

RETURN ADDRESS:

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Please Print or Type Information.

Document Title(s) or transactions contained therein:

1. Crispian Road Short Plat
2. Drainage Report
- 3.
4. December 18, 2006

GRANTOR(S) (Last name, first, then first name and initials)

1. Corrine Tucker
- 2.
- 3.
- 4.

☐ Additional Names on page ____ of document.

GRANTEE(S) (Last name, first, then first name and initials)

1. Public
- 2.
- 3.
- 4.

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LEGAL DESCRIPTION (Abbreviated: I.E., Lot, Block, Plat or Section, Township, Range, Quarter/Quarter)

SE 1/4 NW 1/4 and the SW 1/4 NE 1/4 of Section 4,
Township 1N, Range 5E, W.M., Skamania, Washington

☐ Complete legal on page 3 of document.

REFERENCE NUMBER(S) Of Documents assigned or released:

☐ Additional numbers on page ____ of document.

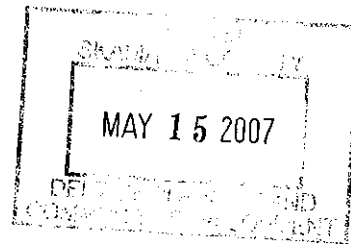
ASSESSOR'S PROPERTY TAX PARCEL/ACCOUNT NUMBER

01-05-04-0-0-0810-00

☐ Property Tax Parcel ID is not yet assigned.

☐ Additional parcel #'s on page ____ of document.

The Auditor/Recorder will rely on the information provided on the form. The Staff will not read the document to verify the accuracy or completeness of the indexing information.

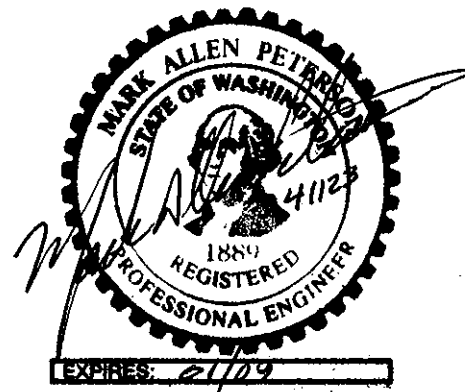


Crispian Road Short Plat
DRAINAGE REPORT
December 18, 2006

Prepared for:
Tom Tucker
93941 Blind Slough Station Road
Astoria, WA
97103

Prepared by:
Western Waters Engineering, Inc.
971 SW Rock Creek Drive
Stevenson, WA
98648

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DC # 2007168270
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*Not recorded but available
@ the Planning Dept.*

Legal Description

Exhibit A

A portion of the Southeast quarter of the Northwest quarter and the Southwest quarter of the Northeast quarter of Section 4, Township 1 North, Range 5 East, Willamette Meridian, Skamania County, Washington, described as follows:

BEGINNING at the Northeast corner of the May Breslan Short Plat, as recorded in Skamania County Auditor's File No. 2004154253; thence South 02°32'05" West, 124.91 feet to a point hereinafter called point A; thence continuing South 02°32'05" West, 31.13 feet to an angle of point in the East line of the May Breslan Short Plat; thence South 44°25'41" West, along the Southeasterly line of the May Breslan Short Plat, 25.00 feet; thence, leaving said Southeasterly line, South 31°45'00" East, 400.00 feet to an angle point; thence South 09°00'00" East, 525.00 feet; thence South 89°00'00" East, 718 feet, more or less, to the West line of the East half of the East half of the Southwest quarter of the Northeast quarter of Section 4; thence North, 1021 feet, more or less, to the Northwest corner of said East half of the East half of the Southwest quarter of the Northeast quarter; thence West, 989 feet, more or less, to the Northwest corner of the Southwest quarter of the Northeast quarter of Section 4; thence North 88°38'30" West, 20.43 feet to the Point of Beginning.

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Crispian Road Short Plat
DRAINAGE REPORT
May 2, 2007

I. General Location and Description

A. Location

1. Area description.

Crispian Road,
Off Hoffman Road,
Off Salmon Falls Road
Near Washougal, WA

2. Tax Parcel Number

01050400081000

3. Township. range. section. 1/4 section

SE 1/4 NW 1/4
And the SW 1/4 NE 1/4, Section 4
Township 1, North, Range 5 East
County of Skamania,
State of Washington

4. Major Drainageways

Drainage from the subject property appears to flow into an unnamed creek to
Canyon Creek to the Washougal River

5. Surrounding Properties

The surrounding area is thickly forested with cleared areas. The area
contains many lots of various sized

B Description of property.

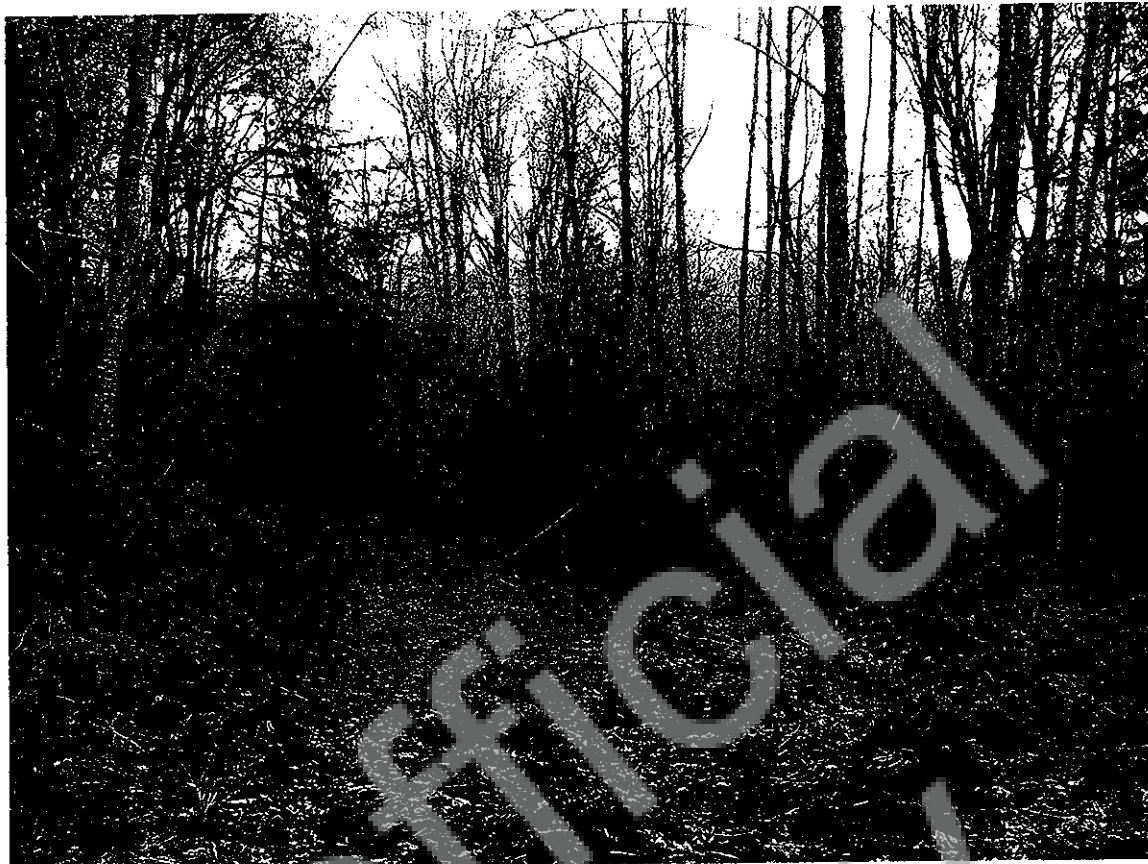
1. Area

The area of the subject property is 20.17 acres, more or less.

2. Ground cover

The property is characterized by moderately heavy forest with moderately
thick brush. One old cabin is on the property. There are some areas which
are free of trees and brush.

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4. Existing irrigation.

No irrigation facilities were observed to cross the property. No irrigation facilities were observed within 100 ft. of the boundary of the property.

5. Proposed land use

The property is proposed to be four lots. Each lot is to be 5 acres, more or less. Please refer to the survey included with this report.

II. Soils Information

A. *Description of Soils*

The soil was inspected by the Skamania County Health Department and classified as type 4 and type 4/5. This author did not conduct a percolation test. The soil type indicates that the soils have an above average to high permeability and well drained. Please refer to the Site Evaluation Results Letters included with this report.

Survey drawings are attached which show the property boundary.

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III. Drainage Facility Design

A. General Concept

The author used two methods to estimate the pre and post development runoff. The author used the Rational Method and the Western Washington Hydrology Model to estimate runoff. I used a parallel analysis because in the developed scenario, the percent of impervious surfaces is small compared to the total area.

All roads in the project will be pervious gravel. Community roads in the project will incorporate a roadside ditch on the uphill side. Any offsite flows collected by that section of Crispian Road beyond the bounds of this project will be directed down Cabin Road, which is the historic direction of flow for that area. All culverts will be 12" diameter minimum, (see spreadsheet).

Impervious area associated with each house is estimated to be 4000 square feet. This includes roof tops, shed tops, and any other impervious surfaces associated with the house, i.e. patios, cement walkways. Each house is expected to incorporate 6,000 square feet of lawn and an additional 14,000 square feet of pasture. Designs which exceed these restrictions will require modification of the stormwater management scheme.

Pre-development runoff, using the Rational Method is estimated to be 9.5 cfs, please refer to the spreadsheet at the end of this report. The owner proposes to use Downspout Infiltration Drywells to infiltrate roof runoff and runoff from other impervious surfaces. Please refer to Figure 3.4, Typical Downspout Infiltration Drywell for drywell design.

Post development Rational Method analysis indicates that runoff is 10.3 cfs. Lawn areas are flat.

The constants used in the Rational Method analysis are taken from 'Introduction to Hydrology', third edition, Weissman, Lewis, and Knapp, Harper and Row, 1989, page 311. The constants are:

| | |
|-----------------|-----|
| Pre-development | .1 |
| Lawn | .12 |
| Pasture | .11 |
| Gravel road | .4 |

Post development percent impervious is 2%. The equation detention analysis indicates no detention/retention is necessary.

The author analyzed the entire 20.17 acre parcel using the Western Washington Hydrology Model, (WWHM), version 2.5. The model indicates that if the parcel were one basin, then development would require just less than 9000 cu. ft. of detention storage. Analysis of each individual parcel yielded a negligible difference between pre and post development runoff.

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B. Design

The roadside ditch along the onsite portion of Crispian Road concentrates flow at the road intersection just north of Lot 4. Just northeast of this area the flow enters the unnamed creek that drains lots 1 and 4. This concentrated flow presents an erosion issue. We propose an energy dissipation/detention pond in the location indicated on the drainage plan drawing. This pond should be approximately 32' by 48' (bottom dimensions) with a controlled outlet per the detail. Side slopes shall be 3h:1v. Pond shall be two feet deep, which includes 1' of freeboard.

Detention half ponds or berms with bottom area of 1800 square feet similar to the pond described above including the controlled outlet but without the trickle channel shall be incorporated into the landscaping design for each lot. See Plan Sheet. Ponds shall be a minimum 50' from slopes of 15% or more and shall conform to regulations outlined in the Stormwater Management Manual for Western Washington, 02/05.

With the above mitigation measures in place, post development flow will not exceed historic flows from the site.

C. Dry Wells

Drywells will be used to infiltrate the runoff from impervious areas. Drywells will not be shared. The proposed parcels will have their own dry wells. With the assumptions stated above, each lot will likely need 4 drywells.

Drywell design:

- 1) Drywell bottoms will be a minimum of 1 foot above seasonal high groundwater level or impermeable soil layers.
- 2) Each drywell will serve up to 1000 square feet of impervious surface.
- 3) Drywells will be 48 inches in diameter (minimum) and have a depth of 5 feet (4 feet of gravel and 1 foot of suitable cover material).
- 4) Filter fabric (geotextile) will be placed on top of the drain rock and on drywell sides prior to backfilling.
- 5) Spacing between drywells will be a minimum of 4 feet.
- 6) Drywells will be placed on slopes of less than 15%.
- 7) Drywells will meet setback requirements and will be at least 50 feet from slopes greater than 25%.

C. Culverts

Culverts on the property shall be 12" diameter minimum. Minimum culvert diameter is based on ease of maintenance. Minimum slope on culverts shall be 2%. Culverts shall be smooth inside wall by ADS or equal. The author assumes all culverts on the property will be inlet control due to the slope of the property. Culvert flow analysis is on the attached spreadsheet.

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C. Pond Outlet Control

Pond outlet controls are designed to meter outflow to historic 6 month, 24 hour flow, and pass through the overflow the ten year flow. At the road intersection, the contributing basin to the pond is less than 2 acres. For the lots, the contributing area is $\frac{1}{2}$ acre or less.

IV. REFERENCES

Stormwater Management Manual for Western Washington

Western Washington Hydrology Model

Fluid Mechanics with Engineering Applications, Daugherty, Franzini, & Finnemore, 8th Edition, McGraw Hill, 1985

Introduction to Hydrology, third edition, Weissman, Lewis, and Knapp, Harper and Row, 1989

Modern Sewer Design, American Iron and Steel Institute, 1st Edition, 1980

NOAA Technical Release 55.

Skamania County Site Evaluation Letters, 05/02/06

All new development is subject to the conditions listed in the Crispian Road Short Plat Drainage Report. Contact Skamania County Department of Planning and Community Development for further information.

I hereby certify that this report for the design of drainage facilities for Crispian Road Short Plat was prepared by me for the owners thereof in accordance with the provisions of the Skamania County. I understand that Skamania County does not and will not assume liability for drainage facilities designed by others.

Mark A Peterson
Registered Professional Engineer
State of Washington Lic. No. 41123

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