



Sustainable Action Plan Stormwater Management Plan

2019

Facilities Services and Design and Construction
Contact: Phil Carroll, Sarah Follett



Executive Summary

The University of Oregon owns and maintains a significant stormwater management system across campus. The system includes over 49 miles of stormwater pipe and over 4400 stormwater structures. This document describes the university's stormwater facilities, records management, and maintenance practices.

Background

Stormwater management at the University of Oregon is driven by compliance with City of Eugene development code and regulations and the university's goal of protecting water quality in our watershed as outlined in the Operations and Maintenance portion of the university's [Comprehensive Environmental Policy](#). The University of Oregon's main campus falls under the jurisdiction of the City of Eugene's municipal stormwater discharge permit. This plan details management that fulfills the goals of both the City of Eugene requirements and related areas of the UO's Comprehensive Environmental Policy. The Facilities Services unit of Campus Planning and Facilities Management (CPFM) maintains this plan.

City of Eugene Stormwater Standards

The City of Eugene's [Stormwater Master Plan](#) identifies conveyance systems within the city that may be deficient and requirements for meeting certain stormwater flow control standards. The City of Eugene's development code and stormwater management manual dictate stormwater treatment requirements. The university registers any stormwater treatment facilities installed as part of a building with the city and they must receive regular maintenance and inspection. See Appendix A for the City of Eugene's development code and standards related to stormwater.

University of Oregon Comprehensive Environmental Policy

The University of Oregon first established the comprehensive environmental policy (CEP) in 1997 and updated the policy in 2011. The CEP includes seven guiding principles, with a mandate to create implementation plans for each principle. The Stormwater Management Plan addresses a portion of principle 2 – Operations and Maintenance: The university will implement conservation and efficiency strategies that reduce consumption of energy, water, and other resources without compromising high quality learning environments.

Plan Objectives

The primary focus of this stormwater management plan is to define maintenance practices. Effective maintenance begins with having a clear understanding of our stormwater system and facilities, and of how they function. Effective maintenance also identifies and tracks elements in need of improvement. This plan breaks this pathway down into the following objectives:

- Understanding existing conditions,
- Maintaining accurate maps and records,
- Defining inspection and maintenance practices (to stay in compliance with city reporting),
- Identifying deficiencies and opportunities for improvement.

Existing Conditions on Campus

The main campus of the University of Oregon in Eugene spans approximately 309 acres in the Willamette River watershed. Of those 309 acres, building rooftops make up roughly 75 acres, other impervious surfaces 94 acres, and pervious surfaces the remaining 140 acres.

Stormwater Outfalls

Approximately 80% of the stormwater runoff from campus discharges into the Millrace. The Millrace is owned by the university as it transverses university property. As it leaves the university campus on the west side, its ownership changes to the City of Eugene and adjacent private property owners. There are several outfalls from the university into the Millrace, some of which the university owns, while the city owns and maintains others. The City of Eugene's Stormwater Master Plan does not indicate any conveyance deficiencies from campus to the Millrace.

Approximately 10% of the stormwater runoff from the main campus discharges into Amazon Creek through the city's piped infrastructure. See Appendix B for basin mapping.

Treatment

The University of Oregon has over 20 building sites with city-registered, vegetated stormwater treatment facilities. This number is increasing each year as the university builds new structures on campus. The number of individual stormwater treatment facilities on a building site varies, based on design decisions made during the planning phase of each site.

In addition to stormwater treatment facilities registered with the city, the university has several other facilities that intend to treat stormwater but may or may not meet city standards. These facilities were designed and installed out of a desire to improve stormwater treatment on campus, but are not held to the same inspection and maintenance standards as those registered with the city.

Both the city and the university prioritize vegetated stormwater treatment facilities over mechanical treatment. However, where building sites are constrained for space the university uses mechanical treatment. The university has eight mechanical stormwater treatment facilities.

A stormwater treatment facility map showing all the facilities mentioned above is included in Appendix B.

Conveyance

The university owns and maintains an extensive conveyance system. The age and condition of the system varies greatly across campus. In older portions of campus, there are clay drainage tiles while everything built in the last 15 years is PVC piping.

CPFM maintains GIS mapping of the university's stormwater conveyance system.

Maps and Records

Record Keeping

Design documents, maintenance manuals and logs, stormwater reports, and any other relevant management information are the responsibility of the Environmental Services division within Facilities Services.

Mapping

The university maps its stormwater facilities on Campus GIS. The Energy and Utilities group within the Design and Construction department will be responsible for maintaining accurate maps of stormwater conveyance and treatment infrastructure on campus. We will use as-built maps from newly completed

projects and stormwater reports to edit the GIS mapping database. Mapping is a crucial piece of our improved record-keeping processes.

Maintenance Procedures

Stormwater System

Regular inspections are the foundation of maintaining campus stormwater facilities to ensure proper flow, treatment, and storage. The inspection process identifies shortcomings that then become corrective work orders. To maintain this foundation, the relevant teams perform the following inspections and maintenance actions on a consistent and effective schedule:

Annually: Engineered below-ground facilities ('stormwater quality manholes') that have been installed to meet water quality and flow control standards. University staff generally clean and inspect these facilities prior to the wet season.

Annually: Catch basins on campus are also cleaned and inspected. Sediment from water quality manholes and catch basins is disposed of in accordance with guidelines.

Twice annually: Vegetated facilities are inspected twice per year, once in the summer and once in the wet season. The form used to record the findings is in Appendix C. As well, university staff clean and weed vegetated facilities on an on-going basis alongside the rest of the campus landscape, but targeted inspections ensure that we remove sediment, vegetation meets minimum coverage requirements, inlets and overflows are clear, and erosion is monitored.

Additional maintenance activities include:

- Regular sweeping of streets and parking lots;
- Trash and litter removal from curbs, drains, and streamsides;
- Camera analysis of pipes on a rotating basis;
- Leaf collection.

As relevant, we will make amendments to this schedule and related tasks to ensure efficient and effective stormwater management.

General Landscape Maintenance

Programs and procedures that minimize the application of chemicals guide landscape and pavement maintenance practices campus-wide. These programs and practices limit the amount of chemicals that may run off in storm events or that may enter the groundwater to emerge further downstream in the Millrace or Willamette River.

Pesticide applications comply with our [Integrated Pest Management plan \(IPM\)](#). The IPM plan identifies evaluative and corrective steps to manage landscape pests, with chemical control being only one of several options. [Environmental Health and Safety](#) reviews and approves chemicals used on campus, including pesticides, for both environmental and health impact. Any pesticides applied on campus comply with procedures that ensure safety and the minimum amount of chemical used to achieve a desired result. The university applies fertilizers on campus on an as-needed basis, rather than according to a pre-set schedule. Therefore, we apply nitrogen, minerals, and inert ingredients at the lowest possible level based on

particular circumstances while maintaining the landscape for plant health and the safety and utility of campus users.

To manage pavement snow and ice clearance, we primarily use mechanical means such as sweeping and sanding. During ice accumulation events, the university applies de-icer in formulations and amounts that have the least potential for harm to the landscape and groundwater while maintaining safe passage through campus.

Identifying Deficiencies and Opportunities for Improvement

As the university both develops new projects on campus that add stormwater facilities to the system and continues to maintain the existing storm system, we can also begin to identify deficiencies and opportunities for capital improvements.

Capital Improvements

As with any significant stormwater system, we must replace broken or old pipe runs, and address drainage problems. Staff identify these projects in three ways: routine maintenance, apparent issues such as flooding or ponding, or known end-of-service-life. Campus Planning and Facilities Management (CPFM) is responsible for identifying and prioritizing these repairs.

Opportunities Assessments

Areas of campus developed prior to city stormwater treatment requirements may provide opportunities to increase stormwater treatment on campus. These areas have little or no stormwater treatment. Stormwater treatment for impervious areas such as parking lots, streets, and access roads would likely provide the most impactful results. CPFM will maintain a short list of these areas and their stormwater treatment feasibility. Identifying and maintaining a list of these opportunities is the first step to strategically determining when to address them. Funding to make these improvements may come from several budget areas and will be determined based on the current or immediate needs of the university.

Appendices

Appendix A

- City of Eugene [Stormwater Basin Master Plan](#)
- City of Eugene Development Code, [Chapter 9 – “land use”](#)
- [University of Oregon Design Standards](#)

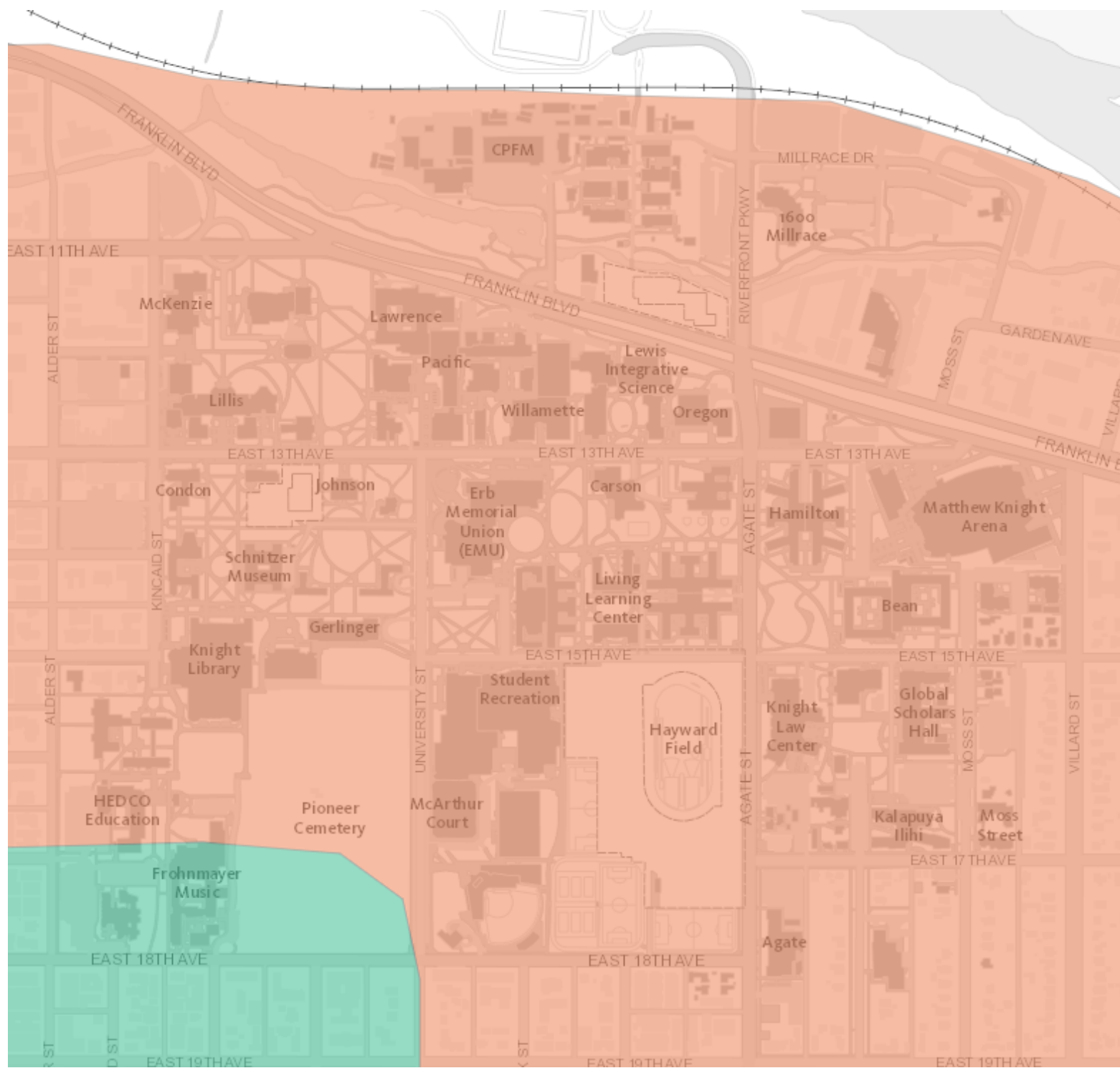
Appendix B

- Basin Mapping
- Stormwater Treatment Facilities - Examples
 - Campus Heart Full Report
 - Jane Sanders Stadium

MAIN CAMPUS DRAINAGE BASINS
January 2019

LEGEND

- 
Amazon
Creek
- 
Millrace



Heart of Campus

COMPLETION DATE

2004

TYPE OF FACILITY

Flow-Through Planters + Permeable Paving

TOTAL AREA MITIGATED

10,000 sq.ft.

CONTACT

Janet Lobue (Project Manager)
Stan Jones (Landscape Architect)
Cameron McCarthy (Landscape Architects)
UO LA Students (Design Build)
Wildish Co. (Construction Company)

SUPPORTING DOCUMENTS

- Planting Plan
- Construction Details

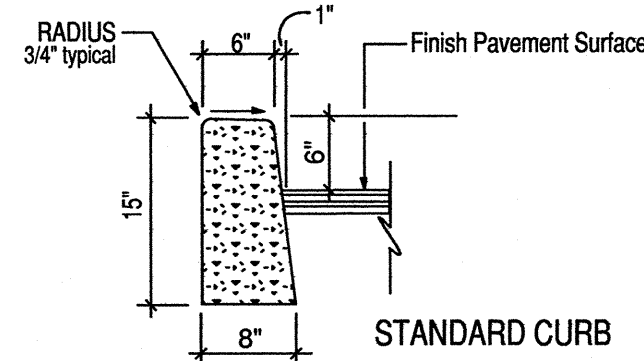
FUNCTION of STORMWATER FACILITY

Flow-Through Planters receive street runoff from University and 13th. Planters are designed to direct the runoff into the vegetated planters, slow the water down and infiltrate it into the ground.

Permeable Paving receives excess street runoff that is not taken up by the Flow Through Planters and either the infiltrates it into the ground or directs it into an overflow drain.



flow-through planters

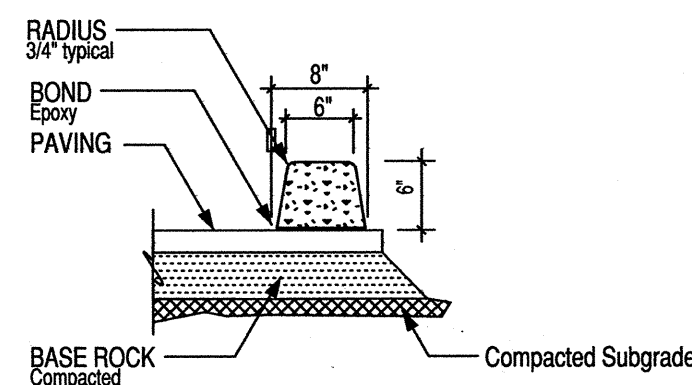


NOTES:

- Slope top of curb toward gutter 2%.
- Provide expansion joints @ 100' o.c. max. and @ all points of tangency. Sawcut green concrete control joints @ 20' o.c. max.
- Drop top of curb @ ramps and aprons.

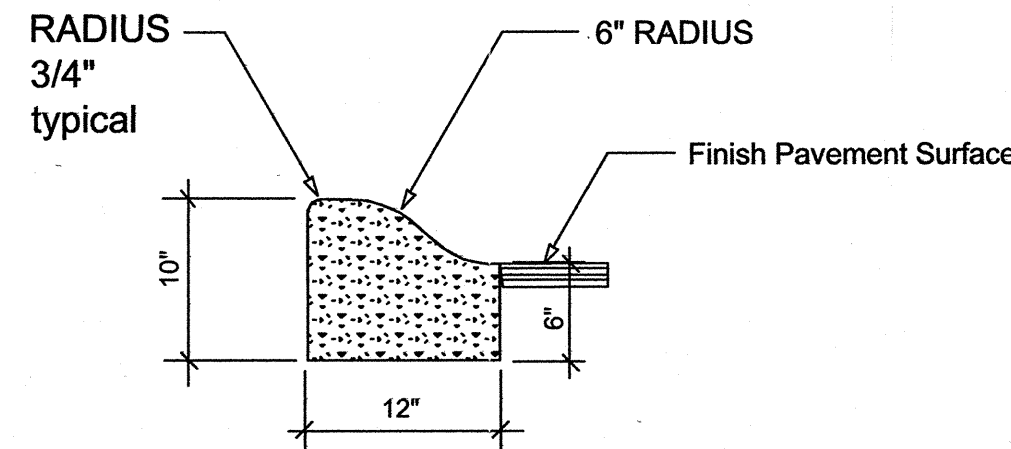
CONCRETE CURB

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HOC
L8



EXTRUDED CONCRETE CURB

NTS
HOC
L8

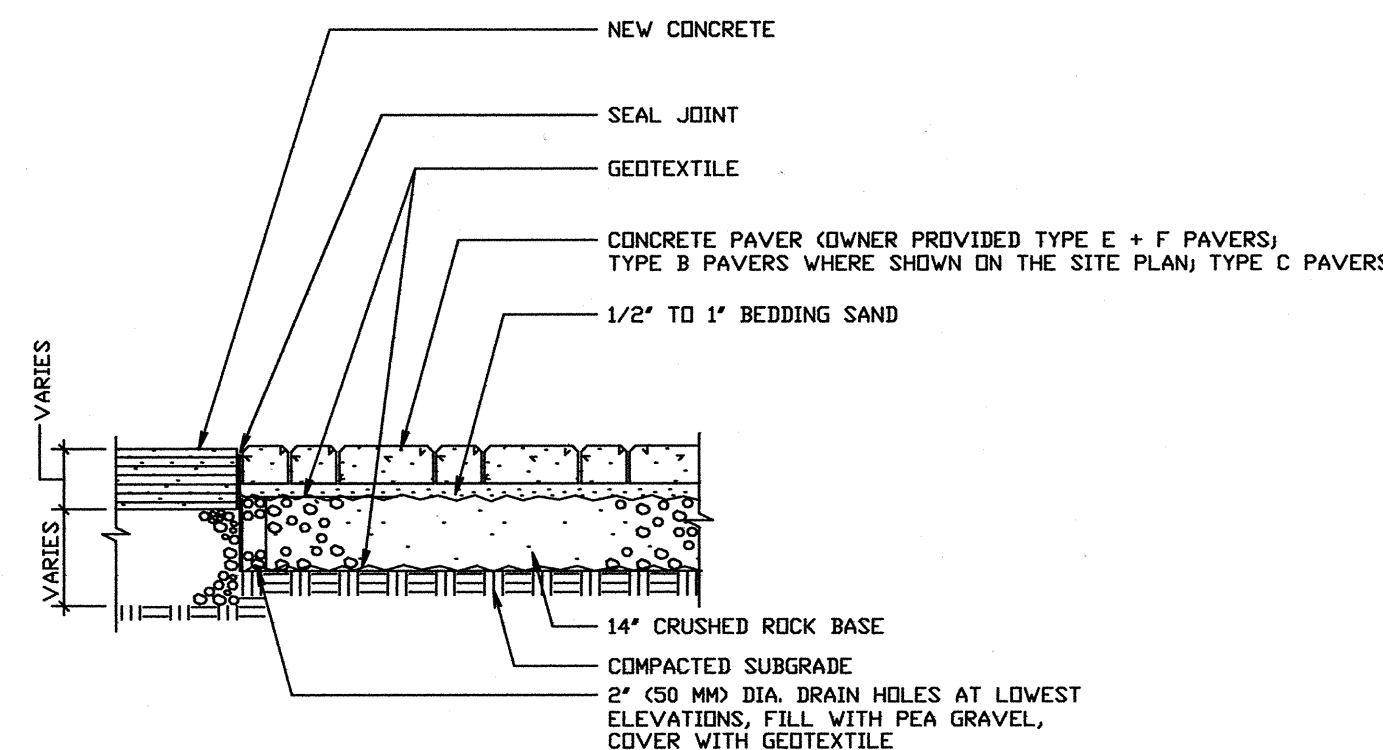


NOTE

- SLOPE TOP OF CURB TOWARD GUTTER 2%.
- PROVIDE EXPANSION JOINTS @ 100' O.C. MAX. AND @ ALL POINTS OF TANGENCY. SAWCUT GREEN CONCRETE CONTROL JOINTS @ 20' O.C. MAX.
- DROP TOP OF CURB @ RAMP AND APRONS.
- BLEND TRANSITIONS AT ENDS OF ROLLED CURB SECTIONS.

ROLLED CONCRETE CURB

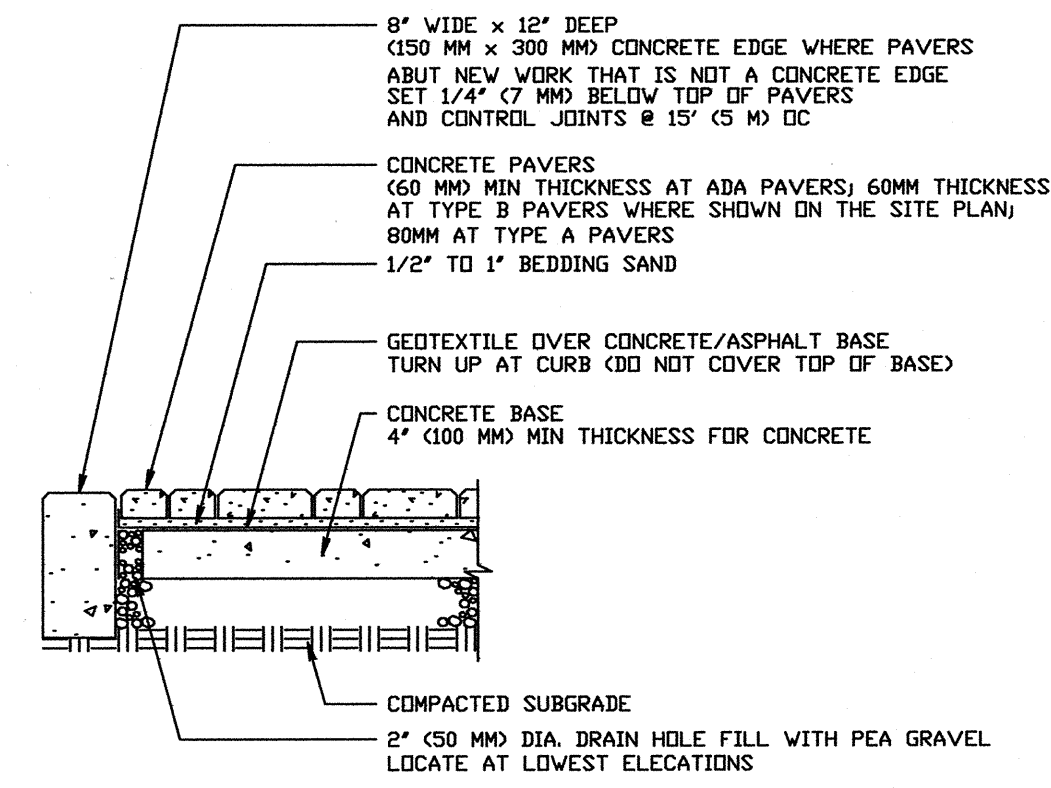
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CONCRETE UNIT PAVING

@ CIRCLE AND 13TH/UNIVERSITY INTERSECTION

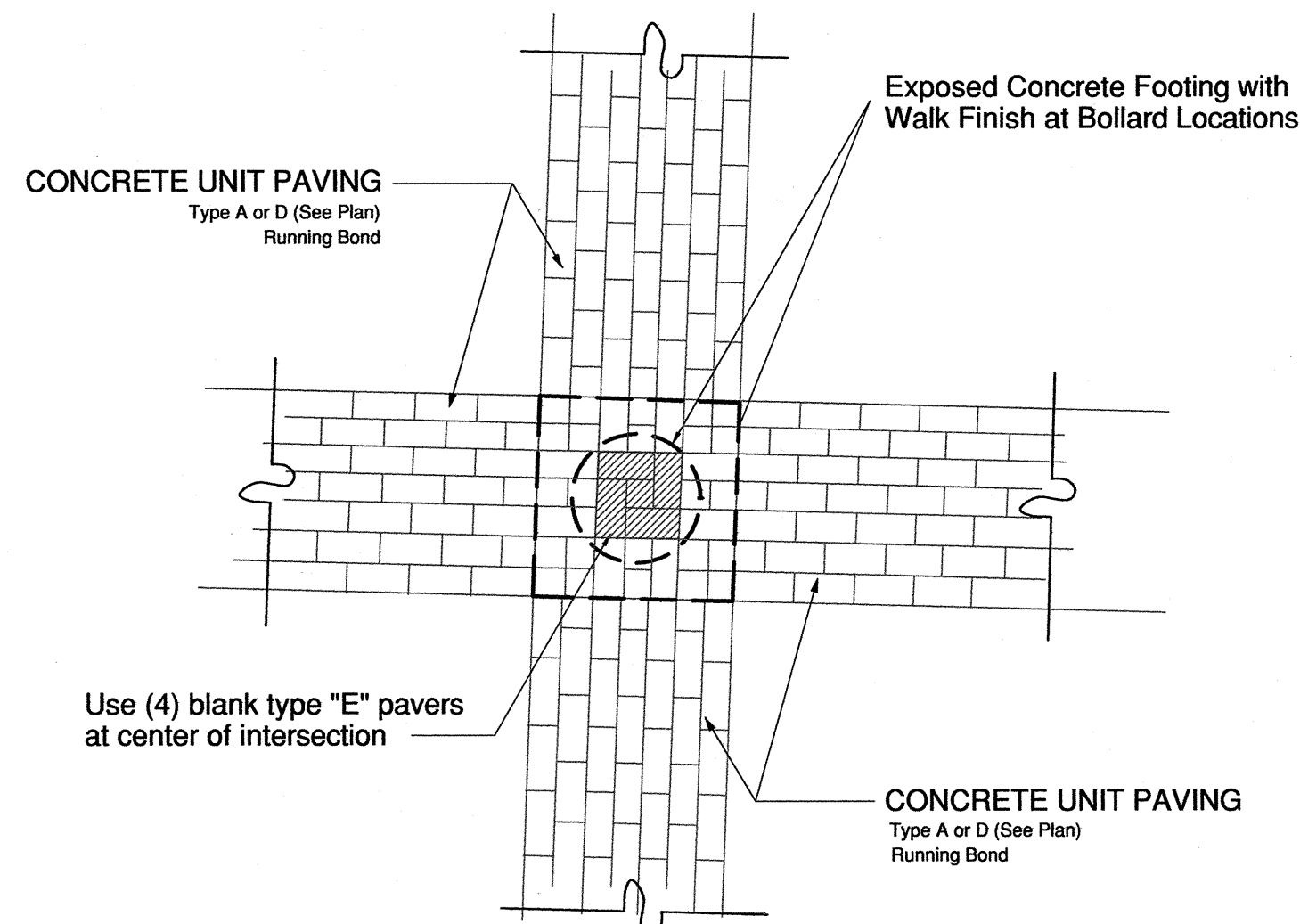
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CONCRETE UNIT PAVING

@ TACTILE WARNING AND PAVING BANDS

NTS
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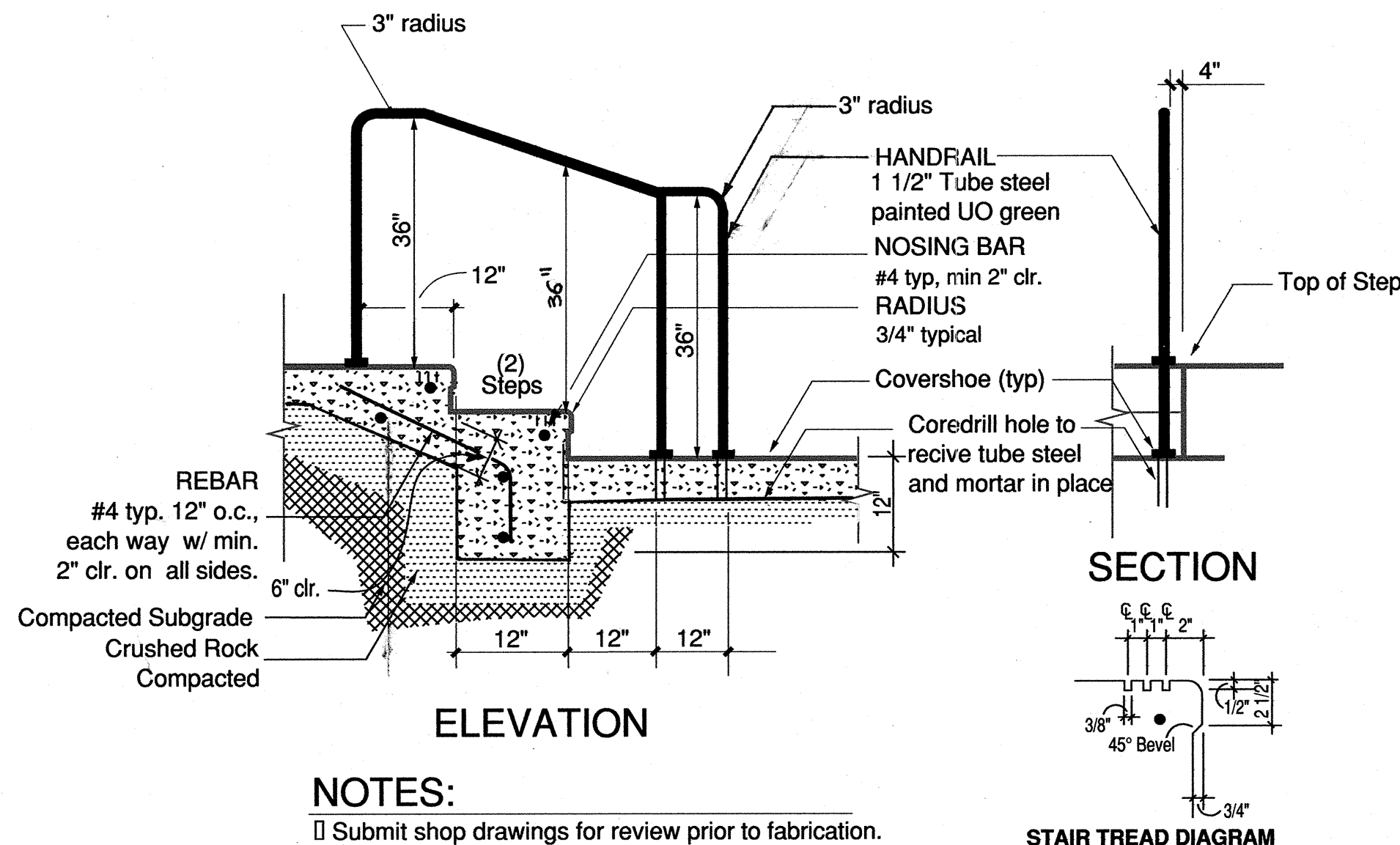


NOTES:

- Layout Running Bond Courses perpendicular to the flow of traffic.
- Begin Layout of Intersections and work outward.

CONCRETE PAVING @ BANDS

NTS
HOC
L8

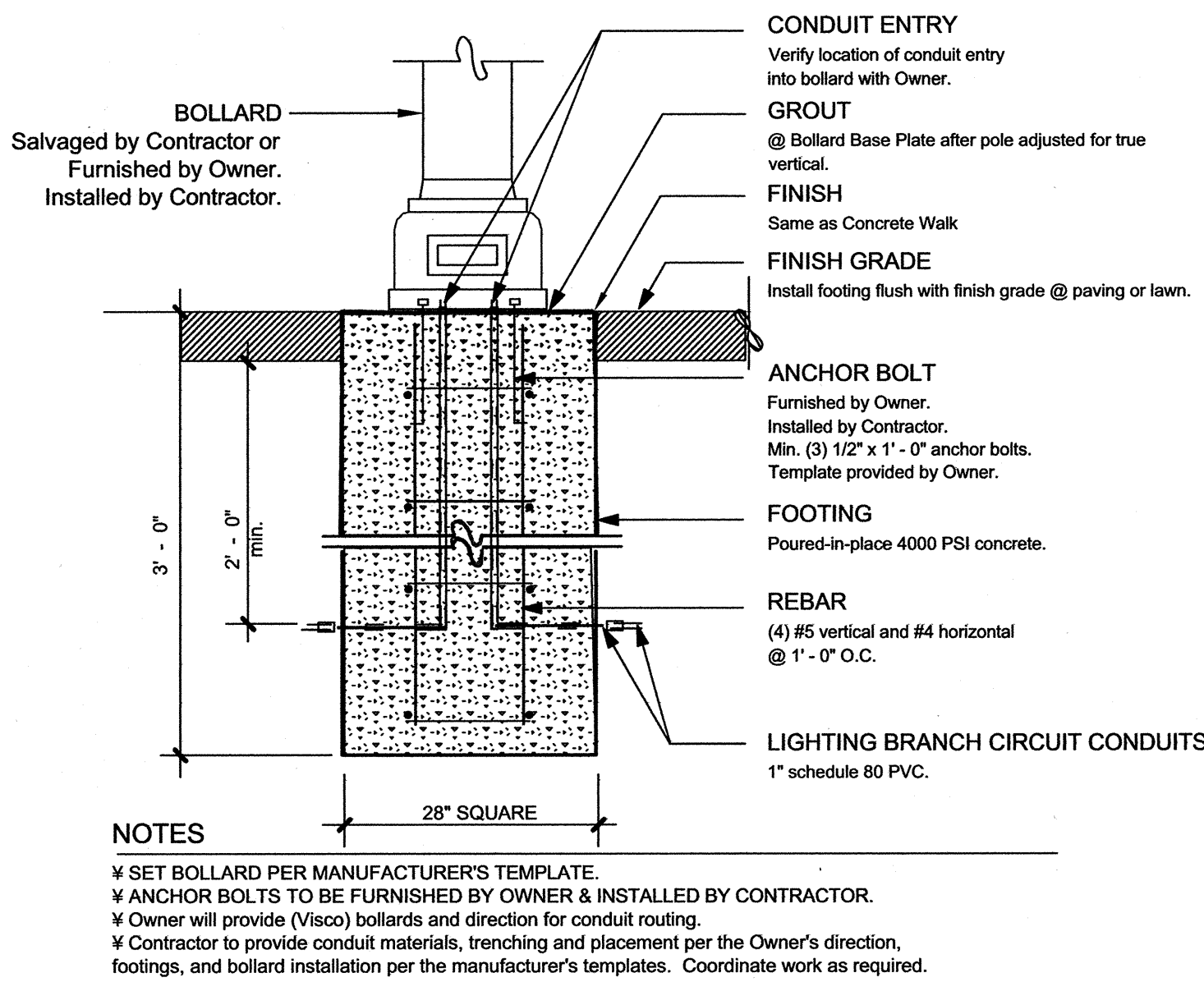


ELEVATION

NOTES:

- Submit shop drawings for review prior to fabrication.

STAIR TREAD DIAGRAM



NOTES

- SET BOLLARD PER MANUFACTURER'S TEMPLATE.
- ANCHOR BOLTS TO BE FURNISHED BY OWNER & INSTALLED BY CONTRACTOR.
- Owner will provide (Visco) bollards and direction for conduit routing.
- Contractor to provide conduit materials, trenching and placement per the Owner's direction, footings, and bollard installation per the manufacturer's templates. Coordinate work as required.

BOLLARD AND FOOTING

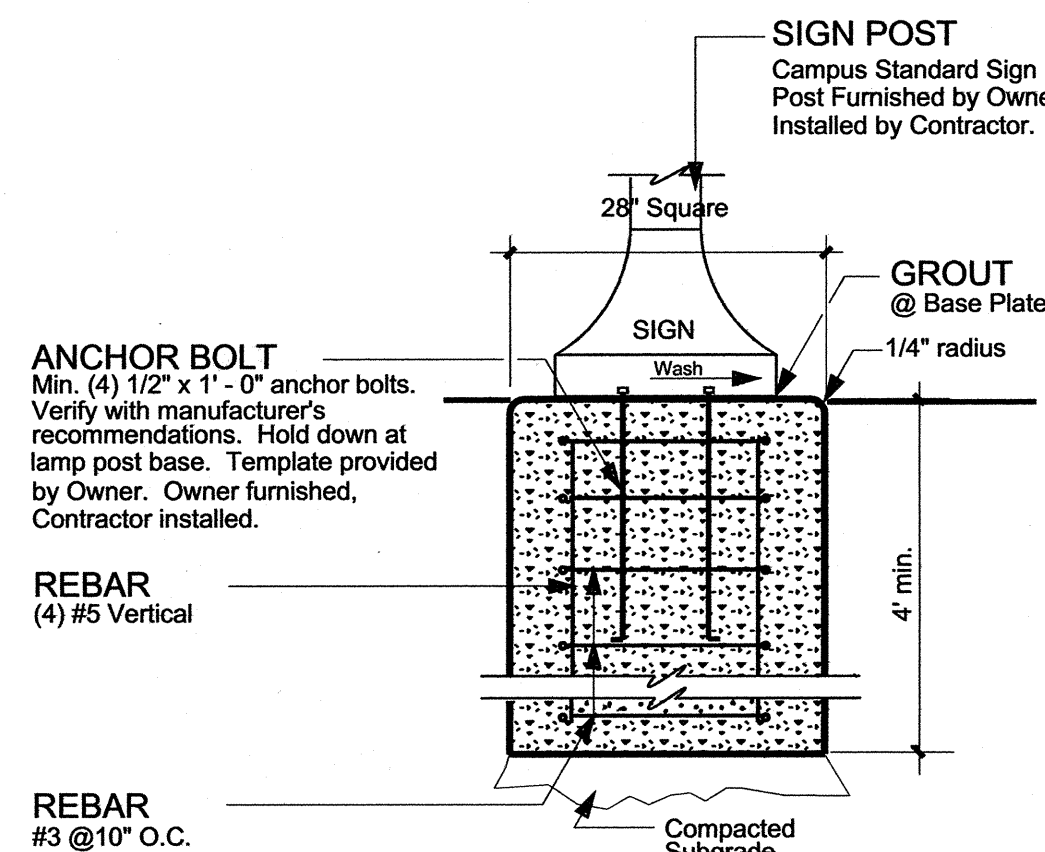
TYPE 1

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HOC
L8

BOLLARD AND FOOTING

TYPE 2 (Removable)

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HOC
L8

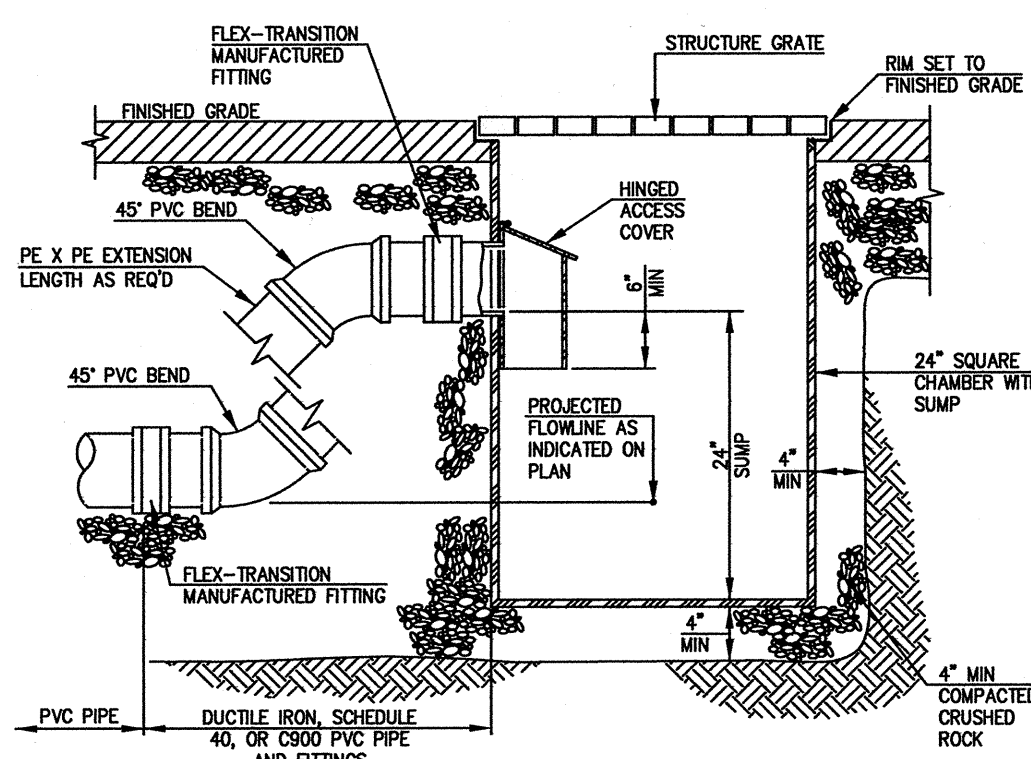


NOTE

- SET POST PER MANUFACTURER'S TEMPLATE

ORNAMENTAL SIGNPOST AND FOOTING

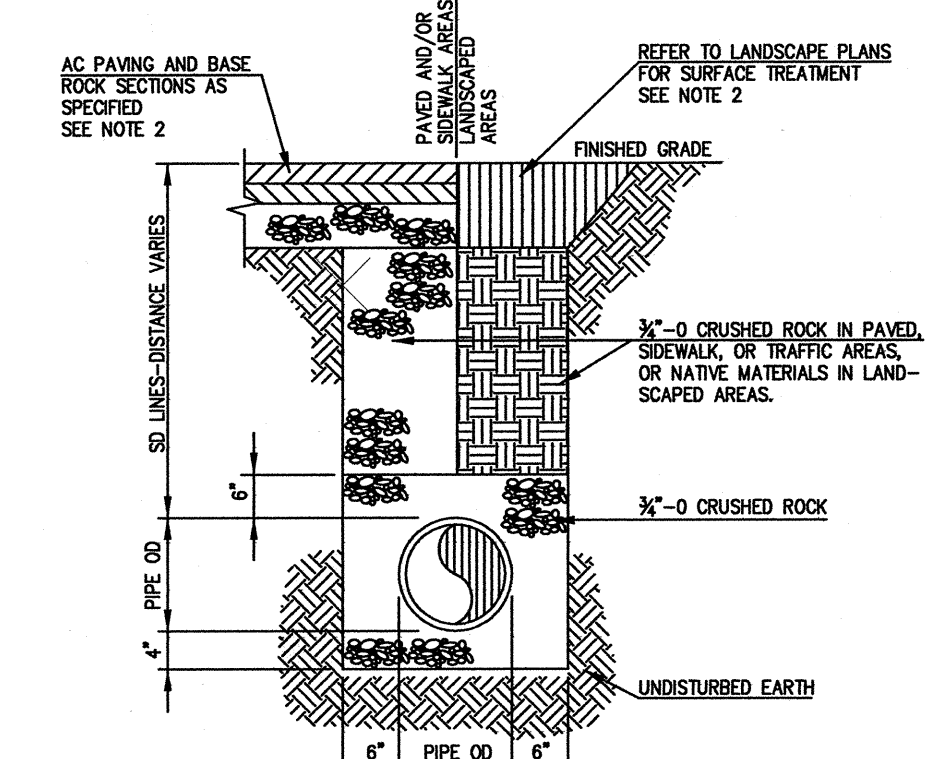
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- TRACER WIRE SHALL ENTER STRUCTURE AT PIPE INLET OR OUTLET. PROVIDE ENOUGH FREE WIRE TO EXTEND 18" ABOVE TOP OF GRATE TO FACILITATE TESTING. COIL WIRE AND SECURE WITH NON-CORROSIVE FASTENER 2" UNDER FRAME.
- LOCATION SPECIFIED ON PLAN INDICATES CENTER OF GRATED SECTION OF BASIN OR FACE OF CURB AT CENTER OF GRATED SECTION.

CATCH BASIN

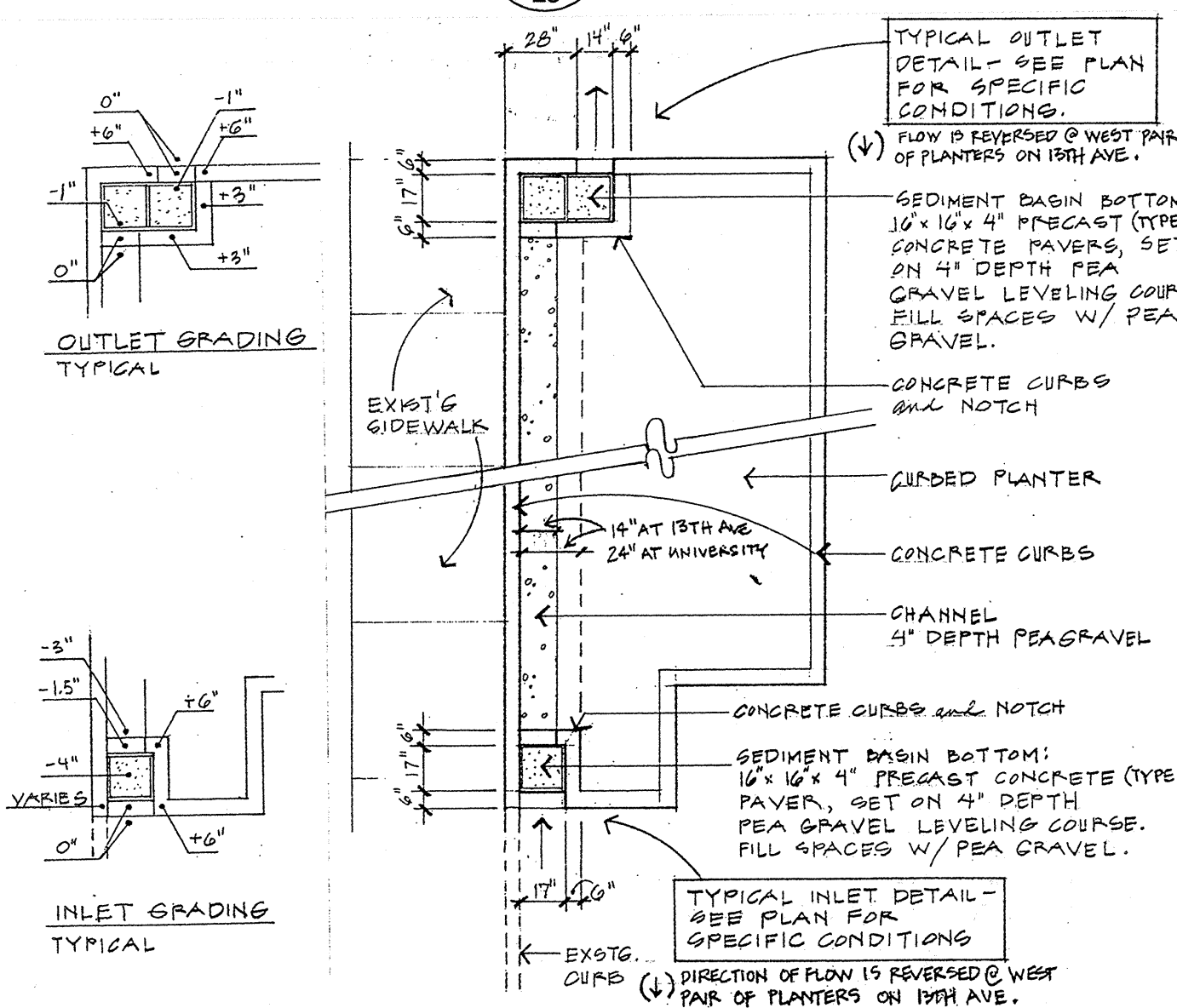
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- WATER LINES THAT PARALLEL SANITARY SEWER LINES SHALL BE LOCATED A MINIMUM OF 12" ABOVE SEWER LINES, WHERE SERVICES ARE NOT HORIZONTALLY SEPARATED BY 10'.
- SAWCUT, REMOVE AND REPAIR EXISTING SURFACES TO MATCH EXISTING ASPHALT, CONCRETE, OR LANDSCAPING IN AREAS WHICH DO NOT RECEIVE NEW IMPROVEMENTS. PROVIDE 4" MINIMUM DEPTH ASPHALT OR CONCRETE PAVEMENT, OR MATCH EXISTING PAVEMENT THICKNESS, WHICHEVER IS GREATER.

TRENCHING AND BACKFILL

NTS
HOC
L8



STORMWATER PLANTER

NTS
HOC
L8

HEART OF CAMPUS PHASE ONE IMPROVEMENTS

UNIVERSITY OF OREGON
1276 UNIVERSITY OF OREGON
EUGENE, OR 97403-1276

CMC
GCS
CAMERON
MC CARTHY
GILBERT &
SCHEIBE
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cmcg@westnet

REGISTERED
#372
Matthew K. Scheibe
OREGON
5/9/97
LANDSCAPE ARCHITECT

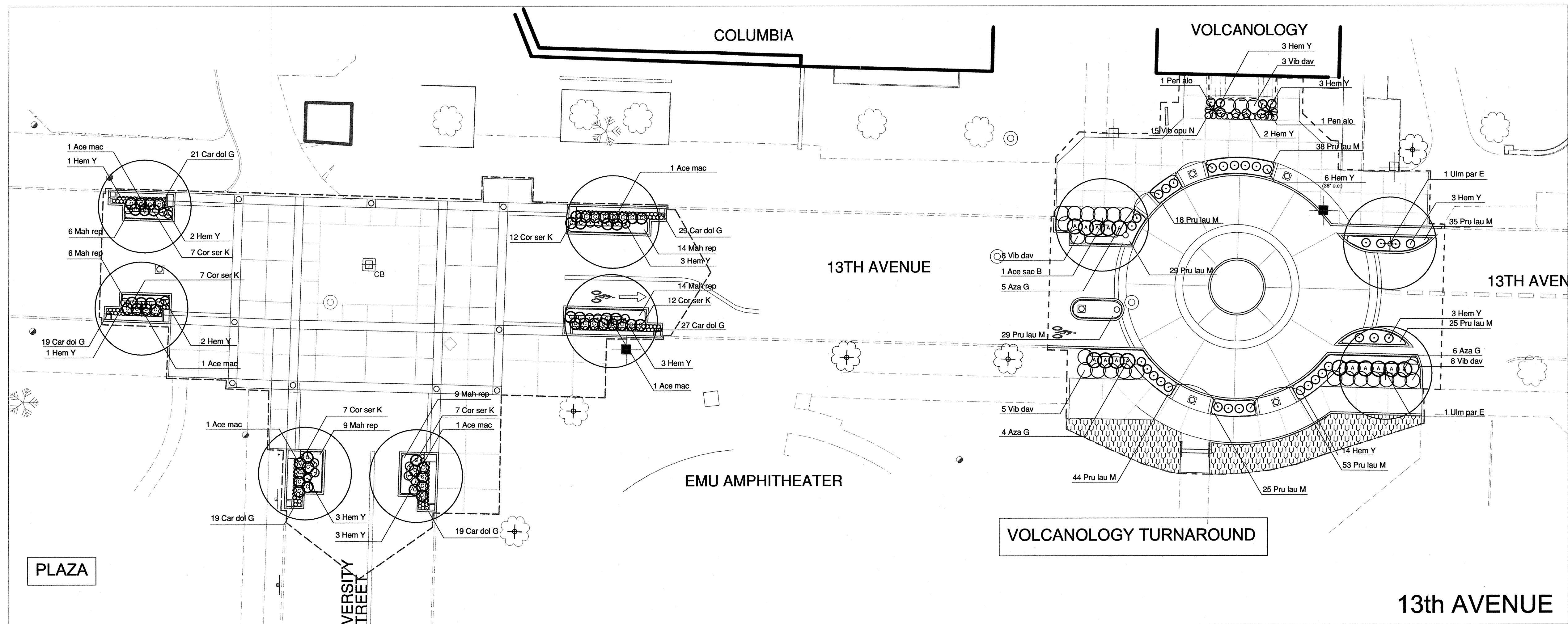
HARDSCAPE DETAILS

DRAWN:
JKK
CHECKED:
MKS
DATE:
06/07/04

PROJECT NO:
0343
FILE NO:

HOC-L8

HARDSCAPE DETAILS



LEGEND

Existing Trees

Proposed Trees

Shrubs

Mulch Only

Lawn Repair

- NOTES
1. Do not install any plant materials until Landscape Architect has reviewed and approved irrigation system installation, area coverage balancing, soil preparation and finish grading. Refinethe shape and finish grade of plant beds as directed by Landscape Architect.

2. Verify exact locations and routing of existing underground utilities prior to starting excavation. Repair any damage to existing pipes, utilities, or related facilities at Contractor's expense in a manner approved by Landscape Architect.

3. Protect all existing trees and plant materials to remain including limbs, trunks, roots and root zones.

4. Finish grade is top of topsoil. Mulch is in addition.

5. Refine the shape and finish grade of all plant beds as directed by Landscape Architect.

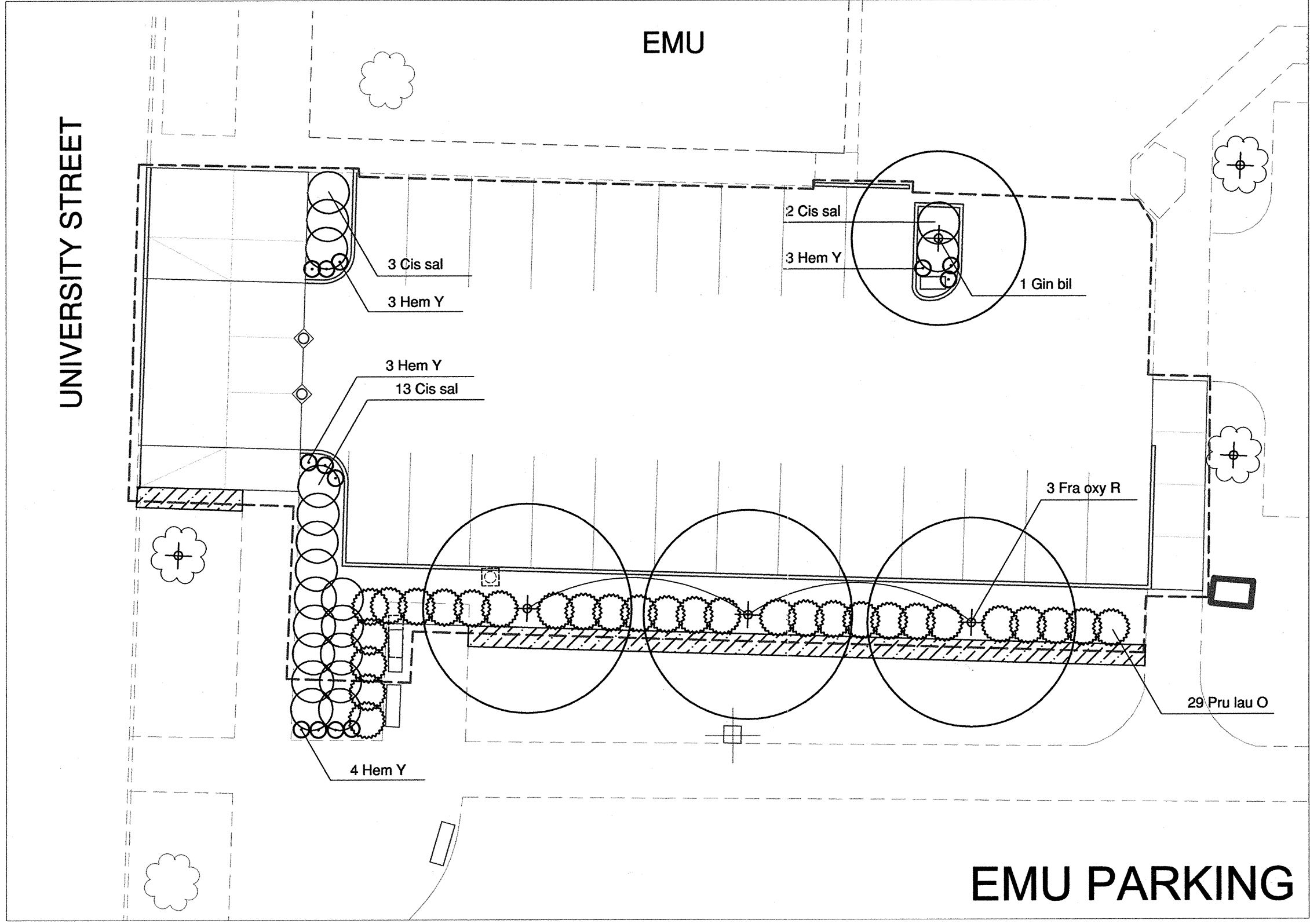
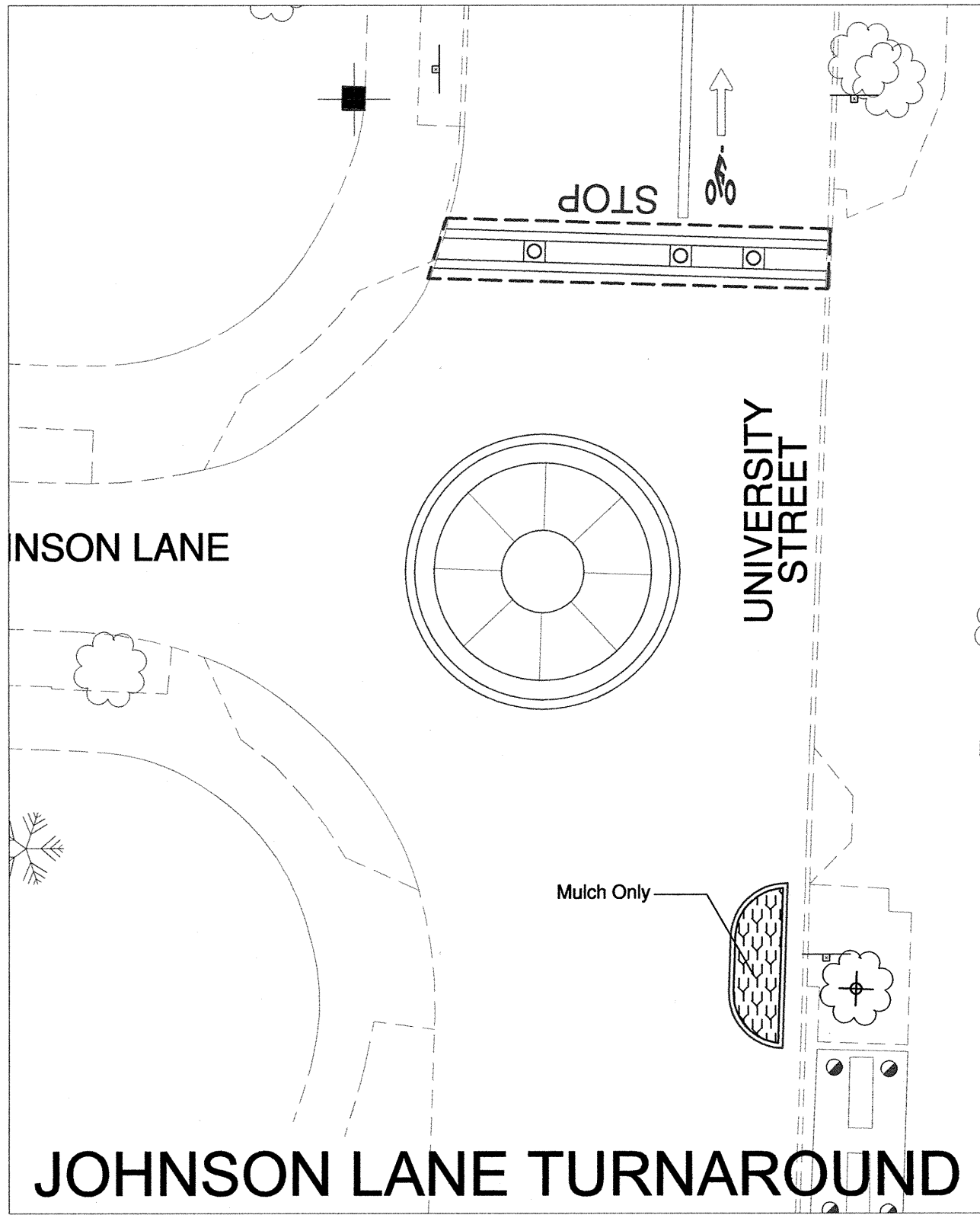
6. Prune all new plant materials as directed by Landscape Architect.

7. Make minor adjustments in tree spacing as necessary to accommodate the irrigation system as installed.

8. Trees, shrubs, and groundcovers planted too deeply will not be accepted. See typical tree planting details. Plant quantities shown are to Contractor's convenience only. Contractor is responsible to provide 100% coverage of entire area at spcing shown.

9. Provide mulch area as shown on drawing at each tree installed in lawn areas.

10. Where new lawn abuts existing, provide a smooth transition and make repairs as necessary to existing lawn.



PLANT LIST

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	CONDITION	COMMENTS
6	Ace mac	Acer macrophyllum	Bigleaf Maple	2" cal	as shown	B&B or cont.	Matching, full, evenly branched
1	Ace sac B	Acer saccharum 'Bonfire'	Bonfire Sugar Maple	2" cal	as shown	B&B or cont.	Matching, full, evenly branched
3	Fra oxy R	Fraxinus oxycarpa 'Raywood'	Raywood Ash	2" cal	as shown	B&B or cont.	Matching, full, evenly branched
1	Gin bil	Ginkgo biloba	Ginkgo	2" cal	as shown	B&B or cont.	Matching, full, evenly branched
2	Ulm par E	Ulmus parvifolia 'Emer II'	Emer II Elm	2" cal	as shown	B&B or cont.	Matching, full, evenly branched
Shrubs							
15	Aza Y	Azalea (yellow flower)	Deciduous Azalea	5 gal	as shown	Container	Full and bushy
18	Cis sal	Cistus salvifolius	Sageleaf Rockrose	3 gal	4" o.c.	Container	Full and bushy. Also sold as Cistus villosus 'Prostratus'
52	Cor ser K	Cornus sericea 'Kaleey'	Kaleey Dogwood	3 gal	3' o.c.	Container	Full and bushy
236	Pru lau M	Prunus laurocerasus 'Mt. Vernon'	Mt. Vernon Laurel	3 gall	18" o.c.	Container	Full and bushy
29	Pru lau O	Prunus laurocerasus 'Otto Luyken'	Otto Luyken Laurel	5 gal.	5' o.c.	Container	Full and bushy
24	Vib dav	Viburnum davidii	David Viburnum	3 gal	4" o.c.	Container	Full and bushy
Perennials, Grasses, and Groundcovers							
134	Car dol G	Carex dolichostachya 'Gold Fountains'	Gold Fountains Sedge	1 gal	12" o.c.	Container	Full and bushy
65	Hem Y	Hemerocallis Yellow	Yellow Daylily	3 gal	30" o.c. or as shown	Container	Full and bushy. Yellow flowering. Plant size prior to flowering a minimum 24" height
59	Mah rep	Mahonia repens	Creeping Mahonia	1 gal	24" o.c.	Container	Full and bushy
2	Pen alo H	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass	1 gal	3' o.c.	Container	Full and bushy
15	Vib opu N	Viburnum opulus Nanum	Dwarf Viburnum	1 gal	18" o.c.	11	

HEART OF CAMPUS
PHASE ONE IMPROVEMENTS

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REGISTERED
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LANDSCAPE ARCHITECT

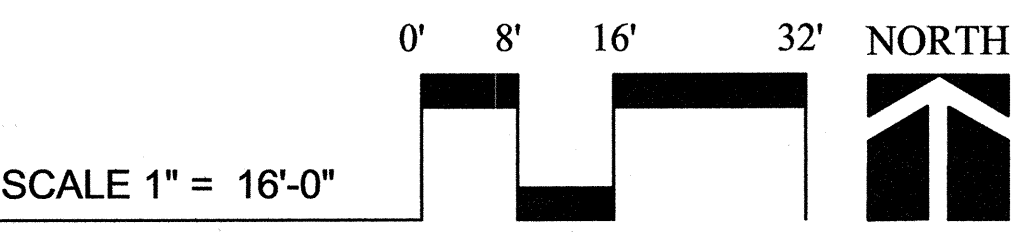
PLANTING PLAN

DRAWN:
JKL
CHECKED:
MKS
DATE:
06/07/04

PROJECT NO:
0343
FILE NO:

HOC-L7

PLANTING PLAN



Jane Sanders Stadium

COMPLETION DATE

2016

TYPE OF FACILITIES

Contained Filtration Planters (4)

TOTAL IMPERVIOUS AREA MITIGATED

xx

CONTACTS

- CPFM contact: Charlene Lindsay, (541) 346-5503
- Civil Engineer: Capital Engineering & Consulting, ATTN: Tina Guard, (541) 510-4225
- Landscape Architect: Cameron McCarthy, ATTN: Larry Gilbert, (541) 485-7385
- Plumbing Engineer: Glumac, ATTN: Geoff Winslow (503) 227-5280

SUPPORTING DOCUMENTS

- G001 General Information
- C200 Stormwater Management Plan
- C400 Civil Notes, Legend, and Details
- L200 Site Plan
- L700 Landscape Plan
- L907 Site Details
- P000 Plumbing Symbols and Abbreviations
- P101u Underground Plumbing
- P601 Enlarged Plans Plumbing (Field North, Concourse Level North)
- P601u Enlarged Plans Plumbing (Underground North)
- P602 Enlarged Plans Plumbing (Field West, Concourse Level West)
- P602u Enlarged Plans Plumbing (Underground West)
- P603 Enlarged Plans Plumbing (Roof North)
- P604 Enlarged Plans Plumbing (Roof West)



Figure 1: Filtration Planter 1

FUNCTION OF STORMWATER FACILITY

The stormwater planters located around Jane Sanders Stadium are contained filtration planters that primarily exist to filter and infiltrate stormwater runoff coming from surrounding rooftops. Most of the planters also filter some sidewalk runoff.

Filtration planter 1 (*figure 1*) only filters runoff coming from the triangle-shaped canopy above the bleachers. Runoff enters from an opening in the northwest corner of the canopy (*figure 2*) and falls freely into the center of the planter below.



Figure 2: Roof Drain into Planter 1



Figure 3: Filtration Planter 2

Planter 2 (*figure 3*) is located by the eastern portion of the walkway between the tennis center and the team building. In the southwest corner of the facility two roof drains allow runoff from the team building's roof to enter the facility. Runoff also enters from two catch basins along the walkway and is piped into an outfall in the planter's northwest corner (*figure 4*). Curb cuts also allow sidewalk runoff to freely enter the planter.



Figure 4: Filtration Planter 2 Outfall



Figure 5: Filtration Planter 3

Planter 3 (*figure 5*) is a smaller facility next to the stairs by the northeast corner of the field. It filters runoff from the raised walkway just above it, via a simple downspout, and from the team building's roof using a system of pipes (*figure 6*).

The 4th planter (*figure 7*) is just inside the fencing surrounding the stadium, directly west of right-field. It filters both roof runoff and runoff that enters the catch basin located about 15 feet south of the planter. The roof runoff is piped into the northern wall of the planter (*figure 8*).



Figure 7: Filtration Planter 4



Figure 6: Filtration Planter 3 Outfall



Figure 8: Filtration Planter 4 Outfall from Roof

MAINTENANCE CONCERNS

There are no significant maintenance concerns for the Jane Sanders stormwater planters. Vine Maples planted in all of the facilities except for planter 1 will provide some leaf debris, but not an exceptionally heavy amount. The placement of these facilities along walkways, along with their depth, could contribute to higher rates of trash within them. (thoughts on cutting back juncus) (safety hazard of planter 3)

Appendix C

Inspection Log Template

Stormwater Treatment Facility Inspection Checklist

Facility Location: _____

Inspection Date: _____ Time: _____ Inspected by: _____

Facility Type: _____ Current Weather: _____

Approximate Date/Time of Last Significant Rainfall: _____

Inspection Items	Yes / No and/or Amount	Notes & Action Needed
<i>Ponding and Water Quality</i>		
Standing water?	Yes:_____ (in.) / No	
Oil sheen present?	Yes / No	
Noticeable odors?	Yes / No	
<i>Sediment Accumulation and Erosion</i>		
Over 1" sediment throughout facility?	Yes / No	
Sediment level at inlets:	(in.)	
Channeling present?	Yes / No	
Animal burrows/other holes?	Yes / No	
Steep slopes?	Yes / No	
Other erosion issues?	Yes:_____ / No	
<i>Vegetation Conditions</i>		
Wanted-vegetation coverage:	%	
Dead plants?	Yes:_____ (amount) / No	
Weeds present?	High / Medium / Low / None	
Grasses height: (if applicable)	(in.)	
Insect damage?	High / Medium / Low / None	
Plants trampled?	High / Medium / Low / None	
Plant debris (leaves, etc.)?	High / Medium / Low / None	
Trash present?	High / Medium / Low / None	
Pruning required?	Yes / No	
Mulch level:	(in.)	
<i>Hardscaping Conditions</i>		
Overflow drain blocked?	Yes / No	
Inlets blocked?	Yes / No	
Facility accessible?	Yes / No	

Damage to planter walls?	Yes:_____ / No	
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Any other notable concerns?

Actions to take:	Complete by: