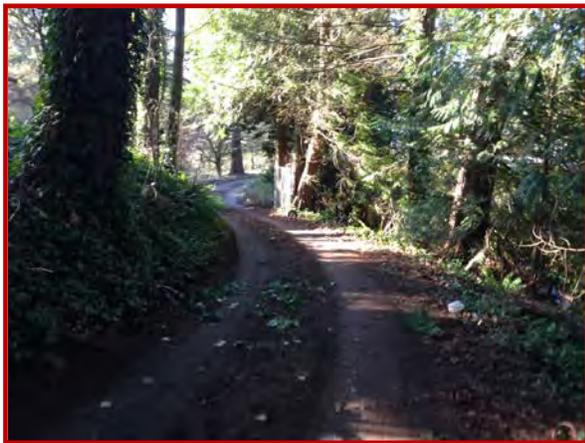


Attachment B

Stream and Buffer Modification/Restoration and Arch Culvert Plan by Re-Align Environmental, 2015

Stream and Buffer Modification/Restoration and Arch Culvert Plan

Kirkland Cottages
Kirkland, Washington



Prepared for:

Mr. Mark Putzke
Chandler Homes LLC
10220 NE 110th St
Kirkland, WA 98033

Prepared by:

Re-Align Environmental

Bill Granger, Owner
14056 180th Ave SE
Renton, WA
(206) 790-6132
Bill@re-alignenv.com

September 18, 2015

Table of Contents

1.0 INTRODUCTION 1

2.0 Stream, Wetland and Buffer Condition 2

3.0 Stream Buffer Modification Plan..... 3

 3.1 Stream Buffer Reduction..... 3

 3.2 Stream and Buffer Enhancement Plan 3

 3.3 Monitoring Plan..... 6

 3.3.1 Year 0..... 6

 3.3.2 Years 1 - 5..... 8

 3.3.3 Monitoring Reports..... 9

4.0 Culvert Removal Plan..... 10

5.0 Arch Culvert Plan 11

6.0 References..... 13

Figures

- Figure 1 – Location Map
- Figure 2 – Existing Conditions
- Figure 3 – Site Plan with Reduced Buffer
- Figure 4 – Specific Areas of Enhancement
- Figure 5 – Driveway Decommissioning
- Figure 6 – Stream Restoration Substrate Plan
- Figure 7 – Planting Plan
- Figure 8 – Arch Culvert Plan
- Figure 9 – Stream Buffer Encroachments

Appendices

- Appendix A – Site Photos

1.0 INTRODUCTION

This report presents the stream buffer modification and restoration plan, as well as the proposed culvert removal and arch culvert placement for the proposed Kirkland Cottages project in Kirkland, WA. The subject parcel is located at 7845 NE 122nd Place in the Finn Hill neighborhood, which is in the Champagne Creek Drainage Basin. The property is developed and contains a single family residence, detached garage/storage area, shed, gravel driveway and parking area, vegetated riparian corridor, and lawn areas. Upland riparian vegetation consists of western red cedar, red alder, and bigleaf maple in the canopy with Indian plum, salmonberry, English holly, sword fern, and English ivy common in the understory. As shown in Figure 1, Champagne Creek and one associated wetland were delineated by The Watershed Company (TWC, 2014). The wetland was designated as a Type 3 wetland under Chapter 90 of the Kirkland Zoning Code (KZC), resulting in a 50-foot wetland buffer along the wetland (TWC, 2014). Champagne Creek was determined to be a Class B stream (KZC.90.30.6) resulting in a buffer width of 60 feet as measured from the ordinary high water mark (KZC.90.90.1) (TWC, 2014).

The subject property is a single-family residence, which is accessed via a one-lane driveway that crosses Champagne Creek over a 12” culvert in the stream, immediately downstream of a wetland area (see Figure 2).

As shown in Figure 3, Chandler Homes LLC (Chandler Homes) proposes to develop ten dwelling units in 5 buildings on the property. The proposed development would include the construction of a new access road over Champagne Creek, using an arch culvert so that no impacts to jurisdictional waters would be necessary. The road crossing would include the placement of clean fill material over the arch culvert to provide for the new access road and utilities. The construction of the new road would displace approximately 1,635 square feet of stream buffer. In order to compensate for the loss of buffer function due to the road crossing, Chandler Homes proposes to restore the stream by removing the existing culvert, and to enhance the stream buffer.

This report has been prepared to address the Stream Buffer Modification Plan, a culvert removal and stream restoration, and the placement of an arch culvert to develop the new access road.

2.0 STREAM, WETLAND AND BUFFER CONDITION

On January 14, 2015, Re-Align Environmental conducted a site reconnaissance to evaluate and document the condition of the stream, wetland and buffer areas to ascertain restoration and enhancement opportunities. Appendix A contains site photos that document the findings.

Champagne Creek is a perennial, non-fish bearing stream within the project area (TWC, 2014). Review of the stream channel indicated that the stream contains man-made debris, including cinder blocks, a coffee pot, an automobile rim and a hubcap, all located upstream of the culvert. In addition, the 12” culvert was identified below the wetland area. As documented in the critical areas report (TWC, 2014), this reach of Champagne Creek does not appear to support salmonid passage due to the presence of a steep gradient reach below the subject property. However, The presence of cutthroat trout was documented in Kirkland’s Streams, Wetlands, and Wildlife Study (TWC, 1998; TWC, 2014).

The small, riverine wetland along the stream and immediately upstream of the culverted stream section was observed by Re-Align Environmental. The invasive reed canarygrass was noted in the wetland area and adjacent buffer area. TWC (2014) identified this invasive species in the upland data point in their report, indicating 50% aerial cover.

The current condition of the buffer area is consistent with the residential development present on the site. As shown in Figure 2, an existing driveway is the primary developed feature in the buffer area. The buildings identified on the site do not appear to be located in the buffer, although use of the garage and shed areas includes storage of man-made materials in the buffer. The buffer also contains a powerline pole, which appears to be an old, creosote-treated wood pole.

Vegetation in the buffer includes sparse, native canopy, shrub and herbaceous species, described in Section 1.0. In addition, the buffer contains a predominance of invasive species, primarily English Ivy, and including English holly, Himalayan blackberry, and English laurel. Vegetation in the buffer and along the stream channel provides little shade, with an estimated canopy coverage of 35 % - 40% on the southern portion of the buffer (i.e., on the residential side of the buffer) and less than 10% on the portion of the buffer along NE 122nd Place (see Appendix A).

3.0 STREAM BUFFER MODIFICATION PLAN

3.1 Stream Buffer Reduction

KZC 90.100(1)(b) states that:

“Buffers may be decreased through buffer enhancement. The applicant shall demonstrate that through enhancing the buffer (by removing invasive plants, planting native vegetation, installing habitat features such as downed logs or snags, or other means) the reduced buffer will function at a higher level than the standard existing buffer. A buffer enhancement plan shall at a minimum provide the following: (1) a map locating the specific area of enhancement; (2) a planting plan that uses native species, including groundcover, shrubs, and trees; and (3) a monitoring and maintenance program prepared by a qualified professional consistent with the standards specified in KZC 90.55(4). Buffers may not be reduced at any point by more than one-third (1/3) of the standards in KZC 90.90(1).”

Chandler Homes, LLC proposes to reduce the buffer consistent with KZC 90.100(1)(b). Under this proposal, Chandler Homes would reduce the existing 60-foot stream buffer by one third, or 20 feet, for a modified stream buffer width of 40 feet (see Figure 3). The following buffer enhancement plan has been prepared to meet the requirements of KZC 90.100(1)(b).

3.2 Stream and Buffer Enhancement Plan

Figure 4 presents a map of the site plan, showing the specific areas of enhancement. The stream and buffer restoration plan has been prepared to document Chandler Homes’ proposed restoration of the stream and enhancement of the buffer area to allow for the reduction in buffer width pursuant to KZC 90.100(1)(b). The primary objectives for the restoration and enhancement actions are to remove man-made debris and invasive species from the area, to restore shade along the riparian corridor, and to preserve the buffer during and after development of the residential homesites.

The stream and buffer enhancement plan for the Kirkland Cottages development is proposed to include the following goals and objectives:

Goal 1 – Restore buffer function and habitat complexity

Objective A: Remove man-made structures and debris from buffer area.

Performance Standard: Remove existing developed facilities from buffer

- a. **Remove any buildings or stored materials from the buffer**
- b. **Remove driveway (1,950 sf - fill in bench with clean, native material –see Figures 4 and 5)**
- c. **Remove power pole**
- d. **Mulch and plant/seed buffer (described below)**

Evaluation Method: Photo-documentation before and after structure/debris removal, documentation in Year 0 Monitoring Report (see Section 3.3).

Objective B: Remove invasive species from buffer and wetland.

Performance Standard: Prior to buffer mulching and planting, remove through manual extraction (including roots):

- Himalayan blackberry
- reed canary grass
- English Ivy
- English Holly
- English Laurel

Evaluation Method: Photo-documentation before and after invasive removal, documentation in Year 0 Monitoring Plan (see Section 3.3).

Objective C: Restore natural substrate in stream channel

Performance Standard 1: Manually remove existing debris from stream channel

- a. Remove cinder blocks
- b. Remove car parts
- c. Remove coffee pot
- d. Remove any other man-made debris

Evaluation Method: Photo-documentation before and after structure removal, documentation in Year 0 Monitoring Report (see Section 3.3).

Performance Standard 2: Remove culverted driveway crossing from stream channel

- a. Do work in late summer, when stream is flowing at lowest volume
- b. Divert flow around the work site into an excavated channel lined with geotextile
 - i. Toe in geotextile at up-and down-stream ends
- c. Excavate fill and remove culvert from historic channel
- d. Fine grade slopes to 2:1, mulch and plant per Table 1
- e. Place 3” – 12” cobbles and 2” minus round gravel in channel, over geotextile (Figure 6)
- f. Divert flow back into new channel

Evaluation Method: Photo-documentation before and after culvert removal, documentation in Year 0 - 5 Monitoring Reports (see Section 3.3).

Objective D: Establish native canopy, shrub and herbaceous species in the buffer

Performance Standard: Plant vegetation according to Table 1 (see Figure 7). Tree and shrub coverage will be have canopy cover percentages (including volunteers, but not herbs) during the monitoring period of:

- 20% or greater at the end of Year 1
- 100% survivability after Year 1
- 30% or greater at the end of Year 2

- 50% or greater at the end of Year 3
- 60% or greater at the end of Year 4
- 80% or greater at the end of Year 5

Contingency:

Consider planting additional plants and varying species

Evaluation Method: Photo-documentation at completion of planting (Yr 0) bi-annual quadrat sampling for five years, documentation in Year 0 - 5 Monitoring Reports (see Section 3.3).

Table 1: Buffer Planting Plan

Species	Common Name	Size	Location in Buffer
<i>Pseudotsuga menziesii</i>	Douglas Fir	3" cal	Outer 50%
<i>Thuja plicata</i>	Western Redcedar	3" cal	Inner 50%
<i>Alnus rubra</i>	Red Alder	3" cal	Throughout
<i>Populus balsamifera</i>	Black cottonwood	1" cal	Throughout
<i>Acer macrophyllum</i>	Big leaf maple	3" cal	Outer 50%
<i>Ribes sanguineum</i>	Red flowering currant	1 gal.	Outer 50%
<i>Oemleria cerasiformis</i>	Indian plum	1 gal	Inner 50%
<i>Sambucus racemosa</i>	Red elderberry	1 gal	Inner 50%
<i>Rubus spectabilis</i>	Salmonberry	1 gal	Inner 50%
<i>Acer glabrum</i>	Douglas maple	1 gal	Outer 50%
<i>Mahonia nervosa</i>	Oregon grape	1 gal	Outer 50%
<i>Gaultheria shallon</i>	Salal	1 gal	Outer 50%
<i>Athyrium filix femina</i>	Lady Fern	1 qt	w/in 10' of stream,
<i>Polystichum munitum</i>	Sword fern	1 qt	throughout

Objective E: Minimize Invasive species in buffer over 5-year monitoring period

Performance Standard: Invasive and non-native species will have 10% or less aerial coverage within the buffer enhancement areas. These plants include:

- Himalayan blackberry
- reed canary grass
- English Ivy
- English Holly
- English Laurel
- cattail
- Scot's broom

Evaluation Method: Bi-annual quadrat sampling for five years, documentation in Year 1 - 5 Monitoring Reports (see Section 3.3). If the standard is exceeded, manual extraction will be preferable, but herbicide application may be considered, subject to riparian application guidelines, as approved by the City of Kirkland.

Goal 2 – Preserve stream and wetlands and buffer

Objective A: Prior to beginning development activities, install a 6-foot-high construction-phase chain link fence, along the upland boundary of the entire stream buffer with silt screen fabric installed per City standard remain upright in the approved location for the duration of development activities, with the exception that buffer restoration activities may require temporary removal of portions of the fence (see KMZ 90.95).

Performance Standard: Appropriate fence and silt screen fabric (or equivalent) is installed prior to, and during construction activities.

Evaluation Method: Photo-documentation before construction and during construction, documentation in Year 0 Monitoring Report (see Section 3.3).

Objective B: Upon project completion, install between the upland boundary of the stream buffer and the developed portion of the site a permanent, 3- to 4-foot-tall split rail fence. Installation of the permanent fence must be done by hand where necessary to prevent machinery from entering the stream or its buffer (see KMZ 90.95).

Performance Standard: A 3 to 4-foot tall, wood rail fence is installed along the stream buffer boundary upon completion of construction and buffer restoration.

Evaluation Method: Photo-documentation after construction and buffer restoration, documentation in Year 0 – 5 Monitoring Reports (see Section 3.3).

3.3 Monitoring Plan

The proposed monitoring plan includes a total of six years of monitoring: one year (Year 0) to verify implementation of the required protection/restoration standards; and five years (Years 1 – 5) of effectiveness monitoring.

3.3.1 Year 0

During Year 0 monitoring, the primary objective of monitoring efforts will be to verify the implementation of required standards, as described in Section 3.2 (Stream and Buffer Enhancement Plan). It is expected that some of this monitoring will overlap with monitoring being conducted according to the Stormwater Pollution Prevention Plan (SWPPP), which will address erosion and sediment control activities and monitoring for the project.

The Year 0 monitoring will include photo-documentation to verify that standards have been implemented. During the early mobilization and construction phases of the project, the initial Year 0 monitoring will include the establishment and permanent marking of photo-documentation points and plant sampling transects (to be used in Year 1 – 5 monitoring). The following standards will be assessed and photo-documented.

3.3.1.1 Goal 1, Objective A, Standards a – d

The objectives of these standards is to remove existing developed facilities from buffer, including the removal of any buildings or stored materials from the buffer, removal and restoration of the driveway, removal of the existing power pole, and upon completion of the restoration work, mulching and planting of the buffer.

During the Year 0 monitoring, photo-points will be established to document the location of each developed facility. Upon removal of these facilities, a second photo will be taken from each photo-point to document its removal from the buffer. The results will be included in the Year 0 monitoring report.

3.3.1.2 Goal 1, Objective B

The objective of this standard is to physically remove any invasive species from the buffer. These include Himalayan blackberry, reed canary grass, English Ivy, English Holly, and English Laurel, which have all been documented in the buffer.

During the Year 0 monitoring, photo-points will be established to document invasive species in the buffer. Upon removal of the plants, a second photo will be taken from each photo-point to document the plants' removal from the buffer. The results will be included in the Year 0 monitoring report.

3.3.1.3 Goal 1, Objective C1, Standards a – d

Under this standard, existing debris in the stream channel would be removed by hand. This includes manually remove existing debris from stream channel, including cinder blocks, car parts, coffee pot, and any other man-made debris that is discovered in the channel.

During the Year 0 monitoring, photo-points will be established to document man-made debris in the channel. Upon removal of the debris, a second photo will be taken from each photo-point to document the removal of the debris from the channel. The results will be included in the Year 0 monitoring report.

3.3.1.4 Goal 1, Objective C2, Standards a – f

This standard specifically addresses the removal of the existing culvert from the stream and the re-establishment of a stream corridor. It is expected that the SWPPP monitoring and any other monitoring requirements established by State and Federal regulatory agencies will overlap with this monitoring.

During the Year 0 monitoring, photo-points will be established to document the location of the culvert. Upon removal of the culvert and re-establishment of the riparian corridor, a second photo will be taken from each photo-point to document the removal of the culvert from the channel. The results will be included in the Year 0 monitoring report.

3.3.1.5 Goal 1, Objective D

Under this standard, the buffer would be re-planted and mulched. During the Year 0 monitoring, photo-points will be established to document the pre-planting condition of the buffer (commensurate with Goal 1, Objective B second photographs). Upon planting of the trees, shrubs and herbaceous plants, a second photo will be taken from each photo-point to document the planting of the vegetation according to the planting schedule (Table 1, Figure 7). The results will be included in the Year 0 monitoring report.

3.3.1.6 *Goal 2, Objective A*

This standard is intended to ensure that a 6-foot tall, chain link fence is placed along the buffer and that silt fence or a suitable substitute is in place prior to mobilization of heavy equipment or any related construction activities.

During the Year 0 monitoring, photo-points will be established to document the installation of the chain link fence and silt fence. The results will be included in the Year 0 monitoring report.

3.3.1.7 *Goal 2, Objective B*

This standard requires the installation of a permanent split rail fence upon completion of the construction and restoration work on the site.

During the Year 0 monitoring, photo-points will be established to document the installation of the split rail fence. The results will be included in the Year 0 monitoring report.

3.3.2 Years 1 - 5

During Year 1 - 5 monitoring, the primary objective of monitoring efforts will be to verify the effectiveness of the restoration with respect to the required standards (see Section 3.2 - Stream and Buffer Enhancement Plan).

The Year 1 - 5 monitoring will take place twice each year: once in summer and once in fall. Monitoring will include quadrat sampling along the established transects (established in Year 0) and photo-documentation to verify that the fence standard has been met. The two monitoring events will be documented in a “year end” report. The report will include the methods and findings, as well as analysis and recommendations for adaptive management, as necessary. The following standards will be assessed and photo-documented.

3.3.2.1 *Goal 1, Objective C2, Standards a – f*

This standard addresses the removal of the existing culvert from the stream and the re-establishment of a stream corridor. During the Year 1 - 5 monitoring, photographs will be taken from the established photo-points (Year 0) riparian corridor along the restored reach of the stream. This monitoring will also include a review of the entire stream corridor within the property to evaluate the accumulation of additional man-made debris/refuse in the channel, and to evaluate the condition of the stream in the vicinity of the new arch culvert (See Section 5.0). The results will be included in the Year 1 – 5 monitoring reports.

3.3.2.2 *Goal 1, Objective D*

This standard requires that the percentage cover of tree and shrubs meet the parameters outlined in Objective D. Quadrats will be randomly located along the established transects sufficient to collect enough data to evaluate the percentage cover over the buffer restoration area, including the decommissioned driveway. In addition, the monitoring will include photographs taken from the established photo-points. The results will be included in the Year 1 – 5 monitoring reports.

3.3.2.3 *Goal 1, Objective E*

Under this standard, the percentage aerial cover of invasive species, as defined in Objective B, must be under 10%. The data collected under Objective D will be used to calculate the percentage cover of any invasive plants. The results will be included in the Year 1 – 5 monitoring reports.

3.3.2.4 *Goal 2, Objective B*

This standard requires the installation of a permanent split rail fence upon completion of the construction and restoration work on the site.

During the Year 1 - 5 monitoring, photographs will be taken at the established photo-points (Year 0) to document the condition of the split rail fence. The results will be included in the Year 1 - 5 monitoring report.

3.3.3 Monitoring Reports

For Year 0, one report will be completed at the end of construction and submitted to the City of Kirkland as part of the construction completion report. It is expected that City staff will include a site visit to evaluate the site and review the monitoring results.

After the completion of the Fall monitoring each year in Years 1 – 5 monitoring, a monitoring report will be prepared to include a summary of the previous year's monitoring, including any adaptive management, the methods used for the current year, the technical results for the two monitoring events, and a discussion about the success of the restoration and any adaptive management needed. The reports will be submitted to the City of Kirkland by December 1 of the current monitoring year. During this process, if it is determined that City staff are needed to assist in determining appropriate adaptive management actions, then the monitor will coordinate with Chandler Homes to include the City in these discussions.

4.0 CULVERT REMOVAL PLAN

As of this writing, Chandler Homes has not commissioned the final engineering of the culvert removal. However, the conceptual plan submitted to the City in February 2015 still provides the basis for the culvert removal and restoration of the riparian corridor. As described in Section 3.2, the culvert removal includes the following standards:

- a. Do work in late summer, when stream is flowing at lowest volume
- b. Divert flow around the work site into an excavated channel lined with geotextile
 - i. Toe in geotextile at up-and down-stream ends
- c. Excavate fill and remove culvert from historic channel
- d. Fine grade slopes to 2:1, mulch and plant per Table 1
- e. Place 3" – 12" cobbles and 2" minus round gravel in channel, over geotextile
- f. Divert flow back into new channel

Figure 5 shows the conceptual design for the culvert removal and stream restoration, based on the above standards. The 12" culvert is approximately 40 ft. long, with an inlet invert elevation of 288.8 ft. and an outlet invert of 285.2 ft., for a total drop of 3.6 ft. The resulting slope gradient is 9%. Chandler Homes proposes to retain the inlet and outlet elevations and the slope in between for the design of the restored channel. As the engineering for the culvert removal is finalized and the Joint Aquatic Resource Permit Application (JARPA) is completed for permitting by the US Army Corps of Engineers (Corps), Washington Department of Ecology (Ecology) and Washington Department of Fish and Wildlife (WDFW), Chandler Homes' consulting team will provide a copy of the JARPA and the engineering drawings to the City.

5.0 Arch Culvert Plan

As of this writing, Chandler Homes has not commissioned the final engineering of the arch culvert installation. However, the conceptual plan submitted to the City in February 2015 still provides the basis for the arch culvert installation. Figure 8 shows the conceptual plan view design for the arch culvert installation.

The arch culvert has been sized to pass the 100-year storm, as modeled by Civil Engineering Solutions at 67 cubic feet per second (CES, 2015). The culvert would span the stream, with a bottom width of 20 feet wide (channel width is approximately 11 feet). The culvert would cover a total stream length of 25.9 feet, occupying a total space of 518 square feet.

Table 2 shows the existing conditions on the project site, including the critical areas.

Table 2: Existing Conditions

Area	Sq. ft.
Site Survey (ex. cond.)	46,754
Sensitive Areas	
Wetland	387
Stream	1,637
Culverted Stream	268
Subtotal	2,292
Unrestored Buffer	
Wetland	6,843
Stream	20,856
Subtotal	27,699
Total Critical Areas	29,991
Total Outside Critical Areas	19,055

Table 3 shows the critical area square footage under the proposed condition. Figure 9 documents the buffer encroachments from the proposed road crossing over the stream.

Table 3: Proposed Conditions

Area	Sq. ft.
Proposed Condition	46,754
Sensitive Areas	
Wetland	387
Stream (268 sf restored)	2,173
Culverted Stream	0
Stream under arch culvert	234
Subtotal	2,794
Buffer	
Fill Causeway (lost buffer)	1,635
Under Arch Culvert (preserved)	284
Temporary Construction Disturbance (restored and preserved)	1,109
Restored Buffer (west)	11,381
Restored Buffer (east)	9,057
Subtotal	23,466
Total Critical Areas	26,260
Total Outside Critical Areas	20,494

As the engineering for the arch culvert installation is finalized and the JARPA is completed for permitting by the Corps, Ecology and WDFW, Chandler Homes' consulting team will provide a copy of the JARPA and the engineering drawings to the City.

6.0 References

CES, 2015. Arch Culvert Sizing TIR. Unpublished.

TWC, 1998. Kirkland Streams, Wetlands, and Wildlife Study. July, 1998.

TWC, 2014. Thornquist Property (Chandler Homes), Wetland and Stream Delineation Report. The Watershed Company Reference Number: 140622.7. Prepared for Tony Leavitt, City of Kirkland, Planning and Community Development. September 10, 2014.

Figures



LEGEND

	FOUND MONUMENT AS DESCRIBED
	FOUND PROPERTY CORNER AS DESCRIBED
	LAMP POST
	POWER METER
	UTILITY POLE
	ORDINARY HIGH WATER MARK FLAG
	PAD MOUNTED TRANSFORMER
	STORM DRAIN MANHOLE
	SANITARY SEWER MANHOLE
	WATER VALVE
	FIRE HYDRANT
	WATER METER
	CABLE TV PEDESTAL / JUNCTION BOX
	APPROXIMATE LOCATION SANITARY SEWER LINE
	APPROXIMATE LOCATION STORM DRAIN LINE
	OVERHEAD UTILITIES
	WOOD FENCE
	CHAIN LINK FENCE
	ASPHALT SURFACE
	CONCRETE SURFACE
	GRAVEL SURFACE
	WETLAND BUFFER
	STREAM BUFFER
	PI PINE
	CE CEDAR
	MP MAPLE
	DF DOUGLAS FIR
	DS DECIDUOUS
	* DENOTES MULTI-TRUNK

Figure 2
Existing Conditions
*Re-Align
Environmental*

PROJECT INFORMATION

SURVEYOR: SITE SURVEYING, INC.
21923 NE 11TH STREET
SAMMAMISH, WA 98074
PHONE: 425.268.4412

PROPERTY OWNER: GABE THORNIQUIST
7845 NE 122ND PLACE
KIRKLAND, WA 98034

TAX PARCEL NUMBER: 007650-0421

PROJECT ADDRESS: 7845 NE 122ND PLACE
KIRKLAND, WA 98034

ZONING: RMA 2.4

JURISDICTION: CITY OF KIRKLAND

PARCEL ACREAGE: 46,764 S.F. (± 1.073 ACRES)
AS SURVEYED

SITE SENSITIVE AREAS:
WETLAND STREAM 387 S.F.
1,905 S.F.

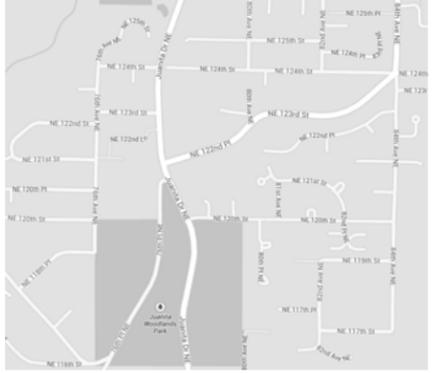
SITE WITHIN SENSITIVE BUFFER AREAS:
60' WETLAND A BUFFER 6,843 S.F.
60' CLASS B STREAM BUFFER 20,558 S.F.
TOTAL BUFFER AREAS 27,400 S.F.

BUILDABLE AREA PER KZC 90.135: 10,055 S.F.

SITE % AREA IN SENSITIVE AREA BUFFERS: 59 %

DEVELOPMENT FACTOR PER KZC 90.135.2: 0.5

MAXIMUM DEVELOPMENT POTENTIAL (KZC 90.135):
(10,055 / 2,400) + ((27,400 / 2,400) x 0.50)
13.7 (ROUNDED UP PER KZC 90.135.1) 14 DWELLING UNITS



LEGAL DESCRIPTION

LOT A, COUNTY OF KING SHORT SUBDIVISION NO. 882027, AS RECORDED UNDER RECORDING NUMBER 629070008, RECORDS OF KING COUNTY, WASHINGTON.
SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON

BASIS OF BEARINGS

THE PLAT OF DUMHOLT HEIGHTS ADDITION, AS PER PLAT RECORDED IN VOLUME 95 OF PLATS ON PAGE 32, RECORDS OF KING COUNTY, WASHINGTON, ACCEPTED THE PLAT BEARINGS OF S 87°07'06" W FOR NE 120TH STREET BASED ON FOUND MONUMENTS IN CASE.

GENERAL NOTES

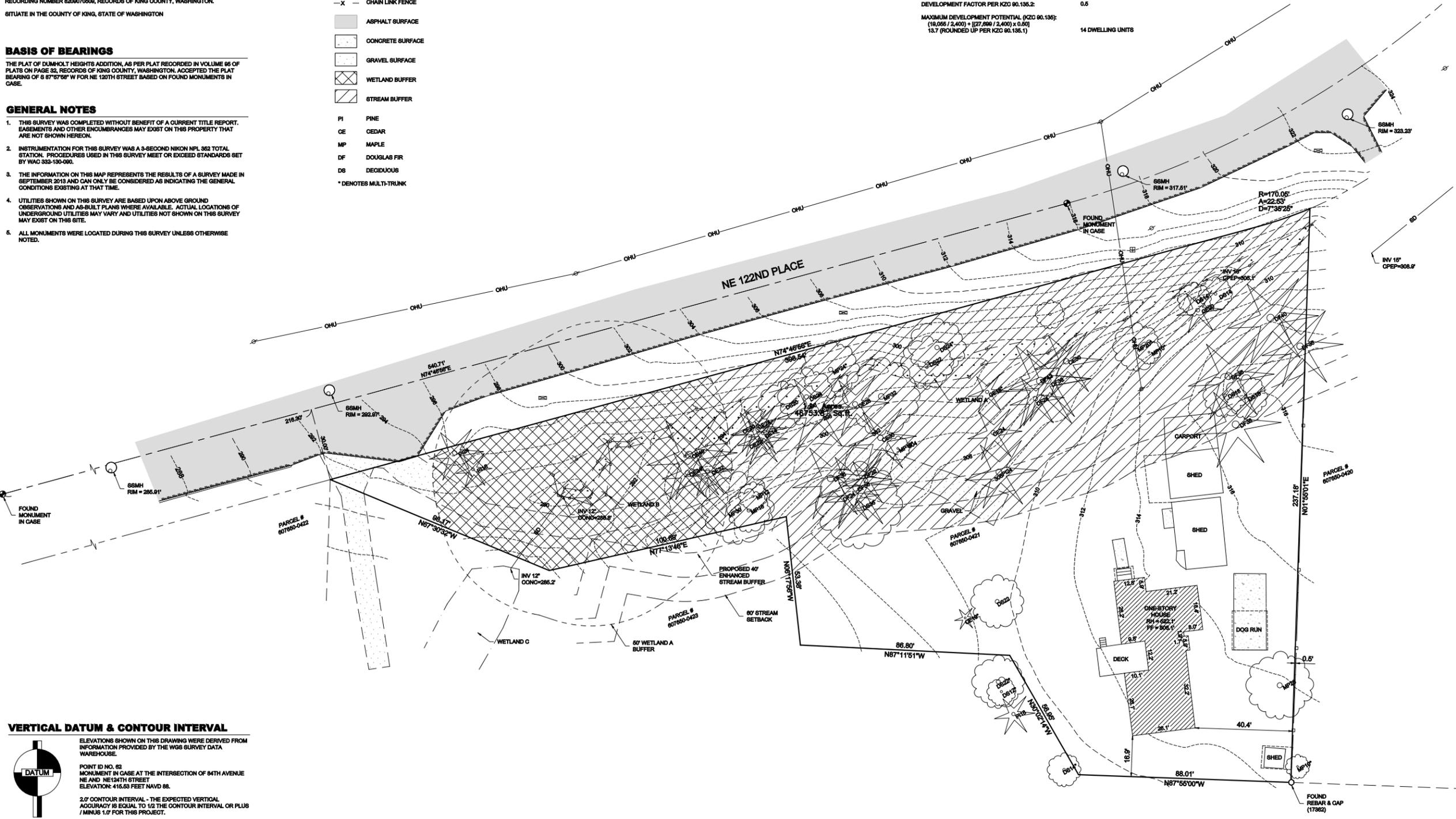
- THIS SURVEY WAS COMPLETED WITHOUT BENEFIT OF A CURRENT TITLE REPORT. EASEMENTS AND OTHER ENCUMBRANCES MAY EXIST ON THIS PROPERTY THAT ARE NOT SHOWN HEREON.
- INSTRUMENTATION FOR THIS SURVEY WAS A 3-SECOND NIKON NPL 352 TOTAL STATION. PROCEDURES USED IN THIS SURVEY MEET OR EXCEED STANDARDS SET BY WAO 332-130-090.
- THE INFORMATION ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE IN SEPTEMBER 2013 AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
- UTILITIES SHOWN ON THIS SURVEY ARE BASED UPON ABOVE GROUND OBSERVATIONS AND AS-BUILT PLANS WHERE AVAILABLE. ACTUAL LOCATIONS OF UNDERGROUND UTILITIES MAY VARY AND UTILITIES NOT SHOWN ON THIS SURVEY MAY EXIST ON THIS SITE.
- ALL MONUMENTS WERE LOCATED DURING THIS SURVEY UNLESS OTHERWISE NOTED.

VERTICAL DATUM & CONTOUR INTERVAL

ELEVATIONS SHOWN ON THIS DRAWING WERE DERIVED FROM INFORMATION PROVIDED BY THE WGS SURVEY DATA WAREHOUSE.

POINT ID NO. 62
MONUMENT IN CASE AT THE INTERSECTION OF 84TH AVENUE NE AND NE 124TH STREET
ELEVATION: 415.53 FEET NAVD 88.

2.0' CONTOUR INTERVAL - THE EXPECTED VERTICAL ACCURACY IS EQUAL TO 1/2 THE CONTOUR INTERVAL OR PLUS / MINUS 1.0' FOR THIS PROJECT.



NW 1/4, SE 1/4, SEC 25, TWP 26N, RNG 4E, W.M.

21923 NE 11th Street Sammamish, WA 98074
www.siteurveying.com
Phone: 425.268.4412

DATE	REVISION	DRN	TNW
10/21/14	EXTRA WETLAND FLAG ADDED		

TOPOGRAPHIC SURVEY
CHANDLER HOMES
7845 NE 122ND PLACE
KIRKLAND, WA 98034

© 2013, SITE SURVEY & MAPPING, INC., ALL RIGHTS RESERVED.

PROJECT NO. 13-350
DRAWN BY: EFJ
CHECKED BY: TNW
DATE: 10/15/14
SHEET 1 OF 1

PROJECT SITE DATA

OWNER: CHANDLER HOMES
 SITE ADDRESS: 1111 NE 122ND PLACE, KIRKLAND, WA 98034
 TAX ACCT. NO.: 607650-0421
 TOTAL GROSS AREA: 46,753 SF

PROJECT CONTACT LIST

OWNER: CHANDLER HOMES
 ENGINEER: CIVIL ENGINEERING SOLUTIONS, 2244 NW MARKET STREET, SUITE B, SEATTLE, WA 98107
 CONTACT: DUFFY ELLIS, PE
 PHONE: 206.930.0342
 DUFFY@CESOLUTIONS.US
 SURVEYOR: SITE SURVEYING, INC., 21923 NE 11TH ST, SAMMAMISH, WA 98074
 PHONE: 425.298.4412

UTILITY CONTACT LIST

SANITARY SEWER: CITY OF KIRKLAND
 WATER: CITY OF KIRKLAND
 ELECTRIC: PUGET SOUND ENERGY, PHONE: 1.800.321.4123
 GAS: PUGET SOUND ENERGY, PHONE: 1.800.321.4123
 TELEPHONE: VERIZON, CONTACT: MIKE FESKENS, PHONE: 425.710.4111



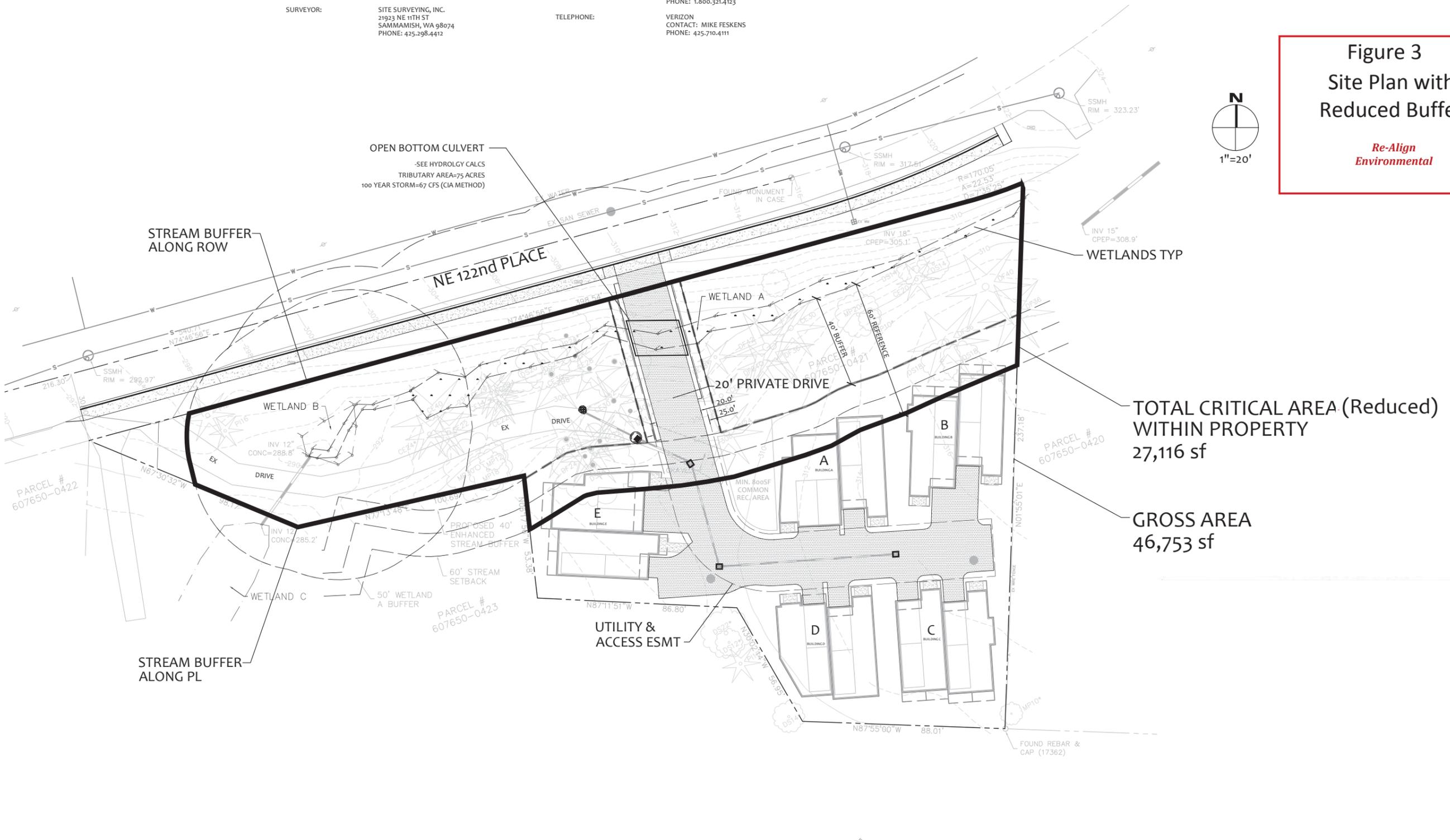
KIRKLAND COTTAGES

SITE PLAN / DENSITY CALC



Figure 3
 Site Plan with
 Reduced Buffer

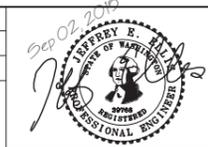
*Re-Align
 Environmental*



NO.	DATE	BY	REVISIONS

APPLICANT: CHANDLER HOMES

DATE: Sep 02, 2015
 DRAFTED: SS DESIGN: DE
 DIGITAL SIGNATURE



CIVIL ENGINEERING SOLUTIONS
 2244 NW MARKET STREET, SUITE B SEATTLE, WA 98107
 PHONE: 206.930.0342 DUFFY@CESOLUTIONS.US

KIRKLAND COTTAGES SITE PLAN
 1111 NE 122ND PLACE, KIRKLAND, WA 98034

DRAWING NO. **C1.0**
 APN: 607650-0421

PROJECT SITE DATA

OWNER: CHANDLER HOMES
 SITE ADDRESS: 0000 NE 0000 PLAC E
 KIRKLAND, WA 98034
 TAX ACCT. NO.: 607650-0421
 TOTAL GROSS AREA: 42,028 sf

PROJECT CONTACT LIST

OWNER: CHANDLER HOMES
 ENGINEER: CIVIL ENGINEERING SOLUTIONS
 2244 NW MARKET STREET, SUITE B
 SEATTLE, WA 98107
 CONTACT: DUFFY ELLIS, PE
 PHONE: 206.930.0342
 DUFFY@CESOLUTIONS.US
 SURVEYOR: SITE SURVEYING, INC.
 21923 NE 11TH ST
 SAMMAMISH, WA 98074
 PHONE: 425.298.4412

UTILITY CONTACT LIST

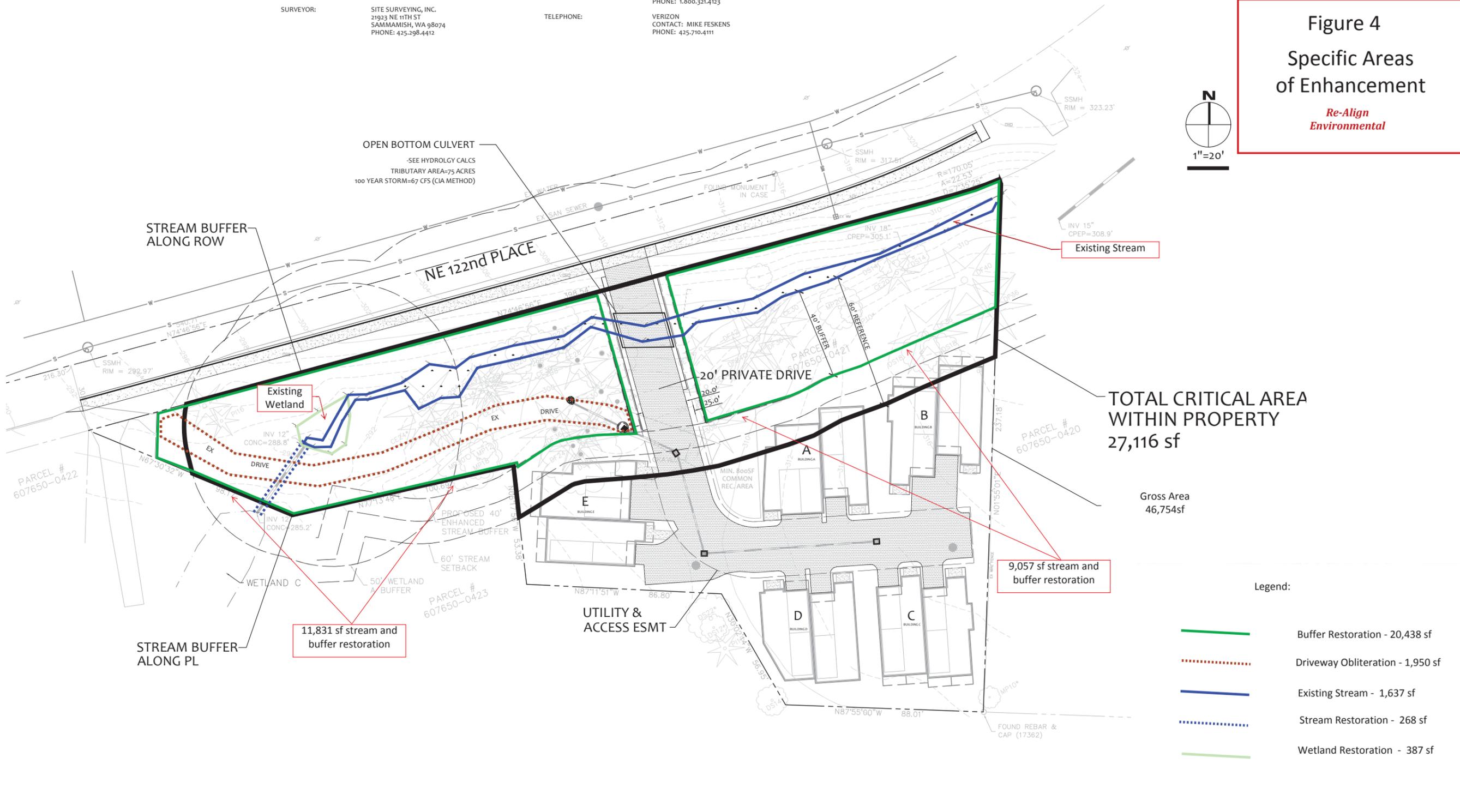
SANITARY SEWER: CITY OF KIRKLAND
 WATER: CITY OF KIRKLAND
 ELECTRIC: PUGET SOUND ENERGY
 PHONE: 1.800.321.4123
 GAS: PUGET SOUND ENERGY
 PHONE: 1.800.321.4123
 TELEPHONE: VERIZON
 CONTACT: MIKE FESKENS
 PHONE: 425.710.4111

KIRKLAND COTTAGES

SITE PLAN / DENSITY CALC

Figure 4
 Specific Areas
 of Enhancement

*Re-Align
 Environmental*

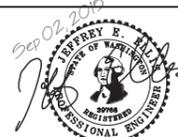


NO	DATE	BY	REVISIONS

APPLICANT
 CHANDLER HOMES



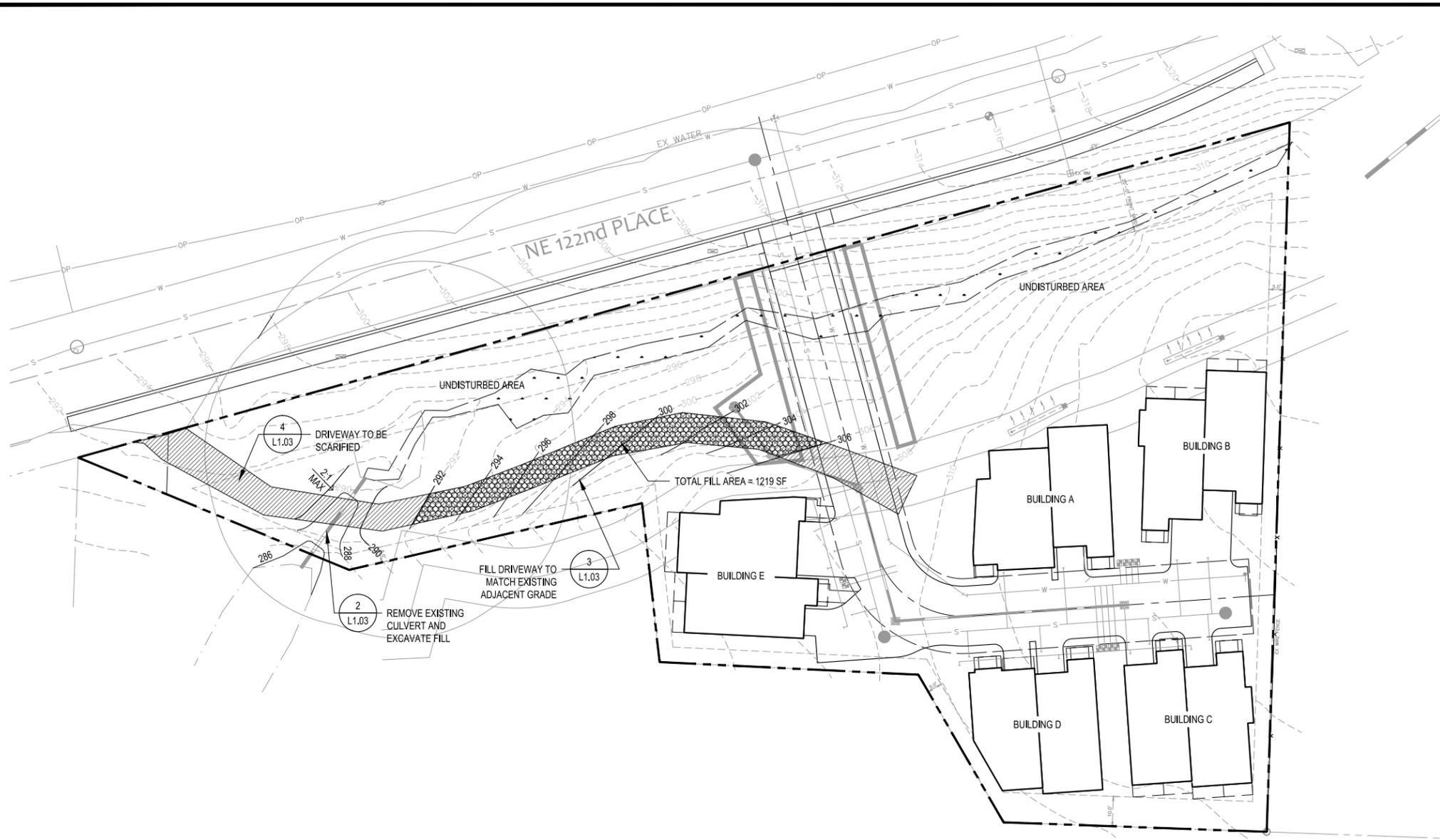
DATE: Sep 02, 2015
 DRAFTED: SS DESIGN: DE
 DIGITAL SIGNATURE



CIVIL ENGINEERING SOLUTIONS
 2244 NW MARKET STREET, SUITE B SEATTLE, WA 98107
 PHONE: 206.930.0342 DUFFY@CESOLUTIONS.US

KIRKLAND COTTAGES SITE PLAN
 0000 NE 0000 PLAC E 0000 LAND 00 A 00030

DRAWING NO.
C1.0
 APN 0000000000



LEGEND

	AREA TO BE FILLED PER		
		L1.03	L1.03
	DRIVEWAY SURFACE TO BE SCARIFIED & CAPPED WITH 4" SOIL		
		L1.03	L1.03

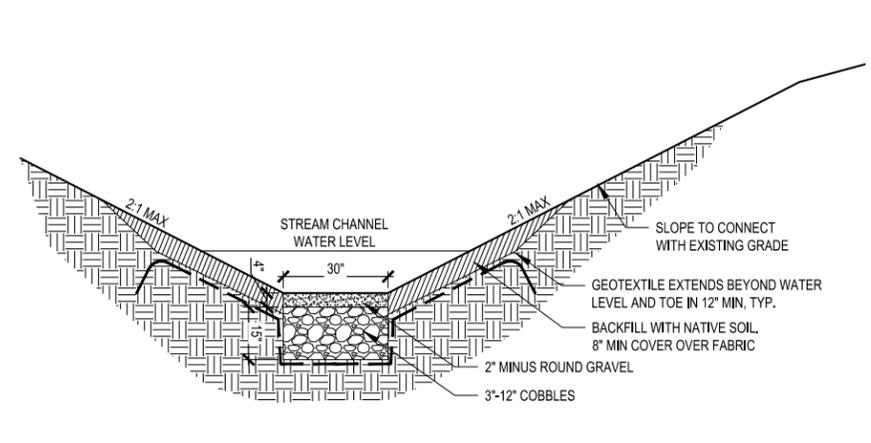
Figure 5
Driveway Decommissioning
Re-Align Environmental

BY	CK. NO.
DATE	REVISION

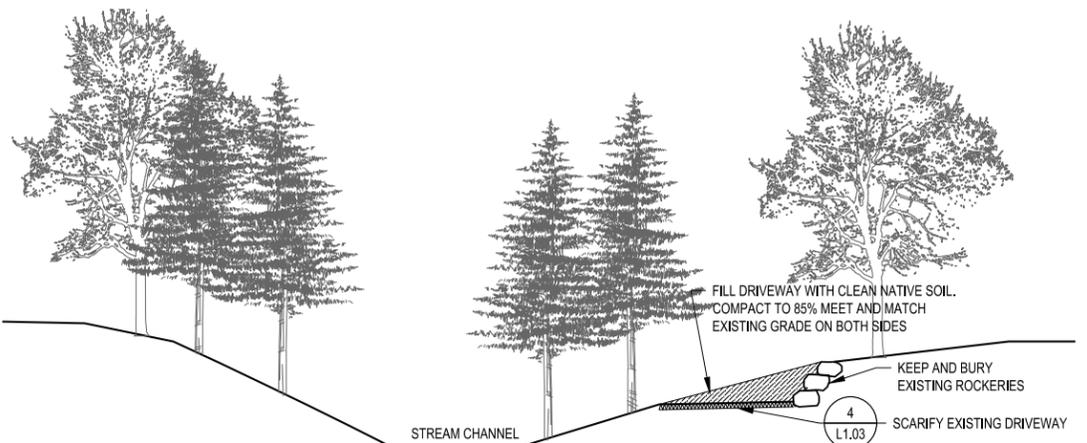


KIRKLAND COTTAGES
NE 122ND PLACE, KIRKLAND, WA 98033

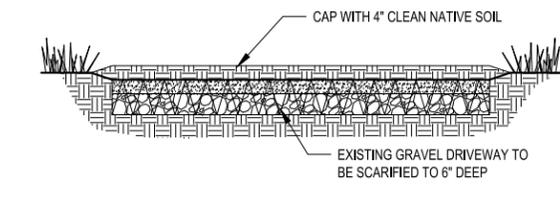
1 DRIVEWAY DECOMMISSIONING PLAN
SCALE: 1"=20'-0"



2 STREAM CHANNEL
SCALE: 1"=12'-0"



3 SCARIFY AND FILL EXISTING DRIVEWAY
SCALE: 1"=18'-0"



4 SCARIFIED EXISTING DRIVEWAY
SCALE: 1"=12'-0"

CLIENT



PROJECT NO.

BUFFER GRADING PLAN

L1.03

SHEET ___ OF ___

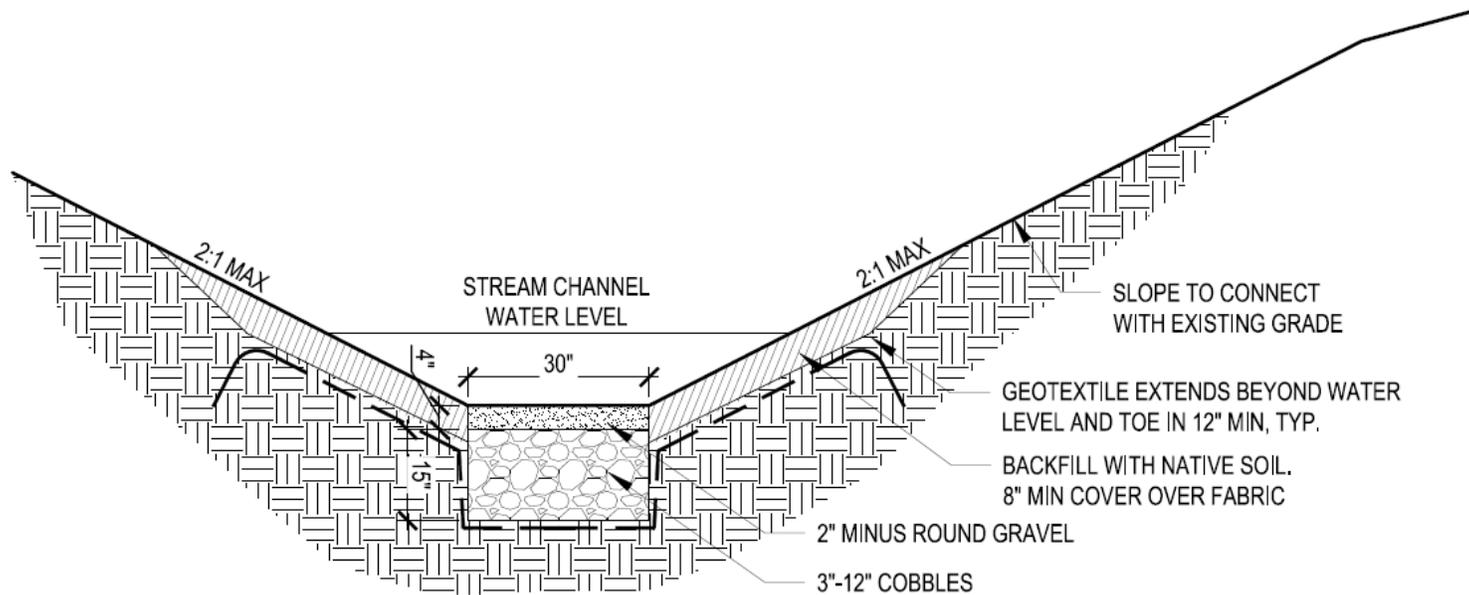


Figure 6

Stream Restoration Substrate Plan

***Re-Align
Environmental***



TREE LEGEND

EXISTING TREES TO REMAIN - WITH DRIPLINES SHOWN. TREE NUMBERS KEYED INTO ARBORIST'S REPORT.

Figure 7
Planting Plan

*Re-Align
Environmental*

1 **BUFFER PLANTING PLAN**
SCALE: 1"=20'-0"

PLANT SCHEDULE					
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	NOTES
DECIDUOUS TREES					
	<i>A...</i>	Douglas Maple	1" GAL	S...	
	<i>A...</i>	Big Leaf Maple	3" 1/2 GAL	S...	
	<i>A...</i>	Red Alder	3" 1/2 GAL	S...	
	<i>P...</i>	Indian Plum	1" GAL	S...	
	<i>P...</i>	Black Cottonwood	1" 1/2 GAL	S...	
EVERGREEN TREES					
	<i>P...</i>	Douglas Fir	3" 1/2 GAL	S...	
	<i>T...</i>	Western Redcedar	3" 1/2 GAL	S...	

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	NOTES
SHRUBS & GROUNDCOVERS					
	<i>S...</i>	Red Elderberry	1" GAL	5' o.c. triangular spacing	
	<i>R...</i>	Salmonberry	1" GAL	5' o.c. triangular spacing	
	<i>A...</i>	Lady Fern	1" T	4' o.c. triangular spacing. Within 10' of stream	
	<i>P...</i>	Sword Fern	1" T	4' o.c. triangular spacing	
	<i>R...</i>	Red Flowering Currant	1" GAL	5' o.c. triangular spacing	
	<i>G...</i>	Salal	1" GAL	4' o.c. triangular spacing	
	<i>M...</i>	Oregon Grape	1" GAL	4' o.c. triangular spacing	

BY	CK-NO.				
DATE	8/19/15	REVISION			
					
KIRKLAND COTTAGES NE 122nd Place, Kirkland, WA 98033					
					
STREAM BUFFER RESTORATION PLAN					
L2.01					
SHEET ____ OF ____					

PROJECT SITE DATA

OWNER: CHANDLER HOMES
 SITE ADDRESS: 1111 NE 1111th PL A E KIRKLAND, WA 98034
 TAX ACCT. NO.: 607650-0421
 TOTAL GROSS AREA: 42,028 S.F. OR (0.96 ACRES)

PROJECT CONTACT LIST

OWNER: CHANDLER HOMES
 ENGINEER: CIVIL ENGINEERING SOLUTIONS 2244 NW MARKET STREET, SUITE B SEATTLE, WA 98107 CONTACT: DUFFY ELLIS, PE PHONE: 206.930.0342 DUFFY@CESOLUTIONS.US
 SURVEYOR: SITE SURVEYING, INC. 21923 NE 11TH ST SAMMAMISH, WA 98074 PHONE: 425.298.4412

UTILITY CONTACT LIST

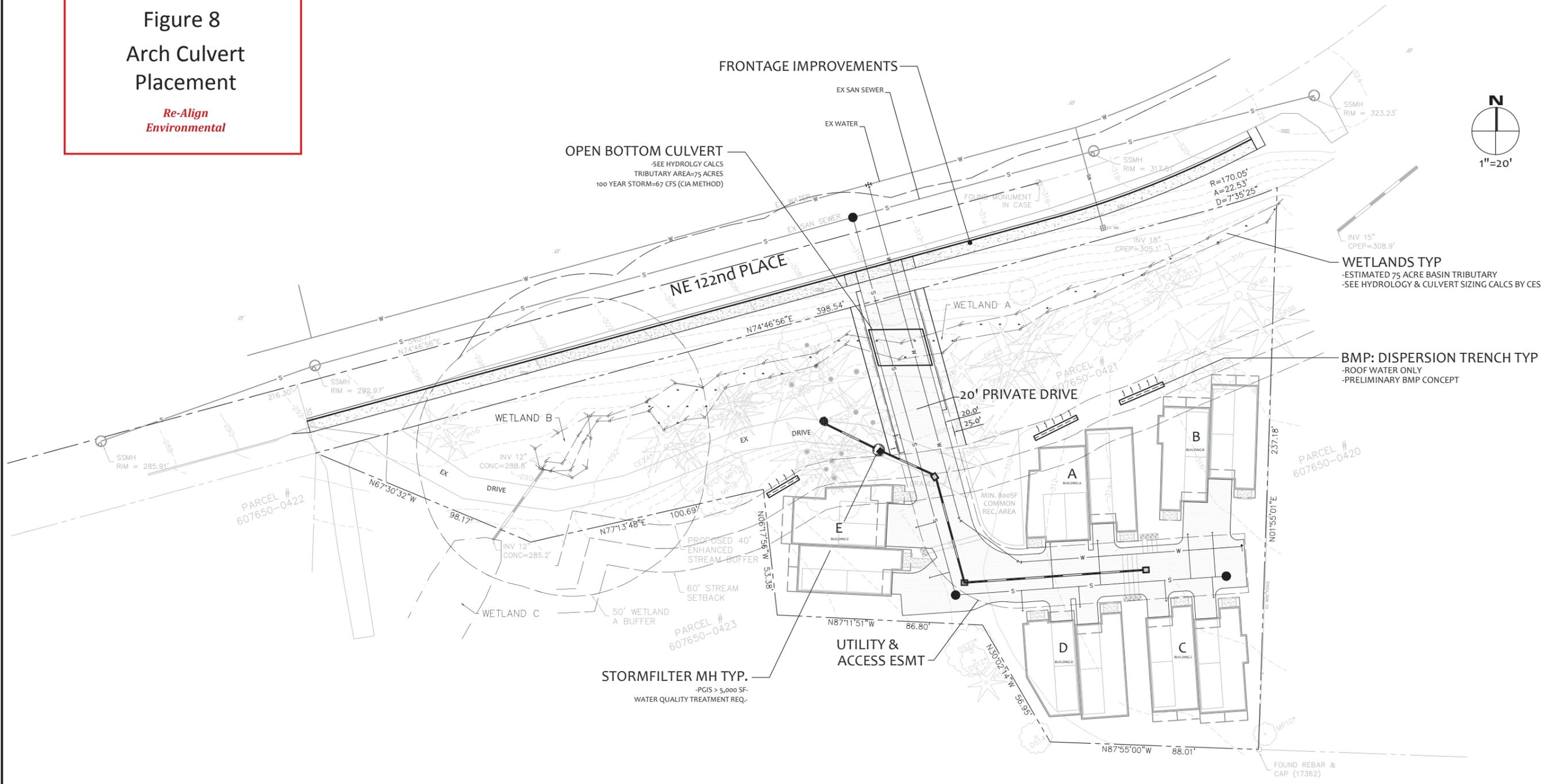
SANITARY SEWER: CITY OF KIRKLAND
 WATER: CITY OF KIRKLAND
 ELECTRIC: PUGET SOUND ENERGY PHONE: 1.800.321.4123
 GAS: PUGET SOUND ENERGY PHONE: 1.800.321.4123
 TELEPHONE: VERIZON CONTACT: MIKE FESKENS PHONE: 425.710.4111



KIRKLAND COTTAGES

PRELIMINARY ENGINEERING

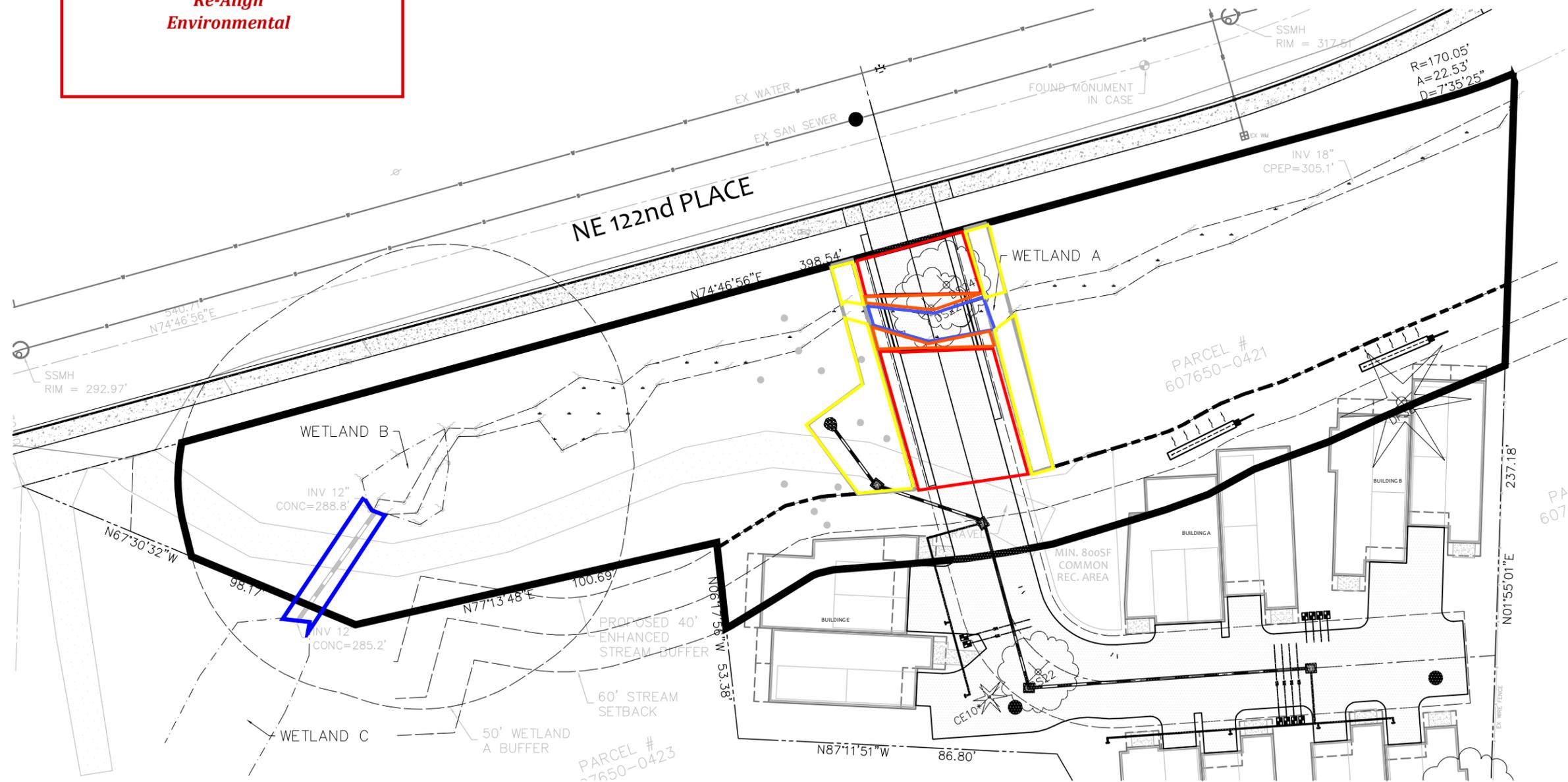
Figure 8
Arch Culvert Placement
Re-Align Environmental



NO	DATE	BY	REVISIONS	APPLICANT CHANDLER HOMES		DATE: Sep 02, 2015 DRAFTED: SS DESIGN: DE DIGITAL SIGNATURE		CIVIL ENGINEERING SOLUTIONS 2244 NW MARKET STREET, SUITE B SEATTLE, WA 98107 PHONE: 206.930.0342 DUFFY@CESOLUTIONS.US	PRELIMINARY ENGINEERING PLAN KIRKLAND COTTAGES 1111 NE 1111th PL A E KIRKLAND WA 98034	DRAWING NO. C3.0 APN
----	------	----	-----------	-----------------------------	--	-------------------------------------------------------------------	--	------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	-----------------------------------

Figure 9
Stream Buffer
Encroachments

Re-Align
Environmental



- Buffer Displaced by Fill Causeway 1,635 sf
- Buffer preserved inside arch culvert 284 sf
- Stream preserved inside arch culvert 234 sf
- Temporary stream buffer disturbance 1,109 sf
- Stream Restoration 268 sf

Appendix A



Photo 1 – Upper reaches of Champagne Creek in the project area looking east and upstream. Note the presence of bricks in the channel.



Photo 2 – Upper reaches of Champagne Creek in the project area looking west and downstream. Note the presence of an automobile rim and a coffee pot in the channel.



Photo 3 – Upper reaches of Champagne Creek in the project area looking west and downstream. Note the dominance of the invasive English ivy in the herbaceous layer.



Photo 4 – Upper reaches of Champagne Creek in the project area looking east and upstream. Note the dominance of the invasive English ivy in the herbaceous layer and lack of vegetative cover or shade on the northern bank (left in this view).



Photo 5 – Looking west along the existing driveway from the parking area at the homesite. Note the invasive English Laurel in the left of the photo. This view is inside the stream buffer and the stream is out of view to the right.



Photo 6 – Looking west along the existing driveway, approximately 75 feet west of photo 5. Note the invasive English Laurel and English ivy. Note that the driveway is cut into the slope. This view is inside the stream buffer and the stream is out of view to the right.



Photo 7 – Looking north from the culverted driveway crossing into the wetland area. Note the prevalence of invasive Himalayan blackberry, and the presence of invasive reed canarygrass in the lower right of the photo.



Photo 8 – Looking south at the inlet of the driveway crossing culvert.



Photo 9 – Looking north at the outlet of the driveway crossing culvert.



Photo 10 – Looking south at the stream below the culvert, off of the subject property.



Photo 11 – Looking north at the shed and carport near the buffer edge. The large trees in this view are just outside of the buffer.



Photo 12 – Looking east at the equipment being stored adjacent to the shed and carport. The equipment is inside the stream buffer. Note the power pole in the center of the photo. This pole is inside the stream buffer.