City of Yelm
EST. 1924
WASHINGTON

SEPA #: 2022.0003

# DETERMINATION OF NON-SIGNIFICANCE

| | |
|---|---|
| Proponent: | Northwest Grind LLC. |
| Description of Proposal: | Bundy Commercial Center (coffee stand and retail) |
| Location of the Proposal: | 9241 Burnett Rd. SE, Yelm, WA 98597 |
| Lead Agency: | City of Yelm |

The City of Yelm as lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

This DNS is issued under WAC 197-11-340(2); the City of Yelm will not act on this proposal for 14 days from the date below.

July 28, 2022

Comments must be submitted by August 11, 2022 to planning@yelmwa.gov by 5:00 P.M.

| | |
|---|---|
| Responsible Official: | London Hawes, Planning and Building Manager |
| Phone: | (360) 400-5003 |
| Address: | 901 Rhoton Rd. NW.<br>Yelm, WA 98597 |
| Date of Issue: | July 28, 2022 |

London Hawes

London Hawes, Planning and Building Manager

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DO NOT PUBLISH BELOW THIS LINE

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Copies to: All agencies/citizens on SEPA mailing list
Dept. of Ecology w/checklist

# SEPA ENVIRONMENTAL CHECKLIST

### *Purpose of checklist:*

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

### *Instructions for applicants:*

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

### *Instructions for Lead Agencies:*

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

### *Use of checklist for nonproject proposals:*

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

## *A. Background* [HELP]

1. Name of proposed project, if applicable:

   Northwest Grind  Also known as the Bundy Commercial Center

2. Name of applicant:

Crystal Bundy

3. Address and phone number of applicant and contact person:

P.O. Box 926 Rochester, Wa 98579

4. Date checklist prepared:

3/3/22

5. Agency requesting checklist: The City of Yelm

6. Proposed timing or schedule (including phasing, if applicable):

Project to be completed in two phases and estimated at being completed within 3 years.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None know at this time

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

no

10. List any government approvals or permits that will be needed for your proposal, if known.

Building permits, site plan approval.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This project will develop 0.99 acres of undeveloped land in a coffee stand and a small business structure with 21 parking spaces.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or

boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

9241 Burnett Rd. S.E. Yelm, Wa 98597
Section 13, TN17N, R1W, W.M.
Parcel number: 21713330200

## B. Environmental Elements [HELP]

### 1. Earth [help]

a. General description of the site:

b.

This site is flat and the site relief ranges from approximately elevation 336 on the west to 340 on the ~~east~~ east side.

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

There are no steep slopes on the property 4% overall slope of 107 feet

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

d.

e. The Soil Conservation Service has mapped one type of soil on this site. It is as follows: Spanaway gravelly sandy loam, 0 to 3 percent slopes, The Spanaway gravelly sandy loam, is listed as Hydrologic Soils Group A which has a high infiltration rate when thoroughly wet and represents over 100% of the project site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

none

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Grading activites proposed would be related to stormwater infiltration galleries, driveways and building construction areas. Approdimately 120 cyds will be moves during excavation of exsisting gound areas. Base course material and gravels will be imported for driveways and parking construction. Area of largest cut/fill will occr in the vicinity of the proposed infiltration galleries. The deepest fill will be approximately 5.5 foot depth.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. Limited erosion could occur during site clearing and grading activites.

g.

Soils are very stable with limited to no erosion potential.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

h. Total proposed impervious surfaces including driveway and building will be approximately 55.6% of the project site.

i. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

j. A drainage and erosion control plan will be prepared and implemented in accordance to the Dept. of Ecology Drainage Design and Erosion Control Manual (DDECM 2019)

## *2. Air* [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

b. Dust and engine emissions from construction equipment during grading and building activities: following completion, and increase of automobile emissions from regular traffic.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

none

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

d. Implement dust control measures for constructions during dry periods. Retention of mature trees where possible.

## *3. Water* [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

2) No, there are no surface water bodies on or in the immediate vicinity of the project site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

no

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected.
Indicate the source of fill material.

~~4)~~

5) none

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

no

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No

6) Does the proposal involve any discharges of waste materials to surface waters? If so,
describe the type of waste and anticipated volume of discharge.

7) no

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

2) no

Stormwater runoff shall be directed towards stormwater facilities

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

There will be no waste material generated from tis site.

City of Yelm STEP collection system that are maintained by the City.

this

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The stormwater improvements will treat and infiltrate all runoff on the project site. For waste materials to enter ground water, they must pass through pre-treatment mechanisms (i.e. sand filter, grass lined swales, filter strips, etc.) prior to the infiltration on the project site.

2) Could waste materials enter ground or surface waters? If so, generally describe.

There is no surface water near the project site and there will be no waste materials associated with the project.

2) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

no

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

All storwater runoff facilities will be dsigne in accordance with the Dept of Ecology's drainage design and erosion control manual.

design

Subject to most current ECY SMMWW

## *4. Plants* [help]

a. Check the types of vegetation found on the site:

X deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
X shrubs
_X___grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Presently the existing site is undeveloped with little scotch broom and grass and this time.

Two shrubs and one deciduous tree

c. List threatened and endangered species known to be on or near the site.

None known at this time.

Mazama Pocket Gopher *(Thomomys mazama)* known to be near the site

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Landscaping around the perimeter will be required for this project.

Landscaping requirements from Chapter 18.55.040 of Yelms Municipal Code will be followed.

e. List all noxious weeds and invasive species known to be on or near the site.

None known at this time.

Scotch broom *(Cytisus scoparius)*

### *5. Animals* [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

hawk, songbird

b. List any threatened and endangered species known to be on or near the site.

None seen or known at this time.

Mazama Pocket Gopher *(Thomomys mazama) known to be near site.*

c. Is the site part of a migration route? If so, explain.

No

d. Proposed measures to preserve or enhance wildlife, if any:

NONE PROPOSED

f. List any invasive animal species known to be on or near the site.

None seen or known. Scotch broom (Cytisus scoparius)

## 6. *Energy and Natural Resources* [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

All forms of energy may be used e.g. electric, LP gas, solar, etc. for commercial consumption (heating, lighting,) on the project site.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

New construction will be required to meet local building and energy codes.

## 7. *Environmental Health* [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?
If so, describe.

no

1) Describe any known or possible contamination at the site from present or past uses.

None known

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None known of, none proposed.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating

life of the project.

There will not be any hazardous materials used or stored on site at any time during construction or in the operation of the business.

4) Describe special emergency services that might be required.

General increase in fire, medical and emergencey services in proportion to the proposed commercial development.

Fire impact fees will be paid upon building permit issuance

5) Proposed measures to reduce or control environmental health hazards, if any:

The commercial development will be in compliance with all local codes.

The development will follow Chapter 18.51 Environmental Performance Standards of the Yelm Municipal Code

*b. Noise*

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Vehicular traffic on SR 510 and Burnett Road.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

2) Proposed measures to reduce or control noise impacts, if any:

Noisy construction activities will be limited to business hours. Retention of exsisting trees where possible: new landscaping for proposed commercial development.

Noise levels will follow the guidelines of Chapter 18.51.020 of the Yelm Municipal Code

## *8. Land and Shoreline Use* [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Current use of the site is undeveloped property. Adjacent land use to the west and east around the project is pasture residential single family homes. To the south is SR 510 and pasture

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

no

c. Describe any structures on the site.

Presently there are no strutures on the project site.

d. Will any structures be demolished? If so, what?

no

d. What is the current zoning classification of the site?

C-1

Commercial District zone

e. What is the current comprehensive plan designation of the site?

Commercial and retail development

f. If applicable, what is the current shoreline master program designation of the site?

Not applicable

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The project site is not in a wellhead protection area or an area of groundwater concern.

All of Yelm is considered a critical area due to being a critical aquifer recharge area

i. Approximately how many people would reside or work in the completed project?

none

Fill in

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

none

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

d

Project is consistent with adjacent land uses which is commercial. Porposed land use is consistent with The City of Yelm Comprhensive Plan and Zoning.

l. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

none

## 9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

There will be no housing on the project site.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

none

b. Proposed measures to reduce or control housing impacts, if any:

There will be no measure to reduce or control housing impacts associated with this project.

## 10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

d

Commercial structures will be about 12' to 15' in height. Siding materials may include concete board, LP, and /or metal siding.

Siding materials will comply with Chapter 18.61 Building Design of the Yelm Municipal Code

c. What views in the immediate vicinity would be altered or obstructed?

No off-site views will be obstructed.

g. Proposed measures to reduce or control aesthetic impacts, if any:

Commercial structures will be aesthetically compatible with surrounding land use. Use of landscaping on project site that will coordinate with a urban setting. Aesthetic requirements must follow the Yelm Municipal Codes for the C-1 zoning District, and Chapter 18.59 site planning

### *11. Light and Glare* [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Project will create little or no glare from commercial structures. Increase ambient light levels may occur at night due to exterior lighting.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light and glare would not presend a safety issue. Overall increase in lighting on the site will not change its character from developed condition.

b. What existing off-site sources of light or glare may affect your proposal?

none

d. Proposed measures to reduce or control light and glare impacts, if any:

Use of exterior building materials and colors that generate less reflective light. Landscaping around perimeter of the project site will also reduce light and glare.

### *12. Recreation* [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Yelm high school is approximately a quarter mile away along with various parks and recreational center within the City Limits of Yelm.

c. Would the proposed project displace any existing recreational uses? If so, describe.

no

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

none

## 13. *Historic and cultural preservation* [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

None known or identified

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None known or identified

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

No methods used

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

No measures proposed

## 14. *Transportation* [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Access to the proposed project sites will be [redacted]
Burnett Street which is a local street.

This site will have only one access off of Burnett Street.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Yes, the nearest public transit is approximately 300 ft away

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

No parking will be elimatnated. The project will add an approximately 21 parking spaces.

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No streets or roads will be required to be constructed for this project

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

It is estimated that there will be approximately 53 vehicular pass by trips per day during the peak hour traffic from 4:00 to 6:00 PM and average daily total of 1,260 trips thoughout the day.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

no

h. Proposed measures to reduce or control transportation impacts, if any:

None proposed

The City of Yelm will be doing a realignment of Burnett St. and 93rd Ave. SE. this proposal will not be affected.

## 15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

A fire impact fee will be due at time of building permit issuance

Project will generate a minimal increased need for fire, medical/emergency and police, services within the community. Increase in need will be proportionate to the proposed volume of commercial development

b. Proposed measures to reduce or control direct impacts on public services, if any.

None proposed

## 16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,

other _____

Electricity, water. Refuse service, telephone, sanitarty sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electrical service will be provided by the puget sound energy. The local refuse/solid waste provider is Lemay or a subsidiary. Sewer and water will be provided by the city of Yelm. Telephone and cable is provded by local communication services or other local providers. Construction activities required to provide services to the site include trenching. Grading, buliding construction and driveway and parking resurfacing where required. Al utility services will be buried thourgh the prosd project site.

## *C. Signature* [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Crystal Bundy

Name of signee Crystal Bundy

Position and Agency/Organization _____

Date Submitted: 3/8/22

*Sec. 3, TW. 17N, Range 1E, W.M.*

# Bundy Commercial Center

20′ BUILDING SETBACK LINE

DUMPSTER AREA

10′ BUILDING SETBACK LINE

RAILROAD SPIKE #1 BENCHMARK
N:598265.74
E:1109192.30
ELEV. = 342.64′

EX. PROP. LINE

EX. EP

EX. PRESSURE SEWER MAIN

C/L BURNETT ROAD

EX. WATER MAIN

BIORETENTION SWALES (TYP.)

S 59°15′10″ W 291.46

PR. BUILDING
35′X 134′

PHASE II

PHASE I

5′ SIDEWALK

14′

15′

20′

9′

12+00

12+32.02

11+00

28+00

29+00

10+00

22+00

BURNETT ROAD

BURNETT RD. STA. 22+51.80 =
DRIVEWAY STA. 12+32.02
℄ OF INTERSECTION

LANDSCAPING AREA

25′× 30′

PR. COFFEE SHOP

N 01°47′08″ E 330.34

DATUM:
BENCHMARK: RAILROAD SPIKE #1
N: 598265.74
E: 1109192.30
ELEV. = 342.64′

1"=40'
0 20 40 80

10′ BUILDING SETBACK LINE

EX. EP

SR 510 STA. 29+50.00 =
DRIVEWAY STA. 10+00.00
℄ OF INTERSECTION

S.R. 510 (YELM AVENUE)

S 49°38′51″ E 312.83

60′

INSTALL DUAL WATER METERS FOR IRRIGATION AND DOMESTIC USE

30

12′

250′

21+00

EX. C/L OF R/W

EX. C/L ROADWAY

31+00

SR 510 STA. 32+00.09 =
BURNETT RD. STA. 20+00.00
℄ OF INTERSECTION

NOT A BOUNDARY SURVEY
All references to property lines, bearing, corners, or any references which indicate property alignment or locations were acquired from

*Chehalis Valley Surveying*

FOR CONSTRUCTION USE ONLY

*Project Application #*

DESIGN INFORMATION
PROJECT IDENTIFICATION No.
FILE NAME: General Site Plan
C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:

Turner Engineering Consulting
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900

Bundy Commercial Center
Site Plan

WILLIAM P. TURNER
STATE OF WASHINGTON
13824
REGISTERED PROFESSIONAL ENGINEER

12-13-21

SHEET ID CODE
GE 2 of 2

SHEET No.
1 of 4

# Key Environmental Solutions, LLC.

October 30, 2021

City of Yelm Community Development
Attn: Sara Williams, Assistant Planner
106 2nd St SE
Yelm, WA 9859

Re: Bundy - Prairie Habitat Critical Area Recon and ESA No Effect Letter, Thurston County Parcel #21713330200. Located at the corner of Yelm Highway and Burnett Rd SE, Yelm, Washington, Section 13 Township 17 Range 1 East, and in accordance with the *Thurston County Critical Areas Ordinance Title 24.03 (Definitions), Interim Prairie Ordinance 14542, WDFW Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers, following the 2018 USFWS Mazama Pocket Gopher Screening Protocol, Thurston County's 2021 survey protocol, and the City of Yelm Code; Title 14 environmental*

Dear Ms. Williams;

Key Environmental Solutions, LLC. (KES) has completed a Prairie Habitat Area Recon on the above referenced parcel located at the corner of Yelm Highway and Burnett Rd SE, Yelm, Thurston County, Washington. Fieldwork was conducted on September 20, 2021 and October 21, 2021.

## Project Description and Findings

The parcel that was reviewed is approximately 0.99 acres. It is at the corner of Yelm Highway and Burnett Rd SE. The parcel is currently undeveloped. The parcel is surrounded Burnett Road SE to the east, Yelm Avenue SE to the southwest and west, and single-family residence to the north. The parcel was reviewed for prairie habitat and Mazama Pocket Gophers. When the site is developed with a coffee stand, driveways and parking there will be not any "Take" of any state or federally listed species. There will be "**No Effect**" on prairie habitat, Mazama Pocket Gophers or any other critical areas or buffer impacted.

KES reviewed Washington Department of Fish and Wildlife's (WDFW) Priority Habitat Species (PHS) lists and maps and no listed species were found to occur onsite. Adjacent areas were also looked at for any critical areas or listed species, and none were found to occur.

The project area was required to be reviewed due to the presence of prairie soils (See Table below). KES reviewed the Natural Resource Conservation Service Soils (NRCS) maps and verified that prairie soils did not exist in the project area.

| Soil Types | Prairie Soil |
|---|---|
| Spanaway gravelly sandy loam, 0 to 3 percent slopes | Yes |

Mapped prairie soils do not necessarily mean that the area is a prairie –vegetation, landuse, development, and historical land practices may have changed the soil conditions. Current site conditions may or may not accurately reflect mapped soils. Conversely, prairies may be found in areas where the soils are not mapped as prairie soils.

**Federal ESA Species, Habitats and No Effect**

There are no Federal ESA species or habitats that exist within the parcel. There will be "No Effect" and/or "No Take" from the proposed project.

In the 1990 Google Earth photo, the parcel was covered in trees.

KES has performed two site visits as required. KES determined that parcel does not meet the definition of prairie from USFWS and that there is no Mazama Gopher occurrence found on onsite.

**Vegetation that occurred on the parcel:**

| **To Common Name** | ***Sc. Name*** | **Status** |
|---|---|---|
| Canada thistle | *Cirsium arvense* | FACU + |
| common dandelion | *Taraxacum officinale* | FACU |
| Himalayan blackberry | *Rubus armenicus* | FACU |
| Hairy's cats ear | *Hypochaeris radicata* | FACU |
| Juniper haircap moss (dense) | *Polytrichum juniperinum* | NI |
| Klamath weed | *Hypericum perforatum* | FACU |
| oat grass | *Avena sativa* | NI |
| orchard grass | *Dactylis glomerata* | FACU |
| Oregon grape | *Mahonia nervosa* | FACU |
| plantain | *Plantago lanceolata* | FAC |
| Reed canarygrass | *Phalaris arundinacea* | FACW |
| Scotch broom | *Cytisus scoparius* | FACU |
| serviceberry | *Amelachier alninfolia* | FACU |
| silver shrub | *Populus alba* | FACU |
| yarrow | *Daucus carota* | FACU |

Based on physical, environmental, and biological conditions on and near the project site, KES has determined that no further site visits are necessary and that this project, will not result in take of the federally listed Mazama pocket gophers (*Thomomys mazama* ssp.). No oaks were found to occur onsite.

It is KES's professional opinion that the parcel located at the corner of Yelm Highway and Burnett Rd SE in Yelm, does not have any endangered prairie species, and when the parcel is developed with a coffee stand, a driveway and a parking area, it will not impact any prairie species or any other critical areas and should be permitted. KES concurs with the site plan. There were no Mazama Pocket Gopher mounds, or any other prairie species observed onsite. There were no mole mounds found to occur onsite. KES concurs with the site plan.

Looking west across parcel.

Looking north across parcel.

Looking north across parcel.

Looking southwest across parcel.

Looking east across parcel.

Looking northwest across parcel.

**Professional Standard of Care:**
Please be advised that KES personnel has provided professional services that are in accordance with the degree of care and skill generally accepted in the performance of this environmental evaluation. Fish and Wildlife Habitat Assessments together with wetland delineations, mitigation plans, classifications, ratings, streamtyping, riparian planting plans, ordinary high-water line determinations, fish removal and other critical area analysis should be reviewed and approved by the agency with permitting authority and potentially other agencies with regulatory authority prior to extensive site design or development. No warranties are expressed or implied by this assessment until approved by the appropriate resource and permitting agency.

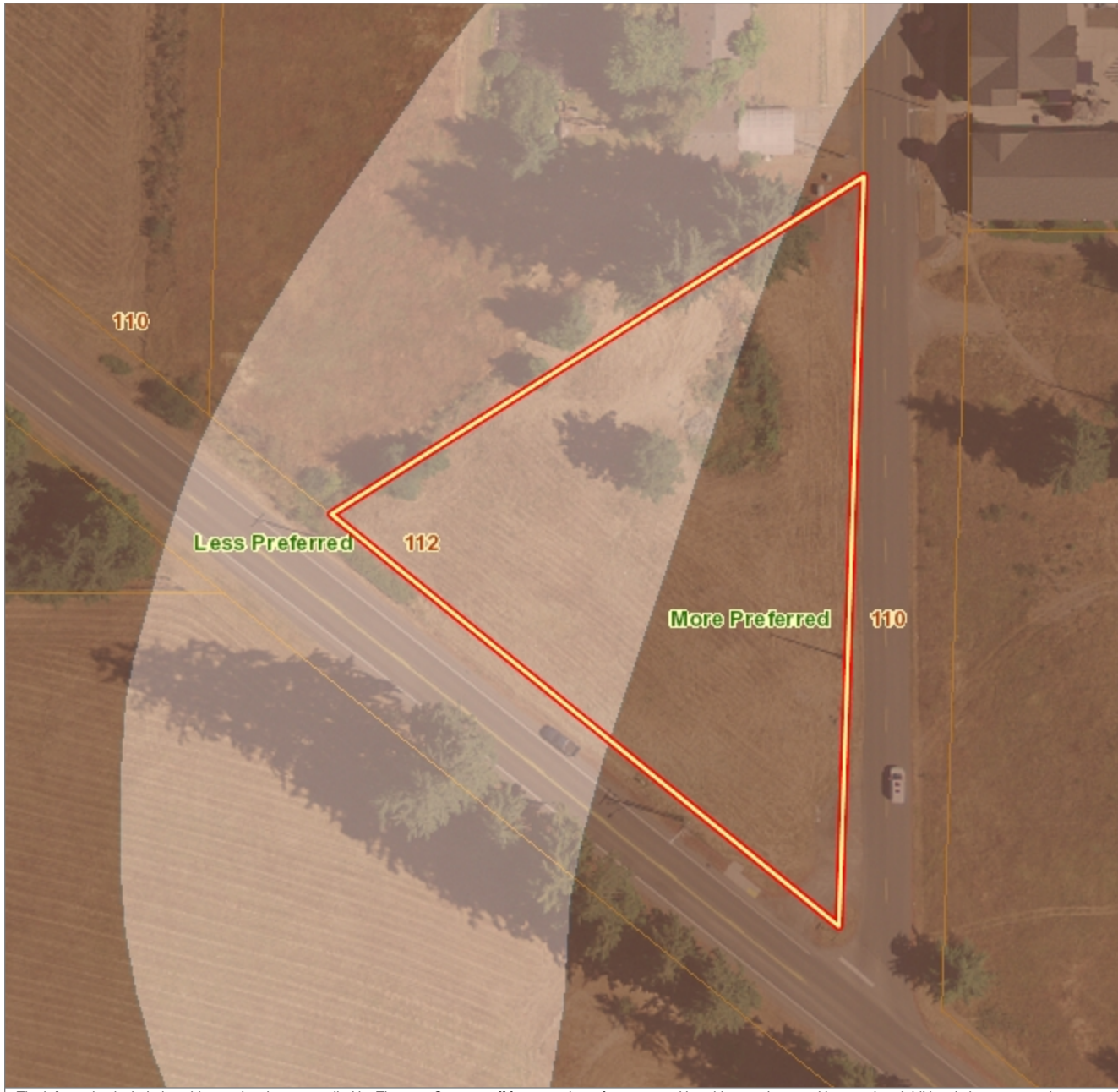
The findings expressed in this report are based on field investigations, best available data, best available science, and our professional judgement. The services described in this report were performed consistent with generally accepted professional consulting principles and practices.

The services performed were consistent with our agreement with our client. Key Environmental Solutions, LLC, (KES) is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. KES does not warrant the accuracy of supplemental information incorporated in this report that was supplied by others.

Thank you for the opportunity to evaluate this project and please contact us if you have any questions regarding this information, our findings, conclusions, or recommendations at (360) 562-5763.

Sincerely,

Key McMurry
Owner/Professional Stream and Wildlife Biologist, SPWS




# Soils

## Legend

### Gopher Indicator Soils

- Less Preferred
- More Preferred

### Soils (USDA)

- Alderwood gravelly sandy loam, 0 to 3% slopes
- Alderwood gravelly sandy loam, 15 to 30% slopes
- Alderwood gravelly sandy loam, 3 to 15% slopes
- Alderwood gravelly sandy loam, 30 to 50% slopes
- Baldhill very stony sandy loam, 0 to 3% slopes
- Baldhill very stony sandy loam, 15 to 30% slopes
- Baldhill very stony sandy loam, 3 to 15% slopes
- Baldhill very stony sandy loam, 30 to 50% slopes
- Baumgard loam, 10 to 40% slopes
- Baumgard loam, 40 to 65% slopes
- Baumgard-Pheeney Comples, 40 to 65% slopes
- Baumgard-Pheeney complex, 10 to 40% slopes
- Baumgard-Rock outcrop complex, 40 to 65% slopes
- Bellingham silty clay loam
- Boisfort silt loam, 20 to 40% slopes
- Boisfort silt loam, 5 to 20% slopes
- Bunker gravelly silt loam, 30 to 65% slopes
- Bunker gravelly silt loam, 5 to 30% slopes
- Bunker-Boisfort complex, 40 to 65% slopes

Scale 1: 1,342

0 50 100

Feet

Map Created Using GeoData Public Website

Published: 10/1/2021

Note:

THURSTON COUNTY
WASHINGTON
SINCE 1852

Thurston County GeoData Center


**PHS Identify**

Select a tool to identify features with.

Buffer Options:
Distance: 0 Units: Feet Clear

Generate Report

| Occurrence Name | Little Brown Bat |
|---|---|
| Scientific Name | *Myotis lucifugus* |
| Notes | This polygon mask represents one or more records of the above species or habitat occurrence. Contact PHS Data Releasing (360-902-2543) for obtaining information about masked sensitive species and habitats. |
| Federal Status | N/A |
| State Status | N/A |
| PHS Listing Status | PHS Listed Occurrence |
| Sensitive | Y |
| SGCN | N |
| Display Resolution | TOWNSHIP |
| Management Recommendations | Click for more info. |

**Key Environmental Solutions, LLC.**
**1047 Summit Avenue**
**Raymond, WA 98577**
**Cell: 360-562-5763**
**key@keyenvironmentalsolutions.com**

**PHS Map**
Crystal Bundy
No Effect Prairie/Gopher Survey
Thurston County,
Yelm Washington
Sec. 13 Township 17 N, Range 01 E, W.M.

**2021 Thurston County Mazama Pocket Gopher Screening Field Form** **Site Visit Date:** 09/20/2021

| | |
|---|---|
| **Site Name and Parcel #** | **Parcel #:** 21713330200<br>**Project #:** 899.01<br>**Site/Landowner:** Crystal Bundy |
| **How were the data collected? (circle the method for each)** | **Transect:** Trimble **Garmin** **Aerial**<br>**Mounds** Trimble Garmin Aerial<br>**Notes:** |
| **Field Team Personnel:**<br>**(Indicate all staff present, CIRCLE who filled out form)** | **Name:** Key McMurry, Key Environmental Solutions, LLC.<br>**Name:**<br>**Name:** |
| **Others onsite (name/affiliation)** | |
| **Site visit #**<br>**(CIRCLE all that apply)** | **1st** **2nd** **Unable to screen**<br>**Notes:** |
| **Do onsite conditions preclude the need for further visits?** | **Yes** **No**<br>**Dense woody cover that encompasses the entire site (trees/shrubs) that appears to preclude any potential MPG use.**<br>**Impervious Compacted Graveled Flooded**<br>**Other** _____<br>**Notes:** |
| **Describe visibility for mound detection:** | **Poor Fair Good Notes:** |
| **Request mowing?**<br>**(CIRCLE and DESCRIBE WHERE MOWING IS NEEDED and SHOW ON AERIAL PHOTO** | **Yes** **No** **N/A** **Notes:** |

| | | | | | |
|---|---|---|---|---|---|
| **Mounds observed over the whole site are characteristic of:**<br><br>**Quantify or describe amount of each type and approx. # of mounds**<br><br>***Group = 3 mounds or more*** | **MPG Mounds** | **Likely MPG Mounds** | **Indeterminate** | **Likely Mole Mounds** | **Mole Mounds** |
| | 0 | 0 | 0 | 0 | 0 |
| | **No MPG mounds (circle)** | | | | |
| **MPG mounds in GPS?**<br><br>**(CIRCLE and DESCRIBE)**<br><br>**If MPG mounds present, entered in GPS?** | **None** **All** **Most** **Some**<br><br>**Notes:**<br><br>**Yes** **No** **N/A** | | | | |
| **Does woody vegetation onsite match aerial photo?** | **Yes** **No - describe differences and show on parcel map/aerial:** | | | | |
| **What portion(s) of the property was screened?**<br><br>**(CIRCLE and DESCRIBE)** | **All** **Part - describe and show on parcel map/aerial:** | | | | |
| **Notes -** | **Describe, and show on parcel map/aerial if applicable:** | | | | |
| **Team reviewed and agreed to data recorded on form?**<br><br>**(CIRCLE, and EXPLAIN if "No")** | **Yes** **No** **Reviewed by initials:** KM _____ _____ _____<br><br>**Notes:** | | | | |

# 2021 Thurston County Critical Areas Ordinance (CAO) Prairie Screening Data Sheet

| | | | |
|---|---|---|---|
| Parcel Number: | 21713330200 | **CAO prairie criteria met?** | Yes or No |
| Property Owner: | Crystal Bundy | **Mima mounds present?** | Yes or No |
| Surveyor(s): | Key McMurry, Key Environmental Solutions, LLC. | **Oaks (*Quercus garryana*) present?** | Yes or No |
| Date: | 09/20/2021 | Mature: | |
| Composition of Vegetation: | | Sapling: | |
| | | Seedling: | |

| X | Target species | Class* (circle) |
|---|---|---|
| | *Apocynum androsaemifolium* | 1 2 3 4 5 N/A |
| | ***Balsamorhiza deltoidea*** | Present / Absent |
| | ***Bistorta bistortoides*** | Present / Absent |
| | *Brodiaea coronaria* | 1 2 3 4 5 N/A |
| | *Camassia leichtlinii* | 1 2 3 4 5 N/A |
| | *Camassia quamash* | Present / Absent |
| | ***Carex densa*** | Present / Absent |
| | *Carex feta* | 1 2 3 4 5 N/A |
| | *Carex inops* ssp. *inops* | 1 2 3 4 5 N/A |
| | *Carex tumulicola* | 1 2 3 4 5 N/A |
| | *Carex unilateralis* | 1 2 3 4 5 N/A |
| | *Castilleja hispida* | 1 2 3 4 5 N/A |
| | ***Castilleja levisecta*** | Present / Absent |
| | *Danthonia californica* | 1 2 3 4 5 N/A |
| | *Delphinium menziesii* | 1 2 3 4 5 N/A |
| | *Delphinium nuttallii* | 1 2 3 4 5 N/A |
| | *Deschampsia cespitosa* | 1 2 3 4 5 N/A |
| | *Deschampsia danthonioides* | 1 2 3 4 5 N/A |
| | *Dodecatheon hendersonii* | 1 2 3 4 5 N/A |
| | *Downingia yina* | 1 2 3 4 5 N/A |
| | *Erigeron speciosus* | 1 2 3 4 5 N/A |
| | *Eriophyllum lanatum* | Cover: ___ $m^2$ N/A |
| | ***Eryngium petiolatum*** | Present / Absent |
| | *Festuca roemeri (F. idahoensis)* | 1 2 3 4 5 N/A |
| | *Fragaria virginiana* | Cover: ___ $m^2$ N/A |
| | *Fritillaria affinis* | 1 2 3 4 5 N/A |
| | *Hieracium scouleri* | 1 2 3 4 5 N/A |
| | ***Hosackia pinnata*** *(Lotus pinnatus)* | Present / Absent |
| | *Koeleria macrantha (K. cristata)* | 1 2 3 4 5 N/A |
| | *Leptosiphon bicolor (Linanthus b.)* | 1 2 3 4 5 N/A |
| | ***Lomatium bradshawii*** | Present / Absent |
| | *Lomatium nudicaule* | 1 2 3 4 5 N/A |
| | *Lomatium triternatum* | 1 2 3 4 5 N/A |
| | *Lomatium utriculatum* | Present / Absent |
| | *Lupinus albicaulis* | 1 2 3 4 5 N/A |
| | *Lupinus lepidus* var. *lepidus* | 1 2 3 4 5 N/A |
| | *Lupinus polyphyllus* | 1 2 3 4 5 N/A |
| | *Micranthes integrifolia (Saxifraga i.)* | Present / Absent |
| | *Micranthes oregana (Saxifraga o.)* | 1 2 3 4 5 N/A |
| | ***Microseris laciniata*** | Present / Absent |
| | *Perideridia gairdneri* | 1 2 3 4 5 N/A |
| | *Plagiobothrys figuratus* | 1 2 3 4 5 N/A |
| | *Plectritis congesta* | Present / Absent |
| | ***Polemonium carneum*** | Present / Absent |
| | *Potentilla gracillis* | Present / Absent |
| | *Ranunculus alismifolius* | 1 2 3 4 5 N/A |
| | *Ranunculus occidentalis* | Present / Absent |
| | *Ranunculus orthorhynchus* | 1 2 3 4 5 N/A |
| | ***Sericocarpus rigidus*** | Present / Absent |
| | ***Sidalcea malviflora* var. *virgata*** | Present / Absent |
| | ***Silene scouleri*** | Present / Absent |
| | *Sisyrinchium idahoense* | 1 2 3 4 5 N/A |
| | *Solidago missouriensis* | 1 2 3 4 5 N/A |
| | *Solidago simplex (S. spathulata)* | 1 2 3 4 5 N/A |
| | *Toxicoscordion venenosum var. venenosum (Zigadenus venenosus)* | 1 2 3 4 5 N/A |
| | *Trifolium willdenowii (T. tridentatum)* | 1 2 3 4 5 N/A |
| | *Triteleia grandiflora* | 1 2 3 4 5 N/A |
| | *Triteleia hyacinthina* | 1 2 3 4 5 N/A |
| | *Veratrum californicum* | 1 2 3 4 5 N/A |
| | ***Veratrum viride*** | 1 2 3 4 5 N/A |
| | *Viola adunca* | 1 2 3 4 5 N/A |
| | *Viola praemorsa* var. *nuttallii* | 1 2 3 4 5 N/A |

*Species Count Class:
1 = < 25
2 = 25 - 49
3 = 50 - 74
4 = 75 - 100
5 = >100

Prairie Plant Manual:
https://www.thurstoncountywa.gov/planning/planningdocuments/cao-prairie-plant-manual-4.23.2018.pdf

## Non-CAO vegetation

| | Species or codons (i.e. "HYPRAD" for *Hypochaeris radicata* ) | Notes |
|---|---|---|
| 1 | *Cirsium arvense* | |
| 2 | *Taraxacum officinale* | |
| 3 | *Rubus armenicus* | |
| 4 | *Hypochaeris radicata* | |
| 5 | *Polytrichum juniperinum* | |
| 6 | *Hypericum perforatum* | |
| 7 | *Avena sativa* | |
| 8 | *Dactylis glomerata* | |
| 9 | *Mahonia nervosa* | |
| 10 | *Plantago lanceolata* | |
| 11 | *Phalaris arundinacea* | |
| 12 | *Cytisus scoparius* | |
| 13 | *Amelachier alninfolia* | |
| 14 | *Daucus carota* | |
| | *Populus alba* | |

Prairie Habitat Criteria: If at any point at least three target species, totaling in general at least 25 plants each are encountered within about 5 meters of each other (WDFW 2015), the area in question meets the criteria to be established as occurrence of prairie. For certain plants such as WNHP rare plants (indicated here in bold), or species which serves as nectar or host plants for both TCB and either SCC or SGCN butterflies (indicated here with underline), presence is enough to meet prairie habitat criteria for such species, even if their count is less than 25 individual plants. CAO wet and dry prairie plant lists can be found in Tables 24.25-7 and 24.25-8, respectively. More info available at: https://www.thurstoncountywa.gov/planning/Pages/hcp-prairie-review.aspx

Mima mounds and oak habitat definitions can be found in TCC 24.03.010

U.S. FISH & WILDLIFE SERVICE

**September 20, 2021**

**Wetland Types**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Google Earth

N

100 ft

**2021 Thurston County Mazama Pocket Gopher Screening Field Form** **Site Visit Date:** 10/21/2021

| | |
|---|---|
| **Site Name and Parcel #** | **Parcel #:** 21713330200<br>**Project #:** 899.01<br>**Site/Landowner:** Crystal Bundy |
| **How were the data collected?**<br>**(circle the method for each)** | **Transect:** Trimble **Garmin** **Aerial**<br>**Mounds** Trimble Garmin Aerial<br>**Notes:** _____ |
| **Field Team Personnel:**<br>**(Indicate all staff present, CIRCLE who filled out form)** | **Name:** Key McMurry, Key Environmental Solutions, LLC.<br>**Name:**<br>**Name:** |
| **Others onsite (name/affiliation)** | |
| **Site visit #**<br>**(CIRCLE all that apply)** | **1st** **2nd** **Unable to screen**<br>**Notes:** |
| **Do onsite conditions preclude the need for further visits?** | **Yes** **No**<br>**Dense woody cover that encompasses the entire site (trees/shrubs) that appears to preclude any potential MPG use.**<br>**Impervious Compacted Graveled Flooded**<br>**Other** _____<br>**Notes:** |
| **Describe visibility for mound detection:** | **Poor Fair** **Good** **Notes:** |
| **Request mowing?**<br>**(CIRCLE and DESCRIBE WHERE MOWING IS NEEDED and SHOW ON AERIAL PHOTO** | **Yes** **No** **N/A** **Notes:** |

| | | | | | |
|---|---|---|---|---|---|
| **Mounds observed over the whole site are characteristic of:**<br><br>**Quantify or describe amount of each type and approx. # of mounds**<br><br>***Group = 3 mounds or more*** | **MPG Mounds** | **Likely MPG Mounds** | **Indeterminate** | **Likely Mole Mounds** | **Mole Mounds** |
| | 0 | 0 | 0 | 0 | 0 |
| | **No MPG mounds (circle)** | | | | |
| **MPG mounds in GPS?**<br><br>**(CIRCLE and DESCRIBE)**<br><br>**If MPG mounds present, entered in GPS?** | **None** **All** **Most** **Some**<br><br>**Notes:**<br><br>**Yes** **No** **N/A** | | | | |
| **Does woody vegetation onsite match aerial photo?** | **Yes** **No - describe differences and show on parcel map/aerial:** | | | | |
| **What portion(s) of the property was screened?**<br><br>**(CIRCLE and DESCRIBE)** | **All** **Part - describe and show on parcel map/aerial:** | | | | |
| **Notes -** | **Describe, and show on parcel map/aerial if applicable:** | | | | |
| **Team reviewed and agreed to data recorded on form?**<br><br>**(CIRCLE, and EXPLAIN if "No")** | **Yes** **No** **Reviewed by initials:** KM _____ _____ _____<br><br>**Notes:** | | | | |

# 2021 Thurston County Critical Areas Ordinance (CAO) Prairie Screening Data Sheet

| | | | |
|---|---|---|---|
| Parcel Number: | 21713330200 | **CAO prairie criteria met?** | Yes or No |
| Property Owner: | Crystal Bundy | **Mima mounds present?** | Yes or No |
| Surveyor(s): | Key McMurry, Key Environmental Solutions, LLC. | **Oaks (*Quercus garryana*) present?** | Yes or No |
| Date: | 10/21/2021 | Mature: | |
| Composition of Vegetation: | | Sapling: | |
| | | Seedling: | |

| X | Target species | Class* (circle) |
|---|---|---|
| | *Apocynum androsaemifolium* | 1 2 3 4 5 N/A |
| | ***Balsamorhiza deltoidea*** | Present / Absent |
| | ***Bistorta bistortoides*** | Present / Absent |
| | *Brodiaea coronaria* | 1 2 3 4 5 N/A |
| | *Camassia leichtlinii* | 1 2 3 4 5 N/A |
| | *Camassia quamash* | Present / Absent |
| | ***Carex densa*** | Present / Absent |
| | *Carex feta* | 1 2 3 4 5 N/A |
| | *Carex inops* ssp. *inops* | 1 2 3 4 5 N/A |
| | *Carex tumulicola* | 1 2 3 4 5 N/A |
| | *Carex unilateralis* | 1 2 3 4 5 N/A |
| | *Castilleja hispida* | 1 2 3 4 5 N/A |
| | ***Castilleja levisecta*** | Present / Absent |
| | *Danthonia californica* | 1 2 3 4 5 N/A |
| | *Delphinium menziesii* | 1 2 3 4 5 N/A |
| | *Delphinium nuttallii* | 1 2 3 4 5 N/A |
| | *Deschampsia cespitosa* | 1 2 3 4 5 N/A |
| | *Deschampsia danthonioides* | 1 2 3 4 5 N/A |
| | *Dodecatheon hendersonii* | 1 2 3 4 5 N/A |
| | *Downingia yina* | 1 2 3 4 5 N/A |
| | *Erigeron speciosus* | 1 2 3 4 5 N/A |
| | *Eriophyllum lanatum* | Cover: ___ $m^2$ N/A |
| | ***Eryngium petiolatum*** | Present / Absent |
| | *Festuca roemeri (F. idahoensis)* | 1 2 3 4 5 N/A |
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| | *Fritillaria affinis* | 1 2 3 4 5 N/A |
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| | ***Hosackia pinnata*** *(Lotus pinnatus)* | Present / Absent |
| | *Koeleria macrantha (K. cristata)* | 1 2 3 4 5 N/A |
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| | *Lupinus lepidus* var. *lepidus* | 1 2 3 4 5 N/A |
| | *Lupinus polyphyllus* | 1 2 3 4 5 N/A |
| | *Micranthes integrifolia (Saxifraga i.)* | Present / Absent |
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| | *Plagiobothrys figuratus* | 1 2 3 4 5 N/A |
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| | ***Polemonium carneum*** | Present / Absent |
| | *Potentilla gracillis* | Present / Absent |
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| | *Solidago missouriensis* | 1 2 3 4 5 N/A |
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| | *Triteleia grandiflora* | 1 2 3 4 5 N/A |
| | *Triteleia hyacinthina* | 1 2 3 4 5 N/A |
| | *Veratrum californicum* | 1 2 3 4 5 N/A |
| | ***Veratrum viride*** | 1 2 3 4 5 N/A |
| | *Viola adunca* | 1 2 3 4 5 N/A |
| | *Viola praemorsa* var. *nuttallii* | 1 2 3 4 5 N/A |

*Species Count Class:
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| | Species or codons (i.e. "HYPRAD" for *Hypochaeris radicata* ) | Notes |
|---|---|---|
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| 2 | *Taraxacum officinale* | |
| 3 | *Rubus armenicus* | |
| 4 | *Hypochaeris radicata* | |
| 5 | *Polytrichum juniperinum* | |
| 6 | *Hypericum perforatum* | |
| 7 | *Avena sativa* | |
| 8 | *Dactylis glomerata* | |
| 9 | *Mahonia nervosa* | |
| 10 | *Plantago lanceolata* | |
| 11 | *Phalaris arundinacea* | |
| 12 | *Cytisus scoparius* | |
| 13 | *Amelachier alninfolia* | |
| 14 | *Daucus carota* | |
| | *Populus alba* | |

Prairie Habitat Criteria: If at any point at least three target species, totaling in general at least 25 plants each are encountered within about 5 meters of each other (WDFW 2015), the area in question meets the criteria to be established as occurrence of prairie. For certain plants such as WNHP rare plants (indicated here in bold), or species which serves as nectar or host plants for both TCB and either SCC or SGCN butterflies (indicated here with underline), presence is enough to meet prairie habitat criteria for such species, even if their count is less than 25 individual plants. CAO wet and dry prairie plant lists can be found in Tables 24.25-7 and 24.25-8, respectively. More info available at: https://www.thurstoncountywa.gov/planning/Pages/hcp-prairie-review.aspx

Mima mounds and oak habitat definitions can be found in TCC 24.03.010

U.S. FISH & WILDLIFE SERVICE

October 21, 2021

**Wetland Types**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Google Earth

N

100 ft

# *Bundy Commercial Project*

**Traffic Impact Analysis**

**February, 2022**

**Prepared For**

## Crystall Bundy

**Prepared By**

*Turner Consulting Engineers, LLC*
**4405 7th Avenue SE Suite 301**
**Lacey, WA 98503**

**(360) 491-6900**

**Traffic Impact Analysis Report**
***Bundy Commercial Project***
Yelm, Washington

February, 2022

## Project Information

| | |
|---|---|
| Project: | *Bundy Commercial Project* |
| Prepared For: | Crystal Bundy. |
| Contact: | Crystal Bundy<br>11349 Summit Lake Rd. NW<br>Olympia, WA 98502<br><br>(360) 280-2929 |


| | |
|---|---|
| | **Project Engineer** |
| Prepared by: | Turner Consulting Engineers, LLC<br>4405-7th Avenue SE, Suite 301<br>Lacey, WA 98503<br>(360) 491-6900 |
| Contact: | Bill Turner, P.E.<br>(360) 239-2847 |



"I hereby certify that this **Traffic Impact Analysis Report** for **Bundy Commercial Project** has been prepared by me or under my supervision and meets **Traffic Impact** analysis standards of **City of Yelm** and normal standards of engineering practice.

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# Bundy Commercial Project

## Introduction

Purpose of Report and Study Objectives

The purpose of this report is to determine if traffic mitigation will be required to improve the traffic and safety impacts that the proposed development will have on the local area roadway system. The study objective is to determine if the level of service within the study area is adequate for all roadway segments and intersections.

Executive Summary

This project is located within the City Limits of Yelm on the northwest corner of SR 510 (Yelm Highway) and Burnett Road. The study area is limited to the driveway intersections that take access off of SR 510 and Burnett Rd. There will be two access driveways for this project

The findings indicate that the intersections within the study area will remain at a Level of Service A with a V/C ration of 0.01. It is estimated through the Trip Generation Manual that there will be 33 trips during peak hours generated by this project. Due to the minimal amount of traffic generated by this project it is recommended that no mitigation fees or improvements are needed for this project at this time.

The project site will have 21 parking stall including a handicap stall for the employees and public to use for business.

## Proposed Development

Description

Bundy Commercial Project is a development that is being proposed through the Administrative Site Plan Review process within the City Limits of Yelm, WA. This project proposes to develop a 0.99-acre parcel of land into a small coffee shop and retail or business structure

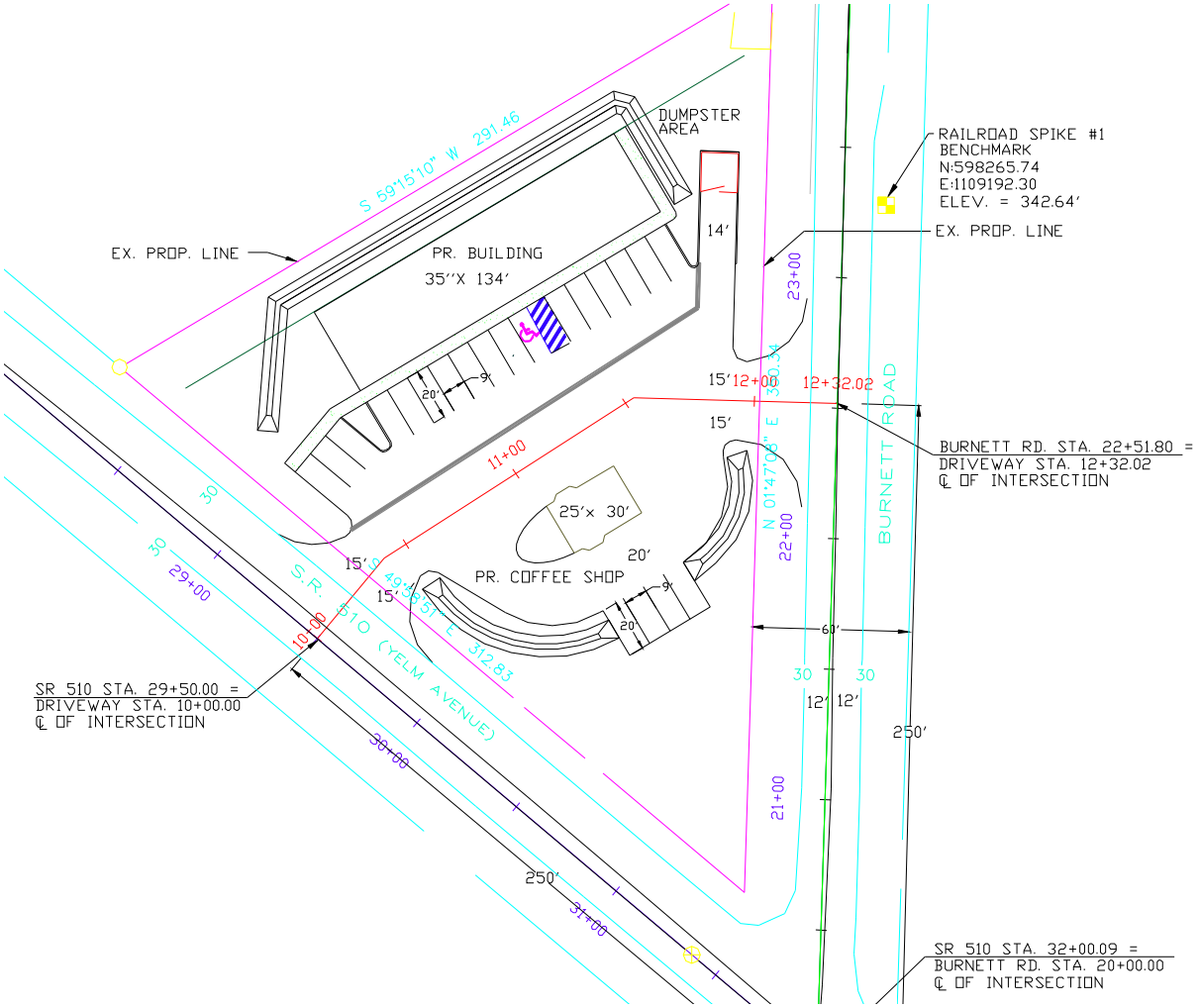
There are two driveway coming into the project site. Both will be private driveways with full access turning movements. One driveway will come off of SR 510 with the other coming off of Burnett Rd. Both driveways are 250-feet from the intersection of SR 510 and Burnett Road.

Figure 1 below shows the location of the site and the surrounding roadway network. Figure 2 shows the existing site and Figure 3 shows the site plan consisting of the structures and access into the site from SR 510 and Burnett Road.

**Figure 1**
**Bundy Commercial Project**
**And Local Neighborhood Roadway**

**Figure 2**
**Bundy Commercial Project**
**Exist Site**

**Figure 3**
**Bundy Commercial Project**
**General Site Plan**



Proposed Zoning
The proposed zoning will remain the same as the existing zoning, which is C – 1.

Proposed Land Use and Intensity
The property is to be used for a commercial business.

Phasing and Timing
This project will probably be constructed in two phases. The initial phase 1 of this project is grade the site, put in the entrances and construct the coffee shop. Phase II will be to construct the business center and finish the project site.

## Existing Conditions

Study Area

Limits of Traffic Study
Presently the site is undeveloped with grass and scotch bloom for vegetation. The project is on one parcels of land and is approximately 0.99-acres. There are no entrances into the project site at this time.

The surrounding area is urban in nature with existing homes on developed large and small parcels. Because of the small number of trips into the property, the Traffic Study Area will be limited to the intersection of the driveways going into the project site.

Existing Zoning
The existing zoning is C - 1.

Existing Land Uses
The existing land use is vacant land. The property is undeveloped and presently there is only vegetation on the project site.

Site Accessibility

Area Roadway System
This project has easy access to and from SR 510 and Burnett Road which is a local roadway. The access into the project site will be from SR 510 and Burnett Road, both access points will remain private driveways. Please note that deferral of frontage improvements has been requested for this project due to the future construction project for the realignment of Burnett Road and SR 510.

Transit Service
There is a bus stop on SR 510 next to the project site.

Pedestrian and Bicycle Facilities
There are no sidewalk or bicycle paths on Burnett Rd. for pedestrians at this time. There is a four to six foot wide shoulder on SR 510 which will facilitate pedestrian and bicycle traffic.

## Trip Generation and Distribution

Trip Generation

Trip generation for this project was approximated through the Trip Generation Manual 11th Addition. Trip Generation Manual, 11th Edition, Land Use Code was used to determine the Peak Hour trips from 4 to 6 PM in the afternoon. The Trip Generation Manual indicated and approximately 33 trips will be generated from the project when phase II has been completed.

For the retail store Land Use Code 822 was used to determine the amount of trips that would be coming into the complex with 46% leaving the facility and 54% entering. Land Use Code 938 was used for the coffee stand with 50% entering and 50% leaving. Because there will be two entrances into the project site the amount of trips entering and leaving were equally split between the two intersections. Out of the 33 trips it was determined that 17 trips will using the intersection on SR 510 and 16 trips will utilize the entrance off of Burnett Road.

Trip Distribution

The trip distribution entering and leaving the project site establishes the conflict that may occur on SR 510 and Burnett Road. There are two intersections that will be analyzed for this project site, both are private driveways. The main entrances into the site will be used by employees, business owners and the public. Please see Appendix A for Trip Distribution Diagram.

## Traffic Analysis

Site Access

The site has easy access from both SR 510 and Burnett Rd. There are no site distance problems at the driveway access points. When leaving the site, the site distance looking to the east and west on SR 510 is clear with no limitation due to vegetation or obstruction. SR 510 is a 35 MPH roadway with two 11-foot lanes, 4-foot shoulders and is straight for a considerable long distance in both directions. Burnett Road is 25 MPH roadway with two 11-foot land and no shoulders. It is straight in both directions with no vegetation or obstruction in either direction. Therefore sight distance is not a problem for this project.

Level Of Service has been calculated for both driveway intersections with the Volume/Capacity (V/C) ratio. It was determined that the Level of Service at these intersections will remain at Level A and the V/C ration will be at 0.01.

There have been no accidents identified at the intersection of SR 510 and Burnett Road at this time. .

Site Circulation and Parking Plan

There are no existing left or right turn lanes in this area and there will not be any required in the future. Parking area at the development is limited to 21 parking stalls including a

handicap space. This area will have adequate turning space for the coffee shop and business portion of the project site when the project has been completed.

Customers coming into and leaving the project site for the coffee shop can circulate easily on both side of the coffee stand. There has been ample room designed into the site to allow for two cars to pass on both sides of the Shop.

## Improvement Analysis

There are no improvements needed to accommodate the existing site from SR 510 or Burnett Road at this time.

## Findings

The findings indicate that the site accessibility is adequate to accommodate the amount of traffic that will flow through the driveway access points. The traffic impacts are not significant enough to require improvements to the intersection or streets at this time.

## Recommendations

The concept of recommending mitigation through analysis is an essential measure in determining roadway deficiencies for the safety of the traveling public. The results of this Traffic Impact Analysis Report indicate that off site mitigation is not recommended to meet concurrency requirements for the Bundy Commercial Project at this time. As population and employment densities increase in the Urban area in the future, the potential for traffic conflicts and safety impacts will increase and should be looked at on a case by case basis.

## Appendices

Trip Distribution Diagrams

Trip Generation Sources

Trip Generation Manual, 11th Addition, Land Use Code 822 and 938.

References:

Trip Generation, Institute of Transportation Engineers, 11th edition, volume 1 through 4.
Trip Generation Handbook, Institute of Transportation Engineers.
American Association of State Highway and Transportation Officials (AASHTO), 4th Edition.
City of Yelm Minimum Roadway Standards

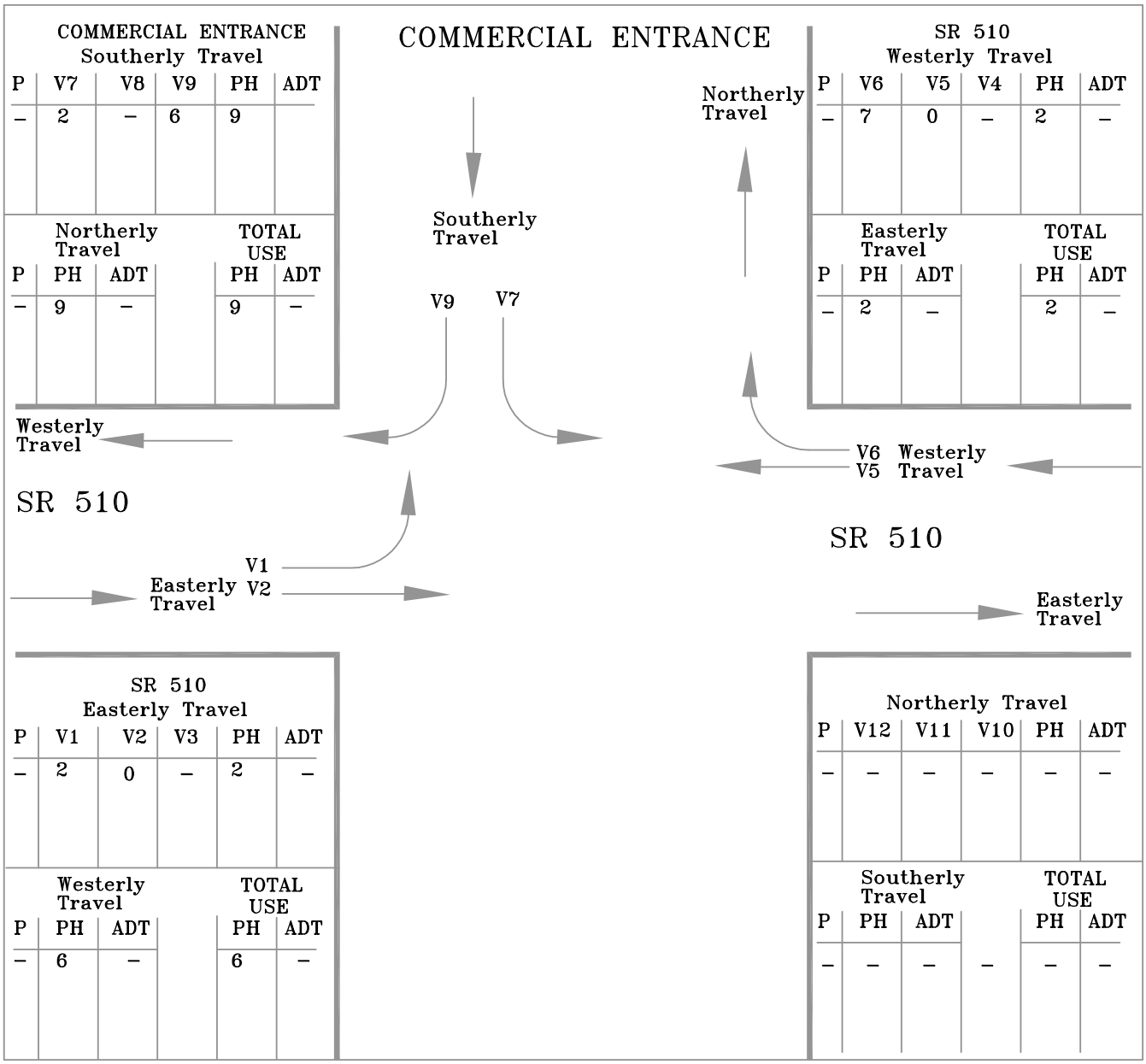
# Appendix A
# Trip Distribution Diagram

# Bundy Commercial Center

## SR 510/COMMERCIAL ENTRANCE INTERSECTION
## TOTAL NEW TRIPS = 17

Legend

P = Phase Identification
V = Direction Of Travel
PH = Peak Hourly Traffic
ADT = Total Average Daily Traffic




NEW TRAFFIC ONLY –
K-VALUE USED = 0.091
SOURCE = HIGHWAY CAPACITY MANUAL 2016


2-11-22

**Bundy Commercial Center**

**Trip Distribution**

**Intersection Diagram**


Turner Consulting Engineer
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900

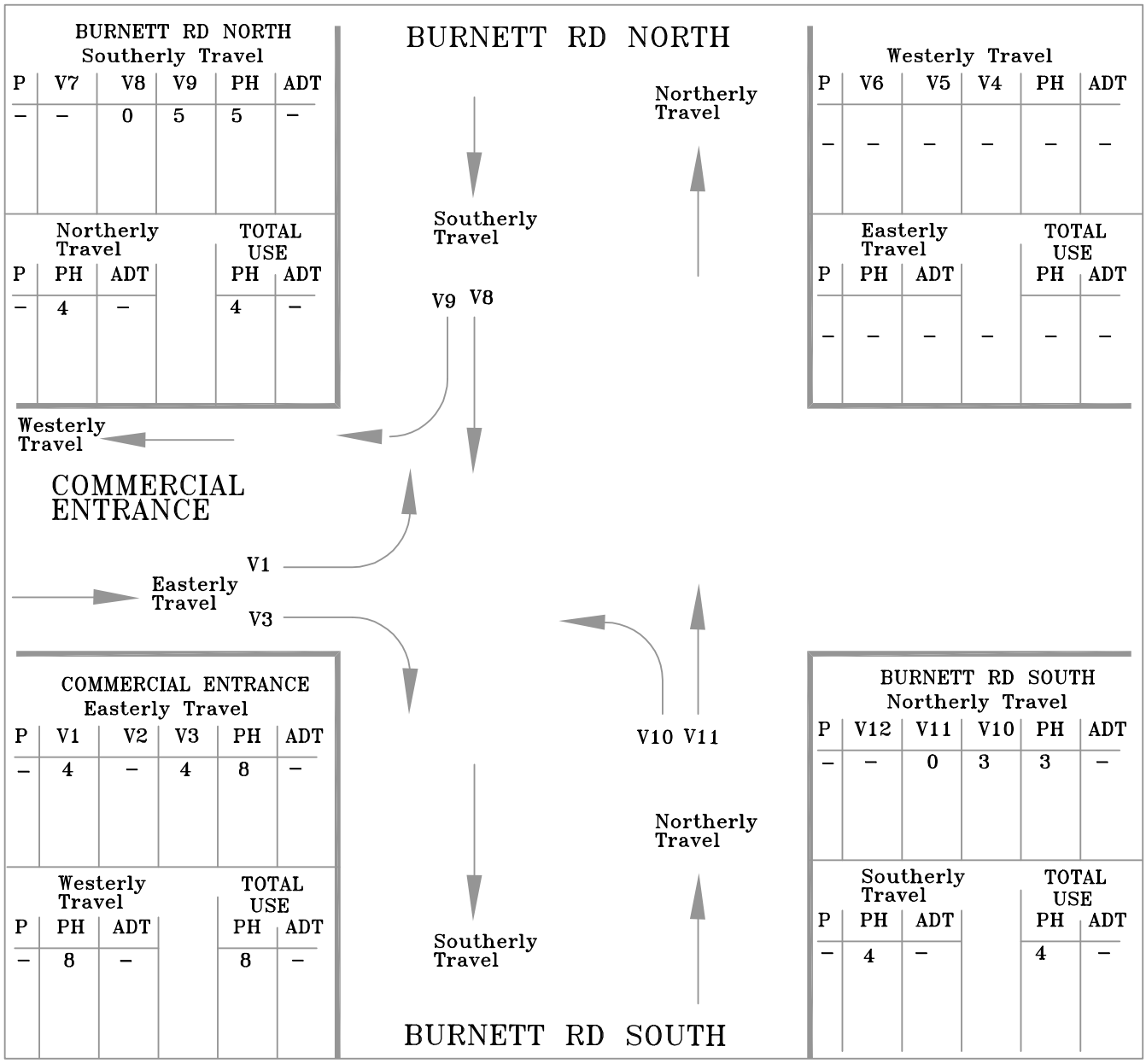

| DESIGN INFORMATION | | |
|---|---|---|
| PAGE #1 | | |
| FILE NAME: Bundy Yelm Project | | |
| | | |
| ACTION | | |
| DESIGNED | BT | 1-11-22 |
| DRAWN | JB | 1-11-22 |
| CHECKED | BT | 1-11-22 |

# Bundy Commercial Center

## BURNETT RD/COMMERCIAL ENTRANCE INTERSECTION
## TOTAL NEW TRIPS = 16

Legend

P = Phase Identification
V = Direction Of Travel
PH = Peak Hourly Traffic
ADT = Total Average Daily Traffic




NEW TRAFFIC ONLY –
K–VALUE USED = 0.091
SOURCE = HIGHWAY CAPACITY MANUAL 2016


2–11–22

**Bundy Commercial Center**

**Trip Distribution**

**Intersection Diagram**


Turner Consulting Engineer
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900


| DESIGN INFORMATION | | |
|---|---|---|
| PAGE #1 | | |
| FILE NAME: Bundy Yelm Project | | |
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| ACTION | | |
| DESIGNED | BT | 1–11–22 |
| DRAWN | JB | 1–11–22 |
| CHECKED | BT | 1–11–22 |

# *Yelm Commercial Project*

## Drainage Report

February, 2022

Turner Consulting Engineers, L.L.C.
**4405 7th Ave. SE Suite 301**
**Lacey, WA 98503**
**(360) 491-6900**

**Preliminary Drainage Report**

***Yelm Commercial Project, LLC***

Yelm, Washington

February, 2022

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## Project Information

| | |
|---|---|
| Project: | *Yelm Commercial Project, LLC* |
| Prepared For: | Crysal Bundy |
| **Contact:** | Crystal Bundy<br>PO Box 926<br>Rochester, WA 98579<br><br>(360) 280-2929 |

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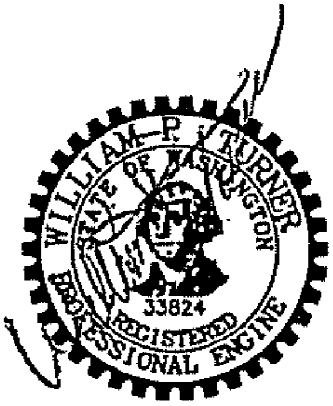
## Project Engineer

| | |
|---|---|
| Prepared by: | Bill Turner, P.E.<br>4405-7th Avenue SE, Suite 301<br>Lacey, WA 98503<br>(360) 491-6900 |
| Contact: | Bill Turner, P.E.<br>(360) 239-2847 |




"I hereby certify that this Drainage and Erosion Control Plan for **Yelm Commercial Project** has been prepared by me or under my supervision and meets minimum standards of **City of Yelm Design and Erosion Control Manual** and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities was designed by me."

*Project Description*

## MR #1: STORMWATER SITE PLAN

**Stormwater Site Plan**

**Proposed Project Description**

| | |
|---|---|
| Developer:<br>Contact | Crystal Bundy.<br>Crystal Bundy<br>PO Box 926<br>Rochester, WA 98579 |
| Site Address: | Unknown<br>Yelm, WA |
| Parcel Numbers: | 21713330200 |
| Total Project Area: | 0.99 Acres |
| Zoned: | C-1 |
| Section, Township, Range: | Section(s) 13<br>Township 17 North<br>Range 1 W, W.M. |
| Legal Description: | Section 13 Township 17 Range 1W<br>SW-SW COM N 77-59E 1383.71F<br>OF SW COR N 410.70F S5 5-20-30 |
| Required Permits: | Site Plan Approval, Building Permits, Grading Permit, Access Permit |

## Executive Summary

This project will construct a coffee stand along with a small retail building for commercial use. It will have 21 parking spaces, a refuge area and landscaping around the perimeter of the area.

Stormwater will be treated through either Rain Gardens or Bioretention areas located on the outsides of the building and asphalt areas. Treat will either through sand filters or through amended soils in the bioretention areas.

Access into the parcel will be from State Route 510 and from Burnett Road which is a City Street. This project is within the City Limits of Yelm, WA. The City of Yelm will provide sewer and water for this project.

## Existing Site Conditions

This 0.99-acre triangular shaped parcel is located in on the corner of Burnett Street and State Route 510. The project site is fairly flat with a with elevation difference from east to west of about 4-feet. Vegetation on the site is mostly prairie grass and scotch broom. The City of Yelm has a water main on the state highway and next to Burnett Road which will provide fire flow to the project site. The City also has sanitary step sewer system the runs across the east portion of the project site.

There is no off site flow coming onto the project site. Stormwater that falls onto the site at this time infiltrates into the ground and does not flow off of the parcel. There are no steep slopes, ravens, creeks, or rivers on or adjacent to the site. This project does not have high ground water and it is not in the 100-year flood plain. Thurston County Geodata does have it listed in the aquifer sensitive area.

**Existing Condition**
**Figure #1**

**Prepare The Preliminary Development Layout**

A preliminary development layout has been completed for the project and can be seen in the appendix.

**Geotechnical Report**

All American Geotech, Inc. has completed soils analysis studies on the project site. Soil types have been identified throughout the project site and an assessment of the groundwater has been completed. The soil is a Spanaway gravelly sandy loam, 0 to 3 percent slopes, the Spanaway gravelly sandy loam, is listed as Hydrologic Soils Group A which has a high infiltration rate when thoroughly wet and represents over 100% of the project site, please see report in appendix.

To evaluate the soils on the project site, All American Geotech. excavated three test pits on-site for analysis. Soil samples were taken and analyzed and a recommended infiltration rates was given for the site. The infiltration rates for the three holes were analyzed and a long term infiltration of **10.0 inches per hour** was recommended. Amended sand has also been recommended for the treatment of the stormwater before infiltration if infiltration trench are used on the project site.

**Off Site Analysis**

There is no offsite stormwater coming onto the project site at this time and there is none expected after this project has been completed. There are no streams, creeks, rivers or ditches flowing through the property that may need to be analyzed. There are no wetlands on or near the project site. This project will infiltrate 100 percent of the stormwater coming from rainfall through infiltration. An Off Site Analysis is not required for this project.

**Wells and Septic Systems**

There are no wells or on-site septic system on the project site at this time. According to the Thurston County Geodata Center this project does not lie within a well head protection area. The FEMA Panel Number for this project is 0345. This project will connect to City sewer and water.

**Analysis Of The 100-Year Flood**

This project does not lie with the 100-Year flood hazard zone.

**Utilities**

Utility will be installed as to not interfere with stormwater facilities. There will be no water and electrical lines shall be installed through under ground trenches directly from the highway to the

## MR #2: CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A Construction Stormwater Pollution Prevention Plan (SWPPP) will be developed prior to construction to address erosion and sediment control anticipated during construction. The Construction SWPPP will address all twelve elements as required by the City of Yelm.

## MR #3: SOURCE CONTROL OF POLLUTION

Commercial Source Control is addressed with onsite treatment and detention of stormwater produced by the developed site. Amended soils and soils infiltration will remove the sediments and heavy metals coming from the project site. All roadways, sidewalks, driveways and parking lot drainage will be treated by one these methods. All of the driveway area will be infiltrate through rain gardens or biofiltration swales. All of the roof area runoff will directed toward infiltration areas where it will be infiltrated into the ground. The property owner will have a copy of the Pollution Source Control Program as found in the Stromwater Maintenance Plan Section VII below. The Source Control Program describes the Best Management Practices (BMPs) for commercial products, pesticides, fertilizers and remodeling.

## MR #4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

There are no natural discharge locations to preserve on this site or adjacent to the site. There is no indication on the project site where rainfall is flowing through a ditch line, channel, trench, raven, stream or waterway. Rainfall coming onto the site at this time in its natural state is infiltrated into the ground. This site has not known to have high ground water and the soil has shown a capacity to infiltrate all of the rainfall. It is the intent of the stormwater facility that has been designed to mimic the natural state of this site.

Adjacent properties to the northwest and southeast are roadways system for the state highway and Myers Street which is a City Street. Property to the northeast and southeast have been developed into large residential lots and.

## MR #5: ONSITE STORMWATER MANAGEMENT

All Projects that require Minimum Requirement #5 must employ Stormwater Management BMPs. Figure I-3.3: Flow Chart For Determining MR #5 Requirements indicates that This project will infiltrate 100-percent of the stormwater on-site and will not qualify for flow control exemption in accordance with Section 2.4.8 of the Manual. It will not be designed under the LID performance standard however this project will restore any native vegetation through BMP T5.13 Post-Construction Soil Quality and Depth. Dispersion of roof and driveway runoff will comply with BMP T7. Basic Bioretention.

**The stormwater facility has been sized on this project to handle all of the stormwater runoff coming from the driveways, roofs and disturbed areas on site. The stormwater facilities were designed with the Western Washington Hydrology Model (WWHM2012). See Appendix for calculations and WWHM2012 printouts.**

Table 8.1 below identifies the threshold areas and the land use summary.

**Table 8.1 WWHM Developed Mitigation Onsite Land Use Summary**

| WWHM Developed Land Use (All Areas Measured In Acres) | Ex. Condition | Pr. Site Development | |
|---|---|---|---|
| **A/B, Forested, Flat** | **0.99** | **0.0** | |
| **A/B, Lawn Flat** | **0** | **0.44** | |
| **Roof Tops** | **0** | **0.125** | **Entered as Grass** |
| **Parking Flat** | **0.00** | **0.425** | |
| **Sidewalks Flat** | **0.00** | **0.0** | |
| **Driveways/Flat** | **0.0** | **0.00** | |
| **Roads/Flat** | **0.0** | **0.00** | |
| **Ponds** | **0.00** | **0.00** | |
| **Total % Impervious** (all roof, driveway and parking areas) | **0.0%** | **55.65%** | |

All American Geotech, Inc. has recommended a **long term design infiltration rate of 10.0 inches per hour** for sizing of the Infiltration galleries and rain gardens. An infiltration rate of **8.0 inches** per hour was used in the hydraulic modeling program for sizing analysis due to the amended sand placed in the bottom of the infiltration facilities.

The Western Washington Hydraulic Modeling Software (WWHM 2012) was used to calculate an rain gardens and/or biofiltration area which would infiltrate 100% of the runoff coming from the internal driveways, roof and disturbed area through the project site. The requirements for the bioretention area were calculated to be approximately 1,200 square feet of surface area. This can be accomplished with an biofiltration swale 6-feet in width at the bottom of the amended soil area, 1 foot of freeboard, 2-feet in swale width, and approximately 200-feet in length located along the asphalt area and along the back of the structure (please see stormwater plans & details in the appendix).. The amount of bioretention area provided is equal to 2,270 sq ft in a swale 178 in length which exceeds the required amount.

In case of an emergency and the bioretention area should over flow, the excess stormwater coming from the swale will flow towards the roadside ditches for infiltration.

Bioretention areas have also been incorporated into the landscaping which will also provide for addition storage, treatment and infiltration. The Bioretention areas design into the site are an extra benefit for water quality treatment and additional storage if needed.

## MR #6: RUNOFF TREATMENT

For developments with greater than 5,000 square feet of pollution generating impervious surface (PGIS) treatment facilities and onsite BMPs shall be required. All of the PGIS on the project site will treated either through compost amended soils (filter strips and Rain Gardens) or through soils infiltration or through biofiltration swales. All other had surfaces

**Table 6.1 – Treatment Requirements by Threshold Discharge Area**

| | < ¾ Acres of PGPS | ≥ ¾ Acres of PGPS | < 5,000 $ft^2$ of PGIS | ≥ 5,000 $ft^2$ of PGIS |
|---|---|---|---|---|
| Treatment Facilites | X | | | X |
| Onsite Stormwater BMPs | X | | | X |

The Treatment Facility Selection Flow chart was used to determine what type of treatment is appropriate for this project. Specifically, the following steps were followed to determine if more than basic treatment was required.

Step 1: Perform Offsite analysis.
Step 2: Determine if oil control facility is required.
Step 3: Determine if infiltration for pollutant removal is practicable.
Step 4: Determine if phosphorus control is required.
Step 5: Determine if enhanced treatment is required.

*Offsite Analysis*

This project lies within the Nisqually River Watershed which presently does not have a watershed plan. There are no receiving water with listed TMDLs near this site therefore no special treatment is required due to existing downstream quality. Stormwater will not be leaving the project site therefore offsite analysis will not be required.

*Oil Control Facility Evaluation*

Oil control facilities are required if the site is commercial or industrial with high traffic counts, used for petroleum storage and transfer exceeding 1,500 gallons per year, used for parking of vehicles exceeding 10 tons, or if the site includes an intersection that exceeds 25,000 ADT on main road and 15,000 ADT on crossing roadways. This site does not fit within this threshold requirement.

*Evaluation of Infiltration for Pollutant Removal*

Infiltration facilities can be designed for runoff treatment within Thurston County. The design infiltration rate and soil texture should be considered along with the physical and chemical characteristics to determine if the soil is adequate for removing the target pollutants. Studies have been completed to determine if this soil would capable to be used for pollutant removal. The

laboratory results indicate that soil is sufficient to provide adequate treatment of stormwater runoff by placing amended sand in the infiltration trenches at the expected loading rates.

*Assessment for Phosphorus Control*

Phosphorus control is not required by Thurston County, Department of Ecology or US Environmental Protection Agency. All stormwater entering the site will be infiltrated into the soil and not into one of the designed lakes required for phosphorus removal.

*Enhanced Treatment Evaluation*

Enhanced treatment BMPs provide a greater degree of removal of dissolved metals (that are toxic to salmon and other endangered species) than "basic" runoff treatment BMPs. Enhanced treatment is required for industrial sites, commercial sites, multi-family project sites or roadways exceeding 7,500 ADT where stormwater discharges to fish-bearing waters. This site does not meet these requirements; therefore enhanced treatment is not required.

**Basic Treatment**

Runoff treatment for this project will be through amended soil lined bioretention trenches and through soils infiltration into the ground. The retail complex infiltration galleries and water quality flow rate has been sized using the WWHM2012 continuous hydrologic model program from Department of Ecology. Please see All American Geological Soils Report in the Appendix along with the WWHM2012 Report.

Please note that although treatment for stormwater runoff will be through the soil, placing amended sand lining in all trenches as required in BMP IN.02 Infiltration Trenches will also qualify as treatment along with slowing the infiltration rate as required in the DDECM.

**Table 6.2 – Runoff Treatment**

| WWHM Water Quality Treatment Location | Water Quality Design Flow (cfs) | Design Imperious Area For Treatment (Acre) | Treatment Type |
|---|---|---|---|
| Roof Area | 0.000 | 0.0 | Not Required for roof areas. |
| Driveways & Parking Areas | 0.0064 | 0.426 | Bioretention Swale, Treatment Through Soils Infiltration |

## MR #7: FLOW CONTROL

There are no detention ponds designed for this project. There are two or three retention areas where water will flow towards for infiltration. This project will infiltrate one hundred percent of the stormwater generated on this site through dispersion areas and infiltration galleries. A contingency plan has been incorporated for this project. The area for infiltration is considerably increased and larger than required through the WWHM1012 Modeling program. Greater safety factors have been incorporated into the design Model for infiltration into the soil.

There is no off-site flow coming onto this site and there will be no flow leaving the site in its post construction state.

## MR #8: WETLAND PROTECTION

Minimum requirement #8 applies to all non-exempt projects that meet the thresholds of Chapter 2 and where stormwater discharges into a wetland, either directly or indirectly, through a conveyance system. This project does not discharge into a wetland either directly or indirectly. There are no wetlands on or near the project site and there are no wetlands adjacent to this parcel. No wetland protection has been provided at this time.

## CORE REQUIRMENT #9: OPERATION AND MAINTENANCE

The Property Owner will be responsible for the maintenance and operation of the stormwater facility for this parcel. A Stormwater Maintenance Agreement between the Owner and the City of Yelm will be signed and recorded for this project.

*Appendix A*
*Soils & Geotechnical Reports*

# SOIL INSPECTION
# FOR
# DEEP INFILTRATION

# COFFEE HUT & RETAIL SPACES
# YELM WASHINGTON

PREPARED FOR

**NW GRIND, INC.**

BY

**ALL AMERICAN GEOTECHNICAL**
**OLYMPIA, WASHINGTON**

NOVEMBER12, 2021

# CONTACT INFORMATION

## PREPARER INFORMATION

| | |
|---|---|
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| **CONTACT:** | **CURTIS D. CUSHMAN** |
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| **TELEPHONE:** | **(360) 491-5155** |
| **CELL:** | **(360) 481-6677** |
| **EMAIL ADDRESS:** | **CURTIS.CUSHMAN@COMCAST.NET** |

## CLIENT INFORMATION

| | |
|---|---|
| **CLIENT:** | **CRYSTAL BUNDY**<br>**DBA NW GRIND, INC** |
| **CLIENT CONTACT:** | **BILL TURNER** |
| **TELEPHONE:** | **360-491-6900 (Bill Turner)** |
| **BILLING ADDRESS:** | **CRYSTAL BUNDY**<br>**11349 SUMMIT LAKE RD NW**<br>**OLYMPIA, WASHINGTON 98502** |
| **SITE ADDRESS:** | **NW CORNER BURNETT ROAD & YELM HIGHWAY**<br>**YELM, WASHINGTON 98597** |
| **PARCEL:** | **21713330200** |
| **GPS LOCATION:** | **N46° 57' 14.58517" W122° 37' 40.69939"** |

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# SCOPE OF UNDERSTANDING

**CRYSTAL BUNDY**
**NW GRIND, INC.**
**11349 SUMMIT LAKE ROAD NW**
**OLYMPIA, WASHINGTON 98502**

| | |
|---|---|
| **RE:** | **SOIL INVESTIGATION** |
| **PROJECT:** | **NW GRIND, LLC** |
| | **NW CORNER BURNETT ROAD & YELM HIGHWAY** |
| | **YELM, WA 98597** |
| **PARCEL #':** | **21713330200** |
| | **NOVEMBER 12, 2021** |

Dear Ms. Bundy:

As per the request of Bill Turner P.E. (contact), All American Geotechnical, Inc. (AAG) visited the site on your property of the proposed coffee hut and retail building to be designed by Bill Turner of Turner Consulting Engineer of Lacey, Washington. The purpose of the visit was to examine the soil to qualify it by pitting for purposes of drainage. This is to comply with regulations that require information from soils sampled for Massmann Analysis and Cation Exchange Capacity. Site inspection during pitting was also to verify the shallow soil column and the underlying deposits. Trench depths varied from 86 to 120 inches below ground surface. We are providing PDF copies of this report for your review and distribution.

We appreciate this opportunity to be of service to you and we look forward to working with you in the future. If you have any questions concerning the above items, the procedures used, or if we can be of any further assistance, please call us at the phone number listed below.

Respectfully Submitted,
**GEOTECHNICAL TESTING LABORATORY**

Curtis D. Cushman, L.G., L.E.G.
Senior Engineering Geologist

# INTRODUCTION

All American Geotechnical. Inc. (AAG) was hired by Crystal Bundy (client) in September of 2021 to prepare a report on soil conditions on the property proposed for a coffee hut and a multi-store retail building. The proposed site is located at the NW corner of the intersection of Burnett Road and Yelm Highway (State Route 510) in Yelm, Washington. It is located near the western edge of the commercial/residential core of the City of Yelm, Washington. This report is the result of our site examination and pitting. Access to the site is from Burnett Road.

The purpose of this examination is to determine if the material is uniform across the site and if it is suitable for infiltration at 2 X the depth of the drainage trenches (4 feet). Specifically, our scope of services for this project includes the following:

1. A review of the available geologic, hydrogeological and geotechnical data for the site area.
2. Pitting at three selected locations.
3. Prepare Pit Logs
4. Laboratory grain-size analysis
5. Collect soil samples for Cation Exchange Capacity.

# SITE CONDITIONS

## SURFACE CONDITIONS

The Thurston County GeoData Map show the contours with an elevation high of 342-feet in the southern corner of the parcel and a low of 336-feet in the northwestern corner of the triangle. Not mapped is a low-lying area in the north central portion of the site that is approximately 8 feet lower than the surrounding grade. The parcel is irregular on its surface, marked by hummocks, grass and low scrub. There are no erosion features, no surface water, and no appreciable slope.

Curtis D Cushman, L.E.G., and Blaise Jelinek, E.I.T. directed pitting on-site with Bill Turner with excavation by Rick Cruse on October 1, 2021.

## SITE GEOLOGY

The description of the geology is from the *Washington Interactive Geological Map*:

Qgog
**Geologic Age:**Pleistocene
**Lithology:**continental glacial outwash, gravel, Fraser-age
**Named Units:**mostly Vashon Stade in western WA; unnamed in eastern WA
**Symbology:**Pleistocene continental glacial drift

This is based on the mapping on the *Geologic Map of the Centralia Quadrangle, Washington* DNR Open File Report 87-11. This 1:100,000-scale map has the deposit as **Qdvg**: *Advance outwash gravel*.

*Vashon Glacial Gravel—Recessional and proglacial, stratified pebble, cobble, and boulder gravel deposited in meltwater streams and their deltas; locally contains ice-contact deposits…*

All these size fractions were seen, but sampling did not include larger cobbles or any of the many boulders present seen on site and in the trenches. Using ASTM D 2487 Unified Soils Classification system the site may be classified as **GP** *Poorly graded gravel with sand or* **GW** *Well-graded gravel with sand* as indicated in the analysis performed by Materials Testing and Consulting, Inc,

**SITE SOILS**

**110**--Spanaway gravelly sandy loam, 0 to 3 percent loam

**Map Unit Setting**

- *National map unit symbol:* 2ndb6
- *Elevation:* 330 to 1,310 feet
- *Mean annual precipitation:* 35 to 65 inches
- *Mean annual air temperature:* 50 degrees F
- *Frost-free period:* 150 to 200 days

**Map Unit Composition**

- *Spanaway and similar soils:* 100 percent

**Description of Spanaway**

**Setting**

- *Landform:* Outwash plains, terraces
- *Parent material:* Volcanic ash over gravelly outwash

**Typical profile**

- *H1 - 0 to 15 inches:* gravelly sandy loam
- *H2 - 15 to 20 inches:* very gravelly loam
- *H3 - 20 to 60 inches:* extremely gravelly sand

**Properties and qualities**

- *Slope:* 0 to 3 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Somewhat excessively drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water storage in profile:* Low (about 3.8 inches)

**112**--Spanaway stony sandy loam, 0 to 3 percent slopes

**Map Unit Setting**

- *National map unit symbol:* 2ndb8
- *Elevation:* 660 to 1,310 feet
- *Mean annual precipitation:* 35 to 65 inches
- *Mean annual air temperature:* 50 degrees F
- *Frost-free period:* 150 to 200 days

**Map Unit Composition**

- *Spanaway and similar soils:* 100 percent

**Description of Spanaway**

**Setting**

- *Landform:* Terraces, outwash plains
- *Parent material:* Volcanic ash over gravelly outwash

**Typical profile**

- *H1 - 0 to 16 inches:* stony sandy loam
- *H2 - 16 to 22 inches:* very gravelly sandy loam
- *H3 - 22 to 60 inches:* extremely gravelly sand

**Properties and qualities**

- *Slope:* 0 to 3 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Somewhat excessively drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water supply, 0 to 60 inches:* Low (about 4.0 inches)

This description applies to the A horizon, made "loamy" by fine ash, with the B and C horizons devoid of ash and corresponding to the geology description, above. This is described in the WWS as *extremely gravelly sand*. The deposits below the soil are much more gravelly and cobbly than the Spanaway loam.

This soil unit is very thin and uniform across the property. It yields to the underlying deposits of gravel and sand at a shallow depth.

## TEST PITS

Three test pits, TP-1, TP-2, and TP-3 were dug to a maximum of 10 feet in depth. TP-1 was to 96" in depth, TP-2 to 86", and TP-3 to 120". These were located as shown on the Site Map in the Appendix. They were chosen to span the property in order to verify the uniformity of lithology. Soil Logs for the test pits are on pages 12-14.

No water was encountered in any test pit. The soils were damp to moist.

As seen in the lab results and in the field observations, the lithology and soils are very uniform in composition and granularity in pits TP-1 and TP-2. However, in TP-3, located in a topographic low resembling a large pit, fill material was encountered from 72-120", total depth. This included grass mounds, ceramics, glass, plastics, and metal artifacts. Native material was encountered at 120" below ground surface as a sand layer. The infiltration sample was collected from the sand layer encountered in the 72"-96" interval in TP-3.

### INFILTRATION

Grab samples from approximately minus 9 feet depth were taken from pits TP-1 and TP-2 of this pitting project with the samples taken for grain-size analysis at Mayes Terraconn, a certified geotechnical laboratory in Tacoma. TP-3 was sampled as noted above. The results are on pages 17-19.

Infiltration rates for these three pits are following the formula in *Thurston County Drainage Design and Erosion Control Manual* (December 2016), Volume III -- Hydrologic Analysis and Flow Control BMPs, Page A-10 eq (1). Massmann Equation 2003

$$\log 10 (K_{sat}) = -1.57 + 1.90D_{10} + 0.015D_{60} - 0.013D_{90} - 2.08f_{fines}$$

This is taken from Massmann, J.W., et al, 2003, *A Design Manual for Sizing Infiltration Ponds*, Research Project Agreement Y8265. The calculations are on page 20. The overall site infiltration for the deposits encountered in the 8-9 feet below ground surface was significantly greater than 60-inches per hour.

The high rates of infiltration will allow an offset of 8 feet minimum from the centerline of the infiltration trench and the outer toe of the building foundation.

### CATION EXCHANGE CAPACITY

Findings for the Cation Exchange Capacity are found on the laboratory results on pages 15-16.

### WELL LOGS

The nearest well of comparable elevation that is located by the Department of Ecology is on the neighboring parcel to the north at 9141 Burnett Road in Yelm. Static water was found at -43 feet. See page 21.

## CONCLUSIONS

- The soil is uniform across the project area.
- The glacial unit is uniform across the project area.

- The infiltration rate is high. We recommend a long-term infiltration rate of 10 inches per hour. As described above by the USDA, it is well ("excessively") drained. (The term "excessively" is due to the soil classification system referencing agricultural needs but well reflects the engineering soil characteristic.)

- No water was encountered and the soil and glacial outwash were damp to moist.

- The CEC test from TP-1 was 13.2 meq/100g, TP-2 was 10.1 meq/100g, and TP-3 was 7.3 meq/100g. Blending native topsoil with sand will increase the CEC of the soil in the base of the trench.

- There was no restrictive layer found to total depth in each pit.

- The closest water well surely located indicated a groundwater static level at deeper than 100-feet;

- An offset of 8 feet minimum from infiltration trench centerline to building foundations is acceptable and recommended.

## PROVISIONS

### GENERAL

We have prepared this report for the exclusive use of Crystal Bundy and her authorized agents for the proposed improvement in Thurston County, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, should be understood.

### READ THESE PROVISIONS CLOSELY

Some clients, design professionals, and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. All American Geotechnical includes these explanatory "limitations" provisions in our reports to help reduce such risks.

# APPENDIX

**SITE MAP**

## SOILS EVALUATION REPORT FORM 1

| PREPARER: | STAFF USE ONLY |
|---|---|
| PLEASE READ ALL INSTRUCTIONS | |

| | | | | |
|---|---|---|---|---|
| Project Title: | **NW Grind, Inc.** | Sheet | **1** | **of** **1** |
| Project Number: | **AAG21-140** | Date | **November 9, 2021** | |
| Prepared By: | **All American Geotechnical, Inc.** | | | |

1. Site Address or Legal Description:

**Parcel Number: 21713330200**
**Section 13 Township 17 Range 1E**
**13-17-1E SW-SW COM N 77-59E 1383.71F OF SW COR N 410.70F S5 5-20-30**

2. Project Description:

**The intent of the developer is to build a coffee hut and a multi-shop retail building.**

3. Site Description:

**The parcel is a triangular parcel with a low lying area in the northern central portion. The lower area is approximately 8 feet lower that most of the property. There are indications that fill material has been placed on the property and noted by the buried debris.**

4 Summary of soils work performed:

**Three test pits were dug on the site, the deepest pit was 10 feet below ground surface. Samples were collected from each of the test pits for grain size analysis and cation exchange capacity.**

5. Additional soils work recommended:

**No additional soils work recommended at this time**

6. Findings including pre-development site percolation rates:

**The following percolation rates were calculated using Massmann's Equation:**

| | |
|---|---|
| **TP-1** | **9.37 in/hour** |
| **TP-2** | **11.26 in/hour** |
| **TP-3** | **22.43 in/hour** |

7. Recommendations:

**We recommend that the project proceed.**

**I hereby certify that I prepared this report and conducted or supervised the preformances of related work. I certify that I am qualified to do this work. I represent my work to be complete and accurate within the bounds of uncertainty inherent to the practice of soil science and to be suitable for the intended use.**

Signed: _____

Dated: _____

**TEST PIT 1**

| Project Title: | NW Grind, Inc. | | | | | | | | | | Sheet 1 of 3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Number: | AAG21-140 | | | | | | | | | | Date: October 1, 2021 | | |
| Prepared By: | Blaise | | | Checked By: | Curtis | | | | | | **Test Pit 1** | | |
| 1. Type of Tests Conducted: | Massmann, CEC | | | 2. NCSC Soil Series | 112-Spanaway | | | 3. Landform: | Terraces | | | | |
| 4. Deposition History: | Volcanic Ash over Gravelly Outwash | | | 5. Hydrologic Soil Group: | A | | | 6. Depth to Seasonal High Water: | unknown | | | | |
| 7. Current Water Depth: | > 96" | | | 8. Depth to Impervious Layer: | > 96" | | | 9. Miscellaneous : | Cation Exchange Capacity 13.2 meq/100 grams | | | | |
| 10: Potential For: | Erosion | Flooding | Ponding | | | | | | | | | | |
| | | None | None | | | | | | | | | | |
| 11. Soil Strata Description: | | | | | | | | | | | | | |
| Elevation | Depth | Color | Texture | Percent Clay | Percent Organic | Percent Coarse Fragments | Structure | Mottling | Induration | Cementation | Roots | Soil Survey Infiltration Range | Massmann Calculated Rate |
| 340' | Surface | | | | | | | | | | | | |
| 340' | 0-8" | black | loamy sandy | | 40% | 60% | | np | np | np | abundant | Somewhat excessively drained | 9.37 in/hr |
| 338' | 8-24" | gray | cobbly gravels with sand | | 25% | 75% | | np | np | np | few | | |
| 336' | 24-48" | brown | med coarse sand | | 15% | 85% | | np | np | np | none | | |
| 332' | 48-96" | | gravel | | 6% | 94% | | np | np | np | none | | |
| 12. Site Percolation Rate | Material sampled in the 6-8 foot interal has a flow rate of 9.37 inches per hour based upon Sieve Analysis and the application of the Massmann Equation. | | | | | | | | | | | | |
| 13. Findings & Recommendations: | The sands and gravels receiving the collected stormwater were found to be somewhat excessively drained as was reported in the NCSC. The soil is appropriate for the desired usage. We recommend the project proceed. | | | | | | | | | | | | |

**TEST PIT 2**

| Project Title: | NW Grind, Inc. | | | | | | | | | | | | Sheet 2 of 3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Number: | AAG21-140 | | | | | | | | | | | | Date: October 1, 2021 | |
| Prepared By: | Blaise | | | Checked By: | Curtis | | | | | | | | **Test Pit 2** | |
| 1. Type of Tests Conducted: | Massmann, CEC | | | 2. NCSC Soil Series | 112-Spanaway | | | | | | | | 3. Landform: | Terraces |
| 4. Deposition History: | Volcanic Ash over Gravelly Outwash | | | 5. Hydrologic Soil Group: | A | | | | | | | | 6. Depth to Seasonal High Water: | unknown |
| 7. Current Water Depth: | > 86" | | | 8. Depth to Impervious Layer: | > 86" | | | | | | | | 9. Miscellaneous : | Cation Exchange Capacity 10.1 meq/100 grams |
| 10: Potential For: | Erosion | Flooding | Ponding | | | | | | | | | | | |
| | | None | None | | | | | | | | | | | |
| 11. Soil Strata Description: | | | | | | | | | | | | | | |

| Elevation | Depth | Color | Texture | Percent Clay | Percent Organic | Percent Coarse Fragments | Structure | Mottling | Induration | Cementation | Roots | Soil Survey Infiltration Range | Massmann Calculated Rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **340'** | Surface | | | | | | | | | | | Somewhat excessively drained | 11.2 in/hr |
| **339'** | **0-14"** | **black** | **loamy sandy** | | **40%** | **60%** | | **np** | **np** | **np** | **abundant** | | |
| **333'** | **14-72"** | **gray** | **gravelly sand** | | **15%** | **85%** | | **np** | **np** | **np** | **few** | | |
| **332'** | **72-86"** | **dark brown** | **cobbly sand** | | **11%** | **89%** | | **np** | **np** | **np** | **none** | | |

12. Site Percolation Rate — **Material sampled in the 4-6 foot interal has a flow rate of 11.2 inches per hour based upon Sieve Analysis and the application of the Massmann Equation.**

13. Findings & Recommendations: **The sands receiving the collected stormwater were found to be somewhat excessively drained as was reported in the NCSC. The soil is appropriate for the desired usage. We recommend the project proceed.**

**TEST PIT 3**

| Project Title: | NW Grind, Inc. | | | | | | | | | | | | Sheet 3 of 3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Number: | AAG21-140 | | | | | | | | | | | | Date: October 1, 2021 | |
| Prepared By: | Blaise | | | Checked By: | Curtis | | | | | | | | Test Pit 3 | |
| 1. Type of Tests Conducted: | | Massmann, CEC | | 2. NCSC Soil Series | | 110-Spanaway | | | | | | | 3. Landform: | Terraces |
| 4. Deposition History: | Volcanic Ash over Gravelly Outwash | | | 5. Hydrologic Soil Group: | | A | | | | | | | 6. Depth to Seasonal High Water: | unknown |
| 7. Current Water Depth: | >120" | | | 8. Depth to Impervious Layer: | | > 120" | | | | | | | 9. Miscellaneous : | Cation Exchange Capacity 7.3 meq/100 grams |
| 10: Potential For: | | Erosion | Flooding | Ponding | | | | | | | | | | |
| | | | None | None | | | | | | | | | | |
| 11. Soil Strata Description: | | | | | | | | | | | | | | |

| Elevation | Depth | | Color | Texture | Percent Clay | Percent Organic | Percent Coarse Fragments | Structure | Mottling | Induration | Cementation | Roots | Soil Survey Infiltration Range | Massmann Calculated Rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 332' | Surface | | | | | | | | | | | | Somewhat excessively drained | 22.5 in/hr |
| | 0-6" | black | | loamy sandy | | 40% | 60% | | np | np | np | abundant | | |
| 329' | 6-36" | gray | | gravelly sand | | 20% | 80% | | np | np | np | few | | |
| 326' | 36-72" | brown | | sand with gravel | | 15% | 85% | | np | np | np | none | | |
| 324' | 72-96" | | | sand | | 7% | 93% | | np | np | np | buried clumps of grass | | |
| | 96-120" | | | | | | | Trash and garbage | | | | | | |
| 322' | 120' | | | Native Sand??? | | | | | | | | | | |

| | |
|---|---|
| 12. Site Percolation Rate | Material sampled in the 6-8 foot interal has a flow rate of 22.5 inches per hour based upon Sieve Analysis and the application of the Massmann Equation. |
| 13. Findings & Recommendations: | The sands receiving the collected stormwater were found to be somewhat excessively drained as was reported in the NCSC. The soil is appropriate for the desired usage. We recommend the project proceed. |

## CATION EXCHANGE CAPACITY TEST PIT 1

PAP-Accredited NAPT 2021

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
Office: (509)765-1622 - Fax:(509)765-0314 - (800)764-1622

Soil & Plant Program 2021 NAPT Participating Laboratory

**SOILTEST FARM CONSULTANTS - 11**
2925 DRIGGS DR

Moses Lake , WA 98837
Laboratory #: S21-22592

Date Received: 10/4/2021
Grower: ALL AMERICAN GEOTECHNIC
Field: BUNDY TP-1
Sampled By:
Customer Account #:
Customer Sample ID:

**Soil Test Results**

| | | | |
|---|---|---|---|
| Cation Exchange | CEC | meq/100g | 13.2 |

pH 1:1
E.C. 1:1 m.mhos/cm
Est Sat Paste E.C. m.mhos/cm
Effervescence

Lbs/Acre

Ammonium - N mg/kg
Organic Matter W.B. % ENR:

## CATION EXCHANGE CAPACITY TEST PIT 2

PAP-Accredited NAPT 2021

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
Office: (509)765-1622 - Fax:(509)765-0314 - (800)764-1622

Soil & Plant Program 2021 NAPT Participating Laboratory

**SOILTEST FARM CONSULTANTS - 11**
2925 DRIGGS DR

Moses Lake , WA 98837
Laboratory #: S21-22593

Date Received: 10/4/2021
Grower: ALL AMERICAN GEOTECHNIC
Field: BUNDY TP-2
Sampled By:
Customer Account #:
Customer Sample ID:

**Soil Test Results**

| | | | |
|---|---|---|---|
| Cation Exchange | CEC | meq/100g | 10.1 |

pH 1:1
E.C. 1:1 m.mhos/cm
Est Sat Paste E.C. m.mhos/cm
Effervescence

Lbs/Acre

Ammonium - N mg/kg
Organic Matter W.B. % ENR:

## CATION EXCHANGE CAPACITY TEST PIT 3

PAP-Accredited NAPT 2021

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 • www.soiltestlab.com
Office: (509)765-1622 • Fax:(509)765-0314 • (800)764-1622

Soil & Plant Program 2021 NAPT Participating Laboratory

**SOILTEST FARM CONSULTANTS - 11**
2925 DRIGGS DR

Moses Lake , WA 98837
Laboratory #: S21-22594

Date Received: 10/4/2021
Grower: ALL AMERICAN GEOTECHNIC
Field: BUNDY TP-3
Sampled By:
Customer Account #:
Customer Sample ID:

**Soil Test Results**

| | | | |
|---|---|---|---|
| Cation Exchange | CEC | meq/100g | 7.3 |

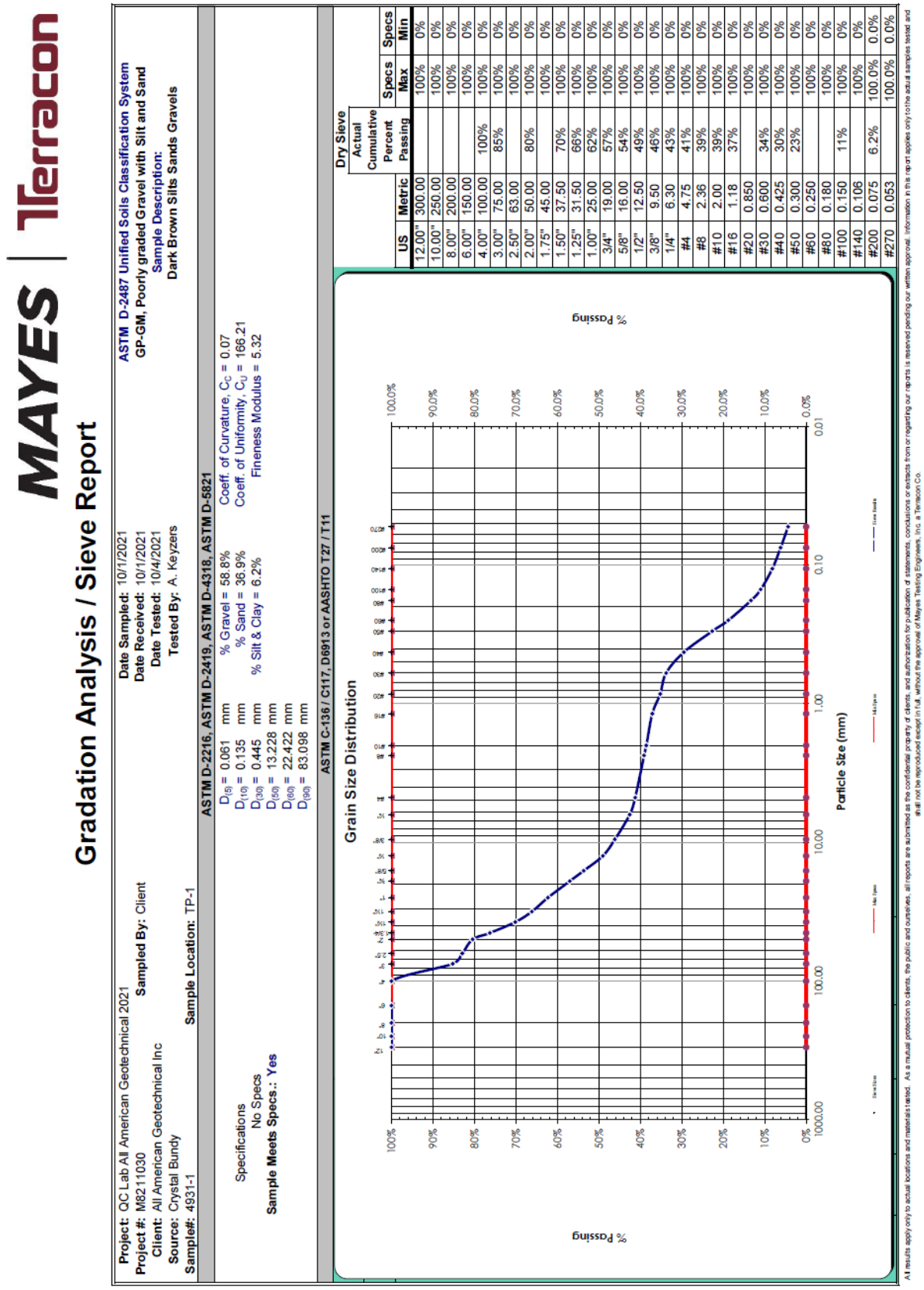
pH 1:1
E.C. 1:1 m.mhos/cm
Est Sat Paste E.C. m.mhos/cm
Effervescence

Lbs/Acre

Ammonium - N mg/kg
Organic Matter W.B. %

ENR:

## LABORATORY SIEVE ANALYSIS TEST PIT 1



MAYES | Terracon

Gradation Analysis / Sieve Report

Project: QC Lab All American Geotechnical 2021
Project #: M8211030
Client: All American Geotechnical Inc
Source: Crystal Bundy
Sample#: 4931-1

Sampled By: Client
Sample Location: TP-1

Date Sampled: 10/1/2021
Date Received: 10/1/2021
Date Tested: 10/4/2021
Tested By: A. Keyzers

ASTM D-2487 Unified Soils Classification System
GP-GM, Poorly graded Gravel with Silt and Sand
Sample Description:
Dark Brown Silts Sands Gravels

ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

$D_{(5)}$ = 0.061 mm
$D_{(10)}$ = 0.135 mm
$D_{(30)}$ = 0.445 mm
$D_{(50)}$ = 13.228 mm
$D_{(60)}$ = 22.422 mm
$D_{(90)}$ = 83.098 mm

% Gravel = 58.8%
% Sand = 36.9%
% Silt & Clay = 6.2%

Coeff. of Curvature, $C_C$ = 0.07
Coeff. of Uniformity, $C_U$ = 166.21
Fineness Modulus = 5.32

Specifications
No Specs
Sample Meets Specs.: Yes

ASTM C-136 / C117, D6913 or AASHTO T27 / T11

Grain Size Distribution

% Passing

Particle Size (mm)

| US | Metric | Dry Sieve Actual Cumulative Percent Passing | Specs Max | Specs Min |
|---|---|---|---|---|
| 12.00" | 300.00 | | 100% | 0% |
| 10.00" | 250.00 | | 100% | 0% |
| 8.00" | 200.00 | | 100% | 0% |
| 6.00" | 150.00 | | 100% | 0% |
| 4.00" | 100.00 | 100% | 100% | 0% |
| 3.00" | 75.00 | 85% | 100% | 0% |
| 2.50" | 63.00 | | 100% | 0% |
| 2.00" | 50.00 | 80% | 100% | 0% |
| 1.75" | 45.00 | | 100% | 0% |
| 1.50" | 37.50 | 70% | 100% | 0% |
| 1.25" | 31.50 | 66% | 100% | 0% |
| 1.00" | 25.00 | 62% | 100% | 0% |
| 3/4" | 19.00 | 57% | 100% | 0% |
| 5/8" | 16.00 | 54% | 100% | 0% |
| 1/2" | 12.50 | 49% | 100% | 0% |
| 3/8" | 9.50 | 46% | 100% | 0% |
| 1/4" | 6.30 | 43% | 100% | 0% |
| #4 | 4.75 | 41% | 100% | 0% |
| #8 | 2.36 | 39% | 100% | 0% |
| #10 | 2.00 | 39% | 100% | 0% |
| #16 | 1.18 | 37% | 100% | 0% |
| #20 | 0.850 | | 100% | 0% |
| #30 | 0.600 | 34% | 100% | 0% |
| #40 | 0.425 | 30% | 100% | 0% |
| #50 | 0.300 | 23% | 100% | 0% |
| #60 | 0.250 | | 100% | 0% |
| #80 | 0.180 | | 100% | 0% |
| #100 | 0.150 | 11% | 100% | 0% |
| #140 | 0.106 | | 100% | 0% |
| #200 | 0.075 | 6.2% | 100.0% | 0.0% |
| #270 | 0.053 | | 100.0% | 0.0% |

## LABORATORY SIEVE ANALYSIS TEST PIT 2

MAYES | Terracon

Gradation Analysis / Sieve Report

**Project:** QC Lab All American Geotechnical 2021
**Project #:** M8211030
**Client:** All American Geotechnical Inc
**Source:** Crystal Bundy
**Sample#:** 4931-2

**Sampled By:** Client
**Sample Location:** TP-2

**Date Sampled:** 10/1/2021
**Date Received:** 10/1/2021
**Date Tested:** 10/4/2021
**Tested By:** A. Keyzers

**ASTM D-2487 Unified Soils Classification System**
**GP-GM, Poorly graded Gravel with Silt and Sand**
**Sample Description:**
**Light Brown Silt Sand Gravel**

**ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821**

$D_{(5)}$ = 0.034 mm
$D_{(10)}$ = 0.069 mm
$D_{(30)}$ = 1.048 mm
$D_{(50)}$ = 13.669 mm
$D_{(60)}$ = 50.430 mm
$D_{(90)}$ = 92.120 mm

% Gravel = 60.1%
% Sand = 32.2%
% Silt & Clay = 10.9%

Coeff. of Curvature, $C_C$ = 0.32
Coeff. of Uniformity, $C_U$ = 730.96
Fineness Modulus = 5.73

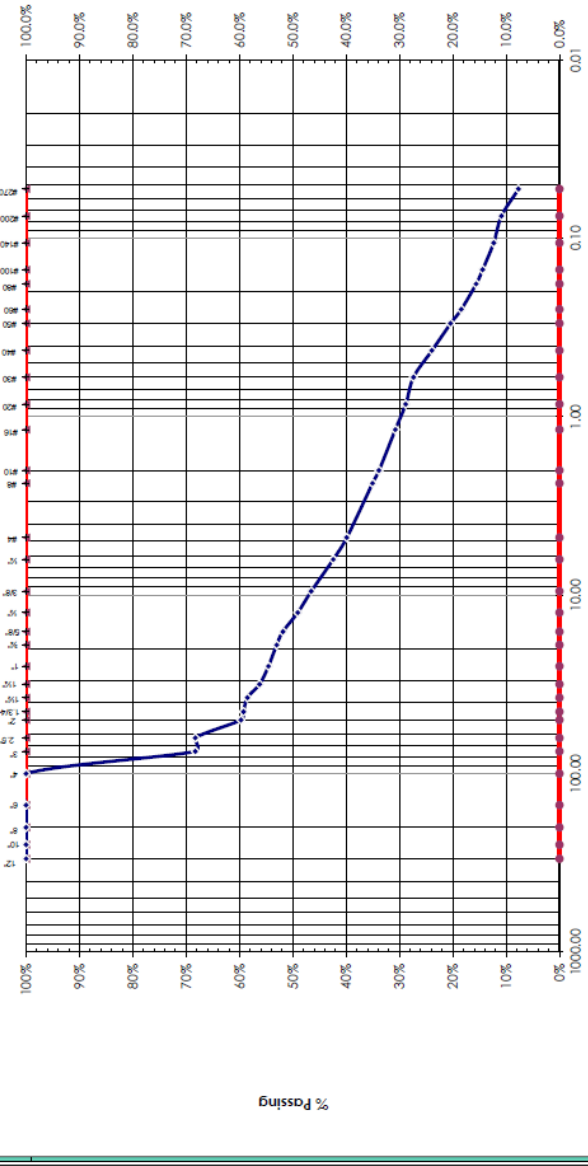
Specifications
No Specs
**Sample Meets Specs.: Yes**

**ASTM C-136 / C117, D6913 or AASHTO T27 / T11**

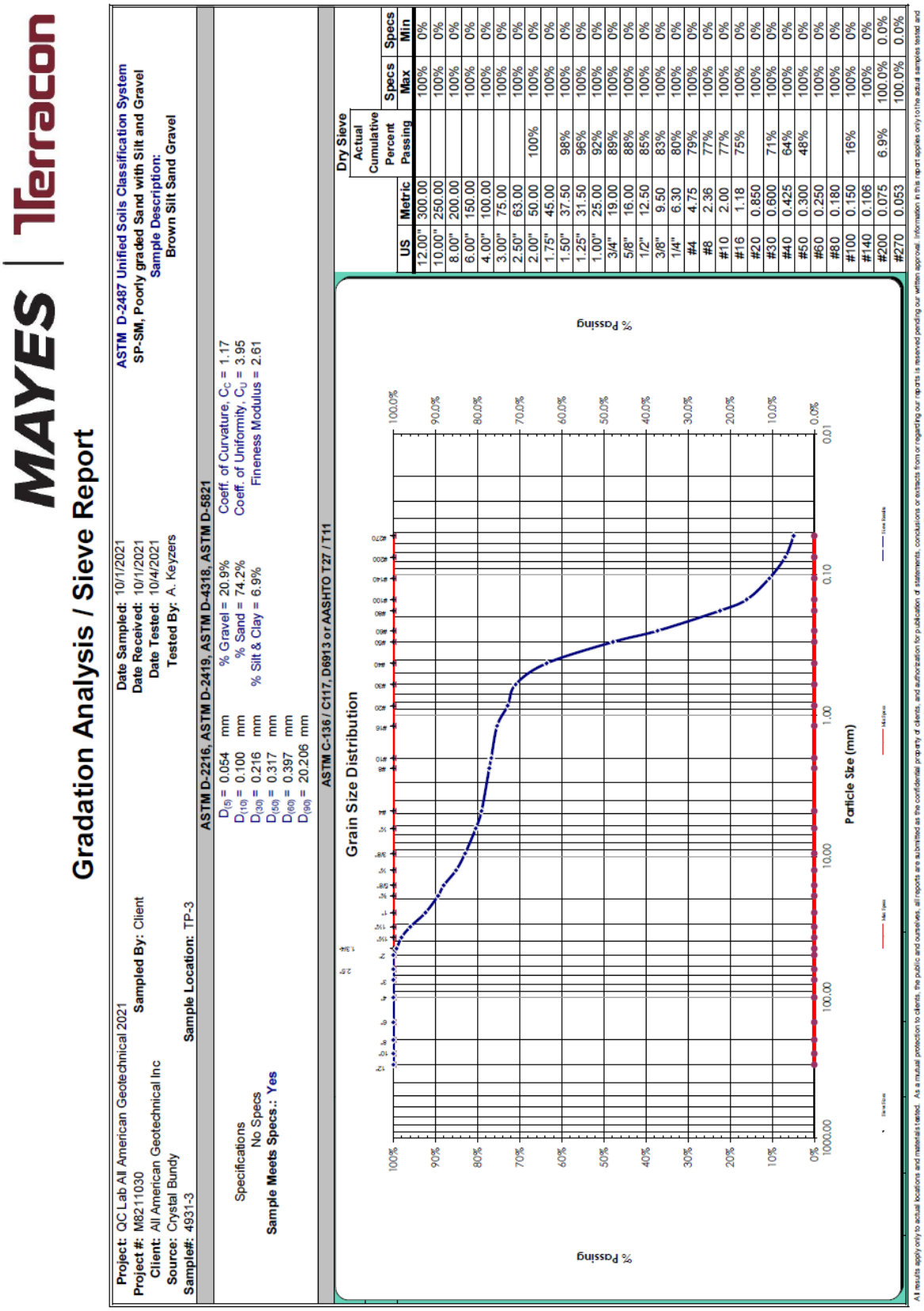
Dry Sieve

| US | Metric | Actual Cumulative Percent Passing | Specs Max | Specs Min |
|---|---|---|---|---|
| 12.00" | 300.00 | | 100% | 0% |
| 10.00" | 250.00 | | 100% | 0% |
| 8.00" | 200.00 | | 100% | 0% |
| 6.00" | 150.00 | | 100% | 0% |
| 4.00" | 100.00 | 100% | 100% | 0% |
| 3.00" | 75.00 | 68% | 100% | 0% |
| 2.50" | 63.00 | 68% | 100% | 0% |
| 2.00" | 50.00 | 60% | 100% | 0% |
| 1.75" | 45.00 | | 100% | 0% |
| 1.50" | 37.50 | 59% | 100% | 0% |
| 1.25" | 31.50 | 56% | 100% | 0% |
| 1.00" | 25.00 | 55% | 100% | 0% |
| 3/4" | 19.00 | 53% | 100% | 0% |
| 5/8" | 16.00 | 52% | 100% | 0% |
| 1/2" | 12.50 | 49% | 100% | 0% |
| 3/8" | 9.50 | 47% | 100% | 0% |
| 1/4" | 6.30 | 42% | 100% | 0% |
| #4 | 4.75 | 40% | 100% | 0% |
| #8 | 2.36 | 35% | 100% | 0% |
| #10 | 2.00 | 34% | 100% | 0% |
| #16 | 1.18 | 31% | 100% | 0% |
| #20 | 0.850 | | 100% | 0% |
| #30 | 0.600 | 27% | 100% | 0% |
| #40 | 0.425 | 24% | 100% | 0% |
| #50 | 0.300 | 20% | 100% | 0% |
| #60 | 0.250 | | 100% | 0% |
| #80 | 0.180 | | 100% | 0% |
| #100 | 0.150 | 14% | 100% | 0% |
| #140 | 0.106 | | 100% | 0% |
| #200 | 0.075 | 10.9% | 100.0% | 0.0% |
| #270 | 0.053 | | 100.0% | 0.0% |

Grain Size Distribution



## LABORATORY SIEVE ANALYSIS TEST PIT 3



MAYES | Terracon

Gradation Analysis / Sieve Report

Project: QC Lab All American Geotechnical 2021
Project #: M8211030
Client: All American Geotechnical Inc
Source: Crystal Bundy
Sample#: 4931-3
Sampled By: Client
Sample Location: TP-3

Date Sampled: 10/1/2021
Date Received: 10/1/2021
Date Tested: 10/4/2021
Tested By: A. Keyzers

ASTM D-2487 Unified Soils Classification System
SP-SM, Poorly graded Sand with Silt and Gravel
Sample Description:
Brown Silt Sand Gravel

ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

$D_{(5)}$ = 0.054 mm
$D_{(10)}$ = 0.100 mm
$D_{(30)}$ = 0.216 mm
$D_{(50)}$ = 0.317 mm
$D_{(60)}$ = 0.397 mm
$D_{(90)}$ = 20.206 mm

% Gravel = 20.9%
% Sand = 74.2%
% Silt & Clay = 6.9%

Coeff. of Curvature, $C_C$ = 1.17
Coeff. of Uniformity, $C_U$ = 3.95
Fineness Modulus = 2.61

Specifications
No Specs
Sample Meets Specs.: Yes

ASTM C-136 / C117, D6913 or AASHTO T27 / T11

Grain Size Distribution

% Passing

Particle Size (mm)

| US | Metric | Dry Sieve Actual Cumulative Percent Passing | Specs Max | Specs Min |
|---|---|---|---|---|
| 12.00" | 300.00 | | 100% | 0% |
| 10.00" | 250.00 | | 100% | 0% |
| 8.00" | 200.00 | | 100% | 0% |
| 6.00" | 150.00 | | 100% | 0% |
| 4.00" | 100.00 | | 100% | 0% |
| 3.00" | 75.00 | | 100% | 0% |
| 2.50" | 63.00 | | 100% | 0% |
| 2.00" | 50.00 | 100% | 100% | 0% |
| 1.75" | 45.00 | | 100% | 0% |
| 1.50" | 37.50 | 98% | 100% | 0% |
| 1.25" | 31.50 | 96% | 100% | 0% |
| 1.00" | 25.00 | 92% | 100% | 0% |
| 3/4" | 19.00 | 89% | 100% | 0% |
| 5/8" | 16.00 | 88% | 100% | 0% |
| 1/2" | 12.50 | 85% | 100% | 0% |
| 3/8" | 9.50 | 83% | 100% | 0% |
| 1/4" | 6.30 | 80% | 100% | 0% |
| #4 | 4.75 | 79% | 100% | 0% |
| #8 | 2.36 | 77% | 100% | 0% |
| #10 | 2.00 | 77% | 100% | 0% |
| #16 | 1.18 | 75% | 100% | 0% |
| #20 | 0.850 | | 100% | 0% |
| #30 | 0.600 | 71% | 100% | 0% |
| #40 | 0.425 | 64% | 100% | 0% |
| #50 | 0.300 | 48% | 100% | 0% |
| #60 | 0.250 | | 100% | 0% |
| #80 | 0.180 | | 100% | 0% |
| #100 | 0.150 | 16% | 100% | 0% |
| #140 | 0.106 | | 100% | 0% |
| #200 | 0.075 | 6.9% | 100.0% | 0.0% |
| #270 | 0.053 | | 100.0% | 0.0% |

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval. Information in this report applies only to the actual samples tested and shall not be reproduced except in full, without the approval of Mayes Testing Engineers, Inc. a Terracon Co.

## MASSMAN CALCULATIONS

NW Grind, Inc.

**TP-1**

log 10(Ksat) = -1.57 + 1.9 * D10 + 0.015 * D60 + -0.013 * D90 + -2.08 * ffines

-1.57 + 0.2565 + 0.33633 + -1.08027 + -0.12696

log 10(Ksat) = -2.186404

Ksat = 0.006510225 cm/sec
0.002604409 in/sec
0.156245401 in/min
9.374724033 in/hr

**TP-2**

log 10(Ksat) = -1.57 + 1.9 * D10 + 0.015 * D60 + -0.013 * D90 + -2.08 * ffines

-1.57 + 0.1311 + 0.75645 + -1.19756 + -0.22672

log 10(Ksat) = -2.10673

Ksat = 0.007821139 cm/sec
0.003128456 in/sec
0.187707334 in/min
11.26244005 in/hr

**TP-3**

log 10(Ksat) = -1.57 + 1.9 * D10 + 0.015 * D60 + -0.013 * D90 + -2.08 * ffines

-1.57 + 0.19 + 0.005955 + -0.28868 + -0.14352

log 10(Ksat) = -1.806243

Ksat = 0.015622733 cm/sec
0.006249093 in/sec
0.374945583 in/min
22.49673497 in/hr

| DATA | D10 | D60 | D90 | f-fines |
|---|---|---|---|---|
| TP-1 | 0.135 | 22.422 | 83.098 | 0.062 |
| TP-2 | 0.069 | 50.430 | 92.120 | 0.109 |
| TP-3 | 0.100 | 0.397 | 22.206 | 0.069 |

## NEARBY WELL LOG

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 012413
Water Right Permit No.

(1) OWNER: Name MORSLEY NORMA P. Address GENERAL DELIVERY YELM, WA 98597-

(2) LOCATION OF WELL: County THURSTON - SW 1/4 SW 1/4 Sec 13 T 17 N., R 1E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 9141 BURNETTE ST SE

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 111.5 ft. Depth of completed well 111.5 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 111.5 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Dian. slot size from ft. to ft.
Dian. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 43 ft. below top of well Date 05/17/88
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test 20 gal/min. 34 ft. drawdown after 1 hrs.
Air test gal/min. w/ stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

| MATERIAL | FROM | TO |
|---|---|---|
| TOPSOIL | 0 | 01 |
| CLAY COBBLES LARGE GRAVEL | 1 | 19 |
| LOOSE GRAVEL COBBLES SAND | 19 | 44 |
| LOOSE GRAVEL CLAY | 44 | 53 |
| LOOSE SAND GRAVEL AND WATER | 53 | 71 |
| LOOSE GRAVEL CLAY | 71 | 77 |
| COMPACTED GRAVEL CLAY | 77 | 90 |
| GRAVEL WATER | 90 | 91 |
| BOULDERS | 91 | 92 |
| LOOSE SAND GRAVEL WATER | 92 | 111.5 |

'88 SEP -9 P4:14

RECEIVED

Y 14

Work started 05/17/88 Completed 05/17/88

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME RICHARDSON WELL DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS P O BOX 44427

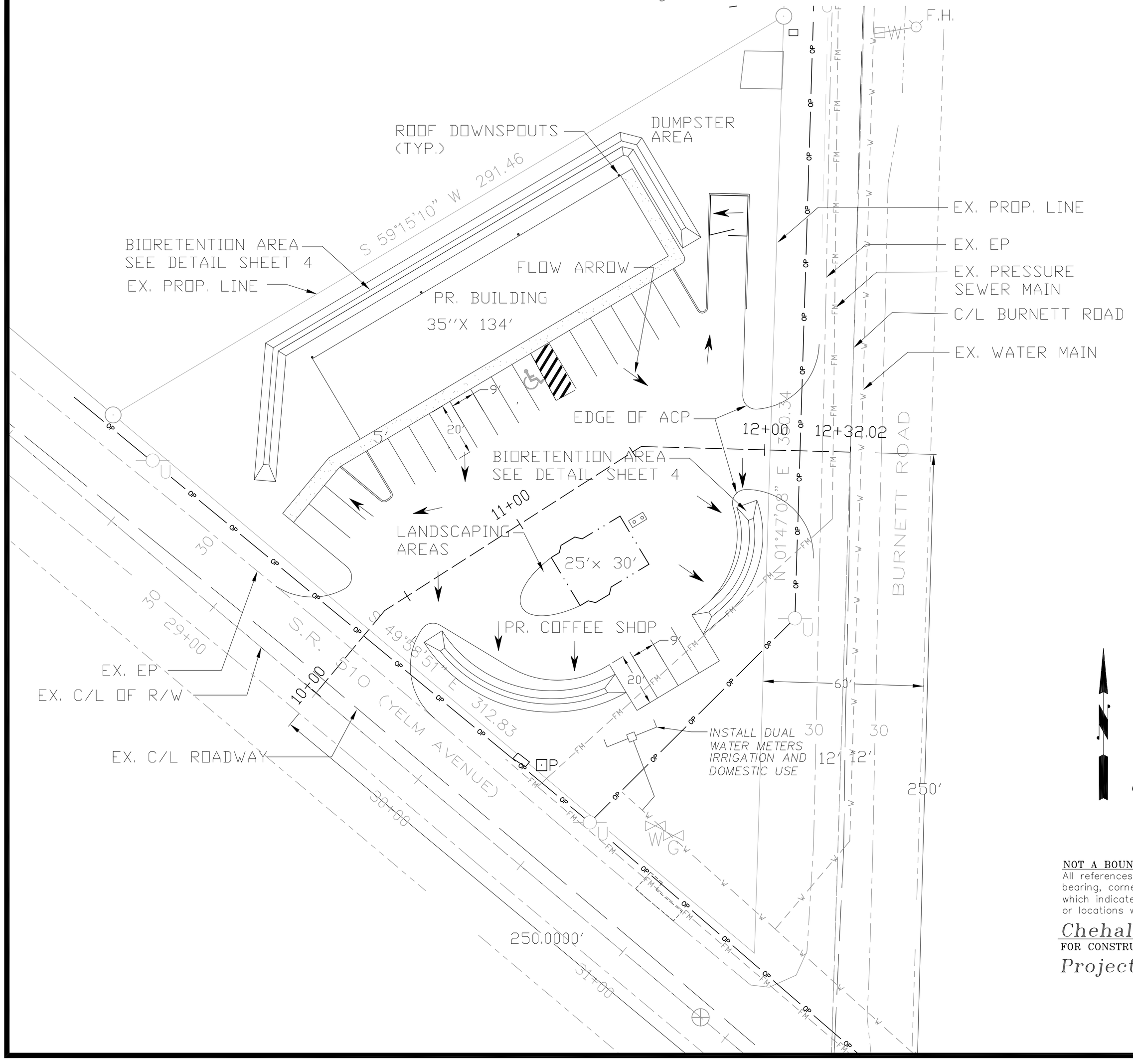
[SIGNED] License No. 1424

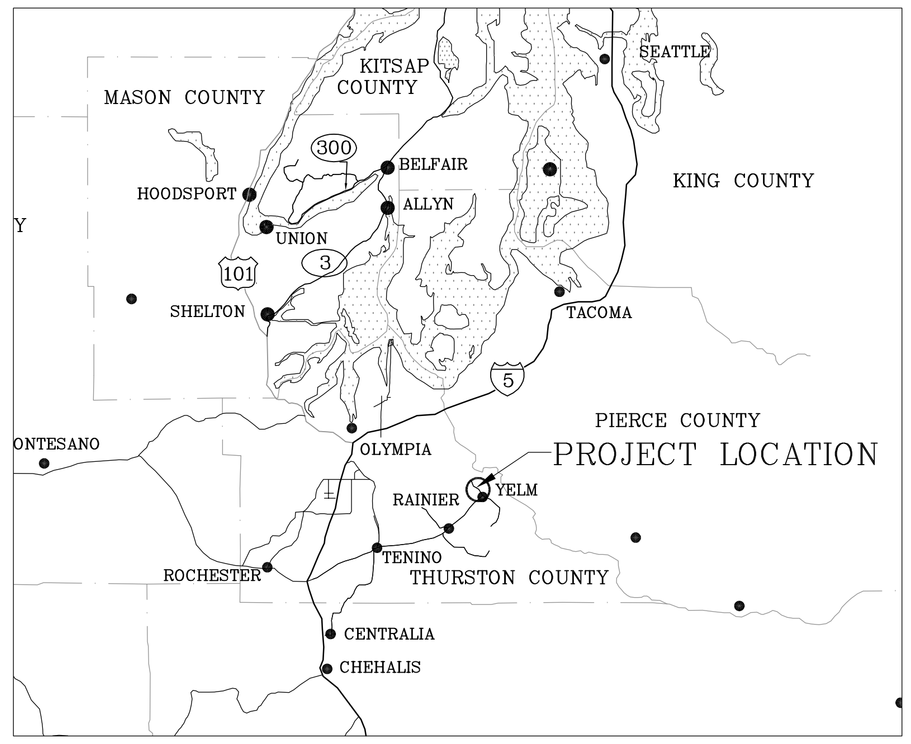
Contractor's
Registration No. RICHAW#32108 Date 09/06/88

*Appendix B*
*Vicinity Maps & Drawings*

*Sec. 3, TW. 17N, Range 1E, W.M.*

# Bundy Commercial Center




*VICINITY MAP*

## *SITE DATA*

| | |
|---|---|
| *APPLICANT/OWNER NAME:* | CRYSTAL BUNDY<br>11349 SUMMIT LAKE RD. NW<br>OLYMPIA, WA 98502 |
| *SITE ADDRESS:* | 9241 Burnett Rd. SE<br>Yelm, WA |
| *REPRESENTATIVE:* | BILL TURNER<br>4405 7TH AVE. SE SUITE 300<br>LACEY, WA 98503<br>PHONE: (360) 239-2847 |
| *ASSESSOR PARCEL NOS.* | 21713330200 |
| *ZONING* | C-1 |
| *SEWER* | CITY OF YELM |
| *WATER* | CITY OF YELM |

N

1"=40'
0 20 40 80

*LEGEND*

- TREES
- EX. FENCE
- EX. PROPERTY LINE
- BUILDING SETBACK LINE
- PROP. PROPERTY LINE
- PR CENTER LINE
- PR EDGE OF GRAVEL
- PR BUILDING
- EX. CONTOURS

NOT A BOUNDARY SURVEY
All references to property lines, bearing, corners, or any references which indicate property alignment or locations were acquired from

*Chehalis Valley Surveying*

FOR CONSTRUCTION USE ONLY

*Project Application #*

DATUM

DESIGN INFORMATION
PROJECT IDENTIFICATION No.
FILE NAME: General Site Plan
C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:


Turner Consulting Engineer
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900


Bundy Commercial Center
Stormwater
Site Plan

WILLIAM E. TURNER
STATE OF WASHINGTON
23824
REGISTERED PROFESSIONAL ENGINEER

12-13-21

SHEET ID CODE

SHEET No.

# *Sec. 3, TW. 17N, Range 1E, W.M.*

Dept. of Ecology Standard Stormwater Notes

1. A preconstruction meeting shall be held prior to the start of land disturbing activity, construction or staking of the site. The preconstruction meeting shall include staff from stormwater, water and sewer utilities if applicable.
2. All workmanship and materials shall be in accordance with the Thurston County Drainage Design and Erosion Control Manual, other County standards and the most current copy of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction (WSDOT/APWA) in that order.
3. Construction SWPPP consistent with the requirements set forth in Vol II in the DDECM and includes all 13 elements or as required in the Construction Stormwater General Permit. BMPs selected for implementation are to be approved by Ecology and are to conform to the current Stormwater Management Manual for Western Washington.
3. A Construction Stormwater Pollution Prevention Plan (SWPPP) and a copy of the approved stormwater plans shall be onsite at all times when construction is in progress. Whenever inspection and/or monitoring reveals that the BMPs are inadequate, due to discharge, track out, or potential to discharge, BMPs or design changes shall be implemented as soon as possible.
If deficiencies are identified the following actions shall be taken by the county. It shall be at the discretion of the inspector which action will be taken based on the severity or history of the site.
A. 1st action taken is a verbal warning to the foreman or person overseeing the site.
B. 2nd action taken is a written inspection with actions to be taken signed by the foreman or person overseeing the site.
C. 3rd action taken if corrective actions are not taken, completed or issues continue to be found will be a written notice and a Stop Work Order shall be posted.
4. Seasonal Work Limitations - From October 1 through April 30, clearing, grading, and other soil disturbing activities will not be permitted unless it is shown to the satisfaction of the County that silt-laden runoff will be prevented from leaving the site through a combination of the following:
Site conditions including existing vegetative coverage, slope, soil type, and proximity to receiving waters; and
Limitations on activities and the extent of disturbed areas; and
Proposed erosion and sediment control measures
The County may expand or restrict the seasonal limitation on site disturbance based on site inspections, local weather conditions, or other information.
If, during the course of any construction activity or soil disturbance during the seasonal limitation period, silt-laden runoff leaving the construction site causes a violation of the surface water quality standard; or
If clearing and grading limits or erosion and sediment control measures shown in the approved plan are not maintained, the County may take enforcement action, including but not limited to a notice of violation, administrative order, fine/penalty, stop-work order, or correction notice.
5. Exposed soils shall not be left exposed and unworked for more than 2 days between (October 1 - April 30) or 7 days between (May1 - Sept. 30).
6. Assure that concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout is performed offsite or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Refer to the Drainage Design and Erosion Control Manual or Stormwater Management Manual for Western Washington for BMP's. Concrete spillage or concrete discharge to stormwater facilities is an illicit discharge.
7. Applicant shall comply with all other permits and other requirements of the governing authority or agency.
8. All storm mains and retention/detention areas shall be staked for grade and alignment by an engineering or survey firm licensed to perform such work.
9. Storm drain pipe materials shall be as specified in the Drainage Design and Erosion Control Manual. Pipe size, slope, cover, etc., shall be as specified in Volume III of the Drainage Design and Erosion Control Manual.
10. The storm drainage system shall be constructed according to approved plans on file with the jurisdiction. Any material deviation from the approved plans will require written approval from the jurisdiction.
11. Special structures, oil/water separators, and outlet controls shall be installed per plans and manufacturer's recommendations.
12. Washington law requires that the rules adopted by Washington Utilities and Transportation Commission be followed. Those rules are set forth in RCW 19.122 and requires anyone performing any type of digging to call at least two business days before digging. Dial 811 or 1-800-424-5555 or visit www.callbeforeyoudig.org .
13. All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington.
14. The minimum staking of storm sewer systems shall be as follows:
A. Stake location of all catch basins/manholes and other fixtures for grade and alignment.
B. Stake location, size, and depth of retention/detention facility.
C. Stake finished grade of all stormwater features, including but not limited to catch basin/manhole rim elevations, overflow structures, weirs, and invert elevations of all pipes in catch basins, manholes, and those pipes that daylight.
15. Final elevations, locations, slopes, grades, roadway alignments, etc. shall be based on a field survey conducted by a licensed professional surveyor and shall be stamped by the surveyor as a record of the final constructed location and elevation of facilities shown.
16. A continuous toning wire shall be buried the entire length of all stormwater pipe and be located and attached to the top of the pipe. The toning wire shall be 12 gauge insulated green toning wire. The toning wire shall end in catchbasins, manholes, other structures, and be placed in a organized manner on a stainless steel concrete wedge anchor and/or hook within six (6) inches of lid or grate or end of pipe if no structures present i.e., cross culvert with a minimum of five (5) foot coil of wire so it will not fall off and can be accessed without entering the structure. The toning wire shall be tested for continuity prior to acceptance. All splices will be made with Copperhead SnakeBite connectors or 3M DBR moisture displacement connectors splice kits designed for in-ground use.
17. Underground warning tape shall be placed approximately twelve (12") above the top of pipe indicating stormwater pipe.
18. All culverts shall be a minimum of twelve (12") diameter and of sufficient length to provide a minimum 3:1 slope from the edge of the driveway or roadway to the bottom of the ditch. The culvert shall extend one foot outside the driveway or roadway radius before the bevel to allow for riprap armoring to prevent sloughing of the base/crushed rock into the ditch. Culverts shall have beveled ends to match the side slope. Ductile iron pipe shall be cut short to allow for transition to PVC or PE beveled pipe ends that are exposed in open conveyance system.
19. The storm drainage system shall be constructed according to accepted plans on file with the County. Any material deviation from the plans will require written acceptance from the Drainage Manual Administrator or designee.
20. Catchbasin grates shall be directional grates where grade or slope is greater than or equal to 1%.
21. A copy of the accepted storm water plans must be on the job site whenever construction is in progress.
22. All building downspouts on commercial sites shall be connected to the storm drainage system, unless otherwise acceptable to the County.
23. The contractor shall be responsible for providing adequate safeguards, safety devices, protective equipment, flaggers, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of work. Any work within the traveled right-of-way that may interrupt normal traffic flow shall require at least one flagger for each lane of traffic affected. All sections of the current WSDOT Standard Specifications for Traffic Control or MUTCD shall apply.
24. It shall be the sole responsibility of the contractor to obtain street use and other related or required permits prior to any construction activity in the County right-of-way. It shall also be the responsibility of the contractor to obtain all required permits prior to any construction.
25. All new storm drain pipelines shall be Closed-circuit television (CCTV) inspected and Air Pressure Tested (APT) by the developer, contractor or applicant after all underground utilities are installed and compaction of the roadway subgrade is complete. Required Pre-Notification: The Contractor shall notify the County Storm and Surface Water Utility at 360-867-2099 at least 3 Working Days in advance of the first television inspection.
26. Thermo-plastic drainage markings are required for all structures in the roadway. Please contact the Storm and Surface Water Utility at 360-867-2099 for marking standards.
27. The Project Engineer shall inspect drainage and erosion control facilities periodically during construction. The Project Engineer shall provide, at a minimum, inspection certification for the drainage and erosion control facilities following any storm event with precipitation equal to or exceeding 2 inches in a 24-hour period. Failure to submit certification to the County within 24 hours following such an event may result in a stop work order being placed on the project.
28. All castings or structures not in pavement areas, and not in the roadway right-of-way of a paved road, shall be set six inches (6") above finished grade. They shall have a cast iron frame and cover grouted to just under the top of the frame and a concrete pad extending out 2 feet in all directions.
29. All disturbed areas shall be seeded and mulched or similarly stabilized to the satisfaction of Thurston County. For sites where grass has been planted through hydroseeding, Final will not occur until the grass has been thoroughly established (90% establishment), unless otherwise approved by the County.
30. No trees or shrubs may be planted within 25 feet of inlet or outlet pipes or manmade drainage structures such as spillways or flow spreaders. Species with roots that seek water, such as willow or poplar, shall be avoided within 50 feet of pipes or manmade structures.
31. TCC 18.16.020 Bonding of drainage improvements shall not be allowed and facilities will be constructed and complete prior to final.

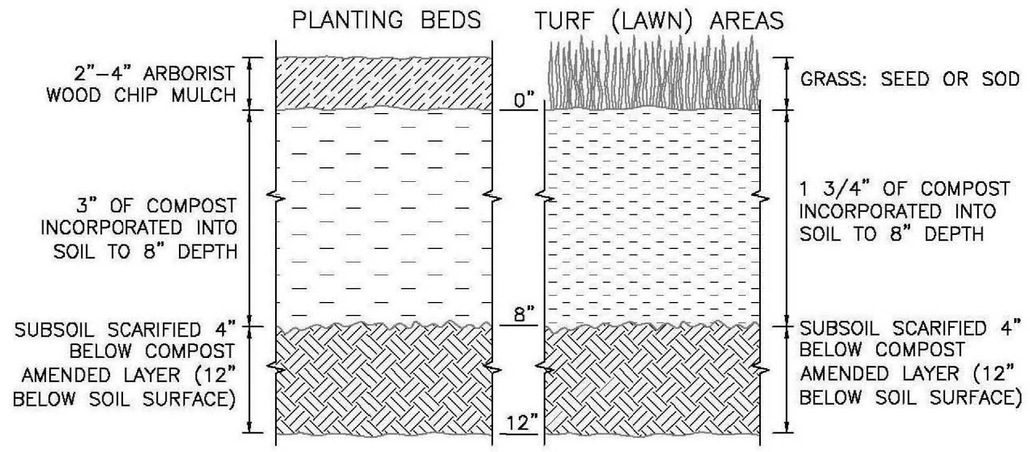



**Figure 2.1. Typical soil amendment sections Source: City of Seattle (reproduced with permission)**

### 2.1.2.6 Construction and Maintenance

See the Soils for Salmon website and the guidance provided in the most current edition of "*Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington*" (available at www.buildingsoil.org) for details on implementing the Post-Construction Soil Quality and Depth BMP.

### 2.1.2.6.1 Maintenance

Soil quality and depth should be established near the end of construction and, once established, protected from compaction (e.g., by large machinery use) and from erosion.

Soil should be planted and mulched after installation.

Plant debris or its equivalent should be left on the soil surface to replenish organic matter.

Reduce irrigation and the application of fertilizers, herbicides and pesticides.

## Figure 3.1 Cross Section of Soil Amendment Detail

NOTE: AMENDED SOILS REQUIRED ON ALL DISTURBED SURFACES AS REQUIRED IN THE DEPARTMENT OF ECOLOGY DRAINAGE MANUAL VOL. 5, CHAPTER 2, BMP T7.30.

DESIGN INFORMATION
PROJECT IDENTIFICATION No.
FILE NAME: General Site Plan
C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:


Turner Engineer Consulting
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900


Bundy Commercial Center

Stormwater Notes & Details

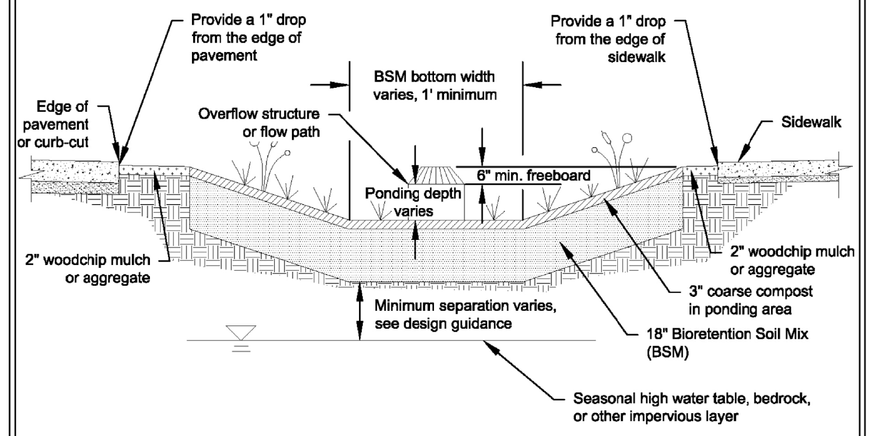
WILLIAM P. TURNER — STATE OF WASHINGTON — 33824 — REGISTERED PROFESSIONAL ENGINEER

12-13-21

SHEET ID CODE

SHEET No.

**Figure V-5.12: Typical Bioretention**




Notes:
1. Scarify subgrade 3" min. before bioretention soil installation
2. Compact BSM to 85% per ASTM 1577

NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Typical Bioretention

Revised January 2019



*2019 Stormwater Management Manual for Western Washington*

*Volume V - Chapter 5 - Page 776*

Cross Section of Bioretention Area

DESIGN INFORMATION
PROJECT IDENTIFICATION No.
FILE NAME: General Site Plan
C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:

Turner Engineer Consulting
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900

Bundy Commercial Center
Stormwater
Notes & Details

WILLIAM P. TURNER
STATE OF WASHINGTON
13824
REGISTERED PROFESSIONAL ENGINEER

12-13-21

SHEET ID CODE

SHEET No.

*Appendix C*
*Hydraulic Calculations*

**WWHM2012**
**PROJECT REPORT**

---

**Project Name:** Bundy Yelm Project 11-29-21
**Site Name:** Bundy Commercial Project
**Site Address:** Unknown
**City :** Yelm
**Report Date:** 11/29/2021
**Gage :** Eaton Creek
**Data Start :** 1955/10/01
**Data End :** 2011/09/30
**Precip Scale:** 0.86
**Version Date:** 2018/10/10
**Version :** 4.2.16

---

**Low Flow Threshold for POC 1 :** 50 Percent of the 2 Year

---

**High Flow Threshold for POC 1:** 50 year

---

**PREDEVELOPED LAND USE**

**Name :** Basin 1
**Bypass:** No

**GroundWater:** No

| **Pervious Land Use** | **acre** |
|---|---|
| **A B, Forest, Flat** | **.99** |

**Pervious Total** **0.99**

| **Impervious Land Use** | **acre** |
|---|---|

**Impervious Total** **0**

**Basin Total** **0.99**

---

**Element Flows To:**

| **Surface** | **Interflow** | **Groundwater** |
|---|---|---|

---

**MITIGATED LAND USE**

**Name :** Basin 1
**Bypass:** No

**GroundWater:** No

| **Pervious Land Use** | **acre** |
|---|---|
| **A B, Lawn, Flat** | **.564** |

**Pervious Total** **0.564**

| **Impervious Land Use** | **acre** |
|---|---|
| **PARKING FLAT** | **0.426** |

**Impervious Total** **0.426**

**Basin Total** **0.99**

---

**Element Flows To:**

| **Surface** | **Interflow** | **Groundwater** |
|---|---|---|
| Gravel Trench Bed 1 | Gravel Trench Bed 1 | |

---

**Name :** Gravel Trench Bed 1
**Bottom Length:** 200.00 ft.
**Bottom Width:** 6.00 ft.
**Trench bottom slope 1:** 0.1 To 1
**Trench Left side slope 0:** 2 To 1
**Trench right side slope 2:** 2 To 1
**Material thickness of first layer:** 1.5
**Pour Space of material for first layer:** 0.5
**Material thickness of second layer:** 0
**Pour Space of material for second layer:** 0
**Material thickness of third layer:** 0
**Pour Space of material for third layer:** 0
**Infiltration On**
**Infiltration rate:** 8
**Infiltration safety factor:** 1
**Wetted surface area On**
**Total Volume Infiltrated (ac-ft.):** 66.743
**Total Volume Through Riser (ac-ft.):** 0
**Total Volume Through Facility (ac-ft.):** 66.743
**Percent Infiltrated:** 100
**Total Precip Applied to Facility:** 0
**Total Evap From Facility:** 0

**Discharge Structure**
**Riser Height:** 5 ft.
**Riser Diameter:** 12 in.

**Element Flows To:**
**Outlet 1** **Outlet 2**

---

**Gravel Trench Bed Hydraulic Table**

| Stage(feet) | Area(ac.) | Volume(ac-ft.) | Discharge(cfs) | Infilt(cfs) |
|---|---|---|---|---|
| 0.0000 | 0.027 | 0.000 | 0.000 | 0.000 |
| 0.0500 | 0.028 | 0.000 | 0.000 | 0.229 |
| 0.1000 | 0.029 | 0.001 | 0.000 | 0.237 |
| 0.1500 | 0.030 | 0.002 | 0.000 | 0.244 |
| 0.2000 | 0.031 | 0.002 | 0.000 | 0.251 |
| 0.2500 | 0.032 | 0.003 | 0.000 | 0.259 |
| 0.3000 | 0.033 | 0.004 | 0.000 | 0.266 |
| 0.3500 | 0.034 | 0.005 | 0.000 | 0.274 |
| 0.4000 | 0.034 | 0.006 | 0.000 | 0.281 |
| 0.4500 | 0.035 | 0.007 | 0.000 | 0.289 |
| 0.5000 | 0.036 | 0.008 | 0.000 | 0.296 |
| 0.5500 | 0.037 | 0.009 | 0.000 | 0.303 |
| 0.6000 | 0.038 | 0.009 | 0.000 | 0.311 |
| 0.6500 | 0.039 | 0.010 | 0.000 | 0.318 |
| 0.7000 | 0.040 | 0.011 | 0.000 | 0.326 |
| 0.7500 | 0.041 | 0.012 | 0.000 | 0.333 |
| 0.8000 | 0.042 | 0.014 | 0.000 | 0.341 |
| 0.8500 | 0.043 | 0.015 | 0.000 | 0.348 |
| 0.9000 | 0.044 | 0.016 | 0.000 | 0.355 |
| 0.9500 | 0.045 | 0.017 | 0.000 | 0.363 |
| 1.0000 | 0.046 | 0.018 | 0.000 | 0.370 |
| 1.0500 | 0.046 | 0.019 | 0.000 | 0.378 |
| 1.1000 | 0.047 | 0.020 | 0.000 | 0.385 |
| 1.1500 | 0.048 | 0.021 | 0.000 | 0.393 |
| 1.2000 | 0.049 | 0.023 | 0.000 | 0.400 |
| 1.2500 | 0.050 | 0.024 | 0.000 | 0.407 |
| 1.3000 | 0.051 | 0.025 | 0.000 | 0.415 |
| 1.3500 | 0.052 | 0.027 | 0.000 | 0.422 |
| 1.4000 | 0.053 | 0.028 | 0.000 | 0.430 |
| 1.4500 | 0.054 | 0.029 | 0.000 | 0.437 |
| 1.5000 | 0.055 | 0.032 | 0.000 | 0.445 |
| 1.5500 | 0.056 | 0.035 | 0.000 | 0.452 |
| 1.6000 | 0.057 | 0.038 | 0.000 | 0.460 |
| 1.6500 | 0.057 | 0.040 | 0.000 | 0.467 |
| 1.7000 | 0.058 | 0.043 | 0.000 | 0.474 |
| 1.7500 | 0.059 | 0.046 | 0.000 | 0.482 |
| 1.8000 | 0.060 | 0.049 | 0.000 | 0.489 |
| 1.8500 | 0.061 | 0.052 | 0.000 | 0.497 |
| 1.9000 | 0.062 | 0.055 | 0.000 | 0.504 |
| 1.9500 | 0.063 | 0.059 | 0.000 | 0.512 |
| 2.0000 | 0.064 | 0.062 | 0.000 | 0.519 |
| 2.0500 | 0.065 | 0.065 | 0.000 | 0.527 |

| | | | | |
|---|---|---|---|---|
| 2.1000 | 0.066 | 0.068 | 0.000 | 0.534 |
| 2.1500 | 0.067 | 0.072 | 0.000 | 0.541 |
| 2.2000 | 0.068 | 0.075 | 0.000 | 0.549 |
| 2.2500 | 0.069 | 0.079 | 0.000 | 0.556 |
| 2.3000 | 0.069 | 0.082 | 0.000 | 0.564 |
| 2.3500 | 0.070 | 0.086 | 0.000 | 0.571 |
| 2.4000 | 0.071 | 0.089 | 0.000 | 0.579 |
| 2.4500 | 0.072 | 0.093 | 0.000 | 0.586 |
| 2.5000 | 0.073 | 0.096 | 0.000 | 0.594 |
| 2.5500 | 0.074 | 0.100 | 0.000 | 0.601 |
| 2.6000 | 0.075 | 0.104 | 0.000 | 0.609 |
| 2.6500 | 0.076 | 0.108 | 0.000 | 0.616 |
| 2.7000 | 0.077 | 0.111 | 0.000 | 0.623 |
| 2.7500 | 0.078 | 0.115 | 0.000 | 0.631 |
| 2.8000 | 0.079 | 0.119 | 0.000 | 0.638 |
| 2.8500 | 0.080 | 0.123 | 0.000 | 0.646 |
| 2.9000 | 0.081 | 0.127 | 0.000 | 0.653 |
| 2.9500 | 0.082 | 0.131 | 0.000 | 0.661 |
| 3.0000 | 0.082 | 0.135 | 0.000 | 0.668 |
| 3.0500 | 0.083 | 0.140 | 0.000 | 0.676 |
| 3.1000 | 0.084 | 0.144 | 0.000 | 0.683 |
| 3.1500 | 0.085 | 0.148 | 0.000 | 0.691 |
| 3.2000 | 0.086 | 0.152 | 0.000 | 0.698 |
| 3.2500 | 0.087 | 0.157 | 0.000 | 0.706 |
| 3.3000 | 0.088 | 0.161 | 0.000 | 0.713 |
| 3.3500 | 0.089 | 0.166 | 0.000 | 0.720 |
| 3.4000 | 0.090 | 0.170 | 0.000 | 0.728 |
| 3.4500 | 0.091 | 0.175 | 0.000 | 0.735 |
| 3.5000 | 0.092 | 0.179 | 0.000 | 0.743 |
| 3.5500 | 0.093 | 0.184 | 0.000 | 0.750 |
| 3.6000 | 0.094 | 0.189 | 0.000 | 0.758 |
| 3.6500 | 0.094 | 0.193 | 0.000 | 0.765 |
| 3.7000 | 0.095 | 0.198 | 0.000 | 0.773 |
| 3.7500 | 0.096 | 0.203 | 0.000 | 0.780 |
| 3.8000 | 0.097 | 0.208 | 0.000 | 0.788 |
| 3.8500 | 0.098 | 0.213 | 0.000 | 0.795 |
| 3.9000 | 0.099 | 0.218 | 0.000 | 0.803 |
| 3.9500 | 0.100 | 0.223 | 0.000 | 0.810 |
| 4.0000 | 0.101 | 0.228 | 0.000 | 0.818 |
| 4.0500 | 0.102 | 0.233 | 0.000 | 0.825 |
| 4.1000 | 0.103 | 0.238 | 0.000 | 0.833 |
| 4.1500 | 0.104 | 0.243 | 0.000 | 0.840 |
| 4.2000 | 0.105 | 0.248 | 0.000 | 0.848 |
| 4.2500 | 0.106 | 0.254 | 0.000 | 0.855 |
| 4.3000 | 0.107 | 0.259 | 0.000 | 0.863 |
| 4.3500 | 0.107 | 0.264 | 0.000 | 0.870 |
| 4.4000 | 0.108 | 0.270 | 0.000 | 0.877 |
| 4.4500 | 0.109 | 0.275 | 0.000 | 0.885 |
| 4.5000 | 0.110 | 0.281 | 0.000 | 0.892 |

---

---

**ANALYSIS RESULTS**

**Stream Protection Duration**

---

**Predeveloped Landuse Totals for POC #1**
**Total Pervious Area:0.99**
**Total Impervious Area:0**

---

**Mitigated Landuse Totals for POC #1**
**Total Pervious Area:0.564**
**Total Impervious Area:0.426**

---

**Flow Frequency Return Periods for Predeveloped. POC #1**

| Return Period | Flow(cfs) |
|---|---|
| **2 year** | 0.000767 |
| **5 year** | 0.001313 |
| **10 year** | 0.001812 |
| **25 year** | 0.00264 |
| **50 year** | 0.003429 |
| **100 year** | 0.004392 |

**Flow Frequency Return Periods for Mitigated. POC #1**

| Return Period | Flow(cfs) |
|---|---|
| **2 year** | 0 |
| **5 year** | 0 |
| **10 year** | 0 |
| **25 year** | 0 |
| **50 year** | 0 |
| **100 year** | 0 |

---

**Stream Protection Duration**
**Annual Peaks for Predeveloped and Mitigated. POC #1**

| Year | Predeveloped | Mitigated |
|---|---|---|
| 1956 | 0.006 | 0.000 |
| 1957 | 0.001 | 0.000 |
| 1958 | 0.001 | 0.000 |
| 1959 | 0.001 | 0.000 |
| 1960 | 0.001 | 0.000 |
| 1961 | 0.001 | 0.000 |
| 1962 | 0.001 | 0.000 |
| 1963 | 0.001 | 0.000 |
| 1964 | 0.001 | 0.000 |
| 1965 | 0.001 | 0.000 |
| 1966 | 0.001 | 0.000 |
| 1967 | 0.001 | 0.000 |
| 1968 | 0.001 | 0.000 |
| 1969 | 0.001 | 0.000 |
| 1970 | 0.001 | 0.000 |
| 1971 | 0.002 | 0.000 |
| 1972 | 0.017 | 0.000 |
| 1973 | 0.001 | 0.000 |
| 1974 | 0.001 | 0.000 |

| | | |
|---|---|---|
| 1975 | 0.001 | 0.000 |
| 1976 | 0.001 | 0.000 |
| 1977 | 0.001 | 0.000 |
| 1978 | 0.001 | 0.000 |
| 1979 | 0.001 | 0.000 |
| 1980 | 0.001 | 0.000 |
| 1981 | 0.001 | 0.000 |
| 1982 | 0.001 | 0.000 |
| 1983 | 0.001 | 0.000 |
| 1984 | 0.001 | 0.000 |
| 1985 | 0.001 | 0.000 |
| 1986 | 0.001 | 0.000 |
| 1987 | 0.001 | 0.000 |
| 1988 | 0.001 | 0.000 |
| 1989 | 0.001 | 0.000 |
| 1990 | 0.001 | 0.000 |
| 1991 | 0.003 | 0.000 |
| 1992 | 0.001 | 0.000 |
| 1993 | 0.001 | 0.000 |
| 1994 | 0.000 | 0.000 |
| 1995 | 0.001 | 0.000 |
| 1996 | 0.001 | 0.000 |
| 1997 | 0.001 | 0.000 |
| 1998 | 0.001 | 0.000 |
| 1999 | 0.001 | 0.000 |
| 2000 | 0.001 | 0.000 |
| 2001 | 0.001 | 0.000 |
| 2002 | 0.000 | 0.000 |
| 2003 | 0.001 | 0.000 |
| 2004 | 0.001 | 0.000 |
| 2005 | 0.000 | 0.000 |
| 2006 | 0.001 | 0.000 |
| 2007 | 0.001 | 0.000 |
| 2008 | 0.000 | 0.000 |
| 2009 | 0.001 | 0.000 |
| 2010 | 0.001 | 0.000 |
| 2011 | 0.001 | 0.000 |

---

**Stream Protection Duration**
**Ranked Annual Peaks for Predeveloped and Mitigated. POC #1**

| Rank | Predeveloped | Mitigated |
|---|---|---|
| 1 | 0.0165 | 0.0000 |
| 2 | 0.0055 | 0.0000 |
| 3 | 0.0028 | 0.0000 |
| 4 | 0.0022 | 0.0000 |
| 5 | 0.0008 | 0.0000 |
| 6 | 0.0008 | 0.0000 |
| 7 | 0.0008 | 0.0000 |
| 8 | 0.0008 | 0.0000 |
| 9 | 0.0008 | 0.0000 |
| 10 | 0.0008 | 0.0000 |
| 11 | 0.0008 | 0.0000 |
| 12 | 0.0008 | 0.0000 |
| 13 | 0.0008 | 0.0000 |
| 14 | 0.0008 | 0.0000 |

| | | |
|---|---|---|
| 15 | 0.0008 | 0.0000 |
| 16 | 0.0008 | 0.0000 |
| 17 | 0.0008 | 0.0000 |
| 18 | 0.0008 | 0.0000 |
| 19 | 0.0008 | 0.0000 |
| 20 | 0.0008 | 0.0000 |
| 21 | 0.0008 | 0.0000 |
| 22 | 0.0008 | 0.0000 |
| 23 | 0.0008 | 0.0000 |
| 24 | 0.0008 | 0.0000 |
| 25 | 0.0008 | 0.0000 |
| 26 | 0.0008 | 0.0000 |
| 27 | 0.0008 | 0.0000 |
| 28 | 0.0008 | 0.0000 |
| 29 | 0.0008 | 0.0000 |
| 30 | 0.0008 | 0.0000 |
| 31 | 0.0008 | 0.0000 |
| 32 | 0.0008 | 0.0000 |
| 33 | 0.0008 | 0.0000 |
| 34 | 0.0008 | 0.0000 |
| 35 | 0.0008 | 0.0000 |
| 36 | 0.0008 | 0.0000 |
| 37 | 0.0008 | 0.0000 |
| 38 | 0.0008 | 0.0000 |
| 39 | 0.0008 | 0.0000 |
| 40 | 0.0008 | 0.0000 |
| 41 | 0.0008 | 0.0000 |
| 42 | 0.0008 | 0.0000 |
| 43 | 0.0008 | 0.0000 |
| 44 | 0.0007 | 0.0000 |
| 45 | 0.0007 | 0.0000 |
| 46 | 0.0007 | 0.0000 |
| 47 | 0.0007 | 0.0000 |
| 48 | 0.0007 | 0.0000 |
| 49 | 0.0006 | 0.0000 |
| 50 | 0.0006 | 0.0000 |
| 51 | 0.0006 | 0.0000 |
| 52 | 0.0006 | 0.0000 |
| 53 | 0.0005 | 0.0000 |
| 54 | 0.0004 | 0.0000 |
| 55 | 0.0003 | 0.0000 |
| 56 | 0.0002 | 0.0000 |

---

**Stream Protection Duration**
**POC #1**
**The Facility PASSED**

**The Facility PASSED.**

| Flow(cfs) | Predev | Mit | Percentage | Pass/Fail |
|---|---|---|---|---|
| 0.0004 | 4200 | 0 | 0 | Pass |
| 0.0004 | 3613 | 0 | 0 | Pass |
| 0.0004 | 3100 | 0 | 0 | Pass |
| 0.0005 | 2649 | 0 | 0 | Pass |

| | | | | |
|---|---|---|---|---|
| 0.0005 | 2237 | 0 | 0 | Pass |
| 0.0005 | 1879 | 0 | 0 | Pass |
| 0.0006 | 1607 | 0 | 0 | Pass |
| 0.0006 | 1357 | 0 | 0 | Pass |
| 0.0006 | 1163 | 0 | 0 | Pass |
| 0.0007 | 922 | 0 | 0 | Pass |
| 0.0007 | 663 | 0 | 0 | Pass |
| 0.0007 | 467 | 0 | 0 | Pass |
| 0.0008 | 270 | 0 | 0 | Pass |
| 0.0008 | 116 | 0 | 0 | Pass |
| 0.0008 | 22 | 0 | 0 | Pass |
| 0.0008 | 21 | 0 | 0 | Pass |
| 0.0009 | 21 | 0 | 0 | Pass |
| 0.0009 | 20 | 0 | 0 | Pass |
| 0.0009 | 19 | 0 | 0 | Pass |
| 0.0010 | 19 | 0 | 0 | Pass |
| 0.0010 | 18 | 0 | 0 | Pass |
| 0.0010 | 18 | 0 | 0 | Pass |
| 0.0011 | 18 | 0 | 0 | Pass |
| 0.0011 | 17 | 0 | 0 | Pass |
| 0.0011 | 16 | 0 | 0 | Pass |
| 0.0012 | 16 | 0 | 0 | Pass |
| 0.0012 | 16 | 0 | 0 | Pass |
| 0.0012 | 14 | 0 | 0 | Pass |
| 0.0012 | 13 | 0 | 0 | Pass |
| 0.0013 | 12 | 0 | 0 | Pass |
| 0.0013 | 12 | 0 | 0 | Pass |
| 0.0013 | 12 | 0 | 0 | Pass |
| 0.0014 | 12 | 0 | 0 | Pass |
| 0.0014 | 11 | 0 | 0 | Pass |
| 0.0014 | 11 | 0 | 0 | Pass |
| 0.0015 | 11 | 0 | 0 | Pass |
| 0.0015 | 10 | 0 | 0 | Pass |
| 0.0015 | 10 | 0 | 0 | Pass |
| 0.0016 | 10 | 0 | 0 | Pass |
| 0.0016 | 10 | 0 | 0 | Pass |
| 0.0016 | 10 | 0 | 0 | Pass |
| 0.0016 | 10 | 0 | 0 | Pass |
| 0.0017 | 9 | 0 | 0 | Pass |
| 0.0017 | 9 | 0 | 0 | Pass |
| 0.0017 | 9 | 0 | 0 | Pass |
| 0.0018 | 9 | 0 | 0 | Pass |
| 0.0018 | 9 | 0 | 0 | Pass |
| 0.0018 | 9 | 0 | 0 | Pass |
| 0.0019 | 9 | 0 | 0 | Pass |
| 0.0019 | 9 | 0 | 0 | Pass |
| 0.0019 | 9 | 0 | 0 | Pass |
| 0.0020 | 9 | 0 | 0 | Pass |
| 0.0020 | 9 | 0 | 0 | Pass |
| 0.0020 | 8 | 0 | 0 | Pass |
| 0.0020 | 8 | 0 | 0 | Pass |
| 0.0021 | 8 | 0 | 0 | Pass |
| 0.0021 | 8 | 0 | 0 | Pass |
| 0.0021 | 7 | 0 | 0 | Pass |
| 0.0022 | 7 | 0 | 0 | Pass |
| 0.0022 | 7 | 0 | 0 | Pass |

| | | | | |
|---|---|---|---|---|
| 0.0022 | 6 | 0 | 0 | Pass |
| 0.0023 | 6 | 0 | 0 | Pass |
| 0.0023 | 6 | 0 | 0 | Pass |
| 0.0023 | 6 | 0 | 0 | Pass |
| 0.0024 | 6 | 0 | 0 | Pass |
| 0.0024 | 6 | 0 | 0 | Pass |
| 0.0024 | 6 | 0 | 0 | Pass |
| 0.0024 | 6 | 0 | 0 | Pass |
| 0.0025 | 6 | 0 | 0 | Pass |
| 0.0025 | 6 | 0 | 0 | Pass |
| 0.0025 | 6 | 0 | 0 | Pass |
| 0.0026 | 6 | 0 | 0 | Pass |
| 0.0026 | 6 | 0 | 0 | Pass |
| 0.0026 | 6 | 0 | 0 | Pass |
| 0.0027 | 6 | 0 | 0 | Pass |
| 0.0027 | 6 | 0 | 0 | Pass |
| 0.0027 | 6 | 0 | 0 | Pass |
| 0.0028 | 6 | 0 | 0 | Pass |
| 0.0028 | 5 | 0 | 0 | Pass |
| 0.0028 | 5 | 0 | 0 | Pass |
| 0.0028 | 4 | 0 | 0 | Pass |
| 0.0029 | 4 | 0 | 0 | Pass |
| 0.0029 | 4 | 0 | 0 | Pass |
| 0.0029 | 4 | 0 | 0 | Pass |
| 0.0030 | 4 | 0 | 0 | Pass |
| 0.0030 | 4 | 0 | 0 | Pass |
| 0.0030 | 4 | 0 | 0 | Pass |
| 0.0031 | 4 | 0 | 0 | Pass |
| 0.0031 | 4 | 0 | 0 | Pass |
| 0.0031 | 4 | 0 | 0 | Pass |
| 0.0032 | 4 | 0 | 0 | Pass |
| 0.0032 | 4 | 0 | 0 | Pass |
| 0.0032 | 4 | 0 | 0 | Pass |
| 0.0032 | 4 | 0 | 0 | Pass |
| 0.0033 | 4 | 0 | 0 | Pass |
| 0.0033 | 4 | 0 | 0 | Pass |
| 0.0033 | 4 | 0 | 0 | Pass |
| 0.0034 | 4 | 0 | 0 | Pass |
| 0.0034 | 4 | 0 | 0 | Pass |
| 0.0034 | 4 | 0 | 0 | Pass |

---

---

**Water Quality BMP Flow and Volume for POC #1**
**On-line facility volume:** 0 **acre-feet**
**On-line facility target flow:** 0 **cfs.**
**Adjusted for 15 min:** 0 **cfs.**
**Off-line facility target flow:** 0 **cfs.**
**Adjusted for 15 min:** 0 **cfs.**

---

**LID Report**

| LID Technique | Used for | Total Volume | Volume | Infiltration | Cumulative | Percent | Water Quality | Percent | Comment |
|---|---|---|---|---|---|---|---|---|---|

| | Treatment? | Needs Treatment (ac-ft) | Through Facility (ac-ft) | Volume (ac-ft.) | Volume Infiltration | Volume Infiltrated | | Water Quality Treated | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Credit | | | | | |
| Gravel Trench Bed 1 POC | N | 60.74 | | | N | 100.00 | | | |
| Total Volume Infiltrated | | 60.74 | 0.00 | 0.00 | | 100.00 | 0.00 | 0% | No Treat. Credit |
| Compliance with LID Standard 8 | | | | | | | | | Duration Analysis Result = Passed |

---

**Perlnd and Implnd Changes**

No changes have been made.

---

# Yelm Commercial Project

Construction Stormwater Pollution Prevention Plan

**February, 2022**

**Turner Consulting Services, LLC**

**4405 7th Ave. SE, Suite 301**
**Lacey, WA 98503**
**(360) 491-6900**

# Construction Stormwater Pollution Prevention Plan

## Yelm Commercial Project
Yelm, Washington
February

---

## Project Information

| | |
|---|---|
| Project: | Yelm Commercial Project |
| Prepared For: | Crystal Bundy |
| Contact: | Crystal Bundy<br>PO Box 926<br>Rochester, WA 98579<br>360-280-2929 |

---

## Project Engineer

| | |
|---|---|
| Prepared by: | Turner Consulting Engineers, LLC,<br>4405-7th Avenue SE, Suite 301<br>Lacey, WA 98503<br>(360) 491-6900 |
| Contact: | Bill Turner, P.E.<br>(360) 491-6900 |


"I hereby state that this Construction SWPPP for Yelm Commercial Project has been prepared by me or under my supervision which is usual and customary in this community for professional engineers. I understand that Thurston County does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by Turner Consulting Engineers, LLC."

11-19-21

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SITE PLAN
CONSTRUCTION BMPs
ALTERNATIVE BMPs
SITE INSPECTION FORMS

# MINIMUM REQUIREMENT #2 – Construction Stormwater Pollution Prevention Plan(SWPPP)

## 1.0 Introduction

The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and record keeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to :

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

The SWPP was prepared using the *Ecology SWPPP Template* down loaded from the Ecology website on December 5, 2012. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit, *Stormwater management manual for Western Washington (SWMMWW 2019).* The report is divided into thirteen elements with several appendices that include stormwater related references materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODCUTION. This section provides a summary description of the project, and the organization of the SEPPP document.

- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing condition and post-conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMWW 2005).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section proved a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This Section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector.

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for the stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site Plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms

# 2.0 Site Description

## 2.1 Existing Conditions

This 0.99-acre parcel is located in the City Limits of Yelm on the corner of Burnett Street and State Route 510. The project site is flat with a with elevation difference from east to west of about 4-foot. Access into the site will be from both SR 510 and Burnett Street. Vegetation on the site is mostly prairie grass and scotch broom. The City of Yelm has a water main next to the state highway and Burnett Street which will provide fire flow to the project site.

There is no off site flow coming onto the project site. Stormwater that falls onto the site at this time infiltrates into the ground and does not flow off of the parcel. There are no steep slopes, ravens, creeks, or rivers on or adjacent to the site. This project does not have high ground water and it is not in the 100-year flood plain. Thurston County Geodata does have it listed in the aquifer sensitive area.

## 2.2 Proposed Construction Activities

Construction of the project will include private roads, grading of new pads for the mobile home units, parking areas, paving, utility, structures and stormwater improvements.

- Total site area: 0.99 Acres
- Estimated Driveway Surface: 0.425 Acres
- Estimated Roof Area: 0.125 Acres
- Percent impervious area before construction: 0.00 %
- Percent impervious area after construction: 55.65 %
- Disturbed area after construction: 0.99 Acres

# 3.0 Construction Stormwater BMPs

## 3.1 The 12 BMP Elements

***Element 1:Preserve Vegetation/Mark Clearing Limits***

- ***Prior to beginning land disturbing activities, including clearing and grading, all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area should be clearly marked, both in the field and on the plans, to prevent damage and offsite impacts.***

- ***Plastic, metal, or stake wire fence may be used to mark the clearing limits.***

***• The duff layer, native topsoil, and natural vegetation shall be retained in an undisturbed state to the maximum extent practicable. If it is not practicable to retain the duff layer in place, stockpile it onsite cover it to prevent erosion, and replace it immediately upon completion of the ground disturbing activities.***

Because this parcel is within the City Limits of Yelm the clearing limits for this project are marked by the existing property lines, neighbors fences and survey markers.

- The Contractor shall clearly identify all clearing and grubbing limits with plastic flagging or metal fence posts.
- The Contractor shall clearly fence all tree protection areas as identified by the construction drawing, certified by Thurston County.
    - Suggested BMPs
      BMP C101: Preserving Natural Vegetation
      BMP C102: Buffer Zones.
      BMP C103: High Visibility Plastic or Metal Fence
      BMP C104: Stake and Wire Fence

***Element 2: Establish Construction Access***

***• Construction vehicle access and exit shall be limited to one route if possible, or two for linear projects such as roadways where more than one access is necessary for large equipment maneuvering.***

***• Access points shall be stabilized with a pad of quarry spall or crushed rock, or equivalent BMP prior to traffic leaving the construction site to minimize the tracking of sediment onto public roads.***

***• Wheel wash or tire baths should be located onsite, if the stabilized construction entrance is not effective in preventing sediment from being tracked on public roads.***

***• If sediment is tracked off site, public roads shall be cleaned thoroughly at the end of each day, or more frequently during wet weather, if necessary to prevent sediment from entering waters of the state. Sediment shall be removed from roads by shoveling or pickup sweeping and shall be transported to a controlled sediment disposal area. Street washing will be allowed only after sediment is removed in this manner.***

***• Street wash wastewater shall be controlled by pumping back on site to an approved infiltration facility, or otherwise must be prevented from discharging into systems tributary to state surface waters. Other options include discharge to the sanitary sewer, or discharge to an approved offsite treatment system. For discharges to the sanitary sewer, permits must be obtained from the local jurisdiction providing the sewer.***

Construction of the storage unit structures take place in different phases beginning with the infrastructure, and stormwater facilities. The construction entrance onto the parcel shall be from Burnett Street which is a City Street and is on the east side of the property.

- The Contractor shall establish the construction entrance as shown on the Erosion Control Site Plan and Detail Sheets before work begins on the project site.

- If sediment is tracked onto SR 12, the Contractor shall take immediate and appropriate steps to remove sediments and keep roadway clean.

    - Suggested BMPs
      BMP C105: Stabilized Construction Entrance
      BMP C106: Wheel Wash
      BMP C107: Construction Road/Parking Area Stabilization

***Element 3: Control Flow Rates***

- ***Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site, as required by local plan approval authority.***

- ***Downstream analysis is necessary if changes in flows could impair or alter conveyance systems, streambanks, bed sediment or aquatic habitat. See Volume 1, Chapter 3 for offsite analysis requirements guidlines.***

- ***Where necessary to comply with Minimum Requirement #7, stormwater retention/detention facilities shall be constructed as one of the first steps in grading. Detention facilities shall be functional prior to construction of site improvements (e.g. impervious surfaces).***

- ***The local permitting agency may require pond designs that provide additional or different stormwater flow control if necessary to address local conditions or to protect properties and waterways downstream from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.***

- ***If permanent infiltration ponds are used for flow control during construction, these facilities shall be protected from siltation during the construction phase and plans made for restoration after construction.***

This project will be over the 5,000 square foot threshold for requiring a downstream analysis. This site will be protected from erosion through standard BMP's such as silt fencing, slope protection, ect.. There will be no increase in the volume, velocity and peak flow rate of stormwater coming from the project site.

This project will require rain gardens and/or bioretention facilities to be constructed during the initial grading phase of construction. It shall be noted on the plans that the excavation for the rain gardens and bioretention basins to final grade will be completed before construction of structures begin. Initial basin excavation should be conducted to within 1-foot of the final elevation of the basin floor. Any accumulation of silt in the infiltration facility must be removed before putting it in service.

- The Contractor shall construct one row of erosion control silt fencing as shown on the plans or as directed by the Engineer to filter sediments from stormwater if runoff should leave construction site.

    - Suggested BMPs
      BMP C233: Silt Fence
      BMP C234: Vegetated Strip
      BMP C240 Sediment Trap

***Element 4: Install Sediment Controls***

***• Prior to leaving a construction site, or prior to discharge to an infiltration facility, stormwater runoff from disturbed areas shall pass through a sediment pond or other appropriate sediment removal BMP. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Element #3, bullet #1. Full stabilization means concrete or asphalt paving; quarry spalls used as ditch lining; or the use of rolled erosion products, a bonded fiber matrix product, or vegetative cover in a manner that will fully prevent soil erosion. The local permitting authority should inspect and approve areas stabilized by means other than pavement or quarry spalls.***

***• Sediment ponds, vegetated buffer strips, sediment barriers or filters, dikes, and other BMPs intended to trap sediment onsite shall be constructed as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.***

***• Earthen structures such as dams, dikes, and diversions shall be seeded and mulched according to the timing indicated in Element #5.***

- The Contractor shall not disturb any vegetation in the tree protection areas and outside of the clearing limits in order to preserve the natural landscaping within and adjacent to the project site. The Contractor shall construct one row of erosion control silt fencing as shown on the plans or as directed by the Engineer to filter sediments from stormwater if runoff should leave construction site.

- Sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

- Suggested BMPs
  BMP C233: Silt Fence
  BMP C234: Vegetated Strip
  BMP C240: Temporary Sediment Pond

***Element 5: Stabilize Soils***

- ***All exposed and unworked soils shall be stabilized by application of effective BMPs that protect the soil from the erosive forces of raindrop impact, flowing water, and wind.***

- ***From October 1 through April 30, no soils shall remain exposed and unworked for more than 2 days. From May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days. This condition applies to all onsite soils, whether at final grade or not. These time limits may be adjusted by the County if it can be shown that the average time between storm events justifies a different standard.***

- ***Soils shall be stabilized at the end of the shift before a holiday or weekend if the weather forecast calls for precipitation.***

- ***Applicable practices include, but are not limited to, compost addition, temporary and permanent seeding, sodding, mulching, plastic covering, soil application of polyacrylamide (PAM), early application of gravel base on areas to be paved, and dust control.***

- ***Soil stabilization measures selected should be appropriate for the time of year, site conditions, estimated duration of use, and potential water quality impacts that stabilization agents may have on downstream waters or ground water.***

- ***Soil stockpiles must be stabilized from erosion, protected with sediment-trapping measures, and located away from storm drains, waterways, or drainage channels.***

- ***Linear construction activities, including right-of-way and easement clearing, roadway development, pipelines, and trenching for utilities, shall be conducted to meet the soil stabilization requirement. Contractors shall install the bedding materials, roadbeds, structures, pipelines, or utilities and re-stabilize the disturbed soils so that:***

  - ***From October 1 through April 30 no soils shall remain exposed and unworked for more than 2 days, and***
  - ***From May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days.***

- The Contractor shall stabilize all exposed and unworked soils by application of effective BMPs such as track walking, Hydroseeding, cover with plastic or mulch to protect the soil from the erosive forces. From October 1 through April 30, no soils shall remain exposed and unworked for more than 2 days. From May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days. This condition applies to all soils on site, whether at final grade or not.

- Soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast. Applicable practices include, but are not limited to, temporary and permanent seeding, sodding, mulching, plastic covering, erosion

control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

- Linear construction activities, including right-of-way and easement clearing, roadway development, pipelines, and trenching for utilities, shall be conducted to meet the soil stabilization requirement. Contractors shall install the bedding materials, roadbeds, structures, pipelines, or utilities and re-stabilize the disturbed soils so that:

  – from October 1 through April 30 no soils shall remain exposed and unworked for more than 2 days and
  – from May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days.

- Suggested BMPs
  BMP C120: Temporary and Permanent Seeding
  BMP C121: Mulching
  BMP C122: Nets and Blankets
  BMP C123: Plastic Covering
  BMP C124: Sodding
  BMP C125: Topsoiling
  BMP C126: Polyacrylamide for Soil Erosion Protection
  BMP C130: Surface Roughening
  BMP C131: Gradient Terraces
  BMP C140: Dust Control
  BMP C180: Small Project Construction Stormwater Pollution Prevention

***Element 6: Protect Slopes***

***• Design and construct cut and fill slopes shall be designed and constructed in a manner that will minimize erosion.***

***• Consider soil type and its potential for erosion.***

***• Reduce slope runoff velocities by reducing the continuous length of slope with terracing and diversions, reduce slope steepness, and roughen slope surface.***

***• Offsite stormwater (run-on) shall be diverted away from slopes and disturbed areas with interceptor dikes and swales. Offsite stormwater should be managed separately from stormwater generated on the site.***

***• At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.***

***• Temporary pipe slope drains shall handle the peak flow from a 10-year, 24-hour event assuming a Type 1A rainfall distribution. Alternatively, the 10-year and 25-year, 1 hour***

***flow rates indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. If a 15-minute (or less) time step is used, no correction factor is required. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates.***

- ***Permanent pipe slope drains shall be sized for the 100-year, 24-hour event.***

- ***Provide drainage to remove ground water intersecting the slope surface of exposed soil areas.***

- ***Excavated material shall be placed on the uphill side of trenches, consistent with safety and space considerations.***

- ***Check dams shall be placed at regular intervals within channels that are cut down a slope.***

- ***Stabilize soils on slopes, as specified in Element #5.***

Excavation of slopes is not likely on this project. If the contractor should required excavation of any slopes then it shall be completed as follows.

- The Contractor shall construct cut and fill slopes in a manner that will minimize erosion and reduce slope runoff velocities. Tracking walking exposed slopes and/or laying matting or mulch to protect soils will be required for all slopes great than 10 to 1.

    - Suggested BMPs
      BMP C120: Temporary and Permanent Seeding
      BMP C130: Surface Roughening
      BMP C200: Interceptor Dike and Swale
      BMP C201: Grass-Lined Channels
      BMP C204: Pipe Slope Drains
      BMP C205: Subsurface Drains
      BMP C206: Level Spreader
      BMP C207: Check Dams
      BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam).

***Element 7: Protect Drain Inlets***

- ***All storm drain inlets made operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.***

***• All approach roads shall be kept clean, and all sediment and street wash water shall not be allowed to enter storm drains without prior and adequate treatment, unless treatment is provided before the storm drain discharges to waters of the State.***

***• Inspect inlets weekly at a minimum and daily during storm events. Clean inlet protection devices, or remove and replace when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).***

There are no drainage inlets within the project area to project. If there were the Contractor shall do the following:

- The Contractor shall protect all storm drain inlets made operable during construction with the filter apparatus shown on the erosion control detail sheet. All inlets shall be inspected weekly at a minimum and daily during storm events or as directed by the Engineer. Inlet protection devices should be cleaned or removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer). There are no storm drain inlets near the site that could potentially receive surface runoff from the construction site.

    - Suggested BMPs
      BMP C220: Storm Drain Inlet Protection

***Element 8: Stabilize Channels and Outlets***

***• All temporary onsite conveyance channels shall be designed, constructed and stabilized to prevent erosion from the peak 10-minute flow velocity from a Type 1A 10-year 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour time step flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. If a 15-minute (or less) time step is used, no correction factor is required. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates.***

***• Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes and downstream reaches shall be provided at the outlets of all conveyance systems.***

There are no channels or outlets on or adjacent to the project site therefore stormwater from this project will be allowed to sheet flow across the ground and infiltrate or be directed toward the wetland buffer or the south undeveloped area.

- The Contractor shall direct the stormwater to areas where it can be cleaned or infiltrated into the ground through sheet flowing across the natural ground or into wetland buffer.

- Suggested BMPs
  BMP C202: Channel Lining
  BMP C209: Outlet Protection

***Element 9: Control Pollutants***

- ***All pollutants, including waste materials and demolition debris that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Woody debris may be chipped, ground or chopped and spread on site.***

- ***Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and non-inert wastes present on the site (see Chapter 173-304 WAC for the definition of inert waste). Onsite fueling tanks shall include secondary containment.***

- ***Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff must be conducted using spill prevention measures, such as drip pans. Contaminated surfaces shall be cleaned immediately following any discharge or spill incident. Report all spills to 911. Emergency repairs may be performed onsite using temporary plastic placed beneath and, if raining, over the vehicle.***

- ***Wheel wash, or tire bath wastewater, shall be discharged to a separate onsite treatment system or to the sanitary sewer if allowed by the local wastewater authority.***

- ***Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' label recommendations shall be followed for application rates and procedures.***
- ***BMPs shall be used to prevent or treat contamination of stormwater runoff by pH modifying sources. These acidic or basic sources include, but are not limited to, bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, and concrete pumping and mixer washout waters. Stormwater discharges shall not cause or contribute to a violation of the water quality standard for pH in the receiving water.***

- ***Construction sites shall adjust the pH of stormwater if necessary to prevent violations of water quality standards. Projects must obtain written approval from the Department of Ecology prior to using chemical treatment other than $CO_2$ or dry ice to adjust pH.***

- The Contractor shall ensure all pollutants, including waste materials and demolition debris, which occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Woody debris may be chopped and spread on site.

- All chemicals, liquid products, petroleum products, and non-inert wastes present on the site (see Chapter 173-304 WAC for the definition of inert waste), shall be covered, contained, and protected from vandalism. On-site fueling tanks shall include secondary containment.

- Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff must be conducted using spill prevention measures, such as drip pans. Contaminated surfaces shall be cleaned immediately following any discharge or spill incident. Emergency repairs may be performed on-site using temporary plastic placed beneath and, if raining, over the vehicle.

- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer.

- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application rates and procedures shall be followed.

- BMPs shall be used to prevent or treat contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to, bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, and concrete pumping and mixer washout waters. Stormwater discharges shall not cause or contribute to a violation of the water quality standard for pH in the receiving water.

- Construction sites with significant concrete work shall adjust the pH of stormwater if necessary to prevent violations of water quality standards.

  • Suggested BMPs
  BMP C151: Concrete Handling
  BMP C152: Sawcutting and Surfacing Pollution Prevention
  See Volume IV – Source Control BMPs

***Element 10: Control De-Watering***

- ***All foundation, vault, and trench de-watering water, which has similar characteristics to stormwater runoff at the site, shall be discharged into a controlled conveyance system, prior to discharge to a sediment trap or sediment pond. Channels must be stabilized, as specified in Element #8.***

- ***Clean, non-turbid de-watering water, such as well-point ground water, can be discharged to systems tributary to state surface waters, as specified in Element #8, provided the de-watering flow does not cause erosion or flooding of the receiving waters. These clean waters should not be routed through sediment ponds with stormwater.***

- ***Highly turbid or otherwise contaminated dewatering water, such as from construction equipment operation, clamshell digging, concrete tremie pour, or work inside a cofferdam, shall be handled separately from stormwater at the site.***

- ***Other disposal options, depending on site constraints, may include: 1) infiltration, 2) transport offsite in vehicle, such as a vacuum flush truck, for legal disposal in a manner that does no pollute state waters, 3) Ecology-approved onsite treatment using chemical treatment or other suitable treatment technologies, or 4) sanitary sewer discharge with local sewer district approval, if there is no other option, 5) use of sedimentation bag with outfall to a ditch or swale for small volumes of localized dewatering.***

- If de-water should occur on this project from the foundation pour or concrete slabs, the Contractor shall either discharge into designated areas as directed by the Engineer or transport offsite to an approval disposal site. If discharged on-site the Contract shall construct the spreader trench in such a manner as to allow the water to sheet flow through the project site for infiltration. All de-watering shall be infiltrated on-site and not be directed to adjacent property.

***Element 11: Maintain BMPs***

- ***All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair shall be conducted in accordance with BMPs.***

- ***Sediment control BMPs shall be inspected weekly or after a runoff-producing storm event during the dry season and daily during the wet season.***

- ***All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil areas resulting from removal of BMPs or vegetation shall be permanently stabilized.***

- The Contractor shall ensure that all temporary and permanent erosion and sediment control BMPs are maintained and repaired in accordance with the BMP specification and as needed to assure they are in proper working order. All temporary erosion and sediment control BMPs shall be removed within 30 days after site stabilization is achieved or not longer needed. All trapped sediment shall be either stabilized on site or removed to an approved disposal site.

***Element 12: Manage The Project***

- ***Phasing of Construction - Development projects shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the project site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.***

  ***Clearing and grading activities for developments shall be permitted only if conducted pursuant to an approved site development plan (e.g., subdivision approval) that establishes permitted areas of clearing, grading, cutting, and filling. When establishing these permitted clearing and grading areas, consideration should be given to minimizing removal of existing trees and minimizing disturbance/compaction of native soils except as needed for building purposes. These permitted clearing and grading areas and any other areas required to preserve critical or sensitive areas, buffers, native growth protection easements, or tree retention areas as may be required by local jurisdictions, shall be delineated on the site plans and the development site.***

  ***All plats shall include lot-specific grading plans, including information specified by the local permitting authority such as finished grades, finished floor elevations, buildable areas, and identified drainage outlets. This information would normally be submitted with the construction drawings, but may be required prior to preliminary plat approval.***

- ***Inspection and Monitoring – All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspection shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. The person must have the skills to 1) assess the site conditions and construction activities that could impact the quality of stormwater, and 2) assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.***

  ***Whenever inspection and/or monitoring reveals that the BMPs identified in the construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.***

  ***The SWPPP shall be modified whenever there is a significant change in the design, construction, operation, or maintenance at the construction site that as, or could have, a significant effect on the discharge of pollutants to waters of the state.***

  ***The SWPPP shall be modified, if during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as***

***necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) calendar days following the inspection.***

- ***Seasonal Work Limitations – In Olympia—except where approved chemical treatment, full dispersion or infiltration is practiced— clearing, grading, and other soil disturbing activities are prohibited in all watersheds between October 15 and April 1.***

***Based on the information provided, and/or local weather conditions, the local permitting authority may expand or restrict the seasonal limitation on site disturbance. If, during the course of any construction activity or soil disturbance during the seasonal limitation period, silt-laden runoff leaving the construction site causes a violation of the surface water quality standard or if clearing and grading limits or erosion and sediment control measures shown in the approved plan are not maintained, the local permitting authority may take enforcement action, including but not limited to a notice of violation, administrative order, fine/penalty, stop-work order, or correction notice.***

***The following activities are exempt from the seasonal clearing and grading limitations:***

1. ***Routine maintenance and necessary repair of erosion and sediment control BMPs;***
2. ***Routine maintenance of public facilities or existing utility structures that do not (a) expose the soil or (b) result in the removal of the soil's vegetative cover; and***
3. ***Self-contained project sites, where there is complete infiltration of the water quality design event runoff within the site.***

***Local governments may restrict clearing and grading activities where site conditions may present a significant risk of impact to property or critical areas. Contact the local permitting authority for information on specific site restrictions.***

- ***Coordination with Utilities and Other Contractors - The primary project proponent shall evaluate, with input from utilities and other contractors, the stormwater management requirements for the entire project, including the utilities, when preparing the Construction SWPPP.***

- ***Inspection and Monitoring - All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. The person shall have the skills to (1) assess site conditions and construction activities that could impact stormwater runoff quality, and (2) assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.***

***A Certified Erosion and Sediment Control Specialist shall be identified in the Construction SWPPP and shall be onsite or on-call at all times. Certification may be obtained an approved training program that meets the erosion and sediment control training criteria established by Ecology. If a pre-construction meeting is held, this person shall attend.***

***Sampling and analysis of the stormwater discharges from a construction site may be necessary on a case-by-case basis to ensure compliance with standards. Monitoring and reporting requirements may be established by the local permitting authority when necessary.***

***The following discharge standard applies:***

- ***Runoff leaving the construction site shall be free of settleable solids, as measured with an Imhoff Cone and in accordance with Standard Methods for the Examination of Water and Wastewater, most recent edition, American Water Works Association. "Free of settleable solids" shall be defined as measuring less than 2.5 mL/L/hr, for storms up to the water quality design event .***

***The following surface water standard applies:***

- ***For storms up to the water quality design event, turbidity downstream of a construction site may not increase more than 5 NTU, if upstream turbidity is 50 NTU or less, and may not increase more than 10 percent, if upstream turbidity is over 50 NTU. To the extent practicable, samples should be taken far enough downstream so that the construction site discharge has been well-mixed with the surface water.***

- ***Maintaining an Updated Construction SWPPP The SWPPP shall be retained onsite or within reasonable access to the site.***

  ***The SWPPP shall be updated within 7 days to reflect any significant changes in the design, construction, operation, or maintenance at the construction site that have, or could have, a significant effect on the discharge of pollutants to waters of the state.***

  ***The SWPPP shall be updated within 7 days if during inspections or investigations by site staff or local or state officials, it is determined that the SWPPP is ineffective in controlling pollutants such that applicable discharge or surface water standards violations are apparent.***

*Element 13: Protect Low Impact Development BMP's*

**• Protect all Bioretention and Rain Garden BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden BMPs.**

**• Restore Bioretention and Rain Garden BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP includes removal of sediment and any sediment-laden Bioretention/Rain Garden soils, and replacing the removed soils with soils meeting the design specification.**

**• Prevent compaction of Bioretention, Rain Garden, and other infiltration BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.**

**• Protect surrounding land uses from erosion and manage to avoid introducing sediment onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-lade runoff onto permeable pavements. • Clean pavements fouled with sediments or no longer passing an initial infiltration test using procedures acceptable to the County or in accordance with manufacturer's procedures.**

**• Keep heavy equipment off of existing soils under LID facilities (Bioretention, Rain Gardens, Infiltration Ponds, Permeable Pavements, etc.) that have been excavated to final grade to retain the infiltration rate of the soils.**

**Suggested BMPs**

**o BMP C102: Buffer Zone**
**o BMP C103: High Visibility Fence**
**o BMP C200: Interceptor Dike and Swale**
**o BMP C201: Grass-Lined Channels o BMP C207: Check Dams**
**o BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam).**
**o BMP C231: Brush Barrier o BMP C233: Silt Fence**
**o BMP C234: Vegetated Strip**
**o Additional Guidance: See Chapter 5: Precision Site Preparation and Construction in the LID Technical Guidance Manual for Puget Sound for more detail on protecting LID integrated management practices.**

Site specific BMPs are shown on the TEC Plan Sheets and Details in Appendix A. These site specific plan sheets will be updated annually.

# 4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project, and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade

Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: _____
- Estimate of construction finish date: _____
- Mobilize equipment on site: _____
- Mobilize and store all ESC and soil stabilization products: _____
- Install stabilized construction entrance: _____
- Begin clearing and grubbing: _____

# 5.0 Pollution Prevention Team

## Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, ect,); to be called upon in case of failure of any ESC measures.

- Resident Engineer – for projects with engineered structures only (sediment ponds, traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative.

- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.

- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of emergency.

- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.

- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lear.

### Team Members

| Title | Name(s) | Phone Number |
|---|---|---|
| Certified Erosion and Sediment Control Lead (CESCL) | | |
| Resident Engineer | Bill Turner | 360-239-2847 |
| Emergency Ecology Contact | Report a Spill | (360) 407-6300 |
| Emergency Owner Contact | Crystal Bundy | (360) 280-2929 |
| Non-Emergency Ecology Contact | | |
| Monitoring Personnel | Contractor | |

## 6.0 Site Inspections and Monitoring

Site inspection and monitoring includes visual inspection, monitoring for water quality parameters of concern and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the sit log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. If log book and SWPPP is separated, the site log book must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

### Site Inspection

All BMPs will be inspected, maintained and repaired as needed to assure continued performance of their intended function. Site inspections will be conducted by a person who is knowledgeable in the principles and practices or erosion and sediment control. The onsite inspector will have the skills to assess the potential for water quality impacts as a result of the type of construction activities occurring on site, and the knowledge of the appropriate and effective ESC measures needed to control the quality of stormwater discharges.

All BMPs will be inspected, maintained and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information of the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

## Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

## Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in the Appendix E. The site inspection log forms may be separated from the SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

## Stormwater Quality Monitoring

Monitoring requirements for the proposed project will include turbidity sampling to monitor site discharges for water quality compliance with the Construction Stormwater General Permit (Appendix D). Sampling will be conducted at all site discharge points at least once per calendar week. A discharge point or outfall is any point along the perimeter of the project site where water leaves (during hours of construction).

> Refer to permit section S4.G for sampling procedures and guidance manual references.

Turbidity monitoring will follow the analytical methodologies described in Section S$ of the Construction Stormwater General Permit (Appendix D). The key benchmark values that require action include 25 NTU and 250 NTU for turbidity. If the 25 NTU benchmark for turbidity is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.

2. Assess whether additional BMPs should be implemented and make revisions to the SWPPP as necessary.

3. Sample the discharge location daily until the analysis results are less than the 25 NTU (turbidity) or 32 cm (transparency).

If the turbidity is greater than 25 NTU but less than 250 NTU for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU bench mark for turbidity is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis.

2. Continue daily sampling until the turbidity is less than 25 NTU.

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.

4. Implement additional treatment BMPS as soon as possible, but within 7 days of the first 250 NTU exceedance.

5. Describe inspection results and remedial actions that are taken in the site log book and in monthly discharge monitoring reports.

**pH Sampling**

Stormwater runoff will be monitored for pH staring on the first day of any activity that includes more than 40 yards of poured or recycled concrete, or after the application of "Engineered Soils" such as, Portland cement treated base, cement kiln dust, or fly ash. This does not include fertilizers. For engineered soils, the pH monitoring period begins when engineered soils are first exposed to precipitation and continue until the area is fully stabilized.

Stormwater samples will be collected daily from all points of discharge from the site and measured for pH using a calibrated pH meter, pH test kit, or wide range pH indicator paper. If the measured pH is 8.5 or greater, the following steps will be conducted:

1. Prevent the high pH water from entering storm drains or surface water.

2. Adjust or neutralize the high pH water if necessary using appropriate technology such as $CO_2$ sparging (liquid or dry ice).

3. Contact Ecology if chemical treatment other than $CO_2$ sparging is planned.

# 7.0 Reporting and Recordkeeping

### Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

### Records Retention

Records of all monitoring information (site log book, inspection reports/check lists, etc.), this Stormwater Pollution Prevention Plan, and nay other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

### Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of the SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

### Updating the SWPPP

In accordance with Conditions S3, S4.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect or the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

# Reporting

## Discharge Monitoring Reports

If cumulative soil disturbance is smaller than 5 acres: Discharge Monitoring Report (DMR) forms will not be submitted to Ecology because water quality sampling is ot being conducted at the site.

If cumulative soil disturbance is 5 acres or larger: Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

## Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will immediately notified of the failure to comply.

2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.

3. A detailed written report describing the noncompliance will be submitted to Ecology within (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S4.F.6.b, the Ecology regional office will be notified if chemical treatment other than $CO_2$ sparging is planned for adjustment of high pH water (see Section 5.0 of this SWPPP for contact information).

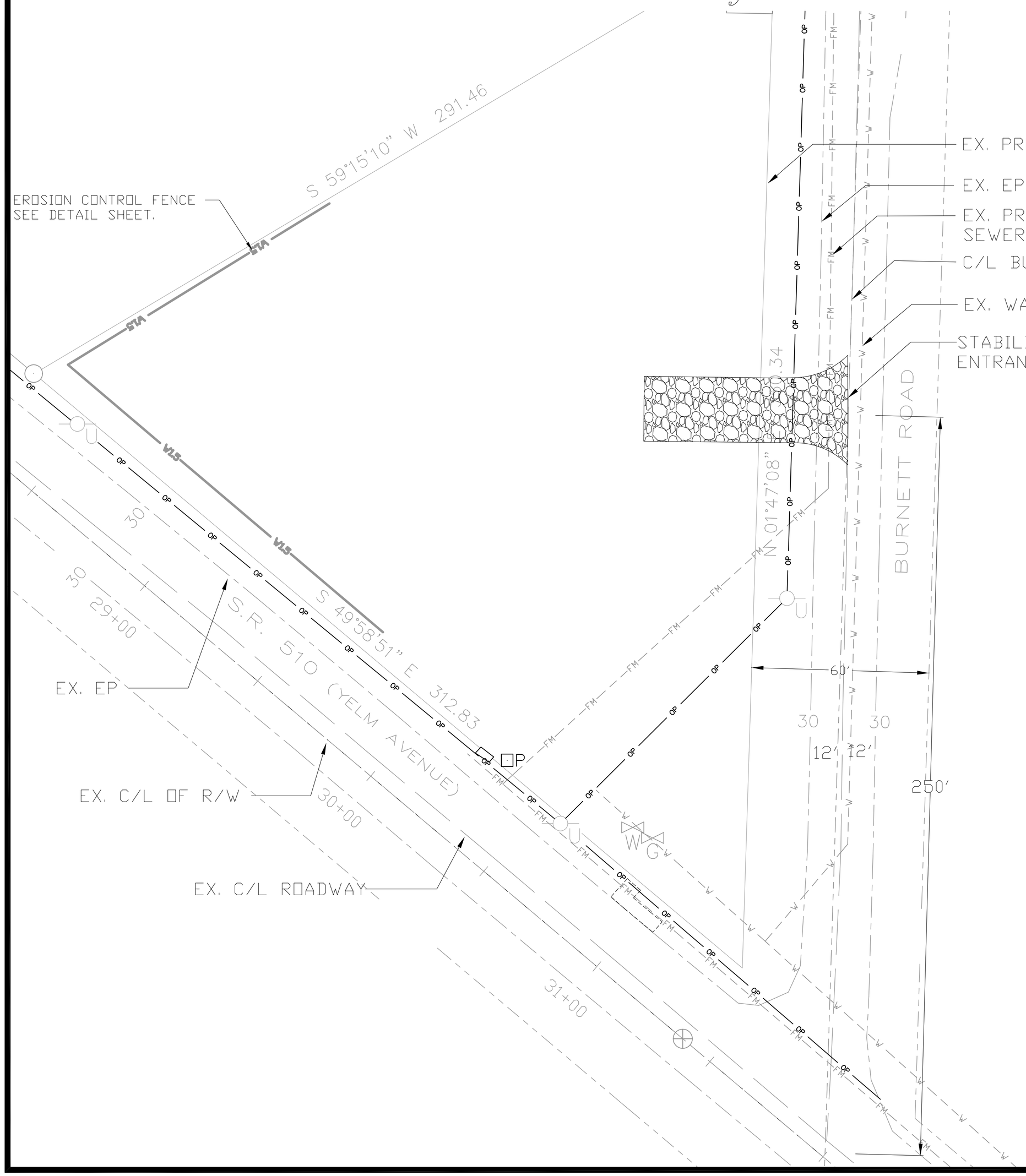
## Permit Application and Changes

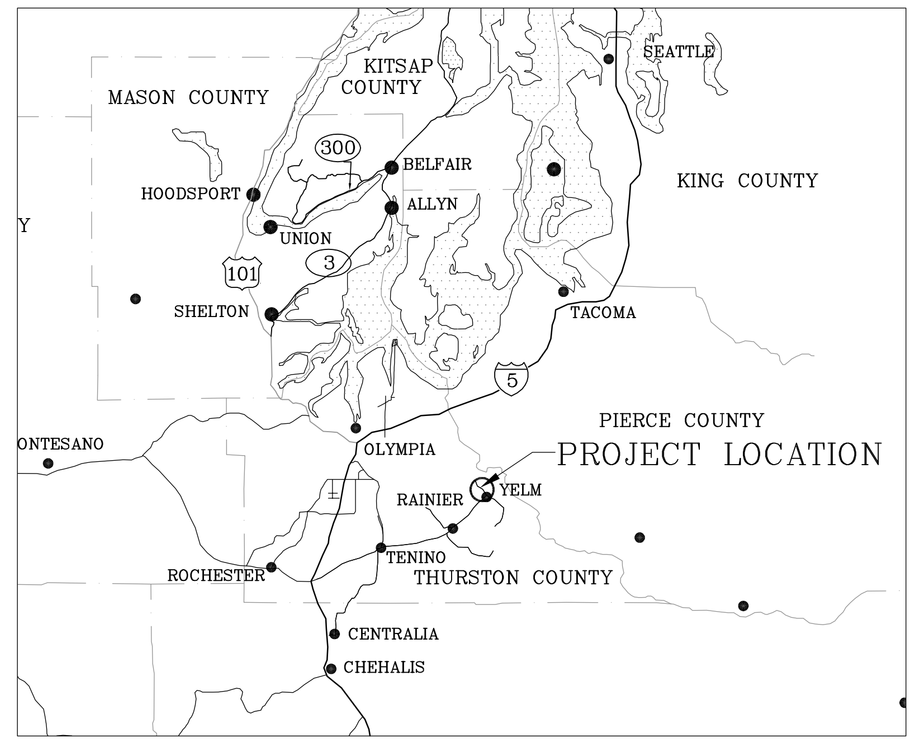
In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

# Appendix A – Site Plan

Sec. 3, TW. 17N, Range 1E, W.M.

# Bundy Commercial Center




*VICINITY MAP*

## *SITE DATA*

| | |
|---|---|
| *APPLICANT/OWNER NAME:* | CRYSTAL BUNDY<br>11349 SUMMIT LAKE RD. NW<br>OLYMPIA, WA 98502 |
| *SITE ADDRESS:* | Unknown |
| *REPRESENTATIVE:* | BILL TURNER<br>4405 7TH AVE. SE SUITE 300<br>LACEY, WA 98503<br>PHONE: (360) 239-2847 |
| *ASSESSOR PARCEL NOS.* | 21713330200 |
| *ZONING* | C-1 |
| *SEWER* | CITY OF YELM |
| *WATER* | CITY OF YELM |

1"=40'
0 20 40 80

NOT A BOUNDARY SURVEY
All references to property lines, bearing, corners, or any references which indicate property alignment or locations were acquired from
*Chehalis Valley Surveying*
FOR CONSTRUCTION USE ONLY
*Project Application #*

DATUM

*LEGEND*

- TREES
- EX. WELL
- EX. FENCE
- 100' WELL PROTECTION AREA
- EX. PROPERTY LINE
- BUILDING SETBACK LINE
- PROP. PROPERTY LINE
- PR CENTER LINE
- PR EDGE OF GRAVEL
- PR BUILDING
- EX. CONTOURS

DESIGN INFORMATION
PROJECT IDENTIFICATION No.
FILE NAME: General Site Plan
C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:


TCE Turner Consulting Engineer
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900


Bundy Commercial Center
Erosion Control
Site Plan

WILLIAM P. TURNER — STATE OF WASHINGTON — 33624 — REGISTERED PROFESSIONAL ENGINEER

12-13-21

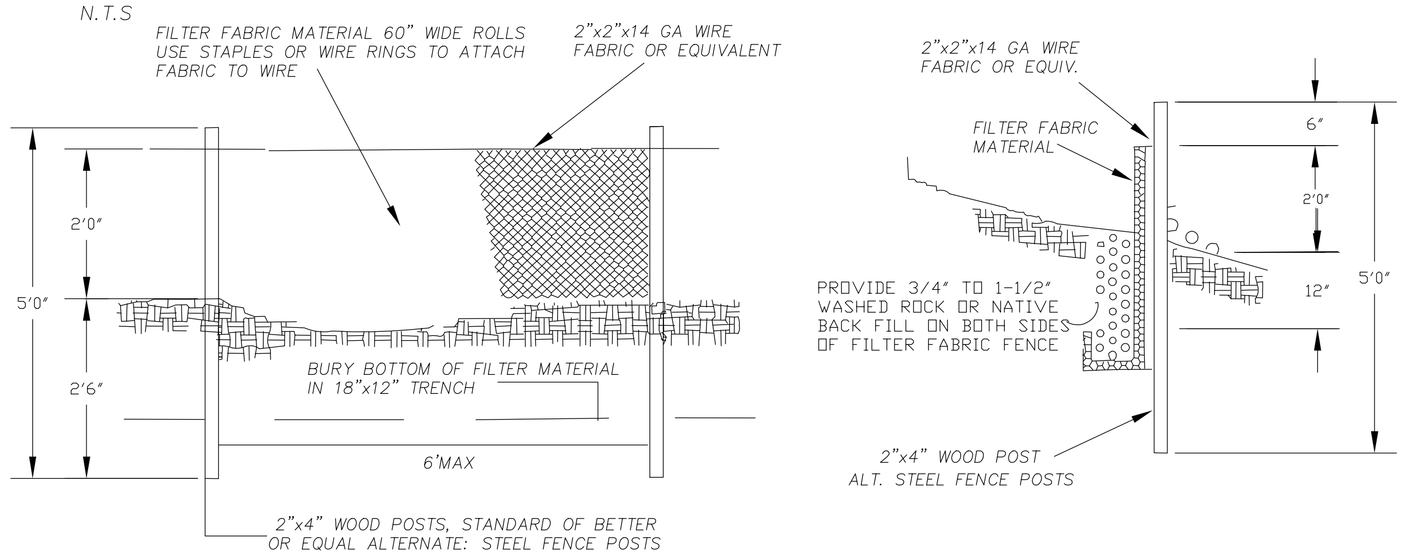
SHEET ID CODE

SHEET No.

Sec. 3, TW. 17N, Range 1E, W.M.

## EROSION CONTROL FENCE DETAIL

N.T.S







PROJECTS WHERE TOPSOIL WILL BE STOCKPILED:

1. STOCKPILES SHALL BE STABILIZED (WITH PLASTIC COVERING OR OTHER APPROVED DEVICE) DAILY BETWEEN NOVEMBER 1 AND MARCH 31.
2. IN ANY SEASON, SEDIMENT LEACHING FROM STOCK PILES MUST BE POSITIVELY PREVENTED.
3. TOPSOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR WHEN CONDITIONS EXIST THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
4. PREVIOUSLY ESTABLISHED GRADES ON THE AREAS TO BE TOPSOILED SHALL BE MAINTAINED ACCORDING TO THE APPROVAL PLAN.

TABLE 9.4 SEED MIXTURE FOR HYDROSEEDING

| Name | Proportions by weight | Percent Purity | Percent Germination |
|---|---|---|---|
| Redtop (Agrostis alba) | 10 percent | 92 | 90 |
| Annual rye (Lolium multiflorum) | 40 percent | 98 | 90 |
| Chewings fescue (Festuca rubra commutata) (Jamestown, Banner, Shadow, | 40 percent | 97 | 80 |
| White dutch clover (Trifolium repens) | 10 percent | 96 | 90 |

1. SEED MIXTURE SHALL BE ACCORDING TO COUNTY REQUIREMENTS, AND SHALL BE APPLIED AT THE RATE OF 120 LBS. PER ACRE.
2. SEED BEDS PLANTED BETWEEN MAY 1 AND OCTOBER 31 WILL REQUIRE IRRIGATION AND OTHER MAINTENANCE AS NECESSARY TO FOSTER AND PROTECT THE ROOT STRUCTURE.
3. FOR SEED BEDS PLANTED BETWEEN OCTOBER 31 AND APRIL 30, ARMORING OF THE SEED BED WILL BE NECESSARY. (E.G., GEOTEXTILES, JUTE MAT, CLEAR PLASTIC COVERING).
4. BEFORE SEEDING, INSTALL NEEDED SURFACE RUNOFF CONTROL MEASURES SUCH AS GRADIENT TERRACES, INTERCEPTOR DIKES, SWALES, LEVEL SPREADERS AND SEDIMENT BASINS.
5. THE SEEDBED SHALL BE FIRM WITH A FAIRLY FINE SURFACE, FOLLOWING SURFACE ROUGHENING. PERFORM ALL CULTURAL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPE.
6. FERTILIZERS ARE TO BE USED ACCORDING TO SUPPLIERS RECOMMENDATIONS. AMOUNTS USED SHOULD BE MINIMIZED, ESPECIALLY ADJACENT TO WATER BODIES AND WETLANDS.

### GENERAL NOTES (EROSION CONTROL)

ACCEPTANCE OF THIS SWPPP BY THURSTON COUNTY DOES NOT CONSTITUTE AN ACCEPTANCE OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).

THE IMPLEMENTATION OF THIS SWPPP AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF ESC FACILITIES IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

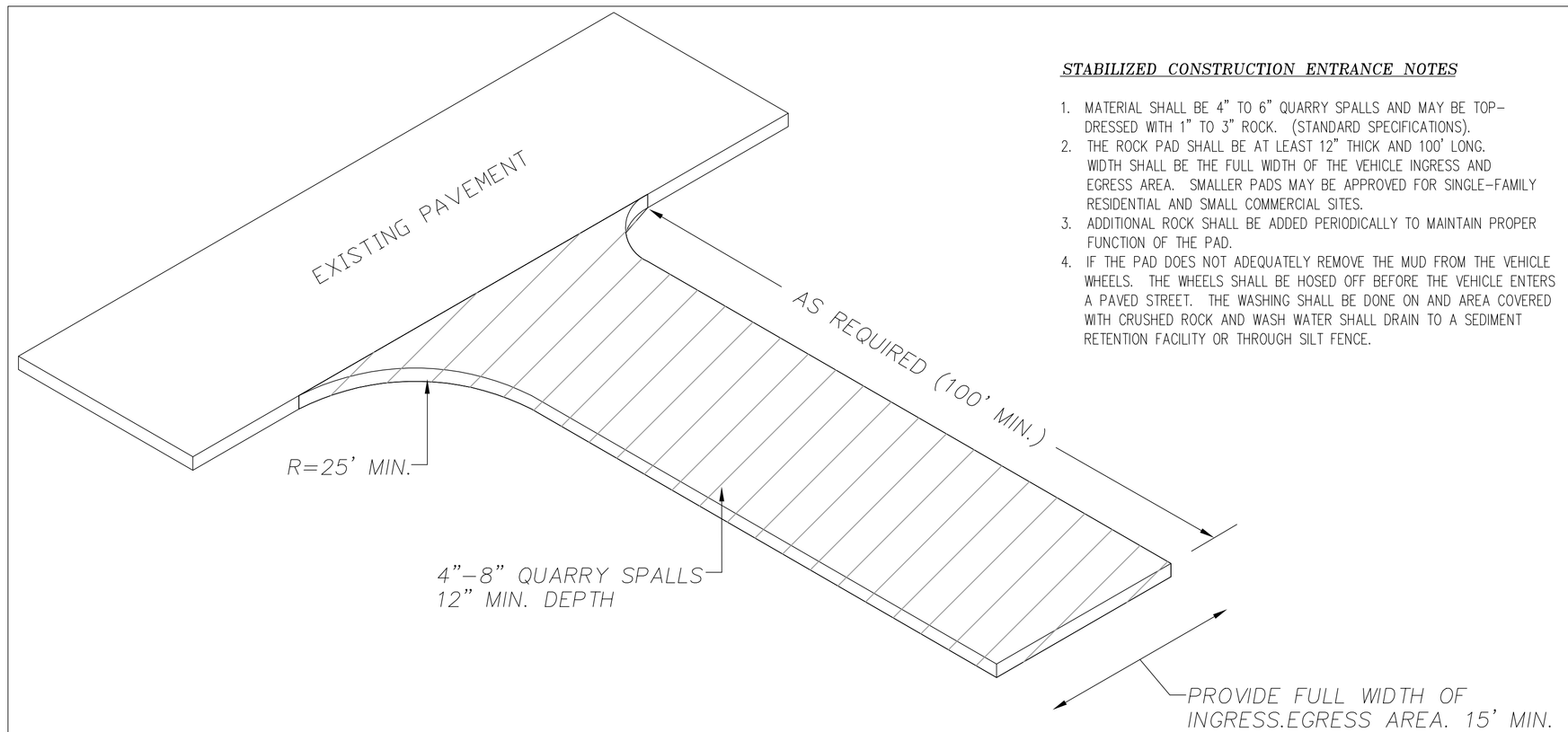
THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER DRAINAGE SYSTEMS, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE CONSTRUCTION SITE.

ALL ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

ALL ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT (>1? IN 24 HOURS).




*STABILIZED CONSTRUCTION ENTRANCE NOTES*

1. MATERIAL SHALL BE 4" TO 6" QUARRY SPALLS AND MAY BE TOP-DRESSED WITH 1" TO 3" ROCK. (STANDARD SPECIFICATIONS).
2. THE ROCK PAD SHALL BE AT LEAST 12" THICK AND 100' LONG. WIDTH SHALL BE THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA. SMALLER PADS MAY BE APPROVED FOR SINGLE-FAMILY RESIDENTIAL AND SMALL COMMERCIAL SITES.
3. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
4. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE WHEELS. THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AND AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH SILT FENCE.

## STABILIZED CONSTRUCTION ENTRANCE DETAIL

SCALE: N.T.S

*NOTE: THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION & PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING THE UNDERGROUND LOCATE LINE AT 1-800-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.*

DESIGN INFORMATION

PROJECT IDENTIFICATION No.

FILE NAME: General Site Plan

C&C/

| ACTION | | |
|---|---|---|
| DESIGNED | BT | 12-13-21 |
| DRAWN | JB | 12-13-21 |
| CHECKED | BT | 12-13-21 |
| PLOTTED DATES | | |

REVISION BLOCK:


Turner Engineering Consulting
4405 7th Ave SE Suite 301
Lacey, WA 98503
360-491-6900


Bundy Commercial Center

Erosion Control Notes & Details


12-13-21

SHEET ID CODE

SHEET No.

# Appendix B – Construction BMPs

BMP C101: Preserving Natural Vegetation
BMP C102: Buffer Zones
BMP C103: High Visibility Plastic or Metal Fence
BMP C104: Stake and Wire Fence
BMP C105: Stabilized Construction Entrance
BMP C106: Wheel Wash
BMP C107: Construction Road/Parking Area Stabilization
BMP C140: Dust Control
BMP C220: Storm Drain Inlet Protection
BMP C233: Silt Fence
Infiltration Trench

# Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

**Element #1 – Mark Clearing Limits**

**Element #2 – Establish Construction Access**

**Element #3 – Control Flow Rates**

Straw Bales
Quarry Spalls or Light Loose Rip Rap

**Element #4 – Install Sediment Controls**

Straw Bales
Early application of gravel base for roads to be paved

**Element #5 – Stabilize Soils**

Track Walking
Jute Matting
Straw Mulch

**Element #6 – Protect Slopes**

Track Walking
Jute Matting
Straw Mulch

**Element #7 – Protect Drain Inlets**

Straw Bales

**Element #8 – Stabilize Channels and Outlets**

**Element #9 – Control Pollutants**

**Element #10 – Control Dewatering**

# Appendix D – General Permit If Required

# Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. It is mandatory that this SWPPP and the site inspection forms be kept on-site at all times during construction and that inspections be performed and documented as outlined below.

At a minimum, each inspection reportor checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected
   ii. locations of BMPs that need maintenance,
   iii. the reason maintenance is needed,
   iv. locations of BMPs that failed to operate as designed or intended, and
   v. locations where additional or different BMPs are needed, and the reasons(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection and the following statement; "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

## Water Quality Monitoring

Was any water quality monitoring conducted? □ Yes □ No

If water quality monitoring was conducted, record results here:

If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?

□ Yes □ No

If Ecology was notified, indicate the date, time, contact name and phone number below:

Date:
Time:
Contact Name:
Phone #:

**General Comments and Notes**

Include BMP repairs, maintenance, or installations made as a result of the inspection.

Were Photos Taken? □ Yes □ No

If photos taken, describe photos below: