



CITY OF OREGON CITY

NATURAL RESOURCES COMMITTEE (NRC)

AGENDA

Virtual Meeting

Wednesday, February 08, 2023 at 6:00 PM

This meeting will be held online via Zoom; please contact ocplanning@orccity.org for the meeting link.

WORK SESSION

1. Update of the NRC Workplan for Biennium 2023-2025

REGULAR MEETING

CALL TO ORDER

PUBLIC COMMENT

Citizens are allowed up to 3 minutes to present information relevant to the City but not listed as an item on the agenda. The Chair has the discretion to waive limitations. Prior to speaking, citizens shall complete a comment form and deliver it to the Staff Member. The Natural Resources Committee does not generally engage in dialog with those making comments but may refer the issue to the City Manager.

ADOPTION OF THE AGENDA

Natural Resources Committee members have the opportunity to rearrange, remove, or add items on the agenda. Adding an item to the agenda requires the consensus of the Natural Resources Committee.

NEW BUSINESS/DISCUSSION ITEMS

2. Heritage Tree Nomination for an Oregon White Oak adjacent to 1506 S. High Street.
3. Stormwater Facilities Maintenance

APPROVAL OF MINUTES

Please review minutes prior to meeting.

COMMUNICATIONS

Communications and updates from members and staff

FUTURE AGENDA ITEMS

ADJOURNMENT

PUBLIC COMMENT GUIDELINES

Complete a Comment Card prior to the meeting and submit it to the City Recorder. When the Mayor/Chair calls your name, proceed to the speaker table, and state your name and city of residence into the microphone. Each speaker is given three (3) minutes to speak. To assist in tracking your speaking time, refer to the timer on the table.

As a general practice, the City Commission does not engage in discussion with those making comments.

Electronic presentations are permitted but shall be delivered to the City Recorder 48 hours in advance of the meeting.

ADA NOTICE

The location is ADA accessible. Hearing devices may be requested from the City Recorder prior to the meeting. Individuals requiring other assistance must make their request known 48 hours preceding the meeting by contacting the City Recorder's Office at 503-657-0891.

Agenda Posted at City Hall, Pioneer Community Center, Library, City Website.

Video Streaming & Broadcasts: The meeting is streamed live on the Oregon City's website at www.orcity.org and available on demand following the meeting. The meeting can be viewed on Willamette Falls Television channel 28 for Oregon City area residents as a rebroadcast. Please contact WFMC at 503-650-0275 for a programming schedule.



CITY OF OREGON CITY

Staff Report

625 Center Street
Oregon City, OR 97045
503-657-0891

To: Natural Resources Committee
From: Pete Walter, Planning Manager

Agenda Date: 02/8/2023

SUBJECT:

Update of the NRC Workplan for Biennium 2023-2025

STAFF RECOMMENDATION:

Update the workplan for 2023-2025.

EXECUTIVE SUMMARY:

Update the workplan for 2023-2025. Please refer to the attached worksheet.

BACKGROUND:

The updated work plan for 2023-2025 will consists of projects and tasks for the 2023-2025 biennium. Some of the work plan items are on-going (such as commenting on land use applications and participating in updates to the comprehensive plan), while others require on-the-ground logistics and the commitment of members and staff resources and budget to complete. Please note that City Commission goals and priorities for the 2023-2025 Biennium have not been finalized yet.

Should any activities be removed? What activities should be added or modified?

OPTIONS:

1. Consider and update the workplan this evening.
2. Do not consider and update the workplan this evening, table.

BUDGET IMPACT:

Amount: \$
FY(s): TBD
Funding Source(s): TBD

Oregon City Natural Resource Committee 2023-2025

Work Plan

Please make reference the City Commission’s goals and priorities as well, and how activities may fit into those priorities, especially if significant staff resources and funding are required.

- The worksheet contains room for additional suggested activities, which will require discussion and prioritization by the committee before being added to the list.
- Should any activities be removed? What activities should be added, or modified?

Activity	KEEP?	REMOVE?	MODIFY:
NRC Responsibility #1: Promote Community Involvement in Natural Resources Conservation Activities (not in order of priority)			
• Support and promote volunteer participation for a public tree inventory for city properties, parks, street trees, school properties and other public lands.			
• Communicate with Neighborhood Associations, Citizen Involvement Commission and the Business Community. NRC members will promote programs such as the heritage tree program, arbor day, etc. through presentations to other groups and boards.			
• Support a process and media (brochures, signage, media, apps, etc.) for naming and interpretation of local natural and geological features for improved awareness of watersheds, enhanced tourism, etc. Support walking tours, etc. This is an on-going project.			
• Continue to strengthen and encourage participation in the Heritage Tree Program (brochures, Informational signs for trees, \$\$\$ for incentives, Further Outreach and Social Media). ○ In 2019, NRC recommended adding site visits by the NRC to the process.			
• Support and provide input on projects that improve connectivity between Rossmann landfill site, End of the Oregon Trail interpretive center, Cove and Willamette Rivers. This is tied to strategies in the adopted Comprehensive Plan (2003), the City’s adopted Waterfront Master Plan (2001) and the Downtown Community Plan (1999).			
• Support funding habitat improvement projects with private landowners within and outside of the city, including Clackamette Cove. Projects could include planting trees for additional shade.			
• Continue work with property owners on heritage tree designation within Thimble Creek Concept Plan.			
• Support a focused investment partnership with Greater Oregon City Watershed Council (GOCWC) and Oregon Watershed Enhancement Board (OWEB) for Coho Salmon habitat improvement project from Newell Creek to Abernethy Creek.			
• Support partnerships with Oregon Heritage Tree Council and Oregon Community Trees.			
Other Activity Suggestion:			
Other Activity Suggestion:			
NRC Responsibility #2. Initiate recommendations and review updates to the City’s comprehensive plan, codes and policy as they relate to statewide Planning Goals that are integral to our mission. Activities (not in order of priority)			
• Update the Nuisance Plant List and Native Plant List. Support a coordinated strategy for invasive species management in 2021-2023, such as encouraging City participation as a partner to the Clackamas County Integrated Pest Management (IPM) program. Improve public outreach / information about invasive plants.			

Activity	KEEP?	REMOVE?	MODIFY:
Update the City-wide Water Resource and Wetland Inventory. Support staff efforts to address as resources allow. NRC recognizes the need to update the City’s water resources, stream and wetland inventory (1999). This involves an extensive and expensive Local Wetland Inventory and Statewide Goal 5 process. Funding for this effort would need to come from grants. It is unknown whether funding sources are available or whether this is a City Commission priority.			
<i>Other Activity Suggestion:</i>			
<i>Other Activity Suggestion:</i>			
NRC Responsibility #3: Receive Notice and Comment on Land Use Applications and Projects within City Limits and the Urban Growth Boundary Activities (not in order of priority)			
Review and comment on requests to vary from the standards of the Natural Resources Overlay District, Geologic Hazard Overlay District, and Willamette River Greenway.			
<i>Other Activity Suggestion:</i>			
<i>Other Activity Suggestion:</i>			
NRC Responsibility #4. Conduct Orderly Meetings that result in Good Communications Activities (not in order of priority)			
Maintain and Update a list of Natural Resources Committee priorities and activities to share with Planning Commission and City Commission.			
<i>Other Activity Suggestion:</i>			
<i>Other Activity Suggestion:</i>			
NRC Responsibility #5. Coordinate with the Parks and Recreation Advisory Committee (PRAC) and Planning and City Commissions on at least an annual basis that results in good communication and mutually beneficial results. Activities			
Support a local levy for parks.			
Invite Kendall Reid, Parks and Rec. Director, to meetings.			
<i>Other Activity Suggestion:</i>			
<i>Other Activity Suggestion:</i>			



2021-2023 City Commission Goals

Final Version June 28, 2021



Introduction

Oregon City is pleased to present the summary of their 2021 goal-setting retreat. The City Commissioners and Executive Team conducted a virtual retreat consisting of three workshops on January 29, January 30, and February 23, 2021 to align around a shared vision, discuss current community projects and issues, and provide City staff with direction regarding the Commission's priorities for the coming years. The City contracted with SSW Consulting, a professional strategic planning and facilitation firm to prepare and guide the group through their discussion. In advance of the retreat workshops, SSW conducted outreach with the Commissioners and staff to discuss community challenges, opportunities, and priorities on the horizon. The agenda for the discussion was based on the following outcomes identified through the outreach process:

- » Identify big-picture goals to guide the City over the next two years;
- » Define clear roles and relationships and enhance the partnership of the Commission and Staff;
- » Build camaraderie and unity amongst the Commission; and,
- » Refresh the goal-setting process. Keep the number of priorities manageable and develop an implementation process that will enhance our accountability.

The City Commissioners and staff worked closely together to identify goals and strategies for 2021-2023 that will build on the work and success of previous years, while also addressing new challenges and/or shifting community needs. The City will work on these goals in addition to maintaining high-quality core City services.

The Commissioners and staff look forward to working together with the community and our partners as we begin our work to advance these goals.

-Oregon City Commission + Executive Team

Table of

Contents



Introduction Page 02

Our Team Page 04

Oregon City's Vision Page 05

Setting the Context Page 06

2021 Goals Page 08

Team Agreement Page 16

Implementation + Progress Reporting Page 17

Our Team

City Commission

Rachel Lyles Smith, Mayor
Denyse McGriff, Commissioner
Frank O'Donnell, Commissioner
Rocky Smith, Commissioner
Adam Marl, Commissioner

Executive Team

Tony Konkol, City Manager
Kattie Riggs, City Recorder
Lisa Oreskovich, Assistant to the City Manager
Kristin Brown, Community Communications Coordinator
Patrick Foiles, Human Resources Director
Greg Williams, Library Director
Matt Zook, Finance Director
James Graham, Economic Development Manager
Kendall Reid, Parks and Recreation Director
John Lewis, Public Works Director
Laura Terway, Community Development Director
Jim Band, Chief of Police

Facilitated By

Sara Singer Wilson, Principal/Owner
SSW Consulting

Oregon City's Vision



Aligning With the Vision

To align the group around a future state of mind, the team imagined how they wanted Oregon City to look, feel and function five years from now. They imagined headlines and stories from the future. This exercise generates group alignment around a future direction. The visioning exercise helps to inspire and guide the goal setting process. Through this visioning exercise, they developed the vision statement below.

Vision

Oregon City is a welcoming, inclusive, engaged, and safe community. We support our local businesses and partner in making them a vibrant part of our community. We are a destination with a strong identity celebrated through art, history and cultural opportunities - we have opportunities for all.

Setting

The Context

City Staff shared updates on the goals from 2019 in addition to other projects on the horizon. This information was mapped in the "Environmental Scan" chart below.

DIVERSITY, EQUITY, + INCLUSION (DEI) • In June, commission approved resolution to support racial equity and DEI, safe space for conversations, learning opportunities • Charged with taking action to support those statements • Explore what these efforts look like in OC • Journey - not just a set of tasks • Implemented programs in the Library - provide space for this • Staff participated in training - CD as part of OC 2040 new methods of engagement to elevate voices of underrepresented groups • What's next? What does success look like?	HOUSING • Housing Excise Tax - concerns from citizens spending more and more on housing • Strategies we can use to support housing that fits our needs • Working to advance housing - amend zoning code, vertical housing, compliance with HB2001, urban renewal, quiet zone, construction excise tax • Metro housing bond funded housing • Bond passed to assist those at risk of losing housing • Variety of strategies, annexing land, inclusionary zoning, change SDC schedule, strategic investment in infrastructure, and more....
INFRASTRUCTURE NEEDS • We've been forward thinking on our infrastructure - kept up rates/ fees to maintain • Facing rising costs, rapidly evolving tech • Community aggravation with increasing rates - material costs, staff, consultant costs all going up • Master planning for sewer and transportation are finished • Water and stormwater plans are complete	PARKS • Hiring a consultant to work on maintenance plan - comprehensive inventory of parks, facilities, parking lots, police station, etc. • Immediate repairs and preventative maintenance, replacement costs • 5-20 forecast of maintenance requirements • Award contract on 2/17/21
HOMELESSNESS • Evolution in how we've learned to serve this population and respond to people in the community • Services - cleaning up, serving mental health issues, getting people into housing - we are doing more than cities larger than us • Missing the political piece in our interaction with the County. County said they were going to purchase a motel for short-term housing - then decided they would buy one in Estacada - this plan also fell through due to lack of public engagement • County trying to do the right thing - funds available through Metro bond • Lack of communication between cities and the county to have a regional cohesive conversation	ECONOMIC DEVELOPMENT/ TOURISM • ED has conducted itself in new ways - helping businesses to stay open • Implementing strategic plan for tourism • What's the direction for urban renewal - only incentive for growth • Enable more people to live downtown to encourage its own eco system as we move forward • Working on strategic plan

The City Commissioners and Staff discussed other various topics to help establish a shared context for the goal setting process. These topics included growth trends, political factors, economic climate, other community trends, technology trends, community needs, and uncertainties.

Context Map

All organizations work in a context, there are larger environmental forces and trends that shape what is and is not possible just as much as the internal capacities and capabilities of a group. This context map develops a big-picture view of the Oregon City environment and increases understanding of complex situations. This exercise assisted the team in establishing their common backdrop for the goal-setting.

Oregon City Context Map 01.29.21

DEI LENS - THINK ABOUT HOW IT APPLIES IN EACH OF THESE CATEGORIES

Oregon City Goal Setting Context Map

GROWTH TRENDS

- White and middle class families, couples
- Big houses, no housing for middle to low income. (2500+ sq ft)
- Expensive housing prices *Ask for more jobs, retail, and entertainment opportunities in community survey
- COVID-19 hit growth hard, changed everything, can't control
- Pent up demand, need to be ready
- DEI - Need to provide support to diverse businesses
- Rising costs
- Demands for affordable housing

POLITICAL FACTORS

- Increase in citizen comment
- Homelessness as regional issue/County • Communication difficulties
- Progressive orientation
- Focus on women and minority groups
- Focus on local
- Tribal partnerships and relationships
- Add diversity in employment documents

ECONOMIC CLIMATE

- Inflation when pandemic ends - unemployment will go down
- Workforce changes - daycare
- Promote job creation without community harms
- Pent up demand, need to be ready - vaccines will impact
- Daycare expenses
- County getting \$ to deal w/homelessness and opportunities for City to utilize
- Ec Dev and Tourism

OTHER COMMUNITY TRENDS

- Public restroom downtown
- Dog parks, youth programs
- Focus on downtown - residential development
- Community conversations around DEI - and how do we pay for it?

COMMUNITY NEEDS

- Increased shopping and dining opportunities
- Work from home
- Corporate HQ to the suburbs
- Opportunities for youth/diversion needs
- Partner with non-profit for community youth programs
- Daycare
- Homeless service center
- Communication needs
- Need to keep small-town feel
- Pedestrian Safety/Healthy Community
- Pedestrian safety
- Reduce burdens of growth on local community
- Homelessness - We HAVE TO work together
- Youth workforce training- Don't want to lose this age group - keep them here
- Willamette Falls Legacy Project
- Elderly care, new options
- Iconic projects, things to look forward to
- DEI Procurement Policy

TECHNOLOGY TRENDS

- High speed internet
- Ensuring all areas of the city have the technology
- Increased fiber to increase speed
- Affordability issues with broadband
- Cyber Security- IT Strategic Plan is a good start
- Cyber Security and transparency - are there partnership opportunities to fill this need?
- Equitable access to fiber
- Clackamas County model? Get fiber in parts of the County that are not served
- Continue to use tech used in pandemic, expand engagement
- Promote fiber optic installation - "smart city"

UNCERTAINTIES

- Revenue, pay taxes?
- Distribution of vaccines
- Mayor changes
- Marijuana tax
- Federal economic aid packages - prepared with projects
- Revenues
- Unknowns such as emergencies
- Opportunities we don't know about
- Uncertainty in revenue

© THE GROVE

2021-2023 Goals

The City Commission Goals serve as a framework for budget development and provide guidance for how best to allocate the resources of the City. Though the budget is prepared to support and accomplish the goals, the goals should not be confused with the budget. The budget is the legal authority for spending and focuses on the near-term (the biennium). The goals, on the other hand, are long-term in nature and therefore, may continue beyond the two-year budget period.

Oregon City Vision

Embrace and advance Oregon City's historic role as a regional leader

Mission

Build a dynamic community that leads the State in safety, economic opportunity, livability, and historic significance

Goals

Goal 1: Promote diversity, equity and inclusion for a safe, inclusive community and organization

Goal 2: Invest in current and future capital needs for safe, sustainable infrastructure and City services

Goal 3: Improve the City's engagement efforts to reach the broader Oregon City community and inform the policy process

Goal 4: Adopt and implement a homelessness strategy for Oregon City

Goal 5: Promote tourism and support economic development to foster community sustainability

Goal 6: Support diverse housing options in Oregon City

Goal 7: Support improvements and partnerships that contribute to our hometown feel and showcase Oregon City's unique community identity

Goal 8: Protect and preserve our environmental health and natural resources



2021 - 2023 COMMISSION GOALS
REVIEWED BY THE CITY COMMISSION ON APRIL 13, 2021

Goal 1 - Promote diversity, equity and inclusion for a safe, inclusive community and organization

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Using the vision articulated in Resolution 20-19, develop a comprehensive internal and external DEI framework	Staff will work with a consultant to lead and develop a DEI framework that will guide the City. The framework will include: • The creation of policies and practices that advance diversity, equity and inclusion throughout City operations.	\$75,000	General Fund	12/21 - 5/23
Create a community task force to guide the external DEI work	Staff will work with a consultant to create, coordinate and lead a community task force. The project will include: • Education and discussion of the concepts lead to equality. • Discussion about the impacts of bias and racism in our community. • Identification of ways to make our community more welcoming and inclusive for all.	\$50,000	General Fund	7/21 - 3/23
Evaluate internal policies, procedures, hiring practices, purchasing, and codes to reduce barriers and systemic inequities	Staff will establish an internal project team that will discuss and explore opportunities to reduce barriers and systemic inequalities such as: • Establishing the Oregon City Municipal Diversity & Equity Purchasing Program. • Utilizing State-certified MWESB firms and local minority and women owned businesses. • Drafting municipal code that requires all city departments and subcontractors doing business with the City to initially engage businesses owned by BIPOC and MWESB. • Promoting the program and educating staff, contractors, vendors, and subcontractors seeking to do business with the City.	No additional funds requested in proposed budget. Existing staff will complete this task.		9/21 - 6/23

Goal 2 - Invest in current and future capital needs for safe, sustainable infrastructure and City services

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Prioritize projects in the transportation master plan to maximize safety and connectivity	Staff with the assistance of a consultant will work with the Transportation Advisory Committee (TAC) to review the Transportation System Plan (TSP) and associated documents to create a prioritization of projects that maximize multimodal safety and connectivity. The process will include: • A public engagement process. • Outreach to the workgroups established by the Planning Department for the OC 2040 Comprehensive Plan Update process, with an emphasis on DEI. • As part of the project, the City will consider and evaluate projects within the TSP, concept plans, the budget, the 5-year pavement maintenance plan, capital improvement plans, transit plans, safety statistics, and existing conditions.	\$40,000	Transportation Fund Transportation SDC Fund	9/21-8/22

Goal 2 - Invest in current and future capital needs for safe, sustainable infrastructure and City services (continued)

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Complete analysis to identify deferred maintenance and ongoing asset management costs for parks and identify funding options	The Parks and Recreation Department selected Bureau Veritas Technical Assessments LLC to help develop a plan to address the need for immediate repairs, preventative maintenance, deferred project backlog, and capital replacement. This plan will include: - Identifying facility maintenance, reducing the need for reactive repairs, and avoid deferred repairs. - Providing a roadmap for corrective recommendations to help reduce the maintenance backlog. - Identifying funding options for the City Commission to consider.	No additional funds requested in proposed budget. This is an existing project.		3/21 - 12/21
Review SDCs and utility rates to strike a balance between SDCs and rates	Staff will prepare a comprehensive review of Oregon City's Water and Stormwater System Development Charges (SDC's) and utility rates. The review will include: - Third party comparison analysis of rates and SDC's from across the Metro region. - A summary report on what innovative strategies other agencies are utilizing to manage and upgrade utility systems.	\$57,000	Water Fund & Stormwater Fund	3/21 - 10/21
Prioritize the implementation of the IT Strategic Plan	Staff will begin implementation of the IT Strategic Plan which will include: - Adoption of the IT Strategic Plan. - Upgrading the City's disaster recovery and backup systems. - Deploying mobile device management system citywide. - Completing the fiber circuit from Operations Complex to the Robert Libke Public Safety Facility. - Creation of the IT Director position beginning in July 2022.	\$466,000	General Fund	3/21 - 7/22
Complete parks master plan and update system development fees	Staff will work with a consultant to create a master plan that will provide a vision for development, maintenance, and operation of the entire park system. The master plan will include: - A public engagement process to identify goals and specific action items envisioned by City staff and the community at large. - An inventory of existing parks and recreation facilities. - Creating a vision statement, goals, and recommendations for system-level and park-specific improvements; park land acquisition strategy; suggested funding strategy. - Identification of capital needs and recommended system development charges (SDC's) to implement the improvements.	\$190,000	General Fund & Parks SDC Fund	9/21 - 9/23
Assess the communication infrastructure and equipment to improve overall quality and reliability of service to the community	Staff will work with a consultant to determine the feasibility of a public/private partnership to improve overall quality and reliability of fiber optic connectivity to the community. The assessment will include: - Conducting a feasibility study to assess the communication infrastructure needed and its marketability of the service. - A strategy to establish community-wide fiber optic connectivity to homes and businesses throughout Oregon City. - If feasible, developing a Request for Proposals and solicitation for partners.	\$200,000	General Fund, contingent upon ARPA funding	9/21 - 6/23
Develop a citywide facility master plan	Staff will work with a consultant to develop a facility master plan. This plan will include: Developing a long-term strategy for City facilities.	\$40,000	General Fund	7/22 - 12/22

Goal 3 - Improve the City's engagement efforts to reach the broader Oregon City community and inform the policy process

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Refine and improve the engagement strategy to enhance two-way engagement and communication, build new relationships in the community, enhance the City's use of online engagement, and gather engagement data to track progress	Staff will work with a consultant to develop a plan to improve engagement and communication with the community. The plan will include: • An inventory of the tools and resources the City currently utilizes and a report of the effectiveness of these tools and platforms. • Creating a snapshot of followers and current engagement on the City's communication platforms. • Guidance on more effective tools and methods to increase followers and the quality of the engagement. • Providing a strategy to increase public engagement.	\$30,000	General Fund	7/21-9/22
	Staff will research and deploy an engagement website platform to enhance online engagement and disseminate information.	\$15,000	General Fund	7/21-9/22

Goal 4 - Adopt and implement a Homelessness Strategy for Oregon City

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Formalize our internal strategy to address homelessness and surrounding issues, communicate the strategy with the community, and continue engaging the community	Staff will work with a consultant to create a written, formalized document that outlines the citywide efforts and approach in response to issues related to homelessness. The document will include: • Development of an internal Oregon City Homeless Solutions task force that will include representatives from multiple departments. • Engagement with existing advisory bodies and community members. • Identification of resources necessary to address the needs of the homeless population. • Identification of the challenges and constraints. • Identification of potential strategies to address the needs of the homeless population with assistance from outside partners. • Development of a communications and engagement plan to inform the community of the resources and strategies that have been identified.	\$40,000	General Fund	7/21 - 12/21
Develop partnerships with other local and regional governments to develop local and regional solutions including Oregon City's needs in serving the homeless population	Staff will update the City Commission on different aspects of the issues related to homelessness in the City and strategic opportunities for the City Commission and staff to engage governmental agencies, non-profits, and other entities. Based on the results of the formalized internal strategy the following will occur: • Creation of an inventory of potential partner organizations/agencies. • Prioritization of Oregon City needs and related strategies. • Development of proposals and requests for potential partner organizations to assist with addressing homelessness in Oregon City.	No additional funds requested in proposed budget.		12/21 - 12/22

Goal 5 - Promote tourism and support economic development to foster community sustainability

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Prioritize and implement the Citywide economic development strategy	Staff will work to create a Citywide Economic Development marketing and promotion strategy to brand and highlight the recreational, business, and investment opportunities in Oregon City. The marketing and promotion strategy will include: The utilization of various promotional tools and marketing techniques such as paid digital content, Developer Familiarization Tours, publicity events, developer and business financial analysis, and social and print media.	\$400,000	General Fund	7/21 - 6/23
	Staff will implement an Ombudsman program that will assist developers, investors, and businesses with navigating through and understanding the City's regulatory process. The Ombudsman program will include: - Workshops and seminars on city regulatory processes for businesses. - Printing educational brochures and pamphlets to aid with understanding and navigating the City's regulatory process. - Working with City departments to reduce and clarify regulatory procedures. - Increasing community presence of Economic Development staff	\$40,000	General Fund	11/21 - 12/21
Determine implementation of 2020 urban renewal study.	Staff will work with the Urban Renewal Commission to complete the Urban Renewal Public Engagement Process. This process is currently ongoing.	No additional funds requested in proposed budget.		5/21 - 10/21
Implement the Tourism strategy	Staff will implement the Tourism Strategy to attract and engage the community to the Travel Oregon City website to increase participation and community opportunities. Implementation of the Tourism Strategy will include: - The marketing and promotion of Oregon City tourism assets. - Implementation of the Community Showcase, the Concierge Institute, and the Arts Treasure Trove which are programs identified in the Oregon City Tourism Strategy.	\$680,000	Transient Room Tax \$75,000 is contingent upon ARPA funding	7/21 - 6/23
Determine the City's role in supporting community events and other amenities that support tourism	Staff will work to create a program to support community events. The program will include: Providing grant funding to private nonprofits that produce city-wide special events designed to reinforce the community hometown brand.	\$100,000	General Fund	7/21 - 12/21

Goal 6 - Support diverse housing options in Oregon City

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Prepare a plan to identify and implement housing strategies, tools and opportunities that work best for Oregon City	Staff will create actions the City may take to increase the supply of housing, including affordable housing. The project will include: • An online public engagement effort to identify strategies to increase the supply of housing in Oregon City. • The public engagement results will be incorporated into the strategies identified at the severely rent burdened community conversation, as well as input from the Citizen Involvement Committee, the Planning Commission, and the best practices and strategies identified from partnerships with other agencies. • Recommendations to the City Commission that will include no-cost strategies, as well as strategies which would rely on funding sources such as the Construction Excise Tax.	\$10,000	General Fund	7/22 - 7/23
Update our code to provide additional housing opportunities in Oregon City	Staff will compare existing Oregon City regulations to HB 2001 and propose amendments to the Oregon City Municipal Code to implement the new requirements. The project will include: • An analysis of the City's infrastructure capacity to determine if there is sufficient capacity for the changes. • Public engagement, such as online surveys and input, Citizen Involvement Committee and Planning Commission presentations, a virtual open house, and a mailer to property owners and tenants. • Final Legislative review by the Planning Commission and City Commission of the proposed changes.	\$20,000	General Fund	7/21 - 7/22

Goal 7 - Support improvements and partnerships that contribute to our hometown feel and showcase Oregon City's unique community identity

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Determine and establish relationships with the Tribes that have a shared history with Oregon City	Staff will work jointly with all five tribes identified in the Willamette Falls Legacy Project and make connections with other tribes that reach out. The process for establishing these relationships and partnership building will include: - Arrangement of smaller introductory meetings between elected officials before a full meeting between elected bodies to form the basis of formal government-to-government relationships. - Development of a formal agreement with commitments, such as continued communication, collaboration, and a formal recognition of past harms.	No additional funds requested in proposed budget.		5/21 - 6/23
	The City would fund the installation of a memorial currently being designed by the Confederated Tribes of the Umatilla Indian Reservation to honor the Cayuse Five.	\$150,000	General Fund	5/21 - 6/22
Enhance partnerships with agencies and organizations to promote Oregon City's resources, opportunities and events	Staff will establish a six to eight week training program on the business of tourism and organizational and professional development for non-profit and for-profit businesses.	No additional funds requested in proposed budget.		9/21 - 6/23
Promote the arts as a focus of community identity and reactivate the Arts Commission	Staff will engage the arts community of Oregon City to further nurture community identification and reactivate the Arts Commission. Promotion of the arts will include: - Public display of sculptures, paintings, decorative features, horticultural enhancements and historical portrayals. - Events that include music, dance, poetry and other forms of artistic expression.	\$50,000	General Fund	8/21 - 2/22
Use art to attract and engage more community members and visitors	Staff will investigate the feasibility of the development of an arts incubator to help artists realize commercial success by establishing a facility to house studios, conference rooms, and administrative, financial, and legal services.	\$40,000	General Fund	10/21 - 3/22

Goal 8 - Protect and preserve our environmental health and natural resources

Strategy	Approach	Proposed Amount	Funding Source	Estimated Timeline
Develop a climate action plan	Staff will work with a consultant to create a Climate Action Plan focusing on actions the City can take to decrease the environmental footprint of City facilities and operations. The Climate Action Plan will include: - Engagement with PGE and other potential partners to identify opportunities to reduce the impacts created by City facilities and operations. - Recommendations for the City Commission to consider and potentially adopt via Resolution.	\$100,000	General Fund	10/22 - 12/23

Team

Agreement

The team agreement describes how the team will work together to advance the goals and strategies identified. The Commission and staff are committed to being a high performing team to advance their vision and improve the Oregon City community.

Our Team agrees to...

- » Assume positive intent of the team and trust the public process.
- » Listen to all voices, not just the loudest voices.
- » Value the personal relationships and partnerships to support the advancement of Oregon City's vision and goals.

The Commission agrees to...

- » Improve communication with each other and staff to improve relationships and help advance our goals.
- » Acknowledge and respect the diversity of perspectives and strengths on our team. They are all important and we commit to balancing and prioritizing the varying interests of the team.
- » Allocate adequate time to have in-depth discussions with our fellow Commissioners on important policy issues.
- » Provide clear direction to staff, stay focused on the goals, support goals with adequate resources, and serve as advocates for program implementation.

Staff agrees to...

- » Provide the best information available to the Commission in a timely manner to inform their policy discussions and decisions.
- » Develop a work plan for the biennium that includes options. Provide realistic timelines, milestones, and resources needed. Help the Commission understand trade offs.

Implementation +

Progress Reporting

To maintain accountability to the goals and ensure two-way communication between the Commission, Staff and the community, the following process has been outlined to support the implementation of the goals. This process will also support evaluating and tracking progress on the goals over the next two years.

The goals were developed with the four seated Commissioners in January 2021. The Commissioners expressed an interest in revisiting the goals following the election of a new Commissioner.

Project Leads + Timelines

The City Manager will assign "Project Leads" for each strategy outlined under the goals. The project leads will be executive team members who will oversee the implementation and report progress. The Executive Team will provide estimated timelines for the strategies based on staff capacity, budgeted resources, and the priorities expressed by the Commission.

Progress Reporting

Every six months, staff will provide the Commission with an update on the goals and strategies. These updates will include any progress made on the goals and strategies, challenges that need to be addressed, and/or recommendations or requests for additional Commission direction. Every three months or as needed, staff will provide abbreviated or informal updates. Staff will provide a dashboard of what work is currently underway.

Additionally, staff reports to the Commission will highlight or indicate if an item is related to a Commission goal or strategy.



**625 Center Street
Oregon City, Oregon 97045
www.orcity.org**

Prepared by:



SSW CONSULTING
www.sarasingerwilson.com



CITY OF OREGON CITY

Staff Report

625 Center Street
Oregon City, OR 97045
503-657-0891

To: Natural Resource Committee
From: Pete Walter, Planning Manager

Agenda Date: 2/8/2023

SUBJECT:

Heritage Tree Nomination for an Oregon White Oak adjacent to 1506 S. High Street.

STAFF RECOMMENDATION:

Consider the nomination for a white oak tree adjacent to 1506 S. High Street. Upon review of this nomination, make a recommendation for City Commission consideration.

EXECUTIVE SUMMARY:

Staff received the attached heritage tree nomination from Didi Dahlsrud with property owner consent. The nominated tree is in the public right-of-way at the intersection of South End Road and S. High Street.

BACKGROUND:

Nomination on Private Property

Dorothy (Didi) Dahlsrud submitted the nomination application for a heritage tree in the public right-of-way at the intersection of South End Road and S. High Street. The abutting property owners responsible for the tree are Chris and Brenda Stephens.

The tree is an Oregon White Oak or Garry Oak (*Quercus garryana*) with a diameter at breast height (DBH) of 36" with a height of approximately 40' and a canopy spread of approximately 35'. The age of the tree is unknown.

To be nominated as a heritage tree, a tree must meet the requirements in OCMC 12.32 (Attached). The criteria are:

- A. Heritage criteria (at least one heritage criterion must be met):
 1. The tree or stand of trees is associated with events that have made a significant contribution to the broad pattern of Oregon City's history; or
 2. The tree or stand of trees is associated with the life of a person or group of historic significance to Oregon City; or

3. The tree or stand of trees represents a significant and distinguishable presence within Oregon City; or
4. The tree or stand of trees has age, size, or species significance (horticultural or ecological), which contributes to Oregon City's heritage status;

B. Site and Condition Criteria (all criteria must be satisfied):

1. The tree species is not listed as invasive on any regionally accepted plant list;
2. If the proposed heritage tree or stand is located on private property or on public property owned by a public agency other than the city of Oregon City, the property owner or, if the tree or stand of trees is located on a public right-of-way, the abutting private property owner consents to the designation and agrees to sign a protective covenant.

The nomination appears to meet the applicable criteria.

Please see attached nomination application for further details. Staff has also attached Google Street View pictures of the tree.

OPTIONS:

1. Recommend approval of the nomination as proposed.
2. Recommend approval of some of the nomination.
3. Do not recommend approval of the nomination.



OREGON CITY

Community Development Department

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

HERITAGE TREE OR STAND NOMINATION FORM

12.32.010 - Purpose.

A. The purpose of this chapter is to recognize, foster appreciation and provide for voluntary protection of certain trees, because their age, species, natural resource value, ecological or horticultural value, or historical association, are of special importance to the city. These trees may grow on private or public property.

Site Address: 506 S. High St. Oregon City, OR 97045
Clackamas County Map and Tax Lot(s): 2-2E-31CC-00200

Nominator(s):

Nominator(s) Signature: [Signature]

Nominator(s) Name Printed: Dorothy Dahlstrud Date: 01-02-2023

Address: 415 Dewey Street, Oregon City, OR 97045
Phone: 503-502-0610 Fax: _____ Email: dorothydahlstrud@gmail.com

Property Owner(s):

Property Owner(s) Signature: Brenda Stephens

Property Owner(s) Name Printed: Chris & Brenda Stephens Date: 01-02-2023

Mailing Address: 506 S. High St. Oregon City, OR 97045
Phone: 503-799-9098 Fax: 503-722-8272 Email: blscms@aol.com
(works intermittently)

Ownership Type:

- ☐ Private Property
- ☒ Public Tree in the Right-of-Way (Abutting owner is responsible and must consent to nomination)
- ☐ Public Property
- ☐ City-Owned Park ☐ County-Owned ☐ Metro
- ☐ Other _____

OWNER CONSENT AND UNDERSTANDING. Signature below indicates that the owner has read and understands the requirements for heritage tree designation and protection as described in section OCMC 12.32, consents to the nomination, and agrees to subject the property to a restrictive covenant or other legal document to assure protection and replacement of the heritage tree or trees in the event of removal.

Brenda Stephens

Owner Signature(s)

STAFF USE ONLY:



TREE SPECIES, SIZE AND CONDITION

*DBH = Diameter at Breast Height, which is the diameter of the trunk measured 4.5' above the ground. To learn how to properly measure or estimate DBH, please visit:

<https://www.wikihow.com/Measure-the-Diameter-of-a-Tree>

Tree	Species	DBH* (inches)	Height (ft)	Canopy Spread (ft)
1.	Oregon White Oak (Quercus garrana)	36"	40'	35'
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

TREE CONDITION. Although optional, it is strongly recommended that the nomination include an assessment of the tree's health and any potentially hazardous conditions that may be present.

Tree	Condition
1.	Looks to be in good condition. The owners had it balanced a bit and some stems removed after the Ice Storm of 2021.
2.	The tree company at that time said its a healthy tree.
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

(Attach Additional Sheets If Needed)

Please proceed to page 3.



OREGON CITY

Community Development Department

695 Warner Parrott Rd | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

HERITAGE TREE OR STAND NOMINATION FORM

OCMC 12.32.010 - Purpose.

The purpose of this chapter is to recognize, foster appreciation and provide for voluntary protection of certain trees, because their age, species, natural resource value, ecological or horticultural value, or historical association, are of special importance to the city. These trees may grow on private or public property.

Site Address: 506 S. High Street Oregon City, OR 97045

Clackamas County Map and Tax Lot(s): 2-2E-31CC-00200

Nominator(s):

Nominator(s) Signature(s): see hard copy on file

Nominator(s) Name(s) Printed: Dorothy L. Dahlsrud

Address: 415 Dewey Street Oregon City, OR 97045

Phone: 503-502-0610 Email: dorothydahlsrud@gmail.com Date: 01/03/2023

Property Owner(s):

Property Owner(s) Signature(s): see hard copy on file

Property Owner(s) Name Printed: Chris and Brenda Strphens

Mailing Address: 506 S. High Street, Oregon City, OR 97045

Phone: 503-799-9098 Email: blscms@aol.com Date: _____

Ownership:

☐ Private Property

☒ Public Tree in the Right-of-Way (Abutting owner is responsible and must consent to nomination)

☐ City Property

☐ City Park

☐ County-Owned

☐ Metro

☐ Other _____

OWNER CONSENT AND UNDERSTANDING. Signature below indicates that the owner has read and understands the requirements for heritage tree designation and protection as described in section [OCMC 12.32](#), consents to the nomination, and agrees to subject the property to a restrictive covenant or other legal document to assure protection and replacement of the heritage tree or trees in the event of removal.

Owner Signature(s)

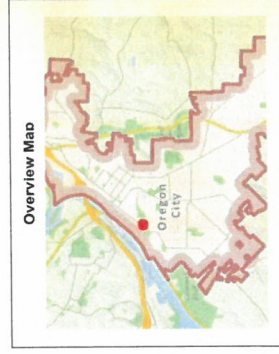
Please proceed to page 2.

Oregon City GIS Map



Legend	
Street Names	
Contours (10 ft)	
50 foot	
10 foot	
Taxlots	
Unimproved ROW	
Water Service Meters (City Owned)	
Water Pipes (City Owned)	
Water Service Lines	
Sewer Structures (City Owned)	
Sewer Pipes (City Owned)	
Force Main	
Gravity Line	
Outfall	
Overflow	
Sewer - Laterals	
Inactive or Abandoned	
Active	

Notes



City of Oregon City
PO Box 3040
625 Center St
Oregon City
OR 97045
(503) 657-0891
www.orcity.org

0 30 60 Feet

1: 360

The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, surveying or navigation purposes. Notification of any errors is appreciated.

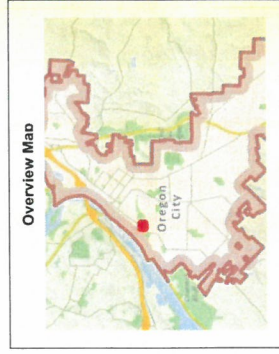
Map created 1/2/2023

Oregon City GIS Map

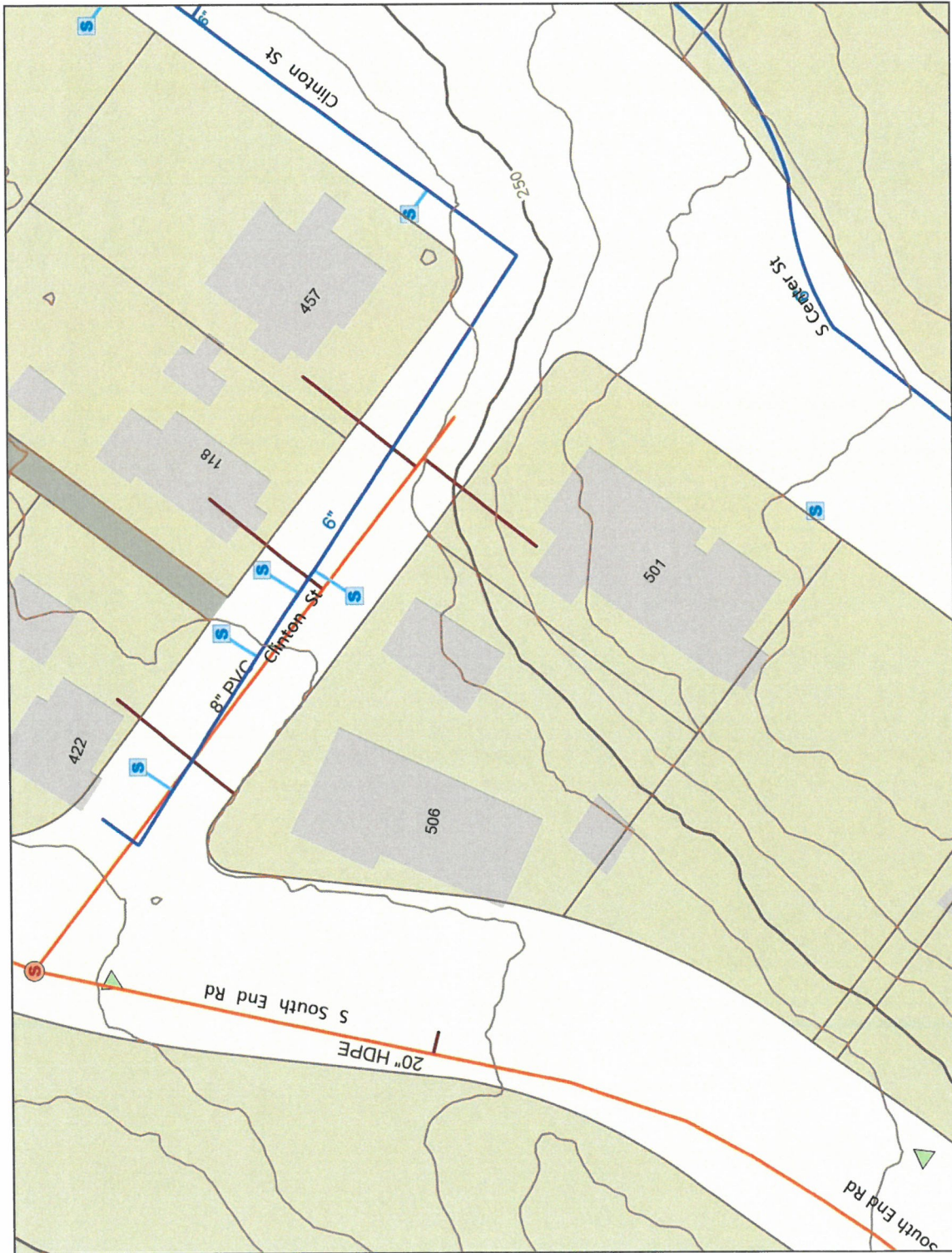
Legend

- Street Names
- Contours (10 ft)
- 50 foot
- 10 foot
- Taxlots
- Unimproved ROW
- Water Service Meters (City Owned)
- Water Pipes (City Owned)
- Water Service Lines
- Sewer Structures (City Owned)
- Sewer Pipes (City Owned)
- Force Main
- Gravity Line
- Outfall
- Overflow
- Sewer - Laterals
- Inactive or Abandoned
- Active

Notes



City of Oregon City
 PO Box 3040
 625 Center St
 Oregon City
 OR 97045
 (503) 657-0891
www.orcity.org



1: 600

The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, surveying or navigation purposes. Notification of any errors is appreciated.

Map created 1/2/2023

01-02-2023

RE: White oak at 506 S High St. Oregon City

We enjoy the beauty of this tree, as well as watching the birds & squirrels that spend time in this tree. It provides the only shade that our yard sees in the summer. We just would like to help ensure the future of this tree. Hopefully this process will guarantee the natural life of this beautiful white oak for the jays, towhees, juncos, northern flickers, downy woodpeckers, sparrows, finches, robins, & other species we have seen. We have even seen a bald eagle land ~~on~~ in this tree a couple of times.



July 2012



December 2021



December 2021



CITY OF OREGON CITY

Staff Report

625 Center Street
Oregon City, OR 97045
503-657-0891

To: Natural Resources Committee
From: Pete Walter, Planning Manager

Agenda Date: 2/8/2023

SUBJECT:

Stormwater Facilities Maintenance

STAFF RECOMMENDATION:

Consider and discuss the City's adopted maintenance requirements for stormwater facilities.

EXECUTIVE SUMMARY:

Recently staff has been working with interested citizens to improve awareness of how the city's various types of stormwater facilities are maintained. The background below provides an initial overview of this topic.

BACKGROUND:

Source: <https://www.orcity.org/publicworks/stormwater-and-grading-design-standards>

Stormwater Management

Stormwater management is a key element in maintaining and enhancing livability within the City of Oregon City (City). There is a direct link between stormwater runoff and the City's surface and ground water quality and quantity. As land is developed, creation of new impervious surfaces and loss of vegetation increases stormwater runoff during rainfall events, altering the natural hydrologic cycle. Without stormwater management, the increase in flows erodes stream channels and limits groundwater recharge. In addition, runoff that flows over roadways, parking areas, rooftops, and other impervious surfaces collects pollutants that are transported within the watershed to streams, rivers, and groundwater resources. Properly managing stormwater is vital to protecting our water resources for a great number of uses, including fish and wildlife habitat, recreation, and drinking water.

Updates to the City's stormwater management standards, set forth in OCMC 13.12, were adopted by [Ordinance No. 15-1006](#) and became effective August 18,

2015. The Stormwater and Grading Design Standards, emphasize low-impact development (LID) practices, source controls for higher pollutant generating activities, erosion prevention and sediment controls, and operation and maintenance practices designed to properly manage stormwater runoff and protect our water resources. Each of these measures have been or are being implemented as direct requirements under the City's existing [NPDES MS4 permit](#).

The goal of these updated standards is to provide local engineers, developers, builders, and City staff clear guidance in planning and designing stormwater conveyance and management systems that are appropriate to the local climate, hydrogeology, and geology. These standards apply to public and private projects throughout the City.

Some stormwater LID techniques approved for use by property owners who live in Oregon City include:

- [Porous Pavement](#) – Typically a walkable or drivable hard surface that looks similar to a traditional finish but allows water to infiltrate through the surface and into the underlying soil or drainage media.
- [Green Roof](#) – A Green Roof or ecoroof is a lightweight vegetated roof system consisting of waterproofing material, a growing medium, and specially selected plants.
- [Filtration planters](#) – A planter with an under drain system which is piped downstream. The planter holds some water but acts more like a filter.
- [Infiltration planters](#) – Like a flow through planter minus the under drain. Infiltration planters need well draining soils.
- [Swales](#) – Gently sloping, landscaped depression that collects and conveys stormwater runoff.
- [Rain gardens](#) – Similar to planters but does not have vertical walls and is completely constructed by grading the earth.

These techniques mimic natural drainage systems by keeping rainwater close to where it falls and attenuate stormwater runoff.

Maintenance

Maintenance standards and procedures for each of the facility types, including the vegetation above are provided in Appendix C of the adopted [Stormwater and Grading Design Standards](#), see attached.



Stormwater and Grading Design Standards

APPENDIX C

Stormwater Facility Design and Maintenance

APPENDIX C. STORMWATER FACILITY DESIGN AND MAINTENANCE

This appendix includes fact sheets, design guideline drawings, and operation and maintenance (O&M) plans for the stormwater management facilities accepted by the City of Oregon City (City). Fact sheets include example photos and concept sketches to illustrate the general appearance and potential use for the stormwater management facilities. The images have been excerpted from the 2009 Clean Water Services LIDA Handbook and are intended to help in the selection of appropriate facilities for preliminary site design.

The facility drawings show minimum facility dimensions, cross sections, and design criteria. These drawings are for reference only. The project engineer must provide facility-specific construction documents with plan views, cross sections, and control structure details for each proposed stormwater management facility. Refer to the City's standard drawings and engineering policy for standard details, applicable for use in construction documents.

This appendix also includes sample O&M plans for typical stormwater management facilities. The O&M plans should be modified as necessary to reflect specific site conditions and facility design before inclusion in the stormwater management plan.

The following figures are included in this appendix:

- Figure C-1. Stormwater Planter – Filtration
- Figure C-2. Stormwater Planter – Infiltration
- Figure C-3. Stormwater Planter O&M Plan
- Figure C-4. Rain Garden – Filtration
- Figure C-5. Rain Garden – Infiltration
- Figure C-6. Rain Garden O&M Plan
- Figure C-7. Vegetated Swale – Filtration
- Figure C-8. Vegetated Swale – Infiltration
- Figure C-9. Vegetated Swale O&M Plan
- Figure C-10. Planter, Rain Garden, and Swale Flow Control Structure
- Figure C-11. Detention Pond
- Figure C-12. Detention Pond Flow Control Structure
- Figure C-13. Detention Pond O&M Plan
- Figure C-14. Underground Infiltration System
- Figure C-15. Underground Infiltration System O&M Plan
- Figure C-16. Pervious Pavement
- Figure C-17. Pervious Pavement O&M Plan
- Figure C-18. Green Roof
- Figure C-19. Green Roof O&M Plan
- Figure C-20. Stormwater Facilities O&M Checklist

Rain Gardens and Stormwater Planters

Rain gardens and Stormwater Planters have similar design guidelines and potential benefits. Stormwater Planters are rain gardens with vertical walls, which may be more appropriate in urban site design or for facilities located adjacent to sidewalks, roadways, or buildings.



RAIN GARDENS

Rain gardens are planted open depressions designed to accept runoff from adjacent impervious surfaces. Rain gardens trap and treat pollutants by filtering it through topsoil as the water infiltrates into native soils or underlying drain pipes. Most rain gardens must be designed to infiltrate the stormwater they receive. An underdrain and overflow device may be required to accommodate flows greater than the infiltration capacity of the underlying soils, or if a liner is required.

Benefits

- Rain gardens may help fulfill a site's landscaping area requirement and can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Rain gardens reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed as the runoff passes through the soil layer and is collected in an underlying layer of gravel or drain rock.
- Detention storage volume can be built into the underlying drain rock layer.

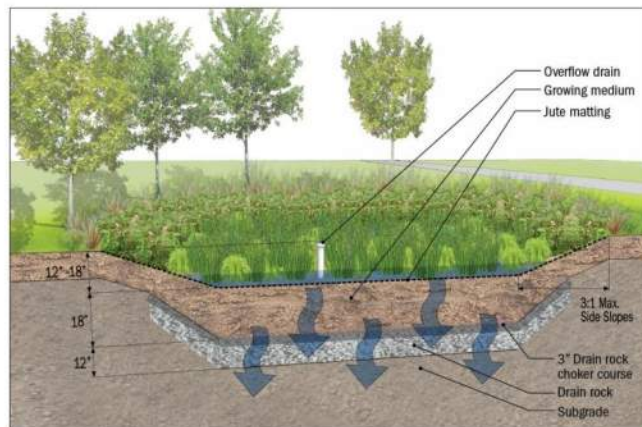


Image from Clean Water Services LIDA Handbook



Buckman Terrace Apartments, Portland



Beaumont Village Lofts, NE Portland

Vegetated Swales

Vegetated Swales function similar to rain gardens, but include a sloped bottom to allow transport of stormwater runoff to a downstream outlet. In this way, vegetated swales can be utilized for stormwater treatment and conveyance.



VEGETATED SWALES

A vegetated swale is a gently sloping landscaped depression that collects and conveys stormwater runoff. The densely planted swale filters stormwater as it flows the length of the swale and allows infiltration of water through topsoil and into the ground. The vegetated swale may discharge to a storm sewer or other approved discharge point where soils do not drain well, or if liner is required.

Benefits

- Vegetated swales may help fulfill a site's landscaping area requirement and can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Vegetated swales reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed as the runoff passes through the vegetation and soil layer and is collected in an underlying layer of gravel or drain rock.
- Where soils do not drain well, swales can overflow to an approved discharge point.



Image from Clean Water Services LIDA Handbook



New Seasons, SE Division St, Portland



Boeckman Road, Wilsonville

Detention Ponds

The principles of detention pond design are the same as those for constructed wet ponds presented in this example from Clean Water Services. The flow control structure should the design principles from the BMP Sizing Tool (See facility design details in Appendix C for more information).



CONSTRUCTED WET PONDS

A constructed wet pond is a landscaped depression that collects and holds stormwater runoff and allows pollutants to settle and filter out during storm events. Constructed wet ponds have a permanent pool of water and also an extended detention area above that fills during storm events and releases water slowly over a number of hours. The permanent pool is sized to reduce pollution by settling and biological processes. The extended detention area is sized to meet flow control requirements.

Benefits

- Constructed Wet Ponds can be used to treat stormwater from all types of impervious surfaces including private property and the public right-of-way, rooftops, parking lots, and streets.
- Constructed Wet Ponds reduce stormwater flow rates, volume, and temperature, and improve water quality. Pollutants are removed through settling and biofiltration through vegetation and soils.
- Constructed Wet Ponds can be designed as multi purpose site amenities and can significantly contribute to urban habitat for birds and other organisms.
- Detention storage volume can be included in wetland sizing, or a detention pond can be designed for detention only without a permanent pool, if water quality requirements are met separately on site.

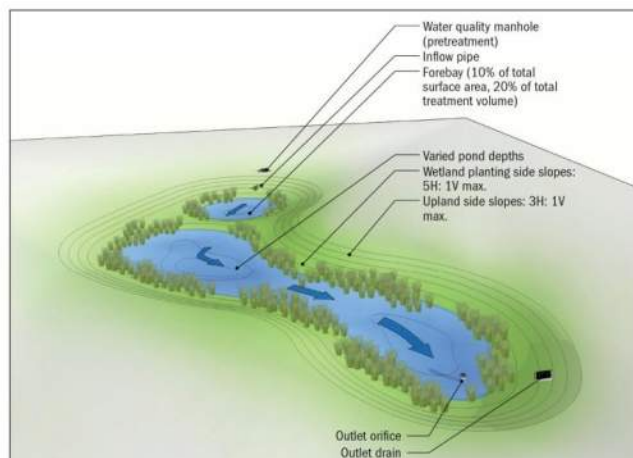


Image from Clean Water Services LIDA Handbook



Washington County

Porous Pavement

Porous pavement is a water permeable structural groundcover that infiltrates precipitation, attenuates stormwater runoff flows and volumes, and reduces temperatures. Porous pavement provides a stable load-bearing surface without increasing a project's total impervious area. The two main categories of porous pavements are 1) pervious concrete and 2) permeable pavers. Pervious concrete is poured in place and resembles its solid counterpart. Permeable pavers are solid, discrete units typically made of pre-cast concrete, brick, stone, or cobbles and set to allow water to flow between them.

Benefits

- The area of a porous pavement may be directly subtracted from site impervious area. Porous pavement reduce site impervious area, reducing the required size of stormwater facilities.
- Porous pavement reduces stormwater flow rates, volume, and temperatures by temporarily storing stormwater and allowing infiltration of stormwater into underlying soils.
- Detention storage volume may be built into the drain rock layer.



Porous Asphalt



Porous Pavers, Tigard Library



Porous Pavers



Porous Concrete, Clean Water Services Field Operations Center

Green Roofs



GREEN ROOFS

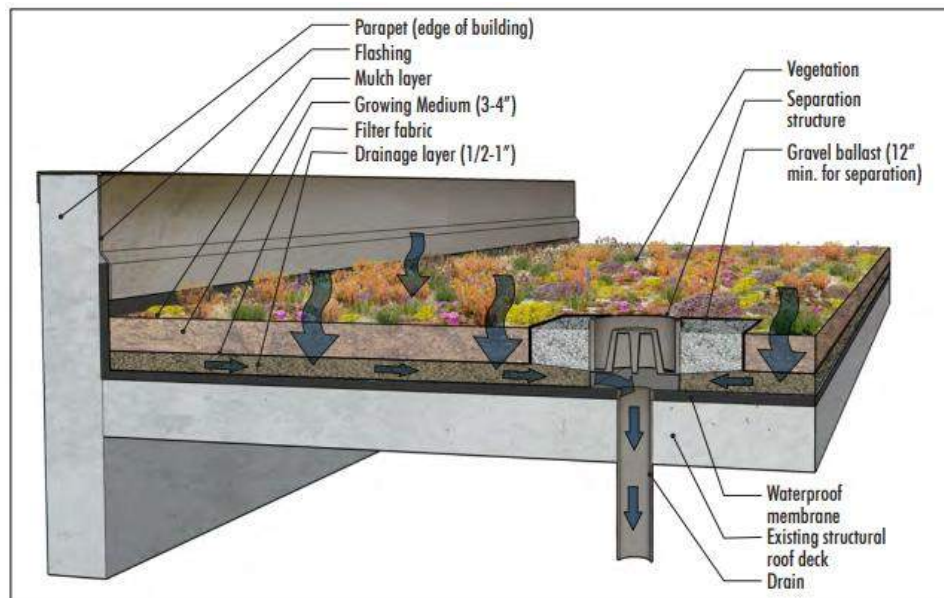
A green roof is a thin lightweight vegetated roof system used in place of a conventional roof. Greenroofs typically consist of a waterproof membrane, drainage material, a lightweight layer of soil, and a cover of plants. Species are chosen appropriate for a rooftop environment - dry and hot in summer, wet in winter. Extensive greenroofs are not intended to be accessed except for maintenance.

Benefits

- Green roofs reduce site impervious area, reducing the required size of stormwater facilities. The area of a green roof may be directly subtracted from site impervious area in the District's Impervious Reduction Form.
- Green roofs can capture and retain 60% of annual precipitation.
- Green roofs reduce runoff flow rate, volume and temperature of roof runoff.
- Green roofs outlasts conventional roofs by twenty years or more. Average green roof lifespan is 40 years.
- Green roofs slow down peak flow rates during heavy storm events which helps prevent on-site erosion and flooding especially in urban areas where soils are heavily compacted and have a low infiltration rate.
- Green roofs filter air pollutants and absorb carbon dioxide.
- Green roofs reduce the heat island effect within an urban area by absorbing thermal UV rays from the sun.

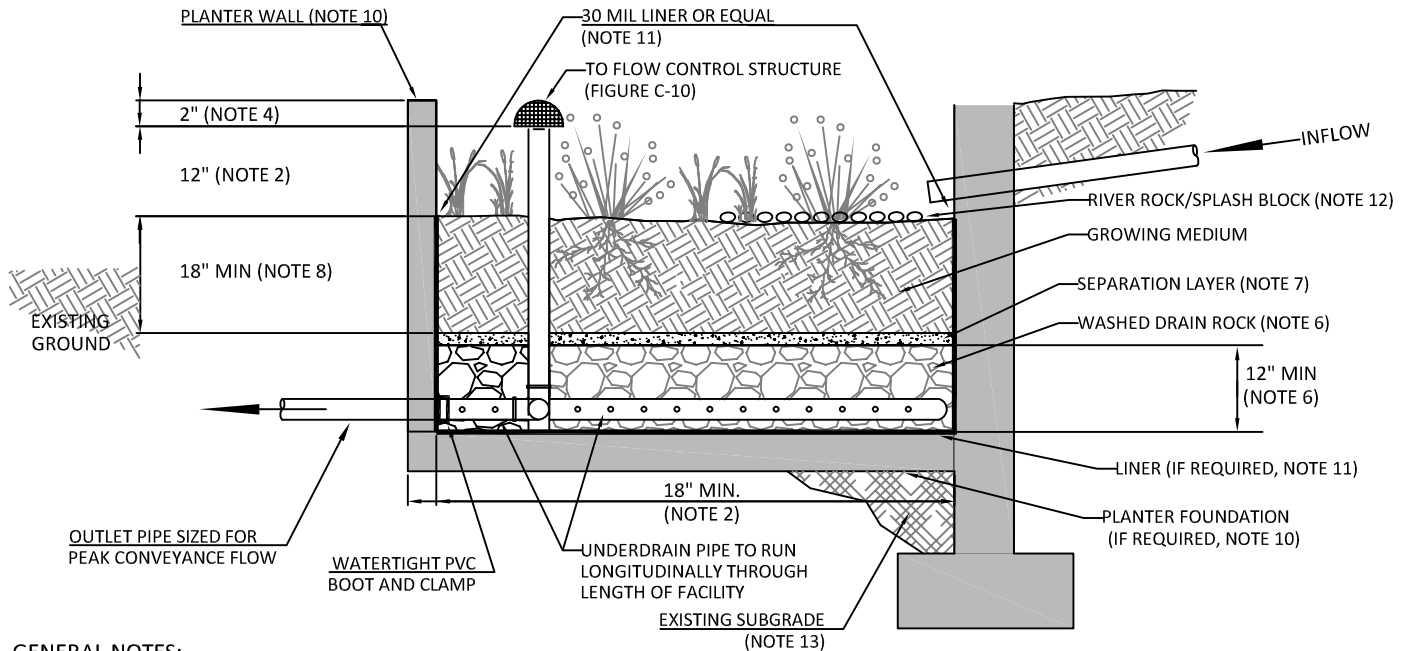


Clean Water Services Field Operations



* SEE CITY'S STANDARD DRAWINGS
FOR LOCATING PLANTERS IN THE
PUBLIC RIGHT-OF-WAY.

Item #3.



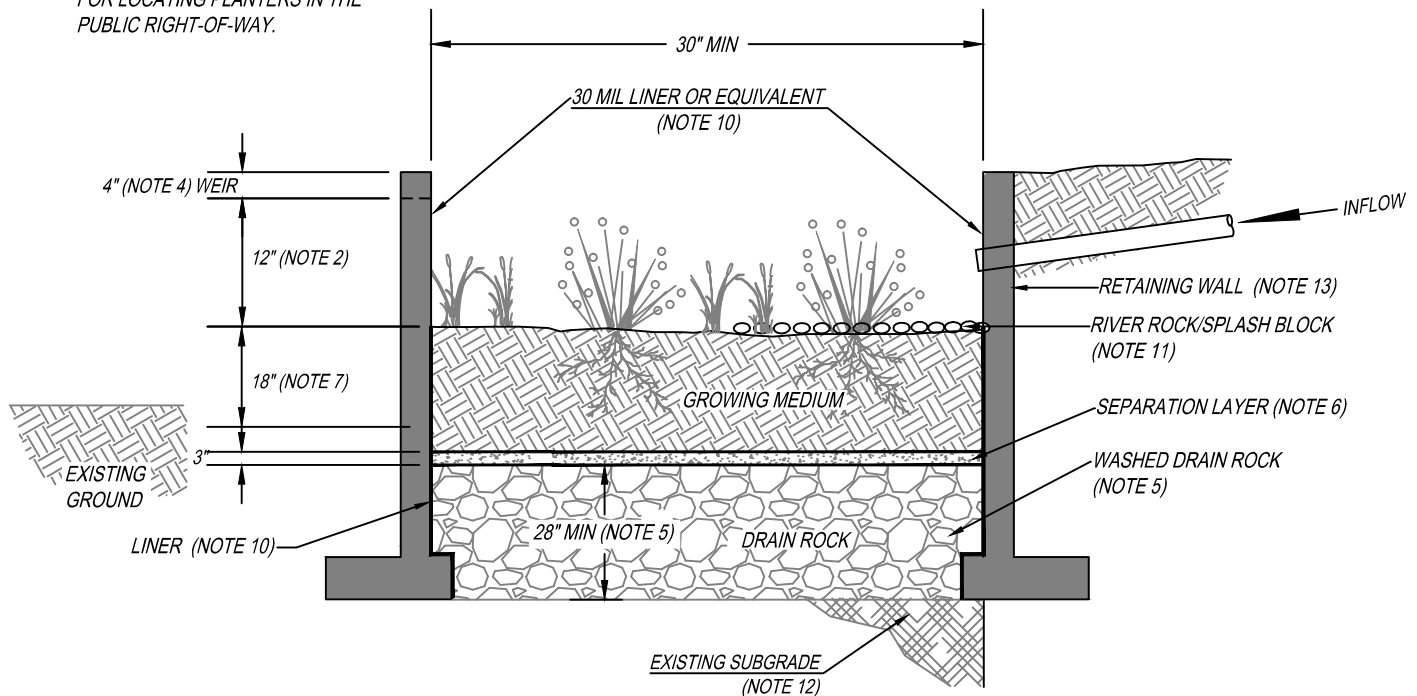
GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
 - WIDTH: 18" MINIMUM
 - DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
 - SLOPE OF PLANTER: 0.5% OR LESS
3. **SETBACKS**
 - PLANTERS MUST BE MINIMUM OF 5 FEET FROM PROPERTY LINE.
4. **OVERFLOW:**
 - INLET ELEVATION MUST ALLOW FOR 2" OF FREEBOARD, MINIMUM. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
 - IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. **PIPING:**
 - PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40, 6" MINIMUM DIAMETER. PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
 - OVERFLOW PIPING: SHALL BE ABS SCH.40, DUCTILE IRON, OR PVC SCH.40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
 - SIZE FOR FLOW-THROUGH PLANTER: 1 1/2" - 3/4" WASHED
 - DEPTH: 12" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
 - DEPTH: 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **PLANTER FOUNDATION AND WALLS:**
 - MATERIALS SHALL BE 4" REINFORCED CONCRETE, STONE, BRICK, OR OTHER DURABLE MATERIAL.
 - CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
 - INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTER AND ROAD SUBGRADE.
 - WALL HEIGHTS GREATER THAN 24" ABOVE GRADE REQUIRE HANDRAIL.
11. **WATERPROOF LINER (IF REQUIRED):**
 - LINER SHALL BE 30 MIL PVC OR EQUIVALENT, FOR FLOW THROUGH FACILITIES.
 - A WATERPROOF LINER IS NOT REQUIRED IF THE FOUNDATION OR WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
12. **INSTALL RIVER ROCK SPLASH PAD** TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
13. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY THE CITY.
14. **SUBMIT RETAINING WALL DESIGN** IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.

Stormwater Planter - Filtration
Figure C-1



* SEE CITY'S STANDARD DRAWINGS
FOR LOCATING PLANTERS IN THE
PUBLIC RIGHT-OF-WAY.



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
 - WIDTH: 30" MINIMUM
 - DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW WEIR ELEVATION): 12"
 - SLOPE OF PLANTER: 0.5% OR LESS
3. **SETBACKS:**
 - PLANTERS MUST BE MINIMUM OF 5 FEET FROM PROPERTY LINE.
4. **OVERFLOW:**
 - WEIR ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM.
 - SIZE OVERFLOW WEIR FOR THE 100 YEAR DESIGN STORM. IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
 - SIZE: 1 1/2" - 3/4" WASHED
 - DEPTH: 28" MINIMUM
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
 - DEPTH: 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **PLANTER WALLS:**
 - MATERIALS SHALL BE STONE, BRICK, CONCRETE OR OTHER DURABLE MATERIAL.
 - CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
 - INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTERS AND ROAD SUBGRADE.
 - WALL HEIGHTS GREATER THAN 24" ABOVE GRADE REQUIRE HANDRAIL.
10. **WATERPROOF LINER:**
 - LINER SHALL BE 30 MIL PVC OR EQUIVALENT.
 - A WATERPROOF LINER IS NOT REQUIRED IF THE WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
11. **INSTALL RIVER ROCK** SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY THE CITY.
13. **SUBMIT RETAINING WALL DESIGN** IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.

Stormwater Planter - Infiltration
Figure C-2



Stormwater Planters Operations & Maintenance Plan

What to Look For	What to Do
Structural Components , including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium , including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.

Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.

Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.

Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.

All seasons. Weed as necessary. Clean scuppers or curb inlets as needed.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

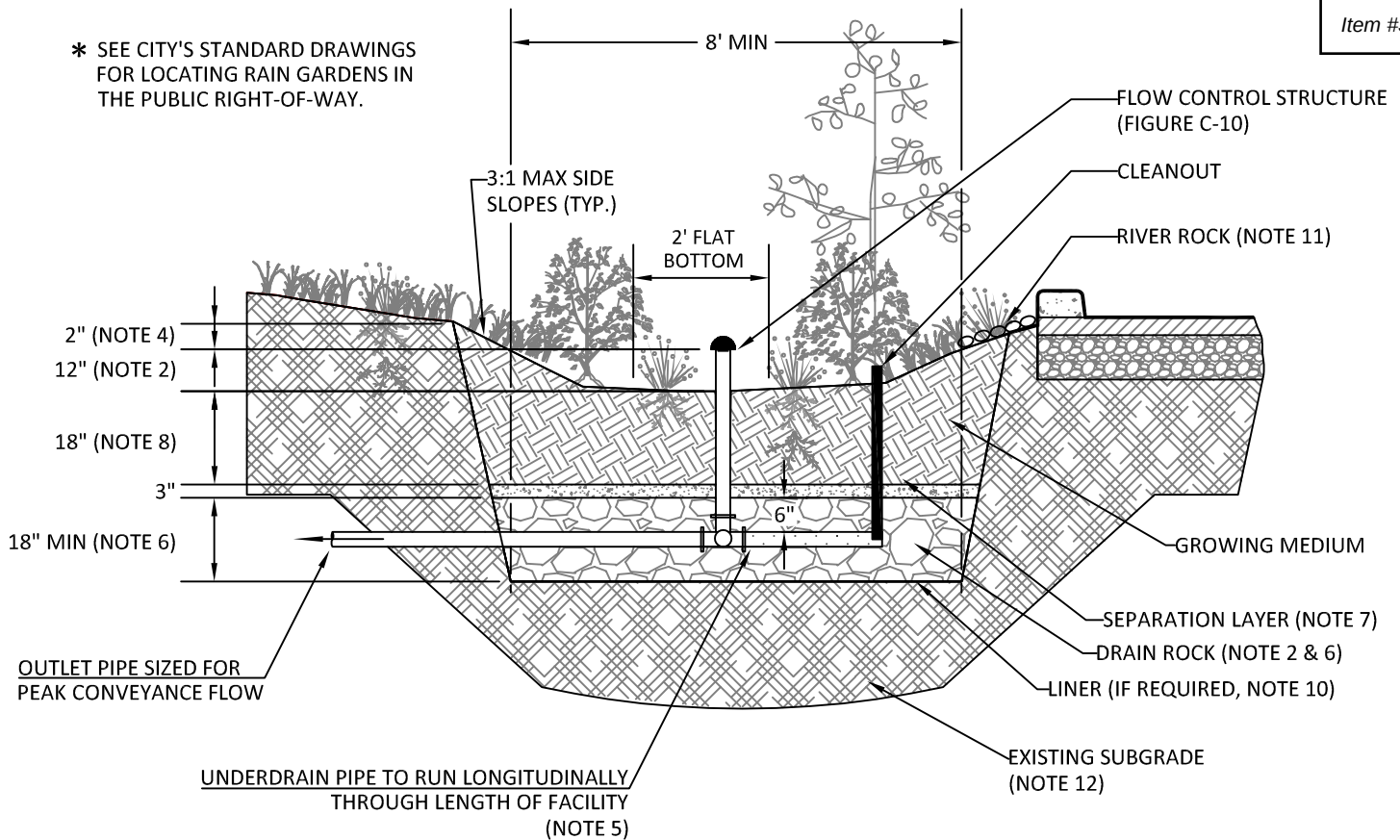
Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.





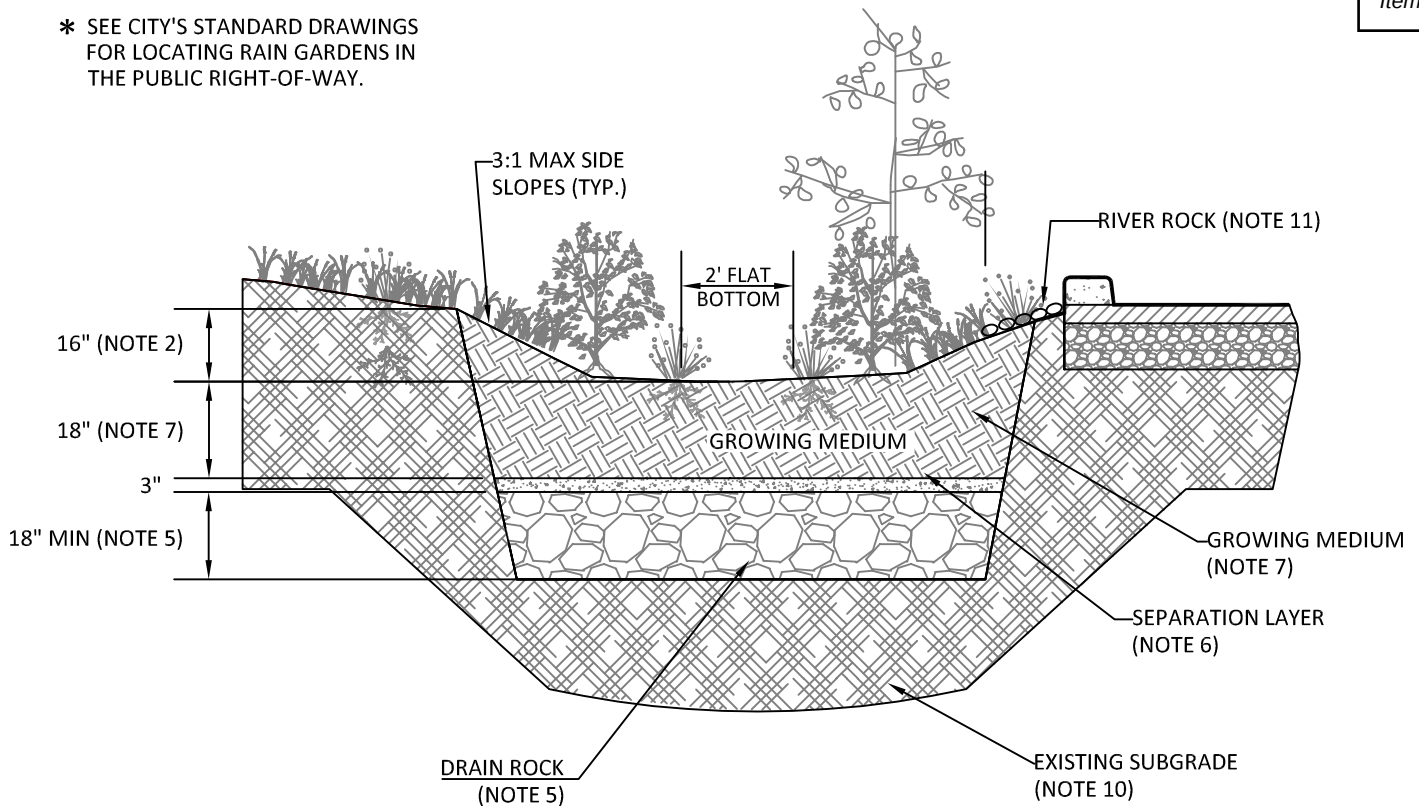
GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED RAIN GARDENS ARE PREFERRED TO MAXIMIZE ONSITE INFILTRATION.
2. **DIMENSIONS:**
 - DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
 - FLAT BOTTOM WIDTH: 2' MINIMUM
 - SIDE SLOPES OF BASIN: 3:1 MAXIMUM
 - SLOPE OF RAIN GARDEN: 0.5% OR LESS
 - FACILITY AREA SHALL BE MEASURED AT THE DEEPEST SECTION (DRAIN ROCK) OF FACILITY
3. **SETBACKS:**
 - FILTRATION RAIN GARDEN MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **OVERFLOW:**
 - INLET ELEVATION MUST ALLOW FOR 2" OF FREEBOARD, MINIMUM. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
 - IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. **PIPING:**
 - PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
 - OVERFLOW PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
 - SIZE: 1 1/2" to 3/4"-0 WASHED
 - DEPTH: 18" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE OR FILTER FABRIC WITH 3" OF ADDITIONAL DRAIN ROCK MAY BE UTILIZED IN LIEU OF OPEN GRATED AGGREGATE IF APPROVED BY CITY ENGINEER.
8. **GROWING MEDIUM:**
 - DEPTH: 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3".
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY CITY.

Rain Garden - Filtration
Figure C-4



* SEE CITY'S STANDARD DRAWINGS FOR LOCATING RAIN GARDENS IN THE PUBLIC RIGHT-OF-WAY.



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
 - DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 16"
 - FLAT BOTTOM WIDTH: 2' MINIMUM
 - SIDE SLOPES OF BASIN: 3:1 MAXIMUM
 - SLOPE OF RAIN GARDEN: 0.5% OR LESS
3. **SETBACKS:**
 - INFILTRATION RAIN GARDEN MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES.
4. **OVERFLOW:**
 - INLET ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
 - EMERGENCY OVERFLOW PATH FOR THE 100 YEAR DESIGN STORM SHALL BE IDENTIFIED IN THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
 - SIZE: 1 1/2" TO 3/4" - WASHED
 - DEPTH: 18"
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
 - DEPTH: 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **INSTALL RIVER ROCK** SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
10. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY THE CITY.

Rain Garden - Infiltration
Figure C-5



Rain Gardens Operations & Maintenance Plan

What to Look For	What to Do
Structural Components , including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium , including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.

Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.

Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.

Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.

All seasons. Weed as necessary. Clean scuppers or curb cuts as needed.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

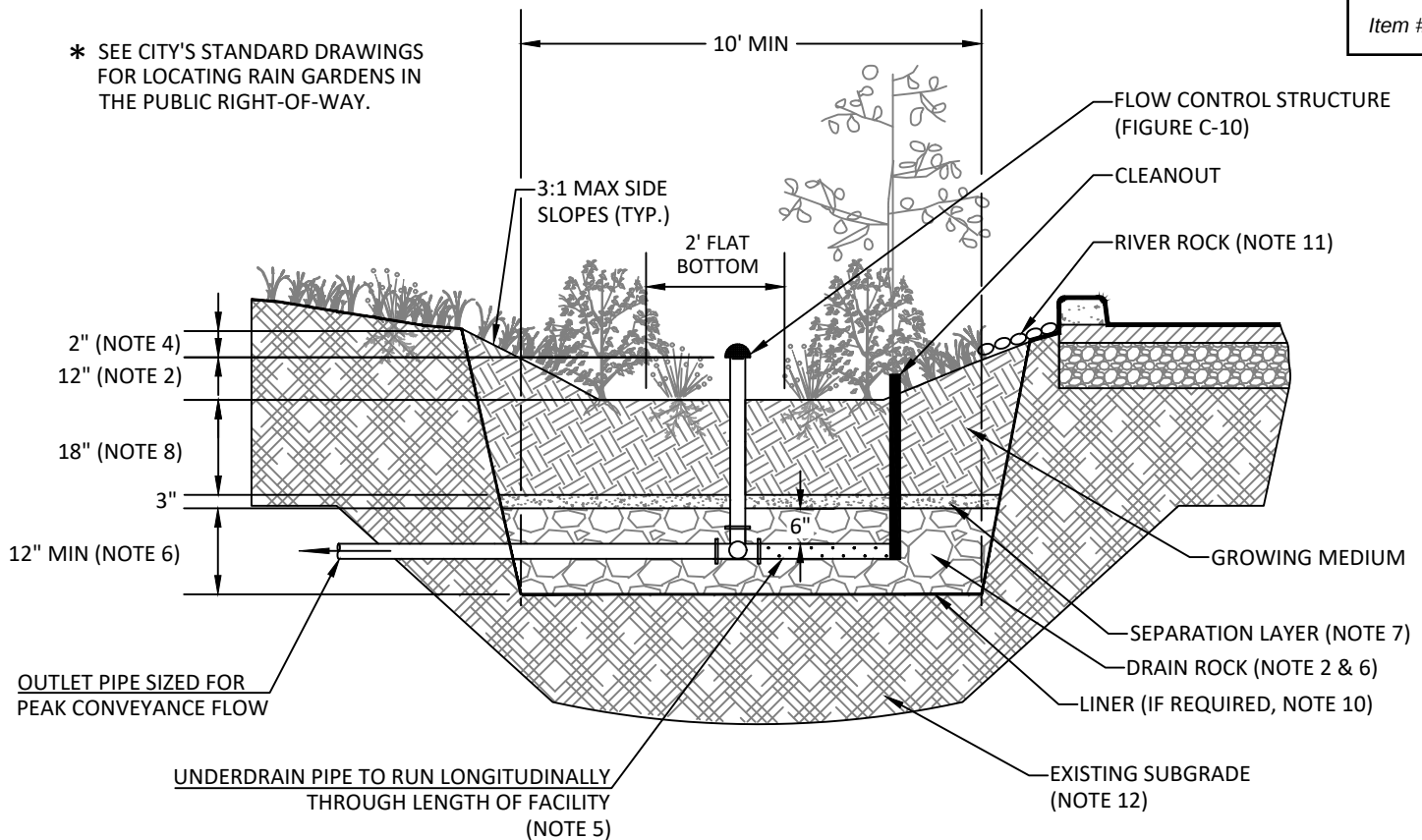
Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.



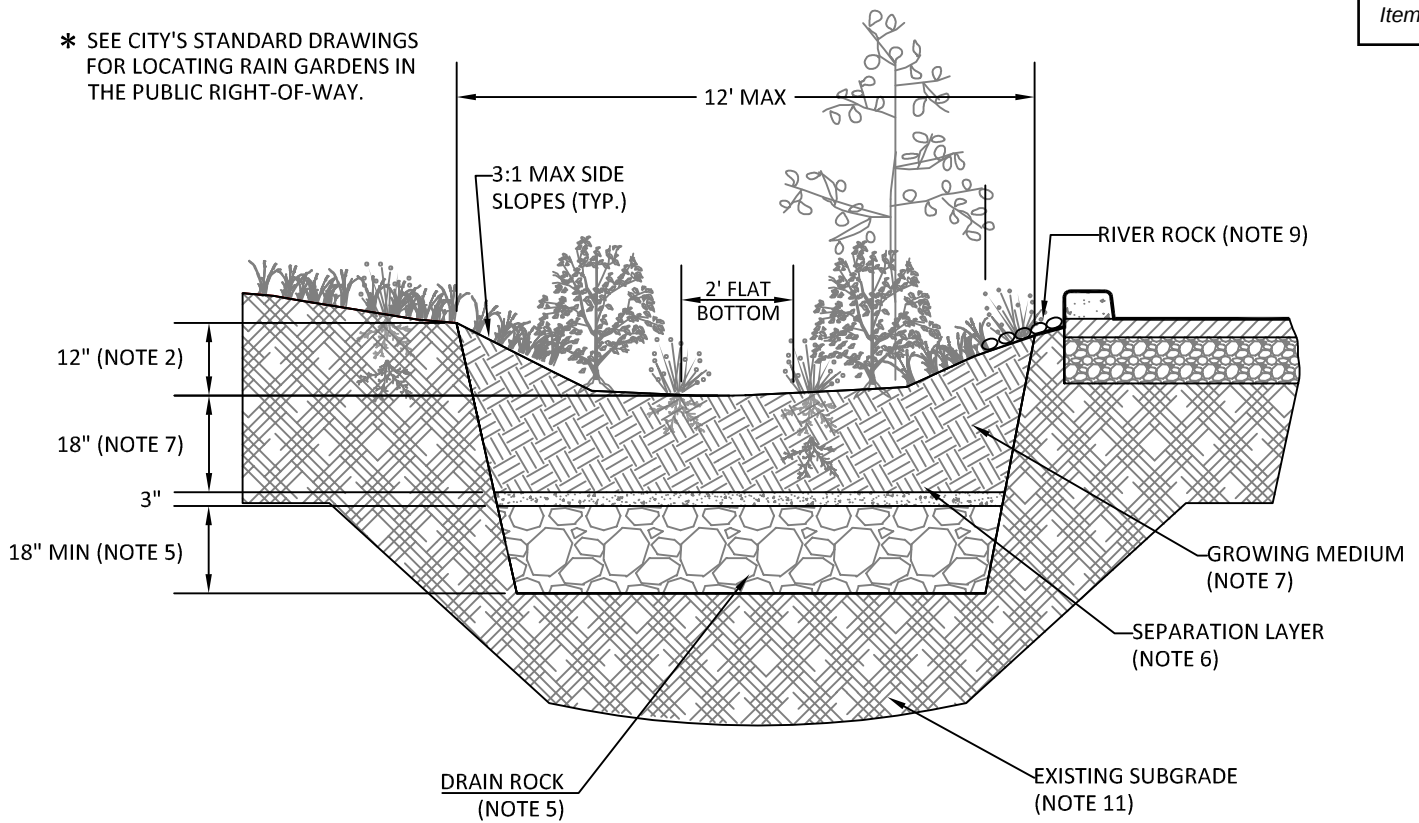


GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED SWALES ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. **DIMENSIONS:**
 - DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
 - LONGITUDINAL SLOPE OF SWALE: 6.0% OR LESS
 - FLAT BOTTOM WIDTH: 2' MINIMUM
 - SIDE SLOPES OF SWALE: 3:1 MAXIMUM
 - FACILITY AREA SHALL BE MEASURED AT THE DEEPEST SECTION (DRAIN ROCK) OF FACILITY
3. **SETBACKS:**
 - FILTRATION SWALES MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **OVERFLOW:**
 - INLET ELEVATION MUST ALLOW FOR 2" OF FREEBOARD, MINIMUM. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
 - IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. **PIPING:**
 - PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
 - OVERFLOW PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
 - SIZE: 1 1/2" - 3/4" WASHED
 - DEPTH: 12"
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
 - 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY CITY.
13. **CHECK DAMS:** SHALL BE PLACED ACCORDING TO FACILITY DESIGN (PER SECTION 5.4.2).

Vegetated Swale - Filtration
Figure C-7





GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. **DIMENSIONS:**
 - DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
 - LONGITUDINAL SLOPE OF SWALE: 6.0% OR LESS
 - FLAT BOTTOM WIDTH: 2'
 - SIDE SLOPES OF SWALE: 3:1 MAXIMUM
3. **SETBACKS:**
 - INFILTRATION VEGETATED SWALES MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES.
4. **OVERFLOW:**
 - EMERGENCY OVERFLOW PATH FOR THE 100 YEAR DESIGN STORM SHALL BE IDENTIFIED ON THE STORMWATER MANAGEMENT PLAN.
5. **DRAIN ROCK:**
 - SIZE: 1 1/2" - 3/4" - WASHED
 - DEPTH: 18"
6. **SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM:** SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
 - 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
 - FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
10. **CHECK DAMS:** SHALL BE PLACED ACCORDING TO FACILITY DESIGN.
11. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY CITY.

Vegetated Swale - Infiltration
Figure C-8



Vegetated Swales Operations & Maintenance Plan

What to Look For	What to Do
Structural Components , including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Replace/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 - 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back to 4-6 inches, 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium , including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Restore or create outfalls, check dams, or splash blocks where necessary.
Slope Slippage	-Stabilize slope.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.

Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.

Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.

Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.

All seasons. Weed as necessary. Clean scuppers or curb cuts as needed.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

Access: Maintain ingress/egress to design standards.

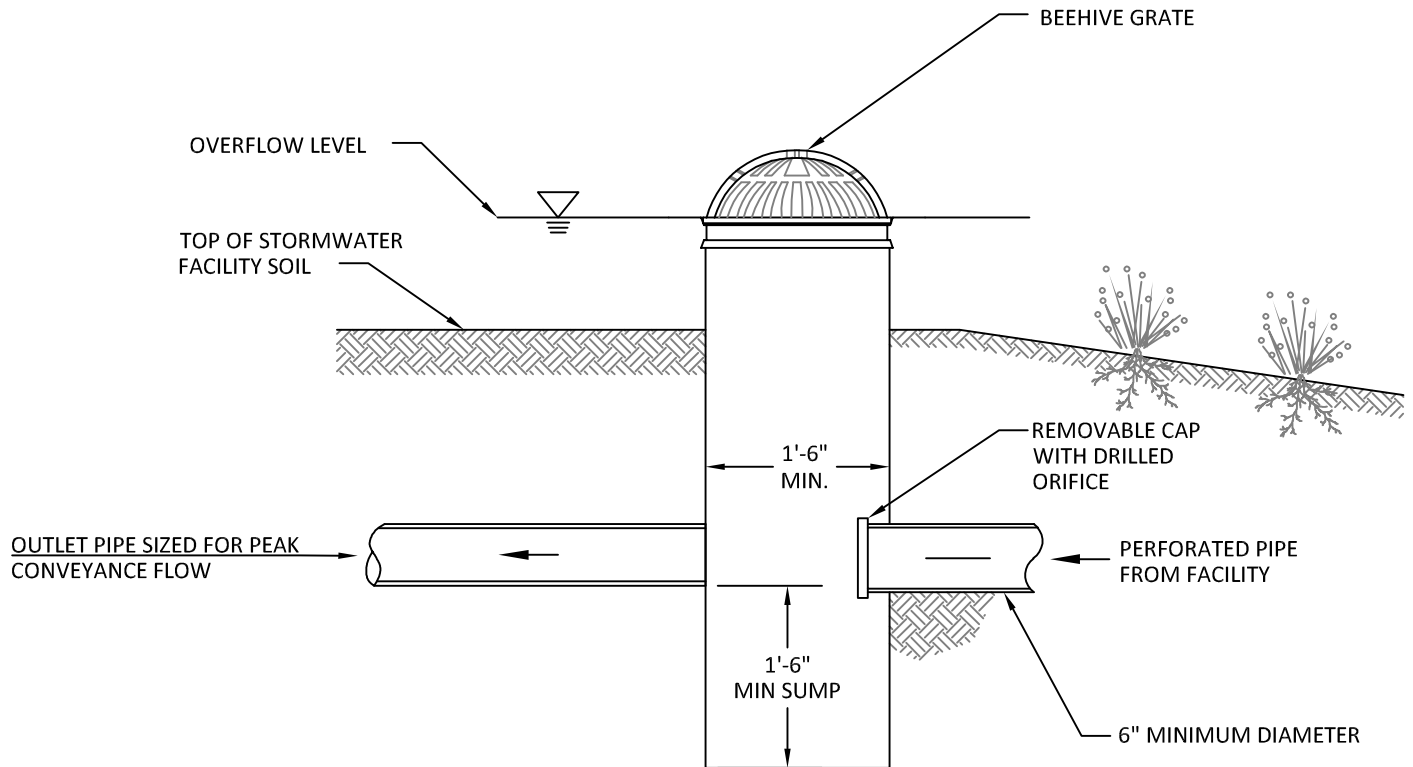
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

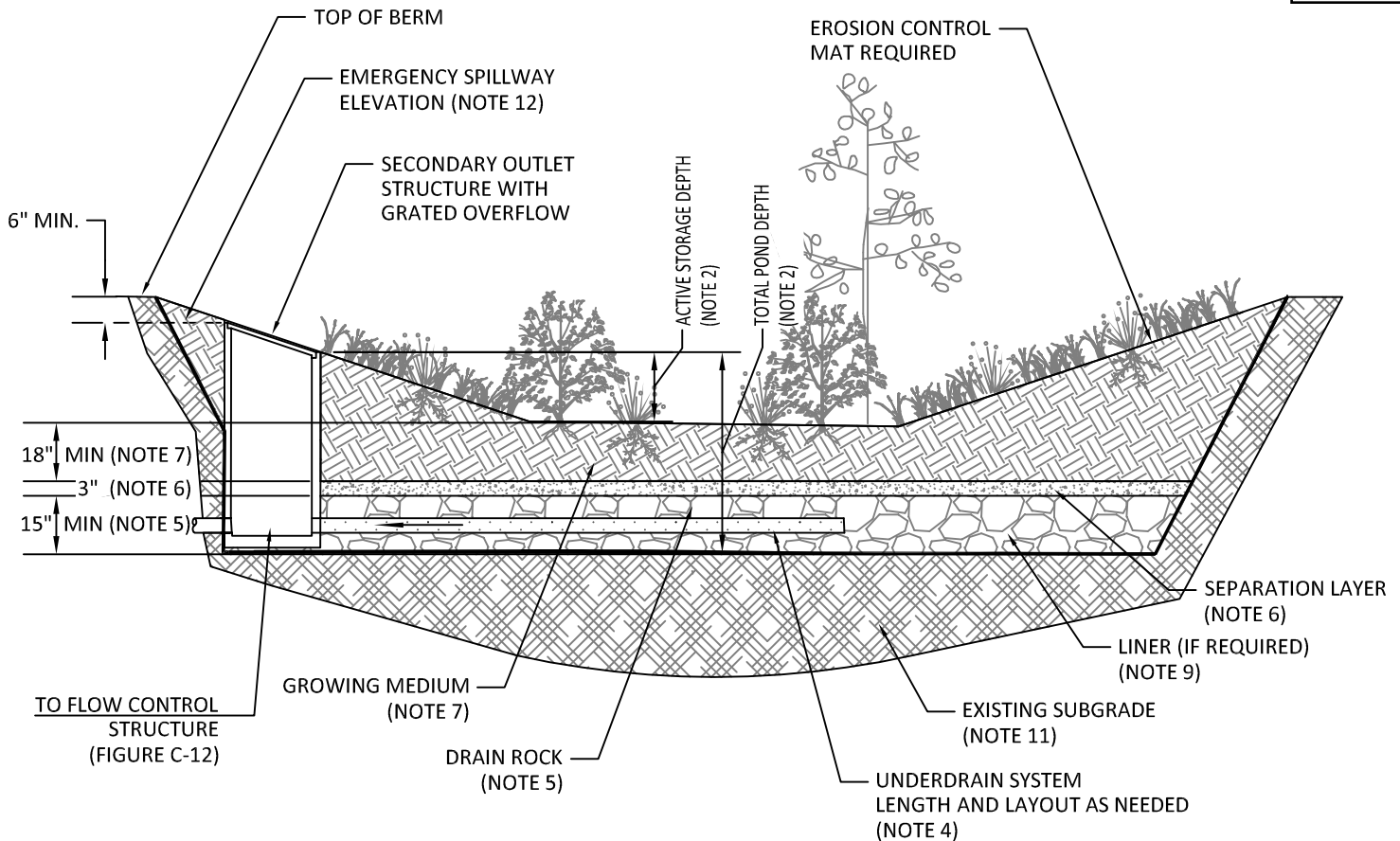


PLANTER, RAIN GARDEN, SWALE FLOW CONTROL STRUCTURE



Planter, Rain Garden, Swale Flow Control Structure
Figure C-10





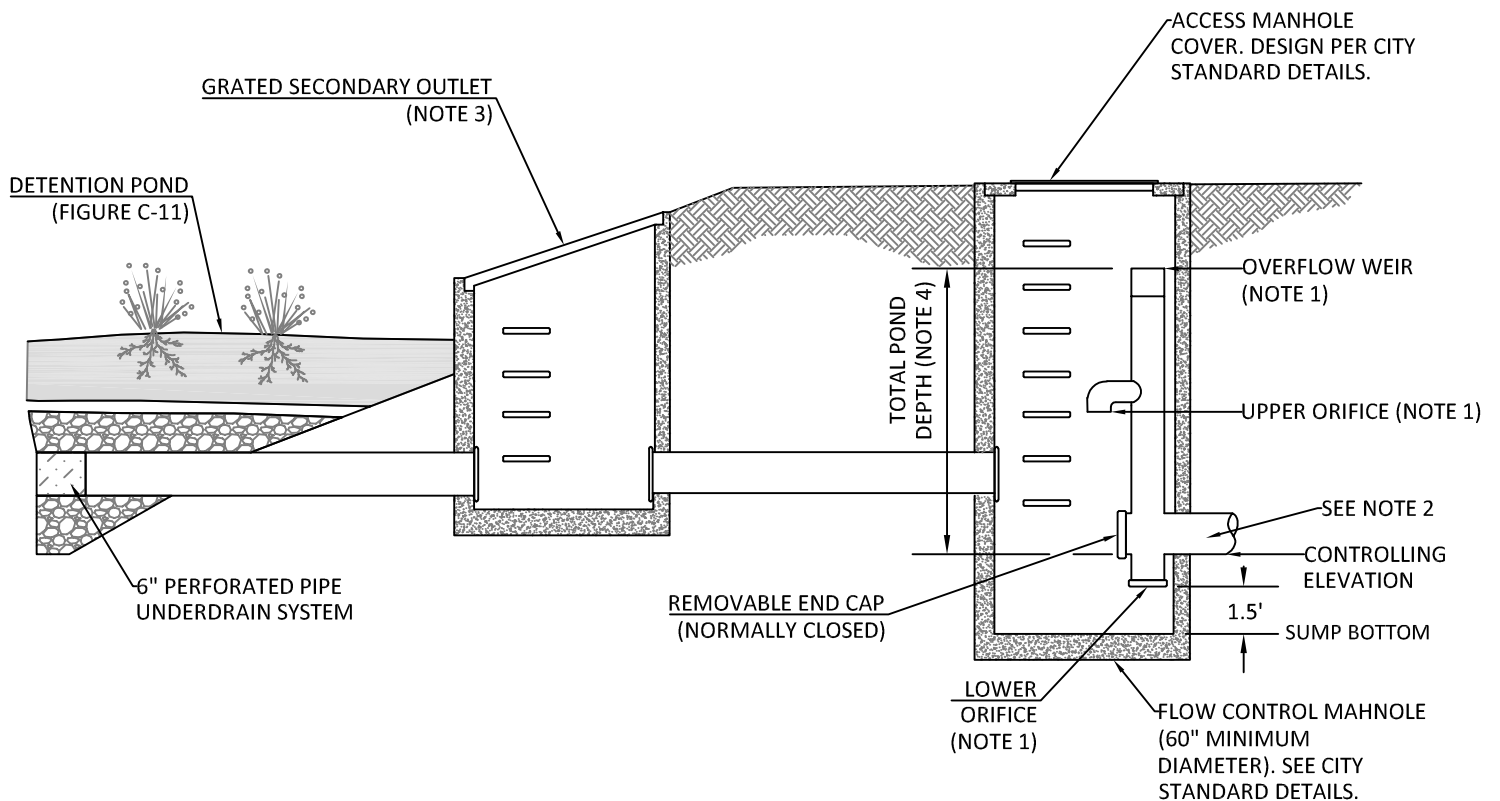
GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED PONDS ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. **DIMENSIONS:**
 - ACTIVE STORAGE DEPTH (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): PER FACILITY SIZING MODEL
 - FACILITY AREA SHALL BE MEASURED AT THE DEEPEST SECTION (DRAIN ROCK) OF FACILITY.
 - TOTAL POND DEPTH: 4' MINIMUM, PER FACILITY SIZING MODEL
 - BOTTOM SLOPE: 2.0% OR LESS
 - SIDE SLOPES OF DETENTION POND: 3:1 MAXIMUM
3. **SETBACKS:**
 - DETENTION POND MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. **PIPING:**
 - PERFORATED UNDERDRAIN PIPING: SHALL BE ABS SCH. 40, DUCTILE IRON OR PVC SCH. 40. 6" MINIMUM DIAMETER. PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
5. **DRAIN ROCK:**
 - SIZE: 1 1/2" - 3/4" WASHED
 - DEPTH: 15" MINIMUM
6. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. **GROWING MEDIUM:**
 - 18" MINIMUM
 - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
8. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT FOR DETENTION POND.
10. **INSTALL RIVER ROCK** OR SPLASH PAD TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3".
11. **SEASONAL HIGH GROUNDWATER SEPARATION:**
 - SEPARATION DISTANCE AS REQUIRED BY CITY.
12. **EMERGENCY SPILLWAY** SIZED TO CONVEY THE 100 - YEAR DESIGN STORM. PROVIDE 6" MINIMUM FREEBOARD ABOVE THE 100 - YEAR DESIGN STORM.

Detention Pond
Figure C-11



DETENTION POND FLOW CONTROL STRUCTURE



NOTES:

1. ORIFICE AND WEIR DIMENSIONS AND ELEVATION DETERMINED THROUGH FACILITY SIZING MODEL.
2. PIPE SIZING DETERMINED BY ENGINEER.
3. SECONDARY OUTLET SIZED FOR PEAK DESIGN STORM.
4. TOTAL POND DEPTH, PER FACILITY SIZING MODEL, INCLUDES GROWING MEDIA, SEPARATION LAYER, AND DRAIN ROCK AS SHOWN ON FIGURE C-11.

Detention Pond Flow Control Structure
Figure C-12



Detention Pond Operations & Maintenance Plan

Detention Ponds remove pollutants through several processes: sedimentation, filtration, and biological processes. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components , including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Clogged Control Structures	-Remove accumulated sediment and debris.
Vegetation shall cover 90% of the facility.	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium , including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 Slopes/banks with plantings from Appendix A.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, and 2 times per year thereafter, and within 48 hours after each major storm event.

Access: Maintain ingress/egress to design standards.

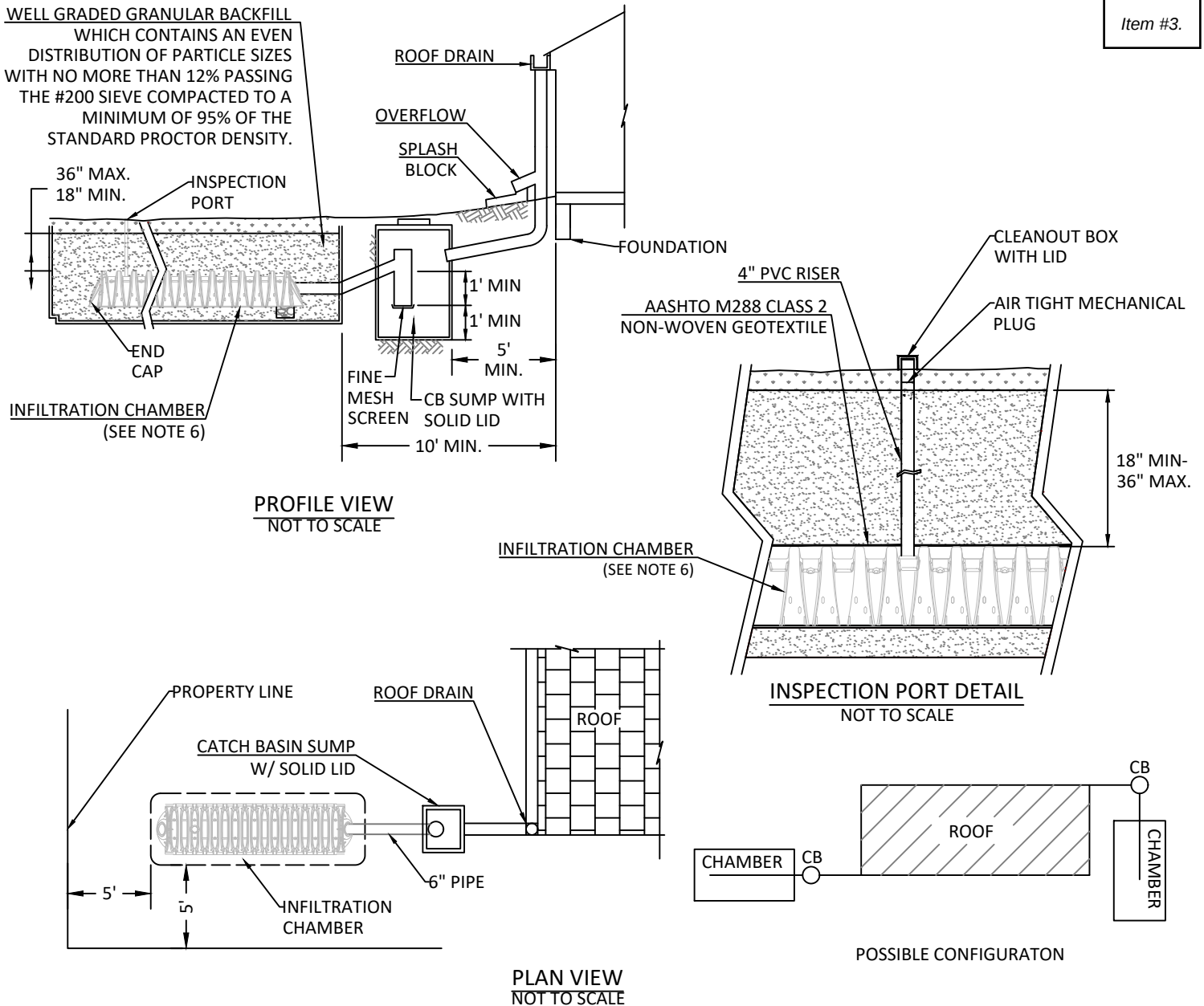
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.



WELL GRADED GRANULAR BACKFILL WHICH CONTAINS AN EVEN DISTRIBUTION OF PARTICLE SIZES WITH NO MORE THAN 12% PASSING THE #200 SIEVE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR DENSITY.



GENERAL NOTES

1. USE OF INFILTRATION SYSTEMS IS ONLY ALLOWED FOR SITES WITH FACTORED INFILTRATION TEST RESULTS OF AT LEAST 2 IN/HR OR WHERE FACILITY IS PLACED ENTIRELY WITHIN AN AREA WITH HYDROLOGIC SOIL GROUP A.
2. FOR SIZING OF FACILITY THE MINIMUM STORAGE VOLUME (CF) = $0.2 \times \text{TOTAL IMPERVIOUS AREA (SF)}$.
3. INFILTRATION CHAMBERS ARE TO BE ENTIRELY WRAPPED BY AASHTO M288 CLASS 2 NON-WOVEN GEOTEXTILE.
4. VOLUME OF CHAMBER VARIES WITH EACH CHAMBER MANUFACTURER AND MODEL.
5. PROVIDE AN ADEQUATE NUMBER OF CHAMBERS TO MEET OR EXCEED THE MINIMUM REQUIRED CHAMBER VOLUME.
6. INFILTRATION CHAMBERS SHALL BE MANUFACTURED BY ONE OF THE FOLLOWING OR APPROVED EQUAL:

STORMTECH
(WWW.STORMTECH.COM)
1-888-892-2694

CULTEC INC.
(WWW.CULTEC.COM)
1-800-4-CULTEC

INFILTRATOR SYSTEMS INC.
(WWW.INFILTRATORSYSTEMS.COM)
1-800-718-2754

7. SOIL CLASSIFICATION MAP IS AVAILABLE FOR VIEWING AT WWW.ORCITY.ORG.

Underground Infiltration System
Figure C-14



Underground Infiltration System Operations & Maintenance Plan

What to Look For	What to Do
Structural Components , include pipes, manholes, rock/sand reservoirs, storm chambers and silt traps.	
Clogged inlets or outlets	-Clean gutters, rain drains, and silt traps twice a year. -Clear piping to facility when blockage occurs.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Catch Basin	-Remove accumulated sediment annually.
Vegetation includes surface cover and nearby plantings.	
Large Shrubs and Trees	-Prevent large root systems from damaging subsurface structural components.
Filter Layer , includes rock/gravel bed.	
Ponding Water	-Clear piping through facility when ponding occurs. -Replace rock/sand reservoirs as necessary. -Tilling of subgrade below reservoir may be necessary (for trenches) prior to backfill. -May require decommissioning and replacement (for infiltrators or trenches).

Annual Maintenance Schedule:

Summer. Make necessary structural repairs. Clean silt traps.

Fall. Clean gutters and rain drains.

Winter. Monitor infiltration rates.

Spring. Clean gutters and rain drains.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

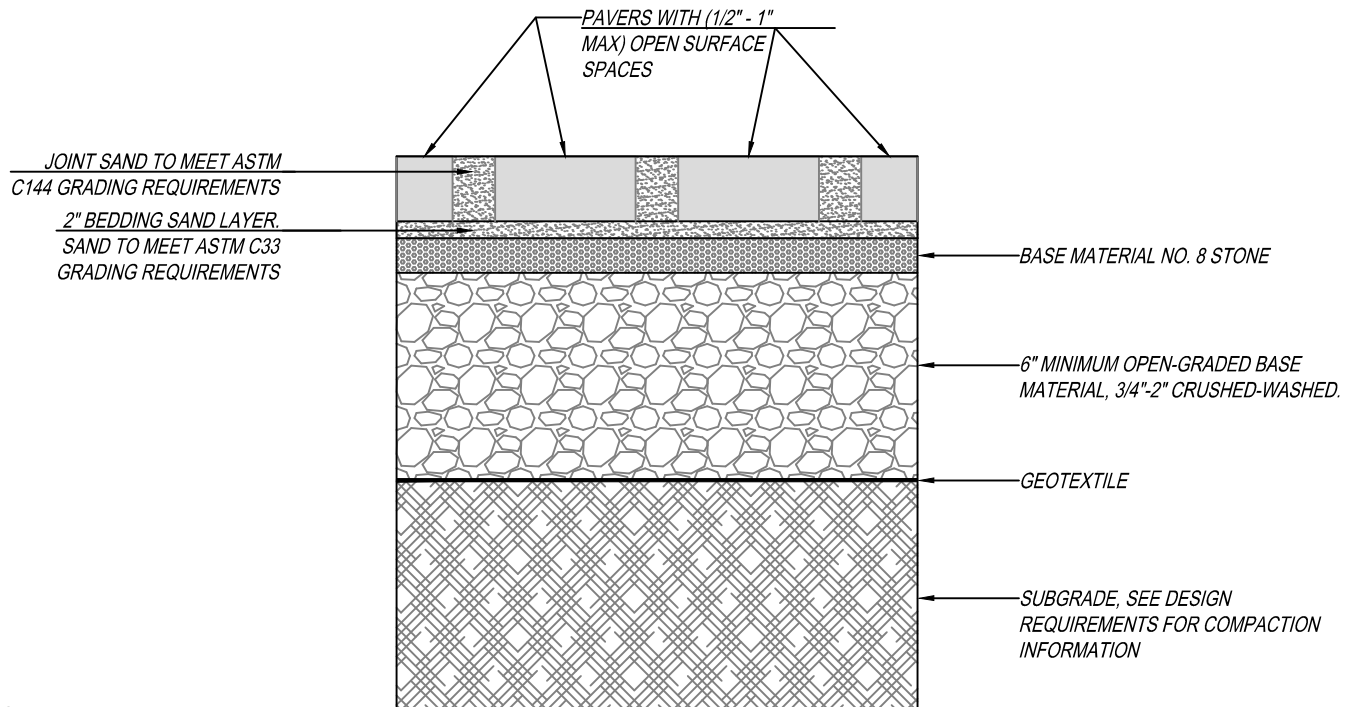
Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

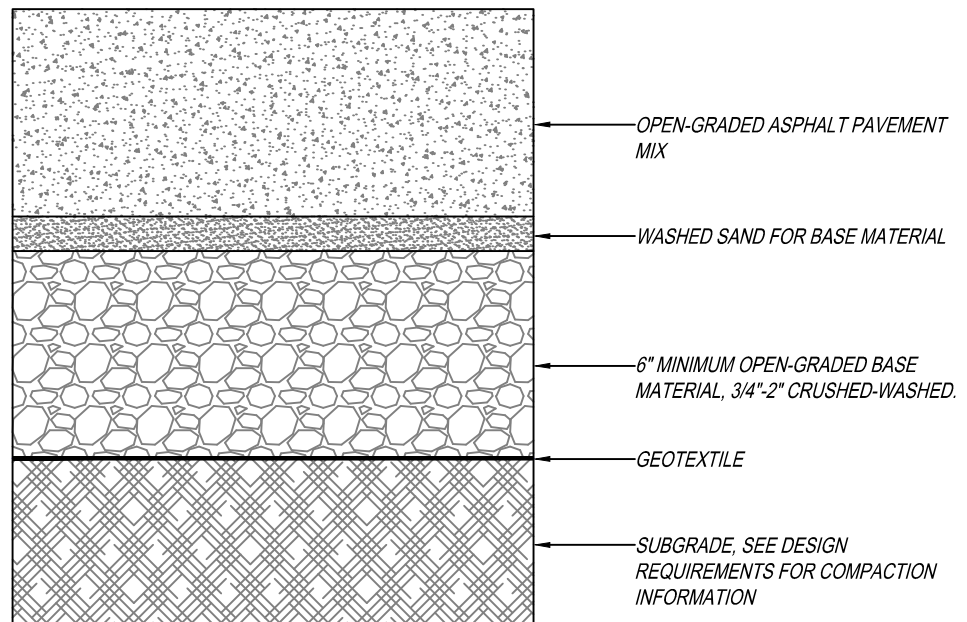




PERVIOUS CONCRETE BLOCK OR
"PAVER" SYSTEMS

NOTES:

1. THE DESIGN ENGINEER SHALL SUBMIT PERVIOUS PAVEMENT DESIGN AND SPECIFICATIONS IN CONFORMANCE WITH INDUSTRY STANDARDS.
2. PAVERS AVERAGE COMPRESSIVE STRENGTH OF 8,000 PSI. NO INDIVIDUAL UNIT LESS THAN 7,200 PSI. MINIMUM 80 MM THICKNESS.
3. BANDED BY CONCRETE EDGE RESTRAINTS.
4. MANHOLE COLLARS PER CITY STANDARD DETAIL.



PERVIOUS (OPEN GRADED)
CONCRETE SYSTEMS

Pervious Pavement Operations & Maintenance Plan

Pervious pavement is a permeable pavement surface with an underlying stone reservoir that temporarily stores surface runoff before infiltrating into the subsoil or being collected in underlying drain pipes and being discharged off-site. There are many types of pervious pavement including plastic rings planted with grass, stone or concrete blocks with pore spaces backfilled with gravel or sand, porous asphalt, and porous concrete. Pervious pavement accepts only precipitation, not stormwater runoff. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components , including surface materials, shall evenly infiltrate stormwater.	
Clogged surface	-Vacuum sweep at least twice a year. -Powerwash annually or as needed. Do not use surfactants.
Cracked or moving edge restraints	-Repair per manufacturer's recommendations.
Cracked or loose pavement	-Repair per manufacturer's recommendations.
Vegetation includes surface cover and nearby plantings.	
Large Shrubs and Trees	-Sweep leaf litter and sediment to prevent surface clogging and ponding. -Prevent large root systems from damaging pavement. -Manually remove weeds. Remove all plant debris.
Filter Medium	
Aggregate loss in pavers from settling and from power washing.	-Replace paver pore space with aggregate from original design.

Maintenance Schedule:

Summer. Make necessary structural repairs.

Fall. Vacuum sweep.

Winter. Monitor infiltration rates.

Spring. Power wash with proper disposal. Vacuum sweep.

All Seasons: Weed as necessary.

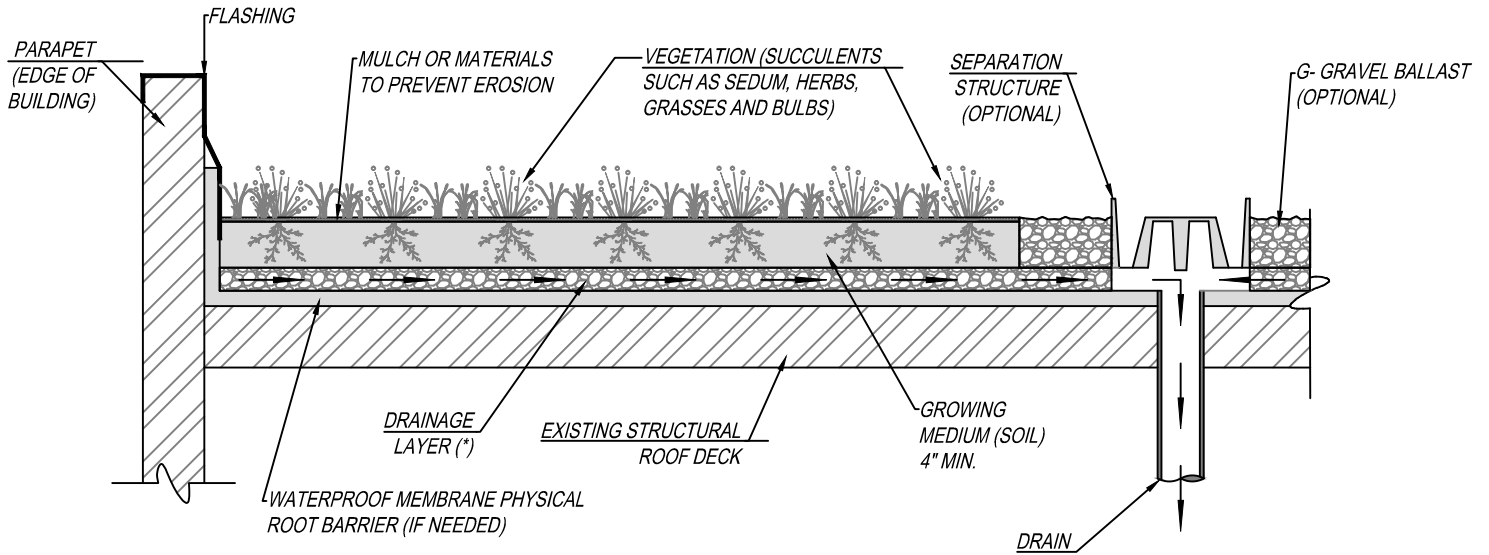
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall not retain standing water during dry weather. Record time/date, weather, and site conditions when ponding occurs.

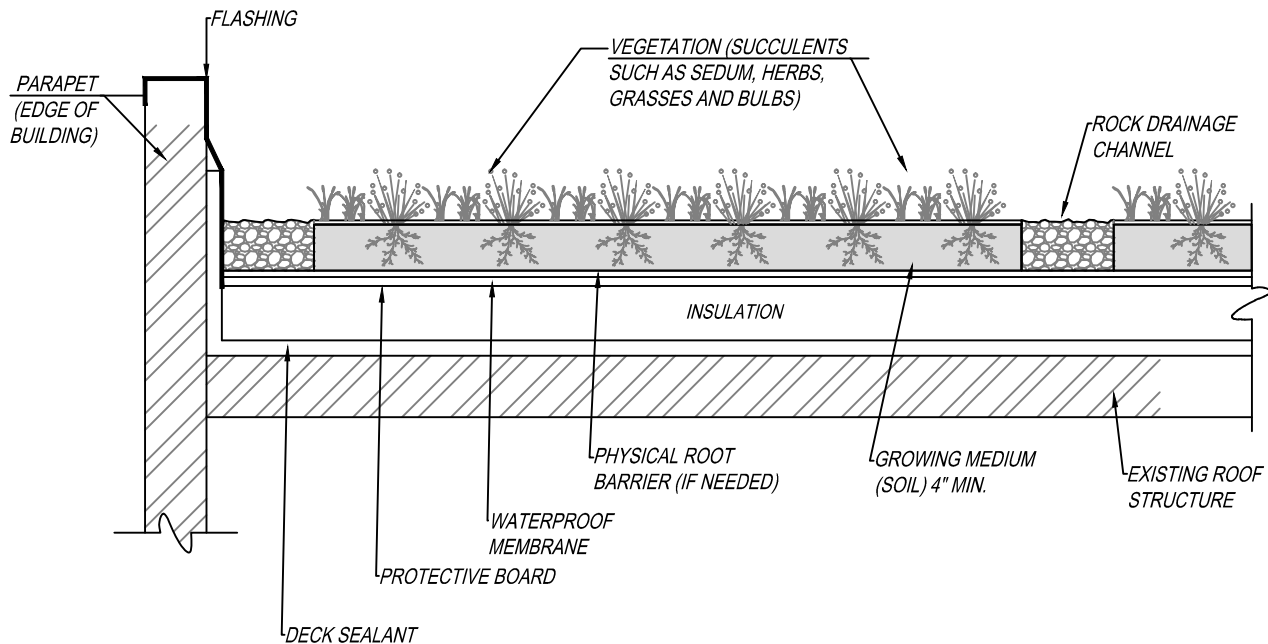
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact emergency response agencies for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.



* SEE DETAIL BELOW FOR OPTION

GREEN ROOF WITH DRAINAGE LAYER



GREEN ROOF WITH DRAINAGE CHANNELS

GENERAL NOTES:

1. **THE DESIGN ENGINEER** SHALL SUBMIT GREEN ROOF DESIGN AND SPECIFICATIONS IN CONFORMANCE WITH INDUSTRY STANDARDS.

Green Roof
Figure C-18



Green Roof Operations & Maintenance Plan

Green Roofs are vegetated roof systems that retain and filter stormwater and provide aesthetic and energy conservation benefits. All facility components, including soil substrate or growth medium, vegetation, drains, irrigation systems (if applicable), membranes, and roof structure shall be inspected for proper operations, integrity of the waterproofing, and structural stability throughout the life of the green roof. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components , including waterproof membrane, shall be operated and maintained in accordance with the manufacturer's and design specifications.	
Clogged drains	-Repair any leaks or structural deficiencies. -Remove sediment and debris if necessary.
Tears or perforated membrane	-Contact manufacturer for repair or replacement.
Vegetation shall cover 90% of facility.	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A.
Dry Grass or other Plants Weeds	-Prune tall, dry grasses and remove clippings. -Manually remove weeds. Do not use pesticides. Remove all plant debris.
Growing/Filter Medium including soil and gravels, shall sustain healthy plant cover and infiltrate within 48 hours.	
Exposed soil Eroded soils and gullies	-Cover with plants and mulch as needed. -Fill, hand tamp or lightly compact, and plant vegetation to disperse flow.
Crusting, dry or shrinking medium Ponding or excessive moisture	-Rake or amend to restore filtration or flow. -Amend soils and clear drains.

Maintenance Schedule:

Summer. Make necessary structural repairs. Improve growing medium as needed. Clear drains. Irrigate as needed.

Fall. Replant exposed soil and dead plants. Remove sediment and debris from drains. Provide erosion control for bare soil if necessary.

Winter. Monitor infiltration rates. Clear drains as needed.

Spring. Replant exposed soil and dead plants. Remove sediment and debris from drains.

All Seasons: Weed as necessary.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

Access: Maintain ingress/egress to design standards.

Irrigation: Adjust irrigation program or consult professional to set system at correct watering system.

Infiltration/Flow Control: All facilities shall drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous wastes from contaminating stormwater. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Green Roof shall not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Contact Clackamas County Vector Control for assistance. Record time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

STORMWATER FACILITIES OPERATIONS AND MAINTENANCE CHECKLIST

Problem	Recommended / Required	Trigger	Preferred Condition
<i>Sediment Accumulation in Treatment Area</i>	<i>Monthly from November through April / Annually Required</i>	<i>Sediment depth exceeds 3 inches</i>	<i>Sediment removed from vegetated treatment area: level side to side and drains freely toward outlet; no standing water within 24 hours of any major storm (1" in 24 hours)</i>
<i>Erosion Scouring</i>	<i>Monthly from November through April / Annually Required</i>	<i>Exposed earth or rutted soil</i>	<i>Repair ruts or bare areas by filling with topsoil during dry season; regrade and replant large bare areas</i>
<i>Standing Water</i>	<i>Monthly from November through April and after any major storm event (1 inch in 24 hours)</i>	<i>Standing water in the planter between storms that does not drain freely</i>	<i>Remove sediment or trash blockages; improve end to end grade so there is no standing water 24 hours after any major storm (1 inch in 24 hours)</i>
<i>Flow not Distributed Evenly</i>	<i>Monthly from November through April / Annually Required</i>	<i>Flows unevenly distributed through planter width due to uneven or clogged flow spreader</i>	<i>Level the spreader and clean so that flows spread evenly over entire planter width</i>
<i>Settlement/ Misalignment</i>	<i>Annually Required</i>	<i>Failure of planters has created safety, function, or design problem</i>	<i>Planter replaced or repaired to design standards</i>
<i>Constant Baseflow</i>	<i>Monthly from November through April / Annually Required</i>	<i>Small, continual flow of water through the planter even after weeks without rain; planter bottom has an eroded, muddy channel</i>	<i>Add a low-flow pea gravel drain the length of the planter or bypass the baseflow around the planter</i>
<i>Vegetation</i>	<i>Monthly from November through April / Annually Required</i>	<i>Vegetation blocking more than 10% of the inlet pipe opening</i>	<i>No vegetation blocking the inlet pipe opening</i>
<i>Poor Vegetation Coverage</i>	<i>Monthly / Annually Required</i>	<i>Grass or other vegetation is sparse, or bare in more than 10% of the planter area</i>	<i>Determine cause of poor growth and correct the condition; replant with plants (per Appendix A) as needed to meet facility standards</i>
<i>Invasive Vegetation</i>	<i>Monthly / Annually Required</i>	<i>No invasive vegetation is planted or permitted to remain</i>	<i>No invasive vegetation present; remove excessive weeds. Control if complete eradication is not feasible</i>
<i>Rodents</i>	<i>Monthly / Annually Required</i>	<i>Evidence of rodents or rodent damage</i>	<i>No rodents; functioning facility</i>
<i>Insects</i>	<i>Annually Required</i>	<i>Insects such as wasps and hornets that interfere with maintenance activities</i>	<i>Harmful Insects removed</i>
<i>Trash and Debris</i>	<i>Monthly and after any major storm event (1 inch in 24 hours) / Annually Required</i>	<i>Visual evidence of trash, debris or dumping</i>	<i>Trash and Debris removed from facility</i>
<i>Contamination and Pollution</i>	<i>Monthly from November through April / Annually Required</i>	<i>Any evidence of oil, gasoline, contamination or other pollutants</i>	<i>No contaminants or pollutants present; coordinate removal/cleanup with local water quality response agency</i>
<i>Obstructed Inlet/Outlet</i>	<i>Monthly and after any major storm event (1 inch in 24 hours) / Annually Required</i>	<i>Inlet/outlet areas clogged with sediment, vegetation or debris</i>	<i>Clear inlet and outlet; obstructions removed</i>
<i>Excessive Shading</i>	<i>Monthly from November through April / Annually Required</i>	<i>Vegetation growth is poor because sunlight does not reach planter</i>	<i>Trim over-hanging limbs and/or remove brushy vegetation as needed</i>
<i>Vegetation</i>	<i>Monthly from November through April / Annually Required</i>	<i>Specified or approved grass grows so tall that it competes with shrubs and/or becomes a fire danger</i>	<i>String trim non-wetland grasses to 4 to 6 inches and remove clippings; protect woody vegetation</i>

