OPERATION & MAINTENANCE MANUAL

DFI No. : D00852
Facility Type: Detention Pond/Water Quality Biofiltration Swale Combo

Figure 1: D00852 looking northeastalong 99W from SW Canterbury Lane

August, 2014
Final – March 2016

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00852**
Facility Type:	Detention Pond/Water Quality Biofiltration Swale Combo
Construction Drawings:	(V-File Number) 47V-131
Location:	District: 2B
	Highway No.: (1W) 91
	Mile Post: MP 10.51-10.54
	Description: This facility is located on the right side (NW'ly) of SW Pacific Highway (OR99W) and at the northwest corner of SW Canterbury Lane intersection. Access to the facility via old Gaarde Street to the frontage road paralleling the right side of OR99W.

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:	Ken Rehms – WHPacific, Inc. (503) 372-3526
Facility construction:	2015
Contractor:	Kerr Construction Company

4. Storm Drain System and Facility Overview

A detention pond/water quality biofiltration swale combo (referred to from this point forward as a pond/swale combo) combines the forms and functions of a water quality swale and a detention pond. In a pond/swale combo, the biofiltration swale is situated within the bottom confines of the detention facility. The facility provides water quality treatment of the smaller storm events and detention of the larger storm events.

The biofiltration swale is designed as if it was a separate facility and consists of a grassy-lined facility with a flat trapezoidal cross section and gradual slope. Treatment is provided through sedimentation and filtration processes. If amended soils are present, additional treatment is obtained through infiltration through the amended soil media.

When the flows exceed the water quality flows, the pond/swale combo facility begins to provide detention. Detention is required to reduce or mitigate the increases in discharge, resulting from development. The facility is designed to store and gradually release (or attenuate) stormwater runoff via a control structure or release mechanism, then releasing it slowly over a more extended period of time. The flow control mechanism for this facility involves a 8.5-inch orifice. When flows exceed the water quality design flow, the orifice restricts the flow causing the water to backup within the facility.

This facility is located on the right side of SW Pacific Highway (OR99W) and at the northwest corner of the Canterbury Lane intersection. Access to the facility can be obtained from the frontage road off of old SW Gaarde Street which runs parallel to the OR99W and is adjacent to the facility. Two asphalt maintenance approaches have been provided at the beginning and ending of the facility to provide access to the control structures. Refer to Facility Maintenance Map for facility location and access.

Stormwater runoff from the highway is captured, conveyed, and discharged to the facility through two outlet pipes. North of the Canterbury Lane intersection, the runoff is captured by four inlets located at the low point of the highway. This runoff is then conveyed south to an inlet at the northwest quadrant of the Canterbury Lane intersection before daylighting to the facility (Note Bubble B from Facility Maintenance Map). The stormwater runoff from the highway south of the Canterbury Lane intersection is also captured by inlets along the highway, conveyed to a control manhole at the northwest corner of the intersection just outside of the sidewalk area, and outfall to the facility (Note Bubble A from Facility Maintenance Map). This control manhole also collects offsite runoff from the hillside on the east leg of Canterbury Lane which will bypass the

facility through an 18-inch conveyance pipe. Once entering the facility, stormwater treatment is achieved by the slow moving water through the grassy swale for smaller storm events. When the runoff exceeds the water quality flow, the facility serves as a detention pond where the release of water is controlled at the flow control manhole at the north end of the facility.

After treatment and/or detention, the stormwater exits the pond/swale combo through a Type D ditch inlet structure at the north end of the facility (Note Bubble C from Facility Maintenance Map). This inlet structure conveys stormwater to a control manhole (Note Bubble D from Facility Maintenance Map) just north of the inlet via a 12-inch storm pipe. Inside the control manhole, stormwater exits the manhole through an 18-inch cross/pipe with an 8.5-inch bottom orifice and 18-inch opening top riser (weir). The orifice restricts the flow from the facility causing the water to backup within the facility to provide the required detention. When the runoff volume exceeds the required detention volume, surface water inside the control manhole will rise up to the top of the riser (weir) at which point the weir will crest to prevent overtopping of the pond/swale combo. After exiting the control manhole, stormwater is conveyed in an 18-inch pipe to an existing manhole just north of the control manhole. At this point, the runoff is conveyed to the west in an existing 18-inch conveyance pipe and flows offsite.

A. Maintenance equipment access:

The facility can be accessed from the frontage road off of old SW Gaarde Street that runs parallel to SW Pacific Highway (OR99W).

B. Heavy equipment access into facility:

☐ Allowed (no limitations)
☒ Allowed (with limitations)
Heavy equipment access is allowed on the frontage road and two asphalt maintenance approaches at each end of the facility. Assess the condition of the pond/swale combo prior to entering the facility with heavy equipment. If wet, the pond/swale combo may not able to support heavy equipment.
☐ Not allowed

C. Special Features:

☒ Amended Soils
☒ Porous Pavers
☐ Liners
☐ Underdrains

5. Facility Haz Mat Spill Feature(s)

The pond/swale combo can be used to store a volume of liquid by blocking the 12-inch diameter outlet pipe of the ditch inlet located at the north end of the facility.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure cannot 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

This facility was designed to detain the increased stormwater runoff volume, which resulted from increases of impervious area caused by roadway widening. Detained water is slowly released from the pond through the bottom orifice in the riser pipe inside the flow control manhole. In the event that the orifice becomes plugged or the flows exceed the capacity of the facility, the water is released through the high flow riser top opening (weir) within the flow control manhole.

The auxiliary high flow bypass for the flow control manhole consists of an 18-inch diameter conveyance outlet pipe that is attached to an 18-inch diameter cross with 8.5-inch bottom orifice and 18-inch riser opening top (weir) inside the control manhole. If stormwater enters the flow control manhole more quickly than the bottom orifice can convey stormwater, the water level within the manhole will rise until water enters the riser pipe through the 18-inch opening top (weir). The water will then discharge through the 18-inch pipe and flow offsite.

If the bottom orifice clogs and the flow control manhole fills with water, remove the mechanical plug within the pipe cross will quickly reduce the water level inside the manhole. Once the mechanical plug is removed, water will flow directly through the outlet pipe and bypass the bottom orifice and the top of the riser pipe. Refer to the Facility Maintenance Map for these flow control mechanism.

☐ Other, as noted below

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: None

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the road waste 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) 731-8290
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

Content:

- Facility Operational Plan and Drawings: D00852

AC Maintenance Approach

Pond/Swale Combo
(DFI D00852)

SW Canterbury Lane

Mile Point
10.54

Mile Point
10.51

AC Maintenance Approach

Old Gaarde Street

SW Gaarde Street

Elmer's

Frontage road

OR99W

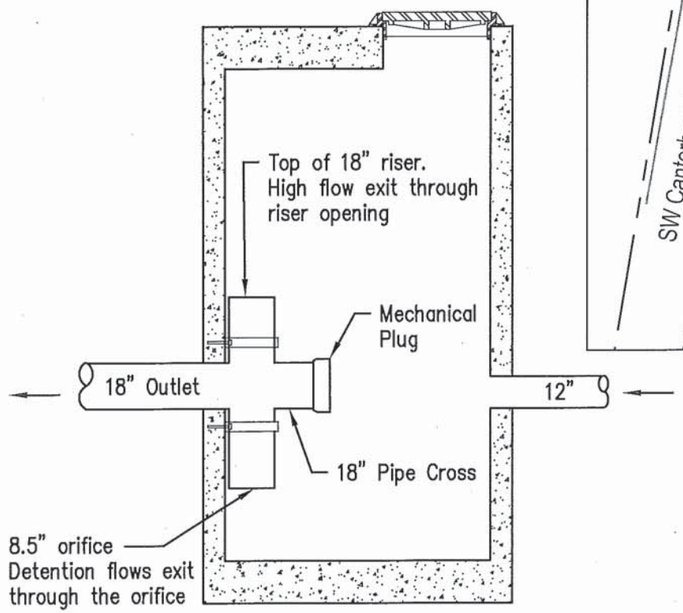
OR99W

SW Canterbury Lane

Flow

12"

18"



Flow Control Manhole for
Detention Pond/Swale Combo (DFI D00852)

N

SCALE
100 0 50 100
(FEET)
1 INCH = 100 FT.

LEGEND

- Ⓐ Pipe Inlet A
- Ⓑ Pipe Inlet B
- Ⓒ Ditch Inlet Structure
- Ⓓ Flow Control Manhole
- Flow — Pavement Flow Path
- New Conveyance Pipe
- Conveyance Direction
- Facility Flow Path

WHPacific

REVISIONS			
NO.	BY	DATE	REMARKS

SHEET INFO		
DESIGNED	JTT	
DRAWN	JTT	
CHECKED	BLB	
APPROVED	BLB	
LAST EDIT	3/28/16	
PLOT DATE	3/28/16	
SUBMITTAL		

OR99W: GAARDE/MCDONALD
INTERSECTION IMPROVEMENTS
ODOT / CITY OF TIGARD
FACILITY MAINTENANCE MAP

SCALE 1"=100'

PROJECT NUMBER 037609

DRAWING FILE NAME FACILITY MAINTENANCE MAP

SHEET NUMBER

DFI D00852

Appendix B

Content:

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

47V-131

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

STATE OF OREGON

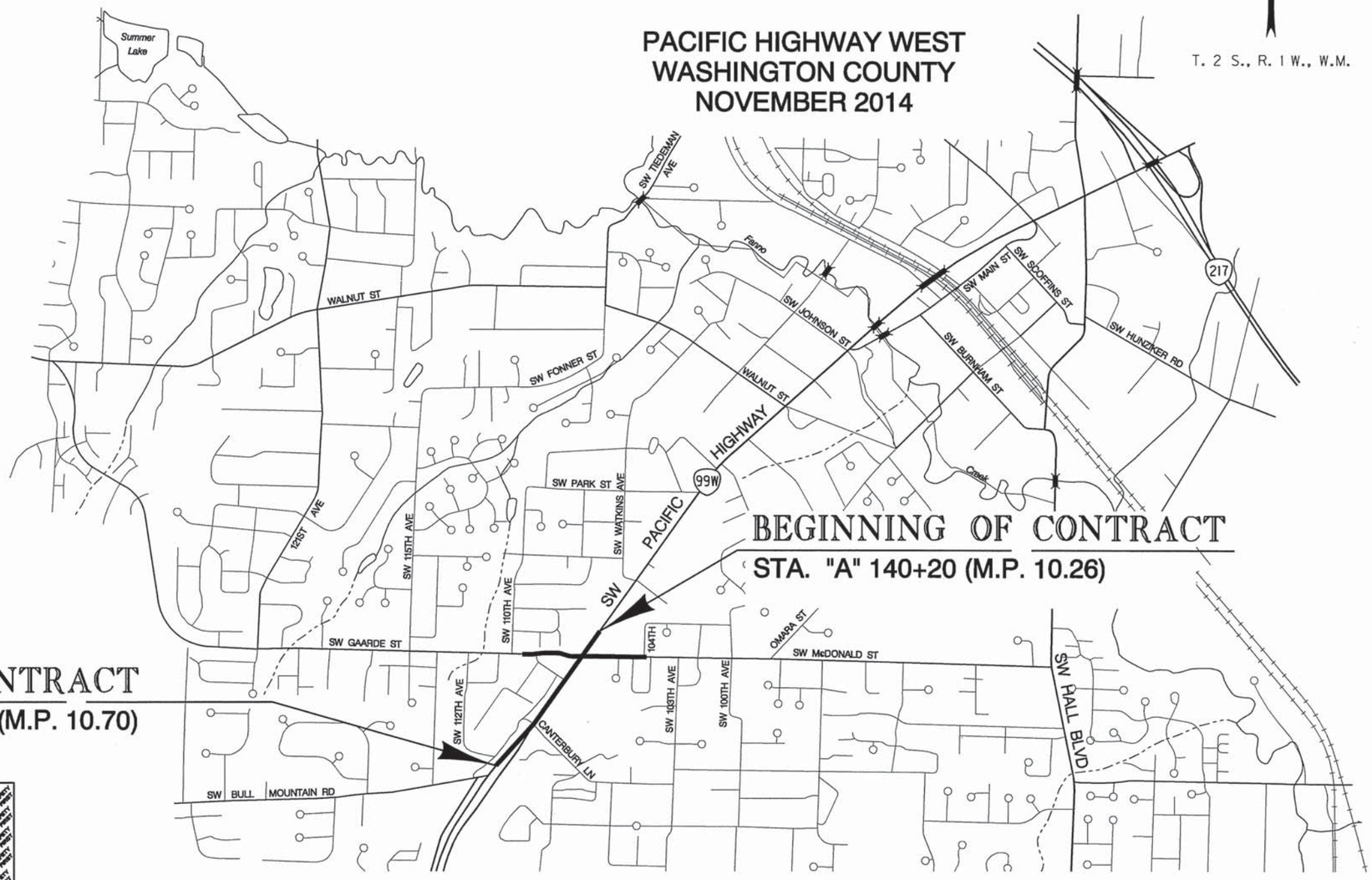
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

OR99W: GAARDE/MCDONALD INTERSECTION IMPRVMTS

PACIFIC HIGHWAY WEST
WASHINGTON COUNTY
NOVEMBER 2014

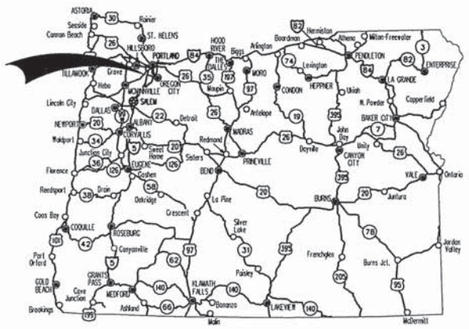


N

T. 2 S., R. 1 W., W.M.

BEGINNING OF CONTRACT
STA. "A" 140+20 (M.P. 10.26)

END OF CONTRACT
STA. "A" 163+54 (M.P. 10.70)



Overall Length Of Project - 0.44 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

PLANS PREPARED FOR
OREGON DEPARTMENT OF TRANSPORTATION
BY:

WHPacific
9755 SW Barnes Road
Suite 300
Portland, OR 97225
t: 503.626.0455 f: 503.526.0775

OREGON TRANSPORTATION COMMISSION

Catherine Mater	CHAIR
David Lohman	COMMISSIONER
Tammy Baney	COMMISSIONER
Susan Morgan	COMMISSIONER
Alando Simpson	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: Wayne Bauer 9/18/14
Signature & date

Wayne Bauer, P.M.
Print name and title

Concurrence by ODOT Chief Engineer

OR99W: GAARDE/MCDONALD INTERSECTION IMPRVMTS

PACIFIC HWY WEST
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STP-7365(013)	1

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47V-131

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SHEET NO.	DESCRIPTION
2 Thru 2A-5	Typical Sections
2B Thru 2B-8	Details
2C Thru 2C-15	Traffic Control Plans
2D Thru 2D-3	Pipe Data Sheet
3 Thru 3B	Alignment (Plan)
4	General Construction (Plan)
4A	Drainage and Utilities (Plan)
4B	Profile
5	General Construction (Plan)
5A	General Construction (Curb Return Tables)
5B	Drainage and Utilities (Plan)
5C Thru 5E	Profile
6	General Construction (Plan)
6A	Drainage and Utilities (Plan)
6B, 6C	Drainage Profile
7	General Construction (Plan)
7A	Drainage and Utilities (Plan)
7B	Profile
8	General Construction (Plan)
8A	Drainage and Utilities (Plan)
8B	Drainage Profile
9	General Construction (Plan)
9A	Drainage and Utilities (Plan)
9B	Profile
10	General Construction (Plan)
10A	Drainage and Utilities (Plan)
10B	Profile
	GEO/HYDRO
GA Thru GA-8	Erosion Control Plans
GC Thru GC-14	Wall Plan & Elevation
GJ Thru GJ-12	Stormwater Details
GN	Irrigation Notes
GN-2, GN-3	Irrigation Details
GN-4	Planting Notes
GN-5	Planting Details
GN-6	Plant Material Schedule
GN-7 Thru GN-11	Irrigation Plans
GN-12 Thru GN-18	Planting Plans
	PERMANENT PAVEMENT MARKING
ST	Pavement Marking Legend
ST-2 Thru ST-9	Pavement Marking Plans
	PERMANENT SIGNING
S-14798 Thru S-14805	Permanent Signing Plans
S-14806 Thru S-14807	Permanent Signing Details
S-14808 Thru S-14810	Sign and Post Data Table
	ILLUMINATION
I-02328	Illumination Legend
I-02329 Thru I-02331	Illumination Plans
	SIGNALS
17759	Signal and Detector Plan Legend
17760	Signal Removal Plan

INDEX OF SHEETS, CONT'D.

SHEET NO.	DESCRIPTION
	SIGNALS, CONT'D.
17761	Signal Plan
17762	Detector Plan
17763	Existing Utility Plan
17764	Signal Removal Plan
17765	Signal Plan
17766	Detector Plan
17767	Existing Utility Plan
17768	Detector Plan
17769, 17770	Interconnect Plans
17771	Pole Entrance Chart
17772	Fiber Optic Splice Diagram
17773	Camera Installation Details
17774	Interconnect Details
17775, 17776	Signal Details

STANDARD DRAWINGS

RD115	- Monument Box
RD120	- Concrete Stairway
RD140	- Roadway Cross Slopes Superelevated Sections
RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302	- Street Cut
RD328	- Slotted C.M.P. Drain Details
RD335, RD336, RD340, RD342, RD344, RD346	- Manholes
RD356	- Manhole Cover & Frames
RD360	- Manhole Frame Adjustment
RD362	- Sanitary Cleanout
RD364, RD365, RD370	- Concrete Inlets
RD371, RD372	
RD386, RD388, RD390,	- Pipe Fill Height Tables
RD393	- Stormwater Treatment & Storage Facility
RD399	Field Markers
RD610	- Asphalt Pavement Details
RD700	- Curbs
RD701	- Drainage Curbs
RD705	- Islands
RD706	- Traffic Separators And Transitions
RD710	- Accessible Route Islands
RD715	- Approaches and Non-Sidewalk Driveways
RD720	- Sidewalks
RD750	- Curb Line Sidewalk Driveways or Alleys - Local Jurisdictions
RD755	- Sidewalk Ramp Details
RD757	- Sidewalk Ramp Placement
RD759	- Truncated Dome Detectable Warning Surface Details and Locations
RD770, RD771	- Pedestrian Handrail
RD815	- Chain Link Fence
RD1000	- Construction Entrances
RD1010, RD1015	- Inlet Protection
RD1035	- Sediment Barrier
RD1040	- Sediment Fence
BR720	- Standard Gravity Retaining Wall Details

R/W map no. 1A-24-16

STANDARD DRAWINGS (CONTD.)

TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM212	- Signing Details
TM223	- Conventional Roads Directional Sign Layout Street Name Signs
TM450	- Mast Arm Pole Details
TM457	- Vehicle, Ped. Signal & Push Button Mounting Details
TM458	- Pedestrian Ramp Placement Details
TM460	- Vehicle Signal Details
TM462	- Adjustable Signal Head Mounting Details
TM465	- Overhead Sign, Fire Preemption & Photoelectronic Details
TM467	- Ped. Signal And Ped. Push Button Details
TM470	- Color Code Charts
TM472	- Traffic Signal Junction Boxes
TM475	- Loop Details
TM480	- Loop Entrance Details
TM482	- Controller Cabinet And Foundation Details
TM485	- Service Cabinets And Service Cabinet Wiring Details
TM488	- Terminal Cabinet Detail
TM498	- Interconnect Wiring Details
TM500, TM501, TM502, TM503	- Pavement Marking Standard Details
TM515	- Pavement Markers
TM520, TM521	- Durable Pavement Markings
TM530	- Intersection Pavement Markings (Crosswalk, Stop Bar, & Bike Lane Stencil)
TM531	- Turn Arrow Marking Details
TM539	- Median and Left Turn Lane Channelization Details
TM560	- Alignment Layout: General
TM561	- Alignment Layout: Left Turn Lane, Centerline, & Medians
TM570	- Traffic Delineators
TM571	- Traffic Delineators Steel Post Details
TM576	- Traffic Delineators Installation for Non-Freeways
(1) TM670	- Wood Post Sign Supports
TM635	- Breakaway Sign & Luminaire Supports
TM650, TM651, TM652, TM653	- Traffic Signal Supports
TM671	- 3 Second Gust Wind Speed Isotach
TM676	- Sign Attachments
TM679	- Signal Mast Arm Street Name Sign Mounts
TM681, TM687, TM688	- Perforated Steel Square Tube Sign Supports
TM800	- Tables, Abrupt Edge And PCMS Details
TM810	- Temporary Reflective Pavement Markers
TM820	- Temporary Barricades
TM821	- Temporary Sign Supports
TM841, TM842, TM843	- Intersection Details
TM844	- Temporary Pedestrian Access Routing
TM850	- 2-Lane, 2 Way Roadways
TM851, TM852	- Non-Freeway Multi-Lane Sections

No.	DATE	REVISIONS	BY
(1)	10-30-14	Added std. dwg.	K.S.R.

WHPacific
9755 SW Barnes Road
Suite 300
Portland, OR 97225
t: 503.626.0455 f: 503.526.0775

OR99W: GAARDE/MCDONALD INTERSECTION IMPRVMTS

PACIFIC HWY WEST
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STP-7365(013)	1A

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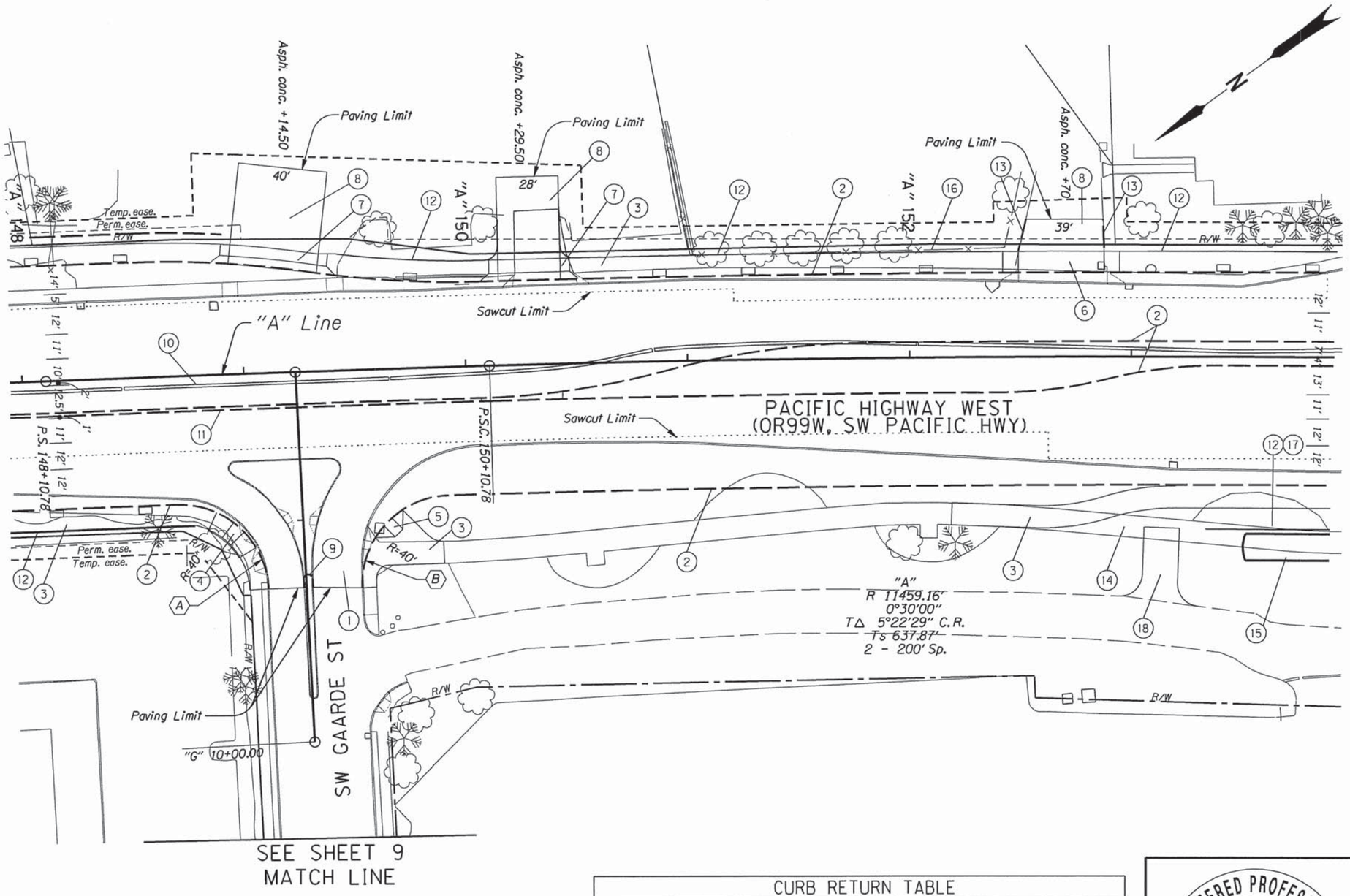
47V-131



LEGEND

▭ *Treewell (See sht. 2B-4 for locations)*

CURB RETURN TABLE							
CURVE	CURB POINT	C.L. STA.	OFFSET	F.L. ELEV.	RADIUS	DELTA	LENGTH
(A)	PC	148+67.70	58.00	287.18	40.00'	89°11'18"	62.27'
	1/4 Δ	148+82.91	60.99	287.33			
	1/2 Δ	148+95.85	69.50	287.31			
	3/4 Δ	149+04.59	82.28	287.01			
	PT	149+07.83	97.41	286.19			
(B)	PC	149+50.22	98.35	286.71	40.00'	90°36'26"	63.26'
	1/4 Δ	149+53.21	82.92	287.50			
	1/2 Δ	149+61.93	69.82	288.01			
	3/4 Δ	149+75.04	61.07	288.42			
	PT	149+90.51	58.00	288.64			

1. *Const. appr. (For 'G' profile, see sht. 5E)*
2. *Const. standard curb*
3. *Const. P.C. conc. sidewalk*
4. *Const. sidewalk ramp, option H*
5. *Const. sidewalk ramp, option G*
6. *Const. P.C. conc. dwy., option N*
7. *Const. P.C. conc. dwy., option M - 2*
8. *Const. asph. conc. connection - 3 (For details, see sht. 2B-6 thru 2B-8)*
9. *Const. type "A" conc. island (Non-Mountable) to match extg. island*
10. *See sht. 5, note 10 Remove extg. traffic separator*
11. *See sht. 5, note 11 Const. type "B" traffic separator (For transition to median curb see sht. 2B-3)*
12. *Const. retaining wall (See GC shts.)*
13. *Inst. drainage curb along edge of pavement to match extg. curb.*
14. *Remove extg. P.C. conc. sidewalk*
15. *Const. water quality swale (For details, see shts. GJ thru GJ-3*
16. *Remove chainlink fence*
17. *Const. CL-4R chainlink fence with vinyl clad fabric. (See drg. no. RD815)*
18. *Const. appr. (For details, see sht. 2B-5)*

GENERAL NOTES

1. *All sawcut lines shown follow along edge or middle of new travel lanes except in transition areas. See sht. 2A-5 for location table.*
2. *All lane dimensions are shown in the permanent pavement marking sheets.*

REGISTERED PROFESSIONAL ENGINEER
48570PE
OREGON
JAN 15, 2002
KENNETH S. REHMS

RENEWS: 12-31-14

OREGON DEPARTMENT OF TRANSPORTATION

WHPacific
9755 SW Barnes Rd Ste 300
Portland, OR 97225
t: 503.626.0455 f: 503.526.0775

OR99W: GAARDE/MCDONALD INTERSECTION IMPRVMTS

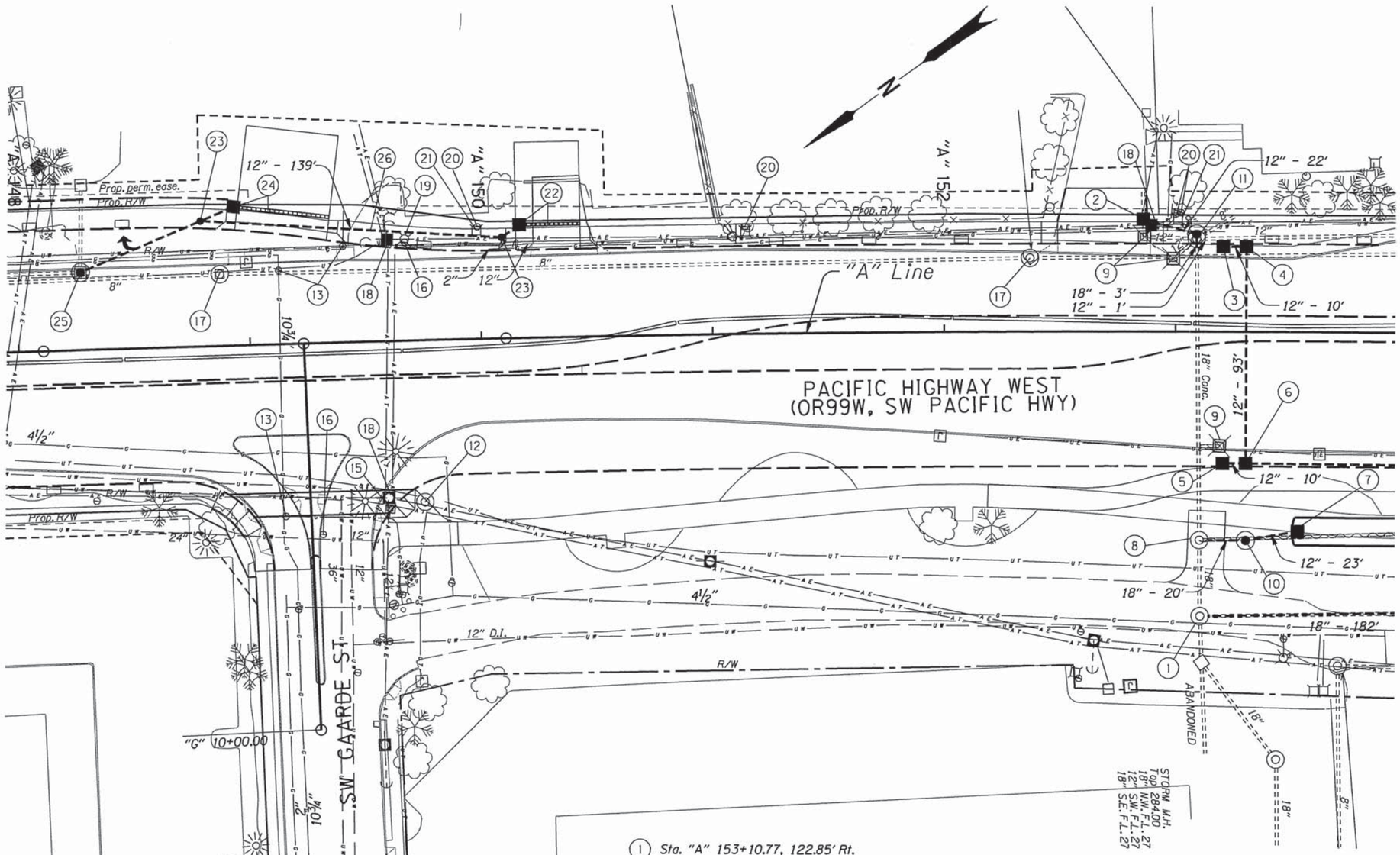
PACIFIC HWY WEST
WASHINGTON COUNTY

Design Team Leader - Ken Rehms
Designed By - Calvin Larwood
Drafted By - Travis Sater

GENERAL CONSTRUCTION

SHEET NO. 6

47V-131



LEGEND

- Remove inlet
- Remove manhole
- Remove pipe

(1) *Sta. "A" 153+10.77, 122.85' Rt.*
Remove extg. pipe (SW)
Inst. 18" storm sew. pipe - 182'
10' depth
Connect to extg manhole

(2) *Sta. "A" 152+86.15, 48' Lt.*
Const. type G-1 inlet (no sump)
Connect extg. pipes to inlet
(See drg. no. RD364)

(3) *Sta. "A" 153+20.50, 36.73' Lt.*
Const. type G-2 inlet (no sump)

(4) *Sta. "A" 153+30.50, 36.73' Lt.*
Const. type G-2 inlet (no sump)
Inst. 12" storm sew. pipe - 10'
5' depth

(5) *Sta. "A" 153+20.50, 56.73' Rt.*
Const. type G-2 inlet (no sump)

(6) *Sta. "A" 153+30.50, 56.73' Rt.*
Const. type G-2 inlet
Inst. 12" storm sew. pipe - 103'
5' depth

(7) *Sta. "A" 153+53.24, 86.00' Rt.*
Const. type D inlet
Grate F.L. - 279.55
(See drg. no. RD370)

(8) *Sta. "A" 153+10.46, 89.92' Rt.*
Inst. 18" storm sew. pipe - 20'
10' depth
Connect to extg. manhole
Adjust manhole, minor

(9) *Remove inlet - 3*

(10) *Sta. "A" 153+30.62, 90' Rt.*
Const. control manhole 72" dia.
Rim - 285.33
Inst. 12" storm sew. pipe - 23'
5' depth
(For detail, see sht. GJ-4)

(11) *Sta. "A" 153+08.96, 42.08' Lt.*
Remove manhole
Const. shallow manhole 72" dia.
Rim - 285.82
Inst. 12" storm sew. pipe - 22'
5' depth
Extend - 12" storm sew. pipe - 1' Lt.
18" storm sew. pipe - 3' Lt.
5' depth
Connect to extg. pipes to manhole
(For detail, see sht. GJ-8)

(12) *Adj. manhole (By others)*

(13) *Adj. gas valve box (By others)*

(14) *Relocate gas valve (By others)*

(15) *Relocate gas vault (By others)*

(16) *Adj. water valve box - 2*

(17) *Adj manhole, minor - 2*

(18) *Relocate utility pole (By others)*

(19) *Relocate fire hydrant (By others)*

(20) *Relocate irrig. valve (By others)*

(21) *Relocate water meter (By others)*

(22) *Const. 12" slotted CMP drain - 26'*
Connect to private inlet

(23) *Inst. cleanout - 2*
(See drg. no. RD362)

(24) *Const. 12" slotted CMP drain - 40'*
Connect to private inlet

(25) *See sht. 5B*

(26) *Inst. 12" storm sew. pipe - 139'*
5' depth

REGISTERED PROFESSIONAL ENGINEER
48570PE
OREGON
JAN 15, 2002
KENNETH S. REHMS

RENEWS: 12-31-14

OREGON DEPARTMENT OF TRANSPORTATION

WHPacific
9755 SW Barnes Rd Ste 300
Portland, OR 97225
t: 503.626.0455 f: 503.526.0775

OR99W: GAARDE/MCDONALD INTERSECTION IMPRVMTS

PACIFIC HWY WEST
WASHINGTON COUNTY

Design Team Leader - Ken Rehms
Designed By - Jason Truong
Drafted By - Travis Sater

DRAINAGE AND UTILITIES

SHEET NO. 6A

47V-131

(1) Const. water quality swale - 140'
12' flat bottom, 1:4 max. side slopes
Inst. stormwater field marker
(For details, see sht. GJ - GJ-3)

(2) Sta. "A" 154+95. 56.73' Rt.
Const. type G-2 inlet (no sump)
Inst. 12" storm sew. pipe - 189'
5' depth
Pipe slope - 1.00% (Outfall)

(3) Sta. "A" 155+15.21. 92.82' Rt.
Remove manhole
Const. diversion manhole 72" dia.
Rim - 286.14
Inst. 12" storm sew. pipe - 141'
5' depth
Inst. 15" storm sew. pipe - 15'
5' depth
Connect and extend 15" storm
sew. pipe at extg. slope (1.16%)
(For details, see sht. GJ-5)

(4) Remove inlet - 1

(5) Sta. "A" 156+29.61. 56.73' Rt.
Const. type G-2 inlet (no sump)
Inst. 12" storm sew. pipe - 170'
5' depth

(6) Sta. "A" 158+00. 56.73' Rt.
Const. type G-2 inlet (no sump)
Inst. 12" storm sew. pipe - 360'
5' depth

(7) Sta. "A" 158+00. 3.83' Lt.
Remove inlet/piping
Const. type D inlet
Rotate inlet grate to face north
Grate F.L. - 293.75

(8) Sta. "A" 157+60. 86.39' Rt.
Const. manhole 48" dia.
Rim - 286.20
Inst. 12" storm sew. pipe - 166'
5' depth

(9) Sta. "A" 159+30. 108.89' Rt.
Const. type G-1 inlet (no sump)

(10) Protect and preserve inlet

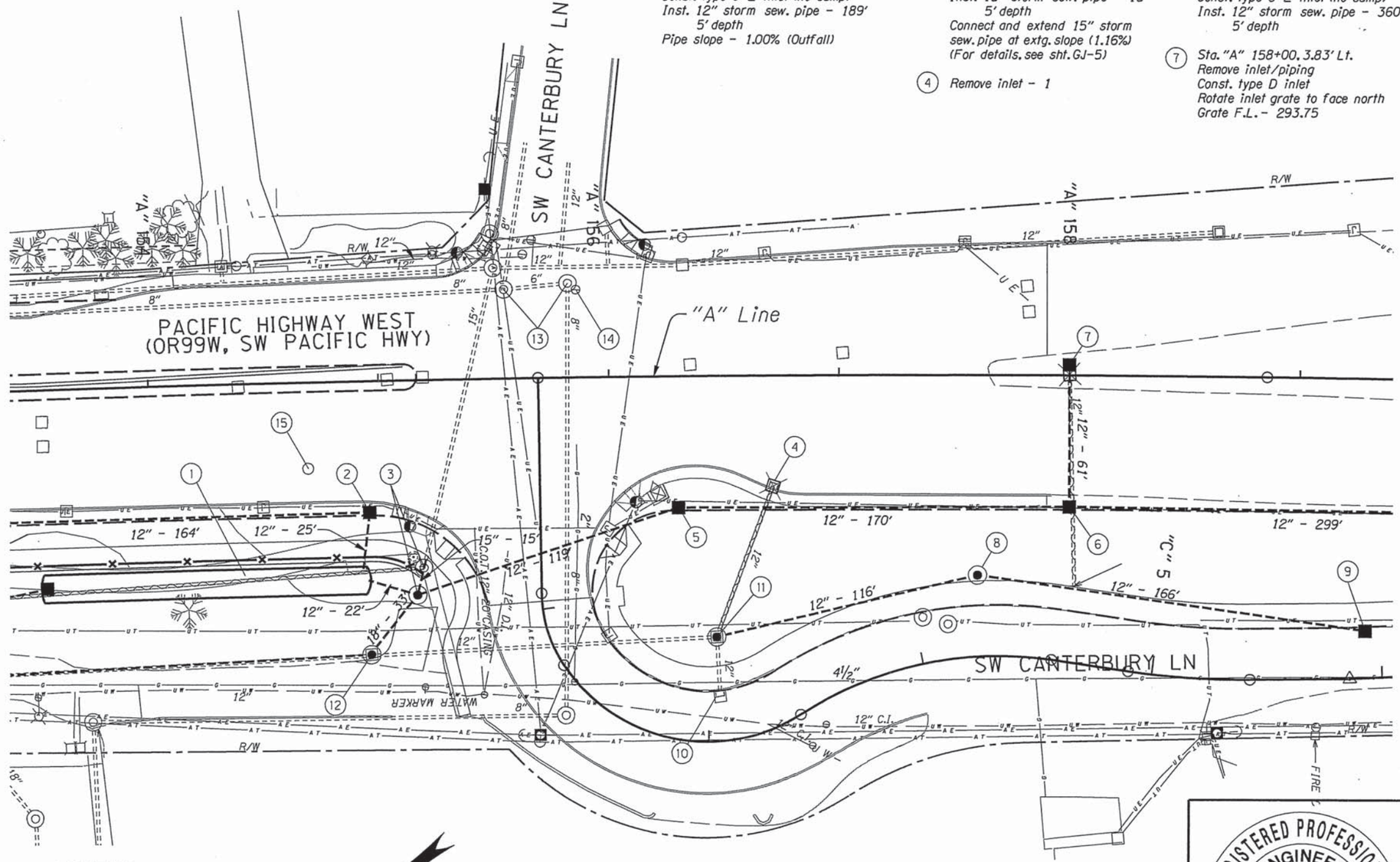
(11) Sta "A" 156+45.7. 112.8' Rt.
Remove inlet
Const. manhole 48" dia.
Rim - 283.30
Inst. 12" storm sew. pipe - 116'
5' depth
Connect extg. pipes to manhole

(12) Sta. "A" 154+94.45. 118.1' Rt.
Remove inlet
Const. manhole 48"dia
Rim - 282.35
Inst. 18" storm sew. pipe - 33'
5' depth
Connect extg. pipes to manhole

(13) Adj. manhole, minor - 2

(14) Adj. gas valve box (By others)

(15) Adj. manhole (By others)



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DRAINAGE AND UTILITIES

SHEET NO. 7A

47V-131

"A" LINE (CURB RIGHT)

290
285
280
275
295

21"
Subgrade
0.50%
Bioswale 12" - 164'
F.L. 279.55
1.1%
Bioswale - 140'
+95 Inlet
F.L. 281.53
+91.7/93.9 Outfall
F.L. 281.28
1.00%
12" - 22'
10.00%
18" - 33'
+15.21 Manhole
F.L. 281.50 (E) W.Q.
F.L. 281.78 (SE)
F.L. 281.70 (SW)
F.L. 282.05 (N) Bypass
0.88%
18" - 182'
+94.45 Manhole
F.L. 277.10 (SW, NE)
F.L. 278.75 (SE)
Profile Grade
@ Curb Flowline Right
Extg. Ground
Line @ "A" ℄
2.76%
12" - 119'
+29.61 Inlet
F.L. 284.98
0.69%
Extg 12"
+45.74 Manhole
F.L. 278.13 (NE) extg.
F.L. 278.28 (NW) extg.
F.L. 280.40 (SW)
+47.04 Extg Inlet
F.L. 278.69
2.00%
12" - 170'
1.70%
12" - 116'
2.0%
12" - 61
+00 Inlet
F.L. 289.80
+00 Inlet
F.L. 288.38 (SW, NE)
F.L. 288.58 (SE)
+60 Manhole
F.L. 282.37
1.70%
12" - 166'
+30 inlet
F.L. 285.19
21"
Subgrade

Gen. Exc. 990 CY

Emb. 320 CY

20' (typ.)

Curb flowline elev. (Typ.)

285.08	285.35	285.70	286.04	286.39	286.79	287.29	287.86	288.33	288.68	288.97	289.26	289.55	289.84	290.15	290.49	290.87	291.27	291.71	292.17	292.67	293.20	293.76	294.34	294.94	295.54	296.13	296.73

154+00 155+00 156+00 157+00 158+00 159+00

300

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PROFILE

SHEET NO. 7B

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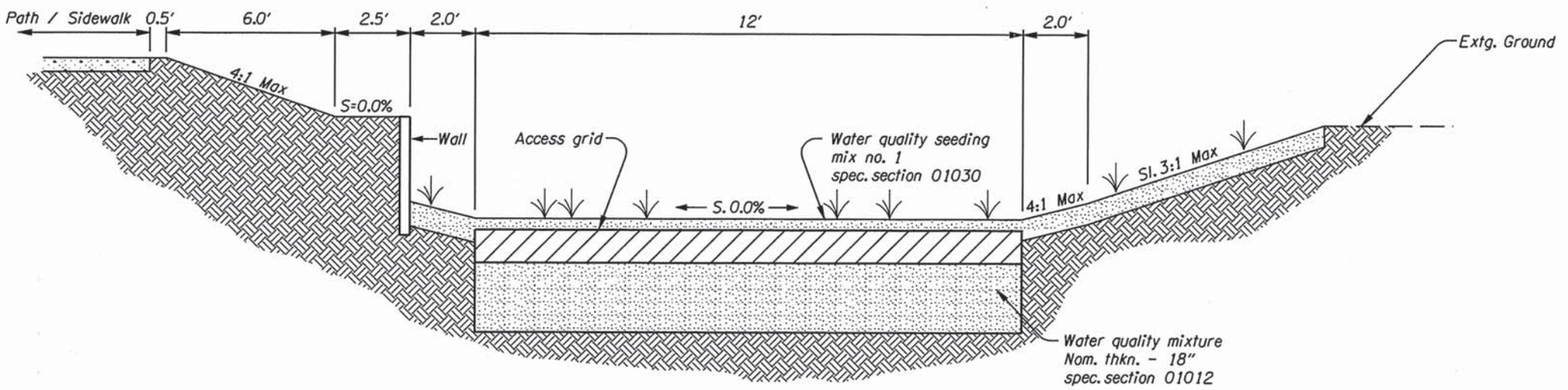
STORMWATER CONTROL FIELD FACILITY MARKER TABLE

FACILITY LOCATION		DFI #	TYPE S2 MARKER LOCATION		TYPE S1 MARKER	
STATION	MP		BEGIN	END	RED	GREEN
"A" 153+51.86.0' Rt.	10.44	D 00852	✓		✓	
"A" 154+95.86.0' Rt.	10.44	D 00852		✓		✓

See drg. no. RD399

✓ Check where appropriate
Red = Beginning of facility
Green = End of facility



WATER QUALITY BIOFILTRATION SWALE/DETENTION
N.T.S.

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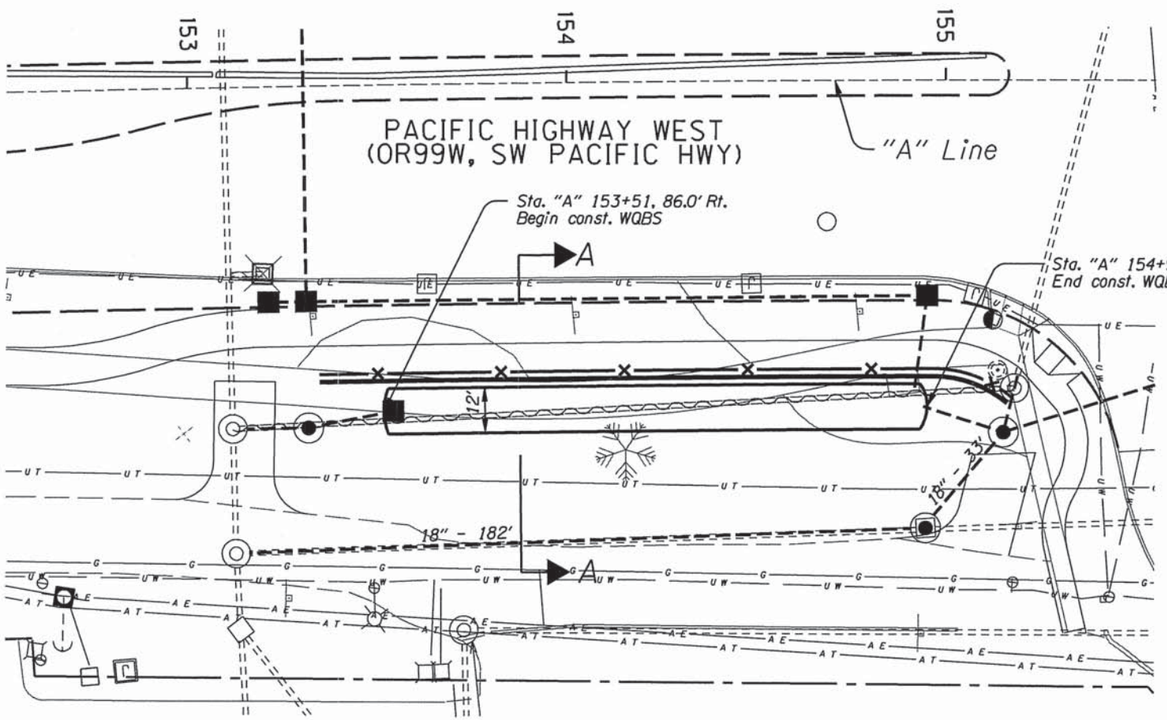
Drafted By - Travis Sater

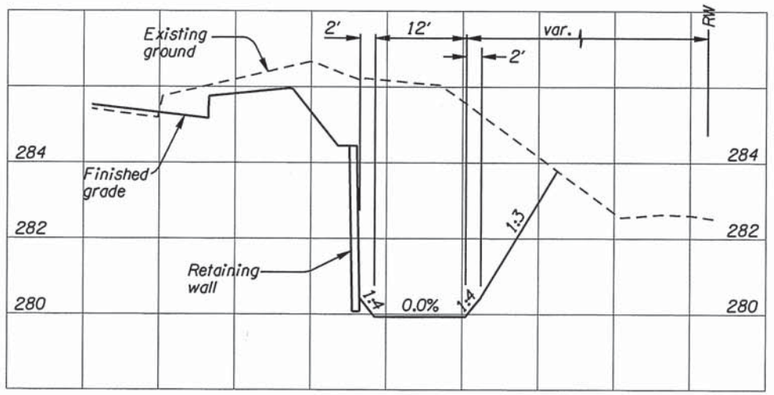
STORMWATER DETAILS

SHEET NO. GJ

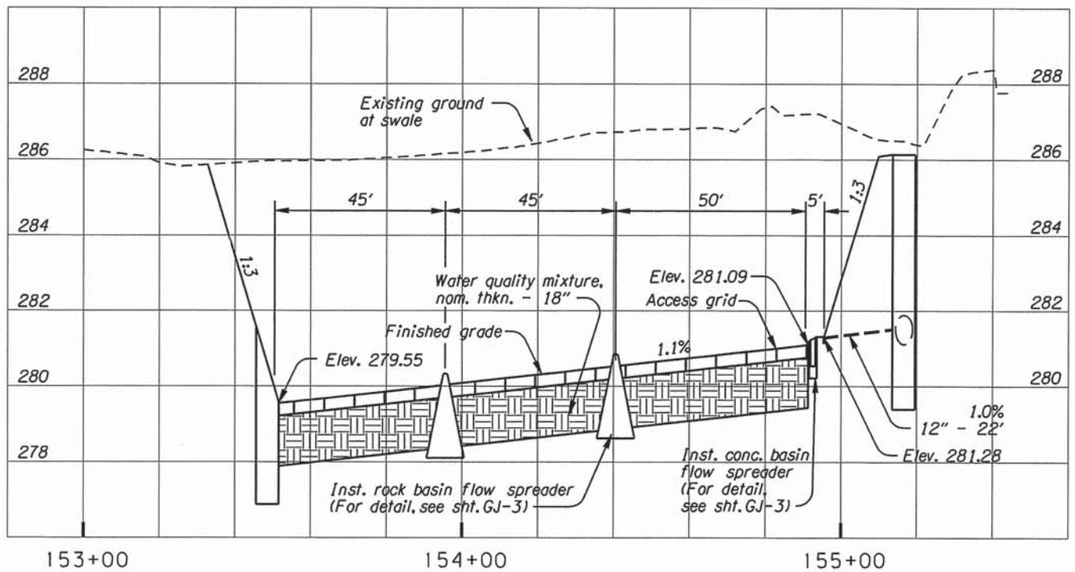
47V-131



WATER QUALITY BIOFILTRATION SWALE (WQBS)/DETENTION
SCALE: 1"=40'



SECTION A-A
SCALE: 1"=20'



(WQBS) PROFILE
SCALE: 1"=40'

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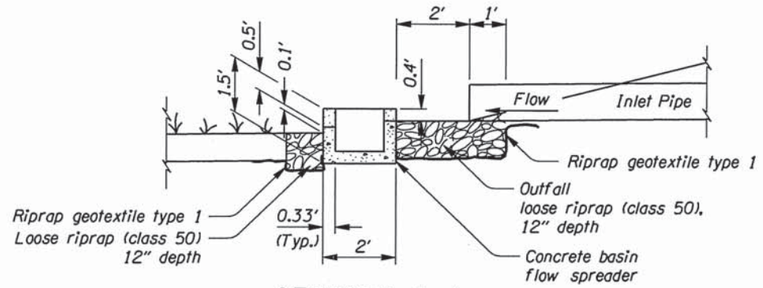
Designed By - Jason Truong
Drafted By - Brian Coursen

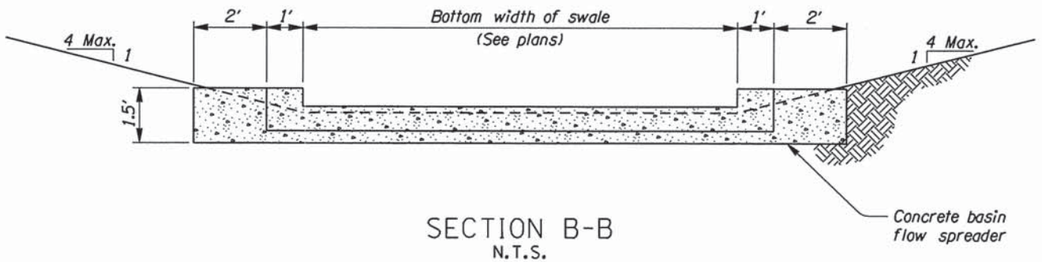
STORMWATER DETAILS

SHEET NO. GJ-2

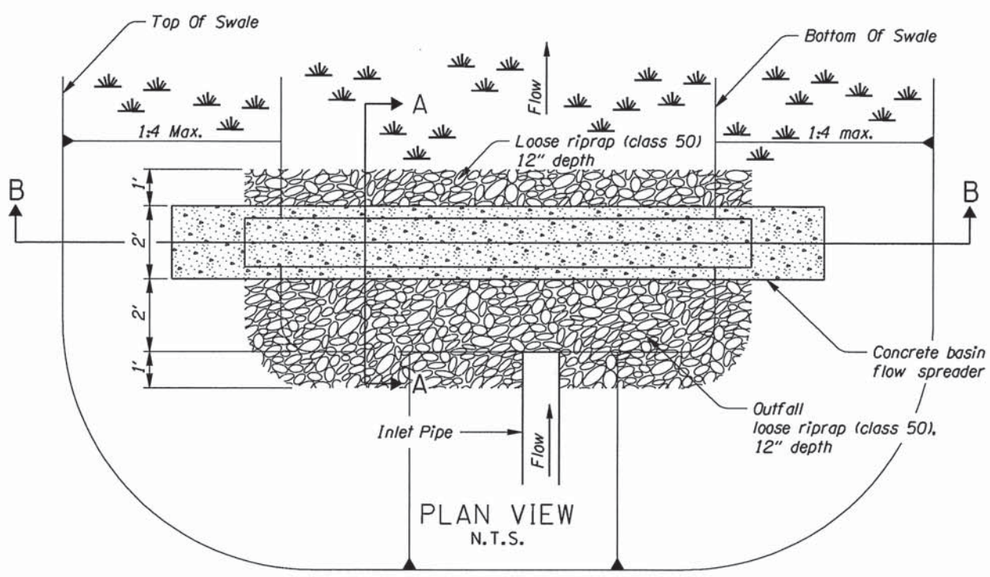
47V-131



SECTION A-A
N.T.S.

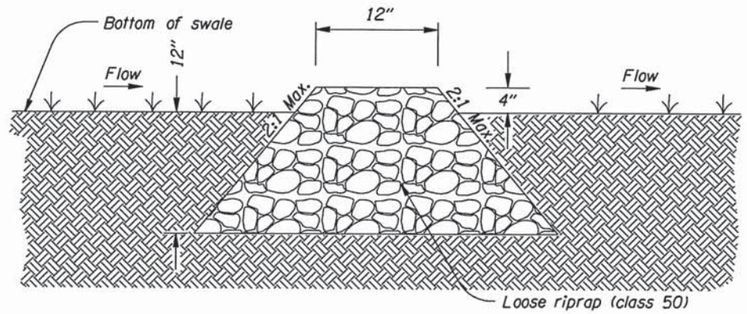


SECTION B-B
N.T.S.



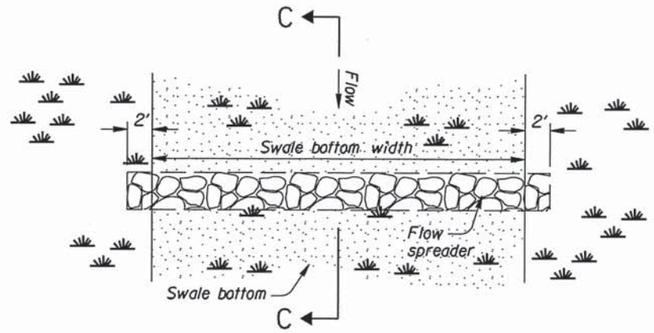
PLAN VIEW
N.T.S.

CONCRETE BASIN FLOW SPREADER



Note: Place 0-15 lb rock gradation as the top layer of the flow spreader.

SECTION C-C
N.T.S.



PLAN VIEW
N.T.S.

ROCK BASIN FLOW SPREADER

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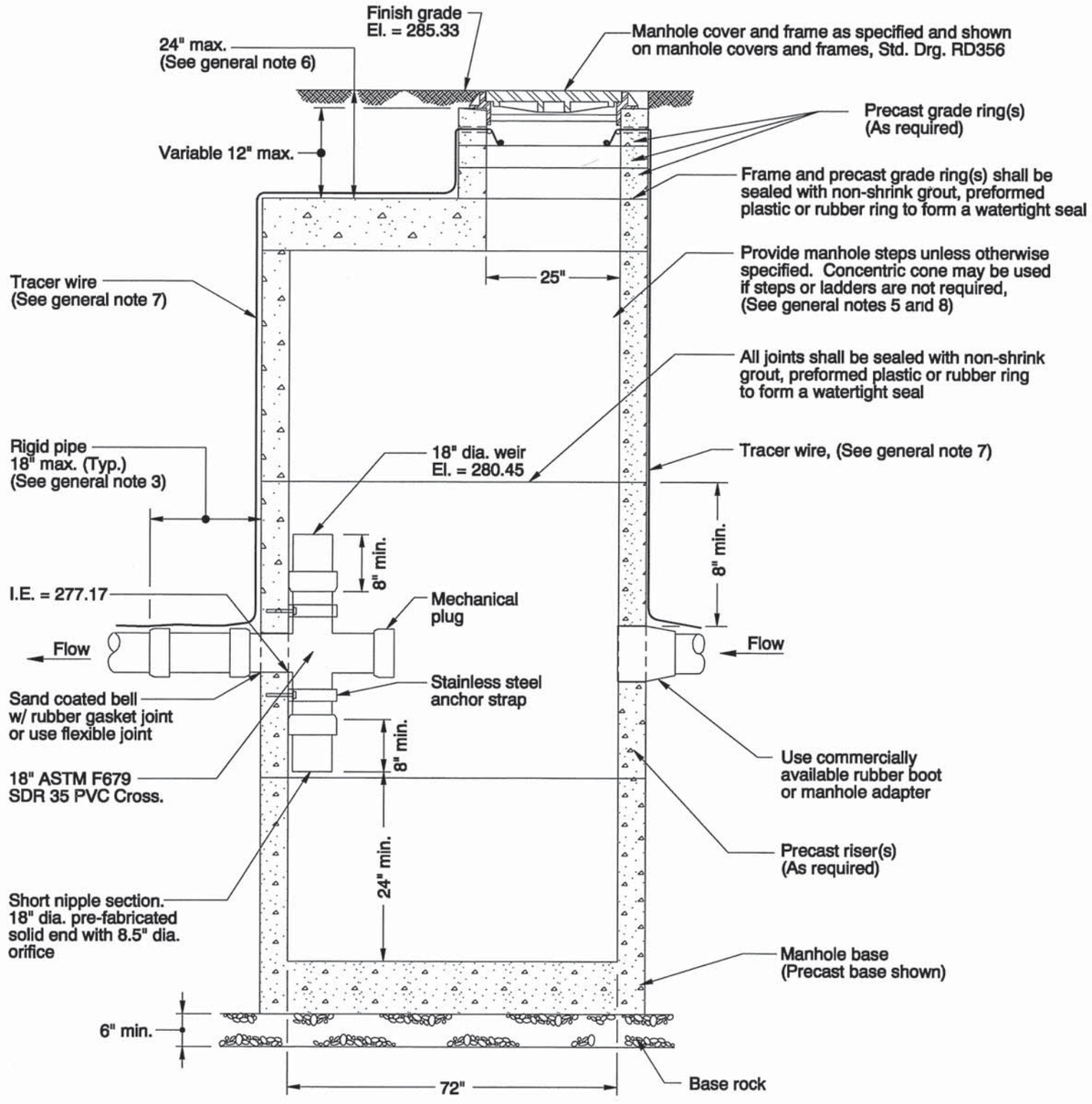
STORMWATER DETAILS

SHEET NO. GJ-3

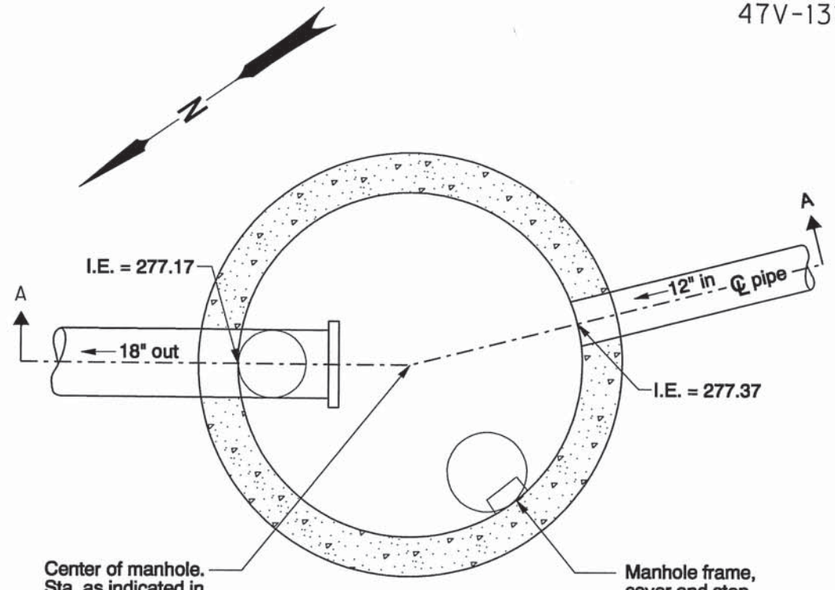
47V-131



SECTION A-A
N.T.S.

CONTROL MANHOLE

Sta. "A" 153+30.62, 90° Rt.
See sht. 6A, note 10



PLAN
N.T.S.

GENERAL NOTES:

1. All precast sections shall conform to requirements of ASTM C478.
2. Standard precast manhole section diameter shall be 72".
3. When rigid pipe is used the connecting pipe shall have a flexible, gasketted, and unrestrained joint within 18" of manhole wall. Joint type varies with manufacturer.
4. See Std. Drg. RD344 for manhole base section, for details not shown.
5. See Std. Drg. RD336 for manhole steps details, and flat slab top orientation.
6. Adjust 24" max.
7. See Std. Drg. RD336 for tracer wire details.
8. Ladder with notched safety rail and removable extension is reqd. for manholes with depths between 24'-0" and 50'-0".
9. Max. pipe diameter varies with pipe material.

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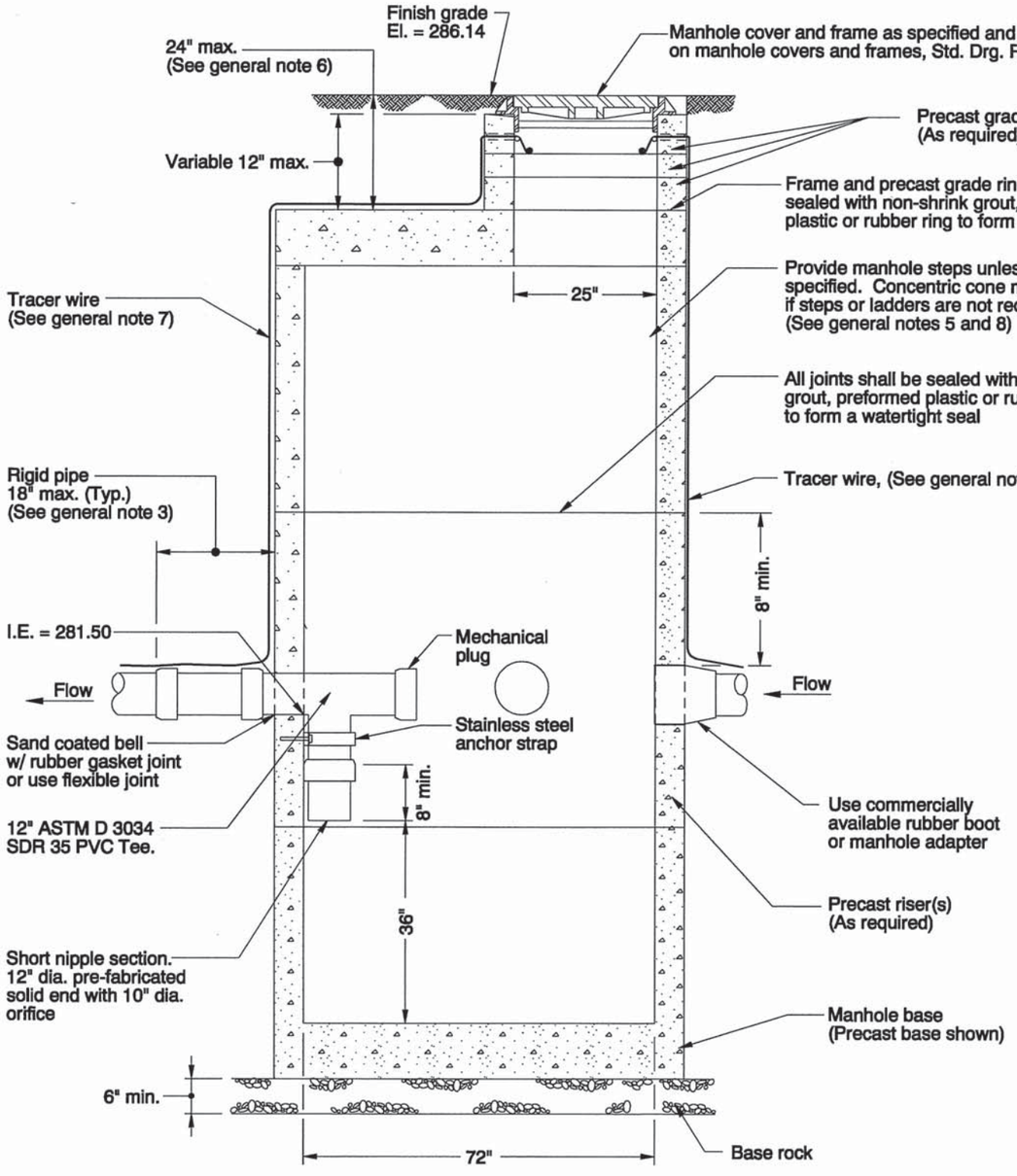
STORMWATER DETAILS

SHEET NO. GJ-4

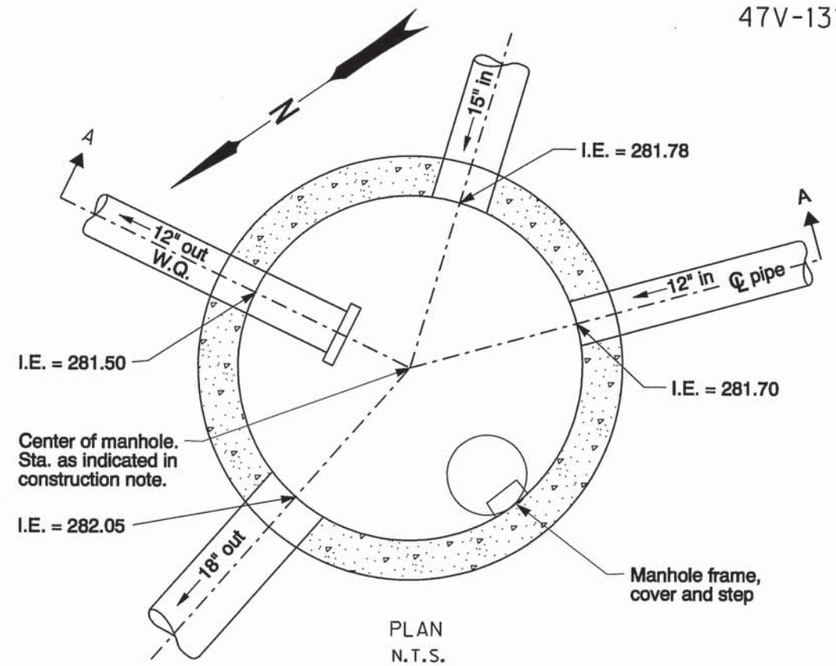
47V-131



SECTION A-A
N.T.S.

DIVERSION MANHOLE

Sta. "A" 155+15.21, 92.82' Rt.
See sht. 7A, note 3



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STORMWATER DETAILS

SHEET NO. GJ-5