



EXHIBIT 18
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**ARBORIST REPORT FOR BRICKYARD RIDGE
18331 – 154TH AVE NE & 15215 NE WOODINVILLE-DUVALL ROAD
WOODINVILLE, WA**



May 6, 2013
Tree Density Calculation Updated 9-17-13

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OCT 07 2013

CITY OF WOODINVILLE
DEVELOPMENT SERVICES

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Addenda

Tree Summary Tables – attached

Tree Plan Map – attached

1. Introduction

American Forest Management, Inc. was contacted by Tom DeDonato and was asked to compile an ‘Arborist Report’ for the proposed brickyard Ridge Development in Woodinville, WA.

Our assignment is to prepare a written report on present tree conditions, which is to be filed with the preliminary permit application. The subject of this report is the area to be set aside for tree preservation.

This report encompasses all the criteria set forth under City of Woodinville Municipal Code – 21.15 Development Standards - Tree Protection. The required minimum tree density is 60 tree credits per acre.

Date of Field Examination: April 30, 2013 and May 1, 2013

2. Description

The site is classified as 2nd growth native forest, regenerated naturally. The oldest trees on the property are approximately 75 to 80 years of age. Tree species are comprised of a mix of big leaf maple, red alder, black cottonwood, bitter cherry, Douglas-fir, western red cedar and western hemlock.

The “significant” trees on the property were surveyed in the past, as evidenced by white flagging tied to located trees. A significant tree is defined by the City of Woodinville as a tree at least 6” DBH (diameter at breast height, 4 ½’ above ground).

The proposal is to retain a large continuous grouping of trees in the southern portion of the property. A tree condition assessment was performed on all trees that are proposed for retention. Tree data can be found on the Tree Summary Tables at the back of this report. Coniferous trees less than 6” DBH in areas where trees will be retained were mapped and assessed. Under the current code, these trees can be accredited towards tree density requirements. The assessed trees can be identified in the field by a numbered aluminum tag attached to the tree at DBH. Tag numbers correspond with the attached Tree Summary Tables and Tree Map.

Trees to be removed from the north portion of the site are similar in species distribution, size, age class, and density of trees to be preserved at the site. The preserved trees will not be exposed to unfamiliar wind loads nor will grade alterations down slope effect drainage patterns or changes in soil moisture.

3. Methodology

Each tree in this report was visited. Tree diameters were measured by tape. The tree heights were measured using a Spiegel Relaskop. Each tree was visually examined for defects and vigor. The tree assessment procedure involves the examination of many factors:

- The crown of the tree is examined for current vigor. This is comprised of inspecting the crown (foliage, buds and branches) for color, density, form, and annual shoot growth, limb dieback and disease. The percentage of live crown is estimated for coniferous species only and scored appropriately.
- The bole or main stem of the tree is inspected for decay, which includes cavities, wounds, fruiting bodies of decay (conks or mushrooms), seams, insects, bleeding, callus development, broken or dead tops, structural defects and unnatural leans. Structural defects include crooks, forks with V-shaped crotches, multiple attachments, and excessive sweep.
- The root collar and roots are inspected for the presence of decay, insects and/or damage, as well as if they have been injured, undermined or exposed, or original grade has been altered.

Based on these factors a determination of viability is made. Trees considered not viable are trees that are in a poor condition due to disease, extensive decay and/or cumulative structural defects, which exacerbate failure potential.

A “viable” tree is a tree found to be in good health, in a sound condition with minimal defects and is suitable for its location. Also, it will be wind firm if isolated or left as part of a grouping or grove of trees.

4. Observations

151 trees were assessed in the tree preservation area. 136 trees are considered viable. Five are non-viable and the viability of 10 is borderline, with the recommendation to periodically monitor health and risk.

The subject trees for the most part are in a sound, healthy condition. The trees to be retained at the site are primarily comprised of Douglas-fir, big leaf maple, western hemlock and western red cedar. The following is a brief discussion of tree conditions by species.

The Douglas-fir is of good condition for the most part. Trees have developed good form and structure. Common defects were observed, such as crooks and spike knots on the main bole. No significant structural defects were identified that warrant any type of action at this time. Foliage appears healthy and of good color. Trees #141 and #178 are infected with *Armillaria* root Disease. This is evident by resin flows at the base of the trees.

The big leaf maple is in fair condition. Many of these exist as large clumps or clusters. Age classes range from young to mature. The lower trunks of these clusters were examined for signs of pre-mature failure. Many have developed poor trunk taper, which is common when they develop in a forested environment due to intense competition for sunlight. Vigor appears good. None are considered non-viable at this time.

The western red cedar is in good condition. Trees have developed good taper and form. Foliage is dense and of good color.

The western hemlock is in good condition for the most part. Trees have developed good structure. Foliage appears healthy and of good color. *Annosus* Root Disease was identified on trees #144 and #145, near the center of the tree preservation area, close to the clearing limit. A few hemlock trees have been wind-thrown above this area in the past.

Impacts to neighboring trees are not anticipated to be significant. Tree #201 on the east property line next to the proposed development area is a small 15” DBH western hemlock. It appears to be located very close to the property line. No concerning issues were noted on the west property line.

5. Discussion

The extent of drip-lines (farthest reaching branches) for subject trees can be found on the tree summary tables at the back of this report. This information needs to be transferred to a final tree retention/protection plan to meet City submittal requirements, per WMZ 21.15.060 – 3 (3). The trees that are to be removed shall be shown “X’d” out on the final plan.

During the inspection, a risk assessment was performed on trees within the striking distance of the proposed development area. Trees designated as non-viable shall be removed to abate hazardous conditions. A re-evaluation of risk is warranted after site clearing and prior to occupancy. This is mainly due to the known presence of *Annosus* root rot in the hemlock and *Armillaria* root rot in the Douglas-fir. The *Annosus* is most concerning due to the wind-throw potential. Trees infected with *Armillaria* are not normally wind-thrown since the disease does not degenerate the structural stability of roots. Dead trees tend to break down slowly, losing to sections as wood decays.

The removal of trees in the north portion of the site will not have adverse impacts on preserved trees. This is primarily due to the prevailing wind direction, which is from the southwest. Trees that have failed on the property in the past have all fell to the north.

For neighboring tree #201, a 6' zone of no disturbance to the west is recommended to preserve structural stability.

6. Tree Protection Measures

The following guidelines are recommended to ensure that the designated space set aside for the preserved trees is protected and construction impacts are kept to a minimum. Standards have been set forth under WMZ 21.15.080 Tree Protection During Construction. Please review these standards prior to any development activity.

1. Tree protection barriers shall be erected prior to moving any heavy equipment on site.
2. Excavation limits should be laid out in paint on the ground to avoid over excavating.
3. Excavations within the drip-lines shall be monitored by a qualified tree professional so necessary precautions can be taken to decrease impacts to tree parts. A qualified tree professional shall monitor excavations when work is required and allowed within the "Limits of Disturbance".
4. To establish sub grade for foundations, curbs and pavement sections near the trees, soil should be removed parallel to the roots and not at 90 degree angles to avoid breaking and tearing roots that lead back to the trunk within the drip-line. Any roots damaged during these excavations should be exposed to sound tissue and cut cleanly with a saw. Cutting tools should be sterilized with alcohol.
5. Areas excavated within the drip-line of retained trees should be thoroughly irrigated weekly during dry periods.
6. Preparations for final landscaping shall be accomplished by hand within the drip-lines of retained trees. Large equipment shall be kept outside of the tree protection zones.

7. Tree Density Calculation Summary

The tree density requirement is 60 tree-credits per acre. The site totals +/- 6.3 acres, therefore the required minimum tree credits is 378. 136 viable trees and 10 borderline viable trees were assessed in the tree preservation area. Credits for these trees have been calculated at 526.8. No credits were awarded to trees in poor condition where removal is recommended nor to black cottonwood trees which are a prohibited plant species in the City. Trees assessed as borderline shall be re-evaluated prior to development completion. The credit for each subject tree can be found in the attached Tree Summary Tables.

Per WMC 21.15.070, tree density calculation for existing individual trees is calculated by multiplying the tree credits (from Table 21.15.070 – Tree Density Calculation) based on the diameter at breast height (DBH) multiplied by the species multiplier. The species multipliers used for this project were provided by the City, based on a recent study by a third party assessment. The species multiplier is ultimately based on mature tree canopy coverage. Per WMC, tree species that have a canopy of 34' or less in diameter at maturity get a 0.75 multiplier, 35' to 44' get a 1.0 multiplier and 45' and greater get a 1.2 multiplier. Multipliers used are as follows:

Douglas-fir – 1.0
Western red cedar – 1.2
Western hemlock – 1.2
Big leaf maple – 1.2
Red alder – 1.0
Willow – 0.75
Cherry – 1.0

The tree density to be retained exceeds the minimum density for the property. No supplemental plantings shall be required, however tree plantings will likely be preferred to enhance the finished landscape of the development.

8. Recommendations

Due to the known presence of root-rotting pathogens in the subject area, a follow-up tree risk assessment is warranted after site clearing and prior to final occupancy.

There is no warranty suggested for any of the trees subject to this report. Weather, latent tree conditions, and future man-caused activities could cause physiologic changes and deteriorating tree condition. Over time, deteriorating tree conditions may appear and there may be conditions, which are not now visible which, could cause tree failure. This report or the verbal comments made at the site in no way warrant the structural stability or long term condition of any tree, but represent my opinion based on the observations made.

Nearly all trees in any condition standing within reach of improvements or human use areas represent hazards that could lead to damage or injury.

Please call if you have any questions or I can be of further assistance.

Sincerely,



Bob Layton
ISA Certified Arborist #PN-2714A
Certified Tree Risk Assessor #233

Tree Summary Table

For: Brickyard Ridge

International Forestry Consultants, Inc

Date: 4/30/2013

Inspector: Layton

Tree/Tag #	Species	Species Rating	Tree DBH	Tree Height	Tree Credit	Drip-Line (feet)				Condition	Viable yes/no or borderline	Comments	Tree Type	Rec
						N	S	E	W					
101	big leaf maple	60	8	41	1.5	8	10	2	12	fair	yes	single trunk, fair trunk taper		1
102	Douglas-fir	75	36	130	8	12	14	14	14	good	yes	good taper, good color		1
103	Douglas-fir	75	27	126	5	12	12	8	14	fair-good	yes	slight crook		1
104	Douglas-fir	75	13	53	1.75	12	8	4	10	fair	yes	somewhat suppressed		1
105	bitter cherry	60	11	60	1.75	12	8	8	10	fair	yes	no concerns		1
106	western hemlock	60	31	123	7.2	12	12	13	16	fair-good	yes	good taper, good color		1
107	Douglas-fir	75	16	52	2.5	6	4	4	6	fair	yes	natural lean, small crown		1
108	big leaf maple	60	37	92	10.8	16	15	12	24	fair	yes	fork at 20'-3 tops, appear sound		1
109	big leaf maple	60	20	88	3.9	18	15	10	14	fair	yes	multiple tops		1
110	big leaf maple	60	15	83	2.1	18	2	12	3	fair	yes	slight lean north		1
16	big leaf maple	60	15	70	2.1	11	12	na	4	fair	yes	near property line		1
17	Douglas-fir	75	26	115	4	12	12	10	10	good	yes	minor sweep, good color		1
18	Douglas-fir	75	14	83	1.75	8	10	8	10	fair	yes	crooks on upper bole		1
19	Douglas-fir	75	14	85	1.75	8	8	8	8	fair	yes	small crooks		1
20	big leaf maple	60	15	65	2.1	10	8	8	10	good	yes	sound		1
21	black cottonwood	40	16	100	0	8	10	8	10	fair	yes	poor taper		1
22	big leaf maple	60	22	85	3.9	16	18	14	16	good	yes	good form		1
23	big leaf maple	60	11	81	2.1	6	8	8	6	fair	yes	poor taper		1
111	big leaf maple	60	15	75	2.1	15	2	8	8	fair-good	yes	slight crook, forked top		1
112	big leaf maple	60	17	75	3	14	6	13	13	fair-good	yes	no concerns		1
113	big leaf maple	60	13	80	2.1	10	12	8	8	fair-poor	borderline	sparse crown, may be declining		2
114	Douglas-fir	75	25	66	4	14	14	10	10	good	yes	good taper, good color		1
115	big leaf maple	60	21	90	3.9	12	20	16	16	fair-good	yes	no concerns		1
116	big leaf maple	60	28	80	6	8	22	20	20	fair	yes	forked top - 4 tops, appear sound		1
117	big leaf maple	60	13	70	2.1	2	10	10	10	fair-poor	borderline	poor trunk taper		2
118	big leaf maple	60	12	66	2.1	4	4	0	0	fair-poor	borderline	poor trunk taper		2
119	Douglas-fir	75	8	30	1.25	0	10	4	4	fair-poor	borderline	suppressed/lean		2

88.8

Parcel Trees - Drip-Line and Limits of Disturbance measurements from face of trunk

Trees on neighboring properties - Drip-Line and Limits of Disturbance measurements from property line

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Tree Summary Table

For: Brickyard Ridge

International Forestry Consultants, Inc

Date: 4/30/2013

Inspector: Layton

Tree/Tag #	Species	Species Rating	DBH	Tree Height	Tree Credit	Drip-Line (feet)				Condition	Viable yes/no or borderline	Comments	Tree Type	Recommen
						N	S	E	W					
						120	big leaf maple	60	29					
121	big leaf maple	60	13	62	2.1	7	0	3	3	fair-poor	borderline	poor trunk taper	2	monitor
122	western red cedar	90	12	42	2.1	2	12	6	12	good	yes	no concerns	1	
123	western red cedar	90	24	56	4.8	12	8	12	10	good	yes	minor fork	1	
124	western red cedar	90	8	31	1.5	6	4	1	10	good	yes	no concerns	1	
125	big leaf maple	60	26	82	4.8	16	22	20	20	good	yes	no concerns	1	
126	western hemlock	60	8	35	1.5	9	8	6	8	fair	yes	suppressed	1	
127	big leaf maple	60	24	80	4.8	12	6	24	10	fair	yes	slight lean	1	
128	big leaf maple	60	29	90	6	20	14	20	18	fair-good	yes	fork, sound attachment	1	
129	big leaf maple	60	19	75	3	14	10	22	6	fair	yes	fork, sound attachment	1	
130	big leaf maple	60	18	75	3	12	6	6	12	fair	yes	crook, appears sound	1	
131	big leaf maple	60	17	70	3	14	0	10	14	fair	yes	thin top, monitor	1	
132	big leaf maple	60	18	75	3	14	4	20	3	fair	yes	fork, sound attachment	1	
133	big leaf maple	60	28	85	6	18	14	24	10	fair	yes	no concerns	1	
134	western hemlock	60	29	92	7.2	14	8	14	10	fair	yes	leans east, appears sound	1	
135	big leaf maple	60	39	90	10.8	30	20	12	30	fair	yes	past stem failure	1	
136	western hemlock	60	9	32	1.5	6	8	8	8	fair	yes	no concerns	1	
137	big leaf maple	60	20	66	3.9	16	12	12	8	good	yes	no concerns	1	
138	Douglas-fir	75	27	95	5	13	13	12	12	good	yes	no concerns	1	
139	western hemlock	60	35	92	9.6	16	10	12	12	fair	yes	monitor for Annosus	1	
140	Douglas-fir	75	30	130	6	14	12	6	10	good	yes	on edge of clearing limits LOD 12'	1	
141	Douglas-fir	75	34	125	0	na	na	na	na	poor	no	root diseased	3	Remove
142	western hemlock	60	7	30	1.5	6	6	8	10	fair-poor	yes	suppressed	1	
143	western hemlock	60	13	54	2.1	6	7	8	10	fair	yes	no concerns	1	
144	western hemlock	60	26	92	0	na	na	na	na	poor	no	root diseased	3	Remove
145	western hemlock	60	27	94	0	na	na	na	na	poor	no	suspect root rot, leans northeast	3	Remove
146	big leaf maple	60	8	48	1.5	10	8	10	10	fair	yes	fair trunk taper	1	

100.7

Parcel Trees - Drip-Line and Limits of Disturbance measurements from face of trunk

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Tree Summary Table

For: Brickyard Ridge

International Forestry Consultants, Inc

Date: 4/30/2013

Inspector: Layton

Tree/Tag #	Species	Species Rating	DBH	Tree Height	Tree Credit	Drip-Line (feet)				Condition	Viable yes/no or borderline	Comments	Tree Type	Recommen
						N	S	E	W					
						147	Douglas-fir	75	25					
148	Douglas-fir	75	27	92	5	10	10	11	11	fair-good	yes	minor trunk sweep, good taper	1	
149	western hemlock	60	27	86	6	14	10	12	12	fair	yes	frost cracks on lower-middle bole	1	
150	big leaf maple	60	7	38	1.5	4	3	14	0	fair	yes	somewhat suppressed	1	
151	western hemlock	60	24	80	4.8	10	12	12	11	fair	yes	monitor for Annosus	1	
152	Douglas-fir	75	33	110	7	14	14	10	12	good	yes	no concerns	1	
153	big leaf maple	60	19	48	3	6	4	18	3	fair	yes	broken top, low risk	1	
154	big leaf maple	60	24	70	4.8	20	10	2	16	fair-poor	borderline	thin crown, deadwood-monitor	2	monitor
30	Douglas-fir	75	4	28	0.75	5	5	4	4	good	yes	no concerns	1	
155	big leaf maple	60	23	78	3.9	0	24	8	16	fair-good	yes	no concerns	1	
156	Douglas-fir	75	22	120	3.25	12	12	14	12	good	yes	no concerns	1	
157	western hemlock	60	9	36	1.5	8	10	8	10	fair-good	yes	somewhat suppressed	1	
158	big leaf maple	60	20	85	3.9	26	10	14	14	fair	yes	leans north, monitor	1	
159	big leaf maple	60	31	85	7.2	16	22	25	10	fair-good	yes	good form	1	
160	big leaf maple	60	23	80	3.9	22	8	11	10	fair-good	yes	fork, appears sound	1	
161	western hemlock	60	10	40	1.5	6	8	6	7	fair	yes	suppressed by 160	1	
162	western hemlock	60	12	48	2.1	6	12	10	8	fair	yes	major crook, suppressed by 160	1	
163	Douglas-fir	75	29	120	5	16	16	16	14	good	yes	no concerns	1	
164	western hemlock	60	16	77	3	13	10	10	13	fair	yes	crook, low to moderate risk	1	
165	Douglas-fir	75	27	110	5	14	12	8	12	fair-good	yes	trunk sweep - ok	1	
166	big leaf maple	60	8	47	1.5	10	2	10	10	fair	yes	no concerns	1	
167	red alder	45	18	68	0	na	na	na	na	fair	no	mature, near clearing limits	2	Remove
168	big leaf maple	60	16,14	70	3	16	0	0	20	fair	yes	slight lean north, fork	1	
169	western hemlock	60	25	95	4.8	14	10	14	10	fair-good	yes	appears sound	1	
170	western red cedar	90	41	82	12	14	12	16	8	good	yes	good trunk taper	1	
171	Douglas-fir	75	25	115	4	14	12	10	16	good	yes	no concerns	1	
172	western hemlock	60	33	96	8.4	12	14	12	13	fair-good	yes	good color, trunk swell	1	

110.8

Parcel Trees - Drip-Line and Limits of Disturbance measurements from face of trunk

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Tree Summary Table

For: Brickyard Ridge

International Forestry Consultants, Inc

Date: 5/1/2013

Inspector: Layton

Tree/Tag #	Species	Species Rating	DBH	Tree Height	Tree Credit	Drip-Line (feet)				Condition	Viable yes/no or borderline	Comments	Tree Type	Recommen
						N	S	E	W					
						195	big leaf maple	60	10					
196	western hemlock	60	18	76	3	12	10	12	13	fair	yes	significant frost cracks, mod decay	1	
197	Douglas-fir	75	25	120	4	14	10	12	10	good	yes	good taper	1	
198	Douglas-fir	75	19	83	2.5	0	12	14	0	fair	yes	bent top, slight lean	1	
199	Douglas-fir	75	31	130	6	16	12	10	18	fair-good	yes	no concerns	1	
200	Douglas-fir	75	14	62	1.75	10	8	9	6	fair	yes	suspect moderate internal decay	1	
201	Douglas-fir	75	12	38	1.75	12	12	2	10	fair	yes	old broken top	1	
202	Douglas-fir	75	17	60	2.5	14	10	7	9	fair-good	yes	no concerns	1	
203	big leaf maple	60	6	31	0.9	13	8	10	12	fair-good	yes	no concerns	1	
204	big leaf maple	60	8	38	1.5	10	8	7	12	fair	yes	fork	1	
205	Douglas-fir	75	27	110	5	14	14	12	10	good	yes	slight crook-remove ivy	1	
206	Douglas-fir	75	30	128	6	16	16	16	18	good	yes	no concerns	1	
207	big leaf maple	60	11	52	2.1	15	12	10	14	good	yes	no concerns	1	
208	Douglas-fir	75	22	93	3.25	14	10	14	10	good	yes	no concerns	1	
209	big leaf maple	60	9	44	1.5	12	12	12	8	fair	yes	fork	1	
210	western hemlock	60	17	86	3	11	6	8	6	fair-good	yes	crook - appears sound	1	
211	big leaf maple	60	12	56	2.1	16	8	14	8	fair	yes	fork	1	
212	western hemlock	60	16	72	3	15	8	11	14	fair-good	yes	minor crook	1	
213	Douglas-fir	75	19	67	2.5	18	2	12	5	fair	yes	old broken top	1	
214	Douglas-fir	75	23	108	3.25	14	10	8	10	good	yes	slight crook	1	
215	big leaf maple	60	32	98	7.2	26	12	26	22	fair	yes	mature, fork	1	
216	Douglas-fir	75	10	44	1.25	6	4	5	7	fair	yes	intermediate	1	
217	Douglas-fir	75	13	62	1.75	9	2	3	8	fair	yes	crooked top	1	
218	big leaf maple	60	14	60	2.1	14	0	16	2	fair	yes	natural lean north	1	
219	big leaf maple	60	13	56	2.1	8	12	12	2	fair	yes	no concerns	1	
220	big leaf maple (3)	60	6	34	0.9	10	0	12	2	fair	yes	no concerns	1	

72.4

Parcel Trees - Drip-Line and Limits of Disturbance measurements from face of trunk

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OF CLEARING

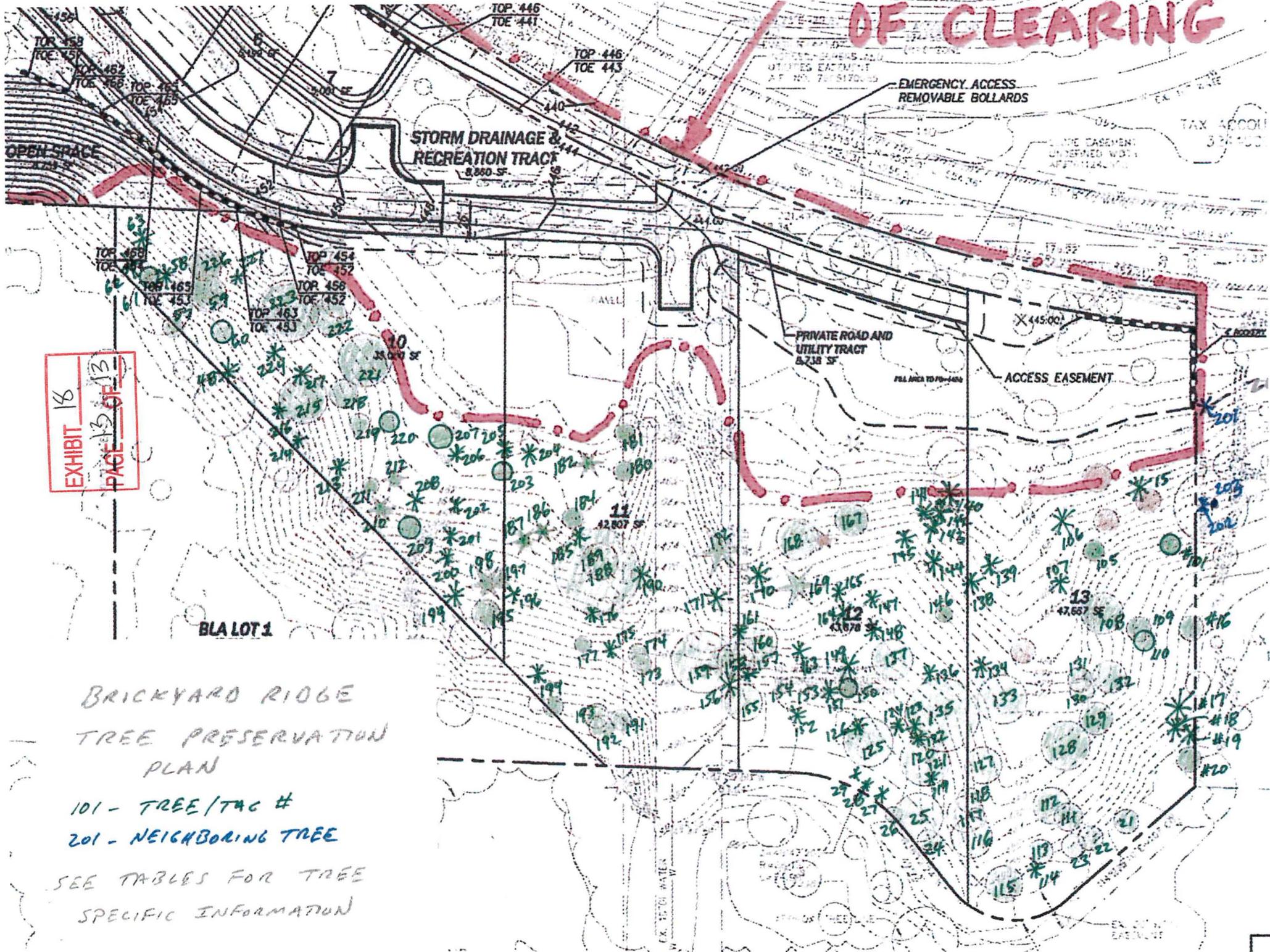


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BRICKYARD RIDGE TREE PRESERVATION PLAN

101 - TREE/TAG #

201 - NEIGHBORING TREE

SEE TABLES FOR TREE
SPECIFIC INFORMATION