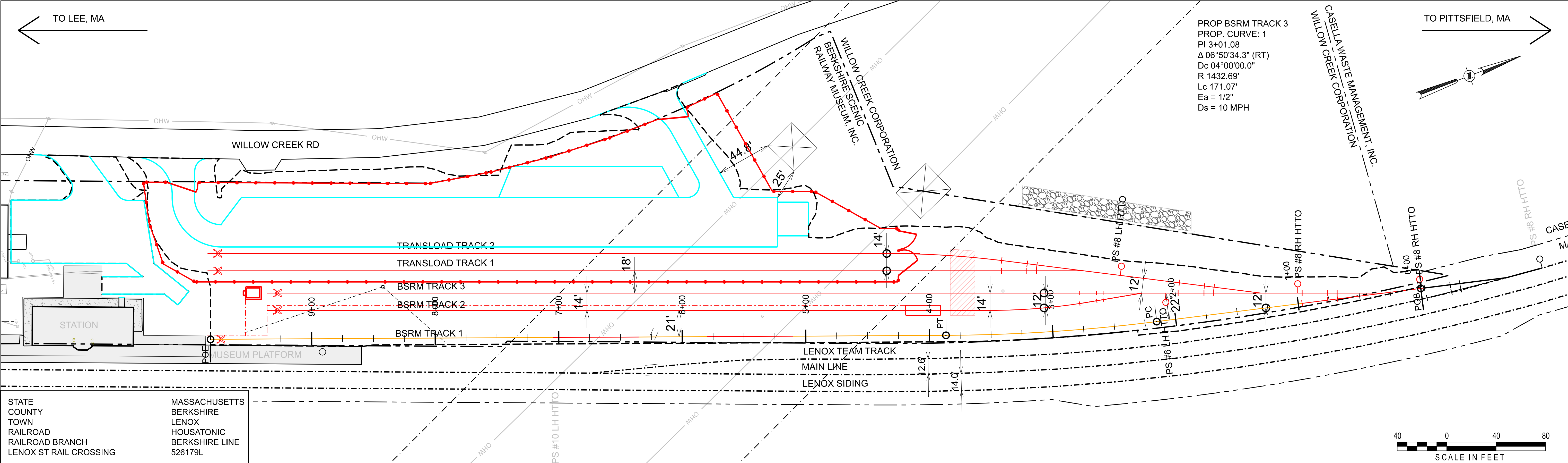


THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE	2	09/2026	FINAL DESIGN	EJC	ESB	Professional Engineer's Name MARK O. GRAVELDING Professional Engineer's No. 42983 State MA Date Signed By Designed by EJC	Project Mgr. LP Checked by WAJ	NOT FOR CONSTRUCTION	ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - TRACK PLAN - PROPOSED SHEET 3 OF 5 TRACK	ARCADIS Project No. 30318691.3000	RT-217
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB						Date SEPTEMBER 2026	
		No.	Date	Revisions	By	Ckd						ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	
		THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.											

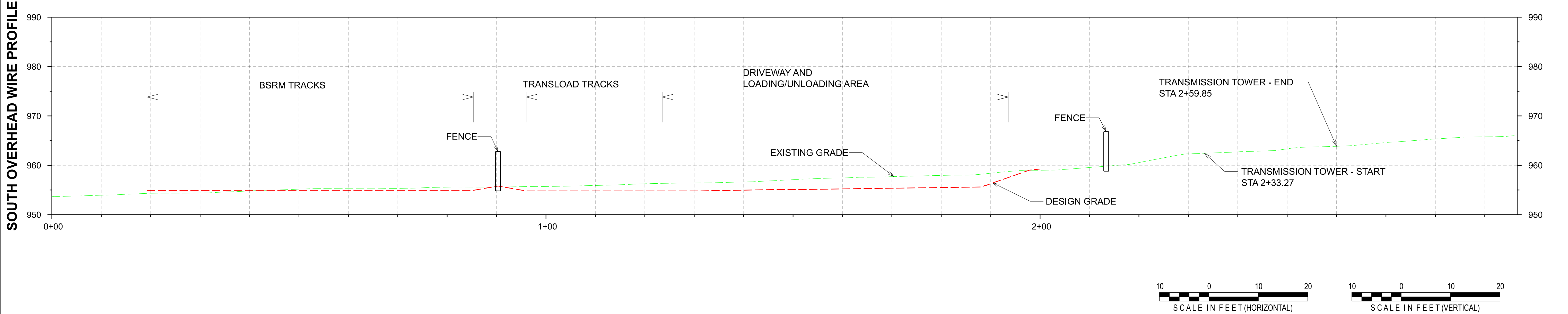
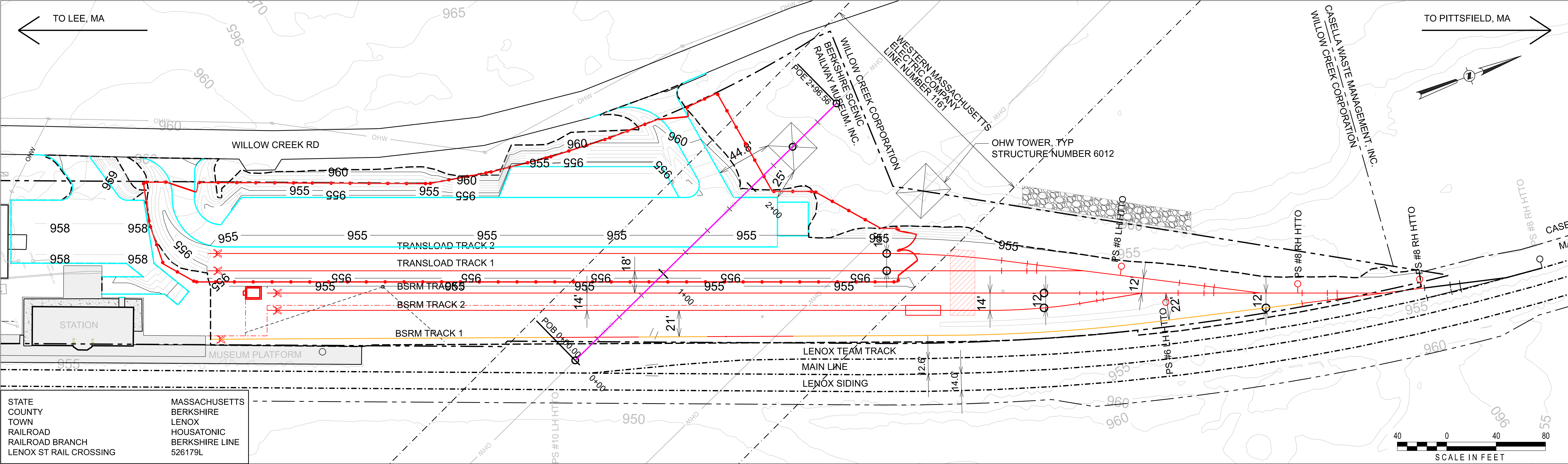


THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE						Professional Engineer's Name MARK O. GRAVELDING	NOT FOR CONSTRUCTION	 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND SPUR - TRACK PLAN - PROPOSED SHEET 4 OF 5 TRACK	ARCADIS Project No. 30318691.3000	RT-218	
		2	09/2026	FINAL DESIGN	EJC	ESB	Date Signed				Project Mgr. LP		Date SEPTEMBER 2026
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	Designed by ESB				Drawn by EJC		Checked by WAJ

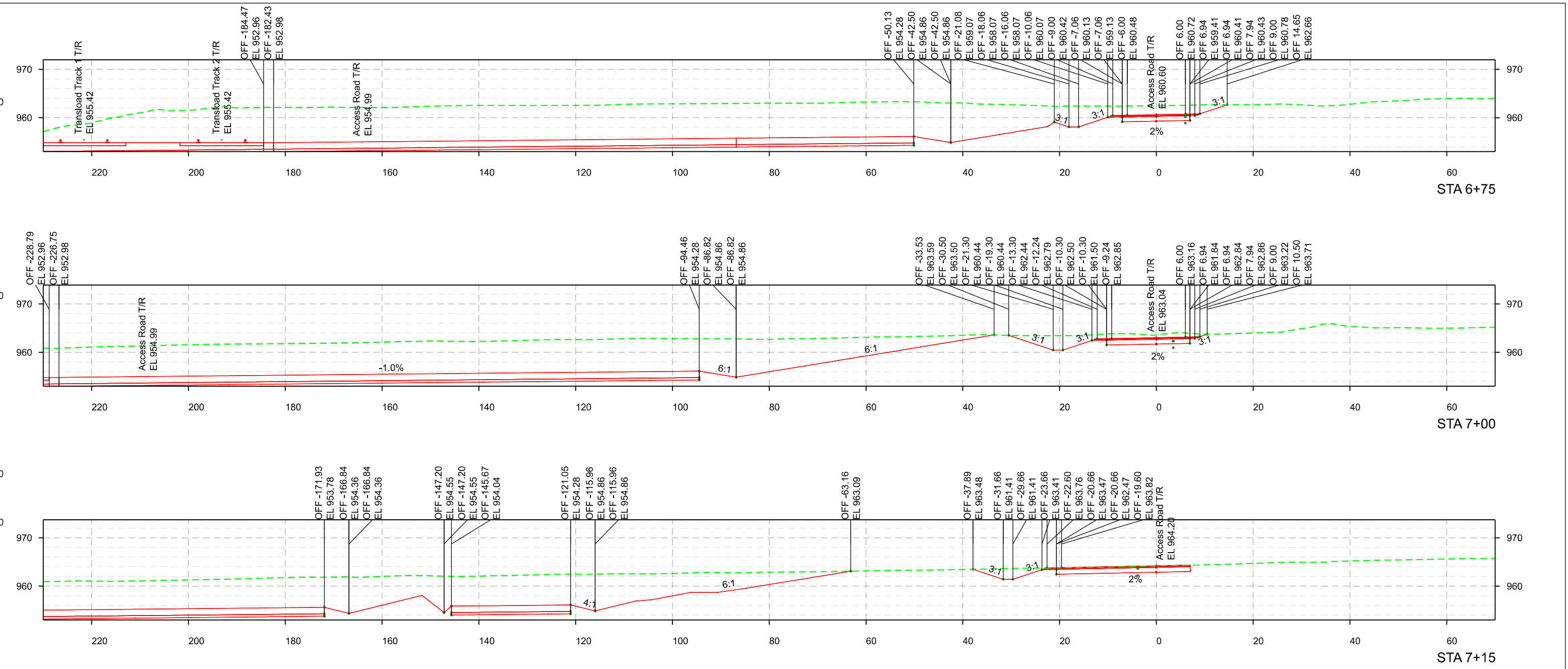
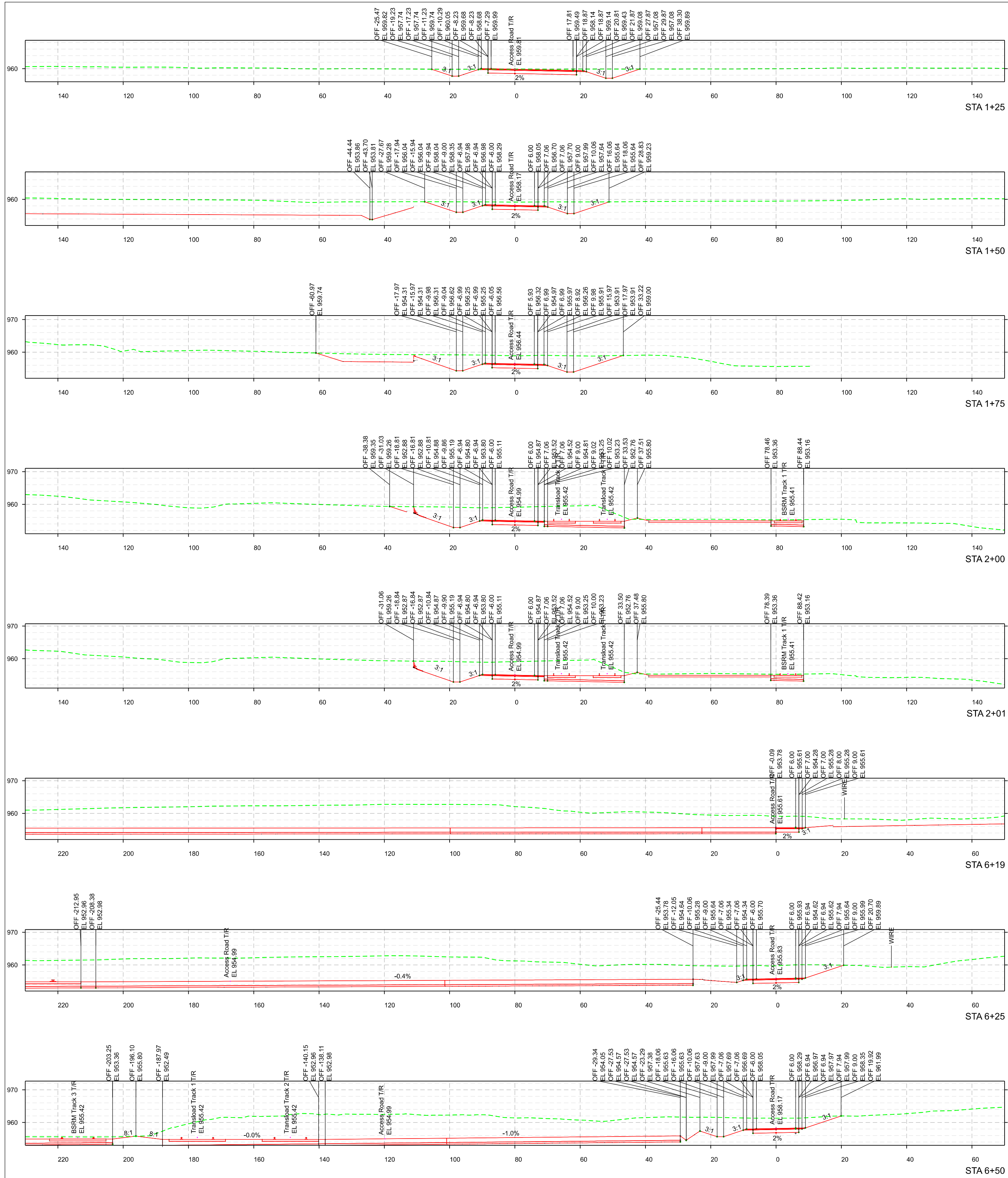
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							Professional Engineer's No. 42983							
		2	09/2026	FINAL DESIGN	EJC	ESB	State MA						Date Signed	Project Mgr. LP
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	Designed by ESB						Drawn by EJC	Checked by WAJ
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		1 02/20/2026 CONCEPTUAL DESIGN EJC ESB							
		No. Date Revisions By Ckd							
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NOTE:
1. CROSS SECTION STATIONING RELATIVE TO PLAN VIEW STATIONING
PROVIDED ON RT-220



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														MARK O. GRAVELDING		
														Professional Engineer's No.		
														42983		
2		09/2026		FINAL DESIGN				EJC		ESB		NOT FOR CONSTRUCTION				
1		02/20/2026		CONCEPTUAL DESIGN				EJC		ESB						
No.		Date		Revisions				By		Ckd						
Designed by		Date Signed		Project Mgr.		ARCADIS U.S., INC.										
ESB		EJC		LP												
Checked by		Drawn by		TRACK												
WAJ		WAJ														

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS

RAIL TRANSLOAD AREA CONSTRUCTION

WOODS POND SPUR - CROSS SECTIONS

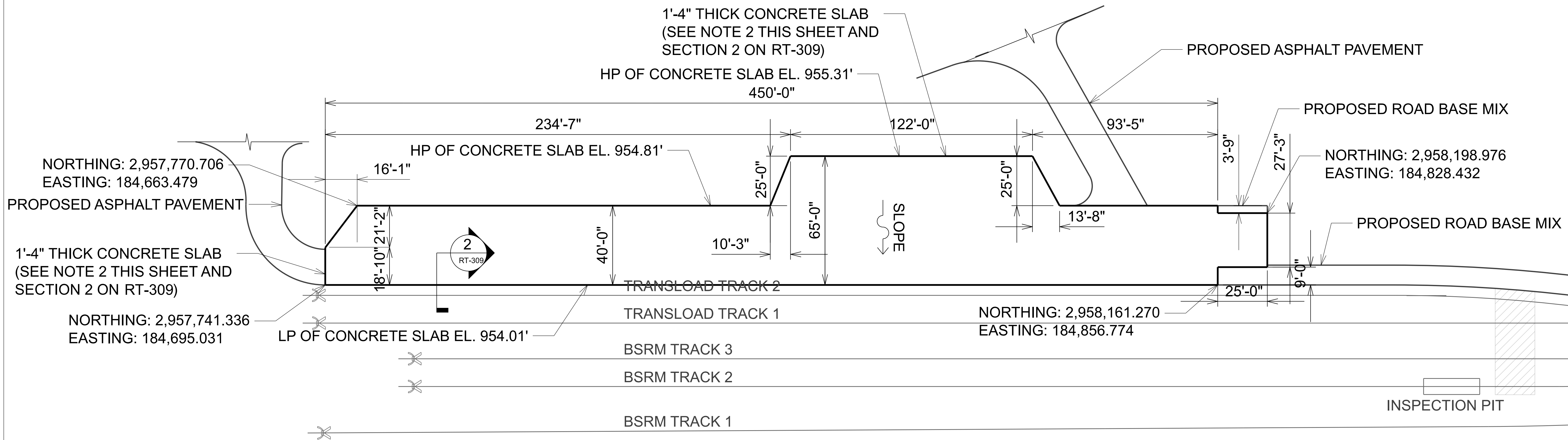
ACCESS ROAD

ARCADIS Project No.
30318691.3000

Date
SEPTEMBER 2026

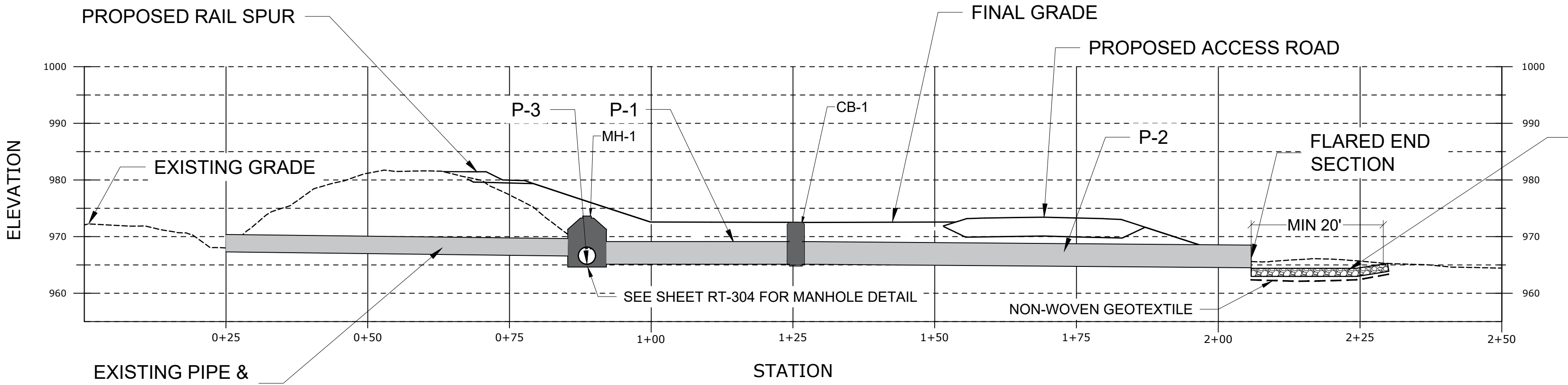
ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

RT-224



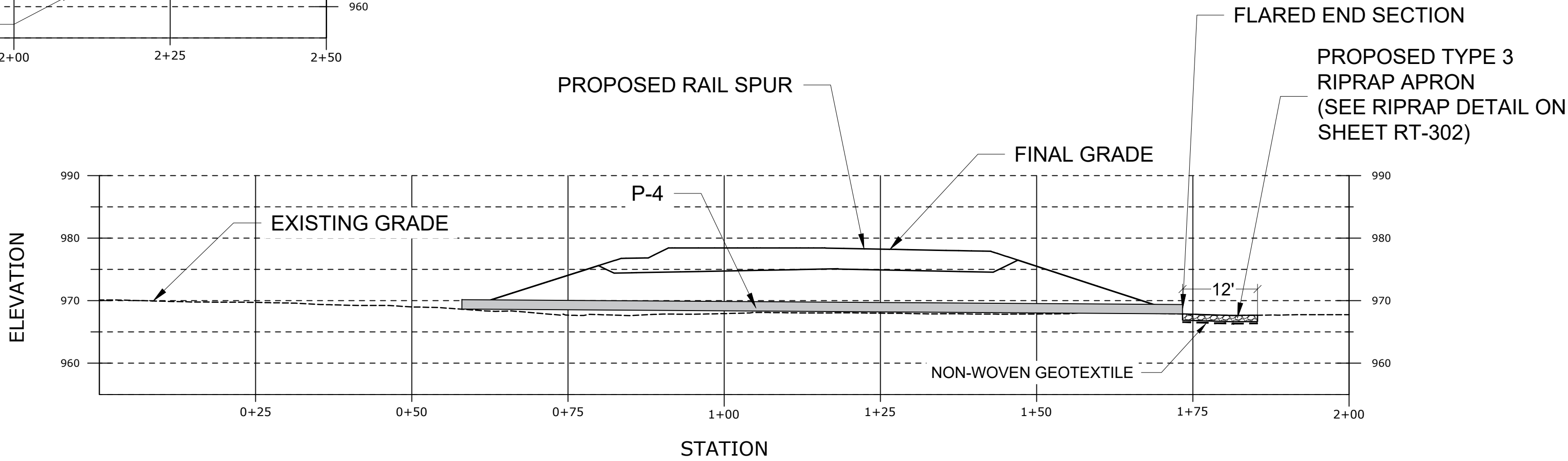
1. REFER TO RT-308 FOR STRUCTURAL NOTES RELATED TO CONSTRUCTION OF THE CONCRETE SLAB.
2. PROVIDE CONCRETE CONSTRUCTION JOINTS @ 40'-0" C/C MAX SPACING (SEE CONSTRUCTION JOINT DETAIL ON RT-309).
3. PROVIDE EXPANSION JOINTS @ 100' C/C MAX SPACING (SEE EXPANSION JOINT DETAIL ON RT-309).
4. PROPOSED GRADE EL. VARIES.





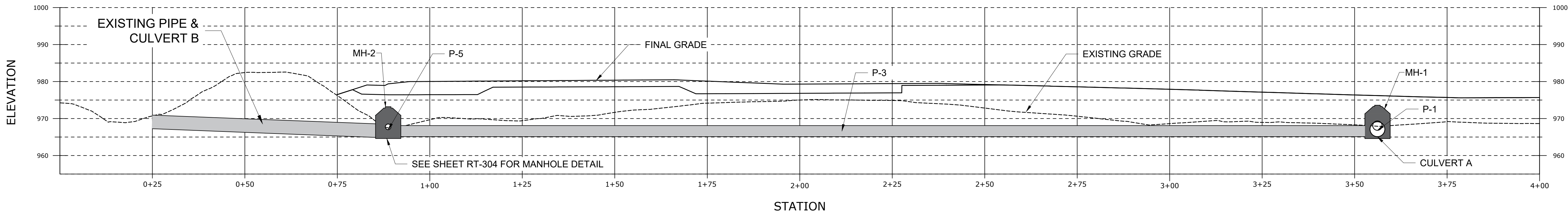
PROFILE CULVERT EXTENSION A
SCALE: HORIZ. 1"=15'
VERT. 1"=15'

1



PROFILE CULVERT C
SCALE: HORIZ. 1"=15'
VERT. 1"=15'

2



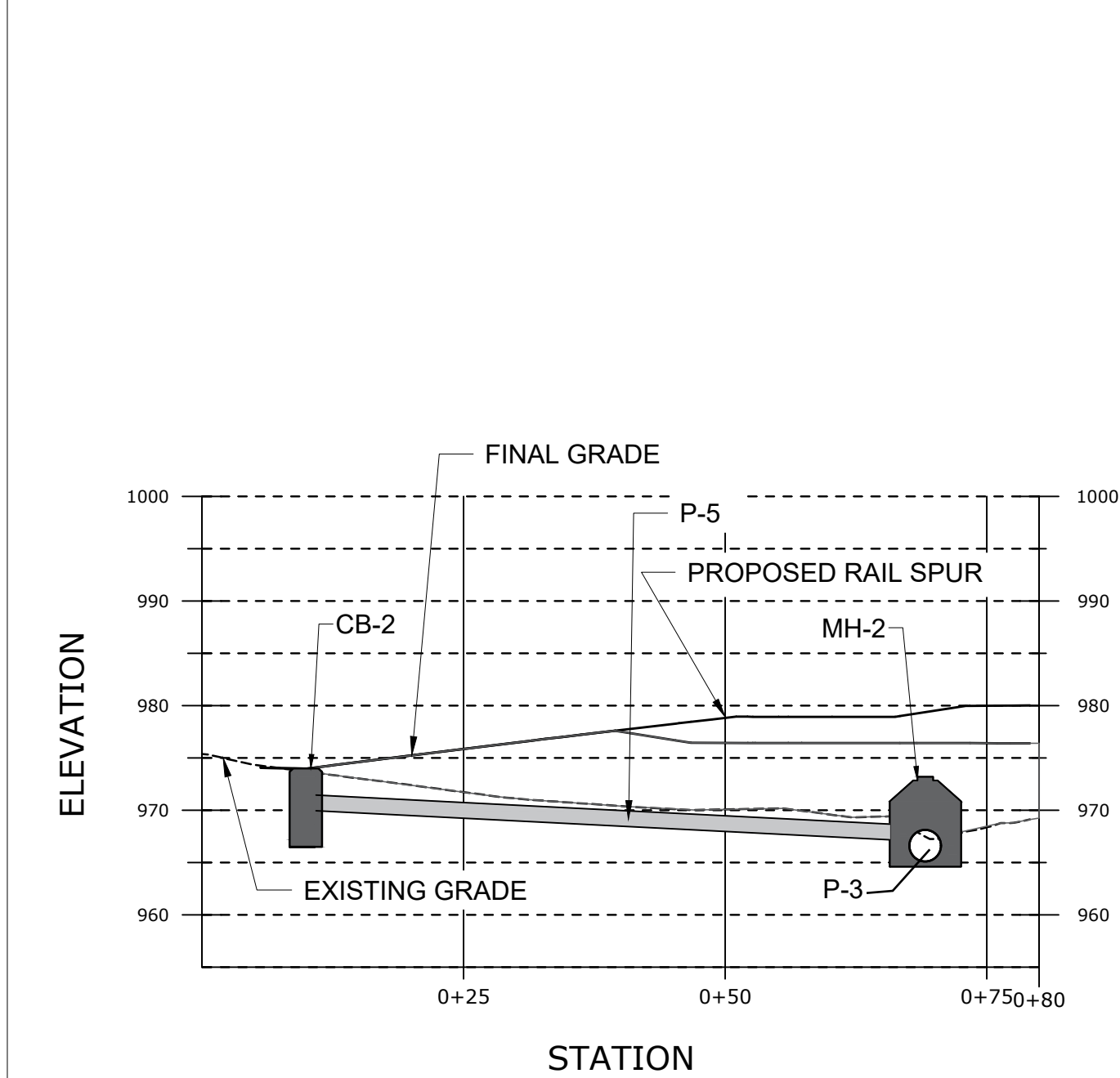
PROFILE CULVERT EXTENSION B
SCALE: HORIZ. 1"=15'
VERT. 1"=15'

3

NOTES

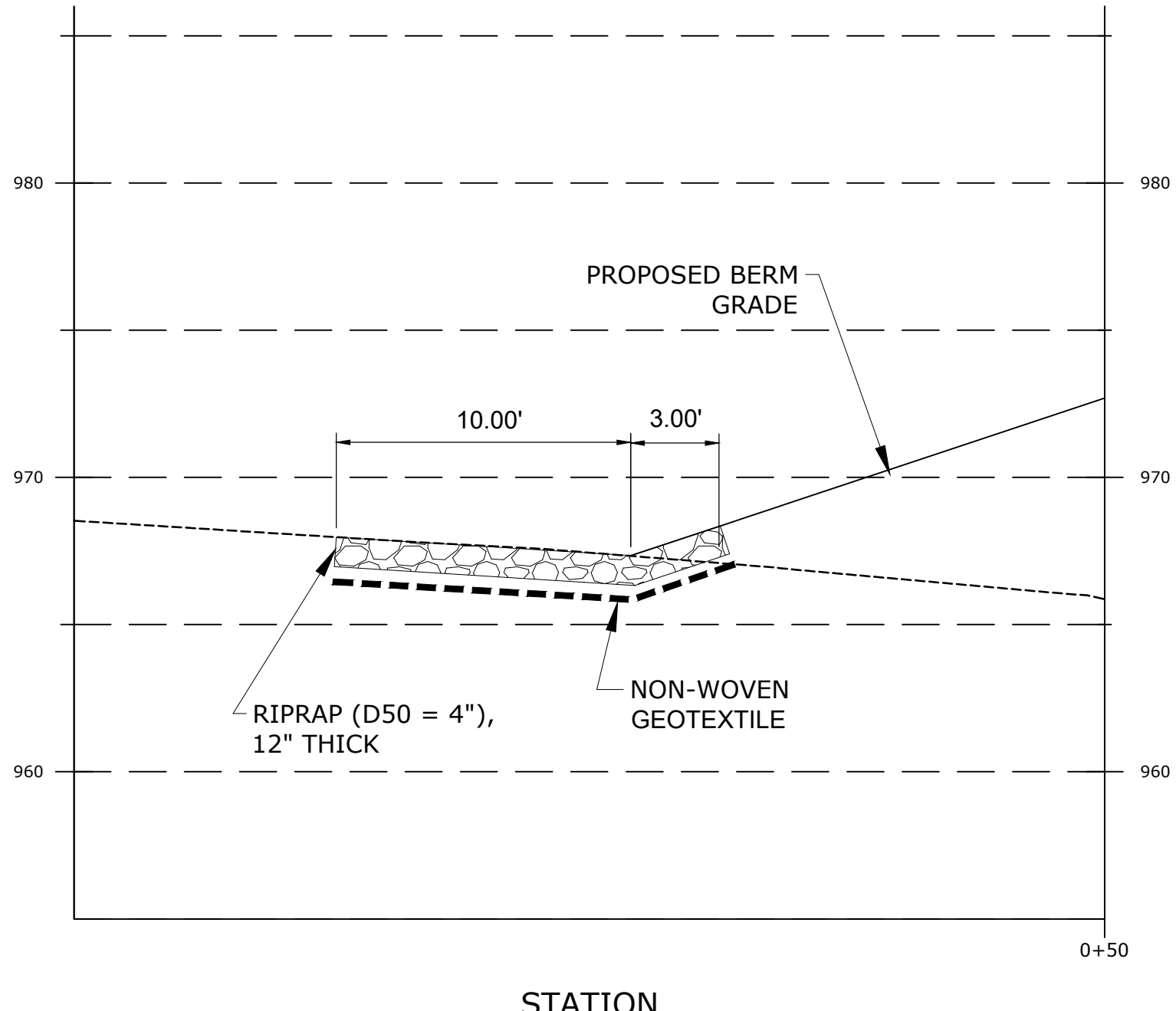
- REMOVE EXISTING HEADWALLS AS REQUIRED TO CONNECT THE PROPOSED CULVERT TO THE EXISTING PIPE AND STONE BOX CULVERT.
- EXISTING DRAINAGE FEATURES ARE APPROXIMATE ONLY BASED ON TOPOGRAPHIC SURVEY AND BASEMAP INFORMATION COLLECTED BY C.T. MALE ASSOCIATES ENGINEERING, SURVEYING, AND ARCHITECTURE, LANDSCAPE, ARCHITECTURE & GEOLOGY D.P.C. DURING THE MONTH OF JULY, 2025 AND FOR OVERHEAD WIRES, DURING THE MONTHS OF SEPTEMBER AND OCTOBER, 2025. CONTRACTOR SHALL VERIFY LOCATION, SIZE AND CONDITIONS OF EXISTING DRAINAGE FEATURES PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES BEFORE INITIATING WORK.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE					Professional Engineer's Name MARK O. GRAVELDING			NOT FOR CONSTRUCTION	 ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION UTILITY DRIVE CULVERT PROFILES TRACK	ARCADIS Project No. 30318691.3000 Date SEPTEMBER 2026 ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	RT-301 ###	
						Professional Engineer's No. 42983								
		2	09/16/2026	FINAL DESIGN	EJC	ESB	State	Date Signed						Project Mgr. LP
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB								
		No.	Date	Revisions	By	Ckd								
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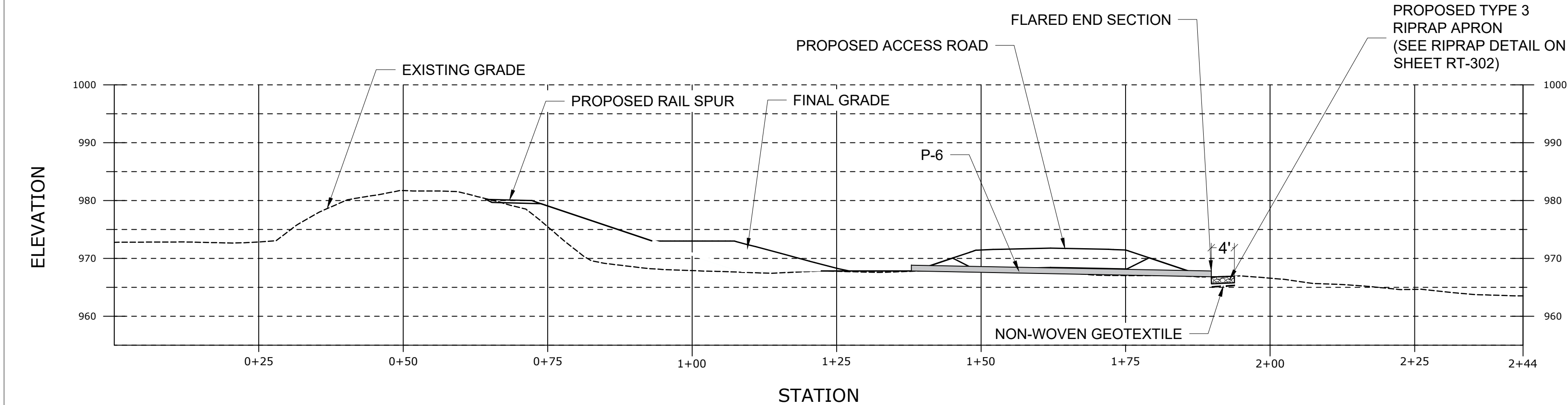
PROFILE ADDITIONAL DRAINAGE - CENTRAL
SCALE: HORIZ. 1"=15'
VERT. 1"=15'

1



PROFILE WEST TYPICAL BERM TOE PROTECTION
SCALE: HORIZ. 1"=5'
VERT. 1"=5'

2



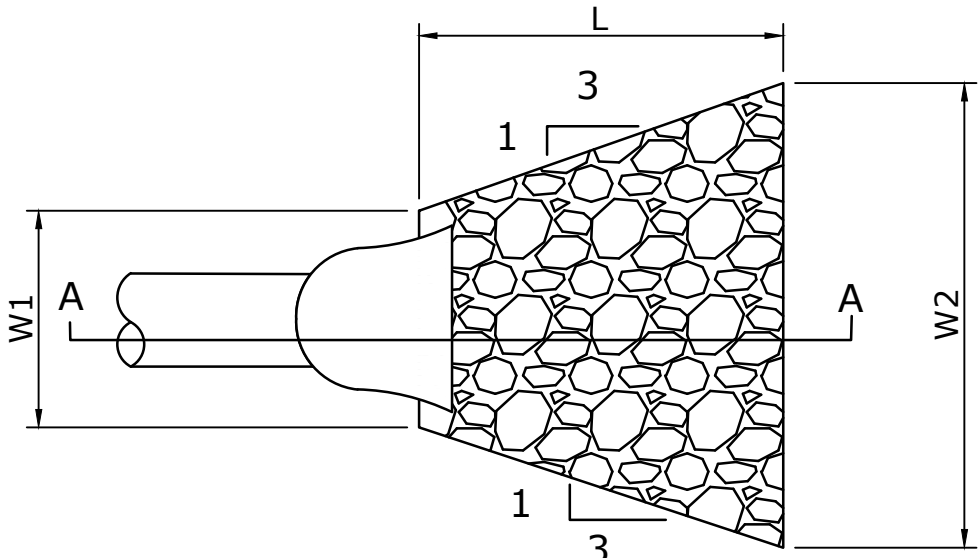
PROFILE ADDITIONAL DRAINAGE - SOUTH
SCALE: HORIZ. 1"=15'
VERT. 1"=15'

3

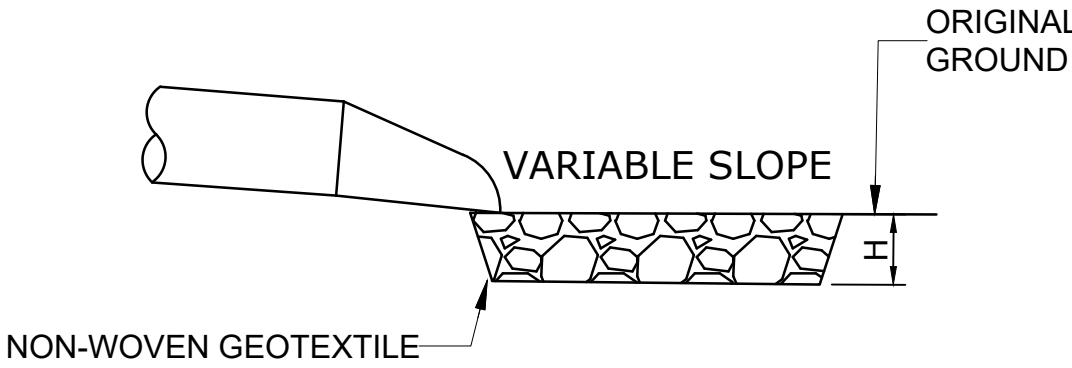
PIPE SCHEDULE						
NAME	SIZE	LENGTH	SLOPE	DESCRIPTION	UPSTREAM INVERT EL.	DOWNSTREAM INVERT EL.
EXISTING RCP B	36"	SEE NOTE 3	3.85%	EXISTING RCP	966.40	965.12
EXISTING STONE BOX CULVERT A	30"	SEE NOTE 3	1.19%	EXISTING STONE BOX CULVERT	967.58	966.82
EXISTING STONE BOX CULVERT B	36"	SEE NOTE 3	3.90%	EXISTING CONCRETE BOX CULVERT	967.59	966.40
P-1	48"	37'	0.00%	HDPE PIPE	965.12	965.12
P-2	48"	80'	0.77%	HDPE PIPE	965.12	964.50
P-3	36"	267'	0.00%	HDPE PIPE	965.12	965.12
P-4	18"	115'	0.67%	HDPE PIPE	968.65	967.87
P-5	18"	59'	5.07%	HDPE PIPE	970.00	967.00
P-6	12"	52'	1.91%	HDPE PIPE	967.82	966.83

STRUCTURE SCHEDULE					
STRUCTURE NAME:	RIM EL.	PIPES IN:	PIPES OUT	NORTHING	EASTING
CB-1	RIM = 972.50 INV IN = 965.12 INV OUT = 965.12	P-1	P-2	2979601.1809	184918.9056
CB-2	RIM = 973.99 INV OUT = 970.00	N/A	P-5	2979940.3785	184897.0078
MH-1	RIM = 973.61 INV IN = 966.82 INV IN = 965.12 INV OUT = 965.12	EXISTING STONE BOX CULVERT A P-3	P-1	2979614.3034	184884.4787
MH-2	RIM = 973.20 INV IN = 965.12 INV IN = 967.00 INV OUT = 965.12	EXISTING RCP B P-5 (SEE RT-302)	P-3	2979881.3135	184899.7052

CULVERT ID	RIPRAP TYPE	LENGTH OF APRON L (FEET)	DEPTH OF APRON H (INCHES)	UPSTREAM WIDTH OF APRON W1 (FEET)	UPSTREAM WIDTH OF APRON W2 (FEET)
P-2	1	20	18	12	25
P-4	3	12	12	9	17
P-6	3	4	12	3	6



PLAN VIEW



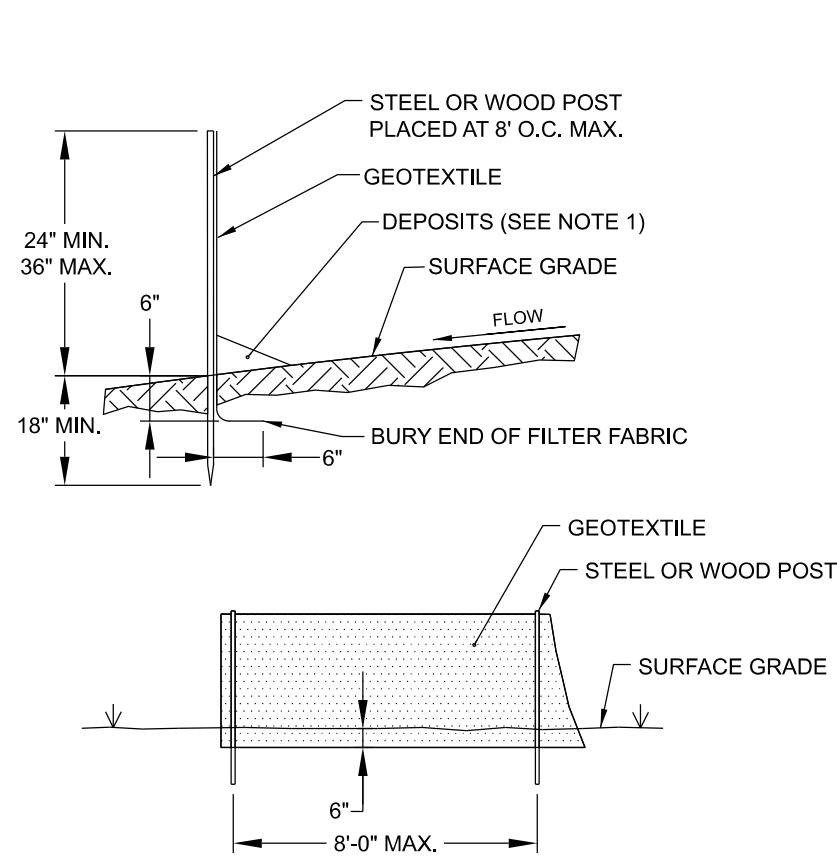
SECTION A-A

RIPRAP APRON DETAIL

4

NOTES

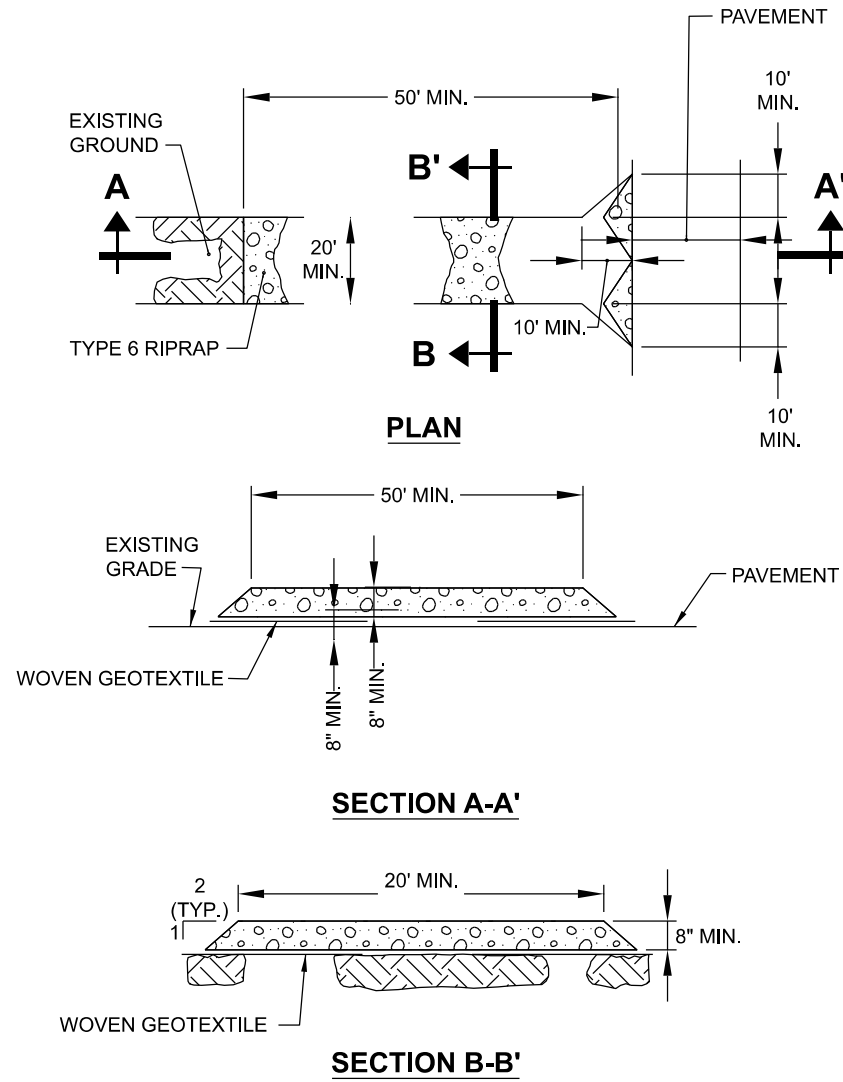
- CB-1 AND CB-2 SHALL BE MASSDOT DETAIL (206.1.1) OR APPROVED EQUAL.
- APRON THICKNESS (H), LENGTH (L), UPSTREAM WIDTH (W1) AND DOWNSTREAM WIDTH (W2) SHALL BE AS SPECIFIED IN THE TABLE ABOVE. APRON SLOPE SHALL BE AT ZERO OR NEGATIVE GRADE FROM OUTLET AND BLENDED TO MEET EXISTING GRADE.
- EXISTING DRAINAGE FEATURES ARE APPROXIMATE ONLY BASED ON TOPOGRAPHIC SURVEY AND BASEMAP INFORMATION COLLECTED BY C.T. MALE ASSOCIATES ENGINEERING, SURVEYING, AND ARCHITECTURE, LANDSCAPE, ARCHITECTURE & GEOLOGY D.P.C. DURING THE MONTH OF JULY, 2025 AND FOR OVERHEAD WIRES, DURING THE MONTHS OF SEPTEMBER AND OCTOBER, 2025. CONTRACTOR SHALL VERIFY LOCATION, SIZE AND CONDITIONS OF EXISTING DRAINAGE FEATURES PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES BEFORE INITIATING WORK.



- NOTES:
- DEPOSITS SHALL BE REMOVED WHEN THEY REACH APPROXIMATELY 6 INCHES ABOVE GRADE ELEVATION.
 - THE SILT FENCE WILL REMAIN IN PLACE UNTIL A VEGETATIVE STAND IS ESTABLISHED.
 - THE SILT FENCE WILL BE USED FOR TEMPORARY EROSION AND SEDIMENTATION CONTROL ONLY.

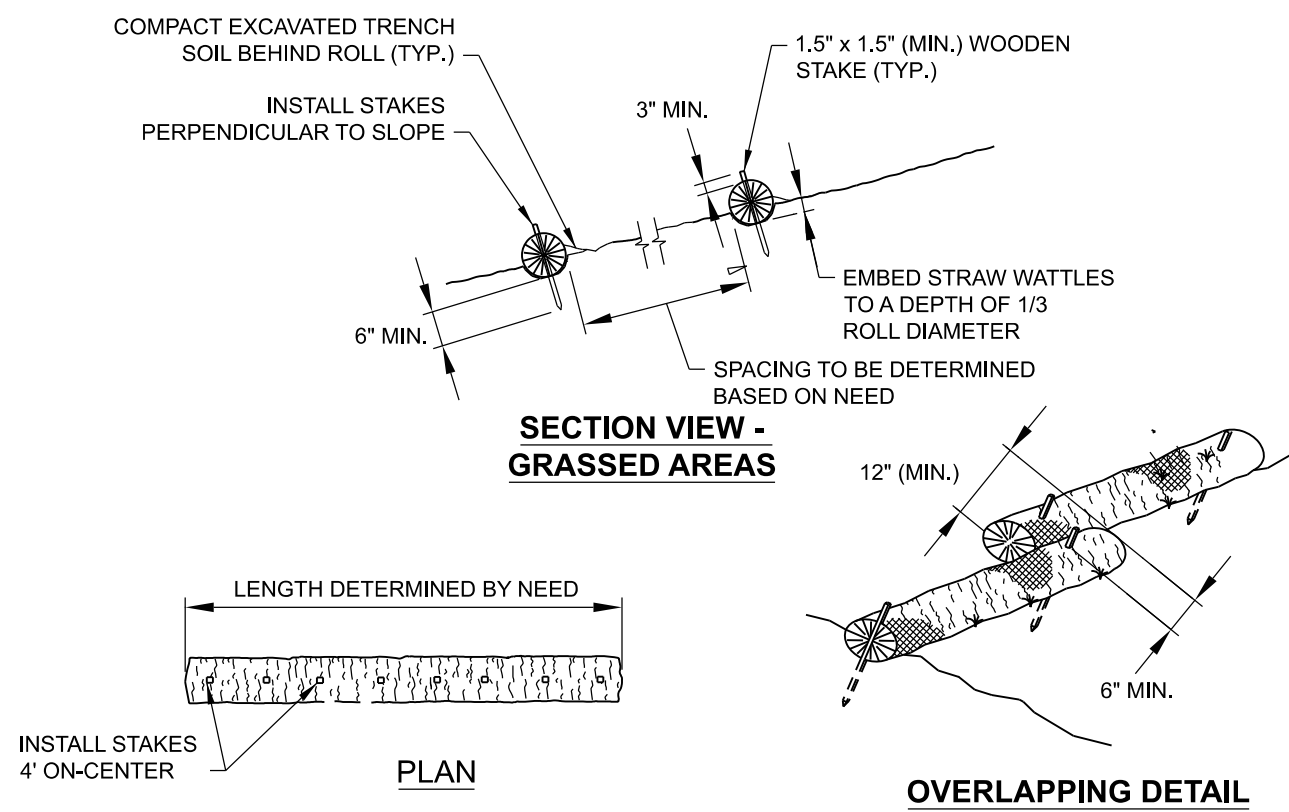
TEMPORARY SILT FENCE 1

NOT TO SCALE



TEMPORARY STABILIZED CONSTRUCTION ENTRANCE FOR MAIN SITE ACCESS 3

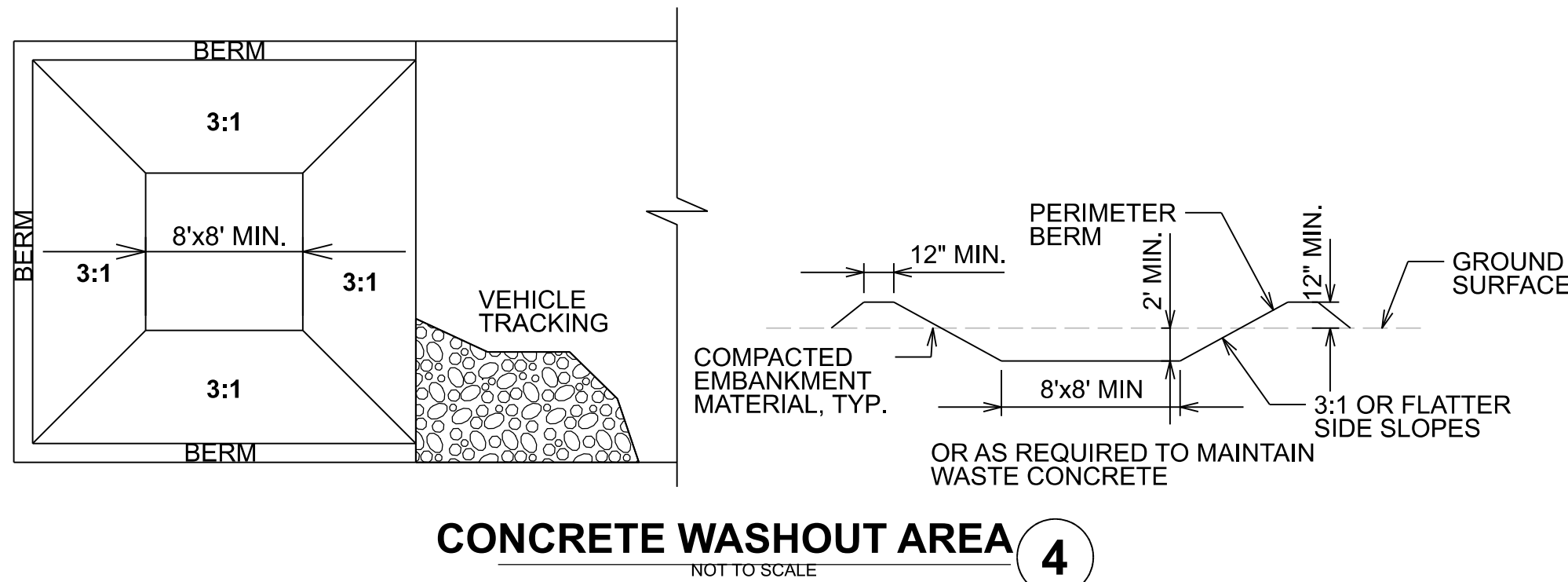
NOT TO SCALE



- NOTES:
- PLACE WATTLES PARALLEL TO TOE OF SLOPE OR ALONG SLOPE CONTOUR, TURN THE ENDS OF EACH WATTLE UPSLOPE TO INHIBIT FLOW A

TEMPORARY STRAW WATTLE 2

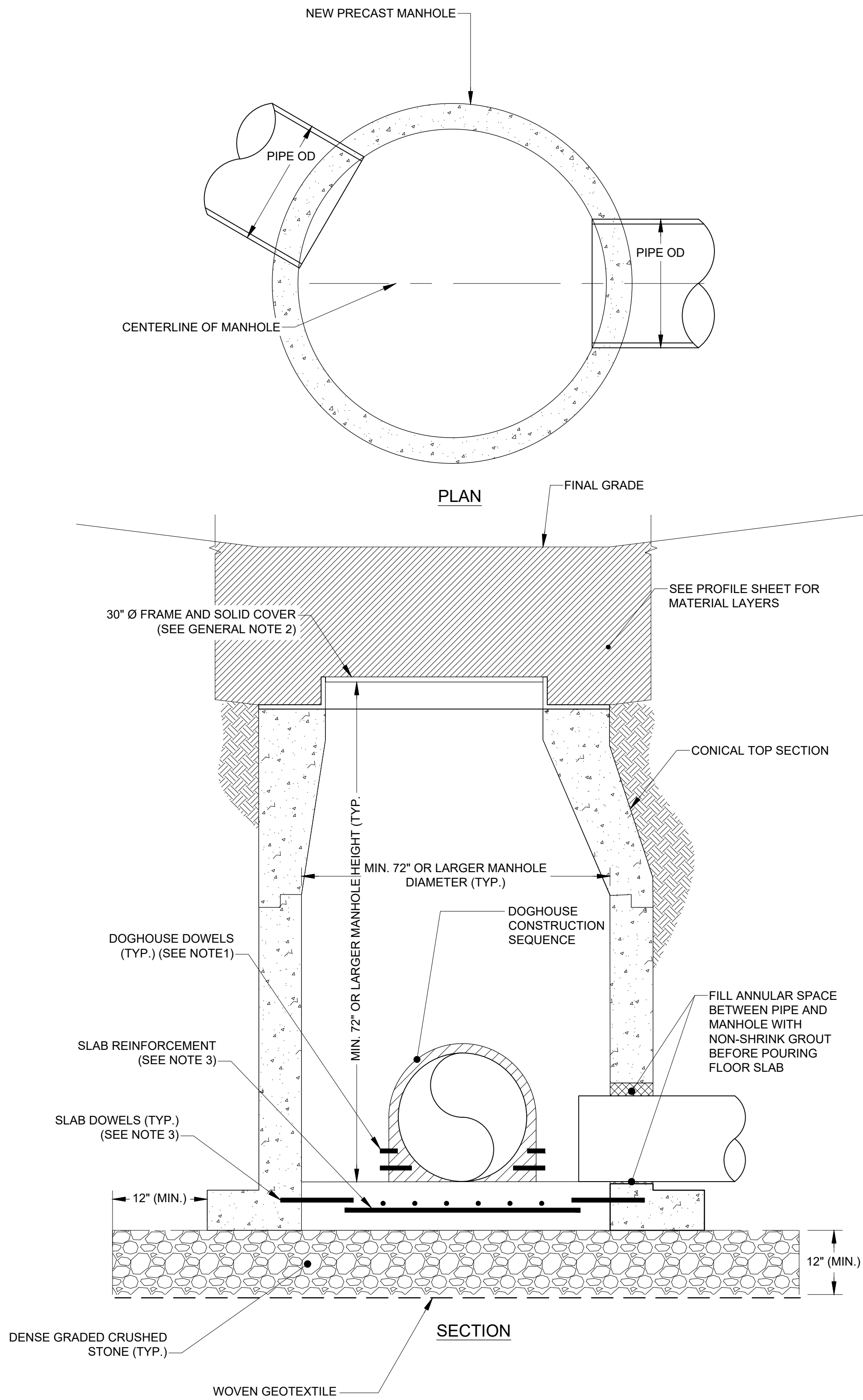
NOT TO SCALE



CONCRETE WASHOUT AREA 4

NOT TO SCALE

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						Professional Engineer's No.						
						42983						
		2	09/2026	FINAL DESIGN	EJC	ESB						
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	State					
No.	Date	Revisions	By	Ckd	MA	Date Signed	Project Mgr. LP			Date SEPTEMBER 2026		
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											TRACK	

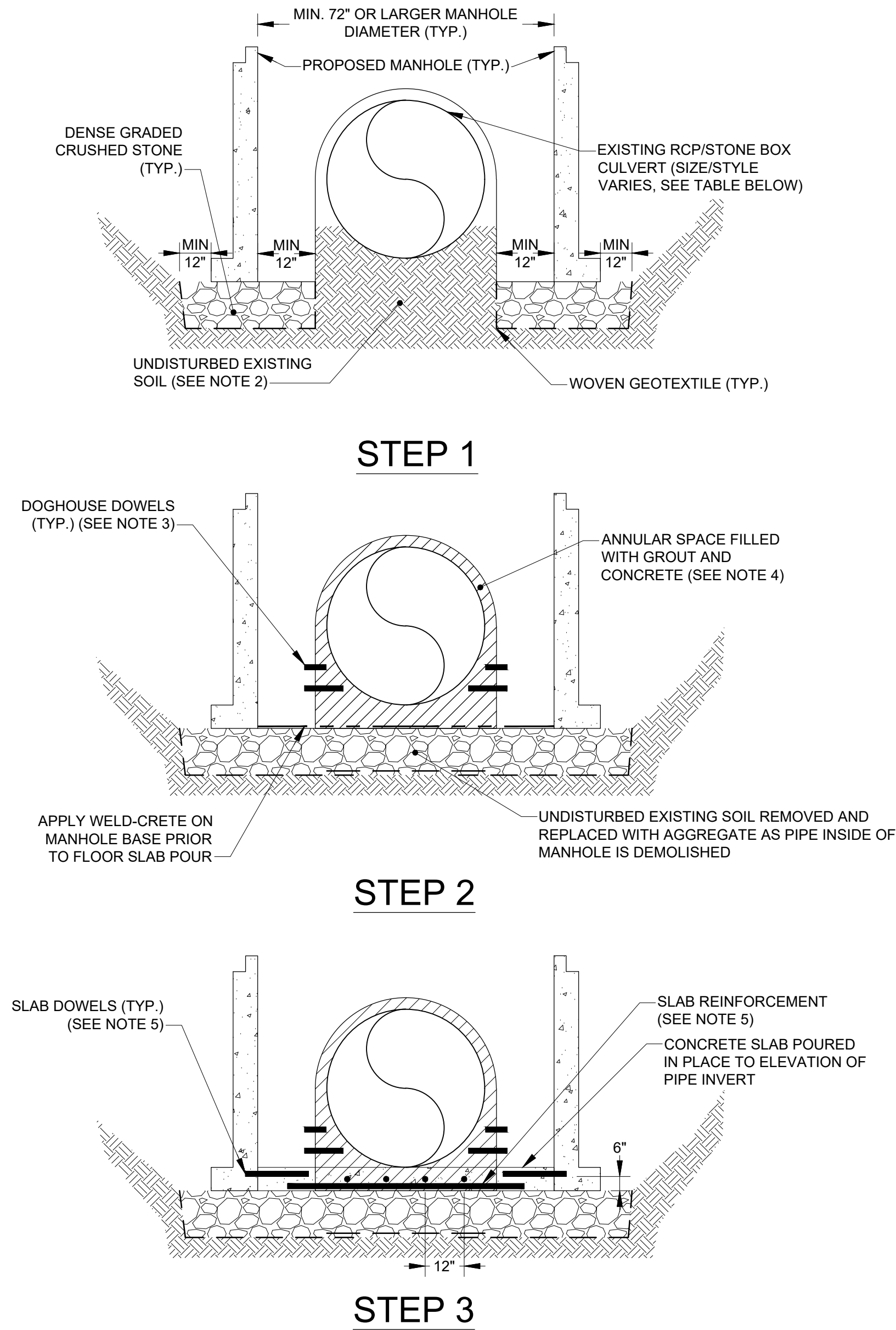


PRECAST DOGHOUSE MANHOLE 1

NOT TO SCALE

GENERAL NOTES:

1. MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO LATEST ASTM C478 SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS INCLUDING THE USE OF GASKETED JOINTS AND WATER PROOFING ALL EXTERIOR SURFACES.
2. MANHOLE FRAME AND COVER SHALL BE SUITABLE FOR BURIED INSTALLATIONS. TRAFFIC-RATED COVERS ARE NOT REQUIRED.
3. STEEL REINFORCED COPOLYMER STEPS SHALL BE SPACED AT 12" O.C. STARTING 30" OFF FLOOR.
4. OPENINGS IN MANHOLE SHALL BE FORMED PRIOR TO MANHOLE CASTING AND SHALL BE SIZED TO ACCOMMODATE PIPE OD AND PROPOSED MANHOLE/PIPE CONNECTION.



CONSTRUCTION NOTES:

1. THIS DETAIL DEPICTS A CONCEPTUAL DOGHOUSE CONSTRUCTION SEQUENCE. THE CONTRACTOR MAY PROPOSE ALTERNATIVE CONSTRUCTION METHODS FOR ENGINEER APPROVAL.
2. UNDISTURBED NATIVE SOIL SHALL REMAIN IN PLACE UNDERNEATH THE EXISTING CULVERT/PIPE TO PROVIDE TEMPORARY SUPPORT DURING CONSTRUCTION. THE AMOUNT AND SHAPE OF EXISTING SOIL SHOWN IS ONLY AS AN APPROXIMATION. THE CONTRACTOR SHALL DETERMINE THE APPROPRIATE AMOUNT OF SOIL.
3. A MINIMUM OF TWO (2) DOGHOUSE DOWELS SHALL BE INSTALLED ON EACH SIDE OF OPENING.
4. ANNULAR SPACE BELOW PIPE SPRINGLINE SHALL BE FILLED WITH CONCRETE USING FLEXIBLE FORMWORK THAT MATCHES CURVE OF MANHOLE WALL. ANNULAR SPACE ABOVE PIPE SPRINGLINE SHALL BE FILLED WITH NON-SHRINK GROUT CONFORMING TO MASSDOT M4.04.5. FILLING OF THE ANNULAR SPACE SHALL BE CONDUCTED BEFORE DESTROYING THE NECESSARY SECTIONS OF EXISTING PIPE. CONCRETE SHALL CONFORM TO MASSDOT M4.06.1, 4,000 PSI MINIMUM COMPRESSIVE STRENGTH.
5. DRILL AND GROUT 16"-LONG #4 SLAB DOWELS 4" INTO MANHOLE WALL AT 2.5' CENTER TO CENTER AROUND PERIMETER. PLACE #4 REINFORCING BAR AT 12" CENTER TO CENTER EACH WAY CENTERED IN SLAB.

DOGHOUSE CONSTRUCTION SEQUENCE 2

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE						Professional Engineer's Name			
							Professional Engineer's No.			
							42983			
			2	09/16/2026	FINAL DESIGN	EJC	ESB	State	Date Signed	Project Mgr.
			1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	MA		LP
			No.	Date	Revisions	EJC	By	Designed by	Drawn by	Checked by
								ESB	EJC	WAJ
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NOT FOR CONSTRUCTION



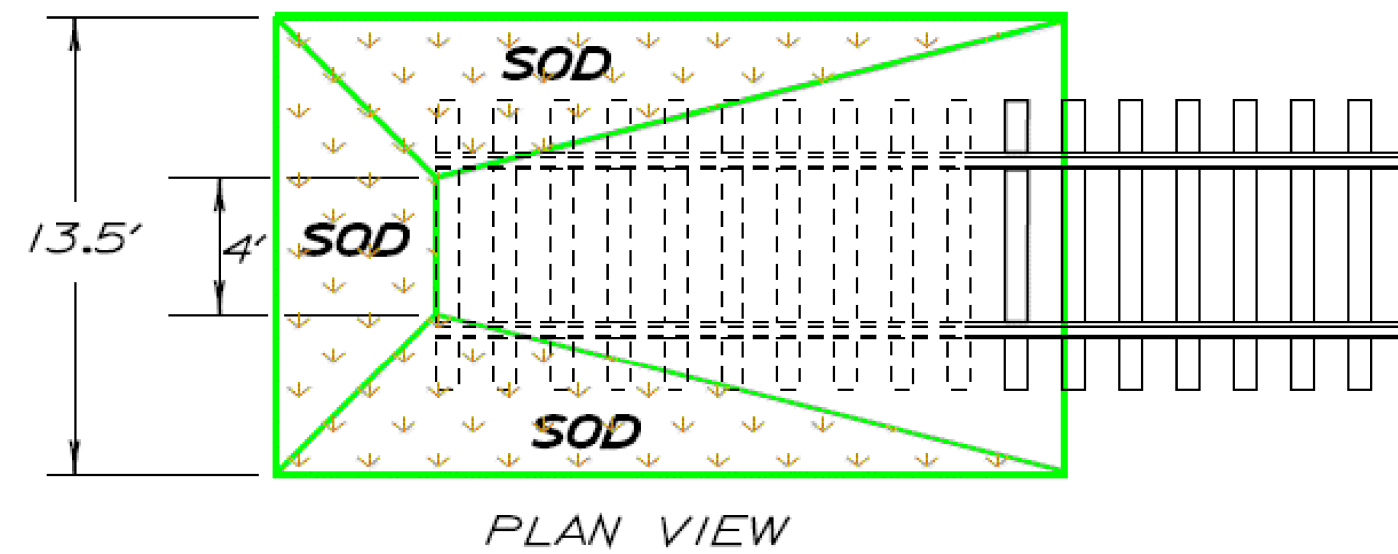
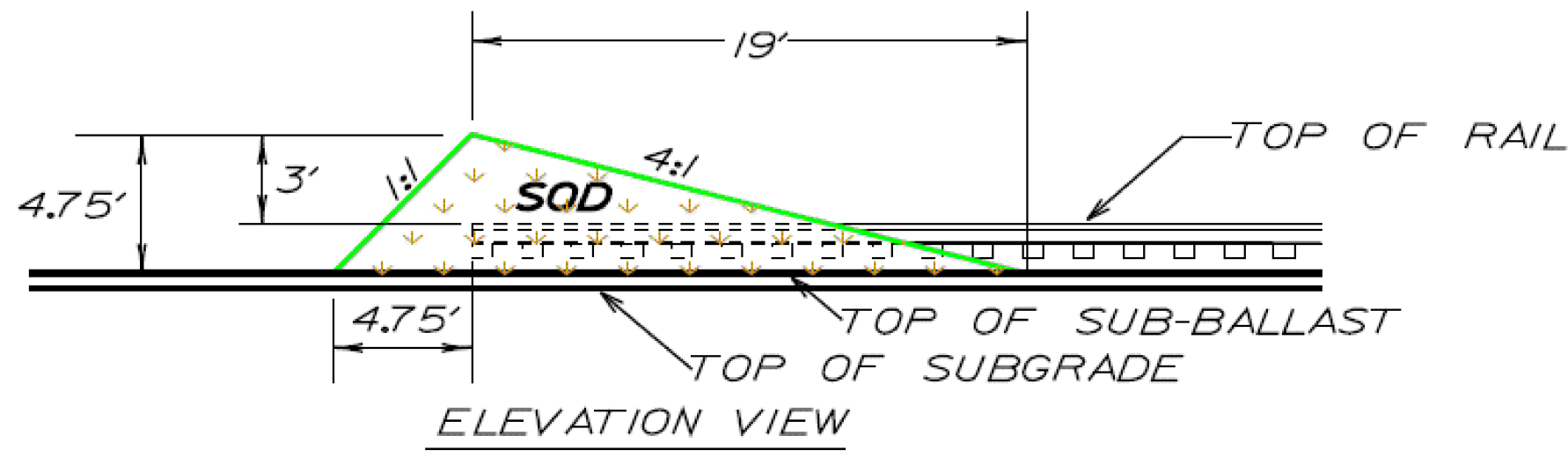
ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION

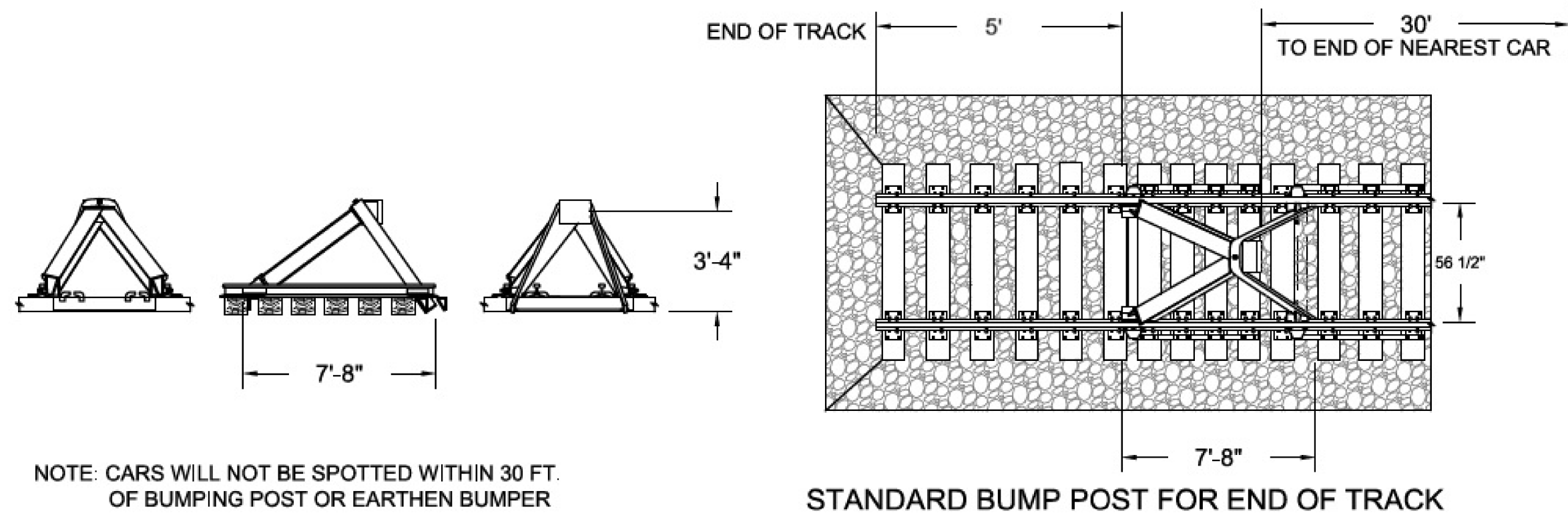
UTILITY DRIVE DRAINAGE DETAILS

TRACK

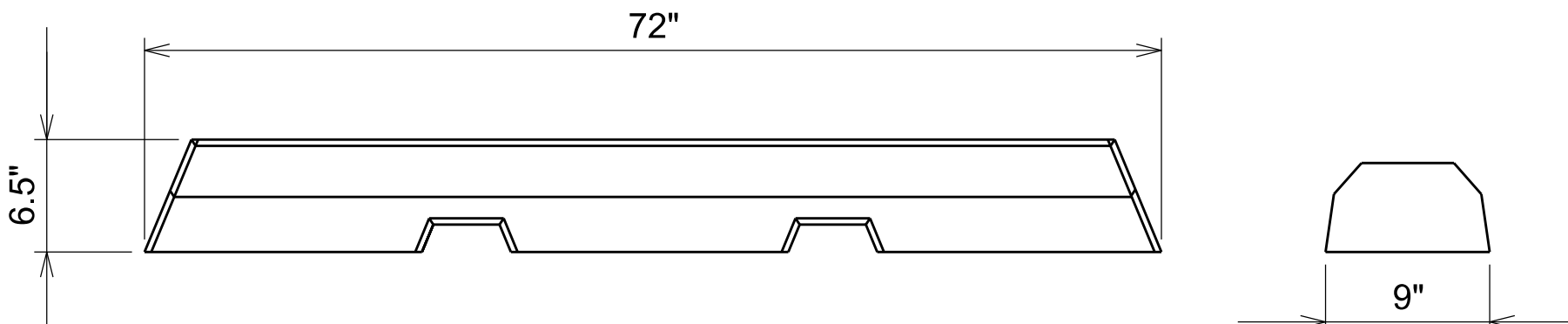
ARCADIS Project No. 30318691.3000	RT-204 11111111
Date SEPTEMBER 2026	
ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	



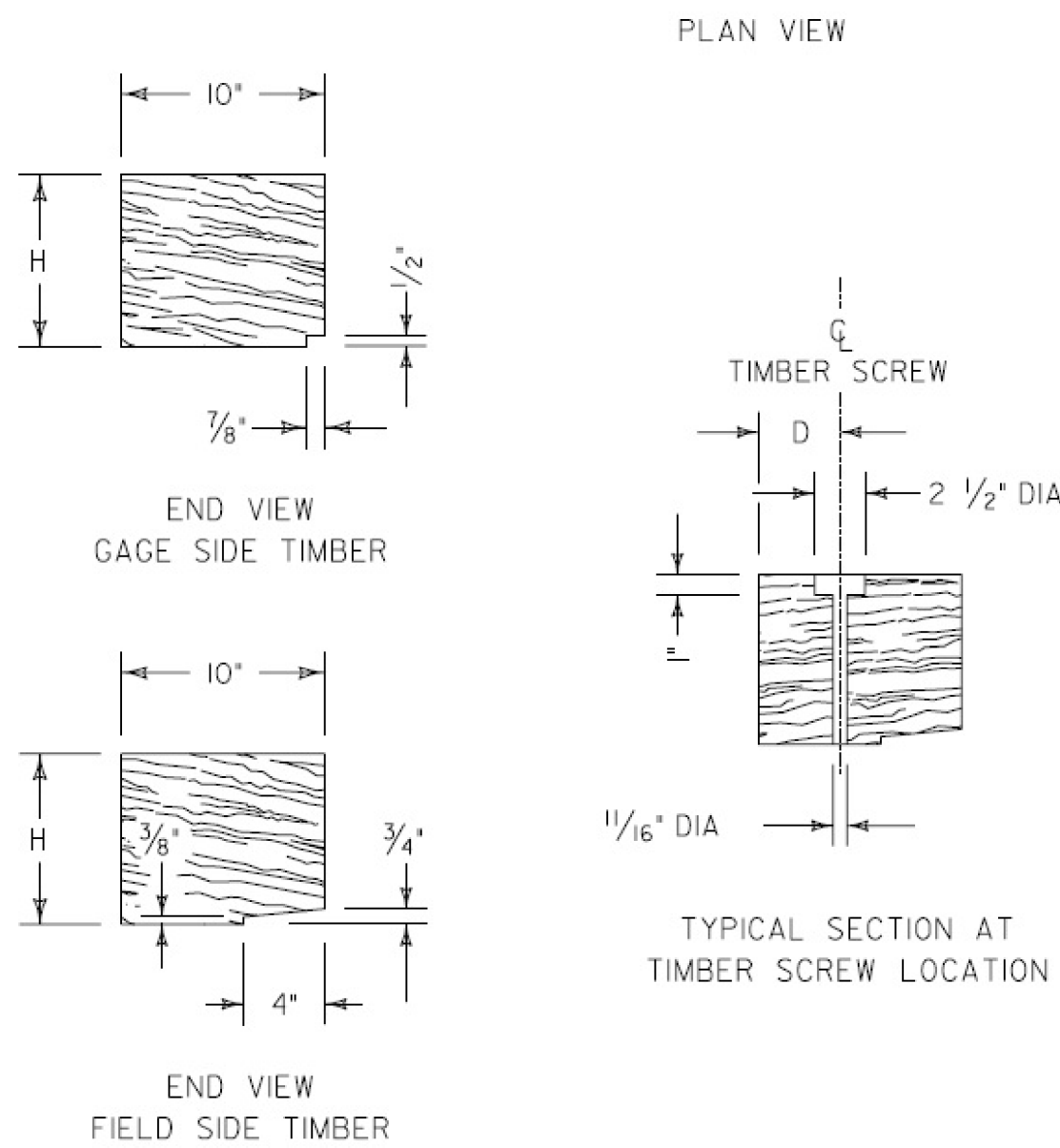
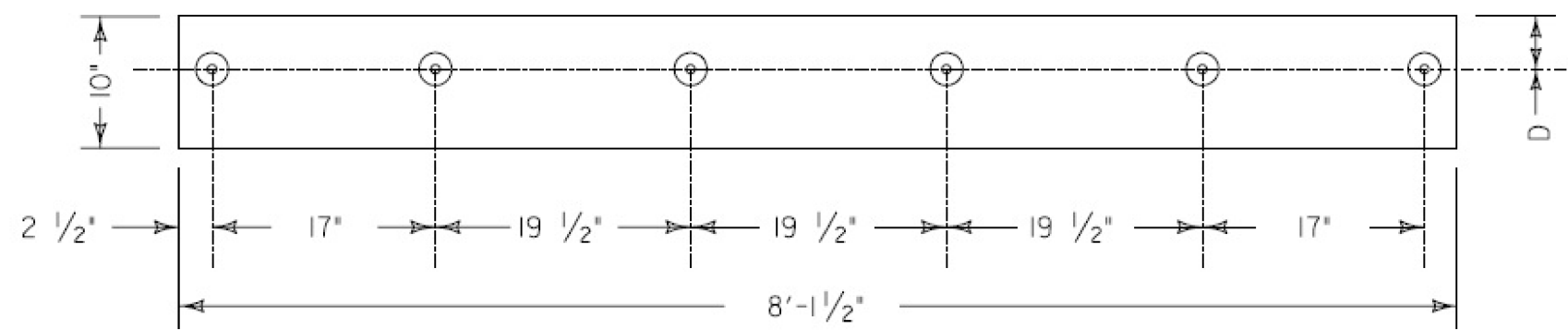
PLAN VIEW
EARTHEN MOUND
NOT TO SCALE 1



BUMPING POST
NOT TO SCALE 2

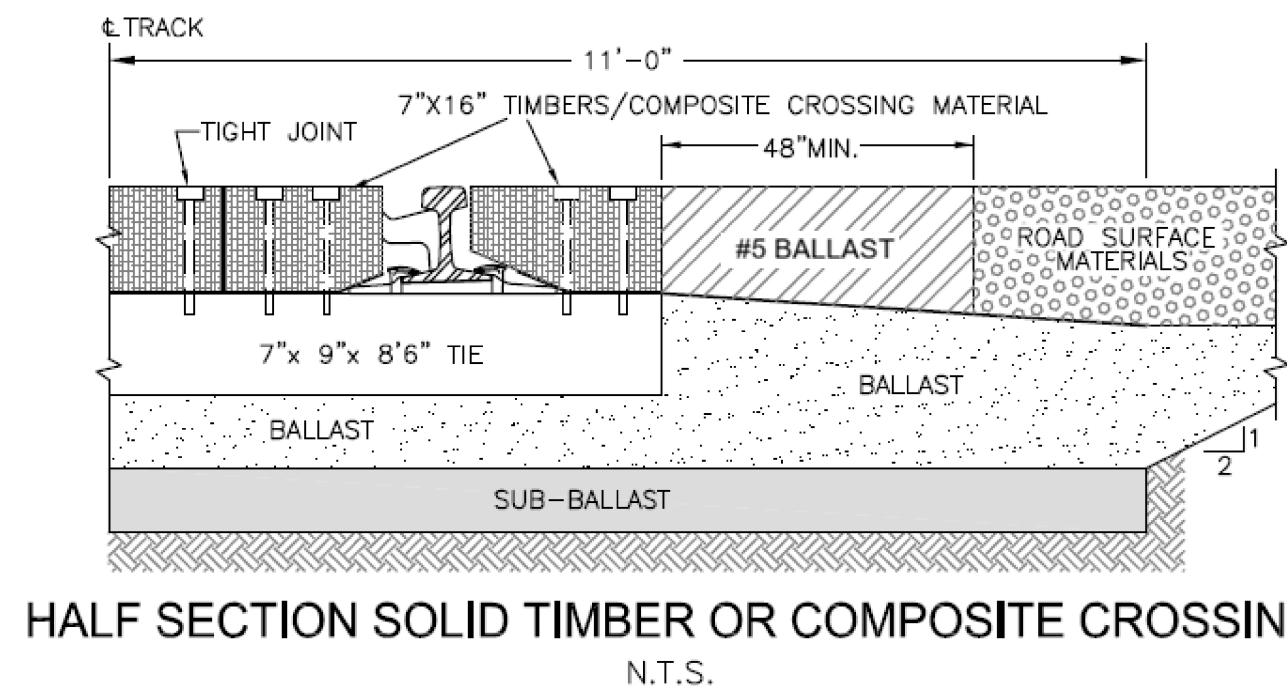


6' CONCRETE PARKING CURB
NOT TO SCALE 3

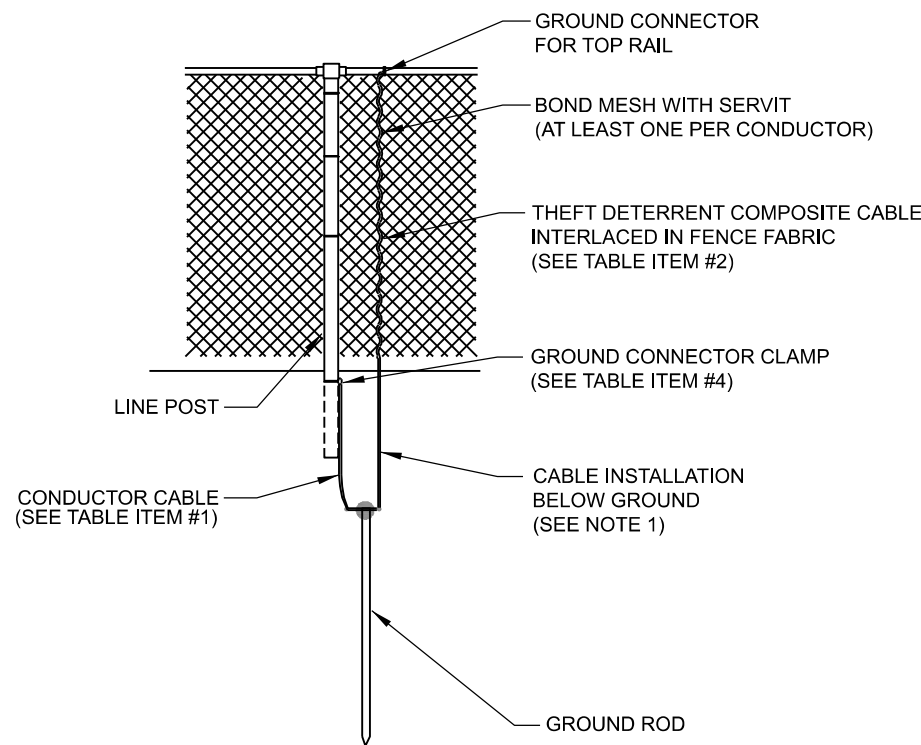


- NOTES
1. TIMBERS ARE NOT PREDRILLED UNLESS SPECIFIED IN THE REQUISITION.
 2. TOLERANCES:
TIE PLATE CUT-OUT AND 'H' - 1/8" +/-
OTHER - 1/4" +/-
 3. MATERIAL:
OAK OR GUM
TREAT PER MW SPEC 99001
 4. TIMBERS TO BE MARKED FOR RAIL SIZE

RAIL WGT.	H	SIDE	D
115-122	7 1/2"	GAGE	5"
132	8"	FIELD	4"
136-141	8 3/8"		

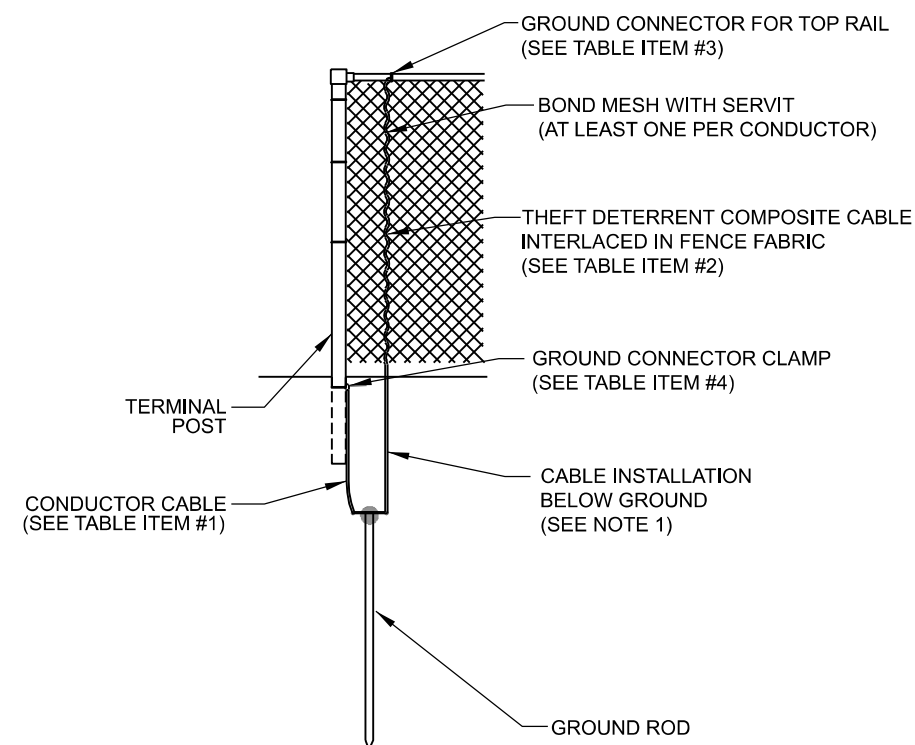


CROSSING TIMBER DETAIL
NOT TO SCALE 4



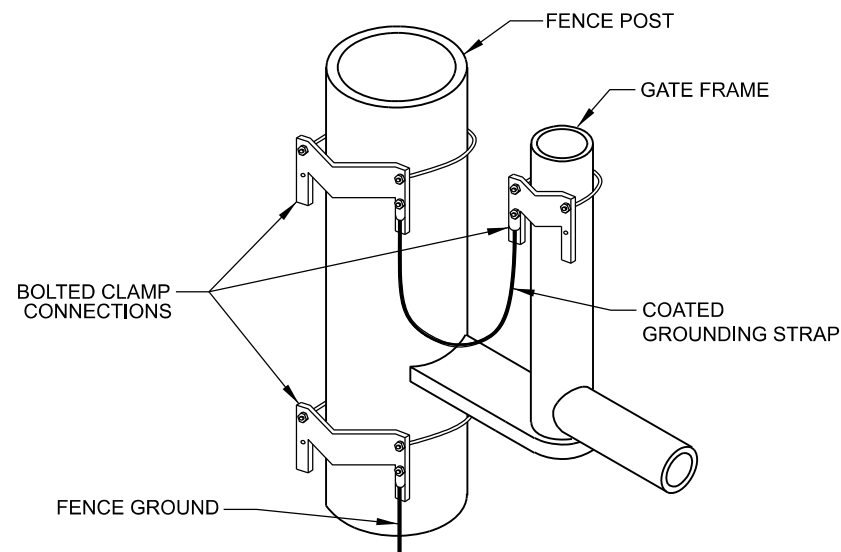
NOTE:
1. THEFT DETERRENT COMPOSITE CABLE CAN BE RUN IN SAME TRENCH USED FOR THE CONDUCTOR WIRE. CABLE CAN BE SECURED TO BOTTOM OF FENCE POST USING ZIP-TIES OR SIMILAR PRODUCT THEN INTERLACED IN FENCE FABRIC UP TO FENCE TOP RAIL.

TYPICAL LINE POST AND FENCE FABRIC GROUNDING 1

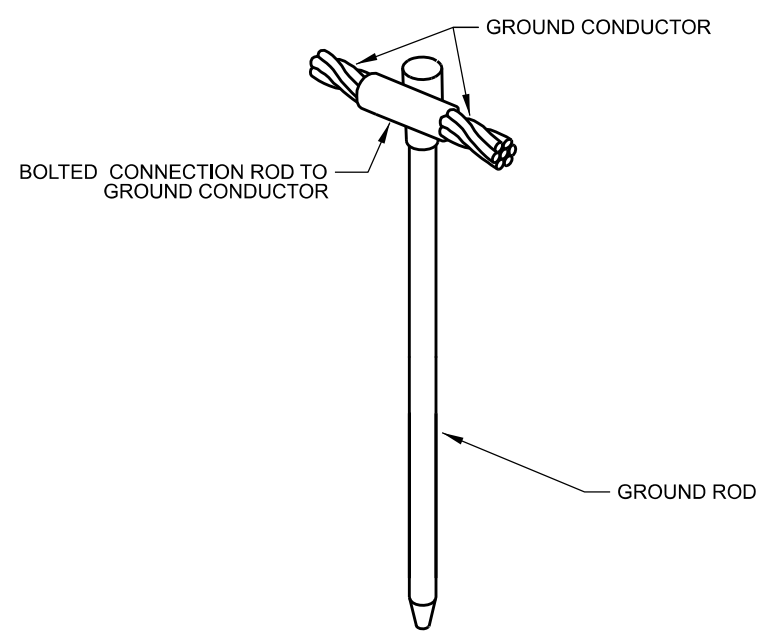


NOTE:
1. THEFT DETERRENT COMPOSITE CABLE CAN BE RUN IN SAME TRENCH USED FOR THE CONDUCTOR WIRE. CABLE CAN BE SECURED TO BOTTOM OF FENCE POST USING ZIP-TIES OR SIMILAR PRODUCT THEN INTERLACED IN FENCE FABRIC UP TO FENCE TOP RAIL.

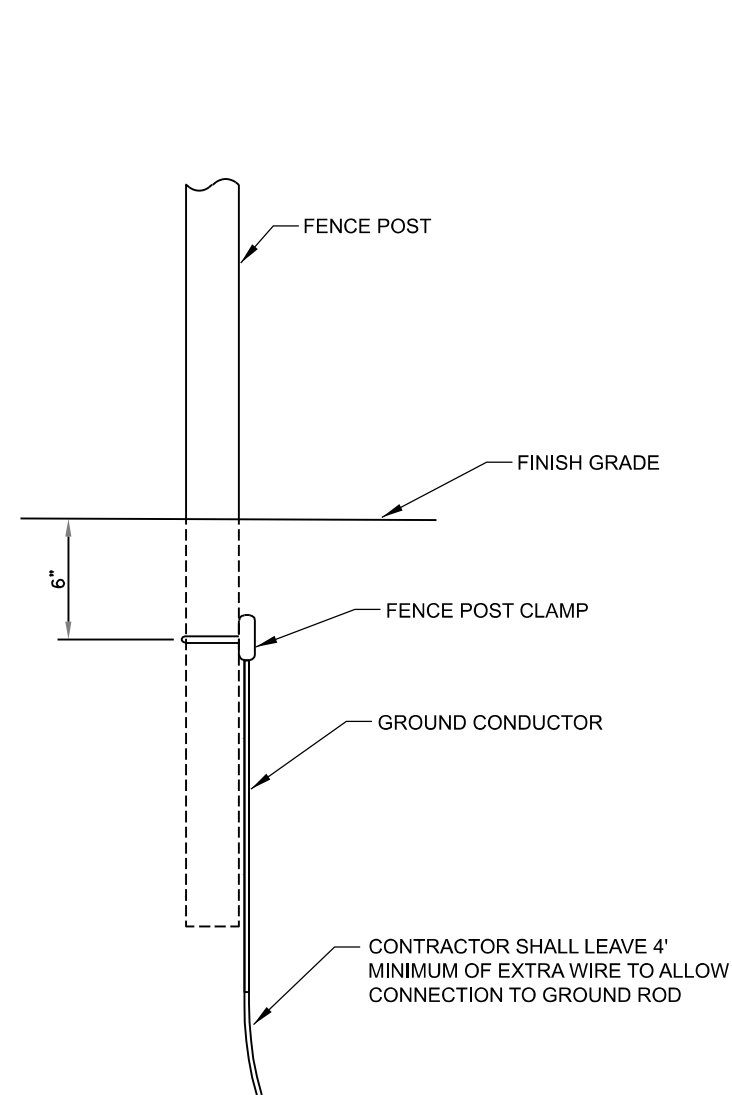
TYPICAL TERMINAL POST AND FENCE FABRIC GROUNDING 2



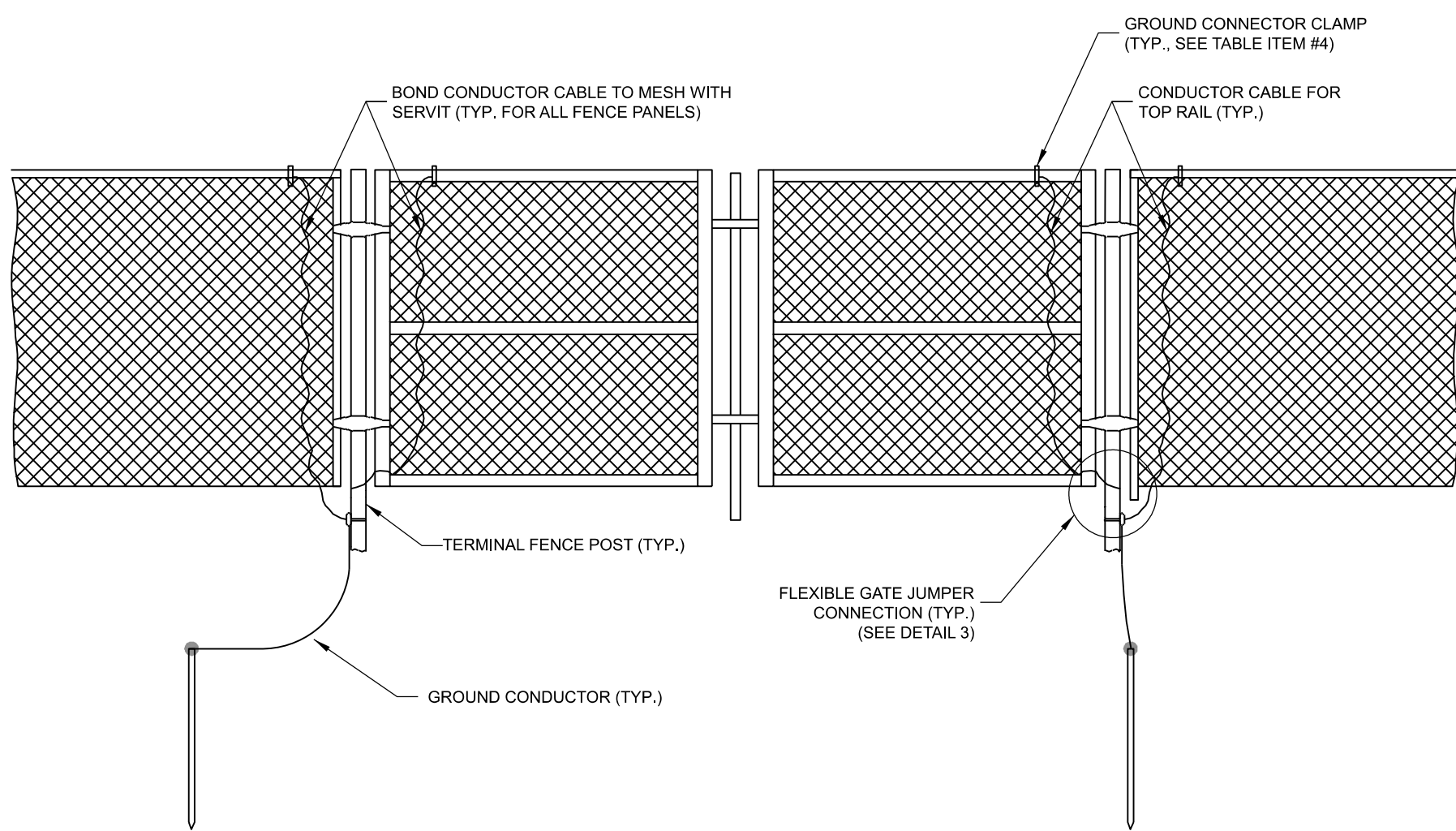
FLEXIBLE GATE JUMPER CONNECTION 3



GROUND ROD CONNECTION 4



TYPICAL FENCE POST 5

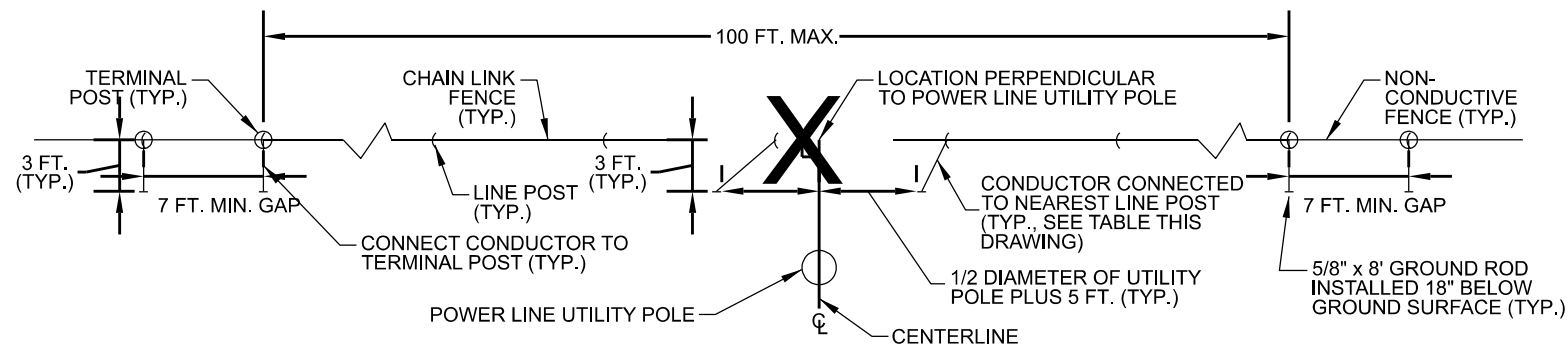


TYPICAL FENCE AND GATE GROUND LOOP 6

- GENERAL NOTES:
1. LINE AND TERMINAL POSTS SHOULD BE SECURELY CONNECTED TO GROUND ROD AT LEAST EVERY 100 LINEAR FEET.
 2. TOP OF GROUND ROD SHALL BE INSTALLED AT MINIMUM DEPTH OF 1.5 FEET BELOW GRADE.
 3. GROUND CONDUCTOR SHALL BE INSTALLED AT MINIMUM DEPTH OF 1.5 FEET BELOW GRADE.

ITEM	MATERIAL DESCRIPTION	MANUF.	CAT. NO.
1	CONDUCTOR, GROUND, #4/0 AWG, 19 STRAND, BARE, SOFT DRAWN COPPER	--	--
2	CONDUCTOR, GROUND, THEFT DETERRENT COMPOSITE CABLE	ERICO	CC5A04
3	GROUND CONNECTOR, 1-1/4" IPS TOP RAIL TO #2 COPPER	SEFCOR	1-QC-2548
4	CLAMP, BRONZE TINNED FENCE POST	ERICO	FC078
5	SERVIT CLAMP CONNECTION FOR MESH (CONDUCTOR WIRE TO FENCE FABRIC)	HARGER	FGC2-4/0
6	FLEXIBLE GATE JUMPER CONNECTION (TERMINAL POST TO FENCE FRAME)	HARGER	AS REQ'D

- NOTE:
1. MANUFACTURER PRODUCTS SHOWN MAY BE SUBSTITUTED WITH EQUIVALENT PRODUCTS.



- NOTE:
1. WHEN THE FENCE IS PARALLEL TO AN OVERHEAD POWER LINE, ADDITIONAL GROUND RODS ARE TO BE INSTALLED AS SHOWN. REFER TO SITE PLAN FOR NUMBER OF GROUNDS REQUIRED AT EACH APPLICABLE STRUCTURE LOCATION.

FENCE GROUND ROD SPACING 7

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE							Professional Engineer's Name	NOT FOR CONSTRUCTION	 ARCADIS ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION	TYPICAL DETAILS - FENCING	TRACK	ARCADIS Project No. 30318691.3000	RT-307			
								Professional Engineer's No.										
								42983										
		2	09/2026	FINAL DESIGN			EJC	ESB								State	Date Signed	Project Mgr.
		1	02/20/2026	CONCEPTUAL DESIGN			EJC	ESB								MA		LP
		No.	Date	Revisions			By	Ckd								Designed by	Drawn by	Checked by
THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.							ESB	EJC	WAJ									

DESIGN AND CODE CRITERIA:

1.

ALL CONSTRUCTION SHALL CONFORM TO THE MASSECHUSETETS BUILDING CODE (10TH EDITION), INTERNATIONAL BUILDING CODE (2021 EDITION), ASCE 7-16.
2.

LIVE LOADS:
EQUIPMENT:
SLABS ON GRADE (TYP UON)

SEE PLAN
725 PSF UNIFORM AND/OR THE FOLLOWING HEAVY EQUIPMENT:
– 3 TON RATED FORKLIFT
– ASHTO HS-20 AXLE LOADS
– KONECRANE LIFTTRUCK REACH STACKERS MODEL SMV 4646 TC5,
MAX LOAD TO TANDEM AXLE = 304,000 LBS (FRONT AXLE = 276,500 LBS;
REAR AXLE = 27,500 LBS)
3.

WIND LOADS:

N/A
4.

SEISMIC LOADS:

N/A
5.

SNOW LOADS:

N/A
6.

FLOOD LOADS:

N/A
7.

FOUNDATION DESIGN:

DESIGN NET BEARING PRESSURE = 14,000 PSF PER
GEOTECHNICAL SUBSURFACE INVESTIGATION AND REPORT
(ARCADIS PROJECT NO. 30318691) BY ARCADIS DATED
FEBRUARY 2026.

ABBREVIATIONS USED IN DRAWINGS:

@	ARCH	AT	HORIZ	HORIZONTAL
	ACI	ARCHITECT OR ARCHITECTURAL	HP	HIGH POINT
	ALT	AMERICAN CONCRETE INSTITUTE	I.D.	INSIDE DIAMETER
	ASTM	ALTERNATE	INT.	INTERIOR
	B/W	AMERICAN SOCIETY FOR TESTING AND MATERIALS	LP	LOW POINT
	C/L AND C	BETWEEN	MFR	MANUFACTURER
	C/C	CENTERLINE	MAX	MAXIMUM
	CHKD	CENTER TO CENTER	MFR	MANUFACTURER
	COL	CHECKERED	MIN	MINIMUM
	CONC	COLUMN	N.T.S.	NOT TO SCALE
	CONT	CONCRETE	O.C.	ON CENTER
	CRSI	CONTINUOUS	O.D.	OUTSIDE DIAMETER
	DIA	CONCRETE REINFORCING STEEL INSTITUTE	O/	OVER
	DWG	DIAMETER	P	PERIODIC
	Ø	DRAWING	PL	PLATE
	EA	DIAMETER	SQ	SQUARE
	EW & E.W.	EACH	STD	STANDARD
	EL.	EACH WAY	STL	STEEL
	EX	ELEVATION	SST	STAINLESS STEEL
	EXT.	EXISTING	T&B	TOP & BOTTOM
	FDN	EXTERIOR	T/	TOP
	FTG.	FOUNDATION	TYP.	TYPICAL
	F.F.	FOOTING	UON	UNLESS OTHERWISE NOTED
	F.F.E.	FINISHED FLOOR	VERT	VERTICAL
		FINISHED FLOOR ELEVATION	W/	WITH

GENERAL:

1.

QUALITY OF CONSTRUCTION REQUIRED, PERFORMANCE LEVELS OF WORKMANSHIP, MANUFACTURING AND INDUSTRY STANDARDS, STRENGTH AND PHYSICAL REQUIREMENTS OF MATERIALS, CONFORMANCE TO CODES AND REGULATIONS, GUARANTEES AND OTHER PROJECT REQUIREMENTS ARE SPECIFIED IN THESE NOTES.
2.

IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED, OR NOTED SHALL BE PROVIDED.
3.

PERFORM ALL WORK IN COORDINATION WITH ALL DRAWINGS AND INFORMATION RELATED TO STRUCTURAL WORK. ANY CHANGES TO THE EQUIPMENT REQUIRING CHANGES TO THE STRUCTURAL SYSTEMS SHALL BE REDESIGNED BY A PROFESSIONAL ENGINEER AT NO COST TO THE OWNER AND SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. SUBMITTAL SHALL BE ACKNOWLEDGED IN WRITING BEFORE BEGINNING CONSTRUCTION.
4.

IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.
5.

STRUCTURAL ITEMS HAVE BEEN DESIGNED FOR DESIGN LOADS SHOWN OR SPECIFIED IN THESE NOTES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STRUCTURAL ITEMS SUBJECT TO CONSTRUCTION LOADS EXCEEDING THE DESIGN LOADS AND SHALL NOTIFY THE ENGINEER OF ANY SUCH ADDITIONAL LOADS.
6.

ALL DIMENSIONS AND ELEVATIONS NOTED THUS (*) SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD OR WITH THE EQUIPMENT MANUFACTURER/BUILDING VENDOR AND SHALL CONFORM TO THOSE SHOWN ON OTHER DRAWINGS.
7.

NO STRUCTURAL MEMBERS SHALL BE CUT FOR PIPES, DUCTS, ETC. UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
8.

ALL SPECIFIED CONCRETE TESTING DURING CONSTRUCTION AND ALL SPECIFIED LABORATORY TEST MIXES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9.

ENGINEER OF RECORD FOR STRUCTURAL DESIGN WILL REVIEW AND APPROVE ALL CONSTRUCTION SUBMITTALS FOR STRUCTURAL WORK PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION OF THOSE COMPONENTS. SUBMITTALS REQUIRED FOR THE FOLLOWING: CONCRETE MIX (INCLUDING ADMIXTURE DATA, AGGREGATE GRADATION REPORTS, AND HISTORICAL MIX STRENGTH DATA), REINFORCING STEEL, JOINT SEALANTS, AND STRUCTURAL BACKFILL.
10.

DESIGN LOADS: BASED ON THE MASSACHUSETTS BUILDING CODE (10TH EDITION), INTERNATIONAL BUILDING CODE (2021 EDITION), ASCE 7-16. SEE DESIGN INFORMATION TABLE ON THIS SHEET FOR LOAD VALUES.
11.

VERIFY EXISTING CONDITIONS AND DIMENSIONS AND NOTIFY ENGINEER OF ANY CONDITIONS WHICH DO NOT COMPLY WITH PLANS AND SPECIFICATIONS. STRUCTURAL DRAWINGS MUST BE COORDINATED WITH CIVIL, ELECTRICAL, AND MECHANICAL DRAWINGS.
12.

SHOP DRAWINGS WILL NOT BE REVIEWED BY THE ENGINEER UNTIL AFTER THE GENERAL CONTRACTOR HAS THOROUGHLY REVIEWED THE SHOP DRAWINGS, VERIFIED EXISTING CONDITIONS, AND COORDINATED THE SHOP DRAWINGS WITH OTHER AFFECTED TRADES. REPRODUCTION OF STRUCTURAL DRAWINGS FOR SHOP DRAWINGS IS NOT PERMITTED.
13.

DO NOT SCALE STRUCTURAL DRAWINGS, AND FOR LOCATION OF MISCELLANEOUS ITEMS (OPENINGS, BENT PLATES, INSERTS, ETC.) AFFECTING STRUCTURAL WORK, SEE CIVIL, ELECTRICAL, AND MECHANICAL DRAWINGS.
14.

EXISTING DIMENSIONS LISTED ON DRAWINGS ARE APPROXIMATE (+/-) AND ARE TO BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION OF NEW ITEMS AND STARTING CONSTRUCTION ACTIVITIES.

FOUNDATIONS:

1.

NET ALLOWABLE SOIL BEARING PRESSURE USED FOR EQUIPMENT SLAB AND FOUNDATION DESIGN IS 14000 PSF.
2.

THE SOIL BEARING CAPACITY AND CONSISTENCY SHALL BE VERIFIED FOR THE SLAB AND FOUNDATION LIMITS BY A REGISTERED GEOTECHNICAL ENGINEER OR THEIR REPRESENTATIVES WHEN EQUIPMENT SLAB AND FOUNDATION EXCAVATIONS HAVE BEEN CARRIED DOWN TO THE PROPOSED ELEVATIONS. REMOVAL OF UNSUITABLE SOIL SUBGRADE MATERIALS AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER SHALL BE REPLACED WITH STRUCTURAL BACKFILL IN ACCORDANCE WITH NOTE 4.
3.

PRIOR TO PLACEMENT OF STRUCTURAL BACKFILL, TOP SOIL OR ANY OTHER DELETERIOUS MATERIAL WITH THE PROPOSED EQUIPMENT SLAB AND FOUNDATION FOOTPRINTS SHALL BE REMOVED IN ITS ENTIRETY TO THE LIMITS SHOWN ON THE DRAWINGS. THE EXISTING SUBGRADE OR NATIVE SOILS SHALL BE PREPARED BY SCARIFYING TO A DEPTH OF 6 INCHES AND FIRMLY COMPACTED TO 95% OF THE STANDARD PROCTOR IN ACCORDANCE WITH ASTM D698 OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER FOR NATIVE SOILS WITHOUT LABORATORY TESTING. COMPACTED SUBGRADES CAN BE VERIFIED BY EITHER COMPACTION TESTING IN ACCORDANCE WITH ASTM D698 OR PROOF ROLLING OBSERVED BY THE GEOTECHNICAL ENGINEER OR THEIR REPRESENTATIVES.
4.

PROVIDE MINIMUM OF 0'-6" COMPACTED STRUCTURAL BACKFILL CONSISTING OF GRANULAR FILL PER MASSDOT STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES (2020) SECTION M1.02.0 AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER ASTM D1557 WITH A MAXIMUM LIFT THICKNESS OF 8".

STRUCTURAL QUALITY ASSURANCE PLAN

THIS STRUCTURAL QUALITY ASSURANCE PLAN IDENTIFIES THE RESPONSIBILITIES OF THE CONTRACTOR AND THE SPECIAL INSPECTOR IN PERFORMING THE TESTING AND INSPECTION OF THE WORK REQUIRED BY CHAPTER 17 OF THE BUILDING CODE THAT IS WITHIN THE SCOPE OF THE STRUCTURAL ENGINEERING SERVICES FOR THIS PROJECT.

STRUCTURAL INSPECTOR'S RESPONSIBILITIES:

GENERAL:

THE SPECIAL INSPECTOR SHALL BE A LICENSED ENGINEER IN THE STATE OF MASSACHUSETTS OR PERFORMING APPROPRIATE DUTIES DIRECTLY UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF MASSACHUSETTS AND HAVE A THOROUGH UNDERSTANDING OF THE SPECIAL INSPECTION REQUIREMENTS OF THE MASSACHUSETTS BUILDING CODE AND 2021 IBC. THE SPECIAL INSPECTOR SHALL BE AN INDIVIDUAL OR INDIVIDUALS CERTIFIED OR EXPERIENCED TO PERFORM SUCH INSPECTIONS IN A PARTICULAR FIELD.

THE SPECIAL INSPECTOR SHALL KEEP RECORDS OF ALL INSPECTIONS AND FURNISH REPORTS TO THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. PERIODIC REPORTS SHALL BE PROVIDED AND SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED TO THE SATISFACTION OF THE SPECIAL INSPECTOR, THE DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE COUNTY BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO THE COMPLETION OF THAT PHASE WORK.

A WEEKLY REPORT OF INSPECTIONS DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED, AT THE COMPLETION OF THE SPECIAL INSPECTIONS, THE LICENSED PROFESSIONAL ENGINEER IN CHARGE OF PERFORMING THE SPECIAL INSPECTION SHALL CERTIFY THE FINAL SPECIAL INSPECTION REPORT AND AFFIX HIS/HER SEAL TO THE SPECIAL INSPECTOR'S FINAL REPORT. PROVIDE THREE (3) COPIES OF THIS REPORT; TWO TO THE COUNTY BUILDING OFFICIAL AND ONE TO THE STRUCTURAL ENGINEER OF RECORD.

SOILS:

- CONTRACTOR SHALL PERFORM THE FOLLOWING:
1.

SUBMIT CERTIFIED MATERIAL TEST REPORTS FOR STRUCTURAL FILL.
- SPECIAL INSPECTOR SHALL PERFORM THE FOLLOWING:

REQUIRED VERIFICATION AND INSPECTION OF SOILS			
TABLE 1705.6			
VERIFICATION AND INSPECTION	C	P	
1. VERIFY MATERIALS BELOW FOOTINGS AND SLAB-ON-GRADE ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		X	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		X	
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS. AS A MINIMUM, PERFORM ONE TEXT PER LIFT FOR EVERY 2,500 SQUARE FEET OF FILL PLACED.		X	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		X	

C=CONTINUOUS P=PERIODIC

CAST-IN-PLACE CONCRETE:

- CONTRACTOR SHALL PERFORM THE FOLLOWING:
1.

ESTABLISH CONCRETE MIX DESIGN PROPORTIONS PER ACI 318, CHAPTER 5. SUBMIT THREE COPIES OF THE CONCRETE MIX DESIGNS. INCLUDE THE FOLLOWING: SPECIFICATIONS.
- A.

TYPE AND QUANTITIES OF MATERIALS
- B.

SLUMP
- C.

AIR CONTENT
- D.

FRESH UNIT WEIGHT
- E.

AGGREGATES SIEVE ANALYSIS
- F.

DESIGN COMPRESSIVE STRENGTH
- G.

LOCATION OF PLACEMENT IN STRUCTURE
- H.

METHOD OF PLACEMENT
- I.

METHOD OF CURING
- J.

SEVEN-DAY AND 28-DAY COMPRESSIVE STRENGTHS
2.

SUBMIT A CERTIFICATION FROM EACH MANUFACTURER OR SUPPLIER STATING THAT MATERIALS MEET THE REQUIREMENTS OF THE SPECIFIED ASTM AND ACI STANDARDS.
3.

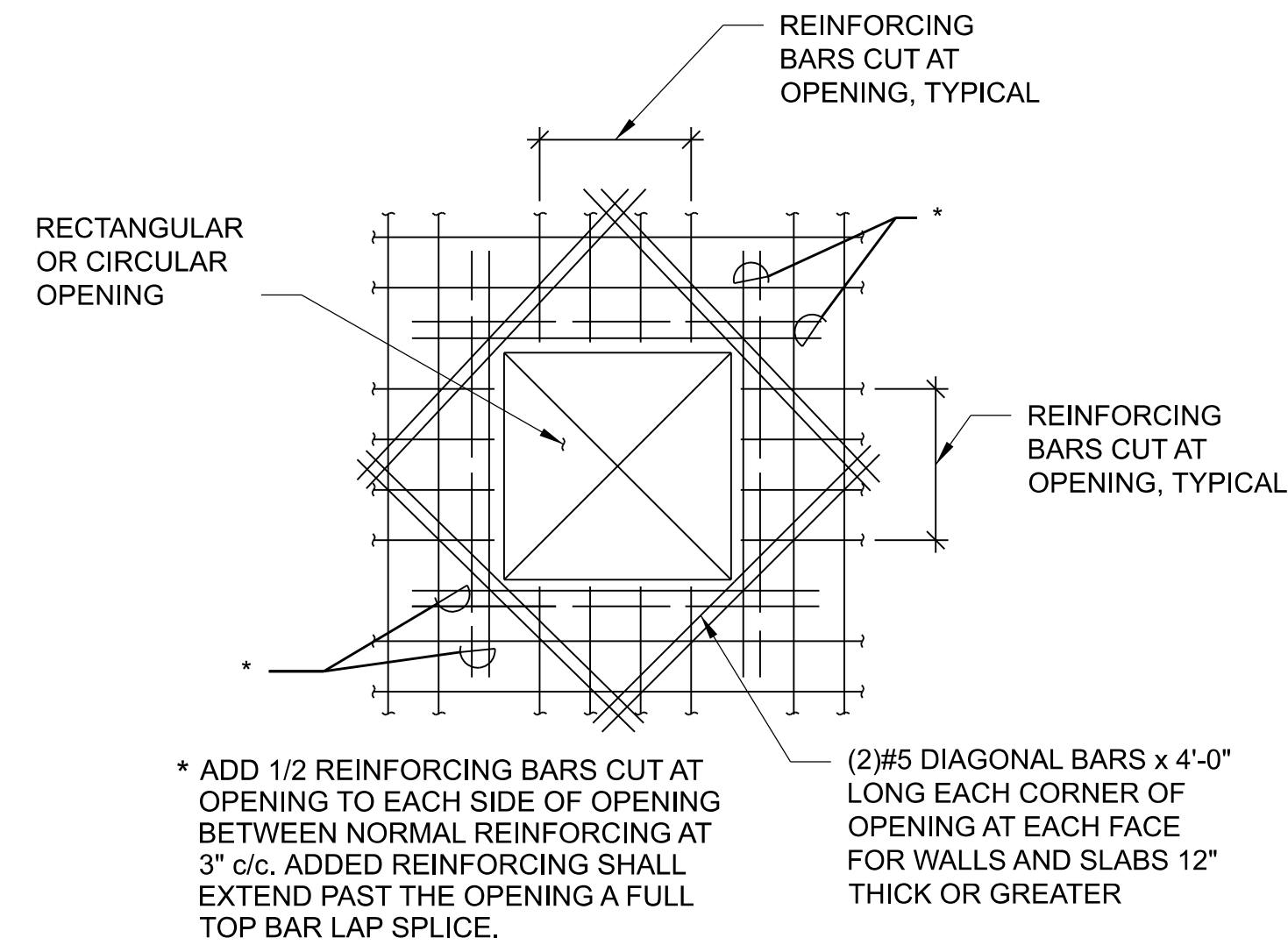
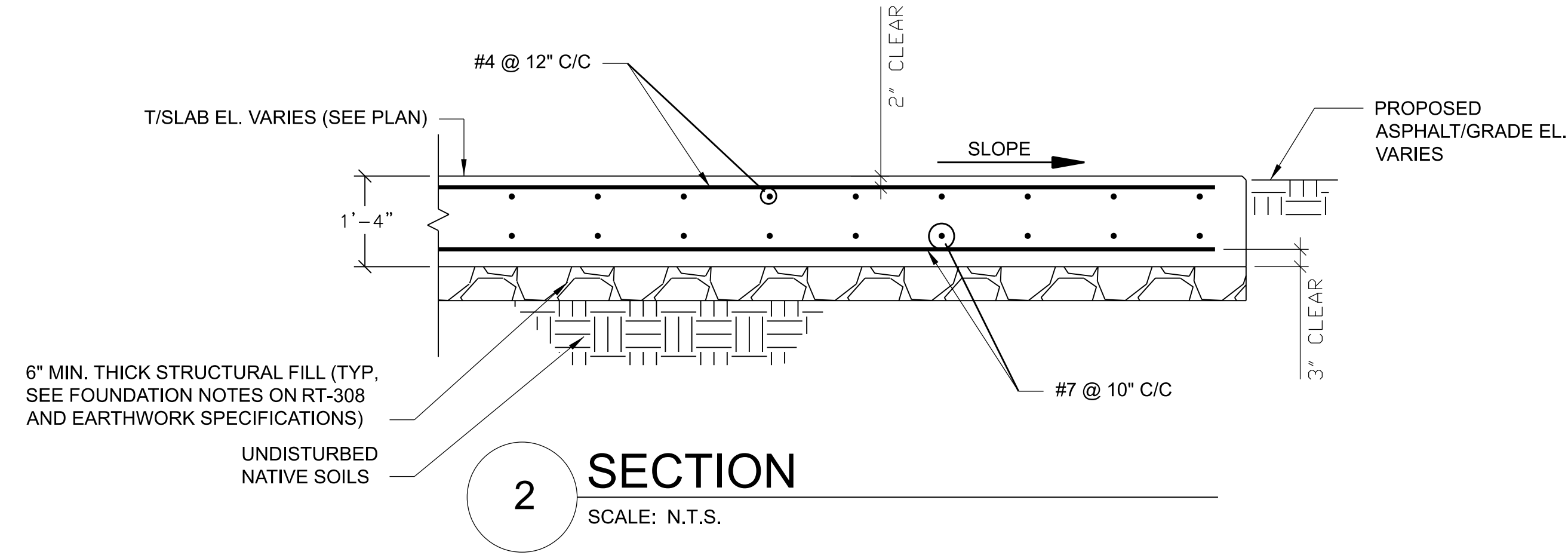
SUBMIT CERTIFICATION THAT THE READY-MIXED CONCRETE PLANT COMPLIES WITH THE REQUIREMENTS OF THE NATIONAL READY MIX CONCRETE ASSOCIATION.

SPECIAL INSPECTOR SHALL PERFORM THE FOLLOWING:

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION				
TABLE 1705.3				
		ACI 318-19		IBC 2021
VERIFICATION AND INSPECTION	C	P	REFERENCE	REFERENCE
1. INSPECTION OF REINFORCING STEEL AND PLACEMENT.		X	ACI 318: CH. 20, 25.2, 25.3, 26.6.1-26.6.3	-
2. INSPECTION OF ANCHORS CAST IN CONCRETE PRIOR TO PLACEMENT OF CONCRETE.		X	ACI 318: CH. 17.8.2	-
3. INSPECTION OF ANCHORS POST INSTALLED IN HARDENED CONCRETE.			ACI 318:	
A. ADHESIVE - HORIZONTAL AND UPWARDLY INCLINED	X		CH. 17.8.2.4	-
B. ALL OTHER		X	CH. 17.8.2	-
4. VERIFY USE OF REQUIRED DESIGN MIX.		X	ACI 318: CH. 19, 26.4.3, 26.4.4	1904.1, 1904.2
5. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X		ASTM C 172 ASTM C 31 ACI 318: CH. 26.5, 26.12	-
6. INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.		X	ACI 318: CH. 26.5	-
7. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X	ACI 318: CH. 26.5.3-26.5.5	-
8. INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		X	ACI 318: CH. 26.11.1,2(b)	-

C=CONTINUOUS P=PERIODIC

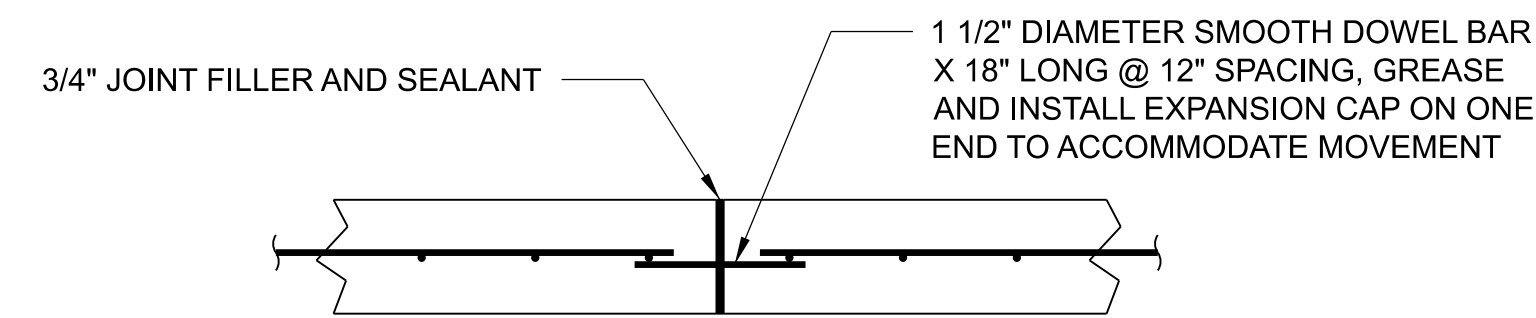
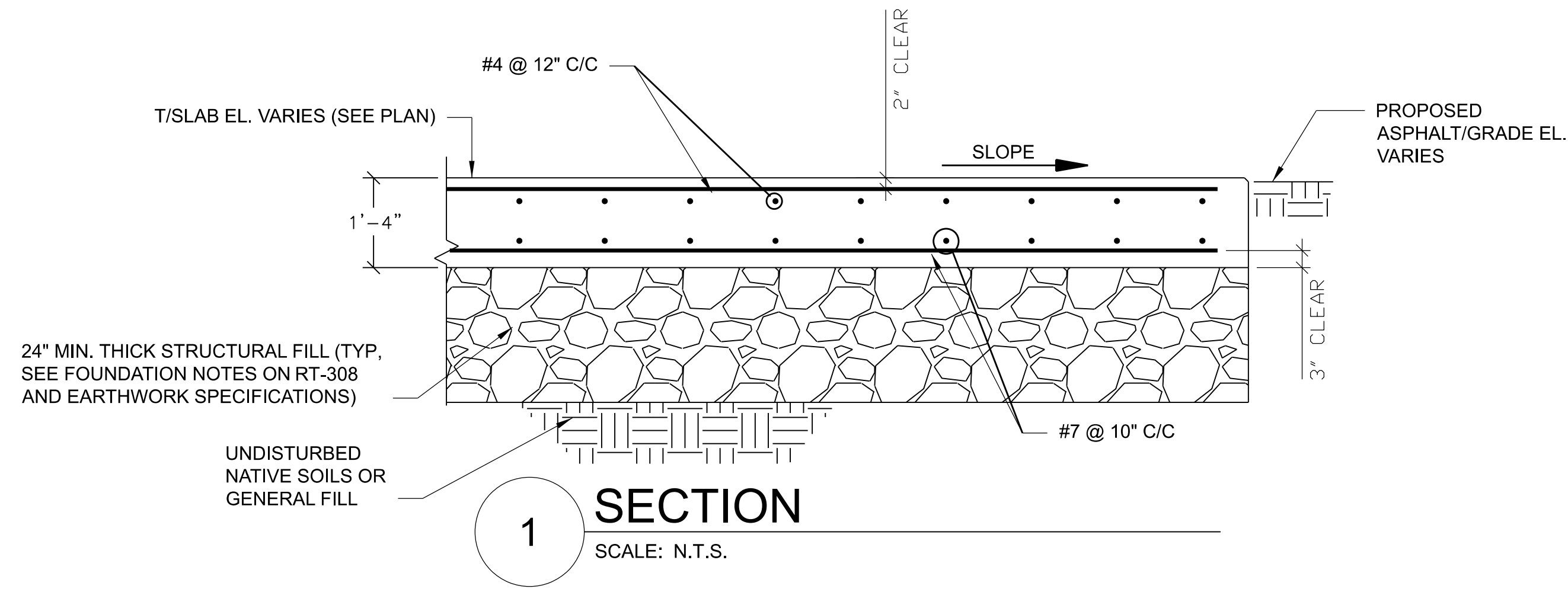
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:		USE TO VERIFY FIGURE REPRODUCTION SCALE						Professional Engineer's Name MARK O. GRAVELDING	NOT FOR CONSTRUCTION	ARCADIS ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION CONCRETE STRUCTURAL NOTES AND DETAILS SHEET 1 OF 2 TRACK	ARCADIS Project No. 30318691.3000 Date SEPTEMBER 2026 ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120	RT-308						
								Professional Engineer's No. 42983											
			2	09/2026	FINAL DESIGN	EJC	ESB	State											
			1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	Date Signed											
			No.	Date	Revisions	By	Ckd	Project Mgr. LP											
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									Drawn by EJC										
									Checked by WAJ										



PLAN OR ELEVATION

TYPICAL REINFORCING AROUND OPENINGS IN SLABS AND WALLS

SCALE: N.T.S.



SECTION

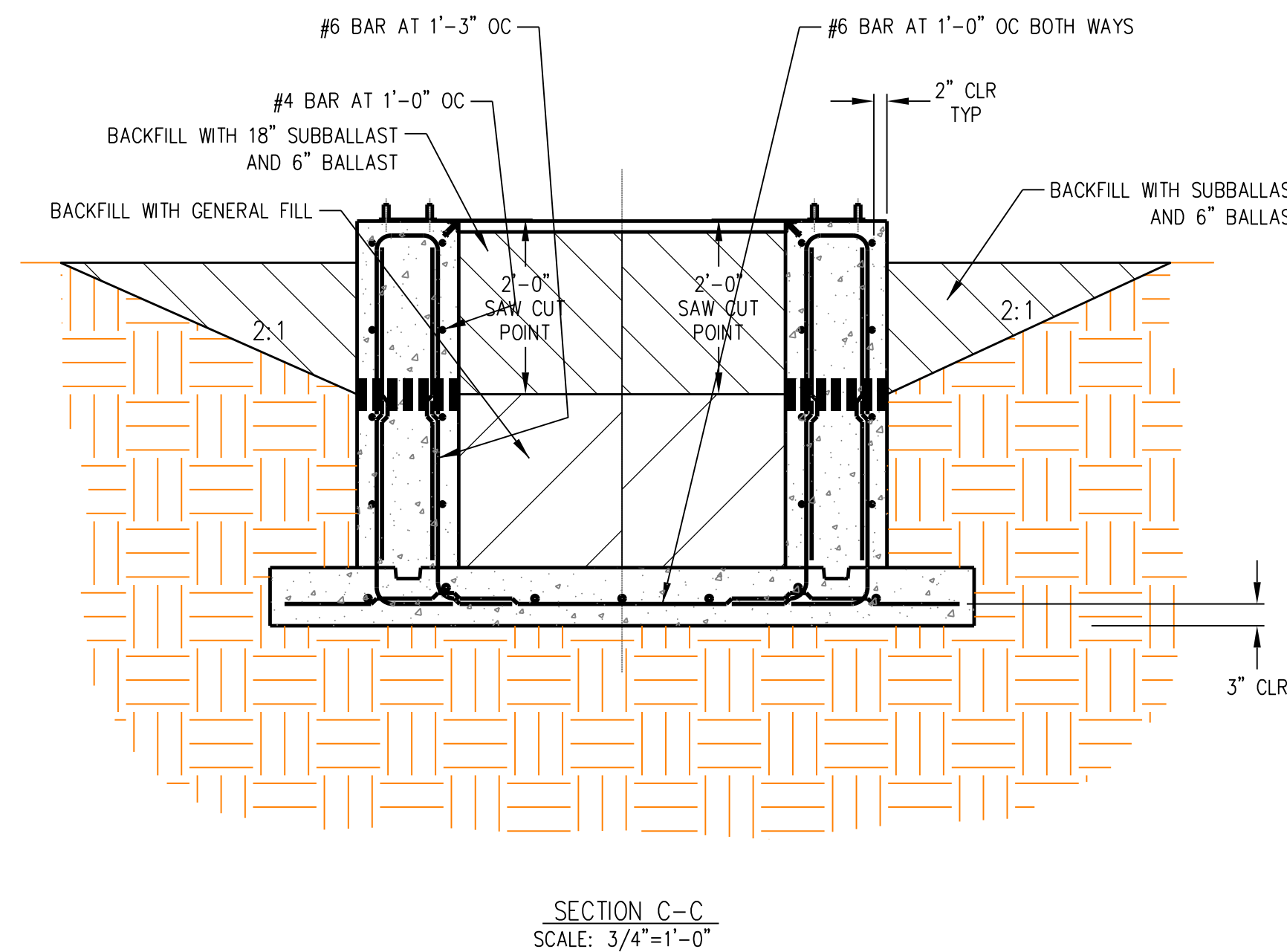
TYPICAL EXPANSION JOINT DETAIL

SCALE: N.T.S.

NOTE:
PLACE EXPANSION JOINT AT 100' MAXIMUM SPACING. TERMINATE ALL REINFORCING STEEL AT EXPANSION JOINTS.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE							Professional Engineer's Name					
								Professional Engineer's No.					
								42983					
			2	09/2026	FINAL DESIGN			EJC	ESB	NOT FOR CONSTRUCTION	ARCADIS ARCADIS U.S., INC.	GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION CONCRETE STRUCTURAL NOTES AND DETAILS SHEET 2 OF 2 TRACK	ARCADIS Project No. 30318691.3000 Date SEPTEMBER 2026 ARCADIS ONE LINCOLN CENTER 110 WEST FAYETTE STREET SYRACUSE, NEW YORK 13202 TEL. 315.446.9120
			1	02/20/2026	CONCEPTUAL DESIGN			EJC	ESB				
			No.	Date	Revisions			By	Ckd				
			THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.										
								ESB	EJC	WAJ			

RT-309



1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY DIMENSIONS AND FIELD CONDITIONS PRIOR TO STARTING WORK.
2. REMOVE ALL EXISTING CONCRETE, REINFORCEMENT, AND RAIL OF EXISTING INSPECTION PIT.
3. FOLLOWING DEMOLITION AND REMOVAL OF EXISTING INSPECTION PIT, CONTRACTOR TO BACKFILL REMAINING INSPECTION PIT HOLE, UP TO THE ELEVATION REQUIRED FOR THE SUITABLE SUBGRADE FOR INSTALLATION OF SUB-BALLAST, WITH SURPLUS SOIL MATERIAL RESULTING FROM SITE GRADING WORK. TO EXTENT POSSIBLE, INITIAL INSPECTION PIT BACKFILLING SHALL INCLUDE USE OF NON-TOPSOIL TYPE MATERIAL PLACED AND COMPACTED IN 12-INCH-THICK LIFTS WITH TRACKED EARTHWORK EQUIPMENT TO CREATE THE REQUIRED SUBGRADE SURFACE ELEVATION.
4. ANY WIRING OR EQUIPMENT WITHIN THE INSPECTION PIT IS TO BE CUT AND REMOVED PRIOR TO BACKFILL.

A	4" DIM WAS 3-1/4", ADDED 4"-5" DIM		TGD	KMC	03-24-04
REV.	DESCRIPTION		BY	CHK'D	DATE
Berkshire Scenic Railway Museum, Inc. ENGINEERING DEPT.					
WILLOW CREEK RD.			LENEX, MA 01240		
DATE:	12-02-03	SCALE:	NOTED	DRWN.BY:	TGD
				CHK'D:	APP'D:
TITLE:	LOCOMOTIVE INSPECTION PIT CONCRETE PLAN & SECTIONS			OWC. NO.	SHOP-C1 SHT 2 OF 2

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE					Professional Engineer's Name			
						Professional Engineer's No.			
						42983			
		2	09/2026	FINAL DESIGN	EJC	ESB	State	Date Signed	Project Mgr.
		1	02/20/2026	CONCEPTUAL DESIGN	EJC	ESB	MA		LP
		No.	Date	Revisions	By	Ckd	Designed by	Drawn by	Checked by
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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS
RAIL TRANSLOAD AREA CONSTRUCTION

WOODS POND - INSPECTION PIT EXISTING CONDITIONS
AND REMOVAL PLAN - SHEET 2 OF 2

TRACK

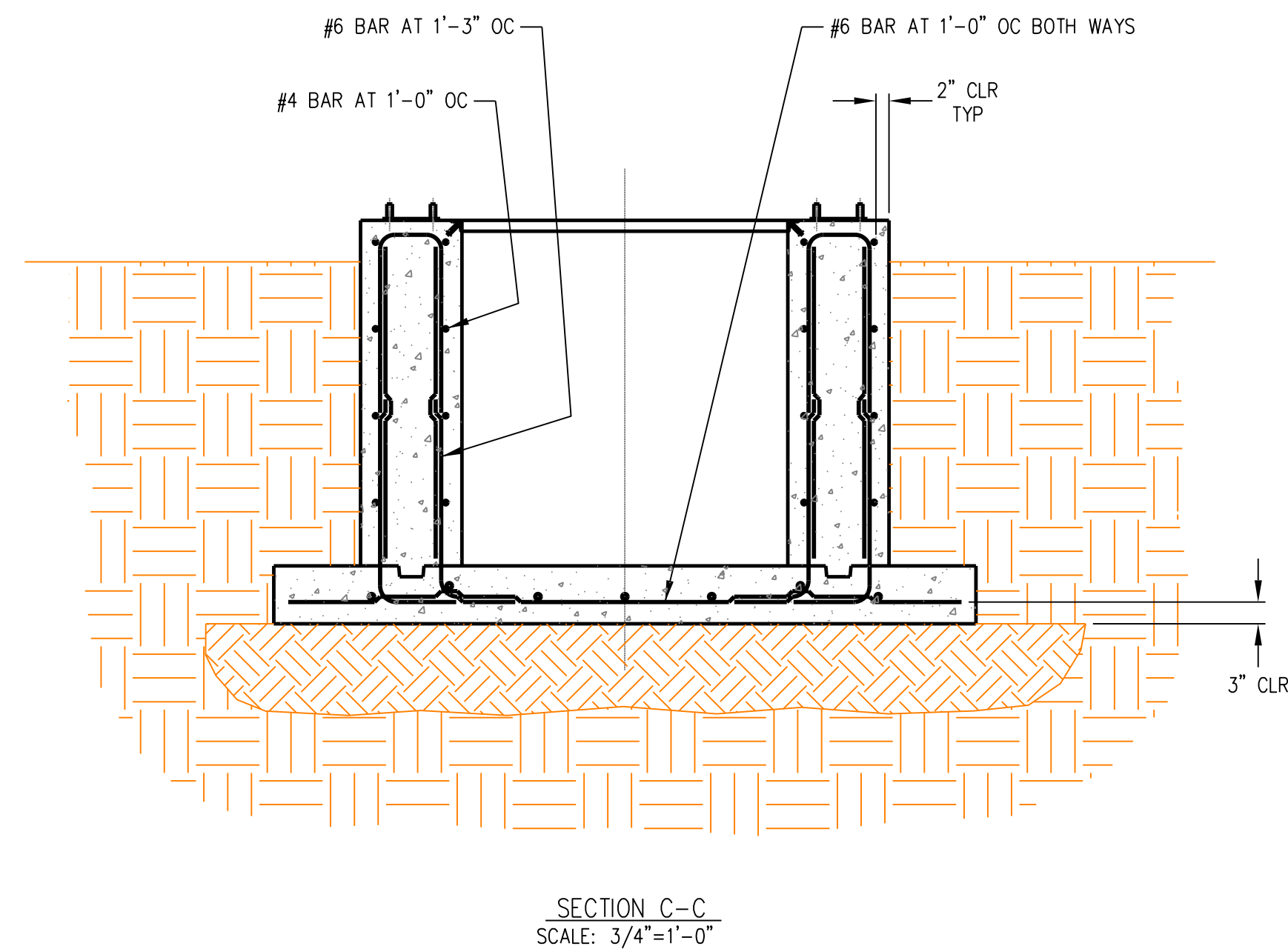
ARCADIS Project No.
30318691.3000

Date
SEPTEMBER 2026

ARCADIS
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110 WEST FAYETTE STREET
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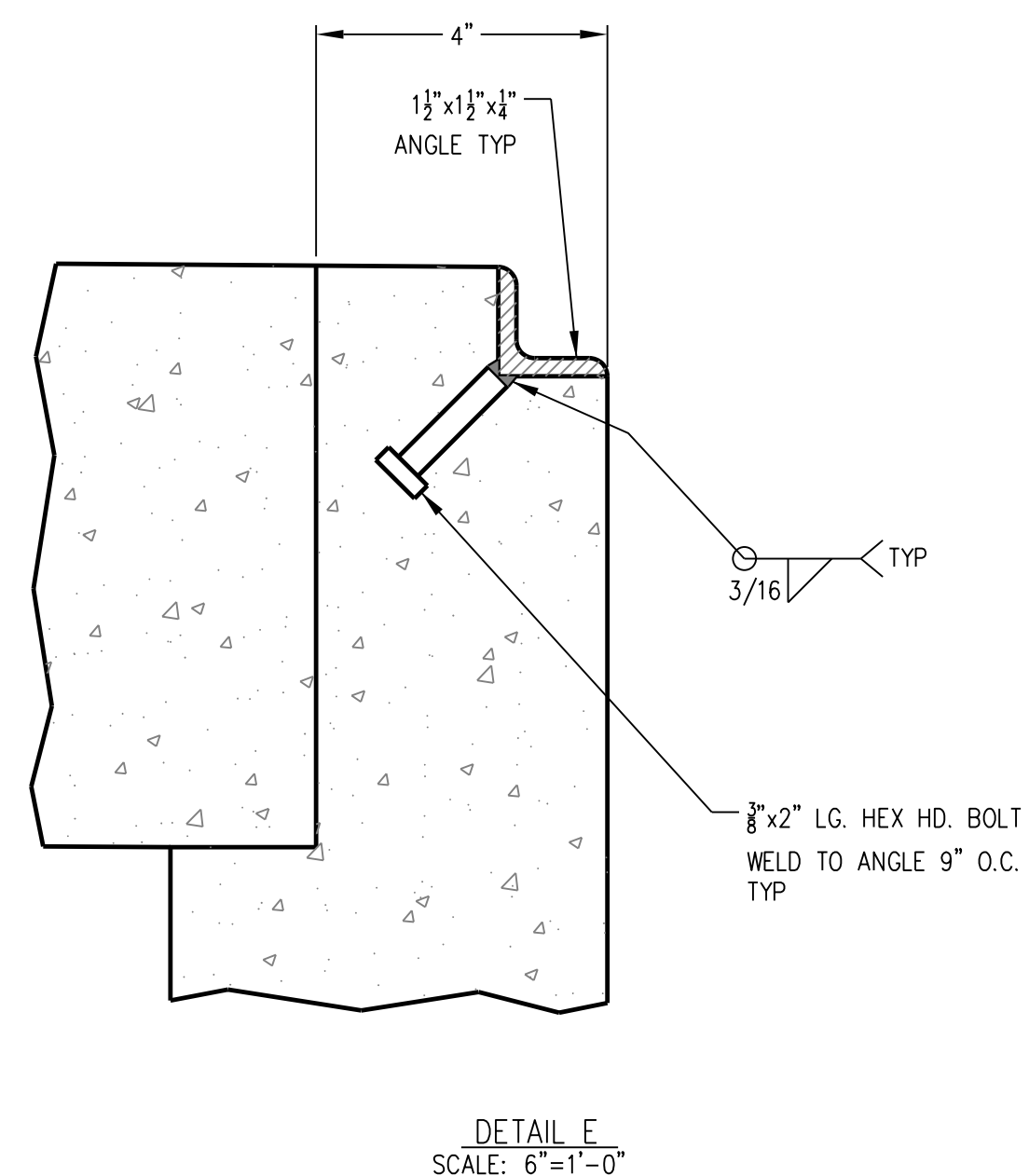
RT-311

NOT FOR CONSTRUCTION



1. INSPECTION PIT DESIGN PROVIDED BY BERKSHIRE SCENIC RAILWAY MUSEUM, INC. ENGINEERING DEPARTMENT, SHOP-C1, DATED 12-02-03.
2. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY DIMENSIONS AND FIELD CONDITIONS PRIOR TO STARTING WORK.
3. GRAVEL SUBBASE SHALL BE SOUND AND DURABLE AND AS SPECIFIED IN TECHNICAL SPECIFICATION 31 05 13 - SOILS AND AGGREGATES.
4. COMPACTION SHALL BE AS SPECIFIED IN TECHNICAL SPECIFICATION 31 23 00 - EXCAVATION AND FILL.

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS (UNLESS OTHERWISE NOTED)
2. CURRENT EDITIONS OF THE FOLLOWING SPECIFICATIONS AND STANDARDS WILL APPLY UNLESS OTHERWISE MODIFIED ON THE DRAWINGS OR IN THE JOB SPECIFICATIONS:
 - A. ACI 301 SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS.
 - B. ACI 315 MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
 - C. ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
 - D. CRSI RECOMMENDED PRACTICE FOR PLACING REINFORCING STEEL.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.
4. ALL BAR SPLICES SHALL BE CLASS B TENSION LAP SPLICES, UNLESS OTHERWISE NOTED.



THIS BAR REPRESENTS ONE [] INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE [] REPRODUCTION SCALE						Professional Engineer's Name			NOT FOR CONSTRUCTION	 ARCADIS ARCADIS U.S., INC. GE-PITTSFIELD/HOUSATONIC RIVER SITE • MASSACHUSETTS RAIL TRANSLOAD AREA CONSTRUCTION WOODS POND - INSPECTION PIT INSTALLATION PLAN SHEET 2 OF 2 TRACK	ARCADIS Project No. 30318691.3000	RT-313	
								Professional Engineer's No.				Date SEPTEMBER 2026		
		2	09/2026	FINAL DESIGN			EJC	ESB	42983					
		1	02/20/2026	CONCEPTUAL DESIGN			EJC	ESB						
		No.	Date	Revisions			By	Ckd						
THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.							State MA	Date Signed	Project Mgr. LP					
							Designed by ESB	Drawn by EJC	Checked by WAJ					

AREMA PORTFOLIO OF TRACKWORK PLANS

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

100-08
Page 1

1 Scope

- 1.1 This Specification covers general instructions, testing and workmanship requirements and detailed material specifications relating to the purchase and manufacture of special trackwork for tee rails weighing 115 lb. per yard and heavier.

2 Applicable Documents

- 2.1 The latest specifications in the AREMA Manual for Railway Engineering, the American Society for Testing and Materials (ASTM) Book of Standards, the Society of Automobile Engineers (SAE) specifications, the American National Standards Institute specifications (ANSI), where indicated, covering a particular component or material shall apply.
- 2.2 The trackwork plans in the Portfolio shall be part of these specifications
- 2.3 Requirements not shown on the drawings, but which are mentioned in the specifications, or vice versa, or anything not expressly set forth in either, but which is specified in the order or contract, shall apply. Should anything be omitted from the drawings or specifications that is necessary for a clear understanding of the work, or should any error appear in either the drawings or specifications affecting the work, the manufacturer shall notify the purchaser and shall not proceed with the work until instructed to do so.
- 2.4 Any variations from the requirements established in 2.1, 2.2 and 2.3 shall be detailed in the inquiry contract and order.

3 Definition of Terms

- 3.1 The AREMA definition of terms relating to trackwork switches, frogs, guard rails, crossings and turnouts appear in the Foreword.

4 Basis of Purchase

- 4.1 The purchaser will furnish the manufacture specifications and drawings giving rail sections, joint drilling, angles, alignment, general dimensions and such special details as may be required.

5 Manufacture

- 5.1 Construction, design and details shall conform to the specified Portfolio Plan adopted by AREMA as recommended practice.

- 5.2 For track structures for which no plans have been adopted, or for proprietary trackwork items, the manufacture shall, when requested, submit detail drawings for approval.

6 WORKMANSHIP

- 6.1 Workmanship shall be in accordance with good commercial practice.
- 6.2 Accuracy of workmanship for completed frogs and switches shall be within the permissible variations prescribed in Plans No. 1020 to 1029.
- 6.3 Bends shall be made accurately in arcs of circles and without injury to the material.
- 6.4 Heating of the rails for bending shall be done in a manner so as to have a minimal adverse effect on the metal. When the nature of the bend permits, rails shall be bent cold.
- 6.5 Machining shall be true and all abutting surfaces shall fit accurately.
- 6.6 All sharp edges and corners shall be eliminated by grinding or machining to a suitable chamfer or radius wherever the rail section is altered by a machining.
- 6.7 A radius of 5/8" (15.9 mm) shall be provided (where possible) at the gage corners where wheel contact will occur.
- 6.8 All grinding shall be carefully performed, in a manner that will not develop grinding cracks.
- 6.9 Running surfaces of manganese steel parts shall be ground to a surface comparable to that of rolled rail. Manganese steel portions fitting into rails or other parts shall be ground or machined to a suitable fit.
- 6.10 Drilling shall be done accurately, at an angle where necessary.
- 6.10.1 All holes in carbon steel shall be drilled.
- 6.10.2 The burrs, fins and sharp edges of trackwork components, formed, sheared or cut by machine, shall be removed by grinding or machining a chamfer.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK

For Rails 115 lb. and Heavier

- 6.10.3 All holes for turned pins or bolts and for tight fit of rough bolts in other than rail steel parts shall also be drilled.
- 6.11 Punching shall be permitted only in mild steel parts for rivets, loose rough bolts and spikes, except where such bolts come so close together or close to the edge of the piece that the metal between the holes or between hole and edge is less in width than the thickness of the material, in which case holes shall be drilled.
- 6.12 All bolt holes in all trackwork components regardless of how manufactured (drilled, punched, cut or forged) must be chamfered. Trackwork requires a minimum 1/32" (0.8 mm) chamfer. Rail hole drilling requires a minimum 1/16" (1.6 mm) chamfer +1/32" (0.8 mm) - 0" (0 mm).

7 PERMISSIBLE VARIATIONS IN DIMENSIONS, FITS AND OTHER PHYSICAL ATTRIBUTES

7.1 Fit of Bolts

- 7.1.1 Main bolts in bolted frogs and bolted rail crossings shall have a tight fit in properly aligned holes.
- 7.1.2 Where a tight fit of bolts in the hole is not required, drilled or punched holes shall be not more than 1/16" (1.6 mm) greater in diameter than the bolts, except that bolts in rail at an angle are to have their holes drilled per Section X-X, Plan 1021, Part II.
- 7.1.3 Cored holes in other than manganese castings shall not be more than 1/8" (3.2 mm) greater in diameter than the bolts.
- 7.1.4 Holes in manganese castings for frogs and crossings may be up to 5/16" (8 mm) greater in diameter than the bolts except that the holes for body bolts in rail bound frogs and crossings, and for the internal joints of solid manganese crossings shall be oval; the larger or horizontal dimension shall not be more than 3/4" (19 mm) greater than the diameter of the bolts.
- 7.1.5 Bolt heads and nuts shall have square bearings.

7.2 Pins

- 7.2.1 Pins shall be of the full diameter called for on the plans, and the holes for them shall be 1/16" (1.6 mm) greater in diameter.

- 7.2.2 Rivets shall have standard button or cone heads of uniform size for the same size rivet.

- 7.2.3 Rivet heads shall be concentric with the holes.

- 7.2.4 Countersunk rivets shall be flush with the surface and fill the counter sink, except that rivets through base plates and tie plates may have a crown of not more than 1/8" (3.2 mm) below the lower surface of the plate.

7.3 Spike Holes

- 7.3.1 Spike holes shall be punched 3/4" (19 mm) square except those holes at rail base edges which shall be 3/4" (19 mm) wide by 13/16" (20.6 mm) long. These holes shall be located nominally 1/16" (1.6 mm) (1/8" (3.2 mm) maximum, 0" minimum) under the edge of the rail base or into the rail seat at the plate shoulder.
- 7.3.2 The edge of the spike holes shall not be less than the thickness of the plate plus 1/4" (6.4 mm) from the ends or sides of plates, except for hook twin tie plates, or where necessary to match spike holes in fittings or to clear structural members.

7.4 Gage, Track and Guard Face

- 7.4.1 All gage measurements shall be made at the level of the gage line 5/8" (16 mm) below the tread surfaces.
- 7.4.2 Track gage in completed crossings may be 1/16" (1.6 mm) under or 1/16" (1.6 mm) over that specified.
- 7.4.3 Guard face gage in completed crossings will be in accordance with Plans 790, 791, 792A, 792B and 793.

7.5 Flangeways

- 7.5.1 All flangeway measurements, except depth, shall be made at the level of the gage line 5/8" (16 mm) below the tread surfaces.
- 7.5.2 Flangeways in completed frogs shall not vary more than plus or minus 1/16" (1.6 mm) from the specified width.
- 7.5.3 Flangeways may be widened, either in design, or as a permissible variation in manufacture by machining not more than 1/8" (3.2 mm) from the side of the guard rail head.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

100-08
Page 3

7.5.4 Flangeways in completed crossings will be in accordance with Plans 790, 791, 792A, 792B and 793.

7.5.5 Flangeways shall be not less than 1-7/8" (47.6 mm) deep, as measured from the top of tread surfaces.

8 Marking

8.1 Finished trackwork units shall be plainly marked as indicated in 8.2 through 8.5. Only hot stamping shall be permitted on rail or rail components.

8.2 The manufacturer's name or initials, section, weight of rail, and month and year of manufacture shall be stamped in letters of appropriate size on a separate rust proof plate secured to the web of the rail.

8.3 Letters and figures 3/4" (19 mm) in height may be stamped on a portion of the structure other than the rail, in a visible location, not exposed to wear.

8.4 Loose parts or fixtures shall be similarly stamped with suitable size letters and figures.

8.5 Frogs shall be marked with the frog number.

8.6 All or part of the identity shall be cast on molded parts.

9 WELDING

9.1 Welding shall not be permitted on rails or surfaces of other parts exposed to wheel wear.

9.2 Where welding is permitted on other portions, as indicated on the drawings or in the material specifications, such welding shall be done with an approved process.

10 PAINTING

10.1 Paint, tar, or other covering shall not be applied unless specified by the purchaser in the order or contract.

10.2 Such covering, when specified, shall not be applied before final inspection.

11 MATERIALS

11.1 Selection

11.1.1 The type and/or grade of material to be used in the production of the various parts of special trackwork shall be as indicated in the particular material specifications detailed herein.

11.1.2 Should two or more types or grades of material be acceptable for production of a particular part, and a preference has not been indicated by the purchaser in the contract or order, the selection shall be optional with the manufacturer.

11.1.3 The type or grade of material used in the production of products shall be at the option of the manufacturer.

11.2 Conformance

11.2.1 Any material entering into the manufacture of special trackwork or parts thereof and which is covered by specification contained (or referred to) herein, shall conform to the requirements of such specifications, except that:

11.2.2 The paragraphs under 12, 13 and 14, cover Test, Claim and Inspection conditions for materials used in the production of special trackwork and take precedence over, or add to, any similar coverage contained in the various established specifications for material referred to in 15, Material Specifications and Details.

12 TESTS

12.1 All tests shall be performed at the place of manufacture prior to shipment, unless otherwise agreed, and shall be so conducted as not to interfere unnecessarily with the operation of the works or the progress of the work on the purchaser's order.

12.1.1 Chemical and mechanical tests may be made at a testing laboratory outside of the manufacturer's works and is to be agreed upon between the manufacturer and the purchaser.

12.2 The records of any test made by the manufacturer on materials used in the production of the purchaser's order shall be made available to the inspector representing the purchaser.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

- 12.3 For materials or parts of the order taken from stock or purchased from other producers, the trackwork manufacturer shall, when required by the order or contract, certify that the material conforms with the requirements of the specifications.
- 12.3.1 Should the purchaser desire any chemical or mechanical tests of these materials, the purchaser shall be responsible for the expense of such tests, unless the materials fail to meet the specifications, in which case the trackwork manufacturer shall be responsible.
- 12.3.2 The manufacturer shall, when required by the order or contract, supply the purchaser with a certificate of inspection from the rail manufacturer for rails used in the order.
- 13 CLAIMS**

13.1 The acceptance of any material by an inspector shall not prevent subsequent rejection if found defective after delivery.

13.2 A claim for defective material and/or trackwork shall cover only such defects as will impair the service life of the material.

13.3 Claims for replacement of defective material and/or workmanship shall not be recognized unless made promptly and based on defects appearing within 90 days from date of installation, and in any event within two years from date of shipment.

13.4 No guarantee of specific length of service will be required.
- 14 INSPECTION**

14.1 The manufacturer shall afford the purchaser's inspector all reasonable facilities necessary to satisfy him that the material is being produced and furnished in accordance with this specification. Mill inspection by purchaser shall not interfere unnecessarily with the manufacturer's operations. All inspections shall be made at the place of manufacture, unless otherwise agreed to.

- 15 MATERIAL SPECIFICATIONS AND DETAILS**

15.1 Scope

15.1.1 Rails, castings, forgings, rolled shapes, washers, and fasteners used in special trackwork ordered to the plans in the Portfolio, shall be produced in conformance with specifications indicated, modified in some instances, but in any case subject to details offered herein, and to the conditions set forth in 11.2.2.

15.1.2 Trackwork to be manufactured to plans other than those in the Portfolio may be ordered produced in conformance with general conditions, material specifications and detailed requirements of the AREMA Portfolio of Trackwork Plans.

15.1.3 The specifications contained (or referred to) herein are based as far as possible on established specifications of various national associations and societies with such modifications as are necessary to adapt the material to the manufacture of special trackwork.

M1. Steel Rails
Refer to *AREMA Manual for Railway Engineering, Chapter 4.*

- M2. MANGANESE STEEL CASTINGS**

M2.1 Material Covered

M2.1.1 Manganese steel castings for solid steel track structures, or wearing parts of fabricated steel track structures.

M2.2 Manufacture

M2.2.1 Austenitic manganese steel castings shall be produced in conformance with the latest issue of ASTM A128, Specification for Austenitic Manganese Steel Castings, Grade A, except that the chemical requirements shall be modified as follows:

Element	Percent	
	Minimum	Maximum
Carbon	1.00	1.30
Manganese	12.00	-
Silicon	-	1.00
Phosphorus	-	0.07

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

100-08
Page 5

M2.2.2 All castings shall be heat treated as prescribed in the ASTM Specification A128.

M2.3 Heat or Cast and Product Analysis

M2.3.1 Heat or cast analysis shall be made by the manufacturer, either chemically or spectrographically, as required by the specifications, to determine the percentages of the elements specified in M2.2.1.

M2.3.2 Product analysis may be made by the purchaser of a sample obtained from a casting representing each heat cast in accordance with the conditions in the specification.

M2.4.1 When specified in the purchase order or contract, one bend test shall be made from each heat of steel in each heat treatment charge.

M2.4.2 The bend test specimens shall be nominally 1/2" by 3/4" (13 by 19 mm) in cross section and 12" (300 mm) long, pored in a separate mold, from the same heat or cast of steel as the lot of castings it represents.

M2.4.3 The bend test specimen shall be heat treated with the castings it represents. When heat treated with castings of comparatively heavy section, the test bar may be protected from oxidation by enclosing it in a pipe or container with a small amount of carbonaceous material, suitably sealed or luted to limit test bar contact with the furnace gases.

M2.4.4 The bend specimen shall be tested without being machined or ground except as may be necessary to remove decarburization or surface irregularities, or to separate it from the runner or sprue through which it was poured.

M2.4.5 The test specimen shall withstand cold bending by any method preferred by the manufacturer, through 150° around a pin 1" (25.4 mm) in diameter without breaking. Surface cracking that does not go deeper than halfway through the test specimen midway between the edges shall be acceptable.

M2.4.6 If any test specimen reveals internal defects during bending and does not conform to the requirement, it shall be discarded and another specimen from the same lot of castings substituted for testing.

M2.4.7 If the bend test representing any lot of castings fails to meet the requirement specified, the lot of castings may be reheat treated, but not more than twice. Bend test specimens shall not be reheat treated, but new specimens shall be substituted. Retests shall be performed in the manner prescribed for the original test, but two specimens representing the lot of castings shall be tested, both of which shall meet the requirements of M2.4.5.

M2.5 Workmanship

M2.5.1 The castings shall be true to the pattern and conform to the shape and sizes indicated by the Purchaser's drawings in accordance with good foundry practice.

M2.5.2 Large protrusions, sharp fins, sand holes and chills outside of the casting shall be removed.

M2.5.3 Castings shall be free from hot tears, cracks and other injurious defects. Castings shall be free of cold shuts that impair serviceability.

M2.5.4 When specified, radiographic testing and/or sectioning will be used to qualify castings for acceptance of internal soundness, by the manufacturer. To verify radiographic testing, the qualification process may include sectioning of the castings.

M2.5.4.1 Internal soundness of castings shall comply to radiographic testing quality standard levels as specified in Plans 1012, 1013, 1014, 1015, 1016 and 1017.

M2.5.4.2 Radiographic testing shall be done in conformance with the latest issue of the following ASTM specifications:

- E – 94 Recommended Practice for Radiographic Testing
- E – 446 Reference Radiographs up to 2 inches in Thickness, (0"-2")
- E – 186 Reference Radiographs for Heavy Wall Steel Castings, (2"-4-1/2")
- E – 280 Reference Radiographs for Heavy Wall Steel Castings, (4-1/2"- 12")

M2.5.4.3 The continued frequency of radiographic testing and surface area coverage of components for castings meeting soundness qualification standards will be specified by the purchaser.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

- M2.5.5 Where testing, in accordance with M2.5.4 through to M2.5.4.3 is not specified, castings shall be free from sand holes, gas pockets, and other imperfections, unless these imperfections are in locations where they will not appreciably weaken the casting or impair its wearing qualities.
- M2.5.6 Where testing, in accordance with M2.5.4 through to M2.5.4.3 is not specified, castings shall be free from all shrinkage cracks unless they are of the size and in such locations that they will not adversely affect the service life of the casting. Shrinkage cracks will not be permitted at any part of the tread surface.
- M2.5.7 As cast tread surfaces within 2-1/2 (63.1 mm) of the gage line and flangeway walls 1" (25.4 mm) down from the tread surface shall be free of imperfections unless they are so small that they will be practically removed by the finish grinding.
- M2.5.8 Castings shall be free from twist and reasonably true, both as to general surface and alignment, and shall not show signs of straining or undue denting from the straightening operation.
- M2.5.9 The bottom part of the casting which rests on plates or ties shall be reasonably straight and without twist, and shall be free of surface irregularities or imperfections that would prevent a good bearing.
- M2.5.10 Castings shall be without sharp corners at the base, having minimum radii of 1/4" (6.4 mm) at the intersection of the inside vertical wall and the bottom, and 1/8" (3.2 mm) at the intersection of the outside vertical wall at the bottom.
- M2.5.11 Bolt holes in castings shall not be enlarged by cutting or reaming with an oxy-acetylene torch, unless specifically approved by the purchaser.
- M2.6 Repair by Welding**
- M2.6.1 Defects that will not ultimately impair the strength of the casting may, with the consent of the purchaser's inspector, be welded by an approved process which meets the requirements of M2.6.2.

- M2.6.2 Only electric arc repair welding utilizing the proper technique and electrodes or semi-automatic wire shall be employed as provided under "Welding of Manganese Castings in Special Trackwork", Chapter 5 of the AREMA Manual for Railway Engineering.

M2.7 Depth Hardening

- M2.7.1 When specified, the impact areas described on the Trackwork Plans shall be hardened to a minimum surface Brinell hardness number of 352 for areas within 1" (25.4 mm) of the gage lines and minimum Brinell hardness number 321 for the balance of the hardened area.
- M2.7.2 The hardening method to be employed, if not otherwise specified, shall be at the option of the manufacturer.
- M2.7.3 Unless otherwise specified, one hardness reading only shall be required on each hardened area. This reading shall be taken at the intersection of lines 1" (25.4 mm) from, and parallel to, the gage or guard lines.
- M2.7.4 In case any hardening measurement does not meet the specified requirements, two additional measurements shall be made, one on either side of the original impression, about 1" (25.4 mm) distant and parallel with the gage or guard line. If both of these measurements meet the requirements, the original reading shall be discarded, and these reading are to be recorded in its place.
- M2.7.5 Castings failing to meet the hardness requirement will be acceptable provided the fee for the hardening process is not assessed.

M3. CARBON STEEL CASTINGS

M3.1 Material Covered

- M3.1.1 Carbon steel castings for solid track structures, or parts of track structures exposed to wheel wear, which are required to be heat treated and mechanical properties are specified, including yokes for guard rail clamps, operating parts for switch stands, special joint bars, and blocks in toe and heel joints. These were formerly designated as Grade H-1 or Class "B" Hard castings.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

M3.1.2 Steel castings for general service in trackwork for which mechanical properties and heat treatment are not specified, including appurtenances and fittings, corner braces, rail braces, washers, spring housings, separator and end blocks for guard rails, adjusting wedges, for guard rail clamps, parts for switch stands, and other parts not exposed to wheel wear. These were formerly designated as Grade N-3 castings.

M3.2 Manufacture

M3.2.1 Heat treated carbon steel castings described in M3.1.1 shall be produced in conformance with the latest issue of ASTM A148 Specification for High Strength Steel Castings for Structural Purposes, Grade 80-40.

M3.2.2 Carbon steel castings described in M3.1.2 shall be produced from AISI/SAE number 1040 steel prescribed in M3.4.1, but as an alternate may be produced from steel of lesser carbon content at the option of the manufacturer, unless otherwise specified in the order or contract. In the absence of a standard specification covering the requirements for this particular group of castings, the castings shall conform in workmanship, finish and general character to the requirements of the latest issue of ASTM A148 specification.

M3.3 Heat Treatment and Stress Relieving

M3.3.1 Grade 80-40 steel castings shall be heat treated by full annealing, normalizing, quenching, tempering or combinations of these heat treatments, at the option of the manufacturer in accordance with ASTM A148 specification.

M3.3.2 Castings of 1040 steel and those with carbon content over 0.30 percent shall be stress relieved, but may be annealed, normalized or otherwise heat treated at the option of the manufacturer, in accordance with ASTM A148 specification. Castings with carbon content over 0.30 percent need not be treated unless otherwise specified in the order or contract.

M3.4 Chemical Requirements

M3.4.1 The steel shall conform to the following as to chemical composition:

Material	Percent			
	Carbon	Manganese	Phosphorus	Sulphur
A148 Grade 80-40	See M3.4.2		0.050 Max.	0.060 Max.
AISI/SAE Number 1040	0.37–0.44	0.60-0.90	0.040 Max.	0.050 Max.
Other	-	-	0.050 Max.	0.060 Max.

M3.4.2 The content of carbon, manganese, silicon, and other alloying elements shall be selected by the manufacturer to obtain the mechanical properties specified for the grade 80-40 steel heat treated castings.

M3.4.3 An analysis of each heat of steel shall be made by the manufacturer to determine the percentages of the elements specified.

M3.4.4 An analysis may be made by the purchaser from a test specimen or from a casting. The chemical composition thus determined shall conform to the specified requirements.

M3.5 Mechanical Requirements

M3.5.1 Mechanical property requirements are not specified for other than the grade 80-40 steel castings.

M3.5.2 The tensile properties for the grade 80-40 steel castings, determined in accordance with the test coupon, method of test, number of tests, and retest conditions established in the ASTM A148 or ASTM 214 specification, shall meet the following specified values:

Property	psi	Percent
Tensile Strength, Minimum	80,000	
Yield Point, Minimum	40,000	
Elongation in 2" (50 mm), Minimum		18
Reduction of Area, Minimum		30

M3.5.3 Bend tests shall not be required for carbon steel castings.

M3.6 Workmanship and Finish

M3.6.1 The castings shall conform substantially to the shape and sizes indicated on the patterns and drawings.

M3.6.2 The castings shall be free from injurious defects.

M3.7 Welding Repairs

M3.7.1 Minor imperfections which do not impair the strength or wearing qualities of the castings, except those located on the tread surface within 1.5" (38.1 mm) of the gage line may be welded with an approved method.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

- M3.7.2 Imperfections shall be considered minor when the depth of the cavity prepared for welding is not greater than 20 percent of the actual wall thickness, but in no case greater than 1" (25.4 mm).
- M3.7.3 With the consent of the purchaser, imperfections other than minor may be repaired by welding with an approved process.
- M3.7.4 All minor welds shall be given a suitable stress relief or heat treatment

M5. MALLEABLE AND DUCTILE IRON CASTINGS

M5.1 Material Covered

- M5.1.1 Malleable or ductile iron castings for fittings and appurtenances for trackwork, braces, washers, switch clips, spring housings, and foot guards which may be produced from either type of iron at the option of the manufacturer.

M5.2 Manufacture

- M5.2.1 Malleable iron castings shall be produced in conformance with the latest issue of ASTM A47, Specification for Malleable Iron Castings, Grade 32510.
- M5.2.2 Ductile iron castings shall be produced in conformance with the latest issue of ASTM A536, Specification for Ductile Iron Castings, Grade 65-45-12.

M5.3 Heat Treatment

- M5.3.1 Malleable iron castings shall be properly annealed. Any casting rejected for improper annealing may be re-annealed.
- M5.3.2 Ductile iron castings shall generally be as-cast, but may be heat treated at the option of the manufacturer.

M5.4 Chemical Requirements

- M5.4.1 It is the intent of the specification to subordinate chemical composition to mechanical properties. The quantities of any chemical elements in either the malleable or ductile iron shall be at the option of the manufacturer, except where the elements may be specified by special agreement between the purchaser and the manufacturer.

M5.5 Mechanical Requirements

- M5.5.1 Mechanical property tests are not normally required for malleable or ductile iron castings.

- M5.5.2 At the option of the purchaser or his representative, a casting may be tested to destruction, or otherwise broken up to determine the presence of any manufacturing condition which may be detrimental to the serviceability of the casting.

- M5.5.3 When so specified by the purchaser in the order or contract, the castings shall be subject to the tensile test prescribed in the particular ASTM specifications referred to in M5.2.1 and M5.2.2.

- M5.5.4 The iron as represented by tensile test specimens obtained, prepared and tested in accordance with the applicable specifications, shall conform to the following minimum requirements as set forth in the specification:

Mechanical Property	Malleable Iron, ASTM A47 Grade 32510			Ductile Iron, ASTM 536 Grade 65-45-12		
	psi	MPa	Percent	psi	MPa	Percent
Tensile Strength, Min.	50,000	345		65,000	448	
Yield Strength, Min.	32,000	224		45,000	310	
Elongation in 2" (50 mm), Min.			10.0			12.0

M5.6 Workmanship and Finish

- M5.6.1 The castings shall conform substantially to the dimensions on the drawings or to the patterns supplied by the purchaser.
- M5.5.2 The castings shall be reasonably smooth and free from injurious imperfections.

M6. STEEL FORGINGS

M6.1 Material Covered

- M6.1.1 Mild carbon steel forgings for corner braces, fillers, and other parts of trackwork and track specialties not exposed to wheel wear.
- M6.1.2 Higher carbon steel forgings for riser blocks, switch tongues, and other parts of trackwork which are exposed to wheel wear, as well as parts of trackwork and track specialties not exposed to wheel wear if produced to this class at the option of the manufacturer.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

M6.2 Manufacture

M6.2.1 Mild steel forgings described in M6.1.1 shall be produced in conformance with the latest issue of ASTM A668, Specification for Forging, Carbon and Alloy Steel, for General Industrial Use, Grade B.

M6.2.2 Higher carbon steel forgings described in M6.1.2 shall be produced in conformance with the latest issue of ASTM A668, Specification for Forging, Carbon and Alloy Steel, for General Industrial Use, Grade C.

M6.2.2.1 Forgings in Grade C may also be produced from rail steel which meets the requirements of M1.2.1 and M1.3.1.

M6.3 Heat Treatment

M6.3.1 Mild steel, Grade B trackwork forgings need not be heat treated unless so specified in the order or contract.

M6.3.2 After forging and before reheating for heat treatment, Grade C forgings shall be cooled below the transformation temperature or to approximately 1000°F (538°C), and must not be permitted to cool below 500°F (260°C), without slow cooling.

M6.3.3 Higher carbon, Grade C trackwork forgings may be annealed, normalized, normalized and tempered, or quenched and tempered to meet the mechanical requirements in ASTM A668 and as indicated in M6.5.2.

M6.4 Chemical Requirements

M6.4.1 The steel shall conform to the following chemical requirements, except when rail steel is utilized (see M6.2.2 and M6.2.2.1):

ASTM A668 Grade	Composition, Percent				
	Carbon	Manganese	Phosphorus	Sulphur	Silicon
Grade B	0.15-0.25	0.30-0.60	0.045 Max.	0.050 Max.	--
Grade C	0.40-0.55	0.60-0.90	0.045 Max.	0.050 Max.	0.15

6.5 Mechanical Requirements

6.5.1 Grade B trackwork forgings are generally not specified to mechanical property requirements.

6.5.2 When specified by the purchaser in the order or contract, higher carbon, Grade C, trackwork forgings shall be tested in accordance with the ASTM A668 specifications, and the properties shall conform to the specified following requirements:

Mechanical Property	psi	MPa	Percent
Tensile Strength, Minimum	75,000	515	
Yield Strength, Minimum	37,500	260	
Elongation in 2" (50 mm), Minimum			20
Reduction in Area, Minimum			33

M6.5.3 Any testing in addition to that prescribed in M6.5.2 shall be a matter of agreement between the manufacturer and the purchaser and shall be required only when specified in the order or contract.

M6.6 Workmanship and Finish

M6.6.1 The forgings shall conform to the sizes and shapes specified by the purchaser.

M6.6.2 The forgings shall be free from injurious imperfections.

M7. ROLLED MILD STEEL

M7.1 Material Covered

M7.1.1 Rolled mild steel bars, bar size and structural shapes, and plates hammered, pressed, cut or machined for fittings and appurtenances, reinforcements, switch rods, clips, braces, slide and turnout plates, base and special tie plates, hold down housings, stops, heavy joint bars for internal joints of solid manganese steel crossings, corner braces, etc., but not including standard tie plates.

M7.2 Manufacture

M7.2.1 Bar and bar size shape stock shall be produced in conformance with the latest issue of ASTM A663, Specification for Merchant Quality Hot-Rolled Carbon Steel Bars, Grade 60 or ASTM A36, Specification for Structural Steel.

M7.2.2 Structural shape and plate stock shall be produced in conformance with the latest issue of ASTM A36, Specification for Structural Steel.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

M7.3 Chemical Requirements

M7.3.1 The steel shall conform to the following chemical requirements:

Element	Percent
Phosphorus	0.04 Max.
Sulphur	0.05 Max.
Copper (when copper steel is specified)	0.20 Min.

M7.4 Tensile Requirements

M7.4.1 When specified in the order or contract, one tensile test representing the material employed shall be made in accordance with the test specimen and procedure set forth in the respective specifications.

M7.4.2 The material represented by the tensile test specimen shall conform to the following requirements:

Tensile Strength of:	Minimum		Maximum	
	psi	MPa	psi	MPa
A663 Grade 60	60,000	415	72,000	495
A36	58,000	400	80,000	550

M7.5 Workmanship and Finish

M7.5.1 Permissible variations in the size and the dimensions of as rolled finished bars, shapes and plates shall be as provided in the specifications referred to in M7.2.

M7.5.2 Completed articles shall be accurately finished for the purpose intended, and shall be free from injurious imperfections.

M8. ROLLED STEEL FROG FILLER

M8.1 Material Covered

M8.1.1 Rolled steel bars of a shape to be fitted as a spacer into the fishing area between two standard tee rail sections.

M8.2 Manufacture

M8.2.1 Filler bars shall be hot rolled from steel produced by any acceptable steel making process.

M8.3 Heat Treatment

M8.3.1 When specified in the order or contract, the bars shall be heat treated to provide the minimum hardness specified in M8.5.1.

M8.4 Chemical Requirements

M8.4.1 The steel shall conform to the following chemical composition:

Element	Percent	
	Minimum	Maximum
Carbon	0.35	0.60

M8.5 Hardness Requirement

M8.5.1 When the filler bars are specified in the order or contract to be heat treated, they shall have a minimum Brinell hardness of 277 after heat treatment.

M8.6 Workmanship and Finish

M8.6.1 The bars shall be smooth, straight and within the dimensions specified in M8.6.2 through M8.6.4. It may be necessary to machine as rolled filler bars to meet these requirements in the case of certain rail sections.

M8.6.2 The fishing height of the as rolled bars shall not vary from that called for by the rail section specified by more than 1/64" (0.4 mm) over or 1/32" (0.8 mm) under the nominal dimensions.

M8.6.3 The width of the as rolled filler bars between the rail web contact faces shall not vary more than 1/16" (1.6 mm) over or under the dimensions specified.

M8.6.4 The depth of the flangeway groove shall not vary by more than 3/16" (4.8 mm) over or 1/16" (1.6 mm) under the dimension specified.

M9. HELICAL SPRINGS

M9.1 Material Covered

M9.1.1 Helical springs for spring rail frogs and spring switch operating mechanisms.

M9.2 Manufacture

M9.2.1 Springs hot-coiled from hot-rolled steel bars 3/8" (9.5 mm) and larger in diameter shall be produced in conformance with the latest issue of ASTM A125, Specification for Heat Treated Steel Helical Springs.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

100-08
Page 11

M9.2.1.1 As provided in ASTM A125 specification, the springs shall be made from carbon steel bars conforming to the requirements of the latest issues of ASTM A689, Specification for Carbon and Alloy Steel Bars for Springs, and ASTM A29, General Requirements for Steel Bars Carbon and Alloy, Hot-Rolled and Cold-Finished.

M9.2.2 Springs may also be made from cold-drawn or oil-tempered wire less than 1/2" (12.7 mm) in diameter and produced in conformance with the latest issue of ASTM A228, Specification for Steel Wire, Music Spring Quality, or ASTM A229, Specification for Steel Wire, Oil-Tempered for Mechanical Springs, respectively.

M9.3 Heat Treatment

M9.3.1 Hot-coiled springs produced in accordance with Specification A125 must be quenched and tempered after forming to meet the hardness requirements of the specification.

M9.3.2 Springs manufactured from pre-hardened wire produced in accordance with Specifications A228 or A229 are not heat treated after forming.

M9.4 Chemical Requirements

M9.4.1 Unless otherwise specified, ASTM A125 specification provides that the springs shall be made from hot-rolled carbon steel bars conforming to the chemical composition requirements of the latest issue of ASTM A689, Specification for Carbon and Alloy Steel Bars for Springs. AISI grade designation 1095 steel is most commonly used.

M9.4.1.1 Due to hardenability limitations of carbon steel, it is suggested that the bar diameter be limited to 1-5/8" (41.8 mm) maximum in order to withstand the maximum test stress requirements of ASTM A125 specification.

M9.4.2 The chemical composition for cold-drawn and oil-tempered wire for springs shall conform to the requirements provided in the respective ASTM A228 and A229 specifications.

M9.5 Mechanical Requirements

M9.5.1 The mechanical requirements, number of tests, and test procedures are detailed in ASTM A125 specification for hot-coiled and heat treated spring steel, and in ASTM A228 for cold-drawn, and ASTM A229 for the oil-tempered spring steel wire.

M9.6 Physical Requirements

M9.6.1 Measurements, permissible variations from drawings, and physical tests on finished springs shall be as detailed in ASTM A125 specification.

M9.7 Workmanship and Finish

M9.7.1 The surface of hot-coiled springs shall be in the as-quenched and tempered condition.

M9.7.2 The surface of all springs shall be free from injurious imperfections.

M10. JOINT BARS

Refer to AREMA Manual for Railway Engineering, Chapter 4.

M11. BOLTS AND NUTS

M11.1 Material Covered

M11.1.1 For steel track bolts refer to AREMA Manual for Railway Engineering, Chapter 4.

M11.2 Manufacture

M11.2.1 Heat treated steel bolts as defined in M11.1.2 and M11.1.3 shall be produced in conformance with the latest issue of SAE J429, Specification for Mechanical and Material Requirements for Externally Threaded Fasteners, to a Grade 5 designation.

M11.2.2 Where specified by the purchaser, heat treated steel bolts as defined in M11.1.2 and M11.1.3 shall be produced to a Grade 8 designation, in conformance with the latest issue of SAE J429, Specification for Mechanical and Material Requirements for Externally Threaded Fasteners.

M11.2.3 Medium carbon steel nuts as defined in M11.1.2 and M11.1.3 shall be produced in conformance with the latest issue of SAE J995, Specification for Mechanical and Material Requirements for Steel Nuts, to a Grade 5 designation.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK
For Rails 115 lb. and Heavier

- M11.2.4Where specified by the purchaser, medium carbon heat treated steel nuts as defined in M11.1.2 and M11.1.3 shall be produced to a Grade 8 designation, in conformance with the latest issue of SAE J995, Specification for Mechanical and Material Requirements for Steel Nuts.
- M11.2.5The Grade of steel of the nut shall correspond to the Grade of steel of the bolt.
- M11.3Chemical and Mechanical Requirements
- M11.3.1Chemical and mechanical requirements, and tests when specified by the purchaser in the order or contract, shall be in accordance with those indicated in the specifications for the particular Grade of material utilized, except that the minimum carbon content of medium carbon steel nuts shall be 0.40 percent.
- M11.4Dimensions and Other Physical Attributes
- M11.4.1The heat treated bolts and medium carbon steel nuts, other than track bolts, shall conform to the details of M11.4.
- M11.4.1.1Main bolts or bolts through the body and filers of frogs, guard rails, and crossings of special trackwork and applicable nuts shall be 1-3/8" in diameter.
- M11.4.1.2The diameter of bolts and applicable nuts, other than those defined in M11.4.1 and M11.4.1.1, shall be as specified in the detail plans.
- M11.4.2The dimensional data for bolts for special trackwork as defined in M11.1.2 and M11.1.3 shall conform to the latest issue of ANSI B18.2.1 specification, for square head bolts, except where otherwise shown on detail plans.
- M11.4.3The dimensional data for nuts for special trackwork, shall conform to the latest issue of ANSI B18.2.2 specification, for heavy square nuts.
- M11.4.4The bolt and nut threads shall conform to the latest issue of the ANSI B1.1, Unified Screw Thread Requirements, Course Thread Series, UNC, with tolerances and allowances in accordance with Class 2A for external threads (bolts) and Class 2B for internal threads (nuts).

- M11.4.5The bolts shall have unthreaded shanks within the limits of ANSI B18.2.1, for Square Head Bolt Requirements, but not less than the minimum major diameter of the threads.
- M11.4.6Bolts shall be equipped as shown on the detailed plans with head locks, spring washers and flat or beveled washers to provide proper bearing and to permit tightening of the nuts with a standard track wrench. Bearing shall be as defined in ANSI B18.2.1 specification.
- M11.4.6.1Torque values to be applied to grades of bolt defined by this specification shall be as per the appropriate table below. Values shall be selected from the tables depending upon the steel grade of the bolt, the diameter of the bolt and the surface condition of the bolt (i.e. lubricated or non-lubricated).

Recommended Torque Values in ft.-lb. to Produce the Minimum Specified Tension in SAE Grade 5 Bolts			
Bolt Diameter	Min. Tension - lb.	Lubricated Condition	Non-Lubricated Condition
1/2"	12,000	80	105
5/8"	19,000	155	210
3/4"	28,000	275	370
7/8"	39,000	450	600
1"	51,000	670	890
1-1/8"	56,000	825	1100
1-1/4"	71,000	1165	1550
1-3/8"	85,000	1535	2040

Recommended Torque Values in ft.-lb. to Produce the Minimum Specified Tension in SAE Grade 8 Bolts			
Bolt Diameter	Min. Tension - lb.	Lubricated Condition	Non-Lubricated Condition
1/2"	15,000	100	130
5/8"	24,000	195	265
3/4"	35,000	345	460
7/8"	49,000	565	750
1"	64,000	840	1120
1-1/8"	80,000	1180	1575
1-1/4"	102,000	1675	2230
1-3/8"	121,000	2185	2910

Note: Lubricated torque values shall be achieved by applying a metal based lubricant to the bolt threads.

AREMA SPECIFICATIONS FOR SPECIAL TRACKWORK

For Rails 115 lb. and Heavier

100-08

Page 13

M11.5 Identification Symbols

M11.5.1 Heat treated steel bolts, as defined in M11.1.2 and M11.2.3, shall be identified by marking symbols on the top of the head of the bolts. Identification markings shall be as per the appropriate SAE Grade Marking for steel bolts.

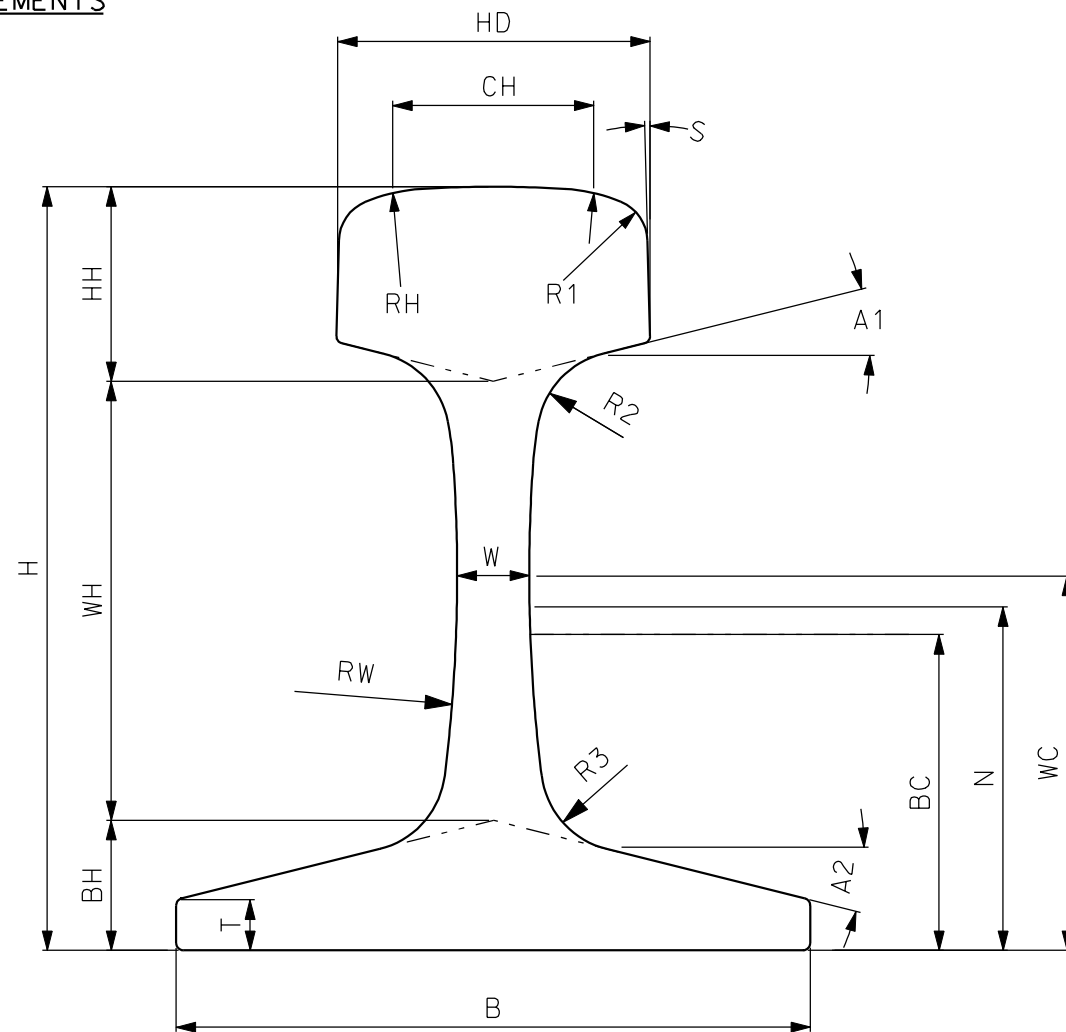
M11.5.2 Medium carbon steel nuts as defined in M11.1.2 and M11.1.3, shall be identified by markings as the manufacturer and grade in conformance with the latest issue of ANSI B18.2.2, Specification for Heavy Square Nuts.

M11.6 Workmanship

M11.6.1 All bolts and nuts shall be free of imperfections that affect their serviceability.

KEY TO RAIL SECTION MEASUREMENTS

A1 - BOTTOM HEAD ANGLE
 A2 - BASE ANGLE
 B - BASE WIDTH
 BC - BOLT CENTER LINE
 BH - BASE HEIGHT
 CH - HEAD RADIUS WIDTH
 H - RAIL HEIGHT
 HD - HEAD WIDTH
 HH - HEAD HEIGHT
 N - NEUTRAL AXIS
 RH - HEAD RADIUS
 RW - WEB RADIUS
 R1 - GAGE CORNER RADIUS
 R2 - TOP FILLET RADIUS
 R3 - BOTTOM FILLET RADIUS
 S - HEAD SIDE SLOPE*
 T - BASE EDGE THICKNESS
 W - WEB THICKNESS
 WC - WEB CENTER LINE
 WH - WEB HEIGHT

KEY FOR REFERENCES:

A - AREMA PLAN 1001-03
 B - AREMA PLAN 1004-03
 C - RAILS AND FASTENINGS 1916, LACKAWANNA STEEL CO.
 D - HANDBOOK OF RAILROAD TRACK STANDARDS (ARMY)
 E - 1948 RAILWAY ENGINEERING & MAINTENANCE CYCLOPEDIA
 F - D.WEMMER - SANTINA & THOMPSON
 G - AREMA VOLUME 1
 H - TABLE FROM DU-WEL STEEL
 I - RAILS AND ACCESSORIES - THE PA.STL. CO., MD STL. CO.
 J - RAILS 1914 CARNEGIE STEEL COMPANY
 K - CORRESPONDENCE FROM BETHLEHEM STEEL CORP.
 L - 1955 RAILWAY ENGINEERING & MAINTENANCE CYCLOPEDIA
 N - RAILWAY TRACK AND TRACK WORK, E.E. RUSSEL TRATMAN, 1897 AND 1909 EDITIONS
 O - ILLINOIS POCKET COMPANION, ILLINOIS STEEL, 1934
 P - CORRESPONDENCE, FROM ART WORTH, CANADIAN NATIONAL RAILWAY
 Q - SYDNEY STEEL CORP.

* ON HEAD FREE SECTIONS, THE BOTTOM OF THE HEAD IS NARROWER THAN THE TOP, THUS THE SIDE SLOPE IN THE OPPOSITE DIRECTION FROM STANDARD SECTIONS.

* THIS DRAWING, ITS CONTENTS AND THE MAINTENANCE THEREOF IS THE RESPONSIBILITY OF AREMA COMMITTEE 4, RAIL. AS SUCH, NO REVISIONS ARE PERMITTED WITHOUT THEIR APPROVAL.

Note: RE refers to AREMA and its predecessor AREA.

AMERICAN RAILWAY ENGINEERING
AND MAINTENANCE OF WAY ASSOCIATION

RAIL SECTIONS - IN USE SINCE ABOUT 1900

TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSEE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC	
8	ARA-B			841		841	841			81							1 9/16	1 9/16	23/32	5/32	7/16	13/16	5/16		8	12				VERT	13°	13°		23/32	0.70		H.O
	ASCE			840	801	840	840										1 9/16	1 3/16	13/16	5/32	15/32	13/16	9/32		12	12	5/32	3/16	3/16	VERT	13°	13°		11/16	0.75	11/16	D.H.+J.O
10	ASCE			1040		1040	1040										1 3/4	1 3/4	15/16	3/16	33/64	15/16	19/64		12	12	5/32	3/16	3/16	VERT	13°	13°		49/64	0.87	49/64	H.+J.L.O
	MISC.									101							1 9/16	1 11/16	23/32	9/32	7/16	13/16	5/16						VERT	13°	13°		23/32			H	
12	ARA-B			1230		1230	1230			122							23/64	1 3/4	59/64	3/16	9/16	1 3/32	25/64		12					4°	13°	13°		STR.	0.91		H.O
	PA STL. CO.- MD STL. CO.		12-AS	1240	1201	1240	1240	120	580								2	2	1	3/16	9/16	1 3/32	1 1/32		12	12	5/32	3/16	3/16	VERT	13°	13°		57/64	0.96	57/64	D.H.+J.O
													66				2	2	1 1/16	3/16	19/32	1 5/64	21/64	3/32	4 1/2	4 1/2	3/16	5/32	5/32	5°	13°	13°		59/64		59/64	I
14	ARA-B			1430		1430	1430			143							23/64	1 27/32	1 1/64	9/32	9/16	1 3/32	25/64							4°	13°	13°		STR.	0.92		H.L.O
	ASCE					1440											2 1/16	2 1/16	1 1/16	1/4	5/8	1 3/32	1 1/32		12	12	5/32	3/16	3/16	VERT	13°	13°		57/64	1.02	57/64	J.O
16	ARA-B			1630		1630	1630			162							2 7/16	2	1 7/64	7/32	4/64	1 23/64	7/16							4°	13°	13°		STR.	1.13		H.O
	ASCE		16-AS	1640	1601	1640	1640	160	579								2 3/8	2 3/8	1 1/64	7/32	4/64	1 23/64	3/8		12	12	3/16	3/16	3/16	VERT	13°	13°		1 1/128	1.15	1 7/128	D.H.+J.O
	PA STL. CO.- MD STL. CO.												48				2 1 1/32	2 11/32	1 7/32	7/32	45/64	1 9/32	23/64		4	4 1/2	3/16	5/32	5/32	5°	12°	12°		1		1	I
18	ARA-B			1830		1830	1830			182							2 7/16	2 5/64	1 3/16	19/64	4/64	1 23/64	7/16							4°	13°	13°		STR.	1.14		H.O
20	ARA-B			2030		2030	2030			203							2 43/64	2 1/4	1 17/64	1/4	2 3/32	1 15/32	31/64							4°	13°	13°		STR.	1.25		H.O
	ASCE		20-AS	2040	2001	2040	2040	200	578								2 5/8	2 5/8	1 1 1/32	1/4	2 3/32	1 15/32	7/16		12	12	1 1/4	3/16	3/16	VERT	13°	13°		1 1/64	1.27	1 1/64	D.H.+J.O
	PA STL. CO.- MD STL. CO.												47				2 1/2	2 1/2	1 7/16	1/4	25/32	1 5/16	13/32	3/32	4 1/2	4 1/2	7/32	3/16	3/16	5°	12°	12°		1 1/32		1 1/32	I
25	ARA-B			2530		2530	2530			252							2 13/16	2 1/2	1 23/64	9/32	25/32	1 3/64	35/64		12	12	1 1/4	1/4	1/4	4°	13°	13°		137/128	1.30		H.O
	ASCE		25-AS	2540	2502	2540	2540	250	577				264				2 3/4	2 3/4	1 1/2	19/64	25/32	1 3/64	31/64		12	12	1 1/4	1/4	1/4	VERT	13°	13°		129/128	1.33	1 29/128	D.H.+J.O
	PA STL. CO.- MD STL. CO.												45				2 3/4	2 21/32	1 9/16	19/64	25/32	1 13/32	7/16	7/64	7	7	7/32	7/32	7/32	5°	12°	12°		1 9/64		1 9/64	I.
30	ARA-B			3030		3030	3030			303							3 1/64	2 3/4	1 19/32	5/16	7/8	1 23/32	37/64		12	12	5/16	1/4	1/4	4°	13°	13°		1 7/16	1.50		H.O
	ASCE												269				3	3	1 5/8	21/64	55/64	1 39/64	17/32		12	12	1/4	1/4	1/4	VERT	13°	13°		1 43/128			I
	ASCE		30-AS	3040	3002	3040	3040	300	576	301							3 1/8	3 1/8	1 11/16	21/64	7/8	1 23/32	17/32		12	12	5/16	1/4	1/4	VERT	13°	13°		1 29/64	1.52	1 25/64	D.H.+J.O
	PA STL. CO.- MD STL. CO.												44				3	3 5/16	1 45/64	1 1/32	15/16	1 9/16	1/2	1 1/8	7 1/2	9	1/4	1/4	1/4	5°	12°	12°		1 9/32		1 9/32	I
35	ARA-B			3530		3530	3530			352							3 23/64	3	1 23/32	1 1/32	61/64	1 25/32	5/8		12	12	5/16	1/4	1/4	4°	13°	13°		1 37/64	1.58		H.O
	ASCE												265				3 1/4	3 1/4	1 3/4	23/64	15/16	1 47/64	37/64		12	12	5/16	1/4	1/4	VERT	13°	13°				157/128	I
	ASCE		35-AS	3540	3502	3540	3540	350	575	351							3 5/16	3 5/16	1 3/4	23/64	61/64	1 25/32	37/64		12	12	5/16	1/4	1/4	VERT	13°	13°		1 15/32	1.60	1 15/32	D.H.+J.O
	PA STL. CO.- MD STL. CO.												43				3 1/16	3 3/8	1 7/8	3/8	1	1 35/64	33/64	1 1/8	7 1/2	10	5/16	5/16	5/16	5°	12°	12°		1 9/32		1 9/32	I
40	ARA-B			4030		4030	4030			403							3 35/64	3 3/16	1 53/64	3/8	1 1/64	1 55/64	43/64		12	12	5/16	1/4	1/4	4°	13°	13°		1 77/128	1.67		H.O
	ASCE		40-AS	4040	4004	4040	4040	400	545	401			138				3 1/2	3 1/2	1 7/8	25/64	1 1/64	1 55/64	5/8		12	12	5/16	1/4	1/4	VERT	13°	13°		1 71/128	1.68	1 71/128	D.H.+J.O
	PA STL. CO.- MD STL. CO.												32				3 1/2	3 1/2	1 29/32	25/64	1 1/8	1 55/64	33/64	5/32	5 1/2	11	9/32	5/16	5/16	6°	10°	10°		1 7/16		1 7/16	I
45	ARA-B			4530		4530	4530			452							3 47/64	3 3/8	1 63/64	13/32	1 1/16	1 31/32	45/64		12	12	5/16	1/4	1/4	4°	13°	13°		1 11/16	1.75		H.O
	ASCE		45-AS	4540	4504	4540	4540	450	549	451			266				3 11/16	3 1/16	2	21/64	1 1/16	1 31/32	21/32		12	12	5/16	1/4	1/4	VERT	13°	13°		1 41/64	1.78	1 41/64	D.H.+J.O
	PA STL. CO.- MD STL. CO.												36				3 5/8	3 5/8	1 15/16	13/32	1 9/32	1 51/64	35/64	5/32	4 1/2	9	1 1/32	1/4	5/16	5°	11°	10°		1 15/32		1 15/32	I

TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC	
48	ARA-B			4830		4830	4830			484							3 ⁷ / ₈	3 ² / ₆₄	2 ¹ / ₁₆	3/ ₆₄	1 ¹ / ₁₆	1 ³ / ₃₂	4 ⁵ / ₆₄		12	12	5/ ₁₆	1/ ₄	1/ ₄	4°	13°	13°		1 ¹¹ / ₁₆			H.O
	ASCE			4840	4803	4840	4840			482							3 ¹¹ / ₁₆	3 ⁴ / ₆₄	2 ⁵ / ₆₄	1 ¹ / ₂	1 ¹ / ₁₆	1 ³ / ₃₂	2 ¹ / ₃₂						VERT.	13°	13°		1 ⁴ / ₆₄		1 ⁴ / ₆₄	D.H	
	M.S.CO.		48-B5														4 ¹ / ₄	4	1 ² / ₃₂	3 ₈	1 ¹ / ₈	2 ² / ₆₄	4 ⁵ / ₆₄						VERT.	13°	13°		1 ¹¹ / ₁₂₈			H	
	PA STL. CO. - MD STL. CO.												88				4	4	1 ² / ₃₂	3 ₈	1 ³ / ₈	2	5 ₈	1/ ₈	10	15	1/ ₄	1/ ₄	1/ ₄	VERT.	13°	13°		1 ⁵ / ₈		1 ⁵ / ₈	I
50	ASCE		50-AS	5040	5005	5040	5040	500	542	500			129				3 ⁷ / ₈	3 ⁷ / ₈	2 ¹ / ₈	7/ ₁₆	1 ¹ / ₈	2 ¹ / ₁₆	1 ¹ / ₁₆		12	12	5/ ₁₆	1/ ₄	1/ ₄	VERT.	13°	13°		1 ² / ₃₂	1.88	1 ² / ₃₂	D.I.J
	PA STL. CO. - MD STL. CO.												22				4	4	2 ³ / ₃₂	1 ³ / ₃₂	1 ³ / ₈	1 ⁶ / ₆₄	4/ ₆₄	1/ ₈	10	8	7/ ₁₆	1/ ₄	1/ ₄	5°	13°	13°		1 ⁵ / ₈		1 ⁵ / ₈	I
52	RIO GRANDE SO.									521							4	4	2 ¹ / ₈	2 ⁵ / ₆₄	1 ² / ₃₂	2	4/ ₆₄						VERT.	13°	13°		1 ⁴ / ₆₄			1 ⁴ / ₆₄	D.H
55	ASCE		55-AS	5540	5501	5540	5540	550	537				130				4 ¹ / ₁₆	4 ¹ / ₁₆	2 ¹ / ₄	1 ⁵ / ₃₂	1 ¹¹ / ₆₄	2 ¹ / ₆₄	2 ³ / ₃₂		12	12	5/ ₁₆	1/ ₄	1/ ₄	VERT.	13°	13°		1 ¹⁰ / ₁₂₈	1.97	1 ¹⁰ / ₁₂₈	D.H.I.J
56	ASCE		56-AS	5640		5640	5640										4 ¹ / ₁₆	4 ¹¹ / ₁₂₈	2 ³⁵ / ₁₂₈	63/ ₁₂₈	1 ⁸¹ / ₅₁₂	2 ⁴¹ / ₂₅₆	371/ ₅₁₂						VERT.	13°	13°		1 ¹⁰ / ₁₂₈			H	
	MISC.			5651		5651	5651										4 ¹ / ₄	3 ³ / ₃₂	2 ⁷ / ₃₂	1 ³ / ₃₂	1 ⁷ / ₁₆	2 ¹ / ₈	1 ¹ / ₁₆						1 ¹ / ₁₀ To 1	14°	12° 50'		1 ³ / ₄		1 ¹ / ₁₆	D.H	
	MISC.			5633	5616	5633	5633										4 ¹ / ₄	4 ¹ / ₈	2 ¹ / ₄	3 ₈	1 ² / ₆₄	2 ¹ / ₈	4 ⁵ / ₆₄	1/ ₈	10	8	7/ ₁₆	1/ ₄	1/ ₄	5°	13°	13°		1 ⁴ / ₆₄		1 ⁴ / ₆₄	D.H.J
	MISC.									562							4 ¹ / ₄	4 ¹ / ₈	2 ¹ / ₄	53/ ₁₂₈	1 ⁷ / ₃₂	2 ¹ / ₆₄	4 ⁹ / ₆₄						VERT.	13°	13°		1 ¹¹ / ₁₂₈		1 ¹¹ / ₁₂₈	D.H	
	MISC.								511								4	3 ⁵ / ₆₄	2 ¹⁹ / ₆₄	2 ³ / ₆₄	1 ⁵¹ / ₁₂₈	2 ⁵⁹ / ₆₄	87/ ₁₂₈						1 ₃₂ To 5 ₈	12°	12°				1 ⁴ / ₆₄	D	
	PA STL. CO. - MD STL. CO.			5607		5607	5607						51				4	3 ² / ₃₂	2 ⁵ / ₁₆	1 ⁵ / ₃₂	1 ¹³ / ₃₂	1 ² / ₃₂	1 ¹ / ₁₆						1 ₃₂ To 5 ₈	12°	12°		1 ⁴ / ₆₄			H	
	C.B. & O.			5608													4 ¹ / ₁₆	4 ¹ / ₁₆	2 ⁷ / ₃₂	1 ⁵ / ₃₂	1 ¹³ / ₆₄	2 ¹ / ₈	4 ⁷ / ₆₄		12	11	1/ ₄	3 ₈	3 ₈	VERT.	13°	13°		1 ⁴ / ₆₄			N
58	PA STL. CO. - MD STL. CO.												7				4 ¹ / ₄	4 ¹ / ₄	2 ³ / ₁₆	1 ³ / ₃₂	1 ² / ₆₄	2 ¹ / ₈	4 ⁵ / ₆₄	1/ ₈	14	10	1/ ₈	1/ ₄	1/ ₄	3°	13°	13°		1 ⁴ / ₆₄		1 ⁴ / ₆₄	I
	PA STL. CO. - MD STL. CO.												63				4	4	2 ¹ / ₃₂	1 ¹ / ₂	1 ¹⁵ / ₃₂	1 ²¹ / ₃₂	1 ¹ / ₁₆	1/ ₄	11	11	7/ ₁₆	1/ ₄	1/ ₄	3°	15°	12°		1 ³⁹ / ₆₄		1 ³ / ₆₄	I
60	ARA-A	6020		6020		60RA	602					568			121		4 ¹ / ₂	4	2 ¹ / ₄	1 ⁵ / ₃₂	1 ¹⁵ / ₆₄	2 ² / ₆₄	1 ³ / ₁₆		14	14	3 ₈	3 ₈	3 ₈	1 ¹ / ₁₆ To 1	1 To 4	1 To 4		2 ¹⁷ / ₆₄	2.13	2 ⁵ / ₁₂₈	D.E.F.J.O
	ARA-B	6030		6030		60RB	6030					571					4 ³ / ₁₆	3 ¹¹ / ₁₆	2 ¹ / ₄	3/ ₆₄	1 ¹ / ₄	2 ¹ / ₁₆	7 ₈		12	12	3 ₈	5/ ₁₆	5/ ₁₆	3°	13°	13°		1 ² / ₃₂	1.95	1 ² / ₃₂	D.E.F.H.J
	ASCE	6040	60-AS	6008	6015	60a	600	600	533	603		533	244	6001	105		4 ¹ / ₄	4 ¹ / ₄	2 ³ / ₈	3/ ₆₄	1 ⁷ / ₃₂	2 ¹ / ₆₄	4 ⁹ / ₆₄		12	12	5/ ₁₆	1/ ₄	1/ ₄	VERT.	13°	13°		1 ¹¹ / ₁₂₈	2.05	1 ¹¹ / ₁₂₈	D.E.F.I.J
	ASCE			6007		60K-R						527					4 ¹ / ₄	4 ¹ / ₄	VAR1																		F
	ASCE			6013		60M-O		600X				509					VAR1	4 ¹ / ₄																			F
	ASCE			6012									71	6002	129																						F
	ASCE					60P						514																									F
	ASCE	6087					6087			4840							4 ⁵ / ₈	4 ¹ / ₂	2 ¹ / ₂																		F
	MISC.	6033		6017		60N	6033		503			503					4 ¹ / ₄	4 ¹³ / ₁₆	2 ² / ₆₄	2 ³ / ₆₄	1 ⁵⁵ / ₁₂₈	2 ⁷ / ₆₄	91/ ₁₂₈	1/ ₈	10	8	7/ ₁₆	1/ ₄	1/ ₄	5°	13°	13°		1 ⁴ / ₆₄		1 ⁴ / ₆₄	D.F.H.J
	MISC.	6051		6051	6001	6051	6051										4 ¹ / ₄	4 ¹ / ₁₆	2 ⁵ / ₁₆	1 ¹ / ₂	1 ⁷ / ₁₆	2 ¹ / ₈	1 ¹ / ₁₆		10		7/ ₁₆	1/ ₄	1/ ₄	1 ¹ / ₁₀ To 1	14°	12° 50'		1 ³ / ₄		1 ³ / ₄	A.D.H
PA STL. CO. - MD STL. CO.												6				4 ¹ / ₄	4 ¹ / ₄	2 ³ / ₈	1 ¹ / ₂	1 ² / ₆₄	2 ¹ / ₈	4 ⁵ / ₆₄		10		7/ ₁₆	1/ ₄	1/ ₄		13°	13°		1 ⁴ / ₆₄		1 ⁴ / ₆₄	I	
QUEBEC CENTRAL																4 ³ / ₈	4 ³ / ₈	2 ¹ / ₄	1 ¹ / ₂	1 ¹ / ₄	2 ⁵ / ₁₆	1 ³ / ₁₆		12	12	1/ ₄	1/ ₄	1/ ₄	VERT.	13°	13°						N
65	ASCE	6540	65-AS	6540	6507	6540	6540	650	534	653			236				4 ⁷ / ₁₆	4 ⁷ / ₁₆	2 ¹³ / ₃₂	1 ¹ / ₂	1 ³ / ₃₂	2 ³ / ₈	2 ⁵ / ₃₂		12	12	5/ ₁₆	1/ ₄	1/ ₄	VERT.	13°	13°		1 ³ / ₃₂	2.14	1 ³ / ₃₂	A.D.E.I.J
	CANADIAN PACIFIC		654	6508		6508	6508	654									4 ³ / ₆₄	4 ³ / ₈	2 ¹ / ₄	1 ⁵ / ₃₂	1 ³ / ₃₂	2 ¹ / ₃₂	5 ⁵ / ₆₄						1 ₃₂ To 3 ₄	1 To 4	1 To 4		2 ¹ / ₃₂		2 ¹ / ₃₂	D.H	
	MISC.				6501												4 ³ / ₈	4 ⁷ / ₁₆	2 ³ / ₈	2 ³ / ₆₄	1 ¹ / ₂	2 ⁵ / ₃₂	2 ³ / ₃₂						1 ¹ / ₁₆ To 3 ₄	14° 30'	12° 30'				1 ⁵ / ₆₄	D	

TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																						
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER																RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC		
65	MISC.				6504												4 1/2	4 1/2	2 3/16	1/2	1 3/64	2 19/64	2 3/32						4°	13°	13°						1 7/8	D
66	MISC.																4 13/32	4 7/16	2 1 3/32	1 5/32	1 1 1/32	2 1/8	3/4					CURV. 4 1/2" R	13°	13°		1 1 3/16					H	
67	NORTHERN PACIFIC			6602		6602	6602		547				145				4 1 7/32	4 1/2	2 5/16	1 7/32	1 2 7/64	2 1 1/32	4 9/64		12	12	1/4	1/4	1/4	VERT.	13°	13°		1 1 5/16		1 1 5/16	D+H+I	
	MISC.	6733		6704		6704	6704		515								4 1/2	4 1/2	2 1 3/32	1/2	1 5/8	2 1/8	3/4	1/8	10	8	7/16	1/4	1/4	1/16 To 3/4	13°	13°	13°		1 1 3/16	1 1 3/16	A+D+J	
	PA STL. CO.- MD STL. CO.												2				4 1/2	4 1/2	2 3/8	1/2	1 2 1/32	2 7/64	4 7/64	1/8	11	11	1 1/32	1/4	1/4	5°	14°	13°		1 2 3/32		1 2 3/32	I	
67.5	RUSSIAN								587								5 3/64	4 2 7/64	2 2 3/64	1 5/32	1 2 7/64	2 1 1/16	2 3/32						VERT.	1 To 3	1 To 3				2 1/4	D		
68	MISC.																4 3/8	4 1/2	2 1/2	1/2	1 1 5/32	2 1/8	2 3/32						1/16 To 1 1/16	13°	13°		1 2 7/32				H	
	PA STL. CO.- MD STL. CO.												62				4 1/2	4 1/2	2 1 5/32	1/2	1 3 5/64	2 3/16	4 9/64	3/32	12	8	1/2	1/4	1/4	6°	13°	13°		1 5 5/64		1 5 5/64	I	
70	ARA-A			7020		7020	7020	7031									4 3/4	4 1/4	2 3/8	1/2	1 1 1/32	2 1/2	2 3/32		14	14	3/8	3/8	3/8	1/16 To 1	1 To 4	1 To 4		2 1 3/32	2.20	2 3/32	C+E+J	
	ARA-B		174	7030		7030	7030	7032									4 3 5/64	4 3/64	2 3/8	3 3/64	1 2 3/64	2 1 7/64	5 9/64		12	12	3/8	5/16	5/16	3°	13°	13°		2 7/128	2.16	2 7/128	C+D+E+J	
	ASCE	7040	70-AS	7040	7010	7040	7040	700	532	701			237				4 5/8	4 5/8	2 7/16	3 3/64	1 1 1/32	2 1 5/32	1 3/16		12	12	5/16	1/4	1/4	VERT.	13°	13°		2 3/64	2.22	2 3/64	A+C+D+E+I+J	
	BANGOR & ARROSTOOK		70-BA					703					97				4 3/4	4 3/4	2 7/16	1/2	1 1 3/32	2 1 9/32	3/4	1/8	12	12	1/4	1/4	1/4	VERT.	12°	12°		2 3/64		2 3/64	D+H+I	
	CHICAGO & ALTON				7002												4 3/8	4	2 3 3/96	3 5/64	1 1 7/24	1 1 1/12	3/4					1/24 To 5/16	12°	12°		1 1 7/24			D			
	PENNSYLVANIA			7033	7005	7033	7033		504				57				4 1/2	4 1/2	2 7/16	1/2	1 1 9/32	2 1/8	2 5/32	9/64	10	8	7/16	1/4	1/4	4°	13°	13°		1 2 7/32		1 2 7/32	D+E+H+I	
72	CAN.PAC. (SANDBERG)																4 1 5/16	4 1/2	2 1/4	1/2	1 5/8	2 2 5/64	5 9/64		6	VERT.	1/2	3/8	3/8	VERT.	15°	15°				2 1 3/128	N	
	CHI. & NOR. WESTERN	7250	72-NP	7250	7201	7250	7250		581								4 3/4	4 3/4	2 3/8	9/16	1 1 3/32	2 1/2	2 1 3/32						VERT.	14°	14°		2 3/32		2 3/32	A+D+E		
	SPOKANE INT'L. RY							722									4 4 5/64	4 5/8	2 7/16	3 5/64	1 2 7/64	2 1 5/32	1 3/16		12	12	5/16	1/4	1/4	VERT.	13°	13°		2 3/64	2.25	2 3/64	C	
74	PA STL. CO.- MD STL. CO.												146				4 1 1/16	4 3/4	2 7/16	9/16	1 3/4	2 3/16	3/4		15	15	3/8	5/16	5/16		17°	13°		1 7/8		1 7/8	I	
75	ASCE	7540	75-AS	7540	7506	7540	7540	750	529	753			214				4 1 3/16	4 1 3/16	2 1 5/32	1 7/32	1 2 7/64	2 3 5/64	2 7/32		12	12	5/16	1/4	1/4	VERT.	13°	13°		2 1 5/128	2.30	2 1 5/128	A+C+D+E+I+J	
	BOSTON AND MAINE		92					752					92				5	5	2 1/2	9/16	1 7/16	2 4 7/64	5 9/64		12	STR.	1/4	1/4	1/4	VERT.	13°	13°		STR.	2.37	2 1/8	C+I	
	LACKAWANNA		75-C					753									4 1 1/16	5	2 1/2	1/2	1 4 3/64	2 1 9/64	1 3/16		10 1/2	10	7/16	5/16	5/16	1/16 To 1	18°	12° 45'		1 1 1 7/128	2.24	1 1 1 7/128	C+D	
	INT. & GRT. NOR			7551		7551	7551										4 3/4	5	2 1/2	9/16	1 7/16	2 1 5/32	2 1 3/32						VERT.	13°	13°		2 5/64			E+H		
	MISC.																4 3/4	4 1/2	2 1/2	1/2	1 2 1/32	2 1/8	2 3/32						6°	13°	13°		1 2 7/32			H		
	MISSOURI PACIFIC	7550	75-MP	7550	7512	7550	7550	754	528								4 3/4	4 3/4	2 9/16	9/16	1 7/16	2 1 5/32	2 7/32		12	30	3/8	1/4	1/4	VERT.	13°	13°		2 5/64	2.29	2 5/64	A+C+D	
	NAT.RY.MEX.		128														5	5	2 3/4	1/2	1 3/8	2 7/8	3/4						VERT.	12°	12°				2 3/16	D		
	N.Y.C.(DUDLEY)																5	4 3/4	2 5/8	1 7/32	1 3/8	2 3/4	7/8	9/32	14	14	1/4	1/2	5/16	4°	14°	14°				2 1/8	N	
	PA STL. CO.- MD STL. CO.												87				4 3/4	4 3/4	2 1/2	9/16	1 1/2	2 7/16	1 3/16		12	VERT.	1/4	1/4	1/4	VERT.	13°	13°		STR.		2 1 3/32	I	
	SEABOARD (DUDLEY)		75-DY	7522		7522	7522						221				5	5	2 9/16	1/2	1 3/8	2 3/4	7/8		14	14	5/16	1/2	5/16	3°	14°	14°		2 5/8		2 1/4	D+H+I+J	
	UNION PACIFIC		75-B	7523	7513	7523	7523			754			249				5	5	2 9/16	3 3/64	1 3/8	2 1 3/16	1 3/16		12	12	5/16	1/4	1/4	VERT.	13°	13°		2 5/8		2 1/4	D+H+I+J	
	UNION PACIFIC	7524	75-SP	7524		7524	7524			757							4 1 5/16	4 7/16	2 7/16	3 3/64	1 3/8	2 5/8	1 5/16		14	14	3/8	3/8	3/8	1/16 To 1	1 To 4	1 To 4		2 1/2		2 1/4	A+D+J	
76	PA STL. CO.- MD STL. CO.												216				4 3/4	5	2 1/2	1/2	1 1 1/16	2 1/4	1 3/16	5/32	20	VERT.	3/8	5/16	5/16		14° 30'	12°		STR.		1 1 5/16	I	
77.5	GREAT NORTHERN				77501			775									5	5	2 3/8	5/8	1 1 1/16	2 1/2	1 3/16						5°	14°	14°				2 1/16	D		
78	OLD COLONY		78-OC										98				4 3/4	5	2 1/2	1 7/32	1 3/4	2 7/32	2 3/32		12	12	3/8	7/16	7/16	5°	14°	12° 15'		1 5 7/64			H+I	

PLAN NO. 1001-18 Page 4 of 8

TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																									
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL				
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE				
		U.S. STEEL	BETHELEM	ILLINOIS	ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL.	PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N		BC			
79	PA STL. CO. - MD STL. CO.																4 3/4	4 3/4	2 5/8	5/8	1 5/8	2 1/32	2 3/32	7/8	1/8	12	9	1/2	1/4	1/4	6°	13°	13°				1 15/16	I			
79.5	FRICITIONLESS		79.5-C														5 3/16	5 3/16	1 15/16	9/16	2 1/32	2 9/32	7/8							4°	13°	13°				2 1/64		2 1/64	D.H		
80	ARA-A	8020	80-RA	8020		8020	8020	8031		801							5 1/8	4 5/8	2 1/2	3 3/64	1 7/16	2 23/32	3 1/32			14	14	3/8	3/8	3/8	1/16 To 1	1 To 4	1 To 4			2 5/16	2.31	2 29/64	C.E.H.+J		
	ARA-B	8030	80-RB	8030		8030	8030	8032	569	802							4 15/16	4 7/16	2 7/16	3 5/64	1 15/32	2 15/32	1			12	12	3/8	5/16	5/16	3°	13°	13°			2 15/64	2.27	2 15/64	C.D.E.H.+J		
	ASCE	8040	80-AS	8040		8040	8040	800	530	800	8040			251			5	5	2 1/2	3 5/64	1 1/2	2 5/8	7/8			12	12	5/16	1/4	1/4	VERT.	13°	13°			2 3/16	2.38	2 3/16	A.C.D.E.I.+J		
	CAN. NOR.		804	8010		8010	8010	804									5	5	2 3/16	3 5/64	1 13/32	2 11/16	2 3/32							1/16 To 1	13°	13°			2 1/4		2 1/4	D.H.L			
	DUDLEY	8022	80-DY	8022		8022	8022							220			5 1/8	5	2 29/32	1 7/32	1 1/2	2 3/4	7/8			14	14		1/4	1/2	5/16	1/16 To 1	1 To 4	1 To 4			2 5/8		2 1/4	A.I.+J	
	FRICITIONLESS		80-MC-F															5 3/16	5 1/16	1 15/16	9/16	2 1/32	2 9/32	7/8							4°	13°	13°			2 1/64			H		
	GREAT NORTHERN				8009				802									5	5	2 13/32	5/8	1 5/8	2 1/2	7/8								5°	14°	14°					2 1/8		D
	HOCKING VALLEY									540								5	4 59/64	2 3/64	2 9/64	1 93/128	2 29/64	1 11/128								4°	13°	13°					2 1/16		D
NEW YORK CENTRAL		220	8022	8008	8022	8022	801	543									5 1/8	5	2 29/32	1 7/32	1 1/2	2 3/4	7/8			14	14	5/16	1/2	5/16	1/16 To 1	1 To 4	1 To 4			2 5/8	2.43	2 1/4		C.D	
85	ASCE	8540	85-AS	8540	8504	8540	8540	850	531	851	8540		235				5 3/16	5 3/16	2 3/16	9/16	1 35/64	2 3/4	5 7/64			12	12	5/16	1/4	1/4	VERT.	13°	13°			2 17/64	2.47	2 17/64	A.C.D.E.I.+J		
	C.B. & O.	8543	85-CB	8543	8506	8543	8543	855		852							5 3/16	5 3/16	2 29/32	9/16	1 35/64	2 3/4	5 7/64								5°	13°	13°			2 17/64		2 17/64	A.D.E		
	CANADIAN PACIFIC	8524	85-CP	8524		8524	8524	856			8524			8501	113		5 1/8	5	2 1/2	9/16	1 7/16	2 11/16	1	3/8	8	8	1/4	3/8	3/8	1/32 To 1	1 To 4	1 To 4			2 19/32	2 19/64	2 11/32		A.D.J.+P		
	HEAD FREE - CAN.PAC													8504	137		5 1/4	5	2 29/64	9/16	1 9/16	2 11/16	1	3/8	8	8	1/4	3/8	3/8	1/25 To 1	1 To 4	1 To 4			2 11/32	2.35	2 11/32		P		
	DENVER & RIO GRANDE									850							5 1/4	5 1/4	2 1/2	9/16	1 3/4	2 5/8	7/8								4°	13°	13°			STR.		2 3/16		A.D	
	D. & R.G. / C & S									853							5 3/8	4 7/8	2 1/2	9/16	1 15/32	2 29/32	1							1/16 To 1	1 To 4	1 To 4			2 29/64		2 29/64		D		
	GREAT NORTHERN		854	8553	8509	8553	8553	854									5	5	2 29/32	2 1/32	1 19/32	2 1/2	2 3/32								5°	14°	14°			2 5/32		2 5/32		D.E	
	MISSOURI PACIFIC	8550	853	8550	8507	8550	8550										5 1/32	5 1/4	2 15/32	7 5/128	1 3/4	2 39/64	5 5/64								2° 30'	13°	13°			STR.		2° 11/28		A.D.E.H	
	N.Y.C. & STL. / KCS		85-NK	8521		8521	8521	8531			8521							5 3/8	4 7/8	2 17/32	1 7/32	1 29/64	2 15/16	6 3/64			14	14	3/8	3/8	3/8	1/16 To 1	1 To 4	1 To 4			2 23/32	2.43	2 29/64		C.E.J.L
	PENNSYLVANIA	8531	85-PS	8531	8530	8531	8531	8530	559		8531							5 1/8	4 5/8	2 1/2	1 7/32	1 29/32	2 15/32	1		10	10	7/16	1/4	1/4	VERT.	15°	13°			2 15/64	2.38	2 15/64		A.C.D.E	
	PENNSYLVANIA		85-PR	8533	8503	8533	8533	852	500					67				5	5	2 3/16	1 7/32	1 3/4	2 3/8	7/8		5/32	10	8	7/16	1/4	1/4	4°	13°	13°			2 1/16		2 1/16		D.E.I
	SEABOARD (DUDLEY)		85-DY	8522		8522	8522	851			261							5 1/4	5	2 11/16	1 7/32	1 5/8	2 3/4	7/8			14	14	5/16	1/2	5/16	1/16 To 1	1 To 4	1 To 4			2 5/8	2.57	2 1/4		C.D.I
SOO LINE	8520		8520		8520	8520											5 3/8	4 7/8	2 1/2	9/16	1 15/32	2 29/32	1							3° 34' 35"	14° 2' 11"	14° 2' 11"			2 29/32		2 29/64		A.D.E.L.M		
WESTERN PACIFIC																	5 1/4	5 1/4	2 1/2	9/16	1 3/4	2 5/8	7/8			10	VERT.	7/16	5/16	5/16	4°	13°	13°					2 3/16		N	
90	ARA-A	9020	90-RA	9020		9020	9020	9031	563	902	9020						5 5/8	5 1/8	2 3/16	3 1/16	1 15/32	2 39/32	1			14	14	3/8	3/8	3/8	1/16 To 1	1 To 4	1 To 4			2 23/32	2.54	2 37/64		A.C.D.E.J	
	ARA-B	9030	90-RB	9030		9030	9030	9032	561	905	9030						5 17/64	4 49/64	2 9/16	9/16	1 39/64	2 5/8	1 1/32			12	12	3/8	5/16	5/16	3°	13°	13°			2 11/32	2.45	2 11/32		A.C.D.E.J	
	ASCE	9040	90-AS	9040	9002	9040	9040	900	535		9040			245			5 3/8	5 3/8	2 5/8	9/16	1 19/32	2 59/64	5 5/64			12	12	5/16	1/4	1/4	VERT.	13°	13°			2° 51/28	2.55	2° 15/28		A.C.D.E.I.+J	
	AT & SF	9021	90-SF	9021		9021	9021	9033			9021			903			5 5/8	5 3/16	2 3/16	9/16	1 15/32	3 5/32	1							1/16 To 1	1 To 4	1 To 4			2 29/32		2 29/64		A.C.D.E		
	CHI. & NOR. WESTERN	9035	90-OM	9035		9035	9035	904									5 17/32	5 3/32	2 1/2	1 1/2	1 17/32	2 31/32	1 1/32			12	12	3/8	5/16	5/16	3/64 To 3/4	13°	13°			2 23/64	2.47	2 23/64		A.D.E.O	
	DENVER & RIO GRANDE										906						5 1/2	5 1/8	2 3/16	9/16	1 5/8	2 7/8	1								4°	14°	14°			2 5/16		2 7/16		A.D	
	FRICITIONLESS			9039			9039	9039										5 5/8	5 1/8	2 1/4	9/16	2	2 5/8	1							1/4 To 1 3/8	13°	13°			2 5/16		2 5/16		D.H	
FRICITIONLESS			9029			9029	9029										6 3/32	5 1/8	1 59/64	9/16	1 15/16	3 5/32	1							1/16 To 1	1 To 4	1 To 4			2 37/64		2 37/64		D.H		

PLAN NO. 1001-18 Page 5 of 8

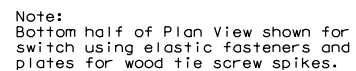
TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																						
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE	
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC		
90	GREAT NORTHERN	9024	90-GH	9024		9024	9024			908	9024						5 3⁄8	5	2 5⁄8	9⁄16	1 1⁄32	2 7⁄8	1 1⁄32		12	14	7⁄16	7⁄16	5⁄8	1⁄16 To 1	13°	13°		2 53⁄64	2.41		A.E.H.O	
	GREAT NORTHERN			9036		9036											5 3⁄8	5	2 5⁄8	19⁄32	1 1⁄32	2 7⁄8	1 1⁄32						5°	13°	13°				2 7⁄16	D		
	GREAT NORTHERN		90-GN	9034	9010	9034	9034	9030	560	904							5 3⁄8	5	2 5⁄8	5⁄8	1 1⁄2	2 7⁄8	1		14	14	5⁄8	3⁄8	3⁄8	5°	13°	13°		2 5⁄8	2.37	2 7⁄16	C.D.E.J	
	HEAD FREE - R.A.	9027	90-RA-T	9027		9027	9027			TC1013							5 23⁄32	5 1⁄8	2 3⁄64	9⁄16	1 5⁄8	3 5⁄32	1		14	14	3⁄8	3⁄8		1⁄16 To 1	1 To 4+U=54°	1 To 4	2 23⁄32			A.B.E.K		
	INTERBOROUGH R.T.	9050	90-RT	9050		9050	9050	902					77				5	5	2 7⁄8	1 1⁄16	1 25⁄32	2 1⁄32	7⁄8	5⁄32	12	9	1⁄2	1⁄4	1⁄4	8°	13°	13°		2 7⁄32		2 1⁄16	A.D.E.I	
	LEHIGH VALLEY																5	5	2 3⁄4	5⁄8	1 53⁄64	2 15⁄64	15⁄16	1⁄3	12	9	1⁄2	1⁄4	1⁄4	5°	14°	14°				2 1⁄16	N	
91	N.Y.C. (DUDLEY)		90-DY					901									5 1⁄2	5	2 29⁄32	9⁄16	1 1⁄2	3 1⁄32	3 1⁄32		14	14	5⁄16	1⁄2	1	1⁄16 To 1	1 To 4	1 To 4		3	2.52	2 3⁄8	A.C.D	
	UNION PACIFIC	9023		9023	9003	9023	9023			901							5 3⁄4	5 3⁄8	2 3⁄4	1 1⁄2	3 3⁄8	7⁄8							VERT.	13°	13°		3		2 3⁄16	A.D.E		
	LACKAWANNA		91-DL	9133		9133	9133	911									5 1⁄4	5 3⁄8	2 5⁄8	5⁄8	1 4⁄64	2 11⁄16	59⁄64		10	8	7⁄16	1⁄4	1⁄4	4°	13°	13°		2 17⁄64	2.43	2 1⁄64	C.D.J	
	FRICTIONLESS		304														5 7⁄16	5 3⁄8	1 15⁄16	5⁄8	2 3⁄32	2 5⁄16	1 1⁄32						4°	13°	13°				2 3⁄16	D		
	FRICTIONLESS		93-NH-F					932									6 1⁄8	5 1⁄2	2 1⁄8	19⁄32	1 13⁄16	3 3⁄8	15⁄16						3⁄16 To 1 1⁄4	13°	13°		2 5⁄8		2 5⁄8	D.H		
	ASCE							950					267				5 9⁄16	5 9⁄16	2 11⁄16	9⁄16	1 4⁄64	2 63⁄64	15⁄16		12	12	5⁄16	1⁄4	1⁄4	VERT.	13°	13°		2 55⁄128	2.65	2 55⁄128	C.I	
95	BOSTON & ALBANY																5 1⁄32	5 1⁄2	3	5⁄8	1 3⁄16	2 15⁄32	1	5⁄16	14	14	5⁄16	1⁄2	5⁄16	4°	14°	14°				2 3⁄32	N	
	W & H RY. (DUDLEY)		95-DY					951									5 1⁄32	5 1⁄2	3	5⁄8	1 3⁄16	2 15⁄32	1		14	14	5⁄16	1⁄2	5⁄16	1⁄16 To 1	1 To 4	1 To 4		2 19⁄32	2.36	2 3⁄32	C.H.I	
97	FRICTIONLESS		97-CO-F														5 7⁄8	5 9⁄64	2 1⁄4	9⁄16	1 15⁄16	2 59⁄64	1 5⁄64						1⁄4 To 1 1⁄4	13°	13°		2 65⁄128		2 65⁄128	D.H		
98	FRICTIONLESS		98-PS-F														5 27⁄32	5	2 1⁄2	9⁄16	1 31⁄32	2 29⁄32	1 3⁄32						15° 30'	15°	13°		2 3⁄64		2 3⁄64	D.H		
100	ARA-A	10020	100-RA	10020		10020	10020	10031	565	1003	10020						6	5 1⁄2	2 3⁄4	9⁄16	1 9⁄16	3 3⁄8	1 1⁄16		14	14	3⁄8	3⁄8	3⁄8	1⁄16 To 1	1 To 4	1 To 4		2 3⁄4	2.75	2 3⁄4	A.C.D.E.J	
	ARA-B	10030	100-RB	10030		10030	10030	10032	564	1002	10030						5 41⁄64	5 9⁄64	2 29⁄32	9⁄16	1 49⁄64	2 59⁄64	1 9⁄64		12	12	3⁄8	5⁄16	5⁄16	3°	13°	13°		2 65⁄128	2.63	2 65⁄128	A.C.D.E.J	
	AREMA	10025	100-RE	10025		10025	10025			10025	10025						6	5 3⁄8	2 11⁄16	9⁄16	1 29⁄32	3 3⁄32	1 1⁄16		14	14	3⁄8	3⁄8	5⁄8	1⁄16 To 1	1 To 4	1 To 4		2 31⁄32	2.75	2 45⁄64	A.D.E.O	
	ASCE	10040	100-AS	10040	10001	10040	10040	1000	536				247				5 3⁄4	5 3⁄4	2 3⁄4	9⁄16	1 49⁄64	3 5⁄64	3 1⁄32		12	12	5⁄16	1⁄4	1⁄4	VERT.	13°	13°		2 65⁄128	2.73	2 65⁄128	A.C.D.E.I.J	
	CANADIAN PACIFIC															100-CP-RE	6 1⁄16	5 3⁄8	2 11⁄16	9⁄16	1 23⁄32	3 3⁄32	1 1⁄16	3⁄8		14	14	9⁄16	3⁄8	5⁄8	1⁄16 To 1	1 To 4	1 To 4		2 31⁄32	2.773	2 45⁄64	O
	CHI. & NOR. WESTERN	10035	100-OM	10035		10035	10035	1006			10035						5 49⁄64	5 9⁄64	2 9⁄16	9⁄16	1 39⁄64	2 61⁄64	1 9⁄64		12	12	3⁄8	5⁄16	5⁄16	3°	13°	13°		2 79⁄128	2.53	2 79⁄128	A.D.E.O	
	ELGIN JOLIET & EAST			10050		10050	10050										5 9⁄16	5	2 29⁄32	9⁄16	1 37⁄64	2 51⁄64	1 3⁄16						1⁄16 To 1	1 To 4	1 To 4		2 75⁄128		2 75⁄128	D.H		
	GREAT NORTHERN	10036	100-GN	10036		10036	10036	1008									5 3⁄4	5	2 3⁄4	9⁄16	1 5⁄8	3	1 1⁄8						1⁄16 To 1	1 To 4	1 To 4		2 3⁄16		2 5⁄8	A.D.E		
	HEAD FREE - R.A.		100-RA-T										10004	136			6 5⁄32	5 1⁄2	2 11⁄16	9⁄16	1 23⁄32	3 3⁄8	1 1⁄16		14	14	3⁄8	3⁄8		1⁄16 To 1	1 To 4+U=49°	1 To 4	2 15⁄16				A.B	
	HEAD FREE - R.E.		100-RE-T														6 1⁄16	5 3⁄8	2 39⁄64	9⁄16	1 23⁄32	3 3⁄32	1 1⁄16						1⁄16 To 1	1 To 4+U=57°	1 To 4	2 31⁄32				A.B.E.K		
	INTERBOROUGH R.T.	10005	100-RT	10005		10005	10005	1005									5 3⁄4	5 3⁄4	2 7⁄8	9⁄16	1 49⁄64	3 5⁄64	3 1⁄32		12	12	1⁄2	1⁄4	1⁄4	8°	13°	13°		2 1⁄2	2.65	2 1⁄2	A.C.E.J.K	
	N.Y., N.H. & H.	10034	100-NH	10034	10004	10034	10034	1002					100				6	5 1⁄2	2 3⁄4	19⁄32	1 23⁄32	3 1⁄32	15⁄16		12	12	7⁄16	1⁄4	1⁄4	4°	13°	13°		2 39⁄64	2.89	2 5⁄8	A.C.D.E.I.J	
	NEW YORK CENTRAL		100-DY	10022	10003	10022	10022	1001									6	5 1⁄2	3	19⁄32	1 5⁄8	3 1⁄32	3 1⁄32		14	14	5⁄16	1⁄2	5⁄16	1⁄16 To 1	1 To 4	1 To 4		2 43⁄64	2.89	2 5⁄8	C.D	
PENNSYLVANIA	10031	100-PS	10031		10031	10031	10030	558		10031						5 11⁄16	5	2 43⁄64	9⁄16	1 13⁄16	2 29⁄32	1 3⁄32		10	10	7⁄16	5⁄16	5⁄16	3⁄32 To 1	15°	13°		2 3⁄64	2.63	2 3⁄64	A.C.D.E.J.O		
PENNSYLVANIA	10033	100-PR	10033	10002	10033	10033	1003	520				96				5 1⁄2	5 1⁄2	2 13⁄16	5⁄8	1 7⁄8	2 11⁄16	15⁄16	11⁄64	10	8	7⁄16	1⁄4	1⁄4	4°	13°	13°		2 9⁄32		2 9⁄32	A.D.E.I		
READING	10032	100-RG	10032		10032	10032	1007									5 5⁄8	5 3⁄8	2 29⁄32	9⁄16	1 49⁄64	2 59⁄64	1 1⁄16		12	12	7⁄16	5⁄16	5⁄16	3⁄64 To 1	13°	13°		2 63⁄128	2.55	2 63⁄128	A.D.O		
R.W. HUNT																6	5 1⁄2	2 9⁄16	9⁄16	1 19⁄32	3 2⁄64	1 5⁄64		12	12	3⁄8	3⁄8	3⁄8	VERT.	14°	14°				2 95⁄128	N		

PLAN NO. 1001-18 Page 6 of 8

TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)																																						
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	REFERENCE	
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC		
100	SANDBERG																5 ³ / ₄	6 ¹ / ₄	3	1 ⁷ / ₃₂	1 ⁷ / ₈			3/8	5 3/4	VERT.	1/2		VERT.	20°	20°						N	
101	LACKAWANNA	10133	101-DL	10133		10133	10133	10130									5 ⁷ / ₁₆	5 ³ / ₈	2 ³ / ₄	5/8	1 ²³ / ₃₂	2 ¹¹ / ₁₆	1 ¹ / ₃₂		10	8	7/16	1/4	1/4	4°	13°	13°		2 ³ / ₈	2.46	2 ³ / ₈	A.C.E	
105	LACKAWANNA	10533	105-DL	10533		10533	10533	1052									6	5 ³ / ₈	2 ³ / ₄	5/8	1 ²³ / ₃₂	3 ¹ / ₄	1 ¹ / ₃₂		10	8	7/16	1/4	1/4	4°	13°	13°		2 ² / ₃₂	2.79	2 ² / ₃₂	A.C.E	
	DUDLEY	10524	105-DY	10524		10524	10524				10524						6	5 ¹ / ₂	3	5/8	1 ⁵ / ₈	3 ¹³ / ₃₂	3 ¹ / ₃₂		14	14	5/16	1/2	3/4	1/16 To 1	1 To 4	1 To 4		3 ¹ / ₈	2.88		A.E.O	
	NEW YORK CENTRAL		105-B	10522		10522	10522	1051									6	5 ¹ / ₂	3	5/8	1 ⁵ / ₈	3 ¹³ / ₃₂	3 ¹ / ₃₂		14	14	5/16	1/2	1	1/16 To 1	1 To 4	1 To 4		3 ¹ / ₈	2.88	2 ⁵ / ₈	C.D	
106	MISC.									1060							6 ³ / ₁₆	5 ¹ / ₂	2 ² / ₃₂	1 ⁹ / ₃₂	1 ³ / ₄	3 ³ / ₈	1 ¹ / ₁₆						1 To 40	1 To 4	1 To 4		2 ¹⁵ / ₁₆			H		
107	N.Y. & N.H. & H.	10734	107-NH	10734		10734	10734	1072									6 ¹ / ₈	5 ¹ / ₂	2 ³ / ₄	1 ⁹ / ₃₂	1 ²³ / ₃₂	3 ¹ / ₃₂	1 ¹ / ₁₆		12	12	7/16	1/4	1/4	4°	13°	13°		2 ⁴ / ₆₄	2.78	2 ⁴ / ₆₄	A.C.E	
110	AREMA	11025	110-RE	11025		11025	11025			1100	11025						6 ¹ / ₄	5 ¹ / ₂	2 ²³ / ₃₂	1 ⁹ / ₃₂	1 ²³ / ₃₂	3 ¹³ / ₃₂	1 ¹ / ₈		14	14	3/8	3/8	5/8	1/16 To 1	1 To 4	1 To 4		3 ¹ / ₈	2.83		A.E.O	
	ASCE												268				6 ¹ / ₈	6 ¹ / ₈	2 ⁷ / ₈	3 ⁷ / ₆₄	1 ²⁵ / ₃₂	3 ¹ / ₃₂	1		12	12	5/16	1/4	1/4	VERT.	13°	13°		2 ⁴³ / ₆₄			I	
	C.T.A.	11050															7	6	2 ³ / ₄	5/16	1 ⁷ / ₈	4 ⁵ / ₁₆	1 ³ / ₁₆						3° 34' 30"	14°	9°					A		
	GREAT NORTHERN	11036	110-GN	11036		11036	11036				11036						6 ¹ / ₂	5 ¹ / ₂	2 ³ / ₄	1 ⁹ / ₃₂	1 ⁵ / ₈	3 ³ / ₄	1 ¹ / ₈		14	14	3/8	1/2	5/8	1/16 To 1	1 To 4	1 To 4		3 ¹ / ₄	2.90		A.E.O	
	HEAD FREE - AREMA	11027	110-RE-T	11027		11027	11027				11027						6 ⁷ / ₁₆	5 ¹ / ₂	2 ¹¹ / ₁₆	1 ⁹ / ₃₂	1 ²³ / ₃₂	3 ¹³ / ₃₂	1 ¹ / ₈		14	14	3/8	3/8		1/16 To 1	1 To 4±U=55° 30'	1 To 4	1 To 4		3 ¹ / ₈			A.B.E.K
112	LEHIGH VALLEY	11033	110-LV	11033		11033	11033										6	5 ¹ / ₂	2 ⁷ / ₈	1 ⁹ / ₃₂	1 ⁷ / ₈	3 ¹ / ₁₆	1 ¹ / ₁₆						4°	1 To 4	1 To 4		2 ¹⁵ / ₁₆		2 ³ / ₄	A.D.E		
	AREMA	11228	112-RE	11228		11228	11228			1121	11228						6 ⁵ / ₈	5 ¹ / ₂	2 ²³ / ₃₂	1 ⁹ / ₃₂	1 ¹¹ / ₁₆	3 ¹ / ₁₆	1 ¹ / ₈		24	10 & 23	1 & 1/4	3/8	5/8	1 To 40	1 To 4	1 To 4		3 ³ / ₄			A.E.K	
	HEAD FREE - R.E.	11227	112-RE-T	11227		11227	11227				11227-HF						6 ³ / ₄	5 ¹ / ₂	2 ¹¹ / ₁₆	1 ⁹ / ₃₂	1 ¹³ / ₁₆	3 ¹³ / ₁₆	1 ¹ / ₈		14	10 & 23	3/8	3/8		1 To 40	1 To 4±U=58°	1 To 4		3 ³ / ₄			A.B.E	
113	CB & O - TR	11229		11229		11229	11229			1122							6 ³ / ₄	5 ¹ / ₂	2 ¹ / ₂	5/8	1 ³ / ₄	3 ⁷ / ₈	1 ¹ / ₈						1 To 40	1 To 4±U=77° 45'	1 To 4		3 ¹ / ₈			A.E.K		
	HEAD FREE - SO.PAC	11327	113-RE-T	11327		11327	11327			1130							6 ¹³ / ₁₆	5 ¹ / ₂	2 ¹¹ / ₁₆	1 ⁹ / ₃₂	1 ⁷ / ₈	3 ¹ / ₁₆	1 ¹ / ₈		14	10 & 23	1 & 3/8	3/8	5/8	1 To 40	1 To 4±U=58°	1 To 4	1 ¹⁹ / ₃₂	3 ³ / ₄			A.B.E	
	AREMA	11525	115-RE	11525		11525	11525			1150	11525						6 ⁵ / ₈	5 ¹ / ₂	2 ²³ / ₃₂	5/8	1 ¹¹ / ₁₆	3 ¹ / ₁₆	1 ¹ / ₈		8	3 & 14	1 ¹ / ₁₆ & 9/16 & 3/8	3/4	3/4	1 To 40	1 To 4	1 To 4		1.104	3 ¹ / ₄	2.9863		A.E.G
	D.R.G.W.									1155							6 ⁵ / ₈	5 ¹ / ₂	2 ²³ / ₃₂	3/4	1 ¹¹ / ₁₆	3 ¹³ / ₁₆	1 ¹ / ₈						4°	13°	13°		3 ¹ / ₃₂			E		
115	DUDLEY	11522/11523	115-DY	11523		11523	11523										6 ¹ / ₂	5 ¹ / ₂	3	5/8	1 ¹¹ / ₁₆	3 ³ / ₄	1 ¹ / ₁₆		14	14	5/16	1/2	3/4	1/16 To 1	1 To 4	1 To 4		3 ³ / ₈	3.03		A.E.O	
	MISC.																6	5 ⁹ / ₁₆	2 ¹⁵ / ₁₆	2 ¹ / ₃₂	1 ⁷ / ₈	3 ¹ / ₁₆	1 ¹ / ₁₆						1/16 To 1	1 To 4	1 To 4		2 ¹⁵ / ₁₆			H		
118	LACKAWANNA		118-DL-M														6 ¹ / ₂	5 ³ / ₈	2 ⁷ / ₈	5/8	1 ²³ / ₃₂	3 ¹ / ₂	1 ⁷ / ₃₂						3.25°	13°	13°		3 ¹³ / ₃₂			E		
119	AREMA	11937								1190	11937						6 ¹³ / ₁₆	5 ¹ / ₂	2 ² / ₃₂	5/8	1 ⁷ / ₈	3 ¹ / ₁₆	1 ¹ / ₈		14	3 & 14	1 ¹ / ₂ & 9/16	3/4	3/4	1 To 40	1 To 4	1 To 4		1 ¹ / ₄	3 ¹ / ₄	3.124		G
120	AREMA			12025		12025	12025										6 ¹ / ₂	5 ³ / ₄	2 ⁷ / ₈	5/8	1 ²⁵ / ₃₂	3 ¹ / ₃₂	1 ³ / ₁₆						1/16 To 1	1 To 4	1 To 4			3 ¹ / ₄			H	
	MFG. STD.		120-MS														6 ¹ / ₄	5 ³ / ₄	2 ⁷ / ₈	5/8	1 ²³ / ₃₂	3 ⁵ / ₃₂	1 ³ / ₁₆	1/8	12	12	7/16	3/8	3/8	4°	14°	14°		2 ⁴⁹ / ₆₄		2 ⁴⁹ / ₆₄	H.J	
	NEW YORK CENTRAL		120-DY					1201									7	6	3	2 ¹ / ₃₂	1 ⁵ / ₈	4 ⁵ / ₁₆	1 ¹ / ₁₆		14	20	5/16	1/2	1	1/16 To 1	1 To 4	1 To 4			3 ⁷ / ₈	3.12	3	C.D.E
122	CB (B&O)		122-CB														6 ²⁵ / ₃₂	6	2 ¹⁵ / ₁₆	2 ¹ / ₃₂	1 ¹⁵ / ₁₆	3 ³ / ₆₄	1 ¹⁵ / ₆₄	1/8	10	3 & 14	1 ¹ / ₄ & 3/8	3/4	3/4	1 To 20	1 To 2 ³ / ₄	1 To 2 ³ / ₄ ± 1 To 13.7	1 ¹⁵ / ₆₄	3 ² / ₆₄	3.18			K
125	PENNSYLVANIA		308	12531		12531	12531	12530	584								6 ¹ / ₂	5 ¹ / ₂	3	2 ¹ / ₃₂	1 ⁷ / ₈	3 ¹³ / ₃₂	1 ⁷ / ₃₂		12	16	7/16	1/2	3/4	VERT.	18°	14°		3 ¹ / ₄	3.00	2 ⁵ / ₆₄		C.D.E
125.5	FRICTIONLESS		125.5-PS-F														7	5 ¹ / ₂	1 ¹³ / ₁₆	1 ¹ / ₁₆	2 ³ / ₈	3 ¹³ / ₃₂	1 ⁷ / ₃₂						VERT.	18°	14°		3 ¹ / ₄		2 ³ / ₄		D.H	
127	DUDLEY	12723	127-DYM								12723						7	6 ¹ / _{4</}																				

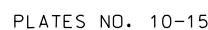
TABLE OF RAIL SECTIONS - (DIMENSIONS IN INCHES)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
WT. / YD. LB.	TYPE	MANUFACTURER AND SECTION NUMBER															RAIL HEIGHT	BASE WIDTH	HEAD WIDTH	WEB THICKNESS	HEAD HEIGHT	WEB HEIGHT	BASE HEIGHT	BASE EDGE THICKNESS	HEAD RADIUS	WEB RADIUS	GAGE CORNER RADIUS	TOP FILLET RADIUS	BOTTOM FILLET RADIUS	HEAD SIDE SLOPE	HEAD BOTTOM ANGLE	BASE ANGLE	HEAD RADIUS WIDTH	WEB CENTER LINE	NEUTRAL AXIS DISTANCE	BOLT CENTER LINE	
		U.S. STEEL	BETHELEM	ILLINOIS	OLD ILLINOIS	CARNEGIE	TENNESSE TC & I	LACKAWANNA	MIDVALE	COLORADO CF & I	INLAND	CAMBRIA	MARYL. PENN.	DOMINION	ALGOMA	SYDNEY	H	B	HD	W	HH	WH	BH	T	RH	RW	R1	R2	R3	S	A1	A2	CH	WC	N	BC	REFERENCE
130	AREMA	13025	130-RE	13025		13025	13025			1300	13025						6 ³ / ₄	6	2 ¹⁵ / ₁₆	2 ¹ / ₃₂	1 ²⁷ / ₃₂	3 ¹¹ / ₁₆	1 ⁷ / ₃₂		14	14	³ / ₈	¹ / ₂	³ / ₄	¹ / ₁₆ To 1	1 To 4	1 To 4		3 ³ / ₈	3.03		A.E.O
	HEAD FREE - P.S.		130-PS-T														6 ¹³ / ₁₆	5 ¹ / ₂	3	2 ¹ / ₃₂	2 ³ / ₁₆	3 ³ / ₈	1 ⁷ / ₃₂					STR.	18° ± U=58°30'	14°		3 ¹ / ₄			A		
	HEAD FREE - R.E.	13027	130-RE-T	13027		13027	13027				13027			13001	138		6 ¹³ / ₁₆	6	2 ²⁷ / ₃₂	2 ¹ / ₃₂	2 ¹ / ₃₂	3 ¹¹ / ₁₆	1 ⁷ / ₃₂		14	14	³ / ₈	¹ / ₂	¹ / ₁₆ To 1	1 To 4; U=61°	1 To 4		3 ³ / ₈	3.08		A.B.E.O	
	PHIL. & READING		130-RG														6 ²⁷ / ₃₂	6	2 ¹⁵ / ₁₆	2 ¹ / ₃₂	1 ¹⁵ / ₁₆	3 ¹¹ / ₁₆	1 ⁷ / ₃₂					¹ / ₁₆ To 1	1 To 4	1 To 4		3 ³ / ₈			E.K		
	PENNSYLVANIA	13031	130-PS	13031		13031	13031	13030	589	1302	13031						6 ⁵ / ₈	5 ¹ / ₂	3	1 ¹ / ₁₆	2	3 ¹³ / ₃₂	1 ⁷ / ₃₂		12	16	⁷ / ₁₆	¹ / ₂	³ / ₄	VERT.	18°	14°		3 ¹ / ₄	3.09	2 ³ / ₄	A.D.E.O
131	AREMA	13128	131-RE	13128		13128	13128			1311	13128						7 ¹ / ₈	6	3	2 ¹ / ₃₂	1 ³ / ₄	4 ³ / ₁₆	1 ³ / ₁₆		24	10 & 23	1 & ¹ / ₄	¹ / ₂	³ / ₄	1 To 40	1 To 4	1 To 4		4 ¹ / ₄			A.E
	HEAD FREE- R.E	13127															7 ¹ / ₄	6	2 ³¹ / ₃₂	2 ¹ / ₃₂	1 ⁷ / ₈	4 ³ / ₁₆	1 ³ / ₁₆	¹ / ₈	14	10 & 23	³ / ₈	¹ / ₂		1 To 40	1 To 4; U=60°30'	1 To 4		4 ¹ / ₄			A.B.K
132	AREMA	13225	132-RE	13225		13225	13225			1321	13225						7 ¹ / ₈	6	3	2 ¹ / ₃₂	1 ³ / ₄	4 ³ / ₁₆	1 ³ / ₁₆	¹ / ₈	8	8 & 16	1 ³ / ₄ & 9 ¹ / ₁₆	³ / ₄ & ⁵ / ₁₆	⁷ / ₈	1 To 40	1 To 4	1 To 4	1.104	3 ⁷ / ₈	3.182		A.E.G
	HEAD FREE - S.O.PAC	13227	132-RE-T	13227		13227	13227			1320							7 ⁵ / ₁₆	6	2 ³¹ / ₃₂	2 ¹ / ₃₂	1 ¹⁵ / ₁₆	4 ³ / ₁₆	1 ³ / ₁₆	¹ / ₈	14	10 & 23	1 & ³ / ₈	¹ / ₂		1 To 40	1 To 4; U=60°30'	1 To 4	1 ¹³ / ₁₆	4 ¹ / ₄			A.B.E
133	AREMA	13331	133-RE	13331		13331	13331			1330	13331						7 ¹ / ₁₆	6	3	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	3 ¹⁵ / ₁₆	1 ³ / ₁₆	¹ / ₈	10	8 & 16	1 ¹ / ₄ & ³ / ₈	³ / ₄ & ⁷ / ₁₆	³ / ₄	1 To 14.3	1 To 3	1 To 4.011	1.4	3 ³ / ₄	3.20		A.E.G
135	CENTRAL OF NJ		135-CR														6 ¹ / ₂	6	3 ⁹ / ₃₂	³ / ₄	2	3 ⁹ / ₃₂	1 ⁷ / ₃₂						4°	14°	14°		3		2 ⁵⁹ / ₆₄	D.H	
136	AREMA	13627	136-RE							1360							7 ⁵ / ₁₆	6	2 ¹⁵ / ₁₆	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4 ³ / ₁₆	1 ³ / ₁₆	¹ / ₈	8	8 & 20	.375 & .5625	³ / ₄ & ⁵ / ₁₆	³ / ₄	1 To 40	1 To 4	1 To 4	1.104	3 ⁷ / ₈	3.3438		G
	LEHIGH VALLEY	13633	136-LV	13633		13633	13633										7	6 ¹ / ₂	2 ¹⁵ / ₁₆	2 ¹ / ₃₂	1 ⁷ / ₈	3 ⁷ / ₈	1 ¹ / ₄						4°	1 To 4	1 To 4		3 ¹ / ₂		3 ¹ / ₁₆	A.D.E	
	LEHIGH VALLEY		136-LV														7 ³ / ₈	6 ¹ / ₂	2 ¹⁵ / ₁₆	1 ¹¹ / ₁₆	1 ²⁵ / ₃₂	4 ³ / ₈	1 ⁷ / ₃₂						4°	1 To 4	1 To 4		3 ⁷ / ₈			E	
	LEHIGH VALLEY		136-LV-M														7	6 ¹ / ₂	2 ¹⁵ / ₁₆	1 ¹¹ / ₁₆	1 ⁷ / ₈	3 ⁷ / ₈	1 ¹ / ₄						4°	1 To 4	1 To 4		3 ¹ / ₂			E.H	
	NEW YORK CENTRAL		136-NYC														7 ⁹ / ₃₂	6 ¹ / ₄	2 ¹⁵ / ₁₆	1 ¹¹ / ₁₆	1 ⁷ / ₈	4 ⁹ / ₃₂															K
140	AREMA / PS	14031	140-RE	14031		14031	14031										7 ⁵ / ₁₆	6	3	³ / ₄	2 ¹ / ₁₆	4 ¹ / ₁₆	1 ³ / ₁₆	¹ / ₈	10	8 & 27	1 ¹ / ₄ & ³ / ₈	1 TO 4.011	³ / ₄	4°	1 To 3	1 To 4.011	1.4	4	3.37		A.E.G
141	AREMA																7 ⁷ / ₁₆	6	3 1/16	1 ¹¹ / ₁₆	2 ⁵ / ₃₂	4 3/32	1 ³ / ₁₆	¹ / ₈	8	8 & 20	1 ³ / ₄ & ⁹ / ₁₆	3/4 & 5/16	3/4	5°	1 To 3	1 To 4	1.1023	3 ⁷ / ₈			G
152	PENNSYLVANIA	15222	152-PS	15224		15224	15224										8	6 ³ / ₄	3	1 ¹¹ / ₁₆	1 ²⁷ / ₃₂	4 ⁷ / ₈	1 ⁹ / ₃₂		24	6 & 30	1 & ¹ / ₄	¹ / ₂	³ / ₄	1 To 40	14°	14°	1 ¹³ / ₁₆	5	3.50		A.E.O
155	PENNSYLVANIA	15531	155-PS	15531		15531	15531										8	6 ³ / ₄	3	³ / ₄	2 ¹ / ₁₆	4 ²¹ / ₃₂	1 ⁹ / ₃₂						4°	18°26'10"	14°		4 ¹¹ / ₁₆				A.E



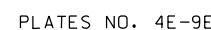
LEGEND

	RAIL BRACE
	ELASTIC FASTENER
	P.S. POINT OF SWITCH



TRACK SPIKE TURNOUT PLATES				
No. 7 & No. 8				
NO.	DETAIL	A	B	X
4	7400	7 ¹³ / ₁₆ "	3 ⁷ / ₁₆ "	5 ¹¹ / ₁₆ "
5	7401	7 ¹³ / ₁₆ "	7 ³ / ₃₂ "	5 ¹¹ / ₁₆ "
6	7402	9 ¹ / ₁₆ "	1 ³ / ₄ "	3 ³ / ₈ "
7	7403	9"	1 ¹ / ₄ "	3 ³ / ₈ "
8	7404	10 ⁵ / ₁₆ "	5 ¹ / ₁₆ "	7 ¹ / ₁₆ "
9	7405	10 ³ / ₁₆ "	1 ¹ / ₄ "	7 ¹ / ₁₆ "
		C	D	E
10	7412	11 ³ / ₈ "	11 ¹ / ₁₆ "	4 ³ / ₃₂ "
11	7413	11 ¹ / ₄ "	11 ¹³ / ₁₆ "	4 ³ / ₃₂ "
12	7414	12 ³ / ₄ "	13 ³ / ₁₆ "	4 ³ / ₃₂ "
13	7415	12 ³ / ₁₆ "	13 ¹ / ₁₆ "	4 ³ / ₃₂ "
14	7416	14 ³ / ₁₆ "	14 ³ / ₄ "	4 ⁵ / ₁₆ "
15	7417	14"	14 ⁵ / ₈ "	4 ⁵ / ₁₆ "

NO.	DETAIL	A	B	X
4E	6400	$7\frac{15}{16}$ "	$3\frac{1}{16}$ "	$1\frac{1}{16}$ "
5E	6401	$7\frac{15}{16}$ "	$1\frac{3}{32}$ "	$1\frac{1}{16}$ "
6E	6402	$9\frac{1}{4}$ "	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "
7E	6403	9"	$1\frac{1}{4}$ "	$1\frac{1}{8}$ "
8E	6404	$10\frac{3}{16}$ "	$5\frac{1}{16}$ "	$3\frac{1}{16}$ "
9E	6405	$10\frac{3}{16}$ "	$1\frac{1}{4}$ "	$3\frac{1}{16}$ "
		C	D	E
10E	6412	$11\frac{3}{16}$ "	$11\frac{15}{16}$ "	$7\frac{3}{32}$ "
11E	6413	$11\frac{1}{4}$ "	$11\frac{1}{16}$ "	$7\frac{3}{32}$ "
12E	6414	$12\frac{1}{4}$ "	$13\frac{5}{16}$ "	$7\frac{3}{32}$ "
13E	6415	$12\frac{7}{16}$ "	$13\frac{1}{2}$ "	$7\frac{3}{32}$ "
14E	6416	$14\frac{1}{16}$ "	$14\frac{3}{4}$ "	$7\frac{5}{16}$ "
15E	6417	$14\frac{1}{4}$ "	$14\frac{5}{8}$ "	$7\frac{5}{16}$ "



NOTES:

1- BILL OF MATERIAL. This plan illustrates and includes in the following Bill of Material several designs of split switch layouts; therefore purchaser must state which Bill of Material specification is wanted. Purchaser to state which turnout plates to furnish. Insulated hand-throw split switch with uniform risers and adjustable rail braces. Spec. 121A Insulated power operated split switch with uniform risers and adjustable rail braces. Spec. 121B RAIL AND JOINT BARS. For new installation, all switches are to be 115 lb. RE, 136 lb. RE, or 145 lb. RE.

2- ALTERNATES:

(a) Any details of fittings that will apply per Plans No. 221, 222, 223, and 224.

(b) Switch points furnished with manganese steel tips per Plan No. 220.

(c) Type "S" stock rails per Plan No. 921.

(d) If equipment having more than 2 pair of flanged wheels on rigid wheel base is to be operated through this switch, consideration to wider gage, side switch and closure curves should be given and gage plates, rods and turnout plates detailed to suit.

3- Switch point rollers may be added per individual customer's request.

4- SPECIFICATIONS - See Plan No. 100

5- Gage plate I.D. stamping to include:

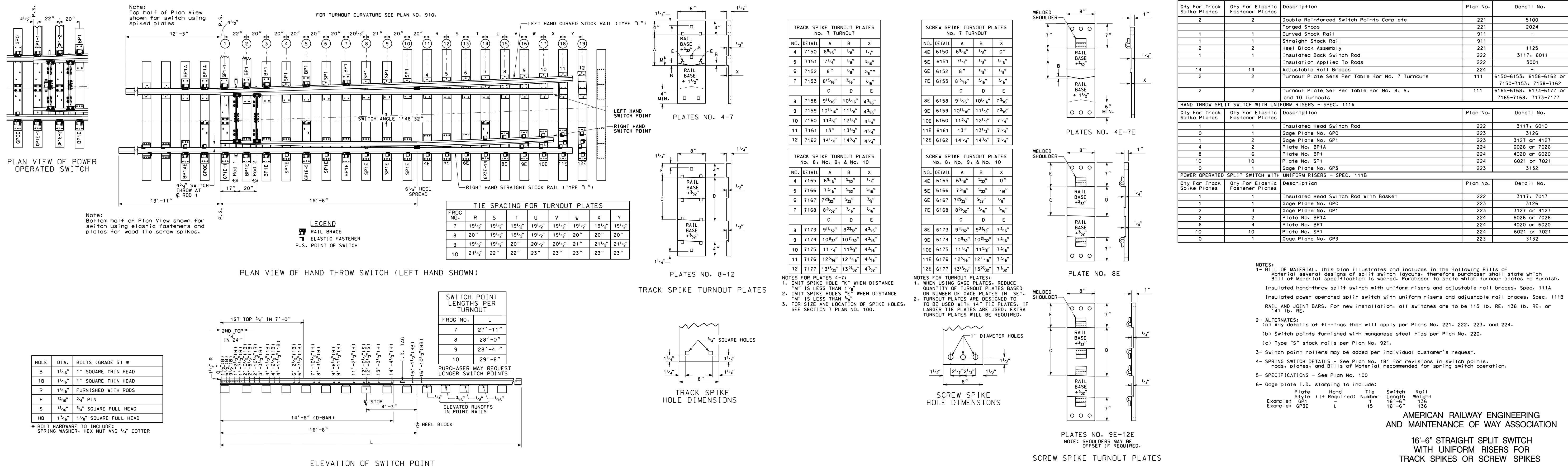
		Switch	Rel.
	Plate	Hand	Tie
Style	(if Required)	Number	Length
Weight			
Example: GP	L	12	136
Example: GPSE	L	12	136

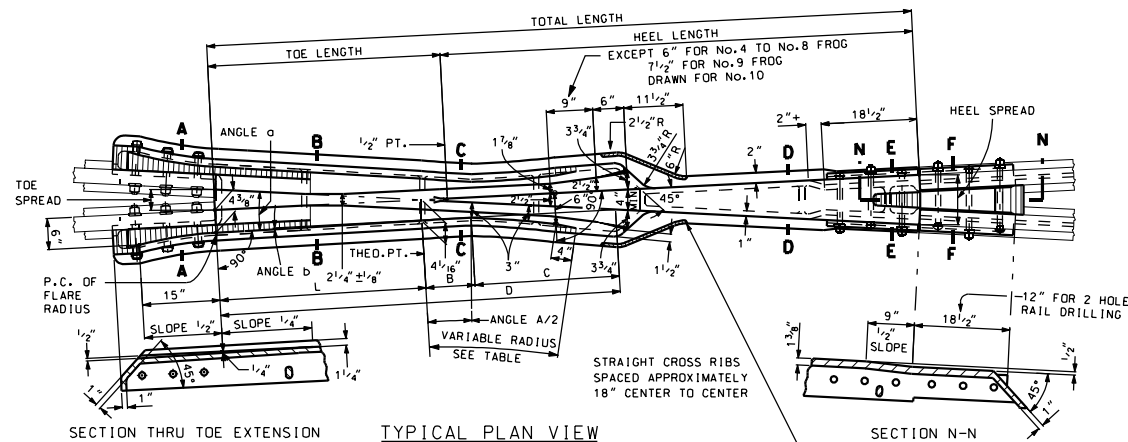
* BOLT HARDWARE TO INCLUDE:
SPRING WASHER, HEX NUT AND 1/4" COTTER



ALIGN WEB OF SWITCH POINT
RAIL SAME AS ADJACENT STOCK
RAIL THROUGH SIDE PLANING.



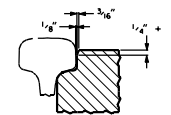
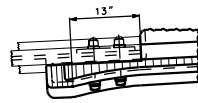
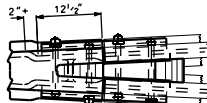




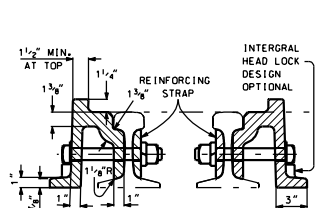
SECTION THRU TOE EXTENSION

TYPICAL PLAN VIEW

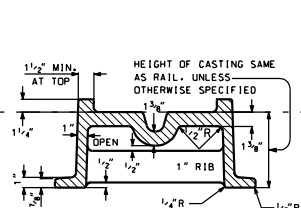
FOR RAILS 112 LB OR HEAVIER
SEE NOTES 2A & 2B FOR DETAILS OF HEEL AND TOE JOINTS

BEVELING OF MANGANESE
STEEL AT SECTION A-A
AND SECTION F-FDETAIL OF TOE END
FOR 2 HOLE RAIL DRILLING
(SEE NOTE 2 B)DETAIL OF HEEL END
FOR 2 HOLE RAIL DRILLING
(SEE NOTE 2 B)

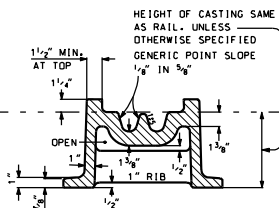
REINFORCEMENT BEADING



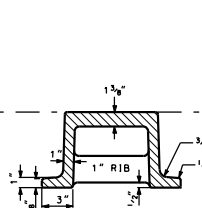
SECTION A-A



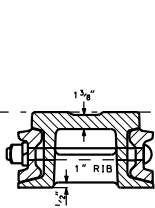
SECTION B-B



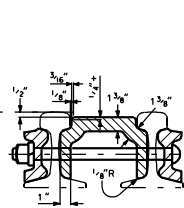
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

GROUP A RAILS				GROUP B RAILS				GROUP C RAILS				GROUP D RAILS				RAILS 112 LB. OR HEAVIER			
FROG No.	TOTAL LENGTH	TOE LENGTH	HEEL LENGTH	VAR. RADIUS*	FROG No.	TOTAL LENGTH	TOE LENGTH	HEEL LENGTH	VAR. RADIUS*	FROG No.	TOTAL LENGTH	TOE LENGTH	HEEL LENGTH	VAR. RADIUS*	FROG No.	TOTAL LENGTH	TOE LENGTH	HEEL LENGTH	VAR. RADIUS*
4	5'-1"	15"	3'-10"	1'-10 1/4"	5	5'-5"	17"	4'-0"	3'-13 3/8"	6	5'-10"	20"	4'-2"	4'-8 1/8"	7	6'-11"	2'-11"	5'-2 1/2"	6'-11 1/8"
5	5'-6"	18"	4'-0"	3'-13 3/8"	6	5'-11"	21"	4'-2"	4'-8 3/4"	7	6'-3"	23"	4'-4"	6'-5 1/2"	8	6'-11"	2'-11"	6'-0"	9'-13 3/8"
6	6'-0"	22"	4'-2"	4'-9 1/4"	7	6'-7"	2'-0"	4'-7"	6'-7"	8	7'-3"	2'-3"	5'-0"	8'-8 3/4"	9	9'-9"	2'-11"	6'-10"	11'-6"
7	6'-10"	2'-1"	4'-9"	6'-7 3/4"	8	7'-7"	2'-4"	5'-3"	8'-9 1/2"	9	8'-1"	2'-6"	5'-7"	11'-13 3/4"	10	11'-4 1/2"	3'-9"	7'-7 1/2"	14'-8 1/8"
8	7'-10"	2'-5"	5'-5"	8'-10 1/4"	9	8'-5"	2'-7"	5'-10"	11'-2 3/8"	10	8'-11"	2'-9"	6'-2"	13'-10 1/4"	11	12'-2 1/2"	3'-9"	8'-5 1/2"	17'-8"
9	8'-10"	2'-9"	6'-1"	11'-4 1/2"	10	9'-4"	2'-10"	6'-6"	13'-11 1/4"										

GROUPING OF RAILS					RAILS 112 LB. OR HEAVIER
RAILS 110 LB. TO 90 LB. INCL.					
GROUP A RAILS	GROUP B RAILS	GROUP C RAILS	GROUP D RAILS		
BASE 5 ³ / ₄ " DOWN TO BUT NOT INCLUDING 5 ¹ / ₂ ". HEAD 2 ¹ / ₄ " TO 2 ³ / ₈ " INCLUSIVE OR HEAD AT OR EXCEEDING 2 ¹ / ₄ " WHEN HEAD + BASE DOES NOT EXCEED 8 ³ / ₈ "	BASE 5 ¹ / ₂ " DOWN TO BUT NOT INCLUDING 5 ¹ / ₄ ". HEAD 2 ¹ / ₈ " TO 2 ³ / ₈ " INCLUSIVE OR HEAD AT OR EXCEEDING 2 ¹ / ₈ " WHEN HEAD + BASE DOES NOT EXCEED 8 ³ / ₈ "	BASE 5 ¹ / ₄ " DOWN TO BUT NOT INCLUDING 5". HEAD 2 ¹ / ₁₆ " TO 2 ¹ / ₈ " INCLUSIVE OR HEAD AT OR EXCEEDING 2 ¹ / ₁₆ " WHEN HEAD + BASE DOES NOT EXCEED 7 ¹⁵ / ₁₆ "	BASE 5" DOWN TO BUT NOT INCLUDING 4 ¹ / ₂ ". HEAD 2 ¹ / ₁₆ " TO 2 ¹ / ₈ " INCLUSIVE OR HEAD AT OR EXCEEDING 2 ¹ / ₁₆ " WHEN HEAD + BASE DOES NOT EXCEED 7 ¹⁵ / ₁₆ "	LENGTHS SHOWN WILL ACCOMMODATE SECTIONS SPECIFIED BELOW. FOR OTHER RAILS 112 LB. OR HEAVIER SEE NOTE 4-A	
100 A.S.C.E. 105 DUD.	90 A.S.C.E. 100 A.R.A.-A. 100 P. & R. 100 N.H. 100 R.E. 107 N.H. 110 R.E.	90 A.R.A.-A. 90 H.F.R.-A. 90 C. & N.W. 90 I.R.T. 100 A.R.A.-B. 100 C. & N.W.	90 A.R.A.-B. 100 P.S.	112 R.E. 112 T.R. 113 H.F.S.P. 115 R.E. 127 DUD. 129 T.R. 130 P.S. 131 R.E. 132 H.F.S.P. 132 R.E. 133 R.E. 136 L.V. 140 R.E.	

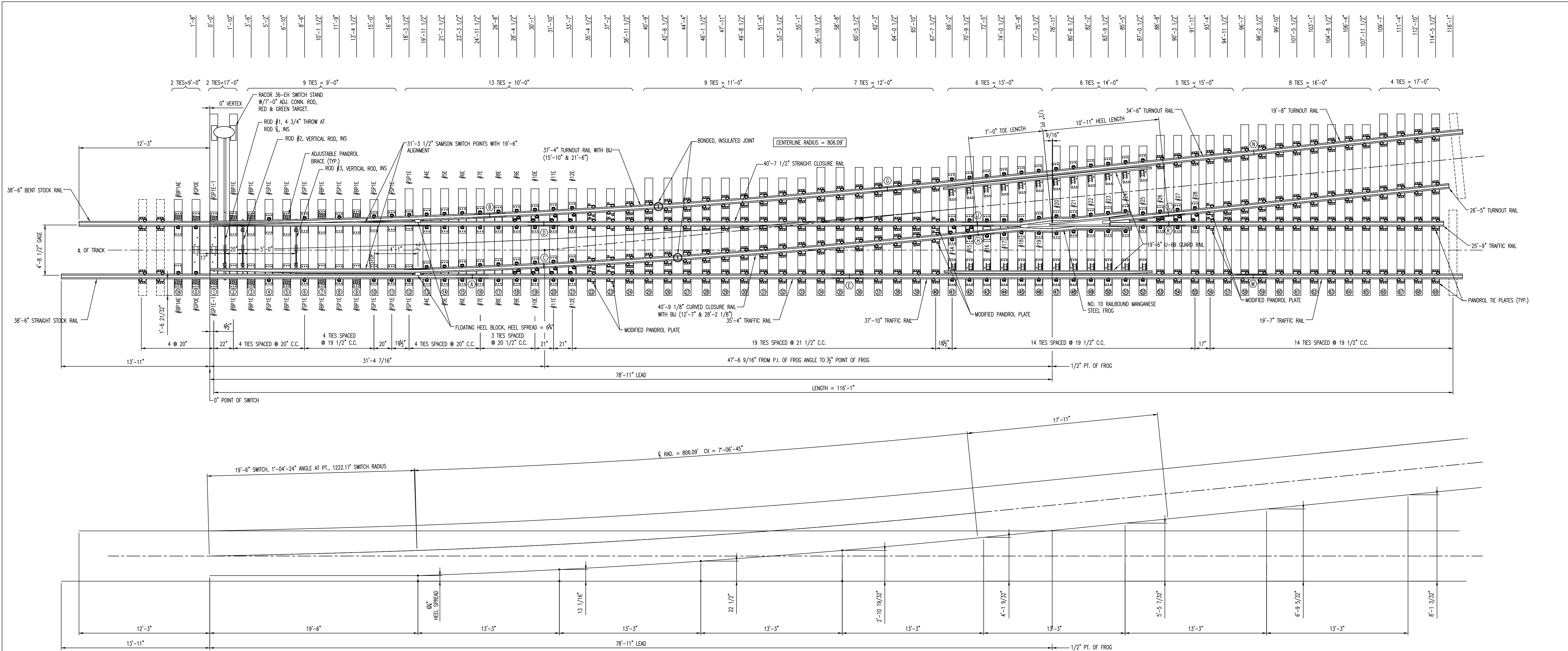
FORMULA FOR VARIABLE RADIUS OF RAISED GUARDS

$$\begin{aligned} \text{TAN. ANGLE } b &= \frac{5/16"}{L} \\ \angle a &= \angle b + \text{FROG ANGLE} \\ D &= \text{TOE SPREAD} + 4-3/8" \\ C &= \frac{3"}{\text{TAN. } a} \\ B &= D - (L + C) \\ \text{RADIUS} &= \frac{B}{\text{TAN. } a/2} \end{aligned}$$

NOTES

- RAIL AND JOINT BARS. Purchaser shall specify weight and designation of rail section and joint drilling and shall supply complete details of joint bars.
- DETAIL OF HEEL AND TOE JOINTS.
 - No. 7, 8, 9, 10 and 11 frogs for rails 112 lb. and heavier shall be designed as illustrated in main plan view for three-hole rail drilling and six-hole joint bars 36" long.
 - Frogs other than those mentioned in 2(a) shall be designed as illustrated in outway views for two-hole rail drilling and four-hole joint bars 24" long.
 - Joint bars for heel and are not furnished with frog unless called for. Purchaser's joint bars if longer than specified in 2(a) or 2(b) should be cut to the lengths stated or joint bars of the required lengths called for with frogs. For proper support of the upper flange projections shown as 18-1/2" long joint bars at least 32" long shall be furnished with frog if purchaser's standard bars are shorter than this length.
 - TRACK BOLTS shall be furnished at heel end and square head machine bolts at toe end to suit joint bar detail specified, other details conforming to Section M11 Plan No.100.
- WIDTH OF FLANGEWAY. Flangeways up to 2" wide shall be obtained by moving the guard line and modifying only the throat opening and length of flare; for flangeways wider than 2" increase flare and throat openings accordingly, but do not change the width of body or other dimensions.
- LENGTH OF FROGS.
 - Rails 112 lb. and heavier. Lengths in table (except No.4) have been designed for uniform tie spacing 19 1/2". For rail sections with width of base plus head exceeding heel spread or base minus head exceeding toe spread, longer frogs shall be specified by increasing toe and/or heel lengths, or corner of rail base removed in field.
 - Rails lighter than 112 lb. Lengths in table provide clearance for abutting rails; those below heavy lines were determined by this requirement, those above heavy lines are minimum and were fixed by other considerations.
- SPECIAL ANGLE FROGS. For fractional numbered frogs use lengths and data for the next smaller numbered frog; if these will not provide joint clearance, use lengths and data for the next larger numbered frog. In the required rail grouping in either case.
- ALTERNATES AND ADDITIONAL EQUIPMENT. To be furnished as specified.
 - With square or tapered heel and toe extensions.
 - BASE EXTENSIONS. For additional support base flange extensions of approved design shall be provided at tie locations.
- GENERAL REFERENCES:
 - POINT AND FLANGEWAY DIMENSIONS. See Plan No.600 for details.
 - BEVELING OF ENDS ABUTTING RAILS. See Plan No.1005.
 - BONDING. Per details specified by purchaser.
- SPECIFICATIONS -- See AREMA Plan No.100.

AMERICAN RAILWAY ENGINEERING
AND MAINTENANCE OF WAY ASSOCIATION
SOLID MANGANESE STEEL
SELF GUARDED FROGS



TURNOUT GEOMETRY

#10 TURNOUT MATERIAL AND FASTENERS	
QTY	DESCRIPTION
1 PR	31'-3 1/2" D/R SAMSON SW. PT. 19'-6" ALIGNMENT, W/STOPS, HH RAIL
1	#1 VERTICAL SWITCH RODS WITH ROCKER CLIP, W/O BASKET, WITH TWIST, INS
1	#2 VERTICAL SWITCH ROD INSULATED WITH ROCKER CLIPS
1	#3 VERTICAL SWITCH ROD INSULATED WITH ROCKER CLIPS
1	#GPOE GAGE PLATE INSULATED, WITH PANDROL ADJUSTABLE BRACES
1	#GPIE-1 GAGE PLATE INSULATED, WITH PANDROL ADJUSTABLE BRACES
2	#BPIAE SLIDE PLATE PANDROL WITH ADJUSTABLE BRACE
10	#BPIE SLIDE PLATE PANDROL WITH ADJUSTABLE BRACE
12	#SPIE SLIDE PLATE PANDROL
1 PR	CAST STEEL FLOATING HEEL BLOCK FOR EXTENDED POINT
1 SET	PANDROL TURNOUT PLATES (2 EA. #4E THROUGH #12E)
1	NEW #10 RAILBOUND FROG 17'-11", HH RAIL, 3-SHOT EDH
126	PANDROL TIE PLATE
12	MODIFIED PANDROL TIE PLATE
416	PANDROL E-CLIPS
15	PANDROL FROG PLATES (1 EA. #14 THROUGH #28)
48	PANDROL J-CLIPS
8	MODIFIED E-CLIPS (YELLOW FOR BU)

#10 TURNOUT MATERIAL AND FASTENERS (CONTINUED)	
QTY	DESCRIPTION
868	15/16" x 6" SCREW SPIKES
12 PR.	JOINT BARS 6 HOLE 36" WITH FASTENERS
1 PR	U69 GUARD RAIL 19'-6" WITH PANDROL PLATES AND FASTENERS
1	38'-6" LEFT HAND STRAIGHT STOCK RAIL
1	38'-6" RIGHT HAND BENT STOCK RAIL
1	40'-9 1/8" CURVED CLOSURE RAIL WITH BU (12'-7" & 28'-2 1/8")
1	40'-7 1/2" STRAIGHT CLOSURE RAIL
1	35'-4" TRAFFIC RAIL
1	37'-4" TURNOUT RAIL WITH BU (15'-10" & 21'-6")
1	37'-10" TRAFFIC RAIL
1	34'-6" TURNOUT RAIL
1	19'-7" TRAFFIC RAIL
1	19'-8" TURNOUT RAIL
1	25'-9" TRAFFIC RAIL
1	26'-5" TRAFFIC RAIL
1 SET	SWITCH TIES (SEE TIE SCHEDULE)
1	RACOR 36-EH SWITCH STAND, WITH 7'-0" ADJUSTABLE CONNECTING ROD, RED & GREEN TARGET

NOTE: 1. RAIL IN TURNOUT IS HEAD HARNED.
2. DOTTED LINES INDICATE MATERIAL SUPPLIED BY OTHERS.

#10 TURNOUT DATA	
VERTIX	0"
THROW OF SWITCH @ 6" #1 ROD	4 3/4"
SWITCH POINT LENGTH	31'-3 1/2"
SWITCH ALIGNMENT	19'-6"
HEEL SPREAD OF SWITCH	6 1/4"
SWITCH ANGLE	1'-04'-24"
SWITCH RADIUS	1222.17'
RADIUS OF CENTER LINE	806.09'
DEGREE OF CURVE	7'-06'-45"
TURNOUT LEAD ACTUAL	78'-11"
NUMBER	#10
ANGLE	5'-43'-29"
FROG LENGTH	17'-11"

* = (2) 17'-0" TIES ARE HEAD BLOCK TIES

TIE SCHEDULE	
LENGTH	QTY
9'-0"	11
10'-0"	13
11'-0"	9
12'-0"	7
13'-0"	6
14'-0"	6
15'-0"	5
16'-0"	8
* 17'-0"	6
TOTAL	71

RAIL SCHEDULE		
RAIL ID	RAIL DESCRIPTION	LENGTH
A	RIGHT HAND STRAIGHT STOCK RAIL	38'-6"
B	LEFT HAND BENT STOCK RAIL	38'-6"
C-H	CURVED CLOSURE RAIL WITH BU (12'-7" & 28'-2 1/8")	40'-9 1/8"
D-J	STRAIGHT CLOSURE RAIL	40'-7 1/2"
A-E	TRAFFIC RAIL	35'-4"
B-G	TURNOUT RAIL WITH BU (15'-10" & 21'-6")	37'-4"
E-M	TRAFFIC RAIL	37'-10"
G-N	TURNOUT RAIL	34'-6"
M	TRAFFIC RAIL	19'-7"
N	TURNOUT RAIL	19'-8"
K	TRAFFIC RAIL	25'-9"
L	TURNOUT RAIL	26'-5"

UNLESS OTHERWISE NOTED, 136RF RAIL DRILLED PER BELOW:

9 1/2" x 6" DRILLING
1 5/16" DIA. HOLES
3 3/32" ABOVE BASE OF RAIL

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REV.	BY	DESCRIPTION



TITLE:		APPROVED BY: P. SHEN		DATE APPROVED: JULY 27, 2020	
DRAWN BY: J. KARTMAN		REVISION NUMBER:		REVISION DATE:	
DATE: JULY 24, 2020		DRAWING NUMBER:			
FILENAME: AK2767.DWG					
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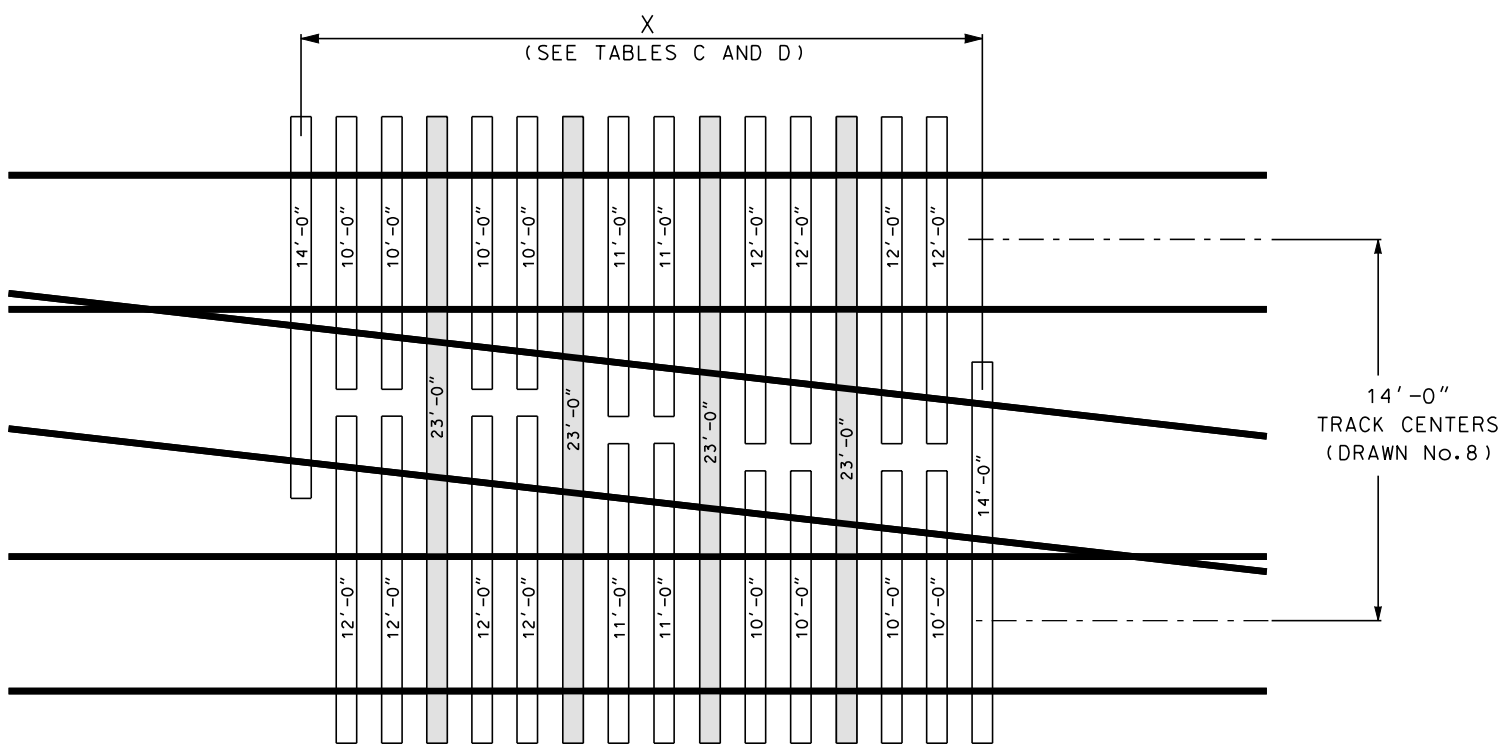
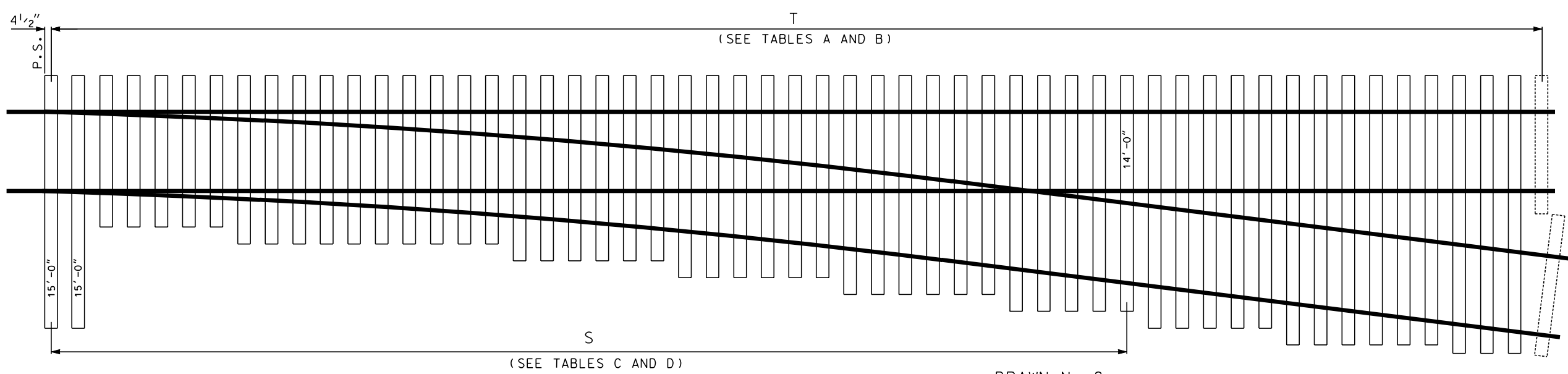


TABLE A BILL OF SWITCH TIES FOR TURNOUTS WITH STRAIGHT SWITCHES

FROG NO.	LENGTH OF SWITCH RAIL	TOE LENGTH TO 1/2" POINT	LEAD P.S. TO 1/2" POINT	LENGTHS AND QUANTITIES OF TIES									QTY OF TIES	BOARD MEASURE	TRACK LENGTHS OF CROSS TIES REPLACED
				9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"	16'-0"	17'-0"			
7	16'-6"	5'-4"	62'-1"	7	13	6	5	3	4	6	6	2	52	3329	88'-0"
8	16'-6"	5'-4 1/2"	68'-0"	7	13	6	6	4	5	7	6	3	57	3701	97'-8"
9	16'-6"	7'-0"	72'-3 1/2"	7	13	7	7	6	5	8	6	4	63	4127	105'-8"
10	16'-6"	7'-0"	78'-9"	7	15	8	7	6	6	7	8	4	68	4452	115'-11"

TABLE B BILL OF SWITCH TIES FOR TURNOUTS WITH CURVED SWITCHES

FROG NO.	LENGTH OF SWITCH RAIL	TOE LENGTH TO 1/2" POINT	LEAD P.S. TO 1/2" POINT	LENGTHS AND QUANTITIES OF TIES										QTY OF TIES	BOARD MEASURE	TRACK LENGTHS OF CROSS TIES REPLACED
				9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"	16'-0"	17'-0"	T			
6	13'-0"	5'-4 1/2"	49'-9"	5	8	5	5	4	3	5	5	2	42	2746	71'-11"	
7	13'-0"	5'-4"	54'-8 1/2"	5	10	6	5	4	4	6	6	2	48	3145	80'-7"	
8	13'-0"	5'-4 1/2"	58'-11 3/4"	5	10	6	6	6	5	5	6	3	52	3429	88'-7"	
9	19'-6"	7'-0"	74'-1 1/4"	9	13	8	6	6	5	8	6	4	65	4216	107'-6"	
10	19'-6"	7'-0"	78'-1 1/4"	9	13	9	7	6	6	7	8	4	69	4499	116'-1"	
11	19'-6"	8'-7 1/2"	83'-6"	9	14	9	8	7	6	8	8	4	73	4762	124'-1"	
12	19'-6"	8'-7 1/2"	87'-3 1/2"	9	14	9	9	8	7	9	9	4	78	5140	131'-11"	
14	26'-0"	10'-3"	108'-7 1/2"	12	19	13	9	9	8	11	11	5	97	6321	160'-9"	
15	26'-0"	10'-3"	113'-5"	12	19	13	11	9	9	11	12	6	102	6694	169'-4"	
16	26'-0"	11'-10 1/2"	118'-5"	12	21	14	11	9	11	10	12	6	106	6867	178'-1"	
20	39'-0"	15'-1 1/2"	156'-0 1/2"	20	27	15	14	13	11	15	14	7	138	8863	230'-8"	
24	39'-0"	16'-9"	177'-3"	34	21	15	12	16	15	17	14	14	158	9666	264'-0"	

TABLE C BILL OF SWITCH TIES FOR CROSSOVERS WITH STRAIGHT SWITCHES

FROG NO.	LENGTH OF SWITCH RAIL	TOE LENGTH TO 1/2" POINT	LEAD P.S. TO 1/2" POINT	LENGTHS AND QUANTITIES OF TIES INCLUDES THE TOTAL NUMBER OF SWITCH TIES FROM POINT OF SWITCH TO POINT OF SWITCH								QTY OF TIES	BOARD MEASURE	TRACK LENGTH (PARALLEL TRACKS) OF CROSS TIES REPLACED = S + X	
														S	X
				9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	23'-0"					
7	16'-6"	5'-4"	62'-1"	14	30	20	14	6	16	5	105	6337	64'-1"	24'-3"	
8	16'-6"	5'-4 1/2"	68'-0"	14	34	14	20	8	10	4	104	6279	72'-10 3/4"	25'-0 1/4"	
9	16'-6"	7'-0"	72'-3 1/2"	14	32	22	20	12	10	5	115	7030	78'-3 1/2"	27'-4 3/8"	
10	16'-6"	7'-0"	78'-9"	14	38	24	22	12	22	5	137	8468	85'-5"	30'-6 3/8"	

TABLE D BILL OF SWITCH TIES FOR CROSSOVERS WITH CURVED SWITCHES

FROG NO.	LENGTH OF SWITCH RAIL	TOE LENGTH TO 1/2" POINT	LEAD P.S. TO 1/2" POINT	LENGTHS AND QUANTITIES OF TIES INCLUDES THE TOTAL NUMBER OF SWITCH TIES FROM POINT OF SWITCH TO POINT OF SWITCH								QTY OF TIES	BOARD MEASURE	TRACK LENGTH (PARALLEL TRACKS) OF CROSS TIES REPLACED = S + X	
				9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	23'-0"	S			X	
6	13'-0"	5'-4 1/2"	49'-9"	10	22	14	16	8	6	3	79	4793	62'-7"	21'-3"	
7	13'-0"	5'-4"	54'-8 1/2"	10	24	20	14	8	16	5	97	6095	57'-8 1/2"	24'-3"	
8	13'-0"	5'-4 1/2"	58'-11"	10	28	14	20	12	10	4	98	6048	63'-10 1/2"	25'-0 1/4"	
9	19'-6"	7'-0"	74'-1 1/4"	18	32	24	18	12	10	5	119	7208	80'-1"	27'-4 3/8"	
10	19'-6"	7'-0"	78'-11"	18	34	26	22	12	22	5	139	8563	85'-7"	30'-6 3/8"	
11	19'-6"	8'-7 1/2"	83'-6"	18	38	24	26	14	12	8	140	8820	89'-11 1/2"	35'-7 1/4"	
12	19'-6"	8'-7 1/2"	87'-3 1/2"	18	36	28	26	16	22	8	154	9671	95'-6"	36'-5 1/2"	
14	26'-0"	10'-3"	108'-7 1/2"	24	50	34	30	18	26	8	190	11718	118'-4 1/2"	42'-9"	
15	26'-0"	10'-3"	113'-5"	24	50	38	34	18	18	10	192	11855	125'-7"	47'-11 1/8"	
16	26'-0"	11'-10 1/2"	118'-5"	24	54	41	37	18	22	8	204	12479	133'-8"	40'-1 1/4"	
20	39'-0"	15'-1 1/2"	156'-0 1/2"	40	74	42	48	26	22	14	266	14690	165'-5 1/8"	66'-3 3/8"	
24	39'-0"	16'-9"	177'-3"	78	54	54	36	32	40	11	305	15419	200'-7 3/4"	60'-4 1/8"	

AMERICAN RAILWAY ENGINEERING
AND MAINTENANCE OF WAY ASSOCIATION

BILLS OF SWITCH TIES
FOR TURNOUTS
AND
CROSSOVERS

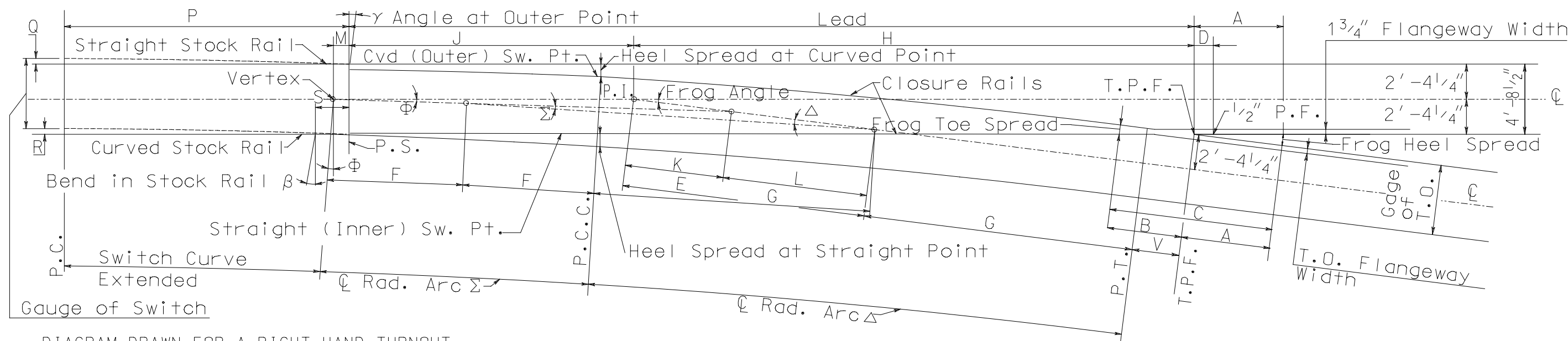


DIAGRAM DRAWN FOR A RIGHT HAND TURNOUT

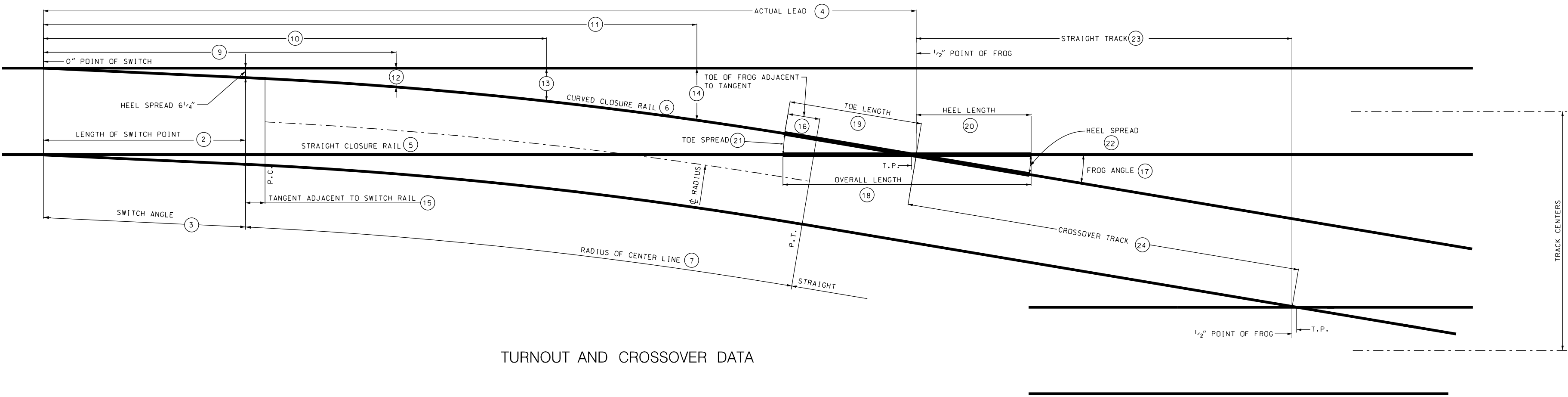
NOTES:

- 1- Turnouts are designed for rapid transit operation with equipment having wheel and car truck dimensions shown in Plan No. PT 793.
- 2- Standard gage of straight track through turnouts is 4'-8 1/2". Switch and turnout curves use a secant type geometry with curved split switch Point of outer switch rail is designed with Detail 5100. Gage widening for switch and turnout curves are obtained by moving the inner rail outward.
- 3- 13'-0" and 18'-0" switches have inner points which are equipped with a guard rail and which continues along the inner rail of the turnout curve. The 19'-6" switch is not equipped with this guard rail. The switches are denoted with suffixes -GRD and -UNGRD respectively. No.8 turnouts optionally utilize guarded or unguarded switches and the appropriate suffix is added to the turnout and frog number.
- 4- 115 RE trackwork is recommended. Where existing site conditions or local practice requires the use of 100 ARA-B rail section such use is acceptable. For dimensions of 100 lb. trackwork see Plan No. PT-111.

Frog No.	A	B	C	D	Spread at Heel of Frog	Spread at Toe of Frog	Arc. Σ ϕ Radius of Switch	Gage of Switch	Inner Pt. Flangeway Width	P P.C.-P.S.	Q	R	M Vertex-P.S.	S Stock Rail Bend-P.S.	ϕ (kink) Angle @ Sw. Vertex	γ Angle of Outer Point	β Bend in Stock Rail	Σ ϕ Angle of Sw. Points	F ϕ Tan. of Curve Σ	Length of Arc Σ		Heel Spread at Sw. Points		Frog No.
																				Outer Rail P.S.-P.C.C.	Inner Rail Bend in Stock Rail-P.C.C.	Outer Pt.	Inner Pt.	
3.5698	4.5000'	4.0000'	8.5000'	1 3/16"	1.2484'	1.0404'	195.6458'	4'-9"	2 1/4"	6'-11"	1 7/16"	0 5/16"	0.0413'	1.3857'	2°-00'-48"	2°-00'-05"	1°-38'-22"	3°-45'-00"	6.4047'	13.0000'	13.9089'	10 3/16"	11 13/32"	3.5698
4	5.0000'	4.0000'	9.0000'	2"	1.2403'	0.9389'	195.6458'	4'-9"	2 1/4"	6'-11"	1 7/16"	0 5/16"	0.0413'	1.3857'	2°-00'-48"	2°-00'-05"	1°-38'-22"	3°-45'-00"	6.4047'	13.0000'	13.9089'	10 3/16"	11 13/32"	4
4 1/2	5.0000'	4.0000'	9.0000'	2 1/4"	1.1043'	0.8432'	195.6458'	4'-9"	2 1/4"	6'-11"	1 7/16"	0 5/16"	0.0413'	1.3857'	2°-00'-48"	2°-00'-05"	1°-38'-22"	3°-45'-00"	6.4047'	13.0000'	13.9089'	10 3/16"	11 13/32"	4 1/2
5	6.0000'	4.0000'	10.0000'	2 1/2"	1.1940'	0.7592'	614.1958'	4'-8 1/2"	1 3/4"	19'-6 27/32"	3 3/4"	3 3/4"	0.0390'	0.0753'	1°-49'-20"	1°-49'-08"	1°-49'-33"	1°-40'-10"	8.9491'	18.0000'	17.7889'	10"	10 1/8"	5
6	7.0000'	4.0000'	11.0000'	3"	1.1626'	0.6398'	614.1958'	4'-8 1/2"	1 3/4"	19'-6 27/32"	3 3/4"	3 3/4"	0.0390'	0.0753'	1°-49'-20"	1°-49'-08"	1°-49'-33"	1°-40'-10"	8.9491'	18.0000'	17.7889'	10"	10 1/8"	6
7	8.0000'	4.0000'	12.0000'	3 1/2"	1.1399'	0.5700'	614.1958'	4'-8 1/2"	1 3/4"	19'-6 27/32"	3 3/4"	3 3/4"	0.0390'	0.0753'	1°-49'-20"	1°-49'-08"	1°-49'-33"	1°-40'-10"	8.9491'	18.0000'	17.7889'	10"	10 1/8"	7
8 Grd.	8.0000'	5.0000'	13.0000'	4"	0.9981'	0.6238'	614.1958'	4'-8 1/2"	1 3/4"	19'-6 27/32"	3 3/4"	3 3/4"	0.0390'	0.0753'	1°-49'-20"	1°-49'-08"	1°-49'-33"	1°-40'-10"	8.9491'	18.0000'	17.7889'	10"	10 1/8"	8 Grd.
8 Ungrd.	8.0000'	5.0000'	13.0000'	4"	0.9981'	0.6238'	1219.8158'	4'-8 1/2"	-	22'-10 3/4"	2 3/16"	2 3/16"	0.0221'	0.0442'	1°-04'-28"	1°-04'-24"	1°-04'-31"	0°-54'-47"	9.7204'	19.5000'	19.3809'	6 1/4"	6 3/32"	8 Ungrd.
9	9.0000'	5.0000'	14.0000'	4 1/2"	0.9985'	0.5547'	1219.8158'	4'-8 1/2"	-	22'-10 3/4"	2 3/16"	2 3/16"	0.0221'	0.0442'	1°-04'-28"	1°-04'-24"	1°-04'-31"	0°-54'-47"	9.7204'	19.5000'	19.3809'	6 1/4"	6 3/32"	9
10	10.0000'	5.0000'	15.0000'	5"	0.9987'	0.4999'	1219.8158'	4'-8 1/2"	-	22'-10 3/4"	2 3/16"	2 3/16"	0.0221'	0.0442'	1°-04'-28"	1°-04'-24"	1°-04'-31"	0°-54'-47"	9.7204'	19.5000'	19.3809'	6 1/4"	6 3/32"	10
11	11.0000'	6.0000'	17.0000'	5 1/2"	0.9989'	0.5449'	1219.8158'	4'-8 1/2"	-	22'-10 3/4"	2 3/16"	2 3/16"	0.0221'	0.0442'	1°-04'-28"	1°-04'-24"	1°-04'-31"	0°-54'-47"	9.7204'	19.5000'	19.3809'	6 1/4"	6 3/32"	11
12	12.0000'	6.0000'	18.0000'	6"	0.9991'	0.4996'	1219.8158'	4'-8 1/2"	-	22'-10 3/4"	2 3/16"	2 3/16"	0.0221'	0.0442'	1°-04'-28"	1°-04'-24"	1°-04'-31"	0°-54'-47"	9.7204'	19.5000'	19.3809'	6 1/4"	6 3/32"	12

Frog No.	Length of Sw. Points	Frog Angle	Theoretical Lead	Theoretical Radius	P.S.-T.P.F. Lead	J P.S.-P.I.	H P.I.-T.P.F.	Arc. Δ ϕ Radius of Turnout	Δ Angle of Turnout	Gage of Turnout	Turnout Flangeway Width	Length of Arc Δ		G ϕ Tan. of Curve Δ	E	K	L	V P.T.-T.P.F.	Frog No.
												Outer Rail	Inner Rail						
3.5698	13'-0" Grd.	15°-56'-47"	33.6155'	120.0000'	31.6155'	16.1250'	16.8078'	112.1753'	10°-10'-59"	4'-9"	2 1/4"	20.3551'	19.5109'	9.9947'	6.8131'	2.3588'	4.4543'	0.0000'	3.5698
4	13'-0" Grd.	14°-15'-00"	37.6667'	150.6667'	37.6667'	15.8313'	18.8333'	146.5228'	8°-29'-12"	4'-9"	2 1/4"	22.0517'	21.3481'	10.8714'	7.9619'	2.6311'	5.3308'	0.0000'	4
4 1/2	13'-0" Grd.	12°-40'-49"	42.3750'	190.6875'	42.3750'	15.3602'	21.1875'	195.6421'	6°-55'-01"	4'-9"	2 1/4"	23.9028'	23.3294'	11.8237'	9.3638'	2.9233'	6.4405'	0.0000'	4 1/2
5	18'-0" Grd.	11°-25'-16"	47.0833'	235.4186'	47.0837'	24.0424'	23.5417'	213.5425'	7°-55'-46"	4'-8 3/4"	2"	29.8790'	29.2277'	14.8002'	8.7415'	4.5922'	4.1993'	0.0000'	5
6	18'-0" Grd.	9°-31'-38"	56.5000'	339.0022'	56.5000'	23.6863'	28.2500'	322.2221'	6°-02'-08"	4'-8 1/2"	1 3/4"	34.1910'	33.6950'	16.9872'	11.2628'	5.6270'	5.6358'	0.0000'	6
7	18'-0" Grd.	8°-10'-16"	65.9167'	461.4245'	54.3093'	21.3509'	32.9584'	396.1422'	4°-40'-46"	4'-8 1/2"	1 3/4"	32.5459'	32.1613'	16.1858'	12.7726'	6.1508'	6.6218'	4.0000'	7
8 Grd.	18'-0" Grd.	7°-09'-10"	75.3333'	602.6580'	57.8493'	20.1826'	37.6667'	546.3908'	3°-39'-40"	4'-8 1/2"	1 3/4"	35.0639'	34.7631'	17.4627'	15.2040'	6.9215'	8.2825'	5.0000'	8 Grd.
8 Ungrd.	19'-6" Ungrd.	7°-09'-10"	75.3333'	602.6667'	69.0530'	31.3863'	37.6667'	494.1064'	5°-09'-55"	4'-8 1/2"	1 3/4"	44.7564'	44.3320'	22.2872'	10.3795'	5.5615'	4.8180'	5.0000'	8 Ungrd.
9	19'-6" Ungrd.	6°-21'-35"	84.7500'	762.7500'	74.2575'	31.8825'	42.3750'	652.0834'	4°-22'-20"	4'-8 1/2"	1 3/4"	49.9399'	49.5806'	24.8922'	12.4828'	6.4941'	5.9887'	5.0000'	9
10	19'-6" Ungrd.	5°-43'-29"	94.1667'	941.6667'	79.1949'	32.1116'	47.0833'	838.7239'	3°-44'-14"	4'-8 1/2"	1 3/4"	54.8609'	54.5538'	27.3634'	14.7199'	7.4315'	7.2884'	5.0000'	10
11	19'-6" Ungrd.	5°-12'-18"	103.5833'	1139.4167'	83.4361'	31.6444'	51.7917'	1032.0846'	3°-13'-03"	4'-8 1/2"	1 3/4"	58.0898'	57.8254'	28.9865'	16.8052'	8.2430'	8.5622'	6.0000'	11
12	19'-6" Ungrd.	4°-46'-19"	113.0000'	1356.0000'	87.9283'	31.4283'	56.5000'	1285.1788'	2°-47'-04"	4'-8 1/2"	1 3/4"	62.5711'	62.3423'	31.2345'	19.2655'	9.1440'	10.1215'	6.0000'	12

AMERICAN RAILWAY ENGINEERING
AND MAINTENANCE OF WAY ASSOCIATION
TURNOUT DATA FOR
RAPID TRANSIT SWITCHES
TURNOUT No. 3.6 TO No. 12
115RE RAIL SECTION



TURNOUT AND CROSSOVER DATA

NOTES

PROPERTIES OF SWITCHES			CLOSURE DISTANCE			LEAD CURVE		GAGE LINE OFFSETS							PROPERTIES OF FROGS							DATA FOR CROSSOVERS				
																						14'-0" TRACK CENTERS		FOR CHANGE OF 1'-0" IN TRACK CENTERS		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)			
FROG NO.	LENGTH OF POINTS	SWITCH ANGLE	ACTUAL LEAD	STRAIGHT CLOSURE RAIL	CURVED CLOSURE RAIL	RADIUS OF CENTER LINE	DEGREE OF CURVE							TANGENT ADJACENT TO SWITCH RAIL	TANGENT ADJACENT TO TOE OF FROG	FROG NO.	FROG ANGLE	OVERALL LENGTH	TOE LENGTH	HEEL LENGTH	TOE SPREAD	HEEL SPREAD	STRAIGHT TRACK	CROSSOVER TRACK	STRAIGHT TRACK	CROSSOVER TRACK
	FT. IN.	DEG. MIN. SEC.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	DEG. MIN. SEC.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.		DEG. MIN. SEC.	FT. IN.	FT. IN.	FT. IN.	INCHES	INCHES	FT. IN.	FT. IN.	FT. IN.	FT. IN.
7	16'-6"(27'-11")	1°-48'-32"	62'-1"	28'-10"	29'-0 ²³ / ₃₂ "	365'-7 ³ / ₃₂ '	15°-43'-17"	26'-2 ¹ / ₄ "	35'-10 ¹ / ₂ "	45'-6 ³ / ₄ "	11 ³ / ₈ "	1'-7 ¹³ / ₃₂ "	2'-6 ²³ / ₃₂ "	2 ⁷ / ₈ "	7 ¹³ / ₃₂ "	7	8°-10'-16"	13'-0"	5'-4"	7'-8"	8 ⁵ / ₈ "	13 ¹³ / ₃₂ '	31'-0"	32'-0"	6'-11 ⁹ / ₁₆ "	7'-0 ⁷ / ₁₆ "
8	16'-6"(28'-0")	1°-48'-32"	68'-0"	34'-7 ¹ / ₂ "	34'-9 ²⁹ / ₃₂ "	487'-3 ³ / ₈ '	11°-46'-44"	27'-7 ¹ / ₄ "	38'-8 ¹ / ₂ "	49'-9 ³ / ₄ "	11 ²³ / ₃₂ "	1'-8 ⁷ / ₃₂ "	2'-7 ²³ / ₃₂ "	11 ³ / ₈ "	3 ¹³ / ₃₂ "	8	7°-09'-10"	14'-8"	5'-4 ¹ / ₂ "	9'-3 ¹ / ₂ "	7 ³ / ₁₆ "	14 ¹³ / ₃₂ '	35'-6 ³ / ₄ "	36'-5 ¹ / ₄ "	7'-11 ⁵ / ₈ "	8'-0 ³ / ₈ "
9	16'-6"(28'-4")	1°-48'-32"	72'-3 ¹ / ₂ "	36'-11 ¹ / ₂ "	37'-1 ¹¹ / ₁₆ "	615'-1 ⁷ / ₁₆ "	9°-19'-29"	28'-10 ¹ / ₄ "	41'-2 ¹ / ₂ "	53'-6 ³ / ₄ "	1'-0 ¹ / ₃₂ "	1'-9 ³ / ₈ "	2'-9 ⁷ / ₁₆ "	4 ¹³ / ₃₂ "	5 ¹³ / ₃₂ "	9	6°-21'-35"	17'-11"	7'-0"	10'-11"	8 ¹³ / ₁₆ "	15 ¹ / ₃₂ "	40'-1 ⁵ / ₁₆ "	40'-10 ²³ / ₃₂ "	8'-11 ²³ / ₃₂ "	9'-0 ¹ / ₃₂ '
10	16'-6"(29'-6")	1°-48'-32"	78'-9"	42'-3"	42'-4 ³ / ₃₂ "	779'-4 ¹¹ / ₁₆ "	7°-21'-23"	29'-11 ³ / ₄ "	43'-5 ¹ / ₂ "	56'-11 ¹ / ₄ "	1'-0 ³ / ₃₂ "	1'-9 ¹ / ₃₂ "	2'-8 ¹³ / ₃₂ "	2'-7"	7 ¹ / ₄ "	10	5°-43'-29"	17'-11"	7'-0"	10'-11"	7 ⁷ / ₈ "	13 ¹³ / ₃₂ "	44'-7 ²³ / ₃₂ "	45'-4 ³ / ₁₆ "	9'-11 ¹¹ / ₁₆ "	10'-0 ⁵ / ₁₆ "

- Dimensions are to nearest 1/32".
- The data shown are computed for turnouts out of straight standard 4'-8 1/2" gage track. If the wheel base of the equipment used requires wider gage for the switch alignment or curvature shown, the lead and alignment of curved closure rail shall be maintained, and inside stock and curved rails shall be moved out the necessary amount. The gage of straight track through switch will then be increased and the straight closure rail shall be bent to true alignment in advance of toe of frog.
- FROG DESIGNS
For short spring rail type frogs, the straight closure, and for solid manganese frogs, the straight and curved closures, shall be lengthened to conform.
- For length of closure rails, see Plan No. 911.
- For bills of timber for various turnouts and crossovers see Plan No. 912.
- For permissible speeds see AREMA Chapter 5.

AMERICAN RAILWAY ENGINEERING
AND MAINTENANCE OF WAY ASSOCIATION
TURNOUT AND CROSSOVER DATA
FOR STRAIGHT SPLIT SWITCHES

Appendix B

Technical Specifications

TECHNICAL SPECIFICATIONS LIST

GE-Pittsfield/Housatonic River Site – Rail Transload Area Construction

Section Number	Section Title
01353	Cultural Resources
01355	Hazardous Materials Control
01572	Construction Environmental Restrictions and Controls
01733	Waste Management
01760	Protecting Installed Construction
02 21 00	Surveys
02 71 10	Chain Link Fence
03 00 05	Concrete
31 05 13	Soils and Aggregates
31 11 00	Clearing and Grubbing
31 23 00	Excavation and Fill
31 25 00	Erosion and Sediment Controls
31 32 19	Geotextiles
31 37 00	Riprap
32 12 00	Flexible Paving
32 30 00	Restoration, Planting, and Seeding
33 41 01	Drainage Piping
33 49 00	Precast Structures
34 72 00	Railway Construction

NOT FOR CONSTRUCTION
Rail Transload Area Construction
September 2026

SECTION 01353 – CULTURAL RESOURCES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Previous cultural resources investigations have been conducted for the rail transload areas in accordance with federal and state regulatory requirements. Cultural resources include archaeological sites and historic structures and properties. These investigations have not identified archaeological resources within the limits of disturbance / limits of work identified on the Design Drawings for either rail transload area property, nor other areas investigated on the property.
- B. Disturbances (e.g., stockpiling material, intrusive earthwork) outside the limits of disturbance / limits of work identified on the Design Drawings shall not be allowed without prior approval from the Construction Manager.
- C. If the contractor proposes to drive heavy equipment over land not previously investigated, the contractor shall first install matting or some other suitable protection over such areas.

1.02 DEFINITIONS

- A. Archaeological Resources means an archaeological site on land or underwater that has been determined to be significant by the U.S. Environmental Protection Agency.
- B. Archaeological Debris means manufactured objects such as pottery jugs, glass bottles, and isolated timbers that do not constitute significant archaeological resources as defined above.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

- A. The General Electric Company (GE) will conduct a short archaeological resource identification training program for remediation field staff in advance of the Work. This training program will be presented by the Project's cultural resource professional and is intended to help remediation staff identify unanticipated discoveries in the field and report them to the Construction Manager.
- B. When encountering any debris that may appear to be an archaeological resource, the Contractor shall immediately notify the Construction Manager. The Construction Manager will halt all activities in the immediate vicinity that may damage or alter such resources. The Contractor shall secure and protect the area from damage or disturbance to the satisfaction of the Construction Manager. The Construction Manager will then promptly notify GE and the appropriate regulatory personnel in accordance with the Cultural Resources Unanticipated Discoveries Plan.

SECTION 01353 – CULTURAL RESOURCES

- C. In the event that human remains are discovered, the Contractor shall halt Work in the immediate vicinity that may damage or alter the human remains, notify the Construction Manager, and secure and protect the area from damage or disturbance. The Construction manager will then promptly notify GE and the appropriate regulatory personnel in accordance with the Cultural Resources Unanticipated Discoveries Plan. The local law enforcement agency and medical examiner will subsequently be notified.
- D. The Contractor shall resume any halted Work activities following notification from the Construction Manager.

- END OF SECTION -

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Control of other Hazardous Materials.
- B. Fire Prevention.
- C. Spill Prevention, Control, and Countermeasures.

1.02 RELATED DOCUMENTS

- A. Toxic Substances Control Act (TSCA) – 40 CFR 761.
- B. Spill Prevention Control and Countermeasure – 40 CFR 264.193.
- C. Section 01733 – Waste Management.

1.03 SUBMITTALS

A. Chemical Management Plans:

1. Contractor shall submit a Chemical Management Plan (“Plan”) that identifies: an inventory of potentially hazardous substances to be used on the Project Site; the intended actions to prevent introduction of such materials into the air, water, or ground; the chemical hazards to which employees may be exposed and personal protective measures; storage and handling practices; identification and labeling requirements for containers and piping; key aspects of emergency response requirements for chemical incidents; and provisions for compliance with federal, state, and local laws and regulations for storage and handling of these materials. A copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on the Project Site at any given time shall be included in the Plan.
2. The Plan shall include process maps and written standard operating procedures for the steps to be followed for implementing the Plan beginning with the chemical purchase and through its receipt, distribution, storage, and use. The procedures shall track chemical by type, volume, use, and disposition. The Plan shall assign responsibility for communication, inventory, procurement/purchasing, receiving, labeling, storage, shipment, training, and program assessment/compliance.
3. The Plan shall include training requirements and methods for all personnel that are responsible for chemical management. Both management and employees shall be trained on their responsibility to properly procure, dispense, label, handle, use, store, and dispose chemicals for their operations. The training shall include:
 - a. Details of specific operations and associated physical or health hazards.
 - b. Use of, location and availability of MSDS and GHS-equivalent documents.

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

- c. Container and piping labeling systems.
- d. Measures employees should take to protect themselves from chemical hazards:
 - 1) Engineering controls;
 - 2) Personal protective equipment (PPE); and
 - 3) Work practices.
- e. Methods and expectations for detection of hazardous chemicals in the work area, and methods to respond to a release.

The Plan shall be updated and submitted for approval by the Construction Manager when new chemicals are brought onto the Project Site. The Plan shall also be reviewed and revised as necessary if a release occurs.

- B. Pesticide Treatment Plan: A Pesticide Treatment Plan shall be submitted and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient, e.g., pounds of active ingredient applied, equipment used for application and calibration of equipment. The Contractor is responsible for federal, state, regional, and local pest management recordkeeping and reporting requirements, as well as any additional specific requirements.
- C. Fire Prevention Plan: Contractor shall develop, implement, maintain, supervise, and be responsible for a comprehensive Fire Prevention Plan. The Fire Prevention Plan shall align with the Contractor's Health and Safety Plan with regards to prevention procedures, equipment, handling and storage and personnel training. The Contractor shall discuss this plan at contractor safety meetings.
- D. Spill Prevention, Control and Countermeasure (SPCC) Plan:
 - 1. Contractor shall develop, implement, maintain, supervise, and be responsible for a comprehensive SPCC Plan. The plan shall provide contingency measures for potential spills and discharges resulting from the Work, including the handling of contaminated materials. Potential spills or discharges of particular concern during Project Site operations are spills of fuel, oil, lubricants, or other fluids from equipment, fuel storage tanks, wastewater storage tanks, spills of contaminated sediment or debris, and discharges of water due to leaks, spills, or breakage of tanks or pipes. The plan shall also detail the different preventative measures to be taken at potential spill or discharge locations to prevent spills or discharges from occurring and if they do occur the secondary containment measures in place to prevent the spill or discharge from entering the surrounding water body or ground.

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

2. Should the total installed storage capacity for Petroleum, Oil and Lubricants (POL) exceed 1,320 gallons or a single storage container exceed 660 gallons on a project site, the SPCC Plan shall comply with the substantive requirements of 40 CFR Part 112. PE certification of the Plan is not required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 CONTROL OF OTHER HAZARDOUS MATERIALS

A. Pollution Prevention.

The Contractor shall monitor activities to prevent pollution of surface and groundwater. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. The Contractor shall monitor all areas affected by the operations. For activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water per substantive State or Federal Clean Water Act requirements. Contractors shall comply with requirements in the Technical Specifications.

B. [NOT USED]

C. Pest Management.

Use of pesticides is subject to approval by the Construction Manager. In order to minimize impacts to existing fauna and flora, the Contractor shall coordinate with the Construction Manager at the earliest possible time prior to pesticide application. The Contractor shall discuss pest management strategies with the Construction Manager and receive concurrence from the Construction Manager prior to the application of any pesticide associated with these specifications.

Pesticides shall be delivered to the Project Site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the Work is to be performed.

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and PPE specified on the labeling for use during all phases of the application. An MSDS shall be available for all pesticide products.

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendations. The Certified Applicator shall wear clothing and PPE as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Construction Manager. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

D. Contractor Generated Hazardous Waste.

Procedures for handling Contractor-generated hazardous waste are specified in Specification 01733 – Construction Waste Management.

E. Fuel and Lubricants.

Storage, fueling, and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants, and oil shall be managed and stored in accordance with all federal, state, regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, state, and local laws and regulations. Requirements applicable to storage of fuel on the Project Site are further detailed in Paragraph 3.04.

F. Chemicals.

The Construction Manager must approve the purchase of all chemicals. The contractor should supply an MSDS, the quantity to be ordered, certification by customs and other appropriate regulatory agencies, and a description of planned use (revision of Chemical Management Plan, as necessary) to gain approval. Storage and use of chemicals, including but not limited to dewatering and stabilization chemicals, shall be conducted in a manner that affords the maximum protection against spill. Chemicals shall be managed and stored in accordance with all federal, state, regional, and local laws and regulations. A chemical inventory, including the chemical name, supplier, storage location, and quantity, must be kept for those chemicals received, in-use, or stored at the Project Site. An annual sweep at the end of each dredge season shall be conducted to verify the inventory and removal of old or unneeded chemicals. The approved chemical list, MSDS, and training records must be kept at the Project Site.

3.02 [NOT USED]

3.03 FIRE PREVENTION

- A. Good housekeeping will be practiced. Combustible scrap and debris will be removed regularly, before they are allowed to accumulate.
- B. Storage areas will be routinely inspected and maintained. The Uniform Fire Code and National Fire Prevention Association (NFPA) standards will be followed when

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

storing compounds that are flammable, ignitable or reactive. All compounds stored on the Project Site will be kept in their original containers, unless damaged. All containers will meet the NFPA or Commonwealth of Massachusetts Department of Transportation (MassDOT) standards for storage. Labels on containers will be visible and readable. An MSDS will be available for each compound present.

- C. Designated smoking areas will be clearly marked for project personnel. During routine Project Site inspections, Contractor shall routinely check for the presence of potentially combustible materials or conditions on the Project Site that could create a fire.

3.04 SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (“SPCC”)

- A. Contractor shall develop, implement, and be responsible for a comprehensive SPCC Program with a goal of “zero spills.” The program shall provide for adequate preventative controls, frequency of preventative maintenance, frequency of inspections, quantity of spill response equipment, supplies and personnel such that the potential for spills is reduced to an absolute minimum and the ability to respond to and control spills is rapid and complete.

B. Training:

1. Project personnel shall be trained to differentiate between non-hazardous waste and potential or known hazardous waste. Project personnel shall also be trained in proper waste management activities and liquid waste storage and disposal procedures. Regular meetings shall be held with Project personnel to discuss and reinforce disposal procedures.
2. The Contractor's Site Safety Officer or Site Safety and Health Officer (SSHO) shall train project personnel in procedures and techniques to avoid unintentional spills of PCBs and POLs. The SSHO shall verify that first-aid supplies, communication devices, e.g., cellular phone and very-high-frequency (VHF) radio, personal flotation devices, and fire extinguishers are available.

C. Prevention Procedures:

1. The Contractor shall provide secondary containment at all locations with the potential for spills or discharges to the surrounding water or ground. For example, spill pans, plastic sheeting or containment membranes placed under all stationary equipment, steel troughs or channel sections under hydraulic fittings and hydraulic hoses.
2. Vehicle and equipment fueling shall occur only in areas designated by the Construction Manager; stored fuel shall be covered or enclosed; spill controls shall be implemented; and project personnel shall be trained in proper fueling procedures. Nozzles used in vehicle and equipment fueling shall have an automatic shutoff to control drips. Project personnel shall not leave fueling operations unattended and shall observe federal, state, and local requirements for any stationary aboveground storage tanks. Vessels, vehicles, and equipment shall

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

be inspected each day of use for leaks. Repairs shall be conducted immediately or leaking vessels, vehicles, or equipment shall be removed immediately from the Project Site.

3. Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on fueling trucks, and project personnel shall dispose of spill kits properly after use. Project personnel shall use absorbent materials on small spills and shall promptly and properly dispose of removed materials. Berms and dikes shall protect fueling areas to prevent runoff and to contain incidental spills.
4. Contractor shall make arrangements with a qualified spill response contractor to be on-call and within 30 miles of the Project Site during project operations.

D. Spill Control and Countermeasure Procedures:

1. The Contractor shall provide methods, means, and facilities required to prevent contamination resulting from spills and discharges. The Contractor shall also provide materials, equipment, and personnel to perform emergency measures which may be required if a spill or discharge does occur. Materials and equipment required on the Project Site include a sufficient quantity of non-combustible absorbent material, shovels, 55-gallon drums, and solvent in case decontamination of structures or equipment is necessary. Solvents should only be used if other means of spill cleanup are not effective, and need to be detailed in the Contractor SPCC Plan.
2. In the event of a spill, the Contractor shall immediately notify the Construction Manager and emergency responders (if the situation creates a hazardous condition for workers and/or the public). Contractor's personnel shall be sufficiently trained to evaluate the apparent scale and severity of the spill so that appropriate response actions can be taken.
3. If a spill or discharge occurs, the Contractor will take immediate measures to control and contain the resulting contamination. Measures shall include isolating the contaminated area; spraying the area with foam if necessary; retrieving any discharge liquids if possible; absorbing the spilled or discharged material if a liquid; and removing, isolating, and covering contaminated sediment if necessary. Particular attention to clean up and clean up requirements shall be given to large spills that occur in portions of the river or canal that are known to be relatively free of PCBs or that have already been dredged and backfilled/capped.
4. Decontamination procedures may be required by the Contractor to remove spillage from previously uncontaminated structures, equipment, or other material and reduce levels of the substance spilled to acceptable levels as determined by Construction Manager. All contaminated materials, such as wood or metal, that cannot be properly decontaminated must be properly containerized, labeled, and stored for disposal. Personnel decontamination shall include cleansing or disposing of clothing and equipment.
5. Disposal of Clean-Up Debris and Contaminated Material – All contaminated soils, absorbent materials, solvents, and other materials resulting from the clean-

SECTION 01355 – HAZARDOUS MATERIALS CONTROL

up of spilled or discharged substances shall be properly stored, labeled, and disposed of at no additional cost to the Owner.

6. Use non-toxic, biodegradable oil in the hydraulic systems of any Contractor-controlled equipment that has the potential to spill or discharge into a waterbody.
7. After any spills, Contractor shall submit a written Spill Response Report, as well as an Engineering Evaluation Report. The Spill Response Report shall include documentation of the spill, cause of the spill, summarize the response actions taken, and record the after-the-fact engineering evaluation and proposed means of preventing recurrence. The Contractor shall submit the Report to the Construction Manager within 48 hours of the incident. The Contractor shall document all spills on the Record Drawings. Based on the findings and recommendations within these reports, potential follow-up steps to prevent recurrence of the spill would be discussed, agreed upon, approved, and implemented as needed. This could include increasing the number of monitoring locations or frequency of monitoring, adjusting operational conditions or procedures, or implementing engineering solutions.

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SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND
CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. This Section is applicable to Rest of River (ROR) construction Work that does not involve active remediation or handling of polychlorinated biphenyl (PCB)-containing materials. [Note: Section 01571 – Operations Environmental Restrictions and Controls addresses Work involving active remediation and handling of PCB-containing materials, that specification is not applicable for this portion of the project.]
2. The Contractor shall conduct all Work in compliance with the ROR Quality of Life (QOL) Standards established for air quality, noise, odor, and lighting. The QOL Standards were established in the United States Environmental Protection Agency (EPA)-approved Second Revised Quality of Life Compliance Plan (QOL Compliance Plan; Anchor QEA and Arcadis, May 2025). The QOL Standards are listed below in Part 1.01.B.
3. The Contractor shall supply and maintain all labor, equipment, tools, methods, controls, materials, temporary construction, and mitigation measures necessary to ensure that all Work is compliant with the QOL Standards.
4. The Construction Manager, or a third party under the direction of the Construction Manager, will perform monitoring to demonstrate compliance with the applicable QOL Standards and, as warranted, in response to project-related complaints. Monitoring for compliance with the QOL Standards will be conducted in accordance with the QOL Compliance Plan and the Project Operations Plan (POP; Arcadis, Revised May 2025), including Attachment D (Ambient Air Monitoring Plan) and Attachment G (Construction Monitoring Plan). The Contractor may choose to conduct its own monitoring; however, the monitoring conducted by the third party shall form the basis for decisions regarding compliance with the QOL Standards.
5. If any QOL Standards are exceeded or a project-related complaint is received that requires corrective action, the Contractor will be notified by the Construction Manager, and the Contractor shall implement controls and any necessary mitigation measures to address the exceedance or complaint. If such an exceedance or complaint occurs, the Contractor shall assist the Construction Manager in investigating the cause of the exceedance and determining any additional engineering or operational controls needed.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

B. QOL Standards:

1. Air Quality QOL Standards (for non-remediation construction):

a. Air Quality QOL Standard for Particulate Matter:

- 1) The QOL Standard for Particulate Matter applies to particulates smaller than 10 micrometers in diameter (PM₁₀) and includes both a Notification Level and an Action Level.
- 2) PM₁₀ Notification Level: 10-hour average PM₁₀ concentration of 120 micrograms per cubic meter (µg/m³).
- 3) PM₁₀ Action Level: 10-hour average PM₁₀ concentration of 150 µg/m³.
- 4) Compliance with the QOL Standard for Particulate Matter will be determined based on PM₁₀ monitoring by the Construction Manager or a third party in accordance with the QOL Compliance Plan, the Ambient Air Monitoring Plan (Attachment D to the POP), and the Construction Monitoring Plan (Attachment G to the POP). PM₁₀ monitoring will occur for a minimum of 10 hours when construction is ongoing and throughout the duration of construction activities. If the duration of construction activities on a particular day is longer than 10 hours, the data collected over the full monitoring period will be averaged and compared to the PM₁₀ Notification Level and Action Level.
- 5) If the work-day average PM₁₀ Notification Level is exceeded at any time, the Contractor shall implement additional engineering or operational controls, as necessary, to reduce dust generation and prevent a PM₁₀ Action Level exceedance from occurring.
- 6) If the work-day average PM₁₀ Action Level is exceeded at any time, the Contractor shall implement additional engineering or operational controls, as necessary, to reduce dust generation and prevent another exceedance of the PM₁₀ Action Level.
- 7) If the work-day average PM₁₀ Action Level is exceeded on two consecutive days, the Contractor shall temporarily stop dust-generating Work, if directed to do so by the Construction Manager, in the vicinity of the location where the exceedance was observed. The stop-work requirement will continue until directed by the Construction Manager based on EPA approval of appropriate response actions to prevent another exceedance of the Action Level from occurring.

b. Air Quality QOL Standard for Visible Dust:

- 1) The QOL Standard for Visible Dust is to mitigate project-related visible dust from leaving the Work area.
- 2) The Construction Manager will investigate, with assistance by the Contractor, the cause of visible dust if observed leaving the Work area. If warranted, the Construction Manager will notify the Contractor if corrective action is required to address observations of visible dust.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

2. Noise QOL Standards:

- a. The primary objective of the Noise QOL Standards is to limit potential impacts of noise generated by the project on the surrounding communities.
- b. For residential areas, separate Noise QOL Standards were established for daytime and nighttime periods, and the residential daytime noise standard includes both a Notification Level and an Action Level. The residential nighttime noise standard and non-residential noise standard (applicable any time of day) are both Action Levels.
- c. The Noise QOL Standards are listed on the table below. All sound levels are presented in decibels on an A-weighted scale (dBA).

Type	Numerical Standard (Maximum Hourly Average)
Notification Level: Residential Daytime (7:00 a.m. to 9:00 p.m.)	75 dBA
Action Level: Residential Daytime (7:00 a.m. to 9:00 p.m.)	80 dBA
Action Level: Residential Nighttime (9:00 p.m. to 7:00 a.m.)	65 dBA
Action Level: Non-Residential (Day or Night)	80 dBA

- d. When nighttime work occurs in an area adjacent to both residential and non-residential receptors, the residential nighttime noise standard will apply.
 - e. Compliance with the Noise QOL Standards will be determined based on noise monitoring conducted by the Construction Manager or a third party in accordance with the QOL Compliance Plan and the Construction Monitoring Plan (Attachment G to the POP).
3. Odor QOL Standard:

- a. The primary objective of the odor QOL standard is to protect the surrounding communities from nuisance odors that unreasonably interfere with the comfortable enjoyment of life and property or the conduct of business.
- b. For general odors, the Odor QOL Standard is to mitigate the presence of uncomfortable project-related odors identified by project workers, the Construction Manager, or EPA or via an odor complaint from the public. The standard will be considered to not be met if uncomfortable project-related odors are identified frequently and recurrently or if such objectionable odors are not mitigated in a timely manner.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

- c. For hydrogen sulfide (H₂S) odors, a numerical QOL Standard is triggered in the event that a complaint or report is received from a worker, the public, or EPA that is related to the distinct rotten-egg smell of hydrogen sulfide.
 - d. The numerical Odor QOL Standard for Hydrogen Sulfide is a one-hour average concentration of 0.01 part per million (ppm) (or 14 µg/m³).
 - e. Compliance with the numerical Odor QOL Standard for Hydrogen Sulfide will be determined based on monitoring by the Construction Manager or a third party in accordance with the QOL Compliance Plan and the Construction Monitoring Plan (Attachment G to the POP).
4. Lighting QOL Standard:
- a. The Lighting QOL Standard is to mitigate nuisance project-related lighting impacts based on any complaints from nearby receptors.
 - b. The Lighting QOL Standard will be considered to be not met if frequent, recurrent lighting complaints related to project activities occur or if project-related nuisance lighting impacts are not mitigated in a timely manner.
 - c. The Lighting QOL Standard does not supersede worker health and safety lighting requirements established by the Occupational Safety and Health Administration (OSHA), where applicable.

C. References:

1. Second Revised Quality of Life Compliance Plan (Anchor QEA and Arcadis, May 2025).
2. Project Operations Plan (Arcadis, Revised May 2025), including Ambient Air Monitoring Plan (Attachment D) and Construction Monitoring Plan (Attachment G).
3. 29 Code of Federal Regulations (CFR) Section 1926.52.

1.02 SUBMITTALS

A. Pre-Construction:

1. The following plans may be submitted separately or as part of the Contractor's Operations Plan.
2. Submit a Dust Control Plan that, at a minimum, includes: a description of routine control measures, methods, and best management practices (BMPs) that will be implemented by the Contractor during each phase of the Work to control on-site dust generation and dust migration from Work areas and to prevent an exceedance of the Air Quality QOL Standards; identification of the water source(s) to be used by the Contractor for dust suppression and control; a contingency plan that details the procedures, additional controls, and mitigation measures that will be followed if there is an exceedance of the PM₁₀ Notification Level, PM₁₀ Action Level, or QOL Standard for Visible Dust; and a description of any air quality sampling or monitoring that the Contractor will perform at its own discretion.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

3. Submit a Noise Control Plan that, at a minimum, includes: a description of routine control measures, methods, and BMPs that will be implemented by the Contractor during each phase of the Work to prevent an exceedance of the Noise QOL Standards and nuisance to neighboring properties; specific controls, methods, and mitigation measures that will be employed to control or reduce noise during sheet pile installation (if applicable); an inventory of noise levels for noise-generating equipment that will be used by the Contractor during the Work; a contingency plan that details the procedures, additional controls, and mitigation measures that will be followed if there is an exceedance of the Noise QOL Standards or if a noise complaint is received that is determined by the Construction Manager to require mitigation; and a detailed description of noise monitoring that will be performed by the Contractor, including the monitoring equipment, procedures, frequency, and locations.
4. Submit an Odor Control Plan that, at a minimum, includes: a description of routine control measures, methods, and BMPs that will be implemented by the Contractor during each phase of the Work to mitigate and minimize odor emissions into the air during the Work as necessary to maintain compliance with the Odor QOL Standard; specific controls, methods, and mitigation measures that will be employed to control or reduce odors during management of wet solids, sediments, and decaying organic matter (e.g., aquatic plants and other organisms), if applicable; a contingency plan that details the procedures, additional controls, and mitigation measures that will be followed if there is an exceedance of Odor QOL Standard or if an odor complaint is received that is determined by the Construction Manager to require mitigation; and a description of any sampling or monitoring that the Contractor will perform at its own discretion.
5. Submit a Lighting Control that, at a minimum, includes: the types and locations of lighting to be used by the Contractor along with the energy sources to power the lighting; a description of routine control measures, methods, mitigation measures, and BMPs that will be implemented by the Contractor during each phase of the Work to prevent an exceedance of the Lighting QOL Standard and nuisance to neighboring properties, to minimize impacts from lights to neighboring properties, and to protect against potential light impacts on traffic safety; a contingency plan in the event of power outages or if certain lights fail to operate; and a contingency plan if the Lighting QOL Standard is exceeded, including potential contingency response actions and mitigation measures.
6. Submit manufacturer's product data, specifications, storage requirements, and application instructions for any proposed dust or odor mitigation agents.
7. Submit shop drawings, material data, and other applicable details for any structures, barriers, or enclosures identified to control noise (e.g., temporary noise barriers, acoustic barrier enclosures, or other noise suppression devices).

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND
CONTROLS

B. During Construction and Operations:

1. Submit the results for any monitoring conducted by the Contractor in a format acceptable to the Construction Manager.
2. Submit Corrective Action Reports within 24 hours of notification by the Construction Manager for any exceedance of a QOL Standard or for any project-related complaint that requires corrective action. Corrective Action Reports shall include a description of the exceedance or complaint, causes of the exceedance or complaint, and actions taken or to be taken to mitigate the exceedance or complaint and to prevent the incident from recurring.

PART 2 – PRODUCTS

2.01 DUST CONTROLS

- A. Clean, potable water.
- B. Mitigation agents selected by the Contractor to control site-specific dust generated during the Work. Specific dust mitigation agents shall be identified by the Contractor in the Dust Control Plan and in any Corrective Action Reports.
- C. Application measures and equipment applicable for water and any other selected dust mitigation agents, including for proper mixing, storage, and application.

2.02 NOISE CONTROLS

- A. Noise monitoring equipment.
- B. Engineering controls (e.g., temporary noise barriers, acoustic barrier enclosures, mufflers, or other noise suppression devices) for use as necessary.
- C. Specific noise control measures shall be identified by the Contractor in the Noise Control Plan and in any Corrective Action Reports.

2.03 ODOR CONTROLS

- A. Mitigation agents selected by the Contractor to control site-specific odors generated during the Work. Specific odor mitigation agents shall be identified by the Contractor in the Odor Control Plan and in any Corrective Action Reports.
- B. Odor mitigation agents may include but are not limited to: BioSolve® Pinkwater (by The BioSolve Company), Atmos Shield 645 (AC-645) Foam Concentrate (by Atmos Technologies), or ConCover 180 spray-on cover (by New Waste Concepts, Inc.).
- C. Application measures and equipment applicable for selected odor mitigation agents, including for proper mixing, storage, and application.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND
CONTROLS

2.04 LIGHTING CONTROLS

- A. Engineering controls (e.g., light shrouds, temporary light barriers, or other light control devices) for use as necessary.
- B. Specific lighting control measures shall be identified by the Contractor in the Light Control Plan and in any Corrective Action Reports.

PART 3 – EXECUTION

3.01 GENERAL

- A. If a QOL Standard is exceeded or a project-related complaint is received that requires corrective action, the Contractor will be notified by the Construction Manager. In the event of an exceedance or a project-related complaint that requires corrective action, the Contractor shall:
 - 1. Assist the Construction Manager in the investigation and evaluation of the cause of the exceedance or complaint and the need for additional and modified engineering or operational controls.
 - 2. Document the project and non-project events that were occurring at the time and location of the exceedance or complaint.
 - 3. Submit a Corrective Action Report describing the exceedance or complaint, causes of the exceedance or complaint, and actions taken to mitigate the exceedance or complaint and to prevent the incident from recurring.
 - 4. Implement additional or modified engineering controls, operational controls, or other mitigation measures, as appropriate, to address such exceedance and prevent another exceedance from occurring.
- B. If the Contractor receives a complaint related to dust, odor, noise, or light, the Construction Manager shall be notified immediately.

3.02 DUST CONTROL

- A. The Contractor shall implement appropriate methods, engineering controls, operational controls, or other mitigation measures, as needed, to conduct Work in compliance with the QOL Standards for Particulate Matter and Visible Dust listed in Part 1.01.B, and to prevent dust from becoming a nuisance to nearby properties.
- B. Provide positive means to prevent airborne dust from dispersing into the atmosphere. Use only potable water when a water misting system is to be used for dust and particulate control.
- C. Water applications shall be applied as frequently as required without creating nuisances such as excessive mud and ponding of water.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

- D. Do not use chemical means for dust and particulate control without the Construction Manager's prior approval.
- E. Employ construction methods, routine control measures, and BMPs throughout the duration of the Work, including during nonworking periods, to control on-site dust generation and dust particulate matter migration from Work areas during each phase of the Work. Construction methods, control measures, and BMPs to control dust may include, but are not limited to:
 - 1. Removing, placing, handling, loading, and unloading soils and materials using methods that minimize the generation of dust.
 - 2. Applying water to control the generation of airborne dust.
 - 3. Applying a temporary cover on exposed soil or material stockpiles.
 - 4. Using temporary vegetative cover on disturbed soil areas, where appropriate.
 - 5. Controlling the speed of construction vehicles.
 - 6. Using covers on trucks hauling fine or dusty material.
 - 7. Preventing tracking of soils onto haul routes.
 - 8. Modifying haul routes or surfaces to control and reduce dust generation.
 - 9. Assessing wind conditions to determine if construction methods or operational controls warrant modification to control dust generation.
- F. Apply water to haul routes, open excavations, soil-covered areas, material staging piles, and loading and unloading areas as needed during Work activities, as needed during nonworking periods, and if requested by the Construction Manager to minimize dust generation.
- G. Ensure that potential dust-generating areas are thoroughly wetted at the end of each working day, unless precipitation is occurring, to prevent the generation of dust during nonworking periods. Apply mulch, wetting, or other methods approved by the Construction Manager prior to long Work stoppages to prevent the generation of dust during nonworking periods.
- H. The Construction Manager may stop Work at any time if the Contractor's control measures are inadequate for the wind conditions or if the Contractor's control measures are not sufficient for controlling the release of Work-related dust and particulates. Any stop-work order shall remain in effect until directed by the Construction Manager.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

3.03 NOISE CONTROL

- A. The Contractor's activities shall minimize noise emissions to greatest degree practicable.
- B. The Contractor shall provide all equipment, controls, and mitigation measures to conduct Work in compliance with the Noise QOL Standards in Part 1.01.B and to minimize nuisance to adjacent properties.
- C. The Contractor shall comply with OSHA regulations related to occupational noise exposure (29 CFR 1926.52).
- D. The Contractor shall obtain written approval from the Construction Manager prior to performing noise-generating Work between 9:00 p.m. and 7:00 a.m. or on weekends or state or federal holidays, except in the case of emergencies (in which case the Construction Manager and Construction Manager shall be notified of such Work as soon as practicable).
- E. When Work is performed during overnight hours (i.e., between 9:00 p.m. and 7:00 a.m.) near residential receptors, activities that generate or have the potential to generate loud or disruptive noise shall be minimized to the extent practicable, except where necessary to address an emergency condition. Loud equipment operation, sheet pile driving, and stone material handling shall not be conducted when working near residential receptors during overnight hours.
- F. Use properly muffled equipment and conduct routine preventive maintenance on equipment and exhaust systems to minimize the noise generated by the Contractor's equipment and to reduce the potential for exceedance of the Noise QOL Standards or nuisance to neighboring properties.
- G. Employ proactive construction methods, routine control measures, and BMPs throughout the duration of the Work, including during nonworking periods, to control noise during each phase of the Work. Construction methods, control measures, and BMPs to control noise may include, but are not limited to:
 - 1. Using shrouds, barriers, or other sound-attenuating walls around stationary equipment (e.g., generators and pumps) or between noise sources and receptors.
 - 2. Scheduling the Work to minimize or avoid equipment use that might result in prolonged or excessive elevated noise levels during early morning or overnight hours.
 - 3. Controlling the speed at which equipment is operated.
 - 4. Using broadband / white noise backup alarms on construction equipment that frequently operate in reverse (e.g., front-end loaders and dump trucks).
 - 5. Using electric- or battery-powered vehicles or equipment, where practicable.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND CONTROLS

- H. The Contractor shall perform noise monitoring near equipment that generates noise to verify that the specifications are satisfied. Monitoring shall begin on the first day of each new construction activity/operation. If the initial monitoring indicates that noise levels are acceptable, subsequent monitoring may be modified with approval from the Construction Manager to occur as follows: (1) bi-weekly for each type of construction activity to verify noise levels; (2) the first day when a new construction activity, equipment, or reduced distance to receptors has the potential to increase noise levels; (3) if work hours are extended to the nighttime period (i.e., between 9:00 p.m. and 7:00 a.m.); and (4) in response to noise complaints. If the bi-weekly monitoring indicates that noise levels are acceptable, with approval from the Construction Manager, subsequent monitoring may be reduced to monthly for each type of construction activity. Should noise monitoring by the Contractor suggest a potential for an exceedance of the specification requirements, the Contractor shall immediately inform the Construction Manager. Submit all noise monitoring data in a format acceptable to the Construction Manager.
- I. If the Construction Manager notifies the Contractor that any of the Noise QOL Standards were exceeded or that a complaint has been received that requires corrective action, the Contractor shall implement operational controls, engineering controls, or other sound mitigation measures as quickly as possible, but no longer than 4 hours after notice by the Construction Manager.

3.04 ODOR CONTROL

- A. The Contractor shall implement appropriate methods, engineering controls, operational controls, or other mitigation measures, as needed, to conduct Work in compliance with the Odor QOL Standard listed in Part 1.01.B and to minimize nuisance to adjacent properties.
- B. The Contractor must proactively employ odor controls during the Work and evaluate and modify construction techniques and site management practices, as necessary and appropriate, to control objectionable odors caused by the Work, the Contractor's operation of vehicles and equipment, and other actions.
- C. The Construction Manager may stop Work at any time if the Contractor's control measures are not sufficient for controlling Work-related odors as specified in this Section. Any stop-work order shall remain in effect until directed by the Construction Manager.

3.05 LIGHTING CONTROL

- A. The Contractor shall provide all equipment, controls, and mitigation measures to conduct Work in compliance with the Lighting QOL Standard in Part 1.01.B and to minimize nuisance to adjacent properties.
- B. Lighting shall be maintained such that it is not a nuisance to the neighboring properties or the community.

SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND
CONTROLS

- C. All Work shall be conducted in compliance with regulations set by the OSHA, where applicable. The Lighting QOL Standard shall not supersede lighting requirements established by OSHA.
- D. The Contractor shall supply sufficient lighting to Work areas to provide safe conditions during low-light and nighttime operations.
- E. Fixed lighting shall be installed where necessary for safe illumination of frequent access areas, such as walkways, temporary office facilities, and equipment staging areas.
- F. Lighting shall be directed toward Work areas and away from adjacent properties.
- G. Measures shall be implemented to protect against potential lighting impacts on traffic safety on public or private roadways.
- H. The Contractor shall employ routine control measures and BMPs to minimize or limit potential off-site nuisance impacts generated by lighting. Routine control measures and BMPs may include, but are not limited to, proper positioning of lights, proper setting of beam direction, adjusting the brightness of lights, limiting the heights of light masts, and shielding.
- I. The Contractor shall provide engineering controls (e.g., light shrouds, balloon lights, temporary light barriers, or other light-control devices) for use, as necessary, to minimize impacts from lights to neighboring properties.

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SECTION 01572 – CONSTRUCTION ENVIRONMENTAL RESTRICTIONS AND
CONTROLS

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SECTION 01733 – WASTE MANAGEMENT

PART 1 – GENERAL

1.01 WORK SPECIFIED

- A. Contractor management and disposal of Contractor wastes generated during performance of the Work. Contractor shall verify onsite management of wastes, and offsite transportation and dispose of wastes are in compliance with federal, state, and local requirements.
- B. Submittals for Waste Management.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01355 – Hazardous Materials Control.

1.03 APPLICABLE CODES, STANDARD, AND REFERENCES

- A. Arcadis. 2025. *Project Operations Plan*. GE-Pittsfield/Housatonic River Site. Prepared for General Electric Company, Pittsfield, Massachusetts. May 15.
- B. Arcadis. 2026. *2025 Road Assessment Report*. Prepared for General Electric Company, Pittsfield, Massachusetts. February 13.
- C. United States Environmental Protection Agency (EPA). 2026. *Conditional Approval of GE's February 13, 2026, 2025 Road Assessment Report*. June 2.

1.04 SUBMITTALS

- A. Prepare and submit a Waste Management Plan (WMP) to the Construction Manager 15 days prior to mobilization to the Project Site.
- B. The WMP shall contain the following:
 - 1. Summary of the proposed Project Site waste to be generated by Contractor, including types and anticipated quantities of each. The list of waste materials shall include, at a minimum, the following materials:
 - a. Cardboard.
 - b. Clean dimensional wood.
 - c. Excess soil.
 - d. Steel sheet piling.
 - e. Steel pipe piles.
 - f. Structural steel.
 - g. Steel rails and appurtenances (e.g., spikes, tie plates, anchors, joint bars).
 - h. Rail ties.
 - i. Excess rail ballast or sub-ballast.

SECTION 01733 – WASTE MANAGEMENT

- j. E-waste (switches, meters).
 - k. Batteries.
 - l. Paints, solvents, and other hazardous fluids.
 - m. Equipment.
 - n. Electric motor and transformers.
 - o. Wood pallets.
 - p. Demolition debris.
 - q. Fencing materials.
 - r. Concrete curing water.
 - s. Clean-up water.
 - t. Dewatering of groundwater.
 - u. Municipal Solid Waste.
 - v. Other Wastes (if identified by bidder).
2. Materials Handling Procedures: Description of the means by which any waste materials identified in Section 1.03 B.1 above will be protected from contamination by sediment and process liquid.
 3. Disposal / Recycling Methods: Description of the proposed disposal method and/or recycling methods for each waste stream identified in Section 1.03 B.1 above. To include any sizing, segregation or decontamination that must be performed prior to disposal or recycling.
 4. Storage Methods: Description of the proposed onsite storage method and United States Department of Transportation (DOT) container type for each waste stream identified in Section 1.03 B.1 above.
 5. Transportation: Describe a means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the Project Site) and destination of such materials. Describe a means of transportation of the materials being disposed. Describe a means of transportation of the materials being reused.
 6. Identification of Hazardous Wastes, if applicable: Provide a description of any anticipated hazardous wastes along with the volumes and federal / state waste codes. Explain the method of disposal for anticipated hazardous wastes or potentially hazardous wastes such as solvents (U.S. Environmental Protection Agency Resource Conservation and Recovery Act [RCRA] waste code F003), oil based paints (RCRA waste code D001), lead paint chips (RCRA waste code D008), used oil (Massachusetts [MA] waste code MA01), waste paint related material (MA waste code MA04), Class A regulated recyclable materials (MA waste code MA97).
 7. Describe the method of disposal or recycling for office materials such as clean white paper, mixed paper, toner cartridges for laser printers, copiers, and fax machines.

SECTION 01733 – WASTE MANAGEMENT

8. List all proposed transporters, transfer stations, disposal facilities and recyclers (with addresses and phone numbers) which the Contractor intends to utilize during the construction and operations period.
 9. Description of Transportation and Disposal Schedule: storage and offsite transportation of waste should be coordinated and scheduled to minimize the footprint and storage time on the Project Site. Additionally, storage space for empty waste containers and packaging materials e.g., wood pallets, 55-gallon drums, is limited.
 10. Description of the proposed traffic routes, which shall be limited to the routes surveyed in spring 2026 in accordance with the 2025 Road Assessment Report (Arcadis 2026) and EPA's conditional approval of that report (EPA 2026).
- C. Following offsite disposal the contractor will submit to the Construction Manager a record of each material recycled, reused, or salvaged and each waste container removed from the Contract Work Area on a monthly basis. The record shall include the waste type, amount of the material removed (in tons or cubic yards), the date on which it was removed and the receiving party. This record shall include copies of manifests/Bill of lading, weight tickets, receipts, or invoices/credits for each item recycled or disposed.

PART 2 – PRODUCTS

- A. Contractor is responsible for any excess hazardous materials (commercial chemical products) that will be discarded. Hazardous materials are defined in 49 CFR 171 – 178.
- B. Contractor is responsible for securing reuse, recycling, or disposal of commercial chemical products and materials that were not used during the scope of work.
- C. Contractor is responsible for cleaning and returning equipment or materials leased or rented for execution of the project scope of work.

PART 3 – EXECUTION

Management of waste shall be performed as specified below, and in accordance with the other sections or as shown on the Drawings.

3.01 ON SITE MANAGEMENT OF WASTES

- A. Contractor shall provide containers for all wastes generated and store containers in an area approved by the Construction Manager.
- B. Contractor shall manage, store and label waste in compliance with applicable state and federal regulations. Waste shall be collected in corrosion-resistant, compatible containers. Collection drums shall be monitored and moved to an area approved by the Construction Manager when contents are within 6 inches of the top.

SECTION 01733 – WASTE MANAGEMENT

- C. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes; protect it from the weather by placing it in a secure covered location; and take precautionary measures such as providing secondary containment, berming, and other appropriate measures. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with state, and local laws and regulations.
- D. Contractor is responsible for properly containerizing, staging, labelling, and inspecting waste containers in accordance with DOT and State and Federal waste requirements.
- E. Contractor shall cover open-top bulk containers used for transport. The cover shall extend over the container and shall comply with DOT standards.
- F. Contractors will provide and install liners in waste containers holding hazardous or regulated waste and will provide secondary containment for containers of liquid hazardous waste.
- G. Contractors shall ensure that wastes are stored and hazardous materials are used in a manner to prevent spillage to the ground or water. Contractor will conduct periodic inspections of dispensing and storage areas to identify leakage. Contractors will perform and document corrective actions. The corrective action log will be periodically reviewed by the Construction Manager.
- H. Contractor shall ensure hazardous materials and waste are labelled with the product or waste name and the hazards in accordance with OSHA, RCRA and DOT requirements.
- I. Contractor shall install signage in the waste storage areas and periodically inspect waste containers to ensure segregation of wastes in accordance with the waste management plan.

3.02 WASTE DETERMINATIONS

- A. Contractor shall make a waste determination based on generator knowledge or sampling. Waste determinations must be performed in accordance with the approved WMP and federal and state waste regulations. The determination must be made at the point of generation prior to any mixing or consolidation.
- B. Waste determinations must be reviewed by the Construction Manager and GE. Copies of Contractor waste determinations must be provided to GE prior to offsite transportation and disposal.
- C. Absolutely no onsite treatment of hazardous waste is permitted. Contractor will dispose of waste offsite and in accordance with federal, state, and local laws and regulations.

SECTION 01733 – WASTE MANAGEMENT

3.03 ADDITIONAL REQUIREMENTS FOR SPECIFIC WASTE TYPES

- A. During operations, Contractor shall place into bags its own personal protective equipment (PPE) that may potentially be contaminated. PPE and bagged PPE shall not be mixed with or mingled with remediation soils or debris. The Contractor shall be responsible for securing and controlling its bagged PPE.
- B. Existing rail ties are assumed to be weathered. Rail ties will be visually inspected to confirm no visible and tacky creosote.
 - 1. Rail ties without visible and tacky creosote will be transported off of the Project Site and disposed in compliance with federal, state, and local requirements for solid waste disposal. A Subtitle D RCRA-permitted landfill shall be the minimum acceptable solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.
 - 2. Rail ties with visible and tacky creosote will be managed as potentially contaminated waste.
- C. Weathered rail ties will be cut into manageable sizes before being transported for disposal, in accordance with the requirements of the transport and/or receiving facility.

3.04 POTENTIALLY CONTAMINATED WASTES

- A. Potentially contaminated waste debris (including but not limited to excess soils, excess rail ballast or sub-ballast, non-weathered rail ties) will be segregated/containerized, and waste characterization sampling will be conducted in accordance with the requirements of the Waste Characterization Plan included as Attachment A of GE's revised Updated Project Operations Plan (Arcadis 2025).
- B. Large waste debris (i.e., non-weathered rail ties) will be cut into manageable sizes before being transported for disposal, in accordance with the requirements of the transport and/or receiving facility.
- C. Once such waste has been characterized, it may be stockpiled for future disposal within the Upland Disposal Facility (UDF) in compliance with the requirements of Permit Condition II.B.5 and Attachment E of the Revised Final RCRA Permit issued by EPA on December 16, 2020.
 - 1. Material shall not be removed/moved for stockpile until the Construction Manager provides approval of the proposed stockpile location.
- D. Potentially contaminated waste materials that do not meet the above-listed requirements for disposal in the UDF will be disposed of off-site at an Owner-approved disposal facility in accordance with applicable federal, state, and local laws and regulations.

SECTION 01733 – WASTE MANAGEMENT

3.05 TRANSPORTATION AND DISPOSAL

- A. Contractor shall coordinate offsite transportation and disposal of all waste generated by Contractor during performance of the Work. Waste transportation and disposal shall be conducted in a timely manner and shall not impact project schedule or result in the need for additional storage areas.
- B. Contractor shall verify the disposal facility is permitted to accept the specific waste type based on the waste determination. A lined non-hazardous industrial waste landfill or treatment storage and disposal (TSD) facility shall be the minimum acceptable disposal option for non-hazardous waste, including construction and demolition debris. A RCRA permitted TSD is the minimum acceptable disposal option for hazardous and TSCA regulated waste.
- C. Wastewater from operating activities, such as washdown water, decontamination fluids, and other sources may be treated through the GE Pittsfield water treatment plant with the approval of the Construction Manager. If approval is denied, all wastewater shall be disposed of off of the Project Site in accordance with applicable regulations. Wastewaters with surfactants are prohibited at the GE Pittsfield water treatment plant.
- D. Contractor shall verify the recycling facility is permitted to accept the specific waste type and has the necessary equipment to properly store and recycling the waste.
- E. The Contractor shall verify that the selected transporters have the necessary permits and licenses to operate.
- F. Contractor is responsible for preparing waste material for transport and disposal in accordance with DOT and State and Federal waste requirements.
- G. Contractor is responsible for ensuring all vehicles are properly maintained and in good working order. Any releases resulting from contractor equipment will be the responsibility of the Contractor. Contractor is responsible for ensuring transporters and disposal/ recycling facilities are permitted and licensed, as applicable.
- H. All transports of waste that travel public roads shall be gross vehicle weight legal and comply with all federal, state, and local vehicle transport standards and regulations. All transports leaving the Project Site shall have all visible mud and waste removed prior to leaving the Project Site. Each transport leaving the Project Site will be inspected and cleaned, as necessary, by the Contractor. Dry decontamination and Wet decontamination methods may be utilized. Wastes generated from decontamination of vehicles will be collected and properly containerized by the contractor.
- I. No shipment of waste will be allowed to leave the Project Site without inspection and review by the Construction Manager.
- J. Traffic control measures shall be implemented to facilitate safe and orderly execution of the waste transportation and other vehicular traffic entering and exiting the Project

SECTION 01733 – WASTE MANAGEMENT

Site. Traffic control measures may include flag personnel, police officers, and other measures, as required and appropriate to facilitate safe and orderly ingress and egress to and from the Project Site. The Contractor shall be responsible for these traffic control measures.

3.06 WASTE MINIMIZATION

- A. Existing steel (e.g., steel rails and appurtenances) shall be reused for BSRM tracks (only), to the extent practicable and otherwise recycled, unless otherwise directed by the Construction Manager that such material should remain onsite.
- B. The Contractor is encouraged to minimize solid waste and hazardous waste generation throughout the duration of the Project. The Contractor shall participate in state and local government-sponsored recycling programs, particularly for scrap metal to be removed from the site.

3.07 RECORDKEEPING

- A. Contractor shall follow up with the disposal, recycling, and reclamation facilities and shall secure copies of fully executed waste manifests, bills of lading, scale tickets, and certificates of disposal/destruction/recycling/reclamation within the timeframe specified by applicable rules and regulations, but no later than within 20 calendar days of the acceptance of waste/recyclable materials by a disposal, recycling, or reclamation facility. At a minimum, the waste manifests and bills of lading shall show the date of receipt, transporter name or truck ID, quantities of waste materials accepted by the final disposal facility and a certificate that the waste has been disposed of/recycled/reclaimed in accordance with applicable rules and regulations.

3.08 SPILL REPORTING

- A. Contractor shall immediately report spills of hazardous or toxic materials shall be to the Construction Manager. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.
- B. Contractor shall immediately report spills and any vehicle breakdowns or accidents occurring during transportation of the waste to the Construction manager.

3.09 TRAINING

- A. Contractor shall ensure all personnel, vendors and subcontractors have been trained on requirements to follow the Site specific transportation routes and adhere to site speed limits, PPE requirements when exiting vehicles, etc.
- B. Contractor shall ensure that personnel are trained in accordance with their assigned tasks and in accordance with RCRA, OSHA and DOT requirements, as applicable.

- END OF SECTION -

SECTION 01733 – WASTE MANAGEMENT

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SECTION 01760 – PROTECTING INSTALLED CONSTRUCTION

PART 1 – GENERAL

1.01 WORK SPECIFIED

- A. This Section includes general procedural requirements governing execution of the Work, including but not limited to the following:
 - 1. Coordination of Contractor installed products.
 - 2. Protection of installed construction by others.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PRODUCTS INSTALLED BY OTHERS

- A. Project Site Access: Provide access to Contract Work Areas for installations by others.
- B. Coordination: Coordinate construction and operations of the Work with other contractors and installers.
 - 1. Pre-installation Conferences: Include construction forces of others at pre-installation conferences covering portions of the Work to be installed by others. Attend pre-installation conferences conducted by the Construction Manager if portions of the Work depend on Work by others.

3.02 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Use equipment and procedures that prevent damage to existing structures and equipment that is installed and/or stored at the Rail Transload Areas.
- C. Hand excavation shall be required within 3 feet of buried utilities.
- D. The Contractor shall, at its own cost and expense, sustain in their places and permanently protect from direct or indirect injury any and all utilities, structures, and property (e.g., rail cars, historical structures) in the vicinity of its work, whether over or underground, or which appear within the trench or excavations, and the Contractor shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.
- E. Prior to performing excavation, the Contractor shall complete and file a project excavation permit application with the Construction Manager. Under this procedure, the Construction Manager will mark or identify Project Site underground facilities,

SECTION 01760 – PROTECTING INSTALLED CONSTRUCTION

such as pipes, wires or conduits, which may be in or near the area of the Contractor's proposed excavation. No work shall proceed without an approved excavation permit. In the event the Contractor fails to provide such prior notification, or fails to provide reasonable and sufficient time for the Construction Manager to identify possible conflicts, or fails to observe and protect identified underground facilities, and such facilities are damaged or destroyed by the Contractor's operations, the Contractor shall be responsible for any and all direct, indirect or consequential costs incurred by the Owner as a result of such failure. Furthermore, in such event, the Construction Manager may order the Contractor to make immediate permanent or temporary repairs of damaged facilities, at the Contractor's sole expense, as directed by the Owner and to the Owner's satisfaction, or the Owner may elect to have the repairs performed by others, with the cost thereof to be borne by the Contractor and deducted from monies otherwise due the Contractor.

- END OF SECTION -

SECTION 02 21 00 – SURVEYS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide survey control sufficient to support the overall Project and document the performance of the work.
- B. The Contractor will employ a licensed Surveyor to provide the surveying functions necessary for the proper construction and documentation of the work. All survey related work products will be sealed and signed by a registered Massachusetts Professional Engineer or Licensed Surveyor.
- C. Survey control for construction and documentation purposes will be the responsibility of the Contractor. The Contractor will safeguard all survey points and benchmarks. Should any of these points be destroyed, the replacement cost will be borne by the Contractor. The Contractor will be responsible for rectifying work improperly constructed due to failure to maintain and protect such established survey points and benchmarks.
- D. Contractor shall furnish and/or provide all supervision, labor, tools, materials, equipment, services, and appurtenances necessary for, or incidental to, completing all work necessary for performing the surveying activities described herein and preparing required as-built survey data and drawings of interim and post-construction grades, as required.
 - 1. The Contractor will perform topographic surveys to verify the design grades (i.e., subgrades and final grades) are met. The Contractor will prepare topographic drawings to document the constructed design conditions (i.e., alignments, elevations slopes).

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS (NOT USED)

1.03 SUBMITTALS

- A. Survey Plan: The Contractor will submit a Survey Plan for review and approval by the Construction Manager 3 weeks prior to the start of any survey related field work. The Plan will include the following:
 - 1. Survey Schedules and Crew:
 - a. The Plan will include all milestone and other field survey activities for the project.
 - b. The Plan will include name, address, telephone number, and qualifications, including licensure and/or certification, of the surveyor, crew chief, superintendent, and all other persons who are proposed to perform surveys or survey related duties to the Construction Manager for review and approval.
- B. Survey Data Records:
 - 1. The Contractor will furnish the Construction Manager with copies of project field notes, computations, any records relating to the layout of the work and

SECTION 02 21 00 – SURVEYS

information on any computer software required to interpret the finished data and records for review and approval prior to the final progress payment. The Construction Manager will use them as necessary to verify completion of the project work prior to submittal of the final payment. The Contractor will retain copies of all such material furnished to the Construction Manager.

2. Survey data will be provided in x, y, z, d (easting, northing, elevation, description) format. Each data file must include a descriptive header, including but not limited to: software and equipment information, project name and client, horizontal and vertical datum, units, survey type, alignment, and stations surveyed.
 3. The Contractor will maintain a complete, accurate log of survey work as it progresses at the Site.
 4. The accuracy of the Contractor's survey and other furnishing of data to the Construction Manager do not constitute a transfer of responsibility for verifying accuracy.
- C. As-Built Drawings. Upon completion of major phases of Work (including each phase of construction for Woods Pond Spur, per Design Drawings), Contractor shall submit a copy of the associated survey drawing with relevant as-built data in a format compatible with AutoCAD Civil 3D 2023 and in PDF. At a minimum, the as-built drawings shall include the following information:
1. Surveyed surface elevation contours (1 foot resolution), spot elevations, alignments and limits of surveyed conditions, and survey points for constructed features with descriptors where applicable.
 2. Survey of installed electric lines, communication lines, and other overhead or subsurface utilities.
 3. Survey of constructed structural fill surfaces, if applicable, including subgrade and top of structural fill.
 4. Survey of constructed final grade (completed topsoil, access roads, loading/unloading area, railroad tracks, railroad turnouts, bumping posts, maintenance pit, drainage features and components).
 5. General site work conditions, including access roads, drainage features (basins, culverts, stormwater management areas), berms, fences and gates, buildings, manholes, etc.

1.04 PERFORMANCE CRITERIA/QUALITY ASSURANCE

- A. The Contractor must have a minimum of 5 years' experience completing the type of work specified herein.
- B. All survey data acquisition, layout, and related work will be performed and signed by a licensed Surveyor.
- C. The Contractor will conduct and document the quality control procedures recommended by the survey equipment manufacturer for the equipment used.

SECTION 02 21 00 – SURVEYS

- D. Survey will be conducted to meet the requirements specified herein, including but not limited to documenting the completed construction work with accuracy sufficient to allow for evaluation and confirmation the project work is being completed in conformance with the Contract Documents.
- E. When applicable, the Contractor will regularly resurvey benchmarks for comparison with original elevations and positions. Where the Contractor uses the laser for control, he will periodically check the grade and alignment during each day's operation. The Contractor will promptly notify the Construction Manager if changes in elevations or positions occur to be reviewed for consistency with Design Drawings.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor will exercise care during the execution of the work activities specified herein to minimize any disturbance to existing property and to the landscape and waters in the areas surrounding the work areas. Survey crews will not traverse into controlled areas or private property without first obtaining approval by the Construction Manager.
- B. The Contractor will reference survey points to the provided survey control points and record all survey locations, with horizontal and vertical data, on project record documents.
- C. Unless otherwise approved by the Construction Manager, topographic survey data shall be collected on a 10-foot by 10-foot grid or wherever the elevation changes more than 1 foot. Survey shall document location of grade breaks and edges of construction areas as appropriate. Structures and features existing within the survey limits shall be surveyed and identified on the survey drawings. Survey shall document the top of rail, both rails, and the full rail embankment. Spot shots along the top of rail no more than approximately 100 feet apart in straight areas and 50 feet apart on curves.

3.02 POST-CONSTRUCTION SURVEY

- A. The Contractor shall perform post-construction topographic and feature surveys to document the completed work. At a minimum, these surveys shall obtain the following information:
 - 1. Location and identification of structures and features (e.g., building walls and structures, rail, roads, fences, poles, equipment, etc.). For building walls and structures, include top and bottom elevations.
 - 2. Surface topography and slope break lines for prominent grade changes.

SECTION 02 21 00 – SURVEYS

3. Location and identification of drainage features (e.g., culvert pipes, subsurface pipes, manholes, catch basins, ditches, swales, pipe inlets/outlets, riprap protection, check dams, berms, etc.). Include descriptions of material types, pipes and sizes, manholes, catch basins, etc. Include elevation of drainage systems (i.e., pipe and channel inverts, manhole and catch basin rim and sump, check dams and berm toes and crests).

3.03 POST-RESTORATION SURVEY (BY OTHERS)

- A. A post-restoration survey of the Utility Drive Rail Transload Area property will be performed by others, after use of the rail transload area is completed and restoration is complete.
- B. The post-restoration topographic and feature surveys will be performed to document the completed restoration work and to confirm restoration to the required conditions. At a minimum, these surveys shall obtain the following information:
 1. Location and identification of structures and features (e.g., structures, rail, roads, culverts, fences, poles.). For walls and structures, include top and bottom elevations.
 2. Surface topography and slope break lines for prominent grade changes.
 3. Location and identification of drainage features (e.g., culvert pipes, subsurface pipes, manholes, catch basins, ditches, swales, pipe inlets/outlets, riprap protection, check dams, berms, etc.). Include descriptions of material types, pipes and sizes, manholes, catch basins, etc. Include elevation of drainage systems (i.e., pipe and channel inverts, manhole and catch basin rim and sump, check dams and berm toes and crests).

3.04 CONTROL OF WORK

- A. Reference Points:
 1. Established reference points damaged or destroyed by Contractor will be re-established by Contractor.
 2. From established reference points, establish lines, grades, and elevations necessary to control the Work. Obtain measurements required for executing the Work to tolerances specified.
 3. Establish, place, and replace as required, such additional stakes, markers, and other reference points necessary for control, intermediate checks, and guidance of construction operations.

SECTION 02 21 00 – SURVEYS

B. Procedures:

1. Accuracy:

a. For topographic land surveys:

- 1) Horizontal accuracy shall be plus or minus 0.05 feet for rail features (railroad tracks, railroad turnouts) and 0.1 feet for other features.
- 2) Vertical accuracy shall be plus or minus 0.05 feet for general site grading and 0.02 feet for structural features (e.g. pipes, manholes) unless otherwise specified or approved by the Construction Manager.

b. Survey calculations shall include an error analysis sufficient to demonstrate required accuracy.

- END OF SECTION -

SECTION 02 21 00 – SURVEYS

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SECTION 02 71 10 – CHAIN LINK FENCE

PART 1 – GENERAL

1.01 WORK SPECIFIED

- A. Installation of new or replacement fence system where shown on the Design Drawings and as specified herein.
- B. Following review of this specification, the Contractor shall notify the Construction Manager of any alternative specifications, recommendations, and requirements that are applicable and should be considered based on the Contractor's direct experience with similar work.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. American Society for Testing and Materials (ASTM).
- B. Chain Link Fence Manufacturers Institute.

1.03 SUBMITTALS

- A. Information on fence materials products and installation methods.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Structural and roll-formed shapes may be used in lieu of pipe sections. The structural or roll-formed shapes have a bending strength greater than the pipe section when measured under a 6-foot cantilever load and be galvanized in accordance with ASTM A123.

B. Posts, Rails, and Braces:

- 1. Schedule 40, steel pipe, high strength grade (50,000 psi yield strength) galvanized, in accordance with ASTM A53.
- 2. Dimensions and Weights (Minimum):

	Outside Dia. (In.)	Weight/ Ft (lbs)
End, Corner, and Pull Posts	2.875	5.79
Line Posts (Heavy Duty)	2.375	3.65
Top Rails and Braces	1.66	2.27
Gate Posts:		
Leaves 6 ft. Wide or Less	2.875	5.79
Leaves over 6 ft., including 13 ft. Wide	4.00	9.11

C. Chain Link Fabric:

- 1. One piece 9-gauge steel wire fabric, width as shown on the Design Drawings, 2-inch mesh galvanized after weaving in accordance with ASTM A392, Class 2.
- 2. 7'-0" high when installed.

SECTION 02 71 10 – CHAIN LINK FENCE

D. Accessories:

1. Stretcher bars shall be a minimum of ½" x ¾" steel and attached to posts with heavy steel bands.
2. Tension wire shall be 7-gauge galvanized coil spring steel.

E. Gates:

1. Gates shall be of the type indicated on the Design Drawings.
2. Welded fabrication shall be of not less than 1.90-inch O.D. Schedule 40 steel pipe.
 - a. Braces and minimum ¾ inch diameter trusses to provide rigidity without sag or twist.
 - b. Galvanized after fabrication in accordance with ASTM A120.
3. Locking devices, latches, stops, and other hardware as required for a complete operating gate.
 - a. Operate from either side.
4. Fabric of gates shall be the same as chain link fence.

F. Miscellaneous (if applicable as determined by Construction Manager):

1. Concrete for footings shall be minimum 3,000 psi (at 28 days) mix.
2. Wire ties or clips shall be minimum of 6 gauge.
 - a. Hog rings may be used to tie fabric to tension wire.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General:

1. Installation shall be in accordance with ASTM F567, Installation of Chain-Link Fence, unless otherwise modified.

B. Posts:

1. Space line posts equidistant at intervals not exceeding 10 feet.
2. Unless otherwise specified by the Construction Manager, post holes shall be of a diameter to provide not less than 4 inches of concrete outside the post or 3 times the O.D. of the post and 3 inches below the bottom of the post.

SECTION 02 71 10 – CHAIN LINK FENCE

3. Unless otherwise specified by the Construction Manager, set plumb and to alignment in concrete base to a depth of:
 - a. 36-inches for line post.
 - b. 42-inches for pull, corner, and gate posts.
 - c. Greater if recommended by fence manufacturer or if required per local building code.
 4. Unless otherwise specified by the Construction Manager, crown concrete 2 inches above finish grade to shed water.
 5. Unless otherwise specified by the Construction Manager, concrete shall cure a minimum of 72 hours before further work is done on post.
- C. Braces:
1. Provide at all ends, gate and in both tangents at pull and corner posts.
- D. Top Rails and Tension Wire:
1. Attach top rail securely to each gate, corner, pull, and end posts.
 - a. Support at each intermediate post to form a continuous brace from end to end.
 2. Bottom tension wire shall be taut and 6 inches above finished grade.
- E. Fabric:
1. Tighten to provide a smooth uniform appearance free from sags.
 2. Attach to terminal post using stretcher bars with tension bands to maximum 14-inch intervals or other approved method.
 3. Install fabric 2 inches above finished grade.
 4. Fasten to line post at intervals not exceeding 14 inches.
 5. Fasten to top rail, braces, and tension wire at intervals not exceeding 24 inches.
- F. Gates:
1. Install true to opening and plumb.
 2. Adjust hardware for smooth operation.
- G. The area shall be left neat and free of any debris caused by the erection of the fence.

- END OF SECTION -

SECTION 02 71 10 – CHAIN LINK FENCE

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SECTION 03 00 05 – CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install concrete, reinforcing, and related materials for construction of the loading/unloading area at the rail transload area.
2. The Work includes:
 - a. Providing concrete consisting of Portland cement, fine and coarse aggregates, water, and approved admixtures; combined, mixed, transported, placed, finished, and cured.
 - b. Fabricating and placing reinforcing, including ties and supports.
 - c. Design, erection, and removal of formwork.
 - d. Building into the concrete all sleeves, frames, anchorage devices, inserts, and other items required to be embedded in concrete.

B. Coordination:

1. Review installation procedures under other Sections and coordinate installation of items to be installed in the concrete Work.

C. Classifications of Concrete:

1. Class “A” concrete shall be steel-reinforced and includes all concrete unless otherwise shown or indicated.

1.02 REFERENCES

A. Standards referenced in this Section are:

1. ACI 224R, Control of Cracking in Concrete Structures.
2. ACI 301, Specifications for Structural Concrete for Buildings.
3. ACI 304R, Guide for Measuring, Mixing, Transporting and Placing Concrete.
4. ACI 305R, Specification for Hot Weather Concreting.
5. ACI 306R, Cold Weather Concreting.
6. ACI 309R, Guide for Consolidation of Concrete.
7. ACI 318, Building Code Requirements for Structural Concrete and Commentary.
8. ACI 347, Guide to Formwork for Concrete.
9. ACI SP-66, ACI Detailing Manual.
10. ASTM A82/A82M, Specification for Steel Wire, Plain, for Concrete Reinforcement.

SECTION 03 00 05 – CONCRETE

11. ASTM A185/A185M, Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
12. ASTM A615/A615M, Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
13. ASTM C31/C31M, Practice for Making and Curing Concrete Test Specimens in the Field.
14. ASTM C33/C33M, Specification for Concrete Aggregates.
15. ASTM C39/C39M, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
16. ASTM C42/C42M, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
17. ASTM C94/C94M, Specification for Ready-Mixed Concrete.
18. ASTM C138/C138M, Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
19. ASTM C143/C143M, Test Method for Slump of Hydraulic-Cement Concrete.
20. ASTM C150/C150M, Specification for Portland Cement.
21. ASTM C172, Practice for Sampling Freshly Mixed Concrete.
22. ASTM C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
23. ASTM C260, Specification for Air-Entraining Admixtures for Concrete.
24. ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
25. ASTM C494/C494M, Specification for Chemical Admixtures for Concrete.
26. ASTM C579, Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
27. ASTM C1064/C1064M, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
28. ASTM D1752, Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
29. ASTM E96/E96M, Test Methods for Water Vapor Transmission of Materials.
30. ASTM E154, Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
31. CRD-C 572, U. S. Army Corps of Engineers Specification for Polyvinylchloride Waterstops.
32. CRSI 1MSP, Manual of Standard Practice.

SECTION 03 00 05 – CONCRETE

1.03 QUALITY ASSURANCE

A. Laboratory Trial Batch:

1. Employ independent testing laboratory experienced in design and testing of concrete materials and mixes to perform material evaluation tests and to design concrete mixes.
2. Each concrete mix design specified shall be verified by laboratory trial batch, unless indicated otherwise.
3. Perform the following testing on each trial batch:
 - a. Aggregate gradation for fine and coarse aggregates.
 - b. Slump.
 - c. Air content.
 - d. Compressive strength, based on three cylinders each tested at seven days and at 28 days.
4. Submit for each trial batch the following information:
 - a. Project identification name and number (if applicable).
 - b. Date of test report.
 - c. Complete identification of aggregate source of supply.
 - d. Tests of aggregates for compliance with the Contract Documents.
 - e. Scale weight of each aggregate.
 - f. Absorbed water in each aggregate.
 - g. Brand, type, and composition of cementitious materials.
 - h. Brand, type, and amount of each admixture.
 - i. Amounts of water used in trial mixes.
 - j. Proportions of each material per cubic yard.
 - k. Gross weight and yield per cubic yard of trial mixtures.
 - l. Measured slump.
 - m. Measured air content.
 - n. Compressive strength developed at seven days and 28 days, from not less than three test cylinders cast for each seven day and 28-day test, and for each design mix.

SECTION 03 00 05 – CONCRETE

1.04 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. List of concrete materials and concrete mix designs proposed for use. Include results of tests performed to qualify the materials and to establish the mix designs.
 - b. Laboratory Trial Batch Reports: Submit laboratory test reports for concrete cylinders, materials, and mix design tests.
 - c. Concrete placement drawings showing the location and type of all joints.
 - d. Drawings for fabricating, bending, and placing concrete reinforcing. Comply with ACI SP-66. For walls and masonry construction, provide elevations to a minimum scale of 1/4-inch to 1 foot. Show bar schedules, stirrup spacing, adhesive dowels, splice lengths, diagrams of bent bars, arrangements, and assemblies, as required for fabricating and placing concrete reinforcing.
2. Product Data:
 - a. Manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.

B. Informational Submittals: Submit the following:

1. Delivery Tickets: Copies of all delivery tickets for each load of concrete delivered to or mixed at the Site. Each delivery ticket shall contain the information in accordance with ASTM C94/C94M along with project identification name and number (if any), date, mix type, mix time, quantity and amount of water introduced.
2. Site Quality Control Submittals:
 - a. Report of testing results for testing of field concrete cylinders for each required time period. Submit within 24 hours after completion of associated test. Test report shall include results of all testing required at time of sampling.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Transportation, Delivery, and Handling:

1. Deliver concrete reinforcing products to Site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings on approved Shop Drawings.
2. Materials used for concrete shall be clean and free from foreign matter during transportation and handling and kept separate until measured and placed into concrete mixer.

SECTION 03 00 05 – CONCRETE

3. Implement suitable measures during hauling, piling, and handling to ensure that segregation of coarse and fine aggregate particles does not occur and grading is not affected.
4. Deliver grout materials from manufacturers in unopened containers that bear intact manufacturer labeling.

B. Storage:

1. Store formwork materials above ground on framework or blocking. Cover wood for forms and other accessory materials with protective, waterproof covering. Provide for adequate air circulation or ventilation under cover.
2. Store concrete reinforcing materials to prevent damage and accumulation of dirt and excessive rust. Store on heavy wood blocking so that reinforcing does not come into contact with the ground. Space framework or blocking supports to prevent excessive deformation of stored materials.
3. Store concrete joint materials on platforms or in enclosures or covered to prevent contact with ground and exposure to weather and direct sunlight.
4. For storage of concrete materials, provide bins or platforms with hard, clean surfaces.

PART 2 – PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Cement – ASTM C150/C150M, Type II.

B. Aggregates – ASTM C33/C33M:

1. Fine Aggregate: Clean, sharp, natural sand free of loam, clay, lumps, and other deleterious substances. Dune sand, bank run sand, and manufactured sand are unacceptable.
2. Coarse Aggregate:
 - a. Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter.
 - b. Coarse aggregate shall comply with the following:
 - 1) Crushed stone, processed from natural rock or stone; and
 - 2) Washed gravel, either natural or crushed. Slag, pit gravel, and bank-run gravel are not allowed.
 - c. Coarse Aggregate Size: ASTM C33/C33M, Nos. 57 or 67, unless otherwise approved by Construction Manager.

C. Water – Clean, potable.

SECTION 03 00 05 – CONCRETE

D. Admixtures:

1. Air-Entraining Admixture: ASTM C260.
2. Water-Reducing Admixture: ASTM C494/C494M, Type A.
3. Water Reducing and Set-Adjusting Admixtures: ASTM C494/C494M, Types D and E.
4. High Range Water-Reducing Admixture: ASTM C494/C494M, Type F/G.
5. Use only admixtures that have been tested and approved in the mix designs.
6. Do not use calcium chloride or admixtures containing chloride ions.

2.02 CONCRETE MIX

A. General:

1. Normal weight: 145 pounds per cubic foot.
2. Use air-entraining admixture in all concrete. Provide not less than four percent, nor more than eight percent, entrained air for concrete exposed to freezing and thawing, and provide from three to five percent entrained air for other concrete.

B. Proportioning and Design of Class “A” Concrete Mix:

1. Minimum compressive strength at 28 days: 4,500 psi.
2. Maximum water-cement ratio by weight: 0.42.
3. Minimum cement content: 564 pounds per cubic yard.

C. Slump Limits:

1. Proportion and design mixes to result in concrete slump at point of placement of not less than 1 inch and not more than 4 inches.
2. When using high-range water reducers, slump prior to addition of admixture shall not exceed 3 inches. Slump after adding admixture shall not exceed 8 inches at point of placement.

D. Adjustment of Concrete Mixes:

1. Concrete mix design adjustments may be requested by Contractor when warranted by characteristics of materials, Site conditions, weather, test results, or other, similar circumstances.
2. Submit for Construction Manager’s approval laboratory test data for adjusted concrete mix designs, including compressive strength test results.
3. Implement adjusted mix designs only after Construction Manager’s approval.
4. Adjustments to concrete mix designs shall not result in additional costs to Owner.

SECTION 03 00 05 – CONCRETE

2.03 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection. Contractor shall be responsible for designing the formwork system to resist all applied loads, including pressures from fluid concrete and construction loads.
- B. Smooth Form Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces in accordance with ACI 301.
- C. Unexposed Concrete Surfaces: Material to suit project conditions.
- D. Provide 3/4-inch chamfer at all external corners. Chamfer is not required at re-entrant corners unless otherwise shown or indicated.
- E. Form Ties:
 - 1. Provide factory-fabricated, removable, or snap-off metal form ties, that prevent form deflection and prevent spalling of concrete surfaces upon removal. Materials used for tying forms are subject to approval of the Construction Manager.
 - 2. Unless otherwise shown or indicated, provide ties so that portion remaining within concrete after removal of exterior parts is at least 1.5 inches from outer surface of concrete. Unless otherwise shown or indicated, provide form ties that, upon removal, will leave a uniform, circular hole not larger than 1-inch diameter in the concrete surface.
 - 3. Ties for exterior walls, below-grade walls, and walls subject to hydrostatic pressure shall be provided with waterstops.
 - 4. Wire ties are unacceptable.

2.04 REINFORCING MATERIALS

- A. Reinforcing Bars – ASTM A615/A615M, Grade 60 deformed bars.
 - 1. Provide smooth dowel bars where required.
- B. Welded Wire Fabric – ASTM A185/A185M.
- C. Steel Wire – ASTM A82/A82M.
- D. Provide supports for reinforcing, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing in place.
 - 1. Use wire bar-type supports complying with CRSI MSP1 recommendations, except as specified in this Section. Do not use wood, brick, or other unacceptable materials.
 - 2. For slabs on grade, use precast concrete blocks, 4 inches square minimum with compressive strength equal to or greater than the surrounding concrete, or

SECTION 03 00 05 – CONCRETE

supports with sand plates or horizontal runners where base materials will not support chair legs.

3. For all concrete surfaces where legs of supports are in contact with forms, provide supports having either hot-dip galvanized, plastic-protected, or stainless-steel legs in accordance with CRSI MSP1.

E. Adhesive Dowels:

1. Dowels:
 - a. Dowel reinforcing bars shall comply with ASTM A615, Grade 60.
2. Adhesive:
 - a. Products and Manufacturers: Provide one of the following:
 - 1) HIT-RE 500-V3 Injection Epoxy Adhesive Anchoring System, by Hilti Fastening Systems, Inc.;
 - 2) HIT-HY 200-A V3 and HIT-HY 200-R V3 Adhesive Anchoring System, by Hilti Fastening Systems, Inc.;
 - 3) SET-3G Adhesive anchoring system, by Simpson Strong-Tie Company, Inc.;
 - 4) AT 3G Acrylic Adhesive Anchoring System, by Simpson Strong Tie Company, Inc.; or
 - 5) Equal.
 - b. Adhesive system shall use two-component adhesive mix.
 - c. Adhesives shall have a current evaluation report by ICC Evaluation Service for use in both cracked and uncracked concrete with seismic recognition for SDC A through F as tested and assessed in accordance with ICC-ES AC308, which incorporates the requirements of ACI 355.4-11.
 - d. Adhesives shall have minimum bond strength and minimum design bond strength in accordance with Table 03 00 05-A:

**TABLE 03 00 05-A:
ADHESIVE BOND STRENGTH^{1,2}**

Bond Strength (psi)					
Rod Diameter	Uncracked Concrete	Cracked Concrete	Dowel Size	Uncracked Concrete	Cracked Concrete
1/2-inch	1670	880	#4	1500	1080
5/8-inch	1670	750	#5	1460	1090
3/4-inch	1670	665	#6	1415	1015
7/8inch	1525	610	#7	1370	835
1-inch	1360	595	#8	1330	760

SECTION 03 00 05 – CONCRETE

Bond Strength (psi)					
Rod Diameter	Uncracked Concrete	Cracked Concrete	Dowel Size	Uncracked Concrete	Cracked Concrete
-	-	-	#9	1560	850
1.25-inch	1070	595	#10	1240	475

Table Notes:

1. Bond strengths listed for hammer-drilled, dry hole.
2. Bond strengths listed for maximum short term concrete temperature of 130 degrees F and maximum long term concrete temperature of 110 degrees F.

2.05 RELATED MATERIALS

- A. Membrane-Forming Curing Compound – ASTM C309, Type I.
- B. Preformed Expansion Joint Filler:
 1. Provide preformed expansion joint filler complying with ASTM D1752, Type I (sponge rubber) or Type II (cork).
- C. Joint Sealant and Accessories:
 1. For joint sealants and accessories used on isolation joints, control joints, and expansion joints, refer to Section 07 92 00, Joint Sealants.
- D. Expansion Cap:
 1. Provide corrosion-resistant dowel caps capable of allowing not less than 1-1/4 inches of longitudinal movement, compatible with the specified dowel diameter, and securely attached during concrete placement.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Contractor shall examine the substrate and the conditions under which the Work will be performed and notify Construction Manager in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.02 FORMWORK

- A. Construct formwork in accordance with ACI 347 such that concrete members and structures are of correct size, shape, alignment, elevation, and position.
- B. Provide openings in formwork to accommodate the Work of other trades. Accurately place and securely support items required to be built into formwork.

SECTION 03 00 05 – CONCRETE

- C. Clean and adjust forms prior to placing concrete. Apply form release agents or wet forms as required. Re-tighten forms during and after concrete placing, when required, to eliminate cement paste leaks.
- D. Removing Formwork:
 - 1. Comply with ACI 301 and ACI 347, except as otherwise indicated in the Contract Documents.
 - 2. Do not remove formwork and shoring until supported concrete members have acquired minimum of 90 percent of specified compressive strength. Results of suitable quality control tests of field-cured specimens may be submitted to Construction Manager for review as evidence that concrete has attained sufficient strength for removal of supporting formwork and shoring prior to removal times indicated in the Contract Documents.
 - 3. Removal time for formwork is subject to the Construction Manager's acceptance.
 - 4. Repair form tie-holes following in accordance with ACI 301.

3.03 REINFORCING, JOINTS, AND EMBEDDED ITEMS

- A. Comply with the applicable recommendations of Laws and Regulations and standards referenced in this Section, including CRSI MSP1, for details and methods of placing and supporting reinforcing.
- B. Clean reinforcing to remove loose rust and mill scale, earth, ice, and other materials which act to reduce or destroy bond between reinforcing material and concrete.
- C. Position, support, and secure reinforcing against displacement during formwork construction and concrete placing. Locate and support reinforcing by means of metal chairs, runners, bolsters, spacers, and hangers, as required.
 - 1. Place reinforcing to obtain minimum concrete coverages as shown on the Drawings and as required in ACI 318. Arrange, space, and securely tie bars and bar supports together with 16-gage wire to hold reinforcing accurately in position during concrete placing. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
 - 2. Do not secure reinforcing to formwork using wire, nails or other ferrous metal. Metal supports subject to corrosion shall not be in contact with formed or exposed concrete surfaces.
- D. Provide sufficient quantity of supports of strength required to carry reinforcing. Do not place reinforcing more than 2 inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- E. Splices: Provide standard reinforcing splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown or indicated for minimum lap of spliced bars, as shown on the Drawings.

SECTION 03 00 05 – CONCRETE

- F. Install welded wire fabric in lengths as long as practical, lapping adjoining sections a minimum of one full mesh.
- G. Do not place concrete until reinforcing is inspected and Construction Manager indicates that conditions are acceptable for placing concrete. Concrete placed in violation of this paragraph will be rejected. Notify the Construction Manager in writing at least two working days prior to proposed concrete placement.
- H. Joints:
 - 1. Provide construction, and expansion joints as indicated or required. Locate construction joints so as to not impair the strength and appearance of the structure.
 - 2. In foundation slabs and slabs-on-grade, locate construction joints at intervals of approximately 40 feet. Locate expansion joints at intervals of approximately 100 feet.
 - 3. Locations of joints shall be in accordance with the Contract Documents and as approved by Construction Manager in the Shop Drawings.
- I. Adhesive Dowels:
 - 1. Adhesive dowels shall be reinforcing bar dowels set in an adhesive in hole drilled into hardened concrete. Comply with adhesive system manufacturer's installation instructions regarding hole diameter, drilling method, embedment depth required to fully develop required tensile strength, and hole cleaning and preparation instructions. Unless more-stringent standards are required by adhesive system manufacturer, comply with the following.
 - 2. Drill holes to adhesive system manufacturer's recommended diameter and depth to develop required tensile strength. Holes shall not be more than 1/4-inch greater than nominal bar diameter, and hole depth shall not be less than twelve times nominal bar diameter. Hammer-drill holes. Cored holes are not allowed.
 - 3. Embedment depths shall be based on concrete compressive strength of 2,000 psi when embedded in existing concrete, and 4,000 psi when embedded in new concrete.
 - 4. Determine location of existing reinforcing steel in vicinity of proposed holes prior to drilling. Adjust location of holes to be drilled to avoid drilling through or damaging existing reinforcing bars only when approved by Construction Manager.
 - 5. Before setting adhesive dowel, hole shall be free of dust and debris using method recommended by adhesive system manufacturer. Hole shall be brushed, with manufacturer-approved brush and blown clean with clean, dry, oil-free compressed air to remove dust and loose particles. Hole shall be dry as defined by adhesive system manufacturer.
 - 6. Inject adhesive into hole through injection system mixing nozzle and necessary extension tubes, placed to bottom of hole. Withdraw discharge end as adhesive is placed but keep end of tube immersed to prevent forming air pockets. Fill hole to

SECTION 03 00 05 – CONCRETE

depth that ensures that excess material is expelled from hole during dowel placement.

7. Twist dowels during insertion into partially filled hole to guarantee full wetting of bar surface with adhesive. Insert bar slowly to avoid developing air pockets.

3.04 CONCRETE PLACING

- A. Site Mixing: Use drum-type batch machine mixer, mixing not less than 1.5 minutes for one cubic yard or smaller capacity. Increase required mixing time by minimum of 15 seconds for each additional cubic yard or fraction thereof.
- B. Ready-Mixed Concrete: Comply with ASTM C94/C94M.
- C. Concrete Placing:
 1. Place concrete in a continuous operation within planned joints or sections in accordance with ACI 304R.
 2. Do not begin placing concrete until work of other trades affecting concrete is completed.
 3. Wet concrete and subgrade surfaces to saturated surface dry condition immediately prior to placing concrete.
 4. Deposit concrete as near its final location as practical to avoid segregation due to re-handling or flowing.
 5. Avoid separation of the concrete mixture during transportation and placing. Concrete shall not free-fall for distance greater than 4 feet during placing.
 6. Complete concrete placing within 90 minutes of addition of water to the dry ingredients.
- D. Consolidate placed concrete in accordance with ACI 309R using mechanical vibrating equipment supplemented with hand rodding and tamping, such that concrete is worked around placing and other embedded items and into all parts of formwork. Insert and withdraw vibrators vertically at uniformly spaced locations. Do not use vibrators to transport concrete within the formwork. Vibration of formwork or placing is not allowed.
- E. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.
 1. In hot weather, comply with ACI 305R.
 2. In cold weather, comply with ACI 306R.

SECTION 03 00 05 – CONCRETE

3.05 QUALITY OF CONCRETE WORK

- A. Make concrete solid, compact, smooth, and free of laitance, cracks, and cold joints.
- B. Cut out and properly replace to extent directed by Construction Manager, or repair to satisfaction of Construction Manager, surfaces that contain cracks or voids, are unduly rough, or are in defective in any way. Patches or plastering are unacceptable.
- C. Repair, removal, and replacement of defective concrete directed by Construction Manager.

3.06 CURING

- A. Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by using moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until formwork is removed. Provide protection, as required, to prevent damage to exposed concrete surfaces. Total curing period shall not be less than seven days. Curing methods and materials shall be compatible with scheduled finishes.

3.07 FINISHING

A. Slab Finish:

- 1. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently. Use a wood float only. Check and level surface plane to a tolerance not exceeding 1/4-inch in 10 feet when tested with a 10-foot straightedge placed on the surface at not less than two different angles. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, re-float the surface to a uniform, smooth, granular texture. Slab surfaces shall receive a float finish. Provide additional trowel finishing as required in this Section.
- 2. After floating, begin first trowel finish operation using power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over the surface.
- 3. Consolidate concrete surface by the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8-inch in 10 feet when tested with a 10-foot straightedge. Grind smooth surface defects that would telegraph through applied floor covering system.
- 4. Use trowel finish for the following:
 - a. Apply non-slip broom finish, after troweling, to exterior concrete slab and elsewhere as shown.

SECTION 03 00 05 – CONCRETE

B. Concrete Sealer:

1. Horizontal Surfaces:

- a. Provide water-based siloxane/silane penetrating water repellent sealer that does not alter the appearance or texture of the substrate, non-film-forming.
- b. Products and Manufacturers: Provide one of the following:
 - 1) Euclid Chemical, Baracade WB 244; or
 - 2) Equal.

C. Formed Finish:

1. Provide smooth form concrete finish at exposed surfaces. Use largest practical form panel sizes to minimize form joints. Exposed surfaces include interior water-contacting surfaces of tanks, whether or not directly visible. All surfaces shall be considered as exposed, unless buried or covered with permanent structural or architectural material. After removing forms, patch form tie holes and defects in accordance with ACI 301. Remove fins exceeding 1/8-inch in height. Where surface will be coated or will receive further treatment, remove all fins flush with concrete surface.
2. Provide rough form finish at all unexposed surfaces. After removing forms, patch form tie holes and defects in accordance with ACI 301. Remove fins exceeding 1/2-inch in height.

3.08 FIELD QUALITY CONTROL

A. Site Testing Services:

1. Contractor shall employ independent testing laboratory to perform field quality control testing for concrete. Construction Manager will direct where samples are obtained.
2. Testing laboratory will provide all labor, material, and equipment required for sampling and testing concrete, including: scale, glass tray, cones, rods, molds, air tester, thermometer, and other incidentals required.
3. Contractor shall provide curing and necessary cylinder storage.

B. Quality Control Testing During Construction:

1. Perform sampling and testing for field quality control during concrete placing, as follows:
 - a. Sampling Fresh Concrete: ASTM C172.
 - b. Slump: ASTM C143/C143M; one test for each concrete load at point of discharge.
 - c. Concrete Temperature: ASTM C1064/C1064M; one for every two concrete loads at point of discharge, and when a change in the concrete is observed. Test each load when time from batching to placement exceeds 75 minutes.

SECTION 03 00 05 – CONCRETE

- d. Air Content: ASTM C231; one for every two concrete loads at point of discharge, and when a change in the concrete is observed.
- e. Unit Weight: ASTM C138/C138M; one for every two concrete loads at point of discharge, and when a change in the concrete is observed.
- f. Compression Test Specimens:
 - 1) In accordance with ASTM C31/C31M, make one set of compression cylinders for each 50 cubic yards of concrete, or fraction thereof, of each mix design placed each day. Each set shall be four standard cylinders, unless otherwise directed by Construction Manager.
 - 2) Cast, store, and cure specimens in accordance with ASTM C31/C31M.
- g. Compressive Strength Tests:
 - 1) In accordance with ASTM C39/C39M, one specimen tested at seven days, and three specimens tested at 28 days.
 - 2) Concrete that does not comply with strength requirements will be considered as defective Work.
- h. Submit test results from certified by testing laboratory to Construction Manager within 24 hours of completion of test.
- i. When there is evidence that strength of in-place concrete does not comply with the Contract Documents, Contractor shall employ the services of concrete testing laboratory to obtain cores from hardened concrete for compressive strength determination. Cores and tests shall comply with ASTM C42/C42M and the following:
 - 1) Obtain at least three representative cores from each concrete member or suspect area of concrete at locations directed by Construction Manager.
 - 2) Strength of concrete for each series of cores will be acceptable if average compressive strength is at least 85 percent of specified compressive strength and no single core is less than 75 percent of required 28-day required concrete compressive strength.
 - 3) Testing laboratory shall submit test results to Construction Manager on same day that tests are completed. Include in test reports Project name and number (if any), date of sampling and testing, Contractor name, name of concrete testing laboratory, exact location of test core in the Work, type or class of concrete represented by core sample, nominal maximum size aggregate, design compressive strength, compression breaking strength, and type of break (corrected for length diameter ratio), direction of applied load to core with respect to horizontal plane of concrete as placed, and moisture condition of the core at time of testing.

SECTION 03 00 05 – CONCRETE

- 4) Fill core holes solid with non-shrink grout in accordance with this Section and finish to match adjacent concrete surfaces.
 - 5) If results of core tests are unacceptable or if it is impractical to obtain cores, perform static load test and evaluations complying with ACI 318 and ACI 350, as directed by Construction Manager.
- j. Contractor will perform field quality testing of adhesive dowels at the Site.
- 1) Testing shall comply with ASTM E488.
 - 2) After adhesive system manufacturer's recommended curing period and prior to placing connecting reinforcing, proof-test for pullout ten percent of adhesive dowels installed. If one or more dowels fail the test, Contractor shall pay cost to test all dowels of same diameter and type installed on the same day as the failed dowel.
 - 3) Test dowels to 60 percent of specified yield strength.
 - 4) Apply test loads with hydraulic ram.
 - 5) Displacement of dowels shall not exceed $D/10$, where D is nominal diameter of dowel.
 - 6) Dowels that fail shall be reinstalled and retested at Contractor's expense.

- END OF SECTION -

SECTION 31 05 13 – SOILS AND AGGREGATES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide all labor, supervision, materials, tools, equipment, services, accessories, and incidentals as shown, specified, and required to furnish, stockpile, transport, and install soils and aggregates for construction of components as indicated on the Design Drawings and in the Specifications.
- B. The Contractor shall be responsible for all sampling and testing of soil and aggregate materials to verify compliance with the specified requirements.
- C. The Contractor shall be responsible for sourcing and procuring the specified soil and aggregate materials, transporting the materials to Temporary Staging Areas, unloading and staging the materials, blending and mixing the materials with amendments as required to achieve specified requirements, loading and transporting materials to the locations of placement, and placing the materials in accordance with the Design Drawings and Specifications.
- D. The Contractor shall implement best management practices (BMPs), controls, and other measures necessary to maintain compliance with the Surface Water Action Levels and Quality of Life Standards described in Section 01572 – Construction Environmental Restrictions and Controls.

1.02 RELATED SECTIONS

- A. Section 01572 – Construction Environmental Restrictions and Controls.
- B. Section 02 21 00 – Surveys.
- C. Section 31 23 00 – Excavation and Fill.
- D. Section 34 72 00 – Railway Construction.

1.03 APPLICABLE CODES, STANDARD, AND REFERENCES

- A. Arcadis. 2023. *Revised Field Sampling Plan and Quality Assurance Project Plan* GE-Pittsfield/Housatonic River Site. Prepared for General Electric Company, Pittsfield, Massachusetts. July.
- B. Arcadis, 2025. *Project Operations Plan*. GE-Pittsfield/Housatonic River Site. Prepared for General Electric Company, Pittsfield, Massachusetts. May.
- C. Arcadis. 2026a. *Addendum No. 1 to the Second Revised Field Sampling Plan and Quality Assurance Project Plan*. GE-Pittsfield/Housatonic River Site. Prepared for General Electric Company, Pittsfield, Massachusetts. August 31.

SECTION 31 05 13 – SOILS AND AGGREGATES

- D. Arcadis, 2026b. *Project Operations Plan Addendum 1*. GE-Pittsfield/Housatonic River Site. Prepared for General Electric Company, Pittsfield, Massachusetts. August 31.
- E. ASTM International (ASTM) – References to ASTM standards shall mean the latest edition in effect at the time of bid:
 - 1. ASTM C29 – Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate.
 - 2. ASTM C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - 3. ASTM C128 – Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate.
 - 4. ASTM C131 – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - 5. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 6. ASTM D854 – Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer.
 - 7. ASTM D2216 – Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - 8. ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 9. ASTM D2974 – Standard Test Methods for Determining the Water (Moisture) Content, Ash Content, and Organic Material of Peat and Other Organic Soils.
 - 10. ASTM D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - 11. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - 12. ASTM D4972 – Standard Test Methods for pH of Soils.
 - 13. ASTM D6913 – Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
- F. Commonwealth of Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges, 2026 Edition, Division III.
- G. U.S. Environmental Protection Agency (EPA) SW-846 – Test Method for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition.

SECTION 31 05 13 – SOILS AND AGGREGATES

1.04 QUALITY ASSURANCE

- A. Materials, procedures, operations, and methods shall be in strict conformance with the Contract Documents. Materials shall be subjected to strict quality control monitoring as detailed herein. The placed materials shall conform exactly to the Contract Documents, except as otherwise authorized in writing by the Construction Manager.
- B. Sampling and analysis of soil and aggregate materials used for construction shall be conducted by the Contractor in accordance with General Electric Company's (GE's) revised Field Sampling Plan/Quality Assurance Project Plan (Arcadis 2023) and associated Addendum 1 (Arcadis 2026a) and Sections 2 and 3 of the Soil Cover/Backfill Characterization Plan included as Attachment B of GE's revised Updated Project Operations Plan (Arcadis 2025) as well as the associated Addendum 1 (Arcadis 2026b).

1.05 SUBMITTALS

A. Pre-Construction:

- 1. The Contractor shall submit background information for each proposed material source to the Construction Manager for review as part of the source's initial screening for acceptance. At a minimum, background information shall include the following:
 - a. The location of the material source, including state, county, municipality, address, block, and lot numbers.
 - b. The names, contact information, and relationship of persons involved with the source material preparation and transport of the fill from the material source to the receiving sites.
 - c. A description of the borrow site, including use history.
 - d. Identification of specific areas within the borrow site on a scaled site plan where material will be obtained for use at the project site.
 - e. Identification of specific areas within the borrow site on a scaled site plan where samples for analytical and geotechnical testing will be obtained.
 - f. A description of sampling methodology to be used to obtain geotechnical and analytical samples.
 - g. The results of geotechnical testing previously performed and a description of the geotechnical properties of the fill material and indication that the material meets the project's geotechnical specifications.
 - h. Evidence of required permits and other necessary approvals shall be provided; if such approvals are not in place, the process and schedule for obtaining permits and other approvals shall be provided.
 - i. A certification letter from the borrow source owner or operator certifying that the source is not from an industrial site or suspected to have been modified by the addition of manufactured chemicals and that the material does not contain

SECTION 31 05 13 – SOILS AND AGGREGATES

oil or hazardous material as supported by test data to be provided with certification letter and a copy of applicable current permits and approvals.

2. Material Transport, Storage, and Handling Plan:

- a. The Contractor shall submit a Material Transport, Storage, and Handling Plan that, at a minimum, includes the following:
 - 1) Details for material transport and stockpiling, including transportation methods, schedules, and routing;
 - 2) Maps showing the transportation routes from the source locations to the Utility Drive and Woods Pond sites (or other approved location);
 - 3) A schedule for procurement, testing, and delivery of the backfill and construction materials;
 - 4) Details for the equipment that will be used to transport backfill and construction materials from the source locations to the Utility Drive and Woods Pond sites;
 - 5) Figures showing the soil and aggregate material storage locations at each site, including details on any protection of materials;
 - 6) Expected time frames the materials that will be stored;
 - 7) Details on the personnel and equipment required to take delivery, store, and handle the soil and aggregate materials; and
 - 8) Manufacturer's instructions for the storage and handling of materials and products.
3. Pre-Construction Testing Reports: The Contractor shall submit Pre-Construction Testing Reports that include the results of laboratory chemical and physical analysis of each material type from each borrow pit as required in this Section. The Contractor shall include written confirmation that the materials meet the required criteria per this Section.
4. The Contractor shall submit two 5-gallon buckets with a sample of each proposed type of material for inspection by the Construction Manager.

B. During Construction:

1. The Contractor must submit chemical and geotechnical results of testing for each material type and source at the frequency specified in this Section.
2. The Contractor must document the total amount and type of material imported to each rail transload area. Submit copy of delivery ticket for each load of material delivered to each rail transload area. Each delivery ticket shall indicate Supplier name and source address, project name, contract number, date, material type, MassDOT item number when applicable, and quantity delivered. All import quantities must be based on tared material weight slips of transport trucks and provided to the Construction Manager.

SECTION 31 05 13 – SOILS AND AGGREGATES

1.06 DELIVERY

- A. The Contractor shall notify the Construction Manager no less than 1 week in advance of deliveries of all soil and aggregate material shipments.
- B. The Contractor shall clean all vehicles leaving the Work Area to prevent the tracking of soil material outside of the limits of Work Area and onto local roads. Vehicles shall be visually inspected and cleaned to the satisfaction of the Construction Manager. Any visible soil or other debris shall be promptly removed and appropriately disposed of in accordance with this Section and to the satisfaction of the Construction Manager.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Grading Fill and General Fill:

1. The Grading Fill and General Fill material shall consist of clean common earth fill, free from excessive moisture, organic material, coatings, sharp angular stones, unsatisfactory fills, and other deleterious materials.
2. General Fill will conform to the Soil Classification Groups of Well-Graded Gravel, Poorly-Graded fine Gravel, Silty Gravel, Well-Graded Sand, SP and SM (as determined by ASTM D2487), or a combination of these groups, with no stones larger than two inches in diameter, no more than 35% fines (passing the No. 200 sieve), and a Plasticity Index less than 10.

B. Structural Fill:

1. Structural fill shall generally consist of clean, well-graded gravelly sand or sandy gravel.
2. Structural fill material shall meet the gradation MassDOT standard specification requirements for Granular Fill (M1.02.0), as follows:

PARTICLE SIZE OR U.S. SIEVE NO.	PERCENT PASSING (DRY-WEIGHT BASIS)
1-1/2 inches	100%
3/4 inch	70% to 100%
3/8 inch	50% to 85%
No. 4	40% to 75%
No. 40	10% to 40%
No. 200	<8%

SECTION 31 05 13 – SOILS AND AGGREGATES

C. Gravel Subbase:

1. Gravel subbase shall be free from organic or deleterious matter, a well-graded mixture of coarse aggregate.
2. Gravel Subbase shall meet the gradation MassDOT standard specification requirements for Gravel Borrow Type B (M1.03.0), as follows:

PARTICLE SIZE OR U.S. SIEVE NO.	PERCENT PASSING (DRY-WEIGHT BASIS)
3 inches	100%
1/2 inch	50% to 85%
No. 4	40% to 75%
No. 200	0% to 10%

D. Topsoil:

1. Topsoil shall be imported from a naturally occurring source approved by the Construction Manager.
2. Topsoil shall be fertile, friable, natural-loam surface soil capable of sustaining vigorous plant growth and free of any admixture of subsoil, clods of hard earth, plants or roots, sticks, stones larger than 1 inch in diameter, pests and pest larvae, seeds of noxious weeds, or other extraneous material harmful to plant growth.
3. Topsoil shall be free of unsuitable materials, including but not limited to the following:
 - a. Commercially or municipally produced organic waste, sewage sludge, or composted waste materials.
 - b. Frozen material, or material containing snow or ice.
 - c. Trees, stumps, branches, roots, or other wood or lumber.
 - d. Wire, steel, cast iron, cans, drums, or other foreign material.
4. Topsoil shall have the following properties:
 - a. A loam texture with Unified Soil Classification System classification of SM (silty sands and sand-silt mixtures) or SC (clayey sands and sand-clay mixtures) granular soil material.
 - b. A weak granular structure and friable consistency.
 - c. 3.8% to 6.1% organic matter by weight (ASTM D2974).
 - d. A pH between 5.9 and 6.2 in accordance with ASTM D4972.
5. Prior to acceptance, imported topsoil samples shall be analyzed by the Contractor for texture, organic matter content, nutrients, and pH to verify they meet the above specifications or are otherwise acceptable to the Construction Manager.

SECTION 31 05 13 – SOILS AND AGGREGATES

E. Processed Aggregate Base:

1. Processed Aggregate Base material shall be a naturally or artificially graded mixture of natural or crushed gravel, crushed stone, or natural or crushed sand. Crushed slag is unacceptable.
2. Aggregate material shall meet the gradation MassDOT standard specification requirements for Dense Graded Crushed Stone for Sub-Base (M2.01.7-1), as follows:

PARTICLE SIZE OR U.S. SIEVE NO.	PERCENT PASSING (DRY-WEIGHT BASIS)
2 inches	100%
1-1/2 inches	70% to 100%
3/4 inch	50% to 85%
No. 4	30% to 55%
No. 50	8% to 24%
No. 200	3% to 10%

F. Riprap:

1. Stone for riprap shall be hard, angular field or quarry stone that is sound, durable, free of shale seams and coatings, and of such characteristics that stone will not disintegrate when subjected to action of water. Stones shall be free of dirt, debris, and deleterious material.
2. Stones shall have a minimum specific gravity of 2.5, as determined according to ASTM C127.
3. Provide riprap from a MassDOT-permitted mine, pit, or quarry. Source shall be approved by MassDOT for furnishing aggregates for MassDOT projects.
4. Each load of riprap shall be well-graded, from smallest to largest size. Width and thickness of each stone shall not be less than one-third the length of the stone. Gradations shall be as specified below:

TYPE 1 RIPRAP

SIZE (INCHES)	PERCENT PASSING (DRY-WEIGHT BASIS)
12	100%
8	50%
4	0% to 10%

TYPE 3 RIPRAP

SIZE (INCHES)	PERCENT PASSING (DRY-WEIGHT BASIS)
6	100%
4	30% to 50%
2	0% to 10%

SECTION 31 05 13 – SOILS AND AGGREGATES

TYPE 5 RIPRAP

SIZE (INCHES)	PERCENT PASSING (DRY-WEIGHT BASIS)
6	100%
4 to 6	30% to 50%
2	0%

TYPE 6 RIPRAP

SIZE (INCHES)	PERCENT PASSING (DRY-WEIGHT BASIS)
4	100%
1	0% to 10%

5. Acceptance of gradation will be based on visual inspection and submittals accepted by the Construction Manager.

G. Pipe Bedding:

1. Bedding material shall angular crushed rock sized from 3/8 inch to 1 inch (free of excessive fines, organic matter, or debris) or Granular Select Material: AASHTO Classifications A-1, A-3, or coarse-grained Class I/II/III soils meeting particle size limits of 1 inch maximum for pipes over 8 inches in diameter.
2. Prohibited Materials: Frozen soils, clay lumps, organic debris, and sharp angular cobbles larger than the specified maximum size.

H. Ballast and Sub-ballast:

1. Gradation specifications and other requirements for ballast and sub-ballast can be found in Section 34 72 00 – Railway Construction.

I. Road Base Mix:

1. Provide a dense-graded crushed stone per MassDOT standard specifications Division II subsection 402 (Quarry Process or Crushed Stone #411). No rounded river rock. As follows:

PARTICLE SIZE OR U.S. SIEVE NO.	PERCENT PASSING (DRY-WEIGHT BASIS)
3/4 inch	100%
1/2 inch	80% to 95%
3/8 inch	65% to 85%
No. 4	35% to 55%
No. 16	5% to 25%
No. 200	0% to 10%

J. Crushed Stone:

1. Materials used for stormwater basin pilot channels, perimeter ditch lining, and stone check dams will consist of a natural or artificially graded mixture of crushed

SECTION 31 05 13 – SOILS AND AGGREGATES

stone, broken stone or natural or crushed sand complying with the gradation requirements below:

PARTICLE SIZE OR U.S. SIEVE NO.	PERCENT PASSING (DRY-WEIGHT BASIS)
1 inch	100%
3/4 inch	90-100%
1/2 inch	20% to 55%
3/8 inch	0% to 15%
No. 4	0% to 5%

2. Material shall meet the requirements of Section M2.01.4 of the State of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges, 2022.

2.02 SOURCE QUALITY CONTROL

- A. The Contractor shall provide imported soil and aggregate material from a permitted mine, pit, or quarry, or a commercial processing facility specializing in the manufacture of topsoil and aggregates.
- B. Soil and aggregate materials shall not be obtained from an industrial site or suspected to have been modified by the addition of manufactured chemicals or petroleum products.
- C. Initial Borrow Source(s) Assessment: The Contractor shall conduct an initial assessment in coordination with the Construction Manager (if not previously conducted for the proposed material and borrow sources) to evaluate whether the materials at the borrow sources are potentially suitable for use, subject to further evaluation through sampling and analysis. This assessment will likely include some or all of the following: a field visit to evaluate the materials and the location of the materials and discussions with the owner of the materials or the property owner regarding the origin of the materials, the historical use of the borrow source area(s), and any chemical/physical characterization data that may already exist for the material at the source(s). The level of detail involved in this initial assessment will depend on the candidate materials and will be limited if the potential materials are undisturbed in-place materials. If the initial assessment indicates the materials at the borrow sources are potentially usable and thus warrant further evaluation, the Contractor shall coordinate with the Construction Manager for sampling and testing of the potential materials as described in this Section. The initial assessment shall also meet the requirements described in the Soil Cover/Backfill Characterization Plan.
- D. The Contractor shall collect samples for geotechnical and chemical analyses in accordance with the requirements herein.
- E. The Contractor shall provide the Construction Manager with the ability to conduct an inspection of the proposed sources.

SECTION 31 05 13 – SOILS AND AGGREGATES

- F. If materials from any proposed source do not meet or cannot reasonably be processed to meet specified requirements, the Contractor shall locate and identify an alternative source or sources.
- G. Acceptance of material or a source shall not preclude future rejection by the Construction Manager if the material fails to conform to the specified requirements, lacks uniformity, or if its field performance is found to be unsatisfactory.
- H. Prior to approval of material sources, the Construction Manager reserves the right to visit each soil and aggregate material source and conduct visual observation of the materials proposed for use. The Contractor shall coordinate access with the material sources for the Construction Manager to perform visits.
- I. The final approval or rejection of sources for all soil and aggregate materials will be at the discretion of the Construction Manager. Any proposed change in source shall require approval of the Construction Manager.
- J. The Contractor is solely responsible for ensuring that the selected soil and aggregate material sources are able to meet the delivery schedule to produce material of the required quality and in sufficient quantity for the Project. If the Contractor is unable to obtain a sufficient amount of acceptable material from an approved source to meet the progress of construction, the Contractor shall identify and obtain Construction Manager approval for an alternate source or sources. All costs incurred due to change of material sources, including sampling and testing requirements, shall be borne by the Contractor. In addition, no extension of Project schedule milestones shall be allowed due to change of material sources.

2.03 SOURCE AND MATERIAL QUALITY

- A. Imported soil and aggregate materials must be free of chemical contamination, below the specified acceptance criteria, and approved by the Construction Manager prior to delivery to the Sites based on chemical characterization testing performed in accordance with this Section.
- B. The imported soil and aggregate materials shall meet the following chemical criteria, per the Soil Cover/Backfill Characterization Plan:
 - 1. Polychlorinated biphenyl (PCB) Aroclors shall be non-detect or less than 1 mg/kg.
 - 2. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) shall be non-detect.
 - 3. Metals and cyanide concentrations shall meet the criteria listed on Table B-1 in Section 3.1.2.2 of the Soil Cover/Backfill Characterization Plan, as summarized below:

CONSTITUENT	CRITERION (MG/KG)
Antimony	20
Arsenic	20
Barium	1,000

SECTION 31 05 13 – SOILS AND AGGREGATES

CONSTITUENT	CRITERION (MG/KG)
Beryllium	90
Cadmium	5
Chromium (total)	100
Copper	150
Cyanide (total)	30
Lead	130
Mercury	0.3 (for soil backfill)
Nickel	49
Selenium	400
Silver	100
Thallium	8
Vanadium	400
Zinc	460

- C. Chemical characterization testing shall be performed for imported soil and aggregate materials (e.g., topsoil, sand, and gravel). Chemical characterization will not be required for stone materials (e.g., riprap and other stone) provided that those materials are from a source determined by the Construction Manager to be acceptable from the Initial Borrow Source(s) Assessment.
- D. Materials shall meet the physical requirements and the chemical characterization criteria specified herein. The Contractor shall be responsible for maintaining gradations as specified herein. Soil and aggregate materials that do not meet gradation or chemical characterization requirements as specified herein will be rejected, and no payment will be made regardless of any general or provisional acceptance of materials from a stockpile or borrow source.
- E. The Contractor shall inform the Construction Manager of proposed soil and aggregate material sources at least 30 days prior to scheduled delivery of materials to the Sites to verify the specified physical properties, chemical properties, and gradations.
- F. The Construction Manager reserves the right to undertake independent investigations and assessments when necessary, including tests other than the tests prescribed herein, to verify that the soil and aggregate materials comply with the specified requirements.
- G. The Contractor shall inform the Construction Manager of any unacceptable conditions immediately upon discovery.
- H. The Contractor shall visually inspect imported materials upon delivery. Imported materials shall be inspected for the presence of foreign, recycled, or reprocessed material. The Construction Manager may, at any and all times, perform an independent inspection of the imported materials. The Construction Manager may also, at any and all times, conduct independent screening of materials using a

SECTION 31 05 13 – SOILS AND AGGREGATES

photoionization detector (PID) to verify the materials do not contain elevated levels of volatile organic vapors. Imported materials may be rejected if identified as substandard or if test results show it to be substandard. Imported materials may be segregated for testing based on appearance or odor. The Construction Manager reserves the right to request that the Contractor test the segregated materials according to designated procedures at the Construction Manager's discretion.

2.04 MATERIAL TESTING REQUIREMENTS

- A. The Contractor shall furnish all labor, materials, tools, supervision, shipping, and transportation necessary to perform materials testing and analysis to meet the testing requirements as specified herein. The Contractor shall comply with all testing requirements with a specified frequency based on the quantity delivered to the Sites.
 - 1. Pre-construction testing shall be performed for each soil and aggregate material type and for each material source. Pre-construction testing results shall be submitted to the Construction Manager with identification of the proposed material sources. Pre-construction physical testing shall be performed for each specified parameter as described in this Section.
 - 2. In addition to pre-construction tests, tests shall be conducted as required based on the quantity of material delivered to the Sites or at the direction of the Construction Manager if material characteristics are visibly different.
 - 3. Prior to submitting material test results, the Contractor shall confirm all necessary material testing documentation is provided and all material testing results meet the specified requirements.
 - 4. Each borrow source material sample collected for chemical characterization testing shall be screened by the Contractor using a PID as described in EPA SW-846 Test Method 3815 to verify the materials do not contain elevated levels of volatile organic vapors. The Contractor shall provide the results of PID screening together with the chemical characterization testing results.
- B. The Contractor shall coordinate, collect, and submit samples for laboratory analysis and pay for laboratory testing of each material to verify conformance with the Contract Documents.
- C. Sampling for geotechnical and chemical quality of the imported materials shall be performed at the source locations prior to shipment to the Sites unless otherwise approved by the Construction Manager.
- D. Sampling for testing of physical and chemical quality of the imported materials shall be performed at the source locations prior to shipment to the Site unless otherwise approved by the Construction Manager. Do not ship soil or aggregate material to the Site until the proposed material, source, and supplier are accepted by the Construction Manager. For material types that require the blending of materials (e.g., Chemical Isolation Layer material), testing for chemical parameters may be performed on the

SECTION 31 05 13 – SOILS AND AGGREGATES

source materials before blending, except where sampling of blended materials is required specified elsewhere.

- E. Geotechnical Testing: If the results of the Initial Borrow Source Assessment indicate the candidate borrow source and materials may be suitable for use, the Contractor shall obtain representative samples of each material type for laboratory geotechnical testing to verify conformance with the Contract Documents.
1. Geotechnical testing shall be completed prior to placement of the material and at a frequency of one per 5,000 cubic yards (cy) of imported off-site materials per site, unless otherwise approved by the Construction Manager.
 2. Geotechnical sample testing results shall be provided to the Construction Manager to verify acceptability of the materials for on-site use. Fill material may not be accepted for import until results of geotechnical analysis are approved by the Owner.
 3. Representative samples from each distinct source (excluding topsoil and stone) shall be submitted for the following geotechnical tests:
 - a. Grain size distribution (ASTM D6913, D1140, C136, or alternate approved by the Construction Manager).
 - b. Moisture content (ASTM D2216).
 - c. Weight per unit volume of uncompacted materials (ASTM D4254 or ASTM C29).
 - d. Particle specific gravity (ASTM D854 or C128).
 4. Geotechnical testing for Topsoil shall include the following tests:
 - a. Grain size distribution (ASTM D6913, D1140, C136, or alternate approved by the Construction Manager).
 - b. Atterberg limits in accordance with ASTM D4318.
 - c. Material classification (ASTM D4827).
 - d. Moisture content (ASTM D2216).
 - e. Organic content (ASTM D2974).
 - f. pH (ASTM D4972).
 5. Stone materials (e.g., riprap and other stone) shall be inspected as follows:
 - a. Contractor shall provide the Construction Manager for review the supplier's riprap production process and material sizing information.
 - b. Contractor shall provide the Construction Manager for review a summary of physical hand measurements of the proposed riprap to identify the gradation range of the manufactured product.
 - c. Based on review of the information provided, the Construction Manager may elect to conduct a thorough visual inspection of the material proposed by the Contractor, which will be conducted by the Construction Manager at the quarry source to assess and verify stone quality, size, and suitability of the material for project use.

SECTION 31 05 13 – SOILS AND AGGREGATES

- F. Chemical Testing: If the results of the Initial Borrow Source Assessment indicate the candidate borrow source and materials may be suitable for use, the Contractor shall obtain representative samples of each material type, in coordination with the Construction Manager, for chemical testing of the materials. Chemical testing of stone materials (e.g., riprap and other stone) is not required, provided that those materials are from a source found to be acceptable in the Initial Borrow Source Assessment. Chemical testing shall be performed as follows:
1. The frequency of sampling/analysis for chemical contaminants is dependent on the source/location of the proposed off-site fill material:
 - a. If the candidate material is from an undisturbed in-place source (e.g., an active gravel or borrow pit), the source shall provide a letter certifying that the material is virgin, and one representative sample of the material shall be collected and analyzed. The analytical data from this chemical characterization shall be submitted to the Construction Manager, who will compare the data with the criteria described in Section 3.1.2.2 of the Soil Cover/Backfill Characterization Plan. If the data are acceptable, the Construction Manager will submit sample test results to USEPA for approval. The results of this sample will be considered to represent the materials that originate from this virgin source for up to 20,000 cy of material from the borrow source or until such time as the physical characteristics of the source location significantly change.
 - b. For off-site materials that have not been certified as a virgin source, the frequency of borrow source characterization testing shall involve the collection of one composite sample from each site for each 2,000 cy from the borrow source at each site and for each distinct material type specified in the technical design documents. If the volume of material to be characterized is less than 2,000 cy, one composite sample shall still be collected from that material. Each composite sample shall be composed of 10 discrete “grab” subsamples that shall be collected at spatially distributed locations within the source material and composited into a single sample to be submitted to a laboratory for the appropriate chemical analyses identified in this Specification. A PID headspace screening shall be performed for all 10 subsample locations used to form the composite sample. However, for analysis of VOCs, each sample shall be a single discrete grab sample collected at one of the 10 subsample locations used to form the composite sample. The analytical data from this chemical characterization shall be submitted to the Construction Manager, who will compare the data with the criteria described in Section 3.1.2.2 of the Soil Cover/Backfill Characterization Plan. If the analytical results from this sampling are acceptable, the Owner will submit sample test results to USEPA for approval. The initial sampling frequency shall be used to characterize up to 2,000 cy of material from the borrow source.
 - c. If more than one off-site source is proposed for the soil fill material, samples shall be collected and analyzed from each source at the appropriate frequency provided in the above Subparagraphs.

SECTION 31 05 13 – SOILS AND AGGREGATES

2. Each material type shall be collected and sampled in accordance with the Soil Cover/Backfill Characterization Plan and, in particular, shall be tested as follows:
 - a. Each borrow source material sample shall be analyzed for PCBs (as Aroclors) and the VOCs, SVOCs, cyanide and metals listed in Appendix IX of 40 Code of Federal Regulations 264, plus cyanide, benzidine, 2- chloroethyl vinyl ether, and 1,2-diphenylhydrazine.
 - b. Each borrow source material sample collected for chemical characterization testing shall also be screened using a PID as described in Appendix A2 (Standard Operating Procedure for Photoionization Detector Field Screening) of GE's revised (2023) FSP/QAPP to verify that the materials do not contain elevated levels of volatile organic vapors. All samples shall be collected, analyzed, and validated in accordance with that revised FSP/QAPP or any USEPA-approved revision of that document.
 3. Chemical testing shall be completed prior to shipment of soil material to the Site. Soil material may not be accepted for import to the Site until results of chemical analysis are approved by the Construction Manager.
- G. Proposed analytical reporting limits should be included in the Contractor Quality Control Plan for review and approval by the Construction Manager. Additional analytical results shall be submitted for these analyses if the source of a material changes or as otherwise directed by the Construction Manager. The results shall be approved by the Construction Manager prior to material transport to the Site.
- H. Laboratory Testing Requirements:
1. All material testing shall be performed by an independent and certified laboratory. The Contractor shall employ and pay for services of an independent laboratory authorized to operate in Massachusetts.
 2. The laboratory shall have current National Environmental Laboratory Accreditation Program and certification for specific methods they are performing from a recognized state or federal laboratory accreditation program.
 3. Re-testing or re-inspection required because of nonconformance to specified requirements shall be performed by the same independent laboratory at no additional cost to GE.
 4. Testing laboratory reports: After each test, the Contractor shall promptly submit testing reports to the Construction Manager along with the Contractor's interpretation of test results.
 5. The results of all tests shall be provided to the Construction Manager. The results of each test shall be provided in a report that clearly identifies the following:
 - a. Source of samples.
 - b. Sampling dates.
 - c. Chain of custody.
 - d. Sampling locations.

SECTION 31 05 13 – SOILS AND AGGREGATES

- e. Test results.
- f. Contractor's certification that the samples that were tested and the results provided are representative of the cap and backfill materials that will be delivered to the Site.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall implement measures to prevent soil or aggregate materials from being misplaced on land or in the river during material delivery, storage, and loading and unloading.
- B. The Contractor shall provide the Construction Manager with access at all times for inspection and testing of the soil or aggregate materials at source(s), material stockpiles, and vessels or vehicles loaded with materials.

3.02 TRANSPORTATION AND DELIVERY

- A. The Contractor shall transport and handle soil and aggregate materials in accordance with requirements of all federal, state, and local laws.
- B. All materials and items delivered to the Site shall be unloaded and placed in a manner that will not hamper the Contractor's normal construction operations or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- C. The Contractor shall provide necessary equipment and personnel to unload all materials delivered to the Sites.
- D. The Contractor shall promptly inspect shipments to ensure products comply with requirements, quantities are correct, and materials are undamaged. The Contractor shall notify the Construction Manager verbally and in writing of any problems and describe the proposed corrective action and schedule.
- E. Soil and aggregate materials delivered to the Site shall be weighed on certified scales at the source location. The Contractor shall provide copies of weight tickets for all soil and aggregate materials transported to the Site. Weight tickets shall indicate the weight, time, and date of weighing for all truck loads.
- F. The Contractor shall deliver and stockpile soil and aggregate materials at the Temporary Staging Areas in sufficient quantities to meet schedule requirements.

SECTION 31 05 13 – SOILS AND AGGREGATES

3.03 TEMPORARY STOCKPILING AND STAGING OF MATERIALS

- A. The Contractor shall store soil and aggregate materials on solid flat surfaces in a well-drained area within the Temporary Staging Areas or at another location approved by the Construction Manager.
- B. The Contractor shall prevent soil and aggregate material mixing with native sediments, soils, and foreign matter.
- C. The Contractor shall construct and maintain stockpiles so they are tidy, well-drained, free of foreign materials, free of standing surface water, and of adequate bearing capacity to support the weight of materials placed thereon.
- D. The Contractor shall separate differing soil and aggregate materials with substantial dividers or stockpile them apart to prevent mixing.
- E. All soil and aggregate material stockpiles shall be labeled with a sign to indicate the material type.
- F. The Contractor shall install and maintain erosion control measures, as needed, around material stockpiles.
- G. The Contractor shall remove and dispose of rejected soil or aggregate materials as directed by the Construction Manager at no additional cost to GE.
- H. Remove excess backfill from the Project Sites and cleanup area or move unused materials as directed by the Construction Manager.

- END OF SECTION -

SECTION 31 05 13 – SOILS AND AGGREGATES

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SECTION 31 11 00 – CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. The Contractor shall provide all labor, materials, equipment, and incidentals required to perform clearing and grubbing as needed to allow completion of the Work.
2. The Contractor shall be responsible for removing and disposing or reusing of trees, shrubs, brush, logs, vegetation, rubbish, and other objectionable material.
3. The Contractor shall implement best management practices, controls, and other measures necessary to maintain compliance with the Quality of Life Standards described in Section 01572 – Construction Environmental Restrictions and Controls.

B. Related Sections:

1. Section 01572 – Construction Environmental Restrictions and Controls.
2. Section 01733 – Waste Management.
3. Section 31 23 00 – Excavation and Fill.
4. Section 31 25 00 – Erosion and Sediment Controls.
5. Section 32 30 00 – Restoration, Planting, and Seeding.

1.02 SUBMITTALS

- A. The Contractor shall prepare and submit a Clearing and Grubbing Plan for review and approval by the Construction Manager prior to mobilization as part of the Contractor's Operations Plan that outlines the areas, methods, and equipment to be used for clearing and grubbing.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PREPARATION

A. Protection:

1. Protect existing Site improvements, including streets, drives, underground and aboveground utilities, and adjacent property and structures throughout the Work. Repair damage caused by the Contractor to original condition or replace in kind to the satisfaction of the Construction Manager at no additional cost to General Electric Company (GE).

SECTION 31 11 00 – CLEARING AND GRUBBING

2. Protect trees, shrubs, and vegetation to remain by providing temporary fencing, barricades, wrapping, or other methods as needed.
 3. Do not remove trees without the approval of the Construction Manager.
- B. Site Preparation:
1. Delineation of Clearing and Grubbing Limits:
 - a. Locate and clearly flag trees, vegetation, and other items to remain within the limits of clearing and grubbing.
 - b. Provide flagging to delineate limits of areas to be cleared or grubbed. Review the limits at the Site with the Construction Manager before initiating clearing and grubbing Work.
 - c. Replace flagging that is lost, removed, or destroyed until clearing and grubbing Work is complete and the Construction Manager allows removal of flagging.
 2. Erosion and Sediment Controls:
 - a. Install applicable erosion and sediment controls before initiating clearing and grubbing Work.
 - b. Comply with erosion and sediment control requirements of Section 31 25 00 – Erosion and Sediment Controls.
 - c. Adjust, relocate, or install additional erosion and sediment controls as clearing and grubbing Work progresses to previously uncleared, ungrubbed areas of the Site.

3.02 CLEARING AND GRUBBING

- A. Clearing and grubbing shall not be performed until the Construction Manager provides approval to initiate construction activities.
- B. All tree removal and any associated chipping shall be conducted under the oversight of a Certified Arborist retained by the Contractor and shall adhere to the Noise Quality of Life Standards in Section 01572 – Construction Environmental Restrictions and Controls.
- C. Remove trees less than 8 inches in diameter at breast height (DBH), shrubs, brush, logs, vegetation, rubbish, and other surface material as needed within the limits of the Work Areas.
- D. Remove small trees, shrubs, brush, logs, vegetation, rubbish, and other material within the support areas and associated with Temporary Access Road construction and improvement only as necessary and as approved by the Construction Manager. Blanket tree removal is prohibited. The goal is to minimize impacts to trees, shrubs, and vegetation in these areas.

SECTION 31 11 00 – CLEARING AND GRUBBING

- E. Mature trees in all areas with DBH greater than 8 inches shall be left in place to the extent practicable, unless approved by the Construction Manager. This will necessitate special excavation adjacent to mature trees within and adjacent to the excavation areas as detailed in Section 31 23 00 – Excavation and Fill.
- F. Where tree cutting is necessary, trees shall be cut flush with the ground and roots left in place to the extent practicable.
- G. Trees and shrubs to remain that have been damaged or require trimming shall be treated and repaired under the oversight of the Construction Manager at no additional cost to GE.

3.03 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

- A. The aboveground portions of all cleared vegetation will be managed on site in a manner supportive of the local ecology, such as spreading of smaller and chipped material for erosion control; with approval from the Construction Manager, staging of tree trunks, brush, and branches for use during restoration within the remediated areas as habitat features; or creation of adjacent brush or log piles as approved by the Construction Manager.
- B. As necessary, large debris items shall be cut to size at the Temporary Staging Areas to facilitate transport and to meet the requirements of the disposal destination in accordance with Section 01733 – Waste Management.
- C. The on-site use of vegetation shall be in accordance with Section 32 30 00 – Restoration, Planting.

- END OF SECTION -

SECTION 31 11 00 – CLEARING AND GRUBBING

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SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading, and disposing of earth materials as shown, specified, and required to complete the Work.
2. Perform excavation and fill Work within the areas shown or indicated on the Design Drawings.
3. Preparation of subgrade for rail and pavements (asphalt and concrete) is included under this Section.
4. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof, except rock requiring drilling, blasting, or special equipment for removal.
5. In accordance with Section 02 21 00 – Surveys, an independent licensed surveyor contracted by the Contractor shall conduct post-construction surveys to confirm adherence to the specified requirements for the Work. The Contractor's surveyor shall be responsible for generating the required survey data and calculations to support decisions by the Construction Manager concerning completion of this Work and the determination of the quantities. The Construction Manager reserves the right to have a third-party surveyor or engineer perform quality control checks on the Contractor's survey data and calculations.
6. Perform excavation and fill Work in a manner that prevents damage to property, structures, and utilities.
7. Heavy construction equipment operated areas not subject to excavation and backfill nor designated approved for such operation (i.e., outside the Limit of Work) shall be operated from construction mats to distribute the equipment loads and minimize disturbance or compaction of the underlying and adjacent soils to the extent practicable. See also Section 01353 – Cultural Resources.
8. The Contractor shall not enter any Wetland and/or Sensitive Vegetation Areas except where Work is specified on the Drawings.
9. Disturbances (e.g., stockpiling material, intrusive earthwork) outside the Limits of Work identified on the Design Drawings shall not be allowed without prior approval from the Construction Manager

B. Coordination:

1. Review procedures under this and other Sections and coordinate Work that must be performed with or before excavation and fill Work.

SECTION 31 23 00 – EXCAVATION AND FILL

C. Related Sections:

1. Section 01353 – Cultural Resources.
2. Section 01572 – Construction Environmental Restrictions and Controls.
3. Section 02 21 00 – Surveys.
4. Section 31 05 13 – Soils and Aggregates.
5. Section 31 11 00 – Clearing and Grubbing.
6. Section 31 25 00 – Erosion and Sediment Controls.
7. Section 32 30 00 – Restoration, Planting, and Seeding.

1.02 REFERENCE STANDARDS

A. Terminology:

1. The following words or terms are not defined but, when used in this Section, have the following meaning:
 - a. "Debris" means man-placed buried or piled material, including but not limited to brick, concrete, asphalt, metal, and wood.
 - b. "Subgrade" means the uppermost surface of native soil material unmoved from the bottom of excavations.

B. The following standards are referenced in this Section:

1. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ [2,700 kN-m/m³]).
2. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
3. ASTM E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Testing Laboratory: Retain the services of an independent testing laboratory to perform field quality control testing required in this Section. Testing laboratory shall comply with ASTM E329 and shall be experienced in the types of testing required.

B. Regulatory Requirements:

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
 - a. 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.
 - b. 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response.
 - c. 29 CFR 1926.650 through 29 CFR 1926.652, Subpart P – Excavations.

SECTION 31 23 00 – EXCAVATION AND FILL

2. Comply with applicable provisions and recommendations of the following:
 - a. Code of Massachusetts Regulations (CMR).
 - b. MassDOT Standard Specifications and Standard Sheets.
 3. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners.
- C. Use materials, procedures, operations, and methods in strict conformance with the Contract Documents. Materials will be subjected to strict quality control monitoring as detailed herein.

1.04 SUBMITTALS

A. Informational Submittals:

1. Excavation and Backfilling Plan: Submit acceptable plan for excavation, backfilling, and related Work not less than 21 days prior to starting excavation Work. At a minimum, include the following:
 - a. Name of Contractor's "competent person" in responsible charge of excavation and fill Work.
 - b. Plan for determining correct field location of all nearby underground structure or facilities or arrange for Representatives of the utilities to locate them.
 - c. Plan for coordinating shut-offs, locating, capping, abandoning, temporary services, and continuing utility services.
 - d. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.
 - e. Proposed excavation, backfilling, and compaction procedures and proposed equipment. Where different procedures or equipment will be used for different types of material or at different locations at the Site, indicate where each procedure and equipment item will be used. This includes procedures for excavation and backfilling work planned in the vicinity of the Eversource Power Lines and/or Towers.
 - f. Details of the estimated or effective ground pressure for any equipment working outside the defined Limit of Work within or adjacent to wetland areas, sensitive habitat areas, and saturated Floodplain Areas, including equipment weights and methods to distribute the equipment loads and minimize disturbance and compaction of the soils and adjacent soils. These details shall include the proposed types and sizes of construction matting that will be used and describe how the matting will be placed, maneuvered, and removed to facilitate the excavation and backfilling operations.
 - g. Pumping and Discharge Plan describing procedures to be used in the event that water is encountered within excavation area that requires removal, collection, filtering, treatment, and/or discharge, as appropriate, to achieve the excavation limits shown on the Drawings.

SECTION 31 23 00 – EXCAVATION AND FILL

- h. Procedures to excavate and handle excavated materials to be disposed of at the Upland Disposal Facility (UDF) or the appropriate off-site facility, as specified by the Construction Manager.
 - i. Procedures, means, methods, and best management practices that will be implemented to minimize dust generation during excavation, material handling, and backfilling.
 - j. List of proposed equipment for excavation, backfilling, and compaction Work.
 - k. Planned sequence of excavation and backfilling operations.
 - l. Detailed schedule of excavation and backfilling Work in accordance with the accepted Progress Schedule.
2. Qualifications Statements:
- a. Testing Laboratory: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.
3. Source Quality Control Submittals: Submit Supplier name, source address, and proof of MassDOT approval, as required, for each proposed source of fill material.
4. Delivery Tickets: Submit copy of delivery ticket for each load of general fill material, subbase material, and pipe bedding material delivered to the Site. Each delivery ticket shall indicate Supplier name and source address, project name, contract number, date, material type, MassDOT item number when applicable, and quantity delivered.
5. Daily Reports:
- a. The Contractor shall prepare and submit a Daily Activities Report. This report shall be submitted to the Construction Manager the day following the Work performed. At a minimum, the Daily Activities Reports shall include the following:
 - 1) A description of general Work activities;
 - 2) The location of excavation and backfilling operations, and daily production rates for each;
 - 3) Survey results, if applicable, and drawings or other visual presentation to show the progress of excavation and backfilling activities each day;
 - 4) Material Hauling Trip Logs, including the date, number of trucks filled and destination (i.e., staging area, UDF, or off-site disposal facility), type of material loaded (e.g., soil, debris, and vegetation), and estimated quantity of material;
 - 5) Hours of downtime and cause(s) of downtime;

SECTION 31 23 00 – EXCAVATION AND FILL

- 6) Any loss of material, accidents, or other incidents that impacted normal operations; and
 - 7) Any measures taken in response to exceedance of environmental monitoring compliance standards in accordance with Section 01572 – Construction Environmental Restrictions and Controls.
6. Field Quality Control Submittals:
- a. Laboratory Test Reports: Submit in accordance with Paragraph 3.10 of this Section.
 - b. Daily Inspection Logs: Submit in accordance with Paragraph 3.10 of this Section.

1.05 SITE CONDITIONS

A. Subsurface Information:

1. Data and information from previous investigations are available in the Reference Documents provided to the Contractor. The Construction Manager will not be responsible for interpretations or conclusions drawn therefrom by Contractor.
2. The results of prior surveys and investigations are indicative of general conditions. Variations in the properties of the materials are to be expected. Information regarding the physical and chemical properties of materials associated with the Work is provided in the supplemental reference information identified in the Reference Documents. The information is based on field investigation and laboratory testing of the materials. The data and results of prior surveys and investigations reflect available information at the time of data collection, are approximate, and may have changed since the time of data collection. Although the results of such investigations are considered generally representative of conditions at their respective locations at the time of the investigation, local variations in the materials are to be expected and, if encountered, shall not be considered materially different within the purview of the Contract.
3. Soil borings and other exploratory operations may be made by Contractor. Coordinate Contractor-performed test borings and other exploratory operations with the Owner and utility owners as appropriate. Perform such explorations without disrupting or otherwise adversely affecting operations of Owner or utility owners. Comply with Laws and Regulations relative to required notifications.

B. Existing Structures or Facilities:

1. Existing structures and underground facilities adjacent to or within the limits of the Work may be encountered during construction. These structures or facilities may include, but are not necessarily limited to, sewers, drains, water mains, gas mains, electrical conduits, and their appurtenances. These facilities may or may not be shown on the Design Drawings. However, the sizes, locations, heights, and depths, if indicated, are only approximate and the Contractor shall conduct its operations with

SECTION 31 23 00 – EXCAVATION AND FILL

caution and satisfy itself as to the accuracy of the information given. The Contractor shall not claim, nor shall it be entitled to receive compensation for damages sustained by reason of the inaccuracy of the information given or by reason of its failure to properly maintain and support such structures. Existing structures and underground facilities shall be supported and protected from damage by Contractor. Immediately repair and restore existing structures and underground facilities damaged by Contractor.

2. The Contractor shall notify Massachusetts Dig Safe at least 72 hours prior to any site work.
3. If underground facilities are known to exist in an area but their location is uncertain, the Contractor shall exercise reasonable care in its excavation technique to avoid damage to them.
4. Movement or operation of construction equipment over underground facilities shall be at Contractor's sole risk and only after Contractor has prepared and submitted to Construction Manager and utility owners (as applicable), and received acceptance therefrom, a plan describing Contractor's analysis of the loads to be imparted and Contractor's proposed measures to protect structures and underground facilities during the Project.
5. Notify owners of nearby underground facilities when excavation is to take place, allowing them reasonable time to institute precautionary procedures or preventive measures which they deem necessary for protection of their facilities.
6. Coordinate with utility owners for shut off of services in active piping and conduits, and for testing, shut off of services, and draining, purging, or de-energizing where specified or required of piping and conduits of unknown status. When required by utility Owner, Construction Manager will assist Contractor with utility owner notifications. Completely remove buried piping and conduits indicated for removal and not otherwise indicated as being abandoned or to remain in place.
7. In general, service lines and laterals to individual houses and businesses are not shown; however, Contractor shall assume that a service exists for each utility owner to each property.
8. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when such interruption is indicated in the Contract Documents or when allowed in writing by Construction Manager after acceptable temporary utility services are provided by Contractor for the affected structure or property. Immediately notify any utility owner of any damage to its underground facilities resulting from the Contractor's operations and arrange for repairs to be made as soon as possible.
9. The Contractor shall be responsible for identification, location, and protection of all utilities and structures (e.g., manholes, utility poles, sewer lines, water lines, gas lines, overhead lines, and other structures/utilities) prior to and during the Work.

SECTION 31 23 00 – EXCAVATION AND FILL

PART 2 – PRODUCTS

2.01 MATERIALS

- A. None – See Sections 31 05 13 – Soils and Aggregates for specifications related to fill materials.

PART 3 – EXECUTION

3.01 INSPECTION

- A. The Contractor shall conduct field reconnaissance and survey activities as necessary to plan the Work and identify any potential obstacles.
- B. Provide Construction Manager with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading Work will be performed. Construction Manager will advise Contractor in writing when Construction Manager is aware of conditions that may be detrimental to proper and timely completion of the Work.
- C. Areas to be filled shall be inspected and approved by the Construction Manager prior to filling operations. Remove unsuitable materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by Construction Manager.
- D. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Dust, Noise, and Odor Control: Provide odor and dust controls in accordance with Section 01572 – Construction Environmental Restrictions and Controls.
- B. Survey Control: The Contractor shall establish and maintain survey control prior to and throughout the duration of Work as described in Section 02 21 00 – Surveys.
- C. Erosion and Sediment Control: Provide temporary erosion and sediment controls in accordance with 31 25 00 – Erosion and Sediment Controls.
- D. Site Preparation:
 - 1. Clearing and Grubbing: Comply with Section 31 11 00 – Clearing and Grubbing.
- E. Temporary Barriers:
 - 1. Provide temporary barrier surrounding excavations and excavation work areas to provide temporary protection to persons and property. Barrier shall have openings only at vehicular, equipment, and worker access points.
 - 2. During non-working hours, completely enclose all sides of excavation with temporary barriers.

SECTION 31 23 00 – EXCAVATION AND FILL

3. Minimum Material Requirements for Temporary Barriers:

- a. Temporary barrier shall be not less than snow fence-type fencing, 4 feet high.
- b. Fence shall be constructed of vertical hardwood slats measuring not less than 1.5 inches by 1/4 inch interwoven with strands of horizontal wire or shall be of equivalent plastic construction.
- c. Posts:
 - 1) Posts shall be steel, either "U"-, "Y"-, or "T"-shaped, or channel section.
 - 2) Posts shall have a nominal weight of not less than 1/3-pound per linear foot, exclusive of the anchor.
 - 3) Posts shall have tapered anchors weighing not less than 0.67 pound, each firmly attached by means of welding, riveting, or clamping.
 - 4) Posts shall have corrugations, knobs, notches, or studs placed and constructed to engage a substantial number of fence line wire in the proper position.
- d. Provide each post with sufficient quantity of galvanized wire fasteners or clamps, of not less than 0.120 inch in diameter, for attaching fence wire to post.

3.03 TEST PITS

- A. In advance of the construction, excavate, make observations and measurements, and fill test pits to determine conditions or location of existing structures and underground facilities. Perform all Work required in connection with excavating, stockpiling, maintaining, and filling test pits. Contractor shall be responsible for the definite location of each existing structure and underground facilities involved within the areas of excavation for the Work. Exercise care during such location work to avoid damaging and disrupting the affected structure or underground facilities. Contractor shall be responsible for repairing damage caused during the Work to existing structures or underground facilities to remain.
- B. There shall be no separate payment for test pits.

3.04 DEWATERING

- A. General:
 1. Provide and maintain adequate drainage and dewatering equipment to remove and dispose of all surface water and groundwater entering excavation and fill areas, or other parts of the Work and work areas. To the extent practicable, keep each excavation and fill areas dry during excavation, subgrade preparation, and continually thereafter until backfilling operations are completed and acceptable to Construction Manager.
 2. Keep all working areas at the Sites free of surface water at all times. Provide temporary drainage ditches and temporary dikes and provide required temporary

SECTION 31 23 00 – EXCAVATION AND FILL

pumping and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavation and fill areas. Perform diversion and removal of surface water in a manner that prevents accumulation of water behind permanent or temporary structures and at any other locations in the work area where such accumulations may be detrimental.

3. Contractor shall be responsible for the condition of piping, conduits, and channels used for drainage, and such piping, conduits, and channels shall be clean and free of sediment. Piping, conduits, and channels used for drainage shall not be located in environmentally-sensitive areas such as wetlands.

B. Temporary Dewatering System:

1. Contractor shall design, provide, operate, and maintain dewatering system to include sufficient trenches, sumps, pumps, hose, piping, well points, and similar facilities, necessary to depress and maintain groundwater level 2 feet below the base of excavation areas until backfilling operations are completed and acceptable to the Construction Manager.
2. Design and operate dewatering system to avoid settlement and damage to existing structures and underground facilities, and to minimize the turbidity of the collected water.
3. To the extent practicable, groundwater table shall be lowered in advance of excavation for a sufficient period of time to allow dewatering of fine grain soils.
4. Operate dewatering system continuously during active excavation and backfilling Work as necessary to maintain acceptable working conditions. Provide standby pumping facilities and personnel to maintain the continued effectiveness of the system. Do not discontinue dewatering operations without first obtaining Construction Manager 's acceptance for such discontinuation.
5. If, in the Construction Manager 's opinion, groundwater levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices, as necessary.
6. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable. Location of temporary dewatering system shall not affect utility owners, adjacent wetlands, public access to streets and drives, or access to private property, unless approved by authorities having jurisdiction.

C. Disposal of Water Removed by Dewatering System:

1. Water resulting from excavation and fill area dewatering shall be discharged in a manner that does not cause excessive erosion or sedimentation and at an on-site location approved by the Construction Manager.

SECTION 31 23 00 – EXCAVATION AND FILL

3.05 EXCAVATION

- A. Before substantive earthwork is started for the Utility Drive rail transload area, the top approximate six-inch layer of topsoil shall be scraped across the limit of construction area and staged on site, in the area illustrated on the Design Drawings, for reuse as topsoil during restoration.
- B. Perform all excavation required to complete the Work as shown, specified, and required in the Design Drawings. Excavation shall include removing and handling of earth, sand, gravel, soft, weathered, or decomposed rock, pavements, rubbish, debris, and other materials within the excavation limits. The Contractor shall minimize over excavation to the greatest extent practicable.
- C. Extent of open excavations shall be minimized to the greatest extent practical.
- D. Excavation Protection: The Contractor shall be responsible for implementing measures to maintain stable excavations and grades. Provide excavation protection systems in accordance with Laws and Regulations to prevent injury to persons and property, including surface structures and underground facilities.
- E. Unauthorized Excavation: All excavations outside the extents shown or indicated and not approved by the Construction Manager, together with appropriate handling of the excavated material and restoring the area, shall be the sole responsibility of the Contractor. It shall be the Contractor's sole responsibility to fill unauthorized excavations at the direction and to the satisfaction of the Construction Manager.
- F. Maintain excavations in dry condition in accordance with Article 3.04 of this Section.
- G. As required based on the rail transload area location and pre-characterization results, the Contractor shall excavate, handle, stage, segregate, and dispose of excavated materials to be transported to the UDF separately from materials to be transported to an appropriate off-site disposal facility.
- H. Subgrades:
 - 1. General:
 - a. Subgrades shall be firm and intact, dense, and thoroughly compacted and consolidated; shall be free of standing water and mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades that are otherwise solid but become soft or mucky on top due to construction operations shall be reinforced with general fill material. Finished elevation of stabilized subgrades shall not be above subgrade elevations shown or indicated.
 - b. If, in the Construction Manager's opinion, subgrade becomes softened or mucky because of construction delays, failure to dewater properly, or other cause within Contractor's control, the subgrade shall be excavated to firm material, trimmed, and backfilled with compacted general fill material.

SECTION 31 23 00 – EXCAVATION AND FILL

I. Pipe Trench Preparation:

1. Not more than 100 feet of trench shall be opened in advance of installing pipe in trench.
2. Trench width shall be minimized to the greatest extent practical, and shall comply with the following:
 - a. Trench width shall be sufficient to provide space for installing, jointing, and inspecting piping. Refer to the Drawings for trench requirements. In no case shall trench be wider at top of pipe than pipe barrel OD plus 2 feet, unless otherwise shown or indicated or as necessary to facilitate manhole installation.
 - b. Enlargement of trench width at pipe joints may be made when required and approved by Construction Manager.
 - c. Trench width shall be sufficient for shoring and bracing or shielding and dewatering.
 - d. Trench width shall be sufficient to allow thorough compaction of fill adjacent to bottom half of pipe.
 - e. Do not use excavating equipment that requires the trench to be excavated to excessive width.
3. Depth of trench shall be as shown or indicated on the Drawings. If required and approved by Construction Manager in writing, depths may be revised.
4. Where bedrock or other unyielding material is encountered at the bottom of the trench, remove such material to a minimum depth of 6 inches below the bottom of the pipe and replace with pipe bedding material.
5. Where Construction Manager considers existing material beneath bedding material unsuitable, remove and replace such unsuitable material with pipe bedding material.

3.06 FILL AND COMPACTION

- A. Provide and compact all fill required for the finished grades as shown on the Design Drawings.
- B. Construction fill material that includes organic materials or other unacceptable materials shall be removed and replaced with approved fill material in accordance with the Contract Documents.
- C. Placement:
 1. Place fill to the grades shown on the Design Drawings or indicated. Bring up evenly on all sides fill around structures and underground facilities. Drainage of the areas being filled shall be maintained at all times.
 2. Where geosynthetics are used, the Contractor shall use appropriately sized equipment and methods when placing and compacting fill so as not to damage

SECTION 31 23 00 – EXCAVATION AND FILL

underlying geosynthetic materials. Areas where geosynthetics may have been damaged during fill installation, as determined by the Construction Manager, shall be inspected, and repaired, if necessary, in accordance with the manufacturer's recommendations.

3. Place fill materials to the density specified for each material type. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range, if required. Furnish and use equipment capable of discing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials requires moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.
4. During construction of the rail transload areas, the Contractor shall adhere to the following requirements for the placement of fill in Topsoil Seed areas indicated on the Design Drawings:
 - a. The Contractor shall place and compact General Fill from the bottom of the excavation or from existing grade to a depth of 4 inches below the final required grade.
 - b. The upper 4 inches of the fill shall be Topsoil and shall be uncompacted to create the final required grade.
5. During restoration of the Utility Drive property after removal of the rail transload areas, in accordance with Section 32 30 00 – Restoration, Planting, and Seeding, the Contractor shall adhere to the following requirements for the placement of fill:
 - a. The Contractor shall place and compact General Fill from the bottom of the excavation to a depth of 6 inches below the final required grade.
 - b. The upper 6 inches of the fill shall be Topsoil and shall be uncompacted to create the final required grade.
 - c. The Topsoil to be used during restoration shall be the topsoil stripped and stockpiled during construction of the Utility Drive rail transload area, in accordance with Paragraph 3.05.A and the Design Drawings.

D. Compaction:

1. General:

- a. The Contractor shall adopt compaction methods that produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support.
- b. Compaction methods used shall avoid disturbance to underlying fine-grained soils, subsurface utilities, and any underlying geosynthetics.

SECTION 31 23 00 – EXCAVATION AND FILL

- c. Hydraulic compaction by ponding or jetting shall not be permitted.
 - d. Backfill material shall not be left in an uncompacted state at the close of a day's construction.
 - e. Prior to terminating work, ridges of soil left on the final layer of compacted fill, by tractors, trucks, or other equipment used for compaction, shall be eliminated using low-pressure equipment. However, soil surfaces may be left in a "tracked" condition (i.e., with parallel indentations from the tracks of tracked equipment running horizontally along the slope) for purposes of erosion and sediment control.
 - f. As fill progresses, the surface shall be graded such that no ponding of water shall occur on the surface of the fill.
2. Equipment:
- a. Unless otherwise specified, equipment for compaction shall be consistent with space limitations of the work areas.
 - b. Compaction of fill material in confined areas shall be accomplished by means of a drum-type, power-driven, hand-guided vibratory compactor, or by hand-guided vibratory plate tampers.
 - c. If the proposed method does not produce the degree of compaction required, an alternate method shall be adopted until the required compaction is achieved.
3. Minimum Compaction Requirements:
- a. Unless otherwise specified on the Design Drawings, the degree of compaction specified for the various items listed below in Table 31 23 00-A shall be the minimum allowable compaction required. Unless the Contractor can successfully demonstrate that its methods will produce the required degree of compaction, materials to be compacted shall be placed in layers not exceeding the uncompacted thicknesses listed in Table 31 22 00-A. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.
 - b. Perform compaction with equipment suitable for the type of fill material placed. Select and use equipment capable of providing the minimum density required in the Contract Documents. Furnish and use equipment capable of compacting in restricted areas next to structures and around piping and underground facilities. Effectiveness of the equipment selected by Contractor shall be tested at start of compacted fill Work by constructing a small section of fill within or adjacent to the area where fill will be placed. Record total number of coverages with selected compaction equipment and perform field moisture content and density tests to ensure that specified compaction of fill has been obtained. If tests on the test section of fill indicate that required compaction has not obtained, do one or more of the following:

SECTION 31 23 00 – EXCAVATION AND FILL

- 1) Increase the amount of coverages.
 - 2) Decrease the lift thicknesses.
 - 3) Use different compaction equipment.
- c. Place fill materials in horizontal, loose lifts, not exceeding specified uncompacted thickness. The maximum lift thickness is 12 inches (measured prior to compaction), unless otherwise noted in this Section or on the Design Drawings Place fill in a manner ensuring uniform lift thickness after placing. Mechanically compact each lift, by not less than three complete coverages of the compactor. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of compactor's compacting surface. Compaction of fill materials by inundation with water is unacceptable.
- d. Do not place fill materials when standing water is present on surface of the area where fill will be placed unless otherwise approved by the Construction Manager. Do not compact fill when standing water is present on the fill to be compacted. Do not place or compact fill in a frozen condition or on top of frozen material. Do not place frozen material nor material that contains frozen fragments when placed. No calcium chloride or other chemicals shall be added to prevent freezing. Fill containing organic materials or other unacceptable materials previously described shall be removed and replaced prior to compaction.
- e. Degree of compaction to be verified using in-place density tests (using ASTM D6938) every 5,000 cubic yards of fill material placed and shall be performed by a certified geotechnical testing company. Submit test results as specified in Paragraph 3.10. The Construction Manager may order additional in-place density tests to ascertain conformance with the compaction requirements shown in Table 31 22 00-A.
- 1) The Contractor shall dig test holes when requested by the Construction Manager for the purpose of taking an in-place density test below the current fill level.
 - 2) The Contractor shall provide free access to fill areas for the purpose of making such tests. Payment for all compaction tests shall be made by the Contractor.
 - 3) The Contractor shall anticipate time needed due to testing procedures and shall not have claims for extra compensation occasioned by such time.
- f. If required densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, Contractor shall perform all work required to provide the required densities. Such work shall include complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.

SECTION 31 23 00 – EXCAVATION AND FILL

- g. Construction Manager may approve material thicknesses by hand-shoveling and measuring the observed material thickness.
- h. Contractor shall repair observed or measured settlement. Make repairs and replacements, as required, within five days after being so advised by Construction Manager.
- i. When proof-rolling existing (or native) soils, the layer shall be acceptable when deformations caused by substantial earthwork equipment (e.g., roller, fully loaded dump truck) are no deeper than 1 inch. All soft or wet materials that continue to deform more than 1 inch shall be removed and replaced with suitable material and retested by the Contractor.

**TABLE 31 23 00-A
MINIMUM DENSITY REQUIREMENTS**

Fill Material	Maximum Uncompacted Lift Thickness (inches)	Minimum Percent Compaction
Excavated Subgrade – Existing Undisturbed Soils (fill areas)	Not Applicable	Proof-rolling
General Fill More than Five Feet Below Final Grade Less than Five Feet Below Final Grade	12 8	92% (ASTM D1557) 95% (ASTM D1557) 1 test per lift per ~5,000 square feet
Structural Fill	6	95% (ASTM D1557) 1 test per lift per ~5,000 square feet
Subballast (see also Section 34 72 00 – Railway Construction)	8	90% (ASTM D1557) 1 test per lift per ~5,000 square feet
Gravel Subbase – Gravel Access Road Area, Parking Lot	6	95% (ASTM D1557) 1 test per lift per ~5,000 square feet
Processed Aggregate Base – Asphalt Subbase	6	95% (ASTM D1557) 1 test per lift per ~5,000 square feet
Stone – Pipe Bedding	6	Compact by appropriate sized roller equipment (minimum three passes)
Topsoil	6	Compact by placing/tracking only
Road Base Mix	6	Compact by appropriate sized roller equipment (minimum three passes)

E. Fill in Pipe Trenches:

- 1. Where shown or indicated, provide geotextile separation fabric between pipe embedment and native material in accordance with Section 31 05 19.13 – Geotextiles for Earthwork.
- 2. Place pipe bedding material in pipe trenches in horizontal layers, and thoroughly compact each layer before the next layer is placed.

SECTION 31 23 00 – EXCAVATION AND FILL

3. Pipe trenches may be backfilled prior to testing of piping unless the nature of the test requires observation of piping during testing.
4. Pipe Bedding: Install piping on not less than 4-inch layer of pipe bedding material. Pipe bedding material shall extend 12 inches above the top of the pipe.
5. Placing and Compacting Pipe Trench Fill: Unless otherwise shown, placement and compaction of pipe trench fill material shall comply with the following:
 - a. Pipe bedding material shall be spread and the surface graded to provide a uniform and continuous support beneath piping at all points between bell holes or pipe joints. Slight disturbance of installed pipe bedding material surface during withdrawal of pipe slings or other lifting tackle is acceptable.
 - b. After each pipe's bedding material has been graded and the piping has been aligned, joined in accordance with the Contract Documents, and placed in final position on bedding material, provide and compact sufficient pipe trench fill material under and around each side of the pipe and back of the bell or end thereof to hold piping in proper position and maintain alignment during subsequent pipe jointing and embedment operations. Deposit and compact pipe trench fill material uniformly and simultaneously on each side of piping to prevent lateral displacement of piping. Place and compact pipe trench fill material to an elevation 12 inches above top of pipe, unless otherwise shown or specified.
 - c. Each layer of pipe trench fill material shall be compacted by at least two complete coverages of all portions of surface of each lift using appropriate compaction equipment.
 - d. Method of compaction and compaction equipment used shall be appropriate for material to be compacted and shall not transmit damaging shocks to the piping.

F. Subbase Placement:

1. Provide subbase material where indicated in the Contract Documents and to the limits required.
2. Place subbase material in compacted lifts not exceeding the specified thicknesses for each lift.

G. Compaction Density Requirements:

1. All soils and aggregates used for fill shall be compacted to the density specified for each material type.
2. Fill shall be wetted and thoroughly mixed to achieve optimum moisture content plus-or-minus three percent.
3. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as specified for their material type.

SECTION 31 23 00 – EXCAVATION AND FILL

4. Field quality control testing for density, to verify that specified density was obtained, shall be performed in accordance with Paragraph 3.10 of this Section.
 5. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by Construction Manager) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.
- H. Replacement of Unacceptable Excavated Materials: In cases where over-excavation to replace unacceptable soil materials is required, backfill the excavation to required subgrade with general fill material and thoroughly compact in accordance with Paragraph 3.06.F of this Section.

3.07 GRADING

A. General:

1. After the completion of all fill operations, grade the site to the lines, grades, and elevations shown on the Design Drawings, taking into account any subsequent construction and site restoration requirements.
2. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
3. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
4. Blend grading over trench or excavation to elevations shown or indicated. Where elevations are not shown or indicated, blend finished grade with existing grade on each side of trench or excavation.

B. Grading Outside Rail Lines: Grade areas adjacent to rail lines to drain away from infrastructures and to prevent ponding. Finish surfaces free of irregular surface changes, and comply with the following:

1. Grassed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover to within not more than 1 inch above or below the required subgrade elevations.
2. Pavements: Shape surface of areas under pavements to line, grade, and cross section, with finish surface not more than 1/2 inch above or below the required subgrade elevation.

C. Compaction: After grading, compact subgrade surfaces to achieve required subgrade elevations and percentage of maximum density for each material classification.

SECTION 31 23 00 – EXCAVATION AND FILL

3.08 SUBBASE COURSE FOR ASPHALT

A. General:

1. After completing filling and grading, shape and compact subgrade to an even, firm foundation in accordance with this Section. Remove unsuitable subgrade materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by Construction Manager.
2. Place subbase material over ground surface to support pavement base course or crushed stone surfacing.
3. Install asphalt in accordance with Section 32 12 00 – Flexible Paving.

B. Grade Control: During construction, maintain lines and grades, including crown and cross-slope of subbase course.

C. Subbase Course Placement:

1. Place subbase course material on prepared subgrade in layers of uniform thickness, in accordance with indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placing operations.
2. Compaction and Grade Control: Comply with compaction requirements for excavation and fill in this Section, and the following requirements:
 - a. Compaction with roller shall begin at the sides of the area to be paved or receive crushed stone surfacing and shall continue toward the center. Continue compaction until there is no movement of the course ahead of the roller.
 - b. After rolling, check for grade with a line not less than 40 feet in length. Depressions over 1/2 inch deep shall be filled to satisfaction of Construction Manager.
3. After completing compaction, other than that necessary for bringing material for the next course, do not haul or drive over the compacted subbase.
4. Do not install subbase in excess of 500 feet in length without compacting to prevent softening of the subgrade.
5. If subgrade material becomes churned up into or mixed with the subbase material, remove the mixed material and replace it with clean, compacted subbase material.

3.09 SUBBALLAST AND BALLAST FOR RAIL

A. General:

1. After completing filling and grading, shape and compact subgrade to an even, firm foundation in accordance with this Section. Remove unsuitable subgrade materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by Construction Manager.

SECTION 31 23 00 – EXCAVATION AND FILL

2. Place structural fill material over ground surface, where required by the Design Drawings, to support subballast and other rail infrastructure.
3. Install subballast and ballast in accordance with Section 34 72 00 – Railway Construction.

3.10 QUALITY CONTROL

- A. Perform in-place density testing of fill materials in accordance with Section 3.06 D.3.
- B. Submit test results, certified by testing laboratory, to Construction Manager within 24 hours after completion of test, including:
 1. Results of moisture/density tests performed on fill materials (determined by ASTM D1557).
 2. Results of in-place density tests performed on fill materials (determined by ASTM D6938).
- C. If testing laboratory reports or inspections indicate subgrade, bedding, or fill compaction below specified density, Contractor shall remove unacceptable materials as necessary and replace with specified materials, and provide additional compaction until subgrades, bedding, and fills are acceptable. Contractor shall retest subgrade, bedding, or fills that did not originally comply with specified density.
- D. Earthwork Inspections:
 1. Perform daily or more frequent inspections of all excavations, adjacent areas, and protective systems as required by Laws and Regulations and this Section to ensure their continued effectiveness and integrity, and the safety of exposed employees.
 2. Inspections shall be performed by Contractor's competent person, together with Construction Manager:
 - a. Prior to the start of Work and as needed throughout the day.
 - b. After every rainstorm or other hazard-increasing occurrence.
 3. Where Contractor's competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions or corrective actions have been taken to ensure their safety.
 4. Document the date, time, and outcome of each inspection in a dedicated log. Submit copy of inspection log to Construction Manager with daily construction report.

3.11 CRITERIA AND TOLERANCES

- A. Excavation and fill materials shall be constructed to the lines and grades shown on the contract drawings unless otherwise requested by the Construction Manager. Acceptance of final grades will be based on site observations by the Construction

SECTION 31 23 00 – EXCAVATION AND FILL

Manager and review of a final as-built survey information by the Construction Manager. Any settlements that occur prior to final acceptance of the work shall be restored to design and/or intended grades by the contractor.

3.12 OTHER REQUIREMENTS

A. Unfinished Work:

1. When for any reason, the work is to be left unfinished, all trenches and excavations shall be filled, and all roadways and watercourses left unobstructed with their surfaces in a safe and satisfactory condition.

B. Hauling Material on Street:

1. When hauling material over the streets or pavement, the Contractor shall provide suitably tight-sealing vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets, and pavements clean and free from dirt, mud, stone, and other hauled material.

- END OF SECTION -

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Prepare a Stormwater Pollution Prevention Plan (SWPPP) to meet the substantive provisions of the latest National Pollutant Discharge Elimination System (NPDES) Construction General Permit. The SWPPP that will describe controls and inspection requirements to reduce pollution from erosion and sedimentation during the construction of the rail transload areas and protect nearby water resources.
2. The Contractor shall prepare a SWPPP to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities. In particular, the plan shall identify control measures to mitigate erosion and sedimentation into wetlands and Vernal Pools not intended for excavation or disturbance during the Work. The plan shall identify all stormwater management activities needed during land disturbance and construction, including source control and pollution prevention measures, best management practices (BMPs) to address erosion and sedimentation, stabilization measures, and procedures for operating and maintaining the BMPs, especially in response to wet weather events and frost. The plan shall include a schedule for sequencing construction and stormwater management activities that minimizes land disturbance by ensuring vegetation is preserved to the extent practicable and disturbed portions of the Site are stabilized as quickly as possible.
3. The Contractor shall be responsible for implementation of the SWPPP for the duration of the Contract, including installing, maintaining, and inspecting the necessary controls and stabilization measures. Implementation of the SWPPP shall be required until the disturbed area is fully stabilized and the temporary erosion and sedimentation controls are removed. The Contractor shall not remove temporary erosion and sedimentation controls until written approval is provided by the Construction Manager.

1.02 RELATED SECTIONS

- A. Section 31 11 00 – Clearing and Grubbing.
- B. Section 31 23 00 – Excavation and Fill.

1.03 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and Stormwater Standards.

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

1.04 SUBMITTALS

- A. The Contractor shall prepare and submit the SWPPP.
- B. The Contractor shall submit the manufacturer's product data, specifications, and installation instructions for all products listed in the SWPPP.
- C. The Contractor shall documentation of inspection and maintenance of erosion and sedimentation controls as required by the SWPPP.

PART 2 – PRODUCTS

2.01 EROSION AND SEDIMENT CONTROLS

- A. General:
 - 1. Materials used for erosion and sediment controls shall be in accordance with the applicable regulatory requirements and the approved SWPPP.
- B. Reinforced Silt Fencing:
 - 1. Filter Fabric:
 - a. Material: Geotextile shall comply with MassDEP guidelines for Soil Erosion and Sediment Control standard and specifications for silt fencing.
 - b. Height shall be 16 inches minimum.
 - 2. Fence Support Posts:
 - a. Material: Hardwood or steel posts may be used.
 - 1) Hardwood posts shall be at least 1.25 by 1.25 inches in cross section.
 - 2) Steel posts shall be "T" or "U" in shape in cross section with a minimum weight of 1 pound per linear foot.
 - b. Length shall be at least 4 feet.
 - 3. Wire Reinforcing: Wire fencing shall be at least 14 gauge with a maximum 6-inch mesh opening or otherwise as approved by the Construction Manager.
 - 4. Fabric fasteners shall be heavy-duty staples, wire ties, or other fasteners compatible with support post material.
- C. Temporary Erosion Control Blankets: Type 3.B, in accordance with Federal Highway Administration FP-03, Section 713.17.
 - 1. Product and Manufacturer: Provide one of the following:
 - a. ECSC-2B by East Coast Erosion Blankets, LLC.
 - b. Curlex II FibreNet by American Excelsior Company.
 - c. Equal as approved by the Construction Manager.

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

2. Erosion control blankets shall be 100% natural and biodegradable and shall not incorporate plastic netting of any kind. Acceptable materials include jute, excelsior, straw or coconut fiber, and cotton.
3. Staples or anchoring stakes shall be 100% biodegradable.

D. Straw Wattles:

1. 12-inch diameter, biodegradable straw wattle, 100% weed free.
2. Up to 24-month life expectancy.
3. 1/8-inch mesh opening.
4. Minimum strength of 180 pounds per square inch per ASTM International 5035.

PART 3 – EXECUTION

3.01 EROSION AND SEDIMENT CONTROL

A. Installation and Maintenance:

1. General:
 - a. No land disturbance activities shall commence until the SWPPP is approved as part of the SIP.
 - b. Install and maintain erosion and sediment controls as shown on the Design Drawings and as specified in the approved SWPPP. Install erosion and sediment controls prior to any land disturbance activities and maintain the controls throughout the duration of the Work.
 - c. Use necessary methods to successfully control erosion and sedimentation, including ecology-oriented construction practices, vegetative measures, and mechanical controls. Use BMPs in accordance with applicable laws and regulations, and regulatory requirements to control erosion and sedimentation during the Project.
 - d. Plan and execute construction, disturbances of soils, and earthwork by methods to control surface drainage from cuts and fills to prevent erosion and sedimentation. Provide temporary measures for controlling erosion and sedimentation as indicated in the SWPPP.
 - e. Regulate drainage and control erosion and sedimentation in areas cleared for storage of materials or equipment, or for temporary facilities.
 - f. Provide erosion and sediment controls, including stabilization of soils, at the end of each workday.
2. Provide all required erosion and sediment control measures for the areas where soil will be disturbed before commencing activities that will disturb soil at the Site.

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

3. Provide erosion and sediment control measures to divert rainfall runoff from entering Work Areas and open excavations.
4. Implement construction procedures associated with, or that may affect, erosion and sediment control to ensure minimum damage to the environment during construction.
5. Straw wattles will be used as needed, including along gravel access roads, in areas where surface water flow is evident (e.g., scour zones or swales) to prevent material migration. Installation procedures for straw wattles include the removal of vegetation, native leaf litter, and debris so that wattles will be in firm contact with the soil surface.
6. Vegetation Removal:
 - a. Remove only those shrubs, grasses, and other vegetation that must be removed for construction. Protect remaining vegetation in accordance with Section 31 11 00 – Clearing and Grubbing.
7. Earthwork and Temporary Controls:
 - a. Control erosion to minimize transport of silt from the Site into existing waterways and surface waters. Such measures shall include, but are not limited to, using berms, silt fencing, gravel or crushed stone, and slope drains. Apply such temporary measures to erodible materials exposed by activities associated with the remedial construction.
 - b. Hold the areas of bare soil exposed at one time to a minimum.
 - c. Provide special care in areas with steep slopes. Minimize vegetation disturbance to maintain soil stability.
8. Inspection and Maintenance:
 - a. The Contractor shall inspect areas of earthwork and areas where soil is disturbed to identify evidence of the start of erosion and sedimentation daily; apply corrective measures as required to control erosion and sedimentation. Continue inspections and corrective measures until soils are permanently stabilized and permanent vegetation has been established.
 - b. Inspect erosion and sediment controls daily and prior to conducting any intrusive activities. During Work, erosion and sediment controls shall be inspected at least once every 7 days until construction is complete.
 - c. Repair or replace damaged erosion and sediment controls within 1 day of becoming aware of such damage.
 - d. Periodically remove silt and sediment that has accumulated in or behind sediment and erosion controls. Properly dispose of silt and sediment.

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

9. Duration of Erosion and Sediment Controls:

- a. Maintain erosion and sediment controls in effective working condition until the associated drainage area has been permanently stabilized.
- b. Maintain erosion and sediment controls until the Site is restored, underlying soils are permanently stabilized, and permanent vegetation has been established.
- c. Remove silt fencing from within the boundaries of the Work Areas and from around perimeters prior to the first post-construction winter freeze, upon direction by the Construction Manager.

10. Work Stoppage: Provide additional temporary controls necessary to prevent environmental damage to the Site and adjacent areas if the Work is temporarily stopped or suspended for any reason.

B. Reinforced Silt Fencing:

1. Locations of Reinforced Silt Fencing:

- a. Install silt fencing at the locations shown in the Design Drawings and elsewhere as needed to control runoff in accordance with SWPPP.
- b. On slopes, install silt fencing at intervals that do not exceed the maximum lengths indicated in the table below unless otherwise approved by the Construction Manager.

MAXIMUM LENGTH OF UPGRADIENT SLOPE BETWEEN RUNS

SLOPE	UPGRADIENT SLOPE LENGTH (FEET)
<2%	N/A
2%–10%	250
10%–20%	150
20%–33%	80
33%–50%	70
>50%	30

- c. Provide silt fencing around the perimeter of each stockpile of topsoil, general fill material, and excavated material. Install silt fencing before expected precipitation and maintain it until the stockpile is removed.
- d. Do not install silt fencing at the following types of locations:
 - 1) Area of concentrated stormwater flows such as ditches, swales, or channels;
 - 2) Where rock or rocky soils prevent full and uniform anchoring of silt fencing; and
 - 3) Across upstream or discharge ends of stormwater piping or culverts.

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS

2. Installation:

- a. Securely fasten filter fabric to each support post in no fewer than four locations. Spacing between support posts shall not exceed 8 feet (center to center).
- b. When two sections of filter fabric abut each other, fold over edges and overlap by at least 6 inches and securely fasten to wire mesh.
- c. Embed posts in the ground to the depth necessary for proper controls but not less than 16 inches below ground surface.
- d. Extend filter fabric at least 6 inches below ground and at least 16 inches above ground.
- e. Bury filter fabric at bottom of silt fence in a trench, in a “J” configuration, to a depth of 6 inches below grade.

3. Maintenance:

- a. Conduct routine inspection at least once every 7 days until construction is complete, including establishment of vegetation.
- b. Remove accumulated sediment when depth reaches half the effective height of the sediment control.
- c. Repair and reinstall silt fencing as required.
- d. Do not allow formation of concentrated stormwater flows on slopes above silt fencing unless so shown or indicated in the Contract Documents. If unauthorized concentrated stormwater flows occur, stabilize the slope via earthmoving and other stabilization measures as required to prevent flow of concentrated stormwater flows toward silt fencing.

3.02 REMOVAL OF EROSION AND SEDIMENT CONTROLS

- A. Remove erosion and sediment controls only when directed by the Construction Manager.

- END OF SECTION -

SECTION 31 32 19 – GEOTEXTILES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. The Contractor shall provide all labor, materials, equipment, services, and incidentals required to furnish and install geotextiles.

B. Related Sections:

1. Section 31 23 00 – Excavation and Fill.
2. Section 31 25 00 – Erosion and Sediment Controls.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. Geosynthetics Research Institute (GRI) GT13, Test Methods and Properties for Geotextiles Used as Separation Between Subgrade Soil and Aggregate.
- B. American Association of State Highway and Transportation Officials (AASHTO) M288, Standard Specification for Geotextile Specification for Highway Applications.
- C. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

1.03 SUBMITTALS

- A. Prior to shipment of any geotextile materials, the Contractor shall submit the following information on the geotextile product to the Construction Manager:
 1. Lot and roll identification numbers for materials.
 2. Quality control certificates that provide reference to the lot and roll identification numbers, sampling procedures, test methods and results, and other items such as the following:
 - a. Name of Manufacturer.
 - b. Chemical Composition.
 - c. Product Identification.
 - d. Statement of Compliance.
 3. All certificates shall be signed by a representative of the manufacturer.
 4. Geotextile quality assurance tests from the manufacturer, including the following:
 - a. Unit weight: ASTM International (ASTM) D-5261.
 - b. Flow rate: ASTM D-4491.
 - c. Permittivity: ASTM D-4491.
 - d. Trapezoidal tear strength: ASTM-D4533.

SECTION 31 32 19 – GEOTEXTILES

- e. Grab elongation: ASTM D-4632.
- f. Apparent opening size: ASTM D-4751.
- g. California Bearing Ratio (CBR) puncture: ASTM D-6241.
- 5. Unless otherwise specified or approved by the Construction Manager, the quality assurance tests by the manufacturer shall be conducted at the frequency of one per lot or one per each 50,000 square feet to be confirmed by the Contractor. One lot is defined as a group of consecutively numbered rolls or panels from the same manufacturing line and using raw materials from the same resin batch.
- 6. The Contractor shall replace any rolls that are rejected for noncompliance with these Specifications.
- 7. If a sample fails to meet the quality control requirements, the Contractor shall ensure the manufacturer tests each roll manufactured from the same resin batch or at the same time as the failing roll.
- 8. Testing shall be at the Contractor's expense and continue until a pattern of acceptable test results is established.

1.04 QUALITY ASSURANCE

- A. The geotextile manufacturer shall be a specialist in the manufacture of geotextile separation and stabilization fabrics and shall have produced and successfully installed a minimum of 5 million square feet of geotextile material.

1.05 DELIVERY STORAGE AND HANDLING

- A. Each roll of geotextile delivered to the Site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number, and roll dimensions.
- B. The Contractor shall inspect all rolls and packages upon delivery to the Site to confirm the materials have not been damaged due to improper transportation, handling, or storage. If the protective wrapping is damaged, or if damage to the roll is suspected, separate the roll from the lot for more detailed inspection.
- C. The Contractor shall notify Construction Manager if any loss or damage to the geotextile exists. The Contractor will replace the loss and repair the damage to new condition in accordance with the manufacturer's instructions.
- D. The Contractor shall protect geotextile from UV light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting, or any other damaging or deleterious conditions. Geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings.
- E. The Contractor shall place geotextile only after the required submittals have been received and reviewed by the Construction Manager and the placement surface has been fully prepared and deemed acceptable for geotextile deployment.

SECTION 31 32 19 – GEOTEXTILES

PART 2 – PRODUCTS

2.01 MATERIALS

A. Nonwoven Geotextile:

1. Nonwoven geotextile shall be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene. The nonwoven geotextile shall be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.
2. Nonwoven geotextile shall be used as a separation layer between dissimilar material types as shown on the Design Drawings. The nonwoven geotextile shall meet GRI GT13 specifications and have the following minimum average roll values (MARVs):

REQUIREMENTS FOR NONWOVEN GEOTEXTILES

PROPERTY	ASTM TEST METHOD	UNIT	VALUE (MARV)
Unit weight	D5261	oz./yd ²	10
Grab tensile strength	D4632	lb	230
Grab tensile elongation	D4632	%	50
Trapezoidal tear strength	D4533	lb	95
Permittivity	D4491	sec ⁻¹	1.3
CBR puncture strength	D6241	lb	700
UV resistance (at 500 hours)	D7238	% strength retained	70

B. Woven Geotextile:

1. Woven geotextile shall be composed of high-tenacity polypropylene yarns woven into a stable network such that the yarns retain their relative position. The woven geotextile shall be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.
2. Woven geotextile shall be used as a separation layer.
3. The woven geotextile shall meet AASHTO M 288-05 requirements for a Class 2 separation geotextile, consist of 95% weight polyethylene or polyester, and have the following MARVs:

REQUIREMENTS FOR WOVEN GEOTEXTILES

PROPERTY	ASTM TEST METHOD	UNIT	VALUE (MARV)
Grab tensile strength	D4632	lb	250
Grab tensile elongation	D4632	%	15
Trapezoidal tear strength	D4533	lb	90
CBR puncture	D6241	lb	700

SECTION 31 32 19 – GEOTEXTILES

PROPERTY	ASTM TEST METHOD	UNIT	VALUE (MARV)
Permittivity	D4491	sec ⁻¹	0.1
Flow rate	D4491	gal/min/ft ²	4
Apparent Opening Size	D4751	mm	0.425
UV resistance (at 500 hours)	D4355	% strength retained	70

PART 3 – EXECUTION

3.01 INSPECTION

- A. The Contractor shall examine the areas and conditions under which the Work will be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to the Construction Manager.

3.02 PREPARATION

- A. The Contractor shall protect existing Site improvements, including streets, drives, underground and aboveground utilities, and adjacent property and structures throughout the Work. The Contractor shall repair any damage to original condition or replace in kind to the satisfaction of the Construction Manager.
- B. The Contractor shall excavate or fill subgrade, as required, to bring subgrade to elevations shown or indicated on the Design Drawings. Confirm that subgrade is at proper elevations and that no further earthwork is required to bring the subgrade to proper elevations. Provide subgrade elevations that slope parallel to finished grade and, in the direction, shown on the Design Drawings.
- C. The Contractor shall remove all stones greater than 2 inches in any dimension, construction debris, trash, rubble, and all other extraneous materials from the subgrade.
- D. The Contractor shall notify the Construction Manager that subgrade has been prepared and obtain the Construction Manager's approval before installing geotextile.

3.03 INSTALLATION

- A. Place (roll out) geotextiles in the direction of most frequent vehicular travel.
- B. Overlap adjoining edges of geotextiles a minimum of 12 inches, unless otherwise specified or approved by the Construction Manager.

SECTION 31 32 19 – GEOTEXTILES

- C. Weight geotextiles with sandbags or equivalent when required. Install sandbags (or equivalent) during placement and maintain until replacement with cover materials.
- D. During placement of geotextiles, take care not to entrap excessive dust, mud, or moisture in the geotextile stone that could damage or cause clogging of the geotextile or hamper subsequent seaming.
- E. Use proper tools to cut and size geotextiles; exercise care while cutting geotextiles.
- F. Do not expose geotextiles to precipitation prior to being installed, and do not expose geotextiles to direct sunlight for more than 15 days.

3.04 GEOTEXTILE REPAIR

- A. Any holes or tears in the fabric shall be repaired as follows:
 - 1. On slopes: Sew a fabric patch into place using a double sewn lock stitch (1/4 inch to 3/4 inch apart and no closer than one inch from any edge). Should any tear exceed 10 percent of the width of the roll, that roll shall be removed from the slope and replaced.
 - 2. Non-Slopes: Spot-seam a fabric patch in place with a minimum of 18 inches of overlap in all directions.

3.05 PLACEMENT OF MATERIALS ON GEOTEXTILE

- A. Place all fill materials located on top of the geotextile in such a manner as to ensure the following:
 - 1. No damage of the geotextile or underlying layers.
 - 2. Minimal slippage between the geotextile and the underlying layers.
 - 3. No excess tensile stresses in the geotextile.
- B. Do not drive vehicles or equipment directly on the geotextile.
- C. Utilize equipment exerting the lowest ground pressure practicable to place the granular materials to minimize the potential for damage to the geotextile. Under no circumstances shall the placement equipment exert more than 5 pounds per square inch of ground pressure.

- END OF SECTION -

SECTION 31 32 19 – GEOTEXTILES

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SECTION 31 37 00 – RIPRAP

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Providing all labor, materials, tools, equipment, and incidentals as shown, specified, and required to install riprap.
2. Extent of riprap is shown or indicated on the Design Drawings.

B. Coordination:

1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before riprap.

C. Related Sections:

1. Section 31 05 13 – Soils and Aggregates.
2. Section 31 11 00 – Clearing and Grubbing.
3. Section 31 23 00 – Excavation and Fill.

1.02 SUBMITTALS

- A. Refer to Section 31 05 13 – Soils and Aggregates for associated submittal requirements.

1.03 DELIVERY

- A. Refer to Section 31 05 13 – Soils and Aggregates for associated delivery requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Refer to Section 31 05 13 – Soils and Aggregates for riprap material product description.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which the Work will be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to the Construction Manager.

3.02 PREPARATION

- A. Clear ground surface of brush, trees, stumps, and other objectionable material, and dress to a smooth surface. Clearing and grubbing, where required, shall comply with Section 31 11 00 – Clearing and Grubbing.

SECTION 31 37 00 – RIPRAP

- B. Remove all soft or spongy material to depth shown or indicated on the Design Drawings or as directed by the Construction Manager and replace with acceptable material. Excavation, removal of unsuitable material if any, and backfilling shall comply with Section 31 23 00 – Excavation and Fill.

3.03 INSTALLATION

A. Riprap Placing:

1. Place minimum total thickness of riprap as shown on the Design Drawings.
2. Place riprap stones so that weight of stone is carried by underlying material and not by adjacent stones. Carefully place the stones on geosynthetics, where required, to produce an even distribution of pieces, with minimum of voids and without damaging the geosynthetic. Place the full-course thickness in one operation while preventing segregation and avoiding displacing of underlying material. Do not place stones in layers, by dumping into chutes, or by other methods that cause segregation or damage to geosynthetic, if any. When necessary, rearrange individual stones for uniform distribution.
3. Riprap may be placed using equipment, and placing shall produce an installation of firm and solid riprap. Level the top surface of riprap to required alignment and slope by hand-placing stones to fill large voids and to make surface even.
4. On slopes, place the largest stones at the bottom. Riprap shall be properly sized to form compact, solid blanket to protect the slope or channel, as applicable. On slopes steeper than 1 foot vertical to 1.5 feet horizontal, do not use rounded boulders or cobbles without grouting stones in place.
5. When existing riprap is in proximity to riprap provided under this Section, place riprap to conform as closely as practicable in size and character to existing riprap.

3.04 FIELD QUALITY CONTROL

- A. Contractor shall perform thickness measurements in the field as directed by the Construction Manager, to determine compliance with the Contract Documents.

3.05 CRITERIA AND TOLERANCES

- A. Fill materials shall be constructed to the lines and grades shown on the Design Drawings unless otherwise requested by the Construction Manager. Acceptance of final grades will be based on site observations by the Construction Manager and review of a final as-built survey information. Any settlements that occur prior to final acceptance of the work shall be restored to design and/or intended grades by the Contractor.

- END OF SECTION -

SECTION 32 12 00 – FLEXIBLE PAVING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install flexible, hot-mix, hot-laid, asphalt concrete pavement.
2. The Work includes:
 - a. Preparation such as saw-cutting, cleaning, compaction, and other preparation for installing asphalt concrete pavement.
 - b. Providing asphalt concrete paving materials.
 - c. Providing tack coat material.
 - d. Providing quality controls and testing.

B. Coordination:

1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before paving.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:

1. ASTM D2950/D2950M, Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
2. ASTM E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
3. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³[600 kN-m/m³]).
4. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth).

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Asphalt Concrete Production Facility: Production facility for asphalt concrete, tack coat materials, and other bitumastic materials will be approved by Commonwealth of Massachusetts Department of Transportation (MassDOT) for furnishing such materials for MassDOT highways.
2. Contractor's Testing Laboratory: Retain the services of an independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section. Testing laboratory shall comply with ASTM E329 and will be experienced in the types of testing required.

SECTION 32 12 00 – FLEXIBLE PAVING

B. Regulatory Requirements:

1. Reference Specifications and Details: Comply with applicable requirements of the MassDOT Standard Specifications (2026 Edition) and pertinent Construction Standard Details.

C. Quality Assurance Testing:

1. Test bituminous materials and asphalt concrete mix design for each asphalt concrete material in accordance with reference specifications indicated in Part 1.03(B) of this Section.
2. In lieu of quality assurance testing submit evidence and certification of material compliance with reference specifications indicated in Part 1.03(B) of this Section. When evidence of conformance submitted is not acceptable to Construction Manager, perform quality assurance testing.
3. To facilitate testing laboratory, Contractor shall:
 - a. Secure and deliver to testing laboratory representative Samples of materials that Contractor proposes to furnish and that are required to be tested.
 - b. Furnish such labor as is necessary to obtain and handle Samples at the Site or at asphalt concrete production facility and other material sources.
 - c. Advise testing laboratory and Construction Manager sufficiently in advance of operations to allow for completion of quality assurance tests and for the assignment of personnel.

1.04 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section. Provide complete data on materials, including location in the Work, source, material content and percentages, temperatures, and all other pertinent data.
 - b. Proposed gradation for each aggregate to be used for subbase and in asphalt paving material. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.
 - c. In lieu of the information required under Paragraphs 1.04(A)(1)(a) and 1.04(A)(1)(b), above, submit certificates of compliance with the reference specifications indicated in Part 1.03(B) of this Section, for each for the following:
 - 1) Each asphalt concrete mix design required;
 - 2) Bituminous materials required;
 - 3) Aggregates to be used in asphalt paving, from each material source and each required gradation;

SECTION 32 12 00 – FLEXIBLE PAVING

- 4) Density of uncompacted asphalt concrete material;
- 5) Density of previously-compacted, previously-tested asphalt concrete material;
- 6) Density and voids analysis for each asphalt concrete material test specimen; and
- 7) Evidence of asphalt concrete plant inspection and compliance with the reference specifications indicated in Part 1.03(B) of this Section.

B. Informational Submittals:

1. Qualifications Statements:

- a. Asphalt Concrete Production Facility: Submit name, address, and proof of MassDOT approval for asphalt concrete production facility.
- b. Contractor's Testing laboratory: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance and field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.

2. Quality Assurance Test Data Submittals:

- a. Submit for quality assurance tests required.

3. Delivery Tickets:

- a. Submit copy of delivery ticket for each load of asphalt concrete, tack coat materials, and other materials obtained from asphalt concrete production facility, signed by Contractor.

4. Field Quality Control Submittals:

- a. Submit results of required field quality control testing.

1.05 SITE CONDITIONS

A. Environmental Requirements:

1. Temperature:

- a. For binder course paving lifts equal to or greater than 2 inches thick, atmospheric temperature will be 40 degrees F and rising.

2. Prohibitions:

- a. Do not place asphalt paving materials when weather is foggy or during precipitation.
- b. Do not place asphalt paving materials when the base on which the material will be placed contains moisture in excess of optimum.

3. Place asphalt paving materials only when Construction Manager concurs that weather conditions are suitable.

SECTION 32 12 00 – FLEXIBLE PAVING

PART 2 – PRODUCTS

2.01 SYSTEM PERFORMANCE

A. System Description:

1. Subbase Course: Provide Gravel Borrow Type B subbase course of the thickness shown or indicated, in accordance with reference specifications indicated in Part 1.03(B). of this Section. Gradation specification can be found in Section 31 05 13 – Soils and Aggregates Part 2.01.C.
2. Asphalt Pavement Courses: Provide the following:
 - a. Binder Course: 2.5 inches compacted thickness (min.).
 - b. Top Course: 1.5 inches compacted thickness (min.).

2.02 ASPHALT CONCRETE MIXES

A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with the reference specifications indicated in Part 1.03(B) of this Section:

1. Binder Course: MassDOT Item No. 460.32 SUPERPAVE Intermediate Course – 19.0 (SIC – 19.0).
2. Top Course: MassDOT Item No. 460.23 SUPERPAVE Surface Course – 12.5 (SSC – 12.5).

2.03 BITUMINOUS MATERIALS

A. Bituminous Materials for Asphalt Concrete:

1. Bituminous materials for asphalt concrete will comply with the reference specifications indicated in Part 1.03(B) of this Section, for the asphalt concrete mixes specified.

B. Tack Coat:

1. Tack coat will be emulsified asphalt that conforms to the requirements of Section 460.43.G of the reference specifications indicated in Part 1.03(B) of this Section.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine the subgrade, subbase, and base on which asphalt paving will be installed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

B. Do not place materials on subgrades or subbase that is muddy or has water thereon.

SECTION 32 12 00 – FLEXIBLE PAVING

3.02 PREPARATION

A. Preparation: Before starting installation of asphalt paving, perform the following:

1. Grade Control: Establish and maintain throughout asphalt paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.
2. Subgrade: The subgrade will be shaped to line and grade and compacted with self-propelled rollers. Compaction will be as specified in Section 31 23 00 – Excavation and Fill.
3. Provide and compact subbase as required to achieve the finished grades as shown and as specified in this Section. Verify aggregate and asphalt paving can be installed at the required thicknesses and to the final grades indicated on the Contract Drawings without cutting into existing material except for area specifically indicated to be cut on the Contract Drawings. Subbase material will be compacted as specified in Section 31 23 00 – Excavation and Fill. Before installing asphalt pavement, obtain Construction Manager's concurrence that subgrade and subbase are suitable for installing asphalt pavement.

3.03 INSTALLATION OF ASPHALT PAVING

A. General:

1. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.
2. Construct paved surfaces to the lines, grades, and typical sections shown or indicated. If grading is not provided, match existing lines and grades.

B. Installation of Asphalt Concrete:

1. Asphalt concrete mixture will be transported to the area of paving and placed as soon as possible after mixing.
2. Placement of each asphalt concrete course will be completed over the full width of the section under construction during each day's paving operations.
3. Spread and finish asphalt concrete courses by means of self-propelled mechanical spreading and finishing equipment. Compacted thickness of layers placed will not exceed 150 percent of specified thickness unless approved in writing by Construction Manager.
4. Compaction:
 - a. Rollers:
 - 1) Use sufficient rolling equipment to satisfactorily compact and finish the quantity of asphalt concrete placed. There will be not less than two rollers on the Project at all times. When acceptable to the Construction Manager, one of the rollers may be a pneumatic-tire roller.

SECTION 32 12 00 – FLEXIBLE PAVING

- 2) During rolling operations, roller speed will not exceed three miles per hour. When sufficient number of rollers is not available, reduce the quantity of asphalt concrete placed to accommodate the available rollers' speed.
- 3) Required rollers will be in acceptable operating condition, prior to placing of asphalt concrete.
- 4) Use of vibratory rollers in lieu of steel-wheeled rollers is acceptable, however when thickness of asphalt concrete is 1 inch or less, rolling will be in the static mode.
- b. Rolling of initially-placed asphalt concrete material, or breakdown rolling, will begin as soon as the asphalt concrete mixture will bear the roller without undue displacement.
- c. Rolling will be longitudinal, overlapping on successive trips by not less than one-half roller rear wheel width, and not more than three-quarters of roller rear wheel width. Alternate trips of the roller will be of slightly different lengths.
- d. At all times, roller motion will be slow enough to avoid displacing the asphalt concrete.
- e. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.
- f. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.
- g. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
- h. At each location not accessible to roller, thoroughly compact asphalt concrete with tampers and finish, where necessary, with a hot smoothing iron to provide uniform, smooth layer over the entire area so compacted.
5. Each compacted asphalt concrete course will be within plus-or-minus 1/4 inch of the indicated thickness. Total thickness of asphalt pavement will be within plus-or-minus 1/2 inch of the indicated thickness.

C. Construction Joints:

1. Construction joints will be made in such a manner as to ensure a neat junction, thorough compaction, and bond throughout.
2. Provide a transverse joint extending over the full width of the strip being laid and at right angles to its centerline at the end of each work day and at other times when the placement of hot-mix asphalt concrete will be suspended for a period of time that will allow asphalt concrete mixture to chill.
3. Thoroughly compact by rolling the forward end of a freshly laid strip of asphalt concrete before the asphalt concrete mixture becomes chilled. When the Work is resumed, the end will be cut vertically for the full depth of the layer.

SECTION 32 12 00 – FLEXIBLE PAVING

D. Joining of Pavements:

1. When pavement is to join previously laid pavement or concrete, the existing or previously laid pavement will be neatly and carefully edged to allow for overlapping and feathering of the subsequent course of asphalt concrete material.
2. Where new pavement is to meet existing pavement, the existing pavement will be saw-cut and notched.
3. Where new pavement will meet existing asphalt pavement, remove existing pavement 12 inches onto undisturbed existing pavement course at edges where new pavement will meet existing pavement.
4. Tack Coat:
 - a. Provide tack coat material at the following locations:
 - 1) At edges where new pavement will connect to existing or previously-installed pavement.
 - 2) On surface of existing or previously-installed pavement course over which new pavement will be installed, prior to placement of the subsequent pavement course. Sweep the underlying HMA surface per requirements of MassDOT 460.43.F before application. Tack coat may be deleted when a succeeding layer of asphalt pavement is being applied over a freshly-placed asphalt pavement course that has been subjected to very little or no traffic, with approval of Construction Manager.
 - 3) Where new pavement will abut concrete railroad crossing, curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.
 - b. Tack Coat Installation: Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with reference specifications indicated in Part 1.03(B) of this Section.

E. Curing:

1. Do not allow traffic onto pavement until directed by the Construction Manager. Traffic will not be allowed on new asphalt concrete pavement until surface temperature is less than 140 degrees F.
2. Hold construction traffic on new pavement to a minimum as acceptable to the Construction Manager.

F. Defective Pavement Work:

1. When directed by the Construction Manager, remove and replace defective asphalt paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

SECTION 32 12 00 – FLEXIBLE PAVING

3.04 FIELD QUALITY CONTROL

- A. Site Tests: Employ a testing laboratory to perform field quality control testing.
1. Testing Laboratory Scope:
 - a. Perform field density tests to verify that required compaction of asphalt materials has been obtained.
 - b. Test the proposed materials for compliance with the Contract Documents, as directed by Construction Manager.
 - c. Submit reports of all test results to the Construction Manager and the Contractor.
 2. Asphalt Concrete Mix Temperature: Measure temperature at time of placement, record, and submit to the Construction Manager.
 3. Surface Smoothness:
 - a. Test finished surface of each asphalt paving course for smoothness, using a 10-foot straightedge applied parallel to and at right angles to centerline of paved areas.
 - b. Check surfaced areas at intervals as directed by the Construction Manager.
 - c. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following:
 - 1) Binder Course: 3/8 inch vertical in 10 feet horizontal.
 - 2) Crowned Surfaces:
 - a) Test crowned surfaces with a crown template, centered and at right angles to the crown.
 - b) Surfaces will be acceptable when variance is equal to or less than 1/4 inch from the template.
 - d. Elevation: Finished surface of pavement will be within plus-or-minus 1/2 inch of elevations shown or indicated.
 4. Density:
 - a. Asphalt: Test in accordance with ASTM D2950/D2950M. Test one sample every 1,000 square feet of pavement. Test for each asphalt concrete course installed.
 - b. Subbase: Test in accordance with ASTM D6938/D6938M. Test one sample every 1,000 square feet of pavement. Test for each lift of sub-base course installed.
 - c. In addition, when directed by Construction Manager, compare density of in-place asphalt paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.
 - d. Criteria for Acceptance: Density of in-place asphalt pavement material will be not less than 90 percent of the recorded laboratory specimen or certificate density. Density will be not greater than 98 percent.

SECTION 32 12 00 – FLEXIBLE PAVING

5. Asphalt Concrete Pavement Thickness: Depth check readings will be taken for each course of compacted pavement at a frequency of one reading from every 1,000 square feet of compacted pavement. Comply with thickness tolerance specified in Part 3.03 of this Section.
6. Repair holes from test specimens in accordance with this Section's requirements for repairing defective Work.
7. Submit test results, certified by testing laboratory, to Construction Manager within 24 hours of completion of test.

3.05 ADJUSTING

A. Pavement Adjustment:

1. Repair or replace in manner acceptable to the Construction Manager areas of pavement that are observed to pond or collect water.

3.06 CLEANING

- #### A. After completing paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.07 PROTECTION

- #### A. Protect finished pavement until pavement has become properly hardened and cool.
1. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

- END OF SECTION -

SECTION 32 12 00 – FLEXIBLE PAVING

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SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. The Contractor shall furnish all labor, materials, equipment, and incidentals required for planting and seeding as detailed in this specification and the Design Drawings for restoration of the Utility Drive rail transload area after use for the Rest of River Remedial Action.
2. Perform planting and seeding Work within all planned habitat restoration areas indicated on the Design Drawings, and referenced herein; these include, but are not limited to, the following habitat, as applicable:
 - a. Upland Field – Grass / Forbs Habitat.
 - b. Upland Field – Shrub / Old Field Habitat.
 - c. Northern Hardwood Habitat.
 - d. Monarch Butterfly Hostplant Habitat.
 - e. Intermittent Stream Habitat.
 - f. Other Upland Habitats.
3. Perform Work in a safe manner that prevents injury to people and adequately protects property, including but not limited to utilities, abutter property, public and private property, environmentally sensitive areas, demarcated work exclusion zones, and preemptively flagged vegetation to remain, as marked in the field or shown or indicated on the Design Drawings.
4. Perform Work such that it does not interfere, conflict with, prevent, or compromise any neighboring operations aligned with remediation, construction, or restoration.
5. The planting and seeding submittals and Work performed by the Contractor will be subject to review and field observations by specialized Restoration Specialists, including but not limited to a qualified biologist/wetland scientist. The Construction Manager, who will coordinate reviews and field observations by the Restoration Specialists.
6. Where necessary, applicable, or requested, and only with the approval of GE or the Construction Manager, coordination or communication between the Contractor and Native Plant Trust (NPT) and/or New England Wetland Plants (contracted separately by GE) may be a factor in obtaining plant materials for restoration that are habitat-specific and sourced from appropriate EPA ecoregions.

1.02 REFERENCES

- A. Arcadis and AECOM. 2024. *Restoration and Performance Objectives and Evaluation Criteria Report*. Prepared for General Electric Company, Pittsfield, Massachusetts. April.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

1.03 RELATED SECTIONS:

- A. Section 31 05 13 – Soils and Aggregates.
- B. Section 31 11 00 – Clearing and Grubbing.
- C. Section 31 23 00 – Soil Excavation and Fill.

1.04 SUBMITTALS

- A. The Contractor shall prepare and submit a Restoration Planting and Seeding Plan as part of the Contractor's Operations Plan for review and approval by the Construction Manager prior to the start of any restoration planting and seeding fieldwork. At a minimum, the Plan shall include the following:
 - 1. Means by which final grades will be checked and verified by the Contractor prior to seeding and planting.
 - 2. Methods, equipment, procedures, and sequence for seeding, planting, placement of tree and shrub guards, and watering. Include fertilizer application and protection fabric if required.
 - 3. Seed mix product datasheets, certificates, and source information. The seed certificates shall include the following: botanical or scientific name and common name of all species included in the seed mixture; percentage of each species of seed by weight in a mixture; percentage of pure seed for each species included in the mixture; germination percentage; amount of undesirable plant seed present in the mixture; date of packaging; name and address of supplier; and county and state of origin.
 - 4. A list of all plants that will be planted, including the target habitat to be restored, locations, species, quantity of each species, and sizes of each item.
 - 5. Fertilizer Certificate, if required. Product datasheet and certificate confirming conformance with this Specification.
 - 6. Protection Fabric, if required. Submit manufacturer product data, as well as delivery, handling, storage, installation, and repair methods.
 - 7. A maintenance (including watering) and inspection schedule that coincides with and adheres to Restoration and Performance Objectives and Evaluation Criteria Report (RPOEC Report; Arcadis and AECOM 2024) criteria and this specification.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall ensure that the seed is delivered in vendor's unopened packages bearing labels showing vendor's name and seed analysis by weight.
- B. The Contractor shall store all seed at the Project Site in a cool, dry place at locations approved by the Construction Manager. The Contractor shall replace any seed damaged during storage.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

- C. The Contractor shall store seed in weather- and rodent-proof enclosures.
- D. All seed shall have the proper stratification or scarification, in accordance with the producer's instructions, to break seed dormancy.
- E. Plants shall be maintained in proper moist conditions and protected from wind, herbivory, or other adverse effects.
- F. Plants must be free of insects and diseases, appear healthy, and exhibit visible signs of viability such as green leaves or stems. Plants must not appear chlorotic or exhibit signs of desiccation. Plants must not exhibit visible signs of herbivory. Leaf margins must be predominantly green with limited areas of spots or blotches. Dormant plants must exhibit healthy roots, rhizomes, and leaf buds. All plant materials, including any collected field stock, must comply with state and federal laws with respect to an inspection for plant diseases and insect infestations. Collected plant materials must be obtained in strict compliance with any applicable state or federal wetland or species protection programs. To the extent practicable, all plants must be sourced from ecoregion 58/Massachusetts. Labels shall be attached securely to all planting materials and shall be durable, legible, use weather resistant ink or other resilient lettering, to allow for confirmation to the specifications (size, species, origin, etc.).
- G. Each plant species must be handled and placed in a manner that is consistent with good trade practice to verify plants are in acceptable condition at their time of arrival at the Site. Plants that are not in acceptable condition will be rejected from use.
- H. All plant stock must be stored in above-ground locations in non-construction areas accepted by the Construction Manager, if not directly transplanted. All plant stock must have soil placed around the roots sufficient to protect from desiccation and to provide nourishment during storage. All plants stored in the field prior to installation must be kept cool and must be sheltered from the drying effects of direct sunlight and prevailing winds. Plants should not be subject to freezing or drying. It is the Contractor's responsibility to supply adequate water for all plant stock to maintain it in a healthy, vigorous state suitable for transplanting.
- I. The Contractor shall ensure fertilizer, if required, is delivered in manufacturer's standard size bags or cartons showing weight, analysis, and the name of the manufacturer. The Contractor shall store as approved by the Construction Manager.

PART 2 – PRODUCTS

2.01 SEED

- A. Seed mixtures should be delivered in original sealed containers. Seed contained in wet, torn, or otherwise obviously damaged packaging are not acceptable. The Contractor shall label containers with the following information: analysis of seed mixture; percentage of pure seed by species; year of production; net weight; date tagged and location; percentage of germination; and name and address of distributor.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

- B. All seed mixes, plant materials, mulch, soil, compost, fill, or any other material used for restoration planting and seeding shall be visually free of weeds and of the seeds, roots, or rhizomes of invasive species. All material shall be inspected ahead of utilization by the Construction Manager. All plants must be sourced from ecoregion 58/Massachusetts to the extent practicable and at a minimum, obtained from nursery stock in the northeastern United States. All seeds shall be native to the region. The source of plant material must be submitted to the Construction Manager, who will coordinate review by a qualified biologist/wetland scientist. Any field collected plant material (e.g., seeds) must be collected from the same region.
- C. The seed mix and application rate for each restoration area type (e.g., Open Field – Grass / Forbs Habitats) to be restored is dependent on the habitat type present and will receive the seed mixes and at the application rate indicated on the Design Drawings.

2.02 PLANTS

- A. Areas to be planted include all mapped habitat extents designated for restoration planting and seeding following remedial activities, as indicated on the Design Drawings.
- B. Cover type, scientific name, common name, size, total number of plantings and pertinent notes for each habitat area are detailed on the Design Drawings. Plantings must be installed as detailed in the Design Drawings or as otherwise directed by the Construction Manager in coordination with the qualified biologist/wetland scientist.

2.03 FERTILIZERS

- A. Fertilizing plants is not anticipated. Any request for fertilizers would require approval by U.S. Environmental Protection Agency and the Construction Manager. If needed, fertilizer mixes and rates of application shall be made based on laboratory testing of the backfill and the recommendations of the Cornell Cooperative Extension.

2.04 WATERING

- A. Water shall be from a source approved by the Construction Manager. The Contractor shall provide a scheduled watering plan that is approved by the Construction Manager in accordance with Section 1.04.A.2 and 1.04.A.7.

2.05 PROTECTION OF TREES AND SHRUBS

- A. The Contractor shall purchase and properly install physical guards for tree and shrub plantings. Guards must be designed to protect young plantings from wind, deer grazing, and rodents. The guards must be durable, well ventilated, UV stable for at least 4 years, and either self-supported or supported and anchored to a wooden stake in accordance with manufacturer requirements.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

- B. The Contractor must provide the Construction Manager with the proposed plant guard product information, including manufacturer, materials, quantities, pricing, and installation and maintenance requirements prior to purchase.

PART 3 – EXECUTION

3.01 WOOD TURTLE PROTECTION

- A. The Contractor shall follow all procedures and requirements detailed in the Wood Turtle Protection Plan and direction of the Construction Manager who will coordinate reviews by a qualified Project herpetologist.

3.02 PREPARATION

- A. Protection before construction of the Rail Transload Areas:

- 1. To promote monarch butterfly habitat, measures will be taken to maintain the primary host plant for this species, milkweed (*Asclepias syriaca*). There are two existing patches of milkweed growth located within the project limits of work, as shown on the Design Drawings. The upland milkweed currently growing in these areas contains an extensive rhizome system. Prior to excavation and grading within the project limits of work, the rhizomes of these milkweed plants shall be transplanted to an existing open area within the Utility Drive Transload Area Property, as illustrated on the Design Drawings, and shall be protected for the duration of the work.

- B. Protection during restoration after use of the Rail Transload Areas:

- 1. Heavy equipment used to perform the Work within wetlands, floodplain habitats, and in any other environmentally sensitive or outstanding areas to be revegetated as part of restoration must be low ground pressure and/or operated from construction mats to prevent compression of soils. Approved access routes are to be utilized for heavy equipment selected to complete the work.
- 2. Protect existing site improvements, including streets, drives, parking areas, trails and walkways and other facilities to remain, and adjacent property and structures throughout the Work. Repair damage caused by the Contractor to original condition or replace in kind, to satisfaction of the Construction Manager at no additional cost to GE.
- 3. Protect trees, shrubs, and herbaceous vegetation to remain by providing temporary fencing, barricades, wrapping, or other methods shown, specified, or accepted by Construction Manager. Correct damage caused by the Contractor outside the limits of work at no additional cost to GE.
- 4. Desirable vegetation intended to be preserved on the site will be flagged by a qualified biologist/wetland scientist under direction of the Construction Manager prior to the start of construction.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

5. Do not remove trees or shrubs without the approval of the Construction Manager and qualified biologist/wetland scientist, unless otherwise shown or indicated for removal on the Drawings or Specifications.
 6. Store construction equipment, materials, or stockpiles within areas approved by the Construction Manager.
- C. Timing and sequencing of remediated habitat restoration through planting and seeding will be determined by the Construction Manager in coordination with the qualified biologist/wetland scientist and subsequently coordinated with the Contractor.
- D. Unless manufacturer instructions for prescribed or similar and Construction Manager-approved specific habitat type seed mixes dictate otherwise, planting and seeding within areas to be restored shall be done when there is no standing water.
- E. In areas where the imported fill was compacted during construction of the rail transload areas, native soil in the top six inches will be scarified and loosened after removal of the infrastructure and imported fill so as to reverse impacts from the overlying (and now removed) rail transload area.

3.03 RESTORATION

- A. Areas of the Utility Drive transload area property disturbed by the project will be restored to reflect the specific baseline condition of the affected area and the final intended post-construction use. At a minimum, restoration of these upland areas will include removal of temporary construction materials and surfacing, grading to pre-construction contours or approved final contours, decompaction where necessary, and placement or re-spreading of topsoil suitable for revegetation. Areas that were previously undeveloped or otherwise undisturbed will be restored primarily through seeding with native seed mixes, invasive-species control, and natural recolonization, supplemented by active planting where needed to re-establish the desired cover type. Natural recruitment of native species from adjacent habitats will also be allowed to contribute to restoration success where consistent with the design objectives and invasive species management needs. Some portions of the open field habitat that previously supported woody shrub vegetation prior to disturbance will be restored as open field – grass / forbs. Other areas that previously supported low to moderate density of tree cover located along the existing railroad tracks and within the existing powerline corridor will be restored as open field – shrub / old field habitats. Areas previously supporting host plants for the monarch butterfly and northern hardwood forest habitats will be restored to their pre-existing habitats.
- B. Open Field Habitats (Grass / Forbs):
1. Following completion of grading and placement of suitable surface soils, the restored surface will be planted and seeded as detailed in the Design Drawings

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

This includes installation of herbaceous plugs that function as host plants for the state-listed mustard white butterfly and application of upland seed mixes available from New England Wetland Plants or similar mixes approved by the Construction Manager in coordination with the qualified biologist/wetland scientist and as described above in Section 2.01.

C. Open Field Habitats (Shrub / Old Field):

1. Following completion of grading and placement of suitable surface soils, the restored surface will be planted and seeded as detailed in the Design Drawings. This includes installation of woody shrubs planted approximately eight-foot on center (681 shrubs per acre) and application of upland seed mixes available from New England Wetland Plants or similar mixes approved by the Construction Manager in coordination with the qualified biologist/wetland scientist and as described above in Section 2.01.

D. Northern Hardwood Forest Habitats:

1. Following completion of grading and placement of suitable surface soils, the restored surface will be planted and seeded as detailed in the Design Drawings. This includes installation of woody shrubs planted approximately 12-foot on center (302 shrubs per acre), trees planted approximately 10-foot on center (436 trees per acre), installation of herbaceous forbs and ferns as two-inch plugs and/or six-inch pots and application of upland seed mixes available from New England Wetland Plants or similar mixes approved by the Construction Manager in coordination with the qualified biologist/wetland scientist and as described above in Section 2.01.

E. Monarch Butterfly Host Plant Planting Zone:

1. Following completion of grading and placement of suitable surface soils, the restored surface will be planted and seeded as detailed in the Design Drawings. This includes installation of approximately 595 two-inch herbaceous plugs of common milkweed, and application of upland seed mixes available from New England Wetland Plants or similar mixes approved by the Construction Manager in coordination with the qualified biologist/wetland scientist and as described above in Section 2.01. Supplemented seed mix must also contain common milkweed seeds.

F. Intermittent Stream Habitat:

1. The existing intermittent stream located north of Utility Drive, to be relocated into a culvert beneath the rail spur during use, will be restored to a similar grade as existing and planted along its banks with woody shrubs as indicated on the Design Drawings.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

3.04 SEEDING AND PLANTING

- A. Seeding and planting shall only occur after site preparations have been reviewed and approved by the Construction Manager.
- B. The Contractor shall not apply seed or install plantings if the ground is frozen.
- C. Seeding and planting shall only occur immediately after approval by the Construction Manager.
- D. Seeding and planting shall not be performed when the temperature may drop below 35 degrees Fahrenheit (°F) or rise above 90°F over the forthcoming week.
- E. The Contractor shall provide notice to the Construction Manager at least 48 hours prior to seeding and planting.
- F. Plant species, quantities, sizes, and placement shall be conducted in accordance with the Construction Drawings and under the oversight and direction of the Construction Manager in coordination with the qualified biologist/wetland scientist.
- G. The Contractor shall use the seed mixes and seeding rates specified in the Design Drawings, unless alternative mixtures and application formulae have been approved by the Construction Manager in coordination with the qualified biologist/wetland scientist.
- H. Seed shall not be applied when wind conditions are such that materials would be carried beyond designated areas or that materials would not be uniformly applied and when wind velocity exceeds 15 miles per hour.
- I. Seeding activities shall not be carried out on days with heavy precipitation that may result in the washing out of seed.
- J. The Contractor shall apply seed in a way that ensures the entire required area receives seed. The Contractor shall reseed areas where gaps in the seeded areas exceed 4 square feet.
- K. The Contractor shall lightly rake seeded areas within 12 hours to ensure proper soil-seed contact.
- L. The Contractor shall not seed areas inundated by water.
- M. Seeding shall overlap adjoining vegetation by at least 12 inches.
- N. The Contractor shall water seeded areas to promote seed germination and growth. The Contractor shall avoid creating rills and furrows because of watering and repair and reseed any rills and furrows resulting from overwatering.
- O. The Contractor shall mark seeded areas to prevent intrusion from foot traffic and equipment.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

3.05 PROTECTION FABRIC

- A. If determined necessary, erosion protection fabric shall be installed after seeding is accepted by the Construction Manager.
- B. The surface shall be free of rocks, clods, sticks, and vegetation prior to fabric installation. Fabric shall be placed to have good contact with the soil.
- C. The Contractor shall lay protection fabric loosely and stake or staple the fabric to the slope to maintain direct contact with the soil. The fabric shall not be stretched during installation.
- D. The Contractor shall install the fabric blankets vertically from top of slope to bottom of slope.
- E. The Contractor shall bury and anchor the top of slope and toe of slope portions of the fabric.

3.06 MAINTENANCE

- A. Maintenance will be conducted in accordance with applicable sections of the RPOEC Report.
- B. The Contractor shall maintain the seeded and planted areas throughout the contracted Warranty period, inclusive of the respective amount of full growing seasons following seeding. Maintenance responsibilities begin immediately after seeding and planting after the Construction Manager has accepted the seeding and planting.
- C. Maintenance will include control of invasive species and herbivores and other vectors that threaten the establishment of the seeding. The Contractor shall remove undesirable plant material that interferes or inhibits the growth of the plants installed by the Contractor. The Contractor shall take necessary action to correct and restore the unacceptable areas.
- D. The Contractor shall maintain vegetative cover by watering, weeding, and reseeding and replanting. In addition, the Contractor shall control invasive plant species listed as Invasive or Likely Invasive by the Massachusetts Invasive Plants Advisory Group (MIPAG), preferably by physical removal. Restricted cut and treat application using EPA approved herbicides may be used under the direction of a licensed applicator, though only with the approval of the Construction Manager.
- E. The Contractor shall maintain vegetative cover by watering, weeding, and reseeding and replanting. In addition, the Contractor shall control prohibited and regulated invasive plant species.
- F. The Contractor shall repeat watering weekly for at least 4 weeks after seeding if natural rainfall is less than 1 inch per week at a minimum.

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

- G. The Contractor shall reseed and replant areas that are unacceptable during the maintenance period. Bare areas greater than 4 square feet shall be reseeded with the specified seed mix.
- H. The Contractor shall conduct corrective action and maintenance within 30 days to address unacceptable areas specified herein. This includes the removal of trash or other non-native debris.
- I. The Contractor shall notify the Construction Manager 48 hours prior to and following any maintenance activity.
- J. Approval of seeded and planted areas will be by the Construction Manager at the end of the growing season the year after seeding and planting. Approval will be provided if all requirements have been met, including the following:
 - 1. Seeded and planted areas are properly established.
 - 2. Seeded and planted areas are free of eroded, bare, or dead spots and free of prohibited and regulated plant species.
 - 3. Planted shrubs and trees have remained viable during the contracted maintenance period.
 - 4. Contractor has provided an approved treatment of invasive species as necessary and prescribed with prior coordination and approval from the Construction Manager.
 - 5. Mean percent survival rate of native target species is equal to or greater than 80 percent in each design plant community type.
 - 6. Mean percent cover of invasive or likely invasive plant species (<https://massnrc.org/mipag/>) is equal to or less than 10 percent cover.

3.07 WARRANTY

- A. The Contractor shall guarantee the plantings for the contracted Warranty period following approval from the Construction Manager. During this Warranty period, monthly inspections of plantings during March through November are to be conducted to document and communicate the current condition of plants established. Measures in accordance with Section 3.06 are to be taken if conditions at the time of inspection dictate maintenance. Inspection reports are to be submitted to the Construction Manager within forty-eight (48) hours of the inspection. Dead or stressed plants noted in inspections shall be replaced with new plants of same size and species within one (1) month or in first month of next growing season, whichever comes first, as permitted by specifications. An arborist can be contracted if necessary to determine plant vitality, however the Construction Manager will have ultimate and final say regarding replanting. Replacement plants shall be installed according to the Drawings and Specifications.
- B. Notify the Construction Manager at least one (1) month in advance of requested date of final inspection at end of the contracted Warranty period. Submit to the

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

Construction Manager, at least fourteen (14) days before final inspection, a compiled list of plants replaced during the Warranty period with species, location, and replacement dates.

- C. At the end of the Warranty period, plant guard or bracing material acquired and installed according to Section 2.05 deemed no longer necessary by the Construction Manager shall be removed from applicable plantings. All dead or unsatisfactory areas shall be addressed according to Section 3.06 until satisfactory growth with intended species has occurred, as a condition of completion of all Work at final inspection.

- END OF SECTION –

SECTION 32 30 00 – RESTORATION, PLANTING, AND SEEDING

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SECTION 33 41 01 – DRAINAGE PIPING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Install the high-density polyethylene (HDPE) drainage pipe to the alignments and grades as indicated on the Design Drawings or as directed by the Construction Manager.

B. Related Sections:

1. Section 31 05 13 – Soils and Aggregates.
2. Section 31 23 00 – Excavation and Fill.

1.02 REFERENCE STANDARDS

A. The following reference standards are applicable to this specification:

1. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
2. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
3. ASTM D3350 – Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.
4. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
5. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
6. ASTM F2648 – Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications.

1.03 SUBMITTALS

- A. Maintain an accurate record of the location of the piping with reference to project baselines, grades, and elevations. Indicate all changes made in the piping installation relative to the layout and materials shown on the Design Drawings and submit to the Construction Manager for approval before proceeding with changes.
- B. Piping specifications, shop drawings, dimensions, joint details, design and installation details, and descriptive literature of pipe materials and accessories.
- C. Verify to the Engineer that the specified bedding material and requirements are acceptable to the Pipe Manufacturer, or submit alternative installation recommendations.

SECTION 33 41 01 – DRAINAGE PIPING

- D. The Pipe Manufacturer shall submit the following information in writing:
1. Handling, storage and installation guidelines.
 2. Certification of compliance with these Specifications for all materials delivered to the site.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Inspect materials delivered to the site for damage.
2. Unload and store materials with a minimum of handling. Store materials in a clean, level area and do not store materials directly on the ground. The inside of pipes shall be kept free of dirt and debris. Store pipe in a manner that provides protection from construction activities.
3. Limit stacking to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary, due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

B. Handling:

1. Handle materials in such a manner as to ensure placement in sound, undamaged condition.
2. Handle pipe in accordance with the Pipe Manufacturer's recommendations.

1.05 WARRANTY

- A. The Pipe Manufacturer and Contractor shall furnish a standard written warranty against defects in materials and workmanship in accordance with ASTM D3350 and ASTM F714. Warranty conditions concerning limits of liability will be evaluated and shall be acceptable to the Owner.

PART 2 – PRODUCTS

2.01 HDPE DRAINAGE PIPE

- A. HDPE drainage pipes shall be smooth-bore corrugated HDPE pipe and comply with the requirements of ASTM F2648.
- B. Pipe joints shall be soil tight.
- C. Pipe sizes shall match those indicated on the Design Drawings.
- D. HDPE pipe shall be ADS N-12 pipe (per ASTM F2648) or approved equivalent.

SECTION 33 41 01 – DRAINAGE PIPING

2.02 PIPE FITTINGS AND JOINTS

- A. All pipe fittings and joints shall be installed in accordance with Pipe Manufacturer's recommendations.
- B. Pipe fittings shall conform to ASTM F2648.
- C. Pipe shall be joined using a bell and spigot joint meeting ASTM F2648.

2.03 PIPE BEDDING

- A. Bedding material shall be as specified in Section 31 05 13 – Soils and Aggregates.

2.04 INSPECTION

- A. Inspect pipe and appurtenances before installation to verify quality and condition of material.

2.05 PREPARATION

- A. Remove dirt and foreign material, inside and outside, from pipe before installation.

2.06 HANDLING AND INSTALLATION

- A. Installation and handling of HDPE pipe shall be performed in accordance with ASTM D2321 and the Pipe Manufacturer's guidelines.
- B. Exercise care when transporting, handling, and placing HDPE pipe, such that the pipe will not be cut, kinked, twisted, or otherwise damaged.
- C. Prior to installation carefully examine all HDPE pipe for damage. Remove from the site and replace defective materials, as determined by the Engineer, immediately at no cost to the Owner.
- D. Make HDPE pipe field-cuts, where required, with a machine specifically designed for cutting pipe. Make cuts carefully, without damage to pipe, so as to leave a smooth end at right angles to the axis of pipe. Smooth and deburr cut pipe ends.
- E. Do not lay any HDPE pipe until the CM has approved the bedding conditions.
- F. The maximum allowable depth of cuts, gouges, or scratches on the exterior surface of the solid wall HDPE outlet pipe or fittings is 10 percent of the wall thickness. The interior of the pipe and fittings shall be free of cuts, gouges, and scratches. Sections of pipe with excessive cuts, gouges, or scratches, as determined by the Engineer, shall be removed and the ends of the pipe rejoined at no cost to the Owner.
- G. Blocking under piping shall not be permitted.

SECTION 33 41 01 – DRAINAGE PIPING

- H. Whenever pipe installation activities are not actively in progress, protect open ends of pipe that have been placed within the trench from clogging by sediment.
- I. Survey the installed location and elevation of all new piping for inclusion in the “As-Built” drawings.

- END OF SECTION -

SECTION 33 49 00 – PRECAST STRUCTURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish, install, and test precast concrete storm drainage structures.

B. Coordination:

1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before manholes.

C. Related Sections:

1. Section 31 23 00 – Excavation and Fill.

1.02 REFERENCE STANDARDS

A. The following standards are referenced in this Section:

1. ANSI A14.3, American National Standard for Ladders, Fixed, Safety Requirements.
2. ASTM A48/A48M, Standard Specification for Gray Iron Castings.
3. ASTM C32, Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale).
4. ASTM C144, Standard Specification for Aggregate for Masonry Mortar.
5. ASTM C150/C150M, Standard Specification for Portland Cement.
6. ASTM C207, Standard Specification for Hydrated Lime for Masonry Purposes.
7. ASTM C443, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
8. ASTM C478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
9. ASTM C923, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
10. ASTM C1107/C1107M, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
 - a. 29 CFR 1910, Occupational Safety and Health Standards.

SECTION 33 49 00 – PRECAST STRUCTURES

2. Comply with requirements and recommendations of authorities having jurisdiction over the Work.
3. Obtain required permits for Work in roads, rights-of-way, and other areas of the Work.

1.04 SUBMITTALS

A. Action Submittals:

1. Shop Drawings – Submit drawings showing design and construction details for the following:
 - a. Precast concrete structures, including details of joints between the bases and riser sections and stubs or openings for connections.
 - b. Access entry steps.
 - c. Cast iron frames and covers.
2. Product Data – Submit manufacturer's data and specifications for the following:
 - a. Resilient pipe connectors and corrugated pipe adapter.
 - b. Cast iron frames and covers.

B. Closeout Submittals:

1. Record Documentation:
 - a. Maintain accurate and up-to-date record documents showing modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to Work. Submittal shall show actual location of all completed Work and appurtenances at same scale as the Drawings.
 - b. Show structure(s) with rim and invert elevations referenced to Project datum.

PART 2 – PRODUCTS

2.01 PRECAST CONCRETE

- A. Except where otherwise specified, precast structure components shall consist of reinforced concrete pipe sections especially designed for structure construction and manufactured in accordance with ASTM C478, except as modified herein.
- B. Precast, reinforced concrete structure bases, riser sections, flat slab tops, and other components shall be manufactured by wet cast methods only, using forms that will provide smooth surfaces free from irregularities, honeycombing, or other imperfections.
- C. Joints between structure components shall be bell-and-spigot-type, employing a single, continuous rubber O-ring gasket complying with ASTM C443. The circumferential and longitudinal steel reinforcement shall extend into the bell and spigot ends of the joint without breaking the continuity of the steel.

SECTION 33 49 00 – PRECAST STRUCTURES

- D. All precast structure components shall be of approved design and of sufficient strength to withstand the loads imposed upon them. They shall be designed for a minimum earth cover loading of 130 pounds per cubic foot, AASHTO H-20 wheel loadings, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact. Precast structure bases shall have two cages of reinforcing steel in their walls, each of the area equal to that required in the riser sections. Wall thickness shall be not less than 5 inches. Concrete flat slab tops shall be not less than 6 inches thick.
- E. Lifting holes, if used in structure components, shall be tapered, and no more than two holes shall be cast in each section. Tapered, solid rubber plugs shall be furnished to seal the lifting holes. Lifting holes shall be made to be sealed by plugs driven from the outside face of the section only.
- F. The point of intersection of the sewer pipe centerlines shall be marked with a 1/4-inch diameter steel pin firmly enclosed in the floor of each structure base and protruding approximately 1 inch above the finished floor of the base.
- G. Mark date of manufacture and name or trademark of manufacturer on inside of barrel.
- H. The barrel of the structure shall be constructed of various lengths of riser pipe manufactured in increments of 1 foot to provide the correct height with the fewest joints. Openings in the barrel of the structures for sewer or drop connections will not be permitted closer than 1 foot from the nearest joint. Special structure base or riser sections shall be furnished as necessary to meet this requirement.
- I. Pipe openings shall be precast, or machine cored. Provide resilient pipe connector and corrugated pipe adapter complying with ASTM C923 for each opening. Connectors shall be flexible and watertight.
- J. A precast flat slab top shall be provided at the top of the structure barrel to receive the cast iron frame and cover.
- K. Structure steps shall conform to the requirements of 29 CFR 1910.27 and ANSI A14.3. Vertical separation of steps shall be uniform at maximum of 12 inches on centers. Steps shall project evenly from structure walls.

2.02 RELATED MATERIALS

- A. Aggregate Bedding Material for Structures: Pipe bedding material in accordance with Section 31 23 00 – Excavation and Fill, unless otherwise shown or indicated.
- B. Non-Shrink Grout: ASTM C1107/C1107M.
 - 1. Pre-packaged, non-metallic, cementitious grout requiring only the addition of water at the Site.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.

SECTION 33 49 00 – PRECAST STRUCTURES

3. Product and Manufacturer – Provide one of the following:
 - a. NS Grout by Euclid Chemical Company.
 - b. Set Grout by Master Builders, Inc.
 - c. NBEC Grout by Five Star Products, Inc.
 - d. Or equal.
- C. Grade Rings: ASTM C478.
- D. Brick: ASTM C32, Grade MS.
- E. Mortar: Mortar shall be composed of Portland cement, hydrated lime, and sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime.
 1. Portland Cement: ASTM C150/C150M, Type II.
 2. Hydrated Lime: ASTM C207, Type S.
 3. Sand: ASTM C144, except that 100 percent of the sand shall pass the No. 8 sieve.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify Site conditions, including locations, invert elevations, materials, and dimensions of existing piping to which connections are to be made, before ordering precast structures.
- B. Examine the areas and conditions under which the Work will be performed and notify Construction Manager in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to Construction Manager.

3.02 INSTALLATION

- A. Precast Structure Bases:
 1. Install precast bases on not less than 12-inch layer of aggregate bedding material placed and compacted in accordance with Section 31 23 00. Precast bases shall be set at the proper grade and carefully leveled and aligned.
- B. Precast Structure Sections:
 1. Install sections, joints, and gaskets in accordance with manufacturer's recommendations.
 2. Set sections vertical with steps and sections in true alignment. All joints shall be sealed inside and out with non-shrink grout and troweled smooth to the contour of the wall surface. Raised or rough joint finishes will not be accepted.
 3. Lifting holes shall be sealed tight with a solid rubber plug driven into the hole from the outside of the barrel and the remaining void filled with 1:2 cement-sand mortar.

SECTION 33 49 00 – PRECAST STRUCTURES

C. Structure Channels:

1. All invert channels through structures shall be constructed of Class “A” concrete in accordance with Section 03 00 05.
 - a. Accurately shape invert to a semi-circular bottom conforming to inside of connecting pipes, and steel-trowel finish to a smooth, dense surface.
 - b. Make changes in size and grade gradually.
 - c. Make changes in direction of entering sewer and branches to a true curve of as large a radius as structure size will permit.
 - d. Benches shall be built up to the heights shown or as directed by Construction Manager and shall be given a uniform float finish. Care shall be taken to slope all benches for proper drainage to the invert channel.

D. Grade Rings:

1. Grade rings or brick stacks shall be used for all precast structures and structures, where required. Stacks or grade rings shall be a maximum of 12 inches in height, constructed on the flat slab or conical top on which the structure frame and cover shall be placed. The height of the brick stack or grade rings shall be such as required to bring the structure frame to the proper grade.
2. Each grade ring or brick course shall be laid in a full bed of mortar and shall be thoroughly bonded.
3. Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to form full bed, end, and side joints in one operation. The joints shall not be wider than 3/8 inch, except when the bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4 inch. Masonry work shall be kept moist for a period of three days after completion, and precautions shall be taken to prevent freezing during cold weather.
4. The outside of brick stacks and grade rings shall be neatly plastered with 1/2 inch of cement mortar as the Work progresses.

- END OF SECTION -

SECTION 33 49 00 – PRECAST STRUCTURES

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SECTION 34 72 00 – RAILWAY CONSTRUCTION

PART 1 – GENERAL

1.01 DESCRIPTION

The Work shall consist of jointed track construction, panel track construction, panel turnout installation, turnout construction and installation, switchtie installation, upgrading of existing track which shall include rail and crosstie installation, surfacing, track lining, relocation of turnouts, and the removal of track and turnouts.

1.02 GENERAL

- A. Material furnished by the Contractor shall be approved by the Construction Manager.
- B. No track shall be laid until the roadbed (subgrade and subballast) is completed and approved by the Construction Manager.
- C. Main line turnouts and turnouts from active tracks shall be installed by OTHERS.
- D. Turnouts to be installed by the Contractor shall be as noted on the plans and bid sheet.

PART 2 – PRODUCTS

2.01 PREPARED RAILROAD TRACK BALLAST AND SUBBALLAST

- A. Mineral aggregates for prepared track ballast and subballast will be procured from supplier(s) with an establish quality system that complies with DOT, AAR Specification for Quality Assurance, M1003 (AAR M-1003), or International Quality Standard ANSI 9000 Series (ISO 9001).
- B. The type and sizes of prepared ballast are as designated in this Section and on the Design Drawings and in conformance to approved standards. The mineral aggregate shall be clean, hard, durable, free from any frozen lumps, deleterious matter and harmful adherent coatings. No materials subject to regulation as hazardous wastes as defined in the administrative code of the state where the material will be used shall be allowed.
- C. Processed ballast shall be handled at the producing plant in such a manner that it is kept free from segregation. It shall be loaded only into containers which are clean and free from rubbish or any substance that would foul or damage the ballast. The producer should not make repeated passes of equipment over the same levels in stock piled ballast. Track ballast shall be washed prior to loading in railcars (or other containers for delivery to the Site).
- D. Gradation Requirements:
 - 1. The grading of prepared track ballast and subballast shall be determined by test with laboratory sieves having square openings and conforming to current ASTM Specifications, Designation E-11.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

E. Quality Requirements:

1. Deleterious substances shall not be present in prepared ballast in excess of the following amounts:
 - a. Material finer than No. 200 sieve (Track ballast only) = 1%.
 - b. Clay lumps and Soft or Friable pieces = 0.5%.
(If clay lumps and soft or friable pieces exceeds 0.5%, the supplier must test and certify that clay lumps do not exceed 0.5% and soft or friable pieces do not exceed 2%. Contractor shall submit an action plan to reduce this material.)
2. The percentage of wear of prepared ballast tested in the Los Angeles Machine shall not be greater than:
 - a. Granite = 32%.
 - b. Dolomite = 28%.Except as otherwise specified by the Construction Manager.
3. The soundness of prepared ballast for use onsite, as freezing temperatures are expected, shall be such that when tested:
 - a. In the sodium sulfate soundness test, the weighted average loss shall not be in excess of 7% after 5 cycles; or
 - b. In the magnesium sulfate soundness test, the weighted average loss shall not be in excess of 11% after 5 cycles.

F. Testing:

1. Determinations of deleterious substances resistance to abrasion and soundness shall be made at a testing laboratory approved by the Construction Manager. These tests will be conducted when adding a new supplier, renewing contract, opening a new quarry or strata, and at least annually. It is the Contractor's responsibility to furnish copies of the annual test results and AAR M-1003, ISO 9001, or DOT certification to the Construction Manager.
2. Visual inspections and gradation test shall be made at the place of production prior to shipment as often as considered necessary. (Minimum of one sample per 1,000 tons of ballast produced but may be reduced if material consistently meets specification.) Gradation test results will be transmitted by email to the Construction Manager for review and approval. The reports shall be forwarded in a consolidated monthly summary of tests in an electronic format such as Excel. The supplier shall retain the details of gradation for a minimum of one year after the test is performed.
3. The Construction Manager retains the right to conduct on-site inspection for compliance to this specification. Deviation from these requirements will require the Contractor to enact corrective actions to identify and permanently eliminate the root cause(s) of the problem.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

4. Samples of the finished product for all tests shall be representative and of sufficient weight for testing.
5. The supplier shall certify the ballast delivered to the Site is typical of that upon which specified tests have been made. Testing shall be accomplished to meet the requirements as set out in Chapter 1, Part 2, Article 2.11, Paragraph 2.11.3 “Testing” and Table 1-2-4 of the AREMA Manual for Railway Engineering.
6. Samples shall be secured in accordance with the current ASTM methods of sampling. Designation D-75.
7. Sieve analysis shall be made in accordance with current ASTM method of test. Designation C-136.
8. Material finer than the No. 200 sieve shall be determined in accordance with the current ASTM of test. Designation C-117.
9. The percentage of clay lumps and soft particles shall be determined in accordance with the current ASTM method of test. Designation C-142.
10. The resistance to abrasion shall be determined in accordance with the current ASTM method of test (e.g., Lost Angeles abrasion and impact testing). Designation C-131, or C-535, using the standard grading most nearly representative of the size of ballast specified.
11. Soundness test shall be made in accordance with the current ASTM method of test. Designation C-88 (i.e., sodium sulfate test for soundness).
12. The weight per cubic foot shall be determined in accordance with the current ASTM method of test. Designation C-29.
13. Analytical testing, if any, shall be performed in accordance with Section 31 05 13 – Soils and Aggregates.

2.02 SUBBALLAST

- A. Subballast shall be crusher-run stone (dense graded aggregate), preferably limestone or granite material and shall meet the requirements as set out in Chapter 1, Part 2, Article 2.11, “Specifications for Subballast” of the American Railway Engineering and Maintenance-of-Way Association (AREMA) manual.

- B. Gradation as follows:

Sieve Size	2"	1"	3/8"	No. 10	No. 40	No. 200
% Passing Size (optimum)	100	95	67	38	21	7
Permissible Range % Passing	100	90-100	50-84	26-50	12-30	0-10

- C. Subballast shall be spread on a graded roadbed as a base, with sufficient width to accommodate the desired number of tracks. The subballast shall be compacted to 90 percent (ASTM D1557; see also Section 31 22 00 – Grading and AREMA Section 1.1)

SECTION 34 72 00 – RAILWAY CONSTRUCTION

and have a minimum depth of 6 inches. (For 6 inches of compacted subballast use approximately 0.83 ton per foot of track.)

2.03 BALLAST

- A. Ballast includes Quarried Granite, Trap Rock, and Dolomite Limestone, produced in a crushing-screening plant designed to satisfy the specifications listed herein.
- B. Materials for ballast used on industry tracks shall be clean crushed stone with a minimum depth of 6 inches for spur tracks between bottom of crosstie and top of subballast. Cribs (spacing between the crossties) shall be filled with ballast to the top of the ties unless otherwise noted.
- C. If approved by the Construction Manager, limestone ballast may be used on tracks. Limestone ballast proposed to be used on tracks will comply with AREMA specifications.
- D. Ballast shall be installed in the locations as required by the Design Drawings.
- E. Gradation shall conform to the following table:

Sieve Designation	Sieve Opening	#3 Ballast (Modified) % Passing Sieve	#5 Ballast % Passing Sieve
2 1/2"	2.5"	100	-
2"	2"	95-100	-
1 1/2"	1.5"	30-65	100
1"	1"	0-15	90-100
3/4"	0.75"	-	40-75
1/2"	0.5"	0-5	15-35
3/8"	0.375"	-	0-15
No. 4	0.187"	-	0-5
No. 200	0.0029"	0.5 Max	0.5 Max

2.04 RAIL

- A. Rail shall be new, or reused (relaid) rail of good quality, with minimum section of 100 pounds/yard. Reused rail should be free from local bends, kinks, battered ends, excessive engine burns and surface corrugations.
 - 1. For BSRM Tracks, as indicated on the Design Drawings, existing BSRM material shall be reused, to the extent practicable and as approved by the Construction Manager.
- B. Rail should be furnished in lengths not less than 31 feet and should be drilled to accept the proper size joint bars for the section of rail being used.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

- C. Rails should be laid one at a time. The bottom of the rail and the bearing surface of the tie plate should be cleaned of all debris before the rail is laid. Joints in opposite rails shall be staggered not less than 8 feet and not more than 14 feet apart, except as close joints may be required at insulated joints or turnouts. To minimize the cutting of full length rails, short rails of not less than 15 feet may be used in adjusting for proper spacing of joints. Proper allowance for expansion should be provided at rail joints by installing rail expansion shims conforming to the section of rail being used.
- D. When necessary to cut and/or drill a rail, it should be cut with an approved rail saw, and drilled with an approved rail drill. Flame cutting of rail will not be permitted.

2.05 TURNOUTS

- A. Turnouts shall be new or reused of good quality of the same or greater rail section as the parent track. The turnouts shall be the size and shape as called for on the plans and shall meet all requirements in accordance with an approved design, AREMA, or equal. The turnout material shall be complete in every respect to construct the needed turnouts ready to receive train traffic. Package switches shall be of an approved design, AREMA, or equal, equipped with standard reinforced points and of correct length for the size of turnout of which they are a part. Frogs shall be of an appropriate design, AREMA or equal, equipped with plates of the proper size and type to fit the designed track layout. Frogs shall be of the same or heavier rail section as that of the parent track.
 - 1. For BSRM Tracks, as indicated on the Design Drawings, existing BSRM material shall be reused, to the extent practicable and as approved by the Construction Manager.

2.06 CROSSTIES

- A. Crossties should be new and conform to 7" x 9" x 8' 6" – Grade 5 for oak and mixed hardwood ties. All ties shall be air dried to a maximum of 50% moisture content for oak and 40% for mixed hardwoods before treatment.
- B. The ties must be sterilized during treatment by holding them in 190°-210° F temperature creosote for at least six hours. This time shall not include creosote filling or emptying, nor temperature adjustments or final vacuum time. Final retentions shall be 8#/CF in oak and 10#/CF for mixed hardwoods. Except as noted above, all treatment shall be governed by American Wood- Preservers' Association Standards C1, C6, M1, M3, and M4. A 60/49 creosote-coal tar solution conforming to AWWPA Standard P-2 shall be used. The solution shall be tested according to AWWPA Standard A-1.
- C. Certification of the ties must be furnished from the contractor and/or supplier.
- D. Crossties shall be placed on the prepared subballast at right angles or normal to the centerline of the track. Crossties shall be spaced 20 inches, center to center (60 ties per 100 feet) with the ends of the ties along one side of the centerline on tangent track and along the inside on curved track being placed 1' 10 3/4" from the gage of the nearest rail.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

2.07 SWITCH TIES

- A. Switch ties shall be new oak and mixed hardwood ties of 7" x 9" in cross section and in 12" length increments as required for the turnout being used. All switch ties shall be air-dried and treated. No second hand switch ties may be used.
- B. Certification of the ties must be furnished from the contractor and/or supplier.
- C. Switch ties shall be placed on finished subballast and spaced according to the Standard Plan for the turnout being used.

2.08 TIE PLATES

- A. Tie plates should be new or second hand, of good quality and of an approved design for the weight of rail to be used. Two tie plates per tie, under the base of rail, must be used. Also, tie plates must be used on all switch ties not protected by switch plates, frog plates, or guard rail plates.
- B. The tie plates shall be double shouldered and have a minimum size of 7 1/2" x 11" with proper punching to fit the base of the rail being used. The down slope (1:40 cant) of the tie plate shall be directly over and parallel with the centerline of the crosstie. The tie plate shall be set so that the outside shoulder of the tie plate shall bear squarely against the base of the rail, having a full bearing for the rail and at the same time, a full bearing on the crosstie.

2.09 RAIL JOINTS

- A. Joints should be either new or second hand, of good quality and of the size, drilling, and hole spacing to fit the rail being used.
- B. Joint bars should be properly installed with the full number of and the correct size of bolts, nuts and spring washers. Bolts shall be placed with nuts alternately on inside and outside of rail and shall be drawn tight before spiking. Bolts shall be tightened by the use of approved track wrenches or track bolt machines.
- C. All joints should be kept out of grade crossings.
- D. When different size rails are to be connected, forged compromise joints shall be used. The above mentioned recommendation for rail joints should apply to compromise joints.
- E. Any field fabrication of compromise joints will be strictly prohibited, that is, the cutting down of larger standard joints to fit smaller rail will not be allowed.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

2.10 BOLTS AND NUTS

- A. Bolts and nuts for the track and turnouts should be new or approved reuse and of the correct diameter and length to fit the rail and joints being used. Bolts and nuts must conform to the latest AREMA specifications.

2.11 LOCK WASHERS

- A. Lock washers should be new and of correct diameter to fit the bolts being used. Each track bolt should be equipped with a spring lock washer, conforming to the most current AREMA Specifications for Spring Washers.

2.12 RAIL ANCHORS (JOINTED RAIL)

- A. Rail anchors should be new or reused of good quality and should be the correct size and of approved design for the rail used. Anchors should be applied so as to box anchor every fourth tie, i.e., the number of anchors shall be equal to the number of ties. Rail anchors should be installed through the turnouts in accordance with the Standard Plan for the turnout being used.

2.13 TRACK SPIKES

- A. Only standard, new 5/8" x 6" track spikes should be used and should conform to the most current AREMA Specifications for Low Carbon Steel Track Spikes. A minimum of two spikes per tie plate is required on tangent track. Spikes through the turnout should be applied in the number and location required in accordance with the Standard Plan attached for the turnout(s) being used.

2.14 DRIVE SCREW SPIKES

- A. New 7/8" x 7" drive screw spikes should be used for turnouts in accordance with the Standard Plan for the turnout(s) being used.
- B. New drive screw spikes of appropriate size shall be used for grade crossings.

2.15 DERAILS

- A. Not applicable.

2.16 EARTH MOUNDS AND BUMPING POSTS

- A. Earth Mounds or Bumping Posts shall be placed at the open end of all stub-ended tracks.
- B. Earth Mounds should be of an approved design sufficient to stop a moving car and should be protected against erosion.
- C. Where factors exist to exclude Earth Mounds, bumping posts may be constructed. Bumping posts shall be either new or second-hand, of good quality and approved

SECTION 34 72 00 – RAILWAY CONSTRUCTION

design. Bumping posts may be used on stub end tracks which end at a structure or dock within a paved roadway, or where public or private safety is required.

- D. The Industry must provide 30 feet or one half car length (whichever is greater) of vacant space between the last car spot and the beginning of the EOT device for safety.

2.17 SWITCH POINT PROTECTORS

- A. Depending on amount of traffic through turnouts and/or location of turnouts, switch point protectors should be installed. Where needed, these protectors should be new or second-hand, of good quality and should be compatible with the size and type of switch point being used.

2.18 FROG GUARD RAILS

- A. Guard rails must be installed for all frogs except self-guarded frogs. They should be new or second-hand, of good quality, of an approved design, AREMA or equal and equipped with proper plates.

2.19 SWITCH STANDS

- A. Switch stands must be installed for each turnout. All switch stands should be complete in every respect and throw rods adjusted for proper throw, including grinding of stock rails if such is necessary for positive closure of switch point against stock rail.
- B. Switch stands and latches shall be securely fastened to head block ties using 5/8“ bolts, or standard cut spikes.. Switch stand cranks must be made of forged steel.

PART 3 – EXECUTION

3.01 UNLOADING AND HANDLING OF MATERIALS

- A. Material shall be handled in such a manner as to insure against damage.
- B. Picks shall not be used in the handling or moving of crossties.
- C. The Contractor shall store and protect all material.
- D. Jointed rail, when used, shall be unloaded or loaded with an approved derrick or crane without dropping, and if stacked shall be placed with the heads up and with sufficient support under the base.
- E. The Construction Manager reserves the right to reject any car of ballast arriving at the Site for unloading that does not conform to the specification as determined by methods of test. If material loaded does not conform to these specifications, the Contractor must notify the supplier to stop loading until the fault has been corrected and to dispose of all defective material without cost to the Owner.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

3.02 JOINTED RAIL CONSTRUCTION

- A. The Contractor shall construct, ballast, line and surface the track to the final grade and alignment.
- B. The Contractor shall be responsible for the track until the track is accepted by the Construction Manager.
- C. Crosstie installation shall conform to the following:
 - 1. Crossties shall be spaced 20 inches center to center, and laid at right angles to the track centerline with the end measuring 1 foot 10-3/4 inches from the end of the tie to the gauge line of the rail.
 - 2. The bearing surfaces of the crossties shall be clean before tie plate and rail installation.
- D. Tie plate installation shall conform to the following:
 - 1. All crossties shall be fully tie plated before the rail is laid.
 - 2. The bottom of the tie plates shall be cleaned before the plate is applied.
 - 3. Tie plates shall be applied with the 1:40 cant down towards the center of track.
 - 4. The tie plate shall be spiked to gauge, not greater than every third crosstie, and shall be set so that the outside shoulder of the tie plate shall bear squarely against the base of the rail, having a full bearing for the rail and, at the same time, a full bearing on the crosstie.
- E. Jointed rail installation shall conform to the following:
 - 1. Joints in opposite rails shall be staggered between 1/4th and 1/3rd of a rail length apart, except as close joints may be required at insulated joints or turnouts.
 - 2. Short rail, not less than 15 feet long, may be used in adjusting for proper spacing of joints.
 - 3. Proper allowance for expansion should be provided at rail joints.
 - 4. Reused jointed rail shall be laid so that the least worn side of the rail is on the gauge side.
- F. Joint bar installation shall conform to the following:
 - 1. Joint bars shall be clean of any foreign material, except metal preservative, and properly installed with the full number of and correct size of bolts, nuts and spring washers.
 - 2. Before placing joint bars, the bearing surfaces of the bars as well as the rail ends within the joint bar area shall be free of any foreign material except metal preservative.
 - 3. Bolts placed with nuts alternately on inside and outside of rail shall be drawn tight before spiking.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

4. Where possible, all joints shall be kept out of road crossings.
 5. Before acceptance of work, all bolts shall be checked by the Contractor and, if necessary, tightened.
- G. Final gauging shall conform to the following:
1. Necessary final gauging shall be done after the rail is laid and jointed.
 2. Before spikes are driven, crossties shall be evenly spaced and square to the rail. Tie plates shall be centered on the tie and provide full bearing.
 3. When spiking, care shall be exercised not to spike the rail.
 4. The final gauge shall be 56-1/2 inches.
 5. Track shall be gauged as spikes are driven home.
 6. Any crossties that do not fully bear on the subballast shall be nipped up while spiking.
 7. When constructing skeleton track, final gauging and anchor spiking shall not be performed until after the track is lined to final alignment.
- H. Anchor and double spiking shall conform to the following:
1. Track curvature shall be spiked as shown on the plans.
 2. Drive screw spikes shall be used for anchor spiking of curves if specified on the plans.
 3. When driving spikes in secondhand crossties, tie plugs shall be placed in all holes before driving spikes.
 4. All spikes shall be started and driven perpendicular to the crosstie and square with the rail and so driven that the head of the spike shall have a full hold on the base of rail or the tie plate when anchor spiking.
 5. Spikes shall not be overdriven so that the lip of the spike head bends upward.
 6. No spikes shall be driven at the ends of joint bars.
 7. The Contractor shall remove any overdriven spikes or spikes that are bent while driving. Tie plugs shall be placed and then spikes properly driven.
 8. Reused spikes shall be used for all anchor spiking of tie plates. The Contractor shall straighten all reused spikes before use.
- I. Rail anchor installation shall conform to the following:
1. For jointed rail every fourth crosstie shall be box anchored.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

J. Ballasting shall conform to the following:

1. Contractor shall be responsible for unloading, hauling, transferring, spreading, tamping and dressing ballast.
2. Ballast shall be uniformly distributed as it is unloaded by the contractor after anchoring of the track has been completed.
3. The depth of preliminary ballast for surfacing shall not be more than 4 inches between the bottom of crossties and the top of subballast. Each successive raise shall not exceed 4 inches.
4. Care shall be taken to avoid disturbing or destroying any centerline or top of rail stakes.
5. The Contractor shall dress ballast to conform to typical roadbed sections as shown on the plans.

K. Surfacing shall conform to the following:

1. A preliminary surfacing shall follow each unloading of ballast.
2. The Contractor shall thoroughly tamp (surface) track with an on-track power (mechanical) tamper.
3. If jacks are used they must be placed close enough together to prevent undue bending of rails or strains at joints.
4. Both rails must be raised at one time as uniformly as possible.
5. The track shall not be raised more than 4 inches in one lift and ballast shall be well tamped under each crosstie before the next lift is made.
6. All crossties that are pulled loose shall be restored to proper position and fully nipped and spiked before tamping.
7. The Contractor shall raise the track to the final profile grades with the necessary additional ballast mechanically tamped under the crossties.
8. Ballast shall be well tamped from a point 15 inches inside of each rail, on both sides and under the crosstie, to the end of the crosstie.

L. The alignment for the track shall not deviate from uniformity more than 1/8 inch at the mid-offset in any 62 foot line on tangent track or more than 1/8 inch mid-offset in any 62 foot chord on curved track.

M. Track surface may not deviate from uniformity more than the following:

1. The deviation from design profile on any rail at the mid-ordinate of a 62 foot chord may not be more than 1/8 inch. Cross level must be maintained.
2. Curved track shall be superelevated as shown by the plans. Deviation from superelevation on spirals may not be more than 1/8 inch.
 - a. No superelevation or spirals are part of this project.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

- N. Upon completion of the final surfacing and lining of the track, the Contractor shall trim the ballast to conform with the typical roadbed section as shown on the plans, and dispose of any surplus ballast as directed by the Construction Manager. The completed ballast section shall have all tie cribs filled, and crossties, tie plates and rails shall be swept clean.
- O. Build-up of rail ends shall conform to the following:
1. The Contractor shall attempt to match rail section as much as possible. A variation of $\frac{3}{32}$ of an inch or more in head wear must be built-up.
 2. A runoff of 4 inches must be made for $\frac{3}{32}$ of an inch of build-up, with an additional inch of runoff for each additional $\frac{1}{16}$ of an inch of build-up.
 3. All welding work must be performed only by personnel that have been approved and cleared by the Construction Manager.
 4. Joints to be built-up shall be marked and approved by the Construction Manager.
 5. Any joint that does not require welding but is slightly mismatched shall be ground smooth.
- P. The sawing and drilling of rail ends shall conform to the following:
1. The Contractor shall, as directed by the Construction Manager, saw out defective or worn segments of rail and all rail ends that been torch cut or otherwise damaged.
 2. The saw cut shall be made at least 12 inches behind the cut when removing torch cuts.
 3. All cuts shall be true and vertical with the cut through the entire rail section.
 4. Rail ends shall be drilled as shown on the plans.

3.03 PANEL TRACK CONSTRUCTION

- A. Panels shall consist of preassembled units of one rail length, including rails, crossties, tie plates, spikes and anchors.
- B. The Contractor shall unload panels and construct track in accordance with subsections 3.01 and 3.02.
- C. Once panels are in place and connected, joints shall be staggered. To accomplish this, rails on one side shall be moved in unison along the tie plates and the resulting gap shall be plugged with a short rail section.
- D. The Contractor shall straighten any skewed crossties and shall install any crossties that are missing.
- E. The Contractor shall install any extra rail anchors required.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

3.04 PANEL TURNOUT INSTALLATION

- A. Panel turnouts shall be unloaded by the Contractor at a point as near as possible to the point of installation.
- B. The Contractor shall be responsible for supplying all necessary equipment and labor required to move the units to the proper location, make final connection of the separate units and to install the turnout at the designated point in the track structure.
- C. Track gauge at the point of switch shall be 57 inches.
- D. Three gauge rods shall be installed ahead of each switch point after the turnout has been installed. Insulated gauge rods must be used where signal circuits exist.
 - 1. Signal circuits are not part of this project.
- E. All hand throw stands, targets, and hold-down latches are to be set by the Contractor and adjusted so that the points operate freely and fit tightly against the stock rail when in a closed position.

3.05 TURNOUT CONSTRUCTION AND INSTALLATION

- A. The Contractor shall assemble the turnout on the prepared roadbed in close vicinity to its final location.
- B. Turnout construction shall be as shown on the plans.
- C. No turnout shall be constructed without supervision by the Construction Manager.
- D. Stock and closure rails shall be cut by the Contractor from rail furnished by the Owner, if available.
- E. All switchties shall be box anchored on each rail, except at switch points and frogs.
- F. Completed turnouts shall be installed in accordance with subsection 3.05.

3.06 SWITCHTIE INSTALLATION

- A. The Contractor shall remove unsuitable switchties and install new or previously used switchties, in existing turnouts as designated by the Construction Manager.
- B. Switchties shall be installed prior to any necessary surfacing.
- C. Switchties shall be equally spaced between adjacent switchties and at right angles to the straight side track centerline.
- D. All switchties shall be box anchored on each rail, except at switch points and frog. Any anchors removed or dislodged during changing out of switchties shall be replaced.
- E. Previously used switchties to be installed shall be plugged prior to spiking.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

3.07 TRACK UPGRADE

- A. The Contractor shall upgrade existing track as shown on the plans or as directed by the Construction Manager. The work shall include the installation of new crossties, placement of tie plugs, replacement of rail and other track materials, unloading of ballast, tamping and surfacing and lining and gauging of track as required.
- B. Disposition of removed materials shall be in accordance with subsection 3.11.
- C. The removal and replacement of rail shall conform to the following:
 - 1. The Contractor shall remove all spikes from crossties, tie plates, rail anchors, joints, bolts and nutlocks as necessary to release the existing rail.
 - 2. Unloading, handling and installation of the rail shall be in accordance with subsections 3.01 and 3.02.
 - 3. All crossties shall have spike holes filled with wooden plugs and be respiked.
- D. The removal and installation of crossties shall conform to the following:
 - 1. Crossties to be replaced shall be as indicated by the Construction Manager.
 - 2. The Contractor shall install new crossties in existing track prior to surfacing track and after installing rail, if rail is to be upgraded.
 - 3. New crossties shall be handled to prevent any splitting or damaging of the crosstie. Any crosstie damaged shall be replaced by the Contractor at his expense.
 - 4. The Contractor shall remove old crossties and straighten all remaining crossties that are skewed.
 - 5. New crossties are to be installed in such a manner that crosstie and tie plates may be set in place without the use of track jacks.
 - 6. Crossties shall be equally spaced between adjacent crossties and at right angles to the rail.
 - 7. Surfaces of crossties and tie plates are to be clean before spiking up.
 - 8. Tie plate installation, spiking and anchoring shall be in accordance with subsection 3.02.
 - 9. All crossties are to be fully nipped.
 - 10. All anchors and any anchors dislodged by the Contractor's operation shall be replaced.
 - 11. All crossties installed shall be hand tamped in order to maintain adequate surface until the final tamping and surfacing operation.
- E. Ballasting, surfacing and alignment shall be in accordance with subsection 3.02.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

3.08 TRACK LINING AND RELOCATION

- A. The Contractor shall line and/or relocate tracks as shown on the plans.
- B. The Contractor shall exercise extreme caution during such operations to insure against damage to rail, crossties, or track material. All materials lost or damaged due to the Contractor's negligence shall be replaced with materials of acceptable quality at the Contractor's expense.
- C. Relocation of tracks shall not disturb the subballast.
- D. Track to be relocated shall be either paneled into units of one rail length and relocated to its new location or dismantled and rebuilt in its new location in accordance with subsection 3.02.
- E. Track to be lined shall be lined with a backhoe, front end loader, dozer, or other equipment approved by the Construction Manager, and in such a manner as not to cause damage to the track structure.
- F. The Construction Manager may elect to change out bad crossties in tracks to be relocated or lined. The Contractor shall install crossties as directed by the Construction Manager and in accordance with subsection 3.02.
- G. Ballasting, surfacing and alignment shall be in accordance with subsection 3.02.

3.09 TURNOUT RELOCATION

- A. The Contractor shall relocate turnouts as shown on the plans.
- B. Turnouts shall not be installed until the roadbed subgrade has been finished and the subballast placed and compacted. Installation of turnouts shall be in accordance with subsection 3.05.
- C. The Contractor shall exercise extreme caution during such operations to insure against damage to rail, switchties, or turnout material. All materials lost or damaged due to the Contractor's negligence shall be replaced with materials of acceptable quality at the Contractor's expense.
- D. The Construction Manager may elect to change out bad switchties in turnouts to be relocated. The Construction Manager shall designate switchties to be replaced by the Contractor. Replacement shall be in accordance with subsection 3.06.
- E. Ballasting, surfacing and alignment shall be in accordance with subsection 3.02.

SECTION 34 72 00 – RAILWAY CONSTRUCTION

3.10 TRACK AND TURNOUT REMOVAL

- A. The Contractor shall remove track and/or turnouts as shown on the plans.
- B. Track removal shall include removing spikes, joint bars, rail anchors, rails, tie plates, crossties, other track material and disposition of materials.
- C. Turnout removal shall include disassembling turnout components and disposition of materials.
- D. Disposition of materials shall be in accordance with subsection 3.11.
- E. The Contractor shall be responsible for shaping, smoothing and compacting the roadbed after removal of track or turnouts. Roadbed shall be free of ruts and depressions and shaped to allow for proper drainage.

3.11 DISPOSITION OF TRACK AND TURNOUT MATERIALS REMOVED

- A. The Contractor shall sort and stockpile removed materials at locations designated by the Construction Manager.
- B. Jointed rail shall be stacked with the heads up and with sufficient support under the base.
- C. Recycling and disposal shall be in accordance with all local, state and federal laws and Section 01733 – Waste Management.
- D. Care shall be taken to prevent damage to salvaged materials during handling.

- END OF SECTION -

Appendix C

**Revised Baseline Restoration Assessment Report for Rail Transload
Area Properties in Reaches 5 and 6**



Appendix C

AECOM

Baseline Restoration Assessment Report for Rail Transload Area Properties in Reaches 5A and 6

Originally Submitted February 20, 2026
Revised September 21, 2026

Prepared for General Electric Company
Pittsfield, Massachusetts

Baseline Restoration Assessment Report for Rail Transload Area Properties in Reaches 5A and 6

Originally Submitted February 20, 2026

Revised September 21, 2026

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TABLE OF CONTENTS

LIST OF TABLES	ii
LIST OF FIGURES	iii
LIST OF ATTACHMENTS	iii
Abbreviations	iv
1.0 Introduction and Scope.....	1
1.1 Introduction.....	1
1.2 Scope of Baseline Restoration Assessment.....	2
2.0 Environmental Setting	5
2.1 Utility Drive Rail Transload Property	5
2.2 Woods Pond Spur Rail Transload Property.....	5
3.0 Methods	6
3.1 Background Data Collections	6
3.2 Field Investigations.....	7
3.2.1 Wetland Delineation and Inventory	7
3.2.2 Vernal Pool Assessment.....	8
3.2.3 Plant Community Inventory and Wildlife Habitat Survey	8
3.2.4 Invasive Species Assessment.....	9
3.3 Wildlife Habitat Assessment	9
3.4 Rare Species Assessment	10
3.5 Geology and Soils	10
3.6 Ecological Functions and Values Assessment	11
4.0 Results.....	12
4.1 Geology and Soils	12
4.2 Plant Community Inventory and Wildlife Habitat.....	13
4.2.1 Cover Type Mapping.....	13
4.2.1.1 Utility Drive Property	13
4.2.1.2 Woods Pond Spur Property.....	14
4.2.2 Plant Inventory	14
4.2.2.1 Utility Drive Property	14
4.2.2.2 Woods Pond Spur Property.....	18

4.2.3	Wildlife Habitat.....	19
4.3	Delineation and Inventory of Wetlands.....	21
4.4	Vernal Pool Findings	21
4.5	Rare Species Habitat Findings.....	22
4.5.1	Utility Drive Property.....	22
4.5.2	Woods Pond Spur Property.....	24
4.6	Ecological Functions and Values Assessment.....	27
4.6.1	Wetland Functions and Values Assessment.....	27
4.6.2	Upland Habitats Functions and Values Assessment.....	27
5.0	References	28

LIST OF TABLES

Table 1:	Cover type comparison: DeGraaf and Yamasaki (2001) versus Woodlot (2002)
Table 2:	Mapped plant communities within the Utility Drive rail transload property
Table 3:	Mapped plant communities within the Woods Pond Spur rail transload property
Table 4:	Vascular plant species observed at the Utility Drive rail transload property
Table 5:	Ranked IV _{ave} values for the Utility Drive rail transload property
Table 6:	Vegetation percent cover for palustrine cover types at the Utility Drive rail transload property
Table 7:	Ranked IV _{ave} values for Upland Field at the Utility Drive rail transload property
Table 8:	Ranked IV _{ave} values for Northern Hardwood Forest at the Utility Drive rail transload property
Table 9:	Vascular plant species observed at the Woods Pond Spur rail transload property
Table 10:	Vegetation percent cover at the Woods Pond Spur rail transload property
Table 11:	Observed and potential bird species presence at the Utility Drive rail transload property
Table 12:	Observed and potential amphibian, reptile, and mammal presence at the Utility Drive rail transload property
Table 13:	Potential rare butterfly host plants identified at the Utility Drive rail transload property in 2025
Table 14:	Survey dates and monitoring of nest building activities by bald eagles adjacent to Woods Pond

LIST OF FIGURES

- Figure 1: Site Locus: Rail Transload Properties in River Reaches 5A and 6
- Figure 2: Habitat Cover Types: Utility Drive Transload Property
- Figure 3: Habitat Cover Types: Woods Pond Spur Transload Property
- Figure 4: NRCS Soils: Utility Drive Transload Property
- Figure 5: NRCS Soils: Woods Pond Spur Transload Property
- Figure 6: NHESP Priority Habitats: Rail Transload Properties in Reaches 5A and 6

LIST OF ATTACHMENTS

- Attachment C-1: Habitat Inventory Forms
- Attachment C-2: Representative Photographs
- Attachment C-3: US Army Corps of Engineers Wetland Determination Forms for the Utility Drive Rail Transload Property
- Attachment C-4: USDA NRCS Soils Mapping and Descriptions for Rail Transload Properties
- Attachment C-5: IPaC Results

ABBREVIATIONS

BRA	Baseline Restoration Assessment
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GE	General Electric Company
GIS	Geographic Information System
GPS	global positioning system
IPaC	Information for Planning and Consultation (USFWS)
LiDAR	Light Detection and Ranging
mg/kg	milligram per kilogram
MIPAG	Massachusetts Invasive Plant Advisory Group
MNHESP	Massachusetts Natural Heritage and Endangered Species Program
MWPA	Massachusetts Wetlands Protection Act
NWI	National Wetlands Inventory
PCB	polychlorinated biphenyl
PDI	pre-design investigation
RCRA	Resource Conservation and Recovery Act
Revised T&D Plan	Revised On-Site and Off-Site Transportation and Disposal Plan
ROR	Rest of River
UDF	Upland Disposal Facility
USACE	U.S. Army Corps of Engineers
USDA NRCS	U.S. Department of Agriculture Natural Resource Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Woodlot	Woodlot Alternatives, Inc (now Stantec)

1.0 Introduction and Scope

1.1 Introduction

This Baseline Restoration Assessment (BRA) Report for the Rail Transload Properties in Reaches 5A and 6 has been prepared by AECOM on behalf of the General Electric Company (GE). This report represents a revision of an earlier version of this report which was submitted as an appendix to GE's *Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6* (Arcadis and AECOM 2026), conditionally approved by the U.S. Environmental Protection Agency (EPA) on June 17, 2026, and has been revised to address the relevant conditions in EPA's conditional approval letter, as well as other updating. This report includes results of the ecological characterization and habitat data collection conducted as part of the pre-design investigation (PDI) activities for the areas that will contain rail transload facilities to be constructed in support of a Remedial Action for the Housatonic Rest of River (ROR). That Remedial Action was specified in the final Revised Resource Conservation and Recovery Act (RCRA) Corrective Action Permit issued by EPA to GE on December 16, 2020 (EPA 2020). On October 15, 2024, GE submitted a *Revised On-Site and Off-Site Transportation and Disposal Plan* (Revised T&D Plan; Arcadis 2024), which described GE's plans for the transportation and disposal of excavated material from the ROR. In that revised plan, GE proposed using rail transport for some of the materials removed during the Remedial Action, and it proposed three locations for the loading and/or unloading of rail cars.

On April 29, 2025, EPA issued a conditional approval letter for the Revised T&D Plan. That letter approved the three locations for the rail transload areas and directed GE to submit pre-design investigation (PDI) work plans to describe the necessary investigations to support the design of these rail transload areas, with the initial work plan to address the first two of those locations. Those locations, shown on **Figure 1**, are:

- Utility Drive area, located adjacent to the Pittsfield Wastewater Treatment Plant in Reach 5A in the City of Pittsfield, Massachusetts; and
- Woods Pond Spur area, located adjacent to Reach 6 along the western side of Woods Pond and adjacent to the Lenox Rail Station and Berkshire Scenic Railway Museum in Lenox, Massachusetts.

On May 15, 2025, GE submitted to EPA a document titled *Pre-Design Investigation Work Plan for Rail Transload Areas in Reaches 5 and 6* (Rail PDI Work Plan). That work plan described GE's proposed pre-design investigations for the properties that will contain rail transload facilities. Section 2.3 of that work plan described the BRA activities that would be conducted by GE at each property that will contain rail transload facilities, including potential locations for construction of the transload areas

and eventual restoration and/or reuse of those areas. EPA provided conditional approval of the Rail PDI Work Plan on July 24, 2025.

In August 2025, AECOM initiated that BRA by conducting an ecological characterization and habitat assessment of these two properties in accordance with the Rail PDI Work Plan. The ecological and habitat assessment covered areas of the proposed rail transload facilities, site access roads, associated support areas, staging and material storage areas, and surrounding habitats within the properties. Although the layout of these rail transload areas was later modified and expanded following submission of the Rail PDI Work Plan, the BRA activities conducted were adequate to cover the modified and expanded layouts at both properties. Approximately 36.5 acres were assessed at the Utility Drive property and approximately four acres were assessed at the Woods Pond Spur property.

In addition, as discussed further in this report, in accordance with a proposal by GE in August 2025 and a conditional approval letter issued by EPA in November 2025, GE conducted a survey for certain state-listed rare species within and adjacent to the Woods Pond Spur rail transload property in 2026. That survey is discussed in Section 4.5.2 of this revised report.

For purposes of this BRA report, the overall properties within which the assessments were conducted (including all mapped habitat types and ecological resources) are referred to as the Utility Drive rail transload property (or just Utility Drive property) and the Woods Pond Spur rail transload property (or just Woods Pond Spur property), as applicable. The specific footprints of the proposed rail transload infrastructure and associated construction or disturbance limits are referred to, where applicable, as the Utility Drive rail transload area and Woods Pond Spur rail transload area, respectively.

1.2 Scope of Baseline Restoration Assessment

This section provides an overview of the BRA baseline activities conducted at the rail transload properties in accordance with the Rail PDI Work Plan and the additional requirements specified by EPA in its July 24, 2025 conditional approval letter for that Work Plan and its June 17, 2026 conditional approval letter for an earlier version of the present report, as well as other directives from EPA. These activities were conducted for GE by AECOM, with field investigations under EPA oversight, to develop and implement a detailed baseline ecological inventory and assessment of existing conditions and serve as the foundation for developing the design plan for the rail transload areas. The baseline habitat assessment of the Utility Drive and Woods Pond Spur properties included the following components:

- The presence, location, and species composition of the habitats at these properties were identified initially through on-line database reviews and aerial photograph interpretation. This

process included producing cover type mapping using the habitat classification system developed by DeGraaf and Yamasaki (2001) as well as the community type classification mapping used in the *Ecological Characterization of the Housatonic River* (Woodlot 2002). The mapping was done with the aid of aerial photographs, and these preliminary delineations were transferred onto the updated aerial photographic and topographic mapping obtained for the rail transload properties. Field investigations were then conducted over the entirety of both properties to review and verify or adjust the habitat cover type delineations.

- During the field surveys, each discrete cover type unit was subject to a detailed inventory. A broad range of habitat parameters was recorded to characterize the structural, physical, hydrologic, and biological conditions within each habitat cover unit, including plant species composition and other habitat features.
- Evaluations for the presence of wetland resource areas were conducted at each rail transload property. Where areas meeting state or federal wetland criteria were identified, they were subject to field verification. This verification included completing the U.S. Army Corps of Engineers (USACE) Wetland Determination Data Form for the Northeast Region.
- An evaluation was conducted for the possible presence of vernal pools at both rail transload properties. This evaluation was performed as part of an overall evaluation of potential vernal pools in the Reach 5A floodplain in 2018 and 2019, which included an inspection of wetland areas using procedures employed by the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) for determining whether a pool meets the criteria for a certified vernal pool (AECOM 2020). No potential vernal pools were identified at either the Utility Drive property or the Woods Pond Spur property.
- The potential presence of federal or state-listed threatened or endangered species or other state-listed species and their habitats was initially identified through review of the U.S. Fish and Wildlife (USFWS) on-line Information for Planning and Consultation (IPaC) and review of the MNHESP records on state-listed species, including "Species Habitat" mapping provided by MNHESP in March 2025. To the extent practicable, the results of these reviews at the Utility Drive property were assessed during field surveys discussed below.
- The presence, location, and abundance of invasive plant species, including both those listed by the USACE New England District (USACE 2020b) and those listed by the Massachusetts Invasive Plant Advisory Group (MIPAG 2022), including "likely invasive" species, were investigated through base mapping and aerial photograph reviews in combination with field surveys.
- In July and August 2025, field surveys were conducted by teams of ecologists to inventory and assess habitat conditions at the Utility Drive and Woods Pond Spur rail transload properties. A

total of 24 vegetation plots were systematically sampled at the Utility Drive property to quantitatively describe the plant communities and assist in mapping habitat cover types. A general overview was conducted to assess vegetation, plant communities and habitat cover types within both the Utility Drive and Woods Pond Spur properties. Rare species surveys were conducted at the Utility Drive property in the summer and fall by subject matter experts as appropriate. Field investigations included either direct oversight by scientists on behalf of EPA or notification to EPA to provide an opportunity for direct oversight.

- In response to an EPA conditional approval letter of November 24, 2025, additional surveys of certain federal and state-listed rare species were conducted in 2026 in areas that covered the Woods Pond Spur property as part of such rare species surveys in Reach 6.

2.0 Environmental Setting

2.1 Utility Drive Rail Transload Property

The Utility Drive rail transload property, situated within or adjacent to the southern portion of Reach 5A, is located in the southern portion of the City of Pittsfield in Berkshire County, Massachusetts, within the George L. Darey Housatonic Valley Wildlife Management Area. This property is bordered by Utility Drive to the south, the existing Springfield Terminal Railroad tracks to the west, a woodland strip bordering a field area to the north, and wetland and floodplain habitats associated with the Housatonic River floodplain to the east. The entire property is mapped by MNHESP as “Priority Habitat of Rare Species” and “Estimated Habitat of Rare Wildlife” (MNHESP 2021). The U.S. Geological Survey (USGS) topographic map identified a portion of this property as a previous gravel pit (MassGIS 2025a). Currently the property exhibits upland open field habitat, limited wetland habitat, a maintained access way and sewer line right-of-way along the property’s eastern border, and a powerline right-of way along the property’s western border parallel to the existing railroad tracks.

2.2 Woods Pond Spur Rail Transload Property

The Woods Pond Spur rail transload property, situated within or adjacent to the western side of Reach 6, is located in the Town of Lenox in Berkshire County. This property is located in the Housatonic River Valley, just west of Woods Pond, between Willow Creek Road and the Springfield Terminal railroad tracks. The Lenox Station and Berkshire Scenic Railway Museum occupy the southeastern portion of the property, adjacent to the proposed rail spur transload area. The Housatonic River and Woods Pond to the east flow south to the Woods Pond Dam, the first significant impoundment on the river. This property is located approximately 0.5 miles northwest of the GE Upland Disposal Facility (UDF) to be used for the disposal of some dredged and excavated materials as part of the ROR Remedial Action.

Zoned as industrial property, this property was previously developed and includes an existing building pad and gravel surface driveway that leads from Willow Creek Road to the railway museum and railroad tracks and station. The northern portion of this property is occupied by a utility line right-of-way, includes two utility tower structures, and is traversed by overhead utility lines.

3.0 Methods

For the overall ecological characterization and habitat inventories, two survey teams including wildlife biologists and wetland and soil scientists conducted site visits in July and August 2025, with oversight by EPA representatives. Surveys included confirmation, refinement, and finalization mapping of the natural plant communities identified during the desktop analysis; detailed identification of the plant types present (including invasive species); delineation of the limits of on-site wetlands (where present); recording of habitat information for each habitat type; and assessment of wildlife habitats. Additional field surveys for rare species were conducted at the Utility Drive rail transload area by subject matter experts as appropriate. This section describes the methods used to conduct this baseline assessment. The results are presented in Section 4.

3.1 Background Data Collections

During preparation of the Rail PDI Work Plan, background information was reviewed to develop a preliminary understanding of potential habitat conditions at and in proximity to both rail transload properties including natural community types, the potential presence of federally listed threatened or endangered species and state-listed rare species, potential wetlands and vernal pools, and invasive species. That information was derived from on-line sources, such as the MassGIS Data Layers (MassGIS 2025a), the USFWS National Wetlands Inventory (NWI) Mapping, IPaC results, MNHESP data, and aerial photograph reviews. In March of 2025, MNHESP provided GE with digital information consisting of “Species Habitat” mapping for state-listed species in Reaches 5 through 8 of the ROR, including a 1,000-foot buffer from the 1 mg/kg PCB isopleth, which provided coverage of the rail transload properties. Surveys for state-listed species were implemented based on this mapping.

During the background data collection, the presence, location, and species composition of terrestrial habitats were reviewed through on-line database reviews and aerial photograph interpretation. This process included producing cover type mapping using the habitat classification system developed by DeGraaf and Yamasaki (2001) as well as the community type classification mapping used in the 2002 Woodlot Ecological Characterization. The DeGraaf and Yamasaki cover type categories are very similar to the cover types used for the Woodlot (2002) ecological characterization but provide for greater differentiation of some of the habitat cover types, particularly in upland areas of the Woods Pond Spur property, whereas the Woodlot Ecological Characterization focused on floodplain habitats.

Table 1 provides a comparison of the habitat cover types between the 2002 Woodlot and 2001 DeGraaf and Yamasaki classification systems. As can be seen there, the cover types are generally comparable, with mostly minor naming changes between the two systems. For example, DeGraaf and Yamasaki provide four distinctions of upland field cover types, whereas Woodlot lumped all such areas into one “cultural grassland” cover type. Given the relatively widespread presence of these

cover types at these properties, use of the DeGraaf and Yamasaki system allowed for finer distinctions in the upland habitat cover mapping and improved characterization of potential wildlife habitat.

The mapping was done with the aid of aerial photographs, and these preliminary delineations were transferred onto the updated aerial photographic and topographic mapping obtained for the transload properties. Field investigations were conducted over the entirety of both properties to review and verify or adjust the habitat cover type delineations.

3.2 Field Investigations

During the field investigations, ecological habitat conditions were documented at the rail transload properties. During these field surveys, the main discrete habitat cover type units were subject to a detailed inventory by recording a range of habitat parameters to characterize structural, physical, hydrologic, and biological conditions within each habitat cover type unit. These characterizations included soil characteristics (at the Utility Drive property only), plant species composition, a broad range of habitat features, and habitat degradation. Plant species were identified using appropriate botanical reference material for the region. The indicator status of each species was identified following USACE (2020a). The specific investigations to assess the potential presence of wetlands and vernal pools are discussed in the following subsections.

3.2.1 Wetland Delineation and Inventory

The evaluation of the potential presence of wetland resource areas within and adjacent to the rail transload properties was performed in two phases – initial desktop studies of existing data sources followed by a detailed field survey effort. Resources consulted during the desktop analyses included USGS topographic quadrangle maps, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Soil Survey data, USFWS NWI mapping, most recent color aerial photographs, and other data layers available from MassGIS (2025a). The field survey work included the identification, delineation, and verification of any wetlands identified. The verification included completing the USACE Wetland Determination Data Forms for the Northeast Region for any wetlands identified, incorporating the three-parameter criteria (vegetation, soils, and hydrology) for federal wetland determinations (USACE 2020a).

At the Utility Drive transload property, the background information reviewed indicated the potential presence of a number of wetlands located within the lower-elevation portions of that property. Those areas were evaluated in the field to determine whether they constitute wetlands under state and/or federal wetland criteria, including completing the USACE Wetland Determination Data Form as part of this determination.

At the Woods Pond Spur transload property, an assessment of that approximate four-acre property east of Willow Creek Road, as well as the forested area west of Willow Creek Road, showed that no wetlands are present within or adjacent to this property.

3.2.2 Vernal Pool Assessment

Investigations to assess the presence of potential vernal pools at the rail transload properties were conducted as part of the vernal pools assessments conducted by GE in 2018 and 2019 in Reach 5A (AECOM 2020). Wetlands at the Utility Drive property did not meet the NHESP criteria for vernal pool certification, and no potential vernal pool habitat was present at the Woods Pond Spur property. As a result, no focused vernal pool surveys were conducted at these properties.

3.2.3 Plant Community Inventory and Wildlife Habitat Survey

Documentation of mammals, birds, and invertebrates at the rail transload properties was made through direct observation and through indirect evidence of wildlife presence (e.g., scat, tracks, vocalizations, burrows). In addition, identification and delineation of any habitats or natural communities which could support listed rare species were recorded.

Habitat requirements for many species of wildlife common to New England are well documented; and therefore, by characterizing plant community composition and structure, the potential for a certain species to be present in an area can be assessed. Plant inventory and cover type mapping were accomplished through both qualitative and quantitative means.

At the Utility Drive property, qualitative meander surveys and mapping of habitat cover types were conducted in the field by randomly locating data collection plots within each plant community/cover type to be representative of general conditions within that property. These plots were located with GPS, digitized using ArcGIS, and then plotted onto a plant community cover type map. Percent cover of trees, woody shrubs, and vines were estimated within five-by-five meter quadrats (25m²) with a nested one-by-one meter (one m²) quadrat for estimating herbaceous plant cover (graminoids and forbs). A Daubenmire mid-point cover class scheme (based on Barbour et al., 1999), modified to include a <1% category, was used to estimate percent cover of each species.

For each habitat type sampled quantitatively at this property, four descriptive metrics were reported: (1) species richness; (2) relative dominance; (3) relative frequency; and (4) an Importance Value identifying those plant species that are essentially most important (i.e., most dominant) and occur most frequently within the given community. These community metrics are further described in Barbour et al. (1999). In addition to the data generated by these plot sampling procedures, overall meander surveys for recording vegetative composition were conducted by an AECOM botanist. These surveys included searches for any targeted state-listed rare plant species mapped by MNHESP

in Reach 5A, as well as host plants for state-listed butterflies (mustard white (*Pieris oleracea*) and moths (ostrich fern borer moth (*Papaipema* sp. 2 near *pterisii*)). A complete list of all plant species identified within the Utility Drive property during both plot sampling and meander surveys was generated.

To consolidate the habitat information collected for the Utility Drive property, habitat inventory forms were completed for three habitat groups: upland field, northern hardwoods, and wetlands. These forms synthesize information collected during the 2025 vegetation, soils, wetland, and wildlife habitat surveys and observations made during a supplemental site visit on May 29, 2026. For these forms, the upland field grass/forb and shrub/old-field cover types were combined into a single upland field category. The palustrine shallow marsh, deep marsh, shrub swamp, and swamp hardwood cover types were similarly combined into a single wetland category. A separate form was completed for the northern hardwood cover type. The completed forms are provided in **Attachment C-1**.

For the Woods Pond Spur rail transload property, given the disturbed conditions and sparse vegetative communities as well as the size of the property, that property was assessed by walking transects and documenting cover types and vegetation percent coverage rather than documenting vegetation percent cover within randomly located data plots. For the same reasons, use of a habitat inventory form was not deemed necessary for this property. The Woods Pond Spur property was also surveyed by the AECOM botanist, and all data were consolidated to generate a comprehensive list of all plant species observed at the Woods Pond Spur property.

The resulting plant community cover maps are presented on **Figures 2 and 3** for the Utility Drive and Woods Pond Spur transload properties, respectively.

3.2.4 Invasive Species Assessment

The presence, location, and abundance of invasive species, including both those listed by the USACE New England District (USACE 2020b) and those listed by the MIPAG (MIPAG 2022), were investigated through base mapping and aerial imagery reviews in combination with field verification. During field investigations, observations of the presence and relative abundance of identified invasive plant species were specifically noted and included in the quantified plant survey plot data within the Utility Drive property, and colonies of invasive species were located by GPS. Overall invasive species observations from meander surveys at both properties were also recorded.

3.3 Wildlife Habitat Assessment

In order to assess habitats for the presence of wildlife species that may be present within the rail transload properties at times but were not observed due to the timing of the surveys or species-

specific behaviors and morphology (e.g., living underground, nocturnal existence, camouflage), the plant community cover types characterized and mapped following those described by DeGraaf and Yamasaki (2001) were used. Cover types described by DeGraaf and Yamasaki (2001) are broken down into a hierarchy of cover types within a "Forest Matrix" and a "Non-forested Matrix" and include terrestrial, wetland and deepwater, and other habitat types. These cover types correspond with various wildlife species in New England that typically breed, forage, or shelter within them. Characterizing the landscape within the rail transload properties following this methodology facilitates a more comprehensive evaluation of wildlife habitat within the properties than just by observation encounters alone.

3.4 Rare Species Assessment

In accordance with the Rail PDI Work Plan, the occurrence of federally listed threatened or endangered species and/or their habitat at the two rail transload properties was assessed based on the USFWS on-line IPaC, consulted in 2025 and then again on July 10, 2026 (USFWS 2026). Using that tool, a list of federally listed or proposed rare species and critical habitats that are known or expected to be on or near these properties was generated.

The potential occurrence of state-listed threatened, endangered, or special concern species and/or their habitat at these two properties was initially assessed based on records and documentation available from the MNHESP. That documentation included "Species Habitat" mapping provided by MNHESP to GE in March 2025 for state-listed species for Reaches 5-8 of the ROR, including a 1,000-foot buffer from the 1 mg/kg PCB isopleth, which provided coverage of the rail transload properties.

Subsequently, as required by EPA, surveys of federal and state-listed rare species were conducted in Reach 5A in 2025. Those surveys encompassed the Utility Drive rail transload property. As also required by EPA (in a conditional approval letter dated November 24, 2025), surveys for certain state-listed and federally listed or proposed species were conducted in 2026 at the Woods Pond Spur rail transload property as part of such surveys in Reach 6.

3.5 Geology and Soils

Documentation of bedrock and surficial geologic conditions at the rail transload properties was based upon information available on MassGIS (2025b & c), supported by previous studies such as that described in the Woodlot 2002 Ecological Characterization. Soil conditions were evaluated using the information provided by the USDA NRCS Web Soil Survey (USDA NRCS 1988), (<https://websoilsurvey.nrcs.usda.gov>). Soil conditions at the Utility Drive property were also evaluated in the field at 24 survey locations distributed among the mapped cover types. At each of these locations, a soil profile description was documented from a test pit, using either a shovel or auger, which allowed for a detailed assessment of the soils in the top two to three feet. Given the disturbed

conditions of the Woods Pond Spur property, such as gravel driveways and hard packed conditions associated with old building pads and parking areas, soil profile data were not collected at that property.

3.6 Ecological Functions and Values Assessment

From a baseline perspective, ecological functions of the habitats identified at the rail transload properties were assessed as provided in the Rail PDI Work Plan.

The assessment of upland ecological functions was based largely on the habitat characteristics and the associated wildlife functions which are observed or have potential to occur within the identified habitat. For establishing and documenting these relationships, the principles and procedures developed by DeGraaf and Yamasaki (2001) were used.

An assessment of the functions and values of the wetlands at the Utility Drive property was conducted in accordance with *The Highway Methodology Workbook Supplement: Wetland Functions and Values: A Descriptive Approach* developed by the USACE (USACE 1999). According to that report, wetland functions are defined as those properties that are intrinsic to the wetland system (e.g., nutrient cycling, hydrology). In contrast, wetland values are properties ascribed to the wetland system by society.

4.0 Results

Results of the desktop analysis and field survey efforts are described below. Representative photographs from the field visits to these rail transload properties are provided in **Attachment C-2**. The USACE wetland determination forms for the Utility Drive property are provided in **Attachment C-3** and the completed habitat inventory forms for the Utility Drive property are provided in **Attachment C-1**.

4.1 Geology and Soils

The rail transload properties are situated within the Housatonic River Drainage Basin and the Grenville Shelf Sequence. The dominant lithogeochemical character of the near-surface bedrock in this sequence is composed of carbonate rocks and other metasedimentary rocks deposited in a carbonate shelf sequence overlying the Grenville basement, which extends from western Connecticut to Massachusetts and Vermont (MassGIS 2025b).

Based on the USGS 1:24,000 Surficial Geology (MassGIS 2025c), the Utility Drive property is mapped as having coarse deposits consisting of gravel deposits, sand and gravel deposits and sand and gravel deposits. Wetland areas are mapped as swamp deposits of organic muck and peat that contain minor amounts of sand, silt, and clay at least three feet thick and overlie glacial deposits or bedrock (**Figure 4** and **Attachment C-4**).

Review of the USDA NRCS Soil Survey indicates soils mapped as Natchaug and Catden muck in the southern portion of the Utility Drive property; these are very poorly drained soils consisting of highly decomposed organic material over loamy glaciofluvial deposits and/or till. Soils in the northern half of the property, mapped as Oakville and Groton series (**Figure 4**), are excessively drained soils composed of loose sandy glaciofluvial deposits. The property's topography consists of two large rolling hills aligned east to west in the northern half of the property and level topography toward the southern and western portions of the property. The mapped soils correspond with this rolling topography, with the excessively drained soils mapped over the higher portions of the property and the poorly drained soils in the lower elevation areas.

The Woods Pond Spur property is mapped as thin till, composed of a nonstratified matrix of sand, some silt, and little clay embedded with scattered pebble, cobble, and boulder clasts, with commonly distributed large surface boulders. The NRCS mapped this area where till is generally less than 10 to 15 feet thick as Udorthents (man-made or altered soils), defining areas of excavated and filled land over loose glaciofluvial deposits. Igneous and metamorphic rock and/or friable basal till derived from igneous and metamorphic rock are indicated to underlay the area (**Figure 5** and **Attachment C-4**).

4.2 Plant Community Inventory and Wildlife Habitat

This section discusses the results of vegetative cover type mapping conducted to characterize the habitat conditions identified at the rail transload properties. In addition, it presents the results of the plant species inventory and documentation of observed and potential wildlife habitat.

4.2.1 Cover Type Mapping

Following the DeGraaf and Yamasaki (2001) habitat classification system, habitat cover types are separated into two broad categories – Forested Matrix and Non-forested Matrix – which represent both terrestrial and (where applicable) wetland habitats. Based on relationships between habitat cover types and the wildlife species that are typically associated with them, a list was generated of potential wildlife species for each rail transload property.

4.2.1.1 Utility Drive Property

A total of eight different habitat cover types were mapped at the Utility Drive property following the DeGraaf and Yamasaki (2001) habitat classification system. The cover types identified are summarized in **Table 2** and shown on **Figure 2**.

Terrestrial cover types observed at the Utility Drive property include northern hardwood forest, upland field (grass/forbs and shrub/old field), palustrine wetlands, and non-vegetated habitats. Upland field habitat grass/forbs was the primary habitat at the property. Subcategories in the upland field class include areas dominated by forbs, grasses, and shrubs. Palustrine wetland cover types include shallow marsh, deep marsh, shrub swamp, and swamp hardwood.¹ In addition, several areas associated with paved access roads and rail tracks were classified as non-vegetated diminished habitat.

Approximately 1.14 acres (3.1% of the total Utility Drive property) comprise the areas of diminished habitat value because they consist of paved access roads and the existing railroad track right-of-way. Approximately 22 acres (59%) of the property comprise upland field habitats dominated by a mixture of forbs, grasses, small clumps shrubs and a few scattered saplings. Approximately seven acres (19%) of the property are forested and eight acres (19%) consist of palustrine wetland cover types.

The baseline characteristics of the primary habitat types at the Utility Drive property are further summarized in the completed habitat inventory forms provided in **Attachment C-1**. As previously noted, separate forms are provided for upland field, northern hardwoods, and wetland habitats. The

¹ Although various palustrine wetland cover types were found at the Utility Drive property, the wetlands (as defined by federal and state criteria) that will be affected are limited. As discussed in Section 4.3 below, only one wetland resource area – an intermittent stream – will be affected by the construction and operation of the rail transload facilities at that property.

wetland form summarizes the combined palustrine wetland cover types mapped at the property, while the upland field form summarizes both the grass/forb and shrub/old-field subtypes.

4.2.1.2 Woods Pond Spur Property

Terrestrial cover types observed at the Woods Pond Spur property comprise areas of non-forested upland field habitat and non-vegetated diminished habitat. Subcategories in the upland field class include areas dominated by forbs, grasses, shrubs and sparse tree cover. Approximately 1.2 acres (28.0%) consist of upland field shrub/old field habitat with diminished habitat value due to previous disturbance from industrial activities and utility infrastructure. In addition, stockpiled railroad ties fragment the herbaceous vegetation centrally located within the property. Approximately 2.9 acres (72.3% of the property) comprise areas of non-vegetated diminished habitat value because they consist of non-vegetated paved access roads, hard-packed parking lot and an old building pad. The cover types identified at the Woods Pond Spur property are summarized in **Table 3** and shown on **Figure 3**.

4.2.2 Plant Inventory

4.2.2.1 Utility Drive Property

A total of 24 vegetation plots were evaluated in detail to quantitatively describe the plant communities and map habitat cover types within the Utility Drive property. Percent cover of trees, woody shrubs, and vines was estimated within 5x5 meter plots, and a nested one-square meter was used for estimating herbaceous plant cover. As described above, several plant metrics were calculated to help describe and summarize the field-collected plot data and included Species Richness, Relative Dominance (D_R), Relative Frequency (F_R) and Importance Values (IV_{ave}).

A total of 142 plant species were observed across the entire Utility Drive property, as listed in **Table 4**. These include 18 trees, 14 woody shrubs, six woody vines, and 104 herbaceous plant species. A total of 17 observed species are listed as invasive and three are listed as likely invasive by MIPAG (<https://www.massnrc.org/mipag/invasive.htm>), as shown in **Table 4**. These invasive species include nine herbaceous plants, six woody shrubs, one tree, and one vine. The USACE New England District (USACE 2020b) does not list any plants as invasive that are not listed by MIPAG (2022) as invasive or likely invasive. No plants were identified as either state-listed or federally listed rare species.

A total of 52 plant species (including those listed by MIPAG as invasive or likely invasive) were observed within the vegetation plots. The number of species observed per plot ranged from three to eight species with an average of 5.3 (± 0.3 SE) species per plot. Six plant species observed in the plots are listed by MIPAG as invasive or likely invasive and occurred in 18 out of the 24 vegetation plots.

Plant metrics calculated for the Utility Drive property include only species that were observed in two or more plots. These metrics are presented in **Table 5**.

The most frequently occurring plant and that with the highest relative dominance and greatest importance value was Morrow's honeysuckle (*Lonicera morrowii*), an invasive species. This invasive species was observed in nine of the vegetation plots. A second invasive plant, common (or European) buckthorn (*Rhamnus cathartica*), was also included in the top five ranked species, along with native vegetation that exhibited the highest percent cover on average – namely, switch grass (*Panicum virgatum*), whorled bedstraw (*Galium mollugo*), and dotted hawthorn (*Crataegus punctata*).

Table 6 provides a list of plant species and corresponding percent covers observed in palustrine cover types at the Utility Drive property.

Upland Field - Grass / Forbs

Upland field grass/forbs habitat account for approximately 18.7 acres of the Utility Drive property. This cover type is typically associated with hayfields or abandoned agricultural fields that are reverting back to secondary succession (shrub and forest habitat).

A total of 18 species of grasses and forbs were observed in the 14 vegetation plots inspected within this cover type (**Table 7**). Based on the plot data, species with the largest IV_{ave} include switchgrass, whorled bedstraw, lemon thyme (*Thymus pulegioides*), spotted knapweed (*Centaurea stoebe*), and bluejoint grass (*Calamagrostis canadensis*). Of these, spotted knapweed is listed as likely invasive. Other MIPAG-listed invasive species were also observed, including Morrow's honeysuckle, Asiatic bittersweet (*Celastrus orbiculatus*), purple loosestrife (*Lythrum salicaria*), common buckthorn, and garlic mustard (*Alliaria petiolata*). Percent cover of invasive species within each plot was generally less than 21%. Only two plots were documented to have approximately 75% cover of spotted knapweed.

Upland Field – Shrub / Old Field

Upland field-shrub/old field habitat accounts for approximately three acres of the Utility Drive property. Twelve areas of this cover type were identified and delineated at the property. DeGraaf and Yamasaki (2001) describe this cover type as abandoned fields reverting to forest and characterized by grasses, shrubs, and small trees. Based on the sample plots, the dominant species observed within this cover type included Morrow's honeysuckle, elderberry (*Sambucus nigra*), gray dogwood (*Cornus racemosa*), white meadowsweet (*Spiraea alba*), common buckthorn, and black raspberry (*Rubus occidentalis*). Bradford pear (*Pyrus calleryana*), autumn-olive (*Elaeagnus umbellata*) and saplings of black oak (*Quercus velutina*) were also observed within the upland field. MIPAG-listed invasive species included Morrow's honeysuckle, common buckthorn, and autumn-olive.

Palustrine Deep Marsh

Approximately 1.5 acres of palustrine deep marsh habitat was mapped within the Utility Drive property. This habitat is part of a wetland system and stream channels that flow east from Holmes Road to the Housatonic River, east of the property. The exact depth of the marsh is unknown at this time, but it is, at a minimum, greater than one to two feet deep at its center. Portions of the marsh appear to be permanently flooded and largely vegetated with emergent vegetation. The marsh system includes a broad fringe of palustrine shallow marsh cover type of emergent cattails (*Typha angustifolia* and *Typha latifolia*), and invasive purple loosestrife that is further surrounded by a narrow band of upland field – shrub/old field and northern hardwood cover types.

Palustrine Shallow Marsh

Approximately 4.4 acres of palustrine shallow marsh habitat are mapped within the property. DeGraaf and Yamasaki (2001) describe this palustrine cover type as a combination of several wetland cover types; the shallow marsh at the property is dominated by emergent vegetation with few woody species. A total of 25 plant species were observed within the shallow marsh cover type; three were upland species, and three were MIPAG-listed invasive plant species (purple loosestrife, common reed (*Phragmites australis*), and common buckthorn).

The largest shallow marsh habitat at the property, approximately 3.8 acres, is located in the south-central half of the property and is contiguous with a wetland system to the east and the Housatonic River via an intermittent stream located in the southeast portion of the property. The southwestern corner of this marsh is bordered by a swamp hardwood cover type.

An approximate 0.23-acre shallow marsh, located at the southeastern corner of the property, receives stormwater runoff from culverts that convey flow to the marsh from the surrounding area. The shallow marsh portion of the wetland is dominated by cattail and the invasive purple loosestrife.

Approximately 0.06 acre of shallow marsh is located along the eastern portion of the property. This marsh is contiguous with palustrine shrub swamp to its south. The marsh is dominated by tussock sedge (*Carex stricta*), sensitive fern (*Onoclea sensibilis*), spotted Joe-Pye-weed (*Eutrochium maculatum*), and purple loosestrife. Only one invasive plant, purple loosestrife, was observed within this portion of the marsh.

The shallow marsh habitat at the property is described as a densely vegetated community dominated by narrow-leaf and broad-leaf cattail, purple loosestrife, soft rush (*Juncus effusus*), sedges (*Carex* spp.) and wrinkle-leaf goldenrod (*Solidago rugosa*). Other commonly observed vegetation within this cover type includes American bur-reed (*Sparganium americanum*), purple marshlocks (*Comarum palustre*), devil's beggar-ticks (*Bidens frondosa*), purple-leaf willowherb (*Epilobium coloratum*), arrow-

leaved tearthumb (*Persicaria sagittata*), sensitive fern, giant goldenrod (*Solidago gigantea*) and jewelweed (*Impatiens capensis*).

Palustrine Shrub Swamp

DeGraaf and Yamasaki (2001) characterize shrub swamps as dominated by woody vegetation less than 20 feet tall with hydric soil that is seasonally or permanently flooded. The palustrine shrub swamp, an approximately 0.15 acre-swamp centrally located along the eastern side of the property, is contiguous with the 0.06-acre shallow marsh described above. This shrub swamp includes a cover type dominated by common buckthorn, Morrow's honeysuckle, silky dogwood (*Cornus amomum*) and speckled alder (*Alnus incana*). Only one invasive plant, common buckthorn, was identified within this cover type. During high water conditions, the swamp appears to flow east overland toward a large wetland system situated adjacent to the Housatonic River.

Swamp Hardwood

Approximately 0.7 acre of swamp hardwood cover type was mapped at the southwestern corner of the 4.4-acre shallow marsh described above. This swamp generally flows east to the 4.4-acre shallow marsh via ephemeral stream channels during highwater conditions. DeGraaf and Yamasaki (2001) describe swamp hardwoods in New England as dominated by red maple (*Acer rubrum*) and associated species. The property's swamp hardwood included an overstory of black birch (*Betula lenta*), eastern cottonwood (*Populus deltoides*), and boxelder (*Acer negundo*), with a shrub understory of common buckthorn, Morrow's honeysuckle, silky dogwood, and multiflora rose (*Rosa multiflora*).

Northern Hardwood

Approximately seven acres of northern hardwood cover type exist along the property's western, northern, and eastern borders, as well as bordering portions of the shallow marsh in the center of the property. This cover type includes a mix of trees and shrubs with minimal herbaceous vegetation. Seven woody species, one vine, and one herbaceous plant were observed in sample plots, four of which were listed as invasive by MIPAG. Based on the plot data, common species observed within this cover type include black birch, white pine (*Pinus strobus*), and black cherry (*Prunus serotina*). Invasive species include Morrow's honeysuckle, Asiatic bittersweet, common buckthorn, and garlic mustard. Dominant species within the sample plots included eastern cottonwood, large-tooth aspen (*Populus grandidentata*), common buckthorn, and Morrow's honeysuckle. Likely due to past disturbances associated with the historic gravel pit activity, the understory of this cover type is dominated by the invasive Morrow's honeysuckle.

Northern hardwood forests are characterized by their diversity of tree species, uneven aged, with greater number of tree species compared to stands dominated by hardwood species. These are characterized as stands of trees where neither hardwoods nor softwoods exceed 75% of the total

basal area or canopy cover in the stand (Kenefic et al. 2021). Species observed within this mapped cover type include black cherry, large-toothed aspen, white pine, dotted hawthorn, gray birch (*Betula populifolia*), common buckthorn, Morrow's honeysuckle, boxelder, and black birch.

Based on plot data, the species with the largest IV_{ave} in this cover type are Morrow's honeysuckle, dotted hawthorn, common buckthorn, boxelder and black cherry as the dominant species (**Table 8**). The invasive plants Morrow's honeysuckle and common buckthorn were observed throughout the northern hardwood cover type. These species accounted for as much as 60% of the total plot area sampled.

Non-Vegetated Cover Type

Approximately 1.1 acres of non-vegetated areas of the property occur, all associated with paved access road and railroad tracks.

4.2.2.2 Woods Pond Spur Property

The Woods Pond Spur rail transload property is vegetated with herbaceous and shrub cover types, typically consisting of mugwort (*Artemisia vulgaris*), spotted knapweed, goldenrods (*Solidago spp.*), blackberries (*Rubus spp.*), purple loosestrife, Morrow's honeysuckle, staghorn sumac (*Rhus hirta*) and silky dogwood. A narrow tree line of aspen (*Populus tremuloides*), ash (*Fraxinus sp.*), hickory (*Carya sp.*), and a mix of honeysuckle and dogwood shrubs separates the northwestern portion of the property from Willow Creek Road. A complete list of plant species observed at the Woods Pond Spur property is provided in **Table 9** (including observations recorded in October 2024 as well as those from the 2025 field survey). In general, the property was characterized as sparsely vegetated open areas of hardpack surfaces covered by grasses with areas of herbaceous vegetation and small stands of trees. A hedge row of three multi-trunk red maples, one eastern cottonwood, and an understory of herbaceous vegetation dominated by mugwort separates the gravel driveway and railroad tracks from the old building pad/parking area.

Upland Field – Shrub / Old Field

Approximately 1.2 acres of upland field-shrub/old field is located within the Woods Pond Spur property. This habitat typically develops after disturbances and is generally dominated by herbaceous vegetation that colonizes the disturbed soils. This cover type at the property is characterized by herbaceous annuals and perennials, a few regenerating trees, and maintained shrublands associated with the utility line right of way at the north end of the property. The percent cover by the various species recorded during the 2025 field survey is listed in **Table 10**. Common species observed at the property within this cover type included mugwort, purple loosestrife, common milkweed (*Asclepias syriaca*), Morrow's honeysuckle, and Bebb's willow (*Salix bebbiana*). Seven of the species observed at the property are listed as invasive by MIPAG (Asian bittersweet,

purple loosestrife, common reed, Morrow's honeysuckle, Japanese knotweed (*Fallopia japonica*), common buckthorn, and multiflora rose), and two are listed as likely invasive (spotted knapweed and common barberry (*Berberis vulgaris*)).

Non-Vegetated Cover Type

Approximately 2.9 acres of the property are identified as non-vegetated areas and include areas that are used for parking and access road to the rail station and railroad tracks. Much of the non-vegetated areas consist of hardpacked gravel or low groundcover surfaces that accommodate the Berkshire Scenic Railway Museum.

4.2.3 Wildlife Habitat

Table 11 and **Table 12** provide lists of observed and potential wildlife species associated with all the habitat cover types identified at the Utility Drive rail transload property. These lists have been generated using the habitat suitability guidance described by DeGraaf and Yamasaki (2001) and include both terrestrial and wetland cover classes from within the Forested Matrix and the Non-forested Matrix. A total of 107 wildlife species have been rated as potentially occurring at the Utility Drive property based on recognized habitat conditions (according to the associations described by DeGraaf and Yamasaki 2001). These include 68 birds, 23 mammals, and 16 species of amphibians and reptiles.

As described above in Section 4.2.1.2, habitat conditions at the Woods Pond property are generally considered low quality for wildlife, as a large proportion of the property is composed of impervious surfaces, open gravel and hardpacked surfaces with low ground cover, and areas of invasive species juxtaposed between a paved public road and an active rail line. Less than one third of the property exhibits a plant community similar in appearance to old field habitat (i.e., herbaceous and upland scrub-shrub cover), but exists as fragmented patches with invasive plant species, surrounded by disturbed areas. Some of the species listed in **Table 11** and **Table 12** under the Upland Field category may be present in these areas at times, but are unlikely to use them as a primary habitat.

The potential occurrence of state-listed and federally listed wildlife species is discussed in Section 4.5.

Forested Matrix

As described above, the forested matrix includes both terrestrial and wetland habitats with deciduous and mixed canopy cover. Forests provide food resources, cover, and nesting habitat for a wide variety of mammals, birds, amphibians, reptiles, and invertebrates. The tree and shrub layers within the forested matrix provide food and cover for many birds and larger mammals such as white-tailed deer (*Odocoileus virginianus*). Although the forested area at the Utility Drive property is

relatively small, it is connected to wetlands systems associated with the Housatonic River. Under these conditions, some of the larger, wide-ranging mammals such as bobcat (*Lynx rufus*) and forest interior birds like thrushes or other neotropical migrants (e.g., warblers) could use this habitat.

The micro-topography and detritus found on the forest floor (e.g., leaf litter and fine and coarse woody debris) provide food and cover for invertebrates, amphibians, and reptiles. Smaller mammals, such as the gray squirrel (*Sciurus carolinensis*), Eastern chipmunk (*Tamias striatus*), and raccoons (*Procyon lotor*), utilize fallen logs for cover and nest cavities.

Forested wetlands also provide a diverse assemblage of vegetation and an abundance of food, shelter, migratory and wintering areas, water sources, and breeding areas for a number of wildlife species. Amphibian species also require forested wetlands for moisture and temperature regulation during the hottest and driest times of the year. Reptiles will use these habitats for thermoregulation and rehydration as well, including eastern garter snake (*Thamnophis sirtalis*) and ribbon snakes (*Thamnophis sauritus*).

Non-Forested Matrix

The Non-forested Matrix, including upland fields, provide food resources, cover, and nesting habitat for a variety of mammals, birds, amphibians, reptiles, and invertebrates. Cover types within the upland field category include those areas dominated by forbs, grasses, and shrub/old field habitats. The open areas dominated by forbs and grasses provide temporary forage and nesting for a number of bird species such as killdeer (*Charadrius vociferus*), field sparrow (*Spizella pusilla*), and raptors including broad-winged hawks (*Buteo platypterus*) and turkey vulture (*Cathartes aura*). During the 2025 site visits, American crow (*Corvus brachyrhynchos*), black vulture (*Coragyps atratus*), and bald eagle (*Haliaeetus leucocephalus*) were observed flying over these habitats at the Utility Drive property. Small mammals and numerous invertebrate species typically use these open field habitats and their edges to forage. These habitats also provide hunting opportunities for larger mammals such as red fox (*Vulpes vulpes*) and predatory birds including red-tailed hawks (*Buteo jamaicensis*) and American kestrels (*Falco sparverius*).

Shrub/old field habitats can be utilized as foraging and nesting habitat or protective cover by a number of mammals, songbirds, invertebrates, reptiles, and amphibians. Species such as the Eastern cottontail (*Sylvilagus floridanus*), gray squirrel, red fox, Virginia opossum (*Didelphis virginiana*), and raccoon utilize these types of habitats. Eastern cottontails and white-tailed deer tracks were observed in these areas. Where these open areas border on forest edges, habitats are available for coyote (*Canis latrans*), eastern cottontail, and forest edge bird species, such as the American robin (*Turdus migratorius*), brown thrasher (*Toxostoma rufum*), and northern mockingbird (*Mimus polyglottus*).

Shallow emergent marsh, shrub swamp, and deep marsh habitats at the Utility Drive property may also be used for breeding and feeding by a variety of bat species and ducks, including the big brown bat (*Eptesicus fuscus*) and mallard duck (*Anas platyrhynchos*), among others. Open field areas are also typically used by these species as secondary habitats for feeding.

The non-forested areas of the Woods Pond Spur property may provide habitat for a limited number of species adapted to disturbed sites in proximity to developed land uses. Several species of sparrows, small mammals, and common snake species find such habitat suitable. During the 2025 site visits, red-winged blackbirds (*Agelaius phoeniceus*) were observed within shallow marsh areas comprising the banks around Woods Pond, and painted turtles (*Chrysemys picta*) were observed to the east of the property.

4.3 Delineation and Inventory of Wetlands

Portions of the overall Utility Drive property, particularly the east-central part, were determined to have wetland conditions consisting primarily of palustrine marshes and swamp hardwoods (discussed in Section 4.2). An intermittent stream discharges into these wetlands from the west. USACE Wetland Determination Data Forms documenting the wetland boundary conditions for the wetlands were completed and are provided in **Attachment C-3**. These forms document the hydrologic, vegetation, and soils conditions both inside and outside of the delineated wetland at two transects along the boundary. In addition to meeting the federal criteria for wetland/waters of the U.S., these wetlands appear to meet the classification of two resource areas as defined in the Massachusetts Wetland Protection Act (MWWA) regulations – a Bordering Vegetated Wetland and the Bank of an intermittent stream. However, only one such wetland area, the intermittent stream, will be impacted by the construction and operation of the Utility Drive rail transload area, which will require a crossing of that stream. This will involve the temporary conveyance of the drainage in the stream channel via culverts during the rail transload operations, to be followed by the restoration of the stream channel after site use. That intermittent stream is considered only a Bank resource area under the MWWA regulations.

No wetland habitats were identified or delineated at the Woods Pond Spur property, although Woods Pond is located within close proximity to that property. However, since the pond is located on the opposite side of the existing railroad tracks and no work or activities are planned in that area, the pond limits were not delineated in the field but rather digitized using aerial photographs and LiDAR (Light Detection and Ranging) generated topography.

4.4 Vernal Pool Findings

As previously discussed, during the field investigations, no vernal pools or potential vernal pool habitats were identified within either rail transload property.

4.5 Rare Species Habitat Findings

As discussed in Section 3.4, the potential occurrence of any federally listed or state-listed rare species or their habitat on the rail transload properties was assessed.

The MassGIS (2025a) MassMapper interactive map, available data layers, and active data layers specific to potential and documented habitats indicated that the Utility Drive property contains MNHESP Priority Habitat of rare species. The current MNHESP Priority Habitat mapping does not include the currently anticipated rail layout area at the Woods Pond Spur property but instead is confined to the area to the east (encompassing the northern part of Woods Pond and its floodplain on the eastern side of the existing rail line). MNHESP has included a small section of the property limits within Core Area 2, but this small overlap between the Woods Pond Spur property boundary and Core Area 2 may be a mapping/delineation issue rather than actually reflecting habitat conditions for Core Area 2 species. This area does not appear to provide habitat suitable for any of the Core Area 2 designated species (American bittern [*Botaurus lentiginosis*], common gallinule [*Gallinula galeata*], mustard white butterfly, and wood turtle [*Glyptemys insculpta*]), considering both the existing habitat conditions and the long-term industrial use of the property along the railway.

Figure 6 shows the MNHESP Priority Habitat mapping covering both rail transload properties. More details relating to rare species finding for each property are provided in the following sections.

4.5.1 Utility Drive Property

A review of the USFWS IPaC on-line mapping tool (USFWS 2026) revealed potential habitat in the general area of the Utility Drive property for the tricolored bat (*Perimyotis subflavus*) and the monarch butterfly (*Danaus plexippus*), both of which have been proposed by the USFWS for federal listing. The results of this review are included in **Attachment C-5**. The tricolored bat is also state-listed as an endangered species while the monarch butterfly is not currently state-listed.

The Species Habitat mapping provided by MNHESP in March 2025 for state-listed species in the ROR and within a 1,000-foot buffer from the ROR limits indicates mapped habitat for the wood turtle, American bittern, and mustard white butterfly at the Utility Drive property. The adjacent floodplain to the east is mapped as habitat for common gallinule and wapato (*Sagittaria cuneata*).

During the summer of 2025, field surveys were conducted in Reach 5A for the state-listed species indicated by the MNHESP Species Habitat mapping, using survey procedures approved by EPA for Reach 5A. These included surveys of wood turtles, rare butterflies and their host plants, and state-listed bird species. Those surveys encompassed the Utility Drive transload property. The surveys also included a survey at the Utility Drive property for any state-listed plant species (including the wapato, which is mapped in the marshes east of the property), and the bird survey included the common gallinule (also mapped in the marshes east of the property). In addition, an acoustic survey of federal

and state-listed bat species was conducted in Reach 5A and also covered the Utility Drive property. Reports on the 2025 surveys were submitted to EPA in September through December 2025 (AECOM 2025a, b, c, d), and the results relevant to this rail transload property are summarized below, along with updates from recent 2026 surveys.²

Wood Turtle

MNHESP Species Habitat mapping indicates that wood turtle habitat overlaps with the northern portion of the Utility Drive rail transload area layout. The wood turtle survey conducted in Reach 5A in 2025 (AECOM 2025a) included visits to the Utility Drive property multiple times in June and July, when wood turtles are most likely to utilize floodplain habitats outside of the river channel for extended periods of time. No wood turtles were observed within the rail transload property during the 2025 and 2026 surveys, but one individual was documented near the property in 2025.

As discussed in this report, the northern portion of the Utility Drive property includes primarily upland field habitat and edge habitat adjacent to forested and palustrine wetland cover types and are hydrologically connected to the intermittent stream draining toward the Housatonic River. These edge habitats and transition areas may be used intermittently by wood turtles for movement or short-term refuge when adequate shrub or herbaceous cover is present. Much of the interior upland field is open and disturbed and may be less likely to support regular wood turtle use as compared to the adjacent forested floodplain and wet meadow habitats; however, areas of dense cover may be attractive for wood turtles, particularly during the summer months.

Monarch Butterfly and Mustard White Butterfly

The rare butterfly survey included both mustard white and monarch butterflies and focused on their host plants (AECOM 2025b). Searches for the presence of, or suitable habitat for, the host plants were conducted on foot by meandering slowly and methodically within and adjacent to typical habitats, as appropriate, along with adjacent and surrounding areas. The field work was conducted within the best survey periods as determined by botanical reference reviews and within the flight period for each species where these time periods overlap. Confirmed occurrences of host plants were located with GPS equipment capable of sub-meter accuracy. Individual plants were mapped as a point, and clusters of plants were mapped with a line or polygon feature.

The survey of the Utility Drive property confirmed the presence of seven species of potential host plants for the target rare butterflies (AECOM 2025b). These species are listed in **Table 13**. Of the species noted in that table, five are host plants for the mustard white butterfly, and two are host plants for the monarch butterfly. Two are non-native and invasive according to MIPAG, one

² GE's report on the state-listed plant species survey is not discussed here. As noted in Section 4.2.2.1, no state-listed plant species were identified in the Utility Drive rail transload property.

additional plant is non-native, and four are native plant species. Observations included scattered individuals or small groups of plants; however, one approximately 0.28-acre patch and one approximately 340-square foot patch dominated by milkweed were observed at the Utility Drive property and the limits were GPS-located during the surveys (**Figure 2**). Adult mustard white and monarch butterflies were not observed at this property during the survey. Milkweeds were inspected for monarch butterfly eggs and larvae with negative results.

American Bittern and Common Gallinule

As previously noted, the Species Habitat mapping provided by MNHESP in March 2025 indicated mapped habitat for the American bittern encompassing all of the Utility Drive property and mapped habitat for the common gallinule in the marsh located in the southeastern portion of the property and in the floodplain to the east of that property. The 2025 surveys included two stations near the Utility Drive property and four site-specific visits during the breeding season. However, the surveys for these state-listed bird species in 2025 did not find any evidence of either of these species in Reach 5A, including at the Utility Drive property (AECOM 2025c).

Bat Species

Although the Species Habitat Mapping provided by MNHESP did not include state-listed bat species in Reach 5A, GE conducted an acoustic field survey in 2025 for the two federally listed or proposed bat species – the northern long-eared bat (*Myotis septentrionalis*, listed as endangered) and the tricolored bat (proposed for federal listing as endangered) – which are also state-listed. That survey also included searches for any other state-listed bat species. An acoustic bat detector station was located along the Housatonic River roughly 1,000 feet east of the Utility Drive property, with two other stations roughly 2,000 feet away; all of these could provide data on potential bat species that may use the Utility Drive property for occasional foraging (there are no significant trees at the property that offer important roosting habitat for bats).

The 2025 acoustic survey confirmed the occurrence of five state-listed bat species, including one that is federally proposed, within Reach 5A, including areas proximal to the Utility Drive property (AECOM 2025d). These were the tricolored bat, little brown bat (*Myotis lucifugus*), eastern red bat (*Lasiurus borealis*), silver-haired bat (*Lasionycteris noctivagans*), and hoary bat (*Lasiurus cinereus*). The northern long-eared bat was not confirmed as occurring anywhere within Reach 5A, including the Utility Drive property.

4.5.2 Woods Pond Spur Property

For the Woods Pond Spur transload property, review of the USFWS IPaC on-line mapping tool (updated in 2026) indicated potential habitat for the northern long-eared bat, the tricolored bat, and

the monarch butterfly in areas encompassing that property (see **Attachment C-5**). As previously noted, the northern long-eared bat is listed by the USFWS as endangered, and the tricolored bat and monarch butterfly have been proposed for federal listing. The northern long-eared bat and the tricolored bat are also state-listed while the monarch butterfly is not.

The Species Habitat mapping provided by MNHESP in March 2025 did not include any state-listed species at the Woods Pond Spur property, although there is mapped habitat for the common gallinule near that area. On August 8, 2025, GE proposed to conduct a survey for the common gallinule within and adjacent to the Woods Pond Spur rail transload property (AECOM 2025e). In its November 24, 2025 conditional approval letter for that proposal, EPA directed GE to expand the surveys in that area to also cover the northern long-eared bat, the tricolored bat, and the monarch butterfly; and it noted that these surveys could be conducted at the same time as the rare species surveys for Reach 6. These surveys, including a survey for the presence of bald eagles (a state-listed species) in the area, were conducted in 2026 to provide additional information on the potential presence of rare species at the Woods Pond Spur property. Summaries of the 2026 surveys are presented below.

Common Gallinule

Based on state-listed bird surveys conducted in Reach 6 in May and June 2026, which covered the Woods Pond Spur rail transload property, no observations of the common gallinule were recorded.

Bald Eagle

During the winter and spring of 2026, GE conducted winter roost site and nesting surveys for bald eagles within Reach 6 and adjacent areas of the Housatonic River, including the Woods Pond Spur rail transload property. A team composed of two wildlife biologists familiar with this species conducted surveys for bald eagles between January and March 2026, many of which were attended by EPA's contractors. The team scheduled observations during periods of highest activity at sunrise and sunset. Due to observed nest building activities within the Reach 6 area, surveys were conducted throughout April 2026 (see **Table 14**), and nest checks continued into May and June.

The primary survey station was an area with the largest viewshed of the project area and included easy access to other nearby viewing locations. This primary station was situated at the southern end of Woods Pond where a maintained clear area for transmission lines provided a 180-degree view of most of the Reach 6 survey area, including prominent flight paths up and down river, as well as preferred roosting locations and the observed nest site. This primary survey station also presented easy access to a secondary survey station with a view of the entire backwater area of Woods Pond for a complete view of the Reach 6 survey area. The team used survey equipment, including

binoculars, spotting scopes, and telephoto photography, to spot and record bald eagle sightings and behavior.

During the early spring surveys, juvenile and adult bald eagles were observed flying over the project area, as well as roosting for periods of time. During these early spring surveys, Woods Pond and the Housatonic River itself were mostly frozen over. On March 10, 2026, the team observed the first nest-building activities by a pair of adult bald eagles. The nest is located immediately outside of the project area in a white pine tree west of Woods Pond. Subsequent surveys observed continued nest-building activities, as well as the pair of eagles sitting in or near the nest for extended periods of time. However, the eagles were not observed to be staying in the nest consistently or overnight, indicating that it was unlikely that eggs were present. Nest-building activities continued into April, and the pair continued to spend a significant amount of time near but outside of the nest. As surveys progressed, the pair were observed near the nest less often. During the surveys conducted in May and June 2026 for American bittern and common gallinule, the bald eagle nest site was also observed, and no bald eagles were identified within the vicinity of the nest.

Bat Species

An acoustic survey for bat species was conducted in July 2026 as part of rare species surveys for Reach 6 (AECOM 2025d). The survey was performed in accordance with USFWS guidelines to evaluate the probable presence or absence of state- and/or federally listed bat species. Two full-spectrum acoustic bat detectors (Wildlife Acoustics SMMINI-BAT) were deployed near Woods Pond. Acoustic surveys occurred during the nights of July 17 through 25, 2026. Bat species detection was based on auto-classification by the SonoBat software and qualitative assessment.

The survey found no evidence of northern long-eared bat or eastern small-footed bat, but indicated the probable presence of tricolored bat, silver-haired bat, eastern red bat, little brown bat, and hoary bat in the project area at the time of the survey. Due to the difficulty in acoustically distinguishing Indiana bat (*Myotis sodalist*) from little brown bat (a species confirmed to be in the survey area) and current information from MNHESP and USFWS on the range of the Indiana bat (which was last recorded in Massachusetts in 1938), the acoustic recordings possibly attributed to the Indiana bat were likely produced by the little brown bat and the Indiana bat is most likely absent from Reach 6, including the Woods Pond Spur property.

Monarch Butterfly

During the habitat evaluations and natural community classification for the Woods Pond Spur rail transload property in 2025, two small patches each containing between eight and 10 host plants for the monarch butterfly were observed. However, no eggs, larvae, or adult monarchs were observed. An additional survey was conducted at that property on August 27, 2026 to further evaluate habitat

and host plant presence for the monarch butterfly. During this 2026 inspection, the two separate patches appear to have merged into one larger patch consisting of approximately 50 individual common milkweed plants. No adult monarch butterflies or monarch eggs were observed, but one monarch caterpillar was observed feeding on the milkweed plants.

4.6 Ecological Functions and Values Assessment

4.6.1 Wetland Functions and Values Assessment

As noted in Section 3.6, an assessment of wetland functions and values was conducted in accordance with USACE Highway Methodology Workbook Supplement (USACE 1999). No wetlands were identified at the Woods Pond Spur property, and some wetlands were identified at the overall Utility Drive property, although only one (an intermittent stream) will be affected by the construction and operation of the rail transload area. As a general matter, the primary functions and values of the palustrine wetlands and hardwood swamp include floodflow alteration, sediment/toxicant retention, nutrient removal, wildlife habitat function and uniqueness/heritage and endangered species habitat values. Due to the high organic content underlying these wetlands, hydrologic input from surface runoff and direct precipitation will likely provide flood storage and desynchronization. The wetlands also serve a groundwater discharge function related to forming the intermittent streamflow from seasonal groundwater discharging to the surface. Wildlife habitat is also considered an important function, especially given the potential presence of rare species habitats at the Utility Drive property. Secondary functions likely include water quality improvement functions related to sediment/toxicant/pathogen retention. These wetland areas are easily accessed with adjacent walking paths and provide value for recreation and have educational/scientific value.

4.6.2 Upland Habitats Functions and Values Assessment

Ecological functions provided by the upland habitats on the Utility Drive and Woods Pond Spur properties are closely related to the habitat cover types. As described in previous sections, eight different habitat cover types were mapped at the Utility Drive property, including, the predominant upland field (grass/forbs and shrub/old field) along with northern hardwood forest, palustrine wetlands, and non-vegetated habitats, collectively providing potential habitat suitable for numerous wildlife species. The vegetative structural diversity and complexity in the areas give rise to habitat and species diversity. The Woods Pond Spur property comprises areas of non-forested upland field habitat and non-vegetated diminished habitat. The non-forested areas of the Woods Pond Spur property may provide habitat for a limited number of species adapted to disturbed sites in proximity to developed land uses.

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Tables

Table 1. Cover type comparison: DeGraaf and Yamasaki (2001) versus Woodlot (2002)

Cover Type per DeGraaf and Yamasaki (2001)	Cover Type per Woodlot (2002)
Aspen/Birch Successional	Successional Northern Hardwoods
Eastern White Pine	Northern Hardwoods-Hemlock-White Pine Forest
Northern Hardwoods	Red Oak-Sugar Maple Transition Forest and Northern Hardwoods-Hemlock-White Pine Forest
Palustrine - Swamp Hardwoods	Red Maple Swamp
Palustrine - Pond	Moderately Alkaline Lake/Pond
Palustrine Deep Marsh	Deep Emergent Marsh
Palustrine - Shallow Marsh	Shallow Emergent Marsh
Palustrine - Shrub Swamp	Shrub Swamp
Upland Field - Forbs	Cultural Grasslands
Upland Field - Grass	Cultural Grasslands
Upland Field - Grass/Forbs	Cultural Grasslands
Upland Field - Shrub/Old Field	Cultural Grasslands
Non-Vegetated	N/A

Table 2. Mapped plant communities within the Utility Drive rail transload property

Cover Type*	Acres	Percent
Forest Matrix		
Northern Hardwoods	6.81	18.7
Palustrine - Swamp Hardwoods	0.68	1.9
Nonforested Matrix		
Palustrine - Shallow Marsh	4.41	12.1
Palustrine – Deep Marsh	1.54	4.2
Palustrine - Shrub Swamp	0.15	0.4
Upland Field - Grass/Forbs	18.73	51.4
Upland Field - Shrub/Old Field	3.00	8.2
Non-Vegetated	1.14	3.1
Grand Total	36.46	100.0

*Cover types follow those of DeGraaf and Yamasaki (2001).

Table 3. Mapped plant communities within the Woods Pond Spur rail transload property

Cover Type*	Acres	Percent
Non-forested Matrix		
Upland Field - Shrub/Old Field	1.15	27.7
Non-Vegetated	3.00	72.3
Total	4.15	100.0

*Cover types follow those of DeGraaf and Yamasaki (2001).

Table 4. Vascular plant species observed at the Utility Drive rail transload property

Scientific Name	Common Name	Scientific Name	Common Name
Herbaceous Sedges, Rushes, Grasses and Forbs		Herbaceous (cont.)	
<i>Achillea millefolium</i>	common yarrow	<i>Schoenoplectus tabernaemontani</i>	softstem bulrush
<i>Agrostis stolonifera</i>	spreading bent	<i>Scirpus cyperinus</i>	woolgrass
^{INV} <i>Alliaria petiolata</i>	garlic mustard	<i>Scirpus hattorianus</i>	mosquito bulrush
<i>Anthoxanthum odoratum</i>	large sweet vernal grass	<i>Scutellaria galericulata</i>	hooded skullcap
<i>Arctium minus</i>	lesser burdock	<i>Scutellaria lateriflora</i>	mad-dog skullcap
<i>Asclepias syriaca</i>	common milkweed	<i>Securigera varia</i>	crown vetch
<i>Berteroia incana</i>	hoary alyssum	<i>Setaria pumila</i>	yellow bristle grass
<i>Bidens frondosa</i>	devil's-pitchfork	<i>Silene vulgaris</i>	bladder campion
<i>Bromus inermis</i>	smooth brome	<i>Solidago altissima</i>	tall goldenrod
<i>Calystegia sepium</i>	hedge false bindweed	<i>Solidago caesia</i>	wreath goldenrod
<i>Carex annectens</i>	yellow-fruit sedge	<i>Solidago canadensis</i>	Canada goldenrod
<i>Carex argyrantha</i>	silvery-flowered sedge	<i>Solidago gigantea</i>	giant goldenrod
<i>Carex cephaloidea</i>	thin-leaf sedge	<i>Solidago nemoralis</i>	gray goldenrod
<i>Carex lacustris</i>	lakebank sedge	<i>Solidago rugosa</i>	wrinkleleaf goldenrod
<i>Carex lurida</i>	sallow sedge	<i>Sparganium americanum</i>	American bur-reed
^{LVN} <i>Centaurea stoebe</i>	spotted knapweed	<i>Sparganium eurycarpum</i>	broad-fruit bur-reed
<i>Cirsium arvense</i>	Canada thistle	<i>Spirodela polyrrhiza</i>	common duckmeal
<i>Clematis virginiana</i>	Virginia Virgin's-Bower	<i>Stellaria graminea</i>	grass-leaf starwort
<i>Comarum palustre</i>	spotted Coralroot	<i>Stellaria media</i>	common chickweed
<i>Cryptotaenia canadensis</i>	purple marshlocks	<i>Thelypteris palustris</i>	marsh fern
^{INV} <i>Cynanchum louiseae</i>	black swallow-wort	<i>Thymus pulegioides</i>	lemon thyme
<i>Dactylis glomerata</i>	orchard grass	<i>Tragopogon pratensis</i>	yellow goat's-beard
<i>Daucus carota</i>	Queen Anne's lace	<i>Trifolium pratense</i>	red clover
<i>Dianthus armeria</i>	Deptford pink	<i>Trifolium repens</i>	white clover
<i>Dichanthelium clandestinum</i>	deer-tongue rosette grass	<i>Turritus glabra</i>	tower mustard
<i>Echinocystis lobata</i>	wild cucumber	<i>Typha angustifolia</i>	narrow-leaf cattail

Scientific Name	Common Name	Scientific Name	Common Name
<i>Epilobium coloratum</i>	purple-leaf willowherb	<i>Typha latifolia</i>	broad-leaf cattail
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	<i>Urtica dioica</i>	stinging nettle
^{LN} <i>Euphorbia cyparissias</i>	cypress spurge	<i>Valeriana officinalis</i>	garden valerian
<i>Festuca ovina</i>	sheep fescue	<i>Verbascum thapsus</i>	great mullein
<i>Festuca rubra</i>	red fescue	<i>Veronica chamaedrys</i>	germander speedwell
<i>Fragaria virginiana</i>	Virginia strawberry	<i>Vicia cracca</i>	Cow Vetch
<i>Galium aparine</i>	cleavers	<i>Zizia aurea</i>	golden Alexanders
<i>Galium mollugo</i>	whorled bedstraw	Woody Shrubs	
<i>Glechoma hederacea</i>	ground ivy	<i>Cornus alba</i>	red osier
^{INV} <i>Hesperis matronalis</i>	dame's rocket	<i>Cornus amomum</i>	silky dogwood
<i>Hieracium caespitosum</i>	yellow hawkweed	<i>Cornus racemosa</i>	gray dogwood
<i>Hypericum perforatum</i>	common St. John's-Wort	^{INV} <i>Elaeagnus umbellata</i>	autumn olive
<i>Impatiens capensis</i>	Jewelweed	^{INV} <i>Frangula alnus</i>	glossy buckthorn
^{INV} <i>Iris pseudacorus</i>	pale-yellow iris	^{INV} <i>Lonicera x bella</i>	showy honeysuckle
<i>Iris versicolor</i>	harlequin blueflag	^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle
<i>Juncus effusus</i>	soft rush	^{INV} <i>Rhamnus cathartica</i>	European buckthorn
<i>Juncus tenuis</i>	lesser poverty rush	<i>Ribes americanum</i>	wild black currant
<i>Lepidium virginicum</i>	poorman's-pepperwort	^{INV} <i>Rosa multiflora</i>	multiflora rose
<i>Linaria vulgaris</i>	butter-and-eggs	<i>Rubus allegheniensis</i>	Allegheny blackberry
<i>Lychnis flos-cuculi</i>	ragged robin	<i>Sambucus nigra</i>	black elder
<i>Lysimachia ciliata</i>	fringed yellow-loosestrife	<i>Spiraea alba</i>	white meadowsweet
^{INV} <i>Lythrum salicaria</i>	purple loosestrife	<i>Viburnum dentatum</i>	southern arrow-wood
<i>Melilotus officinalis</i>	yellow sweet-clover	Trees	
<i>Mentha arvensis</i>	American wild mint	<i>Acer negundo</i>	box elder
<i>Oenothera biennis</i>	common evening-primrose	<i>Crataegus punctata</i>	dotted hawthorn
<i>Onoclea sensibilis</i>	sensitive fern	<i>Crataegus macracantha</i>	long-thorned hawthorn
<i>Origanum vulgare</i>	wild oregano	<i>Euonymus europaeus</i>	European spindle tree
<i>Osmunda spectabilis</i>	Royal Fern	<i>Fagus grandifolia</i>	American beech
<i>Oxalis stricta</i>	upright yellow wood-sorrel	<i>Fraxinus americana</i>	white ash
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	<i>Fraxinus pennsylvanica</i>	green ash

Scientific Name	Common Name	Scientific Name	Common Name
<i>Pastinaca sativa</i>	wild parsnip	<i>Populus deltoides</i>	eastern cottonwood
<i>Persicaria sagittata</i>	arrow-leaf tearthumb	<i>Populus tremuloides</i>	quaking aspen
^{INV} <i>Phalaris arundinacea</i>	reed canary grass	<i>Prunus pensylvanica</i>	fire cherry
^{INV} <i>Phragmites australis</i>	common reed	<i>Prunus serotina</i>	black cherry
<i>Phleum pratense</i>	timothy	^{LVN} <i>Pyrus calleryana</i>	callery pear
<i>Plantago lanceolata</i>	english plantain	<i>Quercus alba</i>	white oak
<i>Plantago major</i>	common plantain	<i>Quercus rubra</i>	northern red oak
<i>Potentilla norvegica</i>	Norway cinquefoil	<i>Rhus typhina</i>	staghorn sumac
<i>Potentilla simplex</i>	oldfield cinquefoil	<i>Salix alba</i>	white willow
<i>Ranunculus acris</i>	tall buttercup	<i>Salix nigra</i>	black willow
<i>Rubus flagellaris</i>	whiplash dewberry	<i>Tilia americana</i>	American Basswood
<i>Rudbeckia laciniata</i>	green-head coneflower	Woody Vines	
<i>Rumex acetosella</i>	sheep sorrel	<i>Calystegia sepium</i>	hedge false bindweed
<i>Rumex crispus</i>	curly dock	^{INV} <i>Celastrus orbiculatus</i>	Asiatic bittersweet
<i>Schizachyrium scoparium</i>	little false bluestem	<i>Echinocystis lobata</i>	wild cucumber
		<i>Fallopia scandens</i>	Climbing Black-Bindweed
		<i>Parthenocissus quinquefolia</i>	Virginia creeper
		<i>Toxicodendron radicans</i>	poison ivy

INV = Listed by MIPAG as invasive species

LVN = Listed by MIPAG as likely invasive species

Table 5. Ranked IV_{ave} values for the Utility Drive rail transload property

Scientific Name	Common Name	# Plots	D _R	F _R	IV _{ave}
^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle	9	17.29	8.82	13.06
<i>Panicum virgatum</i>	switchgrass	4	13.60	3.92	8.76
^{INV} <i>Rhamnus cathartica</i>	common buckthorn	8	8.66	7.84	8.25
<i>Galium mollugo</i>	whorled bedstraw	9	4.90	8.82	6.86
<i>Crataegus punctata</i>	dotted hawthorn	5	8.81	4.90	6.85
<i>Acer negundo</i>	boxelder	3	8.87	2.94	5.91
<i>Thymus pulegioides</i>	lemon thyme	8	3.75	7.84	5.80
<i>Solidago gigantea</i>	giant goldenrod	4	5.92	3.92	4.92
^{LNV} <i>Centaurea stoebe</i>	spotted knapweed	3	6.51	2.94	4.73
<i>Calamagrostis canadensis</i>	bluejoint grass	3	4.26	2.94	3.60
<i>Solidago canadensis</i>	Canada goldenrod	3	2.42	2.94	2.68
<i>Impatiens capensis</i>	jewelweed	3	2.11	2.94	2.53
<i>Prunus serotina</i>	black cherry	3	2.11	2.94	2.53
<i>Calystegia sepium</i>	hedge bindweed	4	0.49	3.92	2.21
<i>Festuca rubra</i>	red fescue	2	2.40	1.96	2.18
<i>Linaria vulgaris</i>	butter-and-eggs	2	1.68	1.96	1.82
<i>Veronica americana</i>	speedwell	3	0.68	2.94	1.81
<i>Cornus racemosa</i>	gray dogwood	3	0.57	2.94	1.76
^{INV} <i>Alliaria petiolata</i>	garlic mustard	3	0.37	2.94	1.65
^{INV} <i>Celastrus orbiculata</i>	Asian bittersweet	3	0.37	2.94	1.65
<i>Vicia cracca</i>	bird vetch	3	0.37	2.94	1.65
<i>Parthenocissus quinquefolia</i>	Virginia creeper	2	0.86	1.96	1.41
<i>Rhus hirta</i>	staghorn sumac	2	0.86	1.96	1.41
<i>Rubus occidentalis</i>	black raspberry	2	0.55	1.96	1.26
<i>Rumex acetosella</i>	sheep sorrel	2	0.55	1.96	1.26
<i>Solidago rugosa</i>	wrinkleleaf goldenrod	2	0.55	1.96	1.26
<i>Asclepias syriaca</i>	common milkweed	2	0.25	1.96	1.10
<i>Eutrochium maculatum</i>	Joe-pye-weed	2	0.25	1.96	1.10

DR = Relative dominance; FR = Relative frequency; IR_{ave} = Importance Value; INV = Listed by MIPAG as invasive species;

LNV = Listed by MIPAG as likely invasive species

Table 6. Vegetation percent cover for palustrine cover types at the Utility Drive rail transload property

Scientific Name	Common Name	Wetland Indicator Status	Percent Cover
<i>Acer negundo</i>	boxelder	FAC	2
<i>Alnus incana</i>	speckled alder	FACW	7
<i>Betula lenta</i>	black birch	FACU	2
<i>Bidens frondosa</i>	Devil's beggar-ticks	FACW	20
<i>Carex spp.</i>	sedges	N/A	30
<i>Carex stricta</i>	tussock sedge	OBL	20
<i>Comarum palustre</i>	purple marshlocks	OBL	23
<i>Cornus amomum</i>	silky dogwood	FACW	15
<i>Epilobium coloratum</i>	purple-leaf willowherb	OBL	20
<i>Eutrochium maculatum</i>	spotted Joe-Pye-weed	OBL	15
<i>Juncus effusus</i>	soft rush	OBL	23
<i>Impatiens capensis</i>	jewelweed	FACW	27
^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle	FACU	10
^{INV} <i>Lythrum salicaria</i>	purple loosestrife	OBL	75
<i>Onoclea sensibilis</i>	sensitive fern	FACW	35
<i>Persicaria sagittata</i>	arrow-leaved tearthumb	OBL	40
^{INV} <i>Phragmites australis</i>	common reed	FACW	2
<i>Populus deltoides</i>	eastern cottonwood	FAC	2
^{INV} <i>Rhamnus cathartica</i>	common buckthorn	FAC	10
^{INV} <i>Rosa multiflora</i>	multiflora rose	FACU	7
<i>Solidago gigantea</i>	giant goldenrod	FACW	30
<i>Solidago rugosa</i>	wrinkle-leaf goldenrod	FAC	55
<i>Sparganium americanum</i>	American bur-reed	OBL	40
<i>Typha angustifolia</i>	narrow-leaf cattail	OBL	80
<i>Typha latifolia</i>	broad-leaf cattail	OBL	80

FAC = Facultative 34-66% occurrence in wetlands; FACW = Facultative Wetland 67-99% occurrence in wetlands;

OBL = Obligate 99% occurrence in wetlands; FACU = Facultative Upland 1-33% occurrence in wetlands.

INV = Listed by MIPAG as invasive species

LVN = Listed by MIPAG as likely invasive species

Table 7. Ranked IV_{ave} values for Upland Field at the Utility Drive rail transload property

Scientific Name	Common Name	# Plots	D _R	F _R	IV _{ave}
<i>Panicum virgatum</i>	switchgrass	4	27.59	7.02	17.30
<i>Galium mollugo</i>	whorled bedstraw	8	9.06	14.04	11.55
<i>Thymus pulegioides</i>	lemon thyme	8	7.60	14.04	10.82
^{LVN} <i>Centaurea stoebe</i>	spotted knapweed	3	13.21	5.26	9.24
<i>Calamagrostis canadensis</i>	bluejoint grass	3	8.64	5.26	6.95
<i>Solidago gigantea</i>	giant goldenrod	2	7.98	3.51	5.74
<i>Festuca rubra</i>	red fescue	2	4.86	3.51	4.18
<i>Calystegia sepium</i>	hedge bindweed	4	1.00	7.02	4.01
<i>Solidago canadensis</i>	Canada goldenrod	2	4.03	3.51	3.77
<i>Linaria vulgaris</i>	butter-and-eggs	2	3.41	3.51	3.46
^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle	2	3.41	3.51	3.46
<i>Veronica americana</i>	speedwell	3	1.37	5.26	3.32
<i>Cornus racemosa</i>	gray dogwood	3	1.16	5.26	3.21
^{INV} <i>Rhamnus cathartica</i>	common buckthorn	2	2.58	3.51	3.04
<i>Vicia cracca</i>	bird vetch	3	0.75	5.26	3.01
<i>Rubus occidentalis</i>	black raspberry	2	1.12	3.51	2.32
<i>Rumex acetosella</i>	sheep sorrel	2	1.12	3.51	2.32
<i>Solidago rugosa</i>	wrinkleleaf goldenrod	2	1.12	3.51	2.32

DR = Relative dominance; FR = Relative frequency; IR_{ave} = Importance Value; INV = Listed by MIPAG as invasive species;

LVN = Listed by MIPAG as likely invasive species

Table 8. Ranked IV_{ave} values for Northern Hardwood Forest at the Utility Drive rail transload property

Scientific Name	Common Name	# Plots	D_R	F_R	IV_{ave}
^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle	5	37.33	22.58	29.96
<i>Crataegus punctata</i>	dotted hawthorn	3	21.07	16.13	18.60
^{INV} <i>Rhamnus cathartica</i>	common buckthorn	4	17.69	19.35	18.52
<i>Acer negundo</i>	boxelder	2	11.61	6.45	9.03
<i>Prunus serotina</i>	black cherry	2	5.05	9.68	7.36
<i>Solidago gigantea</i>	giant goldenrod	2	4.75	6.45	5.60
<i>Impatiens capensis</i>	jewelweed	2	1.32	6.45	3.89
^{INV} <i>Alliaria petiolata</i>	garlic mustard	2	0.59	6.45	3.52
^{INV} <i>Celastrus orbiculatus</i>	Asiatic bittersweet	2	0.59	6.45	3.52

D_R = Relative dominance; F_R = Relative frequency; IV_{ave} = Importance Value; INV = Listed by MIPAG as invasive species

Table 9. Vascular plant species observed at the Woods Pond Spur rail transload property

Scientific Name	Common Name	Scientific Name	Common Name
Herbaceous Sedges, Rushes, Grasses and Forbs		Woody Shrubs	
<i>Artemisia vulgaris</i>	Mugwort	^{LVN} <i>Berberis vulgaris</i>	common barberry
<i>Asclepias syriaca</i>	common milkweed	<i>Carya glabra</i>	pignut hickory
^{LVN} <i>Centaurea stoebe</i>	spotted knapweed	<i>Cornus amomum</i>	silky dogwood
^{INV} <i>Fallopia japonica</i>	Japanese knotweed	^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle
<i>Impatiens capensis</i>	Jewelweed	<i>Phytolacca americana</i>	Pokeweed
^{INV} <i>Lythrum salicaria</i>	purple loosestrife	^{INV} <i>Rhamnus cathartica</i>	common buckthorn
^{INV} <i>Phragmites australis</i>	common reed	^{INV} <i>Rosa multiflora</i>	multiflora rose
<i>Solidago canadensis</i>	Canada goldenrod	<i>Rubus allegheniensis</i>	Allegheny blackberry
<i>Solidago gigantea</i>	giant goldenrod	<i>Salix bebbiana</i>	Bebb's willow
<i>Solidago rugosa</i>	wrinkleleaf goldenrod	<i>Spirea alba</i>	meadowsweet
<i>Vicia cracca</i>	cow vetch	Trees	
<i>Artemisia vulgaris</i>	common wormwood	<i>Acer rubrum</i>	red maple
<i>Cichorium intybus</i>	chicory	<i>Acer saccharum</i>	sugar maple
<i>Daucus carota</i>	Queen Anne's lace	^{INV} <i>Acer platanoides</i>	Norway maple
<i>Galium triflorum</i>	sweet-scent bedstraw	<i>Populus deltoides</i>	cottonwood
<i>Juncus tenuis</i>	path rush	<i>Populus grandidentata</i>	large-tooth aspen
<i>Plantago major</i>	common plantain	<i>Quercus rubra</i>	red oak
<i>Taraxacum officinale</i>	common dandelion	<i>Rhus hirta</i>	staghorn sumac
Woody Vines		<i>Salix alba</i>	weeping willow
^{INV} <i>Celastrus orbiculatus</i>	Asiatic bittersweet		
<i>Parthenocissus quinquefolia</i>	Virginia creeper		
<i>Vitis labrusca</i>	fox grape		

INV = Listed by MIPAG as invasive species

LVN = Listed by MIPAG as likely invasive species

Includes plant observations from October 2024 as well as 2025.

Table 10. Vegetation percent cover at the Woods Pond Spur rail transload property

Scientific Name	Common Name	Percent Cover
<i>Acer rubrum</i>	red maple	10
<i>Acer saccharum</i>	sugar maple	5
<i>Artemisia vulgaris</i>	mugwort	30
<i>Asclepias syriaca</i>	common milkweed	12
^{INV} <i>Berberis vulgaris</i>	common barberry	2
<i>Carya glabra</i>	pignut hickory	5
^{INV} <i>Celastrus orbiculatus</i>	Asiatic bittersweet	7
^{LNV} <i>Centaurea stoebe</i>	spotted knapweed	10
<i>Cornus amomum</i>	silky dogwood	20
^{INV} <i>Fallopia japonica</i>	Japanese knotweed	5
<i>Impatiens capensis</i>	jewelweed	2
^{INV} <i>Lonicera morrowii</i>	Morrow's honeysuckle	15
^{INV} <i>Lythrum salicaria</i>	purple loosestrife	20
<i>Parthenocissus quinquefolia</i>	Virginia creeper	3
^{INV} <i>Phragmites australis</i>	common reed	2
<i>Phytolacca americana</i>	pokeweed	5
<i>Populus deltoides</i>	eastern cottonwood	5
<i>Populus grandidentata</i>	large-tooth aspen	5
<i>Quercus rubra</i>	red oak	5
^{INV} <i>Rhamnus cathartica</i>	common buckthorn	12
<i>Rhus hirta</i>	staghorn sumac	7
^{INV} <i>Rosa multiflora</i>	multiflora rose	12
<i>Rubus allegheniensis</i>	Allegheny blackberry	7
<i>Salix alba</i>	Weeping willow	15
<i>Salix bebbiana</i>	Bebb's willow	2
<i>Solidago canadensis</i>	Canada goldenrod	10
<i>Solidago gigantea</i>	giant goldenrod	10
<i>Solidago rugosa</i>	wrinkleleaf goldenrod	10
<i>Spirea alba</i>	meadowsweet	2
<i>Vicia cracca</i>	vetch	10

INV = Listed by MIPAG as invasive species

LNV = Listed by MIPAG as likely invasive species

Table reflects plant observations from 2025 only.

Table 11. Observed and potential bird species presence at the Utility Drive rail transload property

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Large Wading Birds							
Great Blue Heron	<i>Ardea herodias</i>					■	
Green Heron	<i>Butorides virescens</i>		□				■
Ducks and Geese							
Canada Goose	<i>Branta canadensis</i>					■	
Wood Duck	<i>Aix sponsa</i>		□			■	
Raptors							
American Kestrel	<i>Falco sparverius</i>		□				□
Turkey Vulture	<i>Cathartes aura</i>				■		
Bald Eagle	<i>Haliaeetus leucocephalus</i>		□	□			
Red-shouldered Hawk	<i>Buteo lineatus</i>		□				■
Broad-winged Hawk	<i>Buteo platypterus</i>		■		■		■
Red-tailed Hawk	<i>Buteo jamaicensis</i>						■
Game Birds							
Ring-necked Pheasant	<i>Phasianus colchicus</i>				■		
Ruffed Grouse	<i>Bonasa umbellus</i>						□
Wild Turkey	<i>Meleagris gallopavo</i>						□
Northern Bobwhite	<i>Colinus virginianus</i>				■		
American Woodcock	<i>Scolopax minor</i>	■			■		■
Shorebirds							
Killdeer	<i>Charadrius vociferus</i>				■		
Non-passerine Perching Birds							
Mourning Dove	<i>Zenaida macroura</i>	□				■	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>		□		□	■	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>		□				□
Chimney Swift	<i>Chaetura pelagica</i>				□		
Ruby-throated Hummingbird	<i>Archilochus colubris</i>						■

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Owls							
Eastern Screech Owl	<i>Otus asio</i>		□		□		■
Great Horned Owl	<i>Bubo virginianus</i>	■			□		□
Barred Owl	<i>Strix varia</i>		■		□		■
Woodpeckers							
Downy Woodpecker	<i>Picoides pubescens</i>	■			□		■
Hairy Woodpecker	<i>Picoides villosus</i>		□		□		■
Northern Flicker	<i>Colaptes auratus</i>		■		■	□	
Pileated Woodpecker	<i>Dryocopus pileatus</i>		□			□	
Tyrant Flycatchers							
Eastern Wood-pewee	<i>Contopus virens</i>		□				□
Least Flycatcher	<i>Empidonax minimus</i>	■					■
Willow Flycatcher	<i>Empidonax traillii</i>	■				■	
Eastern Pheobe	<i>Sayornis pheobe</i>		□		□		□
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		□				□
Eastern Kingbird	<i>Tyrannus tyrannus</i>	□			□		
Swallows							
Tree Swallow	<i>Tachycineta bicolor</i>		□		□		■
Bank Swallow	<i>Riparia riparia</i>				■		
Barn Swallow	<i>Hirundo rustica</i>				■		
Corvids							
Blue Jay	<i>Cyanocitta cristata</i>	□			□	□	
American Crow	<i>Corvus brachyrhynchos</i>	□					□
Titmice							
Black-capped Chickadee	<i>Poecile atricapillus</i>	■			□	■	
Tufted Titmouse	<i>Baeolophus bicolor</i>		□		□		□
Nuthatches & Creepers							
Red-breasted nuthatch	<i>Sitta canadensis</i>		■				

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
White-breasted Nuthatch	<i>Sitta carolinensis</i>		■		□		□
Brown Creeper	<i>Certhia americana</i>		□				□
Wrens							
Carolina Wren	<i>Thryothorus ludovicianus</i>				□		■
House Wren	<i>Troglodytes aedon</i>		□		□		□
Gnatcatchers							
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>		□		□	■	
Thrushes							
Eastern Bluebird	<i>Sialia sialis</i>		■				
Veery	<i>Catharus fuscescens</i>	□			□		□
Swainson's Thrush	<i>Catharus ustulatus</i>	■			□		□
Wood Thrush	<i>Hylocichla mustelina</i>	□					□
American Robin	<i>Turdus migratorius</i>	□			□		□
Mimic Thrushes							
Gray Catbird	<i>Dumetella carolinensis</i>		■				■
Northern Mockingbird	<i>Mimus polyglottos</i>				■		■
Brown Thrasher	<i>Toxostoma rufum</i>				■		
Waxwings							
Cedar Waxwing	<i>Bombycilla cedrorum</i>		□		□		■
Starlings							
European Starling	<i>Sturnus vulgaris</i>		□		■		□
Vireos							
Yellow-throated Vireo	<i>Vireo flavifrons</i>		□				■
Warbling Vireo	<i>Vireo gilvus</i>	□				■	
Red-eyed Vireo	<i>Vireo olivaceus</i>						□
Wood Warblers							
Blue-winged Warbler	<i>Vermivora pinus</i>				■		□
Yellow Warbler	<i>Dendroica petechia</i>				□	■	
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>				□		

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Yellow-rumped Warbler	<i>Dendroica coronata</i>		□		□		□
Black-throated Green Warbler	<i>Dendroica virens</i>		■				□
Blackburnian Warbler	<i>Dendroica fusca</i>		□				
Prairie Warbler	<i>Dendroica discolor</i>				■		
Black-and-white Warbler	<i>Mniotilta varia</i>		■		□		□
American Redstart	<i>Setophaga ruticilla</i>		□		□		□
Ovenbird	<i>Seiurus aurocapillus</i>						□
Northern Waterthrush	<i>Seiurus noveboracensis</i>		□				■
Louisiana Waterthrush	<i>Seiurus motacilla</i>						■
Common Yellowthroat	<i>Geothlypis trichas</i>	□			■		
Tanagers							
Scarlet Tanager	<i>Piranga olivacea</i>		■				□
Cardinals & Grosbeaks							
Northern Cardinal	<i>Cardinalis cardinalis</i>				□	■	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	□			□		□
Indigo Bunting	<i>Passerina cyanea</i>				■		□
Sparrows							
Rufus-sided Towhee	<i>Pipilo erythrophthalmus</i>				□		□
Chipping Sparrow	<i>Spizella passerina</i>			□			
Field Sparrow	<i>Spizella pusilla</i>				■		
Dark-eyed Junco	<i>Junco hyemalis</i>		■			□	
Song Sparrow	<i>Melospiza melodia</i>	□					
Swamp Sparrow	<i>Melospiza georgiana</i>					■	
Icterids							
Red-winged Blackbird	<i>Agelaius phoeniceus</i>				■	■	
Common Grackle	<i>Quiscalus quiscula</i>					□	
Brown-headed Cowbird	<i>Molothrus ater</i>		□		■		□
Orioles							

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Baltimore Oriole	<i>Icterus galbula</i>	☐			☐		☐
Finches							
Purple Finch	<i>Carpodacus purpureus</i>		☐		☐		☐
American Goldfinch	<i>Carduelis tristis</i>		☐		☐		☐
Old World Sparrows							
House Sparrow	<i>Passer domesticus</i>				■		

Obsv = observed; Potn = potential

■ Preferred Habitat; ☐ Utilized Habitat

Bird species observed at the Utility Drive property include both visual observations and audible calls.

1. Cover type categories based on DeGraaf and Yamasaki (2001).
2. Upland field category includes forbs, grasses, and shrub-old field.
3. Palustrine wetland category includes swamp hardwood-red maple, shrub swamp, shallow marsh, and deep marsh.

Table 12. Observed and potential amphibian, reptile, and mammal presence at the Utility Drive rail transload property

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Amphibians							
Spotted salamander	<i>Ambystoma maculatum</i>		■				■
Red-spotted newt	<i>Notophthalmus v. viridescens</i>		■				□
Redback salamander	<i>Plethodon cinereus</i>		■				□
Northern two-lined salamander	<i>Eurycea bislineata</i>						□
American toad	<i>Anaxyrus americanus</i>		□		□		□
Spring peeper	<i>Pseudacris crucifer</i>		□				■
Gray tree frog	<i>Dryophytes versicolor</i>	■				□	■
Green frog	<i>Lithobates clamitans</i>					■	
Bullfrog	<i>Lithobates catesbeiana</i>					■	
Pickerel frog	<i>Lithobates palustris</i>		□		□		□
Wood frog	<i>Lithobates sylvaticus</i>	■				■	
Leopard frog	<i>Lithobates pipiens</i>			□		■	
Reptiles (snakes and turtles)							
Painted turtle	<i>Chrysemys picta</i>		□				□
Common snapping turtle	<i>Chelydra s. serpentina</i>						□
Spotted turtle	<i>Clemmys guttata</i>						■
Wood turtle	<i>Glyptemys insculpta</i>		□		□		□
Northern redbelly snake	<i>Storeria occipitomaculata</i>		■		□		■
Eastern garter snake	<i>Thamnophis s. sirtalis</i>		□	□		□	
Ribbon snake	<i>Thamnophis sauritus</i>		□				■
Eastern milksnake	<i>Lampropeltis triangulum</i>		□		□		
Ring-necked snake	<i>Diadophis punctatus</i>		□		□		■
Northern black racer	<i>Coluber constrictor</i>		□				□
Northern Water snake	<i>Nerodia Sipedon</i>						■
Mammals							
Virginia opossum	<i>Didelphus virginiana</i>				□		■

Common Name	Scientific Name	Northern Hardwoods ¹		Upland Field ²		Palustrine Wetland ³	
		Obsv	Potn	Obsv	Potn	Obsv	Potn
Masked shrew	<i>Sorex cinereus</i>		□		□		□
Short-tailed shrew	<i>Blarina brevicauda</i>		□		□		□
Eastern mole	<i>Scolophus aquaticus</i>				■		□
Star-nosed mole	<i>Condylura cristata</i>		□				□
Eastern cottontail	<i>Sylvilagus floridanus</i>			■			
Eastern chipmunk	<i>Tamias striatus</i>		□		□		□
Woodchuck	<i>Marmota monax</i>		□		■		□
Gray squirrel	<i>Sciurus carolinensis</i>		□				□
Red squirrel	<i>Tamasciurus hudsonicus</i>		□		□		□
Beaver	<i>Castor canadensis</i>		■			■	
Deer mouse	<i>Peromyscus maniculatus</i>		□		□		□
White footed mouse	<i>Peromyscus leucopus</i>		■		■		□
Meadow vole	<i>Microtus pennsylvanicus</i>				■		
Muskrat	<i>Ondatra zibethicus</i>					■	
Meadow jumping mouse	<i>Zapus hudsonius</i>		□	■			□
Woodland jumping mouse	<i>Napaeozapus insignis</i>		■		□		■
Northern long-eared bat	<i>Myotis septentrionalis</i>		□		□		■
Tricolored bat	<i>Perimyotis subflavus</i>						
Big brown bat	<i>Eptesicus fuscus</i>		□		□		■
Hoary bat	<i>Lasiurus cinereus</i>		□		□		■
Porcupine	<i>Erethizon dorsatum</i>		■		□		□
Coyote	<i>Canis latrans</i>	□		□			□
Red fox	<i>Vulpes vulpes</i>		□		■		□
Gray fox	<i>Urocyon cinereoargenteus</i>		■		□		■
Black bear	<i>Ursus americanus</i>	■			□	■	
Raccoon	<i>Procyon lotor</i>		□		■		■
Striped skunk	<i>Mephitis mephitis</i>		□		■		□
White-tailed deer	<i>Odocoileus virginianus</i>	□		■		□	

Obsv = observed; Potn = potential

■ Preferred Habitat; □ Utilized Habitat

1. Cover type categories based on DeGraaf and Yamasaki (2001).
2. Upland field category includes forbs, grasses, and shrub-old field.
3. Palustrine wetland category includes swamp hardwood-red maple, shrub swamp, shallow marsh, and deep marsh.

Table 13: Potential rare butterfly host plants identified at the Utility Drive rail transload property in 2025

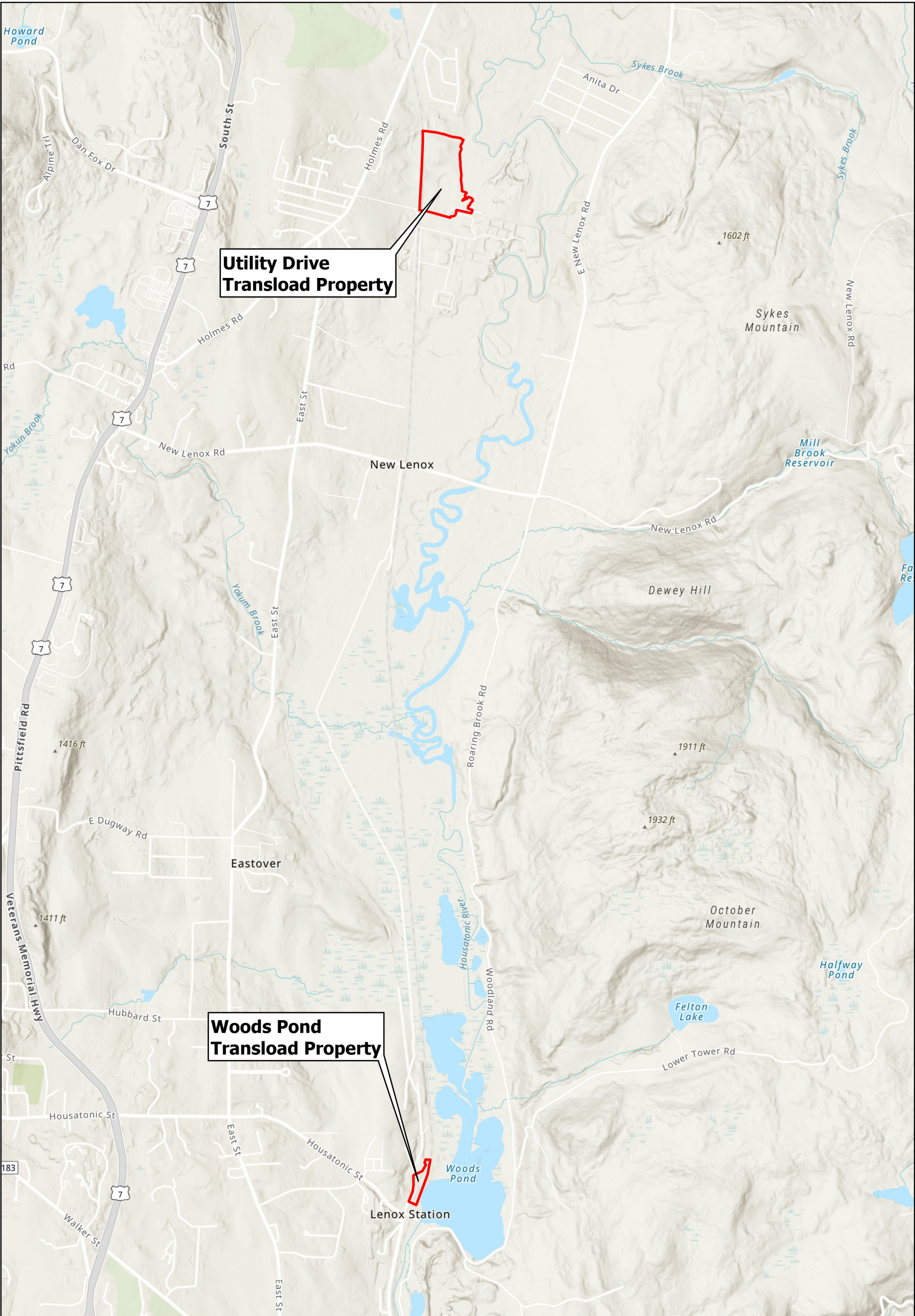
Scientific Name	Common Name	Potential Host Plant for:	Relative Abundance ¹	Status
<i>^{INV}Alliaria petiolata</i>	Garlic Mustard	Mustard White, but known to reduce Mustard White growth and development	Common	Non-native, Invasive
<i>Berteroa incana</i>	Hoary Alyssum	Mustard White	Rare	Non-native
<i>Asclepias incarnata</i>	Swamp Milkweed	Monarch Butterfly	Trace	Native
<i>Asclepias syriaca</i>	Common Milkweed	Monarch Butterfly	Common	Native
<i>Hesperis matronalis</i>	Dame's-Rocket	Mustard White	Abundant	Non-native, Invasive
<i>Lepidium virginicum</i>	Poorman's Pepper	Mustard White	Rare	Native
<i>Turritus glabra</i>	Tower Mustard	Mustard White	Abundant	Native

1. Trace indicates isolated individuals; Rare indicates limited scattered occurrence; Common indicates occurrence at multiple locations or in an established colony; and Abundant indicates local dominance or a strong documented presence.

Table 14: Survey dates and monitoring of nest building activities by bald eagles adjacent to Woods Pond

Survey Date	Survey Time
1-29-26	Evening
2-10-26	Evening
2-27-26	Evening
3-10-26	Morning
3-18-26	Morning
3-24-26	Morning
4-3-26	Morning
4-8-26	Morning
4-17-26	Morning
4-29-26	Evening
Nest Checks During American Bittern and Common Gallinule Surveys	
5-12-26	Morning
5-21-26	Evening
6-5-26	Morning
6-25-26	Evening

Figures



0 1,000 2,000 4,000 Feet



Esri, NASA, NGA, USGS, FEMA, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Site Locus

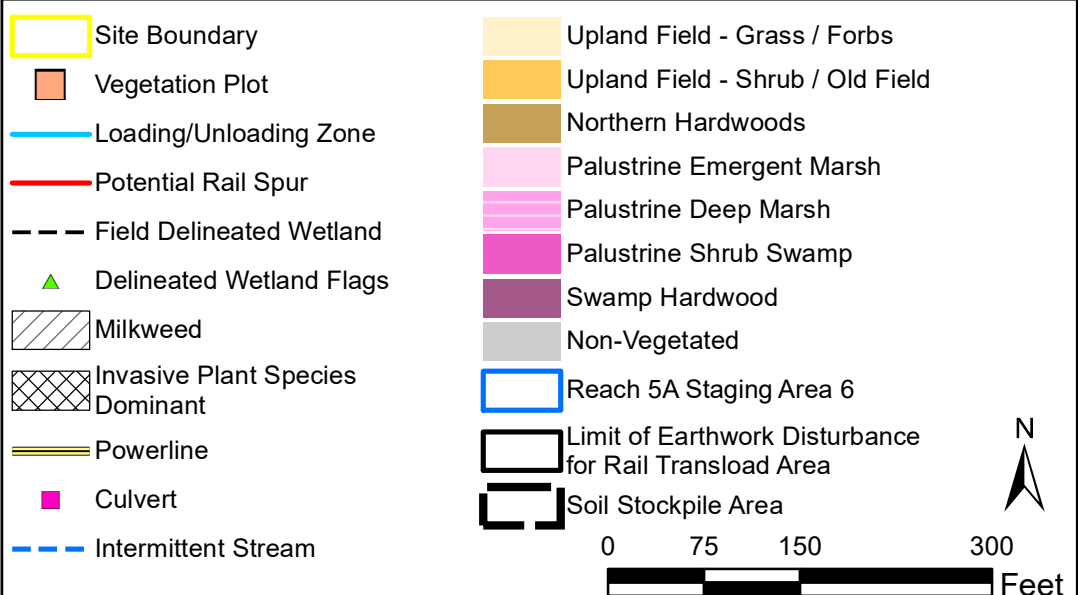
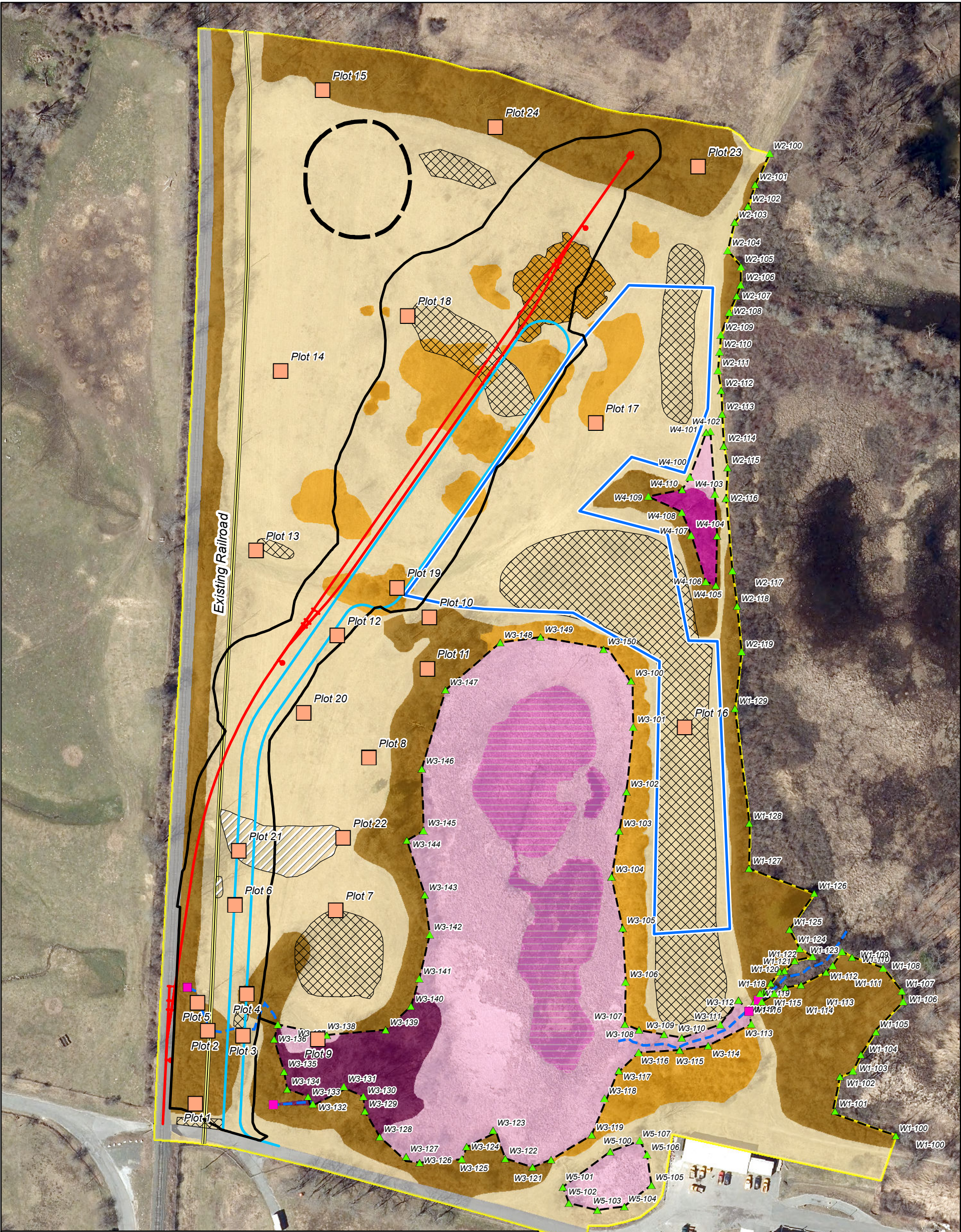
Rail Transload Properties in River Reaches 5A and 6

SCALE	DATE	PROJECT NO.
1:24,000	2/5/2026	60681577

AECOM

Figure

1



Habitat Cover Types

Utility Drive Rail
Transload Property

SCALE	DATE	PROJECT NO.
1:1,800	9/17/2026	60681577

AECOM

Figure

2

Pittsfield Wastewater
Treatment Plant



Legend

- Site Boundary
 - Non-Vegetated
 - Upland Field - Shrub / Old Field
 - Invasive Plant Species Dominant
 - Loading/Unloading Zone
 - Approximate Limit of Proposed Earthwork
 - Potential Rail Spur
 - Powerline
- 0 50 100 200 Feet

Habitat Cover Types

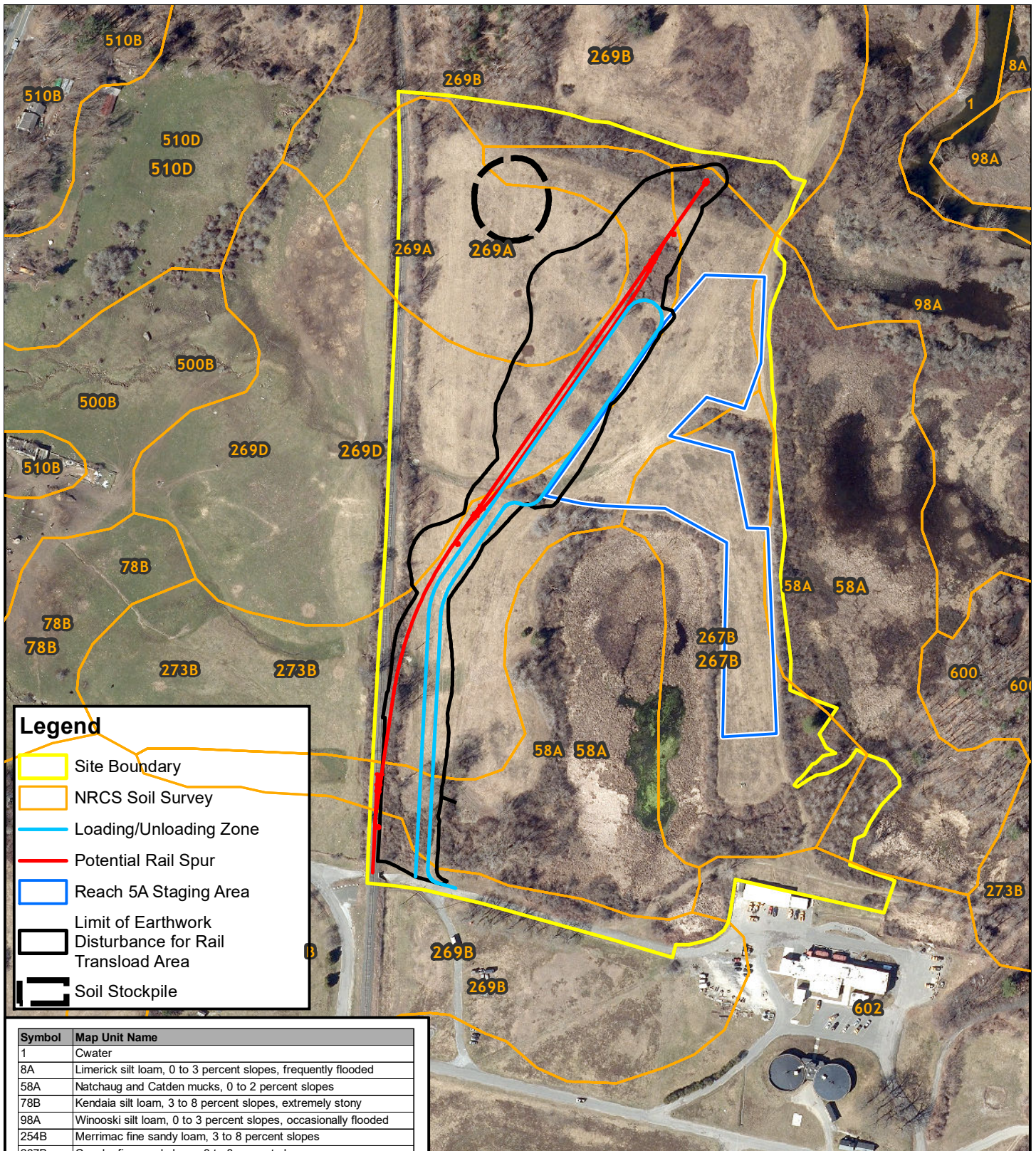
Woods Pond Rail
Transload Property

SCALE	DATE	PROJECT NO.
1:1,200	2/18/2026	60681577

AECOM

Figure

3



Legend

- Site Boundary
- NRCS Soil Survey
- Loading/Unloading Zone
- Potential Rail Spur
- Reach 5A Staging Area
- Limit of Earthwork Disturbance for Rail Transload Area
- Soil Stockpile

Symbol	Map Unit Name
1	Cwater
8A	Limerick silt loam, 0 to 3 percent slopes, frequently flooded
58A	Natchaug and Catden mucks, 0 to 2 percent slopes
78B	Kendaia silt loam, 3 to 8 percent slopes, extremely stony
98A	Winooski silt loam, 0 to 3 percent slopes, occasionally flooded
254B	Merrimac fine sandy loam, 3 to 8 percent slopes
267B	Copake fine sandy loam, 3 to 8 percent slopes
269A	Groton gravelly sandy loam, 0 to 3 percent slopes
269B	Groton gravelly sandy loam, 3 to 8 percent slopes
269D	Groton gravelly sandy loam, 15 to 25 percent slopes
273B	Oakville loamy sand, 3 to 8 percent slopes
500B	Amenia silt loam, 3 to 8 percent slopes
500C	Amenia silt loam, 8 to 15 percent slopes
500D	Amenia silt loam, 15 to 25 percent slopes
510B	Pittsfield loam, 3 to 8 percent slopes
510D	Pittsfield loam, 15 to 25 percent slopes
600	Pits, gravel
602	Urban land
632C	Copake-Urban land complex, 0 to 15 percent slopes

NRCS Soils

Utility Drive Rail Transload Property

SCALE

1:3,600

DATE

9/17/2026

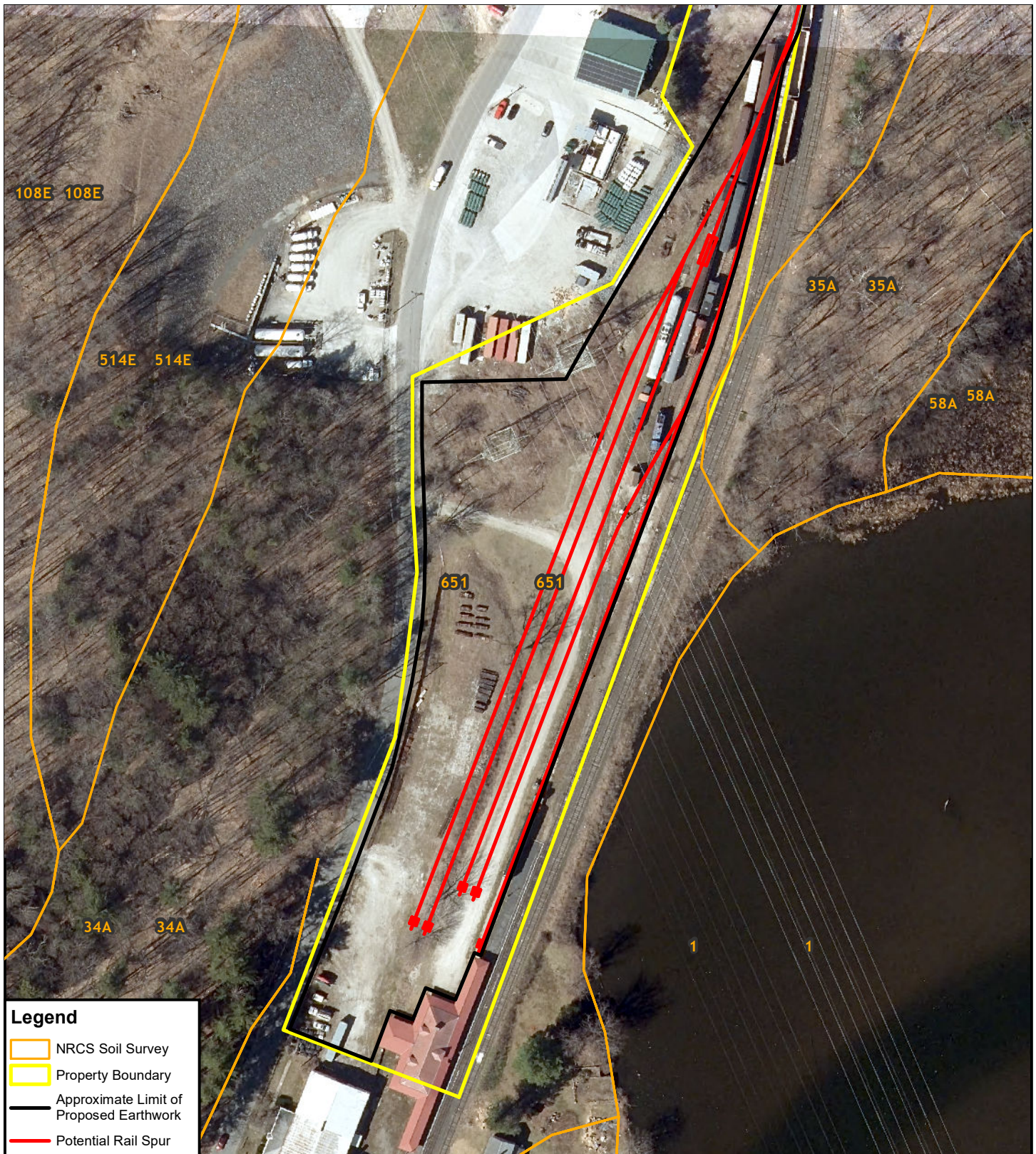
PROJECT NO.

60681577

AECOM

Figure

4



Symbol	Map Unit Name
1	Cwater
34A	Fredon fine sandy loam, 0 to 3 percent slopes
35A	Halsey fine sandy loam, 0 to 3 percent slopes
58A	Natchaug and Catden mucks, 0 to 2 percent slopes
108E	Farmington-Rock outcrop complex, 15 to 35 percent slopes
501C	Amenia silt loam, 8 to 15 percent slopes, very stony
505C	Nellis loam, 8 to 15 percent slopes
514E	Pittsfield and Nellis loams, 25 to 35 percent slopes, extremely stony
651	Udorthents, smoothed

NRCS Soils

Woods Pond Rail Transload Property

SCALE

1:1,600

DATE

8/27/2026

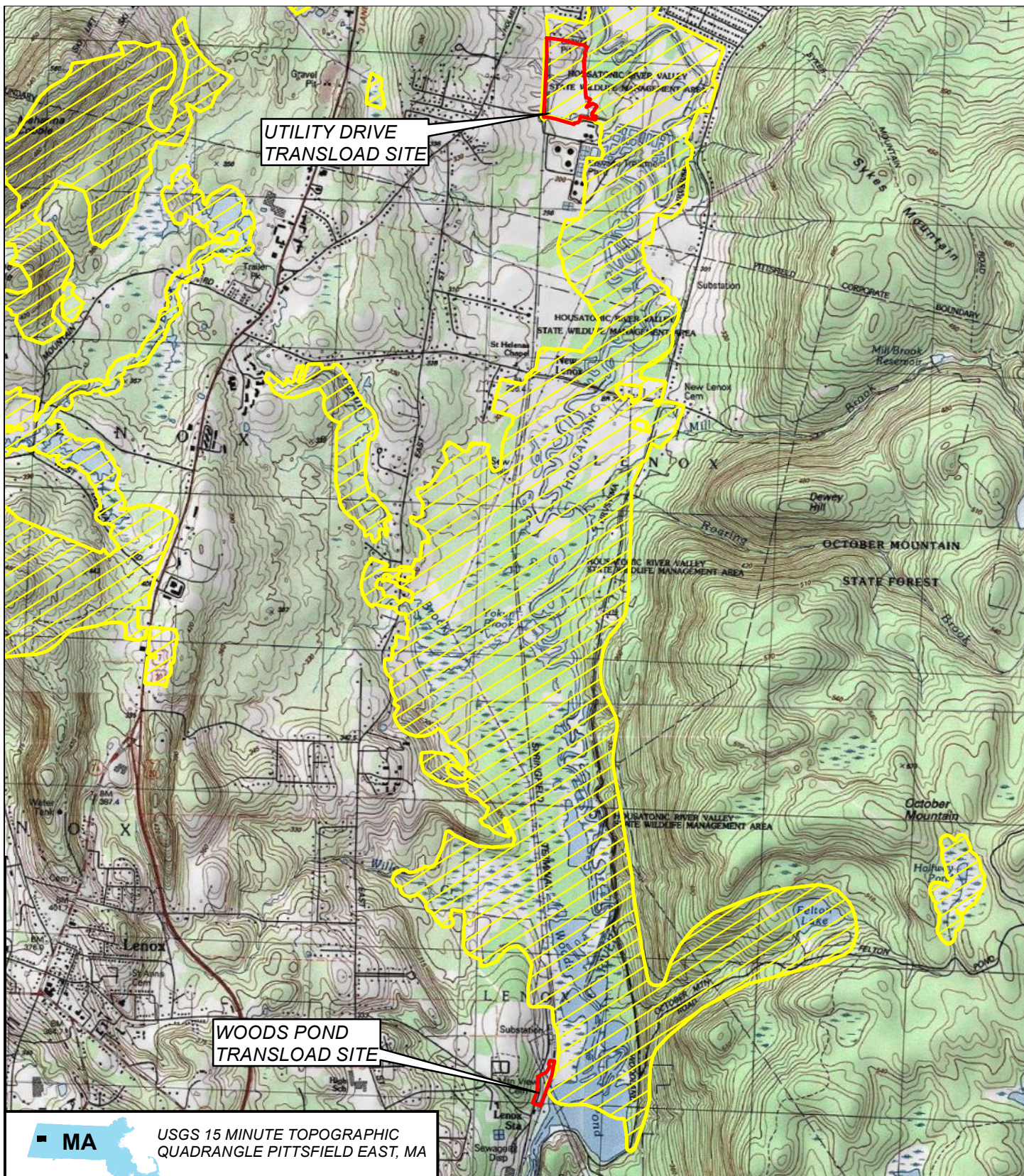
PROJECT NO.

60681577

AECOM

Figure

5



MA USGS 15 MINUTE TOPOGRAPHIC QUADRANGLE PITTSFIELD EAST, MA

Legend

- Study Area Site Boundary
- NHESP Priority Habitats

0 1,000 2,000 4,000
 Feet



NHESP PRIORITY HABITATS: Rail Transload Properties in Reaches 5A and 6		
SCALE	DATE	PROJECT NO.
1:36,000	2/5/2026	60681577

AECOM
Figure Number
6

Attachments

Attachment C-1 Habitat Inventory Forms

**General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form**

I. General Information

Utility Drive Rail Transload Area

Site Name

Utility Drive, Pittsfield MA

Location/Physical Description

05/29/26 Habitat Inventory

Date(s) of Site Visit(s) and Data Collection

Sunny, 60 Degrees F

Weather Conditions During Site Visit

Taylor White

Field Staff Performing Evaluation

06/08/26

Date this form was completed

II. Site Description

A. Hydrology/Water Regime

☐ Permanently flooded

☐ Saturated

☐ Intermittently exposed

☐ Temporarily flooded

☐ Semi-permanently flooded

☐ Intermittently flooded

☐ Seasonally flooded

☐ Artificially flooded

☒ Upland

B. Community Cover Type(s)

Wetland

☐ Transitional floodplain forest

☐ High terrace floodplain forest

☐ Red maple swamp

☐ Vernal pool

☐ Black ash-red maple-tamarack calcareous seepage swamp

☐ Deep emergent marsh

☐ Shallow emergent marsh

☐ Shrub swamp

☐ Wet meadow

Upland

☐ Northern Hardwoods-Hemlock-White Pine Forest

☐ Rich mesic forest

☐ Red Oak-Sugar Maple Transition Forest

☐ Agricultural fields

☒ Cultural grassland

☐ Successional northern hardwoods

☐ Spruce-fir-northern hardwood forest

☐ Developed/disturbed cover types

☐

Bordering Riverine/Aquatic Habitat

☐ High-gradient stream

☐ Low-gradient stream

☐ Medium-gradient stream

☐ Moderately alkaline lake/pond

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Backwater

☐

C. Inventory (Plant community)

% Cover: 7 11 1 0 81
Trees (> 20') Shrubs (< 20') Woody vines Mosses Herbaceous

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
T	Boxelder	H	Whorled bedstraw
T	Staghorn sumac	H	Lemon thyme
S	Morrow's honeysuckle	H	Spotted knapweed
S	Common buckthorn	H	Bluejoint grass
S	Gray dogwood	H	Giant goldenrod
H	Switchgrass	H	Red fescue

D. Inventory (Soils)

Oakville loamy sand

Soil Survey Unit

Fine sandy loam

Texture (upper part)

Excessively drained

Drainage Class

30 in

Depth

Representative Soil Pit Log

Soil Horizon	Depth (inches)	Color	Soil Texture	Mottling
	0-24	10YR 3/4	Fine sandy loam	None
	24-30	10YR 4/6	Fine sandy loam	None

Notes:

III. Important Habitat Features

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant

☐ Present

☐ Absent

☒ Not Applicable

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Cover/Perches/Basking/Denning/Nesting Habitat

Shrub and/or herbaceous vegetation suitable for veery nesting

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Trees (live or dead) > 30" DBH

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Standing Dead Trees (potential for cavities and perches):

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Tree Cavities in trunks or limbs:

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Small mammal burrows:

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Rock piles, crevices, or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

Live or dead standing vegetation overhanging water or offering good visibility of open water (e.g., osprey, kingfisher, flycatchers, cedar waxwings)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Depressions that may serve as seasonal (vernal/autumnal) pools

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Standing water present at least part of the growing season, suitable for use by

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

- | | |
|--|---|
| ☐ Breeding amphibians | ☐ Non-breeding amphibians (foraging, re-hydration) |
| ☐ Turtles | ☐ Foraging waterfowl |

Sphagnum hummocks or mats, moss-covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Important habitat characteristics

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Underwater banks of fine silt and/or clay (beaver, muskrat, otter)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Undercut or overhanging banks (small mammals, mink, weasels)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Vertical sandy banks (bank swallow, kingfisher)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Areas of ice-free open water in winter

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Mud flats

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Exposed areas of well-drained, sandy soil suitable for turtle nesting

- | | | | |
|-----------------------------------|----------------------------------|--|---|
| ☐ Abundant | ☐ Present | ☒ Absent | ☐ Not Applicable |
|-----------------------------------|----------------------------------|--|---|

Wildlife dens/nests (if observed)

Turtle nesting sites

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Bank swallow colony

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Nest(s) present of ☐ Bald Eagle ☐ Osprey ☐ Great Blue Heron ☐ NLE Bat ☐ Other

Den(s) present of ☐ Otter ☐ Mink ☐ Beaver

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

Emergent Wetlands (if Applicable)

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, king rail, Virginia rail, coot, etc.)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (pied-billed grebe) ☐ Present ☐ Absent

Persistent emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

Cattail emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren) ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

Fine-leaved emergent vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

V. Habitat Degradation

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☒ Significant invasion of exotic plants (e.g., purple loosestrife, *Phragmites*, glossy buckthorn)

☐ Disturbance from roads or highways

☐ Evidence of fire

☒ Evidence of other human disturbance

**General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form**

I. General Information

Utility Drive Rail Transload Area

Site Name

Utility Drive, Pittsfield MA

Location/Physical Description

05/29/26 Habitat Inventory

Date(s) of Site Visit(s) and Data Collection

Sunny, 60 Degrees F

Weather Conditions During Site Visit

Taylor White

Field Staff Performing Evaluation

06/08/26

Date this form was completed

II. Site Description

A. Hydrology/Water Regime

☐ Permanently flooded

☐ Saturated

☐ Intermittently exposed

☐ Temporarily flooded

☐ Semi-permanently flooded

☐ Intermittently flooded

☐ Seasonally flooded

☐ Artificially flooded

☒ Upland

B. Community Cover Type(s)

Wetland

☐ Transitional floodplain forest

☐ High terrace floodplain forest

☐ Red maple swamp

☐ Vernal pool

☐ Black ash-red maple-tamarack calcareous seepage swamp

☐ Deep emergent marsh

☐ Shallow emergent marsh

☐ Shrub swamp

☐ Wet meadow

Upland

☒ Northern Hardwoods-Hemlock-White Pine Forest

☐ Rich mesic forest

☐ Red Oak-Sugar Maple Transition Forest

☐ Agricultural fields

☐ Cultural grassland

☐ Successional northern hardwoods

☐ Spruce-fir-northern hardwood forest

☐ Developed/disturbed cover types

☐

Bordering Riverine/Aquatic Habitat

☐ High-gradient stream

☐ Low-gradient stream

☐ Medium-gradient stream

☐ Moderately alkaline lake/pond

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Backwater

☐

C. Inventory (Plant community)

% Cover: 50 35 1 14
 Trees (> 20') Shrubs (< 20') Woody vines Mosses Herbaceous

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
T	Eastern cottonwood	S	Morrow's honeysuckle
T	Large-tooth aspen	S	Common buckthorn
T	Black cherry	T	Dotted hawthorn
T	Boxelder	V	Asiatic bittersweet
T	Black birch	H	Giant goldenrod
T	White pine	H	Garlic mustard

D. Inventory (Soils)

Groton gravelly sandy loam

Soil Survey Unit

Fine sandy loam

Texture (upper part)

Excessively drained

Drainage Class

24 in

Depth

Representative Soil Pit Log

Soil Horizon	Depth (inches)	Color	Soil Texture	Mottling
	0-3	10YR 2/1	Fine sandy loam	None
	3-18	10YR 3/2	Fine sandy loam	None
	18-20	10YR 3/3	VFSL / loam	None
	20-24	10YR 3/6	VFSL / loam	None

Notes:

III. Important Habitat Features

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant

☐ Present

☐ Absent

☒ Not Applicable

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Cover/Perches/Basking/Denning/Nesting Habitat

Shrub and/or herbaceous vegetation suitable for veery nesting

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Trees (live or dead) > 30" DBH

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Standing Dead Trees (potential for cavities and perches):

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Tree Cavities in trunks or limbs:

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Small mammal burrows:

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Rock piles, crevices, or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

Live or dead standing vegetation overhanging water or offering good visibility of open water (e.g., osprey, kingfisher, flycatchers, cedar waxwings)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Depressions that may serve as seasonal (vernal/autumnal) pools

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Standing water present at least part of the growing season, suitable for use by

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

- | | |
|--|---|
| ☐ Breeding amphibians | ☐ Non-breeding amphibians (foraging, re-hydration) |
| ☐ Turtles | ☐ Foraging waterfowl |

Sphagnum hummocks or mats, moss-covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Important habitat characteristics

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Underwater banks of fine silt and/or clay (beaver, muskrat, otter)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Undercut or overhanging banks (small mammals, mink, weasels)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Vertical sandy banks (bank swallow, kingfisher)

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Areas of ice-free open water in winter

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Mud flats

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Exposed areas of well-drained, sandy soil suitable for turtle nesting

- | | | | |
|-----------------------------------|----------------------------------|--|---|
| ☐ Abundant | ☐ Present | ☒ Absent | ☐ Not Applicable |
|-----------------------------------|----------------------------------|--|---|

Wildlife dens/nests (if observed)

Turtle nesting sites

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Bank swallow colony

- | | | | |
|-----------------------------------|----------------------------------|---------------------------------|--|
| ☐ Abundant | ☐ Present | ☐ Absent | ☒ Not Applicable |
|-----------------------------------|----------------------------------|---------------------------------|--|

Nest(s) present of ☐ Bald Eagle ☐ Osprey ☐ Great Blue Heron ☐ NLE Bat ☐ Other

Den(s) present of ☐ Otter ☐ Mink ☐ Beaver

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

Emergent Wetlands (if Applicable)

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, king rail, Virginia rail, coot, etc.)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (pied-billed grebe) ☐ Present ☐ Absent

Persistent emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

Cattail emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren) ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

Fine-leaved emergent vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm ☐ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☐ Absent

V. Habitat Degradation

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☒ Significant invasion of exotic plants (e.g., purple loosestrife, *Phragmites*, glossy buckthorn)

☐ Disturbance from roads or highways

☐ Evidence of fire

☒ Evidence of other human disturbance

**General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form**

I. General Information

Utility Drive Rail Transload Area - Wetland Habitats

Site Name

Utility Drive Site Wetlands, Pittsfield, MA

Location/Physical Description

08/24/22 data collection; 05/29/26 site verification

Date(s) of Site Visit(s) and Data Collection

Sunny, 60 Degrees F (05/29/26)

Weather Conditions During Site Visit

Taylor White

06/08/26

Field Staff Performing Evaluation

Date this form was completed

II. Site Description

A. Hydrology/Water Regime

☐ Permanently flooded

☒ Saturated

☐ Intermittently exposed

☐ Temporarily flooded

☐ Semi-permanently flooded

☐ Intermittently flooded

☒ Seasonally flooded

☐ Artificially flooded

☐ Upland

B. Community Cover Type(s)

Wetland

☐ Transitional floodplain forest

☐ High terrace floodplain forest

☐ Red maple swamp

☐ Vernal pool

☐ Black ash-red maple-tamarack calcareous seepage swamp

☒ Deep emergent marsh

☒ Shallow emergent marsh

☒ Shrub swamp

☐ Wet meadow

Upland

☐ Northern Hardwoods-Hemlock-White Pine Forest

☐ Rich mesic forest

☐ Red Oak-Sugar Maple Transition Forest

☐ Agricultural fields

☐ Cultural grassland

☐ Successional northern hardwoods

☐ Spruce-fir-northern hardwood forest

☐ Developed/disturbed cover types

☐

Bordering Riverine/Aquatic Habitat

☐ High-gradient stream

☐ Low-gradient stream

☐ Medium-gradient stream

☐ Moderately alkaline lake/pond

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Backwater

☐

C. Inventory (Plant community)

% Cover:

1

Trees (> 20')

4

Shrubs (< 20')

Woody vines

Mosses

95

Herbaceous

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; “*” designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
T	Black willow	H	Jewelweed
S	Pussy willow	H	Purple-stemmed aster
H	Narrow-leaved cattail	H	Marsh bedstraw
H	Broad-leaved cattail	H	Nodding beggar-ticks
H	Purple loosestrife	H	Arrow-leaved tearthumb
H	Spotted Joe-Pye weed	H	Spikerush

D. Inventory (Soils)

Natchaug and Catden muck

Soil Survey Unit

Organic/mucky surface

Texture (upper part)

Very poorly drained

Drainage Class

40 inches

Depth

Representative Soil Pit Log

Soil Horizon	Depth (inches)	Color	Soil Texture	Mottling
Organic surface	0-4		Organic/mucky surface	Not recorded
Subsurface	4-40	10YR 4/2 within 12 in.		Redox present

Notes:

III. Important Habitat Features

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant

☒ Present

☐ Absent

☐ Not Applicable

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Cover/Perches/Basking/Denning/Nesting Habitat

Shrub and/or herbaceous vegetation suitable for veery nesting

☒ Abundant ☐ Present ☐ Absent ☐ Not Applicable

Trees (live or dead) > 30" DBH

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Standing Dead Trees (potential for cavities and perches):

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Tree Cavities in trunks or limbs:

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Small mammal burrows:

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☒ Abundant ☐ Present ☐ Absent ☐ Not Applicable

Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Abundant ☒ Present ☐ Absent ☐ Not Applicable

Rock piles, crevices, or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

Live or dead standing vegetation overhanging water or offering good visibility of open water (e.g., osprey, kingfisher, flycatchers, cedar waxwings)

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Depressions that may serve as seasonal (vernal/autumnal) pools

☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Standing water present at least part of the growing season, suitable for use by

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

- ☐ Breeding amphibians ☐ Non-breeding amphibians (foraging, re-hydration)
☐ Turtles ☒ Foraging waterfowl

Sphagnum hummocks or mats, moss-covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander)

- ☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Important habitat characteristics

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Underwater banks of fine silt and/or clay (beaver, muskrat, otter)

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Undercut or overhanging banks (small mammals, mink, weasels)

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Vertical sandy banks (bank swallow, kingfisher)

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Areas of ice-free open water in winter

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Mud flats

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Exposed areas of well-drained, sandy soil suitable for turtle nesting

- ☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Wildlife dens/nests (if observed)

Turtle nesting sites

- ☐ Abundant ☐ Present ☒ Absent ☐ Not Applicable

Bank swallow colony

- ☐ Abundant ☐ Present ☐ Absent ☒ Not Applicable

Nest(s) present of ☐ Bald Eagle ☐ Osprey ☐ Great Blue Heron ☐ NLE Bat ☐ Other

Den(s) present of ☐ Otter ☐ Mink ☐ Beaver

General Electric Housatonic Rest of River
Appendix B: Habitat Inventory Form

Emergent Wetlands (if Applicable)

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, king rail, Virginia rail, coot, etc.)

Flooded > 5 cm ☒ Present ☐ Absent

Flooded > 25 cm (pied-billed grebe) ☒ Present ☐ Absent

Persistent emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm ☒ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☒ Present ☐ Absent

Cattail emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren) ☒ Present ☐ Absent

Flooded > 25 cm (least bittern, common moorhen) ☒ Present ☐ Absent

Fine-leaved emergent vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm ☐ Present ☒ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☒ Absent

V. Habitat Degradation

☐ Evidence of significant levels of dumping

☐ Evidence of significant erosion or sedimentation problems

☒ Significant invasion of exotic plants (e.g., purple loosestrife, *Phragmites*, glossy buckthorn)

☐ Disturbance from roads or highways

☐ Evidence of fire

☐ Evidence of other human disturbance

Attachment C-2

Representative Photographs

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 1	Date: 8/5/2025	Photo No. 2	Date: 8/5/2025
Description: Plot 1: Utility Drive Transload Site view northwest.		Description: Plot 2: Utility Drive Transload Site view south.	
			

Photo No. 3	Date: 8/5/2025	Photo No. 4	Date: 8/5/2025
Description: Plot 3: Utility Drive Transload Site view west.		Description: Plot 4: Utility Drive Transload Site view northeast.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 5	Date: 8/5/2025	Photo No. 6	Date: 8/5/2025
Description: Plot 5: Utility Drive Transload Site view west.		Description: Plot 6: Utility Drive Transload Site view north.	
			

Photo No. 7	Date: 8/5/2025	Photo No. 8	Date: 8/5/2025
Description: Plot 7: Utility Drive Transload Site view southeast.		Description: Plot 8: Utility Drive Transload Site view west.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 9	Date:	Photo No. 10	Date: 8/6/2025
Description: Plot 9: Utility Drive Transload Site View southwest		Description: Plot 10: Utility Drive Transload Site view southwest.	
			

Photo No. 11	Date: 8/6/2025	Photo No. 12	Date: 8/6/2025
Description: Plot 11: Utility Drive Transload Site view north.		Description: Plot 12: Utility Drive Transload Site view west.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 13	Date: 8/6/2025	Photo No. 14	Date: 8/6/2025
Description: Plot 13: Utility Drive Transload Site view west.		Description: Plot 14: Utility Drive Transload Site view north.	
			

Photo No. 15	Date: 8/6/2025	Photo No. 16	Date: 8/6/2025
Description: Plot 15: Utility Drive Transload Site view north.		Description: Plot 16: Utility Drive Transload Site view west.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 17	Date: 8/6/2025	Photo No. 18	Date: 8/6/2025
Description: Plot 17: Utility Drive Transload Site view west.		Description: Plot 18: Utility Drive Transload Site view west.	
			

Photo No. 19	Date: 8/6/2025	Photo No. 20	Date: 8/6/2025
Description: Plot 19: Utility Drive Transload Site view west.		Description: Plot 20: Utility Drive Transload Site view southwest.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 21	Date: 8/20/2025	Photo No. 22	Date: 8/20/2025
Description: Plot 21: General area of Plot 21, view southwest.		Description: Plot 22: General area of Plot 21, view southwest	
			

Photo No. 23	Date: 8/21/2025	Photo No. 24	Date: 8/21/2025
Description: Plot 23: Utility Drive Transload Site view west northwest.		Description: Plot 24: Utility Drive Transload Site view northwest.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Utility Drive, Pittsfield, Massachusetts	Project No. 60778161
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Photo No. 25	Date: 8/6/2025	Photo No. 26	Date: 8/6/2025
Description: Utility Drive Transload Site central portion of upland field view east.		Description: Utility Drive Transload Site northeastern portion of upland field view southeast.	
			

Photo No. 27	Date: 8/6/2025	Photo No. 28	Date: 8/1/2025
Description: Utility Drive Transload Site western portion of upland field view northeast.		Description: Utility Drive Transload Site Wetland 3 view north.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Woods Pond, Lenox, Massachusetts	Project No. 60778161
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Photo No. 29	Date: 7/30/2025	Photo No. 30	Date: 7/30/2025
Description: Woods Pond Transload Site southern portion view north.		Description: Woods Pond Transload Site photo taken from the central portion viewing north of utility structures and overhead line located in the northern portion of the site.	
			

Photo No. 31	Date: 7/30/2025	Photo No. 32	Date: 7/30/2025
Description: Woods Pond Transload Site central portion view south of non-vegetated cover type (gravel access road and hardpacked low groundcover with herbaceous, Upland Field cover type at the right of photo.		Description: Woods Pond Transload Site northern portion view north of non-vegetated gravel access adjacent to railroad tracks.	
			

Client Name: Housatonic River – Rail Transload Areas	Site Location: Woods Pond, Lenox, Massachusetts	Project No. 60778161
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Photo No. 33	Date: 7/30/2025	Photo No. 34	Date: 7/30/2025
Description: Woods Pond Transload Site northern portion view southwest of steep slope transition between railroad tracks gravel access road and utility structures. Invasive honeysuckle (<i>Lonicera morrowii</i>) patch.		Description: Woods Pond Transload Site central portion view east of shrub hedgerow, at the site's western border and adjacent to Willow Creek Road. Weeping willow (<i>Salix babylonica</i>).	
			

Photo No. 35	Date: 7/30/2025	Photo No. 36	Date: 7/30/2025
Description: Woods Pond Transload Site central portion view west. Patch of milkweed (<i>Asclepias</i> sp.).		Description: Woods Pond Transload Site northern portion, new north of utility ROW and hardpack gravel access road in the northern portion of the site.	
			

Attachment C-3
US Army Corps of Engineers
Wetland Determination Forms for Utility
Drive Rail Transload Property

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Housatonic River Restoration/Utility Drive Rail Spur City/County: Pittsfield, MA/Berkshire County Sampling Date: 7/31/2025
Applicant/Owner: General Electric State: MA Sampling Point: W1/W2
Investigator(s): Julia Stearns; Adam Clark; Luke Peplowski Section, Township, Range: Pittsfield, MA
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.411906 Long: -73.242009 Datum: WGS84
Soil Map Unit Name: Natchaug and Catden Mucks NWI classification: PSS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u> If yes, optional Wetland Site ID: <u>Wetland W2</u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>	
Remarks: (Explain alternative procedures here or in a separate report.)		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u> </u> Surface Water (A1) <u>X</u> Water-Stained Leaves (B9) <u>X</u> High Water Table (A2) <u> </u> Aquatic Fauna (B13) <u>X</u> Saturation (A3) <u> </u> Marl Deposits (B15) <u>X</u> Water Marks (B1) <u> </u> Hydrogen Sulfide Odor (C1) <u>X</u> Sediment Deposits (B2) <u> </u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Drift Deposits (B3) <u>X</u> Presence of Reduced Iron (C4) <u> </u> Algal Mat or Crust (B4) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u> </u> Iron Deposits (B5) <u> </u> Thin Muck Surface (C7) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Other (Explain in Remarks) <u> </u> Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> <u> </u> Surface Soil Cracks (B6) <u> </u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u> </u> Stunted or Stressed Plants (D1) <u> </u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> </u> Microtopographic Relief (D4) <u> </u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>8</u> Saturation Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: W1/W2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>145</u></td> <td>x 1 = <u>145</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>30</u></td> <td>x 4 = <u>120</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>175</u> (A)</td> <td><u>265</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>1.51</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>145</u>	x 1 = <u>145</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>30</u>	x 4 = <u>120</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>175</u> (A)	<u>265</u> (B)	Prevalence Index = B/A = <u>1.51</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>145</u>	x 1 = <u>145</u>																			
FACW species <u>0</u>	x 2 = <u>0</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>30</u>	x 4 = <u>120</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>175</u> (A)	<u>265</u> (B)																			
Prevalence Index = B/A = <u>1.51</u>																				
=Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Salix nigra</u>	<u>85</u>	<u>Yes</u>	<u>OBL</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
=Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Lycopus americanus</u>	<u>5</u>	<u>No</u>	<u>OBL</u>																	
2. <u>Silene flos-cuculi</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>																	
3. <u>Eutrochium maculatum</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>																	
4. <u>Lythrum salicaria</u>	<u>40</u>	<u>Yes</u>	<u>OBL</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
=Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
=Total Cover																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
=Total Cover																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1/W2

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Housatonic River Restoration/Utility Drive Rail Spur City/County: Pittsfield, MA/Berkshire County Sampling Date: 7/31/2025
Applicant/Owner: General Electric State: MA Sampling Point: W1/W2
Investigator(s): Julia Stearns; Adam Clark; Luke Peplowski Section, Township, Range: Pittsfield, MA
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): convex Slope (%): 3-8
Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.410996 Long: -73.241816 Datum: WGS84
Soil Map Unit Name: Cokape fine sandy loam NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.)			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>		
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Crayfish Burrows (C8)
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)
		☐ FAC-Neutral Test (D5)
Field Observations:		Wetland Hydrology Present? Yes _____ No <u>X</u>
Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____	Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: W1/W2

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species <u>20</u></td> <td>x 1 = <u>20</u></td> </tr> <tr> <td>FACW species <u>110</u></td> <td>x 2 = <u>220</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>15</u></td> <td>x 5 = <u>75</u></td> </tr> <tr> <td>Column Totals: <u>145</u> (A)</td> <td><u>315</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.17</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>20</u>	x 1 = <u>20</u>	FACW species <u>110</u>	x 2 = <u>220</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>15</u>	x 5 = <u>75</u>	Column Totals: <u>145</u> (A)	<u>315</u> (B)	Prevalence Index = B/A = <u>2.17</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>20</u>	x 1 = <u>20</u>																			
FACW species <u>110</u>	x 2 = <u>220</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>15</u>	x 5 = <u>75</u>																			
Column Totals: <u>145</u> (A)	<u>315</u> (B)																			
Prevalence Index = B/A = <u>2.17</u>																				
=Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Cornus amomoum</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u>Crataegus punctata</u>	<u>15</u>	<u>No</u>	<u>UPL</u>																	
3. <u>Salix nigra</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover																				
=Total Cover				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
=Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Onoclea sensibilis</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
=Total Cover																				
=Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
=Total Cover																				
=Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1/W2

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Housatonic River Restoration/Utility Drive Rail Spur City/County: Pittsfield, MA/Berkshire County Sampling Date: 8/06/2025
Applicant/Owner: General Electric State: MA Sampling Point: W3
Investigator(s): Julia Stearns; Adam Clark; Steve (HDR) Section, Township, Range: Pittsfield, MA
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.415853 Long: -73.241701 Datum: WGS84
Soil Map Unit Name: Winooksi Silt Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) <u>X</u> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>surface</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: W3

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____	=Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Cornus amomum</u>	15	Yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	15	=Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Typha angustifolia</u>	5	No	OBL	
2. <u>Sparangium americanum</u>	20	Yes	OBL	
3. <u>Impatiens capensis</u>	3	No	FACW	
4. <u>Lythrum salicaria</u>	35	Yes	OBL	
5. <u>Onoclea sensibilis</u>	3	No	FACW	
6. <u>Ribes americanum</u>	2	No	FACW	
7. <u>Solidago gigantea</u>	3	No	FACW	
8. <u>Thelypteris palustris</u>	2	No	FACW	
9. <u>Bidens frondosa</u>	5	No	FACW	
10. <u>Comarum palustre</u>	15	No	OBL	
11. <u>Persicaria sagittata</u>	2	No	OBL	
12. <u>Epilobium coloratum</u>	5	No	OBL	
	100	=Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>82</u>	x 1 = <u>82</u>
FACW species <u>33</u>	x 2 = <u>66</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u> (A)	<u>148</u> (B)
Prevalence Index = B/A = <u>1.29</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,
☐ Histic Epipedon (A2)	MLRA 149B)
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
☒ X Hydrogen Sulfide (A4)	☐ High Chroma Sands (S11) (LRR K, L)
☐ Stratified Layers (A5)	☐ Loamy Mucky Mineral (F1) (LRR K, L)
☐ Depleted Below Dark Surface (A11)	☐ Loamy Gleyed Matrix (F2)
☐ Thick Dark Surface (A12)	☐ Depleted Matrix (F3)
☐ Sandy Mucky Mineral (S1)	☐ Redox Dark Surface (F6)
☐ Sandy Gleyed Matrix (S4)	☐ Depleted Dark Surface (F7)
☐ Sandy Redox (S5)	☐ Redox Depressions (F8)
☐ Stripped Matrix (S6)	☐ Marl (F10) (LRR K, L)
☐ Dark Surface (S7)	

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Housatonic River Restoration/Utility Drive Rail Spur City/County: Pittsfield, MA/Berkshire County Sampling Date: 8/06/2025
Applicant/Owner: General Electric State: MA Sampling Point: W3
Investigator(s): Julia Stearns; Adam Clark; Steve (HDR) Section, Township, Range: Pittsfield, MA
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.415346 Long: -73.242474 Datum: WGS84
Soil Map Unit Name: Oakville loamy sand NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ Water-Stained Leaves (B9) ☐ High Water Table (A2) ☐ Aquatic Fauna (B13) ☐ Saturation (A3) ☐ Marl Deposits (B15) ☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1) ☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4) ☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks) ☐ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: W3

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Populus tremuloides</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>5</u> =Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>95</u></td> <td>x 2 = <u>190</u></td> </tr> <tr> <td>FAC species <u>28</u></td> <td>x 3 = <u>84</u></td> </tr> <tr> <td>FACU species <u>5</u></td> <td>x 4 = <u>20</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>128</u> (A)</td> <td><u>294</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.30</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>95</u>	x 2 = <u>190</u>	FAC species <u>28</u>	x 3 = <u>84</u>	FACU species <u>5</u>	x 4 = <u>20</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>128</u> (A)	<u>294</u> (B)	Prevalence Index = B/A = <u>2.30</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>95</u>	x 2 = <u>190</u>																			
FAC species <u>28</u>	x 3 = <u>84</u>																			
FACU species <u>5</u>	x 4 = <u>20</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>128</u> (A)	<u>294</u> (B)																			
Prevalence Index = B/A = <u>2.30</u>																				
<u>5</u> =Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Lonicera morrowii</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>5</u> =Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Solidago gigantea</u>	<u>90</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Rubus occidentalis</u>	<u>20</u>	<u>No</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>110</u> =Total Cover																				
Woody Vine Stratum (Plot size: _____)																				
1. <u>Clematis ligusticfolia</u>	<u>8</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
<u>8</u> =Total Cover																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W3

[illegible]

Attachment C-4

USDA NRCS Soils Mapping and Descriptions for Rail Transload Properties



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Re- port for **Berkshire County, Massachusetts**

Utility Drive Transload Property



January 8, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Berkshire County, Massachusetts.....	13
58A—Natchaug and Catden mucks, 0 to 2 percent slopes.....	13
98A—Winooski silt loam, 0 to 3 percent slopes, occasionally flooded.....	15
267B—Copake fine sandy loam, 3 to 8 percent slopes.....	16
269A—Groton gravelly sandy loam, 0 to 3 percent slopes.....	17
269B—Groton gravelly sandy loam, 3 to 8 percent slopes.....	18
269D—Groton gravelly sandy loam, 15 to 25 percent slopes.....	20
273B—Oakville loamy sand, 3 to 8 percent slopes.....	21
602—Urban land.....	22
References	23

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

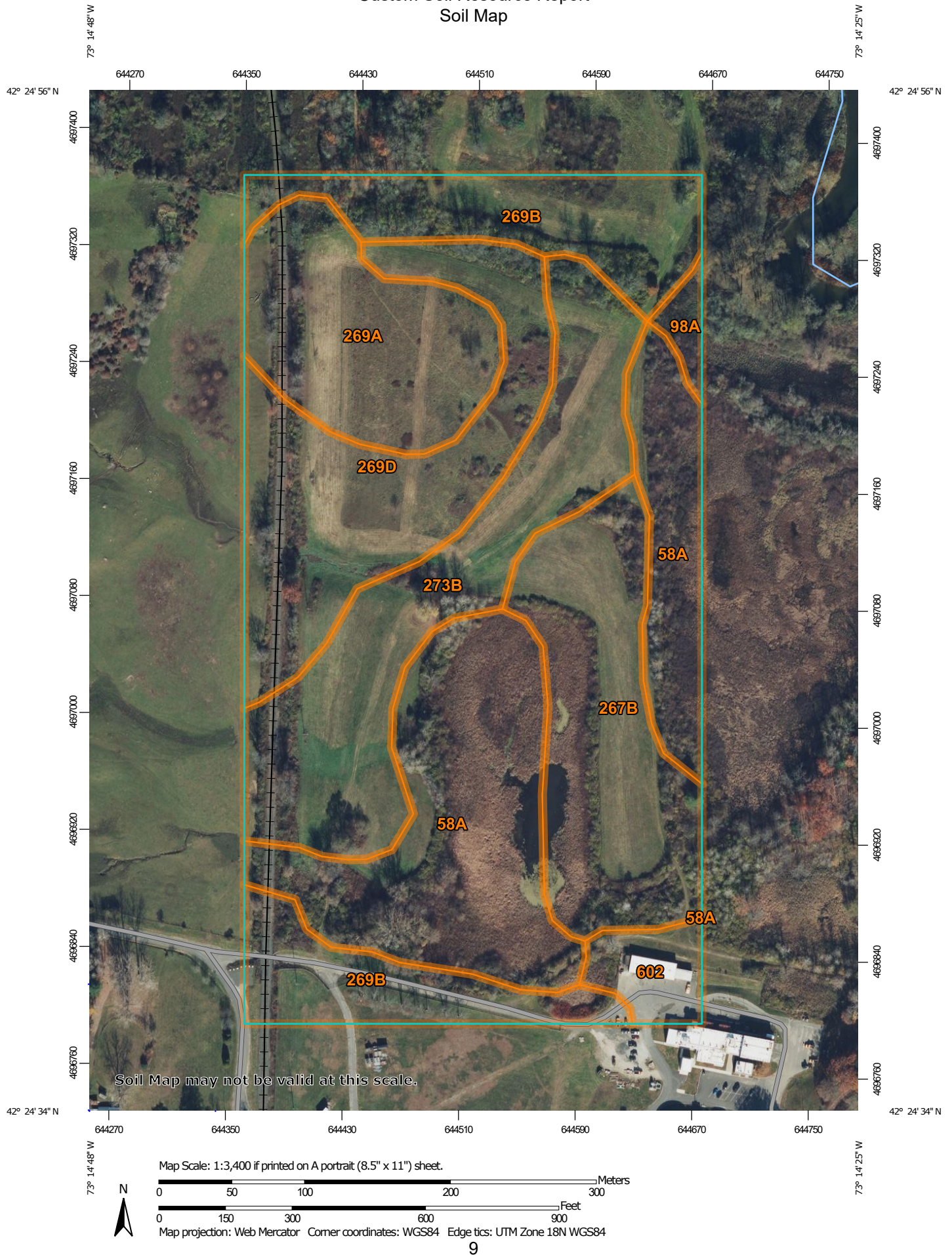
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

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 1:25,000.

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: Berkshire County, Massachusetts
Survey Area Data: Version 20, Sep 5, 2025

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

Date(s) aerial images were photographed: Aug 15, 2021—Nov 8, 2021

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
58A	Natchaug and Catden mucks, 0 to 2 percent slopes	10.4	23.1%
98A	Winooski silt loam, 0 to 3 percent slopes, occasionally flooded	0.4	0.9%
267B	Copake fine sandy loam, 3 to 8 percent slopes	6.5	14.4%
269A	Groton gravelly sandy loam, 0 to 3 percent slopes	5.2	11.4%
269B	Groton gravelly sandy loam, 3 to 8 percent slopes	6.8	14.9%
269D	Groton gravelly sandy loam, 15 to 25 percent slopes	7.1	15.6%
273B	Oakville loamy sand, 3 to 8 percent slopes	7.8	17.2%
602	Urban land	1.1	2.5%
Totals for Area of Interest		45.2	100.0%

Map Unit Descriptions

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, 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 and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils 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. Other minor components, however, have properties and behavioral 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*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one 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.

Berkshire County, Massachusetts

58A—Natchaug and Catden mucks, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w670
Elevation: 650 to 1,240 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Natchaug and similar soils: 50 percent
Catden and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Natchaug

Setting

Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loamy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
2Cg1 - 31 to 39 inches: silt loam
2Cg2 - 39 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.01 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 17.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144BY302ME - Mucky Swamp
Hydric soil rating: Yes

Description of Catden

Setting

Landform: Depressions, depressions, depressions

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Highly decomposed herbaceous organic material and/or highly decomposed woody organic material

Typical profile

Oa1 - 0 to 2 inches: muck

Oa2 - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent

Surface area covered with cobbles, stones or boulders: 0.0 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.14 to 14.17 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D

Ecological site: F144BY210ME - Marsh Wetland Complex

Hydric soil rating: Yes

Minor Components

Halsey

Percent of map unit: 5 percent

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Lyons

Percent of map unit: 5 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

98A—Winooski silt loam, 0 to 3 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2zvd4
Elevation: 560 to 1,300 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Winooski and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Winooski

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty alluvium

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 64 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 6.00 in/hr)
Depth to water table: About 22 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F145XY002MA - Silty Low Floodplain
Hydric soil rating: No

Minor Components

Hadley

Percent of map unit: 6 percent
Hydric soil rating: No

Limerick

Percent of map unit: 2 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Saco

Percent of map unit: 2 percent
Landform: Alluvial flats
Hydric soil rating: Yes

267B—Copake fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98ss
Elevation: 560 to 1,390 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Copake and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Copake

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from limestone and/or loose sandy glaciofluvial deposits derived from limestone

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 26 inches: gravelly fine sandy loam
H3 - 26 to 64 inches: stratified gravelly loamy fine sand to very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches

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Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: A

Ecological site: F144BY506ME - Semi-rich Till Slope

Hydric soil rating: No

Minor Components

Groton

Percent of map unit: 5 percent

Hydric soil rating: No

Hero

Percent of map unit: 3 percent

Hydric soil rating: No

Fredon

Percent of map unit: 2 percent

Landform: Terraces

Hydric soil rating: Yes

269A—Groton gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 98t3

Elevation: 640 to 1,180 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Groton and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Groton

Setting

Landform: Terraces

Landform position (two-dimensional): Summit

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Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Friable coarse-loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from limestone

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam

H2 - 6 to 15 inches: gravelly sandy loam

H3 - 15 to 64 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F144AY021MA - Semi-Rich Dry Outwash

Hydric soil rating: No

Minor Components

Copake

Percent of map unit: 10 percent

Hydric soil rating: No

Hero

Percent of map unit: 4 percent

Hydric soil rating: No

Fredon

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

269B—Groton gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98t4

Elevation: 670 to 1,180 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Custom Soil Resource Report

Frost-free period: 145 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Groton and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Groton

Setting

Landform: Terraces

Landform position (two-dimensional): Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Friable coarse-loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from limestone

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam

H2 - 6 to 15 inches: gravelly sandy loam

H3 - 15 to 64 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F144BY601ME - Dry Sand

Hydric soil rating: No

Minor Components

Copake

Percent of map unit: 10 percent

Hydric soil rating: No

269D—Groton gravelly sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 98t6
Elevation: 640 to 1,510 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Groton and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Groton

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over loose sandy and gravelly glaciofluvial deposits derived from limestone

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam
H2 - 6 to 15 inches: gravelly sandy loam
H3 - 15 to 64 inches: very gravelly sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Minor Components

Copake

Percent of map unit: 5 percent

Hydric soil rating: No

273B—Oakville loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98vg

Elevation: 600 to 1,200 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Oakville and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville

Setting

Landform: Terraces

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loamy sand

H2 - 8 to 27 inches: sand

H3 - 27 to 64 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Copake

Percent of map unit: 5 percent

Hydric soil rating: No

Groton

Percent of map unit: 5 percent

Hydric soil rating: No

602—Urban land

Map Unit Setting

National map unit symbol: 98wd

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

References

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United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Berkshire County, Massachusetts**

**Woods Pond Spur Transload
Property**



February 3, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Berkshire County, Massachusetts.....	13
35A—Halsey fine sandy loam, 0 to 3 percent slopes.....	13
651—Udorthents, smoothed.....	14
References	15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

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 1:25,000.

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: Berkshire County, Massachusetts
Survey Area Data: Version 20, Sep 5, 2025

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

Date(s) aerial images were photographed: Aug 15, 2021—Nov 8, 2021

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
35A	Halsey fine sandy loam, 0 to 3 percent slopes	0.0	0.2%
651	Udorthents, smoothed	4.1	99.8%
Totals for Area of Interest		4.1	100.0%

Map Unit Descriptions

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, 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 and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils 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. Other minor components, however, have properties and behavioral 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,

Custom Soil Resource Report

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*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one 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.

Berkshire County, Massachusetts

35A—Halsey fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 98t9
Elevation: 660 to 1,490 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Halsey and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Halsey

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over loose sandy glaciofluvial deposits derived from slate and/or loose sandy and gravelly glaciofluvial deposits derived from slate

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 20 inches: fine sandy loam
H3 - 20 to 64 inches: stratified very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY030NY - Semi-Rich Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Palms

Percent of map unit: 5 percent

Landform: Bogs

Hydric soil rating: Yes

Fredon

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Hero

Percent of map unit: 5 percent

Hydric soil rating: No

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 98wc

Elevation: 640 to 1,620 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Setting

Anthropogenic Feature: Leveled land

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Excavated and filled land over loose glaciofluvial deposits
derived from igneous and metamorphic rock and/or friable basal till derived
from igneous and metamorphic rock

Properties and qualities

Depth to restrictive feature: More than 80 inches

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

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- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

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United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment C-5

IPaC Results



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
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In Reply Refer To:

07/10/2026 19:34:22 UTC

Project Code: 2026-0114842

Project Name: Housatonic River - Utility Drive Rail Spur

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0114842

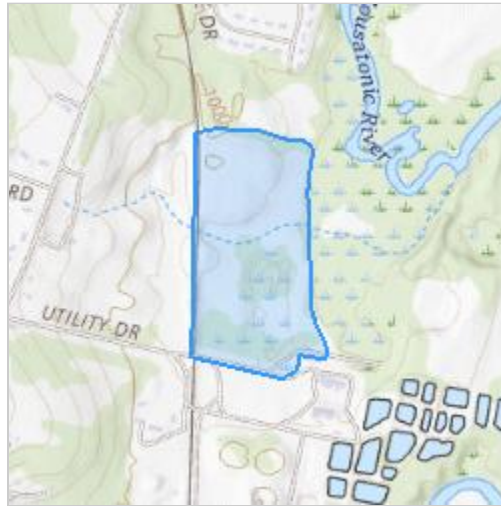
Project Name: Housatonic River - Utility Drive Rail Spur

Project Type: Non-NPL Site Remediation

Project Description: Potential material storage and transloading on this site

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.412466800000004,-73.24382085026443,14z>



Counties: Berkshire County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

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LEAD AGENCY CONTACT INFORMATION

Lead Agency: Environmental Protection Agency



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

07/10/2026 19:41:07 UTC

Project Code: 2026-0114846

Project Name: Housatonic River - Woods Pond Rail Spur

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2026-0114846

Project Name: Housatonic River - Woods Pond Rail Spur

Project Type: Non-NPL Site Remediation

Project Description: Potential material storage area adjacent to Woods Pond

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.35189595,-73.24384063817901,14z>



Counties: Berkshire County, Massachusetts

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-Eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

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State: MA
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Email: taylor.white@aecom.com
Phone: 4138544148

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Environmental Protection Agency

Appendix D

**Cultural Resources Survey Report for Rail Transload Areas
in Reaches 5 and 6**



September 2026
Housatonic River - Rest of River



Addendum to Phase IB Cultural Resources Survey Report for Rail Transload Areas in Reaches 5 and 6

Prepared for General Electric Company
Pittsfield, Massachusetts

September 2026

Addendum to Phase IB Cultural Resources Survey Report for Rail Transload Areas in Reaches 5 and 6

Prepared for

General Electric Company
1 Plastics Avenue
Pittsfield, Massachusetts 01201

Prepared by

AECOM
500 Enterprise Drive
Rocky Hill, Connecticut 06067

TABLE OF CONTENTS

Abbreviations	iii
Abstract.....	iv
1 Introduction and Background	7
1.1 Introduction.....	7
1.2 Objective and Requirements	11
1.3 Areas of Potential Effects	11
1.4 Report Organization.....	12
2 Summary of 2024 and 2025 Cultural Resource Surveys.....	14
2.1 Utility Drive Rail Transload Area.....	14
2.1.1 STG-006 and Archaeological Site STG-006-1.....	14
2.1.2 STG-011.....	15
2.1.3 Historic Architectural Survey.....	16
2.2 Woods Pond Spur Rail Transload Area.....	16
2.2.1 STG-001.....	16
2.2.2 STG-002.....	17
2.2.3 Historic Architectural Survey.....	17
2.3 Summary of Previous Cultural Resource Survey Findings.....	17
3 Supplemental Phase IB Archaeological Survey Research Areas and Methods.....	19
3.1 Field Investigations.....	19
3.2 Laboratory Analysis and Curation.....	20
4 Results of Supplemental Phase IB Archaeological Surveys	21
4.1 Utility Drive Transload Area.....	25
4.2 Woods Pond Spur Rail Transload Area.....	38
5 Review of Historic Architectural Resources	45
6 Summary	46
7 References	48

LIST OF FIGURES

Figure 1.1: Revised Utility Drive Transload Area for Cultural Resource Survey	9
Figure 1.2: Woods Pond Spur Transload Revised Area for Cultural Resource Survey.	10
Figure 4.1: Utility Drive Transload Area Photo Location Map.	23
Figure 4.2: Woods Pond Spur Transload Area Photo Location Map.....	24
Figure 4.3: Survey Coverage Map, Utility Drive Transload Area.....	27
Figure 4.4: Survey Coverage Map, Utility Drive Transload Area.....	28
Figure 4.5: Survey Coverage Map, Utility Drive Transload Area.....	29
Figure 4.6: Representative STP Profiles, Supporting Area STG-012, STPs E6 and R32.....	35
Figure 4.7: Representative STP Profiles, Supporting Area STG-012, STPs N31 and S34.	36
Figure 4.8: Survey coverage map, Woods Pond Spur Rail Transload Area	40
Figure 4.9: Survey coverage map, Woods Pond Spur Rail Transload Area	41

LIST OF TABLES

Table 4.1: Proposed STPs Excluded from the 2026 Phase IB Archaeological Survey.....	21
---	----

LIST OF PHOTOGRAPHS

Photograph 4.1: Overview of Supporting Area STG-012, facing north.....	30
Photograph 4.2: Wetlands within survey area STG-012, facing east.....	30
Photograph 4.3: Dense vegetation within Supporting Area STG-012, facing north.....	31
Photograph 4.4: Railroad line over proposed STPs A2 and A3, facing north.....	31
Photograph 4.5: Overview of STP P33, isolated post-contact find. Facing west.....	32
Photograph 4.6: STG-012 STP P33 west profile. Scale is graduated in decimeters and centimeters.....	32
Photograph 4.7: STG-012 STP H18 north profile, showing the burned soil deposit at base of Ap horizon. Scale is in centimeters.....	33
Photograph 4.8: STG-012 STP E6 south profile. Scale is graduated in decimeters and centimeters.	34
Photograph 4.9: STG-012 STP N31 north profile. Scale is graduated in decimeters and centimeters.....	37
Photograph 4.10: STG-012 STP R32 south profile. Scale is graduated in decimeters and centimeters....	37
Photograph 4.11: STG-012 south profile. Scale is graduated in decimeters and centimeters.....	38
Photograph 4.12: STG-013 southern APE, featuring Willow Creek Road, along Transect A. Facing north.....	42
Photograph 4.13: STG-013 southern APE featuring graveled and compacted surfaces. Facing south, including Transects B through D.	42
Photograph 4.14: STG-013 central portion of the APE, facing south.	43

Photograph 4.15: STG-013 central portion of the APE, facing north.....	43
Photograph 4.16: STG-013 overview of northern APE, featuring active tracks and ballast. Facing north.....	44

APPENDICES

Appendix A: Shovel Test Form Logs

Appendix B: Artifact Catalog

ABBREVIATIONS

AHPA	Archaeological and Historic Preservation Act
APE	Area of Potential Effects
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CD	Consent Decree for GE-Pittsfield/Housatonic River Site
cm	centimeter
CRS	Cultural Resources Survey
EPA	U.S. Environmental Protection Agency
GE	General Electric Company
m	meters
MACRIS	Massachusetts Cultural Resources Inventory System
NRHP	National Register of Historic Places
PCBs	polychlorinated biphenyls
PDI	pre-design investigation
RCRA	Resource Conservation and Recovery Act
ROR	Rest of River
SRHP	State Register of Historic Places
STP	shovel test pit

Abstract

This Addendum to the *Phase IB Cultural Resources Survey Report for Rail Transload Areas in Reaches 5 and 6* (Rail Transload CRS Report) documents additional investigations conducted by AECOM on GE's behalf in 2026 within expanded portions of the Utility Drive and Woods Pond Spur rail transload areas. Following completion of the 2025 CRS activities described in the Rail Transload CRS Report, GE revised the configurations of both rail transload areas, expanding their Archaeological Areas of Potential Effects (APEs) by approximately 3.07 acres. The additional areas included approximately 1.9 acres at Utility Drive rail transload area in Reach 5A and approximately 1.1 acres at Woods Pond Spur rail transload area in Reach 6. Approximately 2.8 acres of the expanded APEs had been identified as having high archaeological sensitivity.

The 2026 Phase IB CRS methods followed those described in Section 6 of the Rail Transload CRS Report and included pedestrian inspection, ground-truthing, and systematic shovel test pit (STP) excavation where field conditions permitted. A total of 304 STPs were proposed within the expanded survey areas. Of these, 159 were excavated and 145 were excluded from these surveys, with concurrence by the EPA-contracted archaeologist, because of railroad infrastructure and associated disturbance, roads and other improved surfaces, wetlands and drainage conditions, steep slopes, dense vegetation, or utility and berm disturbance.

At the Utility Drive rail transload area, the expanded survey area was designated STG-012. Within that area, 159 of the 200 proposed STPs were excavated and 41 were excluded from the survey. One post-contact nail was recovered from STP P33. Radial testing around P33 did not identify additional artifacts or cultural materials. A burned soil deposit was identified in STP H18, and a similar deposit was observed in one of four surrounding radial STPs. No artifacts or other evidence of cultural origin were associated with the burned deposits. At the Woods Pond Spur rail transload area, the expanded survey area was designated STG-013. A pedestrian inspection of that area documented extensive prior disturbance associated with railroad infrastructure, roads, parking areas, and other improved surfaces. All 104 proposed STPs within STG-013 were excluded from the survey because they were located within these disturbed or developed areas. No archaeological sites were identified within either expanded survey area.

AECOM architectural historians also conducted a desktop review of previously identified historic architectural resources within the revised Historic Architectural APEs for the Utility Drive and Woods Pond Spur rail transload areas. The review determined that the previously identified Lenox Railroad Station, listed in the National Register of Historic Places, was the only historic architectural resource within the revised APEs. No additional historic architectural resources were identified within either expanded rail transload area, and no new historic architectural field survey was conducted.

Based on the results of the 2026 investigations, no additional archaeological or historic architectural investigations are recommended within the expanded Utility Drive and Woods Pond Spur rail transload areas.

1 Introduction and Background

1.1 Introduction

On December 16, 2020, pursuant to the 2000 Consent Decree (CD) for the GE Pittsfield/Housatonic River Site, the U.S. Environmental Protection Agency (EPA) issued to the General Electric Company (GE) a final revised modification of GE's Resource Conservation and Recovery Act (RCRA) Corrective Action Permit (Revised Permit) for the Rest of River (ROR) portion of that site. The Revised Permit set forth a Remedial Action selected by EPA to address polychlorinated biphenyls (PCBs) in the ROR. Under the Revised Permit, GE is required to evaluate the ROR areas that will be subject to remediation and support activities for the potential presence of cultural resources in areas that contain or have a high potential to contain such resources. As a result, GE has submitted a number of deliverables to EPA that propose and report on its cultural resource evaluation activities.

This submittal relates to two rail loading and/or unloading areas, referred to herein as rail transload areas, that GE proposed and EPA approved to support the rail transport of a portion of excavated material from the ROR for disposal. Those rail transload areas will be constructed at the following locations within Reaches 5 and 6 of the ROR:

- Utility Drive, located adjacent to Reach 5A in the City of Pittsfield, near the Pittsfield Wastewater Treatment Plant; and
- Woods Pond Spur, located adjacent to Reach 6 in the Town of Lenox, at a railway museum property.

On May 15, 2025, as directed by EPA, GE submitted a *Pre-Design Investigation Work Plan for Rail Transload Areas in Reaches 5 and 6* (Rail Transload PDI Work Plan; Arcadis and AECOM 2025). That work plan presented preliminary layouts of the Utility Drive and Woods Pond Spur rail transload areas and proposed certain PDI activities for them. Those PDI activities included the performance of cultural resource survey activities within the rail transload areas. The work plan described the proposed CRS activities for the Utility Drive rail transload area in some detail and noted that the CRS activities for the Woods Pond Spur rail transload area had already been presented and approved in a prior *Phase IB Cultural Resources Survey Work Plan for Reach 6* (Reach 6 CRS Work Plan; AECOM 2024). The Rail Transload PDI Work Plan was conditionally approved by EPA on July 24, 2025.

On GE's behalf, AECOM conducted the approved Phase IB CRS activities at the Utility Drive and Woods Pond Spur rail transload areas in July 2025. The results of those investigations were presented in the *Phase IB Cultural Resources Survey Report for Rail Transload Areas in Reaches 5 and 6* (Rail Transload CRS Report; AECOM 2026a), submitted in February 2026 as an appendix to GE's *Conceptual Design*

Plan for Rail Transload Areas in Reaches 5 and 6 (Arcadis and AECOM 2026). That report presented the results of the Utility Drive survey and summarized the results of the Woods Pond Spur survey, which had previously been presented in more detail in the prior *Phase IB Cultural Resources Survey Report for Reach 6* (Reach 6 CRS Report; AECOM 2026b), submitted in January 2026. The Rail Transload CRS Report was conditionally approved by EPA as part of the Conceptual Design Plan on June 17, 2026.

As discussed in the Rail Transload CRS Report, following submission of Rail Transload PDI Work Plan and performance of the 2025 CRS investigations at the rail transload areas, the configurations of both rail transload areas were revised and expanded. The revised configurations expanded the Archaeological Areas of Potential Effects (APEs) by a total of 3.07 acres, including an additional 1.9 acres at the Utility Drive rail transload area and an additional 1.1 acres at the Woods Pond Spur rail transload area. Those revised configurations are shown on Figures 1.1 and 1.2, respectively, along with the revised areas subject to CRS investigations. Section 6 of the Rail Transload CRS Report presented a work plan for additional archaeological investigations within the expanded portions of the rail transload areas and for a review of historic architectural resources within the revised Historic Architectural APEs. That work plan was approved via EPA's June 17, 2026 conditional approval letter.

In June and July 2026, on GE's behalf, AECOM conducted the additional Phase IB CRS investigations described in Section 6 of the Rail Transload CRS Report. These investigations included pedestrian inspection and an archaeological survey of the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas. They also included a review of any historical architectural resources in the expanded areas, although a new historic architectural survey was not conducted.

This Addendum documents the results of those additional investigations.

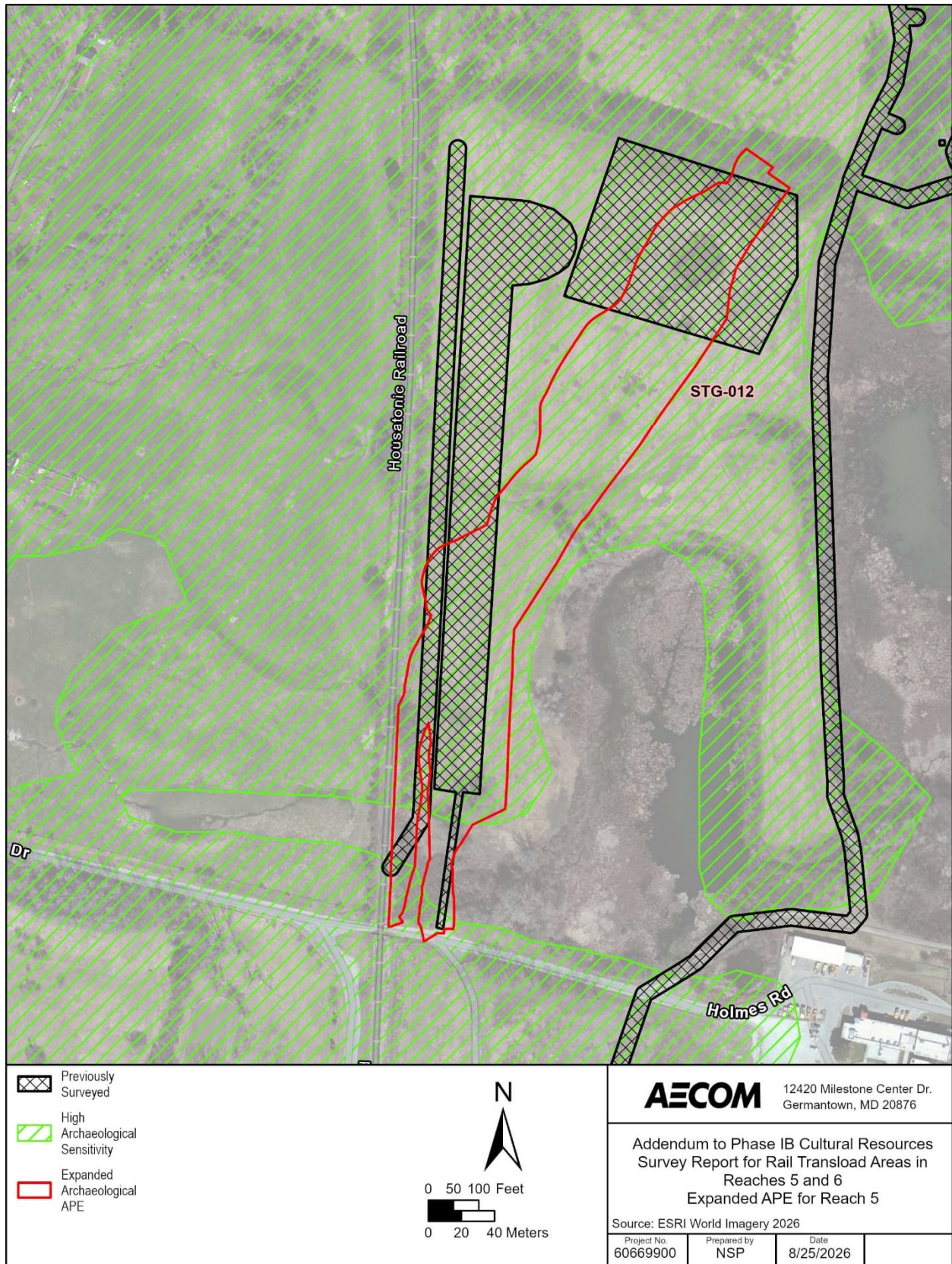


Figure 1.1: Revised Utility Drive Transload Area for Cultural Resource Survey.

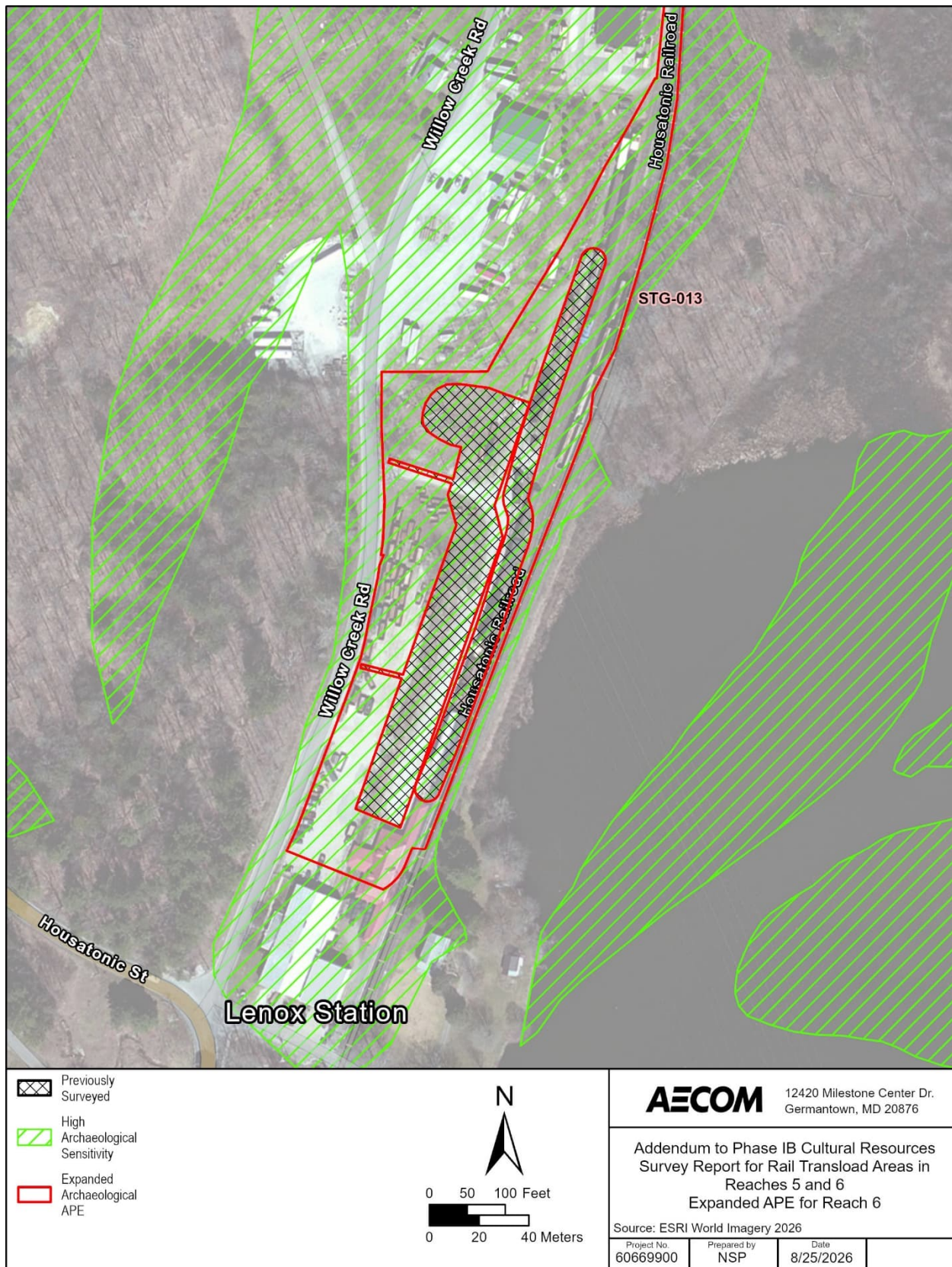


Figure 1.2: Woods Pond Spur Transload Revised Area for Cultural Resource Survey.

1.2 Objective and Requirements

The objective of this Rail Transload CRS Addendum is to describe the results of the additional CRS investigations conducted in 2026 within the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas. These investigations were conducted to determine whether and the extent to which potentially significant cultural resources could be impacted by remediation support activities within portions of the rail transload areas that were added to the Archaeological APEs following completion of the 2025 CRS activities. Specifically, the additional investigations addressed supporting area STG-012 at the Utility Drive rail transload area in Reach 5A and supporting area STG-013 at the Woods Pond Spur rail transload area in Reach 6.

For purposes of the Phase IB CRS, potentially significant cultural resources consist of archaeological and historic architectural resources in Reaches 5 and 6 that are subject to the Applicable or Relevant and Appropriate Requirements (ARARs) relating to such resources, as listed in Attachment C to the Revised Permit, namely, the National Historic Preservation Act and its regulations, the federal Archaeological and Historic Preservation Act of 1974 (AHPA), the Massachusetts Historical Commission Act (950 CMR 70.00), and the Massachusetts Historical Resources Protection Act (950 CMR 71.00) and its regulations. Significant cultural resources are defined, for purposes of this CRS, as resources that are listed or meet the eligibility criteria for listing in the National Register of Historic Places (NRHP), resources that are listed in the Massachusetts State Register of Historic Places (SRHP) and included on the State Inventory of Historic and Archaeological Assets, and other significant scientific, pre-contact, post-contact, or archaeological data subject to the AHPA. These resources include properties of traditional religious and cultural importance that fall into any of the above categories.

The additional investigations documented in this Addendum were conducted within the expanded Archaeological APEs identified in Section 6 of the Rail Transload CRS Report. These investigations included pedestrian inspection and archaeological survey of the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas. A review of historic architectural resources within the revised Historic Architectural APEs was also conducted, but a new historic architectural field survey was not undertaken.

1.3 Areas of Potential Effects

The Archaeological APEs for the Utility Drive and Woods Pond Spur rail transload areas were originally established in the Rail Transload PDI Work Plan and the Reach 6 CRS Work Plan, respectively. As described in the Rail Transload CRS Report, the Archaeological APE for each rail transload area encompassed the proposed rail spur or siding and its associated operational areas. Areas of high archaeological sensitivity identified within the Archaeological APEs were subsequently selected for Phase IB archaeological investigations.

As previously noted, following completion of the 2025 CRS investigations, GE revised and expanded the configurations of both rail transload areas. As described in Section 6 of the Rail Transload CRS Report, these modifications expanded the Archaeological APEs by approximately 3.07 acres. The Archaeological APE for the Utility Drive rail transload area was expanded by approximately 1.9 acres, including approximately 1.7 acres identified as having high archaeological sensitivity. The Archaeological APE for the Woods Pond Spur rail transload area was expanded by approximately 1.1 acres, all of which was identified as having high archaeological sensitivity. The expanded Archaeological APEs, including the additional areas subject to CRS investigations, are identified on Figures 1.1 and 1.2. In total, approximately 2.8 acres within the expanded Archaeological APEs were identified as having high archaeological sensitivity.

The additional investigations documented in this Addendum were conducted within these expanded portions of the Archaeological APEs. At the Utility Drive rail transload area, the expanded survey area was designated STG-012 and was situated adjacent to the area previously surveyed as STG-011. At the Woods Pond Spur rail transload area, the expanded survey area was designated STG-013 and was situated adjacent to and partially overlapped the areas previously surveyed as STG-001 and STG-002. The 2026 investigations consisted of pedestrian inspection and ground-truthing throughout the expanded areas, followed by systematic subsurface testing where field conditions permitted.

The Historic Architectural APEs were also revised to account for the expanded configurations of the Utility Drive and Woods Pond Spur rail transload areas. A review of historic architectural resources within the revised Historic Architectural APEs was conducted as part of the additional CRS activities documented in this Addendum. A new historic architectural field survey was not conducted.

1.4 Report Organization

The remainder of this Rail Transload CRS Addendum is organized into the following sections:

- Section 2 summarizes the previous Phase IB archaeological investigations conducted within and adjacent to the Utility Drive and Woods Pond Spur rail transload areas in 2024 and 2025.
- Section 3 summarizes the methods used for the 2026 Phase IB archaeological investigations.
- Section 4 presents the results of the 2026 Phase IB archaeological investigations within STG-012 and STG-013.
- Section 5 describes the updated review of any historical architectural resources in the expended historic architectural APEs.
- Section 6 summarizes the 2026 CRS activities and presents recommendations.
- Section 7 lists the references cited in this Addendum.

Appendix A to this report contains shovel test pit (STP) logs for the Phase IB archaeological surveys. Appendix B contains the artifact catalog.

2 Summary of 2024 and 2025 Cultural Resource Surveys

Previous Phase IB cultural resource investigations were conducted within and adjacent to the Utility Drive and Woods Pond Spur rail transload areas before the 2026 investigations documented in this Addendum. These investigations are summarized in the following sections.

2.1 Utility Drive Rail Transload Area

Previous cultural resource investigations within and adjacent to the Utility Drive rail transload area included archaeological surveys of STG-006 in 2024 and STG-011 in 2025. The STG-006 investigation was documented in GE's *Revised Phase IB Cultural Resources Survey Report for Reach 5A* (Revised Reach 5A CRS Report; AECOM 2025), which was approved by EPA on August 8, 2025. The STG-011 investigation was documented in the Rail Transload CRS Report. An archaeological survey was also previously conducted along the proposed Utility Drive access road and an associated staging area, as described in the Revised Reach 5A CRS Report. Additionally, an historic architectural survey of the Utility Drive rail transload area was conducted in 2025. As directed by EPA in a July 9, 2026 conditional approval letter for GE's *Addendum 1 to Revised Phase IB CRS Report for Reach 5A* (AECOM 2026c), the results of the prior surveys are repeated in the following subsections of this Addendum for completeness.

2.1.1 STG-006 and Archaeological Site STG-006-1

Supporting area STG-006 occupied 1.22 hectares (3.03 acres) within the George Darey Housatonic Valley Wildlife Management Area in the southern portion of Reach 5A. The terrain included a hill with a relatively level top, moderate west- and north-facing slopes, and relatively level terrain in the eastern portion. Vegetation consisted of grasses, pockets of dense brush, and sporadic deciduous trees. Surface visibility was less than 10 percent during the archaeological survey.

A total of 111 STPs were excavated within STG-006, and 19 proposed STPs were excluded from the survey because they were situated on slopes exceeding 20 percent. The excavated STPs exhibited variable stratigraphy, including deflated Ap horizons and both shallow and deeply stratified soil sequences.

Artifacts were recovered from five STPs during the initial survey of STG-006. Pre-contact lithic debitage was recovered from STPs E12 and H12. Low-density post-contact material was also recovered within the survey area. The post-contact artifacts were interpreted as field scatter and were not considered indicative of a post-contact archaeological site.

The pre-contact artifacts resulted in the identification of archaeological site STG-006-1 in the eastern portion of STG-006; this location is currently outside of the design boundary of the rail transload area.

The site occupied approximately 404 square meters (4,356 square feet) on a gentle east-facing slope within a fallow field, approximately 135 meters (443 feet) southwest of the Housatonic River. Additional STPs were excavated at five-meter (16.4-foot) intervals in a cruciform pattern to define the horizontal extent of the pre-contact deposit.

The pre-contact assemblage consisted of three pieces of chert debitage recovered from two STPs. These included one gray chert trimming flake from STP E12 and two bifacial thinning flakes, one gray and one black, from STP H12. The post-contact assemblage consisted of five artifacts recovered from STPs A8, E12, E12+5M East, H12+5M East, and H12+5M North. These included container and lamp glass, one indeterminate nail fragment, and one pearlware sherd. The post-contact artifacts were interpreted as a low-density field scatter and were not considered indicative of a post-contact occupation. All pre-contact and post-contact artifacts were recovered from plow-zone contexts.

No diagnostic pre-contact artifacts or intact archaeological features were identified. Based on the low density and limited diversity of the assemblage and the absence of intact archaeological deposits, it was concluded in the Revised Reach 5A CRS Report that site STG-006-1 is not eligible for listing in the NRHP and not otherwise significant. No further investigation or avoidance measures were recommended in this area.

2.1.2 STG-011

Supporting area STG-011 occupied 1.65 hectares (4.08 acres) approximately 265 meters (869 feet) west of the western bank of the Housatonic River within the George Darey Housatonic Valley Wildlife Management Area. Under the then-current layout of the transload area, the westernmost portion of STG-011 encompassed a proposed rail transport area and the remaining eastern portion encompassed a proposed rail loading and unloading area.

The northern portion of STG-011 consisted of level terrain covered in tall grasses and shrubbery that descended along a steep southern slope toward a drainage channel. The central portion consisted of slightly elevated, generally level terrain with gentle southeast-facing slopes and a low-lying drainage channel. The southern portion consisted of low-lying deciduous forest with pockets of dense underbrush. Surface visibility was less than 10 percent during the archaeological survey.

A total of 159 STPs were excavated within STG-011, and 24 proposed STPs were excluded from the survey because of slopes exceeding 15 percent or obvious prior disturbance. Excavated STPs exhibited variable stratigraphy, including deflated Ap horizons, relatively shallow stratified soil sequences, colluvial deposits, and deep A horizons overlying poorly drained or scoured subsoils.

Three post-contact artifacts were recovered from the Ap horizons of two STPs. Two aqua glass shards were recovered from STP F8, and one whiteware sherd was recovered from STP A6. Short-interval

testing around the positive STPs did not recover additional artifacts. The artifacts were classified as post-contact field scatter and were not considered to represent an archaeological site. No archaeological sites were identified within STG-011, as noted in the Rail Transload CRS Report.

2.1.3 Historic Architectural Survey

As discussed in the Rail Transload CRS Report, the historic architectural survey conducted for the Utility Drive rail transload area in 2025 showed that there are no NRHP-listed or eligible resources, previously identified historic architectural resources, or any other historic architectural resources within the boundaries of the Historic Architectural APE for this rail transload area.

2.2 Woods Pond Spur Rail Transload Area

Previous cultural resource investigations at the Woods Pond Spur rail transload area included archaeological surveys of supporting areas STG-001 and STG-002 and an historic architectural survey in 2025. These investigations were conducted as part of the Reach 6 Phase IB CRS and were described in the January 2026 Reach 6 CRS Report and summarized briefly in the Rail Transload CRS Report. The Reach 6 CRS Report was conditionally approved by EPA on June 4, 2026 and was revised on August 3, 2026 to address the conditions in EPA's letter.¹ Again, the results of these prior surveys are repeated in the following subsections of this Addendum for completeness.

2.2.1 STG-001

Supporting area STG-001 occupied 0.39 hectares (0.98 acres) along the western bank of Woods Pond in the northern portion of Reach 6. The area was designated for use as a rail loading and unloading area within the greater Woods Pond Spur area. The southwestern portion of STG-001 consisted of an elevated, level, modified earthen platform designated for use as a laydown area for railroad equipment and soil disposal. The eastern portion consisted of a level gravel loading area adjacent to the railroad tracks. The north-central portion included a relatively level lawn containing exposed concrete slabs and a gravel access road leading to Willow Creek Road. The northern portion consisted of another elevated, modified earthen platform containing a power-line structure and dense brush.

A total of 11 STPs were excavated within STG-001, while 35 proposed STPs were excluded from the survey because of obvious prior disturbance or slopes exceeding 20 percent. The excavated STPs

¹ As noted in that revised report, Site 19-BK-188 was previously identified as a pre-contact site in or near the Woods Pond Spur rail transload area. However, it was subsequently determined, based on review of the original archaeological report on this site at the Massachusetts Historical Commission, that this site location is currently mapped incorrectly in the Massachusetts Cultural Resource Information System (MACRIS) and that this site is in fact located west of Willow Creek Road, outside of the project APE.

contained uniform disturbed stratigraphy characterized by multiple stacked fill deposits. No undisturbed soils, artifacts, or archaeological sites were identified within STG-001.

2.2.2 STG-002

Supporting area STG-002 occupied 0.23 hectares (0.57 acres) approximately 30 meters (98 feet) west of the western bank of Woods Pond. The area was designated for use as a rail transport area within the greater Woods Pond Spur area.

The southern portion of STG-002 consisted of an active railroad line with an asphalt platform. The remainder of the area was located within the active railroad line or running track. Because of the heavily disturbed conditions, no STPs were excavated within STG-002. AECOM instead conducted a pedestrian inspection of the area. The inspection did not identify any artifacts, archaeological features, or archaeological sites.

2.2.3 Historic Architectural Survey

The historic architectural survey conducted for the Woods Pond Spur Rail Transload Area resulted in the identification of one previously identified resource – the Lenox Railroad Station – and four newly identified resources in the Historic Architectural APE, as discussed in the revised Reach 6 CRS Report. The Lenox Railroad Station was previously listed in the NRHP. After consideration of the nature and length of the remediation project, including the transload area, it was determined that there would be no adverse effect of that project on this NRHP-listed resource. The report also showed that none of the four newly identified resources meets the eligibility criteria for listing in the NRHP or is otherwise significant, and therefore potential effects on those resources were not assessed.

2.3 Summary of Previous Cultural Resource Survey Findings

The previous investigations described above documented different levels of archaeological potential within and adjacent to the two rail transload areas. At the Utility Drive transload area, as discussed in Section 2.1, the 2024 survey identified the low-density pre-contact archaeological site STG-006-1, which was concluded to be not eligible for listing in the NRHP; and the 2025 survey of STG-011 identified only isolated post-contact field scatter and no archaeological sites. At the Woods Pond Spur transload area, as discussed in Section 2.2, the 2025 investigations of STG-001 and STG-002 documented extensive prior modification associated with railroad construction and operation. No undisturbed soils or archaeological sites were identified in either supporting area. In addition, the historic architectural surveys showed no historic architectural resources at the Utility Drive transload area and showed, at the Woods Pond Spur transload area, one NRHP-listed resource (the Lenox

Railroad Station), which would not be adversely affected by the remediation project, and four newly identified resources that do not meet the eligibility criteria for the NRHP.

These previous investigations, together with the 2026 investigations of STG-012 and STG-013 described in the next section, provide the cumulative archaeological survey results for the expanded Utility Drive and Woods Pond Spur rail transload areas.

3 Supplemental Phase IB Archaeological Survey Research Areas and Methods

The methods used for the 2026 Phase IB archaeological investigations followed those specified in Section 6 of the Rail Transload CRS Report and implemented during the 2025 field investigations documented in that report. The procedures for pedestrian inspection, subsurface testing, artifact recovery, documentation, and field photography remained consistent with those used during the previous archaeological investigations and are therefore not repeated here in full. The following sections summarize the methods applied during the 2026 archaeological investigations.

3.1 Field Investigations

The 2026 field investigations focused on the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas, designated STG-012 and STG-013, respectively. The investigations began with pedestrian inspection and ground-truthing to assess environmental characteristics, surface conditions, vegetation, evidence of prior disturbance and land modification, drainage, soil saturation, slope, accessibility, and the suitability of proposed STP locations for subsurface testing.

Within areas determined suitable for subsurface testing, STPs measured 50 centimeters (19.7 inches) square and were generally spaced at 10-meter (32.8-foot) intervals. STPs were excavated in arbitrary 10-centimeter (3.9-inch) levels within natural soil strata and continued into undisturbed subsoil or the first C horizon, but in no case deeper than 0.91 meters (three feet). Excavated soils were screened through 1/4-inch mesh hardware cloth for systematic artifact recovery. Following excavation, STPs were completely backfilled, the backfill was compacted, and the ground surface was restored to the extent practicable.

If artifacts or potential cultural features were encountered, supplemental STPs were excavated at five-meter (16.4-foot) intervals around the initial location to assess the horizontal extent, density, and integrity of the deposit. Supplemental testing continued until sufficient negative STPs were excavated to evaluate the deposit or until the limits of the Archaeological APE were reached.

All STPs were documented using field forms that recorded provenience, excavation depth, soil horizons, Munsell colors, soil textures, inclusions, recovered artifacts, and other relevant observations. STP locations and field observations were mapped using a sub-meter-accurate GPS unit. General field photographs and representative soil-profile photographs were taken to document environmental conditions and subsurface stratigraphy in accordance with the applicable technical-photography guidance (Simon 2014).

3.2 Laboratory Analysis and Curation

As discussed below, one artifact (a nail) was recovered during the 2026 archaeological CRS activities. That artifact was returned to the AECOM laboratory for processing, analysis, and cataloging. The artifact was cleaned, categorized by material and functional class, and packaged in a labeled polyethylene bag containing the applicable provenience information. Analysis included identification of the artifact's material composition, general form and function, and manufacturing characteristics, where identifiable.

The artifact recovered and project records generated during the 2026 Phase IB CRS activities will be prepared for permanent curation with a qualified facility. Project documentation will include notes, photographs, drawings, maps, artifact records, and both original and duplicate copies, photo-reproduced onto acid-free paper, of the field documentation. The records and artifact collection will be packaged in archivally stable containers. An electronic copy of the final catalog and field documentation will also be provided.

4 Results of Supplemental Phase IB Archaeological Surveys

The additional Phase IB archaeological survey activities were conducted in June and July 2026. The field crew consisted of AECOM archaeologists, and the fieldwork was observed by the EPA-contracted archaeologist. The investigations included pedestrian inspection and subsurface testing within the expanded Utility Drive rail transload area, designated STG-012, and pedestrian inspection of the expanded Woods Pond Spur rail transload area, designated STG-013. A total of 304 STPs were proposed within the two survey areas. Of these, 159 were excavated and 145 were excluded from survey based on field conditions. The reasons for such exclusion are listed in Table 4.1.

In summary, within STG-012, 159 of the 200 proposed STPs were excavated, and 41 were excluded from the survey. One post-contact nail was recovered from the Ap horizon of STP P33. Four radial STPs excavated around P33 did not contain additional artifacts or cultural materials. A burned soil deposit was identified immediately above the C horizon in STP H18. Four radial STPs were excavated around H18, and a similar burned deposit was observed in one of them; however, no associated artifacts or other evidence of cultural origin were identified. Within STG-013, all 104 proposed STPs were excluded from surveying because of existing roads, gravel surfaces, railroad tracks and ballast, parking areas, and other prior disturbances. Thus, no STPs were excavated within STG-013. No archaeological sites were identified during the 2026 Phase IB archaeological investigations. The following sections discuss the survey results and environmental conditions encountered within STG-012 and STG-013. Representative photographs are provided, and a photo location key map is included as Figures 4.1 and 4.2.

Table 4.1: Proposed STPs Excluded from the 2026 Phase IB Archaeological Survey

Survey area	Reason for exclusion	STP identifiers	Total
STG-012	Railroad infrastructure and associated disturbance	A2, A3, B6-B10, C13, C14	9
STG-012	Road or other improved surface	D1	1
STG-012	Wetland or drainage conditions	C12, I24, J24, K24, L23, L24, N21-N23, O21-O23	12
STG-012	Steep slope	K28, K29, L28, L29, M28, M29, N28, N29, O28, O29	10
STG-012	Dense vegetation or overgrowth	B3, B11, C11, G7, G8, W38, X37, Y36	8
STG-012	Utility or berm disturbance	B2	1

Survey area	Reason for exclusion	STP identifiers	Total
STG-012 subtotal			41
STG-013	Railroad infrastructure and associated disturbance	C1-C4, D4-D7, E8-E10, F11, F12, G13-G15, H6, H16, I9, K14, K15, L17-L20, M19-M23, N23-N28, O25-O32, P29-P33, Q24, Q33-Q38	56
STG-013	Road, parking, or other improved surface	A2, B3, B4, C5-C7, D2, D8, D9, E4, E11-E13, F4, F13-F22, G4, G16-G19, G22, H18, H19, H22, I22, J16, J17, J22, J23, K22-K24, L24-L26, M27, M28, N29, N30	48
STG-013 subtotal			104
Grand total			145

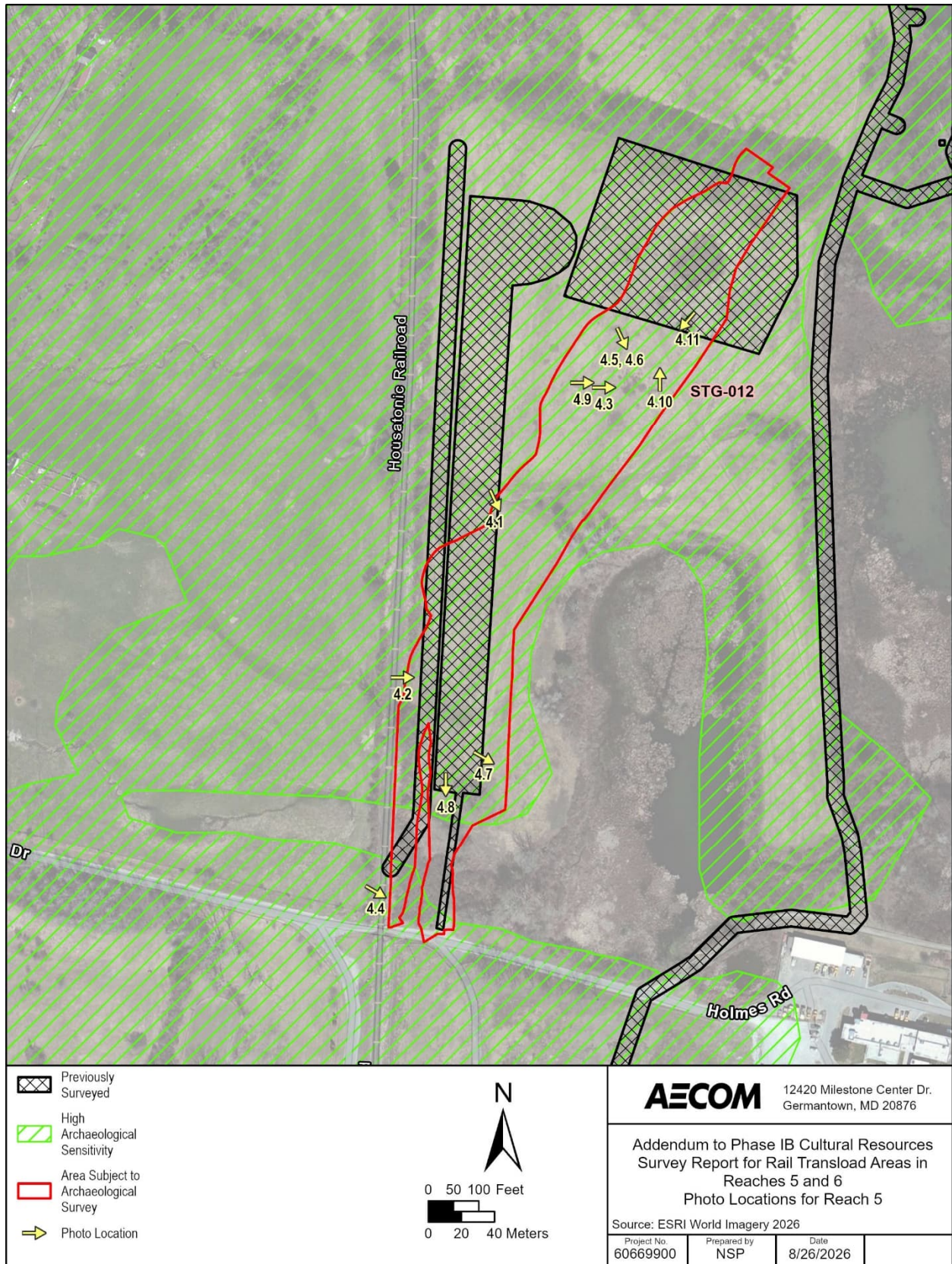


Figure 4.1: Utility Drive Transload Area Photo Location Map.

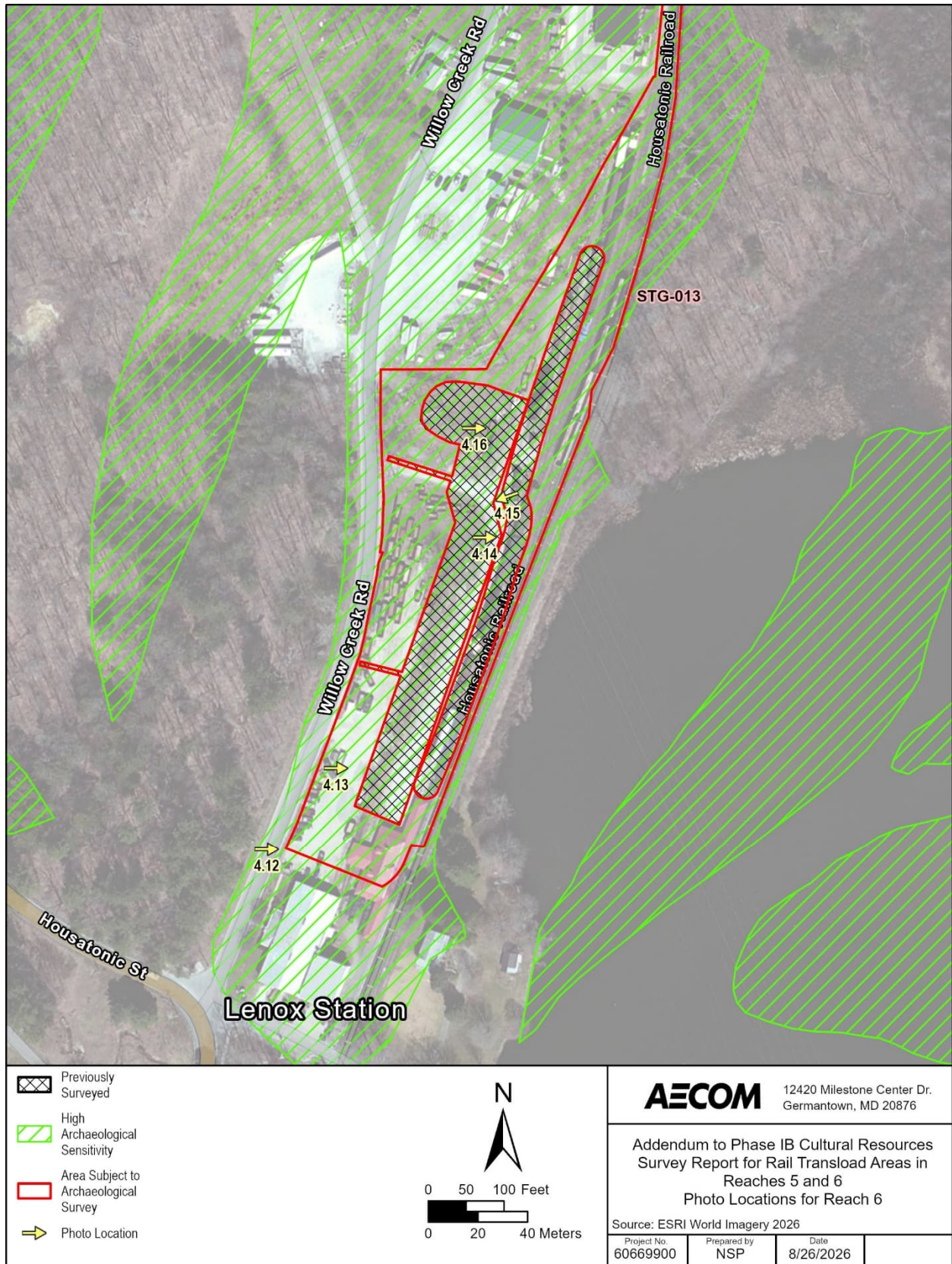


Figure 4.2: Woods Pond Spur Transload Area Photo Location Map.

4.1 Utility Drive Transload Area

Supporting area STG-012 encompassed the expanded portion of the Utility Drive rail transload area and was situated adjacent to the area previously surveyed as STG-011 (Figures 4.3, 4.4, and 4.5). STG-012 occupied the same general landscape as STG-011, approximately 265 meters (869 feet) west of the western bank of the Housatonic River within the George Darey Housatonic Valley Wildlife Management Area in the southern portion of Reach 5A. The survey area consisted of generally level to gently sloping terrain vegetated with grasses, shrubbery, and areas of dense vegetation (Photograph 4.1). Portions of the survey area also contained wetlands, drainage features, railroad tracks and ballast, and areas of steep slope.

A total of 200 STPs were proposed within STG-012. Of these, 159 STPs were excavated and 41 STPs were excluded from survey with concurrence by the EPA-contracted archaeologist. The excluded STPs consisted of 11 located in wetlands (Photograph 4.2), eight on slopes, seven within railroad ballast, seven within dense vegetation (Photograph 4.3), two within the railroad (Photograph 4.4), two within areas of combined slope and overgrowth, one within a drainage feature, one within overgrowth, one within a pipeline, and one within a road.

One post-contact artifact, a nail, was recovered from the Ap horizon of STP P33, in arbitrary Level 2, at a depth of 0.10 to 0.20 meters (0.33 to 0.66 feet) bgs (Photographs 4.5 and 4.6). Four radial STPs were excavated around STP P33 to determine whether the nail was associated with a broader artifact concentration or an archaeological deposit. No additional artifacts or cultural materials were recovered. The nail was therefore classified as an isolated post-contact artifact and is not considered to represent an archaeological site.

In STP H18, a burn layer was identified immediately above the C horizon (Photograph 4.7). A second set of four radial STPs was excavated around that location to assess the horizontal extent of the burned deposit and to determine whether it represented a potential cultural feature. A similar burned deposit was observed in one of the radial STPs; however, no artifacts or other cultural materials were recovered from STP H18 or any of the surrounding radial STPs. Based on the absence of associated cultural material or other evidence of cultural origin, the burned deposit was classified as natural and not an archaeological feature.

STPs within STG-012 generally exhibited an Ap-Bw-C or Ap-C soil sequence. STP E6 contained three strata (Photograph 4.8; Figure 4.7). Stratum I extended to 0.25 meters (0.82 feet) bgs and was a dark brown (10YR 3/3) sandy loam Ap horizon with less than 2 percent subrounded gravel. Stratum II extended to 0.32 meters (1.05 feet) bgs and was a dark yellowish brown (10YR 4/6) sandy loam Bw horizon. Stratum III was excavated to 0.42 meters (1.38 feet) bgs and was a light olive brown (2.5Y 5/4) fine sand C horizon with iron oxide inclusions.

STP N31 exhibited a comparatively shallow two-stratum profile (Photograph 4.9; Figure 4.7). Stratum I extended to 0.28 meters (0.92 feet) bgs and was a dark yellowish brown (10YR 4/4) sandy loam Ap horizon with less than 2 percent subrounded gravel and rocks. Stratum II was excavated to 0.44 meters (1.44 feet) bgs and was a dark reddish brown (2.5YR 3/3) coarse sand C horizon.

STP R32 contained three strata (Photograph 4.8; Figure 4.7). Stratum I extended to 0.25 meters (0.82 feet) bgs and was a dark yellowish brown (10YR 4/4) sandy loam Ap horizon with less than 5 percent gravel. Stratum II extended to 0.35 meters (1.15 feet) bgs and was a dark yellowish brown (10YR 4/6) sandy loam Bw horizon. Stratum III was excavated to 0.45 meters (1.48 feet) bgs and was a brownish yellow (10YR 6/8) fine sand C horizon with moderate iron oxide inclusions.

STP S34 exhibited a deeper soil sequence with increasing gravel content (Photograph 4.9; Figure 4.7). Stratum I extended to 0.25 meters (0.82 feet) bgs and was a dark yellowish brown (10YR 4/4) sandy loam Ap horizon with 15 percent small, rounded gravel. Stratum II extended to 0.54 meters (1.77 feet) bgs and was a dark yellowish brown (10YR 4/6) sandy loam Bw horizon with 25 percent small, rounded gravel. Stratum III was excavated to 0.74 meters (2.43 feet) bgs and was a dark reddish brown (2.5YR 3/3) coarse sand C horizon with 35 percent small, rounded gravel.

No archaeological sites were identified within STG-012.



Figure 4.3: Survey Coverage Map, Utility Drive Transload Area.

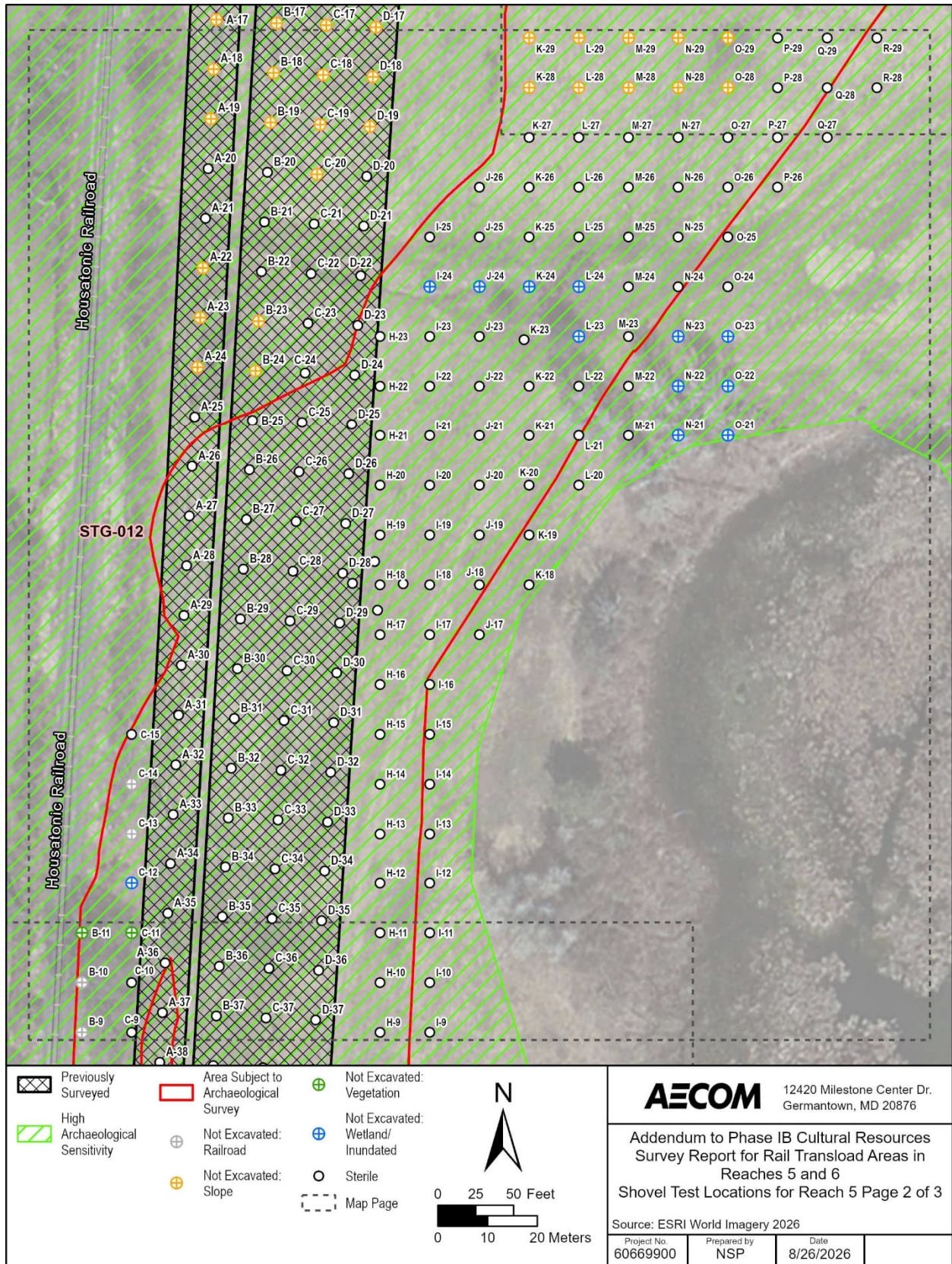


Figure 4.4: Survey Coverage Map, Utility Drive Transload Area.

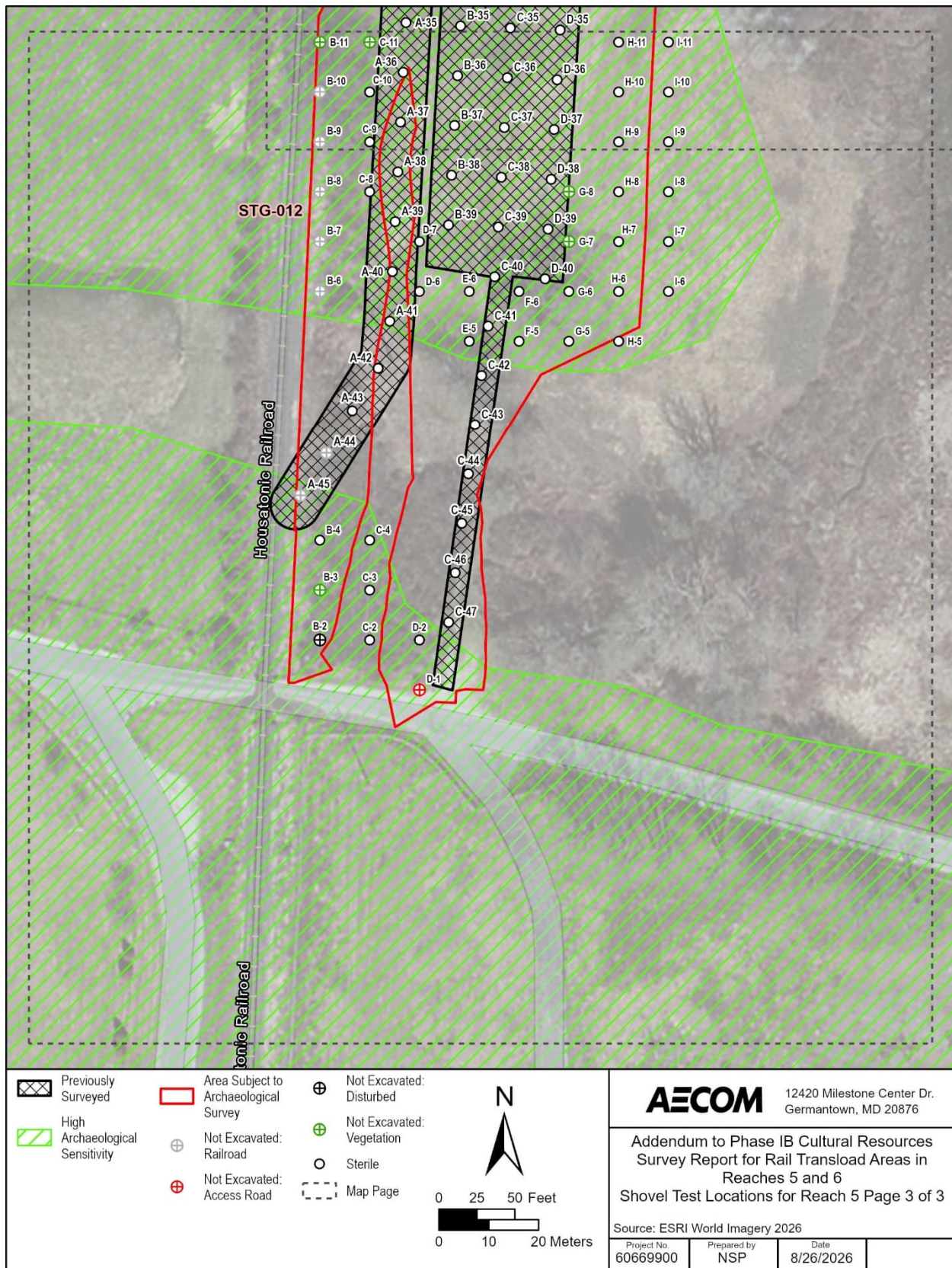


Figure 4.5: Survey Coverage Map, Utility Drive Transload Area.



Photograph 4.1: Overview of Supporting Area STG-012, facing north.



Photograph 4.2: Wetlands within survey area STG-012, facing east.



Photograph 4.3: Dense vegetation within Supporting Area STG-012, facing north.



Photograph 4.4: Railroad line over proposed STPs A2 and A3, facing north.



Photograph 4.5: Overview of STP P33, isolated post-contact find. Facing west.



Photograph 4.6: STG-012 STP P33 west profile. Scale is graduated in decimeters and centimeters.



Photograph 4.7: STG-012 STP H18 north profile, showing the burned soil deposit at base of Ap horizon. Scale is in centimeters.



Photograph 4.8: STG-012 STP E6 south profile. Scale is graduated in decimeters and centimeters.

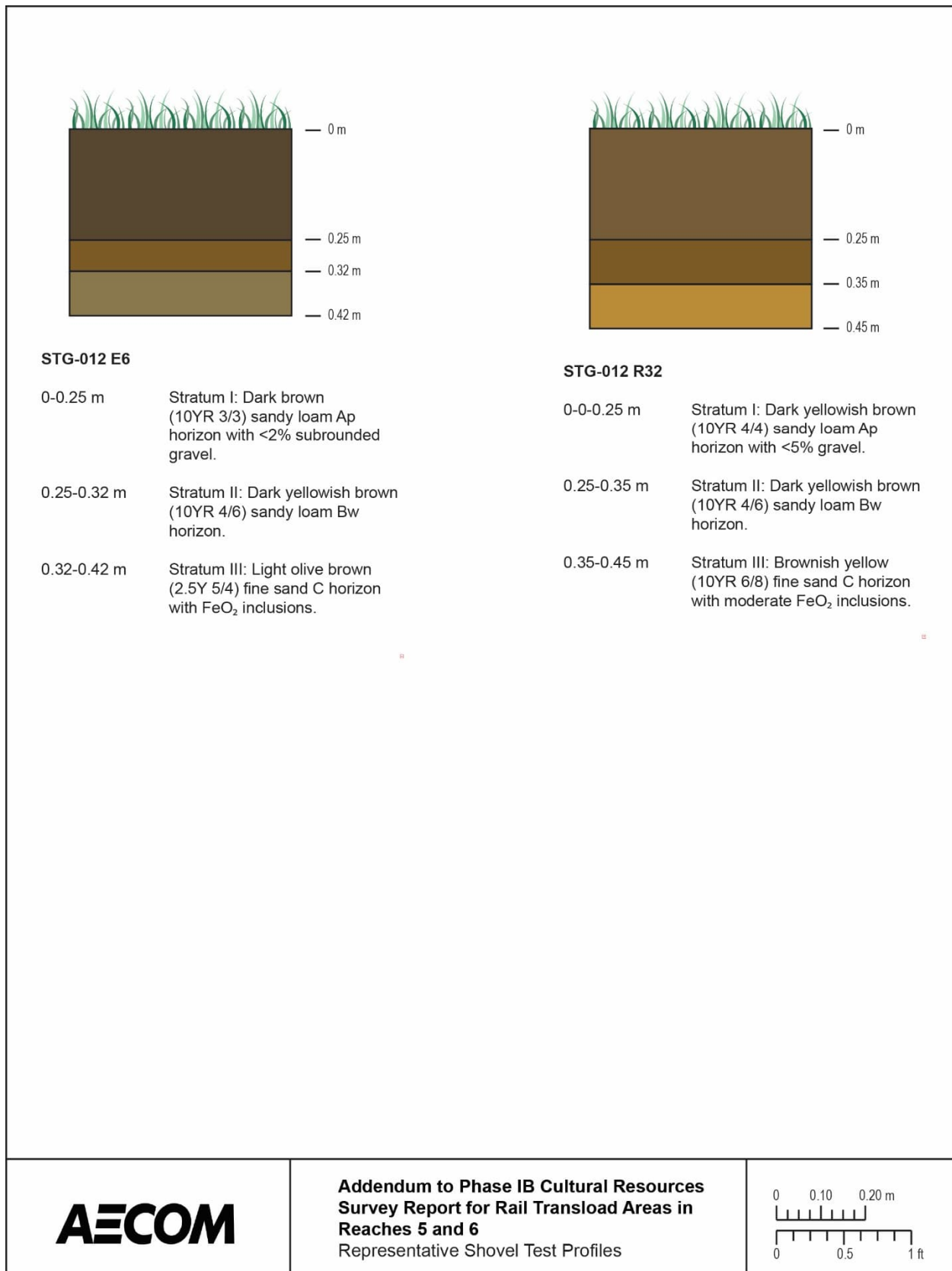


Figure 4.6: Representative STP Profiles, Supporting Area STG-012, STPs E6 and R32.

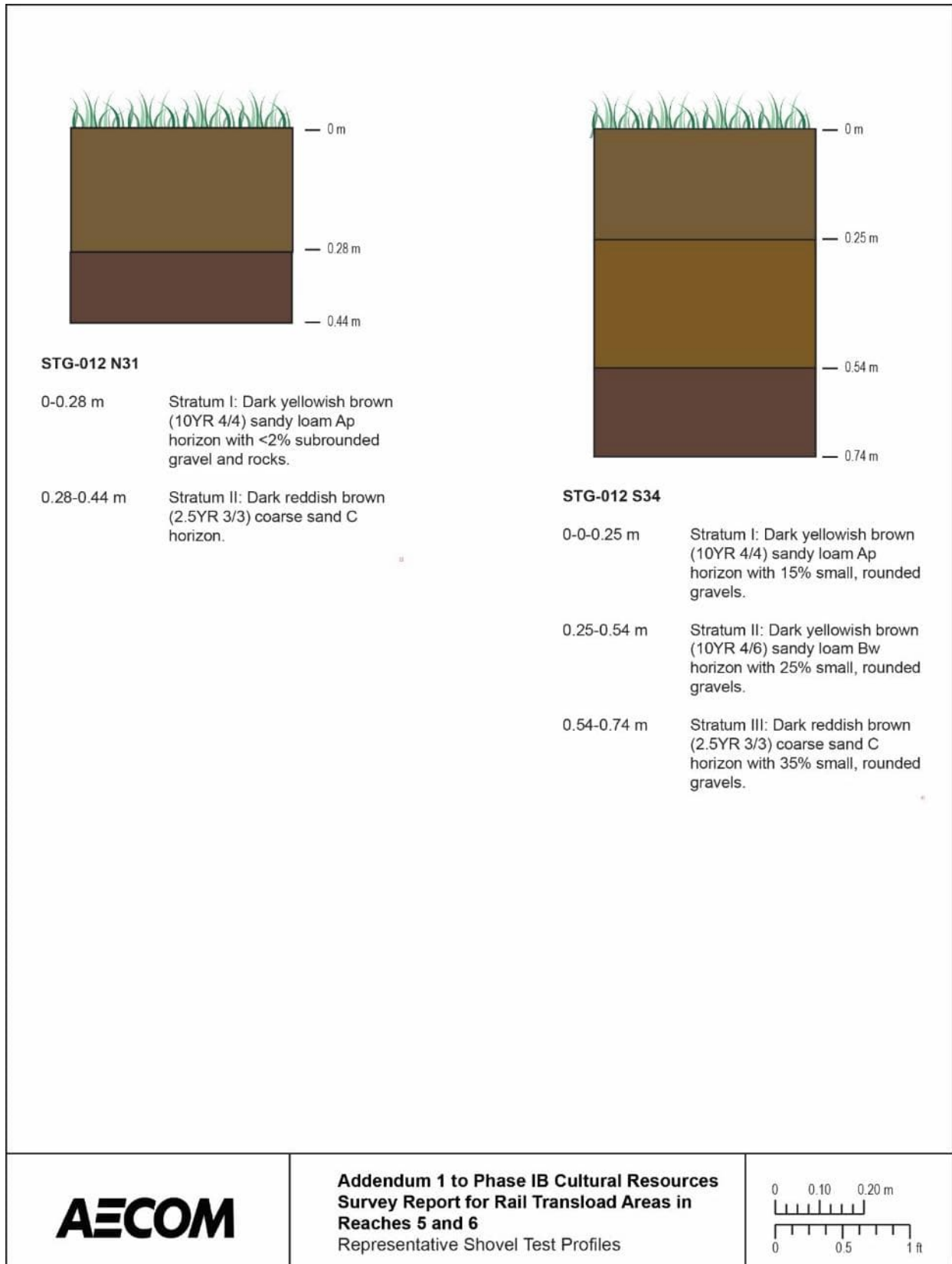


Figure 4.7: Representative STP Profiles, Supporting Area STG-012, STPs N31 and S34.



Photograph 4.9: STG-012 STP N31 north profile. Scale is graduated in decimeters and centimeters.



Photograph 4.10: STG-012 STP R32 south profile. Scale is graduated in decimeters and centimeters.



Photograph 4.11: STG-012 south profile. Scale is graduated in decimeters and centimeters.

4.2 Woods Pond Spur Rail Transload Area

Supporting area STG-013 encompassed the expanded portion of the Woods Pond Spur rail transload area and was situated adjacent to the areas previously surveyed as STG-001 and STG-002 (Figures 4.8 and 4.9). The survey area was located along the western bank of Woods Pond in the northern portion of Reach 6. STG-013 included portions of the existing railroad yard, railroad tracks, gravel loading and work areas, parking and access areas, and the corridor adjacent to Willow Creek Road.

A pedestrian inspection of STG-013 was conducted to evaluate existing ground conditions and to determine whether subsurface testing was warranted. The inspection identified clear evidence of extensive prior disturbance throughout the survey area. The southern portion included an access road and modified surfaces associated with the existing railroad facility (Photographs 4.12 and 4.13). The central portion contained gravel loading and work areas, railroad equipment, railroad sidings, and active or previously used railroad tracks and ballast (Photographs 4.14 and 4.15). The northern portion consisted primarily of the gravel-surfaced railroad yard and associated tracks extending along the northern extent of the APE (Photograph 4.16). Additional modified areas included gravel surfaces, a parking area, and vegetated areas containing exposed concrete slabs.

A total of 104 STPs were proposed within STG-013. However, following the pedestrian inspection, all 104 proposed STPs were excluded from survey, with concurrence from the EPA archaeologist, because

they were located within previously disturbed or developed surfaces. These included 41 STPs within a gravel road, 26 within the railroad yard or tracks, 17 within a gravel-surfaced railroad work area, 13 within the railroad, three within an access road, two within a parking lot, one within another gravel surface, and one within a road. Since no areas suitable for subsurface testing were identified, no STPs were excavated.

The pedestrian inspection did not identify any artifacts, archaeological features, or archaeological sites within STG-013.

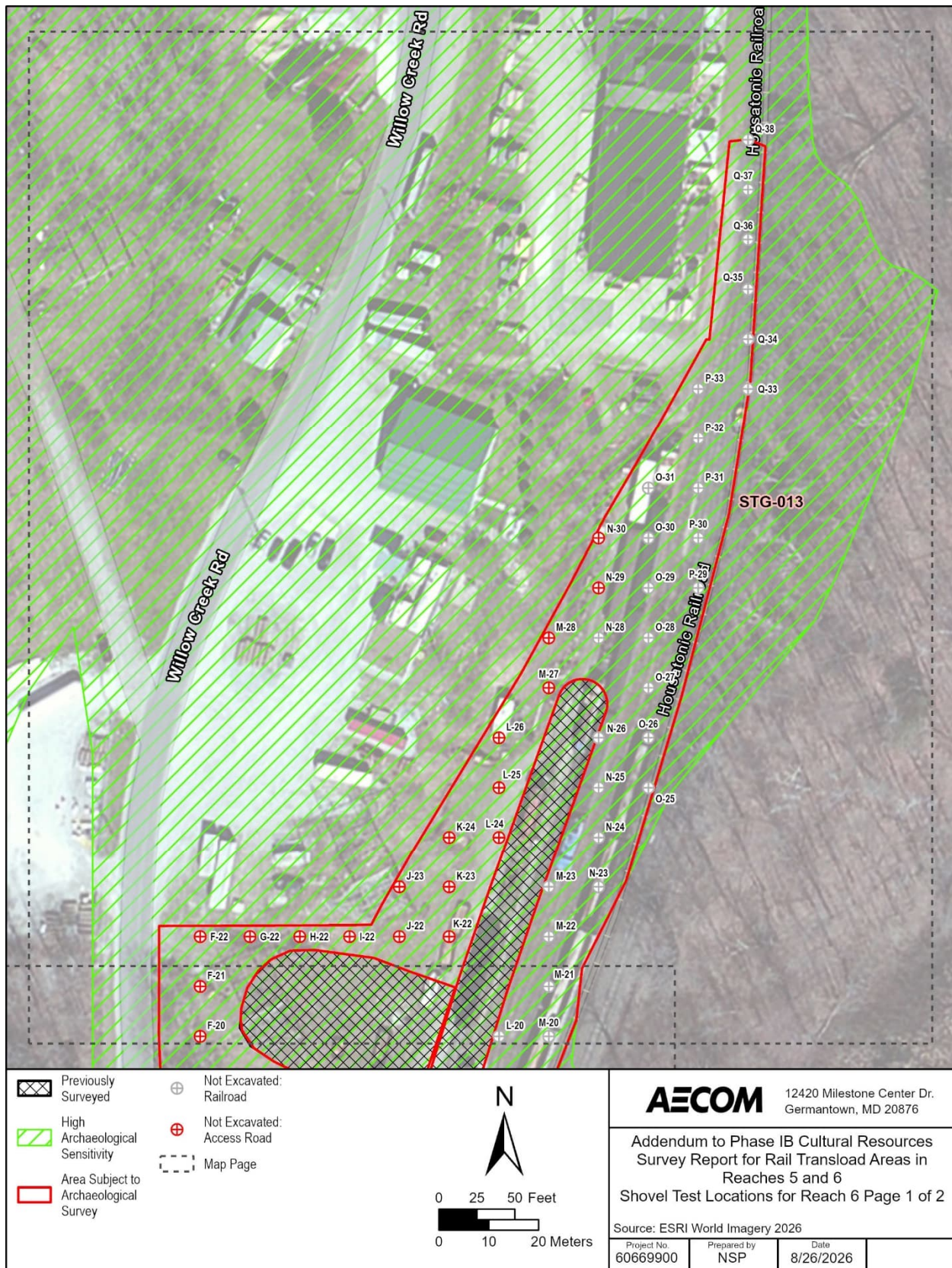


Figure 4.8: Survey coverage map, Woods Pond Spur Rail Transload Area.



Figure 4.9: Survey coverage map, Woods Pond Spur Rail Transload Area.



Photograph 4.12: STG-013 southern APE, featuring Willow Creek Road, along Transect A. Facing north.



Photograph 4.13: STG-013 southern APE featuring gravelled and compacted surfaces. Facing south, including Transects B through D.



Photograph 4.14: STG-013 central portion of the APE, facing south.



Photograph 4.15: STG-013 central portion of the APE, facing north.



Photograph 4.16: STG-013 overview of northern APE, featuring active tracks and ballast. Facing north.

5 Review of Historic Architectural Resources

Section 6 of the Rail Transload CRS Report provided that a review of any historical architectural resources would be undertaken in the expanded historic architectural APEs, but that a new historic architectural survey would not be conducted. It noted that any historic structures that could be negatively affected by the rail transloading and associated activities in the expanded areas area would be identified.

Architectural historians conducted a desktop review of the previously identified historic architectural resources within the revised Historic Architectural APEs. For purposes of this review, the Historic Architectural APEs encompassed the revised project footprints and immediately adjacent areas where rail transloading and associated activities could result in effects to historic properties. The review determined that the NRHP-listed Lenox Railroad Station was the only previously identified historic architectural resource within the revised APEs. No additional historic architectural resources were identified within either expanded rail transload area, and no new historic architectural field survey was conducted.

6 Summary

AECOM, on GE's behalf, conducted additional Phase IB CRS investigations in June and July 2026 within the expanded Archaeological APEs for the Utility Drive and Woods Pond Spur rail transload areas. The additional survey areas were delineated following revisions to the configurations of both rail transload facilities and were proposed in Section 6 of the Rail Transload CRS Report. The 2026 Phase IB fieldwork followed the same methods and procedures described in that report and included pedestrian inspection, ground-truthing, systematic STP excavation where conditions permitted, and documentation of existing environmental and disturbance conditions.

A total of 304 STPs were proposed within the two expanded survey areas. Of these, 159 STPs were excavated and 145 were excluded from survey based on field conditions. The excluded locations were situated within existing railroad infrastructure, roads and other improved surfaces, wetlands and drainage features, steep slopes, dense vegetation, or areas of utility and berm disturbance.

At the Utility Drive rail transload area, the expanded survey area was designated STG-012. Of the 200 proposed STPs, 159 were excavated and 41 were excluded from survey. One post-contact nail was recovered from the Ap horizon of STP P33. Four radial STPs excavated around P33 did not contain additional artifacts or cultural materials. A burned soil deposit was identified immediately above the C horizon in STP H18. Four radial STPs were excavated around H18, and a similar burned deposit was identified in one of them. No artifacts or other evidence of cultural origin were associated with the burned deposits. The nail was classified as an isolated post-contact artifact, the burned deposit was not identified as an archaeological feature, and no archaeological sites were identified within STG-012.

At the Woods Pond Spur rail transload area, the expanded survey area was designated STG-013. Pedestrian inspection and ground-truthing documented extensive prior disturbance associated with existing railroad tracks, ballast, railroad-yard and work surfaces, gravel roads, access roads, parking areas, and other improved surfaces. All 104 proposed STPs were excluded from survey because they were located within these disturbed or developed areas. No artifacts, archaeological features, or archaeological sites were identified during the pedestrian inspection of STG-013.

The results of the 2026 investigations are consistent with the previous archaeological findings within the rail transload areas, which were summarized in Section 2.3. As discussed there, previous investigations at these transload areas did not identify any archaeological sites that would meet the eligibility criteria for listing in the NRHP. The previous and current survey results, considered together, provide cumulative archaeological coverage of the rail transload areas.

AECOM architectural historians conducted a desktop review of previously identified historic architectural resources within the revised Historic Architectural APEs. That review determined that,

apart from the previously identified, NRHP-listed Lenox Railroad Station, there are no historic architectural resources within either expanded rail transload area.

Based on the results of the 2026 archaeological investigations and the updated review of historic architectural resources, no additional archaeological or historic architectural investigations are recommended for the expanded portions of the Utility Drive and Woods Pond Spur rail transload areas addressed in this Addendum.

If the final design or contractor operations plans modify the rail transload areas or support footprints further in a manner that changes the Archaeological or Historic Architectural APEs, GE will coordinate with EPA and, as appropriate, submit revised figures and proposals for additional CRS activities with the applicable design submittal.

Finally, should unanticipated archaeological resources be encountered during construction or operation of the rail transload facilities, the project's Unanticipated Discovery Plan will be implemented.

7 References

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- AECOM. 2025. *Revised Phase IB Cultural Resources Survey Report for Reach 5A*. Prepared for General Electric Company, Pittsfield, Massachusetts. June 2025.
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- AECOM. 2026c. *Addendum 1 to Revised Phase IB CRS Report for Reach 5A*. Prepared for General Electric Company, Pittsfield, Massachusetts. January 2026.
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Appendices

Appendix A: Shovel Test Form Logs

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	A2	No Test: Railroad								
STG-012	A3	No Test: Railroad								
STG-012	B2	No Test: Pipeline								
STG-012	B3	No Test: Disturbance								
STG-012	B4	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	B6	No Test: Railroad Ballast								
STG-012	B7	No Test: Railroad Ballast								
STG-012	B8	No Test: Railroad Ballast								
STG-012	B9	No Test: Railroad Ballast								
STG-012	B10	No Test: Railroad Ballast								
STG-012	B11	No Test: Disturbance								
STG-012	C2	I		1	0-9	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	9-22	Fill	2.5Y 4/4 mixed with 10YR 3/2	Sandy Loam	None	Asphalt and 20% gravel
		III		1	22-32	Bw	10YR 4/4	Sandy Loam	None	10% subangular gravel
		III		2	32-38	Bw	10YR 4/4	Sandy Loam	None	10% subangular gravel
		IV		1	38-48	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	C3	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-16	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	16-26	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
		II		2	26-32	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	C4	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-15	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	15-25	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	C8	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	C9	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	2.5Y 4/6	Medium Sand	None	<5% small, subangular gravel
		II		2	39-49	C	2.5Y 4/6	Medium Sand	None	<5% small, subangular gravel
STG-012	C10	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	C11	No Test: Railroad Ballast								
STG-012	C12	No Test: Railroad Ballast								
STG-012	C13	No Test: Drainage								

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	C14	No Test: Overgrowth								
STG-012	C15	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-22	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	22-32	C	10YR 4/6	Coarse Sand	None	20% small to medium subangular gravel
STG-012	D1	No Test: Road								
STG-012	D2	I		1	0-10	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	30-40	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	40-50	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	50-30	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	D6	I		1	0-10	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-32	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	C	2.5Y 5/3	Medium Sand	None	<5% small, subangular gravel
		II		2	42-52	C	2.5Y 5/3	Medium Sand	None	<5% small, subangular gravel
STG-012	D7	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	E5	I		1	0-10	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	35-39	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	39-49	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
		III		2	49-58	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	E6	I		1	0-10	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-32	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	32-42	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	F5	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-14	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	14-24	Cg	2.5Y 5/3 mixed with 10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	F6	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		1	30-40	Bw	2.5Y 5/4	Sandy Loam	None	<5% small, subangular gravel
		II		2	40-50	Bw	2.5Y 5/4	Sandy Loam	None	<5% small, subangular gravel
		II		3	50-60	Bw	2.5Y 5/4	Sandy Loam	None	<5% small, subangular gravel
		II		4	60-65	Bw	2.5Y 5/4	Sandy Loam	None	<5% small, subangular gravel
		III		1	65-75	Cg	2.5Y 5/3 mixed with 10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	G5	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	G6	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	G7	No Test: Disturbance								
STG-012	G8	No Test: Disturbance								
STG-012	H5	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
STG-012	H6	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
STG-012	H7	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	C	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
STG-012	H8	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-35	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	35-45	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H9	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H10	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	H11	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-37	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	37-47	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H12	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-50	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		6	50-60	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	60-70	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H13	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-31	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	31-41	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H14	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-34	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	34-44	C	2.5Y 5/4	Medium Sand	None	<5% small, subangular gravel
STG-012	H15	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	40-50	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H16	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H17	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H18	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-33	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	33-43	C	2.5Y 5/4	Fine Sand	None	Burn layer at base of stratum <5% subangular gravel
		II		2	43-50	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	H8 +5m W	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-41	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	41-51	C	2.5Y 5/4	Fine Sand	None	Burn layer at base of stratum <5% subangular gravel
STG-012	H8 +5m S	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H8 +5m N	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-37	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	37-47	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H8 + 5m E	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-44	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	44-54	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H19	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H20	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-26	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	26-36	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	36-40	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H21	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	30-35	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	35-45	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	45-55	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H22	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		2	33-43	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	43-53	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		4	53-62	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	62-72	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	72-76	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	H23	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	33-43	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	43-46	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	46-56	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	56-60	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I6	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	I7	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-32	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	C	2.5Y 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	I8	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I9	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I10	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I11	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I12	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-46	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	46-56	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I13	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-27	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	27-37	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I14	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I15	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-34	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	34-44	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I16	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I17	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-22	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	22-32	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I18	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-38	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	38-48	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I19	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I20	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-32	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I21	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-38	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	38-48	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	I22	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-21	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	21-31	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	31-41	Bw	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
		II		2	41-51	Bw	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
		II		3	51-58	Bw	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
		III		1	58-68	C	2.5Y 6/3	Fine Sand	None	25% small subrounded gravel
		III		2	68-70	C	2.5Y 6/3	Fine Sand	None	25% small subrounded gravel
STG-012	I23	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	33-43	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	43-48	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	48-58	C	2.5Y 6/3	Fine Sand	None	25% small subrounded gravel
		III		2	58-68	C	2.5Y 6/3	Fine Sand	None	25% small subrounded gravel
		III		3	68-74	C	2.5Y 6/3	Fine Sand	None	25% small subrounded gravel
STG-012	I24	No Test: Wetland Drainage								
STG-012	I25	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-50	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	50-60	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J17	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-37	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	37-47	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J18	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J19	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		1	25-35	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J20	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J21	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	J22	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	J23	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	45-55	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	55-60	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	60-70	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	J24	No Test: Disturbance								
STG-012	J25	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	30-40	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	40-50	C	10YR 6/4	Coarse Sand	None	20% small, subangular gravel
		III		2	50-58	C	10YR 6/4	Coarse Sand	None	20% small, subangular gravel
STG-012	J26	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	K18	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	K19	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-34	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		1	34-44	C	10YR 5/4	Fine Sand	None	20% small, subangular gravel
STG-012	K20	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-31	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	31-41	C	10YR 5/4	Fine Sand	None	20% small, subangular gravel
STG-012	K21	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	C	10YR 4/6	Coarse Sand	None	20% small, subangular gravel
STG-012	K22	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-17	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	17-27	C	10YR 4/6	Coarse Sand	None	20% small, subangular gravel
STG-012	K23	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-29	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	29-39	C	10YR 5/6	Fine Sand	None	20% small, subangular gravel
		III		2	39-42	C	10YR 5/6	Fine Sand	None	20% small, subangular gravel
STG-012	K24	No Test: Wetland Drainage								
STG-012	K25	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-45	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	45-55	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	55-65	C	10YR 6/4	Fine Sand	None	20% small, subangular gravel
STG-012	K26	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	36-46	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
		III		2	46-50	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	K27	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	36-46	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
		III		2	46-50	C	10YR 5/4	Coarse Sand	None	20% small, subangular gravel
STG-012	K28	No Test: Slope								
STG-012	K29	No Test: Slope								

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	K30	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-36	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	36-46	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L20	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L21	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L22	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-16	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	16-26	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L23	No Test: Wetland								
STG-012	L24	No Test: Wetland								
STG-012	L25	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-50	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	50-57	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	57-70	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L26	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	39-49	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	49-59	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		4	59-62	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	62-72	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	72-75	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L27	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-42	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	42-52	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	52-60	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		III		1	60-70	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	70-75	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L28	No Test: Slope								
STG-012	L29	No Test: Slope								
STG-012	L30	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	L31	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	L32	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-27	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	27-37	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	M21	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-12	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	12-22	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	M22	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-15	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	15-25	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	M23	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	M24	No Test: Wetland								
STG-012	M25	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-32	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	42-47	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	47-57	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	57-67	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	M26	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		5	40-44	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	49-59	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	59-64	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	64-74	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		III		2	74-83	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	M27	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-50	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		6	50-60	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	60-70	Bw1	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	70-77	Bw2	10YR 4/4	Fine Sand	None	<5% small, subangular gravel
		IV		1	77-87	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	M28	No Test: Slope								
STG-012	M29	No Test: Slope								
STG-012	M30	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	2.5Y 3/3	Fine Sand	None	<5% small, subangular gravel
		II		2	36-46	C	2.5Y 3/3	Fine Sand	None	<5% small, subangular gravel
		II		3	46-56	C	2.5Y 3/3	Fine Sand	None	<5% small, subangular gravel
STG-012	M31	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-27	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	27-37	C	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
STG-012	M32	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	10YR 4/6	Coarse Sand	None	<5% small, subangular gravel
STG-012	M33	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-24	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	24-34	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	M34	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-24	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	24-34	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	N21	No Test: Wetland								
STG-012	N22	No Test: Wetland								

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	N23	No Test: Wetland								
STG-012	N24	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-18	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	18-28	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	N25	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-25	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	25-35	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	N26	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	45-47	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	47-57	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
		III		2	57-65	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	N27	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-37	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	37-47	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	47-57	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	57-60	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	60-70	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	N28	No Test: Slope								
STG-012	N29	No Test: Slope								
STG-012	N30	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
		II		2	38-44	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
STG-012	N31	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
		II		2	38-44	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
STG-012	N32	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-27	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	27-37	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-012	N33	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Coarse Sand	None	<5% small, subangular gravel
STG-012	N34	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-26	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	26-36	C	2.5Y 5/4	Coarse Sand	None	40% small, subangular gravel
STG-012	N35	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-23	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	23-33	C	2.5Y 5/4	Coarse Sand	None	40% small, subangular gravel
STG-012	O21	No Test: Wetland								
STG-012	O22	No Test: Wetland								
STG-012	O23	No Test: Wetland								
STG-012	O24	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		5	40-50	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		6	50-60	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		I		7	60-70	Ap	10YR 3/2	Sandy Loam	None	10% small, subangular gravel
		II		1	70-80	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	O25	I		1	0-10	Ap	10YR 4/1	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/1	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/1	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-33	Ap	10YR 4/1	Sandy Loam	None	<5% small, subangular gravel
		II		1	33-43	Bw	10YR 5/2	Sandy Loam	None	<5% small, subangular gravel
		II		2	43-53	Bw	10YR 5/2	Sandy Loam	None	<5% small, subangular gravel
		II		3	53-56	Bw	10YR 5/2	Sandy Loam	None	<5% small, subangular gravel
		III		1	56-66	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	O26	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	C	10YR 4/3	Fine Sand	None	<5% small, subangular gravel
STG-012	O27	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-36	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		1	36-46	C	10YR 4/3	Fine Sand	None	<5% small, subangular gravel
STG-012	028	No Test: Slope								
STG-012	029	No Test: Slope								
STG-012	030	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-15	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	15-25	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	25-28	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	28-38	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
STG-012	031	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	10YR 4/6	Fine Sand	None	10% gravels
		II		2	40-50	C	10YR 4/6	Fine Sand	None	10% gravels
		II		3	50-58	C	10YR 4/6	Fine Sand	None	10% gravels
STG-012	032	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	34-44	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
		III		2	44-54	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
STG-012	033	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
		II		2	39-48	C	2.5Y 3/3	Coarse Sand	None	<5% small, subangular gravel
STG-012	034	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-34	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	34-44	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	035	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-39	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	39-49	C	2.5Y 5/4	Coarse Sand	None	40% subangular gravel
STG-012	P26	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		5	40-45	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		II		1	45-55	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P27	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	40-50	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P28	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-32	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P29	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-27	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	27-37	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	37-47	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		3	47-57	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		4	57-61	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P30	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	33-40	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P31	No Test: Disturbance								
STG-012	P32	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-30	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	30-40	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P33	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	1 Nail <5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	34-44	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		3	44-50	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P33 + 5m W	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P33 + 5m N	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		3	20-23	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	23-33	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	33-43	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P33 + 5m E	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	38-48	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P33 + 5m S	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	34-44	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P34	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	34-36	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	36-46	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
		III		2	46-56	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	P35	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-38	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	38-48	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	Q27	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	Q28	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	Q29	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-38	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	38-48	C	10YR 4/6	Fine Sand	None	<5% small, subangular gravel
STG-012	Q30	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		3	20-30	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-33	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	33-41	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	41-51	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	Q31	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	36-46	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		2	46-56	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	Q32	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-16	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	16-26	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	26-30	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	30-40	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		2	40-50	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		3	50-60	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	Q33	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	36-46	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		3	46-56	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	Q34	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-24	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	24-34	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	34-44	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		3	44-54	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R28	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-32	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	32-42	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R29	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-40	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	40-50	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R30	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R31	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-35	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	35-45	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R32	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	35-45	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R33	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	20-29	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	29-39	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		2	39-49	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		3	49-59	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		III		4	59-70	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	R34	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-26	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	26-36	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
		II		2	36-46	C	10YR 6/4	Fine Sand	None	<5% small, subangular gravel
STG-012	S30	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	S31	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	30-40	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	S32	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-33	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	33-43	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	S33	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		I		3	20-27	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	27-37	Bw1	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	37-45	Bw1	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	45-55	Bw2	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		III		2	55-61	Bw2	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		IV		1	61-71	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
		IV		2	71-81	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
		IV		3	81-91	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
		IV		4	91-100	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
STG-012	S34	I		1	0-10	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-25	Ap	10YR 4/4	Sandy Loam	None	<5% small, subangular gravel
		II		1	25-35	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		2	35-45	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		II		3	45-54	Bw	10YR 4/6	Sandy Loam	None	<5% small, subangular gravel
		III		1	54-64	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
		III		2	64-74	C	10YR 3/3	Fine Sand	None	<5% small, subangular gravel
STG-012	T31	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-30	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		4	30-36	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	36-46	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	T32	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-31	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	31-41	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	T33	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-29	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	29-39	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	U33	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-20	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		3	20-28	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	28-38	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	W37	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-15	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	15-25	Bw1	2.5Y 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		2	25-35	Bw1	2.5Y 3/3	Sandy Loam	None	<5% small, subangular gravel
		II		3	35-45	Bw1	2.5Y 3/3	Sandy Loam	None	<5% small, subangular gravel
		III		1	45-55	Bw2	10YR 4/6 mixed with 2.5Y 6/6	Sandy Loam	None	<5% small, subangular gravel

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
		III		2	55-65	Bw2	10YR 4/6 mixed with 2.5Y 6/6	Sandy Loam	None	<5% small, subangular gravel
		III		3	65-75	Bw2	10YR 4/6 mixed with 2.5Y 6/6	Sandy Loam	None	<5% small, subangular gravel
		III		4	75-85	Bw2	10YR 4/6 mixed with 2.5Y 6/6	Sandy Loam	None	<5% small, subangular gravel
		III		5	85-90	Bw2	10YR 4/6 mixed with 2.5Y 6/6	Sandy Loam	None	<5% small, subangular gravel
		IV		1	90-100	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	W38	No Test: Disturbance								
STG-012	X36	I		1	0-10	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		I		2	10-19	Ap	10YR 3/2	Sandy Loam	None	<5% small, subangular gravel
		II		1	19-29	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
		II		2	29-39	C	2.5Y 5/4	Fine Sand	None	<5% small, subangular gravel
STG-012	X37	No Test: Disturbance								
STG-012	Y36	No Test: Disturbance								
STG-013	A2	No Test: Railroad Disturbance								
STG-013	B3	No Test: Railroad Disturbance								
STG-013	B4	No Test: Railroad Disturbance								
STG-013	C1	No Test: Railroad Disturbance								
STG-013	C2	No Test: Railroad Disturbance								
STG-013	C3	No Test: Railroad Disturbance								
STG-013	C4	No Test: Railroad Disturbance								
STG-013	C5	No Test: Railroad Disturbance								
STG-013	C6	No Test: Railroad Disturbance								
STG-013	C7	No Test: Railroad Disturbance								
STG-013	D2	No Test: Railroad Disturbance								
STG-013	D4	No Test: Railroad Disturbance								
STG-013	D5	No Test: Railroad Disturbance								
STG-013	D6	No Test: Railroad Disturbance								
STG-013	D7	No Test: Railroad Disturbance								
STG-013	D8	No Test: Railroad Disturbance								
STG-013	D9	No Test: Railroad Disturbance								
STG-013	E4	No Test: Railroad Disturbance								
STG-013	E8	No Test: Railroad Disturbance								
STG-013	E9	No Test: Railroad Disturbance								
STG-013	E10	No Test: Railroad Disturbance								
STG-013	E11	No Test: Railroad Disturbance								
STG-013	E12	No Test: Railroad Disturbance								
STG-013	E13	No Test: Railroad Disturbance								
STG-013	F4	No Test: Railroad Disturbance								
STG-013	F11	No Test: Railroad Disturbance								
STG-013	F12	No Test: Railroad Disturbance								
STG-013	F13	No Test: Railroad Disturbance								

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-013	F14							No Test: Railroad Disturbance		
STG-013	F15							No Test: Railroad Disturbance		
STG-013	F16							No Test: Railroad Disturbance		
STG-013	F17							No Test: Railroad Disturbance		
STG-013	F18							No Test: Railroad Disturbance		
STG-013	F19							No Test: Railroad Disturbance		
STG-013	F20							No Test: Railroad Disturbance		
STG-013	F21							No Test: Railroad Disturbance		
STG-013	F22							No Test: Railroad Disturbance		
STG-013	G4							No Test: Railroad Disturbance		
STG-013	G13							No Test: Railroad Disturbance		
STG-013	G14							No Test: Railroad Disturbance		
STG-013	G15							No Test: Railroad Disturbance		
STG-013	G16							No Test: Railroad Disturbance		
STG-013	G17							No Test: Railroad Disturbance		
STG-013	G18							No Test: Railroad Disturbance		
STG-013	G19							No Test: Railroad Disturbance		
STG-013	G22							No Test: Railroad Disturbance		
STG-013	H6							No Test: Railroad Disturbance		
STG-013	H16							No Test: Railroad Disturbance		
STG-013	H18							No Test: Railroad Disturbance		
STG-013	H19							No Test: Railroad Disturbance		
STG-013	H22							No Test: Railroad Disturbance		
STG-013	I9							No Test: Railroad Disturbance		
STG-013	I22							No Test: Railroad Disturbance		
STG-013	J16							No Test: Railroad Disturbance		
STG-013	J17							No Test: Railroad Disturbance		
STG-013	J22							No Test: Railroad Disturbance		
STG-013	J23							No Test: Railroad Disturbance		
STG-013	K14							No Test: Railroad Disturbance		
STG-013	K15							No Test: Railroad Disturbance		
STG-013	K22							No Test: Railroad Disturbance		
STG-013	K23							No Test: Railroad Disturbance		
STG-013	K24							No Test: Railroad Disturbance		
STG-013	L17							No Test: Railroad Disturbance		
STG-013	L18							No Test: Railroad Disturbance		
STG-013	L19							No Test: Railroad Disturbance		
STG-013	L20							No Test: Railroad Disturbance		
STG-013	L24							No Test: Railroad Disturbance		
STG-013	L25							No Test: Railroad Disturbance		

Survey Area	STP	Strat		Level	Depth (cm)	Hzn	Munsell	Texture	Artifacts	Comments
STG-013	L26							No Test: Railroad Disturbance		
STG-013	M19							No Test: Railroad Disturbance		
STG-013	M20							No Test: Railroad Disturbance		
STG-013	M21							No Test: Railroad Disturbance		
STG-013	M22							No Test: Railroad Disturbance		
STG-013	M23							No Test: Railroad Disturbance		
STG-013	M27							No Test: Railroad Disturbance		
STG-013	M28							No Test: Railroad Disturbance		
STG-013	N23							No Test: Railroad Disturbance		
STG-013	N24							No Test: Railroad Disturbance		
STG-013	N25							No Test: Railroad Disturbance		
STG-013	N26							No Test: Railroad Disturbance		
STG-013	N27							No Test: Railroad Disturbance		
STG-013	N28							No Test: Railroad Disturbance		
STG-013	N29							No Test: Railroad Disturbance		
STG-013	N30							No Test: Railroad Disturbance		
STG-013	O25							No Test: Railroad Disturbance		
STG-013	O26							No Test: Railroad Disturbance		
STG-013	O27							No Test: Railroad Disturbance		
STG-013	O28							No Test: Railroad Disturbance		
STG-013	O29							No Test: Railroad Disturbance		
STG-013	O30							No Test: Railroad Disturbance		
STG-013	O31							No Test: Railroad Disturbance		
STG-013	O32							No Test: Railroad Disturbance		
STG-013	P29							No Test: Railroad Disturbance		
STG-013	P30							No Test: Railroad Disturbance		
STG-013	P31							No Test: Railroad Disturbance		
STG-013	P32							No Test: Railroad Disturbance		
STG-013	P33							No Test: Railroad Disturbance		
STG-013	Q24							No Test: Railroad Disturbance		
STG-013	Q33							No Test: Railroad Disturbance		
STG-013	Q34							No Test: Railroad Disturbance		
STG-013	Q35							No Test: Railroad Disturbance		
STG-013	Q36							No Test: Railroad Disturbance		
STG-013	Q37							No Test: Railroad Disturbance		
STG-013	Q38							No Test: Railroad Disturbance		

Appendix B: Artifact Catalog

FS#	Segment	Site	Artifact Count	Group	Object	Color	Ware	Decoration	Manufacture Technique	Comments
153	STG-012	R5A	1	Architectural	Nail				Cut, Hand Headed	

Appendix E

**Basis of Design Report for Access Road Asphalt and
Loading/Unloading Area Concrete**

General Electric Company

Calculation Package for Access Road Asphalt and Loading/Unloading Area Concrete

**Housatonic River – Rest of River
Pittsfield, Massachusetts**

September 2026

Calculation Package for Access Road Asphalt and Loading/Unloading Area Concrete

**Housatonic River – Rest of River
Pittsfield, Massachusetts**

September 2026

Prepared By:

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Prepared For:

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Pittsfield, Massachusetts

Our Ref:

ARC31156 (30318691)

Table of Contents

Abbreviations iii

1 Introduction 1

2 General Design Assumptions 1

3 Concrete Loading Pad Design 2

 3.1 Design Loads 2

 3.1.1 Dead Loads..... 2

 3.1.2 Live Loads 3

 3.1.3 Soil Loads..... 3

 3.2 Reinforced Concrete Design Criteria..... 4

 3.3 Concrete Pad Design..... 4

4 Asphalt Access Road Design 4

 4.1 Asphalt Design Assumptions..... 4

 4.2 Asphalt Design..... 4

5 References 5

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADTT	average daily truck traffic
CBR	California bearing ratio
DD	direction distribution
Geotechnical Report	<i>Geotechnical Evaluation Report for Transload Areas in Reaches 5 and 6</i>
HMA	hot mix asphalt
MassDOT	Massachusetts Department of Transportation
pcf	pound per cubic foot
psf	pounds per square foot
psi	pound per square inch
Rail Conceptual Design Plan	<i>Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6</i>
Rail Final Design Plan	<i>Final Design Plan for Rail Transload Areas in Reaches 5 and 6</i>

1 Introduction

Arcadis U.S., Inc. (Arcadis) has prepared this Basis of Design Report for Access Road Asphalt and Loading/Unloading Area Concrete for the General Electric Company to present the basis of design for the asphalt access roads and concrete loading/unloading area concrete pads for the planned rail transload areas in Reaches 5 and 6 located in Pittsfield and Lenox, Massachusetts, respectively. This report is Appendix E to the *Final Design Plan for Rail Transload Areas in Reaches 5 and 6* (Rail Final Design Plan). The planned rail transload areas in Reaches 5 and 6 are as follows:

- Utility Drive rail transload area (in Reach 5, Pittsfield, MA); and
- Woods Pond Spur rail transload area (in Reach 6, Lenox, MA).

This report documents the details of the assumptions and calculations for design of the asphalt access road and concrete loading/unloading area pads. The geotechnical information used to support the basis of the design presented herein was submitted to the United States Environmental Protection Agency (EPA) in the *Geotechnical Evaluation Report for Transload Areas in Reaches 5 and 6* (Geotechnical Report), which is Appendix B of the *Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6* (Rail Conceptual Design Plan; Arcadis 2026). The Rail Conceptual Design Plan was conditionally approved by EPA on June 17, 2026.

2 General Design Assumptions

As part of the design for both the asphalt access roads and concrete pads for the Utility Drive and Woods Pond Spur rail transload areas, the following assumptions were used:¹

- Work may occur on five to six working days per week, with a winter shutdown, for total of up to 180 working days per year.
- Trucks to be used will weigh up to approximately 40 tons per truck (loaded), and be a truck type with a wheel base (WB) corresponding up to the American Association of State Highway and Transportation Officials (AASHTO) WB-40 (equivalent to WB-12 in metric) design vehicle.
- Konecranes Lift Trucks reach stacker Model SMV 4646 TC5 or equivalent was assumed to be used for the loading/unloading equipment.
- Containers to be staged on the concrete loading pads will likely be intermodal containers, up to approximately 28 tons each (loaded).
- Staged containers may be stacked up to two high.

Specific assumptions that apply to only the Utility Drive rail transload area are as follows:

- Up to approximately 25 trucks may be used on average per day.
- The asphalt road and concrete pad will likely have two-way truck traffic, with two-lane access. Therefore, the road will likely have up to an average daily truck traffic (ADTT) of 50 trucks with direction distribution (DD) of 50%.

¹ Assumptions are generally considered to be conservative and greater than what is expected to be required to support the anticipated ROR production rates.

- This transload area may have heavy use (up to 100% truck loading [i.e., 100% ADTT for the expected days per year]) for up to six years, through 2033.
- Based on the Geotechnical Report, two feet of structural fill is designed to be placed under the proposed asphalt road and concrete pad.

Specific assumptions that apply to only the Woods Pond Spur rail transload area are as follows:

- Up to approximately 25 to 30 trucks may be used on average per day.
- The asphalt road and concrete pad will likely have one-way truck traffic, with one-lane access. Therefore, the road will likely have up to an ADTT of 25 to 30 trucks with DD of 100%.
- This transload area may have heavy use (100% truck loading) for up to six years, through 2033, and lighter use (10 to 15% truck loading) for up to five subsequent years. Conservatively, the asphalt design uses as an assumption 11 years of heavy use.
- Access road driveway slope of 6% to 9%.
- Based on the Geotechnical Report and concrete design considerations presented herein, six inches of structural fill is designed to be placed under the proposed concrete pad.

3 Concrete Loading Pad Design

This section describes the design loads, design criteria, and structural design for the concrete loading pads at the Utility Drive and Woods Pond transload areas. The following codes and standards were used in the design of the concrete loading pads:

- Massachusetts Building Code (State of Massachusetts 10th Edition);
- International Building Code (International Code Council 2021);
- Minimum Design Loads for Buildings and Other Structures, ASCE (American Society of Civil Engineers 7-16); and
- Building Code Requirements for Structural Concrete, ACI (American Concrete Institute 318-19).

3.1 Design Loads

This section presents the design loads that were used for the design of the concrete loading pads at the Utility Drive and Woods Pond transload areas.

3.1.1 Dead Loads

The dead load for the concrete loading pad design consisted of the weight of the concrete loading pad itself and was calculated using unit weights from ASCE 7-16.

3.1.2 Live Loads

The live loads for the concrete loading pad are the following:

- Intermodal containers stacked two high: 725 pounds per square foot (psf) uniform load;
- A forklift rated for three tons;
- AASHTO HS-20 axle loads; and
- Konecranes Lift Trucks reach stacker Model SMV 4646 TC5 (or equivalent): max load to tandem axle of 304,000 pounds (276,500 and 27,500 pounds for the front axle and rear axle, respectively).

3.1.3 Soil Loads

Based on the Geotechnical Report, the soil loads are the following:

- Net allowable soil bearing pressure: 14,000 psf.
- Subgrade modulus: 150 pounds per cubic inch.
- Maximum expected settlements:
 - Utility Drive: two inches; and
 - Woods Pond: two inches.
- Frost depth minimum: 48 inches below proposed grade.
- Groundwater:
 - Utility Drive: 10.5 feet below proposed grade; and
 - Woods Pond: not anticipated to be encountered during construction.
- Earth pressure:
 - Structural fill:
 - Moist unit weight: 130 pounds per cubic foot (pcf);
 - Internal friction angle: 34 degrees;
 - Coefficient of at-rest earth pressure: 0.44;
 - Equivalent at-rest pressure: 57 pcf;
 - Coefficient of active earth pressure: 0.28; and
 - Equivalent active pressure: 36 pcf.
 - Native soils:
 - Moist unit weight: 120 pcf;
 - Internal friction angle: 30 degrees;
 - Coefficient of at-rest earth pressure: 0.50;

- Equivalent at-rest pressure: 60 pcf;
- Coefficient of active earth pressure: 0.33; and
- Equivalent active pressure: 40 pcf.

3.2 Reinforced Concrete Design Criteria

The following design criteria were considered for the design of reinforced concrete:

- Reinforced concrete will have a minimum 28-day compressive strength (f'_c) of 4,500 pounds per square inch (psi) and ASTM International Grade 60 deformed reinforcement that has a minimum yield strength of 60,000 psi.
- All concrete will be air-entrained 6% $\pm$ 1% with a water/cement ratio equal to or less than 0.42.

3.3 Concrete Pad Design

Based on assumptions provided in Section 2 above and in the Geotechnical Report, a design for the Utility Drive and Woods Pond Spur concrete loading pads was developed. The reinforced concrete slabs will be 1 foot, 4 inches thick with #4 @ 12" C/C each way in the top face and #7 @ 10" C/C each way in the bottom face.

A cross section of the concrete loading pad can be found in the Design Drawings (Appendix A of the Rail Final Design Plan).

4 Asphalt Access Road Design

This section describes the design criteria and design of the asphalt access roads at the Utility Drive and Woods Pond transload areas.

4.1 Asphalt Design Assumptions

The design assumptions for the asphalt at the rail transload area are the following:

- Based on the Geotechnical Report, the soils underlying the asphalt at the Utility Drive rail transload area are anticipated to have a California bearing ratio (CBR) of 7, assuming two feet of structural fill.
- Based on the Geotechnical Report, soils underlying the asphalt at the Woods Pond Spur rail transload area are anticipated to have a CBR of 5 with no structural fill required.

4.2 Asphalt Design

In accordance with Chapter 9 of the MassDOT Project Development and Design Guide, the following asphalt design for the access road at the Utility Drive rail transload area was developed:

- 1.50-inch hot mix asphalt (HMA) surface course meeting MassDOT Standard Specification M3.06.0: Hot Mix Asphalt (MassDOT 2026);
- Tack Coat;

Basis of Design Report for Access Road Asphalt and Loading/Unloading Area Concrete

- 2.50-inch HMA intermediate course meeting MassDOT Standard Specification M3.06.0: Hot Mix Asphalt;
- 12-inch gravel subbase for drainage meeting MassDOT Standard Specification M1.03.1-1: Gradation Requirements for Processed Gravel for Subbase; and
- 24-inch structural fill subgrade (according to the Geotechnical Report).

In accordance with Chapter 9 of the MassDOT Project Development and Design Guide, the following asphalt design for the access road at the Woods Pond Spur rail transload area was developed:

- 1.50-inch HMA surface course meeting MassDOT Standard Specification M3.06.0: Hot Mix Asphalt;
- Tack Coat;
- 2.50-inch HMA intermediate course meeting MassDOT Standard Specification M3.06.0: Hot Mix Asphalt;
- 12-inch gravel subbase for drainage meeting MassDOT Standard Specification for M1.03.1-1: Gradation Requirements for Processed Gravel for Subbase; and
- Compacted fill subgrade in accordance with MassDOT Standard Specification Subsection 150.

A cross section of the asphalt access road can be found in the Design Drawings (Appendix A of the Rail Final Design Plan).

5 References

American Concrete Institute. 2019. Building Code Requirements for Structural Concrete (ACI 318-19).

American Society of Civil Engineers. 2016. Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7-16).

Arcadis. 2026. *Conceptual Design Plan for Rail Transload Areas in Reaches 5 and 6*. Prepared for General Electric Company, Pittsfield, Massachusetts. February 20.

International Code Council. 2021. International Building Code.

MassDOT. 2023. MassDOT Project Development and Design Guide, Chapter 9—Pavement Design.

MassDOT. 2026. Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges. Division III. Available online at: <https://www.mass.gov/doc/2026-standard-specifications-for-highways-and-bridges-division-iii-materials-specifications/download>.

State of Massachusetts. 2025. Massachusetts State Building Code, 780 Code of Massachusetts Regulations.

Appendix F

Cultural Resources Unanticipated Discovery Plan

(previously submitted with Reach 5A Final Design Plan)



Cultural Resources Unanticipated Discoveries Plan

Housatonic River – Rest of River Pittsfield, Massachusetts

Prepared for

General Electric Company
1 Plastics Avenue
Pittsfield, Massachusetts 01201

Prepared by

AECOM
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April 2026

Cultural Resources Unanticipated Discoveries Plan

This *Unanticipated Discoveries Plan* (UDP) has been prepared by AECOM on behalf of the General Electric Company (GE) to address the handling of any human remains or other cultural resources that were not previously identified during archaeological surveys and that are encountered during the remediation, support activities, or related construction activities in the Housatonic Rest of River area or associated areas such as the Upland Disposal Facility (UDF), rail transload areas, other staging areas, and access roads. This UDP has been developed to protect any such resources, taking into account the applicable federal regulations embodied in "Protection of Historic Properties." 36 C.F.R. §§ 800.2 through 800.7, 800.12, and 800.13. This plan will be implemented by GE if previously undiscovered archaeological resources and/or human remains are identified. A list of contacts is provided at the end of this plan.

In the case of an unanticipated discovery, GE will follow all relevant federal and state laws and regulations regarding treatment of human remains and other items of cultural patrimony. Potentially relevant laws include the following:

- Native American Graves Repatriation Act (NAGPRA) (Public Law 101-601; 25 U.S.C. 3001-3031);
- Massachusetts General Laws (M.G.L.) Chapter 38, §6, as amended, Discovery of Unmarked Skeletal Remains;
- M.G.L. Chapter 9, §26A – State Archaeologist's duties;
- M.G.L. Chapter 9, §27C – Cessation of Activities;
- M.G.L. Chapter 7, §38A – Preservation, Excavation and Analysis of Native American Human Remains;
- M.G.L. Chapter 114, §17 – Preservation of Ancient Burial Places;
- M.G.L. Chapter 272, §71 – Crimes and Punishment: Disinterring Bodies;
- M.G.L. Chapter 272, §73, as amended – Crimes and Punishment: Injuring or Removal of Burial Markers; and
- M.G.L. Chapter 91, §63 – Salvage, Recovery, etc. of Underwater Archaeological Resources; Permits.

1. Human Remains

In the case of an unanticipated discovery of human remains during remediation activities, GE will follow all relevant federal and state laws and recommendations regarding treatment of human remains. GE and its consultants recognize the importance of providing careful and respectful treatment for human remains recovered as an unanticipated discovery or as part of remediation or

support activities. In the event of an unanticipated discovery of human remains, the following protocols will be followed:

- (1) Stop Work and Protect the Site. Should human remains or evidence of possible burials be encountered, work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance. GE's on-site representative or Construction Manager will have the authority and responsibility to stop activities in the area of the discovery.
- (2) Leave Remains in Place. Human remains and associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.
- (3) Notify Project Manager and Cultural Resources Contractor. GE's on-site representative or Construction Manager at the time when the discovery is made will notify the GE Project Manager and the AECOM cultural resource professional immediately. The applicable GE Project Manager is currently Kevin Mooney for Reach 5A, Matthew Calacone for the UDF and rail transload areas; and Rachel Leary for Reaches 5B, 5C, and 6. If the applicable GE Project Manager is unavailable, then GE's on-site representative or Construction Manager will notify GE's Operations Manager, Andrew Inglis. The AECOM cultural resource professional is currently Elisabeth LaVigne. Contact information for these individuals is attached.
- (4) Notify Local Authorities. GE's on-site representative or Construction Manager at the time when the discovery is made will notify the county coroner/medical examiner and local law enforcement immediately. The coroner and local law enforcement will make the official ruling on the nature of the remains, being either forensic or archaeological. If the remains are determined to be human, forensic, and not archaeological, GE's on-site representative or Construction Manager will consult with law enforcement authorities to resolve the situation, and action by those authorities will be necessary before work may resume in the secured area.
- (5) Notify EPA and Its Archaeologist. If the human remains are identified as archaeological, the GE Project Manager (or, if he/she is not available, the GE Operations Manager) will notify EPA, and AECOM's cultural resource professional will notify the archaeologist serving as EPA's Archaeologist.
- (6) Further Steps for Native American Burials. If the human remains are determined to be archaeological and are identified as Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. AECOM's cultural resource professional will notify and consult with the Massachusetts Historical Commission (MHC) and appropriate federally recognized Native American tribes and nations to develop a plan of action that is consistent with the Preservation,

Excavation, and Analysis of Native American Human Remains (M.G.L. Chapter 7, §38A), the Native American Graves Protection and Repatriation Act (25 U.S.C. Ch. 32), and regulations thereunder (43 CFR Part 10). The Native American tribes and nations to be notified will include the Stockbridge Munsee Band of Mohican Indians, the Wampanoag Tribe of Gay Head (Aquinnah), the Schaghticoke Tribal Nation, the Schaghticoke Indian Tribe, and the Narragansett Indian Tribe. In addition the procedures outlined in the *Stockbridge Munsee Community Treatment and Disposition Of Human Remains and Cultural Items/Inadvertent Discovery Protocol* [smc-inadvertent-discovery-policy.pdf](#) (Stockbridge Munsee Community Band of Mohican Indians, 2025) will be followed.

- (7) Further Steps for Historic Non-Native American Burials. If the human remains are determined to be archaeological and identified as non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated in accordance with MHC's "Policy and Guidelines for Non-Native Human Remains Which are Over 100 Years Old or Older" and in a manner consistent with the Advisory Council on Historic Preservation (ACHP) Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects (ACHP 2007). AECOM's cultural resource professional will notify and consult with the Massachusetts Historical Commission (MHC) and EPA's Archaeologist to determine a plan of action.
- (8) Continue Temporary Cessation of Work. Remediation activities will remain stopped until EPA advises GE to proceed in the area of the specific unanticipated discovery of human remains.
- (9) Documentation. The unanticipated discovery of human remains and the actions taken to address it will be documented in a written report that will be submitted to EPA.

2. Other Archaeological Resources

The following steps will be taken in the event that any archaeological resources other than human remains are encountered by a GE employee, a contractor, or subcontractor during remediation, support, or other construction activities. These resources may include, but are not limited to, foundations, walls, stone piles, timber structures, sunken vessels, pits, shafts, and artifact clusters.

- (1) Stop Work. Remediation or other invasive activities within the immediate area of the archaeological resource will be stopped; "immediate area" is a context-specific measure, but roughly 50 feet away from the find is generally adequate, although the need for an extension of this area beyond this buffer zone should be considered. The discovery will be immediately protected from further disturbance. GE's on-site representative or Construction Manager will have the authority and responsibility to stop remediation or other invasive activities in the immediate area of the find.

- (2) Notify Project Manager and Cultural Resources Contractor. GE's on-site representative or Construction Manager at the time when the discovery is made will notify the applicable GE Project Manager (or, if he/she is not available, the GE Operations Manager) and the AECOM cultural resource professional, identified above.
- (3) Notify EPA. The GE Project Manager (or, if he/she is not available, the GE Operations Manager) will notify EPA.
- (4) Protect the Site. The GE Project Manager (or, if he/she is not available, the GE Operations Manager) and GE's on-site representative or Construction Manager will arrange for protection of the find from further disturbance or vandalism.
- (5) Notify EPA's Archaeologist. The AECOM cultural resource professional will notify EPA's Archaeologist.
- (6) Engage in Archaeological Consultation. GE, through its cultural resources consultant, will engage in consultation with EPA's Archaeologist to determine whether the find could potentially meet the criteria for listing on the National Register of Historic Places (NRHP). Sufficient archaeological work will be performed at the unanticipated discovery location to stabilize deposits, protect deposits from scavengers or looters, and collect readily available samples (e.g., radiocarbon dating) that may help pinpoint the age of deposits. If the find is determined to be potentially eligible for listing on the NRHP, additional data recovery work will be performed as required by EPA or determined by GE with EPA approval.
- (7) Notify Indian Tribes If Appropriate. If the find is determined to be indigenous, the AECOM cultural resource professional will notify the Stockbridge-Munsee Band of Mohican Indians, the Wampanoag Tribe of Gay Head (Aquinnah), the Schaghticoke Tribal Nation, the Schaghticoke Indian Tribe, and the Narragansett Indian Tribe.
- (8) Continue Temporary Cessation of Work. Remediation activities will remain stopped until EPA advises GE to proceed in the area of the specific unanticipated discovery.
- (9) Report. The unanticipated discovery and the actions taken to address it will be documented in a written report that will be submitted to EPA. The report format will be determined by the level of effort required.

3. Implementation and Training

GE will implement the measures outlined in this UDP following EPA approval of it.

GE will conduct a short archaeological resource identification training program for remediation and construction field activity staff in advance of the work in a given river reach or area. This training

program will be presented by the AECOM cultural resource professional and is intended to help remediation/construction staff identify unanticipated discoveries in the field and report them to GE's on-site representative or Construction Manager.

4. References

Advisory Council on Historic Preservation (ACHP), 2007. *Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects*. February 23, 2007.

Stockbridge Munsee Community Band of Mohican Indians, 2025. *Treatment and Disposition Of Human Remains and Cultural Items/Inadvertent Discovery Protocol*. [smc-inadvertent-discovery-policy.pdf](#).

Contact List: Cultural Resources Unanticipated Discoveries Plan

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Appendix G

Wood Turtle Management Plan

Appendix G: Wood Turtle Management Plan

Housatonic Rest of River - Reach 5A
Utility Drive Rail Transload Area

Prepared for:

General Electric Company
Pittsfield, MA

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September 16, 2026

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Table of Contents

1.	Introduction	1
2.	Methods and Responsibilities	2
3.	Pre-Construction Activities	2
3.1	Radio Telemetry	3
3.2	Installation of Turtle Exclusion Barriers	3
3.3	Requirements for Site Preparation	4
4.	Monitoring During Construction and Operations.....	5
5.	Contractor Education	5
6.	Qualifications and Training.....	5
7.	Reporting.....	6
8.	References.....	6

Exhibit A – Contractor and Construction Phase Education

Exhibit B – Rare Species Incident Reporting Form

1. Introduction

On behalf of the General Electric Company (GE), AECOM has prepared this Wood Turtle Protection Plan for the Utility Drive rail transload area associated with Reach 5A of the Housatonic Rest of River (ROR) project in Pittsfield, Massachusetts. This plan applies to construction, operation, and restoration activities that occur within the Utility Drive rail transload area property and that involve vegetation clearing and construction and operation of a temporary railroad spur and transload area with associated access roads and staging areas located within mapped or otherwise suitable wood turtle habitat. During operation, the area will include large-equipment operation, stockpiling, vehicle movement and loading of impacted soils on to rail cars for transportation to an Upland Disposal Facility.

Wood turtles (*Glyptemys insculpta*) are semi-aquatic turtles that rely on a seasonal mosaic of instream, riparian, floodplain, and upland habitats. In the Northeast, they overwinter in streams and are generally more aquatic during their spring emergence period and in autumn as they return to their overwintering areas. Wood turtles may spend weeks to months in adjacent floodplain and upland habitats during the summer active season. Females typically nest in June in open, well-drained sandy or gravelly settings along point bars, banks, floodplain openings, fields, or other nearby uplands (Compton et al., 2002; Jones & Willey, 2021).

The wood turtle is listed as a species of special concern under the Massachusetts Endangered Species Act (MESA). MNHESP Species Habitat mapping provided in March 2025 indicates that the Utility Drive rail transload area overlaps mapped wood turtle habitat. Although targeted surveys conducted during the 2025 and 2026 active seasons did not document a wood turtle within the Utility Drive rail transload area property, recent observations on the nearby Housatonic River floodplain have been documented.

In accordance with EPA requirements, GE previously prepared a Reach 5A Wood Turtle Standard Operating Procedure (SOP) and conducted reconnaissance and radio-telemetry surveys of this species in 2025 and to date in 2026. These surveys have resulted in the capture of a number of wood turtles that were subsequently fitted with radio-transmitters and were or are being tracked using telemetry equipment between April and November. Observations to date have shown spring and fall use to be primarily aquatic, summer use to extend into floodplain and upland habitats, and repeated use of large woody debris, root wads, undercut banks, soft-bottom areas, and point-bar or river-margin settings relevant to basking, refuge, nesting, and overwintering functions. These data, together with MNHESP Species Habitat Mapping as well as a Wood Turtle Management Plan submitted for Reach 5A as an attachment to GE's Reach 5A Restoration Plan (AECOM 2026), form the technical basis for this protection plan.

This Wood Turtle Management Plan establishes procedures to avoid and minimize impacts on wood turtles before and during construction, throughout operation, and during decommissioning and restoration of the Utility Drive rail transload area.

This management plan includes the following elements:

- Responsibilities of participating parties, including a designated herpetologist (DH), GE, field biologists, and construction personnel;
- Pre-construction review, survey, telemetry, and work-area planning, and exclusion-fence installation measures intended to reduce the likelihood of direct impacts to wood turtles during vegetation clearing, access-road construction, staging, stockpile, and other ground-disturbing activities;
- Protocols for active-season and inactive-season site preparation and related ground-disturbing work within mapped or otherwise suitable wood turtle habitat;
- Construction-period monitoring and encounter response; and
- Contractor education, qualifications and training, and reporting procedures.

2. Methods and Responsibilities

For implementation of this management plan, GE will designate a qualified professional as the DH. The DH will be responsible for wood turtle protection and management measures at the Utility Drive rail transload area, including review of survey and radio-telemetry tracking information, oversight of exclusion-fence installation and clearance surveys, data management, construction oversight related to wood turtles, and coordination with GE, EPA, and MNHESP, all subject to the overall supervision of GE and its Construction Manager. Because the Utility Drive transload area will remain in operation during the Reach 5A remedial program, the DH will integrate current wood turtle information into adaptive management throughout the entirety of transload area operations. The DH will:

- Maintain or update project-specific standard operating procedures for wood turtle surveys, handling, processing, transmitter attachment and removal, relocation, release, and documentation;
- Coordinate with EPA and MNHESP regarding any approvals, reporting, or consultation needed for implementation of wood turtle protection measures in Reach 5A;
- Provide technical input to the design and construction teams regarding the spatial and temporal distribution of wood turtle use in relation to site preparation, exclusion fence installation, and construction activities;
- Direct pre-construction wood turtle surveys, telemetry tracking, clearance sweeps, and installation and inspection of turtle exclusion barriers;
- Oversee contractor training regarding wood turtle identification, avoidance, encounter response, and reporting;
- Ensure that any capture, handling, transmitter deployment, or relocation of wood turtles is performed only by authorized personnel operating under the applicable approved protocol and any required agency authorizations; and
- Maintain records of all survey, telemetry, construction-period monitoring, exclusion barrier inspection, and incident-response activities associated with the Utility Drive rail transload area and prepare summary documentation for regulatory review, including submission of appropriate observations to the MNHESP Heritage Hub online reporting system.

3. Pre-Construction Activities

The pre-construction activities described in this section are intended to reduce the likelihood that wood turtles are present within the Utility Drive rail transload area when vegetation clearing, access-road construction, rail and support-area construction, stockpiling, or other ground-disturbing or large-equipment activities begin, and to prevent turtles from entering the work area during construction and operation of the transload area. Pre-construction tasks will include the following:

- Existing Reach 5A wood turtle survey and telemetry results will be reviewed in relation to the Utility Drive rail transload area to refine active-season use areas and inform site-specific protection measures.
- Specific pre-construction visual encounter surveys and clearance sweeps will be conducted within and immediately adjacent to planned site preparation and construction areas in mapped or otherwise suitable wood turtle habitat.
- A continuous wood turtle exclusion barrier will be installed around the Utility Drive rail transload area. The barrier will isolate areas of concentrated construction, machinery operation, vehicle movement, and rail transload activity from surrounding habitat.
- Radio-telemetry tracking of turtles tagged during prior survey efforts will be continued and transmitters will be deployed on additional turtles captured during pre-construction surveys, as appropriate and consistent with the approved protocol.
- The final limits of the transload area, exclusion-fence alignment, and any site-specific habitat features identified for special attention will be field-delineated or otherwise clearly marked before construction.

- Initial coordination meetings will be held among the DH, the Construction Manager, and the construction or operations contractor to review work sequences, sensitive habitat areas, wood turtle protection procedures, and encounter-response protocols.

Any wood turtles encountered during pre-construction surveys within the Utility Drive transload area will be processed in accordance with the approved SOP, including photo-documentation and recording of basic morphometric information as appropriate, and will be released into suitable habitat outside planned work areas at locations selected by the DH in consultation with EPA. If an individual is fitted with a transmitter, processing and release locations will be selected to support continued monitoring and to minimize the likelihood of re-entry before the exclusion barrier is fully secured.

3.1 Radio Telemetry

Radio telemetry will continue to serve as a primary tool for understanding wood turtle movements and habitat use near the Utility Drive rail transload area and for informing construction and operational planning. The surveys conducted to date have demonstrated the value of telemetry by documenting movements across riverine, riverbank, tributary, floodplain, and adjacent upland habitats, identified overwintering locations; and demonstrated that individual turtles can make substantial movements over short periods.

Prior to vegetation clearing, grading, access-road construction, rail and support-area construction, or other ground-disturbing activities at the Utility Drive rail transload area, the DH and team will:

- Continue to track turtles tagged during pre-construction surveys in 2025 and 2026 and fit additional captured turtles with radio transmitters as appropriate under the approved protocol;
- Map and review recent and historical telemetry locations relative to the Utility Drive transload area and surrounding habitat, with emphasis on identifying travel corridors, seasonal use areas, nesting areas, and overwintering areas within or near the facility.
- Provide written or mapped summaries of telemetry information to the design and construction teams as needed; and
- Use telemetry information to identify locations where additional protection measures may be warranted, such as enhanced oversight by the DH or designee, more frequent fence inspection, or changes in work sequencing.

3.2 Installation of Turtle Exclusion Barriers

A continuous turtle exclusion barrier will be installed around the Utility Drive rail transload area before active-season ground disturbance begins. The barrier will remain in place and be maintained throughout construction and operation of the temporary rail transload area. The final alignment will be shown on the construction drawings or field implementation plan.

- Before barrier installation, vegetation and woody debris will be removed as necessary from a narrow path along the proposed alignment under direct oversight of the DH or designee during the active season. Surveys will be conducted immediately in advance of mowing, grubbing, trenching, or other installation activities. However, if barriers are installed during the inactive season for wood turtles, no oversight during installation of barriers or clearing for turtles within the work limits will be necessary (see Section 3.3).
- The barrier will consist of continuous silt fence or equivalent durable material. Where practicable, the barrier will be installed in a trench at least six inches deep, with the lower portion of the fence buried and backfilled. Where trenching is impracticable because of site conditions or would create unnecessary disturbance, a minimum six-inch horizontal apron will be secured tightly to the ground and continuously weighted with coir fiber rolls, silt socks, or an equivalent method approved by the DH.
- Support stakes will be installed at intervals sufficient to keep the barrier upright and taut. The barrier will be either buried or continuously secured to the ground so that wood turtles cannot pass beneath it. Erosion-control materials that could provide a climbing surface, including straw bales, will be placed on the work side of the barrier.

- Vehicle, equipment, and rail access points will be fitted with movable gates or another closure system that provides equivalent exclusion. Gates will be closed whenever the access point is not actively attended or in use during the wood turtle active season. The gate design and operating procedure will be reviewed and approved by the DH.
- Immediately following installation and before clearance surveys begin, the DH or approved delegate will conduct a full-length inspection of the barrier to identify gaps, loose or undermined sections, climbable materials, or other potential entry points. Any deficiency observed will be corrected before the enclosed area is cleared for work.

No construction, stockpiling, or ground-disturbing activities will occur outside the established fenced limits within mapped wood turtle habitat unless the area has first been evaluated by the DH and appropriate protection measures have been implemented (other than vehicle traffic along approved access routes).

The construction/operations contractor will maintain repair materials on site throughout construction and operation. Any damaged, undermined, displaced, or open section of fence will be repaired promptly, and the DH will determine whether supplemental clearance surveys are required before work resumes in the affected area.

All exclusion barriers will be removed after rail transload operations and decommissioning are complete, and disturbed areas have been stabilized, unless a barrier segment is retained temporarily for restoration protection with approval from the DH.

3.3 Requirements for Site Preparation

Wood turtles in Massachusetts typically overwinter in rivers and perennial streams, using features such as undercut banks, woody debris accumulations, root masses, and deep pools. Full-time submersion typically begins in November and continues through early spring. Chance encounters in terrestrial habitats are unlikely during the inactive season. Accordingly, vegetation clearing and exclusion-barrier installation will be conducted between November 1 and March 31 where practicable. Tree removal at the Utility Drive rail transload area will also be limited to November through March, consistent with the rail transload design plan's measures for listed bat species.

If exclusion fencing is installed and the enclosed terrestrial work area is fully secured before April 1, active-season clearance surveys will be unnecessary, subject to concurrence from the DH and consistent with applicable EPA direction.

However, in the event that site preparation work is conducted during the wood turtle's active season (April 1 through October 31), vegetation clearing, exclusion-barrier installation, and other site-preparation activities within mapped wood turtle habitat at the rail transload area will be conducted under direct oversight of the DH or trained biological inspectors. Surveys will be performed immediately in advance of clearing and fence installation. After the barrier is fully installed and inspected, the entire enclosed work area will be systematically searched by qualified biologists before construction-related activities begin.

For work during the active season, the enclosed area will be searched at a minimum effort of four person-hours per acre in forested habitat and two person-hours per acre in open-field habitat, both of which are present at the Utility Drive rail transload area. Search effort will be distributed to provide complete coverage of the entire rail transload area. The DH will document the personnel, dates, weather conditions, area covered, search hours, and results.

Site preparation construction activities conducted during the active season within the fenced area may begin only after the DH has determined that the required search effort has been completed, any turtles encountered have been removed in accordance with the approved SOP, and the exclusion barrier is secure. Where tagged turtles are known from telemetry to be within or near a planned work area, the DH may recommend adjusting the timing of work, conduct more intensive surveys, or temporarily relocate the turtle to suitable nearby habitat outside the work zone, consistent with the approved protocol and any required authorizations.

If a turtle is observed within an active work area and is determined to be within harm's way, work in the immediate vicinity will be temporarily stopped until the turtle can be protected through avoidance, controlled

movement away from equipment, or capture and relocation by authorized personnel. Any wood turtles encountered during site preparation will be captured and relocated only by qualified authorized personnel following approved handling procedures. If a turtle is observed outside work areas and access roads and is not within harm's way, it will not be handled unless directed by the DH, to minimize unnecessary disturbance.

4. Monitoring During Construction and Operations

This section describes the monitoring to be conducted during construction, operation, maintenance, decommissioning, and restoration activities at the Utility Drive rail transload area. During this construction and operational period:

- The DH and/or trained biological inspectors will provide oversight and turtle-clearing activities during key phases of the construction work within mapped or suitable wood turtle habitat, including initial ground disturbance, barrier installation and closure, opening of new work areas, major fence repairs, decommissioning ground disturbance, and work near recent turtle locations based on telemetry or surveys.
- The DH or qualified staff will inspect the full exclusion barrier at least weekly from April 1 through October 31 and following major storm events, tree or limb falls, or any event that could damage or undermine it. If a wood turtle is found inside the fenced area, a full-length barrier inspection will be completed within 24 hours. Inspection findings and repairs will be documented.
- The construction or operations contractor will visually check gates and readily observable fence sections during routine daily site opening activities and will promptly report damage, open gates, or turtle observations to the DH. Gates will remain closed when not actively attended or in use
- If a wood turtle is observed within an active work area, work in the immediate vicinity will be temporarily halted and the DH, in coordination with the Construction Manager, will assess appropriate response measures, which may include capture and relocation by authorized personnel, modification of work practices, enhanced monitoring, or adjustment of barrier coverage. (Any observation of an injured or dead wood turtle will be handled as described in Section 7 below.)
- Barrier inspections and wood turtle monitoring will continue through decommissioning and restoration until the DH determines that construction-related risk has ended and the barrier may be removed.

5. Contractor Education

To further ensure the protection of wood turtles, field construction and operations personnel engaged in Utility Drive rail transload area construction and operations activities will be trained to recognize wood turtles and to understand the conservation practices necessary to avoid or minimize direct impacts during those activities. Training will emphasize that only authorized personnel may capture, handle, relocate, or otherwise process wood turtles except under the circumstances described in **Exhibit A**.

Training will be provided before initial vegetation clearing in wood turtle habitat and before installation of any barrier fence associated with a new work area. Additional training will be provided for new construction or operations personnel or crews that begin work within wood turtle habitat after the initial briefing. Topics will include wood turtle identification; expected habitats and seasonal use patterns in Reach 5A; speed, scanning, and stopping protocols along access roads; work-area limits and barrier requirements; encounter-response procedures; communication and stop-work expectations; and reporting requirements.

A field handout describing wood turtle identification, photographs of representative habitats and turtles, and step-by-step response procedures for turtle encounters will be provided to site supervisors, construction crews, and operations personnel performing the work and is included in this attachment as **Exhibit A**. (The names and contact information for three qualified biologists will be added to this document before it is distributed).

6. Qualifications and Training

The DH will have at a minimum, a graduate degree in biology, wildlife ecology, herpetology, or a related natural-resources discipline, or equivalent specialized professional experience, together with at least five years

of experience working with state-listed turtle species and implementing field surveys and construction oversight for such species. The DH will be familiar with wood turtle handling, transmitter attachment and tracking, habitat-use interpretation, and encounter-response procedures, and will operate under any applicable approved protocol or MNHESP authorization.

Biologists assisting the DH with surveys, telemetry, exclusion-barrier inspection, and monitoring will have, at a minimum, a bachelor's degree in biology or a related natural-resources discipline or demonstrated experience working with state-listed turtle species, and documented training by the DH in wood turtle identification, proper handling and care, telemetry protocols, encounter response, and data collection procedures. Any person directly handling or processing wood turtles must be specifically authorized to do so.

7. Reporting

The DH or qualified staff will maintain standardized field forms and/or digital records for all pre-construction surveys, telemetry tracking events, barrier inspections, and monitoring visits during construction and operation of the rail transload area. These records will include, as applicable, dates and times of surveys, personnel present, survey locations and coverage, turtle observations and locations, transmitter deployment and status, barrier conditions, incidents, corrective actions, and communications with construction management or agencies.

During construction and operations, internal oversight records will be prepared when work is occurring within mapped or suitable wood turtle habitat. Matters requiring immediate attention, such as turtle encounters in active workspace, barrier breaches, or deviations from protection measures, will be communicated promptly to the Construction Manager and documented together with the corrective action taken.

The DH will immediately report any observation of an injured or dead wood turtle to the MNHESP State Herpetologist and EPA following the incident. Within 72 hours, a follow-up written notification will be sent via email to MNHESP and EPA describing the event and any response action taken, using the form attached as **Exhibit B**. Injured individuals will be transferred to an appropriate wildlife rehabilitation facility, such as Tufts Wildlife Clinic (50 Willard Street, North Grafton, MA; phone: 508-839-7918) or another MNHESP-approved facility, as directed by MNHESP.

A summary will be prepared by the DH annually while the Utility Drive rail transload area is under construction or in operation. That summary will describe, for the subject period, any pre-construction survey and telemetry activities, construction or operations period monitoring and turtle encounters, telemetry-derived information relevant to the Utility Drive rail transload area, any injuries or mortalities and associated corrective measures, and recommendations for refining wood turtle protection measures. Reporting will be incorporated into the applicable rail transload area project reporting, as required.

8. References

- AECOM. 2026. Reach 5A Restoration Plan. Prepared for General Electric Company, Pittsfield, Massachusetts. April 29.
- Compton, B. W., Rhymer, J. M., & McCollough, M. (2002). Habitat selection by wood turtles (*Glyptemys insculpta*): An application of paired logistic regression. *Ecology*, 83(3), 833-843.
- Jones, M. T., & Willey, L. L. (Eds.). (2021). *Biology and conservation of the wood turtle*. Northeast Association of Fish and Wildlife Agencies.

Exhibit A – Contractor and Construction Phase Education

Purpose

The wood turtle (*Glyptemys insculpta*) is a Massachusetts state-listed species of Special Concern and is therefore protected against direct harm to the individual, and against destruction or disturbance of its habitat. The purpose of this document is to provide construction personnel with important information that will help reduce the potential for direct harm to individual wood turtles should they be encountered during construction activities. This includes a basic understanding of wood turtle habitat use, instructions on proper turtle handling and temporary detainment and relocation techniques, contact information of at least three qualified biologists, and representative photographs of the wood turtle to assist in proper identification.

General Overview of Wood Turtle Activity and Habitat Use

Wood turtles in the Northeast use a variety of habitats over the course of the year based on life cycle requirements (e.g., nesting and hibernating) and body temperature regulation. A generalized breakdown of this seasonal habitat use is provided below to give contractors an idea of where chance encounters are most likely to occur given the time of year construction activities are occurring;

- *April and May.* Wood turtles are just emerging from hibernation and are typically found within the river or on the adjacent riverbanks and floodplains, usually near the river (i.e., typically within 100 feet). They would be found basking on logs, in dense woody shrub cover, or meandering on the floodplain.
- *June through September.* Wood turtles are typically observed feeding in successional fields, hayfields and forests. They can also be seen in riparian wetlands such as wet meadows, bogs, and beaver ponds. The majority of wood turtle nesting activity occurs in June in areas which provide sandy and/or gravelly substrate (including point bars, cutbanks, sand and gravel bars, and open sand and gravel pits).
- *October through March.* Wood turtles typically spend winters hibernating in flowing rivers and perennial streams. In October, the turtles start to make their way back to the rivers and streams with full-time submersion in the water starting in November. Overwintering occurs in muddy banks, stream bottoms, deep pools, in-stream woody debris, and abandoned mammalian bank-burrows.

Methods

Below is a step-by-step process that shall be followed in the event of a wood turtle observation.

- 1) If a turtle is observed, first determine if the individual is within harm's way. If the individual is observed outside of the rail transload area work areas and access roads, then the turtles should not be handled to minimize disturbance and prevent altering their behavior. Photograph the turtle and notify the DH.
- 2) When a turtle is determined to be within harm's way, or does not already have a radio-transmitter glued to its shell, it should be captured and temporarily detained until the designated herpetologist has been notified and can perform standard data collection and turtle relocation.
- 3) When handling a turtle, grasp it firmly by the sides of the carapace (top shell). Wood turtles are typically shy and will typically retract into their shell. If the turtle does not retreat into its shell, be cautious of the turtle's head, mouth and feet. Although wood turtles typically do not bite, they certainly are capable of doing so. In addition, they have very sharp claws and powerful legs for digging, which can scratch the skin.
- 4) Captured turtles may be placed into a small tub or cooler if necessary. Turtles can easily die from overheating. Therefore, this tub **MUST** be placed in a cool shaded area out of direct sunlight, indoors or out. Outdoor shaded areas must be persistent, that is, make sure that the tub is not in an area that will BECOME sunny later in the day. In addition, fresh vegetation (e.g., leaves, tall grass cuttings) and water **SHALL** be placed into the tub for cover and hydration.
- 5) Within one hour of capturing a wood turtle, one of the three qualified biologists listed below **SHALL** be notified.

Contact Information for Qualified Biologists

Name _____
Work No. _____
Cell No. _____
Email _____

Name _____
Work No. _____
Cell No. _____
Email _____

Name _____
Work No. _____
Cell No. _____
Email _____



Exhibit B – Rare Species Incident Reporting Form

Rare Species Observed

Common Name: _____ Scientific Name: _____
State Status: _____ Federal Status: _____
Town: _____ Site Name: _____

Location Information

Directions to the Observation Location: _____

Site Coordinates: Coord. Projection (circle one): UTM / Lat-Long / Mass. State Plane / Other (_____)

Source of Coordinates: (circle one) GPS / Google Earth / Other GIS System (_____)

Location Coordinates: X (Easting): _____ Y (Northing): _____

Incident Description

Was the incident project-related (Yes/No): _____

Date: _____ Time: _____ Notifications made: _____

Describe the incident: _____

If project-related, response taken or proposed to address incident and/or avoid reoccurrence: _____

Photographs

Description:	Description:

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