STORMWATER OPERATION & MAINTENANCE MANUAL

Oregon Department of Transportation

Bundle 224 – I-84: Exit 64 (Hood River)

Prepared By:
HNTB Corporation
111 SW Columbia Street, Suite 940
Portland, OR 97201

August, 2009

HNTB

1.0 Identification

Facility Name: Exit 64 WB On-Ramp Swale

Project Name: I-84: Exit 64 (Hood River) – Bundle 224

Facility Type: Biofiltration Swale and Stormwater Pump Station

Drawings: 42V-191

Location: The Bundle 224 project is located on Highway 2 (I-84) in Hood River, OR. The project includes a segment of I-84 and Connector 2 (Button Bridge Road / OR 35). The project site is bordered on the south side by an earthen levee and a considerable natural incline. Railroad tracks and a wetland area are located on the south side of the levee. The Columbia River is located to the north. The Hood River bridge crosses the Columbia River just north of the project.

2.0 Designer

ODOT Representative: Tom Braibish – Region 1 Geo/Hydro 503-731-8529

Designer: John Maloney, PE HNTB Corporation 503-205-4144

3.0 Construction

The project bid date is October 15, 2009. Construction is scheduled for completion in October 2011.

4.0 System Overview

Stormwater Conveyance Systems

The interchange has a system of roadside ditches along the ramps that collect and convey runoff to downstream inlets near the center of the interchange. The curbed section of Button Bridge Road collects stormwater using curbed inlets. All runoff that is conveyed to the low point on Button Bridge Road located beneath the I-84 overpass is conveyed to the stormwater lift station located within the northwest quadrant of the interchange. During low flows the stormwater lift station pumps the runoff to the biofiltration swale and during high flows the lift station pumps runoff south over the levee to the wetland outfall.

Stormwater Management Facility

The stormwater runoff for the project is treated in a biofiltration swale located north of the westbound on-ramp. The low flow pumps discharge water into a riprap basin at the high end of the swale. The large fragmented rock reduce flow velocities and reduce erosion. The swale is grassed with a mild slope and has two riprap flow

spreaders. Stormwater runoff is treated by the grass vegetation and conveyed to an inlet at the end of the swale. Treated runoff is discharged into an existing manhole that connects to the Columbia River.

Stormwater Outfalls

The biofiltration swale conveys water to an inlet and pipe system that discharges into an existing manhole located in Marina Way that connects to the Columbia River. A flap gate located in the manhole upstream of the existing manhole restricts backflow water from the Columbia River. The high capacity outfall is pumped through a pressurized pipe to discharges into a riprap basin that reduces flow velocities. The pressurized pipe includes restrained joints, thrust blocks, and pressure release valves.

Stormwater Lift Station

The stormwater lift station is comprised of two pump station structures, two valve vaults, an electrical control panel, a backup generator, and an access driveway. The stormwater lift station includes detailed mechanical and electrical systems. The pump station has a low flow pump system and a high flow pump system as described above. The maintenance access is provided along the west side of Button Bridge Road just south of the westbound ramp intersection.

5.0 Hazmat Spill Operation

The stormwater treatment swale can be used to store a large volume of liquid by blocking the inlet at the downstream end of the swale (Sheet 20). The stormwater pump station wet well can also be used to store a large amount of liquid by turning off the pump system. The wet well can store a maximum of approximately 30,000 gallons before liquid back flows out of upstream inlets. See Sheet 2B-8 for pump station operating details.

6.0 Overflow System

The swale is located within a localized low point. The westbound on-ramp, Button Bridge Road, and Marina Way are elevated. Overflow water from the swale will stage within this low area. In a large storm event the low flow pumps are turned off when the high flow pumps are turned on, this condition should limit any staging in the swale. Staging should not overtop the Button Bridge Road curb. If the water surface elevations approach within 6 inches of the Button Bridge Road curb, check pipe or outlet structure blockage and remove obstructions immediately.

7.0 Maintenance Requirements

This section describes the stormwater systems and maintenance requirements for the systems to allow proper operation of the stormwater conveyance systems and stormwater management facility.

Schedule:

Special

- Inspection and maintenance (as needed) of swale after first 24-hr rainfall > 0.50 inches).

Annual

- Inspection and maintenance (as needed) of swale
- Inspection and maintenance (as needed) of structures and roadside ditches
- Clean Stormwater pump station structures using Vactor Truck and jet hose

Every 3 to 5 Years

- Remove sediments from swale bottom.
- Clean riprap basins of all sediments.
- Re-establish vegetation in roadside ditches and swale (as needed)

Stormwater Biofiltration Swale:

A. Inlet – Remove debris and vegetation obstructing pipe inlet into the swale.

B. Embankments – Check for and repair cracking, sloughing, and erosion.

C. Storage Area – Remove sediments when a 4 inch depth has accumulated on the swale bottom. The swale bottom slope should be maintained at a 0.55 percent.

D. Outlet structure – Remove debris from grate and sediments from inlet sump. Clean 18 inch outlet pipe as needed. Inspect flap gate and maintain per manufacture's specification.

E. Vegetation – Mow grassed swale. Re-establish grass as needed.

F. Hazmat Spill – Remove all contaminated sediment and sludge from all portions of the system following any Hazmat spill and dispose of according to Section 8 of this document.

The standard maintenance requirements for the swale are included in the appendix.

Stormwater Pump Station:

A. Inlet – Remove debris and vegetation obstructing pipe inlet into the swale

B. Pump station structures – Remove sediments from pump station structures with Vactor Truck and jet hose.

C. Clean weir openings as needed.

D. Hazmat Spill – Remove all contaminated sediment and sludge from all portions of the system following any Hazmat spill and dispose of according to Section 8 of this document.

E. Access – Repair severe cracking or deterioration in asphalt pavement.

The detailed Operations and Maintenance manuals for the pump station systems will be provided by the contractor after construction and should be added to this manual.

8.0 Waste Material Handling

Material removed from the facility is defined as waste by DEQ. This means the material must be disposed of at permitted waste management facility or managed, reused, or recycled according to DEQ waste rules.

Roadwaste materials can be contaminated with chemical pollutants such as heavy metals or hydrocarbons generated from highway vehicles. Roadwaste is sent to a permitted waste management facility, facility operators may require testing for specific pollutants before the material will be accepted for disposal. If roadwaste material is being stockpiled or recycled it should be known if the material is contaminated and at what concentrations. Chemical testing for total metals and hydrocarbons is required. Other pollutants may be present such as pesticides. All trash and litter must be removed and properly disposed.

Contact any of following for more detailed information about management of this waste material:

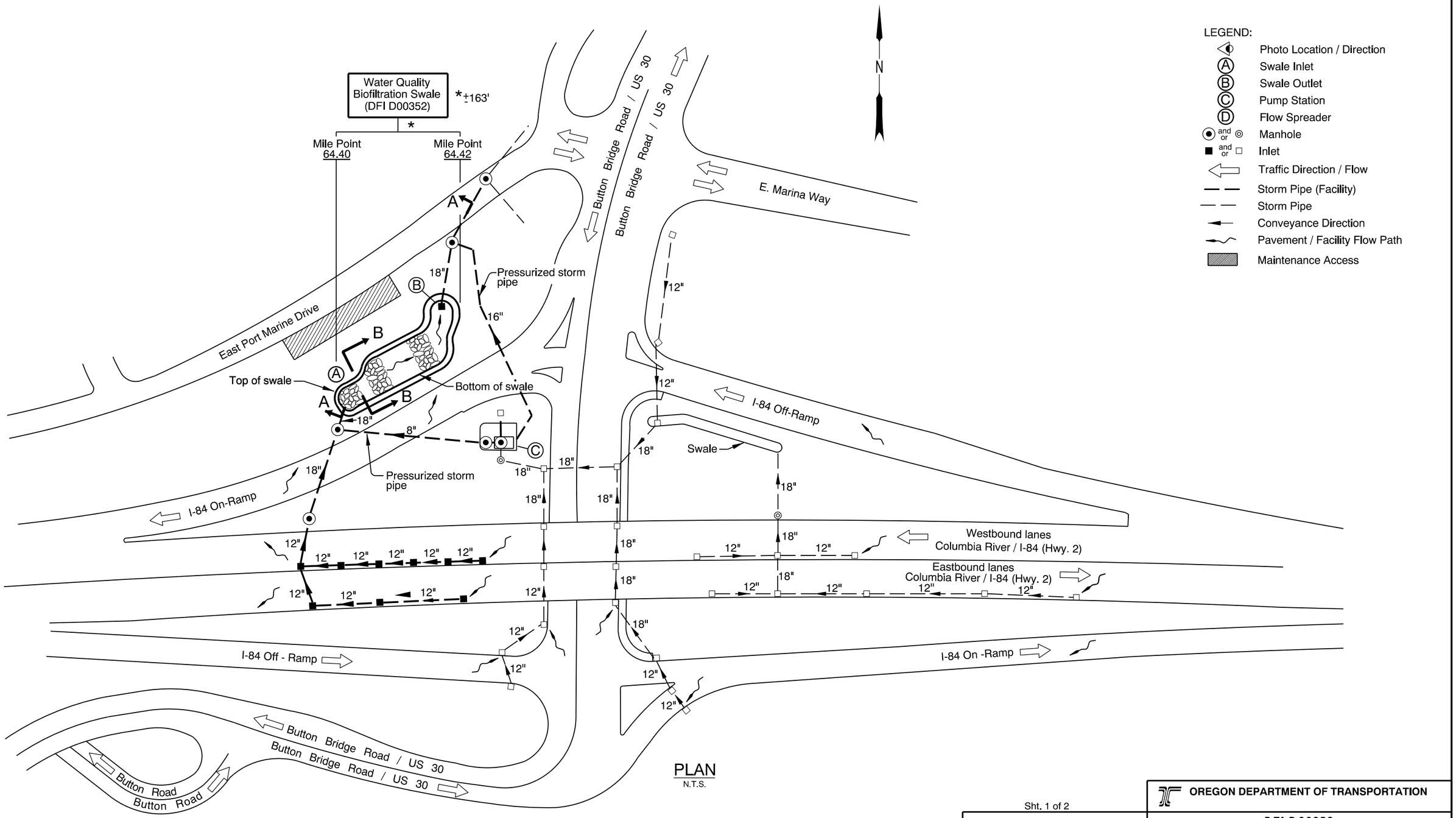
ODOT Clean Water Unit	503-986-3509
ODOT Statewide Hazmat Coordinator	503-229-5129
ODOT Region Hazmat Coordinator	503-731-8455
ODEQ Eastern Region Office	541-298-7255

Appendix

Biofiltration Swale Maintenance Table
Plans (Excerpts)

Maintenance Requirements for Biofiltration Swales

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment accumulation along bottom of swale	Sediment depth exceeds 2 inches.	Sediment deposits removed along bottom of swale. Swale slope and geometry restored to design standards. Areas with minimal grass cover reseeded. There should be no areas of standing water once inflow has ceased.
	Ponding water	Ponding water in the swale between storms and does not drain freely.	Any of the following may apply: remove sediment or trash blockages; improve grade from head to foot of swale; or add an under drain
	Flow spreader	Flow spreader is uneven or clogged so that flows are not uniformly distributed through entire swale width.	Spreader is re-leveled and cleaned to restore sheet flow conditions along the swale.
	Poor vegetation coverage	Grass is sparse or bare, or eroded patches occur in more than 10 percent of the swale bottom.	Poor grass growth is corrected and bare areas reseeded.
	Vegetation growth	Grass becomes excessively tall (greater than 10 inches); nuisance weeds and other vegetation start to take over.	Vegetation is mowed and nuisance vegetation removed so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches. Remove grass clippings. Noxious weeds are removed following state or local policies. Herbicides should not be used to control vegetation.
	Excessive shading	Grass growth is poor because the lack of sunlight.	Overhanging limbs are trimmed. Brushy vegetation on adjacent slopes is removed.
	Inlet/outlet conveyance piping and structures	Inlet/outlet areas are clogged with sediment and/or debris.	Material removed so there is no clogging or blockage in the inlet and outlet area.
	Trash and debris	Trash and debris have accumulated in the swale.	Trash and debris removed from swale.
	Erosion	Swale bottom has eroded due to flow channelization or high flows.	Bare areas are regarded and reseeded.



PLAN
N.T.S.

Sht. 1 of 2

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Craig Fox

Drafted By: Chris Wallen

DFI D00352
MAINTENANCE DISTRICT 2C HWY 2
WATER QUALITY BIOFILTRATION SWALE
COLUMBIA RIVER HWY. MP 64.40-64.42
HOOD RIVER COUNTY

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

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

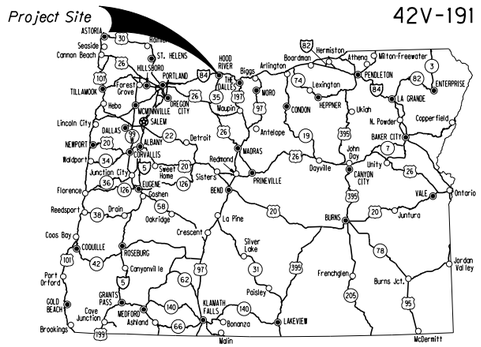
I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224

COLUMBIA RIVER HIGHWAY

HOOD RIVER COUNTY

OCTOBER 2009

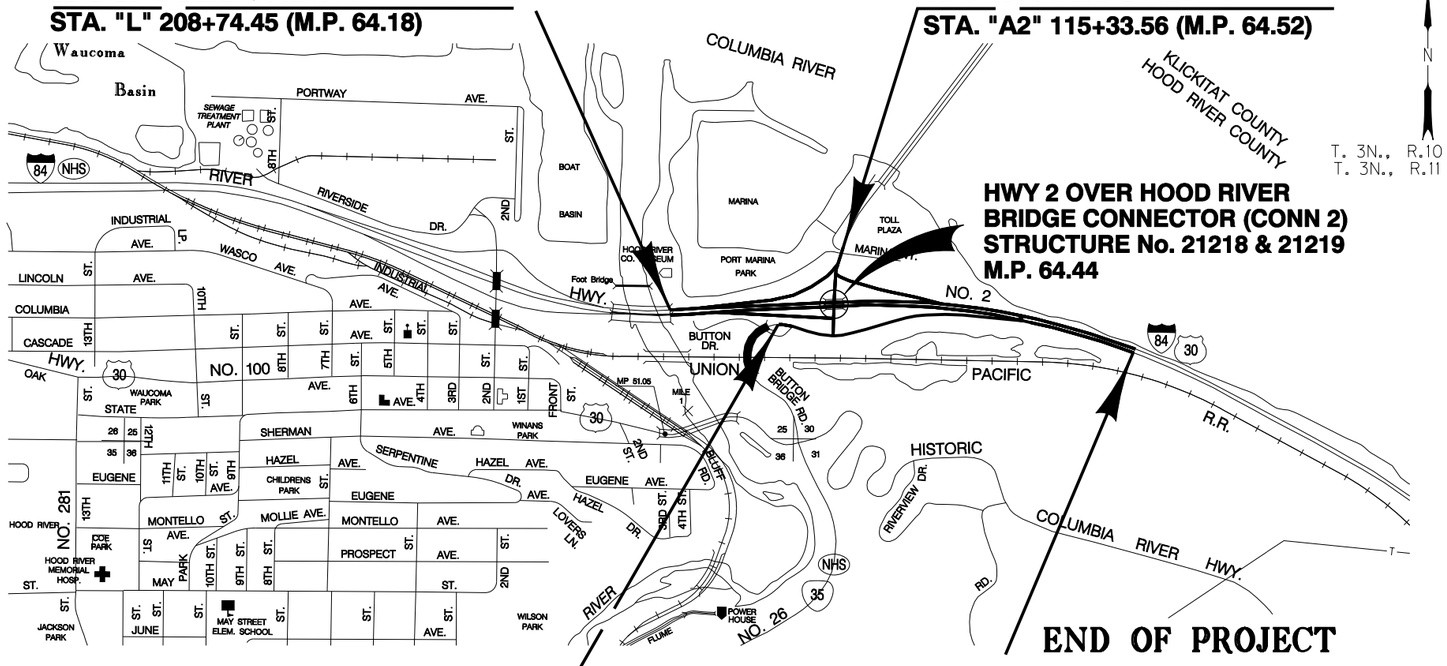
42V-191



Overall Length Of Project - 0.63 Miles

BEGINNING OF PROJECT
X-NH-OTIA-S002(095)
STA. "L" 208+74.45 (M.P. 64.18)

BEGINNING OF PROJECT
X-NH-OTIA-S002(095)
STA. "A2" 115+33.56 (M.P. 64.52)



HWY 2 OVER HOOD RIVER
BRIDGE CONNECTOR (CONN 2)
STRUCTURE No. 21218 & 21219
M.P. 64.44

END OF PROJECT
X-NH-OTIA-S002(095)
STA. "A2" 124+11.89 (M.P. 64.37)

END OF PROJECT
X-NH-OTIA-S002(095)
STA. "L" 242+12.50 (M.P. 64.81)

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

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

Gail L. Achterman	CHAIR
Mike Nelson	VICE-CHAIR
Janice J. Wilson	COMMISSIONER
Alan Brown	COMMISSIONER
David Lohman	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
ODOT
BY:
HNTB

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.

By: _____
Signature & date

_____
Print name and title

_____
Concurrence by ODOT Chief Engineer

OREGON TRANSPORTATION INVESTMENT ACT

I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	X-NH-OTIA-S002(095)	1

EA NO. 22421119

INDEX OF SHEETS, CONT'D

SHEET NO.	DESCRIPTION
1B	Plan Sheet Layout
1C Thru 1C-3	Survey Control Data Sheets
2 Thru 2A-4 Incl.	Typical Sections
2B Thru 2B-3	Intersection Details
2B-4 Thru 2B-6	Drainage Details
2B-7 Thru 2B-10	Pump Station Details
2B-11 Thru 2B-16	Miscellaneous Details
2C Thru 2C-6	Traffic Control Details
2D Thru 2D-32 Incl.	Traffic Control Plans
2E, 2E-2	Pipe Data Sheets
3, 3A	Alignments
4 Thru 10A	General Construction
11 Thru 17	Profiles
18 Thru 20	Drainage & Utilities
GA	Erosion Control Plans
GN Thru GN-3	Roadside Development Details
GN-4 Thru GN-7	Roadside Development Plans
ST Thru ST-5	Striping Plans
S-08291 Thru S-08297	Permanent Signing Plans
IL-1647, IL-1648	Underdeck Illumination Plans
15384 Thru 15396	Signal Plans

BRIDGE DRAWINGS - STRUCTURE 21218

SHEET NO.	DESCRIPTION
82313	Plan And Elevation
82314	General Notes
82315, 82316	Construction Staging
82317	Concrete Pour Sequence And Finish
82318, 82319	Foundation Data Sheet
82320	Foundation Plan
82321	End Bent 1 - Plan And Elevation
82322	End Bent 2 - Plan And Elevation
82323	End Bent Details (1 of 3)
82324	End Bent Details (2 of 3)
82325	End Bent Details (3 of 3)
82326	Pylon Details
82327	Typical Deck Section
82328	Deck Plan
82329	Framing Plan
82330	Girder Elevation
82331	Camber Diagram and Details
82332	Crossframe Details
82333	Steel Girder Details
82334	Miscellaneous Steel Details
82335	Miscellaneous Details
82336	MSE Wall General Notes And Details
82337	MSE Wall Details

BRIDGE DRAWINGS - STRUCTURE 21219

SHEET NO.	DESCRIPTION
82338	Sign Support Footing

Standard Drg. Nos.

BR165	- Bridge End Panel
BR200	- Standard Concrete Bridge Rail Type "F"
BR214	- Concrete Parapet With Steel Post
BR223	- Combination Rail
BR266	- Modified Type 2A Rail
BR273	- Thrie Beam Rail Retrofit For Curb And Parapet Rail
BR970	- Luminaire Base On Structures With Mounting Details
RD150	- Slope Rounding
RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD318	- Sloped Ends For Concrete Pipe
RD336, RD342, RD344	- Manholes
RD356	- Manhole Cover & Frames
RD360	- Manhole Frame Adjustment
RD364, RD366	- Concrete Inlets
RD386	- Pipe Fill Height Tables
RD400, RD405, RD410, RD415, RD420, RD425, RD440, RD445, RD450, RD470	- Guardrail
RD500	- Precast Concrete Barrier Pin And Loop Assembly
RD505	- Concrete Barrier Cast-In-Place
RD515	- Median Barrier Anchoring Details
RD516	- Securing Concrete Barrier To Roadway
RD560	- Cast-In-Place Tall Conc. Barrier Tran. To Std. Conc. Barrier
RD590	- 35" Concrete Median Barrier Cast-In-Place
RD610	- Asphalt Pavement Details
RD700	- Curbs
RD705	- Islands
RD715	- Approaches And Non-Sidewalk Driveways
RD720	- Sidewalks
RD755	- Sidewalk Ramp Details
RD759	- Truncated Dome Detectable Warning Surface Details
RD810	- Barbed And Woven Wire Fences
RD815	- Chain Link Fence
RD1000	- Construction Entrances
RD1005	- Check Dams
RD1010, RD1015, RD1020	- Inlet Protection
RD1025, RD1030, RD1035	- Sediment Barrier
RD1040	- Sediment Fence
TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM204	- Flag Board Mounting Details
TM206	- Sign Bracing Detail
TM211, TM212	- Signing Details
TM220	- Multi-Post Installations
TM223, TM224	- Directional Sign Layout
TM300, TM301	- Illumination Control Cabinets

Standard Drg. Nos.

TM450	- Mast Arm Pole Details
TM452	- Strain Pole Details
TM453	- Stabilizer Details
TM455	- Temporary Signal 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, TM478	- Loop Details
TM480	- Loop Entrance Details
TM482	- Controller Cabinet And Foundation Details
TM485	- Service Cabinets And Service Cabinet Wiring Details
TM488	- Terminal Cabinet Detail
TM490	- Crosswalk Closure Detail
TM498	- Interconnect Wiring Details
TM500, TM501, TM502, TM503	- Pavement Marking Standard Details
TM525	- Turn Arrow Marking Details
TM530	- Intersection Pavement Markings
TM547	- Freeway Entrance Ramp Pavement Markings
TM551	- Freeway Exit Ramp Pavement Markings
TM570	- Traffic Delineators
TM571	- Traffic Delineators Steel Post Details
TM575, TM576, TM577	- Traffic Delineator Installation
TM600, TM601	- Multi-Post Breakaway Sign Supports
TM602	- Triangular Base Breakaway Multi-Direction Slip Base
TM622, TM623, TM626	- Monotube Cantilever Sign Support
TM635	- Breakaway Sign & Luminaire Supports
TM650, TM651, TM652, TM653	- Traffic Signal Supports
TM670	- Perm. Signing Wood Post Supports Sizing Charts
TM675	- Extruded Aluminum Panels
TM676	- Sign Attachments
TM677	- Sign Mounts
TM678	- Secondary Sign Mounting Details
TM679	- Signal Mast Arm Street Name Sign Mounts
TM680	- Signal Pole 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
TM830	- Temporary Concrete Barrier And Rumble Strips
TM831, TM832	- Temporary Impact Attenuators
TM840	- Closure Details
TM841, TM842	
TM843	- Intersection Details
TM850	- 2-Lane, 2 Way Roadways
TM851, TM852	- Non-Freeway Multi-Lane Sections
TM860, TM861, TM862	- Freeway Sections
No R/W Map	

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

HNTB CORPORATION
111 SW COLUMBIA ST. , STE 940 PORTLAND, OR 97201
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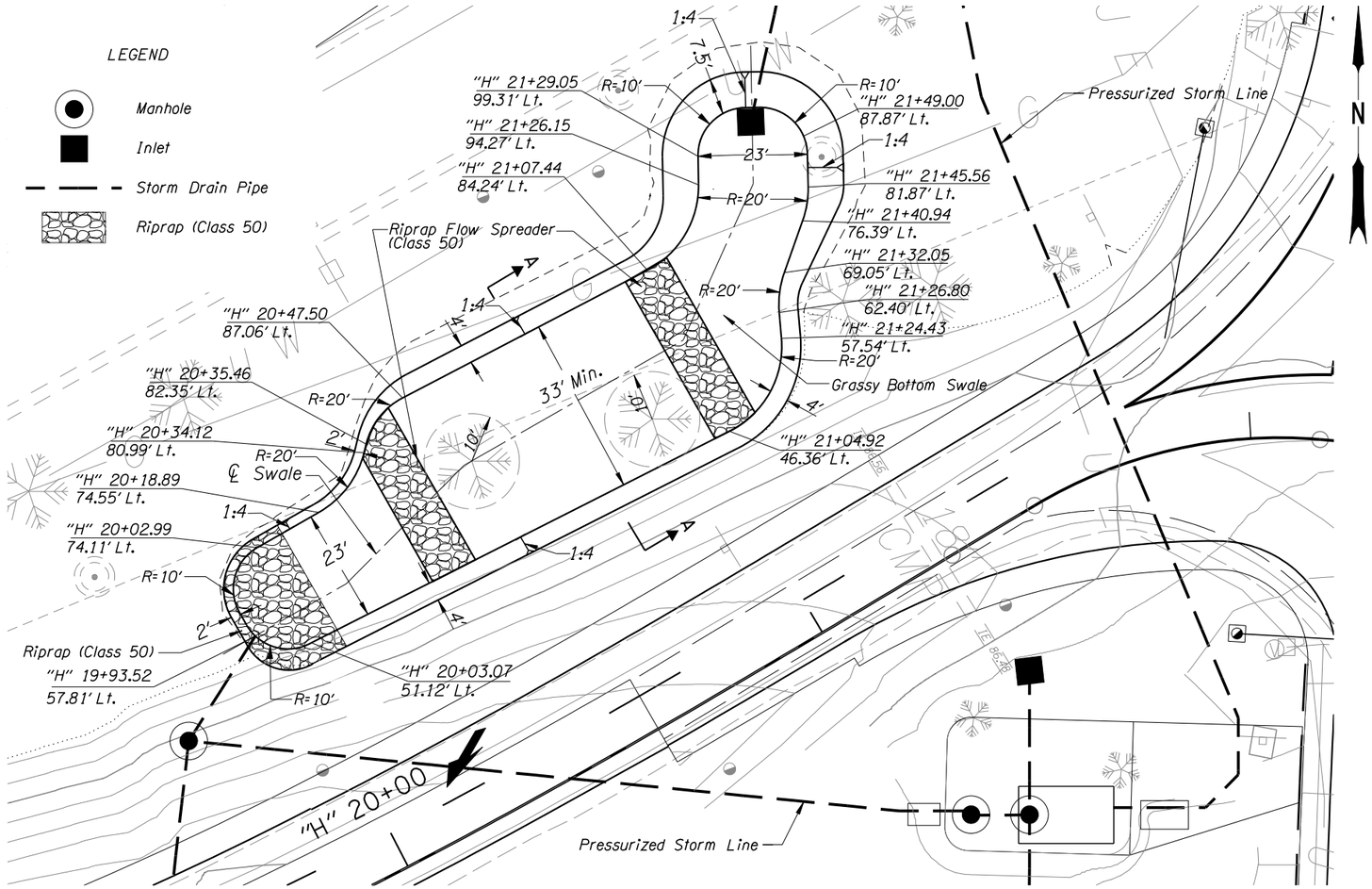
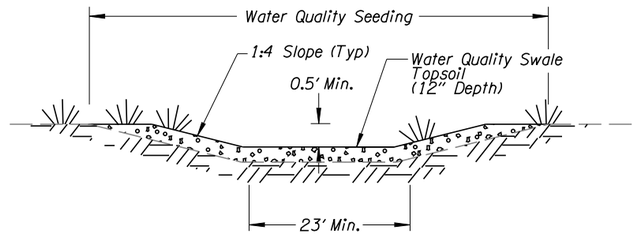
I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	X-NH-0TIA-S002(095)	1A



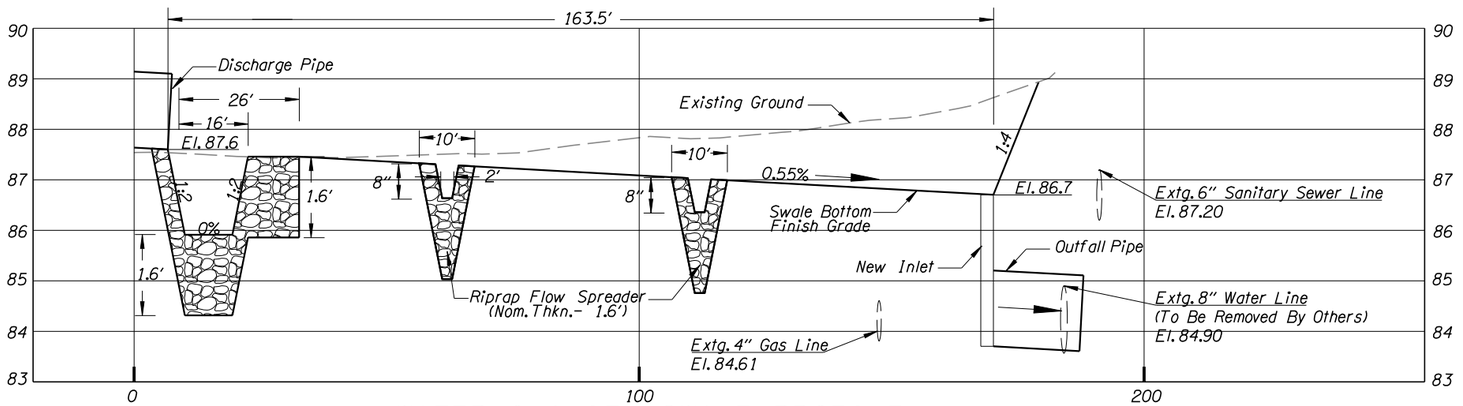
WATER QUALITY SWALE PLAN

Scale: 1"=30'



WATER QUALITY SWALE SECTION A-A

N.T.S.



WATER QUALITY SWALE PROFILE

Scale: Horz: 1"=30'
Vert.: 1"=3'

NOTES:

1. Contractor Shall Maintain And Protect Existing Trees. Grading Shall Occur 10-Feet Away From Existing Trees.
2. For Drainage Structure Dimensions, See Drainage & Utility Plans.
3. Protect Existing Utilities. Adjust Existing Irrigation System As Necessary.

REGISTERED PROFESSIONAL ENGINEER
77802PE
OREGON
JULY 11, 2006
JOHN F. MALONEY
EXPIRES: 12-31-2010

OREGON DEPARTMENT OF TRANSPORTATION

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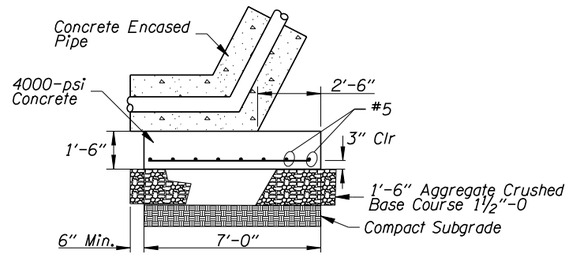
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

Reviewed By - S. Litchfield
Designed By - J. Maloney
Drafted By - R. Moore

DRAINAGE DETAILS

SHEET NO. 2B-4



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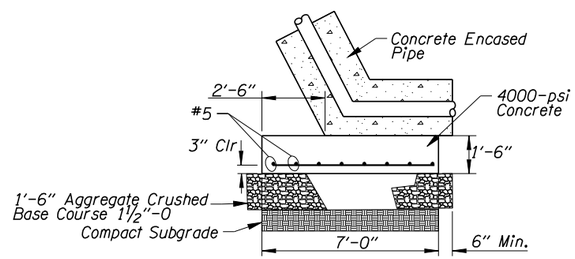

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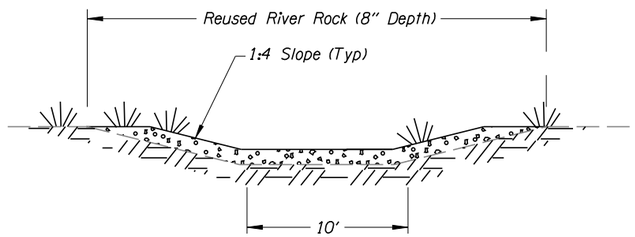

ROADSIDE DITCH SECTION
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

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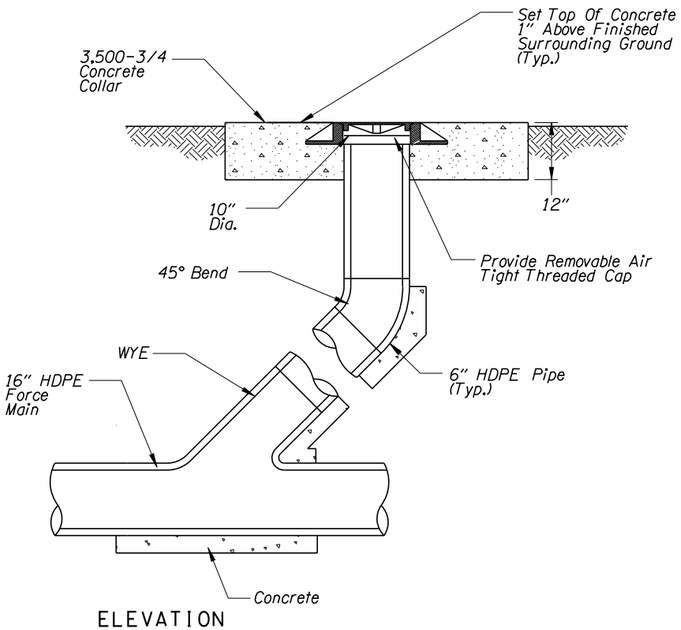
REGISTERED PROFESSIONAL ENGINEER
77802PE
OREGON
JULY 11, 2006
JOHN F. MALONEY
EXPIRES: 12-31-2010

I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

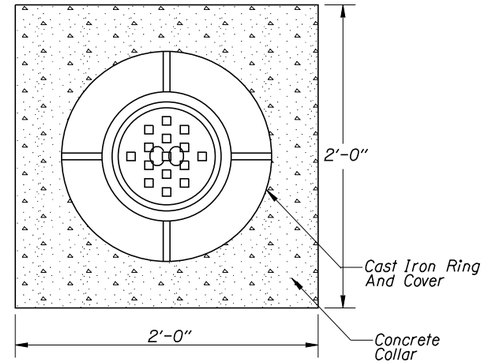
Reviewed By - S. Litchfield
Designed By - J. Maloney
Drafted By - R. Moore

DRAINAGE DETAILS

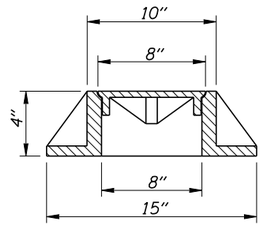
SHEET NO. 2B-5



ELEVATION



PLAN



CLEANOUT RING
AND COVER SECTION

TYPICAL CLEANOUT DETAIL

NOTES:

1. *Cover Shall Be Tamperproof, Bolted Or Screwed To Ring.*

REGISTERED PROFESSIONAL ENGINEER
77802PE
OREGON
JULY 11, 2006
JOHN F. MALONEY
EXPIRES: 12-31-2010

OREGON DEPARTMENT OF TRANSPORTATION

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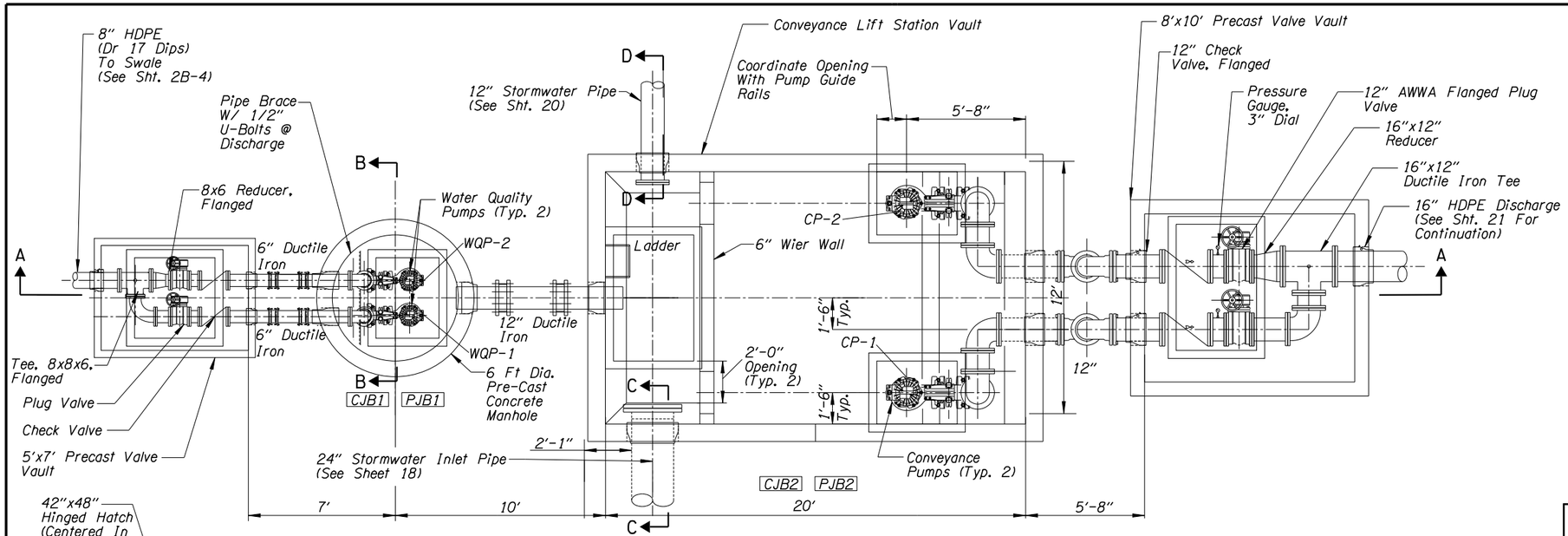
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

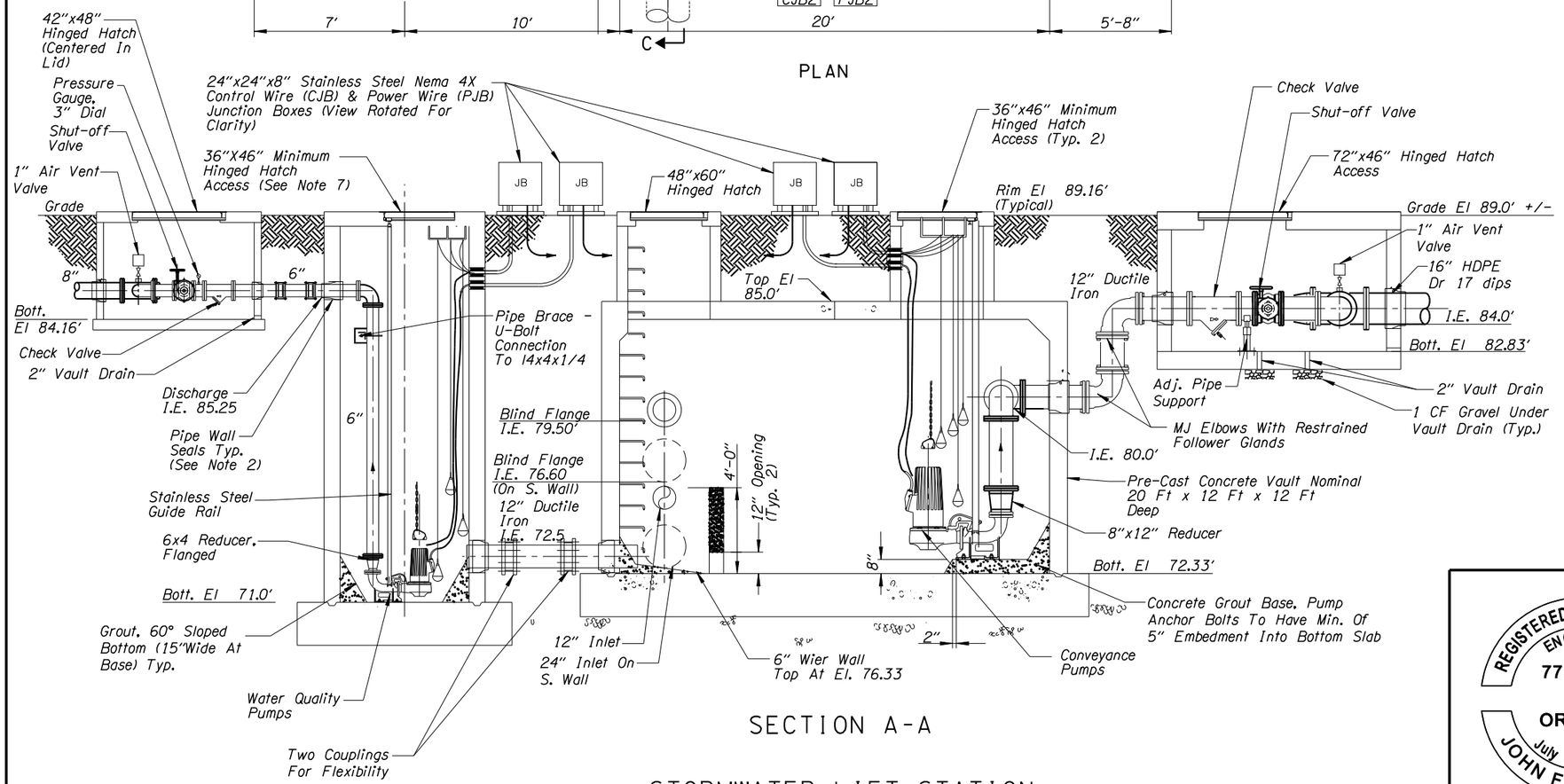
Reviewed By - S. Litchfield
Designed By - J. Maloney
Drafted By - R. Moore

DRAINAGE DETAILS

SHEET NO.
2B-6



PLAN



SECTION A-A

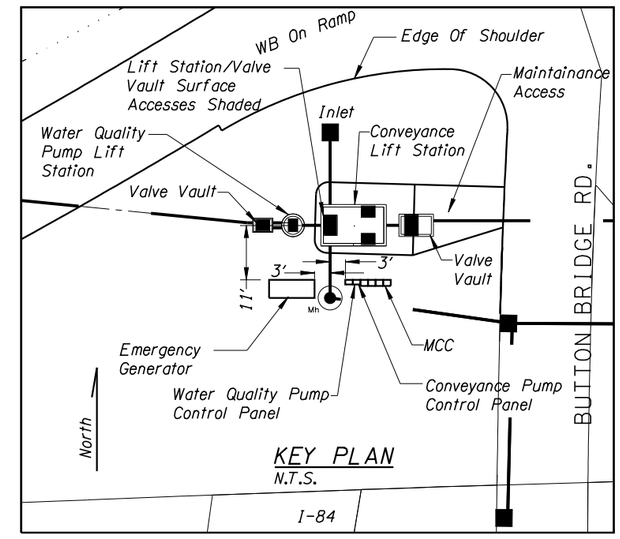
STORMWATER LIFT STATION

(For Location, See Sht. 18 And 20)

NOTE: For Section B. C. And D Details. See Sht. 2B-8.

NOTES:

1. Guide Rails Shall Be Supported Securely With A Minimum Of 3 Supports.
2. Use Kor-N-Seals Or Approved Equal Around Pipe Openings.
3. Wet Wells Shall Be Precast Concrete. Calculations For Design Of The Wet Wells Shall Be Included. Wet Well Shall Be Designed To Resist Bouyant Forces Of Groundwater.
4. Provide Broomed Sidewalk Finish And Smooth 1/4-in Radius Tooled Edges On Wet Well Lid.
5. Wetwells And Valve Vaults Shall Be Designed For H-20 Traffic Loading.
6. Assume Groundwater At 2' Above Existing Ground Elevation.
7. Provide Diamond Plate Double-Leaf Locking Covers And Frames With Automatic Hold-Open Arm And Spring Assit. Designed And Rated For H-20 Traffic Loading. Coordinate Exact Size With Pump Manufacturer.
8. All Lift Station Access Covers To Be Tamperproof (Bolt-Down).
9. Paint Outside Of Wet Wells With Coal Tar Epoxy Paint.
10. Reinforce Ballast Slab With #6@12"Ew T&B. Top Bars May Be Cut At Pipe Wall.
11. Piping Within 5 Feet Of Structures Shall Be Paid For As Part Of Stormwater Lift Station.



KEY PLAN

N.T.S.

REGISTERED PROFESSIONAL ENGINEER
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OREGON
JUN 11, 2006
JOHN F. MALONEY

EXPIRES: 12-31-2010

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I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224

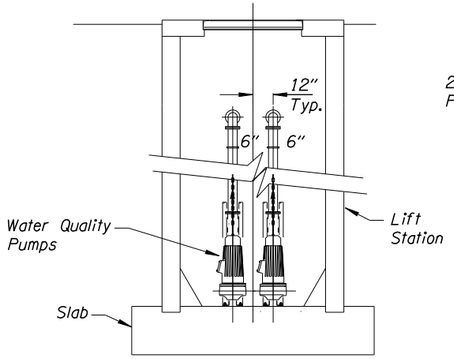
COLUMBIA RIVER HIGHWAY

HOOD RIVER COUNTY

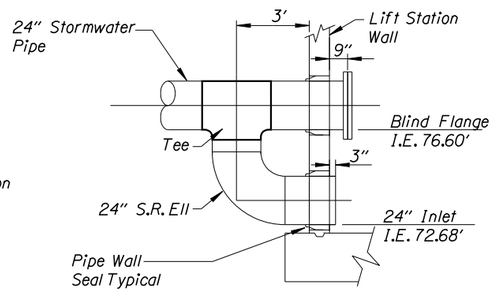
Reviewed By - J. Maloney
Designed By - T. Hoech
Drafted By - L. Olsen

PUMP STATION DETAILS

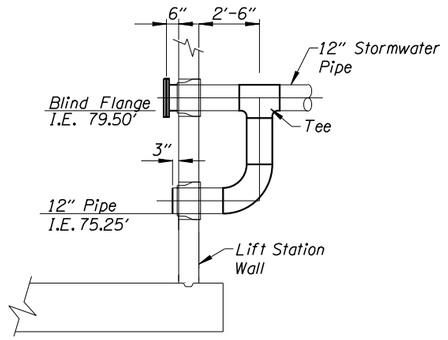
SHEET NO. 2B-7



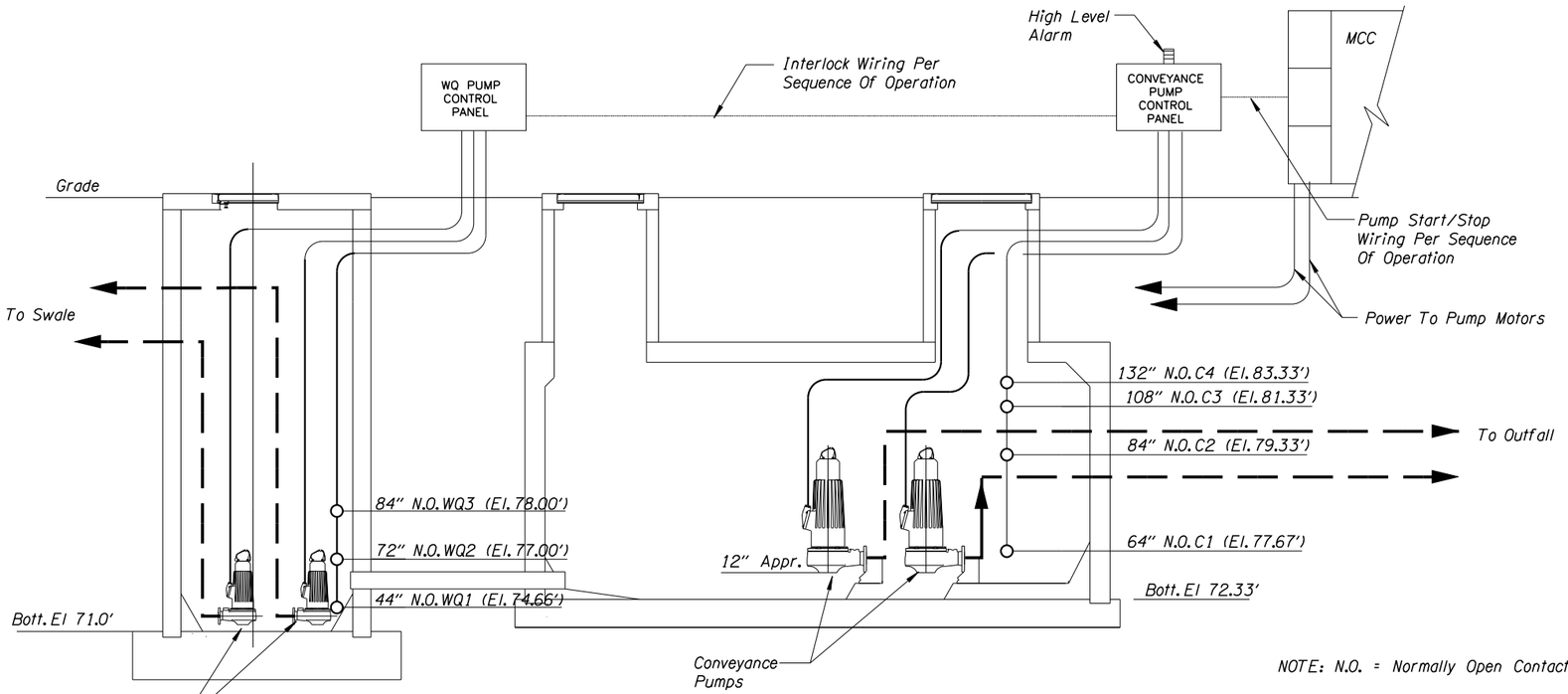
SECTION B-B



SECTION C-C
24" INLET PIPE



SECTION D-D
12" INLET PIPE



LIFT STATION SCHEMATIC
(For Location, See Sht. 18 And 20)

NOTE: N.O. = Normally Open Contacts

SEQUENCE OF OPERATION

1. System Consists Of (1) Duplex Water Quality Pump Station And (1) Conveyance Pump Station.
2. Upon Rising Water Levels
   - A. Level Switch Wq1 Enables The Water Quality Pumps For Operation When Contact Closes Indicating Water Level Is Above Wq Minimum Level (74.66').
   - B. Level Switch C1 Enables The Conveyance Pumps For Operation When Contact Closes Indicating Water Level Is Above Conveyance Minimum Level.
   - C. Start The Lead Water Quality Pump When Level Switch WQ2 Contact Closes.
   - D. Start The Lag Water Quality Pump When Level Switch WQ3 Contact Closes.
   - E. When Level Switch C2 Contact Closes, Start A Timer Set To 30 Seconds. If C2 Contact Is Still Closed When The Timer Contact Closes Stop Both Water Quality Pumps Through Activation Of An Interlock Relay And Start The Lead Conveyance Pump.
   - F. When Level Switch C3 Contact Closes, Start A Timer Set To 30 Seconds. If C3 Contact Is Still Closed When The Timer Contact Closes Start The Lag Conveyance Pump.
   - G. When Level Switch C4 Contact Closes An Alarm Relay To Activate A Red Beacon On The Control Panel.
3. Upon Falling Water Levels
   - A. When Level Switch C4 Contact Opens Stop Alarm.
   - B. When Level Switch C1 Contact Opens The Conveyance Pumps Shall Stop And The Water Quality Pump Interlock Relay Shall Be Opened Allowing Water Quality Pumps To Operate Based On Wq Float Levels. (I.E. Lead Wq Pump Will Start.)
   - C. Level Switch WQ1 Contact Opens Stop All Pumps.
4. The Lead And Lag Pump Designations Shall Be Alternated After Completion Of Each Pumping Cycle.
5. Pump Motor Thermostats Shall Be Wired To Stop Respective Pump Motors Upon Detection.
6. Pump Motor Water Sensor Indication Shall Light A Control Panel Warning Light, But Pumps Shall Continue To Operate.

PUMP SCHEDULE

PROJECT MARK NO.	SERVICE	TYPE	DESIGN CONDITIONS GPM	DESIGN CONDITIONS TDH (FT)	SHUTOFF HEAD MIN (FT)	MIN NPSHr MAX (FT)	Min EFFICIENCY %	APPROX. IMPELLER DIA (IN)	MOTOR HP	MOTOR Min. % Eff.	MOTOR Volt/ PH/HZ	MOTOR RPM	REMARKS
WQP-1	Water Quality Storm Water	Submersible	550	25	40	---	70	---	5		460/3/60	1150	
WQP-2	Water Quality Storm Water	Submersible	550	25	40	---	70	---	5		460/3/60	1150	
CP-1	Conveyance Storm Water	Submersible	2200	40	65	---	70	---	40		460/3/60	1150	
CP-2	Conveyance Storm Water	Submersible	2200	40	65	---	70	---	40		460/3/60	1150	

NOTES:
(1) Continuously Rising Head To Shutoff

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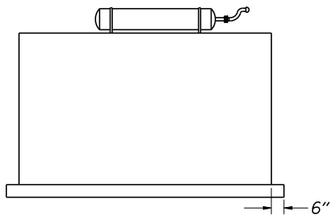
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

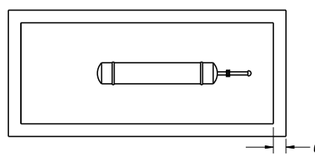
Reviewed By - J. Maloney
Designed By - T. Hoech
Drafted By - L. Olsen

PUMP STATION DETAILS

SHEET NO. 2B-8



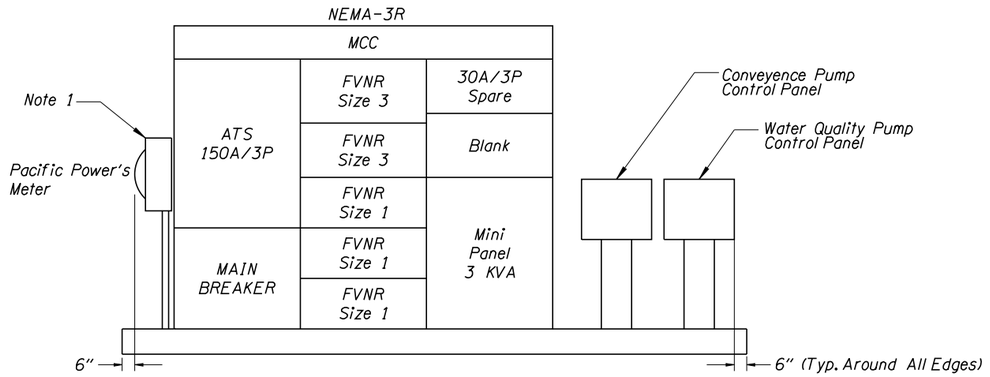
ELEVATION



PLAN

GENERATOR DETAILS

(For Location, See Sht. 2B-10)



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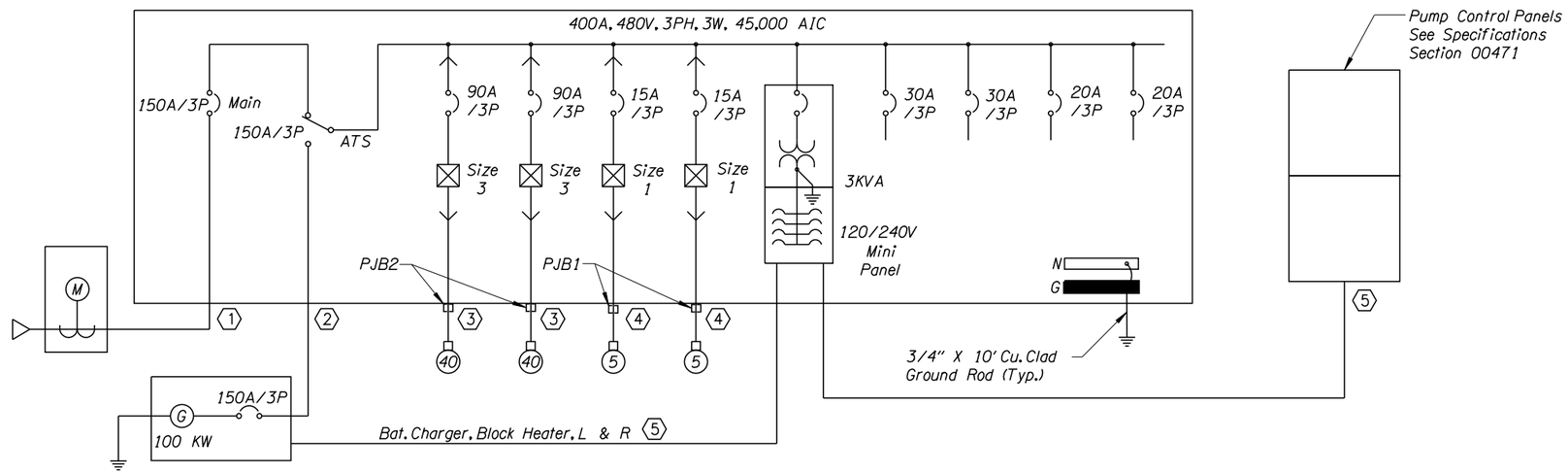

MCC SINGLE LINE DIAGRAM

(For Location, See Sht. 2B-10)

1. 3"C, 3#4/0, 1#2 GND.
2. 2"C, 3#2/0, 1#4 GND.
3. 1 1/4"C, 3#6, 1#8 GND.
4. 1"C, 3#12, 1#12 GND.
5. 1 1/4"C, 2#10, 2#10, 2#10, 1#8 GND. 2 #10 SPARE.

NOTES:

1. Location Of Meter Per PPL's Requirement.
2. Contractor Shall Submit Plans For Review And Approval Of Concrete Bases, Signed And Sealed By A Licensed Engineer In The State Of Oregon, At Least 15 Days Prior To Installation.

STORMWATER LIFT STATION ELECTRICAL DETAILS

(For Location, See Sht. 2B-10)

REGISTERED PROFESSIONAL ENGINEER
17540PE
OREGON
Nov 15, 1994
PATRICIA L. FORDYCE
EXPIRES: 12-31-2009

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COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

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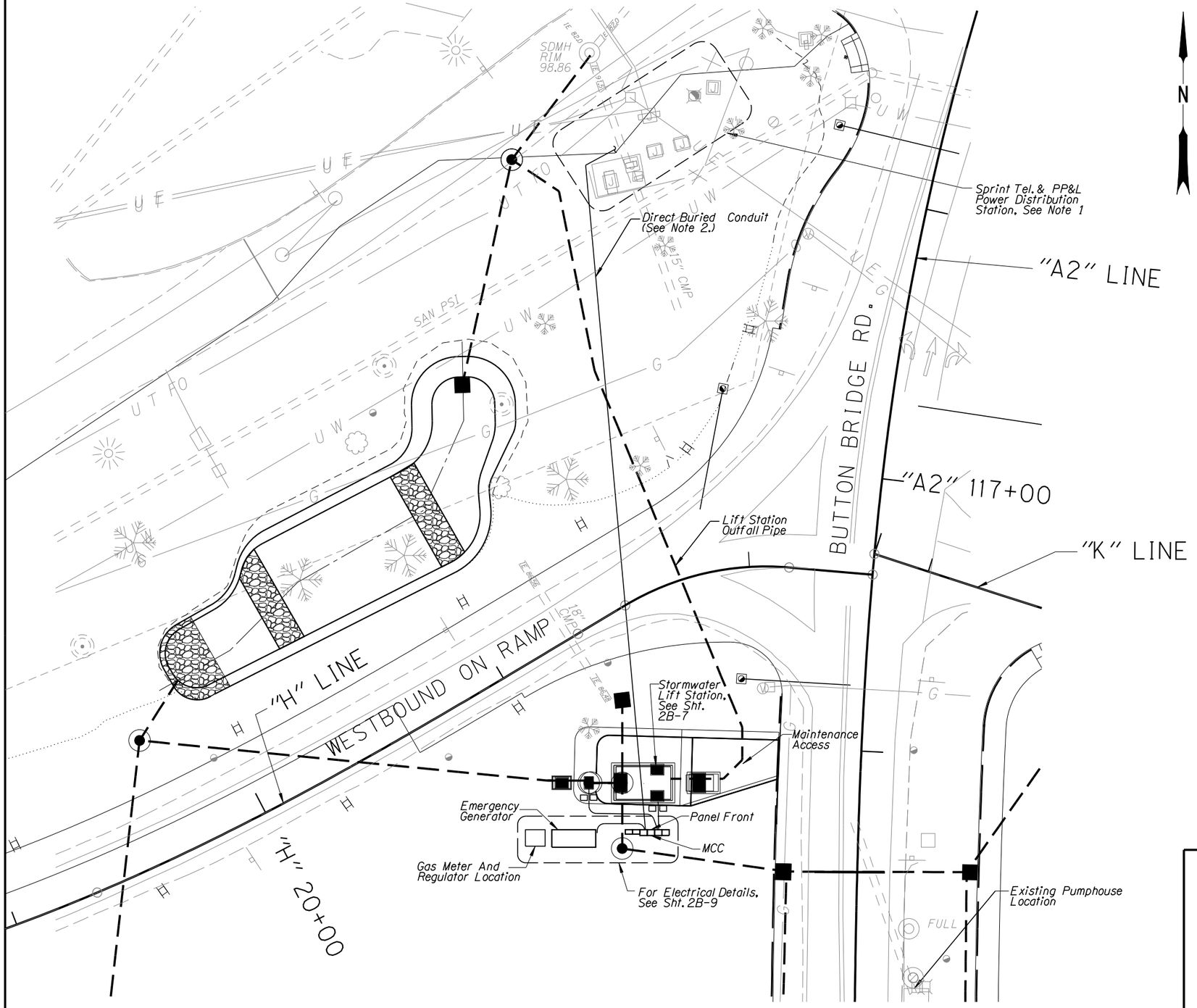
Drafted By - D. Becker

PUMP STATION DETAILS

SHEET NO. 2B-9



NOTES:

1. Coordinate With Pacific Power To Terminate Mcc Feeder To Existing Circuit. Existing Feeder To Pumphouse Shall Be Abandoned In Place.
2. Direct Buried 3" PVC Conduit. Minimum 24" Below Grade. Place Red Warning Tape 18" Above Conduit.
3. Coordinate Power Meter Adjustments With Pacific Power For Final Grading.

STORMWATER LIFT STATION ELECTRICAL SITE PLAN

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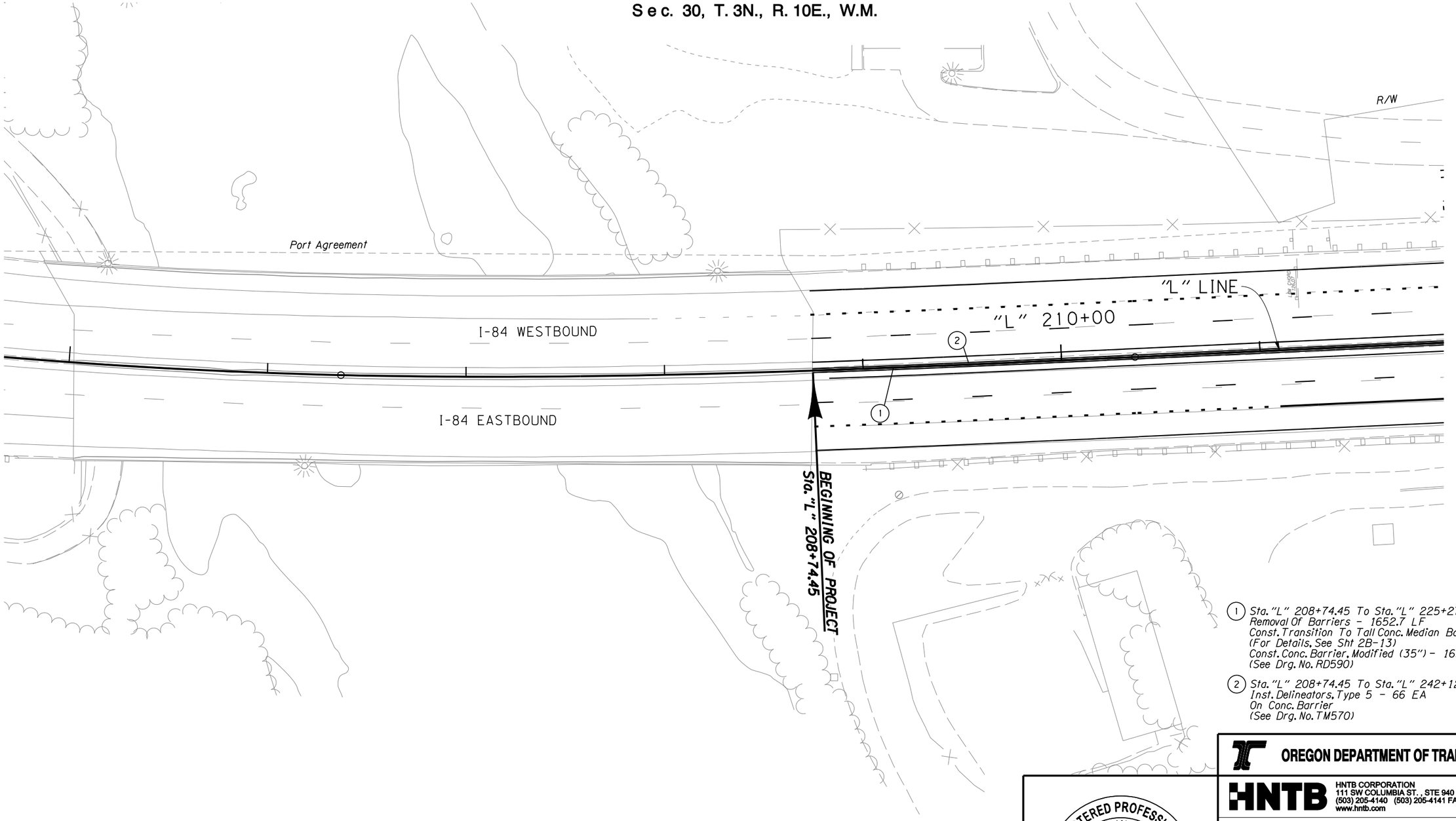
PUMP STATION DETAILS

SHEET NO. 2B-10

Sec. 30, T. 3N., R. 10E., W.M.

42V-191



(1) Sta."L" 208+74.45 To Sta."L" 225+27.18
Removal Of Barriers - 1652.7 LF
Const.Transition To Tall Conc.Median Barrier
(For Details, See Sht 2B-13)
Const.Conc.Barrier, Modified (35") - 1652.7 LF
(See Drg.No.RD590)

(2) Sta."L" 208+74.45 To Sta."L" 242+12.50
Inst.Delineators,Type 5 - 66 EA
On Conc.Barrier
(See Drg.No.TM570)

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COLUMBIA RIVER HIGHWAY
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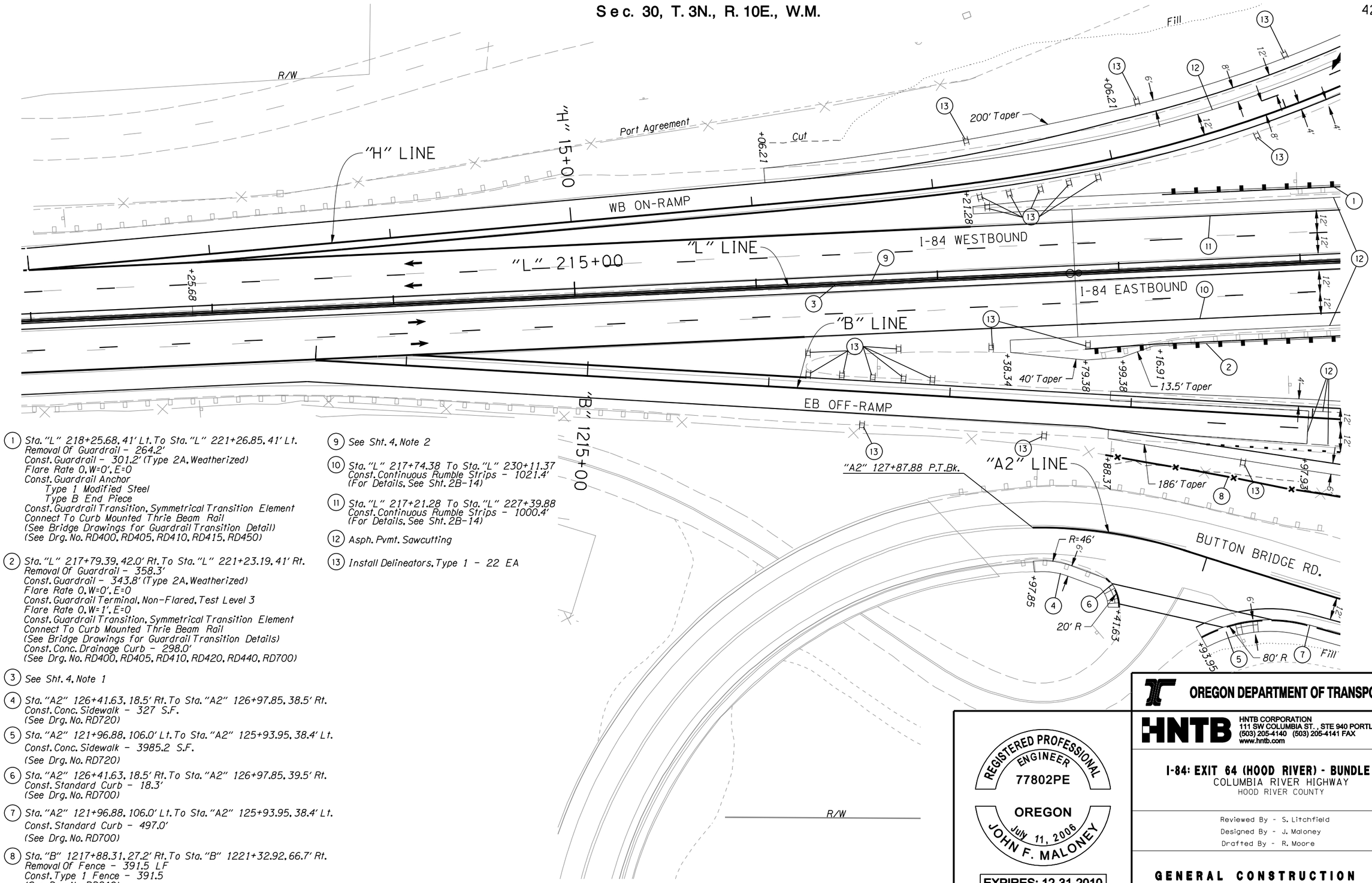
GENERAL CONSTRUCTION

SHEET NO. 4

Sec. 30, T. 3N., R. 10E., W.M.



(1) Sta. "L" 218+25.68, 41' Lt. To Sta. "L" 221+26.85, 41' Lt.
Removal Of Guardrail - 264.2'
Const. Guardrail - 301.2' (Type 2A, Weatherized)
Flare Rate 0, W=0', E=0
Const. Guardrail Anchor
Type 1 Modified Steel
Type B End Piece
Const. Guardrail Transition, Symmetrical Transition Element
Connect To Curb Mounted Thrie Beam Rail
(See Bridge Drawings for Guardrail Transition Detail)
(See Drg. No. RD400, RD405, RD410, RD415, RD450)

(2) Sta. "L" 217+79.39, 42.0' Rt. To Sta. "L" 221+23.19, 41' Rt.
Removal Of Guardrail - 358.3'
Const. Guardrail - 343.8' (Type 2A, Weatherized)
Flare Rate 0, W=0', E=0
Const. Guardrail Terminal, Non-Flared, Test Level 3
Flare Rate 0, W=1', E=0
Const. Guardrail Transition, Symmetrical Transition Element
Connect To Curb Mounted Thrie Beam Rail
(See Bridge Drawings for Guardrail Transition Details)
Const. Conc. Drainage Curb - 298.0'
(See Drg. No. RD400, RD405, RD410, RD420, RD440, RD700)

(3) See Sht. 4, Note 1

(4) Sta. "A2" 126+41.63, 18.5' Rt. To Sta. "A2" 126+97.85, 38.5' Rt.
Const. Conc. Sidewalk - 327 S.F.
(See Drg. No. RD720)

(5) Sta. "A2" 121+96.88, 106.0' Lt. To Sta. "A2" 125+93.95, 38.4' Lt.
Const. Conc. Sidewalk - 3985.2 S.F.
(See Drg. No. RD720)

(6) Sta. "A2" 126+41.63, 18.5' Rt. To Sta. "A2" 126+97.85, 39.5' Rt.
Const. Standard Curb - 18.3'
(See Drg. No. RD700)

(7) Sta. "A2" 121+96.88, 106.0' Lt. To Sta. "A2" 125+93.95, 38.4' Lt.
Const. Standard Curb - 497.0'
(See Drg. No. RD700)

(8) Sta. "B" 1217+88.31, 27.2' Rt. To Sta. "B" 1221+32.92, 66.7' Rt.
Removal Of Fence - 391.5 LF
Const. Type 1 Fence - 391.5
(See Drg. No. RD810)

(9) See Sht. 4, Note 2

(10) Sta. "L" 217+74.38 To Sta. "L" 230+11.37
Const. Continuous Rumble Strips - 1021.4'
(For Details, See Sht. 2B-14)

(11) Sta. "L" 217+21.28 To Sta. "L" 227+39.88
Const. Continuous Rumble Strips - 1000.4'
(For Details, See Sht. 2B-14)

(12) Asph. Pvmt. Sawcutting

(13) Install Delineators, Type 1 - 22 EA

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COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

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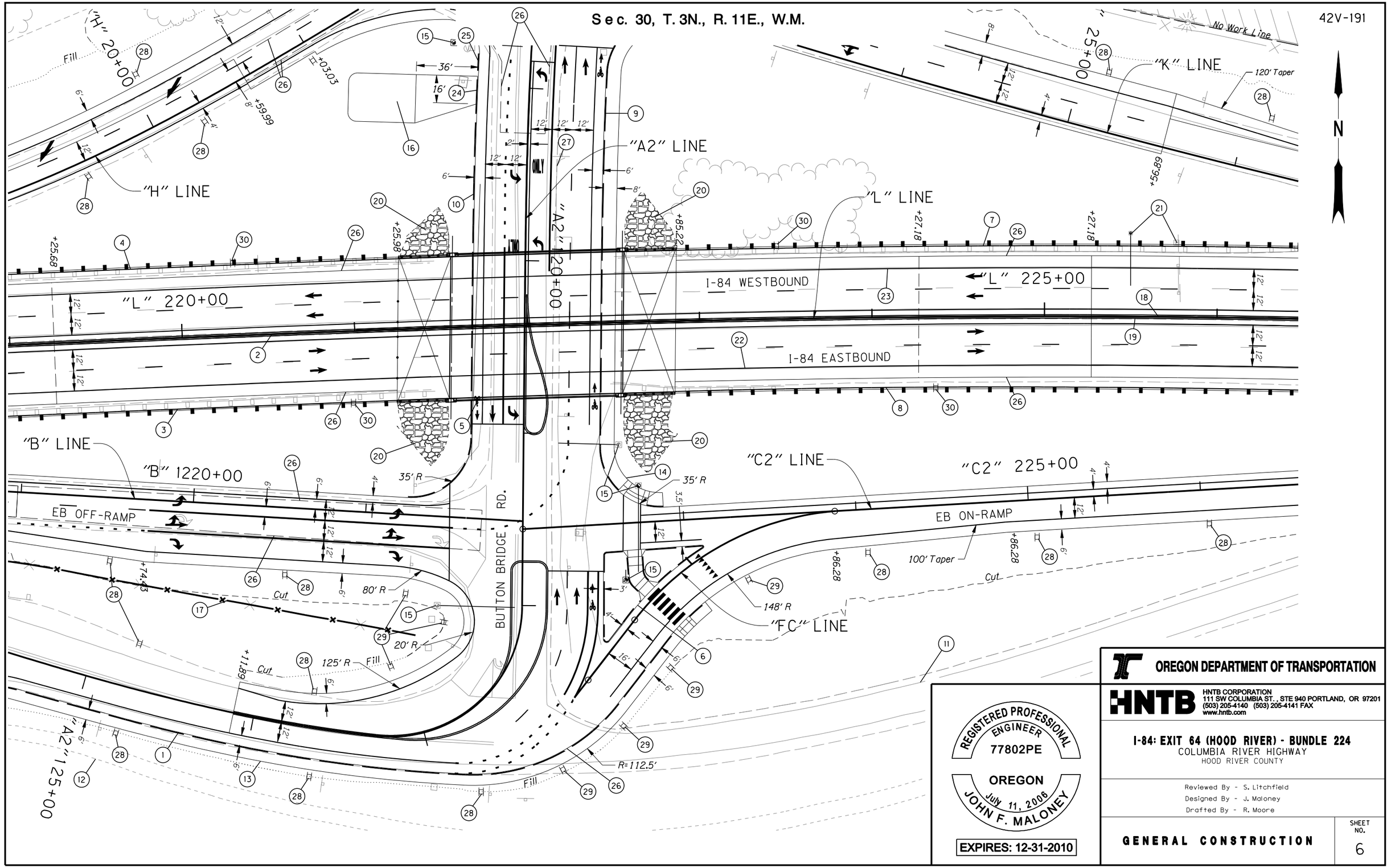
Drafted By - R. Moore

GENERAL CONSTRUCTION

SHEET NO. 5

Sec. 30, T. 3N., R. 11E., W.M.

42V-191



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I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224

COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

Reviewed By - S. Litchfield
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Drafted By - R. Moore

GENERAL CONSTRUCTION

SHEET NO. 6

(1) See Sht. 5, Note 7

(2) See Sht. 4, Note 1

(3) See Sht. 5, Note 2

(4) See Sht. 5, Note 1

(5) Const. Br. No. 21218 (See Bridge Drgs.)
Remove Extg. Bridge (Str. # 07398)

(6) Const. Standard Curb - 230.5 LF
(See Sht. 2B-3)
(See Std. Drg. No. RD700)

(7) Sta. "L" 222+87.49, 41' Lt. To Sta. "L" 227+34.89, 42.0' Lt.
Removal Of Guardrail - 448.7'
Connect To Curb Mounted Thrie Beam Rail
Const. Guardrail Transition, Symmetrical Transition Element
Const. Guardrail - 427.4' (Type 2A, Weatherized)
Sta. "L" 225+66.57, 41' Lt. To Sta. "L" 225+86.45, 41' Lt.
Const. Guardrail - 20' (Type 2A Modified)
Where Extg. Sign Support Interferes With Guardrail Posts
Flare Rate 0, W=0', E=0
Const. Guardrail Terminal, Non-Flared, Test Level 3
Flare Rate 0, W=1', E=0
(See Drg. Nos. RD400, RD405, RD410, RD415, RD420, RD440, BR266)
(See Bridge Drawings For Guardrail Transition Details)

(8) Sta. "L" 222+84.83, 41' Rt. To Sta. "L" 229+66.09, 41' Rt.
Removal Of Guardrail - 101.4'
Connect To Curb Mounted Thrie Beam Rail
Const. Guardrail Transition, Symmetrical Transition Element
Const. Guardrail - 681.3' (Type 2A, Weatherized)
Const. Conc. Drainage Curb - 428.9
Const. Guardrail Anchor
Type 1 Modified Steel
Type B End Piece
(See Drg. Nos. RD400, RD405, RD410, RD415, RD450, RD700)
(See Bridge Drawings For Guardrail Transition Details)

(9) Sta. "A2" 118+52.67, 86.4' Lt. To Sta. "A2" 121+42.19, 81.3' Lt.
Const. Standard Curb - 336.8 LF
(See Std. Drg. No. RD700)

(10) Sta. "A2" 119+10.25, 30.0' Rt. To Sta. "A2" 121+38.00, 66.7' Rt.
Const. Standard Curb - 250.5 LF
(See Std. Drg. No. RD700)

(11) Sta. "C2" 227+55.37 To Sta. "C2" 229+25.15
Remove Existing Eastbound On-Ramp
Removal Of Pavement - 804 Tons
Sawcut At Proposed Edge of Shoulder
Exc. - 909 C.Y.

(12) Preserve and Protect Existing Earthen Levee

(13) See Sht. 5, Note 5

(14) Sta. "A2" 118+53.19, 86.3' Lt. To Sta. "A2" 121+41.69, 81.3' Rt.
Const. Conc. Sidewalk - 2576.4 S.F.
(See Std. Drg. No. RD720)

(15) Signal Pole and Foundation, See Signal Plans

(16) Sta. "A2" 118+94.50, 30.4' Lt. To Sta. "A2" 119+10.25, 30.4' Lt.
Const. Conc. Driveway
(For Details, See Sht. 2B-2)
(See Std. Drg. No. RD715)
Em. - 35.7 C.Y.

(17) See Sht. 5, Note 8

(18) See Sht. 4, Note 2

(19) Sta. "L" 225+27.18 To Sta. "L" 242+12.50
Removal Of Barriers - 1685.3'
Const. Conc. Barrier, Modified (35") - 1685.3'
With Scuppers Left Open
(For Details, See Sheet 2B-12)

(20) Const. Stone Embankment - (1:1.5 Slope)
NW Slope - 58 C.Y.
NE Slope - 75 C.Y.
SW Slope - 88 C.Y.
SE Slope - 111 C.Y.
(For Details, See Sht. 2B-14)

(21) Sta. "L" 225+50.00
Remove And Reinstall Existing Sign
Remove And Reinstall Extg. Cantilever Sign Structure
Const. Sign Support Footings
(For Details, See Structure Drg. 82338)

(22) See Sht. 5, Note 10

(23) See Sht. 5, Note 11

(24) Sta. "A2" 118+94.50, 30.0' Rt. To Sta. "A2" 119+10.25, 30.0' Rt.
Const. Mountable Curb - 16.0 LF
(See Std. Drg. No. RD700)

(25) Sta. "A2" 118+81.89, 30.0' Rt. To Sta. "A2" 118+94.50, 30.0' Rt.
Const. Standard Curb - 13.2 LF
(See Std. Drg. No. RD700)

(26) Asph. Pvmt. Sawcutting

(27) Sta "A2" 119+44.68, 17.4' Lt. To Sta. "A2" 119+85.61, 17.7' Lt.
Remove Extg. Conc. Retaining Wall

(28) Install Delineators, Type 1 - 15 EA

(29) Install Delineators, Type 3 - 7 EA

(30) Install Delineators, Type 4 Alt. 2 - 4 EA

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COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

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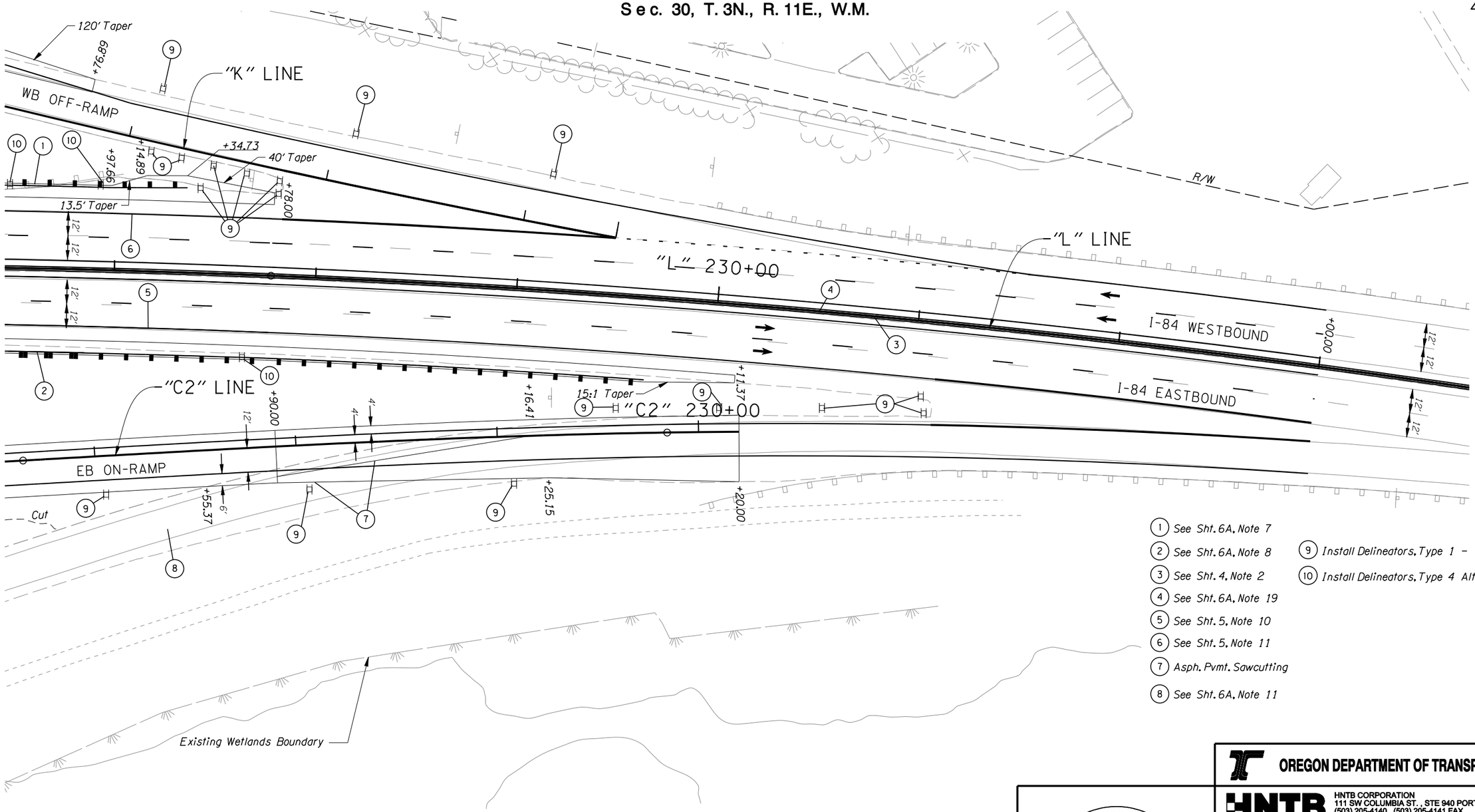
Drafted By - R. Moore

GENERAL CONSTRUCTION

SHEET NO. 6A

Sec. 30, T. 3N., R. 11E., W.M.



(1) See Sht. 6A, Note 7
(2) See Sht. 6A, Note 8
(3) See Sht. 4, Note 2
(4) See Sht. 6A, Note 19
(5) See Sht. 5, Note 10
(6) See Sht. 5, Note 11
(7) Asph. Pvmt. Sawcutting
(8) See Sht. 6A, Note 11
(9) Install Delineators, Type 1 - 18 EA
(10) Install Delineators, Type 4 Alt. 2 - 3 EA

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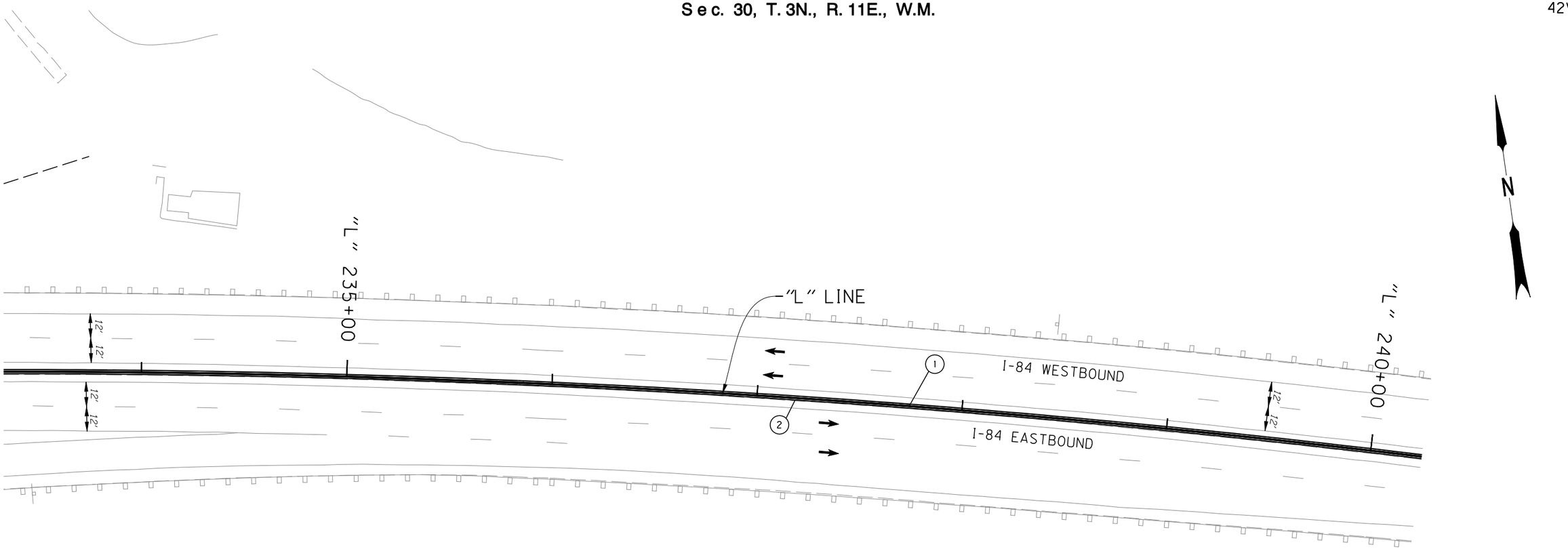
Drafted By - R. Moore

GENERAL CONSTRUCTION

SHEET NO. 7

Sec. 30, T. 3N., R. 11E., W.M.

42V-191



(1) See Sht. 6A. Note 19

(2) See Sht. 4. Note 2

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77802PE
OREGON
JULY 11, 2006
JOHN F. MALONEY
EXPIRES: 12-31-2010

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I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224

COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

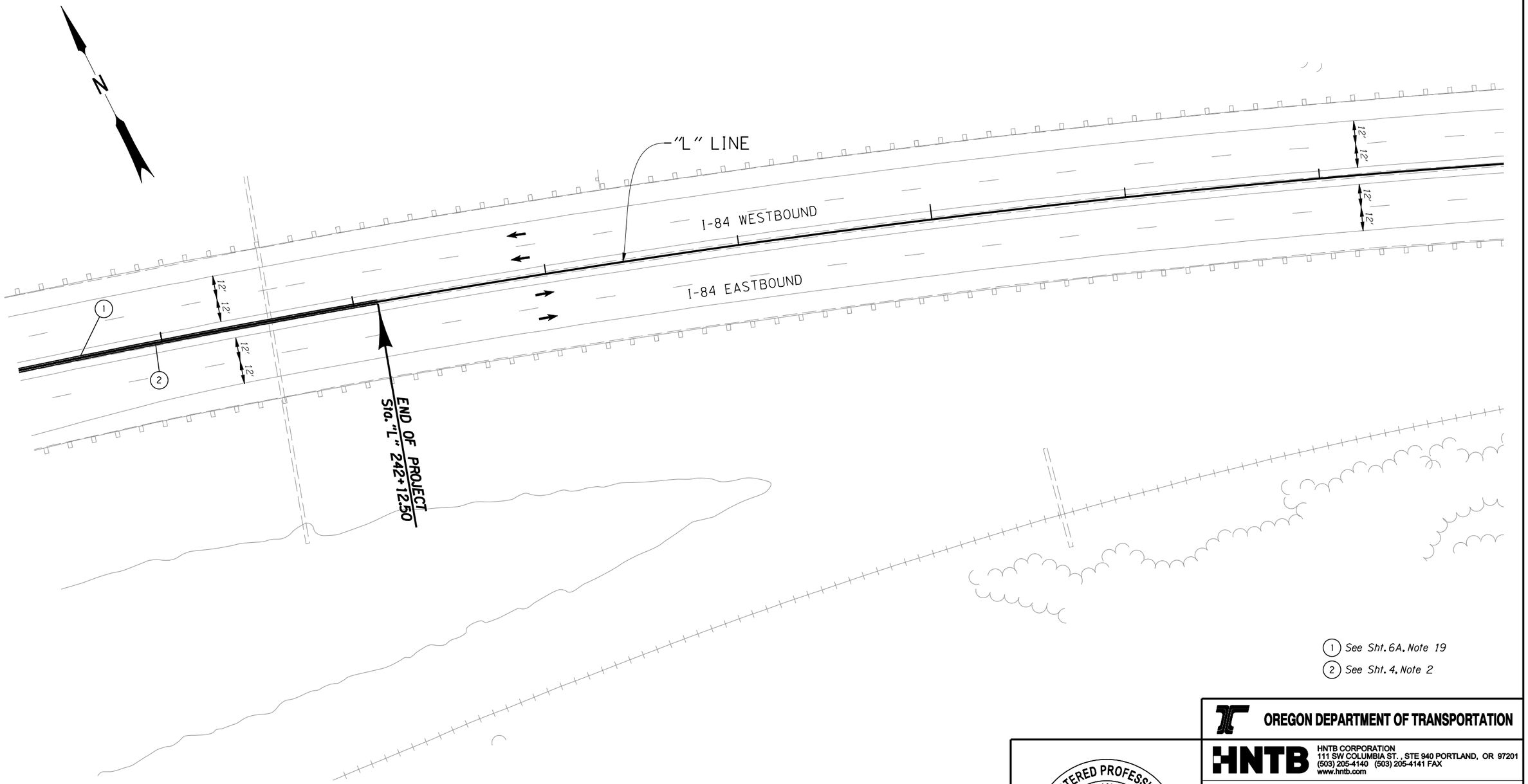
Reviewed By - S. Litchfield
Designed By - J. Maloney
Drafted By - R. Moore

GENERAL CONSTRUCTION

SHEET NO. 8

Sec. 30, T. 3N., R. 11E., W.M.

42V-191



(1) *See Sht. 6A, Note 19*

(2) *See Sht. 4, Note 2*

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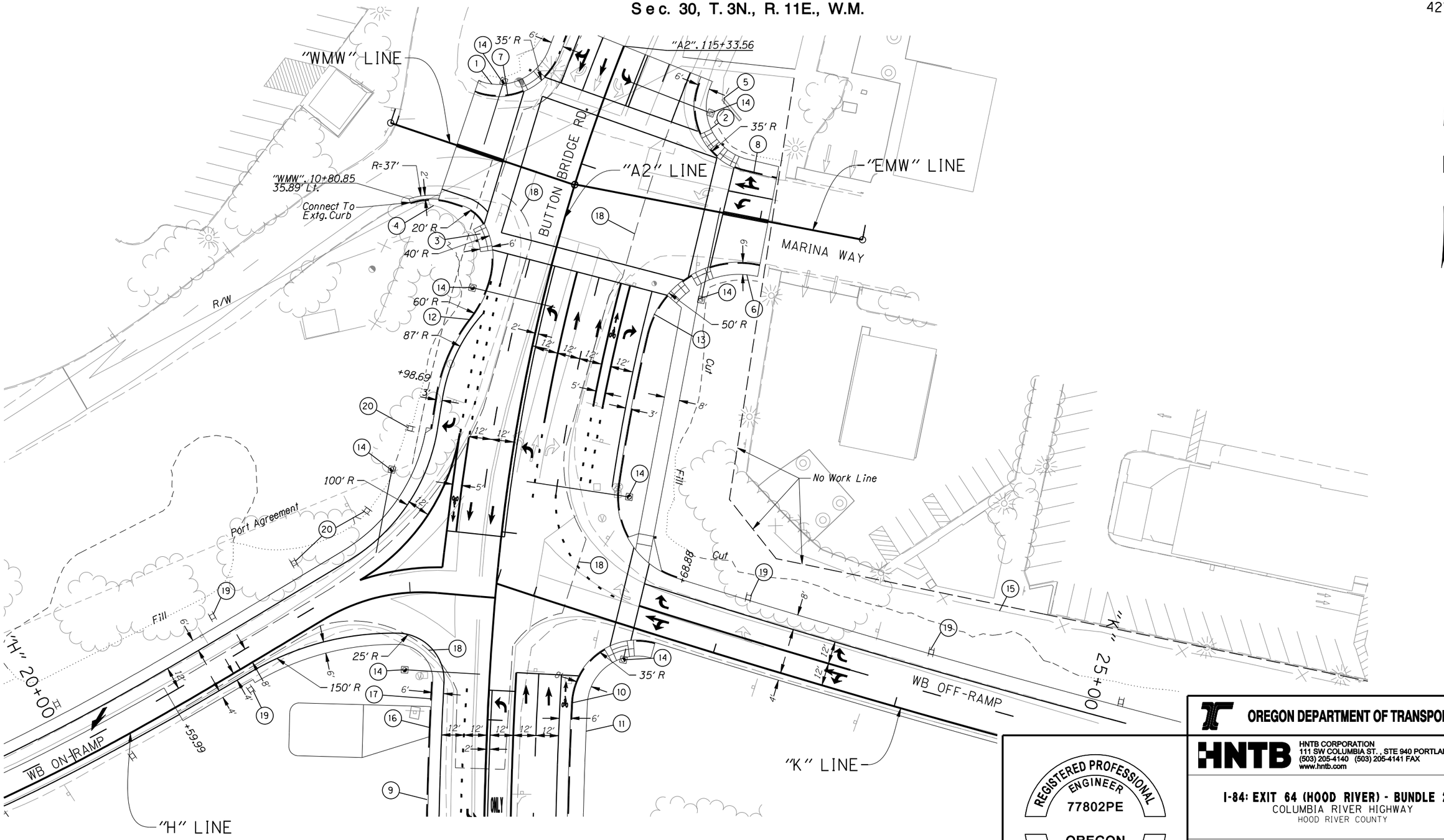
GENERAL CONSTRUCTION

SHEET NO. 9



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GENERAL CONSTRUCTION

SHEET NO. 10

(1) Sta."A2" 15+33.56, 30.5' Rt. To Sta."A2" 115+82.05, 67.7' Rt.
Const. Conc. Sidewalk - 414.9 S.F.
(See Std. Drg. No. RD720)

(2) Sta."A2" 15+33.56, 50.5' Lt. To Sta."A2" 115+72.32, 100.5' Lt.
Const. Conc. Sidewalk - 366.4 S.F.
(See Std. Drg. No. RD720)

(3) Sta."A2" 116+44.66, 40.6' Rt. To Sta."A2" 116+56.27, 32.3' Rt.
Const. Conc. Sidewalk - 56.3 S.F.
(See Std. Drg. No. RD720)

(4) Preserve and Protect Extg. "Port of Hood River" Concrete Sign

(5) Preserve and Protect Extg. Sign

(6) Sta."A2" 116+24.78, 106.4' Lt. To Sta."A2"118+01.50 , 71.6' Lt.
Const. Conc. Sidewalk - 1791.6 S.F.
(See Std. Drg. No. RD720)

(7) Sta."A2" 115+33.56, 30.0' Rt. To Sta."A2" 115+82.52, 65.7' Rt.
Const. Standard Curb - 131.5 LF
(See Std. Drg. No. RD700)

(8) Sta."A2" 115+33.56, 44.0' Lt. To Sta."A2" 115+72.87, 100.5' Lt.
Const. Standard Curb - 140.4 LF
(See Std. Drg. No. RD700)

(9) See Sht. 6A, Note 10

(10) See Sht. 6A, Note 9

(11) See Sht. 6A, Note 14

(12) Sta."A2" 116+56.27, 32.3' Rt. To Sta."A2" 117+51.89, 44.2' Rt.
Const. Standard Curb - 362.3 LF
(See Std. Drg. No. RD700)

(13) Sta."A2" 116+24.22, 106.3' Lt. To Sta."A2"118+15.08 , 95.0' Lt.
Const. Standard Curb - 225.0 LF
(See Std. Drg. No. RD700)

(14) Signal Pole and Foundation. See Signal Plans

(15) 4' Fence. Protect in Place

(16) See Sht. 6A, Note 24

(17) See Sht. 6A, Note 25

(18) Asph. Pvmt. Sawcutting

(19) Install Delineators. Type 1 - 4 EA

(20) Install Delineators. Type 3 - 3 EA

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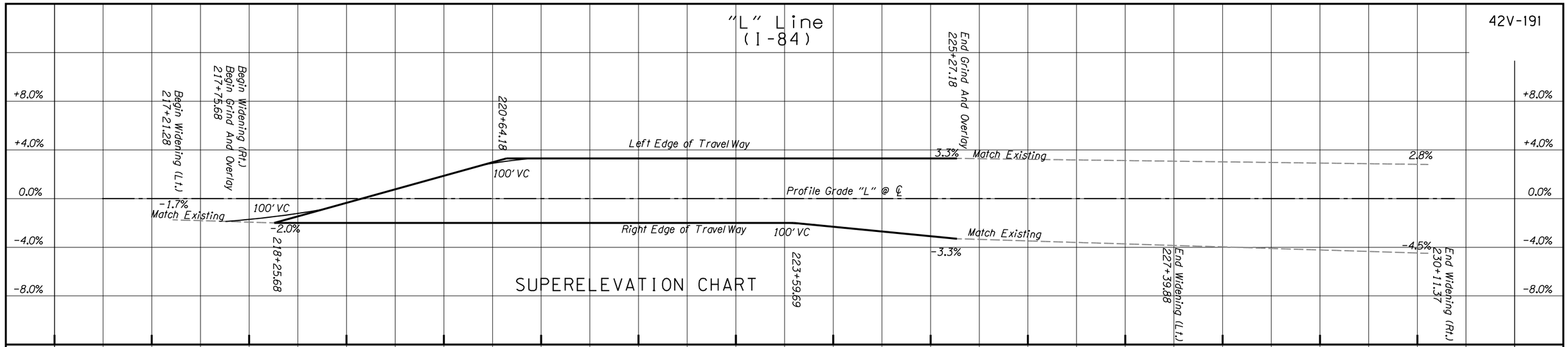
GENERAL CONSTRUCTION

SHEET NO. 10A

"L" Line
(I-84)



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HOOD RIVER COUNTY

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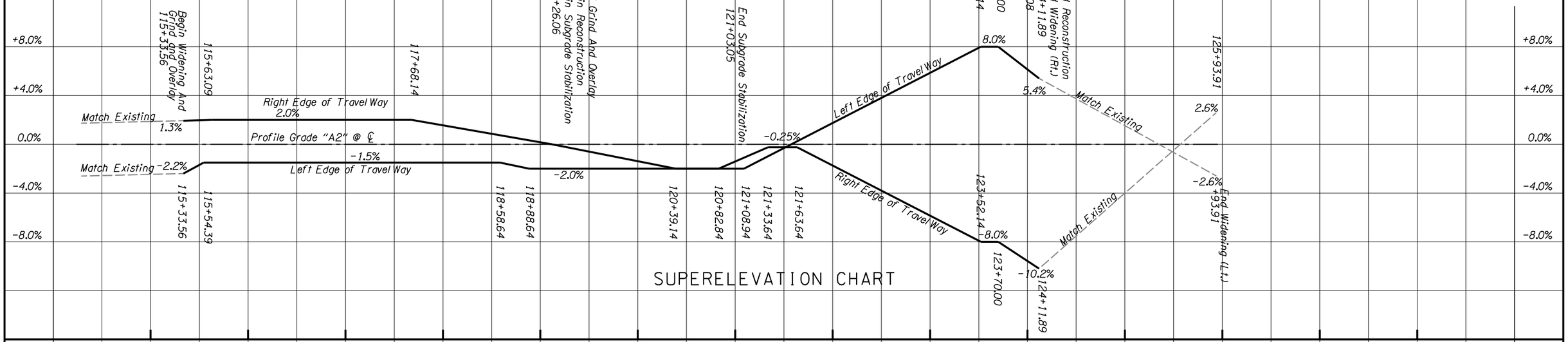
Designed By - J. Maloney
Drafted By - R. Moore

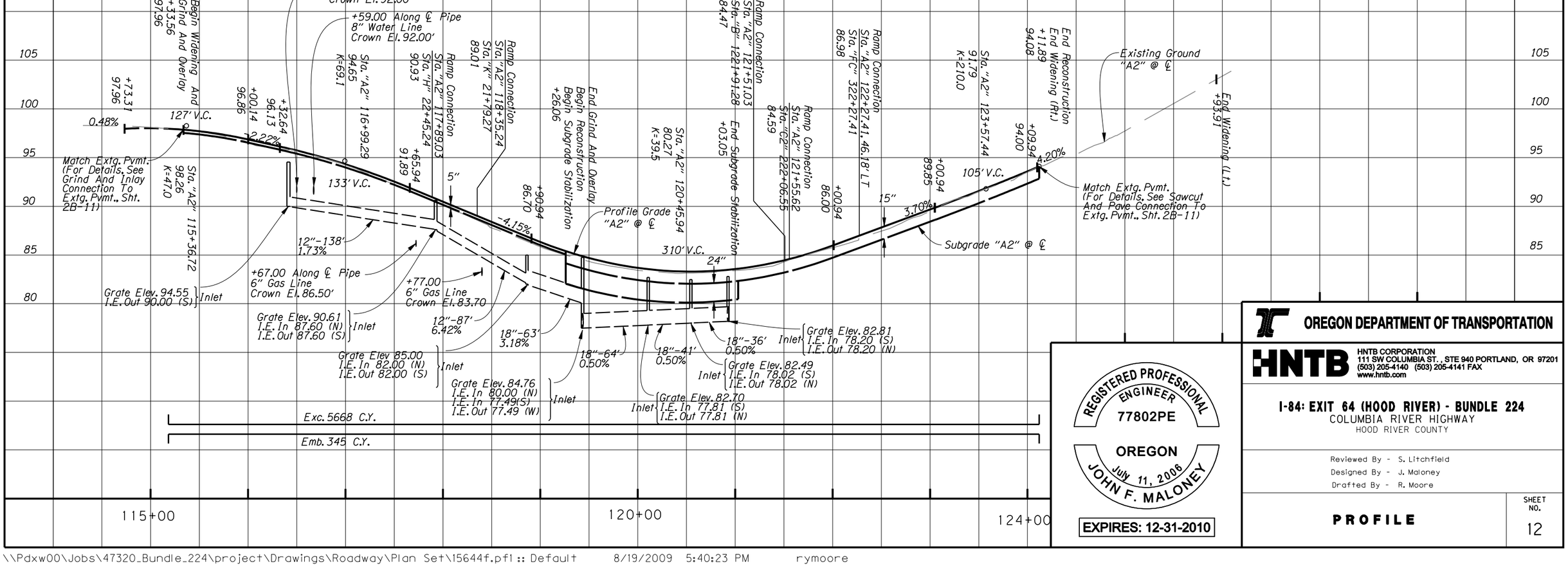
PROFILE

SHEET NO. 11

"A2" Line (Button Bridge Road)

SUPERELEVATION CHART





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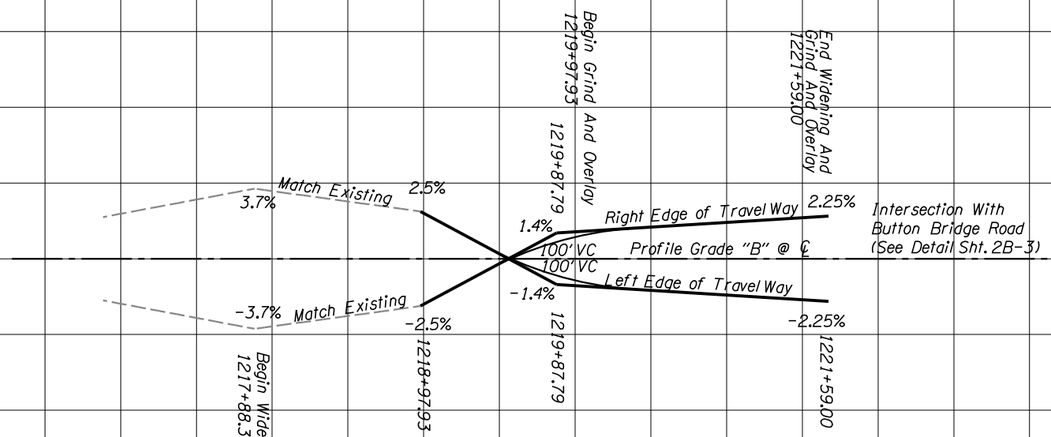
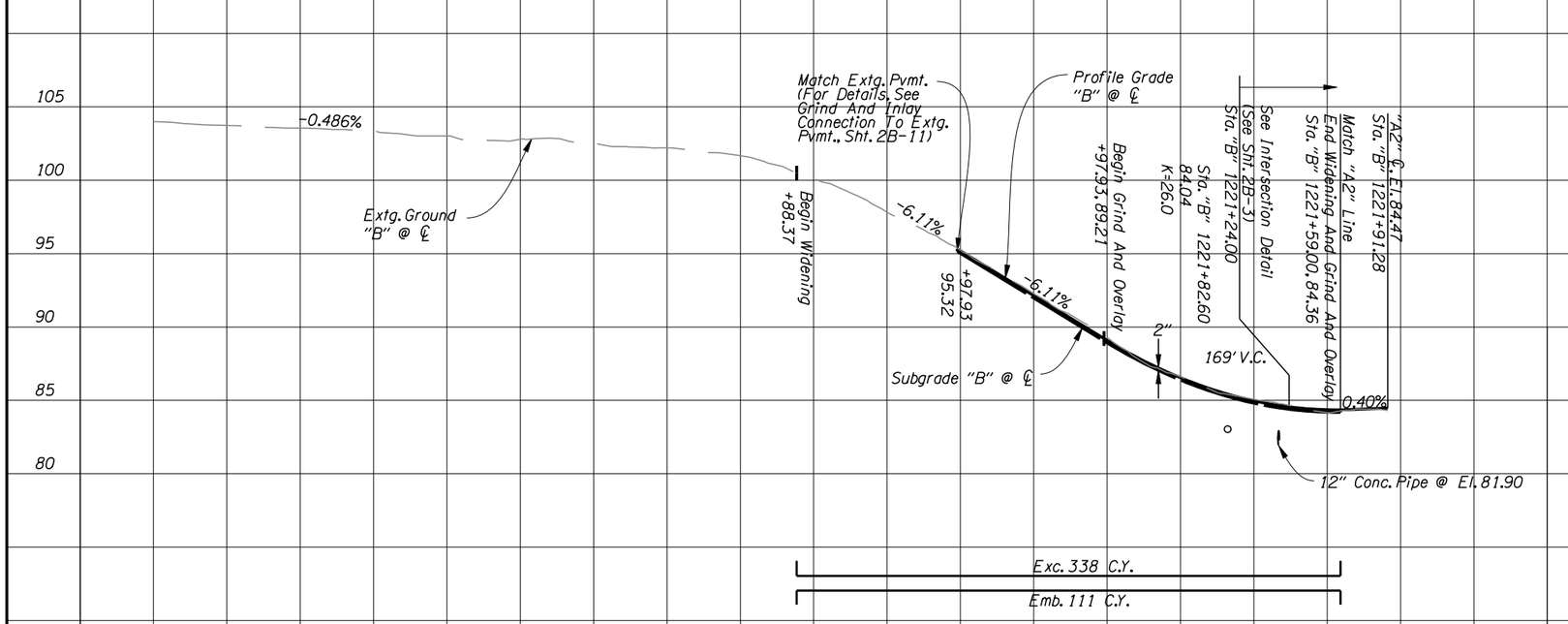
PROFILE

SHEET NO. 12

"B" Line
Eastbound Off Ramp



SUPERELEVATION CHART



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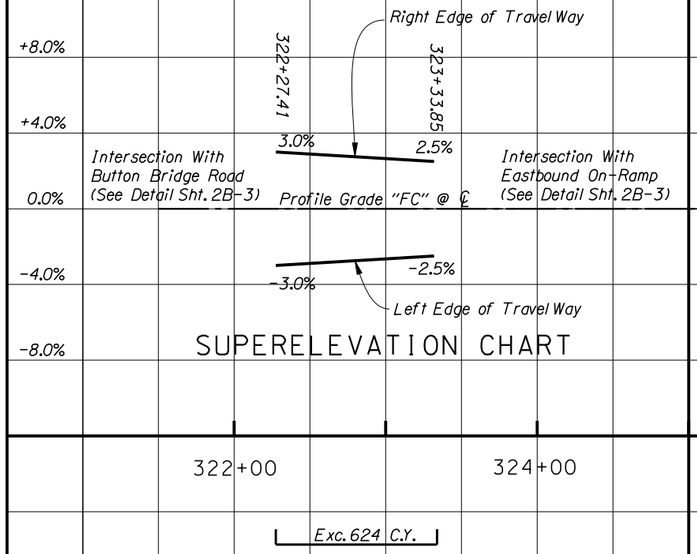
PROFILE

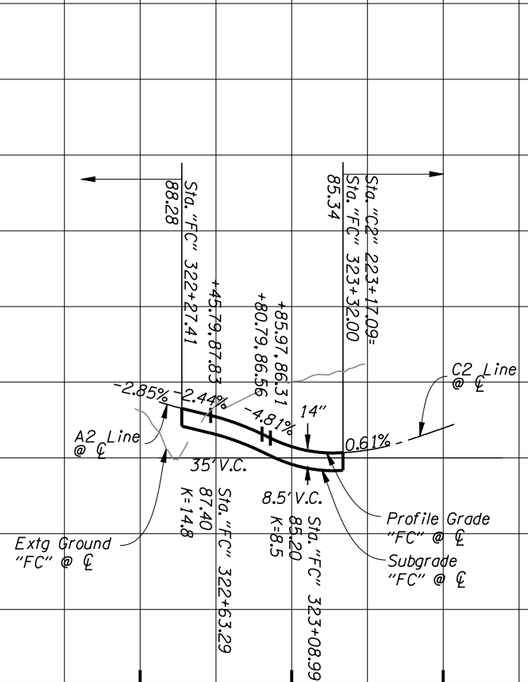
SHEET NO. 13

"FC" Line Eastbound On Ramp

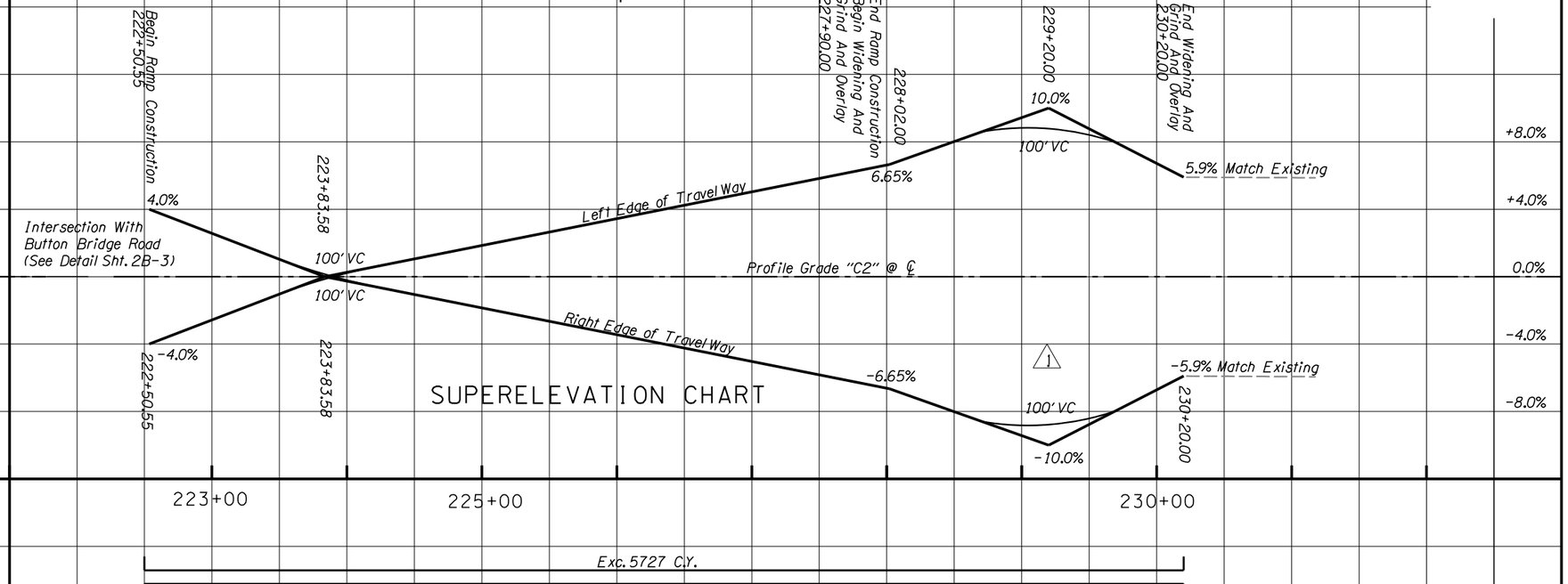


Exc. 624 C.Y.

Emb. 127 C.Y.

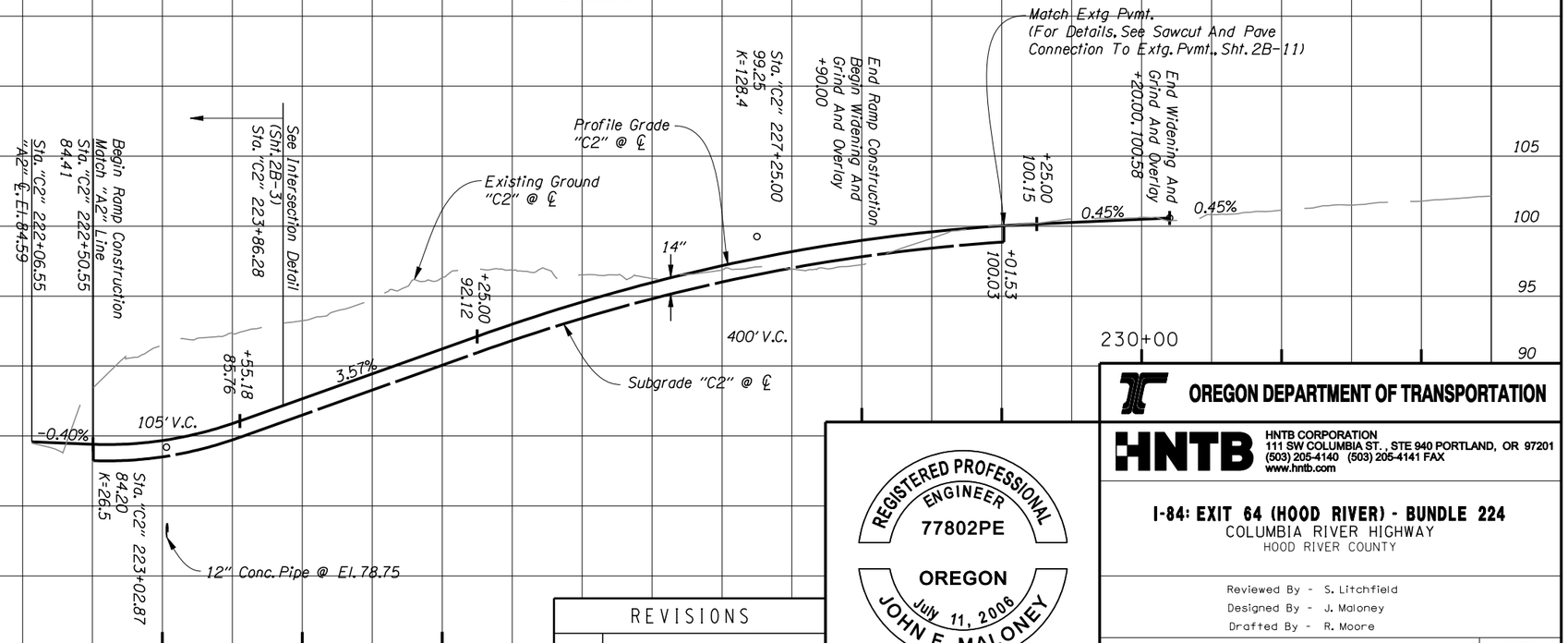


"C2" Line Eastbound On Ramp



Exc. 5727 C.Y.

Emb. 65 C.Y.



REVISIONS	
1	Revised 8-27-2008 Changed C2 Superelevation

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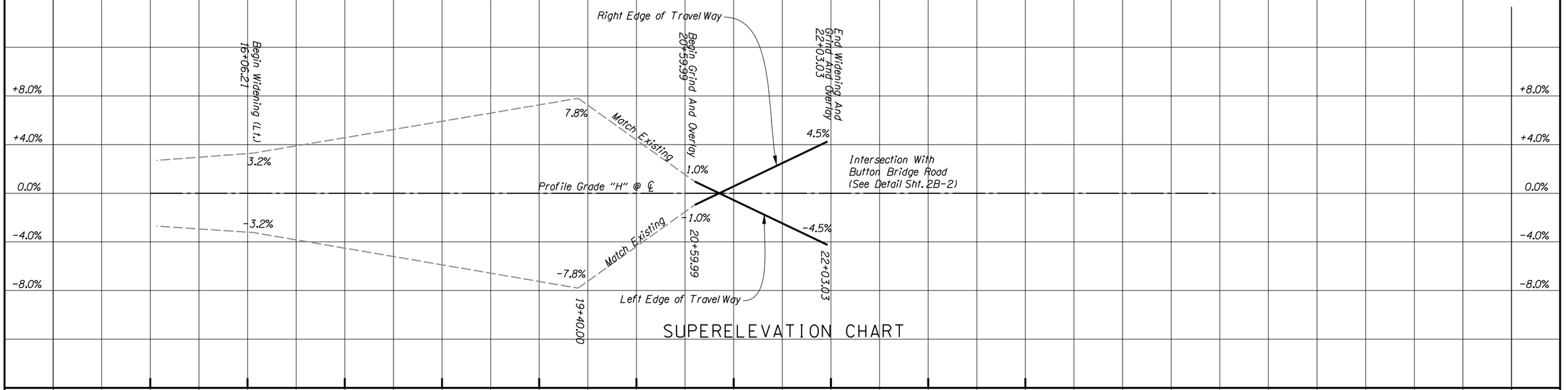
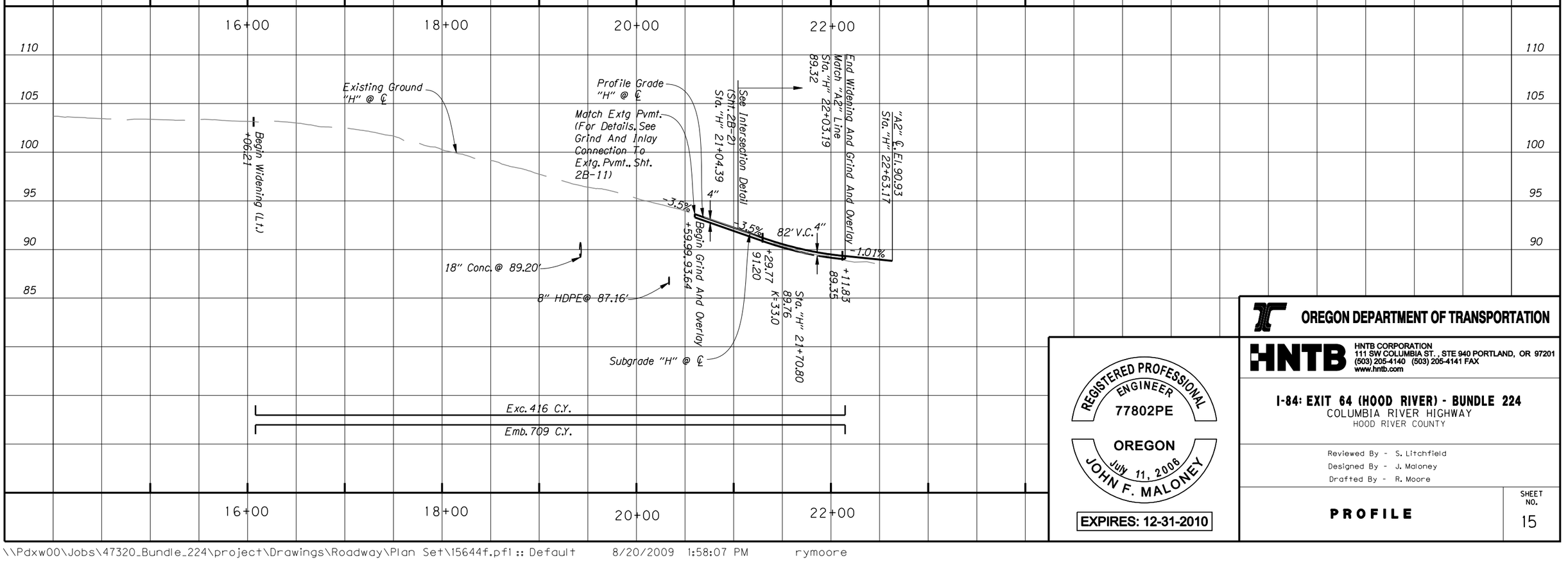
PROFILE

SHEET NO. 14

"H" Line
Westbound On Ramp



SUPERELEVATION CHART



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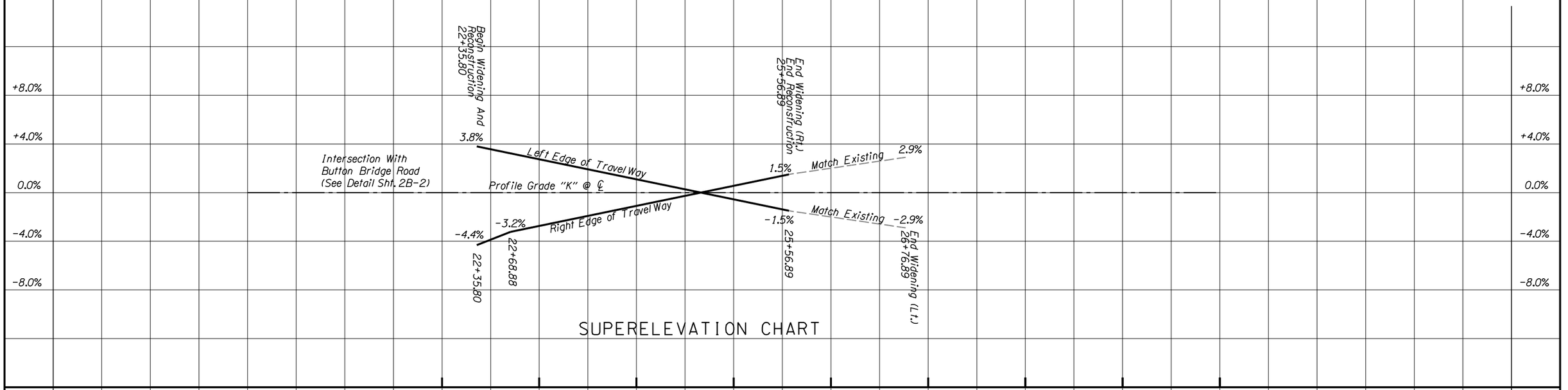
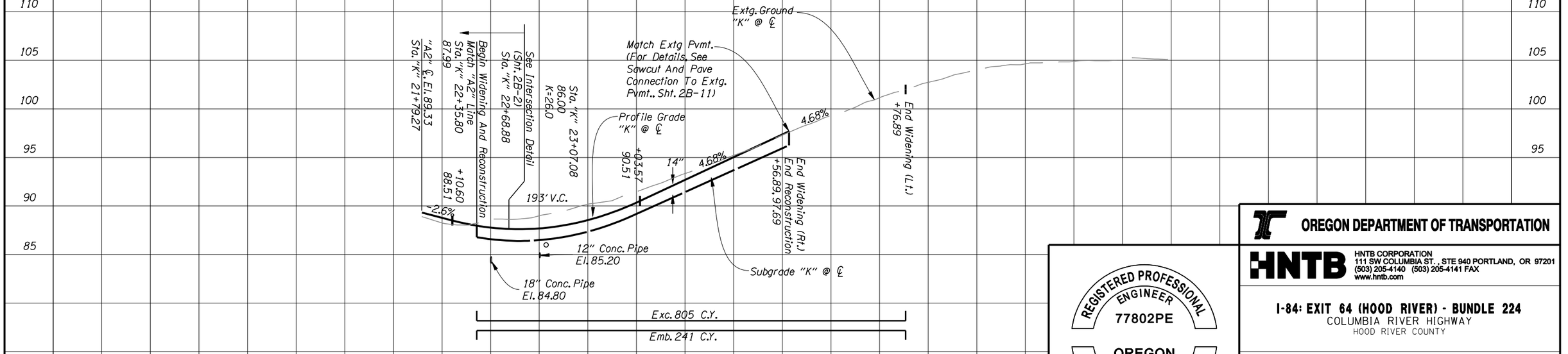
PROFILE

SHEET NO. 15

"K" Line
Westbound Off Ramp



SUPERELEVATION CHART



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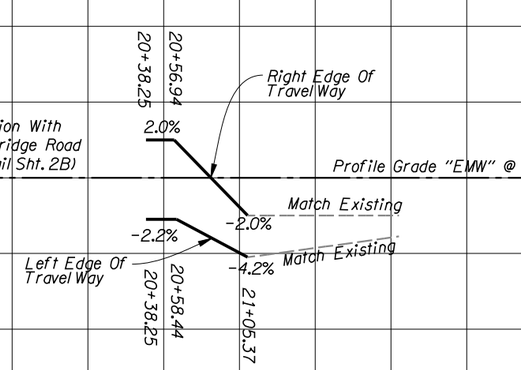
SHEET NO. 16

"EMW" Line
Marina Way



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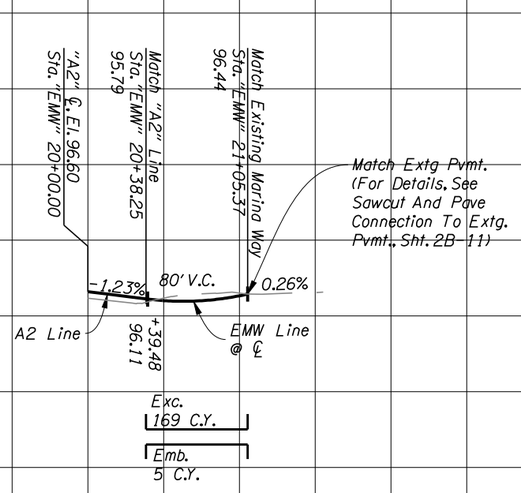
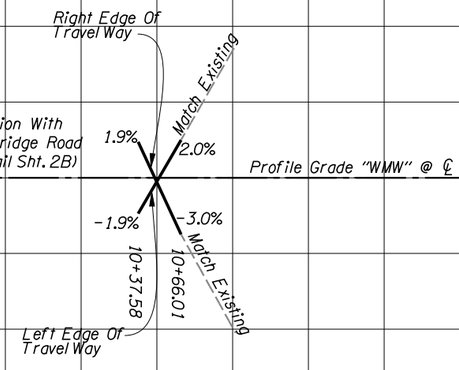
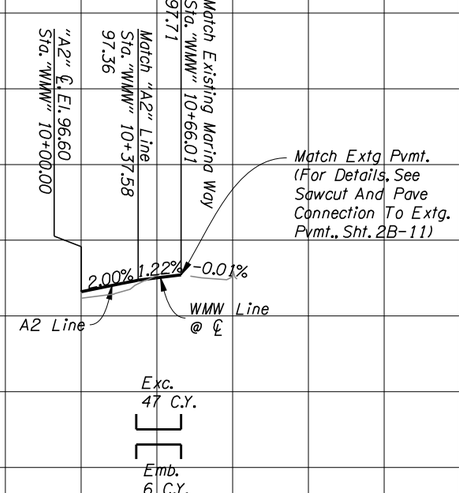


"WMW" Line
Marina Way



SUPERELEVATION CHART



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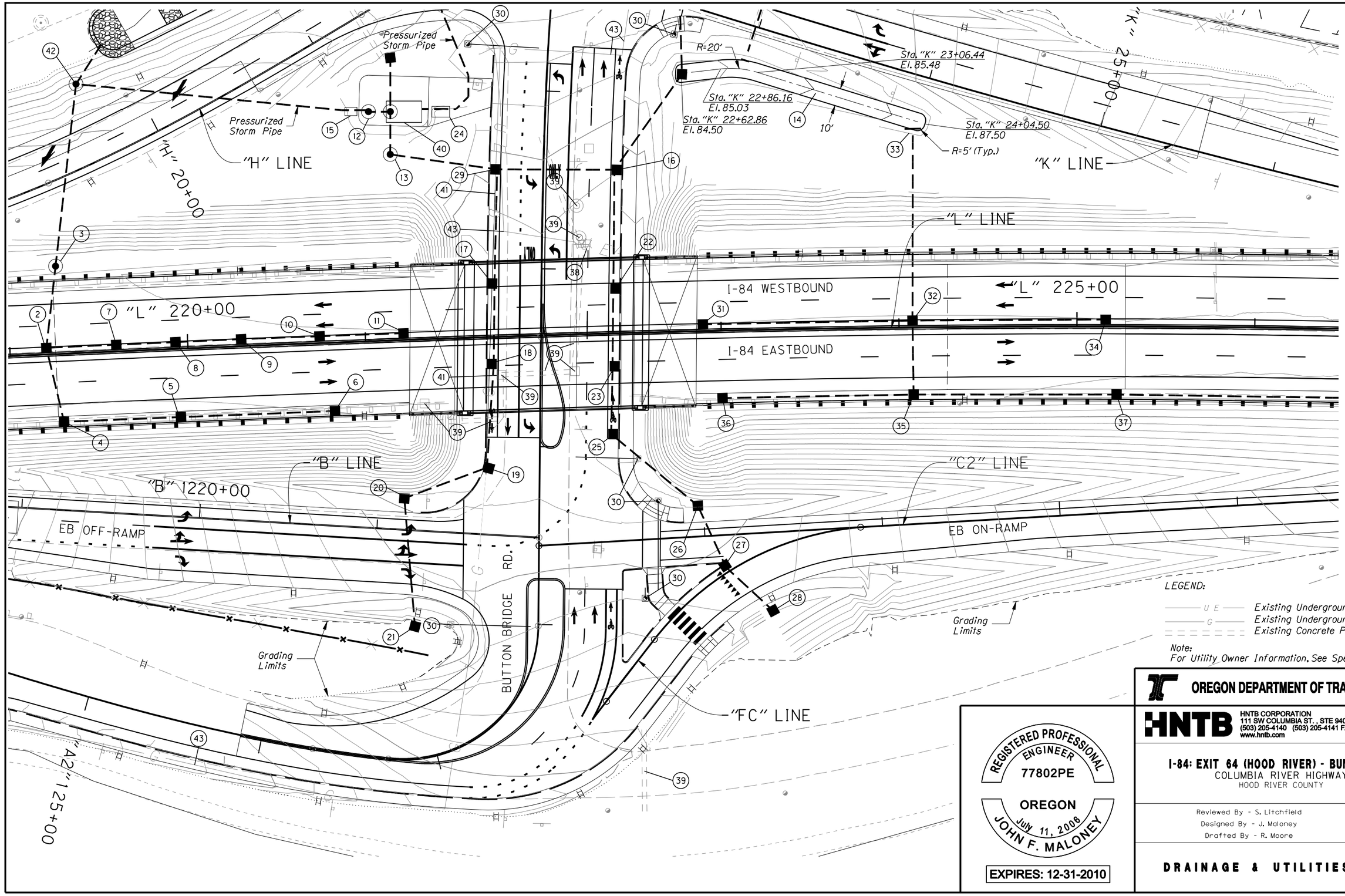
SHEET NO. 17



LEGEND:

- *Existing Underground Electric Line*
- *Existing Underground Gas Line*
- *Existing Concrete Pipe*

Note:
For Utility Owner Information, See Special Provisions

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DRAINAGE & UTILITIES

SHEET NO. 18

(1) Protect In Place

(2) Sta. "L" 219+20.53, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 43.3 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.05
Invert Elev. (N) = 96.70
Invert Elev. (S) = 97.00
Invert Elev. (E) = 97.17

(3) Sta. "L" 219+29.28, 68.0' Lt.
Const. Precast Manhole (3.5' Dia.)
Inst. 99.5 LF of 18" Conc. Pipe
See Std. Drawing RD336, RD344
Rim Elev. = 101.88
Invert Elev. (N) = 90.00
Invert Elev. (S) = 96.10

(4) Sta. "L" 219+28.65, 38.3' Rt.
Const. Inlet Type G-2
Inst. 40.5 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.75
Invert Elev. (N) = 97.40
Invert Elev. (E) = 97.40

(5) Sta. "L" 219+94.51, 38.4' Rt.
Const. Inlet Type G-2
Inst. 63.4 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.77
Invert Elev. (W) = 98.10
Invert Elev. (E) = 98.10

(6) Sta. "L" 220+81.31, 35.7' Rt.
Const. Inlet G-2
Inst. 84.3 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.96
Invert Elev. (W) = 99.00

(7) Sta. "L" 219+59.85, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 37.0 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.13
Invert Elev. (W) = 97.72
Invert Elev. (E) = 97.72

(8) Sta. "L" 219+93.17, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 31.0 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.63
Invert Elev. (W) = 98.18
Invert Elev. (E) = 98.18

(9) Sta. "L" 220+30.10, 4.0' Lt.
Const. Inlet Type G-2M
Inst. 34.6 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.71
Invert Elev. (W) = 98.70
Invert Elev. (E) = 98.70

(10) Sta. "L" 220+74.22, 3.9' Lt.
Const. Inlet Type G-2M
Inst. 41.8 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.63
Invert Elev. (W) = 99.33
Invert Elev. (E) = 99.33

(11) Sta. "L" 221+21.44, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 44.9 LF of 12" Conc. Pipe
See Std. Drawings RD364
Grate Elev. = 103.87
Invert Elev. (W) = 100.00

(12) Sta. "A2" 119+15.24, 99.3' Rt.
Const. Water Quality Pump Station
Inst. 164.0' LF of 8" HDPE Pipe
For Details, See Sht. 2B-7 Thru 2B-10
Rim Elev. = 89.16
Invert Elev. (W) = 85.25
Invert Elev. (E) = 72.50

(13) Sta. "A2" 119+38.02, 86.2' Rt.
Inst. Precast Manhole
Inst. 20.5 LF of 24" Conc. Pipe
See Std. Drawing RD336, RD344
Rim Elev. = 89.42
Invert Elev. (N) = 76.80
Invert Elev. (E) = 76.80

(14) Sta. "K" 22+62.86, 38.4' Lt. To
Sta. "K" 24+04.50, 25.4' Lt.
Const. Roadside Ditch
Exc. - 71.8 C.Y.
For Details, See Sht. 2B-5

(15) Sta. "A2" 119+15.54, 109.1' Rt.
Inst. Precast Valve Vault
For Details, See Sht. 2B-7
Rim Elev. = 88.30

(16) Sta. "A2" 119+43.28, 41.3' Lt.
Const. Inlet Type CG-2
Inst. 63.7 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 84.76
Invert Elev. (N) = 80.00
Invert Elev. (S) = 77.49
Invert Elev. (W) = 77.49

(17) Sta. "A2" 120+08.54, 27.6' Rt.
Const. Inlet Type CG-2
Inst. 61.9 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 83.09
Invert Elev. (N) = 78.50
Invert Elev. (S) = 78.50

(18) Sta. "A2" 120+53.68, 27.6' Rt.
Const. Inlet Type CG-2
Inst. 42.8 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 82.89
Invert Elev. (N) = 78.80
Invert Elev. (S) = 78.80

(19) Sta. "A2" 121+12.34, 28.4' Rt.
Const. Inlet Type CG-2
Inst. 47.5 LF of 12" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 83.09
Invert Elev. (N) = 79.10
Invert Elev. (W) = 79.10

(20) Sta. "A2" 121+29.66, 75.9' Rt.
Const. Inlet Type G-2
Inst. 53.9 LF 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 84.72
Invert Elev. (E) = 80.00
Invert Elev. (S) = 81.80

(21) Sta. "A2" 122+11.55, 69.3' Rt.
Const. Inlet Type G-2
Inst. 70.2 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 86.20
Invert Elev. (N) = 82.20

(22) Sta. "A2" 120+10.64, 41.7' Lt.
Const. Inlet Type CG-2
Inst. 64.4 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 82.70
Invert Elev. (N) = 77.81
Invert Elev. (S) = 77.81

(23) Sta. "A2" 120+54.41, 41.7' Lt.
Const. Inlet Type CG-2
Inst. 41.4 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 82.49
Invert Elev. (N) = 78.02
Invert Elev. (S) = 78.02

(24) Sta. "A2" 119+13.85, 58.6' Rt.
Inst. Precast Valve Box
For Details, See Sht. 2B-7
Rim Elev. = 89.00

(25) Sta. "A2" 120+92.53, 41.3' Lt.
Const. Inlet Type CG-2
Inst. 35.5 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 82.81
Invert Elev. (N) = 78.20
Invert Elev. (S) = 78.20

(26) Sta. "A2" 121+32.29, 84.1' Lt.
Const. Inlet Type G-2
Inst. 52.7 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 83.80
Invert Elev. (N) = 78.50
Invert Elev. (S) = 78.50

(27) Sta. "C2" 223+10.46, 17.1' Rt.
Const. Inlet Type CG-2
Inst. 44.6 LF of 12" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 85.15
Invert Elev. (N) = 79.00
Invert Elev. (S) = 81.10

(28) Sta. "C2" 223+35.89, 44.0' Rt.
Const. Inlet Type G-2
Inst. 33.7 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 86.89
Invert Elev. (N) = 81.50

(29) Sta. "A2" 119+44.59, 27.1' Rt.
Const. Inlet Type CG-2
Inst. 57.8 LF of 18" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 84.73
Invert Elev. (S) = 78.20
Invert Elev. (W) = 77.10
Invert Elev. (E) = 77.10

(30) Signal Pole and Foundation
See Signal Plans

(31) Sta. "L" 222+89.78, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 115.5 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 104.00
Invert Elev. (E) = 100.50

(32) Sta. "L" 224+07.63, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 105.4 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.94
Invert Elev. (N) = 96.50
Invert Elev. (S) = 96.50
Invert Elev. (W) = 98.77
Invert Elev. (E) = 98.91

(33) Sta. "L" 224+08.99, 110.4' Lt.
Const. Conc. Pipe End Slope (1:4)
See Std. Drawing RD318
Invert Elev. (N) = 91.00

(34) Sta. "L" 225+16.17, 3.8' Lt.
Const. Inlet Type G-2M
Inst. 106.2 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 104.03
Invert Elev. (W) = 100.50

(35) Sta. "L" 224+07.79, 37.8' Rt.
Const. Inlet Type G-2
Inst. 39.3 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 103.29
Invert Elev. (N) = 96.70
Invert Elev. (W) = 98.40
Invert Elev. (E) = 96.70

(36) Sta. "L" 222+99.94, 37.9' Rt.
Const. Inlet Type G-2
Inst. 105.1 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev= 103.44
Invert Elev. (E) = 99.00

(37) Sta. "L" 225+22.39, 38.3' Rt.
Const. Inlet Type G-2
Inst. 111.7 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.62
Invert Elev. (W) = 97.40
Invert Elev. (E) = 97.40

(38) Removal Of Lift Station

(39) Removal Of Manhole, Inlet And/Or Pipe

(40) Sta. "A2" 119+14.60, 79.3' Rt.
Const. Stormwater Pump Station
Inst. 270 LF 16" HDPE Pipe
For Details, See Sht. 2B-5 Thru 2B-10
Grate Elev. = 89.16
Invert Elev. (N) = 79.50
Invert Elev. (S) = 76.60
Invert Elev. (W) = 72.50
Invert Elev. (E) = 80.00

(41) Existing Utilities To Be Relocated By Others

(42) Sta. "H" 19+69.89, 44.3' Rt.
Const. Precast Manhole
Inst. 24.0 LF 18" Conc. Pipe
Inst. 1:4 Fill Slope
See Std. Drgs RD336, RD344
Rim Elev. 92.00
Invert Elev. (N) = 88.30
Invert Elev. (S) = 88.30
Invert Elev. (E) = 88.30

REGISTERED PROFESSIONAL ENGINEER
77802PE
OREGON
JULY 11, 2006
JOHN F. MALONEY
EXPIRES: 12-31-2010

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I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

Reviewed By - S. Litchfield
Designed By - J. Maloney
Drafted By - R. Moore

DRAINAGE & UTILITIES

SHEET NO. 18A

(1) *Sta. "L" 226+78.70, 38.6' Rt.*
Construct Inlet Type G-2
Inst. 153.1 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.78
Invert Elev. (W) = 98.20
Invert Elev. (E) = 98.20

(2) *Sta. "L" 227+97.50, 38.2' Rt.*
Construct Inlet Type G-2
Inst. 115.7 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 102.83
Invert Elev. (W) = 98.80

Note:
For Utility Owner Information, See Special Provisions

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SHEET NO. 19

INDEX OF SHEETS, CONT'D

SHEET NO.	DESCRIPTION
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1C Thru 1C-3	Survey Control Data Sheets
2 Thru 2A-4 Incl.	Typical Sections
2B Thru 2B-3	Intersection Details
2B-4 Thru 2B-6	Drainage Details
2B-7 Thru 2B-10	Pump Station Details
2B-11 Thru 2B-16	Miscellaneous Details
2C Thru 2C-6	Traffic Control Details
2D Thru 2D-32 Incl.	Traffic Control Plans
2E, 2E-2	Pipe Data Sheets
3, 3A	Alignments
4 Thru 10A	General Construction
11 Thru 17	Profiles
18 Thru 20	Drainage & Utilities
GA	Erosion Control Plans
GN Thru GN-3	Roadside Development Details
GN-4 Thru GN-7	Roadside Development Plans
ST Thru ST-5	Striping Plans
S-08291 Thru S-08297	Permanent Signing Plans
IL-1647, IL-1648	Underdeck Illumination Plans
15384 Thru 15396	Signal Plans

BRIDGE DRAWINGS - STRUCTURE 21218

SHEET NO.	DESCRIPTION
82313	Plan And Elevation
82314	General Notes
82315, 82316	Construction Staging
82317	Concrete Pour Sequence And Finish
82318, 82319	Foundation Data Sheet
82320	Foundation Plan
82321	End Bent 1 - Plan And Elevation
82322	End Bent 2 - Plan And Elevation
82323	End Bent Details (1 of 3)
82324	End Bent Details (2 of 3)
82325	End Bent Details (3 of 3)
82326	Pylon Details
82327	Typical Deck Section
82328	Deck Plan
82329	Framing Plan
82330	Girder Elevation
82331	Camber Diagram and Details
82332	Crossframe Details
82333	Steel Girder Details
82334	Miscellaneous Steel Details
82335	Miscellaneous Details
82336	MSE Wall General Notes And Details
82337	MSE Wall Details

BRIDGE DRAWINGS - STRUCTURE 21219

SHEET NO.	DESCRIPTION
82338	Sign Support Footing

Standard Drg. Nos.

BR165	- Bridge End Panel
BR200	- Standard Concrete Bridge Rail Type "F"
BR214	- Concrete Parapet With Steel Post
BR223	- Combination Rail
BR266	- Modified Type 2A Rail
BR273	- Thrie Beam Rail Retrofit For Curb And Parapet Rail
BR970	- Luminaire Base On Structures With Mounting Details
RD150	- Slope Rounding
RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD318	- Sloped Ends For Concrete Pipe
RD336, RD342, RD344	- Manholes
RD356	- Manhole Cover & Frames
RD360	- Manhole Frame Adjustment
RD364, RD366	- Concrete Inlets
RD386	- Pipe Fill Height Tables
RD400, RD405, RD410, RD415, RD420, RD425, RD440, RD445, RD450, RD470	- Guardrail
RD500	- Precast Concrete Barrier Pin And Loop Assembly
RD505	- Concrete Barrier Cast-In-Place
RD515	- Median Barrier Anchoring Details
RD516	- Securing Concrete Barrier To Roadway
RD560	- Cast-In-Place Tall Conc. Barrier Tran. To Std. Conc. Barrier
RD590	- 35" Concrete Median Barrier Cast-In-Place
RD610	- Asphalt Pavement Details
RD700	- Curbs
RD705	- Islands
RD715	- Approaches And Non-Sidewalk Driveways
RD720	- Sidewalks
RD755	- Sidewalk Ramp Details
RD759	- Truncated Dome Detectable Warning Surface Details
RD810	- Barbed And Woven Wire Fences
RD815	- Chain Link Fence
RD1000	- Construction Entrances
RD1005	- Check Dams
RD1010, RD1015, RD1020	- Inlet Protection
RD1025, RD1030, RD1035	- Sediment Barrier
RD1040	- Sediment Fence
TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM204	- Flag Board Mounting Details
TM206	- Sign Bracing Detail
TM211, TM212	- Signing Details
TM220	- Multi-Post Installations
TM223, TM224	- Directional Sign Layout
TM300, TM301	- Illumination Control Cabinets

Standard Drg. Nos.

TM450	- Mast Arm Pole Details
TM452	- Strain Pole Details
TM453	- Stabilizer Details
TM455	- Temporary Signal 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, TM478	- Loop Details
TM480	- Loop Entrance Details
TM482	- Controller Cabinet And Foundation Details
TM485	- Service Cabinets And Service Cabinet Wiring Details
TM488	- Terminal Cabinet Detail
TM490	- Crosswalk Closure Detail
TM498	- Interconnect Wiring Details
TM500, TM501, TM502, TM503	- Pavement Marking Standard Details
TM525	- Turn Arrow Marking Details
TM530	- Intersection Pavement Markings
TM547	- Freeway Entrance Ramp Pavement Markings
TM551	- Freeway Exit Ramp Pavement Markings
TM570	- Traffic Delineators
TM571	- Traffic Delineators Steel Post Details
TM575, TM576, TM577	- Traffic Delineator Installation
TM600, TM601	- Multi-Post Breakaway Sign Supports
TM602	- Triangular Base Breakaway Multi-Direction Slip Base
TM622, TM623, TM626	- Monotube Cantilever Sign Support
TM635	- Breakaway Sign & Luminaire Supports
TM650, TM651, TM652, TM653	- Traffic Signal Supports
TM670	- Perm. Signing Wood Post Supports Sizing Charts
TM675	- Extruded Aluminum Panels
TM676	- Sign Attachments
TM677	- Sign Mounts
TM678	- Secondary Sign Mounting Details
TM679	- Signal Mast Arm Street Name Sign Mounts
TM680	- Signal Pole 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
TM830	- Temporary Concrete Barrier And Rumble Strips
TM831, TM832	- Temporary Impact Attenuators
TM840	- Closure Details
TM841, TM842	
TM843	- Intersection Details
TM850	- 2-Lane, 2 Way Roadways
TM851, TM852	- Non-Freeway Multi-Lane Sections
TM860, TM861, TM862	- Freeway Sections
No R/W Map	

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

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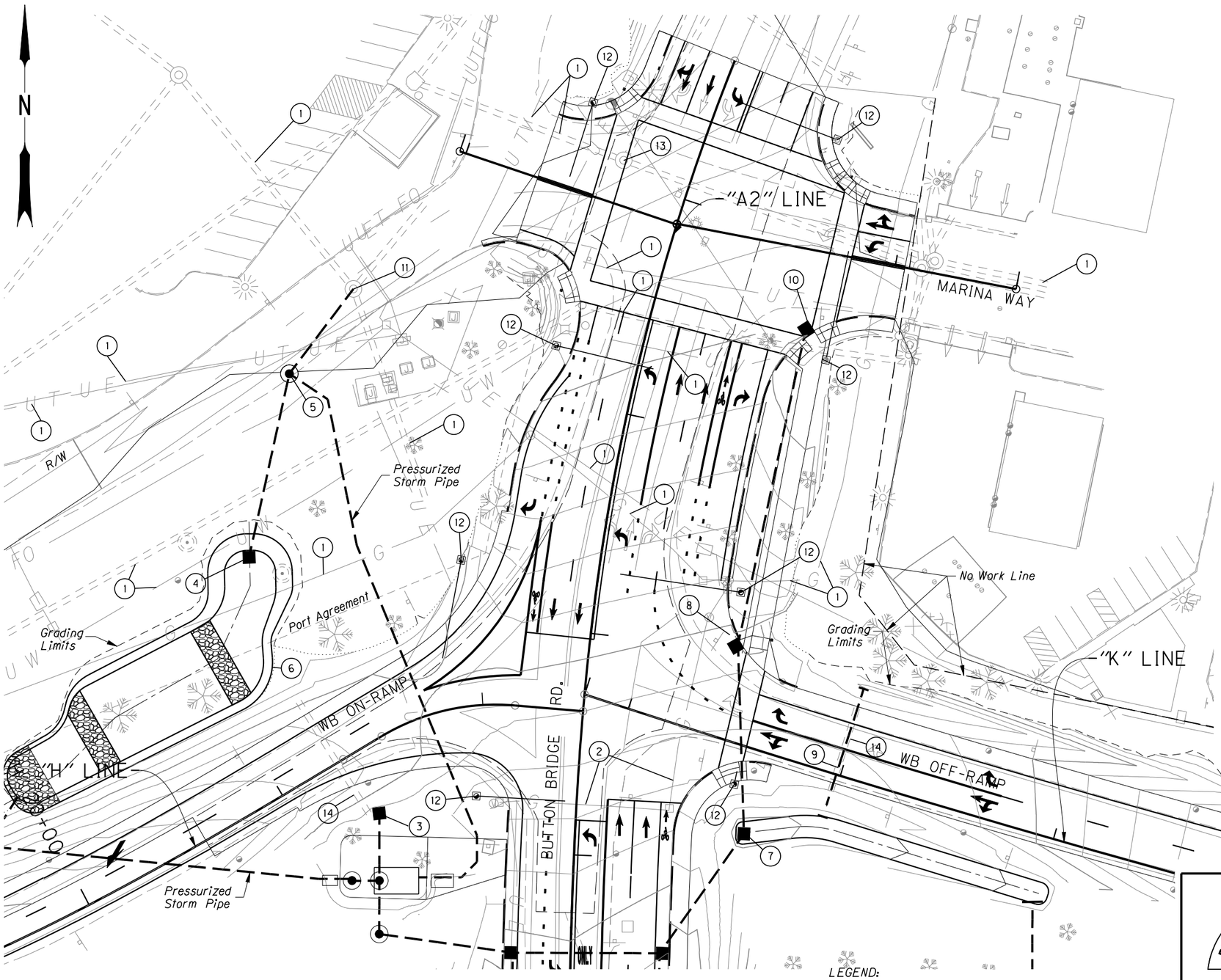
I-84: EXIT 64 (HOOD RIVER) - BUNDLE 224
COLUMBIA RIVER HIGHWAY
HOOD RIVER COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	X-NH-0TIA-S002(095)	1A



(1) *Protect In Place*

(2) *Existing Utilities To Be Relocated By Others*

(3) *Sta. "A2" 118+85.95, 88.3' Rt.*
Const. Inlet Type G-2
Inst. 27.4 LF of 12" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 86.39
Invert Elev. (S) = 80.00

(4) *Sta. "A2" 117+85.55, 156.7' Rt.*
Const. Inlet Type G-2
Inst. 81.7 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 86.70
Invert Elev. (N) = 83.70

(5) *Sta. "A2" 117+12.41, 152.3' Rt.*
Inst. Precast Manhole (3.5' Dia.)
Inst. 46.1 LF of 48" Conc. Pipe
Inst. 18" Wall Mounted Flap Gate
See Std. Drawing RD336, RD344
Rim Elev. = 94.52
Invert Elev. (N) = 83.40
Invert Elev. (SE) = 83.40
Invert Elev. (SW) = 83.40

(6) *Construct Water Quality Swale*
For Details, See Sht. 2B-4
Riprap Class 50 - 74 C.Y.
Exc. - 369.5 C.Y.
Water Quality Seeding - 0.15 Ac.
Water Quality Swale Topsoil - 240 C.Y.

(7) *Sta. "A2" 118+86.60, 75.9' Lt.*
Const. Inlet Type G-2
Inst. 63.0 LF of 18" Conc. Pipe
See Std. Drawing RD364
Grate Elev. = 85.00
Invert Elev. (N) = 82.00
Invert Elev. (S) = 82.00

(8) *Sta. "A2" 117+98.21, 65.3' Lt.*
Const. Inlet Type CG-2
Inst. 87.4 LF of 12" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 90.02
Invert Elev. (N) = 87.60
Invert Elev. (S) = 87.60

(9) *Sta. "K" 22+97.90, 14.5' Rt.*
Const. Culvert w/Embankment Protection
Inst. 60.4 LF of 12" Conc. Pipe
Inst. 1:4 Slope Ends
See Std. Drawing RD317
Invert Elev= 85.10 (S)
Invert Elev= 85.50 (N)

(10) *Sta. "A2" 116+41.46, 69.0' Lt.*
Const. Inlet Type CG-2
Inst. 138.0 LF of 12" Conc. Pipe
See Std. Drawing RD366
Grate Elev. = 94.55
Invert Elev. (S) = 90.00

(11) *Sta. "A2" 116+74.32, 132.5' Rt.*
Inst. Pipe Into Existing Manhole
Invert Elev. (SW) = 83.20

(12) *Signal Pole and Foundation*
See Signal Plans

(13) *Sta. "A2" 115+91.88, 31.6' Rt.*
Adjust Existing Manhole - 1 Ea.
Rim Elev. = 97.03
(See Std. Drg. No. RD360)

(14) *Remove Existing Manhole, Inlet And/Or Pipe*

LEGEND:

A E	*Existing Above Ground Electric Line*
U T FO	*Existing Underground Fiber Optic Line*
U W	*Existing Underground Water Line*
U TV	*Existing Underground CATV Line*
G	*Existing Underground Gas Line*
	Existing Concrete Pipe

Note:
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REGISTERED PROFESSIONAL ENGINEER
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DRAINAGE & UTILITIES

SHEET NO. 20