Weston & Sampson

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Buffer Zone Restoration & Enhancement Plan

February 2024

LITTLETON WATER SUPPLY CONNECTION

PREPARED FOR:
LITTLETON ELECTRIC LIGHT & WATER DEPARTMENT

SUBMITTED TO:
LITTLETON CONSERVATION COMMISSION

Buffer Zone Enhancement Plan
Littleton Well and Water Main Extension Project

Project Name: Littleton Well and Water Main Extension Project

Project Address: 153 Taylor Street, Littleton, MA

Application Prepared by: Weston & Sampson Engineers, Inc.

Overview

This Buffer Zone Enhancement Plan has been prepared for the Littleton Electric Light & Water Departments (LELWD) in support of the proposed Littleton Well and Water Main Extension Project (MassDEP File No. 204-0995). The proposed project involves the construction of a new water supply well to a water treatment plant in Littleton via a raw water transmission main, construction of a finished water main from the LELWD system, and construction of a new water main to bring treated water to the Town of Boxborough. The project area within Littleton, MA proposes approximately 58,931 square feet (s.f.) of impacts to the 100-foot buffer zone to Bordering Vegetated Wetlands (BVW). Portions of the project are also proposed within Bordering Land Subject to Flooding and the 200-foot Riverfront Area associated with Beaver Brook.

The project has been designed to minimize impacts to the maximum extent practicable. As such, tree clearing within forested areas is limited to the space needed to construct the gravel and paved access road, well site, and stormwater basin, with limited space for restoration plantings. The project proposes to remove 58 trees within the 100-foot buffer zone to facilitate construction.

To mitigate the impacts of the proposed tree removals, LELWD proposes to restore and enhance the habitat through targeted tree and shrub plantings. Plantings are proposed in the open area next to the parking lot at the 151 Taylor Street property and proposed access road to enhance this edge habitat, as well as within the 100-foot buffer zone with plantings along the proposed access road. There is also opportunity to plant and restore an existing cleared access road within the forest.

Based on the field work completed, the existing forest is noted to be a White Pine-Oak forest type[1]. The applicant is proposing a diverse list of plantings, including both overstory and understory woody species and native seed mix, to enhance the habitat in this area for wildlife species that rely on pine-oak forests.

[1] Classification of Natural Communities of Massachusetts: White Pine – Oak Forest, NHESP, https://www.mass.gov/doc/white-pine-oak-forest/download

Specifically, the project proposes to enhance and restore approximately 28,700 s.f. with native plantings like those found in the surrounding area, 25,300 s.f. of which are within the 100-foot buffer zone. Proposed restoration efforts also include incorporating coarse woody debris and brush piles to enhance wildlife habitat on site.

Additional information describing the proposed plan is provided in the balance of this report. Refer to the Buffer Zone Enhancement Drawings in Appendix C for additional detail.

Existing Conditions at Buffer Zone Enhancement Sites

An existing access road in the woods is proposed to be restored. Additionally, plantings are proposed adjacent to the proposed access road, including along the existing tree line adjacent to an open field at the 151 Taylor Street property (refer to the drawings in Appendix C and the graphic in Appendix A for more information).

The existing access road is approximately 10 feet wide and borders BVW Series A along its southern edge. Photos of the access road are included in Appendix B. The access road is cleared of vegetation. Vegetation immediately adjacent to the access road consists of species typical of a White Pine-Oak Forest[2], including Eastern white pine (*Pinus strobus*), Northern red oak (*Quercus rubra*), black oak (*Quercus velutina*), white oak (*Quercus alba*), and quaking aspen (*Populus tremuloides*). Vegetation in the sapling and shrub layers included red oak, white pine, and highbush blueberry (*Vaccinium corymbosum*).

The proposed access road and raw water main will travel through an easement located on the 151 Taylor Street property, adjacent to a parking lot owned by the adjacent Amazon facility. The proposed access road and raw water main will be installed in an open grassed area south and west of the parking lot. Photos of this area are provided in Appendix B. This area currently contains herbaceous species including grass species (*Poa* spp.), common mullein (*Verbascum thapsus)*, and goldenrods (*Solidago* spp.).

According to the NRCS Soil Survey, soils within both areas are mapped as Udorthents, sandy. Soil profiles observed at the proposed well site included loamy sand topsoil with a fine sand subsoil.

Buffer Zone Restoration and Enhancement Plan

To enhance wildlife habitat value within the 100-foot buffer zone adjacent to the project, the LELWD proposes to plant a combination of native trees and shrubs along with a restoration seed mix within the existing access road, adjacent to the proposed well site, and along the proposed gravel access road between the parking lot and the forest. The locations of the buffer zone restoration and enhancement areas are depicted on the plans in Appendix C. In total, 25,300 square feet of the 100-foot buffer zone will be planted.

[2] From *Classification of Natural Communities of Massachusetts*, Natural Heritage & Endangered Species Program. https://www.mass.gov/doc/white-pine-oak-forest/download

According to the Massachusetts Natural Heritage & Endangered Species Program's *Classification of Natural Communities of Massachusetts*, White Pine-Oak Forests provide habitat for many generalist wildlife species. They provide tree cavity den sites for a variety of bird and mammal species, and coarse woody debris which is used by various amphibians, reptiles, and invertebrates. Oak acorns provide an important source of food for many wildlife species.

The goal of the restoration areas is to enhance the value of these areas for wildlife, particularly for species likely to use the upland forest edge habitat. Part of the existing access road proposed for planting is adjacent to a forested wetland that may support reptile and amphibian species. The area is within NHESP-mapped habitat for species including the blue-spotted salamander (*Ambystoma laterale*) and Blanding's turtle (*Emydoidea blandingii*). Thus, the goal is to enhance this area, which is currently a sparse access road. Planted shrubs and coarse woody debris will provide food, cover, and perching habitat for a variety of wildlife species.

One main goal of this restoration plan is to focus on species diversity to enhance resiliency. Although space on the site is limited, the plan focuses on creating more forest edge habitat and enhancing the wildlife habitat value of the existing access road by restoring it. The proposed planting areas will consist of a variety of native tree and shrub species that have been selected based on their habitat value and suitability for this site. By planting a diverse array of species and seeding a native seed mix to enhance the understory, the project will contribute to the overall health and vigor of the ecosystem and strengthen its ability to adapt to changing environmental conditions, promoting long-term sustainability.

A planting table for the buffer zone restoration and enhancement areas is provided below. The topsoil in the proposed planting areas will be rototilled, supplemented with loam, and planted. The native plants will be installed in clusters to mimic a natural environment. A qualified wetland scientist or arborist will oversee the restoration work and will provide direction on where to install the plantings based on field conditions.

Table 1-1 Restoration and Enhancement Area Plantings

Species	Plant Size	Plant Quantity[3]	Planting Notes
Red Oak (*Quercus rubra*)	2-3" caliper saplings, bare root or 20 gallon min.	10	Red oak provides good cover for mammal and bird species and nesting sites for songbirds. Deer browse the leaves, and acorns are eaten by a variety of mammals. Adds important leaf litter.
Black Oak (*Quercus velutina*)	2-3" caliper saplings, bare root or 20 gallon min.	8	Black oak provides cover for mammal and bird species and nesting sites for songbirds. Acorns provide a food source for numerous species including small mammals, deer, and wild turkey.
Eastern White Pine (*Pinus strobus*)	2-3" caliper saplings, bare root or 20 gallon min.	8	Songbirds and small mammals eat eastern white pine seeds. Deer and rabbits browse the foliage. Several mammal species feed on the bark.
White Birch (*Betula papyrifera*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Some small mammals eat the twigs and bark. Birds feed on the catkins.
American Hop-Hornbeam (*Ostrya virginiana*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Excellent pollinator habitat. Nutlets are eaten by songbirds, turkeys, and small mammals.
Red Maple (*Acer rubrum*)	2-3" caliper saplings, bare root or 20 gallon min.	8	Red maple flowers early in the spring. The leaves and shoots are browsed by deer. Rodents feed on the fruits. Adds important leaf litter.
Sugar Maple (*Acer saccharum*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Deer, porcupine, and rodents eat the bark, twigs, or fruit. Songbirds and woodpeckers nest in the branches.
	Tree Total	*52*	
Highbush Blueberry (*Vaccinium corymbosum*)	2-3'	17	Berries provide a food source for birds and small mammals. Foliage is browsed by deer and rabbits. Plant attracts many pollinators.
Sweet Pepperbush (*Clethra alnifolia*)	2-3'	20	A medium-sized shrub found in coastal and inland wetlands. Sweet-smelling flowers in July. Provides food and cover for birds.

[3] Assumes an average plant spacing of 20-feet on center for tree species and 10-feet on center for shrub species.

Maple-leaved Viburnum (*Viburnum acerifolium*)	2-3'	30	Deer, rabbits, and beavers eat the twigs, bark and leaves.
American Witch Hazel (*Hamamelis virginiana*)	2-3'	35	Fruit is eaten by deer and rabbits.
Black Chokeberry (*Aronia melanocarpa*)	2-3'	20	Host plant for pollinators. Provides shelter and nesting sites for birds. Browsed by deer and rabbits.
	Shrub Total	*122*	
New England Conservation/Wildlife Seed Mix[4]			The New England Conservation/Wildlife Mix™ (or equivalent) contains a variety of grasses, wildflowers, and legumes. This seed mix enhances wildlife habitat value.
New England Logging Road Mix[5] (for use within the former access road)			The New England Logging Road Seed Mix™ provides native plant cover in low fertility and compacted soils.

Only plant materials native and indigenous to the region should be used. The restoration areas should be sown with a conservation seed mix (see Table 1-1 above) and covered with a light mulch of weed free straw, particularly if planted during the summer months. The woody plants should be surrounded with an approximately 3-foot diameter ring of woody mulch to a depth of approximately 2 inches or biodegradable plastic or fiber (which should be stapled or staked to the ground), to reduce the threat of competition from herbaceous species during the first growing season.

Miscellaneous Planting Requirements:

1. The wetland specialist (WS) or arborist may propose substitutions relative to species, size, and quantities if there is limited availability of plant stock at the time of planting. All plant material shall be purchased from a New England nursery and guaranteed by the site contractor to be in vigorous growing condition.

2. Insofar as it is practicable, plant material shall be planted on the day of delivery. In the event that this is not practicable, the site contractor shall protect, and water stock

[4] New England Conservation/Wildlife Mix: Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus*/*Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

[5] Red Fescue (*Festuca rubra*), Little Bluestem (*Schizachyrium scoparium*), Switch Grass (*Panicum virgatum*), Virginia Wild Rye (*Elymus virginicus*), Big Bluestem (*Andropogon gerardii*), Indian Grass (*Sorghastrum nutans*), Partridge Pea (*Chamaecrista fasciculata*), Soft Rush (*Juncus effusus*), Path Rush (*Juncus tenuis*), Upland Bentgrass (*Agrostis perennans*)

not planted in consultation with the WS and nursery. Plants shall not remain unplanted for longer than a 3-day period after delivery to the site. Any plants not installed during this 3-day period may be rejected by the WS.

3. Quality and size of plants and spread of roots shall be in accordance with ANSI 260 (REV.1980) "American Standard for Nursery Stock" as published by the American Association of Nurserymen, Inc.

4. All plants shall be planted in transported topsoil that is thoroughly watered. Raise and replant any plant which settles more than 2 inches after planting and watering.

5. Plants shall not be bound with wire or rope at any time to damage the bark or break branches. Plants shall be handled from the bottom of container only.

6. Planting operations shall be performed during periods within the planting season when weather and soil conditions are suitable as determined by the supervising WS. This is typically between April 15 and June 15 and September 15 and November 15. Plants shall not be installed in topsoil that is muddy or frozen. The site contractor shall be responsible for re-setting any plants that become dislodged or uprooted because of frost heaves or other environmental factors during the first two growing seasons.

7. Set all plants plumb and straight. Located plant in the center of the pit.

8. The seed mixes shall be sown according to the manufacturer's recommendations and specifications.

9. Contractor will be responsible for tree maintenance for one year after planting. Any tree that is dead after one year shall be replaced by the contractor, free of charge.

10. Planted trees shall receive protection from deer and rodent browse through a trunk wrap or similar.

Approximately 5% of the restoration area shall be covered in coarse woody debris consisting of tree branches or logs that will provide cover for amphibians, snakes, and small mammals. Three to five brush piles shall be placed in the buffer zone restoration areas for the same purpose.

Monitoring Plan

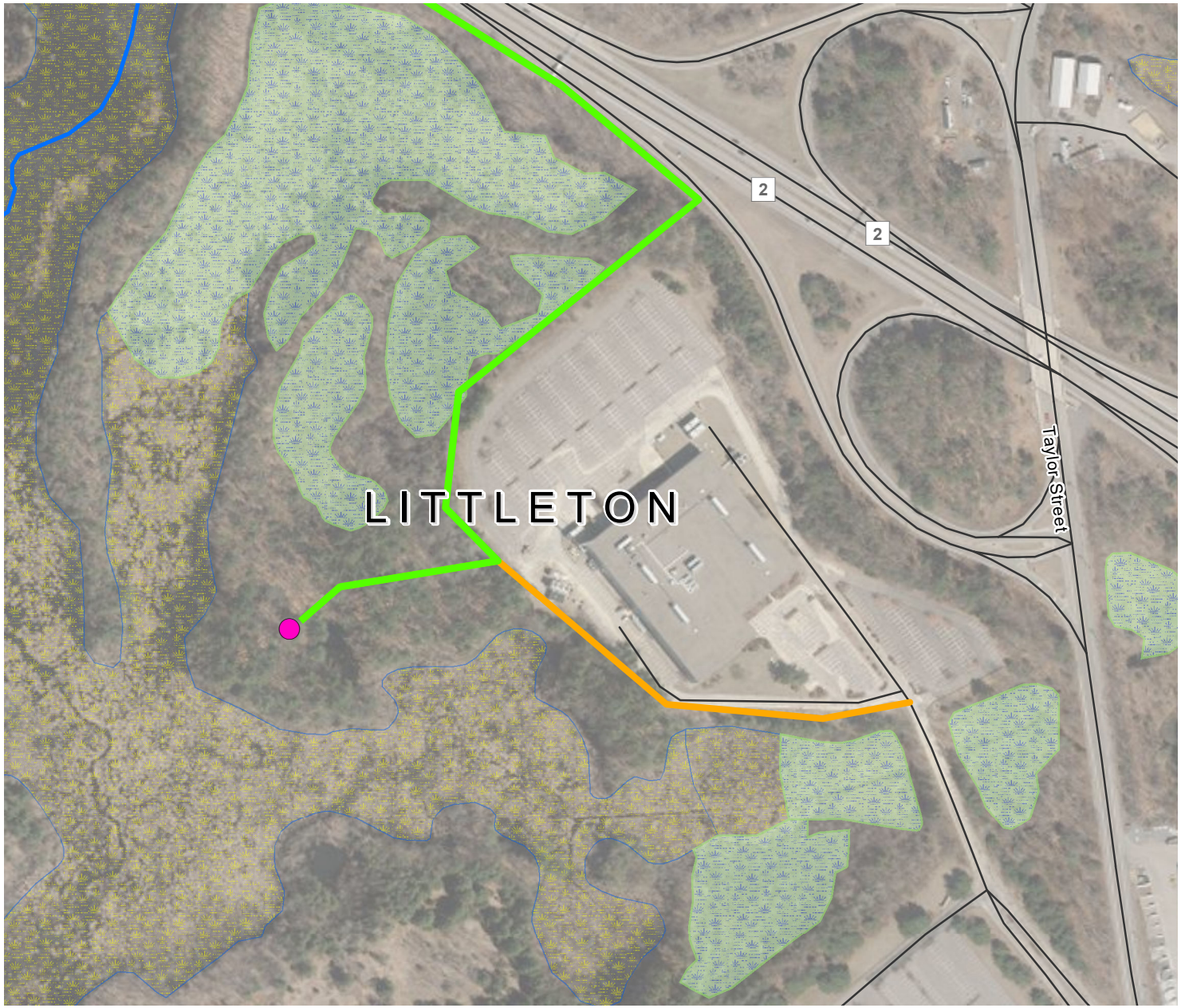
The buffer zone restoration and enhancement areas will be monitored twice per year (spring and fall) for two growing seasons by a qualified WS. The plantings will be monitored, the germination of the seed mix will be documented, and observed wildlife activity and usage will be documented. The annual reports will be submitted to the Littleton Conservation

Commission no later than December 31 of each year and will include results from the spring and fall inspections.

APPENDIX A

PROJECT SITE AERIAL LOCUS MAP

Path: P:\MA\Littleton MA\Digital Property New Source Approval\008 Permitting\NOI Littleton\Appendix D maps\littletonwellsitemap.mxd **User:** Sommers.Rhianna **Saved:** 2/1/2024 2:46:31 PM **Opened:** 2/1/2024 2:46:45 PM



Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

- Well Site
- Finish Extension
- Raw Extension
- Access Road
- Perennial Stream
- Intermittent Stream
- Marsh/Bog
- Wooded marsh
- Cranberry Bog
- Salt Marsh
- Open Water
- Reservoir (with PWSID)
- Tidal Flats
- Beach/Dune

FIGURE 1

New Well Source and Raw Water Main

Littleton , MA

Weston & Sampson

APPENDIX B
SITE PHOTOGRAPHS

Photo 1: View of proposed planting area along the proposed access road easement.

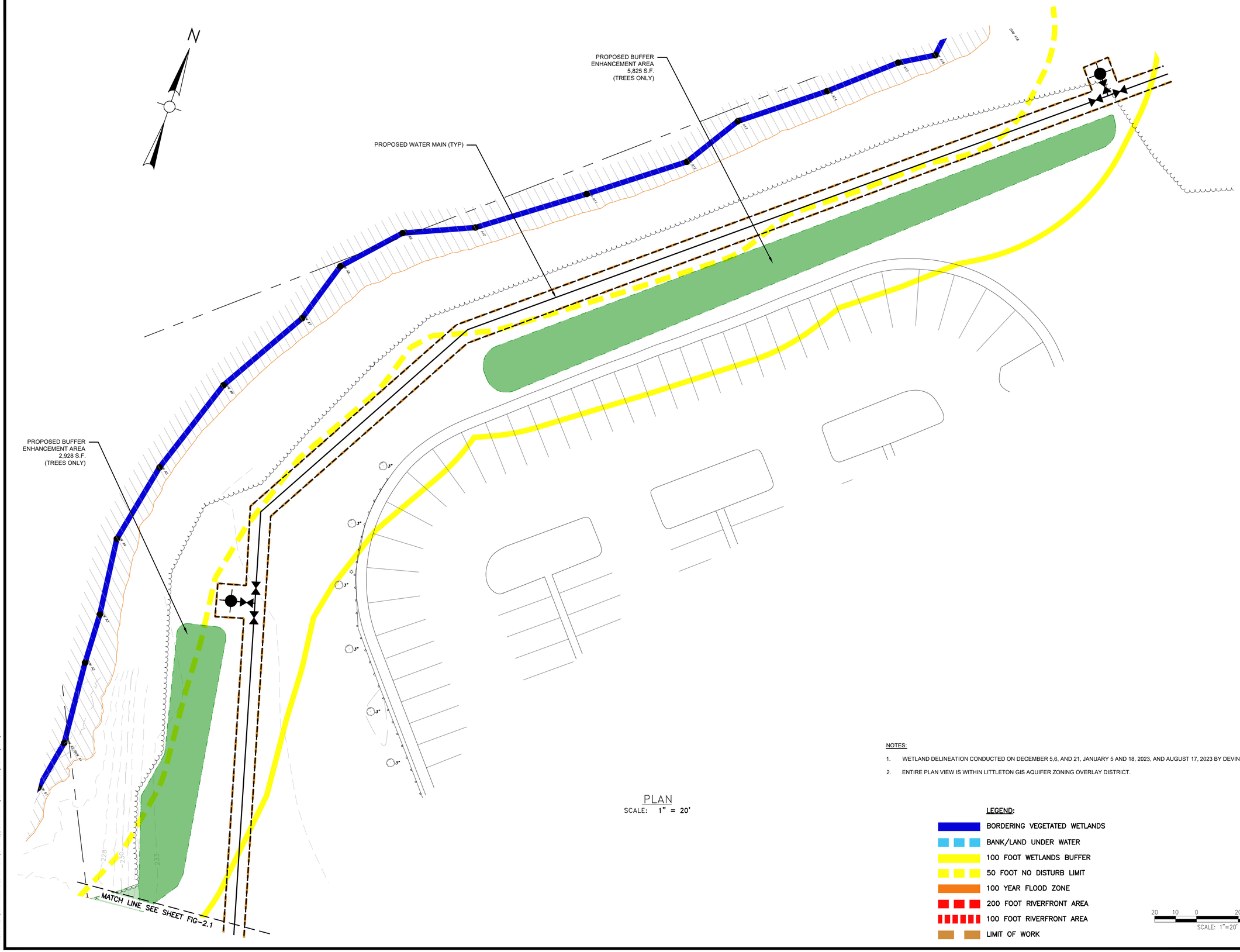
Photo 2: View of existing access road where restoration is proposed.

Photo 3: View of area of proposed gravel access road and proposed well building. Plantings are proposed north of this area.

Photo 4: Another view of the existing access road which is proposed to be restored and planted.

Photo 5: View of existing conditions along the existing access road. Forest is dominated by white pine and oak species.

APPENDIX C
BUFFER ZONE PLANTING PLAN DRAWINGS



PLAN
SCALE: 1" = 20'

NOTES:

1. WETLAND DELINEATION CONDUCTED ON DECEMBER 5,6, AND 21, JANUARY 5 AND 18, 2023, AND AUGUST 17, 2023 BY DEVIN HERRICK, CWS.
2. ENTIRE PLAN VIEW IS WITHIN LITTLETON GIS AQUIFER ZONING OVERLAY DISTRICT.

LEGEND:

- BORDERING VEGETATED WETLANDS
- BANK/LAND UNDER WATER
- 100 FOOT WETLANDS BUFFER
- 50 FOOT NO DISTURB LIMIT
- 100 YEAR FLOOD ZONE
- 200 FOOT RIVERFRONT AREA
- 100 FOOT RIVERFRONT AREA
- LIMIT OF WORK

20 10 0 20 40
SCALE: 1"=20'

Project:
LITTLETON WATER DEPARTMENT

LITTLETON LELWD ELECTRIC LIGHT & WATER DEPARTMENTS

TAYLOR STREET WELL AND RAW WATER MAIN
TOWN CONTRACT NO. IFB-2024
DWSRF NO. 12397
CONTRACT NO.1

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

Issued For:
PERMITTING

Scale: AS NOTED

Date: JANUARY 2024
Drawn By: GJK
Reviewed By: BAR
Approved By: TEM

W&S Project No.: ENG23-0679
W&S File No.:

Drawing Title:
PLANTING PLAN

Sheet Number:
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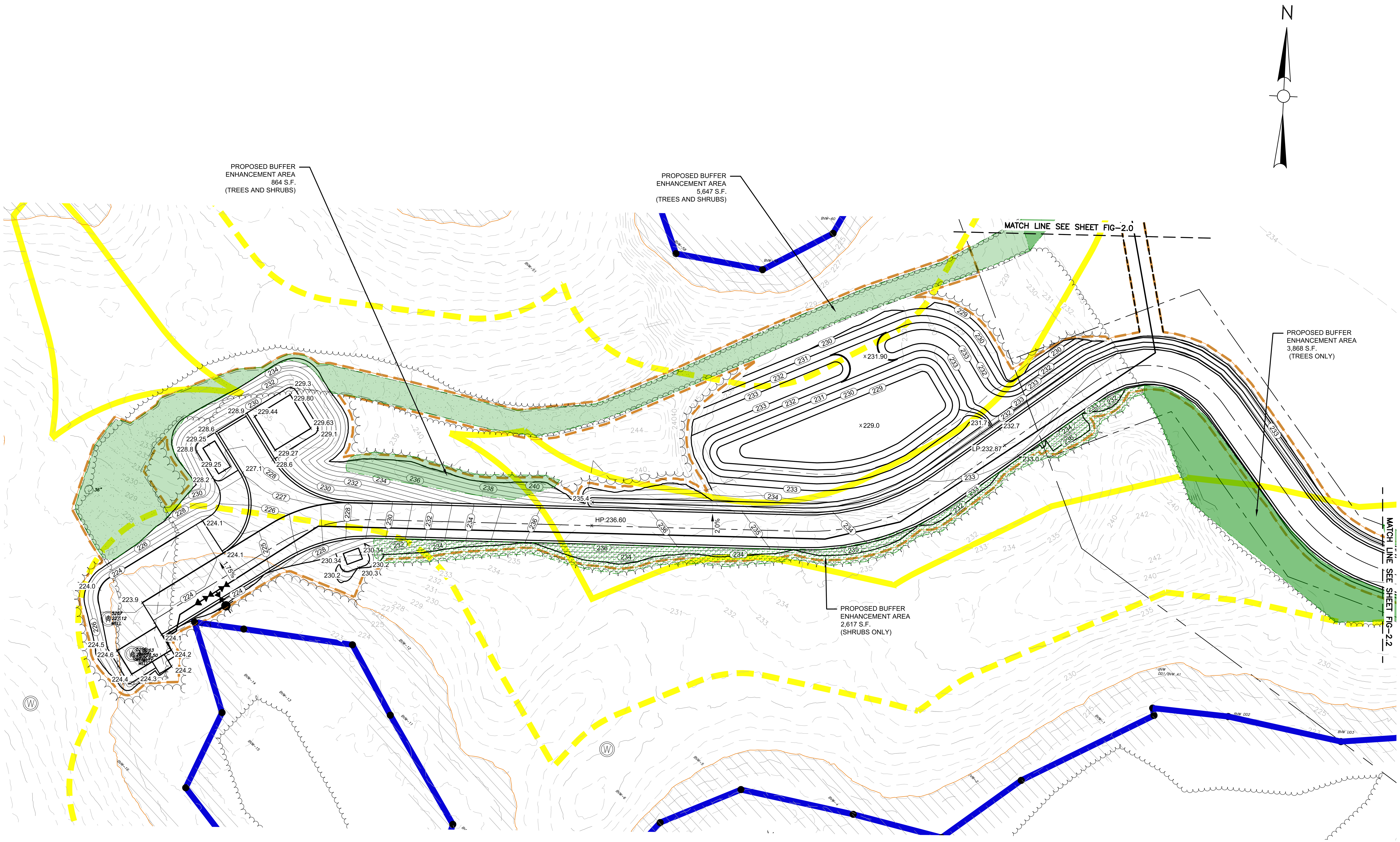

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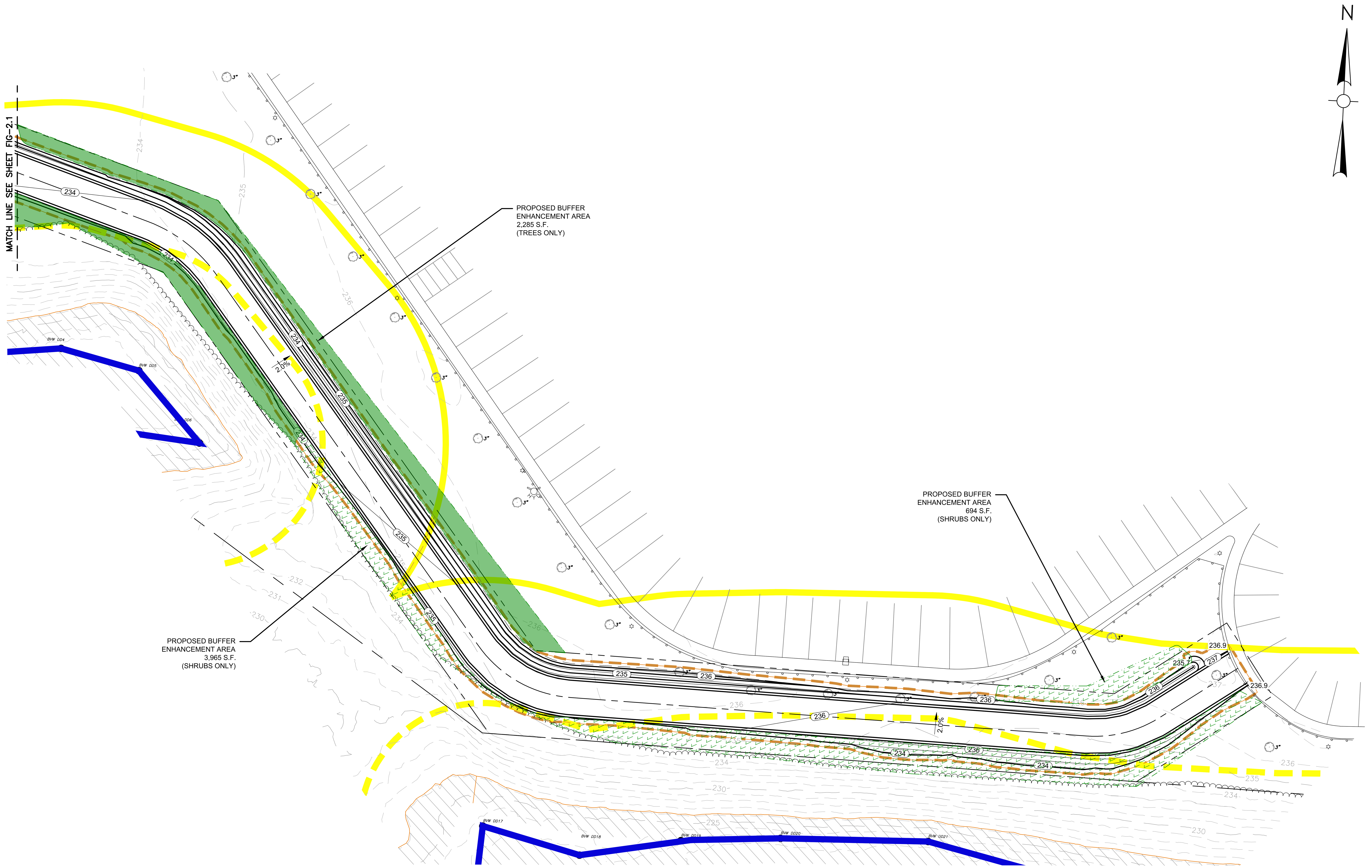

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SCALE: 1" = 20'

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Approved By: TEM
W&S Project No.: ENG23-0679
W&S File No.:

Drawing Title:
PLANTING PLAN

Sheet Number:
FIG-2.2

Restoration and Enhancement Plantings

Species	Plant Size	Plant Quantity	Planting Notes
Red Oak (Quercus *rubra*)	2-3" caliper saplings, bare root or 20 gallon min.	10	Red oak provides good cover for mammal and bird species and nesting sites for songbirds. Deer browse the leaves, and acorns are eaten by a variety of mammals. Adds important leaf litter.
Black Oak (Quercus *velutina*)	2-3" caliper saplings, bare root or 20 gallon min.	8	Black oak provides cover for mammal and bird species and nesting sites for songbirds. Acorns provide a food source for numerous species including small mammals, deer, and wild turkey.
Eastern White Pine (Pinus strobus)	2-3" caliper saplings, bare root or 20 gallon min.	8	Songbirds and small mammals eat eastern white pine seeds. Deer and rabbits browse the foliage. Several mammal species feed on the bark.
White Birch (Betula *papyrifera*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Some small mammals eat the twigs and bark. Birds feed on the catkins.
American Hop-Hornbeam (Ostrya *virginiana*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Excellent pollinator habitat. Nutlets are eaten by songbirds, turkeys, and small mammals.
Red Maple (Acer *rubrum*)	2-3" caliper saplings, bare root or 20 gallon min.	8	Red maple flowers early in the spring. The leaves and shoots are browsed by deer. Rodents feed on the fruits. Adds important leaf litter.
Sugar Maple (Acer *saccharum*)	2-3" caliper saplings, bare root or 20 gallon min.	6	Deer, porcupine, and rodents eat the bark, twigs, or fruit. Songbirds and woodpeckers nest in the branches.
	Tree Total	*52*	
Highbush Blueberry (Vaccinium *corymbosum*)	2-3'	17	Berries provide a food source for birds and small mammals. Foliage is browsed by deer and rabbits. Plant attracts many pollinators.
Sweet Pepperbush (Clethra alnifolia)	2-3'	20	A medium-sized shrub found in coastal and inland wetlands. Sweet-smelling flowers in July. Provides food and cover for birds.
Maple-leaved Viburnum (Viburnum *acerifolium*)	2-3'	30	Deer, rabbits, and beavers eat the twigs, bark and leaves.
American Witch Hazel (Hamamelis *virginiana*)	2-3'	35	Fruit is eaten by deer and rabbits.
Black Chokeberry (Aronia *melanocarpa*)	2-3'	20	Host plant for pollinators. Provides shelter and nesting sites for birds. Browsed by deer and rabbits.
	Shrub Total	*122*	
New England Conservation/Wildlife Seed Mix			The New England Conservation/Wildlife MixTM (or equivalent) contains a variety of grasses, wildflowers, and legumes. This seed mix enhances wildlife habitat value.
New England Logging Road Mix (for use within the former access road)			The New England Logging Road Seed MixTM provides native plant cover in low fertility and compacted soils.

NEW ENGLAND WETLAND PLANTS, INC

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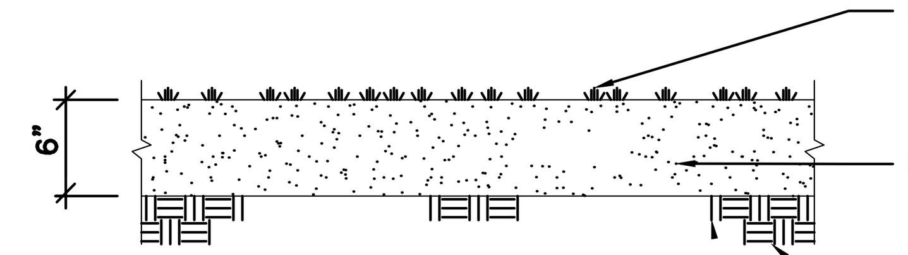
New England Logging Road Mix

Botanical Name	Common Name	Indicator
Festuca rubra	Red Fescue	FACU
Schizachyrium scoparium	Little Bluestem	FACU
Panicum virgatum	Switch Grass	FAC
Elymus virginicus	Virginia Wild Rye	FACW-Andropogon
gerardii	Big Bluestem	FAC
Sorghastrum nutans	Indian Grass	UPL
Chamaecrista fasciculata	Partridge Pea	FACU
Agrostis perennans	Upland Bentgrass	FACU
Juncus tenuis	Path Rush	FAC
Juncus effusus	Soft Rush	FACW+

PRICE PER LB. $26.00 MIN. QUANITY 3LBS.TOTAL: $78.00 APPLY: 20 LBS/ACRE :2200 sq ft/lb

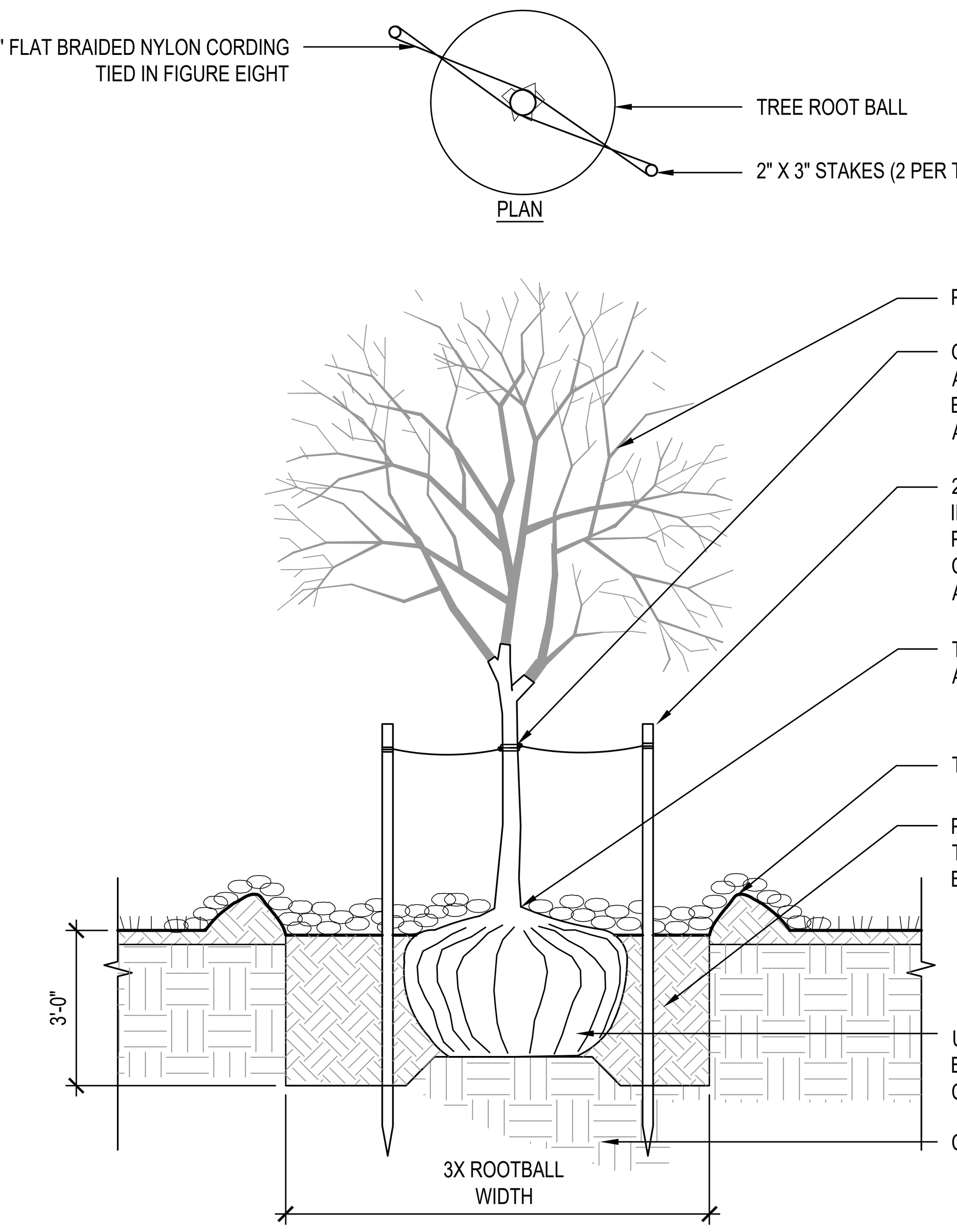
The New England Logging Road Seed Mix was originally designed for restoring Maine logging roads, but has application on other types of restoration sites. Provides native plant cover in low fertility and compacted soils. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a Spring or late Summer seeding. Late Spring and early Summer seeding will benefit from a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering may be required. Late Fall and Winter dormant seeding require an increase in the seeding rate. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free soil surface is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.



LOAM & SEED

SECTION NO SCALE



TREE STAKING & PLANTING

PLAN & SECTION NO SCALE

NEW ENGLAND WETLAND PLANTS, INC

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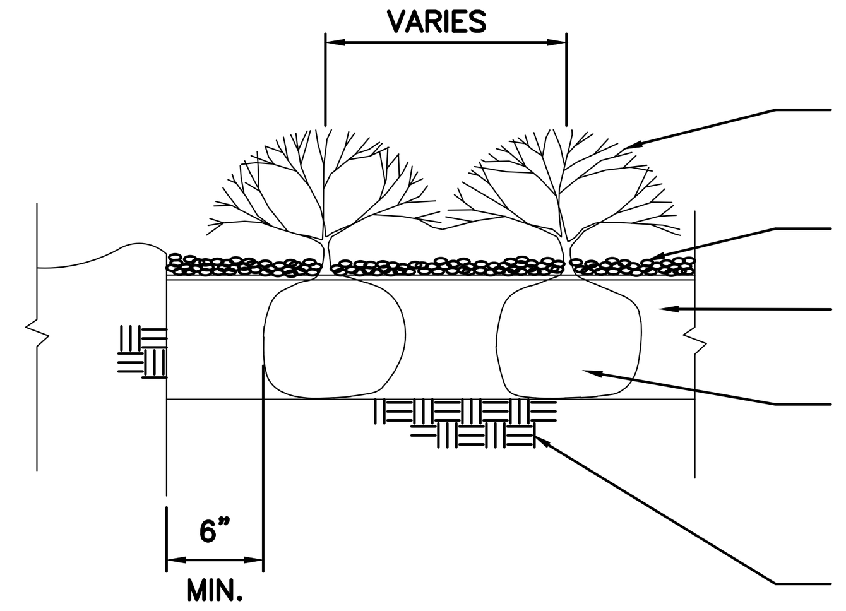
New England Conservation/Wildlife Mix

Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-Schizachyrium
scoparium	Little Bluestem	FACU
Andropogon gerardii	Big Bluestem	FAC
Festuca rubra	Red Fescue	FACU
Sorghastrum nutans	Indian Grass	UPL
Panicum virgatum	Switch Grass	FAC
Chamaecrista fasciculata	Partridge Pea	FACU
Desmodium canadense	Showy Tick Trefoil	FAC
Asclepias tuberosa	Butterfly Milkweed	NI
Bidens frondosa	Beggar Ticks	FACW
Eupatorium purpureum (Eutrochium maculatum)	Purple Joe Pye Weed	FAC
Rudbeckia hirta	Black Eyed Susan	FACU-Aster
pilosus (Symphyotrichum pilosum)	Heath (or Hairy) Aster	UPL
Solidago juncea	Early Goldenrod	

PRICE PER LB. $39.50 MIN. QUANITY 2LBS. **TOTAL:** $79.00 APPLY: 25 LBS/ACRE :1750 sq ft/lb

The New England Conservation/Wildlife Mix provides a permanent cover of grasses, wildflowers, and legumes For both good erosion control and wildlife habitat value. The mix is designed to be a no maintenance seeding, and is appropriate for cut and fill slopes, detention basin side slopes, and disturbed areas adjacent to commercial and residential projects.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.



SHRUB PLANTING

SECTION NO SCALE

Project:

LITTLETON WATER DEPARTMENT

LITTLETON LELWD ELECTRIC LIGHT & WATER DEPARTMENTS

TAYLOR STREET WELL AND RAW WATER MAIN
TOWN CONTRACT NO. IFB-2024
DWSRF NO. 12397
CONTRACT NO.1

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FIG-2.3