Slope Wetland Restoration Plan for Bakerview Park Mount Vernon, Washington

May 7, 2009

Prepared for:

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I. INTRODUCTION

The City of Mount Vernon, Washington manages a waters/wetlands reserve system as part of their Critical Areas Ordinance (CAO) program. In 2007, the City identified waters/wetlands within Bakerview Park as a priority location for restoration activities in the Trumpeter Creek watershed. The park is located at 3101 East Fir Street, Mount Vernon, Washington (Figure 1). Recently, and in cooperation with the Seattle District of the U.S. Army Corps of Engineers, it has become possible to direct CAO efforts towards restoring 4.2 acres at Bakerview Park, including 3.7 acres of slope and depressional wetlands (Restoration Plan, Appendix A). This restoration will be accomplished by implementing turf conversion and weed control measures, creating complex microtopography, installing large wood, and planting a mix of native forest and scrub/shrub plant communities. To achieve these goals, four major Project Targets (Table 1) have been outlined:

Target 1. Restore complex microtopography to manage kinetic energy of floodwaters, and increase short and long term water storage.

Target 2. Improve water quality by increasing residence time of water.

Target 3. Re-establish a native forest and scrub-shrub plant community.

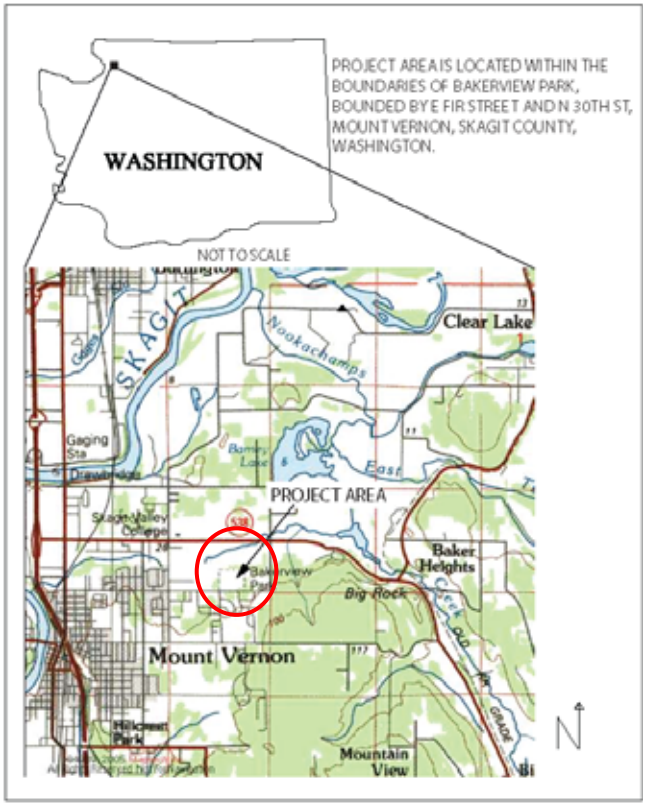
Target 4. Re-establish a compositionally and structurally complex ecosystem with habitat attributes important to several classes of faunal species.

This wetland restoration plan includes the following elements: (1) a brief summary of site conditions; (2) a detailed wetland restoration plan design and rationale; (3) a proposed work plan (project timing, sequencing, and methods); (4) a monitoring plan including project performance targets, standards, and success criteria; and (5) an adaptive management plan with recommended "first-line" contingency measures.

Table 1. Selected HGM terminology (from Brinson 1993, Brinson *et al.* 1995).

HGM Terms	Definition
Field Indicator/Measurement	Observable and/or measurable characteristics of waters/wetlands that correspond or correlate to articulated Project Standards
Project Standard	Performance criteria and/or specifications used to guide restoration activities toward Project Targets. Project Standards should include and specify reasonable Contingency Measures if Project Target is not achieved.
Project Target	The level of functioning identified or negotiated for a restoration project. This target must be based on reference standards and/or site potential and be consistent with restoration goals. Project Targets are used to evaluate whether a project is developing toward reference standards and/or site potential.

Figure 1. Location map of the Bakerview Park project area (Map source: Maptech Inc.).



II. SUMMARY OF SITE CONDITIONS

The proposed restoration area is located in the northeastern portion of Bakerview Park (see "limit of work," Appendix A). The site consists of 3.7 acres of slope and depressional wetlands which are "adjacent" (i.e. bordering, neighboring, or contiguous) to Trumpeter Creek, and 0.5 acres of uplands. The upland area includes a large mound (Photo 1; Area D, Appendix A), and a hillslope in the southern portion of the site (Area E, Appendix A). The existing vegetation communities include portions of actively maintained lawn (Photographs 2-4; Most of Area C, Appendix A) and wet meadows dominated by reed canarygrass (*Phalaris arundinaceae*) (Photographs 3-5; Area A, Appendix A). Historically, the wetlands likely supported a mosaic of mature conifer forest and scrub/shrub plant communities.

III. DETAILED WETLAND RESTORATION PLAN DESIGN AND RATIONALE

As introduced above, this plan for wetland restoration focuses on turf conversion, weed control, creation of complex microtopography, installation of large wood, and planting a mix of native forest and scrub/shrub plant communities. The proposed restoration activities will improve ecosystem functions by (1) increasing short and log term depressional storation, (2) energy dissipation, (3) stimulating biogeochemical cycling including retention of nutrients and other pollutants, (4) establishing native plant community processes, and (5) providing restored habitat

and faunal support functions. These restoration techniques contribute to preservation of water quality, improvement of biogeochemical cycling, plant and animal diversity, and faunal habitat complexity.

Detailed design rationale and approaches for restoration activities are discussed below. In Section IV, construction sequencing is described.

A. Turf Conversion and Weed Control

The restoration area is dominated by actively maintained lawn (Photographs 1-4; Area C, Appendix A). In addition, large portions of the area, which are not actively maintained, are dominated by reed canarygrass (*Phalaris arundinaceae*) (Photographs 3-5; Area A, Appendix A). Reed canarygrass is difficult to control once it becomes established at a site. It can tolerate both saturated and dry soils, and has a long-lived seed bank (DOE 2009). These attributes enable reed canarygrass to dominate a site unless weed management efforts are continued while a forest canopy is established.

Turf conversion and weed control efforts shall include the following techniques developed in consultation with Pacific Northwest Invasive Plant Council coordinator, Lisbeth Ann Seebacher, Ph.D. (items 4 shall only be applied to those areas dominated by reed canarygrass (*Phalaris arundinaceae*):

1. Mark any desirable native plants to save and avoid.

2. Remove/strip above ground vegetation with a bush hog, mower, and/or small dozer. Take care to avoid damage to all marked trees and shrubs. Vegetative material should be removed from the site to the greatest extent possible without damaging desirable native plants. Areas inaccessible to the mower/dozer should be weed whacked by hand.

3. After above-ground vegetation has been removed, the site should be ripped two ways and disked two ways. Large wood should be installed (see Sections II.B and II.C below). Only rip/disc at the direction of a certified wetland scientist.

4. Following earthwork, the site should site fallow for 4-6 weeks to allow for reed canarygrass (RCG) rhizome regeneration. After emergence of new leaves, RCG should be sprayed with Rodeo herbicide. The typical recommended foliage spray mixture is one ounce per gallon of water. A non-ionic surfactant should be mixed with the herbicide at the rate of one ounce per gallon. Agridex is recommended because it is the least toxic surfactant.

   For a low-volume foliar application we recommend backpack sprayers with flat or adjustable spray tips, Model 30 GunJet with rollover nozzle, Philly Foam system, Thinvert system or Radiarc sprayer mounted to a truck or skidder.

   We recommend the following spraying techniques:
   a. Spray herbicide directly onto foliage of individual plants.

b. Use spray pressures and techniques that minimize spray drift.
c. Get good coverage on the growing tips and terminal leader.
d. Spray front and back sides of the target clump to ensure adequate coverage.
e. Apply the herbicide solution at a volume that wets the crown, but minimizes runoff.

5. Regular site maintenance (*i.e.* at least twice annual) will be conducted to control weeds until the tree canopy develops.

B. Create Complex Microtopography

Microtopographic variation can be created by constructing a suite of features that include microdepressions, small mounds, and large wood. Microtopographic features can be installed with and without large wood (Typical Microdepression Details, Appendix B). We shall install at least 10 and not more than 15 microtopographic features with wood (Table 2; Notes, Appendix A). We shall install at least 4 and not more than 8 microtopographic features without wood (Take-Off Schedule for Microtopographic Features and Logs, Appendix A). Construction of microtopographic features shall immediately follow ripping and disking (see Section III.A above). Earthwork activities shall be supervised by a certified professional wetland scientist and a certified erosion and sediment control lead.

Table 2. Take-off schedule for logs to be used for large wood installation and the construction of microtopographic features.

Number of Pieces	Minimum Length	Min. Dia. At Breast Height	Min. Dia. At Top	Allowable Species	Notes
30-45	20’	12”	4”	*Thuja plicata*, *Pseudotsuga menziesii*, *Picea sitchensis*, *Tsuga heterophylla*, *Acer macrophyllum*, and *Populus balsamifera spp. trichocarpa*	Logs must have root balls attached

C. Install Large Wood

Large wood improves ecosystem functions in wetlands through facilitation of biogeochemical cycling and provision of habitat suitable for recruitment of trees and shrubs (Lassettre and Harris 2001, McHenry et al. 2007). In addition to the logs associated with microtopographic features, we shall install at least 20 and not more than 30 logs (Table 2; Typical Large Wood Installation, Appendix B) as directed in the field by a certified professional wetland scientist.

C. Plant a Mix of Native Forest and Scrub/Shrub Plan Communities

Installation of plants (Tables 3 and 4) should follow at least 1 week after the application of herbicide. Plant installation should occur between October 15 (after first rain) and November 30

or between February 15 and April 30. Planting efforts should target stem densities of 400 trees per acre and 250 shrubs per acre. Trees should be planted at 10-12 feet on center (o.c). spacing and shrubs should be massed in groups of three at 5 feet o.c. spacing (Tree, Shrub, and Live Stake Details, Appendix B). Immediately before planting, rip and disc the soil to a depth of 12 inches to prepare the planting substrate. Rip/disc at the direction of a certified wetland scientist.

Microdepressions within the forested scrub-shrub mosaic will be planted with herbaceous, emergent species (*e.g.*, slough sedge and small-fruited bulrush, Table 3). To maximize plant survival, plant layout will be directed in the field by an experienced biologist or forester. Plants will be installed in microsites that are suited to their particular life history requirements. Planting specifications that are tailored to site conditions are provided Tables 3 and 4. Plants should be installed according to planting details provided in Appendix B. Where soils are poor in nutrients, a handful of "osmocote" (approximately 4 ounces) should be added to soils in the planting hole. Weed control should be implemented for at least 5 years to ensure that new plants survive. Our on-going adaptive management approach will examine any causes of mortality and will replace dead individuals with either the same species or with alternate species. This adaptive management approach will also aim to minimize losses by determining ways to minimize root causes of mortality.

Table 3. Take-off schedule for the forested scrub-shrub wetland plant community (Restoration Plan, Appendix A).

Scientific Name	Common Name	Plant Material	On-Center Spacing (ft)	Wetland Indicator Status	Number of Plants
Trees: target 400 stems per acre					
Thuja plicata	Western red cedar	1 gallon pots	12	FAC	272
Pseudotsuga menziesii	Douglas fir	1 gallon pots	12	FACU	272
Malus fusca	Pacific crabapple	1 gallon pots	12	FACW	136
Populus balsamifera spp. trichocarpa	Black cottonwood	live stakes	12	FAC	204
Populus tremuloides	Trembling aspen	1 gallon pots	12	NL	68
Betula papyrifera	Paper birch	1 gallon pots	12	FAC	136
Acer Macrophyllum	Bigleaf maple	1 gallon pots	12	FACU	204
Prunus emarginata	Bitter cherry	1 gallon pots	12	FACU	68
Shrubs: target 250 stems per acre					
Acer circinatum	Vine maple	1 gallon pots	5	FAC	255
Salix sitchensis	Sitka willow	live stakes	5	FACW	255
Salix lucida	Pacific willow	live stakes	5	FACW	alternate
Salix scouleriana	Scouler's willow	live stakes	5	FAC	alternate
Oemlaria cerasiformis	Indian plum	1 gallon pots	5	FACU	85
Ribes sanguineum	Red-flowering currant	1 gallon pots	5	NL	85
Rubus parviflorus	Thimbleberry	1 gallon pots	5	FAC	170
Herbs: target 19,360					
Carex obnupta	Slough sedge	plugs or flats	1.5	OBL	1,550
Scirpus microcarpus	Small-fruited bullrush	plugs or flats	1.5	OBL	1,550
Agrostis alba	Redtop bentgrass	Seed	N/A	FAC	140 pounds
Alopecurus geniculatus	Water foxtail	Seed	N/A	OBL	140 pounds

Table 4. Take-off schedule for the mixed conifer deciduous upland forest (Restoration Plan, Appendix A).

Scientific Name	Common Name	Plant Material	On-Center Spacing (ft)	Wetland Indicator Status	Number of Plants
Trees: target 400 stems per acre					
Pseudotsuga menziesii	Douglas fir	1 gallon pots	12	FACU	51
Tsuga heterophylla	Western hemlock	1 gallon pots	12	FACU	51
Malus fusca	Pacific crabapple	1 gallon pots	12	FACW	13
Populus balsamifera spp. trichocarpa	Black cottonwood	live stakes	12	FAC	26
Acer Macrophyllum	Bigleaf maple	1 gallon pots	12	FACU	38
Populus tremuloides	Trembling aspen	1 gallon pots	12	NL	51
Betula papyrifera	Paper birch	1 gallon pots	12	FAC	26
Shrubs: target 250 stems per acre					
Oemlaria cerasiformis	Indian plum	1 gallon pots	5	FACU	64
Ribes sanguineum	Red-flowering currant	1 gallon pots	5	NL	64
Rubus parviflorus	Thimbleberry	1 gallon pots	5	FAC	32
Herbs					
Festuca rubra	Creeping red fescue	Seed	N/A	FAC	80 pounds

IV. PROPOSED WORK PLAN

As introduced above, elements of this restoration plan include turf conversion and weed control measures, creating complex microtopography, installing large wood, and planting a mix of native forest and scrub/shrub plant communities. The following sequence of activities shall be conducted in order to implement these elements:

1. Using a combination of flagging and "T"-posts painted orange, mark the limit of work.

2. Mark any desirable native plants to save and avoid.

3. Remove/strip above ground vegetation with a bush hog, mower, and/or small dozer. Take care to avoid damage to all marked trees and shrubs. Vegetative material should be composted on site and or removed from the site to the greatest extent possible without damaging desirable native plants. Areas inaccessible to the mower/dozer should be weed whacked by hand.

4. After above-ground vegetation has been removed, the site should be ripped two ways, and disked two ways. Large wood should be installed. Only rip/disc at the direction of a certified wetland scientist.

5. Following earthwork, the site should site fallow for 4-6 weeks to allow for reed canarygrass (RCG) rhizome regeneration. After emergence of new leaves, RCG should be sprayed with Rodeo herbicide. The typical recommended foliage spray mixture is one ounce per gallon of water. A non-ionic surfactant should be mixed with the herbicide at the rate of one ounce per gallon. Agridex is recommended because it is the least toxic surfactant.

6. Immediately before planting, rip and disc the soil again to a depth of approximately 12 inches at the direction of a certified wetland scientist to prepare the planting substrate.

7. Under supervision of a qualified forester/biologist, determine and, if necessary, mark planting locations with color-coded flagging according to microtopographic conditions.

8. Commence planting between October 15 (after first rain) and November 15 or between February 15 and March 31. Plant shrubs and trees according to typical planting specifications (Tables 3 and 4 and Appendix B). Forest community planting efforts should target 400 stems per acre. Planting layout should be designed for optimum weed management. Specifically, planting in aggregated thickets or in loose rows allows for easier mechanical weed control. Each plant should be marked (e.g., with a bamboo cane and bright colored flagging) to protect it during weeding operations.

9. Apply grass seed (Tables 3 and 4) and mulch or sterile straw, or other appropriate erosion control measures, to any bare soils.

10. Following planting, weeds will be removed by hand and/or with weed whackers at least twice per year to promote establishment of trees and shrubs.

V. MONITORING PLAN: PROJECT TARGETS, PROJECT STANDARDS, AND SUCCESS CRITERIA

Success of the wetland restoration will be ensured through regular maintenance, monitoring, and adaptive management. Monitoring of the wetland restoration shall be conducted at years 0 (baseline), 1, 2, 5, 7, and 10 to document the project trajectory and ensure that Project Targets and Project Standards are being met. A monitoring report which documents milestones,

successes, problems, and any contingency actions shall be prepared and provided to the City of Mount Vernon.

The Project Standards and measurement methods (Table 5) will be used to assess whether the Bakerview Park wetland restoration project is achieving the Project Targets. These Project Standards are based upon project attributes that directly, or indirectly, measure Hydrologic, Biogeochemical, Plant Community and Faunal Habitat/Support functions according to current best available science. The functional performance standard analysis which includes designation of Project Targets and Project Standards (Table 1) follows the *Draft Operational Guidebook to Assessment of Riverine, Slope and Depressional Waters/Wetlands in the City of Mount Vernon, Washington* (*Mount Vernon HGM Guidebook*) (Lee et al. 2008). The *Mount Vernon HGM Guidebook* (Lee et al. 2008) was developed to be consistent with the federal guidelines on development of HGM Guidebooks and best available science (Brinson 1993; Brinson 1995; Brinson et al. 1995; Brinson 1996; Smith et al. 1995; U.S. Army Corps of Engineers 1996; and U.S. Army Corps of Engineers 1997). The approach is similar to that presented in *Guidance on Wetland Mitigation in Washington State, Guidelines for Developing Wetland Mitigation Plans and Proposals* (Department of Ecology, U.S. Army Corps of Engineers, Seattle District Environmental Protection Agency Region 10).

Table 5. A Summary of the Project Targets, Project Standards, Success Criteria, Performance Standard Measurement Methods, and Recommended "First Line" Contingency Measures for the Bakerview Park Restoration.

Project Target	Project Standard: Success Criteria	Performance Standard Measurement Methods	Recommended "First Line" Contingency Measures
1. Restore complex microtopography to manage kinetic energy of floodwaters, and increase short and long term water storage.	1. Install 18 pieces of large wood as single logs and standing dead (*i.e.*, snags): Placement of 18 pieces of large wood. 2. Construct 14 microtopographic features with wood and 6 without wood: Construction of 14 microtopographic features with wood and 6 without wood.	1. As-built survey and photo documentation.	1. N/A – complete installation of specified structures. 2. N/A – complete specified grading.
2. Improve water quality by increasing residence time of water.	1. Install 18 pieces of large wood as single logs and standing dead (*i.e.*, snags): Placement of 18 pieces of large wood. 2. Construct 14 microtopographic features with wood and 6 without wood: Construction of 14 microtopographic features with wood and 6 without wood.	1. As-built survey and photo documentation.	1. N/A – complete installation of specified structures. 2. N/A – complete specified grading.
3. Re-establish a native forest and scrub-shrub plant community.	1. Survival of planted stock: Greater than or equal to 90% survival. 2. Percent cover of native tree species in forest communities: Greater than or equal to 10% after 1 year, 20% after 3 years, 40% after 5 years, 50% after 7 years, and 60% after 10 years. 3. Percent cover of native shrub species in forest communities: Greater than or equal to 5% after 1 year, 10% after 3 years, 15% after 5 years, 25% after 7 years, and 40% after 10 years. Not to exceed 75%. 4. Percent of native species cover in each stratum: Greater than or equal to 85%.	1. Establish (mark and GPS) six representative 0.1 acre monitoring plots to measure plant species abundance and composition. 2. A permanent photo point at each plot with photos taken in each cardinal direction.	1. Replant trees and shrubs which suffer mortality. 2. If mortality is high, identify the likely cause. Install tree protectors or alter species composition as needed.
4. Re-establish a compositionally and structurally complex ecosystem with habitat attributes important to several classes of faunal species.	1. Vegetative strata: Forest community should average two strata (*i.e.*, trees, shrubs, and herbs, with sapling/seedling and/or vines as additional stratum) after 1-5 years, 2 to 3 strata after 5-7 years, and three or more strata after 10 years. 2. Faunal diversity: Restoration site attracts greater than or equal to two classes of fauna after 1-5 years; greater than or equal to three classes of fauna after 5-10 years. 3. Canopy cover by two or three strata: Greater than or equal to 15% after 1 year, 25% after 3 years, 40% after 5 years, 60% after 7 years, and 80% after 10 years.	1. Establish (mark and GPS) six representative 0.1 acre monitoring plots to measure plant species abundance and composition. 2. A permanent photo point at each plot with photos taken in each cardinal direction. 3. Record observations of faunal classes observed.	1. Replant trees and shrubs which suffer mortality. 2. If mortality is high, identify the likely cause. Install tree protectors or alter species composition as needed.

VI. ADAPTIVE MANAGEMENT PLAN

We have designed our adaptive management strategy to address unforeseen changes in site conditions or other components of the wetland restoration project. We will use a comparison of compliance monitoring data to Project Targets and Project Standards listed in Section IV to prompt or indicate which site conditions or components of the restoration needs focus or attention. If and when shortfalls or failures in site conditions or restoration components are identified, we will use a combination of our practical experience and best available science to design and implement replacement, repair, or change of an approach. For example, if compliance monitoring data indicate undue mortality in planted stock due to drought, our adaptive management approach is to replace planted stock with the same, similar, or more-well adapted species. If herbivory is the cause of mortality, then various protection systems (*e.g.*, tubes, socks, live trapping, direct reduction) could be installed or implemented. As the forest community becomes established, maintenance needs should decrease significantly. Eventually, minimal effort will be necessary to maintain a healthy forest community throughout the project area.

As a standard practice, we identify the type and need for adaptive management measures in the compliance monitoring reports. In these reports we recommend how, when, where and by whom adaptive management measures should be completed. Continued maintenance including weed removal will promote success of the wetland restoration program.

VII. SUMMARY OF RESTORATION EFFECTIVENESS

We have performed an HGM functional assessment to rate the effectiveness of the proposed restoration efforts using the *Mount Vernon HGM Guidebook* (Lee et al. 2008). The functional assessment is performed for the hydrology, biogeochemistry, plant community, and faunal support functions for slope wetlands listed in Table 6. The HGM functional assessment produces results in the form of Functional Capacity Index (FCI) scores. In Table 6 we offer these FCI scores for baseline conditions, and at years 5 and 10. We also offer the change in FCI over the different time intervals. As portrayed in Table 6 and Figure 2, FCI increases for each HGM function except Function 9, "Interspersion of Connectivity of Habitats." Function 9 reflects the reality that this restoration does not provide greater connectivity of habitats in the landscape context. Bakerview Park will remain relatively isolated within the urban setting in which it exists.

We also offer the results of the functional assessment in the form of Functional Capacity Units, which are FCI's multiplied by the area of wetlands restored (3.7 acres). These results are provided in Table 7.

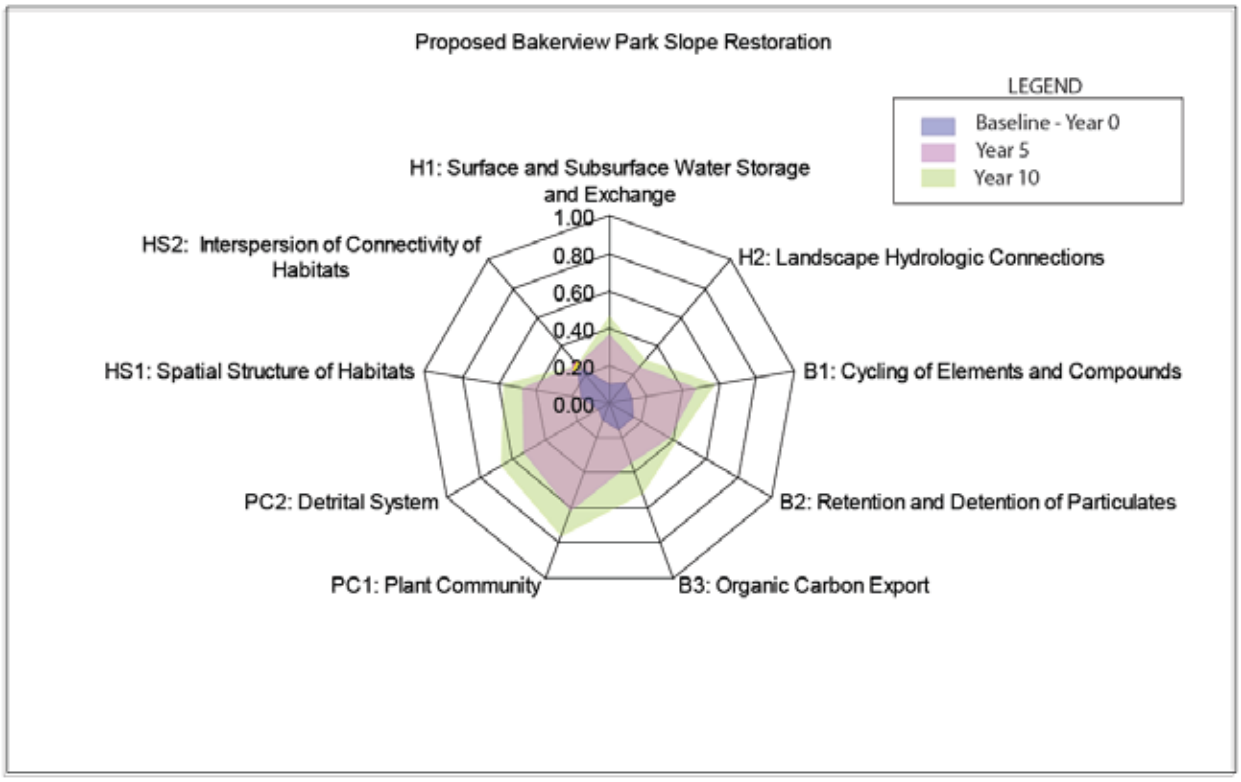
Table 6. These Functional Capacity Indices (FCIs) are the result of the HGM functional assessment performed for the Bakerview Park restoration using the *Mount Vernon HGM Guidebook* (Lee et al. 2008).

Function	Baseline FCI	Year 5 FCI	Year 5 Δ_b	Year 10 FCI	Year 10 Δ_b	Year 10 Δ_5
A. Hydrology						
1. Surface and Subsurface Water Storage and Exchange	0.10	0.36	+0.26	0.46	+0.36	+0.10
2. Landscape Hydrologic Connections	0.14	0.25	+0.11	0.30	+0.16	+0.05
B. Biogeochemistry						
3. Cycling of Elements and Compounds	0.12	0.47	+0.35	0.57	+0.45	+0.10
4. Retention and Detention of Particulates	0.15	0.37	+0.22	0.41	+0.26	+0.04
5. Organic Carbon Export	0.15	0.34	+0.20	0.51	+0.36	+0.17
C. Plant Community						
6. Plant Community	0.10	0.61	+0.51	0.75	+0.65	+0.14
7. Detrital System	0.07	0.53	+0.43	0.67	+0.60	+0.14
D. Faunal Support						
8. Spatial Structure of Habitats	0.15	0.47	+0.32	0.57	+0.43	+0.10
9. Interspersion of Connectivity of Habitats	0.26	0.26	0.00	0.26	0.00	0.00

Table 7. These Functional Capacity Units (FCUs) are the result of the HGM functional assessment performed for the Bakerview Park restoration using the *Mount Vernon HGM Guidebook* (Lee et al. 2008) and expressed as a function of area.

Function	**Baseline FCU**	**Year 5 FCU**	**Year 5 Δ_b**	**Year 10 FCU**	**Year 10 Δ_b**	**Year 10 Δ_5**
A. Hydrology						
1. Surface and Subsurface Water Storage and Exchange	0.37	1.32	+0.95	1.70	+1.33	+0.38
2. Landscape Hydrologic Connections	0.50	0.91	+0.40	1.09	+0.59	+0.18
B. Biogeochemistry						
3. Cycling of Elements and Compounds	0.44	1.71	+1.27	2.09	+1.65	+0.38
4. Retention and Detention of Particulates	0.54	1.35	+0.81	1.50	+0.96	+0.15
5. Organic Carbon Export	0.54	1.25	+0.72	1.87	+1.33	+0.61
C. Plant Community						
6. Plant Community	0.37	2.24	+1.88	2.75	+2.39	+0.51
7. Detrital System	0.24	1.94	+1.69	2.45	+2.20	+0.51
D. Faunal Support						
8. Spatial Structure of Habitats	0.54	1.71	+1.18	2.09	+1.56	+0.38
9. Interspersion of Connectivity of Habitats	0.96	0.96	+0.00	0.96	0.00	0.00

Figure 2. Spider diagram demonstrating the increases in HGM functioning over time for the proposed slope wetland restoration at Bakerview Park.



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IX. PHOTOGRAPHS

Photograph 1. The upland mound located along the eastern edge of the restoration area (Area D, Appendix A) has a lower water table than the surrounding wetlands.

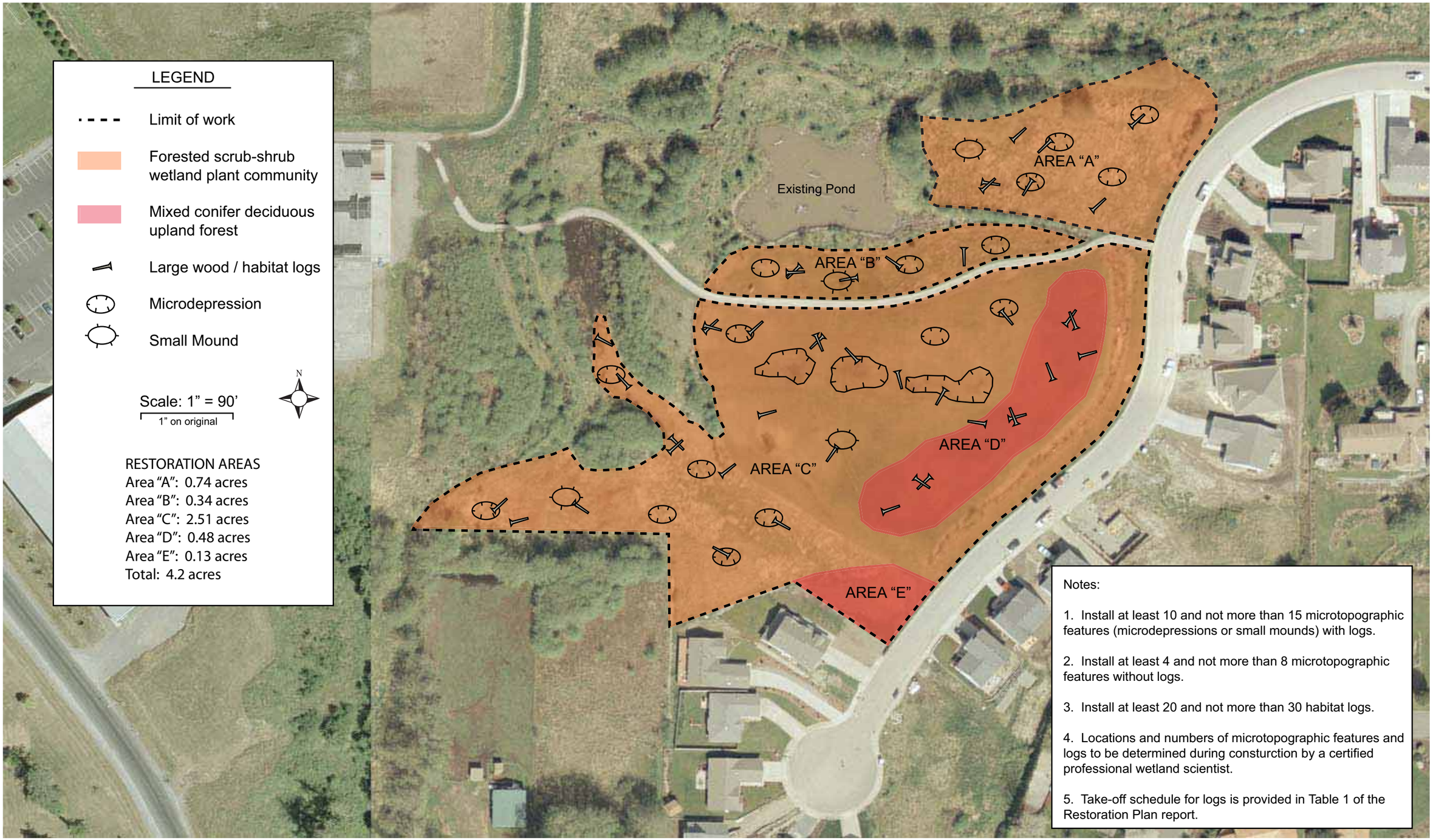
Photograph 2. Area C (Appendix A), which comprised the majority of the restoration area is primarily actively maintained lawn.

Photograph 3. Portions of the restoration are maintained lawn with adjacent areas dominated by reed canarygrass.

Photograph 4. This photo depicts the typical vegetation – actively maintained lawn in the foreground and a reed canarygrass-dominated wet meadow in the back left.

Photograph 5. The reed canarygrass dominated meadow comprising Area A (Appendix A).

APPENDIX A – RESTORATION PLAN



Notes:

1. Install at least 10 and not more than 15 microtopographic features (microdepressions or small mounds) with logs.

2. Install at least 4 and not more than 8 microtopographic features without logs.

3. Install at least 20 and not more than 30 habitat logs.

4. Locations and numbers of microtopographic features and logs to be determined during consturction by a certified professional wetland scientist.

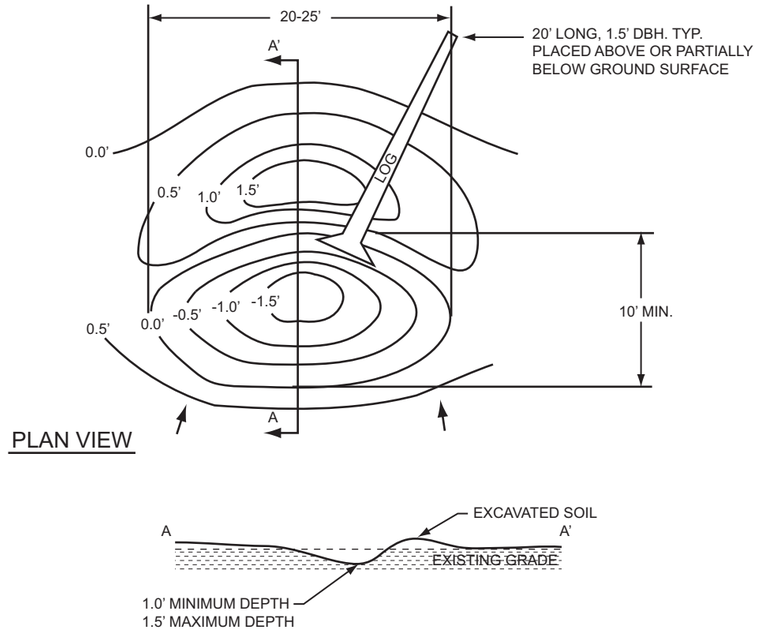
5. Take-off schedule for logs is provided in Table 1 of the Restoration Plan report.

Bakerview Park Restoration Plan
May 7, 2009

WSP

MOUNT VERNON

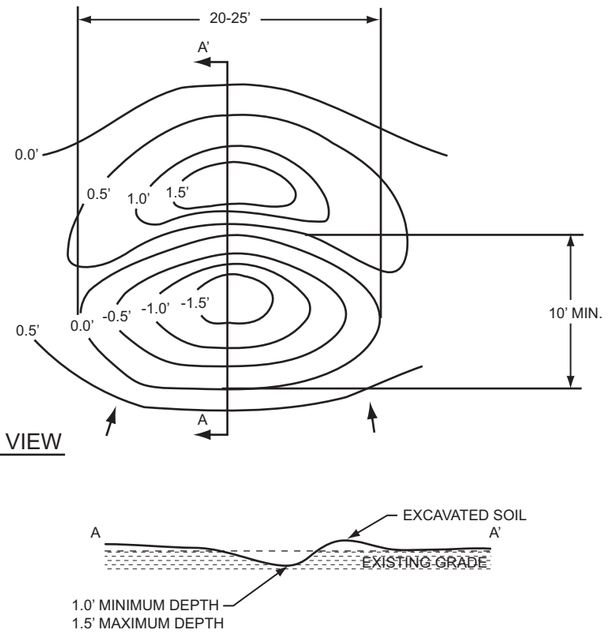
APPENDIX B – DETAILS AND SPECIFICATIONS



PLAN VIEW

SECTION A-A'

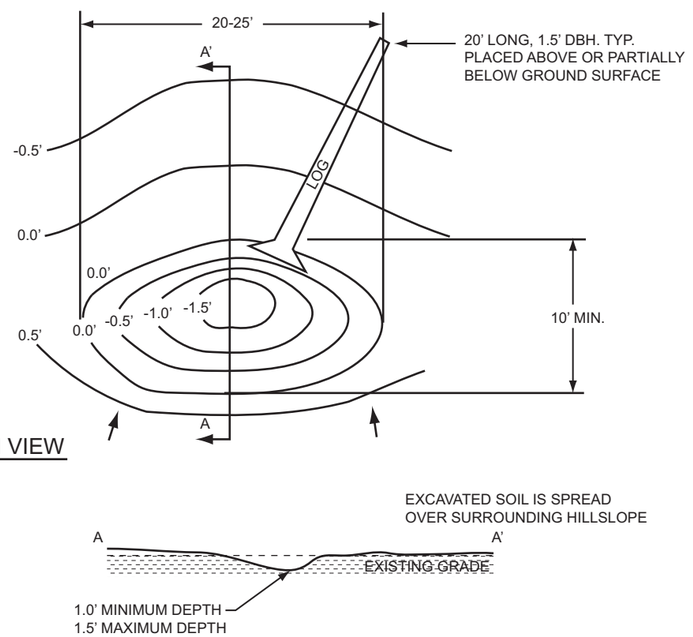
MICRODEPRESSION WITH BERM / WITH LARGE WOOD



PLAN VIEW

SECTION A-A'

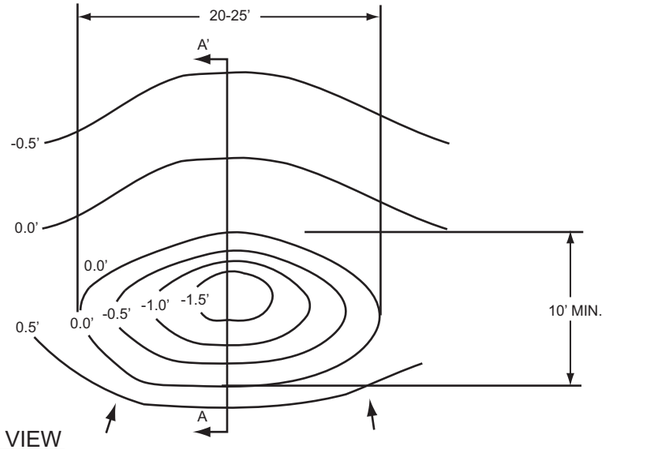
MICRODEPRESSION WITH BERM / NO LARGE WOOD



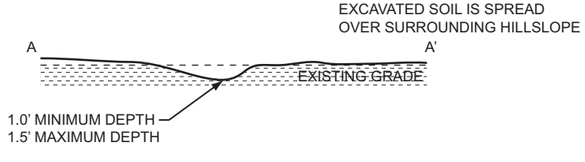
PLAN VIEW

SECTION A-A'

MICRODEPRESSION WITHOUT BERM / WITH LARGE WOOD



PLAN VIEW



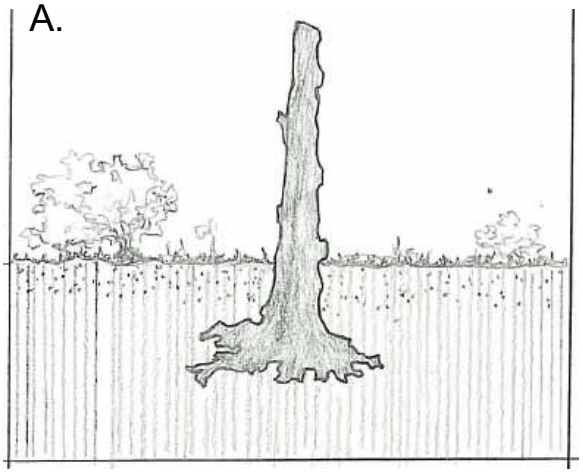
SECTION A-A'

MICRODEPRESSION WITHOUT BERM / NO LARGE WOOD

TYPICAL MICRODEPRESSION DETAILS

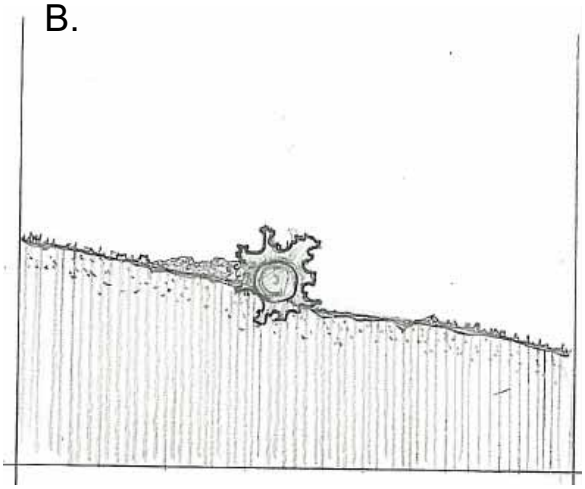
WSP

A.



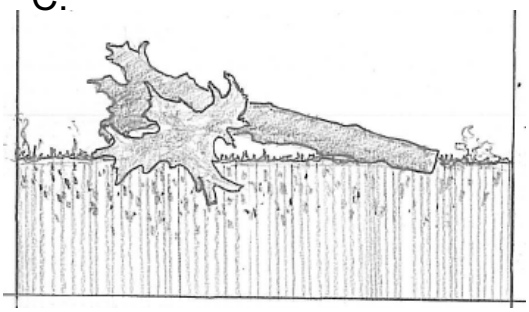
UPRIGHT

B.



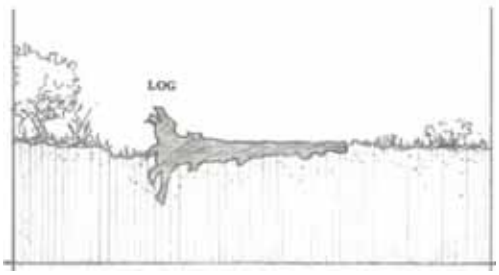
BACKFILLED

C.



JACK STRAW

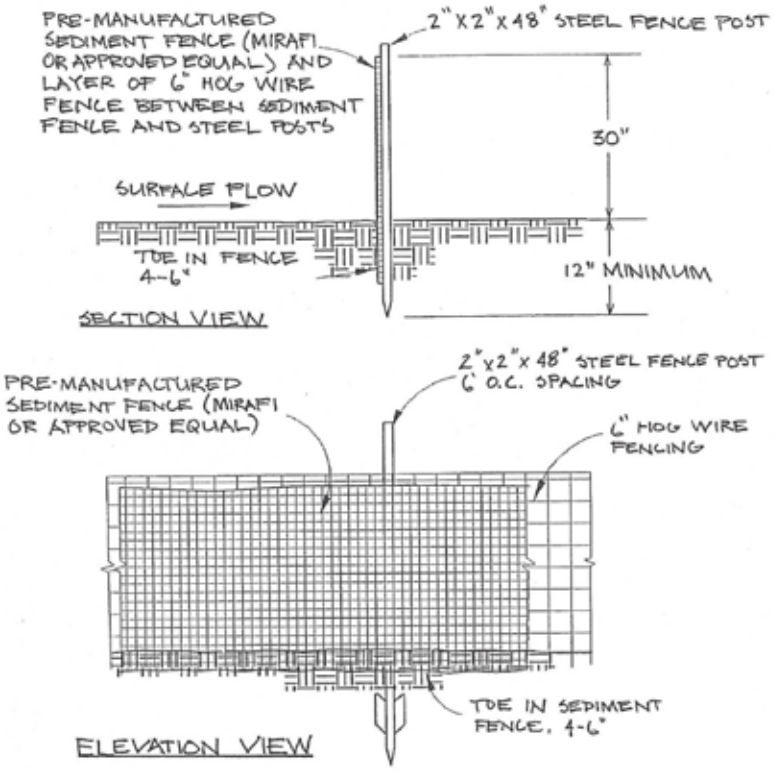
D.



PARTIALLY BURIED

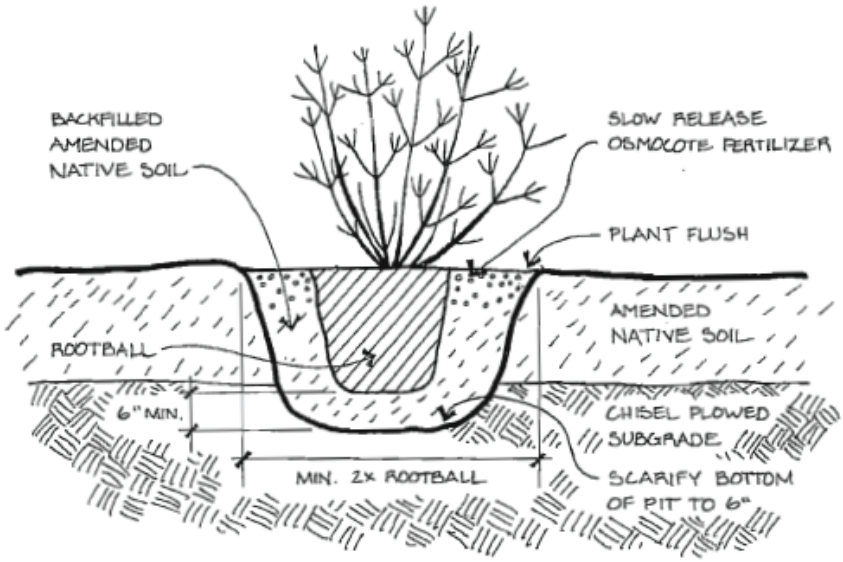
TYPICAL LARGE WOOD INSTALLATIONS

Not to scale



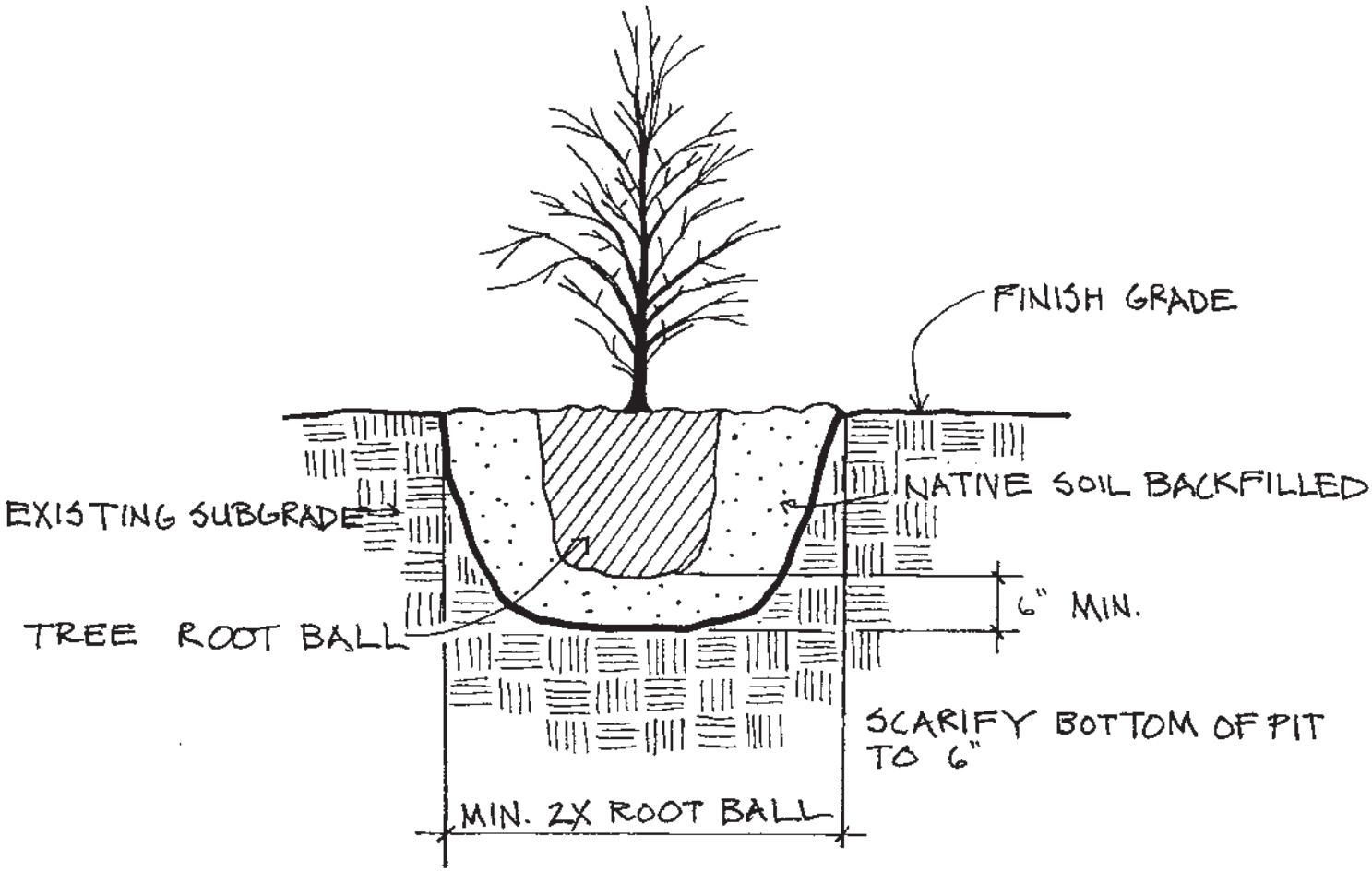
HEAVY DUTY SEDIMENT FENCE

Not to Scale



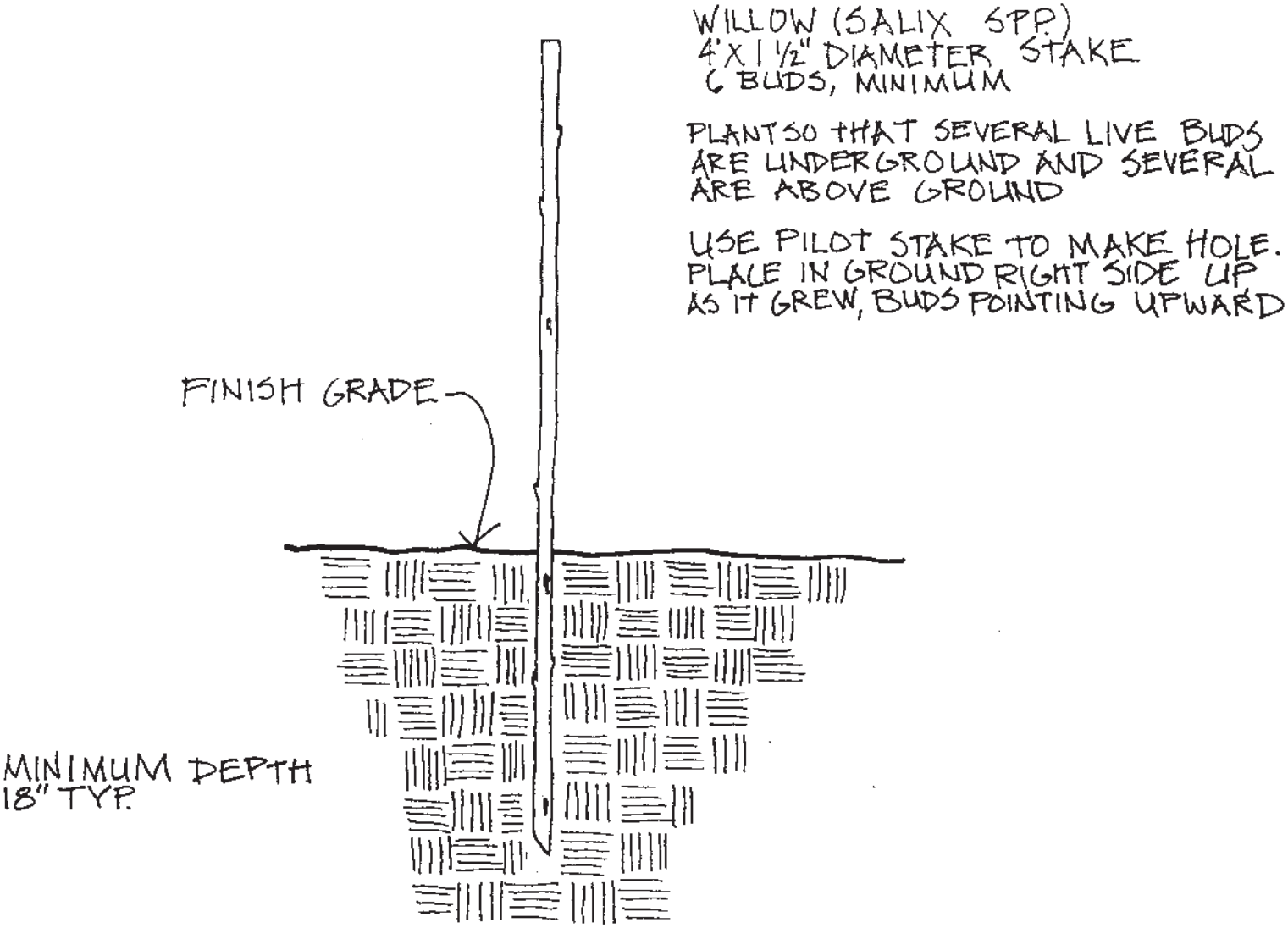
SHRUB PLANTING DETAIL

Not to scale



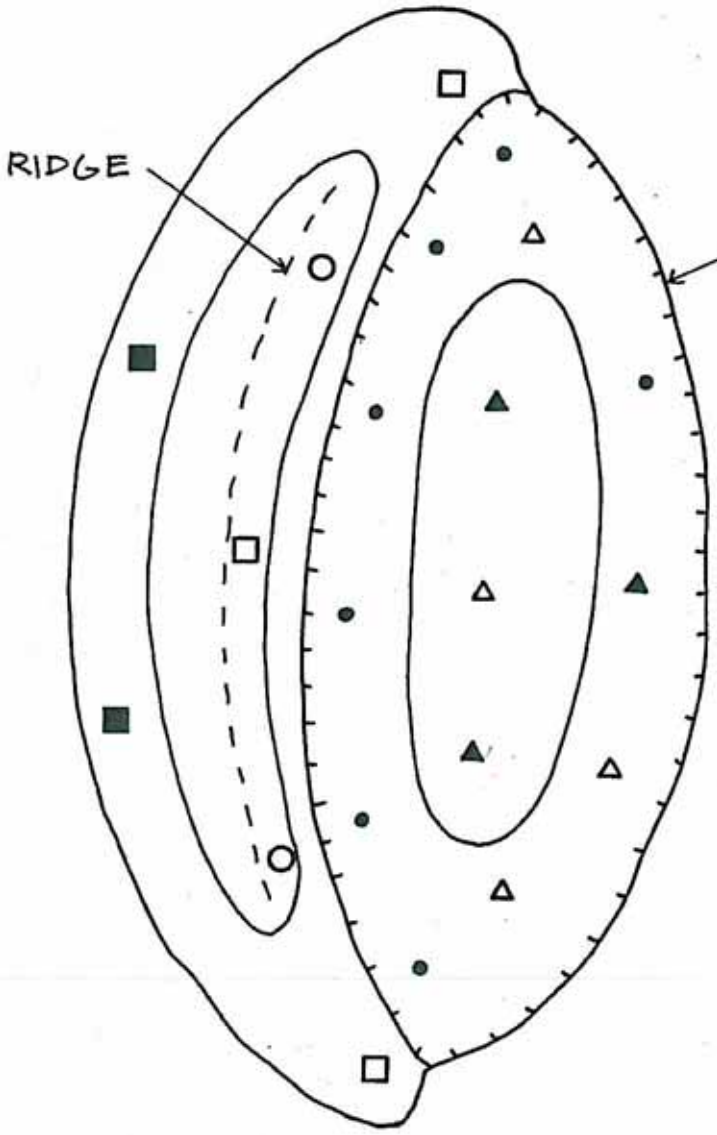
TREE PLANTING DETAIL

No Scale



LIVE STAKE (CUTTING) DETAIL

No Scale



■ SALIX LASIOLEPIS

○ CORNUS SERICEA SSP. SERICEA

□ SAMBUCUS RACEMOSA

▲ OENANTHE SARMENTOSA

• JUNCUS BALTICUS

△ SCIRPUS MICROCARPUS AND/OR CAREX OBNUPTA

SMALL MICRODEPRESSION PLANTING DETAIL, TYP. PLAN VIEW

No Scale

WSP