

MADRONA RIDGE SURVEY AND TREE CONSERVATION PLAN

Report Date: 09/01/06
Report Amended Date : 10/23/08
Richard R Hefley
Consulting Arborist
ISA #PN-0784A



CONTENTS:

<i>TITLE PAGE</i>	Page 1
<i>CONTENTS</i>	Page 2
<i>SUMMARY / ASSIGNMENT</i>	Page 3
<i>BACKGROUND / METHODS</i>	Page 4
<i>SURVEY A DEFINITIONS & TABLES</i>	Pages 5-9
<i>SURVEY B DEFINITIONS & TABLES</i>	Pages 10-15
<i>SURVEY B SITE PLAN</i>	Page 16
<i>CANOPY COVERAGE AREAS</i>	Page 17
<i>CANOPY COVERAGE MAP</i>	Page 18
<i>TREE PROTECTION REQUIREMENTS</i>	Page 19
<i>TREE CONSERVATION PLAN</i>	Page 20
<i>TREE DENSITY CALCULATIONS</i>	Page 21
<i>TREE UNIT CALCULATIONS / LOT</i>	Pages 22-25
<i>LANDSCAPE PLAN NOTES</i>	Page 26
<i>PLANT KEY</i>	Page 27
<i>RAINGARDEN DIAGRAM - #1</i>	Page 29
<i>RAINGARDEN DIAGRAM #2</i>	Page 30
<i>RAINGARDEN DIAGRAM #3</i>	Page 31
<i>TREE CONSERVATION PLAN DIAGRAM</i>	Page 32
<i>LANDSCAPE PLAN DIAGRAM #1</i>	Page 33
<i>LANDSCAPE PLAN DIAGRAM #2</i>	Page 34

SUMMARY:

1. The purpose is to identify and measure desirable trees in the Madrona Ridge property, and determine the area covered by tree canopies.
2. Survey A determined the types and measurements of trees in an 80,000 sq ft area.
3. From this survey it is determined that there are 128 Tree Units / 40,000 sq ft. The PT Code 19.06 requires 40 Tree Units.
4. Survey B determined the type, health and location of all trees over 20" in diameter throughout the entire area. It is accompanied by a site plan prepared by WestSound Engineering showing the location of these trees.
5. An aerial photo, separate from this report, was used to determine a canopy density of at least 35%. The maximum required is 25%.
6. The Tree Conservation Plan identifies the planting philosophy of Madrona Ridge, methods for preserving existing native vegetation, and reasons for requesting an exemption from Tree Credit Unit requirements for certain lots.
7. Tree Unit Calculations Per Lot table illustrates the lot # and size, tree units required, and notes lots where an exemption is requested.
8. The Landscape Plan details the planting philosophy for the Madrona Ridge street trees, shrubs and groundcovers.
9. Diagrams are provided of sample raingardens for different site locations, as well as copies of the Tree Conservation and Landscape Plans.

ASSIGNMENT:

The purpose of this Tree Report is;

1. Identify the desirable genus and species of trees on the property.
2. Determine required Tree Units from a sample size
3. Designate trees of a significant size. This was determined to be greater than 20" in diameter.
4. Note the health and condition of these trees.
5. Number and locate these trees on a site plan.
6. Determine the approximate canopy coverage for the purpose of complying with the Port Townsend Municipal Code 19.06.
7. Provide a written protection plan to be used in the course of development of this property.

BACKGROUND:

I was contacted by Jeremy Scott, property owner, and Craig Baldwin of WestSound Engineering in June 2006 for the purpose of preparing a Tree Conservation Plan for the Scott property located at Section 9, Township 30 North, Range 1 West, W.M. Jefferson County. This area consists of approx. 35 acres of trees and pasture.

The predominant desirable species of trees consist of Douglas Fir, Madrone, and some Western Red Cedar.

The undesirable species consist of native Willows, Bitter Cherry, and Alder.

These trees are commonly known to be short lived, have brittle wood which breaks easily, and have a poor record of surviving the stresses of development

I initially measured an 80,000 square foot representative section of the property, cataloging all trees, their measurements and conditions.

The results are listed in SURVEY A.

Due to the scope of this project, I requested of John McDonagh, Port Townsend City Planner, that I reduce the scale of the survey to trees with a measurement of 20" or greater diameter. These are considered to be priority trees.

These results are listed as SURVEY B.

METHODS:

To obtain the tree type, measurements and conditions I examined all desirable species of trees on the property.

A visual inspection determined the general condition of the tree. I examined the canopy for dead branches and thickness of the foliage, and the trunk for obvious flaws such as fungal growths, dramatic leans, visible rot etc.

I would then measure the tree using a caliper tape measure.

I then fixed a numbered aluminum tag onto the tree with a 2" aluminum nail.

Trees with a diameter greater than 20" were marked with lime-green flagging tape.

Trees less than 20" that are part of SURVEY A are marked with orange flagging tape.

SURVEY A:

The purpose of this survey is to take a representative sample of the variety of trees and their sizes of the Madrona Ridge property.

I surveyed an area of approximately 80000 square feet. The area is a 400' x 200' rectangle located east of the existing house and south of the gravel drive.

SURVEY A DEFINITIONS:

- # - refers to the numbered tag fixed to each tree
- TYPE – refers to the genus and species of the tree.
 - Madrone = *Arbutus menziesii*
 - Doug Fir = *Pseudotsuga menziesii*
 - Cedar = *Thuja plicata*
 - Cottonwood = *Populus nigra*
- CALIPER – refers to the tree’s diameter measured at 4.5’ above ground, or the sum of its multi-trunked leaders measured at 4.5’ above ground.
- CONDITION– refers to the sum of my visual assessment of the tree.
 - Excellent = no visual flaws, full canopy, and branching close to the ground.
 - Good = minor flaws such as a light canopy or high branching, a few dead limbs in the case of Madrones, but still a structurally sound tree.
 - Fair = more flaws; tree may be retained in some conditions. Recommend further evaluation.
 - Poor= significant flaws, tree should be removed.
- NOTES – offers some explanation of condition rating or caliper of tree.

SURVEY A TABLE 1:

#	TYPE	CALIPER	CONDITION	NOTES
001	Doug Fir	16.0	Excellent	
002	Madrone	22.0	Good	3 trunks
003	Madrone	17.0	Fair	2 trunks
004	Madrone	11.5	Good	2 trunks
005	Doug Fir	16.5	Excellent	
006	Doug Fir	11.0	Fair	
007	Doug Fir	10.0	Good	
008	Doug Fir	11.0	Good	
009	Doug Fir	21.0	Excellent	
010	Madrone	16.5	Good	2 trunks
011	Doug Fir	11.0	Good	
012	Madrone	27.0	Good	2 trunks
013	Doug Fir	31.0	Excellent	
014	Madrone	11.0	Good	
015	Madrone	12.0	Good	2trunks
016	Madrone	10.0	Good	
017	Madrone	11.0	Good	
018	Doug Fir	26.0	Good	
019	Doug Fir	12.0	Excellent	
020	Doug Fir	17.0	Excellent	
021	Madrone	16.0	Good	2 trunks
022	Doug Fir	15.0	Good	
023	Madrone	12.0	Good	

024	Doug Fir	10.0	Good	
025	Doug Fir	10.0	Good	
026	Doug Fir	9.0	Good	
027	Doug Fir	26.0	Good	
028	Doug Fir	12.0	Good	
029	Doug Fir	16.5	Good	
030	Doug Fir	18.0	Good	
031	Doug Fir	16.0	Good	
032	Doug Fir	12.0	Good	
033	Doug Fir	14.5	Good	
034	Doug Fir	12.0	Good	
035	Doug Fir	13.0	Good	
036	Doug Fir	11.5	Good	
037	Doug Fir	12.0	Fair	
038	Doug Fir	17.0	Good	
039	Doug Fir	13.5	Good	
040	Doug Fir	12.5	Good	
041	Doug Fir	12.0	Poor	Lean and trunk damage. REMOVE
042	Doug Fir	16.0	Good	
043	Doug Fir	13.0	Good	
044	Doug Fir	13.5	Good	
045	Doug Fir	10.0	Good	
046	Madrone	13.0	Good	
047	Doug Fir	16.5	Fair	Trunk damage
048	Doug Fir	13.0	Good	
049	Doug Fir	7.0	Good	
050	Doug Fir	7.0	Good	
051	Doug Fir	10.0	Poor	Lean REMOVE
052	Doug Fir	14.0	Good	
053	Doug Fir	9.0	Good	
054	Doug Fir	9.5	Good	
055	Madrone	6.5	Good	
056	Madrone	7.0	Good	
057	Madrone	26.5	Fair	2 trunks. Dead top and dieback.
058	Doug Fir	11.0	Good	
059	Madrone	8.0	Good	
060	Madrone	8.0	Fair	Dieback in crown
061	Madrone	7.0	Fair	Dieback in crown
062	Madrone	10.0	Good	

063	Doug Fir	17.0	Good	
064	Madrone	10.0	Fair	Dieback in crown
065	Doug Fir	20.0	Excellent	
066	Doug Fir	9.5	Excellent	
067	Doug Fir	10.5	Good	
068	Doug Fir	8.0	Good	
069	Doug Fir	11.0	Good	
070	Doug Fir	12.0	Fair	Galls on trunk
071	Madrone	8.0	Good	
072	Madrone	10.0	Good	
073	Doug Fir	6.5	Excellent	
074	Madrone	8.0	Fair	Dieback in crown
075	Doug Fir	9.0	Good	
076	Madrone	12.0	Good	2 trunks
077	Madrone	10.0	Fair	Trunk damage
078	Doug Fir	14.0	Good	
079	Madrone	8.0	Good	
080	Madrone	10.0	Good	
081	Doug Fir	13.0	Good	
082	Doug Fir	11.0	Good	
083	Madrone	8.0	Good	
084	Doug Fir	19.0	Excellent	
085	Madrone	10.0	Good	
086	Madrone	6.0	Good	
087	Madrone	5.5	Fair	
088	Madrone	8.0	Good	
089	Madrone	9.0	Good	
090	Madrone	11.0	Good	
091	Madrone	7.0	Good	
092	Doug Fir	17.0	Excellent	
093	Doug Fir	14.0	Good	
094	Doug Fir	11.5	Good	
095	Madrone	7.0	Good	
096	Doug Fir	10.0	Poor	Fallen – REMOVE
097	Doug Fir	13.5	Good	
098	Doug Fir	6.0	Excellent	
099	Doug Fir	12.0	Good	
100	Doug Fir	14.0	Excellent	
101	Doug Fir	8.0	Fair	Trunk damage
102	Doug Fir	8.0	Good	
103	Doug Fir	20.0	Excellent	
104	Doug Fir	15.0	Good	
105	Madrone	33.0	Excellent	

106	Doug Fir	15.0	Good	
107	Doug Fir	14.0	Good	
108	Doug Fir	14.0	Good	
109	Doug Fir	12.0	Fair	
110	Doug Fir	11.5	Good	
111	Doug Fir	11.0	Good	
112	Doug Fir	8.5	Fair	Corrected lean
113	Doug Fir	13.0	Excellent	
114	Doug Fir	9.0	Good	
115	Doug Fir	9.0	Good	
116	Doug Fir	15.0	Good	
117	Doug Fir	10.0	Good	
118	Madrone	14.0	Fair	3 trunks
119	Doug Fir	10.0	Poor	Fallen – REMOVE
120	Doug Fir	5.5	Fair	
121	Doug Fir	6.5	Fair	
122	Doug Fir	8.0	Good	
123	Doug Fir	13.5	Good	
124	Doug Fir	9.0	Fair	Lean
125	Madrone	8.0	Good	
126	Doug Fir	10.0	Fair	Lean
127	Doug Fir	10.0	Good	
128	Doug Fir	14.0	Fair	Corrected lean
129	Doug Fir	7.0	Excellent	
130	Doug Fir	9.0	Good	
131	Doug Fir	9.0	Good	
132	Madrone	36.0	Good	4 trunks
133	Doug Fir	15.0	Good	
134	Doug Fir	9.0	Good	
135	Doug Fir	12.5	Good	
136	Doug Fir	12.0	Fair	
137	Doug Fir	10.0	Good	
138	Doug Fir	12.0	Good	
139	Doug Fir	10.0	Good	
140	Doug Fir	10.0	Good	
141	Doug Fir	8.0	Good	
142	Doug Fir	18.0	Fair	Dual leader
143	Doug Fir	8.5	Good	
144	Doug Fir	14.0	Good	
145	Doug Fir	6.5	Good	
146	Doug Fir	10.0	Good	
147	Madrone	23.5	Good	
148	Doug Fir	14.0	Good	
149	Doug Fir	7.5	Good	
150	Doug Fir	10.0	Good	

151	Doug Fir	10.0	Good	
152	Cedar	21.0	Fair	Rot in trunk
153	Doug Fir	21.5	Fair	Dual leaders
154	Doug Fir	12.0	Good	
155	Doug Fir	11.0	Good	
156	Doug Fir	10.0	Good	
157	Doug Fir	16.0	Good	
158	Doug Fir	15.0	Good	
159	Doug Fir	12.5	Good	
160	Doug Fir	14.0	Good	
161	Doug Fir	15.0	Good	
162	Doug Fir	11.0	Good	
163	Cedar	17.0	Fair	Dead branches in crown
164	Cedar	11.0	Good	
165	Madrone	11.0	Good	
166	Doug Fir	10.0	Good	
167	Doug Fir	19.0	Excellent	
168	Doug Fir	9.0	Good	
169	Doug Fir	11.0	Good	
170	Madrone	12.0	Good	
171	Madrone	17.0	Fair	Dead top - 2 trunks
172	Doug Fir	12.0	Good	
173	Doug Fir	10.0	Good	

RESULTS OF SURVEY A:

The survey measures 80,000 sq. ft., which is approx 1/16th of the area to be developed.

173 trees surveyed showed 142 trees to be in Good to Excellent condition.

SURVEY A shows the number of Tree Units (TU) as defined by PT Code 19.06 to be 256 for the entire area of 80,000 sq ft, or 128TU / 40,000 sq ft unit.

PT Code 19.06 requires 40 TU / 40,000 sq ft. for Zone R-1, R-2.

Madrona Ridge currently averages 128 TU / 40,000 sq ft.

SURVEY A Summary Table

	Doug Fir-total 126	Madrone-total 44	Cedar-total 3
Condition-excellent	17	1	0
Condition-good	90	33	1
Condition-fair	15	10	2
Condition-poor	4	0	0
Diameter 1"-6"	5	0	0
Diameter 7"-19"	113	38	2
Diameter 20"+	8	6	1

SURVEY B TABLE:

The following table lists the data collected.

Definitions;

---# - refers to the numbered tag fixed to each tree

---TYPE - refers to the genus and species of the tree.

Madrone = *Arbutus menziesii*

Doug Fir = *Pseudotsuga menziesii*

Cedar = *Thuja plicata*

Cottonwood = *Populus nigra*

---CALIPER - refers to the tree's diameter measured at 4.5' above ground, or the sum of its multi-trunked leaders measured at 4.5' above ground.

---CONDITION- refers to the sum of my visual assessment of the tree.

Excellent = no visual flaws, full canopy, and branching close to the ground.

Good = minor flaws such as a light canopy or high branching, a few dead limbs in the case of Madrones, but still a structurally sound tree.

Fair = more flaws; tree may be retained in some conditions. Recommend further evaluation.

---NOTES - offers some explanation of condition rating or caliper of tree.

#	TYPE	CALIPER	CONDITION	NOTES
002	Madrone	22.0	Good	3 trunks
009	Doug Fir	21.0	Excellent	
012	Madrone	27.0	Good	2 trunks
013	Doug Fir	31.0	Excellent	

018	Doug Fir	26.0	Good	
027	Doug Fir	26.0	Good	
057	Madrone	26.5	Fair	2 trunks, 1 dead
065	Doug Fir	20.0	Excellent	
084	Doug Fir	20.0	Excellent	
103	Doug Fir	20.0	Excellent	
105	Madrone	33.0	Excellent	
132	Madrone	36.0	Good	4 trunks
147	Madrone	23.5	Good	
152	Cedar	21.0	Fair	Rot in trunk
153	Doug Fir	21.5	Fair	2 trunks
216	Doug Fir	21.0	Good	
217	Doug Fir	22.0	Excellent	
218	Madrone	21.0	Excellent	
219	Madrone	32.0	Fair	3 trunks, some rot
220	Doug Fir	21.0	Good	
221	Doug Fir	21.0	Good	
222	Doug Fir	23.0	Good	
223	Doug Fir	21.0	Good	
224	Doug Fir	21.0	Good	
225	Cedar	22.5	Good	
226	Cedar	22.0	Good	
227	Cedar	25.0	Good	
228	Cedar	34.0	Fair	2 trunks
229	Cedar	22.0	Good	
230	Cedar	21.0	Good	
231	Cedar	21.0	Good	
232	Cedar	22.5	Good	
233	Cedar	44.0	Fair	3 trunks
234	Doug Fir	21.0	Good	
235	Doug Fir	21.0	Good	
236	Doug Fir	21.0	Good	2trunks
237	Madrone	33.0	Good	
238	Doug Fir	21.0	Good	
239	Doug Fir	21.0	Good	
240	Doug Fir	21.0	Good	
241	Doug Fir	21.0	Good	
242	Doug Fir	23.0	Good	
243	Doug Fir	24.0	Good	
244	Doug Fir	22.0	Good	
245	Madrone	21.0	Good	
246	Doug Fir	22.0	Good	
247	Doug Fir	23.0	Good	
248	Cedar	30.0	Fair	6 trunks
249	Cedar	28.0	Good	
250	Doug Fir	24.0	Good	

251	Doug Fir	22.5	Good	
252	Doug Fir	21.0	Good	
253	Madrone	20.0	Good	
254	Doug Fir	21.0	Good	
255	Doug Fir	21.0	Good	
256	Doug Fir	21.0	Good	
257	Doug Fir	21.0	Good	
258	Madrone	23.0	Good	
259	Doug Fir	22.0	Good	
260	Doug Fir	22.0	Good	
261	Doug Fir	22.5	Good	
262	Doug Fir	21.0	Fair	Lean in base of tree
263	Doug Fir	21.0	Good	
264	Madrone	21.0	Good	3 trunks
265	Doug Fir	22.0	Good	
266	Doug Fir	20.0	Good	
267	Doug Fir	20.0	Good	
268	Madrone	33.0	Good	3 trunks
269	Madrone	23.0	Good	2trunks
270	Madrone	37.0	Good	3 trunks
271	Madrone	22.0	Good	
272	Doug Fir	24.0	Excellent	
273	Doug Fir	20.0	Good	
274	Doug Fir	22.0	Good	
275	Madrone	44.0	Good	2 trunks
276	Doug Fir	21.0	Good	
277	Madrone	30.0	Good	2trunks
278	Madrone	24.0	Good	3 trunks
279	Madrone	21.0	Good	2 trunks
280	Doug Fir	20.0	Fair	Corrected lean
281	Madrone	24.0	Good	2 trunks
282	Madrone	34.0	Good	3 trunks
283	Madrone	33.0	Good	2 trunks
284	Doug Fir	28.5	Excellent	
285	Doug Fir	23.0	Excellent	
301	Madrone	21.0	Good	
302	Madrone	34.0	Excellent	
303	Madrone	35.0	Good	5 trunks
304	Doug Fir	24.5	Excellent	
305	Madrone	24.0	Good	2 trunks
306	Doug Fir	20.0	Good	Corrected lean
307	Madrone	22.0	Fair	2 trunks, 1 is dead
308	Madrone	21.0	Good	
309	Doug Fir	21.0	Excellent	
310	Madrone	25.0	Good	2 trunks
311	Madrone	26.0	Good	

312	Madrone	21.0	Good	
313	Madrone	21.0	Good	3trunks
314	Doug Fir	21.0	Good	
315	Doug Fir	21.0	Good	Corrected lean
316	Madrone	22.0	Good	2 trunks
317	Madrone	20.0	Good	
318	Madrone	22.0	Good	2 trunks
319	Madrone	21.0	Good	
320	Madrone	23.0	Good	2 trunks
321	Doug Fir	22.0	Good	
322	Madrone	20.0	Good	
323	Doug Fir	21.0	Good	
324	Doug Fir	21.0	Good	
325	Doug Fir	20.0	Good	
326	Madrone	34.0	Good	2 trunks
327	Doug Fir	20.0	Good	
328	Doug Fir	21.0	Good	
329	Madrone	28.0	Good	
330	Doug Fir	19.0	Good	
331	Doug Fir	21.0	Good	
332	Doug Fir	21.0	Good	
333	Doug Fir	20.0	Good	
334	Doug Fir	22.0	Excellent	
335	Madrone	37.0	Good	3 trunks
336	Madrone	20.0	Good	2 trunks
337	Doug Fir	21.0	Good	
338	Doug Fir	22.0	Good	
339	Doug Fir	20.0	Good	
340	Madrone	31.0	Good	2 trunks
341	Doug Fir	21.0	Good	
342	Doug Fir	20.0	Good	
343	Doug Fir	24.5	Excellent	
344	Doug Fir	25.0	Good	
345	Madrone	28.0	Good	5 trunks
346	Doug Fir	20.0	Good	
347	Madrone	27.0	Good	3 trunks
348	Doug Fir	20.0	Excellent	
349	Madrone	27.0	Good	2 trunks
350	Doug Fir	20.0	Good	
351	Doug Fir	20.0	Good	
352	Doug Fir	21.0	Excellent	
353	Doug Fir	20.0	Good	
354	Madrone	24.0	Good	2 trunks
355	Madrone	24.0	Good	
356	Madrone	32.0	Good	
357	Madrone	40.0	Good	2 trunks

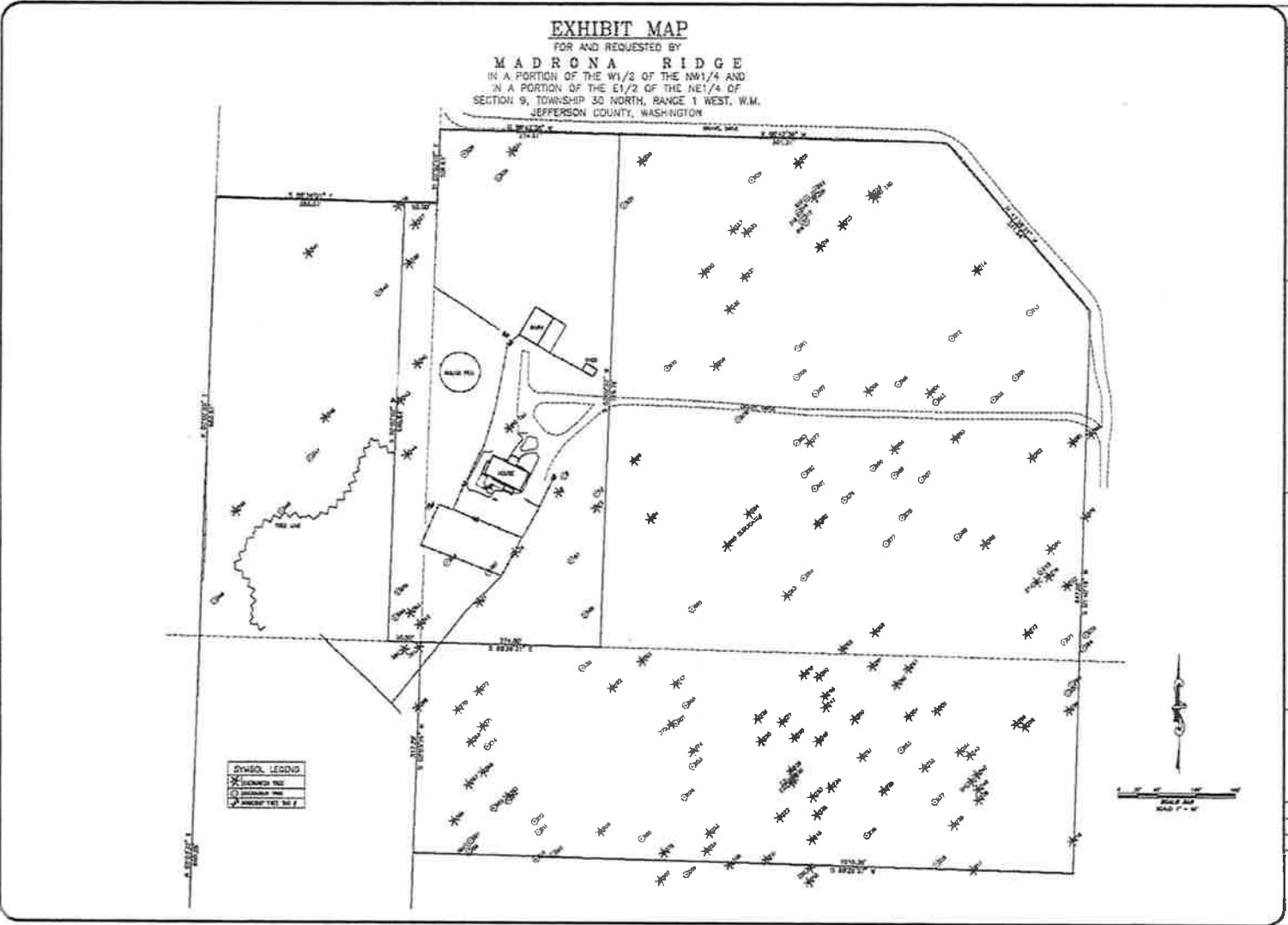
358	Doug Fir	25.5	Good	
359	Cottonwood	26.0	Good	
360	Cottonwood	20.0	Good	
361	Cottonwood	23.0	Good	
362	Madrone	25.0	Good	2 trunks
363	Madrone	34.0	Good	3 trunks
364	Madrone	24.0	Good	3 trunks
365	Doug Fir	22.0	Good	
366	Doug Fir	20.0	Good	
367	Doug Fir	21.0	Fair	Lean
368	Doug Fir	22.0	Good	Corrected lean
369	Doug Fir	26.0	Excellent	
370	Doug Fir	21.0	Good	
371	Doug Fir	21.5	Good	
372	Doug Fir	21.0	Good	
373	Doug Fir	20.0	Good	
374	Doug Fir	21.0	Fair	Lean
376	Madrone	21.0	Good	
377	Doug Fir	20.0	Good	
378	Doug Fir	20.0	Good	
380	Doug Fir	34.0	Good	
381	Doug Fir	23.5	Good	
382	Doug Fir	20.0	Good	
383	Doug Fir	20.0	Good	Corrected lean
384	Doug Fir	20.0	Good	
385	Madrone	24.0	Good	2 trunks
386	Madrone	21.0	Good	
387	Madrone	48.0	Good	4 trunks
388	Madrone	26.0	Good	3 trunks
389	Doug Fir	20.0	Good	
390	Doug Fir	21.0	Good	

SURVEY B SITE PLAN:

The following site plan was prepared by WestSound Engineering It shows the location of all trees from Survey B.

The '*' symbol denotes a coniferous tree (Douglas Fir, Western Red Cedar).

The 'o' symbol denotes a broadleaf tree (Madrone, Cottonwood)



 WestSound Engineering, Inc. 2111 W. 10th Street Portland, OR 97224 Phone: (503) 241-1170 Fax: (503) 241-1171 E-mail: westsound@westsoundeng.com		EXHIBIT MAP FOR AND REQUESTED BY MADRONA RIDGE <small>IN A PORTION OF THE W1/2 OF THE NW1/4 OF SECTION 9, TOWNSHIP 30 NORTH, RANGE 1 WEST, W.M. JEFFERSON COUNTY, WASHINGTON</small>		DATUMS NATIONAL FEDERAL STATE LOCAL		1 of 1	
SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY	SEARCHED FOR RECORDED FOR RECORDED BY

CANOPY COVERAGE AREAS:

Accompanying this report is a 36" x 48" aerial photograph of the Madrona Ridge property.

Though the resolution is not clear, it can be determined from this the area of canopy coverage of desirable species of trees.

From this photo it can be determined that at least 35% of the area surveyed is covered with canopy of desirable trees (Douglas Fir, Madrone, Western Red Cedar).

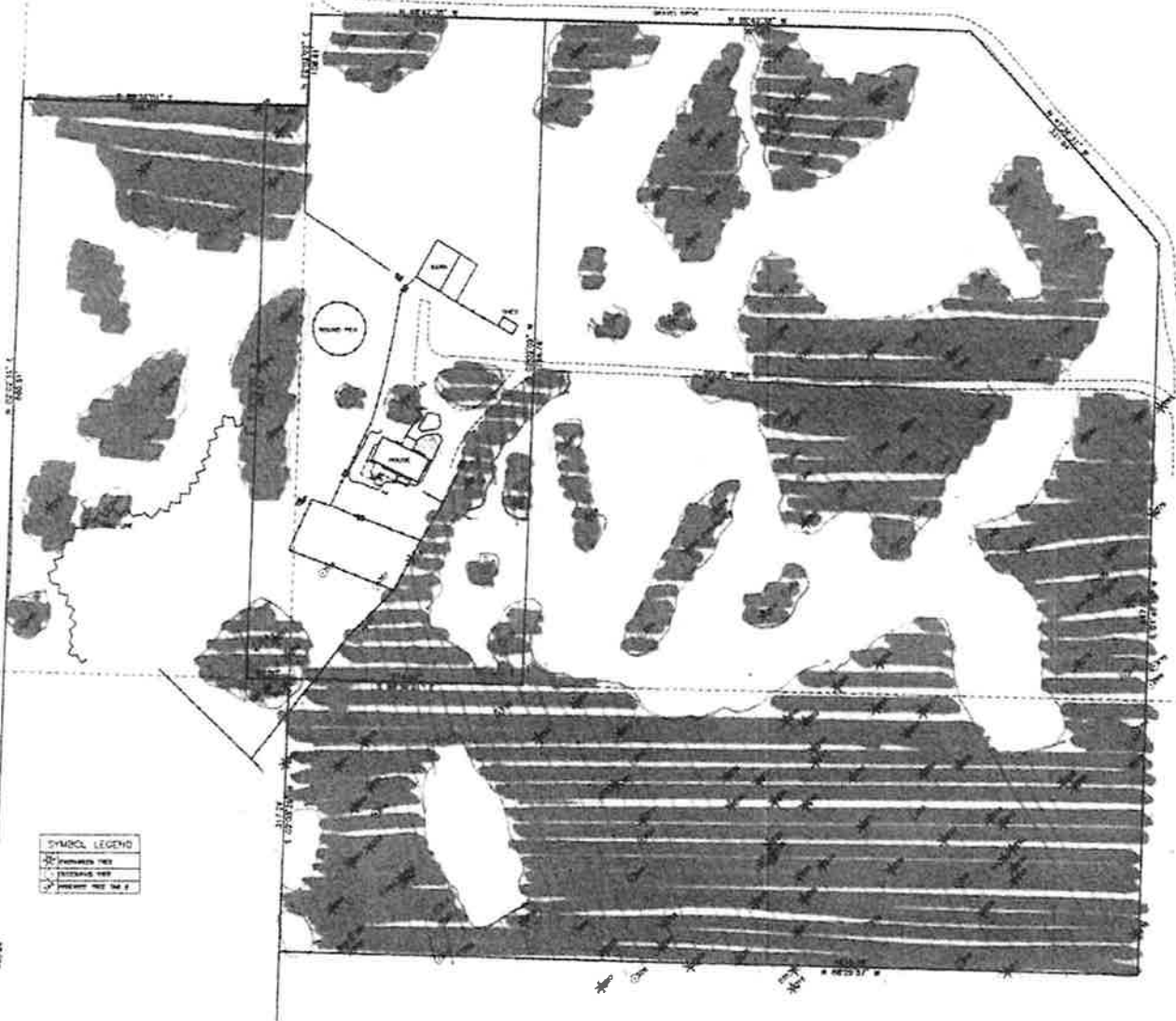
I have included on the following page the site map provided by WestSound Engineering. The areas densely covered with desirable species has been shaded in Red. It should be assumed that the shaded areas represent at least 80% canopy coverage. The remaining areas have been left White, though they may contain Madrone and smaller Douglas Firs that are not visible from aerial photos.

Using the PT Code 19.06.120 Table for canopy coverage, the maximum required for R-1, R-2 is 25%

Madrona Ridge possesses at least 35% canopy coverage.

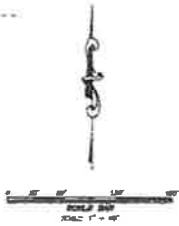
EXHIBIT MAP

FOR AND REQUESTED BY
MADRONA RIDGE
 IN A PORTION OF THE W1/2 OF THE NW1/4 AND
 IN A PORTION OF THE E1/2 OF THE NE1/4 OF
 SECTION 9, TOWNSHIP 30 NORTH, RANGE 1 WEST, W.M.
 JEFFERSON COUNTY, WASHINGTON



SYMBOL LEGEND

[Symbol]	PROPERTY LINE
[Symbol]	ADJACENT PROPERTY
[Symbol]	EXISTING ROAD
[Symbol]	PROPOSED ROAD



DATE PLOTTED	11/11/11
PLANNED BY	WEST SOUND ENGINEERING, INC.
CHECKED BY	WEST SOUND ENGINEERING, INC.
DATE	11/11/11
PROJECT NO.	1 of 1
DATUMS	
HORIZONTAL	NAD 83
VERTICAL	NAVD 83
SCALE	AS SHOWN
PROJECT	SECTION 9, TOWNSHIP 30 NORTH, RANGE 1 WEST, W.M. JEFFERSON COUNTY, WASHINGTON
EXHIBIT MAP	
FOR AND REQUESTED BY MADRONA RIDGE IN A PORTION OF THE W1/2 OF THE NW1/4 AND IN A PORTION OF THE E1/2 OF THE NE1/4 OF SECTION 9, TOWNSHIP 30 NORTH, RANGE 1 WEST, W.M. JEFFERSON COUNTY, WASHINGTON	
WestSound Engineering, Inc. 217 E. West Drive, Post Office Box 8008 Spokane, WA 99208 Phone: 509-325-1111 Fax: 509-325-1112 Email: westsound@westsoundeng.com http://www.westsoundeng.com	
DATE PLOTTED	11/11/11
PLANNED BY	WEST SOUND ENGINEERING, INC.
CHECKED BY	WEST SOUND ENGINEERING, INC.
DATE	11/11/11
PROJECT NO.	1 of 1

TREE PROTECTION PLAN REQUIREMENTS:

Pre-Development;

1. Locate all trees to be preserved.
2. Assess their health and suitability for preservation.
3. Designate all trees or groups of trees to be preserved prior to development.
4. Place a physical barrier at 3' beyond the dripline of the trees to be preserved wherever possible. An ideal protection zone should be 1' radius from the tree's trunk for every 1" diameter of the trunk (a 10" diameter tree should have a protection zone of a 10' radius from the trunk).
5. Additional protection can be provided by placing mulch up to 12" deep in areas outside the fenceline to prevent soil compaction.
6. Water stressed trees may be irrigated and fertilized prior to development to relieve stress.
7. Limit access of contractors and designate sites for material storage as far from root zones as possible.
8. Plan to minimize grade changes.
9. A 24" caliper Douglas Fir appraises for approx. \$5000.00. Be certain contractors are aware of the value of your trees. Some developers have used fines to help contractors remember not to violate the protection zones of desirable trees.

Development;

1. Prune branches that interfere with construction equipment to prevent tearing.
2. Prune exposed roots with a sharp saw to prevent further tearing.
3. Mitigate grade changes to prevent destruction of roots.
4. Tunnel beneath anchoring roots where possible.

Post-Development;

1. Alleviate soil compaction with air-spade
2. Irrigate water-stressed trees
3. Provide mulch for trees which no longer have the protection of groundcover.
4. Prune damaged limbs or exposed roots.

09/01/06

Richard R Hefley
Consulting Arborist
ISA # PN-0784A
PO Box 177
Nordland WA 98358
360.385.2921
rkhefley@olympen.com

TREE CONSERVATION PLAN
Madrona Ridge

10/23/08

Background:

I was asked to complete a Tree Conservation Plan on 07/14/08.
This plan provides information and details in addition to the initial Tree Survey and Tree Conservation Plan dated 09/01/06.

Observations, General:

The Tree Conservation and Landscape Plans require the preservation and augmentation of native trees and shrubs.

The preservation of native plant communities is the prime component of the plans. Where vegetation removals are required, the replanting is to be done primarily with native vegetation.

The Madrona Ridge property consists primarily of mixed aged conifers, Douglas Fir and Western Red Cedar, with a fair percentage of Madrones.

Previous surveys have identified significant sized trees that will be given priority for retention.

It is recommended that the minimum protection for these mature priority trees be a protection fence located slightly beyond the canopy of the tree.

I recommend that trees to be retained be part of a larger grove of trees or native shrubs for reasons of health and stability.

Isolated trees, particularly when they were once part of a larger grove, have a very high rate of failure.

Due to the large amounts of parks and greenways planned for this development (approximately 25% of the available space for development), the small size of many of the lots to be developed as cottage housing, and the planned use of both passive and/or solar power in this development, I strongly recommend that certain lots be exempt from the Tree Units Required.

The attached Landscape Plan denotes approximately 20% of the development as Retained Native Vegetation.

The Tree Conservation Plan denotes an addition of approximately 5-10% of the total development area to be Retained Native Vegetation. This consists primarily of areas attached to the Common Areas which extend into private property.

Raingardens located in the common areas which will require the initial removal of the native vegetation will be replanted with native groundcovers, shrubs and trees, or a low

growing turf variety that incorporates a majority of elements of native plants (such as a grass/wildflower mix).

Tree Density Calculations Table :

The Lot# column corresponds to the lot numbers given on the attached site plan.

The Lot Square Footage column has been rounded to the nearest foot.

The Tree Units Required has been rounded to the nearest ½ Tree Unit.

.Per Port Townsend Municipal Code Tree Calculations Table at 19.06.120, R2 zoning requires that 40 large trees be retained or planted per 40000 square feet. This reduces to 1 large tree per 1000 square feet.

Required (Replanted) Trees Calculations :

Large maturing trees count as 1 Tree Unit.

Small maturing trees count as .5 Tree Unit.

Retained Trees Calculations :

Trees 1"-6" in diameter, measured at 4.5' above ground level, count as 1 Tree Unit.

Trees 7"-19" in diameter count as 2 Tree Units.

Trees greater than 20" count as 3 Tree Units.

This calculation will be performed at a later date when Lot Lines have been surveyed and located.

Tree Units Needed column is the difference between Trees Required and Trees Retained. This is the number of Tree Units to be replanted.

The column labeled 'RECOMMENDED EXEMPT' are the lots where I recommend that the Required Tree Units be either reduced or eliminated.

These lots are, in my opinion, too small to support both a suitable dwelling and the required number of trees and/or the location of the trees will prohibit the efficient use of passive and active solar access.

TREE UNIT CALCULATIONS PER LOT:

Lot #	Square Feet	Tree Units Required	Recommend Exemption	Notes
01	3104	3.0		
02	3392	3.5	X	
03	3392	3.5	X	
04	3392	3.5	X	
05	3498	3.5	X	
06	3000	3.0	X	
07	3154	3.0		
08	3314	3.5	X	
09	3088	3.0	X	
10	3269	3.5	X	
11	3009	3.0	X	
12	3007	3.0	X	
13	3000	3.0	X	
14	3046	3.0	X	
15	3010	3.0	X	
16	3000	3.0		
17	12062	12.0		
18	14392	14.5		
19	11814	12.0		
20	3660	3.5		
21	3657	3.5		
22	3324	3.5		
23	3338	3.5	X	
24	3317	3.5		
25	3270	3.5		
26	3295	3.5		
27	3347	3.5	X	
28	3657	3.53.5	X	
29	3660	3.5		
30	4182	4.0		
31	3690	3.5		
32	3690	3.5		
33	3690	3.5		
34	3690	3.5		
35	4885	5.0		
36	4097	4.0		
37	3136	3.0		
38	3952	4.0		
39	3490	3.5		
40	3690	3.5		
41	3690	3.5		

42	3690	3.5		
43	4182	4.0		
44	4182	4.0		
45	3690	3.5		
46	3490	3.5		
47	4182	4.0		
48	3690	3.5		
49	3412	3.5		
50	4018	4.0		
51	3492	3.5		
52	3379	3.5		
53	4178	4.0		
54	4185	4.0		
55	3379	3.5		
56	3457	3.5		
57	4020	4.0		
58	3479	3.5		
59	3735	3.5		
60	4233	4.0		
61	3490	3.5		
62	3690	3.5		
63	4182	4.0		
64	4182	4.0		
65	3690	3.5		
66	3690	3.5		
67	3690	3.5		
68	3690	3.5		
69	3708	3.5	X	
70	3136	3.0	X	
71	3174	3.0	X	
72	3131	3.0	X	
73	3362	3.5	X	
74	3168	3.0	X	
75	3168	3.0	X	
76	3168	3.0	X	
77	3168	3.0	X	
78	3168	3.0	X	
79	3168	3.0		
80	3663	3.5		
81	3088	3.0	X	
82	3138	3.0	X	
83	3898	4.0	X	
84	3993	4.0	X	
85	3450	3.5	X	
86	4959	5.0	X	

87	6600	6.5		
88	6600	6.5		
89	7140	7.0		
90	7142	7.0		
91	6600	6.5		
92	6600	6.5		
93	3375	3.5	X	
94	3375	3.5	X	
95	3375	3.5	X	
96	3499	3.5	X	
97	4233	4.0	X	
98	4750	4.5	X	
99	3149	3.0	X	
100	4043	4.0	X	
101	3163	3.0	X	
102	3261	3.5	X	
103	3545	3.5	X	
104	3182	3.0	X	
105	3401	3.5	X	
106	4160	4.0	X	
107	7755	8.0		
108	6420	6.5		
109	7106	7.0		
110	7062	7.0		
111	6420	6.5		
112	7757	8.0		
113	5242	5.0		
114	4374	4.5		
115	3956	4.0		
116	4386	4.5		
117	4202	4.0		
118	5398	5.5		
119	5405	5.5		
120	5412	5.5		
121	5419	5.5		
122	5473	5.5		
123	6471	6.5		
124	5760	6.0		
125	5760	6.0		
126	5760	6.0		
127	6240	6.0		
128	6240	6.0		
129	5760	6.0		
130	5760	6.0		
131	5760	6.0		

132	6592	6.5		
133	6350	6.5		
134	5400	5.5		
135	5400	5.5		
136	5400	5.5		
137	5850	6.0		
138	5375	5.5		
139	5400	5.5		
140	5400	5.5		
141	8576	8.5		
142	10563	10.5		
143	11024	11.0		
144	11407	11.5		
145	15498	15.5		
146	11055	11.0		
147	4182	4.0		
148	3379	3.5		
149	3492	3.5		
150	3548	3.5		
151	3379	3.5		
152	3690	3.5		
153	4172	4.0		
154	4189	4.0		
155	3690	3.5		
156	3690	3.5		
157	4182	4.0		
158	4182	4.0		
159	3690	3.5		
160	3690	3.5		
161	4182	4.0		
162	4182	4.0		
163	3690	3.5		
164	3490	3.5		

MADRONA RIDGE LANDSCAPE PLAN:

The primary landscaping goal of this development is to retain as much of the native vegetation as possible.

These Tree Conservation and Landscape Plans require that approximately 25% of the Madrona Ridge property be set aside as common areas in native vegetation.

Where these common areas are developed, such as raingarden areas, I recommend they be replanted with native plants.

Samples of native raingarden plantings are recorded on the following pages.

STREET TREES:

The goal is to use native plants wherever possible.

There are limitations to our native trees.

There is not a suitable native tree which will withstand temporary standing water in the bottom of raingardens, and serve as adequate street trees.

Therefore, the only exception to the rule of using native trees is the introduction of cultivars of *Acer rubrum*, red maple.

These red maples are located primarily in the bottommost regions of raingardens (Zone 1).

For raingardens located on side streets where there is no curbside parking, the native tree *Betula papyrifera* (paper-bark birch) can be used.

Birch is not a suitable tree for main roads and parking areas due to its brittle branches and occasional messy pests (aphids).

Street Trees are to be placed on thirty foot centers with exceptions made to accommodate driveways or other infrastructure.

Groundcovers consist of two primary native groundcovers;

Fragaria chiloensis – Evergreen Strawberry –

This is a hardy evergreen groundcover that can withstand moderate amounts of foot traffic and drought conditions. For these reasons it is the most abundant groundcover used in this development.

Arctostaphylos uva-ursi – Kinnikinnick –

This is also a hardy evergreen groundcover, though its taller growth at these low elevations make it difficult to walk on, and it is not as tolerant of foot traffic. This groundcover is to be used in areas where foot traffic is less likely, such as away from parking strips.

Festuca glauca – Blue Fescue-

This plants heavy clumping habit makes it less useful. It is more of a decorative feature used in areas restricted of foot traffic.

PLANT ABBREVIATION KEY

The following key is that used on the attached pages of the Landscape and Tree Conservation Plans

NV – Native Vegetation

LG – Low Groundcovers (Eco-Turf)

ST# – Street Tree

SH# - Shrub

GC# - Groundcover

LT# - Landscape Tree

ST1 – *Acer circinatum* ; Vine Maple

ST2 – *Acer rubrum* ‘Brandywine’ ; Red Maple

ST3 – *Betula papyrifera* ; Paper Birch

ST4 – *Calocedrus decurrens* ; Incense Cedar

ST5 – *Cornus* ‘Eddies White Wonder’ ; Dogwood

ST6 - *Pinus contorta* ; Shore Pine

ST7 – *Tsuga mertensiana* ; Mountain Hemlock

ST8 – *Quercus garryana* ; Garry Oak

Arbutus Menziesii ; Madrone

SH1 – *Cornus stolonifera* ‘Winterfire’; Dogwood

SH2 – *Helictotrichon sempervirens*; Oat Grass

SH3 – *Polystichum munitum* ; Sword Fern

GC1 – *Arctostaphylos uva-ursi* ; Kinnikinnick

GC2 – *Fragaria chiloensis* ; Evergreen Strawberry

GC3 – *Festuca glauca* ; Blue Fescue

LT1 – *Populus tremuloides* – Quaking Aspen

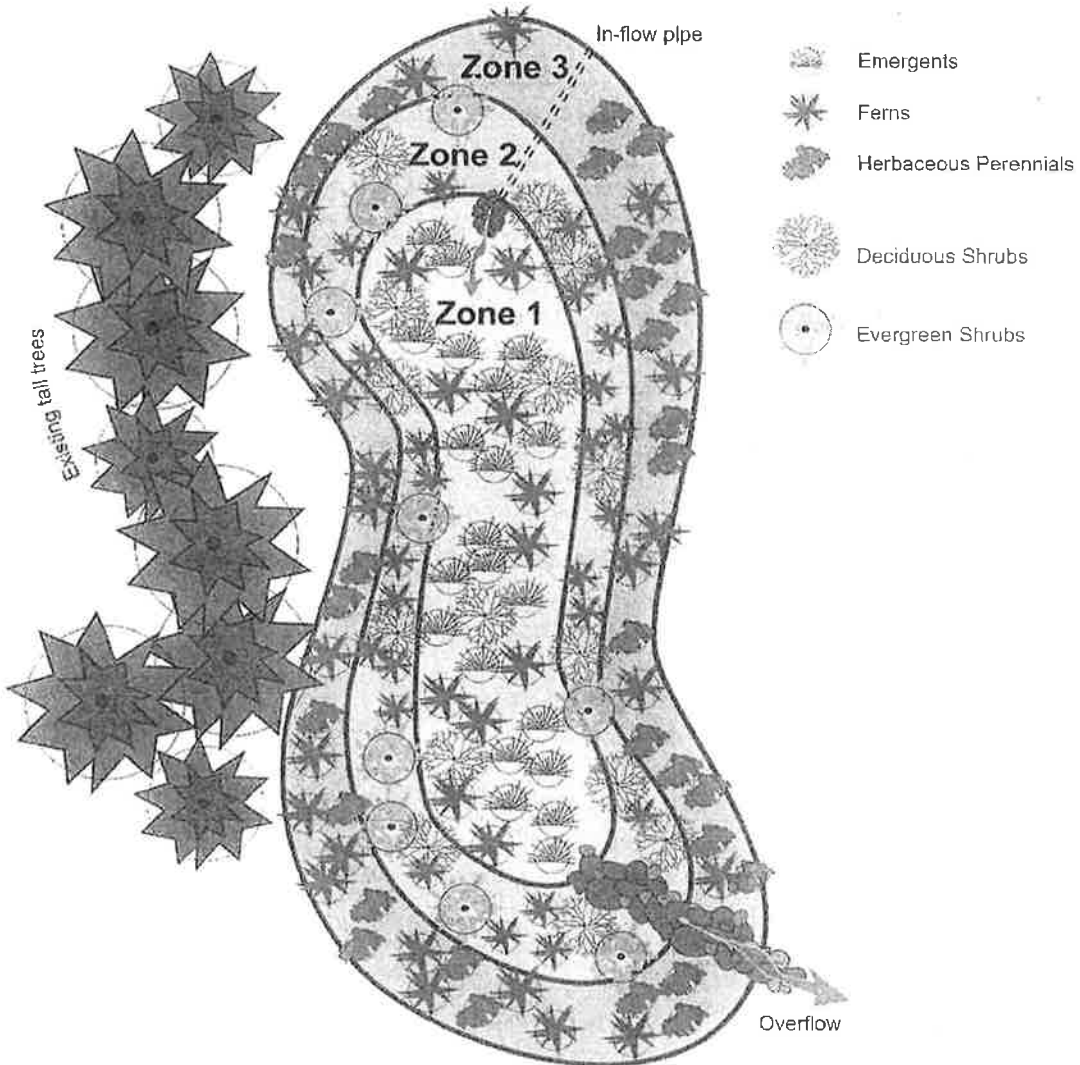
LT2 – *Amelanchier alnifolia* – Serviceberry

LT3 – *Garrya elliptica* – Coast Silktassel

Sample Planting Plans

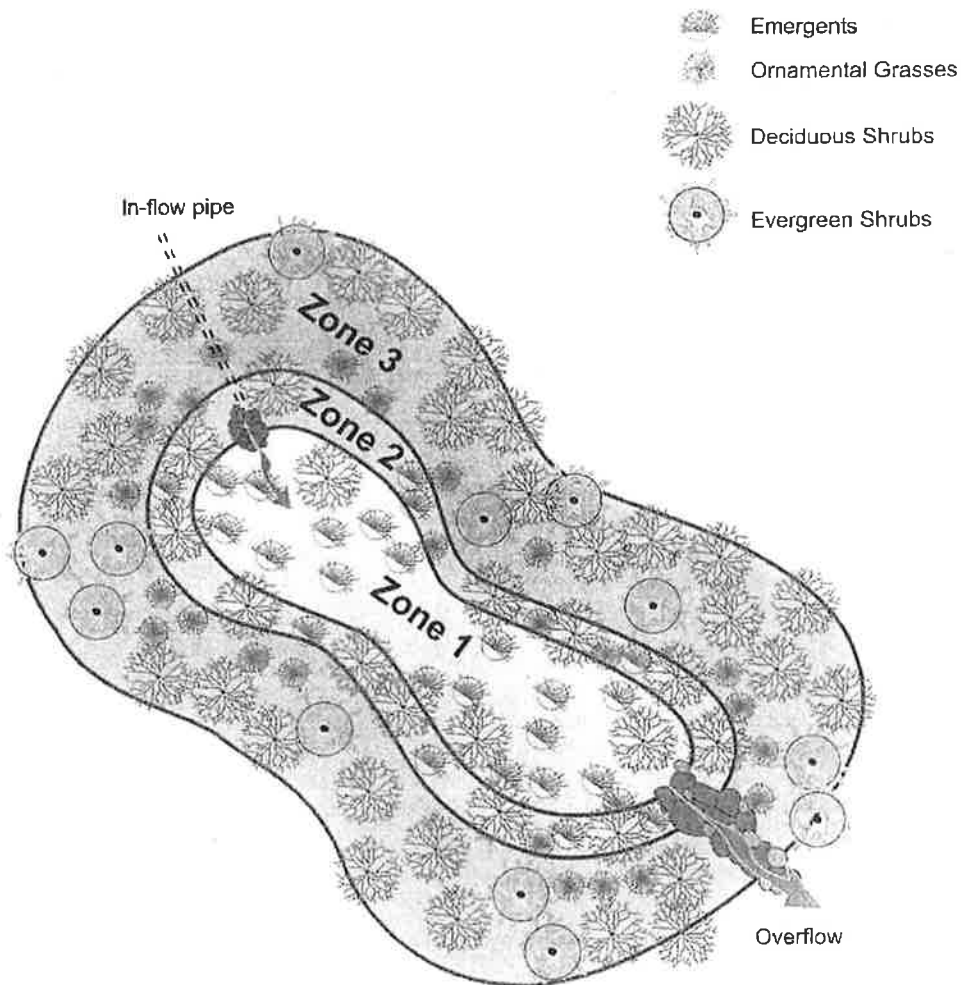
Garden 1: **Shade Garden**

- ZONE 1** **Emergents:** Slough sedge (*Carex obnupta*) and small-fruited bulrush (*Scirpus microcarpus*).
Ferns: Lady fern (*Athyrium filix-femina*) and deer fern (*Blechnum spicant*).
Deciduous shrubs: Stink currant (*Ribes bracteosum*). If the garden is large add black twinberry (*Lonicera involucrata*).
- ZONE 2** **Deciduous shrubs:** Snowberries (*Symphoricarpos albus*).
Evergreen shrubs: Evergreen huckleberry (*Vaccinium ovatum*).
Ferns: Sword fern (*Polystichum munitum*) and lady fern.
- ZONE 3** **Evergreen shrubs:** Evergreen huckleberry, low Oregon-grape (*Berberis nervosa*).
Ferns: Sword fern.
Herbaceous perennials: Wild ginger (*Asarum caudatum*), inside-out flower (*Vancouveria hexandra*), and western bleeding heart (*Dicentra formosa*).

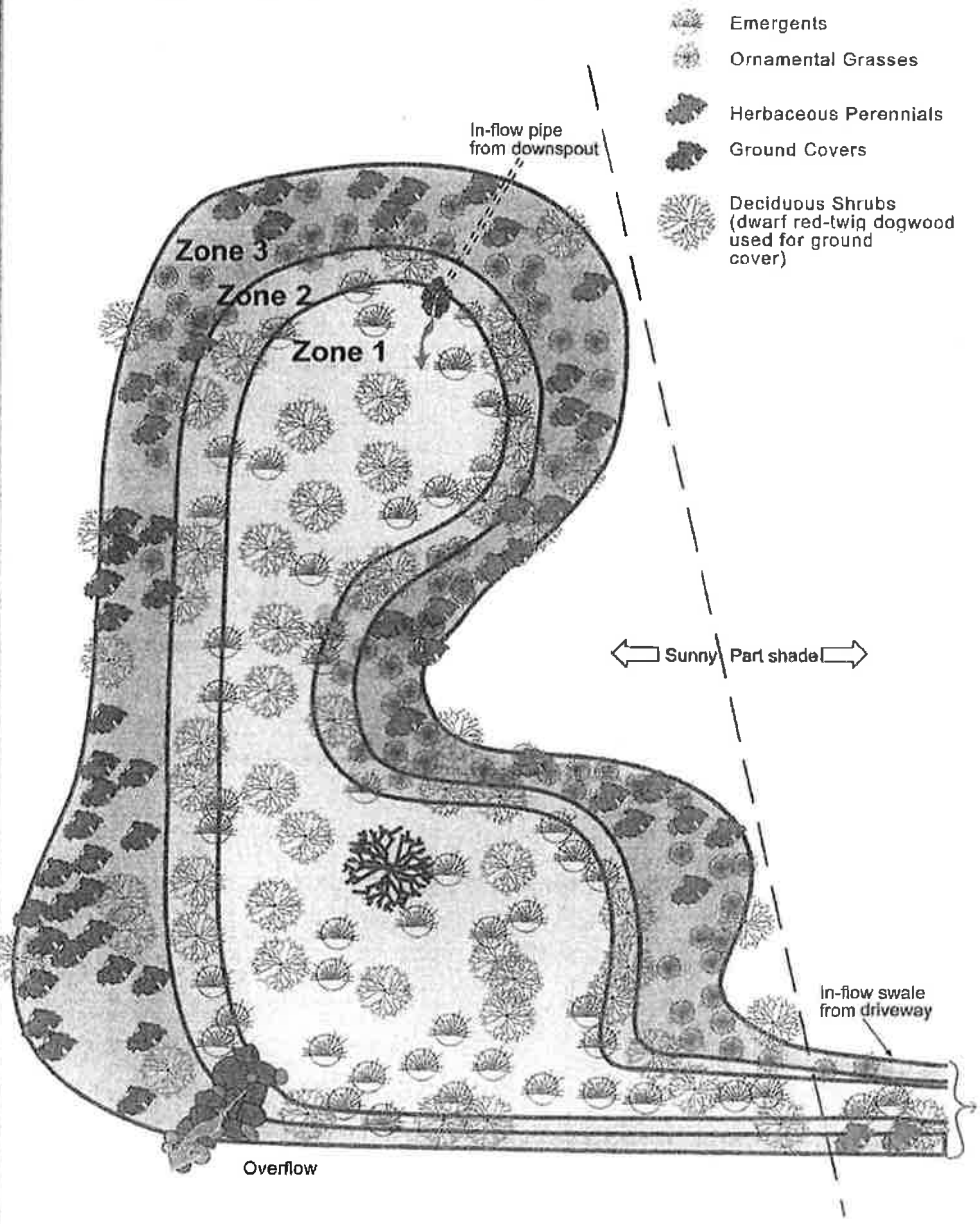


Garden 2: Sunny and Wilder

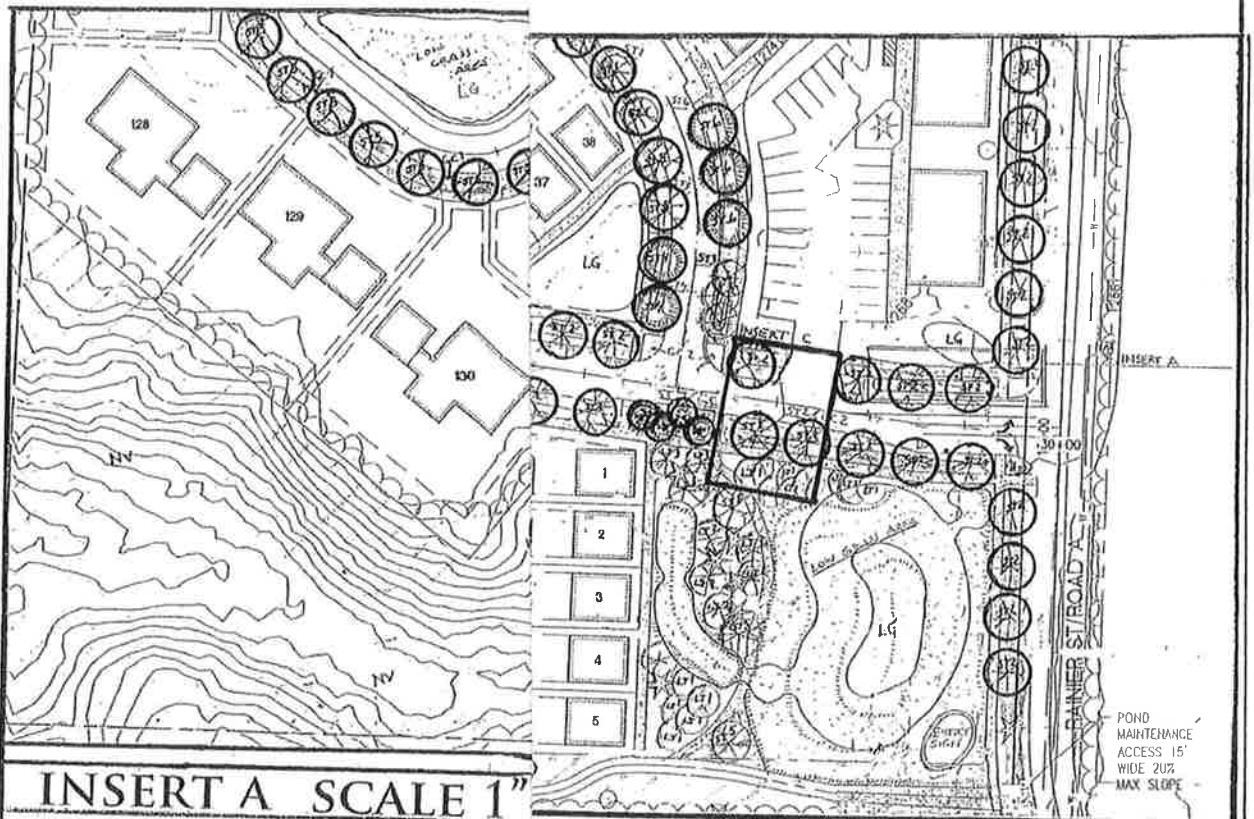
- ONE 1 **Emergents:** Slough sedge (*Carex obnupta*), dagger-leaf rush (*Juncus ensifolius*), and taper-tipped rush (*Juncus acuminatus*).
Deciduous shrubs: Dwarf red-twig dogwood (*Cornus sericea* 'Kelseyi'), Pacific ninebark (*Physocarpus capitatus*), and *Cornus* 'Midwinter Fire'.
- ONE 2 **Deciduous shrubs:** Dwarf red-twig dogwoods, snowberry (*Symphoricarpos albus*), tall Oregon-grape (*Mahonia aquifolium*).
- ONE 3 **Deciduous shrubs:** Western serviceberry (*Amelanchier alnifolia*), oceanspray (*Holodiscus discolor*), red-flowering currants (*Ribes sanguineum*), and snowberries to fill in (set back from the grasses).
Evergreen shrubs: Tall Oregon-grape.
Ornamental grasses: At the top add taller grasses, such as *Miscanthus* 'Morning Light', *Pennisetum alopecuroides*, and switch grasses (*Panicum virgatum* 'Heavy Metal,' and 'Shenandoah').



Garden 3: Sunny rain garden with a swale in partial shade

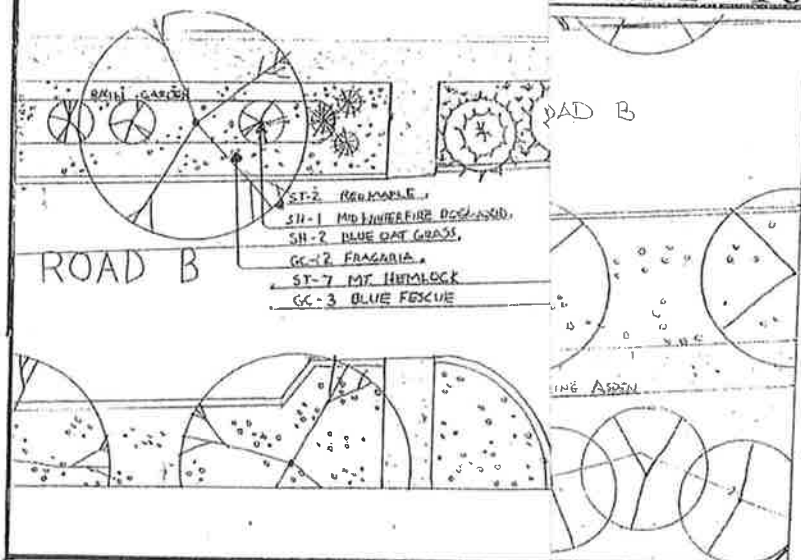


Plant 27



INSERT A SCALE 1" = 10'

SCALE 1" = 10' PLANTING KEY



- NV - Native Vegetation
- LG - Low Groundcovers (Beco-Turf)
- ST# - Street Tree
- SH# - Shrub
- GC# - Groundcover
- L1# - Landscape Tree

- ST1 - Acer circinatum; Vine Maple
- ST2 - Acer rubrum 'Brandywine'; Red Maple
- ST3 - Betula papyrifera; Paper Birch
- ST4 - Calocedrus decurrens; Incense Cedar
- ST5 - Cornus 'Eddies White Wonder'; Dogwood
- ST6 - Pinus contorta; Shore Pine
- ST7 - Tsuga mertensiana; Mountain Hemlock
- ST8 - Quercus garryana; Garry Oak
Arbutus Menziesii; Madrone

- SH1 - Cornus stolonifera 'Winterfire'; Dogwood
- SH2 - Helictotrichon sempervirens; Out Grass
- SH3 - Polystichum munifolium; Sword Fern

- GC1 - Arctostaphylos uva-ursi; Kinnikinnick
- GC2 - Fragaria chiloensis; Evergreen Strawberry
- GC3 - Festuca glauca; Blue Fescue

- L11 - Populus tremuloides - Quaking Aspen
- L12 - Amelanchier alnifolia - Serviceberry
- L13 - Garrya elliptica - Coast Silktassel

DATE 09/21/08

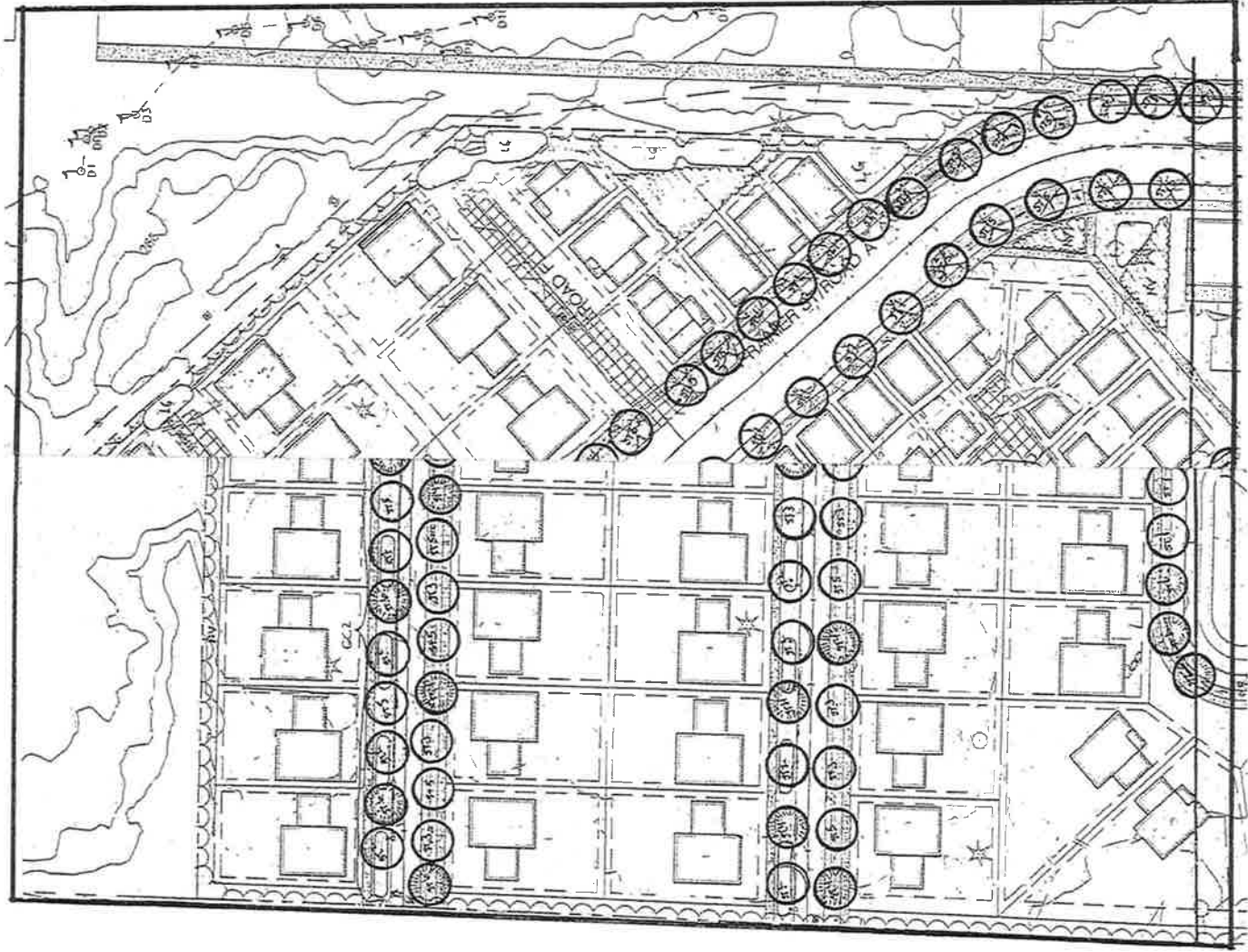
360-385-2921 rkehffley@olypen.com

NORTH

PAGE 1

OLYMPIAN LANDSCAPE

RICHARD R. HEFLEY
DESIGNER -
CONSULTING ARBORIST-



DATE 09/21/08

PAGE

2

N TW

L. 360-385-2921 rldrefley@atvpen.com

RICHARD R. HEFLEY

3

3



