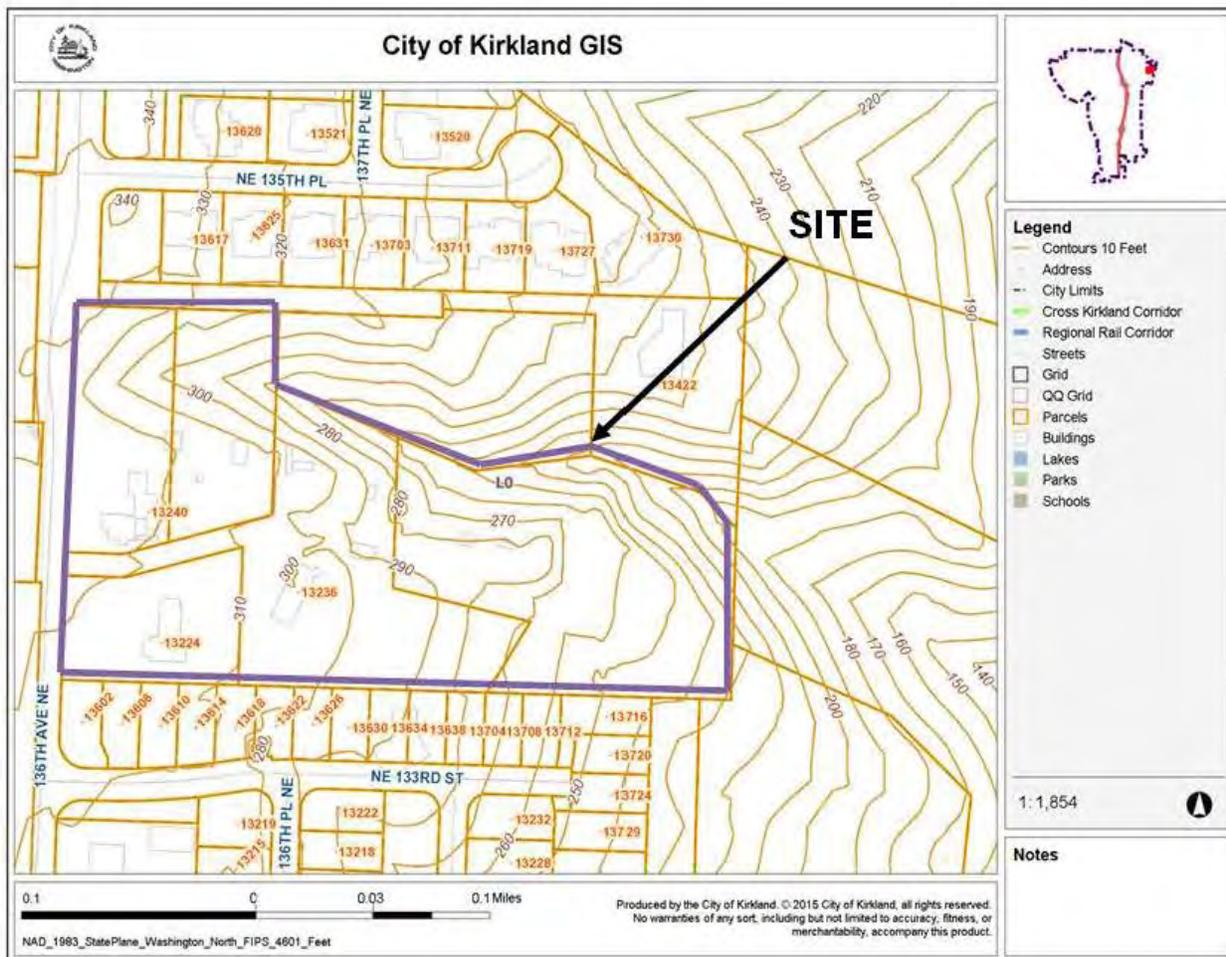
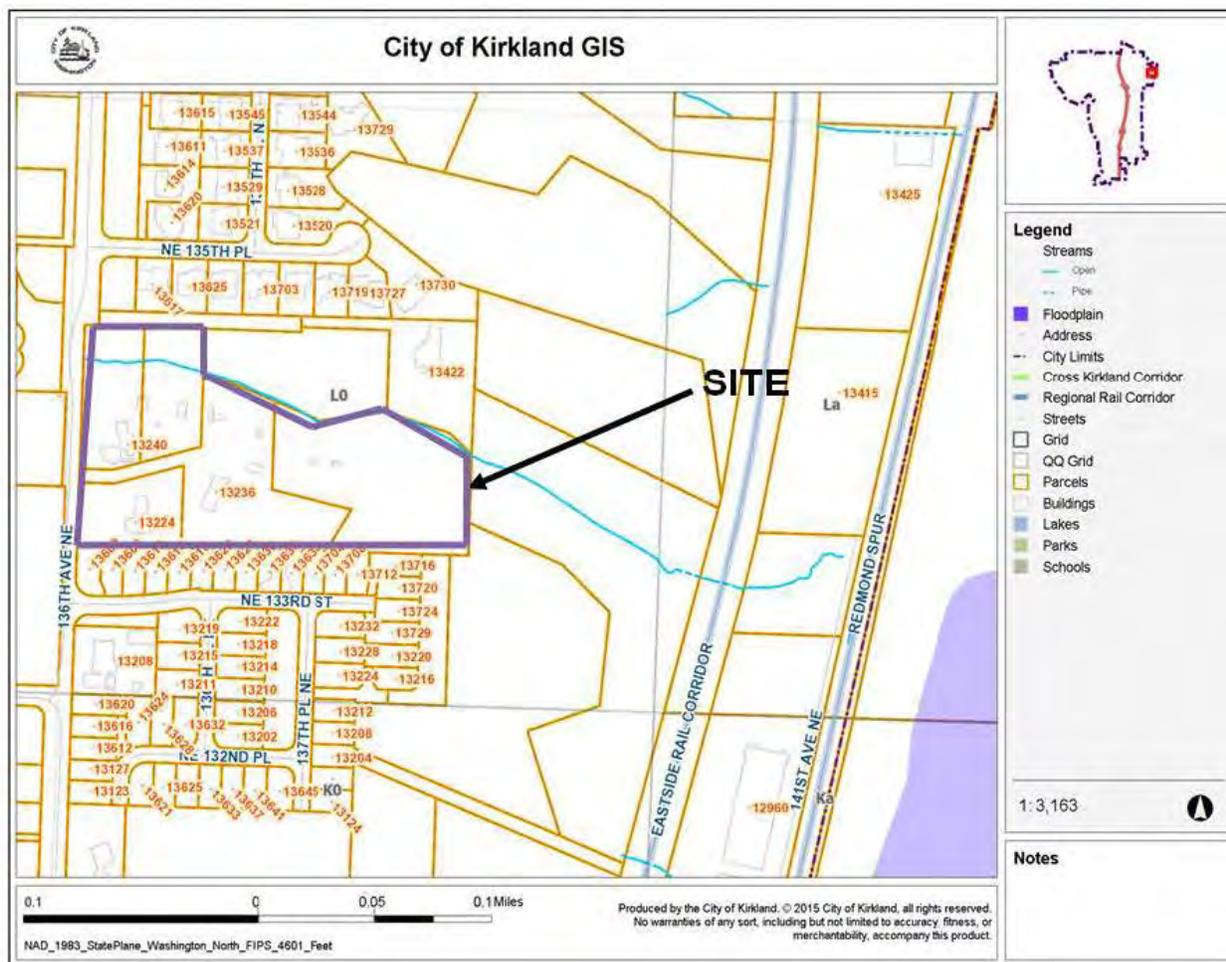


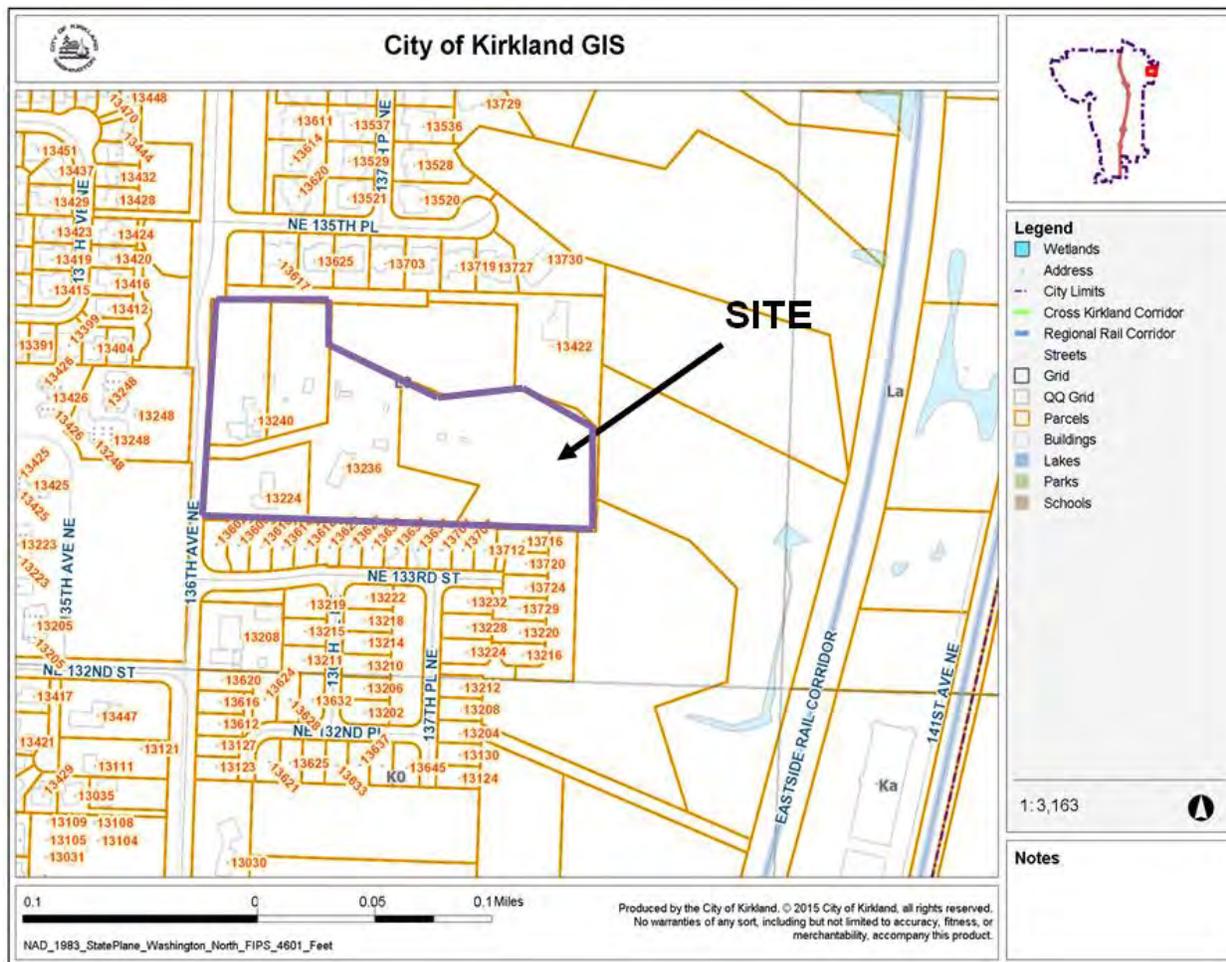
**FIGURE 5
KING COUNTY IMAP TOPOGRAPHY**



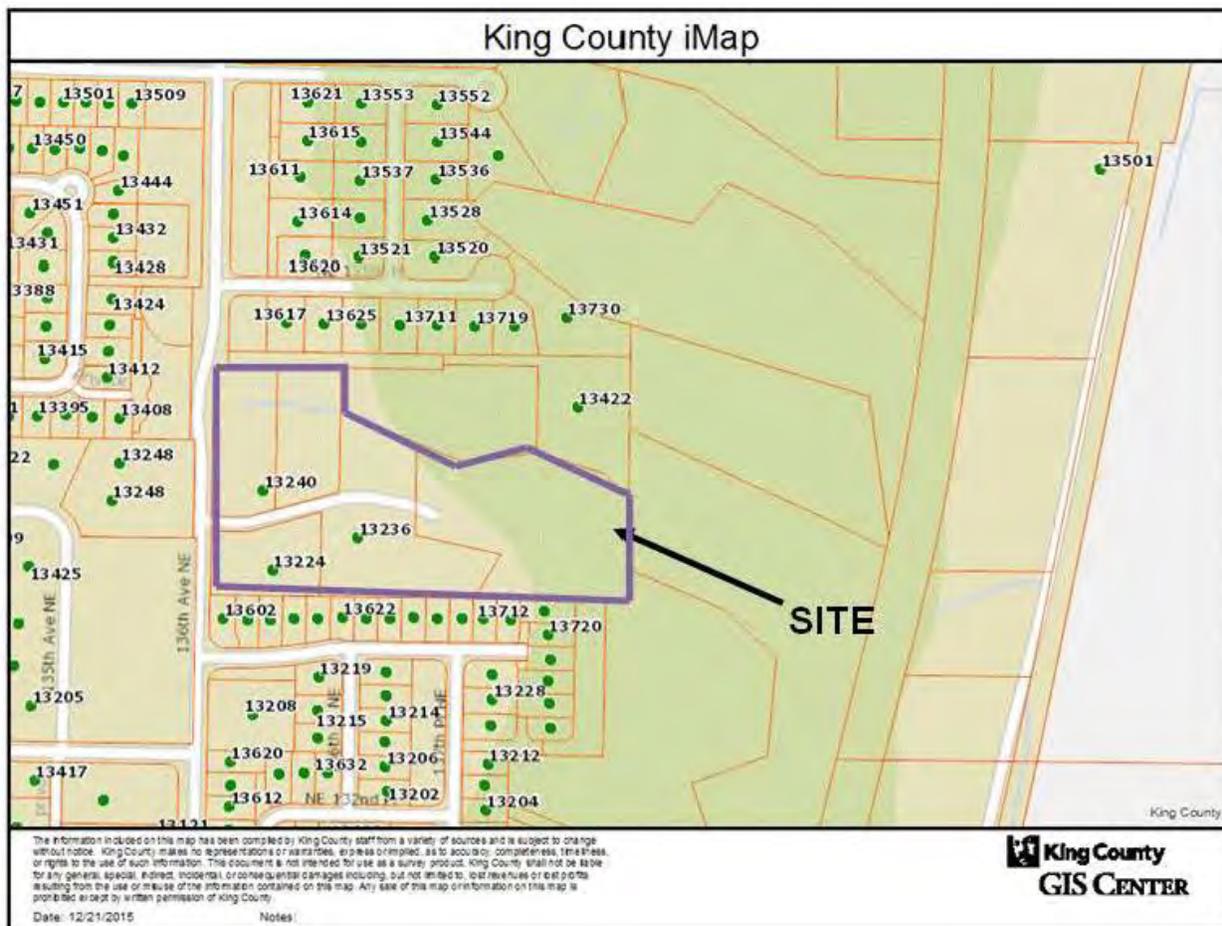
**FIGURE 6
STREAMS & 100-YEAR FLOODPLAINS**



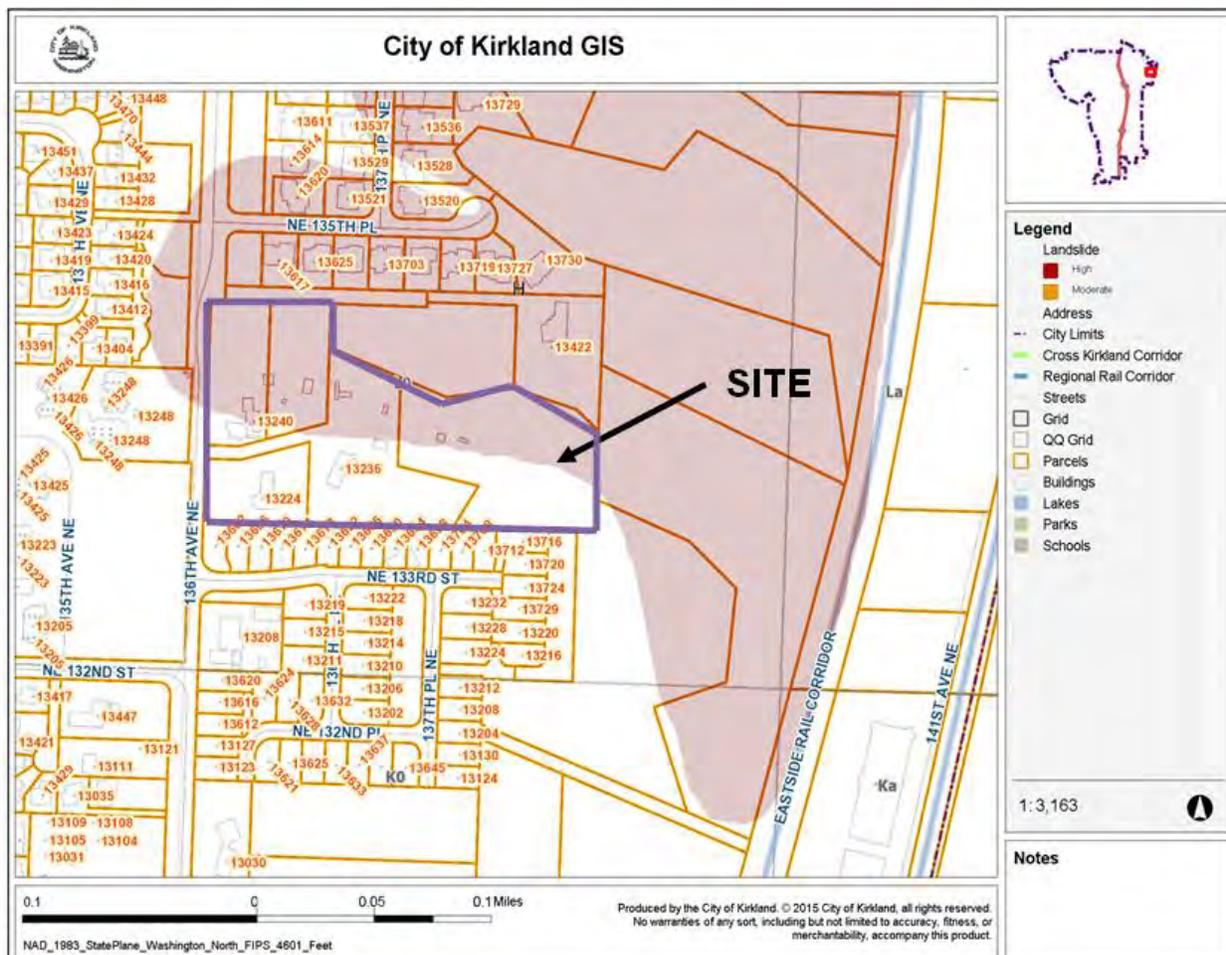
**FIGURE 7
WETLANDS**



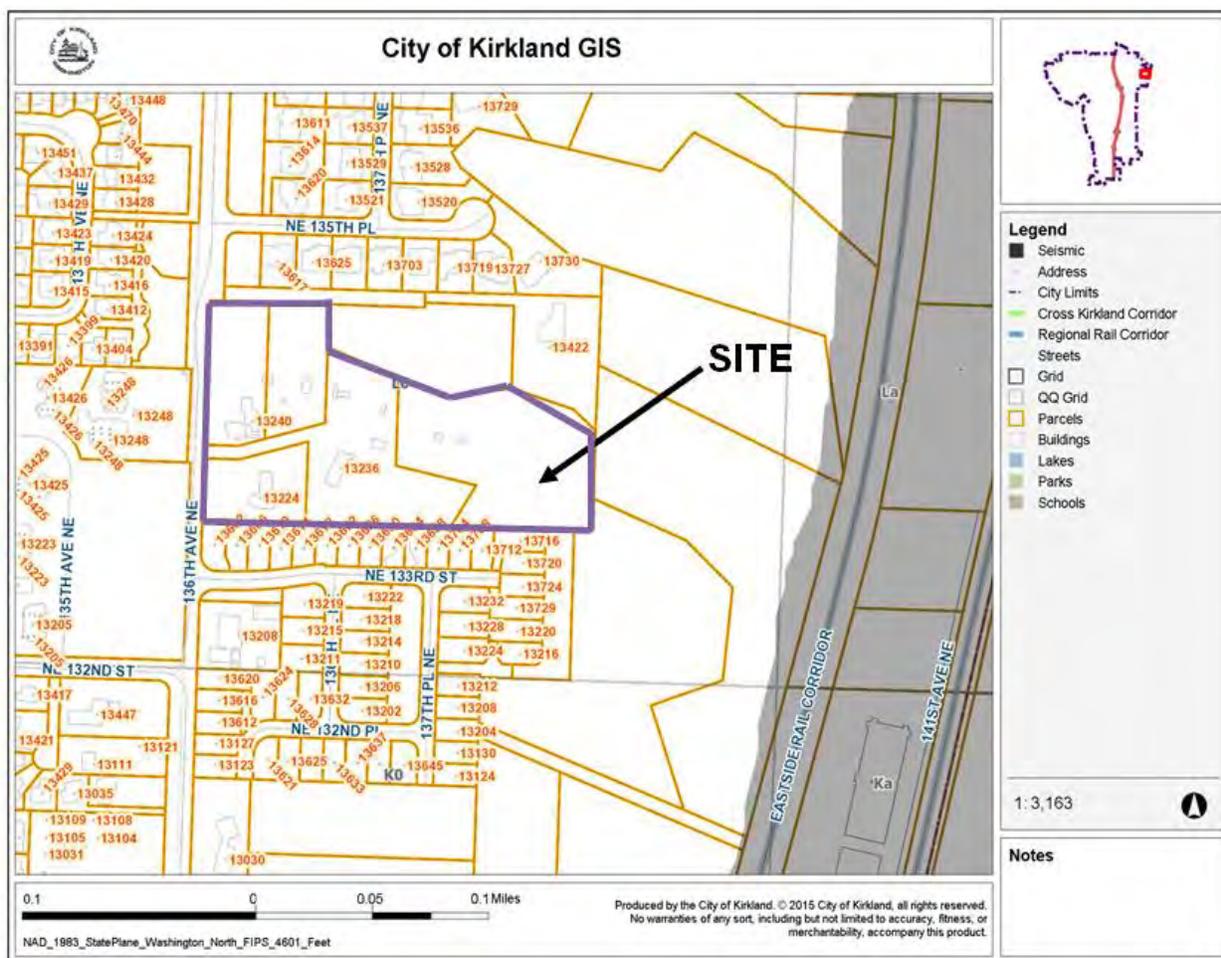
**FIGURE 8
EROSION HAZARD AREAS**



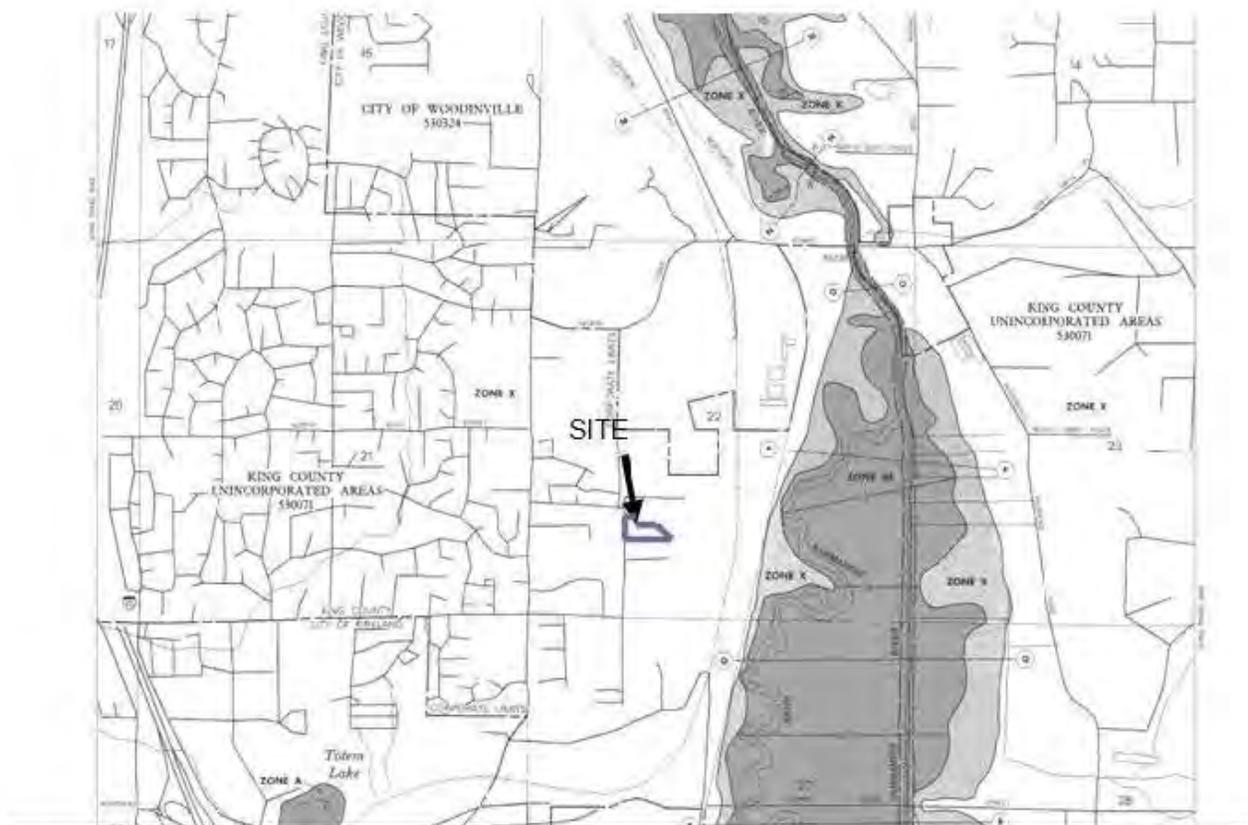
**FIGURE 9
LANDSLIDE HAZARD AREAS**



**FIGURE 10
SEISMIC HAZARD AREAS**



**FIGURE 11
FEMA MAP**



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

KING COUNTY,
WASHINGTON AND
INCORPORATED AREAS

PANEL 685 OF 1725

MAF NUMBER
53023C0685 F

MAP REVISED:
MAY 16, 1995

Federal Emergency Management Agency

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevation determined.
- ZONE AE** Base Flood Elevation determined.
- ZONE AH** Flood depths of 1 to 3 feet (except areas in ponding) base flood elevation determined.
- ZONE AO** Flood depths of 1 to 3 feet (except areas in ponding) base flood elevation determined.
- ZONE AV** To be protected from 100-year flood by Federal flood protection system under construction or in final flood elevation determined.
- ZONE V** Coastal flood with return period not stated; base flood elevation determined.
- ZONE VE** Coastal flood with return period not stated; base flood elevation determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X1** Area of 100-year flood area of 100-year flood with average depth of less than 1 foot or with average area less than 1 square mile, and area protected by levee from 100-year flood.
- OTHER AREAS** Area determined to be outside 100-year floodplain.
- ZONE D** Area in which flood hazard is undetermined.

UNDEVELOPED COASTAL BARRIERS

- Identified (IM)
- Identified (I)
- Circularly Protected Area

Coastal Barrier Areas are normally located within or adjacent to Special Flood Hazard Areas.

Boundary

- Floodway Boundary
- Zone B Boundary
- Boundary Dividing Special Flood Hazard Zones and Boundary Dividing Areas of Different Coastal Base Flood Elevation Within Special Flood Hazard Zones.

Base Flood Elevation Line
Elevation in feet. See Map Index for Elevation Data.

Cross Section Line
Base Flood Elevation in feet where uniform within Zone. See Map Index for Elevation Data.

Water Mile
Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

513
(EL 967)
RM7
M2
97°07'30" W, 32°22'30" N

TASK 3: FIELD INSPECTION

UPSTREAM TRIBUTARY AREA

In evaluating the upstream area, we reviewed both the King County iMap and City of Kirkland GIS Mapping Portal as well as performed a field reconnaissance on December 22, 2015 under rainy conditions. Topography indicates no upstream tributary area from the south or east. Existing development of the frontage to the west conveys runoff away from the Site. A 12-inch diameter concrete culvert conveys runoff from the existing upstream development under 136th Ave NE and into the on-site stream. Negligible upstream area from an existing driveway enters the Site from the north and sheet flows south into the stream. Therefore, upstream runoff for the Site is considered negligible.

GENERAL ONSITE AND OFFSITE DRAINAGE DESCRIPTIONS

The Site contains two Natural Discharge Areas (NDA) in one Threshold Discharge Area (TDA). NDA 1 discharges from the classified stream at point $\%A+$ over the eastern property line. NDA 2 travels as sheet flow, crossing over the southeastern property corner.

The Site topography generally slopes from west to east at slopes ranging from 5% to 65%. The vegetation consists of trees and moderate underbrush with steep slopes on the northern side surrounding the stream. On the southern half of the Site there are several existing houses and outbuildings with associated paved driveways. Site runoff travels easterly as sheet flow either into the on-site stream or over the eastern property line.

TASK 4: DRAINAGE SYSTEM DESCRIPTION AND PROBLEM DESCRIPTIONS

DRAINAGE SYSTEM DESCRIPTION

The downstream analysis is further illustrated and detailed in the Downstream Map and Downstream Table located in Figures 13 and 14. The downstream area is located within the Sammamish River Drainage Basin. The downstream area was evaluated by reviewing available resources, and by conducting a field reconnaissance on December 22nd, 2015 under overcast conditions.

DOWNSTREAM PATH NDA 1

Point 1+ is the natural discharge point of NDA #1. Runoff leaves Site as stream channel flow to the east. (0+)

From Point 1+ to Point 2+, runoff heads east as stream channel flow through moderate vegetation. NDA 2 converges with NDA 1 along this path. (0+ ±524+)

Point 2+, flow enters a Type 2 catch basin with birdcage inlet. (±524+)

From Point 2+ to Point 3+, runoff travels east as pipe flow through a 24-inch CPP. (±524+ ±586+)

Point 3+, runoff exits 24-inch diameter CPP headed east. (±586+)

From Point 3+ to Point 4+, runoff travels east as channel flow through a ~1-foot wide moderately vegetated ditch. (±586+ ±617+)

Point 4+, runoff enters a 36-inch diameter CMP headed east under the railroad tracks. (±617+)

From Point 4+ to Point 5+, runoff continues as easterly pipe flow via a 36-inch CMP, crossing under the BNSF railroad tracks. (±617+ ±656+)

Point 5+, runoff exits 36-inch diameter CMP headed east into a vegetated ditch. (±656+)

From Point 5+ to Point 6+, runoff travels easterly as channel flow via a ~1-foot wide vegetated channel. (±656+ ±943+)

Point 6+, runoff enters a 54-inch Type 2 catch basin with birdcage inlet on parcel 2226059042 just west of 141st Ave NE. (±943+)

From Point 6+ to Point 7+, runoff continues as easterly pipe flow via a 36-inch ductile iron (DI) pipe, crossing under 141st Ave NE. (±943+ ±983+)

Point 7+, runoff outfalls into ditch on the west side of 141st Ave NE. (±983+)

From Point 7+ to Point 8+, runoff moves north through a ~2-foot wide grass lined ditch. (±983+ ±1392+)

Point 8+, runoff enters a 24-inch diameter concrete pipe headed east. (±1392+)

From Point 8+ to Point 9+, runoff travels east under railroad tracks through a 24-inch diameter concrete pipe. (±1392+ ±1441+)

Point 9+, runoff exits pipe into a grass lined ditch on the east side of the railroad tracks over a quarter mile downstream of the Site. Runoff continues north in the ditch, which

outfalls into another ditch headed east towards the Sammamish River, where it eventually outfalls. (±1441q)

DOWNSTREAM PATH NDA 2

Point %A2+ is the natural discharge point of NDA #2. Runoff exits Site as sheet flow across the southeastern property corner. (0q)

From Point %A2+ to Point %B1+, runoff heads easterly as sheet flow through a forested area (undeveloped tract of adjacent development) with steep slopes. (0q ±461q)

Point %B1+, runoff converges with NDA 1 and continues along the same downstream path. (±461q)

TASK 5: MITIGATION OF EXISTING OR POTENTIAL PROBLEMS

According to the City of Kirkland Addendum to the 2009 King County Surface Water Design Manual, this section is to be excluded. Water quality problems in the City of Kirkland are addressed through educational programs and source control.

**FIGURE 13
OFFSITE ANALYSIS DOWNSTREAM MAP**

**FIGURE 14
OFFSITE ANALYSIS DOWNSTREAM TABLE**

NDA #1

Symbol	Drainage Component Type, Name, and Size	Drainage Component Description	Slope	Distance From site Discharge	Existing Problems	Potential Problems	Observations of field inspector resource reviewer, or resident
See map	Type: sheet flow, swale, Stream, channel, pipe, Pond; Size: diameter Surface area	drainage basin, vegetation, cover, depth, type of sensitive area, volume	%	1/4 mi=1,320 ft	Constrictions, under capacity, ponding, overtopping, flooding, habitat or organism destruction, scouring, bank sloughing, sedimentation, incision, other erosion		tributary area, likelihood of problem, overflow pathways, potential impacts.
A1-B1	Stream Channel Flow	Moderate vegetation, defined channel with steep slopes on either side.		±524q	None Observed	None Anticipated	Light Flow Observed
B1-C1	Easterly Pipe Flow	24+Ø CPP out of Type 2 CB		±586q	None Observed	None Anticipated	Light Flow Observed
C1-D1	Easterly Channel Flow	Moderate vegetation, ~1qwide ditch		±617q	None Observed	None Anticipated	Light Flow Observed
D1-E1	Easterly Pipe Flow	36+Ø CMP under railroad		±656q	None Observed	None Anticipated	Light Flow Observed
E1-F1	Easterly Channel Flow	Moderate vegetation, ~1qwide ditch		±943q	None Observed	None Anticipated	Light Flow Observed
F1-G1	Easterly Pipe Flow	36+Ø Ductile Iron (DI) Pipe out of 54+ Type 2 CB under 141 st Ave NE		±983q	None Observed	None Anticipated	Light Flow Observed
G1-H1	Northerly Channel Flow	~2qwide grass lined channel		±1392q	None Observed	None Anticipated	Light Flow Observed
H1-I1	Easterly Pipe Flow	24+Ø Concrete Pipe under railroad tracks		±1441q	None Observed	None Anticipated	Light Flow Observed

NDA #2

Symbol	Drainage Component Type, Name, and Size	Drainage Component Description	Slope	Distance From site Discharge	Existing Problems	Potential Problems	Observations of field inspector resource reviewer, or resident
See map	Type: sheet flow, swale, Stream, channel, pipe, Pond; Size: diameter Surface area	drainage basin, vegetation, cover, depth, type of sensitive area, volume	%	1/4 mi=1,320 ft	Constrictions, under capacity, ponding, overtopping, flooding, habitat or organism destruction, scouring, bank sloughing, sedimentation, incision, other erosion		tributary area, likelihood of problem, overflow pathways, potential impacts.
A2-B1	Easterly Sheet Flow	Runoff leaves site and travels as sheet flow through forested area, converges with NDA 1 at Type 2 CB with birdcage inlet (Point 1B1)		±461q	None Observed	None Anticipated	No flow observed

SECTION IV

FLOW CONTROL AND WATER QUALITY FACILITY ANALYSIS AND DESIGN FOR EXISTING SITE HYDROLOGY

KCRTS was used to model the peak runoff from the Site. Per the Geotechnical Engineering Study the site was modeled as %till+soils. The entire Site was modeled as %till Forest+for existing conditions. Results of the KCRTS analysis are included in this section.

Modeling Input

PREDEVELOPED	
Land Cover	Entire
	Site
Till Forest (ac)	5.107
Till Grass (ac)	0.000
Impervious (ac)	0.000
Scale Factor:	1.00
Time Step:	Hourly
Data Type:	Reduced
Project	
Location:	Sea-Tac
Total Area:	5.107

Table 1 Pre-Developed KCRTS Modeling Input

Modeling Results

Flow Frequency Analysis
 Time Series File:predev.tsf
 Project Location:Sea-Tac

---Annual Peak Flow Rates---				-----Flow Frequency Analysis-----			
Flow Rate (CFS)	Rank	Time of Peak		Peaks	Rank	Return Period	Prob
0.322	2	2/09/01	18:00	0.412	1	100.00	0.990
0.087	7	1/06/02	3:00	0.322	2	25.00	0.960
0.239	4	2/28/03	3:00	0.247	3	10.00	0.900
0.009	8	3/24/04	20:00	0.239	4	5.00	0.800
0.142	6	1/05/05	8:00	0.209	5	3.00	0.667
0.247	3	1/18/06	21:00	0.142	6	2.00	0.500
0.209	5	11/24/06	4:00	0.087	7	1.30	0.231
0.412	1	1/09/08	9:00	0.009	8	1.10	0.091
Computed Peaks				0.382		50.00	0.980

**FIGURE 15
PREDEVELOPED AREA MAP**

DEVELOPED SITE HYDROLOGY

Soil Type

The soil types are unchanged from predeveloped conditions.

Land covers

KCRTS was used to model the developed peak runoff from the Site. The portions of the Site within the developable area tributary to the proposed detention facility were modeled as Till Grass+, and Impervious as appropriate. Results of the KCRTS analysis are included in this section.

Modeling Input . Developed

DEVELOPED	
Land Cover	Entire Site
Till Forest (ac)	0.000
Till Grass (ac)	1.129
Impervious (ac)	3.284
Scale Factor:	1.00
Time Step:	Hourly
Data Type:	Reduced
Project Location:	Sea-Tac
Total Area:	4.413

Table 2 Developed KCRTS Modeling Input

Modeling Results - Developed

Flow Frequency Analysis
 Time Series File:dev.tsf
 Project Location:Sea-Tac

---Annual Peak Flow Rates---				-----Flow Frequency Analysis-----			
Flow Rate (CFS)	Rank	Time of Peak		Peaks (CFS)	Rank	Return Period	Prob
0.897	6	2/09/01	2:00	1.79	1	100.00	0.990
0.753	8	1/05/02	16:00	1.22	2	25.00	0.960
1.08	3	2/27/03	7:00	1.08	3	10.00	0.900
0.839	7	8/26/04	2:00	1.01	4	5.00	0.800
1.01	4	10/28/04	16:00	0.955	5	3.00	0.667
0.955	5	1/18/06	16:00	0.897	6	2.00	0.500
1.22	2	10/26/06	0:00	0.839	7	1.30	0.231
1.79	1	1/09/08	6:00	0.753	8	1.10	0.091
Computed Peaks				1.60		50.00	0.980

Modeling Input . Bypass

BYPASS	
Land Cover	Entire
	Site
Till Forest (ac)	0.000
Till Grass (ac)	0.606
Impervious (ac)	0.088
Scale Factor:	1.00
Time Step:	Hourly
Data Type:	Reduced
Project	
Location:	Sea-Tac
Total Area:	0.694

Modeling Results . Bypass

Flow Frequency Analysis
 Time Series File:bypass.tsf
 Project Location:Sea-Tac

```

---Annual Peak Flow Rates---
Flow Rate Rank  Time of Peak
(CFS)
0.076      4    2/09/01  2:00
0.046      6    1/05/02 16:00
0.094      2    2/27/03  7:00
0.033      8    8/26/04  2:00
0.044      7   10/28/04 16:00
0.078      3    1/18/06 16:00
0.072      5   11/24/06  3:00
0.170      1    1/09/08  6:00
Computed Peaks
    
```

```

-----Flow Frequency Analysis-----
- - Peaks - - Rank  Return  Prob
(CFS)          Period
0.170          1    100.00  0.990
0.094          2     25.00  0.960
0.078          3     10.00  0.900
0.076          4      5.00  0.800
0.072          5      3.00  0.667
0.046          6      2.00  0.500
0.044          7      1.30  0.231
0.033          8      1.10  0.091
0.144          50.00  0.980
    
```

**FIGURE 16
DEVELOPED AREA MAP**

PERFORMANCE STANDARDS

The Project is located in a Conservation Flow Control Area and will therefore adhere to Level 2 Flow Control Standards, forested conditions. One detention vault will provide flow control as required. The Project is required to match developed discharge durations to predeveloped durations for the range of predeveloped discharge rates from 50% of the two-year peak flow up to the full 50-year peak flow. Also match developed peak discharge rates to predeveloped peak discharge rates for the 2 and the 10 year return periods. Assum(ing) historic conditions as the predeveloped condition.+ (KCSWDM, Sec. 1.2).

FLOW CONTROL SYSTEM

The Project will utilize an detention facility designed to control site runoff. The King County Runoff Time Series (KCRTS) software was used to size the facility. The detention pond design information is included in this section.

Retention/Detention Facility

Type of Facility: Detention Vault
 Facility Length: 66.18 ft
 Facility Width: 66.18 ft
 Facility Area: 4380. sq. ft
 Effective Storage Depth: 15.00 ft
 Stage 0 Elevation: 244.50 ft
 Storage Volume: 65694. cu. ft
 Riser Head: 15.00 ft
 Riser Diameter: 18.00 inches
 Number of orifices: 3

Orifice #	Height (ft)	Diameter (in)	Full Head Discharge (CFS)	Pipe Diameter (in)
1	0.00	0.82	0.071	
2	10.25	1.67	0.165	4.0
3	14.00	1.50	0.061	4.0

Top Notch Weir: None
 Outflow Rating Curve: None

Stage (ft)	Elevation (ft)	Storage (cu. ft)	Discharge (cfs)	Percolation (cfs)
0.00	244.50	0.	0.000	0.000
0.01	244.51	44.	0.001	0.002
0.02	244.52	88.	0.002	0.002
0.03	244.53	131.	0.003	0.003
0.04	244.54	175.	0.004	0.004
0.05	244.55	219.	0.005	0.004
0.06	244.56	263.	0.006	0.004
0.07	244.57	307.	0.007	0.005
0.36	244.86	1577.	0.036	0.011
0.66	245.16	2891.	0.066	0.015
0.95	245.45	4161.	0.096	0.018
1.24	245.74	5431.	0.125	0.020
1.54	246.04	6745.	0.155	0.023
1.83	246.33	8015.	0.184	0.025
2.13	246.63	9329.	0.214	0.027
2.42	246.92	10599.	0.243	0.028
2.72	247.22	11913.	0.273	0.030
3.01	247.51	13183.	0.303	0.032
3.30	247.80	14453.	0.332	0.033
3.60	248.10	15767.	0.362	0.035
3.89	248.39	17037.	0.391	0.036
4.19	248.69	18351.	0.421	0.037
4.48	248.98	19621.	0.450	0.039
4.77	249.27	20891.	0.480	0.040
5.07	249.57	22205.	0.510	0.041

5.36	249.86	23475.	0.539	0.042	0.00
5.66	250.16	24789.	0.569	0.043	0.00
5.95	250.45	26059.	0.598	0.044	0.00
6.24	250.74	27329.	0.627	0.046	0.00
6.54	251.04	28643.	0.658	0.047	0.00
6.83	251.33	29913.	0.687	0.048	0.00
7.13	251.63	31227.	0.717	0.049	0.00
7.42	251.92	32497.	0.746	0.050	0.00
7.72	252.22	33811.	0.776	0.051	0.00
8.01	252.51	35081.	0.805	0.052	0.00
8.30	252.80	36351.	0.835	0.053	0.00
8.60	253.10	37665.	0.865	0.053	0.00
8.89	253.39	38935.	0.894	0.054	0.00
9.19	253.69	40249.	0.924	0.055	0.00
9.48	253.98	41519.	0.953	0.056	0.00
9.77	254.27	42789.	0.982	0.057	0.00
10.07	254.57	44103.	1.012	0.058	0.00
10.25	254.75	44891.	1.031	0.058	0.00
10.27	254.77	44979.	1.033	0.059	0.00
10.28	254.78	45022.	1.034	0.061	0.00
10.30	254.80	45110.	1.036	0.064	0.00
10.32	254.82	45198.	1.038	0.068	0.00
10.34	254.84	45285.	1.040	0.073	0.00
10.35	254.85	45329.	1.041	0.079	0.00
10.37	254.87	45417.	1.043	0.085	0.00
10.39	254.89	45504.	1.045	0.087	0.00
10.68	255.18	46774.	1.074	0.109	0.00
10.98	255.48	48088.	1.104	0.125	0.00
11.27	255.77	49358.	1.133	0.138	0.00
11.57	256.07	50672.	1.163	0.149	0.00
11.86	256.36	51942.	1.192	0.159	0.00
12.15	256.65	53212.	1.222	0.168	0.00
12.45	256.95	54526.	1.252	0.176	0.00
12.74	257.24	55796.	1.281	0.185	0.00
13.04	257.54	57110.	1.311	0.192	0.00
13.33	257.83	58380.	1.340	0.199	0.00
13.62	258.12	59650.	1.369	0.206	0.00
13.92	258.42	60964.	1.400	0.213	0.00
14.00	258.50	61315.	1.408	0.215	0.00
14.02	258.52	61402.	1.410	0.215	0.00
14.03	258.53	61446.	1.411	0.217	0.00
14.05	258.55	61534.	1.413	0.220	0.00
14.06	258.56	61577.	1.414	0.223	0.00
14.08	258.58	61665.	1.416	0.228	0.00
14.09	258.59	61709.	1.417	0.233	0.00
14.11	258.61	61796.	1.419	0.237	0.00
14.13	258.63	61884.	1.421	0.239	0.00
14.42	258.92	63154.	1.450	0.263	0.00
14.71	259.21	64424.	1.479	0.281	0.00
15.00	259.50	65694.	1.508	0.297	0.00
15.10	259.60	66132.	1.518	0.763	0.00
15.20	259.70	66570.	1.528	1.610	0.00
15.30	259.80	67008.	1.538	2.710	0.00
15.40	259.90	67446.	1.548	4.010	0.00
15.50	260.00	67884.	1.558	5.480	0.00
15.60	260.10	68322.	1.568	6.920	0.00
15.70	260.20	68760.	1.579	7.450	0.00

15.80	260.30	69198.	1.589	7.940	0.00
15.90	260.40	69636.	1.599	8.410	0.00
16.00	260.50	70074.	1.609	8.850	0.00
16.10	260.60	70512.	1.619	9.270	0.00
16.20	260.70	70950.	1.629	9.670	0.00
16.30	260.80	71388.	1.639	10.050	0.00
16.40	260.90	71826.	1.649	10.420	0.00
16.50	261.00	72264.	1.659	10.780	0.00
16.60	261.10	72702.	1.669	11.130	0.00
16.70	261.20	73140.	1.679	11.460	0.00
16.80	261.30	73578.	1.689	11.790	0.00
16.90	261.40	74016.	1.699	12.100	0.00

Hyd	Inflow	Outflow	Peak		Storage	
			Stage	Elev	(Cu-Ft)	(Ac-Ft)
1	1.79	0.86	15.11	259.61	66180.	1.519
2	0.90	0.29	14.95	259.45	65483.	1.503
3	1.08	0.20	13.56	258.06	59381.	1.363
4	1.22	0.19	12.75	257.25	55827.	1.282
5	0.95	0.08	10.36	254.86	45358.	1.041
6	0.75	0.06	9.35	253.85	40938.	0.940
7	1.01	0.06	9.27	253.77	40601.	0.932
8	0.84	0.04	6.08	250.58	26618.	0.611

Hyd	R/D Facility	Tributary	Reservoir	POC Outflow	
	Outflow	Inflow	Inflow	Target	Calc
1	0.86	0.17	*****	*****	0.91
2	0.29	0.08	*****	0.32	0.34
3	0.20	0.09	*****	*****	0.25
4	0.19	0.07	*****	*****	0.23
5	0.08	0.08	*****	*****	0.13
6	0.06	0.05	*****	*****	0.09
7	0.06	0.04	*****	*****	0.09
8	0.04	0.03	*****	*****	0.07

Route Time Series through Facility
Inflow Time Series File:dev.tsf
Outflow Time Series File:rdout
POC Time Series File:dsout

Inflow/Outflow Analysis

Peak Inflow Discharge: 1.79 CFS at 6:00 on Jan 9 in Year 8
Peak Outflow Discharge: 0.851 CFS at 10:00 on Jan 9 in Year 8
Peak Reservoir Stage: 15.11 Ft
Peak Reservoir Elev: 259.61 Ft
Peak Reservoir Storage: 66180. Cu-Ft
: 1.519 Ac-Ft

Add Time Series:bypass.tsf

Peak Summed Discharge: 0.908 CFS at 10:00 on Jan 9 in Year 8
Point of Compliance File:dsout.tsf
Flow Frequency Analysis
Time Series File:rdout.tsf
Project Location:Sea-Tac

---Annual Peak Flow Rates--- -----Flow Frequency Analysis-----

Flow Rate (CFS)	Rank	Time of Peak	- - Peaks - - (CFS)	Rank	Return Period	Prob
0.294	2	2/09/01 20:00	0.851	15.11	1	100.00 0.990
0.056	6	1/07/02 4:00	0.294	14.95	2	25.00 0.960
0.205	3	3/06/03 22:00	0.205	13.56	3	10.00 0.900
0.045	8	8/26/04 8:00	0.185	12.75	4	5.00 0.800
0.055	7	1/08/05 6:00	0.081	10.36	5	3.00 0.667
0.081	5	1/19/06 2:00	0.056	9.35	6	2.00 0.500
0.185	4	11/24/06 8:00	0.055	9.27	7	1.30 0.231
0.851	1	1/09/08 10:00	0.045	6.08	8	1.10 0.091
Computed Peaks			0.666	15.08	50.00	0.980

Flow Frequency Analysis

Time Series File:dsout.tsf

Project Location:Sea-Tac

---Annual Peak Flow Rates---			-----Flow Frequency Analysis-----			
Flow Rate (CFS)	Rank	Time of Peak	- - Peaks - - (CFS)	Rank	Return Period	Prob
0.342	2	2/09/01 19:00	0.908	1	100.00	0.990
0.094	6	1/05/02 16:00	0.342	2	25.00	0.960
0.246	3	3/06/03 19:00	0.246	3	10.00	0.900
0.074	8	8/26/04 2:00	0.225	4	5.00	0.800
0.092	7	1/05/05 8:00	0.127	5	3.00	0.667
0.127	5	1/18/06 16:00	0.094	6	2.00	0.500
0.225	4	11/24/06 6:00	0.092	7	1.30	0.231
0.908	1	1/09/08 10:00	0.074	8	1.10	0.091
Computed Peaks			0.720		50.00	0.980

Flow Duration from Time Series File:rdout.tsf

Cutoff CFS	Count	Frequency %	CDF %	Exceedence_Probability %
0.004	26900	43.868	43.868	56.132
0.012	8365	13.642	57.510	42.490
0.021	7909	12.898	70.408	29.592
0.029	7235	11.799	82.206	17.794
0.037	4929	8.038	90.245	9.755
0.045	2699	4.402	94.646	5.354
0.054	2347	3.827	98.474	1.526
0.062	639	1.042	99.516	0.484
0.070	18	0.029	99.545	0.455
0.079	11	0.018	99.563	0.437
0.087	15	0.024	99.587	0.413
0.095	22	0.036	99.623	0.377
0.103	28	0.046	99.669	0.331
0.112	22	0.036	99.705	0.295
0.120	30	0.049	99.754	0.246
0.128	21	0.034	99.788	0.212
0.136	11	0.018	99.806	0.194
0.145	10	0.016	99.822	0.178
0.153	8	0.013	99.835	0.165
0.161	11	0.018	99.853	0.147
0.169	14	0.023	99.876	0.124
0.178	15	0.024	99.901	0.099
0.186	11	0.018	99.918	0.082
0.194	15	0.024	99.943	0.057
0.202	13	0.021	99.964	0.036
0.211	7	0.011	99.976	0.024

0.219	3	0.005	99.980	0.020	0.196E-03
0.227	0	0.000	99.980	0.020	0.196E-03
0.236	0	0.000	99.980	0.020	0.196E-03
0.244	1	0.002	99.982	0.018	0.179E-03
0.252	2	0.003	99.985	0.015	0.147E-03
0.260	1	0.002	99.987	0.013	0.130E-03
0.269	1	0.002	99.989	0.011	0.114E-03
0.277	2	0.003	99.992	0.008	0.815E-04
0.285	1	0.002	99.993	0.007	0.652E-04
0.293	3	0.005	99.998	0.002	0.163E-04

Flow Duration from Time Series File:dsout.tsf

Cutoff CFS	Count	Frequency %	CDF %	Exceedence_Probability %	
0.005	27073	44.150	44.150	55.850	0.558E+00
0.014	9653	15.742	59.892	40.108	0.401E+00
0.024	7831	12.771	72.663	27.337	0.273E+00
0.034	6888	11.233	83.896	16.104	0.161E+00
0.043	4696	7.658	91.554	8.446	0.845E-01
0.053	2474	4.035	95.589	4.411	0.441E-01
0.063	1562	2.547	98.136	1.864	0.186E-01
0.072	654	1.067	99.203	0.797	0.797E-02
0.082	138	0.225	99.428	0.572	0.572E-02
0.091	43	0.070	99.498	0.502	0.502E-02
0.101	32	0.052	99.550	0.450	0.450E-02
0.111	35	0.057	99.607	0.393	0.393E-02
0.120	30	0.049	99.656	0.344	0.344E-02
0.130	30	0.049	99.705	0.295	0.295E-02
0.139	32	0.052	99.757	0.243	0.243E-02
0.149	16	0.026	99.783	0.217	0.217E-02
0.159	15	0.024	99.808	0.192	0.192E-02
0.168	9	0.015	99.822	0.178	0.178E-02
0.178	9	0.015	99.837	0.163	0.163E-02
0.187	11	0.018	99.855	0.145	0.145E-02
0.197	10	0.016	99.871	0.129	0.129E-02
0.207	15	0.024	99.896	0.104	0.104E-02
0.216	9	0.015	99.910	0.090	0.897E-03
0.226	18	0.029	99.940	0.060	0.603E-03
0.235	11	0.018	99.958	0.042	0.424E-03
0.245	8	0.013	99.971	0.029	0.294E-03
0.255	4	0.007	99.977	0.023	0.228E-03
0.264	0	0.000	99.977	0.023	0.228E-03
0.274	2	0.003	99.980	0.020	0.196E-03
0.284	2	0.003	99.984	0.016	0.163E-03
0.293	0	0.000	99.984	0.016	0.163E-03
0.303	2	0.003	99.987	0.013	0.130E-03
0.312	1	0.002	99.989	0.011	0.114E-03
0.322	2	0.003	99.992	0.008	0.815E-04
0.332	1	0.002	99.993	0.007	0.652E-04
0.341	3	0.005	99.998	0.002	0.163E-04

Duration Comparison Analysis

Base File: predev.tsf

New File: dsout.tsf

Cutoff Units: Discharge in CFS

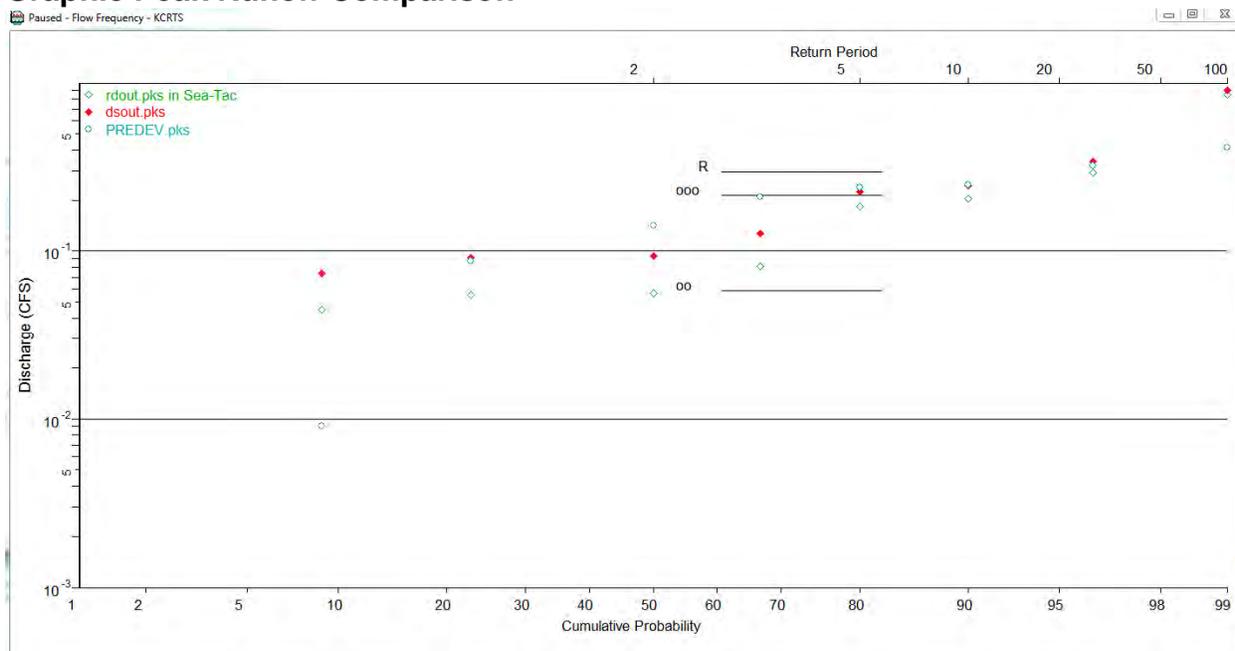
Cutoff	-----Fraction of Time-----		-----Check of Tolerance-----		
	Base	New	%Change	Base	New %Change

0.095	0.60E-02	0.48E-02	-19.2	0.60E-02	0.095	0.080	-16.0
0.112	0.47E-02	0.38E-02	-19.7	0.47E-02	0.112	0.097	-13.9
0.130	0.37E-02	0.30E-02	-19.2	0.37E-02	0.130	0.116	-10.8
0.147	0.29E-02	0.22E-02	-23.2	0.29E-02	0.147	0.131	-11.2
0.165	0.23E-02	0.18E-02	-20.6	0.23E-02	0.165	0.144	-12.8
0.182	0.16E-02	0.16E-02	-3.0	0.16E-02	0.182	0.179	-1.5
0.200	0.12E-02	0.12E-02	1.4	0.12E-02	0.200	0.201	0.8
0.217	0.77E-03	0.86E-03	12.8	0.77E-03	0.217	0.220	1.3
0.235	0.46E-03	0.44E-03	-3.6	0.46E-03	0.235	0.233	-0.7
0.252	0.29E-03	0.23E-03	-22.2	0.29E-03	0.252	0.246	-2.6
0.270	0.18E-03	0.21E-03	18.2	0.18E-03	0.270	0.283	4.9
0.287	0.15E-03	0.16E-03	11.1	0.15E-03	0.287	0.303	5.3
0.305	0.82E-04	0.13E-03	60.0	0.82E-04	0.305	0.326	7.0
0.322	0.16E-04	0.82E-04	400.0	0.16E-04	0.322	0.342	6.1

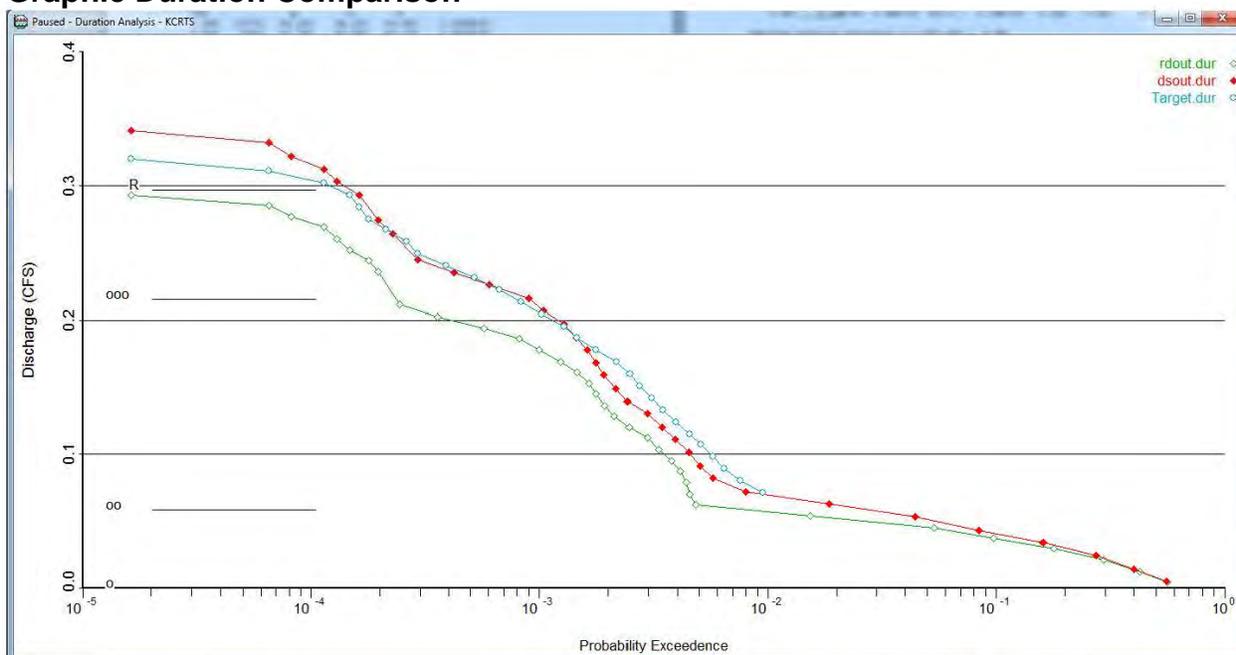
Maximum positive excursion = 0.028 cfs (8.9%)
 occurring at 0.312 cfs on the Base Data:predev.tsf
 and at 0.340 cfs on the New Data:dsout.tsf

Maximum negative excursion = 0.017 cfs (-17.2%)
 occurring at 0.100 cfs on the Base Data:predev.tsf
 and at 0.083 cfs on the New Data:dsout.tsf

Graphic Peak Runoff Comparison



Graphic Duration Comparison



WATER QUALITY TREATMENT SYSTEM

The Project is located in the Basic Water Quality Treatment area. A detention vault with a StormFilter media filtration system will be utilized for the Site. Sizing for for the StormFilter system will be determined at time of final engineering.

FIGURE 17
DETENTION & WATER QUALITY FACILITY DETAILS

(To be completed at time of final engineering)

SECTION V

CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Per Core Requirement #4 of the KCSWDM, the conveyance system must be analyzed and designed for the existing tributary and developed onsite runoff. Pipe systems shall be designed to convey the 100-year design storm. The Rational Method will be used to calculate the Q-Ratio for each pipe node.

A conveyance system consisting primarily of pipes and catch basins will be designed for the Project. Onsite runoff will be collected by the multiple catch basins. Pipes are typically eight-inch to twelve-inch diameter LCPE material.

A backwater analysis will be provided at time of final engineering.

SECTION VI

SPECIAL REPORTS AND STUDIES

The following report and studies have been provided with this submittal.

Critical Area Report: Sewall Wetland Consulting, Inc. . November 24th, 2015

Geotechnical Engineering Study: Earth Solutions NW, LLC . April 12th, 2016

Arborist Report: Greenforest Incorporated Consulting Arborist . April 1st, 2016

Traffic Impact Analysis: TraffEx . April 8th, 2016

SECTION VII

OTHER PERMITS, VARIANCES AND ADJUSTMENTS

The Project is seeking an adjustment for lot BMP requirements through the City of Kirkland's PUD process.

SECTION VIII

CSWPPP ANALYSIS AND DESIGN (PART A)

The Erosion and Sedimentation Control Design will meet the seven minimum King County requirements:

1. Areas to remain undisturbed shall be delineated with a high visibility plastic fence prior to any site clearing or grading.
2. Site disturbed areas shall be covered with mulch and seeded, as appropriate, for temporary or permanent measures.
3. Perimeter protection shall consist of a silt fence down slope of any disturbed areas or stockpiles.
4. A stabilized construction entrance will be located at the point of ingress/egress (i.e. onsite access road).
5. The detention pond will act as a sediment pond for sediment retention. Perimeter silt fences will provide sediment retention within the bypass areas.
6. Surface water from disturbed areas will sheet flow to the sediment pond for treatment.
7. Dust control shall be provided by spraying exposed soils with water until wet. This is required when exposed soils are dry to the point that wind transport is possible which would impact roadways, drainage ways, surface waters, or neighboring residences.

SWPPP PLAN DESIGN (PART B)

Construction activities that could contribute pollutants to surface and storm water include the following, with applicable BMPs listed for each item:

1. Storage and use of chemicals: Utilize source control, and soil erosion and sedimentation control practices, such as using only recommended amounts of chemical materials applied in the proper manner; neutralizing concrete wash water, and disposing of excess concrete material only in areas prepared for concrete placement, or return to batch plant; disposing of wash-up waters from water-based paints in sanitary sewer; disposing of wastes from oil-based paints, solvents, thinners, and mineral spirits only through a licensed waste management firm, or treatment, storage, and disposal (TSD) facility.
2. Material delivery and storage: Locate temporary storage areas away from vehicular traffic, near the construction entrance, and away from storm drains. Material Safety Data Sheets (MSDS) should be supplied for all materials stored, and chemicals kept in their original labeled containers. Maintenance, fueling, and repair of heavy equipment and vehicles shall be conducted using spill prevention and control measures. Contaminated surfaces shall be cleaned immediately following any spill incident. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other potentially hazardous materials.

3. Building demolition: Protect stormwater drainage system from sediment-laden runoff and loose particles. To the extent possible, use dikes, berms, or other methods to protect overland discharge paths from runoff. Street gutter, sidewalks, driveways, and other paved surfaces in the immediate area of demolition must be swept daily to collect and properly dispose of loose debris and garbage. Spray the minimum amount of water to help control windblown fine particles such as concrete, dust, and paint chips. Avoid excessive spraying so that runoff from the site does not occur, yet dust control is achieved. Oils must never be used for dust control.
4. Sawcutting: Slurry and cuttings shall be vacuumed during the activity to prevent migration offsite and must not remain on permanent concrete or asphalt paving overnight. Collected slurry and cuttings shall be disposed of in a manner that does not violate ground water or surface water quality standards.

The complete CSWPPP will be completed and submitted at time of final of engineering.

SECTION IX

BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

1. Bond Quantity Worksheet . will be submitted at final engineering
2. The Stormwater Facility Summary Sheet is included in this section

DESIGN INFORMATION		INDIVIDUAL BASIN		
Water Quality design flow				
Water Quality treated volume				
Drainage basin(s)				
Onsite area (includes frontage)		5.14		
Offsite area		0		
Type of Storage Facility		Vault		
Live Storage Volume (required)		65,694		
Predev.Runoff Rate	2-year	0.142		
	10-year	0.247		
	100-year	0.412		
Developed Runoff Rate (includes bypass)	2-year	0.094		
	10-year	0.246		
	100-year	0.908		
Type of Restrictor		FROP		
Size of orifice/restriction	No. 1	0.82 in. Ø	0.00'	
	No. 2	1.67 in. Ø	10.25'	
	No. 3	1.50 in. Ø	14.00'	

SECTION X

OPERATIONS AND MAINTENANCE MANUAL

Excerpts from the 2009 KCSWDM will be provided at final engineering.

The Broadmoor 2881

ATTACHMENT 9
2881 Approx. Sq. Ft.
4 Bedroom, 2.5 Bath
Den, Bonus Room



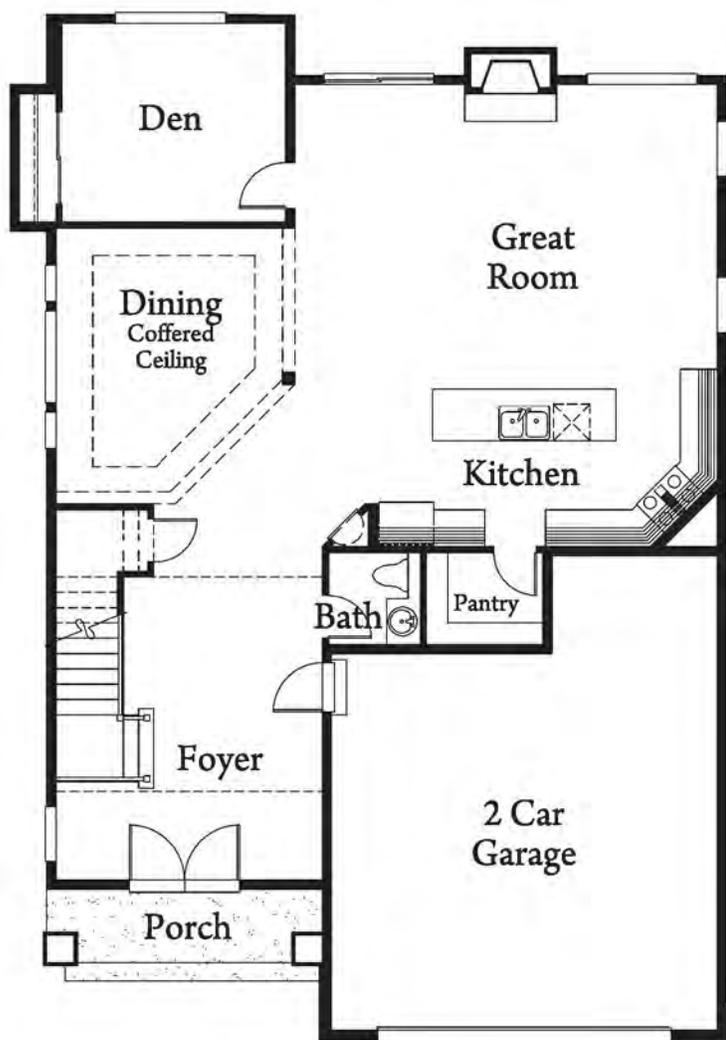
Elegant. Distinctive. Uniquely Northwest.



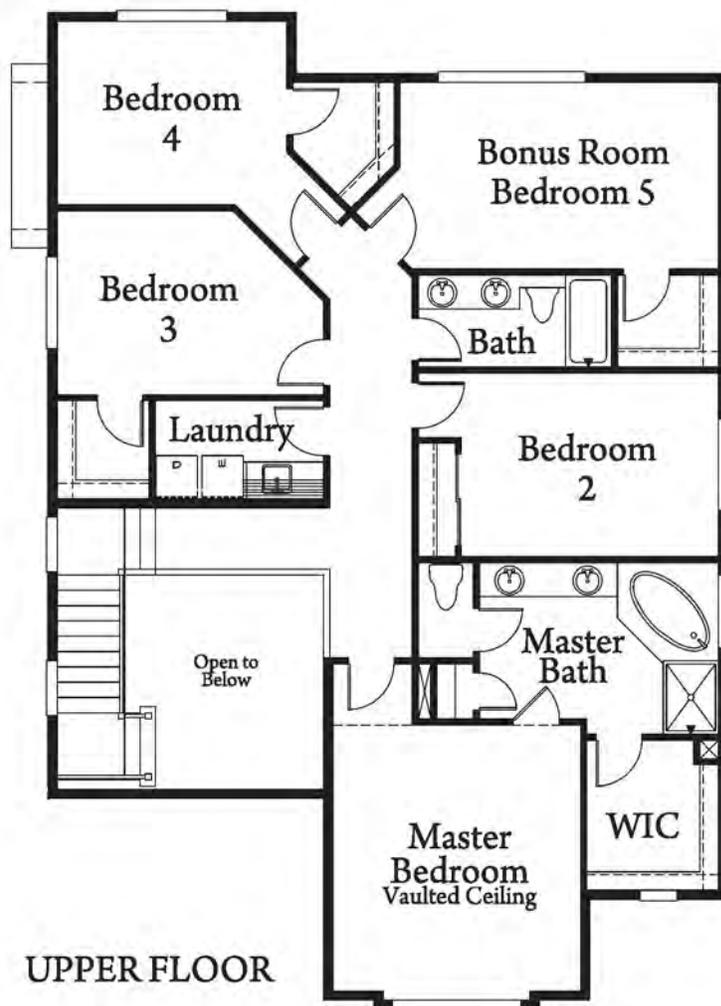
American Classic Homes



The Broadmoor 288I



MAIN FLOOR



UPPER FLOOR

The Astoria 3664

ATTACHMENT 9

3,664 Approx. Sq. Ft.
5 Bedroom, 3.75 Bath
Den, Curved Staircase
Bonus Room
2 Car Garage



American
ClassicHomes



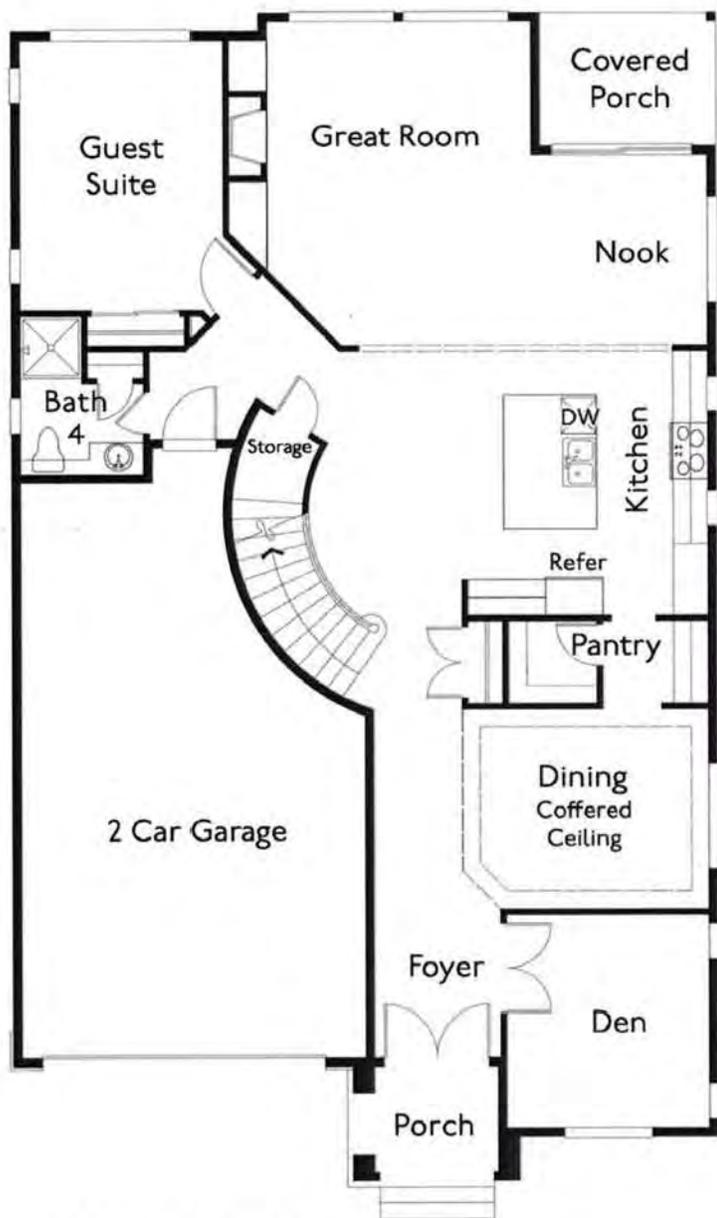
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www.AmericanClassicHomes.com

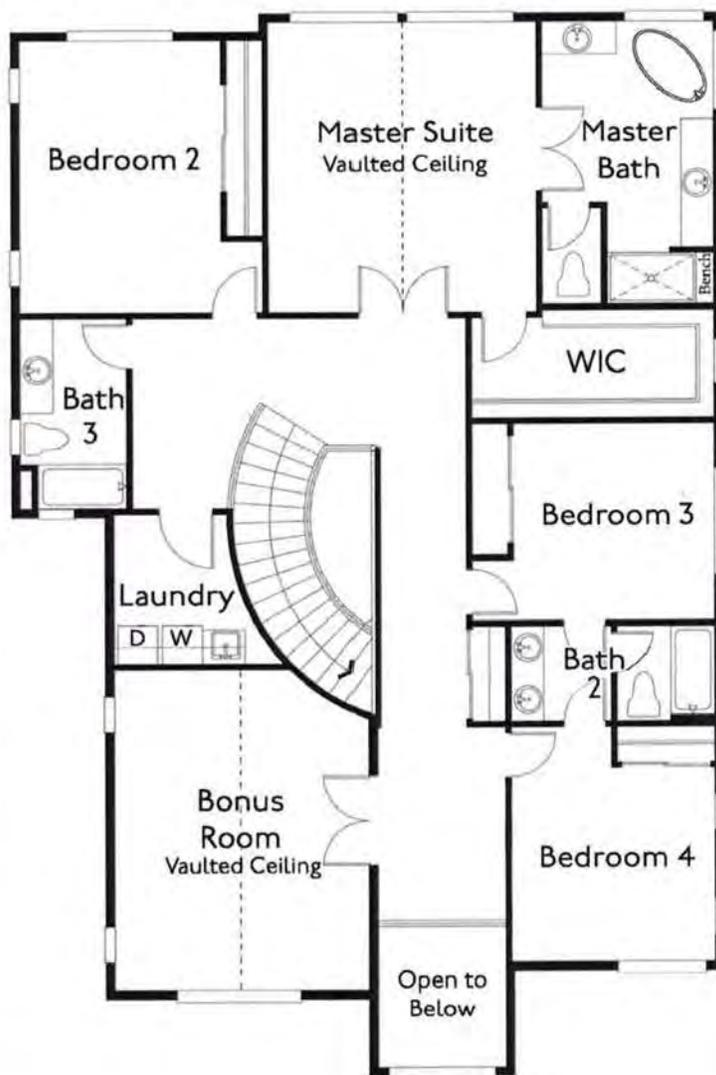
American Classic Homes



The Astoria 3664



Main Level



Upper Level

The Medina 3582

ATTACHMENT 9
3582 Approx. Sq. Ft.
4 Bedroom, 2.75 Bath,
Master on the Main
Bonus Room
3 Car Garage



American
ClassicHomes



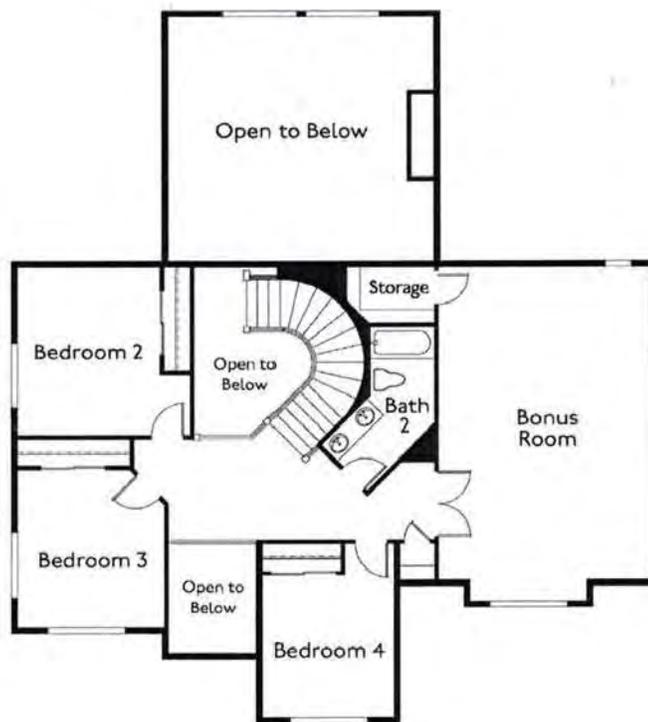
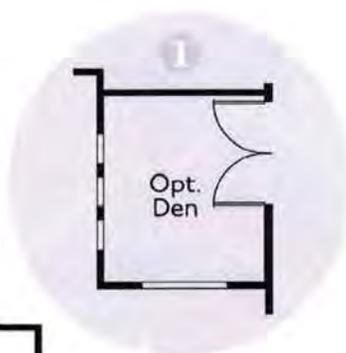
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American Classic Homes



The Medina 3582



Main Level

Upper Level

The Westport 3870

ATTACHMENT 9
3870 Approx. Sq. Ft.
5 Bedroom, 3.75 Bath,
Bonus Room
Guest Suite
3 Car Garage



American
ClassicHomes



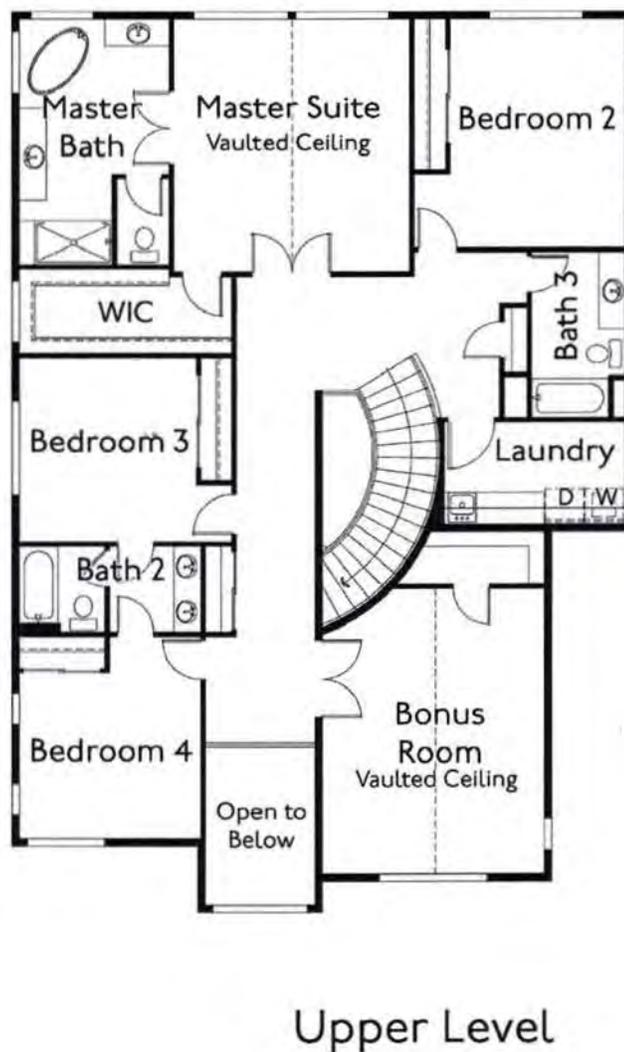
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American Classic Homes



The Westport 3870



American Classic HOMES

9675 S.E. 36th ST. MERCER ISLAND, WA 98040

ASTORIA - 3664-A GARAGE LEFT



GARAGE LEFT
ASTORIA - 3664-A



REGISTERED PLAN
PERMIT NO.: BL02015-00512
REVIEWED BY: G/one
APPROVAL DATE: 05/22/2015

REVISED
2.3.2015

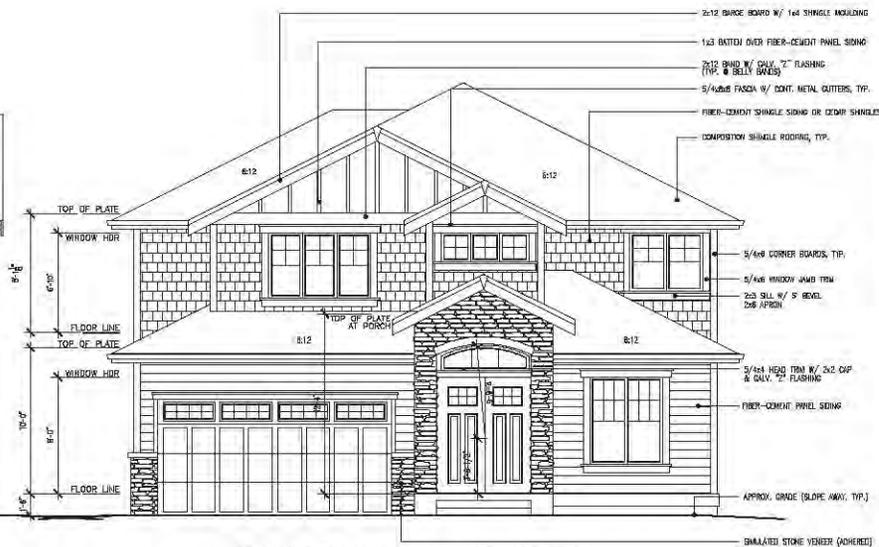
SCALE
1.20.2015
DATE
ASTORIA
COMPUTER FILE NAME

COVER-A
SHEET NUMBER

DESIGNER	PLAN DESCRIPTION	ENERGY CREDIT INFORMATION	SHEET INDEX	CURRENT DATE												
BROBST DESIGN WORKS 15109 SE 53RD PLACE BELLEVUE WA 98006 CONTACT: DAN BROBST 206.409.6690 dan@brobstdesignworks.com	<table border="1"> <tr><td>FLOOR AREA:</td><td></td></tr> <tr><td>MAIN LEVEL:</td><td>1756 S.F.</td></tr> <tr><td>UPPER LEVEL:</td><td>1908 S.F.</td></tr> <tr><td>TOTAL LIVING:</td><td>3664 S.F.</td></tr> <tr><td>GARAGE:</td><td>961 S.F.</td></tr> <tr><td>3-CAR GARAGE:</td><td>801 S.F.</td></tr> </table> <p>SINGLE FAMILY RESIDENCE WOOD FRAME STRUCTURE STEM WALL / CRAWL SPACE FOUNDATION DETACHED RESIDENCE WITH ATTACHED 2 or 3 CAR GARAGE</p>	FLOOR AREA:		MAIN LEVEL:	1756 S.F.	UPPER LEVEL:	1908 S.F.	TOTAL LIVING:	3664 S.F.	GARAGE:	961 S.F.	3-CAR GARAGE:	801 S.F.	EFFICIENT WATER HEATING 5B: Water heating system shall be a gas water heater with a minimum of EF of 0.82 CREDIT = 1.5	COVER SHEET PLAN INFORMATION SHEET A1 FLOOR PLANS SHEET A2 ELEVATION A SHEET A2.1 ELEVATION (FRONT AND SIDE) - 3-CAR OPTION SHEET A2.2 ELEVATION (SIDE AND REAR) - 3-CAR OPTION SHEET A4 SECTION AND DETAILS SHEET N1 ENERGY COMPLIANCE / NOTE SHEET SHEET N2 GENERAL NOTE PAGE SHEET S1 SHEARWALL PLANS AND STRUCTURAL NOTES FOR UPPER LEVEL AND 2-CAR MAIN SHEET S2 FOUNDATION PLAN / M.F FRAMING PLAN & DETAILS 2-CAR VERSION SHEET S3 UPPER LEVEL FLOOR FRAMING PLAN 2-CAR VERSION SHEET S4 ROOF FRAMING PLAN AND DETAILS SHEET S5 FOUNDATION PLAN / M.F FRAMING PLAN & DETAILS 3-CAR VERSION SHEET S6 SHEARWALL PLAN FOR 3-CAR MAIN LEVEL UPPER LEVEL FLOOR FRAMING PLAN 3-CAR VERSION	2.3.2015 2.3.2015 2.3.2015 1.20.2015 2.3.2015 1.20.2015 1.20.2015 1.20.2015 1.20.2015
FLOOR AREA:																
MAIN LEVEL:	1756 S.F.															
UPPER LEVEL:	1908 S.F.															
TOTAL LIVING:	3664 S.F.															
GARAGE:	961 S.F.															
3-CAR GARAGE:	801 S.F.															
STRUCTURAL ENGINEER	BUILDING CODE / ENERGY COMPLIANCE	ATTIC VENTILATION:														
MYERS ENGINEERING LLC 3206 50TH ST CT. NW SUITE 210-B GIG HARBOR, WA 98335 CONTACT: MARK MYERS 253.585.3248 myersengineering@centurytel.net	2012 INTERNATIONAL RESIDENTIAL CODE 2012 INTERNATIONAL BUILDING CODE 2012 WASHINGTON STATE ENERGY	<p>ATTIC VENTILATION: MINIMUM ATTIC VENTILATION SHALL BE 1/300 OF THE ATTIC PLAN AREA. UPPER VENTING SHALL BE PROVIDED BY: 26"-40" ROOF JACKS LOCATED ABOVE THE WISPOINTE OF THE ROOF EACH JACK VENT PROVIDES .34 SF OF VENTING PER JACK LOWER VENTING SHALL BE EAVE VENT BLOCKS W/ (3) 2" DIA SCREENED HOLES PROVIDING A NET VENT AREA OF 0.42 SQM = 4.6 SQ FT OR (IN ADDITION) 26"-40" ROOF JACKS LOCATED BELOW THE WISPOINTE OF THE ROOF EACH JACK VENT PROVIDES .34 SF OF VENTING PER JACK MAINTAIN 1" CLEAR AIR-SPACE ABOVE INSULATION AT EAVES</p> <p>UPPER ROOF: 2071.0 SQ. FT ATTIC AREA / 300 = 6.9 SQFT. VENT'S REQ'D 3.0 SQFT. OF VENTS TO BE PROVIDED ABOVE THE HALF-WAY POINT AND 3.9 SQFT. OF VENTS TO BE PROVIDED BELOW THE HALF-WAY POINT. UPPER VENTING: 3.0 SQ. FT. / .34 PER VENT = 10.2 ; PROVIDE (11) ROOF JACKS LOWER VENTING: 3.9 SQ. FT. / .065 PER VENT = 53.8 ; PROVIDE (24) EAVE VENTS</p> <p>LOW DEN ROOF: 118.0 SQ. FT ATTIC AREA / 300 = .39 SQFT. VENT'S REQ'D .2 SQFT. OF VENTS TO BE PROVIDED ABOVE THE HALF-WAY POINT AND 2.3 SQFT. OF VENTS TO BE PROVIDED BELOW THE HALF-WAY POINT. UPPER VENTING: 1.1 SQ. FT. / .34 PER VENT = .58 ; PROVIDE (1) ROOF JACKS LOWER VENTING: 2.3 SQ. FT. / .065 PER VENT = 3.07 ; PROVIDE (4) EAVE VENTS</p> <p>FRONT PORCH ROOF: 61.0 SQ. FT ATTIC AREA / 300 = .21 SQFT. VENT'S REQ'D .1 SQFT. OF VENTS TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .11 SQFT. OF VENTS TO BE PROVIDED BELOW THE HALF-WAY POINT. UPPER VENTING: .11 SQ. FT. / .34 PER VENT = .32 ; PROVIDE (1) ROOF JACKS LOWER VENTING: 1.1 SQ. FT. / .065 PER VENT = 1.6 ; PROVIDE (2) EAVE VENTS OR PROVIDE (4) EAVE VENTS AND NO UPPER VENTS</p> <p>LOW GARAGE ROOF: (2-CAR VERSION) 228.0 SQ. FT ATTIC AREA / 300 = .76 SQFT. VENT'S REQ'D .39 SQFT. OF VENTS TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .38 SQFT. OF VENTS TO BE PROVIDED BELOW THE HALF-WAY POINT. UPPER VENTING: .39 SQ. FT. / .34 PER VENT = 1.1; PROVIDE (2) ROOF JACKS LOWER VENTING: .38 SQ. FT. / .065 PER VENT = 5.8 ; PROVIDE (6) EAVE VENTS</p> <p>LOW GARAGE ROOF: (3-CAR VERSION) 488.0 SQ. FT ATTIC AREA / 300 = 4.56 SQFT. VENT'S REQ'D .28 SQFT. OF VENTS TO BE PROVIDED ABOVE THE HALF-WAY POINT AND .78 SQFT. OF VENTS TO BE PROVIDED BELOW THE HALF-WAY POINT. UPPER VENTING: .78 SQ. FT. / .34 PER VENT = 2.21; PROVIDE (3) ROOF JACKS LOWER VENTING: .78 SQ. FT. / .065 PER VENT = 12 ; PROVIDE (12) EAVE VENTS</p>	<p>*S* PAGES PREPARED BY MYERS ENGINEERING, LLC</p>													
REVISIONS																



RIGHT SIDE ELEVATION



FRONT ELEVATION A - 2-CAR GARAGE



LEFT SIDE ELEVATION



REAR ELEVATION

PROBST

15108 SE 53RD PL.
BELLINGHAM WA 98226
206.838.6850

**GARAGE LEFT
ASTORIA - 3664
ELEVATION A
2-CAR VERSION**

**American
Classic
HOMES**

9875 S.E. 36th ST., MERCER ISLAND, WA 98040

REGISTERED PLAN
PROJECT NO.: 6.02015-0012
REVIEWED BY: dlores
APPROVAL DATE: 05/22/2015

REVISED
2.3.2015

SCALE
1/4"=1'-0"
DATE
1.20.2015

ASTORIA-E
COMPUTER FILE NAME
A2
SHEET NUMBER



PROBST
 15106 SE 53RD PL.
 BELLEVUE WA 98006
 206.483.6800

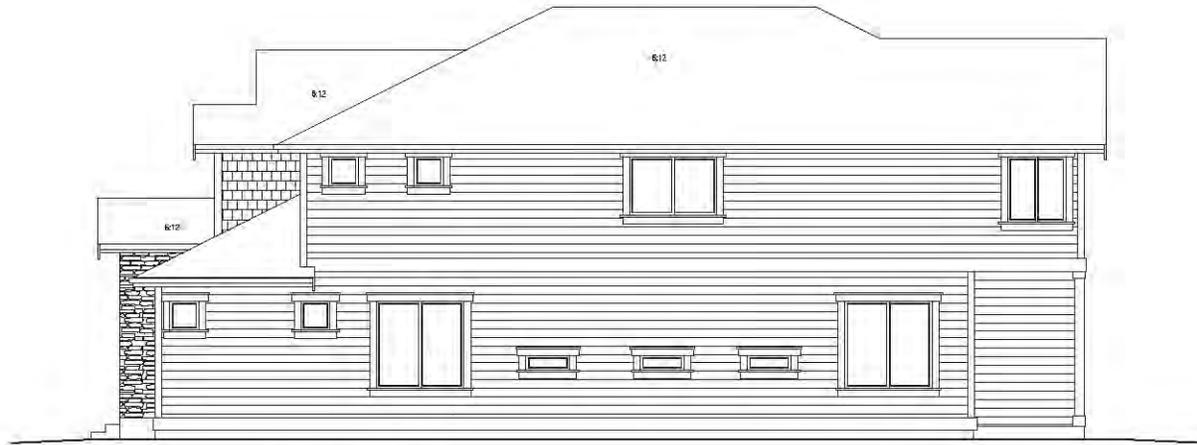
GARAGE LEFT
ASTORIA - 3664
 ELEVATION A
 3-CAR VERSION

American Classic
 HOMES
 9875 S.E. 38th ST., MERCEY ISLAND, WA 98040

REGISTERED PLAN
 PERMIT NO.: BLD0015-0512
 REVIEWED BY: diana
 APPROVAL DATE: 02/22/2015

REVISION

1/4"=1'-0"
 SCALE
 1.20.2015
 DATE
 ASTORIA-E
 COMPUTER FILE NAME
A2.1
 SHEET NUMBER



RIGHT SIDE ELEVATION



REAR ELEVATION



15106 SE 53RD PL.
 BELLEVUE, WA 98006
 206.488.6800

GARAGE LEFT
ASTORIA - 3664
 ELEVATION A
 3-CAR VERSION

American
Classic
 HOMES
 9875 S.E. 38th ST., MERCER ISLAND, WA 98040

REGISTERED PLAN
 PROJECT NO. 812015-0012
 REVIEWED BY: GJ
 APPROVAL DATE: 02/22/2015

REVISION
 2.3.2015

1/4"=1'-0"
 SCALE
 1.20.2015
 DATE

ASTORIA-E
 COMPUTER FILE NAME

A2.2
 SHEET NUMBER

American Classic HOMES

9675 S.E. 36th ST. MERCER ISLAND, WA 98040
WESTPORT - 3870
 ELEVATION A
 GARAGE RIGHT



GARAGE RIGHT
WESTPORT - 3870
 ELEVATION A

American Classic HOMES
 9675 S.E. 36th ST. MERCER ISLAND, WA 98040

DESIGNER	PLAN DESCRIPTION	ENERGY CREDIT INFORMATION	SHEET INDEX	CURRENT DATE												
BROBST DESIGN WORKS 15108 SE 53RD PLACE BELLEVUE WA 98006 CONTACT: DAN BROBST 206.409.6890 dan@brobstdesignworks.com	<table border="1"> <tr> <td colspan="2">FLOOR AREA: 2-STORY</td> </tr> <tr> <td>MAIN LEVEL:</td> <td>1900 S.F.</td> </tr> <tr> <td>UPPER LEVEL:</td> <td>1970 S.F.</td> </tr> <tr> <td>TOTAL LIVING:</td> <td>3870 S.F.</td> </tr> <tr> <td>GARAGE:</td> <td>778 S.F.</td> </tr> </table> <p>SINGLE FAMILY RESIDENCE WOOD FRAME STRUCTURE STEM WALL / CRAWL SPACE FOUNDATION DETACHED RESIDENCE WITH ATTACHED 3 CAR GARAGE</p>	FLOOR AREA: 2-STORY		MAIN LEVEL:	1900 S.F.	UPPER LEVEL:	1970 S.F.	TOTAL LIVING:	3870 S.F.	GARAGE:	778 S.F.	EFFICIENT WATER HEATING 5B: Water heating system shall be a gas water heater with a minimum of EF of 0.82. CREDIT = 1,5	COVER SHEET PLAN INFORMATION SHEET A2 MAIN LEVEL FLOOR PLAN SHEET A3 UPPER LEVEL FLOOR PLAN SHEET A4 ELEVATION (FRONT AND SIDE) SHEET A4.1 ELEVATION (SIDE AND REAR) SHEET A5 BUILDING SECTION SHEET E2 MAIN LEVEL ELECTRICAL PLAN SHEET E3 UPPER LEVEL ELECTRICAL PLAN SHEET A01 ARCHITECTURAL DETAILS SHEET N1 ENERGY COMPLIANCE / NOTE SHEET SHEET N2 GENERAL NOTE PAGE <table border="1"> <tr> <td colspan="2">*S* PAGES PREPARED BY MYERS ENGINEERING, LLC</td> </tr> </table> SHEET S1 SHEARWALL PLANS AND STRUCTURAL NOTES SHEET S2 FOUNDATION PLAN SHEET S3 MAIN LEVEL FLOOR FRAMING PLAN SHEET S4 UPPER LEVEL FLOOR FRAMING AND LOW ROOF FRAMING PLAN SHEET S5 ROOF FRAMING PLAN SHEET S6 STRUCTURAL DETAILS SHEET S7 STRUCTURAL DETAILS	*S* PAGES PREPARED BY MYERS ENGINEERING, LLC		10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015 10.5.2015
FLOOR AREA: 2-STORY																
MAIN LEVEL:	1900 S.F.															
UPPER LEVEL:	1970 S.F.															
TOTAL LIVING:	3870 S.F.															
GARAGE:	778 S.F.															
S PAGES PREPARED BY MYERS ENGINEERING, LLC																
STRUCTURAL ENGINEER	BUILDING CODE / ENERGY COMPLIANCE															
MYERS ENGINEERING LLC 3206 50TH ST CT. NW SUITE 210-B GIG HARBOR, WA 98335 CONTACT: MARK MYERS 253.585.3248 myersengineering@centurytel.net	2012 INTERNATIONAL RESIDENTIAL CODE 2012 INTERNATIONAL BUILDING CODE 2012 WASHINGTON STATE ENERGY 2012 UNIFORM PLUMBING CODE															
REVISIONS																

DATE: 10.5.2015
 DATE:
 COMPUTER FILE NAME:
COVER-A
 SHEET NUMBER



PROBST

15106 SE 53RD PL.
BELL CREEK WA 98004
206.488.6800

GARAGE RIGHT
WESTPORT - 3870
ELEVATION - ELEVATIONS
FLAT/LOT

American Classic
HOMES
9875 S.E. 38th St., MERCER ISLAND, WA 98040

REVISION

1/4"=1'-0"
SCALE
DATE 10.5.2015
WESTPORT-E
COMPUTER FILE NAME
A4
SHEET NUMBER



REAR ELEVATION



LEFT SIDE ELEVATION

DROBST

15106 SE 53RD PL.
BELLEVUE, WA 98006
206.488.6800

GARAGE RIGHT
WESTPORT - 3870
ELEVATION A - ELEVATIONS
FLAT LOT

American
Classic
HOMES
9875 S.E. 38th ST., MERIDEN ISLAND, WA 98040

REVISION

1/4"=1'-0"

SCALE

10.5.2015

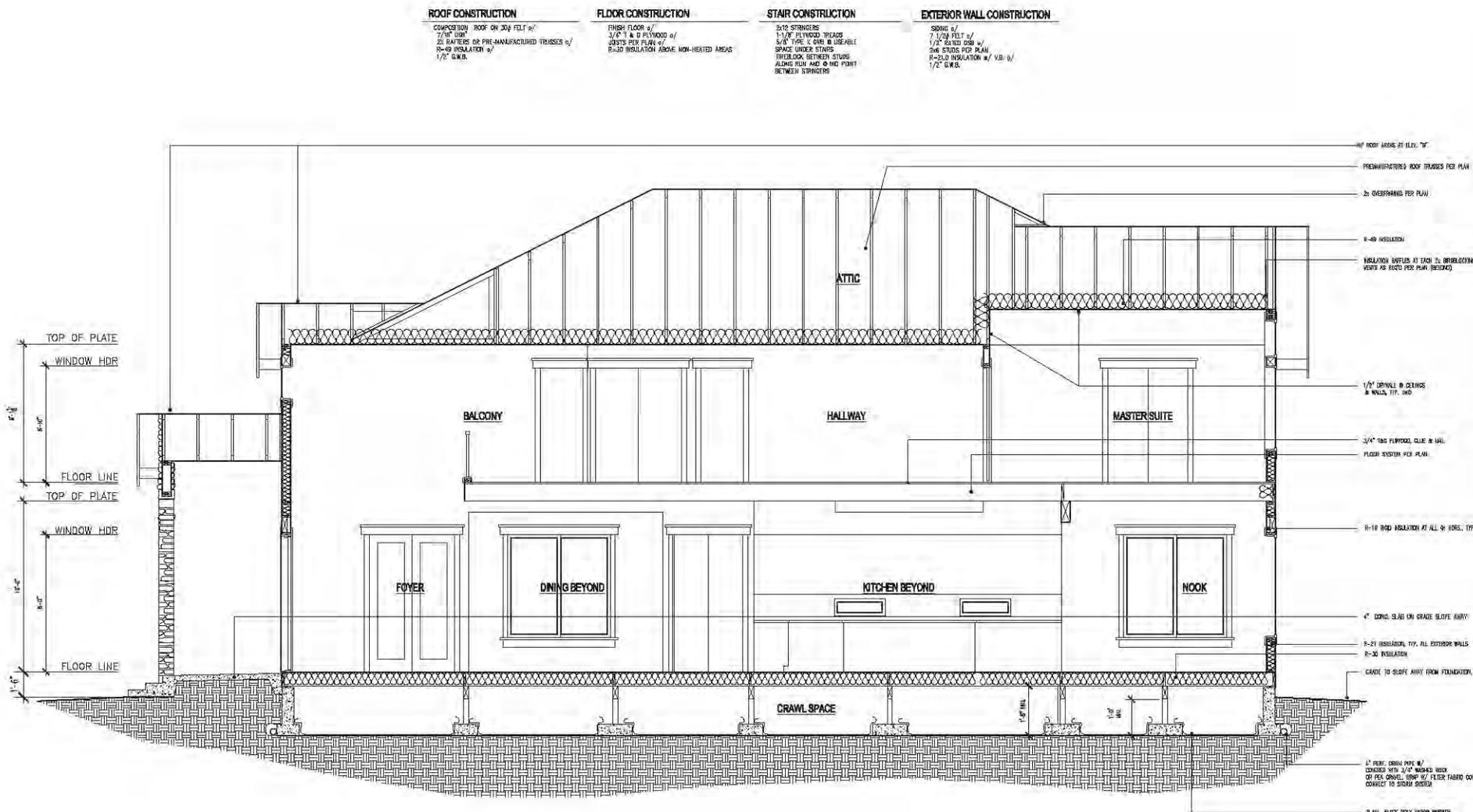
DATE

WESTPORT-E

COMPUTER FILE NAME

A4.1

SHEET NUMBER



SECTION AA

BRUBS!

15106 SE 53RD PL.
 BELLEVUE, WA 98006
 206.488.6850

**GARAGE RIGHT
 WESTPORT - 3870
 BUILDING SECTION**

**American
 Classic
 HOMES**

9875 S.E. 38th ST., MERCER ISLAND, WA 98040

REVISION

1/4"=1'-0"
 SCALE
 10.5.2015
 DATE
 WESTPORT-E
 COMPUTER FILE NAME
A6
 SHEET NUMBER



Greenforest Incorporated



Consulting Arborist

April 1, 2016

Carol Rozday
GGM Investments, LLC
9675 SE 36th St., Ste. 105
Mercer Island, WA 98040

RE: Arborist Report for Calvert Anderson Project.

Dear Ms. Rozday:

You contacted me and contracted my services as a consulting arborist. My assignment is to tag and inspect trees at the above referenced site. The purpose of this report is to establish the condition of the significant trees to satisfy City of Kirkland permit submittal requirements.

I received a tree survey from DR Strong, Consulting Engineers, Inc., showing the locations of the significant trees on the site. I visited the site 1/16/16 and 3/23/16 and visually inspected the trees indicated on the survey, which are the subject of this report.

The site consists of three parcels, each with a single-family residence. Landscaping includes a mix of lawn, hedges, ornamental trees and shrub beds, fruit trees, and natural areas with native vegetation. The subject trees include both native and ornamental species.

TREE INSPECTION – Tree Health, Condition and Viability

I marked each tree with 1" x 3.5" aluminum tag indicating tree number. I visually inspected each tree from the ground and rated both tree health and structure.

A tree's structure is distinct from its health. This inspection identifies what is visible with both. Structure is the way the tree is put together or constructed, and identifying obvious defects can be helpful in determining if a tree is predisposed to failure. Tree health assesses disease, insect infestation and old age.

Carol Rozday, GGM Investments, LLC
 RE: Arborist Report for Calvert Anderson Project
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No invasive procedures were performed on any trees. The results of this inspection are based on what was visible at the time of the inspection. Attachment 2 is the tree inventory, which summarizes my inspection results and provides the following information for each tree:

Tree number as shown on tag in the field and on tree plan.

Tree Status: Remove or Retain indicates if tree is proposed for removal or retention.

Tree Density Credit from Tree Plan III– Short Plats & Subdivisions, chart in §C.4. (For multiple-trunked trees, credit is assigned based on square root of the sum of the DBHs squared.)

DBH Stem diameter in inches measured 4.5 feet from the ground.

Tree Species Common name.

Dripline Average branch extension from the trunk as radius in feet.

Health & Structure rating ('1' indicates no visible health-related problems or structural defects, '2' indicates minor visible problems or defects that may require attention if the tree is retained, and '3' indicates significant visible problems or defects and tree removal is recommended.

Viable Tree a determination by the arborist whether the tree is viable for retention.

Visible defects Obvious structural defects or diseases visible at time of inspection, which includes:

Asymmetric canopy– the tree has an asymmetric canopy from space and light competition from adjacent trees.

Chlorosis – Yellowing or off-color foliage.

Crack – separation of wood fibers and predisposed to failure.

Dead – tree is dead.

Deadwood – Large and/or multiple dead branches throughout canopy.

Decay – process of wood degradation by microorganisms resulting in weak and defective structure.

Diseased – foliage and trunk/stems are diseased.

Disease center – possible soil borne fungal infection site.

Dogleg in trunk – trunk with a bow or defective bend (90°) in trunk often half way of further up the trunk.

Double leader – the tree has multiple stem attachments, which may require maintenance or monitoring over time.

Included bark - Bark inclusion at attachment of multiple leaders and is preventing a wood-to-wood attachment

Ivy - Dense ivy prevents a thorough inspection, and other defects may be present.

Previous failure – Tree trunk previously broken and defective.

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Sweep in trunk – characterized by a leaning lower trunk and a more upright top.
 Stumpsprout- Tree previously cut at grade with multiple stems and potentially weak attachments.
 Suppressed – tree crowded by larger adjacent trees; with defective structure and/or low vigor. Retain tree only as a grove tree, not stand-alone.
 Sweep – tree leans away from adjacent trees. Characterized by a leaning lower trunk and a top that is more upright.
 Thinning Canopy – low foliage density may indicate stress, or early infection/declining health.
 Topped – the tree is previously topped and has poor structure and/or stem decay.
 Tree leans – Trunk has significant lean from vertical.
 Tree suppressed - Tree is suppressed by adjacent tree canopies.
 Trunk decay - Wood decay is visible in the trunk.
 Wound/decay base of trunk - Open wound with visible decay in trunk.

LIMITS OF DISTURBANCE

All retained trees are within the steep slope area at the north side of the project. Limits of Disturbance (LOD) for all trees is defined by the tree's dripline, or for trees near the top of the slope, the 15' slope BSBL, whichever is shorter. These distances follow ISA Best Management Practices¹, and are the minimum distances from the trees for any soil disturbance, and represent the area to be protected during construction. These LOD are malleable and may be adjusted during the construction process.

Minor grading is proposed within the 15' Steep Slope BSBL in certain locations near retained trees. Based on the proposed grading and tree species/size, it is my opinion that this grading will have no negative impact on these trees. (See attached exhibit.)

No other work is proposed within the critical root zone of any retained trees. If any future plans require such, special instructions specifically outlining any work proposed within the limits of the disturbance will be provided by the project arborist.

For trees not viable for retention, a description of the reason(s) for recommended removal, based on poor health or structure, are provided in Attachment 2.

The impact of necessary tree removal to the remaining trees will be negligible. The trees proposed for removal are mostly scattered as individual trees or small groups. Trees being

¹ Companion publication to the ANSI A300 Series, Part 5: Managing Trees During Construction. 2008. ISA.

Carol Rozday, GGM Investments, LLC
RE: Arborist Report for Calvert Anderson Project
April 1, 2016
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retained remain in a dense group and will not be isolated or unduly exposed by the proposed tree removal.

TREE PROTECTION

Tree protection fencing shall be installed prior to site clearing or demolition. Minimum six (6) foot temporary chain-link fence shall be installed at the driplines of all retained trees or at the limits of disturbance when construction or access is required within the dripline. Fence shall completely encircle the retained trees. Install fence posts using pier block only. A City planner must approve any modifications to the fencing material and location. Fencing signage must be posted every fifteen (15) feet along the fencing.

No stockpiling of materials, vehicular or pedestrian traffic, material storage or use of equipment or machinery shall be allowed within the protective fencing. Fencing shall not be moved or removed unless approved by a City planner. Any work, activity or soil disturbance within the protection fencing, or critical root zone, shall be reviewed, approved and monitored by the project arborist.

Instructions and specifications for pruning roots or branches shall be addressed individually for specific trees based on any future proposed encroachment.

LIMITATIONS AND USE OF THIS REPORT

This tree report establishes, via the most practical means available, the existing conditions of the trees on the subject property. Ratings for health and structure, as well as any recommendations are valid only through the development and construction process. This report is based solely on what is readily visible and observable, without any invasive means.

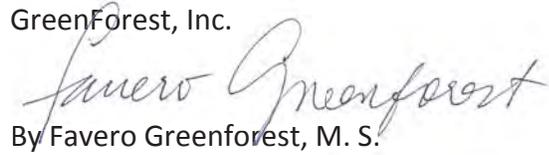
There are several conditions that can affect a tree's condition that may be pre-existing and unable to be ascertained with a visual-only analysis. No attempt was made to determine the presence of hidden or concealed conditions which may contribute to the risk or failure potential of trees on the site. These conditions include root and stem (trunk) rot, internal cracks, structural defects or construction damage to roots, which may be hidden beneath the soil. Additionally, construction and post-construction circumstances can cause a relatively rapid deterioration of a tree's condition.

Thank you again for your business. Please let me know if I can be of further assistance.

Carol Rozday, GGM Investments, LLC
RE: Arborist Report for Calvert Anderson Project
April 1, 2016
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Sincerely,

GreenForest, Inc.



By Favero Greenforest, M. S.

Favero Greenforest

Digitally signed by Favero Greenforest
DN: cn=Favero Greenforest, o, ou,
email=greenforestinc@mindspring.com,
c=US
Date: 2016.04.01 16:19:14 -07'00'

ISA Certified Arborist # PN -0143A
ASCA Registered Consulting Arborist® #379
ISA Tree Risk Assessment Qualified

Attachments:

1. Assumptions and Limiting Conditions
2. Significant Tree Inventory
3. Tree Plan



Carol Rozday, GGM Investments, LLC
RE: Arborist Report for Calvert Anderson Project
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Attachment No. 1 - Assumptions & Limiting Conditions

1. A field examination of the site was made 1/16/16 and 3/23/16. My observations and conclusions are as of that date.
2. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/arborist can neither guarantee nor be responsible for the accuracy of information provided by others.
3. I am not a qualified land surveyor. Reasonable care was used to match the trees indicated on the sheets with those growing in the field.
4. Construction activities can significantly affect the condition of retained trees. All retained trees should be inspected after construction is completed, and then inspected regularly as part of routine maintenance.
5. Unless stated other wise: 1) information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) the inspection is limited to visual examination of the subject trees without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied that problems or deficiencies of the subject tree may not arise in the future.
6. All trees possess the risk of failure. Trees can fail at any time, with or without obvious defects, and with or without applied stress. A complete evaluation of the potential for this (a) tree to fail requires excavation and examination of the base of the subject tree. Permission of the current property owner must be obtained before this work can be undertaken and the hazard evaluation completed.
7. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made.
8. This report and any values/opinions expressed herein represent the opinion of the consultant/appraiser, and the consultant's/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.



Carol Rozday, GGM Investments, LLC
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 April 1, 2016
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Attachment No. 2 – Significant Tree Inventory

Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
1	Retain	1	7"	Cherry	6'	2	1	Yes	Diseased
2	Retain	1	9	Alder	10	1	1	Yes	
3	Retain	1	7	Alder	8	1	1	Yes	
4	Retain	1	10	Alder	8	1	1	Yes	
5	Retain	1	9	Alder	8	1	1	Yes	
6	Retain	1	9	Alder	8	1	1	Yes	
7	Retain	3	14	Alder	12	1	1	Yes	
8	Retain	2	12	Alder	10	1	1	Yes	
9	Retain	1	10	Alder	10	1	1	Yes	
10	Retain	1	7	Maple	12	1	1	Yes	
11	Retain	1	10	Alder	8	1	1	Yes	
12	Retain	1	9	Alder	10	1	1	Yes	
13	Retain	2	12	Alder	12	1	1	Yes	
14	Retain	1	9	Maple	14	1	1	Yes	
15	Retain	1	10	Alder	6	1	1	Yes	
16	Retain	1	7	Alder	6	1	1	Yes	
17	Retain	1	9	Alder	8	1	1	Yes	
18	Retain	1	8	Alder	6	1	1	Yes	
19	Retain	2	12	Alder	10	1	1	Yes	
20	Retain	1	10	Alder	8	1	1	Yes	



Carol Rozday, GGM Investments, LLC
 RE: Arborist Report for Calvert Anderson Project
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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
21	Retain	3	14	Alder	8	1	1	Yes	
22	Retain	1	10	Alder	6	1	1	Yes	
23	Retain	2	12	Alder	8	1	1	Yes	
24	Retain	2	12	Alder	8	1	1	Yes	
25	Retain	1	8	Alder	6	1	1	Yes	
26	Retain	1	10	Alder	8	1	1	Yes	
27	Retain	2	12	Alder	6	1	1	Yes	
28	Retain	1	10	Maple	8	1	1	Yes	
29	Retain	1	6	Alder	8	1	1	Yes	
30	Retain	2	(4) 6	Maple	12	1	2	Yes	Stumpsprout
31	Retain	3	(6) 6	Maple	12	1	2	Yes	Stumpsprout
32	Retain	1	7	Alder	8	1	1	Yes	
33	Retain	1	10	Alder	8	1	1	Yes	
34	Retain	1	7	Alder	8	1	1	Yes	
35	Retain	1	10	Alder	8	1	1	Yes	
36	Retain	1	10	Alder	8	1	1	Yes	
37	Retain	1	8	Alder	8	1	1	Yes	
38	Retain	1	9	Alder	8	1	1	Yes	
39	Retain	2	12	Alder	8	1	1	Yes	
40	Retain	1	10	Alder	10	1	1	Yes	
41	Retain	1	9	Alder	8	1	1	Yes	



Carol Rozday, GGM Investments, LLC
 RE: Arborist Report for Calvert Anderson Project
 April 1, 2016
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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
42	Retain	1	8	Alder	6	1	1	Yes	
43	Retain	1	8	Fir	6	1	1	Yes	
44	Retain	1	6	Dogwood	8	1	1	Yes	
45	Retain	1	8	Maple	12	1	1	Yes	
46	Retain	2	(4) 6	Maple	14	1	2	Yes	Stumpsprout
47	Retain	1	8	Cherry	6	2	1	Yes	Diseased
48	Retain	1	6	Cherry	6	2	1	Yes	Diseased
49	Retain	1	6	Cherry	6	2	1	Yes	Diseased
50	Retain	1	7	Cherry	6	2	1	Yes	Diseased
51	Retain	1	6	Cherry	6	2	1	Yes	Diseased
52	Retain	1	8	Cherry	6	2	1	Yes	Diseased
53	Retain	2	12	Maple	14	1	1	Yes	
54	Retain	1	8	Maple	10	1	1	Yes	
55	Retain	1	8	Cherry	6	2	1	Yes	Diseased
56	Retain	1	6	Cherry	6	2	1	Yes	Diseased
57	Retain	1	6	Maple	12	1	1	Yes	
58	Retain	2	12	Maple	12	1	1	Yes	
59	Retain	6	(4) 6-14	Maple	16	1	2	Yes	Stumpsprout
5133	Remove	2	12	Sweetgum	14	1	1	Yes	
5134	Remove	4	8,10,12	Purpleleaf plum	16	1	1	Yes	
5135	Remove	3	6,8,10	Purpleleaf plum	10	1	2	Yes	Trunk decay



Carol Rozday, GGM Investments, LLC
 RE: Arborist Report for Calvert Anderson Project
 April 1, 2016
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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
5136	Remove	3	14	Sweetgum	16	1	1	Yes	
5155	Remove	1	10	Paper birch	14	2	1	Yes	Decline
5156	Remove	1	8	Paper birch	8	2	1	Yes	Top dieback
5157	Remove	1	10	Paper birch	12	1	1	Yes	
5172	Remove	1	10	Norway maple	10	1	1	Yes	
5173	Remove	1	10	Apple	8	1	1	Yes	
5214	Remove	15	38	Douglas-fir	18	1	2	Yes	Double leader
5215	Remove	2	12	Italian prune	10	1	2	Yes	Diseased, mal-pruned
5340	Remove	6	20	Bitter cherry	16	2	1	Yes	Brown rot fungus infection
5476	Remove	14	36	Douglas-fir	18	1	1	Yes	
5477	Remove	8	24	Douglas-fir	14	1	1	Yes	
5478	Remove	10	28	Douglas-fir	16	1	1	Yes	
5479	Remove	14	36	Douglas-fir	18	1	1	Yes	
5480	Remove	8	24	Douglas-fir	16	2	1	Yes	Thinning and chlorotic canopy, (possible root rot disease center)
5481	Remove	7	22	Douglas-fir	16	1	1	Yes	
5609	Remove	0	22	Douglas-fir	16	3	2	No	Thinning and chlorotic canopy, deadwood, top dieback (possible root rot disease center)
5610	Retain	13	34	Douglas-fir	18	1	1	Yes	
5611	Remove	6	20	Douglas-fir	14	2	2	Yes	Asymmetric, trunk wound, dogleg



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
5755	Remove	1	8	Ginkgo	8	1	1	Yes	
5756	Remove	0	16	Western red-cedar	0	3	3	No	Cut down
5757	Remove	0	18	Western red-cedar	0	3	3	No	Dead
5758	Remove	1	8	Honey locust	8	1	2	Yes	Topped for overhead power lines
5759	Remove	0	8,8,8	Apple	6	2	3	No	Topped, decay
5806	Remove	0	18	Western red-cedar	0	3	3	No	Cut down
5807	Remove	3	14	Goldenchain tree	10	1	1	Yes	
5816	Remove	2	12	Redbud	14	1	1	Yes	
5820	Retain	13	34	Bigleaf maple	20	1	2	Yes	Asymmetric, seam in trunk
5821	Retain	8	24	Black cottonwood	18	1	1	Yes	
5822	Retain	8	24	Douglas-fir	16	1	2	Yes	Dense ivy covering trunk
5823	Retain	14	36	Douglas-fir	18	1	2	Yes	Dense ivy covering trunk
5824	Remove	0	26	Douglas-fir	18	3	2	No	Thinning and chlorotic canopy, dense ivy covering trunk (possible root rot disease center)
5854	Remove	2	12	European weeping beech	20	1	1	Yes	
5855	Remove	2	12	Plum	10	2	2	Yes	Diseased, mal-pruned
5861	Retain	12	32	Douglas-fir	18	1	1	Yes	
5862	Remove	0	34	Bigleaf maple	20	2	3	No	Deadwood, suppressed, decay
5908	Remove	1	10	Young's birch	10	1	2	Yes	Sapsucker injury



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
5909	Remove	1	10	Young's birch	10	1	2	Yes	Sapsucker injury
5910	Remove	1	6	Italian prune	6	2	1	Yes	Diseased, mal-pruned
5911	Remove	1	10	Young's birch	10	1	2	Yes	Sapsucker injury
5912	Retain	9	26	Douglas-fir	16	1	1	Yes	
5914	Retain	9	26	Western red-cedar	16	1	1	Yes	
5915	Retain	3	14	Western red-cedar	10	1	2	Yes	Suppressed
5916	Remove	0	24	Douglas-fir	0	3	3	No	Dead
5917	Retain	14	36	Western red-cedar	18	1	1	Yes	
5919	Retain	9	26	Western red-cedar	16	1	2	Yes	Woodpecker injury
5920	Remove	0	18	Douglas-fir	0	3	3	No	Dead
5921	Retain	6	20	Western red-cedar	14	1	1	Yes	
5922	Retain	6	20	Western red-cedar	14	1	1	Yes	
5923	Retain	14	22,30	Bigleaf maple	25	2	2	Yes	Decline, deadwood, stumpsprout
5924	Retain	3	14	Western red-cedar	10	1	2	Yes	Suppressed
5925	Remove	0	20	Bigleaf maple	16	2	3	No	Suppressed, stumpsprout, decay
5949	Retain	5	18	Bigleaf maple	14	1	1	Yes	
5950	Retain	1	10	Bigleaf maple	12	1	1	Yes	
5951	Retain	4	16	Bigleaf maple	16	1	1	Yes	
5954	Retain	14	26,26	Bigleaf maple	25	2	2	Yes	Deadwood, double leader, included bark
5958	Remove	0	14	Bigleaf maple	12	2	3	No	Suppressed, topped for power lines



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
5959	Remove	0	12	Bigleaf maple	10	1	3	No	Suppressed, topped for power lines
5960	Retain	15	38	Western red-cedar	18	1	1	Yes	
5961	Retain	5	18	Western red-cedar	12	1	2	Yes	Suppressed
5962	Retain	4	16	Western red-cedar	14	1	1	Yes	
5963	Retain	5	18	Douglas-fir	16	1	2	Yes	Thin canopy
5964	Retain	4	16	Western red-cedar	10	1	1	Yes	
5965	Retain	8	24	Douglas-fir	12	1	1	Yes	
5978	Retain	20	48	Douglas-fir	18	1	1	Yes	
5983	Retain	1	8	Bigleaf maple	14	2	2	Yes	Decay, failure
5984	Retain	4	16	Western red-cedar	14	1	1	Yes	
5985	Retain	1	8	Western red-cedar	10	1	2	Yes	Suppressed
5986	Retain	14	36	Western red-cedar	16	1	1	Yes	
5987	Retain	5	18	Bigleaf maple	16	2	2	Yes	Deadwood, failure, suppressed
5988	Retain	12	32	Douglas-fir	18	1	2	Yes	Dogleg
5989	Retain	4	16	Bigleaf maple	18	1	1	Yes	
5990	Retain	5	18	Bigleaf maple	16	1	2	Yes	Asymmetric
5991	Retain	18	44	Douglas-fir	18	1	1	Yes	
5992	Retain	4	16	Douglas-fir	12	2	1	Yes	Oozing resin on lower trunk
5993	Retain	8	24	Douglas-fir	16	1	1	Yes	
5994	Retain	2	12	Red alder	14	1	2	Yes	Sweep in trunk
5995	Retain	5	18	Douglas-fir	12	1	1	Yes	



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
5996	Retain	6	20	Hemlock	14	2	1	Yes	Thinning canopy
5997	Retain	1	10	Western red-cedar	8	1	2	Yes	Suppressed
6071	Retain	9	26	Douglas-fir	18	1	1	Yes	
6072	Retain	3	14	Douglas-fir	12	1	2	Yes	Suppressed
6074	Remove	0	10	Bigleaf maple	8	3	3	No	Suppressed, topped
6076	Retain	1	10	Douglas-fir	6	1	2	Yes	Suppressed
6077	Retain	3	14	Bigleaf maple	16	1	2	Yes	Suppressed
6078	Retain	8	24	Western red-cedar	16	1	1	Yes	
6080	Retain	1	10	Western red-cedar	10	1	2	Yes	Suppressed
6081	Retain	7	22	Douglas-fir	14	1	1	Yes	
6082	Retain	3	14	Western red-cedar	10	1	2	Yes	Suppressed
6083	Retain	5	18	Western red-cedar	14	1	2	Yes	Asymmetric
6084	Retain	5	18	Western red-cedar	14	1	1	Yes	
6085	Retain	9	26	Douglas-fir	18	1	2	Yes	Asymmetric
6086	Retain	8	24	Douglas-fir	16	1	2	Yes	Asymmetric
6087	Retain	14	36	Western red-cedar	18	1	1	Yes	
6088	Retain	11	30	Douglas-fir	18	2	1	Yes	Oozing resin on lower trunk
6089	Retain	5	18	Western red-cedar	14	1	1	Yes	
6090	Retain	9	26	Douglas-fir	16	1	1	Yes	
6092	Retain	11	30	Douglas-fir	18	1	1	Yes	
6093	Retain	10	28	Douglas-fir	16	1	2	Yes	Topped, dogleg



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
6094	Retain	1	8	Bigleaf maple	10	2	2	Yes	Decline, suppressed
6097	Retain	10	28	Douglas-fir	18	1	1	Yes	
6098	Retain	1	10	Bigleaf maple	14	1	2	Yes	Asymmetric
6099	Retain	3	14	Douglas-fir	12	1	1	Yes	
6100	Retain	1	10	Bigleaf maple	14	1	2	Yes	Suppressed
6101	Retain	14	36	Douglas-fir	20	1	1	Yes	
6102	Retain	1	8	Bigleaf maple	14	1	2	Yes	Asymmetric
6104	Retain	5	18	Bigleaf maple	16	1	2	Yes	Asymmetric
6146	Retain	4	16	Western red-cedar	14	1	1	Yes	
6147	Retain	10	28	Douglas-fir	16	1	1	Yes	
6148	Retain	7	22	Douglas-fir	16	1	1	Yes	
6149	Retain	Offsite	28	Douglas-fir	16	1	1	Yes	Offsite
6150	Retain	7	22	Douglas-fir	16	1	1	Yes	
6152	Retain	4	16	Douglas-fir	12	1	1	Yes	
6153	Retain	3	14	Western red-cedar	10	2	2	Yes	Suppressed, sweep in trunk
6154	Retain	2	12	Western red-cedar	8	2	2	Yes	Suppressed, dogleg
6155	Retain	5	18	Douglas-fir	14	1	1	Yes	
6156	Retain	3	14	Western red-cedar	8	1	1	Yes	
6157	Retain	4	16	Douglas-fir	12	1	2	Yes	Asymmetric
6158	Retain	8	24	Douglas-fir	16	1	1	Yes	
6159	Retain	10	28	Douglas-fir	16	1	1	Yes	



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
6160	Retain	7	8,10,12,14	Bigleaf maple	18	2	2	Yes	Deadwood, stump sprout
6434	Retain	10	29	Douglas-fir	16	1	1	Yes	
6435	Retain	9	12,24	Douglas-fir	12	1	2	Yes	Double leader
6436	Retain	5	18	Douglas-fir	14	1	1	Yes	
6437	Retain	10	28	Douglas-fir	16	1	1	Yes	
6438	Remove	16	40	Douglas-fir	20	2	1	Yes	Stunted foliage, chlorosis
6439	Retain	2	12	Pacific dogwood	12	1	1	Yes	
6440	Retain	13	34	Douglas-fir	16	1	1	Yes	
6441	Retain	1	6	Douglas-fir	8	2	2	Yes	Suppressed tree
6442	Remove	0	18	Douglas-fir	0	3	3	No	Dead
6443	Retain	6	6,6,8,8,10,10,11	Bigleaf maple	16	2	2	Yes	Seam, decay, stumpsprout
6444	Retain	9	26	Douglas-fir	16	1	1	Yes	
6445	Retain	13	35	Douglas-fir	18	2	2	Yes	Deadwood, oozing resin
6446	Retain	5	19	Douglas-fir	12	1	1	Yes	
6447	Remove	2	12	Bigleaf maple	16	1	1	Yes	
6449	Retain	12	32	Douglas-fir	16	1	1	Yes	
6450	Retain	9	27	Pacific madrone	18	2	2	Yes	Lean, seam, diseased
6451	Retain	15	39	Douglas-fir	20	1	1	Yes	
6452	Retain	7	23	Bigleaf maple	16	1	2	Yes	Crack/seams in trunk



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
6453	Retain	4	17	Western red-cedar	12	1	1	Yes	
6454	Retain	1	7	Bitter cherry	8	1	2	Yes	Asymmetric canopy
6455	Retain	2	13	Western red-cedar	10	1	1	Yes	
6456	Retain	1	10	Black cottonwood	12	1	2	Yes	Lean, asymmetric
6457	Retain	1	10	Black cottonwood	12	1	2	Yes	Lean, asymmetric
6460	Retain	1	10	Bitter cherry	12	1	2	Yes	Suppressed tree
6461	Retain	6	20	Bitter cherry	16	1	2	Yes	Double leader, asymmetric
6462	Retain	1	10	Bitter cherry	12	2	2	Yes	Trunk decay, asymmetric
6463	Retain	1	10	Bigleaf maple	10	2	2	Yes	Previous failure, decay, asymmetric
6464	Retain	1	10	Bigleaf maple	10	2	2	Yes	Deadwood, seam in trunk, asymmetric
6465	Retain	3	8,11	Bigleaf maple	12	1	2	Yes	Double leader with included bark
6466	Remove	0	11	Bigleaf maple	14	1	3	No	Trunk cracks/decay
6467	Retain	1	8	Bigleaf maple	10	1	2	Yes	Asymmetric canopy
6468	Retain	1	8	Bigleaf maple	10	1	2	Yes	Suppressed tree
6469	Retain	2	6,7,8	Bigleaf maple	12	1	2	Yes	Suppressed, stump sprout, deadwood
6470	Retain	1	6	Western red-cedar	8	1	1	Yes	
6471	Retain	8	10,10, 14,14	Bigleaf maple	16	1	2	Yes	Stump sprout
6472	Retain	6	20	Bitter cherry	16	1	2	Yes	Asymmetric canopy



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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
6473	Retain	5	6,8,10,12	Bigleaf maple	12	1	2	Yes	Stumpsprout, asymmetric
6474	Retain	8	10,10,14,14	Bigleaf maple	18	2	2	Yes	Stumpsprout, decay, deadwood
6475	Retain	3	15	Bigleaf maple	12	2	2	Yes	Stumpsprout, decay, previous failure
6476	Retain	10	29	Hemlock	16	2	1	Yes	Thinning canopy
6477	Retain	1	7	Western red-cedar	6	1	1	Yes	
6478	Retain	5	18	Western red-cedar	8	1	1	Yes	
7242	Retain	8	16,18	Madrone	14	1	2	Yes	Stumpsprout
7244	Retain	4	12,12	Maple	12	1	2	Yes	Stumpsprout
7245	Retain	1	6	Maple	10	1	1	Yes	
7246	Retain	1	6,6	Cherry	6	2	1	Yes	Diseased
7249	Retain	1	8	Cherry	6	2	1	Yes	Diseased
7250	Retain	8	(4) 8-16	Maple	16	1	2	Yes	Stumpsprout
7252	Retain	3	14	Alder	12	1	1	Yes	
7253	Retain	1	10	Alder	8	1	1	Yes	
7254	Retain	2	12	Alder	10	1	1	Yes	
7255	Retain	2	12	Alder	10	1	1	Yes	
7256	Retain	2	12	Alder	8	1	1	Yes	
7257	Retain	1	10	Alder	10	1	1	Yes	

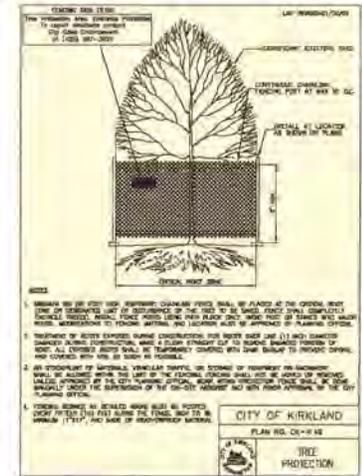


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Tree Number	Tree Status: Remove or Retain	Density Credit	DBH	Tree Species	Dripline	Health	Structure	Viable Tree?	Defects/notes
7258	Retain	2	12	Alder	10	1	1	Yes	
7259	Retain	2	12	Alder	10	1	1	Yes	
7260	Retain	2	12	Alder	8	1	1	Yes	
A	Remove	0	32	Douglas-fir	16	2	3	No	Asymmetric, decline
B	Remove	0	14	Western red-cedar	10	2	3	No	Trunk decay, suppressed
C	Retain	1	10	Western red-cedar	8	1	2	Yes	Suppressed
D	Retain	6	20	Red alder	14	1	2	Yes	Sweep in trunk
E	Retain	6	20	Bigleaf maple	16	2	2	Yes	Deadwood, asymmetric
F	Retain	12	32	Douglas-fir	16	1	1	Yes	
G	Retain	15	38	Douglas-fir	18	1	1	Yes	
H	Remove	0	6,6,8, 8,10,10	Bigleaf maple	16	2	3	No	Deadwood, decay, stumpsprout
I	Remove	1	8	Alaska weeping cedar	6	1	1	Yes	
J	Remove	1	6	Mountain hemlock	6	1	1	Yes	
K	Remove	1	6	Mountain hemlock	6	1	1	Yes	
L	Retain	13	34	Douglas-fir	34	1	1	Yes	



SW 1/4 SECTION 22, TOWNSHIP 26 N, RANGE 5 E, W.M.
CALVERT ANDERSON PUD



CALVERT ANDERSON PUD/DP SUBMITTAL
 INTEGRATED TREE PLAN
 12204, 12224, & 12234 NORTH AVE NE
 BENTONVILLE, MISSOURI 64826

GDM INVESTMENTS, LLC
 6075 SE 90TH STREET, SUITE 103
 MCKENZIE, MO, MO 64578
 (417) 425-1147



DATE: _____
 REVIEW: _____
 APPROVED: _____

DRAFTED BY: GRS
 DESIGNED BY: MJA
 PROJECT ENGINEER: MAJ
 DATE: 02.21.16
 PROPERTY NO.: 12657

DRAWING: C3
 SHEET: 3 OF 1

TREE TABLE

TREE #	LOT AREA (SQ. FT.)	EXISTING TREES	RETAINED TREES	RETAINED TREE CROWN (PROPOSED TREE DENSITY DIVIDED)	PROPOSED TREE DENSITY	PROPOSED TREE DENSITY CROWN
1	5,714	2	17	0	0	0
2	5,714	0	0	0	0	0
3	5,714	0	0	0	0	0
4	5,714	0	0	0	0	0
5	5,714	0	0	0	0	0
6	5,714	17	17	0	0	0
7	5,714	0	0	0	0	0
8	5,714	0	0	0	0	0
9	5,714	0	0	0	0	0
10	5,714	0	0	0	0	0
11	5,714	0	0	0	0	0
12	16,801	0	0	0	0	0
13	25,844	21	21	12	15	27
14	16,801	40	40	26	33	79
15	5,714	0	0	0	0	0
16	5,714	13	11	47	8	47
17	5,714	0	0	0	0	0
18	5,714	2	2	37	0	37
19	5,714	0	0	0	0	0
20	5,714	0	0	0	0	0
21	16,801	10	1	18	7	18
22	11,778	7	7	10	0	10
23	5,714	0	0	0	0	0
24	5,714	2	0	0	0	0
25	5,714	0	0	0	0	0
26	5,714	0	0	0	0	0
27	26,778	10	42	280	29	289
28	22,815	29	45	208	23	208
TOTAL						841



TREE DENSITY REQUIREMENT

THE REQUIRED MINIMUM TREE DENSITY IS 30 TREE CROWNS PER ACRE.
 TOTAL SITE AREA = 298,017 SQ. FT. (2.08 AC)
 TREE DENSITY REQUIRED = 7,549 X .30 = 2,264 TREE CROWNS.
 TREE DENSITY PROVIDED = 841
 TREE DENSITY REPLACEMENT CROWN REQUIRED = 0

NOTES:

- TREE LOCATIONS AND TAG NUMBERS FOR FIELD SURVEY BY G.D. MOORE CONSULTING ENGINEERS.
- TAG NUMBERS FOR NON-LIVABLE TREES OBTAINED FROM AERIAL PHOTOGRAPHY PREPARED BY UNIFORMITY, INC. DATED 12/14/15.

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 Attachment No. 3 - Tree Plan

