

Stormwater Facilities Maintenance Plan

The Landing at Hawks Prairie
Lacey, WA

Parcels:
11811430400, 82730000100, 82730000200, 82730000300

Prepared By:
LDC, Inc.
1411 State Ave. NE Suite 200
Olympia, WA 98506
425.806.1869



July 2022

MAINTENANCE AND SOURCE CONTROL MANUAL

THE LANDING AT HAWKS PRAIRIE

1120, 1200, 1300, 1370 GALAXY DR NE, LACEY, WA 98516

PARCEL NUMBERS: 11811430400, 82730000100, 82730000200, 82730000300

SECTION 1: OWNER INFORMATION

The maintenance staff at the Landing at Hawks Prairie will maintain the grounds and stormwater facilities. The stormwater facilities maintenance plan will be kept in safe and well-known place and will be made available for inspection to the City upon request. See the general requirements below regarding frequency of inspections.

SECTION 2: DESCRIPTION OF THE DRAINAGE SYSTEM AND FACILITIES SERVING THE SITE

The proposed improvements are included in one stormwater basin. This basin includes the roof and other impervious surfaces of the building site. Stormwater runoff will be collected and sent to an underground infiltration trench to the west of the proposed building in the parking lot aisles. The stormwater will infiltrate on site using the infiltration trench, providing on-site stormwater management.

Typical maintenance of the stormwater system includes removing debris from catch basin grates, removing sediment from pipes and catch basins, and removing sediment and debris from the underground infiltration system. It is important to note that this maintenance manual was written for the proposed improvements. The existing stormwater facilities shall be maintained per the previous maintenance manual and requirements. The drawings of the stormwater facilities are found in **Attachment 1** of the Drainage Control Plan. See **Appendix 1** of this report for the Basin Map Exhibit.

SECTION 3: COST ESTIMATE FOR LONG-TERM FACILITIES MAINTENANCE, REPAIR, & REHABILITATION

Introduction:

The following are assumptions, estimates, and recommendations for funds to set aside for routine maintenance costs and future replacement costs for the stormwater facilities that are the responsibility of Landing at Hawks Prairie, LLC. The sinking fund is an approximation of the annual funding needed over the next 20 years to keep the stormwater system fully functional.

The initial value of the facilities, the annual maintenance costs (assuming all work is by hired workers), occasional improvements, and factors such as inflation over time are incorporated in the “sinking fund” calculation of future costs and the annual funding reserve amount needed. The calculations take into account the expected life of the materials, structures, and facilities, and include a summary of the amount of money to be set aside annually for the fund and the annual charge per lot owner to equal the annual set-aside.

Note that the sinking fund calculations are only a “best estimate” using approximated values. The owner should use these computations as a guide and modify as needed to more accurately reflect actual costs as routine maintenance is conducted.

Assumptions:

1. The drainage facilities are constructed properly, as per the approved plans and details.
2. Inspection and minor maintenance (e.g. debris removal) performed by facility owners (no labor cost), but mowing and all other work is performed by hired workers.
3. Catch basins will be cleaned-out by hired vector truck, once per year.
4. Catch basins and pipes should last at least 20 years but assume replacement of 20% of the drainage system over the next 20 years.
5. Infiltration facilities will need infiltration enhancement every 15 years.

Part I: On-Site Stormwater Facilities Inventory			Part II: Routine O&M Assumptions		Part III: Routine O&M Estimated Annual Cost	
Facility	Quantity	Unit	Activity	Frequency	Unit Price ^a	Annual Cost ^b
			Annual Report	Annual	\$300	\$300
Catch Basin/Area Drain	1	Each	Sediment Removal with Vector Truck	Annual	\$170	\$170
Infiltration System (Gravel Trench)	1	Each	Remove debris, inspect infiltration rocks	Annual	\$500	\$500
Annual Total: \$970						

Notes:

^a Cost to maintain each unit based on estimate from maintenance contractor or literature values

^b Product of multiplying quantity by frequency by unit price

O&M = Operation and maintenance

Part IV: Estimated Partial Replacement Cost		
Assumptions		Notes
Annual Inflation Rate	4%	Annual inflation of construction cost.
Annual Interest Rate	3%	Estimate of how fast the account balance will grow
Years in Calculation	20	Duration of calculation
Percent of System Replaced in 20 Years	20%	Assumes 20% of the system will need replacement during the calculation period
Present Value of Stormwater System	\$10,000	Initial construction cost of stormwater system
Initial Reserves	\$0	Initial balance in the O&M account
Number of Owners	1	Number of lot owners

Using Above Assumptions, Calculate Future Replacement Cost for 20% of System and Required Annual Payments		
Description	Cost	Notes
Present Value of 20% of Stormwater System (portion requiring replacement)	\$2000	Present value of the stormwater system x percent of the system that requires replacement
Future Replacement Cost for 20% of Stormwater System	\$4382	Cost to replace the system in the future, i.e., Present Value adjusted to account for inflation
Annual Payment for Future Replacement	\$163	Annual account contributions required to cover the future replacement cost. Accounts for interest.
Part V: Estimated Monthly Contribution to Stormwater Facilities O&M Account		
Description	Cost	Notes
Annual Payment for Routine O&M	\$970	Result of Part III
Annual Payment for Future Replacement	\$163	Result of Part IV
Total Annual Cost for O&M and Repair	\$1,133	Sum of above values
Total Monthly Cost for O&M and Repair	\$95	Annual cost divided by 12 months
Monthly Cost per Lot Owner	\$95	Monthly cost divided by 122 lot owners

Because operation and maintenance costs will vary and are also subject to inflation, they should be adjusted over time. Owners should evaluate actual operation and maintenance needs and costs each year, and adjust set-aside funds for the following year's cost projection.

Note: Since operation and maintenance costs will vary and are also subject to inflation, they should be adjusted over time. Facility owners should evaluate actual O&M needs and costs each year and adjust set-aside funds for the following year's cost projection.

SECTION 4: SITE AND FACILITY MANAGEMENT

Intent:

The importance of maintenance for the proper functioning of stormwater control facilities cannot be over-emphasized. A substantial portion of failures (clogging of filters, resuspension of sediments, loss of storage capacity, etc.) are due to inadequate maintenance. Stormwater BMP maintenance is essential to ensure that BMPs function as intended throughout their full life cycle.

The fundamental goals of maintenance activities are to ensure the entire flow regime and treatment train designed for this site continue to fully function. For this site these include:

- Maintain designed stormwater infiltration capacity
- Maintain designed stormwater detention/retention volume
- Maintain ability to safely convey design stormwater flows
- Maintain ability to treat stormwater runoff quality
- Preserve soil and plant health, as well as stormwater flow contact with plant and soil systems
- Clearly identify systems so they can be protected

- Keep maintenance costs low
- Prevent large-scale or expensive stormwater system failures
- Prevent water quality violations or damage to downstream properties

The intent of this section and manual is to pass on to the responsible party(s) all the information critical to understand the design of the system, risks and considerations for proper use, suggestions for maintenance frequencies, and cost so that realistic budgets can be established.

General Requirements:

1. Maintenance Required – all stormwater facilities shall be maintained in accordance with this maintenance program, the drainage report for the Woodbrook Townhomes, and the most current version of the City of Lacey Stormwater Design Manual.
2. Minimum Standards – the following are the minimum standards for the maintenance of this project’s stormwater facilities.
 - a. Facilities shall be inspected annually and cleared of debris, sediment, and vegetation when they affect the functionality and/or design capacity of the facility.
 - b. Landscape and lawn/turf areas shall be inspected quarterly and mowed and replanted as necessary. Clippings are to be removed and properly disposed of.
 - c. Where lack of maintenance is causing or contributing to a water quality problem, immediate action shall be taken to correct the problem. Within one month, after initial recognition of the problem, a City of Lacey inspector may revisit the facility to assure that the problem has been rectified at his or her convenience.
3. Disposal of Waste from Maintenance Activities – disposal of waste from maintenance activities shall be conducted in accordance with City of Lacey’s waste disposal standards.
4. Compliance – property owners are responsible for the maintenance, operation or repair of stormwater drainage systems, and project installed BMPs. Property owners shall maintain, operate, and repair these facilities in accordance with the requirements of this maintenance program, the drainage report, and the most current edition of the City of Lacey Drainage Design and Erosion Control Manual.

SECTION 4a: POLLUTION SOURCE CONTROL PLAN

See Appendix 2 for the completed Stormwater Pollution Source Control Checklist and Worksheet. All required BMPs are listed on the Stormwater Pollution Source Control Worksheet and identified on Stormwater Site Plans.

1. Avoid the activity or reduce its occurrence:

If possible, avoid the activity or do it less frequently. Is there a substitute process or a different material available to get the job done? Can a larger run of a process be performed at one time, thus reducing the number of times per week or month it needs to be repeated? For instance, raw materials could be delivered close to the time of use instead of being stockpiled and exposed to the weather. Perhaps the site could avoid one solvent-washing step altogether. Apply lawn care chemicals following directions and only as needed. Many lawns are excessively fertilized. Do not apply herbicides right before it rains.

Ecology or the Thurston County Department of Public Health and Social Services can provide pollution prevention assistance.

2. Move activities under shelter:

Sometimes it is fairly easy to move an activity indoors out of the weather. The benefits of this are twofold; preventing runoff contamination, and providing for easier, more controlled cleanup if a spill occurs. An example would be unloading and storing barrels of chemicals inside a garage area instead of doing it outside. Please be aware that moving storage areas indoors may require installation of fire suppression equipment or other building modifications as required by the International Building Code (IBC), the International Fire Code or local ordinances.

3. Clean up spills quickly:

Promptly contain and clean up solid and liquid pollutant leaks and spills on any exposed soil, vegetation, or paved area. Commercial spill kits are available, but readily available absorbents such as kitty litter also work well in many cases. Promptly repair or replace all leaking connections, pipes, hoses, valves, etc., which can contaminate stormwater.

4. Use less material:

Don't buy or use more material than you really need. This not only helps keep potential disposal, storage, and pollution problems to a minimum, but will probably save money, too.

5. Use the least toxic materials available:

Investigate the use of materials that are less toxic than what is used now. Perhaps a caustic-type detergent or a solvent could be replaced with a more environmentally friendly product. Such a change might allow the site to discharge process water to the sanitary sewer instead of paying for expensive disposal (contact the City of Lacey Wastewater Utility or the LOTT Clean Water Alliance to find out about allowable sanitary sewer discharges and pretreatment permits). Remember that even if using a biodegradable product, nothing but uncontaminated water is allowed to enter the stormwater drainage system.

6. Create and maintain vegetated areas near activity locations:

Vegetation of various kinds can help filter pollutants out of stormwater, so it is advisable to route stormwater through vegetated areas located near the activity. For instance, many parking lots contain grassy islands, typically formed in a "hump." By creating those islands as depressions instead of humps, they can be used to treat runoff from the parking lot or roof. Also, don't forget the erosion control benefits of vegetation at a site.

7. Locate activities as far as possible from surface drainage paths:

Activities located as far as possible from known drainage paths, ditches, streams, other water bodies, and storm drains will be less likely to pollute, since it will take longer for material to reach the drainage feature. This gives more time to react to a spill, or if it is a "housekeeping" issue, may protect the local waters long enough for you to clean up the area around the activity. Don't forget that groundwater protection is important throughout the region, no matter where the activity is located, so the actions taken on your site on a day-to-day basis are always important, even in dry weather.

8. Maintain stormwater drainage systems

Pollutants can concentrate over time in storm drainage structures such as catch basins, ditches, and storm drains. When a large storm event occurs, it can mobilize these pollutants and carry them to receiving waters. Develop and implement maintenance practices, inspections, and schedules for treatment facilities (e.g., detention ponds, oil/water separators, vegetated swales). Clean oils, debris, sludge, etc., from all BMP systems regularly, including catch basins, settling/detention basins, oil/water separators, boomed areas, and conveyance systems, to prevent the contamination of stormwater. Promptly repair or replace all substantially cracked or otherwise damaged paved secondary containment, high-intensity parking, and any other drainage areas that are subjected to pollutant material leaks or spills. Also repair or replace all leaking connections, pipes, hoses, valves, etc., which can contaminate stormwater. Requirements for cleaning stormwater facilities are discussed in Volume IV of the 2014 Ecology Manual, specifically BMP S417. Maintenance standards can be found in Chapter 3, Appendix 3B.

9. Reduce, reuse, and recycle as much as possible

Always look for ways to recycle instead of just disposing. This can save money as well as keep both hazardous and non-hazardous materials out of the landfills. Learn more about other businesses that have made process changes allowing recycling of chemicals by calling Ecology at 1-800-RECYCLE and requesting publications No. 92-45 and No. 90-22. Another unique recycling opportunity for businesses is available through the Industrial Materials Exchange. This free service acts as a waste or surplus “matchmaker,” helping one company’s waste become another company’s asset. For instance, waste vegetable oil can become biofuel for another business. Call Industrial Materials Exchange at (206) 625-6232 to list potentially usable solid or chemical waste in their publication.

10. Be an advocate for stormwater pollution prevention

Help friends, neighbors, and business associates find ways to reduce stormwater pollution in their activities. Most people want clean water and do not pollute intentionally. Share your ideas and the BMPs in this chapter to get them thinking about how their everyday activities effect water quality.

11. Report problems

We all must do our part to protect water, fish, wildlife, and our own health by implementing proper BMPs, and reporting water quality problems that we observe. In the City of Lacey, call the Department of Public Works at (360) 491-5644 to report dumping to sewers and to report spills and other incidents involving storm drains or ditches. Also contact Ecology’s Southwest Regional Office at (360) 407-6300.

12. Provide oversight and training

Assign one or more individuals at your place of business to be responsible for stormwater pollution control. Hold regular meetings to review the overall operation of BMPs. Establish responsibilities for inspections, operation and maintenance (O&M), documentation, and availability for emergency situations. Train all team members in the operation, maintenance, and inspection of BMPs and reporting procedures.

13. Dust control

Sweep paved material handling and storage areas regularly as needed, to collect and dispose of dust and debris that could contaminate stormwater. Do not hose down pollutants from any area to the ground, storm drain, conveyance ditch, or receiving water.

14. Eliminate illicit connections

An illicit connection is formally defined in the city's NPDES Municipal Stormwater Permit, but generally includes any connection to the city stormwater system that is not intended, permitted, or used for collecting and conveying stormwater. A common problem with the stormwater drainage system for most communities is the existence of illicit connections of wastewater to the storm drainage system. Wastewater other than stormwater runoff, such as wash water, must be discharged to a wastewater collection system, and may not be discharged to a storm drainage system (the storm drainage system does not drain to a wastewater treatment plant). Many businesses and residences have internal building drains, sump overflows, process wastewater discharges, and even sanitary sewer and septic system pipes that were connected to the nearby storm drainage system in the past as a matter of course. All businesses and residences must examine their plumbing systems to determine if illicit connections exist. Any time it is found that toilets, sinks, appliances, showers and bathtubs, floor drains, industrial process waters, and/or other indoor activities are connected to the stormwater drainage system, these connections must be immediately rerouted to the sanitary or septic system, holding tanks, or a process treatment system.

15. Dispose of waste properly

Every business and residence in the city must dispose of solid and liquid wastes and contaminated stormwater properly. There are generally four options for disposal depending on the type of materials. These options include:

- Sanitary sewer and septic systems
- Recycling facilities
- Municipal solid waste disposal facilities
- Hazardous waste treatment, storage, and disposal facilities

SECTION 4b: VEGETATION MANAGEMENT PLAN

Refer to the landscape plans for the planting schedule of the project site.

SECTION 5: STORMWATER FACILITY MAINTENANCE GUIDE

The parties responsible for maintenance must review and apply the maintenance requirements contained herein. These maintenance instructions outline conditions for determining if maintenance actions are required, as identified through inspection. However, they are not intended to be measures of the facility's required condition at all times between inspections. Exceedance of these conditions at any time between inspections or maintenance activity does not automatically constitute a violation of these standards. However, based upon inspection observations, the inspection and maintenance presented in the checklists shall be adjusted to minimize the length of time that a facility is in a condition that requires a maintenance action. For facilities not owned and maintained by the city, a log

of maintenance activity that indicates what actions were taken must be kept on site and be available for inspection by the city.

Inspection Program:

1. Inspection – it will be the responsibility of the Owner to complete the necessary stormwater inspection tasks stated herein and prepare the inspection reports that will be submitted to the city of Lacey. Inspection reports shall be submitted annually or at the City of Lacey’s request.

2. Records – the Owner shall keep records of the following;

- a. As-built plans and locations of installed stormwater facilities.
- b. Findings of fact from any exemption granted by the City of Lacey.
- c. Operation and maintenance requirements and records of inspection maintenance actions and frequencies
- d. Declaration of Covenant associated with the maintenance and operation of stormwater facilities.
- e. Any pertinent engineering reports.

It is important to keep the catch basins and stormwater pipes clean and free of debris, because if they get clogged the stormwater system will fail and will not meet water quality standards. Maintenance activities for the downspout infiltration trench and the catch basins include but are not limited to the actions listed below and the referenced checklists from the *City of Lacey 2016 Stormwater Design Manual*:

Downspout Infiltration:

Includes an infiltration trench or drywell intended only for use in infiltrating runoff from roof surfaces. Infiltration trenches and drywells are backfilled with washed drain rock, allowing for temporary storage of stormwater runoff in the voids of the drain rock material. Stored runoff gradually infiltrates into the surrounding soil.

Actions to keep downspout infiltration functioning:

- Remove litter, leaves, debris, and obstructions from the infiltration trench or drywell.
- Stabilize adjacent landscaped areas to avoid runoff from eroding and mobilizing soil into the surface inlet.

1s. Downspout Infiltration

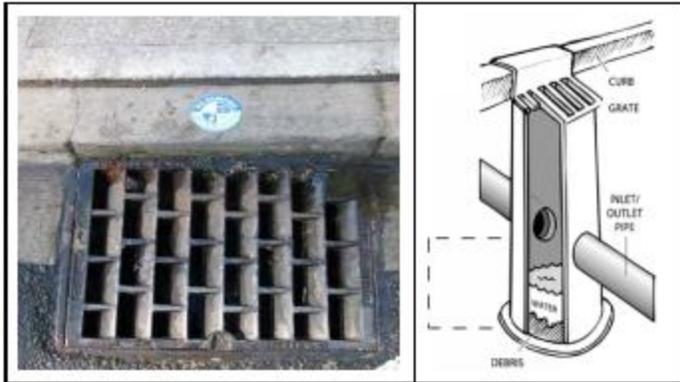
Downspout infiltration systems are trench or drywell designs intended only for use in infiltrating runoff from roof downspout drains.

Downspout Infiltration					
Drainage System Feature	Problem or Defect	Conditions To Check For	√ Check	What To Do for Desired Condition	√ Done
Rock Trench/Well	Inflow Disruption	Accumulated trash, debris, or sediment on drain rock surface impeding sheet flow into facility.		Sheet flow re-established. Material removed and disposed of in accordance with applicable solid waste requirements.	
	Inflow Disruption	Vegetation/moss present on drain rock surface impeding sheet flow into facility.		Material removed and sheet flow re-established.	
	Inflow Disruption	Water ponding at surface, or standing water in subgrade observation port.		Inflow to facility is consistent and no ponding is observed. Inlet piping is clear and/or rock or sand reservoirs have been replaced.	
Inlet/Outlet Pipe Conveyance	Conveyance Blockage	Accumulation of trash, debris, or sediment in roof drains, gutters, driveways drains, area drains, etc.		Conveyance systems are clear of debris and free-flowing.	
	Conveyance Blockage	Pipes to or from sump, trench, or drywell have accumulated sediment or is plugged.		Pipe systems are clear of debris and free-flowing.	
	Conveyance Damage	Pipes to or from sump, trench, or drywell is cracked, broken, or misaligned.		Pipe systems are undamaged and free-flowing.	
Roof Downspout	Splash Pad Malfunction	Splash pad missing or damaged.		Splash pad installed and functioning correctly	
	Overflow	Water overflows from the gutter or downspout during rain.		First try cleaning out the gutter and downspouts. If this doesn't solve the problem, a larger drywell may be needed. Contact the city before changing the design or upgrading to a larger drywell.	
Storage Sump	Sediment in Sump	Excess sediment accumulate in sump.		Material removed and disposed of in accordance with applicable solid waste requirements.	
	Access Lid Problems	Access lid cannot be opened or is missing.		Access lid is functioning as designed. Refer to record drawings to confirm type, function, and required components.	

Downspout Infiltration					
Drainage System Feature	Problem or Defect	Conditions To Check For	✓ Check	What To Do for Desired Condition	✓ Done
Roof	Moss	Moss and algae are taking over the shadier parts of the shingles.		Disconnect the flexible part of the downspout that leads to the drywell. Then perform moss removal as desired. Pressure wash or use fatty acid solutions instead of highly toxic pesticides or chlorine bleach. Install a zinc strip as a preventive.	

Catch Basin:

An underground concrete box structure with a slotted metal grate on top that collects runoff water from the ground surface. Typically located within pavement in parking lots and in the street gutter, usually next to a curb. Grate on top lets water in and keeps larger debris out. Sediment settles in the sump in the bottom (below the pipe openings) and must be removed periodically. Catch basins have an outlet pipe between the grate and the sump, to let the cleaner water flow out to a storm pond or other location. Some catch basins have both inflow and outflow pipes, to convey collected runoff water through.



Actions to keep catch basins functioning:

- Remove litter, leaves, debris, and obstructions from catch basin grates.
- Hire a professional to remove sediment buildup from sump (if road is privately owned; catch basins in the public right-of-way are maintained by the city).

Debris Barriers and Trash Racks:

A structural device with metal bars, to prevent debris from entering a pipe, spillway, or hydraulic structure.



Actions to keep debris barriers and trash racks functioning:

- Remove trash, debris, vegetation, and dirt from around the structure.
- Check inflow and outflow, and remove any flow obstructions.
- Remove plants such as alder and willow that tend to grow near the pipe ends.
- Check for structural integrity; hire a professional to fix broken bars or racks.

2b. Catch Basins

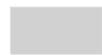
These structures are typically located in the streets. The City of Lacey is responsible for routine maintenance of the pipes and structures in the public rights-of-way, while the property owner or homeowners association is responsible for maintenance of pipes and catch basins in private areas and for keeping the grates clear of debris in all areas.

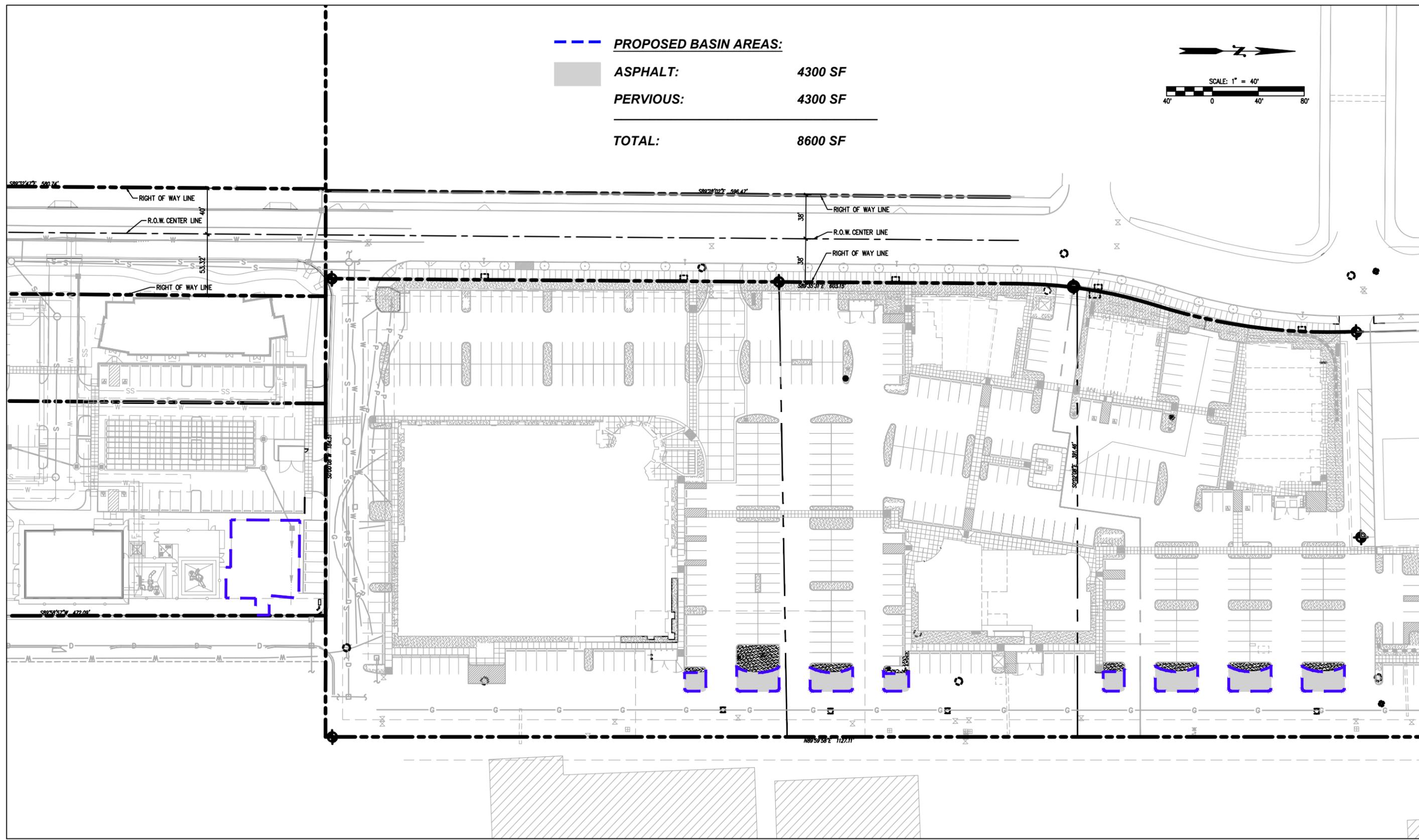
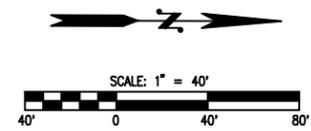
Catch Basins					
Drainage System Feature	Problem or Defect	Conditions To Check For	√ Check	What To Do for Desired Condition	√ Done
General	Trash and Debris	Trash, leaves or debris which is located immediately in front of the catch basin opening or is blocking inflow capacity of the basin by more than 10 percent.		Remove trash, leaves and debris located directly in front of catch basin or on grate.	
		Trash or debris (in basin) that exceeds 60 percent of the sump depth as measured from bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches of clearance from the debris surface to the invert of the lowest pipe.		No trash or debris present. Remove and properly dispose of all trash and debris.	
		Trash or debris in any inlet or outlet pipe blocking more than 33 percent (one-third) of its height.		Inlet and outlet pipes free of trash or debris. Remove and properly dispose of all trash and debris.	
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).		Remove dead animals, etc., present within the catch basin.	
	Sediment	Sediment (in basin) exceeds 60 percent of sump depth as measured from the bottom of basin to invert of lowest pipe into or out of basin, but in no case less than a minimum of 6 inches of clearance from the sediment surface to the invert of lowest pipe.		No sediment in the catch basin.	
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 0.25 inch (intent is to make sure no material is running into basin).		Top slab is free of holes and cracks.	

Catch Basins					
Drainage System Feature	Problem or Defect	Conditions To Check For	✓ Check	What To Do for Desired Condition	✓ Done
General (continued)	Structure Damage to Frame and/or Top Slab (continued)	Frame not sitting flush on top slab, i.e., separation of more than 0.75 inch of the frame from the top slab. Frame not securely attached.		Frame is sitting flush on the riser rings or top slab and firmly attached.	
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person determines structure is unsound.		Basin replaced or repaired to design standard	
		Grout fillet has separated or cracked wider than 0.5 inch and longer than 1 foot at the joint of any inlet/outlet pipe, or any evidence of soil entering basin.		Pipe regouted and secure at basin wall.	
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.		Replaced or repair to design standards.	
	Vegetation	Vegetation growing across and blocking more than 10 percent of the basin opening.		Remove vegetation blocking opening to basin.	
		Vegetation growing in inlet/outlet pipe joints that is more than 6 inches tall and less than 6 inches apart.		No vegetation or root growth present.	
	Contamination and Pollution	Presence of contaminants such as oil, gasoline, concrete slurries, paint, obnoxious color, odor, or sludge.		Locate the source of the pollution and remove contaminants or pollutants present. <i>Report and coordinate source control, removal, and/or cleanup with City of Lacey Spill Response Team (360) 491-5644, Moderate Risk Waste Program at Thurston County Environmental Health (360) 754-4111, and/or Dept. of Ecology Spill Response (800) 424-8802.</i>	
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.		Catch basin cover is in place and secured.	
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 0.5 inch of thread.		Mechanism opens with proper tools.	

Catch Basins					
Drainage System Feature	Problem or Defect	Conditions To Check For	√ Check	What To Do for Desired Condition	√ Done
Catch Basin Cover (continued)	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)		Cover can be removed by one maintenance person.	
Ladder	Ladder Rungs Unsafe	Maintenance person judges that ladder is unsafe due to missing rungs, misalignment, rust, or cracks. Ladder must be fixed or secured immediately.		Ladder meets design standards and allows maintenance persons safe access.	
Metal Grates (if applicable)	Grate Opening Unsafe	Grate with opening wider than 0.875 (7/8) inch.		Grate opening meets design standards.	
	Trash and Debris	Trash and debris that is blocking more than 20 percent of grate surface inletting capacity.		Grate free of trash and debris. Remove and properly dispose of all trash and debris.	
	Damaged or Missing	Grate missing or broken member(s) of the grate.		Grate is in place and meets design standards.	

APPENDIX 1: BASIN MAP

	PROPOSED BASIN AREAS:	
	ASPHALT:	4300 SF
	PERVIOUS:	4300 SF
TOTAL:		8600 SF



Drawing: P:\Drawings\2022-2023\The Landing at Hawks Prairie\Drawings\Exhibits\Stormwater\C22-213 Existing Map.dwg Plotted: Jun 29, 2022 - 11:20am

JOB NUMBER: C22-213
 DRAWING NAME: EX-01
 DESIGNER: AW
 DRAFTING BY: AW
 DATE: 06-28-2022
 SCALE: 1"=40'
 JURISDICTION: LACEY

LDC | Surveying
 Engineering
 Planning

Woodinville Olympia Kent
 1411 State Avenue NE, #200
 Olympia, WA 98506
 T 425.806.1869 www.LDCcorp.com F 425.482.2893

LANDING AT HAWK'S PRAIRIE, LLC
THE LANDING AT HAWK'S PRAIRIE
EXISTING CONDITIONS MAP

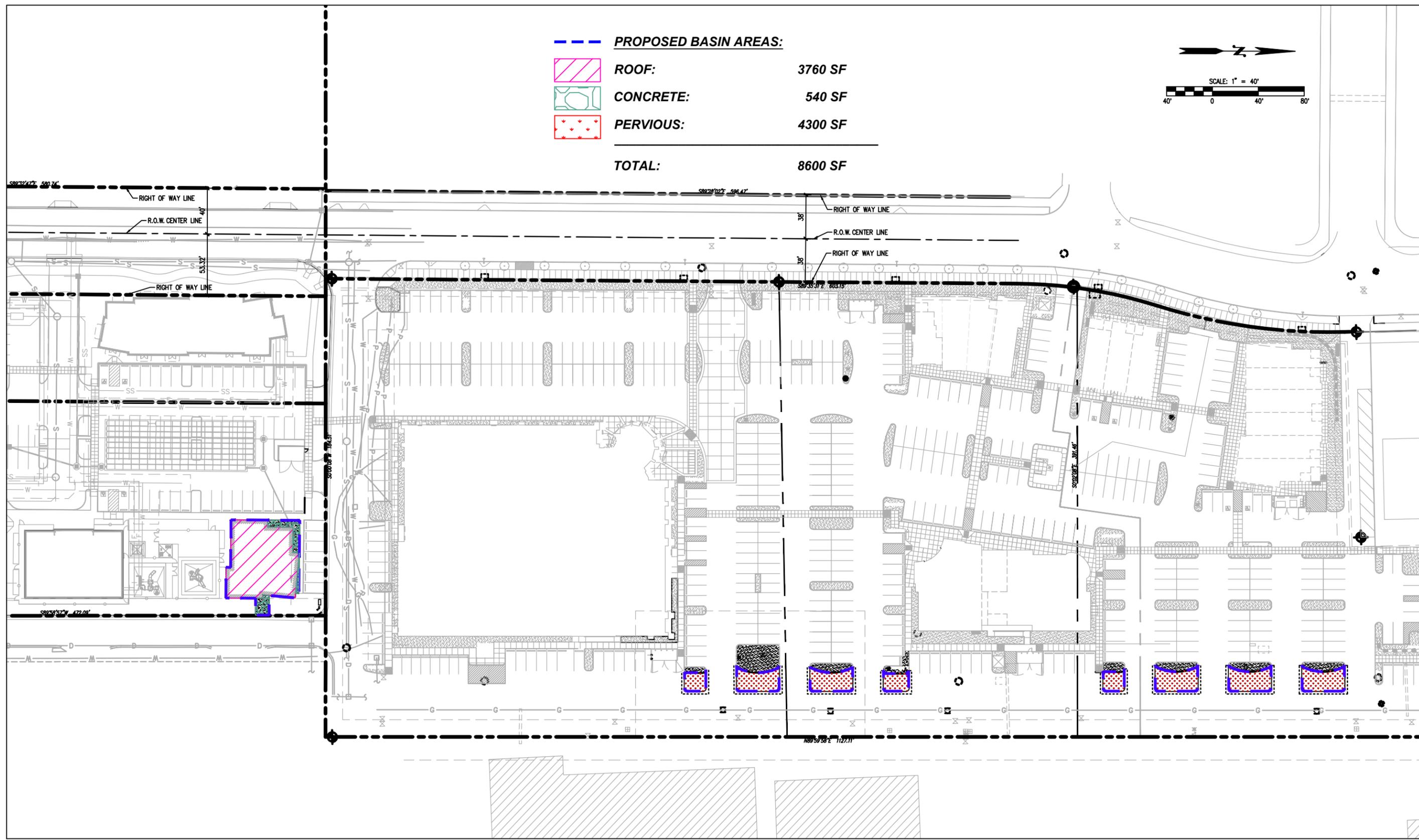
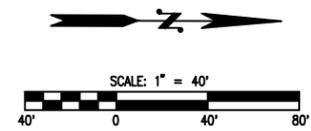
EX-01

SHEET 1 OF 2

PROPOSED BASIN AREAS:

	ROOF:	3760 SF
	CONCRETE:	540 SF
	PERVIOUS:	4300 SF

TOTAL: 8600 SF



Drawing: P:\Draw\2022\C22-213 The Landing at Hawk's Prairie\Drawings\Exhibits\Stormwater\C22-213 Pr. Conditions Map.dwg Plotted: Jun 29, 2022 - 11:25am

JOB NUMBER: C22-213
 DRAWING NAME: EX-02
 DESIGNER: AW
 DRAFTING BY: AW
 DATE: 06-28-2022
 SCALE: 1"=40'
 JURISDICTION: LACEY

LDC | Surveying
 Engineering
 Planning

Woodinville Olympia Kent
 1411 State Avenue NE, #200
 Olympia, WA 98506

T 425.806.1869 www.LDCcorp.com F 425.482.2893

LANDING AT HAWK'S PRAIRIE, LLC
THE LANDING AT HAWK'S PRAIRIE
PROPOSED CONDITIONS MAP

EX-02

SHEET 2 OF 2

**APPENDIX 2:
STORMWATER POLLUTION SOURCE CONTROL
CHECKLIST AND WORKSHEET**

CITY OF LACEY

STORMWATER POLLUTION SOURCE CONTROL CHECKLIST

Project Name: The Landing at Hawk's Prairie

Check all activities that will occur at proposed project.

<input type="checkbox"/>	Boat/Ship Building, Repair or Maintenance (see BMP S401)
<input type="checkbox"/>	Commercial Animal Handling (see BMP S402)
<input type="checkbox"/>	Commercial Composting (see BMP S403)
<input type="checkbox"/>	Commercial Printing Operations (see BMP S404)
<input type="checkbox"/>	De-Icing and Anti-Icing Operations- Airport and Streets (see BMP S405)
<input type="checkbox"/>	Streets/ Highways (see BMP S406)
<input type="checkbox"/>	Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots (see BMP S407)
<input type="checkbox"/>	Dust Control at Manufacturing Areas (see BMP S408)
<input type="checkbox"/>	Fueling at Dedicated Stations (see BMP S409)
<input type="checkbox"/>	Landscaping and Lawn/Vegetation Maintenance (see BMP S411)
<input type="checkbox"/>	Loading and Unloading of potential pollutants (see BMP S412)
<input type="checkbox"/>	Log Sorting and Handling (see BMP S413)
<input type="checkbox"/>	Maintenance and Repair of Vehicles and Equipment (see BMP S414)
<input type="checkbox"/>	Maintenance of Public and Private Utility Corridors and Facilities (see BMP S415)
<input type="checkbox"/>	Maintenance of Roadside Ditches (see BMP S416)
<input checked="" type="checkbox"/>	Maintenance of Stormwater Drainage and Treatment Systems (see BMP S417)
<input type="checkbox"/>	Manufacturing Activities- Outside (see BMP S418)
<input type="checkbox"/>	Mobile Fueling of Vehicles and Heavy Equipment (see BMP S419)
<input type="checkbox"/>	Painting/Finishing/Coating of Vehicles/Boats/Buildings/Equipment (see BMP S420)
<input type="checkbox"/>	Parking and Storage of Vehicles and Equipment (see BMP S421)
<input type="checkbox"/>	Railroad Yards (see BMP S422)
<input type="checkbox"/>	Recyclers/Scrap Yards (see BMP S423)
<input type="checkbox"/>	Roof/Building Drains at Manufacturing and Commercial Buildings (see BMP S424)
<input type="checkbox"/>	Erosion and Sediment Control at Commercial or Industrial Sites (see BMP S425)
<input type="checkbox"/>	Potential Spills of Oil or Hazardous Substances (see BMP S426)
<input type="checkbox"/>	Storage of Liquids, Food Waste, or Dangerous Waste Containers (see BMP S427)

<input type="checkbox"/>	Storage of Liquids in Permanent Aboveground Tanks (see BMP S428)
<input type="checkbox"/>	Storage or Transfer (Outside) of Solid Raw Materials, By-products or Finished Products (see BMP S429)
<input type="checkbox"/>	Urban Streets (see BMP S430)
<input type="checkbox"/>	Washing and Steam Cleaning Vehicles/Equipment/Building Structures (see BMP S431)
<input type="checkbox"/>	Wood Treatment Areas (see BMP S432)
<input type="checkbox"/>	Spas, Pools, Hot Tubs, and Fountains (see BMP S433)

CITY OF LACEY

STORMWATER POLLUTION SOURCE CONTROL WORKSHEET

List All BMPs to be used at site. Use one worksheet for each activity from the checklist.

Project: The Landing at Hawk's Prairie Activity: Maintenance of Stormwater Drainage and Treatment Systems BMP S427

<i>OPERATIONAL BMPs</i>
- Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine necessary O&M improvements.
- Promptly repair any deterioration threatening the structural integrity of the stormwater facilities. These include replacement of clean-out grates, catch basins lids, and rock in emergency spillways.
- Ensure adequacy of storm sewer capacities and prevent heavy sediment discharges to sewer system.
- Regularly remove debris and sludge from BMPs used for peak rate control, treatment, etc. and discharge to a sanitary sewer if approved by the sewer authority, or truck it to an appropriate local or state government approved disposal site.
<i>STRUCTURAL BMPs</i>
<i>TREATMENT BMPs</i>