Exhibit 6.1

Lauren Anderson

From: Frank Close <fclose@guardiansecurity.com>
Sent: Tuesday, June 1, 2021 10:10 AM
To: Lauren Anderson
Subject: Freeman subdivision parking & Right of way Issues:
Attachments: Freeman Subdivion Parking 6-1-2021.pdf

This letter addresses my concerns for the following:

1. Parking
2. Right of way and the lack of any follow thru on the current right of way issues.

Frank Close
PE, DIRECTOR
O: (206) 467-5298 M: (206) 349-5694
E: fclose@guardiansecurity.com W: www.guardiansecurity.com

Lauren Anderson

From: Frank Close <fclose@guardiansecurity.com>
Sent: Tuesday, June 1, 2021 10:08 AM
To: Lauren Anderson
Subject: Freeman subdivision 4001 West Mercer way
Attachments: Freeman Subdivion drainage 6-1-2021-2021.pdf; Freeman subdivisioin arborist report iTree Letter (Mercer Island) (2).pdf

Categories: Red Category

My wife and I have concerns on the subdivision.
Here is the main one followed by two others.
This is the issue of water, drainage and the environment of the entire 4001, 4007, 4003 West Mercer way.
It includes 2 reports one attached, the other in the body of the document.
Please confirm receipt of these documents.

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Lauren Anderson

From: Frank Close <fclose@guardiansecurity.com>
Sent: Tuesday, June 1, 2021 10:47 AM
To: Lauren Anderson
Subject: Subdivision Water reference Surface Water and ground water on coastal bluffs
Attachments: 20210601103735779.pdf

This document was taken to Jeff Wischman while he was installing his drainage system.
He said, to Marilyn, he could do whatever he wanted on his property.
And, yes, he did that.

Frank Close
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Lauren Anderson

From: Frank Close <fclose@guardiansecurity.com>
Sent: Tuesday, June 1, 2021 11:00 AM
To: Lauren Anderson
Subject: Subdivision Legal minor revision
Attachments: Freeman Subdivion Legal 6-1-2021.pdf

Just added one picture to show it was not always this way.

Frank Close
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GUARDIAN SECURITY

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Tel: 206.622.6545
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6-1-2021
Freeman Road subdivisions: 4001 West Mercer Way

To: Mercer Island Planning and Development Department:

My wife and I have lived at 3887 West Mercer Way for 32 years. This has been a very pleasant neighborhood with just fun living there.
The wonderful Charles Wischman ran the family. There were no real issues, just normal neighbor relations.
Charles died 4 + years ago.
Judie deferred to her two stepsons Mark Wischman and Jeff Wischman and then things changed and much to the worse.
These changes have altered the environment of these connected properties.

Environmental Degradation and Water Damage Pose Severe Slide Risk

My first concern is environmental. I do not think of this as an environment of 4001 West Mercer Way. I look at it as the environment of the South Side of Freeman Ave.
This includes addresses 4001 and 4007 West Mercer way and 4003 to a lesser extent.

Tree/Landscape Management
If you look at the north side of the private road, you see on 3883 West Mercer Way, the property closest to west mercer way and 3881 West Mercer way, and even 3887 West Mercer way, you see a great deal of trees to manage the slope and to assist in minimizing the issues with the slope.

This is true for the city property section landscaped and planted.
This is true for the private property exclusive of the unitary access provided to the Snows, To Marilyn O'Neil and my access to my stairs, the top of the stairs.

However, on the other side of the road the 4001 and 4007 properties there is minimum tree coverage.

The division allows another house to be added. It furthermore asks to leave less than half of the trees. In the math they calculate the number of trees, but then do not count one tree asserting it is a shrub, and do not count another tree since it is diseased so by my math, they would preserve 38% not 45% of the trees, 30% being the minimum.
In addition, I understand they will be using the right of way more than before

Water Drainage

- The neighbor to the North of 3883 West Mercer Way had no place to tie into and it was agreed that he could tie into our drainage system going down west Mercer way. During this time, the city mentioned that this was at capacity.

- The city storm water goes through 2 Catchbasins, one located at the top of 3887 west mercer way and one located on the other side of Freeman ave providing drainage on that side of the road.
- Mr. Close is responsible with Mr. Galvin for the top portion of the Freeman Private road just beyond Soldier Pile P-6.
- The City has a storm water pipe that is above ground but goes down a steep slope.

It is simple, Water either goes on top of the road or water goes under the road and or places that can create slides that harm the road.
What is the history of slides here?
There have been a minimum of 3 slides in the last 3 years.

1. The Freeman Ave private road had a slide just beyond piling P6, the water gushed out from the side of the hillside and spread debris and clay over the road. [Figure 1 &2]
2. Just below the large City Catchbasin, just to the south of the City Storm drain black pipe, another slide took place. There are no soldier piles at this location. Fortunately, The closes has built a retaining wall in anticipation of this event, again, this was a result of water coming from 4001 and 4007 west Mercer way.
3. The property 3887 West Mercer way at the top of the stairs a huge slide during our rain of 1.7" in 24 hours or so. This took all of the top soil and it took a section of clay and sent it down the hillside in a steam of mud. [Figure 3]
4. Additionally Mr Close has a 5-6' crowbar and he has dropped it in several spots on the property and without pushing it down it sank down more than 2' in several spots, critically one was the property line adjacent the city soldier pile 6 or about 6.2, [Figure 6,7]
5. The second areas of excessive water is just on the border of the property that was the city privatization, just next to the existing fence on the North side of the fence, it was never this wet before and it is now. Again, just above the concrete blocks is another area that is now wet and was never wet before. [Figure 6,7]

In summary, we have the following in the last 3 years.

- 3 slides photos are attached.
- 1 crowbar testing photos attached.

Here is one of the recent slides just south of the city property line:

Figure 1

Here is another picture of this slide with a better perspective:

Figure 2

The next slide happened when the raid poured about 1.7 inches in 1 day.
This was a slide on the Close property but the water comes from above
Clay flooded down the hillside from the top. Here is a picture after it was cleaned up.

Figure 3 Next up is te slide south of the city waterpipe and

Here is the same area.

Here is a crowbar test. . You take a 5’ crowbar and drop it at the ground and see where it settles in.
Here is the picture on the property line. It drops about 2.5’ on the property border.

Figure 4

The second crowbar picture is at the bottom of the site adjacent the fence about 20’ up from the lake and is the same dimension as the previous picture.

Slides are caused by many things but fundamental to all of them is water and water flows downhill.

I believe these three slide events are caused from water from 4001 and 4007. In addition to poor runoff management, those properties have reduce tree coverage.

In Summary, these slides show the pattern in the last 3 years of the existing water and we are now set to add more water to the system that is struggling currently.

Drainage System Design Concerns

While the property provided a drainage system to ensure appropriate water runoff the system was not executed properly and is failing.
Here is the design. Figure 8.

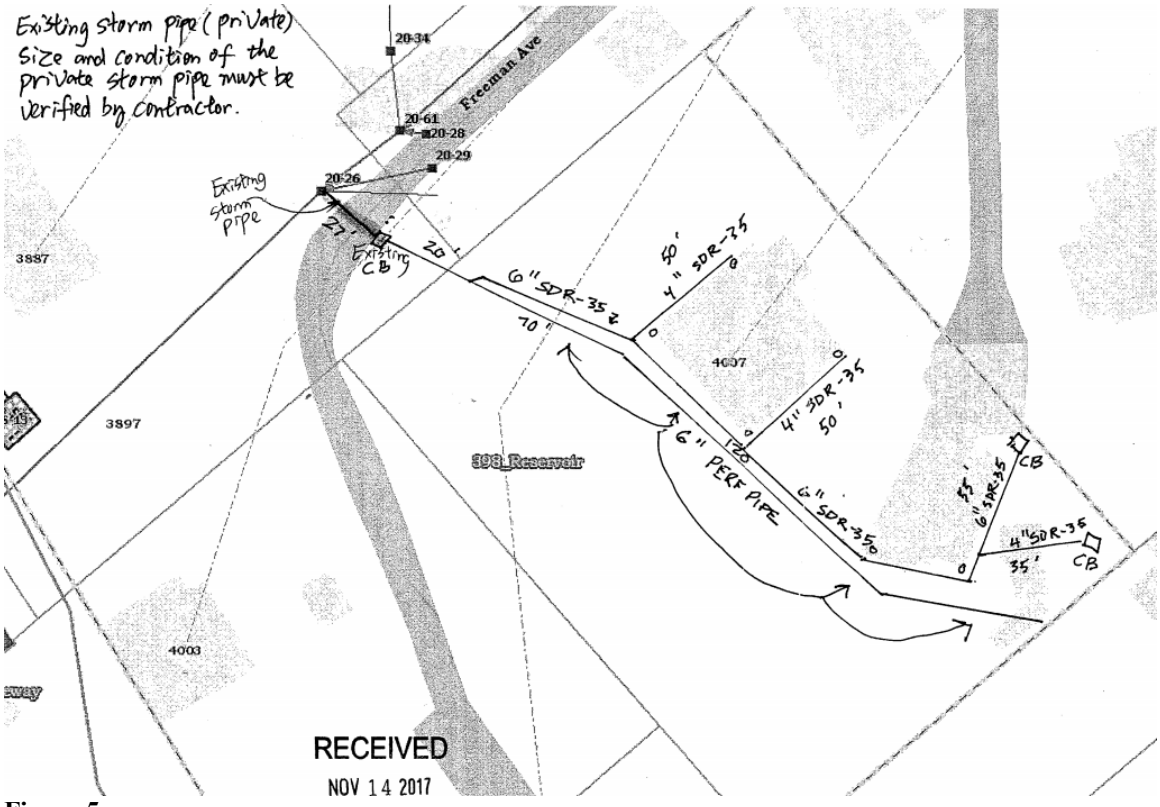


Figure 5

As I reviewed the diagram, I wondered why the drainage was so far East of the hillside, as far as 30’ away in parts.

Figure 9 shows pre-construction phase.

Figure 6

Figure 10 shows during construction

Figure 7

Figure 11 shows during construction for a 4-6” drain pipe.

Figure 8 Not implemented in a normal way and note the steep slope. Jeff Wischman.

Figure 9 There used to be many plants in front of this house. Note the storage of equipment under trees.

See the work in figure 12 that is done and note the heavy equipment in and around the city tree. Note the trench below and it's width.

Figure 10

Figure 11 This used to have lots of trees and shrubs

Figure 15 shows a drain end that is not connected to any existing infrastructure.

Figure 12

Figure 16 shows an additional drainage pipe held together with duct tape

Figure 13

The drainage project and construction was done without a permit. I am concerned that it was done improperly and will lead to degradation and slide on my property.

Figure 14

Figure 17 shows the construction activity on the property. These practices are extremely damaging to existing vegetation. From the book Vegetation Management, A Guide for Puget Sound Bluff property owners.
"Trees retained on a development site often die as a result of various construction-related influences. Understanding these damaging construction practices can help the property owner and contractor be more effective in preserving trees as well as increasing property values."

Here is the specific permit violation.

The slope has been recently denuded of vegetation and other coverings without first obtaining required permits. See MICC 19.07 regarding alterations to critical areas and MICC 17.14 Section 105 regarding Permits (note that exemptions for minor clearing and grading work do not apply within critical areas). Your immediate attention is required to install temporary erosion control measures under the direction of your geotechnical engineer, and to submit their confirmation letter that the installation is per their recommendations. Permanent restoration measures shall be under the direction of a geotechnical engineer and a clearing and grading permit shall be obtained prior to performing the work. Please submit the restoration plan, geotechnical report and a completed permit application to the City.

The result of this poorly executed construction project is the death of this cedar tree.

Figure 15

Professional opinion on this stormwater runoff situation.

J CARR CONSULTANT LLC

Water Resource and Environmental Services

EVALUATION OF FREEMAN AVENUE STORMWATER ISSUES

DRAFT

SUMMARY

Storm runoff from the rooftop drain system of PARCEL #3623500366) immediately southeast of Freeman Avenue appears to have saturated the hillside and now enters the roadbed. During cold weather, this excess water emerging from a joint between the two concrete slabs will freeze and can be expected to crack the concrete and impair the utility of the road. Cold weather will also freeze the super-saturated steep bank thus increasing the hydraulic pressure in the soils. When the temperature rises above 32F, the icy soils melt and could be expected to flow down gradient.

INVESTIGATION

This document describes the results of a January 5, 2019 professional site inspection of several properties on the southwest shoreline of Mercer Island, Washington. The inspection was requested by Frank Close and Marilyn O'neill who occupy residences at 3881 and 3887 West Mercer Way. These two properties are located on the northwest side of the NE – SW trending Freeman Ave.

Freeman Ave slopes moderately to the southwest - to a point about 2,500 ft from West Mercer Island Way - where the downward slope increases significantly. Below this point, Freeman Ave arcs sharply to the SE and becomes even steeper. During the summer of 2017, the City of Mercer Island improved the surface of Freeman Ave with jointed concrete slabs - from the area of increasing slope to near the bottom of the hill. The City's 2017 work included installation of interceptor drains that cross the road, infiltration drains paralleling the SE side of the road and a 3 ft deep catch basin on the SE side of Freeman. This catch basin discharges through an 8-inch PVC pipe beneath the road to a much larger existing stormwater sump on the NW side of Freeman Ave. The inlet to the sump is at least four feet below the catch basin outlet.

According to the residents, the drainage system operated without incident during the fall and winter of 2017 as well as throughout 2018. In early January 2019, the Wischmans (owners of the property located SE of Freeman (PARCEL #3623500366) inserted a 6-inch diameter PVC drain into the SE side of the collection box. This 6-inch diameter (PVC – SDR 35) perforated drain is over 400 ft in length and based on IGS drawings (submitted to the City of Mercer Island November 14, 2017) collects storm runoff from the Wischman residence, garage and outbuilding as well as stormwater from the driveway of the neighboring property to the east. Based on photographs taken during construction of the 400 ft long system, the drainpipe appears to have been laid in an unlined, rectangular trench about two feet deep. The grade (slope) and pipe perforation scheme are unknown, as are the details of the terminal closure of the ditch and nature and character of the backfill materials.

After connecting the Wischman drainpipe to the collection box, water was observed emerging from the joint between the concrete slabs near the collection box. This flow of

stormwater emerging from beneath the slabs was also observed during our January 5 site inspection. We also noted that the steep bank immediately above the catch basin was super-saturated with water that could initiate a slump or slide.

DATA ANALYSIS

Rainfall data from Station WA-KG 37 (Mercer Island) recorded 0.49 and 0.48 inches of precipitation on January 3 and 4, 2019 respectively. Our January 5 inspection of the catch basin revealed very little inflow (< 1 liter /minute) from the new Wischman inlet. The available evidence indicates that much of the stormwater collected in the Wischman drainage system (rather than discharging through the drainpipe) is emerging from the trench itself at the steep slope above the road and through the subsoil to the joint between the concrete slabs. During a freeze, this subsurface water will expand and can be expected to destroy the integrity of the concrete and road bed. It appears that the impermeable barrier (if any) at the terminus of the drain line is ineffective and that much of the stormwater in the ditch (outside the pipe) escapes the drainpipe. This water has super-saturated the hillside soils above the catch basin and after a freeze will fluidize the soils above the road.

The new Wischman drain system collects water from large on-site rooftop areas and from the neighboring Lee property. The drain's location (just below the Wischman house) probably collects only limited water from the local subsurface soils.

AREAS CONTRIBUTING TO THE DRAIN (APPROXIMATE)

Location	Approximate dimensions	Square feet
Wischman house	45'X50'	2,250
Wischman garage	40'X30'	1,200
Lee house and driveway	>40'X50'	>2,000
	TOTAL	**>5.450**

As noted above, Mercer Island recorded 0.97 inches or rain on January 3 and 4, 2018. This rain falling on the 5,450 square feet of roof tops produced 454 cubic feet or 3.396 gallons of water in two days. On the date of our site visit (January 5) no rain was recorded and the discharge from the drain into the collection box was minimal (less than one liter/second). . Yet the subsurface discharge from the roadbed joint and saturated soils on the slope above the box probably exceeded the flow to the box.

The design details of the storm drain are unknown. Ideally, an impermeable clay or geotech membrane should be in place before the steep slope at the NW terminus of the drain excavation. This barrier would force stormwater into the drainpipe and prevent leakage through the steep bank above the catch basin.

ADDITIONAL STORMWATER ISSUES

While the stormwater drain system may collect most of the water from the rooftops, its design and position prevent it from collecting subsurface stormwater infiltrating from areas below the drain and upslope from the house. This water moves downward through the moderately permeable silty sand and emerges below the road as it turns to the southeast. Additional properly designed subsurface stormwater collection systems may be required to stabilize the steep slope above and below the road.

REFERENCES

- IGS site map of Wischman property, received by the City of Mercer Island (Nov. 14, 2017)
- IGS areal photo of local area (Map date 5/8/2017)
- Geology and Ground-Water Resources of Northwestern King County, US Geological Survey, Water Supply Bulletin 20, 1963
- Rainfall data – CoCoRaHS; station WA-KG 77

Prepared by:
JCCLLC
James R. Carr
Licensed Hydrogeologist #940

Mr Close had his landscape contractor place a ¾" water meter in the Catchbasin and measured the water with a ¾" water meter. They put an overflow in it so that if it was at full ¾" velocity it would trip.
It never tripped and measurements were taken.
They showed the following:

The drainage system that Jeff Wischman put in over a years period of time, storing heavy equipment on the cedar trees and digging in the wet season with heavy equipment on the edge of a steep slope had following impact.

THERE WAS NO IMPACE EXCEPT TO TAKE THE WATER OFF OF THE ROOF OF THE WISCHMAN'S AND THE LEES.

Perhaps this was the intention.

The water continues to go under the road as it does not go over the road.

But wait, There is another water issue:

Jeff and Mark Wischman were involved in the remodel of the beach cabin.

During that process, it was decided they needed a new water line. They chose to hiring a boring company to bore down about 50-60' in elevation and come out on the other side of the Freeman private road.

They did this , and it was scheduled for one day. It was not done by 7pm and so, in violation of MI permit requirements they worked later.
Here is a picture of the work on this boring.

In Summary:

This complaint is in regards to the lack of compliance for 4007 West Mercer Way .

- Lack of any plan, Lack of Geotech, Lack of explaining to the neighbors.
- a tree root which was 10" diameter to 12 " was severed rather that work around it. It is unknown if this was the root for the large healthy tree , or the tree that the Wischman's received a permit to take out that was dying. In either case , it was severed by heavy machinery.
- Taking steps to look after the critical nature of the hillside.

Drainage project for Wischman.

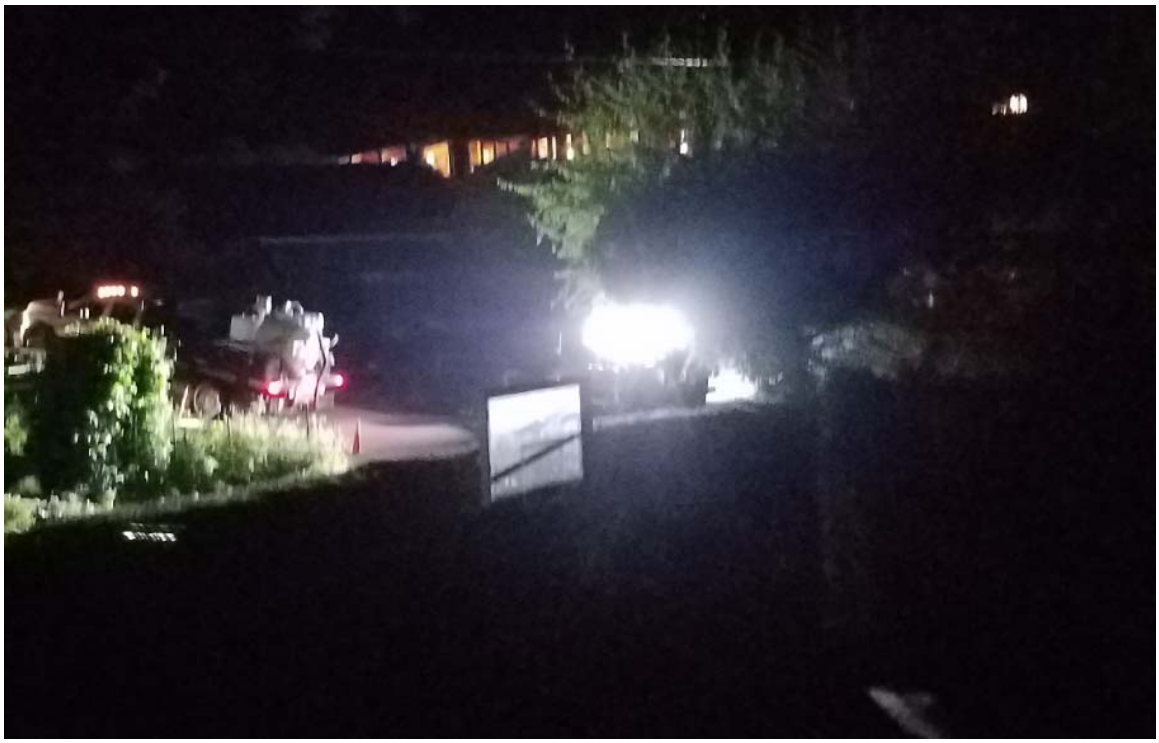
Here is the scope of work on the permit application: 4007 west Mercer way.
"install a perf pipe in French drain from North property line to South propertty line, install 6"

- The installation of a perf pipe system for drainage.
- The drainage system was started by Jeff Wischman and a permit submitted on this date.
- The work took place over a period of a year and a half from date to date
- Notice the drawing of the piping and how it does not drain anything near the top of the slope. Drawing is about x feet from edge of property.
- Heavy machinery equipment was operated during the winter. For months and months.
- The drainage system was laid out in a way that kept it from the bluff.
- The water was measured at the catch basin where it came in and during a heavy rainstorm the measured water in the catch basin only drained off a bit less water than the roofs of the houses.
- The balance of the water was not drained off and during heavy rains a ¾" water meter did not overflow.
- In short, the water coming from the pipe never exceeded the ¾" measured piping and the only water coming off the hill is the roofs of the 4007 main hours and the 4001 Less house. The balance of the water a huge amount is going into the ground and likely going towards my slide area adjacent the property and under the road undermining it.
- Without knowing the design intent , it is not possible , this may be what was intended but it does not make me feel comfortable.
- Note the heavy equipment stored under the cedar tree and today this cedar tree is dead and it was the key environmental plus to the 4007 property on the top of the hill and in my and other neighbors opinion was done by Jeff Wischman and his crew likely with the full knowledge and approval of Mark Wischman.

Thus, for 4001 and 4007, the water goes under the road for the balance of the water.

BORING COMPANY:

Here is the boring finished at night very late.



There is another water issue created by the Wischman's . They hired a boring company to bore from near the now dying cedar tree down 60 vertical feet to get water to the beach cabin.
This was not completed as desired. The boring missed it's target and the Wischman's kept working past their construction hours and finished at night about 9-10pm .

About week later Mr Close was Kayaking by and he saw a hose that had lots of water coming out of it. He went back and got a quart measuring cup and measured 3 gallons every 2 minutes or 1.5 gallons per minute of flow or roughly 2000 gallons per day of water.

In a quart container using my phone as a timer , this water was measured. It happened about 1-2 weeks after the boring.

TWO THOUSAND GALLONS OF WATER PER DAY WHEN MEASURED FROM THE HOSE GOING INTO THE LAKE.

What did Jeff Wischman do to solve this problem?

He decided to hide it and created a drainage field around his house. Rather than solve the problem , he decided to spread it out.

The result is areas around the beach house and the garden on the closes property to be has more water than ever before.

Again, the water continues to be the issue.

After this time, the wetness near the edge of the property increased immensely.

Jeff Solved this problem, not by trying to find what is wrong but by having the drainage system be expanded and make it all go into the lawn and around the beach cabin.

It has been far wetter since that time.

Why is this important to the city? Why is this important to the Closes?

Here is a picture of the old Freeman road

Here is the road before it was closed:

. My son who is now 32 at 14 years of age, he could crawl under the Freeman Private road.
The road had water going under it and this led to gaps in the pavement.

Eventually this road was deemed unsafe by the City and closed to Michael Gladstein's use.
Michael Gladstein has an offer to sell his property for 5.1 million dollars from Matt Galvin and files a claim for 5.1 million against the city of Mercer Island.

INSERT COPY OF CLAIM

1 Picture of the original freeman road
2. Picture of the Freeman road when it was closed.
3. Claim for 5.1 million from Michael Gladstein.

The City reached out and looked for solutions to this problem.

The city was confronted with a long term problem on the private area of Freeman ave.

They decided to Privatize Freeman avenue.

The City's solution to this was to privatize Freeman avenue which was accomplished in part.

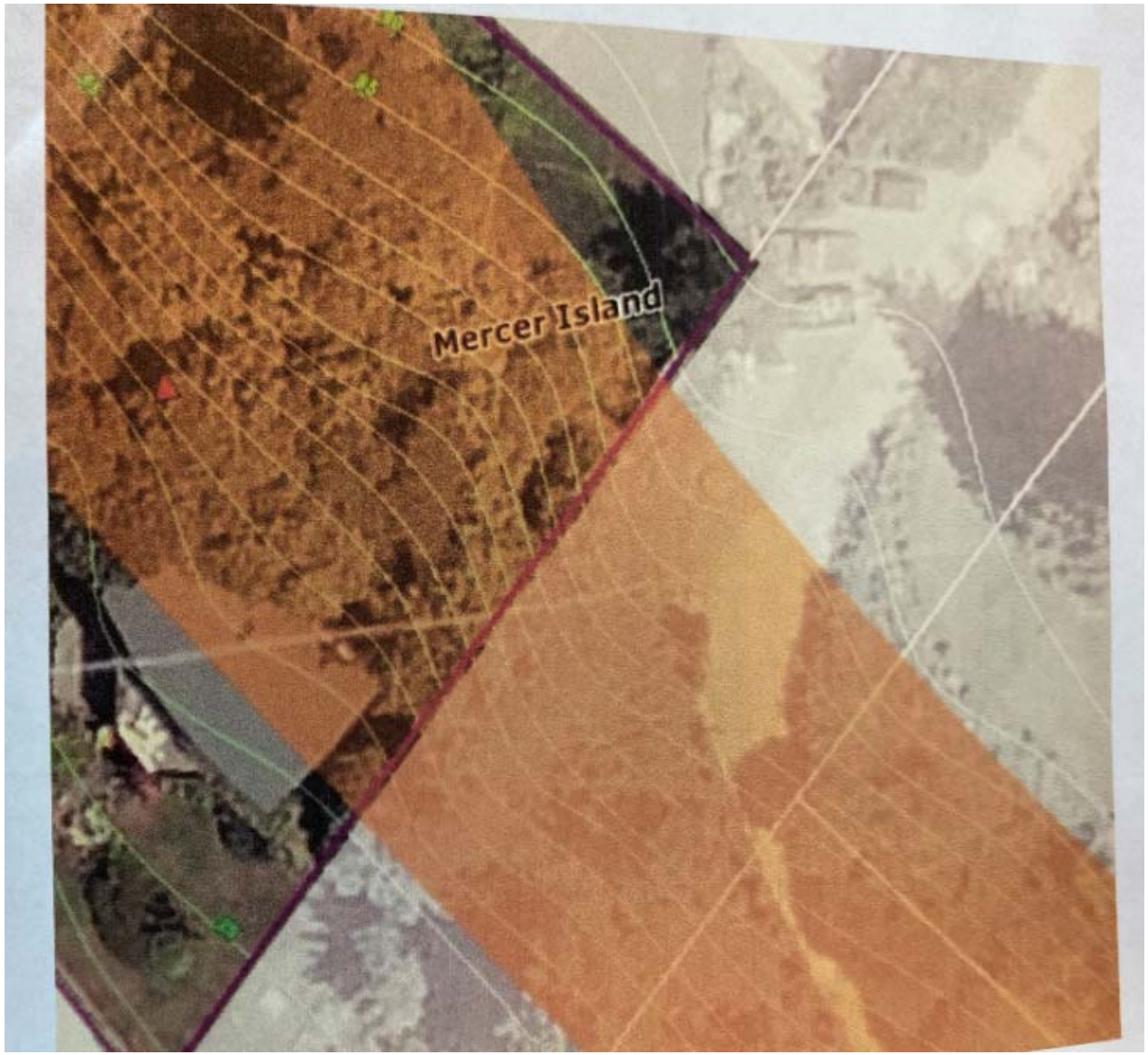
SUMMARY:

- **The water from above 3887 and the old city property continues to be an issue and slides are happening at a more rapid rate in the last few years.**
- **This time relates directly to the workmanship , drainage and removal of trees and shrubs done by Jeff and under direction of Mark Wischman.**
- **This is a long term problem and is likely to take some time to resolve.**
- **The consequences to the city have been great in the past.**
- **It is not my belief that the storm sewer can handle this added load.**

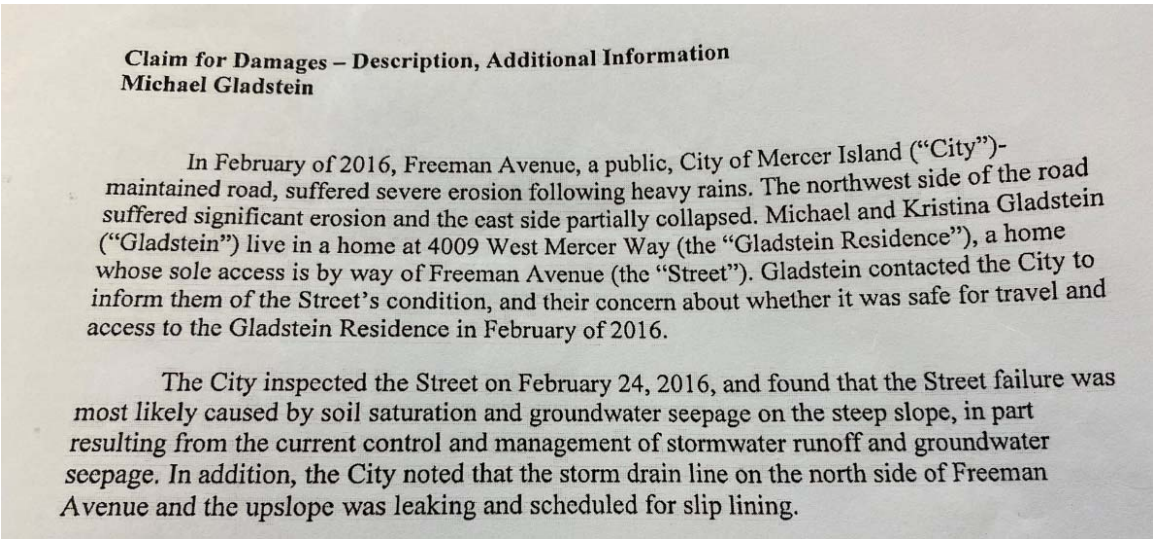
Other questions:

- **Can 4007 be subdivided and need more city infrastructure?**
- **Can 3887 be subdivided and need more city infrastructure?**
- **Can 3883 be subdivided and need more city infrastructure?**
- **Thus, we must design for 4 added subdivisions , this is the infrastructure we must design for.**
- **Does the steep slope category matter in the short plat process when it is a steep slope.**

Here is a picture of the King County steep slope designation.


Mercer Island

Here is what the city determined in February 24, 2016, Nothing has really changed except the problem has been privatized, but the water issues remain.



Claim for Damages – Description, Additional Information
Michael Gladstein

In February of 2016, Freeman Avenue, a public, City of Mercer Island ("City")-maintained road, suffered severe erosion following heavy rains. The northwest side of the road suffered significant erosion and the east side partially collapsed. Michael and Kristina Gladstein ("Gladstein") live in a home at 4009 West Mercer Way (the "Gladstein Residence"), a home whose sole access is by way of Freeman Avenue (the "Street"). Gladstein contacted the City to inform them of the Street's condition, and their concern about whether it was safe for travel and access to the Gladstein Residence in February of 2016.

The City inspected the Street on February 24, 2016, and found that the Street failure was most likely caused by soil saturation and groundwater seepage on the steep slope, in part resulting from the current control and management of stormwater runoff and groundwater seepage. In addition, the City noted that the storm drain line on the north side of Freeman Avenue and the upslope was leaking and scheduled for slip lining.

- **It is ironic that one of the projects that could help stabilize this steep slope is the Close's building a private road to their house.**
- **This has been held up for 3 years by Mark Wischman's refusal to correct the error Judie's defective quit claim deed. 16+ more soldier piles and an improved hillside stability would improve this issue but not resolve the water from the top.**

Here is our summary

- **Water drainage and trees matter and continue to matter.**
- **The infrastructure should be designed for the maximum load, so assume that 4001, 4007 , 3883 and 3887 all subdivide, what is the load from increased water on the hillside?**
- **Can the global environment on the hillside withstand this ? I do not believe so.**

Sincerely Yours,

Frank C. Close

Frank Close P.E.

Gladstein's damage claim below.

Please print clearly and complete this form in its entirety (two-sided).

Received Date Stamp

CLAIM FOR DAMAGES FORM

CITY OF MERCER ISLAND, WASHINGTON

Please take note that Michael Gladstein
who currently resides at 4009 W Mercer Way, Mercer Island, WA
mailing address c/o VanNess Feldman LLP, 719 2nd Ave, Seattle, WA 98104
with home phone # 206 623 9372 and work phone #
and resided at 4009 W Mercer Way, Mercer Island, WA
at the time of the occurrence and whose date of birth is 06/25/71, is claiming damages
against the **CITY OF MERCER ISLAND** in the sum of $ 5.1 million arising out of the following
circumstances listed below.

DATE OF OCCURRENCE: 04/2016 **TIME:**

LOCATION OF OCCURRENCE: 4009 W Mercer Way, Freeman Ave.

DESCRIPTION:

1. Describe the conduct and circumstances that brought about the injury or damage. Also describe the injury or damages (attach an extra sheet for additional information, if needed).

See attached

2. Name(s) of Witnesses	Address(es)	Phone Number(s)
Michael Gladstein	719 2nd Ave, Seattle WA 98104	206 623 9372
Kristina Gladstein	719 2nd Ave, Seattle WA 98104	206 623 9372

3. Attach copies of all documentation relating to expenses, injuries, losses, and/or estimates for repair.

GUARDIAN SECURITY

Seattle - Tacoma - Poulsbo - Bellingham

1743 First Avenue South
Seattle, WA 98134

Tel: 206.622.6545
Fax: 206.341.9928

Freeman Road subdivisions: 4001 West Mercer Way

June 1, 2021

Dear Folk's

Here are my legal concerns.

I have several comments and objections to the development application for 4001 West Mercer Way property. The city's review should consider the cumulative impact of the removal of trees and the drainage and slide problems in the area and more detailed information about the development.

Those drainage and slide problems are evidenced by the closure of a portion of Freeman Avenue west of the 4001 West Mercer property in early 2016. In April 2016, a neighbor filed a $5.1 million claim against the city for the road closure.

In 2017, the city resolved the claim by repairing a portion of Freeman Avenue and by vacating and privatizing of a portion of Freeman Avenue. I have spent a substantial amount of time facilitating the privatization process. And, my wife and I have spent a substantial amount of money funding the privatization process. Our goal was for a win, win for the neighborhood: a stable road, avoiding the future construction of a mega mansion of the vacant land, and allowing my wife and me to build a driveway down to our house. The driveway will eliminate the 89 stairs we climb up and down to access our house.

In July 2017, we paid the City $329,891 for the vacated parcel and have spent over a hundred thousand dollars on road repairs. Yet, almost four years later, we haven't been able to apply for a permit for the driveway.

The city is aware of our litigation with the Wischmans. We are seeking a clean quit claim deed for the vacated and privatized. Close v. Wischman, King County Superior Court No. 19-2-33067-8. (We voluntarily dismissed our claim against the city in the case.) Defendants Judie Wischman and the trust created by her beloved deceased husband own the properties at 4003 and 4007—west of the 4001 property which is applying for the development permit. Her son, Mark Wischman, has an ownership interest in the LLC that owns the 4001 property, which is applying for the development permit. He also has a beneficial interest in the 4003 and 4007 properties through the trust. And, Mark has been involved in our dispute and suit. Our goal is to resolve the suit either by settlement or in arbitration. Our aim is to apply for a driveway permit, once we receive a clean quit claim deed and a boundary line adjustment.

The neighborhood on the hillside shares common interests and enemies like water and drainage ….

The application for 4001 directly refers to shared access and utility easements with the adjacent property to the west at 4007 West Mercer and to drainage issues.

Here is what was provided at no cost to the Wischman's to resolve the Freeman Ave Private road issue which eliminated the City's 5.1 million dollar claim.

It did not eliminate ongoing problem's but transferred them to the private sector.

Here is what the Close's working with the Gladstein's accomplished for the Galvin's and the city.

Here is what the closes accomplished for the neighborhood

Here is what Michael Gladstein, Matt Galvin and the Close's made happen.

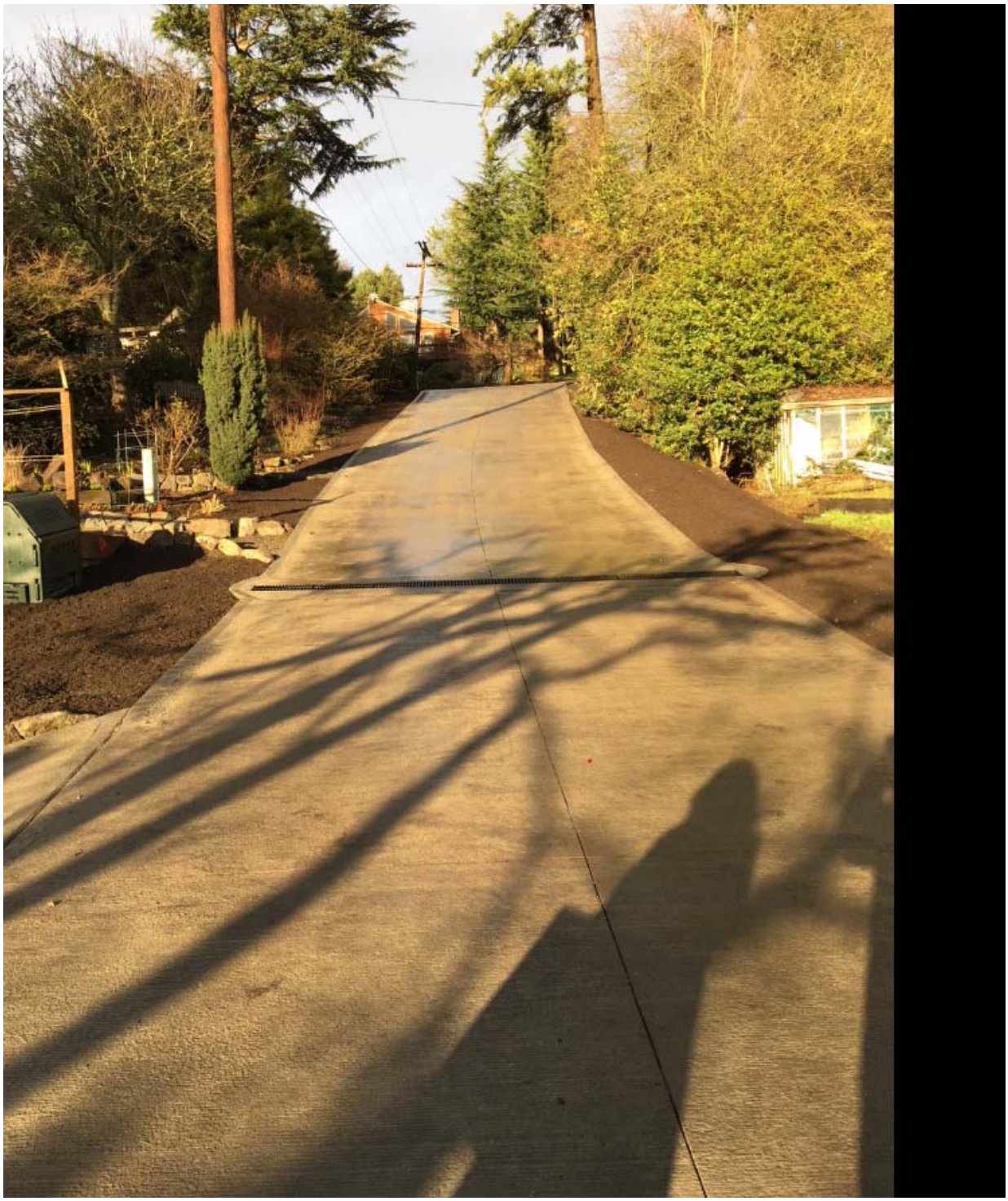
Check out the new road.

It started with Mr and Mrs Close agreeing to purchase Freeman ave for the appraised value regardless of the value. They made this commitment and lived up to it. Bio Park also promised if budget allowed to repair the old Freeman City road to west mercer way. The city lived up to it's promise.

Additionally, this was part of the deal, the city would redo Freeman ave to West Mercer with the funds from the having Freeman go private if possible.

This part of Freeman ave was part of the agreement to have Freeman ave Private.

Bio kept his promise and used city funds to upgrade the Old tired Freeman private road.



Here is the new parking the neighbors have:

Here is the freeman road and the cracks that closed it:

Here is Freeman ave 11-2-1998 before Michael Gladstein

It was only truly fixed when it became privatized!

The value added to the neighbors was the following

1. The new road allowed them to use it in ways that could expand their capabilities for use of the beach cabin, and therefore improved efficiencies for all of their construction as well as the usual traffic items.

2. The road from west Mercer to the edge of the private road was the honoring by the City of MI, Mr Close's request to use the monies from Privatization to improve the private road. Mr and Mrs Close made a commitment to Bio Park Mercer Island City Attorney to purchase all of the 60' of Freeman ave for the fair marker value without any knowledge of the fair market value.

3. This was done to help the city and to have the capability to build a road from our house.

It has been almost 4 years and we still only own 30' of waterfront as the Wischman's provided a defective quit claim deed and have not corrected this error.

In summary, the neighborhood has changed and Judie Wischman has deferred all legal decisions to Mark Wischman and Jeff Wischman.

Mark Wischman told Mr Close the survey never does it right, there are no stakes on the waterfront survey. Mr Close and his attorney went to the water and found the survey stake. The city did it correctly.

Mark was wrong.

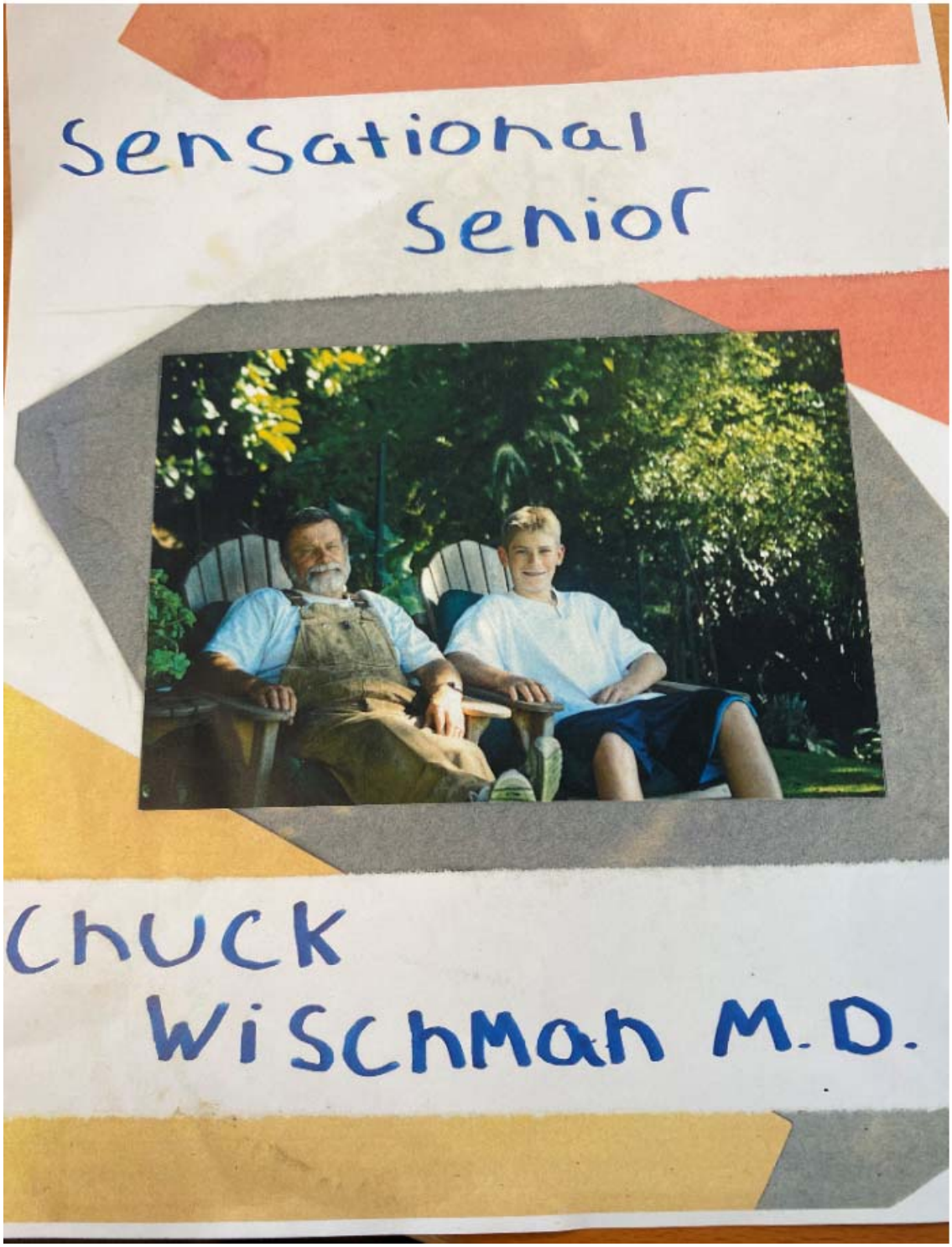
Mark Wischman said the Wischman's did not need a road and they could build stairs for $5-6 thousand. One of the landings for the closes was repaired by a carpenter for $7500.00. Mark was wrong.

When Marilyn heard that Mark and Jeff had given Judie advice to change her mind at the 11th hour I called Mark and asked how he could have allowed this win win process to be derailed…"Marilyn, Marilyn you just don't know how to play the game….it's not over till the last signature is on the paper."

The process or litigation continues. The Close have been thanked by every neighbor except one.

However, it was not always this way:
Here is my son with Chuck Wischman to whom the entire neighborhood enjoyed.

The passing away of the patriarch and the unwillingness for Judie to run the ship and defer to Mark and Jeff Wischman have created the new normal.



Sincerely Yours,

Frank Close P.E.

GUARDIAN SECURITY

Seattle - Tacoma - Poulsbo - Bellingham

1743 First Avenue South
Seattle, WA 98134

Tel: 206.622.6545
Fax: 206.341.9928

Freeman Road subdivisions: 4001 West Mercer Way

June 1 2021

Dear Folk's

Here are 3 concerns.

1. Parking
2. Right of way usage
3. The steep entrance for the two houses as they enter from Freeman and how that Right of way will be preserved by the neighbors who have NOT done so in the past.
4. Think about the development of all possible subdivisions and the infrastructure necessary.

The Parking is the first concern.

There is the rule and there is the way the folks do not follow the rules.

Here are the applicable codes

City of Mercer Island 19.02.020

G. *Parking.*

1. *Applicability.* Subsection (G)(2) of this section shall apply to all new construction and remodels where more than 40 percent of the length of the structure's external walls have been intentionally structurally altered.

2. *Parking Required.*

a. Each single-family dwelling with a gross floor area of 3,000 square feet or more shall have at least three parking spaces sufficient in size to park a passenger automobile; provided, at least two of the stalls shall be covered stalls.

b. Each single-family dwelling with a gross floor area of less than 3,000 square feet shall have at least two parking spaces sufficient in size to park a passenger automobile; provided, at least one of the stalls shall be a covered stall.

3. No construction or remodel shall reduce the number of parkingspaces on the lot below the number existing prior to the project unless the reduced parking still satisfies the requirements set out above.

4. Except as otherwise provided in this chapter, each lot shall provide parking deemed sufficient by the code official for the use occurring on the lot; provided, any lot that contains 10 or more parking spaces shall also meet the parking lot requirements set out in Appendix A of this development code.

The parking is as follows.

We need parking for the existing Less house.
We have parking for the new house.

So, we have roughly 4 cars from these two houses., The rules will tell us this.

Next, we have 4007 West Mercer way Judie Wischman's home.
We have cars for this hourse.
How many cars do we have?
Judie has a car.
Judie has a renter and the renter has a car.
Judie is sharp as a tack and has no major health issues that I know of.
Judie also has an Accessory Living Unit inside her house with a dedicated Kitchen, cooking, and a patio.
This leads to 3 cards, one for Jesus, one perhaps for Amanda, and I am not sure what the third one is for.

So, we now have 5 cars of 4007 and we have 4 cars on 4001 or a total of approximately 9 cars.

Most of these (3-4) park on the RIGHT OF WAY, which is city owned and was to be landscaped to create more green space.

With the cars parked there the space is not permeable with the car there.

What is the ADU doing there?

Let's take a look at the ADU or accessory dwelling unit space.

Here is the definition of ADU.

City of MI - Definitions

Accessory Dwelling Unit (ADU): A habitable dwelling unit added to, created within, or detached from a single-family dwelling that provides basic requirements for living, sleeping, eating, cooking and sanitation.

Single Family Dwelling: A building designed and/or used to house not more than one family, plus any live-in household employees of such family.

Jesus, Amanda and family live in a ADU in Judie's basement on 4007 West Mercer way.

Here is Judie's permit application for this space.

WHEN RECORDED SUBMIT A COPY TO:
Development Services Group
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040
(206) 275-7605

KING COUNTY DEPARTMENT OF RECORDS AND ELECTIONS

AFFIDAVIT OF:	Affidavit In Support Of
Name:	Single-Family Building Permit # 1803-172
Address:	

I, Judie Wischman, am over the age of 21 years, and make the statements herein of actual knowledge.

1. The address of my property is 4007 West Mercer Wy and there is **not** an accessory dwelling unit or a duplex at this address.
2. This shall remain a single family unit, unless approved otherwise by the City of Mercer Island.
3. I will notify my prospective purchasers of the limitations of Mercer Island's Accessory Dwelling Unit regulations.
4. I understand that the City may require the removal of any accessory dwelling unit, duplex, or other multi-family unit if any of the requirements for single-family housing are violated.
5. I agree to have this document recorded with the King County Department of Records at my expense, and supply a copy to the City of Mercer Island.

I declare under penalty of perjury that the foregoing is true and correct.

SIGNED: Judie Wischman DATE: 3/29/2018
Property Owner(s)

As you can see Judie Wischman< PR for the estate of Charles Wischman perjured herself.
Has this harmed the Closes?
Most certainly it has in numerous ways.
Jesus and Amanda are not property owners or even renters in the current sense.

They work on the Wischman property and other properties as a result of Mark and Jeff Wischman. They perform garden tasks for both properties.

How is Jesus time even compensated for? Is the trade for labor ? Is overtime compensated for , Jesus works long weeks usually 50-60 hours. He is a hard worker.

We would like the city to deal with the situation of this perjury for personal gain and a caretaker on their property.
We would like no ill will to happen to Jesus and family, however as neighbors, our neighborhood has been degraded due to the ADU.

However, Judie , I believe executed this document at the direction of Mark Wischman and while she perjured herself, the consequences Mark created for her were to have a steady supply of cheap labor in exchange for Rent.

These are not neighbors but more like workers living in your home full time gardening and also working elsewhere as directed.

This is not conducive to a good neighborhood.

Judie has created a DEFECT, and this DEFECT needs to be cured by proper municipal procedure.

Right of way Issues:

The Wischman's do not have access to their house via the city street direct, but this "Right of way is used for this purpose and IS NOT USED TO PROVIDE A NICELY MAINTAINED RIGHT OF WAY THAT IS EXPECTED OF MUNCIPAL CODE.

The parking issues are simple.

There are garage requirements but we need to plan for the parking of 8-9 +/- vehicles.

These vehicles will sit for along time and where they sit , when they sit even on permeable area will not be permeable.

Here are some photos to illustrate THIS POINT.

Here is an example of the situation.

Here we go with how they resolved the parking: Note this was one space and now is space for 4, what about the responsibility of the RIGHT OF WAY to have Green spaces on City owned property?

They expanded the ones slot with the path to handle all of the added traffic.

Here is the parking they have created for themselves with no city permission.

Here is what they Neighbors had previously:

There was one road access to the site and one parking spot, now there are 3-4 and yes, they are all used up, however they are on the right of way?

Will Mark Wischman use the right of way on 4001 West Mercer Way like he does the other one?

He is supposed to support the right of way, but did not do so on 4007 , so why would one think he would do differently in 4001 West Mercer Way?

Just look at the current use verses the previous use. This access is not their current access, but it will now have lot's more vehicles.

THEY DID NOT LANDSCAPE THE PROPERTY THEY DID NOT OWN FOR ENVIRONMENTAL REASONS.

NOTE THE OLD DESCRIPTION OF ONLY ONE CAR SPACE AND GO FROM THERE TO 3 CARS AND ACTUALLY ROOM FOR 4?

We simply ask the City to resolve the issue with the perjured ADU in order to get the permit.

Example. There was an emergency permit to repair the foundation and that became Jesus Deck.
There was a permit for some windows to be changed out and that became the ADU combined with the above.

Judie does not need care , Jesus is simply provided with a place to live in exchange in for working Lots of houses for Mark Wischman and Jeff Wischman.

I have no idea how the income and labor and industry taxes are sorted out.
Jesus is delightful and hard working, but he is there because Judie Wischman lied in the above document.

These are our concerns:
What you have in the plans is not what the Mark Wischman and Jeff Wischman deal with on the ground.

Thanks for your understanding of the large number of vehicles to go up and down this road.

Here is my summary:

- Parking needs to be thought thru and this means we assume the worst case, the short plat of 3883, 3887, 4001 and 4007 and all of the traffic and parking this entails.
- Recognize that the Wischman's do not execute on the right of way and after 3.5 years they still have right of way issues that prevent the green spaces that would be so advantageous to the hillside.
- Right of way issues go directly to the lack of municipal enforcement as the "Green House was to have been removed by Mr Neuman and it is still there.
- The entrance off of Freeman ave needs study as it is right below a steep portion.
- Again, I would look at the subdivision of all possible properties and see where that lead with the right of ways.
- Anything done on 4001 will impact the properties below in terms of parking, street relocations and drainage.

Sincerely Yours,

Frank Close P.E.

DAVEY Resource Group

Corporate Headquarters
295 South Water Street, Suite 300
Kent, OH 44240
800-828-8312

Local Office
18809 10th Ave NE
Shoreline, WA, 98155
1-800-966-2021

May 25, 2021

Frank Close
3887 W Mercer Way
Mercer Island, WA, 98040

RE: Arborist Consultation on Stormwater Benefits of Trees

In May 2021, DRG was asked to review the short plat application for 4001 W Mercer Way, the existing arborist report documents, and background information. The assignment was to model the changes to the stormwater mitigation services provided by the trees at this property. The analysis was performed using the i-Tree software models (https://www.itreetools.org/), specifically the iTree MyTree and iTree Design tools for modeling stormwater mitigation benefits provided by these trees. DRG had no permission to trespass on the property, so tree data was provided from the short plat application documents as well visual estimates using aerial imagery provided by Google services (Google Street View).

Rainfall interception by trees reduces the amount of stormwater that enters collection and treatment facilities during storm events. Trees intercept rainfall in their canopy, acting as mini reservoirs, controlling runoff at the source (EPA, 2013). Healthy urban trees help to avoid the amount of runoff and pollutant loading in receiving waters in three primary ways:

- Leaves and branch surface intercept and store rainfall, thereby reducing runoff volumes and delaying the onset of peak flows.
- Root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and reduce overland flow.
- Tree canopies reduce soil erosion and surface flows by diminishing the impact of raindrops on bare soil.

There were a total of 18 trees evaluated on three properties, 4000, 4003, and 4007 W Mercer Way. The stormwater benefits provided by trees at these three properties intercept an estimated 34,376 gallons of rainfall each year and help to avoid an estimated 24,130 gallons per year into adjacent stormwater systems (Table 1). **The anticipated removal of seven (7) mature trees at 4000 W Mercer Way could increase runoff by an estimated 14,237 gallons annually into the stormwater system along Freeman Ave** (Asset ID SD-GM-05189, Figure 1).

The existing trees at 4001, 4003, and 4007 provide stormwater mitigation benefits to the neighboring homes reducing the impacts of rainwater and demands on City stormwater systems. Although actual amounts of rainfall avoided cannot be calculated, the iTree models provide the best available science to evaluate the benefits of trees in the built environment. The City of Mercer Island has recognized the benefits of trees in their 2017 urban tree canopy assessment project and their 2021 Stormwater Management Program plan update.

The DRG team is devoted to providing excellent customer service through our technical expertise and our passion for innovative solutions. We recognize that our success depends on meeting your needs. Please feel free to contact me with any additional questions you may have.

Sincerely,

Ian Scott | Seattle Area Manager
ISA Board Certified Master Arborist® (PN-5408BUM)
ASCA Registered Consulting Arborist #698
Davey Resource Group Incorporated
P: 206-714-3147
www.DaveyResourceGroup.com

ENCL.

References

1. U.S. Environmental Protection Agency (2013) Stormwater to Street Trees. Document No. EPA 841-B-13-001
2. U.S. Department of Agriculture Forest Service's i-Tree: Tools for Assessing and Managing Forests and Community Trees. Available online: http://www.itreetools.org
3. City of Mercer Island (2021), Stormwater Management Program Plan Update
4. City of Mercer Island (2018), Urban Tree Canopy Assessment

TABLE 1: Summary Estimates of Intercepted and Avoided Rainfall at Subject Properties

Street Address	Tree ID#	DBH (in)	Species	Condition	Plans to Retain or Remove?	Intercepted Rainfall (gallons/yr)	Avoided Runoff (gallons/yr)
4000	1	29.5	Douglas-fir (Pseudotsuga menziesii)	Poor	Remove	2,295	1,587
4000	2	36	Douglas-fir (Pseudotsuga menziesii)	Fair	Remove	3,778	2,654
4000	3	20	Bigleaf Maple (Acer macrophyllum)	Poor	Remove	1,975	1,484
4000	4	12	Prunus cerasifera	Fair	Retain	1,394	977
4000	5	10	Crataegus	Fair	Retain	846	593
4000	6	14	Fraxinus latifolia	Fair	Remove	1,806	1,265
4000	7	10,10	Thuja plicata	Fair	Remove	925	648
4000	8	11	Crataegus	Fair	Retain	945	622
4000	9	10	Crataegus	Fair	Retain	846	593
4000	10	42	Bigleaf Maple (Acer macrophyllum)	Excellent	Remove	7,715	5,405
4000	11		Holly Hedge	Good	Retain	unavailable	unavailable
4000	12	18	Prunus cerasifera	Very Poor	Remove	1,704	1,194
4000	13	34.5	Thuja plicata	Fair	Retain	3,664	2,567
				Sub-Total		27,893	19,589
4007	101	14	Thuja plicata(?)	DEAD	YES	1,071	750
4007	102	12	Thuja plicata(?)	Fair	YES	846	593
4007	105	14	Hemlock (?)	Fair	YES	1,178	825
				Sub-Total		3,095	2,168
4003	103	6	Ash(?)	Fair	YES	597	418
4003	104	20	Ash (?)	Fair	YES	2,791	1,955
				Sub-Total		3,388	2,373
				TOTAL for All Properties		34,376	24,130

Figure 1: Illustration of stormwater infrastructure adjacent to subject properties.

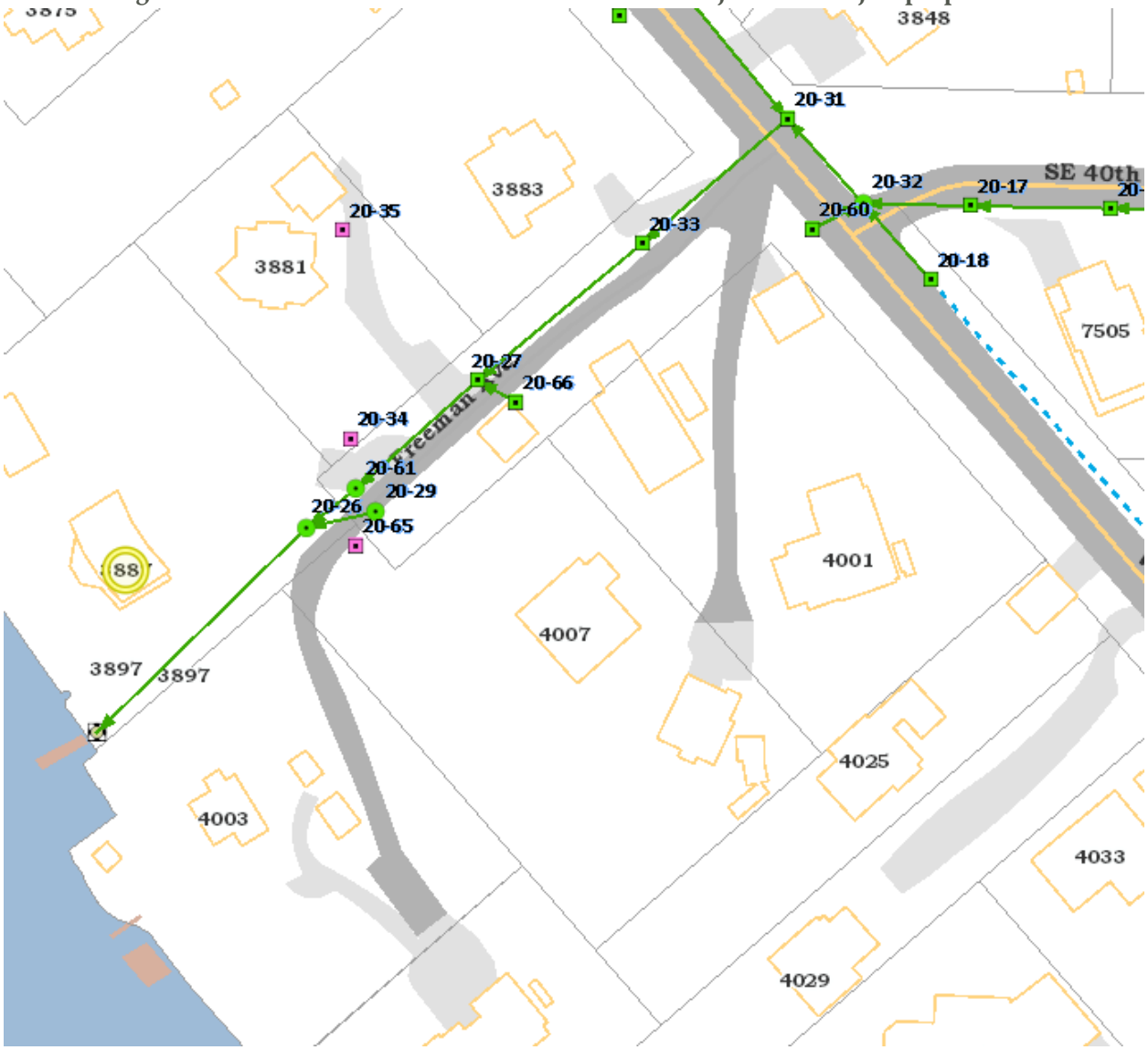
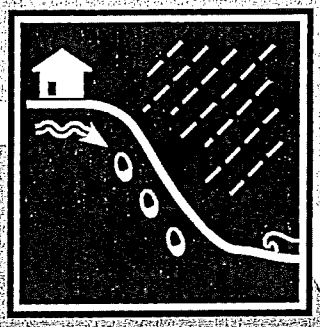


Figure 2. Aerial view of subject trees at 4003 and4007 W Mercer Way.

Figure 3. Aerial view of subject trees at 4001 WMercer Way



SURFACE WATER AND GROUNDWATER ON COASTAL BLUFFS:

A GUIDE FOR PUGET SOUND PROPERTY OWNERS

DEPARTMENT OF ECOLOGY
State of Washington

JUNE 1995
PUBLICATION 95-107

GETTING STARTED WITH DRAINAGE CONTROL

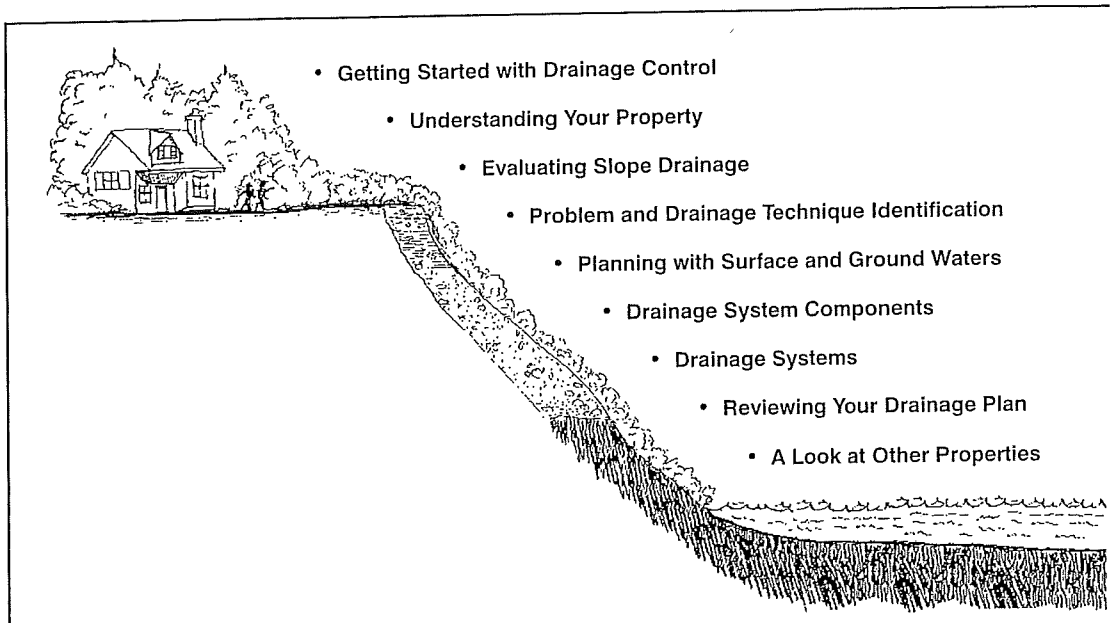


Figure 1. Sections of this booklet.

Drainage and erosion are natural processes. Do not panic. Every coastal property has some degree of surface and groundwater flow. You will never be able to control these drainages entirely. So the goal of absolute drainage control is usually not technically feasible nor is it usually necessary. The practice of drainage control is really the practice of managing flows to the point where they are not contributing to accelerated erosion and landsliding along your coastal slope. Drainage and coastal erosion may be managed but not eliminated. Therefore, you must plan with them.

Surface and ground waters in-fl ence slope erosion and stability. Each year wet weather stresses many vulnerable properties to their points of failure which cau severe erosion and landsliding events around Puget Sound. Th notable occurrences can usually be traced to the following issue recent changes in the surface conditions around a property; accumulated small slope stabilit weaknesses that go undetected unattended; or poor drainage sy tem performance on a property.

You have probably observed some signs of slope distress during a wet weather season. As a coastal property owner, you should be aware of the role water plays in the short and long term stability of coastal slopes. Excessive soil erosion and land movements can create restoration costs and environmental impacts costs. Each of these costs is avoidable.

Although this publication deals primarily with managing drainage issues along coastal slopes, other factors also influence slope stability and erosion of slopes. These factors include: subsurface geological characteristics; vegetation management on and above slopes; property modifications during property development; and coastal marine processes acting at the slope toe. Each of these factors should also be considered in your drainage planning to provide a comprehensive approach to slope stabilization and erosion control. Other Ecology publications are available to help with your planning. Refer to the booklet section *For More Information* on page 61.

The main booklet sections are introduced on *Figure 1*. Each section builds on information presented in previous sections. So, it is important that you review each section of the booklet before skipping directly to specific sections.

Three basic steps can protect your slope against accelerated erosion and landsliding. *First,* understand your property. It is not an extensive effort to generally characterize your slope area and identify the water movement around the slope.

Second, identify problems and plan appropriate improvements into your site. Take the opportunity during property development to include drainage control with your landscaping work. On each coastal property, there are typical site constraints which must be considered. Identifying the oppor-tunities and constraints of your site are key goals of your planning effort.

Third, carefully construct and maintain your drainage system. Taking the time to ensure that good materials and workmanship are used on your property cannot be overemphasized. Give your system periodic maintenance tune-ups.

PLANNING WITH SURFACE AND GROUND WATERS

After spending time evaluating the drainage characteristics of your property, completing the checklist and locating potential problem areas, you may feel ready to start taking action on your drainage issues. However, before you go forward you should take advantage of published information, public agency guidance, and opinions from technical experts in specific areas (see section *For More Information*). Seeking additional resources and guidance will allow you to clarify or modify your checklist notes on your property. You should resist jumping from your initial property observations directly to the installation of drainage control elements. If you spend just a little time with site planning, you may be able to pull the pieces of your drainage observations into a coordinated system which can help you avoid re-locating problems from one area to another.

CREATING A PROPERTY DRAWING

Making a plan (drawing) is the best way to organize your drainage control system and is certainly the best way to communicate your approach to others. *Figure 9* shows an example drawing. Nearly everyone feels comfortable with pictures. Your drawing will help everyone associated with your property clearly know the nature and extent of your proposed work. Governmental agencies that may be involved in project permit approval usually request if not require a proper drawing or plan. The drawing may be part of a more formal submittal to an agency usually called a drainage control plan. The plan may include a drawing of your prop-erty and some written descriptions of the project. Regardless of the different reasons for a plan, it is in your interest to create a drawing because of the following:

- A drawing helps you cost-effectively coordinate and locate your planned improvements in relation to other property features;
- A drawing helps you clearly communicate your drainage control goals to potential contractors which should help you obtain good work proposals and accurate cost estimates;
- A drawing helps avoid damage to property;
- A drawing helps form a basis of communication between property owners, contractors, and agencies that is clear and positive
- A drawing can be used to record locations of constructed drainage improvements.

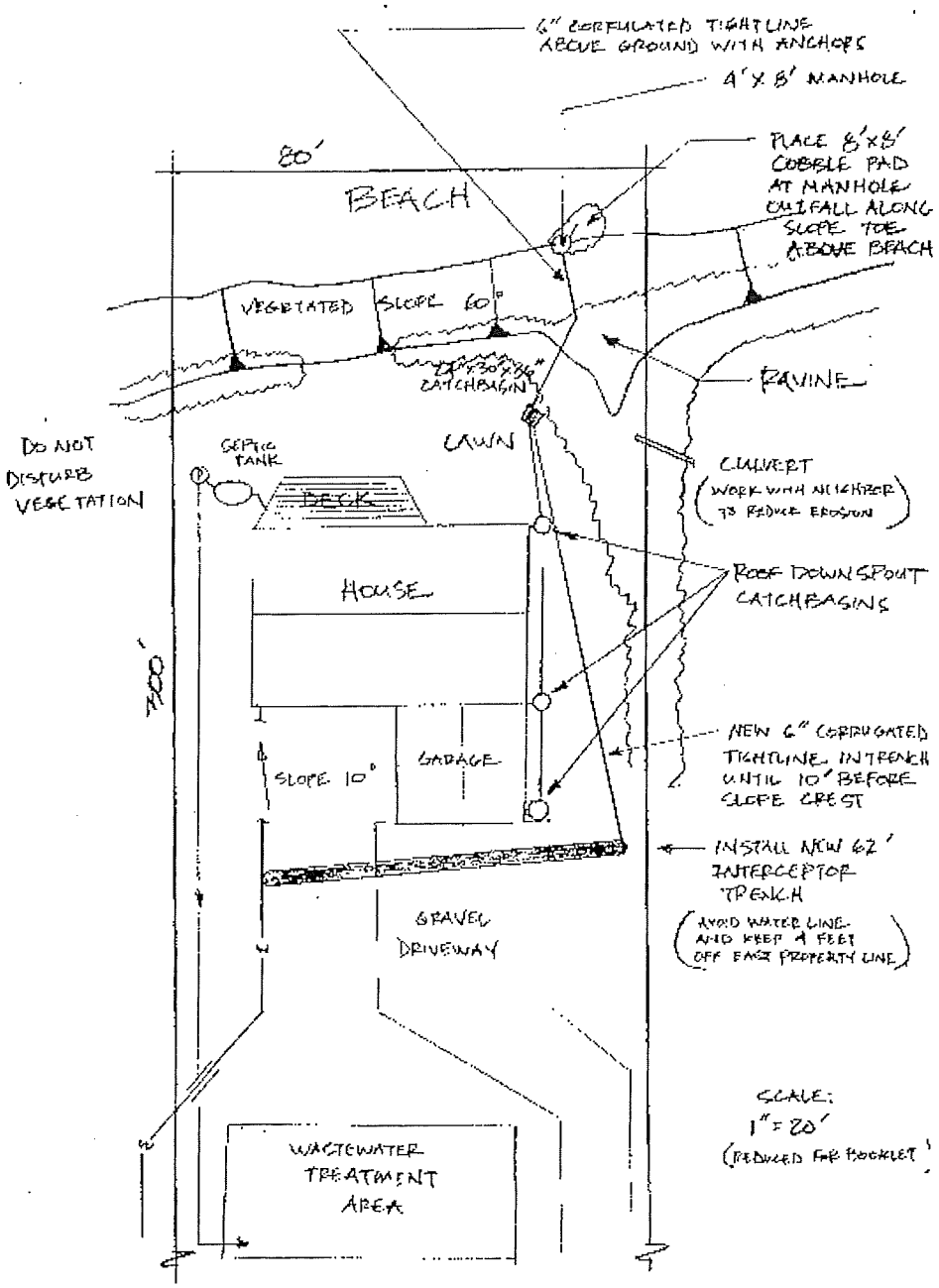


Figure 9. Example of a drawing.

Elements of the Drawing

There are three primary types of information you are likely to put on your drawing: general topography, existing features, and planned features. Each of these pieces of information is fairly easy to acquire. For topography you have the choice of either hiring a professional surveyor to do a boundary and topographic survey or generating portions of the plan yourself. If the planning area is small with the topography contours and boundary lines easily established, you may decide to undertake the work yourself. To begin the drawing, you must identify the locations of your property corners and general property dimensions. You will need a pencil, a pro-tractor, straight edge and an engineer's scale or ruler in order to sketch the configuration of your property on a large sheet of paper. Using a scale of one inch on paper equals 20 feet on your property usually works fine for most sites where the planning area is restricted to under an acre. Otherwise, you can use a scale of one inch equals 30 feet or greater.

Setting topographic contours or grades in a small open area of ro ly a couple hundred feet square be performed measuring or estin ing the vertical drop per 100 feet. feet dropped in 100 feet equals t average slope angle in percent (i. feet in 100 feet equals 2 percent). On steep slopes, you may be able only approximate the grade but s be sure to identify the locations c your observed features.

For most sites there are enough c plex issues or enough area to cov that it helps to hire a surveyor to a topographic site plan. The surv can also locate any existing featu on your property that you identi The locations of roads, houses, la scaping, outbuildings, the top an bottom of slopes, existing draina features, and septic systems can be included in your topographic vey work. Remember to check ar survey against what you actually observe on your property. Typica you will need to add more detail to your plan than what is shown.

Now that you have most of the information shown on your plan, the last remaining bit of information is to identify features that are part of any planned construction. With your plan showing existing site information you can now locate potential drainage improvements on your site. Review this booklet along with other references before choosing the final location any proposed drainage system improvements.

The Department of Ecology Water Quality Program as part of the Puget Sound Water Quality Management Plan suggests that both small and large parcel construction projects put together an Erosion and Sediment Control Plan. The Water Quality Program identifies small parcels as properties having: individual, detached single family residences and duplexes; created or added less than 5,000 square feet of impervious area (driveways, parking lots, roof area, etc.); and land disturbing activities of less than one acre. Your plan may satisfy all or part of any erosion and sediment control plan.

Check with your local public works department for more details on specific drainage or drainage plan requirements. A typical drainage plan package submitted to your local building and planning office usually includes the following basic information: location of property and physical description of the property; a scaled plan (drawing) of the property showing accurate locations of existing and proposed structures and topography; locations of drainage system(s) and erosion control measures; limits of site disturbances; locations of any required setbacks and critical areas; and identification of the final points or areas of water discharge.

Installation Considerations

Always mark the locations of utilities before you begin construction. You can call the Utilities Underground Location Center "1-call" at 1-800-424-5555 for a free service that will locate the utilities that service your property. Utilities can include power, telephone, water, gas, cable, and others. There may be some utilities and underground features that only you know about (power to an out-building, drainage lines, buried tanks). Be sure to also locate these utilities prior to construction.

Drainage system installation should be done during dry weather periods except in emergency situations. Excavations can quickly be flooded with water making proper construction difficult and dangerous. If there is a lot of water present while excavating soil, you will have sediments accumulating in the gravel openings, on the geotextile, in pipes and catchbasins, and in marine waters where the drainage will eventually discharge.

Avoid construction when the ground is wet. Your system will perform better with dry weather construction and not cause sedimentation in other areas.

Before you complete the installation of your system check to make sure pipes have not been crushed by heavy equipment. Make sure each connection is solid and not leaking. Check the slope of pipe runs. It is a common practice to water test your drainage system before covering it with soil (backfilling).

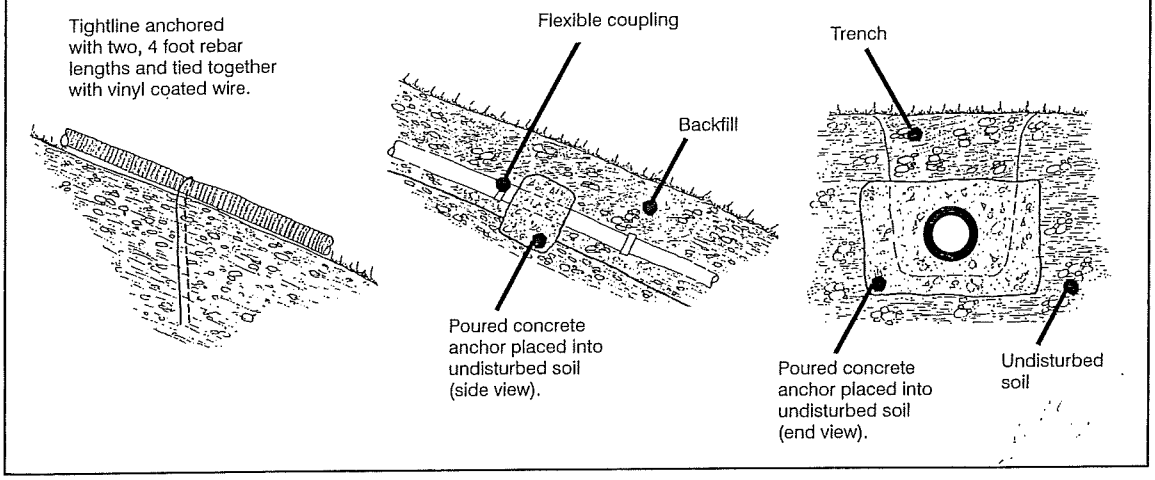


Figure 10. Anchoring Systems.

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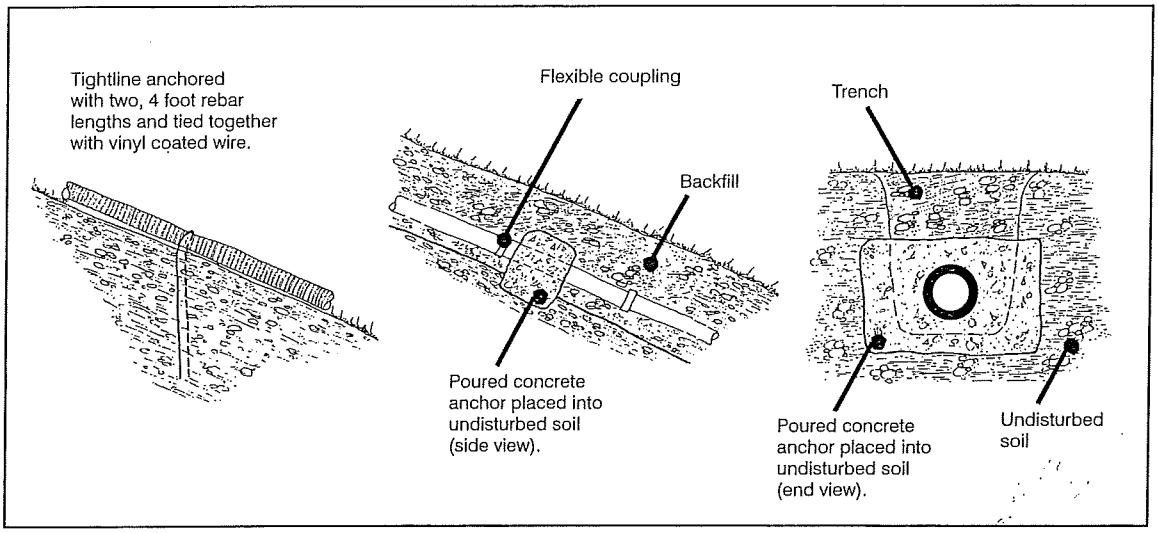


Figure 10. Anchoring Systems.

Water must move downhill so double check to see that water moves to your planned locations. If you do not do the installation yourself at least observe your construction so you can help troubleshoot any future problems. Make a photo record of the work if you have a camera handy.

During construction you should take your plan drawing and sketch onto the plan what actually was installed. Important items such as locations, depths, sizes, and problems will help you improve or expand your system later. A system "as-built" will also help you or a future property owner avoid damaging the system during other site improvement work.

Care and Maintenan

Every drainage system needs some periodic inspection to s that the system performs pro Surface features like yard dra roof drain catchbasins, manh swales, above ground pipes a couplings, pipe anchors, and discharge areas can be quickl checked. Catchbasins and ma holes are usually designed tc ture debris and heavier sedir and will require the removal few buckets of material from to time to prevent pipe clogg and discharge of material int water bodies.

Below ground drainage featu like pipes, strip drains, coup and overall system performa should be checked regularly signs of failure during rainfa events. Overflows, leaks, we areas, flow bypassing your s and discharge interferences noted and immediately repa if you detect the problems ea

DRAINAGE SYSTEMS

Approaches to drainage issues will usually fall into two general types of solutions which incorporate drainage minimization solutions and drainage control system solutions. Each group of solutions helps manage slope stability and slope erosion at your property. The practices introduced in this section are general and cover basic drainage management techniques around coastal slopes. Consequently, any single technique by itself may not sufficiently address the broad range of drainage issues occurring on your property. Nor may this publication discuss in sufficient detail the application of each technique to the unique characteristics of your property. There-fore, it is always a good practice to reference other information sources before making the final selection of your drainage system.

General slope shapes for Puget Sound shorelines used in this publication are shown in *Figure 11*. Use *Figure 11* to approximate some of the slope shapes that are familiar to you. When you identify your general shape(s), you can match drainage control techniques with your property characteristics identified in your planning efforts.

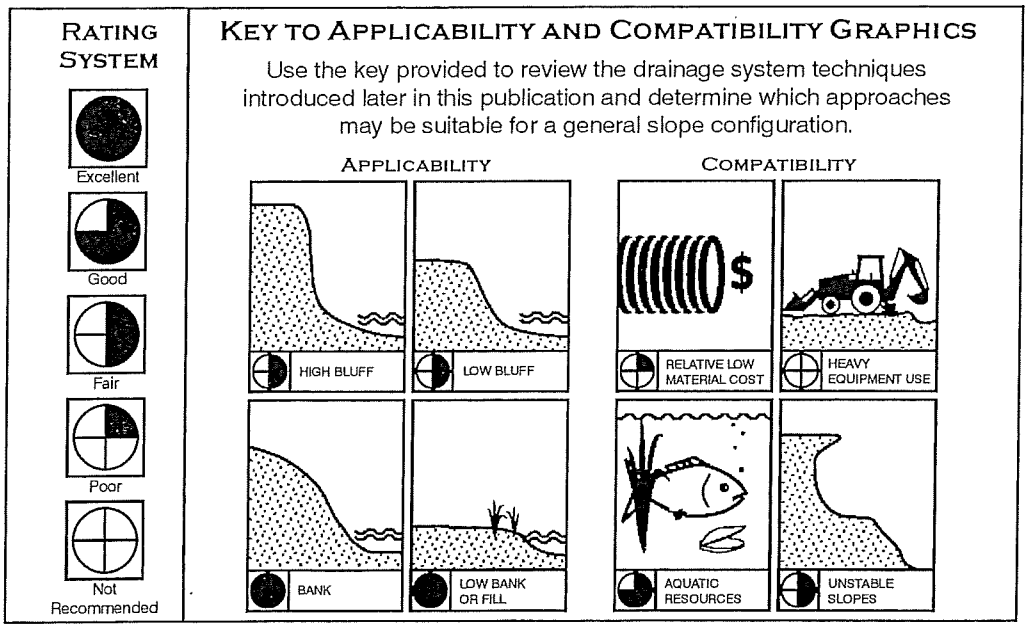


Figure 11. Indicates general applicability of a drainage system technique for typical slope shapes and compatibility of drainage system approaches with existing shoreline issues. The degree of general applicability or compatibility ranges from **Not Recommended** ⊕ to **Excellent** ● and is indicated accordingly in the graphics window.

You then can implement a number of drainage control measures presented in this section.

Drainage improvements on a coastal property can be located in any of the following areas: above the slope crest, on the slope face, and near the slope toe. In each of these slope zones, a variety of construction techniques can be applied. Nevertheless, some generalizations can be made about each group of techniques based on their locations. The compatibility of each group in different slope areas is summarized on *Table 2* located on page 37.

Above Slope Crest

Managing surface and groundwater before flow reaches a slope is usually the most prudent approach to improving slope stabilization soil and erosion control. Improving drainage at the top of the slope typically requires an integrated approach to drainage control instead of a single, large-scale approach which may be seen on the slope face and along the slope toe. In a system there can be many different drainage control elements including: groundwater interceptor and relief drains, surface water interceptor swales, tightlines, catchbasins, landscaping yard drains, and detention storage. The construction approaches for systems with these components are similar.

Slope Face

Designing and installing drai control systems on slope face can be risky for both the slope for slope workers. Make sure you and other people are secu on the slope and that you are working in unstable areas. Dr age control on slope faces typ addresses issues such as grou water seepage from the slope surface water erosion control. Depending on the geometry a characteristics of your slope, y can consider different control niques. Construction disturba risks to your slope should alw be weighed against the potent gains in slope stability. A num of the construction practices a low impact techniques while c ers may require heavy equipm

Below Slope Toe

Slope drainage in Puget Sound been historically modified by t construction of retaining walls bulkheads near shorelines. Wa designs should have adequate drainage to keep water pressu from developing behind walls. Presently many bulkheads and wall systems around Puget Sou are in varying conditions of fai and consequently are not perfc ing as designed. Should you su pect that drainage at your slop toe accumulates behind structu you should seek technical assis tance to assess your site conditi before performing improvemer in this high risk area.

Chapter 3: Vegetation Management: Tree Removal

Owners of bluff properties have many questions about site development, erosion control, view clearing and beach access. Often, these questions are asked too late: after the damage is done and possible options are eliminated. Even when a property owner is aware that his or her decisions are critical to the long-term stability of a site, it can be difficult to judge the best course of action.

In preceding chapters the complexity of the shoreline environment and the role of vegetation has been discussed. By now you realize that it is important to consider all the factors involved before acting. This chapter and the next address some of the most common questions asked by shore property owners and offers generalized answers.

Should trees be removed?

This simple question generates a range of sometimes contradictory answers. There are many factors to consider before reaching a decision. These factors include: stability of the slope, species, age, health, current stability of the tree, position on the slope, surrounding vegetation, rooting habit/soil type, density of the stand, and the ability of the tree to sprout. Before we discuss these factors, it is necessary to mention some general considerations that apply to tree removals on steep slopes.

General Considerations Pertaining to Any Tree Removal

Tree Roots. The root systems of trees form an interlocking network, especially on many shoreline sites where rooting can be shallow. Often rooting is only two to three feet deep. The depth of root penetration is largely a function of soil depth and type, soil moisture, and the presence or absence of a dense layer of clay or till. These factors have a greater influence on rooting than any tendency of a tree to develop a characteristically deep or shallow root system.

Trees compensate for shallow rooting by increased spread of root systems. Recent research has indicated that a tree's root system will extend considerably beyond the dripline, often as much as two to three times as far. Extensive lateral root systems are common where soil moisture is excessive, soil is shallow, and impervious soil layers impede vertical growth. Where soils are porous, well-drained, deep, and no impervious layer exists, deeper rooting will occur.

Generally, the influence of a tree's roots on a given site will be related to the tree's age and size. Larger trees will have more extensive, often deeper and better developed root systems. Dominant trees, those larger and taller than the surrounding ones, have been more subject to wind and usually have developed stronger root systems as a result. Before clearing trees, consider the effects of removal on tree rootmass over time. Roots of dead trees decay, their stabilizing influence diminishing over a three to nine year period. As a result of the gradual loss of root strength after tree removal, barely stable slopes may fail several years after clearing or thinning.

Trimming debris can contribute to stability problems by smothering vegetation and by causing damage to the slope in sliding or rolling downhill. It is difficult to offer general recommendations for dealing with this material due to the wide range of site characteristics and debris volumes that might be generated.

Since regulations regarding the disposition of trimming debris vary it is advisable to

check with local planning or engineering departments for advice.

Disposing of bluff top clearing debris over the edge of a slope will be discussed later in the guide.

Do Not Remove Trees Without Cause. People tend to remove many more trees than are necessary during site preparation. The value of a healthy, strong tree on a slope or bluff far outweighs its value as lumber or firewood. A tree should be retained unless it is a hazard to life or property, is growing on the proposed house site or drainfield area or has some other major problem. Do not clear a reserve drainfield area before it is needed. Explore alternatives to removal thoroughly before deciding to cut. The location of trees and other factors involved should be considered carefully. Do not remove trees on slopes until home construction is complete. You may find that the trees do not need to be removed.

On Choosing a Tree Service

The tree care industry is currently undergoing something of a revolution. Many common practices, such as tree topping, are no longer recommended. There has been a great deal of recent research regarding how trees grow and react to environmental changes. New equipment and techniques are continually being developed.

Groups like the Seattle-based Plant Amnesty actively lobby to abolish topping and poor pruning practices. Professional associations such as the International Society of Arboriculture support research and provide certification programs for tree care practitioners. They are good sources of assistance in finding a tree service. See "For More Information."

Choosing a tree service can be a bewildering experience for a property owner. For an owner of shore property, making the wrong choice can have serious consequences. Beware of bids that seem "too good to be true." The money saved initially may pay dividends of disaster within a few years.

When hiring a tree service to work on a potentially unstable site, require proof of the following:

1. Experience (ask for references)
2. Proper equipment
3. Valid license and insurance
4. Understanding of your concerns

Most of the pruning practices described later in this guide are hazardous operations. They should only be performed by qualified and well-equipped personnel. Most property owners should not attempt to perform the work themselves.

Specific Factors to Consider in Tree Removal

Species. Different species have different characteristics. The growth habit, rooting habit, height, shape, longevity, strength, durability, resistance to salt and climatic stresses, and tolerance to pruning all differ among species. Refer to the plant lists in the Appendix for a relative comparison of characteristics for trees commonly encountered on Puget Sound shorelands.

Age. Tree age in relation to expected longevity of a particular species, can be an important consideration when deciding whether or not a tree should be removed. For example, should you cut down a 65 year-old, large Red alder that is obscuring your view? Because alder is a fairly short-lived species that seldom survives beyond 70 years of age, it is probably not going to survive much longer. In this case, expensive view pruning would not be warranted.

The advisability of the tree's removal would be dependent on its role in stabilizing the site. If the tree in question were a Pacific madrone, which can live for well beyond 200 years, then removal would not be advised. Alternatives such as pruning would be an excellent investment for the Pacific madrone. This simple example does not take into consideration other factors that may bear upon a decision to remove a tree in a particular location.

Health of the Tree. Tree health and vigor are important considerations when deciding on removal. Root rots and stem or trunk diseases are the most serious defects. In dense, single species stands infested by root rot, removal may be your only choice. It is advisable to confer with a knowledgeable professional, such as a forest pathologist or arborist if widespread forest health problems are observed.

Current Stability. An assessment of the stability of a tree in relationship to surrounding trees is important. Before landscape alterations begin, determine if the tree is part of an inter-dependent group or can be managed as an individual. Generally, if mature trees grow within 10 feet of each other and share crown canopy space, they are functionally a group. If rooting in the area is shallow due to high water table, impervious or impermeable layers, or shallow soils, then inter-dependence will be greater. If tree trunks lean away from each other (Illustration 8) it is probable they are "balanced" and the removal of one will predispose the other to windthrow.

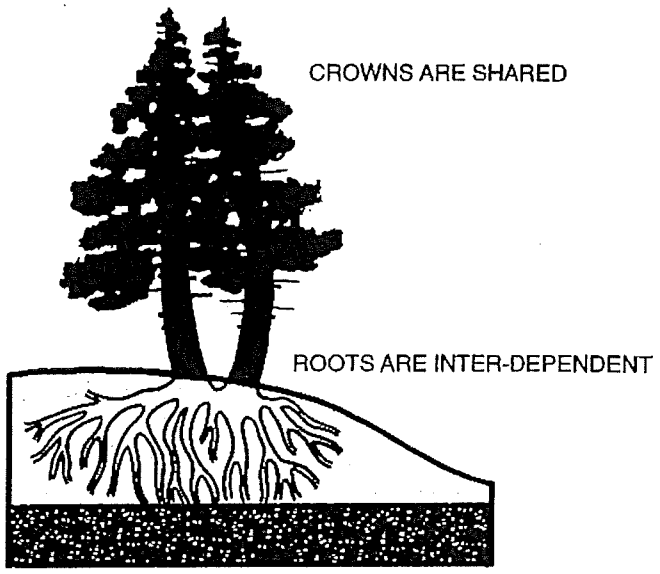


Illustration 8:
INTER-DEPENDENT GROUPING

It is often difficult to evaluate how inter-dependent a grouping is when considering a dense stand. Normally, the denser the stand and the younger the trees, the more can be removed safely. Again, consider all pertinent factors.

When a tree on a slope has become undermined or is otherwise in danger of falling over it should be cut. Determine if an individual tree is losing anchorage or if the lean is the result of soil movement as shown in Illustration 6. Exercise extreme caution when cutting trees on slopes.

Position on Slope. Consider a tree's location on the slope before removal. Illustration 9 depicts a situation where various conifers and deciduous broad-leaved trees are obscuring the

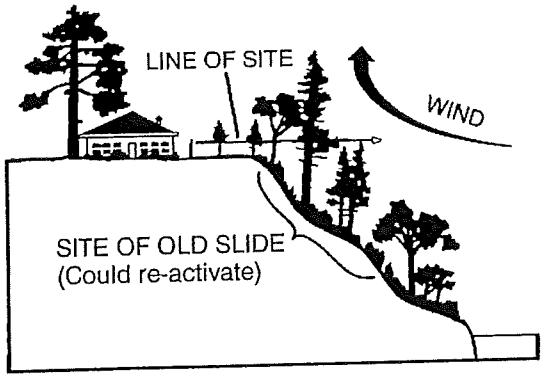


Illustration 9:
POSITION OF TREES ON A SLOPE

view. They are also protecting the residence from the full force of prevailing winds, as well as stabilizing the site of an old slide. Tree cover can often reduce the height of brush. If trees are removed, the brush grows higher thereby requiring constant trimming.

One solution would be to remove some or all of the trees to access a view. However, upon considering the benefits these trees provide and some of the possible adverse impacts that could result, a landowner might seek ways to enhance the view without removing the trees. This might include interlimbing, cutting windows, and skirting-up as discussed later in the question, "What are alternatives to tree removal and topping?" (See illustrations 12 and 13.)

Surrounding Vegetation. All factors should be considered together. This is especially important in regard to the vegetation surrounding trees being considered for removal.

As mentioned, some brush species thrive and flourish when a tree overstory is removed, creating a view management problem. This is particularly true for species such as elderberry, oceanspray, and salmonberry. Alder, wild cherry and some willow species may become maintenance problems when tree canopies are removed and additional light is able to reach the ground. Another species encouraged by increased light levels is Himalayan blackberry which is difficult to control. Invasive species such as Scot's broom prefer disturbed sites with abundant light, and can require constant control to maintain a view.

Native shrub species such as Oregon grape, salal, snowberry, and Evergreen huckleberry are excellent groundcovers that are often common under conifers. They are sometimes over-stressed when trees are removed and can be replaced by less desirable or weedy species.

Most brush problems occur in the area of the bluff between the uplands, the crest, and the upper margin of the slope face. Lower down on the slope, brush is not a consideration in view obstruction. When contemplating the removal of trees high on the bluff, consider the response of surrounding vegetation so as not to create subsequent problems.

Stability of the Slope. An analysis of slope condition by a geologist or geotechnical engineer is strongly advised and in many counties is required. Vegetative clues should be used in conjunction with the geotechnical data and an assessment of the role of the vegetation on the site should be made.

In situations where soil and hydrological conditions promote well-rooted, healthy, mature trees, the trees should be left insofar as is possible. As mentioned, the practice of removing a majority of trees on a slope can greatly increase the probability of a slope failure in the future as the trees roots decompose and their soil-binding capacity declines.

Some geologists or geotechnical engineers routinely recommend the removal of trees because of concerns that: 1) large trees exposed to wind can transmit that force to the slope, thereby causing slope failure; 2) soil moisture is reduced by evapotranspiration of trees, thereby creating cracks in impermeable layers and promoting water infiltration to lower soil layers; and 3) the weight of trees on the slope may cause landslides.

These concerns have been addressed in recent research and the overwhelming conclusion is that in the vast majority of cases, vegetation (especially well-rooted, mature trees) helps to stabilize a slope.

Density of the Stand. The implications of dense stands of short-lived species such as alder and willow have been discussed. In the case of dense stands of conifers such as Douglas-fir, Western hemlock, Red cedar, Grand fir, Sitka spruce or mixed stands of these species, the situation can be quite different. On stable sites with no serious ground water or surface runoff problems, the landowner has several options.

When trees are fairly young (between 5 and 30 years old) they are still capable of vigorous growth in response to thinning. It is possible to remove enough trees to attain a view and even improve the strength and growth of existing trees without creating a potentially hazardous situation. If the crowns of the trees are "crowding" each other and receiving light only from the top, then a thinning could be done. Caution should be exercised not to predispose the remaining trees to windthrow by altering the wind-deflecting properties of the windward trees or allowing wind to be channeled into the interior of a stand that was previously protected.

Removal of trees from a dense stand without damaging those remaining can be difficult and expensive, but the extra care required is a good investment in maintaining the health of the trees that protect your property. Broken tops and branches, as well as trunk scars left by falling trees can serve as entry ports for disease and insects. Consult with a qualified tree service when low-impact falling and removal of trees on a slope is necessary.

There are many other possible situations where stand density could be a consideration. Most of them require good judgement and compromise.

Ability of the Tree to Stump-sprout

The ability of a tree to sprout from a cut stump can be an important characteristic when a property owner is concerned about securing a view without jeopardizing the stability of a slope. The maintenance of a vigorous, live root system insures soil-binding benefits.

Though most tall brush species common to our area will readily sprout when cut, there are relatively few tree species that do so. All of these are broad-leaved deciduous trees. Careful cutting of the species listed offers a means of view clearing without jeopardizing slope stability. The following common trees are capable of sprouting when cut. (See the question "When is the best time to cut back vegetation?" in the next chapter.)

Willow: sprouts readily.

Red alder: often sprouts; leave four to five inches of trunk uncut for more vigorous growth. Older trees sprout less consistently. Repeated cutting increases mortality.

Bigleaf maple: sprouts profusely when cut. Older, larger stems, when cut, can be avenues of infection. Sprouts can grow as much as six feet per year.

Vine maple: sprouts similarly to Bigleaf maple. Vine maple can be trained and pruned into tree form.

Most conifers will not successfully stump-sprout when cut.

Remember that cutting back of brush and trees near the crest will be required periodically to maintain your view. If you find that brush must be cut more often than once every two to three years you may want to consider planting a lower-growing species to replace the existing brush. Kinnikinnick, an evergreen, forms a dense, low mat and has good erosion control properties. Allow at least three years for its establishment and provide protection from animal damage for the new plantings as required. The offending brush will eventually die if cut back repeatedly after two or three years. Under no circumstances should herbicides be applied to kill unwanted brush. The value of the root system far outweighs the inconvenience of maintenance when slope stability is a concern.

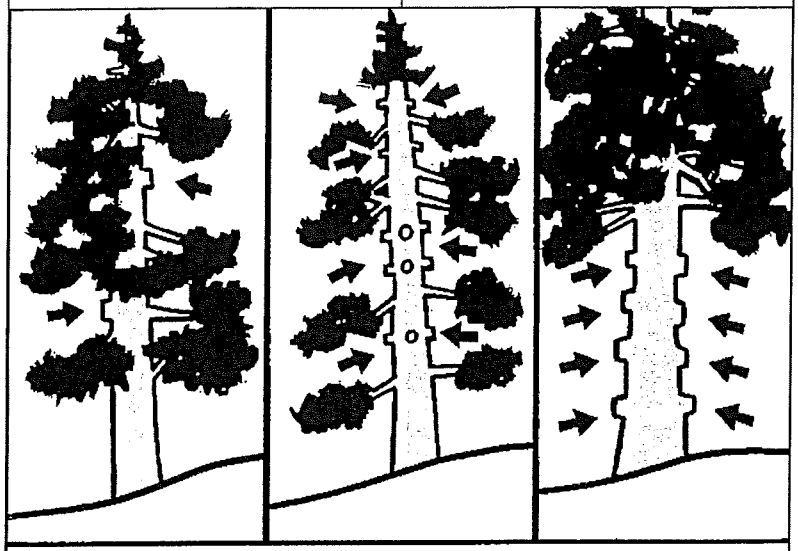
If a tree must be cut, should the stump and roots also be removed?

Stumps and root systems should be left undisturbed when a tree is cut on a slope. The beneficial nature of roots for erosion control has been discussed. Trees removed for foundation excavations, septic system construction, road building, or gardens should be removed during site development. Stumps remaining when trees are cut for view or hazard considerations should generally be left. They can be cut flush with the ground or be incorporated into a landscape design. In some cases stump grinders can be employed to remove the stump without causing the disturbance associated with pulling or digging the stump out.

Should groundcovers and brush be removed?

Extensive clearing of bluff properties is very common, especially on uplands. Since heavy equipment is on the property, people decide they may as well make the most of the machinery's presence. Rather than planning what requires site preparation (septic system, well site, house site, access road) they have the entire area scraped at one time. While it may appear simpler and less expensive to conduct site development this way, in the long run you may be setting the stage for chronic slope stability problems and greater expense. Keep in mind the processes at work on bluff properties and the benefits of vegetation, as well as the results of altering local hydrology, topography and vegetational cover. It makes sense to proceed carefully and thoughtfully in clearing your property.

Leave and maintain a buffer of groundcover and brush between the construction site and the crest of the bluff. If the vegetation is suitable it can be incorporated into a landscape scheme. Many native brush and groundcover species are effective as noise and site barriers between you and your neighbors. They are already established and require little care. If your property supports species such as Oregon grape, salal, snowberry, Wild rose, Sword fern, Evergreen huckleberry and Butterfly bush, then you have a wide range of valuable

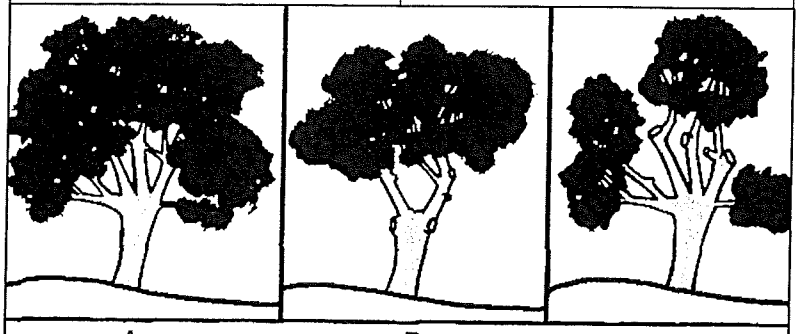


A WINDOWING | B INTERLIMBING | C SKIRTING UP

Illustration 12:
ALTERNATIVE PRUNING PRACTICES: Conifers

plant materials with which to work. On disturbed sites where plants such as blackberry, Scot's broom, thistle, dock, tansy and Bracken fern predominate, you may want to judiciously clear them out and establish native or ornamental plantings. This can require a lot of work and dedication on the part of the landowner. It should be done by hand to reduce damage to potentially unstable areas. In the case of horsetail, be fore-warned that trying to dig them out only makes them thrive, but sometimes establishing a dense growth of evergreen shrubs will discourage their growth. Refer to Slope Stabilization and Erosion Control Using Vegetation for some helpful suggestions.

Note: English ivy is common on many sites. It has a tendency to climb trees and can constrict tree growth and contribute to mortality. It should therefore be removed from the trunks of trees. Ivy also tends to cascade over sheer bluff faces. While it offers little rooting protection it does protect exposed bluff faces from wind and rain erosion. Ivy is emphatically not recommended for new plantings, but if it exists on a site it can be of some protective value. It is almost impossible to eradicate once it has become established.



A BEFORE | B AFTER (Correct) | C AFTER (Wrong)

Illustration 13:
PRINING PRACTICES: Broad leaved trees

When is the best time to cut back vegetation?

Generally, the best time to trim woody vegetation is the period between late fall and early spring, when the plant is dormant. The frequency of trimming should not be so often that the food reserves needed for growth are depleted. Generally, a five-year maintenance schedule for most brush species will be adequate. Severity of pruning or trimming should be commensurate with the ability of the plant to tolerate the pruning damage.

Should I install a lawn?

Bluff-top property owners often install large expanses of lawn subsequent to land clearing. Lawns are relatively inexpensive to establish and maintain, and allow free access and open space around residences. They are especially good groundcovers for septic drainfields because of their shallow rooting. However, the shallow rooting of most grasses that makes them attractive cover for drainfields means their erosion control values are limited.

On sites where soil erosion and surface water runoff could be of concern it would be wise to limit the area of lawn. While low-growing or closely cropped vegetation (like lawns) helps filter and trap sediments to some extent, its capacity to do so is limited when compared to other groundcovers. During heavy rain periods, areas covered by

lawns soon become saturated since rooting is shallow, water retention capacity is minimal, and canopy interception is not available. Surface water can pool in depressions and runoff occurs.

Lawns on upland sites should be bordered on the downslope side by a buffer of deeper rooted, more effective groundcover like salal, Oregon grape, Wild rose, trailing blackberry, kinnikinnick or other low-growing plants. Lawns should not extend to the crest of a slope, nor should they be established on erosion-prone sloping areas that would tend to drain over the bluff.

Are some trees better than others?

Previous sections of the guide have discussed factors that contribute to a particular species' usefulness as an erosion control element. Generally, short-lived deciduous trees are of less value and require more management than longer-lived species. Conifers, maples, and the evergreen broad-leaf tree, Madrone, are the most valuable and every effort should be made to retain and safeguard them. The relative value of a tree is a function of the physical characteristics of the site, the natural processes influencing the property, and the property owner's needs and goals.

What about construction damage during site development?

Trees retained on a development site often die as a result of various construction-related influences. Understanding these damaging construction practices can help the property owner and contractor be more effective in preserving trees as well as increasing property values.

Construction Damage to Trees (see "Recommended Reading") is required reading. This informative publication discusses major construction-related impacts that should be avoided. These are:

1. Grade changes around trees

2. Soil compaction by heavy machinery

3. Mechanical injury caused by heavy machinery

4. Tree thinning

Give the trees you retain plenty of room. Keep machinery back at least to the edge of the dripline of the canopy. Do not bury roots when grading. Even a foot of fill over the existing grade can cause the death of a mature evergreen. Wounding of the tree by equipment can stress the tree directly as well as offer entry paths for decay organisms. Installations of temporary exclusion fencing during construction can be helpful.

Soil compaction is a common occurrence on construction sites. Hand clear brush surrounding trees rather than using heavy machinery. Compacted earth restricts root development and reduces water-holding capacity. Exclusion fencing will reduce soil compaction.

As mentioned, thinning of trees on the bluff top should be done only after consideration of factors such as species, rooting, hydrology, wind patterns, tree health, and age have been assessed. The economic value of the timber should be of secondary importance. The extra initial expense of careful site development will be a worthwhile investment.

Note: There are several general site development and construction-related practices that property owners should be aware of. Since they are beyond the scope of this guide, they are not discussed here. Refer to the Shorelands Technical Advisory Papers in "Recommended Reading."

What to do with clearing debris

The process of site development invariably creates a large volume of plant debris. The disposal of this material can become a major concern. The location of debris on your property will dictate the best disposal method to employ.

Upland areas, where development and home construction occurs, generate the largest volume of debris. The best way to deal with this material is by chipping. The resultant chips can be used on rustic walkways and as free mulching materials to discourage weeds. Other options include piling and burning or disposal off-site. In densely populated areas burning may be restricted and burning in rural areas may require a permit. Contact the Washington State Department of Natural Resources or your local Fire Department. Disposal off-site may be expensive but some counties have large-scale composting programs that accept clearing debris.

Never dump material over the bluff edge or allow your equipment operator to do so. Stumps and clearing debris can cause slope damage, add unwanted weight, disturb and smother vegetation, and make access difficult in the future. Yard waste and construction debris can also cause problems and a steep bluff is no place to dump toxic chemicals such as paint or solvents. It is up to you to make sure your contractor understands your concerns.

Are there any problems to consider in using the existing trees in my landscaping?

Often when trees are retained and integrated in a landscape design, they are damaged inadvertently by typical yard maintenance practices. Remember that native trees evolved over time to become suited to regional conditions such as rainfall, shade, and wind. Radical changes should be avoided or done gradually to allow the tree to adjust to new conditions over time.

One notable example is Pacific madrone. This tree is intolerant of root disturbance. Established madrones should never be watered in the summer. Because madrone is such a striking tree, it is often used as a major landscape element with flower beds surrounding it. As a result, the area is tilled and watered. Both of these practices can kill madrone within a few years. Madrone, while valued by many, can be a problem as a landscape element because it tends to shed leaves all year. Its value as wildlife habitat and its excellent erosion control qualities make it worthwhile nonetheless.

Bigleaf maple can often prove to be a maintenance concern because of heavy leaf-fall and a tendency to drop large limbs. Again, wildlife and erosion control benefits often outweigh these drawbacks. Maple branches should be removed where they present a hazard to residences but in general the tree should be retained. At present, there is little information available that deals with maintaining native vegetation in residential settings. The best practice is to alter local conditions as little as possible.

Why did my trees blow over?

After site development and construction is completed, and sometimes even after several years have passed, the retained trees on a property will blow over. This can cause property owners considerable expense. To safeguard against this occurrence it is necessary to understand the nature of the inter-dependence of trees in the original stand. This has been discussed in the question

"Should Trees Be Removed?" and in the question concerning construction damage. Briefly, trees blow over due to increased exposure to wind, root damage and decline, and changes in hydrology caused by vegetation removal and soil compaction. Careful consideration of factors discussed in this guide during site planning and careful construction practices during development will reduce subsequent tree loss. Blowdown often occurs as a result of tree removal or clearing on adjacent properties. Talk with your neighbors.

Why do the trees on my bluff look so scraggly?

As discussed in the section on "Factors Influencing Vegetation" in Chapter 2, trees exposed to severe environmental stresses such as exposure to wind and salt-laden air will develop differently than trees that have grown in protected environments. Trees growing on exposed bluff sites often are twisted, stunted, and smaller than their inland cousins. They often have many broken branches and tops. Their foliage can be sparse and of a different color than less-exposed trees of the same species.

Trees adjust in various ways to local conditions and show the wear and tear of time. These trees often protect the ones behind them from the full force of the elements. They are a valuable asset on a bluff site. Any pruning done on them should be carefully considered and properly executed. They should not be removed unless conditions absolutely warrant it.

Is this tree a hazard?

The question of hazard trees often comes up during site development. The conditions existing on a particular site and the specific tree characteristics dictate the hazard potential present. The erosion control values of a tree on bluff properties are an additional consideration in determining whether a tree should be removed or pruned.

Two major considerations contribute to the hazard present. First, a determination of the nature, probability, and severity of a failure must be made. Second, the worst-case damage resulting from a potential failure should be determined. For example, even if a tree is in poor shape with a broken top, an old unhealed trunk wound and perhaps other defects, if it will not cause property damage or personal injury when it falls, it is not a hazard. Conversely, if a tree is healthy and sound but has a large heavy branch overhanging a bedroom or nursery it could be a hazard and the limb should be removed. Remember Bigleaf maple's tendency to drop branches.

If a potentially hazardous situation exists and you cannot decide what to do, contact a qualified arborist or other competent person. Be sure to explain your concern regarding the stability of the site.

Note regarding snags: Snags are dead, standing trees. They have died for a variety of reasons: old age, insect attack, disease, past disturbances. In the case of conifers, they are seldom a blowdown hazard and may persist for many years. (Large conifer snags can remain standing for as long as 100 years.) They offer nesting and perching sites for many wildlife and bird species, including Bald eagles. If they are located so as not to constitute a hazard to structures, they should be retained. Smaller conifers and most hardwood trees will not last nearly as long (madrone and oak are exceptions). Generally snags will not be a threat to bank stability.

If I have existing slope erosion problems on my land how do I solve them? Can vegetation help?

Often, properties already have problems resulting from past practices like those described in the Introduction. There are many ways that low-cost solutions using vegetation can be implemented. A companion volume to this guide dealing specifically with the use of vegetation to control erosion is available from the Washington State Department of Ecology. Ask for *Slope Stabilization and Erosion Control Using Vegetation.*

Conclusion

This publication has stressed that shoreland areas in the Puget Sound region are complex and often fragile places. Influenced by many factors, they are in a constant state of change from the effects of wind, rain, and the waters of Puget Sound.

While not all landslides and erosion can be prevented, it is clear that the actions of shoreline property owners can have a great inpact on the stability of bluff areas. Land owners need to understand how their actions can affect their surroundings and learn to minimize or avoid development-related practices that can set the state for future problems and require costly, difficult solutions.

The clearing of trees and brush, installation of utilities, construction of access roads, and siting of homes should all be well-planned with landscape and stability concerns in mind. Compromise is often necessary between the needs of the property owner and the unforgiving realities imposed by land and water.

Wise planning and development will improve property values, reduce maintenance costs, and contribute to slope stability. Before you decide that doing things right is too expensive, talk to neighbors who have lived on the edge for a while. Their stories might sound similar to that of the hapless landowner in the Introduction. Make the effort to learn to live in harmony with your land.