DETERMINATION OF NON-SIGNIFICANCE
Northshore School District No. 417
Timbercrest Middle School Field Improvements

DESCRIPTION OF PROPOSAL: The applicant, Northshore School District (District), proposes recreational track and field and associated facilities improvements at Timbercrest Middle School. The proposal includes replacing the existing natural grass field with a new multi-purpose synthetic athletic field. It also includes replacing the existing cinder track with a new six lane rubberized running track. An underdrainage system beneath the renovated track and field is also included, as well as stormwater and utility infrastructure improvements. The proposal also includes the construction of accessible walkways, bleachers, and stairs to enhance site accessibility, and a new access road to provide improved service and maintenance access to the school. Associated replacement fencing and landscaping improvements are also anticipated as a part of the proposal.

The proposed action will require approval of a Conditional Use Permit, Land Use Permit, Drainage Variance/Adjustment, Clearing and Grading Permit, Building Permit from King County. It will also include a National Pollutant Discharge Elimination System Permit from the Washington State Department of Ecology.

PROPONENT: Northshore School District No. 417

LOCATION OF PROPOSAL: The site is located at 19115 215th Way NE, Woodinville, Washington 98077 and is in unincorporated King County. The King County Tax Parcel Numbers are 0426069023 and 0426069010 and it is located in the SW Quarter of Section 4, Township 26 North, Range 6 East, W.M.

LEAD AGENCY: Northshore School District No. 417

The lead agency for this proposal has determined that the proposal does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This determination assumes compliance with State law and King County (as the permitting jurisdiction) ordinances related to general environmental protection. Issuance of this threshold determination does not constitute approval of the permit(s). This proposal will be reviewed for compliance with all King County codes, which regulate development activities.

This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available electronically to the public on the Capital Projects website. The link to that page is https://www.nsd.org/our-district/departments/capital-projects.

It is the policy of the District that, when undertaking an action involving the exercise of substantive SEPA authority, the District shall consider, as appropriate under the circumstances, the ramifications of such action as to one or more of the factors listed in Northshore School District No. 417 Policy 9630, Substantive Authority.

This Determination of Non-Significance (DNS) is issued under WAC 197-11-340(2). The lead agency will not act on this proposal for 14 days from the published date below. Comments must be submitted by July 23, 2026, to the Responsible Official as named below.

Responsible Official: Dri Ralph
Title: Executive Director of Support Services
Address: Northshore School District No. 417
22105 23rd Drive SE
Bothell, Washington 98021
Phone: (425) 408-7864; Email: dralph@nsd.org

Signature: Dri Ralph Dri Ralph (Jul 7, 2026 12:06:37 PDT) **Date:** 07/09/2026

Date Published and Issued: July 9, 2026
Comments Due: July 23, 2026
Appeals Due: July 23, 2026

This determination may be appealed to the Superintendent pursuant to the requirements of Northshore School District Board Policy No. 9280, within fourteen (14) days of the date of the challenged environmental document or determination is issued. An appeal must be in writing and addressed to the Superintendent.

Form of Appeal: For an appeal to be accepted, the letter must specify: (a) the determination being appealed; (b) the errors complained of; (c) the corrective action being sought; (d) the reasons why the determination should be changed; and (e) whether further oral or written comment or a hearing is being requested. Supporting documents may be submitted with the letter of appeal.

NORTHSHORE SCHOOL DISTRICT NO. 417

ENVIRONMENTAL CHECKLIST

Timbercrest Middle School Field Improvements

November 2025
Revised July 2026

SHOCKEY
PLANNING GROUP, Inc.

Project

Timbercrest Middle School Field Improvements

Applicant

NORTHSHORE SCHOOL DISTRICT
Attn: William Tribble
22105 23rd Drive SE
Bothell, Washington 98021-4409
Phone: (425) 408-7867

Environmental Consultant

SHOCKEY PLANNING GROUP
Attn: Camie Anderson
1426 35th Street, Suite 1
Everett, Washington 98201
Phone: (425) 258-9308

Revised July 2026
November 2025

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Appendix A – Legal Description
Appendix B – Geotechnical Report
Appendix C – Delineation Report
Appendix D – Preliminary Technical Information Report
Appendix E – Traffic Memorandum

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. **Name of proposed project, if applicable:** Timbercrest Middle School Field Improvements

2. **Name of applicant:** Northshore School District No. 417

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

Applicant Contact:	**Northshore School District No. 417** **Attn: William Tribble** 22105 23rd Drive SE Bothell, Washington 98021-4409 Phone: (425) 408-7867 Email: wtribble@nsd.org
Environmental/Permitting Consultant:	**Shockey Planning Group, Inc.** **Attn: Camie Anderson** 1426 35th Street, Suite 1 Everett, Washington 98201 Phone: (425) 258-9308 Email: canderson@shockeyplanning.com
Field Consultant:	**Ethos Civil** **Attn: Andy Epstein, P.E.** 1901 65th Ave W, Suite 250 Tacoma, Washington 98466 Phone: (253) 366-5483 Email: andy@ethoscivil.com

4. **Date checklist prepared:** November 10, 2025, revised July 6, 2026

5. **Agency requesting checklist:** King County is the agency with land use permit authority. Northshore School District (District) is the lead agency for SEPA compliance in accordance with WAC 197-11-050.

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

   Construction is anticipated to begin in 2027 or as soon as all required permits have been obtained.

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

   There are no plans for future additions, expansion or further activity related to or connected with this proposal.

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

The following reports/information are incorporated by reference, and some are attached to this environmental checklist:

Project Plans ..... Ethos Civil
Delineation Report ..... PACE Engineers
Preliminary Technical Information Report ..... Ethos Civil
Geotechnical Report ..... Certerra (formerly GeoTest)
Traffic Memorandum ..... Transpo Group

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.

There are no other applications pending that would affect this proposal.

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

The following permits/approvals have been identified for this proposal:

SEPA Review and Compliance ..... Northshore School District No. 417
Land Use Permit ..... King County
Conditional Use Permit (for increased impervious surface on the site) ..... King County
Critical Area Designation ..... King County
Drainage Variance/Adjustment ..... King County
Clearing and Grading Permit ..... King County
Building Permits ..... King County
National Pollutant Discharge Elimination System (NPDES) Permit ..... Department of Ecology

Other permits may be identified during the review and permitting process.

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

Project Description:
The Northshore School District proposes campus improvements at Timbercrest Middle School, located at 19115 215th Way NE in Woodinville, Washington. The 33.7-acre site is currently developed with a middle school building in the southeast corner, a red cinder track and natural turf field in the southwest corner, parking and student drop-off/pick-up lanes north of the school, tennis courts near the center of the campus, and two ball fields along the northern edge.

The Timbercrest Middle School Field Renovation Project will include replacing the existing cinder running track with a new six lane rubberized track surface and converting the natural grass turf field to a synthetic turf system. New spectator seating with aluminum bleachers will be installed on a new concrete pad located closer to the track and field. Site accessibility will be improved through the addition of concrete stairs with handrails and ADA compliant accessible walkways. In addition, maintenance and emergency vehicle access at the north end of the site will be modified to accommodate the renovated track and field layout.

The project will continue to utilize the existing subsurface drainage collection system, which will be reused and upgraded as necessary. Stormwater runoff will continue to be managed by the existing stormwater pond,

which will be expanded and improved to comply with current code requirements. No critical areas or associated buffers are located within or in close proximity to the proposed improvement area.

Improvements providing for field use during the evening are not planned as a part of the proposal. No amplified systems are included in the project scope work. Community use is expected to remain the same as current, with use subject to Northshore School District policy.

The upgraded athletic facilities and infrastructure will include:

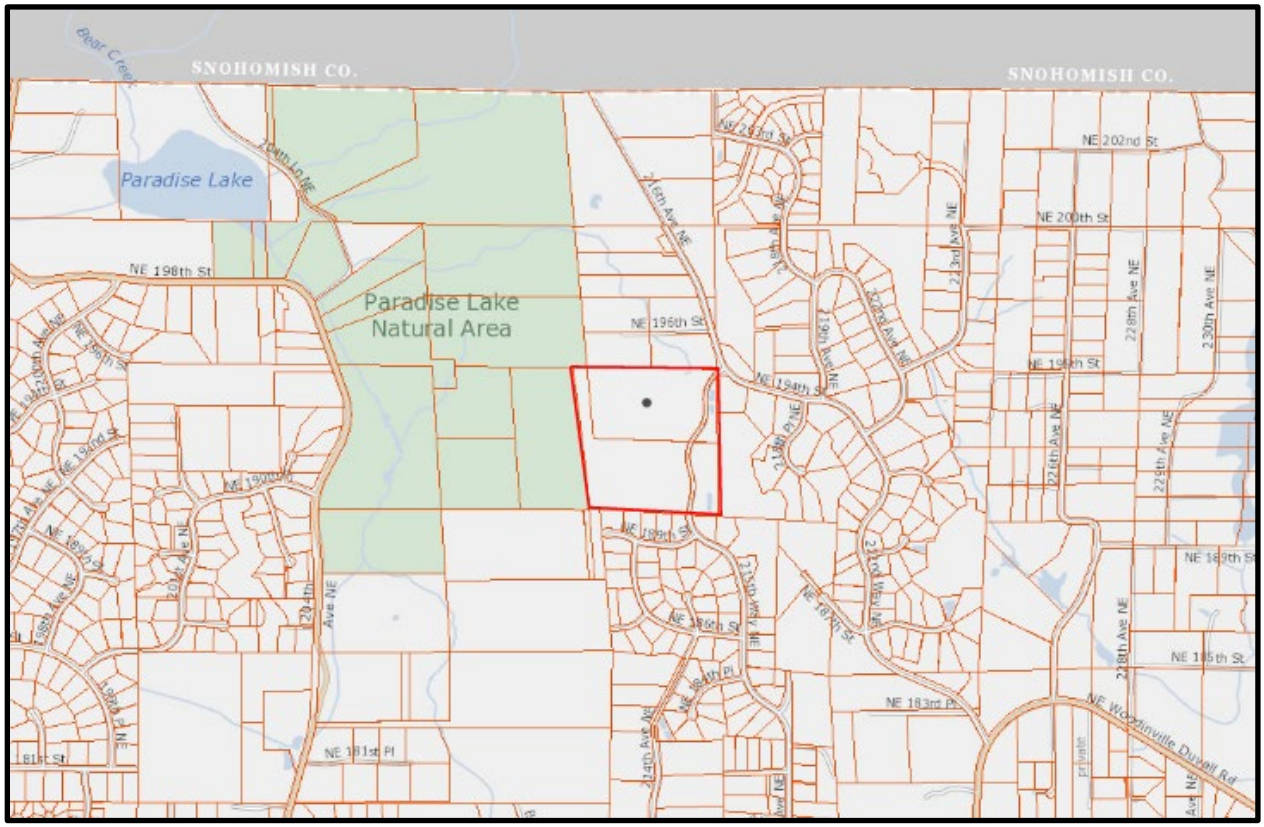
- A new multi-purpose synthetic athletic field.
- A new six-lane rubberized running track for track and field events replacing the existing cinder track.;
- An improved underdrainage system beneath the renovated track and field
- Construction of a bioretention facility with underdrains and bio-retention planting;
- Construction of accessible walkways, bleachers, and stairs to enhance site accessibility;
- Construction of an access road providing improved service and maintenance access;
-
- Grading and expansion of the existing drainage pond located north of the western ball field;
- Stormwater and utility infrastructure improvements designed to meet current King County standards;
- Removal and replacement of perimeter fencing around the track and field; and
- Restoration planting at areas of construction disturbance.

A new Conditional Use Permit is also being reviewed by King County to authorize an increase in impervious surface area on the site. Please see ***Figure 3 – Site Plan*** for additional details.

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 project site is located at 19115 215th Way NE, Woodinville, Washington 98077, within unincorporated King County. The site consists of two parcels (0426069023 and 0426069010) situated in the SW¼ of Section 4, Township 26 North, Range 6 East, Willamette Meridian (W.M.). 215th Way NE runs through the two parcels along the east side. See ***Appendix A – Legal Description*** and ***Figure 1 – Vicinity Map.***

Figure 1 - Vicinity Map



Overall site identified in red outline. Source: King County iMap 2025

Figure 2 - Project Area Aerial Map



Project area generally identified in red outline. Source: King County iMap 2025

MATCHLINE
SHEET L0.01

MATCHLINE
SHEET L0.01

WETLAND BOUNDARY
EXISTING GATE
215TH WAY NE
38.00'
EXISTING GATE
EXISTING PARKING
15'-0" WATER EASEMENT
15.00'
10.00'
EASEMENT
EXISTING GATE
EXISTING SERVICE ROAD
WETLAND BUFFER
BUS PARKING
PARCEL A
042606-9010
BOUNDARY LINE TYP.
PARCEL B
042606-9023
TIMBERCREST MIDDLE SCHOOL BUILDING
15'-0" WATER EASEMENT
EXISTING TENNIS COURTS (IMPERVIOUS)
EASEMENT
EXISTING ASPHALT
PROPOSED 6' FENCE
EXISTING SPORT FIELDS (IMPERVIOUS)
EXISTING STORAGE FACILITY
EXISTING ASPHALT
PROPOSED AREA OF IMPROVEMENT
EXPANDED DETENTION POND
PROPOSED 4' FENCE
30'-0" SETBACK
PROPOSED NEW RUBBERIZED TRACK AND SYNTHETIC TURF MULTI USE FIELD (IMPERVIOUS)
30'-0" SETBACK
60'-0" INGRESS EGRESS & UTILITIES EASEMENT
60.00'
PROPOSED BIORETENTION POND
PROPOSED 6' FENCE
TIE IN TO EXISTING FENCE
EXISTING DETENTION PONDS
EXISTING GATE
TIE IN TO EXISTING FENCE
30'-0" SETBACK
TIE IN TO EXISTING FENCE
75'-0" PIPELINE EASEMENT
75.00'
BOUNDARY LINE TYP.

0 40 80
SCALE IN FEET

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REVISIONS	DATE
JOB NO: 24.000730	
DRAWN BY: --	
APPROVED BY:	
DATE: JUNE 2026	

SCJ ALLIANCE
CONSULTING SERVICES
3625 WOODLAND PARK AVE N, SUITE 100, SEATTLE WA 98103
P: 206.789.1460
SCJSTUDIOLA.COM

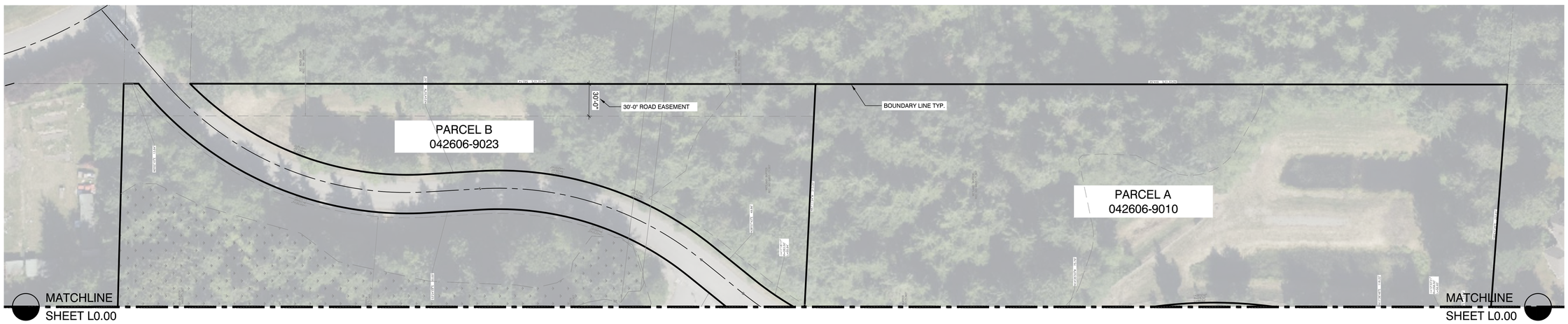
TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

SEAL:

OVERALL SITE PLAN

Figure 3

DRAWING NO:
L0.00
2 OF 18



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JOB NO: 24-000730	REVISIONS	DATE
DRAWN BY: —		
APPROVED BY: —		
DATE: JUNE 23RD,		

SCJ ALLIANCE
CONSULTING SERVICES
3625 WOODLAND PARK AVE N, SUITE 100, SEATTLE WA 98103
P: 206.729.1900
SCJSTUDIOLA.COM

TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

SEAL:

OVERALL SITE PLAN

Figure 4

DRAWING NO:

3 OF 18

STORM DRAINAGE PIPE NOTE
PIPE MINIMUM COVER IS 2'.

DRAINAGE ADJUSTMENT NOTE:
ON 9/22/2025 THE PROJECT OBTAINED A VARIANCE TO WAIVE CORE REQUIREMENT (CR) #9 (VARD25-00141) DUE TO THE SITE'S HYDROLOGY AND CONSTRAINTS. THE FIELD IS EXPECTED TO ATTENUATE RUNOFF MORE THAN WHAT CAN BE ACCOMPLISHED BY A FLOW CONTROL BMP FACILITY ALONE WHICH ACCORDING TO THE VARIANCE DECISION IS CONSIDERED MITIGATION FOR NOT PROVIDING A FLOW CONTROL BMP.

ON 1/9/2026 THE PROJECT OBTAINED A SECOND VARIANCE TO WAIVE THE PRESETTLING PORTION OF CR #8 (VARD25-0028) IN REGARDS TO THE PROPOSED BIORETENTION CELL PRESETTLING REQUIREMENTS. THE BIORETENTION CELL IS INCLUDED IN THE DESIGN TO TREAT THE PROJECT'S POLLUTION GENERATING SURFACES (THE FIELD). THE APPROVED VARIANCE STATES THAT THE FIELD'S PERMEABLE AGGREGATE BASE MATERIALS AND UNDERDRAINAGE SYSTEM WILL PROVIDE ADEQUATE PRESETTLING OF THE STORMWATER COMING FROM THE FIELD PRIOR TO DISCHARGING TO THE BIORETENTION CELL. THEREFORE, STORMWATER GENERATED FROM THE FIELD IS EXEMPT FROM PRESETTLING REQUIREMENTS.

MATCHLINE A - SEE SHEET C1.1

MAINTAIN EXISTING UNDERDRAINS. IF UNDERDRAINS ARE DETERMINED TO BE INADEQUATE BASED ON FIELD OBSERVATIONS, REPLACE EXISTING UNDERDRAINS IN KIND.

NOTE: BIORETENTION FACILITY IS SIZED FOR WATER QUALITY PURPOSES ONLY (CORE REQUIREMENT #8)

WALL ELEVATIONS KEY

1 NOT TO SCALE

TOP OF WALL (TW)
BACK OF WALL (BW)
FACE OF WALL (FW)
RETAINING WALL PER STRUCTURAL

LEGEND

- RIGHT-OF-WAY / PROPERTY LINE
- CATCH BASIN TYPE 2 (7 C2.03)
- CATCH BASIN TYPE 1 OR 30, AS NOTED (1 C2.03, 6 C2.03)
- STORM DRAINAGE CLEANOUT (SDCO) (5 C2.03)
- STORM DRAINAGE PIPING (D) (2 C2.03)
- FOOTING DRAIN/PERFORATED UNDERDRAIN (3 C2.03)
- 6" PERFORATED UNDERDRAIN
- ASPHALT PAVEMENT
- SWALE
- 123.45 SPOT ELEVATION
- 1.0% OR 3:1 SLOPE
- RETAINING WALL - REFER TO LANDSCAPE DRAWINGS
- TRENCH DRAIN - REFER TO LANDSCAPE DRAWINGS
- RIDGE OR VALLEY
- 101 EXISTING MINOR CONTOUR
- 100 EXISTING MAJOR CONTOUR
- 101 PROPOSED MINOR CONTOUR
- 100 PROPOSED MAJOR CONTOUR

N

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SCALE IN FEET

DATE	
REVISIONS	
JOB NO:	24-000730
DRAWN BY:	JTB
APPROVED BY:	TJM
DATE:	JUNE 2026

ETHOS CIVIL
Engineering Entitlement Project Management
ethoscivil.com info@ethoscivil.com 253.414.1999

TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

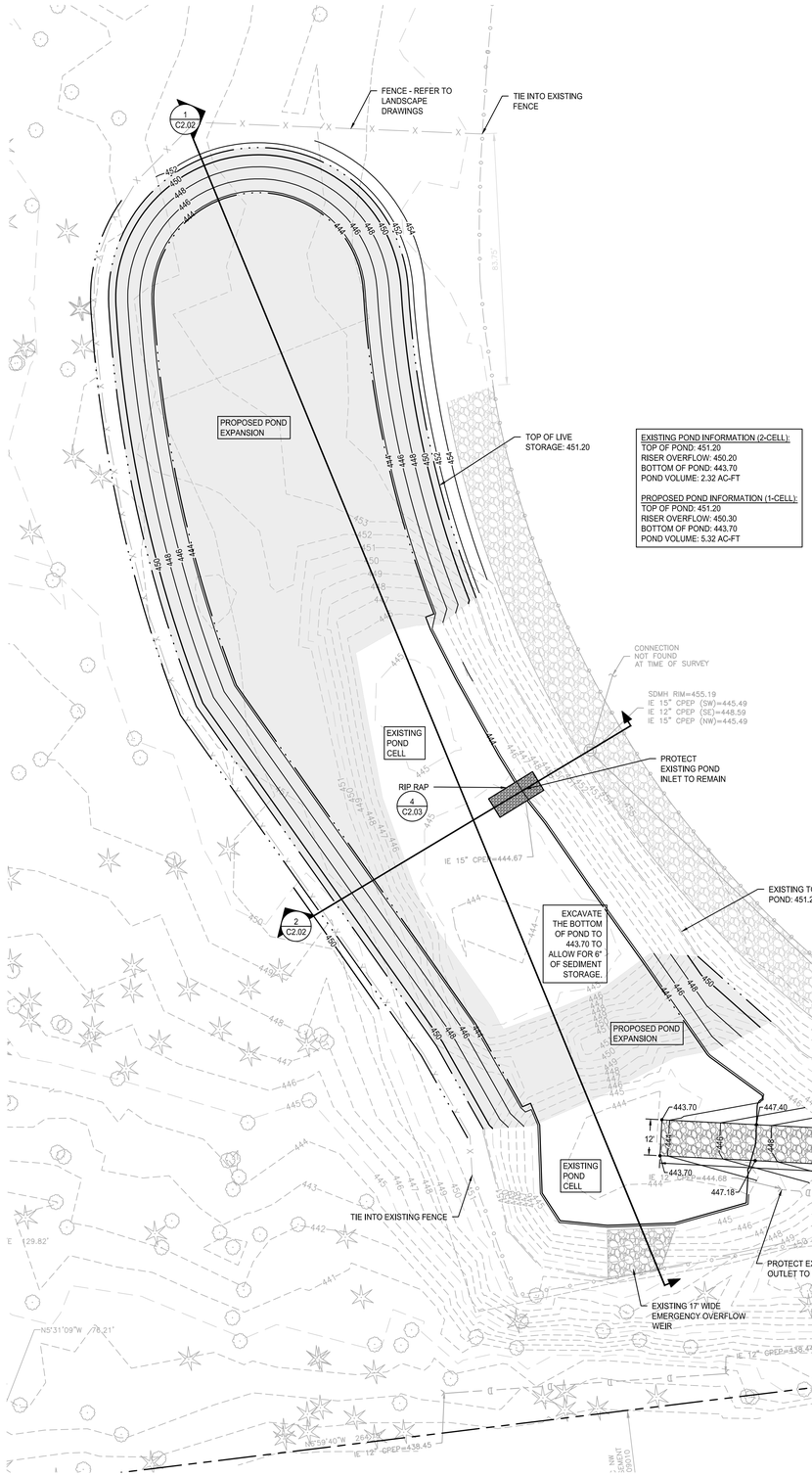
SEAL:
STATE OF WASHINGTON THOMAS J. MCCAULEY 19410 REGISTERED PROFESSIONAL ENGINEER
6.17.2026

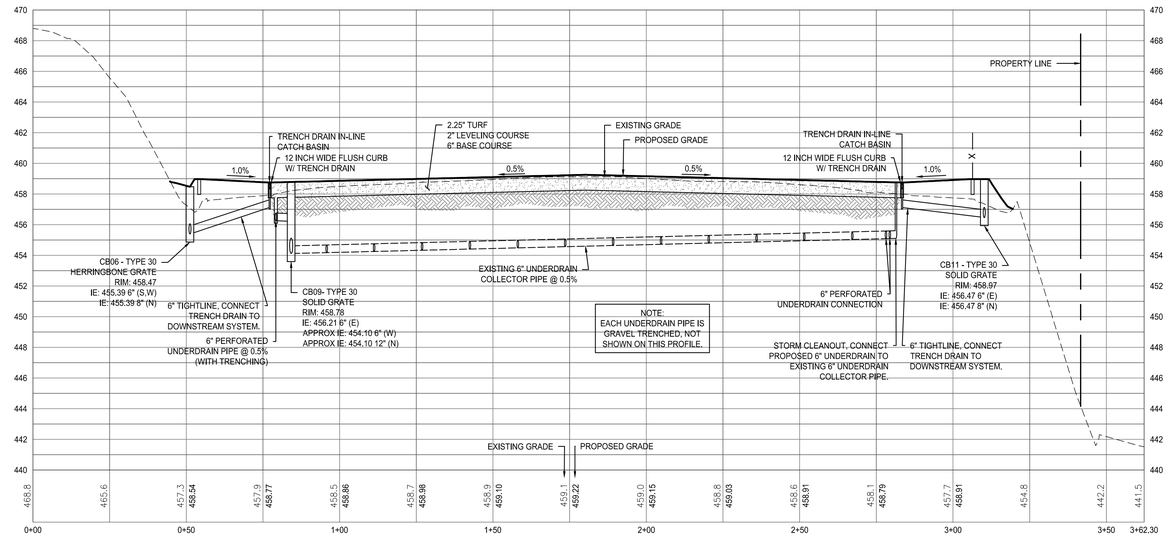
GRADING AND STORM DRAINAGE PLAN

Figure 5

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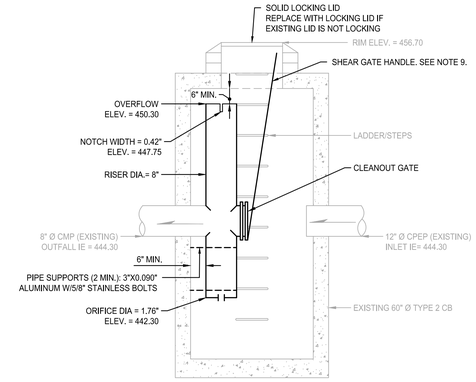


1 SITE SECTION

SCALE: HORIZONTAL 1" = 20', VERTICAL 1" = 4'

LEGEND

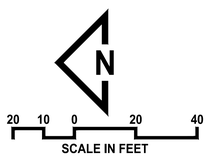
- RIGHT-OF-WAY / PROPERTY LINE
- CATCH BASIN - AS NOTED (7 C2.03)
- CATCH BASIN - AS NOTED (1 C2.03, 6 C2.03)
- STORM DRAINAGE CLEANOUT (SDCO) (5 C2.03)
- D — STORM DRAINAGE PIPING (2 C2.03)
- FOOTING DRAIN/PERFORATED UNDERDRAIN (3 C2.03)
- 6" PERFORATED UNDERDRAIN
- ASPHALT PAVEMENT
- SWALE/DITCH
- 123.45 SPOT ELEVATION
- 1.0% OR 3:1 SLOPE
- RETAINING WALL - REFER TO LANDSCAPE DRAWINGS
- RIDGE OR VALLEY
- 101 EXISTING MINOR CONTOUR
- 100 EXISTING MAJOR CONTOUR
- 101 PROPOSED MINOR CONTOUR
- 100 PROPOSED MAJOR CONTOUR



2 CONTROL STRUCTURE

NOT TO SCALE

NOTES:
1. EXISTING CONNECTING PIPES, INVERT ELEVATIONS, AND SLOPES TO REMAIN.
2. PIPE SUPPORTS AND RESTRICTOR SHALL BE OF SAME MATERIAL, AND BE ANCHORED AT 3' MAX. SPACING BY 5/8" DIAMETER STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
3. THE RESTRICTOR SHALL BE FABRICATED FROM 0.060" ALUMINUM, PVC, CPE, OR HDPE PIPE PER THESE ENGINEERING STANDARDS.
4. RESTRICTOR OUTLET SHALL BE CONNECTED TO EXISTING STORM PIPE OUTLET. ENSURE SEALED CONNECTION BETWEEN RESTRICTOR AND EXISTING OUTLET PIPE, AND EXISTING OUTLET SEAL WITH CATCH BASIN WALL IS NOT DAMAGED DURING CONSTRUCTION.
5. THE VERTICAL RISER STEM OF THE RESTRICTOR SHALL BE THE SAME DIAMETER AS THE EXISTING HORIZONTAL OUTLET PIPE, 8" DIAMETER.
6. ENSURE:
   6.1. SHEAR GATE IS VISIBLE FROM TOP.
   6.2. CLIMB DOWN SPACE IS CLEAR OF RISER AND SHEAR GATE.
7. SHEAR GATE HANDLE SHALL BE ATTACHED TO AN EXISTING LADDER/STEP LOCATED WITHIN EXISTING 24" ACCESS SECTION.
8. IF EXISTING STRUCTURE DOES NOT MEET ANY OF THESE REQUIREMENTS, CONTRACTOR SHALL REPLACE THE STRUCTURE IN ITS ENTIRETY.



DATE	REVISIONS

JOB NO: 24-000730
DRAWN BY: JTB
APPROVED BY: TJM
DATE: JUNE 2026

ETHOS CIVIL
Engineering Environment Project Management
ethoscivil.com info@ethoscivil.com 253.414.1989

TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

SEAL:



6.17.2026

GRADING AND STORM DRAINAGE PLAN

Figure 6

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12 OF 18

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B. ENVIRONMENTAL ELEMENTS

1. EARTH

a. General description of the site (underline or highlight one): Flat, rolling, hilly, steep slopes, mountainous, other.

The site contains an active middle school and is relatively flat within the previously developed area. The school is adjacent to a residential neighborhood with single-family housing to the north, east, and south of the property, with a forested area to the west. The western portion of the school property contains the current track and football field. A chain-link fence surrounds the field to the south and west, dirt baseball/softball fields exist to the north, and a gently sloping grass hill to the east. The field itself is flat with little to no relief. There are rubber-covered areas for track and field activities both at the north and south ends, as well as a sandy area for volleyball.

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

The project area does not exceed an approximate slope of 15 percent. However, within the overall 33.7-acre campus, the slopes reach approximately 65 percent.

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

Subsurface explorations indicate that soils at the site generally consist of topsoil, fill, and Glacial Till. The uppermost soils include approximately 0.5 to 1 foot of loose, brown, silty sand with organics interpreted as topsoil and draining sand for the existing field. Beneath the topsoil, subsurface explorations identified 0.75 to 7.5 feet of loose to medium dense, dark brown to gray, slightly gravelly, very silty sand interpreted as previously placed or uncontrolled fill, which is thicker toward the western portion of the site.

Underlying the fill, weathered and non-weathered Glacial Till was encountered across the site, consisting of medium dense to very dense gravelly, silty sand with trace cobbles and boulders. These deposits extended to the termination depths of the borings and test pit.

According to Natural Resources Conservation Service (NRCS) mapping, the site is classified as Alderwood gravelly sandy loam, 8 to 15 percent slopes. The farmland classification for this soil type is "prime farmland if irrigated." However, the site is currently developed as a middle school campus and is not designated as agricultural land of long-term commercial significance. See ***Appendix B – Geotechnical Report*** for additional information.

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

Based on available geologic mapping, subsurface explorations, and review of regional data, there are no surface indications or historical evidence of unstable soils or landslide activity in the immediate vicinity of the project site. The specific project site is generally level and lacks slopes greater than 15 percent, groundwater seeps, or springs. Subsurface explorations revealed dense Glacial Till underlying the site, which provides a stable foundation and is not typically susceptible to landsliding. The site soils, classified as Alderwood gravelly sandy loam (AgC, 8–15% slopes), are considered to present erosion hazards per King County Code (KCC) 21A.06.415; however, due to the lack of significant slopes or topographic relief, the

actual erosion risk is considered low. As such, the project site does not meet the criteria for a Landslide Hazard Area as defined in KCC 21A.06.680.

Regarding seismic hazards, mapping from the Washington Geologic Information Portal and the U.S. Geological Survey (USGS) indicates the site has a low potential for seismic liquefaction and is located approximately two miles from the Southern Whidbey Island Fault Zone. The Washington State Department of Natural Resources (DNR) Geologic Information Portal further identifies the site as possessing a "very low" liquefaction susceptibility. While the Pacific Northwest is seismically active, most notably influenced by the Cascadia Subduction Zone, which has produced magnitude 8–9 earthquakes approximately every 300–700 years (Atwater and Haley, 1997), the site is not classified as a seismic hazard area. See ***Appendix B – Geotechnical Report*** for additional information.

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

The proposed project will involve approximately 12,000 cubic yards (CY) of cut and 4,500 CY of fill to support site grading for the renovated track and field and associated stormwater improvements. Clearing and grading activities will occur over approximately 3.87 acres of the overall site area. Fill material will consist of native soil reused where feasible and imported structural fill meeting the recommendations of the project geotechnical engineer.

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

There is little potential for erosion due to construction activities. The underlying soils could erode during rainfall events if left unprotected. Precautions would be required through the use of best management practices and implementation of the erosion control plan to limit erosion.

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

The existing impervious surface area on the site totals approximately 12.74 acres, which represents about 37.8% of the overall site area. Following project completion, the proposed impervious surface area, including the new synthetic turf, track surface, walkways, and associated hardscape improvements, will total approximately 15.82 acres, or 46.9% of the overall site area.

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

A Construction Stormwater Pollution Prevention Plan (CSWPPP) will be prepared and implemented to reduce and control erosion during construction. Best Management Practices (BMPs) may include silt fencing, a stabilized construction entrance, temporary and permanent seeding, and other measures appropriate to prevent sediment migration and minimize soil disturbance.

See ***Appendix B – Geotechnical Report*** for additional information.

2. AIR

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

The Puget Sound Clean Air Agency (PSCAA), in connection with the Washington State Department of Ecology (Ecology), conducts air quality monitoring at several sites around Puget Sound. According to PSCAA's 2024 *Air Quality Data Summary* (the most recently available), fine particle levels in Puget Sound met the Environmental Protection Agency's health-based standard of 35 micrograms per cubic meter in 2017. However, air quality within King, Kitsap, Pierce, and Snohomish Counties continued to exceed the EPA standard for particulate (PM) air quality of 25 micrograms per cubic meter. Ozone levels remain a concern in our region.

The proposed project would result in direct emissions from construction activities. Construction of the proposed project would result in temporary, localized increases in pollutant emissions from construction activities and equipment. For example, dust from excavation and grading would contribute to ambient concentrations of suspended particulate matter. Construction contractor(s) would have to comply with the PSCAA's Regulation I, Section 9.15 requiring reasonable precautions to minimize dust emissions. Reasonable controls may include applying water or dust suppressants during dry weather, and vehicle washing and street cleaning to prevent dirt, mud and other debris deposits on paved roadways open to the public.

As long as good construction management practices are followed, emissions related to construction would be short-term and relatively minor. As a result, no significant air quality impacts would be expected from construction.

Once the project is completed, main emissions sources would be from vehicles on the site and traffic on the adjacent road system. The proposal would not generate additional traffic. Existing levels are anticipated to remain the same.

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

Off-site sources of emissions are related to vehicles on site and public rights-of-way. These would have no impact on the proposal.

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

Under PSCAA's Regulation I, Section 9.15, contractor(s) would be required to take all reasonable precautions to avoid or minimize fugitive dust emissions. These precautions and control measures would include dust control by watering areas of soil disturbance, street cleaning to prevent dirt, mud and other debris deposits on paved roadways open to the public. With such control measures in place, the potential for off-site air quality impacts is minimal.

No air quality impacts are expected, so other than the means to control dust, odor and other emissions during construction, which are required by local regulations, no additional control measures for emissions are necessary or proposed.

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.

According to the Delineation Report (***Appendix C***), one Category II wetland (Wetland A) is located northeast of the two existing ball fields. Wetland A is a large depressional wetland in the northeastern section of the site, with a sloped northern portion that drains into a broader depressional basin as it extends north. The wetland received a total rating score of 22 (water quality: 8, hydrology: 6, habitat: 8) and is subject to a standard 225-foot buffer in accordance with King County Code (KCC) 21A.24.325 for Category II wetlands with moderate land use intensity.

The delineation report also identified a small stream segment (Stream A) located within the southern portion of Wetland A. Stream A originates approximately 150 feet north of a culvert beneath 215th Way NE, where it loses channel definition. It is approximately two feet wide and exhibits ordinary high water mark indicators, including sorted sediments and distinct bed and bank characteristics. Based on its physical characteristics, gradient, and width, Stream A meets the definition of fish habitat under WAC 222-16-031 and is classified as a Type F stream. Outside an Urban Growth Area, a Type F stream requires a 165-foot buffer per KCC 21A.24.358; however, because the Wetland A buffer is more restrictive, Stream A was not separately delineated.

In addition, King County iMap identifies four wetlands located east of 215th Way NE and two streams in the northeast corner of the overall site boundary.

The buffer associated with Wetland A does not encumber the proposed project area in the northwestern section of the site. At this time, no impacts to Wetland A, Stream A, or their associated buffers are proposed. Should future revisions to the site plan result in potential buffer or wetland impacts, a mitigation plan will be developed and incorporated into the delineation documentation.

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 would occur within 200 feet of the described waters.

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.

No wetland fill or dredging is proposed.

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

The proposal does not require surface water withdrawals or diversions.

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

No, the site is not within a 100-year floodplain.

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.**

There would be no discharge of waste materials to surface waters.

b. Ground Water:

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

No groundwater will be withdrawn from a well for drinking or other purposes. The existing school is served by domestic water service. Stormwater runoff from the proposed renovations will be treated and detained onsite, with no infiltration proposed. No other discharges to groundwater or pollutants are anticipated.

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

No waste material will be discharged into the ground. The existing campus is served by an on-site septic system, which will remain in use and continue to serve the school facilities. No new septic systems are proposed as part of this project.

c. Water Runoff (including stormwater):

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

The proposed development includes the renovation of the track and field from natural grass to synthetic turf, the addition of an ADA path, bleacher pad, and stairs, an access road, and related utility and stormwater infrastructure upgrades for the new and replaced impervious surface.

In the post-developed condition, runoff from a portion of the proposed improvements will be conveyed through a closed drainage system (underdrains, catch basins and pipes) to a bioretention facility for treatment. The rest of the proposed improvements will be conveyed through a closed conveyance system (trench drain, catch basins and pipes) to the closest existing conveyance connection point downstream of the bioretention facility.

The existing field underdrain system has been studied and will be reused for the proposed field, pending physical inspection of its condition. If the existing underdrains require replacement, they will be replaced in kind and in place. Stormwater generated by the project will be conveyed to either the bioretention facility or it's existing stormwater conveyance structure. This structure outlets to the existing flow control pond located north of the field, which will be expanded and renovated as part of this project. The flow control pond drains to a dispersion trench which drains west/southwest towards Bear Creek.

The project obtained a variance from Core Requirement (CR) #9 – Flow Control BMPs due to the infeasibility of meeting the Low Impact Development (LID) Performance Standard. The standard cannot be met because of non-infiltrating native soils, steep slopes, and limited available area within the developed school property. See ***Appendix D – Preliminary Technical Information Report*** for additional information.

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

No waste materials would enter ground or surface waters.

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

Drainage patterns in the vicinity of the site will remain unchanged.

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

The project proposes more than 5,000 square feet of new and replaced impervious surface, therefore flow control is required. The project site is located within a Conservation Flow Control Area, as identified on the Flow Control Applications Map, and is therefore required to implement flow control measures. This site does not drain entirely by non-erodible manmade conveyance to a major receiving water. Thus, according to Table 1.2.3.A, in the ***Preliminary Technical Information Report***, this project must apply the Level 2 flow control standard (historic site conditions), which matches historic durations for 50% of 2-yr through 50-year peaks and matches historic 2- and 10-year peaks.

This project proposes to meet CR #3 Flow Control Facilities by expanding the existing flow control pond located to the north of the project site. This project will update the pond footprint as well as replace the existing flow control riser with an updated design. The new flow control pond, including the riser, will meet Level 2 flow control standards. These improvements will bring the entire basin tributary to the existing flow control pond up to current flow control standards. See ***Appendix D – Preliminary Technical Information Report*** for additional information.

4. PLANTS

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

X deciduous tree: alder, maple, aspen, other
X evergreen tree: fir, cedar, pine, other
X shrubs
X grass
__ pasture
__ crop or grain
__ orchards, vineyards or other permanent crops
__ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other:
__ other types of vegetation

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

To accommodate the proposed renovations, the existing natural turf field and adjacent landscaping located east of the track and field, as well as vegetation surrounding the northern pond, will be removed.

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

A query of the Washington State Department of Natural Resources (WDNR) Natural Heritage Program's Rare Plant and Ecosystem database was conducted on October 14, 2025. No state or federally listed threatened or endangered plant species or ecosystems were identified on or near the site.

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

The east edge of the project site will be restored with native, drought-tolerant groundcovers and shrubs, and disturbed lawn areas will be hydroseeded with Eco-Grass as part of the restoration effort.

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

Himalayan blackberry and common lawn weeds exist on site.

5. ANIMALS

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

birds: hawk, heron, eagle, songbirds, other: crows/ravens
mammals: deer, bear, elk, beaver, other: rodents, squirrels
fish: bass, salmon, trout, herring, shellfish, other:

The nearby Paradise Lake Natural Area, located west of the overall site boundary, is known to support a variety of wildlife species, including deer, cougar, and black bear, as well as numerous bird and small mammal species.

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

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool identifies the marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), northwestern pond turtle (*Actinemys marmorata*), bull trout (*Salvelinus confluentus*), monarch butterfly (*Danaus plexippus*), and Suckley's cuckoo bumble bee (*Bombus suckleyi*) as species that may occur near the project area.

According to the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) database, freshwater forested wetland habitat is present to the east of 215th Way NE. In addition, the nearby Paradise Lake Conservation Area supports a wider range of wildlife species, including deer, black bear, and cougar.

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

Ducks, geese and various birds migrate over the area during various times of the year. The project is located in the Pacific Flyway where these migratory birds travel in spring and fall.

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

Existing vegetation on the perimeter of the site would be retained and would continue to provide cover for smaller animals.

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

Other than rodents, there are no known invasive animal species known to be on or near the site.

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.

There are no power needs for the proposed project.

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

The project would not affect the use of solar energy by adjacent properties.

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:

No energy conservation features are proposed as there are no components of the project that require it.

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 proposed project would not generate any environmental health hazards during operation. The Northshore School District follows established safety procedures as part of its ongoing campus safety and maintenance programs. During construction, there is a minor potential for accidental spills or releases of hazardous materials from demolition activities, construction equipment, or vehicles. A spill prevention and control plan will be implemented to minimize the risk of accidental releases and to ensure proper containment, cleanup, and reporting in the event of a spill.

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

The Washington State Department of Ecology's Facility/Site Map did not identify any previous contamination or hazardous waste activities associated with the property.

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

The National Pipeline Mapping System Public Map Viewer identifies a gas transmission line, located west of the overall site boundary. The operator's name is Northwest Pipeline LLC and status code is active (filled).

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

Gasoline or diesel may be used in construction equipment or maintenance equipment during and after construction. Other than that, no toxic or hazardous chemicals would be stored, used or produced.

4) Describe special emergency services that might be required.

Police, fire and emergency medical services currently serve the site. No changes in emergency service would occur. Adequate access for emergency vehicles would be retained during construction.

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

A spill prevention and control plan will be developed to prevent the accidental release of contaminants into the environment.

b. Noise

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

The surrounding area consists of Paradise Lake Natural Area to the west and residential homes to the north, east, and south. Noise from nearby traffic would be audible but would not affect the proposed project. A public address (PA) system is not proposed at this time.

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.

Operational Noise

The site currently operates as a middle school. Existing sources of noise include buses and vehicles traveling on on-site roadways, operation of an emergency generator during power outages and monthly generator maintenance, and an air-cooled chiller.

Construction Noise

The increase in noise levels would depend on the type of equipment being used and the amount of time it is in use. At 200 feet from the area of construction, the equivalent sound level (Leq, a measure of long-term average noise exposure) for activities and equipment would be approximately the following:

Activity	Leq (in decibels)
Clearing	71
Grading	63-76
Paving	60-76
Erection	60-72
Finishing	62-77

Types of Equipment	Range of Noise Levels
Bulldozer	65-84
Dump Truck	70-82
Drilling rig	60-65
Paver	74-76
Generators	59-70
Compressors	62-69

*Decibels – The decibel (abbreviated dB) is the unit to measure the intensity of sound.

These noise levels would be short term and, in many cases, of limited duration. Per King County Code, noise generated from construction activities is exempt from noise requirements between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 9:00 a.m. and 7:00 p.m. on weekends.

Noise levels would be consistent with an educational project and be consistent with the County's noise regulations.

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

No significant noise impacts are anticipated; therefore, no specific mitigation measures are proposed. The project will comply with applicable regulations regarding permitted construction hours and contractors will make reasonable efforts to minimize noise during construction.

8. LAND AND SHORELINE USE

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

The subject site is currently occupied by Timbercrest Middle School. The proposed project includes renovation of the existing track and field, upgrades to athletic facilities, and stormwater infrastructure improvements. These improvements will not alter the overall use of the property as an educational facility.

Surrounding land uses:

- North: Residential homes
- East: Residential homes
- South: Residential homes
- West: Forested land that is part of the Paradise Lake Natural Area

The proposed improvements are consistent with the existing educational use of the site and are not expected to affect nearby or adjacent land uses.

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

The site has not been used as working farmlands or working forest lands.

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

The proposal would not affect or be affected by surrounding working farm or forest lands as there are none in the vicinity.

c. Describe any structures on the site.

The site is developed with Timbercrest Middle School, which includes a main school building, covered areas, accessory structures, athletic field equipment, fencing, and parking lot lighting poles.

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

Existing accessory athletic structures, including bleachers, fencing, posts, and netting that conflict with the proposed renovations will be removed. No primary school buildings are proposed for demolition.

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

The current zoning is RA-5, Rural Area, one dwelling unit per 5 acres.

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

The Comprehensive Plan designates the site as RA, Rural Area 2.5-10 acres per dwelling unit.

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

Not applicable. Timbercrest Middle School is not within a designated shoreline.

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

King County iMap identifies four wetlands located east of 215th Way NE, which extends through the eastern portion of the project parcels. The iMap also indicates two streams in the northeast corner of the overall site boundary. The County designates the site as being within an upper tributary basin of the Cedar-Sammamish Water Resource Inventory Area (WRIA 8). Potential landslide and steep slope hazard areas are also identified along the western boundary of the site.

Please refer to the Earth and Water section of this SEPA checklist, as well as ***Appendix B – Geotechnical Report*** and ***Appendix C – Delineation Report***, for detailed information regarding the identified critical areas

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

No one will reside on the site as part of this project. Additionally, proposed improvements will not result in any changes to school staffing or enrollment levels.

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

Sports activities currently using the existing track and field will be temporarily displaced during construction but will resume once the renovations are complete.

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

No permanent impacts are anticipated; therefore, no measures are proposed.

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

The proposal is consistent with the King County 2024 Comprehensive Plan and goals identified below.

Facilities: F-101 King County shall seek to identify the needs and propose strategies for public facilities and services, including physical infrastructure and health, human, and public safety services necessary to support all communities at appropriate urban and rural service levels.

Economic Development: ED-401 King County shall support and partner on programs and strategies to maintain existing infrastructure and construct new infrastructure and facilities (including, but not limited to, transportation, utilities, schools, information, communications, and an adequate supply of housing), prioritizing historically underinvested areas, and as necessary to accommodate current and future economic demand, in locations and at a size and scale that is consistent with other policies in the Comprehensive Plan.

- The proposed improvements at Timbercrest Middle School align with King County's objective to provide adequate public facilities and services that meet the needs of surrounding communities. The project upgrades existing athletic facilities to modern standards, including renovation of the track and field and associated drainage improvements. The existing natural turf field currently experiences poor drainage, and the proposed upgrades will correct these issues through improved stormwater management and installation of synthetic turf, allowing for year-round use. These enhancements improve accessibility, safety, and usability of the school's recreational spaces, ensuring the facilities continue to support educational and community activities at appropriate service levels for the area.

- The project also supports long-term economic and community development by maintaining and improving essential infrastructure that contributes to the region's quality of life. Educational facilities, such as Timbercrest Middle School, play a key role in sustaining neighborhood vitality and attracting families and investment. The proposed improvements ensure the campus remains functional, efficient, and resilient to local climate conditions, thereby supporting continued use of existing infrastructure and reducing the need for new land development. In doing so, the proposal advances King County's broader goal of promoting equitable access to high-quality public facilities and infrastructure that serve both urban and rural communities.

In addition, the *Districtwide Educational Specifications Update* for the Northshore School District (dated May 1, 2023), which have been adopted by the District's Board of Directors, speifies that synthetic turf be used for all main fields at the middle school level. Timbercrest Middle School is the last middle school in the District to receive permit approval for conversion to synthetic fields. The Board's intent in adopting the educational specifications related to athletics was to improve equity and consistency of athletic opportunities at each school level (elementary, middle and high) within the District.

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

There are no agricultural or forest lands of long-term commercial significance in the immediate vicinity.

9. HOUSING

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

No housing units would be provided.

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

No housing units would be eliminated.

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

No impacts are anticipated; therefore, no measures are proposed.

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?

Aside from bleachers, no structures are proposed.

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

No views would be altered or obstructed as a result of the proposed project.

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

No significant aesthetic impacts are anticipated; therefore, no specific mitigation measures are proposed.

11. LIGHT AND GLARE

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

No light or glare would be produced by the proposed project.

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

Nonapplicable; no lighting or glare-causing components are planned as a part of the proposal.

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

Off-site light sources include vehicle headlights from nearby roadways, building lighting from surrounding uses, and streetlights along adjacent public rights-of-way. These existing sources are not expected to adversely affect operation of the proposal.

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

No impacts are anticipated, therefore no mitigation is proposed.

12. RECREATION

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

Several designated parks and open space areas are located in the vicinity of Timbercrest Middle School. Paradise Valley Conservation Area, located to the north, includes approximately 793 acres of forested land with over 13 miles of multi-use trails for hiking, biking, and equestrian use. Cottage Lake Park, located southwest of the site, provides picnic areas, playgrounds, a swimming pool, and walking trails surrounding Cottage Lake. Rotary Community Park, located within the City of Woodinville, includes playground equipment, picnic shelters, and a forested boardwalk loop trail.

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

The project will result in the temporary displacement of the existing track and field during renovation. Use of the amenities will be temporarily paused or relocated until the renovation is complete.

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

Upon completion, the renovated track and field will enhance recreational opportunities by providing improved and safer facilities for students and greater accessibility for students and the community. Proposed improvements include a new multi-purpose synthetic turf athletic field replacing the existing natural grass field, designed for football, soccer, and lacrosse; a six-lane running track; improved site accessibility; and stormwater and utility infrastructure upgrades meeting current King County standards.

These upgrades will create a year-round recreational facility that is more durable, functional, and accessible than the existing amenities.

13. HISTORIC AND CULTURAL PRESERVATION

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

According to the Washington State Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural & Archaeological Records Data (WISAARD), a review conducted on October 14, 2025, did not identify any buildings, structures, or sites on the project site as being listed or "determined eligible" for listing on any national, state, or local historic register.

The existing school building was constructed in 1997, making it 28 years old and not eligible for historic designation. Surrounding residential homes may be over 45 years old.

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

There are no cemeteries or known burial grounds in the immediate vicinity of the project site. A query of the Washington Information System for Archaeological and Architectural Records Data (WISAARD), maintained by the Washington State Department of Archaeology and Historic Preservation (DAHP), was

conducted on October 14, 2025. This search found no landmarks, features, or other historic properties on or near the site. According to the Archaeological Risk Assessment Model, the site carries a risk level of "Moderately Low Risk" to "Low Risk" for encountering cultural resources. No professional studies have been conducted at the site to date to identify such resources.

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

The WISAARD map query was used to assess whether there were historic properties or likely presence of subsurface archaeological features.

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

If evidence of any historic, archaeological, scientific or cultural significance were found, construction would be halted in that area, and the State Historical Preservation Officer would be notified.

14. TRANSPORTATION

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

The site is served by one public roadway, 215th Way NE, which runs generally north–south and crosses through the two parcels along the eastern boundary. Vehicular access to the site is currently provided by four existing driveways along 215th Way NE. The proposed project does not include any new vehicular access points along the street frontage.

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

The site is not directly served by public transit. The nearest King County Metro bus stop is located approximately 1.3 miles southeast of the school at NE Woodinville-Duvall Road and 226th Avenue NE, served by Route 931. Additional transit stops are located along NE Woodinville-Duvall Road, south of the site.

Students within the Northshore School District service area are provided school bus transportation to and from Timbercrest Middle School.

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

The proposal would not require any new improvements to the existing public street network.

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

The project would not use, nor is it located in the immediate vicinity of, water, rail, or air transportation facilities.

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

Because the proposed project involves renovation of the existing track and field and improvements to stormwater infrastructure, with no lighting, amplification, or use other than daylight areas, there is no expected increase in vehicle trips per day over existing levels. The project would not alter the existing school use or enrollment and therefore would not generate additional vehicular trips beyond those currently associated with normal school operations. Peak traffic volumes will continue to occur during school arrival and dismissal periods and during after-school athletic events, see ***Appendix E – Traffic Memorandum*** for additional information.

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

The proposal would not interfere with or be impacted by the movement of agricultural or forest products on roads or streets in the area.

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

No impacts are anticipated; therefore, no measures are proposed.

15. PUBLIC SERVICES

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

The proposal would not result in an increased need for public services. The site is currently developed and operates as a middle school.

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

There are no public service impacts anticipated with the proposal; therefore, no mitigation is proposed.

16. UTILITIES

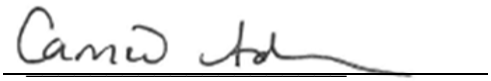
a. Underline utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other: _____

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.

There are no proposed changes to existing utility providers.

C. SIGNATURE

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

Signature: 

Applicant Representative

Name of signee: Camie Anderson

Position and Agency/Organization: Principal, Shockey Planning Group

Date submitted: July 6, 2026

Appendix A
Legal Descriptions

Parcel Numbers: 0426069023 & 0426069010

Site Address: 19115 215th Way NE, Woodinville, Washington 98077

Legal Descriptions:

0426069023:
N 1/2 OF NW 1/4 OF SW 1/4 LESS POR FOR RD PER REC # 20011022000157

0426069010:
S 1/2 OF NW 1/4 OF SW 1/4 TGW POR OF NE 1/4 OF SE 1/4 OF STR 05-26-06 LY ELY OF LN DAF - BAAP ON N LN & 129.82 FT WLY OF NE COR OF SD SUBD TH S 5-29-03 E 76.21 FT TH S 6-57-34 E 264.78 FT TH S 6-14-32 E 521.92 FT TH S 4-16-11 E 387.92 FT TAP ON S LN OF SD SUBD & MEAS 96.62 FT WLY OF SE COR THOF PER KCLLA S92L0173 APPROVED 10-05-92 LESS POR FOR RD PER REC # 20011022000157

Appendix B
Geotechnical Report

Limited Geotechnical Engineering Report

Timbercrest Middle School Field and Track
19115 215th Way NE
Woodinville, Washington 98077

Prepared For:

Northshore School District
22015 23rd Drive SE
Bothell, Washington 98021

Attn: Devlin Piplic
Construction Project Manager

GEOTEST
An RMA Company

1.888.251.5276
Bellingham | Arlington | Oak Harbor
www.geotest-inc.com

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September 27, 2023
Project No. 23-1901

Northshore School District
22105 23rd Drive SE
Bothell, Washington 98021

Attention: **Devlin Piplic**
Construction Project Manager

Regarding: **Limited Geotechnical Engineering Report**
Timbercrest Middle School Field and Track
19115 215th Way NE
Woodinville, Washington 98077

Dear Mr. Piplic,

GeoTest Services, Inc. [GeoTest] is pleased to submit the following report summarizing the results of our limited geotechnical engineering evaluation for the proposed improvements to Timbercrest Middle School Field and Track in Woodinville, WA (see *Vicinity Map*, Figure 1). This report has been prepared in general accordance with the terms and conditions established in our services agreement dated June 14, 2023 and authorized through the issuing of Purchase Order P198400, dated July 26, 2023.

GeoTest appreciates the opportunity to provide geotechnical services on this project and looks forward to assisting you during the construction phase. Should you have any further questions regarding the information contained within the report, or if we may be of service in other regards, please contact the undersigned.

Respectfully,
GeoTest Services, Inc.

EDWARDO A. GARCIA
STATE OF WASHINGTON
40819
REGISTERED
PROFESSIONAL ENGINEER
09-27-23

Coire McCabe, L.G.
Staff Geologist

Edwardo Garcia, P.E.
Geotechnical Department Manager

Enclosure: Limited Geotechnical Engineering Report

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PURPOSE AND SCOPE OF SERVICES

The purpose of this evaluation is to establish general subsurface conditions beneath the site from which recommendations pertaining to project design can be formulated. Our scope of services includes the following tasks:

- Explore soil and groundwater conditions underlying the site by advancing six Dynamic Cone Penetrometers (DCPs), five soil borings, and a Pilot Infiltration Test (PIT) at predetermined locations using a track-mounted excavator, track-mounted drill rig equipped with a hollow stem auger, and hand tools.

- Perform laboratory testing on representative samples to classify and evaluate the engineering characteristics of the soils encountered.

- Perform one Pilot Infiltration Test (PIT) at a predetermined location in accordance with the *King County Surface Water Design Manual* [Manual].

- Provide commentary regarding the feasibility of on-site stormwater infiltration based on the *Manual.*

- A discussion of the Seismic Site Class considerations based on the 2021 International Building Code (IBC).

- Provide a written report containing a description of subsurface conditions and exploration logs. The findings and recommendations in this report pertain to site preparation and earthwork, fill and compaction, seismic design, foundation recommendations, foundation and site drainage, temporary and permanent slopes, geotechnical consultation, and construction monitoring.

- Assessment of Geologically Hazardous Areas (if present) per the King County Code (KCC).

PROJECT DESCRIPTION

GeoTest understands that the existing track and sports field will be removed and replaced with a new synthetic turf field. The planned improvement areas are located directly west of the existing school facility and to the south of the baseball and softball fields. GeoTest anticipates that the finished product will include a new synthetic turf field with an asphalt-based rubberized track section. GeoTest also anticipates a 4-foot-tall perimeter “crowd control” fence paired with a football goal post and similar over-height structures.

GeoTest generally anticipates that about 1 foot of material will be removed from the field area to allow for the construction of the new turf surface. Stormwater and/or vault excavations are expected to be slightly deeper than field stripping elevations.

SITE CONDITIONS

This section includes a description of the general surface and subsurface conditions observed at the project site during the time of our field investigation. Interpretations of site conditions are based on a review of available information, site reconnaissance, subsurface explorations, laboratory testing, and previous experience in the project vicinity.

Surface Conditions

The project area contains an active middle school and is relatively flat within the previously developed area. The school is adjacent to a residential neighborhood with single-family housing to the north, east, and south of the property, with a forested area to the west. The western portion of the school property contains the current dirt track and football field. A chain link fence surrounds the field to the south and west, dirt baseball/softball fields exist to the north, and a gently sloping grass hill to the east. The field itself is flat with little to no relief. There are rubber-covered areas for track and field activities both at the north and south ends, as well as a sandy area for volleyball. At the time of our site visit there were also two soccer nets and two football goal posts.



Images 1 and 2: Flat grassy football field which is the location of the future turf field, facing south (Image 1). Drilling the boring at the B-1 location, facing southeast (Image 2). Images 1 and 2 were taken on August 8, 2023.

Subsurface Soil Conditions

Dynamic Cone Penetrometer (DCPs)

Subsurface conditions were explored and documented by advancing six Dynamic Cone Penetrometer tests (DCP-1 through DCP-6) on August 23, 2023, under the direction of a Geologist. Approximate locations of these explorations have been plotted on the *Site and Exploration Plan* (Figure 2). DCP Logs can be viewed as attachments at the end of this report.

DCP tests were conducted to evaluate the relative density and/or consistency of the site soils. The DCP analyses consisted of driving an approximately 1-inch diameter steel rod into the ground utilizing a 35-pound drop hammer. By measuring the number of blows it takes to drive the rod every four inches (10 cm), the general density of granular soils and the stiffness of cohesive soils can be determined. The number of blows for each increment can be correlated to standard N values typically obtained from Standard Penetration Testing (SPT) performed using a mechanized soil drill rig. DCPs were advanced to depths ranging from 0.75 and 4 feet BGS or until refusal was reached (50 blow per 4 inches).

GeoTest interprets the DCP results as approximately 0.75 to 4 feet of previously placed fill overlying Glacial Till, with our DCP explorations reaching refusal upon encountering the Glacial Till.

Soil Boring Explorations

Subsurface conditions were also explored by advancing five hollow stem auger (HSA) soil borings (B-1 to B-5) on August 7, 2023. Our soil borings were advanced to depths of 11.5 BGS, using 6-inch diameter hollow-stem augers, and a track-mounted assembly operated by Boretec1, Inc. Samples were generally taken at 2.5-foot intervals until the terminal depth. A Geologist directed and observed drilling operations and logged the soils encountered. Soils were classified in general accordance with the guidelines of the American Society for Testing and Materials (ASTM) D2487 and D2488. Upon completion, all the boring locations (B-1 to B-5) were backfilled with bentonite and soil tailings to match pre-existing surface conditions.

The approximate locations of the explorations have been plotted on the *Site and Exploration Plan* (Figure 2). A *Soil Classification System and Key* can be found as Figure 4, *Boring Logs* as Figures 5 through 9, and laboratory results as Figures 11 and 12.

Disturbed but representative samples were obtained during drilling by using the Standard Penetration Test (SPT) procedure in accordance with American Society for Testing and Materials (ASTM) D1586 during the explorations. This test and sampling method consists of driving a standard 2-inch outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound drop hammer free-falling a height of 30 inches. The number of blows for each 6-inch interval is recorded and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance (“N”) or blow count. If a total of 50 blows is recorded within one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils; these values are reported on the attached boring logs.

The on-site subsurface soils consisted of approximately 0.5-feet of loose topsoil in locations not covered by the dirt track. Generally, there was 0.75 to 1 foot of loose, gray, poorly graded sand with trace gravel underlying the topsoil. Beneath the topsoil and loose sand, boring explorations

indicated there was approximately 4 to 7.5 feet of loose to medium dense, dark brown to dark gray, slightly gravelly, very silty sand that was interpreted to be uncontrolled fill. It should be noted that there were no indications of uncontrolled fill at the location B-1, B-4, or B-5. Uncontrolled fill tended to only be present on the western side of the existing field. Stated differently, it's likely that thicker sections of fill were pushed out towards the west to make a flat area during original construction.



Images 3 and 4: Split spoon sample showing native Till at a depth of approximately 7.5 feet at location B-1 (Image 3). Topsoil underlain by clean sand in the top 1.5 feet at location B-1 (Image 4). Images 3 and 4 taken on August 7, 2023.

Underlying the uncontrolled fill (when observed) was weathered Glacial Till consisting of medium dense to dense, orange-gray, gravelly, silty sand with orange oxidations staining and occasional mottling. Underlying the Weathered Glacial Till, GeoTest observed dense to very dense, gray, gravelly, silty sands with trace cobbles indicated by grinding during drilling. These soils were interpreted to be Glacial Till.

Pilot Infiltration Test (PIT)

Subsurface conditions were explored and documented by advancing a PIT (PIT-1) at a predetermined location on August 23, 2023. Soils were classified in general accordance with the guidelines of the American Society for Testing and Materials (ASTM) D2487 and D2488.

Approximate locations of these explorations have been plotted on the *Site and Exploration Plan* (Figure 2). A *Soil Classification System and Key* can be found as Figure 4, a detailed PIT log is presented as Figure 10, with laboratory results as Figures 11 – 12.

The exploration consisted of a shallow open pit excavated with a rubber tracked excavator subcontracted by GeoTest. Grab samples were obtained at approximately 2-foot intervals or upon changes in soil stratigraphy. The PIT itself was performed by excavating a 4.4 feet (length) by 3.2 feet (width) by 2.8 feet (depth). The PIT was advanced to a depth of 8.5 feet BGS following the infiltration portion of the test.



Image 5: Following the Pilot Infiltration Test (PIT-1) the excavation was advanced an additional 5 feet below the bottom of the PIT. Soils were consistent to the termination of the excavation. Image 5 taken on August 23, 2023.

The subsurface soils generally consisted of about 1-foot of loose, brown, silty sand with appreciable organics that were interpreted to be topsoil and draining sand for the existing football field. Underlying the topsoil, GeoTest observed dense, gray to tan, gravelly, silty sand with trace cobbles that was interpreted as weathered Glacial Till. At a depth of about 2.5 to 3 feet below existing site grades, the native subsurface soils graded into very dense, brown, gravelly, very silty sand with cobbles and boulders. This soil is interpreted to be non-weathered Glacial Till. The Glacial Till was observed to the termination of the PIT excavation.

General Geologic Conditions

Geologic information for the project site was obtained from the *Geologic Map of the Maltby 7.5-minute Quadrangle, Snohomish and King Counties, Washington* (Allen et al., 2017) and from the Washington State *Geologic Information Portal*. According to these publications, geology within the vicinity of the project site consists of Till (map unit Qgt), Ice-Contact, and Peat deposits with the glacial deposits originating from Pleistocene glacial periods.

Glaciers advanced south to the vicinity of the project area and the depositional environment transitioned to a subglacial one. Here, the height, weight, and horizontal velocity of the advancing and receding glaciers created a grinding-like, geologic, depositional environment, in which Till is created. These soils generally consist of glacially consolidated clays, silts, sands, and gravels, in which are non-sorted, matrix supported, and rest unconformably on older geologic units. Till can also typically be described as a concrete-like mixture of sediment that is very dense or hard due to very large glaciers overriding and densifying these soils during glacial advance and retreat. The Ice-Contact deposits are similar in composition except that they consist of a mixture of ablation till, flow till, or melt-out till. It's GeoTest's opinion that the flat topography on and around the site supports this interpretation.

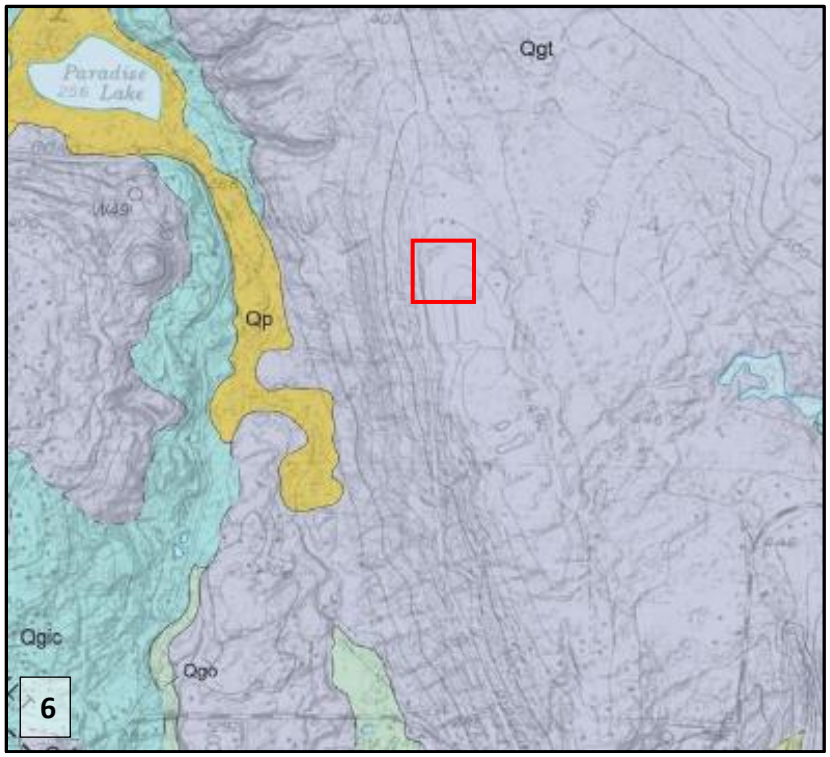


Image 6. Clip from the *Geologic Map of the Maltby 7.5-minute Quadrangle, Snohomish and King Counties, Washington* (Allen et al., 2017) illustrating that the subject property is underlain by mapped Till, and the close proximity of the mapped Ice-Ice Contact deposits. Approximate site vicinity encapsulated by the red polygon.

Groundwater

At the time of our site visits on August 7 and August 23, 2023, perched groundwater seepage was not encountered. Due to the presence of fill soils overlying glacially consoidated Till soils at depth throughout most of the project site, GeoTest believes perched groundwater seepage could be possible due to the lower density, granular soil being underlain by dense, siltier soil. Perched groundwater seepage should be anticipated during the wet season or after long periods of precipation, atop the low permeability Till soils found at depth.

Perched water is not representative of a widespread, regional aquifer. Rather, it is representative of surface water and near-surface interflow that collects over denser or siltier soils with reduced hydraulic conductivities. Perched water is typically less than a few feet in thickness and usually present during extended periods of wet weather.

The groundwater conditions reported on the exploration logs are for the specific locations and dates indicated, and therefore may not be indicative of other locations and/or times. Groundwater levels are variable and groundwater conditions will fluctuate depending on local subsurface conditions, precipitation, and changes in on-site and off-site use.

Web Soil Survey

According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) *Web Soil Survey* website, one primary soil is present within the vicinity of the subject property.

Table 1
USDA NRCS Soil Classifications

Map Unit Symbol	AgC
Map Unit Name	Alderwood gravelly sandy loam, 8 to 15 percent slopes
Soil Description	Very gravelly sandy loam
Landform	Ridges, hills
Parent Material	Glacial drift and/or glacial outwash over dense glaciomarine deposits
Land Capability Classification	4s
Erosion K Factor, Whole Soil	.17

This soil is classified as Alderwood gravelly sandy loam, 8 to 15 percent slopes. See Table 1 for a summary of the USDA *Web Soil Survey* classification information. Values of K range from 0.02 to 0.69; the higher the value, the more susceptible the soil is to sheet and rill erosion by water. It is interpreted that the site has a **low** erosion factor based on the findings in Table 1.

GEOLOGIC HAZARD ASSESSMENT

According to current King County Code (KCC), critical areas include *any area that is subject to natural hazards or a land feature that supports unique, fragile, or valuable natural resources including fish, wildlife, or other organisms or their habitats or such resources that carry, hold, or purify water in their natural state*. KCC goes on to define aquatic areas, coal mine hazard areas, critical aquifer recharge areas, erosion hazard areas, flood hazard areas, landslide hazard areas, seismic hazard areas, steep slope hazard areas volcanic hazard areas, wetlands, wildlife habitat conservation areas, and wildlife habitat networks as critical areas.

The hazards considered to be relevant to the proposed development at the project site are discussed in detail within the following sections of this report.

Erosion Hazard Areas

King County Code (KCC) 21A.06.415 defines Erosion Hazard Areas as, *an area underlain by soils that is subject to severe erosion when disturbed. These soils include, but are not limited to, those classified as having a severe to very severe erosion hazard according to the United States Department of Agriculture Soil Conservation Service, the 1990 Snoqualmie Pass Area Soil Survey, the 1973 King County Soils Survey or any subsequent revisions or addition by or to these sources such as any occurrence of River Wash ("Rh") or Coastal Beaches ("Cb") and any of the following when they occur on slopes inclined at fifteen percent or more:*

- *The Alderwood gravelly sandy loam ("AgD")*
- *The Alderwood and Kitsap soils ("AkF")*
- *The Beausite gravely sandy loam ("BeD" and "BeF")*
- *The Kitsap silt loam ("KpD")*
- *The Ovall gravely loam ("OvD" and "OvF")*
- *The Ragnar fine sandy loam ("RaD")*
- *The Ragnar-Indianola Association ("RdE")*

The soils underlying the project site consist of Alderwood gravelly sandy loam, 8 to 15 percent slopes (AgC). **As such, the areas of the project site are considered to present erosion hazards per KCC.** However, due the lack of slopes and relief its GeoTest's opinion that the risk is alleviated.

Landslide Hazard Areas

King County Code (KCC) 21A.06.680 defines Landslide Hazard Areas as, *an area subject to severe risk of landslide, such as:*

1. *An area with a combination of:*
    - *Slopes steeper than fifteen percent of inclination*

- *Impermeable soils, such as silt and clay, frequently interbedded with granular soils, such as sand and gravel; and*
- *Springs or ground water seepage*

2. *An area that has shown movement during the Holocene epoch, which is from ten thousand years ago to the present, or that is underlain by mass wastage debris from that epoch.*

3. *Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action;*

4. *An area that shows evidence of or is at risk from snow avalanches; or an area located on an alluvial fan, presently or potentially subject to inundation by debris flows or deposition of stream-transported sediments.*

Based on the mapped geologic units underlying the project site, the lack of slopes greater than 15 percent, lack of groundwater seeps and springs near the project site, and finally there are no signs of mass wasting within the project area. Therefore, it appears that **the proposed development area does not contain landslide hazard areas as defined by KCC.**

Seismic Hazard Areas

King County Code (KCC) 21A.06.1045 defines Seismic Hazard Areas as, *an area subject to severe risk of earthquake damage from seismically induced settlement or lateral spreading as a result of soil liquefaction in an area underlain by cohesionless soils of low density and usually in association with a shallow groundwater table.*

According to the *Washington Geologic Information Portal* and the *PDS Map Portal*, the subject property is mapped as having a **low** potential for seismic liquefaction. According to the *Geologic Information Portal* and *United States Geological Survey (USGS),* the closest known faults are part of the Southern Whidbey Island Fault Zone, approximately 2 miles north and south of the project area.

Based on our understanding of the local geology, it is GeoTest's opinion that **the subject property is not a Seismic Hazard.** Outside of compliance with current building codes, GeoTest does not recommend specific mitigations for the planned construction to address potential seismic hazards that exist in the region.

Please keep in mind that the Pacific Northwest is seismically active. Large Cascadia subduction zone earthquakes with possible magnitudes of 8 or 9 could produce ground shaking events with the potential to significantly impact the subject property regardless of the topography or subsurface conditions. Cascadia subduction zone earthquakes have occurred 6 times in the last 3,500 years with the most recent taking place in 1700, approximately 322 years ago. They have

been determined to have an average recurrence interval of approximately 300 to 700 years (Atwater and Haley, 1997).

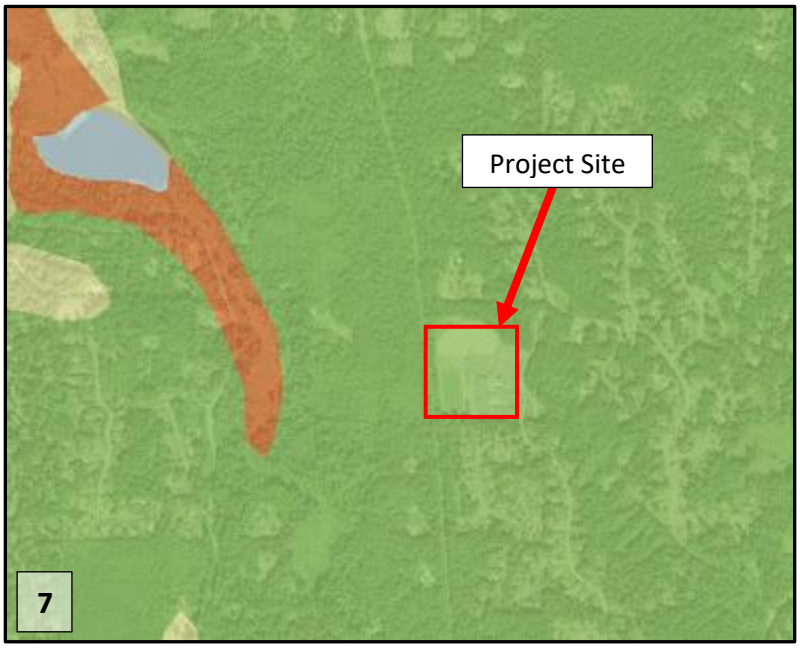


Image 7. Screenshot from the *DNR Geologic Information Portal*, in which the entire project site is considered to possess a "very low" liquefaction susceptibly (shown in green).

CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of the data collected during this investigation, it is our opinion that the subsurface conditions at the site are suitable for the proposed development, provided the recommendations contained herein are incorporated into the project design.

Synthetic turf fields are often proprietary products that require a specific design based on the manufacturer's recommendations. As such, the turf field designer may have elements of the design or specifications for materials that are only applicable for the turf field and may not necessarily apply to the subgrade that supports the field. GeoTest strongly recommends that, prior to project submittal, that the design team meet and confirm that GeoTest's recommendations for subgrade preparations do not interfere or conflict with the turf field designer's recommendations for field construction.

Existing fill, organics, and loose/unsuitable portions of native soil (if remedial compaction is infeasible) should be removed and replaced with suitable Structural Fill. Overlying the weathered and non-weathered Till soils across much of the site is 1 to 6.5 feet of uncontrolled fill, with the thicker sections observed in the northwestern portions of the project area. Existing fill soils are not suitable for shallow conventional foundation support as a result of loose soil conditions and organics. The approximately 6.5 feet of fill observed at the B-2 location is thought to be an outlier

based on other data obtained in the area. In general, the fill thickness appeared to be approximately 1 to 6.5 feet thick in most locations.

Assuming that the planned finished field elevation will remain at or near existing site grades, typical excavation down to the base of the planned turf field section is expected to expose suitable site soils for turf section support. Subsurface explorations exposed in this study generally encountered 1.5 feet of loose topsoil and sand overlying between 1 to 6.5 feet of loose to medium-dense, fill soils with medium dense to very dense Till soil below. Portions of the previously placed fill or portions of the native soil disturbed during site stripping and excavation should be re-compacted to a firm and unyielding condition using vibratory compaction equipment. After excavation to the base of the planned turf field section has been completed and the underlying native or fill soils have been suitably prepared, it is assumed that Structural Fill associated with the planned turf field section will be placed and compacted in accordance with project plans and specifications. Further recommendations regarding the placement and compaction of structural fill can be found in the *Fill and Compaction* section of this report.

Shallow restriction layers exist on the property that will make the design of infiltration systems challenging. It should also be noted that very dense glacially consolidated Till was encountered as shallow as 1-foot and as deep as 6.5 feet BGS in some exploration borings, DCPs, and the PIT at the time of our investigation. The *King County Surface Water Design Manual* [Manual] has requirements and limitations for the design of stormwater facilities when shallow restriction layers exist below a facility. Stormwater management strategies that include detention vaults may be feasible but should have a fundamental expectation that there will be shallow restriction layers present that might influence the overall design of stormwater systems. At the time of writing this report, it is our understanding that there are no conceptual stormwater facility designs available for review. A Pilot Infiltration Test (PIT) was performed during one of our site visits on August 23, 2023, results are presented in the *Stormwater Infiltration Potential* Section of this report.

GeoTest attempted to get as wide of a range of subsurface data as possible to help with the planning process but was limited in some respects due to avoiding the irrigation system throughout the existing field. It should be expected that additional design services, possibly paired with additional field work and collaboration with the project Civil Engineer, may be needed to complete the grading and stormwater design until finalized plans are put in place.

Site Preparation and Earthwork

The portions of the site proposed for improvements should be prepared by removing topsoil, deleterious material, and significant accumulations of organics. Based on our explorations, GeoTest anticipates approximately 6 inches of topsoil and 1 foot of fill sand removal to expose native and/or pre-existing fill within the proposed turf field location. This removal depth could vary if the location of the proposed turf field is to be moved from the current location. If foundations or concrete slabs are added, prior to placement of any foundation elements or

Structural Fill, the exposed subgrade under all areas to be occupied by soil-supported concrete slabs, spread, or continuous foundations should be recompacted to a firm and unyielding condition. At the time of this report, foundations and/or concrete slabs are not anticipated.

Verification of compaction can be accomplished through proof rolling with a loaded dump truck, large self-propelled vibrating roller, or similar piece of equipment applicable to the size of the excavation. The purpose of this effort is to identify loose or soft soil deposits so that, if feasible, the soil disturbed during site work can be recompacted.

Proof rolling should be carefully observed by qualified geotechnical personnel. Areas exhibiting significant deflection, pumping, or over-saturation that cannot be readily compacted should be overexcavated to firm soil. Alternatively, Dynamic Cone Penetrometers or soil probing by a qualified GeoTest representative can confirm firm and unyielding conditions in localized areas if a proof roll cannot be performed. Overexcavated areas should be backfilled with compacted granular material placed in accordance with subsequent recommendations for Structural Fill. During periods of wet weather, proof rolling could damage the exposed subgrade. Under these conditions, qualified geotechnical personnel should observe subgrade conditions to determine if proof rolling is feasible.

Fill and Compaction

If footings and soil-supported floor slabs are desired, Structural Fill used to obtain final elevations must be properly placed and compacted. In most cases, suitable, non-organic, predominantly granular soil may be used for fill material provided the material is properly moisture conditioned prior to placement and compaction, and the specified degree of compaction is obtained. Material containing topsoil, wood, trash, organic material, or construction debris is not suitable for reuse as Structural Fill and should be properly disposed off-site or placed in nonstructural areas.

Soils containing more than approximately 5 percent fines are considered moisture sensitive and are difficult to compact to a firm and unyielding condition when over the optimum moisture content by more than approximately 2 percent. The optimum moisture content is that which allows the greatest dry density to be achieved at a given level of compactive effort.

Reuse of On-Site Soil – Existing Fill

GeoTest does not anticipate significant amounts of site grading due to the proposed turf field being reconstructed over the footprint of the existing field. However, if it is desired that existing fill soils be utilized in Structural Fill applications, additional evaluations may be necessary. Locally, existing fill soils should be expected to have elevated organic contents. Existing fill soils should be expected to have elevated silt contents throughout, and their use as Structural Fill materials will largely be dependent on the ability to place and compact these materials at or near optimum moisture content. The existing fill should be considered moisture sensitivity and that additional efforts will be needed if this material is utilized during wet-season grading activities.

Reuse of On-Site Soil – Native Soil

The non-organic, native Till may be suitable for reuse as Structural Fill when placed at or near optimum moisture contents, as determined by ASTM D1557 and if allowed for in the project plans and specifications. The Till soils contain high percentage of fines and should be considered moisture sensitive. Reuse of Till may be considerably more difficult, if not impossible, to use at or near perched groundwater elevations and during the wet weather season (October 1 – April 30). Furthermore, the silty nature of the Till may limit its use if being considered close to areas where infiltration or a stormwater vault may be planned. If using on-site materials, the Contractor or Owner should be prepared to manage over-optimum moisture content soils. The moisture content of the soils may be difficult to control during periods of wet weather.

Imported Structural Fill

GeoTest recommends that imported Structural Fill consist of clean, well-graded sandy gravel, gravelly sand, or other approved naturally occurring granular material (pit run) or a well-graded crushed rock. We recommend Structural Fill for dry weather construction meet Washington State Department of Transportation (WSDOT) Standard Specification 9-03.14(2) for "Select Borrow" with the added requirement that 100 percent pass a 4-inch-square sieve.

Soil containing more than about 5 percent fines (that portion passing the U.S. No. 200 sieve) cannot consistently be compacted to a dense, non-yielding condition when the water content is greater than optimum. Accordingly, GeoTest recommends that imported Structural Fill for wet weather construction meet WSDOT Standard Specification 9-03.14(1) for "Gravel Borrow" with the added requirement that no more that 5 percent pass the U.S. No. 200 sieve. Due to wet weather or wet site conditions, soil moisture contents could be high enough that it may be very difficult to compact even 'clean' imported select granular fill to a firm and unyielding condition. Soils with over-optimum moisture contents should be scarified and dried back to more suitable moisture contents during periods of dry weather or removed and replaced with fill soils at a more suitable range of moisture contents.

Based on local availability, the designer may elect to utilize Crushed Surfacing Base Course (CSBC) or Crushed Surfacing Top Course (CSTC) as Structural Fill. As such, we recommend WSDOT Standard Specification 9-03.9(3) be incorporated into the project plans.

Backfill and Compaction

Structural Fill should be placed in horizontal lifts. The Structural Fill must measure 8 to 10 inches in loose thickness and be thoroughly compacted. All Structural Fill placed under load bearing areas should be compacted to at least 95 percent of the maximum dry density, as determined using test method ASTM D1557. The top of the compacted Structural Fill should extend outside all foundations and other structural improvements a minimum distance equal to the thickness of the fill. We recommend that compaction be tested after placement of each lift in the fill pad.

Wet Weather Earthwork

The native soils on site have a significant percentage of silt. As such, these soils may be susceptible to degradation during wet weather. If construction takes place during wet weather, GeoTest recommends that Structural Fill consist of imported, clean, well-graded sand or sand and gravel as described above. If fill is to be placed or earthwork is to be performed in wet conditions, the contractor may reduce soil disturbance by:

- Limiting the size of areas that are stripped of topsoil and left exposed
- Accomplishing earthwork in small sections
- Limiting construction traffic over unprotected soil
- Sloping excavated surfaces to promote runoff
- Limiting the size and type of construction equipment used
- Providing gravel 'working mats' over areas of prepared subgrade
- Removing wet surficial soil prior to commencing fill placement each day
- Sealing the exposed ground surface by rolling with a smooth drum compactor or rubber-tired roller at the end of each working day
- Providing up-gradient perimeter ditches or low earthen berms and using temporary sumps to collect runoff and prevent water from ponding and damaging exposed subgrades

Seismic Design Considerations

The Pacific Northwest is seismically active, and the site could be subject to movement from a moderate or major earthquake. Consequently, moderate levels of seismic shaking should be accounted for during the design life of the project, and the proposed structure should be designed to resist earthquake loading using appropriate design methodology.

For structures designed using the seismic design provisions of the 2021 International Building Code, the dense to very dense Till soils that underly the project site are classified as Site Class C according to ASCE 7-22. The structural engineer should select the appropriate design response spectrum based on Site Class C soils and the geographical location of the proposed construction.

Foundation Support

New buildings are not anticipated to be included as part of the planned field improvements. New shallow foundation systems are, however, expected to support proposed fencing, goal posts and light standards.

Foundation support and settlement recommendations are based on the information obtained during our review of geologic information, the subsurface exploration program conducted for this project, and our experience in the project vicinity. GeoTest's foundation recommendations

are based on the assumption that soil conditions within the depth of influence of the new foundation are similar to those encountered and inferred from the information collected.

Foundation support for the proposed construction is recommended to be provided by continuous or isolated spread footings founded on properly prepared existing fill soils, native subgrades, or on properly compacted granular fill placed over firm and unyielding existing fill or native soils. To provide proper support, we recommend that any encountered organic debris be removed below foundation areas and the subgrade be compacted to a firm and unyielding condition prior to foundation formwork or Structural Fill placement.

Areas of unsuitable soil, or soil that cannot be recompacted should be handled according to the recommendations of the *Site Preparation and Earthwork* section of this report. All continuous and isolated spread footings should be designed by a licensed, structural engineer, and should be founded a minimum of 18 inches below the lowest adjacent final grade for freeze/thaw protection.

Allowable Bearing Capacity

Assuming the above foundation support criteria are satisfied, continuous or isolated spread footings founded on properly prepared existing fill soils, native subgrades, or on properly compacted granular fill placed over firm and unyielding existing fill or native soils may be proportioned using a net allowable soil bearing pressure of 2,500 pounds per square foot (psf).

The "net allowable bearing pressure" refers to the pressure that can be imposed on the soil at foundation level. This pressure includes all dead loads, live loads, the weight of the footing, and any backfill placed above the footing. The net allowable bearing pressure may be increased by one-third for transient wind or seismic loads.

Foundation Settlement

Settlement of shallow foundations depends on foundation size and bearing pressure, as well as the strength and compressibility characteristics of the underlying soil. If construction is accomplished as recommended and at the maximum allowable soil bearing pressure, GeoTest estimates the total settlement of foundations to be less than one inch under static conditions. Differential settlement between two adjacent load-bearing components supported on competent soil is estimated to be less than one half the total settlement.

Lateral Bearing Capacity of Light Standards

Based on the relative density of the exiting fill encountered in the upper 6.5 feet onsite, GeoTest recommends that an allowable lateral bearing capacity of 1,500 pounds per square foot be used in the design of the proposed light standard foundations. The recommended lateral bearing capacity is based on soil type and Standard Penetration Resistance, as reported in Chapter 17 of

the WSDOT Geotechnical Design Manual. Light standards must have sufficient embedment to resist moment and wind loads. Given the nature of the project, it is feasible that the designer may wish to use an alternative design approach than WSDOT methodology. GeoTest should be contacted by the luminary designer to discuss specific soil parameter inputs and/or approaches that will be used should alternative design approaches be selected.

At the time of this report the locations of the light standards were not known. Once the locations of the light standards are known, further evaluations and/or explorations, as necessary, may be performed at the proposed locations to provide updated lateral bearing capacities for foundations design.

We recommend that qualified geotechnical personnel confirm that suitable bearing conditions have been reached prior to placement of new light standard foundations. In areas where subgrade soils are not sufficient for the support of the foundation, extending the shaft length to firm and unyielding native soil will be required.

Drainage Considerations – *Outside of Field Improvements*

Positive surface gradients should be provided adjacent to the proposed field to direct surface water away from the field and toward suitable drainage facilities. Pavement and sidewalk areas, if present, should be sloped and drainage gradients should be maintained to carry surface water towards an approved stormwater collection system. Construction excavations should be sloped to drain to sumps where water from seepage, rainfall, and runoff can be collected and pumped to a suitable discharge facility.

The filtering media for drains may consist of open-graded drain rock wrapped in a nonwoven geotextile fabric such as Mirafi® 140N (or performance equivalent). For foundations supporting retaining walls, drainage backfill should be carried up the back of the wall and be at least 12 inches wide. The drainage backfill should extend from the foundation drain to within approximately 1 foot of the finished grade and consist of open-graded drain rock containing less than 3 percent fines by weight passing the U.S. Standard No. 200 sieve (based on a wet sieve analysis of that portion passing the U.S. Standard No. 4 sieve). The invert of the footing drainpipe should be placed at approximately the same elevation as the bottom of the footing or 12 inches below the adjacent floor slab grade (whichever is deeper) so that water will be contained. This process prevents water from seeping through walls or floor slabs. The drain system should include cleanouts to allow for periodic maintenance and inspection.

The drainage backfill for walls should extend from the foundation drain to within approximately 1 foot of the finished grade and consist of open-graded drain rock containing less than 3 percent fines by weight passing the U.S. Standard No. 200 sieve (based on a wet sieve analysis of that portion passing the U.S. Standard No. 4 sieve). The invert of the footing drainpipe should be placed at approximately the same elevation as the bottom of the footing. The drain system should include cleanouts to allow for periodic maintenance and inspection.

Drainage Considerations – *Inside of Field Improvements*

The exiting fill soils and underlying native soils that exist below the planned field improvements are expected to have low infiltration rates that will restrict the downward movement of water, particularly during extended periods of wet weather. Extensive drain systems around and below the planned field improvements will be required for the field to function as intended. The functionality and implementation of the drain systems on this site are critical to the success of the planned field improvements. As such, GeoTest recommends that we be allowed to review plans and specifications for the project prior to the start of construction. The purpose of the review would be to ensure that our recommendations are being properly implemented and incorporated into the design of the project.

Existing Site Drainage System

A functional drainage system likely exists below the existing field. Although it is our opinion that the existing drain system is unlikely to remain in place, the various elements of the drain system should be reviewed by the design team members to confirm that the existing drain system will be removed or, if left in place, will not interfere with planned drainage improvements or elements of the drain system for the new field.

Field Design and Construction

Turf field design and construction is expected to include Best Management Practices (BMP's) that, generally, include the following construction elements:

- Site grading activities that incorporate mild slopes or crowns to allow for passive drainage toward suitable discharge areas.
- An aggregate drainage layer of sufficient thickness that is incorporated into the new field design to reduce the potential for surface saturation from occurring during extended period of wet weather.
- A network of interreceptor trenches (trench drains) that captures surface runoff and directs it into the storm utility system or other suitable discharge areas.

It is anticipated that the turf field designer has established criteria for design and construction of the planned field improvements. The frequency, depth, construction materials, and type of drain should be specified by the field designer, with final project plans and specifications incorporating the field designer's recommendations. In the event that the field does not contain specific or proprietary trench drain recommendations by the field designer, GeoTest can be retained to provide trench drain recommendations. GeoTest requests the opportunity to review the field designer's design prior to construction to verify that his recommendations do not conflict with other drainage recommendations presented by GeoTest.

Resistance to Lateral Loads – *Retaining Walls*

The lateral earth pressures that develop against foundation walls will depend on the method of backfill placement, degree of compaction, slope of backfill, type of backfill material, provisions for drainage, magnitude and location of any adjacent surcharge loads, and the degree to which the wall can yield laterally during or after placement of backfill. If the wall can rotate or yield so the top of the wall moves an amount equal to or greater than about 0.001 to 0.002 times its height (a yielding wall), the soil pressure exerted comprises the active soil pressure. When a wall is restrained against lateral movement or tilting (a nonyielding wall), the soil pressure exerted comprises the at rest soil pressure. Wall restraint may develop if a rigid structural network is constructed prior to backfilling or if the wall is inherently stiff.

GeoTest recommends that yielding walls under drained conditions be designed for an equivalent fluid density of 35 pounds per cubic foot (pcf) for Structural Fill and native Till in active soil conditions. Nonyielding walls under drained conditions should be designed for an equivalent fluid density of 55 pcf for Structural Fill and native Till soils in at-rest conditions.

Design of walls should include appropriate lateral pressures caused by surcharge loads located within a horizontal distance equal to or less than the height of the wall. For uniform surcharge pressures, a uniformly distributed lateral pressure equal to 35 percent and 50 percent of the vertical surcharge pressure should be added to the lateral soil pressures for yielding and nonyielding walls, respectively. GeoTest also recommends that a seismic surcharge of 8H be included where H is the wall height. The seismic surcharge should be modeled as a rectangular distribution with the resultant applied at the midpoint of the wall.

Passive earth pressures developed against the sides of building foundations, in conjunction with friction developed between the base of the footings and the supporting subgrade, will resist lateral loads transmitted from the structure to its foundation. For design purposes, the passive resistance of well-compacted fill placed against the sides of foundations is equivalent to a fluid with a density of 350 pcf. The recommended value includes a safety factor of about 1.5 and assumes that the ground surface adjacent to the structure is level in the direction of movement for a distance equal to or greater than twice the embedment depth. The recommended value also assumes drained conditions that will prevent the buildup of hydrostatic pressure in the compacted fill. Retaining walls should include a drain system constructed in general accordance with the recommendations presented in the *Drainage Considerations – Outside of Field Improvements* section of this report. In design computations, the upper 12 inches of passive resistance should be neglected if the soil is not covered by floor slabs or pavement. If future plans call for the removal of the soil providing resistance, the passive resistance should not be considered.

An allowable coefficient of base friction of 0.35, applied to vertical dead loads only, may be used between the underlying soil and the base of the footing. If passive and frictional resistance are considered together, one half the recommended passive soil resistance value should be used

since larger strains are required to mobilize the passive soil resistance as compared to frictional resistance. A safety factor of about 1.5 is included in the base friction design value. GeoTest does not recommend increasing the coefficient of friction to resist seismic or wind loads.

Temporary and Permanent Slopes

The contractor is responsible for construction slope configurations and maintaining safe working conditions, including temporary excavation stability. All applicable local, state, and federal safety codes should be followed. All open cuts should be monitored during and after excavation for any evidence of instability. If instability is detected, the contractor should flatten the side slopes or install temporary shoring.

Temporary excavations in excess of 4 feet should be shored or sloped in accordance with Safety Standards for Construction Work Part N, WAC 296-155-66403. Till soils are classified as Type B soil. According to WAC 296-155-66401, Type B soils may be sloped as steep as 1:1 (Horizontal: Vertical). All soils encountered are classified as Type C soil in the presence of groundwater seepage. Flatter slopes or temporary shoring may be required in areas where groundwater flow is present and unstable conditions develop.

Temporary slopes and excavations should be protected as soon as possible using appropriate methods to prevent erosion from occurring during periods of wet weather.

GeoTest recommends that permanent cut or fill slopes be designed for inclinations of 2H:1V or flatter. Permanent cuts or fills used in detention ponds, retention ponds, or earth slopes intended to hold water should be 3H:1V or flatter. All permanent slopes should be vegetated or otherwise protected to limit the potential for erosion as soon as practical after construction.

Utilities

Trench backfill in improved areas should consist of Structural Fill as defined in the *Fill and Compaction* section of this report. Outside of improved areas, trench backfill may consist of reused native material provided the backfill can be compacted to the project specifications. Trench backfill should be placed and compacted in general accordance with the recommendations presented in the *Fill and Compaction* section of this report.

Surcharge loads on trench support systems due to construction equipment, stockpiled material, and vehicle traffic should be included in the design of any anticipated shoring system. The contractor should implement measures to prevent surface water runoff from entering trenches and excavations. In addition, vibration as a result of construction activity and traffic may cause caving of the trench walls.

The contractor is responsible for trench configurations. All applicable local, state, and federal safety codes should be followed. All open cuts should be monitored by the contractor during

excavation for any evidence of instability. If instability is detected, the contractor should flatten the side slopes or install temporary shoring. If groundwater or groundwater seepage is present, and the trench is not properly dewatered, the soil within the trench zone may be prone to caving, channeling, and running. Trench widths may be substantially wider than under dewatered conditions.

Stormwater Infiltration Potential

The native soils observed underlying the site are medium dense to very dense, contain elevated silt contents (14 to 41 percent), and are expected to exhibit low permeability characteristics. GeoTest anticipates perched groundwater seepage atop low permeability Till during the wet season and after extended periods of heavy precipitation. Both groundwater seepage and glacial deposits such as Till are widely regarded as "hydraulic restriction layers" as defined by the Manual. Till, in particular, is used as construction materials in stormwater pond liners and in berm construction where low-permeability soils are required as part of the design.

Shallow restriction layers, as defined by the Manual, exist on the property that will make the design of infiltration systems challenging. The Manual has requirements and limitations for the design of stormwater facilities when shallow restriction layers exist below a facility. At the time of this report, a Stormwater Plan has not been developed for this property. Thus, it should be expected that the Civil Engineer will need to review the contents of this report with a specific focus on soil type, soil density, and/or the amount of vertical separation between the bottom of the facility and the restriction layer.

GeoTest should be contacted during the preparation of the Stormwater Plan to facilitate a discussion with the designer regarding shallow restriction layers and stormwater management approaches. Stormwater management strategies that include elements of Low Impact Development (LID) may be feasible but should have a fundamental expectation that native soils underlying facilities will consist of low permeability materials. For these reasons, infiltration is expected to be challenging, if not infeasible on this project.

Pilot Infiltration Test Results

GeoTest performed one small-scale PIT test on August 23, 2023 in order to determine the initial infiltration rate (I_{design} initial) in inches per hour. The base of the PIT was excavated to the dimensions of approximately 4.4 feet long by 3.2 feet wide, with an approximate elevation of 2.8 feet BGS. The bottom of the PIT extended into the native Till. Approximate ground elevations were obtained from *King County iMap*.

Infiltration testing is conducted by discharging water into the flat-bottom excavation for a 6-hour "soaking period". The purpose of the 6-hour pre-soak is to allow the soils in the immediate vicinity of the test area to exhibit saturated conditions. Water was discharged into the excavation at a metered rate while keeping the water level within the testing area relatively fixed. The

cumulative volume and instantaneous flow rates are recorded every 15 minutes. Water for the infiltration testing was obtained from an on-site fire hydrant.

Following a 2.25-hour pre-soak, GeoTest was unable to keep a low enough flow to conduct a steady state water level. As a result, the water was shut off and the rate of infiltration (the drop of the standing water) in inches per hour was recorded for two hours. At the conclusion of the testing, the bottom of the PIT was excavated an additional 5 feet to identify possible restrictive layers. GeoTest observed similar Till soil conditions within this over excavation to an approximate and terminal depth of 8.5 feet BGS.

Table 2 below presents topographic information for the surface elevations, the bottom of PIT elevation, and the regional groundwater table elevation:

Table 2
PIT Test Elevations

PIT ID	Test Date	Surface Elevation* (ft)	Bottom of PIT Elevation (ft)	Groundwater Elevation (ft)	Groundwater Separation (ft)
PIT-1	8/23/2023	457	454.2	Not Encountered	NA

*Surface elevation data is approximate and is derived from the *King County iMap.*

Design Infiltration Rates

The initial, uncorrected design infiltration rate (I_{design}) was calculated for the PIT using the infiltration rate recorded during the falling-head test. This is measured as a change in depth per recorded time interval. The I_{design} initial value is shown below in Table 3. GeoTest then determined the corrected, maximum design infiltration rate (I_{design} max) by applying the following correction factors in accordance with the Manual:

- Site variability and uncertainties in the testing methods, $F_{testing} = 0.50$
- Influence of facility geometry and depth to water table or impervious strata, $F_{geometry} = 0.50$
- Reductions in infiltration rates over the long term due to plugging of soils, $F_{plugging} = 0.70$

Based on our PIT result and analysis of the subsurface soils, the infiltration rates within the native, non-weathered Till on site was calculated to be 0.03 inches per hour. This rate is representative of an excavation that extends to an elevation of approximately 454.2 feet above mean sea level within the Till. It should be noted that this rate is only valid for a facility that is in the vicinity of PIT-1, and specifically within non-weathered Till.

Table 3 provides a summary of the calculated infiltration rate determined at the PIT location:

Table 3 Calculated Infiltration Rate			
PIT ID	**I_{design} Initial (in/hr)**	**Reduction Factor***	**I_{design} Max (in/hr)**
PIT-1	0.2	0.175	0.03
*Total Reduction Factor = (0.50)(0.50)(0.70) = 0.175			

Design Considerations

Stormwater infiltration potential is a function of the relative permeability of the site soils, and the separation between the base of the stormwater facility and the groundwater table. GeoTest assumed that the bottom of infiltration facilities would need to be placed within the weathered Till due to the shallow native soil conditions that were encountered during our explorations.

For facility bottoms within non-weathered Till, GeoTest recommends that the Civil Engineer use a design infiltration rate of **0.03 inches per hour** for preliminary design purposes. Since the size and depth of stormwater facilities are not currently known, it is not possible to perform a groundwater mounding analysis at this time.

It should be noted that the above rate is unlikely to allow for the conventional design of an infiltration facility and infeasibility criteria for infiltration appear to be met for this project site.

Stormwater Treatment

The on-site stormwater facilities may require some form of pollutant pretreatment with an amended soil prior to on-site infiltration or off-site discharge. The reuse of on-site topsoil is often the most sustainable and cost-effective method for pollutant treatment purposes. Cation exchange capacities, organic contents, and pH of site subsurface soils were also tested to determine possible pollutant treatment suitability.

Cation exchange capacity, organic content, and pH tests were performed by Northwest Agricultural Consultants on two soil samples collected from the explorations shown in Table 4. A summary of the laboratory test results is presented in Table 4 below.

Table 4 Cation Exchange Capacity, Organic Content, and pH Laboratory Test Results					
Test Pit ID	**Sample Depth (ft)**	**Geologic Unit**	**Cation Exchange Capacity (meq/100 grams)**	**Organic Content (%)**	**pH**
B-1	2.5	Weathered Till	9.5	1.41	6.4
B-2	2.5	Weathered Till	12.2	3.75	6.2

Suitability for on-site pollutant treatment is determined in accordance with Section 6.2.4.2 of the Manual. Soils with an organic content greater than or equal to 1 percent and a cation exchange capacity of greater than or equal to 8 meq/100 grams are characterized as suitable soils for stormwater treatment. Based on the results shown in Table 4, the native soils and topsoil observed on-site are suitable for stormwater treatment purposes.

Geotechnical Consultation and Construction Monitoring

GeoTest recommends that we be involved in the project design review process. The purpose of the review is to verify that the recommendations presented in this report are understood and incorporated in the design and specifications.

We also recommend that geotechnical construction monitoring services be provided. These services should include observation by GeoTest personnel during Structural Fill placement, compaction activities and subgrade preparation operations to confirm that design subgrade conditions are obtained beneath the areas of improvement.

Periodic field density testing should be performed to verify that the appropriate degree of compaction is obtained. The purpose of these services is to observe compliance with the design concepts, specifications, and recommendations of this report. In the event that subsurface conditions differ from those anticipated before the start of construction, GeoTest would be pleased to provide revised recommendations appropriate to the conditions revealed during construction.

GeoTest is available to provide a full range of materials testing and special inspection during construction as required by the local building department and the International Building Code. This may include specific construction inspections on materials such as reinforced concrete, reinforced masonry, and structural steel. These services are supported by our fully accredited materials testing laboratories.

USE OF THIS REPORT

GeoTest Services, Inc. has prepared this preliminary report for the exclusive use of the Northshore School District and their design consultants for specific application to the design of the proposed turf field located at 19115 215th Way NE, in Woodinville, WA. Use of this report by others is at the user's sole risk. This report is not applicable to other site locations. Our services are conducted in accordance with accepted practices of the geotechnical engineering profession; no other warranty, express or implied, is made as to the professional advice included in this report.

Our site explorations indicate subsurface conditions at the dates and locations indicated. It is not warranted that these conditions are representative of conditions at other locations and times.

The analyses, conclusions, and recommendations contained in this report are based on site conditions to the limited depth and time of our explorations, a geological reconnaissance of the area, and a review of previously published geological information for the site. If variations in subsurface conditions are encountered during construction that differs from those contained within this report, GeoTest should be allowed to review the recommendations and, if necessary, make revisions. If there is a substantial lapse of time between submission of this report and the start of construction, or if conditions change due to construction operations at or adjacent to the project site, we recommend that we review this report to determine the applicability of the conclusions and recommendations contained herein.

The earthwork contractor is responsible for performing all work in conformance with all applicable WISHA/OSHA regulations. GeoTest Services, Inc. is not responsible for job site safety on this project, and this responsibility is specifically disclaimed.

Attachments:	Figure 1	Vicinity Map
	Figure 2	Site and Exploration Plan
	Figure 3	Conceptual Footing and Wall Drain Section
	Figure 4	Soil Classification System and Key
	Figures 5 – 9	Soil Boring Exploration Logs
	Figure 10	Pilot Infiltration Test (PIT) Log
	Figures 11 – 12	Grain Size Test Data
	Attachment	Dynamic Cone Penetrometer (DCP) Analysis
	Attachment	NW Agricultural Consultants Test Results
	Attachment	Report Limitations and Guidelines for Its Use (4 pages)

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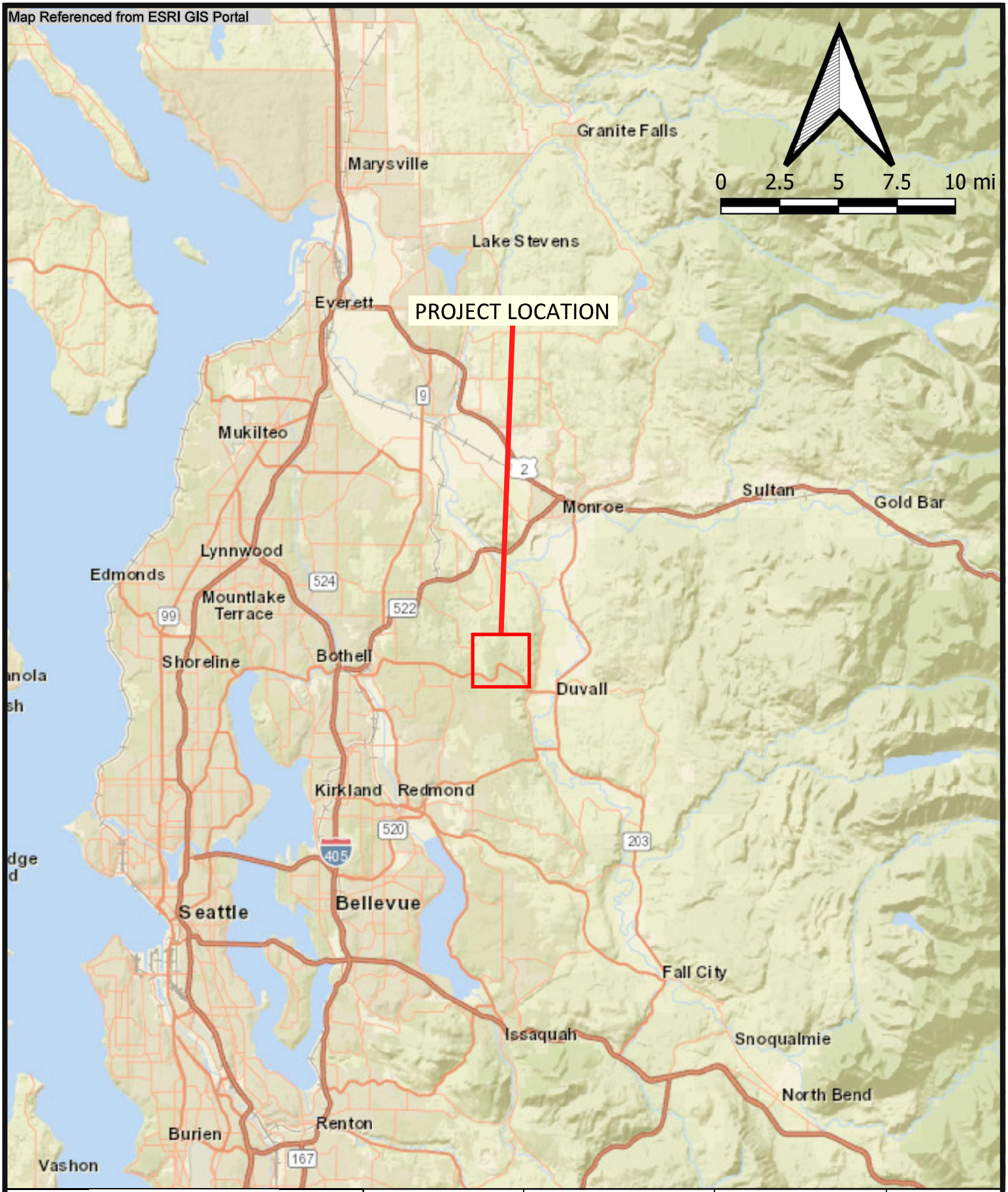
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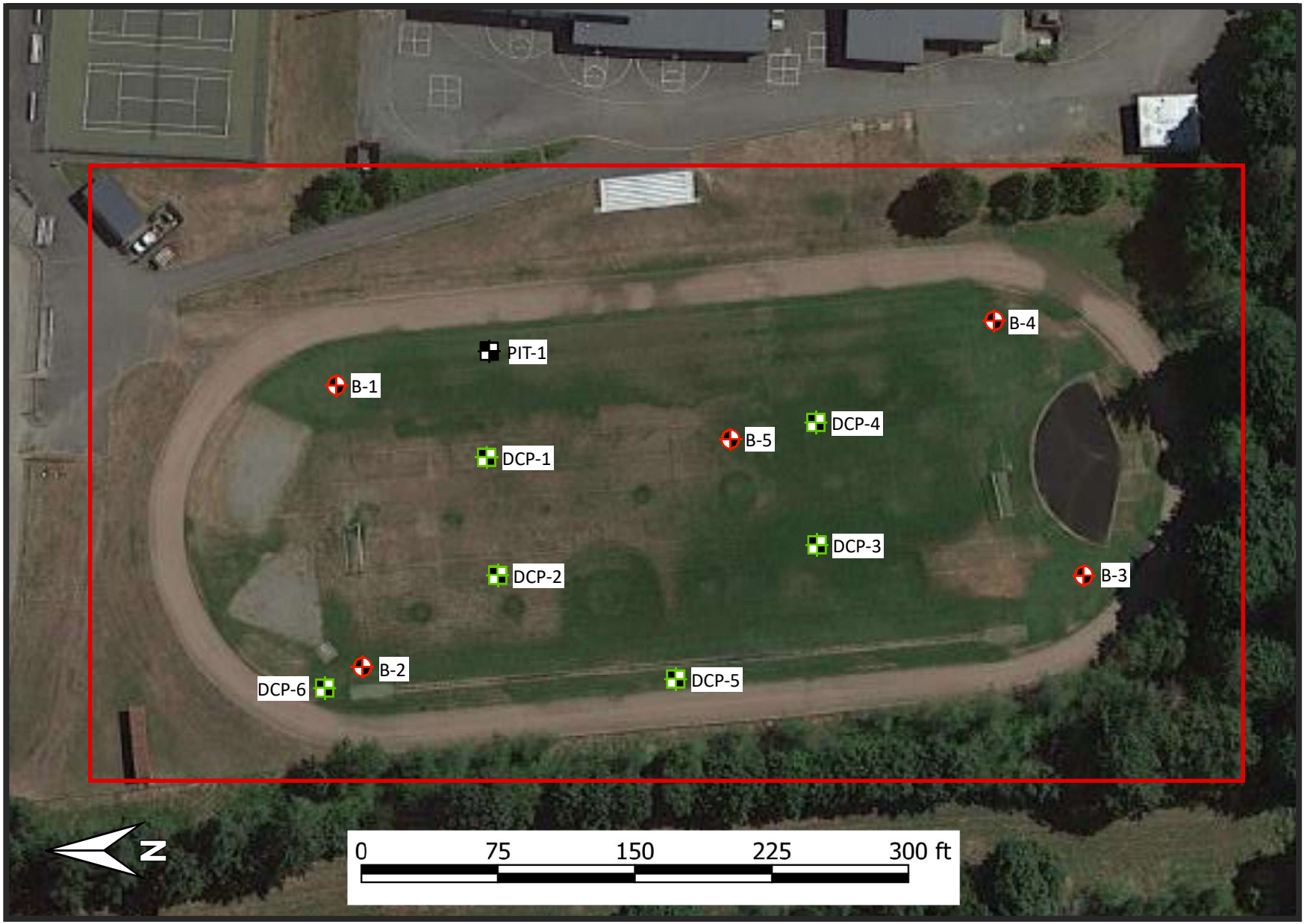


Date: 8-7-2023	By: CM	Scale: As Shown	Project 23-1901

VICINITY MAP

TIMBERCREST MIDDLE SCHOOL FIELD AND TRACK
19115 215TH WAY NE
WOODINVILLE, WASHINGTON 98077

Figure 1



B-# = Approximate Boring Location

DCP-# = Approximate Dynamic Cone Penetrometer Location

PIT-# = Approximate Pilot Infiltration Test (PIT) Location

Notes:

1) Approximate project area outlined in RED

2) Map image created using *QGIS 3.22.6.*

GEOTEST
An RMA Company

Date: 8-9-2023	By: CM	Scale: As Shown	Project 23-1901

SITE AND EXPLORATION PLAN

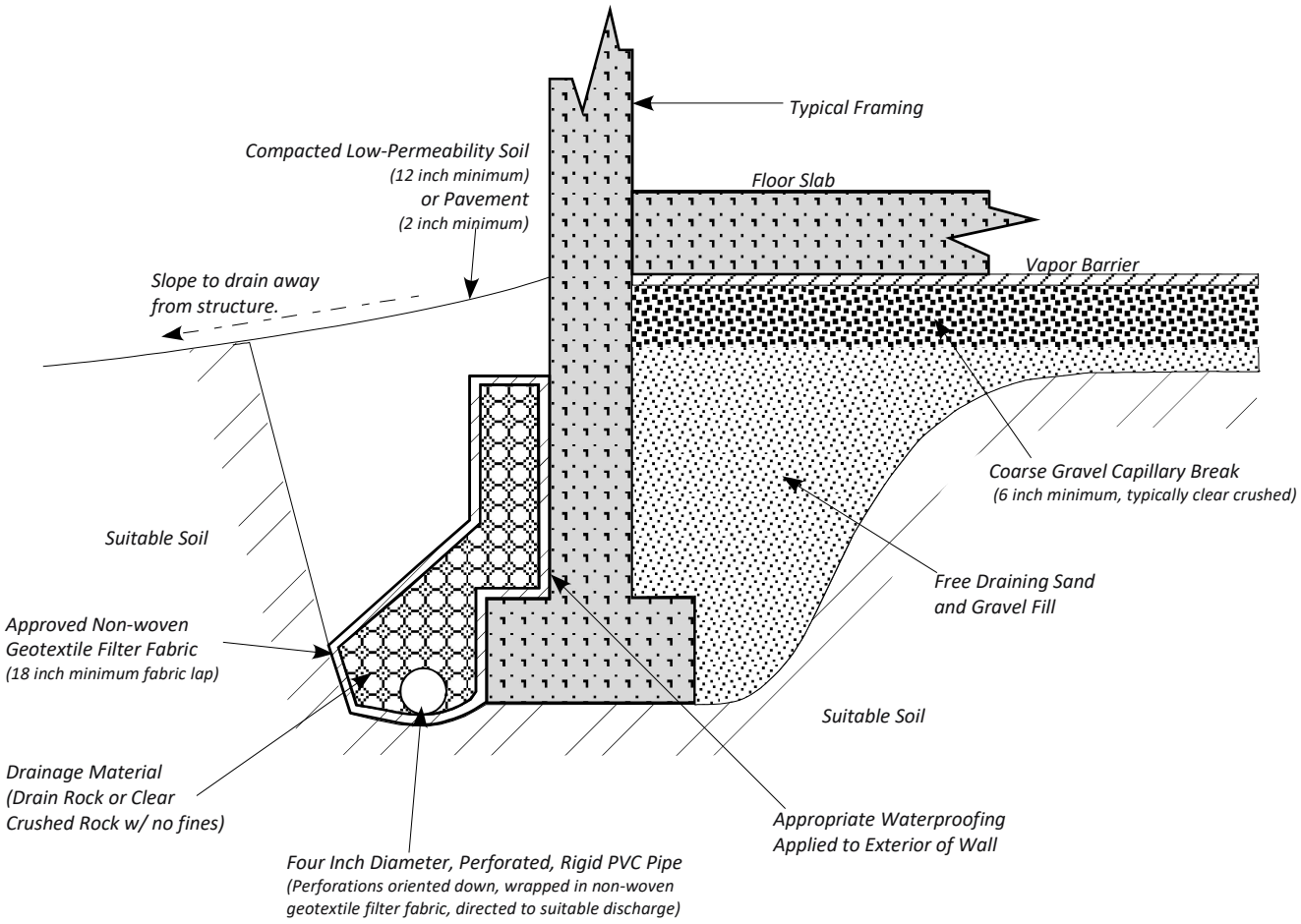
TIMBERCREST MIDDLE SCHOOL FIELD AND TRACK

19115 215TH WAY NE

WOODINVILLE, WASHINGTON 98077

Figure 2

CONCEPTUAL FOOTINGS WITH INTERIOR SLAB-ON-GRADE



Notes:

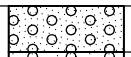
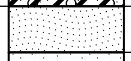
This figure is not intended to be representative of a design. This figure is intended to present concepts that can be incorporated into a functional foundation drain designed by a Civil Engineer. In all cases, refer to the Civil plan sheet for drain details and elevations.

Footings should be properly buried for frost protection in accordance with International Building Code or local building codes (Typically 18 inches below exterior finished grades).

The footing drain will need to be modified from this typical drawing to fit the dimensions of the planned footing and slab configuration.

GEOTEST An RMA Company	Date: 9-7-2023	By: CM	Scale: None
	CONCEPTUAL FOOTING & WALL DRAIN SECTION **TIMBERCREST MIDDLE SCHOOL FIELD AND TRACK** **19115 215TH WAY NE** **WOODINVILLE, WASHINGTON 98077**		Project **23-1901** Figure **3**

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL	TYPICAL DESCRIPTIONS[1][2]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

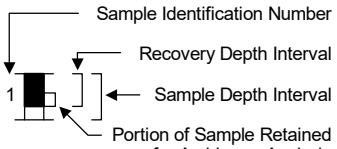
OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*, as outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
2. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
	> 12% and ≤ 30% - "gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 12% - "slightly gravelly," "slightly sandy," "slightly silty," etc.
	≤ 5% - "trace gravel," "trace sand," "trace silt," etc., or not noted.

Drilling and Sampling Key

SAMPLE NUMBER & INTERVAL



SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Other - See text if applicable

Groundwater

▽ ATD — Approximate water elevation at time of drilling (ATD) or on date noted. Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

GEOTEST An RMA Company

Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Soil Classification System and Key

Figure 4

B-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-stem Auger Ground Elevation (ft): 457 Drilled By: Boretec1, Inc./C. McCabe	
0						SM	Loose, dark brown, moist, silty SAND with grass and roots (Topsoil)	Groundwater not encountered.
						SP	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
2						SM	Very dense, gray, moist, gravelly, silty SAND with localized oxidation (Weathered Till)	
	1	b2	50					
4							Very dense, tan, moist, slightly gravelly, very silty SAND (Till) Grinding at 4 feet	
	2	b2	50	W = 11 GS				
6								
							Density changes to dense	
8	3	b2	46					
							Soils become very gravelly	
10								
	4	b2	50				Density changes to very dense	
12								

Boring Completed 08/07/23
Total Depth of Boring = 11.5 ft.

Notes: Approximate Elevations Obtained from King County iMap

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Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Log of Boring B-1

Figure
5

B-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-stem Auger Ground Elevation (ft): 457 Drilled By: Boretec1, Inc./C. McCabe	
0						SM	Loose, dark brown, moist, silty SAND with grass and roots (Topsoil)	Groundwater not encountered.
						SP	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
2						SM	Medium dense, brown and gray, moist, gravelly, silty SAND with occasional roots and wood (Fill) Grinding at 2 feet	
	5	b2	27					
4						SM	Loose, brown to gray, moist, slightly gravelly, very silty SAND with occasional roots (Fill) Grinding at 4 feet Low recovery of sample	
	6	b2	10	W = 19 GS				
6						SM	Very dense, gray to brown, moist, gravelly, silty SAND (Till)	
8	7	b2	50/ 6"					
10	8	b2	50					
12								

Boring Completed 08/07/23
Total Depth of Boring = 11.5 ft.

Notes: Approximate Elevations Obtained from King County iMap

GEOTEST
An RMA Company

Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Log of Boring B-2

Figure
6

B-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-stem Auger Ground Elevation (ft): 457 Drilled By: Boretec1, Inc./C. McCabe	
0						SM	Loose, dark brown, moist, silty SAND with grass and roots (Topsoil)	Groundwater not encountered.
						SP	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
2						SM	Dense, dark brown, moist, gravelly, silty SAND with occasional roots and wood (Fill)	
	9	b2	36	W = 14 GS				
4						SM	Very dense, gray-brown, moist, gravelly, silty SAND with localized oxidation (Weathered Till)	
	10	b2	50/ 5"					
6								
8	11	b2	50					
						SM	Very dense, tan, moist, gravelly, very silty SAND (Till)	
10	12	b2	50					
12								

Boring Completed 08/07/23
Total Depth of Boring = 11.5 ft.

Notes: Approximate Elevations Obtained from King County iMap

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An RMA Company

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Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Log of Boring B-3

Figure
7

B-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-stem Auger Ground Elevation (ft): 457 Drilled By: Boretec1, Inc./C. McCabe	
0						SM	Loose, dark brown, moist, silty SAND with grass and roots (Topsoil)	Groundwater not encountered.
						SP	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
2						SM	Very dense, orange-gray, moist, gravelly, silty SAND with oxidation throughout (Weathered Till)	
	13	b2	50/ 5"					
4								
	14	b2	50/ 5"					
6								
	15	b2	50/ 6"					
8								
						SM	Very dense, brown, moist, gravelly, silty SAND (Till)	
10	16	b2	50/ 6"	W = 8 GS				
12								

Boring Completed 08/07/23
Total Depth of Boring = 11.5 ft.

Notes: Approximate Elevations Obtained from King County iMap

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Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Log of Boring B-4

Figure
8

B-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-stem Auger Ground Elevation (ft): 457 Drilled By: Boretec1, Inc./C. McCabe	
0						SM	Loose, dark brown, moist, silty SAND with grass and roots (Topsoil)	Groundwater not encountered.
						SP	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
2						SM	Very dense, tan, moist, gravelly, silty SAND with localized oxidation (Weathered Till)	
	17	b2	47					
4						SM	Very dense, tan, moist, gravelly, silty SAND (Till) Grinding at 4 feet	
	18	b2	50/ 6"					
6								
							Increase in gravel content	
8	19	b2	43	W = 7 GS				
							Decrease in gravel content	
10	20	b2	50					
12								

Boring Completed 08/07/23
Total Depth of Boring = 11.5 ft.

Notes: Approximate Elevations Obtained from King County iMap

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Timbercrest Middle School Field and Track 19115 215th Way NE Woodinville, Washington 98077	Log of Boring B-5	Figure 9

PIT-1

SAMPLE DATA			SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 457 Excavated By: Cascade Excavation/SEM	
0					SM	Loose, brown, dry, silty SAND with rootlets and grass (Topsoil)	Groundwater not encountered.
	1	d			SP		
2					ML	Loose, gray, moist, poorly graded SAND with trace gravel (Fill)	
	2	d			SM	Dense, gray-tan, moist, gravelly, sandy SILT with cobbles (Weathered Till)	
4	3	d	W = 19 GS			Very dense, brown, moist, gravelly, very silty SAND with cobbles and boulders (Till)	
						Bottom of Pilot Infiltration Test (PIT) @ 2.8 feet	
6	4	d	W = 9 GS				
8	5	d					
10							

Test Pit Completed 08/23/23
Total Depth of Test Pit = 8.5 ft.

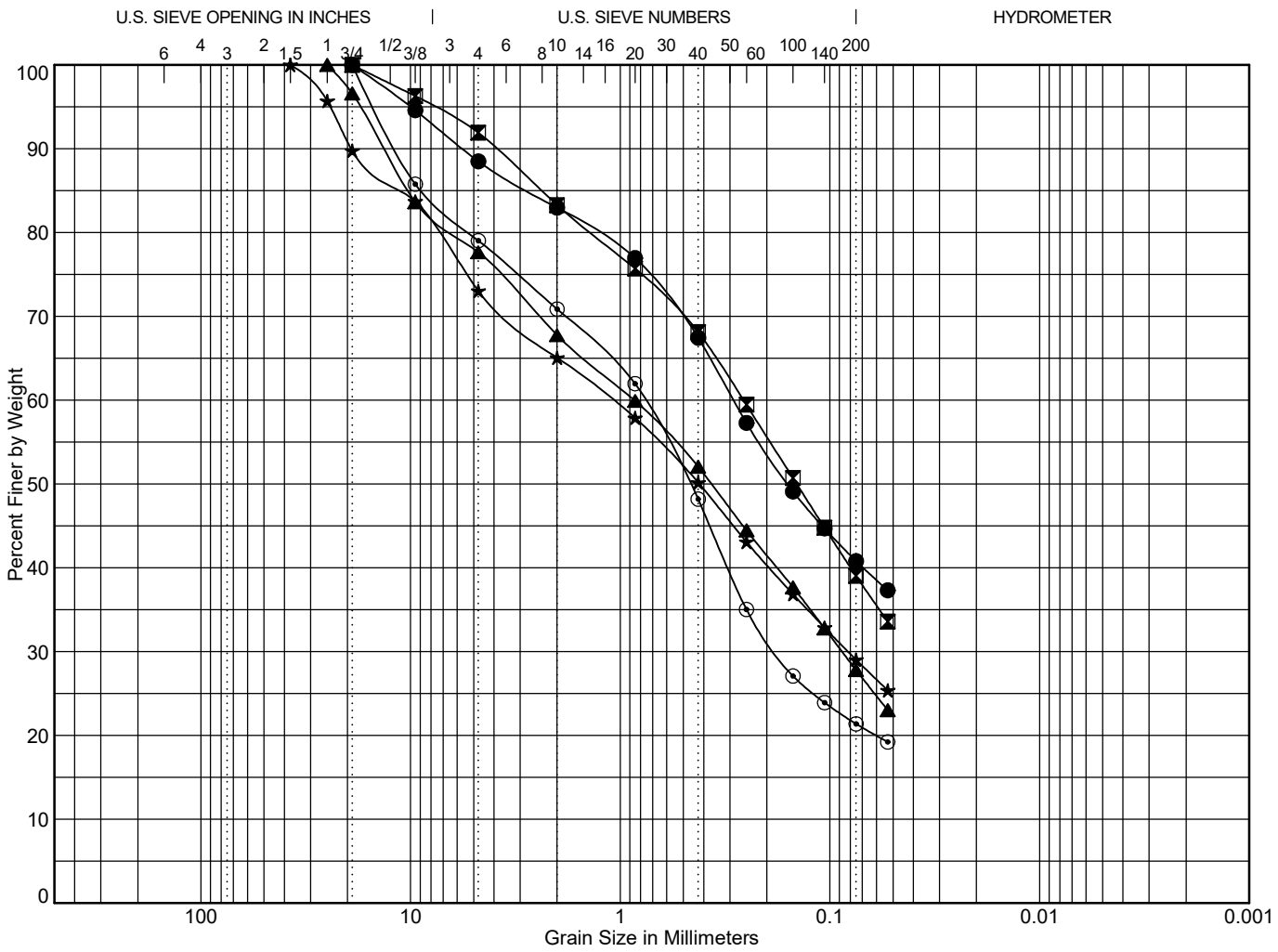
Notes: Approximate Elevations Obtained from King County iMap

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Field and Track
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98077

Log of Test Pits

Figure
10



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point		Depth	Classification	LL	PL	PI	C_c	C_u
●	B-1	5.0	Slightly gravelly, very silty SAND (SM)					
⊠	B-2	5.0	Slightly gravelly, very silty SAND (SM)					
▲	B-3	2.5	Gravelly, silty SAND (SM)					
★	B-4	10.0	Gravelly, silty SAND (SM)					
⊙	B-5	7.5	Gravelly, silty SAND (SM)					

Point		Depth	D_{90}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
●	B-1	5.0	5.64	0.288	0.159			0.0	11.5	5.5	15.5	26.6	40.8
⊠	B-2	5.0	3.926	0.259	0.144			0.0	8.1	8.6	15.2	29.1	39.0
▲	B-3	2.5	13.355	0.858	0.368	0.087		3.4	19.0	9.9	15.7	24.3	27.8
★	B-4	10.0	19.212	1.094	0.42	0.082		10.2	16.7	8.0	14.9	21.1	29.0
⊙	B-5	7.5	11.676	0.77	0.466	0.181		0.0	21.0	8.2	22.7	26.8	21.4

$C_c = D_{30}^2/(D_{60} * D_{10})$
$C_u = D_{60}/D_{10}$

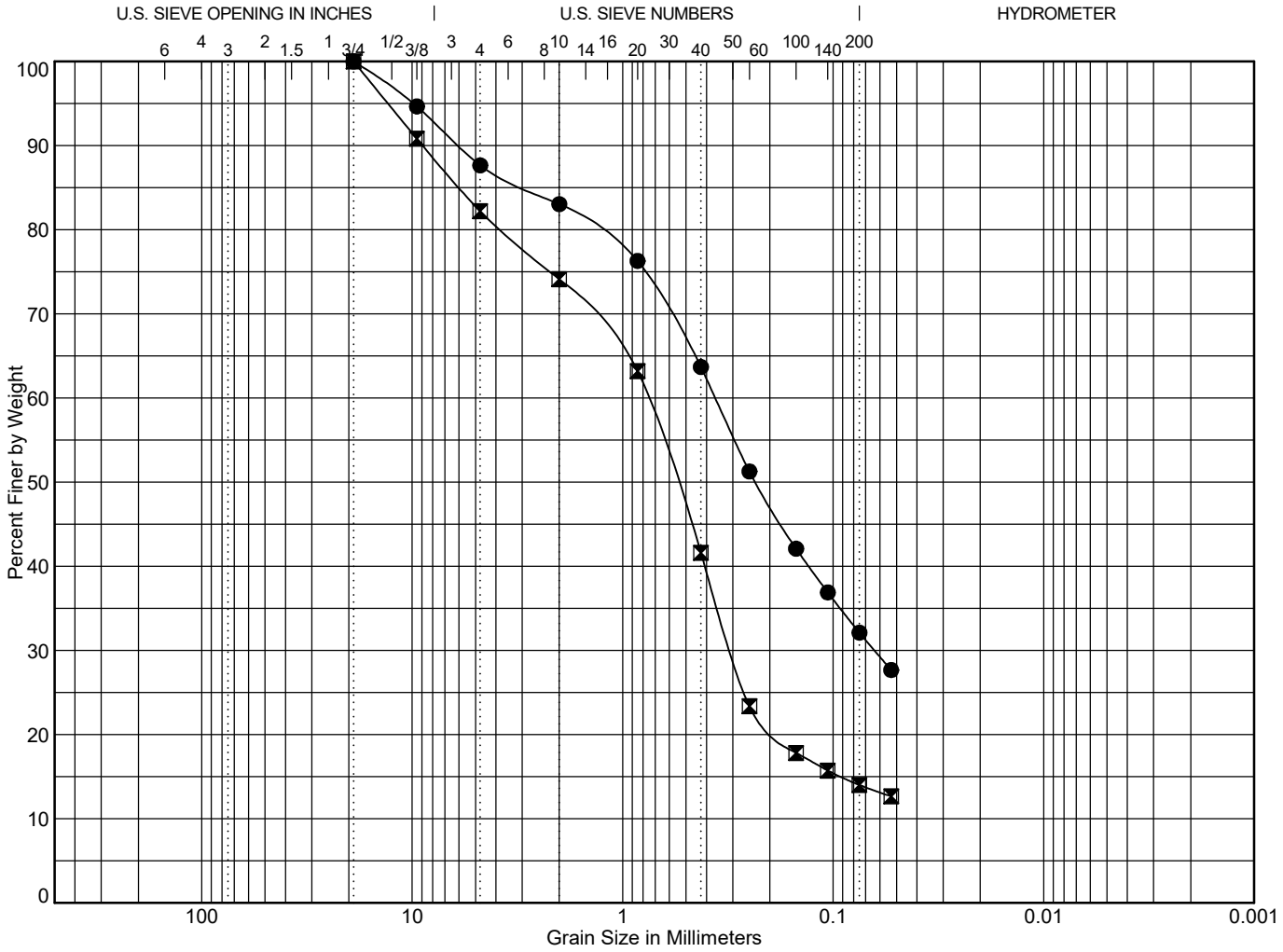
To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

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Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Grain Size Test Data

Figure
11



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point		Depth	Classification	LL	PL	PI	C_c	C_u
●	PIT-1	4.0	Gravelly, very silty SAND (SM)					
⊠	PIT-1	6.0	Silty, gravelly SAND (SM)					

Point		Depth	D_{90}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
●	PIT-1	4.0	5.995	0.363	0.233	0.064		0.0	12.4	4.6	19.4	31.6	32.1
⊠	PIT-1	6.0	8.903	0.767	0.557	0.303		0.0	17.8	8.1	32.5	27.6	14.0

$C_c = D_{30}^2/(D_{60} * D_{10})$
$C_u = D_{60}/D_{10}$

To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

GEOTEST
An RMA Company

Timbercrest Middle School
Field and Track
19115 215th Way NE
Woodinville, Washington
98077

Grain Size Test Data

Figure
12

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-1
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	8	35.5	••••••••••	10	LOOSE	STIFF
-	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
- 1 ft	50	222.0	••	-	VERY DENSE	HARD
-						
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-2
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
-	8	35.5	•••••••••	10	LOOSE	STIFF
- 1 ft	50	222.0	••	-	VERY DENSE	HARD
-	50	222.0	••	-	VERY DENSE	HARD
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-3
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
- 1 ft	50	222.0	••	-	VERY DENSE	HARD
-						
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
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-						
- 6 ft						
-						
- 2 m						
- 7 ft						
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- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-4
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	7	31.1	••••••••	8	LOOSE	MEDIUM STIFF
-	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
- 1 ft	50	222.0	••	-	VERY DENSE	HARD
-						
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-5
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
- 1 ft	48	213.1	••	-	VERY DENSE	HARD
-	50	222.0	••	-	VERY DENSE	HARD
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

GeoTest Services, Inc.
741 Marine Drive
Bellingham, WA 98225

PROJECT NUMBER: 23-1901
DATE STARTED: 08-23-2023
DATE COMPLETED: 08-23-2023

HOLE #: DCP-6
CREW: CM/GS
PROJECT: Timbercrest Middle School
ADDRESS: 19115 215th Way NE
LOCATION: Woodinville, Washington 98077

SURFACE ELEVATION: Approx. 457 feet
WATER ON COMPLETION: Not Determined
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
- 1 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
-	18	79.9	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	25	111.0	••••••••••••••••••••••••••••••	-	DENSE	HARD
- 2 ft	37	164.3	••	-	DENSE	HARD
-	26	115.4	••••••••••••••••••••••••••••••	-	DENSE	HARD
-	26	115.4	••••••••••••••••••••••••••••••	-	DENSE	HARD
- 3 ft	27	119.9	••••••••••••••••••••••••••••••	-	DENSE	HARD
- 1 m	21	93.2	••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-	36	139.0	••••••••••••••••••••••••••••••••••••	-	DENSE	HARD
- 4 ft	50	193.0	••	-	VERY DENSE	HARD
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

Northwest Agricultural Consultants

2545 W Falls Avenue
Kennewick, WA 99336
509.783.7450
www.nwag.com
lab@nwag.com

PAP-Accredited
NAPT

GeoTest Services Inc.
741 Marine Drive
Bellingham, WA 98225

Report: 64721-1-1
Date: August 10, 2023
Project No: 23-1901
Project Name: Timbercrest Middle Track & Field

Sample ID	pH	Organic Matter	Cation Exchange Capacity
B1 @ 2.5’	6.4	1.41%	9.2 meq/100g
B2 @ 2.5’	6.2	3.75%	12.2 meq/100g
Method	**SM 4500-H^+ B**	**ASTM D2974**	**EPA 9081**

REPORT LIMITATIONS AND GUIDELINES FOR ITS USE[1]

Subsurface issues may cause 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:

Geotechnical Services are Performed for Specific Purposes, Persons, and Projects

At GeoTest our geotechnical engineers and geologists structure their services to meet specific needs of our clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of an owner, a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineer who prepared it. And no one – not even you – should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report is Based on a Unique Set of Project-Specific Factors

GeoTest's geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the clients goals, objectives, and risk management preferences; the general nature of the structure involved its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless GeoTest, who conducted the study specifically states otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

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Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed, for example, from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed construction,
- alterations in drainage designs; or
- composition of the design team; the passage of time; man-made alterations and construction whether on or adjacent to the site; or by natural alterations and events, such as floods, earthquakes or groundwater fluctuations; or project ownership.

Always inform GeoTest's geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. Do not rely on the findings and conclusions of this report, whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact GeoTest before applying the report to determine if it is still relevant. A minor amount of additional testing or analysis will help determine if the report remains applicable.

Most Geotechnical and Geologic Findings are Professional Opinions

Our site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoTest's engineers and geologists review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in your report. Retaining GeoTest who developed this report to provide construction observation is the most effective method of managing the risks associated with anticipated or unanticipated conditions.

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A Report's Recommendations are Not Final

Do not over-rely on the construction recommendations included in this report. Those recommendations are not final, because geotechnical engineers or geologists develop them principally from judgment and opinion. GeoTest's geotechnical engineers or geologists can finalize their recommendations only by observing actual subsurface conditions revealed during construction. GeoTest cannot assume responsibility or liability for the report's recommendations if our firm does not perform the construction observation.

A Geotechnical Engineering or Geologic Report may be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. Lower that risk by having GeoTest confer with appropriate members of the design team after submitting the report. Also, we suggest retaining GeoTest to review pertinent elements of the design teams plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having GeoTest participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do not Redraw the Exploration Logs

Our geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors of omissions, the logs included in this report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable; but recognizes that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In that letter, consider advising the contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoTest and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might you be in a position to give contractors the best information available, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

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In addition, it is recommended that a contingency for unanticipated conditions be included in your project budget and schedule.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering or geology is far less exact than other engineering disciplines. This lack of understanding can create unrealistic expectations that can lead to disappointments, claims, and disputes. To help reduce risk, GeoTest includes an explanatory limitations section in our reports. Read these provisions closely. Ask questions and we encourage our clients or their representative to contact our office if you are unclear as to how these provisions apply to your project.

Environmental Concerns Are Not Covered in this Geotechnical or Geologic Report

The equipment, techniques, and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated containments, etc. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. Do not rely on environmental report prepared for some one else.

Obtain Professional Assistance to Deal with Biological Pollutants

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts biological pollutants from growing on indoor surfaces. Biological pollutants includes but is not limited to molds, fungi, spores, bacteria and viruses. To be effective, all such strategies should be devised for the express purpose of prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional biological pollutant prevention consultant. Because just a small amount of water or moisture can lead to the development of severe biological infestations, a number of prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of this study, the geotechnical engineer or geologist in charge of this project is not a biological pollutant prevention consultant; none of the services preformed in connection with this geotechnical engineering or geological study were designed or conducted for the purpose of preventing biological infestations.

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Appendix C
Delineation Report

Heavy Civil | Land Development | Municipal | Structural | Survey | Water Resources | Environmental

PACE Engineers
11255 Kirkland Way, Suite 300
Kirkland, Washington 98033
425.827.2014

















DELINEATION REPORT

TIMBERCREST MIDDLE SCHOOL
KING COUNTY, WASHINGTON

October 2025

DELINEATION REPORT
TIMBERCREST MIDDLE SCHOOL

PREPARED FOR

Juliana Loli
3625 Woodland Park Avenue N, Suite 100
Seattle, Washington 98107

October 2025

PREPARED BY

PACE Engineers
11255 Kirkland Way, Suite 300
Kirkland, Washington 98033
Project No.: 250512

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1.0 INTRODUCTION

This report describes the findings of an onsite critical areas investigation and delineation conducted for the proposed upgrades to the northern fields of Timbercrest Middle School located at 19115 215th Way NE in King County, Washington (Parcel Nos. 0426069010 and 0426069023). This report outlines the existing conditions of the property, herein referred to as the subject site or site, and identifies relevant city ordinances and regulatory agency requirements pertaining to potential redevelopment of the property, including local, state, and federal laws and regulations. In addition, this report will discuss the critical areas identified onsite and their required buffers. This report does not discuss mitigation strategies as a final site plan has not been completed. Upon completion of the site plan, if needed, mitigation planning and design will be included in this report. This report has been prepared to comply with the requirements of King County Code (KCC) 21A.24 – Critical Areas.

1.1 Project Location/Study Area

The study area is defined as parcels 0426069010 and 0426069023, zoned RA-5 Rural Area (1 dwelling unit / 2.5 - 10acres) and is approximately 34.9 acres in size (Figure 1). Adjacent public or private property within 200 feet was screened from the edge of the parcel or nearest publicly accessible area; no private property was accessed without permission. The site is situated within Section 04 of Township 26 North, Range 6 East.

1.2 Site Description / Summary

The study area is in the Bear Creek subwatershed (HUC 171100120301) of the Cedar-Sammamish Water Resource Inventory Area (WRIA 8). The northern portion of the study area and area east of 215th Way NE remain forested with second growth forest. Wetlands were identified within these forested areas, but were not delineated or rated as their buffer is functionally interrupted by the road. Site topography has been graded into a level plain, with exception of the northern area, which has gradual slopes to the northeast.

The majority of the parcels are developed, with the exception of the northern and eastern edges where Wetland A and the wetlands that were not delineated are found. The parcel has been developed with a middle school, parking lots, and sports fields and unregulated stormwater detention ponds. The vegetation within the forested area outside of the wetlands consists of bigleaf maple (*Acer marcrophyllum*), Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla)*, western red cedar (*Thuja plicata*), oceanspray (*Holodiscus discolor*), Vine maple (*Acer circinatum*), red huckleberry (*Vaccinium parvifolium*), Himalayan blackberry (*Rubus spectabilis*), trailing blackberry (*Rubus ursinus*), western swordfern (*Polystichum munitum*), and areas of dense moss.

Wetland A and its associated buffer encumbers a large portion of the northern forested area west of 215th Way NE. Wetland A is a large depressional wetland found in the northeastern portion of the site and extends offsite to the north. A narrow stream channel was observed in the southern section of the wetland, which originated from a culvert under 215th Way NE but

stream definition was lost approximately 150 feet into Wetland A. This small stream section was not delineated as Wetland A's buffer is the most encumbering to the site. A summary of the wetland and its required buffer is outlined in Table 1 below. A figure of the delineated critical areas is provided in Figure 2.

Table 1: Summary of Wetlands, Streams, and Required Buffer Widths

Feature Name	Category/Type	Habitat Score	Impact Intensity	Buffer (ft)	Structure Setback (ft)
Wetland A	Category II	8	Moderate	225	15

.

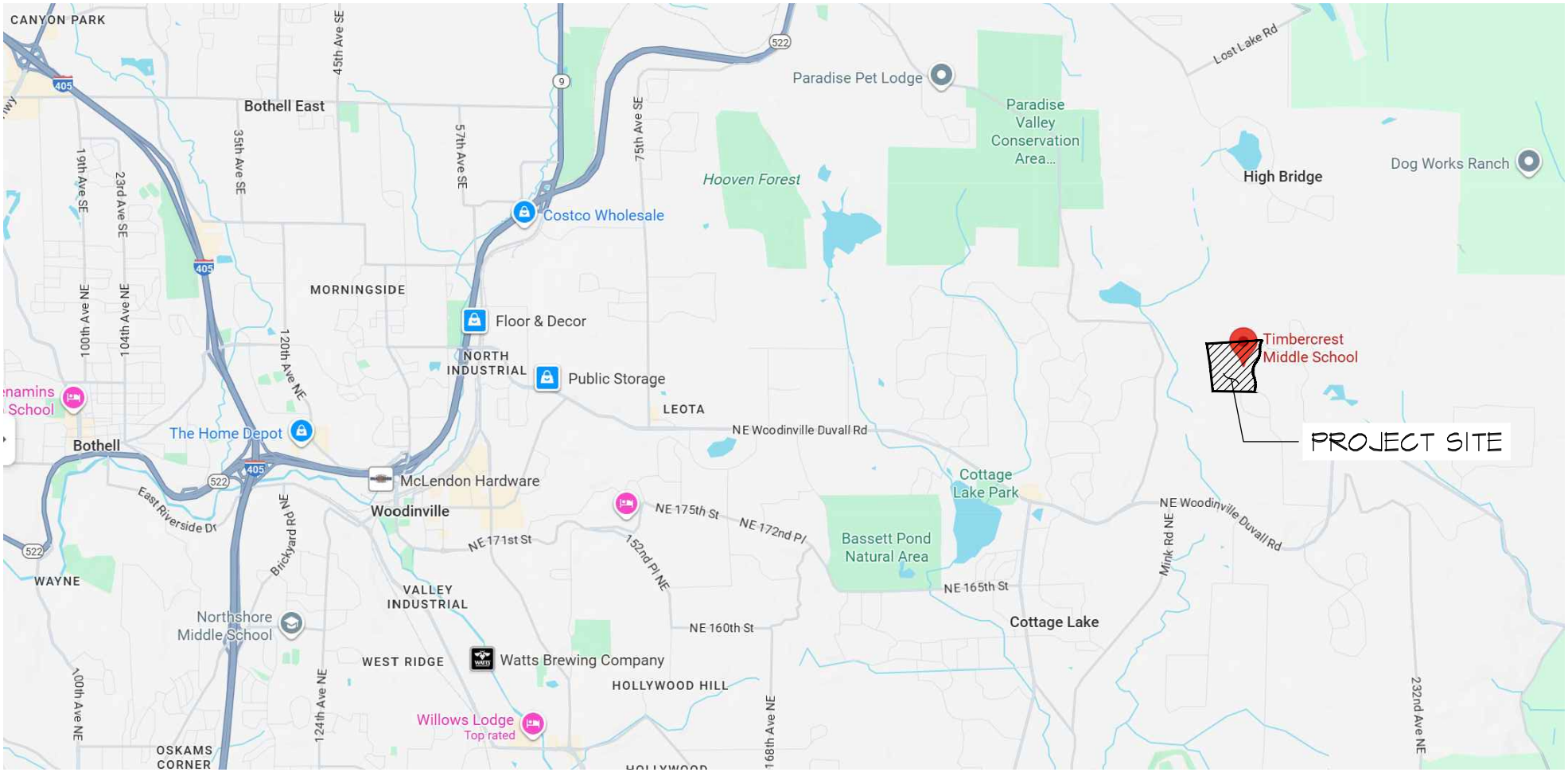


IMAGE SOURCE: GOOGLE MAP. HTTPS://WWW.GOOGLE.COM/MAPS (ACCESSED 10/2/25)

VICINITY MAP

DRIVING DIRECTIONS:

1. LEAVING FROM WOODINVILLE CITY HALL. HEAD SOUTHEAST TOWARD 133RD AVE NE
2. TURN LEFT TOWARD 133RD AVE NE
3. TURN LEFT AT THE 1ST CROSS STREET ONTO 133RD AVE NE
4. TURN RIGHT ONTO NE 175TH ST
5. CONTINUE ONTO NE WOODINVILLE DUVALL RD
6. TURN RIGHT TO STAY ON NE WOODINVILLE DUVALL RD
7. TURN LEFT ONTO 222ND WAY NE
8. CONTINUE STRAIGHT ONTO NE 194TH ST
9. TURN LEFT ONTO 215TH WAY NE
10. DESTINATION WILL BE ON YOUR RIGHT

19115 215TH WAY NE
WOODINVILLE, WA 98077

N

SCALE: N.T.S.

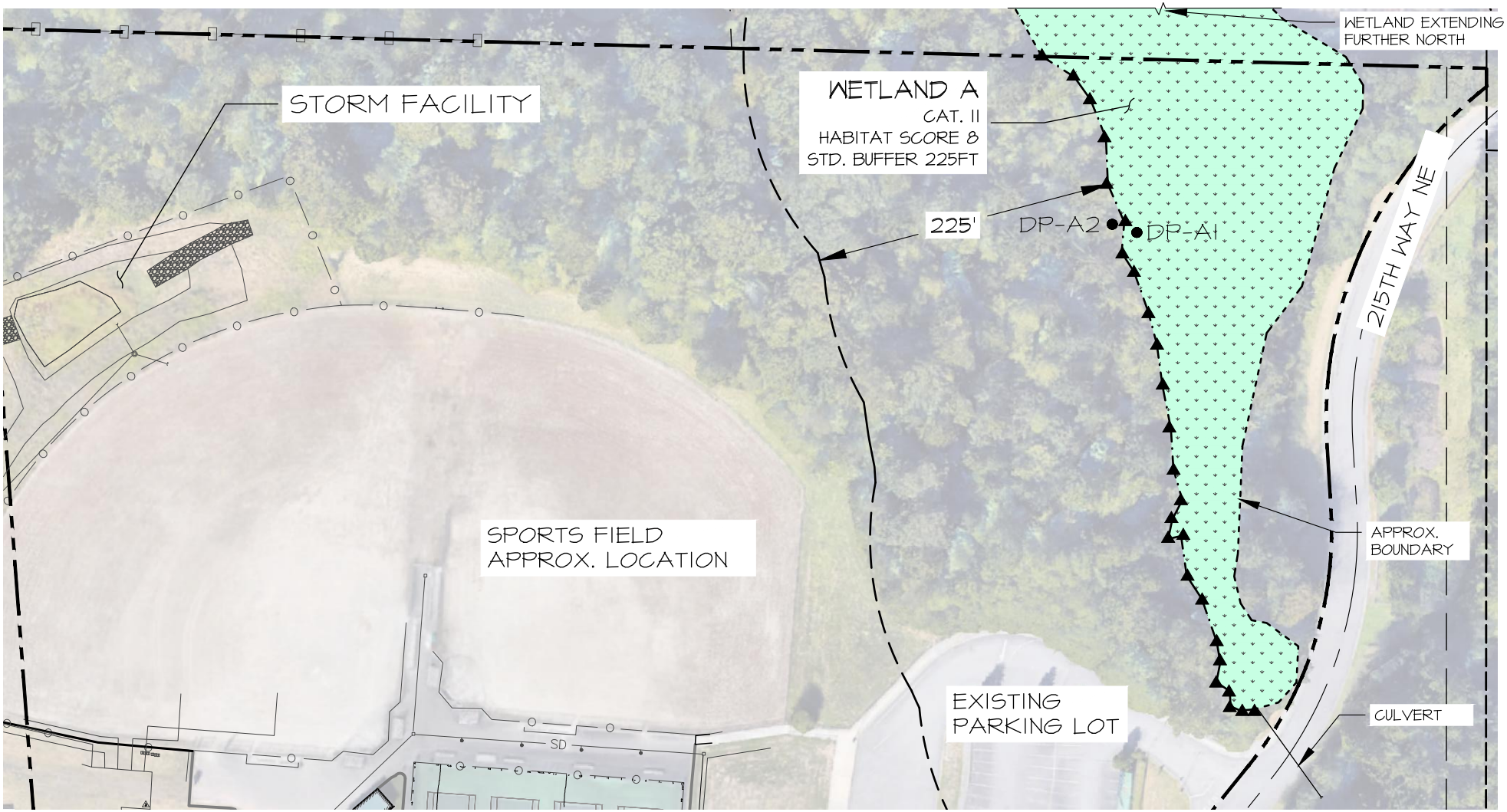
DESIGNED	
DRAWN	TH
CHECKED	BR
DATE	10/2/25
SCALE	AS SHOWN

TIMBERCREST MIDDLE SCHOOL
WETLAND DELINEATION
VICINITY MAP

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p. 425.827.2014
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SHEET NAME FIGURE 1



WETLAND DELINEATION FIGURE

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- DELINEATED WETLAND BOUNDARY
- APPROX. WETLAND BOUNDARY
- STANDARD BUFFER
- ▲ WETLAND FLAG LOCATION
- ● DP-# DATA POINT LOCATION

NOTE: ONLY THE WEST BOUNDARY HAS BEEN DELINEATED. WETLAND BOUNDARIES ON THE OTHER SIDES ARE APPROXIMATE.

N

SCALE: N.T.S.

DESIGNED	
DRAWN	TH
CHECKED	BR
DATE	10/2/25
SCALE	AS SHOWN

TIMBERCREST MIDDLE SCHOOL
WETLAND DELINEATION
DELINEATION FIGURE

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SHEET NAME FIGURE 2

SHEET 2 OF 2

2.0 METHODOLOGY

The study area was evaluated for wetlands using the guidelines put forth in the US Army Corps of Engineers (USACE) Wetlands Delineation Manual for the Western Mountains, Valleys, and Coast Region (Version 2.0, May 2010), as required by USACE and King County. The wetlands were rated and classified using the Washington State Department of Ecology (Ecology) Wetland Rating System for Western Washington (2014 update). Soils were identified using the 1990 Edited and Revised Edition of the Munsell Soil Color Charts. Wetlands were flagged with pink "Wetland Delineation" flagging and labeled using a consecutive alpha-numerical system. There was a total of two data points recorded, labeled DP-A1 and DP-A2, and marked with orange flagging and marked on Figure 2. Flagging locations were mapped in the field using a handheld Trimble R12i GNSS receiver. Wetland data and rating forms are provided in Appendices B and C.

Weather conditions for precipitation in the Wetland Determination Data Forms were determined using the USACE Antecedent Precipitation Tool. It is a desktop tool developed by USACE to help assess whether recent precipitation (rainfall) at a site is "normal" compared to historical conditions. Outputs include graphs and tables showing recent versus historical precipitation, percentile comparisons, and whether recent precipitation is above, below, or within standard bounds. It also shows drought indices and seasonality.

The study area was evaluated for streams based on the presence or absence of an OHWM as defined by Section 404 of the Clean Water Act, the Washington Administrative Code (WAC) 220-660-030, and the Revised Code of Washington (RCW) 90.58.030 and guidance documents including Determining the OHWM for Shoreline Management Act Compliance in Washington State and A Guide to OHWM Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States.

Desktop research and onsite wetland delineation was performed by Brent Rutley, PWS and Evan Todd at PACE Engineers. A survey drawing that includes mapped critical areas was prepared by PACE Engineers and is provided as Figure 2.

3.0 DESKTOP REVIEW

Before conducting the onsite field investigation, a literature and website review was conducted to review and identify existing information on soils, wetlands, site topography, wildlife presence, and other critical areas and site data within the study area. A list of the resources used are listed below:

- USFWS National Wetlands Inventory map of project area, online version located at: http://www.fws.gov/wetlands/Data/mapper.html)
- USDA Web Soil Survey located at: http://www.or.nrcs.usda.gov/pnw_soil/wa_reports.html
- King County iMap at: iMap
- WDFW Priority Habitats and Species (PHS) Maps, online version located at: http://wdfw.wa.gov/mapping/phs/

- Washington Department of Fish and Wildlife Fish Passage Tool at: Washington State Fish Passage
- Washington State Department of Natural Resources (WDNR) Forest Practices Application Mapping Tool (FPAMT) located at: Forest Practices Application Mapping Tool (FPAMT)
- USACE Antecedent Precipitation Tool

3.1 Existing Site Documentation

The following information was gathered during initial desktop research and review of available information.

3.1.1 USFWS National Wetland Inventory (NWI)

The NWI online map indicates the presence of two freshwater ponds classified as a PUBHx located adjacent to the eastern edge of 215th Way Northeast. These ponds are greater than 300 feet from the proposed work area on the site and their buffers are interrupted by 215th Way Northeast.

3.1.2 USDA Natural Conservation Resources Service (NRCS) Soil Survey

Soil within the study area is classified as Alderwood gravelly sandy loam. Alderwood gravelly sandy loam soils are described as non-hydric, moderately well drained, and found on hill and ridges. The parent material is glacial drift and/or glacial outwash over dense glaciomarine deposits with a depth to water table about 18 to 37 inches. The soil has minor hydric components of Shalcar (3%) and Norma (2%).

3.1.3 King County iMap

King County iMap shows an unclassified stream that originates in the northeastern section of the site and extends offsite to the north. Approximately 60 feet of the stream channel is mapped within the property boundary.

3.1.4 Washington Department of Fish and Wildlife (WDFW) PHS on the Web

PHS on the Web shows two freshwater ponds north of Northeast 194th Street and a freshwater forested/shrub wetland east of 215th Way Northeast. The mapped wetland has interrupted buffer that does not encumber the study area. See PHS Report in Appendix D for more information.

3.1.5 WDFW Fish Passage Tool

WDFW Fish Passage Tool shows a stream just north of the property boundary. The southern reach of the stream that is adjacent to the property is not mapped as fish bearing. A mitigated fish passage culvert is noted approximately 0.4 miles north of the property boundary. Just north of the marked culvert crossing, the stream has recorded presence for cutthroat trout and coho salmon.

3.1.6 WDNR FPAMT

The FPAMT shows a Type N stream just north of the property boundary. There is a noted stream type change to the Type F stream approximately 0.4 miles north of the property boundary.

3.1.7 USACE Antecedent Precipitation Tool

The Antecedent Precipitation Tool determined that the site visit was conducted in the dry season with normal climatic conditions. A precipitation figure is provided in Appendix E.

4.0 CRITERIA FOR CRITICAL AREAS IDENTIFICATION

For the purpose of this assessment, the specific critical areas reviewed included potential wetlands, streams (natural waters), and fish and wildlife habitats that may be located within or immediately adjacent to the subject site. This assessment did not include an assessment of potential steep slopes or geotechnically hazardous critical areas.

4.1 Wetlands

Wetlands are transitional areas between aquatic and upland habitats. In general terms, wetlands are lands where the extent and duration of saturation with water is the primary factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin, et al., 1979). Wetlands are generally defined within land use regulations as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (1987 Manual). Wetlands exhibit three essential characteristics, all of which must be present for an area to meet the established criteria within the 1987 Manual. These essential characteristics are:

- **Hydrophytic Vegetation**: A predominance of plants that are typically adapted for life in saturated soils.
- **Hydric Soil**: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper horizons.
- **Wetland Hydrology**: Permanent or periodic inundation, or soil saturation to the surface, at least seasonally.

4.2 Streams

A stream is defined in general terms as any perennial, intermittent, or ephemeral surface water flowing within the bed and banks of a channel that flows under gravity to progressively lower levels within the landscape. In Washington State streams have the potential to provide support for fish species, including anadromous fish, and provide habitat for spawning, rearing, or runs.

For regulatory purposes, streams are further defined in Washington State through WAC 222-16-030, which in general terms identifies Type S as “Shorelines of the State,” Type F

as segments of natural waters other than Type S waters that support fish, and Type N that include upper portions of perennial streams and seasonal, non-fish habitat streams. Streams are considered regulated Fish and Wildlife Habitat Conservation Areas under the Washington State Growth Management Act and the KCC Chapter 21A.24.

5.0 FIELD OBSERVATIONS

5.1 Uplands

The upland area within the site is mostly developed and consists of commercial buildings, parking lots, and a large stormwater detention pond to the north. However, non-wetland forested areas remain in the northwestern portion of the site. The vegetation within the forested area outside of the wetlands consists of bigleaf maple (*Acer marcrophyllum*), Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla)*, western red cedar (*Thuja plicata*), oceanspray (*Holodiscus discolor*), vine maple (*Acer circinatum*), red huckleberry (*Vaccinium parvifolium*), salmonberry (*Rubus spectabilis*), Himalayan blackberry (*Rubus armeniacus*), trailing blackberry (*Rubus ursinus*), western swordfern (*Polystichum munitum*), and areas of dense moss.

Soils within the sample pit dug in upland areas around Wetland A (DP-A2) consisted of sandy loam soils with Munsell soils colors ranging of 10YR 3/2 to a depth of 12 inches with no redox features or hydrology indicators observed.

5.2 Wetlands

One wetland (Wetland A) was observed and delineated onsite by PACE staff during site investigations conducted on September 24, 2025. Delineated areas are depicted in Figure 2.

5.2.1 Wetland A

Wetland A is a large depressional wetland in the northeastern section of the site. The northern portion of the wetland is sloped and leads to a large depressional basin as it extends north. Vegetation within Wetland A met the criteria for wetland vegetation and is dominated by western red cedar, red alder (*Alnus rubra*), hardhack (*Spiraea douglasii*), red osier dogwood (*Cornus sericea*), vine maple, salmonberry, slough sedge (*Carex obnupta*), lady fern (*Athyrium filix-femina*), piggy-back plant (*Tolmiea menziesii),* stinging nettle (*Urtica dioica)*, and skunk cabbage (*Lysichiton americanus*).

One soil pit was dug within the wetland, DP-A1, and revealed loam and silt loam soils in the soil profile. Soils within the wetland met the criteria for hydric soils with Munsell Soil colors of 10YR 2/1 in the upper 10 inches and soils with Munsell Soil colors of 2.5Y 4/2 with 5 percent redox features in the lower horizon meeting the hydric soil indicators for depleted below dark surface and depleted matrix.

Hydrology within the test pit met the wetland criteria with soils that were saturated within 12 inches, geomorphic position, and FAC neutral test. Sources of hydrology include precipitation and groundwater infiltration.

Using the Washington State Department of Ecology (Ecology) Revised 2014 Wetland Rating System, Wetland A was rated as a Category II depressional wetland with a total score of 22 (water quality 8, hydrology 6, habitat 8). The wetland rating forms and figures and wetland determination data sheets are provided in Appendix B and C.

5.3 Streams

A small stream section (Stream A) was noted in the southern portion of Wetland A. The stream loses channel definition approximately 150 ft north of the culvert under 215th Way NE where it originates. It is approximately 2 ft wide and has OHWM indicators including sorted sediments and bed and bank characteristics. The stream meets the definition of fish habitat for gradient and width and is therefore, considered a Type F stream under WAC 222-16-031. However, the stream was not delineated as Wetland A's buffer is the most encumbering to the site.

6.0 REGULATORY

6.1 Local

King County regulates wetlands and streams according to the KCC 21A.24 – Critical Areas.

6.1.1 Wetlands

Wetland buffers in King County are determined based on the following metrics: wetland rating category, land use intensity, and habitat score. Wetland A has a standard buffer of 225 feet because it is classified as a Category II wetland with a habitat score of eight points and a moderate impact intensity (KCC 21A.24.325).

Where a legally established roadway transects a wetland buffer, the department may approve a modification of the minimum required buffer width to the edge of the roadway if the part of the buffer on the other side of the roadway sought to be reduced does not provide additional protection of the proposed development or the wetland; and it provides insignificant biological, geological, or hydrological buffer functions relating to the other portion of the buffer adjacent to the wetland (KCC 21A.24.325.C.4). Therefore, the wetland buffers on the east side of 215th Way NE are functionally interrupted by the road as the western side of the buffer provides insignificant biological, geological, or hydrological buffer functions.

6.1.2 Streams

Stream buffers in King County are established based on water typing and if it is found within an Urban Growth Area. Stream A is not found within an Urban Growth Area, is a Type F stream, and would require a 165-foot buffer (KCC 21A.24.358). However, the buffer for Wetland A is more encumbering so Stream A was not delineated.

6.2 Federal and State Regulations

6.2.1 Federal Agencies

Many wetlands and streams are regulated by USACE under Section 404 of the Clean Water Act. Any proposed filling or other direct impacts to Waters of the US, including wetlands (except isolated wetlands), would require preconstruction notification and permit authorization from the USACE. Wetland A is not isolated. Unavoidable impacts to jurisdictional wetlands are typically required to be compensated through implementation of an approved mitigation plan. If activities requiring a USACE permit are proposed, a Joint Aquatic Resource Permit Application (JARPA) could be submitted to obtain authorization.

Federally permitted actions that could affect endangered species may also require a biological assessment study and consultation with the USFWS and/or the National Marine Fisheries Service. Compliance with the Endangered Species Act must be demonstrated for activities within jurisdictional streams, wetlands, and the 100-year floodplain. Application for Corps permits may also require an individual Section 401 Water Quality Certification and Coastal Zone Management Consistency determination from Ecology and a cultural resource study in accordance with Section 106 of the National Historic Preservation Act.

6.2.2 Washington Department of Ecology (Ecology)

Ecology is charged with reviewing, conditioning, and approving or denying certain federally permitted actions that result in discharges to state waters under Section 401 of the Clean Water Act. However, Ecology review under the Clean Water Act would only become necessary if a Section 404 permit from USACE is required. Ecology approvals are typically approved within 90 days following USACE approval.

Ecology also regulates non-federally regulated wetlands (i.e., isolated wetlands) under the Water Pollution Control Act (RCW 90.48 and WAC 173-201A) through Administrative Orders, but only if direct wetland impacts are proposed. Therefore, authorization from Ecology would not be needed if filling activities are avoided.

A JARPA can also be submitted to Ecology to obtain an Administrative Order, Section 401 Water Quality Certification, and/or Coastal Zone Management Consistency Determination if filling is proposed.

In general, neither USACE nor Ecology regulates wetland and stream buffers, unless direct impacts are proposed. When direct impacts are proposed, buffers are applied based on USACE and Ecology joint regulatory guidance.

6.2.3 WDFW

Chapter 77.55 of the RCW (the Hydraulic Code) gives WDFW the authority to review, condition, and approve or deny “any construction activity that will use, divert, obstruct, or change the bed or flow of state waters.” This provision includes any in-water work, the

crossing or bridging of any state waters and can sometimes include stormwater discharge to state waters or other adjacent activities that may affect the bed, or banks, of state waters. WDFW will issue a Hydraulic Project Approval (HPA) if a project meets regulatory requirements.

WDFW can also restrict activities to a particular timeframe through the conditions of approval on an HPA. Work is typically restricted to late summer and early fall, however, WDFW generally allows for overwater of adjacent activities that do not involve in-stream work to occur at any time during the year.

7.0 CONCLUSION

Wetland A (Category II), and Stream A (Type F) were identified on the site. Stream A was not delineated as it is found within Wetland A and its buffer is not the most encumbering to the site. The buffer for Wetland A does not encumber the proposed work area in the northwestern section of the site.

Per KCC 21A.24, wetland buffers in King County are determined based on the following metrics: wetland rating category, land use intensity, and habitat score. Wetland A has a standard buffer of 225 feet because it is classified as a Category II wetland with a habitat score of 8 points and a moderate impact intensity (KCC 21A.24.325).

Currently, the proposed development does not impact the wetland, stream, or their buffers. If amendments are made and the final site plan proposes impacts to the identified critical areas and their buffers, mitigation will be required. If needed, a mitigation plan can be incorporated into this delineation report at a later date.

Appendix A
Site Photos



Photo 1: View looking east at Wetland A.



Photo 2: View looking east at Wetland A and the culvert under 215th Way NE.



Photo 3: View looking North at Stream A withing Wetland A.

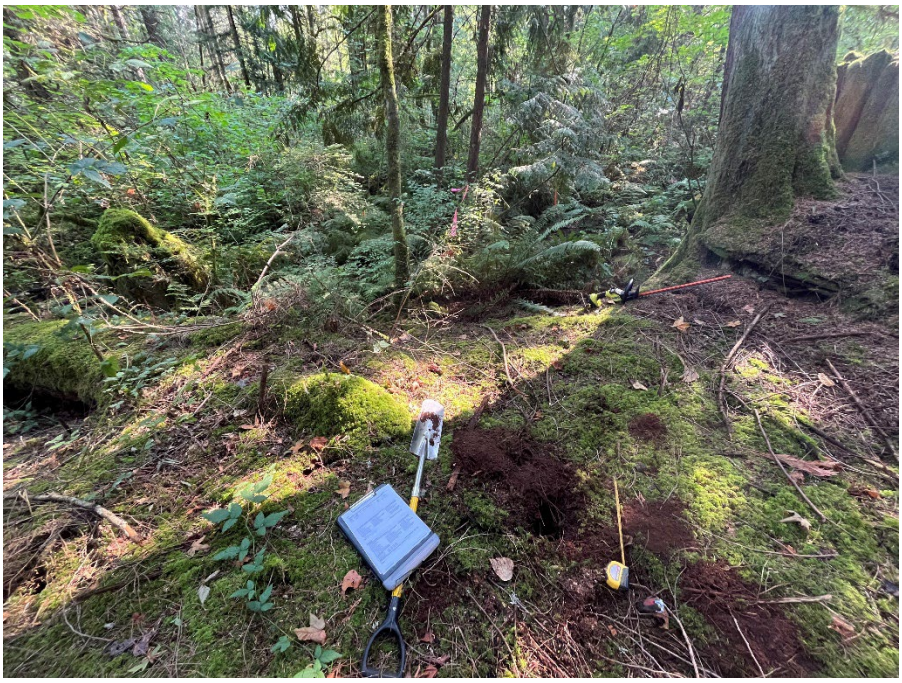


Photo 4: View of the upland DP-A2 soil pit location.



Photo 5: View looking southwest at the remaining forested area outside of Wetland A.

Appendix B
Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Timbercrest Middle School City/County: King County Sampling Date: 08/24/2025

Applicant/Owner: North Shore School Distrcit State: WA Sampling Point: DP-A1

Investigator(s): B.Rutley Section, Township, Range: SW - 4 - 26 - 6

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Alderwood gravelly sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: Normal Climatic Conditions - Dry Season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	30	Yes	FAC
2. Tsuga heterophylla	30	Yes	FACU
3. Alnus rubra	5	No	FAC
4.			
	65	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer circinatum	30	Yes	FAC
2. Rubus spectabilis	20	Yes	FAC
3.			
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Lysichiton americanus	20	Yes	OBL
2. Athyrium filix-femina	40	Yes	FAC
3. Tolmiea menziesii	5	No	FAC
4. Urtica dioica	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 5')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Tsuga heterophylla rooted out of the wetland

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					Loam	Some Cobble
10-14	2.5Y 4/2	95	2.5YR 3/2	5	C	M	Silty Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks: Soil Moist

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 12

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Timbercrest Middle School City/County: King County Sampling Date: 08/24/2025

Applicant/Owner: Northshore School Distict State: WA Sampling Point: DP-A1

Investigator(s): B.Rutley Section, Township, Range: SW - 4 - 26 - 6

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Alderwood gravelly sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: Normal Climatic Conditions - Dry Season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	20	Yes	FAC
2. Tsuga heterophylla	70	Yes	FACU
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Vaccinium parvifolium	15	Yes	FACU
2. Rubus spectabilis	15	Yes	FAC
3. Rubus armeniacus	5	No	FAC
4.			
5.			
	35	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Rubus ursinus	5	Yes	FACU
2. Moss sp.	95	N/A	N/A
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	= Total Cover	
Woody Vine Stratum (Plot size: 5')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	LFH (Duff)							
6-14	10YR 3/2	100					Sandy Loam	Lots of Roots

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Soil Powder Dry - Wetted to Color

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Appendix C

Wetland Rating Forms and Figures

Wetland name or number: Wetland A

RATING SUMMARY - Western Washington

Name of wetland (or ID#): Wetland A **Date of site visit:** 09/24/2025
Rated By: Brent Rutley **Trained by Ecology? Yes** [X] **No** [ ] **Date of Training:** 10/01/2023
HGM Class used for rating: Depressional
Wetland has multiple HGM classes? Yes [ ] **No** [X]

NOTE: Form is not complete without the figures requested *(figures can be combined).*
Source of base aerial photo/map: WATOR Tool

OVERALL WETLAND CATEGORY: [**Category II**] (based on functions [X] or special characteristics [ ])

1. Category of wetland based on FUNCTIONS

[ ] **Category I** - Total score = 23 - 27
[X] **Category II** - Total score = 20 - 22
[ ] **Category III** - Total score = 16 - 19
[ ] **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Site Potential	**M**	**L**	**M**	
Landscape Potential	**H**	**H**	**H**	
Value	**H**	**M**	**H**	**Total**
Score Based on Ratings	**8**	**6**	**8**	**22**

Score for each function based on three ratings (order of ratings is not important)
9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	
Wetland of High Conservation Value	
Bog	
Forested	
Coastal Lagoon	
Interdunal	
None of the above	**Not Applicable**

Wetland name or number: Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	2
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	3
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	4
Map of the contributing basin	D 4.3, D 5.3	5
1km Polygon: Area that extends 1km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	8

Wetland name or number: Wetland A

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0 Does the site have the potential to improve water quality?

D 1.1 What are the characteristics of surface water outflows from the wetland?		
Wetland has no surface water outlet.	points = 3	
Wetland has an intermittently flowing, or highly constricted, outlet.	points = 2	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
Wetland is a flat depression whose outlet is a permanently flowing ditch.	points = 1	**Score: 2**
D 1.2 Is the soil 2 in. below the surface a true clay or organic soil?		
Mapped as true clay or organic (muck or peat)	points = 4	
Soil texture identified as clay or organic in field	points = 4	
Soil texture identified as clay or organic by laboratory test	points = 4	
None of the above	points = 0	**Score: 0**
D 1.3 What are the characteristics and distribution of persistent plants?		
Wetland has persistent, ungrazed, plants > 95% of area	points = 5	
Wetland has persistent, ungrazed, plants > 50% of area	points = 3	
Wetland has persistent, ungrazed plants > 10% of area	points = 1	
Wetland has persistent, ungrazed plants < 10% of area	points = 0	**Score: 5**
D 1.4 What are the characteristics of seasonal ponding or inundation in the wetland area?		
Area seasonally ponded is > 50% total area of wetland	points = 4	
Area seasonally ponded is equal to or > 25% total area of wetland	points = 2	
Area seasonally ponded is < 25% total area of wetland	points = 0	**Score: 0**
	Total for D 1:	**7**

Rating of Site Potential [ ] **12-16 = H** [X] **6-11 = M** [ ] **0-5 = L** *Record the rating on the first page*

D 2.0 Does the landscape have the potential to support the water quality function of the site?

D 2.1 Does the wetland unit receive stormwater discharges?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 2.2 Is >10% of the area within 150ft of the wetland in land uses that generate pollutants in surface runoff?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 2.3 Are there septic systems within 250ft of the wetland?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 2.4 Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?		
Yes	points = 1	
No	points = 0	**Score: 0**

Wetland name or number: Wetland A

D 2.5 What are the other sources of pollutants coming into the wetland?		
	Total for D 2:	**3**

Rating of Landscape Potential [X] **3-4 = H** [ ] **1-2 = M** [ ] **0 = L** *Record the rating on the first page*

D 3.0 Is the water quality improvement provided by the site valuable to society?		
D 3.1 Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 3.2 Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality?		
Yes	points = 2	
No	points = 0	**Score: 2**
	Total for D 3:	**4**

Rating of Value [X] **2-4 = H** [ ] **1 = M** [ ] **0 = L** *Record the rating on the first page*

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradtion

D 4.0 Does the site have the potential to reduce flooding and erosion?		
D 4.1 What are the characteristics of surface water outflows from the wetland?		
Wetland has no surface water outlet.	points = 4	
Wetland has an intermittently flowing, or highly constricted, outlet.	points = 2	
Wetland is a flat depression whose outlet is a permanently flowing ditch.	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	**Score: 2**
D 4.2 What is the depth of storage during the wet periods?		
Marks of ponding are 3ft or more above the surface or bottom of the outlet.	points = 7	
Marks of ponding are between 2ft to <3ft from the surface or bottom of the outlet.	points = 5	
Marks of ponding are at least 0.5ft to <2ft from the surface or the bottom of the outlet.	points = 3	
The wetland is a "headwater" wetland.	points = 3	
The wetland is flat but has small depressions on the surface that trap water.	points = 1	
Marks of ponding are less than 0.5ft (6in).	points = 0	**Score: 0**

Wetland name or number: Wetland A

D 4.3 What is the contribution of the wetland to storage in the watershed?		
The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	**Score: 3**
	Total for D 4:	**5**

Rating of Site Potential [ ] **12-16 = H** [ ] **6-11 = M** [X] **0-5 = L** *Record the rating on the first page*

D 5.0 Does the landscape have the potential to support hydrologic functions of the site?		
D 5.1 Does the wetland unit receive stormwater discharges?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 5.2 Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?		
Yes	points = 1	
No	points = 0	**Score: 1**
D 5.3 Is more than 25% of the contributing basin of the wetland covered with intensive human land uses?		
Yes	points = 1	
No	points = 0	**Score: 1**
	Total for D 5:	**3**

Rating of Landscape Potential [X] **3 = H** [ ] **1-2 = M** [ ] **0 = L** *Record the rating on the first page*

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 Is the wetland in a landscape that has flooding problems?		
Flooding occurs in a sub-basin that is immediately down-gradient of the wetland.	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the basin.	points = 1	
The existing or potential outflow from the wetland is so constrained that water cannot reach areas that flood.	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	**Score: 1**
D 6.2 Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?		
Yes	points = 2	
No	points = 0	**Score: 0**
	Total for D 6:	**1**

Rating of Value [ ] **2-4 = H** [X] **1 = M** [ ] **0 = L** *Record the rating on the first page*

Wetland name or number: Wetland A

HABITAT FUNCTIONS

These questions apply to wetlands of all HGM classes - Indicators that the site functions to provide important habitat

H 1.0 Does the wetland have the potential to provide habitat for many species?

H 1.1 What is the structure of the plant community?

- [ ] Aquatic Bed
- [ ] Emergent
- [ ] Scrub-shrub
- [x] Forested
- [ ] Multiple strata within the Forested class (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)

4 structures or more	points = 4	
3 structures	points = 2	
2 structures	points = 1	
1 structure	points = 0	
No structures present	points = 0	**Score: 0**

H 1.2 What are the hydroperiods that meet the size thresholds in the wetland?

- [ ] Permanently flooded or inundated
- [x] Seasonally flooded or inundated
- [ ] Occasionally flooded or inundated
- [x] Saturated only
- [ ] Permanently flowing stream or river in, or adjacent to, the wetland
- [ ] Seasonally flowing stream in, or adjacent to, the wetland
- [ ] Lake Fringe wetland
- [ ] Freshwater Tidal wetland

4 or more types present	points = 3	
3 types present or Lake Fringe / Freshwater Tidal Fringe	points = 2	
2 types present	points = 1	
1 type present	points = 0	
None present	points = 0	**Score: 1**

H 1.3 What is the richness of the plant species in the wetland?

>19 species	points = 2	
5-19 species	points = 1	
<5 species	points = 0	**Score: 1**

Wetland name or number: Wetland A

H 1.4 What is the interspersion of habitats?

High	points = 3	
Moderate	points = 2	
Low	points = 1	
None	points = 0	**Score: 1**

H 1.5 What are the special habitat features in the wetland?

- [✓] Large, downed, woody debris within the wetland (>4in diameter and 6ft long).
- [✓] Standing snags (dbh >4in) within the wetland
- [✓] Undercut banks are present for at least 6.6ft (2m) and/or overhanging plants extend at least 3.3ft (1m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33ft (10m)
- [ ] Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)
- [ ] At least 0.25ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians)
- [✓] Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)

6 habitats selected	points = 6	
5 habitats selected	points = 5	
4 habitats selected	points = 4	
3 habitats selected	points = 3	
2 habitats selected	points = 2	
1 habitat selected	points = 1	
No habitats selected	points = 0	**Score: 4**

Total for H 1: **7**

Rating of Site Potential [ ] **15-18 = H** [X] **7-14 = M** [ ] **0-6 = L** *Record the rating on the first page*

H 2.0 Does the landscape have the potential to support habitat functions of the site?

H 2.1 What is the percentage of accessible habitat within 1km of the wetland?

>33% of 1km Polygon	points = 3	
20-33% of 1km Polygon	points = 2	
10-19% of 1km Polygon	points = 1	
<10% of 1km Polygon	points = 0	**Score: 2**

H 2.2 What is the percentage of total habitat in a 1km polygon around the wetland?

Total habitat is >50% of the Polygon	points = 3	
Total habitat is 10-50% of the Polygon and in 1-3 patches	points = 2	
Total habitat is 10-50% of the Polygon and in >3 patches	points = 1	
Total habitat is <10% of the Polygon	points = 0	**Score: 3**

Wetland name or number: Wetland A

H 2.3 What is the land use intensity in the 1km polygon?

50% of the Polygon is high intensity land use	points = -2	
<50% of the Polygon is high intensity land use	points = 0	**Score: 0**
	Total for H 2:	**5**

Rating of Landscape Potential [X] **4-6 = H** [ ] **1-3 = M** [ ] **0 = L** *Record the rating on the first page*

H 3.0 Is the habitat provided by the site valuable to society?

H 3.1 Does the site provide habitat for species valued in laws, regulations, or policies?

- [ ] Aspen Stands
- [ ] Biodiversity Areas and Corridors
- [ ] Herbaceous Balds
- [ ] Old-growth/Mature Forests
- [ ] Oregon White Oak
- [✓] Riparian
- [ ] Westside Prairie
- [ ] Fresh Deepwater
- [✓] Instream
- [ ] Nearshore (Coastal, Open Coast, Puget Sound)
- [ ] Caves
- [ ] Cliffs
- [✓] Snags and Logs
- [ ] Talus

The following criteria automatically score 2 points:

- [ ] The wetland provides habitat for Threatened or Endangered species
- [ ] The wetland is mapped as a location for an individual WDFW priority species
- [ ] The wetland is a Wetland of High Conservation Value
- [ ] The wetland has been categorized as an important habitat site in a local plan

The wetland has 3 or more WDFW priority habitats within 100m, or meets the criteria for societal value	points = 2	
The site has 1 or 2 WDFW priority habitats within 100m	points = 1	
The site does not meet any of the criteria for societal value	points = 0	**Score: 2**
	Total for H 3:	**2**

Rating of Value [X] **2 = H** [ ] **1 = M** [ ] **0 = L** *Record the rating on the first page*

Wetland name or number: Wetland A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

SC 1.0 Estuarine Wetlands

SC 1.1 Does the wetland meet all of the following criteria for Estuarine wetlands?

☐ The dominant water regime is tidal

☐ The wetland is vegetated

☐ The water salinity is greater than 0.5 ppt

Yes - Go to SC 1.2

No - Not an Estuarine Wetland

Result: Not an Estuarine Wetland

SC 1.2 Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?

Yes - Category I Estuarine Wetland

No - Go to SC 1.3

Result:

SC 1.3 Is the wetland unit at least 1ac in size and meets at least two of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species.

☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland

☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.

Yes - Category I Estuarine Wetland

No - Category II Estuarine Wetland

Result:

SC 2.0 Wetlands of High Conservation Value

SC 2.1 Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?

Yes - Category I Wetland of High Conservation Value

No - Go to SC 2.2

Result: Go to SC 2.2

SC 2.2 Does the wetland have a rare plant species, rare plant community, or high-quality common plant community that may qualify the site as a WHCV?

Yes - Category I Wetland of High Conservation Value

No - Not a Wetland of High Conservation Value

Result: Not a Wetland of High Conservation Value

Wetland name or number: Wetland A

SC 3.0 Bogs

SC 3.1 Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16in or more of the first 32in of the soil profile?

Yes - Go to SC 3.3
No - Go to SC 3.2 **Result: Go to SC 3.2**

SC 3.2 Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?

Yes - Go to SC 3.3
No - Not a Bog Wetland **Result:**

SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least 30% cover of plant species listed in the table provided in the instructions?

Yes - Category I Bog Wetland
No - Go to SC 3.4 **Result:**

SC 3.4 Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann Spruce, or western white pine AND any of the species (or combinations of species) listed in the table found in the instructions provide more than 30% of the cover under the canopy?

Yes - Category I Bog Wetland
No - Not a Bog Wetland **Result:**

SC 4.0 Forested Wetlands

SC 4.1 Does the wetland have at least 1 contiguous acre of forest that meets one of the following criteria?

- [ ] Old-growth forests
- [ ] Mature forests

Yes - Category I Forested Wetland

No - Not a Forested Wetland **Result: Not a Forested Wetland**

Wetland name or number: Wetland A

SC 5.0 Wetlands in Coastal Lagoons

SC 5.1 Coastal Lagoons: Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or rocks

☐ The depression in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the open water area (measured near the bottom)

☐ The lagoon retains some of its surface water at low tide during spring tides

Yes - Go to SC 5.2

No - Not a Coastal Lagoon Wetland **Result: Not a Coastal Lagoon Wetland**

SC 5.2 Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species).

☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ the wetland is larger than 0.10ac (4350 sqft)

Yes - Category I Coastal Lagoon

No - Category II Coastal Lagoon **Result:**

SC 6.0 Interdunal Wetlands

SC 6.1 Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership WBUO)?

Yes - Go to SC 6.2

No - Not an Interdunal Wetland **Result: Not an Interdunal Wetland**

SC 6.2 Is the wetland 1ac or larger in size, or a mosaic that is 1ac or larger in size?

Wetland is larger than 1ac in size - Go to SC 6.3

Wetland is a mosaic larger than 1ac is size - Category II Interdunal Wetland

No - Go to SC 6.4 **Result:**

SC 6.3 Does the wetland score 8 or 9 points for the habitat functions?

Yes - Category I Interdunal Wetland

No - Category II Interdunal Wetland **Result:**

SC 6.4 Is the wetland unit between 0.1ac and 1ac, or in a mosaic of wetlands that is between 0.1ac and 1ac in size?

Yes - Category III Interdunal Wetland

No - Category IV Interdunal Wetland **Result:**

Wetland name or number: Wetland A

Category of wetland based on Special Characteristics	
If you answered No for all types, enter "Not Applicable" on Summary Form	**Special Characteristics Category: Not Applicable**

Legend | Wetland Tools | Zoom | Tools

Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

About | Close

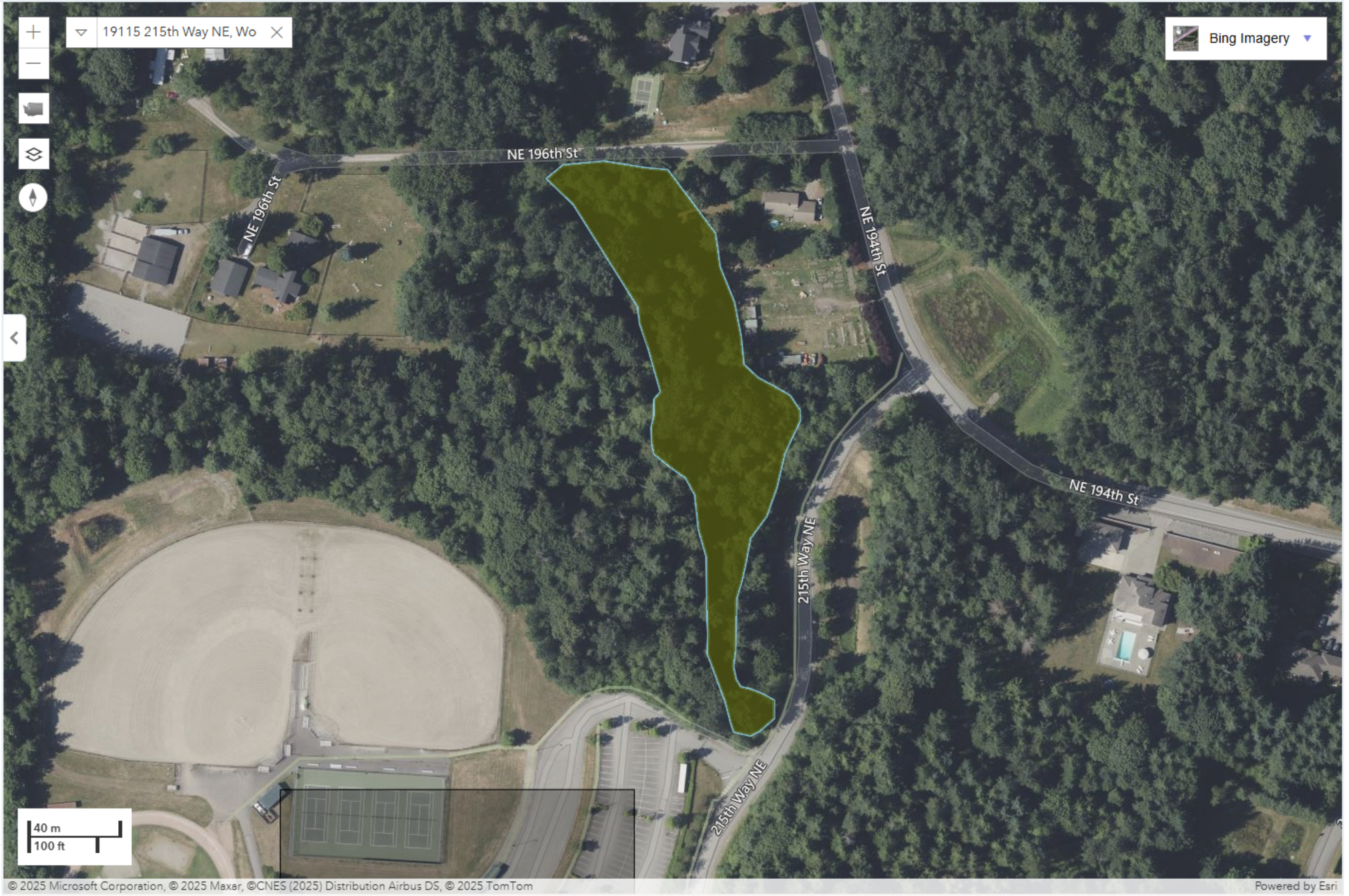
Add/Remove map data layers

Cowardin Plant Class Items

Cowardin Classes

- Forested
- Scrub-shrub
- Emergent
- Aquatic bed
- Open water
- Wetland/Unmapped wetland

Data transparency 10%



Legend | Wetland Tools | Zoom | Tools

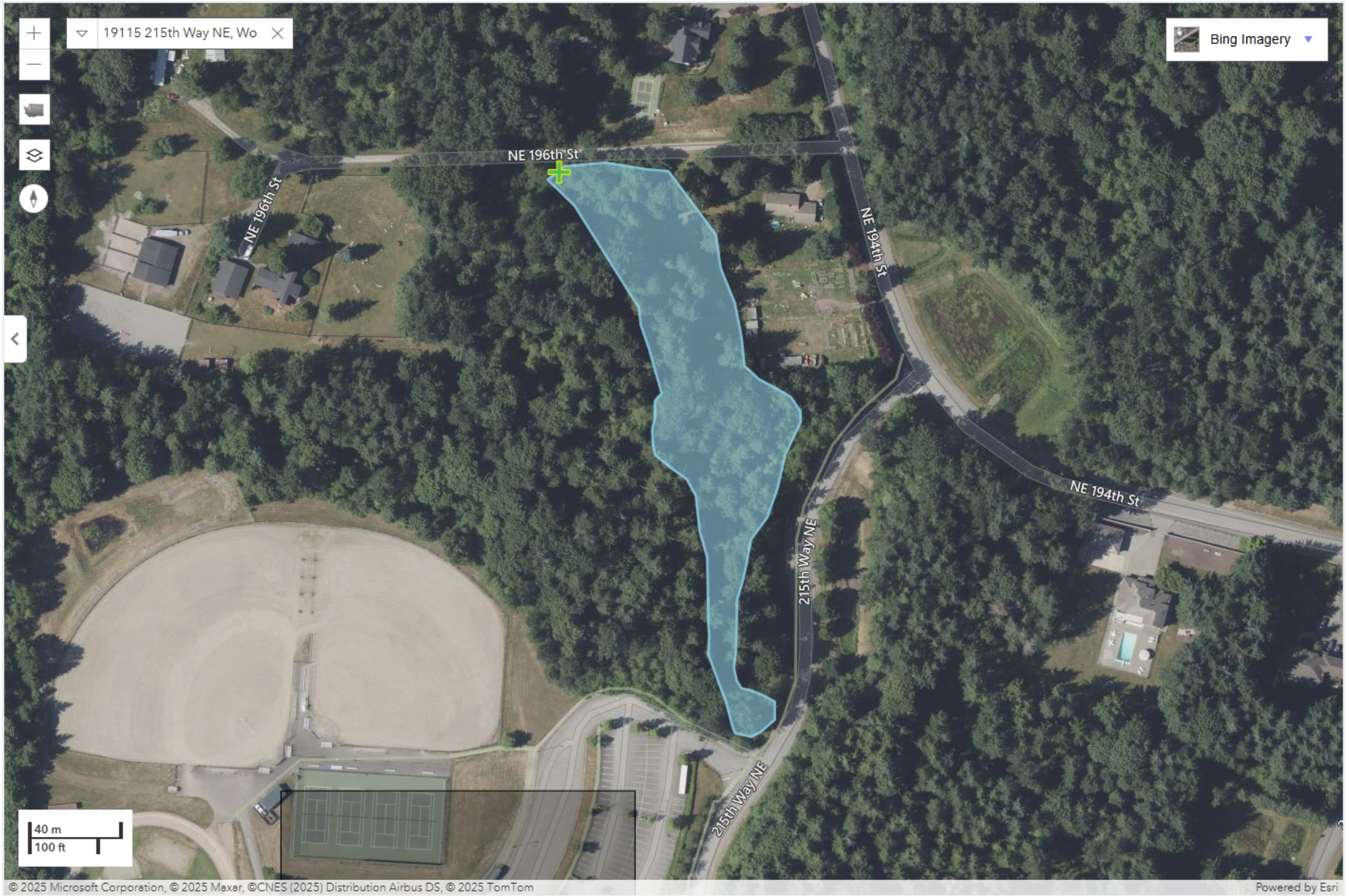
Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

About | Close

Add/Remove map data layers

Location of Outlet Items

- Wetland
- Outlet location



Data transparency 10%

Legend | Wetland Tools | Zoom | Tools

Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

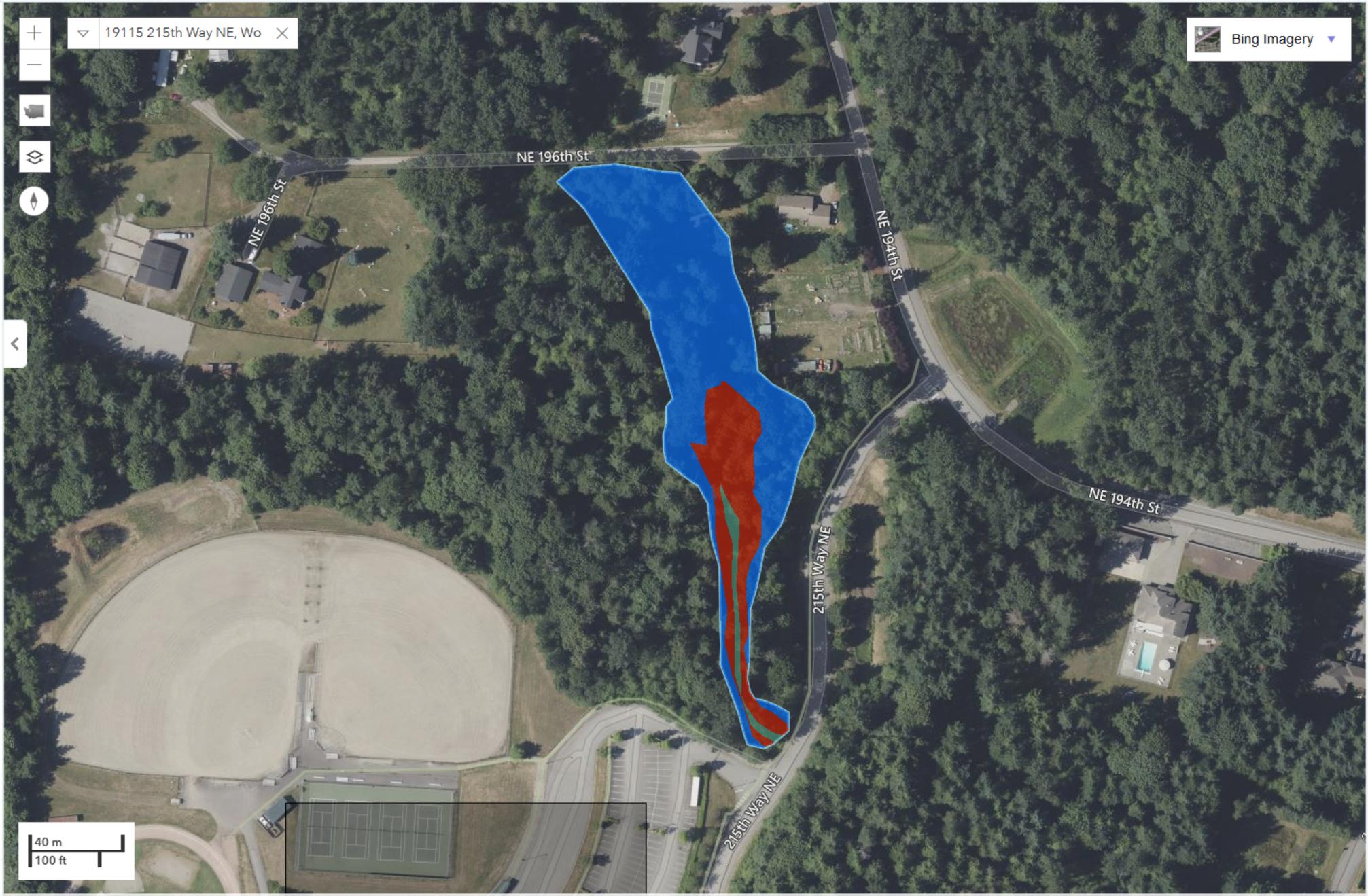
About | Close

Add/Remove map data layers

Hydroperiod Items

- Permanent Stream
- Seasonal Stream
- Permanently
- Seasonally
- Occasionally
- Saturated only
- Wetland/Unmapped wetland

Data transparency 10%



Legend | Wetland Tools | Zoom | Tools

Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

About | Close

Add/Remove map data layers

Land Use Items

- Generates excessive runoff
- Generates pollutants
- Generates excessive runoff and pollutants
- Upland within 150' wetland buffer
- Wetland
- Wetland buffer (150')

Data transparency 10%



Legend | Wetland Tools | Zoom | Tools

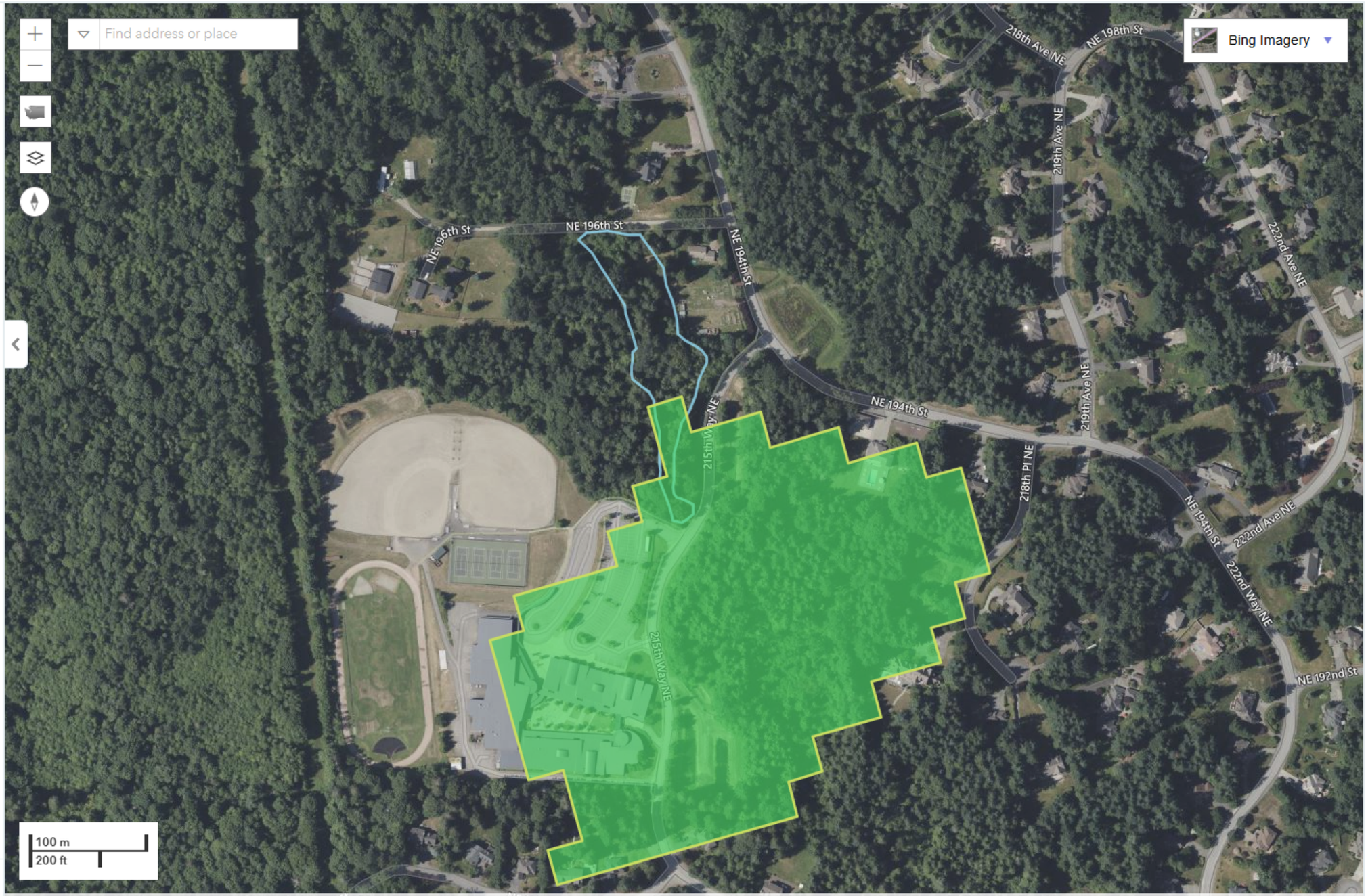
Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

About | Close

Add/Remove map data layers

Contributing Basin Items

- Wetland
- Contributing basin



Data transparency 10%

Legend | Wetland Tools | Zoom | Tools

Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

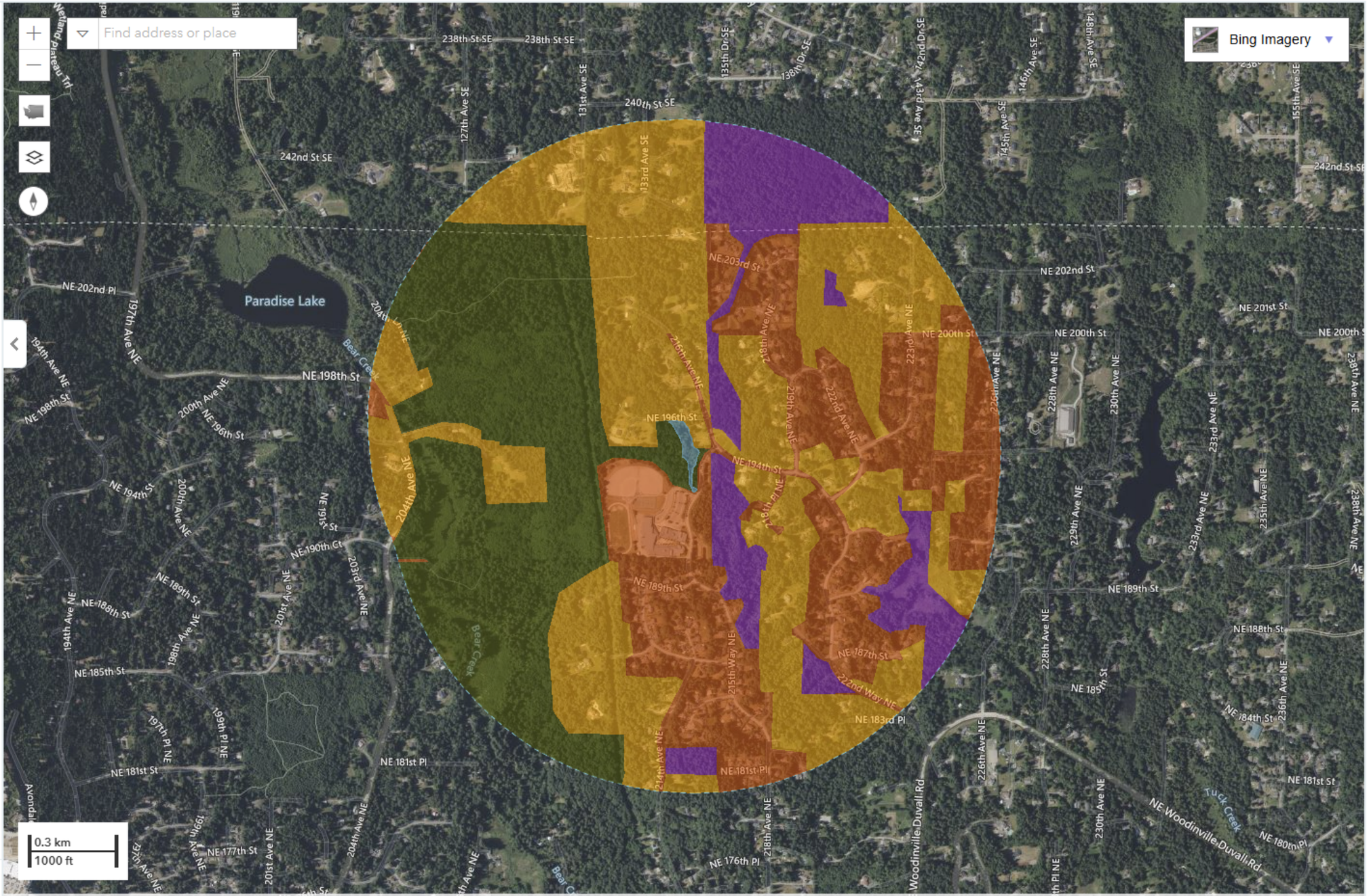
About | Close

Add/Remove map data layers

Habitat Items

- Relatively undisturbed - accessible
- Low/Moderate intensity - accessible
- Relatively undisturbed - not accessible
- Low/Moderate intensity - not accessible
- High Intensity
- Wetland
- Unmapped wetland buffer (1 km)

Data transparency 10%



Legend | Wetland Tools | Zoom | Tools

Project: **250512 - Timbercrest middle school** Wetland: **Wetland A** (Depressional) Date: **10/02/2025**

About | Close

Add/Remove map data layers

Wetland Width Items

- Wetland
- Distance: wetland to nearest 303(d) listing

303(d) List

- Category 5 Water
- Category 5 Sediment

National Hydrography Dataset

NHD Watercourses

- Stream/river (perennial)
- Stream (intermittent)

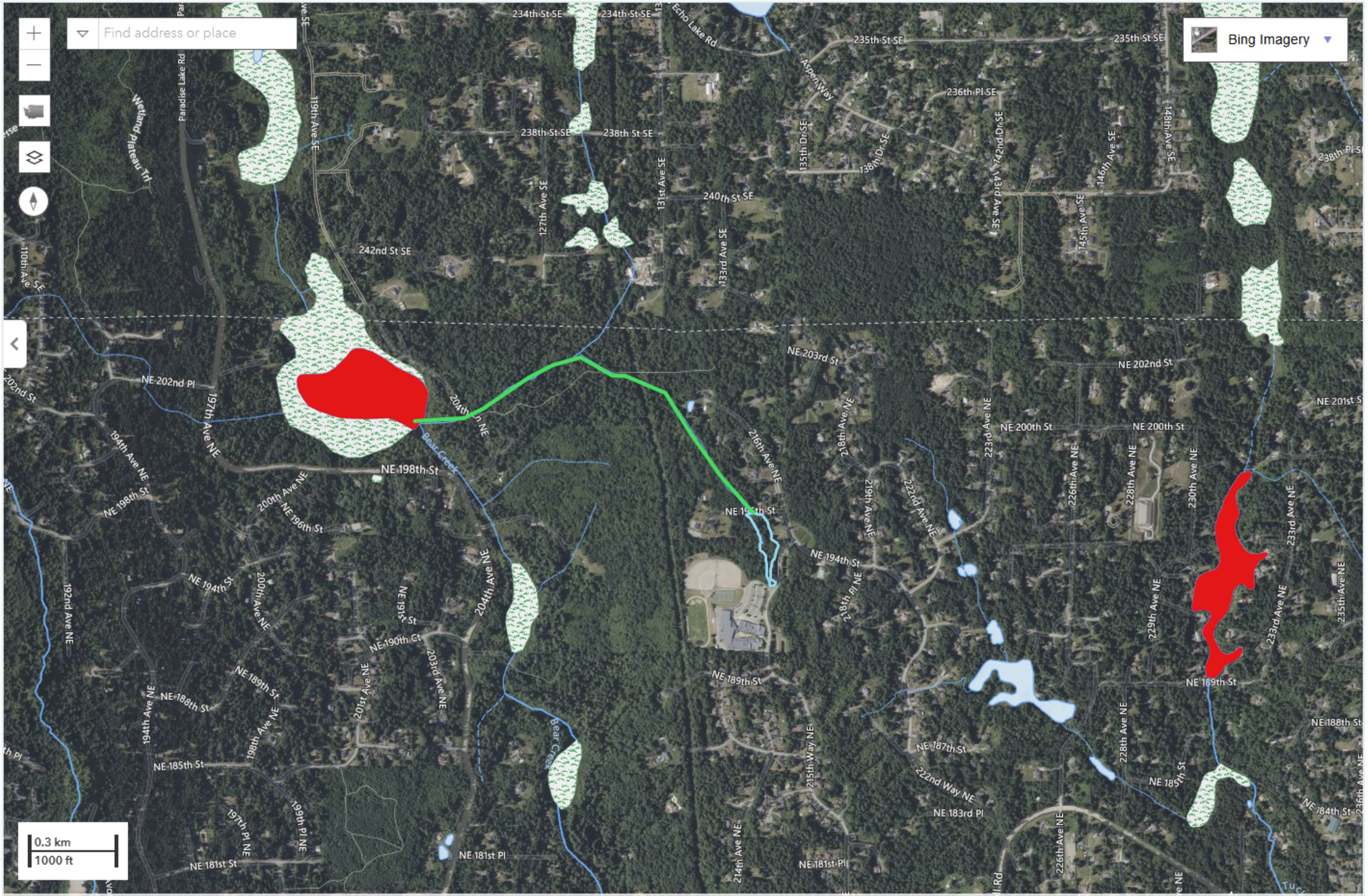
NHD Waterbodies

- Lake/pond/reservoir
- Swamp/marsh
- Canal/ditch
- Ice mass

NHD Areas

- Large river
- Rapids

Data transparency 10%



Add/Remove map data layers

TMDL Items

- Wetland

305(b) List

- Category 4A Water
- Category 4A Sediment
- Category 4B Water
- Category 4B Sediment
- Category 4C Water

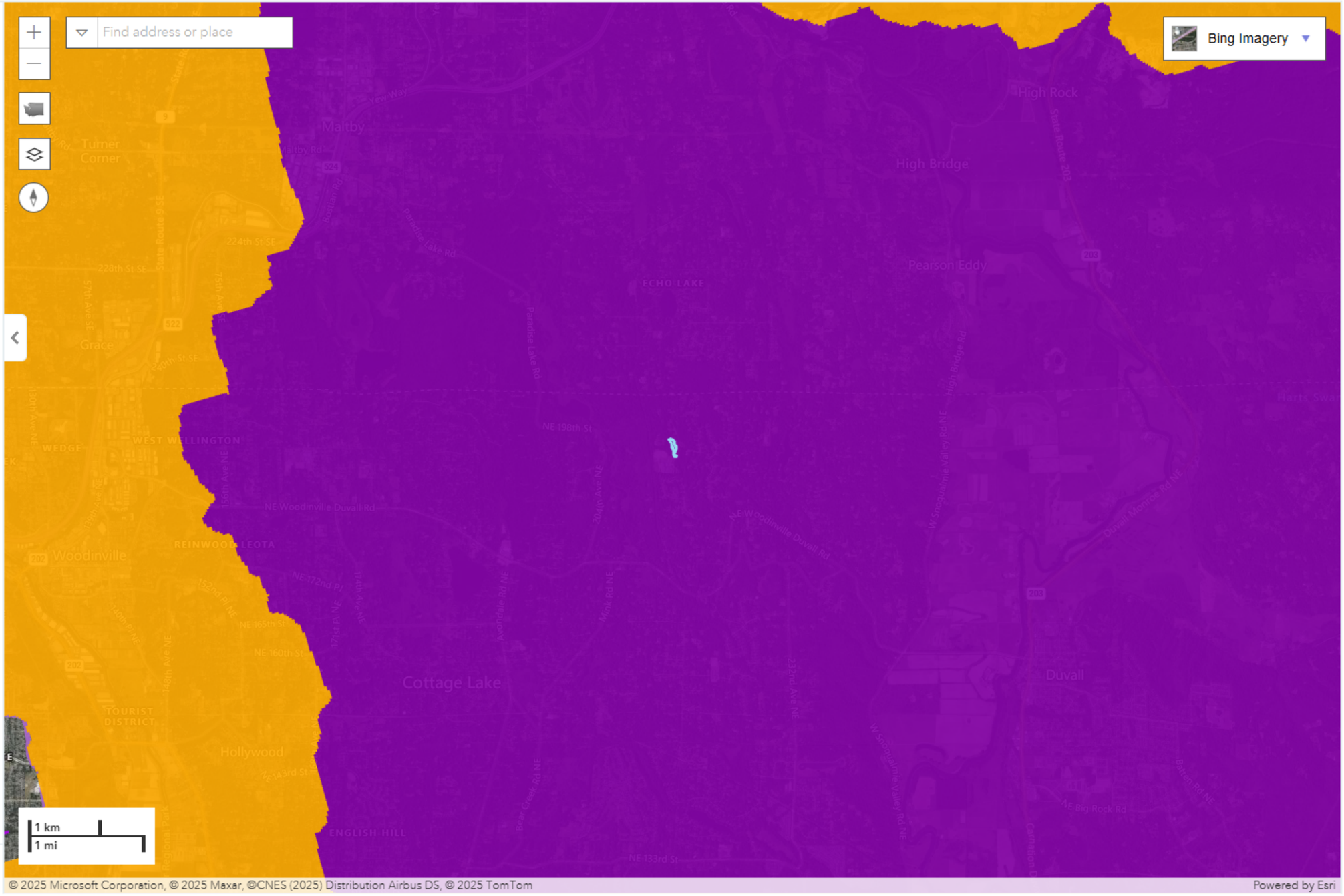
Water Quality Improvement Projects

- Approved
- In Development

Subbasins (12 digit HUCs)

- HUC boundary

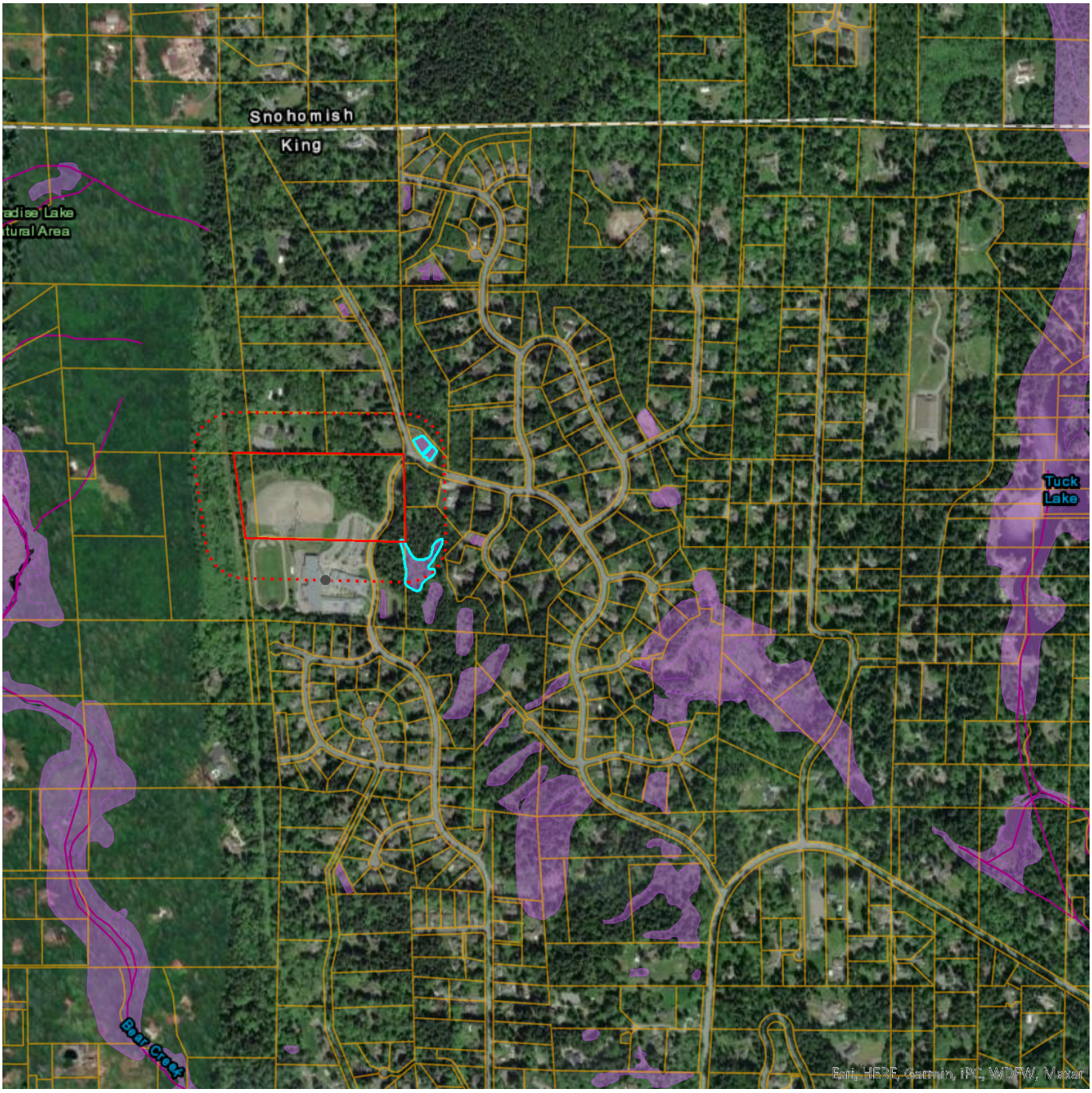
Data transparency 10%



Appendix D

PHS Report

Priority Habitats and Species on the Web



Buffer radius: 300 Feet

Report Date: 09/23/2025

PHS Species/Habitats Overview:

Occurence Name	Federal Status	State Status	Sensitive Location
Freshwater Pond	N/A	N/A	No
Freshwater Forested/Shrub Wetland	N/A	N/A	No

PHS Species/Habitats Details:

Freshwater Pond	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Pond - NWI Code: PABFx
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

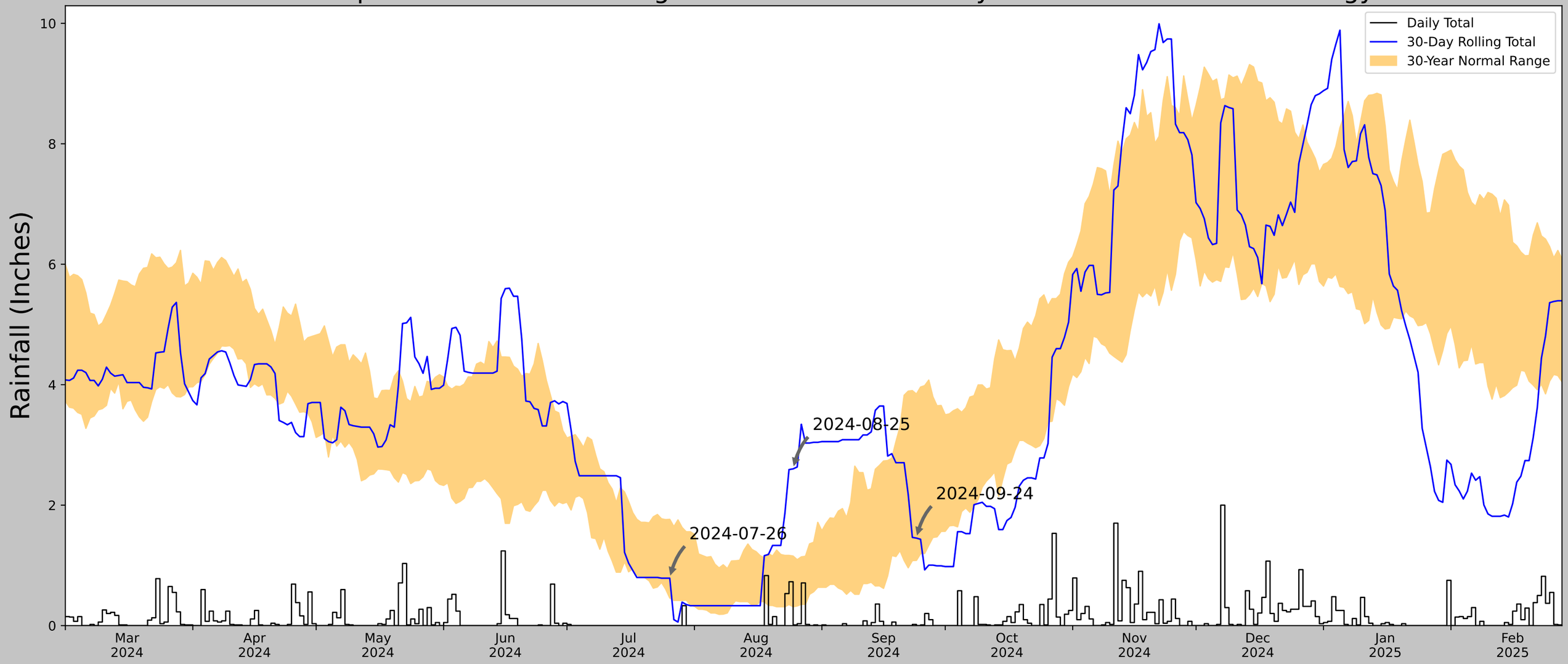
Freshwater Pond	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Pond - NWI Code: PABFx
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSS1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necesssary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.

Appendix E

USACE Antecedent Precipitation Tool Figure



Coordinates	47.76647, -122.05191
Observation Date	2024-09-24
Elevation (ft)	469.133
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-09-24	1.082677	3.844882	1.452756	Normal	2	3	6
2024-08-25	0.312598	1.154724	2.602362	Wet	3	2	6
2024-07-26	0.458268	1.764961	0.787402	Normal	2	1	2
Result							Normal Conditions - 14

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MONROE	47.845, -121.9956	125.0	6.022	344.133	4.783	10966	90
MONROE 0.6 SE	47.8526, -121.9712	73.163	1.247	51.837	0.626	6	0
MONROE 1.8 NW	47.8785, -122.0066	128.937	2.37	3.937	1.076	4	0
DUVALL 0.8 WNW	47.7391, -121.9841	129.921	7.336	4.921	3.337	14	0
WOODINVILLE 0.9 ENE	47.7531, -122.0943	288.058	7.83	163.058	4.8	117	0
WOODINVILLE 1.7 SE	47.7295, -122.0836	217.848	8.965	92.848	4.867	7	0
SNOHOMISH 3.5 NNE	47.9641, -122.0572	255.906	8.71	130.906	5.06	1	0
STARTUP 1 E	47.8672, -121.7175	170.932	12.984	45.932	6.439	235	0
EVERETT	47.9753, -122.195	45.932	12.897	79.068	6.823	2	0

Appendix D
Preliminary Technical Information Report

Preliminary Technical Information Report

June 17, 2026

PROJECT

Timbercrest Middle School Field Renovation
19115 215th Way NE
Woodinville, WA 98077
Project No: 24161

OWNER/APPLICANT

Nate Yates
Northshore School District
3330 Monte Villa Parkway
Bothell, WA 98021

PREPARED BY

Garret Frerichs, PE
Ethos Civil

REVIEWED BY

John Babb, PE
Ethos Civil

ETHOS CIVIL

Preliminary Technical Information Report

June 17, 2026

PROJECT

Timbercrest Middle School Field Renovation
19115 215th Way NE
Woodinville, WA 98077
Project No: 24161

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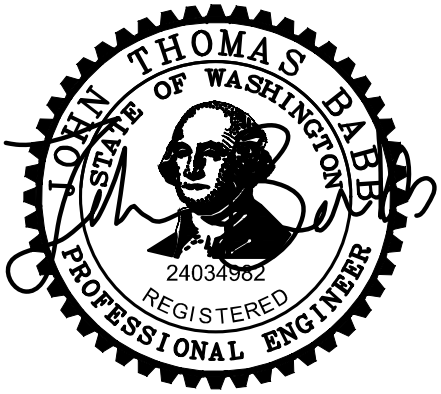
Nate Yates
Northshore School District
3330 Monte Villa Parkway
Bothell, WA 98021

PREPARED BY

Garret Frerichs, PE
Ethos Civil

REVIEWED BY

John Babb, PE
Ethos Civil



6.17.2026

I hereby state that this Drainage Assessment for the Timbercrest Middle School Field Renovation project has been prepared by me or under my supervision and meets the standard of care and expertise that is usual and customary in this community for professional engineers. I understand that the King County does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by

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Section 11 – Conclusion 26

Section 1 – Project Overview

The Timbercrest Middle School Field Renovation project includes the renovation of the track and field from natural grass to synthetic turf, the addition of accessible walkways, a bleacher pad and stairs, an access road, and related utility and stormwater infrastructure upgrades. The anticipated project improvements total 168,475 square feet. The project address is 19115 215th Way NE, King County, Washington and the involved project scope includes King County parcels 0426069023 and 0426069010 which is approximately 33.7 acres. See **Figure 1-1** for the Vicinity Map of the project.

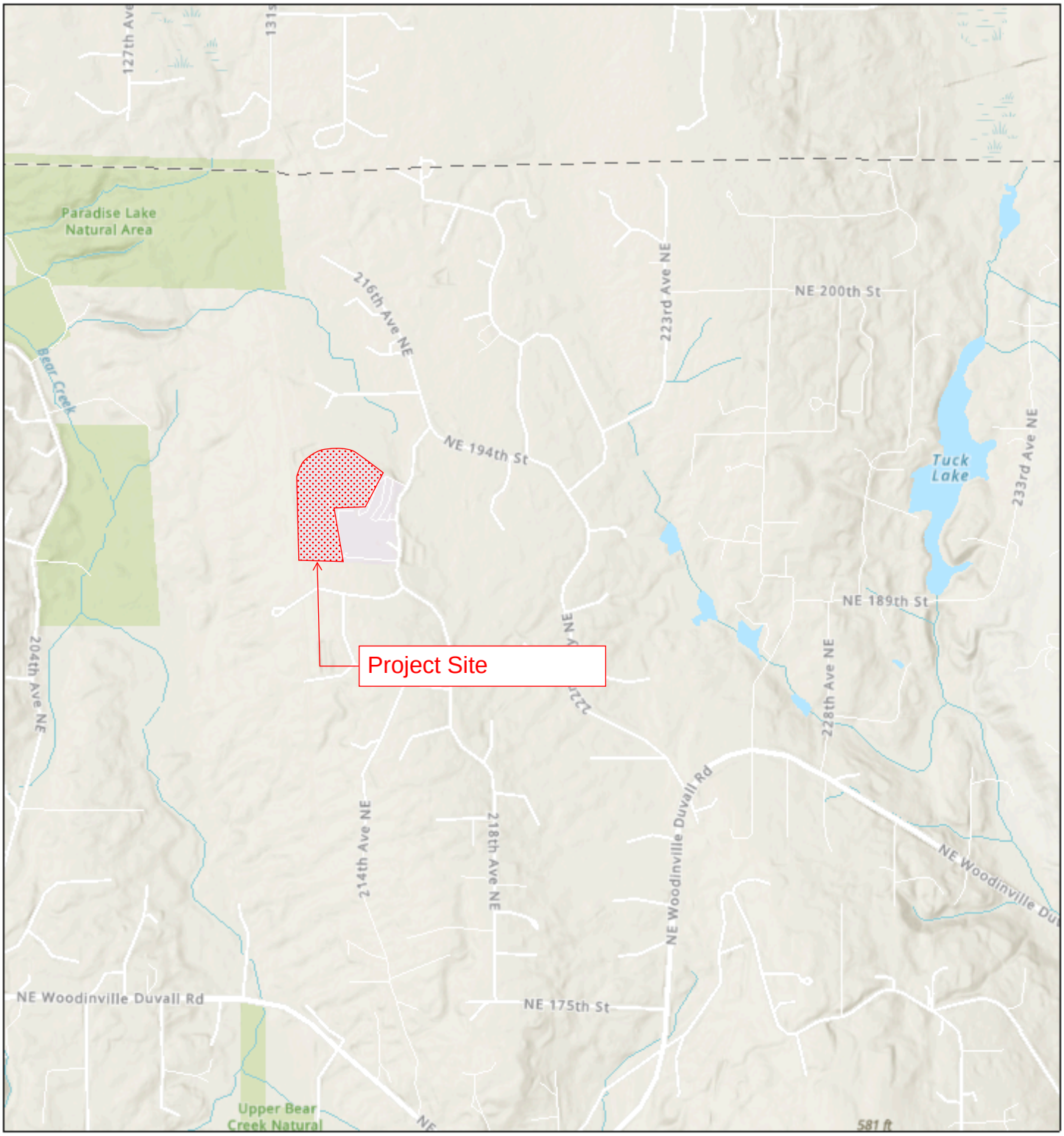
The existing parcels are developed with school buildings, pavement, 2 baseball fields, a track and field and landscaped areas. The existing site drains from east to west and south to north with a total elevation change of approximately 25 feet. There is an existing pond and 5 wetlands located on the 2 parcels, 3 of the 5 wetlands are located to the southeast of parcel 0426069010, while the other 2 wetlands are located to the east of parcel 0426069023 and the pond is located between the two parcels to the north. Refer to the King County iMap snapshot within **Figure 1-2** for the location of the existing pond and wetlands. Stormwater is collected and conveyed via roof leaders, catch basins, swales and storm pipes to the ponds and wetlands.

Stormwater within the project limits drain to the pond located to the north of the site. The pond outlets to a dispersion trench located to the west. Stormwater downstream of the dispersion trench overland flows in the direction of Bear Creek which ultimately drains to the Puget sound. The parcel is bordered by forest to the east and west, single-family residences to the north and south. The total elevation change across the site is approximately 25 feet. The project is designed in accordance with the 2021 King County Surface Water Design Manual (KCSWDM) amended in November 2024 and the 2016 King County Road Design and Construction Standards (KCRDCS).

Section 1 – Figures

1-1 VICINITY MAP

1-2 KING COUNTY IMAP



ETHOS CIVIL

TIMBERCREST MIDDLE SCHOOL FIELD RENOVATION

VICINITY MAP

FIGURE 1-1

Timbercrest Middle School Field Renovation Figure 1-2



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 4/7/2025 Notes:

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King County

Section 2 – Conditions and Requirements Summary

Section 2.1 – Core Requirements

Please see **Figure 2-1** for filled out flow charts for determining project minimum requirements.

The completed and filled out TIR Worksheet will be included in the final TIR.

SECTION 2.1.1 – CORE REQUIREMENT #1: DISCHARGE AT THE NATURAL LOCATION

All surface and stormwater runoff from a project must be discharged at the natural location so as not to be diverted onto or away from downstream properties. The manner in which stormwater runoff and surface water are discharged from the project site must not create a significant adverse impact to downhill properties or drainage facilities.

The majority of the site collects stormwater through a closed pipe conveyance system and sends flow to the north detention pond. The north detention pond has an outlet control structure and a flow spreader that sends excess stormwater offsite to the west into Paradise Lake natural area.

The post-developed site proposes to maintain the existing conditions of the drainage basins and discharge locations. The discharge locations will be maintained as a part of this project.

SECTION 2.1.2 – CORE REQUIREMENT #2: OFFSITE ANALYSIS

All proposed projects must submit an offsite analysis report that assesses potential offsite drainage and water quality associated with development of the project site. A Level 1 downstream analysis has been performed and is described in Section 3.0.

SECTION 2.1.3 – CORE REQUIREMENT #3: FLOW CONTROL

All proposed projects, including redevelopment projects, must provide onsite flow control facilities to mitigate the impacts of storm and surface water runoff generated by new impervious surface, new pervious surface, and replaced impervious surface targeted for flow control mitigation as specified in the KCSWDM.

The project site is located within a Conservation Flow Control Area, as identified on the Flow Control Applications Map, and is therefore required to implement flow control measures. This site does not drain entirely by non-erodible manmade conveyance to a major receiving water. Therefore, according to Table 1.2.3.A, this project must apply the Level 2 flow control standard (historic site conditions), which matches historic durations for 50% of 2-yrthrough 50-year peaks and matches historic 2- and 10-year peaks.

SECTION 2.1.4 – CORE REQUIREMENT #4: CONVEYANCE SYSTEM

All engineered conveyance system elements for proposed projects must be analyzed, designed, and constructed to provide a minimum level of protection against overtopping, flooding, erosion, and structural failure as specified in the KCSWDM.

A complete conveyance analysis will be included in the final TIR.

SECTION 2.1.5 – CORE REQUIREMENT #5: CONSTRUCTION STORMWATER POLLUTION PREVENTION (CSWPP)

SECTION 2.1.6 – CORE REQUIREMENT #6: MAINTENANCE AND OPERATIONS

Maintenance and operation of all drainage facilities are the responsibility of the applicant or property owner, except those facilities for which King County assumes maintenance and operations, as described

in the KCSWDM. Drainage facilities must be maintained and operated in accordance with the maintenance standards in Appendix A of the KCSWDM.

Maintenance and operations associated with the proposed drainage facilities will be provided in the final TIR.

SECTION 2.1.7 – CORE REQUIREMENT #7: FINANCIAL GUARANTEES AND LIABILITY

All drainage facilities constructed or modified for projects must comply with the financial guarantee requirements in King County.

A bond quantity worksheet will be filled out for reference and provided in the final TIR.

SECTION 2.1.8 – CORE REQUIREMENT #8: WATER QUALITY

All proposed projects, including redevelopment projects, must provide water quality facilities to treat the runoff from those new and replaced pollution-generating impervious surfaces and new pollution-generating pervious surfaces targeted for treatment as specified in the KCSWDM. Because more than 5,000 square feet of pollution-generating impervious surface is proposed and the project is a commercial site, the project must provide Enhanced Basic Water Quality. Further discussion, including presettling, is located in Section 4 below.

On 1/9/2026 the project obtained a variance to waive the presettling portion of Core Requirement (CR) #8 (VARD25-0028) for stormwater generated by the turf field. The field's permeable aggregate base materials and underdrainage system will provide adequate presettling of the stormwater coming from the field prior to discharging to the proposed water quality system.

SECTION 2.1.9 – CORE REQUIREMENT #9: FLOW CONTROL BEST MANAGEMENT PRACTICES (BMPS)

All proposed projects, including redevelopment projects, must provide onsite flow control BMPs to mitigate the impacts of storm and surface water runoff generated by new impervious surface, new pervious surface, existing impervious surfaces, and replaced impervious surface targeted for mitigation. Large Rural Lot BMP requirements apply to this project because the proposed project is on a lot that is larger than 5 acres and outside the Urban Growth Area(UGA) as described in Section 1.2.9.2.3 of the KCSWDM. The project is required to demonstrate compliance with the Low Impact Development (LID) Performance Standard using an approved continuous runoff model.

On 9/22/2025 the project obtained a variance to waive CR #9 (VARD25-0014) due to the site's hydrology and constraints. The field is expected to attenuate runoff more than what can be accomplished by a flow control BMP facility alone which according to the variance decision is considered mitigation for not providing a flow control BMP. Please see the VARD25-0014 decision in **Appendix B**.

Section 2.2 – Special Requirements

SECTION 2.2.1 – SPECIAL REQUIREMENT #1: OTHER ADOPTED AREA-SPECIFIC REQUIREMENTS

Besides the KCSWDM, there are other regulations that may apply requirements for controlling drainage on an area-specific basis. Examples of these regulations include: Basin Plans (BPs) and Wildland Urban Interface Area plans. To our knowledge, there are no adopted area-specific requirements applicable to the project site.

SECTION 2.2.2 – SPECIAL REQUIREMENT #2: FLOOD HAZARD AREA DELINEATION

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map was reviewed for this project. It indicates that the project site is in an area of minimal flood hazard potential (Zone X). Refer to **Figure 2-2** for the Flood Insurance Rate Map.

SECTION 2.2.3 – SPECIAL REQUIREMENT #3: FLOOD PROTECTION FACILITIES

The project site does not contain, nor is it adjacent to, any existing flood protection facilities. Project improvements do not include flood protection measures.

SECTION 2.2.4 – SPECIAL REQUIREMENT #4: SOURCE CONTROL

The Water quality source controls prevent rainfall and runoff water from coming into contact with pollutants, thereby reducing the likelihood that pollutants will enter public waterways and violate water quality standards or city stormwater discharge permit limits. The CSWPPP identifies and implements source controls for activities that often pollute water bodies. All applicable structural source control measures are implemented on the project site.

SECTION 2.2.5 – SPECIAL REQUIREMENT #5: OIL CONTROL

The project site is not considered a high-use site. Therefore, it is not subject to oil control requirements.

Section 2 – Figures

2-1 FLOW CHARTS FOR DETERMINING MINIMUM REQUIREMENTS

2-2 FEMA FIRM

Figure 2-1

FIGURE 1.1.2.A FLOW CHART FOR DETERMINING TYPE OF DRAINAGE REVIEW REQUIRED

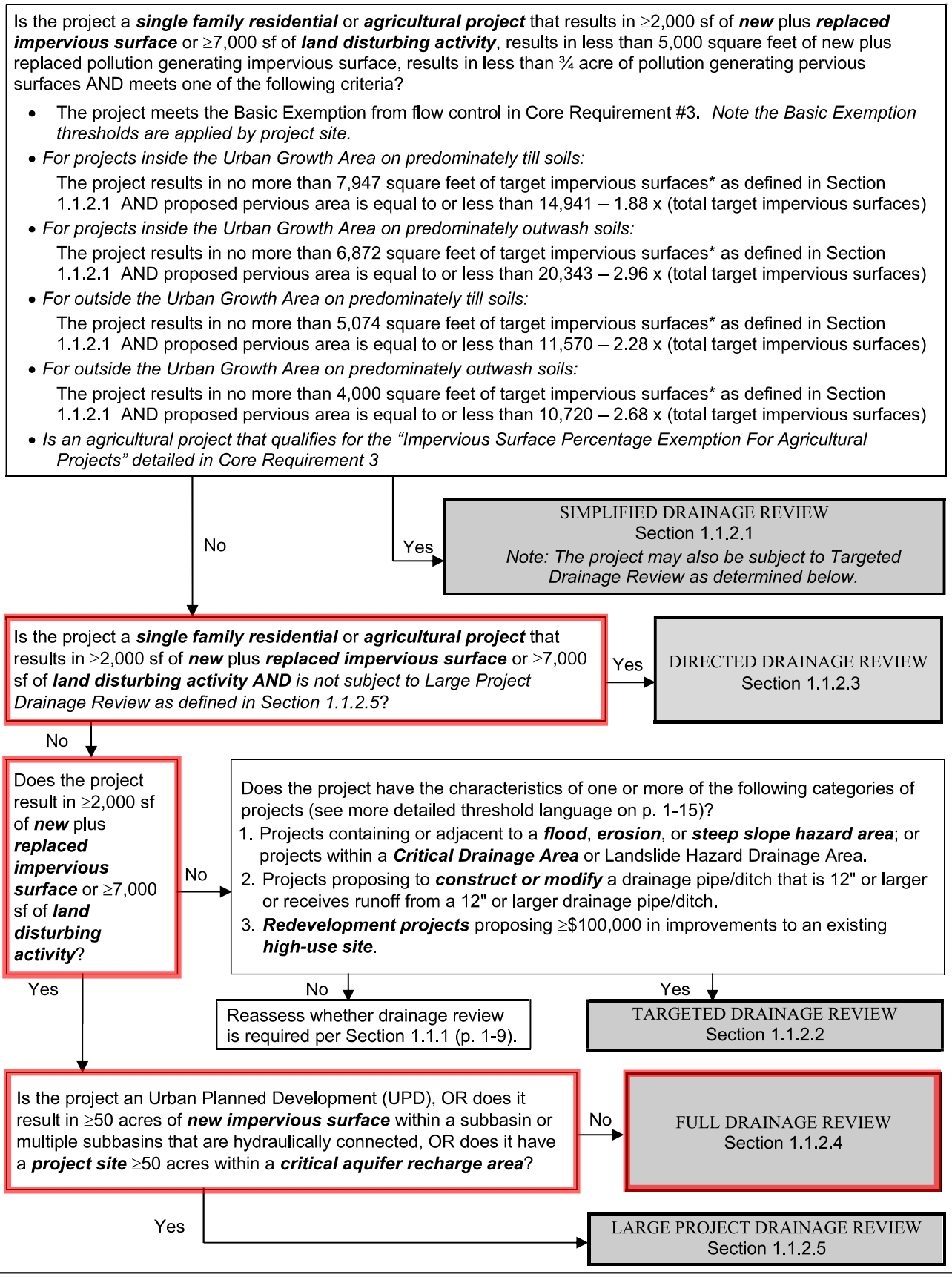


TABLE 1.1.2.A REQUIREMENTS APPLIED UNDER EACH DRAINAGE REVIEW TYPE

Simplified	***Single family residential projects*** and ***agricultural projects*** that result in ≥2,000 sf of ***new*** plus ***replaced impervious surface*** or ≥7,000 sf of ***land disturbing activity*** but do not exceed the new plus replaced PGIS, new PGPS, and ***new pervious surface*** thresholds specified in Sec. 1.1.2.1; OR is an agricultural project that qualifies for the "Impervious Surface Percentage Exemption For Agricultural Projects".
Directed	***Single family residential projects*** and ***agricultural projects*** that result in ≥2,000 sf of ***new*** plus ***replaced impervious surface*** or ≥7,000 sf of ***land disturbing activity*** that are not subject to Simplified Drainage Review or Large Project Drainage Review
Targeted	Projects that **are not** subject to Directed, Full or Large Project Drainage Review, AND have characteristics of **one or more** of the following categories of projects: 1. Projects containing or adjacent to a ***flood***, ***erosion***, or ***steep slope hazard area***; projects within a ***Critical Drainage Area*** or Landslide Hazard Drainage Area. 2. Projects that ***construct or modify*** a drainage pipe/ditch that is 12" or larger or receive runoff from a 12" or larger drainage pipe/ditch. 3. ***Redevelopment projects*** with ≥$100,000 in improvements to a ***high-use site.***(1)
Full	All projects that result in ≥2,000 sf of ***new*** plus ***replaced impervious surface*** or ≥7,000 sf of ***land disturbing activity*** but are not subject to Simplified Drainage Review, Directed Drainage Review , OR Large Project Drainage Review.
Large Project	UPDs, OR projects that result in ≥50 acres of ***new impervious*** within a sub-basin or multiple sub- basins that are hydraulically connected, OR ***project sites*** ≥50 acres within a ***critical aquifer recharge area***.

	DRAINAGE REVIEW TYPE						
	Simplified	Directed	Targeted			Full	Large Project
			Categ 1	Categ 2	Categ 3		
SIMPLIFIED DRAINAGE REQUIREMENTS	SEE NOTE 4						
CORE REQUIREMENT #1 Discharge at Natural Location	✓(4)	✓(2,3)	*(2)	✓		✓	✓
CORE REQUIREMENT #2 Offsite Analysis	✓(4)	✓(2,3)	*(2)	✓(3)		✓(3)	✓(3)
CORE REQUIREMENT #3 Flow Control	✓(4)	✓(2,3)	*(2)			✓(3)	✓(3)
CORE REQUIREMENT #4 Conveyance System	✓(4)	✓(2,3)	*(2)	✓		✓	✓
CORE REQUIREMENT #5 Erosion & Sediment Control	✓(4)	✓(2,3)	✓	✓	✓	✓	✓
CORE REQUIREMENT #6 Maintenance & Operations	✓(4)	✓(2,3)	*(2)	✓	✓	✓	✓
CORE REQUIREMENT #7 Financial Guarantees & Liability	✓(4)	✓(2,3)	*(2)	✓(3)	✓(3)	✓(3)	✓(3)
CORE REQUIREMENT #8 Water Quality	✓(4)	✓(2,3)	*(2)			✓(3)	✓(3)
CORE REQUIREMENT #9 Flow Control BMPs	✓(4)	✓				✓	✓
SPECIAL REQUIREMENT #1 Other Adopted Requirements	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #2 Flood Hazard Area Delineation	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #3 Flood Protection Facilities	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #4 Source Control	✓(4)	✓(2,3)	✓(3)	✓(3)	✓(3)	✓(3)	✓(3)
SPECIAL REQUIREMENT #5 Oil Control	✓(4)	✓(2,3)			✓(3)	✓(3)	✓(3)

(1) Category 3 projects installing oil controls that construct or modify a 12-inch pipe/ditch are also Category 2 projects.

(2) May be applied by DLS-Permitting based on project or ***site***-specific conditions. Documentation of compliance required.

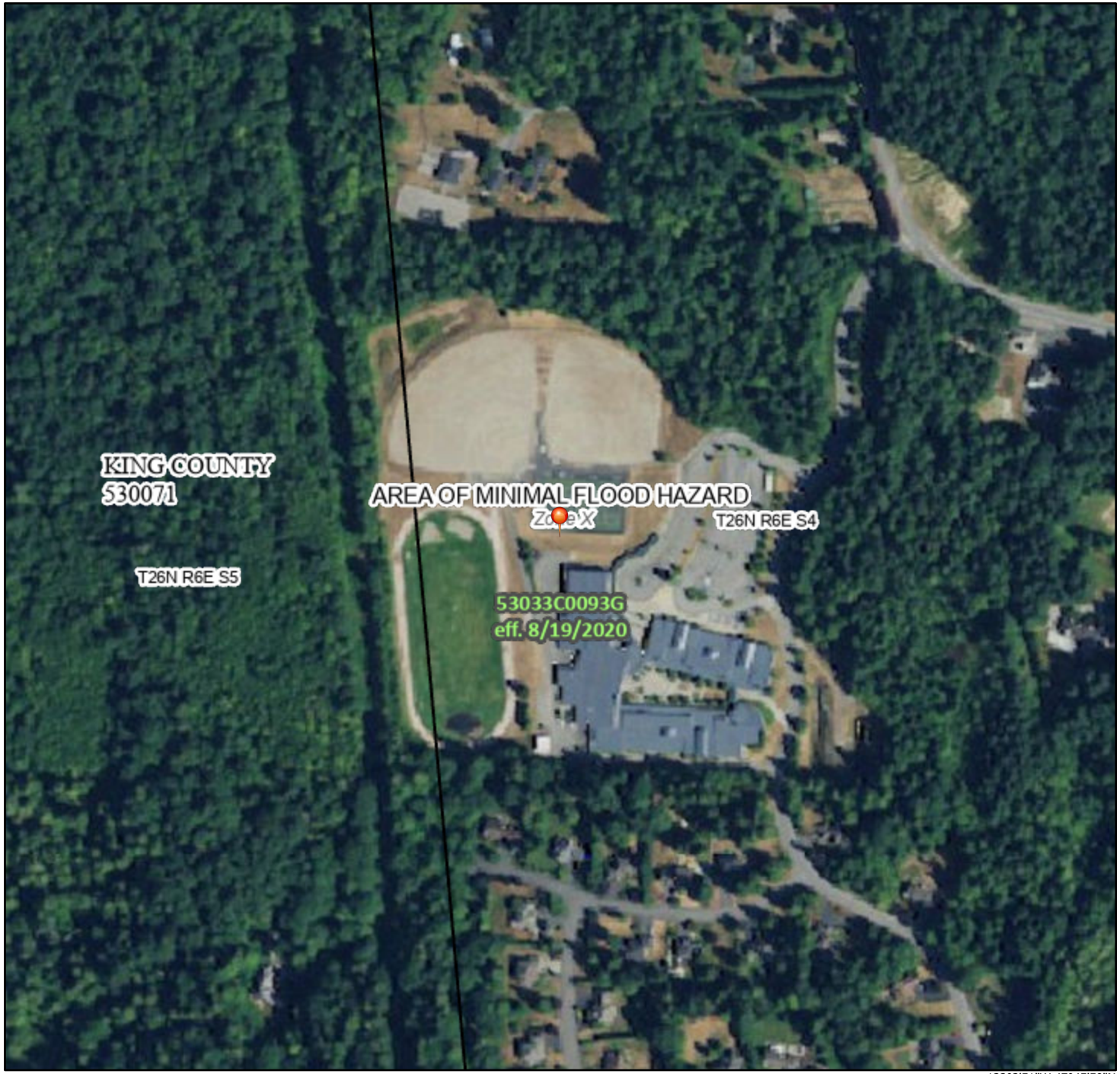
(3) These requirements have exemptions or thresholds that may preclude or limit their application to a specific project.

(4) A proposed project subject to Simplified Drainage Review that complies with the Simplified drainage requirements detailed in Appendix C is presumed to comply with all the core and special requirements in Sections 1.2 and 1.3 except those requirements that would apply to the project if it is subject to Targeted Drainage Review as specified in Section 1.1.2.2.

National Flood Hazard Layer FIRMette Figure 2-2

FEMA

122°3'28"W 47°46'14"N



122°2'51"W 47°45'50"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/4/2025 at 10:25 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Section 3 – Offsite Analysis

Downstream Analysis – Level 1

Section 3.1.1 Task 1 – Study Area Definition and Maps

Task 1 of the offsite analysis involves mapping and defining the stormwater characteristics around the subject property one quarter mile downstream, and as far upstream as necessary to encompass the offsite drainage tributary to the site. According to the King County Department of Natural Resources and Parks – Sammamish Watershed map, the project is in the Bear Creek Subwatershed Basin. Topographical information was obtained from the site survey, King County iMap resource, and GIS maps from the King County.

Section 3.1.2 Task 2 – Resource Review

Task 2 of the offsite analysis involves reviewing available references and records that describe the site's flow path and potential flooding, erosion, and water quality problems for one mile downstream of the project site. The following references were used to complete the offsite analysis:

- 2021 King County Surface Water Design Manual (amended in 2024)
- King County iMap Resource
- FEMA Flood Maps
- Geotechnical Evaluation by GeoTest Services
- Stormwater facilities maintenance records from King County
- Drainage Investigation Report from King County Land and Water Resources Division
- Construction Plans provided by the Northshore School District:
    - Northshore School District #417, Northshore Junior High School #6, Bothell, Washington, dated Feb 15th, 1996. Prepared by Bush, Roed & Hitchings, Inc.

Review of these references show that the project area does not discharge into the wetlands within and outside the parcel area. Stormwater from the project area flows into the pond located to the north of the site. The discharge locations of the project site and parcel area have been regularly maintained as shown in the maintenance records as shown in **Figure 3-5**. There are no known area-specific requirements established in local plans, ordinances, regulations, or in Water Clean-Up Plans approved by the Department of Ecology. The project site is not located within a flood zone. Refer to **Figure 2-2** in **Section 2** for a Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM).

According to King County iMap, a potential steep slope is located west of the project site. This slope is a fill slope that was constructed as part of the original school development. Refer to **Figure 3-4** for the location of the potential steep slope as identified in King County iMap.

A level 1 virtual downstream analysis has been completed for the project. All runoff from the project site stormwater basin is dispersed offsite in the direction of Bear Creek. Bear creek eventually feeds into Lake Sammamish, which eventually feeds into the Puget Sound.

Upstream of the project site are residential properties and forested/wetland areas. No offsite runoff is anticipated to enter the project site.

The project does not fall within any Department of Public Health setbacks for potential on-site or adjacent septic and private wells.

The subject parcels are divided into 3 basins: the West, Southeast and Northeast basins as shown in **Figure 3-3**. The additions and improvements will be located West basin. See **Figure 3-2** for a mile downstream map showing the project site's outfall to Bear Creek.

Stormwater from the West basin is collected and conveyed in a swale, underdrain pipes, and a series catch basins to the existing flow control pond located between the 2 parcels near the Northwest corner of the project site. The West flow control pond has an outlet control structure and a flow spreader that sends excess stormwater offsite to the west in the direction of Bear creek. The pond also contains an existing emergency overflow spillway.

The Southeast sub-basin collects flow from roof downspouts from the main school building and a series of catch basins in the Southeastern portion of the campus into a detention pond/wetland located near the Southeast corner of the property. The detention pond/wetland outlets through a control structure into wetland located on site. Refer to **Figure 1-2** for locations of wetlands.

The Northeast sub-basin collects flow from onsite swales and catch basins. Flow is directed to a detention pond near the Northeastern corner of the property with a dispersion outlet into the forested area across 215th Way NE.

There are no drainage complaints that are known to be open at this time. King County Water and Land Resources Division was contacted to obtain all known drainage complaints for the project parcel and only one record was returned. Refer to **Figure 3-6** for the record of the onsite drainage pond water levels rising higher than usual in 2011. The pond has since undergone maintenance that resolved the complaint. Furthermore, the proposed project design will subsequently improve its current state.

Section 3.1.3 Task 3 – Field Inspection

Task 3 of the offsite analysis involves an inspection of the existing onsite and offsite drainage system. The existing storm network was observed for deficiencies and drainage problems. There are no known deficiencies or drainage problems observed on site. No apparent flooding or erosion problems are known to exist on, or downstream, of the project site. Ethos Civil staff observed the site on March 18th, 2025.

Section 3.1.4 Task 4 – Drainage System Description and Problem Descriptions

The existing drainage system is fed by a series of on-site catch basins as shown in **Figures 3-2** and **3-3**. The on-site catch basins release storm water directly into the existing on-site detention also shown in **Figures 3-2** and **3-3**. The existing pond is made up of two grass lined cells with a berm in between the two cells. The berm does include a spillway that hydraulically connects the two cells. The existing pond design documents showing side slopes, size, and emergency overflow spillway design details are included as **Figure 3-7**. The existing pond outlets to a 100' dispersion trench also shown in **Figures 3-2**, **3-3**, and **3-7**. The drainage path from the project site is forested land cover for the first 0.3 miles before it reaches Bear Creek. The drainage path from the 0.3 mile to the 1 mile point downstream of the project site remains in Bear Creek. Refer to **Figure 3-8** for the Off-Site Analysis Drainage System Table.

There are no drainage complaints that are known to be open at this time.

Section 3 – Figures

3-1 EXISTING DRAINAGE BASIN MAP

3-2 MILE DOWNSTREAM MAP

3-3 KING COUNTY IMAP BASIN BOUNDARY MAP

3-4 KING COUNTY IMAP POTENTIAL STEEP SLOPE MAP

3-5 KING COUNTY STORMWATER FACILITIES MAINTENANCE RECORDS

3-6 KING COUNTY WATER AND LAND RESOURCES DIVISION DRAINAGE INVESTIGATION REPORT

3-7 TIMBERCREST EXISTING POND PERMIT DESIGN DOCUMENTS

3-8 OFF-SITE ANALYSIS DRAINAGE SYSTEM TABLE

FIGURE 3-1: EXISTING DRAINAGE BASIN MAP

IMPERVIOUS (NON-TRACK): 2.62 AC

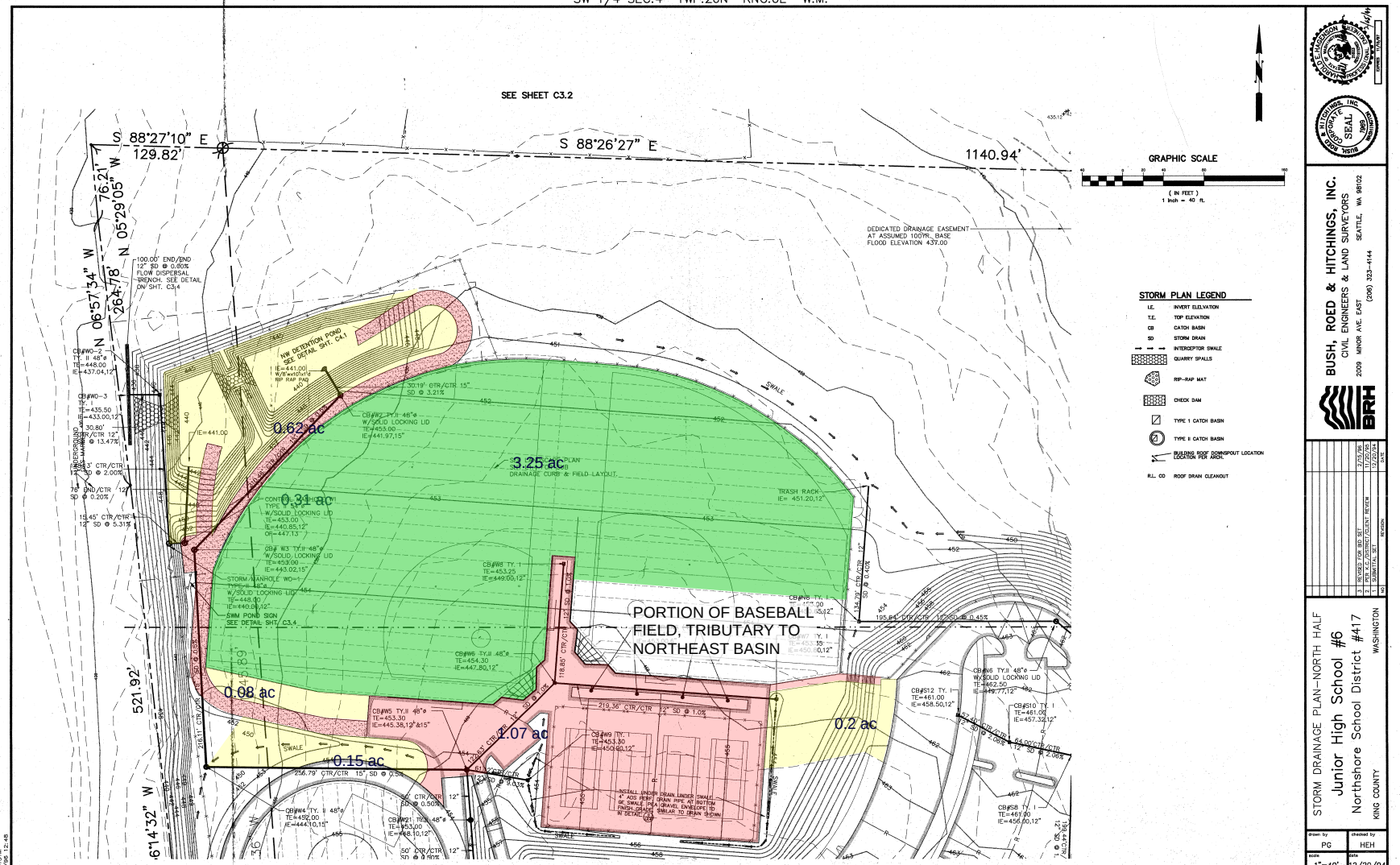
IMPERVIOUS (TRACK): 0.74 AC

IMPERVIOUS (FIELDS): 5.58 AC

PERVIOUS: 1.67 AC

TOTAL BASIN AREA
TRIBUTARY TO POND: APPROXIMATELY 10.61 AC

SW 1/4 SEC.4 TWP.26N RNG.6E W.M.



BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2009 MINOR AVE. EAST SEATTLE, WA 98102
(206) 323-4144

NO.	REVISION	DATE
1	REVISED FOR BID SET	2/15/95
2	REVISED PER PLANCK REVIEW	12/20/94
3	SUBMITTAL SET	9/9/94

STORM DRAINAGE PLAN—NORTH HALF
Junior High School #6
Northshore School District #417
KING COUNTY WASHINGTON

drawn by PG | checked by HEH
scale 1"=40' | date 12/20/94
job no. 93201.12
sheet C3.1

BID SET

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2009 MINOR AVE. EAST SEATTLE, WA 98102
(206) 323-4144

NORTHSHORE SCHOOL DISTRICT #417
NORTHSHORE JUNIOR HIGH SCHOOL #6
BOTHELL, WASHINGTON

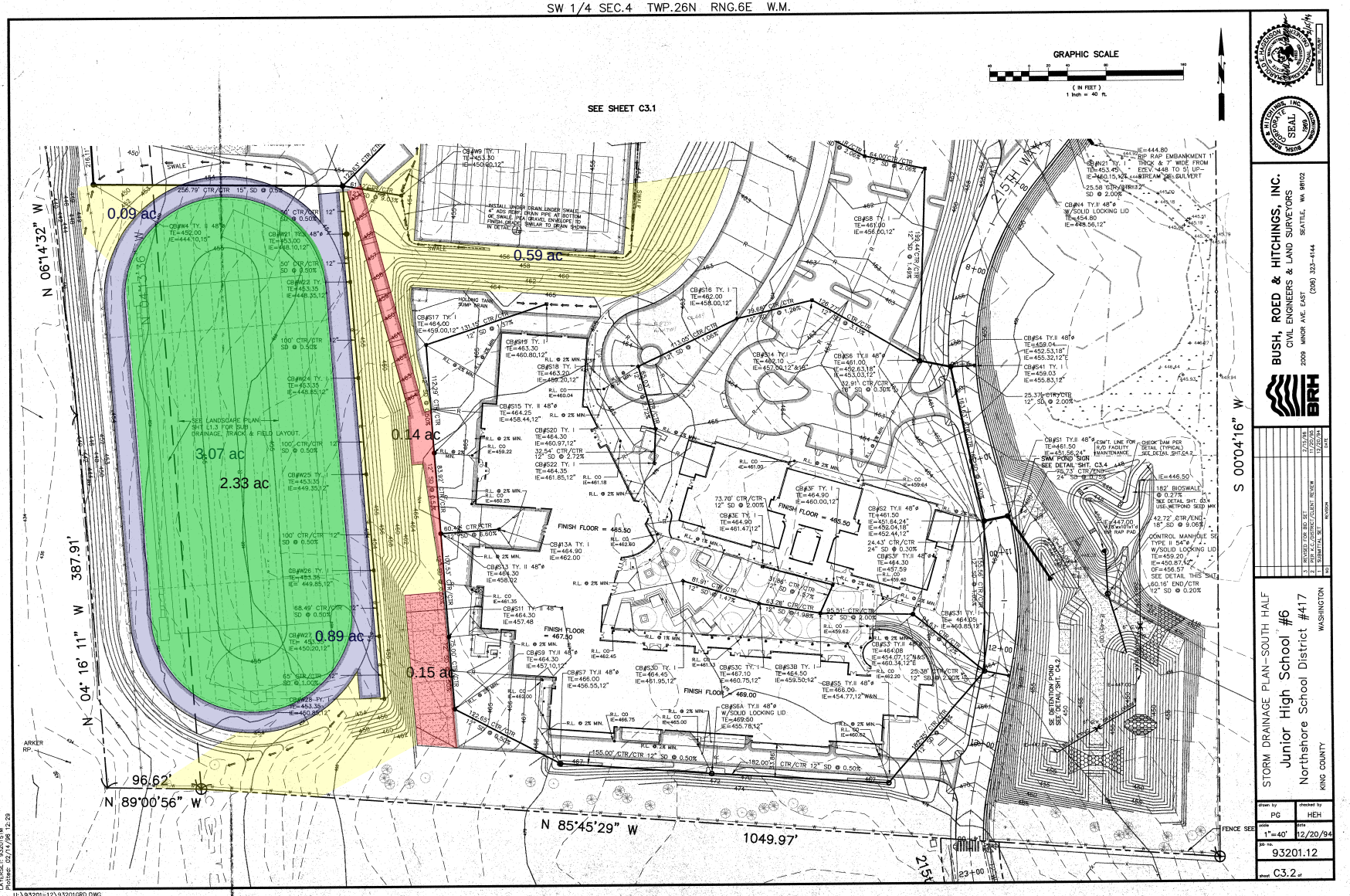
Northwest Sanitational Company
303 BATTERY STREET SEATTLE, WA 98121 (206) 882-2441
WEST 1203 RIVERSIDE SPOKANE, WA 99201 (509) 838-8240

JOB NO. 93201.12
DRAWN WPG
CHECKED HEH
DATE 2/15/95

C3.1

93201.12 C3.1 of STORM DRAINAGE PLAN—NORTH HALF Junior High School #6
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U:\93201-12\93201GRD.DWG

SW 1/4 SEC.4 TWP.26N RNG.6E W.M.



BID SET

BUSH, ROED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2009 MINOR AVE. EAST SEATTLE, WA 98102 (206) 323-4144

NORTHSHORE SCHOOL DISTRICT #417
NORTHSHORE JUNIOR HIGH SCHOOL #6
BOTHELL, WASHINGTON

NO.	REVISED FOR BID SET	DATE
1		2.15.95
2	PER K.C. COMMENTS/AGENCY REVIEW	1/20/95
3	SUBMITTAL SET	12/20/94

STORM DRAINAGE PLAN-SOUTH HALF
Junior High School #6
Northshore School District #417
KING COUNTY WASHINGTON

drawn by PG | checked by HEH
scale 1"=40' | date 12/20/94
job no. 93201.12
sheet C3.2 of

Northwest Aerosurveys Company
303 BATTERY STREET SEATTLE, WA 98121 (206) 882-2441
WEST 1203 RIVERSIDE SPOKANE, WA 99201 (509) 838-8240

JOB NO. 93201.12
DRAWN WPC
CHECKED HEH
DATE 2/15/95

C3.2

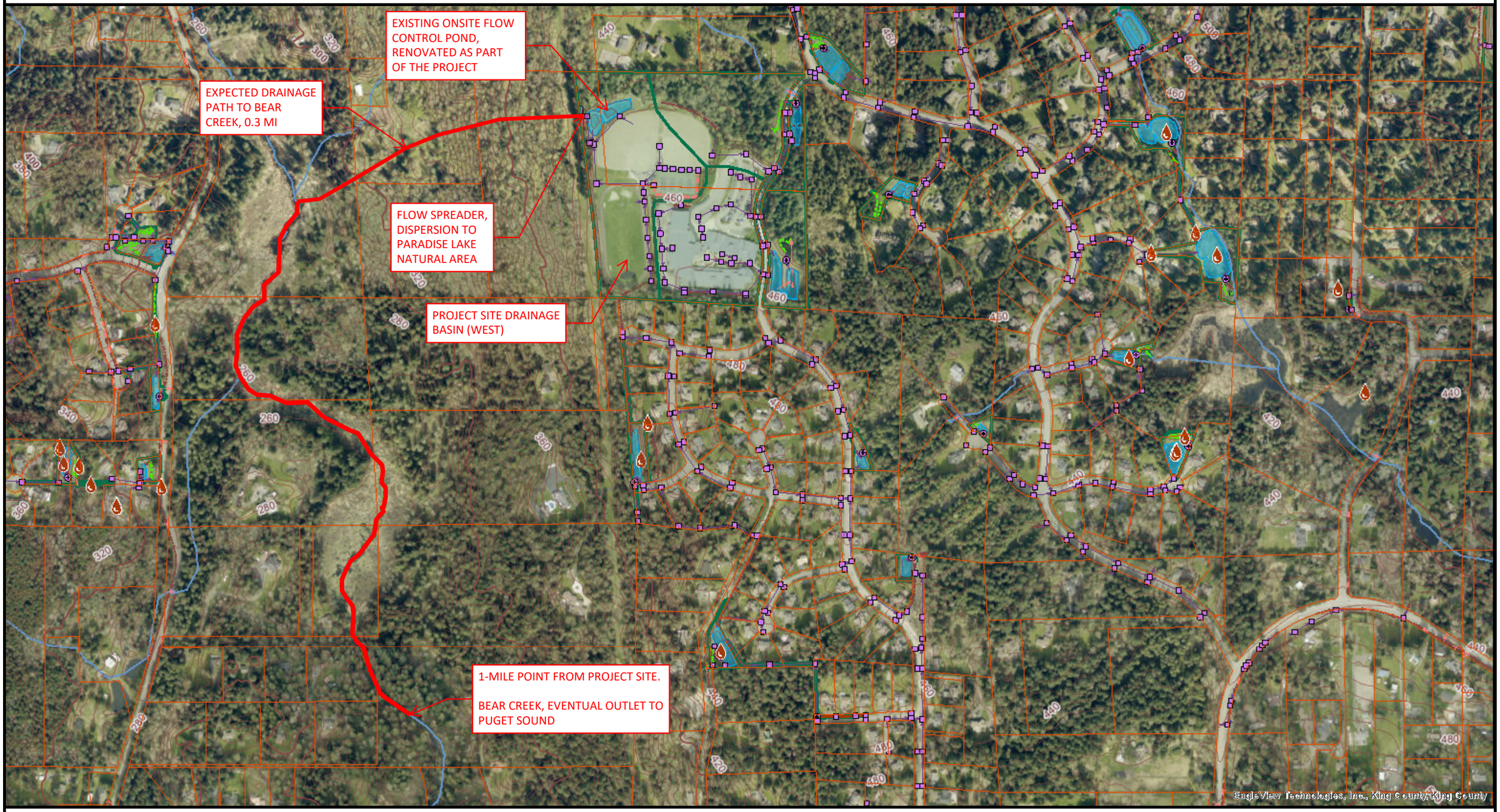
93201.12 C3.2 of NORTHSHORE SCHOOL DISTRICT #417 NORTHSHORE JUNIOR HIGH

93201.12 C3.2 of
STORM DRAINAGE PLAN-SOUTH HALF
Junior High School #6

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Figure 3-2: Mile Downstream Analysis



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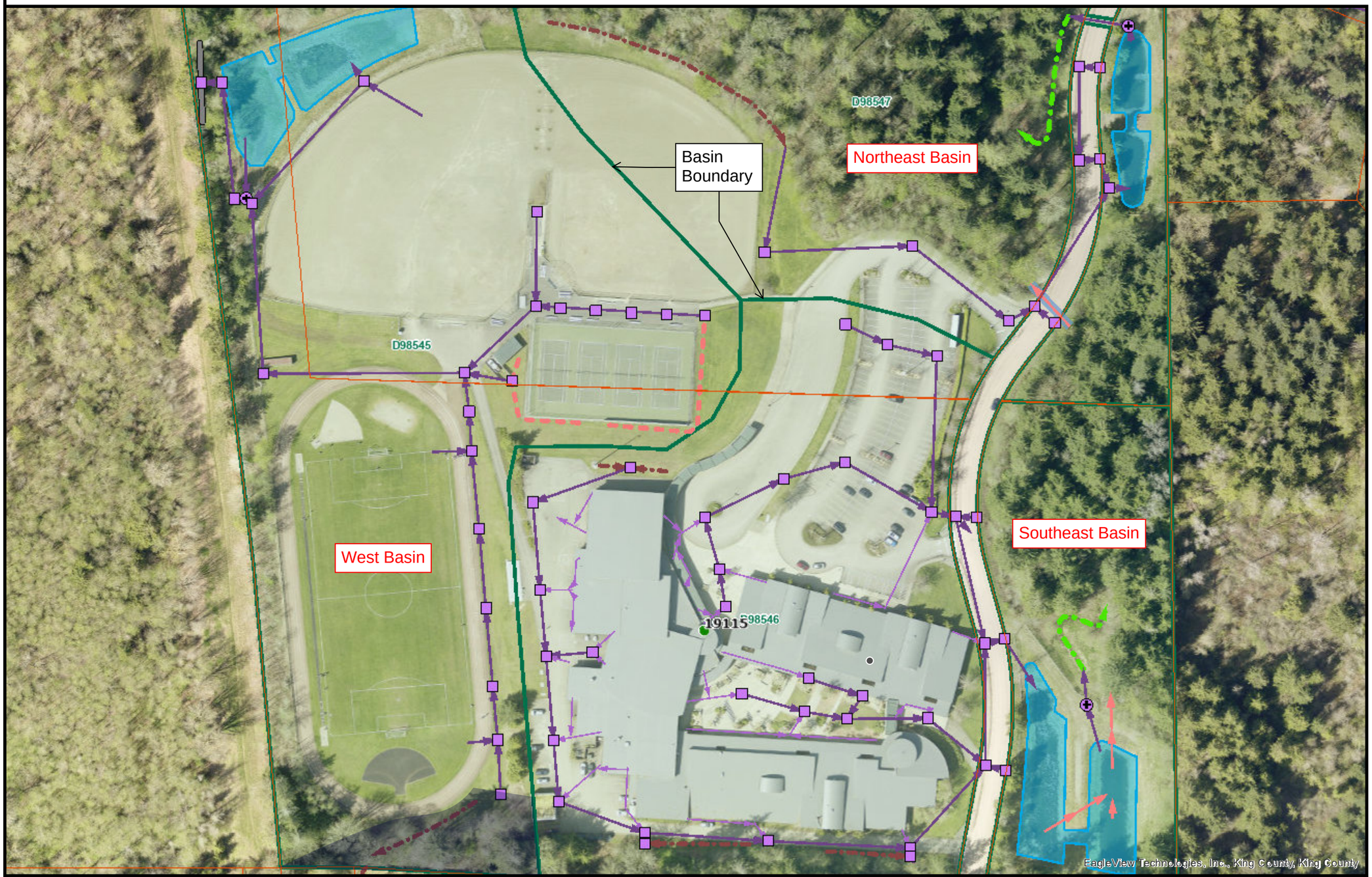
Date: 6/4/2026

Notes:

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King County

Figure 3-3: King County iMap Basin Boundary Map



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 4/4/2025

Notes:

N

King County

FIGURE 3-4: KING COUNTY IMAP POTENTIAL STEEP SLOPE MAP



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 11/6/2025 Notes:

N

King County

FIGURE 3-5: KING COUNTY STORMWATER FACILITIES MAINTENANCE RECORDS

King County

Water and Land Resources Division Stormwater Services
Department of Natural Resources and Parks
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855
206-477-4811 **Fax** 206-296-0192 TTY Relay: 711
stormwater@kingcounty.gov Other formats and languages available

September 08, 2022

Northshore School District #417
Bruce Skowyra
3330 Monte Villa Pkwy
Bothell WA 98021-8972

RE: Timbercrest Junior High School - West Pond - 19115 215th Wy NE - D98545

Dear Property Owner:

To prevent flooding and protect water quality, King County inspects storm drainage facilities in privately maintained developments. Inspections help us spot and alert property owners to drainage system problems before they escalate.

A King County drainage investigator visited your drainage system on July 13, 2022 and identified items needing maintenance. King County Code Chapter 9.04.120 requires property owners to maintain the drainage facilities on their properties to King County Standards. Enclosed is the work list of those maintenance items and a sketch of your facility.

In order to be eligible for a discount on your Surface Water Management fee next year, you must:

1. **Complete the work on the enclosed Maintenance Correction List, sign, and return within 60 days from the date of this letter**. If needed, please call (206) 477-4811 or email stormwater@kingcounty.gov to request an extension. Extensions will *only* be granted past December 31 for extenuating circumstances; and
2. Implement and maintain pollution prevention best management practices (BMPs) applicable to activities occurring on your property as per King County Code 9.12 and King County's Stormwater Pollution Prevention Manual (kingcounty.gov/pollution-prevention).

If these maintenance items are not addressed and/or the BMPs not maintained on your property, you will be in violation of King County Code 9.04 and 9.12, and subject to enforcement action which may include penalties and other costs.

Thank you for protecting our lakes, rivers, and streams by maintaining your drainage system. If you have any questions, please call Drainage Investigator Conor Framke at (206) 477-4299.

Sincerely,

Wes Chin, Managing Engineer
Stormwater Services Section

Maintenance Corrections List
Facility Number D98545

Please make the following corrections, sign the form, and return it either by email at stormwater@kingcounty.gov, or by mail/fax as noted on the letterhead with attention to Andrew McDonald.

Each line of the following table requires action. To better interpret this Maintenance Correction List, please refer to the enclosed sketch of your facility.

Asset ID	Additional comments on the asset	Findings	Completed
D98545	**Signage placed at facility D98545 directs readers to contact King County and infers that King County is responsible for the maintenance of the facility. The signage placement requirement is intended solely for facilities that are maintained by King County. It is not placed on facilities maintained by other entities private or public. Please remove the signage from the facility.**	Miscellaneous maintenance is needed. Please contact inspector with any questions.	
SNS-31061	**The joint around the outlet pipe in this catch basin needs grout work. Access to this catch basin is limited. Use non-shrink grout to repair the joint.**	• The catch basin has cracks at the joint of an inlet/outlet pipe. Grout all holes and cracks around the pipe joint.	
SNS-31062	**The locking bolts are stuck and cannot be removed. Loosen the bolts so that the lid can be removed.**	• The catch basin lid cannot be opened. Repair the lid so that it can be opened and closed by one maintenance person.	
SNS-31063	**The recent gravel added to the access road has covered this catch basin. Find the lid and remove surface material so it can be accessed.**	• The catch basin has been buried or paved over. Locate and expose the catch basin so that it can be accessed and inspected.	
SNS-31065	Marked For Vactor Next to Shop	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	

Need to make Alert

I, the undersigned, do hereby certify under penalty of perjury, that the materials have been furnished, the services rendered, and/or the labor performed as described in the Maintenance Correction List.

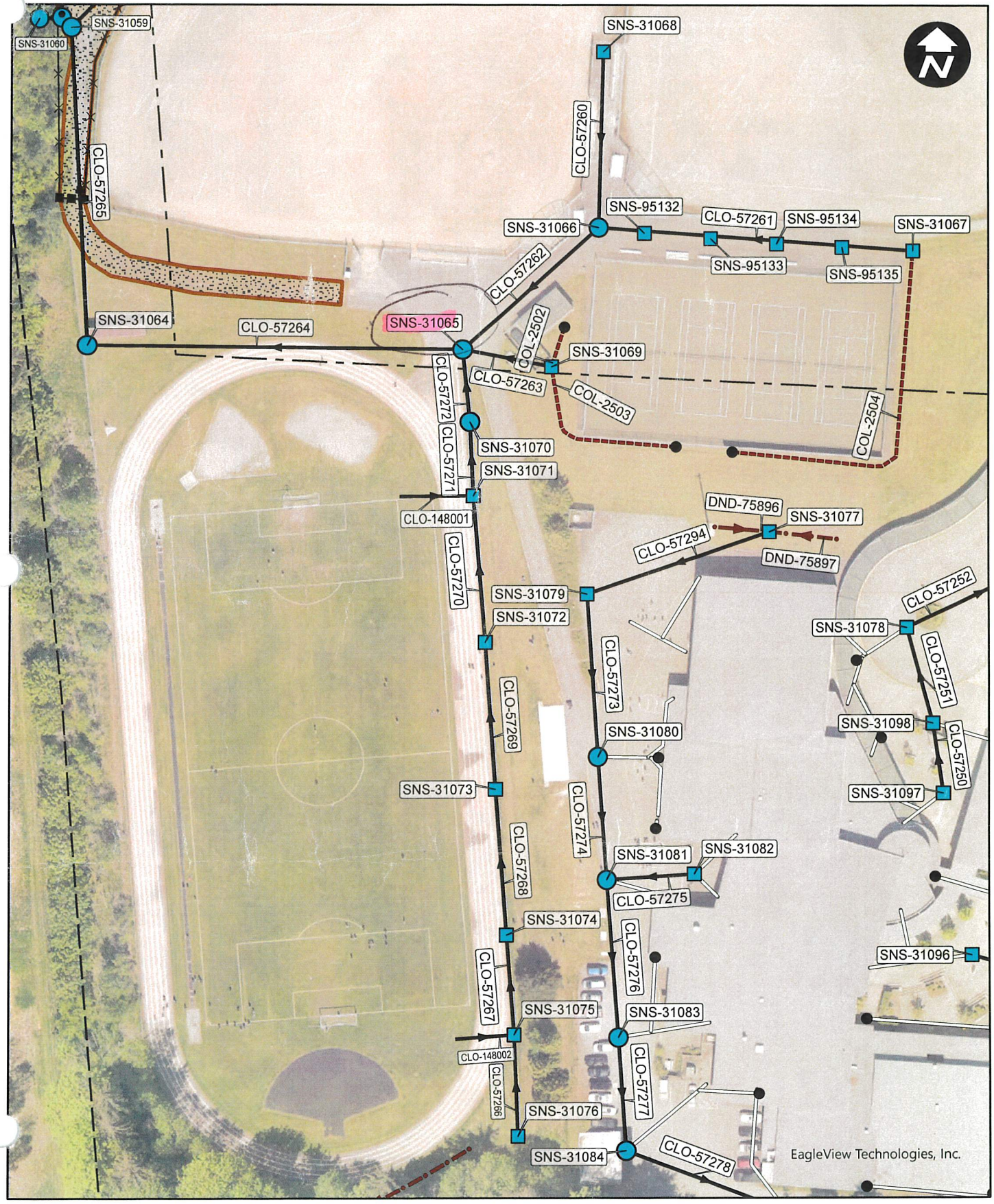
Signature (Owner / Managing Agent)	Service Contractor Name
Printed Name	Representative's Signature
11/21/22 Date	11/21/22 Date

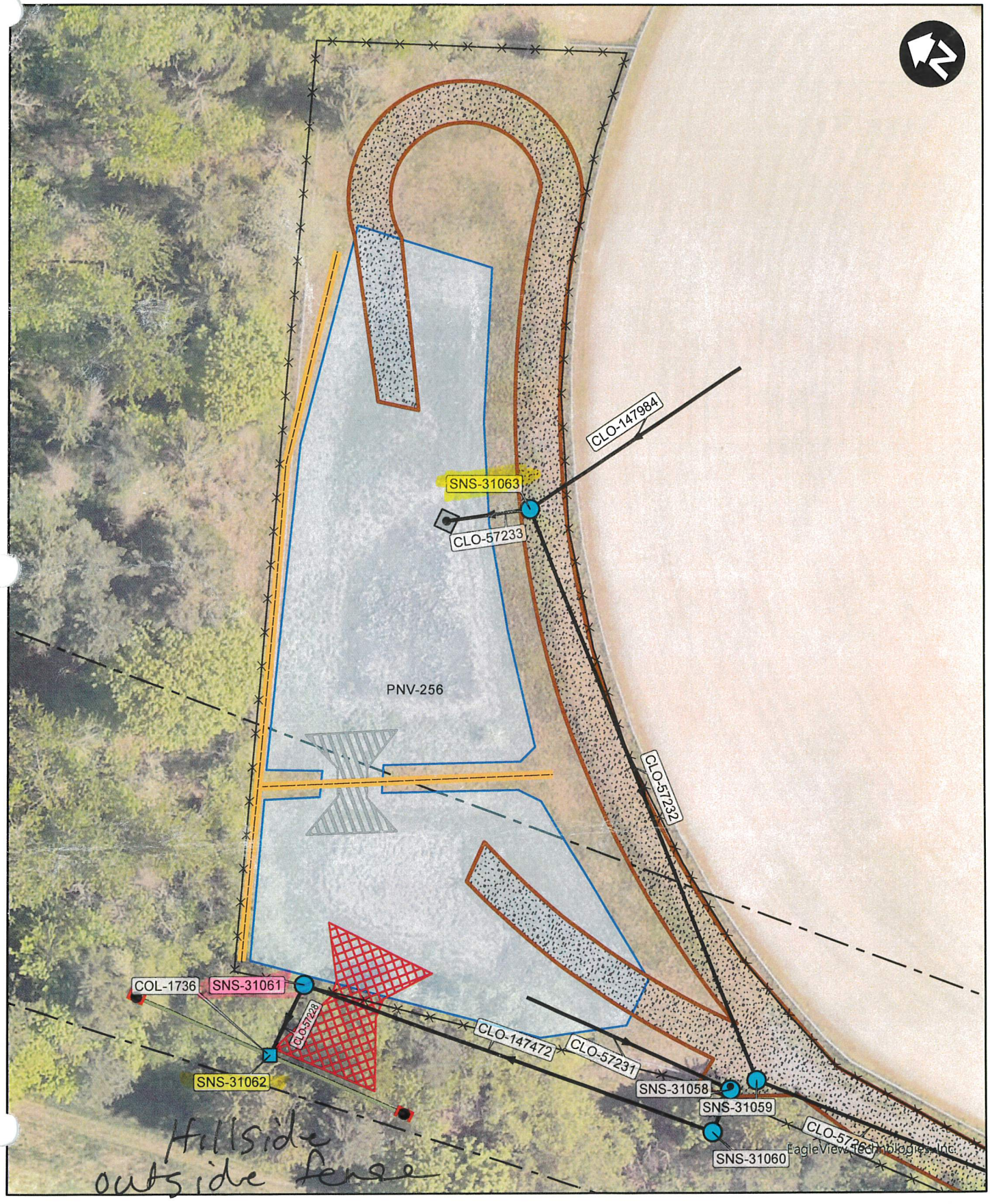
Please note any changes in ownership/managing agent or comments in the space provided below:

D98545 - 11575 (MCL_Commercial_MF) mail: Yes email: Yes

King County
Department of Natural Resources
Water Land Resources Division

Facility ID : **D98545** DATE : 9/27/2020
Facility Name : Timbercrest Junior High School - West Pond
Location : 19115 215th Wy NE
Type : Pond, Trench




CLO-147984
SNS-31063
CLO-57233
PNV-256
CLO-57232
COL-1736
SNS-31061
CLO-57228
CLO-147472
CLO-57231
SNS-31058
SNS-31059
SNS-31062
SNS-31060
Hillside
outside fence
EagleView Technologies, Inc.

Water and Land Resources Division Stormwater Services
Department of Natural Resources and Parks
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855
206-477-4811 **Fax** 206-296-0192 TTY Relay: 711
stormwater@kingcounty.gov Other formats and languages available

July 23, 2021

Northshore School District
Rob Smith
3330 Monte Villa Pkwy
Bothell WA 98021

RE: Timbercrest Junior High School - SE Pond - 19115 215th Wy NE - D98546

Dear Property Owner:

To prevent flooding and protect water quality, King County inspects storm drainage facilities in privately maintained developments. Inspections help us spot and alert property owners to drainage system problems before they escalate.

A King County drainage investigator visited your drainage system on June 24, 2021 and identified items needing maintenance. King County Code Chapter 9.04.120 requires property owners to maintain the drainage facilities on their properties to King County Standards. Enclosed is the work list of those maintenance items and a sketch of your facility.

In order to be eligible for a discount on your Surface Water Management fee next year, you must:

1. **Complete the work on the enclosed Maintenance Correction List, sign, and return within 60 days from the date of this letter**. If needed, please call (206) 477-4811 or email stormwater@kingcounty.gov to request an extension. Extensions will *only* be granted past December 31 for extenuating circumstances; and
2. Implement and maintain pollution prevention best management practices (BMPs) applicable to activities occurring on your property as per King County Code 9.12 and King County's Stormwater Pollution Prevention Manual (kingcounty.gov/pollution-prevention).

If these maintenance items are not addressed and/or the BMPs not maintained on your property, you will be in violation of King County Code 9.04 and 9.12, and subject to enforcement action which may include penalties and other costs.

Thank you for protecting our lakes, rivers, and streams by maintaining your drainage system. If you have any questions, please call Drainage Investigator Conor Framke at (206) 477-4299.

Sincerely,

Wes Chin, Managing Engineer
Stormwater Services Section

Maintenance Corrections List
Facility Number D98546

Please make the following corrections, sign the form, and return it either by email at stormwater@kingcounty.gov, or by mail/fax as noted on the letterhead with attention to Andrew McDonald.

Each line of the following table requires action. To better interpret this Maintenance Correction List, please refer to the enclosed sketch of your facility.

Asset ID	Additional comments on the asset	Findings	Completed
SNS-31078	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
SNS-31080	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
SNS-31082	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
SNS-31105	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
SNS-31106	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
	One of the locking bolts has been damaged and cannot be removed. Fix or replace the bolt so that it can loosened and the lid can be removed.	• The catch basin's locking bolts are damaged. Replace the locking bolts so that the catch basin can be locked and is secure.	
SNS-31107	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	
SWL-216	**The first 50' of the bioswale has thick growth of basic bioswale vegetation. Cut and remove clippings from the site. For future vegetation removal be sure not to leave clippings in the treatment or flow control areas, such as ponds and bioswales, as this can clog up the system and effect flows.**	• Grass or groundcover exceeds standards. Mow vegetation or eradicate nuisance vegetation so that flow is not impeded. Mow grass to a height of between 4 and 9 inches. If grass has died, replant/re-establish grass. Do not use sod to re-establish grass.	

I, the undersigned, do hereby certify under penalty of perjury, that the materials have been furnished, the services rendered, and/or the labor performed as described in the Maintenance Correction List.

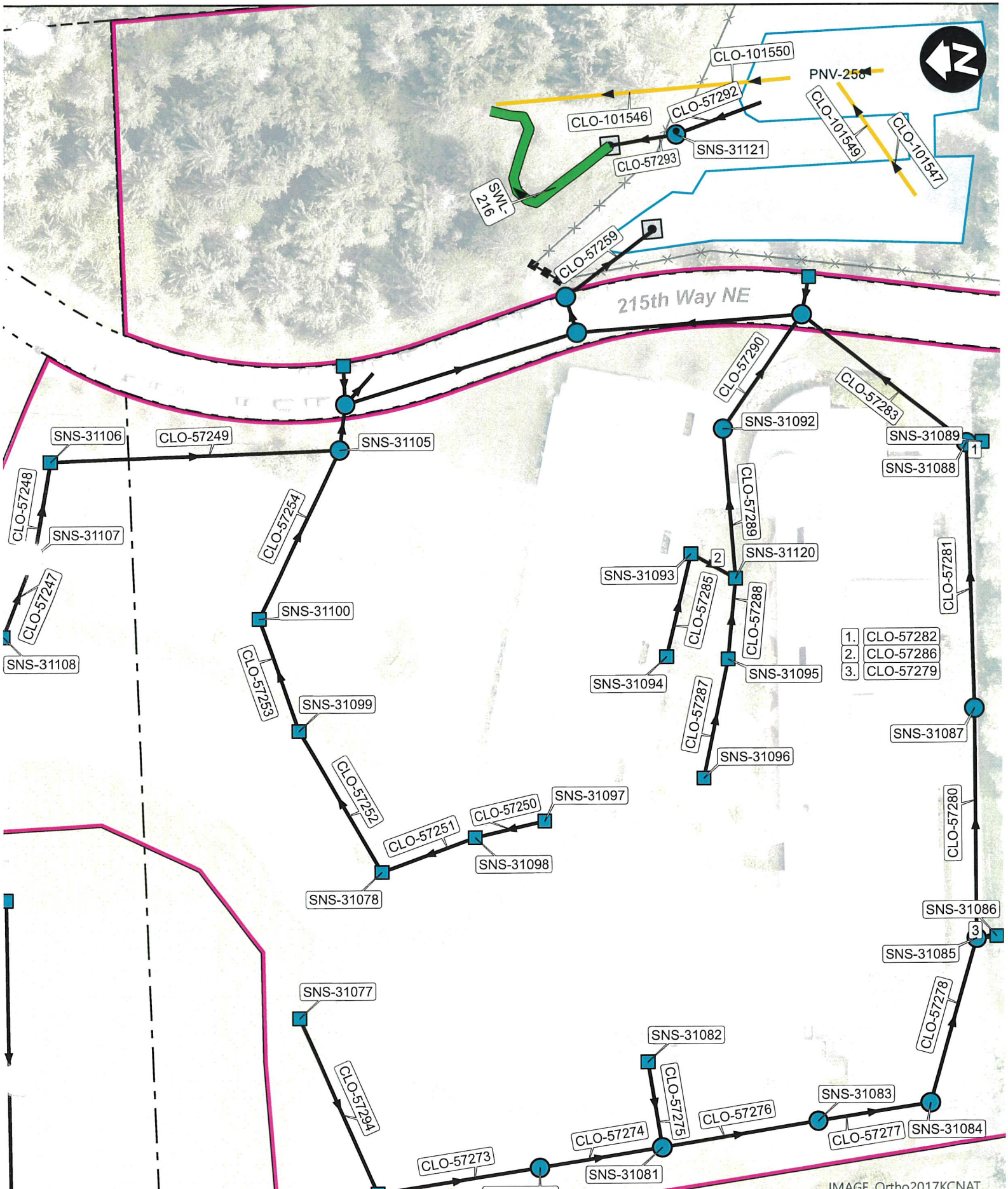
Signature (Owner / Managing Agent)	Service Contractor Name
Printed Name	Representative's Signature
10-1-21 Date	10-1-21 Date

Please note any changes in ownership/managing agent or comments in the space provided below:

D98546 - 8074 (MCL_Commercial_MF) mail: Yes email: Yes

King County
Department of Natural Resources
Water Land Resources Division

Facility ID : **D98546** DATE : 4/23/2020
Facility Name : Timbercrest Junior High School - SE Pond
Location : 19115 215th Wy NE
Type : Pond, Trench



King County

Water and Land Resources Division Stormwater Services
Department of Natural Resources and Parks
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855
206-477-4811 **Fax** 206-296-0192 TTY Relay: 711
stormwater@kingcounty.gov Other formats and languages available

July 23, 2021

Northshore School District
Rob Smith
3330 Monte Villa Pkwy
Bothell WA 98021

RE: Timbercrest Junior High School-NE Pond - 19115 215th Wy NE - D98547

Dear Property Owner:

To prevent flooding and protect water quality, King County inspects storm drainage facilities in privately maintained developments. Inspections help us spot and alert property owners to drainage system problems before they escalate.

A King County drainage investigator visited your drainage system on June 24, 2021 and identified items needing maintenance. King County Code Chapter 9.04.120 requires property owners to maintain the drainage facilities on their properties to King County Standards. Enclosed is the work list of those maintenance items and a sketch of your facility.

In order to be eligible for a discount on your Surface Water Management fee next year, you must:

1. **Complete the work on the enclosed Maintenance Correction List, sign, and return within 60 days from the date of this letter**. If needed, please call (206) 477-4811 or email stormwater@kingcounty.gov to request an extension. Extensions will *only* be granted past December 31 for extenuating circumstances; and
2. Implement and maintain pollution prevention best management practices (BMPs) applicable to activities occurring on your property as per King County Code 9.12 and King County's Stormwater Pollution Prevention Manual (kingcounty.gov/pollution-prevention).

If these maintenance items are not addressed and/or the BMPs not maintained on your property, you will be in violation of King County Code 9.04 and 9.12, and subject to enforcement action which may include penalties and other costs.

Thank you for protecting our lakes, rivers, and streams by maintaining your drainage system. If you have any questions, please call Drainage Investigator Conor Framke at (206) 477-4299.

Sincerely,

Wes Chin, Managing Engineer
Stormwater Services Section

Maintenance Corrections List
Facility Number D98547

Please make the following corrections, sign the form, and return it either by email at stormwater@kingcounty.gov, or by mail/fax as noted on the letterhead with attention to Andrew McDonald.

Each line of the following table requires action. To better interpret this Maintenance Correction List, please refer to the enclosed sketch of your facility.

Asset ID	**Additional comments on the asset**	Findings	Completed
CLO-57246	**The inlet of this pipe collects water from a ditch line on the backside of the ball fields. Vegetation including blackberry has grown in thick around the pipe inlet. Clear the vegetation in an area several feet around so the pipe end is clear.**	• There is vegetation that reduces the flow of water through the pipe. Remove the vegetation from the pipe.	RB
SNS-31109	**The catch basin needs to be cleaned. Remove sediment and dispose of it properly.**	• The catch basin has accumulated sediment in excess of standards. Remove all sediment from the catch basin.	RB
SWL-215	**Keep bioswale bottom and sides clear of vegetation. When cutting vegetation be sure to remove all clippings from the site. During future cuttings be sure to keep all clippings out of the bioswale to reduce clogging and promote flow.**	• Grass or groundcover exceeds standards. Mow vegetation or eradicate nuisance vegetation so that flow is not impeded. Mow grass to a height of between 4 and 9 inches. If grass has died, replant/re-establish grass. Do not use sod to re-establish grass.	RB

I, the undersigned, do hereby certify under penalty of perjury, that the materials have been furnished, the services rendered, and/or the labor performed as described in the Maintenance Correction List.

Signature (Owner / Managing Agent)	Service Contractor Name
Mark Leland	
Printed Name	Representative's Signature
10-1-21	10-1-2021
Date	Date

Please note any changes in ownership/managing agent or comments in the space provided below:

D98547 - 8073 (MCL_Commercial_MF) mail: Yes email: Yes

King County
Department of Natural Resources
Water Land Resources Division

Facility ID : **D98547** DATE : 4/23/2020
Facility Name : Timbercrest Junior High School-NE Pond
Location : 19115 215th Wy NE
Type : Pond, Trench

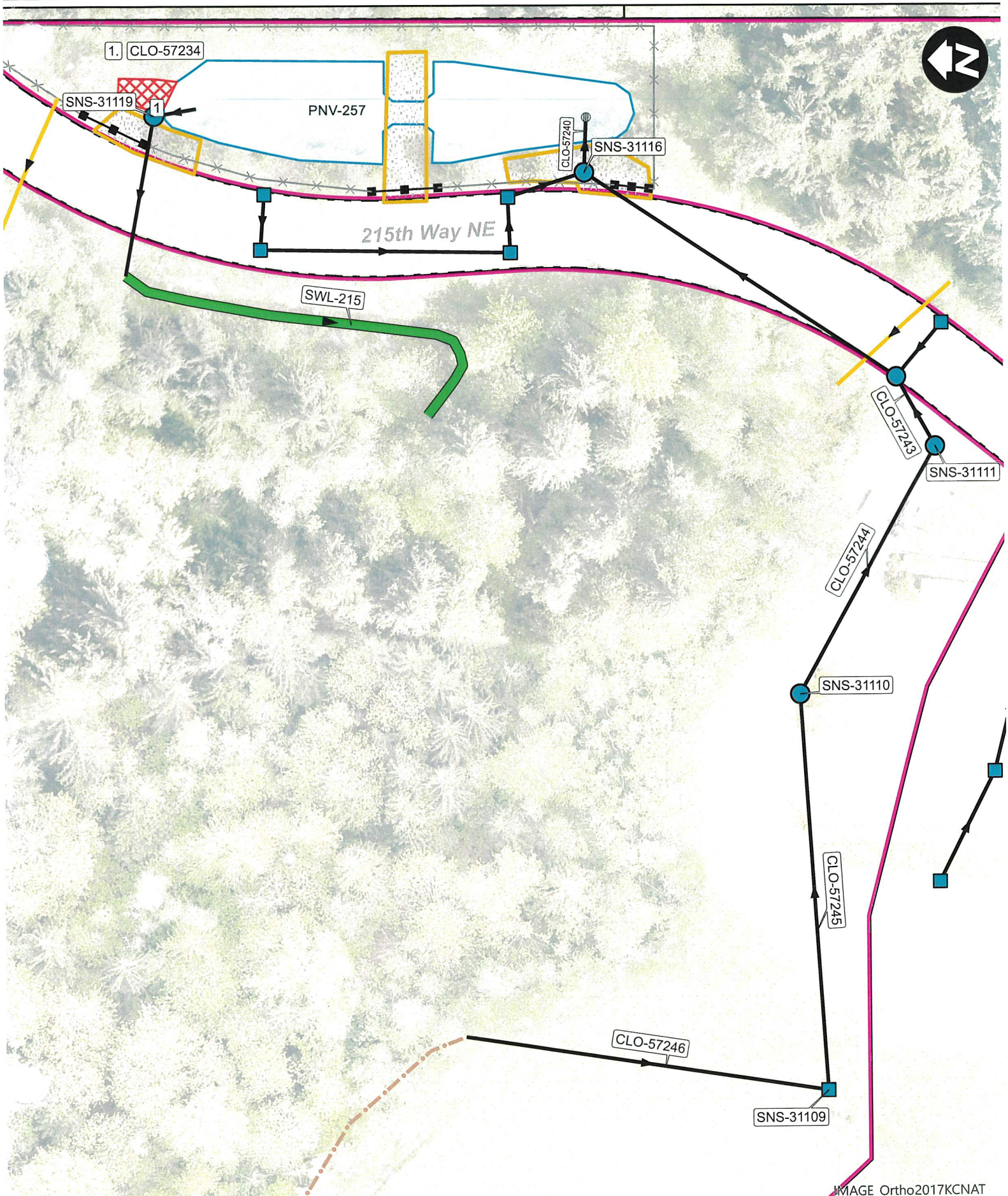


Figure 3-6: KING COUNTY WATER AND LAND RESOURCES DIVISION DRAINAGE INVESTIGATION REPORT

KING COUNTY WATER AND LAND RESOURCES DIVISION

DRAINAGE INVESTIGATION REPORT

INVESTIGATION REQUEST

N

PROBLEM: WATER RISING IN POND Type FCC

RECEIVED BY: wkp Date: 3/09/11 11:32 OK'd by: _____ File No 2011-0199

Received from:

NAME: CHRIS WANDELL PHONE: 425.408.6903 Other: _____

Address: Timbercrest Junior High School City WOODINVILE State Zip 98077

Location of problem, if different: **19115 215th Way NE**

Access Permission Granted ☐ **Call First** (Would Like To Be Called and/or Present) ☐

REMARKS:

WATER HAS BEEN RISING IN POND FOR THE LAST WEEK AND IS NOT DRAINING. CHRIS SAYS SHE HAS BEEN WORKING AT THE SCHOOL FOR SOME YEARS NOW AND HAS NOT SEEN IT GET THIS HIGH BEFORE. SHE THINKS SOMETHING IS BLOCKING.

D98546 Timbercrest Junior High School - SE Pond

Plat name: _____ Lot No: _____ Block No: _____

Other agencies involved: _____ No field investigation required ☐

TO BE COMPLETED BY COMPLAINT PROGRAM STAFF

¼ SW S 4 T 26 R 6 Parcel # 0426069023 Kroll: 902W TBros: 478A5

MD 1 2 3 4 Basin BBR Council Dist 3 Charge #: _____

RESPONSE:

Citizen notified on 3/9/11 ☑ phone ☐ letter ☐ in person ☐ email

NORTHSHORE SCHOOL DISTRICT IS RESPONSIBLE FOR MAINTAINING THEIR STORM SYSTEMS. PROVIDED CONTACT INFO (BRAD TAYLOR AND STEVE BLOOMBERG).

DISPOSITION:

Turned to: _____ on _____ by _____ OR: No further action recommended because: _____

☑ Lead agency has been notified: NORTHSHORE SCHOOL DISTRICT

☐ Problem has been corrected. ☐ No problem has been identified. ☐ Prior investigation addresses problem: SEE FILE # _____

☐ Private problem - NDAP will not consider because:

- ☐ Water originates onsite and/or on neighboring parcel.
- ☐ Location is outside WLRD Service Area.
- ☐ Other (Specify):

DATE CLOSED: 3/15/11 By: TL

NORTHSHORE SD

King County Water and Land Resources Division - Drainage Services Section

Complaint Search

Printed : 03/09/2011 11:59:23 AM

Complaint Number	Type Code	Type of Problem	Address of Problem				Comments	Tbros Page
1981-0280	C		19510		PARADISE LK RD		BRIDGE ACROSS PARADISE LK	477J5
1992-0343	C	DRAINAGE	19531	SE	24TH WAY		YARD PONDING	478A5
1992-0343	SR	DRAINAGE	19531	SE	24TH WAY		YARD PONDING TO FM	478A5
1992-0344	C	DRAINAGE	19301		218TH PL	NE	BACKYARD DRAINAGE	478A5
1992-0344	SR	DRAINAGE	19301		218TH PL	NE	BACKYARD DRAINAGE NOT NDAP>75%R	478A5
1995-0774	C	DISCHARG	18808		215TH WAY	NE	INSTALLATION OF SUMP PUMP	478A5
1996-2101	FCR	R/D	18616		215TH WY	NE	UPSTREAM CB OVERFLOW BEFORE SPIL	478A5
1997-0534	C	DRAINAGE	OPPOS		19727 216TH AVE	NE	OFFSITE FLOW IMPACTING ROADWAY	477J5
1999-0282	FCR	WEEDS	19313		218TH PL	NE	TANSY IN POND W14133	478A5
1999-0283	FCR	WEEDS	21600	NE	194TH ST		TANSY IN POND W14132	478A5
1999-0447	C	OXIDE	22235	NE	195TH PL		IRON OXIDE BACTERIA ORANGE WATER	478A5
2000-0266	C	TA	19504		222ND AVE	NE		478A5
2001-0042	R	BSR	21600	NE	194TH ST			478A5
2001-0043	R	BSR	22240	NE	187TH ST			478A5
2001-0044	R	BSR	22225	NE	189TH CT			478A5
2001-0046	R	BSR	19422		222ND AVE	NE		478A5
2001-0081	FCR	MNM	22232	NE	192ND ST		Closed to 200-0045	478A5
2001-0227	C	DDM	19420		222ND AVE	NE	CONCERN ABOUT PONDING WATER ON	478A5
2002-0608	FCR	MNW	21600		NE 194TH ST		REPORT OF TANSY RAGWORT INFESTAT	478A5
2003-0478	FCR	MNW	21500		NE 194TH ST			478A5
2003-0479	FCR	MNW	22225		NE 189TH CT			478A5
2003-0682	C	DDM	18616		215TH WAY NE		WATER EXITING TOP OF CB IN ROADWA	478A5
2003-0682	RET	DDM	18616		215TH WAY NE		WATER EXITING TOP OF CB IN ROADWA	478A5
2004-0130	FCR	MNM	NE 194T &		218TH PL NE		HOA hiring contractor to remove trees downe	478A5
2007-0694	WQA	WQAI	19115		215TH WAY	NE	Audit conducted audit letter sent. Will deter	477J5
2008-0747	C	DDM	19503		222ND AVE	NE	Source of flooding in crawlspace?NLK dispat	478A5
2009-0080	RET	RET	19422		222ND AVE	NE	RETROFIT REVIEW FOR ASPENWOOD TR	478A5
2009-0089	RET	RET	22225	NE	189TH CT		RETROFIT LIST FOR ASPENWOOD TRAC	478A5
2009-0090	RET	RET	22232	NE	192ND ST		RETROFIT REVIEW FOR ASPENWOOD TR	478A5
2009-0277	RET	RET	21500	NE	194TH ST		RETROFIT REVIEW FOR ASPENWOOD TR	478A5
2009-0454	FI	REM	19115		215TH WAY	NE	2 parcels. 9023=38.1%. 9010=41.5%.	477J5

By December 03, 2010 please make the following corrections, sign the form, and return to WLR Stormwater Services Section (201 Jackson St., Suite 600, Seattle WA 98104-3855).

Any changes to the MCL must be approved by the Manager of WLR Stormwater Services Section, or his or her designee, and noted on this form.

(To better interpret this Maintenance Correction List, please refer to the enclosed diagram.)

Item	Completed
Hand Brushing - Vegetation is impeding flows in the biofiltration swale (bioswale). Remove nuisance vegetation from site.	
Hand Brushing - Ground cover vegetation should be trimmed to 4-5 inches in height within the pond area. Shrubs and bushes must be removed from inlets, outlets, and engineered structures. Remove all cuttings from site. Wet	
Tree Removal - Remove trees that either impede maintenance activity or appear to be dead, diseased, or damaged. Wet: Clear the saplings and trees from the tract. Also, clear the fallen tree and limbs leaning on the southerly portion of the east fence line.	
Repair Access Road - Restore or rebuild the access road as required on the approved plans. The large quarry spalls covering the access road are a hazard. At a minimum provide a pathway of crushed gravel over the large rock from the entrance to CS/CB-SE, both gate valve stems and the small access gate.	
Repair/Replace Pipe - Locate and expose the following pipe end(s). Cell 2 North Maint. Drain w/Gate Valve: Clear a path to the outlet pipe end and flag its location.	
Repair Signage - Clean the sign.	
Facility Mowing/Litter Control - Grass is impeding flows in the biofiltration swale (bioswale). Mow grass to a height of 3-4 inches. Remove clippings from site.	
Facility Mowing/Litter Control - Access to your facility is retricted due to excessive vegetation. Cut vegetation from access road and remove from site. Clear the infestation of blackberrie and other brush from the road.	
Miscellaneous Maintenance - Locate and expose the gate valve access cap. Cell 2 North Maint. Drain w/Gate Valve	
Miscellaneous Maintenance - Our records indicate that some or all of these work tasks have been identified in a previous MCL. If these defects are not addressed, enforcement action may be initiated. Refer Note: KC Code Chapter 9.04.120	

King County Code Chapter 9.04.120 requires property owners to maintain stormwater drainage facilities on their property to King County standards.

COPY

ALL ITEMS COMPLETED AND CLOSED

D98546 - POND NOT DRAINING - 19115 215th Wy NE



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 3/9/2011 Source: King County iMAP - Stormwater (http://www.metrokc.gov/GIS/iMAP)

King County

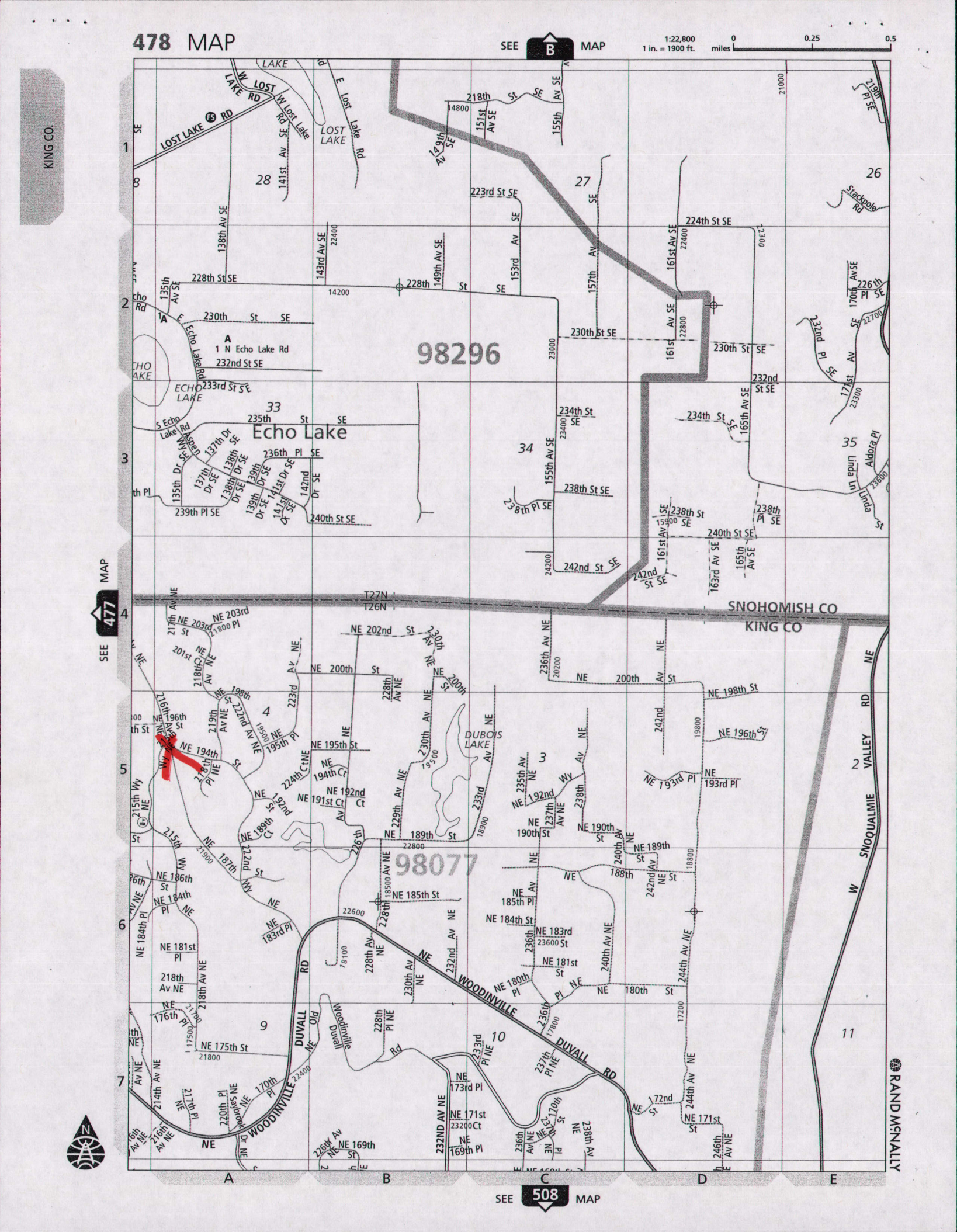
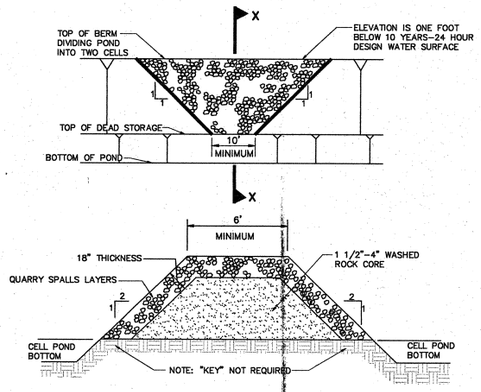

478 MAP
SEE B MAP
1:22,800
1 in. = 1900 ft.
0 0.25 0.5
miles
KING CO.
LOST LAKE RD
W LOST LAKE RD
E Lost Lake Rd
LOST LAKE
W Lost Lake Rd
141st Av SE
138th Av SE
143rd Av SE
149th Av SE
151st Av SE
155th
218th St SE
223rd St SE
224th St SE
228th St SE
230th St SE
232nd St SE
233rd St SE
235th St SE
238th St SE
240th St SE
242nd St SE
234th St SE
153rd Av SE
157th Av SE
161st Av SE
165th Av SE
163rd Av SE
170th Av SE
Stackpole Rd
232nd Pl SE
177th Av SE
Aldora Pl
Linda Ln
Aldora St
Echo Lake Rd
S Echo Lake Rd
N Echo Lake Rd
Aspen Wy
135th Dr SE
137th Dr SE
138th Dr SE
139th Dr SE
141st Dr SE
142nd Dr SE
236th Pl SE
239th Pl SE
238th Pl SE
ECHO LAKE
Echo Lake
98296
98077
DUBOIS LAKE
SNOHOMISH CO
KING CO
T27N
T26N
SEE 477 MAP
NE 203rd St
NE 202nd St
NE 200th St
NE 198th St
NE 196th St
NE 195th St
NE 194th St
NE 193rd Pl
NE 192nd St
NE 191st Ct
NE 190th St
NE 189th St
NE 188th St
NE 187th St
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NE 175th St
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NE 171st St
NE 169th Pl
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223rd Av NE
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229th Av NE
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233rd Av NE
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240th Av NE
242nd Av NE
244th Av NE
246th Av NE
214th Av NE
216th Av NE
217th Av NE
215th Wy NE
218th Pl NE
228th Pl NE
232ND AV NE
237th Pl NE
236th Pl NE
238th Pl NE
WOODINVILLE DUVALL RD NE
Woodinville Duvall Rd NE
Old
DUVALL RD
W SNOQUALMIE VALLEY RD NE
SEE 508 MAP
RAND McNALLY
A
B
C
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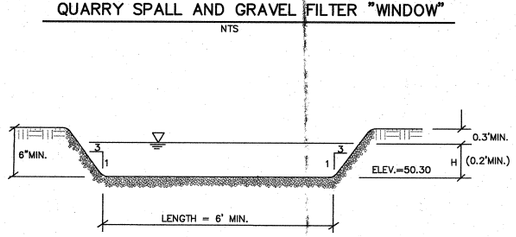
Figure 3-7: Timbercrest Existing Pond Permit Design Documents

SW 1/4 SEC.4 TWP.26 RNG.4E W.M.



QUARRY SPALL AND GRAVEL FILTER "WINDOW"

NTS



WEIR SECTION FOR EMERGENCY OVERFLOW SPILLWAY

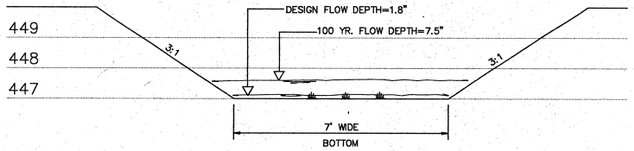
NTS

WETPOND SEED MIX

WETLAND APPLICATION	PROPORTIONS BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
CREEPING RED FESCUE (PENNLAWN)	40%	98%	90%
BIRDSFOOT TREFOIL (LOTUS CORNICULATUS)	30%	90%	80%
RED TOP (AGROSTIS ALBA)	30%	92%	80%

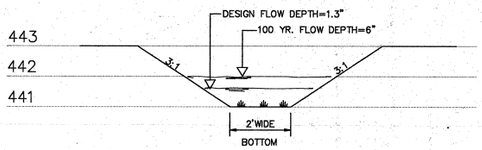
BIOSWALE SEED MIX

RURAL APPLICATION	PROPORTIONS BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
KENTUCKY BLUEGRASS (POA PRATENSIS, BIRKA, MAJESTIC OR SYDSPORT)	15%	85%	80%
TALL FESCUE (FESTUCA ARUNDINCEA, ARID, JAGUAR OR REBEL)	40%	95%	90%
PERENNIAL RYE (LOLIUM PERENNE, DERBY OR PENNANT)	30%	95%	90%
CHEWINGS FESCUE (BANNER)	15%	95%	90%



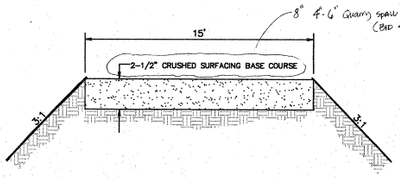
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S.E. BASIN BIOFILTRATION SWALE

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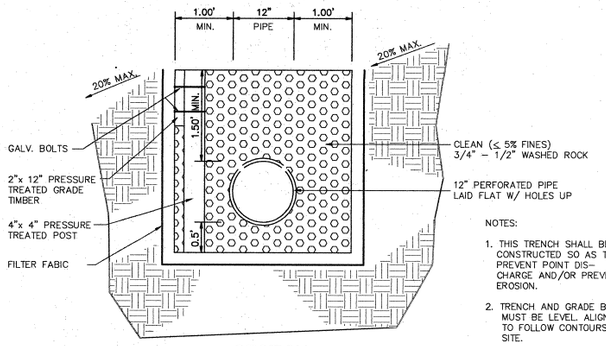
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N.E. BASIN BIOFILTRATION SWALE

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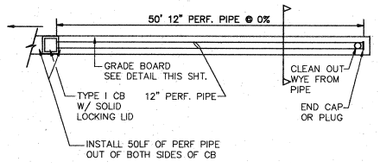


MAINTENANCE ACCESS ROAD
SECTION INTO BOTTOM OF POND

NOT TO SCALE (SEE SHEET C4.1 THRU C4.3 FOR LOCATION)

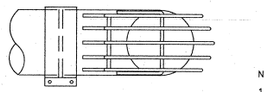


SECTION



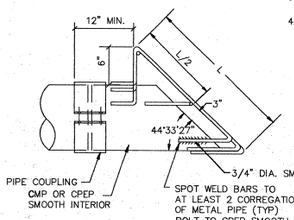
PLAN

FLOW DISPERSAL TRENCH

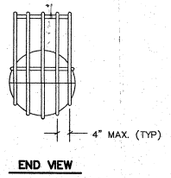


PLAN

NOTE:
1. 36" DIA. AND SMALLER. SEE FIGURE 4.3.4H FOR DEBRIS BARRIERS ON PIPES PROJECTING FROM DRIVEWAY OF ROADWAY SIDESLOPES.
2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER).
3. CPEP-SMOOTH INTERIOR PIPE REQUIRES BOLTS TO SECURE DEBRIS BARRIER TO PIPE.
4. FOR FLAT PIPES, DELETE BEVEL ANGLES.



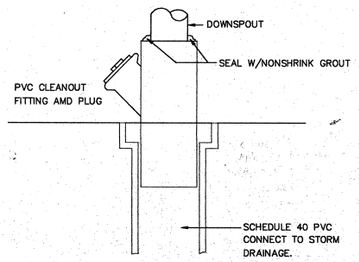
SIDE VIEW



END VIEW

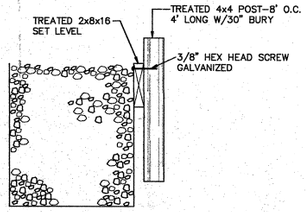
DEBRIS BARRIER DETAIL

NTS



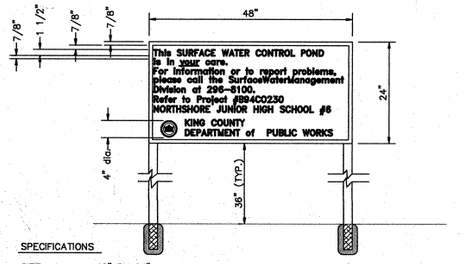
ROOF DRAIN CONNECTION DETAIL

NOT TO SCALE



GRADE BOARD DETAIL

NOT TO SCALE



SPECIFICATIONS

SIZE: 48" BY 24"
MATERIAL: GRADE "B" OR BETTER EXTERIOR PLYWOOD.
PAINT: FACE - 3 COATS OUTDOOR ENAMEL (SPRAYED).
BACK - 1 COAT OUTDOOR ENAMEL (SPRAYED).
LETTERING: SILK SCREEN ENAMEL WHERE POSSIBLE, OR HAND-PAINTED ENAMELS.
COLORS: BLACK AND WHITE. WHITE BACKGROUND, LETTERING AND BORDER IN BLACK.
TYPE FACE: HELVETICA. 1-1/2" TALL WITH 7/8" SPACING BETWEEN LETTERS AND OUTER BORDER. OUTER BORDER 1/4" WIDTH.
INSTALLATION: SECURED TO CHAIN LINK FENCE IF AVAILABLE, OTHERWISE INSTAL ON TWO 8 FOOT LONG 4" X 4" POSTS, PRESSURE TREATED, INSTALLED IN 3 FOOT DEEP CONCRETE FILLED POST HOLES (8" MIN. DIA.).

PERMANENT SURFACE WATER CONTROL POND SIGN

NO SCALE

PERMIT SET

BUSH, RODED & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2009 MINOR AVE. EAST SEATTLE, WA 98102 (206) 323-4144

NO	DATE	REVISION
4	3/8/96	REVISED PER K.C. COMMENTS
3	2/15/96	REVISED FOR BID SET
2	11/20/95	PER K.C./DISTRICT/CLIENT REVIEW
1	12/20/94	SUBMITTAL SET

STORM DRAINAGE DETAILS
Junior High School #6
Northshore School District #417
KING COUNTY WASHINGTON

drawn by	checked by
CJR	HEH
scale	date
N/A	12/20/94
job no.	
93201.12	
sheet C3.4 of	

NORTHSHORE SCHOOL DISTRICT #417
NORTHSHORE JUNIOR HIGH SCHOOL # 6
.BOTHELL, WASHINGTON

Northwest Architectural Company PS
303 BATTERY STREET SEATTLE, WA 98121 (206) 882-2441
WEST 1203 RIVERSIDE SPOKANE, WA 99201 (509) 838-8240

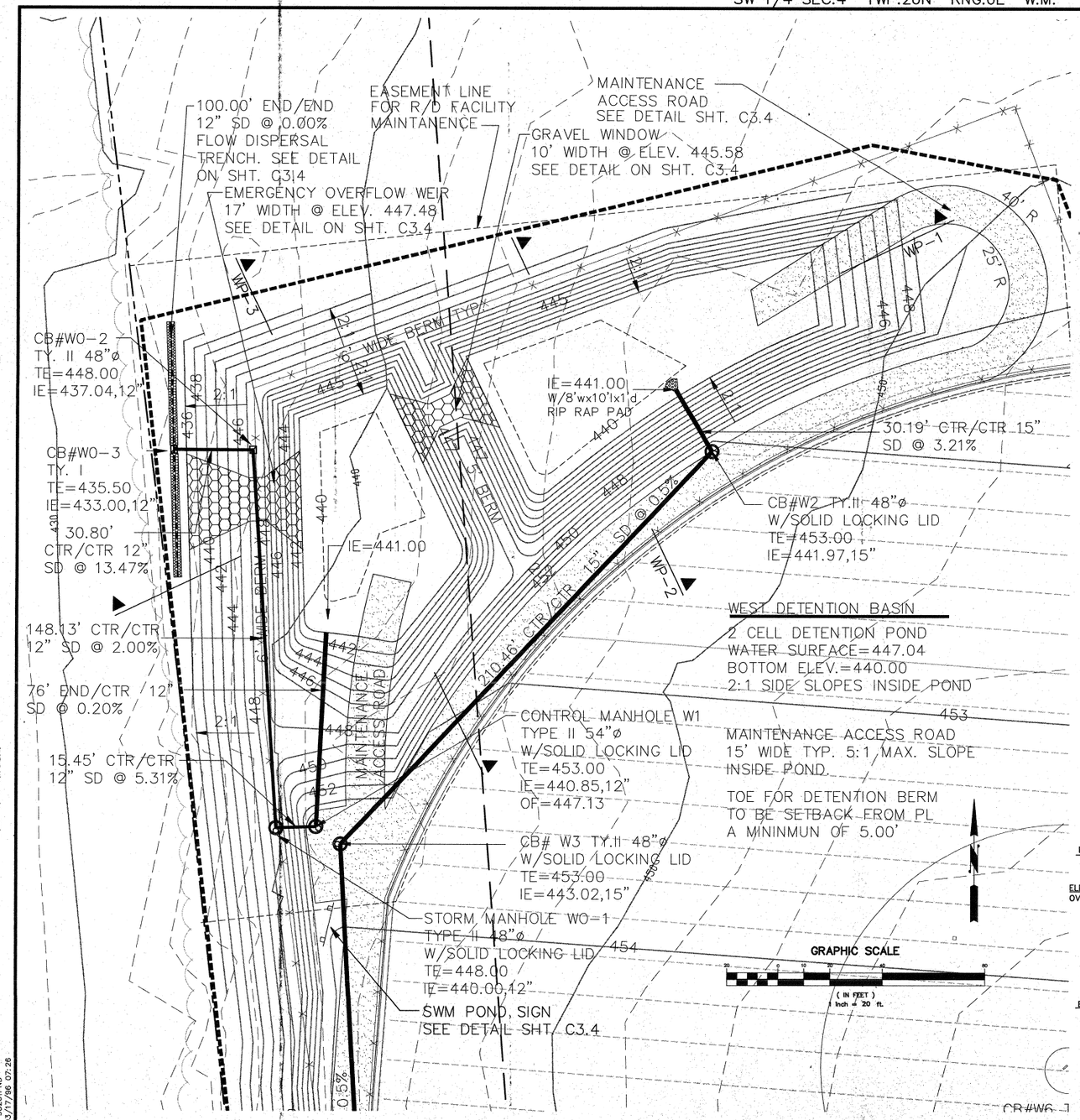
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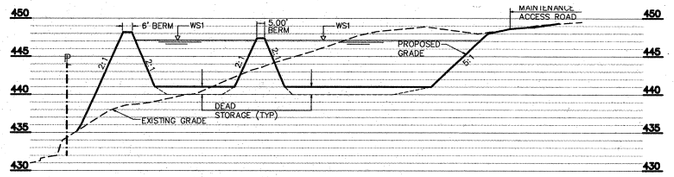
C3.4

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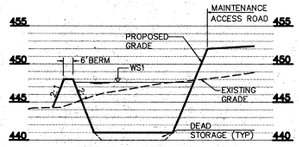
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SW 1/4 SEC.4 TWP.26N RNG.6E W.M.

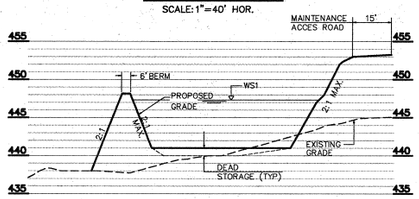




SECTION WP-1
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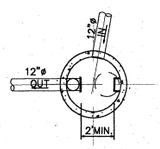


SECTION WP-2
SCALE:1"=40' HOR.

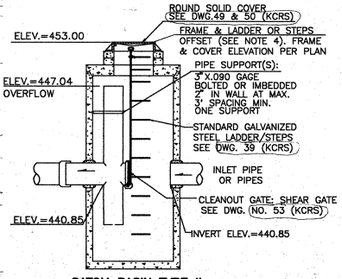


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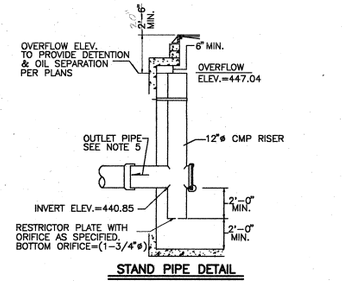
▽WS1- WATER SURFACE ELEVATION= 447.13
BOTTOM OF DETENTION STORAGE=441.00
BOTTOM OF POND=440.00



PLAN VIEW
SCALE:1"=5'



CATCH BASIN TYPE II
54"ø



STAND PIPE DETAIL

NOTES:

1. PIPE SIZES AND SLOPES: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. METAL PARTS: CORROSION RESISTANT. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
4. FRAME & LADDER OR STEPS OFFSET SO
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OULET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4".
6. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE.

WEST CONTROL MANHOLE DETAIL
NO SCALE

PERMIT SET

BUSH, RODE & HITCHINGS, INC.
CIVIL ENGINEERS & LAND SURVEYORS
2009 MINOR AVE. EAST SEATTLE, WA 98102 (206) 323-4144

NO	DATE	REVISION
4	3/8/96	REVISED PER K.C. COMMENTS
3	2/16/96	REVISED PER K.C. COMMENTS
2	11/20/95	PER K.C./DISTRICT/CLIENT REVIEW
1	12/20/94	SUBMITTAL SET

WEST DETENTION POND
Junior High School #6
Northshore School District #417
KING COUNTY WASHINGTON

drawn by	checked by
PG	HEH
scale 1"=20'	date 12/20/94
job no. 93201.12	
sheet C4.1 of	

NORTHSHORE SCHOOL DISTRICT #417
NORTHSHORE JUNIOR HIGH SCHOOL # 6
BOTHELL, WASHINGTON

Northwest Architectural Company inc
303 BATTERY STREET SEATTLE, WA 98121 (206) 682-2441
WEST 1203 RIVERSIDE SPOKANE, WA 99201 (509) 838-8240

JOB NO. 93201.12
DRAWN WPG
CHECKED HEH
DATE 2/15/96

C4.1

93201.12 C4.1 of
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Junior High School #6
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FIGURE 3-8: OFF-SITE ANALYSIS DRAINAGE SYSTEM TABLE
KING COUNTY SURFACE WATER DESIGN MANUAL, CORE REQUIREMENT #2

Basin:	West	Subbasin Name:	N/A	Subbasin Number:	N/A	Date	6/4/26

Symbol	Drainage Component Type, Name, and Size	Drainage Component Description	Slope	Distance from site discharge	Existing Problems	Potential Problems	Observations of field inspector, resource reviewer, or resident
see map	Type: sheet flow, swale, stream, channel, pipe, pond, flow control/wq BMP; Size: diameter, surface area	drainage basin, vegetation, cover, depth, type of sensitive area, volume	%	¼ mi = 1,320 ft.	constrictions, under capacity, ponding, overtopping, flooding, habitat or organism destruction, scouring, bank sloughing, sedimentation, incision, other erosion		tributary area, likelihood of problem, overflow pathways, potential impacts
Figure 3-2	Catch basins and conveyance pipes	Onsite conveyance system to existing pond, West Basin	0.5-6.5%	Farthest CB: 0.2 mi = 1170 ft	None	None	No issues. Tributary area is surrounding sloped areas near existing field.
Figure 3-2	Existing pond	Existing pond with 2 cells separated by berm	N/A	50 ft	None; one drainage report (resolved)	Sedimentation	No issues. Tributary area is West Basin conveyance system. The pond includes an overflow structure and spillway.
Figure 3-2	Level Spreader	Outlet from existing pond	N/A	0 ft	None; one drainage report (resolved)	Sedimentation, Clogging	No issues. Tributary area is existing pond outlet. This is the outlet for the system and it sends drainage to forested area West.
Figure 3-2	Forested Area	Drainage path downstream of level spreader	~5-20%	0.3 = 1575 ft	None	Erosion	No issues. Tributary area is existing level spreader outlet. This is a forested dispersion drainage path.
Figure 3-2	Bear Creek	Creek alignment downstream of site	~1%	0.7 = 3705 ft	None	Bank Sloughing	No issues. Tributary area is the surrounding areas along Bear Creek.

Section 4 – Flow Control and Water Quality Facility Analysis and Design

Section 4.1 – Flow Control

Section 4.1.1 – EXISTING SITE HYDROLOGY (PART A)

In the pre-developed condition, the parcel is developed with school buildings, pavement, 2 baseball fields, a track and field and landscaped areas. The existing site drains from east to west and south to north with a total elevation change of approximately 25 feet.

There is a pond and 5 wetlands located on the 2 parcels, 3 of the 5 wetlands are located to the southeast of parcel 0426069010, while the other 2 wetlands are located to the east of parcel 0426069023 and the pond is located between the two parcels to the north. Refer to King County iMap snapshot within **Figure 1-2** for the location of the existing pond and wetlands. Stormwater is collected and conveyed via roof leaders, catch basins, swales and storm pipes to the ponds.

Stormwater within the project limits drain to the pond located to the north of the site. The pond overflows to a dispersion trench with overland flows in the direction of Bear Creek, which flows south to Lake Sammamish before eventually going to the Puget Sound.

A Geotechnical Report was conducted by Geotest Services, dated September 27th, 2023 which identified that the site is underlain 1.5 feet of loose topsoil and sand overlying between 1 to 6.5 feet of loose to medium-dense, fill soils with medium dense to very dense Till soil below. Based on the underlying soils, infiltration is infeasible with an initial design infiltration rate of 0.03 inches per hour; since September 2023 the Geotechnical Engineer completed further testing which indicates infiltration is all together infeasible on the project site. The updated Geotechnical Report (addendum) has been included as **Appendix A** under separate cover.

Table 4.1 below shows the project site area breakdown in existing conditions. Refer to **Figure 4-1** for the Existing Conditions Map.

Table 4.1 – Existing Site Areas Summary

	Existing Site Areas	
	sf	ac
Non-PGIS (Sidewalk and Asphalt)	1866	0.04
Non-PGIS (Track)	37520	0.86
Total Non-PGIS	**39386**	**0.90**
PGIS (Field)	96048	2.20
Total Impervious	**135434**	**3.11**
Total Pervious	**33041**	**0.76**
Total	**168475**	**3.87**

Section 4.1.2 – POST DEVELOPMENT SITE HYDROLOGY (PART B)

The proposed development includes the renovation of the track and field from natural grass to synthetic turf, the addition of an ADA path, a bleacher pad and stairs, an access road, and related utility and stormwater infrastructure upgrades totaling 140,485 square feet of new and replaced impervious surface.

In the post-developed condition, runoff from the turf field will be conveyed through a closed conveyance system (underdrains, catch basins and pipes) to a bioretention facility for treatment. The rest of the proposed improvements will be conveyed through a closed conveyance system (trench drain, catch basins, and pipes) to the closest existing conveyance connection point downstream of the bioretention facility.

The existing field underdrain system has been studied and will be reused for the proposed field, pending a physical inspection of the existing system condition. If the existing underdrains require replacement, they will be replaced in kind and place. Stormwater generated by the project will be conveyed either to the bioretention facility or its existing downstream conveyance structure. This structure outlets to the existing flow control pond to the north, which is being expanded and renovated as part of this project.

Table 4.2 below shows the project site area breakdown in post-developed conditions. Refer to **Figure 4-2** for the Proposed Conditions Map.

Table 4.2 – Post-Developed Site Areas Summary

	Proposed Site Areas	
	sf	ac
New Non-PGIS (Sidewalk and Asphalt)	5421	0.12
New Non-PGIS (Track)	15280	0.35
Replaced Non-PGIS (Sidewalk and Asphalt)	291	0.01
Replaced Non-PGIS (Track)	31685	0.73
Total New and Replaced Non-PGIS	**52677**	**1.21**
New PGIS (Field)	4808	0.11
Replaced PGIS (Field)	83000	1.91
Total New and Replaced PGIS	**87808**	**2.02**
Total New and Replaced Impervious	**140485**	**3.23**
New Pervious	2559	0.06
Replaced Pervious	25431	0.58
Total New and Replaced Pervious	**27990**	**0.64**
Total	**168475**	**3.87**
Total Increase in Impervious Areas from Existing to Proposed Conditions	**5051**	**0.12**

Section 4.1.3 – PERFORMANCE STANDARDS (PART C)

The project is subject to a Full Drainage Review. It must address all nine Core Requirements, as well as all five Special Requirements. Large Rural Lot BMP requirements apply to this project because the proposed project is on a lot that is larger than 5 acres and outside the Urban Growth Area (UGA) as described in Section 1.2.9.2.3 of the KCSWDM. This project must demonstrate compliance with the LID Performance Standard using an approved continuous runoff model per Large Rural Lot BMP requirements in the KCSWDM.

As stated above, the project has obtained a variance to waive CR #9 (VARD25-0014) due to the site's hydrology and constraints. Please see the VARD25-0014 decision in **Appendix B** for the approval language, infeasibility criteria for LID compliance and each BMP option, as well as justification for the variance.

The conveyance system is designed with sufficient capacity to convey and contain the 25-year peak flow, assuming developed conditions for onsite tributary areas and existing conditions for any offsite tributary areas according to section 1.2.4.1 of the *KCSWDM*. This project uses the Uniform Flow Analysis method to analyze the capacity of the proposed pipe network. Conveyance calculations will be provided in the full TIR.

Section 4.1.4 – FLOW CONTROL SYSTEM (PART D)

The project proposes more than 5,000 square feet of new and replaced impervious surface, therefore flow control is required. The project site is located within a Conservation Flow Control Area, as identified on the Flow Control Applications Map, and is therefore required to implement flow control measures. This site does not drain entirely by non-erodible manmade conveyance to a major receiving water. Therefore, according to Table 1.2.3.A, this project must apply the Level 2 flow control standard (historic site conditions), which matches historic durations for 50% of 2-yr through 50-year peaks and matches historic 2- and 10-year peaks.

This project proposes to meet CR #3 Flow Control Facilities by expanding the existing flow control pond located to the north of the project site. This project will update the pond footprint as well as replace the existing flow control riser with an updated design. The new flow control pond, including the riser, will meet Level 2 flow control standards. These improvements will bring the entire basin tributary to the existing flow control pond up to current flow control standards.

As shown in **Tables 4.1** and **4.**2 and **Figures 4-1** and **4-2**, the proposed improvements result in an increase in impervious area of 0.12 acres. As shown in **Figure 3-1** and **Table 4.3** below, the existing drainage basin for the existing flow control pond (10.61 acres) includes 8.94 acres of impervious surfaces. The proposed drainage basin for the expanded existing flow control pond includes 9.06 acres of impervious surfaces and 1.55 acres of pervious surfaces.

Table 4.3 – Flow Control Site Areas Summary

	Total Ex Basin	Total Prop Basin
	ac	ac
Non-PGIS (Sidewalk and Asphalt)	2.62	2.62
Non-PGIS (Track)	0.74	0.86
Total Non-PGIS	3.36	3.48
PGIS (Field)	5.58	5.58
Total Impervious	8.94	9.06
Pervious	1.67	1.55
Total	10.61	10.61

The preliminary flow control calculations for the expanded existing flow control pond using the surface areas in **Table 4.3** are included as **Figure 4-3**.

Section 4.1.5 – WATER QUALITY SYSTEM (PART E)

As discussed above, the project proposes more than 5,000 square feet of pollution generation impervious surface and is required to provide Enhanced Basic water quality facilities to treat the proposed runoff.

The project meets CR #8 Water Quality Facilities through the use of a non-infiltrating bioretention cell as briefly discussed in Section 4.1.3. The bioretention cell will utilize a High Performance Bioretention Soil Mix as listed in Reference 11-C of the *KCSWDM* and be sized to meet treatment requirements per Section 1.2.8.1 of the *KCSWDM*. Bioretention cells with underdrains are allowed for enhanced basic water quality under Section 6.1.2, Option 4 of the *KCSWDM*. Please see the preliminary water quality calculations in **Figure 4-4**.

As stated above, the project has obtained a variance to waive the presettling portion of CR #8 (VARD25-0028) for stormwater generated by the turf field. Due to site and project constraints, the preapproved presettling options are infeasible to implement. However, the area requiring presettling (the turf field, as it is the only surface with an outlet to the bioretention facility) is isolated from runoff coming from all other areas. The permeable layers within the field (synthetic turf, leveling and base courses, and pea gravel surrounding the underdrains) will provide filtration of the stormwater before it reaches the bioretention cell, which has been determined to be adequate presettlement of the runoff generated by the turf field per the variance decision.

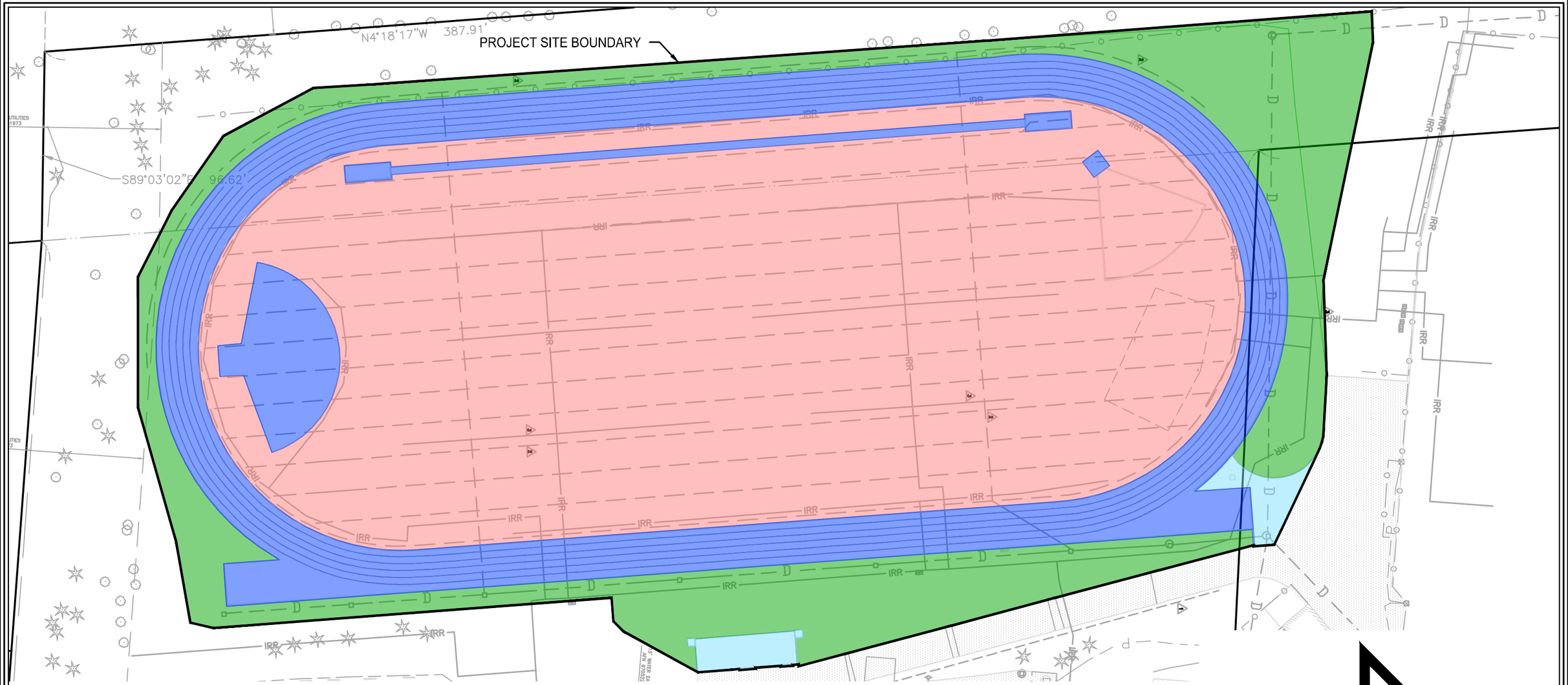
Section 4 – Figures

4-1 EXISTING CONDITIONS MAP

4-2 PROPOSED CONDITIONS MAP

4-3 FLOW CONTROL CALCULATIONS

4-4 WATER QUALITY CALCULATIONS



EXISTING SITE AREAS

	IMPERVIOUS - NON PGIS (NON-TRACK)	1866 SF (0.04 AC)
	IMPERVIOUS - NON-PGIS (TRACK)	37520 SF (0.86 AC)
	IMPERVIOUS - PGIS (FIELD	96048 SF (2.20 AC)
	PERVIOUS - NON PGPS	33041 SF (0.76 AC)

TOTAL SITE AREA: 168475 SF (3.87 AC)

N

50 25 0 50 100

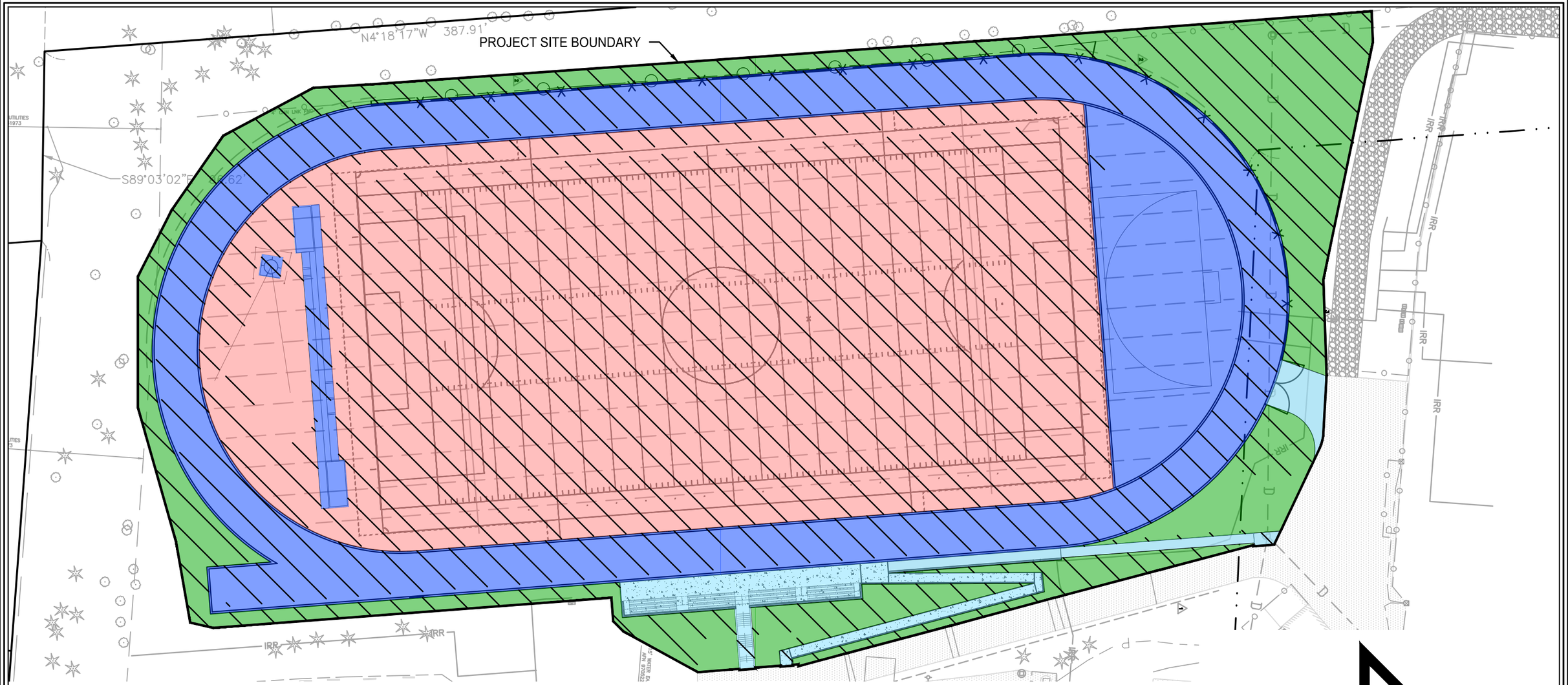
SCALE IN FEET

ETHOS CIVIL

TIMBERCREST MIDDLE SCHOOL FIELD RENOVATION

EXISTING CONDITIONS MAP

FIG. 4-1



NEW IMPERVIOUS - NON PGIS (SIDEWALK + ASPHALT)	5421 SF (0.12 AC)	REPLACED IMPERVIOUS - NON PGIS (SIDEWALK + ASPHALT)	291 SF (0.01 AC)
NEW IMPERVIOUS - NON PGIS (TRACK)	15280 SF (0.35 AC)	REPLACED IMPERVIOUS - NON PGIS (TRACK)	31685 SF (0.73 AC)
NEW IMPERVIOUS - PGIS (FIELD)	4808 SF (0.11 AC)	REPLACED IMPERVIOUS - PGIS (FIELD)	83000 SF (1.91 AC)
NEW PERVIOUS	2559 (0.06 AC)	REPLACED PERVIOUS	25431 (0.58 AC)

TOTAL SITE AREA: 168475 SF (3.87 AC)

N

50 25 0 50 100

SCALE IN FEET

ETHOS CIVIL

TIMBERCREST MIDDLE SCHOOL FIELD RENOVATION

PROPOSED CONDITIONS MAP

FIG. 4-2

Figure 4-3: Flow Control Calculations



General Model Information

WWHM2012 Project Name: TCMS_Expanding_Ex_Pond
Site Name:
Site Address:
City:

Report Date:	1/16/2026
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	10.61
Pervious Total	10.61
Impervious Land Use	acre
Impervious Total	0
Basin Total	10.61

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Lawn, Flat	1.55
Pervious Total	1.55
Impervious Land Use	acre
ROADS FLAT	9.06
Impervious Total	9.06
Basin Total	10.61

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 166.00 ft.
Bottom Width: 166.00 ft.
Depth: 7 ft.
Volume at riser head: 4.4261 acre-feet.
Side slope 1: 2 To 1
Side slope 2: 2 To 1
Side slope 3: 2 To 1
Side slope 4: 2 To 1
Discharge Structure
Riser Height: 6 ft.
Riser Diameter: 8 in.
Notch Type: Rectangular
Notch Width: 0.426 ft.
Notch Height: 2.555 ft.
Orifice 1 Diameter: 1.760 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Pond Hydraulic Table

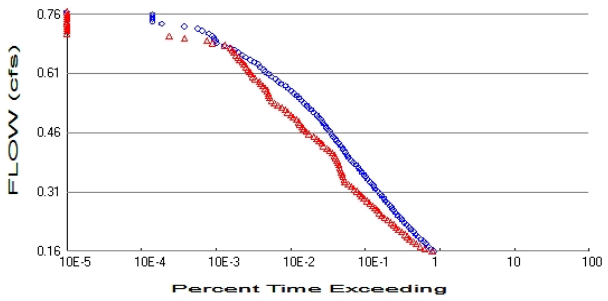
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.632	0.000	0.000	0.000
0.0778	0.635	0.049	0.023	0.000
0.1556	0.637	0.098	0.033	0.000
0.2333	0.639	0.148	0.040	0.000
0.3111	0.642	0.198	0.046	0.000
0.3889	0.644	0.248	0.052	0.000
0.4667	0.646	0.298	0.057	0.000
0.5444	0.649	0.349	0.062	0.000
0.6222	0.651	0.399	0.066	0.000
0.7000	0.654	0.450	0.070	0.000
0.7778	0.656	0.501	0.074	0.000
0.8556	0.659	0.552	0.077	0.000
0.9333	0.661	0.603	0.081	0.000
1.0111	0.663	0.655	0.084	0.000
1.0889	0.666	0.707	0.087	0.000
1.1667	0.668	0.759	0.090	0.000
1.2444	0.671	0.811	0.093	0.000
1.3222	0.673	0.863	0.096	0.000
1.4000	0.676	0.915	0.099	0.000
1.4778	0.678	0.968	0.102	0.000
1.5556	0.680	1.021	0.104	0.000
1.6333	0.683	1.074	0.107	0.000
1.7111	0.685	1.127	0.110	0.000
1.7889	0.688	1.181	0.112	0.000
1.8667	0.690	1.234	0.114	0.000
1.9444	0.693	1.288	0.117	0.000
2.0222	0.695	1.342	0.119	0.000
2.1000	0.698	1.396	0.121	0.000
2.1778	0.700	1.451	0.124	0.000
2.2556	0.703	1.505	0.126	0.000
2.3333	0.705	1.560	0.128	0.000
2.4111	0.708	1.615	0.130	0.000

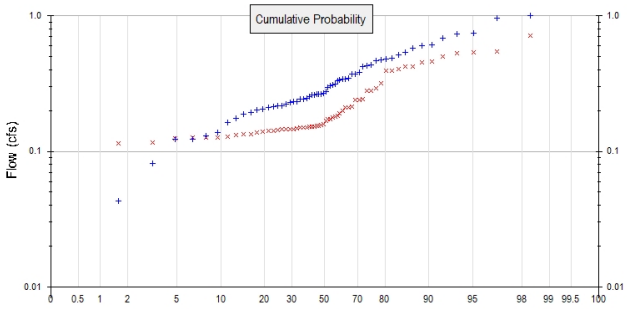
2.4889	0.710	1.670	0.132	0.000
2.5667	0.713	1.726	0.134	0.000
2.6444	0.715	1.781	0.136	0.000
2.7222	0.718	1.837	0.138	0.000
2.8000	0.720	1.893	0.140	0.000
2.8778	0.723	1.949	0.142	0.000
2.9556	0.725	2.006	0.144	0.000
3.0333	0.728	2.062	0.146	0.000
3.1111	0.731	2.119	0.148	0.000
3.1889	0.733	2.176	0.150	0.000
3.2667	0.736	2.233	0.151	0.000
3.3444	0.738	2.290	0.153	0.000
3.4222	0.741	2.348	0.155	0.000
3.5000	0.743	2.406	0.175	0.000
3.5778	0.746	2.464	0.225	0.000
3.6556	0.749	2.522	0.291	0.000
3.7333	0.751	2.580	0.369	0.000
3.8111	0.754	2.639	0.455	0.000
3.8889	0.756	2.697	0.547	0.000
3.9667	0.759	2.756	0.645	0.000
4.0444	0.761	2.816	0.747	0.000
4.1222	0.764	2.875	0.853	0.000
4.2000	0.767	2.934	0.961	0.000
4.2778	0.769	2.994	1.071	0.000
4.3556	0.772	3.054	1.182	0.000
4.4333	0.775	3.114	1.294	0.000
4.5111	0.777	3.175	1.426	0.000
4.5889	0.780	3.235	1.567	0.000
4.6667	0.782	3.296	1.712	0.000
4.7444	0.785	3.357	1.862	0.000
4.8222	0.788	3.418	2.017	0.000
4.9000	0.790	3.480	2.813	0.000
4.9778	0.793	3.541	3.028	0.000
5.0556	0.796	3.603	3.248	0.000
5.1333	0.798	3.665	3.474	0.000
5.2111	0.801	3.727	3.705	0.000
5.2889	0.804	3.790	3.941	0.000
5.3667	0.806	3.852	4.182	0.000
5.4444	0.809	3.915	4.428	0.000
5.5222	0.812	3.978	4.679	0.000
5.6000	0.814	4.042	4.934	0.000
5.6778	0.817	4.105	5.194	0.000
5.7556	0.820	4.169	5.459	0.000
5.8333	0.822	4.233	5.728	0.000
5.9111	0.825	4.297	6.001	0.000
5.9889	0.828	4.361	6.279	0.000
6.0667	0.831	4.426	6.441	0.000
6.1444	0.833	4.490	6.688	0.000
6.2222	0.836	4.555	6.934	0.000
6.3000	0.839	4.621	7.087	0.000
6.3778	0.842	4.686	7.186	0.000
6.4556	0.844	4.752	7.271	0.000
6.5333	0.847	4.817	7.350	0.000
6.6111	0.850	4.883	7.423	0.000
6.6889	0.853	4.950	7.492	0.000
6.7667	0.855	5.016	7.557	0.000
6.8444	0.858	5.083	7.619	0.000
6.9222	0.861	5.150	7.678	0.000

7.0000	0.864	5.217	7.735	0.000
7.0778	0.866	5.284	7.790	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 10.61
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.55
Total Impervious Area: 9.06

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.311943
5 year	0.489918
10 year	0.59078
25 year	0.697634
50 year	0.763756
100 year	0.819996

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.192076
5 year	0.298421
10 year	0.386754
25 year	0.521652
50 year	0.641001
100 year	0.778247

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.306	0.137
1950	0.382	0.178
1951	0.687	0.530
1952	0.216	0.124
1953	0.175	0.168
1954	0.269	0.146
1955	0.429	0.143
1956	0.341	0.278
1957	0.275	0.146
1958	0.310	0.157

1959	0.266	0.139
1960	0.464	0.393
1961	0.262	0.211
1962	0.163	0.126
1963	0.224	0.155
1964	0.295	0.199
1965	0.211	0.244
1966	0.203	0.150
1967	0.424	0.180
1968	0.265	0.149
1969	0.259	0.146
1970	0.213	0.158
1971	0.228	0.155
1972	0.512	0.420
1973	0.232	0.240
1974	0.252	0.152
1975	0.342	0.141
1976	0.247	0.149
1977	0.029	0.132
1978	0.217	0.173
1979	0.131	0.117
1980	0.485	0.459
1981	0.194	0.151
1982	0.373	0.290
1983	0.334	0.151
1984	0.206	0.127
1985	0.122	0.134
1986	0.541	0.190
1987	0.478	0.318
1988	0.189	0.143
1989	0.123	0.133
1990	1.000	0.395
1991	0.602	0.406
1992	0.232	0.173
1993	0.242	0.126
1994	0.081	0.114
1995	0.347	0.211
1996	0.731	0.499
1997	0.611	0.543
1998	0.138	0.128
1999	0.573	0.420
2000	0.241	0.182
2001	0.043	0.109
2002	0.264	0.215
2003	0.337	0.147
2004	0.437	0.537
2005	0.313	0.147
2006	0.369	0.278
2007	0.742	0.714
2008	0.957	0.455
2009	0.470	0.238

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.9999	0.7136
2	0.9575	0.5433
3	0.7422	0.5373

4	0.7309	0.5296
5	0.6869	0.4986
6	0.6110	0.4593
7	0.6021	0.4552
8	0.5730	0.4203
9	0.5407	0.4195
10	0.5116	0.4060
11	0.4848	0.3953
12	0.4783	0.3928
13	0.4701	0.3176
14	0.4645	0.2904
15	0.4366	0.2783
16	0.4287	0.2781
17	0.4242	0.2440
18	0.3821	0.2396
19	0.3726	0.2382
20	0.3693	0.2150
21	0.3468	0.2111
22	0.3417	0.2107
23	0.3411	0.1989
24	0.3372	0.1903
25	0.3341	0.1823
26	0.3132	0.1803
27	0.3101	0.1775
28	0.3064	0.1734
29	0.2946	0.1731
30	0.2753	0.1684
31	0.2688	0.1577
32	0.2660	0.1575
33	0.2646	0.1549
34	0.2643	0.1547
35	0.2620	0.1522
36	0.2589	0.1514
37	0.2522	0.1512
38	0.2470	0.1500
39	0.2419	0.1493
40	0.2412	0.1493
41	0.2324	0.1468
42	0.2322	0.1466
43	0.2283	0.1461
44	0.2238	0.1460
45	0.2168	0.1459
46	0.2165	0.1434
47	0.2135	0.1426
48	0.2110	0.1409
49	0.2062	0.1393
50	0.2028	0.1371
51	0.1938	0.1344
52	0.1887	0.1332
53	0.1751	0.1318
54	0.1630	0.1275
55	0.1382	0.1270
56	0.1310	0.1262
57	0.1231	0.1259
58	0.1224	0.1241
59	0.0813	0.1170
60	0.0433	0.1144
61	0.0294	0.1094

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1560	17793	16829	94	Pass
0.1621	16189	13267	81	Pass
0.1682	15004	11599	77	Pass
0.1744	13907	10232	73	Pass
0.1805	12900	9283	71	Pass
0.1867	11922	8466	71	Pass
0.1928	11009	7845	71	Pass
0.1989	10220	7225	70	Pass
0.2051	9394	6498	69	Pass
0.2112	8754	5938	67	Pass
0.2174	8179	5493	67	Pass
0.2235	7642	5133	67	Pass
0.2296	7110	4714	66	Pass
0.2358	6639	4261	64	Pass
0.2419	6209	3856	62	Pass
0.2481	5781	3521	60	Pass
0.2542	5437	3302	60	Pass
0.2603	5120	3095	60	Pass
0.2665	4821	2894	60	Pass
0.2726	4549	2654	58	Pass
0.2788	4282	2449	57	Pass
0.2849	4045	2263	55	Pass
0.2910	3784	2043	53	Pass
0.2972	3553	1916	53	Pass
0.3033	3345	1791	53	Pass
0.3095	3148	1638	52	Pass
0.3156	2967	1506	50	Pass
0.3217	2796	1376	49	Pass
0.3279	2620	1259	48	Pass
0.3340	2447	1142	46	Pass
0.3401	2308	1106	47	Pass
0.3463	2165	1075	49	Pass
0.3524	2035	1048	51	Pass
0.3586	1910	1022	53	Pass
0.3647	1800	997	55	Pass
0.3708	1710	970	56	Pass
0.3770	1607	945	58	Pass
0.3831	1483	914	61	Pass
0.3893	1385	887	64	Pass
0.3954	1295	847	65	Pass
0.4015	1225	821	67	Pass
0.4077	1160	766	66	Pass
0.4138	1104	712	64	Pass
0.4200	1057	653	61	Pass
0.4261	997	592	59	Pass
0.4322	930	557	59	Pass
0.4384	884	510	57	Pass
0.4445	841	474	56	Pass
0.4507	790	438	55	Pass
0.4568	746	374	50	Pass
0.4629	719	343	47	Pass
0.4691	668	318	47	Pass
0.4752	633	304	48	Pass

0.4814	597	286	47	Pass
0.4875	569	272	47	Pass
0.4936	541	253	46	Pass
0.4998	501	228	45	Pass
0.5059	477	213	44	Pass
0.5120	434	195	44	Pass
0.5182	401	181	45	Pass
0.5243	370	163	44	Pass
0.5305	350	143	40	Pass
0.5366	325	129	39	Pass
0.5427	299	118	39	Pass
0.5489	277	111	40	Pass
0.5550	256	109	42	Pass
0.5612	235	107	45	Pass
0.5673	217	103	47	Pass
0.5734	199	98	49	Pass
0.5796	182	90	49	Pass
0.5857	158	84	53	Pass
0.5919	146	81	55	Pass
0.5980	133	72	54	Pass
0.6041	119	66	55	Pass
0.6103	109	63	57	Pass
0.6164	97	60	61	Pass
0.6226	92	57	61	Pass
0.6287	82	54	65	Pass
0.6348	78	51	65	Pass
0.6410	69	48	69	Pass
0.6471	61	44	72	Pass
0.6532	54	42	77	Pass
0.6594	48	39	81	Pass
0.6655	42	37	88	Pass
0.6717	38	35	92	Pass
0.6778	33	33	100	Pass
0.6839	28	28	100	Pass
0.6901	22	19	86	Pass
0.6962	21	16	76	Pass
0.7024	20	8	40	Pass
0.7085	19	5	26	Pass
0.7146	17	0	0	Pass
0.7208	14	0	0	Pass
0.7269	12	0	0	Pass
0.7331	8	0	0	Pass
0.7392	4	0	0	Pass
0.7453	3	0	0	Pass
0.7515	3	0	0	Pass
0.7576	3	0	0	Pass
0.7638	3	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	1407.50			☐	0.00			
Total Volume Infiltrated		1407.50	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

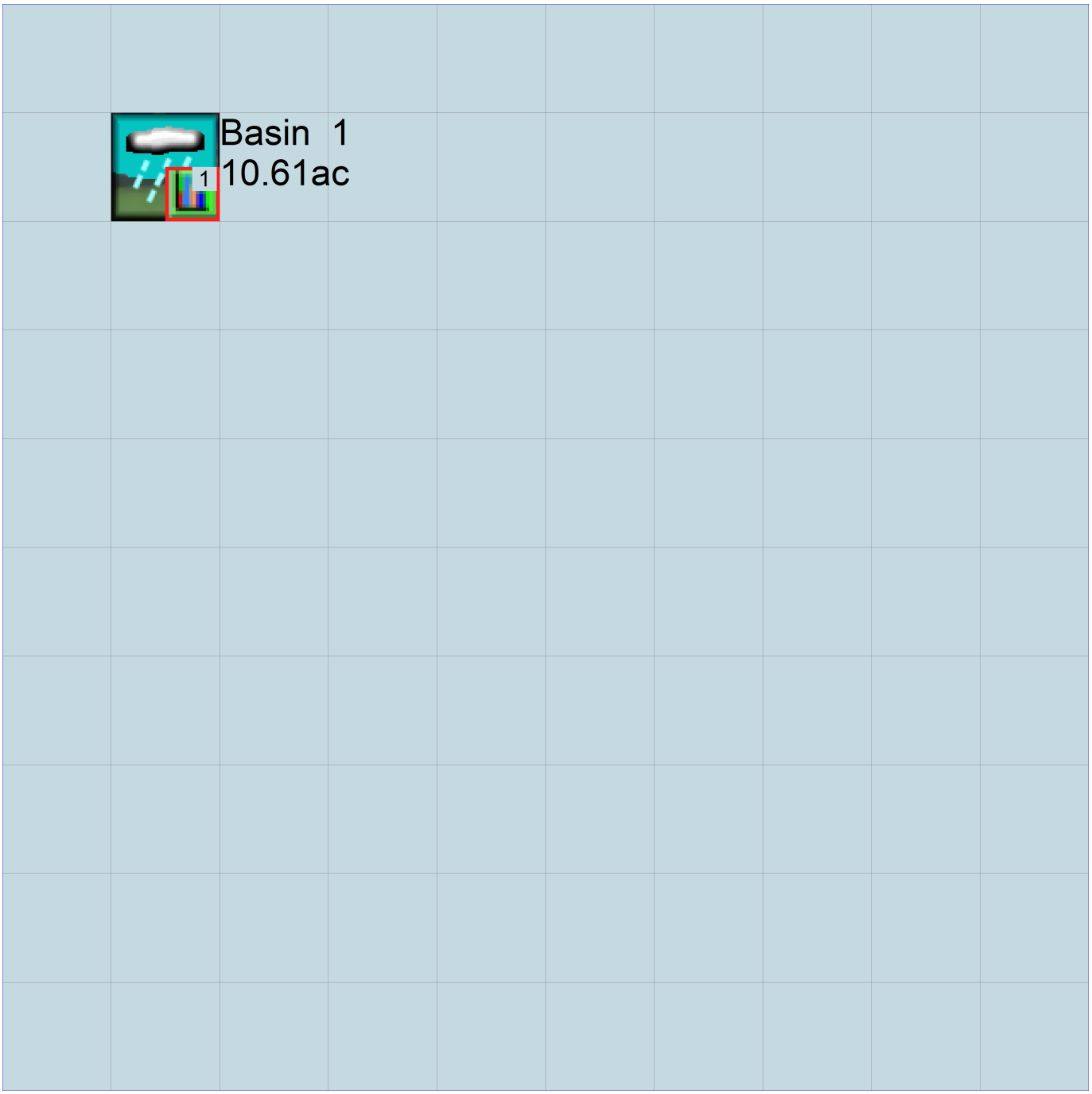
PERLND Changes

No PERLND changes have been made.

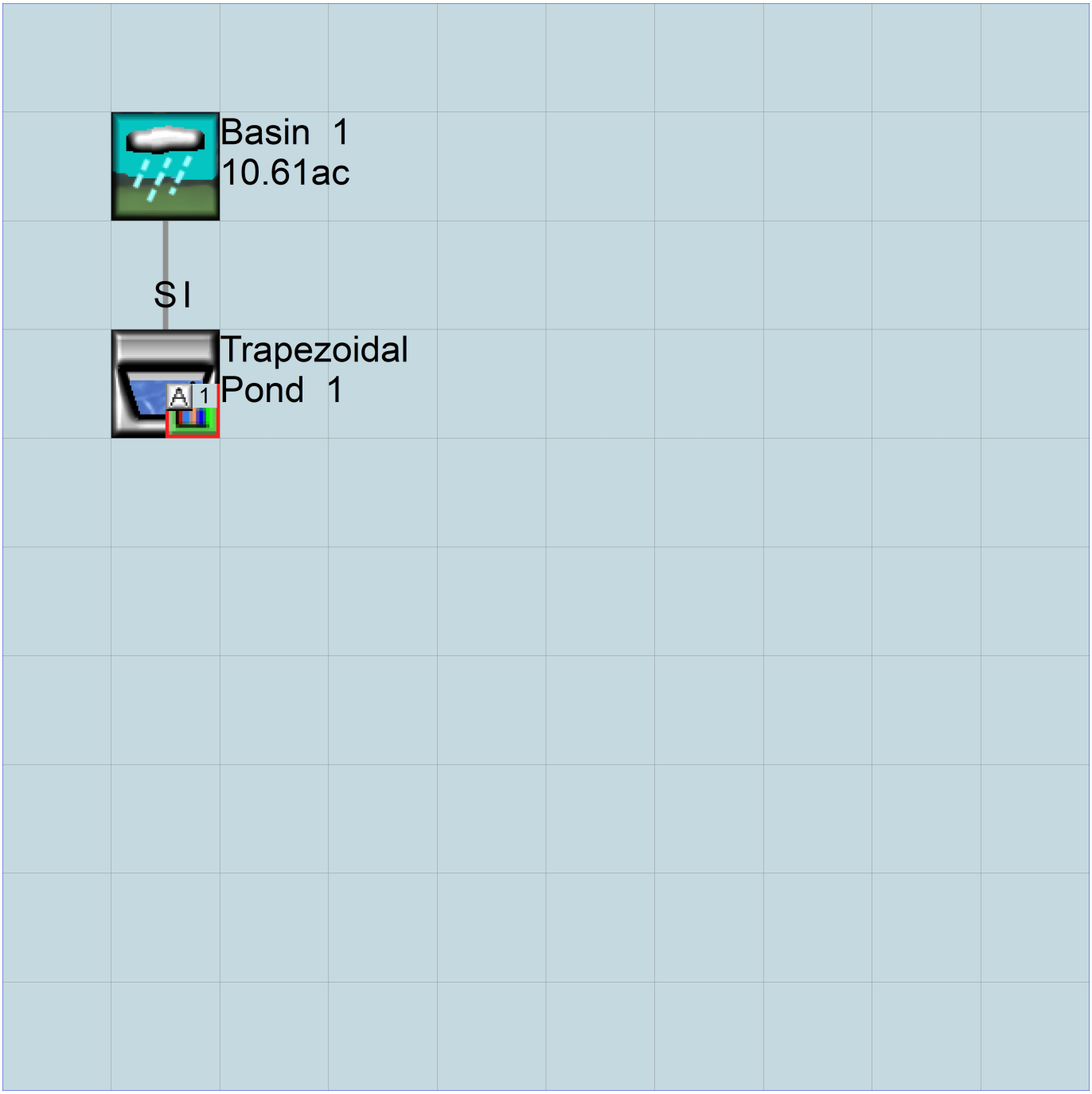
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TCMS_Expanding_Ex_Pond.wdm
MESSU       25   PreTCMS_Expanding_Ex_Pond.MES
            27   PreTCMS_Expanding_Ex_Pond.L61
            28   PreTCMS_Expanding_Ex_Pond.L62
            30   POCTCMS_Expanding_Ex_Pond1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       10.61     COPY   501     12
PERLND  10                       10.61     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *        *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   TCMS_Expanding_Ex_Pond.wdm
MESSU      25   MitTCMS_Expanding_Ex_Pond.MES
           27   MitTCMS_Expanding_Ex_Pond.L61
           28   MitTCMS_Expanding_Ex_Pond.L62
           30   POCTCMS_Expanding_Ex_Pond1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      16
      IMPLND       1
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                      in  out           ***
   16     C, Lawn, Flat           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   16         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
 16         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 16         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
 16             0       4.5      0.03       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
 16             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
 16            0.1      0.25      0.25         6       0.5      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS       GWVS
 16             0         0         0         0       2.5         1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                  in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
```

```
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  16                        1.55     RCHRES   1      2
PERLND  16                        1.55     RCHRES   1      3
IMPLND   1                        9.06     RCHRES   1      5

******Routing******
PERLND  16                        1.55     COPY     1     12
IMPLND   1                        9.06     COPY     1     15
PERLND  16                        1.55     COPY     1     13
RCHRES   1                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Trapezoidal Pond-014    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
    <------><--------><--------><--------><--------><--------><-------->      ***
```

```
    1             1      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.632599  0.000000  0.000000
  0.077778  0.634972  0.049294  0.023443
  0.155556  0.637350  0.098774  0.033153
  0.233333  0.639732  0.148438  0.040604
  0.311111  0.642119  0.198288  0.046886
  0.388889  0.644510  0.248323  0.052420
  0.466667  0.646906  0.298545  0.057423
  0.544444  0.649306  0.348953  0.062024
  0.622222  0.651710  0.399548  0.066307
  0.700000  0.654119  0.450331  0.070329
  0.777778  0.656533  0.501300  0.074133
  0.855556  0.658951  0.552458  0.077751
  0.933333  0.661373  0.603804  0.081209
  1.011111  0.663800  0.655338  0.084525
  1.088889  0.666231  0.707062  0.087715
  1.166667  0.668666  0.758975  0.090794
  1.244444  0.671107  0.811077  0.093772
  1.322222  0.673551  0.863369  0.096658
  1.400000  0.676000  0.915852  0.099460
  1.477778  0.678453  0.968525  0.102185
  1.555556  0.680911  1.021389  0.104840
  1.633333  0.683374  1.074445  0.107429
  1.711111  0.685840  1.127692  0.109957
  1.788889  0.688311  1.181131  0.112428
  1.866667  0.690787  1.234763  0.114846
  1.944444  0.693267  1.288587  0.117215
  2.022222  0.695752  1.342604  0.119536
  2.100000  0.698241  1.396815  0.121813
  2.177778  0.700734  1.451220  0.124048
  2.255556  0.703232  1.505818  0.126244
  2.333333  0.705734  1.560611  0.128402
  2.411111  0.708241  1.615599  0.130525
  2.488889  0.710752  1.670782  0.132613
  2.566667  0.713268  1.726161  0.134669
  2.644444  0.715788  1.781735  0.136695
  2.722222  0.718312  1.837506  0.138690
  2.800000  0.720841  1.893473  0.140658
  2.877778  0.723375  1.949637  0.142598
  2.955556  0.725912  2.005998  0.144512
  3.033333  0.728455  2.062557  0.146401
  3.111111  0.731001  2.119313  0.148266
  3.188889  0.733553  2.176268  0.150108
  3.266667  0.736108  2.233422  0.151928
  3.344444  0.738668  2.290774  0.153726
  3.422222  0.741233  2.348326  0.155503
  3.500000  0.743802  2.406077  0.158738
  3.577778  0.746375  2.464029  0.164461
  3.655556  0.748953  2.522180  0.171456
  3.733333  0.751535  2.580532  0.179350
  3.811111  0.754122  2.639086  0.187929
  3.888889  0.756713  2.697840  0.197046
  3.966667  0.759309  2.756797  0.206589
```

```
  4.044444  0.761909  2.815955  0.216465
  4.122222  0.764513  2.875316  0.226599
  4.200000  0.767122  2.934880  0.236925
  4.277778  0.769736  2.994646  0.247386
  4.355556  0.772353  3.054617  0.257929
  4.433333  0.774976  3.114791  0.268508
  4.511111  0.777602  3.175169  0.280767
  4.588889  0.780233  3.235751  0.293690
  4.666667  0.782869  3.296538  0.306993
  4.744444  0.785509  3.357531  0.320666
  4.822222  0.788154  3.418729  0.334695
  4.900000  0.790803  3.480133  0.401270
  4.977778  0.793456  3.541743  0.420226
  5.055556  0.796114  3.603559  0.439620
  5.133333  0.798776  3.665583  0.459441
  5.211111  0.801443  3.727814  0.479679
  5.288889  0.804114  3.790252  0.500326
  5.366667  0.806790  3.852898  0.521371
  5.444444  0.809470  3.915753  0.542808
  5.522222  0.812154  3.978816  0.564629
  5.600000  0.814843  4.042088  0.586825
  5.677778  0.817536  4.105569  0.609391
  5.755556  0.820234  4.169260  0.632320
  5.833333  0.822936  4.233161  0.655606
  5.911111  0.825643  4.297273  0.679243
  5.988889  0.828354  4.361595  0.703225
  6.066667  0.831070  4.426128  0.828851
  6.144444  0.833790  4.490873  1.076179
  6.222222  0.836514  4.555829  1.321367
  6.300000  0.839243  4.620997  1.474368
  6.377778  0.841977  4.686378  1.573452
  6.455556  0.844715  4.751972  1.659170
  6.533333  0.847457  4.817778  1.737931
  6.611111  0.850203  4.883798  1.811213
  6.688889  0.852955  4.950032  1.880033
  6.766667  0.855710  5.016480  1.945128
  6.844444  0.858470  5.083143  2.007052
  6.922222  0.861235  5.150020  2.066234
  7.000000  0.864004  5.217113  2.123013
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76          PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76          IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1014 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1015 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
```

```
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Figure 4-4: Water Quality Calculations



General Model Information

WWHM2012 Project Name: TCMS_Bioretention
Site Name:
Site Address:
City:

Report Date:	6/12/2026
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	8 Percent of the 2 Year
High Flow Threshold for POC1:	2 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	2.02
Pervious Total	2.02
Impervious Land Use	acre
Impervious Total	0
Basin Total	2.02

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROADS FLAT	2.02
Impervious Total	2.02
Basin Total	2.02

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention Cell

Bottom Length: 28.25 ft.
Bottom Width: 28.00 ft.
Depth: 2 ft.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Filtration On
Hydraulic conductivity: 6
Depth of filter medium: 1.75
Total Volume Infiltrated (ac-ft.): 301.28
Total Volume Through Riser (ac-ft.): 16.014
Total Volume Through Facility (ac-ft.): 317.294
Percent Infiltrated: 94.95
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 18 in.
Element Flows To:
Outlet 1 Outlet 2

Sand Filter Hydraulic Table

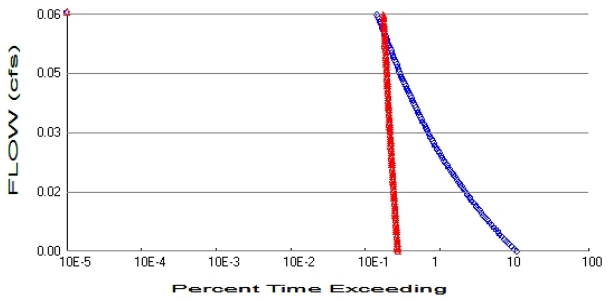
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.018	0.000	0.000	0.000
0.0222	0.018	0.000	0.000	0.111
0.0444	0.018	0.000	0.000	0.112
0.0667	0.018	0.001	0.000	0.114
0.0889	0.018	0.001	0.000	0.115
0.1111	0.019	0.002	0.000	0.116
0.1333	0.019	0.002	0.000	0.118
0.1556	0.019	0.002	0.000	0.119
0.1778	0.019	0.003	0.000	0.121
0.2000	0.019	0.003	0.000	0.122
0.2222	0.019	0.004	0.000	0.123
0.2444	0.020	0.004	0.000	0.125
0.2667	0.020	0.005	0.000	0.126
0.2889	0.020	0.005	0.000	0.128
0.3111	0.020	0.006	0.000	0.129
0.3333	0.020	0.006	0.000	0.130
0.3556	0.021	0.007	0.000	0.132
0.3778	0.021	0.007	0.000	0.133
0.4000	0.021	0.007	0.000	0.135
0.4222	0.021	0.008	0.000	0.136
0.4444	0.021	0.008	0.000	0.137
0.4667	0.022	0.009	0.000	0.139
0.4889	0.022	0.009	0.000	0.140
0.5111	0.022	0.010	0.000	0.141
0.5333	0.022	0.010	0.000	0.143
0.5556	0.022	0.011	0.000	0.144
0.5778	0.022	0.011	0.000	0.146
0.6000	0.023	0.012	0.000	0.147

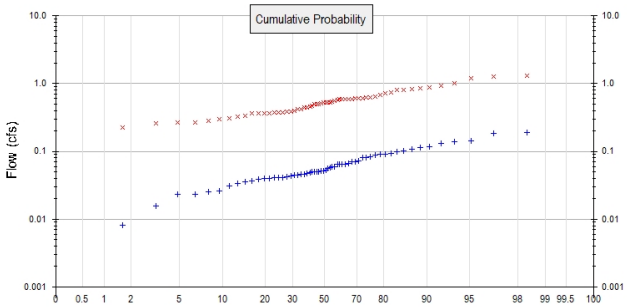
0.6222	0.023	0.012	0.000	0.148
0.6444	0.023	0.013	0.000	0.150
0.6667	0.023	0.013	0.000	0.151
0.6889	0.023	0.014	0.000	0.153
0.7111	0.024	0.015	0.000	0.154
0.7333	0.024	0.015	0.000	0.155
0.7556	0.024	0.016	0.000	0.157
0.7778	0.024	0.016	0.000	0.158
0.8000	0.024	0.017	0.000	0.160
0.8222	0.025	0.017	0.000	0.161
0.8444	0.025	0.018	0.000	0.162
0.8667	0.025	0.018	0.000	0.164
0.8889	0.025	0.019	0.000	0.165
0.9111	0.025	0.020	0.000	0.167
0.9333	0.026	0.020	0.000	0.168
0.9556	0.026	0.021	0.000	0.169
0.9778	0.026	0.021	0.000	0.171
1.0000	0.026	0.022	0.000	0.172
1.0222	0.026	0.022	0.052	0.174
1.0444	0.027	0.023	0.149	0.175
1.0667	0.027	0.024	0.273	0.176
1.0889	0.027	0.024	0.421	0.178
1.1111	0.027	0.025	0.587	0.179
1.1333	0.028	0.026	0.771	0.181
1.1556	0.028	0.026	0.970	0.182
1.1778	0.028	0.027	1.181	0.183
1.2000	0.028	0.027	1.404	0.185
1.2222	0.028	0.028	1.636	0.186
1.2444	0.029	0.029	1.877	0.188
1.2667	0.029	0.029	2.123	0.189
1.2889	0.029	0.030	2.374	0.190
1.3111	0.029	0.031	2.628	0.192
1.3333	0.030	0.031	2.882	0.193
1.3556	0.030	0.032	3.135	0.195
1.3778	0.030	0.033	3.386	0.196
1.4000	0.030	0.033	3.632	0.197
1.4222	0.030	0.034	3.871	0.199
1.4444	0.031	0.035	4.103	0.200
1.4667	0.031	0.035	4.326	0.201
1.4889	0.031	0.036	4.537	0.203
1.5111	0.031	0.037	4.737	0.204
1.5333	0.032	0.037	4.924	0.206
1.5556	0.032	0.038	5.097	0.207
1.5778	0.032	0.039	5.256	0.208
1.6000	0.032	0.040	5.401	0.210
1.6222	0.032	0.040	5.532	0.211
1.6444	0.033	0.041	5.649	0.213
1.6667	0.033	0.042	5.754	0.214
1.6889	0.033	0.043	5.848	0.215
1.7111	0.033	0.043	5.934	0.217
1.7333	0.034	0.044	6.014	0.218
1.7556	0.034	0.045	6.159	0.220
1.7778	0.034	0.046	6.249	0.221
1.8000	0.034	0.046	6.338	0.222
1.8222	0.035	0.047	6.425	0.224
1.8444	0.035	0.048	6.512	0.225
1.8667	0.035	0.049	6.597	0.227
1.8889	0.035	0.050	6.681	0.228

1.9111	0.036	0.050	6.764	0.229
1.9333	0.036	0.051	6.846	0.231
1.9556	0.036	0.052	6.927	0.232
1.9778	0.036	0.053	7.007	0.234
2.0000	0.037	0.054	7.086	0.235
2.0222	0.037	0.054	7.165	0.236

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.02
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0
Total Impervious Area: 2.02

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.05939
5 year	0.093274
10 year	0.112477
25 year	0.13282
50 year	0.145409
100 year	0.156116

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.502828
5 year	0.716424
10 year	0.865468
25 year	1.061898
50 year	1.213904
100 year	1.370664

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.058	0.807
1950	0.073	0.876
1951	0.131	0.418
1952	0.041	0.382
1953	0.033	0.379
1954	0.051	0.365
1955	0.082	0.541
1956	0.065	0.532
1957	0.052	0.605
1958	0.059	0.310

1959	0.051	0.330
1960	0.088	0.448
1961	0.050	0.503
1962	0.031	0.269
1963	0.043	0.374
1964	0.056	0.397
1965	0.040	0.521
1966	0.039	0.364
1967	0.081	0.742
1968	0.050	0.647
1969	0.049	0.511
1970	0.041	0.475
1971	0.043	0.596
1972	0.097	0.631
1973	0.044	0.297
1974	0.048	0.364
1975	0.065	0.591
1976	0.047	0.383
1977	0.006	0.334
1978	0.041	0.587
1979	0.025	0.591
1980	0.092	0.523
1981	0.037	0.613
1982	0.071	0.919
1983	0.064	0.710
1984	0.039	0.259
1985	0.023	0.613
1986	0.103	0.421
1987	0.091	0.592
1988	0.036	0.492
1989	0.023	0.282
1990	0.190	1.195
1991	0.115	0.849
1992	0.044	0.378
1993	0.046	0.206
1994	0.015	0.222
1995	0.066	0.491
1996	0.139	0.627
1997	0.116	0.562
1998	0.026	0.439
1999	0.109	1.296
2000	0.046	0.580
2001	0.008	0.530
2002	0.050	0.807
2003	0.064	0.266
2004	0.083	1.269
2005	0.060	0.463
2006	0.070	0.361
2007	0.141	1.014
2008	0.182	0.835
2009	0.090	0.678

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1904	1.2959
2	0.1823	1.2692
3	0.1413	1.1948

4	0.1392	1.0136
5	0.1308	0.9188
6	0.1163	0.8765
7	0.1146	0.8488
8	0.1091	0.8346
9	0.1029	0.8070
10	0.0974	0.8068
11	0.0923	0.7417
12	0.0911	0.7098
13	0.0895	0.6775
14	0.0884	0.6467
15	0.0831	0.6312
16	0.0816	0.6270
17	0.0808	0.6135
18	0.0727	0.6128
19	0.0709	0.6050
20	0.0703	0.5965
21	0.0660	0.5915
22	0.0651	0.5914
23	0.0649	0.5905
24	0.0642	0.5870
25	0.0636	0.5802
26	0.0596	0.5618
27	0.0590	0.5408
28	0.0583	0.5323
29	0.0561	0.5302
30	0.0524	0.5228
31	0.0512	0.5211
32	0.0506	0.5108
33	0.0504	0.5027
34	0.0503	0.4916
35	0.0499	0.4909
36	0.0493	0.4748
37	0.0480	0.4627
38	0.0470	0.4485
39	0.0460	0.4388
40	0.0459	0.4209
41	0.0442	0.4179
42	0.0442	0.3971
43	0.0435	0.3832
44	0.0426	0.3822
45	0.0413	0.3787
46	0.0412	0.3779
47	0.0406	0.3737
48	0.0402	0.3655
49	0.0393	0.3637
50	0.0386	0.3636
51	0.0369	0.3605
52	0.0359	0.3337
53	0.0333	0.3295
54	0.0310	0.3100
55	0.0263	0.2974
56	0.0249	0.2821
57	0.0234	0.2686
58	0.0233	0.2663
59	0.0155	0.2587
60	0.0082	0.2224
61	0.0056	0.2059

Duration Flows

The Duration Matching Failed

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0048	229502	5803	2	Pass
0.0053	211471	5771	2	Pass
0.0059	195301	5751	2	Pass
0.0064	180949	5726	3	Pass
0.0070	168095	5696	3	Pass
0.0075	156737	5662	3	Pass
0.0081	146471	5636	3	Pass
0.0086	137038	5612	4	Pass
0.0092	128247	5589	4	Pass
0.0097	119991	5568	4	Pass
0.0103	112355	5531	4	Pass
0.0108	105169	5508	5	Pass
0.0114	98538	5478	5	Pass
0.0119	92421	5446	5	Pass
0.0125	86839	5416	6	Pass
0.0130	81662	5386	6	Pass
0.0136	76743	5358	6	Pass
0.0141	72251	5328	7	Pass
0.0147	68187	5307	7	Pass
0.0152	64316	5283	8	Pass
0.0158	60787	5251	8	Pass
0.0163	57557	5227	9	Pass
0.0169	54477	5206	9	Pass
0.0174	51611	5174	10	Pass
0.0180	48916	5153	10	Pass
0.0185	46392	5123	11	Pass
0.0191	43954	5103	11	Pass
0.0197	41772	5080	12	Pass
0.0202	39698	5063	12	Pass
0.0208	37708	5029	13	Pass
0.0213	35805	5009	13	Pass
0.0219	34008	4984	14	Pass
0.0224	32340	4960	15	Pass
0.0230	30736	4932	16	Pass
0.0235	29217	4913	16	Pass
0.0241	27805	4885	17	Pass
0.0246	26501	4860	18	Pass
0.0252	25239	4838	19	Pass
0.0257	24084	4817	20	Pass
0.0263	23036	4795	20	Pass
0.0268	22052	4778	21	Pass
0.0274	21102	4761	22	Pass
0.0279	20221	4733	23	Pass
0.0285	19316	4716	24	Pass
0.0290	18476	4699	25	Pass
0.0296	17716	4684	26	Pass
0.0301	16991	4663	27	Pass
0.0307	16360	4639	28	Pass
0.0312	15749	4618	29	Pass
0.0318	15201	4592	30	Pass
0.0323	14653	4575	31	Pass
0.0329	14112	4558	32	Pass
0.0335	13629	4539	33	Pass
0.0340	13137	4513	34	Pass

0.0346	12637	4498	35	Pass
0.0351	12168	4479	36	Pass
0.0357	11710	4457	38	Pass
0.0362	11289	4438	39	Pass
0.0368	10861	4417	40	Pass
0.0373	10489	4400	41	Pass
0.0379	10123	4385	43	Pass
0.0384	9766	4365	44	Pass
0.0390	9430	4340	46	Pass
0.0395	9120	4327	47	Pass
0.0401	8810	4312	48	Pass
0.0406	8538	4297	50	Pass
0.0412	8258	4286	51	Pass
0.0417	7980	4269	53	Pass
0.0423	7713	4250	55	Pass
0.0428	7452	4241	56	Pass
0.0434	7210	4222	58	Pass
0.0439	6973	4209	60	Pass
0.0445	6735	4190	62	Pass
0.0450	6526	4167	63	Pass
0.0456	6320	4156	65	Pass
0.0461	6109	4134	67	Pass
0.0467	5944	4119	69	Pass
0.0472	5771	4109	71	Pass
0.0478	5610	4090	72	Pass
0.0484	5443	4077	74	Pass
0.0489	5296	4064	76	Pass
0.0495	5142	4047	78	Pass
0.0500	4986	4025	80	Pass
0.0506	4853	4008	82	Pass
0.0511	4712	3985	84	Pass
0.0517	4584	3968	86	Pass
0.0522	4451	3953	88	Pass
0.0528	4327	3927	90	Pass
0.0533	4201	3906	92	Pass
0.0539	4092	3891	95	Pass
0.0544	3976	3871	97	Pass
0.0550	3876	3865	99	Pass
0.0555	3764	3850	102	Fail
0.0561	3634	3833	105	Fail
0.0566	3538	3809	107	Fail
0.0572	3439	3792	110	Fail
0.0577	3339	3775	113	Fail
0.0583	3232	3760	116	Fail
0.0588	3148	3745	118	Fail
0.0594	3052	3728	122	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.3475 acre-feet
On-line facility target flow:	0.3214 cfs.
Adjusted for 15 min:	0.3214 cfs.
Off-line facility target flow:	0.1423 cfs.
Adjusted for 15 min:	0.1423 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

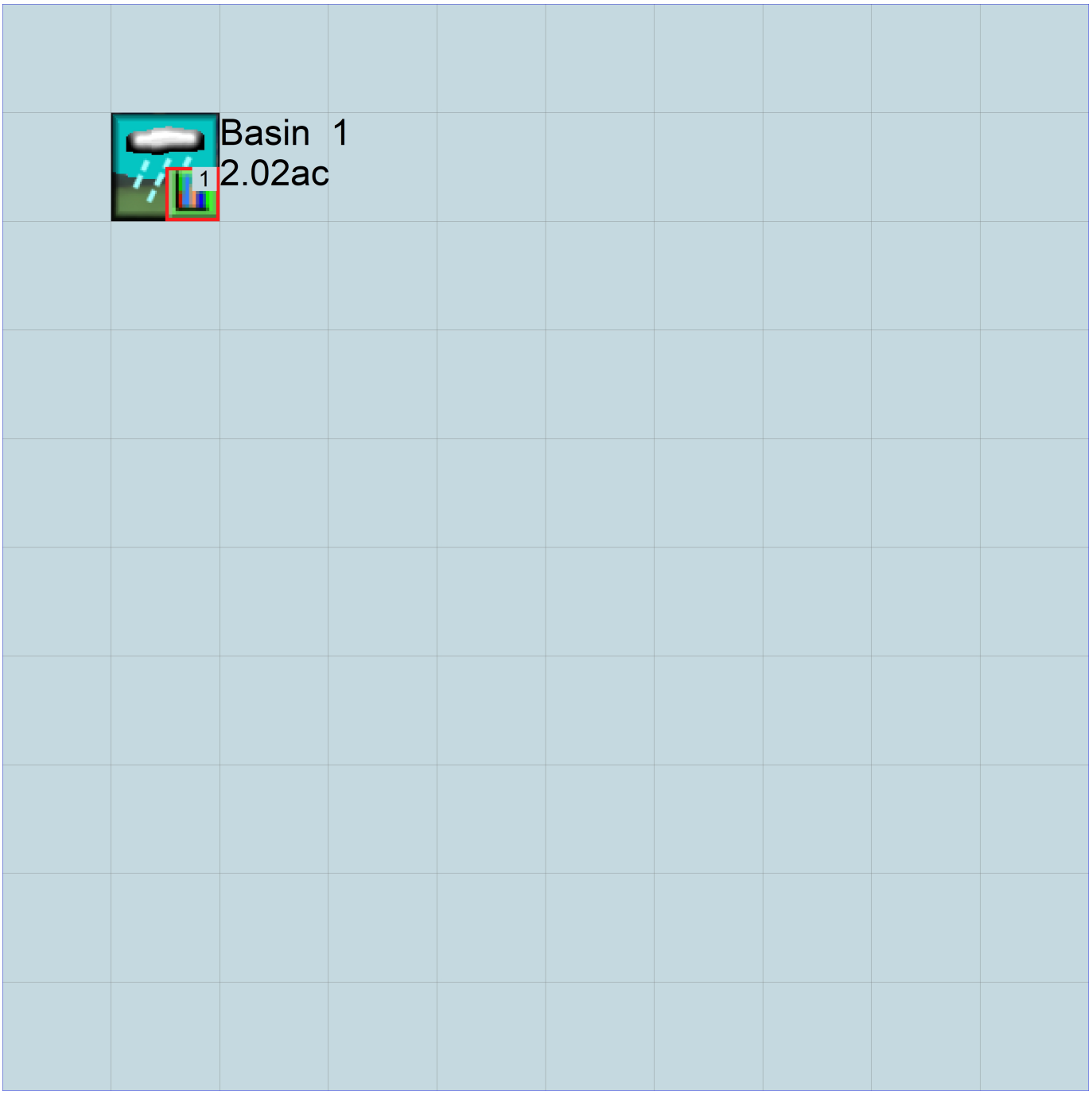
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TCMS_Bioretention.wdm
MESSU       25   PreTCMS_Bioretention.MES
            27   PreTCMS_Bioretention.L61
            28   PreTCMS_Bioretention.L62
            30   POCTCMS_Bioretention1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                        2.02     COPY   501     12
PERLND  10                        2.02     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *        *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TCMS_Bioretention.wdm
MESSU       25   MitTCMS_Bioretention.MES
            27   MitTCMS_Bioretention.L61
            28   MitTCMS_Bioretention.L62
            30   POCTCMS_Bioretention1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      IMPLND       1
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Sand Filter  1             MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                          in  out           ***
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
  END PRINT-INFO

  PWAT-PARM1
```

```
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS       AGWS      GWVS
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
IMPLND   1                        2.02     RCHRES   1      5

******Routing******
IMPLND   1                        2.02     COPY     1     15
RCHRES   1                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                      in  out                               ***
    1     Sand Filter  1          2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
```

FTABLES
FTABLE 1
91 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.018159	0.000000	0.000000	0.000000		
0.022222	0.018331	0.000405	0.000000	0.111256		
0.044444	0.018505	0.000815	0.000000	0.112651		
0.066667	0.018679	0.001228	0.000000	0.114046		
0.088889	0.018854	0.001645	0.000000	0.115441		
0.111111	0.019030	0.002066	0.000000	0.116836		
0.133333	0.019207	0.002491	0.000000	0.118231		
0.155556	0.019384	0.002919	0.000000	0.119627		
0.177778	0.019562	0.003352	0.000000	0.121022		
0.200000	0.019742	0.003789	0.000000	0.122417		
0.222222	0.019921	0.004230	0.000000	0.123812		
0.244444	0.020102	0.004674	0.000000	0.125207		
0.266667	0.020284	0.005123	0.000000	0.126602		
0.288889	0.020466	0.005576	0.000000	0.127997		
0.311111	0.020649	0.006033	0.000000	0.129392		
0.333333	0.020833	0.006494	0.000000	0.130787		
0.355556	0.021018	0.006959	0.000000	0.132182		
0.377778	0.021204	0.007428	0.000000	0.133577		
0.400000	0.021390	0.007901	0.000000	0.134972		
0.422222	0.021578	0.008378	0.000000	0.136367		
0.444444	0.021766	0.008860	0.000000	0.137762		
0.466667	0.021955	0.009346	0.000000	0.139157		
0.488889	0.022144	0.009836	0.000000	0.140552		
0.511111	0.022335	0.010330	0.000000	0.141948		
0.533333	0.022526	0.010828	0.000000	0.143343		
0.555556	0.022718	0.011331	0.000000	0.144738		
0.577778	0.022911	0.011838	0.000000	0.146133		
0.600000	0.023105	0.012349	0.000000	0.147528		
0.622222	0.023300	0.012865	0.000000	0.148923		
0.644444	0.023495	0.013385	0.000000	0.150318		
0.666667	0.023691	0.013909	0.000000	0.151713		
0.688889	0.023889	0.014438	0.000000	0.153108		
0.711111	0.024086	0.014971	0.000000	0.154503		
0.733333	0.024285	0.015509	0.000000	0.155898		
0.755556	0.024485	0.016050	0.000000	0.157293		
0.777778	0.024685	0.016597	0.000000	0.158688		
0.800000	0.024886	0.017148	0.000000	0.160083		
0.822222	0.025088	0.017703	0.000000	0.161478		
0.844444	0.025291	0.018263	0.000000	0.162873		
0.866667	0.025494	0.018827	0.000000	0.164269		
0.888889	0.025699	0.019396	0.000000	0.165664		
0.911111	0.025904	0.019969	0.000000	0.167059		
0.933333	0.026110	0.020547	0.000000	0.168454		
0.955556	0.026317	0.021129	0.000000	0.169849		
0.977778	0.026525	0.021717	0.000000	0.171244		
1.000000	0.026733	0.022308	0.000000	0.172639		
1.022222	0.026943	0.022905	0.052737	0.174034		
1.044444	0.027153	0.023506	0.149070	0.175429		
1.066667	0.027364	0.024112	0.273695	0.176824		
1.088889	0.027575	0.024722	0.421060	0.178219		
1.111111	0.027788	0.025337	0.587805	0.179614		
1.133333	0.028001	0.025957	0.771465	0.181009		
1.155556	0.028216	0.026582	0.970000	0.182404		
1.177778	0.028431	0.027211	1.181580	0.183799		
1.200000	0.028646	0.027845	1.404464	0.185194		
1.222222	0.028863	0.028484	1.636945	0.186590		
1.244444	0.029081	0.029128	1.877310	0.187985		
1.266667	0.029299	0.029777	2.123824	0.189380		
1.288889	0.029518	0.030430	2.374724	0.190775		
1.311111	0.029738	0.031089	2.628224	0.192170		
1.333333	0.029959	0.031752	2.882519	0.193565		
1.355556	0.030180	0.032420	3.135803	0.194960		
1.377778	0.030403	0.033093	3.386283	0.196355		
1.400000	0.030626	0.033771	3.632201	0.197750		
1.422222	0.030850	0.034454	3.871856	0.199145		

```
  1.444444  0.031075  0.035143  4.103633  0.200540
  1.466667  0.031300  0.035836  4.326027  0.201935
  1.488889  0.031527  0.036534  4.537676  0.203330
  1.511111  0.031754  0.037237  4.737392  0.204725
  1.533333  0.031982  0.037945  4.924197  0.206120
  1.555556  0.032211  0.038658  5.097354  0.207515
  1.577778  0.032441  0.039377  5.256407  0.208910
  1.600000  0.032671  0.040100  5.401220  0.210306
  1.622222  0.032903  0.040829  5.532017  0.211701
  1.644444  0.033135  0.041562  5.649420  0.213096
  1.666667  0.033368  0.042301  5.754494  0.214491
  1.688889  0.033602  0.043045  5.848795  0.215886
  1.711111  0.033836  0.043795  5.934405  0.217281
  1.733333  0.034072  0.044549  6.013989  0.218676
  1.755556  0.034308  0.045309  6.159923  0.220071
  1.777778  0.034545  0.046074  6.249853  0.221466
  1.800000  0.034783  0.046844  6.338508  0.222861
  1.822222  0.035022  0.047620  6.425940  0.224256
  1.844444  0.035261  0.048401  6.512198  0.225651
  1.866667  0.035501  0.049187  6.597328  0.227046
  1.888889  0.035743  0.049979  6.681374  0.228441
  1.911111  0.035984  0.050776  6.764376  0.229836
  1.933333  0.036227  0.051578  6.846371  0.231231
  1.955556  0.036471  0.052386  6.927396  0.232627
  1.977778  0.036715  0.053199  7.007484  0.234022
  2.000000  0.036961  0.054018  7.086668  0.235417
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1006 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1007 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1008 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1009 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>           <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Section 5 – Conveyance System Analysis and Design

A complete conveyance system analysis will be provided in the final TIR.

A backwater analysis was performed to size the central collector pipe in conformance with KCSWDM Reference 14-B. The synthetic turf field was divided into two basin, one collected at CB09 to the south and one collected at CB 08 to the north. Underdrain collector pipe discharges to CB 02, which was modeled as an outfall with a fixed flow depth of 90%.

Additionally, the existing emergency overflow spillway was studied to ensure it is adequately sized to convey the proposed condition 100-year, 15-minute peak flow per KCSWDM Section 5.1.1. The existing emergency overflow spillway is approximately 17' wide with an overflow depth of 0.2'. Based on the equation found in KCSWDM Section 5.1.1.2 the existing emergency overflow spillway has the capacity to convey 5.02 cfs. The proposed condition 100-year, 15-minute peak flow is 0.778 cfs. Therefore, the existing emergency overflow spillway is adequately sized.

Section 6 – Special Reports and Studies

The following special reports and studies have been prepared as part of this project:

- *Geotechnical Report* by GeoTest Services dated September 27th, 2023 **(Appendix A)**
    - *Since September 2023 the Geotechnical Engineer completed further testing which indicates infiltration is infeasible on the project site. The updated report is dated June 19th, 2025 and is included in Appendix A.*

Section 7 – Other Permits

The following list includes permits/approvals expected for this project.

- Clearing and Grading Permit
- Department of Ecology Construction Stormwater General Permit
- Conditional Use Permit
- SEPA

Section 8 – CSWPP Analysis and Design

The proposed development will comply with guidelines set forth in the 2021 KCSWDM (amended in 2024). The plan includes erosion/sedimentation control measures designed to prevent sediment-laden runoff from leaving the site or from adversely affecting critical water resources during construction.

Section 8.1 – ESC plan ANALYSIS AND DESIGN (PART A)

The erosion potential of the site is influenced by four major factors: soil characteristics, vegetative cover, topography, and climate. Erosion/sedimentation control is achieved by a combination of structural measures, cover measures, and construction practices that are tailored to fit the specific site.

The following measures will be used to control erosion/sedimentation processes. These measures comply with the Erosion and Sediment Control Standards in the *KCSWDM*:

1. **Clearing Limits:** Limits of Disturbance will be marked by fencing or other means on the ground; this will be completed prior to land disturbing activity to protect vegetated areas which do not need to be disturbed with the proposed improvements, including offsite vegetation to the north and to the south.

2. **Cover Measures:** Straw, mulch or plastic will be used to cover the site or to provide immediate temporary/short-term protection from erosion.

3. **Perimeter Protection:** A row of siltation fence is provided around the site; this BMP was selected to provide perimeter protection since site grades will not concentrate flows and site slopes are shallow (less than 10%, which allows for a maximum flow path of up to 250 feet). Flow path lengths are less than 250 feet.

4. **Traffic Area Stabilization:** The existing pavement will provide a stabilized construction access to the site; a stabilized construction entrance may be used, if found necessary. Wheel washing and/or street sweeping will be provided, as necessary, to prevent tracking of sediment onto adjacent surfaces.

5. **Sediment Retention:** Inlet protection devices will be installed in all existing and new catch basins. Silt fence will be installed at the perimeter of the disturbed areas located adjacent to downhill slopes. The existing detention pond onsite will be utilized as a sediment pond for larger runoff volumes and can be used in conjunction with a sediment tank for additional treatment/filtration if required.

6. **Surface Water Collection:** Not anticipated during construction. If present, surface water will sheet flow toward catch basins. Inlet protection devices will be installed in all new and existing catch basins and silt fence will be installed at the project boundary. These measures will assist with removing sediment from surface water.

7. **Dewatering Control:** Accumulated water in foundation areas, excavations, and utility trenches shall be removed and disposed of in a manner that does not pollute surface waters or cause downstream erosion or flooding. See "Dewatering Control," Section D.2.1.7 (p. D-68), for detailed specifications. The existing detention pond (used as a sediment pond) is a viable location for disposal for settling.

8. **Dust Control:** Not anticipated. If necessary, the contractor shall spray exposed soils with water to prevent wind transport of soil.

9. **Flow Control:** Flow Control will be provided by the expanded pond footprint to the north of the project site. Both the existing and proposed detention pond footprints meet the sediment pond requirements found in Section D.2.1.5.2 of the 2021 KCSWDM (amended in 2024). Sizing was checked using the surface area equation below. The 10-year, 15 minute peak flow shall be used if the project conditions warrant a higher level of protection, refer to **Appendix C** for the WWHM report showing the flow frequencies strictly for the project site areas.

SA = 2 x Q10/0.00096

This equation describes the required surface area at the top of the riser pipe and assumes several basic geometry requirements that are listed in the section and detailed on the plans. The developed site was modeled in WWHM 2012 and the 10-year peak flow rate was determined to be 1.8605 CFS. This results in a minimum required sediment pond surface area at riser height of 3,875 SF. The existing pond has a surface area of 10,000 SF.

10. **Control Pollutants:** Refer to SWPPS Measures below.

11. **Protect Existing and Proposed Flow Control BMPs:** Improvements to existing pond will bring the entire basin tributary to the existing flow control pond up to current flow control standards.

12. **Maintain BMPs:** BMPs will be maintained by the CSWPP Supervisor or designee per King County BMPs. All BMPs implemented on site must be maintained and repaired until after the site is completely stabilized in order to protect the function of the BMP in erosion control practice.

13. **Manage Project:**

    - Site demolition and grading shall be performed after the erosion and sediment control measures have been constructed.

    - Trenches shall be opened only immediately prior to installation of the stormwater conveyance pipes and the trenches should be backfilled immediately after any required testing or inspections of the installed pipes. Trenching spoils must be treated as other disturbed earthwork and measures should be taken to cover or otherwise stabilize the material, as required.

    - The Construction SWPPP shall be retained on-site or within reasonable access to the site at all times. The SWPPP shall be modified to include any additional or modified BMPs that are deemed necessary to manage erosion and sediment on the site. Revisions to the SWPPP must be completed within seven days.

    - Report spillage or discharge of pollutants within 24-hours to the King County.

Section 8.1.1 – ESC MAINTENANCE

All ESC measures shall be maintained and reviewed on a regular basis, as prescribed in the maintenance requirements of each BMP (see Figure 8-3).

Section 8.1.2 – ESC SUPERVISOR

The contractor shall designate an Erosion and Sedimentation Control (ESC) supervisor who shall be responsible for maintenance and review of ESC and for compliance with all permit conditions relating to ESC. The ESC supervisor must be available for rapid response to ESC problems. The ESC supervisor is required to be a Certified Erosion and Sedimentation Control Lead (CESCL), with demonstrated expertise in ESC to perform these reviews and to be responsible for ESC implementation.

Section 8.1.3 – DOCUMENTATION

The ESC supervisor shall review the site at least once a month during the dry season, weekly during the wet season, and within 24 hours of significant storms. Written records of these reviews shall be kept onsite, with copies submitted to King County within 48 hours.

If the Department of Local Services (DLS) requires that a written record be maintained, a standard ESC Maintenance Report, included here as Figure 8-1, may be used. A copy of all required maintenance reports shall be kept onsite throughout the duration of construction.

Section 8.1.4 – REVIEW TIMING

During the wet season, weekly reviews shall be conducted every six to eight calendar days. During the dry season, monthly reviews shall be conducted within three days of the calendar day for the last inspection (e.g., if an inspection occurred on June 6, then the next inspection must occur between July 3 and July 9). Reviews shall also take place within 24 hours of significant storms. In general, a significant storm is one with more than 0.5 inch of rain in 24 hours or less. Another indication that a storm is "significant" is if gullies form as a result of the runoff.

Section 8.2 – STORMWATER POLLUTION PREVENTION AND SPILL (SWPPS) PLAN DESIGN (PART B)

The below SWPPS Plan shall be completed by the contractor for use during construction of the project. Blanks are intentional as they are part of the contractor's means and methods.

The Stormwater Pollution Prevention and Spill (SWPPS) Plan includes three elements: a site plan, a pollution prevention report, and a spill prevention and cleanup report. This report includes identifying the expected sources of potential pollution and spills that may occur during construction and works to develop a plan to prevent pollution and spills. It also develops a plan to mitigate spills that may occur. The SWPPS Plan will be kept on-site at all times during construction. The general contractor will be responsible to ensure that subcontractors are aware of the SWPPS Plan, and a form or record will be provided stating that all subcontractors have read and agree to the SWPPS Plan. An employee training worksheet is provided for the contractor's use (see Figure 8-2).

A SWPPS Site Plan will be developed by the contractor. The SWPPS Site Plan, Pollution Prevention Report, and Spill Prevention and Cleanup Report were preliminarily developed and BMPs were selected based on Section 2.3.1.4 of the 2021 KCSWDM (amended in 2024) and the KCSPPM.

Section 8.2.1 – Pollution and Spill Prevention Source Controls and BMPs

The sources of pollution and spills are identified below, and the BMPs to be used for each source for prevention of both pollution and spills are listed below:

Liquids that will be handled or stored on-site are the following: _____. Containers will be stored as shown on the SWPPS Site Plan and include the following types and sizes: _____. Tight-fitting lids shall be placed on all containers containing liquids. Containers shall be covered with plastic sheeting during rain events. Drip pans or absorbent materials shall be placed beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers. Containers shall be stored such that if a container leaks or spills, the contents will not be discharged, flow, or be washed into the storm drainage system, surface water, or groundwater. Appropriate spill cleanup materials shall be stored and maintained near the container storage area. Storage area shall be swept and cleaned as needed. Area shall not be hosed down such that water drains to the storm drainage system or neighboring areas. Containers shall be checked daily for leaks and spills and replaced, as necessary. All spilled liquids will be collected and disposed of properly. Spill control devices shall be routinely inspected on a weekly basis.

Dry pesticides and fertilizers shall be covered with plastic sheeting or stored in a sealed container. Materials shall be stored on pallets, or another raised method to prevent contact with stormwater runoff. Alternatively, the materials shall be contained in a manner such that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater. Maintenance requirements are the same as liquid materials described above.

Chemicals that will be handled or stored on-site are the following: _____. Containers will be stored as shown on the SWPPS Site Plan and include the following types and sizes: _____. BMPs and maintenance requirements are the same as liquids with the addition of the following _____.

Soil, sand, and other erodible materials shall be stored on-site in a contractor-designated location. Materials shall be covered with plastic sheeting per standard detail. Perimeter controls shall be constructed as shown on the TESC plan to prevent eroded materials from leaving the project site.

Fueling shall not occur on-site. If fueling does occur on-site, the contractor shall develop a containment plan for spills and provide lighting and signage if fueling occurs at night in conformance with the 2021 KCSPPM.

Maintenance and repair of vehicles shall not occur on-site. If maintenance or repair of vehicles does occur on-site, the contractor shall develop a spill prevention plan in conformance with the 2021 KCSPPM.

Truck wheel washing shall occur in a controlled manner, such that runoff is collected and disposed of in a legal manner.

Rinsing of hand tools shall occur in a designated location, and water for washing shall be collected and disposed of in a legal manner.

Contaminated soils shall be covered with plastic sheeting or contained to prevent stormwater from carrying pollutants away to surface or ground waters. Appropriate spill cleanup materials, such as brooms, dustpans, vacuum sweepers, etc., shall be stored and maintained near the storage area. Storage area shall be swept and cleaned as needed. Area shall not be hosed down such that water drains to the storm drainage system, groundwater, surface water, or neighboring areas.

During concrete and asphalt construction, the contractor shall provide the following BMPs, or equivalent measures, methods or practices as required:

1. Drip pans, ground cloths, heavy cardboard, or plywood wherever concrete, asphalt, and asphalt emulsion chunks and drips are likely to fall unintentionally, such as beneath extraction points from mixing equipment.
2. Storm drains shall be covered to prevent concrete and asphalt from entering the storm system.
3. Concrete, concrete slurry, and rinse water shall be contained and collected, and shall not be washed or allowed to discharge into storm drain, ditch, or neighboring parcels. All collected runoff shall be properly disposed of.
4. Contractor shall designate an area where application and mixing equipment cleaning will be conducted. Rinse water and slurry shall be collected, contained, and disposed of in a legal manner.
5. Routine maintenance: the pouring area shall be swept at the end of each day or more frequently if needed. Loose aggregate chunks and dust shall be collected. Areas shall not be hosed down.

The contractor may provide the following optional BMPs if the above do not provide adequate source controls:

6. Cover portable mixing equipment with an awning or plastic sheeting to prevent contact with rainfall.
7. Provide catch basin inserts configured for pollutant removal.

pH elevated water shall not be discharged from the site. Contractor shall monitor stormwater for pH prior to discharging from the site. Contractor shall implement a pH treatment plan if pH is not within the natural range.

Section 8.2.2 – Responsible Personnel and Contact Information

The contractor shall designate an ESC Supervisor and post their contact name, company, and phone number and/or email in a readily visible location onsite.

__[name]__with __[company]__ shall be responsible for pollution and spill prevention and cleanup and can be contacted at __[phone]__ or __[email]__.

Contractor shall fill out the attached Pollution Prevention Team Worksheet (see Figure 8-2).

Section 8.2.3 – Pollution and Spill Prevention Worksheets

Pollution prevention, BMP implementation reports, material inventory worksheets, pollutant source identification worksheet, and spill/leak report may be found attached as Figure 8-2.

Section 8.2.4 – Disposal Methods

Contractor shall dispose of contaminated soils and water in a legal manner. Options include the following: _____.

Section 8 – Figures

8-1 ESC PLANS

8-2 ESC MAINTENANCE REPORT

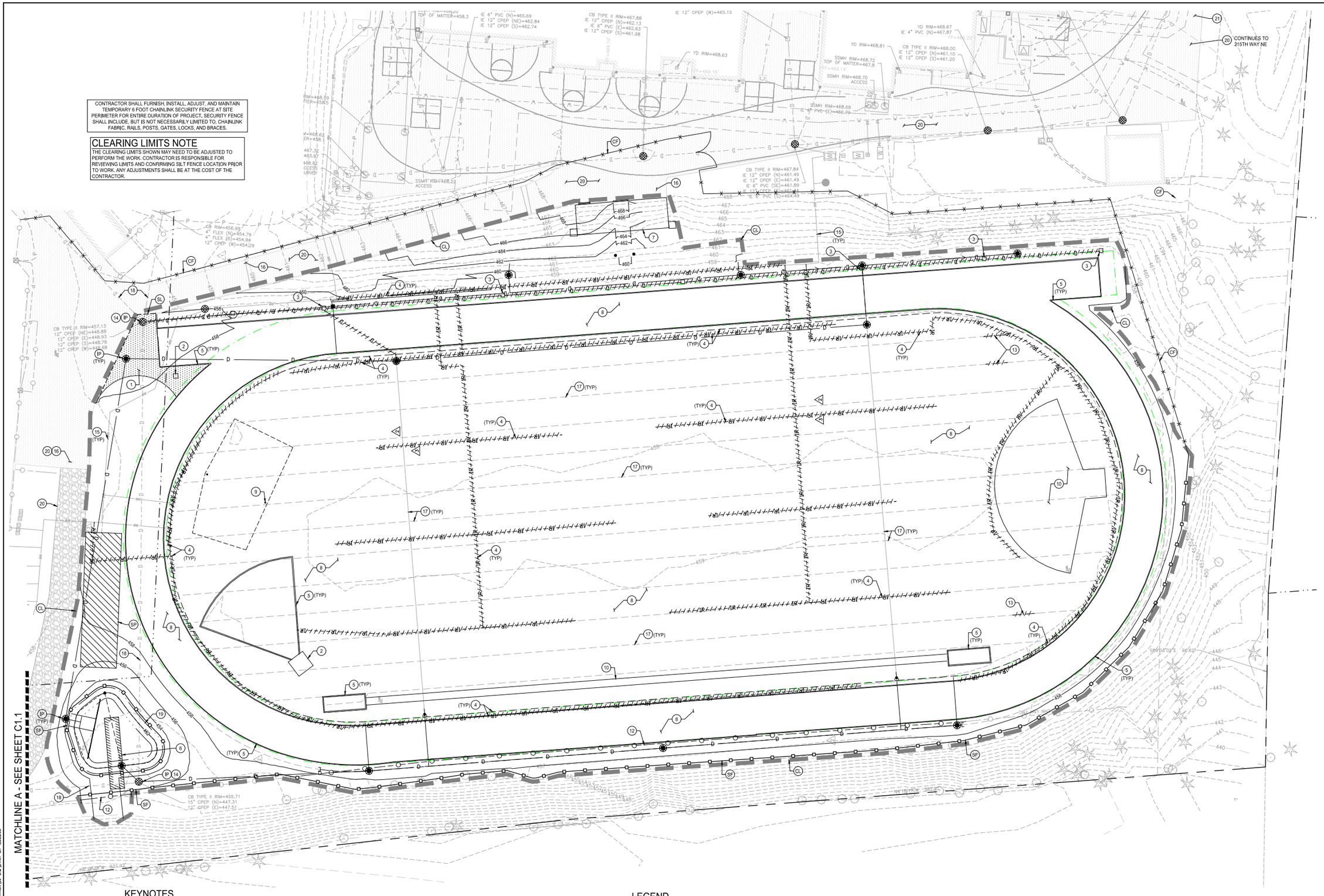
8-3 BMPS

FIGURE 8-1: ESC PLANS

CONTRACTOR SHALL FURNISH, INSTALL, ADJUST, AND MAINTAIN TEMPORARY 6 FOOT CHAINLINK SECURITY FENCE AT SITE PERIMETER FOR ENTIRE DURATION OF PROJECT. SECURITY FENCE SHALL INCLUDE, BUT IS NOT NECESSARILY LIMITED TO, CHAINLINK FABRIC, RAILS, POSTS, GATES, LOCKS, AND BRACES.

CLEARING LIMITS NOTE

THE CLEARING LIMITS SHOWN MAY NEED TO BE ADJUSTED TO PERFORM THE WORK. CONTRACTOR IS RESPONSIBLE FOR REVIEWING LIMITS AND CONFIRMING SILT FENCE LOCATION PRIOR TO WORK. ANY ADJUSTMENTS SHALL BE AT THE COST OF THE CONTRACTOR.



KEYNOTES

1. REMOVE EXISTING ASPHALT PAVEMENT.
2. REMOVE EXISTING CEMENT CONCRETE.
3. REMOVE EXISTING CATCH BASIN.
4. REMOVE EXISTING IRRIGATION SYSTEM AND APPURTENANCES. REFER TO LANDSCAPE PLAN FOR ADDITIONAL REQUIREMENTS.
5. REMOVE EXISTING CURB.
6. REMOVE AND RELOCATE EXISTING STORAGE CONTAINER.
7. REMOVE EXISTING BLEACHERS AND ASSOCIATED FOOTINGS.
8. REMOVE EXISTING TRACK AND FIELD SURFACING, AS REQUIRED.
9. REMOVE EXISTING POSTS AND NETTING.
10. REMOVE EXISTING RUBBER SURFACING AND UNDERLYING PAVEMENT SURFACING.
11. NOT USED.
12. REMOVE EXISTING FENCING.
13. REMOVE EXISTING UNDERDRAINS.
14. PROTECT EXISTING CATCH BASIN.
15. PROTECT EXISTING IRRIGATION PIPING.
16. PROTECT EXISTING ASPHALT.
17. PROTECT EXISTING UNDERDRAIN SYSTEM.
18. PROTECT EXISTING STORM DRAINAGE PIPING.
19. BIORETENTION CELL FOOTPRINT. CONTRACTOR SHALL SEQUENCE CONSTRUCTION TO PROTECT BIORETENTION SOIL MEDIA AND AGGREGATE FROM SEDIMENT LADEN WATER.
20. UTILIZE EXISTING PAVEMENT AND GRAVEL ROAD FOR CONSTRUCTION ACCESS. (1 C1.01)
21. PROVIDE INLET PROTECTION FOR ALL STORM DRAIN INLETS ALONG CONSTRUCTION ACCESS TO 215TH WAY NE

LEGEND

- RIGHT-OF-WAY / PROPERTY LINE
- CL — CLEARING / PROJECT LIMITS
- REMOVE EXISTING ASPHALT
- REMOVE EXISTING CONCRETE
- SF — SILT FENCE (4 C1.01)
- CF — CONSTRUCTION FENCE
- SL — SAWCUT LINE
- REMOVE EXISTING UTILITY
- IP — INLET PROTECTION (5 C1.01)
- REMOVE EXISTING TREE
- EXISTING TREE TO REMAIN
- 100 — EXISTING MAJOR CONTOURS
- 102 — EXISTING MINOR CONTOURS
- 102 — PROPOSED MINOR CONTOUR
- 100 — PROPOSED MAJOR CONTOUR
- PROPOSED STORM STRUCTURES
- D — PROPOSED STORM DRAINAGE PIPING
- PROPOSED STORM FACILITY
- EXTENTS OF PROPOSED TRACK AND FIELD
- SP — TEMPORARY STOCKPILE (2 C1.01)

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SCALE IN FEET

DATE	
REVISIONS	
JOB NO:	24-100720
DRAWN BY:	JTB
APPROVED BY:	TJM
DATE:	JUNE 2026

ETHOS civil engineering
ethos4.com info@ethos4.com 253.414.1999

TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

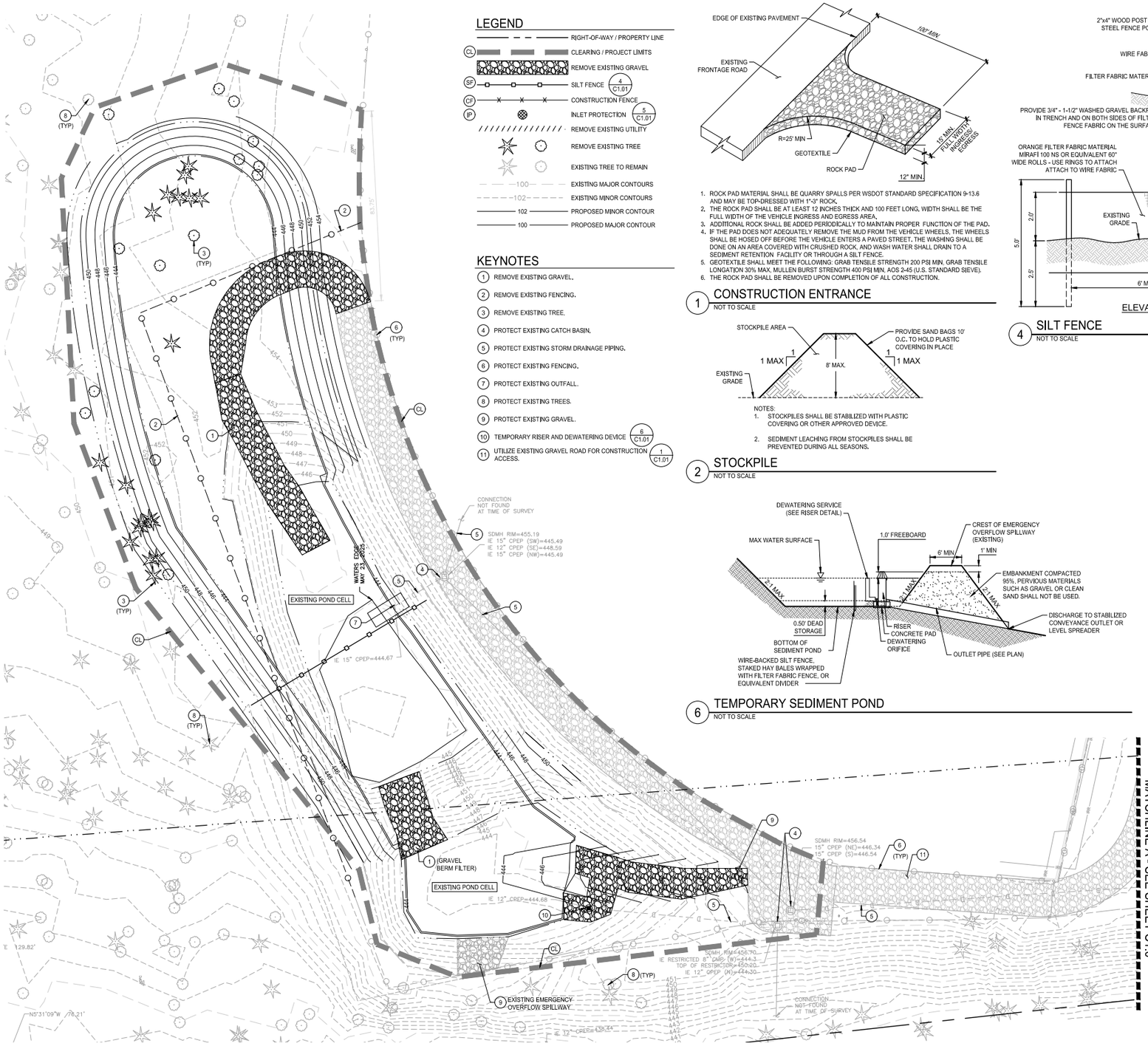
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6.17.2026

TESC AND DEMOLITION PLAN

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LEGEND

- RIGHT-OF-WAY / PROPERTY LINE
- CL — CLEARING / PROJECT LIMITS
- REMOVE EXISTING GRAVEL
- SF — SILT FENCE (4 / C1.01)
- CF — CONSTRUCTION FENCE
- IP — INLET PROTECTION (5 / C1.01)
- REMOVE EXISTING UTILITY
- REMOVE EXISTING TREE
- EXISTING TREE TO REMAIN
- 100 — EXISTING MAJOR CONTOURS
- 102 — EXISTING MINOR CONTOURS
- 102 — PROPOSED MINOR CONTOUR
- 100 — PROPOSED MAJOR CONTOUR

KEYNOTES

1. REMOVE EXISTING GRAVEL.
2. REMOVE EXISTING FENCING.
3. REMOVE EXISTING TREE.
4. PROTECT EXISTING CATCH BASIN.
5. PROTECT EXISTING STORM DRAINAGE PIPING.
6. PROTECT EXISTING FENCING.
7. PROTECT EXISTING OUTFALL.
8. PROTECT EXISTING TREES.
9. PROTECT EXISTING GRAVEL.
10. TEMPORARY RISER AND DEWATERING DEVICE (6 / C1.01)
11. UTILIZE EXISTING GRAVEL ROAD FOR CONSTRUCTION ACCESS. (1 / C1.01)

1. ROCK PAD MATERIAL SHALL BE QUARRY SPALLS PER WSDOT STANDARD SPECIFICATION 9-13.6 AND MAY BE TOP-DRESSED WITH 1"-3" ROCK.
2. THE ROCK PAD SHALL BE AT LEAST 12 INCHES THICK AND 100 FEET LONG, WIDTH SHALL BE THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA.
3. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
4. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK, AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH A SILT FENCE.
5. GEOTEXTILE SHALL MEET THE FOLLOWING: GRAB TENSILE STRENGTH 200 PSI MIN. GRAB TENSILE LONGATION 30% MAX, MULLEN BURST STRENGTH 400 PSI MIN, AOS 2-45 (U.S. STANDARD SIEVE).
6. THE ROCK PAD SHALL BE REMOVED UPON COMPLETION OF ALL CONSTRUCTION.

1 CONSTRUCTION ENTRANCE
NOT TO SCALE

NOTES:
1. STOCKPILES SHALL BE STABILIZED WITH PLASTIC COVERING OR OTHER APPROVED DEVICE.
2. SEDIMENT LEACHING FROM STOCKPILES SHALL BE PREVENTED DURING ALL SEASONS.

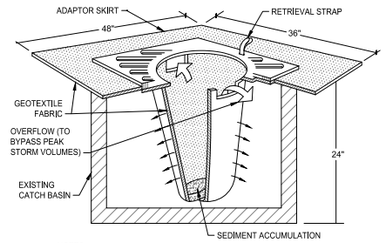
2 STOCKPILE
NOT TO SCALE

6 TEMPORARY SEDIMENT POND
NOT TO SCALE

4 SILT FENCE
NOT TO SCALE

NOTES

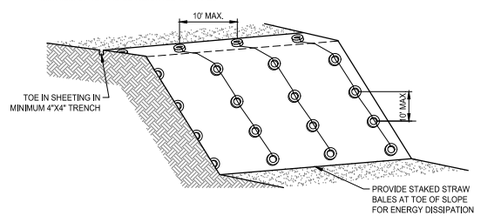
1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM SIX-INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS (WHERE FEASIBLE). THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF SIX FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30")
3. A TRENCH SHALL BE EXCAVATED, ROUGHLY EIGHT INCHES WIDE AND TWELVE INCHES DEEP, UPSLOPE AND ADJACENT TO THE WOOD POST TO ALLOW THE FILTER FABRIC TO BE BURIED.
4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST ONE INCH LONG, TIE WIRES, OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF FOUR INCHES AND SHALL NOT EXTEND MORE THAN THIRTY SIX INCHES ABOVE THE ORIGINAL GROUND SURFACE.
5. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND TWENTY INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN THIRTY SIX INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF STANDARD NOTE (5) APPLYING.
7. THE TRENCH SHALL BE BACKFILL WITH 3/4 INCH MINIMUM DIAMETER WASHED GRAVEL.
8. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
9. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
10. DO NOT INSTALL BELOW AN OUTLET PIPE OR WEIR.
11. DO NOT DRIVE OVER OR FILL OVER FILTER FABRIC FENCE.



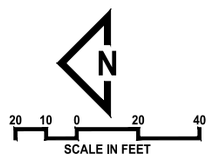
NOTES:
1. FILTERS SHALL BE INSPECTED AFTER EACH STORM EVENT AND CLEANED OR REPLACED WHEN 1/3 FULL.
2. INSTALL INLET PROTECTION IN ALL NEW STORM STRUCTURES THAT WILL COLLECT STORMWATER AS THEY ARE INSTALLED.

5 INLET PROTECTION
NOT TO SCALE

NOTES:
1. CLEAR PLASTIC COVERING SHALL MEET WSDOT 9-14-5(3)
2. TIRE SIDEWALLS, SANDBAGS, OR EQUIVALENT MAY BE USED TO WEIGHT PLASTIC SEAMS BETWEEN SHEETS MUST OVERLAP A MINIMUM OF 12" AND BE WEIGHTED OR TAPED



3 COVERED SLOPE
NOT TO SCALE



CONTRACTOR SHALL FURNISH, INSTALL, ADJUST, AND MAINTAIN TEMPORARY 6 FOOT CHAINLINK SECURITY FENCE AT SITE PERIMETER FOR ENTIRE DURATION OF PROJECT. SECURITY FENCE SHALL INCLUDE, BUT IS NOT NECESSARILY LIMITED TO, CHAINLINK FABRIC, RAILS, POSTS, GATES, LOCKS, AND BRACES.

CLEARING LIMITS NOTE
THE CLEARING LIMITS SHOWN MAY NEED TO BE ADJUSTED TO PERFORM THE WORK. CONTRACTOR IS RESPONSIBLE FOR REVIEWING LIMITS AND CONFIRMING SILT FENCE LOCATION PRIOR TO WORK. ANY ADJUSTMENTS SHALL BE AT THE COST OF THE CONTRACTOR.

DATE | REVISIONS

JOB NO: 24-100720
DRAWN BY: JTB
APPROVED BY: TJM
DATE: JUNE 2026

ETHOS Civil Engineering
ethosce.com info@ethosce.com 253.414.1369

TIMBERCREST MIDDLE SCHOOL SPORTS FIELD
19115 215th WAY NE, WOODINVILLE, WA

SEAL:
JONATHAN THOMAS BOYD — STATE OF WASHINGTON — 24019 — REGISTERED PROFESSIONAL ENGINEER
6.17.2026

TESC AND DEMOLITION PLAN

DRAWING NO: C1.01
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ESC MAINTENANCE REPORT

Performed By: _____
Date: _____
Project Name: _____
DPER Permit #: _____

Clearing Limits

Damage	OK ____	Problem
Visible	OK ____	Problem
Intrusions	OK ____	Problem
Other	OK ____	Problem

Mulch

Rills/Gullies	OK ____	Problem
Thickness	OK ____	Problem
Other	OK ____	Problem

Nets/Blankets

Rills/Gullies	OK ____	Problem
Ground Contact	OK ____	Problem
Other	OK ____	Problem

Plastic

Tears/Gaps	OK ____	Problem
Other	OK ____	Problem

Seeding

Percent Cover	OK ____	Problem
Rills/Gullies	OK ____	Problem
Mulch	OK ____	Problem
Other	OK ____	Problem

Sodding

Grass Health	OK ____	Problem
Rills/Gullies	OK ____	Problem
Other	OK ____	Problem

Perimeter Protection including Silt Fence

Damage	OK ____	Problem
Sediment Build-up	OK ____	Problem
Concentrated Flow	OK ____	Problem
Other	OK ____	Problem

Flow Control BMP protection

Damage	OK ____	Problem
Sedimentation	OK ____	Problem
Concentrated Flow	OK ____	Problem
Rills/Gullies	OK ____	Problem
Intrusions	OK ____	Problem
Other	OK ____	Problem

Brush Barrier

Damage	OK ____	Problem
Sediment Build-up	OK ____	Problem
Concentrated Flow	OK ____	Problem
Other	OK ____	Problem

Vegetated Strip

Damage	OK ____	Problem
Sediment Build-up	OK ____	Problem
Concentrated Flow	OK ____	Problem
Other	OK ____	Problem

Construction Entrance

Dimensions	OK ____	Problem
Sediment Tracking	OK ____	Problem
Vehicle Avoidance	OK ____	Problem
Other	OK ____	Problem

Wheel Wash
- Dimensions OK Problem
- Sed build up or tracking OK..... Problem
- Other OK Problem

Construction Road
- Stable Driving Surf. OK ____ Problem
- Vehicle Avoidance OK ____ Problem
- Other OK ____ Problem

Sediment Trap/Pond
- Sed. Accumulation OK ____ Problem
- Overtopping OK ____ Problem
- Inlet/Outlet Erosion OK ____ Problem
- Other OK ____ Problem

Catch Basin/Inlet Protection
- Sed. Accumulation OK ____ Problem
- Damage OK ____ Problem
- Clogged Filter OK ____ Problem
- Other OK ____ Problem

Interceptor Dike/Swale
- Damage OK ____ Problem
- Sed. Accumulation OK ____ Problem
- Overtopping OK ____ Problem
- Other OK ____ Problem

Pipe Slope Drain
- Damage OK ____ Problem
- Inlet/Outlet OK ____ Problem
- Secure Fittings OK ____ Problem
- Other OK ____ Problem

Ditches
- Damage OK ____ Problem
- Sed. Accumulation OK ____ Problem
- Overtopping OK ____ Problem
- Other OK ____ Problem

Outlet Protection
- Scour OK ____ Problem
- Other OK ____ Problem

Level Spreader
- Damage OK ____ Problem
- Concentrated Flow OK ____ Problem
- Rills/Gullies OK ____ Problem
- Sed. Accumulation OK ____ Problem
- Other OK ____ Problem

Dewatering Controls
- Sediment OK.. Problem

Dust Control
- Palliative applied OK Problem

Miscellaneous
- Wet Season Stockpile OK ____ Problem
- Other OK ____ Problem

Comments:

Actions Taken:

Problems Unresolved:

BMP Implementation	Completed by:_____ Title:_____ Date:_____

Develop a plan for implementing each BMP. Describe the steps necessary to implement the BMP (i.e., any construction or design), the schedule for completing those steps (list dates), and the person(s) responsible for implementation.

BMPs	Description of Action(s) Required for Implementation	Scheduled Milestone and Completion Date(s)	Person Responsible for Action
Good Housekeeping	1.		
	2.		
	3		
Preventive Maintenance	1.		
	2.		
	3.		
	4.		
Spill Prevention and Emergency Cleanup	1.		
	2.		
	3.		
Inspections	1.		
	2.		
	3.		

BMPs	Description of Action(s) Required for Implementation	Schedule Milestone and Completion Date(s)	Person Responsible for Action
Source Control BMPs	1.		
	2.		
	3		
	4.		
	5.		
	6.		
	7.		
	8.		
Treatment BMPs	1.		
	2.		
	3.		
	4.		
Emerging technologies	1.		
	2.		
Flow Control BMPs	3.		
	4.		

Pollution Prevention Team	**Completed by:** _____ **Title:** _____ **Date:** _____
Responsible Official:_____	Title:_____
Team Leader:_____	Office Phone:_____
	Cell Phone #:_____
	Pager #:_____
Responsibilities: _____ _____ _____	
(1)_____	Title:_____
	Office Phone:_____
	Pager #:_____
	Cell Phone:_____
Responsibilities: _____ _____ _____	
(2)_____	Title:_____
	Office Phone:_____
	Pager #:_____
	Cell Phone #:_____
Responsibilities: _____ _____ _____	

Employee Training	Completed by:_____ Title:_____ Date:_____		
Describe the annual training of employees on the SWPPP, addressing spill response, good housekeeping, and material management practices.			
Training Topics **1.) LINE WORKERS**	**Brief Description of Training Program/Materials (e.g., film, newsletter course)**	**Schedule for Training (list dates)**	**Attendees**
Spill Prevention and Response			
Good Housekeeping			
Material Management Practices			
2.) P2 TEAM:			
SWPPP Implementation			
Monitoring Procedures			

List of Significant Spills and Leaks	Completed by:_____ Title:_____ Date:_____

List all spills and leaks of toxic or hazardous pollutants that were significant but are not limited to, release of oil or hazardous substances in excess of reportable quantities. Although not required, we suggest you list spills and leaks of non-hazardous materials.

Date (month/day/year)	Location (as indicated on site map)	Description				Response Procedure		Preventive Measure Taken
		Type of Material	Quantity	Source, If Known	Reason for Spill/Leak	Amount of Material Recovered	Material No longer exposed to Stormwater (Yes/No)	

Potential Pollutant Source Identification	Completed by:_____ Title:_____ Date:_____

List all potential stormwater pollutants from materials handled, treated, or stored on-site.

Potential Stormwater Pollutant	Stormwater Pollutant Source	Likelihood of pollutant being present in your stormwater discharge. If yes, explain

Material Inventory

Completed by:_____
Title:_____
Date:_____

List materials handled, treated, stored, or disposed of at the project site that may potentially be exposed to precipitation or runoff.

Material	Purpose/Location	Quantity (Units) (indicate per/wk. or yr.) Used	Produced	Stored		Likelihood of contact with stormwater If Yes, describe reason		Past Spill or Leak Yes	No

D.2.1.3 PERIMETER PROTECTION

Perimeter protection to filter sediment from sheetwash shall be located downslope of all disturbed areas and shall be installed prior to upslope grading. Perimeter protection includes the use of vegetated strips as well as, constructed measures, such as silt fences, fiber rolls, sand/gravel barriers, brush or rock filters, triangular silt dikes and other methods. During the wet season, 50 linear feet of silt fence (and the necessary stakes) per acre of disturbed area must be stockpiled on site.

Purpose: The purpose of perimeter protection is to reduce the amount of sediment transported beyond the disturbed areas of the construction site. Perimeter protection is primarily a backup means of sediment control. Most, if not all, sediment-laden water is to be treated in a sediment trap or pond. The only circumstances in which perimeter control is to be used as a primary means of sediment removal is when the catchment is very small (see below).

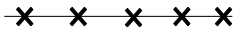
When to Install: Perimeter protection is to be installed prior to any upslope clearing and grading.

Measures to Use: The above measures may be used interchangeably and are not the only perimeter protection measures available. If surface water is collected by an interceptor dike or swale and routed to a sediment pond or trap, there may be no need for the perimeter protection measures specified in this section.

Criteria for Use as Primary Treatment: At the boundary of a site, perimeter protection may be used as the sole form of treatment when the flowpath meets the criteria listed below. If these criteria are not met, perimeter protection shall only be used as a backup to a sediment trap or pond.

Average Slope	Slope Percent	Flowpath Length
1.5H:1V or less	67% or less	100 feet
2H:1V or less	50% or less	115 feet
4H:1V or less	25% or less	150 feet
6H:1V or less	16.7% or less	200 feet
10H:1V or less	10% or less	250 feet

D.2.1.3.1 SILT FENCE

Code: SF Symbol: 

Purpose

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

1. Silt fence may be used downslope of all disturbed areas.
2. Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment trap or pond. The only circumstance in which overland flow may be treated solely by a silt fence, rather than by a sediment trap or pond, is when the area draining to the fence is small (see "**Criteria for Use as Primary Treatment**" in Section D.2.1.3 above).

Design and Installation Specifications

1. See Figure D.2.1.3.A and Figure D.2.1.3.B for details.

2. The geotextile used must meet the standards listed below. A copy of the manufacturer's fabric specifications must be available on site.

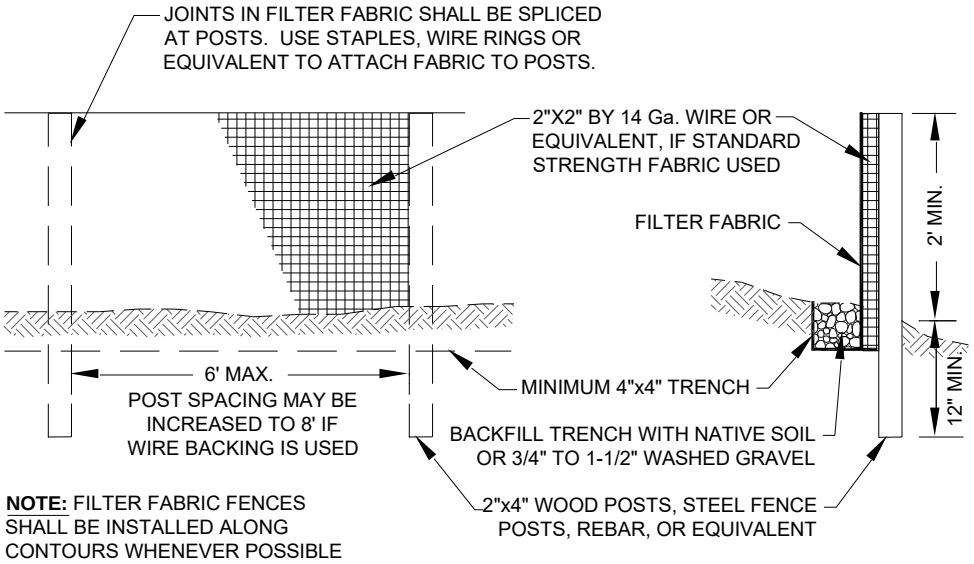
AOS (ASTM D4751)	30-100 sieve size (0.60-0.15 mm) for slit film 50-100 sieve size (0.30-0.15 mm) for other fabrics
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632) (see Specification Note 3)	180 lbs. min. for extra strength fabric 100 lbs. min. for standard strength fabric
Grab Tensile Elongation (ASTM D4632)	30% max. (woven)
Ultraviolet Resistance (ASTM D4355)	70% min.

3. Standard strength fabric requires wire backing to increase the strength of the fence. Wire backing or closer post spacing may be required for extra strength fabric if field performance warrants a stronger fence.
4. Where the fence is installed, the slope shall be no steeper than 2H:1V.
5. If a typical silt fence (per Figure D.2.1.3.A) is used, the standard 4 x 4 trench may be reduced as long as the bottom 8 inches of the silt fence is well buried and secured in a trench that stabilizes the fence and does not allow water to bypass or undermine the silt fence.

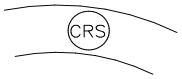
Maintenance Standards

1. Any damage shall be repaired immediately.
2. If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment trap or pond.
3. It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
4. Sediment must be removed when the sediment is 6 inches high.
5. If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.

FIGURE D.2.1.3.A SILT FENCE



D.2.1.4.2 CONSTRUCTION ROAD/PARKING AREA STABILIZATION

Code: CRS Symbol: 

Purpose

Stabilizing subdivision roads, parking areas and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Conditions of Use

1. Roads or parking areas shall be stabilized wherever they are constructed, whether permanent or temporary, for use by construction traffic.
2. Fencing (see Section D.2.1.1) shall be installed, if necessary, to limit the access of vehicles to only those roads and parking areas that are stabilized.

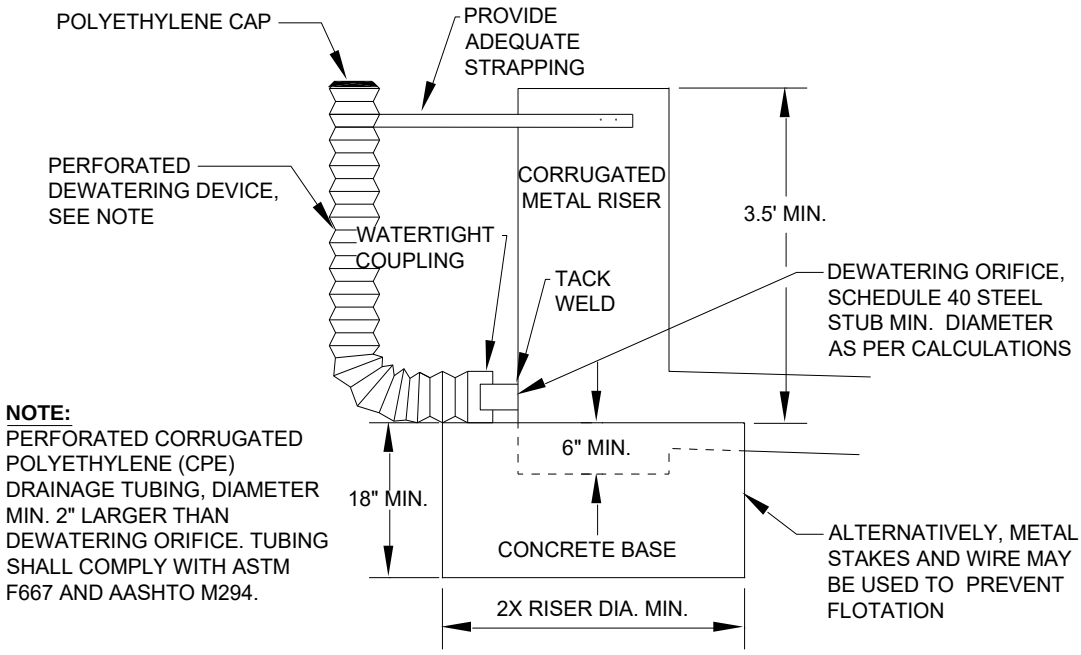
Design and Installation Specifications

1. A 6-inch depth of 2- to 4-inch **crushed rock, gravel base, or crushed surfacing base course** shall be applied immediately after grading or utility installation. A 4-inch course of asphalt treated base (ATB) may also be used, or the road/parking area may be paved. It may also be possible to use cement or calcium chloride for soil stabilization. If the area will not be used for permanent roads, parking areas, or structures, a 6-inch depth of hog fuel may also be used, but this is likely to require more maintenance. Whenever possible, construction roads and parking areas shall be placed on a firm, compacted subgrade. *Note: If the area will be used for permanent road or parking installation later in the project, the subgrade will be subject to inspection.*
2. **Temporary road gradients** shall not exceed 15 percent. Roadways shall be carefully graded to drain transversely. Drainage ditches shall be provided on each side of the roadway in the case of a crowned section, or on one side in the case of a super-elevated section. Drainage ditches shall be designed in accordance with the standards given in Section D.2.1.6.4 (p. D-64) and directed to a sediment pond or trap.
3. Rather than relying on ditches, it may also be possible to **grade the road** so that runoff sheet-flows into a heavily vegetated area with a well-developed topsoil. Landscaped areas are not adequate. If this area has at least 50 feet of vegetation, then it is generally preferable to use the vegetation to treat runoff, rather than a sediment pond or trap. The 50 feet shall not include vegetated wetlands. If runoff is allowed to sheet flow through adjacent vegetated areas, it is vital to design the roadways and parking areas so that no concentrated runoff is created.
4. In order to control construction traffic, the County may require that **signs** be erected on site informing construction personnel that vehicles, other than those performing clearing and grading, are restricted to stabilized areas.
5. If construction roads do not adequately reduce trackout to adjacent property or roadways, a wheel wash system will be required.

Maintenance Standards

Crushed rock, gravel base, hog fuel, etc. shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded.

FIGURE D.2.1.5.D SEDIMENT POND RISER DETAIL



D.2.1.5.3 STORM DRAIN INLET PROTECTION

Code: FFP or CBI or CBP Symbol:  or  or 

Purpose

Storm drain inlets are protected to prevent coarse sediment from entering storm drainage systems. Temporary devices around storm drains assist in improving the quality of water discharged to inlets or catch basins by ponding sediment-laden water. These devices are effective only for relatively small drainage areas.

Conditions of Use

1. Protection shall be provided for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless the runoff that enters the catch basin will be conveyed to a sediment pond or trap.
2. Inlet protection may be used anywhere at the applicant's discretion to protect the drainage system. This will, however, require more maintenance, and it is highly likely that the drainage system will still require some cleaning.
3. The contributing drainage area must not be larger than one acre.

Design and Installation Specifications

1. There are many options **for protecting storm drain inlets**. Two commonly used options are filter fabric protection and catch basin inserts. *Filter fabric protection* (see Figure D.2.1.5.E) is filter fabric (geotextile) placed *over* the grate. This method is generally very ineffective and requires intense maintenance efforts. *Catch basin inserts* (see Figure D.2.1.5.F) are manufactured devices that nest inside a catch basin. This method also requires a high frequency of maintenance to be effective. Both

options provide adequate protection, but filter fabric is likely to result in ponding of water above the catch basin, while the insert will not. Thus, filter fabric is only allowed where ponding will not be a traffic concern and where slope erosion will not result if the curb is overtopped by ponded water.

Trapping sediment in the catch basins is unlikely to improve the water quality of runoff if it is treated in a pond or trap because the coarse particles that are trapped at the catch basin settle out very quickly in the pond or trap. **Catch basin protection normally only improves water quality where there is no treatment facility downstream**. In these circumstances, catch basin protection is an important last line of defense. It is not, however, a substitute for preventing erosion.

The placement of filter fabric *under* grates is generally prohibited and the use of filter fabric over grates is strictly limited and discouraged.

2. It is sometimes possible to construct a small sump around the catch basin before final surfacing of the road. This is allowed because it can be a very effective method of sediment control.

3. Block and gravel filters, gravel and wire mesh filter barriers, and bag barriers filled with various filtering media placed around catch basins can be effective when the drainage area is 1 acre or less and flows do not exceed 0.5 cfs. It is necessary to allow for overtopping to prevent flooding. Many manufacturers have various inlet protection filters that are very effective in keeping sediment-laden water from entering the storm drainage system. The following are examples of a few common methods.

   a) **Block and gravel filters** (Figure D.2.1.5.G) are a barrier formed around an inlet with standard concrete block and gravel, installed as follows:

      - Height is 1 to 2 feet above the inlet.
      - Recess the first row of blocks 2 inches into the ground for stability.
      - Support subsequent rows by placing a 2x4 through the concrete block opening.
      - Do not use mortar.
      - Lay some blocks in the bottom row on their side for dewatering the pooled water.
      - Place cloth or mesh with ½ inch openings over all block openings.
      - Place gravel below the top of blocks on slopes of 2:1 or flatter.
      - An alternate design is a gravel donut.

   b) **Gravel and wire mesh filters** consist of a gravel barrier placed over the top of an inlet. This structure generally does not provide overflow. Install as follows:

      - Cloth or comparable wire mesh with ½ inch openings is placed over inlet.
      - Coarse aggregate covers the cloth or mesh.
      - Height/depth of gravel should be 1 foot or more, 18 inches wider than inlet on all sides.

   c) **Curb inlet protection with a wooden weir** is a barrier formed around an inlet with a wooden frame and gravel, installed as follows:

      - Construct a frame and attach wire mesh (½ inch openings) and filter fabric to the frame.
      - Pile coarse washed aggregate against the wire/fabric.
      - Place weight on frame anchors.

   d) **Curb and gutter sediment barriers** (Figure D.2.1.5.H) consist of sandbags or rock berms (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape, installed as follows:

      - Bags of either burlap or woven geotextile fabric, filled with a variety of media such as gravel, wood chips, compost or sand stacked tightly allows water to pond and allows sediment to separate from runoff.

- Leave a "one bag gap" in the top row of the barrier to provide a spillway for overflow.
- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 x 3 and at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm to sediment trap standards for protecting a culvert inlet.

4. **Excavated drop inlet sediment traps** are appropriate where relatively heavy flows are expected and overflow capability is needed. If emergency overflow is provided, additional end-of-pipe treatment may be required. Excavated drop inlets consist of an excavated impoundment area around a storm drain. Sediment settles out of the stormwater prior to enter the drain. Install according to the following specifications:

   a) The impoundment area should have a depth of 1 - 2 feet measured from the crest of the inlet structure.

   b) Side slopes of the excavated area must be no steeper than 2:1.

   c) Minimum volume of the excavated area should be 35 cubic yards.

   d) Install provisions for draining the area to prevent standing water problems.

   e) Keep the area clear of debris.

   f) Weep holes may be drilled into the side of the inlet.

   g) Protect weep holes with wire mesh and washed aggregate.

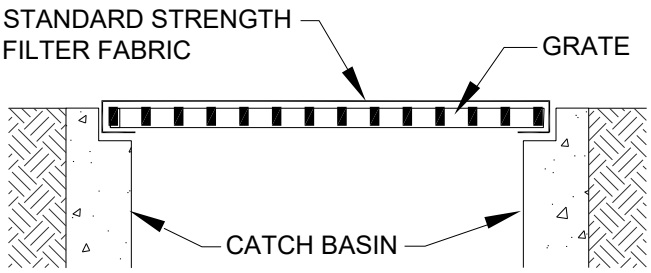
   h) Weep holes must be sealed when removing and stabilizing excavated area.

   i) A temporary dike may be necessary on the down slope side of the structure to prevent bypass flow.

Maintenance Standards

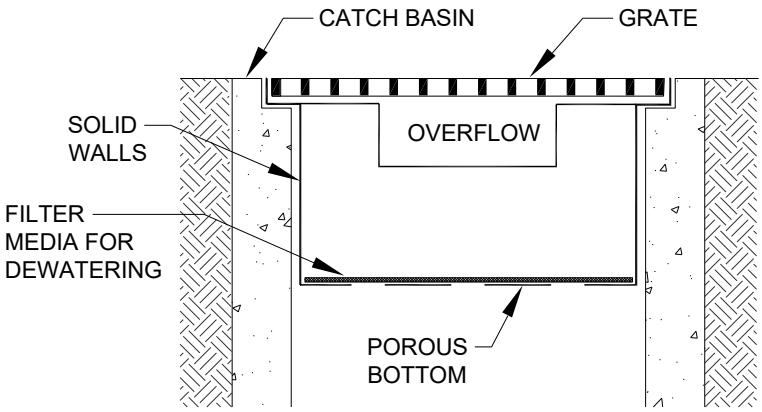
1. Any accumulated sediment on or around inlet protection shall be removed immediately. Sediment shall not be removed with water, and all sediment must be disposed of as fill on site or hauled off site.
2. Any sediment in the catch basin insert shall be removed when the sediment has filled one-third of the available storage. The filter media for the insert shall be cleaned or replaced at least monthly.
3. Regular maintenance is critical for all forms of catch basin/inlet protection. Unlike many forms of protection that fail gradually, catch basin protection will fail suddenly and completely if not maintained properly.

FIGURE D.2.1.5.E FILTER FABRIC PROTECTION



NOTE: ONLY TO BE USED WHERE PONDING OF WATER ABOVE THE CATCH BASIN WILL NOT CAUSE TRAFFIC PROBLEMS AND WHERE OVERFLOW WILL NOT RESULT IN EROSION OF SLOPES.

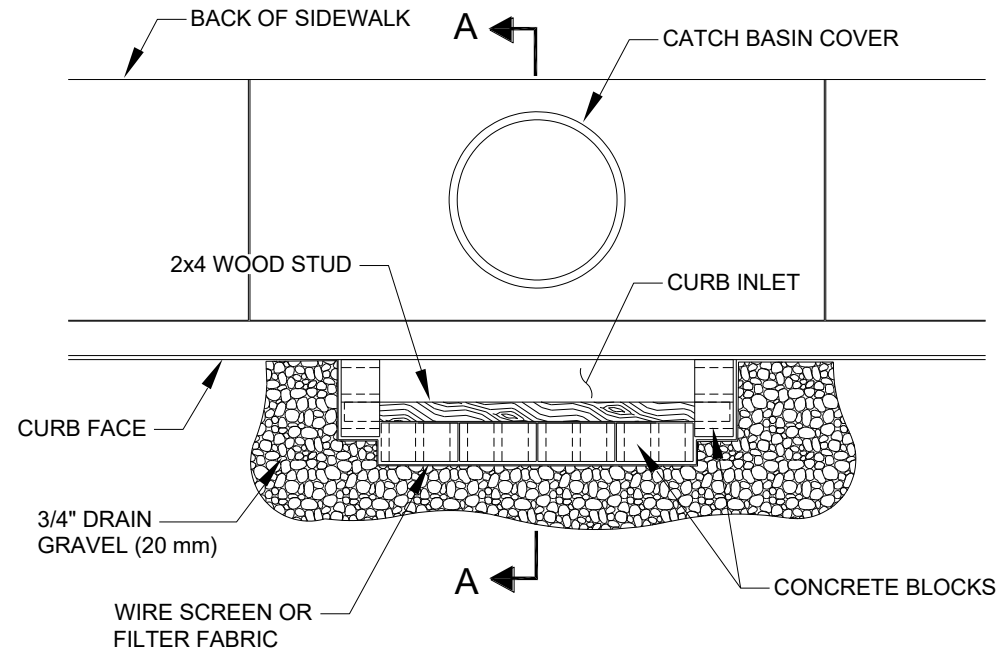
FIGURE D.2.1.5.F CATCH BASIN INSERT



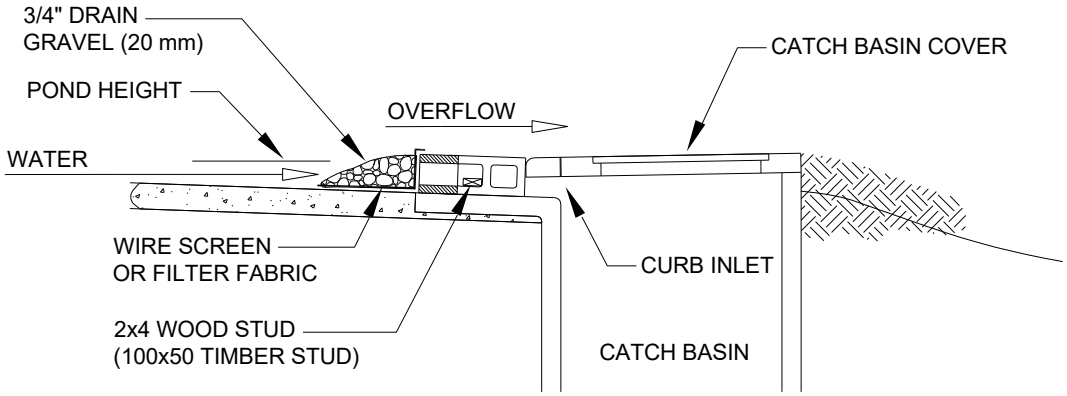
NOTE: THIS DETAIL IS ONLY SCHEMATIC. ANY INSERT IS ALLOWED THAT HAS:

- A MIN. 0.5 C.F. OF STORAGE,
- THE MEANS TO DEWATER THE STORED SEDIMENT,
- AN OVERFLOW, AND
- CAN BE EASILY MAINTAINED.

FIGURE D.2.1.5.G BLOCK AND GRAVEL CURB INLET PROTECTION



PLAN VIEW
NTS



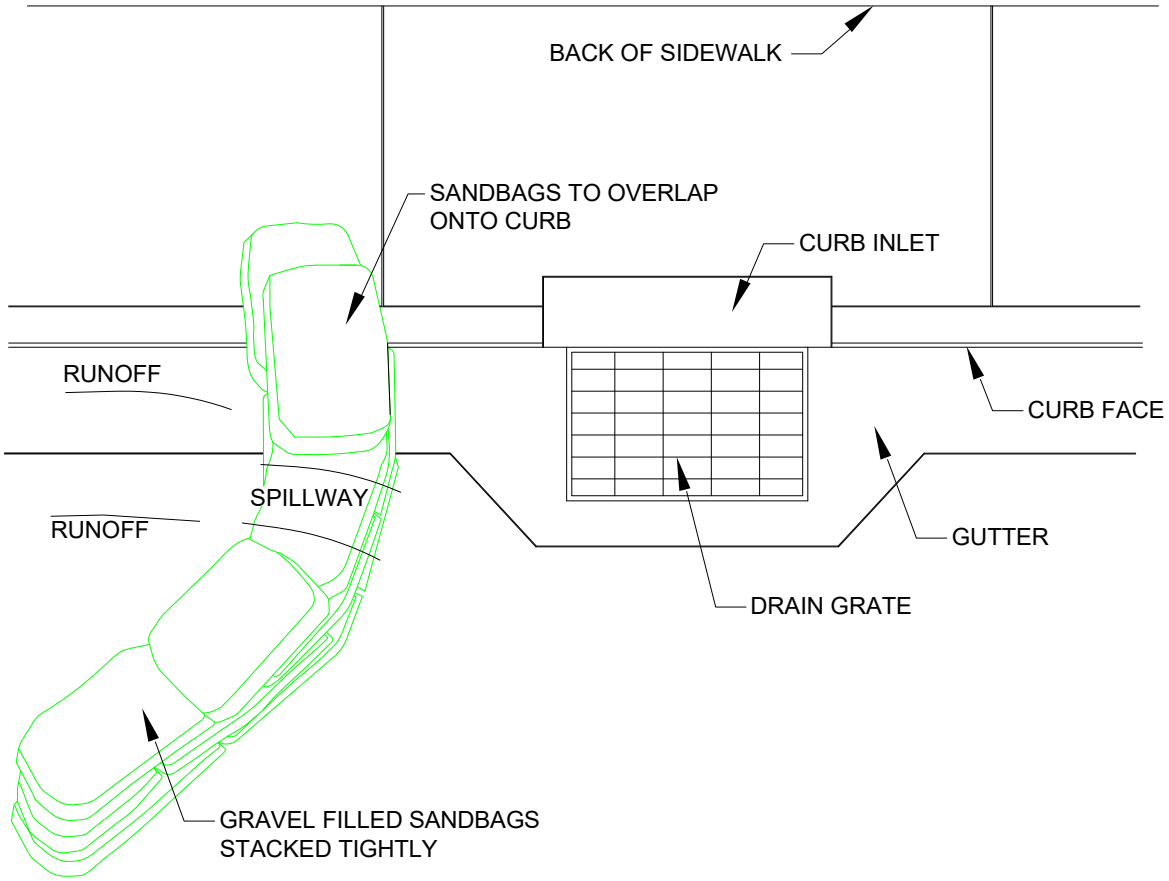
SECTION A-A
NTS

NOTES:

1. USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

BLOCK AND GRAVEL CURB INLET PROTECTION
NTS

FIGURE D.2.1.5.H CURB AND GUTTER BARRIER PROTECTION



PLAN VIEW
NTS

NOTES:

1. PLACE CURB-TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
3. LEAVE A ONE-SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

CURB AND GUTTER BARRIER
NTS

Section 9 – Bond Quantities, Facility Summaries, and Declaration of Covenant

In order to establish an appropriate bond amount, a Site Improvement Bond Quantities Worksheet is included in Figure 9-1. A Declaration of Covenant for the proposed project has been included under separate cover.

Section 9 – Figures

9-1 BOND QUANTITY WORKSHEET

FIGURE 9-1: Site Improvement Bond Quantity Worksheet

King County

King County Permittng
919 SW Grady Way, Suite 300
Renton, WA 98057
206-296-6600 TTY Relay 711

For alternate formats, call 206-296-6600.

Project Name:	Timbercrest Middle School Field Renovation	**Date:**	02.27.2026
Location:	19115 215th Way NE, Woodinville WA 98077	**Project No.:**	24161
		Activity No.:	NA

Clearing greater than or equal to 5,000 board feet of timber?

yes X no

If yes,
Forest Practice Permit Number: _____
(RCW 76.09)

Note: All prices include labor, equipment, materials, overhead and profit. Prices are from RS Means data adjusted for the Seattle area or from local sources if not included in the RS Means database.

Site Improvement Bond Quantity Worksheet

		Reference #	Unit Price	Unit	Quantity	# of Applications	Cost
EROSION/SEDIMENT CONTROL	**Number**						
Backfill & compaction-embankment	**ESC-1**		$ 7.65	CY			
Check dams, 4" minus rock	**ESC-2**	SWDM 5.4.6.3	$ 105.00	Each			
Crushed surfacing 1 1/4" minus	**ESC-3**	WSDOT 9-03.9(3)	$ 122.00	CY			
Ditching	**ESC-4**		$ 11.50	CY			
Excavation-bulk	**ESC-5**		$ 2.75	CY			
Fence, silt	**ESC-6**	SWDM 5.4.3.1	$ 2.00	LF	960	1	1920
Fence, Temporary (NGPE)	**ESC-7**		$ 2.00	LF			
Hydroseeding	**ESC-8**	SWDM 5.4.2.4	$ 1.10	SY			
Jute Mesh	**ESC-9**	SWDM 5.4.2.2	$ 4.50	SY			
Mulch, by hand, straw, 3" deep	**ESC-10**	SWDM 5.4.2.1	$ 3.25	SY			
Mulch, by machine, straw, 2" deep	**ESC-11**	SWDM 5.4.2.1	$ 2.75	SY			
Piping, temporary, CPP, 6"	**ESC-12**		$ 18.00	LF			
Piping, temporary, CPP, 8"	**ESC-13**		$ 20.50	LF			
Piping, temporary, CPP, 12"	**ESC-14**		$ 30.75	LF			
Plastic covering, 6mm thick, sandbagged	**ESC-15**	SWDM 5.4.2.3	$ 5.25	SY			
Rip Rap, machine placed; slopes	**ESC-16**	WSDOT 9-13.1(2)	$ 60.00	CY	50	1	3000
Rock Construction Entrance, 50'x15'x1'	**ESC-17**	SWDM 5.4.4.1	$ 2,300.00	Each			
Rock Construction Entrance, 100'x15'x1'	**ESC-18**	SWDM 5.4.4.1	$ 4,100.00	Each			
Sediment pond riser assembly	**ESC-19**	SWDM 5.4.5.2	$ 2,850.00	Each			
Sediment trap, 5' high berm	**ESC-20**	SWDM 5.4.5.1	$ 25.00	LF			
Sed. trap, 5' high, riprapped spillway berm section	**ESC-21**	SWDM 5.4.5.1	$ 89.50	LF			
Seeding, by hand	**ESC-22**	SWDM 5.4.2.4	$ 1.50	SY			
Sodding, 1" deep, level ground	**ESC-23**	SWDM 5.4.2.5	$ 10.25	SY			
Sodding, 1" deep, sloped ground	**ESC-24**	SWDM 5.4.2.5	$ 12.75	SY			
TESC Supervisor	**ESC-25**		$ 140.25	HR	100	1	14025
Water truck, dust control	**ESC-26**	SWDM 5.4.7	$ 178.50	HR			
Catch basin insert	**ESC-27**		$ 50.00	Each	17	1	850
WRITE-IN-ITEMS ** (see page 9)**							
				Each			

ESC SUBTOTAL:	$ 19,795.00
30% CONTINGENCY & MOBILIZATION:	$ 5,938.50
ESC TOTAL:	$ 25,733.50
COLUMN:	**A**

Unit prices updated: 5/21/2021
Version: 5/21/2021

Report Date: 2/27/2026

Site Improvement Bond Quantity Worksheet

Web date: 05/12/2021

				Existing Right-of-Way		Future Public Right of Way & Drainage Facilities		Private Improvements		
		Unit Price	Unit	Quant.	Cost	Quant.	Cost	Quant.	Cost	
GENERAL ITEMS	**No.**									
Backfill & Compaction- embankment	GI - 1	$ 7.65	CY							
Backfill & Compaction- trench	GI - 2	$ 11.48	CY							
Clear/Remove Brush, by hand	GI - 3	$ 1.28	SY							
Clearing/Grubbing/Tree Removal	GI - 4	$ 12,750.00	Acre					2	25,500.00	
Excavation - bulk	GI - 5	$ 2.55	CY					6500	16,575.00	
Excavation - Trench	GI - 6	$ 6.38	CY							
Fencing, cedar, 6' high	GI - 7	$ 25.50	LF							
Fencing, chain link, vinyl coated, 6' high	GI - 8	$ 25.50	LF					1000	25,500.00	
Fencing, chain link, gate, vinyl coated, 2(	GI - 9	$ 1,785.00	Each					2	3,570.00	
Fencing, split rail, 3' high	GI - 10	$ 2,439.00	LF							
Fill & compact - common barrow	GI - 11	$ 31.88	CY					4000	127,520.00	
Fill & compact - gravel base	GI - 12	$ 34.43	CY							
Fill & compact - screened topsoil	GI - 13	$ 49.75	CY							
Gabion, 12" deep, stone filled mesh	GI - 14	$ 82.90	SY							
Gabion, 18" deep, stone filled mesh	GI - 15	$ 114.75	SY							
Gabion, 36" deep, stone filled mesh	GI - 16	$ 191.25	SY							
Grading, fine, by hand	GI - 17	$ 3.20	SY							
Grading, fine, with grader	GI - 18	$ 2.55	SY					25000	63,750.00	
Monuments, 3' long	GI - 19	$ 318.75	Each							
Sensitive Areas Sign	GI - 20	$ 10.50	Each							
Sodding, 1" deep, sloped ground	GI - 21	$ 10.25	SY							
Surveying, line & grade	GI - 22	$ 1,083.75	Day							
Surveying, lot location/lines	GI - 23	$ 2,295.00	Acre							
Traffic control crew (2 flaggers)	GI - 24	$ 153.00	HR							
Trail, 4" chipped wood	GI - 25	$ 11.00	SY							
Trail, 4" crushed cinder	GI - 26	$ 12.00	SY							
Trail, 4" top course	GI - 27	$ 15.50	SY							
Wall, retaining, concrete	GI - 28	$ 71.00	SF					220	15,620.00	
Wall, rockery	GI - 29	$ 26.00	SF							
		SUBTOTAL							278,035.00	

*KCC 27A authorizes only two bond reduction.

TMS Bond Quantity

Unit prices updated: 05/12/2021

Version: 05/12/2021

Report Date: 2/27/2026

Site Improvement Bond Quantity Worksheet

				Existing Right-of-way		Future Public Right of Way & Drainage Facilities		Private Improvements		
		Unit Price	Unit	Quant.	Cost	Quant.	Cost	Quant.	Cost	
ROAD IMPROVEMENT	**No.**									
AC Grinding, 4' wide machine < 1000sy	RI - 1	$ 38.25	SY							
AC Grinding, 4' wide machine 1000-2000	RI - 2	$ 20.50	SY							
AC Grinding, 4' wide machine > 2000sy	RI - 3	$ 12.75	SY							
AC Removal/Disposal	RI - 4	$ 45.00	SY					120	5,400.00	
Barricade, type III (Permanent)	RI - 6	$ 71.50	LF							
Curb & Gutter, rolled	RI - 7	$ 22.00	LF							
Curb & Gutter, vertical	RI - 8	$ 16.00	LF					3075	49,200.00	
Curb and Gutter, demolition and disposal	RI - 9	$ 23.50	LF					3000	70,500.00	
Curb, extruded asphalt	RI - 10	$ 7.00	LF							
Curb, extruded concrete	RI - 11	$ 9.00	LF							
Sawcut, asphalt, 3" depth	RI - 12	$ 2.50	LF					65	162.50	
Sawcut, concrete, per 1" depth	RI - 13	$ 4.00	LF							
Sealant, asphalt	RI - 14	$ 3.00	LF							
Shoulder, AC, (see AC road unit price)	RI - 15	$ -	SY							
Shoulder, gravel, 4" thick	RI - 16	$ 20.00	SY							
Sidewalk, 4" thick	RI - 17	$ 48.50	SY					400	19,400.00	
Sidewalk, 4" thick, demolition and disposa	RI - 18	$ 43.00	SY							
Sidewalk, 5" thick	RI - 19	$ 52.50	SY							
Sidewalk, 5" thick, demolition and disposa	RI - 20	$ 51.00	SY							
Sign, handicap	RI - 21	$ 110.00	Each							
Striping, per stall	RI - 22	$ 9.00	Each							
Striping, thermoplastic, (for crosswalk)	RI - 23	$ 4.00	SF							
Striping, 4" reflectorized line	RI - 24	$ 0.70	LF							

SUBTOTAL 144,662.50

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Site Improvement Bond Quantity Worksheet

				Existing Right-of-way		Future Public Right of Way & Drainage Facilities		Private Improvements		
		Unit Price	Unit	Quant.	Cost	Quant.	Cost	Quant.	Cost	
ROAD SURFACING	**No.**	(4" Rock = 2.5 base & 1.5" top course) 9 1/2" Rock= 8" base & 1.5" top course)								
Additional 2.5" Crushed Surfacing	RS - 1	$ 4.75	SY							
HMA 1/2" Overlay, 1.5"	RS - 2	$ 18.00	SY							
HMA 1/2" Overlay 2"	RS - 3	$ 24.00	SY							
HMA Road, 2", 4" rock, First 2500 SY	RS - 4	$ 36.00	SY					200	7,200.00	
HMA Road, 2", 4" rock, Qty. over 2500 SY	RS - 5	$ 27.00	SY							
HMA Road, 3", 9 1/2" Rock, First 2500 SY	RS - 6	$ 54.00	SY							
HMA Road, 3", 9 1/2" Rock, Qty Over 250	RS - 7	$ 45.00	SY							
Not Used	RS - 8									
Not Used	RS - 9									
HMA Road, 6" Depth, First 2500 SY	RS - 10	$ 43.00	SY							
HMA Road, 6" Depth, Qty. Over 2500 SY	RS - 11	$ 38.50	SY							
HMA 3/4" or 1", 4" Depth	RS - 12	$ 20.00	SY							
Gravel Road, 4" rock, First 2500 SY	RS - 13	$ 20.00	SY							
Gravel Road, 4" rock, Qty. over 2500 SY	RS - 14	$ 13.00	SY							
PCC Road (Add Under Write-Ins w/Desig	RS - 15									
Thickened Edge	RS - 17	$ 11.25	LF							

SUBTOTAL 7,200.00

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				Existing Right-of-way		Future Public Right of Way & Drainage Facilities		Private Improvements		
		Unit Price	Unit	Quant.	Cost	Quant.	Cost	Quant.	Cost	
DRAINAGE (CPP = Corrugated Plastic Pipe, N12 or Equivalent)		For Culvert prices, Average of 4' cover was assumed. Assume perforated PVC is same price as solid pipe.								
Access Road, R/D	D - 1	$ 27.00	SY					150	4,050.00	
Bollards - fixed	D - 2	$ 307.00	Each							
Bollards - removable	D - 3	$ 577.00	Each							
* (CBs include frame and lid)										
CB Type I	D - 4	$ 1,915.00	Each					1	1,915.00	
CB Type IL	D - 5	$ 2,232.00	Each							
CB Type II, 48" diameter	D - 6	$ 2,950.00	Each					1	2,950.00	
for additional depth over 4'	D - 7	$ 615.00	FT					2	1,230.00	
CB Type II, 54" diameter	D - 8	$ 3,190.00	Each							
for additional depth over 4'	D - 9	$ 635.00	FT							
CB Type II, 60" diameter	D - 10	$ 3,570.00	Each							
for additional depth over 4'	D - 11	$ 765.00	FT							
CB Type II, 72" diameter	D - 12	$ 4,600.00	Each							
for additional depth over 4'	D - 13	$ 1,100.00	FT							
Through-curb Inlet Framework (Add)	D - 14	$ 525.00	Each							
Cleanout, PVC, 4"	D - 15	$ 192.00	Each							
Cleanout, PVC, 6"	D - 16	$ 217.00	Each					3	651.00	
Cleanout, PVC, 8"	D - 17	$ 255.00	Each							
Culvert, PVC, 4"	D - 18	$ 12.75	LF							
Culvert, PVC, 6"	D - 19	$ 16.60	LF							
Culvert, PVC, 8"	D - 20	$ 19.25	LF							
Culvert, PVC, 12"	D - 21	$ 29.50	LF							
Culvert, CMP, 8"	D - 22	$ 24.24	LF							
Culvert, CMP, 12"	D - 23	$ 37.00	LF							
Culvert, CMP, 15"	D - 24	$ 45.00	LF							
Culvert, CMP, 18"	D - 25	$ 52.50	LF							
Culvert, CMP, 24"	D - 26	$ 71.50	LF							
Culvert, CMP, 30"	D - 27	$ 99.50	LF							
Culvert, CMP, 36"	D - 28	$ 166.00	LF							
Culvert, CMP, 48"	D - 29	$ 242.50	LF							
Culvert, CMP, 60"	D - 30	$ 344.50	LF							
Culvert, CMP, 72"	D - 31	$ 446.50	LF							

SUBTOTAL 10,796.00

*KCC 27A authorizes only two bond reduction.

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Site Improvement Bond Quantity Worksheet

DRAINAGE CONTINUED				Existing Right-of-way		Future Public Right of Way & Drainage Facilities		Private Improvements		
	No.	Unit Price	Unit	Quant.	Cost	Quant.	Cost	Quant.	Cost	
Culvert, Concrete, 8"	D - 32	$ 32.00	LF							
Culvert, Concrete, 12"	D - 33	$ 46.00	LF							
Culvert, Concrete, 15"	D - 34	$ 54.00	LF							
Culvert, Concrete, 18"	D - 35	$ 61.50	LF							
Culvert, Concrete, 24"	D - 36	$ 100.00	LF							
Culvert, Concrete, 30"	D - 37	$ 160.00	LF							
Culvert, Concrete, 36"	D - 38	$ 192.00	LF							
Culvert, Concrete, 42"	D - 39	$ 225.00	LF							
Culvert, Concrete, 48"	D - 40	$ 262.00	LF							
Culvert, CPP, 6"	D - 41	$ 18.00	LF					207	3,726.00	
Culvert, CPP, 8"	D - 42	$ 20.50	LF					865	17,732.50	
Culvert, CPP, 12"	D - 43	$ 30.75	LF					575	17,681.25	
Culvert, CPP, 15"	D - 44	$ 44.75	LF							
Culvert, CPP, 18"	D - 45	$ 52.50	LF							
Culvert, CPP, 24"	D - 46	$ 71.50	LF							
Culvert, CPP, 30"	D - 47	$ 99.50	LF							
Culvert, CPP, 36"	D - 48	$ 165.75	LF							
Ditching	D - 49	$ 12.25	CY							
Flow Dispersal Trench (1,436 base+)	D - 50	$ 35.75	LF							
French Drain (3' depth)	D - 51	$ 33.50	LF							
Geotextile, laid in trench, polypropylene	D - 52	$ 4.00	SY							
Infilration Pond Testing	D-53	$ 96.00	HR							
Mid-tank Access Riser, 48" dia, 6' deep	D - 54	$ 2,550.00	Each							
Pond Overflow Spillway	D - 55	$ 21.00	SY							
Restrictor/Oil Separator, 12"	D - 56	$ 1,475.00	Each							
Restrictor/Oil Separator, 15"	D - 57	$ 1,725.00	Each							
Restrictor/Oil Separator, 18"	D - 58	$ 2,175.00	Each							
Riprap, placed	D - 59	$ 54.00	CY					50	2,700.00	
Tank End Reducer (36" diameter)	D - 60	$ 1,530.00	Each							
Trash Rack, 12"	D - 61	$ 450.00	Each							
Trash Rack, 15"	D - 62	$ 525.00	Each							
Trash Rack, 18"	D - 63	$ 625.00	Each							
Trash Rack, 21"	D - 64	$ 715.00	Each							

SUBTOTAL 41839.75

*KCC 27A authorizes only two bond reduction.

TMS Bond Quantity

Unit prices updated: 05/12/2021
Version: 05/12/2021
Report Date: 2/27/2026

Site Improvement Bond Quantity Worksheet

Web date: 05/12/2021

				Existing Right-of-way		Future Public Right of Way & Drainage Facilities		Private Improvements		
		Unit Price	Unit	Quant.	Price	Quant.	Cost	Quant.	Cost	
PARKING LOT SURFACING					Not To Be Used For Roads Or Shoulders					
	No.									
2" AC, 2" top course rock & 4" borrow	PL - 1	$ 27.00	SY	NA		NA				
2" AC, 1.5" top course & 2.5" base cours	PL - 2	$ 35.75	SY	NA		NA				
4" select borrow	PL - 3	$ 6.50	SY	NA		NA				
1.5" top course rock & 2.5" base course	PL - 4	$ 18.00	SY	NA		NA				
UTILITY POLES & STREET LIGHTING					Utility pole relocation costs must be accompanied by **Franchise Utility's Cost Estimate**					
Utility Pole(s) Relocation	UP-1	Lump Sum								
Street Light Poles w/Luminaires	UP-2	$ 9,575.00	Each							
WRITE-IN-ITEMS					Stormwater Vault, Pond Liners, and Proprietary items must be accompanied by **Cost Estimate, including all materials to install.**					
(Such as detention/water quality vaults.)	No.									
	WI - 1		Each							
	WI - 2		SY							
	WI - 3		CY							
	WI - 4		LF							
	WI - 5		FT							
	WI - 6									
	WI - 7									
	WI - 8									
	WI - 9									
	WI - 10									

SUBTOTAL			
SUBTOTAL (SUM ALL PAGES):			482,533.25
30% CONTINGENCY & MOBILIZATION:			144,759.98
GRANDTOTAL:			627,293.23
COLUMN:	**B**	**C**	**D**

*KCC 27A authorizes only two bond reduction.
TMS Bond Quantity

Unit prices updated: 05/12/2021
Version: 05/12/2021
Report Date: 2/27/2026

Site Improvement Bond Quantity Worksheet

Web date: 05/21/202

Original bond computations prepared by:

Name:	Timbercrest Middle School Field Renovation	**Date:**	2/27/2026
PE Registration Number:	57658	**Tel. #:**	253.318.8116
Firm Name:	Ethos Civil		
Address:	1901 65th Ave W Suite 250, Tacoma, WA 98466	**Project No:**	24161

FINANCIAL GUARANTEE REQUIREMENTS

		PERFORMANCE BOND* AMOUNT	MINIMUM BOND* AMOUNT REQUIRED FOR RECORDING OR TEMPORARY OCCUPANCY AT SUBSTANTIAL COMPLETION ***	PUBLIC ROAD & DRAINAGE MAINTENANCE/DEFECT BOND*
Stabilization/Erosion Sediment Control (ESC)	(A)	$ 25,733.5		
Existing Right-of-Way Improvements	(B)	$ -		
Future Public Right of Way & Drainage Facilities	(C)	$ -		
Private Improvements	(D)	$ 627,293.2		
Calculated Quantity Completed				
Total Right-of Way and/or Site Restoration Bond*/** (First $7,500 of bond* shall be cash.)	(A+B)	$ 25,733.5		
Performance Bond* Amount (A+B+C+D) = TOTAL	(T)	$ 653,026.7 (Minimum is $2000.)	T x 0.30 $ 195,908.0 (Minimum is $2000.)	
Maintenance/Defect Bond* Total				(B+C) x 0.25 = $ - (Minimum is $2000.)

NAME OF PERSON PREPARING BOND* REDUCTION: _____ Date: _____

*** NOTE:** The word "bond" as used in this document means a financial guarantee acceptable to King County.

**** NOTE:** KCC 27A authorizes right of way and site restoration bonds to be combined when both are required. The restoration requirement shall include the total cost for all TESC as a minimum, not a maximum. In addition, corrective work, both on- and off-site needs to be included. Quantities shall reflect worse case scenarios not just minimum requirements. For example, if a salmonid stream may be damaged, some estimated costs for restoration needs to be reflected in this amount. The 30% contingency and mobilization costs are computed in this quantity.

***** NOTE:** Per KCC 27A, total bond amounts remaining after reduction shall not be less than 30% of the original amount (T) or as revised by major design changes.

REQUIRED BOND* AMOUNTS ARE SUBJECT TO REVIEW AND MODIFICATION BY KING COUNTY

Check out the DDES Web site at www.kingcounty.gov/permits

Section 10 – Operations and Maintenance Plan

Section 10.1 – Facility Descriptions

Control Structure/Flow Restrictor

Control Structures regulate the rate and volume of water as it is released. They are catch basins or manholes with a restrictor device for controlling outflow from a facility to meet the desired performance. The restrictor device is typically a tee section with an orifice plate welded to the bottom (called a "FROP-T"). To meet performance requirements, one or more elbow sections with orifice plates may need to be mounted on the side of the tee section. The restrictor device may also be a weir section sized to meet performance requirements.

Catch Basins and Manholes

Catch basins collect surface drainage. Catch basins and manholes direct stormwater into storm conveyance pipes. They help prevent downstream drainage problems by trapping sediment and other debris that would otherwise flow downstream with the runoff. It is important to keep catch basins and manholes clean so that accumulated silt is not flushed out during a significant storm. Additionally, if the outflow pipe becomes blocked with debris, surface flooding will occur. All catch basins and manholes should be inspected at least once each year and after major storms.

Conveyance Pipes and Ditches

Pipes transport stormwater runoff from the proposed improvements to the detention pond. To work properly, pipes must be kept free of silt and other debris. If pipes become blocked, surface flooding will occur.

Fencing

Fencing is meant to discourage access to portions of a pond where steep side slopes (steeper than 3H:1V) increase the potential for slipping into the pond, and to guide those who have fallen into a pond to side slopes that are flat enough (flatter than 3H:1V and unfenced) to allow for easy escape.

Access Roads

Access roads allow for vehicular access to facilitate maintenance.

Bioretention BMP

A bioretention cell is made up of shallow depressions with a designed planting soil mix and a variety of plant material, including trees, shrubs, grasses, and/or other herbaceous plants.

Detention Pond

A bioretention cell is made up of shallow depressions with a designed planting soil mix and a variety of plant material, including trees, shrubs, grasses, and/or other herbaceous plants.

Section 10.2 – Maintenance Requirements

See Figure 10-1 for a copy of the Maintenance Requirements for control structures, catch basins, manholes, conveyance pipes, and ditches, fencing, access roads, and bioretention BMPs.

Section 10 – Figures

10-1 MAINTENANCE REQUIREMENTS FOR STORMWATER FACILITIES

NO. 1 – DETENTION PONDS

Maintenance Component	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Site	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Top or Side Slopes of Dam, Berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
Storage Area	Sediment accumulation	Accumulated sediment that exceeds 10% of the designed pond depth.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.
	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
Inlet/Outlet Pipe.	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering at the joints of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Emergency Overflow/Spillway	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.
	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger or any exposure of native soil on the spillway.	Spillway restored to design standards.

NO. 4 – CONTROL STRUCTURE/FLOW RESTRICTOR

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the structure opening or is blocking capacity of the structure by more than 10%.	No Trash or debris blocking or potentially blocking entrance to structure.
		Trash or debris in the structure that exceeds $^1/_3$ the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the structure.
		Deposits of garbage exceeding 1 cubic foot in volume.	No condition present which would attract or support the breeding of insects or rodents.
	Sediment	Sediment exceeds 60% of the depth from the bottom of the structure to the invert of the lowest pipe into or out of the structure or the bottom of the FROP-T section or is within 6 inches of the invert of the lowest pipe into or out of the structure or the bottom of the FROP-T section.	Sump of structure contains no sediment.
	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable).	Frame is even with curb.
		Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab.	Frame is sitting flush on top slab.
	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet, any evidence of soil particles entering structure through cracks, or maintenance person judges that structure is unsound.	Structure is sealed and structurally sound.
		Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering structure through cracks.	No cracks more than $^1/_4$ inch wide at the joint of inlet/outlet pipe.
	Settlement/ misalignment	Structure has settled more than 1 inch or has rotated more than 2 inches out of alignment.	Basin replaced or repaired to design standards.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the structure at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Ladder rungs missing or unsafe	Ladder is unsafe due to missing rungs, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
FROP-T Section	Damage	T section is not securely attached to structure wall and outlet pipe structure should support at least 1,000 lbs of up or down pressure.	T section securely attached to wall and outlet pipe.
		Structure is not in upright position (allow up to 10% from plumb).	Structure in correct position.
		Connections to outlet pipe are not watertight or show signs of deteriorated grout.	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed.
		Any holes—other than designed holes—in the structure.	Structure has no holes other than designed holes.
Cleanout Gate	Damaged or missing	Cleanout gate is missing.	Replace cleanout gate.

NO. 4 – CONTROL STRUCTURE/FLOW RESTRICTOR

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
		Cleanout gate is not watertight.	Gate is watertight and works as designed.
		Gate cannot be moved up and down by one maintenance person.	Gate moves up and down easily and is watertight.
		Chain/rod leading to gate is missing or damaged.	Chain is in place and works as designed.
Orifice Plate	Damaged or missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
	Deformed or damaged lip	Lip of overflow pipe is bent or deformed.	Overflow pipe does not allow overflow at an elevation lower than design
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering at the joints of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Metal Grates (If Applicable)	Unsafe grate opening	Grate with opening wider than $^{7}/_{8}$ inch.	Grate opening meets design standards.
	Trash and debris	Trash and debris that is blocking more than 20% of grate surface.	Grate free of trash and debris.
	Damaged or missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.
Manhole Cover/Lid	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open structure requires urgent maintenance.**	Cover/lid protects opening to structure.
	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to Remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 5 – CATCH BASINS AND MANHOLES

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure	Sediment	Sediment exceeds 60% of the depth from the bottom of the catch basin to the invert of the lowest pipe into or out of the catch basin or is within 6 inches of the invert of the lowest pipe into or out of the catch basin.	Sump of catch basin contains no sediment.
	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the catch basin opening or is blocking capacity of the catch basin by more than 10%.	No Trash or debris blocking or potentially blocking entrance to catch basin.
		Trash or debris in the catch basin that exceeds $^1/_3$ the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the catch basin.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within catch basin.
		Deposits of garbage exceeding 1 cubic foot in volume.	No condition present which would attract or support the breeding of insects or rodents.
	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable).	Frame is even with curb.
		Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab.	Frame is sitting flush on top slab.
	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet, any evidence of soil particles entering catch basin through cracks, or maintenance person judges that catch basin is unsound.	Catch basin is sealed and is structurally sound.
		Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	No cracks more than $^1/_4$ inch wide at the joint of inlet/outlet pipe.
	Settlement/ misalignment	Catch basin has settled more than 1 inch or has rotated more than 2 inches out of alignment.	Basin replaced or repaired to design standards.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the catch basin at the joint of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Inlet/Outlet Pipe	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering at the joints of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.

NO. 5 – CATCH BASINS AND MANHOLES

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Metal Grates (Catch Basins)	Unsafe grate opening	Grate with opening wider than $^{7}/_{8}$ inch.	Grate opening meets design standards.
	Trash and debris	Trash and debris that is blocking more than 20% of grate surface.	Grate free of trash and debris.
	Damaged or missing	Grate missing or broken member(s) of the grate. **Any open structure requires urgent maintenance.**	Grate is in place and meets design standards.
Manhole Cover/Lid	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open structure requires urgent maintenance.**	Cover/lid protects opening to structure.
	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to Remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift.	Cover/lid can be removed and reinstalled by one maintenance person.

NO. 6 – CONVEYANCE PIPES AND DITCHES

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Pipes	Sediment & debris accumulation	Accumulated sediment or debris that exceeds 20% of the diameter of the pipe.	Water flows freely through pipes.
	Vegetation/roots	Vegetation/roots that reduce free movement of water through pipes.	Water flows freely through pipes.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Damage to protective coating or corrosion	Protective coating is damaged; rust or corrosion is weakening the structural integrity of any part of pipe.	Pipe repaired or replaced.
	Damaged	Any dent that decreases the cross section area of pipe by more than 20% or is determined to have weakened structural integrity of the pipe.	Pipe repaired or replaced.
Ditches	Trash and debris	Trash and debris exceeds 1 cubic foot per 1,000 square feet of ditch and slopes.	Trash and debris cleared from ditches.
	Sediment accumulation	Accumulated sediment that exceeds 20% of the design depth.	Ditch cleaned/flushed of all sediment and debris so that it matches design.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Vegetation	Vegetation that reduces free movement of water through ditches.	Water flows freely through ditches.
	Erosion damage to slopes	Any erosion observed on a ditch slope.	Slopes are not eroding.
	Rock lining out of place or missing (If Applicable)	One layer or less of rock exists above native soil area 5 square feet or more, any exposed native soil.	Replace rocks to design standards.

NO. 8 – ENERGY DISSIPATERS

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed.
Site	Trash and debris	Trash and/or debris accumulation.	Dissipater clear of trash and/or debris.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
Rock Pad	Missing or moved Rock	Only one layer of rock exists above native soil in area five square feet or larger or any exposure of native soil.	Rock pad prevents erosion.
Dispersion Trench	Pipe plugged with sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed so that it matches design.
	Not discharging water properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench).	Water discharges from feature by sheet flow.
	Perforations plugged.	Over 1/4 of perforations in pipe are plugged with debris or sediment.	Perforations freely discharge flow.
	Water flows out top of "distributor" catch basin.	Water flows out of distributor catch basin during any storm less than the design storm.	No flow discharges from distributor catch basin.
	Receiving area over-saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
Gabions	Damaged mesh	Mesh of gabion broken, twisted or deformed so structure is weakened or rock may fall out.	Mesh is intact, no rock missing.
	Corrosion	Gabion mesh shows corrosion through more than ¼ of its gage.	All gabion mesh capable of containing rock and retaining designed form.
	Collapsed or deformed baskets	Gabion basket shape deformed due to any cause.	All gabion baskets intact, structure stands as designed.
	Missing rock	Any rock missing that could cause gabion to loose structural integrity.	No rock missing.
Manhole/Chamber	Worn or damaged post, baffles or side of chamber	Structure dissipating flow deteriorates to ½ or original size or any concentrated worn spot exceeding one square foot which would make structure unsound.	Structure is in no danger of failing.
	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch or any evidence of soil entering the structure through cracks, or maintenance inspection personnel determines that the structure is not structurally sound.	Manhole/chamber is sealed and structurally sound.
	Damaged pipe joints	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering the structure at the joint of the inlet/outlet pipes.	No soil or water enters and no water discharges at the joint of inlet/outlet pipes.

NO. 9 – FENCING

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Site	Erosion or holes under fence	Erosion or holes more than 4 inches high and 12-18 inches wide permitting access through an opening under a fence.	No access under the fence.
Wood Posts, Boards and Cross Members	Missing or damaged parts	Missing or broken boards, post out of plumb by more than 6 inches or cross members broken	No gaps on fence due to missing or broken boards, post plumb to within 1½ inches, cross members sound.
	Weakened by rotting or insects	Any part showing structural deterioration due to rotting or insect damage	All parts of fence are structurally sound.
	Damaged or failed post foundation	Concrete or metal attachments deteriorated or unable to support posts.	Post foundation capable of supporting posts even in strong wind.
Metal Posts, Rails and Fabric	Damaged parts	Post out of plumb more than 6 inches.	Post plumb to within 1½ inches.
		Top rails bent more than 6 inches.	Top rail free of bends greater than 1 inch.
		Any part of fence (including post, top rails, and fabric) more than 1 foot out of design alignment.	Fence is aligned and meets design standards.
		Missing or loose tension wire.	Tension wire in place and holding fabric.
	Deteriorated paint or protective coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.	Structurally adequate posts or parts with a uniform protective coating.
	Openings in fabric	Openings in fabric are such that an 8-inch diameter ball could fit through.	Fabric mesh openings within 50% of grid size.

NO. 11 – GROUNDS (LANDSCAPING)

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Site	Trash or litter	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Trees and Shrubs	Hazard	Any tree or limb of a tree identified as having a potential to fall and cause property damage or threaten human life. **A hazard tree identified by a qualified arborist must be removed as soon as possible.**	No hazard trees in facility.
	Damaged	Limbs or parts of trees or shrubs that are split or broken which affect more than 25% of the total foliage of the tree or shrub.	Trees and shrubs with less than 5% of total foliage with split or broken limbs.
		Trees or shrubs that have been blown down or knocked over.	No blown down vegetation or knocked over vegetation. Trees or shrubs free of injury.
		Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Tree or shrub in place and adequately supported; dead or diseased trees removed.

NO. 12 – ACCESS ROADS

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Site	Trash and debris	Trash and debris exceeds 1 cubic foot per 1,000 square feet (i.e., trash and debris would fill up one standards size garbage can).	Roadway drivable by maintenance vehicles.
		Debris which could damage vehicle tires or prohibit use of road.	Roadway drivable by maintenance vehicles.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Blocked roadway	Any obstruction which reduces clearance above road surface to less than 14 feet.	Roadway overhead clear to 14 feet high.
		Any obstruction restricting the access to a 10- to 12 foot width for a distance of more than 12 feet or any point restricting access to less than a 10 foot width.	At least 12-foot of width on access road.
Road Surface	Erosion, settlement, potholes, soft spots, ruts	Any surface defect which hinders or prevents maintenance access.	Road drivable by maintenance vehicles.
	Vegetation on road surface	Trees or other vegetation prevent access to facility by maintenance vehicles.	Maintenance vehicles can access facility.
Shoulders and Ditches	Erosion	Erosion within 1 foot of the roadway more than 8 inches wide and 6 inches deep.	Shoulder free of erosion and matching the surrounding road.
	Weeds and brush	Weeds and brush exceed 18 inches in height or hinder maintenance access.	Weeds and brush cut to 2 inches in height or cleared in such a way as to allow maintenance access.
Modular Grid Pavement	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Damaged or missing	Access surface compacted because of broken on missing modular block.	Access road surface restored so road infiltrates.

NO. 23 – COALESCING PLATE OIL/WATER SEPARATOR

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and cover access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

NO. 24 – CATCH BASIN INSERT

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Media Insert	Visible Oil	Visible oil sheen passing through media	Media inset replaced.
	Insert does not fit catch basin properly	Flow gets into catch basin without going through media.	All flow goes through media.
	Filter media plugged	Filter media plugged.	Flow through filter media is normal.
	Oil absorbent media saturated	Media oil saturated.	Oil absorbent media replaced.
	Water saturated	Catch basin insert is saturated with water, which no longer has the capacity to absorb.	Insert replaced.
	Service life exceeded	Regular interval replacement due to typical average life of media insert product, typically one month.	Media replaced at manufacturer's recommended interval.
	Seasonal maintenance	When storms occur and during the wet season.	Remove, clean and replace or install new insert after major storms, monthly during the wet season or at manufacturer's recommended interval.

NO. 31 – BIORETENTION BMP

Maintenance Component	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Preventative	Vegetation	Vegetation to be watered and pruned as needed and mulch applied to a minimum of 2 inches to maintain healthy growth.	Healthy vegetation growth with full coverage as designed.
Bioretention Area	Trash and debris	Trash and debris in the bioretention area; leaf drop in the fall season.	No trash or debris In the bioretention area.
	Sediment accumulation	Sediment accumulation in the bioretention area interfering with infiltration.	Water in the bioretention infiltrates as designed.
	Ponding	Standing water in the bioretention area for more than two days.	Standing water infiltrates at the desired rate.
	Inflow	Inflow not getting into bioretention; debris/sediment blockage at inlet features; native soil is exposed or other signs of erosion damage is present.	Unobstructed and properly routed inflow into bioretention area; inlet is stabilized and appropriately armored.
	Overflow outlet	Overflow water not controlled by outlet features; native soil is exposed or other signs of erosion damage is present.	Outlet features control overflow; overflow is stabilized and appropriately armored.
	Underdrain	Underdrain is not flowing when bioretention area has been infiltrating water.	Underdrain flows freely when water is present.
Vegetation	Plant health	Plants not thriving across at least 80% of the entire design vegetated area within the BMP; overly dense vegetation requiring pruning.	Healthy water tolerant plants in bioretention area, plants thriving across at least 80% of the entire design vegetated area within the facility.
	Plant species	Plants not water tolerant species.	Plants are water tolerant.
	Weeds	Weeds growing in bioretention area.	No weeds in bioretention area.
	Watering	Planting schedule requires frequent watering (approx. weekly Year 1, bimonthly Years 2 and 3) for new facilities, and as needed for established plantings or dry periods	Plants are established and thriving
	Pest Control	Signs of pests, such as wilting or chewed leaves or bark, spotting or other indicators; extended ponding period encouraging mosquitoes	Plant community is pest-free when following an approved Integrated Pest Management plan; bioretention functioning normally and ponding controlled as needed for pest control
Containment Berm and Earthen Slopes	Erosion;	Erosion occurring at earthen slopes or containment berm side slope.	Erosion on the containment berm and side slopes has been repaired and the cause of the erosion corrected.
	Voids created by nuisance animals (e.g., rodents) or tree roots	Voids affecting berm integrity or creating leaky pond condition	Voids have been repaired; facility is free of nuisance animals following an approved Integrated Pest Management plan.
	Settlement	Any part of the containment berm top has less than 6 inches of freeboard from the maximum pond level to the top of the berm.	A minimum of 6 inches freeboard from the maximum pond level to the top of the berm.
Amended Soil	Soil nutrients	Soil not providing plant nutrients.	Soil providing plant nutrients.
	Bare spots	Bare spots on soil in bioretention area.	No bare spots, bioretention area covered with vegetation or mulch mixed into the underlying soil.
	Compaction	Poor infiltration due to soil compaction in the bioretention area.	No soil compaction in the bioretention area.
Inspection	Frequency	Annually and after large storms, and as needed seasonally for pruning, plant maintenance, pest control and to control leaf drop, evergreen needles etc.	Bioretention facility is functioning normally; plant community is thriving and pest-free.

Section 11 – Conclusion

The Timbercrest Middle School Field Renovation project is designed to meet the requirements of the 2021 King County *Surface Water Design Manual* as amended in November 2024 and the 2016 King County Road Design and Construction Standards (KCRDCS). This analysis is based on data and records either supplied to or obtained by Ethos Civil. These documents are referenced within the text of the analysis. The analysis was prepared using procedures and practices within the standard accepted practices of the industry. We conclude that this project, as schematically represented, will not create any new problems within the downstream drainage system. This project will not noticeably aggravate any existing downstream problems due to either water quality or quantity.

Appendix A

GEOTECHNICAL REPORT

Provided under separate cover.

Appendix B

VARD25-0014 DECISION: CR #9 FLOW CONTROL BMPS VARIANCE

Provided under separate cover.

VARD25-0028 DECISION: CR #8 WATER QUALITY (PRESETTLING) VARIANCE

Provided under separate cover.

Appendix C

TEMPORARY SEDIMENT POND CALCULATIONS

WWHM2012

PROJECT REPORT

TEMPORARY
SEDIMENT POND
CALCULATIONS

General Model Information

WWHM2012 Project Name: TCMS_Temp_Sediment_Pond
Site Name:
Site Address:
City:

Report Date:	2/27/2026
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	3.87
Pervious Total	3.87
Impervious Land Use	acre
Impervious Total	0
Basin Total	3.87

Mitigated Land Use

Basin 1

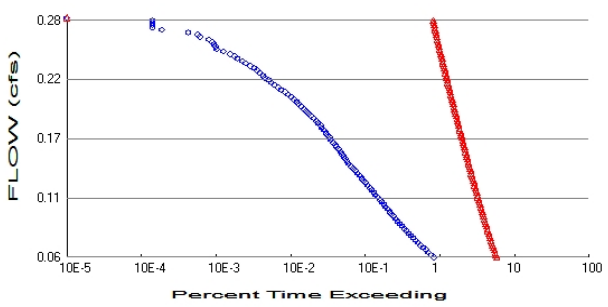
Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Lawn, Flat	0.64
Pervious Total	0.64
Impervious Land Use	acre
ROADS FLAT	3.23
Impervious Total	3.23
Basin Total	3.87

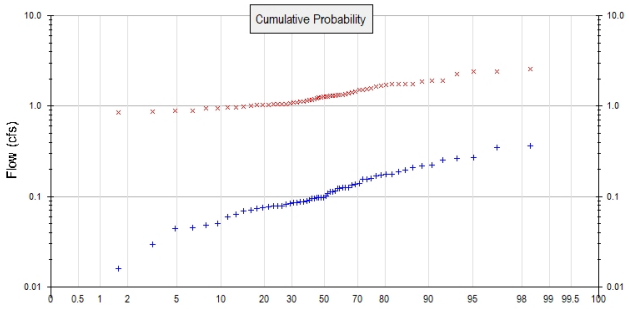
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 3.87
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.64
Total Impervious Area: 3.23

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.113781
5 year	0.178698
10 year	0.215487
25 year	0.254462
50 year	0.27858
100 year	0.299094

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.272412
5 year	1.62163
10 year	1.860537
25 year	2.172113
50 year	2.411718
100 year	2.658055

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.112	1.688
1950	0.139	1.738
1951	0.251	1.052
1952	0.079	0.893
1953	0.064	0.965
1954	0.098	1.036
1955	0.156	1.165
1956	0.124	1.149
1957	0.100	1.329
1958	0.113	1.045

1959	0.097	1.044
1960	0.169	1.086
1961	0.096	1.128
1962	0.059	0.957
1963	0.082	1.092
1964	0.107	1.034
1965	0.077	1.375
1966	0.074	0.896
1967	0.155	1.552
1968	0.097	1.766
1969	0.094	1.251
1970	0.078	1.187
1971	0.083	1.416
1972	0.187	1.515
1973	0.085	0.856
1974	0.092	1.305
1975	0.125	1.439
1976	0.090	1.010
1977	0.011	1.048
1978	0.079	1.287
1979	0.048	1.765
1980	0.177	1.701
1981	0.071	1.324
1982	0.136	1.894
1983	0.122	1.500
1984	0.075	0.962
1985	0.045	1.324
1986	0.197	1.130
1987	0.174	1.738
1988	0.069	1.042
1989	0.045	1.303
1990	0.365	2.435
1991	0.220	1.903
1992	0.085	0.953
1993	0.088	0.813
1994	0.030	0.869
1995	0.127	1.170
1996	0.267	1.291
1997	0.223	1.241
1998	0.050	1.216
1999	0.209	2.573
2000	0.088	1.264
2001	0.016	1.350
2002	0.096	1.656
2003	0.123	1.287
2004	0.159	2.397
2005	0.114	1.098
2006	0.135	0.979
2007	0.271	2.251
2008	0.349	1.869
2009	0.171	1.593

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3647	2.5728
2	0.3492	2.4351
3	0.2707	2.3975

4	0.2666	2.2507
5	0.2506	1.9034
6	0.2229	1.8945
7	0.2196	1.8694
8	0.2090	1.7660
9	0.1972	1.7654
10	0.1866	1.7383
11	0.1768	1.7376
12	0.1744	1.7013
13	0.1715	1.6878
14	0.1694	1.6565
15	0.1592	1.5935
16	0.1564	1.5515
17	0.1547	1.5150
18	0.1394	1.5000
19	0.1359	1.4386
20	0.1347	1.4164
21	0.1265	1.3752
22	0.1246	1.3497
23	0.1244	1.3286
24	0.1230	1.3238
25	0.1219	1.3238
26	0.1142	1.3053
27	0.1131	1.3029
28	0.1118	1.2915
29	0.1075	1.2873
30	0.1004	1.2865
31	0.0981	1.2640
32	0.0970	1.2510
33	0.0965	1.2414
34	0.0964	1.2161
35	0.0956	1.1871
36	0.0944	1.1699
37	0.0920	1.1648
38	0.0901	1.1488
39	0.0882	1.1299
40	0.0880	1.1275
41	0.0848	1.0981
42	0.0847	1.0915
43	0.0833	1.0858
44	0.0816	1.0524
45	0.0791	1.0484
46	0.0790	1.0454
47	0.0779	1.0436
48	0.0770	1.0418
49	0.0752	1.0359
50	0.0740	1.0342
51	0.0707	1.0103
52	0.0688	0.9787
53	0.0639	0.9651
54	0.0595	0.9617
55	0.0504	0.9570
56	0.0478	0.9527
57	0.0449	0.8956
58	0.0446	0.8934
59	0.0296	0.8694
60	0.0158	0.8557
61	0.0107	0.8130

Duration Flows

The Duration Matching Failed

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0569	17545	123371	703	Fail
0.0591	16164	120162	743	Fail
0.0614	14968	117146	782	Fail
0.0636	13854	114216	824	Fail
0.0658	12814	111414	869	Fail
0.0681	11811	108676	920	Fail
0.0703	10900	106088	973	Fail
0.0726	10119	103565	1023	Fail
0.0748	9383	101212	1078	Fail
0.0770	8729	98923	1133	Fail
0.0793	8143	96699	1187	Fail
0.0815	7593	94496	1244	Fail
0.0838	7058	92357	1308	Fail
0.0860	6588	90325	1371	Fail
0.0882	6145	88272	1436	Fail
0.0905	5777	86347	1494	Fail
0.0927	5431	84529	1556	Fail
0.0950	5097	82646	1621	Fail
0.0972	4808	80764	1679	Fail
0.0994	4524	79032	1746	Fail
0.1017	4261	77363	1815	Fail
0.1039	4017	75695	1884	Fail
0.1062	3788	74134	1957	Fail
0.1084	3555	72615	2042	Fail
0.1106	3339	70989	2126	Fail
0.1129	3140	69535	2214	Fail
0.1151	2952	68123	2307	Fail
0.1174	2789	66733	2392	Fail
0.1196	2603	65343	2510	Fail
0.1218	2449	63931	2610	Fail
0.1241	2310	62691	2713	Fail
0.1263	2160	61364	2840	Fail
0.1285	2028	60188	2967	Fail
0.1308	1904	59012	3099	Fail
0.1330	1790	57793	3228	Fail
0.1353	1691	56573	3345	Fail
0.1375	1584	55461	3501	Fail
0.1397	1483	54306	3661	Fail
0.1420	1383	53237	3849	Fail
0.1442	1292	52167	4037	Fail
0.1465	1222	51205	4190	Fail
0.1487	1154	50178	4348	Fail
0.1509	1098	49216	4482	Fail
0.1532	1049	48296	4604	Fail
0.1554	997	47312	4745	Fail
0.1577	930	46456	4995	Fail
0.1599	884	45558	5153	Fail
0.1621	838	44660	5329	Fail
0.1644	790	43783	5542	Fail
0.1666	743	42927	5777	Fail
0.1689	713	42136	5909	Fail
0.1711	671	41345	6161	Fail
0.1733	631	40532	6423	Fail
0.1756	596	39805	6678	Fail

0.1778	565	38970	6897	Fail
0.1801	539	38222	7091	Fail
0.1823	497	37516	7548	Fail
0.1845	473	36767	7773	Fail
0.1868	436	36126	8285	Fail
0.1890	399	35398	8871	Fail
0.1912	368	34714	9433	Fail
0.1935	348	34094	9797	Fail
0.1957	323	33473	10363	Fail
0.1980	296	32875	11106	Fail
0.2002	272	32254	11858	Fail
0.2024	256	31677	12373	Fail
0.2047	235	31099	13233	Fail
0.2069	217	30522	14065	Fail
0.2092	197	29966	15211	Fail
0.2114	180	29410	16338	Fail
0.2136	158	28918	18302	Fail
0.2159	145	28404	19588	Fail
0.2181	129	27870	21604	Fail
0.2204	119	27378	23006	Fail
0.2226	109	26886	24666	Fail
0.2248	97	26372	27187	Fail
0.2271	91	25923	28486	Fail
0.2293	82	25474	31065	Fail
0.2316	76	25004	32900	Fail
0.2338	69	24576	35617	Fail
0.2360	61	24084	39481	Fail
0.2383	54	23656	43807	Fail
0.2405	48	23207	48347	Fail
0.2428	41	22822	55663	Fail
0.2450	38	22415	58986	Fail
0.2472	33	22030	66757	Fail
0.2495	27	21645	80166	Fail
0.2517	22	21248	96581	Fail
0.2539	21	20858	99323	Fail
0.2562	20	20538	102690	Fail
0.2584	19	20129	105942	Fail
0.2607	17	19791	116417	Fail
0.2629	13	19434	149492	Fail
0.2651	12	19132	159433	Fail
0.2674	9	18850	209444	Fail
0.2696	4	18527	463175	Fail
0.2719	3	18236	607866	Fail
0.2741	3	17913	597100	Fail
0.2763	3	17618	587266	Fail
0.2786	3	17312	577066	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

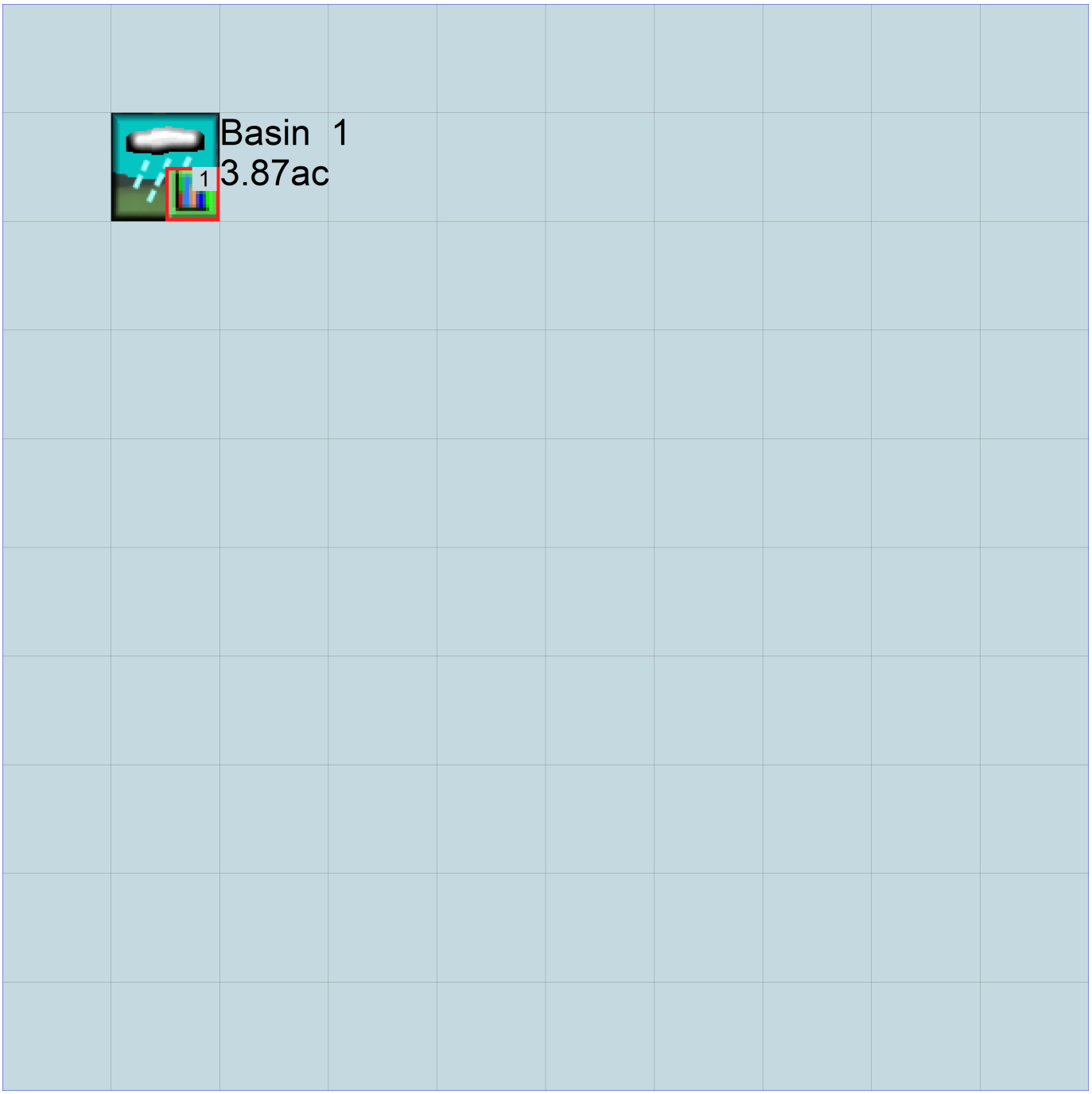
PERLND Changes

No PERLND changes have been made.

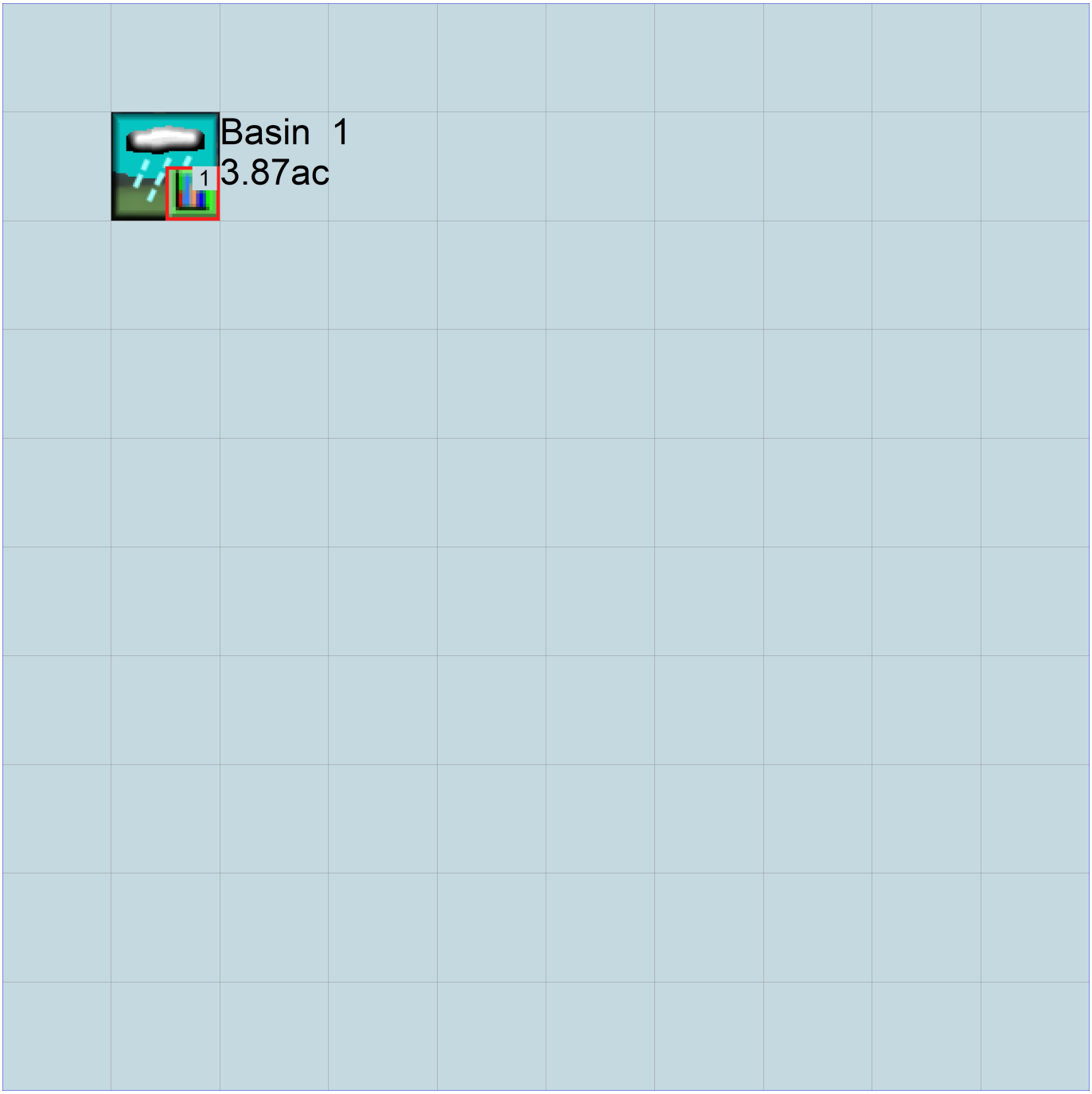
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TCMS_Temp_Sediment_Pond.wdm
MESSU       25   PreTCMS_Temp_Sediment_Pond.MES
            27   PreTCMS_Temp_Sediment_Pond.L61
            28   PreTCMS_Temp_Sediment_Pond.L62
            30   POCTCMS_Temp_Sediment_Pond1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                        3.87     COPY   501     12
PERLND  10                        3.87     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TCMS_Temp_Sediment_Pond.wdm
MESSU       25   MitTCMS_Temp_Sediment_Pond.MES
            27   MitTCMS_Temp_Sediment_Pond.L61
            28   MitTCMS_Temp_Sediment_Pond.L62
            30   POCTCMS_Temp_Sediment_Pond1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      16
      IMPLND       1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   16     C, Lawn, Flat           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   16         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   16         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   16         0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   16             0       4.5      0.03       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   16              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   16            0.1      0.25      0.25         6       0.5      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   16             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
```

```
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  16                        0.64     COPY   501     12
PERLND  16                        0.64     COPY   501     13
IMPLND   1                        3.23     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
```

```
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Appendix E
Traffic Memorandum

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WHAT TRANSPORTATION CAN BE.

MEMORANDUM

Date:	June 14, 2026	**TG:**	1.26046.00
To:	Scott Reynolds, King County		
From:	Mike Swenson, PE, PTOE & Brandon Alvarado, PTP – Transpo Group		
cc:	Nate Yates and William Tribble, Northshore School District Camie Anderson, Shockey Planning Group		
Subject:	Timbercrest Middle School Athletic Field Improvements Traffic Memorandum		

Timbercrest Middle School is planning to make athletic field and site improvements ("project"). This memorandum outlines the scope of the proposed site improvements and impacts on site related traffic levels.

Project Description

Timbercrest Middle School is part of the Northshore School District and is located at 19115 215th Way NE in Woodinville. An aerial showing the campus, including the athletic fields, is provided below. The proposed project includes replacing the existing cinder running track with a new six-lane rubberized track surface and converting the natural grass field to a synthetic turf system. New spectator seating with aluminum bleachers will be installed on a new concrete pad located closer to the track and field. Site accessibility will also be improved through the addition of concrete stairs with handrails and ADA-compliant accessible walkways. Maintenance and emergency vehicle access at the north end of the site will be modified to accommodate the renovated track and field layout. The upgraded athletic facilities and infrastructure will include:

- New multi-purpose synthetic athletic field designed for football, soccer, lacrosse and track and field events
- New six-lane rubberized running track for track and field events.
- Improved underdrainage system beneath the renovated track and field
- Construction of accessible walkways
- Bleacher pad with new bleachers (ADA and Code Compliant)
- Stairs to enhance site accessibility
- Construction of a bioretention facility with underdrains and bio-retention planting
- Grading and expansion of the existing drainage pond located north of the western ball field
- Stormwater and utility infrastructure improvements designed to meet current King County standards
- Removal and replacement of perimeter fencing around the track and field
- Restoration planting at areas of construction disturbance



Timbercrest Middle School – 19115 215th Way NE

Existing Traffic Activity

Traffic counts were conducted at the Timbercrest Middle School parking lot entrances on Tuesday May 12, 2026, and Thursday May 14, 2026, from 3:30 – 7:30 p.m. while events were being held at the athletic fields. These activities were primarily related to the baseball fields, which are not being modified as part of the project. Additionally, a count was conducted on Thursday May 21, 2026, from 3:30 – 7:30 p.m. while no events were being held at the athletic field. To determine the peak hour of traffic activity for Timbercrest Middle School overall, the inbound and outbound volumes at the north and south entrances were added together. The table below summarizes the traffic activity on each day.

Existing Traffic Activity at Timbercrest Middle School

Date of Count	Event Being Held?	Peak Hour Time	Peak Hour Volume[1]
Tuesday May 12, 2026	Yes	3:45 – 4:45 p.m.	216
Thursday May 14, 2026	Yes	3:30 – 4:30 p.m.	169
Thursday May 21, 2026	No	3:30 – 4:30 p.m.	153

1. Peak hour volume was calculated by adding the north Timbercrest Middle School parking lot entrance and south Timbercrest Middle School parking lot entrance inbound volumes (northbound left and southbound right) and outbound volumes (eastbound left and eastbound right).

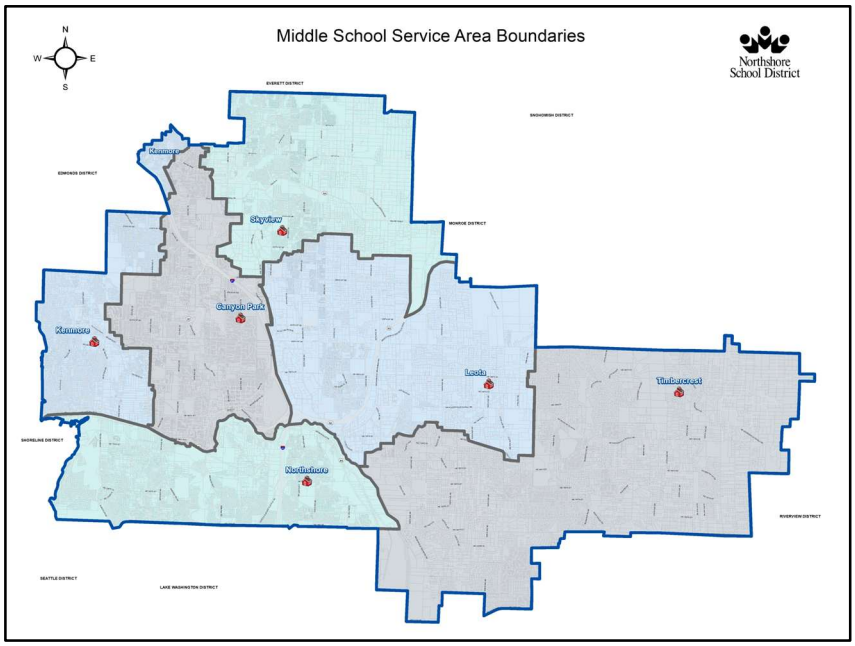
Without events, the peak hour volume is 153 vehicles. When events were being held, the peak hour volume increased by 41% to 216 vehicles on Tuesday May 12 and by 10% to 169 vehicles on Thursday May 14. On average, the peak hour volume when events are being held is 193 vehicles, which amounts to an increase of 26% from non-event peak hour volumes.

Project Effect on Traffic

Similar projects involving improvements to athletic fields have been completed at other schools within the Northshore School District. Post conversion of the soccer fields to synthetic turf, the schools experienced a minimal increase in rental activity.

The project at Timbercrest Middle School, however, is expected to result in no changes to traffic and no increases in the number of rentals of the athletic fields. This is due to the location of Timbercrest Middle School in relation to the rest of the schools in the district, other turf fields in closer proximity to the urban areas, and the low density of surrounding residences and land uses.

The Northshore School District boundary and middle school locations are provided below. Timbercrest Middle School is located near the eastern boundary of the Northshore School District service area in a low-density area of unincorporated King County. The other middle schools within Northshore School District are located within the higher-density limits of Woodinville, Bothell, Kenmore, and unincorporated King County.



Northshore School District Service Area Boundary and Middle School Locations

Summary

The proposed project includes conversion of the soccer/track facility to synthetic turf and upgrades to the track. A review of the rental activity for the school shows limited rentals for the soccer field. The activities held at the facility are generally related to school use. The existing baseball fields are used by outside groups. However, the proposed improvements do not include modifications to these facilities so increase in activity is unlikely.

Overall increases in traffic are not expected with the project. The school is located outside of the denser populus and not currently used by groups. There are other facilities located closer to Bothell and Woodinville that have similar level of facilities. Thus, increases by outside entities of any significance is unlikely.