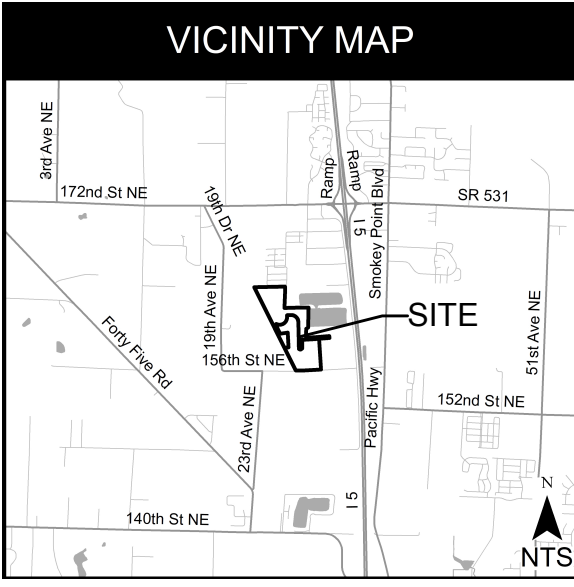


FINAL BUFFER ENHANCEMENT PLAN
10 DEGREES
 PORTION OF SECTION 29, TOWNSHIP 31N, RANGE 5E, W.M.



PROJECT DESCRIPTION

The subject property is 45.97 acres in size, composed of portions from two tax parcels (Parcel# 31052900303100 and 31052900303200). It is located at 2703 156th St NE, in the city limits of Marysville, Washington (Section 29, Township 31N, Range 5E, W.M.) and is within the Snohomish River watershed (WRIA 7).

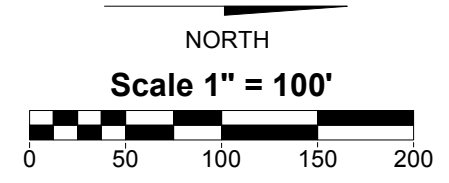
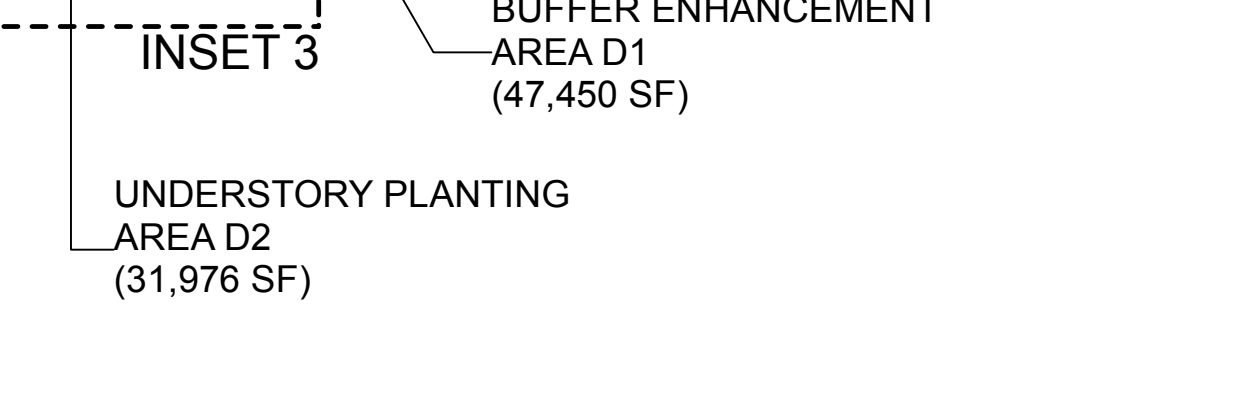
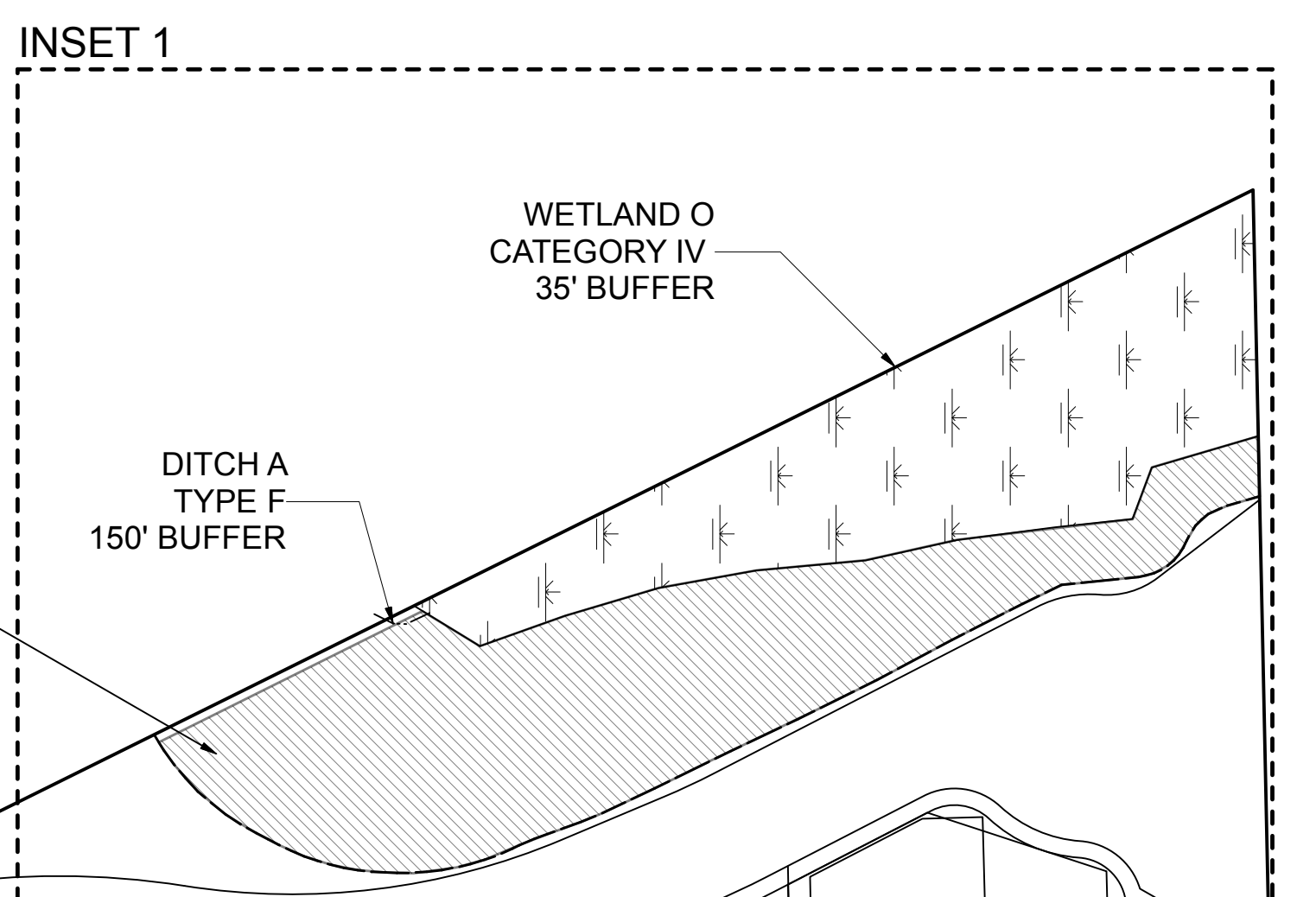
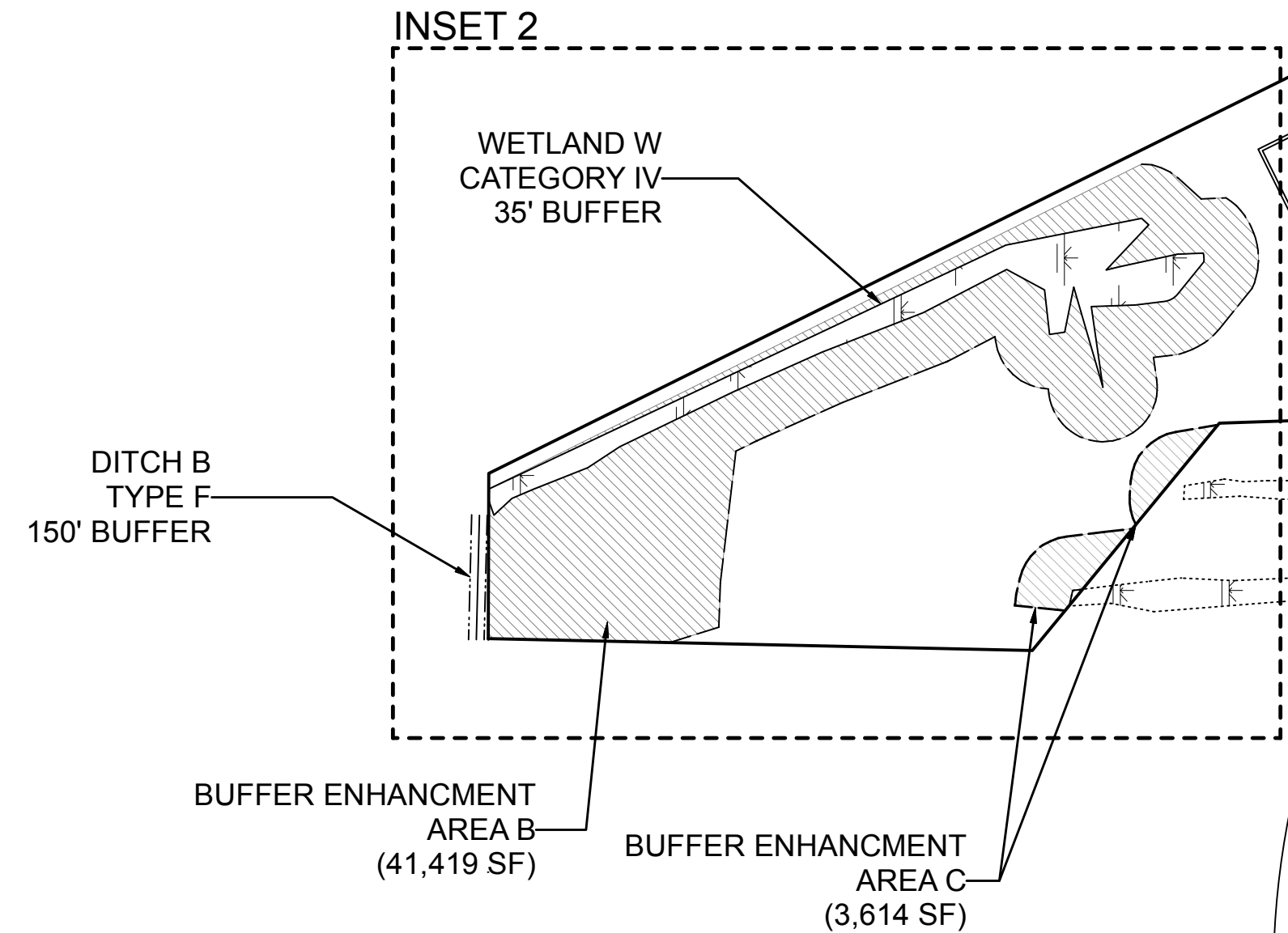
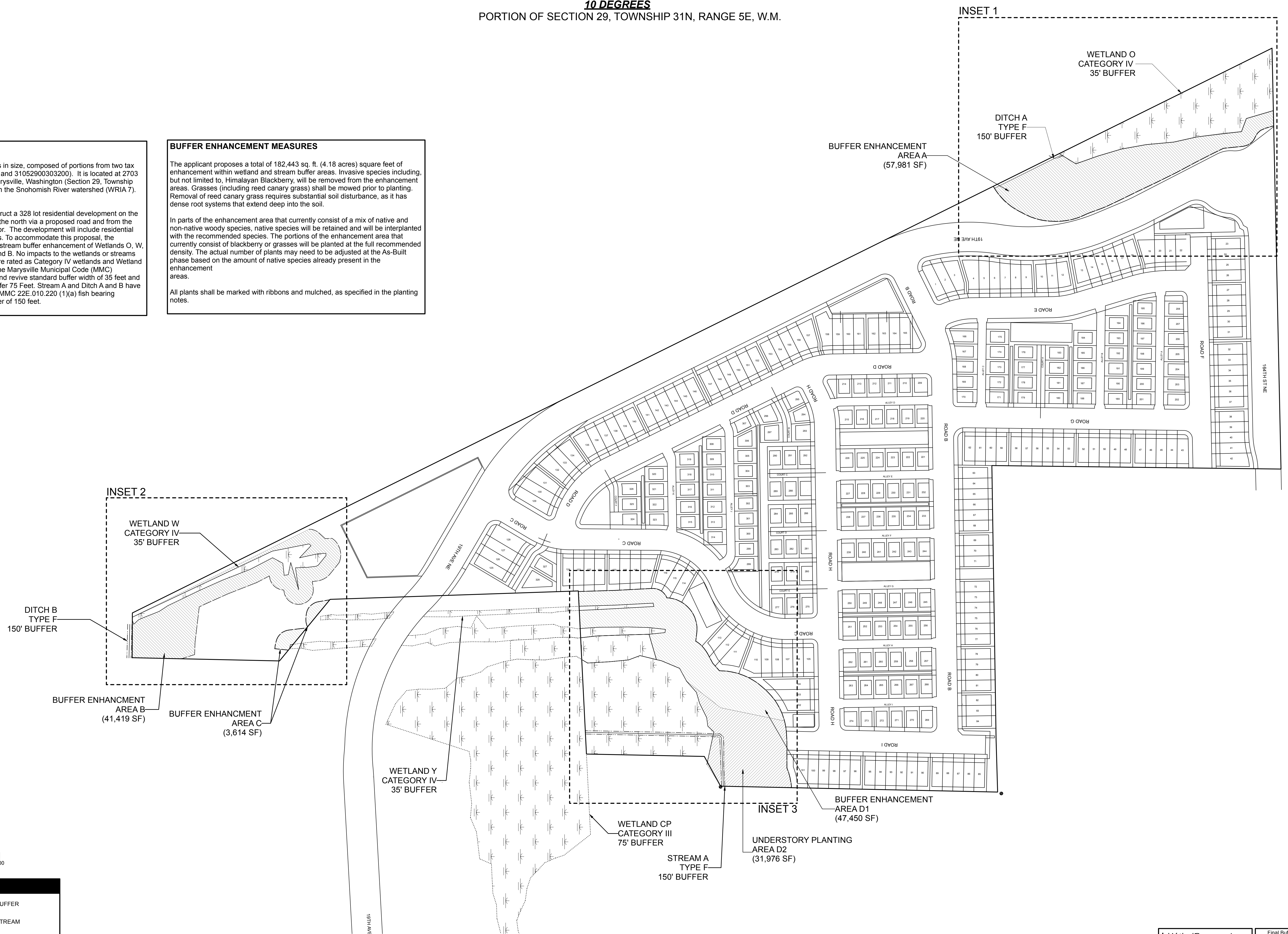
The applicant is proposing to construct a 328 lot residential development on the subject property, with access from the north via a proposed road and from the southeast via Twin Lakes Connector. The development will include residential buildings, access roads and utilities. To accommodate this proposal, the applicant is proposing wetland and stream buffer enhancement of Wetlands O, W, Y, And CP, Stream A and Ditch A and B. No impacts to the wetlands or streams will occur. Wetlands O, W, and Y are rated as Category IV wetlands and Wetland CP is rated as a Category III, per the Marysville Municipal Code (MMC) 22E.010.100 (4) Category IV wetland revive standard buffer width of 35 feet and Category III wetlands receive a buffer 75 Feet. Stream A and Ditch A and B have been identified as fish bearing per MMC 22E.010.220 (1)(a) fish bearing waterways receive a standard buffer of 150 feet.

BUFFER ENHANCEMENT MEASURES

The applicant proposes a total of 182,443 sq. ft. (4.18 acres) square feet of enhancement within wetland and stream buffer areas. Invasive species including, but not limited to, Himalayan Blackberry, will be removed from the enhancement areas. Grasses (including reed canary grass) shall be mowed prior to planting. Removal of reed canary grass requires substantial soil disturbance, as it has dense root systems that extend deep into the soil.

In parts of the enhancement area that currently consist of a mix of native and non-native woody species, native species will be retained and will be interplanted with the recommended species. The portions of the enhancement area that currently consist of blackberry or grasses will be planted at the full recommended density. The actual number of plants may need to be adjusted at the As-Built phase based on the amount of native species already present in the enhancement areas.

All plants shall be marked with ribbons and mulched, as specified in the planting notes.

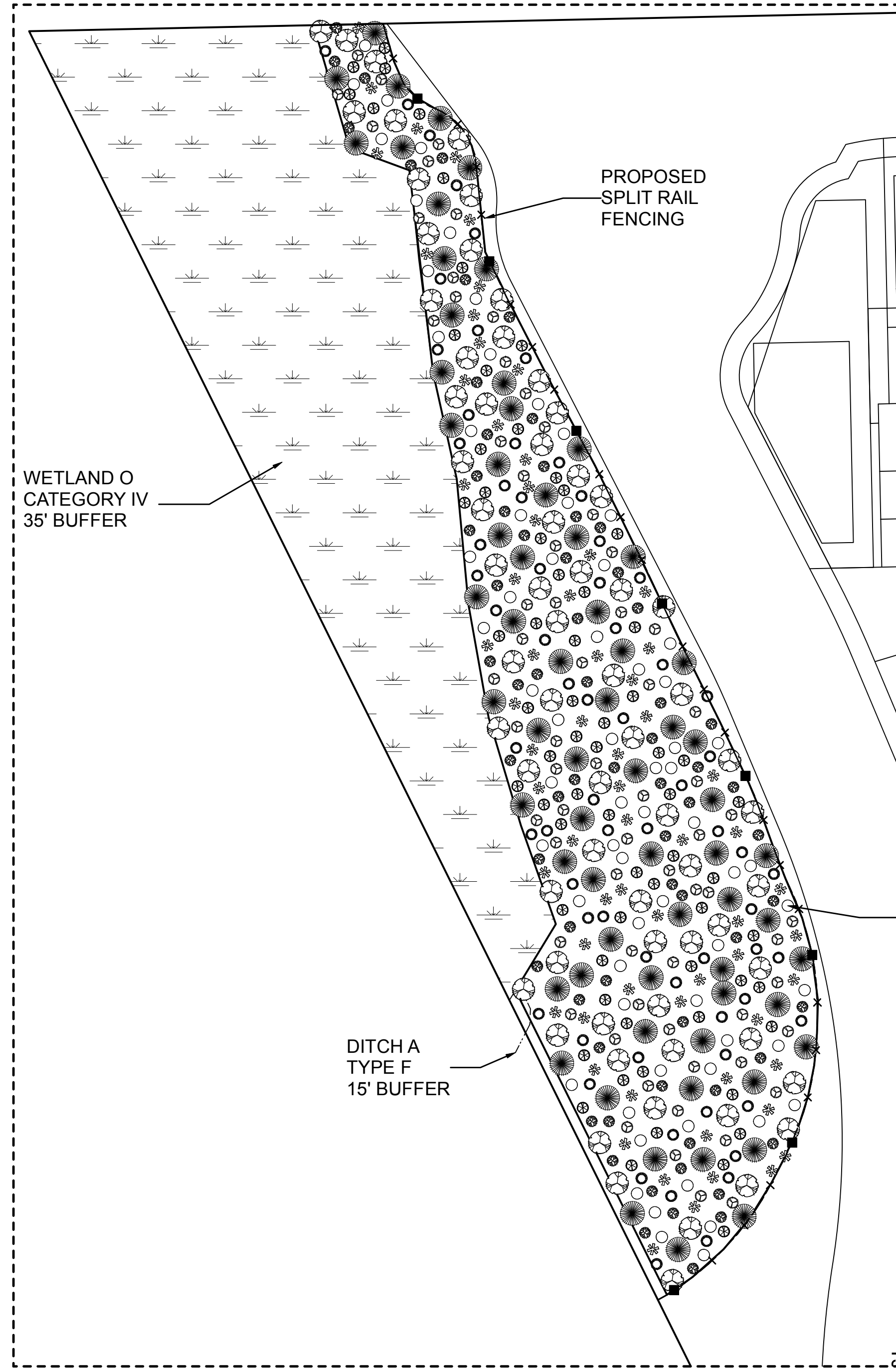


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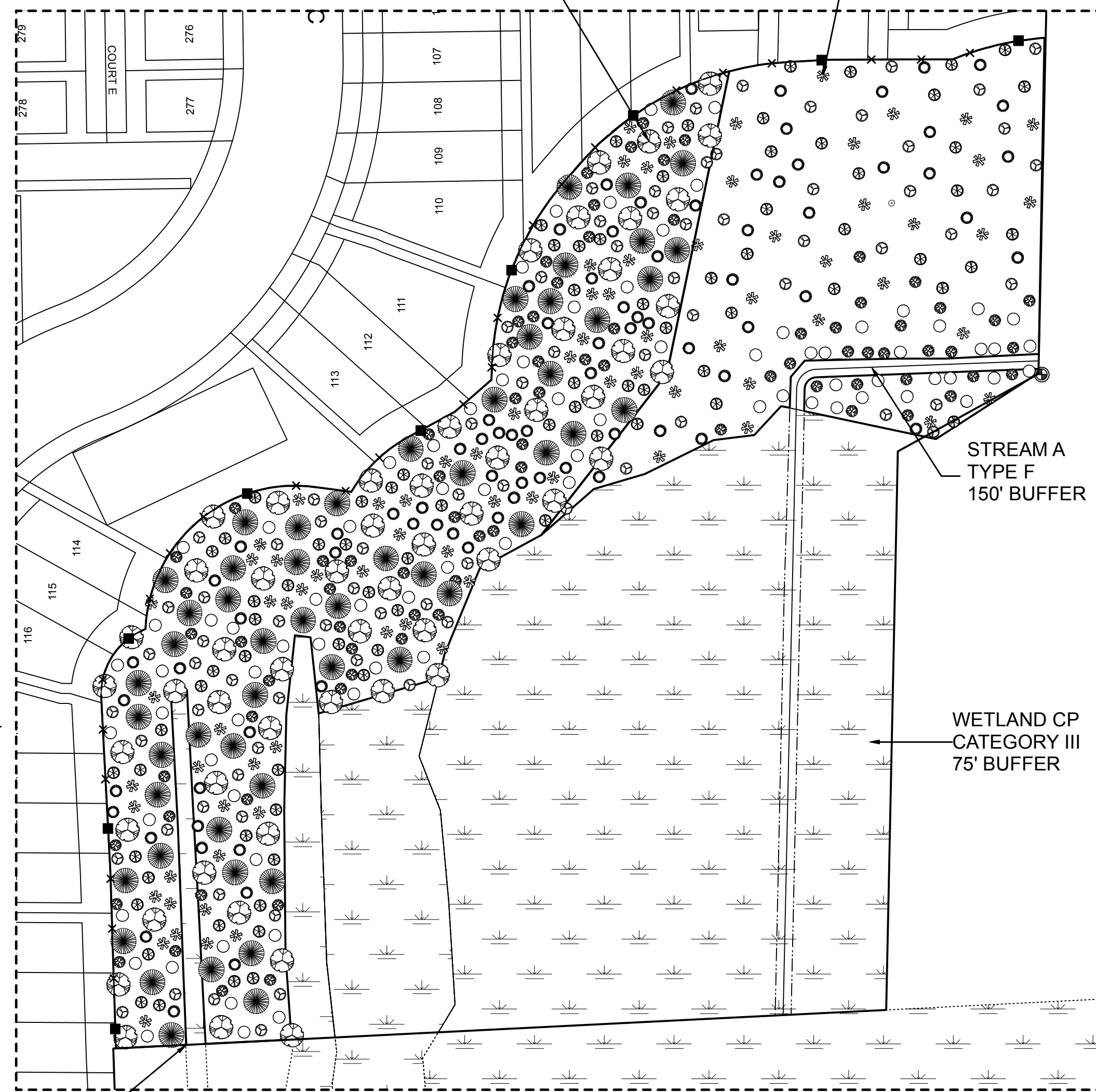
	WETLAND		BUFFER
	OFFSITE WETLAND		STREAM
	BUFFER ENHANCEMENT		OFFSITE STREAM
	UNDERSTORY PLANTING		

FINAL BUFFER ENHANCEMENT PLAN
10 DEGREES
 PORTION OF SECTION 29, TOWNSHIP 31N, RANGE 5E, W.M.

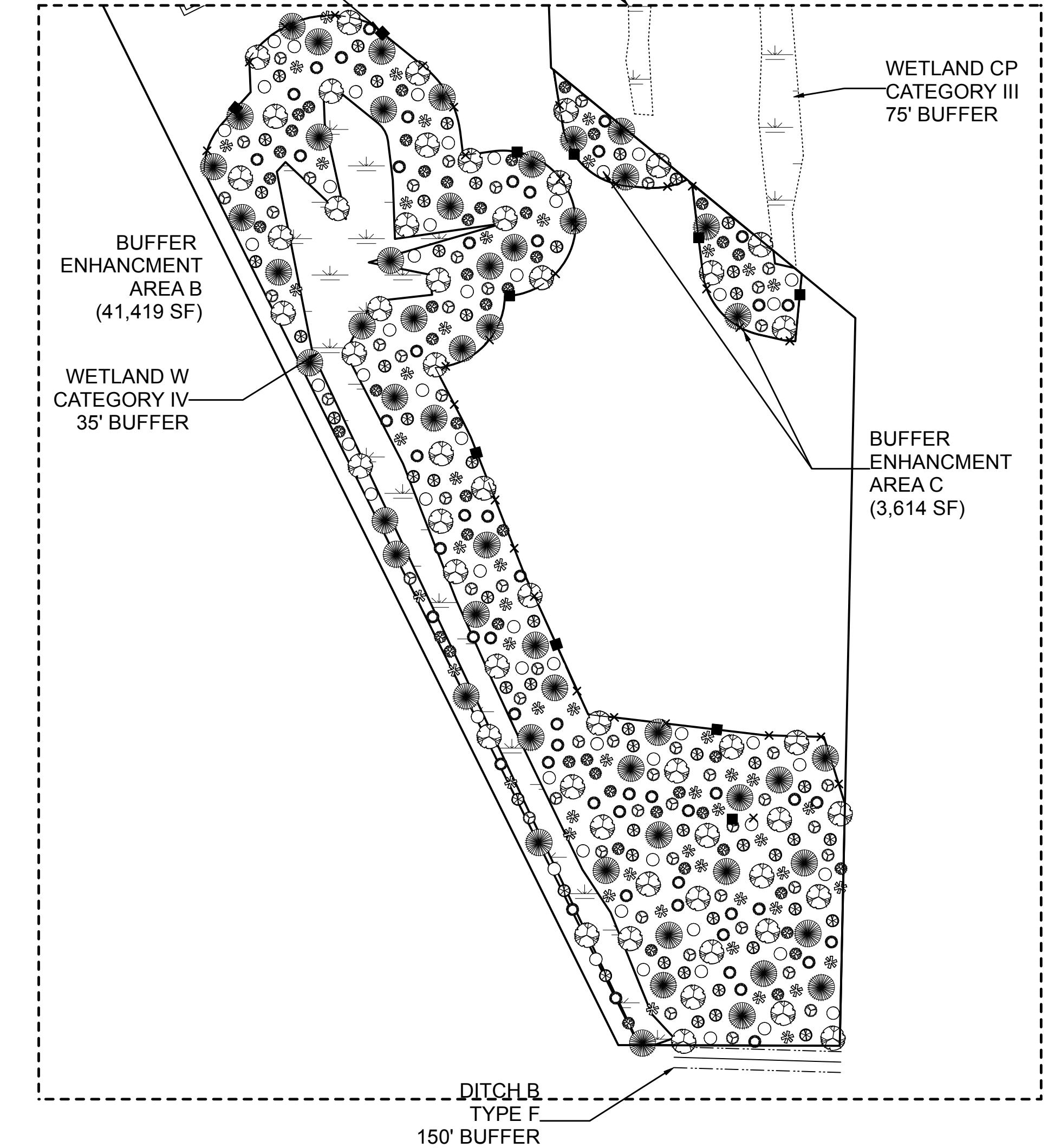
INSET 1



INSET 2



INSET 3



WETLAND O
CATEGORY IV
35' BUFFER

UNDERSTORY PLANTING
AREA D2
(31,976 SF)

BUFFER ENHANCEMENT
AREA D1
(47,450 SF)

PROPOSED NGPA
SIGNAGE

WETLAND Y
CATEGORY IV
35' BUFFER

WETLAND CP
CATEGORY III
75' BUFFER

BUFFER ENHANCEMENT
AREA B
(41,419 SF)

WETLAND W
CATEGORY IV
35' BUFFER

BUFFER ENHANCEMENT
AREA C
(3,614 SF)

DITCH A
TYPE F
15' BUFFER

BUFFER ENHANCEMENT
AREA A
(57,981 SF)

STREAM A
TYPE F
150' BUFFER

WETLAND CP
CATEGORY III
75' BUFFER

WETLAND Y
CATEGORY IV
35' BUFFER

DITCH B
TYPE F
150' BUFFER

BUFFER UNDERSTORY PLANTINGS

The following plants shall be installed in the specified buffer understory areas:

Understory Buffer Planting Area D2 (31,976 square feet)				
Common Name	Latin Name	Size	Spacing	Quantity
Snowberry	<i>Symphoricarpos albus</i>	1 gallon	7'	126
Thimbleberry	<i>Rubus parviflorus</i>	1 gallon	7'	126
Nootka Rose	<i>Rose nutkana</i>	1 gallon	7'	126
Beaked Hazelnut	<i>Corylus cornuta</i>	1 gallon	7'	125
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	7'	125
Vine maple	<i>Acer circinatum</i>	1 gallon	7'	125

BUFFER ENHANCEMENT PLANTINGS

The following plants shall be installed in the specified buffer enhancement areas:

Buffer Enhancement Area A (57,981 square feet)				
Common Name	Latin Name	Size	Spacing	Quantity
Big leaf maple	<i>Acer macrophyllum</i>	1 gallon	10'	335
Douglas Fir	<i>Pseudotsuga menziesii</i>	1 gallon	10'	334
Snowberry	<i>Symphoricarpos albus</i>	1 gallon	5'	335
Thimbleberry	<i>Rubus parviflorus</i>	1 gallon	5'	335
Nootka Rose	<i>Rose nutkana</i>	1 gallon	5'	335
Beaked Hazelnut	<i>Corylus cornuta</i>	1 gallon	5'	335
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	5'	335
Vine maple	<i>Acer circinatum</i>	1 gallon	5'	334

Buffer Enhancement Area B (41,419 square feet)				
Common Name	Latin Name	Size	Spacing	Quantity
Big leaf maple	<i>Acer macrophyllum</i>	1 gallon	10'	239
Douglas Fir	<i>Pseudotsuga menziesii</i>	1 gallon	10'	239
Snowberry	<i>Symphoricarpos albus</i>	1 gallon	5'	240
Thimbleberry	<i>Rubus parviflorus</i>	1 gallon	5'	239
Nootka Rose	<i>Rose nutkana</i>	1 gallon	5'	239
Beaked Hazelnut	<i>Corylus cornuta</i>	1 gallon	5'	239
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	5'	239
Vine maple	<i>Acer circinatum</i>	1 gallon	5'	239

Buffer Enhancement Area C (3,614 square feet)				
Common Name	Latin Name	Size	Spacing	Quantity
Big leaf maple	<i>Acer macrophyllum</i>	1 gallon	10'	21
Douglas Fir	<i>Pseudotsuga menziesii</i>	1 gallon	10'	21
Snowberry	<i>Symphoricarpos albus</i>	1 gallon	5'	21
Thimbleberry	<i>Rubus parviflorus</i>	1 gallon	5'	21
Nootka Rose	<i>Rose nutkana</i>	1 gallon	5'	21
Beaked Hazelnut	<i>Corylus cornuta</i>	1 gallon	5'	21
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	5'	20
Vine maple	<i>Acer circinatum</i>	1 gallon	5'	20

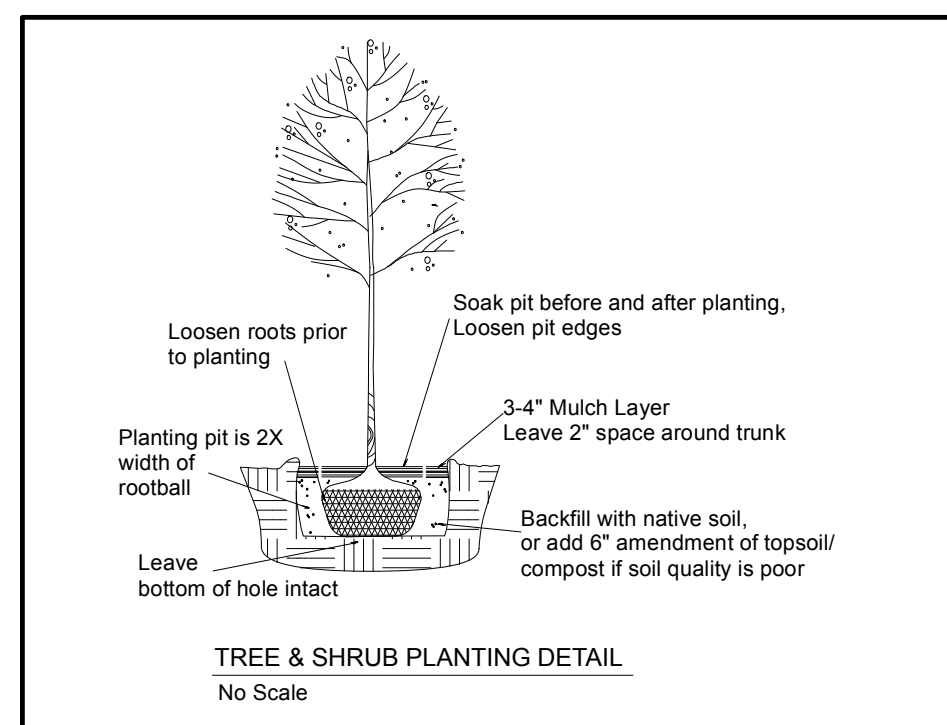
Buffer Enhancement Area D1 (47,450 square feet)				
Common Name	Latin Name	Size	Spacing	Quantity
Big leaf maple	<i>Acer macrophyllum</i>	1 gallon	10'	274
Douglas Fir	<i>Pseudotsuga menziesii</i>	1 gallon	10'	273
Snowberry	<i>Symphoricarpos albus</i>	1 gallon	5'	278
Thimbleberry	<i>Rubus parviflorus</i>	1 gallon	5'	278
Nootka Rose	<i>Rose nutkana</i>	1 gallon	5'	277
Beaked Hazelnut	<i>Corylus cornuta</i>	1 gallon	5'	277
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	5'	277
Vine maple	<i>Acer circinatum</i>	1 gallon	5'	277

INSET LEGEND

- BIG LEAF MAPLE
- DOUGLAS FIR
- SNOWBERRY
- THIMBLEBERRY
- NOOTKA ROSE
- BEAKED HAZLENUIT
- SALMONBERRY
- VINE MAPLE

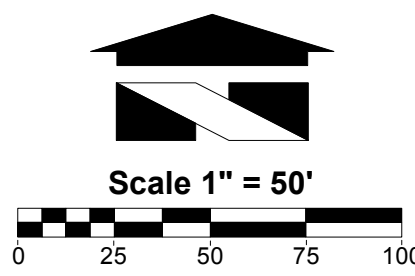
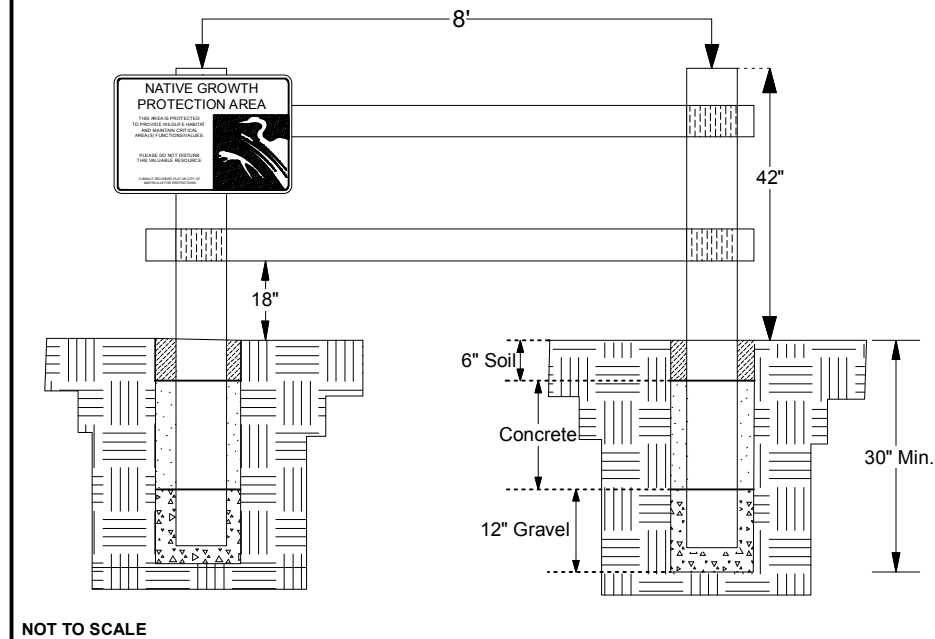
EACH PLANT SYMBOL ON THE PLANTING PLAN REPRESENT 5 INDIVIDUAL PLANTS.

NOTE: THIS PLANTING PLAN IS INTENDED TO GIVE A GENERAL IDEA OF HOW PLANTS WILL BE ARRANGED IN THE PLANTING AREAS. ACTUAL PLANT LOCATIONS WILL BE DETERMINED ON SITE AT THE TIME OF INSTALLATION AND MAY DEVIATE FROM THE ARRANGEMENT SHOWN.



TWO-RAIL FENCE AND SIGN DETAIL

Wetland fencing and signage adjacent to a regulated wetland or stream corridor shall be required. Two-rail fencing shall be constructed with pressure treated posts and rails and cemented into the ground with either cedar or treated rails. Alternative materials may be used subject to approval by the city. Signs designating the presence of an environmentally sensitive area shall be posted along the buffer boundary. The signs shall be posted at a minimum rate of one every 100 linear feet. Sign design, materials, and restrictive language shall be approved by the City prior to installation.



LEGEND

- WETLAND
- OFFSITE WETLAND
- FINAL BUFFER/ SPLIT RAIL FENCE
- STREAM
- NGPA SIGN

FINAL BUFFER ENHANCEMENT PLAN
10 DEGREES
 PORTION OF SECTION 29, TOWNSHIP 31N, RANGE 5E, W.M.

PROJECT MONITORING PROGRAM

1. Initial compliance/as-built report at completion of construction
2. Inspection and brief status report 30 days after planting
3. Inspection and brief status report early in the first growing season
4. Inspection and brief status report and the end of the first growing season
5. Inspection and brief status report early in the second growing season
6. Inspection and brief status report and the end of the second growing season
7. Annual site inspection (once per year in the fall) in years 3-5
8. Annual reports (one report submitted in the fall of each monitored year) for years 3-5

Purpose for Monitoring

The purpose for monitoring this mitigation project shall be to evaluate its success. Success will be determined if monitoring shows that the definitions of success stated below are met. The property owner shall grant access to the mitigation area for inspection and maintenance to the contracted landscape and/or wetland specialist and City of Marysville staff during the monitoring period, until the project is evaluated as successful.

Monitoring

Monitoring shall be conducted in accordance with the approved Mitigation Plan. The monitoring period will begin once the City receives written notification confirming the mitigation plan has been implemented and City staff inspects the site and issues approval of the installation. The monitoring period is proposed to last for five years, however, if the site meets the Year 5 performance standards in earlier years, the monitoring program can be completed early. If the site does not meet the Year 5 performance standards at the end of Year 5, contingency actions may be necessary and monitoring may be extended one year at a time until the Year 5 performance standards are met.

Vegetation Monitoring

Sampling points or transects will be established for vegetation monitoring and photo points will be established from which photos will be taken throughout the monitoring period. Permanent sampling points shall be identified in the field and on the monitoring map in the first monitoring report. Each sampling point or transect shall detail tree, shrub, and herbaceous aerial coverage. During Years 3 through 5, vegetation monitoring shall occur between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

Photo points

At least one photo point shall be established in each buffer enhancement area and at least two permanent photo points shall be established within each buffer enhancement area. Photographs will be taken from these points to visually record the condition of the restoration/enhancement area. Photos shall be taken between May 15 and September 30 (prior to leaf drop), unless otherwise specified. Photo points shall be identified on the monitoring map in the first monitoring report.

Monitoring Report Contents

- During Years 3 through 5, monitoring reports shall be submitted by October 31 of each year. As applicable, monitoring reports must include descriptions / data for:
1. Site plan and vicinity map
 2. Historic description of project, including date of installation, current year of monitoring, restatement of mitigation / restoration goals, and performance standards
 3. Plant survival, vigor, and areal coverage for every plant community (transect or sampling point data), and explanation of monitoring methodology in the context of assessing performance standards
 4. Wetland and buffer conditions, e.g., surrounding land use, use by humans, and/or wild and domestic creatures
 5. Observed wildlife, including amphibians, avians, and others
 6. Assessment of nuisance / exotic biota and recommendations for management
 7. Descriptions of any structural repair or replacement (i.e. fencing, signs, etc.)
 8. Color photographs taken from permanent photo-points that shall be depicted on the monitoring report map

CONTINGENCY PLAN

If 20% of the plants are severely stressed during any of the inspections, or it appears 20% may not survive, contingency actions may be necessary. Elements of a contingency plan may include, but are not limited to: replacing plants, more aggressive weed and invasive species control, pest control, mulching, replanting with larger plant material, species substitution, fertilization, soil amendments, and/or irrigation.

GOAL, OBJECTIVES, AND PERFORMANCE STANDARDS

Upon completion of the proposed mitigation project, an inspection by a qualified wetland professional shall be made to determine plan compliance. An as-built report will be supplied to the City of Marysville within thirty (30) days after the completion of planting to show compliance with the mitigation plan. The qualified wetland professional will perform condition monitoring of the plantings and provide reports according to the approved schedule.

Goal

To mitigate the impacts to functions and values from the proposed development.

Objectives

Objective 1: To establish a diverse, native plant community in the buffer that will persist and create an appropriate vegetative matrix.

Objective 2: To have significant native vegetative cover throughout the buffer.

Objective 3: To remove and replace existing invasive species and limit the establishment and spread of those species in the buffer.

Definition of Success

The mitigation project goal will be deemed successful when objectives are met, as evidenced through the observation of set performance standards.

Performance Standards

The objectives will be considered successfully met when the following performance standards are observed in all enhancement and restoration areas:

Performance Standard 1

End of Year 1: 100 percent survival of installed species and no more than 5 percent cover by invasive woody plant species.

Performance Standard 2

End of Year 2: at least 90 percent survival of installed plant species and no more than 10 percent cover by invasive plant species.

Performance Standard 3

End of Year 3: at least 80 percent survival of installed plant species and no more than 10 percent cover by invasive woody plant species.

Performance Standard 4

End of Year 4: at least 70 percent survival of installed plant species, at least 40 percent aerial coverage by native species and groundcover, and no more than 10 percent cover by invasive plant species.

Performance Standard 5

End of Year 5: at least 60 percent survival of installed plant species, at least 50 percent aerial coverage by native species and groundcover, and no more than 10 percent cover by invasive plant species.

When assessing areal coverage, native volunteer plants may be included when making calculations. However, for the purpose of assessing survival of installed plant species, only installed plantings shall be considered. Installed plantings shall be clearly marked with flagging during installation, as described in the *Flagging* section of Section 3.6 "Planting Notes."

In the event that a performance standard is not met by the time specified, maintenance and/or contingency actions shall be implemented promptly to work toward meeting the standard.

*If Year 5 performance standards are met by the end of Year 3 or Year 4, the City may consider the project to be successful and terminate the monitoring period at that time.

PERFORMANCE AND/OR MAINTENANCE BOND

Performance and/or maintenance bonds, or other assurance device, shall be provided to the City of Marysville, in an amount to be determined by the City. The following is an estimate of the cost to install the mitigation measures.

One-gallon plants	7,721 x \$15/plant, installed	\$115,815.00
Maintenance	10,000.00/year x 5 years	\$50,000.00
Monitoring	5,000/year x 5 year	\$25,000.00
Total Estimated Cost		\$123,315.00

MAINTENANCE

The mitigation areas will require periodic maintenance to remove undesirable species and replace vegetation mortality. Maintenance shall occur in accordance with the approved plans. Maintenance may include, but will not be limited to: removal of competing grasses (by hand if necessary), irrigation, fertilization (if necessary), replacement of plant mortality, and the replacement of mulch for each maintenance period. Chemical control, only if approved by City staff, shall be applied by a licensed applicator following all label instructions.

Duration and Extent

In order to achieve performance standards, the permittee shall be responsible for maintaining the mitigation area for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List, WAC 16-750-005) as well as Himalayan blackberry, cutting down competing grasses, and any other measures needed to ensure plant survival.

Survival

The permittee shall be responsible for the health of 100 percent of all newly installed plants for one growing season after installation has been accepted by the City of Marysville. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 14 of the following year). For fall installation (if required), the growing season will begin the following spring. The permittee shall replace any plants that are failing, weak, defective in manner of growth, dead, or missing during the first growing season.

Installation Timing for Replacement Plants

Replacement plants shall be installed between November 1 and March 15, unless otherwise determined.

Standards for Replacement Plants

Replacement plants shall meet the same standards for size and type as those specified for the original installation, unless otherwise directed by a qualified professional.

Replanting

Plants that have settled in their planting pits too deep, too shallow, loose, or crooked shall be replanted.

Herbicides / Pesticides

Unless deemed absolutely necessary by the consulting biologist and/or the City, chemical controls shall not be used in the mitigation area, critical areas, or their buffers. Any chemical controls used shall be applied by a licensed applicator following all label instructions.

Irrigation / Watering

Water shall be provided during the dry season (July 1 through October 15) for the first two years after installation to ensure plant survival and establishment. A temporary above-ground irrigation system shall provide water at a rate of one inch (1") of water twice per week for year one and one inch (1") per week during year two. Adjustments to this schedule may be recommended by the wetland professional during the monitoring period.

General

The permittee shall include in general maintenance activities the replacement of any vandalized or damaged signs, habitat features, fences, or other structural components of this mitigation site.

USE OF THIS PLAN

This Final Buffer Enhancement Plan is supplied to Pulte Group as a means of mitigating for buffer impacts. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

PLANTING NOTES

Plant in the early spring or late fall and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some species substitution may be allowed with the agreement of the consulting wetland professional and/or City staff.

Pre-Planting Meeting

Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting wetland professional shall occur to resolve any questions that may arise. During this meeting, a discussion regarding plant spacing and locations of plant species including wetland verses buffer species shall occur between the landscape contractor and the consulting wetland professional.

Handling

Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation.

Damaged plants

Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site, and properly replaced.

Storage

Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the wetland biologist and/or landscape designer prior to installation.

Plant Names

Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape designer, wetland professional, or City staff. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition

Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1" in diameter will be rejected.

Roots

All plants (except whips/livestakes) shall be balled and burlapped (B&B) or containerized, unless explicitly authorized by the landscape designer and/or wetland professional. Rootbound plants or B&B plants with damaged, cracked, or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of approximately half an inch in two to four places.

Sizes

Plant sizes shall be the size indicated in the plant schedule in approved plans. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions, though must be approved by the City and/or wetland professional. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

PLANTING NOTES (CON'T)

Form

Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting

Unless otherwise approved by City staff, all planting shall occur between November 1 and March 1. Overall, the earlier the plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of spring and summer.

Weeding

Non-native and invasive vegetation in the buffer areas will be hand-weeded from the entire buffer area at the time of installation and on a routine basis within the restoration areas throughout the monitoring period.

Site conditions

The contractor shall immediately notify the landscape designer and/or wetland professional of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits

Planting pits shall be circular or square with vertical sides, and shall be 6" deeper and 12" wider in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. Burlap shall be removed from the planting pit. Backfill shall be worked back into holes such that air pockets are removed without adversely compacting soils.

Staking

Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Plant Location

Colored surveyors ribbon or other appropriate marking shall be attached to installed woody plants to assist in locating the plants while removing the competing non-native vegetation and during the monitoring period. Flagging or ribbon should not be tied to the plant's leader, but to smaller branches instead.

Arrangement and Spacing

The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings may be adjusted to maintain existing vegetation with the agreement of the landscape designer, wetland biologist, and/or City staff.

Inspection(s)

A wetland biologist shall be present on site to inspect the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Mulch

All containerized plants to be installed within the restoration areas shall receive no less than 3 inches of wood chip mulch after planting. Mulch will be formed in 2-foot wide rings around each plant, and shall be kept about 2 inches away from the trunks and stems of woody plants.