OPERATION & MAINTENANCE MANUAL

DFI No. : D00126
Facility Type: Water Quality Biofiltration Swale

June, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00126**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 41V-021
Location:	District: 2B (Old 2A)
	Highway No.: 029
	Mile Post: 16.34 - 16.36 (beg./end)
	Description: This facility is located on the north side of N. Adair Street (OR-8, hwy 29). Access can be achieved through the gate located on the east end of the facility.

2. Facility Contact Information

Contact the Engineer of Record, Region Technical Center, or Geo-Environmental's Senior Hydraulics Engineer for:

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

Engineering Contacts:

Region Technical Center Hydro Unit Manager

Or

Geo-Environmental Senior Hydraulics Engineer (503) 986-3365.

3. Construction

Engineer of Record:	Consultant Designer, Harper Houf Peterson Righellis Inc., Kenneth Michael Ackerman (503) 221-1131
Facility construction:	2008
Contractor:	Kerr Contractors, Inc.

4. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

This facility (Photo 1 and Photo 6) is located on the north side of N. Adair Street. It is 250 feet east of 17th street. Access can be achieved through the unlocked access gate (Photo 4) located on the east end of the facility.

Water flows from east to west after entering the facility at the swale inlet (Appendix A Operational Plan Point A, Photo 3, and Photo 2) from a 12-inch pipe, feeding water from a flow splitter/diversion manhole (Point D). From here, the water travels through the swale toward the 12-inch outlet pipe (Photo 5, Point B). Once water leaves the swale it travels south into a flow control manhole (Point C), and west from there into the stormwater piping system.

A. Maintenance equipment access:
   Access is achieved by entering through a gate located at the east end of the facility. The swale is not large and the access gate is less than 6 feet wide, so maneuvering equipment large with turning radii may be difficult.

B. Heavy equipment access into facility:

   ☐ Allowed (no limitations)
   ☒ Allowed (with limitations)
   ☐ Not allowed

C. Special Features:

   ☐ Amended Soils
   ☐ Porous Pavers
   ☐ Liners
   ☐ Underdrains

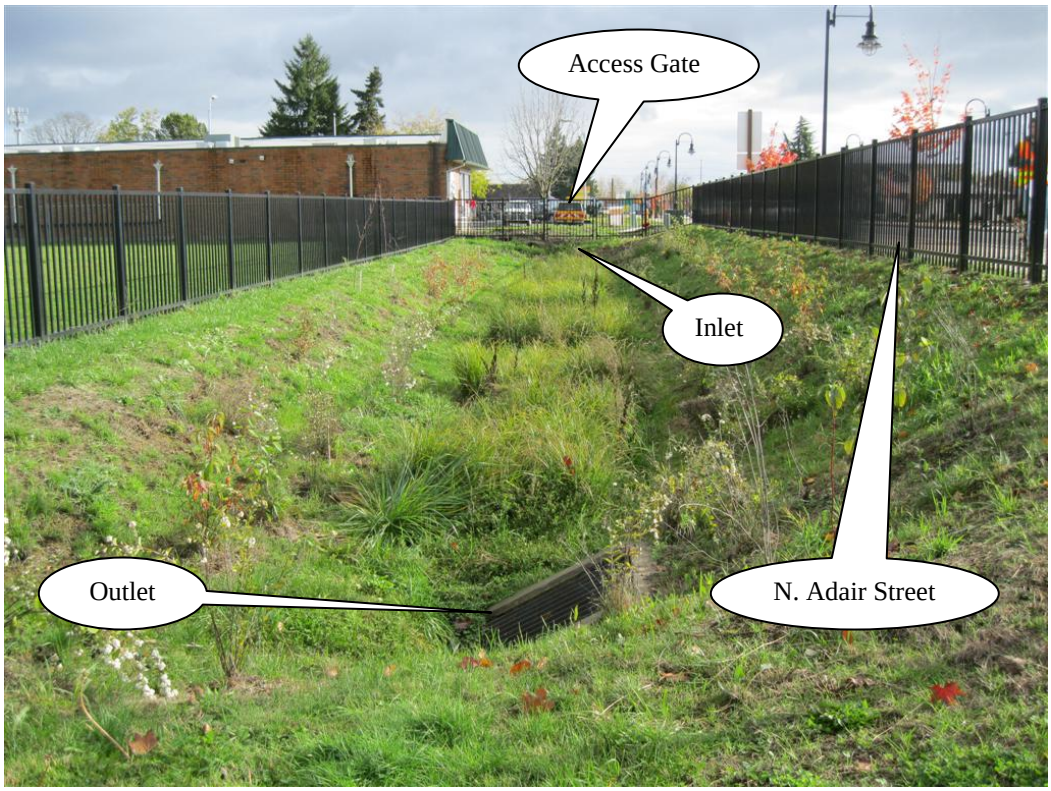


Photo 1: This is an overview of the swale looking towards the East.

Photo 2: A look at the swale inlet located on the eastside of the facility

Photo 3: Looking southeast toward the access gate and swale inlet.

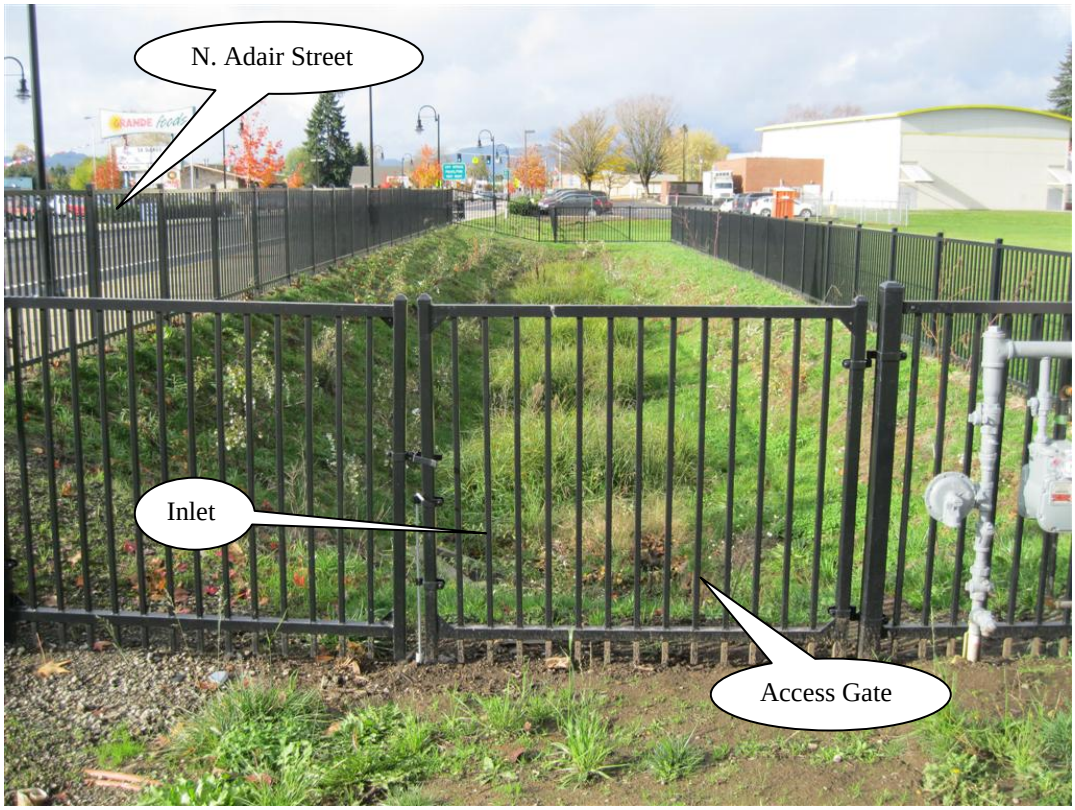


Photo 4: Looking west

Photo 5: Looking south


Photo 6: Looking west

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 12 inch-diameter outlet pipe located at the outlet of the water quality biofiltration swale. This pipe is noted as point C in the Operational Plan, Appendix A.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure can not safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater treatment facility design. The auxiliary outlet feature is either a part of the facility or an additional storm drain feature/structure.

The auxiliary outlet feature for this facility is:

☐ Designed into facility

☒ Other, as noted below

There are no auxiliary outlets designed into this facility.

7. Maintenance Requirements

Routine maintenance table for non-proprietary stormwater treatment and storage/detention facilities have been incorporated into ODOT's Maintenance Guide. These tables summarize the maintenance requirements for ponds, swales, filter strips, bioslopes, and detention tanks and vaults. Special maintenance requirements in addition to the routine requirements are noted below when applicable.

The ODOT Maintenance Guide can be viewed at the following website:

http://www.oregon.gov/ODOT/HWY/OOM/MGuide.shtml

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance

requirements outlined in Appendix C when proprietary structure is selected below:

- ☒ Table 1 (general maintenance)
- ☐ Table 2 (stormwater ponds)
- ☒ Table 3 (water quality biofiltration swales)
- ☐ Table 4 (water quality filter strips)
- ☐ Table 5 (water quality bioslopes)
- ☐ Table 6 (detention tank)
- ☐ Table 7 (detention vault)
- ☐ Appendix C (proprietary structure)
- ☐ Special Maintenance requirements:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options: http://egov.oregon.gov/ODOT/HWY/OOM/EMS.shtml

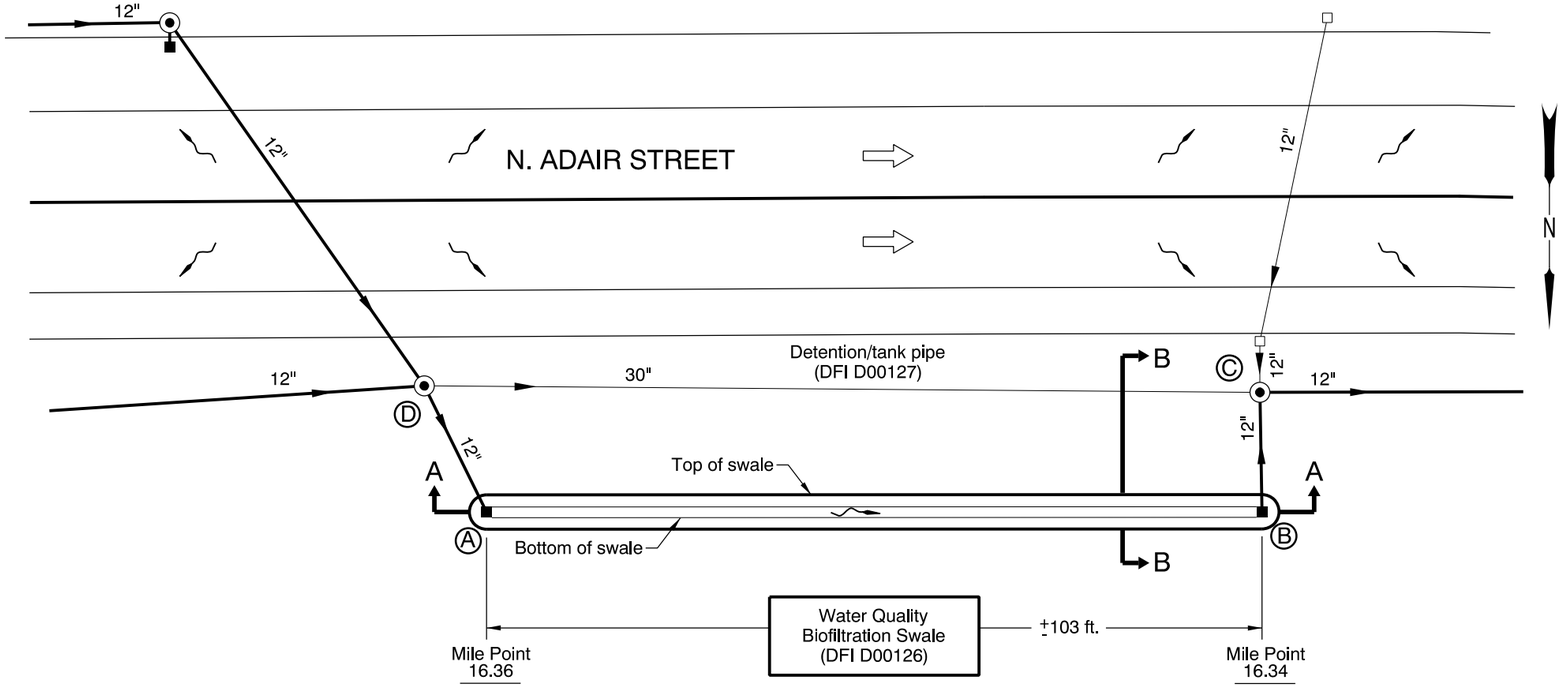
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8304
ODEQ Northwest Region Office	(503) 229-5263

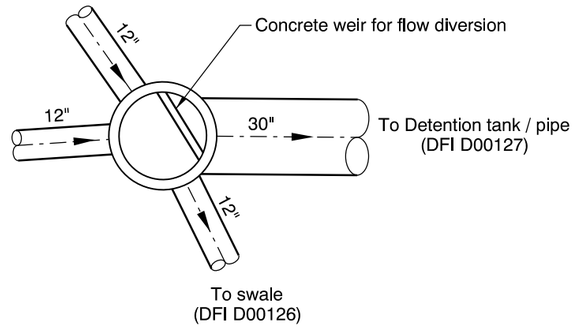
Appendix A

Content:

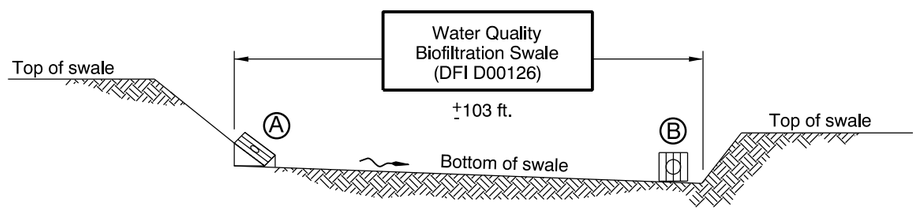
- **Operational Plan and Profile Drawing(s)**



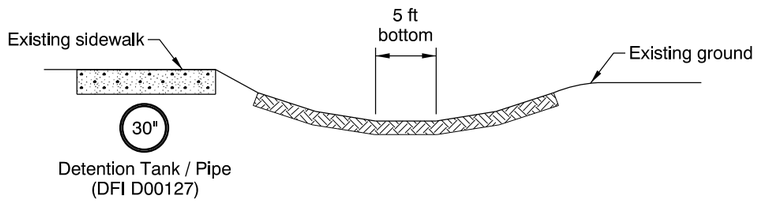
PLAN
N.T.S.



FLOW SPLITTER/DIVERSION MANHOLE DETAIL AT POINT Ⓓ
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:
- Photograph location / direction
- Ⓐ Swale Inlet
- Ⓑ Swale Outlet
- Ⓒ Flow Control Manhole
- Ⓓ Flow Splitter/Diversion Manhole
- ◉ and/or ◎ Manhole
- ■ and/or □ Inlet
- Traffic Flow/Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sheet 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Craig Fox

Drafted By: Tam Nguyen / HDR

DFI D00126
MAINTENANCE DISTRICT 2B HWY 29
WATER QUALITY BIOFILTRATION SWALE
TUALATIN VALLEY HIGHWAY MP 16.34-16.36
WASHINGTON COUNTY

Appendix B

Content:

- **ODOT Project Plan Sheets**
  - ***Cover/Title Sheet***
  - ***Water Quality/Detention Plan Sheets***
  - ***Other Details***

Revised Plan
Sheets Incorporated

41V-21

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index of Sheets Cont'd., Standard Drg. Nos.
1B	Sheet Layout

Revised Plan
Sheets Incorporated

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION

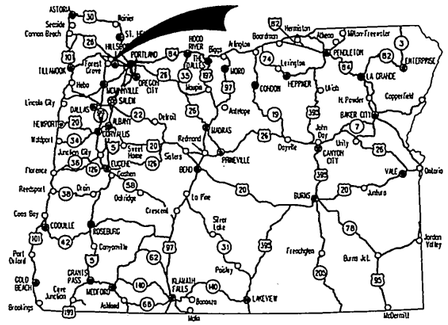
PLANS FOR PROPOSED PROJECT

GRADING, PAVING, STRIPING, SIGNS, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

OR8: N 10TH AVE- N 19TH AVE (CORNELIUS) SEC.

TUALATIN VALLEY HIGHWAY

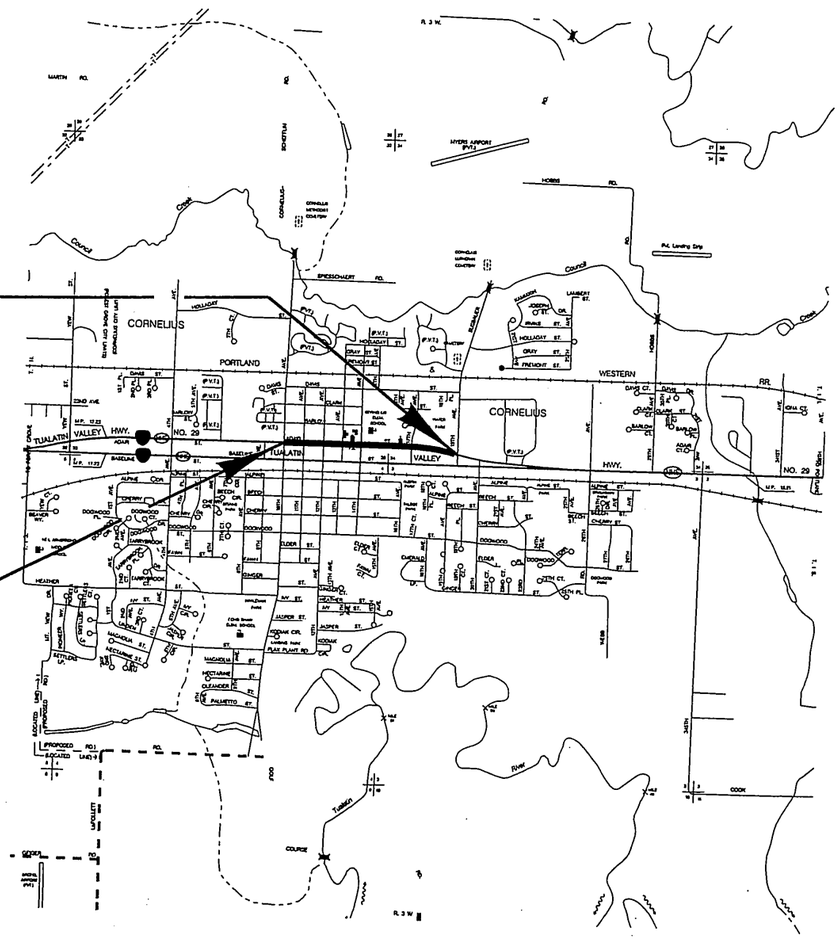
WASHINGTON COUNTY
APRIL 2008



Overall Length Of Project - 0.58 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.)

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE



BEGINNING OF PROJECT
STA. "CL" 135+82.65 (M.P. 16.17)

END OF PROJECT
STA. "CL" 164+00 (M.P. 16.70)

T. 1 N., R. 3 W., W.M.

CHARGE NUMBER

HHPR Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • SURVEYORS
205 SE SPOKANE STREET, SUITE 200, PORTLAND, OR 97202
TEL 503-221-1131 www.hhpr.com FAX 503-221-1171

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Pape	COMMISSIONER
Janice J. Wilson	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
ODOT
BY:
Harper Houf Peterson Righellis Inc.

REGISTERED PROFESSIONAL ENGINEER
19424
OREGON
SEPT. 16, 1997
KENNETH MICHAEL ACKERMAN

RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION
CONCURRENCE
CHIEF ENGINEER — DATE 3-08

OR8: N 10TH AVE - N 19TH AVE (CORNELIUS) SEC.
TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NAME	SHEET NO.
OREGON DIVISION	X-CM-1555(008)	1

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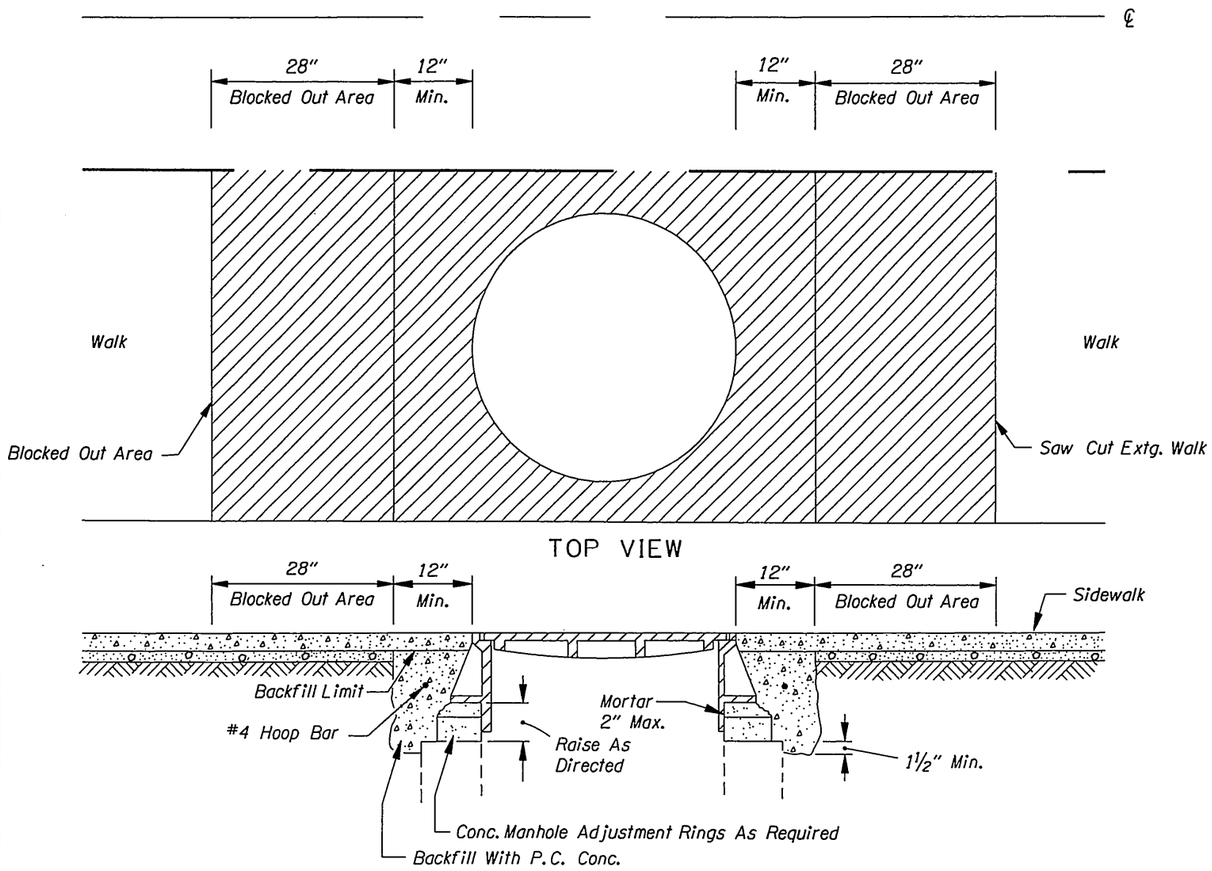
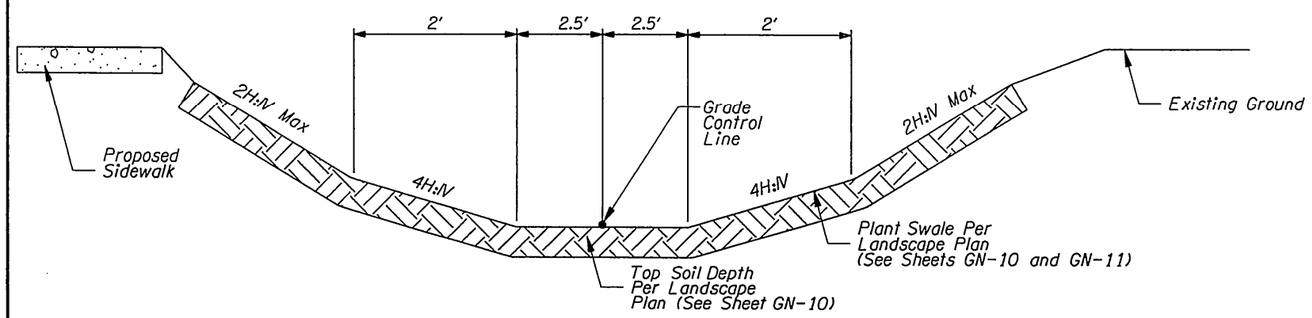


SECTION

MANHOLE ADJUSTMENT SEQUENCE IN SIDEWALKS

N.T.S.



WATER QUALITY SWALE DETAIL

N.T.S.

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Righellis Inc.
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KENNETH MICHAEL ACKERMAN
Expires 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OR8: N 10TH AVE - N 19TH AVE (CORNELIUS) SEC.
TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

Reviewed By - CLH
Designed By - AJI
Drafted By - SMR

DETAILS

SHEET NO. 2B-23

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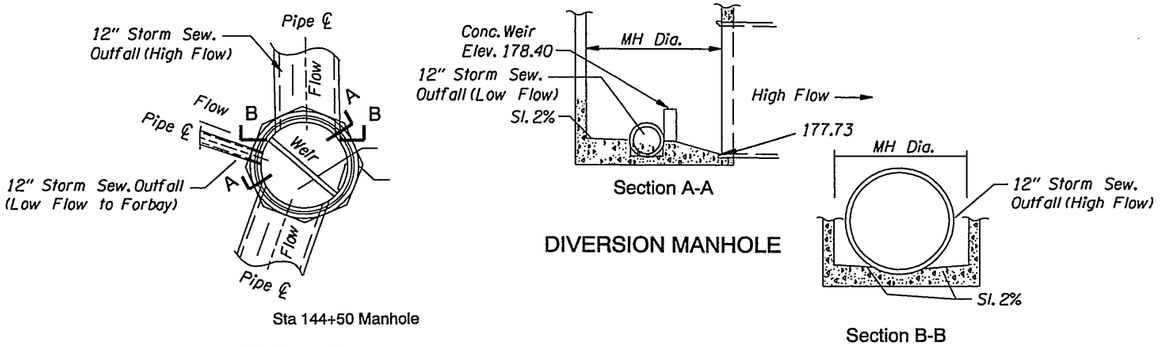
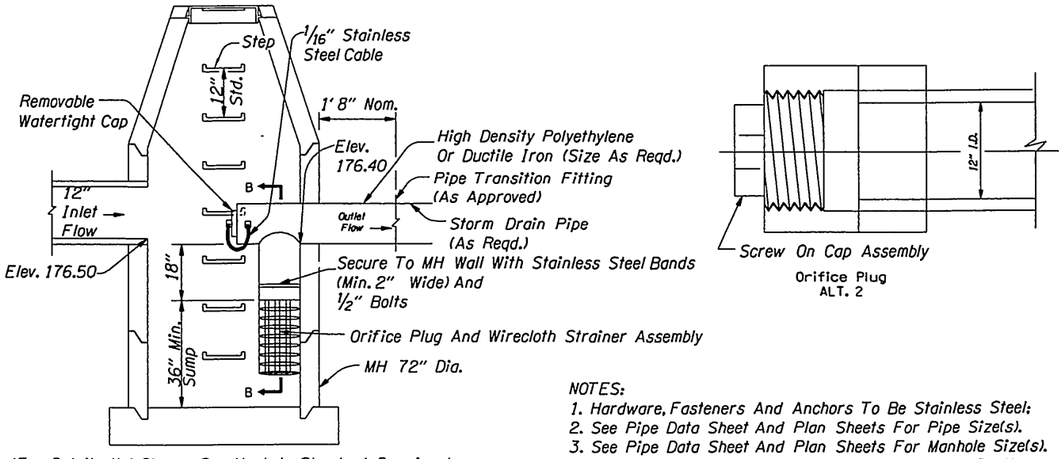
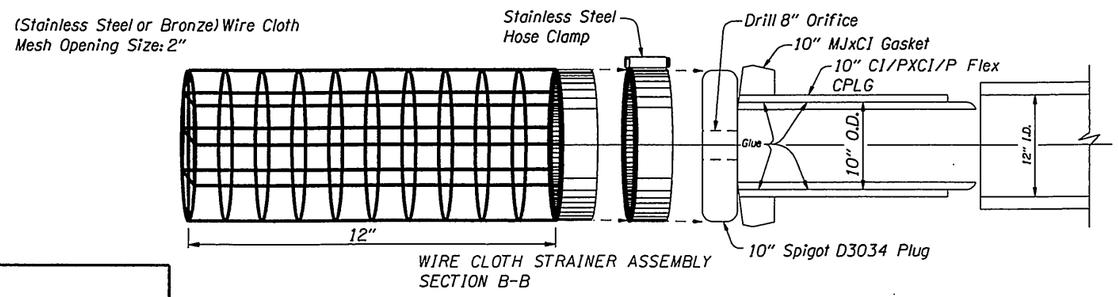


DIVERSION MANHOLE DETAIL
N.T.S.

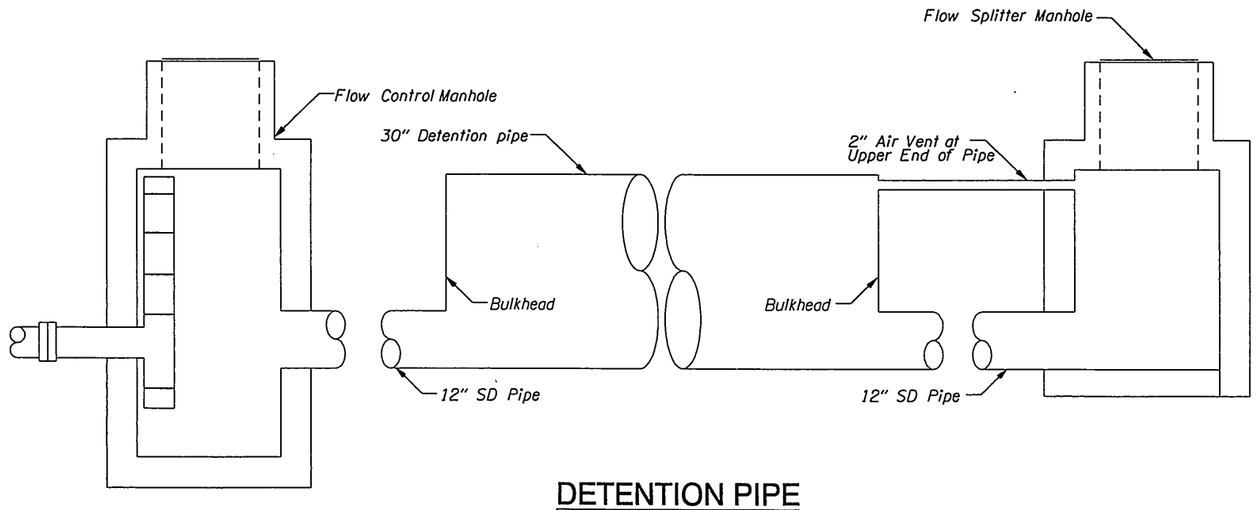


(For Details Not Shown, See Manhole Standard Drawings)

NOTES:
1. Hardware, Fasteners And Anchors To Be Stainless Steel;
2. See Pipe Data Sheet And Plan Sheets For Pipe Size(s).
3. See Pipe Data Sheet And Plan Sheets For Manhole Size(s).
4. See Pipe Data Sheet And Plan Sheets For Sump Depth.
5. Manhole And Base Per Manhole Standard Drawings.



FLOW CONTROL MANHOLE
N.T.S.



DETENTION PIPE
N.T.S.

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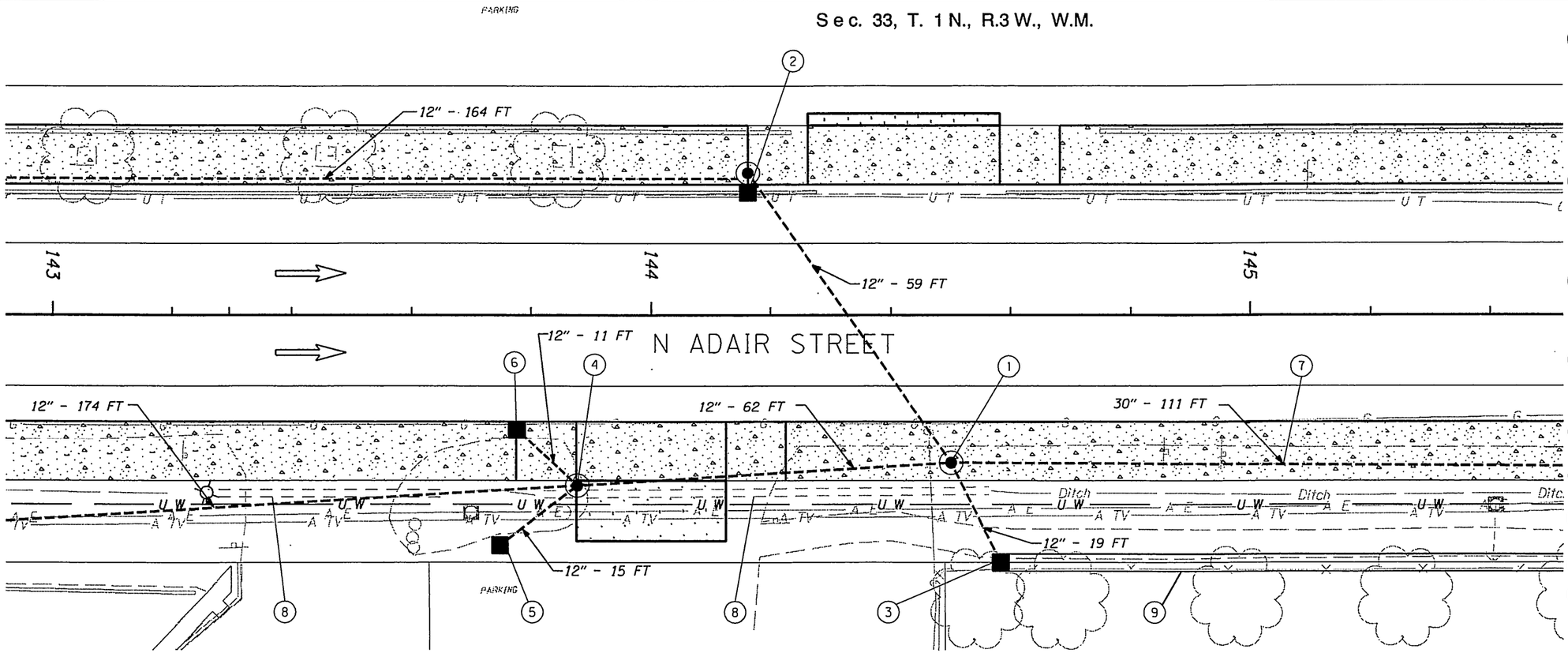
TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

Reviewed By - CLH
Designed By - AJI
Drafted By - SMR

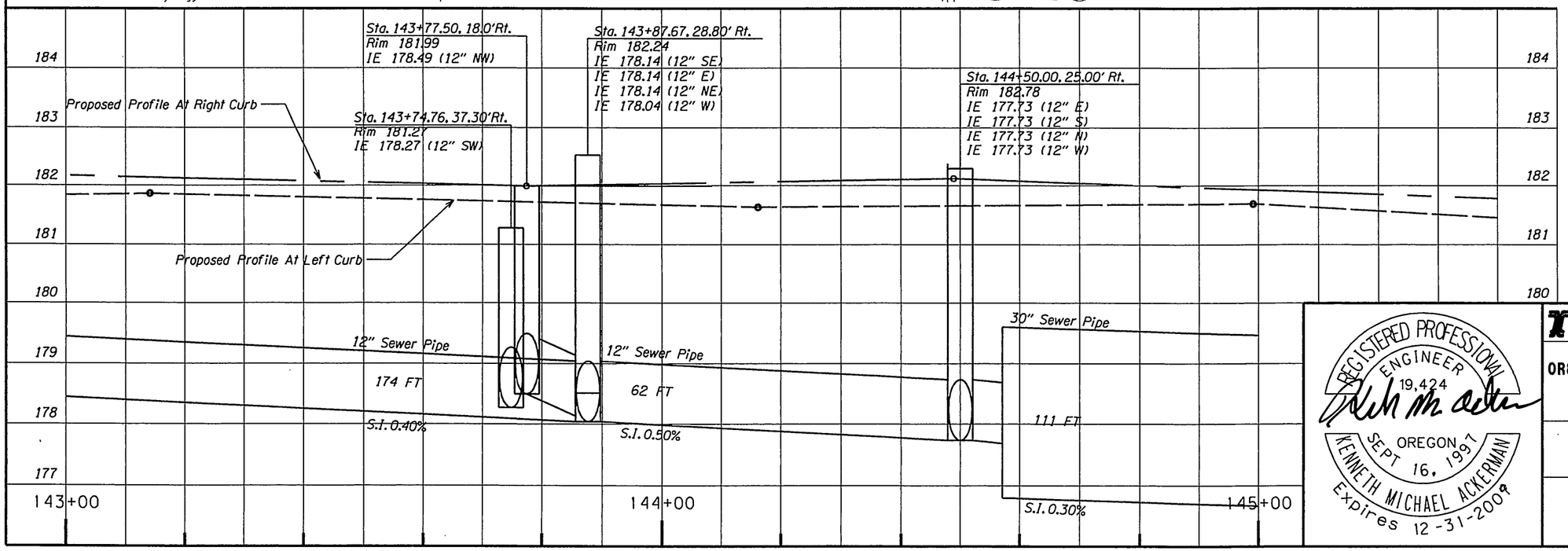
DETAILS

SHEET NO. 2B-24

Sec. 33, T. 1 N., R.3 W., W.M.



1. Sta. 144+50.00, 25.00' Rt.
   Const. Diversion Manhole
   Inst. 12" Sew. Pipe - 62'
   10' Depth
   Inst. 12" D.I.P. - 59'
   10' Depth
   Trench Resurf. - 16.70 Sq.Yd.
   (See Detail Sheet 2B-24)
   (For Pipe Profile See Sht. 7D Line "ST3")
2. Sta. 144+16.22, 23.39' Rt.
   Const. Manhole with Inlet
   Inst. 12" Sew. Pipe - 164'
   5' Depth
   (For Pipe Profile See Sht. 7D Line "ST3")
   (See Drg. No. RD348)
3. Sta. 144+58.28, 41.50' Rt.
   Const. Ditch Inlet Type "D"
   Inst. 12" Sew. Pipe - 19'
   5' Depth
   (For Pipe Profile See Sht. 7D Line "ST3")
4. Sta. 143+87.67, 28.80' Rt.
   Const. Large Precast Manhole, 60"
   Inst. 12" Sew. Pipe - 200'
   5' Depth
5. Sta. 143+74.76, 37.30' Rt.
   Const. Type "D" Ditch Inlet
6. Sta. 143+77.5, 18.00' Rt.
   Const. Type "CG-2" Inlet
7. Construct Detention Pipe
   (See Detail Sheet 2B-24)
8. Remove Pipe
9. Sta. 144+58.28, 41.50' Rt. To
   Sta. 145+61.15, 41.85' Rt.
   Const. Water Quality Swale
   Slope @ 0.15%
   (See Detail Sht. 2B-23)



N

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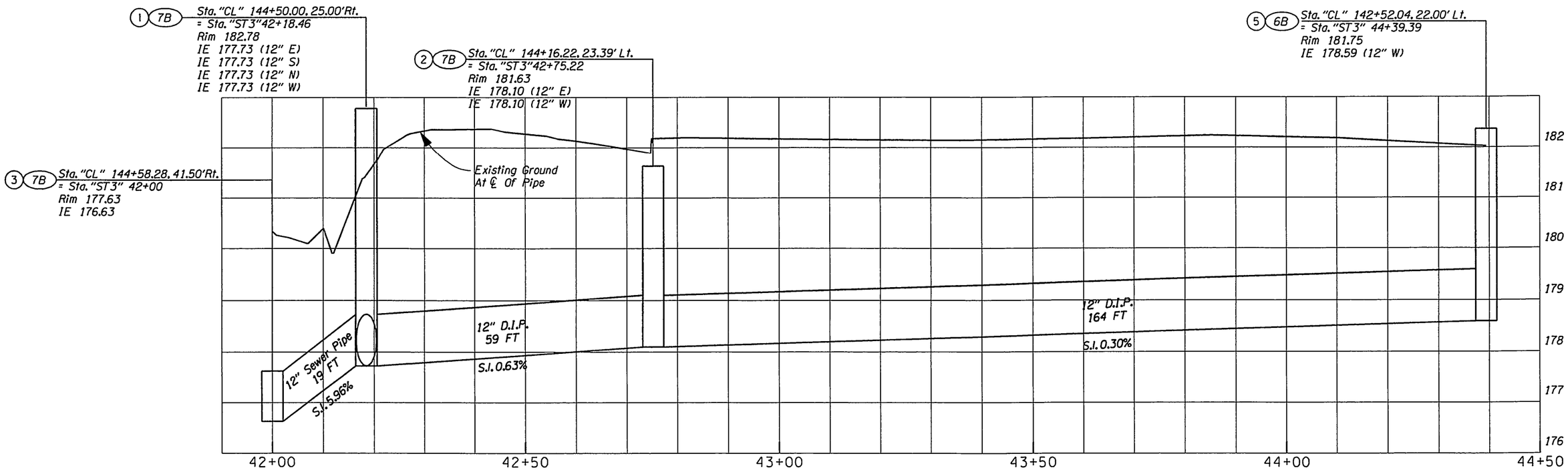
TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

Reviewed By - CLH
Designed By - KMA
Drafted By - SMR

DRAINAGE

SHEET NO. 7B



"ST3"

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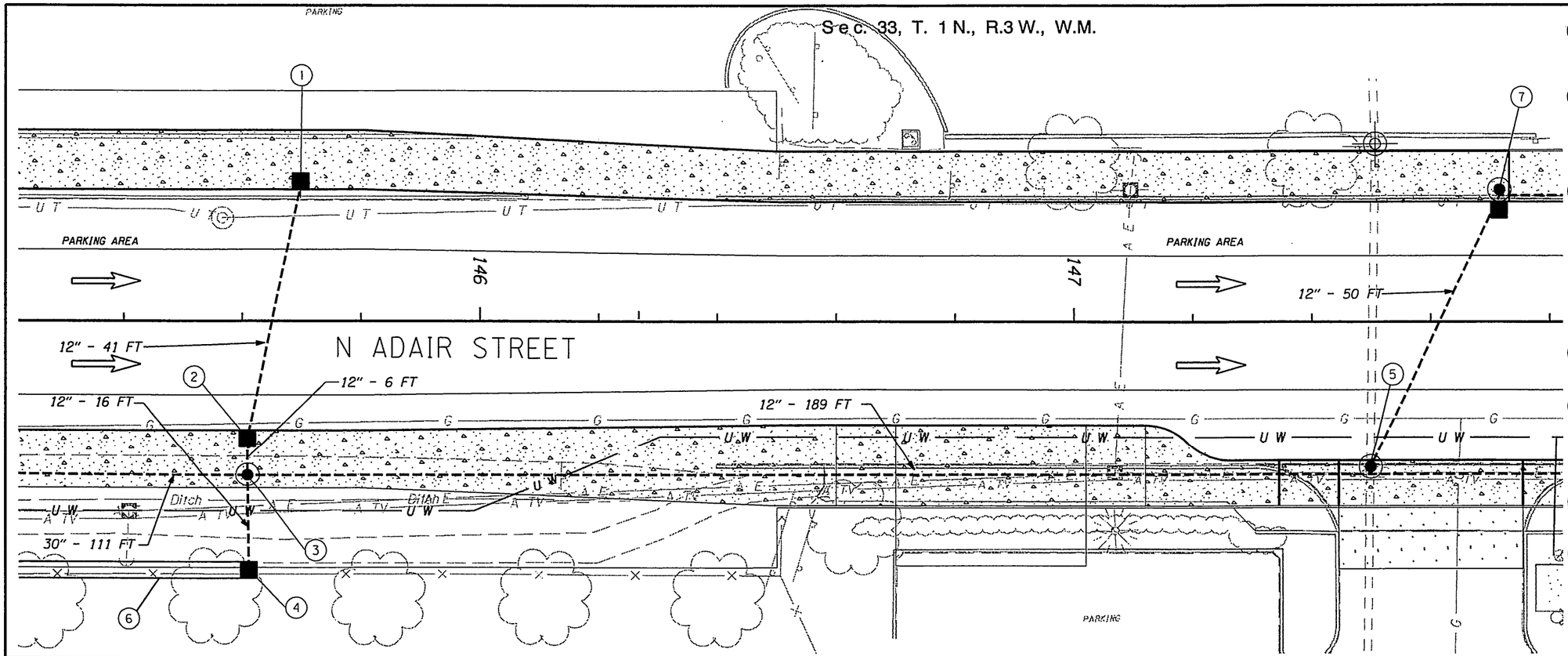
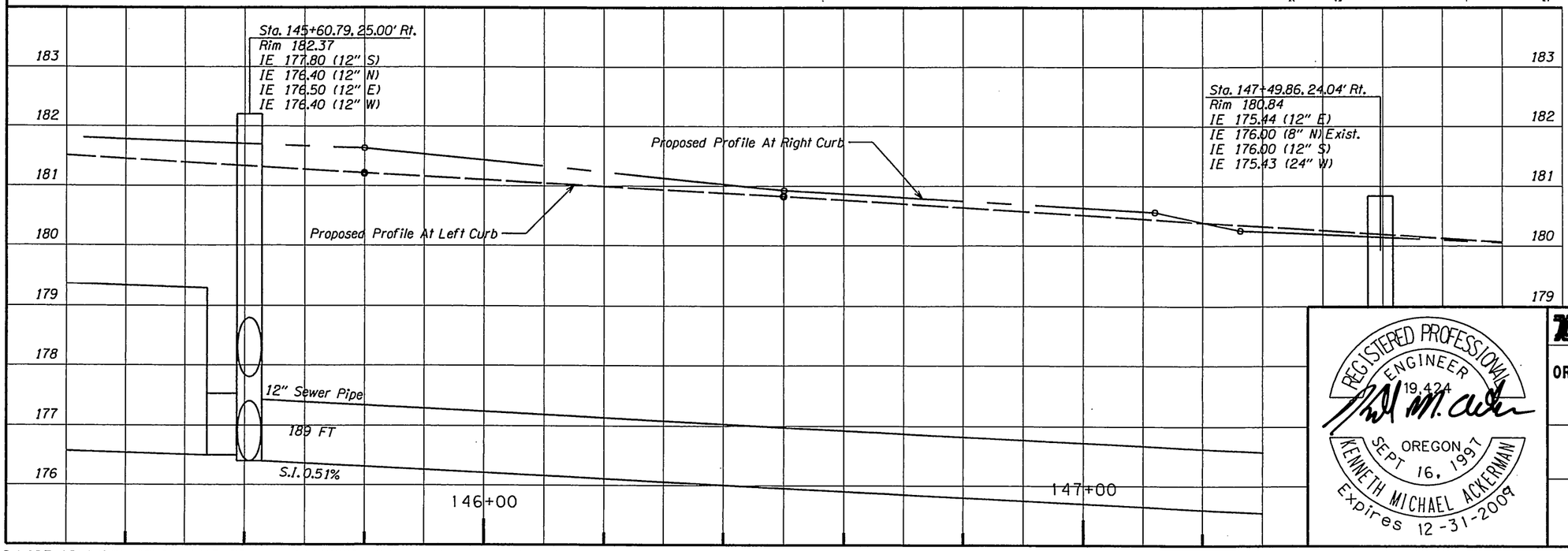
STORM SEWER PROFILES

SHEET NO. 7D

Sec. 33, T. 1 N., R.3 W., W.M.



1. Sta. 145+69.86, 23.39' Lt.
   Const. Type "CG-3" Inlet
   (For Pipe Profile see Sht. 8D Line "ST4")
2. Sta. 145+60.79, 16.61' Rt.
   Const. Type "CG-3" Inlet
   Inst. 12" Sew. Pipe - 41'
   5' Depth
   Trench Resurf. - 13.30 Sq.Yd.
   (For Pipe Profile see Sht. 8D Line "ST4")
3. Sta. 145+60.92, 25.51' Rt.
   Const. Flow Control Manhole
   Inst. 12" Sew. Pipe - 6'
   5' Depth
   Inst. 12" Sew. Pipe - 16'
   10' Depth
   Inst. 30" Sew. Pipe - 111'
   10' Depth
   (See Detail Sheet 2B-24)
   (For Pipe Profile See Sht. 8D Line "ST4")
4. Sta. 145+61.15, 41.83' Rt.
   Const. Ditch Inlet Type "D"
   (For Pipe Profile See Sht. 8D Line "ST4")
5. Sta. 147+49.86, 24.04'Rt.
   Const. Large Precast Manhole, 60"
   Inst. 12" Sew. Pipe 239'
   10' Depth
   Trench Resurf.- 14.70 Sq.Yd.
   (See Dwg. No. RD346)
6. See Sht. 7B Note 9
   Water Quality Swale
   (See Detail Sht. 2B-23)
7. See Sht. 9B, Note 7



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TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

Reviewed By - CLH
Designed By - KMA
Drafted By - SMR

DRAINAGE

SHEET NO. 8B

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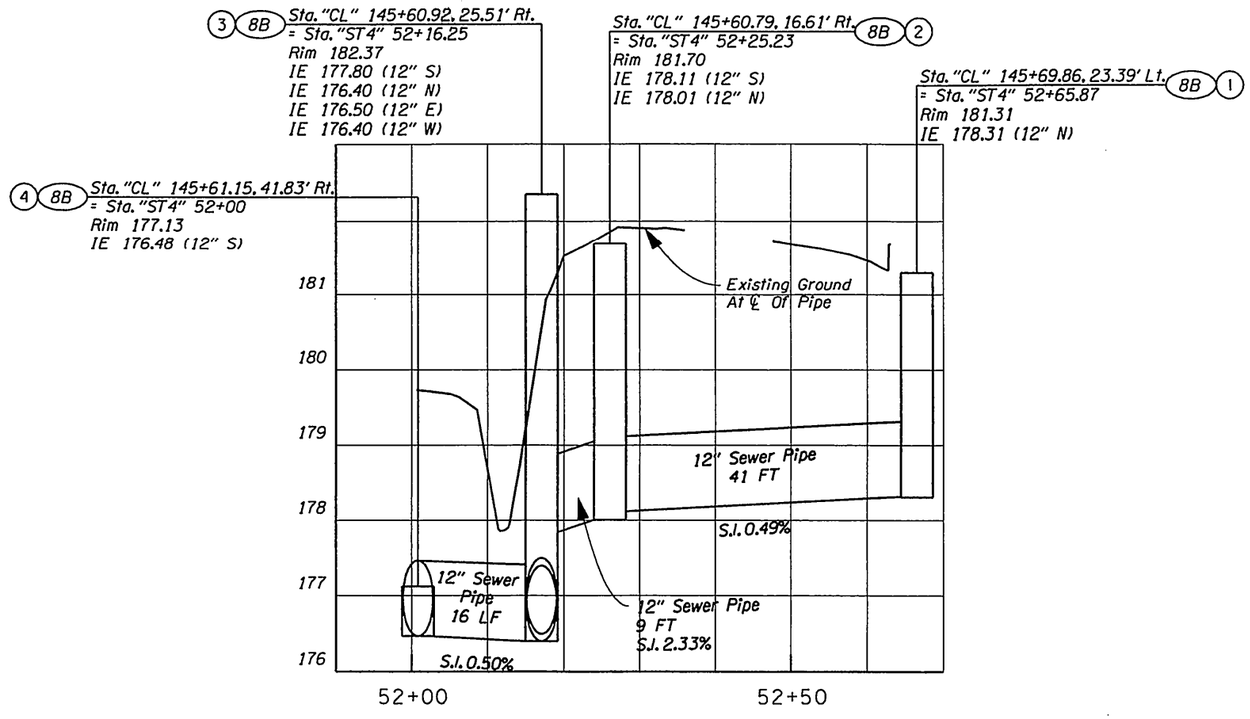

"ST4"

HHPR Harper Houf Peterson Righellis Inc.
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SEPT 16, 1997
KENNETH MICHAEL ACKERMAN
Expires 06-30-2009

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

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TUALATIN VALLEY HIGHWAY
WASHINGTON COUNTY

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Designed By - KMA
Drafted By - SMR

STORM SEWER PROFILES

SHEET NO. 8D