OPERATION & MAINTENANCE MANUAL

DFI No. D00054
Facility Type: Water Quality Biofiltration Swale

DECEMBER, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00054**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 34V-107
Location:	District: 1
	Highway No.: 009
	Mile Post: 4.22 / 4.28 (beg./end)
	Description: This facility is located on the western side of the southbound lane of the US 101 (Hwy 009). Access may be obtained directly from the right shoulder of the southbound travel lane.

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

Or

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

3. Construction

Engineer of Record:	ODOT Designers: Region 2 Tech. Center, T. Yamada, K. Austin, 503-986-2990
Facility construction:	2001
Contractor:	NB Hatch Company

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 is located on the western side of the southbound lane of the US 101 (Hwy 009) just north of the round-a-bout configured intersection with Newhalem Highway. Access may be obtained directly from the right shoulder of the southbound travel lane.

The drainage area for this swale includes a segment of the southbound travel lanes of US 101 (Hwy 009). The swale receives water from three sources including sheet flow throughout the swale length, inlets near the center of the swale, and the treated flow from a nearby swale facility DFI D00053. At the northern end of the swale, runoff sheet flows into the facility. At the southern end of the swale, the treated flow from DFI D00053 is directed into the swale through a 12-inch culvert pipe, conveyed beneath a 10-foot concrete sidewalk (Refer to Point A of the Operational Plan in Appendix A; and Photo 1). The inlets near the center of the swale serve as overflow stormwater inlets (Point D) for a sag (roadway low point where extra runoff collects) vertical curve.

After treatment, the stormwater exits the swale through a ditch inlet located approximately midway through the facility (Point B, and Photos 3 and 4). Piping from the ditch inlet is directed into a collector manhole (Point C) that also accommodates the flows from other adjacent swale facilities, DFI D00049, and DFI D00050. Flows from the collector manhole are then directed westerly into an 18-inch outfall and discharged toward a fairly steep ditch that drains into the Columbia River.

A. Maintenance equipment access:
   Maintenance access can be obtained from the southbound travel lanes of US 101 (Hwy 009). The concrete sidewalk can be used for parking vehicles.

B. Heavy equipment access into facility:

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

C. Special Features:

   ☐ Amended Soils
   ☒ Porous Pavers

☐ Liners
☐ Underdrains

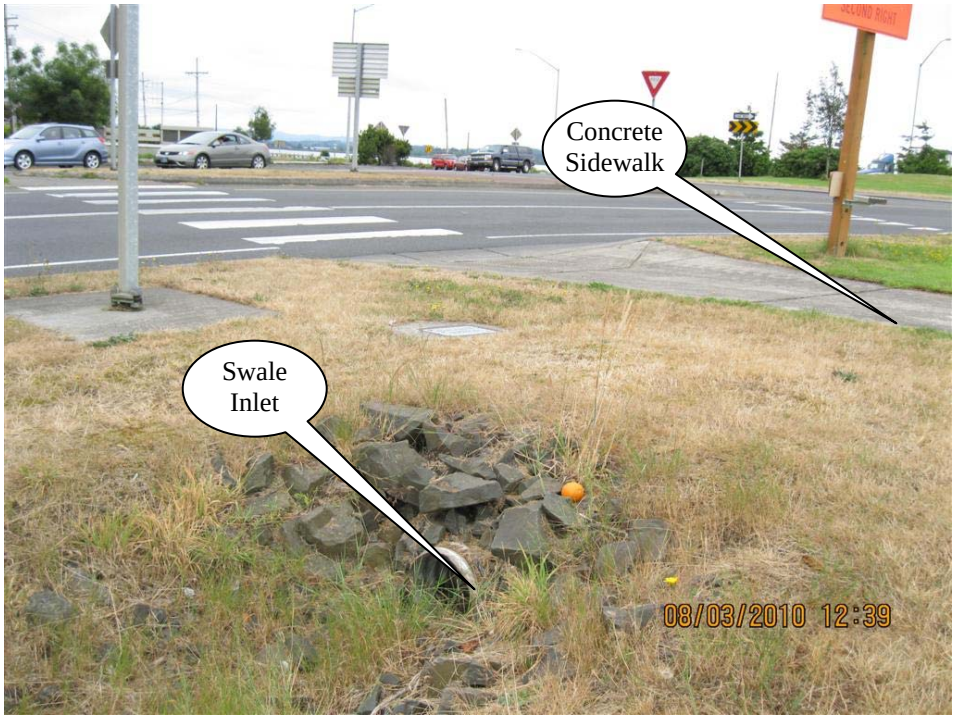


Photo 1: Swale Inlet, 12-inch culvert pipe, at the southern portion of the swale. A 10-foot wide concrete sidewalk is shown to the right.

Photo 2: Photo of swale looking to the north.

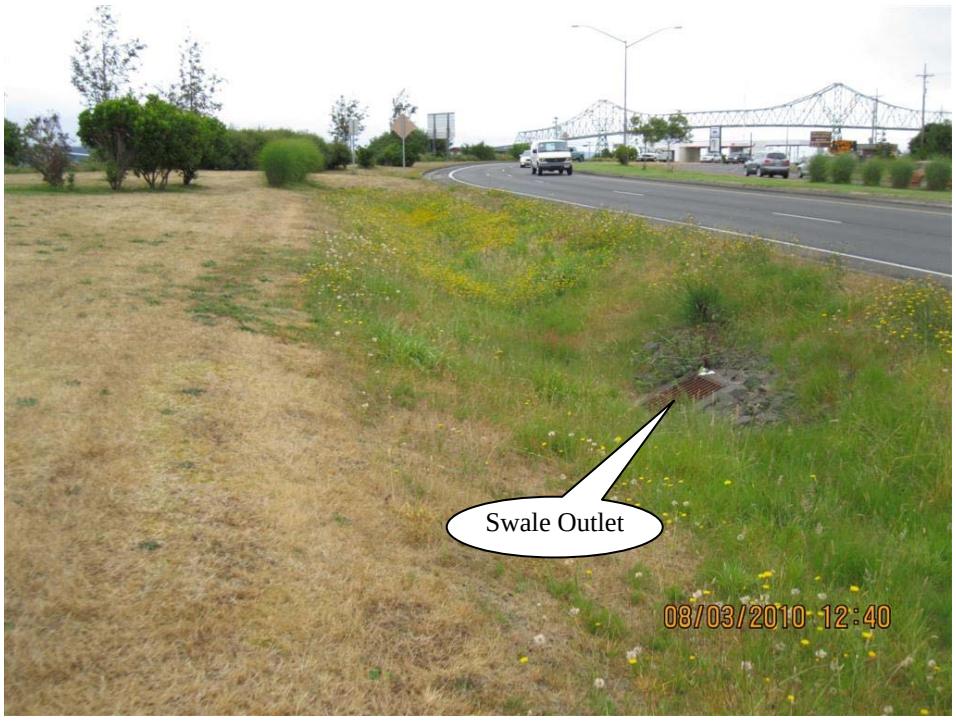


Photo 3: Midpoint of swale where swale outlet is obtained from ditch inlet.

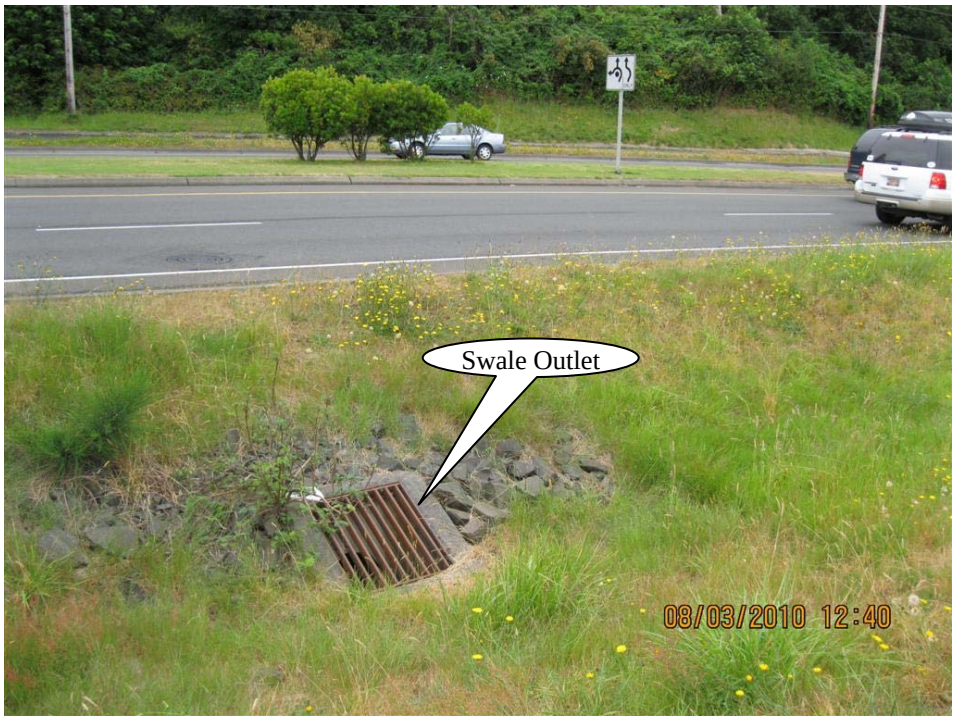


Photo 4: Looking southeast at the facility outlet; Point B on the Operational Plan.

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 18-inch diameter outlet pipe located at the outlet of the swale. This pipe is noted as point B on 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
The auxiliary outlet is included in the design of the swale by including a pipe connecting to adjacent swales. By linking the swales, stormwater can flow into neighboring facilities and slow down while undergoing treatment.

☐ 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:

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

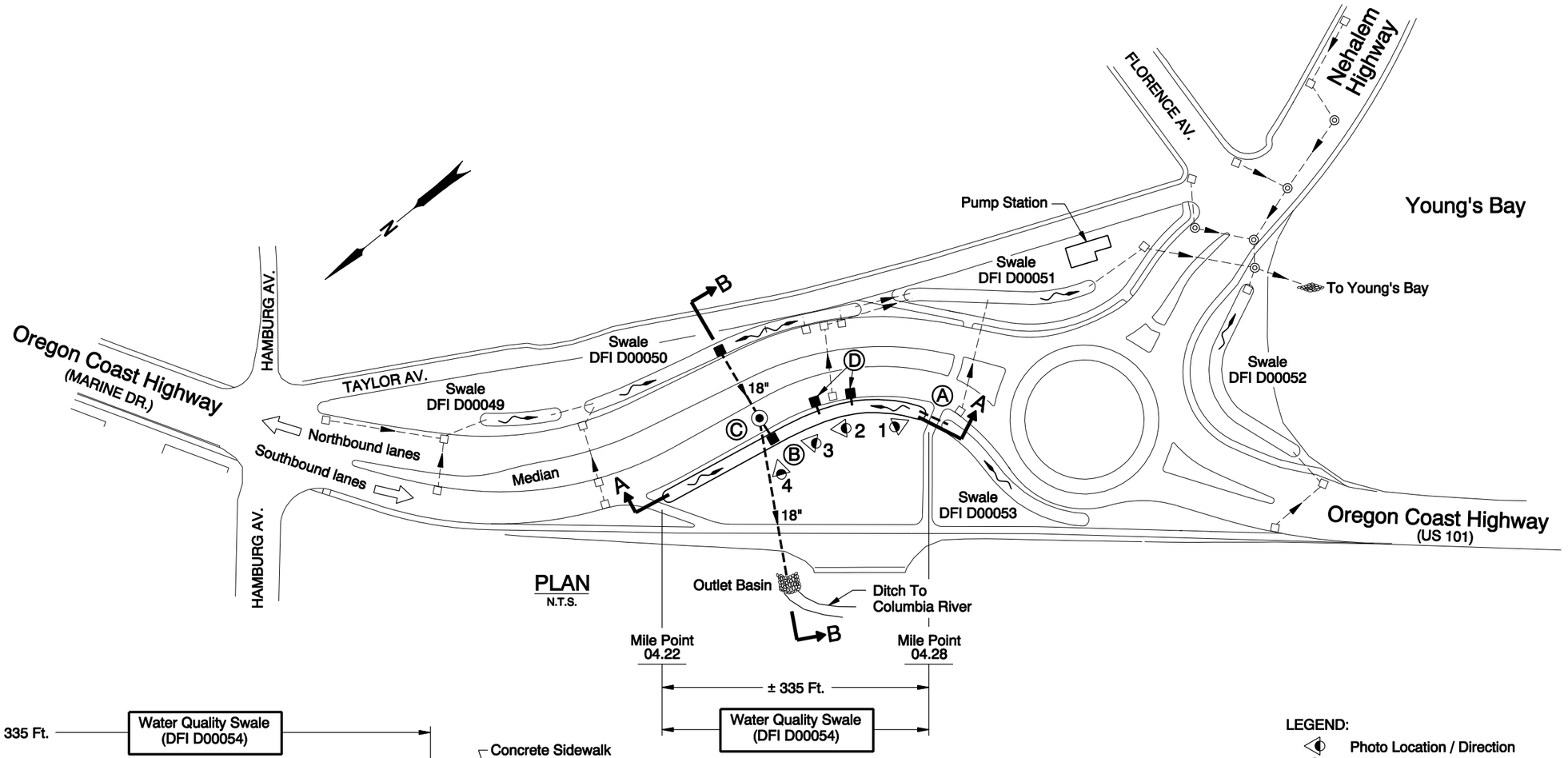
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 986-2647
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

Content:

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



LEGEND:

- Photo Location / Direction
- (A) 12" Storm Drain Pipe Outfalls Into Swale
- (B) Swale Outlet, Ditch Inlet
- (C) Collector Manhole
- (D) Sag Inlets, 2 Into swale
- ◉ and or ◎ Manhole
- ■ and or □ Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: M. Wittenbrink

Drafted By: Jim Holeman

DFI D00054
MAINTENANCE DISTRICT 1 HWY 9
WATER QUALITY BIOFILTRATION SWALE
OREGON COAST HIGHWAY MP 04.22-04.28
CLATSOP COUNTY

G:\01_009_D00054\Operational Plan\DFI_D00054.dgn :: Default 9/29/2011 11:12:42 AM hwye94w

DFI_D00054.dgn

Appendix B

Content:

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

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Standard Drawing Nos.
2, 2A, 2A-2	Typical Sections
2B Thru 2B-6 Incl.	Details
2C	Traffic Control Detour & Details
2C-2 Thru 2C-21 Incl.	Traffic Control Plans
2D, 2D-2	Erosion Control Details
2D-3 Thru 2D-4 Incl.	Erosion Control Plans
2E	Pipe Data
3	"ML", "MR" Line Alignment
3A, 3B	General Construction
3C	"ML", "MR" Line Profile
4	"ML", "MR", "MC", "C", "TL", "TR" Line Alignment
4A, 4B	General Construction
4C	"ML", "MR" Line Profile
4D	"C" Line Profile
5	"MC", "TL", "TR" Line Alignment
5A, 5B	General Construction
5C	"MC" Line Profile
6	"TL", "TR" Line Alignment
6A, 6B	General Construction
6C	"TL", "TR" Line Profile
7	"TL" Line Alignment
7A, 7B	General Construction
7C	"TL" Line Profile

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

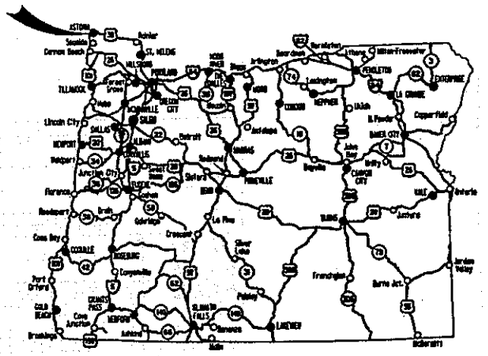
GRADING, PAVING, & SIGNING

US-101 AT NEHALEM HWY. (ASTORIA) SEC.

OREGON COAST & NEHALEM HWYS.

CLATSOP COUNTY

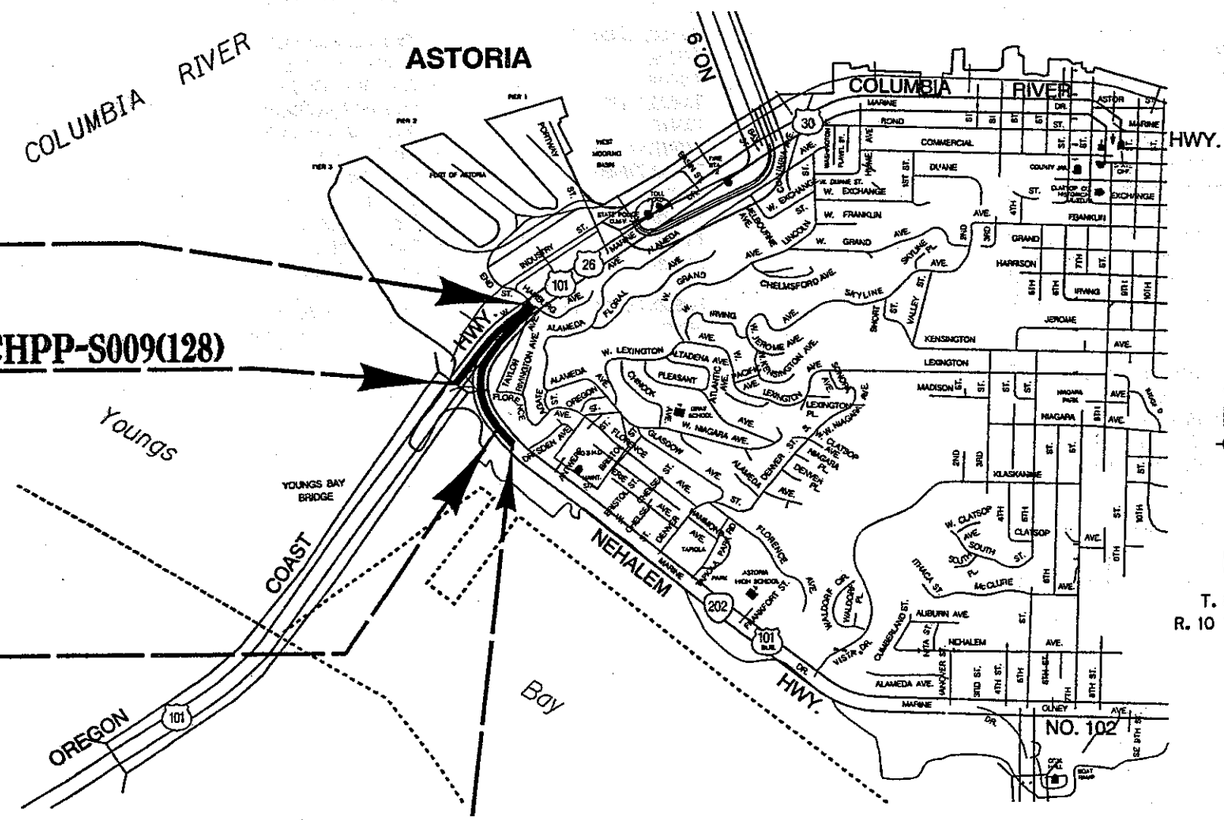
OCTOBER 2001



Overall Length Of Project - 0.61 km (0.38 Mile)

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 From The Center, Or Answers To Questions About The Rules By Calling (503) 232-1987.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE



NH-HPP-ACHPP-S009(128)
BEGINNING OF PROJECT
STA. 'MR" 10+060

END OF PROJECT **NH-HPP-ACHPP-S009(128)**
STA. 'MR" 10+450

NH-HPP-ACHPP-S009(128)
END OF PROJECT
STA. 'TL" 30+640

AS CONSTRUCTED
PROJECT MANAGER
8/20/07
C.Lite

END OF CONTRACT PROJECT
STA. 30+733.049

OREGON TRANSPORTATION COMMISSION

Steven H. Corey	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Stuart Foster	COMMISSIONER
Randall Papé	COMMISSIONER
John Russell	COMMISSIONER
Bruce A. Warner	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
13,704
OREGON
JULY 16, 1987
CATHERINE M. NELSON
Expires Dec. 31, 2002

Catherine M. Nelson

ACTING TECHNICAL SERVICES MANAGING ENGINEER

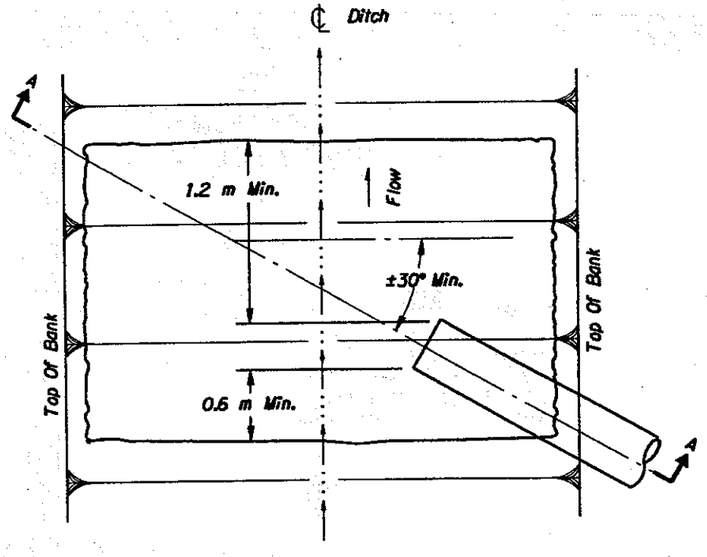
US-101 AT NEHALEM HWY.
(ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-HPP-ACHPP-S009(128)	1

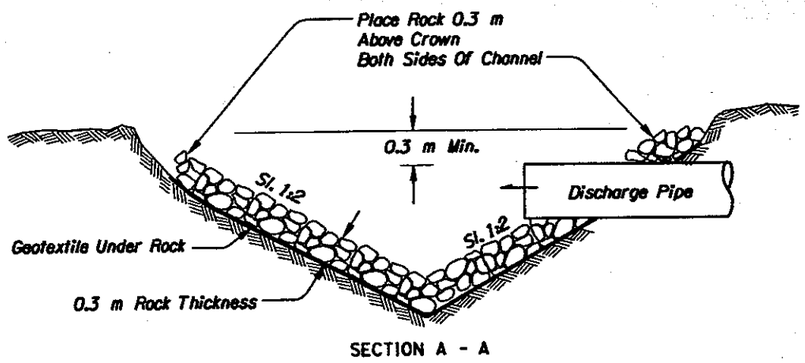
METRIC

22-AUG-2001 11:54
c:\usr\proj\eds\1204ir2.mst
VIEW A1 C004-1420

CH2MHILL

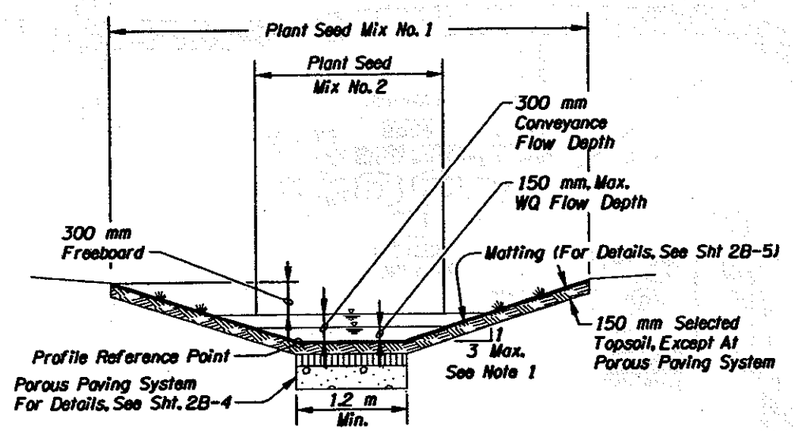


PLAN



SECTION A - A

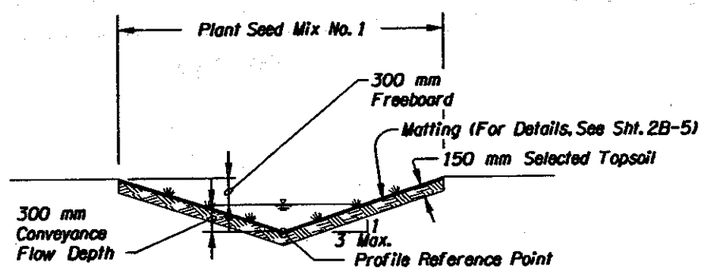
OUTLET BASIN



Eastside Ditch
Sta. "ML" 20+125.3 Lt. To Sta. "ML" 20+217.8 Lt.
Sta. "ML" 20+275.6 Lt. To Sta. "TL" 30+424.9 Lt.

Southside Ditch:
Sta. "MC" 10+403.2 Lt. To Sta. "TL" 30+489.3 Rt.

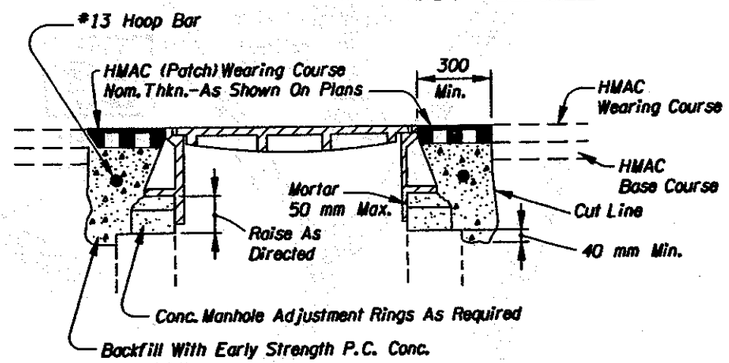
NOTE:
1. Increase Slope To 1V : 2H Adjacent To Existing Wastewater Pump Station (Sta. "TL" 30+432.7 Lt. To Sta. "TL" 30+452.9 Lt.)



Westside ditch:
Sta. "MC" 10+342.9 Rt. To Sta. "MR" 10+163.4 Rt.

Eastside Ditch:
Sta. "ML" 20+217.8 Lt. To Sta. "ML" 20+275.6 Lt.

DRAINAGE SWALE DETAIL



1. Cover Manhole With Building Paper And Const. HMAC Base And Wearing Courses.
2. Sawcut Square Or Circular Excavation Around Manhole 300 mm Min. From M.H. Frame. Orient Diagonal Of Square So That Its Is Parallel To Roadway Center Line.
3. Raise Manhole Frame And Cover To Finish Grade By Installing Conc. Rings And Leveling Mortar.
4. Backfill With Early Strength P.C. Conc. And HMAC Wearing Course.

METHOD "A"
MANHOLE ADJUSTMENT SEQUENCE

Note:
All Dimensions Are In Millimeters (mm) Unless Otherwise Indicated.

REGISTERED PROFESSIONAL ENGINEER
62601PE
OREGON
NOVEMBER 9, 1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Drafted By - Rob Luke

DETAILS

SHEET NO. 2B-6

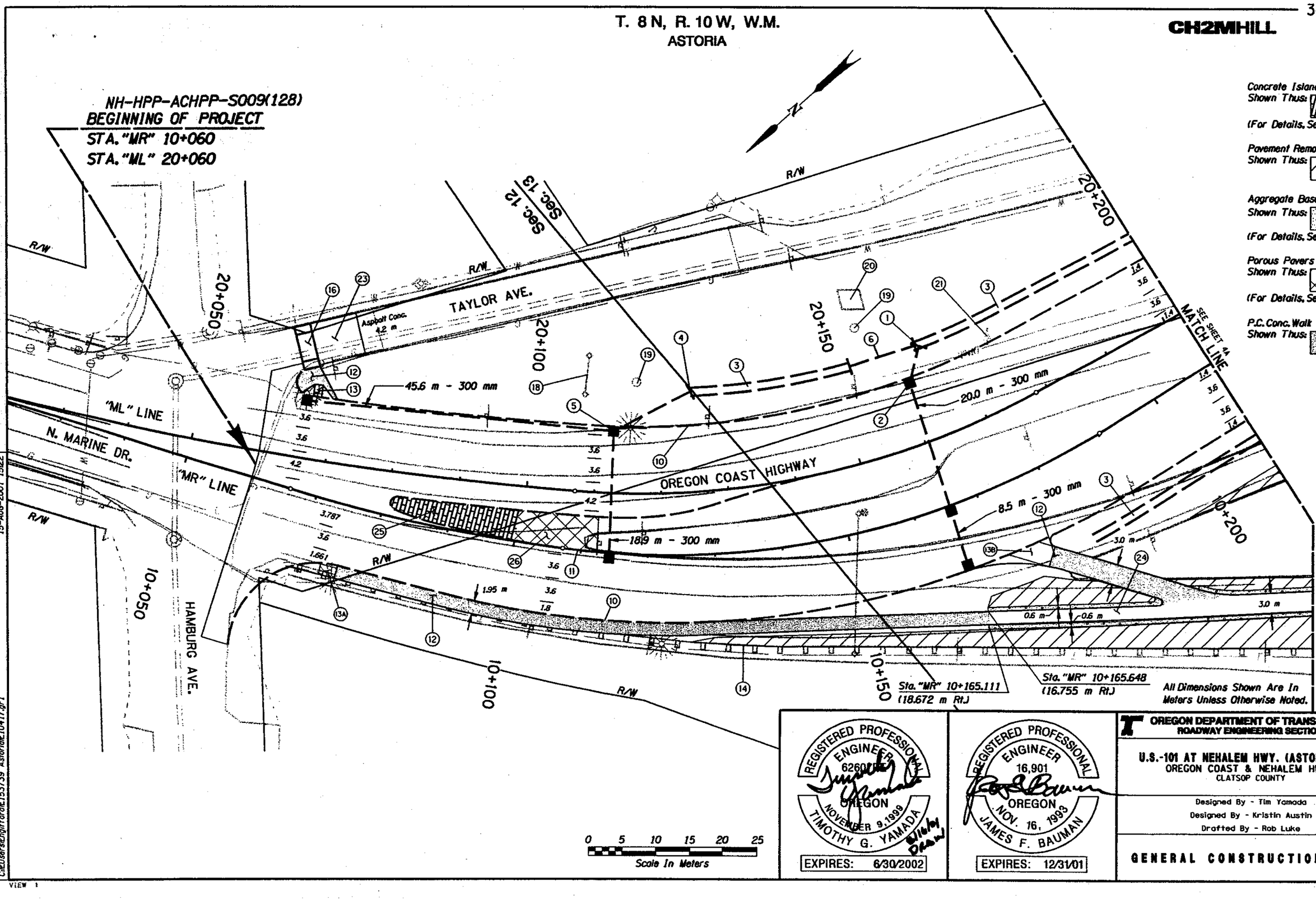
15-AUG-2001 09:51
C:\Users\lhgifford\153739 Astoria\10417.dt1

VIEW 6

T. 8 N, R. 10 W, W.M.
ASTORIA

CH2MHILL

NH-HPP-ACHPP-S009(128)
BEGINNING OF PROJECT
STA. "MR" 10+060
STA. "ML" 20+060



Concrete Island
Shown Thus:
(For Details, See Sht. 2B-4)

Pavement Removal
Shown Thus:

Aggregate Base
Shown Thus:
(For Details, See Sht. 2B-4)

Porous Pavers
Shown Thus:
(For Details, See Sht. 2B-4)

P.C. Conc. Walk
Shown Thus:

0 5 10 15 20 25
Scale In Meters

REGISTERED PROFESSIONAL ENGINEER
6260
OREGON
NOVEMBER 9,1999
TIMOTHY G. YAMADA
Visiting Design
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 3A

15-AUG-2001 15:22
C:\Users\Engl\Ford\153739 Astoria\10417.gr1

VIEW 1
VIEW 1

CH2MHILL

① Sta. "ML" 20+164.65
Inst. 300 mm Sew. Pipe Outfall - 5.8 m
Trench Exc. - 4.1 m³
Inst. Outlet Basin
(For Details, See Sht. 2B-6)

② Sta. "ML" 20+161.03
Const. Type "CG-2" Inlet - 2
Const. Type "G-2" Inlet
Inst. 300 mm Sew. Pipe - 28.5 m
Trench Exc. - 19.7 m³
(See Drg. No. RD336)

③ Const. Drainage Swale
(For Details, See Sht. 2B-6)

④ Sta. "ML" 20+125.26
Inst. 300 mm Sew. Pipe Outfall - 12.8 m
Trench Exc. - 11.2 m³
Inst. Outlet Basin
(For Details, See Sht. 2B-6)

⑤ Sta. "ML" 20+112.60
Const. Type "CG-2" Inlet
Const. Type "G-2" Inlet - 2
Inst. 300 mm Sew. Pipe - 64.5 m
Trench Exc. - 57.4 m³
(See Drg. No. RD336)

⑥ Sta. "ML" 20+152.65
Inst. 450 mm Culvert Pipe - 10.0 m
Trench Exc. 9.8 m³

⑩ Const. Type "A" Curb
(See Drg. No. RD700)

⑪ Const. Type "F" Curb
(See Drg. No. RD700)

⑫ Const. P.C. Conc. Walk

⑬ Const. Sidewalk Ramp
(See Drg. No. RD725)

⑬A Const. Modified Sidewalk Ramp
(For Details, See Sht. 2B-4)

⑬B Const. Modified Sidewalk Ramp (Bikeway)
(See Drg. No. RD725, General Note 7)

⑭ Sta. "MR" 10+068 To Sta. "MC" 10+453
Remove Extg. Guardrail - 384 m

⑯ Const. P.C. Conc. Driveway, Option A
(See Drg. No. 720)

⑱ Maintain And Protect Historic Sign

⑲ Maintain And Protect Stone Monument - 2

⑳ Maintain And Protect Historic Statue

㉑ Remove Utility Pole

㉓ Const. Asphalt Conc. Connection
(See Drg. No. 715)

㉔ Sawcut Extg. Pavement To Maintain 3.0 m Wide Asphalt Conc. Path.
(For Details, See Sht. 2B-4)
Const. Connection Between P.C. Conc. Walks And Asphalt Conc. Path As Directed By Engineer.

㉕ Const. Conc. Island - 65 m²
Stamped Conc. Island Surfacing
(For Details, See Sht 2B-4)

㉖ Const. Porous Paver System - 60 m²
(For Details, See Sht 2B-4)

REGISTERED PROFESSIONAL ENGINEER
6260[illegible]
OREGON
NOVEMBER 9,1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 3B

15-AUG-2001 15:16
C:\Users\khoiffordk.153739 Astoriak.10417.nt1

VIEW 1

VIEW 1

CH2MHILL

"ML" LINE

NH-HPP-ACHPP-S009(128)
BEGINNING OF PROJECT
STA. "ML" 20+060

-0.72%
475 mm
Subgrade
9.254
30.000 m V.C.
+116000
Profile Grade ℄
Ground Line ℄
"ML" 20+159.739 Type "G-2" Inlet (19.99 m Rt.)
F.L. 7.55
"ML" 20+160.15 Type "G-2" Inlet (10.00 m Rt.)
F.L. 7.51
"ML" 20+161.03 Type "CG-2" Inlet (10.00 m Lt.)
F.L. 7.01 W.
F.L. 7.01 S.E.
-1.73%
475 mm
300 mm - 18.9 m
-4.87%
300 mm - 45.6 m
-0.50%
"ML" 20+065.80 Type "G-2" Inlet (9.58 m Lt.)
F.L. 7.70
"ML" 20+112.60 Type "CG-2" Inlet (10.00 m Lt.)
F.L. 7.47 N.
F.L. 7.47 W.
F.L. 7.47 S.
"ML" 20+112.60 Type "G-2" Inlet (8.90 m Rt.)
F.L. 8.39
300 mm - 12.8 m
-1.80%
"ML" 20+125.26 Outfall (15.04 m Lt.)
F.L. 7.24
F.L. Swale 7.16
300 mm - 20.0 m
-2.50%
-1.03%
450 mm
10.0 m
-1.03%
F.L. Swale 6.9
F.L. Swale 6.8
300 mm - 8.5 m
-0.50%
300 mm - 5.8 m
-3.60%
Subgrade
-1.03%
"ML" 20+164.55 Outfall (13.91 m Lt.)
F.L. 6.80
Drainage Swale

20+050 20+100 20+150 20+200

"ML" Line
Earthwork Quantities:
Exc. 590 m3
Emb. 1000 m3
Ditch Exc. 260 m3

"MR" LINE

BEGINNING OF PROJECT
STA. "MR" 10+060

-0.08%
475 mm
Subgrade
9.727
70.000 m V.C.
+120.000
Profile Grade ℄
Ground Line ℄
-2.15%
475 mm
F.L. Swale 7.66
Drainage Swale
Subgrade
-3.84%

10+050 10+100 10+150 10+200

"MR" Line
Earthwork Quantities:
Exc. 1190 m3
Emb. 910 m3
Ditch Exc. 100 m3

All Dimensions Shown Are In Meters Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
62607PE
OREGON
NOVEMBER 9, 1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Timothy Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

PROFILE

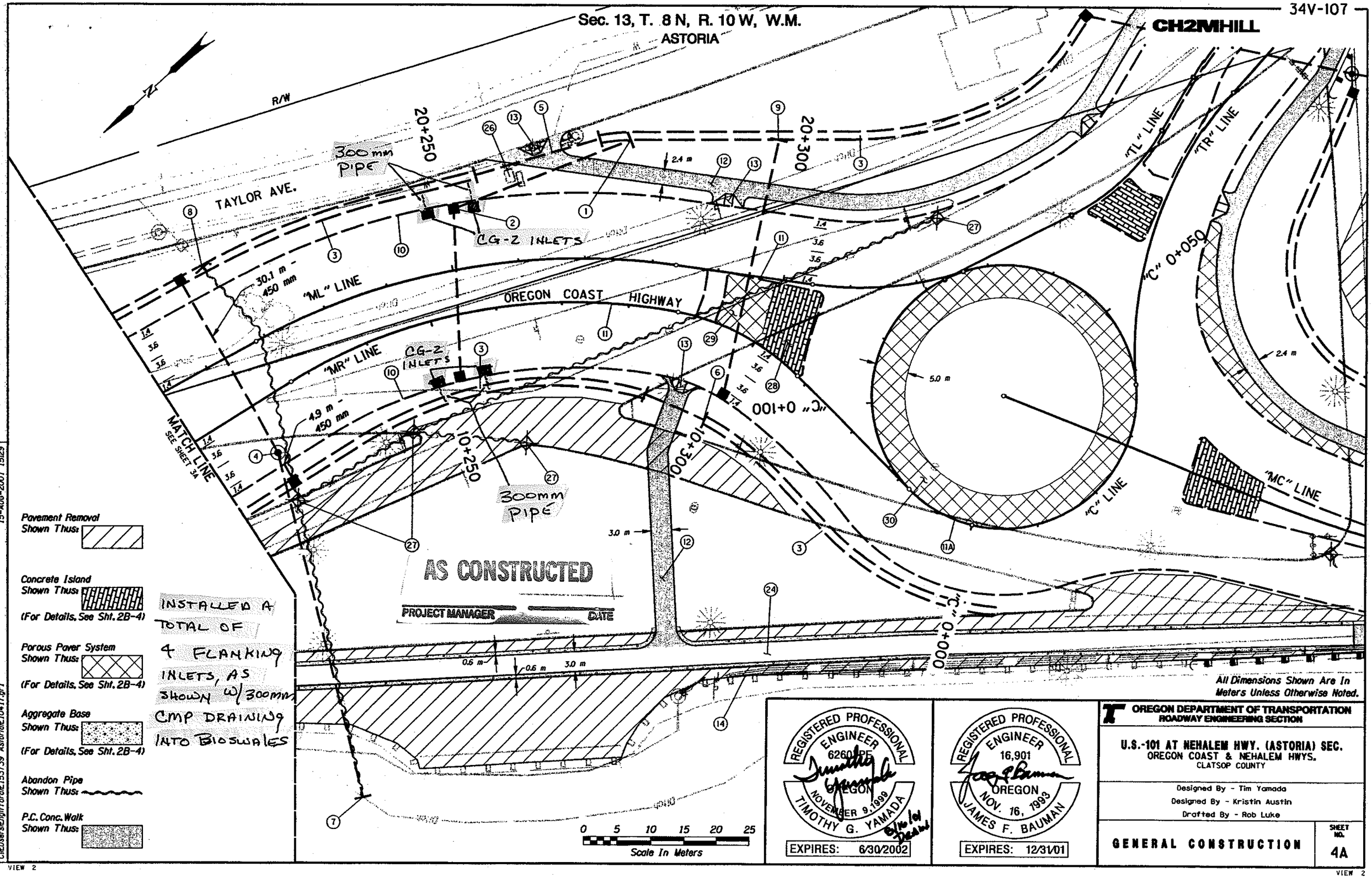
SHEET NO. 3C

15-AUG-2001 10:43
C:\Users\thgifford\153739 Astoria\10417_pf1

VIEW 1

Sec. 13, T. 8 N, R. 10 W, W.M.
ASTORIA

CH2MHILL



All Dimensions Shown Are In Meters Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER 62601PE OREGON NOVEMBER 9,1999 TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER 16,901 OREGON NOV. 16, 1993 JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 4A

15-AUG-2001 15:29
C:\Users\tbgifford\153739 Astoria\10417.gr1

VIEW 2

VIEW 2

CH2MHILL

① Sta. "ML" 20+275.58
Inst. 450 mm Sew. Pipe Outfall - 28.5 m
Trench Exc. - 23.0 m³
Inst. Outlet Basin
(For Details, See Sht. 2B-6)

② Sta. "ML" 20+251.75
Const. Type "CG-2" Inlet - 2
Inst. 300 mm Sew. Pipe - 25.6 m
Trench Exc. - 20.3 m³

③ Const. Drainage Swale
(For Details, See Sht. 2B-6)

④ Sta. "MR" 10+219.74
Const. Manhole
(See Drg. No. RD327)
Const. Type "D "mod. Inlet - 2
(For Details, See Sht. 2B-4)
Inst. 450 mm Sew. Pipe - 35.0 m
Trench Exc. 29.2 m³

⑤ Sta. "ML" 20+255.29
Inst. 300 mm Culvert Pipe - 19.6 m
Trench Exc. - 14.5 m³

⑥ Sta. "MR" 10+284.69
Inst. 300 mm Culvert Pipe - 9.8 m
Trench Exc. - 5.9 m³

⑦ Sta. "MR" 10+203.11
Inst. 450 mm Sew. Pipe Outfall - 53.5 m
Trench Exc. - 87.6 m³
Inst. Outlet Basin
Remove Extg. Sew. Pipe
(For Details, See Sht. 2B-6)

⑧ Sta. "ML" 20+216.95
Cut Extg. Sew. Pipe At Proposed Ditch
I.E. 6.35
Inst. Outlet Basin
(For Details, See Sht. 2B-6)

⑨ Sta. "ML" 20+296.17
Inst. 300 mm Sew. Pipe Outfall - 39.5 m
Trench Exc. - 6.5 m³
Inst. Outlet Basin
(For Details, See Sht. 2B-6)
Const. Type "CG-2" Inlet - 1

⑩ Const. Type "A" Curb

⑪ Const. Type "F" Curb

⑪A Const. Type "B" Curb
(See Drg. No. RD700)

⑫ Const. P.C. Conc. Walk

⑬ Const. Sidewalk Ramp - 3

⑭ See Sht. 3B, Note 14

㉔ See Sht. 3B, Note 24

㉖ Abandon RV Dump Site (By Others)

㉗ Remove Inlet - 4

㉘ Const. Conc. Island - 84 m²
Stamped Conc. Island Surfacing
(For Details, See Sht 2B-4)

㉙ Const. Porous Paver System - 63 m²

㉚ Const. Porous Paver System - 550 m²
(For Details, See Sht 2B-4)

REGISTERED PROFESSIONAL ENGINEER
6206
OREGON
NOVEMBER 9,1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By -Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 4B

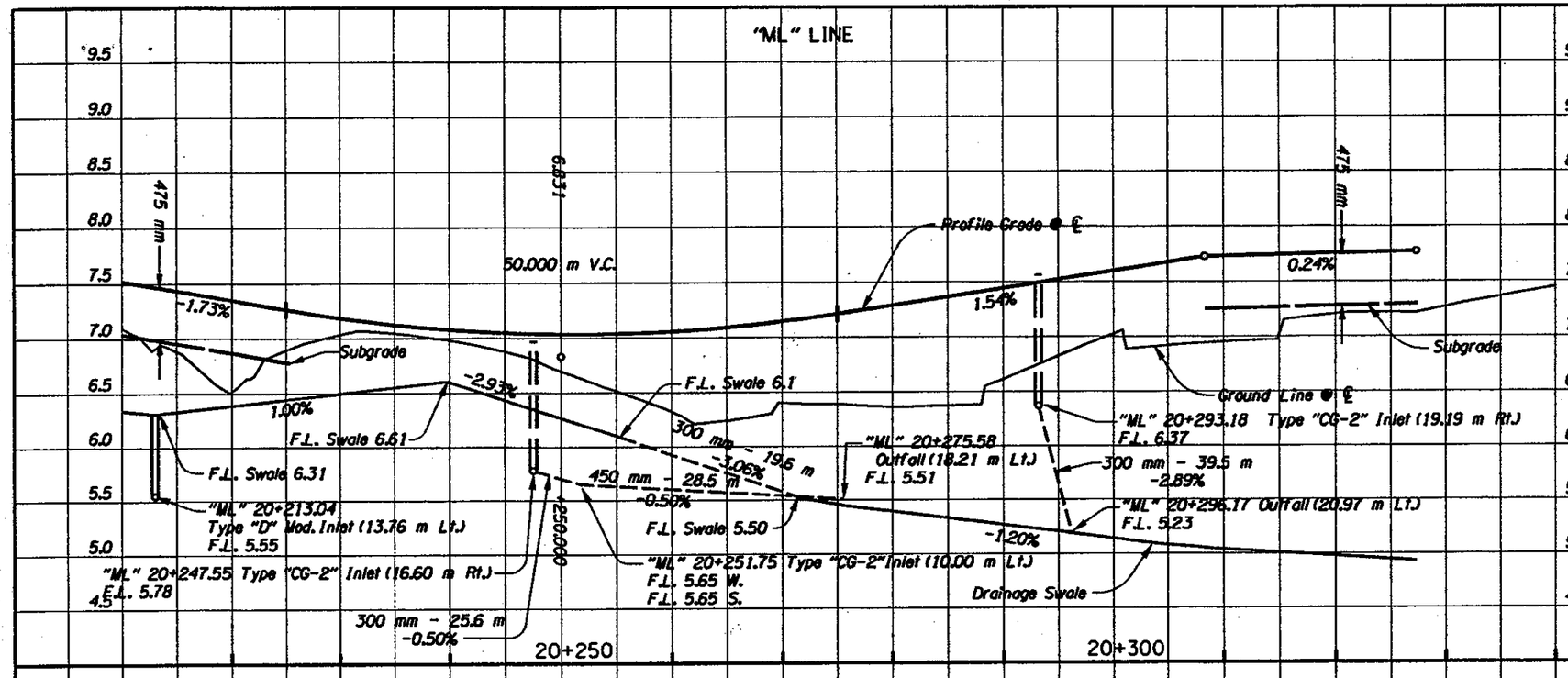
VIEW 2

VIEW 2

C:\Users\bgitford\153739 Astoria\10417.nt1 15-AUG-2001 15:09

CH2MHILL

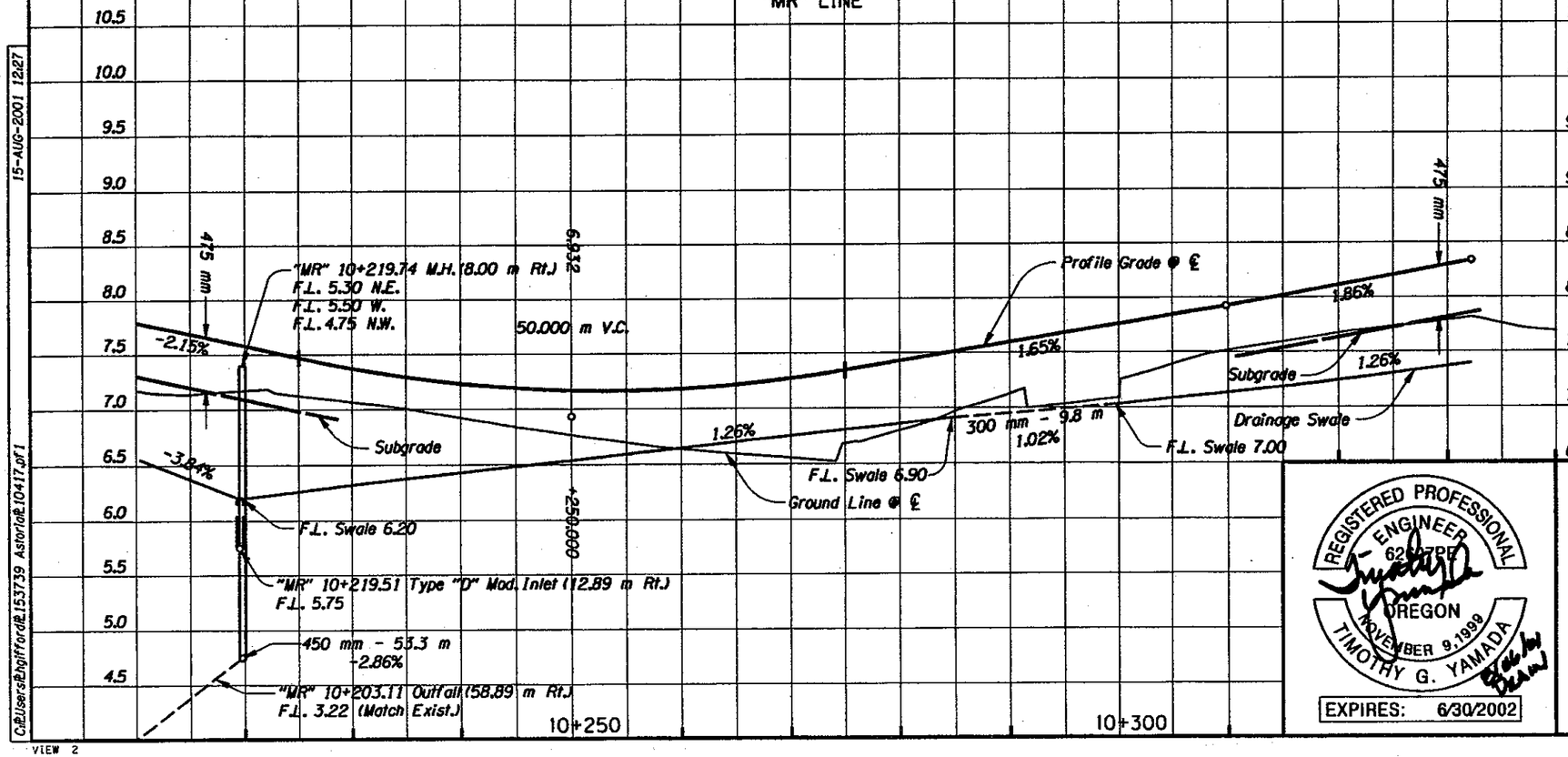
"ML" LINE



"ML" Line
Earthwork Quantities:

Exc.	490 m3
Emb.	1100 m3
Ditch Exc.	460 m3

"MR" LINE



"MR" Line
Earthwork Quantities:

Exc.	520 m3
Emb.	620 m3
Ditch Exc.	390 m3

All Dimensions Shown Are In Meters Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
62[illegible]PE
OREGON
NOVEMBER 9,1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Timothy Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

PROFILE

SHEET NO. 4C

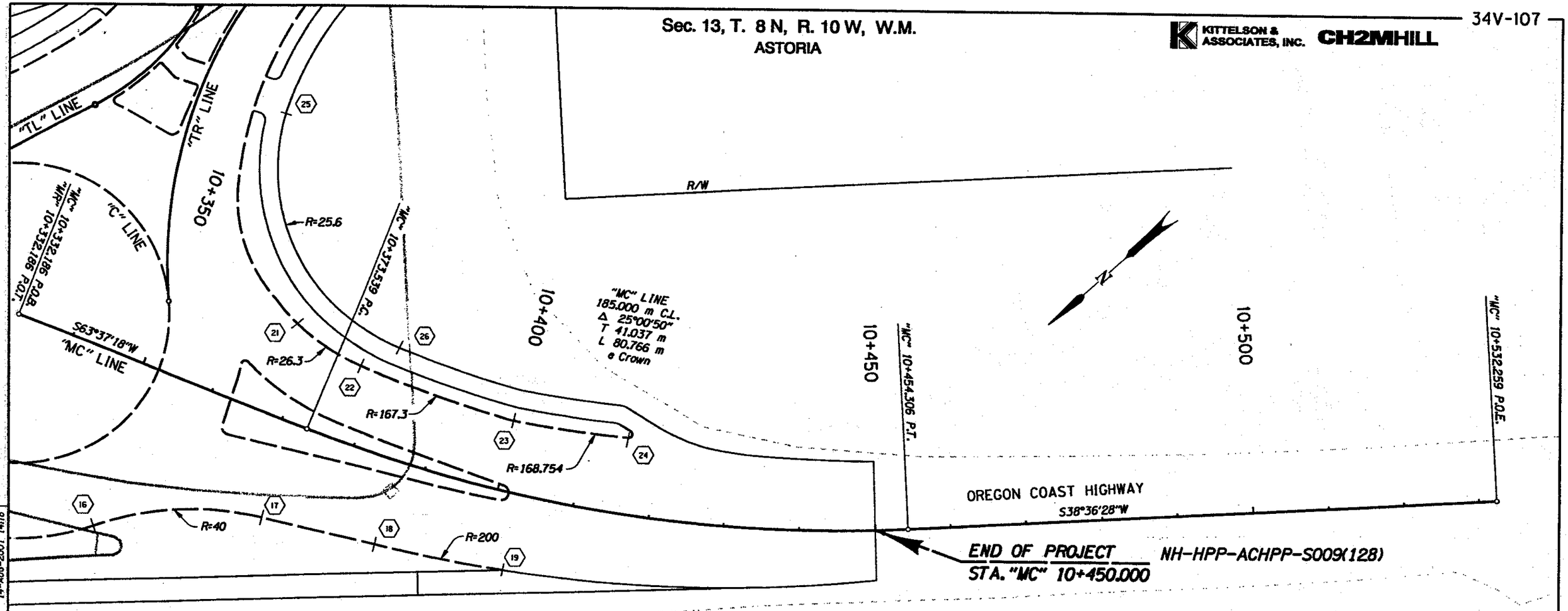
C:\Users\thgifford\153739 Astoria\10417.prf 15-AUG-2001 12:27

VIEW 2

VIEW 2

Sec. 13, T. 8 N, R. 10 W, W.M.
ASTORIA

KITTELSON & ASSOCIATES, INC. CH2MHILL



Point No.	Station
16	"C" 0+011.374 (10.000 Rt.)
17	"MC" 10+372.423 (13.194 Rt.)
18	"MC" 10+386.636 (11.507 Rt.)
19	"MC" 10+402.993 (10.248 Rt.)
21	"MC" 10+363.364 (14.613 Lt.)
22	"MC" 10+377.070 (10.407 Lt.)
23	"MC" 10+399.805 (9.463 Lt.)
24	"MC" 10+415.681 (10.181 Lt.)
25	"TR" 40+458.805 (11.702 Rt.)
26	"MC" 10+381.358 (14.424 Lt.)

0 5 10 15 20 25
Scale In Meters

All Dimensions Shown Are In Meters Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER 59547 OREGON SEPT 22, 1998 LEE A. RODEGERDTS
8/16/01
EXP: 12/31/02

REGISTERED PROFESSIONAL ENGINEER 16,901 OREGON NOV. 16, 1993 JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Lee Rodegerdts
Designed By - Kristin Austin
Drafted By - Rob Luke

ALIGNMENT

SHEET NO. 5

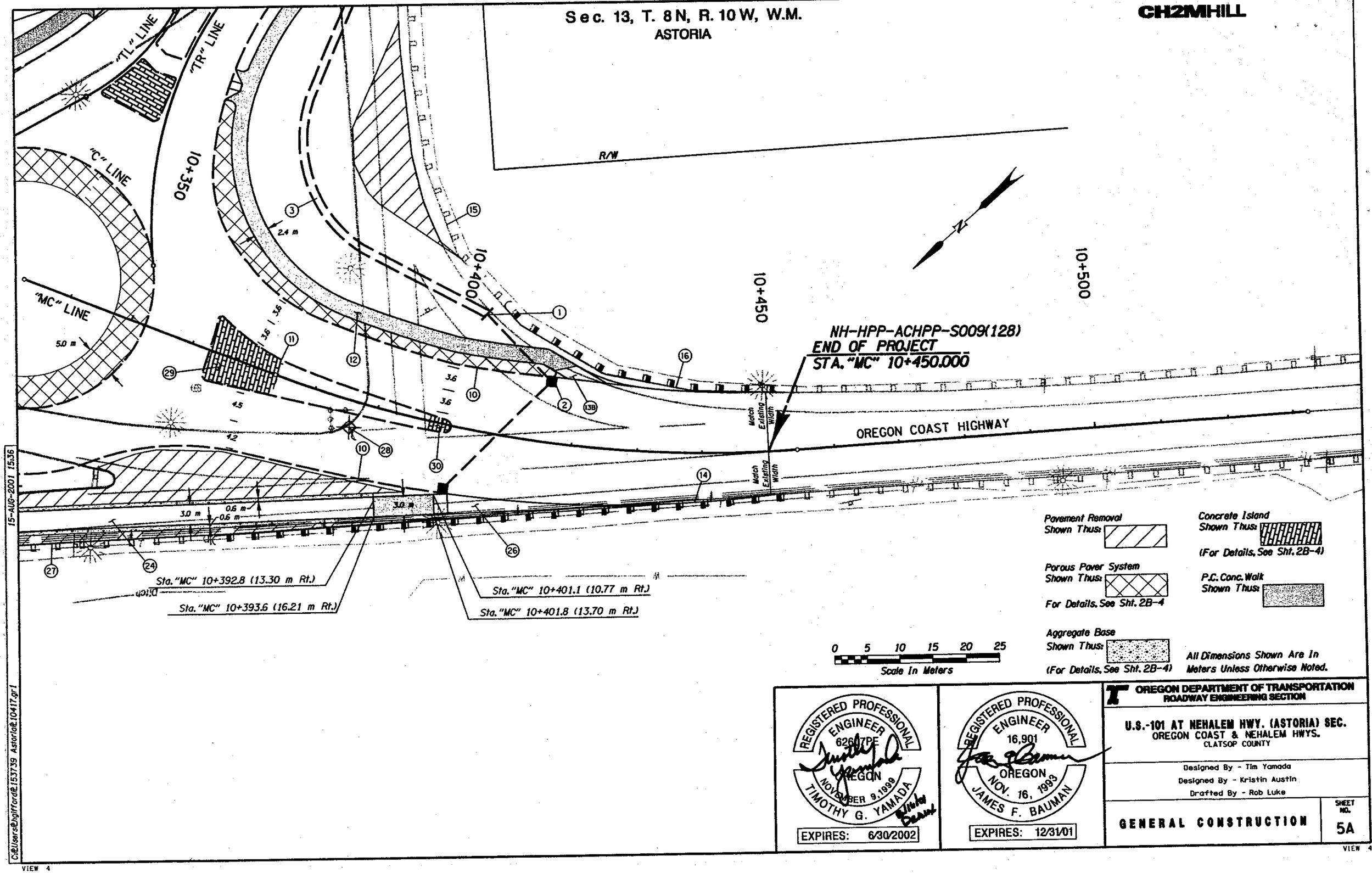
14-AUG-2001 14:18
C:\Users\jhgifford\153739 Astoria\10417.dt1

VIEW 4

VIEW 4

Sec. 13, T. 8 N, R. 10 W, W.M.
ASTORIA

CH2MHILL



Pavement Removal
Shown Thus:

Concrete Island
Shown Thus:
(For Details, See Sht. 2B-4)

Porous Paver System
Shown Thus:
For Details, See Sht. 2B-4

P.C. Conc. Walk
Shown Thus:

Aggregate Base
Shown Thus:
(For Details, See Sht. 2B-4)

0 5 10 15 20 25
Scale In Meters

All Dimensions Shown Are In Meters Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
62607PE
OREGON
NOVEMBER 9, 1999
TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER
16,901
OREGON
NOV. 16, 1993
JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 5A

VIEW 4

15-AUG-2001 15:36
C:\Users\bgifford\153739 Astoria\10417.gr1
VIEW 4

CH2MHILL

① *Sta. "MC" 10+403.39*
Inst. 300 mm Sew. Pipe Outfall - 14.3 m
Trench Exc. - 11.1 m³
Inst. Outlet Basin
(For Details, See Sht. 2B-6)

② *Sta. "MC" 10+415.68*
Const. Type "CG-2" Inlet - 2
Inst. 300 mm Sew. Pipe - 23.3 m
Trench Exc. - 16.7 m³

③ *Const. Drainage Swale*
(For Details, See Sht. 2B-6)

⑩ *Const. Type "A" Curb*

⑪ *Const. Type "F" Curb*

⑫ *Const. P.C. Conc. Walk*

⑬B *Const. Sidewalk Ramp (Bikeway)*

⑭ *Sta. "MC" 10+373.9 (26.2 Rt.)*
To Sta. "MC" 10+453.0 (6.6 Rt.)
Const. Guardrail - 87.63 m (Type 2A)
Const. Anchor (Type 1)
Inst. End Piece (Type B)
Const. Guardrail Connection
(See Drg. No. RD400, RD405, RD415, RD417, RD440)

⑮ *Sta. "TL" 30+627 To Sta. "MC" 10+453*
Remove Extg. Guardrail - 245 m ±

⑯ *Sta. "MC" 10+406.4 (19.4 Lt.)*
To Sta. "MC" 10+453.0 (8.9 Lt.)
Const. Guardrail - 45.72 m (Type 2A)
Const. Anchor (Type 1)
Inst. End Piece (Type B)
Const. Guardrail Connection

㉔ *See Sht. 3B, Note 24*

㉖ *Const. Asphalt Ramp*
(For Details, See Sht. 2B-4)

㉗ *See Sht. 3B, Note 14*

㉘ *Remove Inlet*

㉙ *Const. Conc. Island - 87 m²*
Stamped Conc. Island Surfacing
(For Details, See Sht 2B-4)

㉚ *Const. Conc. Island - 8 m²*
Stamped Conc. Island Surfacing
(For Details, See Sht 2B-4)

REGISTERED PROFESSIONAL ENGINEER 62607PE OREGON NOVEMBER 9,1999 TIMOTHY G. YAMADA
EXPIRES: 6/30/2002

REGISTERED PROFESSIONAL ENGINEER 16,901 OREGON NOV. 16, 1999 JAMES F. BAUMAN
EXPIRES: 12/31/01

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

U.S.-101 AT NEHALEM HWY. (ASTORIA) SEC.
OREGON COAST & NEHALEM HWYS.
CLATSOP COUNTY

Designed By - Tim Yamada
Designed By - Kristin Austin
Drafted By - Rob Luke

GENERAL CONSTRUCTION

SHEET NO. 5B

VIEW 4

VIEW 4