NORMANDEAU ASSOCIATES
Environmental Consultants

Natural Resources Impact Compensation Plan
Nordic Aquafarms Aquaculture Facility
285 Northport Avenue
Belfast, Maine

Prepared For
Ransom Consulting Engineers and Scientists
400 Commercial Street
Suite 404
Portland, Maine 04101

Submitted By
Normandeau Associates, Inc.
501 Forest Avenue
Suite 201
Portland, Maine 04101
(207) 518-6765
www.normandeau.com

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1.0 Introduction

The proposed Nordic Aquafarms Aquaculture facility represents impacts to wetlands and streams that require compensation. Compensation is proposed, to the extent feasible, within the project site. This includes restore in place temporary impacts and, compensation for some permanent impacts. Where on-site compensation does not fully represent the impacts, additional compensation is proposed as participation in the in-lieu-fee program. This report outlines the complete compensation proposal to address impacts resulting from the construction of the Nordic Aquafarms Aquaculture facility. Appendix A includes Normandeau information and Bios of experienced personnel to illustrate sufficient scientific expertise to carry out the proposed on-site compensation work.

2.0 Impact Discussion

The natural resources under the jurisdiction of the Natural Resource Protection Act (NRPA) are shown on Figure 1. Impacts to these resources resulting from the project are shown on Figure 2. Impacts are discussed based on the type of resource, the specific functions and values of the resource and the amount and type of impact to each individual resource identified within the project footprint.

2.1 Wetlands

A total of 17 wetlands were identified on site (Figure 1). Of these, nine wetlands meet the criteria for freshwater wetlands of special significance (WOSS) under the Natural Resources Protection Act (NRPA): W7, W8, W9, W10, W11, W12, W16, W17, and W18. Eight wetlands do not meet such criteria. Each wetland was classified in accordance with Cowardin, *et.al.* [1] and assessed using the Army Corps of Engineers Highway Methodology[2]. A summary of the wetlands classification and functions and values are presented in Table 1.

[1] Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service: Washington, D.C.

[2] The Highway Methodology Workbook, Supplement, NAEEP-360-1-30a, September 1999

Table 1. Summary of Palustrine and Estuarine Wetlands Identified on Site

Wetland ID	Cowardin Class	Groundwater Recharge/Discharge	Floodflow Alteration	Fish/Shellfish Habitat	Sediment/Toxicant Retention	Nutrient Removal	Sediment/Shoreline Stabilization	Production Export	Wildlife Habitat	Recreation	Educate/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Endangered/Threatened Species Habitat	Wetland Description
W1	PFO	X	P	-	-	-	X	X	X	-	-	-	-	-	Coniferous overstory, highly invaded by buckthorn
W2	PFO	X	X	-	-	-	-	-	X	-	-	-	-	-	Deciduous dominated, drains off-site
W3	PFO	-	-	-	-	-	-	X	-	-	-	-	-	-	Small, marginal swale, drains into ephemeral gully off survey area
W4	PFO	X	-	-	-	-	-	-	-	-	-	-	-	-	Isolated pocket, area of standing water
W5	PSS	X	P	-	-	-	-	X	P	-	-	-	X	-	Old field, disturbed but high plant diversity, good shrub habitat for wildlife
W6	PFO	-	P	-	X	-	X	P	X	-	-	-	-	-	Stream S7 braids through this area, wetland is broad and saturated prior to roadway
*W7	PFO	-	X	-	X	X	X	P	X	-	-	-	-	-	Wetland area around stream S8
*W8	PFO	-	X	-	-	-	P	X	-	-	-	-	X	-	Floodplain wetland associated with stream S9
*W9	PFO	-	X	-	-	-	P	X	-	-	-	-	-	-	Small floodplain wetland
*W10	PSS	X	X	-	-	-	X	-	-	-	-	-	-	-	Narrow fringe on stream S8, surrounded by development
*W11	E2EM/ M2US	-	-	X	-	-	P	-	X	-	-	-	X	-	Saltmarsh and cobble beach at mouth of stream S8
*W12	PSS	X	X	-	-	-	X	-	-	-	-	-	-	-	Narrow fringe on stream S8, surrounded by development
W13	PEM	X	-	-	-	-	-	-	-	-	-	-	-	-	Small emergent wetland along edge of field
W15	PEM	X	-	-	-	-	-	-	-	-	-	-	-	-	Small wet meadow
*W16	PSS	X	X	-	-	-	X	-	-	-	-	-	-	-	Floodplain along stream S9
*W17	PSS	X	X	-	-	-	X	-	-	-	-	-	-	-	Narrow wetland fringe along stream S9
*W18	PSS	X	X	-	-	-	X	-	-	-	-	-	-	-	Narrow wetland fringe along stream S9

*= WOSS, Functional Assessment Qualitative Assessment Categories: P=Principal Function/Value; X=Suitable Function/Value.
Cowardin Class: PSS = Palustrine (freshwater) Scrub-Shrub; PFO = Palustrine Forested

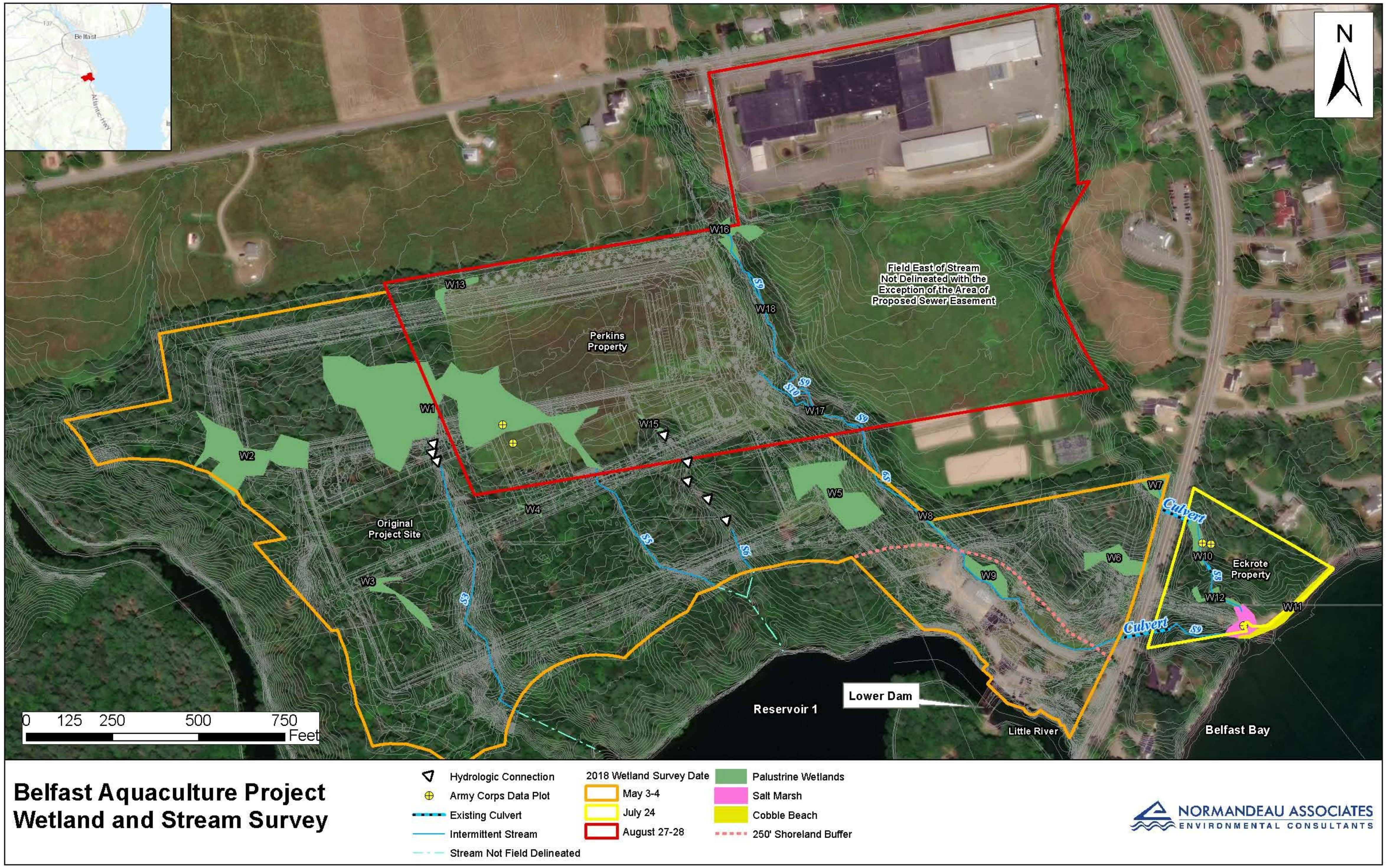
N
Field East of Stream Not Delineated with the Exception of the Area of Proposed Sewer Easement
Perkins Property
Original Project Site
Eckrote Property
Culvert
Lower Dam
Reservoir 1
Little River
Belfast Bay
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
W11
W12
W13
W15
W16
W17
W18
0 125 250 500 750 Feet
Belfast Aquaculture Project
Wetland and Stream Survey
Hydrologic Connection
Army Corps Data Plot
Existing Culvert
Intermittent Stream
Stream Not Field Delineated
2018 Wetland Survey Date
May 3-4
July 24
August 27-28
Palustrine Wetlands
Salt Marsh
Cobble Beach
250' Shoreland Buffer
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Figure 1.

2.1.1 Forested Wetlands

Wetlands W1, W2, and W3 are forested wetlands dominated by a mixture of deciduous and coniferous species, including red maple (*Acer rubrum*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), and red spruce (*Picea rubens*). Species such as the pine, spruce, and hemlock are not typically regarded as wetland species, however it is acknowledged that these species are known to be found in wetlands in the northeastern region. This site is largely composed of fine textured soils that restrict the infiltration of water and create wetland environments. This is exemplified by the roots of the white pine, red spruce, and hemlock in wetlands W1 and W2, which are at or near the surface of the soil. This limited rooting depth in response to a high water table is known as a morphological adaptation of upland plants to wetland soil, and is sufficient to meet wetland vegetation criteria for the purpose of wetland delineations. Additionally, the understory in these wetlands consisted of wetland species such as cinnamon fern (*Osmundastrum cinnamomeum*) and sensitive fern (*Onoclea sensibilis*). A large amount of the non-native invasive shrub glossy false buckthorn (*Frangula alnus*) was present throughout W1, limiting the value of this wetland. Wetland W1 also extends into the adjacent hayfield on the Perkins Avenue parcel. This portion of the wetland is dominated by bluejoint (*Calamagrostis canadensis*) with numerous other common weedy field species present, including red clover (*Trifolium pretense*) and cow vetch (*Viccia cracca*).

Wetland W4 is an isolated depression in an oak dominated forest. There is evidence of standing water, and the understory is generally sparse and dominated by various sedges (*Carex* spp.) that were unidentifiable to species due to the early season survey. This wetland is marginal and possesses no discernible surface water outlet.

Wetlands W6, W7, W8, and W9 are all associated with watercourses. These wetlands receive additional flow during periods of seasonal high water, and likely during major storm events as well. W8 and W9 are along the same stream and are of similar character. The understory is dominated by herbs such as American trout-lily (*Erythronium americanum*) and cinnamon fern. The overstory of these wetlands often contains black ash (*Fraxinus nigra*), a frequent floodplain species, as well as green ash (*Fraxinus pennsylvanica*), black cherry (*Prunus serotina*), speckled alder (*Alnus incana* ssp. *rugosa*), and red maple. Wetland W7 is the most highly degraded by disturbance due to proximity to the road and a nearby residence, whereas W9 is generally undisturbed. Wetlands W7, W8, and W9 are considered WOSS under NRPA.

Wetlands W10 and W12 are palustrine forested wetlands separated by a driveway, but hydrologically connected by an intermittent stream. These wetlands are similar in character and lie on a narrow terrace at the bottom of a deeply incised ravine. Given their small size, these wetlands contain a relatively low diversity of plants, but are dominated by black elderberry (*Sambucus canadensis*), green ash (*Fraxinus pennsylvanica*), and speckled alder (*Alnus incana*) with an understory of sensitive fern (*Onoclea sensibilis*), spotted touch-me-not (*Impatiens capensis*), and cinnamon fern (*Osmunda cinnamomea*). These wetlands are moderately disturbed on account of the adjacent road and driveway. Due to their proximity to the ocean and association with an intermittent stream, they are WOSS under NRPA.

2.1.1 Wet Meadows

Wetland W5 is a portion of an old field. The water table in this area is at or near the surface, likely due to repeated disturbance and compaction associated with maintaining the field. The wetland is

dominated by meadowsweet (*Spiraea alba* var. *latifolia*), with various herbs such as common wrinkle-leaved goldenrod (*Solidago rugosa* ssp. *rugosa*), sensitive fern, and common grass-leaved-goldenrod (*Euthamia graminifolia*) intermixed.

Wetlands W13 and W15 (W14 = W1) are small wet meadow (PEM1) depressions. These wetlands are relatively limited in function due to the short hydroperiod and low diversity of wetland plants.

2.1.2 Scrub Shrub Wetlands

Wetlands 16, 17, and 18 are narrow fringes to stream S9, collectively occupying less than one tenth of an acre. These wetlands are classified as palustrine scrub-shrub (PSS1) wetlands and are dominated by speckled alder (*Alnus incana*) in the shrub layer and spotted touch-me-not (*Impatiens capensis*) in the herb layer. These wetlands provide some flood storage and shoreline stabilization due to the proximity to the intermittent stream (S9). Their location along the stream results in their classification as WOSS under NRPA.

2.1.3 Estuarine/Marine Wetlands

Wetland W11 is a salt marsh and cobble beach. The salt marsh area is relatively small and limited to the mouth of a stream (S8). It is dominated primarily by black rush (*Juncus gerardi*) at higher elevations and smooth cordgrass (*Spartina alterniflora*) at lower elevations. The adjacent cobble beach is dominated by a firm sand and cobble substrate with little to no vegetation.

2.1.4 Permanent Wetland Impacts

The proposed project will result in direct alteration of 4.01 acres (174,713 sq. ft.) of wetland (Tables 2 & 3). Freshwater Wetlands W1, W2, W3, W4, W5, W6, W13, and W15 will be directly impacted by the proposed project. None of the directly impacted freshwater wetlands meet the criteria for a wetland of special significance with the exception of W16, which will be temporarily impacted to install a sewer force main.

Wetlands W1, W3, W4, W13, and W15 will be completely filled by the Project. As a result, these wetlands will no longer perform the assessed wetland functions and values. Wetland W2 will also have a significant (approximately 66%) reduction in area as a result of the project, but the impacted wetland will continue to perform the identified functions and values proportional to its reduced size. Wetland W5 will have a 75% reduction in area as a result of the project and will still be suitable for floodflow alteration and wildlife habitat but no longer will do so in a principal manner. This wetland will no longer be suitable for the visual quality value. Wetland W6 will experience an approximately 66% reduction in size as a result of the project. This wetland will no longer perform floodflow alteration and production export principally but will generally continue to function proportionally to the available area. Impacts to wetlands have been considered in the development of the mitigation package.

Table 2. Permanent Impacts to Wetland Resources

Wetland ID	Permanent Impacts (Sq.Ft.)	Impact Characterization
W1	115,674	Direct, Fill
W2	24,612	Direct, Fill
W3	5,057	Direct, Fill
W4	692	Direct, Fill
W5	18,672	Direct, Fill
W6	3,120	Direct, Fill
W13	556	Direct, Fill
W15	708	Direct, Fill
Totals	169,091	

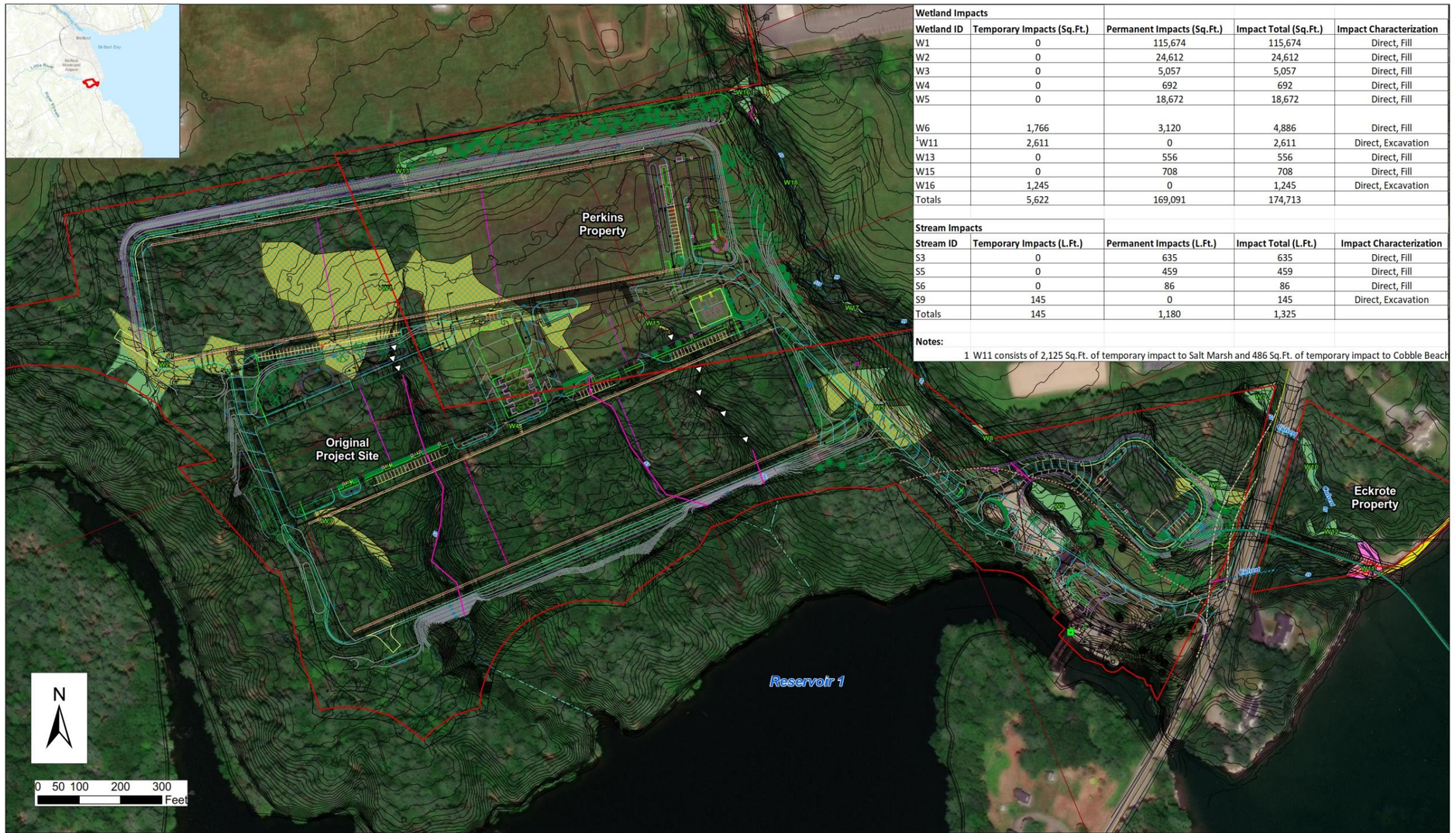
2.1.5 Temporary Wetland Impacts

There will also be direct, temporary impacts to wetland W6, W11 (a coastal wetland) and W16. The Route 1 By-Pass for the installation of the intake and discharge pipes will temporarily impact W6. The installation of the intake and discharge pipes will temporarily impact and W11. The sewer force main will temporarily impact W16 (Table 3). All temporary impacts are to be restored in place (Section 3.3).

Table 3. Temporary Impacts to Wetland Resources

Wetland ID	[1]Temporary Impacts (Sq.Ft.)	Impact Characterization
W6	1,766	Direct, Fill
[1]W11	2,611	Direct, Excavation
W16	1,245	Direct, Excavation
Total	5,622	

1 W11 consists of 2,125 Sq.Ft. of temporary impact to Salt Marsh and 486 Sq.Ft. of temporary impact to Cobble Beach



Wetland Impacts				
Wetland ID	**Temporary Impacts (Sq.Ft.)**	**Permanent Impacts (Sq.Ft.)**	**Impact Total (Sq.Ft.)**	**Impact Characterization**
W1	0	115,674	115,674	Direct, Fill
W2	0	24,612	24,612	Direct, Fill
W3	0	5,057	5,057	Direct, Fill
W4	0	692	692	Direct, Fill
W5	0	18,672	18,672	Direct, Fill
W6	1,766	3,120	4,886	Direct, Fill
[1]W11	2,611	0	2,611	Direct, Excavation
W13	0	556	556	Direct, Fill
W15	0	708	708	Direct, Fill
W16	1,245	0	1,245	Direct, Excavation
Totals	5,622	169,091	174,713	

Stream Impacts				
Stream ID	**Temporary Impacts (L.Ft.)**	**Permanent Impacts (L.Ft.)**	**Impact Total (L.Ft.)**	**Impact Characterization**
S3	0	635	635	Direct, Fill
S5	0	459	459	Direct, Fill
S6	0	86	86	Direct, Fill
S9	145	0	145	Direct, Excavation
Totals	145	1,180	1,325	

Notes:

1 W11 consists of 2,125 Sq.Ft. of temporary impact to Salt Marsh and 486 Sq.Ft. of temporary impact to Cobble Beach

Figure 2.

2.2 Streams

There are six NRPA regulated streams on the project site. All of the streams are narrow intermittent drainages that result from groundwater discharge during periods of seasonal high water tables and stormwater runoff from adjacent slopes. The surrounding landscape is predominately forested with the exception of the lower reaches of S9 where the area has been channelized and is mowed and maintained lawn. Stream 9 is the only stream that is significant enough to be depicted on the United States Geological Survey quadrangle. Due to the geology of the site the substrate is predominately sand/silt/clay with some cobbles. Each stream was characterized for flow regime, substrate, channel characteristics and functions (Table 4).

Table 4. Summary of Functions for Streams Identified on Site

Feature ID	Flow Regime	Flow Observations	Dominant Bed Composition	Average Width (feet)	Average Depth (inches)	Functions
S3	Intermittent	Low	Sand, silt	4	2	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
S5	Intermittent	Low	Silt, clay	4	2	Floodflow alteration
S6	Intermittent	Low	Silt, cobbles	3	2	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
S8	Intermittent	Moderate	Silt, clay	5	4	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
S9	Intermittent	Moderate	Silt, clay, cobbles	7	6	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
S10	Intermittent	Dry	Silt, clay	2	1	Floodflow Alteration

2.2.1 Permanent Stream Impacts

There will be a total of 1,180 linear feet of permanent impacts to streams S3, S5 and S6 within the project area (Table 5). The culvert crossing at S9 located between wetlands W8 and W9 will be constructed using a natural open bottom culvert design that will span the banks and effectively eliminate impacts to the stream and will not impair flow during storm events. To avoid impact to S9 for the roadway crossing, a crossing location was chosen approximately midway between wetlands W8 and W9 at a point where the stream channel is relatively narrow (average width = 6.67'). To accommodate 1.2 times bank-full width an approximately 65 foot long culvert is proposed. The culvert will be open-bottom and allow the existing stream profile to remain unaffected while avoiding constriction of the upstream floodplain.

The upper reaches of streams S3, S5, and S6 will be filled as a result of this project. Impacts to these streams will typically result in the loss of Groundwater Recharge/Discharge, Floodflow Alteration, and Wildlife Habitats in these locations. A drainage system design to route clean foundation water to the streams and drainages to the south of the project site will prevent the remaining streams areas that flow off site areas from drying up. Additionally, flows into these areas will be controlled via a weir system to prevent erosion.

Table 5. Permanent Impacts to Stream Resources

Stream ID	Permanent Impacts (L.Ft.)	Impact Characterization
S3	635	Direct, Fill
S5	459	Direct, Fill
S6	86	Direct, Fill
Totals	1,180	

2.2.2 Temporary Stream Impacts

Stream 9 will be temporarily impacted by the by-pass constructed along Route 1 (Table 6), the installation of the sewer force main, and construction of the open bottom culvert crossing located between wetlands W8 and W9. The permanent S9 open bottom culvert crossing has been designed to not impact the stream. The by-pass is being proposed during the installation of the intake and discharge pipes to reduce traffic congestion and address safety concerns. Once the discharge pipes are installed the by-pass will be removed and the stream will be restored in place. Similarly, once the sewer force main is installed the area will be restored.

Table 6. Temporary Impacts to Stream Resources

Stream ID	Temporary Impacts (L.Ft.)	Impact Characterization
S9	145	Direct, Temporary Culvert, and Excavation
Totals	145	

3.0 Impact Compensation

On-site impact compensation for impacts to streams includes a proposal for riparian restoration and deeded riparian buffer protection. Restore in place activities will compensate for temporary impacts to some degree. The balance of the compensation is in the form of participation in the in-lieu-fee program.

3.1 Riparian Restoration and Deeded Riparian Buffer

This section of the Natural Resource Impact Compensation Plan provides a description of the existing conditions along S9 and the specifications for planting the riparian restoration areas as well as providing details for the Deeded Riparian Buffer as shown in Appendix B.

3.1.1 Riparian Restoration

Nordic Aquafarms is proposing to revegetate areas along S9 that are currently either open or mowed and maintained grass areas. The Riparian Restoration Area is 2.17 acres in size. There are a series of small wetlands of special significance that fringe S9. Soils are predominately a silt loam. Hydrology is provided by seasonally high water tables and surface run off. Where vegetated, the existing riparian area along S9 is thickly vegetated with a variety of trees, shrubs and herbaceous plant species that include red maple (*Acer rubrum*), quaking aspen (*Populus tremuloides*), multiflora rose (*Rosa multiflora*), speckled alder (*Alnus incana*), black ask (*Fraxinus nigra*), red oak (*Quercus rubra*), paper birch (*Betula papyrifera*), meadowsweet (*Spiraea latifolia*), white pine (*Pinus strobus*), rough-stemmed goldenrod (*Solidago rugosa*), sensitive fern (*Onoclea sensibilis*) and, spotted touch-me-not (*Impatiens capensis*).

3.1.2 Deeded Riparian Buffer

Nordic Aquafarms is proposing to establish a deed restricted buffer along the intermittent stream designated as S9 (Figure 1). This deed restricted area is shown in Appendix B and encompasses 4.73 acres. The deed restricted buffer varies in width but is a minimum of 75 feet wide and as much as 150 feet in width. Portions of the riparian area are currently mowed and maintained lawn. Therefore, as part of the impact compensation package, specific portions of the riparian buffer will be restored with native plantings as previously described in Section 3.1.1 and as detailed in Appendix B. To ensure protection into perpetuity language will be developed, reviewed and, once acceptable to the MDEP, registered with the land.

3.2 Aquatic Passage Improvement

The corrugated pipe culverts that currently carries Stream S8 under the driveway on the property located at 282 Northport Road will be removed and replaced with an improved structure for aquatic passage. Existing conditions photos and culvert details are provided in Appendix C. This structure will have natural bottom consisting of a minimum of 12 inches of streambed material laid on the existing substrate. This material has been chosen to match existing material and will allow for natural stream channel development, maintaining aquatic connectivity up and down stream by preventing down cutting at either end of the culvert. This channel is expected to provide adequate habitat for stream-associated insects, which in turn creates suitable habitat for stream dwelling salamanders. The dimensions of the culvert will provide passage opportunities for a variety of small to medium wildlife species, such as frogs, weasels, fox, and racoon. The disturbed area at the outfall of the culvert will be restored with native vegetation, including a conservation seed mix and, and a mix of native shrubs (see Appendix B). To ensure this area is protected into perpetuity language will be developed, reviewed and, once acceptable to the MDEP, registered with the land.

3.3 Restore in Place Impacts

Impacts resulting from temporary construction activities will be restored in place. Each area is discussed individually below. Stabilization measures, where needed, are outlined in Appendix B.

3.3.1 Intake and Discharge Pipes

The impacts to W11 (salt marsh and cobble beach) will be restored in place but also will be compensated for as required using a multiplier of 2 for the In-Lieu-Fee program calculation (see Section 4.2).

Cobble Beach

The cobble beach (486 sq.ft.) will be restored to its original condition after construction of the intake and outfall pipes. A trench will be dug in this zone, allowing the pipes to be buried in 5 feet +/- of cover. Due to the flat and stable surface, it is envisioned that an open-cut trench and side casting the material is the quickest and least impactful method to install the pipes in this zone. The excavated material will be side cast to the opposite side of the trench route from the staged pipes. After pipe placement, the trench will be backfilled with the side cast material, and the back-filled surface will be shaped to match to the original profile. Excess soil, rocks, and boulders not used to back fill the trench will be removed and disposed of off-site, leaving the cobble beach in the same profile appearance as originally found. Tidal action is expected to quickly blend the back-filled area in with the undisturbed cobble beach.

Salt Marsh

A small area of salt marsh vegetation (2,125 sq.ft.) will be disturbed during construction of the intake and outfall pipes. The salt marsh vegetation will be carefully separated from the subsoil with its root mat intact, in large pieces, and placed to the side in an area where it will not be trampled or otherwise covered with excavated material. The vegetated mat will be covered with burlap to prevent exposure and drying. If the root mat is exposed during freezing temperatures it should be also be mulched with straw. After the trench is backfilled, the salt marsh vegetation will be returned to its original location and tacked in place using wooden stakes at least 3 feet longer than the depth of the root zone. It is anticipated that the salt marsh will be restored to its original condition after 1 or 2 growing seasons.

3.2 Sewer Force Main

The installation of the sewer force main will temporarily impact W16. Similar to other restore in place activities, this area will be excavated and the material will be side cast for use in backfilling and restoring to original grade. Disturbed areas will be stabilized by hydroseeding with New England Wetland Mix.

3.3 Route 1 By-Pass

The installation of the intake and discharge pipes across Route 1 will require the installation of a temporary by-pass. This 2 lane bypass will divert all traffic flow to the west of the current roadway onto the Applicants property to provide the least amount of disruption to traffic and traffic patterns. Once the pipes are installed, Route 1 will be restored in kind and temporary impacts to S9 and W6 will be restored.

Stream 9 stream bed will be replicated to pre-construction conditions. The banks and surrounding disturbed area will be restored to original grade and stabilized by hydroseeding with New England Wildlife Conservation Mix.

4.0 Compensation Goals

The project as proposed will have temporary and permanent impacts to wetlands and streams. No vernal pools are present so no vernal pool impacts will occur. All permanent impacts to wetlands will be mitigated through participation in the in-lieu-fee program. Impacts to streams will be mitigated via riparian habitat restoration, culvert repairs to improve aquatic passage and deed restrictions on riparian buffers. The goal of the onsite mitigation components is to offset certain functions and values associated with impacted streams. These include floodflow alteration, groundwater recharge and discharge and wildlife habitat.

All temporary impacts will be restored in place. Permanent, direct impacts to protected natural resources have been minimized to the extent practicable (see Alternative Analysis in Attachment 2 of the NRPA application). Direct impacts associated with permanent fill of wetlands are anticipated to be compensated for with a contribution to the In-Lieu-fee program resulting in a significant financial commitment that will enable Nordic Aquafarms and the Maine Department of Environmental Protection (MDEP) to achieve the regulatory goals of no-net-loss of wetland functions and values which include the primary functions and values of flood flow alteration, sediment/shoreline stabilization, production export and wildlife habitat.

4.1 On-Site Compensation

A summary of on-site compensation and correlation to functions and values is presented in Table 7. Based on the calculations for compensation ratios, as set forth under Chapter 310, Section 5.C.(5) the stream impacts on the site have been compensated for up to 1,965 linear feet (S9) and 60 linear feet (aquatic passage) correlating to 1.677 acres, for the proposed 1,180 linear feet of stream to be permanently impacted. Although the coastal wetland (W11) and wetland of special significance impacts (W16) are restored in place the in-lieu-fee still applies at a multiplier of 2.

Table 7. On-Site Stream Compensation

Compensation Area	*Functions and Values Provided	Compensation Amount	Compensation Ratio	Total Compensated
Riparian Restoration	• Wildlife Habitat • **Visual Quality	2.17 acre	2:1	1.08 acre
Deeded Riparian Buffer	• Wildlife Habitat	4.73 acre	8:1	0.59 acre

Aquatic Passage Improvements	• Wildlife Habitat • Flood flow Alteration	0.014 acre	2:1	0.007 acre
Totals				1.677 acre

*Floodflow alteration as it relates to S9 will continue to be provided under proposed conditions.
** This is a value added

4.2 In-Lieu-Fee

To compensate for wetland impacts the project will pay into the in-lieu-fee program as calculated below using the following formula:

(Direct wetland impact/sq. ft. x (natural resource enhancement & restoration cost/sq. ft. + avg. assessed land valuation/sq. ft.)) x (resource multiplier)

The enhancement and restoration cost for Waldo County is $3.61 per sq.ft. and the average assessed land value is $0.09 per sq.ft. The resource multiplier for coastal wetlands and wetlands of special significance is 2. All other resources are set at a multiplier of 1.

Coastal Wetlands:

(2,611 x ($3.61 + 0.09)) x (2) = $19,321.40

Permanent Freshwater Wetlands:

(169,091 x ($3.61 + 0.09)) x (1) = $625,636.70,

Temporary Wetlands of Special Significance

(1,245 x ($3.61 + 0.09)) x (2) = $9,213.00

Total Compensation $654,171.10

5.0 Schedule for Implementation

Given the phased nature of the development construction, both in-place restoration of impacted wetlands and riparian restoration along stream 9 will have to be scheduled so that no ensuing phases affect the restored areas. Attachment 7 of this application contains the full construction narrative and schedule for the project. The construction of the intake/discharge pipeline system will occur at the outset of Phase 1, with construction beginning with the Route 1 bypass and proceeding outward into Belfast Bay. It is expected that the total duration of this construction will be approximately 7 months, with construction beginning in September of 2019 (based on the assumed timeline of permit issuance) and continuing into March of 2020. Appendix 7-B of Attachment 7 contains a graphic representation of the proposed pipeline construction schedule; portions of wetland W6 impacted by the construction of the temporary bypass will be filled with suitable soils and stabilized following deconstruction of the bypass, however the area will not be fully restored until the end of the pipeline construction phase to ensure no further alteration of the area will occur. Likewise impacts to salt marsh W11 by the 40' construction easement and pipeline trenching will be immediately stabilized following installation of the pipe; however the need for conveyance of

equipment and materials along this portion as construction proceeds out into the Bay mandates that final restoration occurs only after the pipeline system is fully installed. The major impacts to stream 9 will consist of the addition of a culvert during construction of the access road to the water treatment plant area at the outset of Phase 1 construction, as well as a temporary diversion during installation of the force main sewer connection. A proposed construction schedule for the main facility site can be found in Attachment 7, Appendix 7-A. The sewer installation will occur during Phase 1E, as shown in Attachment 1.B, plan CE115. Following the trenching, sewer pipe installation, and backfill/stabilization of the impacted region, routing of stream 9 will be restored to its original state. Restoration and improvements to the riparian buffer along stream 9, as shown in Appendix 13-B, will also occur towards the conclusion of Phase 1E in the fall of 2021.

6.0 Compensation Monitoring Plan

All on-site compensation components will be monitored for proper implementation. Monitoring will include site preparation, stabilization, seeding and planting. During monitoring of site preparation the sediment and erosion control plans (Attachment 8 to the NRPA application) will be adhered to. All monitoring events will be documented and, in the event of minor field changes or remedial measures required to ensure restoration success, the monitor will alert the MDEP and an acceptable alternative will be developed and remedial measures proposed. Monitoring will also include reporting that addresses invasive species control measures and photo documentation for inclusion in monitoring reports. The riparian restoration areas and restore in place areas will be monitored for five years unless otherwise specified by a condition of approval issued by the MDEP. During the monitoring period transplant success will be quantified by establishing fixed plots. At the end of three years a functional assessment of the riparian restoration and restore in place areas will document the functions and values anticipated to be compensated for. The goal for restoration success will be achieved if 85% of the compensation area has successfully resulted in providing lost functions and values.

Appendix A
Expertise and Bios

STREAM RESTORATION SERVICES

Core Values

Results-oriented environmental services

Respect for stakeholders, the public and our natural environment

Ethical work conduct and scientific integrity at all times

Safe and positive work environment

Pride, investment, and accountability through employee ownership

Corporate Office

25 Nashua Road
Bedford, NH 03110
603.472.5191

Nationwide Offices

California
Delaware
Florida
Maine
Massachusetts
New Hampshire
New York
Pennsylvania
South Carolina
Vermont
Washington

www.normandeau.com

Stream channel redirection from agricultural and urban land development has associated environmental impacts on aquatic habitat and water quality. An increase in runoff from developed urban and suburban areas has also led to destabilization of stream channels and degradation of aquatic habitat.

Normandeau's staff of aquatic biologists, ecologists, engineers, and hydrologists are experienced in the assessment of streams, stream restoration design, supervision of construction projects and post-construction monitoring.

Stream restoration projects are typically completed in four phases:

- Aquatic and Geomorphic Assessment.
- Aquatic Habitat Enhancement and Restoration Design.
- Restoration Construction.
- Post-Construction Monitoring.

In the assessment phase, our biologists, geomorphologists and hydrologists characterize, describe and evaluate the aquatic habitat and morphological condition of the stream and its streamflow regime. Our engineers, in association with the stream assessment team, then develop a restoration plan.

The actual design of the restored channel is based on the natural channel stability concept, founded on the principles of fluvial geomorphology. This creates a channel whose hydraulic geometry, planform and profile are in dynamic equilibrium with existing watershed conditions and are geomorphically stable.

During the design phase boulder clusters, large woody debris, LUNKERS, and specific riparian vegetation can be incorporated to enhance aquatic habitat. Following the design phase, we can assist in the selection of an experienced construction contractor and oversee the construction activities. Following restoration of the stream channel, a post-construction monitoring program is implemented to confirm effectiveness of the design and to document improvements in aquatic habitat conditions.

Our company has over 45 years of experience in the environmental consulting business that is well-recognized by state and Federal regulatory agencies.

Normandeau's staff is highly trained in the geomorphic assessment of streams and the design of stream channels, and use natural channel design concepts that have been identified by Leopold, Rosgen, Newbury and others.

NORMANDEAU ASSOCIATES
Environmental Consultants

SARAH D. ALLEN, PWS, NHCWS

Principal Scientist, Wetlands/Terrestrial

Ms. Allen has a broad background in wetland and wildlife services, gained from over 30 years in natural resource research and consulting. She has technical experience in coastal and inland wetland delineation, functional assessment, mitigation design, botanical and wildlife surveys, and rare species surveys. As her project experience indicates, she has been involved in various terrestrial aspects for a range of projects including private development, hydroelectric relicensings, transmission lines, wind projects, ski area expansion, and transportation projects. Her work has included all stages of local, state and federal permitting, including agency coordination, permit preparation and regulatory review. Ms. Allen has managed numerous projects during her long career at Normandeau; participated in NEPA EA/EIS preparation; given presentations to professional and public audiences; and provided expert testimony at regulatory hearings.

EDUCATION

MS, Natural Resources Science, (Wetland Ecology), University of Rhode Island

BS, Wildlife Biology, University of Vermont

PROFESSIONAL EXPERIENCE

1989-Present	Normandeau Associates
1985-1986	K-V Associates, Inc.
1983-1985	Woods Hole Oceanographic Institution
1979-1985	Boston University Marine Program

PROFESSIONAL CERTIFICATIONS

- Professional Wetlands Scientist. Society of Wetlands Scientists (1995)
- Certified Wetlands Scientist. NH Association of Natural Resource Scientists (1999)

PROFESSIONAL AFFILIATIONS

- Society of Wetland Scientists
- Coastal & Estuarine Research Federation
- New Hampshire Association of Natural Resource Scientists
- Maine Association of Wetland Scientists

NORMANDEAU ASSOCIATES
Environmental Consultants

SARAH A. BARNUM, CWB®
Senior Wildlife Ecologist

Dr. Barnum is a Senior Wildlife Ecologist at Normandeau with over 20 years of professional experience. Her background includes providing expertise to the transportation and energy sectors, as well as a variety of general development projects. She has hands-on experience with a wide range of species including forest birds, waterfowl, raptors, small mammals, large mammals, amphibians, and reptiles. Dr. Barnum's projects have emphasized examining habitat relationships, impact assessment for threatened and endangered species, mitigation planning, and Federal Endangered Species Act (ESA) compliance. Dr. Barnum also has extensive experience in project planning, project management, experimental design, and data analysis.

EDUCATION

Ph.D., Conservation Planning, University of Colorado
M.S., Wildlife Biology, Utah State University
B.S., (cum laude) Wildlife Biology, University of Vermont

PROFESSIONAL EXPERIENCE

2007-Present	Normandeau Associates
2005-2007	New Hampshire Audubon
2004-2005	Baystate Environmental Consultants
2001-2003	Environmental Planning and Policy Unit, Colorado DOT
1998-2000	Office of Environmental Services, Colorado DOT
1996-1998	Dames & Moore
1993-1994	Bio-Resources, Inc.

PROFESSIONAL CERTIFICATIONS

- Certified Wildlife Biologist
- AAE's Airport Wildlife Manager's Course and Wildlife Management Techniques Course
- Cyber Tracker Level III Tracking Certification

PROFESSIONAL AFFILIATIONS

- The Wildlife Society
- New Hampshire Association of Natural Resource Scientists
- Epsom, NH Conservation Commission
- Bear-Paw Regional Greenways Land Conservation Committee

NORMANDEAU ASSOCIATES
Environmental Consultants

LEE E. CARBONNEAU, PWS/NHCWS
Wetland Scientist/Wildlife Biologist

Ms. Carbonneau is a wetland scientist and wildlife biologist with almost 30 years of experience assessing terrestrial and wetland communities throughout the northeastern United States. As a senior project manager, she is responsible for providing ecological services for clients in the energy, transportation, site remediation, and development sectors, with particular emphasis on large-scale and complex undertakings. Ms. Carbonneau also provides third-party expertise to state and local resource agencies. Her skills include wetland delineation and assessment, mitigation design, wildlife survey, habitat assessment, and state and federal natural resource permitting in both inland and estuarine environments. Ms. Carbonneau is vice-chair of Normandeau's Transmission Client Service Group and supervises the Wildlife Scientist staff assigned to Normandeau's corporate headquarters in New Hampshire.

EDUCATION

M.S.	Wildlife Ecology, University of New Hampshire
B.S.	Forest Biology, SUNY College of Environmental Science and Forestry, Magna cum laude

PROFESSIONAL EXPERIENCE

1989-Present	Normandeau Associates, Inc.
1986-1989	The Smart Associates
1985-1986	Environmental Consultant
1983-1985	University of New Hampshire
1982	EIP Northeast and The Nature Conservancy
1981	The Nature Conservancy-Lower Hudson Chapter

PROFESSIONAL CERTIFICATIONS

- Professional Wetland Scientist #882
- NH Certified Wetland Scientist #123
- Maine DIFW Credentialed Vernal Pool Observer

PROFESSIONAL AFFILIATIONS

- Society of Wetland Scientists
- New Hampshire Association of Natural Resource Scientists
- New Hampshire Wetlands Council Member
- Board of Trustees – Five Rivers Conservation Trust (2004-2009)

NORMANDEAU ASSOCIATES
Environmental Consultants

ADELE F. FIORILLO, PWS, NHCWS
Principal Wetland Scientist

Ms. Fiorillo is a Principal Scientist with over 30 years of experience. She is responsible for a variety of professional services including: project team development and management; wetlands delineation; mitigation plan development/ implementation; environmental impact evaluations; wetlands analysis and permit applications for federal, state and local entities. Her project experience includes energy, transportation and real estate development projects as well as projects for communities and non-profit groups. She has prepared Environmental Assessments and Categorical Exclusion documents to comply with the National Environmental Policy Act (NEPA). Ms. Fiorillo collaborates with multi-disciplined project teams, establishes and oversees project staff and budgets, defines scoping guidelines and stays updated on changes in environmental regulations. Ms. Fiorillo teaches graduate courses in Wetlands Ecology and Marine and Coastal Processes. Technical expertise includes fresh water and coastal wetland ecosystems.

EDUCATION

M.A., Marine Biology, San Francisco State University

B.A., Biological Sciences, University of California, Berkeley

PROFESSIONAL EXPERIENCE

2010-Present	Normandeau Associates
2009-2010	GZA Geo Environmental
1998-2009	NHSC, Inc.
1994-1998	Wetlands Preservation, Inc.
1990-1994	Tiburon Center for Environmental Studies
1986-1989	Tenera, Corporation

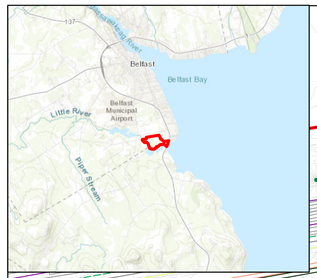
PROFESSIONAL CERTIFICATIONS

- Professional Wetland Scientist, Society of Wetland Scientists #823
- NH Certified Wetland Scientist #064
- Certificate of Completion – Project Management Institute (2008)
- Maine DIFW Credentialed Vernal Pool Observer

PROFESSIONAL AFFILIATIONS

- Society of Wetland Scientists – Life Member
- New Hampshire Association of Natural Resource Scientists – Member
- Adjunct Professor University of Massachusetts, Lowell Department of Civil and Environmental Engineering
- Gulf of Maine EcoSystem Indicator Partnership – Climate Change Committee Member
- Hodgson's Brook Advisory Board Member

Appendix B
Compensation Plan Specifications



Restore in Place Specifications

Sewer Force main

1. All excavated material will be side cast within the construction easement
2. Install Force Main
3. Backfill to original grade using side cast material
4. Restore stream channel to original elevations, slope and substrate
5. Hydroseed disturbed area using New England Wetland Mix or equivalent at manufacturers specifications

Rte 1 By-Pass

1. Temporary wetland fill will be placed on geotextile fabric
2. A temporary adequately sized culvert will be placed along the stream channel
3. Once the intake and discharge pipes are installed all temporary areas will be removed and restored to original grades
4. The weltand area will be restored to original grade and hyroseeded with New England wet mix ror equivalent at manufactures specifications
5. Restore stream channel to original elevations, slope and substrate

Intake and Discharge Pipes

1. All excavated material will be side cast within the construction easement
2. Excavated material will be side cast and preserved for backfill keeping salt marsh root mat intact and cobble beah substrate separate from subsurface soils
3. Protect root mat from exposure, drying, freezing
4. Install intake and discharge pipes
5. Once the intake and discharge pipes are installed carefully backfill using preserved side cast materials
6. Ensure the root mat and cobble beach backfill material are set a original grade
7. Stablize root mat with wooden staked at least 3 feet longer in depth than the root zone

Herbaceous Species	Planting Specification/Number of Stock				
	*Indicator Code	Restoration Area 1	Restoration Area 2	Restoration Area 3	Restoration Area 4
Onoclea sensibilis /Sensitive Fern	FACW			60	
Acorus americana /Sweetflag	OBL			60	
Aster novae-angliae /New England Aster	FACW			60	
New England Conservation/Wildlife Mix	See Appendix B			25 lbs/acre, 1750 sq ft/lb	25 lbs/acre, 1750 sq ft/lb
Shrub Species					
Cornus racemosa /Gray Dogwood	FAC		10		3
Hamamelis virginiana /Witch Hazel	FAC		10		3
Alnus incana /Speckled Alder	FACW		10		3
Cornus alternifolia /Alternate-leaved dogwood	UPL	5	13	3	
Tree Species					
Pinus strobus /White pine	FACU	16		6	
Acer Rubrum /Red maple	FAC	7		9	
Acer saccharum /Sugar maple	UPL	4			
Picea rubens /Red spruce	FACU	3		4	
Fagus grandifolia /American beech	FACU	6			
Carpus caroliniana /American hornbeam	FAC	6			
Acer negundo /Boxelder	FAC	6			
Populus tremuliodes /Quaking Aspen	FACU	5			
Tsuga Canadensis /Eastern Hemlock	FACU	2		3	

Species and specifications shown on SMRT plans (see LP 101-107)
Species and specifications shown on Normandeau Impact Compensation Plan

Impact Compensation Plan Specifications		
Plant Type	Stock	Planting Specification
Trees	4'-6'	64 sq. ft. on center
Shrubs	3'-4'	16 sq.ft. on center
Herbaceous	2" plugs	2 sq.ft. on center
Ferns	1 gal. pot	2 sq.ft. on center

*Indicator Code	Indicator Status	Comment
OBL	Obligate Wetland	Almost always occur in wetlands (>99%)
FACW	Facultative Wetland	Usually occur in wetlands, but may occur in non-wetlands (67-99%)
FAC	Facultative	Occur in wetlands and non-wetlands (34-66%)
FACU	Facultative Upland	Usually occur in non-wetlands, but may occur in wetlands (1-33%)
UPL	Obligate Upland	Almost never occur in wetlands (<1%)

Note: For planting details see SMRT plan LP501

New England Wetland Mix
5 Quaking aspen
3 Alternate leaved dogwood
6 Hornbeam
6 Box Edler
3 Alternate leaved dogwood
10 Speckled alder
10 Gray dogwood
10 Witch hazel
10 Alternate leaved dogwood
2 Alternate leaved dogwood
10 Cinnamon fern
10 Sweet flag
10 New England aster
Conservation
Wildlife Seed mix
50 Cinnamon fern
50 Sweet flag
50 New England aster
Conservation
Wildlife Seed mix
3 Gray dogwood
3 Witch hazel
3 Speckled alder

AREA 1
AREA 2
AREA 3
AREA 4

W1 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W15 W17 W18

Culvert

N

0 35 70 140 210 Feet

Belfast Aquaculture Project
Impact Compensation Plan

Sewer Easement
SMRT Tree Symbol Lines
Stream Impact
Current Pipeline Route
Easement Centerline
Permanent Easement 25' Wide
Temporary Easement 40' Wide

Temp US1 bypass
Edge of Pavement
Fog Line
Centerline
Existing Culvert
Intermittent Stream
Stream Not Field Delineated

Project Area
Deeded Riparian Buffer
Wetland Impact
Restoration Area

Palustrine Wetlands
Salt Marsh
Cobble Beach
Intermittent Stream
Other Belfast Parcels
Hydrologic Connection

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

GENERAL NOTES

1. THE SCOPE OF SITE WORK FOR THIS PROJECT INCLUDES PROTECTION OF EXISTING STRUCTURES AND UTILITIES, AND REINSTATEMENT OF DISTURBED AREAS OF THE SITE TO MATCH EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ON THE PROJECT DRAWINGS ARE TAKEN FROM RECORD DRAWINGS AND HISTORICAL INFORMATION. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SITE CONDITIONS PRIOR TO THE START OF WORK AND CONTACT THE PROJECT ARCHITECT IMMEDIATELY IF DISCREPANCIES ARE FOUND.
2. EXISTING UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM HISTORICAL RECORDS AND PREVIOUS DESIGN DRAWINGS. NO GUARANTEE IS MADE THAT THE UTILITIES SHOWN WILL BE FOUND IN THE LOCATIONS INDICATED, OR THAT THE INFORMATION SHOWN IS COMPLETE. INFORMATION ON EXISTING UTILITY LOCATIONS IS PROVIDED FOR REFERENCE ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING EXISTING UTILITY LOCATIONS AND DEPTHS AND COORDINATING THE WORK ACCORDINGLY.
3. THE CONTRACTOR SHALL UNDERTAKE TEST PITS AT THE SITE AND ENGAGE PRIVATE UTILITY DETECTION SERVICE, AS NECESSARY, TO ACCURATELY IDENTIFY UTILITIES IN ORDER TO EFFICIENTLY PLAN AND COMPLETE THE WORK.
4. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITIES ADJACENT TO THE WORK. ANY DAMAGE TO EXISTING STRUCTURES, ROADS, SIDEWALKS, UTILITIES, OR OTHER SITE FEATURES CAUSED BY THE WORK SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
5. ANY UTILITY REPAIRS OR RECONFIGURATION REQUIRED AS PART OF THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION.
6. TEMPORARY WORKS, SUPPORT AND PROTECTION OF STRUCTURES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE COSTS SHALL BE CONSIDERED INCIDENTAL TO THE OVERALL PROJECT SUM.
7. ALL WORK SHALL BE UNDERTAKEN IN STRICT ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY STANDARDS.
8. OPEN EXCAVATIONS AND WORK AREAS SHALL BE CLEARLY DELINEATED AND FENCED, AS NECESSARY TO PREVENT UNAUTHORIZED ACCESS
9. DRIVEWAYS, WALKWAYS AND ENTRANCES SERVING PREMISES SHALL BE KEPT CLEAR AND AVAILABLE TO OWNER, OWNER'S EMPLOYEES, AND EMERGENCY VEHICLES, AS NECESSARY TO MAINTAIN THE FUNCTION OF THE FACILITY. COORDINATE ALL WORK WITH OWNER TO ENSURE THAT ADEQUATE ACCESS AND CIRCULATION IS MAINTAINED AT ALL TIMES.
10. DE-WATERING, IF NECESSARY, SHALL BE UNDERTAKEN IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL STANDARDS. NO DISCHARGE OF SEDIMENT LADEN RUNOFF TO SURFACE WATERS, OR THE PIPED STORM DRAIN SYSTEM AT THE SITE SHALL BE ALLOWED.
11. ALL DISTURBED PAVEMENT AREAS, ROADS AND SIDEWALKS SHALL BE REINSTATED TO MATCH EXISTING GRADES, MATERIALS AND DEPTHS.
12. EXISTING PAVEMENT SHALL BE SAW-CUT AT LEAST TWELVE INCHES INTO SOUND MATERIAL TO PROVIDE A CLEAN, STRAIGHT EDGE BETWEEN EXISTING SOUND SURFACE MATERIAL AND THE REPAIRED AREA.
13. A SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN REPAIR WORKS AND EXISTING PAVEMENT. ALL REINSTATED AREAS SHALL BE GRADED TO PITCH UNIFORMLY TO ENSURE POSITIVE DRAINAGE.

LAYOUT NOTES:

1. DO NOT SCALE THE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY OMISSIONS IN DIMENSIONING SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT FOR DECISION. ANY DISCREPANCIES BETWEEN DRAWINGS, DETAILS, NOTES, AND SPECIFICATIONS SHALL IMMEDIATELY BE REPORTED TO THE ARCHITECT FOR FURTHER DIRECTION AND RESOLUTION BEFORE ANY ADDITIONAL WORK PROCEEDS.
2. ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS FROM BUILDING ARE TO FACE OF BUILDING FOUNDATION. ALL DIMENSIONS FROM CURBS ARE TO FACE OF CURB.
4. PROVIDE A SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING WORK.
5. CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND LOCAL UTILITY COMPANIES TO VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION.
6. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR WORK SHOWN ON THESE PLANS.
7. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS AND MEET OR EXCEED CITY OF BELFAST STANDARDS.
8. PROVIDE TAPERED END SECTIONS AT ALL CURB ENDS.
9. EXISTING CONDITIONS AND TOPOGRAPHIC DATA ARE BASED UPON BOUNDARY & TOPOGRAPHIC SURVEY PREPARED BY GOOD DEEDS LAND SURVEYING, BELFAST, MAINE, DATED SEPTEMBER 17, 2018.

GRADING NOTES:

1. SOIL DISTURBANCE IS TO BE KEPT TO A MINIMUM AND ALL DISTURBED AREAS SHALL BE STABILIZED (WITH PERMANENT OR TEMPORARY MEASURES) AS QUICKLY AS POSSIBLE.
2. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE LOAMED AND SEEDED (6" DEPTH).
3. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED ON A REGULAR BASIS AND AS REQUIRED AFTER STORM EVENTS.
4. GULLIES OR OTHERWISE ERODED AREAS IN SEEDED AREAS SHALL BE RESTORED AS SOON AS POSSIBLE FOLLOWING OBSERVATION, USING EROSION CONTROL MESH TO STABILIZE AS REQUIRED.
5. FILL IN AND AROUND THE AREA OF THE NEW BUILDING ADDITION SHALL MEET THE SPECIFICATION FOR 'STRUCTURAL FILL'.
6. ALL EMBANKMENTS AND OTHER FILL SECTIONS SHALL BE CONSTRUCTED USING GRANULAR BORROW - A MIXTURE OF SAND AND GRAVEL MEETING MDOT SPECIFICATION 703.19 GRANULAR BORROW. SUITABLE SOIL BORROW MAY BE USED IN PLACE OF GRANULAR BORROW ONLY WHERE MOISTURE CONTENT CAN BE CONTROLLED TO MEET THE SPECIFIED COMPACTION.

EMBANKMENT NOTES:

1. BASIN EMBANKMENTS SHALL BE CONSTRUCTED OF SUITABLE ON-SITE SOIL, COMPACTED IN MAXIMUM EIGHT INCH LIFTS TO 90% MAXIMUM DRY DENSITY. A MINIMUM OF SIX INCHES OF CLEAN SCREENED LOAM SHALL BE APPLIED TO FINISHED GRADE AND THE AREA SHALL BE IMMEDIATELY SEEDED AND STABILIZED WITH MULCH, HYDROSEED, OR EROSION BLANKET DEPENDING ON THE LEVEL OF EXPECTED INUNDATION (SEE EROSION CONTROL SHEETS).
2. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES STEEPER THAN 4H:1V SHOULD BE KEYED INTO THE EXISTING GROUND SURFACE WITH CONTINUOUS LEVEL BENCHES. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES FLATTER THAN 4H:1V SHALL HAVE A 10FT WIDE BENCH CUT INTO THE NATIVE SOIL AT THE TOE OF THE SLOPE FOR FILL EMBANKMENTS. A ONE FOOT (1') MINIMUM LAYER OF DRAINAGE COURSE MATERIAL SHALL BE PLACED OVER THE INITIAL BENCH PRIOR TO PLACING EMBANKMENT FILL. THE TOE BLANKET DRAIN SHALL BE CONSTRUCTED SUCH THAT GRAVITY DRAINAGE FORM THE BLANKET DRAIN OCCURS.

DEWATERING NOTES:

1. THE CONTRACTOR SHALL EMPLOY A DEWATERING SYSTEM THAT ACHIEVES THE FOLLOWING FUNCTIONS DURING CONSTRUCTION:

   A. DEVELOP A SUBSTANTIALLY DRY AND STABLE SUBGRADE DURING EXECUTION OF THE WORK,

   B. PREVENT DAMAGE TO STRUCTURES ADJACENT TO THE WORK,

   C. RETAIN SEDIMENTS ON-SITE AND WITHIN THE WORK AREA. DEWATERING OPERATIONS SHALL BE SUSPENDED IF THE TURBIDITY OF DISCHARGES TO THE DOWNSTREAM DRAINAGE SYSTEM IS INCREASED ABOVE AMBIENT LEVELS.
2. FLOCCULANTS MAY BE USED TO CONTROL THE TURBIDITY OF DISCHARGE WATER. REFER TO THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS (2014, OR AS CURRENTLY REVISED) FOR RECOMMENDATIONS AND SPECIFICATIONS.
3. SURFACE WATER ENTERING THE CONSTRUCTION SITE SHALL BE INTERCEPTED AND DIVERTED AROUND THE WORK AREA THROUGH THE USE OF DIKES, CURB WALLS, DITCHES, SUMPS, PUMPING, OR OTHER APPROVED MEANS.
4. ANY ENFORCEMENT ACTIONS OR FINES RESULTING FROM THE IMPROPER DISCHARGE OF TURBID WATER AND SEDIMENT TO DOWNSTREAM AREAS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
5. DIRT BAGS AND TEMPORARY DEWATERING PONDS SHALL BE CONSTRUCTED AND MAINTAINED AS NEEDED TO CAPTURE AND TREAT PUMPATE FROM DEWATERED AREAS.

GEOTEXTILE & EROSION BLANKET NOTES:

1. EROSION CONTROL BLANKET FOR USE IN PONDS AND DRAINAGE CHANNELS SHALL BE 100% BIODEGRADABLE DOUBLE NET EROSION BLANKET WITH A 100% COCONUT FIBER MATRIX AND ORGANIC JUTE NETTING. EROSION CONTROL BLANKET FOR USE IN CHANNELS SHALL BE NORTH AMERICAN GREEN® BIONET® C125-BN™. EAST COAST EROSION BLANKETS ECC-2B OR APPROVED EQUAL.
2. PERMANENT TURF REINFORCEMENT MAT FOR REINFORCED TURF SPILLWAYS AND EMERGENCY OVERFLOW WEIRS SHALL BE A UV-STABILIZED POLYPROPYLENE MAT WITH TWO LAYERS OF UV-STABILIZED NETTING. PERMANENT TURF REINFORCEMENT MAT SHALL BE NORTH AMERICAN GREEN® P300, EAST COAST EROSION BLANKETS ECP-2, OR APPROVED EQUAL.
3. GEOTEXTILE SEPARATION FABRIC SHALL BE A WOVEN SLIT FILM GEOTEXTILE WITH AN APPARENT OPENING SIZE OF 50 (US STANDARD SIEVE) (PER ASTM D4751) THAT MEETS THE REQUIREMENTS FOR A CLASS 2 SEPARATION GEOTEXTILE PER AASHTO M288.96. GEOTEXTILE SEPARATION FABRIC SHALL BE MIRAFI® 500X OR APPROVED EQUAL.
4. GEOTEXTILE DRAINAGE FABRIC SHALL BE A NONWOVEN GEOTEXTILE MANUFACTURED FOR USE IN SUBSURFACE DRAINAGE APPLICATIONS. THE MATERIAL SHALL HAVE AN APPARENT OPENING SIZE OF 70 (US STANDARD SIEVE) (PER ASTM D4751), A PERMITTIVITY OF 1.7/SEC OR GREATER (PER ASTM D4491) AND RETAIN A MINIMUM OF 70% STRENGTH AT 500 HOURS UV EXPOSURE (PER ASTM D4355). GEOTEXTILE DRAINAGE FABRIC SHALL BE MIRAFI® 140N, CONTECH® C-35NW, OR APPROVED EQUAL.

RIPRAP STONE NOTES:

1. STONE FOR RIPRAP SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR TOUGH UNHEWN QUARRY STONE OF APPROXIMATE RECTANGULAR SHAPE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE, AND IT SHALL BE SUITABLE IN ALL RESPECTS FOR THE PURPOSE INTENDED.
2. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
3. THE AVERAGE SIZE OF THE STONE IN A MIXTURE IS INDICATED ON DIAMETER OF THE STONE FOR WHICH 50%, BY WEIGHT, WILL BE SMALLER AND 50% WILL BE LARGER. THE MIXTURE IS COMPOSED PRIMARILY OF THE LARGER STONES BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL PROGRESSIVELY SMALLER VOIDS.
4. THE DIAMETER OF THE LARGEST STONE SIZE IN A GIVEN D_{50} MIXTURE SHALL BE 1.5 TIMES THE D_{50} SIZE SPECIFIED.
5. THE RIPRAP SHALL BE PLACED TO THE THICKNESSES INDICATED OR A MINIMUM OF 2.2 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6 INCHES. FOR D_{50} LARGER THAN 12 INCHES THE RIPRAP LAYER SHALL HAVE A MINIMUM THICKNESS OF 2 TIMES THE D_{50}.

PLANTING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL SUPPLY AND INSTALL ALL PLANTS IN SUFFICIENT QUANTITIES TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS. DISCREPANCIES BETWEEN QUANTITIES NOTED ON THE DRAWINGS AND THOSE GRAPHICALLY SHOWN SHALL BE REPORTED IMMEDIATELY TO THE LANDSCAPE ARCHITECT AND SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL REMUNERATION.
2. THE LANDSCAPE CONTRACTOR IS ADVISED THAT BELOW GROUND UTILITIES EXIST ON SITE, THE LOCATIONS OF WHICH SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF OPERATIONS (SEE GENERAL NOTES REGARDING DIGSAFE). SHOULD THE LOCATION OF ANY PROPOSED PLANTING CONFLICT WITH ANY UTILITY, THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY FOR DECISION.
3. ANY AND ALL PAVING, CURBING, UTILITIES, LAWNS, ETC., DAMAGED AS A RESULT OF THE LANDSCAPE CONTRACTOR'S OPERATIONS SHALL BE REPLACED OR REPAIRED TO ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. LOCATIONS OF PROPOSED PLANTINGS AND BED LINES SHALL BE REVIEWED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
5. PLANTS SHALL BE PLACED NO CLOSER THAN ONE-HALF THE NOTED SPACING TO PAVEMENT EDGES, BED LINES, OR STRUCTURE FACES, UNLESS NOTED OR SHOWN OTHERWISE.
6. PLANT MASSES SHALL BE LAID OUT AND INSTALLED STARTING AT THE PRINCIPAL, FORM-DEFINING PERIMETER, THEN FILLING INWARD IN DOUBLE-ROW-STAGGERED FASHION, UNLESS NOTED OR SHOWN OTHERWISE.
7. ALL PLANTING BEDS INCLUDING TREE AND SHRUB PITS AS INDICATED SHALL RECEIVE 3" APPROVED CLEAN, UNIFORMLY GROUND OR SHREDDED PINE OR HEMLOCK BARK MULCH.
8. THE LANDSCAPE CONTRACTOR SHALL RELOCATE ANY PLANT ACCORDING TO THE DIRECTION OF THE LANDSCAPE ARCHITECT.
9. ALL PLANT MATERIALS CALLED FOR AND INSTALLED SHALL MEET OR EXCEED SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
10. ALL PLANTING BEDS SHALL BE DEFINED BY A NEAT, SHOVEL-CUT BED LINE. BED LINES SHALL BE TRUE TO FORM AS SHOWN ON THE DRAWINGS, CONSISTING OF SMOOTH CURVES AND SHARP LINES AND CORNERS.
11. IF, BECAUSE OF CULTURE REQUIREMENTS, AVAILABILITY, OR OTHER CIRCUMSTANCES, THE LANDSCAPE CONTRACTOR BELIEVES A PARTICULAR PLANT CALLED FOR IS INAPPROPRIATE, THE LANDSCAPE CONTRACTOR SHALL REPORT THE SITUATION IMMEDIATELY TO THE LANDSCAPE ARCHITECT FOR DECISION.
12. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL RECEIVE 6" LOAM AND SEED.

SITE LEGEND

EXISTING		PROPOSED	
BODY OF WATER/STREAM		BOLLARD	
BOLLARD		BORING	
BORING		BRIDGE	
BRIDGE		BUILDING W/ DOOR	
BUILDING W/ DOOR		BUILDING CANOPY	
BUILDING CANOPY		CATCH BASIN	
CATCH BASIN		CHECKDAM - STONE	
CHECKDAM - STONE		COMMUNICATIONS LINE-OH	NTC NTC
COMMUNICATIONS LINE-OH		COMMUNICATIONS LINE-UG	NUC NUC
COMMUNICATIONS LINE-UG	C C C	CONCRETE PAD	
CONCRETE PAD		CULVERT	
CULVERT		CURB - BITUMINOUS	
CURB - BITUMINOUS		CURB - FLUSH	
CURB - SLOPED GRANITE		CURB - SLOPED GRANITE	
CURB - VERT GRANITE		CURB - VERT GRANITE	
CURB - SLIPFORM		CURB - SLIPFORM	
DETENTION POND		DETENTION POND	
DIRECTION OF FLOW		DIRECTION OF FLOW	
DITCH		DITCH	
DRAIN MANHOLE		DRAIN MANHOLE	
DRIP STRIP		DRIP STRIP	
EASEMENT		EASEMENT	
ELECTRIC MANHOLE		ELECTRIC MANHOLE	
ELECTRIC - OVERHEAD	OHW OHW	ELECTRIC - OVERHEAD	NOHE
ELECTRIC - UNDERGROUND	E E E	ELECTRIC - UNDERGROUND	NUGE
ELEVATION BOT OF CURB	+BOC	ELEVATION BOT OF CURB	+BOC
ELEVATION BOT OF STEP	+BOS	ELEVATION BOT OF STEP	+BOS
ELEVATION TOP OF CURB	+TOC	ELEVATION TOP OF CURB	+TOC
ELEVATION TOP OF STEP	+TOS	ELEVATION TOP OF STEP	+TOS
ELEVATION - SPOT	+100.0	ELEVATION - SPOT	+100.0
FENCE - CHAINLINK	X X X X	EMERGENCY CALL BOX	
FENCE - ORNAMENTAL		EROSION CONTROL MESH	
FIELD INLET		FENCE - CHAINLINK	X X X X
FIRE HYDRANT		FENCE - ORNAMENTAL	
FLAG POLE		FIRE HYDRANT	
FORCE MAIN PIPE	SFM SFM	FLAG POLE	
GAS & FUEL EQUIPMENT	GAS	FORCE MAIN PIPE	NSFM
GAS LINE	G G G	FOUNDATION DRAIN	NFND
GAS VALVE		GAS & FUEL EQUIPMENT	GAS
GENERATOR ON CONC PAD		GAS LINE	NGAS
GRAVEL DRIVE		GAS VALVE	
GUARDRAIL		GENERATOR ON CONC PAD	G
HELIPAD	H	GRAVEL DRIVE	
HIGH POINT ELEVATION	+HP	GUARDRAIL	
IRRIGATION PIPING	IW IW	HELIPAD	H
LANDMARK SIGN		HIGH POINT ELEVATION	+HP
LIGHT - BOLLARD		IRRIGATION PIPING	NIW NIW
LIGHT POLE		LANDMARK SIGN	
LIGHT - SPOT		LIGHT - BOLLARD	
LOW POINT ELEVATION	+LP	LIGHT POLE	
MAJOR CONTOUR	100	LIGHT - SPOT/WALL	
MINOR CONTOUR	100	LIMIT OF WORK	
PARKING AREA-BITUMINOUS		LOW POINT ELEVATION	+LP
PAVEMENT STRIPING		MAJOR CONTOUR	100
PROPERTY LINE		MINOR CONTOUR	102
PROPERTY LINE - ABUTTER		PARKING AREA-BITUMINOUS	
		PAVEMENT STRIPING	
RETAINING WALL		PROPERTY LINE	
RIPRAP	RIP	RETAINING WALL	
ROADWAY		RIPRAP	RIP
ROADWAY CENTER LINE		ROADWAY	
SANITARY SEWER PIPE	SS SS	ROADWAY CENTER LINE	
SANITARY SEWER MANHOLE	S	SANITARY SEWER MANHOLE	S
SETBACK		SANITARY SEWER PIPE	NSS NSS
SIGN		SETBACK	
SIGN - TWO-SIDED		SIGN	
SILT FENCE	SF SF	SIGN - TWO-SIDED	
SLOPE NOTATION	S = .01	SILT FENCE	SF SF
SOIL TYPE BOUNDARY		SLOPE NOTATION	S = .01
SPRINKLER		SPRINKLER	
STONE WALL		STONE WALL	
STORM DRAIN PIPE	SD SD	STORM DRAIN PIPE	NSD NSD
TELEPHONE EQUIPMENT	TE	TELEPHONE EQUIPMENT	TE
TEST PIT		TEST PIT	
TRAFFIC ARM & SIGNAL		TRAFFIC ARM & SIGNAL	
TRANSFORMER ON CONC	T	TRANSFORMER ON CONC	T
TURF		TURF	
UNDERDRAIN PIPE	UD UD UD UD UD	UNDERDRAIN PIPE	UD UD UD UD UD
UTILITY POLE		UTILITY POLE	
WALKWAY - BITUMINOUS		WALKWAY - BITUMINOUS	
WALKWAY - BRICK/COBBLE		WALKWAY - BRICK/COBBLE	
WALKWAY - CONCRETE		WALKWAY - CONCRETE	
WALL - ORNAMENTAL		WALL - ORNAMENTAL	
WATER GATE VALVE		WATER GATE VALVE	
WATER PIPE (DOMESTIC)	W W W	WATER PIPE (DOMESTIC)	NW NW
WATER PIPE (FIRE)	F	WATER PIPE (FIRE)	NFS NFS
WATER SHUTOFF		WATER SHUTOFF	
WATERSHED BOUNDARY		WELL	W
WELL	W		
WETLAND BOUNDARY			

NOTE:
THIS LEGEND IS FOR REFERENCE ONLY AND APPLIES ONLY TO THE CIVIL/SITE LAYOUT DRAWINGS. NOT ALL ITEMS SHOWN HEREIN MAY APPEAR ON THE DRAWINGS, OR BE INCORPORATED IN THE DESIGN.

PLANTING LEGEND

EXISTING		PROPOSED			
DECIDUOUS TREE		BARK MULCH		ORNAMENTAL GRASS - LOW	
EXISTING TREE TO BE RELOCATED		DECIDUOUS SHADE TREE		ORNAMENTAL GRASS - HIGH	
EXISTING TREE TO REMAIN		DECIDUOUS SHRUB		PERENNIAL	
EVERGREEN TREE		EVERGREEN SHRUBS		PERENNIAL BED	
FLOWERING TREE		EVERGREEN TREES		PLANT BED EDGING / BED LINE	
SHRUB MASS		GROUND COVER		SHRUB MASS	
TREE LINE		HEDGE		SMALL DECIDUOUS TREE	
TURF				TREE LINE - PROPOSED	
				LAWN SEED MIX	
				STORMWATER SEED MIX	
				CONSERVATION SEED MIX	

SITE ABBREVIATIONS

ALT	ALTERNATE
BOC	BOTTOM OF CURB
BOW	BOTTOM OF WALL
CIP	CAST-IN-PLACE
℄	CENTER LINE
CLL	CONTRACT LIMITS LINE
ECB	EXISTING CATCH BASIN
FFE	FINISHED FLOOR ELEVATION
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
HC	HANDICAPPED
HMA	HOT MIX ASPHALT
HP	HIGH POINT
ID	INSIDE DIAMETER
LP	LOW POINT
LT	LEFT
MAX.	MAXIMUM
MIN.	MINIMUM
MISC.	MISCELLANEOUS
NSD	NEW STORM DRAIN (LINE)
NSS	NEW SANITARY SEWER (LINE)
NW	NEW WATER (LINE)
O.C.	ON CENTER
OD	OUTSIDE DIAMETER
R	RADIUS
RE:	REFER (TO)
ROW	RIGHT-OF-WAY
RT	RIGHT
S	SLOPE
T & B	TOP & BOTTOM
TO	TOP OF
TOC	TOP OF CURB
TOW	TOP OF WALL
TP	TEST PIT
TYP.	TYPICAL
UG	UNDERGROUND
W/	WITH
W/O	WITHOUT

REV	DESCRIPTION	DATE

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NORDIC AQUAFARMS
285 NORTHPORT AVENUE

BELFAST, MAINE

SITE NOTES & LEGENDS

SHEET TITLE:

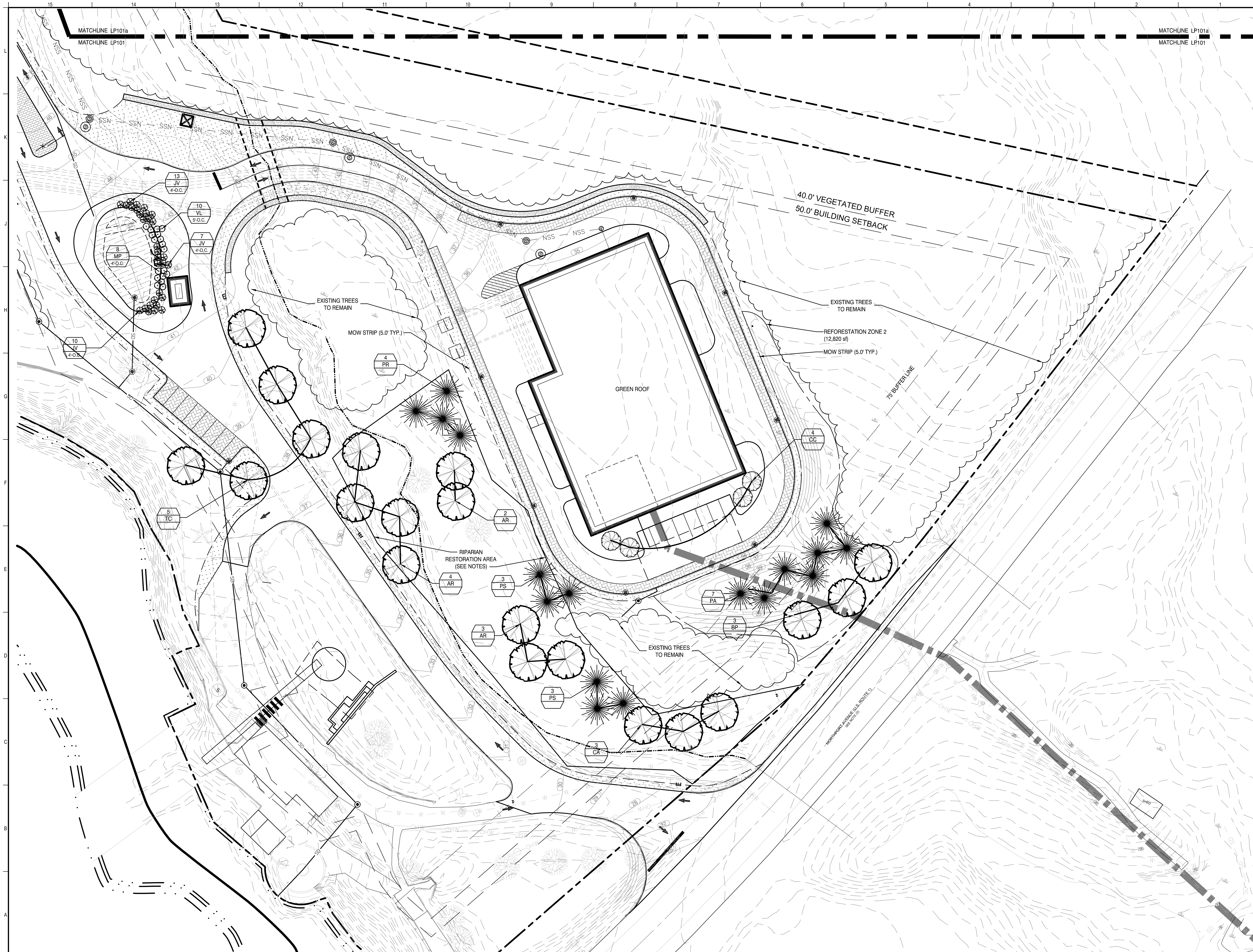
0 15' 30' 60' 90'

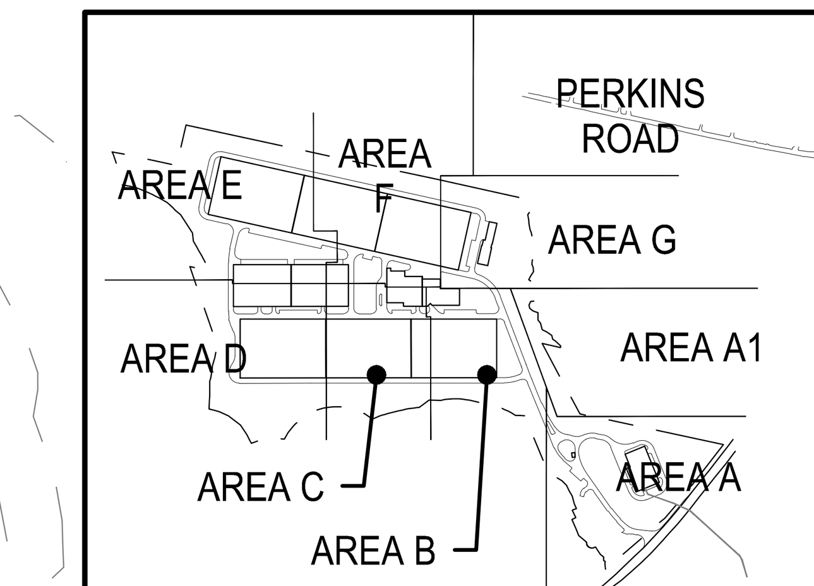
SCALE: 1" = 30'

PROJECT MANAGER:	ADB	PROJECT NO:	18076
A/E OF RECORD:	MGJ		
JOB CAPTAIN:	SP		
DRAWN BY:	WSM	SHEET No.	C-001
SMRT FILE:	C-001-18076		

NOT FOR CONSTRUCTION

24x36





KEY PLAN

REV	DESCRIPTION	DATE

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NORDIC AQUAFARMS
285 NORTHPORT AVENUE

BELFAST, MAINE

PLANTING PLAN
AREA A

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	ADB	PROJECT NO:	18076
A/E OF RECORD:			
JOB CAPTAIN:	SP		
DRAWN BY:	WSM	LP101	
SMRT FILE:	LP101-18076	SHEET No.	

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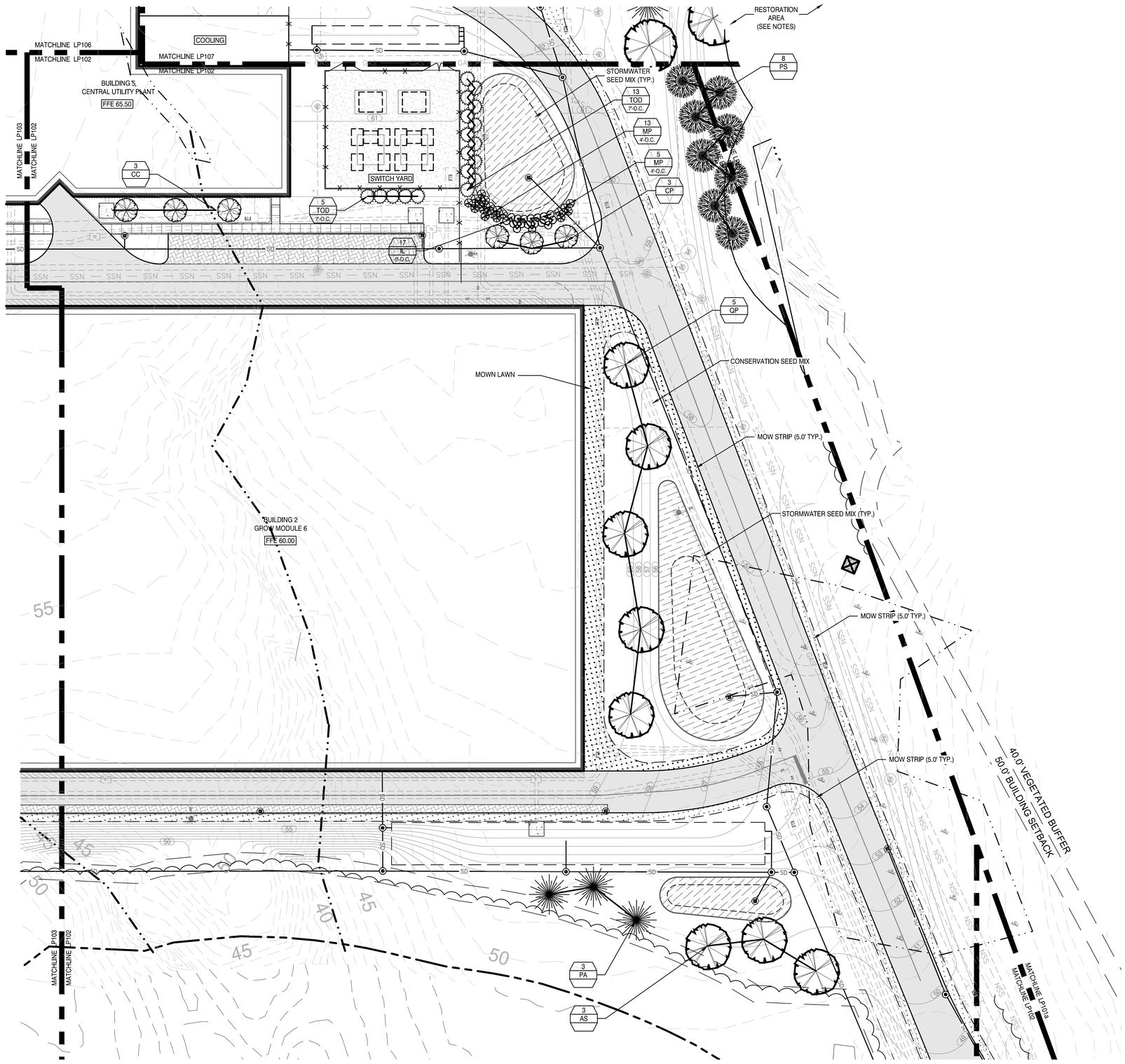

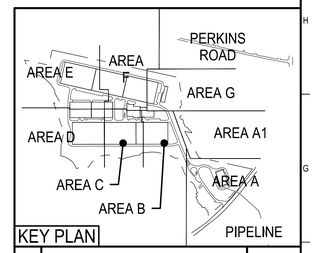

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285 NORTHPORT AVENUE

BELFAST, MAINE

PLANTING PLAN
AREA B

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	ADB	PROJECT NO:	18076
A/E OF RECORD:			
JOB CAPTAIN:	SP		LP102
DRAWN BY:	WSM		
SMRT FILE:	LP102-18076	SHEET No.	

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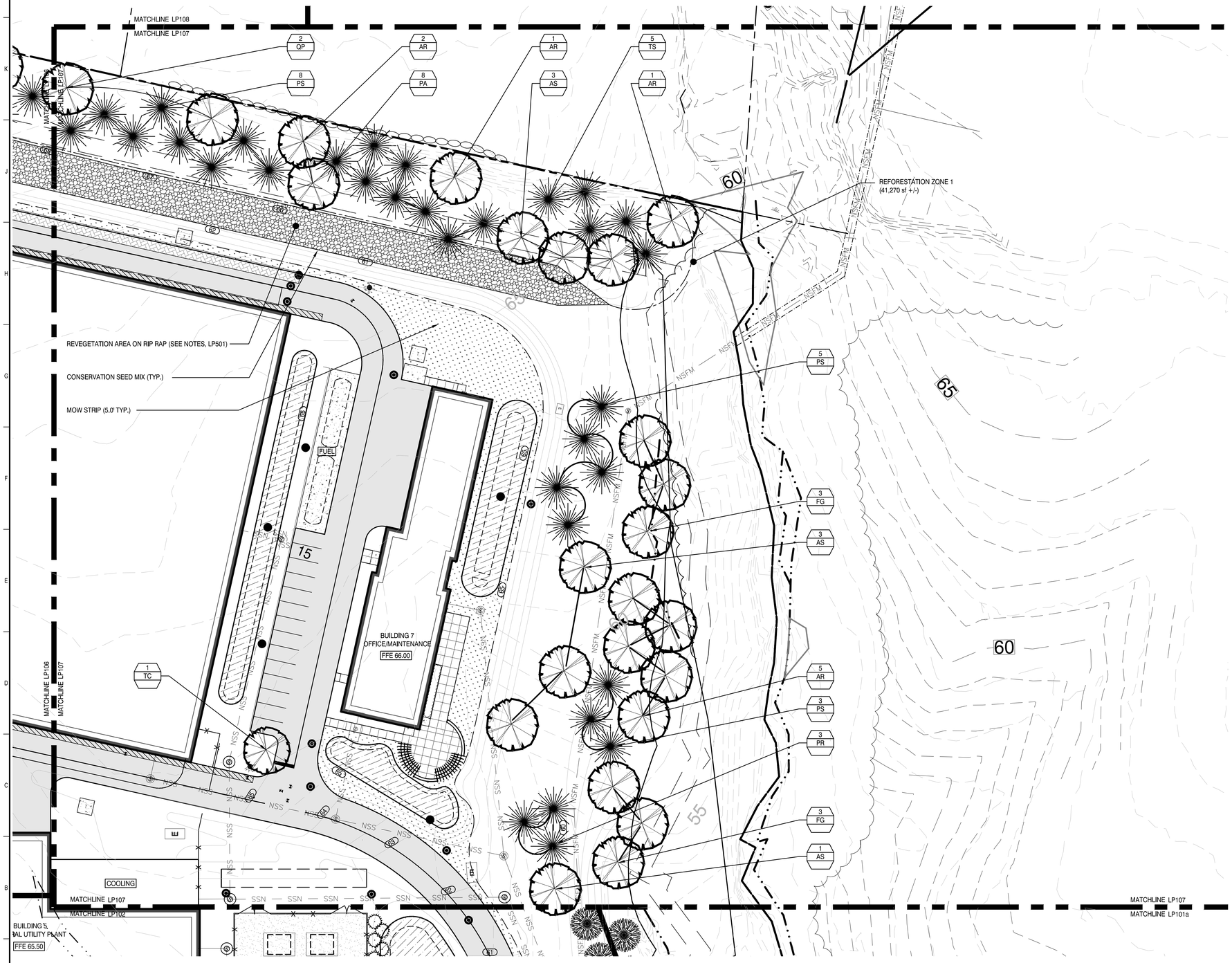

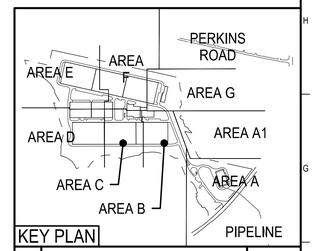

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NORDIC AQUAFARMS
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BELFAST, MAINE

PLANTING PLAN
AREA G

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	ADB	PROJECT NO:	18076
A/E OF RECORD:	ADJ		
JOB CAPTAIN:	SP		
DRAWN BY:	WSM		
SMRT FILE:	LP107-18076	SHEET No.	LP107

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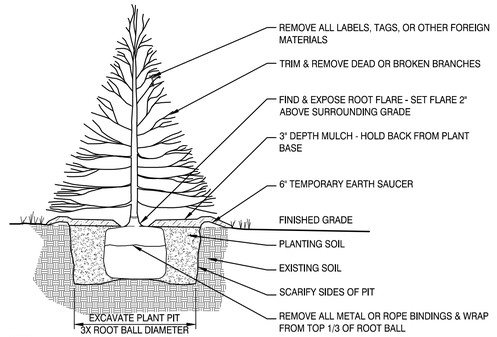
PLANT LIST - REFORESTATION AREAS					
MARK	**SCIENTIFIC NAME / COMMON NAME**	**PERCENTAGE OF MIX**	**QUANTITY**	**SIZE/CONDITION**	**REMARKS**
Zone 1					
AREA (ACRES)	1				
RATE (#/ACRE)	450				
TREES					
AB	Abies balsamia / Balsam Fir	12	51		
AR	Acer rubrum / Red Maple	11	47		
AR	Acer sacharum / Sugar Maple	2	9		
BA	Betula alleghaniensis / Yellow Birch	4	17		
BP	Betula papyrifera / Paper Birch	2	9		
PR	Picea rubens / Red Spruce	4	17		
PS	Pinus strobus / Eastern White Pine	9	38		
PG	Populus grandidentata / Bigtooth Aspen	13	56		
QR	Quercus rubra / Red Oak	45	192		
TC	Tsuga canadensis / Eastern Hemlock	3	13		
Zone 2					
AREA (ACRES)	0				
RATE (#/ACRE)	450				
TREES					
AB	Abies balsamia / Balsam Fir	12	16		
AR	Acer rubrum / Red Maple	11	14		
BP	Betula papyrifera / Paper Birch	12	16		
FG	Fagus grandiflora / American Beech	2	3		
PS	Pinus strobus / Eastern White Pine	51	67		
PG	Populus grandidentata / Bigtooth Aspen	10	13		

MARK	**SCIENTIFIC NAME / COMMON NAME**	**SIZE CAL**	**SIZE HT**	**ROOT**	**REMARKS**
TREES					
AR	Acer rubrum / Red Maple	2" - 2.5"	12'-14'	B & B	Full, matched specimens
AS	Acer saccharum / Sugar Maple	2" - 2.5"	12'-14'	B & B	Full, matched specimens
BP	Betula papyrifera 'Renaissance Reflection' / Paper Birch	-	8'-10'	B & B	Full, matched specimens; clump form; 3-stem min.
CA	Cornus alternifolia / Pagoda Dogwood	-	8'-10'	B & B	Full, matched specimens
CC	Crataegus crusgalli var. inermis / Cockspur Thornless Hawthorn	1 1/2"	8'-10'	B & B	Full, matched specimens
MS	Malus Donald Wyman / Donald Wyman Crabapple	1 1/2"	8'-10'	B & B	Full, matched specimens
FG	Fagus grandifolia / American Beech	2" - 2.5"	12'-14'	B & B	Full
PA	Picea abies / Norway Spruce	-	5' - 10'	B & B	Equal parts: 5'-6', 6'-8', 8'-10'. Randomly mix.
PR	Picea rubra / Red Spruce	-	5' - 10'	B & B	Equal parts: 5'-6', 6'-8', 8'-10'. Randomly mix.
PS	Pinus strobus / Eastern White Pine	-	5' - 10'	B & B	Equal parts: 5'-6', 6'-8', 8'-10'. Randomly mix.
QP	Quercus palustris / Pin Oak	2" - 2.5"	12'-14'	B & B	Full, matched specimens
TC	Tilia cordata 'Greenspire' / Littleleaf Linden	2" - 2.5"	12'-14'	B & B	Full, matched specimens
TS	Tsuga canadensis / Eastern Hemlock	-	5' - 10'	B & B	Equal parts: 5'-6', 6'-8', 8'-10'. Randomly mix.
TOD	Thuja occidentalis 'Douglasii' / Douglas Arborvitae	-	6'-8'	B & B	Full
SHRUBS					
CS	Cornus sericea 'Baileyi' / Red Twig Dogwood	#3	3'	Cont.	
IV	Ilex verticillata / 'Winter Red' & 'Apollo' / Winterberry	#3	3'	Cont.	Equal numbers of each in each mass; mixed
JV	Juniperus virginiana 'Grey Owl' / Grey Owl Juniper	#3	3'	Cont.	
MP	Myrica pensylvanica / Bayberry	#3	3'	Cont.	
VC	Viburnum carlesii / Koreanspice Viburnum	#3	3'	Cont.	
VL	Viburnum lentago 'Mohican' / Viburnum	#3	3'	Cont.	
VAS	Vaccinium angustifolium / Lowbush Blueberry	-	-	sod	
PERENNIALS					
CP	Carex pennsylvanica / Pennsylvania Sedge	#1	-	Cont.	2 year clump
DM	Dryopteris marginalis / Marginal Wood Fern	#1	-	Cont.	2 year clump
HS	Hemerocallis 'Stella d'Oro' / Daylily	#1	-	Cont.	2 year clump
MD	Monarda didyma 'Jacob Cline' / Bee-Balm	#1	-	Cont.	2 year clump
PV	Panicum virgatum 'Northwind' / Switch Grass	#1	-	Cont.	2 year clump
RF	Rudbeckia fulgida 'Goldstrum' / Black-eyed Susan	#1	-	Cont.	2 year clump
SS	Schizachyrium scoparium 'Blue Paradise' / Little Bluestem	#1	-	Cont.	2 year clump
SH	Sporobulus heterolepis / Prairie Dropseed	#1	-	Cont.	2 year clump

PLANTING SCHEDULES D5

1. ALL DISTURBED AREAS NOT OTHERWISE TREATED OUTSIDE THE PERIMETER DRIVE LIMITS TO BE STABILIZED AS FOLLOWS:
   A. UPPER CUT SLOPE: TEMPORARY RIPRAP TO REMAIN. APPLY SLURRY OF TOPSOIL TO A DEVELOPED DEPTH OF 4 INCHES IN THE INTERSTITIAL SPACES BETWEEN STONES. HYDROSEED/MULCH WITH "NEW ENGLAND ROADSIDE MATRIX UPLAND SEED MIX" (BASIS OF DESIGN) BY NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUAL.
   B. PERIMETER CUT/FILL SLOPES: SCARIFY AND DECOMPACT SOILS BEFORE APPLYING 6 INCHES LOAM, COMPACTING AS SPECIFIED. HYDROSEED/MULCH WITH "NEW ENGLAND CONSERVATION/WILDLIFE MIX" (BASIS OF DESIGN) BY NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUAL.
   C. STORMWATER MANAGEMENT BASINS: PLACE 6 INCHES LOAM TO SIDE SLOPES. HYDROSEED/MULCH WITH "NEW ENGLAND CONSERVATION/WILDLIFE MIX" (BASIS OF DESIGN) BY NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUAL. APPLY JUTE EROSION CONTROL MESH AND PEG AT REGULAR INTERVALS PER MANUFACTURER RECOMMENDATIONS TO PREVENT FLOATING OF SEED UNTIL SECURELY ROOTED. NOTE: VEGETATION IN STORMWATER BASINS IS TO BE FULLY ESTABLISHED AND SOILS STABILIZED PRIOR TO INTRODUCTION OF STORMWATER DRAINAGE.
2. ALL DISTURBED AREAS NOT OTHERWISE TREATED INSIDE THE PERIMETER DRIVE LIMITS TO BE LOAMED (6 INCHES) AND SEEDED WITH LAWN MIX UNLESS NOTED OTHERWISE.
3. LIMITS OF MOWING TO BE AS SHOWN AND GENERALLY 5-FEET +/- PAST THE EDGE OF PAVING.
4. AREAS LABELED "RESTORATION AREAS" ARE TO BE REVEGETATED AS SPECIFIED (REFER TO RIPARIAN BUFFER AND RESTORATION PLAN FOR DETAILS).

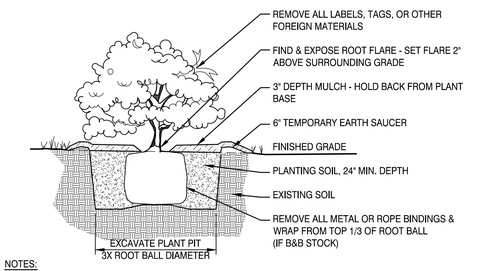
PLANTING NOTES A10



NOTES:

1. TREE TO BE SET PLUMB.
2. SECURE TREE AS MAY BE REQUIRED ACCORDING TO TREE SIZE, LOCATION, & WIND/WEATHER CONDITIONS.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

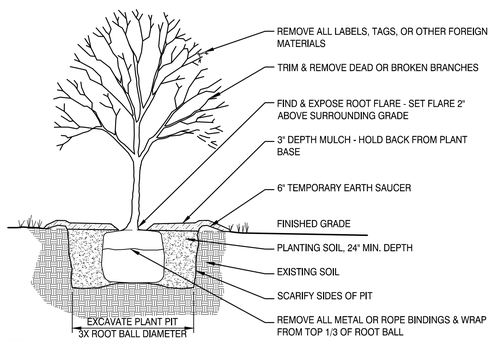
STANDARD EVERGREEN TREE PLANTING H1
NOT TO SCALE



NOTES:

1. SHRUB TO BE SET PLUMB.

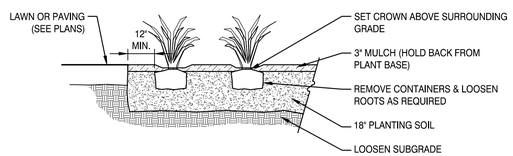
STANDARD SHRUB PLANTING D1
NOT TO SCALE



NOTES:

1. TREE TO BE SET PLUMB.
2. SECURE TREE AS MAY BE REQUIRED ACCORDING TO TREE SIZE, LOCATION, & WIND/WEATHER CONDITIONS.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

STANDARD DECIDUOUS TREE PLANTING A1
NOT TO SCALE



STANDARD PERENNIAL PLANTING A5
NOT TO SCALE

REV	DESCRIPTION	DATE

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285 NORTHPORT AVENUE

BELFAST, MAINE

PLANTING DETAILS & SCHEDULE

SHEET TITLE:

0 1/2" 1" 2" 3"

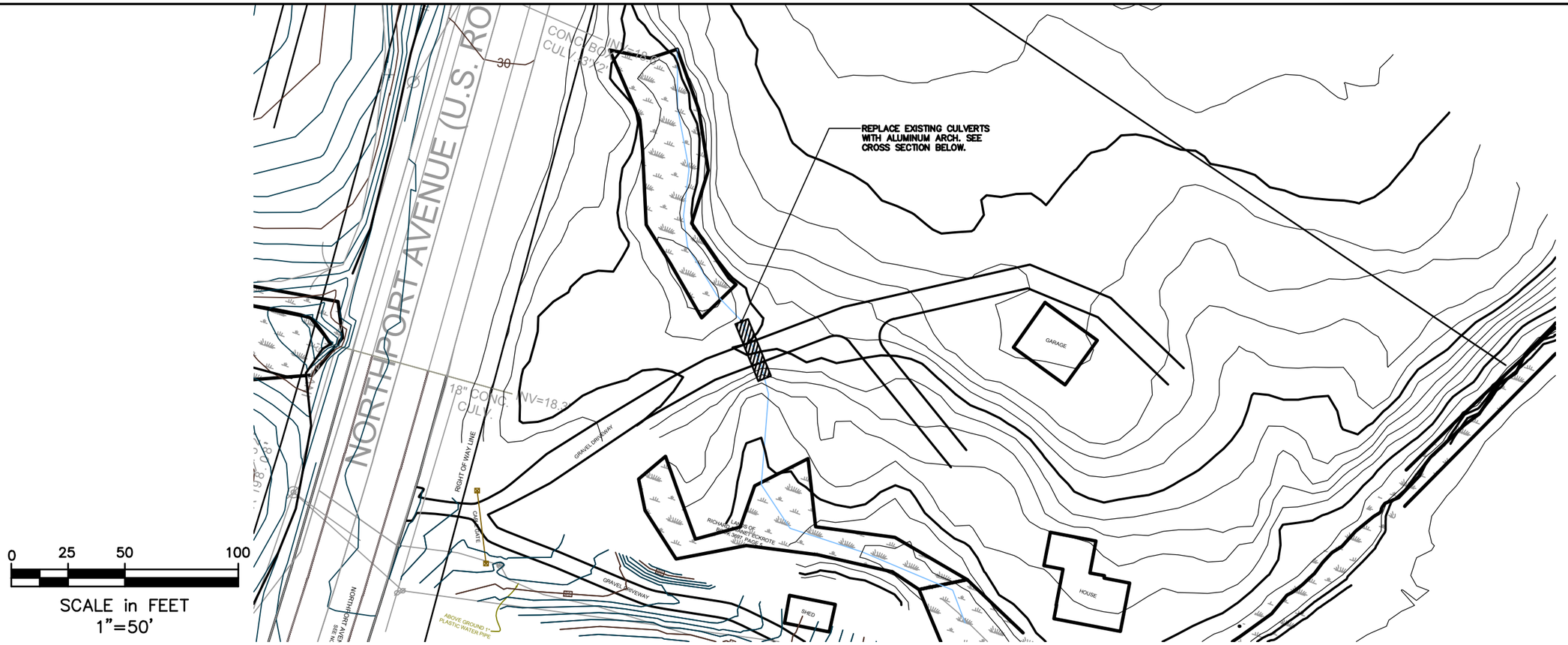
SCALE: AS SHOWN

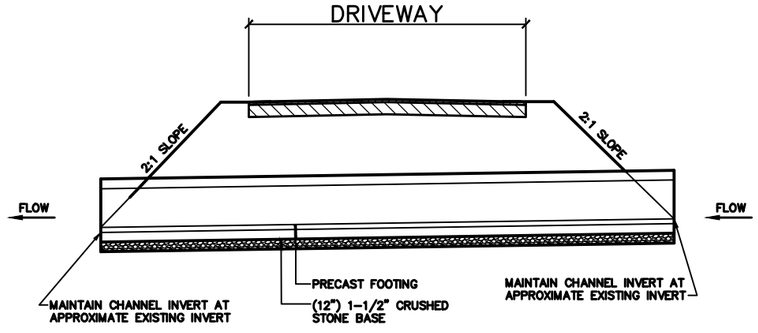
PROJECT MANAGER:	ADB	PROJECT NO:	18076
A/E OF RECORD:	MGJ		
JOB CAPTAIN:	SP		
DRAWN BY:	WSM		
SMRT FILE:	LP501-18076	SHEET No.	LP501

NOT FOR CONSTRUCTION

24x36

Appendix C
Aquatic Passage Culvert Detail

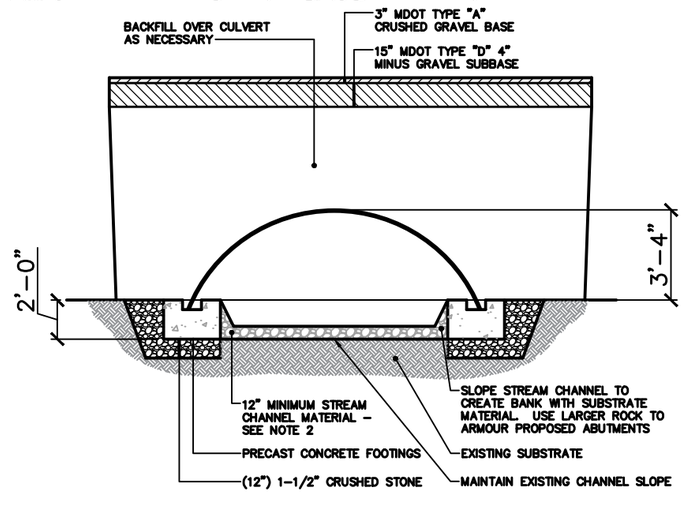




NOTES:

1. CULVERT TO BE SET AT BEST FIT TO EXISTING CHANNEL ELEVATION AS SHOWN. EXISTING CHANNEL ELEVATION HAS BEEN DETERMINED BY INTERPOLATION BETWEEN UPSTREAM AND DOWNSTREAM ELEVATIONS.
2. USE EROSION CONTROL BLANKETS ON SLOPE LESS THAN OR EQUAL TO 2:1; SLOPES GREATER THAN 2:1 REQUIRE RIPRAP STABILIZATION.
3. RIPRAP STABILIZATION SHALL CONSIST OF MIRAFI 500X GEOTEXTILE FABRIC OR APPROVED EQUAL WITH 30" IF 6" D50 RIPRAP.

CULVERT PROFILE
NOT TO SCALE



NOTES:

1. CULVERT TO BE SET AT BEST FIT TO EXISTING CHANNEL ELEVATION.
2. STREAM CHANNEL EMBEDMENT MATERIAL TO MATCH EXISTING CHANNEL MATERIAL.

CROSS SECTION OF ALUMINUM ARCH CULVERT
NOT TO SCALE

Site:
ECKROTE DRIVEWAY CULVERT

Prepared for:
RICHARD AND JANET ECKROTE
42 GRANDVIEW AVE.
LINCOLN PARK, NJ

PLAN, PROFILE AND CROSS SECTIONS

STATE OF MAINE
MAUREEN P. McGLONE
#7705
REGISTERED PROFESSIONAL ENGINEER

CIVIL ENGINEER:
MAUREEN P. McGLONE, PE #7705
400 COMMERCIAL STREET, SUITE 404
PORTLAND, ME 04101
207-772-2891

RANSOM
Consulting Engineers and Scientists
400 Commercial Street
Suite 404
Portland, Maine 04101
Tel (207) 772-2891
Fax (207) 772-3248
www.ransomenv.com

No.	Revision/Issue	Date
B	PERMITTING	5/10/19
A	REVIEW	4/29/19

Project: 171.05027

Sheet No:
CC-101

Examples of Culvert Design