City of Yelm
EST. 1924
WASHINGTON

SEPA #: 2021.0034

DETERMINATION OF NON-SIGNIFICANCE

Proponent:	Patrick Gilroy
Description of Proposal:	Stor-House Self Storage
Location of the Proposal:	10508 Creek St SE
Section/Township/Range:	Section 29 Township 17 Range 2E Quarter NW
Threshold Determination:	The City of Yelm as lead agency for this action has determined that this proposal does not have a probable significant adverse impact on the environment. Therefore, an environmental impact statement (EIS) will not be 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.
Mitigating Measures:	None
Lead agency:	City of Yelm
Responsible Official:	Cody Colt, Public Services Director
Date of Issue:	July 28, 2021
Comment Deadline:	August 12, 2021
Appeal Deadline:	There is no local administrative appeal of a DNS

Cody Colt, Public Services Director

This Determination of Non-Significance (DNS) is issued pursuant to Washington Administrative Code 197-11-340 (2). Comments must be submitted to Casey Mauck, caseym@yelmwa.gov, at City of Yelm, 106 2nd St SE, Yelm, WA 98597, by August 12, 2021 at 5:00 P.M. The City of Yelm will not act on this proposal prior August 12, 2021 at 5:00 P.M.

DO NOT PUBLISH BELOW THIS LINE

Published: Nisqually Valley News, Thursday, August 5, 2021
Posted in public areas: Wednesday, July 28, 2021

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

City of Yelm

Fee	
Date Received	
By	
File No.	

Community Development Department
ENVIRONMENTAL CHECKLIST

Instructions:

The State Environmental Policy Act (SEPA) requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. The purpose of this checklist is to provide information to help identify impacts from your proposal, to reduce or avoid impacts from the proposal if it can be done, and to help the City decide whether an EIS is required. An environmental impact statement (EIS) must be prepared for any proposal with probable significant adverse impacts on environmental quality.

This environmental checklist asks you to describe some basic information about your proposal. The City will use this checklist to determine whether the environmental impacts of your proposal are significant and require preparation of an EIS. You must answer each question accurately, carefully and to the best of your knowledge. Answer the questions briefly, but give the best description you can. In most cases, you should be able to answer the questions from your own observations or project plans without the need for experts. If you do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply". Complete answers to the questions now may avoid delays later. If the space provided is too small, feel free to attach additional sheets.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the city staff can assist you.

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. You may be asked to explain your answers or provide additional information for determining if there may be significant adverse impacts.

Nonproject Proposals Only:

Complete both the checklist (even though many questions may be answered "does not apply") and the **Supplemental Sheet for Nonproject Actions** (part D). For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

CITY OF YELM

ENVIRONMENTAL CHECKLIST

CITY USE ONLY
FEE: $150.00
DATE REC'D_____
BY:_____
FILE NO._____

A. BACKGROUND

1. Name of proposed project, if applicable:

   The Stor-House Self Storage – Yelm

2. Name of applicant:

   Gilroy Family Five, LLC

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

   Applicant:
   Gilroy Family Five, LLC
   1614 118th Ave SE
   Bellevue, WA 98005
   (425) 999-8250

   Contact:
   Patrick Gilroy
   The Stor-House Self Storage
   1614 118th Ave SE
   Bellevue, WA 98005
   (425) 999-8250

4. Date checklist prepared:

   May 28, 2021

5. Agency requesting checklist:

   City of Yelm Department of Community Development

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

   Site and building construction is scheduled to start in the winter of 2021, subject to the City's approval process.

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.

   Geotechnical Engineering Study (May 28, 2021, Earth Solutions NW LLC)
   Phase I Environmental Site Assessment (May 27, 2021, Earth Solutions NW LLC)
   Preliminary Stormwater Site Plan (June 2021, JE Gibson Engineering & Consulting)

   Trip Generation (July 2021, JTE, Inc)

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.

None to our knowledge.

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

Environmental Review
Site Plan Review
Grading Permit
Water, Sewer and Surface Water Engineering Permits
Commercial Building Permit
Demolition Permit
Fire Sprinkler/Suppression System Installation
Fire Alarm Installation
Electrical Permit
Plumbing Permit
Mechanical Permit
Sign Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site.

This applicant proposes redevelopment of an existing parking lot and 2 pads for commercial retail buildings in the City of Yelm. The existing improvements will be removed and replaced by a new, three-story, 84,945 square-foot self-storage building, plus associated drive aisles, parking, and utilities to serve the new building.

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.

The site is located north of E Yelm Avenue, south of Old Yelm-McKenna Road, east of the US Post Office and west of the Tustin Apartment Homes. A legal description is attached hereto and incorporated by reference.

B. ENVIRONMENTAL ELEMENTS

1. EARTH

a. General description of the site (circle one); (flat), rolling, hilly, steep slopes, mountainous, other _____.

The site is gently sloping. There are no steep slopes.

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

The steepest slope is approximately 2%.

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 prime farmland.

Please refer to the Geotechnical reports, listed below, that have been prepared for this property:

Geotechnical Engineering Study (May 28, 2021, Earth Solutions NW LLC)

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

Not to our knowledge.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Some grading may be needed to bring the existing grade level to elevation for construction of building pads and utilities. At this time, no fill material is anticipated to be brought onto the site

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

BMPs required

Erosion could occur during site construction. However, erosion and sedimentation control measures will be required by the City and will be implemented during site construction.

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

The project will not add any new impervious surface area to the site. The project proposes to replace approximately 67,934 square feet of existing asphalt and planned roof areas with new replaced impervious surface area (see table below).

STORMWATER SURFACE AREAS:			
Areas	Existing Conditions	Proposed Conditions	Difference
Asphalt (SF)	28,739	26,045	-2,694
Sidewalk (SF)	7,336	3,480	-3,856
Building (SF)	18,082	27,016	8,934
Landscaping (SF)	13,777	11,393	-2,384
Totals (SF)	**67,934**	**67,934**	
PSIG (% of site)	0.5310	0.4346	-9.64%
Total Imp Area (% of site)	0.7972	0.8323	3.51%
Landscaping (% of site)	0.2028	0.1677	-3.51%

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

A temporary erosion and sedimentation control (TESCP) plan will be prepared, approved by the City, and implemented as part of construction activities. During site construction, erosion and sedimentation control measures may include any of the following: siltation fences, one or more temporary siltation ponds, and other measures that may be used in accordance with requirements of the City. At completion of the project, permanent drainage control measures will include a stormwater detention and water quality vault, which was already designed and constructed in conjunction with the Creek Road Mixed Use Project (City File No. 20070404). BMPs required

Existing stormwater infrastructure may need upgrades to meet 2019 SWMMWW

2. AIR

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

During construction, there will be increased exhaust and dust particle emissions. After construction, the principal source of emissions will be from the automobile traffic that uses the site, which will be minimal.

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

Off-site sources of emissions or odors are those typical of the mixed-use neighborhoods that surround this site, such as automobile emissions from traffic on adjacent roadways and fireplace emissions from nearby homes.

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

Construction impacts will not be significant and can be controlled by several methods: watering or using dust suppressants on areas of exposed soils, washing truck wheels before leaving the site, and maintaining gravel construction entrances. BMPs required

Automobile and other emission standards are regulated by the State of Washington.

3. WATER

a. Surface Water:

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.

Yes. According to the permit application materials for the previously-permitted development (Creek Road Mixed Use; City File No. 20070404), Yelm Creek (a seasonal

stream) is located along the eastern property line of Parcel No. 64303400400, which abuts the subject property to the east.

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 work will be performed within 200 feet of the stream.

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.

None.

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

There will be no surface water withdrawals or diversions. Please refer to the storm drainage narrative, submitted with the Site Plan Review application.

5) Does the proposal lie within a 100-year flood plain? 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.

No. A public sanitary sewer system exists to serve the site.

b. Ground Water:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No groundwater will be withdrawn – public water mains will be installed as part of the site construction. There is an existing, onsite underground stormwater infiltration system to handle run-off from roof drains and paved surfaces. The proposed project will connect to this system. Existing stormwater infrastructure may need upgrades to meet 2019 SWMMWW

2) Describe the underlying aquifer with regard to quality and quantity, sensitivity, protection, recharge areas, etc.

The subject site is located within a critical aquifer recharge area. Applicable DOE and City regulations with regard to aquifer protection will be followed.

3) Describe waste material that will be discharged into or onto the ground from septic tanks or other sources, if any (such as domestic sewage; industrial byproducts; agricultural chemicals).

The site is served by sanitary sewers. There will be no waste material discharged to the ground from the development.

c. Water Runoff (including storm water):

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.

Stormwater runoff will result from roadways and other impervious surfaces. The run-off will be collected and routed to the infiltration vault located on-site, treated for sediment and petroleum removal, then infiltrated through the on-site native soils. The existing, on-site infiltration vault is designed to handle storm water runoff from the entire site, including the proposed project. City of Yelm requirements for water quality and runoff rate control will continue to be met. Existing stormwater infrastructure may need upgrades to meet 2019 SWMMWW

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

This would be very unlikely. The only materials that could enter ground or surface waters would be those associated with automobile discharges and yard and garden preparations.

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

A City-approved storm drainage system was previously designed and constructed to handle runoff from the entire project at full build-out in order to mitigate any adverse impacts from stormwater runoff. The proposed project will connect to this existing system. During construction, temporary erosion control measures will be used. After construction, all site runoff will continue to be directed to the permanent storm water collection/treatment facility. Existing stormwater infrastructure may need upgrades to meet 2019 SWMMWW

4. PLANTS

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

____ deciduous tree: alder, maple, aspen, other
____ evergreen tree: fir, cedar, pine, other
____ shrubs
____ grass
____ pasture
____ crop or grain
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eel grass, milfoil, other
__X__ other types of vegetation: Site Landscaping (please refer to the Creek Road Mixed Use landscape plan, City File No. 20070404).

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

Some of the existing landscaping will be removed to accommodate the proposed new improvements. Once construction is complete, new plantings will be added to restore landscape buffers around the site. Please refer to the proposed Landscape Plan submitted with the Site Plan Review application. Any trees removed with diameter exceeding 8 inches will be replaced at 1:1 basis

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

None to our knowledge.

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

Certain areas throughout the site have been landscaped with native species in an effort to enhance the vegetation on site and to diminish the impact of site construction. Please refer to the Landscaping Plan, submitted with the Site Plan Review application. Landscaping must meet Chapter 18.55 YMC

5. ANIMALS

a. Circle any birds and animals, which have been observed on or near the site or are known to be on or near the site:

Birds: hawk, heron, eagle, songbirds, other crows, miscellaneous small birds
Mammals: deer, bear, elk, beaver, other ____squirrels_____
Fish: bass, salmon, trout, herring, shellfish, other _____

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

Maps indicate the property contains soils moderately suitable as habitat for the Mazama Pocket Gopher, a protected species listed on the Washington Priority Species and Habitat List as well as the Federal Threatened Species List. The site has been developed, is mostly paved with graded building pads. Visual reconnaissance shows no evidence of gopher activity. If there is evidence of pocket gopher activity on the property, a critical areas report would be required.

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

The site is located within the boundaries of the western flyway for migratory bird populations.

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

Certain areas throughout the site have been landscaped with native species in an effort to enhance the vegetation on site and to diminish the impact of the site construction. Some of these landscaped areas will be kept, and some will be replaced. Please refer to the proposed Landscaping Plan submitted with this application.

6. ENERGY AND NATURAL RESOURCES

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.

Electricity will be needed to serve the proposed building with lighting and heat. Electrical energy is immediately available to the site. During the colder months the upper floors of the building will be heated to an average temperature of 54 degrees.

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:

The requirements of the State Building Code and the State Energy Code will be incorporated into construction. Energy conserving materials and fixtures are encouraged in all new construction.

7. ENVIRONMENTAL HEALTH

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.

The project will not generate any environmental health hazards.

1) Describe special emergency services that might be required.

None to our knowledge.

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

There are no on-site environmental health hazards known to exist today nor are there any that will be generated as a direct result of this proposal.

b. Noise

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

The main source of off-site noise in this area originates from the vehicular traffic present on Creek Street SE.

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.

Short-term noise impacts will result from the use of construction and building equipment during site development. These temporary activities will be limited to normal working hours.

Long-term impacts will be those associated with the increase of activity on the site; additional traffic and noise associated with the use of the self-storage facility (which is minimal) will not create a significant impact in the area.

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

Building construction will be done during the allowed construction hours prescribed by the Yelm Municipal Code. Construction equipment will be equipped with muffler devices.

8. LAND AND SHORELINE USE

a. What is the current use of the site and adjacent properties?

The site is currently developed as a parking lot and two commercial building pads.

North: Heavy Commercial (C-2), commercial buildings and lumber yard
East: Heavy Commercial (C-2), residential apartment homes
South: Heavy Commercial (C-2), commercial buildings and tractor dealer
West: Commercial (C-1), strip retail buildings and United States Post Office.

b. Has the site been used for mineral excavation, agriculture or forestry? If so, describe.

Not to our knowledge.

c. Describe any structures on the site.

None. The site is currently developed as a parking lot and two commercial building pads.

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

None. The parking lot improvements and some of the landscaping will be removed to make way for the proposed structure.

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

The current zoning is Heavy Commercial (C-2).

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

The current comprehensive plan designation Heavy Commercial (C-2).

g. 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 "natural resource", "critical" or "environmentally sensitive" area? If so, specify.

The site is located within an aquifer recharge area.

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

The proposal will employ two full time people. None will reside in the completed structure

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:

The proposal is consistent with current City of Yelm zoning and will conform to the goals and policies set forth by the City.

9. HOUSING

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

Not applicable.

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

None.

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

Not applicable.

10. AESTHETICS

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

The height of the building will be approximately 40 feet. The exterior of the building will be concrete modular units (CMU) and metal siding. The exterior will feature alternating colors and materials and a parapet roof line topped with a cornice and featuring transitions in height.

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

No views will be obstructed. In fact, the proposed structure will offer additional screening and privacy from Creek Street for the apartment homes to the east.

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

The proposed building will be of a scale and size that will be compatible with the surrounding buildings. Colors and types of construction materials will be tasteful and residential in theme, in keeping with the style of the surrounding buildings. Construction materials will include CMU, metal and other textured siding, which provides variation and visual interest. Building finishes will be painted with alternating dark and light colors to break-up the building façades. A parapet roof line with residential-style cornices will accent the building facades. Existing and proposed landscaping will continue to buffer the development from the surrounding properties and from Creek Street.

11. LIGHT AND GLARE

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

Light and glare will originate from exterior lighting. Some lighting may be used to enhance the security of the buildings at night, but the effect on surrounding properties will be minimal. Light will also be produced from vehicles using the site. These impacts would occur primarily in the evening and before dawn.

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

No.

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

The only offsite source of light and glare will be from vehicles, street lighting from adjacent streets and nearby commercial buildings and apartment homes.

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

Wherever possible, exterior lights will be installed and shielded to direct light downward.

12. RECREATION

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

There are no known recreational opportunities in the immediate vicinity.

b. 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:

Not applicable.

13. HISTORIC AND CULTURAL PRESERVATION

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

None to our knowledge.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None.

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

Not applicable.

14. TRANSPORTATION

a. Identify sidewalks, trails, public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Primary access to the site is from Creek Street SE. Two vehicular entrances to the site were constructed in 2008 during the Creek Road Mixed Use Project (City File No 20070404). The subject site is also fronted by public sidewalks.

b. Is site currently served by public transit? By what means? If not, what plans exist for transit service?

Yes, there is public transit service on Creek Street SE – Intercity Transit Route 94.

c. How many parking spaces would the completed project have? How many would the project eliminate?

The project would eliminate the existing parking lot improvements and 71 parking spaces to make way for the new structure, but would add 24 new parking stalls: 8 near the retail/leasing office, 5 in the loading bay, and 11 near the exit gate. Parking for the entire project will meet City requirements for retail (1 stall per 250 square feet of gross floor area) and general industrial use (1 space per employee based on the greatest number of employees on a single shift, plus one for each vehicle owned or operated by the company).

Parking subject to Chapter 18.54 YMC

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

The northern-most site access will be the primary site access for all traffic; the proposed development will use the second, southerly access primarily for egress and for emergency access. New private sidewalks will be constructed to connect the proposed building and other site pathways to the public sidewalk.

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

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Self-storage is one of the lowest traffic generators and has less traffic than typical retail, office, business and even residential subdivisions. According to previous traffic studies conducted by the applicant, similar-sized storage facilities generate as few as 10-15 PM peak hour trips.

Trip generation report July 2021 showed 14.4 new pm peak hour trips

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

Payment of TFCs

None at this time.

15. PUBLIC SERVICES

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

Self-storage is a low-intensity use. The number of people present at any time on the site that may require emergency services (such as fire, health, and police services) is relatively small compared to other types of land uses.

b. Proposed measures to reduce or control direct impacts on public services, if any. Fire impact fees will be required

The building will be constructed to meet all applicable standards and codes of the City and the International Building Code. The proposed development will contribute to the local tax base and provide additional tax revenue for the various public services. The impact to traffic will be mitigated through the payment of impact fees.

16. UTILITIES

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

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.

All utilities are available to the site.

Electric Service will be provided by Puget Sound Energy
Natural Gas will be provided by Puget Sound Energy
Refuse Service will be provided by LeMay
Water Service will be provided by the City of Yelm
Sanitary Sewer will be provided by The City of Yelm
Telephone Service will be provided by Consolidated Communications

C. SIGNATURE

IThe above answers are true and complete to the best of my knowledge. I understand that the City of Yelm is relying on them to make its decision.

Signature: _____

Date Submitted: May 28, 2021

First American Exhibit A	ISSUED BY **First American Title Insurance Company** File No: NCS-1053898-WA1

The Land referred to herein below is situated in the County of Thurston, State of Washington, and is described as follows:

UNITS 1, 2 AND UNDIVIDED INTEREST OF TRACTS A AND B OF AMENDED CREEK ROAD BINDING SITE PLAN NO. BSP-07-0404-YL, AS RECORDED NOVEMBER 14, 2017 UNDER RECORDING NO. 4596870, WHICH IS AN AMENDMENT OF BINDING SITE PLAN RECORDED JANUARY 9, 2017 UNDER RECORDING NO. 4543027, IN THURSTON COUNTY, WASHINGTON.

Stormwater Site Plan

Stor-House Yelm
Yelm, WA 98597

Prepared For:
Gilroy Family Five, LLC
1614 – 118th Avenue SE
Bellevue, WA 98005

Report Prepared By:
J.E. Gibson Engineering and Consulting Inc.
PO Box 178
Tenino, WA 98589
360.951.1454

Date Prepared
June 2021

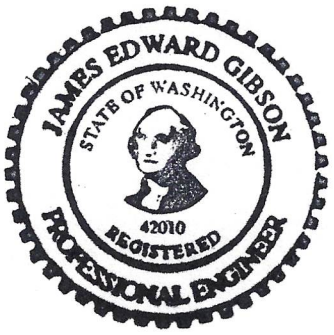
PROJECT ENGINEER'S CERTIFICATION

The technical material and data contained in these documents were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer to practice as such, is affixed below.

James E Gibson 6-7-2021

Jim Gibson, PE
Principal

Date



SECTION 1: PROJECT OVERVIEW

This Stormwater Site Plan was prepared for the proposed self-storage facility that will be located adjacent to Creek Street SE in Yelm. The Stormwater Site Plan was prepared to comply with the minimum technical standards and requirements that are set forth in the *2012 Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW) as amended in December 2014*. The proposed self-storage commercial development improvements will be constructed on Unit 1, Unit 2, and Tract A of the amended Creek Road Binding Site Plan. Specifically, the proposed site improvements and construction activities include the following:

- Site preparation, grading, and erosion control activities
- Construction of a 3-story self-storage facility
- Replacement/reconfiguration of the existing impervious surface parking lot
- Construction of on-site stormwater facilities
- Reconnection/extension of utilities (water, sewer, storm, power, etc.)

The proposed project improvements will result in more than 2,000 ft^2, but less than 5,000 ft^2 of "net-new" impervious surface area. According to the *SWMMWW,* Minimum Requirements 1-5 need to be addressed. The following table summarizes how each requirement will be met.

MINIMUM REQUIREMENT	COMPLIANCE WITH MINIMUM REQUIREMENT
#1 - Stormwater Site Plan	The contents of this report and the enclosed plans are intended to satisfy this requirement.
#2 - Construction SWPPP	A Construction SWPPP has been prepared and is enclosed as an appendix.
#3 - Source Control of Pollution	If required, a Source Control Pollution Prevention Plan will be recorded against the property prior to certificate of occupancy.
#4 - Drainage Path Preservation	Preservation of the site's previously established natural drainage paths will be maintained to the maximum extent practicable.
#5 - Stormwater Management	A below-grade infiltration trench is being proposed; the LID Performance Standard will be met.

Table 1: Compliance with Minimum Technical Requirements

SECTION 2: SITE CONDITIONS

Existing Site Conditions

The Threshold Discharge Area (TDA), which consists of Unit 1, Unit 2, and Tract A of the amended Creek Road Binding Site Plan, is approximately 1.56 acres in size and is developed; an existing parking lot, landscaping area, and two building pads currently reside on the TDA. The proposed site improvements will disturb approximately 95% of the TDA area. The site, generally, slopes in a west-to-east direction. According to Thurston County GIS mapping, there are no on-site wetlands, and the subject area is not positioned in the floodplain. City of Yelm water and sewer facilities will be extended to the proposed storage facility and power will be provided by PSE. At the time of the project survey, there wasn't any evidence to suggest that the site was or is being used as a solid waste dump site. The TDA is bordered by other commercial development enterprises.

The TDA was developed back in the late 2000s and was a part of a bigger development (Creek Road Mixed Use) with master planned water quality and flow control facilities for multiple businesses. The Stormwater Report for the project is enclosed as an appendix. The TDA's parking lot was constructed, but the two building pads have remained vacant. The proposed parking lot will be reconfigured, and the proposed self-storage facility will be positioned closer to NE Creek Street. Currently, on-site generated stormwater from the TDA is routed to the east and discharged through Contech StormFilters for water quality treatment and then released to below-grade infiltration rock galleries. The existing stormwater facilities were designed in accordance with the *2005 Department of Ecology Stormwater Management Manual for Western Washington*. An equivalent amount of landscaping and impervious surface area from the proposed development will be routed to the existing off-site stormwater infrastructure for treatment and infiltration after construction activities are completed.

Soils Information

A geotechnical report was finalized by Earth Solutions NW, LLC in May 2021. The geotechnical engineer classified the in-situ soil along the vertical profile of the infiltration stratum as poorly graded gravel with sand. Groundwater was not encountered in the test pits. The geotechnical engineer recommended a long-term design infiltration rate of 5 inches per hour for proposed stormwater facilities. The geotechnical report is enclosed as an appendix.

SECTION 3: OFF-SITE ANALYSIS AND REPORT

A majority of on-site generated stormwater runoff from the proposed project will continue to be routed off-site to the existing water quality and flow control facilities. The "net-new" increase in impervious surface area from the proposed site improvements will be conveyed to an on-site Aqua-Swirl AS-2 unit for water quality treatment and then discharged to a below-grade rock infiltration gallery for 100% infiltration. Off-site discharge from the "net-new" increase in impervious surface area is not proposed. Historic off-site drainage courses will not be altered. Consequently, downstream impacts are not anticipated.

SECTION 4: PERMANENT STORMWATER CONTROL PLAN

Summary Section

The following tables identifies the different land-type designations & their respective areas for the TDA:

LAND TYPE DESIGNATIONS	EXISTING CONDITIONS	PROPOSED CONDITIONS
Threshold Discharge Area	67,934 sq. ft.	67,934 sq. ft
Asphalt Area	28,739 sq. ft	26,045 sq. ft
Building Area	18,082 sq. ft	27,016 sq. ft
Sidewalk Area	7,336 sq. ft	3,480 sq. ft
Landscaping Area	13,777 f sq. ft	11,393 sq. ft

Table 2: Land Type Designations Summary Table

The "net-new" increase in impervious surface area from the existing conditions to the proposed conditions is 2,384 ft^2. A 4,018 ft^2 area of the proposed parking lot will be conveyed to an on-site Aqua Swirl AS-2 unit for water quality treatment and then discharged to a 5' wide x 50' long x 4' deep below-grade rock gallery for 100% infiltration; stormwater from the remaining impervious and pervious site improvements will be collected and routed off-site to the existing water quality and flow control infrastructure that was constructed/installed in the late 2000s.

Low Impact Development Features

The LID performance standard will be met for this project. Consequently, the construction of bioretention facilities, rain gardens, permeable pavement, etc. are not required for this project.

Water Quality System

Stormwater from the parking lot area that will not be routed off-site (4,018 ft^2) will be conveyed to an on-site Aqua-Swirl AS-2 unit. *Clear Creek's Western Washington Hydrologic Modeling (WWHM)* software was used to size the Aqua-Swirl unit. According to the analysis, the water quality flow rate from the "net-new" parking lot area is 0.02 cfs. Aqua-Swirl AS-2 units have a maximum water quality flow rate of approximately 0.55 cfs.

Flow Control System

After treatment, on-site generated stormwater will be discharged to a below-grade infiltration rock gallery. According to a completed *WWHM* model, a 5' wide x 50' long x 4' deep (includes 1' of freeboard) rock gallery is required to infiltrate 100% of the influent runoff file. Refer to the enclosed *WWHM* report for calculations and design parameters of the proposed infiltration facility.

SECTION 5: PERMITS

Building and Right-of-Way permits will need to be secured from the City of Yelm prior to beginning construction activities.

SECTION 6: CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

A Construction Stormwater Pollution Prevention Plan has been prepared in accordance with *Volume II of the SWMMWW* and is enclosed as an appendix.

END OF STORMWATER SITE PLAN

Earth Solutions NW LLC

Geotechnical Engineering
Construction Observation/Testing
Environmental Services

GEOTECHNICAL ENGINEERING STUDY
STOR-HOUSE YELM
10520 CREEK STREET SOUTHEAST
YELM, WASHINGTON

ES-1259.03

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PREPARED FOR

GILORY FAMILY FIVE, LLC

May 28, 2021

Adam Z. Shier, L.G.
Project Geologist

KEVEN D. HOFFMANN
STATE OF WASHINGTON
53734
REGISTERED
PROFESSIONAL ENGINEER
05/28/2021

Keven D. Hoffmann, P.E.
Geotechnical Engineering Services Manager

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
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May 28, 2021
ES-1259.03

Gilroy Family Five, LLC
1614 – 118th Avenue Southeast
Bellevue, Washington 98005

Earth Solutions NW LLC
Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

Attention: Mr. Patrick Gilroy

Dear Mr. Gilroy:

Earth Solutions NW, LLC (ESNW) is pleased to present this geotechnical report to support the subject project. Based on the results of the geotechnical investigation, construction of the proposed storage facility and related infrastructure improvements is feasible from a geotechnical standpoint. Our study indicates the site is underlain by about two to four feet of compact fill, with native recessional outwash deposits below.

the proposed self-storage building structure may be supported on conventional continuous and spread footing foundations bearing on either compact structural fill (including suitable or re-compacted fill placed during past grading activities) or competent native soil. In general, competent soils suitable for support of the new foundation should be encountered within the upper two to three feet of existing grades. In any case, where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, mechanical compaction of the soils to the specifications of structural fill or overexcavation and replacement with suitable structural fill may be necessary.

For sizing and design considerations, it is our opinion a preliminary long-term design rate of 5 inches per hour may be considered in the native recessional outwash deposits. The native outwash deposits have the potential to successfully facilitate the implementation of infiltration facilities on site, provided that proper separation from the groundwater table is maintained. A higher infiltration rate may be feasible following infiltration facility placement and targeted in-situ infiltration testing. As part of any infiltration proposal, monitoring of seasonal high groundwater levels (through at least one wet season) may also be prudent and/or required by the presiding jurisdiction.

Pertinent geotechnical recommendations are provided in this report. The opportunity to be of service to you is appreciated. Should you have any questions regarding the content of this geotechnical engineering study, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC

Adam Z. Shier, L.G.
Project Geologist

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GEOTECHNICAL ENGINEERING STUDY
STOR-HOUSE YELM
10520 CREEK STREET SOUTHEAST
YELM, WASHINGTON

ES-1259.03

INTRODUCTION

General

This geotechnical engineering study (study) was prepared for the proposed storage unit facility to be constructed east of Creek Street Southeast, about 300 feet north of the intersection with 106th Avenue Southeast, in Yelm, Washington. The purpose of this study was to provide geotechnical recommendations for currently proposed development plans. Our scope of services for completing this study included the following:

- Excavating test pits to characterize soil and near-surface groundwater conditions.
- Laboratory testing of soil samples collected at the test pit locations.
- Conducting engineering analyses.
- Preparation of this report.

The following documents and maps were reviewed as part of our study preparation:

- Topographic Survey, prepared by MTN2COAST, LLC, dated April 2, 2021.
- Yelm Municipal Code (YMC) Chapter 18.21: Critical Areas and Resource Lands.
- Surficial Hydrogeologic Units of the Puget Sound Aquifer System, Washington and British Columbia, for the Centralia Quadrangle, by M.A. Jones, 1998.
- Stormwater Management Manual for Western Washington (2019 SWMMWW), prepared by the Washington State Department of Ecology, July 2019.
- Online Web Soil Survey (WSS) resource, maintained by the Natural Resources Conservation Service under the United States Department of Agriculture.
- Geologic Information Portal, maintained by the Washington State Department of Natural Resources (DNR).
- Liquefaction Susceptibility Map of Thurston County, Washington, by Stephen P. Palmer et al., September 2004.

Project Description

We understand a new three-story storage facility and related infrastructure improvements are proposed for the subject site. We anticipate grading activities will include a series of cuts and fills to establish the planned finish grade elevations and building pad(s). Based on the existing grades, we estimate cuts and fills to establish finish grades will be roughly five feet or less.

At the time of report submission, building plans were not readily available for review. However, based on our experience with similar projects, we expect the building structure will be comprised of concrete masonry unit (CMU) wall construction and slab-on-grade floors. As such, building loads are anticipated to be approximately 4 to 6 kips per foot, with slab-on-grade loading of roughly 250 to 350 pounds per square foot (psf).

If the above design assumptions either change or are incorrect, ESNW should be contacted to review the recommendations provided in this report. ESNW should review final designs to confirm that our geotechnical recommendations have been incorporated into the plans.

SITE CONDITIONS

Surface

The subject site is located at 10520 Creek Street Southeast, in Yelm, Washington. The approximate location of the property is illustrated on Plate 1 (Vicinity Map). The property is comprised of two tax parcels (Thurston County parcel numbers 64303400-404 and -405), totaling about two-thirds acre.

The site is bordered to the north by open space, to the east by an apartment development, to the south by a commercial warehouse building, and to the west by Creek Street Southeast. Per the referenced survey, the site is relatively level, with about two feet of elevation change. Currently, the site is vacant and covered with grass and a paved parking area.

Subsurface

An ESNW representative observed, logged, and sampled five test pits on April 27, 2021. The test pits were completed using an excavator and operator retained by our firm. The approximate locations of the test pits are depicted on Plate 2 (Test Pit Location Plan). Please refer to the test pit logs provided in Appendix A for a more detailed description of subsurface conditions. Representative soil samples collected at the test pit locations were evaluated in accordance with Unified Soil Classification System (USCS) and USDA methods and procedures.

Soil Profile & Geologic Setting

Fill was encountered at all test pit locations extending to depths of about two to three-and-one-half feet below the existing ground surface (bgs). The fill was characterized as silty gravel, consistent with reworked native soil.

Underlying the fill, native soils consisted primarily of medium dense well-graded gravel, poorly graded gravel, and poorly graded sand (USCS: GW, GP, and SP, respectively). The native soils were encountered in a moist condition extending to the maximum exploration depth of approximately eight feet bgs.

The referenced geologic map identifies Vashon recessional outwash (Qvrg) as underlying the site and surrounding area. According to the geologic map, the recessional outwash deposit is typified by moderately to poorly sorted gravel and sand with small amounts of silt and clay. Ice-contact deposits, glacial outwash alluvium, and minor amounts of ablation till may also be included. The referenced WSS resource identifies Spanaway gravelly sandy loam (Map Unit Symbol: 110) as underlying the site and immediately surrounding areas. The Spanaway series is associated with volcanic ash over gravelly outwash. Based on our field observations, native soil conditions observed at the test pit locations are consistent with recessional outwash deposits, as outlined herein.

Groundwater

During our subsurface exploration completed on April 27, 2021, groundwater seepage was not encountered at the test pit locations. Seeps are common within glacial deposits; elevations and seepage rates depending on many factors, including precipitation duration and intensity, the time of year, and soil conditions. In general, groundwater flow rates are higher during the winter, spring, and early summer months.

Geologically Hazardous Areas Review

We reviewed both YMC 18.21 and a database maintained by Thurston County to assist in characterizing potential geologically hazardous areas both on site and in the immediate vicinity of the site. YMC 18.21.100 designates erosion, landslide, and seismic hazard areas as the geologically hazardous areas specifically recognized by the City of Yelm. Our review indicates that geologically hazardous areas have not been mapped on site or in proximity to the site. Based on our field observations, it is our opinion the site is correctly mapped outside of geologically hazardous areas.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our investigation, construction of the proposed self-storage facility and related infrastructure improvements is feasible from a geotechnical standpoint. The primary geotechnical considerations associated with the proposed development include building subgrade preparation, foundation support, slab-on-grade subgrade support, the suitability of using on-site soils as structural fill, and infiltration facility design (where applicable).

The proposed self-storage building structure may be supported on conventional continuous and spread footing foundations bearing on either compact structural fill (including suitable or re-compacted fill placed during past grading activities) or competent native soil. In general, competent soils suitable for support of the new foundation should be encountered within the upper two to three feet of existing grades. In any case, where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, mechanical compaction of the soils to the specifications of structural fill or overexcavation and replacement with suitable structural fill may be necessary.

For sizing and design considerations, it is our opinion a preliminary long-term design rate of 5 inches per hour may be considered in the native recessional outwash deposits. The native outwash deposits have the potential to successfully facilitate the implementation of infiltration facilities on site, provided that proper separation from the groundwater table is maintained. A higher infiltration rate may be feasible following infiltration facility placement and targeted in-situ infiltration testing. As part of any infiltration proposal, monitoring of seasonal high groundwater levels (through at least one wet season) may also be prudent and/or required by the presiding jurisdiction.

Site Preparation and Earthwork

Initial site preparation activities will consist of installing temporary erosion control measures, establishing grading limits, and clearing and stripping the site (as necessary). Subsequent earthwork procedures will likely involve grading activities and related infrastructure improvements.

Temporary Erosion Control

The following temporary erosion and sediment control (TESC) Best Management Practices (BMPs) are offered:

- Temporary construction entrances and drive lanes, consisting of at least six inches of quarry spalls, should be considered to both minimize off-site soil tracking and provide a stable access entrance surface. Placement of a geotextile fabric beneath the quarry spalls will provide greater stability, if needed.
- Silt fencing should be placed around the site perimeter.
- When not in use, soil stockpiles should be covered or otherwise protected.
- Temporary measures for controlling surface water runoff, such as interceptor trenches, sumps, or interceptor swales, should be installed prior to beginning earthwork activities.
- Dry soils disturbed during construction should be wetted to minimize dust.
- When appropriate, permanent planting or hydroseeding will help to stabilize site soils.

Additional TESC BMPs, as specified by the project civil engineer and indicated on the plans, should be incorporated into construction activities. TESC BMPs may be modified during construction as site conditions require and as approved by the site erosion control lead.

Excavations and Slopes

Excavation activities are likely to expose medium dense soil (both fill and native). Based on the soil conditions observed at the test pit locations, a maximum allowable temporary slope inclination of one-and-one-half horizontal to one vertical (1.5H:1V) inclination is recommended. Per Federal Occupation Safety and Health Administration and Washington Industrial Safety and Health Act guidelines, the on-site soil should be considered a Type C soil.

The presence of perched groundwater may cause localized sloughing of temporary slopes. An ESNW representative should observe temporary and permanent slopes to confirm the slope inclinations are suitable for the exposed soil conditions and to provide additional excavation and slope recommendations, as necessary. If the recommended temporary slope inclinations cannot be achieved, temporary shoring may be necessary to support excavations. Permanent slopes should be planted with vegetation to both enhance stability and minimize erosion and should maintain a gradient of 2H:1V or flatter.

In-situ and Imported Soils

From a geotechnical standpoint, in general, our field observations indicate on-site soils likely to be encountered during construction will be suitable for use as structural fill, provided the soil moisture content is at (or slightly above) the optimum level at the time of placement and compaction. Successful use of on-site soils as structural fill will largely be dictated by the moisture content at the time of placement and compaction. It should be noted on-site soils are generally well drained and are not considered moisture sensitive.

Imported soil intended for use as structural fill should consist of a well-graded, granular soil with a moisture content that is at (or slightly above) the optimum level. During wet weather conditions, imported soil intended for use as structural fill should consist of a well-graded, granular soil with a fines content of 5 percent or less (where the fines content is defined as the percent passing the Number 200 sieve, based on the minus three-quarter-inch fraction).

Structural Fill

Structural fill placed and compacted during site grading activities should meet the following specifications and guidelines:

- Structural fill material — Granular soil*
- Moisture content — At or slightly above optimum**
- Relative compaction (minimum) — 95 percent (Modified Proctor)
- Loose lift thickness (maximum) — 12 inches

* *Existing on-site soil may not be suitable for use as structural fill, unless at or near the optimum moisture content at the time of placement and compaction.*

** *Soil shall not be placed dry of optimum and should be evaluated by ESNW during construction.*

With respect to underground utility installations and backfill, local jurisdictions may dictate the soil type(s) and compaction requirements. We recommend removing any unsuitable material or debris from structural areas, if encountered.

Subgrade Preparation

Foundations should be constructed on competent native soil or structural fill placed directly atop competent native soil. Loose or unsuitable soil conditions encountered below areas of footing and slab elements should be remedied as recommended in this report. Uniform compaction of the foundation and slab subgrade areas will establish a relatively consistent subgrade condition below the foundation and slab elements. ESNW should observe the foundation and slab subgrade prior to placing formwork. Supplementary recommendations for subgrade improvement can be provided at the time of construction and would likely include further mechanical compaction effort and/or overexcavation and replacement with suitable structural fill.

Foundations

Based on the findings of our investigation, the proposed self-storage building structure may be supported on conventional continuous and spread footing foundations bearing on either compact structural fill (including suitable or re-compacted fill placed during past grading activities) or competent native soil. In general, competent soils suitable for support of the new foundation should be encountered within the upper two to three feet of existing grades. In any case, where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, mechanical compaction of the soils to the specifications of structural fill or overexcavation and replacement with suitable structural fill may be necessary. Provided foundations will be supported as prescribed above, the following parameters may be used for design:

- Allowable soil bearing capacity 3,000 psf
- Passive earth pressure 300 pcf (equivalent fluid)
- Coefficient of friction 0.40

A one-third increase in the allowable soil bearing capacity may be assumed for short-term wind and seismic loading conditions. The above passive pressure and friction values include a factor-of-safety of 1.5. With structural loading as expected, total settlement in the range of one inch and differential settlement of about one-half inch is anticipated. Most of the anticipated settlement should occur during construction as dead loads are applied.

Seismic Design

The 2018 International Building Code (2018 IBC) recognizes the most recent edition of the Minimum Design Loads for Buildings and Other Structures manual (ASCE 7-16) for seismic design, specifically with respect to earthquake loads. Based on the soil conditions encountered at the test pit locations, the parameters and values provided below are recommended for seismic design per the 2018 IBC.

Parameter	Value
Site Class	D*
Mapped short period spectral response acceleration, S_S (*g*)	1.28
Mapped 1-second period spectral response acceleration, S_1 (*g*)	0.462
Short period site coefficient, F_a	1.0
Long period site coefficient, F_v	1.838†
Adjusted short period spectral response acceleration, S_{MS} (*g*)	1.28
Adjusted 1-second period spectral response acceleration, S_{M1} (*g*)	0.849†
Design short period spectral response acceleration, S_{DS} (*g*)	0.853
Design 1-second period spectral response acceleration, S_{D1} (*g*)	0.566†

* *Assumes medium dense native soil conditions, encountered to a maximum depth of eight feet bgs during the April 2021 field exploration, remain medium dense to at least 100 feet bgs.*

† *Values assume F_v may be determined using linear interpolation per Table 11.4-2 in ASCE 7-16.*

As indicated in the table footnote, several of the seismic design values provided above are dependent on the assumption that site-specific ground motion analysis (per Section 11.4.8 of ASCE 7-16) will not be required for the subject project. ESNW recommends the validity of this assumption be confirmed at the earliest available opportunity during the planning and early design stages of the project. Further discussion between the project structural engineer, the project owner, and ESNW may be prudent to determine the possible impacts to the structural design due to increased earthquake load requirements under the 2018 IBC. ESNW can provide additional consulting services to aid with design efforts, including supplementary geotechnical and geophysical investigation, upon request.

The referenced liquefaction susceptibility map indicates the site and surrounding areas maintain very low liquefaction susceptibility. Liquefaction is a phenomenon where saturated and loose soils suddenly lose internal strength and behave as a fluid. This behavior is in response to increased pore water pressures resulting from an earthquake or other intense ground shaking. In our opinion, site susceptibility to liquefaction can be considered low. The soil gradation, the relative density of native soils, and the absence of a uniformly established, shallow groundwater table were the primary bases for this opinion.

Slab-on-Grade Floors

Slab-on-grade floors for the proposed building structure should be supported on a well-compacted, firm, and unyielding subgrade. Existing fill and native soils exposed at the slab-on-grade subgrade level can likely be compacted in situ to the specifications of structural fill. Unstable or yielding areas of the subgrade should be recompacted, or overexcavated and replaced with suitable structural fill, prior to slab construction.

A capillary break consisting of a minimum of four inches of free-draining crushed rock or gravel should be placed below the slab. The free-draining material should have a fines content of 5 percent or less (where the fines content is defined as the percent passing the Number 200 sieve, based on the minus three-quarter-inch fraction). In areas where slab moisture is undesirable, installation of a vapor barrier below the slab should be considered. If a vapor barrier is to be utilized, it should be a material specifically designed for use as a vapor barrier and should be installed in accordance with the specifications of the manufacturer.

Retaining Walls

Retaining walls must be designed to resist earth pressures and applicable surcharge loads. The following parameters may be used for design:

- Active earth pressure (unrestrained condition) — 35 pcf (equivalent fluid)
- At-rest earth pressure (restrained condition) — 55 pcf
- Traffic surcharge* (passenger vehicles) — 70 psf (rectangular distribution)
- Passive earth pressure — 300 pcf (equivalent fluid)
- Coefficient of friction — 0.40
- Seismic surcharge — 7H**

* *Where applicable*
** *Where H equals the retained height (in feet)*

The above design parameters are based on a level backfill condition and level grade at the wall toe. Revised design values will be necessary if sloping grades are to be used above or below retaining walls. Additional surcharge loading from adjacent foundations, sloped backfill, or other relevant loads should be included in the retaining wall design.

Retaining walls should be backfilled with free-draining material that extends along the height of the wall and a distance of at least 18 inches behind the wall. The upper 12 inches of the wall backfill may consist of a less permeable soil, if desired. A perforated drain pipe should be placed along the base of the wall and connected to an approved discharge location. A typical retaining wall drainage detail is provided on Plate 3. If drainage is not provided, hydrostatic pressures should be included in the wall design.

Drainage

Although not encountered at the time of our subsurface exploration (April 2021), groundwater seepage should be anticipated in deeper site excavations, particularly during the winter, spring, and early summer months. Temporary measures to control surface water runoff and groundwater during construction would likely involve interceptor trenches, interceptor swales, and sumps. ESNW should be consulted during preliminary grading to both identify areas of seepage and provide recommendations to reduce the potential for seepage-related instability.

Finish grades must be designed to direct surface drain water away from structures and slopes. Water must not be allowed to pond adjacent to structures or slopes. In our opinion, foundation drains should be installed along building perimeter footings. A typical foundation drain detail is provided on Plate 4.

Preliminary Infiltration Feasibility

As indicated in the *Subsurface* section of this report, the native soil encountered during our fieldwork was characterized primarily as medium dense outwash sand and gravel deposits. In accordance with USDA textural analyses, the deposits are classified primarily as extremely gravelly coarse sand. Disregarding gravel contents at the tested locations, fines contents within the native gravelly sandy loam were about 2 to 8 percent, per USDA testing procedures and methods.

For preliminary sizing and design considerations, a long-term infiltration rate was calculated using the soil grain size analysis method, which is K_{sat} Determination Option 3 in the 2019 SWMMWW. Based on the gradation analyses performed on representative soil samples collected during the fieldwork, it is our opinion a preliminary long-term design rate of 5 inches per hour may be considered in the native recessional outwash deposits.

The native outwash deposits have the potential to successfully facilitate the implementation of infiltration facilities on site, provided that proper separation from the groundwater table is maintained. A higher infiltration rate may be feasible following infiltration facility placement and targeted in-situ infiltration testing. As part of any infiltration proposal, monitoring of seasonal high groundwater levels (through at least one wet season) may also be prudent and/or required by the presiding jurisdiction. In any case, ESNW should be contacted to review submittal designs and to provide additional recommendations or consulting services, as necessary.

Utility Support and Trench Backfill

In our opinion, on-site soils will generally be suitable for support of utilities. Remedial measures may be necessary in some areas to provide support for utilities, such as overexcavation and replacement with structural fill and/or placement of geotextile fabric. Groundwater seepage may be encountered within utility excavations, and caving of trench walls may occur where groundwater is encountered. Depending on the time of year and conditions encountered, dewatering or temporary trench shoring may be necessary during utility excavation and related installations.

Native and existing fill soils encountered at the test pit locations may be suitable for use as structural backfill in the utility trench excavations provided the soil is at or near the optimum moisture content at the time of placement and compaction. Moisture conditioning of the soils will likely be necessary at some locations prior to use as structural fill and may likely require the addition of moisture due to the coarse nature of the native deposits. Each section of utility line must be adequately supported in the bedding material. Utility trench backfill should be placed and compacted to the specifications of structural fill as previously detailed in this report or to the applicable specifications of the presiding jurisdiction.

Preliminary Pavement Sections

The performance of site pavements is largely related to the condition of the underlying subgrade. To ensure adequate pavement performance, the subgrade should be in a firm and unyielding condition when subjected to proofrolling with a loaded dump truck. Structural fill in pavement areas should be compacted to the specifications previously detailed in this report. Soft, wet, or otherwise unsuitable subgrade areas may still exist after base grading activities. Areas containing unsuitable or yielding subgrade conditions will require remedial measures, such as overexcavation and/or placement of thicker crushed rock or structural fill sections, prior to pavement.

We anticipate new pavement sections will be subjected primarily to passenger vehicle traffic. For lightly loaded pavement areas subjected primarily to passenger vehicles, the following preliminary pavement sections may be considered:

- A minimum of two inches of hot-mix asphalt (HMA) placed over four inches of crushed rock base (CRB).

- A minimum of two inches of HMA placed over three inches of asphalt-treated base (ATB).

Heavier traffic areas generally require thicker pavement sections depending on site usage, pavement life expectancy, and site traffic. For preliminary design purposes, the following pavement sections for occasional truck traffic and access roadways areas may be considered:

- Three inches of HMA placed over six inches of CRB.

- Three inches of HMA placed over four-and-one-half inches of ATB.

An ESNW representative should be requested to observe subgrade conditions prior to placement of CRB or ATB. As necessary, supplemental recommendations for achieving subgrade stability and drainage can be provided. If on-site roads will be constructed with an inverted crown, additional drainage measures may be recommended to assist in maintaining road subgrade and pavement stability.

Final pavement design recommendations, including recommendations for heavy traffic areas, access roads, and frontage improvement areas, can be provided once final traffic loading has been determined. Road standards utilized by the governing jurisdiction may supersede the recommendations provided in this report. The HMA, ATB, and CRB materials should conform to WSDOT specifications. All soil base material should be compacted to a relative compaction of 95 percent, based on the laboratory maximum dry density as determined by ASTM D1557.

LIMITATIONS

This report has been prepared for the exclusive use of Gilroy Family Five, LLC, and its representatives. The recommendations and conclusions provided in this report are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. No warranty, express or implied, is made. Variations in the soil and groundwater conditions observed at the test locations may exist and may not become evident until construction. ESNW should reevaluate the conclusions provided in this study if variations are encountered.

Additional Services

ESNW should have an opportunity to review final project plans with respect to the geotechnical recommendations provided in this study. ESNW should also be retained to provide testing and consultation services during construction.

Reference:
Thurston County, Washington
OpenStreetMap.org

NORTH

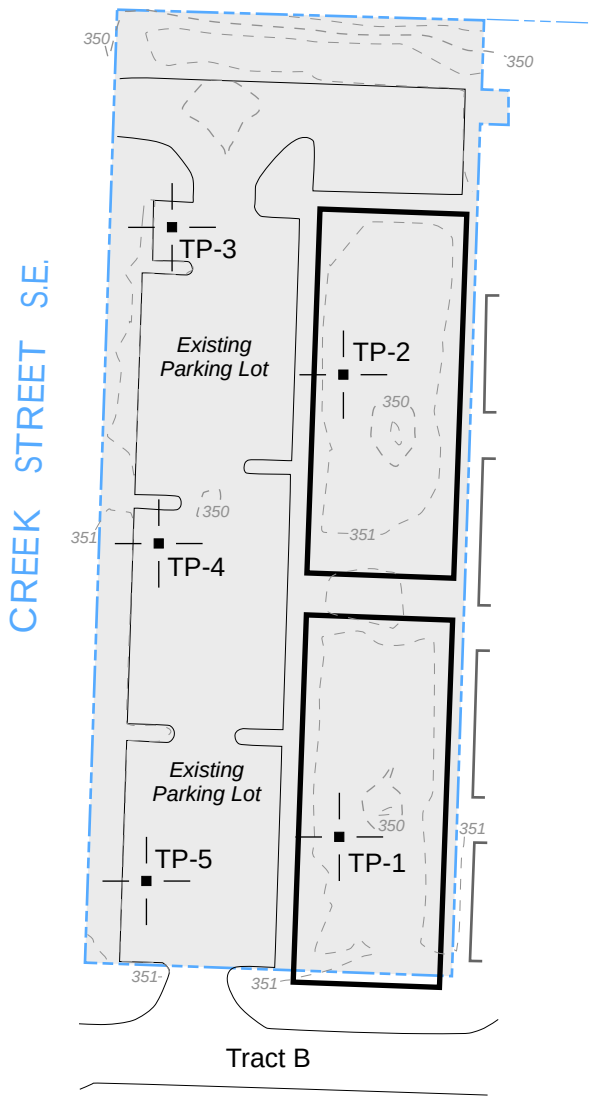
NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Vicinity Map
Stor-House Yelm
Yelm, Washington

Drwn. CAM	Date 05/27/2021	Proj. No. 1259.03
Checked KDH	Date May 2021	Plate 1



LEGEND

TP-1 — Approximate Location of ESNW Test Pit, Proj. No. ES-1259.03, April 2021

Subject Site

Proposed Building

Existing Building

NORTH

0 40 80 160

1"=80'

Scale in Feet

NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

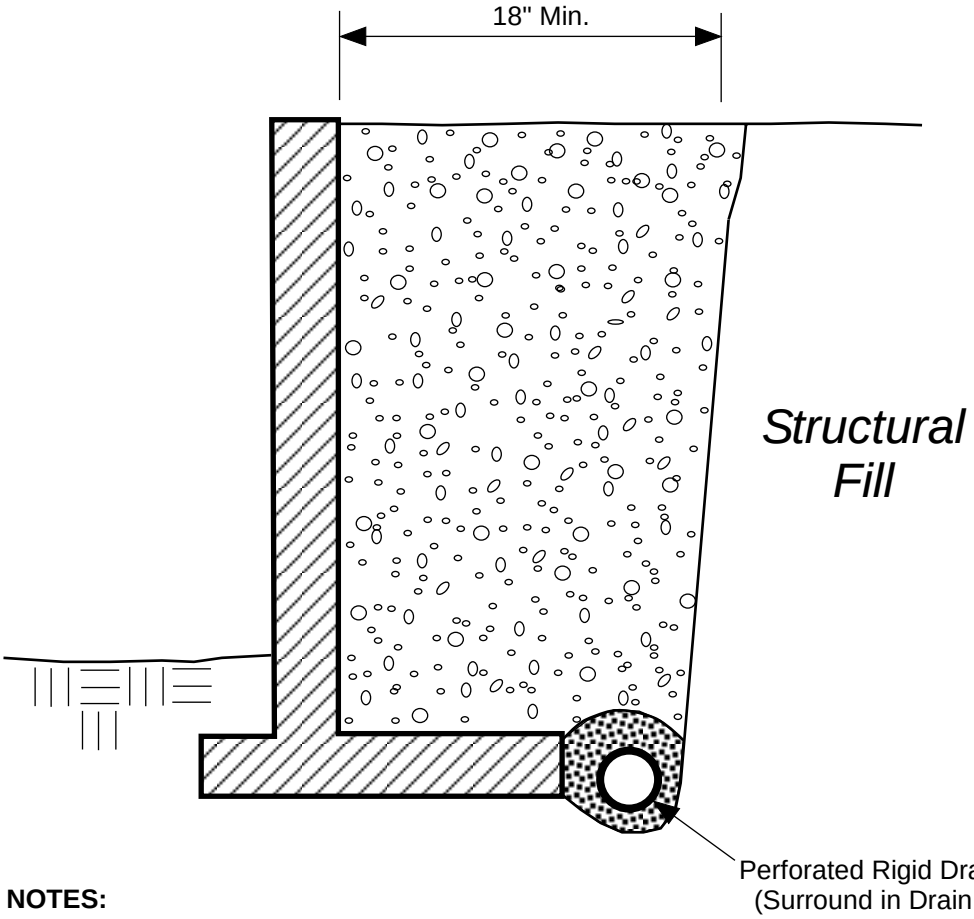
NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Test Pit Location Plan
Stor-House Yelm
Yelm, Washington

Drwn. CAM	Date 05/27/2021	Proj. No. 1259.03
Checked KDH	Date May 2021	Plate 2



NOTES:

- Free-draining Backfill should consist of soil having less than 5 percent fines. Percent passing No. 4 sieve should be 25 to 75 percent.
- Sheet Drain may be feasible in lieu of Free-draining Backfill, per ESNW recommendations.
- Drain Pipe should consist of perforated, rigid PVC Pipe surrounded with 1-inch Drain Rock.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:

Free-draining Structural Backfill

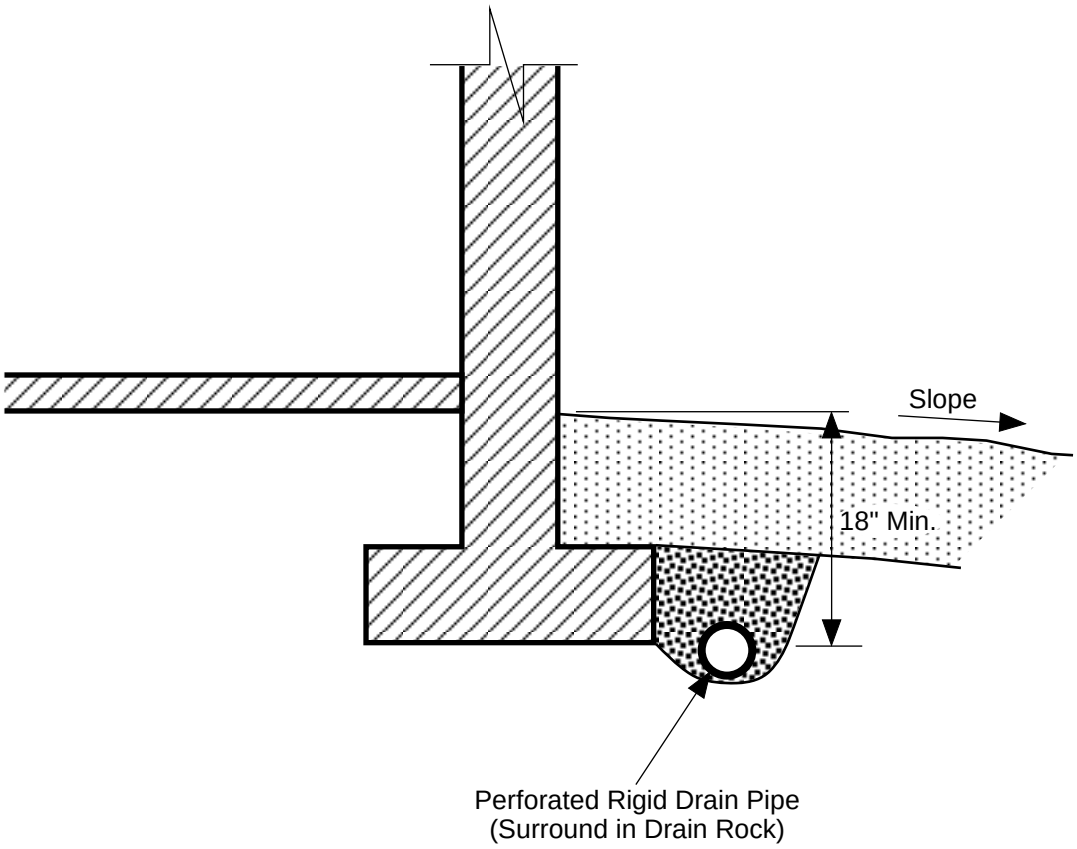
1-inch Drain Rock

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Retaining Wall Drainage Detail
Stor-House Yelm
Yelm, Washington

Drwn. CAM	Date 05/27/2021	Proj. No. 1259.03
Checked KDH	Date May 2021	Plate 3



NOTES:

- Do NOT tie roof downspouts to Footing Drain.
- Surface Seal to consist of 12" of less permeable, suitable soil. Slope away from building.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:

Surface Seal: native soil or other low-permeability material.

1-inch Drain Rock

Earth Solutions NW LLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Footing Drain Detail
Stor-House Yelm
Yelm, Washington

Drwn. CAM	Date 05/27/2021	Proj. No. 1259.03
Checked KDH	Date May 2021	Plate 4

Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

for

Shur – Stor Yelm

Prepared for:
Department of Ecology
Southwest Region

Permittee / Owner	Developer	Operator / Contractor
Shur – Stor Yelm	Gilroy Family Five, LLC	T.B.D.

XX Creek Street SE
Yelm, WA 98597

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
T.B.D.	T.B.D.	T.B.D.

SWPPP Prepared By

Name	Organization	Contact Phone Number
Jim Gibson, P.E.	J.E. Gibson Consulting	(360) 951-1454

SWPPP Preparation Date

June 2021

Project Construction Dates

Activity / Phase	Start Date	End Date
Commercial Construction	Summer 2021	Spring 2022

List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO_2	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

Project Information (1.0)

Project/Site Name: Shur – Stor Yelm
Street/Location: XX Creek Street SE
City: Yelm State: WA Zip code: 98597
Subdivision: N/A
Receiving waterbody: Yelm Creek

Existing Conditions (1.1)

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: 1.56 acres

Disturbed acreage: 1.50 acres

Existing structures: N/A

Landscape topography: Paved and flat.

Drainage patterns: On-site generated stormwater runoff is routed to binding site plan water quality and follow control facilies.

Existing Vegetation: N/A

Proposed Construction Activities / Project Narrative (1.2)

The proposed self-storage commercial development improvements will be constructed on Unit 1, Unit 2, and Tract A of the amended Creek Road Binding Site Plan. Specifically, the proposed site improvements and construction activities include the following:

- Site preparation, grading, and erosion control activities
- Construction of a 3-story self-storage facility
- Replacement/reconfiguration of the existing impervious surface parking lot
- Construction of on-site stormwater facilities
- Reconnection/extension of utilities (water, sewer, storm, power, etc.)

There are no known groudnwater and/or soil contaminants on the site.

“Track-out” is an illicit discharge. To prevent truck “track-out,” quarry spall construction entrances will be installed at the construction entrance for both project sites. Brooming of tires, wheel washing, etc. may be required to prevent “track-out.” Silt fencing and/or straw wattles will be installed along the perimeter of both project sites. The bottom of the silt fencing shall be lined with plastic lining to prevent filtration through the silt fencing on the south site.

Contingency Planning

In the event that the previously described construction stormwater strategies or following BMPs fail to satisfy the permit requirements, additional measures shall be taken. Additional measures may include, but are not limited to auxiliary treatment facilities, retention or impoundment of untreated wastes, stopping production, or transport of untreated wastes to another treatment facility.

Construction Stormwater Best Management Practices (BMPs) (2.0)

The purpose of a Construction Stormwater Pollution Prevention Plan (SWPPP) is to describe the potential for pollution problems during the duration of a construction project. The SWPPP also explains and illustrates the measures that may need to be taken on the construction site to control said problems. The SWPPP is a guideline for the Contractor to follow during the construction process to prevent erosion and migration of sediments. Erosion control measures are not limited to those that are identified in this SWPPP or on the temporary erosion and sediment control plans. Construction Best Management Practices (BMPs) shall be installed as necessary to meet the Department of Ecology's guidelines for construction stormwater pollution prevention and the requirements that are set forth in the National Pollutant Discharge Elimination System (NPDES) Permit.

This SWPPP was prepared in accordance to the established guidelines and BMPs that are set forth in *Volume* 2 *of the 2014 Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW)*. The *SWMMWW* describes the twelve (12) elements of construction stormwater pollution prevention. The twelve (12) elements include the following:

- Element 1 – Mark Clearing Limits
- Element 2 – Establish Construction Access
- Element 3 – Control Flow Rates
- Element 4 – Install Sediment Controls
- Element 5 – Stabilize Soils
- Element 6 – Protect Slopes
- Element 7 – Protect Drain Inlets
- Element 8 – Stabilize Channels and Outlets
- Element 9 – Control Pollutants
- Element 10 – Control Dewatering
- Element 11 – Maintain BMPs
- Element 12 – Manage the Project
- Element 13 – Protection of Low Impact Development BMPs

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

The 13 Elements (2.1)

Element 1: Preserve Vegetation / Mark Clearing Limits (2.1.1)

Prior to beginning land disturbing activities, which include site clearing and grading, the Contractor shall mark the clearing limits (including trees) that are to be preserved within the construction zone. High-visibility fences shall be installed/erected as shown on the temporary erosion and sediment control plan and in accordance with the landscaping plan. The following BMPs are applicable for this project. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

- BMP C101: Preserving Natural Vegetation
- BMP C103: High-Visibility Plastic or Metal Fence with Backup Support
- BMP C104: Stake and Wire Fence

Element 2: Establish Construction Access (2.1.2)

A stabilized construction entrance shall be constructed to minimize the tracking of sediment onto any public road. The stabilized construction entrance shall be constructed per the TESC plans and details and in accordance with the requirements of BMP C105.

- BMP C105: Stabilized Construction Entrance

Element 3: Control Flow Rates (2.1.3)

Properties and waterways downstream from the development site shall be protected from erosion due to increases in the volume, velocity, and/or peak flow rates of stormwater runoff from the project site. The following BMPs are applicable for this project. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

- BMP C240: Sediment Trap
- BMP C241: Temporary Sediment Pond

Element 4: Install Sediment Controls (2.1.4)

Prior to leaving a construction site or prior to discharging into an infiltration facility, stormwater runoff must pass through a sediment pond or some other appropriate BMP for removal of sediments. Silt fencing and straw bale barriers shall be constructed as shown on the temporary and erosion sediment control plans. The following BMPs are applicable for this project. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

- BMP C230: Straw Bale Barrier
- BMP C231: Brush Barrier
- BMP C232: Gravel Filter Berm
- BMP C233: Silt Fence
- BMP C234: Vegetated Filter Strip
- BMP C235: Straw Wattles
- BMP C240: Sediment Trap
- BMP C241: Temporary Sediment Pond
- BMP C251: Construction Stormwater Filtration

Element 5: Stabilize Soils (2.1.5)

All exposed and unworked soils shall be stabilized by application of effective BMPs, which protect the soil from the erosive forces of raindrop impact, flowing water, and from wind erosion. From October 01 through April 30 of each calendar year, no soils shall remain exposed and unworked form more than two (2) days. From May 01 to September 30 of each calendar year, no soils shall remain exposed and unworked for more than seven (7) days. This condition applies to all on-site soils, whether at final grade or not.

In areas where the on-site soils will remain unworked for more than the aforementioned time duration limits or have reached final grade, seeding and mulching shall be installed in accordance with BMP C120 and C121. Sod shall be installed in accordance with BMP C124 for disturbed areas that require immediate vegetative cover. Dust control shall be used as needed to prevent wind transport of dust from disturbed soil surfaces and in accordance with BMP C140. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C123: Plastic Covering
- BMP C124: Sodding
- BMP C125: Topsoiling
- BMP C140: Dust Control

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

East of the Cascade Mountains Crest, except the Central Basin*

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	July 1 – September 30	10 days
During the Wet Season	October 1 – June 30	5 days

The Central Basin*, East of the Cascade Mountain Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	July 1 – September 30	30 days
During the Wet Season	October 1 – June 30	15 days

*Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Element 6: Protect Slopes (2.1.6)

Slopes shall be constructed in such a manner that will minimize erosion. This shall include, but is not limited to: placing excavated material on the uphill side of trenches, collecting drainage at the top of slopes, etc. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

- BMP C200: Interceptor Dike and Swale
- BMP C205: Subsurface Drains
- BMP C206: Level Spreader
- BMP C207: Check Dams

Element 7: Protect Drain Inlets (2.1.7)

All storm drain catch basins/inlets that are in use during construction, as well as all existing structures within the project limits, shall be protected so that stormwater runoff shall not enter any conveyance system without first being filtered or treated to remove sediment from sediment laden runoff. Install storm drain inlet protection devices as shown on the erosion and sediment control plans and in accordance with BMP C220.

- BMP C220: Storm Drain Inlet Protection

Element 8: Stabilize Channels and Outlets (2.1.8)

All temporary on-site conveyance channels shall be constructed and stabilized to prevent erosion. Stabilization that is adequate to prevent erosion of outlets and drainage channels shall be provided. If the following BMPs are not shown on the construction plan set, the Engineer reserves the right to direct the Contractor to install, construct, and/or implement said BMPs.

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

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

Element 9: Control Pollutants (2.1.9)

All pollutants, including waste materials and demolition of debris, that are generated or brought on-site during construction activities shall be handled and disposed of in a manner that does not cause contamination of stormwater. Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drawdown, solvent and degreasing cleaning operations, fuel tank drawdown 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. 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. 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(s) to stormwater runoff. Manufacturers' recommendations shall be followed for application rates and procedures. The following Source Control BMPs will be prepared/implemented by the Contractor for this project.

- A Spill Prevention Plan
- Maintenance of storm drainage facilities
- Street sweeping at an interval that's prescribed by the authority having jurisidction

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Element 10: Control Dewatering (2.1.10)

Clean, non-turbid dewatered water, as determined by the Certified Professional in Erosion and Sediment Control, can be discharged to systems tributary to state surface waters, provided the dewatering flow does not cause erosion or flooding to receiving waters.

Highly turbid or otherwise contaminated dewatered water that's from construction equipment operation, clamshell digging, concrete tremie pour, or work inside a cofferdam, shall be handled separately from stormwater at the site. Some disposal options, depending on site constraints, may include:

- Transport off-site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute State waters
- On-site treatment using chemical treatment or other suitable treatment technologies
- Sanitary sewer discharge with local sewer district's approval if there is no other option

Element 11: Maintain BMPs (2.1.11)

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW or Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC 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 stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

Element 12: Manage the Project (2.1.12)

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
    - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
    - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the Site Map. Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
    - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

Table 6 – BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
[Insert construction activity]	[Insert BMP]	[MM/DD/YYYY]	[Insert Season]
Phase of Construction Project	**Stormwater BMPs**	**Date**	**Wet/Dry Season**

[Insert construction activity]	[Insert BMP]	[MM/DD/YYYY]	[Insert Season]

Element 13: Protect Low Impact Development (LID) BMPs (2.1.13)

Protect all biofiltration swale and detention pond BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the biofiltration swale and/or detention pond. Restore BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden swale and/or pond soils, and replacing the removed soils with soils meeting the design specification.

Prevent compacting the biofiltration soil and detention pond BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment. Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

- BMP C102: Buffer Zone
- BMP C103: High Visibility Fence
- BMP C200: Interceptor Dike and Swale
- BMP C201: Grass-Lined Channels
- BMP C207: Check Dams
- BMP C208: Triangular Silt Dike
- BMP C231: Brush Barrier
- BMP C233: Silt Fence
- BMP C234: Vegetated Strip

Pollution Prevention Team (3.0)

Table 7 – Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)		
Resident Engineer		
Emergency Ecology Contact		
Emergency Permittee/ Owner Contact		
Non-Emergency Owner Contact		
Monitoring Personnel		
Ecology Regional Office	Southwest Regional Office	(360) 742-9751

Monitoring and Sampling Requirements (4.0)

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling 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
- Stormwater sampling data

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

Complete the following paragraph for sites that discharge to impaired waterbodies for fine sediment, turbidity, phosphorus, or pH:

Site Inspection (4.1)

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

Stormwater Quality Sampling (4.2)

Turbidity Sampling (4.2.1)

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

Table 8 – Turbidity Sampling Method

	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU **or** the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU **or** the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours. https://www.ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue
    - Central Region (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490
    - Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
    - Northwest Region (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000
    - Southwest Region (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
    - Turbidity is 25 NTU (or lower).
    - Transparency is 33 cm (or greater).
    - Compliance with the water quality limit for turbidity is achieved.
        - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
        - 1% - 10% over background turbidity, if background is 50 NTU or greater
    - The discharge stops or is eliminated.

pH Sampling (4.2.2)

pH monitoring is required for “Significant concrete work” (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project).The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO_2) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO_2 sparging or dry ice.

Method for sampling pH:

Table 8 – pH Sampling Method

	pH meter
	pH test kit
	Wide range pH indicator paper

Reporting and Record Keeping (6.0)

Record Keeping (6.1)

Site Log Book (6.1.1)

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
- Sample logs

Records Retention (6.1.2)

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

Updating the SWPPP (6.1.3)

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

Reporting (6.2)

Discharge Monitoring Reports (6.2.1)

Cumulative soil disturbance is one (1) acre or larger; therefore, Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting "No Discharge". The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology's WQWebDMR System.

https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance

Notification of Noncompliance (6.2.2)

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. 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 five (5) days, unless requested earlier by Ecology.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- Central Region at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County
- Eastern Region at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- Northwest Region at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- Southwest Region at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call

6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water.

APPENDIX 5
2007 CREEK ROAD MIXED USE STORMWATER REPORT

· SOUND ENGINEERING, INC. ·

civil engineers · land planners

PRELIMINARY STORMWATER SITE PLAN

FOR

CREEK ROAD MIXED USE TACOMA, WASHINGTON

SEPTEMBER 2007

PREPARED FOR:

YELM CREEK BUILDINGS, LLC
240 STADIUM WAY SOUTH
TACOMA, WA 98402

PREPARED BY:

JAMEY BARR, E.I., PROJECT ENGINEER

SOUND ENGINEERING, INC.
1102 COMMERCE STREET, SUITE 300
TACOMA, WA 98402
(253) 573-0040

PROJECT 07118.10

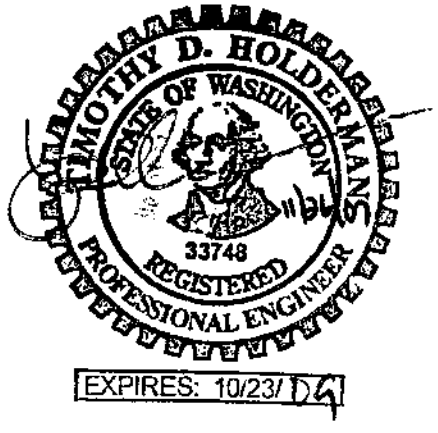
DATED 11.07

PRELIMINARY STORMWATER SITE PLAN

FOR

CREEK ROAD MIXED USE
YELM, WASHINGTON

November 2007



Prepared For:

Yelm Creek Buildings, LLC
240 Stadium Way South
Tacoma, WA 98402

Prepared By:

Jamey Barr, Project Engineer

Approved By:

Timothy D. Holderman, P.E., Principal

REPORT #07118.10

This analysis is based on data and records either supplied to or obtained by Sound Engineering, Inc. These documents are referenced within the text of the analysis. This analysis has been prepared utilizing procedures and practices within the standard accepted practices of the industry.

SOUND ENGINEERING, INC.

TABLE OF CONTENTS

1.0 PROJECT OVERVIEW

1.1 Project Location and Minimum Requirements

This report has been prepared as part of requirements for Site Plan Review for the Creek Road mixed use project, as submitted to the City of Yelm. The site Address is 10520 Creek Rd. SE, Yelm WA, 98567

Section 29 Township 17 Range 2E

General site located is at the northeast corner of Creek Road, and Yelm Ave. (SR 507), the parcel numbers are PARCEL 'A' – 64303400400, and PARCEL 'B' – 64303400501. See associated topographic boundary survey as submitted with the plan set. Also see vicinity map provided within Appendix 'A'.

All storm drainage requirements have been designed according to the *2005 Stormwater Management Manual for Western Washington.* Stormwater runoff from the developed site will be collected and conveyed via tighlined systems to one of four infiltration trench beds. Prior to release into the trenches, pollution generating surface runoff is designed to be conveyed through the required "*Contech" Stormwater Solution*s stormfilter vaults.

Minimum requirements as listed in Volume 1 of the *2005 Stormwater Management Manual for Western Washington* are:

1. Preparation of Stormwater Site Plans

2. Construction Stormwater Pollution Prevention (SWPPP)

3. Source Control of Pollution

4. Preservation of Natural Drainage Systems and Outfalls

5. On-site Stormwater Management

6. Runoff Treatment

7. Flow Control

8. Wetlands Protection

9. Basin/Watershed Planning

10. Operation and Maintenance

1.2 Project Description

The proposal is to construct a 164-unit multi-family residential and two commercial/retail strip buildings totaling 16,740 square feet. The total site area is approximately 11.06 acres. The development will include stormwater facilities, utilities, public and private roadways, parking lots and open space. In addition, a commercial development of three buildings totaling approximately 28,800 square feet and approximately 6.02 acres on the tax parcels known as 64303400501 and 64303400502 will be incorporated in the design of the aforementioned development.

The proposed storm drain systems onsite have been broken into 4 sub basins which will collect and convey all pollution generating stormwater runoff from the paved areas to a

stormfilter manhole or vault by *Contech Stormwater Solutions,* for water quality treatment, then to the associated infiltration bed. Runoff from nonpollution generating surfaces will be collected and conveyed directly to associated infiltration bed. Roof runoff from several units to the east side of the site will be conveyed directly to wetland buffer which is to remain undisturbed, via dispersal trenches. Runoff from the existing adjacent site is designed to be treated via a bioswale then released into the existing retention facility. Minor disturbance to the existing bioswale is required in order to construct the adjacent site parking areas, it is to be slightly regraded and replanted in place.

2.0 EXISTING CONDITIONS SUMMARY

The project parcels are bordered to the west by Creek Road and to the south by Yelm Ave (SR 507). An existing commercial building with associated parking areas, and runoff treatment and infiltration facilities exists onsite to the south. To the north an existing lumber yard, with associated access and parking exists. The eastern side of the site development area abuts Yelm Creek. All construction is proposed outside of the buffer zone for the creek.

The site is predominantly covered by mid sized grass and vegetation historically used as agricultural pasture. Runoff sheet flows naturally at a slight slope of approximately 1% from the west to the east. A couple existing residences exist onsite which are to be demolished. A Geotechnical study was performed by *GeoResources*, see Appendix 'B'.

Soils onsite are mapped as Spanaway gravelly sandy loam (110) and Spanaway stony sandy loam (112) by NCRS – SCS (Thurston County Soil Conservation Survey).

3.0 Off-Site Analysis

Runoff from the site sheet flows to the east to the Yelm Creek, where it then flows to the south within the creek. Due to highly permeable soils found onsite it is likely that much of the existing runoff also infiltrates and is conveyed via subsurface flows.

4.0 Permanent Stormwater Control Plan

4.1 Pre-developed Site Hydrology

A roadway for access to the existing commercial building and associated parking exist on the site to the south. A bioswale has been implemented to treat runoff from the existing road and parking areas, and then routed to an existing infiltration pond to the south east of the site. Runoff from the existing building is designed to be routed directly to drywells adjacent to the building.

4.2 Developed Site Hydrology

The developed site is broken into four basins:

The first basin (Basin 1) is located to the northwest of the site, adjacent to Creek Road. Stormwater runoff generated by roadway, sidewalk and parking areas will be collected and conveyed to a 72" *Contech Stormwater Solutions* Stormfilter manhole housing 5 cartridges for water quality treatment. Flow is then conveyed to infiltration trench bed 'A' which consists of 2, 125' long x 6' wide trenches hydraulically connected. See Appendix 'D' for basin exhibits, calculations, and details.

The second basin (Basin 2) encompasses a majority of the north parcel directly to the east of Basin 1 and adjacent to Yelm Creek. Stormwater runoff generated by roadway, sidewalk and parking areas will be collected and conveyed to one of the two 6'x12' Stormfilter vaults housing 16 total cartridges for water quality treatment. Flow is then conveyed to infiltration trench bed 'B' which consists of 5, 150' long x 8' wide trenches hydraulically connected. See Appendix 'D' for Basin exhibits, calculations, and details.

The third Basin (Basin 3) is located directly to the south of Basin 2, and adjacent to Yelm Creek. Stormwater runoff generated by roadway, sidewalk and parking areas will be collected and conveyed to a *Contech Stormwater Solutions* 72" Stormfilter manhole housing 5 cartridges for water quality treatment. Flow is then conveyed to infiltration trench bed 'C' which consists of 3, 125' long x 6' wide trenches hydraulically connected. See Appendix 'D' for basin exhibits, calculations, and details.

The fourth basin (Basin 4) is located to the south and west of the existing access road constructed through the site, 160th Avenue SE. Stormwater runoff generated by roadway, sidewalk and parking areas will be collected and conveyed to a *Contech Stormwater Solutions* 72" Stormfilter manhole housing 4 cartridges for water quality treatment. Is then conveyed to infiltration trench bed 'd' which consists of 1, 125' long x 6' wide trench. See Appendix 'D' for basin exhibits, calculations, and details.

Additional roof runoff from the eastern most apartments, #5 & 6, and the apartment office building have been designed to disperse runoff to their natural discharge location via appropriately sized dispersal trenches located along the wetland boundary. Per Vol. III sec. 3.1.2 of the 2005 D.O.E. *Stormwater Management Manual for Western Washington.*

4.3 Performance Standards and Goals

Infiltration trench bed facilities and dispersion trenches for roof drainage will be implemented in accordance with minimum requirement #5 On-site Stormwater Management Vol. 1 sec. 2.5.5 of the 2005 D.O.E. *Stormwater Management Manual for Western Washington.*

Contech Stormwater Solutions Stormfilter facilities will be implemented in accordance with minimum requirement #6, Runoff Treatment Vol. 1 sec 2.5.6 of the above referenced manual. This satisfies the required "Basic treatment" facilities per Vol. 1 sec. 4.2.

4.4 Flow Control System

Storm runoff generated by proposed impervious surfaces onsite is designed to be infiltrated within the previously discussed infiltration trench beds. Doing so satisfies on-site Stormwater Management requirements for flow control.

Several test pits were dug to accurately analyze the groundwater elevations throughout the site. Careful consideration and design of the infiltration facilities was done in order to maintain the minimum 5' separation from the bottom of the trenches to the seasonal high water mark. See Appendix 'B' for Geotechnical analysis of test pit findings, and refer to preliminary grading and drainage plans for trench elevations.

The infiltration beds were sized using the Western Washington Hydrology Model Version 3 (WWHM3), see Appendix 'F'. The designed flow rate of 60 in/hr was provided by GeoResources, see Appendix 'B'. The long term infiltration rate used to size the trenches was achieved by applying a safety factor of 5 to the actual rate. Per Table 3.9 Vol. III p. 3-80 of the 2005 D.O.E *Stormwater Management Manual for Western Washington.*

Long term rate = 60 in/hr (1/5.5) = **10.9 in/hr**

Due to high permeability of the existing soils, the infiltration trenches are designed for flow control only, see the water quality system section for treatment facility design.

4.5 Water Quality System

Contech Stormwater Solutions stormfilter structures were chosen to treat the storm water runoff from the traveled area (travelways, parking stalls, sidewalks) of the developed site.

Each of the infiltration trenches is preceded by a stormfilter structure for the pollution generating surface runoff. Storm filter cartridge counts were calculated using WWHM3 to generate the target water quality 15 minute flow rate, then by applying the equation:

(Treatment flow)(449gpm/cfs / 15 gpm/cart.) = # cartridges

The results are as follows:

Basin 1: Treatment flow= 0.17 cfs

Number of Required Cartridges = **5 Cartridges**

Size of Stormfilter Vault = **72" stormfilter manhole**

Basin 2: Treatment flow= 0.53 cfs

Number of Required Cartridges = **16 Cartridges (total)**

Size of Stormfilter Vault = **(2) 6' x 12' Precast Stormfilter**

Basin 3: Treatment flow= 0.19 cfs

Number of Required Cartridges = **6 Cartridges**

Size of Stormfilter Vault = **72" stormfilter manhole**

Basin 4: Treatment flow= 0.08 cfs

Number of Required Cartridges = **3 Cartridges**

Size of Stormfilter Vault = **48" stormfilter manhole**

(See Appendix 'D' for a more complete breakdown of calculations)

Runoff collected from roofs is proposed to bypass the water quality system and be routed directly to the infiltration trench beds.

4.6 Conveyance System Analysis and Design

Conveyance calculations to be submitted with final Stormwater Site Plan.

5.0 Discussion of Minimum Requirements

The Minimum Requirements have been addressed as discussed below.

1. Preparation of Stormwater Site Plans: ***Included herein.***
2. Construction Stormwater Pollution Prevention Plan (SWPPP): ***To be submitted with construction document plans.***
3. Source Control of Pollution: ***To be submitted with construction document plans.***

4. Preservation of Natural Drainage Systems and Outfalls: ***The project does not abut a natural drainage system or outfall, flow control is designed as infiltration.***
5. On-Site Stormwater Management: ***Onsite infiltration trenches have been sized in accordance with the 2005 Stormwater Management Manual for Western Washington.***
6. Runoff Treatment: ***Stormfilter vaults and manholes will be provided.***
7. Flow Control: ***Runoff is designed to infiltrate onsite.***
8. Wetlands Protection: ***All development is outside the 50 buffer zone of the existing wetland.***
9. Basin/Watershed Planning: *NA*
10. Operation and Maintenance: ***To be submitted with final Stormwater Site Plan.***

6.0 Operation and Maintenance Manual

To be submitted with final Stormwater Site Plan.

7.0 Special Reports and Studies

To be submitted with final Stormwater Site Plan.

8.0 Bond Quantities Worksheet

To be submitted with final Stormwater Site Plan.

SOUND ENGINEERING, INC.

Jamey Barr
Project Engineer

TABLE 1- TRIP GENERATION
CREEK ROAD SELF STORAGE - YELM
ITE Trip Generation 10th Edition

Time Period	Size (X)	TG Rate	Enter %	Enter Trips	Exit %	Exit Trips	Total (T)	*Pass-by %**	*Pass-by Trips*	*Net Total*
Storage: Mini-Storage (ITE LUC 151; 84,495 sf)										
Weekday	84,495	1.51	50%	63.8	50%	63.8	127.6	*5.0%*	*6.4*	*121.2*
AM peak hour	84,495	0.1	60%	5.1	40%	3.4	8.4	*5.0%*	*0.4*	*8.0*
PM peak hour	84,495	0.17	47%	6.8	53%	7.6	14.4	*5.0%*	*0.7*	*13.6*
Storage: Mini-Storage (ITE LUC 151; 559 units)										
Weekday	559	0.1796	50%	50.2	50%	50.2	100.4	*5.0%*	*5.0*	*95.4*
AM peak hour	559	0.0139	51%	4.0	49%	3.8	7.8	*5.0%*	*0.4*	*7.4*
PM peak hour	559	0.0195	50%	5.5	50%	5.5	10.9	*5.0%*	*0.5*	*10.4*

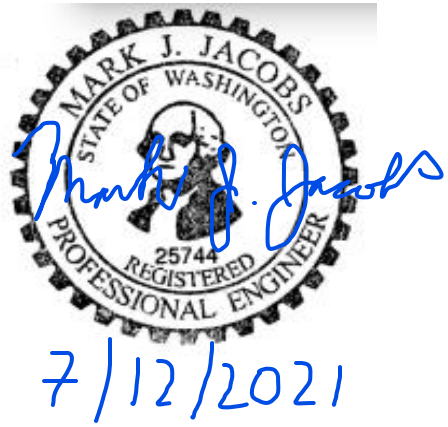
Where X = 1,000 sf or per 100 units; T = Trips
* - per ITE and JTE experience - aka Clients swinging by their storage unit on their way to and from another destination
Note: Due to rounding some values may not add up.

A vehicle trip is defined as a single or one direction vehicle movement with either the origin or destination (exiting or entering) inside the study site. The above trip generation values account for all the site trips made by all vehicles for all purposes, including commuter, visitor, recreation, and service and delivery vehicle trips.

TABLE 2 - TRAFFIC IMPACT FEE
CREEK ROAD SELF STORAGE - YELM

Use	PMPHT's	City TIF*	Estimated TIF
Mini - Storage	14.4	$ 1,497	$ 21,503

* - per Casey Mauck, Assistant Planner email to Patrick Gilroy dated 07.12.2021



7/12/2021