

OPERATION & MAINTENANCE MANUAL

Water Quality Planter

Manual prepared: November 2017

DFI No. D00583, D00584, D00585, D00586



Figure 1: DFI D00584, looking south

1. Identification

Drainage Facility ID (DFI): D00583
Facility Type: Water Quality Planter
Construction Drawings: (V-File Numbers) 45V-038
Location: District: 2B
Highway No.: 123
Mile Post: 12.72-12.73, right side

Drainage Facility ID (DFI): D00584
Facility Type: Water Quality Planter
Construction Drawings: (V-File Numbers) 45V-038
Location: District: 2B
Highway No.: 123
Mile Post: 12.75-12.76, right side

Drainage Facility ID (DFI): D00585
Facility Type: Water Quality Planter
Construction Drawings: (V-File Numbers) 45V-038
Location: District: 2B
Highway No.: 123
Mile Post: 12.78-12.79, right side

Drainage Facility ID (DFI): D00586
Facility Type: Water Quality Planter
Construction Drawings: (V-File Numbers) 45V-038
Location: District: 2B
Highway No.: 123
Mile Post: 12.82-12.83, right side

2. Manual Purpose

The purpose of this manual is to outline inspection needs and summarize maintenance actions for water quality planters.

3. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map.

Facility location type: In sidewalk

Flow direction: East



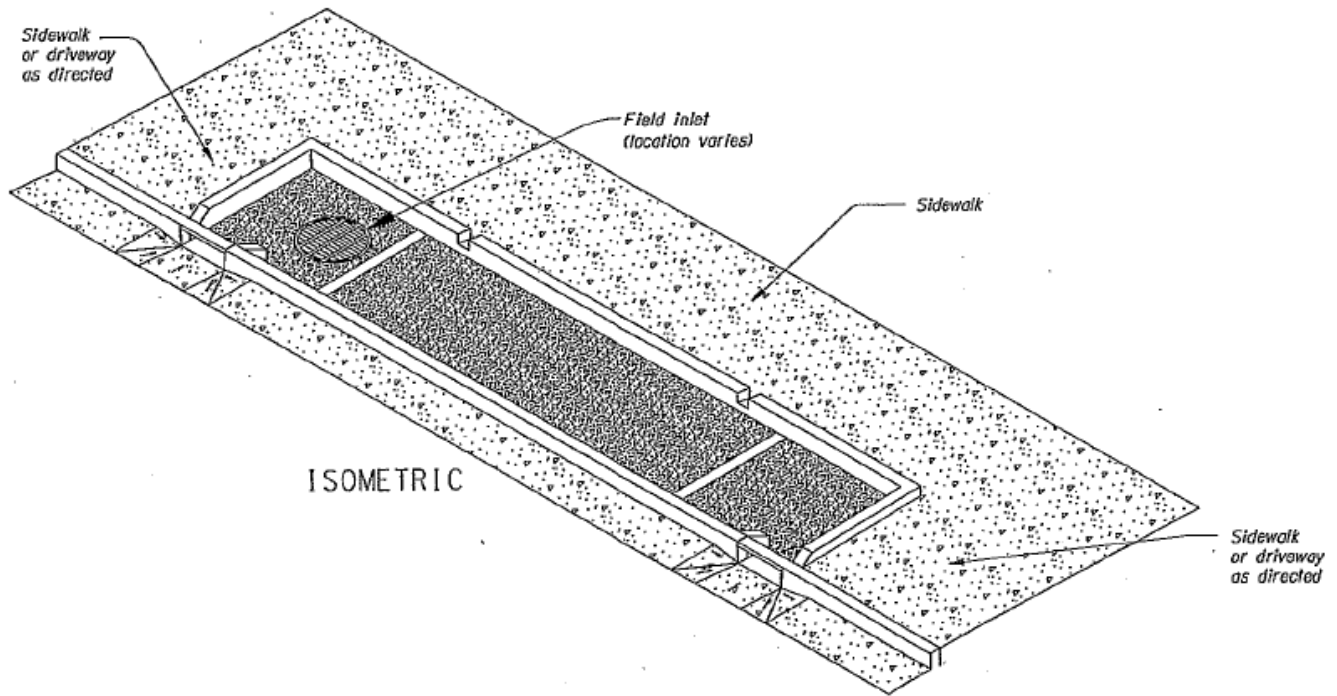
Figure 2: Facility Location Map

4. Facility Summary

The length and width of the WQ Planter is based on the dimensions of the inside of the treatment cell.

The length and width of the WQ Planters are:

Facility DFI	Length (Feet)	Width (Feet)
D00583	76	3.5
D00584	27	3.5
D00585	45	3.5
D00586	31	3.5



Site Specific Information: The planters have blended compost and topsoil mixture. There are also three types of grasses in the planters and two curb inlets. There are no bypass inlets on the planters.

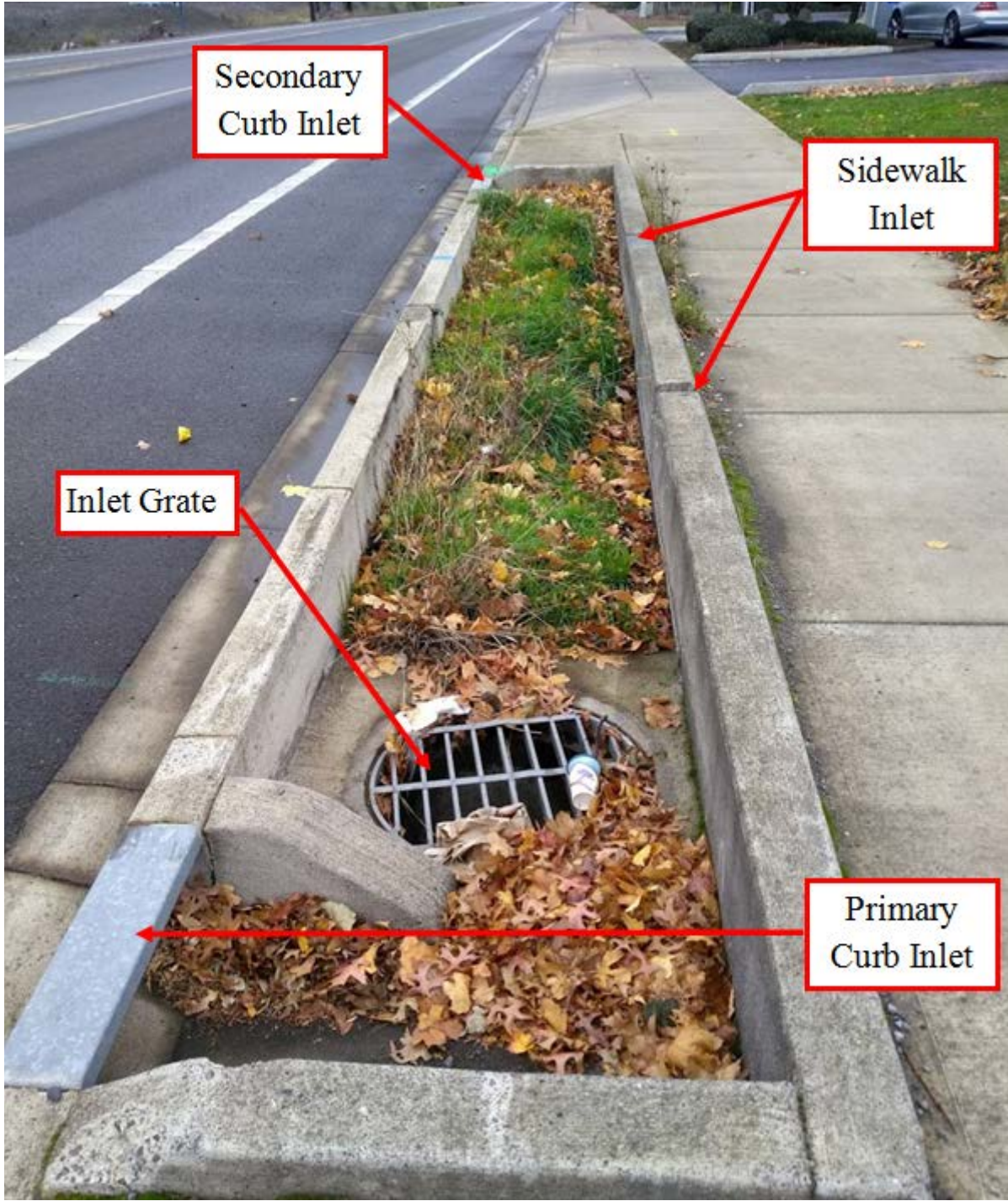


Figure 4: Facility Components



Figure 5: Facility Components

5. Facility Access

Maintenance access to the facility: Curb and gutter (travel lane)

Lane Closure Needed

Water quality planters do not typically have access roads/access pads, nor are they gated, as they are located in urban areas alongside sidewalks and curbs. Use caution when accessing these facilities as there may be pedestrians or cyclists in the vicinity.

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

<input type="checkbox"/> Filterra (Op Plan A)	<input checked="" type="checkbox"/> WQ Planter (Op Plan B)	<input type="checkbox"/> MWS (Op Plan C)
A Filterra is a single chamber treatment cell that utilizes filter media, a plant, and a perforated underdrain.	A WQ Planter is a single chamber treatment cell that utilizes plants, filter media, and a perforated underdrain. The auxiliary outlet is located inside of the treatment cell.	A <u>Modular Wetland System</u> is a three chamber treatment cell that utilizes plants, filter media, filter media cartridges, and a perforated underdrain network.
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A and B) are provided in the Standard Operation Manual.		

See Appendix A for the site specific operational plan.

Operational Components

The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an “x” (e.g.).

The Standard Operation Manual for Water Quality Planters (implemented April 2018) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.

<https://gis.odot.state.or.us/TransGIS/>

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated below.

Table 1: Facility Components		ID #
Facility Inlet		
Inlet Grate	<input type="checkbox"/>	P1
Curb Inlet	<input checked="" type="checkbox"/>	P2
Sidewalk Chute	<input type="checkbox"/>	P3
Bypass Inlet	<input type="checkbox"/>	P4
Treatment		
Plants (Tree or Shrub)	<input type="checkbox"/>	P5
Grass	<input checked="" type="checkbox"/>	P6
Filter Media	<input type="checkbox"/>	P7
Filter Media Cartridge	<input type="checkbox"/>	P8
Planter Components		
Perforated Pipe	<input checked="" type="checkbox"/>	P9
Outlet Grate	<input checked="" type="checkbox"/>	P10
Outfall Type		
Waterbody (Creek/Lake/Ocean)	<input type="checkbox"/>	P11
Ditch	<input type="checkbox"/>	P12
Storm Drain System	<input checked="" type="checkbox"/>	P13

7. Maintenance

Maintenance Frequency/Maintain Records

- a. Full inspection annually. Preferably prior to the rainy season.
- b. Clean and maintain as necessary. Refer to Activity 125 for conditions when maintenance is needed.
- c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The ODOT Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) outlines the standard maintenance actions for water quality facilities under Activity 125.

There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition

when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain these water quality planters:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities. Maintenance of inlets, outlets, trash removal and noxious weeds is recommended seasonally.
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales. The planted area of these planters should be maintained as described for the bottom and sides of swales, by using equipment other than mowers to control plant height. Replant if needed with plants from the original plans, or as recommended by ODOT landscaping and stormwater staff.

The *Blue Book* can be viewed at the following website:

http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

8. Limitations

Vactors may be used at the inlet, outlet, and grated areas. No heavy equipment may be used in the planted areas.

9. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the road waste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

<http://www.oregon.gov/ODOT/HWY/OOM/pages/ems.aspx>

Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186

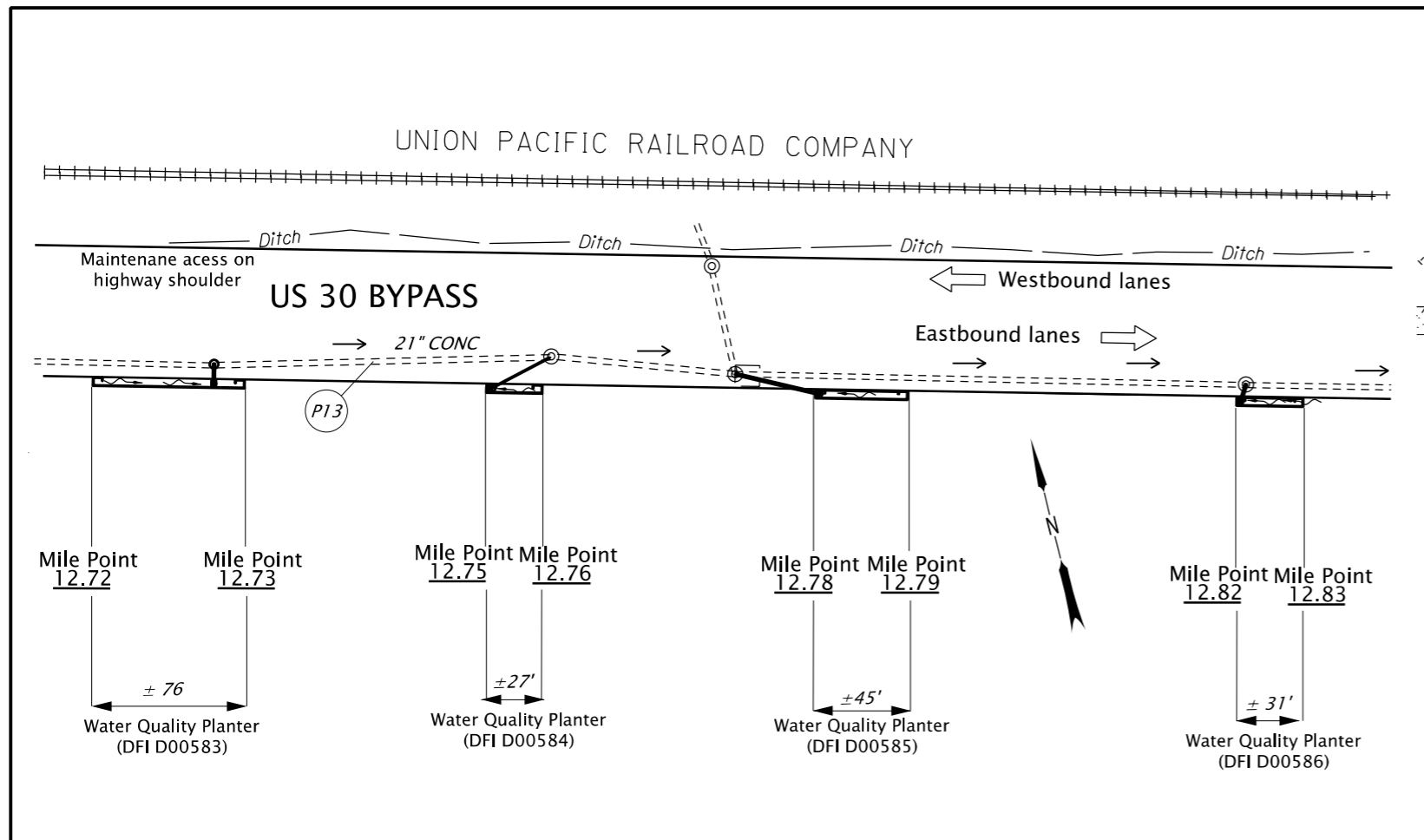
ODOT Region 5 Hazmat Coordinator
ODEQ Northwest Region Office

(541) 963-1590
(503) 229-5263

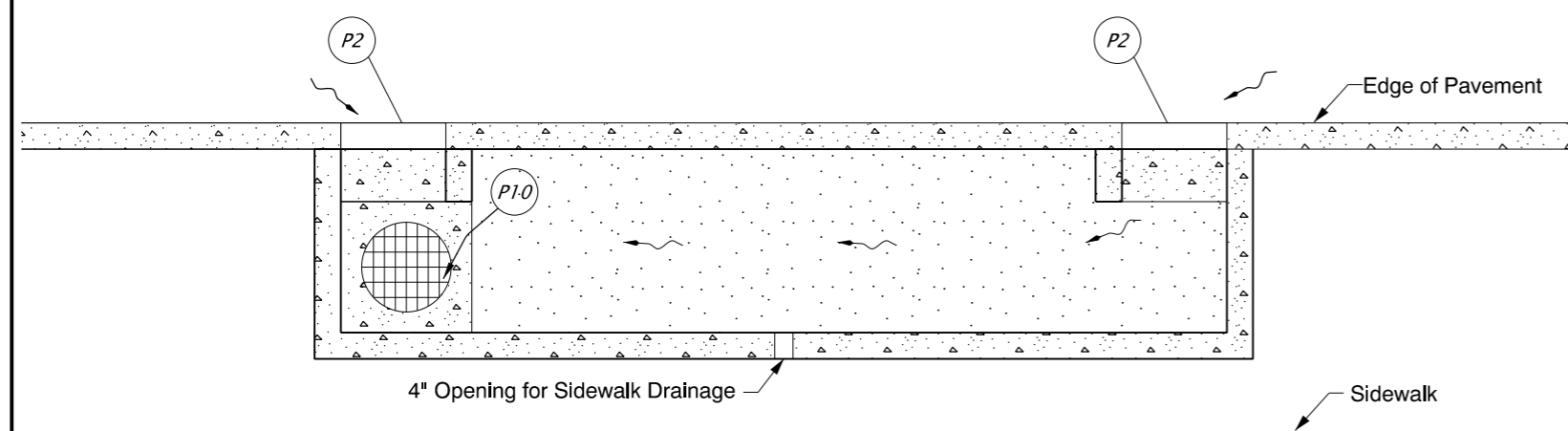
A Appendix A – Site Specific Operational Plan

Contents:

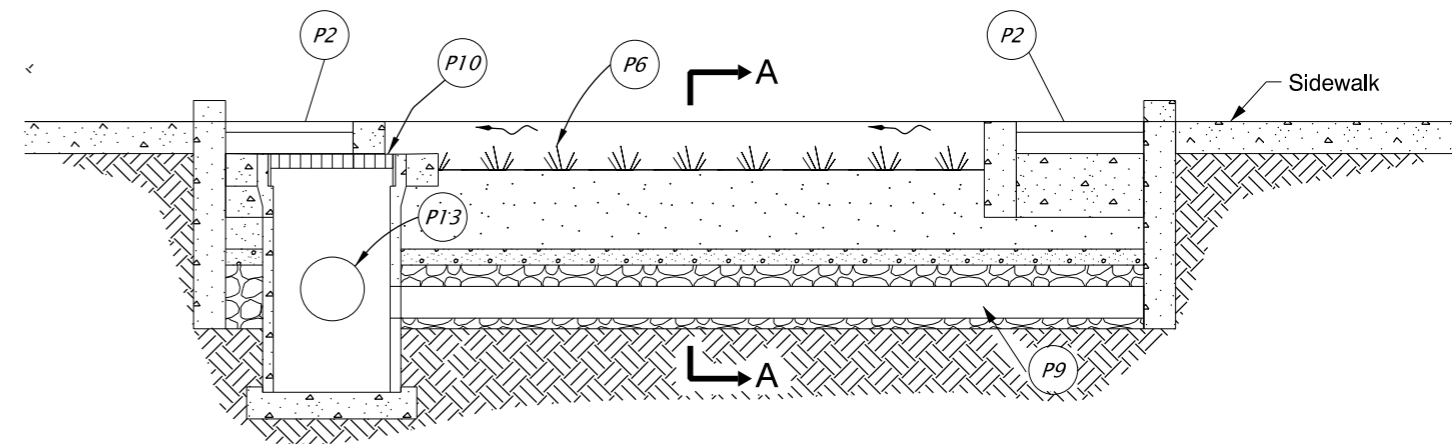
Operational Plan: DFI D00583-D00584, D00585, and D00586



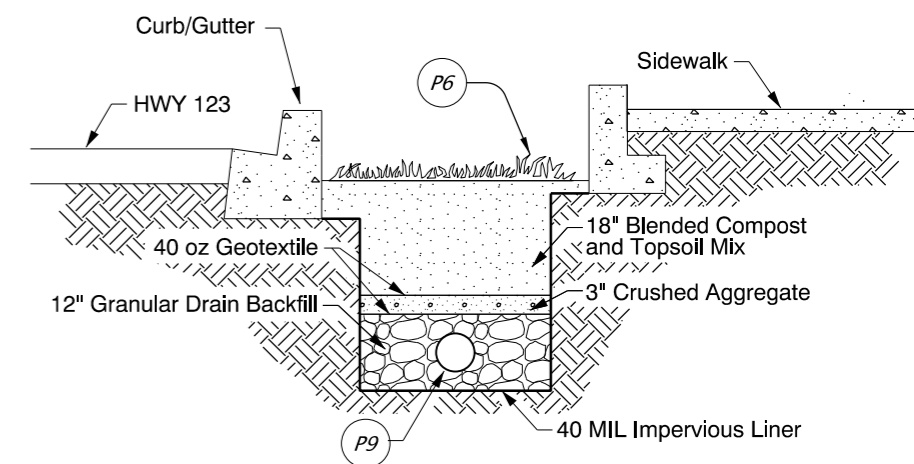
PLAN
N.T.S.



PLAN
N.T.S.



PROFILE
N.T.S.



SECTION A-A
N.T.S.

Legend

- ⊙ Standard Manhole
- Inlet
- === Storm Pipe (Facility)
- Conveyence Direction
- ~ Water Flow Direction
- ← Traffic Flow Direction

Sht. 01 of 01

Prepared By:
Katrina Sepulveda

Drafted By:
Katrina Sepulveda



OREGON DEPARTMENT OF TRANSPORTATION

DFI D00583, D00584, D00585, D00586
MAINTENANCE DISTRICT 2B HWY 123
Water Quality Planters
US 30 Bypass MP 12.72-12.83
Multnomah County

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 45V-038

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, PAVING, PAVEMENT MARKERS, SIGNING,
SIGNALS & ROADSIDE DEVELOPMENT

US 30 BYPASS: NE 122ND - M.P. 13.54 SEC.

NORTHEAST PORTLAND HIGHWAY

MULTNOMAH COUNTY
MAY 2012

END OF CONTRACT PROJECT
HSIP-STP-S123(016)

STA. "RW" 177+93.00 (M.P. 13.68)

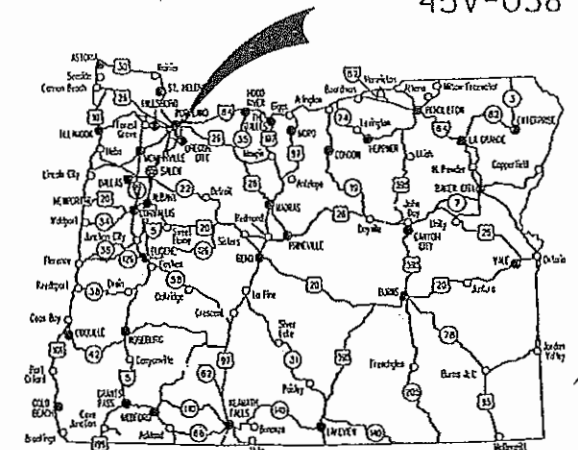
END OF PROJECT
HSIP-STP-S123(016)

STA. "RW" 170+44.71 (M.P. 13.54)

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Std. Drg. Nos.

BEGINNING OF PROJECT &
CONTRACT PROJECT
HSIP-STP-S123(016)

STA. "RW" 112+79.00 (M.P. 12.45)



Overall Length Of Project - 1.09 Miles

ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center. (Note: The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)



OREGON TRANSPORTATION COMMISSION
Pat Egan CHAIR
Mary F. Olson COMMISSIONER
David Lohman COMMISSIONER
Mark Frohnmayer COMMISSIONER
Tommy Boney COMMISSIONER
Matthew L. Garrett DIRECTOR OF TRANSPORTATION

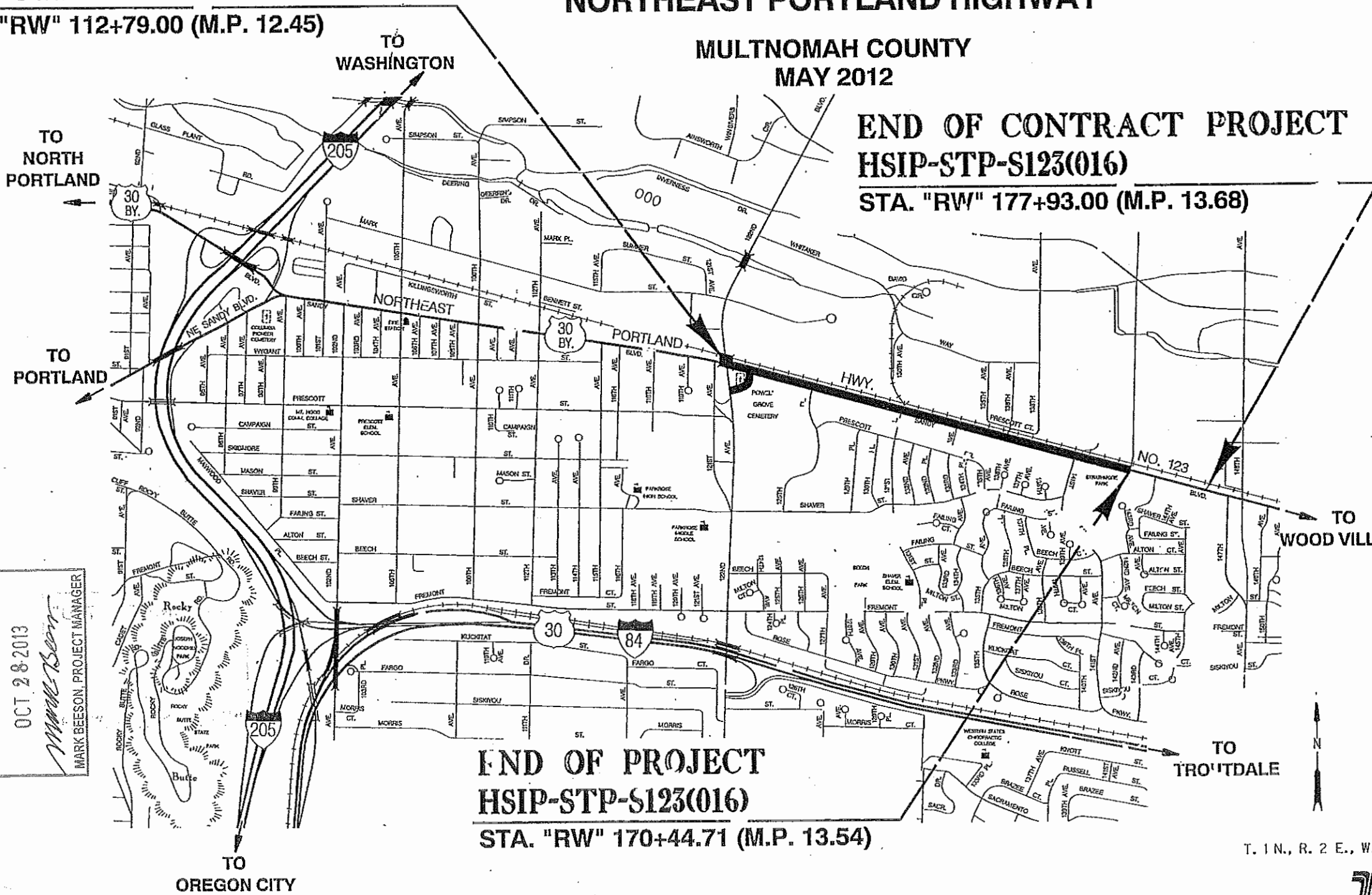
These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: *Naveen G. Chandra*
Naveen G. Chandra, P.E.
Project Delivery Manager, Region 1

J.M. Hill
Concurrence by ODOT Chief Engineer

US 30 BYPASS: NE 122ND - M.P. 13.54 SEC.
NORTHEAST PORTLAND HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HSIP-STP-S123(016)	1



"AS CONSTRUCTED"
OCT 28 2013
Mark Beeson
MARK BEESON, PROJECT MANAGER

T. 1 N., R. 2 E., W.M.



INDEX OF SHEETS, CONT'D.	
SHEET NO.	DESCRIPTION
2, 2A, 2A-2 thru 2A-5	Typical Sections
2B, 2B-2 thru 2B-8	Details
2C, 2C-2 Thru 2C-5	Traffic Control Plans
2D	Pipe Data Sheet
3	General Construction
3A & 3A-2	Drainage & Utilities
3B	Profile
4	General Construction
4A & 4A-2	Drainage & Utilities
4B	Profile
5	General Construction
5A & 5A-2	Drainage & Utilities
5B	Profile
6	General Construction
6A & 6A-2	Drainage & Utilities
7	General Construction
7A & 7A-2	Drainage & Utilities
7B	Profile
8	General Construction
8A	Drainage & Utilities
GEO/HYDRO	
GA, GA-2 Thru GA-10	Erosion Control
GB & GB-2	Geotechnical Data
GM	Mandatory Disposal Site
ROADSIDE DEVELOPMENT	
GN, GN-2 & GN-3	Details
GN-4 Thru GN-8	Roadside Development Plans
PERMANENT PAVEMENT MARKINGS	
ST, ST-2 Thru ST-5 Incl.	Striping Plans
PERMANENT SIGNING	
S-13094 Thru S-13104	Permanent Signing

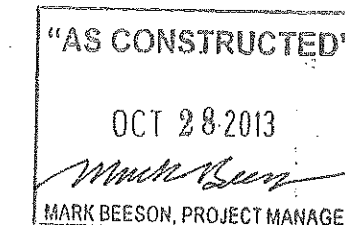
INDEX OF SHEETS, CONT'D.	
SHEET NO.	DESCRIPTION
TRAFFIC SIGNALS	
16463	Legend
16464	Removal Plan
16465	Signal Plan
16466	Detector Plan
16467	Existing Utilities
16468	Removal Plan
16469	Signal Plan
16470	Detector Plan
16471	Existing Utilities
16472	Interconnect Plan
16473	Flashing Beacon Plan
16474	Existing Utilities
16475	Details
16476	Details
16494	Details
16495	Details

Standard Drg. Nos.

- RD140 - Roadway Cross Slopes Superelevated Sections
- RD150 - Slope Rounding
- RD300 - Trench Backfill, Bedding, Pipe Zone And Mult. Installations
- RD302 - Street Cut
- RD312 - Subsurface Drain
- RD336, RD338, RD342 - Manholes
- RD344, RD346 - Manhole Cover & Frames
- RD356 - Manhole Frame Adjustment
- RD360 - Sanitary Cleanout
- RD362 - Concrete Inlets
- RD370 - Pipe Fill Height Tables
- RD380, RD386, RD388 - Stormwater Treatment and Storage Facility Field Markers
- RD390
- RD399
- RD400, RD405, RD410, RD415, RD420, RD425, RD430, RD435, RD440, RD445, RD450, RD470 - Guardrail
- RD610 - Asphalt Pavement Details
- RD700, RD701 - Curbs
- RD705 - Islands
- RD710 - Accessible Route Islands
- RD715 - Approaches And Non-Sidewalk Driveways
- RD720 - Sidewalks
- RD725 - Separated Sidewalk Driveways or Alleys
- RD735 - Curb Line Sidewalk Driveways or Alleys
- RD755 - Sidewalk Ramp Details
- RD759 - Truncated Dome Detectable Warning Surface Details And Locations

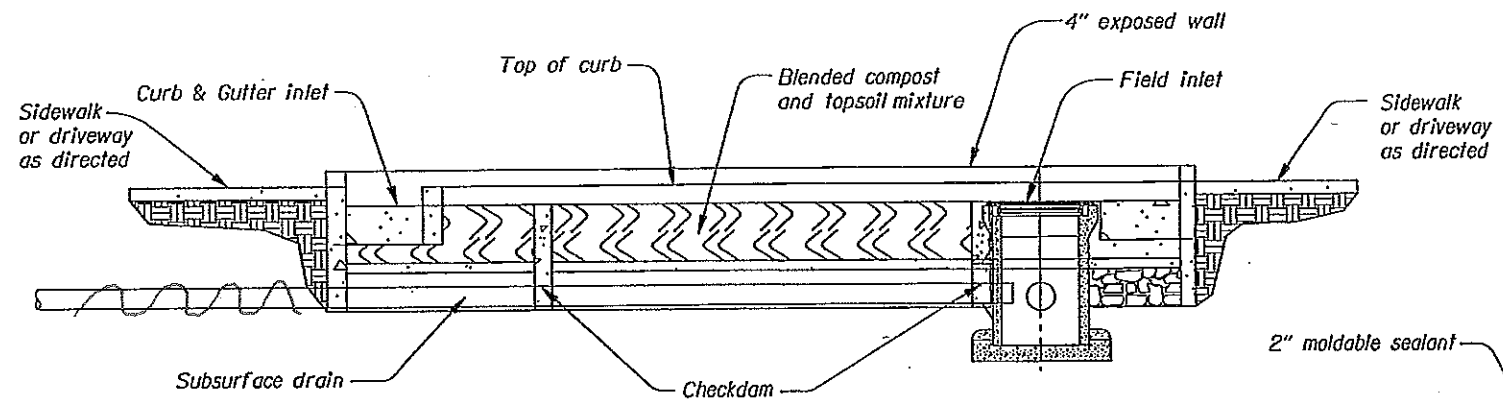
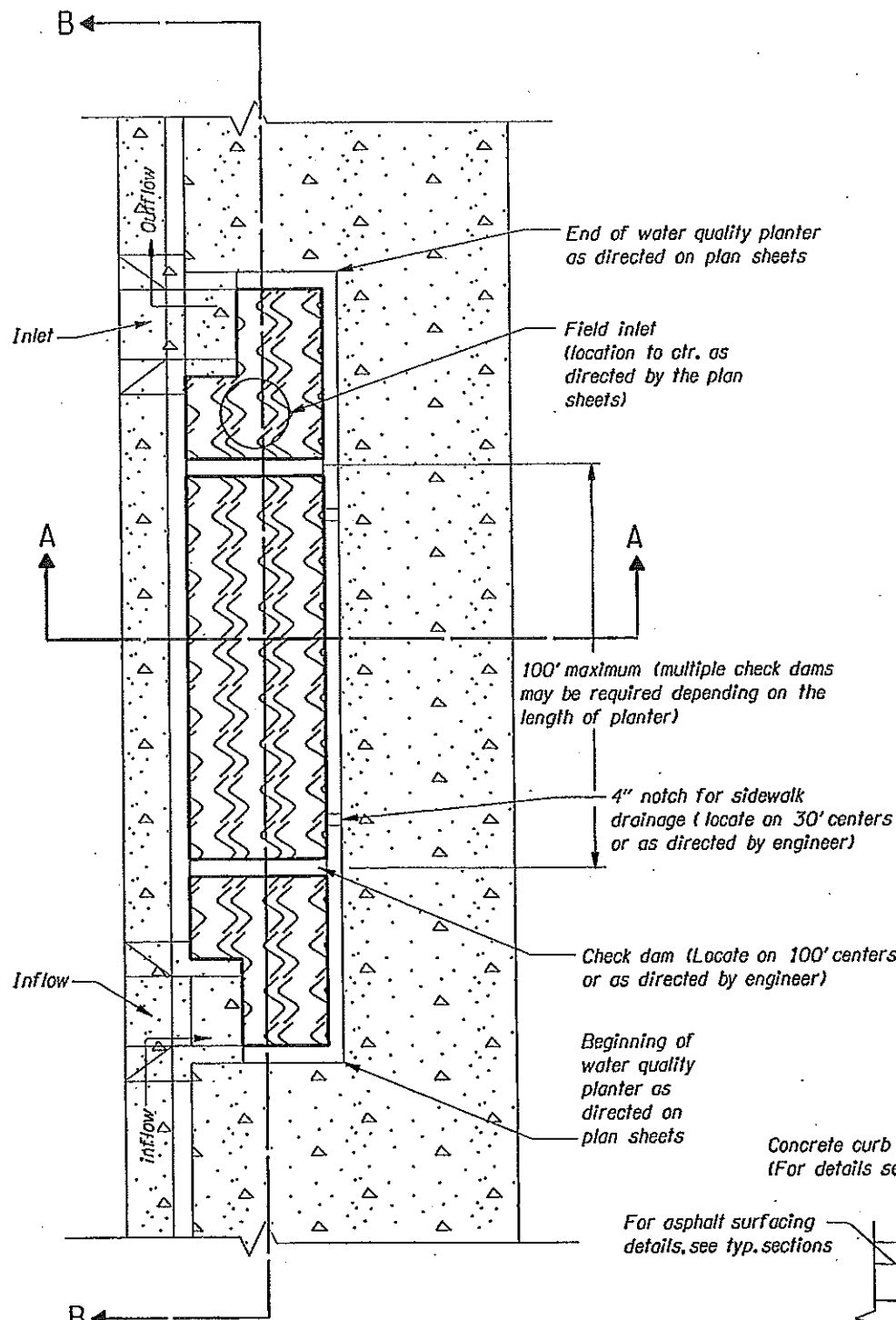
- RD1000 - Construction Entrances
- RD1015 - Inlet Protection
- RD1040 - Sediment Fence
- BR270 - Rail Transition From Flex Beam Rail To Curb & Parapet Rail
- TM204 - Details
- TM211 - Sign Bracing Detail
- TM457 - Vehicle, Ped. Signal & Push Button Mounting Details
- TM458 - Pedestrian Ramp Placement Details
- TM462 - Adjustable Signal Head Mounting Details
- TM465 - Overhead Sign, Fire Preemption & Photoelectronic Details
- TM500, TM501, TM503 - Pavement Marking Standard Details
- TM505 - Rail Crossing Pavement Markings
- TM520, TM521 - Durable Pavement Markings
- TM525 - Turn Arrow Marking Details
- TM530 - Intersection Pavement Markings
- TM539 - Median And Left Turn Channelization Details
- TM560, TM561 - Alignment Layout
- TM570 - Traffic Delineators
- TM571 - Traffic Delineators Steel Post Details
- TM576 - Traffic Delineator Installation
- TM670 - Wood Post Sign Supports
- TM671 - 3 Second Gust Wind Speed Isotach
- TM677 - Sign Mounts
- TM681, TM687, TM688 - Square Tube Sign Supports
- TM800 - Tables, Abrupt Edge And PCMS Details
- TM810 - Temporary Reflective Pavement Markers
- TM820 - Temporary Barricades
- TM821 - Temporary Sign Supports
- TM840, TM841, TM842 - Closure Details
- TM844 - Temporary Pedestrian Access Routing
- TM850 - 2-Lane, 2 Way Roadways
- TM851 - Non-Freeway Multi-Lane Sections

R/W Map No. 11B-05-0025

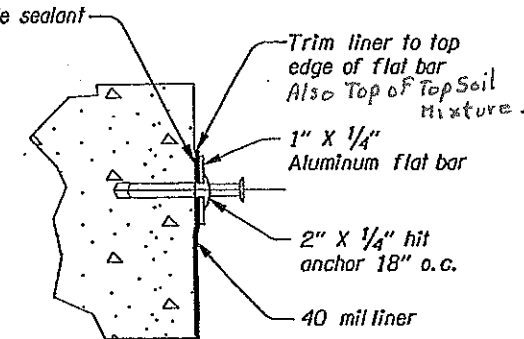


US 30 BYPASS: NE 122ND - M.P. 13.54 SEC. NORTHEAST PORTLAND HIGHWAY MULTNOMAH COUNTY		
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HSIP-STP-S123(016)	1A

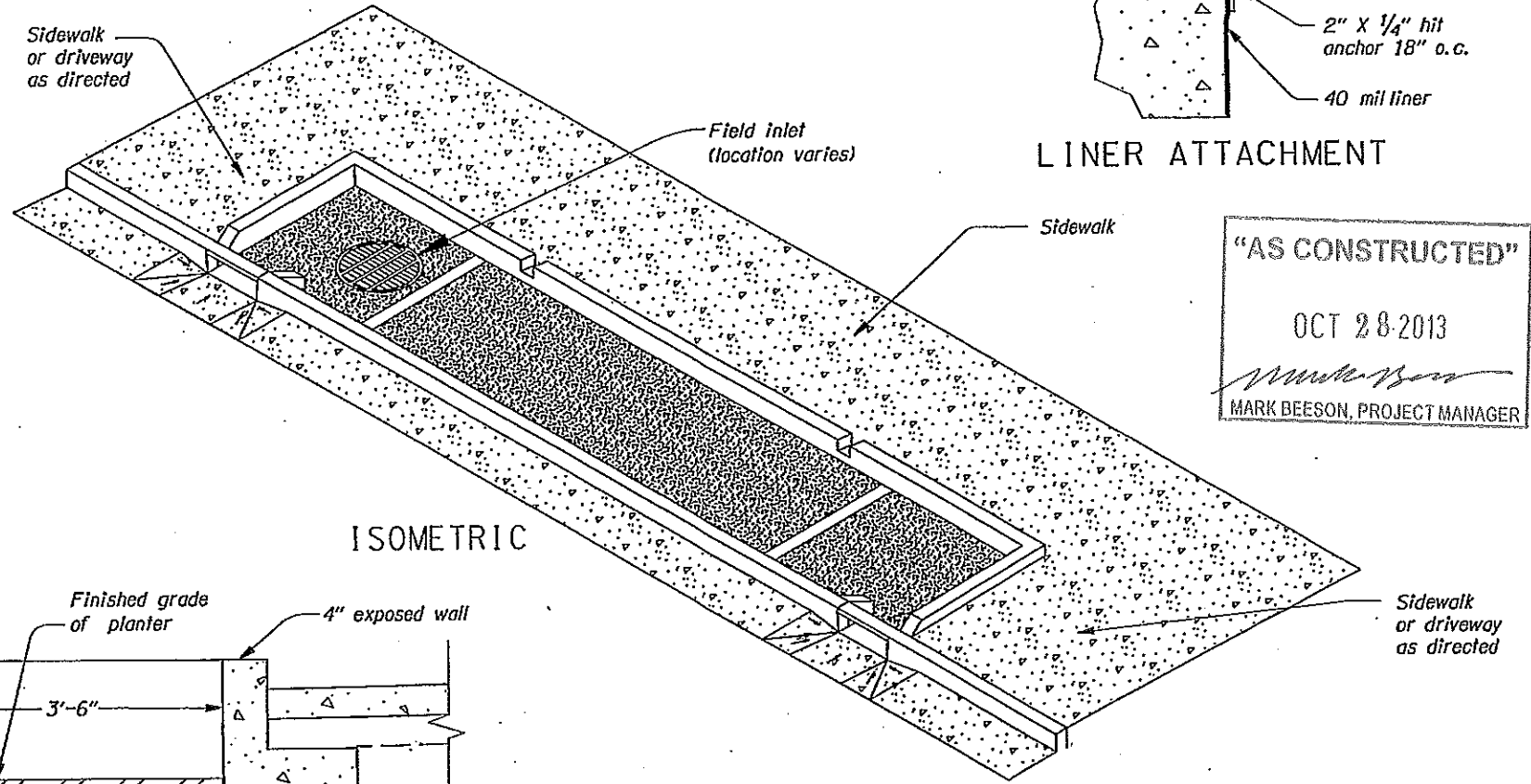
Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/standard_drawings_home.shtml



SECTION B-B
STORM WATER PLANTER



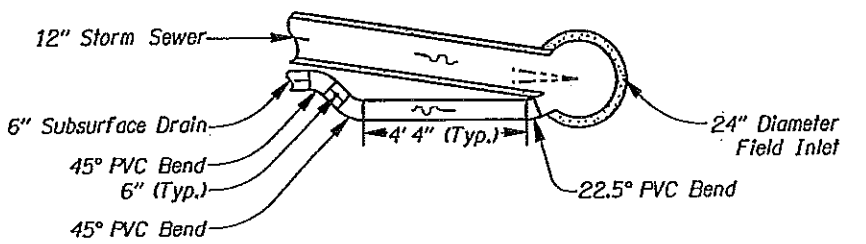
LINER ATTACHMENT



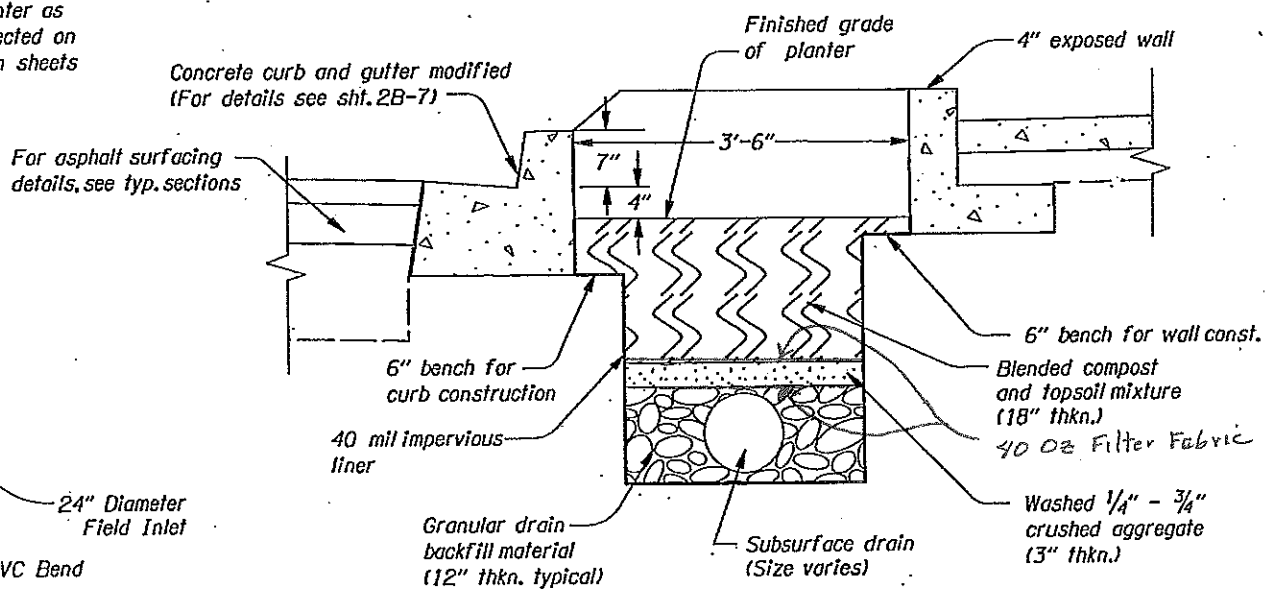
ISOMETRIC

"AS CONSTRUCTED"
OCT 28 2013
MARK BEESON, PROJECT MANAGER

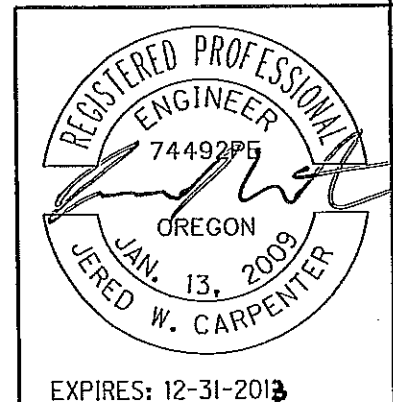
STORM WATER PLANTER DETAIL



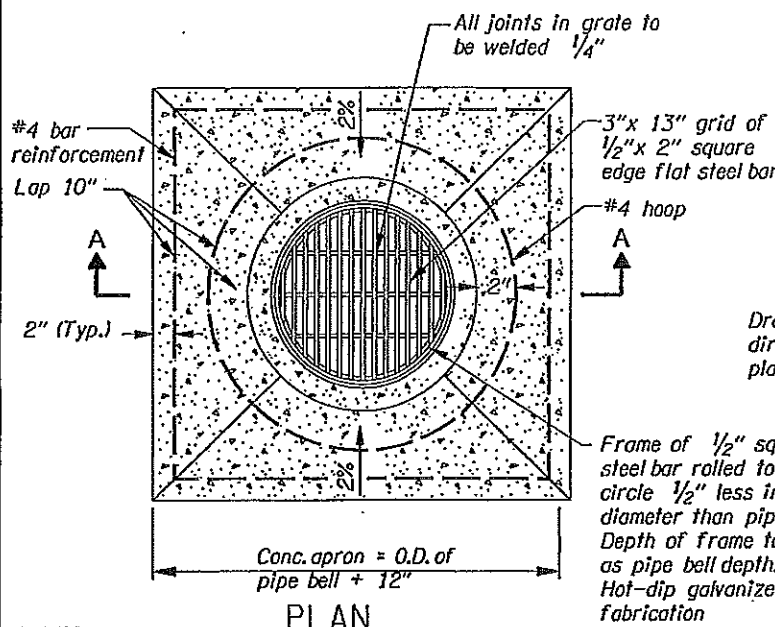
ACUTE ANGLE PIPE CONNECTION DETAIL
(As Required)



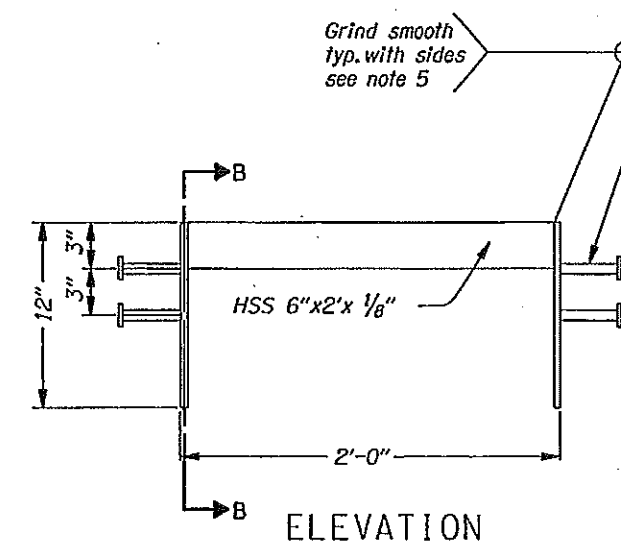
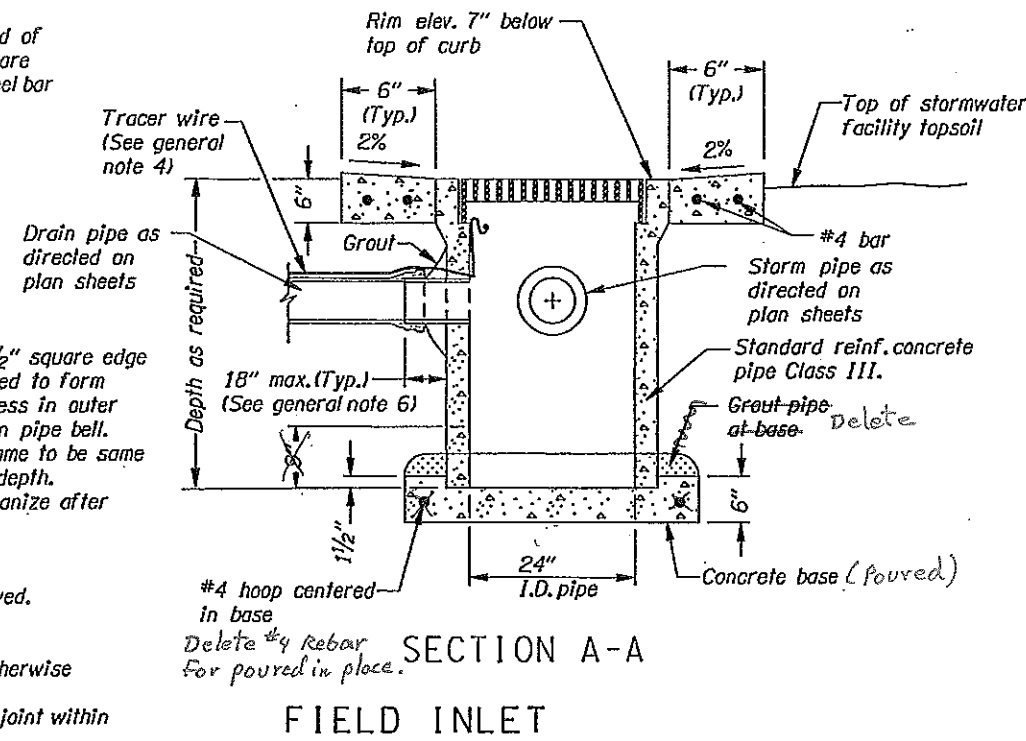
SECTION A-A
STORM WATER PLANTER



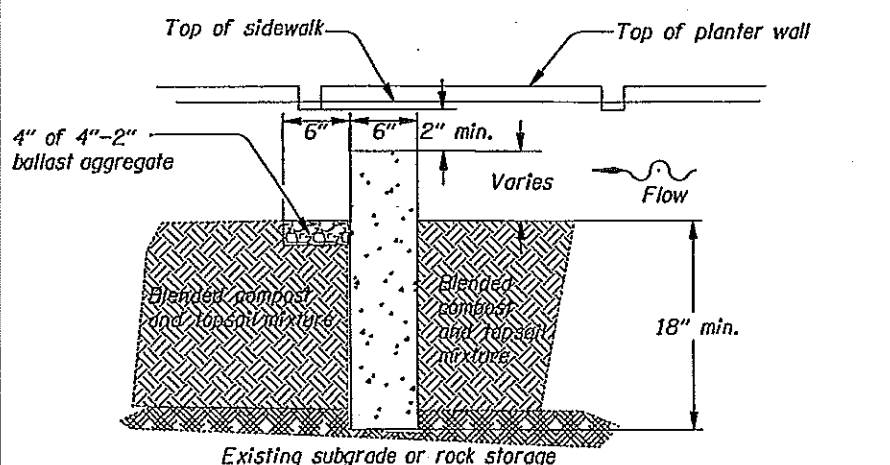
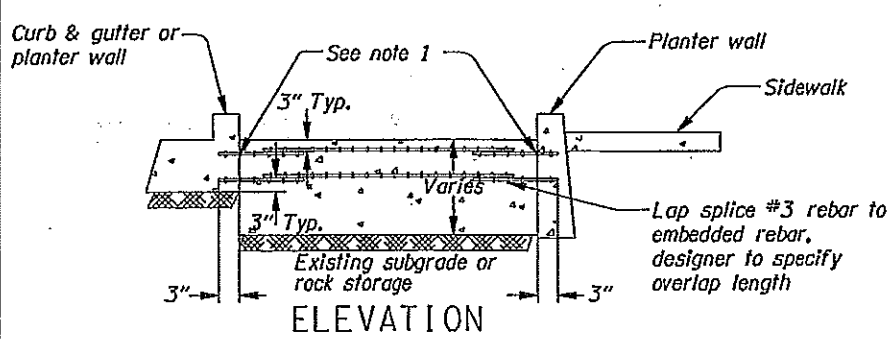
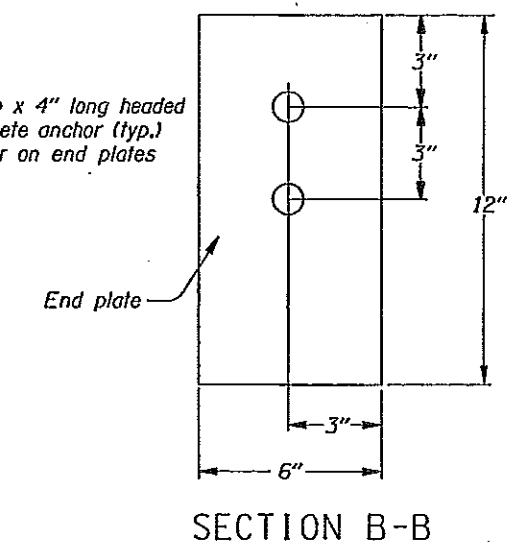
OREGON DEPARTMENT OF TRANSPORTATION	
REGION 1 - GEO/HYDRO/HAZMAT UNIT	
US 30 BYPASS: NE 122ND - M.P. 13.54 SEC. NORTHEAST PORTLAND HIGHWAY MULTNOMAH COUNTY	
Reviewed By - Ed Foltyn Designed By - Jered Carpenter Drafted By - Billy Shafer	
DETAILS	SHEET NO. 2B



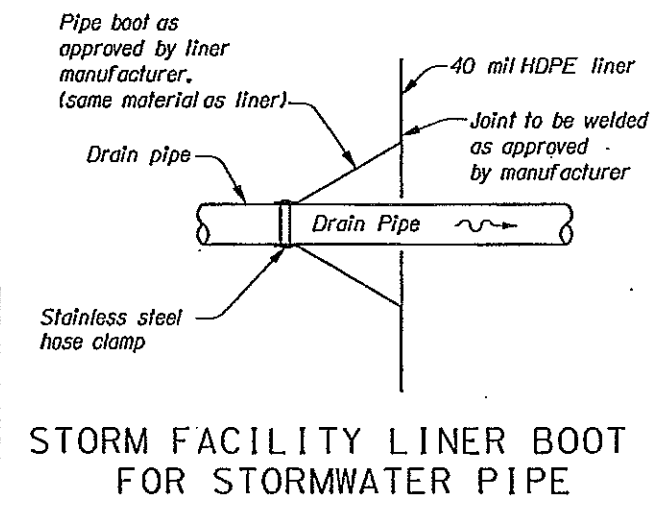
NOTES
 1. Grates shall be constructed for bicycle safety.
 2. Precast concrete catch basins may be used when specified or approved.
 3. Anchor vertical leg of inlet pipe if not a glued joint.
 4. See Std. Drg. RD336 for tracer wire details.
 5. All reinforcement shall be 2" clear of nearest face of conc., unless otherwise shown.
 6. All connecting pipes shall have a flexible, gasketed, and unrestrained joint within 18" of vertical 24" I.D. pipe.



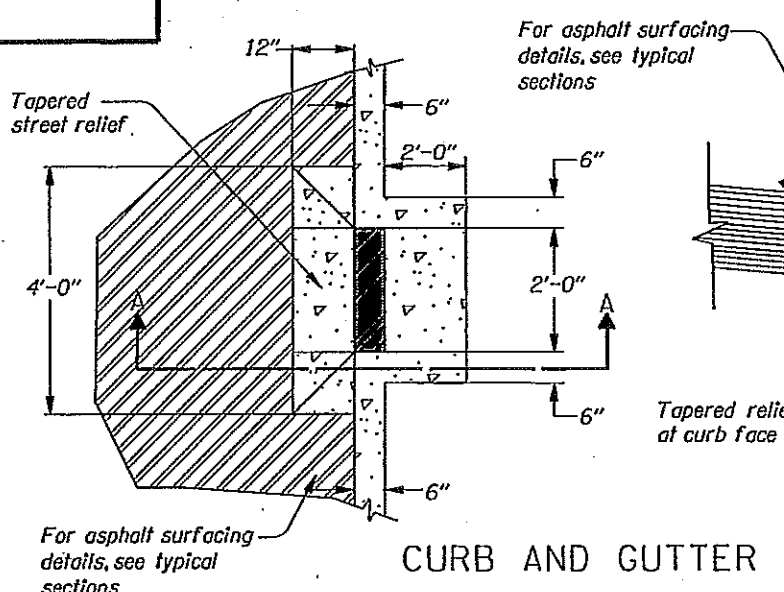
"AS CONSTRUCTED"
 OCT 28 2013
 MARK BEESON, PROJECT MANAGER



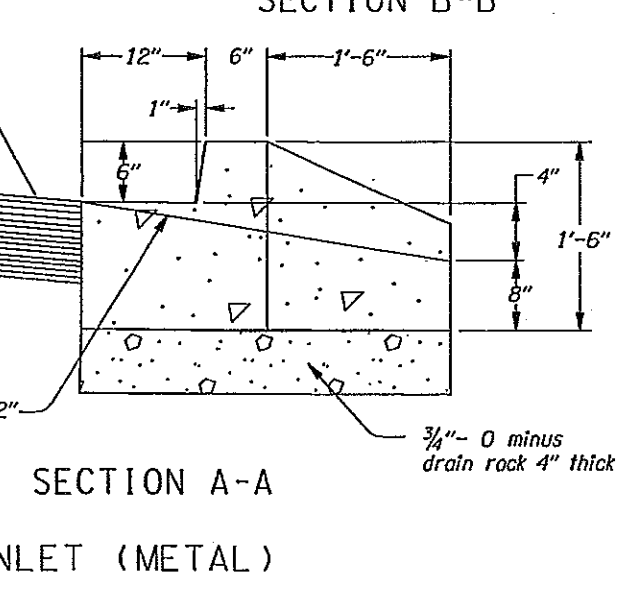
SECTION CONCRETE CHECK DAM
NOTES:
 1. Embed #3 rebar 3" into curb and planter wall.



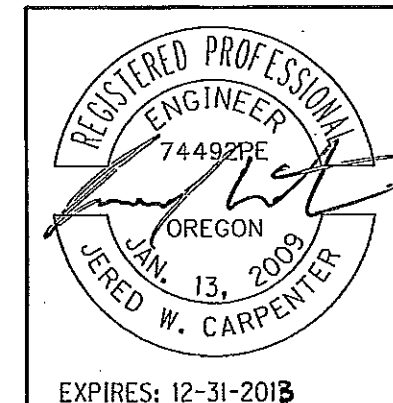
STORM FACILITY LINER BOOT FOR STORMWATER PIPE
Notes:
 1. Headed concrete anchors shall meet the requirements of ASTM A-10B.
 2. HSS 6" X 2" X 1/8" shall meet the requirements of ASTM A-500 Grade B.
 3. End plates shall meet the requirements of ASTM A-36.
 4. Entire assembly shall be hot dip galvanized in accordance with ASTM A-123.
 5. Single Bevel groove weld.



PLAN
ISOMETRIC



SECTION A-A
CURB AND GUTTER INLET (METAL)



OREGON DEPARTMENT OF TRANSPORTATION
REGION 1 - GEO/HYDRO/HAZMAT UNIT
US 30 BYPASS: NE 122ND - M.P. 13.54 SEC.
NORTHEAST PORTLAND HIGHWAY
MULTNOMAH COUNTY
 Reviewed By - Ed Foltyn
 Designed By - Jared Carpenter
 Drafted By - Billy Shafer
DETAILS
 SHEET NO. 2B-2

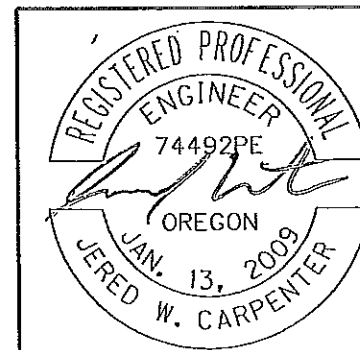
- ① See sht. 3A, notes 1 & 17
- ② See sht. 3A, note 9
- ③ Minor adjust manhole (By others)
- ④ Relocate sanitary manhole - 2 (By others)
- ⑤ Sta. "RW" 124+70.51, Rt. to Sta. "RW" 125+08.51, Rt. Const. water quality planter strip - 16.9 sq. yds. (Drainage facility ID# D00582) (For details, see shts. 2B & 2B-2)
- ⑥ Sta. "RW" 124+71.01, 34.25', Rt. to Sta. "RW" 125+01.72, 34.25', Rt. Inst. 6" drain pipe - 31' (For details, see shts. 2B & 2B-2)
- ⑦ Sta. "RW" 125+01.72, 34.25', Rt. to Sta. "RW" 125+08.01, 34.25', Rt. Inst. 6" drain pipe - 6' (For details, see shts. 2B & 2B-2)
- ⑧ Sta. "RW" 126+81.34, Rt. to Sta. "RW" 127+56.99, Rt. Const. water quality planter strip - 33.6 sq. yds. (Drainage facility ID# D00583) (For details, see shts. 2B & 2B-2)
- ⑨ Sta. "RW" 126+81.84, 34.25', Rt. to Sta. "RW" 127+41.49, 34.25', Rt. Inst. 6" drain pipe - 60' (For details, see shts. 2B & 2B-2)
- ⑩ Sta. "RW" 127+41.50, 24.64' Rt. Const. storm sewer manhole 60" over existing storm sewer Inst. 12" Ductile Iron sewer pipe 10'
- ⑪ Sta. "RW" 127+41.49, 34.25', Rt. to Sta. "RW" 127+56.49, 34.25', Rt. Inst. 6" drain pipe - 15' (For details, see shts. 2B & 2B-2)
- ⑫ Sta. "RW" 128+77.01, Rt. to Sta. "RW" 129+05.01, Rt. Const. water quality planter strip - 12.4 sq. yds. (Drainage facility ID# D00584) (For details, see shts. 2B & 2B-2)
- ⑬ Sta. "RW" 128+79.26, 34.25', Rt. to Sta. "RW" 129+04.51, 34.25', Rt. Inst. 6" drain pipe - 25' (For details, see shts. 2B & 2B-2)
- ⑭ Sta. "RW" 128+79.26, 34.25', Rt. to Sta. "RW" 128+47.40, 45.19', Rt. Inst. 12" sewer pipe - 65' 23.42' Rt. 10' depth ductile iron Connect to extg. manhole 60" New
- ⑮ Sta. "RW" 130+40.65, Rt. to Sta. "RW" 130+86.65, Rt. Const. water quality planter strip - 20.4 sq. yds. (Drainage facility ID# D00585) (For details, see shts. 2B & 2B-2)
- ⑯ Sta. "RW" 130+42.90, 34.25', Rt. to Sta. "RW" 130+86.15, 34.25', Rt. Inst. 6" drain pipe - 43' (For details, see shts. 2B & 2B-2)
- ⑰ Sta. "RW" 130+42.90, 34.25', Rt. to Sta. "RW" 130+00.68-25.05', Rt. 130+08.73, 27' Rt. Inst. 12" sewer pipe - 43' 55.6' 5' depth Connect to extg. manhole
- ⑱ Sta. "RW" 132+52.25, 34.25', Rt. to Sta. "RW" 132+82.79, 34.25', Rt. Inst. 6" drain pipe - 31' (For details, see shts. 2B & 2B-2)
- ⑲ Sta. "RW" 132+52.25, 34.25', Rt. to Sta. "RW" 132+54.62 25.75', Rt. Inst. 12" sewer pipe - 9' 10' depth Connect to extg. manhole
- ⑳ Relocate phone pedestal (By others)
- ㉑ Relocate hydrant - 2 (By others)
- ㉒ Relocate utility poles - 9 (By others)
- ㉓ Sta. "RW" 127+41.49, 34.25' Rt. to Sta. "RW" 127+41.50, 24.64' Rt. Inst. 12" sewer pipe - 10' 10' depth
- ㉔ Minor adjust manhole - 4
- ㉕ Sta. "RW" 128+83.1, 23.42' Rt. Const. 60" storm sewer manhole over existing storm sewer

Ctr. Station	Offset (Rt.)	Feature Type	Notes
"RW" 124+72.01	32.00	Curb & Gutter Inl	**
"RW" 125+01.72	34.25	Field Inlet	*. place on top of extg. storm sewer
"RW" 126+82.84	32.00	Curb & Gutter Inl	**
"RW" 127+41.49	34.25	Field Inlet	*
"RW" 127+55.49	32.00	Curb & Gutter Inl	**
"RW" 128+79.26	34.25	Field Inlet	*
"RW" 129+03.51	32.00	Curb & Gutter Inl	**
"RW" 130+42.90	34.25	Field Inlet	*
"RW" 130+50.65	32.00	Curb & Gutter Inl	**
"RW" 130+63.65	34.25	Flow Spreader	*
"RW" 130+85.15	32.00	Curb & Gutter Inl	**
"RW" 132+52.25	34.25	Field Inlet	*
"RW" 132+81.80	32.00	Curb & Gutter Inl	**

General Notes:
See Sht. 2B-1 for details of curb & gutter inlet, flow spreader, and field inlet referenced in the table above.

* Offset shown is to ctr of feature
** Offset shown is to top face of curb

"AS CONSTRUCTED"
OCT 28 2013
MARK BEESON, PROJECT MANAGER



OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

US30 BYPASS: NE 122ND - M.P. 13.54 SEC.
NORTHEAST PORTLAND HIGHWAY
MULTNOMAH COUNTY

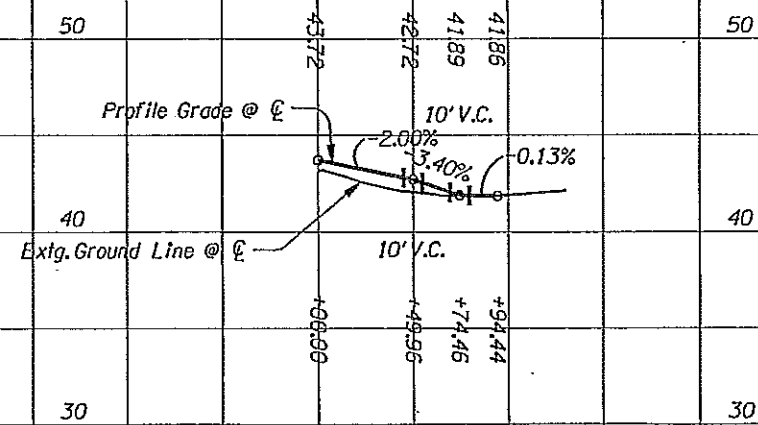
Reviewed by - Ed Foltyn
Designed by - Jered Carpenter
Drafted by - Billy Shofer

DRAINAGE & UTILITIES

SHEET NO. 4A-2

"125TH" LINE

45V-038



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OCT 28 2013

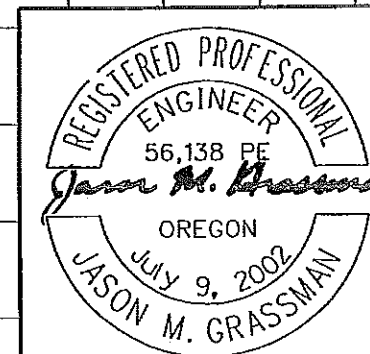
Mark Beeson
MARK BEESON, PROJECT MANAGER

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 ROADWAY ENGINEERING SECTION

US 30 BYPASS: NE 122ND - M.P. 13.54 SEC.
NORTHEAST PORTLAND HIGHWAY
MULTNOMAH COUNTY

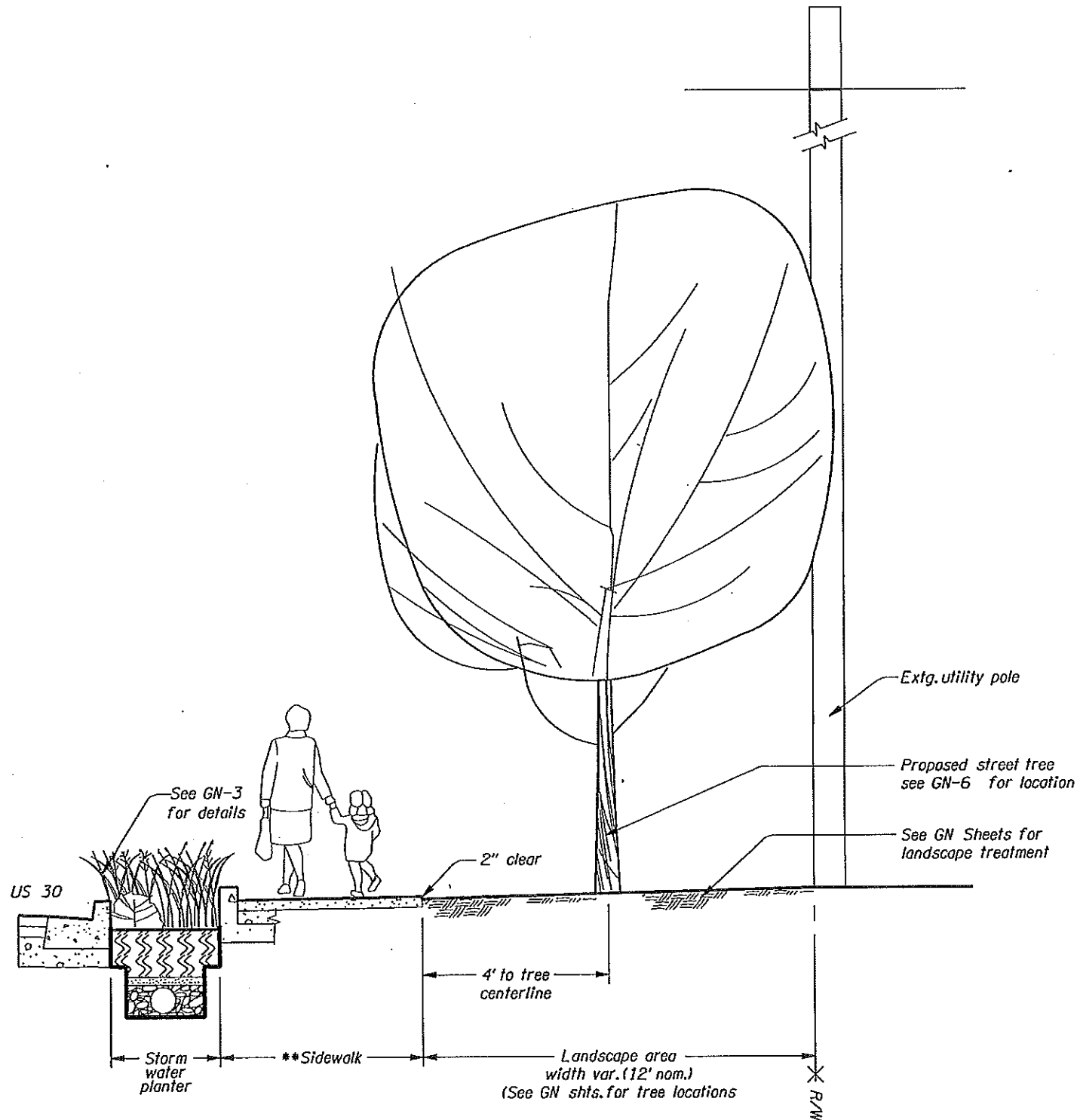
Design Team Leader - John P. Wolf
Designed By - Jason Grassman, P.E.
Drafted By - Marco Singer



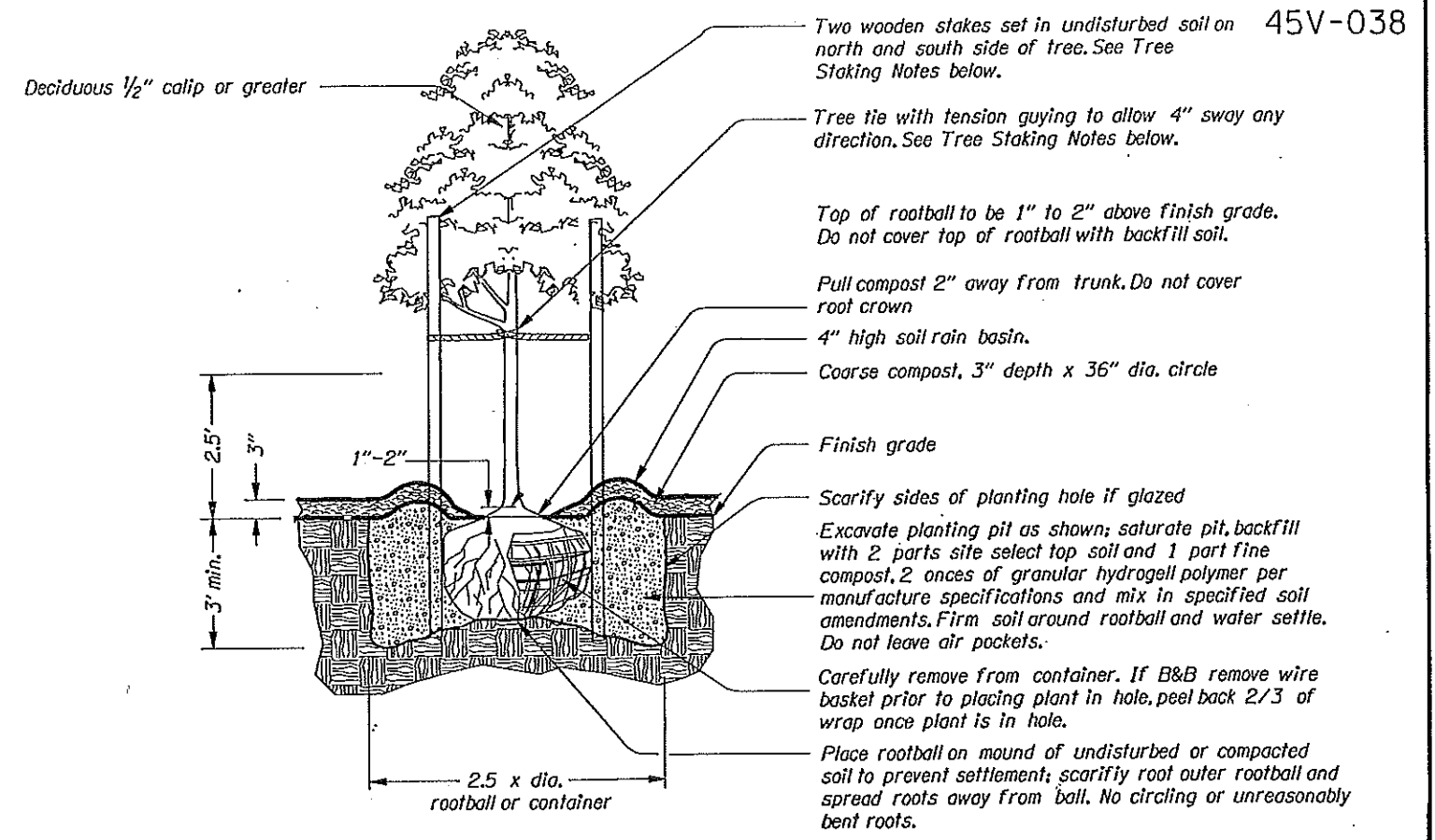
RENEWAL DATE: 6-30-2013

PROFILE

SHEET NO.
4B



1 STORM WATER PLANTER AND TREE PLANTING SECTION
Not to scale



TREE STAKING NOTES:

1) Tree ties to be either:
 Rigid guy system as manufactured by Alpine Nursery, Boring Oregon. Galvanized wire to be approx. 1/8" thickness and 24" length. There is a plastic sleeve over portion that goes around tree. The wire tie is to go thru the wood stake and be securely fastened.
 Plastic chain type, approx. 1" width by 1/8" depth where two stakes are required. Cross ties between stakes and wrap tie around tree. Fasten securely to stake.

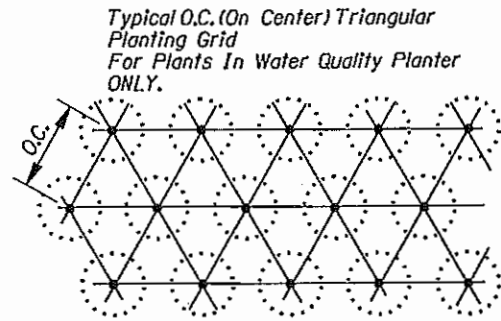
2) Furnish tree stakes on all tree plantings. Stakes to be construction grade, rough sawn or finished Douglas Fir or Pine. Stain with approved green penetrating oil. Stake Size is to be 1 1/2" x 1 1/2" by following lengths:
 Trees 36" and shorter - Use one - 6' (approx.) stake
 Trees taller than 36" - Use one - 8' (approx.) stake
 Drive stakes vertically and at least 24" into undisturbed soil. Do not drive stakes thru root ball. Locate stakes to best resist prevailing winds.

2 STREET TREE PLANTING AND STAKING
Not to scale

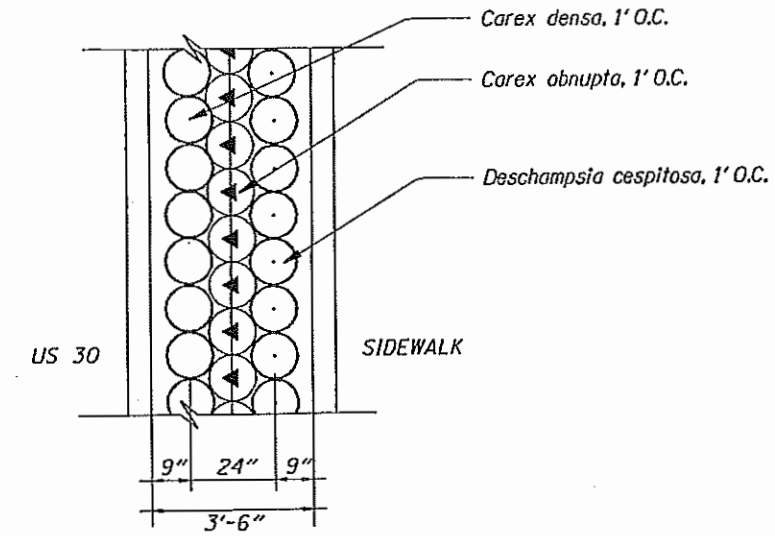
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 OCT 28 2013
 MARK BEESON, PROJECT MANAGER

REGISTERED
 424
 Magnus U. Bernhardt
 OREGON
 04/14/99
 LANDSCAPE ARCHITECT

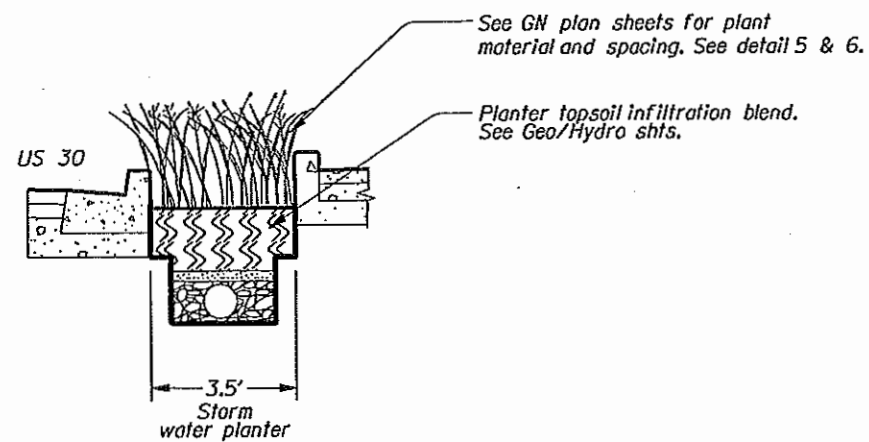
OREGON DEPARTMENT OF TRANSPORTATION	
REGION 1 ROADWAY ENGINEERING SECTION	
US 30 BYPASS: NE 122ND - M.P. 13.54 SEC. NORTHEAST PORTLAND HIGHWAY MULTNOMAH COUNTY	
Design Team Leader - Magnus Bernhardt Designed By - Magnus Bernhardt Drafted By - Marco Singer	
DETAILS	SHEET NO. GN-2



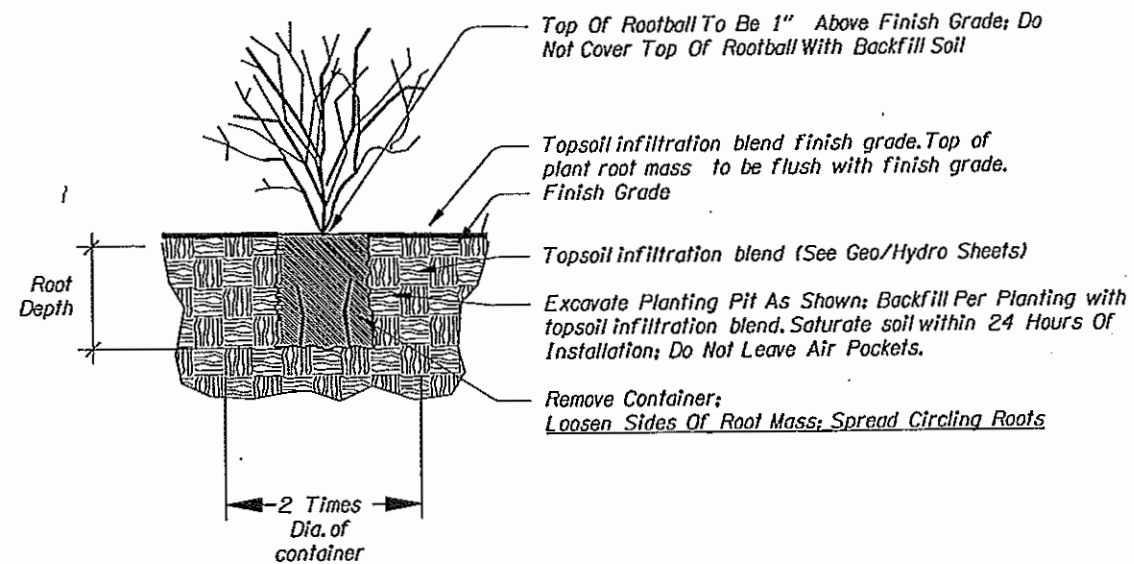
3 STORM WATER PLANT SPACING
Not to scale



5 STORM WATER PLANTER PLANTING LAYOUT DETAIL
Plan layout Not to scale

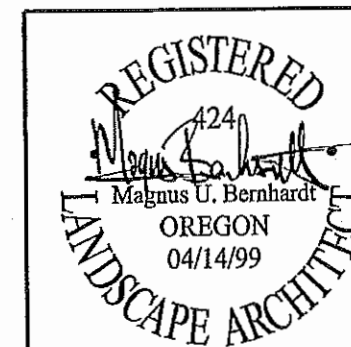


4 STORM WATER PLANTER PLANTING DETAIL
SECTION Not to scale



6 CONTAINER SHRUB PLANTING
Water Quality Planter Planting Not To Scale

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OCT 28 2013
MARK BEESON, PROJECT MANAGER



OREGON DEPARTMENT OF TRANSPORTATION	
REGION 1 ROADWAY ENGINEERING SECTION	
US 30 BYPASS: NE 122ND - M.P. 13.54 SEC. NORTHEAST PORTLAND HIGHWAY MULTNOMAH COUNTY	
Design Team Leader - Magnus Bernhardt Designed By - Magnus Bernhardt Drafted By - Marco Singer	
DETAILS	SHEET NO. GN-3