**CASCADE SURVEYING & ENGINEERING, INC.**

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SURVEYORS
ENGINEERS
PLANNERS

# CONCEPTUAL DRAINAGE PLAN

*TUSCON OFFICE BUILDING SITE*

*FOR VINE STREET GROUP*
(PRELIMINARY PLAT)

FILE NO. _____

5-08-00

KELLEY E. WRIGHT
STATE OF WASHINGTON
35715
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES: 01/01/02

RECEIVED
MAY 12 2000
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CITY OF ARLINGTON

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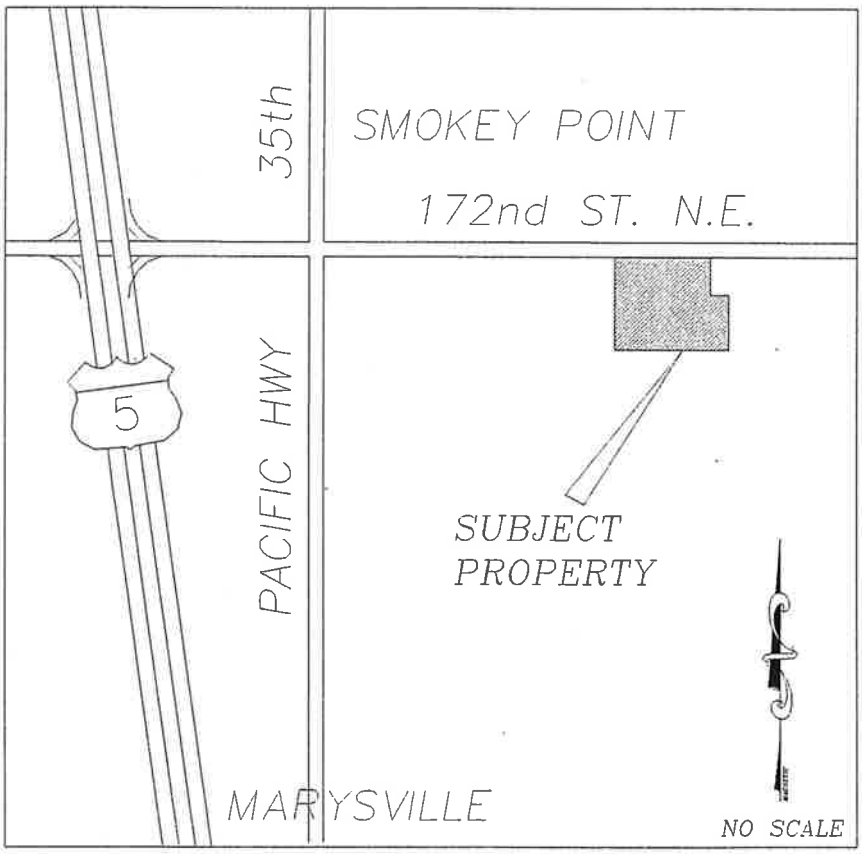
## PROPERTY DESCRIPTION

The site consists of 23.83 acres of open pasture in northern Snohomish County in the City of Arlington (Smokey Point area). The site is situated along the south side of 172nd St. NE. directly east of the Washington Mutual Bank. (See Vicinity Map Below). The site soils consist of Lynnwood Loamy Sands based on the Soil Survey of Snohomish County, however the Lynnwood group can contain areas of the Custer Soil type. The map shows Custer Loams directly south of the site, and our onsite site work indicated a high water table which is characteristic of the area.. Two decrepit farming structures are on the site, otherwise the site is open pasture. The site is bounded on the south by an existing drainage which drains west to east to the southeast corner of the site, thence turns south.




VICINITY MAP

Although the site soils are classified as a type A soil, we modeled the site as a Type B soil for the following reason. The SCS model assumes that the portion of water which goes into the ground will have no further impact on the surface system. On this site the high water table is most likely acting to recharge the ditch on the south (downslope) side of the property. As rainwater falls on the site, it

quickly makes it way down through the sandy soils to the water table. As the hydraulic head of the water table is raised by this surface recharge, the recharge rate into the stream from the water table is raised accordingly. So even as the rainfall from a storm event is impacting the flow in the ditch, rainfall which was absorbed into the ground is also having an impact on the stream. This increased flow is similar to the impact as if less water had been aborbed by the ground (ie. Rainwater falling on a soil type with a lower absorbtion capacity), and instead made it's way to the ditch.

Twelve temporary observation wells were emplaced in a grid pattern across the site to measure the water table elevation. The water table was measured at between 37" at soil log #4 (Proposed Parcel #9) and 80" in depth at soil log #2 (Proposed Parcels 3 & 4). In the area of the wet pond (permanent detention site) the water table is at about 114'. Two decrepit farming structures are on the site, otherwise the site is open pasture. The site is bounded on the south by an existing drainage which drains west to east to the southeast corner of the site, thence turns south.

## SOIL LOGS

The following Soil logs were observed on 15 December, 1999. Observation wells were then installed for the purpose of measuring static water table depth. (See following page.)

SL-1
0-48" Brown Coarse Sand
48-60" Gray Medium Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-2
0-24" Brown Loamy Sand
24-60" Gray Loamy Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-3
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-60" Gray Loamy Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-4
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-60" Gray Loamy Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-5
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-70" Gray Loamy Sand
70-84"+ Mottled Coarse Gravelly Sand

SL-5
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-60" Gray Loamy Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-7
0-18" Brown Loamy Sand
18-54" Tan Loamy Sand
54-70" Gray Loamy Sand
70-84"+ Mottled Coarse Gravelly Sand

SL-8
0-18" Brown Loamy Sand
18-54" Tan Loamy Sand
54-70" Gray Loamy Sand
70-84"+ Mottled Coarse Gravelly Sand

SL-9
0-24" Brown Loamy Sand
24-40" Tan Loamy Sand
40-84" Gray Loamy Sand
84-96"+ Mottled Coarse Gravelly Sand

SL-10
0-48" Brown Coarse Sand
48-60" Gray Medium Sand
60-84"+ Mottled Coarse Gravelly Sand

SL-11
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-70" Gray Loamy Sand
70-84"+ Mottled Coarse Gravelly Sand

SL-12
0-12" Brown Loamy Sand
12-36" Tan Loamy Sand
36-70" Gray Loamy Sand
70-84"+ Mottled Coarse Gravelly Sand

The following table is a summary of measurements of water table depth taken at the twelve observation wells. (See the Preliminary Grading and Drainage Plan for hole locations.)

| *Description* | *12-16-99* | *12-30-99* | *1-24-00* | *2-14-00* | *2-23-00* | *3-22-00* |
|---|---|---|---|---|---|---|
| **SL-1** | 55" | 56" | 50" | 53" | 60" | 52" |
| **SL-2** | 74" | 72" | 55" | 71" | 72" | 69" |
| **SL-3** | 64" | 68" | 51" | 66" | 68" | 64" |
| **SL-4** | 49" | 54" | 37" | 52" | 55" | 50" |
| **SL-5** | 50" | 59" | 42" | 57" | 58" | 55" |
| **SL-6** | 55" | 59" | 44" | 59" | 60" | 57" |
| **SL-7** | 65" | 69" | 53" | 66" | 68" | 66" |
| **SL-8** | 67" | 72" | 57" | 72" | 71" | 71" |
| **SL-9** | 73" | 80" | 64" | 79" | 77" | 78" |
| **SL-10** | 51" | 56" | 42" | 55" | 57" | 54" |
| **SL-11** | 60" | 66" | 51" | 65" | 68" | 66" |
| **SL-12** | 57" | 64" | 49" | 63" | 65" | 61" |

## PROPOSED DEVELOPMENT

The overall proposed activity for this site is for commercial development. The proposed development will add a small road network, and parcels for up to 22 commercial sites. The stormwater from developed site will be directed to a wet pond in the southeastern portion of the site (See attached Basin Map from the Plat of Tuscon submittal).

This development will start with the development of Parcels 21 and 22 as a proposed site for a new building and associated parking. Since this site is on the far side of the overall site from the proposed future stormwater management system, a temporary stormwater management system is being proposed, until the larger system can be brought online.

## UPSTREAM AND DOWNSTREAM ANALYSIS

Since the property and the adjacent parcels are all nearly flat, there is little if any offsite flow onto the property. There is an existing drainage easement along the southern boundary of the property which flows West to East to the southeastern corner of the property where it turns south. The flow in this drainage is generated by the commercial properties West of the proposed site. The developed flow from the property will exit the site in the existing drainage at the turning point to the south. The flow continues in this ditch directly south for over a ¼ of a mile without obstruction.

## RISK ASSESSMENT

**Slope**: Site slopes are less than 2%, risk is low

**Critical Areas:** None

**Soils:** Lynnwood loamy sands

**Ground Movement Potential:** Site appears stable

**Source of Water Erosion**: Rainfall

**Measures Proposed to Prevent/Minimize Erosion:**

**During Construction**: Temporary construction BMP's. Re: construction entrance etc.
**After Construction**: Seeding of exposed soils

**Nearest Downstream body of water other than road ditches:** tributary of Quilceda

**Nearest fish bearing water**: Quilceda Creek, (2 ½ miles downstream)

**Conclusion:** Potential for significant erosion/siltation impact on or off site is **LOW**
Because of the following reasons:

1. Lack of site slope inhibits surface flow across the site
2. Offsite flow to be treated and resticted, so no offsite impacts are expected.

## STREAMBANK EROSION CONTROL

Streambank erosion control will be accomplished through the use of a temporary Detention BMP (See the Preliminary Grading and Drainage Plan). The flow from the site will be restricted to ½ of the 2 year existing release rate, and to less than the existing flow for the larger storm events.

## SOURCE CONTROL OF POLLUTION

The source control BMP recommended for this site would be good housekeeping. As the lots themselves are developed, other specific bmp's may be required for that lot in accordance with the guidelines set forth in DOE Stormwater Manual.

## WATER QUALITY BEST MANAGEMENT PLAN

The water quality best management plan proposed for this site will be a Bioswale. Flow from the detention pond cells will be directed into a Bioswale before being released into the existing ditch along the south property line.

## CALCULATIONS

No calculations are being provided at this time. A more complete report (including calculations) will be submitted at the time of Construction Plan submittal.

# IN THE NW. 1/4 OF SEC. 28, T. 31 N., R. 5 E. W.M.


## LEGEND

- EXISTING WATER VALVE
- ~~EXISTING FIRE HYDRANT~~
- EXISTING UTILITY POLE
- EXISTING CATCH BASIN
- EXISTING SAN. SEWER MANHOLE
- EXISTING SAN. SEWER
- EXIST. TELEPHONE LINE
- EXIST. GAS LINE
- EXIST. WATERLINE
- PROPERTY LINE BOUNDARY
- EXISTING GROUND CONTOURS
- PROPOSED LOT LINES
- PROPOSED STORM LINE
- SOIL LOG

## DATUM/BENCHMARK

DATUM: NGVD 1929
BENCHMARK: CATCHBASIN LID AT SOUTHEASTERLY MOST CORNER OF GATEWAY CENTER
ELEVATION = 118.80'

*TOPOGRAPHY NOTE:*
TOPOGRAPHY FROM SURVEY BY CURTIS & ASSOCIATES




VICINITY MAP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| REVISION | BY | DATE |
|---|---|---|
| | | |

DESIGNED BAR 12/96
DRAWN BAR 12/96 REVISED
CHECKED BAR 12/96
FIELD BOOK, PG

FOR: VINE STREET ASSOCIATES
IN THE CITY OF ARLINGTON, WA.
PLAT OF TVISON

# BASIN MAP

1 OF 1

#13627