

SENSITIVE AREA STUDY

Brentwood Beach – Lake Forest Park, WA

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SENSITIVE AREA STUDY

BRENTWOOD BEACH – LAKE FOREST PARK, WA

1 INTRODUCTION

1.1 Background and Purpose

The purpose of this study is to document potential sensitive area impacts associated with the proposed Brentwood Beach residential development project in the City of Lake Forest Park, Washington (Figures 1 - 3). The project is located at 17114 Brentwood Place NE (parcel #1062100005). Lyon Creek’s standard stream buffer currently encroaches onto approximately half of the project site.

The applicant is proposing demolition of the existing single-family residence and the construction of two new single-family residences on each of the two legal lots located on the site. The standard stream buffer for Lyon Creek is 115-feet, which currently encroaches onto approximately half of the site. The applicant is seeking a stream buffer reduction to accommodate the development.

Lake Forest Park Municipal Code (LFPMC) 16.16.100 requires preparation of a sensitive area study that adequately evaluates probable impacts that may result from the proposed project. This study summarizes the findings of an on-site buffer assessment and fulfills all necessary sensitive area reporting requirements.

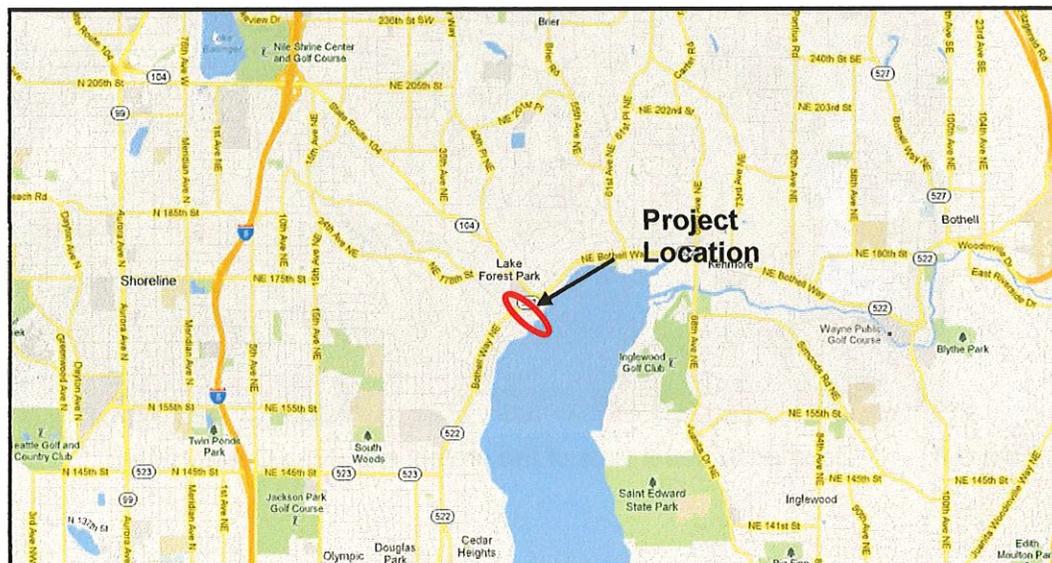


Figure 1. Vicinity Map (Google Maps).



Figure 2. Aerial view of the project area (King County iMap).

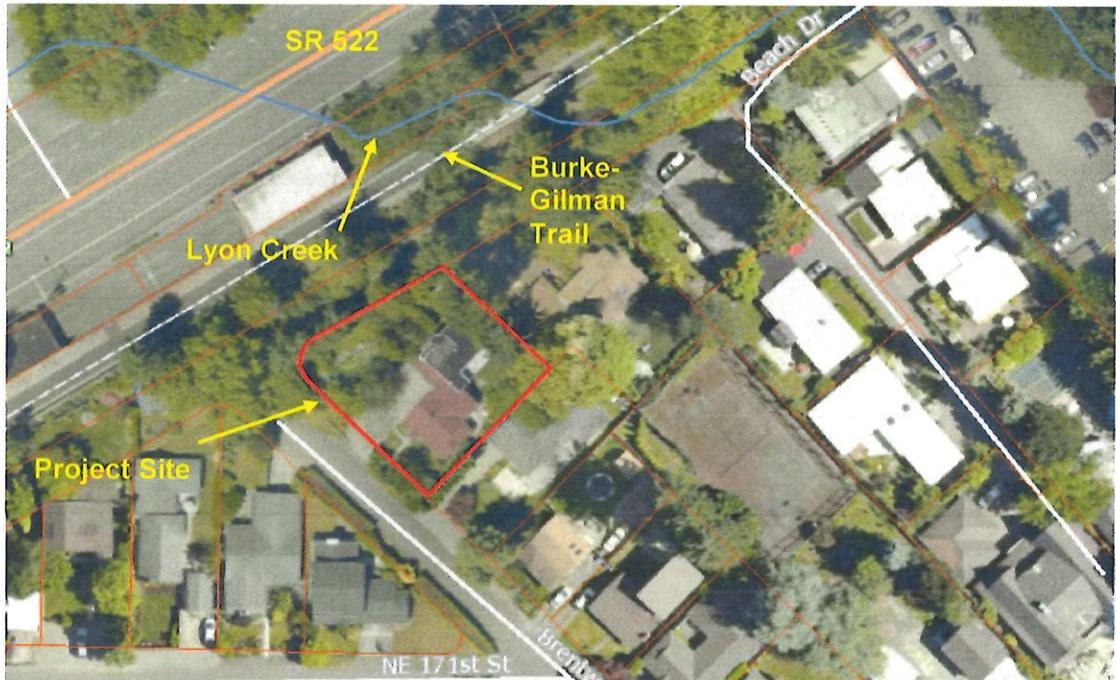


Figure 3. Zoomed in aerial view of the project site (King County iMap).

1.2 Description of the Project Area and Sensitive Areas

1.2.1 Lyon Creek

Lyon Creek originates from wetlands in the Cities of Mountlake Terrace and Brier, north of Lake Forest Park. The Lyon Creek watershed has an area of about 3.8 square miles, sloping from a high elevation of 550 feet down to 20 feet above sea level at the outlet, and is located primarily in the City of Lake Forest Park.

A portion of the project site is within the 115-foot standard buffer of Lyon Creek as it crosses beneath State Route (SR) 522 and the Burke-Gilman Trail, generally flowing in an east-northeasterly direction. Within this area, the SR-522 culvert crossing was replaced in 2015, as part of the Lyon Creek Flood Mitigation project. Improvements downstream of the culvert included the placement of large woody debris and native plantings (see Figure 4 below). The Burke-Gilman Trail crossing includes significant rock armoring with some woody debris present (see Figure 5 below).



Figure 4. View of the recently replaced SR-522 culvert (photo taken 5-12-16).



Figure 5. View of the Burke-Gilman Trail bridge crossing (photo date unknown).

1.2.2 Stream Buffer

As mentioned, the standard stream buffer for Lyon Creek extends partially onto the Brentwood Beach project site. However, the site does not include or border on any of the Lyon Creek stream channel. Several intervening land types or zones with varying conditions occur within the buffer, between Lyon Creek and the Brentwood Beach site property boundary.

The northwest corner of the site lies approximately 80 feet from the nearest point along the Lyon Creek channel, which is at the Burke-Gilman Trail crossing of the creek. Beginning at Lyon Creek and proceeding towards the site, the first zone encountered is a sparsely weeded bouldery streambank (see Figure 6 below).



Figure 6. Heavily rock-armored Lyon Creek streambank at the Burk-Gilman Trail bridge crossing supports only low-growing weeds between the boulders (photo taken 6-20-16).

The next zone proceeding towards the Brentwood Beach site is a forested strip, which at that location includes the unimproved Beach Drive NE right-of-way (see Figure 7, below). Though some native trees and shrubs are present, vegetation consists largely of non-native, invasive plant species including morning glory, English ivy, and horse chestnut.



Figure 7. Undeveloped Beach Drive NE right-of-way (photo taken 6-20-16).



Figure 8. Beach Drive NE right-of-way serving as the driveway to an adjoining house (photo taken 6-20-16).

Continuing towards the Brentwood Beach site, a paved section of the Beach Drive NE right-of-way is encountered that also serves as the driveway to an adjacent home (see Figures 8 and 9).

A vegetated strip situated between the Beach Drive NE right-of-way and the Burke-Gilman Trail adjacent to the site has some native vegetation growing along it including Douglas-fir, bigleaf maple, tall Oregon grape, osoberry, and snowberry, but also has several non-native, invasive species including London plain (Sycamore) trees, Himalayan blackberry, morning glory (bindweed), English Ivy, and Robert's geranium. A second narrow vegetated strip between a gravel driveway section of the Beach Drive NE right-of-way and the site (Figures 8 and 10) is also dominated by such invasive species including yellow archangel, Himalayan blackberry, morning glory (bindweed), English Ivy, and Robert's geranium.



Figure 9. Undeveloped Beach Drive NE right-of-way with Brentwood Beach site in the background (photo taken 6-20-16).



Figure 10. Off-site driveway section of Beach Drive NE right-of-way with the Brentwood Beach site behind the fence on the right, Burke-Gilman Trail out of the photo to the left, and Lyon Creek out of sight in the background (photo taken 6-20-16).

On-site yard areas within the standard buffer include very little native vegetation, though vine maple was noted. Non-native invasive and landscaping plant species include non-native poplar, rhododendron, yellow archangel, Himalayan blackberry, morning glory (bindweed), and English Ivy (see Figures 11 and 14). In addition, the standard stream buffer includes a portion of the existing home and carport (Figure 12), as well as some of the in-ground pool (Figure 13).



Figure 11. On-site corner of the yard area closest to Lyon Creek is dominated by invasive, non-native vegetation with some landscaping plants. The driveway section of the Beach Drive NE right-of-way is beyond the fence to the left with the Burke-Gilman Trail beyond that (photo taken 6-20-16).



Figure 12. View of the existing home on the subject parcel. The standard stream buffer bisects the carport and two story portion of the home (photo taken 6-20-16).



Figure 13. View of the existing pool partially located within the standard stream buffer (photo taken 6-20-16).



Figure 14. View of the degraded on-site standard stream buffer (photo taken 6-20-16).

1.2.3 Habitat

The vegetation described above provides some terrestrial wildlife habitat along the property fringes, particularly in the northern corner of the lot. A few vine maples and a primarily invasive understory comprise this area. This area provides some habitat for small mammals and songbirds. However, the lack of structural diversity limits food and cover opportunities for most wildlife species. Several Douglas-fir are located just off-site, adjacent to the gravel driveway in the Beach Drive NE right-of-way. There are a few native and non-native nut- and berry-producing plants on the site, which provide a food source for songbirds and small mammals. However, these resources are not unique to the site or particularly rare in the vicinity, and provide habitat regardless of whether they are within or outside of the regulated stream buffer.

The location of the property within the surrounding landscape is relevant in characterizing habitat, as it determines whether or not the opportunity for wildlife to find and use a site exists. The conifers mentioned above are somewhat contiguous with other vegetation within the Beach Drive NE right-of-way and adjacent Burke-Gilman Trail. While a fairly intact tree canopy makes up this area, the understory is quite disturbed and broken up by the Beach Drive NE gravel driveway and the paved trail. The lack of understory and extensive disturbance limit the ability of this area to provide meaningful habitat and access opportunities for wildlife.

According to WDFW PHS data (July 2016), Lyon Creek contains coho and sockeye salmon fish species, with no other sensitive habitat or species in the vicinity. In addition to those species, the stream is also known to support cutthroat trout.

2 REGULATORY COMPLIANCE

2.1 City of Lake Forest Park

In Lake Forest Park, sensitive areas, including streams, are regulated under Chapter 16.16 of the Lake Forest Park Municipal Code. Type 1 streams are those waters that are used at least seasonally by fish for spawning, rearing, or migration. Lyon Creek has documented fish use, and is thus, a Type 1 stream. Type 1 streams require a 115-foot standard buffer. An additional 15-foot building setback, as measured from the edge of the buffer, is required per LFPMC 16.16.350.M. Pursuant to LFPMC 16.16.040.DD, Lyon Creek is also designated as a wildlife habitat conservation area.

The stream buffer can be reduced from 115-feet to no less than 70-feet through enhancement, pursuant to LFPMC 16.16.350.G. Any such buffer reduction

proposal is to ensure that a net improvement of stream and buffer functions results. Mitigation options include removal of impervious surfaces; installation of bio-filtration/infiltration mechanisms, such as bio-swales or storm drainage ponds; removal of invasive vegetation and the plantings of new native trees and shrubs; in-stream habitat enhancement; the installation of oil/water separators; the use of pervious materials for driveway construction; green roofs; removal of significant refuse or toxic materials; or the revegetation of degraded areas outside of the reduced buffer.

3 PROJECT DESCRIPTION

The proposed project includes a reduction of the Lyon Creek stream buffer to accommodate the construction of two new single-family residences on two existing legal lots. The stream buffer will be reduced to a minimum of 80-feet at the closest point to accommodate the proposed development. The standard 15-foot building setback would also be implemented, with the majority of the setback utilized as a mitigation area.

The project includes a comprehensive mitigation plan that includes the removal of invasive species within the modified building setback area and restoration with native trees, shrubs, and groundcover. Within the mitigation area, two raingardens, each approximately 320 square feet in size, will capture stormwater runoff from a significant portion of the lots, where it will be detained and infiltrated. A split rail fence will help to protect portions of the mitigation area to ensure it remains free of disturbance.

3.1 Project Purpose

The primary purpose of the proposed project is to construct a single-family residence on two previously platted lots within the Brentwood Beach neighborhood. The site currently consists of a single tax parcel, occupied by one single-family residence. However, the site was platted in 1927 into two separate legal and buildable lots. Thus, the project proposes to remove the existing home, create two separate tax parcels and construct two single-family residences. The goal in constructing each new residence is to create a structure that will contain all of the essential components of a modern-day residence, as well as be compatible with existing residences within the same area.

3.2 Mitigation Sequencing

Pursuant to LFPMC 16.16.130, attempts to avoid and minimize impacts to the on-site stream buffer have been taken.

3.2.1 Avoidance

As previously mentioned, the standard 115-foot buffer and 15-foot structure setback extend onto the project site and encumber a significant portion of the site. In fact, the buffer and setback encumber nearly the entirety of the northernmost lot. Thus, in order to fulfil the project purpose of developing both legal lots, there is no means by which to avoid some modification of the standard stream buffer. However, due to the distance from Lyon Creek, direct stream impacts have been avoided.

3.2.2 Minimization

Minimization techniques were utilized during the design process in order to limit the extent of buffer reduction necessary to fulfill the project purpose.

Minimization measures included:

- Constructing as much of the proposed residences closest to 47th Avenue NE. An attempt was made to reduce the front yard setback for both lots from 20-feet to 10-feet. However, the total combined setback requirement would not allow for use of this provision.
- The inclusion of on-site raingardens will ensure that water quality and hydrological impacts to the stream are minimized. The raingardens will hold stormwater runoff from a significant portion of both lots, allowing much of it to infiltrate and thereby limiting the rate and volume of runoff into the City's storm drain system.

3.2.3 Mitigation

As mitigation for reduction of the standard stream buffer, an area totaling 2,850 square feet of the two lots will be restored with native plantings and the installation of two separate raingardens. Restoration will consist of the removal of invasive plant species from within and outside of the modified building setback and the planting of native trees, shrubs and groundcover. Restoration will occur in areas currently occupied by non-native vegetation or void of vegetation. Trees species include western red cedar and vine maple. Proposed shrubs include serviceberry, red-osier dogwood, oceanspray, tall Oregon grape, snowberry, evergreen huckleberry. Groundcover species include goatsbeard, western bleeding heart, low Oregon grape, and sword fern. Red-osier dogwood, black twinberry, pacific ninebark, red-flowering currant, pea-fruited rose, nodding onion, sand strawberry, Oregon iris, taper-tipped rush, and yellow-eyed grass will be planted in the raingardens. The proposed restoration will provide an additional level of protection for the stream buffer and will offset the disturbance associated with modification of the standard buffer (see Table 1). Overall, a net improvement in stream buffer functions is proposed.

4 BUFFER REDUCTION AND MITIGATION ANALYSIS

4.1 Buffer Reduction

The proposed project includes the construction of new single-family residences on each of two legal buildable lots. The development of the northern lot will require that the standard 115-foot stream buffer be reduced to allow for placement of the residence, and its corresponding building setback. Thus, the buffer would be reduced to a minimum of 80-feet at a single point, with an overall reduction in buffer area of 3,260 square feet. The reduced buffer will be contiguous with the rear property line for both lots, then extending approximately five feet beyond the northwesterly property boundary of the northwesterly lot, running parallel for the nearly the entire length. This five-foot reduction of the buffer beyond the property line will occur within the Beach Drive NE right-of-way. The boundary of the reduced buffer will allow room for a 15-foot building setback for each of the two homes.

Buffer modifications are only requested along these two specific areas. The standard 115-foot buffer will remain intact on adjacent properties. Beyond the five-foot reduction within the Beach Drive NE right-of-way, no further reduction will occur within that area. The adjacent parcel to the northeast contains an existing single-family residence, most of which appears to be located within the standard stream buffer.

4.2 Mitigation Analysis

The existing standard 115-foot buffer is highly degraded. With respect to their functioning effectively, specifically as a stream buffer, the areas lying directly between the site and Lyon Creek are compromised most significantly due to being interrupted by the paved and gravel roadway surfaces forming the off-site residence access along the Beach Drive NE right-of-way. The Burk-Gilman Trail also contributes to the amount of non-vegetated, paved area within the buffer near the site. A prevalence of non-native vegetation, particularly in the understory, also detracts significantly from habitat function and the carrying out of natural processes such as biofiltration and stream shading within the buffer.

Reduction of the standard stream buffer will allow for placement of a home and a restored building setback area along two sides of the combined site. This includes the removal of existing invasive and non-native species and the addition of dense native plantings, improving the overall functions and values of the adjacent buffer. An analysis of the specific functions and values provided by the pre-existing site and the post-project site is provided in Table 1.

Table 1. Functional Lift Analysis

Buffer Functions	Existing Conditions	Proposed Conditions	Functional Improvement?
Water Quality	Off-site buffer areas include impervious roofed, paved, and graveled surfaces. Remaining on-site buffer areas are either sparsely vegetated or have invasive or landscaping plants. The biofiltration and infiltration capacity of these areas is not optimal. Stormwater flows across paved and other developed areas may entrain pollutants including oil, toxics, and silt/turbidity.	Stormwater will be infiltrated and biofiltered more effectively. Buffer/riparian enhancements will collectively improve these processes to improve water quality and increase effective buffer width. Raingardens will be incorporated and invasive species will be removed and replaced with native plants, thereby increasing native plant density.	Yes; water quality will be improved. New and denser native plantings will help to filter storm water prior to it reaching the stream. A dense native plant community will be more efficient at filtering stormwater and will constitute an improvement over the existing condition. Raingardens will store runoff to allow improved biofiltration and increased infiltration over longer time periods. Remaining overland and discharged stormwater flows will carry less pollutants from paved and other developed areas.
Hydrology	Stormwater controlled and regulated, if at all, by outdated, ineffective standards.	Stormwater will be managed by current, more effective standards. Raingardens are included as an integral part of the stormwater treatment and storage system to increase infiltration volumes and biofiltration effectiveness. Discharge of remaining surface flows will occur over a longer time period at a more even rate. Additional improvement will be realized due to the addition of dense native vegetation, which will increase evapotranspiration as well as infiltration and biofiltration.	Yes, updated stormwater management including raingardens and supplemental native vegetation will increase biofiltration and infiltration, and reduce overland runoff. This updated, comprehensive stormwater system will result in water quality improvements and a more even supply of both infiltrated and surface water to Lyon Creek.

Buffer Functions	Existing Conditions	Proposed Conditions	Functional Improvement?
Habitat	The existing on-site stream buffer areas contain a few native trees and shrubs, but generally lack structural diversity and density, which limits shade, food, and cover opportunities for most wildlife species. An off-site driveway and paved trail interrupt the buffer between the site and Lyon Creek.	The proposed planting plan will increase vegetation density with a redefined buffer area and consist exclusively of native vegetation. Existing non-native vegetation will be removed, and monitoring with regular and contingency maintenance will prevent its re-growth during a prescribed 5-year period.	Yes; dense native vegetation will provide food and cover primarily for small native mammals and birds. Aquatic habitat for fish, aquatic insects, waterfowl, and other species using Lyon Creek and Lake Washington directly will be improved through improved water quality and a steadier water supply source.
Net Condition	On-site, degraded conditions result primarily from a decrease in plant density in the overstory as well as understory, and the substitution of non-native landscaping and invasive plant species for native species. Off-site, the buffer has the same problems, but is also interrupted by paved driveway and trail areas.	On-site, non-native vegetation will be replaced with dense native vegetation in an assemblage designed to provide optimal habitat conditions within constraints of space and location. Planted vegetation will be monitored and nurtured with implementation of maintenance and contingency measures as necessary to ensure a flourishing plant community providing well-functioning habitat conditions at the end of the prescribed 5-year monitoring period.	Yes; buffer habitats restored with an increase in native vegetation; filtering of stormwater by native plantings with infiltration and slow release from two separate raingardens; increased habitat structural and compositional complexity to provide nesting and cover; and an increase in organic material to the food chain.

Vegetation to be removed as part of the proposed project consists of lawn, landscaping species, and invasive species; existing native species will be retained, where feasible, and therefore temporal habitat loss will be minimal. The change from existing state to restored state will represent an increase in the quality of habitat from the perspective of the site's potential. Screening and microhabitat will be increased and enhanced with increased plant density, and, subject to spatial constraints, a greater area of diverse, native habitat will result from the proposal. In addition to water quality and quantity benefits to nearby Lyon Creek, the property will be more suitable overall for urban songbird and

small mammal species than it is presently. The understory will contain more woody vegetation and a greater structural complexity, which is more attractive to songbirds and small mammals than is non-native low-growing, homogeneous vegetation. As well, a greater mix of flowering, fruiting and seeding plants will provide forage over a longer yearly timespan than the relatively uniform existing vegetation. Wildlife species of the Pacific Northwest are also better adapted to forage provided by native plants than non-native species. The provision of wetter, raingarden areas also allows for the inclusion of an even greater variety of native plantings, with this increase in diversity translating into an increase in habitat function and stability.

5 RESTORATION PLAN

This plan seeks to restore and enhance portions of the modified building setback on the subject site. The setback has a high potential for restoration to increase several important adjacent buffer functions as it contains large patches of disturbed areas and non-native invasive plants.

An area within the modified building setback, including the proposed raingardens, measuring 2,850 square feet will be restored and enhanced by removing and/or controlling non-native weeds, improving soil conditions, and revegetating with native plant species. A combination of trees, shrubs, and groundcover is proposed. Trees species include western red cedar and vine maple. Proposed shrubs include service berry, red-osier dogwood, oceanspray, tall Oregon grape, snowberry, evergreen huckleberry. Groundcover species include goatsbeard, western bleeding heart, low Oregon grape, and sword fern. Red-osier dogwood, black twinberry, pacific ninebark, red-flowering currant, pea-fruited rose, nodding onion, sand strawberry, Oregon iris, taper-tipped rush, and yellow-eyed grass will be planted in the raingardens.

5.1 Goals

- Within the planted area of the building setback, establish dense native vegetation that is appropriate to the ecoregion and site.
- Where indicated on the plan, areas within the setback will remain substantially vegetated with a preponderance of native plants and will contain little invasive or noxious weed cover.
- Increase habitat cover and refuge for amphibians, small mammals and invertebrates.

5.2 Performance Standards

The standards listed below shall be used to judge the success of the installation over time. If performance standards are met at the end of Year 5, the site will then be deemed successful and will be eligible for release by the City of Lake Forest Park.

Survival: Achieve 100% survival of installed plants by the end of Year 1. This standard can be met through plant establishment or through replanting as necessary to achieve the required numbers.

Native cover:

- Achieve 60% understory cover of native shrubs by Year 3. Native volunteer species may count towards this cover standard.
- Achieve 80% understory cover of native shrubs by Year 5. Native volunteer species may count towards this cover standard.
- **Species diversity:** Establish at least three native shrub species by Year 5. Native volunteer species may count towards this standard.
- **Invasive cover:** Aerial cover for all non-native, invasive and noxious weeds will not exceed 10% at any year during the monitoring period. Invasive plants include Himalayan blackberry (*Rubus armeniacus*), cut leaf blackberry (*Rubus laciniatus*), reed canarygrass (*Phalaris arundinacea*), cherry (hedge) laurel (*Prunus laurocerasus*), English holly (*Ilex aquifolium*), and ivy species (*Hedera spp.*).

5.3 Monitoring Methods

This monitoring program is designed to track the success of the mitigation site over time and to measure the degree to which it is meeting the performance standards outlined elsewhere in this document.

An as-built plan will be prepared by the **restoration professional** (Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects) prior to the beginning of the monitoring period. The as-built plan shall be a mark-up of the planting plans included in this plan set. The as-built plan will document any departures in plant placement or other components from the proposed plan.

Transects: During the as-built inspection, the monitoring **restoration professional** shall install monitoring transects. Approximate transect locations shall be marked on the as-built plan.

All other planted areas not directly covered by transects will be visually assessed and noted as to how they are meeting the performance standards.

Monitoring shall take place twice annually for five years. During each year there shall be a spring and a late summer or fall visit. Year 1 monitoring shall commence in the first spring subsequent to installation.

The spring monitoring visit will record maintenance needs such as plant replacement and weeding needs. Following the spring visit the restoration professional will notify the owner and/or maintenance crews of necessary early growing season maintenance. The second annual monitoring visit will contain the bulk of the site assessment and will take place in the late summer or early fall. The late-season formal monitoring visit shall record and report the following in an annual report submitted to the City of Lake Forest Park:

- General summary of the spring visit.
- Year 1 counts of live and dead plants by species.
- Counts of dead plants where mortality is significant in any monitoring year.
- Estimate of native shrub cover using the line intercept method along established transects in planted areas.
- Estimate of non-native, invasive weed cover using the cover class method site-wide.
- Tabulation of established native species, including both planted and volunteer species.
- Photographic documentation from four fixed reference points.
- Any intrusions into or clearing of the planting areas, vandalism or other actions that impair the intended functions of the mitigation area.
- Recommendations for maintenance or repair of any portion of the mitigation area.

5.4 Construction Notes and Specifications

Note: specifications for items in **bold** can be found below under “Material Specifications and Definitions.”

Note: The Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects, shall monitor:

- All site preparation
- Soil preparation.
- Mulch placement.
- Plant material inspection
- Plant material delivery inspection.
- 50% plant installation inspection.
- 100% plant installation inspection.

5.5 General Work Sequence

- All plant installation is to take place during the dormant season (October 15th – March 1st), for best survival.
- Prepare a planting pit for each plant and install per the planting details.
- Mulch each plant with a circular **wood chip mulch ring**, four inches thick and extending to a distance of 9 inches from the plant stem (18 inches in diameter).
- Install a split-rail fence per the plan details.

5.6 Material Specifications and Definitions

1. **Fertilizer:** Slow release, granular PHOSPHOROUS-FREE fertilizer. Follow manufacturer's instructions for application. Keep fertilizer in a weather-tight container while on site. Note that fertilizer is to be applied only in Years two, three, four and five and not in the first year.
2. **Irrigation system:** Automated system capable of delivering at least two inches of water per week from June 1 through September 30 for the first two years following installation.
3. **Restoration Professional:** Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects.
4. **Wood chip mulch:**
 - a. Wood chip mulch shall meet WSDOT Standard Specifications for Road, Bridge, and Municipal Construction for Wood Strand Mulch as defined 9-14.4(4). "Wood strand mulch shall be a blend of angular, loose, long, thin wood pieces

that are frayed, with a high length-to-width ratio, and it shall be derived from native conifer or deciduous trees. A minimum of 95 percent of the wood strand shall have lengths between 2 and 10 inches. At least 50 percent of the length of each strand shall have a width and thickness between 1/16 and 1/2 inch. No single strand shall have a width or thickness greater than 1/2 inch. The mulch shall not contain salt, preservative, glue, resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood chips or shavings will not be acceptable. The contractor shall provide Material Safety Data Sheet (MSDS) that demonstrates that the product is not harmful to plant life and a test report performed in accordance with WSDOT Test Method 125 demonstrating compliance to the specification prior to acceptance;

b. Alternatively, on-site chipped mulch will be acceptable provide that the mulch meets the general dimensions of the specification above and likewise shall not contain salt, preservatives, glue, resin, tannin, or other compounds in quantities that would be detrimental to plan life. Sawdust or wood chips or shavings will not be acceptable.

5.7 Contingencies

If there is a significant problem with the restoration areas meeting performance standards, a contingency plan will be developed and implemented. Contingency plans can include, but are not limited to: soil amendment; additional plant installation; and plant substitutions of type, size, quantity, and location.

5.8 Maintenance

- The site will be maintained for five years following completion of the construction. Operate the temporary irrigation system during June through September of Years 1 and 2. The system should be set to provide at least 2 inches of water per week to all plants during June, July, August and September. Less water is needed during March, April, May and October. Replace each plant found dead in the summer monitoring visits during the upcoming fall dormant season (October 15 to March 1).
- Follow the recommendations noted in the spring monitoring site visit.
- General weeding for all planted areas:
 - At least twice yearly, remove all competing weeds and weed roots from beneath each installed plant and any desirable volunteer vegetation to a distance of 18 inches from the main plant stem. Weeding should occur at least twice during the spring and summer. Frequent weeding will result in lower mortality, lower plant replacement costs and will increase the likelihood that the plan meets performance standards by Year 5.

- More frequent weeding may be necessary depending on weed conditions that develop after plan installation.
- Do not weed the area near the plant bases with string trimmer (weed whacker/weed eater). Native plants are easily damaged or killed, and weeds easily recover after trimming.
- Apply slow release granular fertilizer to each installed plant annually in the spring (by June 1) of Years two through five.
- Replace mulch as necessary to maintain a 4-inch-thick layer, retain soil moisture and limit weeds.
- The homeowner shall ensure that water is provided for the entire planted area with a minimum of 2 inches of water provided per week from June 1 through September 30 for the first two years following installation through the operation of a temporary irrigation system.

6 SUMMARY

A modification from the standard 115-foot stream buffer is proposed. A reduction to a minimum 80 feet just outside the northern boundary of the site is requested to allow for the construction of new single-family residences on each of the two legal lots on the site. The net reduction in buffer square footage will be 3,260 square feet. The proposed stream buffer reduction request will allow for restoration of a portion of the site (within the modified building setback). A restoration plan has been prepared that details the areas proposed for enhancement as a result of the requested buffer modification. The restoration plan mitigates for the proposed reduction of the standard 115-foot critical area buffer. Mitigation will involve the removal of non-native weed species, the planting of 2,850 square feet of native vegetation within and outside of the modified building setback, including construction of two raingardens to collect and treat stormwater runoff from portions of both lots. The planting layout incorporates a great diversity of native plant species configured in a naturalistic fashion. Proposed plantings include trees, shrubs, and groundcover. The proposed restoration plan will provide significantly better protection of those stream buffer functions and values than would be provided by application of the standard 115-foot stream buffer. This includes an increase in water quality, hydrology, and habitat functions. Therefore, an overall net gain in stream buffer functions is proposed.

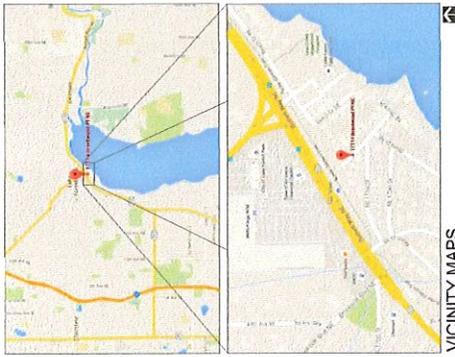
APPENDIX A

Mitigation Plan

BRENTWOOD BEACH



EXISTING CONDITIONS



- SHEET INDEX**
- 1 EXISTING CONDITIONS
 - 2 BUFFER MODIFICATION PLAN
 - 3 PROPOSED MITIGATION PLAN
 - 4 PLANTING PLAN & PLAN DETAILS
 - 5 MITIGATION PLAN NOTES

NOTES

1. LYON CREEK DELINEATED BY THE WATERSHED COMPANY IN 2016.
2. SURVEY RECEIVED ON 03/16/16 FROM SIGNATURE SURVEYING AND MAPPING PLLC, SHORELINE, WA. (206) 947-4975.

PERMIT SET
NOT FOR CONTRACTOR BIDDING

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
P 425.822.5242
www.watershedco.com
Science & Design

BRENTWOOD BEACH
MITIGATION PLAN
PREPARED FOR
LINDA PRUITT, THE COTTAGE COMPANY
LAKE FOREST PARK, WA 98155

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD BY
1	08-05-16	PERMIT SET		

PROJECT MANAGER: MSF
DESIGNED: MSF
DRAFTED: MSF
CHECKED: KB
JOB NUMBER: 160313
SHEET NUMBER: W1 OF 5

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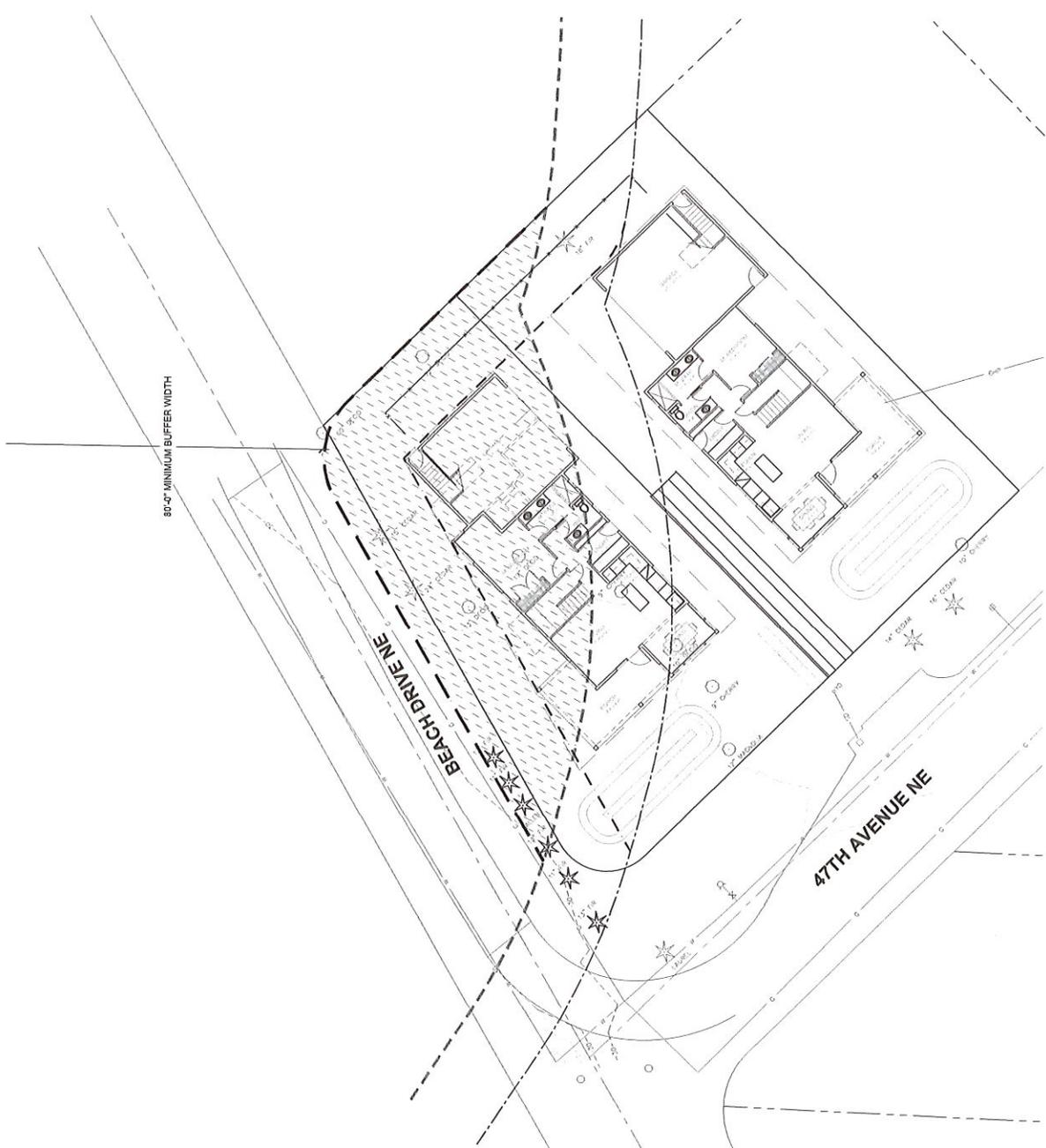
NO.	DATE	DESCRIPTION
1	08-05-16	PERMIT SET

SHEET SIZE: 24" x 36"
 CONSTRUCTION: 1/8" = 1'-0"
 SCALE: ACCORDINGLY
 PROJECT MANAGER: KB
 DESIGNED: MSF
 CHECKED: KB
 JOB NUMBER: 160313
 SHEET NUMBER: W2 OF 5

PERMIT SET
 NOT FOR
 CONTRACTOR
 BIDDING

LEGEND

	STANDARD 115'-0" STREAM BUFFER
	STANDARD 15'-0" BUILDING SETBACK LINE
	REDUCED STREAM BUFFER 80'-0" (MINIMUM)
	MODIFIED 15'-0" BUILDING SETBACK LINE
	BUFFER REDUCTION AREA (3,289 SF)



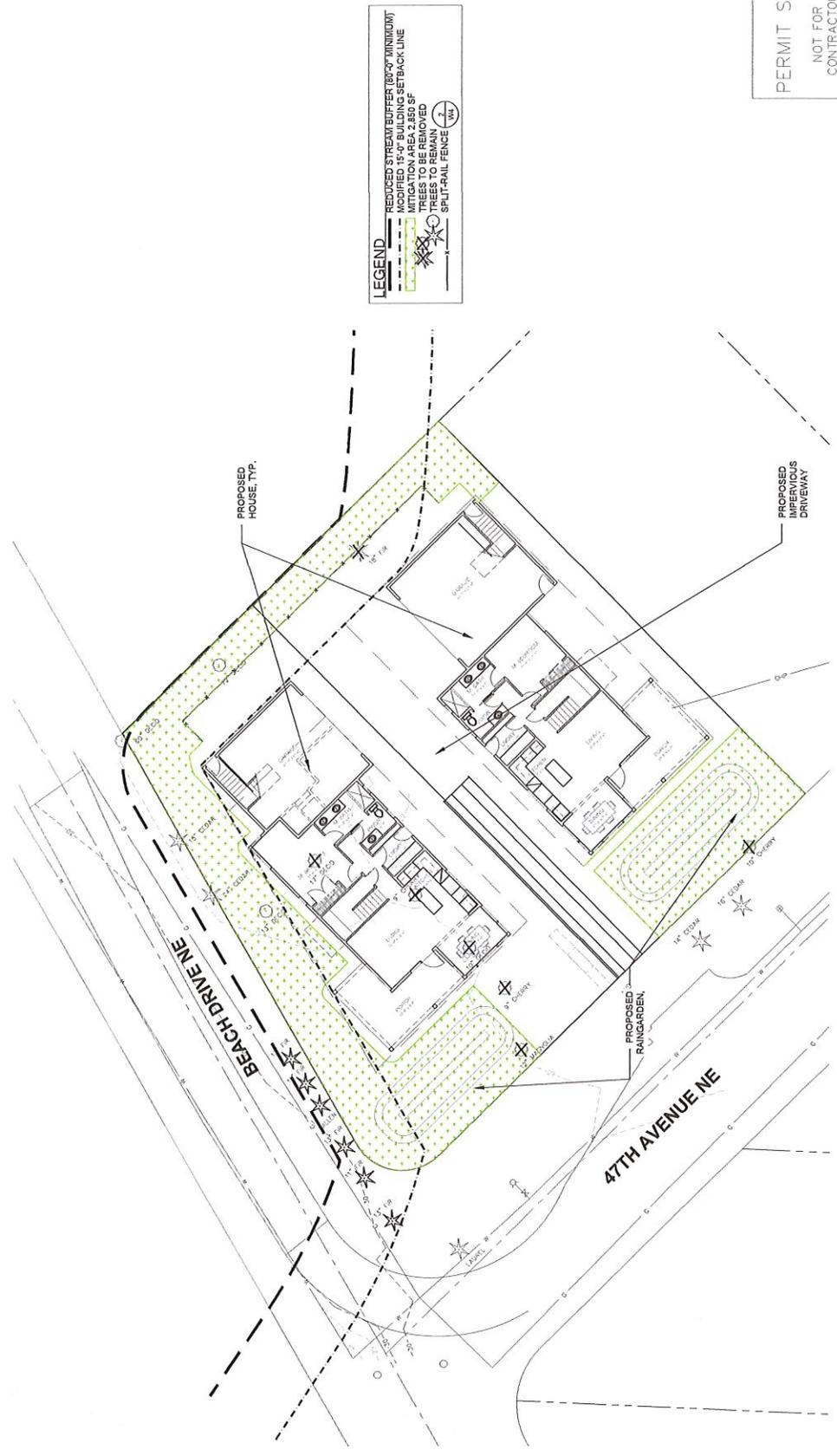
BUFFER MODIFICATION PLAN

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NO.	DATE	DESCRIPTION
1	08-05-16	PERMIT SET

BY: KWB

PROJECT MANAGER: KSB
 DESIGNED: MSF
 DRAFTED: MSF
 CHECKED: KSB
 JOB NUMBER: 160313
 SHEET NUMBER: W3 OF 5



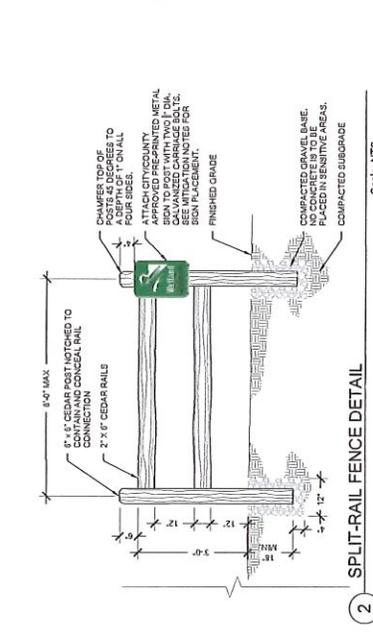
PERMIT SET
 NOT FOR
 CONTRACTOR
 BIDDING

PROPOSED MITIGATION PLAN

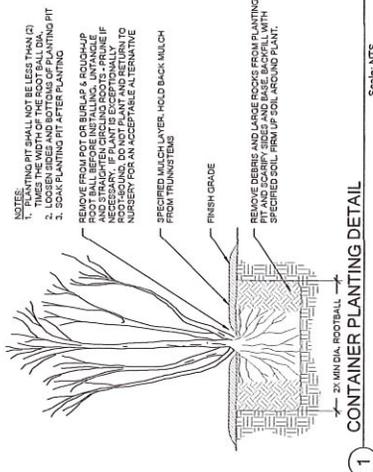
NO.	DATE	DESCRIPTION
1	04-15-16	PREP SET

SUBMITTALS & REVISIONS

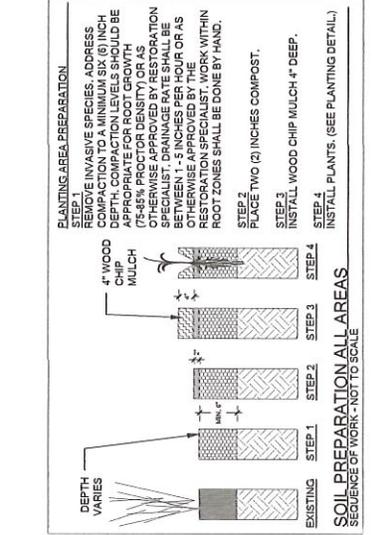
PROJECT MANAGER:	NS
DESIGNED:	MSF
DRAWN:	KB
CHECKED:	KB
JOB NUMBER:	160313
SHEET NUMBER:	W4 OF 5



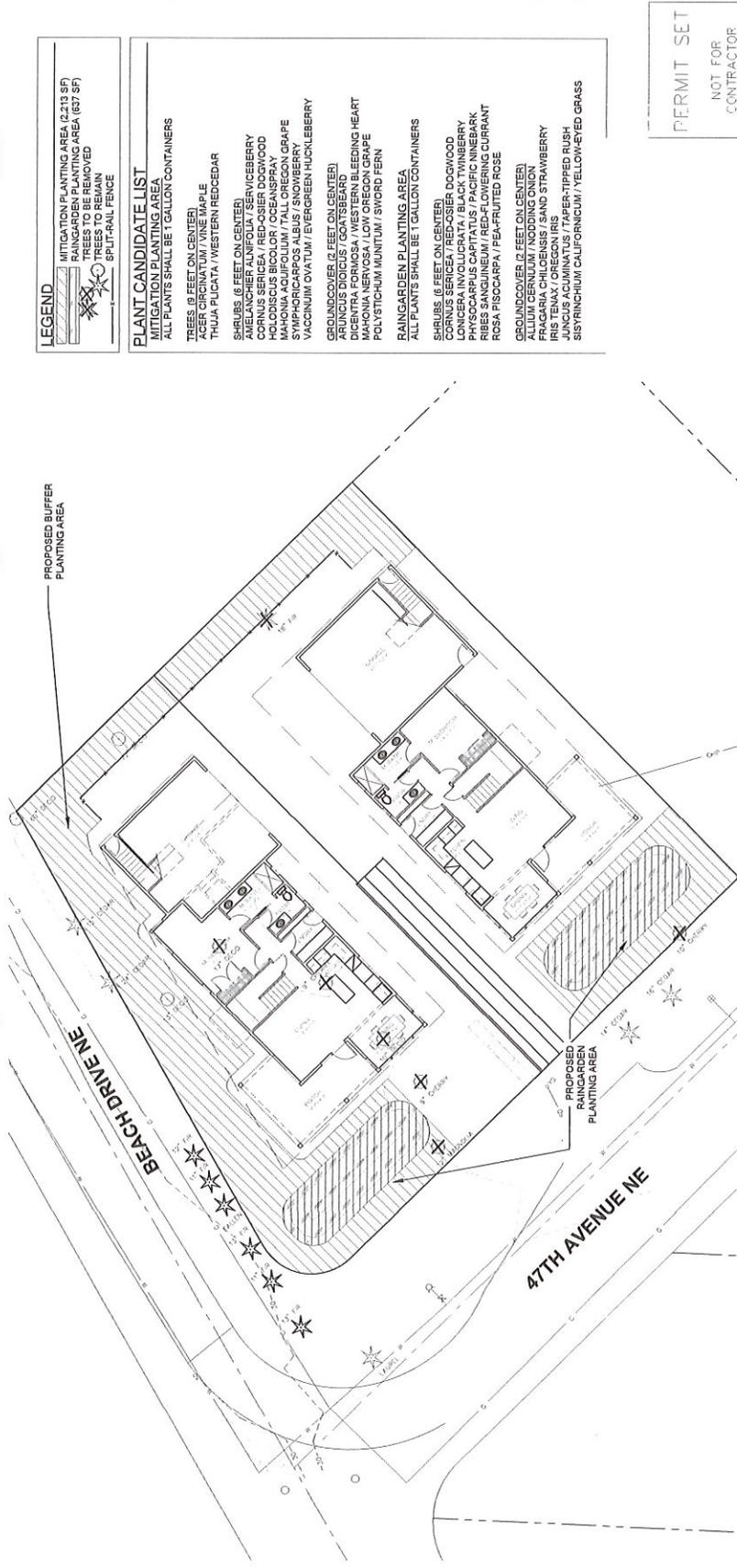
1 CONTAINER PLANTING DETAIL
 Scale: NTS



2 SPLIT-RAIL FENCE DETAIL
 Scale: NTS



3 SOIL PREPARATION ALL AREAS
 SEQUENCE OF WORK - NOT TO SCALE



PROPOSED PLANTING PLAN & PLAN DETAILS

PERMIT SET
 NOT FOR CONTRACTOR BIDDING

Scale: 0 5' 10' 20' 40'

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