48V-010

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	*Title Sheet*
1A	*Index Of Sheets Cont. & Std. Drg. Nos.*

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

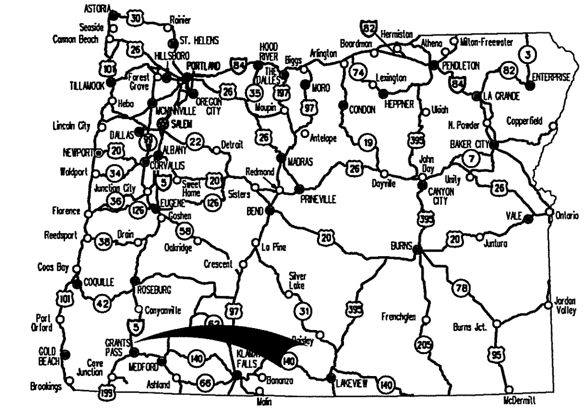
PLANS FOR PROPOSED PROJECT

GRADING, PAVING, SIGNALS

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS

PACIFIC HIGHWAY

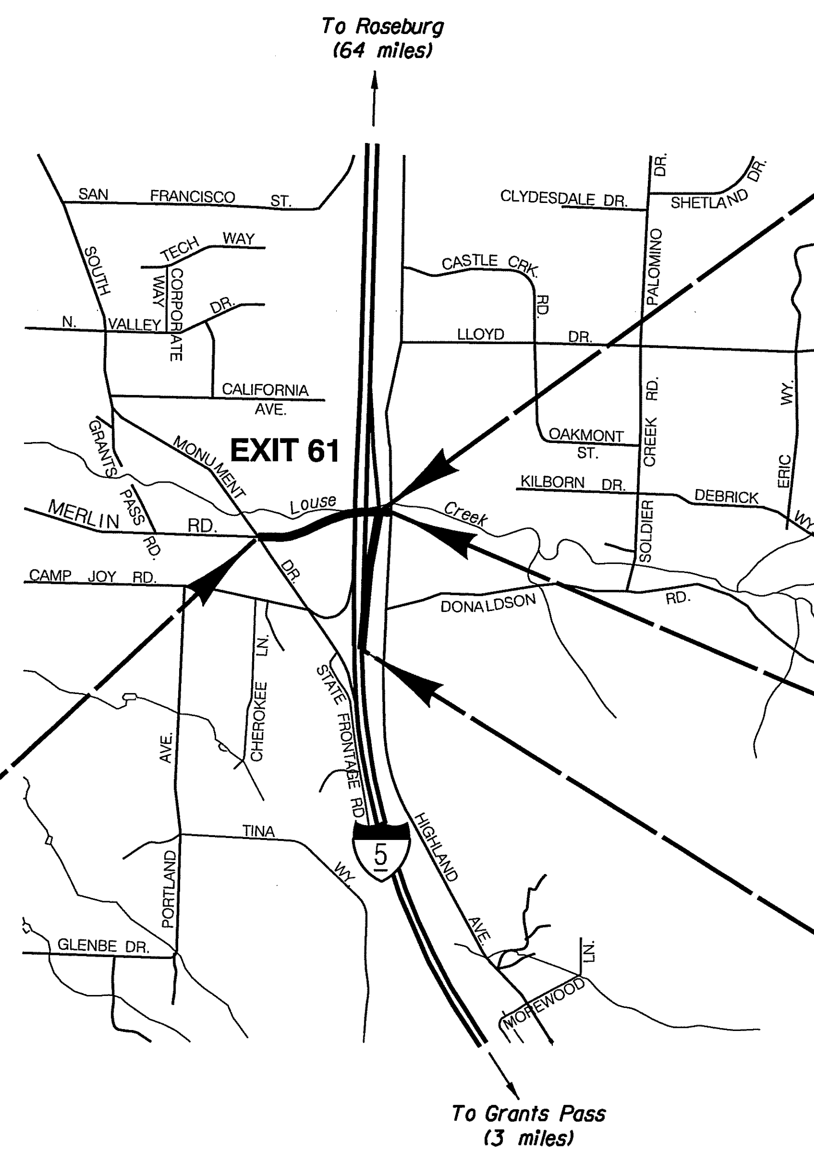
JOSEPHINE COUNTY
FEBRUARY 2015



Overall Length Of Project – 0.2 Miles

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

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE



BEGINNING OF PROJECT
NHPP-S001(456)
STA. "A" 32+95.00 (M.P. 61.50)

BEGINNING OF PROJECT
NHPP-S001(456)
STA. "C" 0+00.41 (M.P. 0.0)

END OF PROJECT
NHPP-S001(456)
STA. "C" 14+06.79 (M.P. 0.3)

END OF PROJECT
NHPP-S001(456)
STA. "D" 39+00.00 (M.P. 61.34)

T. 35 S., R. 6 W., W.M.

OREGON TRANSPORTATION COMMISSION

Catherine Mater	CHAIR
Tammy Baney	COMMISSIONER
David Lohman	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: [signature]
Signature & date 12-31-2014

Mark Thompson, Reg. 3 Tech. Ctr. Mgr.
Print name and title

[signature]
Concurrence by ODOT Chief Engineer

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NHPP-S001(456)	1

\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062r3.tsl :: Default 12/22/2014 3:53:06 PM hwye33g

1:1200 - 001

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INDEX OF SHEETS, CONT.

SHEET NO.	DESCRIPTION
1C	Survey Control Sheet
2 thru 2A-3	Typical Sections
2B thru 2B-5	Details
(1) 2C thru 2C-10	Traffic Control Plans
2D	Pipe Data Sheet
3	Plan
3A	Notes
3B	Profiles
4	Plan
4B	Profiles
5, 6	Plan and Profile

GEO/HYDRO	
GA, GA-2	Erosion Control Details
GA-3, GA-4	Erosion Control Plan
GJ	Stormwater
GJ-2 thru GJ-6	Stormwater Details

PERMANENT PAVEMENT MARKINGS	
ST & ST-2	Striping Plans

PERMANENT SIGNING	
S-15109, S-15110	Signing Plan
S-15111 thru S-15114	Signing Details
S-15115 thru S-15117	Sign & Post Data Table

TRAFFIC SIGNALS	
17952	Signal Plan Legend
17953	Signal Plan
17954	Detector Plan
17957	Signal Plan
17958	Detector Plan
17959	Existing Utilities
17960 thru 17962	Details

These sections are not included in the training set.

No.	DATE	REVISIONS	BY
(1)	2/6/2015	Revised sht. nos. for Traffic Control	RP.
(2)	2/10/2015	Added std. drgs.	RP.

Standard Drg. Nos.

- RD300 – Trench Backfill, Bedding, Pipe Zone And Mult. Installations
- RD302 – Street Cut
- (2) RD316 – Sloped Ends For Metal Pipe
- RD317 – Culvert Embankment Protection
- RD318 – Sloped Ends For Concrete Pipe
- RD319 – Miscellaneous Culvert Details
- RD320 – Paved End Slope For Culverts 60" Maximum Pipe Size
- RD326 – Coupling Bands For Corrugated Metal Pipe Types D & E
- RD327 – Coupling Bands For Corrugated Metal Pipe Types F, J, & K
- (2) RD335 – Standard Storm Sewer Manhole
- RD336 – Standard Manhole Details
- (2) RD342 – Shallow Manholes
- RD344 – Standard Manhole Base Section
- RD346 – Large Precast Manhole
- RD356 – Manhole Covers And Frames
- (2) RD360 – Manhole Frame Adjustment
- RD364 – Concrete Inlets Type G-1, G-2, G-2M & G-2MA
- RD370 – Ditch Inlet Type D
- RD378 – Type "3" Catch Basin, Frame and Grate
- RD380 – Fill Height Tables for Aluminum & Steel Carrugated Pipe
- RD382 – Fill Height Tables for Aluminum & Steel Arch Pipe
- RD384 – Fill Height Tables for Aluminum & Steel Spiral Rib Pipe
- (2) RD386 – Fill Height Table for Circular Concrete Pipe
- RD388 – Fill Height Tables for PVC Pipe
- RD390 – Fill Height Table for Corrugated HDPE Pipe
- RD391 – Fill Height Table for Steel Reinforced HDPE Pipe
- RD393 – Fill Height Tables for Polypropylene Pipe
- RD398 – Culvert ID Marker

- RD400 – Guardrail And Metal Median Barrier
- RD405 – Guardrail And Metal Median Barrier Parts
- RD410 – Guardrail Parts (Thrie Beam)
- RD415 – Guardrail And Metal Median Barrier Parts
- RD420 – Energy Absorbing Terminal
- RD450 – Guardrail Anchors (Steel)
- RD470 – Guardrail Over Low-Fill Culverts

- RD610 – Asphalt Pavement Details

- RD700 – Curbs

- RD810 – Barbed And Woven Wire Fences
- RD820 – Fence Gates

- RD1000 – Construction Entrances
- RD1005 – Check Dams
- RD1010 – Inlet Protection (Type 1, 2 & 3)
- RD1015 – Inlet Protection (Type 4) Biofilter Bags
- (2) RD1025 – Sediment Barrier (Type 1)
- RD1055 – Matting

- BR203 – Transition Concrete Bridge Rail To Guardrail
- (2) BR207 – 2-Tube Curb Mount Rail Transition
- BR270 – Rail Transition From Flex Beam Rail To Curb And Parapet Rail

- TM200 – Sign Installation Details
- TM201 – Miscellaneous Sign Placement Details
- TM211 – Sign Details US & Interstate Route Shields
- TM223 – Conventional Roads Directional Sign Layout Street Name Signs
- TM224 – Freeway/Expressway Directional Sign Layout
- TM225 – Exit Number And Gore Signing Details
- TM230 – Mounting Details For Removable Legend 4" Through 8" Letters & Numbers
- TM231 – Mounting Details For Removable Legend 10" Through 12" Letters & Numbers
- TM233 – Mounting Details For Removable Legend Various Arrow Sizes

- TM450 – Mast Arm Pole Details
- TM45[illegible] – Vehicle, Pedestrian Signal And Push Button Mounting Option Details
- TM458 – Pedestrian Ramp Placement Details
- TM460 – Vehicle Signal Details
- TM462 – Adjustable Signal Head Mounting Details
- TM465 – Ove[illegible]trol Details
- TM467 – Pe[illegible]
- TM470 – Co[illegible]
- TM472 – Traffic Sig[illegible]
- TM482 – Controller Cabinet And Foundation Details
- TM485 – Service Cabinets And Service Cabinet Wiring Details
- TM488 – Terminal Cabinet Detail
- TM490 – Crosswalk Closure Detail

These sections are not included in the training set.

- TM500 – Pavement Marking Standard Detail Blocks
- TM501 – Pavement Marking Standard Detail Blocks
- TM502 – Pavement Marking Standard Detail Blocks
- TM503 – Pavement Marking Standard Detail Blocks
- TM521 – Durable Pavement Markings Method "A" & Method "B" Surface & Groove Installed Non-Profiled
- TM530 – Intersection Pavement Markings (Crosswalk, Stop Bar & Bike Lane Stencil)
- TM531 – Turn Arrow Marking Details
- TM539 – Median and Left Turn Channelization Details
- (2) TM560 – Alignment Layout: General
- TM561 – Alignment Layout: Left Turn Lane, Centerline, & Medians
- TM570 – Traffic Delineators
- TM571 – Traffic Delineators Steel Post Details
- TM576 – Traffic Delineator Installation For Non-Freeways

- TM602 – Triangular Base Breakaway Multi-Directional Slip Base Design
- TM629 – Slip Base And Fixed Base Luminaire Supports General Details And Design Criteria
- TM635 – Breakaway Sign & Luminaire Supports – Support Location Guidelines
- TM650 – Traffic Signal Supports General Details & Design Criteria
- TM651 – Traffic Signal Supports Notes And Reactions
- TM652 – Traffic Signal Supports Steel Details
- TM653 – Traffic Signal Supports Foundation Requirements
- TM670 – Wood Post Sign Supports
- TM671 – 3 Second Gust Wind Speed Map
- TM675 – Extruded Aluminum Panels
- TM676 – Sign Attachments
- TM678 – Secondary Sign Mounting Details
- TM679 – Signal Mast Arm Street Name Sign Mounts
- TM680 – Signal Pole Mounts
- TM681 – Perforated Steel Square Tube (PSST) Sign Support Installation
- TM687 – Perforated Steel Square Tube (PSST) Anchor Foundation
- TM688 – Perforated Steel Square Tube (PSST) Slip Base Foundation

- TM800 – Tables, Abrupt Edge And PCMS Details
- TM810 – Temporary Reflective Pavement Markings
- TM820 – Temporary Barricades
- TM821 – Temporary Sign Supports
- TM840 – Closure Details
- TM841 – Intersection Work Zone Details
- TM843 – Multi-Lane Signalized Intersection Details
- TM850 – 2-Lane, 2-Way Roadways
- TM860 – Freeway Sections

R/W Map No.

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

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NHPP-S001(456)	1A

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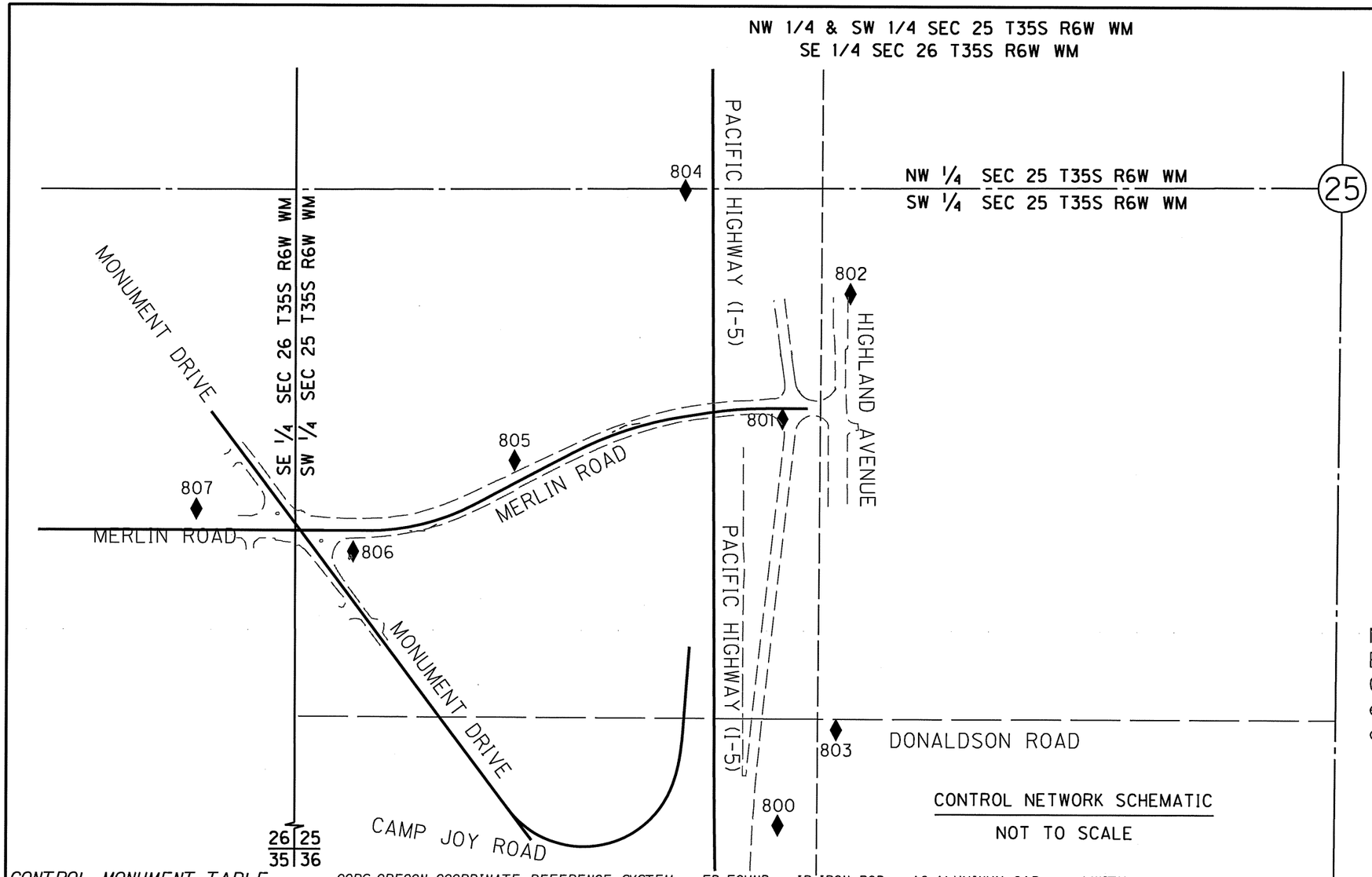


CONTROL NETWORK SCHEMATIC

NOT TO SCALE

POINT LEGEND
♦ SET STRATEGIC POINT

Note:
Elevations are based on levels from a GPS derived NAV88 value for point 801 elevations. Field verify all coordinates and elevations before use.

CONTROL MONUMENT TABLE OCRS=OREGON COORDINATE REFERENCE SYSTEM FD=FOUND IR=IRON ROD AC=ALUMINUM CAP w/=WITH

PT. NO.	OCRS NORTHING	OCRS EASTING	ELEV.	DATE	DESCRIPTION
800	271226.22	156176.06	1190.74	12/27/2012	SET 5/8" IR w/2" A.C. "ODOT CONTROL POINT 800"
801	272250.94	156183.34	1145.80	12/27/2012	SET 5/8" IR w/2" A.C. "ODOT CONTROL POINT 801"
802	272567.02	156353.53	1151.05	12/27/2012	SET PK NAIL w/ALUMINUM WASHER "ODOT 802"
803	271466.96	156321.90	1185.24	12/27/2012	SET PK NAIL w/ALUMINUM WASHER "ODOT 803"
804	272827.04	155936.61		12/27/2012	SET PK NAIL w/ALUMINUM WASHER "ODOT 804"
805	272143.87	155508.36	1134.70	12/27/2012	SET 5/8" IR w/2" A.C. "ODOT CONTROL POINT 805"
806	271912.91	155101.52	1133.41	12/27/2012	SET PK NAIL w/ALUMINUM WASHER "ODOT 806"
807	272020.78	154705.82	1126.56	12/27/2012	SET PK NAIL w/ALUMINUM WASHER "ODOT 807"

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 15, 2003
ANDREW DAVID AUSLAND
56136

EXPIRES: 12/31/2015

SI FEET

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3, DISTRICT 8 SURVEY

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

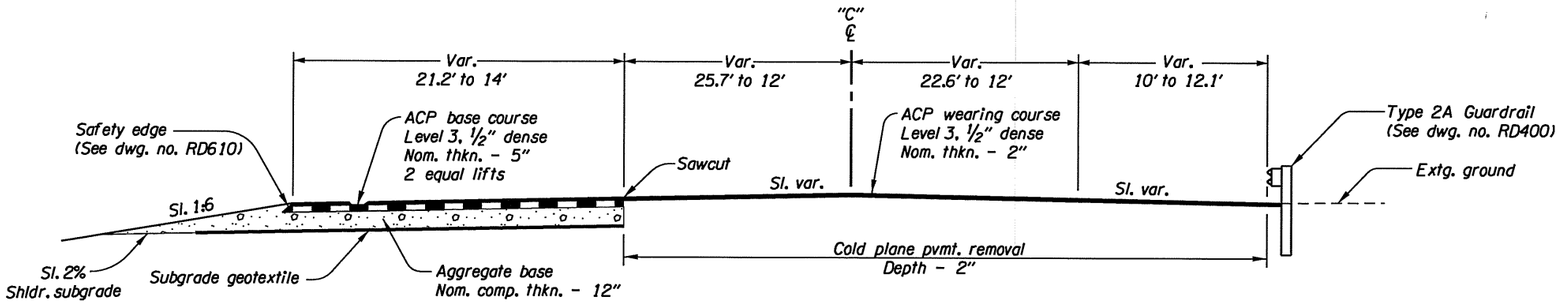
FULL SURVEY ON FILE WITH JOSEPHINE COUNTY SURVEYOR'S OFFICE AS C.S. 13-2014

Designed By - Andy Ausland
Reviewed By - Stuart Cappello
Drafted By - Richard Carson

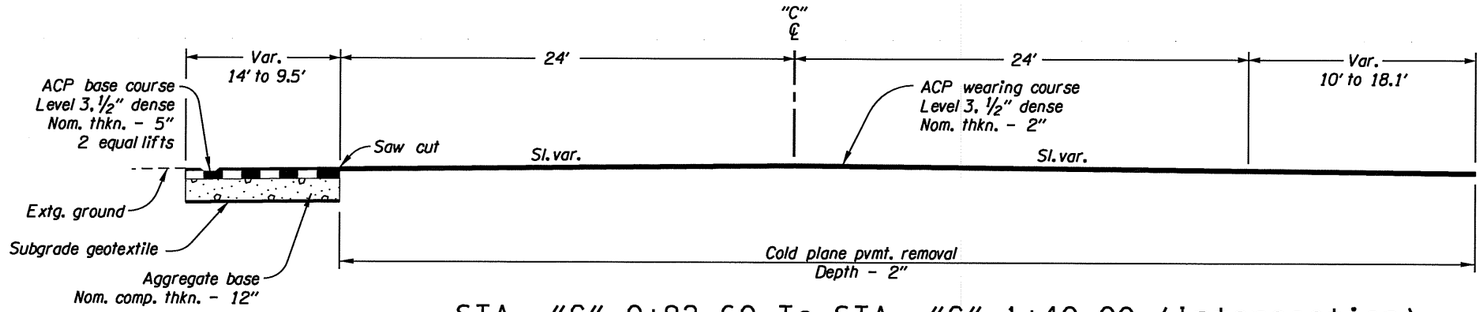
SURVEY CONTROL SHEET

SHEET NO. 1C

Z:\Josephine\16062_Exit61_LouseCreek\Final_Products\ROW_Files\16062rw.dgn :: SCS Schematic 12/23/2014 3:09:50 PM hwye29g



STA. "C" 0+30.86 To STA. "C" 0+92.60



STA. "C" 0+92.60 To STA. "C" 1+40.00 (Intersection)

NOTE:
1. *Side-slopes are shown as vert. to horiz.*
2. *For geotextile placement details, see sht. 2B.*

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

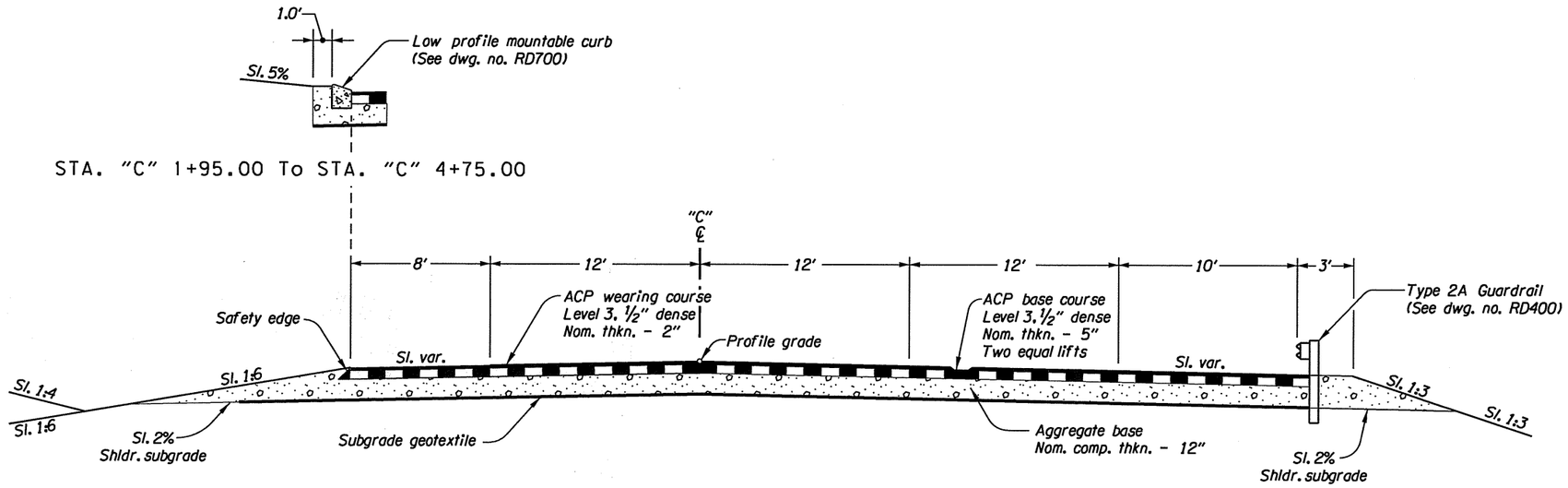
REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

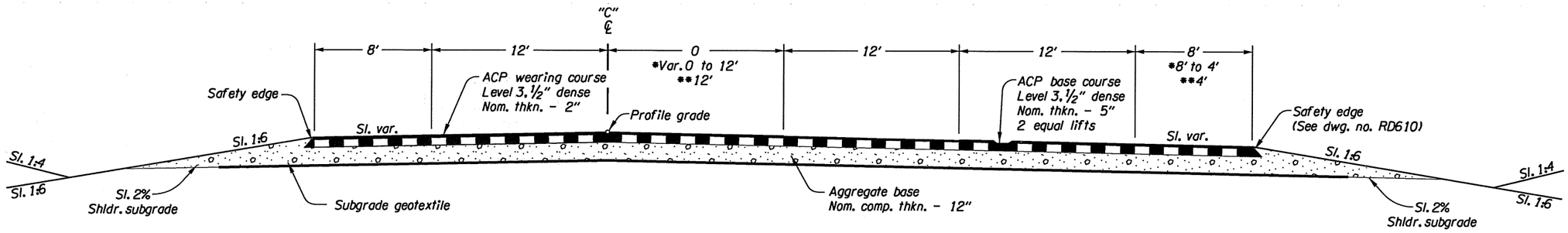
TYPICAL SECTIONS

SHEET NO. 2



STA. "C" 1+95.00 To STA. "C" 4+75.00

STA. "C" 1+40.00 To STA. "C" 7+26.55



STA. "C" 7+26.55 To STA. "C" 9+12.13
*STA. "C" 9+12.13 To STA. "C" 12+30.58
**STA. "C" 12+30.58 To STA. "C" 14+06.79

NOTE:
1. *Side-slopes are shown as vert. to horiz.*
2. *For geotextile placement details, see sht. 2B.*

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TYPICAL SECTIONS

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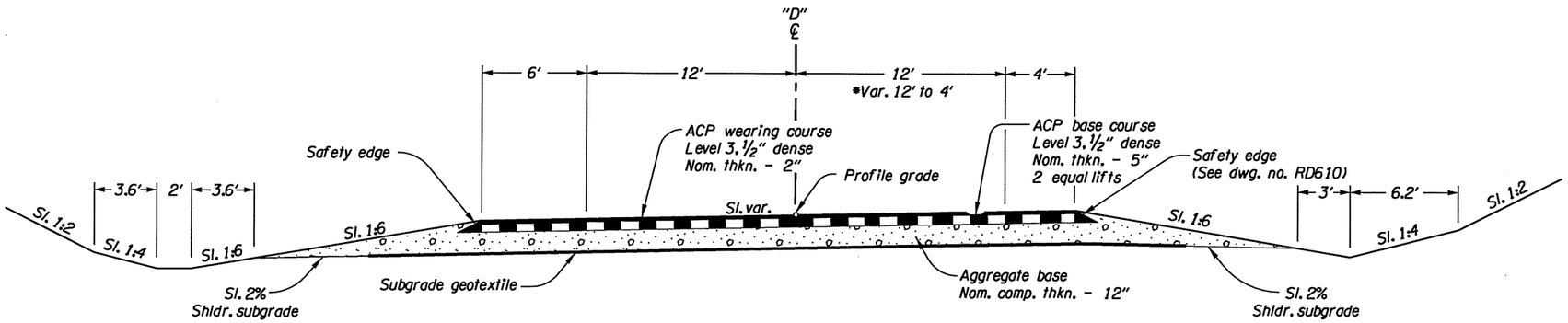
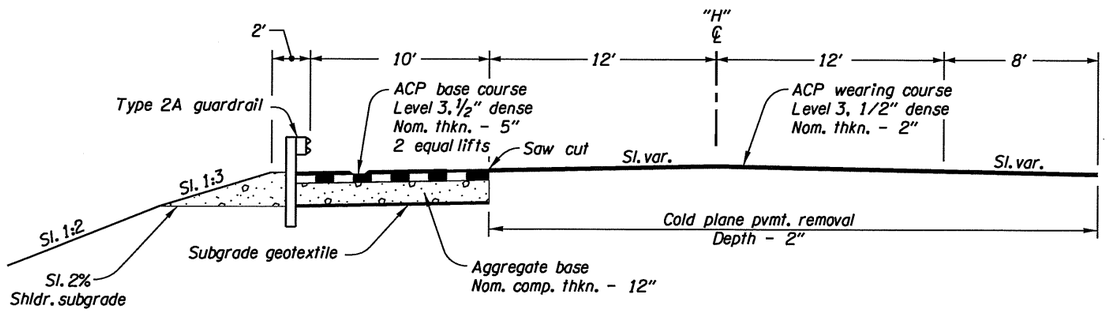


STA. "D" 34+00.00 To STA. "D" 37+00.00
*STA. "D" 37+00.00 To STA. "D" 39+00.00



STA. "H" 2+45.46 To STA. "H" 4+03.00

NOTE:
1. *Side-slopes are shown as vert. to horiz.*
2. *For geotextile placement details, see sht. 2B.*

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

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I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

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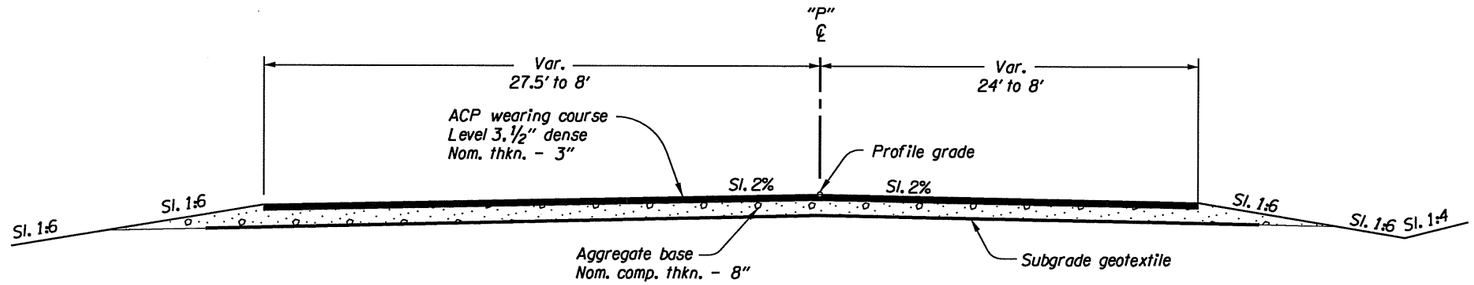
Drafted By - Judy Hardin

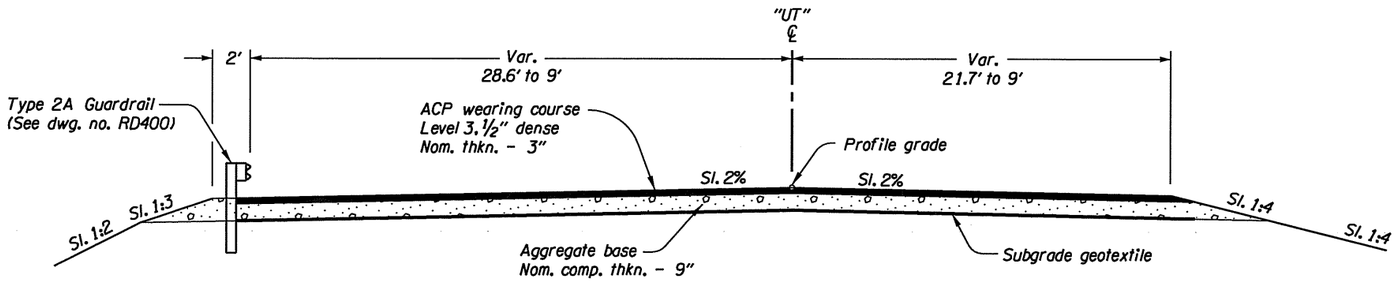
TYPICAL SECTIONS

SHEET NO. 2A-2

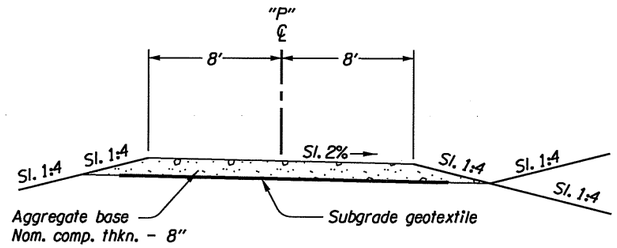
48V-010



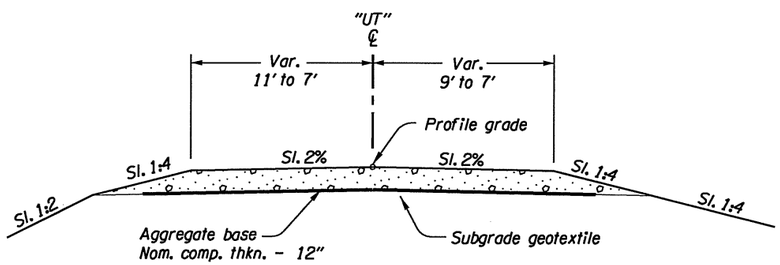
STA. "P" 1+20 To STA. "P" 1+40



STA. "UT" 1+23.00 To STA. "UT" 1+44.00



STA. "P" 1+40 To STA. "P" 2+10



STA. "UT" 1+44.00 To STA. "UT" 1+66.72

NOTE:
1. Side-slopes are shown as vert. to horiz.
2. For geotextile placement details, see sht. 2B.

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TYPICAL SECTIONS

SHEET NO. 2A-3

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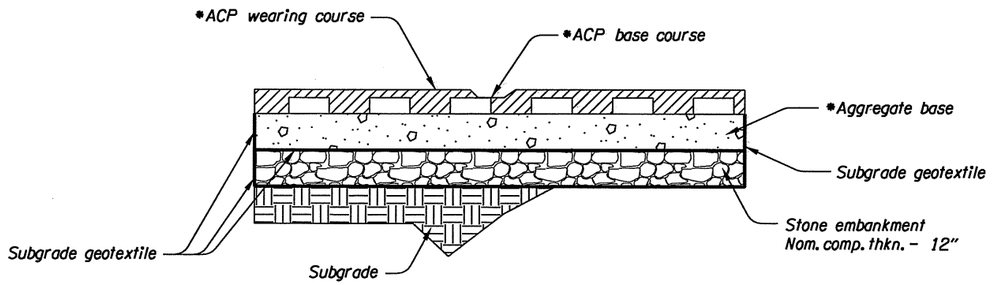
48V-010



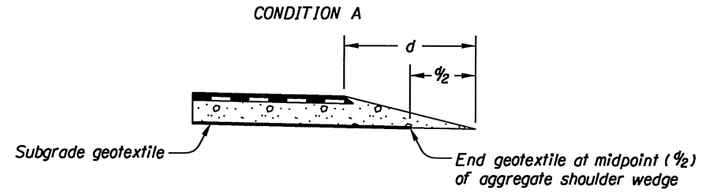
* For ACP wearing course, base course & aggregate base nom. comp. thickness - see typical sections.

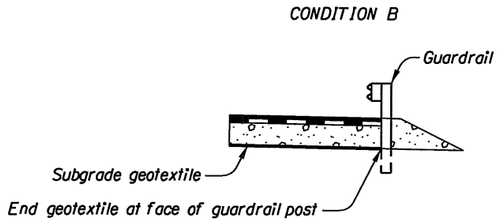
Notes:

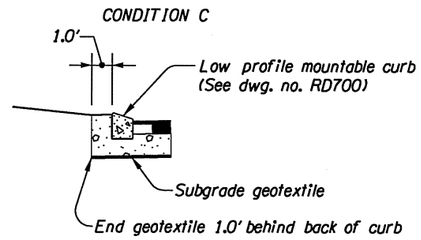
1. The 12" subgrade stabilization may be omitted if no soft or unstable subgrade is found during construction.
2. Excavate to a depth of 12" below subgrade.
3. Replace with 12" of stone embankment prior to placement of aggregate base..

12" SUBGRADE STABILIZATION

(As located by the Engineer)







GEOTEXTILE INSTALLATION

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

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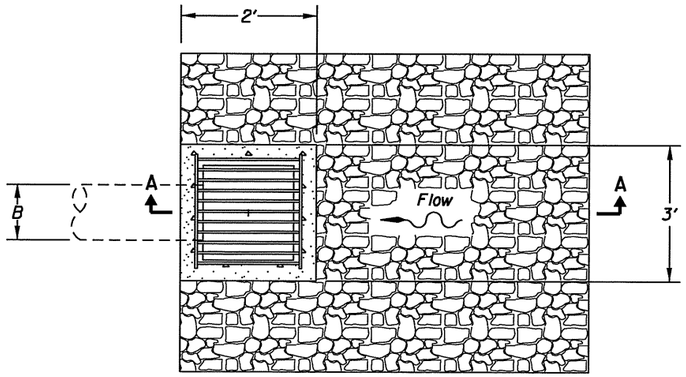
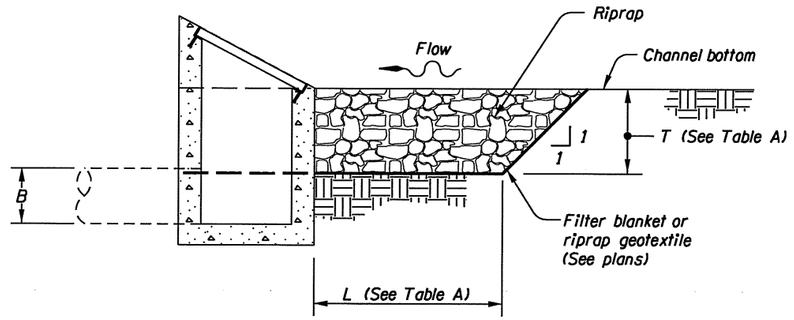
DETAILS

SHEET NO. 2B





SECTION A-A

LOOSE RIPRAP PAD W/INLET DETAIL

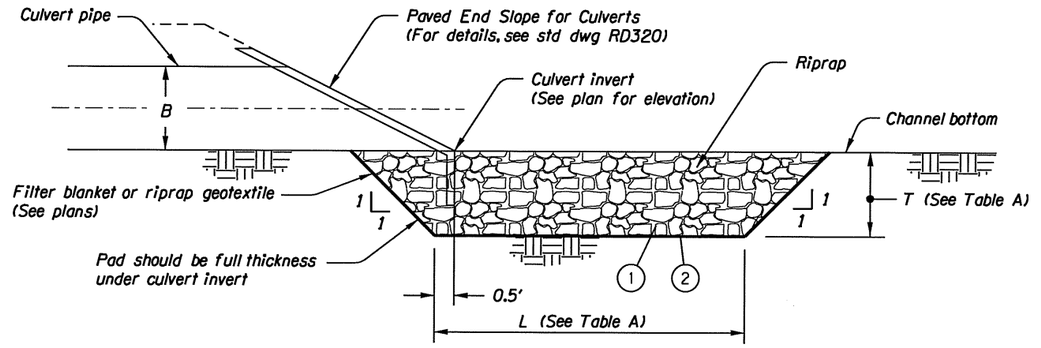


TABLE A			
Riprap Class	L* (ft)	W (ft)	T (ft)
50	4B or 1.3	5B	2.3

* L is the greater of 4B or the listed dimension
B = Diameter or span of conduit, ft.
L = Length of bottom of riprap pad, ft.
T = Thickness of riprap pad, ft.
W = Width of top of riprap pad, ft.

Notes:

1. Do not excavate non-erodible rock in order to place riprap.
2. Use filter blanket beneath Class 200 loose riprap.
3. Top width of the riprap pad to match width of swale bottom.

LOOSE RIPRAP PAD DETAIL

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

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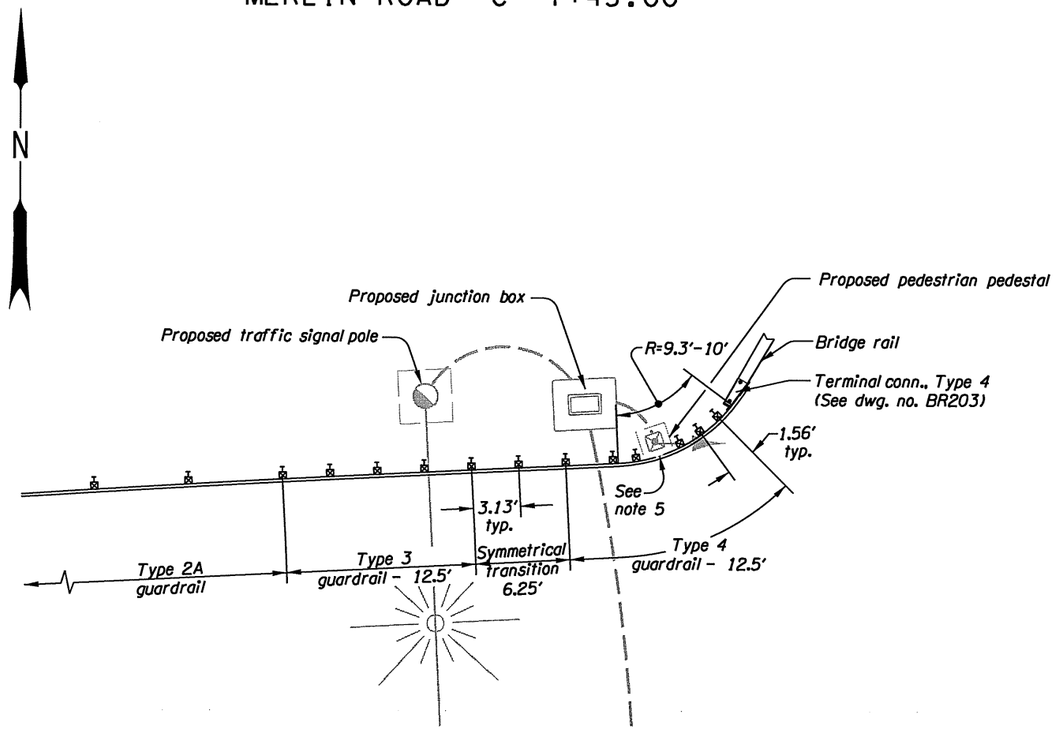
Drafted By - Judy Hardin

DETAILS

SHEET NO. 2B-2

48V-010

GUARDRAIL TRANSITION AND RADIUS DETAIL
MERLIN ROAD "C" 1+45.00



Notes:

1. *For connection details not shown see bridge standard drawings BR203 & BR270.*
2. *Place radius ID plate (See dwg. no. RD415).*
3. *Shop fabricate all radius rail to dimensions shown.*
4. *Post placement may vary with bridge rail type. (See dwg. nos. BR207 & BR270)*
5. *Leave guardrail post out to allow room for pedestrian pedestal.*

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

DETAILS

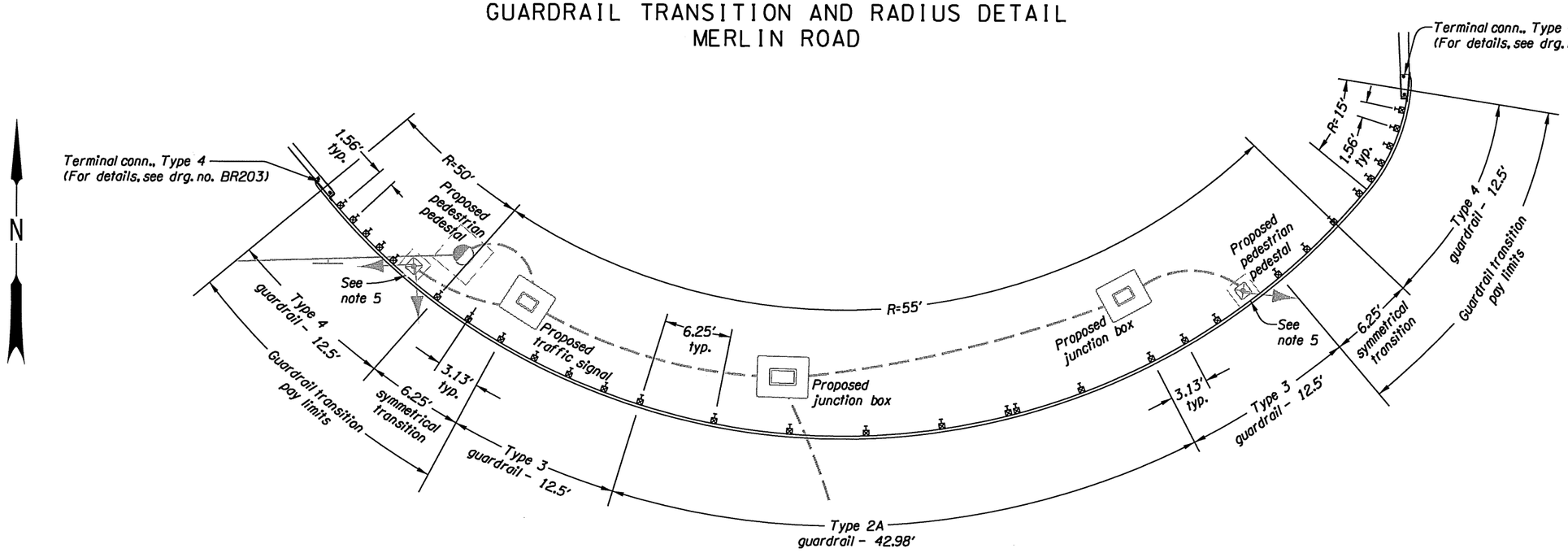
SHEET NO. 2B-3

F:\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.dtl :: Default 12/22/2014 3:53:42 PM hwye33g

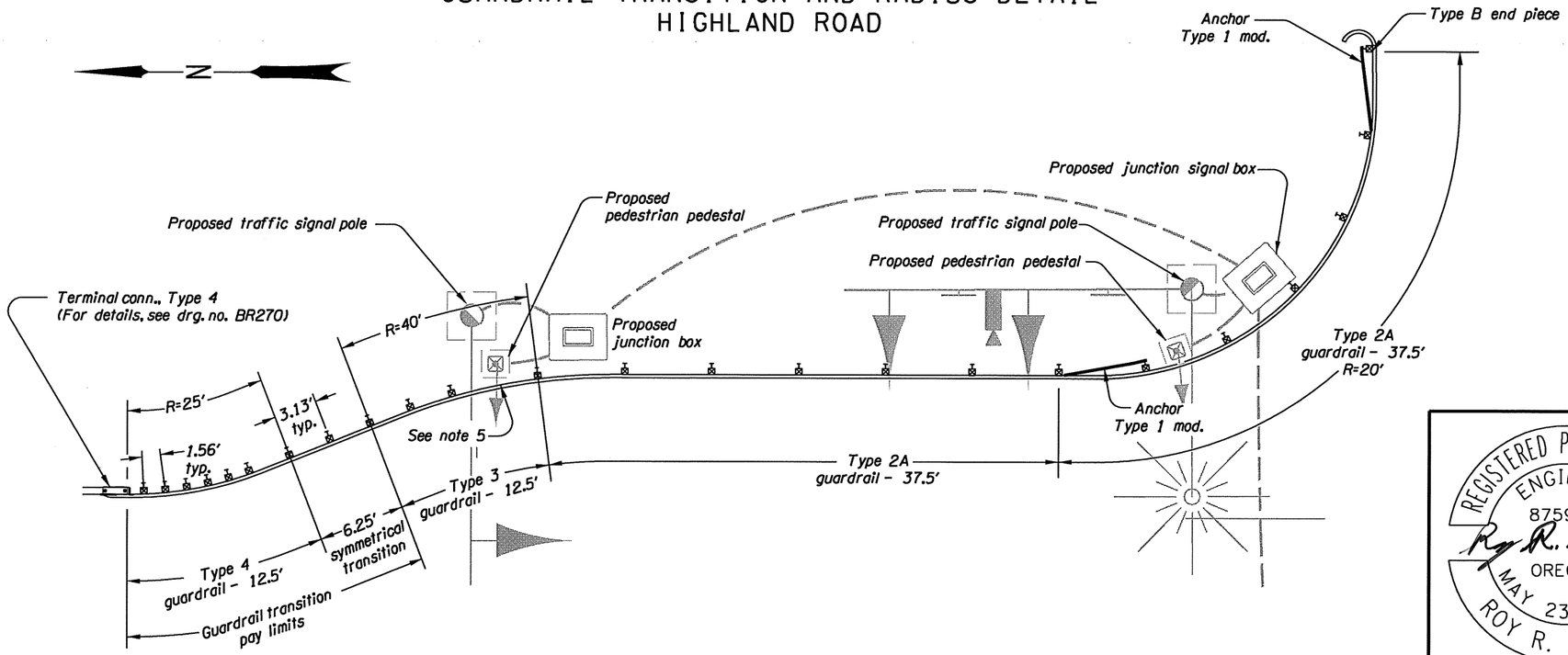
Rotation: 0° Scale: 1"=100'

48V-010

GUARDRAIL TRANSITION AND RADIUS DETAIL
MERLIN ROAD



GUARDRAIL TRANSITION AND RADIUS DETAIL
HIGHLAND ROAD



Notes:

1. *For connection details not shown see bridge standard drawings BR203 & BR270.*
2. *Place radius ID plate (See dwg. no. RD415).*
3. *Shop fabricate all radius rail to dimensions shown.*
4. *Post placement may vary with bridge rail type. (See dwg. nos. BR207 & BR270)*
5. *Leave guardrail post out to allow room for pedestrian pedestal.*

REGISTERED PROFESSIONAL ENGINEER
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ROY R. BLOWER
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

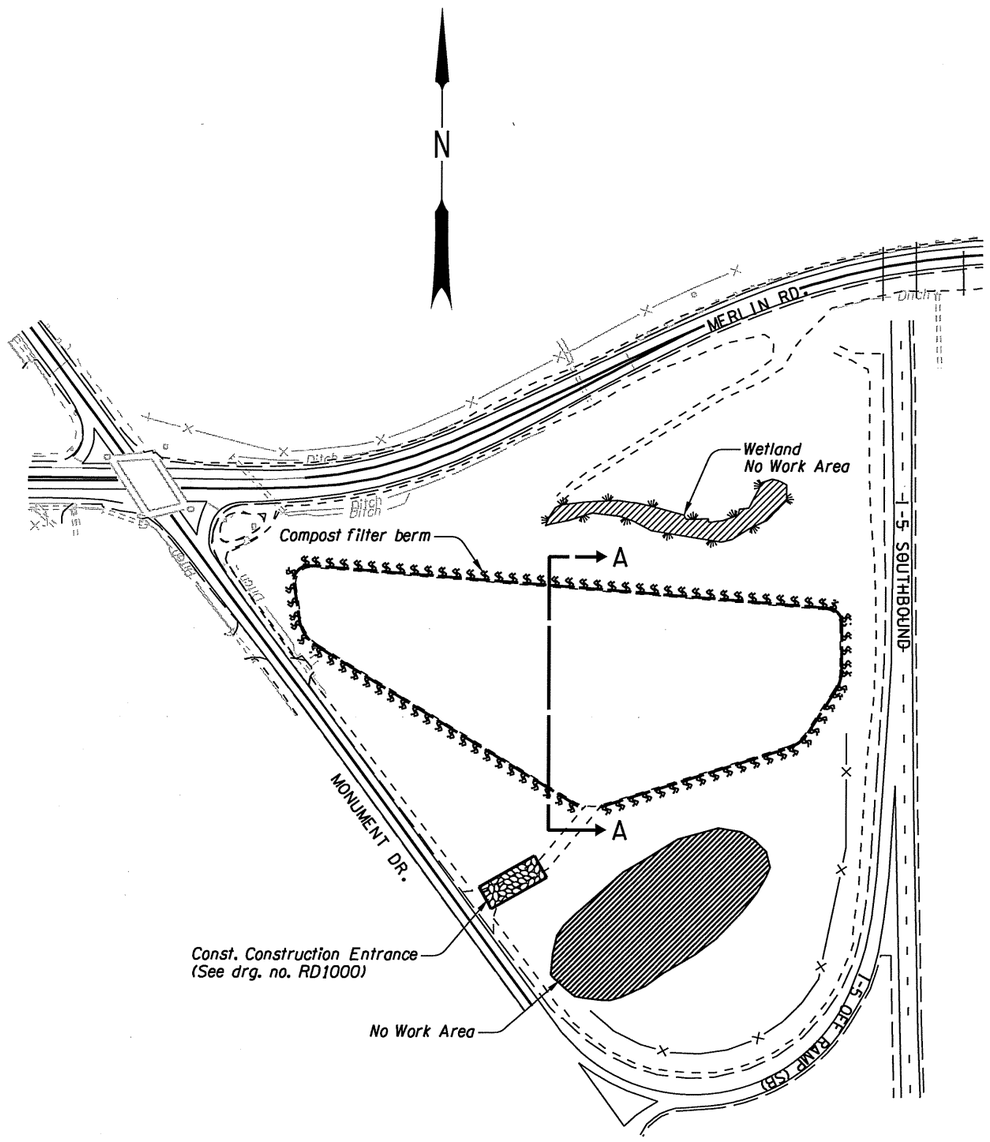
DETAILS

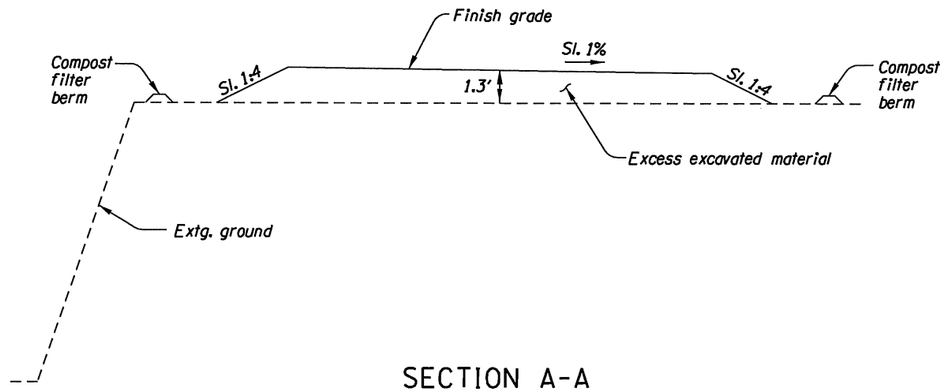
SHEET NO. 2B-4

F:\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.dt1 :: Default 12/22/2014 3:53:42 PM hwye33g

Rotation: 0° Scale: 1"=100'

WASTE SITE





SECTION A-A

(Not to scale)

Notes:

1. *The contractor shall restore the staging area to pre-construction conditions by completing the following:*
   a) *Remove all fencing when project is complete.*
   b) *Remove all fabric and other construction debris.*
   c) *Regrade and smooth the ground where disturbed.*
   d) *Reseed all disturbed earth with compost blanket. (See Erosion Control Plans.)*
2. *Place all generated excess excavated material in location shown, according to SS00330.*

REGISTERED PROFESSIONAL ENGINEER
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REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

DETAILS

SHEET NO. 2B-5

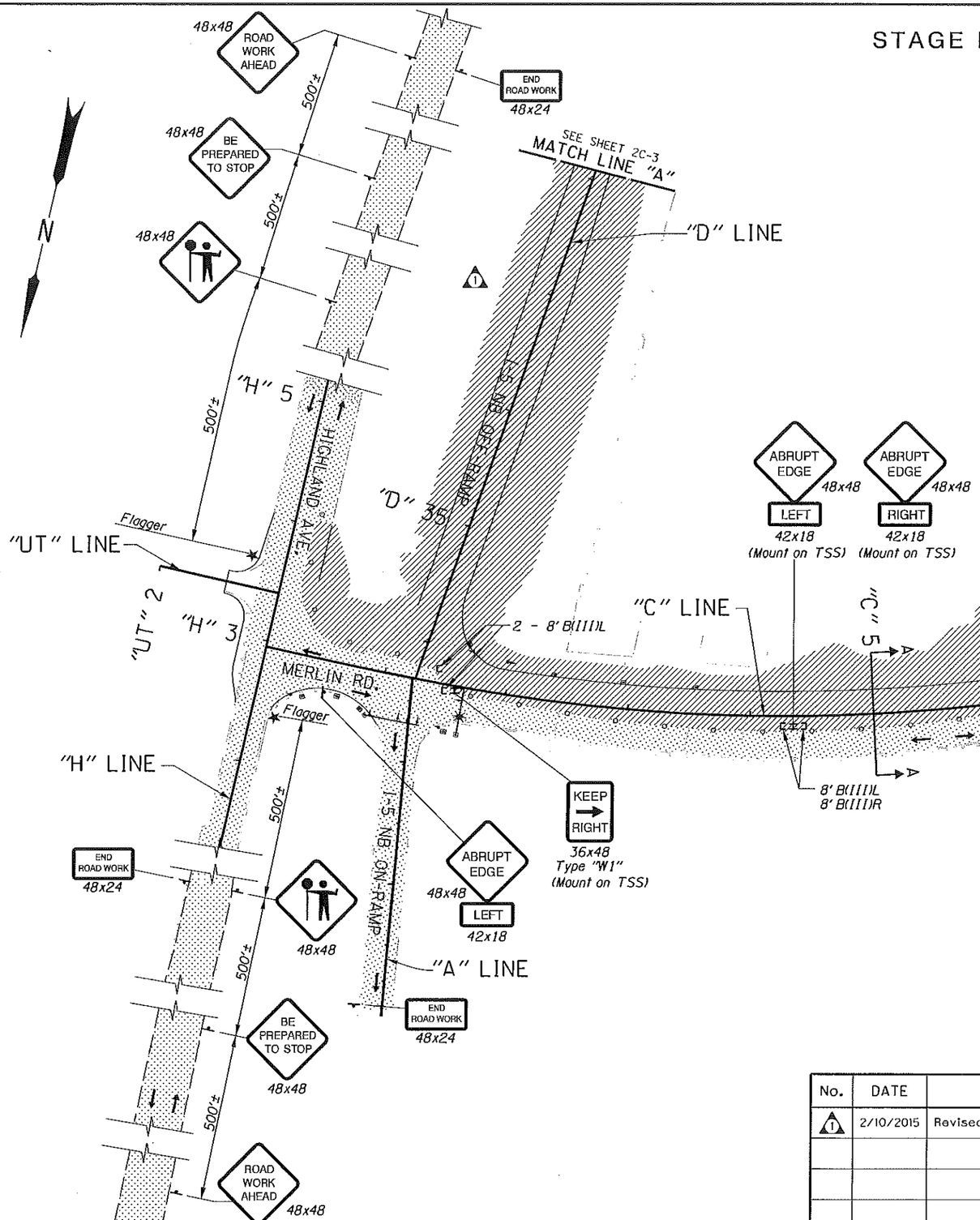
F:\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.dt2 :: Default 1/6/2015 1:52:56 PM hwye33g

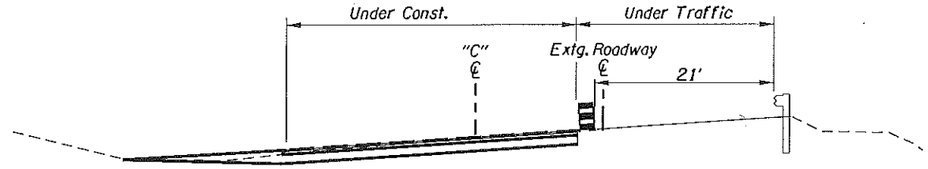
Rotation: 0° Scale: 1"=200'

48V-010

STAGE I

Work to be done
1. Const. "C" line widening on south side of alignment.
2. Const. "D" line widening.
3. Install signal features.
4. Const. detention pond.
5. For detour route, see sht. 2C-4.





SECTION A-A

- IMMEDIATE GRADING LIMITS
- FINAL GRADING LIMITS
- UNDER TRAFFIC
- EXISTING GROUND
- TOP OF STAGE, TEMP. OR FINAL SURFACING
- FLAGGER
- UNDER TRAFFIC
- UNDER CONSTRUCTION
- TEMP. PLASTIC DRUMS ON 40' MAX. SPACING

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised staging layout	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C

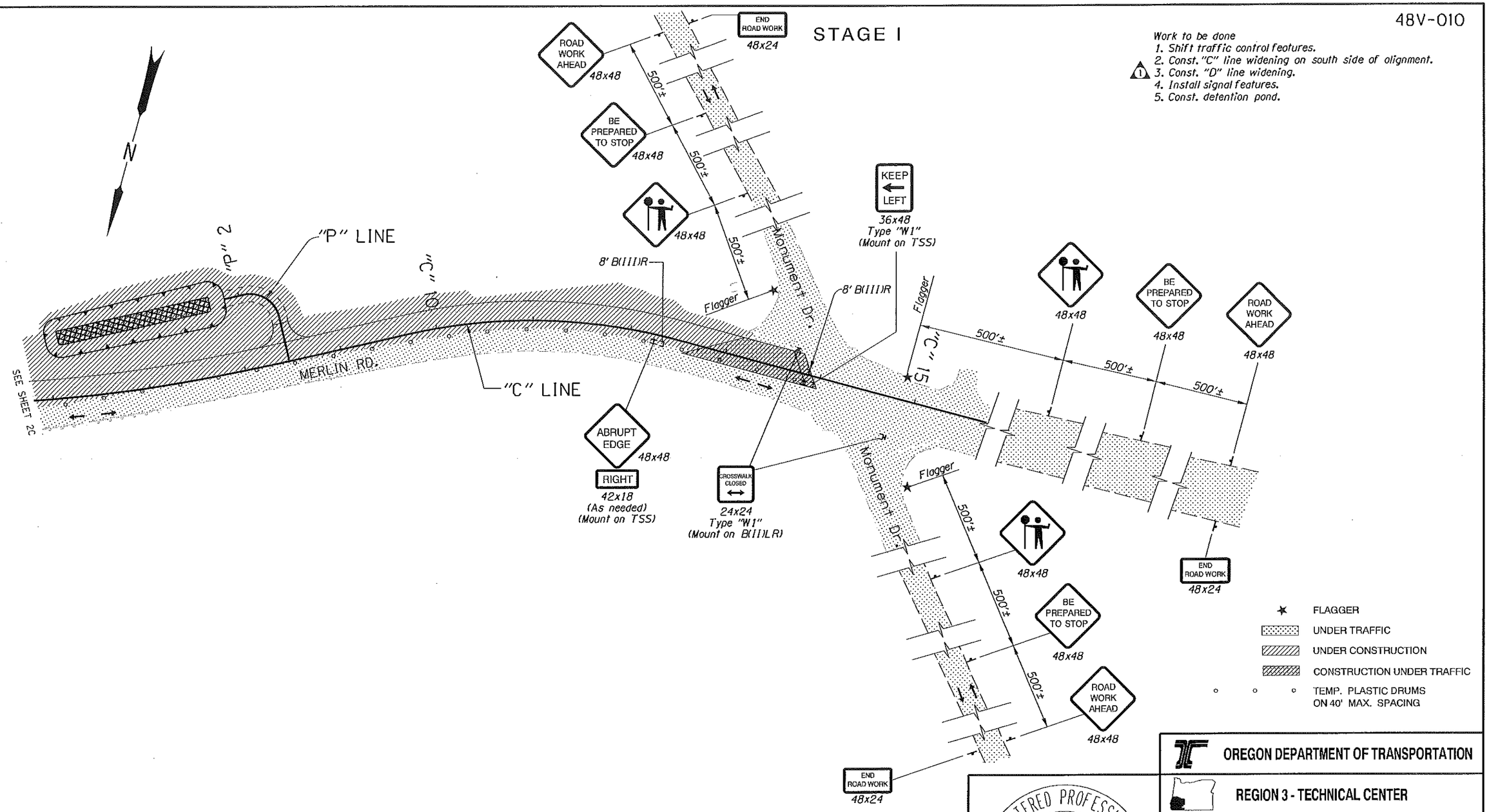
\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tcl :: Default 2/10/2015 4:01:13 PM hwye33g

Rotation: 0° Scale: 1"=100'

48V-010

STAGE I

Work to be done
1. *Shift traffic control features.*
2. *Const. "C" line widening on south side of alignment.*
3. *Const. "D" line widening.*
4. *Install signal features.*
5. *Const. detention pond.*



No.	DATE	REVISIONS	BY
1	2/10/2015	Revised staging layout	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

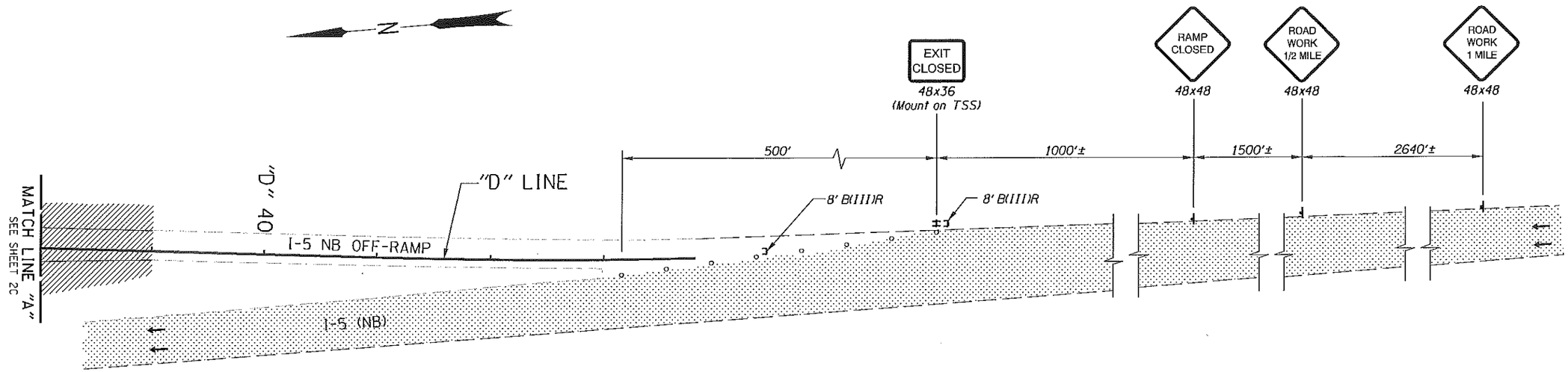
SHEET NO. 2C-2

\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tcl :: Default 2/10/2015 4:01:14 PM hwye33g

Rotation: 0° Scale: 1"=100'

48V-010

STAGE 1



UNDER TRAFFIC

UNDER CONSTRUCTION

TEMP. PLASTIC DRUMS ON 40' MAX. SPACING

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised stage layout, Replaced sht. 2C-3 with 2C-7	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS

PACIFIC HIGHWAY

JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer

Designed By - Roy Blower

Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-3

F:\ODOT_DATA\Projects\16062 Merlin interchange\16062.TCI :: Default 2/10/2015 4:01:14 PM hwye33g

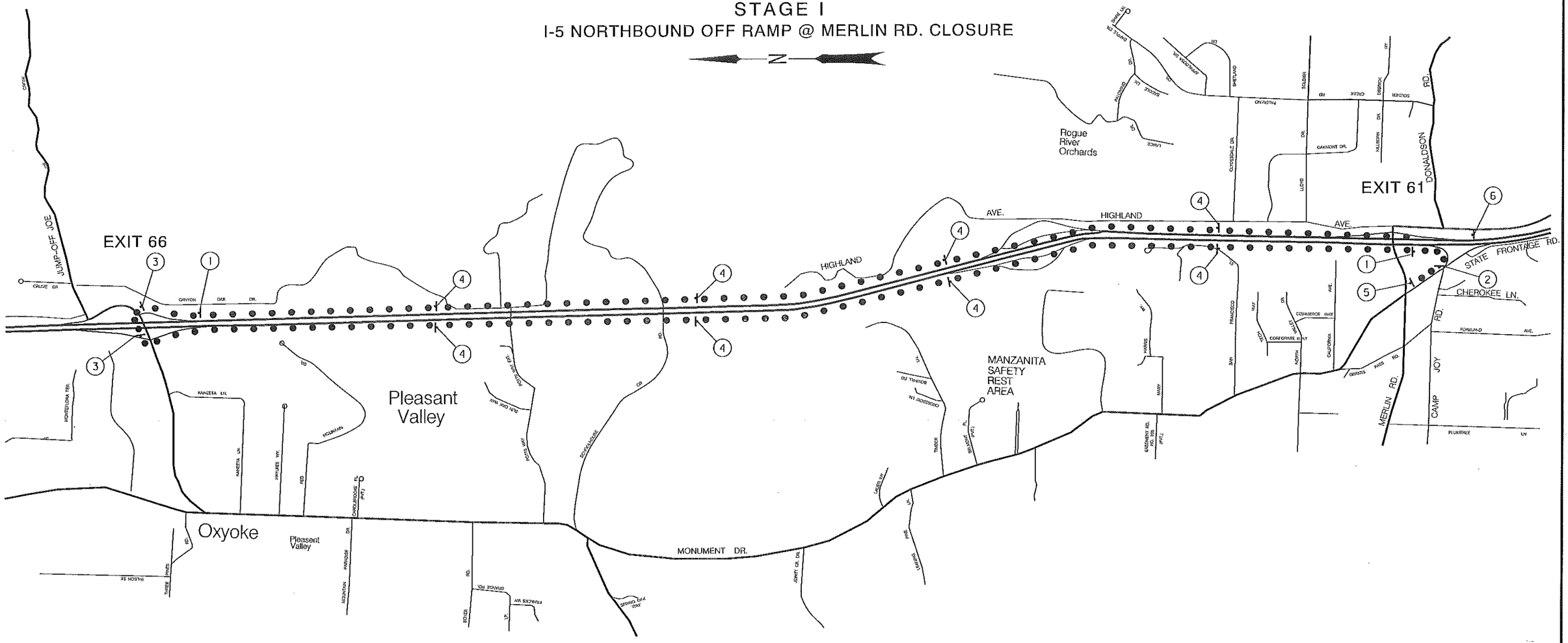
Rotation: 0° Scale: 1"=100'

48V-010

D E T O U R

STAGE I

I-5 NORTHBOUND OFF RAMP @ MERLIN RD. CLOSURE



(1) - 2 req'd	(2) - 1 req'd	(3) - 2 req'd	(4) - 8 req'd
DETOUR 24x12	DETOUR 24x12	DETOUR 24x12	DETOUR 24x12
Merlin Rd 24x12	Merlin Rd 24x12	Merlin Rd 24x12	Merlin Rd 24x12
21x15	21x15	21x15	21x15

(5) - 1 req'd: END DETOUR 30x24

(6) - 1 req'd: RAMP CLOSED 48x30 Type "W1"

I-5 NB OFF RAMP CLOSED	USE EXIT 66

PORTABLE CHANGEABLE MESSAGE SIGN
(Suggested Message) (2 req'd)
(Locate As Directed)

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised stage and sht. number	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
Roy R. Blower
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-4

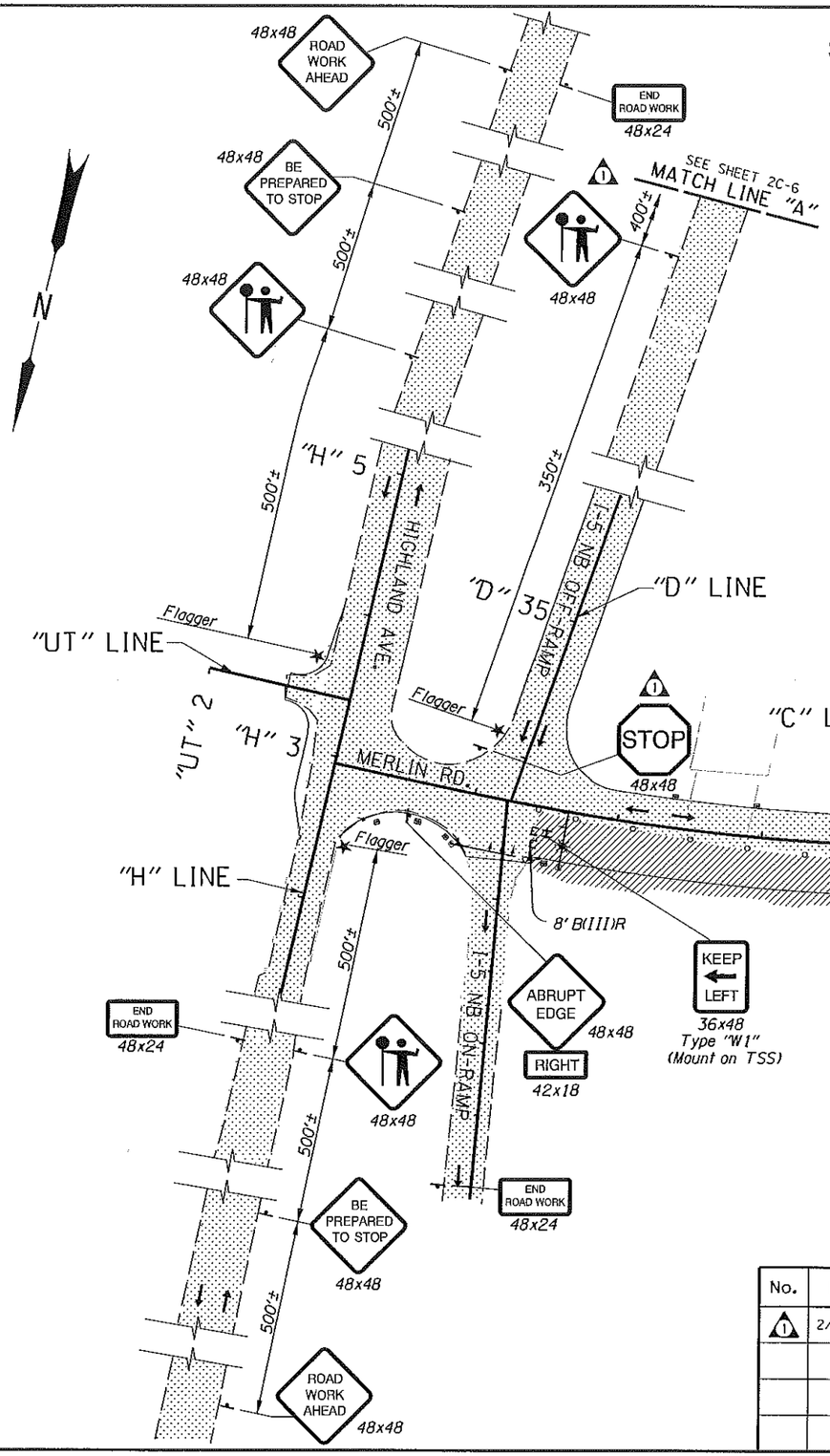
F:\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tc2 :: Default 2/11/2015 9:09:02 AM hwye33g

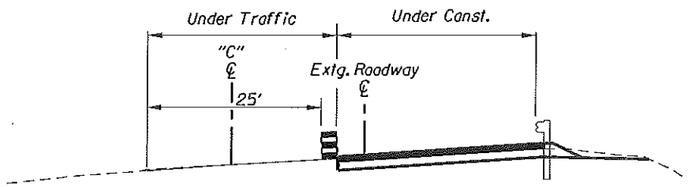
Rotation: 0° Scale: proportional

48V-010

STAGE II

Work to be done
1. *Shift traffic control features.*
2. *Const. "C" line widening on north side of alignment.*
3. *Install signal features.*





SECTION A-A

IMMEDIATE GRADING LIMITS
FINAL GRADING LIMITS
UNDER TRAFFIC
EXISTING GROUND
TOP OF STAGE, TEMP. OR FINAL SURFACING

FLAGGER
UNDER TRAFFIC
UNDER CONSTRUCTION
TEMP. PLASTIC DRUMS ON 40' MAX. SPACING

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised sign layout and sht. number	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

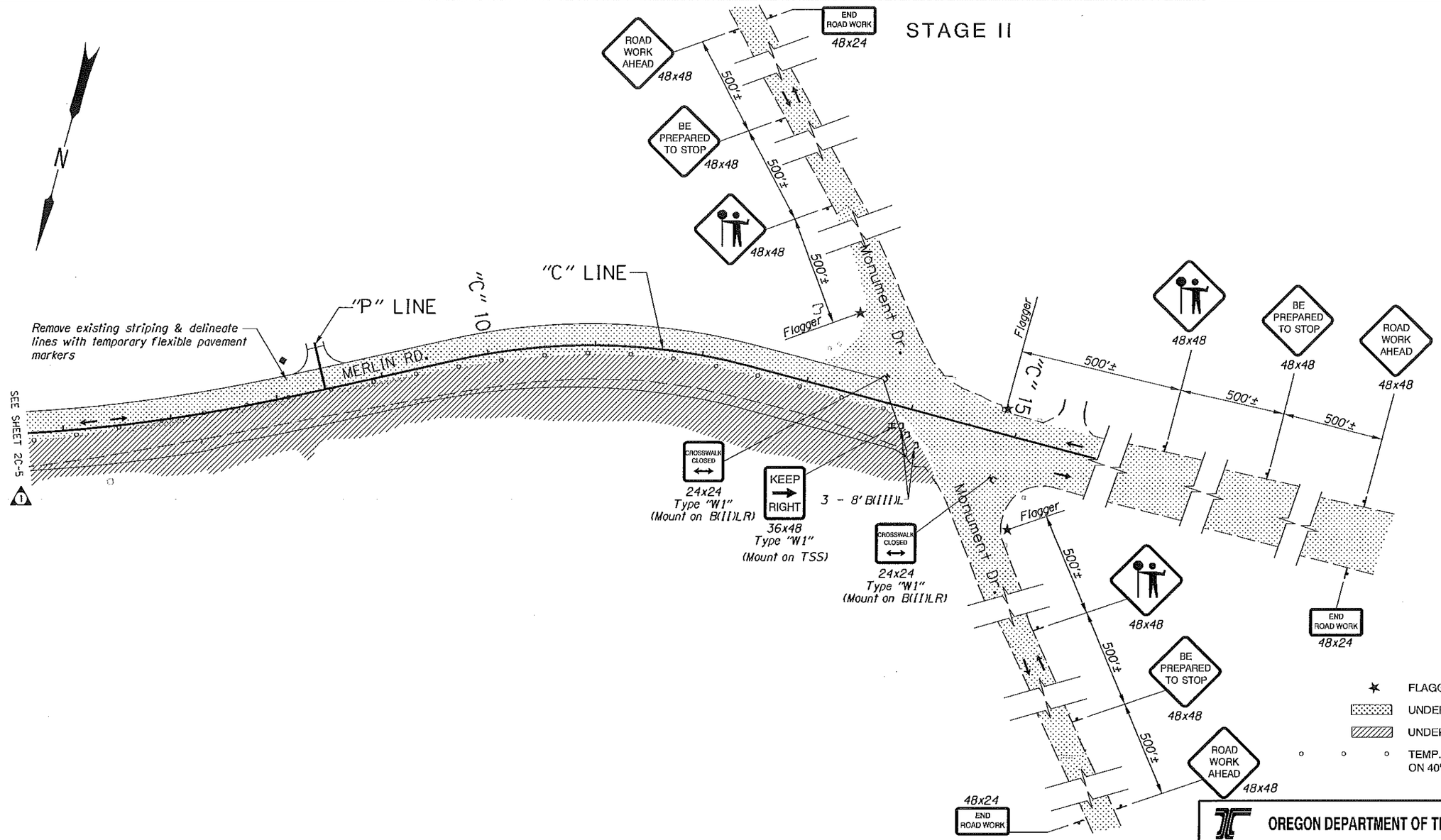
SHEET NO. 2C-5

F:\ODOT_DATA\Projects\16062 Merlin interchange\16062.TCI :: Default 2/10/2015 4:01:15 PM hwye33g

Rotation: 0° Scale: 1"=100'

48V-010

STAGE II



No.	DATE	REVISIONS	BY
1	2/10/2015	Revised sht. number	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS

PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

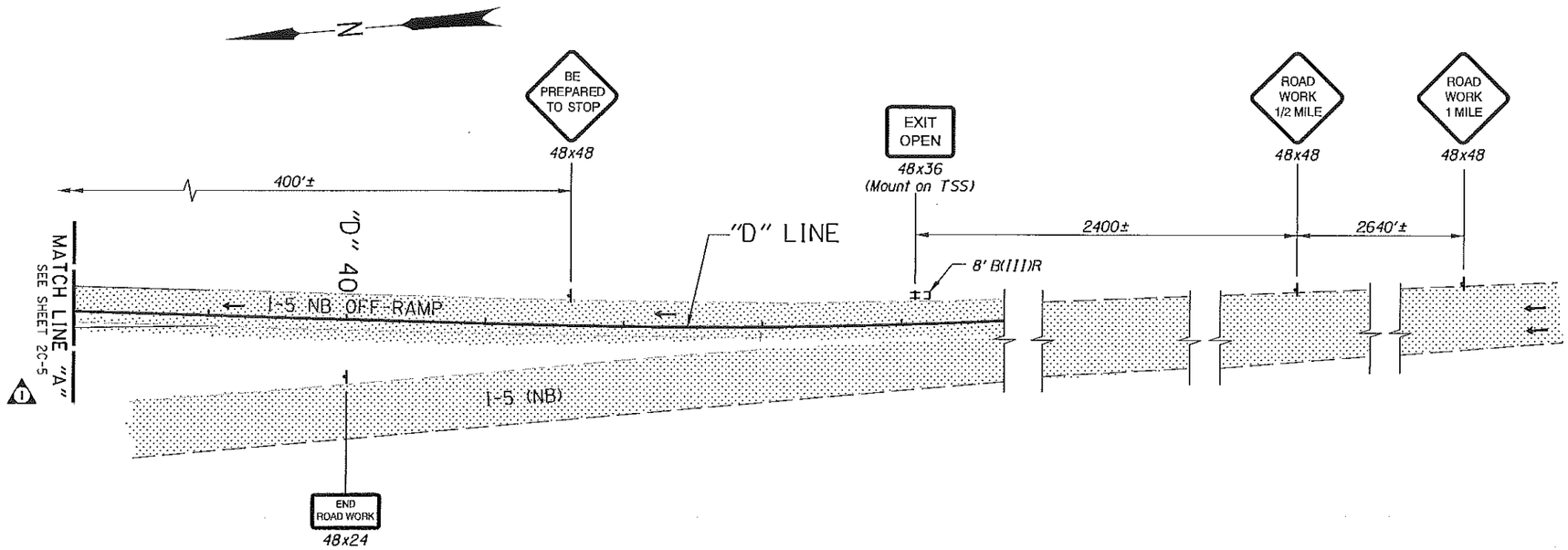
SHEET NO. 2C-6

F:\ODOT_DATA\Projects\16062 Merlin interchange\16062.TCI :: Default 2/10/2015 4:01:16 PM hwye33g

Rotation: 0° Scale: 1"=100'

48V-010

STAGE II
(1)



UNDER TRAFFIC

UNDER CONSTRUCTION

TEMP. PLASTIC DRUMS ON 40' MAX. SPACING

No.	DATE	REVISIONS	BY
(1)	2/10/2015	Revised sign layout and sht. number, Moved to Stage II	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hordin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-7

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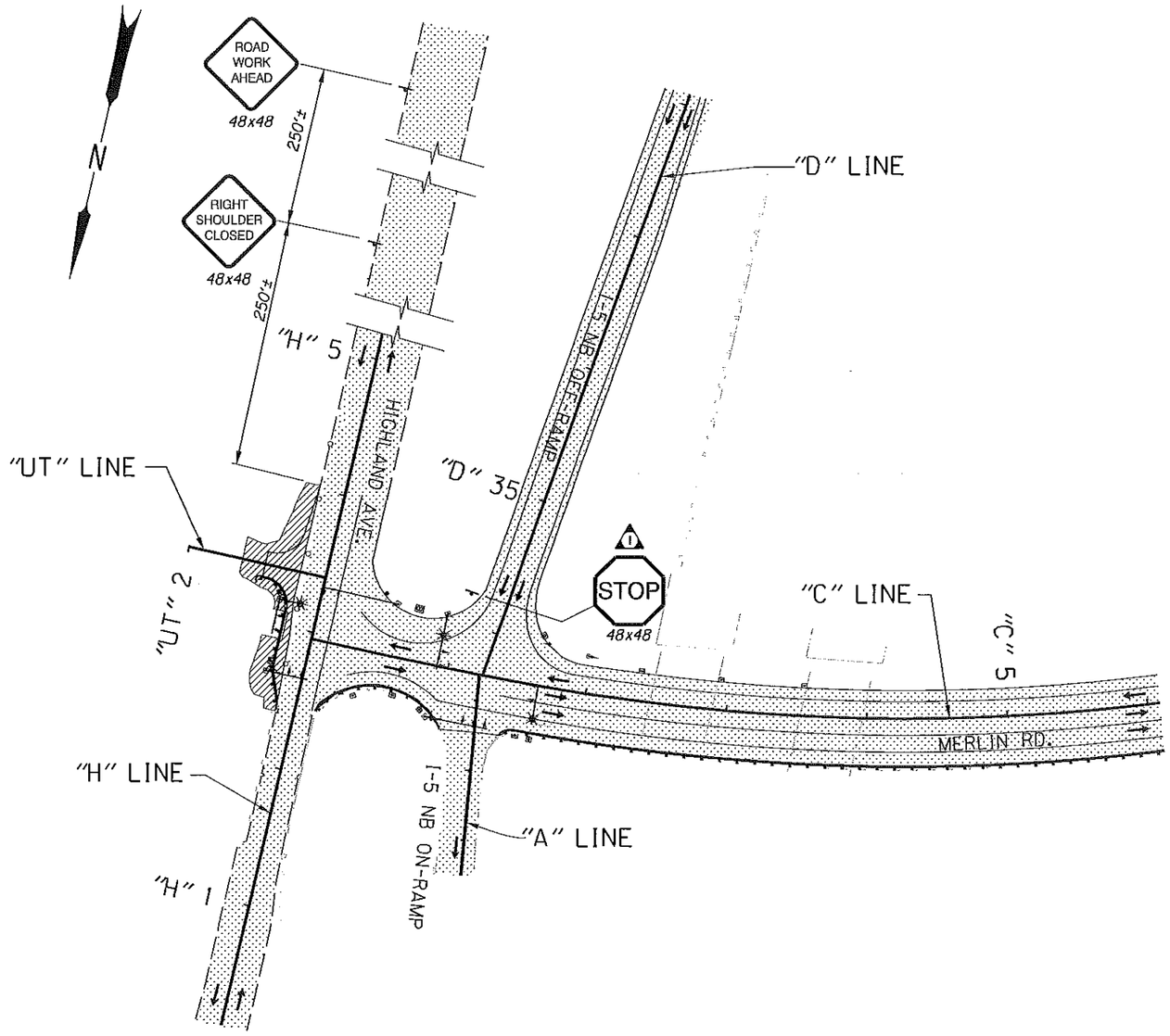
Rotation: 0° Scale: 1"=100'

48V-010

STAGE III
Phase 1 ⚠1

Work to be done
1. Establish traffic control features.
2. Construct "UT" access road.
3. Install signal features.



UNDER TRAFFIC
UNDER CONSTRUCTION
TEMP. PLASTIC DRUMS ON 40' MAX. SPACING

No.	DATE	REVISIONS	BY
⚠1	2/10/2015	Moved to Stage III, Added stop sign	RB.

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-8

F:\ODOT_DATA\Projects\16062 Merlin interchange\16062.TCI :: Default 2/10/2015 4:01:17 PM hwye33g

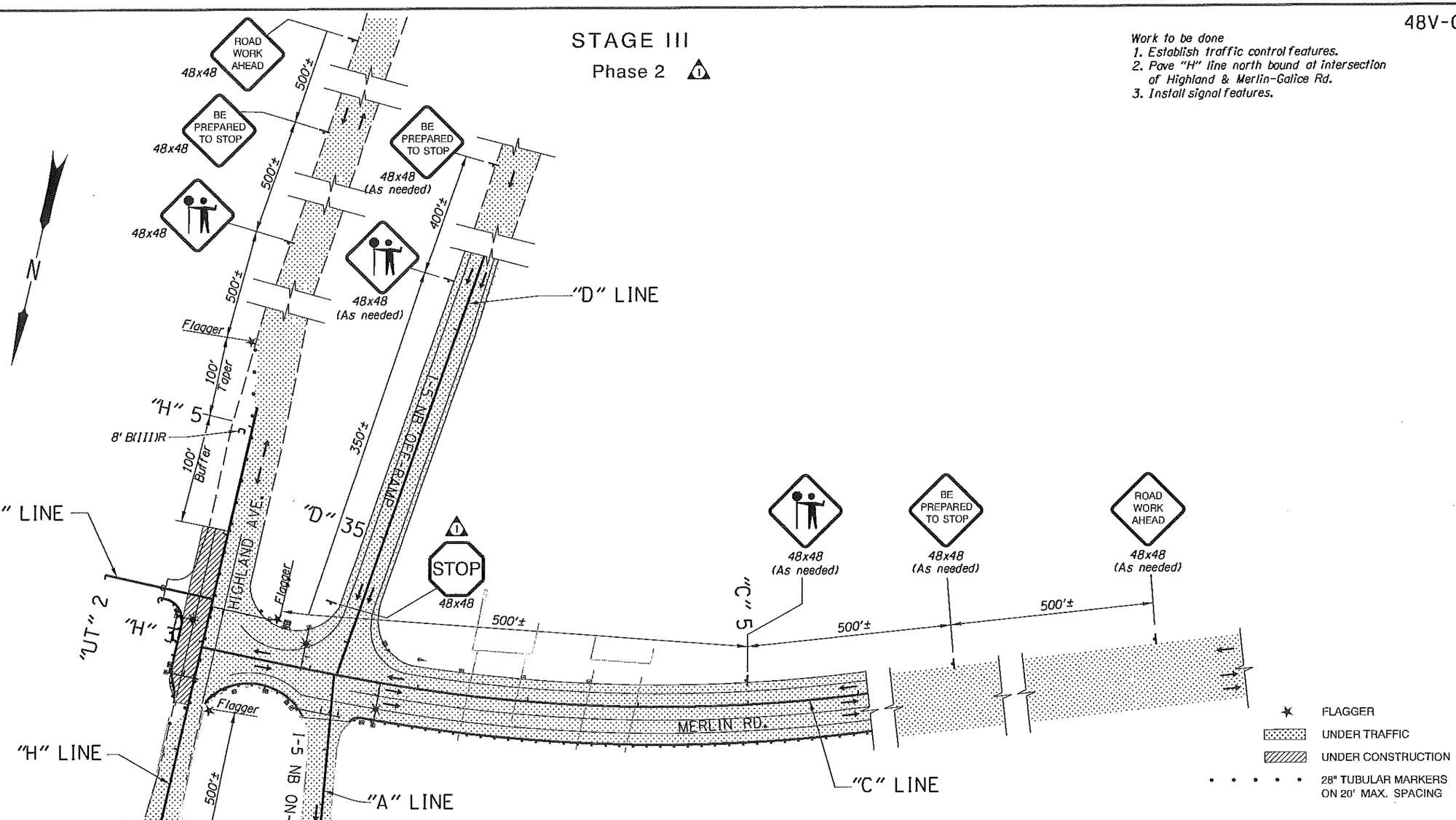
Rotation: 0° Scale: 1"=100'

48V-010

STAGE III

Phase 2 (1)

Work to be done
1. *Establish traffic control features.*
2. *Pave "H" line north bound at intersection of Highland & Merlin-Galice Rd.*
3. *Install signal features.*



No.	DATE	REVISIONS	BY
(1)	2/10/2015	Moved to Stage III, Added stop sign	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
Roy R. Blower
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-9

\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tcl :: Default 2/11/2015 8:46:27 AM hwye33g

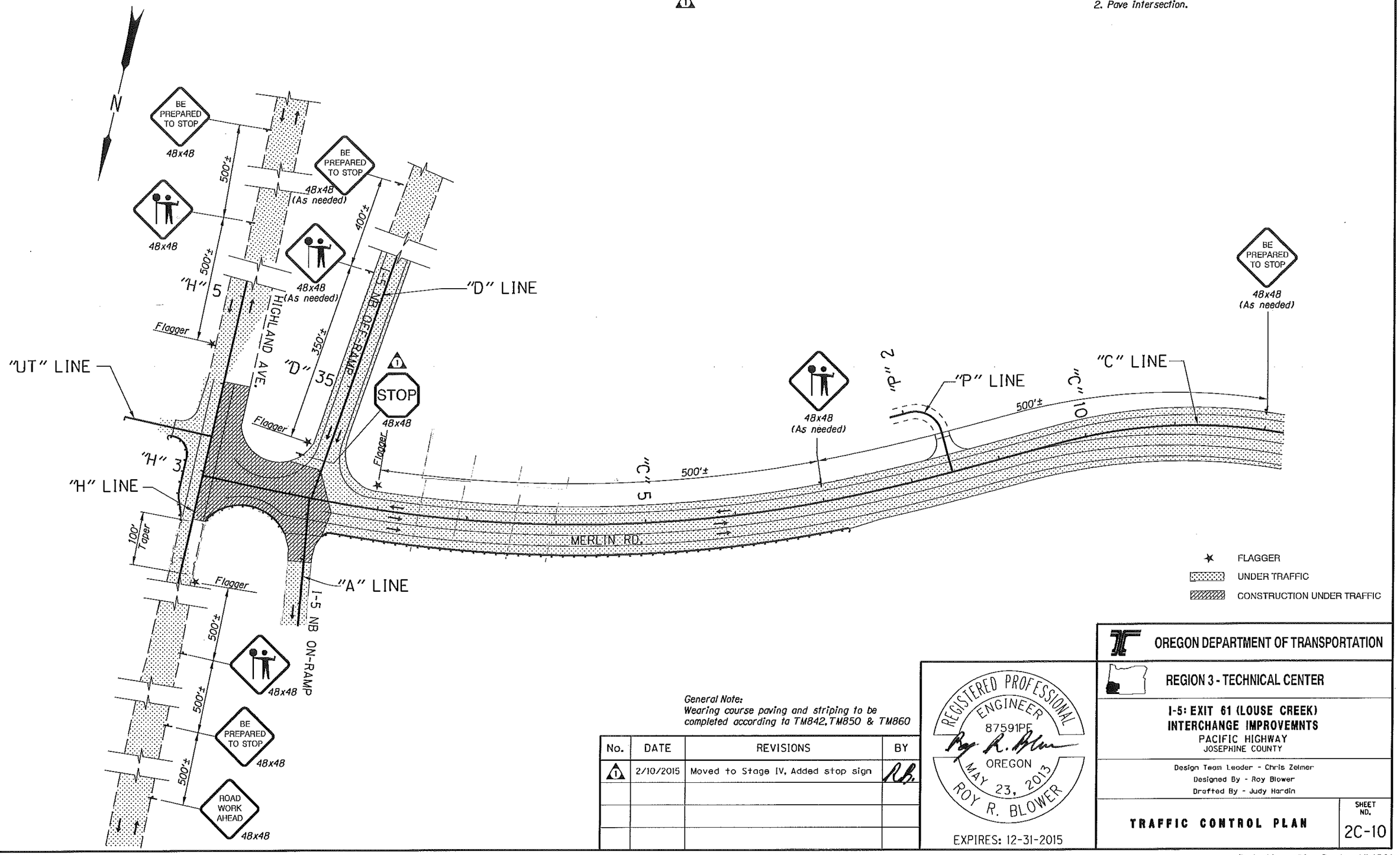
Rotation: 0° Scale: 1"=100'

48V-010

STAGE IV

1

Work to be done
1. Establish traffic control features.
2. Pave intersection.



General Note:
Wearing course paving and striping to be completed according to TM842, TM850 & TM860

No.	DATE	REVISIONS	BY
1	2/10/2015	Moved to Stage IV, Added stop sign	RB

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-10

\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tcl :: Default 2/11/2015 9:14:48 AM hwye33g

Rotation: 0° Scale: 1"=100'

D E T O U R

STAGE III

I-5 NORTHBOUND OFF RAMP @ MERLIN RD. CLOSURE

48V-010

N

EXIT 66

EXIT 61

JUMP-OFF JOE CREEK

CRUME DR.

CANYON

OAK DR.

HIGHLAND AVE.

Rogue River Orchards

DONALDSON RD.

STATE FRONTAGE RD.

CHEROKEE LN.

COMMERCE WAY

CORPORATE WAY

PORTLAND AVE.

MERLIN RD.

CAMP JOY RD.

GRANTS PASS RD.

PLUMTREE LN.

MANZANITA SAFETY REST AREA

Pleasant Valley

KANEETA LN.

MONTELOMA TER.

HAYLEES WY.

RED MOUNTAIN DR.

CAROLBROOKE PL. (PVT.)

PARADISE DR.

SUN OAK WAY

POSTEL WAY

SCHOOLHOUSE RD.

Oxyoke

Pleasant Valley

WILSON ST

THREE PINES RD.

GRANGE RD.

PARADISE WY.

IDLER RD.

MONUMENT DR.

SPRING OAK WAY

JEWET DR.

LAUREL WY.

(1) - 2 req'd	(2) - 1 req'd	(3) - 2 req'd	(4) - 8 req'd	(5) - 1 req'd	(6) - 1 req'd
DETOUR 24x12 Merlin Rd. 24x12 21x15	DETOUR 24x12 Merlin Rd. 24x12 21x15	DETOUR 24x12 Merlin Rd. 24x12 21x15	DETOUR 24x12 Merlin Rd. 24x12 21x15	END DETOUR 30x24	RAMP CLOSED 48x30 Type "W1"

I-5 NB OFF RAMP CLOSED	USE EXIT 66

PORTABLE CHANGEABLE MESSAGE SIGN
(Suggested Message) (2 req'd)
(Locate As Directed)

REGISTERED PROFESSIONAL ENGINEER
87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER

EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

TRAFFIC CONTROL PLAN

SHEET NO. 2C-11

F:\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.tc2 :: Default 12/22/2014 3:56:11 PM hwye33g

Rotation: 0° Scale: proportional

PIPE 2008 - File Update: Aug. 2014

48V-010

PIPE / USE / INSTALLATION CRITERIA / TERMINAL TREATMENT

SHEET NUMBER	NOTE No. ON PLANS	DESIGN HEIGHT OF COVER ① (FEET)	CIRCULAR OR ELLIPTICAL SIZE IN (Inches) 6 — LENGTH IN FEET	12	18	24						PIPE - ARCH HELICAL Riveted Welded or Lock Seam EQUIV. RND SIZE (Inches)	LENGTH (Feet)	CROSS-SECTIONAL DIMENSIONS ② SPAN (Feet-Inches)	RISE (Feet-Inches)	CORNER RADII (Inches)	DRAIN (PERFORATED)	CULVERT (ROAD APPROACH)	CULVERT (CONDUIT)	CULVERT	IRRIGATION	SIPHON	STORM SEWER	SANITARY SEWER	OTHERS (SEE REMARKS)	WATERTIGHT JOINTS	SLOPE ANCHORS	IMPERFECT TRENCH	PH	RESISTIVITY (HUNDREDS)	SLOPED ENDS LT./RT. Not For Conc. Pipe Over 60" Dia.	SKEW NUMBER	PAVED END SLOPES No.
3	2																																
3	5																																
3	6																																
3	7	2.5				82																	✓			✓			7.4	49	1:2		✓
3	9	0			83															✓						✓			7.4	49	1:4 / 1:4		✓
3	10																																
3	11	1.0			115																		✓			✓			7.4	49			
4	2	2.7			29															✓						✓			7.4	49	1:6		✓
4	5	1.0			10																		✓			✓			7.4	49			
4	8	1.0			164																		✓			✓			7.4	49	1:6		✓
4	9	1.0			39																		✓			✓			7.4	49			
5	3	4.1			105																		✓			✓			7.4	49	1:4 / 1:4		✓
GJ	1	2.0		24																			✓			✓			7.4	49			
GJ	1	1.0		13																			✓			✓			7.4	49			
GJ	1	0.5	19														✓												7.4	49			
GJ	1																																

ALTERNATE MATERIALS — HELICAL CORRUGATED METAL

SHEET NUMBER	NOTE No. ON PLANS	ALUMINUM, RIVETED, WELDED OR LOCK SEAM 1½" x ¼" PLATE THKN. (Inches)	CROSS SECTION③	2⅔" x ½" PLATE THKN. (Inches)	CROSS SECTION③	3" x 1" PLATE THKN. (Inches)	CROSS SECTION③	COATING⑤	ALUMINUM LOCK SEAM SMOOTH WALL SPIRAL RIB ¾" x ¾" @ 7½" O.C. Or ¾" x 1" @ 11½" O.C. PLATE THKN. (Inches)	CROSS SECTION③	COATING⑤	ALUMINIZED OR GALVANIZED IRON AND STEEL, RIVETED, WELDED OR LOCK SEAM 1½" x ¼" PLATE THKN. (Inches)	CROSS SECTION③	2⅔" x ½" PLATE THKN. (Inches)	CROSS SECTION③	3" x 1" PLATE THKN. (Inches)	CROSS SECTION③	COATING GALVANIZED⑤	COATING ALUMINIZED⑤	LOCK SEAM SMOOTH WALL SPIRAL RIB ¾" x ¾" @ 7½" O.C. Or ¾" x 1" @ 11½" O.C. PLATE THKN. (Inches)	CROSS SECTION③	COATING GALVANIZED⑤	COATING ALUMINIZED⑤
3	2																						
3	5																						
3	6																						
3	7			.060	R			U				.064	R						✓				
3	9																						
3	10																						
3	11																						
4	2																						
4	5			.060	R			U				.064	R						✓				
4	8																						
4	9			.060	R			U				.064	R						✓				
5	3																						
GJ	1																						
GJ	1			.060	R			U				.064	R						✓				
GJ	1			.060	R			U						.060	R				✓				
GJ	1																						

ALTERNATE MATERIALS — RIGID, PLASTIC & IRON / APPURTENANCES / EXTENSION / REMARKS

SHEET NUMBER	NOTE No. ON PLANS	RIGID PRE-CAST CONCRETE PLAIN ④ 1	2	3	REINF. III	IV	V	CORRUGATED HDPE	SOLID WALL HDPE	REINFORCED HDPE	PVC - PSI STIFFNESS	POLYPROPYLENE, DOUBLE WALL	POLYPROPYLENE, TRIPLE WALL	DUCTILE IRON - PIPE CLASS	MANHOLES DEPTH, TOP OF COVER TO INVERT (Feet)	DIAMETER OF LARGEST PIPE IN BASE (In.)	CONC. PRECAST	CONC. CAST-IN-PLACE	DROP MANHOLE	SPECIAL	INLETS TYPE Type "D"	Type "G-2"	Type "D" Mod.	Type "G-2MA" (Number Required)	EXTENSION LEFT (Feet)	RIGHT (Feet)	EXTG. PIPE MATERIAL ⑥	REMARKS
3	2														5.3	18	✓	✓									St	Manhole over existing sewer
3	5														5.6	24	✓	✓									Pl	Manhole over existing sewer
3	6																				✓						Pl	Remove and replace inlet lid
3	7				✓			✓				✓	✓															
3	9													✓														
3	10																				✓							
3	11						✓															✓						Radius Pipe = 400 ft.
4	2				✓																				29		Co	
4	5				✓			✓				✓	✓		2.3	18	✓	✓									Co	Manhole over existing sewer
4	8						✓																					Radius Pipe = 500 ft.
4	9				✓			✓				✓	✓		2.3	18								✓				
5	3													✓														
GJ	1						✓														✓							
GJ	1																						✓					5" orifice plate
GJ	1																											Subsurface drain
GJ	1														4.0	18	✓	✓										Manhole w/overflow cage top

GENERAL NOTES:

1. A check (✓) indicates column heading applies.
2. A new pipe culvert installation shall be of like material throughout.
3. Extension of existing metal culverts may be of unlike metal or corrugations. For connecting details, see Std Drg. No. RD326.
4. Dimensions shown are nominal.
5. All pipes shall conform to the AASHTO specification applicable for the type of material and the diameter of the pipe involved.

FOOTNOTES:

① Design height of cover is the critical design height used to select pipe materials. The height of cover for any given run of pipe may vary. Design height of cover shall be measured to subgrade.

② Cross-sectional dimensions may vary with different materials. When galvanized iron or steel and aluminum are acceptable alternates use a separate line for each type of material.

③ Cross-sectional shape of pipe normal to longitudinal axis, prior to loading
A = Pipe - Arch
R = Round
E = Elliptical (5% nominal elongation)

④ Minimum allowable diameter for Class 1 nonreinforced concrete pipe is 15".

⑤ Abbreviations for protective coatings for metal pipe
PM = Polymeric, 10 Mil. thkn. coated both sides
PO = Polyethylene inside lining, polymeric outside
U = Uncoated
CIM = Chevron industrial membrane
Ep = Epoxy coated

⑥ Abbreviations for existing pipe materials
AB = Asbestos cement
Al = Corrugated aluminum
Co = Concrete
Pl = Plastic
St = Corrugated steel
X = Other material, see remarks column

■	RD300	Trench Backfill, Bedding, Pipe Zone And Multiple Installations
■	RD302	Street Cut
☐	RD304	Arch Pipe Backfill/Compaction
☐	RD306	Concrete Encasement, Cradle, and Cap Details
☐	RD308	Bore Casing Detail
☐	RD310	Shallow/Deep Trench Service Connection, Blocking and Markers
☐	RD312	Subsurface Drain
■	RD316	Sloped Ends For Metal Pipe
■	RD317	Culvert Embankment Protection
■	RD318	Sloped Ends For Concrete Pipe
■	RD319	Miscellaneous Culvert Details
■	RD320	Paved End Slope For Culverts 60" Maximum Pipe Size
☐	RD321	Paved End Slope With Removable Safety Bar(s)
☐	RD322	Safety End Section For Metal Pipe
☐	RD324	Safety End Section For Concrete, PVC, HDPE & Polypropylene Pipe
■	RD326	Coupling Bands For Corrugated Metal Pipe Types A, B, D & E
■	RD327	Coupling Bands For Corrugated Metal Pipe Types F, J & K
☐	RD328	Slotted C.M.P. Drain Details
☐	RD330	Metal Pipe Slope Anchors
☐	RD332	Concrete Pipe Anchor Detail
☐	RD334	Locator Post
■	RD335	Standard Storm Sewer Manhole
■	RD336	Standard Manhole Details
☐	RD337	Manhole Safety Ladder
☐	RD338	Standard Sanitary Sewer Manhole
☐	RD339	Pipe To Structure Connections
☐	RD340	Storm Sewer Pollution Control Manhole
■	RD342	Shallow Manholes
☐	RD343	24" Manholes
■	RD344	Standard Manhole Base Section
☐	RD345	Pipe To Manhole Connections
☐	RD346	Large Precast Manhole
☐	RD348	Manhole With Inlet
☐	RD350	Sanitary Sewer Piped Inside Drop Connection for Manholes
☐	RD352	Outside Drop Manholes
☐	RD354	Carry Through Manhole - Storm
■	RD356	Manhole Covers And Frames
☐	RD358	Manhole Slope Protectors
☐	RD360	Manhole Frame Adjustment
☐	RD362	Sanitary Cleanout
■	RD364	Concrete Inlets Type G-1, G-2, G-2M, & G-2MA
☐	RD365	Frames & Grates For Concrete Inlets
☐	RD366	Concrete Inlets Type CG-1, CG-2 And Curb Inlet Channel
☐	RD368	Concrete Inlets Type M-E, M-O, B And B-SL
■	RD370	Ditch Inlet Type D
☐	RD371	Concrete Inlet Base Type CG-3
☐	RD372	Concrete Inlet Top, Option 1 Type CG-3
☐	RD373	Concrete Inlet Top, Option 2 Type CG-3
☐	RD374	Area Drainage Basin Or Field Inlet
☐	RD376	Miscellaneous Drainage Structures Siphon Box, Inlet Cap & Inlet Adjustment
■	RD378	Type "3" Catch Basin, Frame and Grate
■	RD380	Fill Height Tables For Aluminum & Steel Corrugated Pipe
☐	RD382	Fill Height Tables For Aluminum & Steel Arch Pipe
■	RD384	Fill Height Tables For Aluminum & Steel Spiral Rib Pipe
■	RD386	Fill Height Table For Circular Concrete Pipe
■	RD388	Fill Height Tables For PVC Pipe
■	RD390	Fill Height Table For Corrugated HDPE Pipe
■	RD391	Fill Height Table For Steel Reinforced HDPE Pipe
■	RD393	Fill Height Tables For Polypropylene Pipe
■	RD398	Culvert ID Marker
☐	RD399	Stormwater Treatment and Storage Facility Field Markers

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MAY 23, 2013
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

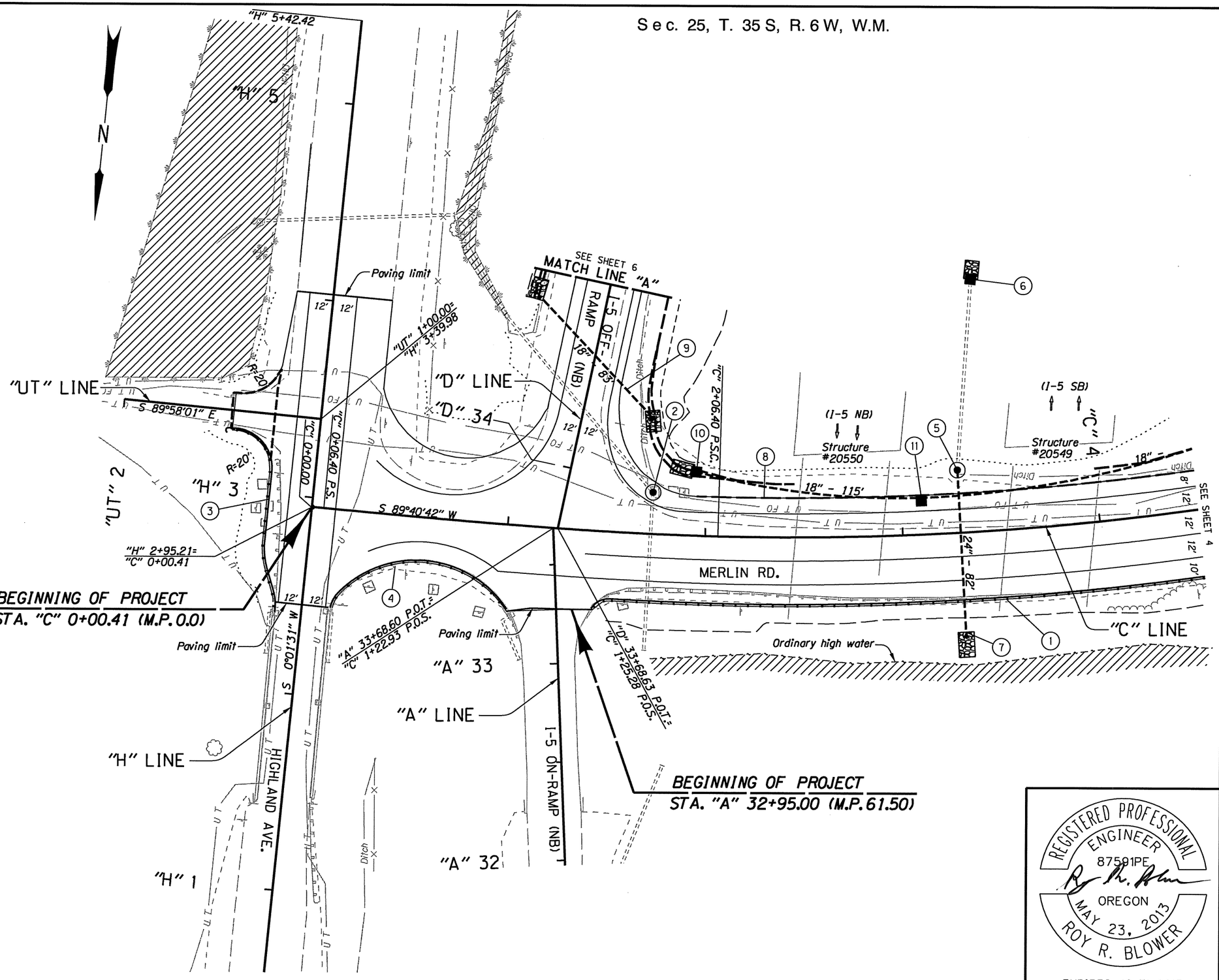
Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

PIPE DATA SHEET

SHEET NO.
2D

Sec. 25, T. 35 S, R. 6 W, W.M.

48V-010



(1) Sta. "C" 1+45.0, Rt. to Sta. "C" 7+20.0, Rt.
Remove guardrail - 600'
Const. guardrail - 512.5' (Type 2A)
- 12.5' (Type 3)
Const. guardrail to bridge transition
Const. guardrail terminal, non-flared
Flare Rate=0, W=1', E=0
Test Level 3
(For details, see sht. 2B-3)
(See dwg. nos. RD400, RD405, RD410, RD415, RD420, RD450, RD470, BR203)

(2) Sta. "C" 1+72.62, 21.09' Lt.
Remove extg. inlet
Const. manhole over extg. sewer
Rim Elev = 1145.89
F.L. = 1140.52 (18" SE)
F.L. = 1140.32 (18" N)
(See dwg. nos. RD335, RD336, RD344, RD356, RD360)

(3) Sta. "H" 2+39.5 to Sta. "H" 3+31.00, Lt.
Remove guardrail - 87.5'
Const. guardrail - 75' (Type 2A)
- 12.5' (Type 3)
Const. guardrail to bridge transition
Const. anchor (Type 1 mod.) - 2
Inst. end piece (Type B)
(For details, see sht. 2B-4)
(See drg. nos. RD415, BR270)

(4) Sta. "C" 0+14.5 to Sta. "C" 1+11.10, Rt.
Remove guardrail - 125'
Const. guardrail - 62.5' (Type 2A)
Const. guardrail - 25' (Type 3)
Const. guardrail to bridge transition - 2
(For details, see sht. 2B-4)

(Notes continued on shee 3A.)

Notes:
1) Guardrail end terminal based on 37.5' length
2) For Profile, see sht. 3B.

No Work Area Shown Thus: ////

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PLAN

SHEET NO. 3

(5) *Sta. "C" 3+29.29, 31.80 Lt.*
Const. manhole over extg. storm sew.
Rim Elev = 1144.00
F.L.= 1141.88 (Extg 24" S)
F.L.= 1136.25 (24" N)

(6) *Sta. "C" 3+42.50, 127.6' Lt.*
Remove type 3 catch basin
Const. Type "D" inlet
over extg. catch basin frame
Const. loose riprap (Class 50) - 6.5 cu. yd.
(Loose riprap pad w/inlet)
Riprap geotextile - 10 sq. yd.
GR = 1159.38
F.L.= 1155.63 (Extg 18" N)
(For details, see sht. 2B-2)
(See dwg. no. RD370)

(7) *Sta. "C" 3+29.22, 50.30 Rt.*
Inst. 24" sew. pipe - 82'
10' depth
S=0.70%
Const. sloped end section, Rt.
Const. paved end slope, Rt. - 29 sq. ft.
Const. loose riprap (Class 50) - 8.8 cu. yd.
(Loose riprap pad)
Riprap geotextile - 16.1 sq. yd.
F.L.= 1135.69
(For details, see sht. 2B-2)
(See dwg. nos. RD300, RD302, RD316, RD317, RD318, RD320, RD326, RD327, RD380, RD382, RD384, RD386, RD391, RD398, TM570, TM571

(8) *Sta. "C" 1+95.00, 20' Lt. toSta. "C" 4+75.00, 20' Lt.*
Const. low profie mountable curb - 280'
(See dwg. nos. RD700)

(9) *Sta. "D" 34+82.09, 34.59' Lt. to*
Sta. "D" 34+34.63, 33.80' Rt.
Inst. 18" culv. pipe - 83'
5' depth
S=1.00%
Const. sloped end section, - 2
Const. paved end slope, - 75 sq.ft.
Const. loose riprap (Class 50) - 10.4 cu. yd.
(Loose riprap pad)
Riprap geotextile - 10 sq.yd.
F.L.= 1144.58 Lt
F.L.= 1143.75 Rt
(For details, see sht. 2B-2)

(10) *Sta. "C" 1+93.25, 32.45' Lt.*
Const. Type "D" inlet
Const. loose riprap (Class 50) - 5.3 cu. yd.
(Loose riprap pad w/inlet)
Riprap geotextile - 8.5 sq. yd.
GR = 1143.00
F.L.= 1140.52 (18" W)
(For details, see sht. 2B-2)

(11) *Sta. "C" 3+10.00, 20' Lt.*
Const. Type "G-2" inlet
Inst. 18" sew. pipe - 115' (Radius=400')
5' depth
S=1.20%
GR = 1142.63
F.L.= 1139.17 (18" thru)
(See dwg. nos. RD364)

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PACIFIC HIGHWAY
JOSEPHINE COUNTY

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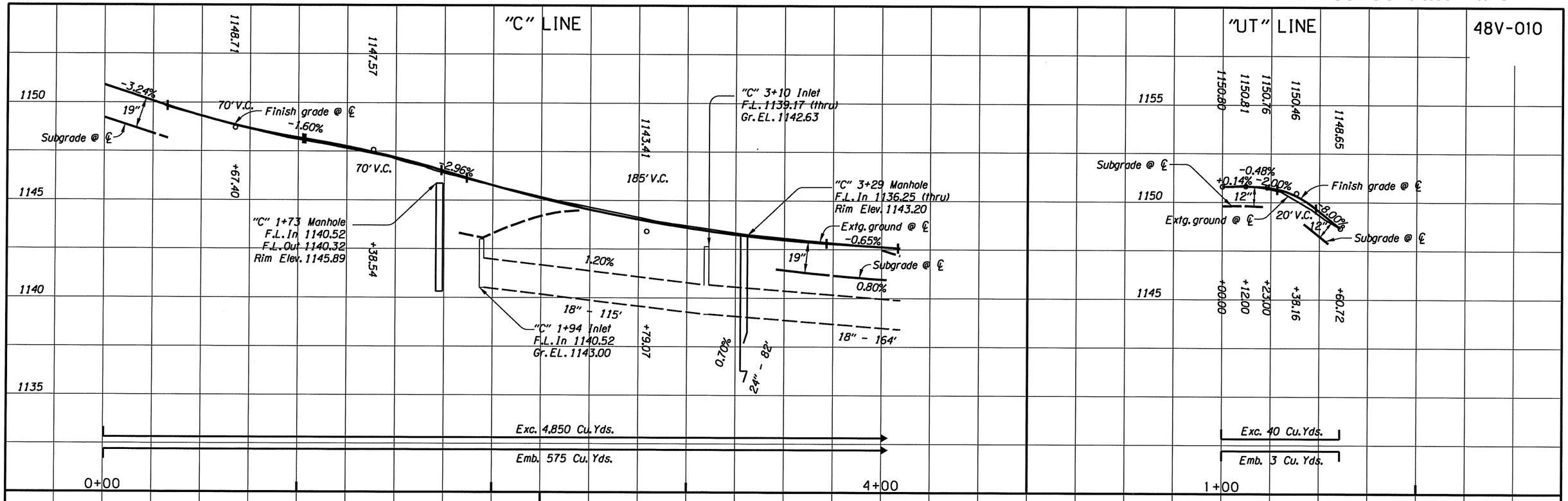
Drafted By - Judy Hardin

NOTES

SHEET NO. 3A



48V-010

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Designed By - Roy Blower
Drafted By - Judy Hardin

PROFILE

SHEET NO. 3B

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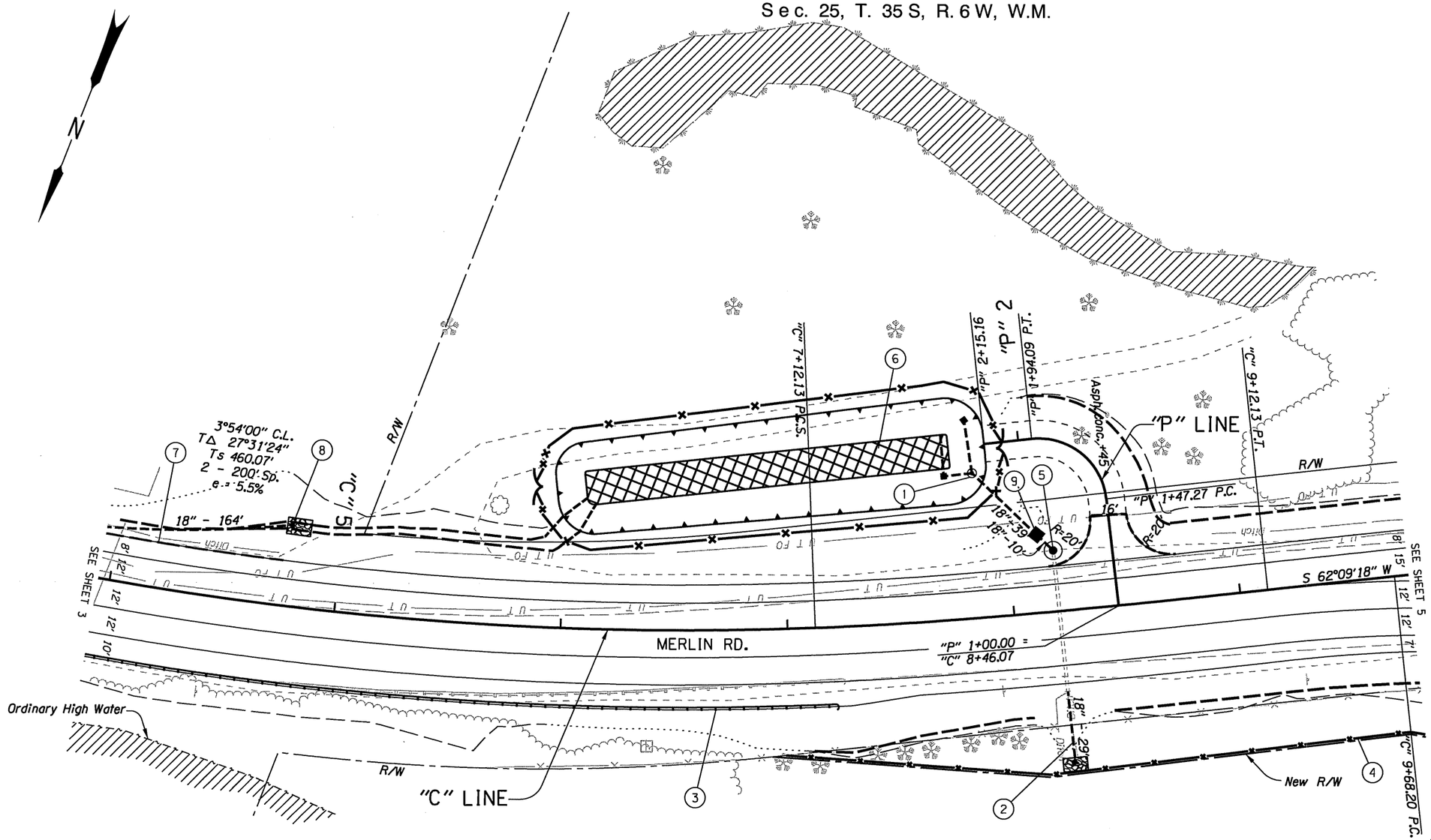
Rotation: 0° Scale: 1"=50'

Sec. 25, T. 35 S, R. 6 W, W.M.

48V-010



(1) Sta. "C" 7+85.21, 62.17' Lt.
Outlet structure
F.L.= 1133.00
(For details, see shts. GJ thru GJ-4)

(2) Sta. "C" 8+20.85, Rt.
Extend 18" conc. culvert - 29'
5' depth
S=0.48%
Const. sloped end section, Rt.
Const. paved end slope, Rt. - 44 sq. ft.
Const. loose riprap (Class 50) - 5.2 cu. yd.
(Loose riprap pad)
Riprap geotextile - 10 sq. yd.
F.L.= 1131.89 (In)
F.L.= 1131.75 (Out)
(For details, see sht. 2B-2)

(3) See sht. 3, note 1.

(4) Sta. "C" 6+98.00, 58.80' Rt. to
Sta. "C" 14+22.00, 94.00' Rt.
Const. type 1 fence - 690'
Connect to extg. fence
(See dwg. no. RD810)

(5) Sta. "C" 8+19.59, 26.93' Lt.
Const. manhole over extg. sewer
Inst. 18" storm sew. pipe - 10'
5' depth
S=0.68%
Rim=1134.98
F.L.=1132.68 (18" thru)

(6) Const. bioretention pond
(For details, see shts. GJ thru GJ-4)

(7) See sht. 3, note 8.

(8) Sta. "C" 4+75.00, 37' Lt.
Inst. 18" storm sew. pipe - 164' (Radius=500')
5' depth
S=0.80%
Const. sloped end section, Lt.
Const. paved end slope, Lt. - 35 sq. ft.
Const. loose riprap (Class 50) - 5.2 cu. yd.
(Loose riprap pad)
Riprap geotextile - 10 sq. yd.
F.L.= 1137.87 (18" E)
(For details, see sht. 2B-2)

Notes:
1) For Profile, see sht. 4B.

No Work Area Shown Thus:

(9) Sta. "C" 8+13.00, 34.47' Lt.
Const. Type "G-2MA" inlet
Inst. 18" storm sew. pipe - 39'
5' depth
S=0.72%
GR=1134.80
F.L.=1132.73 (18" thru)
(See dwg. no. RD 364)

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PLAN

SHEET NO. 4

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Rotation: 0° Scale: 1"=50'

48V-010

"P" LINE

1138.12 1138.00 1138.12

1136.34 1136.39

1140 1140

Finish grade @ ℄ +0.00% -2.00%

20' V.C. +3.55% 20' V.C.

+0.24%

11"

1135 1135

Subgrade @ ℄

Ditch, Rt.

Extg. ground @ ℄

+89.16 +09.16 +15.16

+20.00 +40.34

1130 1130

Exc.=15 Cu. Yds.

Exc.=131 Cu. Yds.

0+00 1+00

"C" LINE

1142.00 ℄

19"

1140 0.80% 173' V.C.

Ditch, Lt.

Subgrade @ ℄

18" - 164'

+75.00 Lt. Out
FL= 1137.87

+95.03

1135

Extg. ground @ ℄

Finish grade @ ℄

-1.63%

Ditch, Rt.

"C" 8+13 Inlet
F.L.= 1132.73 (thru)
Gr. EL. 1134.80

"C" 8+19.59 Manhole
F.L. In 1132.68 (thru)
Rim Elev. 1134.98

1140

0.71% 0.68%

18"-10'

Ditch, Lt.

1135

19"

Subgrade @ ℄

18" - 40'

Ditch, Rt.

1130

18" Culvert Ext. - 29' @ 0.48%
F.L. In Elev. = 1131.89
F.L. Out Elev. = 1131.75

1130

1125

See sht. 3B profile, for earthwork quantities

5+00

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PROFILE

SHEET NO. 4B

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Sec. 25, T. 35 S, R. 6 W, W.M.

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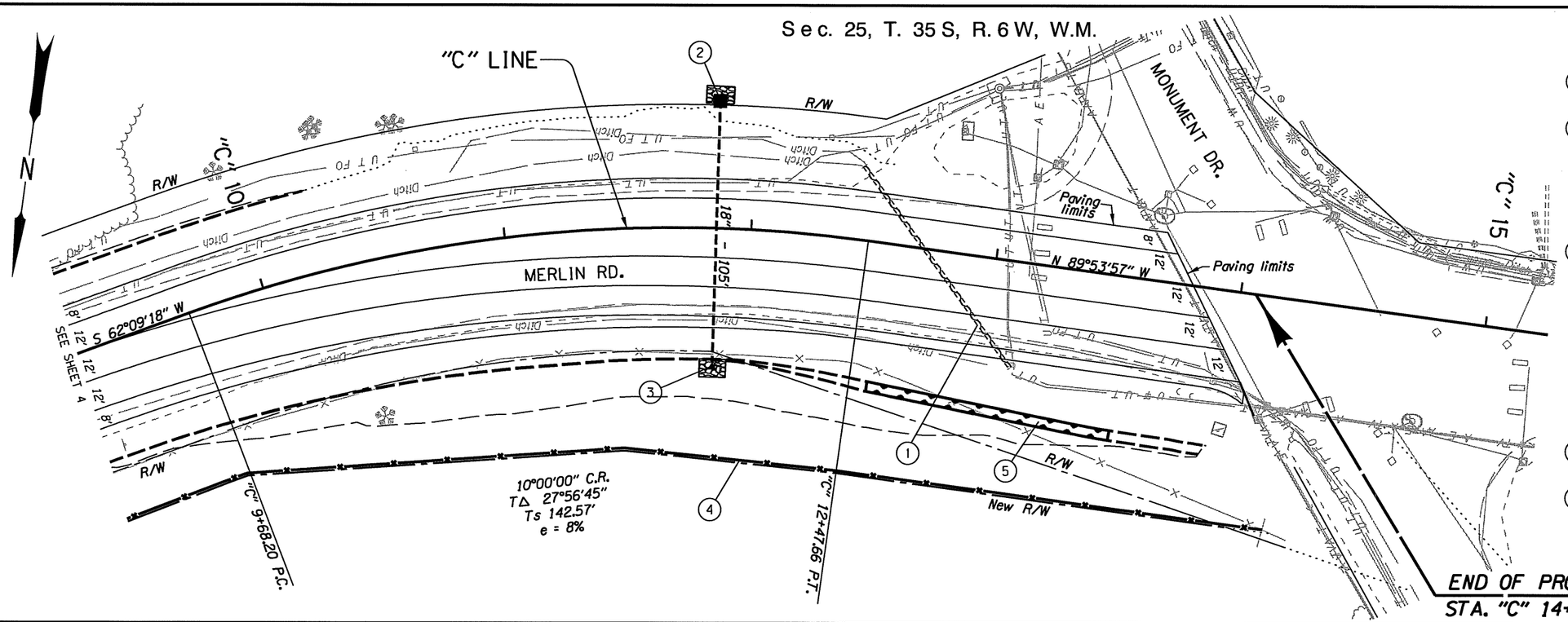


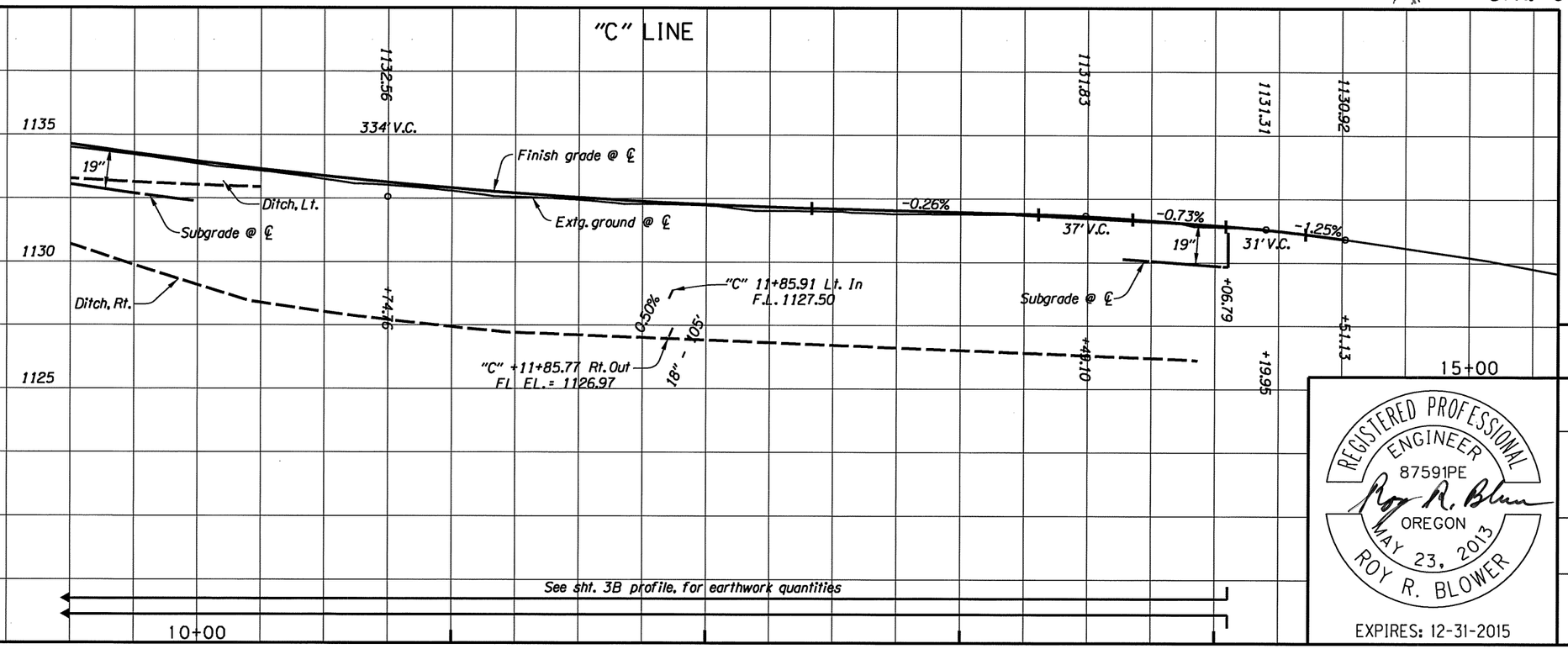
1. Remove 18" conc. pipe

2. Sta. "C" 11+85.91, 51.50 Lt.
Const. loose riprap (Class 50) - 5.2 cu.yd.
(Loose riprap pad)
Riprap geotextile - 10 sq.yd.
F.L.= 1127.50
(For details, see sht. 2B-2)

3. Sta. "C" 11+85.77, 55.77' Rt.
Inst. 18' sew. pipe - 105'
10' depth
S=0.50%
Const. sloped end section, Rt.
Const. paved end slope, Rt. - 35 sq.ft.
Const. loose riprap (Class 50) - 5.2 cu.yd.
(Loose riprap pad)
Riprap geotextile - 10 sq.yd.
F.L.= 1126.97
(For details, see sht. 2B-2)

4. See sht. 4, note 4.

5. Const. water quality swale
(For details, see sht. GJ-5)



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REGION 3 - TECHNICAL CENTER

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PLAN AND PROFILE

SHEET NO. 5

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Rotation: 0° Scale: 1"=50'

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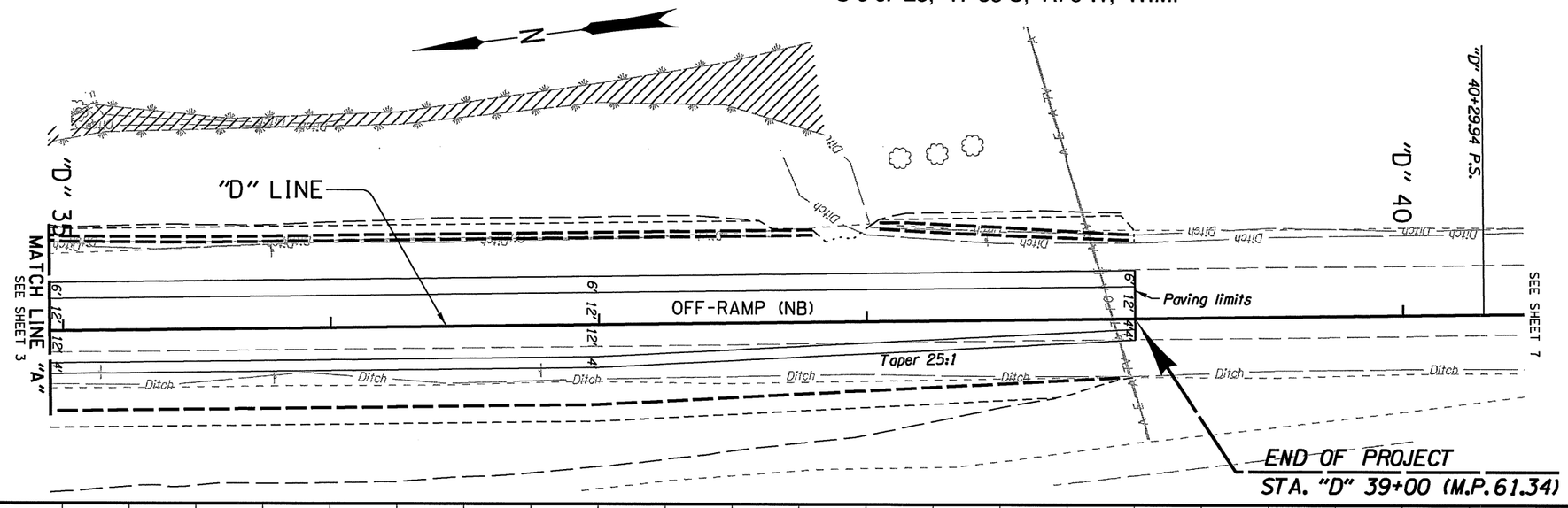

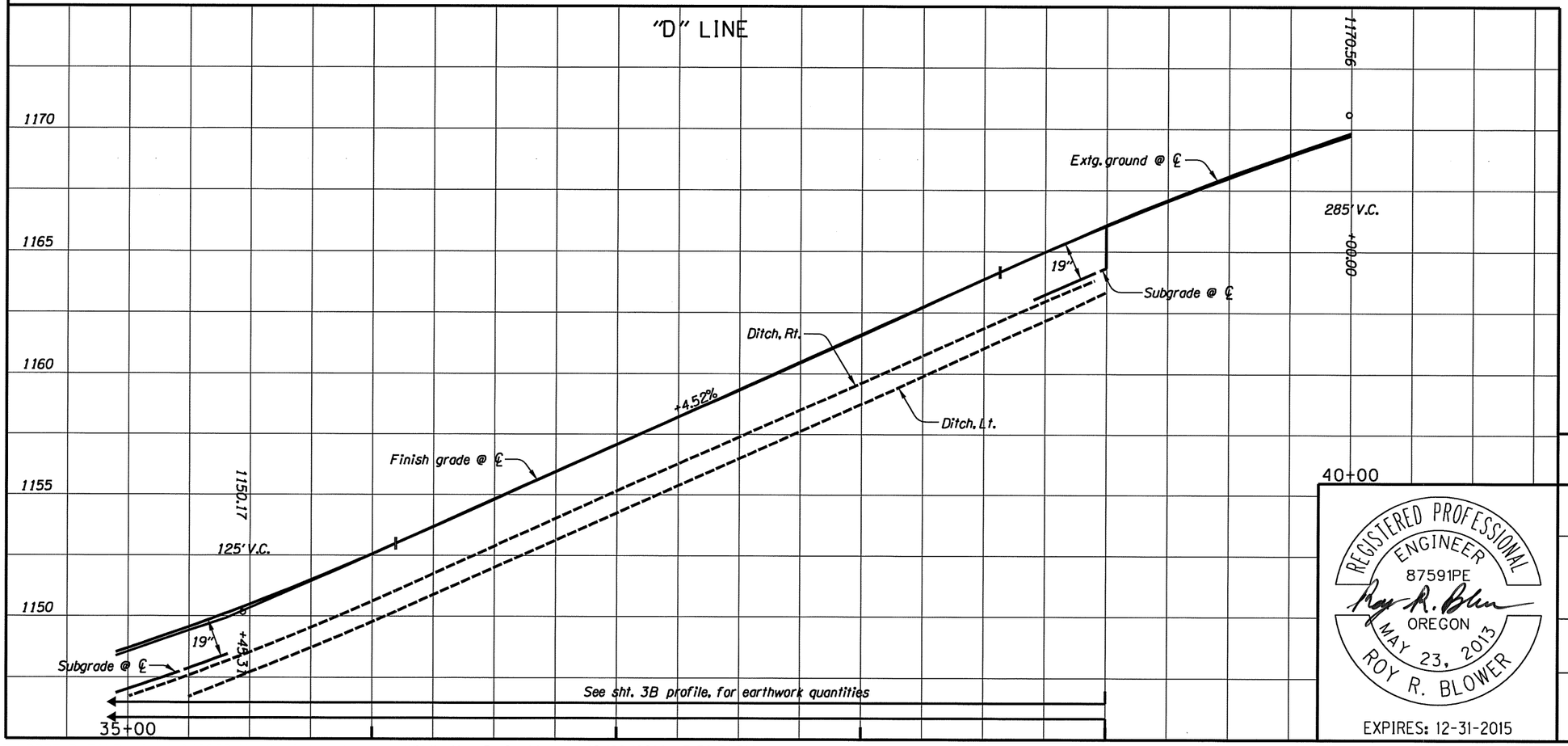

No Work Area Shown Thus:

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REGION 3 - TECHNICAL CENTER

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PLAN AND PROFILE

SHEET NO. 6

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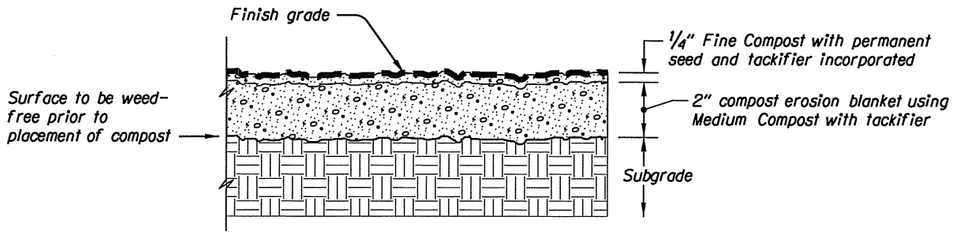
Rotation: 0° Scale: 1"=50'

COMPOST BLANKET APPLICATION DETAIL - STEEP SLOPES & SHALLOW DITCHES

(Not to scale)



Note: See Special Provision 03020 for compost specifications.
See plans and specifications for matting when required.

EROSION AND SEDIMENT CONTROL PLAN NOTES:

1. The implementation of these Erosion Control plans and the construction, maintenance, replacement and upgrading of these facilities are the responsibility of the contractor until all construction is completed and approved.

2. Develop a revised plan of the Erosion Control facilities shown in accordance with the requirements of Sec. 00280, supplemental standard specifications.
This plan must be constructed in conjunction with all clearing and grading activities. Construct in such a manner as to insure that sediment and sediment -laden water does not enter the Drainage System, Roadway, or violate applicable water standards. Construct controls in segments applicable to each staging phase.

3. The Erosion Control facilities shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these facilities shall be upgraded for unexpected storm events and to insure that sediment and sediment-laden water do not leave the site.

4. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to insure that all paved areas are kept clean for the duration of the project.

5. Install measures within the right-of-way unless directed otherwise.

6. Construct compost filter berm 5 feet downslope from the toe of fill slopes where sediment -laden water has a potential of entering waterways or leaving the R/W.

7. Protect all inlets during surface grinding, paving, and earthwork operations to prevent pollutants from entering storm water systems.

8. Establish concrete truck and other concrete equipment washout areas before beginning concrete work.

9. Prevent tracking of sediment onto public or private roads using BMPs such as: graveled (or paved) exits and parking areas, gravel all unpaved roads located onsite, or use on exit tire wash. these BMPs must be in place prior to land-disturbing activities.

10. When trucking saturated soils from the site, either use watertight trucks or drain loads on site.

11. Use water, soil-binding agent or other dust control technique as needed to avoid wind-blown soil.

12. Construction activities must avoid or minimize excavation and creation of bare ground during wet weather.

STANDARD DRAWINGS

- ■ RD1000 Construction entrance
- ■ RD1005 Check dam
- ■ RD1010 Inlet protection type 1,2,3
- □ RD1015 Inlet protection type 4
- □ RD1020 Inlet protection type 5
- ■ RD1025 Sediment barrier type 1
- □ RD1030 Sediment barrier type 2,4
- □ RD1035 Sediment barrier type 3
- □ RD1040 Sediment fence supported/unsupported
- □ RD1045 Temporary slope drain
- □ RD1050 Temporary scour basin
- □ RD1055 Matting
- □ RD1060 Tire wash type 1

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OREGON
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ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

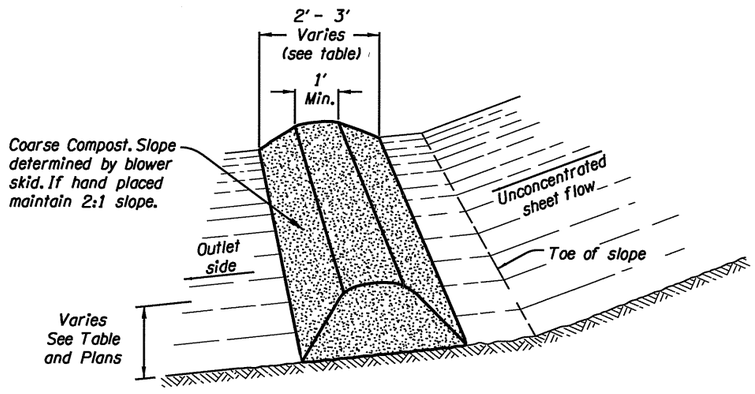
REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

EROSION CONTROL DETAILS

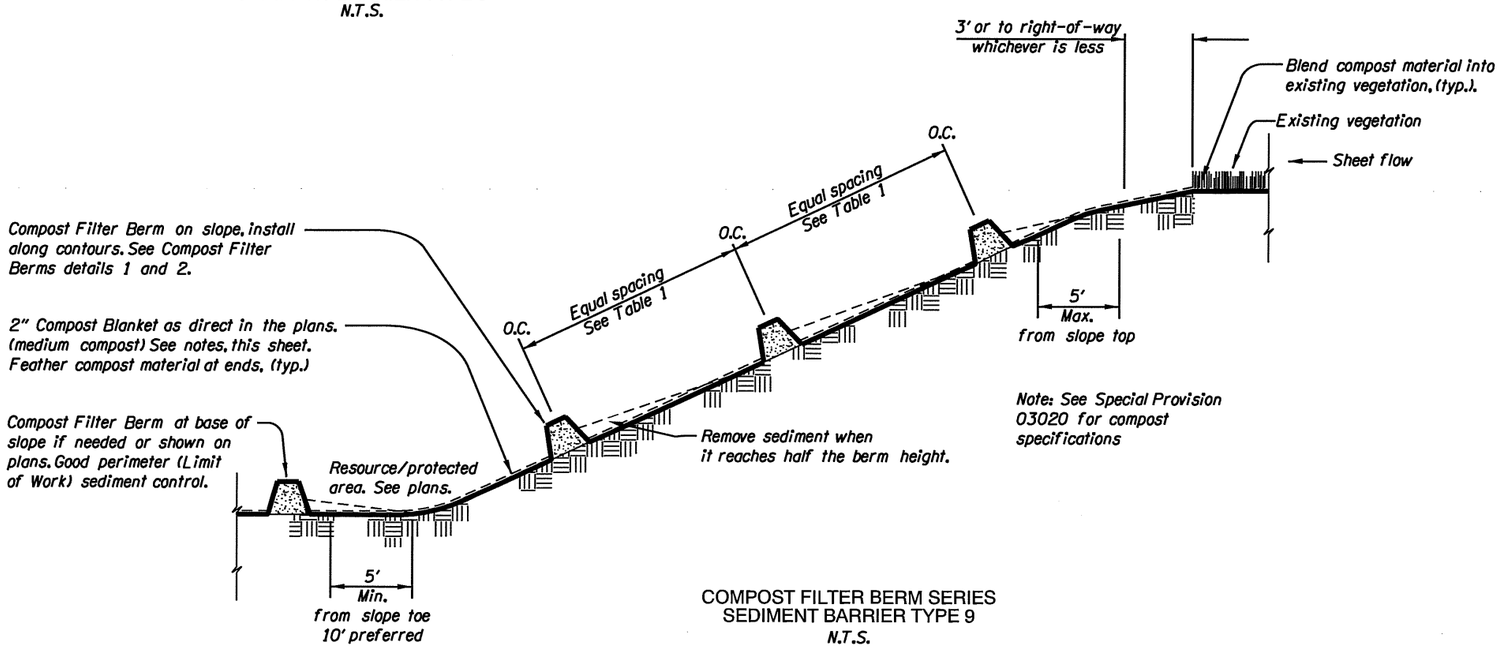
SHEET NO. GA



COMPOST FILTER BERM
SEDIMENT BARRIER TYPE 9
N.T.S.

COMPOST FILTER BERM

Compost Filter Berm Dimensions and Spacing Based on Slope				
Slope	Berm Spacing	Berm Dimensions		
		Height	Bottom width	Top width
< 50:1	250 ft	1 ft	2 ft (min)	1 ft
50:1 - 10:1	125 ft	1 ft	2 ft (min)	1 ft
10:1 - 5:1	100 ft	1 ft	2 ft (min)	1 ft
5:1 - 4:1	50 ft	1.3 ft	2.6 ft (min)	1 ft



Note: See Special Provision 03020 for compost specifications

COMPOST FILTER BERM SERIES
SEDIMENT BARRIER TYPE 9
N.T.S.

Compost Filter Berm General Notes:

1. Compost filter berms are sediment control devices for areas where runoff occurs as sheet flow. See Section 00280, Oregon Standard Specifications.
2. The maximum drainage area for a continuous berm shall be 1/4 acre per 100 linear feet of filter berm.
3. Where possible, berms should be placed away from the toe of slopes a minimum of 5 feet (10 feet preferred) to allow for energy dissipation and sediment storage.
4. Direct the outlet side of filter berm, located at base of slope, onto a stabilized area, such as vegetation and/or aggregate.
5. Place Filter Berms along or on the ground contour with the ends of the filter berm turned up slope per details. Adequate area shall be provided behind berm for ponding.
6. Compost filter berm may be vegetated with temporary or permanent seeding after placement.
7. If placed in area with existing ground vegetation, cut vegetation to 2-4 inches above grade of berm footprint. Do not remove existing vegetation or cut back outside berm footprint unless directed by Agency.
8. If soils are exposed apply compost blanket per details and specifications.
9. Routinely inspect filter berms and maintain to a functional condition throughout construction. Install additional filter material as directed by Agency. Upon project completion, spread compost or leave in place as directed by Agency.

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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

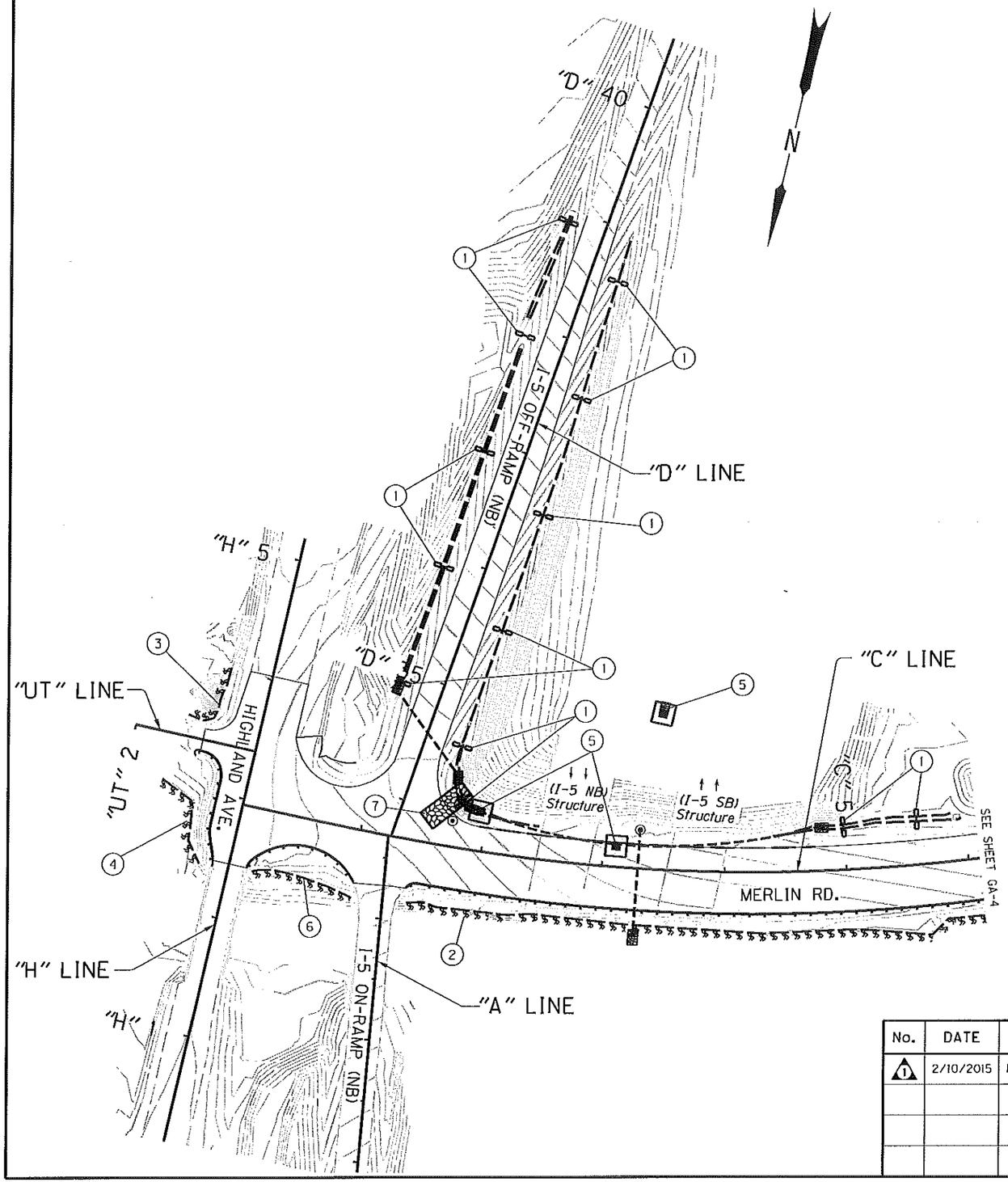
Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

EROSION CONTROL DETAILS

SHEET NO. GA-2

Sec. 25, T. 35 S, R. 6 W, W.M.

48V-010



LEGEND

- Fill slope
- Cut slope
- Inlet protection
- Compost filter berm
- Check dam in ditch section
- Construction entrances

1. Inst. check dam - 13 (See dwg. no. RD1005)
2. Inst. campost filter berm - 705' (For details, see sht. GA-2)
3. Inst. compost filter berm - 70' (For details, see sht. GA-2)
4. Inst. compost filter berm - 85' (For details, see sht. GA-2)
5. Const. inlet protection - 3
6. Inst. compost filter berm - 87' (For details, see sht. GA-2)
7. Const. construction entrance (See dwg. RD1000)

STANDARD DRAWINGS

■	RD1000	Construction entrance
■	RD1005	Check dam
■	RD1010	Inlet protection type 1,2,3
□	RD1015	Inlet protection type 4
□	RD1020	Inlet protection type 5
□	RD1025	Sediment barrier type 1
□	RD1030	Sediment barrier type 2,4
□	RD1035	Sediment barrier type 3
□	RD1040	Sediment fence supported/unsupported
□	RD1045	Temporary slope drain
□	RD1050	Temporary scour basin
□	RD1055	Matting
□	RD1060	Tire wosh type 1

GENERAL NOTES:

1. The construction, adjustment, maintenance and upgrading of these Erosion and Sediment Control measures is the responsibility of the contractor for the duration of the project to comply with Section 00280 of the Oregon Standard Specifications for construction and the NPDES 1200-CA permit.
2. Erosion and Sediment Control measures shown on this plan are for onticipated site conditions. Adjust or upgrade these measures for unexpected storm events to ensure that sediment and sediment-laden water does not leave the site.
3. Develop a revised plan of the Erosian and Sediment Control measures shawn as required by Section 00280, Oregon Standard Specificotions for Construction. Implement this plan for all clearing and grading activities and in segments opplicable to each staging phase. Construct in such a manner so as to ensure that sediment and sediment-laden water does not enter the roadway or drainage system, or violate applicable water standards.
4. Install measures within the right-of-way unless directed otherwise.
5. Contour intervals shown are 1.0'
6. Install compost blanket to all areas of disturbed soil. (For details, see sht. GA) (1)

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised note.	RB.

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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

EROSION CONTROL PLAN

SHEET NO. GA-3

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Sec. 25, T. 35 S, R. 6 W, W.M.

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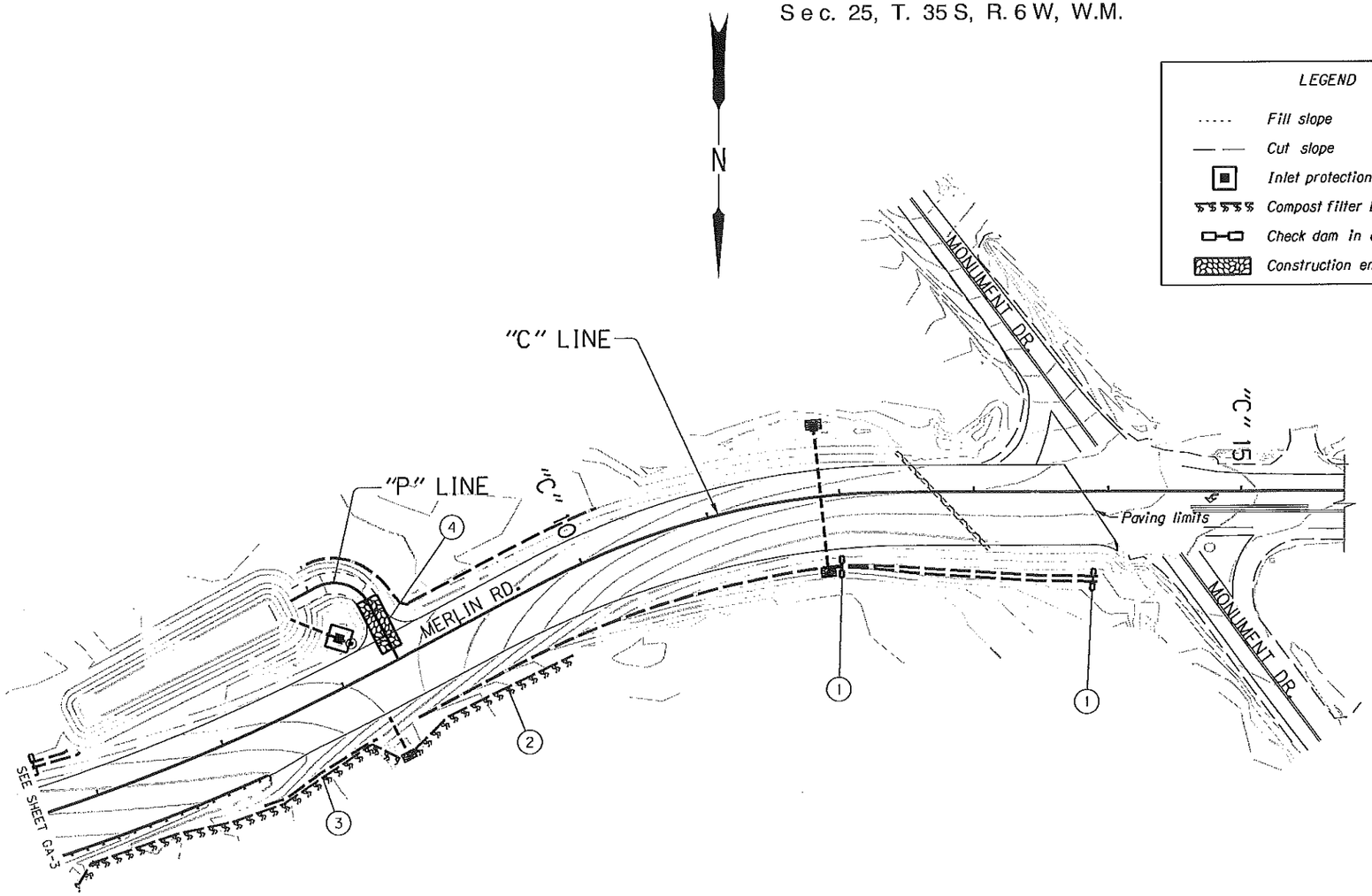

LEGEND

- Fill slope
- Cut slope
- Inlet protection
- Compost filter berm
- Check dam in ditch section
- Construction entrances

(1) Inst. check dam - 2

(2) Inst. compost filter berm - 140' (For details, see sht. GA-2)

(3) See sht. GA-2, note 2

(4) Const. construction entrance

GENERAL NOTES:

1. The construction, adjustment, maintenance and upgrading of these Erosion and Sediment Control measures is the responsibility of the contractor for the duration of the project to comply with Section 00280 of the Oregon Standard Specifications for construction and the NPDES 1200-CA permit.
2. Erosion and Sediment Control measures shown on this plan are for anticipated site conditions. Adjust or upgrade these measures for unexpected storm events to ensure that sediment and sediment-laden water does not leave the site.
3. Develop a revised plan of the Erosion and Sediment Control measures shown as required by Section 00280, Oregon Standard Specifications for Construction. Implement this plan for all clearing and grading activities and in segments applicable to each staging phase. Construct in such a manner so as to ensure that sediment and sediment-laden water does not enter the roadway or drainage system, or violate applicable water standards.
4. Install measures within the right-of-way unless directed otherwise.
5. Contour intervals shown are 1.0'
6. Install compost blanket to all areas of disturbed soil. (For details, see sht. GA)

LEGEND

- Fill slope
- Cut slope
- Inlet protection
- Compost filter berm
- Check dam in ditch section
- Construction entrances

No.	DATE	REVISIONS	BY
1	2/10/2015	Revised note.	RB.

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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
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EROSION CONTROL PLAN

SHEET NO. GA-4

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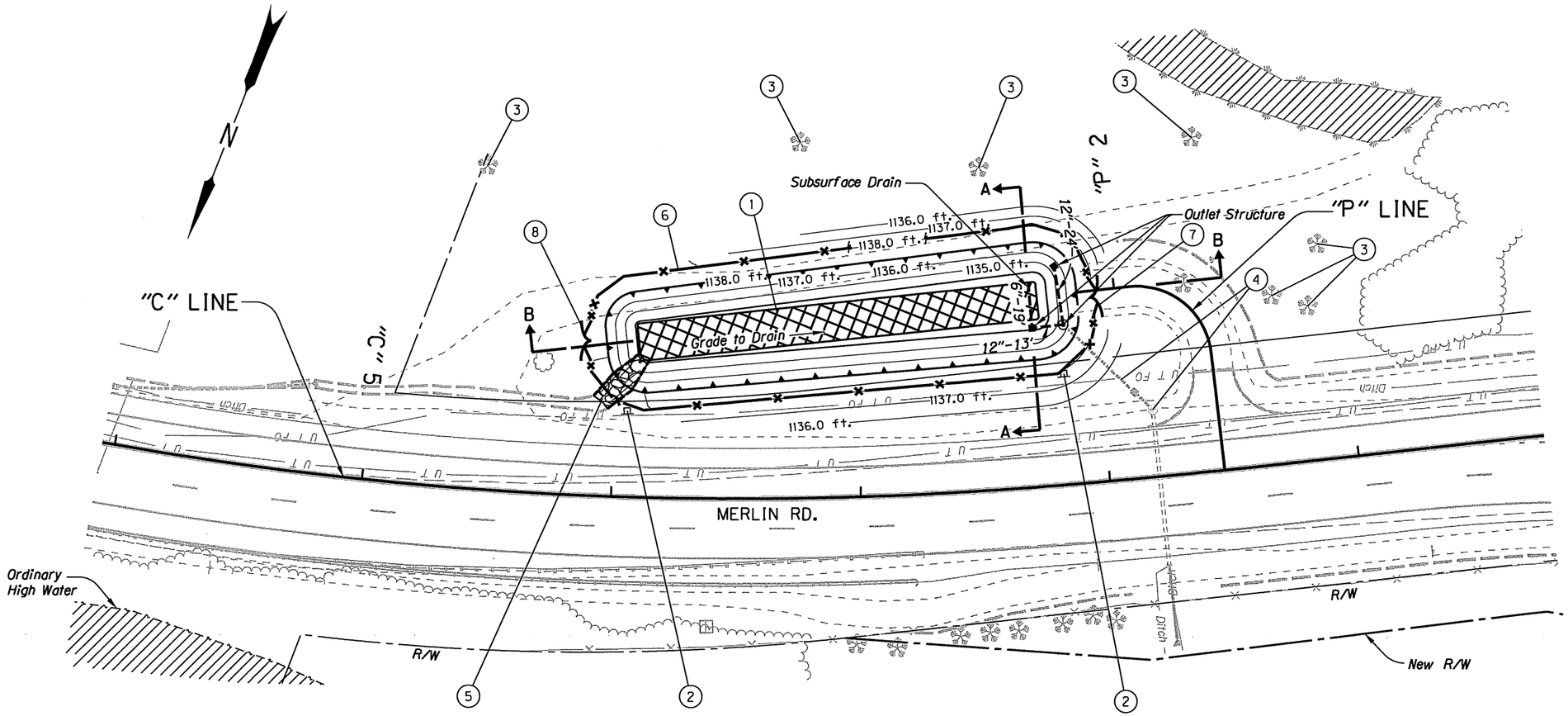

1. Sta. "C" 5+95.0, Lt. to Sta. "C" 7+95.0, Lt
   Const. bioretention pond
   (For details, see shts. GJ-2 thru GJ-4 & GJ-6)
2. Inst. field facility marker, Type "S2" - 2
   (For details, see sht. GJ-6)
3. Protect tree - 7
4. See sht. 4, note 5
5. Const. loose riprap, Class 50 - 7.3 cu. yd.
6. Inst. Type 2 fence - 440 ft.
   (See drg. no. RD810)
7. Sta. "C" 7+98.16, 73.7' Lt.
   Inst. 16 ft. double gate
   (See drg. no. RD820)
8. Sta. "C" 5+89.38, 61.8' Lt.
   Inst. 16 ft. double gate

NOTES:
1. Elevations shown are based on NAVD88 datum.
2. All dimensions shown are in feet unless otherwise noted.
3. For drainage details not shown, see sht. 4.
4. For sections A-A and B-B, see sheet GJ-2.

No Work Area Shown Thus:

Pourous Pavers Shown Thus:

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JULY 12, 2005
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REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Designed By - DeLanie Cutsforth
Reviewed By - Wade Holaday
Drafted By - Judy Hardin

STORMWATER

SHEET NO. GJ

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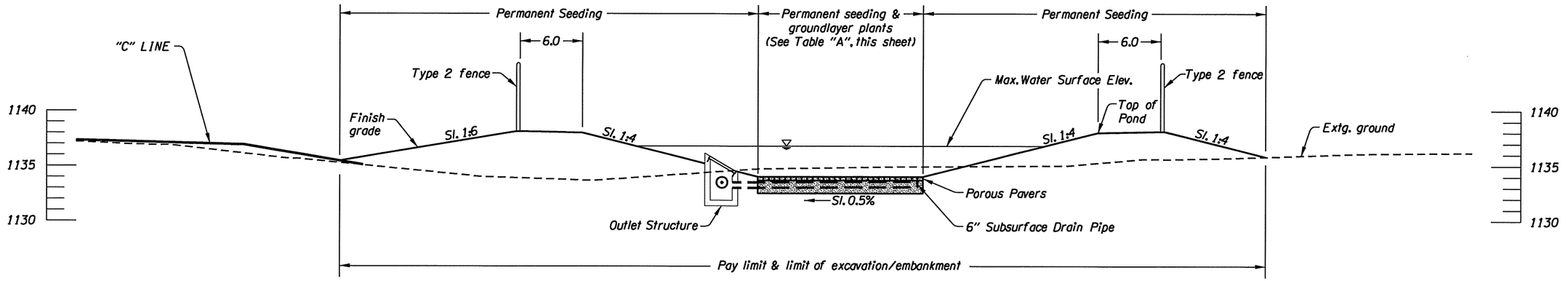
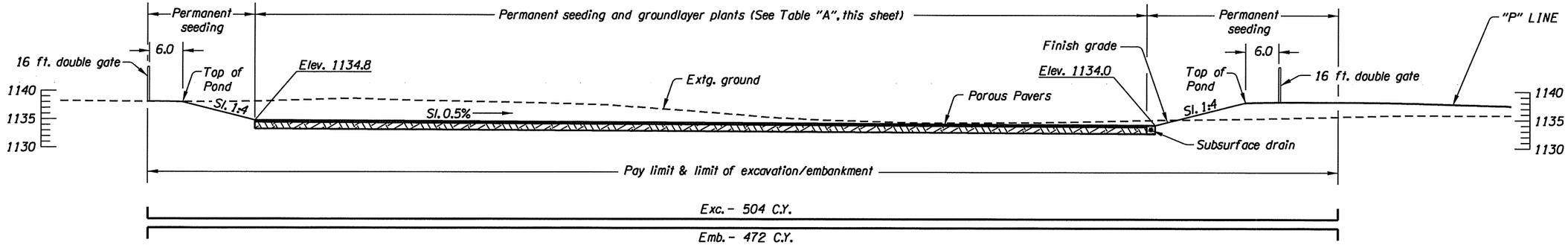
Rotation: 0° Scale: 1"=50'

POND SECTIONS

48V-010



SECTION A-A
Scale 1" = 10'



SECTION B-B
Scale 1" = 20'

TABLE "A"				
ACCEPTABLE GROUNDLAYER PLANTS				
SCIENTIFIC NAME	COMMON NAME	TYPE	SPACING	QUANTITY
Carex Densa	Dense Sedge	Plugs	1 per 2 ft²	1200
Eleocharis Palustris	Common Spikebrush	Plugs	1 per 2 ft²	1200
Juncus Tenuis	Proverty Rush	Plugs	1 per 2 ft²	1200
Mimulus Guttatus	Seep Monkeyflower	Plugs	1 per 2 ft²	1200
			TOTAL	4800

Water Quality Mixture

Granular Drain Backfill

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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Designed By - DeLanie Cutsforth
Reviewed By - Wade Holaday
Drafted By - DeLanie Cutsforth

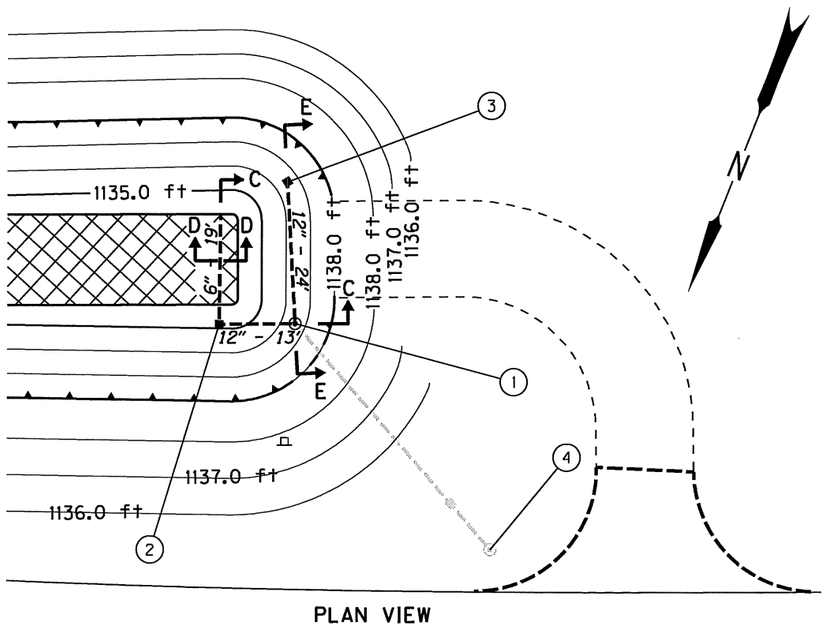
STORMWATER DETAILS

SHEET NO. GJ-2

48V-010

OUTLET STRUCTURE

(Not to scale)
(From Plan Sheet GJ)



PLAN VIEW

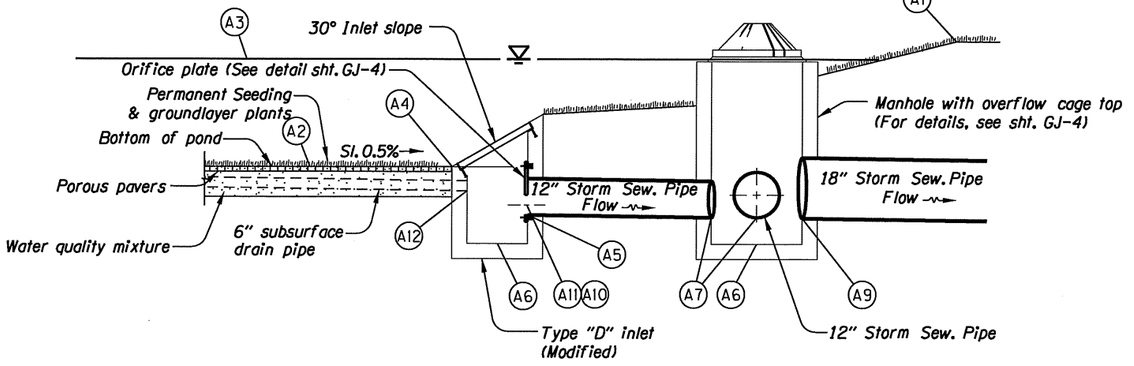
	ELEVATION	DESCRIPTION
A1	1138.00'	Top of berm elev.
A2	1134.00'	Bottom of pond min. elev.
A3	1136.78'	Max. water surface elev.
A4	1134.50'	Elev. of lip of lower type "D" inlet
A5	1133.10'	Invert-in elev. of 12" storm sew. pipe
A6	1132.00'	Max. sump elev. of type "D" inlet & manhole
A7	1133.00'	Invert-out elev. of 12" storm sew. pipe
A8	1136.50'	Elev. of lip of upper type "D" inlet
A9	1133.00'	Invert-in elev. of outlet pipe
A10	1133.30'	Orifice center elev.
A11	5.0"	Orifice diameter
A12	1133.10'	Invert-out elev. of 6" subsurface drain pipe
A13	1137.00'	Elev. of rim

(1) *Sta. "C" 7+86.3, 63.8' Lt.*
Const. manhole, modified with cage top
Rim El.=1137.0
F.L.=1133.0
Inst. 12" storm sew. pipe - 13'
5' depth
Sl.=0.008'/ft.
F.L. (In)=1133.10
F.L. (Out)=1133.00
(For details, see sht. GJ-4)

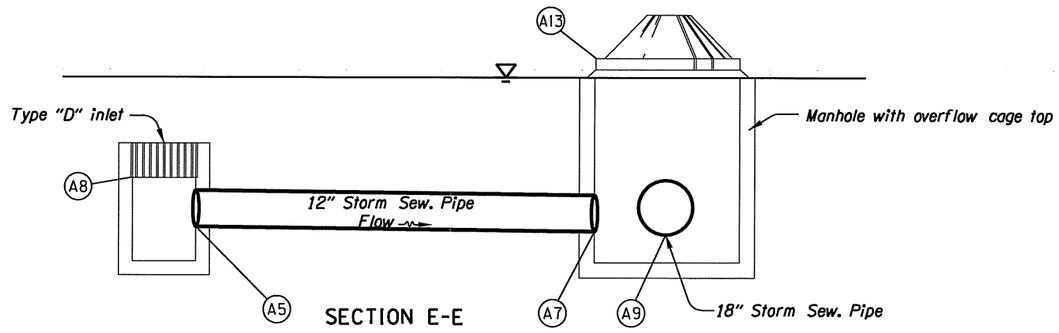
(2) *Sta. "C" 7+73.4, 63.4' Lt.*
Const. type "D" inlet, modified with orifice plate
Rim El.=1134.50
F.L. (In - S)=1133.10
F.L. (Out - W)=1133.10
Inst. 6" perforated drain pipe - 19'
5' depth
Sl.=0.002'/ft.
F.L. (In)=1133.14
F.L. (Out)=1133.10
(For details, see sht. GJ-4)

(3) *Sta. "C" 7+84.5, 87.2' Lt.*
Const. type "D" inlet
Rim El.=1136.50
F.L.=1133.48
Inst. 12" storm sew. pipe - 24'
5' depth
Sl.=0.02
F.L. (In)=1133.48
F.L. (Out)=1133.00

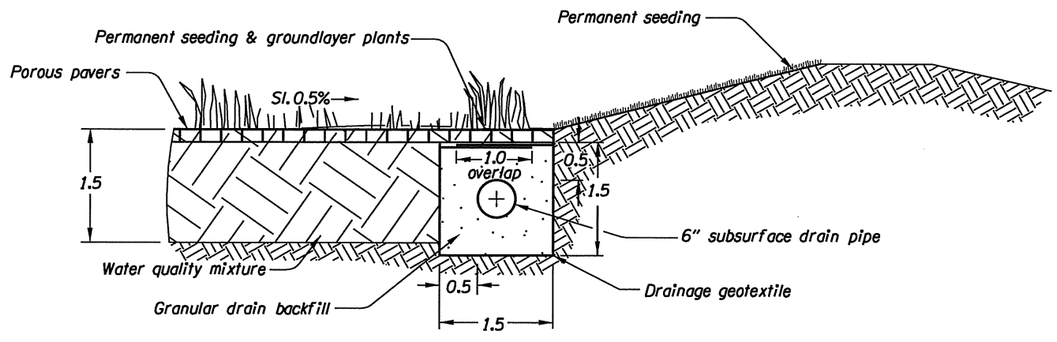
(4) *See sht. 4, note 5*



SECTION C-C



SECTION E-E



SECTION D-D

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

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Reviewed By - Wode Holoday
Drafted By - DeLanie Cutsforth

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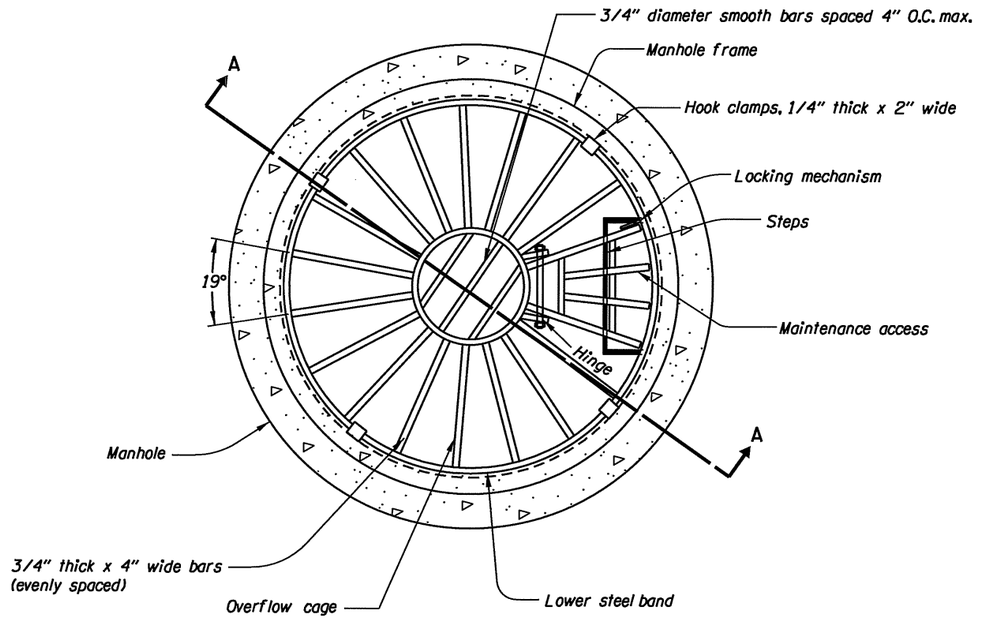
JULY 12, 2005
DELANIE L. CUTSFORTH
EXPIRES: 12-31-2015

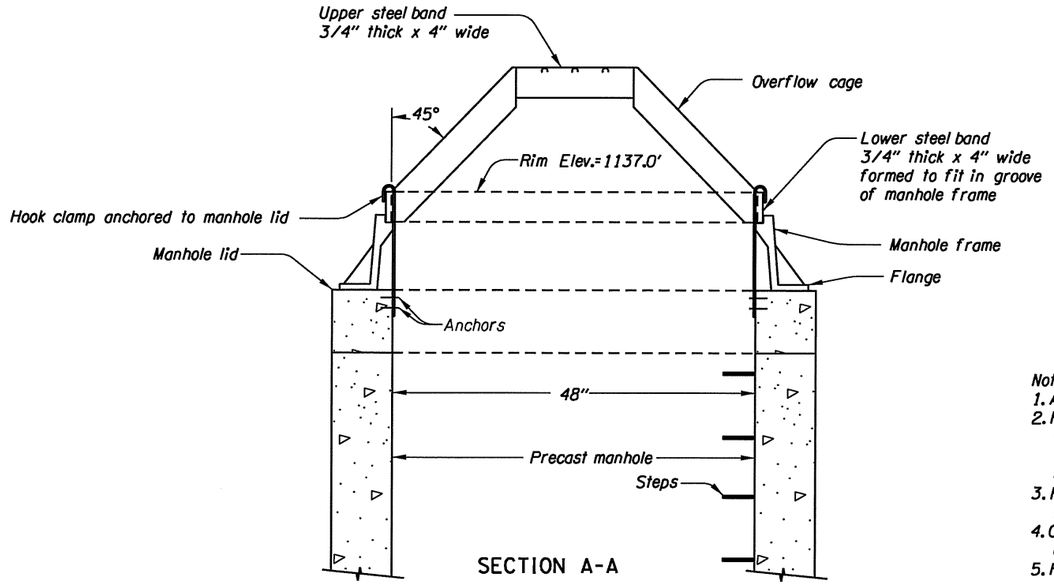
STORMWATER DETAILS

SHEET NO. GJ-3

MODIFIED MANHOLE WITH OVERFLOW CAGE TOP

(Not to scale)

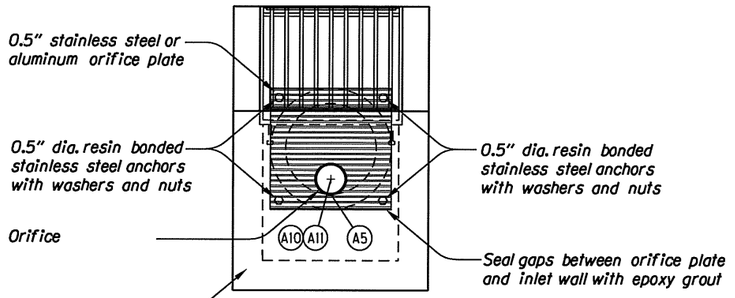




SECTION A-A

ORIFICE PLATE DETAIL

(Not to scale)



FRONT VIEW

Notes:

1. *All metal parts corrosion resistant.*
2. *Provide maintenance access by welding 4 cross bars to vertical bars as shown. Hinge upper ends with bolted flanges and provide locking mechanism on lower end. Locate ladder steps directly below.*
3. *Place 4 hook clamps over lower steel bar. Anchor to mahole lid.*
4. *Construct overflow cage with 3/4"x 4" square edge steel bars. Weld all joints.*
5. *Hot-dip galvanize overflow cage and all steel parts after fabrication.*
6. *Use galvanized or stainless steel for all fasteners and hardware.*
7. *To be accompanied by drg. nos. RD336, RD346 & RD356.*

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REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
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PACIFIC HIGHWAY
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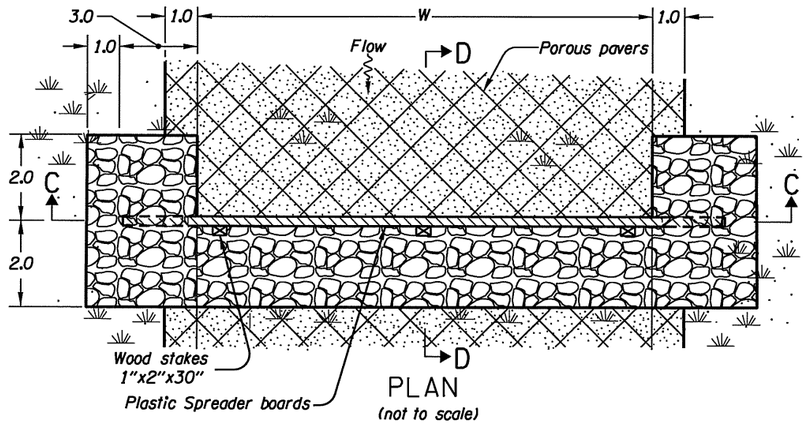
STORMWATER DETAILS

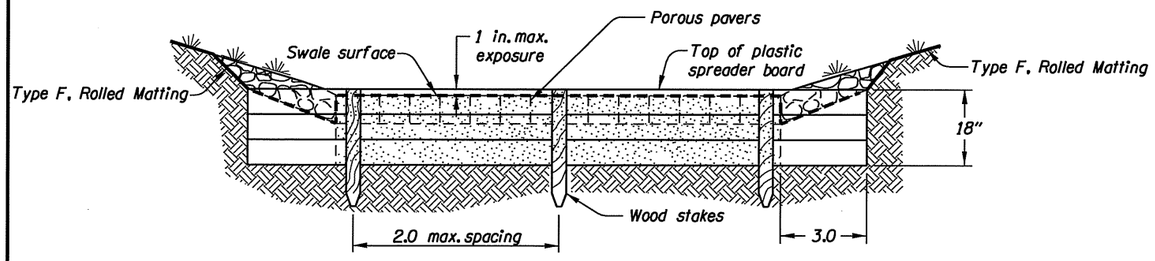
SHEET NO. GJ-4

WATER QUALITY SWALE DETAILS

48V-010



PLAN
(not to scale)



SECTION C-C
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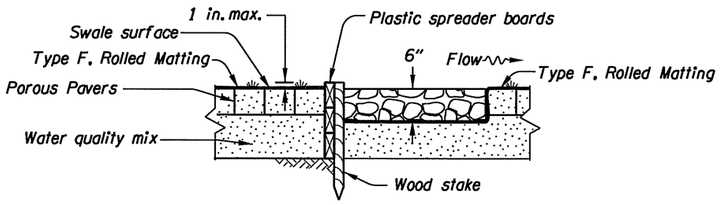
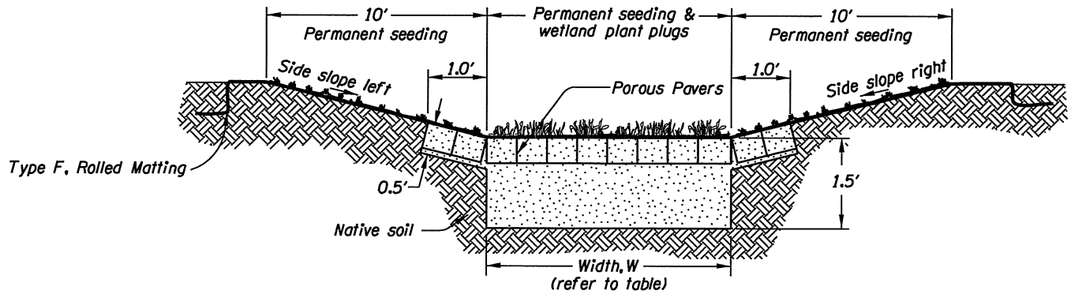


SECTION D-D
(not to scale)

PLASTIC BOARD FLOW SPREADER DETAIL



TYPICAL SECTION
(Not to scale)

BIOFILTRATION SWALE DATA						
Facility Name	Plan Sheet & Note #	STA. To STA.	W (ft.)	Longitudinal Slope (ft./ft.)	Side Slope Left (V:H)	Side Slope Right (V:H)
Water quality Swale	5, (5)	"C" 12+57.6, 62.4' Rt. To "C" 13+57.6, 69.5' Rt.	4.0	0.005	1:4	1:4

TABLE "B"				
ACCEPTABLE WETLAND PLANT PLUGS				
SCIENTIFIC NAME	COMMON NAME	TYPE	SPACING	QUANTITY
Carex Densa	Dense Sedge	Plugs	1 per 2 ft²	200
Eleocharis Palustris	Common Spikebrush	Plugs	1 per 2 ft²	200
Juncus Tenuis	Proverty Rush	Plugs	1 per 2 ft²	200
Mimulus Guttatus	Seep Monkeyflower	Plugs	1 per 2 ft²	200
			TOTAL	800

NOTES:
1. Construct spreader boards level.
2. Extend spreader boards a minimum of 3 feet into side slopes.
3. Reinforce side slopes at flow spreader locally with 1½"-¾" granular drain backfill material..
4. Fasten wood stakes to spreader boards with 2½" galvanized wood screws every 2" (minimum).
5. Place plastic board flow spreader at beginning and end of swale and every 50 feet throughout length of biofiltration swale.
6. Install matting according to RD1055 channel application. Omit check slots.
7. Install Type S2 markers at beginning and end of biofiltration swale. See sheet GJ-6 for details.

1½"-¾" Granular Drain Backfill Material

Water quality mix (and swale excavation pay limit)

Note: All dimensions are in feet unless otherwise noted.

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JULY 12, 2005
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

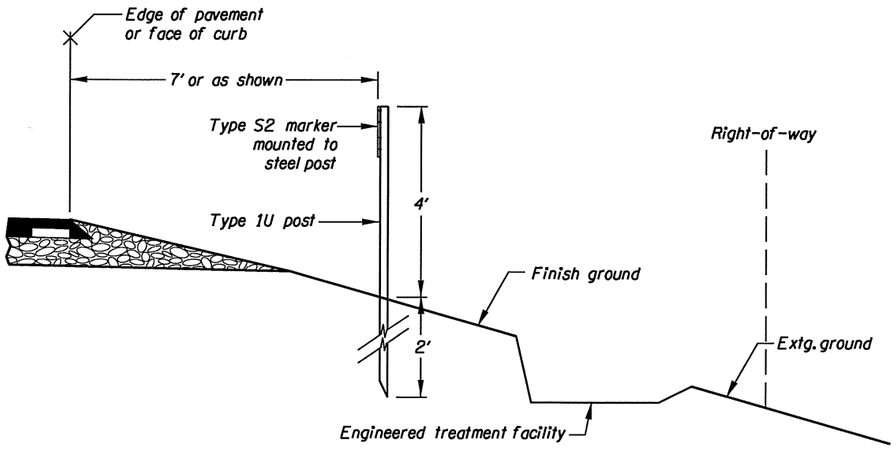
Designed By - DeLanie Cutsforth
Reviewed By - Wade Holaday
Drafted By - DeLanie Cutsforth

STORMWATER DETAILS

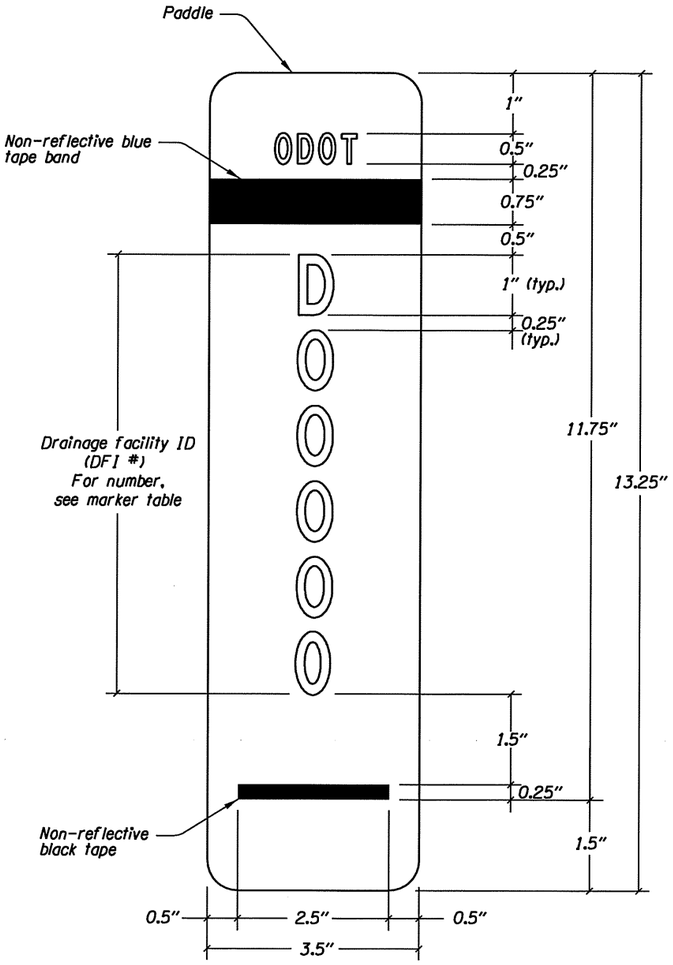
SHEET NO. GJ-5

STORMWATER DRAINAGE FACILITY IDENTIFICATION

48V-010



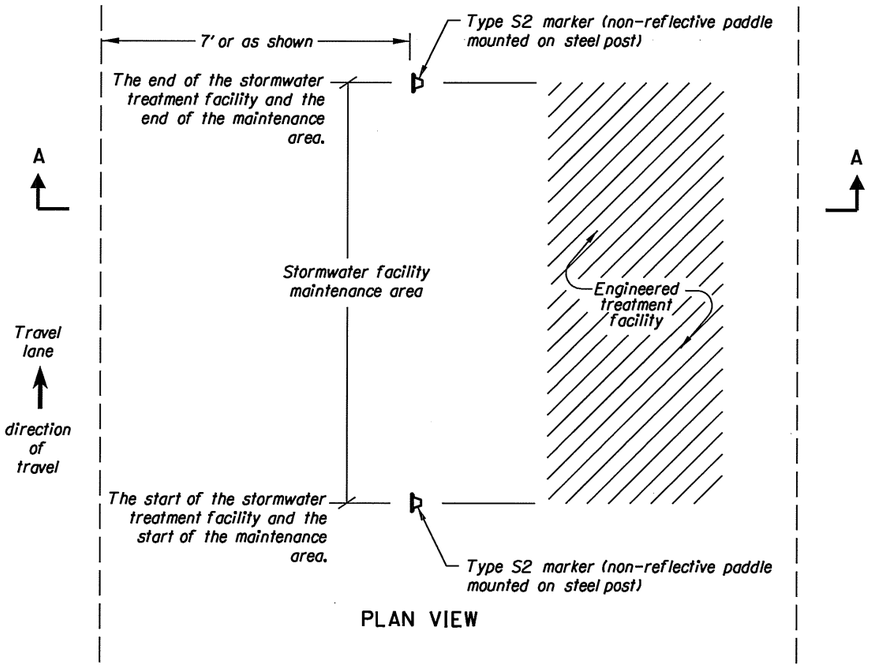
SECTION A-A



TYPE S2 MARKER

MARKER TABLE

FACILITY NAME	FACILITY LOCATION	DFI #	TYPE S2 MARKER	
	STATION		BEGIN	END
Water Quality Swale	"C" 12+57.6	D00423	✓	
Water Quality Swale	"C" 13+57.6	D00423		✓
Bioretention Pond	"C" 5+98.4	D00424	✓	
Bioretention Pond	"C" 7+84.9	D00424		✓



PLAN VIEW

INSTALLATION DETAIL

Notes:

1. *Paddle:*
   - *Aluminum sheet, nominal thickness 0.050"*
   - *White non-reflective background*
   - *Mount paddle to one (1) type 1U steel post using 3/16" diameter aluminum blind rivets and washers. See standard drawing TM570 detail labeled "Steel Posts" for mounting a traffic target. Install paddle onto Type 1U steel post using same hole pattern.*
   - *Text and numbers are type C font in non-reflectorized black*
   - *Band is non-reflective blue tape*
   - *Do not mount paddle to other highway signing posts*
   - *Install paddle parallel to travel lane*
   - *Prepare paddle for each "DFI" noted in the marker table*
2. *Steel Posts:*
   - *See drg. no. TM571 for type 1U steel post dimensions*
3. *Place 7 feet from edge of pavement or as directed.*
4. *See marker table for installation locations.*

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REGION 3 - TECHNICAL CENTER

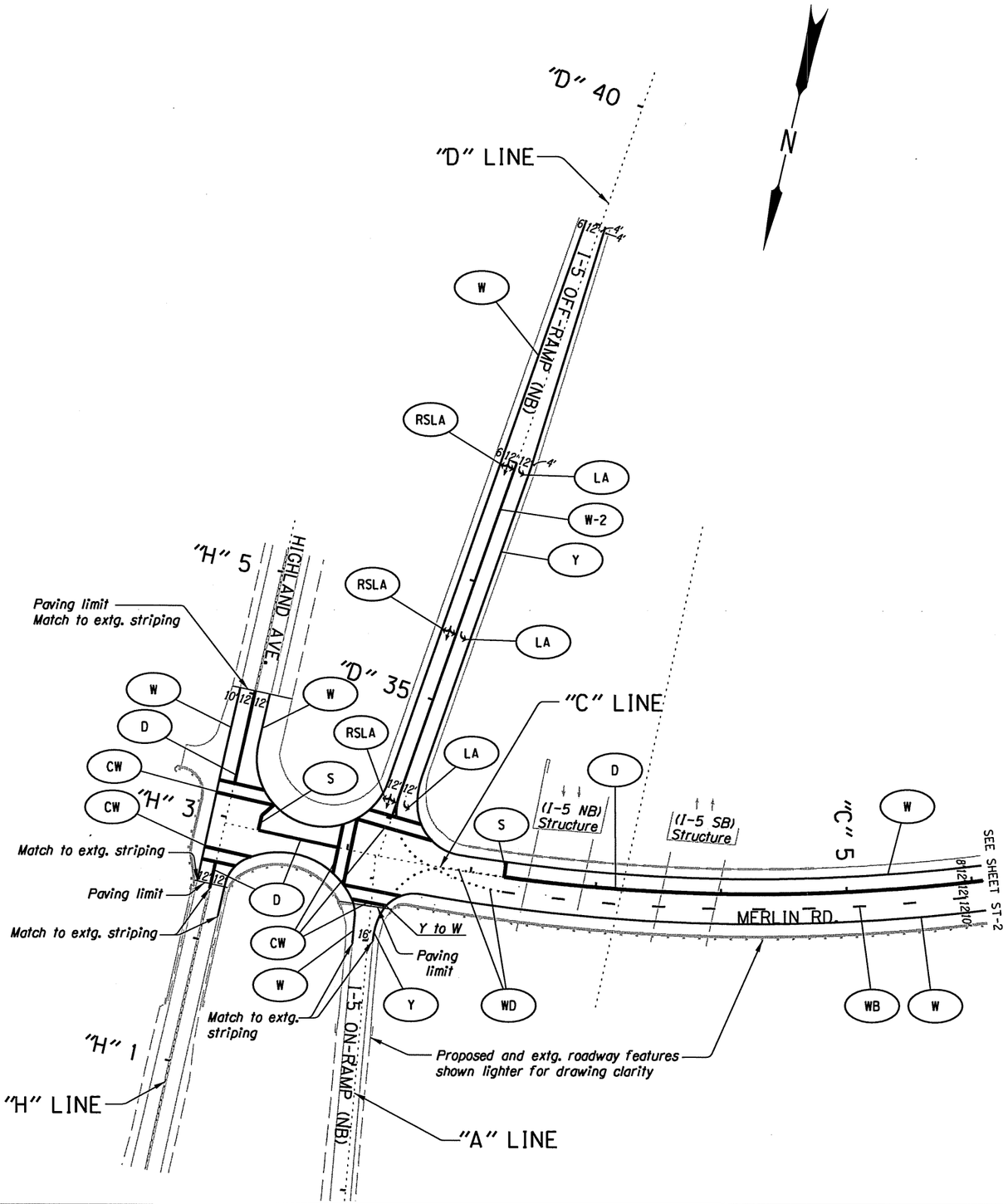
I-5: EXIT 61 (LOUSE CREEK)
INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Designed By - DeLanie Cutsforth
Reviewed By - Wade Haladay
Drafted By - DeLanie Cutsforth

STORMWATER DETAILS

SHEET NO. GJ-6

48V-010



- CW — *Inst. standard crosswalk*
- D — *Inst. double no-pass*
- DLL — *Inst. 4" white dotted lane line*
- LA — *Inst. left turn arrow (white)*
- RA — *Inst. right turn arrow (white)*
- SA — *Inst. straight arrow (white)*
- RSLA — *Inst. right turn straight left turn arrow (white)*
- S — *Inst. 12" white stop bar*
- W — *Inst. 4" white line*
- WB — *Inst. 4" white broken line*
- WD — *Inst. 4" white dotted line*
- W-2 — *Inst. 8" white line*
- Y — *Inst. 4" yellow line*

To be accompanied by std. dwgs:
TM502, TM521, TM530, TM531, TM539, TM560, TM561, TM570, TM571, TM576

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87591PE
OREGON
MAY 23, 2013
ROY R. BLOWER
EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

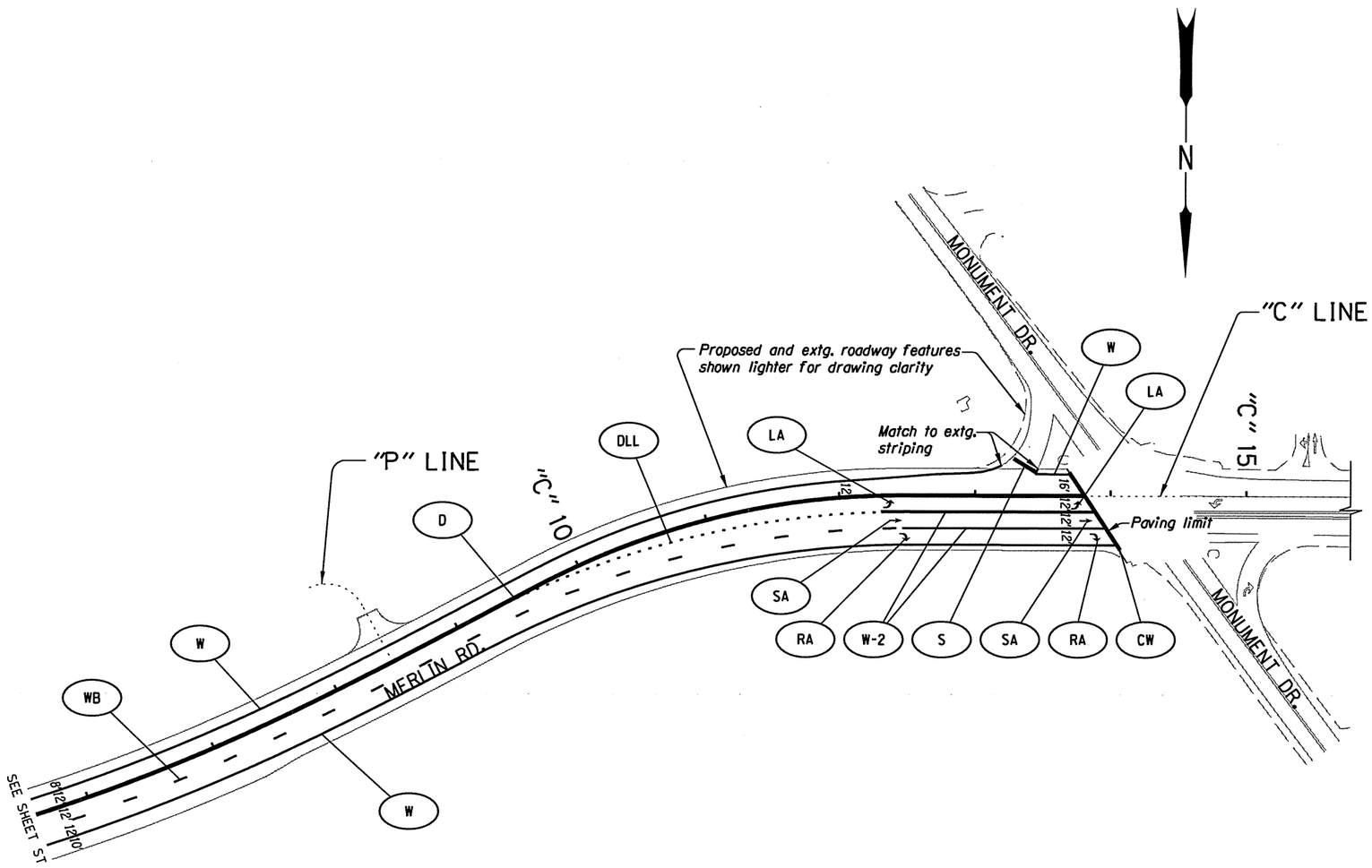
I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
Designed By - Roy Blower
Drafted By - Judy Hardin

STRIPING PLAN

SHEET NO. ST

48V-010



See sheet no. ST for legend and general notes.

REGISTERED PROFESSIONAL ENGINEER
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EXPIRES: 12-31-2015

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMNTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

Design Team Leader - Chris Zelmer
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Drafted By - Judy Hardin

STRIPING PLAN

SHEET NO. ST-2

\\wpdotfpsr821\userseng\hwye33g\ODOT_DATA\Projects\16062_Merlin_Interchange\16062.st1 :: Default 12/22/2014 4:02:53 PM hwye33g

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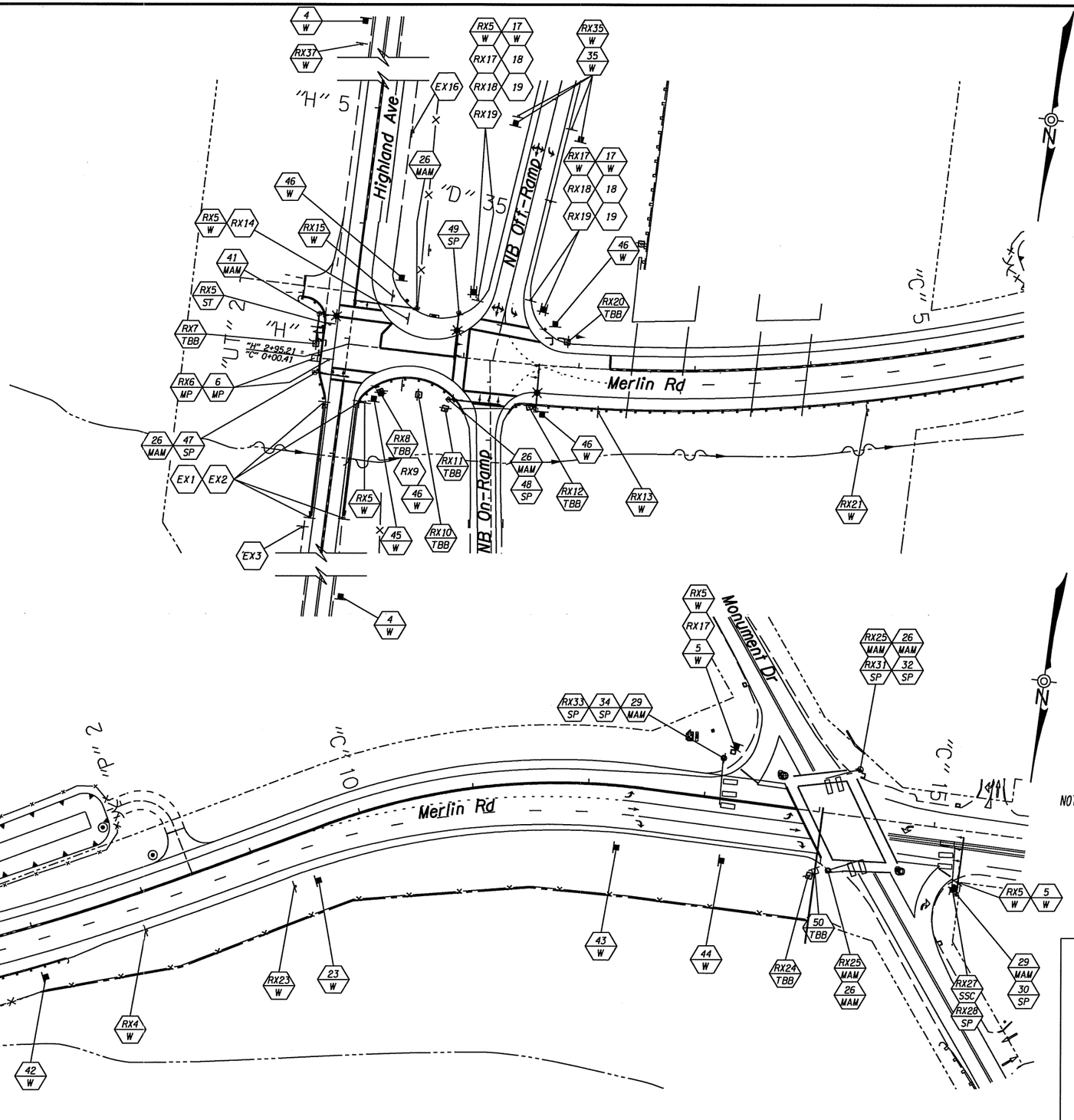


SIGNING PLAN
MERLIN RD.
STA. 'C' 0+00 TO STA. 'C' 15+75
EXIT 61 NB OFF-RAMP
STA. 'D' 33+68 TO STA. 'D' 36+00

L E G E N D

RXN	Remove existing sign (N)
RXN / M	Remove existing sign (N) and (M) sign support
N	Install new sign (N)
N / M	Install new sign (N) on new (M) sign support
RSN / M	Remove and save existing sign (N) and remove (M) sign support
RIN / M	Reinstall existing sign (N) on new (M) sign support
EXN	Maintain and protect existing sign (N) and support

N = Sign Number

M = Material

Material options are: W = Wood
ST = Perf. Steel Square Tube
SP = Signal Pole Mount
SSC = Stainless Steel Clamp
TBB = Triangular Base Breakaway
MAM = Mast Arm Mount
MP = Milemarker Post

NOTE: Existing signs not shown are to remain in place unless otherwise directed by the Engineer.

NOTE: The locations of sign installations shown are approx. with exact locations to be determined in the field.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

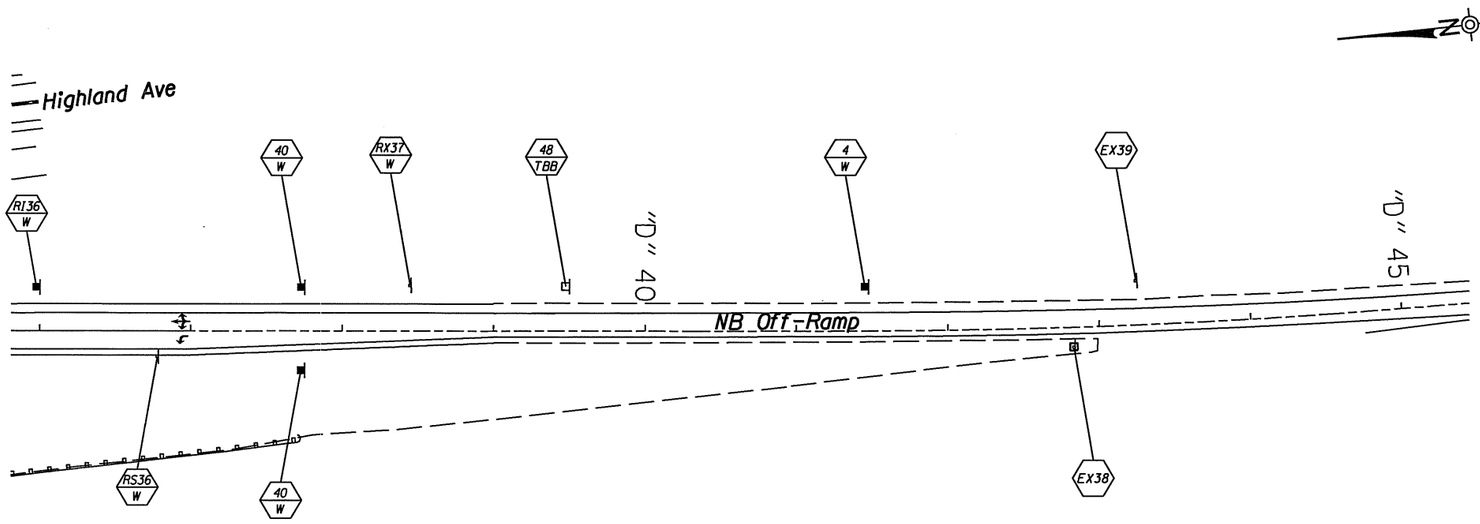
DESIGNED BY: Scott Porker
REVIEWED BY: Don Dorrell
DRAWN BY: Scott Porker
FC: 001 MP: 61.29-61.50

ACCOMPANIED BY DWGS. TM200, TM201, TM211, TM223, TM224, TM225, TM230, TM231, TM233, TM602, TM635, TM670, TM671, TM675, TM676, TM678, TM679, TM680, TM681, TM687, TM688

SIGNING PLAN

Str. ID. No. _____ T.R.S. DWG. NO. S-15109

SIGNING PLAN
EXIT 61 NB OFF-RAMP
STA. 'D' 36+00 TO STA. 'D' 45+00



L E G E N D

- RXN — Remove existing sign (N)
- RXN / M — Remove existing sign (N) and (M) sign support
- N — Install new sign (N)
- N / M — Install new sign (N) on new (M) sign support
- RSN / M — Remove and save existing sign (N) and remove (M) sign support
- RIN / M — Reinstall existing sign (N) on new (M) sign support
- EXN — Maintain and protect existing sign (N) and support

N = Sign Number

M = Material

Material options are: W = Wood
ST = Perf. Steel Square Tube
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REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
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SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Parker
REVIEWED BY: Don Darrell
DRAWN BY: Scott Parker
FC: 001 MP: 61.29-61.50

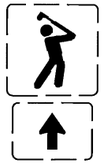
SIGNING PLAN

Str. ID. No. _____ T.R.S. DWG. NO. S-15110

SIGNING DETAILS

Sign No. 1

Sign No. 2



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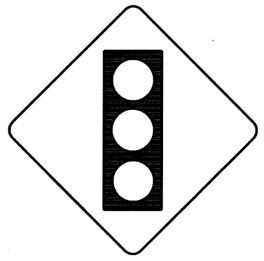

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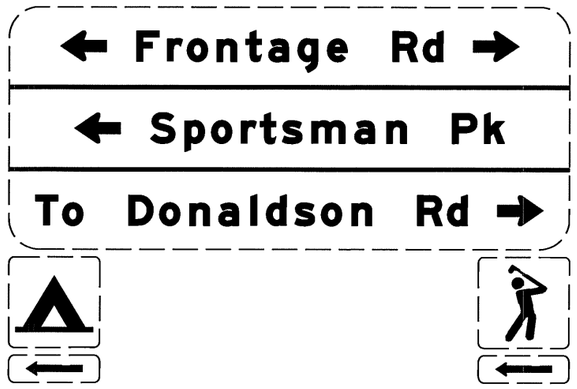
Sign No. 5

Sign No. 6



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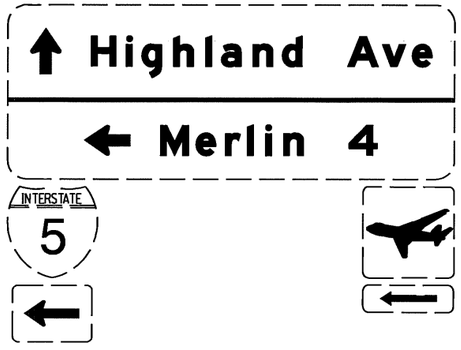

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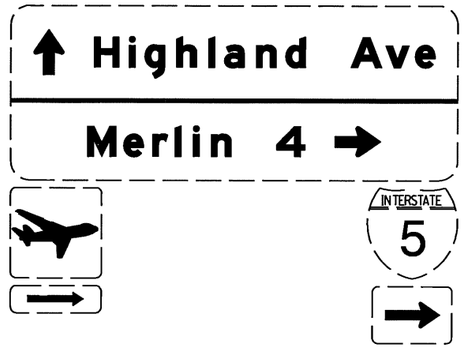

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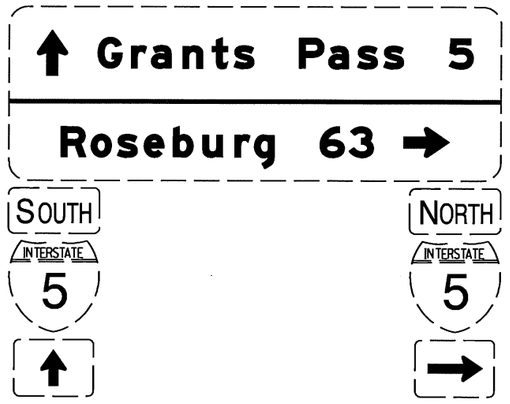

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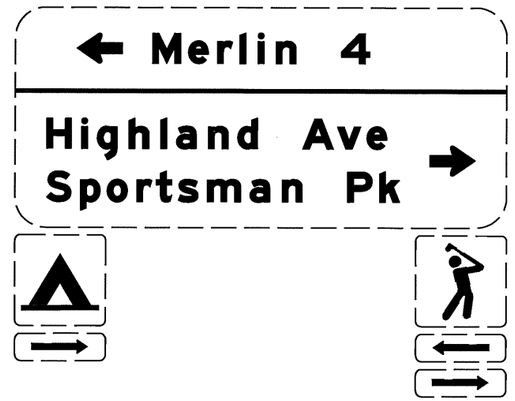

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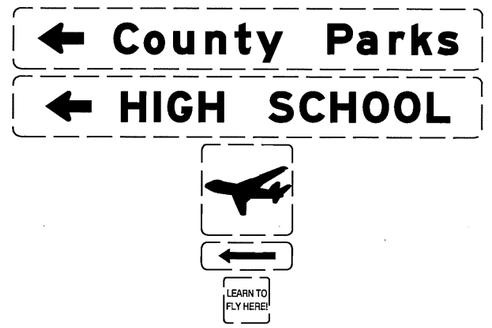


Sign No. 12

NOTE: Signs shown with broken borders are existing signs.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Parker
REVIEWED BY: Don Darrell
DRAWN BY: Scott Parker
FC: 001 MP: 61.29-61.50

SIGNING DETAILS

Str. ID. No. _____ T.R.S. DWG. NO. S-15111

SIGNING DETAILS

Sign No. 13

Sign No. 14

Sign No. 15

Sign No. 16

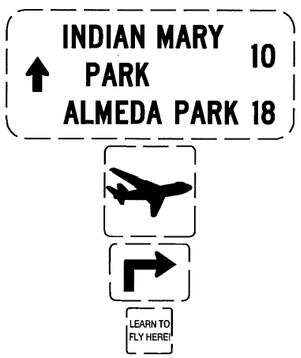
Sign No. 17

Sign No. 18

Sign No. 19

Sign No. 20

Sign No. 21



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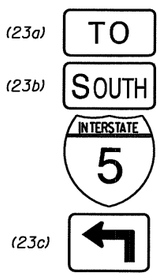

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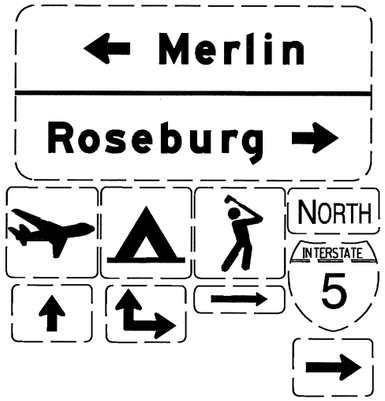
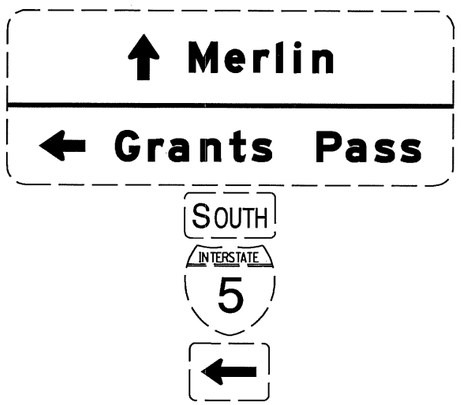


Sign No. 24

Sign No. 25

Sign No. 26

Sign No. 27



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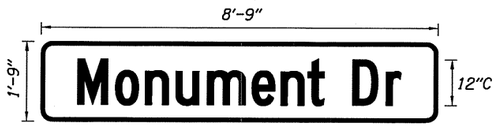

Sign No. 29

NOTE: Signs shown with broken borders are existing signs.

REGISTERED PROFESSIONAL ENGINEER
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OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

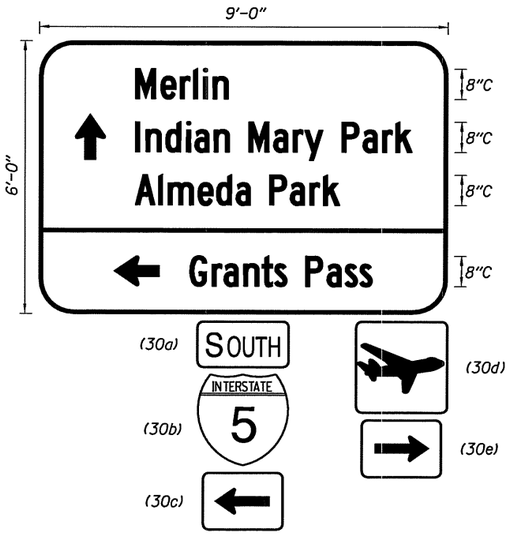
FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Parker
REVIEWED BY: Dan Darrell
DRAWN BY: Scott Parker
FC: 001 MP: 61.29-61.50

SIGNING DETAILS

Str. ID. No. _____ T.R.S. DWG. NO. S-15112

SIGNING DETAILS



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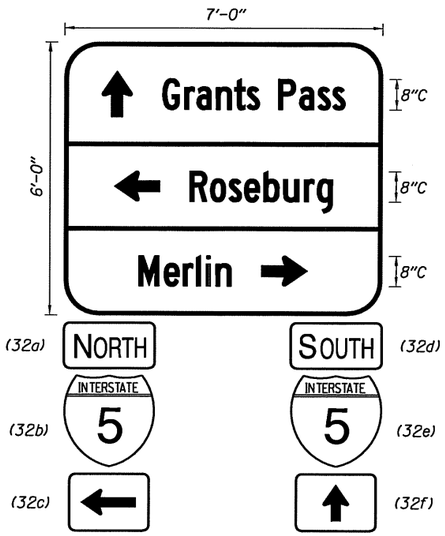

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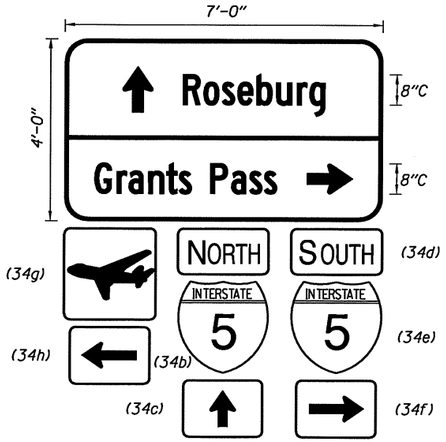

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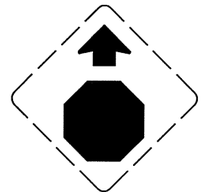
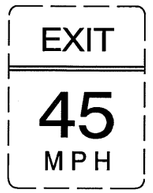


Sign No. 37

Sign No. 38

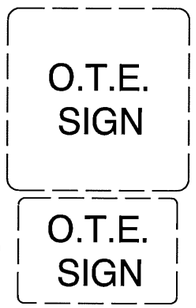
Sign No. 35



Sign No. 39

Sign No. 31

Sign No. 33



Sign No. 36

NOTE: Signs shown with broken borders are existing signs.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

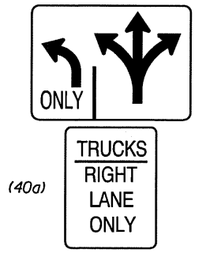
FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Porker
REVIEWED BY: Don Dorrell
DRAWN BY: Scott Porker
FC: 001 MP: 61.29-61.50

SIGNING DETAILS

Str. ID. No. _____ T.R.S. DWG. NO. S-15113

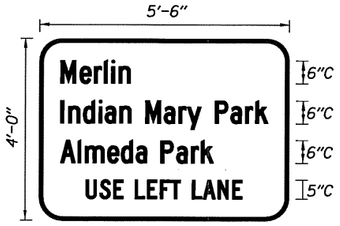
SIGNING DETAILS



(40a)

Sign No. 40

Sign No. 41



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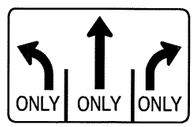
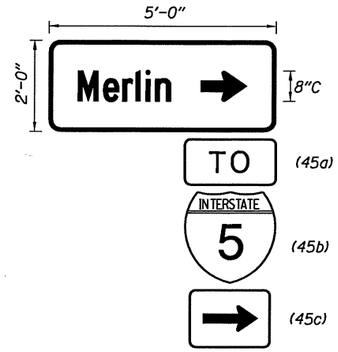


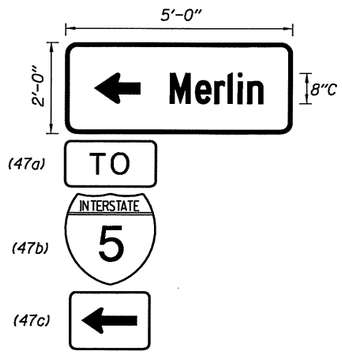
Sign No. 43

Sign No. 44



Sign No. 45

Sign No. 46



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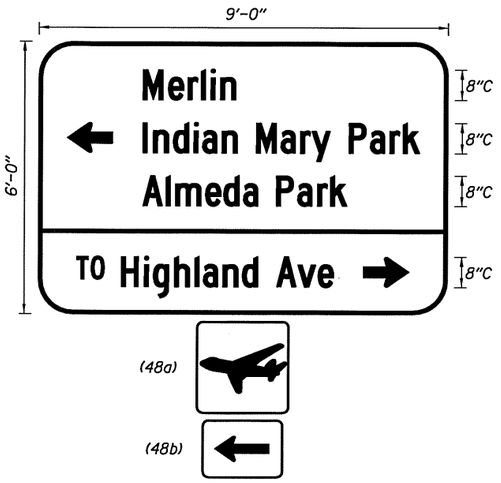

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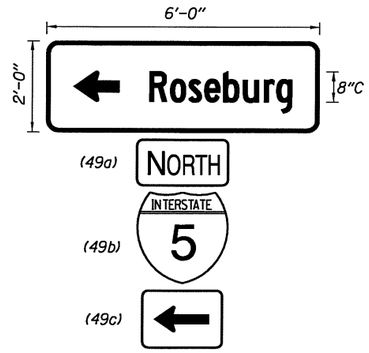

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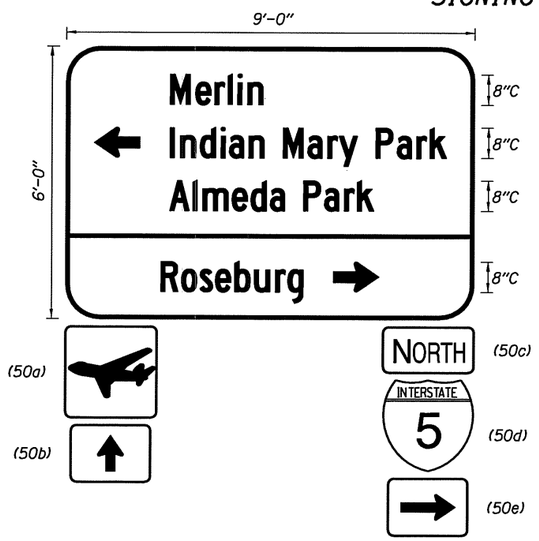

Sign No. 50

NOTE: Signs shown with broken borders are existing signs.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Porker
REVIEWED BY: Don Dorrell
DRAWN BY: Scott Porker
FC: 001 MP: 61.29-61.50

SIGNING DETAILS

Str. ID. No. _____ T.R.S. DWG. NO. S-15114

SIGN & POST DATA TABLE

SIGN NO.	SIGN LOCATION 4/	SIGN DIMENSIONS WIDTH	SIGN DIMENSIONS HEIGHT	BORDER WIDTH 1/2"	BORDER WIDTH 1"	BORDER WIDTH 2"	RADIUS 1 1/2"	RADIUS 3"	RADIUS 6"	RADIUS 9"	RADIUS 12"	ARROW INFO TYPE & SIZE	SIGN TYPE	SUB-STRATE PLYWOOD	SUB-STRATE SHEET ALUMINUM	SUB-STRATE EXTRUDED ALUMINUM	COLOR 1/ BACKGROUND ASTM TYPE III or TYPE IV	COLOR 1/ BACKGROUND ASTM TYPE IX	COLOR 1/ LEGEND ASTM TYPE III or TYPE IV	COLOR 1/ LEGEND ASTM TYPE IX	COLOR 1/ LEGEND NON-REFLECTIVE	LEGEND TYPE PERMANENT	LEGEND TYPE DEMOUNTABLE	SIGN NO. 2/	TYPE OF SUPPORT: WOOD POST	SQUARE TUBE SIGN SUPPORT	TRIANGULAR BASE BREAKAWAY	MULTI-POST BREAKAWAY	STAINLESS STEEL CLAMP (SSC)	SIGNAL POLE MOUNT	CROSSWALK CLOSURE BARRICADE	STRUCTURE MOUNT	VERTICAL SIGN MOUNT	CANTILEVER / BUTTERFLY	SIGN BRIDGE	EXIT NUMBER SIGN SUPPORT	"H" FRAME	ROUTE MARKER FRAME	MILE POST MARKER POST	MAST ARM SIGN MOUNT	CUSTOM VARIABLE SUPPORT	SECONDARY SIGN C 4X5.4	SECONDARY SIGN C 4X7.25	SECONDARY SIGN LENGTH	POST SIZE (BASED ON ESTIMATED LENGTH)	POST LENGTH (MUST BE FIELD VERIFIED)	FOOTING LOCATION 3/	FOOTING MIN. DEPTH 5/	REFER TO OREGON STANDARD DRAWING: TM200-TM201, TM635	TM211-TM212	TM678	TM680	TM223-TM224	TM221-TM222	TM679	TM602	TM670	TM671	TM676	TM681, TM687-TM688	REMARKS
4	N/A	36"	36"										'Y2'		✓		Y		R/G		BK			4	✓																				4"x6"	18'		5	✓								✓	✓	✓		Sign To Be Installed Along Highland Ave
	N/A	36"	36"										'Y2'		✓		Y		R/G		BK				✓																				4"x6"	18'		5	✓								✓	✓	✓		Sign To Be Installed Along Highland Ave
	D 41+45 L	48"	48"										'Y2'		✓		Y		R/G		BK	✓			✓																				6"x6"	18'		5	✓								✓	✓	✓		
	-																																																												
5	C 13+21 L	36"	36"										'R'		✓		R		SW			✓		5	✓																				4"x6"	16'		5	✓								✓	✓	✓		
	C 15+25 R	36"	36"										'R'		✓		R		SW			✓			✓																				4"x6"	16'		5	✓								✓	✓	✓		
	-																																																											
6	H 2+79 L	10"	18"										'G'		✓		G		SW			✓		6															✓							8'-6"								✓							Mount Signs Back To Back
	H 2+79 L	10"	18"										'G'		✓		G		SW			✓																																✓							Mount Signs Back To Back
	-																																																											
17	D 34+22 L	48"	48"										'R'		✓		R		SW			✓		17	✓																				6"x8"	22'		7	✓								✓	✓	✓		
	D 34+22 R	48"	48"										'R'		✓		R		SW			✓			✓																				6"x8"	22'		7	✓								✓	✓	✓		
	-																																																											
18	D34+22 L	54"	18"										'W1'	✓			SW				BK			18																									✓										✓		Mount Above Sign #17 And Back To Back
	D34+22 R	54"	18"										'W1'	✓			SW				BK																												✓										✓		Mount Above Sign #17 And Back To Back
	-																																																											
19	D34+22 L	54"	18"										'W1'	✓			SW				BK			19																									✓										✓		Mount Above Sign #17 And Back To Back
	D34+22 R	54"	18"										'W1'	✓			SW				BK																												✓										✓		Mount Above Sign #17 And Back To Back
	-																																																											
23	C 9+46 R	24"	24"										'F'		✓		R/B		SW			✓		23	✓																				4"x6"	18'		5	✓								✓	✓	✓		
23a	-	24"	12"										'B'		✓		BL		SW			✓		23a																									✓										✓		
23b	-	24"	12"										'B'		✓		BL		SW			✓		23b																									✓										✓		
23c	-	21"	15"										'B'		✓		BL		SW			✓		23c																									✓										✓		
	-																																																												
26	H 2+66 L	6'-6"	1'-9"		✓			✓					'G2'		✓		G			W		✓		26																✓															✓						
	C 0+55 L	6'-6"	1'-9"		✓			✓					'G2'		✓		G			W		✓																		✓															✓						
	C 0+91 R	6'-6"	1'-9"		✓			✓					'G2'		✓		G			W		✓																		✓															✓						
	C 14+14 R	6'-6"	1'-9"		✓			✓					'G2'		✓		G			W		✓																		✓															✓						
	C 14+30 L	6'-6"	1'-9"		✓			✓					'G2'		✓		G			W		✓																		✓															✓						
	-																																																											
29	C 13+12 L	8'-9"	1'-9"		✓			✓					'G2'		✓		G			W		✓		29																✓															✓						
	C 15+27 R	8'-9"	1'-9"		✓			✓					'G2'		✓		G			W		✓																		✓															✓						
	-																																																											

1/
BK=BLACK
BL=BLUE
BR=BROWN
FY=FLUORESCENT YELLOW
G=GREEN
O=ORANGE
R=RED
RB=RED-BLUE
SW=SILVER-WHITE
W=WHITE
Y=YELLOW
YG=YELLOW-GREEN

2/
NOTE: L,C,R ARE LOCATIONS OF POSTS FACING THE SIGN.
L = LEFT POST
C = CENTER POST
R = RIGHT POST

3/
DISTANCE FROM EDGE OF TRAVEL LANE, FACE OF CURB, GUARDRAIL, OR BARRIER TO THE CENTERLINE OF FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM600, TM602, AND TM635

4/
NOTE: THE LOCATIONS SHOWN ARE APPROXIMATE EXCEPT FOR SPEED ZONES, SCHOOL ZONES, OBJECT MARKERS AND MILEPOST MARKERS. EXACT LOCATIONS ARE TO BE DETERMINED BY THE ENGINEER

5/
MINIMUM DEPTH OF FOOTING FOR TRIANGULAR BASE BREAKAWAY AND MULTI-POST BREAKAWAY INSTALLATIONS IS FOR A 2' DIAMETER FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM601 AND TM602.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Porker
REVIEWED BY: Don Dorrell
DRAWN BY: Scott Porker
FC: 001 MP: 61.29-61.50

SIGN AND POST DATA TABLE

Str. ID. No.______ T.R.S. DWG. NO. S-15115

SIGN & POST DATA TABLE

SIGN NO.	SIGN LOCATION 4/	SIGN DIMENSIONS		BORDER WIDTH			RADIUS					ARROW INFO	SIGN TYPE	SUB-STRATE			COLOR 1/				LEGEND TYPE		SIGN NO. 2/	TYPE OF SUPPORT																			POST		FOOTING		REFER TO OREGON STANDARD DRAWING													REMARKS
		WIDTH	HEIGHT	1/2"	1"	2"	1 1/2"	3"	6"	9"	12"	TYPE & SIZE		PLYWOOD	SHEET ALUMINUM	EXTRUDED ALUMINUM	BACKGROUND ASTM TYPE III or TYPE IV	BACKGROUND ASTM TYPE IX	LEGEND ASTM TYPE III or TYPE IV	LEGEND ASTM TYPE IX	NON-REFLECTIVE	PERMANENT	DEMOUNTABLE		WOOD POST	SQUARE TUBE SIGN SUPPORT	TRIANGULAR BASE BREAKAWAY	MULTI-POST BREAKAWAY	STAINLESS STEEL CLAMP (SSC)	SIGNAL POLE MOUNT	CROSSWALK CLOSURE BARRICADE	STRUCTURE MOUNT	VERTICAL SIGN MOUNT	CANTILEVER / BUTTERFLY	SIGN BRIDGE	EXIT NUMBER SIGN SUPPORT	"H" FRAME	ROUTE MARKER FRAME	MILE POST MARKER POST	MAST ARM SIGN MOUNT	CUSTOM VARIABLE SUPPORT	SECONDARY SIGN C 4X5.4	SECONDARY SIGN C 4X7.25	SECONDARY SIGN LENGTH	SIZE (BASED ON ESTIMATED LENGTH)	LENGTH (MUST BE FIELD VERIFIED)	LOCATION 3/	MIN. DEPTH 5/	TM200-TM201, TM635	TM211-TM212	TM678	TM680	TM223-TM224	TM221-TM222	TM679	TM602	TM670	TM671	TM676	TM681, TM687-TM688	
30	C 15+27 R	9'-0"	6'-0"		✓					✓		B - 8x12	'G'			✓	G		SW				✓	30						✓						✓																✓							
30a	-	24"	12"										'B'		✓		BL		SW			✓		30a																✓		83"						✓										
30b	-	24"	24"										'F'		✓		R/B		SW			✓		30b																								✓										
30c	-	21"	15"										'B'		✓		BL		SW			✓		30c																								✓										
	-																																																									
32	C 14+30 L	7'-0"	6'-0"		✓					✓		D - 8x12	'G'			✓	G		SW				✓	32						✓						✓																✓							
32a	-	24"	12"										'B'		✓		BL		SW			✓		32a																✓		83"						✓										
32b	-	24"	24"										'F'		✓		R/B		SW			✓		32b																								✓										
32c	-	21"	15"										'B'		✓		BL		SW			✓		32c																								✓										
32d	-	24"	12"										'B'		✓		BL		SW			✓		32d																✓		83"						✓										
32e	-	24"	24"										'F'		✓		R/B		SW			✓		32e																								✓										
32f	-	21"	15"										'B'		✓		BL		SW			✓		32f																								✓										
	-																																																									
34	C 13+12 L	7'-0"	4'-0"		✓					✓		D - 8x12	'G'			✓	G		SW				✓	34						✓						✓																✓							
34a	-	24"	12"										'B'		✓		BL		SW			✓		34a																✓		83"						✓										
34b	-	24"	24"										'F'		✓		R/B		SW			✓		34b																								✓										
34c	-	21"	15"										'B'		✓		BL		SW			✓		34c																								✓										
34d	-	24"	12"										'B'		✓		BL		SW			✓		34d																✓		83"						✓										
34e	-	24"	24"										'F'		✓		R/B		SW			✓		34e																								✓										
34f	-	21"	15"										'B'		✓		BL		SW			✓		34f																								✓										
	-																																																									
35	D 35+72 L	42"	30"										'R'		✓		R		SW			✓		35	✓																							4"x6"	16'		5	✓					✓	✓	✓					
	D 35+72 R	42"	30"										'R'		✓		R		SW			✓			✓																							4"x6"	16'		5	✓					✓	✓	✓					
	-																																																									
36	D 36+00 L	(48")	(48")										'Existing'											36	✓																							6"x8"	22'		7	✓					✓	✓	✓					Re-Install Existing O.T.E. Sign
36a	-	(42")	(30")										'Existing'											36a																												✓							✓					Re-Install Existing O.T.E. Sign
	-																																																									
38	D 42+72 R	78"	60"										'G'			✓	G		SW				✓	38			✓																						TS4x4x3/16	11.58'	7.5'	4'-0"	✓					✓							*7.5' From Edge Of Pavement. See TM225
	-																																																									
40	D 37+75 L	36"	30"										'W1'		✓		SW				BK	✓		40	✓																							4"x6"	18'		5	✓					✓	✓	✓					
40a	-	24"	30"										'W1'		✓		SW				BK	✓		40a																												✓							✓					
40	D 37+75 R	36"	30"										'W1'		✓		SW				BK	✓		40	✓																							4"x6"	18'		5	✓					✓	✓	✓					
40a	-	24"	30"										'W1'		✓		SW				BK	✓		40a																												✓							✓					
	-																																																									
41	H 3+18 L	8'-6"	2'-0"		✓		✓						'G2'		✓		G			W		✓		41																	✓													✓							
	-																																																									
42	C 7+00 R	5'-6"	4'-0"		✓					✓			'G'	✓			G		SW			✓		42	✓																							6"x6"	18'		5	✓					✓	✓	✓					
	-																																																									

1/
BK=BLACK
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DISTANCE FROM EDGE OF TRAVEL LANE, FACE OF CURB, GUARDRAIL, OR BARRIER TO THE CENTERLINE OF FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM600, TM602, AND TM635

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NOTE: THE LOCATIONS SHOWN ARE APPROXIMATE EXCEPT FOR SPEED ZONES, SCHOOL ZONES, OBJECT MARKERS AND MILEPOST MARKERS. EXACT LOCATIONS ARE TO BE DETERMINED BY THE ENGINEER

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MINIMUM DEPTH OF FOOTING FOR TRIANGULAR BASE BREAKAWAY AND MULTI-POST BREAKAWAY INSTALLATIONS IS FOR A 2' DIAMETER FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM601 AND TM602.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Parker
REVIEWED BY: Dan Darrell
DRAWN BY: Scott Parker
FC: 001 MP: 61.29-61.50

SIGN AND POST DATA TABLE

Str. ID. No. _____ T.R.S. DWG. NO. S-15116

SIGN & POST DATA TABLE

SIGN NO.	SIGN LOCATION 4/	SIGN DIMENSIONS		BORDER WIDTH			RADIUS					ARROW INFO	SIGN TYPE	SUB-STRATE			COLOR 1/				LEGEND TYPE		SIGN NO. 2/	TYPE OF SUPPORT																								POST		FOOTING		REFER TO OREGON STANDARD DRAWING											REMARKS
		WIDTH	HEIGHT	1/2"	1"	2"	1 1/2"	3"	6"	9"	12"	TYPE & SIZE		PLYWOOD	SHEET ALUMINUM	EXTRUDED ALUMINUM	BACKGROUND		LEGEND			PERMANENT	DEMOUNTABLE		WOOD POST	SQUARE TUBE SIGN SUPPORT	TRIANGULAR BASE BREAKAWAY	MULTI-POST BREAKAWAY	STAINLESS STEEL CLAMP (SSC)	SIGNAL POLE MOUNT	CROSSWALK CLOSURE BARRICADE	STRUCTURE MOUNT	VERTICAL SIGN MOUNT	CANTILEVER / BUTTERFLY	SIGN BRIDGE	EXIT NUMBER SIGN SUPPORT	"H" FRAME	ROUTE MARKER FRAME	MILE POST MARKER POST	MAST ARM SIGN MOUNT	CUSTOM VARIABLE SUPPORT	SECONDARY SIGN			SIZE	LENGTH	LOCATION 3/	MIN. DEPTH 5/	TM200-TM201, TM635	TM211-TM212	TM678	TM680	TM223-TM224	TM221-TM222	TM679	TM602	TM670	TM671	TM676	TM681, TM687-TM688	
																	ASTM TYPE III or TYPE IV	ASTM TYPE IX	ASTM TYPE III or TYPE IV	ASTM TYPE IX	NON-REFLECTIVE																								C 4X5.4	C 4X7.25	LENGTH															
43	C 12+29 R	48"	30"										'W1'	✓			SW				BK	✓		43	✓																									4"x6"	16'		5	✓						✓	✓	✓		
	-																																																											
44	C 13+22 R	30"	30"										'W1'		✓		SW				BK	✓		44	✓																									4"x6"	16'		5	✓						✓	✓	✓		
	-																																																											
45	C 0+28 R	5'-0"	2'-0"		✓			✓				D - 8x12	'G'			✓	G		SW				✓	45	✓																									6"x6"	20'		5	✓						✓	✓	✓		
45a	-	24"	12"										'B'		✓		BL		SW			✓		45a																							✓	81"					✓									
45b	-	24"	24"										'F'		✓		R/B		SW			✓		45b																															✓									
45c	-	21"	15"										'B'		✓		BL		SW			✓		45c																															✓									
	-																																																											
46	C 0+34 R	24"	18"										'W1'		✓		SW				BK	✓		46	✓																									4"x4"	14'		4	✓						✓	✓	✓		Location To Be Adjusted Per Engineer
	C 0+39 L	24"	18"										'W1'		✓		SW				BK	✓			✓																									4"x4"	14'		4	✓						✓	✓	✓		Location To Be Adjusted Per Engineer
	C 1+72 R	24"	18"										'W1'		✓		SW				BK	✓			✓																									4"x4"	14'		4	✓						✓	✓	✓		Location To Be Adjusted Per Engineer
	C 1+77 L	24"	18"										'W1'		✓		SW				BK	✓			✓																									4"x4"	14'		4	✓						✓	✓	✓		Location To Be Adjusted Per Engineer
	-																																																											
47	H 2+88 L	5'-0"	2'-0"		✓			✓				D - 8x12	'G'			✓	G		SW				✓	47						✓							✓																				✓		✓								
47a	-	24"	12"										'B'		✓		BL		SW			✓		47a																							✓	81"					✓									
47b	-	24"	24"										'F'		✓		R/B		SW			✓		47b																															✓									
47c	-	21"	15"										'B'		✓		BL		SW			✓		47c																															✓									
	-																																																											
48	C 0+91 R	9'-0"	6'-0"		✓					✓		D - 8x12	'G'			✓	G		SW				✓	48						✓							✓																				✓		✓								
48a	-	24"	24"										'G'		✓		G		SW			✓		48a																															✓	69"					✓									
48b	-	21"	15"										'G'		✓		G		SW			✓		48b																															✓						✓				
48	D 39+50 L	9'-0"	6'-0"		✓					✓		D - 8x12	'G'			✓	G		SW				✓	48		✓																									TS7x7x3/16	17.14'	20'	6'-0"	✓				✓						*20' From Fog Line
48a	-	24"	24"										'G'		✓		G		SW			✓		48a																															✓	69"					✓	✓								
48b	-	21"	15"										'G'		✓		G		SW			✓		48b																															✓						✓	✓			
	-																																																											
49	C 0+92 L	6'-0"	2'-0"		✓			✓				D - 8x12	'G'			✓	G		SW				✓	49					✓				✓																											✓		✓								
49a	-	24"	12"										'B'		✓		BL		SW			✓		49a																															✓	83"					✓	✓								
49b	-	24"	24"										'F'		✓		R/B		SW			✓		49b																															✓						✓	✓			
49c	-	21"	15"										'B'		✓		BL		SW			✓		49c																															✓						✓	✓			
	-																																																											
50	C 14+03 R	9'-0"	6'-0"		✓					✓		D - 8x12	'G'			✓	G		SW				✓	50		✓																									TS7x7x3/16	18.31'	12'	6'-0"	✓				✓						*12' From Edge Of Pavement (Both Directions)
50a	-	24"	24"										'G'		✓		G		SW			✓		50a																															✓	69"					✓	✓								
50b	-	21"	15"										'G'		✓		G		SW			✓		50b																															✓						✓	✓			
50c	-	24"	12"										'B'		✓		BL		SW			✓		50c																															✓	83"					✓	✓			
50d	-	24"	24"										'F'		✓		R/B		SW			✓		50d																															✓						✓	✓			
50e	-	21"	15"										'B'		✓		BL		SW			✓		50e																															✓						✓	✓			
	-																																																											

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NOTE: L,C,R ARE LOCATIONS OF POSTS FACING THE SIGN.
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R = RIGHT POST

3/
DISTANCE FROM EDGE OF TRAVEL LANE, FACE OF CURB, GUARDRAIL, OR BARRIER TO THE CENTERLINE OF FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM600, TM602, AND TM635

4/
NOTE: THE LOCATIONS SHOWN ARE APPROXIMATE EXCEPT FOR SPEED ZONES, SCHOOL ZONES, OBJECT MARKERS AND MILEPOST MARKERS. EXACT LOCATIONS ARE TO BE DETERMINED BY THE ENGINEER

5/
MINIMUM DEPTH OF FOOTING FOR TRIANGULAR BASE BREAKAWAY AND MULTI-POST BREAKAWAY INSTALLATIONS IS FOR A 2' DIAMETER FOOTING. FOR ADDITIONAL INFORMATION SEE STANDARD DRAWINGS TM601 AND TM602.

REGISTERED PROFESSIONAL ENGINEER
63353PE
OREGON
JULY 12, 2005
SCOTT B. PARKER
EXPIRES: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 3 - TECH CENTER

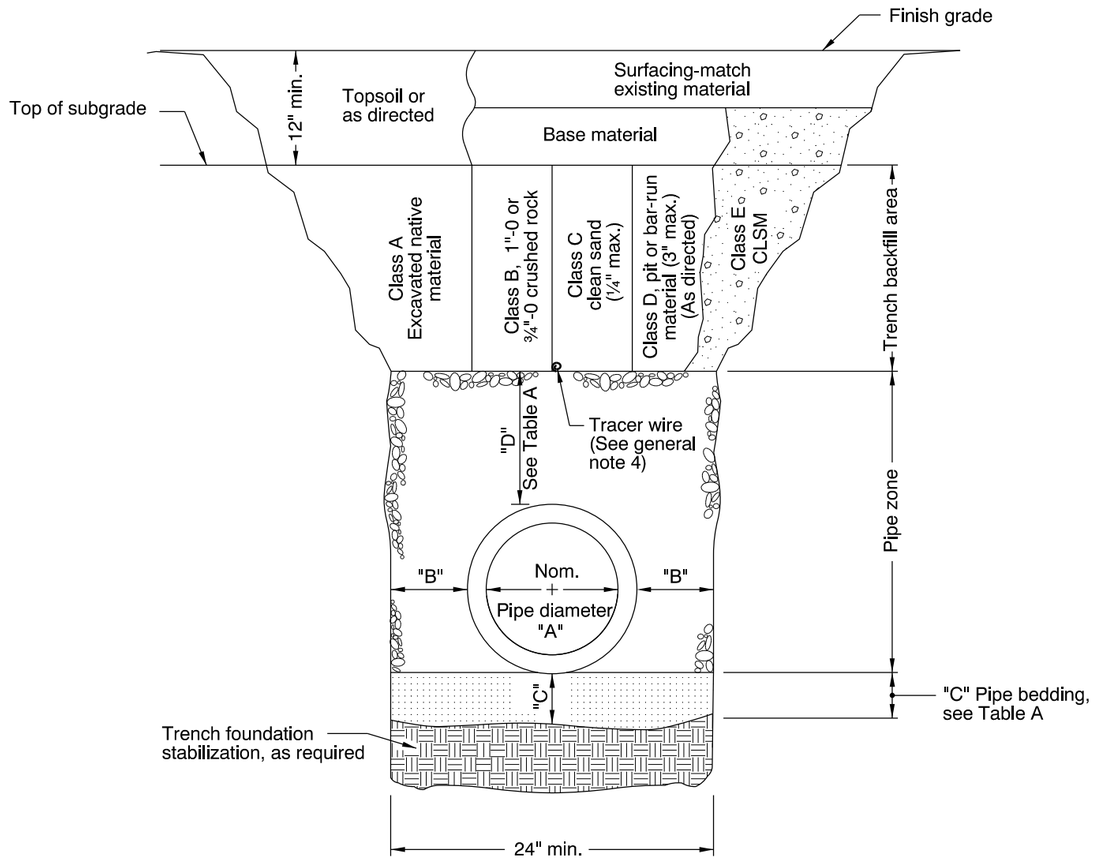
FFO I-5: EXIT 61 (LOUSE CREEK) INTERCHANGE IMPROVEMENTS
PACIFIC HIGHWAY
JOSEPHINE COUNTY

DESIGNED BY: Scott Porker
REVIEWED BY: Don Dorrell
DRAWN BY: Scott Porker
FC: 001 MP: 61.29-61.50

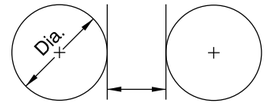
SIGN AND POST DATA TABLE

Str. ID. No. _____ T.R.S. DWG. NO. S-15117

rd300.dgn 14-JUL-2014



MULTIPLE INSTALLATIONS



DIAMETER	MIN. SPACE BETWEEN PIPES
Up to 48"	24"
48" to 72"	One half (½) dia. of pipe

TABLE A

"A" (in)	"B" (in)	"C" (in)	"D" (in)
4	10	4	8
6	10	4	8
8	10	6	10
10	10	6	10
12	12	6	10
15	12	6	10
18	16	6	12
21	16	6	12
24	18	6	12
30	18	6	12
36	24	6	14
42	24	6	14
48	24	6	14
54	24	6	14
60	24	6	14
66	24	6	14
72	24	6	14

For pipes over 72" diameter, see general note 3.

GENERAL NOTES FOR ALL DETAILS:

1. Surfacing of paved areas shall comply with street cut Std. Drg. RD302.
2. For pipe installation in embankment areas where the trench method will not be used and the pipe is ≥ 36" diameter, increase dimension "B" to nominal pipe diameter.
3. Pipes over 72" diameter are structures, and are not applicable to this drawing.
4. See Std. Drg. RD336 for tracer wire details (When required).

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

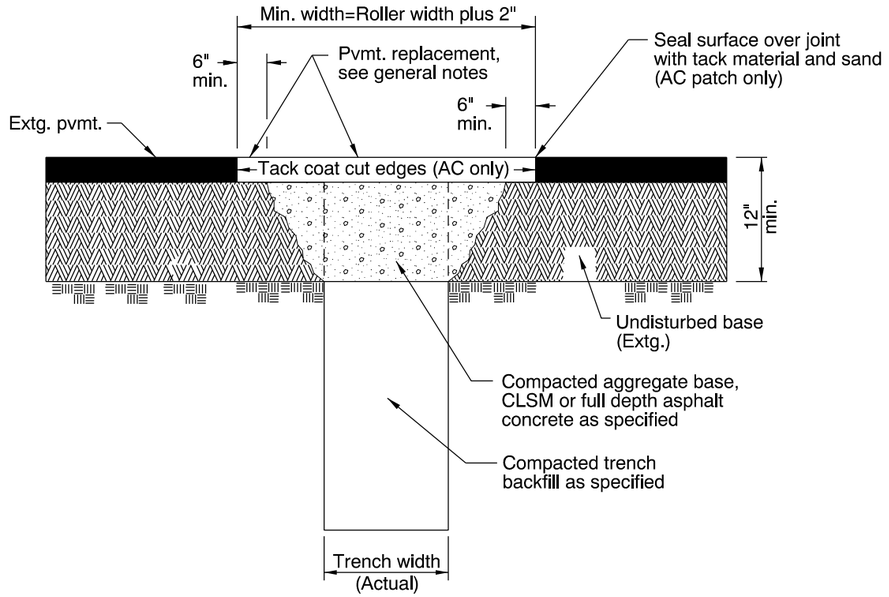
TRENCH BACKFILL, BEDDING, PIPE ZONE AND MULTIPLE INSTALLATIONS

2015

DATE	REVISION DESCRIPTION

RD300

rd302.dgn 14-JUL-2014



GENERAL NOTES FOR ALL DETAILS:

1. All existing AC or PCC pavement shall be sawcut prior to repaving.
2. Concrete pavement shall be replaced with concrete to a minimum thickness of 6" or to the thickness of removed pavement, whichever is greater.
3. Place AC mix minimum thkn. of 4" or the thkn. of the removed pavement, whichever is greater. Compact as specified.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12-JUN-2008

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

STREET CUT

2015

DATE	REVISION DESCRIPTION

RD302

rd316.dgn 14-JUL-2014

ARCH PIPE

CORRUGATED STRUCTURAL PLATE (Dimension in inches)

SIZE *** SPAN	SIZE *** RISE	X	B1 SLOPES 1:1.5	B1 SLOPES 1:2	B1 SLOPES 1:3	SIZE *** SPAN	SIZE *** RISE	X	B1 SLOPES 1:1.5	B1 SLOPES 1:2	B1 SLOPES 1:3
73	55	28	45	60	89	139	89	32	88	118	174
76	57	25	51	67	101	142	91	30	94	126	189
81	59	29	48	64	95	148	93	34	91	121	181
84	61	28	54	72	107	150	95	32	97	130	195
87	63	25	60	79	119	152	97	30	103	138	206
92	65	28	57	77	115	154	100	28	110	148	220
95	67	26	63	85	126	161	101	31	108	144	215
98	69	24	70	94	139	167	103	35	104	139	209
103	71	28	67	90	134	169	105	34	110	148	221
106	73	26	73	97	145	171	107	31	117	156	234
112	75	29	70	95	143	178	109	35	114	151	227
114	77	28	77	102	152	184	111	38	111	149	223
117	79	26	83	109	165	186	113	36	118	156	234
123	81	29	80	108	161	188	115	34	124	165	246
128	83	33	78	103	152	190	118	32	131	174	258
131	85	31	84	112	167	197	119	36	127	169	256
137	87	33	82	109	162	199	121	34	133	178	268

X dimensions are to top edge of corner plates on structural plate pipe.

CORRUGATED (Dimension in inches)

EQUIVALENT ROUND SIZE	*** SPAN	*** RISE	X
15	17	13	5¼
18	21	15	6
21	24	18	7¼
24	28	20	8
30	35	24	9½
36	42	29	10½
42	49	33	11½
48	57	38	13½
54	64	43	15
60	71	47	16½
66	77	52	18
72	83	57	20

Slopes as directed.

*** See general note 8

CIRCULAR OR ELLIPTICAL PIPE

CORRUGATED (Dimension in inches)

SIZE	X	Y
12 to 36	4 *	0
42	8 *	8 *
48	8 *	8 *
54	8 *	8 *
60	8 *	8 *
66	12	12
72	12	12
78	12	12
84	16	16

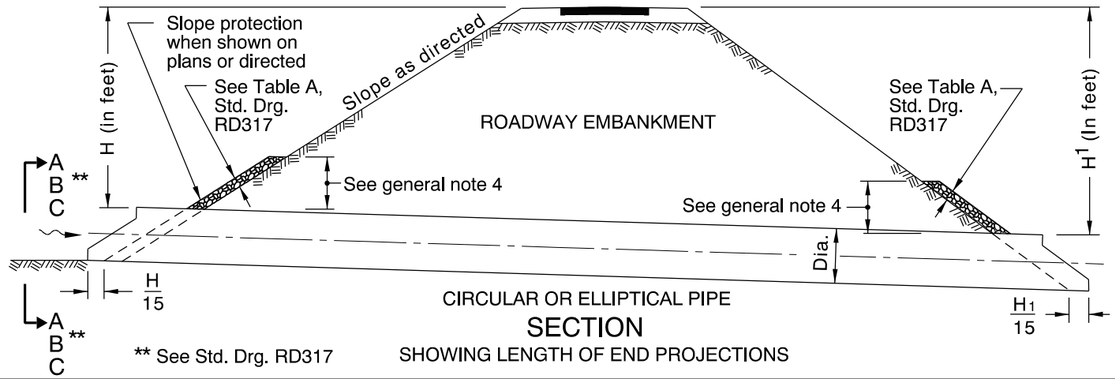
Slopes as directed.

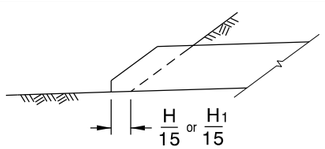
* 0 when used with paved end slope.

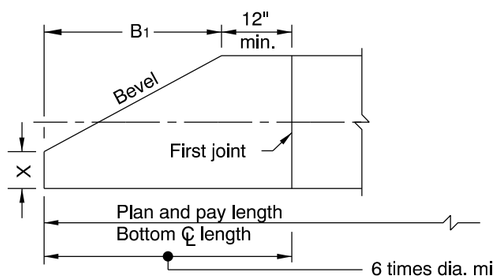
CORRUGATED STRUCTURAL PLATE (Dimension in inches)

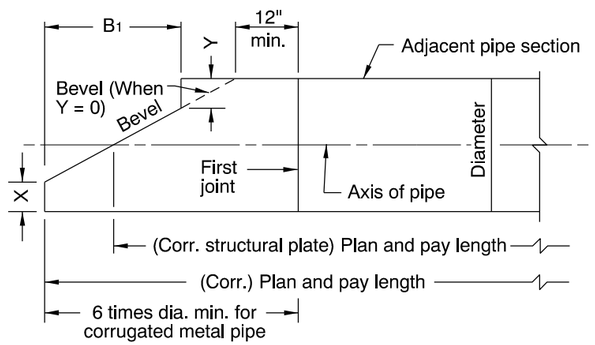
SIZE	B1 SLOPES 1:1.5	B1 SLOPES 1:2	B1 SLOPES 1:3	ALTERNATE - 1 X SLOPES 1:1.5	ALTERNATE - 1 X SLOPES 1:2	ALTERNATE - 1 X SLOPES 1:3	ALTERNATE - 1 Y SLOPES 1:1.5	ALTERNATE - 1 Y SLOPES 1:2	ALTERNATE - 1 Y SLOPES 1:3	ALTERNATE - 2 X & Y SLOPES 1:1.5	ALTERNATE - 2 X & Y SLOPES 1:2	ALTERNATE - 2 X & Y SLOPES 1:3
60	72	72	96	5	11	13	7	13	15	6	12	15
66	72	72	96	7	15	17	11	16	18	10	16	17
72	72	96	144	11	13	11	13	13	13	12	12	12
78	72	72	144	13	20	15	17	22	16	16	22	16
84	72	96	144	17	17	17	19	19	19	18	18	18
90	72	96	144	19	20	20	23	22	22	22	22	22
96	96	96	192	15	23	16	17	25	17	16	24	17
102	96	96	168	18	26	23	20	29	24	19	28	23
108	96	96	168	20	29	25	23	31	26	22	30	26
114	96	168	168	23	15	29	26	16	30	25	28	29
120	96	168	216	26	17	23	29	19	25	28	18	24
126	96	168	216	30	20	26	32	22	28	31	22	28
132	144	168	216	17	23	29	19	25	31	18	24	30
138	144	192	288	19	20	20	23	22	22	22	22	22
144	144	144	240	23	35	31	25	37	32	24	36	32
150	144	192	288	25	26	26	29	28	28	28	28	28
156	144	192	288	29	29	29	31	31	31	30	30	30
162	144	192	288	31	32	32	35	34	34	34	34	34
168	168	168	264	26	41	40	29	43	41	28	42	40
174	168	168	288	30	44	39	32	46	40	31	46	40
180	168	192	288	42	41	41	43	43	43	42	42	42

For elliptical pipe increase X and Y dimensions by percent of ellipse.









GENERAL NOTES FOR ALL DETAILS:

1. All dimensions are subject to necessary tolerances to meet manufacturer's requirements for plate arrangements.
2. See Std. Drgs. RD300 or RD304 for installation details.
3. All embankment slopes to be warped where required to provide end projections as shown.
4. Minimum elevation of top of riprap at inlet and outlet is one diameter (D) or one foot higher than design headwater or tailwater elevation respectively whichever is greater.
5. Slope protection required for hydraulic installations. See Table A on Std. Drg. RD317.
6. $\frac{H}{15}$ and $\frac{H^1}{15}$ only applicable for non-hydraulic applications.
7. Open ends of pipes normally require a site specific design, and may require special treament (slope ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.
8. Cross-sectional dimensions may vary with different materials.
9. Full bevel cuts are not recommended for multiple radius shaped pipes.
10. For pipes with skew no.'s 50, 70, 110 or 130, omit the top step (Y).
    (For skew diagram, see Std. Drg. RD319).

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

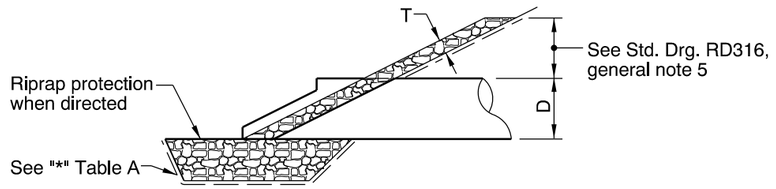
SLOPED ENDS FOR METAL PIPE

2015

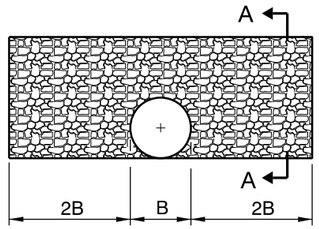
DATE	REVISION DESCRIPTION

RD316

rd317.dgn 14-JUL-2014



SECTION A-A

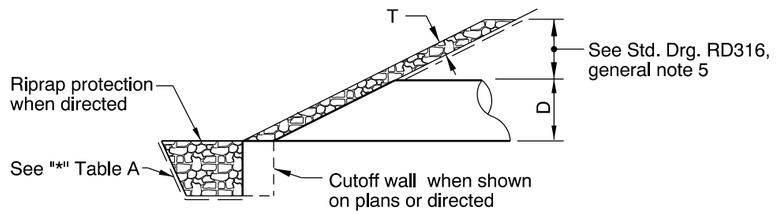


SLOPED OR PROJECTING END

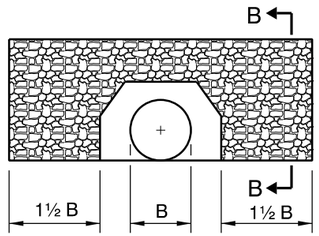
B = Diameter of circular barrel or span of arch pipe, box, or open-bottom arch.
D = Diameter of circular barrel or rise of arch pipe, box, or open-bottom arch.
T = Thickness of riprap blanket, see Table A.

TABLE A	
Riprap Class	T Distance
50	12 Inches
100	18 Inches
200	24 Inches *
700	36 Inches *

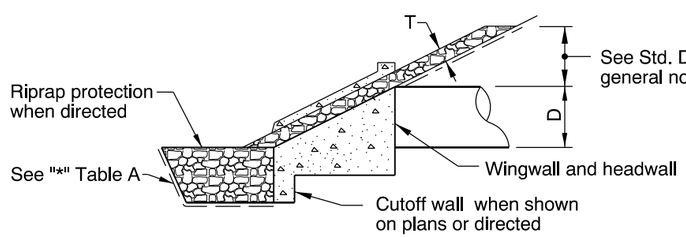
* Filter blanket required between riprap and embankment



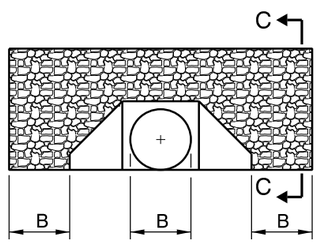
SECTION B-B



SLOPED END WITH SLOPE PAVING



SECTION C-C



HEADWALL AND WINGWALLS

GENERAL NOTES FOR ALL DETAILS:

1. See Std. Drgs. RD300 & RD304 for installation details.

2. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 16-JUN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CULVERT EMBANKMENT PROTECTION

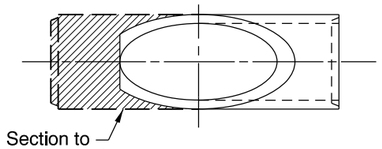
2015

DATE	REVISION DESCRIPTION

RD317

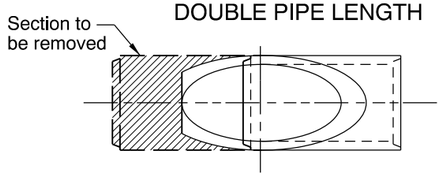
14-JUL-2014
rd318.dgn

CASE 1
SINGLE PIPE LENGTH



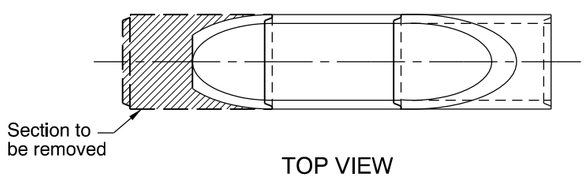
TOP VIEW

CASE 2
DOUBLE PIPE LENGTH

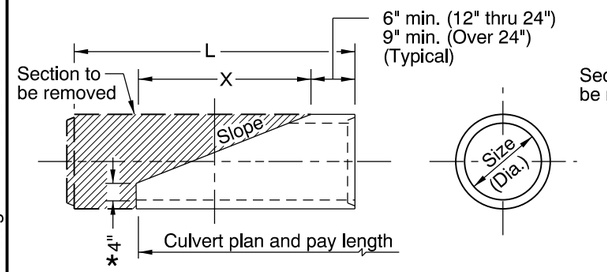


TOP VIEW

CASE 3
TRIPLE PIPE LENGTH

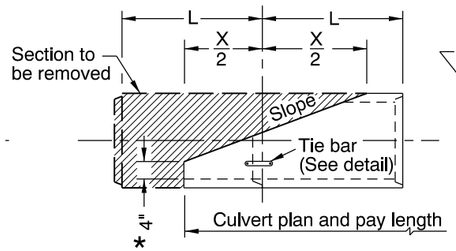


TOP VIEW

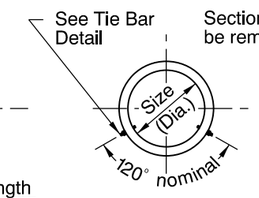


SIDE VIEW

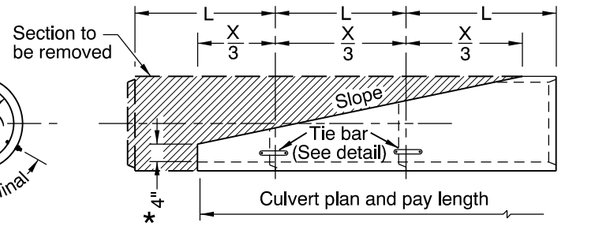
END VIEW
(CASE 1)



SIDE VIEW



END VIEW
(CASE 2 & 3)



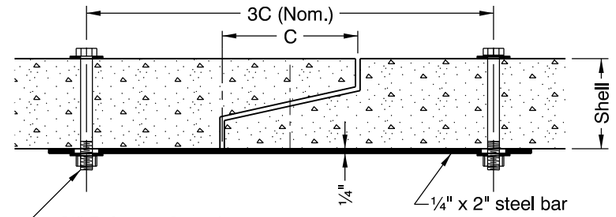
SIDE VIEW

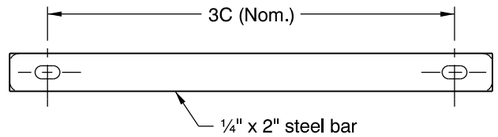
*0 when used with paved end slope.

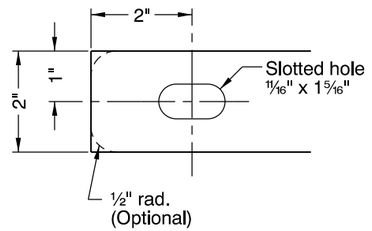
NOTE:
Sloped ends shall be made from minimum Class III concrete pipe.
"X" Values shown are for vertical dimension at bottom of sloped end = 0.

TABLE A

SIZE (Diameter)	SLOPE																					SIZE (Diameter)
	1:1.5			1:2			1:2.5			1:3			1:4				1:6				
	X	CASE 1 L (Min.)	CASE 2 L (Min.)	X	CASE 1 L (Min.)	CASE 2 L (Min.)	X	CASE 1 L (Min.)	CASE 2 L (Min.)	X	CASE 1 L (Min.)	CASE 2 L (Min.)	X	CASE 1 L (Min.)	CASE 2 L (Min.)	CASE 3 L (Min.)	X	CASE 1 L (Min.)	CASE 2 L (Min.)	CASE 3 L (Min.)	
	DIMENSION IN INCHES																				
12	18	36	36	24	36	36	30	48	36	36	72	36	48	72	36		72	90	48		12
15	22.5	36	36	30	48	36	37.5	72	36	45	72	36	60	72	36		90		72		15
18	27	48	36	36	48	36	45	72	36	54	72	36	72	90	48		108		72		18
21	31.5	48	36	42	72	36	52.5	72	36	63	90	48	84		72		126		90		21
24	36	48	36	48	72	36	60	90	48	72	90	48	96		72		144		90		24
27	40.5	72	36	54	72	36	67.5	90	48	81		72	108		72		162			72	27
30	45	72	36	60	90	48	75		48	90		72	120		90		180			72	30
33	49.5	72	36	66	90	48	82.5		72	99		72	132		90		198			90	33
36	54	72	36	72	90	48	90		72	108		72	144		90		216			90	36
42	63	90	48	84		72	105		72	126		90	168			72	252			90	42
48	72	90	48	96		72	120		90	144		90	192			90	288				48
54	81		72	108		72	135		90				216			90	324				54







NOTES:

1. All bolts, nuts and washers to be galvanized.
2. Tie bar to be galvanized after fabrication.
3. "C" is tongue length.
4. Install 2 tie bars at each joint (See end view, Case 2 & 3).

TIE BAR DETAIL

GENERAL NOTES FOR ALL DETAILS:

1. For dimensions indicated by letter, see Table A.

2. Open ends of pipes normally require a site specific design, and may require special treament (slope ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

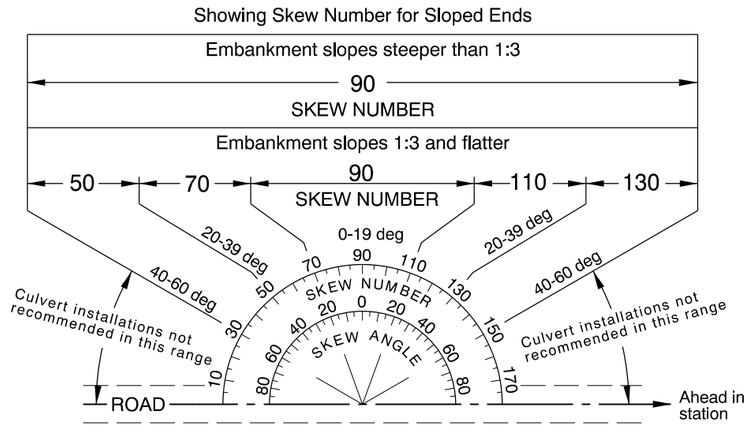
OREGON STANDARD DRAWINGS

SLOPED ENDS FOR CONCRETE PIPE

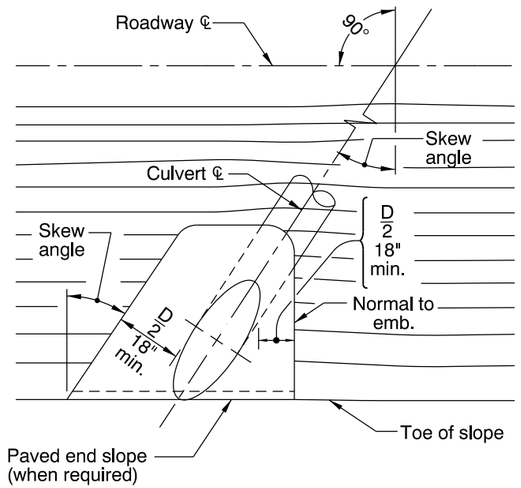
2015

DATE	REVISION DESCRIPTION

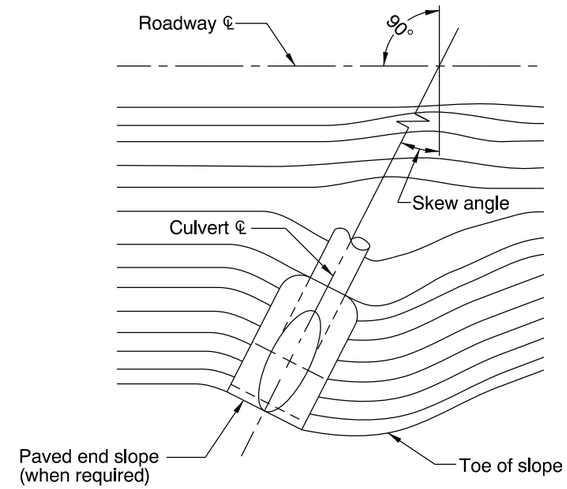
RD318



SKEW DIAGRAM



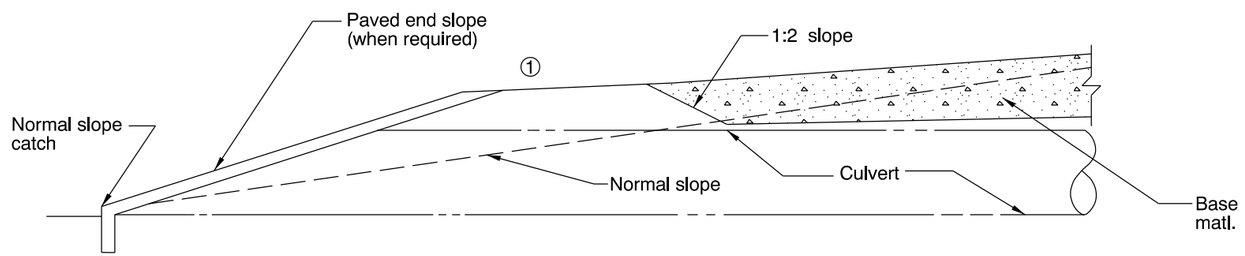
TYPICAL SKEW PLAN



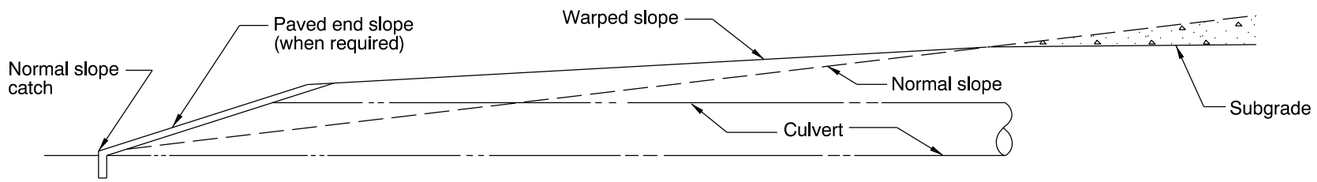
(Where shown on plans)
Contour embankment slope to match paved end slope

ALTERNATE SKEW PLAN

① Modification when nature of installation would result in an adverse slope from subgrade to top of the paved end slope.



INSERT



EMBANKMENT SLOPE WARPING DETAILS
(Warp 100' each side of culvert)

GENERAL NOTES:

1. All embankment slopes to be warped where required to provide end projections as shown.

2. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 06-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MISCELLANEOUS CULVERT DETAILS

2015

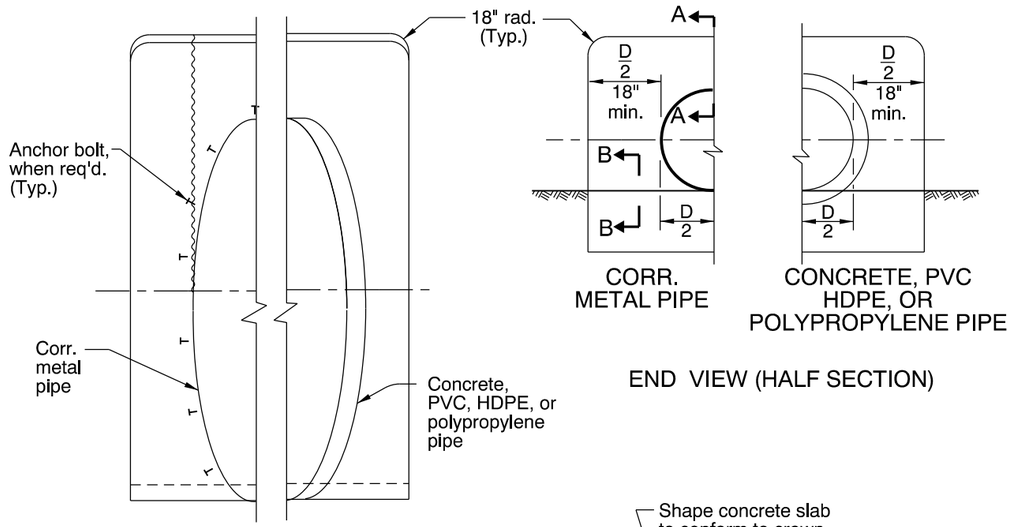
DATE	REVISION DESCRIPTION

rd319.dgn 14-JUL-2014

RD319

rd320.dgn 14-JUL-2014

CIRCULAR PIPE CULVERT

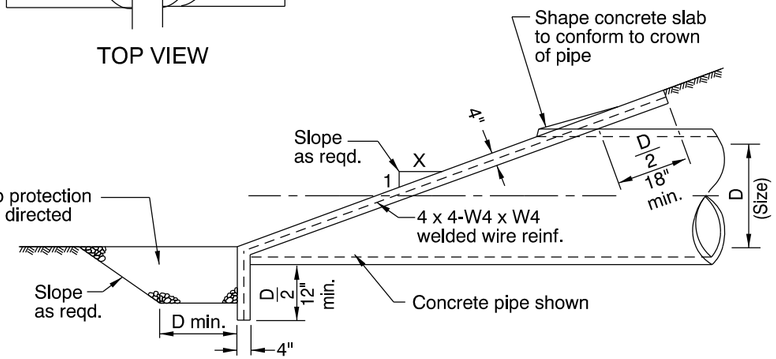


TOP VIEW

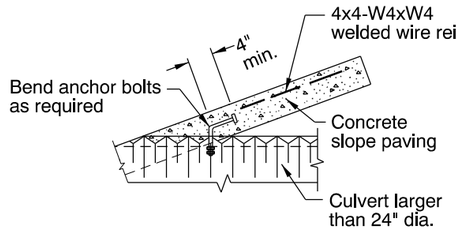
CORR. METAL PIPE

CONCRETE, PVC HDPE, OR POLYPROPYLENE PIPE

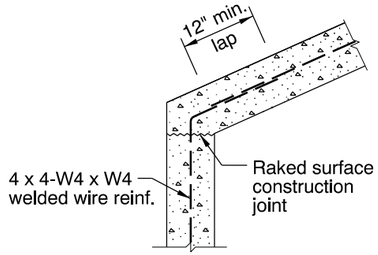
END VIEW (HALF SECTION)



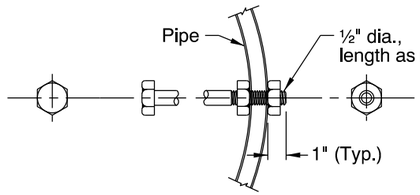
SIDE VIEW



SECTION A-A



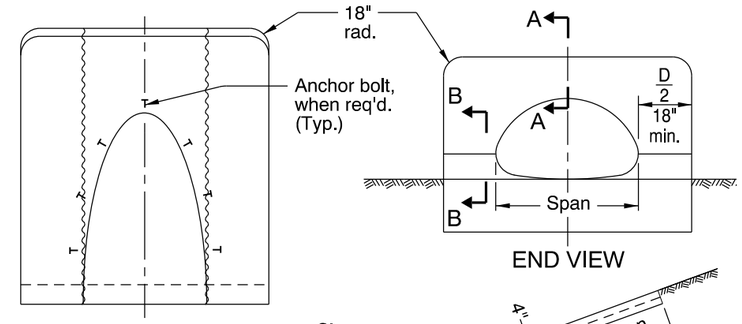
SECTION B-B



ANCHOR BOLT DETAILS

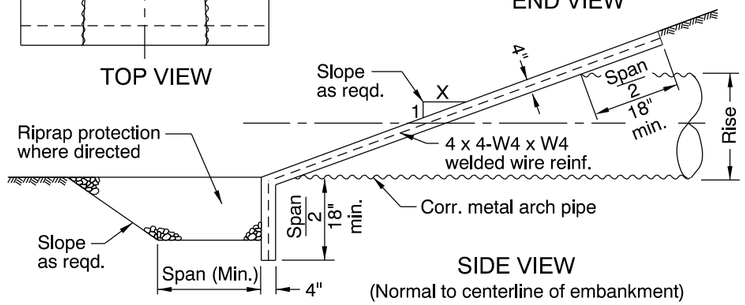
Anchor bolts to be ASTM A307 galv., equally spaced at a max. of 18" centers around entire perimeter at end of pipes over 24" size. Not required for concrete pipe.

ARCH PIPE CULVERT



TOP VIEW

END VIEW



SIDE VIEW
(Normal to centerline of embankment)

GENERAL NOTES FOR ALL DETAILS:

1. When rock is encountered, cut off wall depth D/2 or span/2 may be reduced to rock line but not less than 12".
2. When using pervious bedding and backfill, it is desirable to prevent seepage and piping by placing impervious material at the inlet. Cutoff collars may be used in lieu of impervious material.
3. For multiple pipe installations, see Std. Drgs. RD300 & RD304.
4. All exposed conc. edges shall be chamfered ¾" unless noted otherwise. Slope paving surface variations shall not exceed ⅜" in 10' .
5. All metal reinforcement shall be placed 1½" clear of nearest face of concrete unless shown or noted otherwise.
6. All concrete shall be commercial grade concrete.
7. Open ends of pipes normally require a site specific design, and may require special treament (slope ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.
8. See Std. Drg. RD321 for removable safety bars, when required.

PAVED END SLOPE AREA TABLE

Nominal Pipe Diameter (Inches)	PAVED END SLOPE AREA SQUARE FEET					
	1:3 SLOPE		1:4 SLOPE		1:6 SLOPE	
	Circular Pipe	Arch Pipe	Circular Pipe	Arch Pipe	Circular Pipe	Arch Pipe
12	23	--	26	--	32	--
15	26	23	32	27	41	34
18	30	26	35	30	44	38
21	33	30	39	35	51	45
24	37	33	44	39	57	51
30	47	39	55	46	72	61
36	56	53	67	63	88	83
42	76	67	90	80	119	107
48	98	90	117	108	155	144
54	124	114	148	137	196	184
60	164	137	197	165	264	221

(1) Areas for multiple installations are as shown on the plans.

CALC. BOOK NO. RD07-02

BASELINE REPORT DATE 21-JUN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

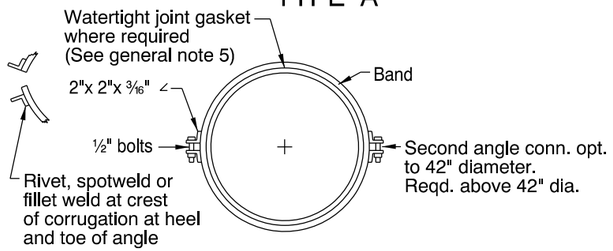
PAVED END SLOPE FOR CULVERTS 60" MAXIMUM PIPE SIZE

2015

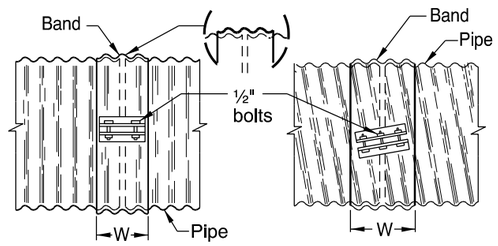
DATE	REVISION DESCRIPTION

RD320

TYPE A



CONNECTION ANGLE DETAIL

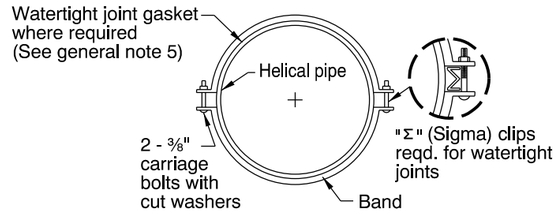


ANNULAR COUPLING HELICAL COUPLING

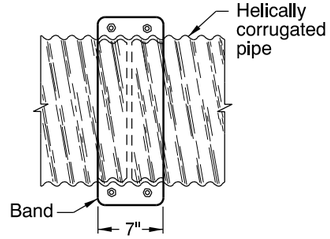
2⅔ " x ½" Corrugations				3"x 1" Corrugations			
Pipe Dia. (In)	W (In)		# Of ½" Bolts	Pipe Dia. (In)	W (in)		# Of ½" Bolts
	Ann.	Hel.			Ann.	Hel.	
6-10	7	7	2	36-84	14	14	3
12-15	7	12	2-3	36-120 ④	26	26	5
18-84 ④	12	12	3				
24-84	24	24	5				

TYPE B

(For 6"-10" dia. pipes)

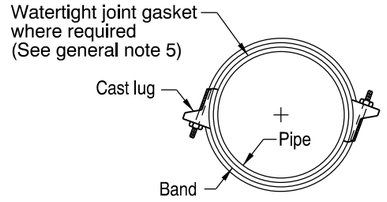


END VIEW

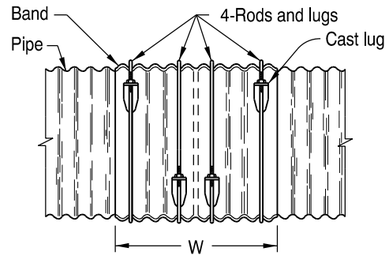


TOP VIEW

TYPE D



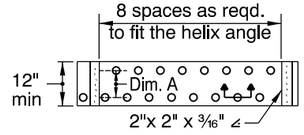
END VIEW



		Pipe Dia. (In)	Rod Dia. (In)	Narrow Band W (in)	Narrow Band # Of Rods	Wide Band W (in)	Wide Band # Of Rods
Corrugations	2⅔"X ½"	12-21	⅜	12	2		
		24-54 ④	½	12	2	24	4
		60-84 ④	⅝	12	2	24	4
	3"x 1"	36-54 ④	½	14	2	26	4
		60-84 ④	⅝	14	2	26	4
		84-120	⅝			26	4

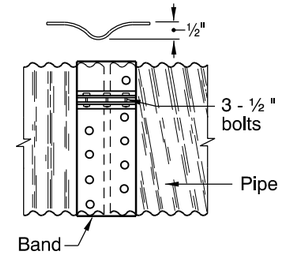
TYPE E

(For 12"-30" dia. pipes)



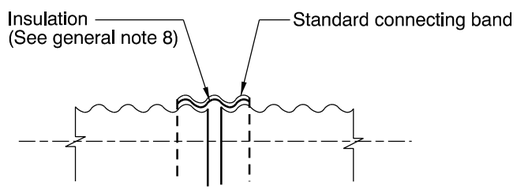
Dimension A: 7" min. between dimples as reqd. to fit the helix angle.

SECTION THRU DIMPLE



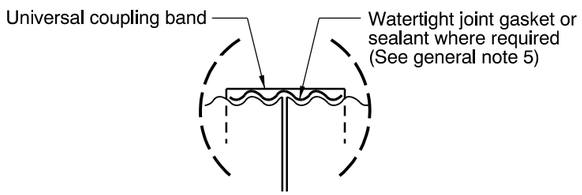
GENERAL NOTES FOR ALL DETAILS:

1. All steel coupling bands and conn. hardware shall be galv.or aluminum coated.
2. Coupling bands for corr. iron and steel pipes may be two numerical thkn. lighter than that used for the pipe but not more that 0.109" nom. thkn. nor less than 0.052" nom. thkn. Coupling bands for corr. aluminum pipe shall be of the same thickness as that used for the pipe.
3. Types A & D coupling bands shown for pipes 15" to 72" in dia. are typical to arch pipes of equal peripheral measurement.
4. Under conditions where conc. pipe may be used as an acceptable alt., the min. width coupling band indicated for the band type, corr. and pipe dia. shown may be used.
5. Watertight joints with gaskets are reqd. for irrigation pipes, storm sewers, and other installations when shown on the plans. Gaskets for Types A, B, D and E coupling bands shall be (butt-cemented or vulcanized) synthetic, closed-cell sponge rubber ⅜" thick of a width equal to the band width and centering on the joint. For pipe 12" or less in dia., the gasket thkn. may be 3/16".
6. Joints for sanitary sewers and siphons are to be tested for water tightness in accordance with the Standard Specifications.
7. One or two piece coupling bands are optional for pipe dia. up to and including 42". Coupling bands of two or more pieces are required for pipe diameters over 42".
8. To prevent galvanic action when unlike metals are connected, the connecting band shall be coated with asphalt or other insulating material as approved by the engineer.
9. See Std. Drgs. RD330 & RD332 for pipe slope anchors, when required.



CONNECTION DETAILS

(Extending existing pipe culvert with pipe of unlike material.)



WATERTIGHT JOINT

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

COUPLING BANDS FOR CORRUGATED METAL PIPE TYPES A, B, C & D

2015

DATE	REVISION DESCRIPTION

rd326.dgn 14-JUL-2014

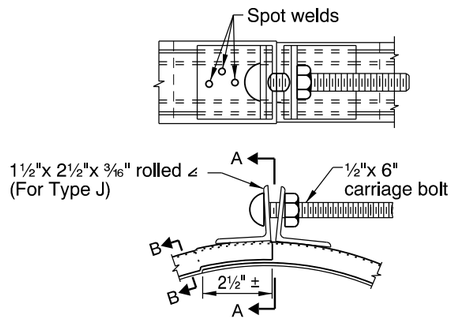
RD326

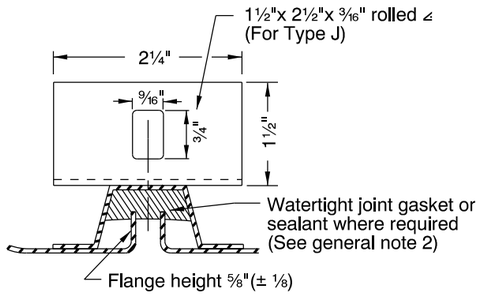
Effective Date: February 1, 2015 - May 31, 2015

TYPE J

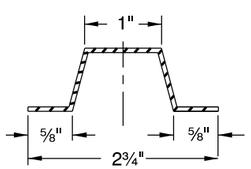
NOTE:
Design variations in fasteners (Straps, bars, & welds) which provide a tensile strength of 7500 lbs are permissible.

DETAIL Z



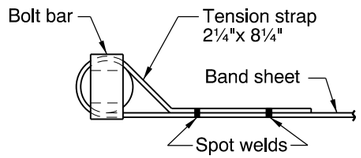


SECTION A-A

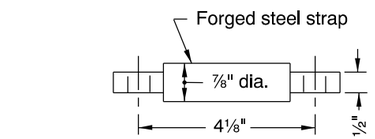


SECTION B-B

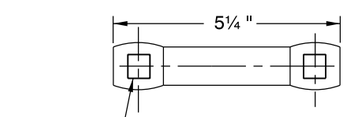
DETAIL Y



TENSION STRAP



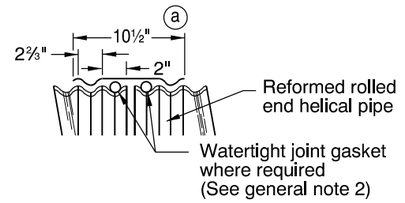
TOP VIEW



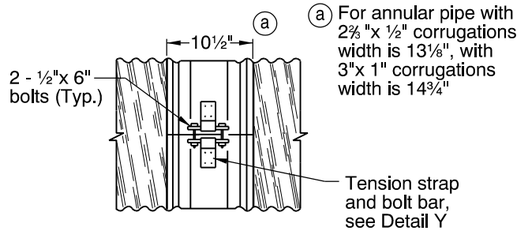
FRONT VIEW

BOLT BAR

TYPE F

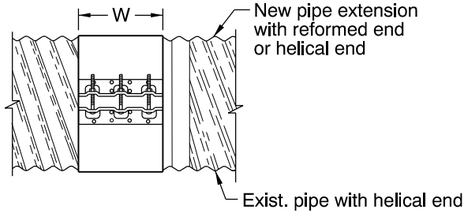


JOINT CROSS SECTION



TYPE K

FLAT BAND OR DIMPLE BAND

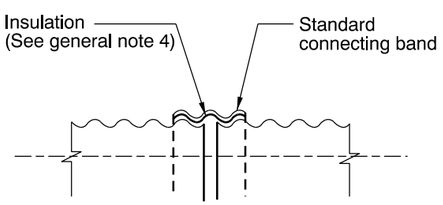


* ARCH PIPE ONLY

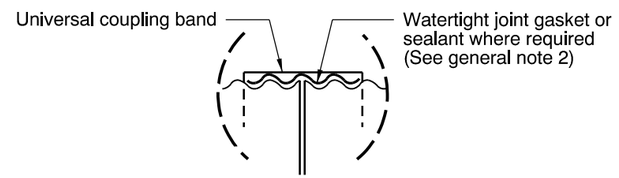
Band Type	Corrugations	Pipe Dia. (In)	Min. W (In)	Gasket Type
Steel	2⅔"x ½"	12-48	12	Sleeve
		54-84	24	
	* 3" x 1"	54-144	24	
Aluminum	2⅔"x ½"	12-48	12	Sleeve
		54-84	24	
	* 3" x 1"	54-96	24	

GENERAL NOTES FOR ALL DETAILS:

1. Type F coupling bands shown for pipes 15" to 72" in dia. are typ. to arch pipes of equal peripheral measurement. Type J coupling bands shown for pipes 12" to 66" with pipe thkn. of 0.064"nom. thkn. to 0.109" nom. thkn. Type J limited to 36" max. dia. for pipe down slope installations.
2. Watertight joints with gaskets are reqd. for irrigation pipes, storm sewers, and other installations when shown on the plans.
3. Gaskets for the Type F coupling band shall be "O" rings conforming to ASTM C443 and a mastic sealant strip ⅛"x 1½" wide by 5" (10½" band) or 8" (13⅛" band) or 9" (14¾" band) shall be placed in lap between bands. "O" ring gaskets shall be 13⁄16" min. dia. (10½" and 13⅛" bands) and 1⅜" min. dia. (14¾" bands). Gaskets for Type J coupling bands shall be butyl rubber base joint sealant or other appr. resilient matl. placed in the channel section and shall be ⅜" thick, min.
4. To prevent galvanic action when unlike metals are connected, the connecting band shall be coated with asphalt or other insulating material as approved by the engineer.
5. See Std. Drgs. RD330 & RD332 for pipe slope anchors, when required.



CONNECTION DETAILS
Extending existing pipe culvert with pipe of unlike material



WATERTIGHT JOINT

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

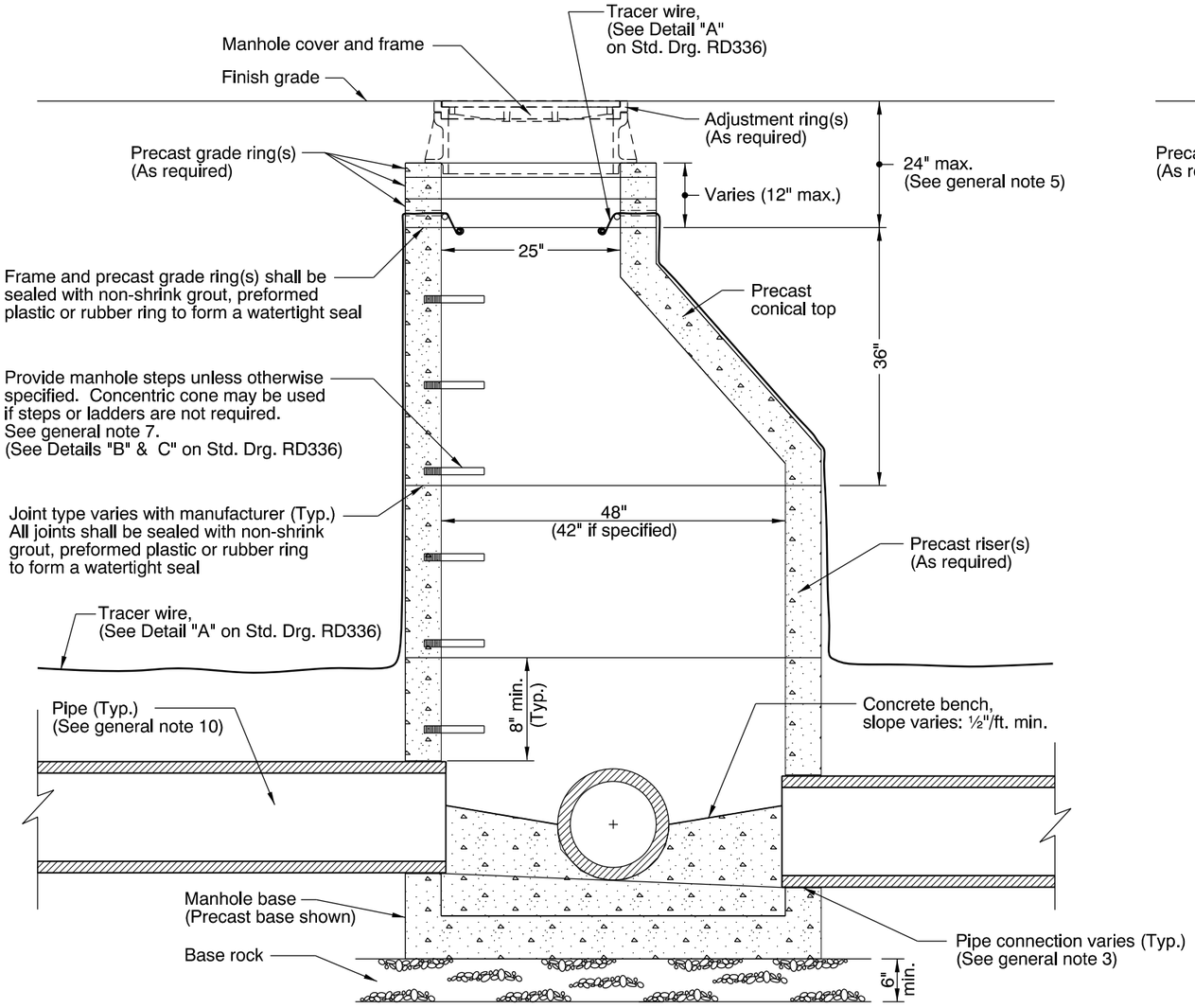
COUPLING BANDS FOR CORRUGATED METAL PIPE TYPES F, J, & K

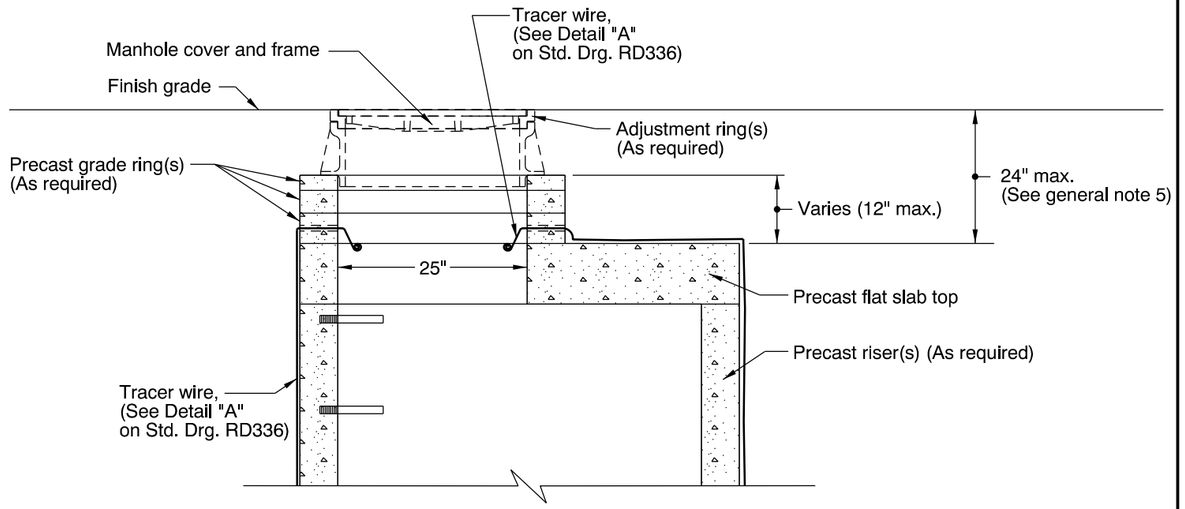
2015

DATE	REVISION DESCRIPTION

14-JUL-2014 rd327.dgn

RD327





GENERAL NOTES FOR ALL DETAILS:

1. All precast products shall conform to requirements of ASTM C478.
2. Standard precast manhole section diameter shall be 48". Use 42" if specified by the Engineer.
3. See Std. Drg. RD345 for pipe to manhole connections.
4. See Std. Drg. RD344 for manhole base section.
5. Adjust 24" maximum.
6. All connecting pipes shall have a tracer wire, or approved alternate.
7. See Std. Drg. RD337 for manhole safety ladder.
8. See Std. Drg. RD336 for details not shown.
9. See Std. Drg. RD356 for manhole covers and frames, manhole adjustment rings, etc.
10. Max. pipe diameter varies with pipe material.
11. See Std. Drg. RD342 for shallow manholes.
12. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

STANDARD
STORM SEWER MANHOLE

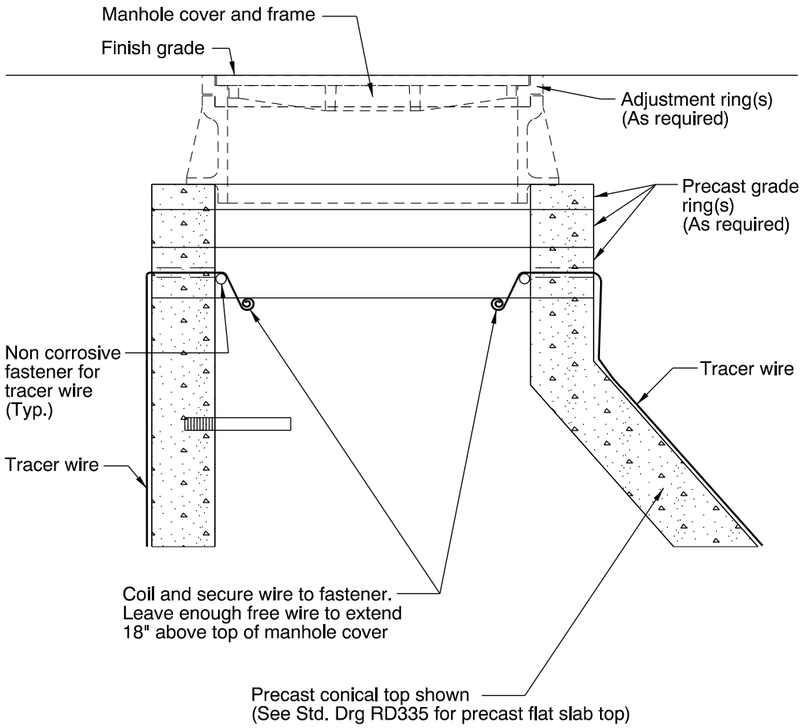
2015

DATE	REVISION DESCRIPTION

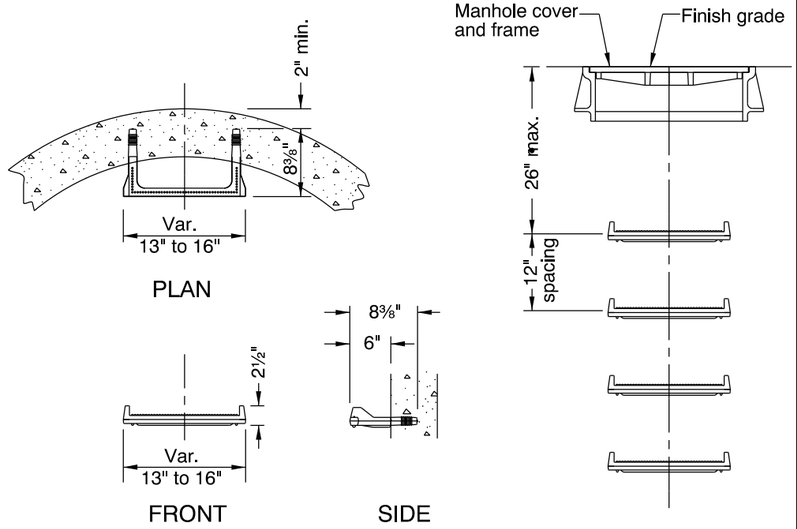
rd335.dgn 14-JUL-2014

RD335

Effective Date: February 1, 2015 - May 31, 2015

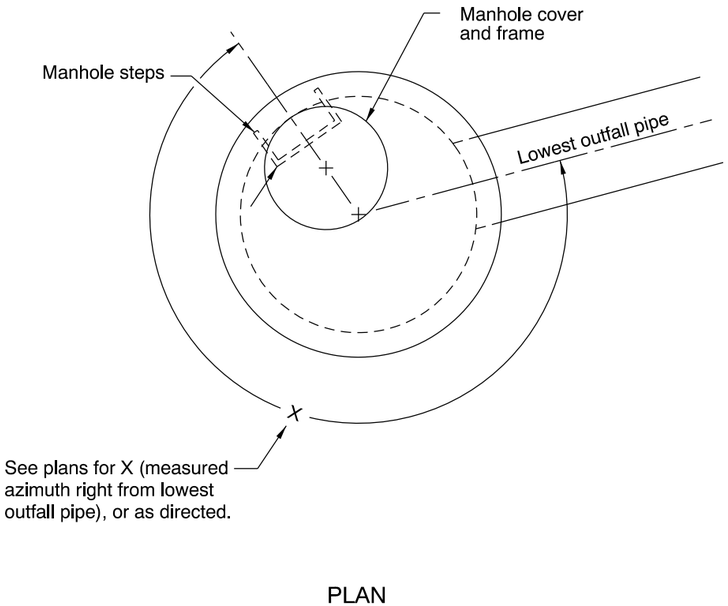


DETAIL "A"
TRACER WIRE
(See general note 6)



See ODOT's QPL for acceptable alternate manhole steps and/or ladders.
NOTE: No conflict with pipe align with available shelf.

DETAIL "B"
MANHOLE STEPS
(See general note 7)



PLAN

DETAIL "C"
PRECAST CONICAL TOP
OR
PRECAST FLAT SLAB TOP
AND MANHOLE STEPS ORIENTATION
(See general note 7)

GENERAL NOTES FOR ALL DETAILS:

1. All precast products shall conform to requirements of ASTM C478.
2. Standard precast manhole section diameter shall be 48". Use 42" if specified by the Engineer.
3. See Std. Drg. RD345 for pipe to manhole connections.
4. See Std. Drg. RD344 for manhole base section.
5. Adjust 24" maximum.
6. All connecting pipes shall have a tracer wire, or approved alternate. Place tracer wire directly over pipe centerline and on top of the pipe zone material.
7. Steps and ladders shall conform to requirements of ASTM C478. See Std. Drg. RD337 for manhole safety ladder.
8. See Std. Drg. RD335 for details not shown.
9. See Std. Drg. RD356 for manhole covers and frames, manhole adjustment rings, etc.
10. Max. pipe diameter varies with pipe material.
11. See Std. Drg. RD342 for shallow manholes.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

STANDARD MANHOLE DETAILS

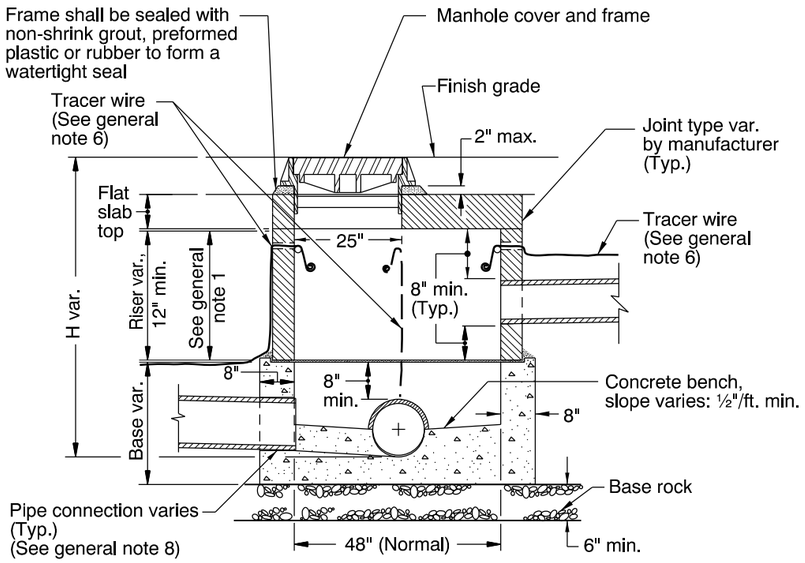
2015

DATE	REVISION DESCRIPTION

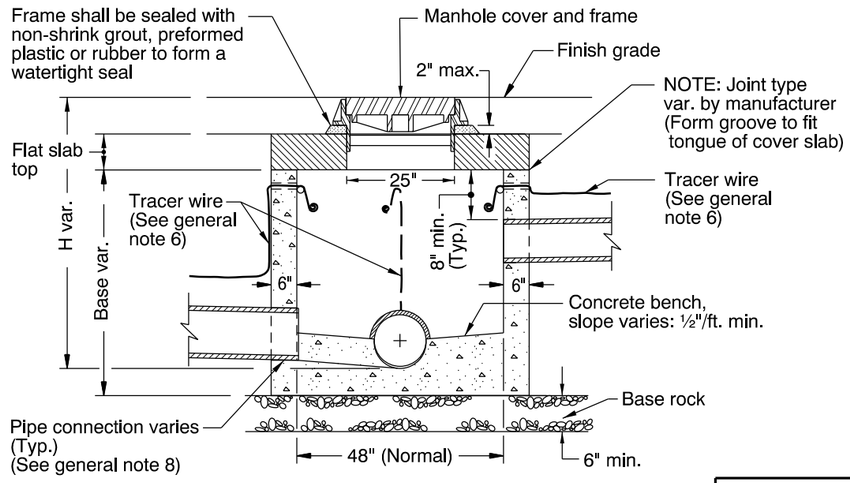
14-JUL-2014 rd336.dgn

RD336

Effective Date: February 1, 2015 - May 31, 2015



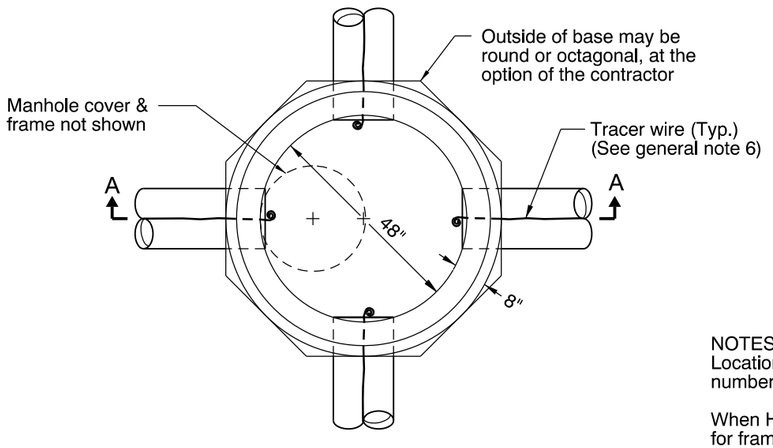
SECTION A-A
(Base, Riser & Flat Slab Top)



SECTION B-B
(Base & Flat Slab Top)

LEGEND
(See general note 3)

- Cast-in-Place concrete
- Precast concrete
- 1: 2 cement mortar
- Sewer pipe

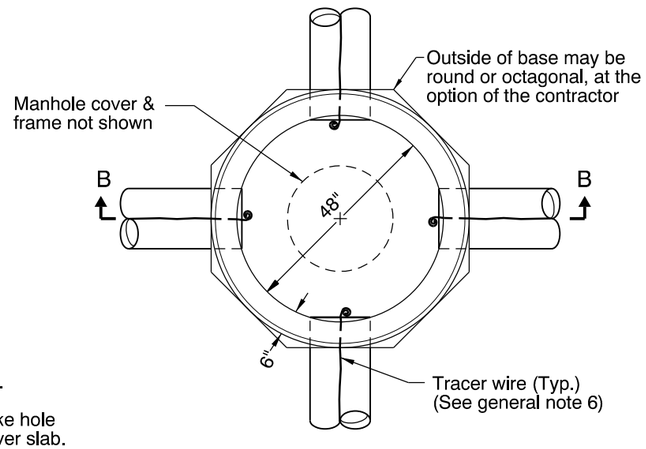


TOP VIEW
(Base, Riser & Flat Slab Top)

NOTES:
Location, elevation, and number of pipe(s) varies.

When H=60" or less make hole for frame in center of cover slab.

When H=42" or less omit steps.



TOP VIEW
(Base & Flat Slab Top)

GENERAL NOTES FOR ALL DETAILS:

1. Minimum length if laterals or connections are inserted: outside diameter of pipe + 17".
2. Use Section B-B when length of riser becomes less than minimum shown.
3. Base may be precast or cast-in-place.
4. All precast products shall conform to the requirements of ASTM C478.
5. See Std. Drg. RD336 for manhole steps details, and flat slab top orientation.
6. See Std. Drg. RD336 for tracer wire details.
7. See Std. Drg. RD344 for manhole base section.
8. See Std. Drg. RD345 for pipe to manhole connections.
9. See Std. Drg. RD356 for manhole covers and frames.
10. All concrete shall be commercial grade concrete.
11. Max. pipe diameter varies with pipe material.
12. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SHALLOW MANHOLES

2015

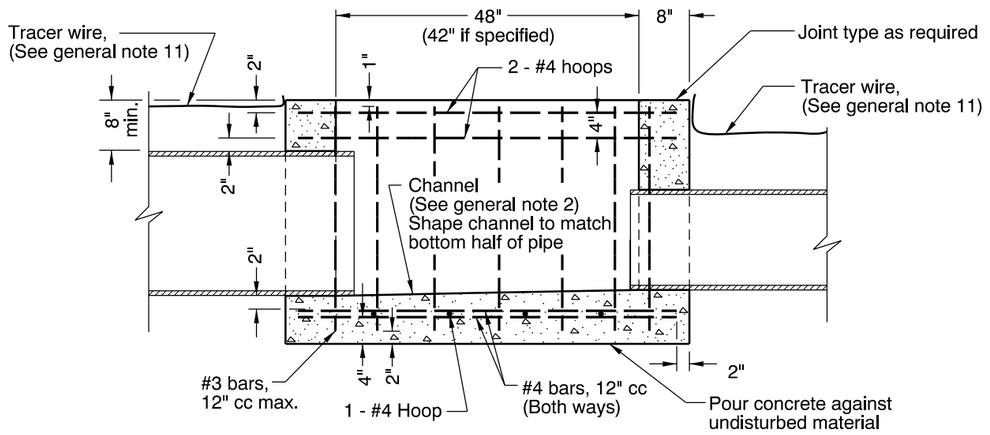
DATE	REVISION DESCRIPTION

rd342.dgn 14-JUL-2014

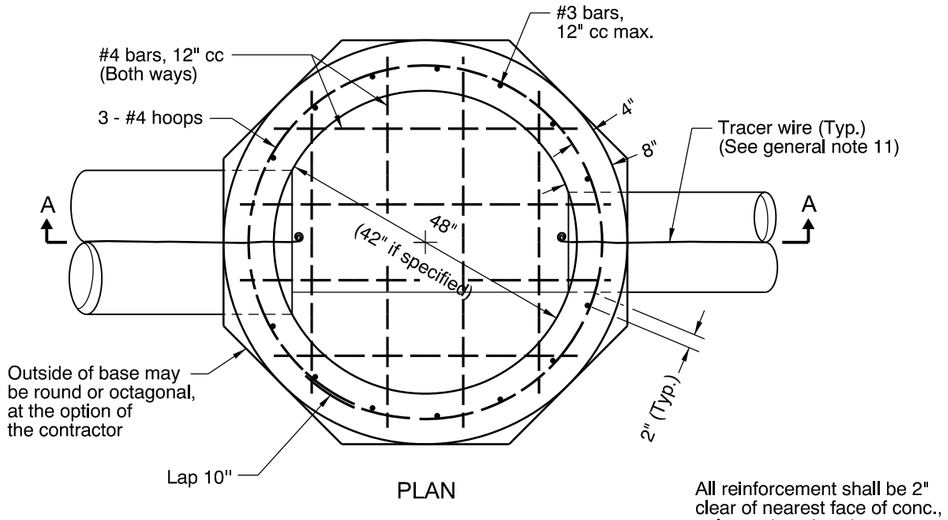
RD342

Effective Date: February 1, 2015 - May 31, 2015

rd344.dgn 14-JUL-2014



SECTION A-A

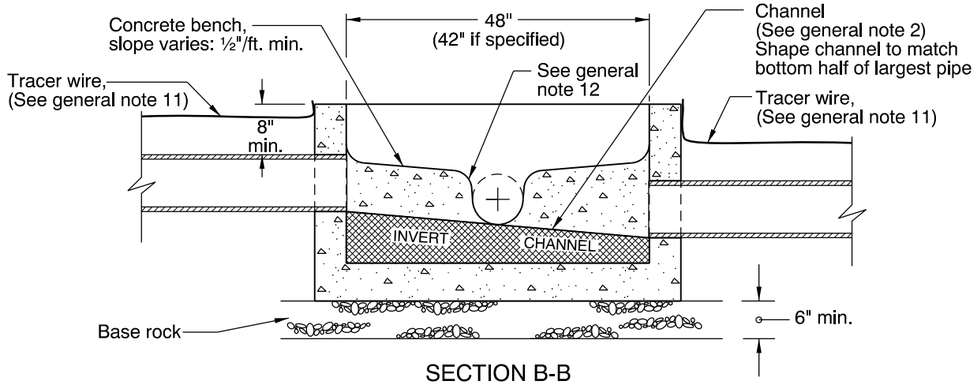


PLAN

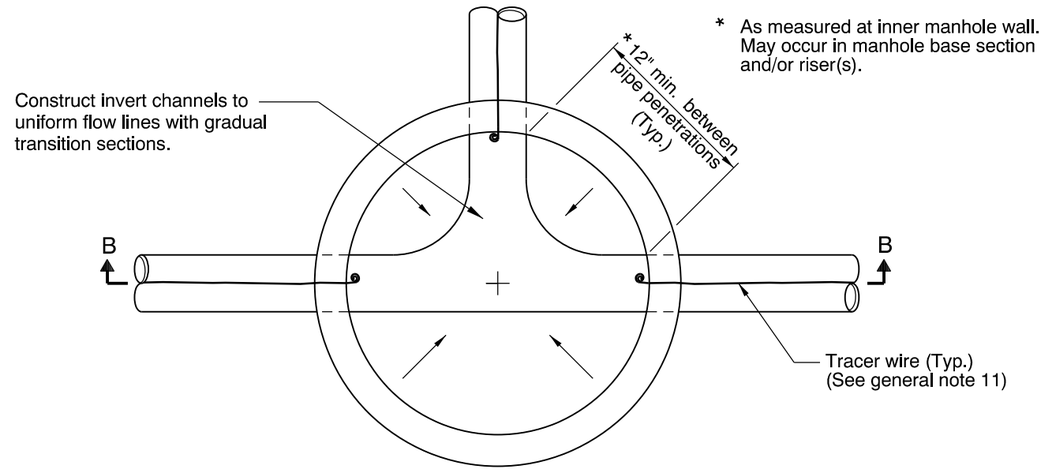
All reinforcement shall be 2" clear of nearest face of conc., unless otherwise shown.

CAST IN PLACE MANHOLE BASE

(For invert channel details, see precast option at right)



SECTION B-B



* As measured at inner manhole wall. May occur in manhole base section and/or riser(s).

PLAN

PRECAST MANHOLE BASE

GENERAL NOTES FOR ALL DETAILS:

1. All concrete shall be commercial grade concrete.
2. Channels shall be constructed to provide smooth slopes and radii to outlet pipe.
3. Bases may be precast or cast in place.
4. Max. pipe diameter varies with pipe material.
5. Use on 42" and 48" diameter manhole.
6. Extend pipe into manhole and grout smooth. Pipe(s) may extend 2" max. beyond the interior manhole wall.
7. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.
8. All precast products shall conform to the requirements of ASTM C478.
9. See Std. Drg. RD345 for pipe to manhole connections.
10. See Std. Drg. RD336 for manhole steps details.
11. See Std. Drg. RD336 for tracer wire details.
12. At spring line of pipe, extend channel up to crown line on 12:1 batter.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

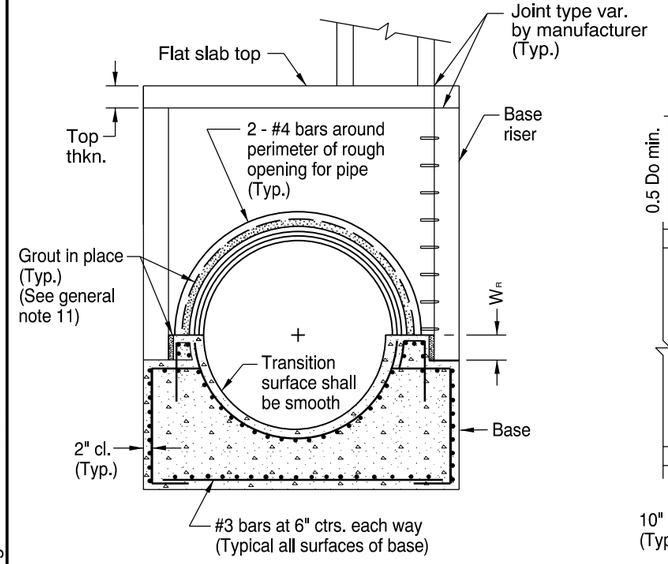
STANDARD MANHOLE BASE SECTION

2015

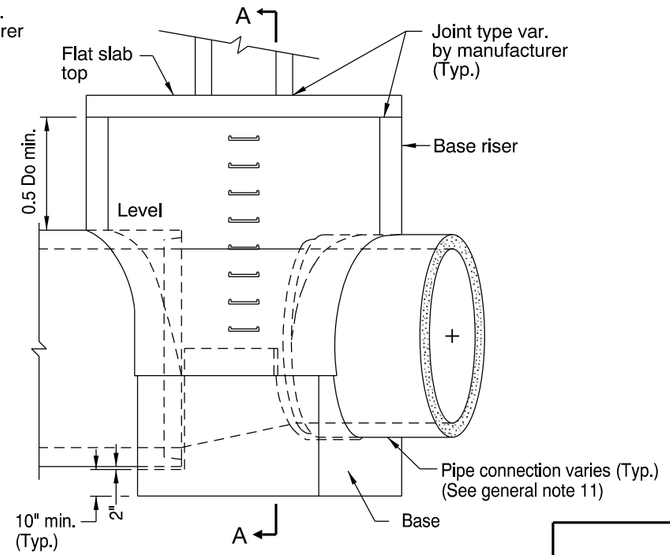
DATE	REVISION DESCRIPTION

RD344

Effective Date: February 1, 2015 - May 31, 2015



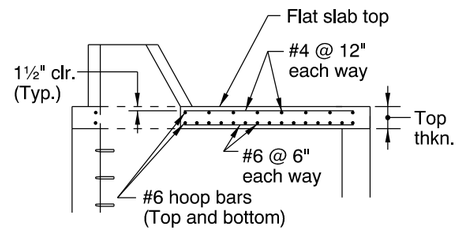
SECTION A-A



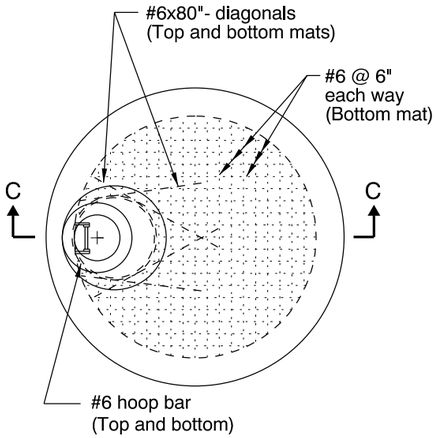
MANHOLE BASE ELEVATION

Dia. of largest pipe in manhole (Inch)	* ⊖ max when $D_I = D_O$	* Base Riser D_R (Inch)	* Base Riser W_R (Inch)	* Base Riser Top Thkn. (Inch)	Base X_O $X_I = X_O$ when $D_I = D_O$ (Feet)	Base X_I when $D_I < D_O$ $D_I = (D_O - 6")$ (Feet)	Base X_I when $D_I < D_O$ $D_I = (D_O - 12")$ (Feet)	Base X_I when $D_I < D_O$ $D_I = (D_O - 18")$ (Feet)
30"	75°	60"	6"	10"	2.42	2.63	2.75	2.89
36"	67°	72"	7"	10"	2.75	2.97	3.15	3.29
42"	60°	72"	7"	10"	2.75	2.97	3.15	3.29
48"	54°	84"	8"	10"	3.02	3.27	3.48	3.66
54"	49°	84"	8"	10"	3.02	3.27	3.48	3.66
60"	45°	96"	9"	12"	3.25	3.54	3.78	3.99
66"	42°	96"	9"	12"	3.25	3.54	3.78	3.99
72"	39°	108"	10"	12"	3.48	3.79	4.06	4.29
78"	36°	108"	10"	12"	3.48	3.79	4.06	4.29
84"	34°	120"	11"	12"	3.69	4.03	4.32	4.57
90"	32°	120"	11"	12"	3.69	4.03	4.32	4.57
96"	30°	126"	11½"	12"	3.79	4.15	4.45	4.71

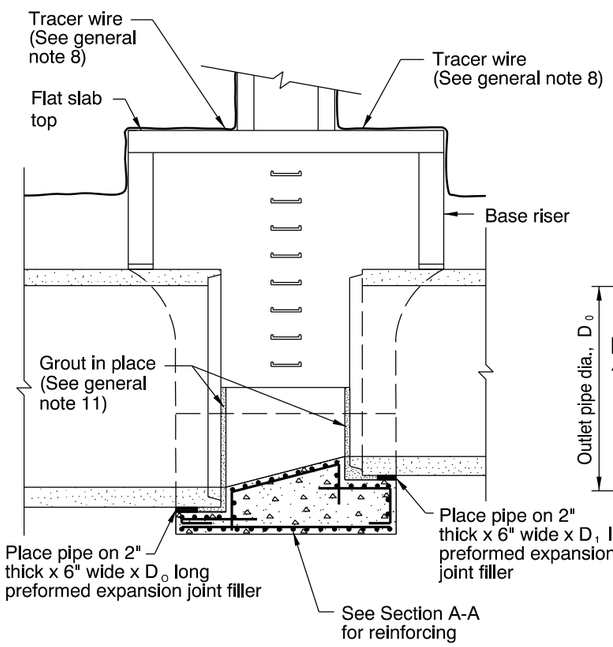
* A special design using a larger Base Riser diameter D_R may be required to obtain specified 12" min. dimension when ⊖ angle exceeds ⊖ max.



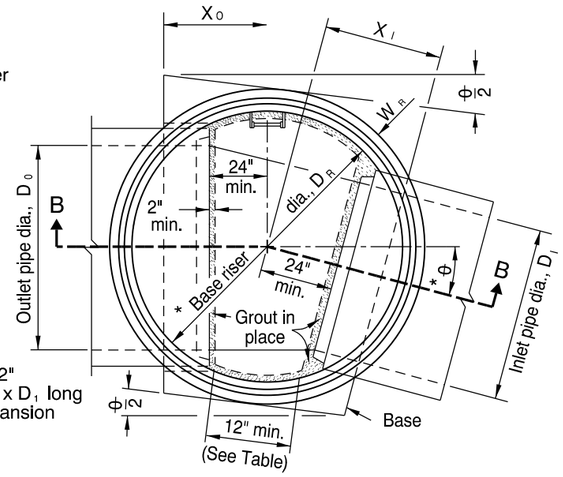
SECTION C-C



MANHOLE FLAT SLAB TOP PLAN
(Bottom reinf. mat shown)
(Manhole I.D. >4', Δ10' 6")



DEVELOPED SECTION B-B
ALONG PIPE CENTERLINE



MANHOLE BASE PLAN

GENERAL NOTES FOR ALL DETAILS:

1. All concrete shall be Class 4000. All precast products shall conform to requirements of ASTM C478.
2. All reinforcing steel shall conform to ASTM Specification A706 or AASHTO M31 (ASTM A615), Grade 60. The following splice lengths shall be used (unless shown otherwise):

Bar Size	4	5	6
Uncoated	16"	20"	24"

3. All reinforcement shall be placed 2" clear of the nearest face of the concrete unless shown otherwise.
4. Eccentric reducing cones or eccentric reducing flat slabs designed in accordance with AASHTO M199 shall be placed on top of the base riser as required by the contract plans. Eccentric reducing flat slabs shall be designed to support a load of 120 lb/ft in addition to the dead load of the slab, the risers above the slab, and the earth overburden above the slab.
5. Base riser to be pre-cast unless otherwise shown on the plans.
6. Cast-in-Place concrete, shown thus:
7. See Std. Drg. RD336 for manhole steps details, and flat slab top orientation.
8. See Std. Drg. RD336 for tracer wire details.
9. See Std. Drg. RD337 for manhole safety ladder.
10. Max. pipe diameter varies with pipe material.
11. See Std. Drg. RD345 for pipe to manhole connections.
12. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

LARGE PRECAST MANHOLE

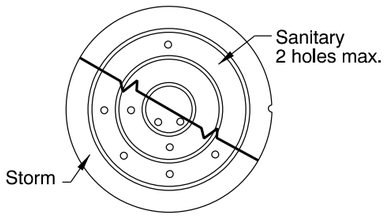
2015

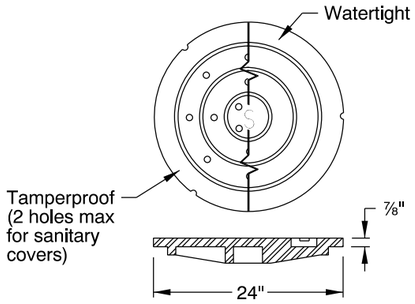
DATE	REVISION DESCRIPTION

RD346

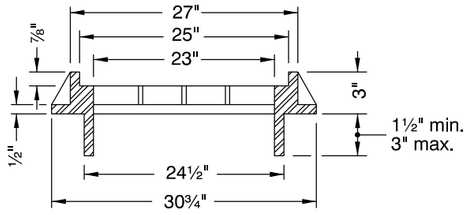
14-JUL-2014 rd346.dgn

rd356.dgn 14-JUL-2014



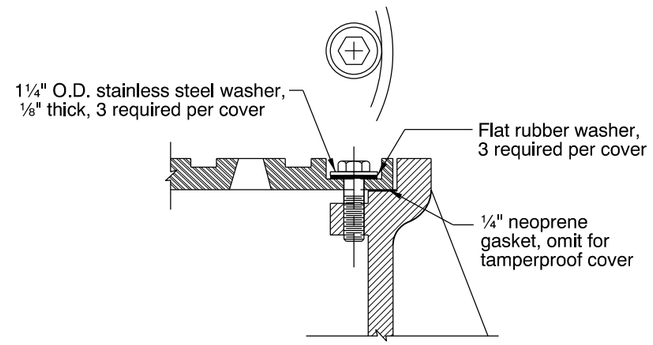


Cast iron tamperproof & watertight
(Frames available in standard or suburban pattern)



CAST IRON SUBURBAN FRAME
For use on local streets only, as specified

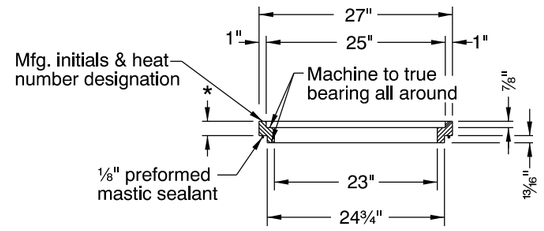
SUBURBAN MANHOLE COVER & FRAME



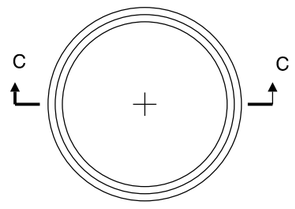
NOTE:
3 reqd., equally spaced, ½" x 1½" pentagonal or hexagonal head, bronze or stainless steel. Install frame so that one bolt boss is located over the manhole ladder. (See general note 8)

BOLT-DOWN DETAIL
(FOR TAMPERPROOF AND WATERTIGHT)

* Std. depths 1½", 2", 2½" & 3"
Matl. to be grey cast iron ASTM A 48, Class 35B. Tolerance on non-machined surfaces to be ±0.06", see general note 6

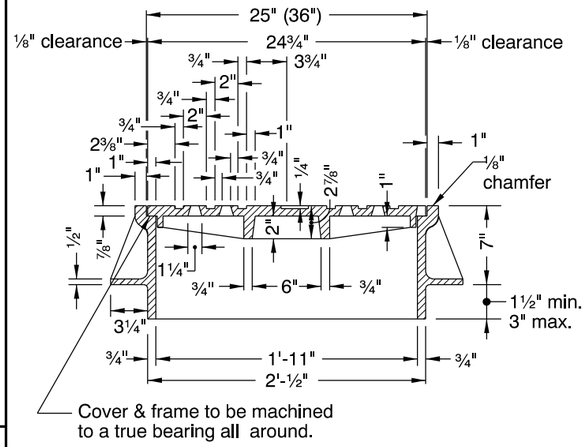


SECTION C-C



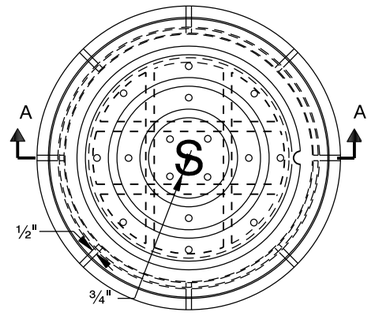
MANHOLE ADJUSTMENT RING
For use with Standard Manhole Frame

STANDARD MANHOLE COVER, FRAME & GRATE



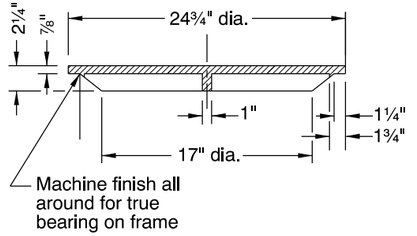
SECTION A-A

36" min. diameter cover is reqd. for manholes with depths of 20' or greater. (See general note 4)

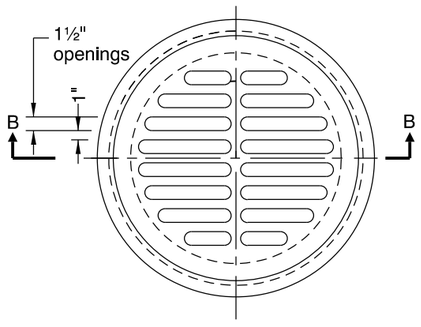


NOTE:
Coat outside of frame with asphalt, where frame is to be placed in conc. pvmt., conc. gutter, or walk.

PLAN
MANHOLE COVER & FRAME



SECTION B-B



For use with Standard Manhole Frame
(See general note 7)

PLAN
MANHOLE GRATE

GENERAL NOTES FOR ALL DETAILS:

1. Tamperproof covers reqd. on sanitary or storm drain manhole where located in pedestrian ways or easement areas. Covers for sanitary manholes shall have 2 holes maximum.
2. Watertight covers required if located where cover may be submerged (no holes).
3. Covers and frames shall be stamped with manufacturer's initials, heat number and point of origin.
4. See Std. Drg. RD337 for manhole safety ladder.
5. See Std. Drg. RD360 for manhole frame adjustment.
6. See ODOT's QPL for alternate manhole adjustment rings.
7. Manhole grate allowed only in locations not subject to bicycle or pedestrian use.
8. See ODOT's QPL for alternate bolt-down products.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

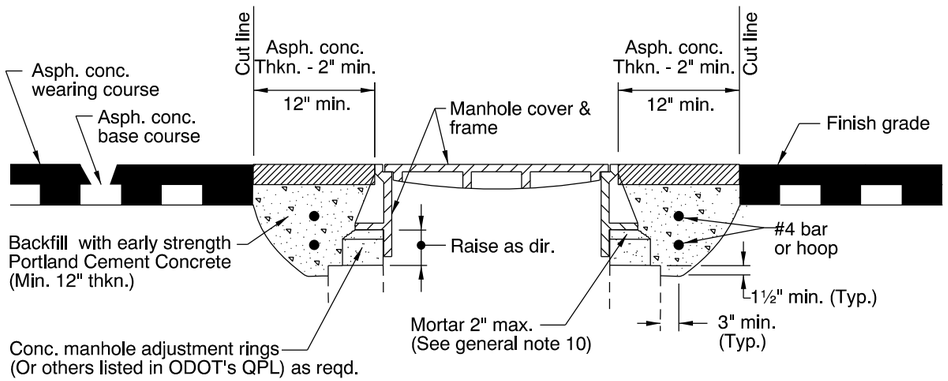
OREGON STANDARD DRAWINGS

MANHOLE COVERS AND FRAMES

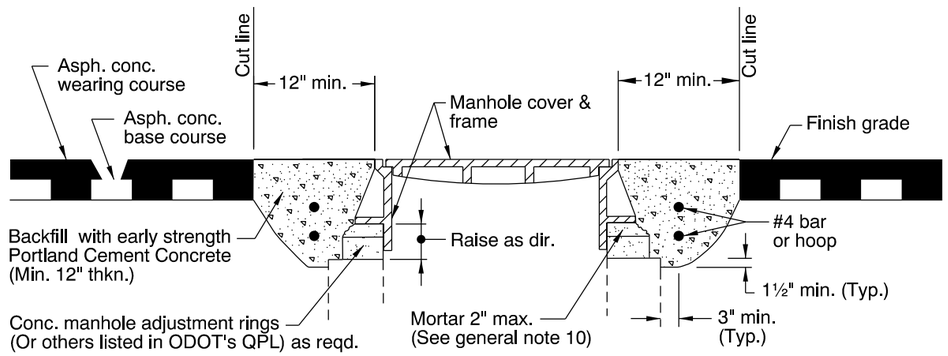
2015

DATE	REVISION DESCRIPTION

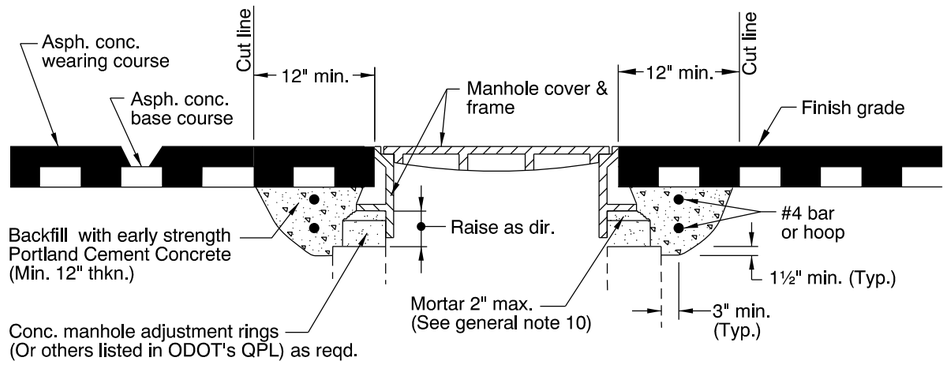
RD356



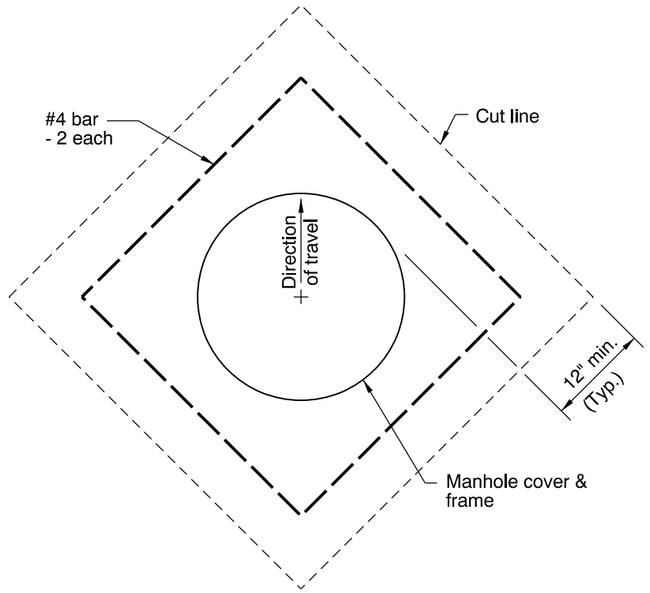
METHOD "A"



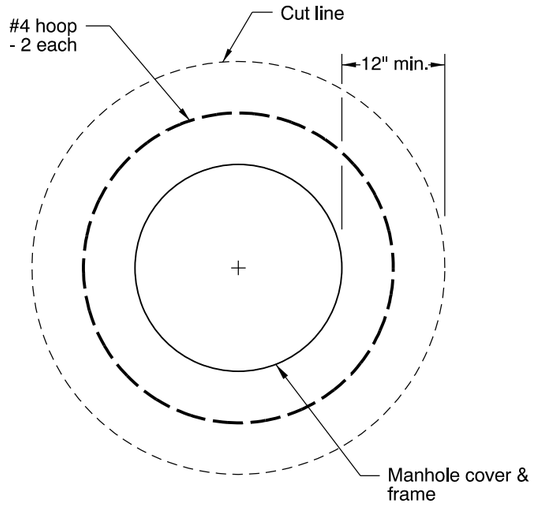
METHOD "B"



METHOD "C"



PLAN
SQUARE CUT



PLAN
CIRCULAR CUT

GENERAL NOTES FOR ALL DETAILS:

1. Cover manhole with building paper and const. asph. conc. base course and wearing courses.
2. Saw cut square or circular excavation around manhole 12" min. from manhole frame.
3. Raise manhole cover and frame to finish grade by installing conc. manhole adjustment rings and leveling mortar.
4. Backfill with early strength Portland Cement Concrete. All concrete shall be commercial grade concrete.
5. Protect from traffic loading until conc. has cured to 3000 psi.
6. Apply tack coat to edges of existing pavement before installing patch.
7. Finish joint with asphalt seal and sand.
8. See Std. Drg. RD336 for manhole steps details.
9. See appropriate manhole standard drawings for details not shown.
10. Use epoxy for synthetic grade rings.
11. See Std. Drg. RD336 for tracer wire details.
12. See Std. Drg. RD356 for manhole cover and frame.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 24-JAN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MANHOLE FRAME ADJUSTMENT

2015

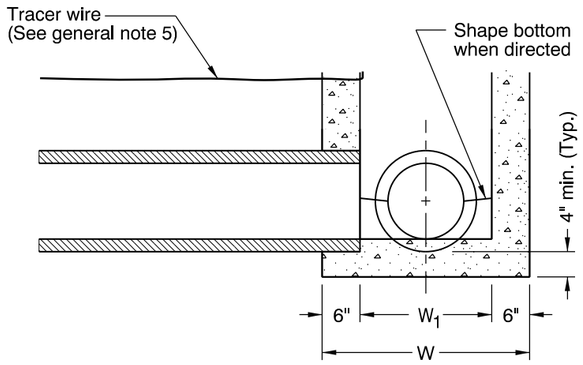
DATE	REVISION DESCRIPTION

14-JUL-2014

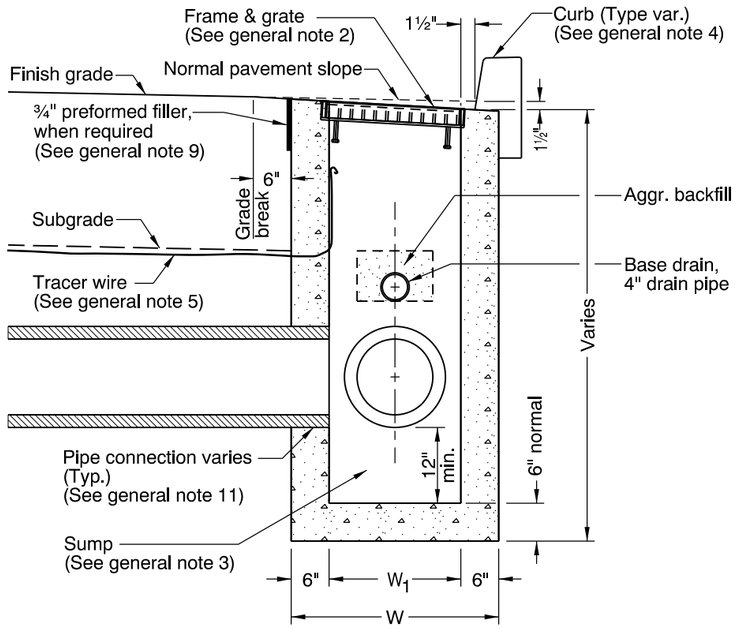
rd360.dgn

RD360

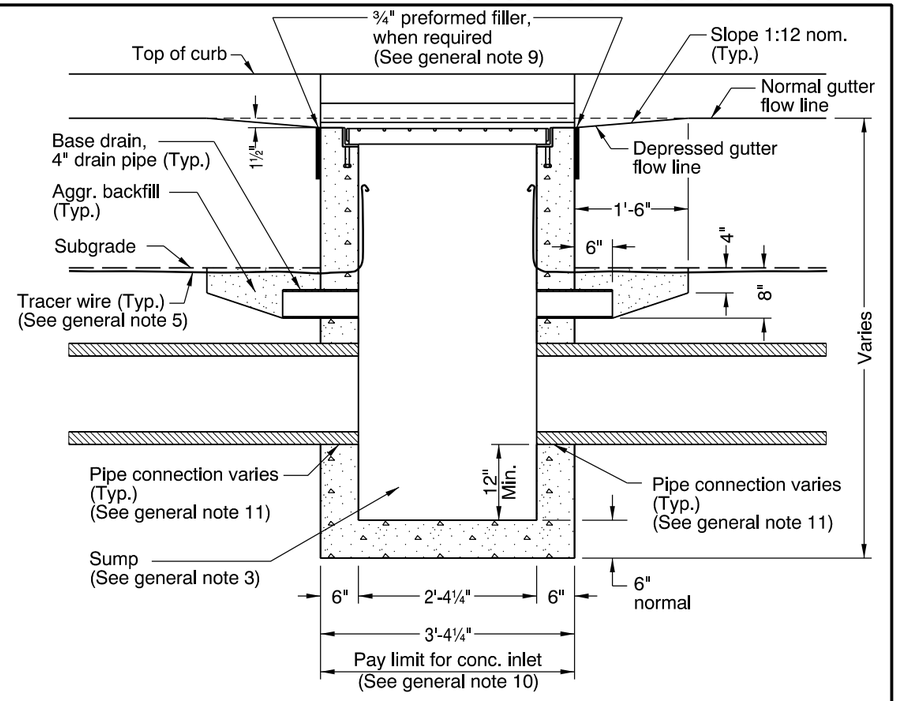
Effective Date: February 1, 2015 - May 31, 2015



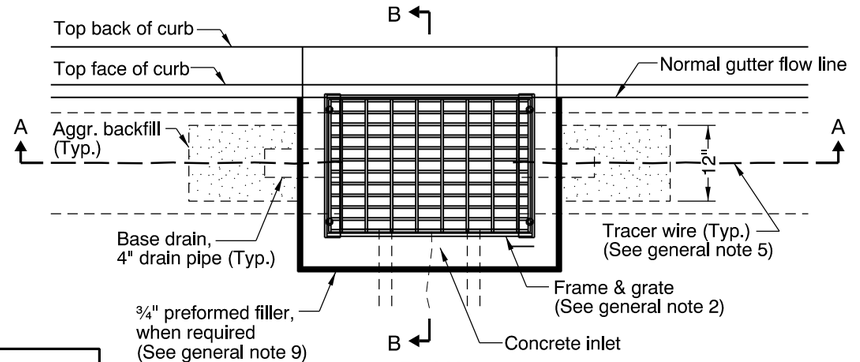
DETAIL A
WITHOUT SUMP



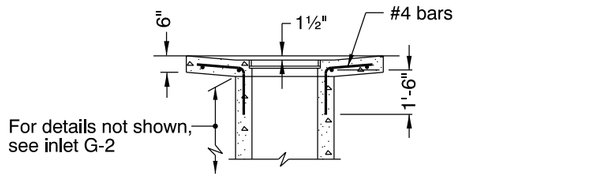
SECTION B - B



SECTION A - A



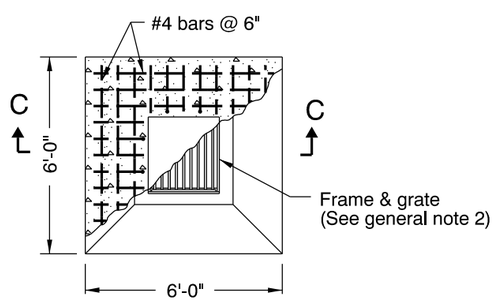
PLAN
TYPE G-1, G-2, G-2M



SECTION C-C

NOTE:

All reinforcement to be placed 2" clear of nearest face of concrete unless shown or noted otherwise



PLAN
TYPE G-2MA

TABLE A		
INLET TYPE	W	W_1
G-1	2'-8⅞"	1'-8⅞"
G-2, G-2M, G-2MA	3'-3⅜"	2'-3⅜"

GENERAL NOTES FOR ALL DETAILS:

1. Where precast inlets are used as an alternate to cast-in-place inlets, a 4" compacted leveling bed of sand or ¼"-0 crushed aggregate shall be provided. All precast inlets shall conform to requirements of ASTM C913.
2. Graphics show G-1 inlet with Type 2 grate. See Table A for inlet dimensions.
   Type 1 grate allowed only in locations not subject to bicycle or pedestrian use.
   For frame and grate details, see Std. Drg. RD365.
3. Provide sump only where shown on plans, and allowed by jurisdiction. See Detail A for inlet without sump.
4. For curb details, see Std. Drgs. RD700 & RD701.
5. See Std. Drg. RD336 for tracer wire details, or approved alternate.
6. Max. pipe diameter varies with pipe material.
7. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.
8. All concrete shall be commercial grade concrete.
9. ¾" preformed filler (in concrete pavement or gutter only) to extend through thickness of concrete.
10. See Std. Drg. RD363 for gutter transition section, when required.
11. See Std. Drg. RD339 for pipe to structure connections.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CONCRETE INLETS
TYPE G-1, G-2, G-2M, & G-2MA

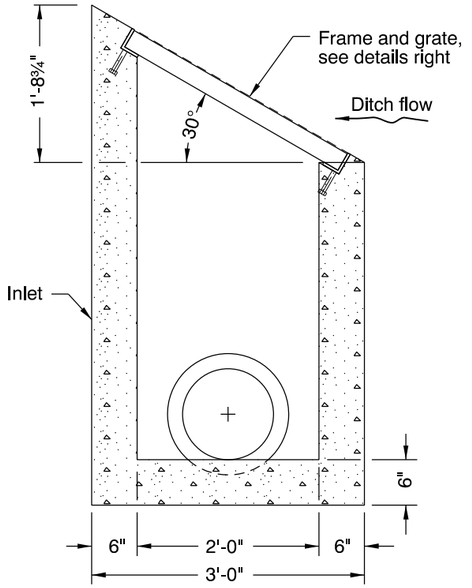
2015

DATE	REVISION DESCRIPTION

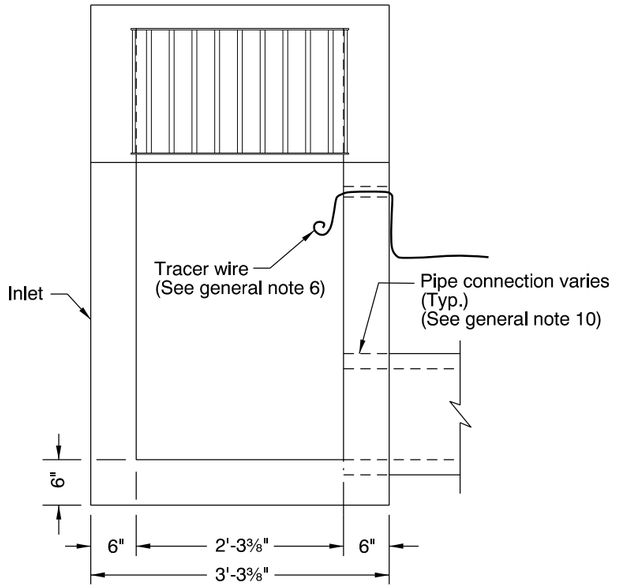
rd364.dgn 14-JUL-2014

RD364

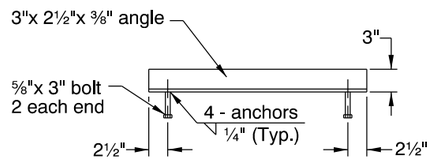
rd370.dgn 14-JUL-2014



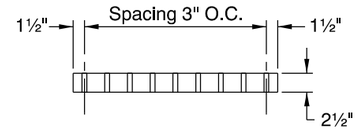
SECTION A - A



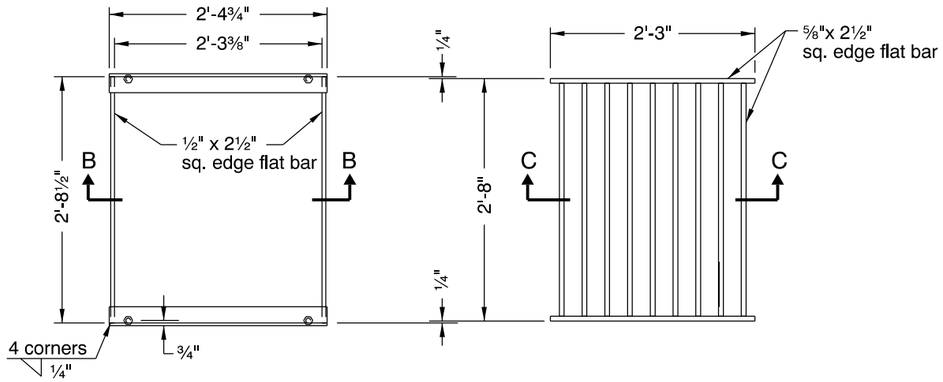
ELEVATION



SECTION B-B

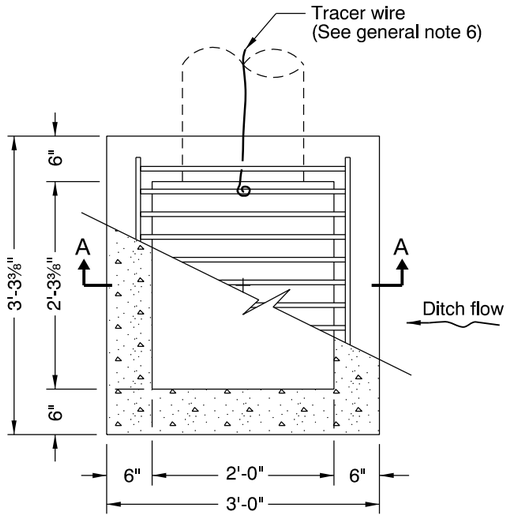


SECTION C-C



PLAN
FRAME

PLAN
GRATE - TYPE 1



PLAN

GENERAL NOTES FOR ALL DETAILS:

1. All concrete shall be commercial grade concrete.
2. G-2 (Type 2) grates may be used if approved by the engineer. See Std. Drg. RD364.
3. Catch basin, frame, and grates shall meet H20 loading.
4. Provide sump only when shown on plans, and allowed by jurisdiction. For sump details, see Std. Drg. RD364.
5. ⅝" cross bars shall be flush with the grate surface and may be fillet welded, resistance welded or electroforged to bearing bars.
6. See Std. Drg. RD336 for tracer wire details, or approved alternate.
7. Max. pipe diameter varies with pipe material.
8. Do not use in locations where inlet can be struck by an errant vehicle, or provide shielding of inlet.
9. Inlet base may be cast-in-place or precast. Where precast inlet base is used as an alternate, a 4" compacted leveling bed of sand or ¼"-0 crushed aggregate shall be provided. All precast inlets shall conform to requirements of ASTM C913.
10. See Std. Drg. RD339 for pipe to structure connections.
11. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

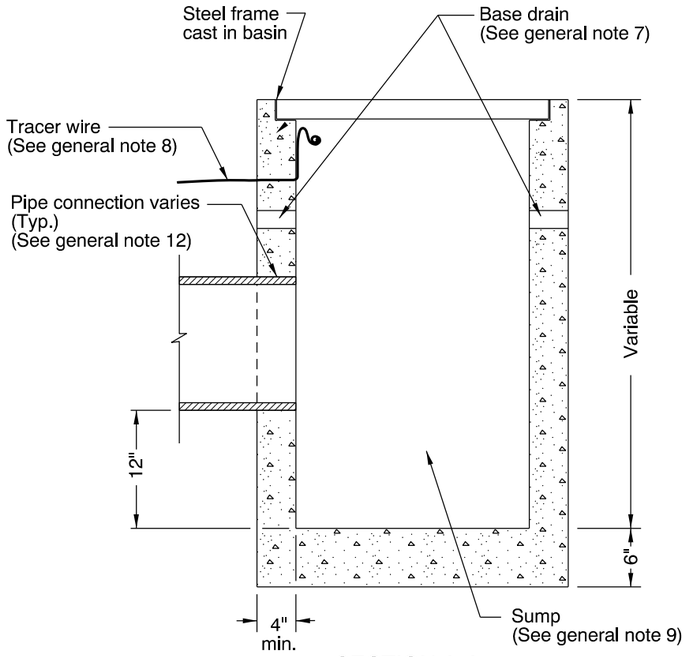
OREGON STANDARD DRAWINGS

DITCH INLET
TYPE D

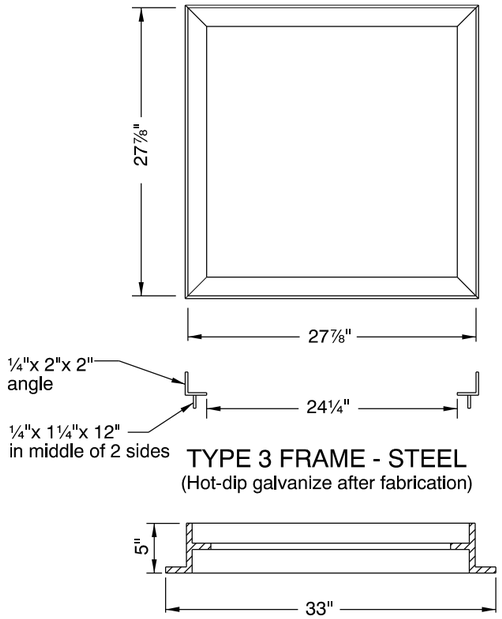
2015

DATE	REVISION DESCRIPTION

RD370

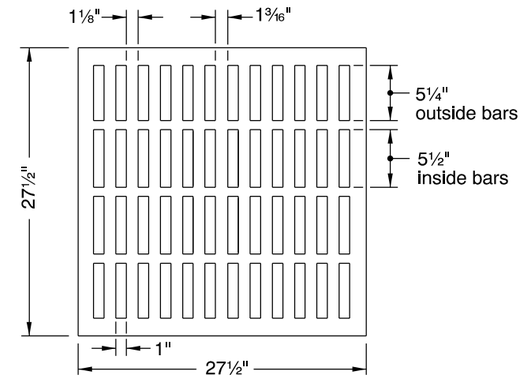


SECTION A-A

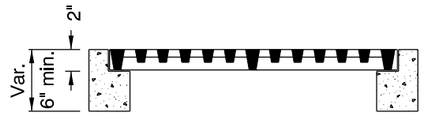


TYPE 3 FRAME - STEEL
(Hot-dip galvanize after fabrication)

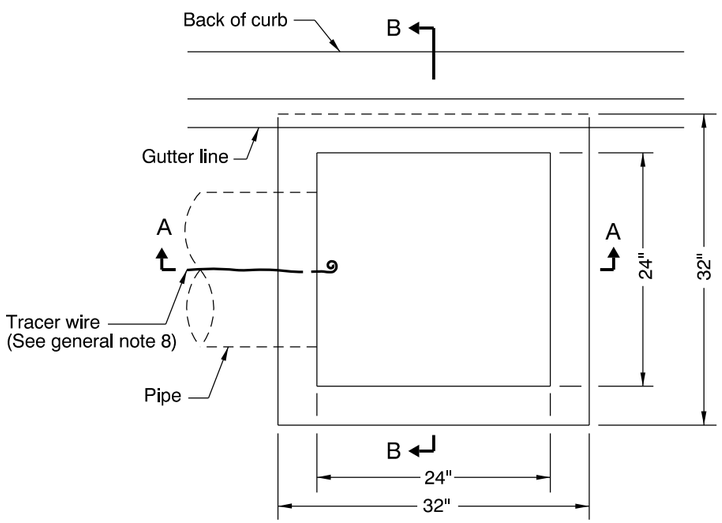
OPTIONAL CAST IRON FRAME
FOR A MORTAR-ON TYPE 3 CATCH BASIN



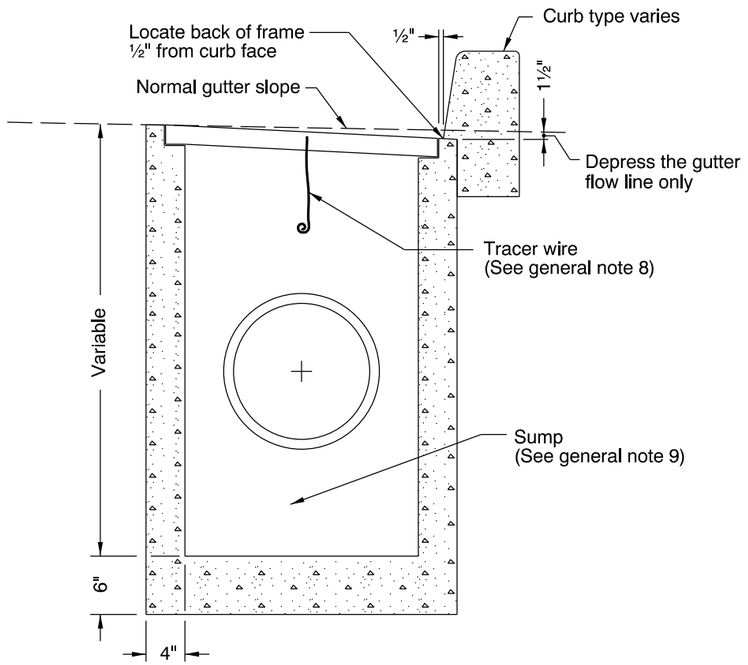
TYPE 3 CATCH BASIN GRATE



PRECAST RISER



PLAN



SECTION B-B

GENERAL NOTES FOR ALL DETAILS:

1. Catch basin & grate shall meet H20 loading.
2. All concrete shall be commercial grade concrete.
3. Precast walls shall be a minimum of 4" thick.
4. For use by local agencies on low volume residental facilities as directed.
5. Depress gutter flowline and transition gutter as shown in Std. Drg. RD366 perspective view.
6. Knockouts allowed for precast option.
7. If directed, install 3" dia. base drain with field installed mesh screen for subgrade drainage.
8. See Std. Drg. RD336 for tracer wire details, or approved alternate.
9. Provide sump only where shown on plans, and allowed by jurisdiction. For sump details, see Std. Drg. RD364.
10. Max. pipe diameter varies with pipe material.
11. All precast inlets shall conform to requirements of ASTM C913.
12. See Std. Drg. RD339 for pipe to structure connections.
13. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

TYPE "3" CATCH BASIN, FRAME AND GRATE

2015

DATE	REVISION DESCRIPTION

rd378.dgn 14-JUL-2014

RD378

Effective Date: February 1, 2015 - May 31, 2015

FILL HEIGHT TABLE
FOR CORRUGATED CIRCULAR PIPE

ALUMINUM HELICAL

PIPE DIAMETER (In.)	1½" x ¼"			2⅔" x ½"						3" x 1"						
	MINIMUM COVER (Ft.)	LOCK SEAM		MINIMUM COVER (Ft.)	LOCK SEAM				MINIMUM COVER (Ft.)	MINIMUM COVER (Ft.)	LOCK SEAM				MINIMUM COVER (Ft.)
		SPECIFIED THICKNESS (In.)			SPECIFIED THICKNESS (In.)						SPECIFIED THICKNESS (In.)				
		.060	0.075		.060	.075	.105	.135	.164		.060	.075	.105	.135	.164	
		MAXIMUM COVER (Ft.)			MAXIMUM COVER (Ft.)						MAXIMUM COVER (Ft.)					
6	1.0	100	100													
8	1.0	100	100													
10	1.0	100	100													
12				1.0	100	100	100			1.0						
15				1.0	100	100	100			1.0						
18				1.0	84	100	100			1.0						
21				1.0	72	90	100			1.0						
24				1.0	63	78	100	100	100	1.0						
30				1.0		63	88	100	100	1.0	1.0	57	72	100	100	1.0
36				1.0		52	73	94	100	1.0	1.5	48	60	84	100	1.0
42				1.5			63	81	99	1.0	1.5	41	52	72	97	1.0
48				1.5			55	71	86	1.0	1.5	36	45	63	84	100	1.0
54				1.5			48	63	77	1.0	1.5	32	40	56	75	88	1.0
60				1.5				52	65	1.0	1.5	28	36	50	67	80	1.0
66				1.5					53	1.5	1.5	26	33	46	61	72	1.0
72				1.5					43	1.5	1.5	24	30	42	56	66	1.0
78											1.5		28	39	52	61	1.0
84											1.5			36	48	57	1.0
90											1.5			33	45	53	1.0
96											1.5			31	42	50	1.5
102											1.5				39	47	1.5
108											1.5				37	44	1.5
114											1.5					40	1.5
120											1.5					36	1.5

STEEL HELICAL

PIPE DIAMETER (In.)	1½" x ¼"		2⅔" x ½"							3" x 1" and 5" x 1"						
	MINIMUM COVER (Ft.)	LOCK SEAM	MINIMUM COVER (Ft.)	WELDED OR LOCK SEAM					MINIMUM COVER (Ft.)	MINIMUM COVER (Ft.)	WELDED OR LOCK SEAM					MINIMUM COVER (Ft.)
		SPECIFIED THICKNESS (In.)		SPECIFIED THICKNESS (In.)							SPECIFIED THICKNESS (In.)					
		.064		.064	.079	.109	.138	.168			.064	.079	.109	.138	.168	
		MAXIMUM COVER (Ft.)		MAXIMUM COVER (Ft.)							MAXIMUM COVER (Ft.)					
6	1.0	100														
8	1.0	100														
10	1.0	100														
12			1.0	100	100	100										
15			1.0	100	100	100										
18			1.0	100	100	100										
21			1.0	100	100	100										
24			1.0	100	100	100										
30			1.0	83	100	100										
36			1.0	69	86	100	100	100	1.0	1.0	79	99	100			1.0
42			1.5	59	74	100	100	100	1.0	1.0	68	85	100			1.0
48			1.5	52	65	91	100	100	1.0	1.5	59	74	100	100		1.0
54			1.5		57	80	100	100	1.0	1.5	53	66	93	100		1.0
60						72	93	100	1.0	1.5	47	59	83	100		1.0
66							85	100	1.0	1.5	43	54	76	98		1.0
72							78	95	1.0	1.5	39	49	69	89	100	1.0
78								84	1.0	1.5	36	45	64	82	100	1.0
84								73	1.0	1.5	34	42	59	77	94	1.0
90										1.5	31	39	55	71	88	1.0
96										1.5		37	52	67	82	1.0
102										1.5		35	49	63	77	1.5
108										1.5			46	59	73	1.5
114										1.5			44	56	69	1.5
120										1.5			41	53	66	1.5
126										2.0				51	62	2.0
132										2.0				49	60	2.0
138										2.0				46	57	2.0
144										2.0					55	2.0

5" x 1", these values shown can be increased, (See general note 9)

CALC. BOOK NO. RD07-01

BASELINE REPORT DATE 08-JUL-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with diameters greater than 72" must be reviewed by the Geo-Environmental Section.
4. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
5. For multiple pipe installations, see Std. Drg. RD300.
6. Heavy solid line denotes boundary between minimum cover requirements.
7. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures). See special details or Standard Drawings as called for on plans.
8. For minimum thickness, see AASHTO M197, M218, and M274.
9. 5" x 1" corrugation can be used as an alternate for 3" x 1" corrugation. Maximum fill height for 3" x 1" can be increased by up to 12% over values shown for pipe size 54" and larger.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLES FOR ALUMINUM & STEEL CORRUGATED PIPE

2015

DATE	REVISION DESCRIPTION

rd380.dgn 14-JUL-2014

RD380

Effective Date: February 1, 2015 - May 31, 2015

FILL HEIGHT TABLE

PIPE		ALUMINUM ARCH PIPE 2 ⅔" x ½" HELICAL SEAM (LOCK)					STEEL ARCH PIPE 2 ⅔" x ½" HELICAL SEAM (LOCK OR WELDED)				
EQUIVALENT ROUND DIAMETER (Inches)	ARCH PIPE SIZE * (Inches)	MINIMUM CORNER RADIUS (Inches)	SPECIFIED THICKNESS (Inches)	SPECIFIED THICKNESS (Gage)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM CORNER RADIUS (Inches)	SPECIFIED THICKNESS (Inches)	SPECIFIED THICKNESS (Gage)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)
15	17 x 13	3	0.060	16	1.0	22	3	0.064	16	1.0	22
18	21 x 15	3	0.060	16	1.0	17	3	0.064	16	1.0	17
21	24 x 18	3	0.060	16	1.0	15	3	0.064	16	1.0	15
24	28 x 20	3	0.075	14	1.5	13	3	0.064	16	1.0	13
30	35 x 24	3	0.075	14	1.5	10	3	0.064	16	1.0	10
36	42 x 29	3.5	0.105	12	2.0	10	3.5	0.064	16	1.0	10
42	49 x 33	4	0.105	12	2.0	10	4	0.079	14	1.0	10
48	57 x 38	5	0.135	10	2.0	10	5	0.109	12	1.5	10
54	64 x 43	6	0.135	10	2.0	11	6	0.109	12	1.5	11
60	71 x 47	7	0.164	8	2.5	12	7	0.138	10	1.5	12
66	77 x 52						8	0.168	8	2.0	12
72	83 x 57						9	0.168	8	2.0	13

* See general note 9

FILL HEIGHT TABLE

PIPE		ALUMINUM ARCH PIPE 3" x 1" HELICAL SEAM (LOCK)					STEEL ARCH PIPE 3" x 1" HELICAL SEAM (LOCK OR WELDED)					STEEL ARCH PIPE 5" x 1" HELICAL SEAM (LOCK OR WELDED)			
EQUIVALENT ROUND DIAMETER (Inches)	ARCH PIPE SIZE * (Inches)	MINIMUM CORNER RADIUS (Inches)	SPECIFIED THICKNESS (Inches)	SPECIFIED THICKNESS (Gage)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM CORNER RADIUS (Inches)	SPECIFIED THICKNESS (Inches)	SPECIFIED THICKNESS (Gage)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	SPECIFIED THICKNESS (Inches)	SPECIFIED THICKNESS (Gage)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)
36	40 x 31	5	0.060	16	2.0	15	5	0.064	16	1.0	15				
42	46 x 36	6	0.060	16	2.0	16	6	0.064	16	1.0	16				
48	53 x 41	7	0.060	16	2.0	16	7	0.064	16	1.0	16	0.109	12	1.0	25
54	60 x 46	8	0.060	16	2.0	16	8	0.064	16	1.5	16	0.109	12	1.5	25
60	66 x 51	9	0.075	14	2.0	17	9	0.064	16	1.5	17	0.109	12	1.5	25
66	73 x 55	12	0.105	12	2.5	20	12	0.064	16	1.5	20	0.109	12	1.5	24
72	81 x 59	14	0.105	12	2.5	21	14	0.064	16	2.0	21	0.109	12	1.5	21
78	87 x 63	14	0.105	12	3.0	20	14	0.079	14	2.0	20	0.109	12	1.5	20
84	95 x 67	16	0.135	10	3.0	21	16	0.109	12	2.0	21	0.109	12	1.5	20
90	103 x 71	16	0.164	8	3.5	19	16	0.109	12	2.5	19	0.109	12	1.5	20
96	112 x 75	18	0.164	8	3.5	20	18	0.109	12	2.5	20	0.109	12	2.0	20
102	117 x 79						18	0.138	10	2.5	19	0.109	12	2.0	19
108	128 x 83						18	0.138	10	3.0	17	0.109	12	2.0	19
114	137 x 87						18	0.168	8	3.0	16	0.109	12	2.0	19
120	142 x 91						18					0.138	10	2.0	19

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, arch pipes with equivalent round diameter greater than 72" must be reviewed by the Geo-Environmental Section.
4. For ODOT, arch pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
5. For multiple pipe installations, see Std. Drg. RD304.
6. Heavy solid line denotes boundary between minimum cover requirements.
7. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures). See special details or Standard Drawings as called for on plans.
8. For minimum thickness, see AASHTO M197, M218, and M274.
9. Cross-sectional dimensions may vary with different materials.

CALC. BOOK NO. RD07-01

BASELINE REPORT DATE 11-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLES FOR ALUMINUM & STEEL ARCH PIPE

2015

DATE	REVISION DESCRIPTION

rd382.dgn 14-JUL-2014

RD382

rd384.dgn 14-JUL-2014

MAXIMUM FILL HEIGHT TABLES

ALUMINUM SPIRAL RIB PIPE
(HS 25-44 Live Load)

ALUM. SRP = 11½" x¾" x 1" CORRUGATION					
DIAMETER (Inches)	MINIMUM COVER (Feet)	SPECIFIED THICKNESS (Inches)			
		.060 (16 ga.)	.075 (14 ga.)	.105 (12 ga.)	.135 (10 ga.)
		MAXIMUM COVER (Feet)			
24	1.0	25	34	56	82
30	1.5	20	27	45	65
36	1.5		23	37	54
42	2.0			32	46
48	2.0			28	41
54	2.0			25	36
60	2.0				32
66	2.0				29

ALUM. SRP = 7½" x ¾" x ¾" CORRUGATION					
DIAMETER (Inches)	MINIMUM COVER (Feet)	SPECIFIED THICKNESS (Inches)			
		.060 (16 ga.)	.075 (14 ga.)	.105 (12 ga.)	.135 (10 ga.)
		MAXIMUM COVER (Feet)			
18	1.0	45	61	99	100
21	1.0	38	52	85	100
24	1.0	33	46	74	100
27	1.5	30	41	66	93
30	1.5	27	37	59	84
36	1.5		30	49	70
42	2.0			42	60
48	2.0			37	52
54	2.0			33	46
60	2.0				42
66	2.0				38

MAXIMUM FILL HEIGHT TABLES

STEEL SPIRAL RIB PIPE
(HS 25-44 Live Load)

STEEL SRP = 11½" x¾" x 1" CORRUGATION				
DIAMETER (Inches)	MINIMUM COVER (Feet)	SPECIFIED THICKNESS (Inches)		
		.064 (16 ga.)	.079 (14 ga.)	.109 (12 ga.)
		MAXIMUM COVER (Feet)		
24	1.0	50	70	100
30	1.0	40	56	94
36	1.0	33	46	79
42	1.0	28	40	67
48	1.0	25	35	59
54	1.5	22	31	52
60	1.5		28	47
66	1.5		25	43
72	1.5			39
78	2.0			36

STEEL SRP = 7½" x ¾" x ¾" CORRUGATION				
DIAMETER (Inches)	MINIMUM COVER (Feet)	SPECIFIED THICKNESS (Inches)		
		.064 (16 ga.)	.079 (14 ga.)	.109 (12 ga.)
		MAXIMUM COVER (Feet)		
24	1.0	68	95	100
30	1.0	54	76	100
36	1.0	45	63	100
42	1.0	39	54	100
48	1.0	34	47	100
54	1.5		42	100
60	1.5		38	92
66	1.5			83
72	1.5			76

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with diameters greater than 72" must be reviewed by the Geo-Environmental Section.
4. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
5. For multiple pipe installations, see Std. Drg. RD300.
6. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.
7. The use of Spiral Rib Pipe is limited to applications where both ends of the pipe run are enclosed in a structure (e.g. inlet, manhole, etc.).
8. For minimum thickness, see AASHTO M197, M218 and M274.
9. Heavy solid line denotes boundary between minimum cover requirements.

CALC. BOOK NO. RD07-01

BASELINE REPORT DATE 12-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLES FOR ALUMINUM & STEEL SPIRAL RIB PIPE

2015

DATE	REVISION DESCRIPTION

RD384

rd386.dgn 14-JUL-2014

ALLOWABLE FILL HEIGHTS FOR CIRCULAR CONCRETE PIPE

HS 25 - 44 LIVE LOAD

PIPE DIAMETER (Inches)	NONREINFORCED CONCRETE PIPE				REINFORCED PIPE					
	CLASS 2		CLASS 3		CLASS III		CLASS IV		CLASS V	
	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)
4	2.0	19	2.0	23						
6	2.0	20	2.0	24						
8	2.0	21	2.0	23						
10	2.0	20	2.0	24						
12	2.0	22	2.0	24	1.5	17	1.0	27	0.5	41
15	2.0	25	2.0	28	1.5	18	1.0	27	0.5	42
18	2.0	29	2.0	31	1.5	18	1.0	27	0.5	42
21	2.0	31	2.0	35	1.5	17	1.0	27	0.5	42
24	2.0	32	2.0	39	1.5	17	1.0	27	0.5	42
27	2.0	34	2.0	41	1.5	17	1.0	27	0.5	41
30	2.0	37	2.0	41	1.5	17	1.0	27	0.5	41
33	2.0	38	2.0	43	1.5	17	1.0	27	0.5	41
36	2.0	39	2.0	44	1.5	17	1.0	26	0.5	41
42					1.5	17	1.0	26	0.5	41
48					1.5	16	1.0	26	0.5	41
54					1.5	16	1.0	26		
60					1.5	16	1.0	26		
66					1.5	16	1.0	26		
72					1.5	16	1.0	25		

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with diameters greater than 72" must be reviewed by the Geo-Environmental Section.
4. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
5. For multiple pipe installations, see Std. Drg. RD300.
6. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. RD07-02

BASELINE REPORT DATE 12-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLE FOR CIRCULAR CONCRETE PIPE

2015

DATE	REVISION DESCRIPTION

RD386

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	2.0	40	ASTM D 3034 SDR35 (46 psi stiffness)
6	2.0	40	
8	2.0	40	
10	2.0	40	
12	2.0	40	
15	2.0	40	
18	2.0	40	ASTM F 679 (46 psi stiffness)
21	2.0	40	
24	2.0	40	
27	2.0	40	
30	2.0	40	
33	2.0	40	
36	2.0	40	
42	2.0	40	
48	2.0	40	

PIPE	PROFILE WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	2.0	40	ASTM F 794 Series 46 (46 psi stiffness)
6	2.0	40	
8	2.0	40	
10	2.0	40	
12	2.0	40	
15	2.0	40	
18	2.0	40	
21	2.0	40	
24	2.0	40	
27	2.0	40	
30	2.0	40	
33	2.0	40	
36	2.0	40	
39	2.0	40	
42	2.0	40	
45	2.0	40	
48	2.0	40	

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
4. For multiple pipe installations, see Std. Drg. RD300.
5. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	2.0	41	AWWA C905 DR 32.5 (57 psi stiffness)
16	2.0	41	
18	2.0	41	
20	2.0	41	
24	2.0	41	
30	2.0	41	
36	2.0	41	
42	2.0	41	
48	2.0	41	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	46	AWWA C905 DR 26 (115 psi stiffness)
16	1.0	46	
18	1.0	46	
20	1.0	46	
24	1.0	46	
30	1.0	46	
36	1.0	46	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	48	AWWA C905 DR 25 (129 psi stiffness)
16	1.0	48	
18	1.0	48	
20	1.0	48	
24	1.0	48	
30	1.0	48	
36	1.0	48	
42	1.0	48	
48	1.0	48	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	61	AWWA C905 DR 21 (224 psi stiffness)
16	1.0	61	
18	1.0	61	
20	1.0	61	
24	1.0	61	
30	1.0	61	
36	1.0	61	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	48	AWWA C900 DR 25 (129 psi stiffness)
6	1.0	48	
8	1.0	48	
10	1.0	48	
12	1.0	48	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	69	AWWA C900 DR 18 (364 psi stiffness)
6	1.0	69	
8	1.0	69	
10	1.0	69	
12	1.0	69	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	109	AWWA C900 DR 14 (814 psi stiffness)
6	1.0	109	
8	1.0	109	
10	1.0	109	
12	1.0	109	

CALC. BOOK NO. RD11-02

BASELINE REPORT DATE 13-JUN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLES FOR PVC PIPE

2015

DATE	REVISION DESCRIPTION

rd388.dgn 14-JUL-2014

RD388

Effective Date: February 1, 2015 - May 31, 2015

PIPE	CORRUGATED HDPE	
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)
12	2.0	29
15	2.0	30
18	2.0	27
24	2.0	24
30	2.0	21
36	2.0	23
42	2.0	22
48	2.0	22
60	2.5	21

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
4. For multiple pipe installations, see Std. Drg. RD300.
5. Heavy solid line denotes boundary between minimum cover requirements.
6. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. RD07-02

BASELINE REPORT DATE 13-JUL-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLE FOR CORRUGATED HDPE PIPE

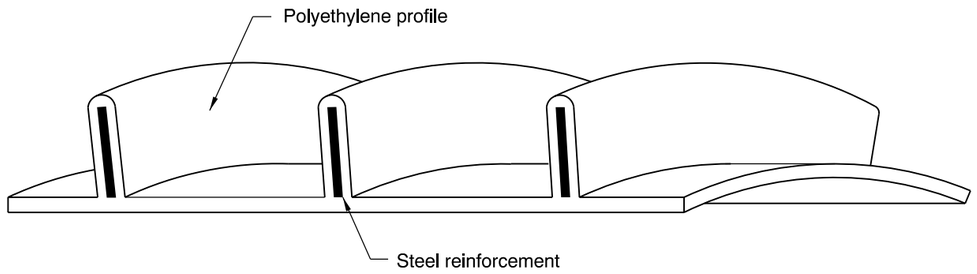
2015

DATE	REVISION DESCRIPTION

rd390.dgn 14-JUL-2014

RD390

PIPE	STEEL REINFORCED HDPE	
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)
30	1.0	50
36	1.0	50
42	1.0	50
48	1.0	30
60	1.0	30
66	1.5	30
72	1.5	30



STEEL REINFORCED THERMOPLASTIC RIBBED PIPE PROFILE

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with maximum cover greater than those shown in the Table shall be approved by the Senior Standards Engineer.
4. For multiple pipe installations, see Std. Drg. RD300.
5. Heavy solid line denotes boundary between minimum cover requirements.
6. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13-JAN-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLE FOR STEEL REINFORCED HDPE PIPE

2015

DATE	REVISION DESCRIPTION

rd391.dgn 14-JUL-2014

RD391

PIPE	DUAL WALL POLYPROPYLENE		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
12	1.0	28	ASTM F 2736
15	1.0	30	
18	1.0	26	
24	1.0	22	
30	1.0	22	

PIPE	TRIPLE WALL POLYPROPYLENE		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
30	1.0	22	ASTM F 2764
36	1.0	19	
48	1.0	16	
60	2.0	22	

GENERAL NOTES FOR ALL TABLES:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
4. For multiple pipe installations, see Std. Drg. RD300.
5. Heavy solid line denotes boundary between minimum cover requirements.
6. Open ends of pipes normally require a site specific design, and may require special treatment (sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
   See special details or Standard Drawings as called for on plans.

CALC. BOOK NO. RD11-01

BASELINE REPORT DATE 09-JUN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLES FOR POLYPROPYLENE PIPE

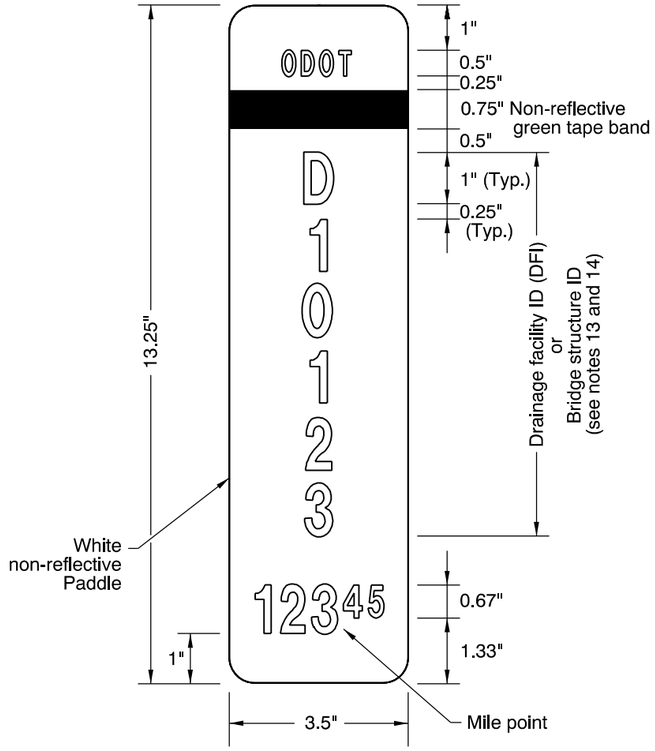
2015

DATE	REVISION DESCRIPTION

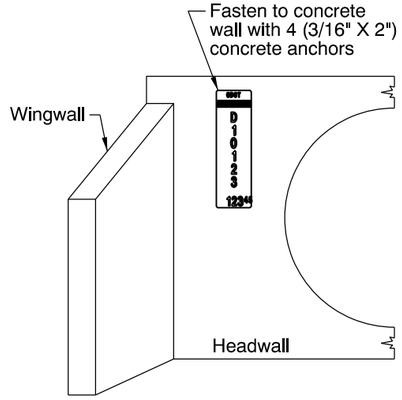
rd393.dgn 14-JUL-2014

RD393

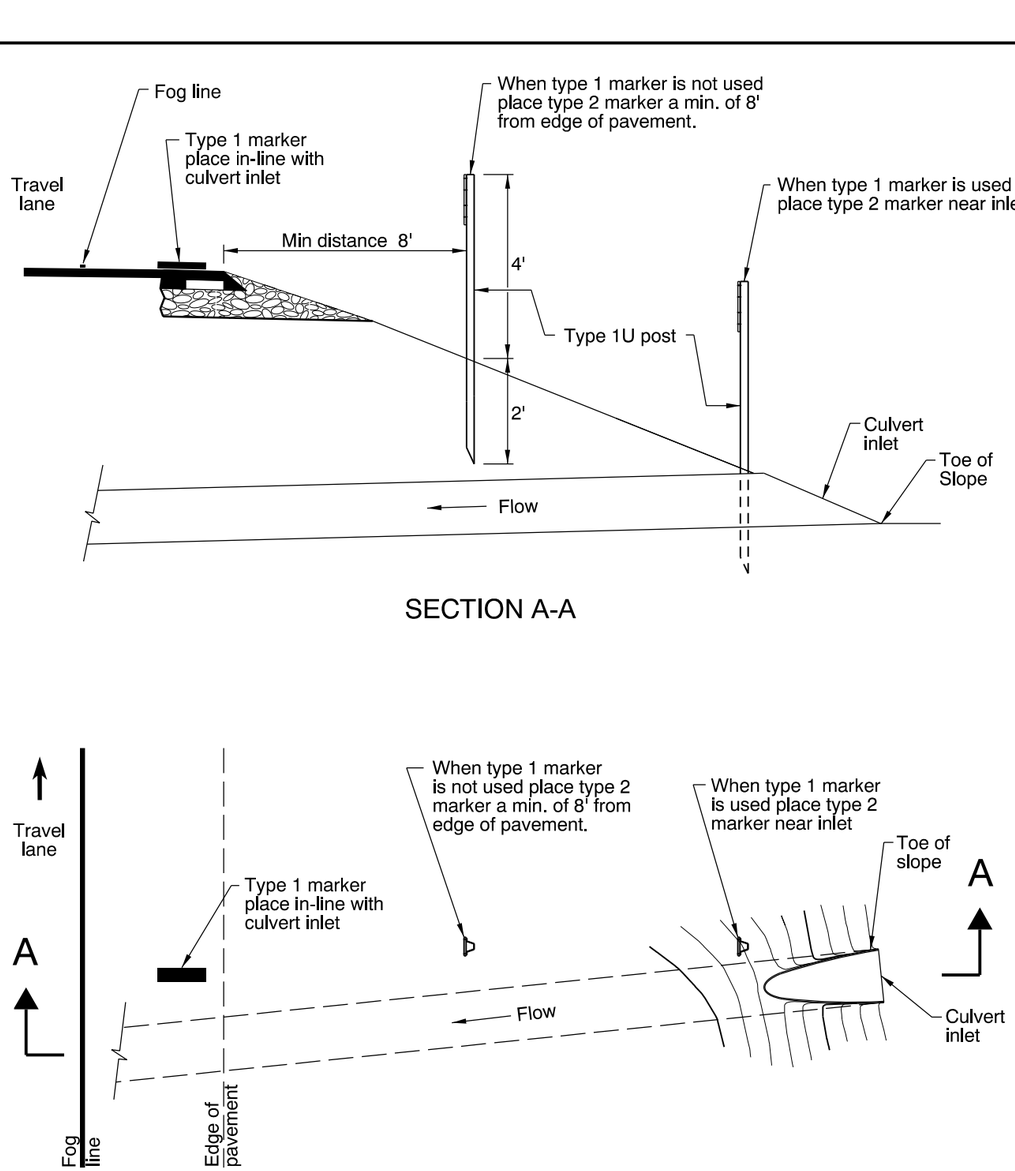
SECTION A-A



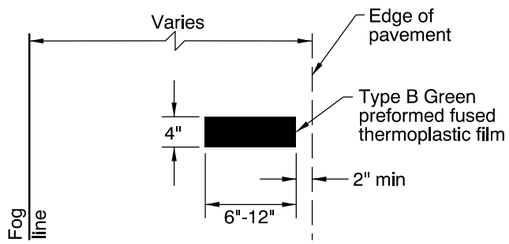
TYPE 2 MARKER



CONCRETE HEADWALL INSTALLATION



TYPE 1 & 2 MARKERS INSTALLATION DETAIL



TYPE 1 MARKER

WOOD POST GUARDRAIL INSTALLATION

NOTES:

1. See Standard Drawing TM 570 for Target detail and notes for paddle.
2. See Standard Drawing TM 570 for 'Steel Posts' detail for mounting to Type 1U steel post.
3. See Standard Drawing TM571 for Type 1U steel post dimensions and details.
4. Letters and numbers are type C font in non-reflectorized black.
5. Do not mount paddle to any other highway signing post.
6. Place Type 1 marker on inlet edge of the pavement directly in line with the inlet.
7. Do not place Type 1 marker over fog line or in the travel lane.
8. Install Type 2 culvert markers parallel to travel lane.
9. Place Type 2 culvert markers so they are not noticed or conspicuous to traffic.
10. Where three or more culverts are within 50' of each other place Type 1 marker or Type 2 marker at the first culvert and the last culvert only.
11. On non-divided highways place markers only at the culvert inlet side of highway.
12. On divided highways placing markers on the outlet side is optional.
13. Drainage Facility ID: Place the assigned DFI number on the Type 2 marker when the culvert span is less than 6 feet. Example D10123.
14. Bridge Structure ID: Place the assigned five or six digit number on the Type 2 marker when the culvert has a span between 6 feet and 20 feet. Example 01234 or 01234A.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CULVERT ID MARKER

2015

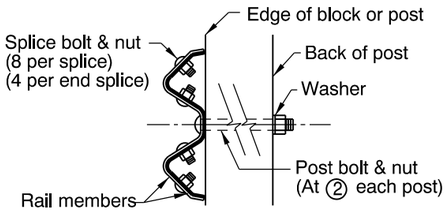
DATE	REVISION DESCRIPTION

rd398.dgn 01-10-2013

RD398

14-JUL-2014

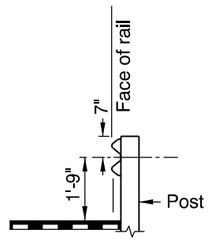
rd400.dgn



1. When required by the plans, post bolts to extend beyond the tightened nuts within limits of ¼" to ½".
2. When steel posts are used see "APPURTENANCES" for modified bolt detail, Std. Drg. RD415.
3. All post bolt threads to be set after assembly for wrench removal only.

FITTINGS

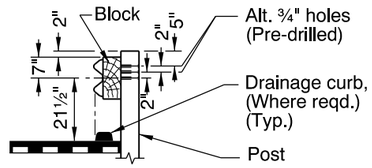
NOTES:
1. Rail height measured from final paved surface at face of rail (Typ. all types).
2. Final paved surfacing to extend to face of post.
3. Drainage curb alignment same as face of guardrail.



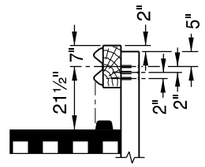
TYPE 1

(Use restricted to non-roadway applications)

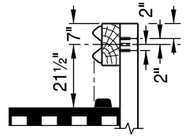
GUARDRAIL



INITIAL INSTALLATION



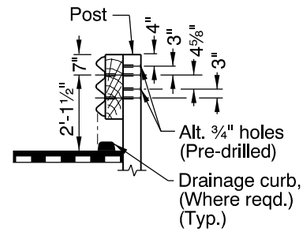
FUTURE ADJUSTMENT



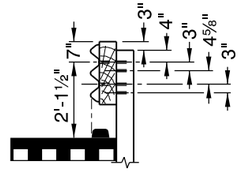
ALTERNATE
INITIAL INSTALLATION
OR FUTURE ADJUSTMENT

TYPES 2A & 3

(See General Note 3)
(For Type 3 use double thickness (2) rail elements)



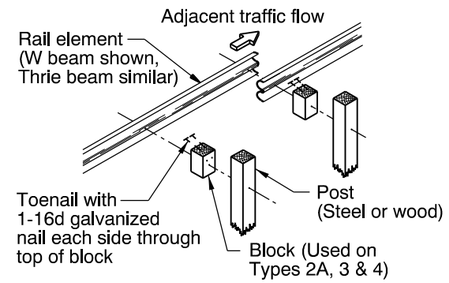
INITIAL INSTALLATION



RAIL AFTER OVERLAY
(Adjust as shown)

TYPE 4

ASSEMBLY DETAILS



RELATION OF PARTS

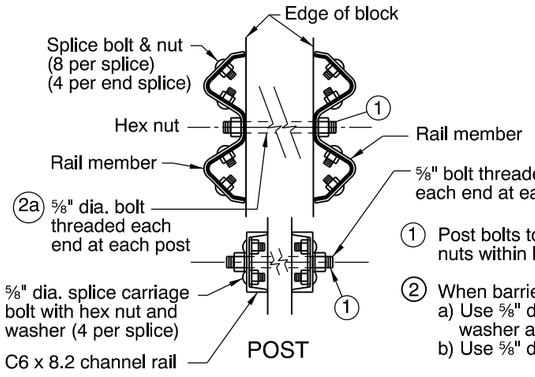
TABLE OF POST SPACING				
TYPE	1	2A	3	4
SPACING	12'-6"	6'-3"	3'-1½"	6'-3"

NORMAL RAIL ELEMENT DATA			
Type	Rail	Effective Lengths	Thkn. *
1, 2A, 3	W beam	6.25', 12.5', 25'	0.105" & 0.135"
4	Thrie beam	6.25', 12.5', 25'	0.105" & 0.135"

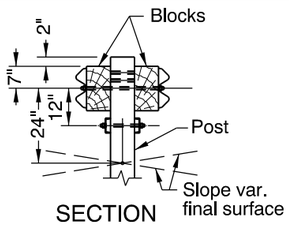
* Base metal thkn. nom. (Before galv.)

METAL MEDIAN BARRIER

NOTE:
Median barrier post spacing 6'-3".
See end construction for variations.



POST

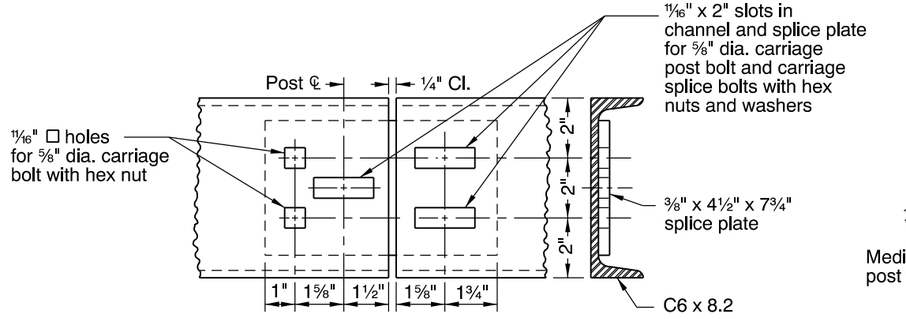


SECTION
(See "Guardrail" details and general note 3)

① Post bolts to extend beyond the tightened nuts within limits of ¼" to ½".

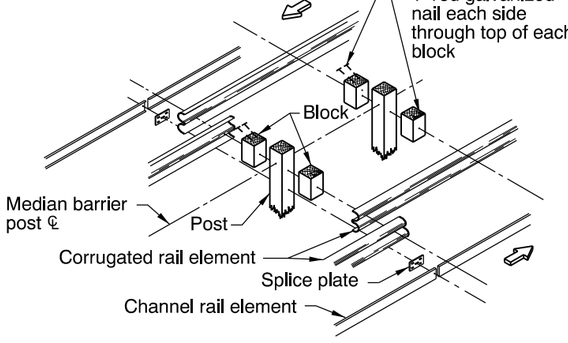
② When barrier separates to double post mounting:
a) Use ⅝" dia. button or alternate bolt with washer and hex nut.
b) Use ⅝" dia. carriage bolt with washer and nut.

CHANNEL RAIL AND SPLICE PLATE
(METAL MEDIAN BARRIER)



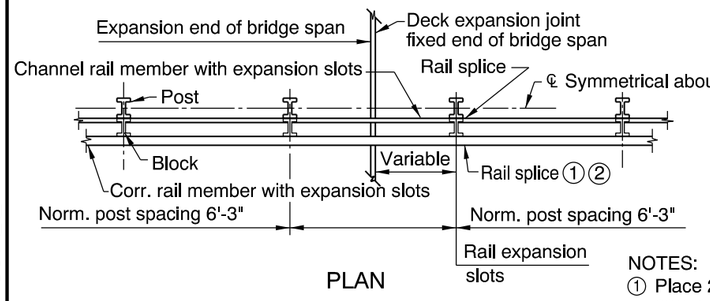
NOTE:
Clearance to be 1⅞" at rail splice for bridge expansion joints.

ASSEMBLY DETAILS

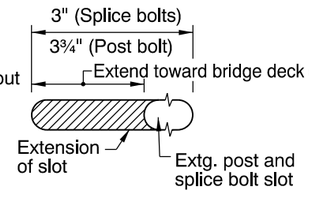


RELATION OF PARTS

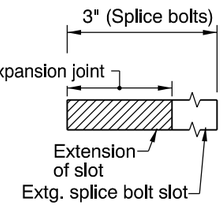
METAL MEDIAN BARRIER/SHOULDER GUARDRAIL INSTALLATION AT BRIDGE DECK EXPANSION JOINT



PLAN



CORRUGATED RAIL



CHANNEL RAIL AND SPLICE PLATE

NOTES:
① Place 2 - 1/32" polytetrafluoroethylene (TFE) sheets between corrugated rail members. The sheets shall be 12½" x 1'-7".

② Adjust nuts to provide a sliding fit and set threads to prevent loosening.

GENERAL NOTES FOR ALL DETAILS:

1. For details of parts, see Std. Drgs. RD405, RD410 & RD415.
2. For details of guardrail installation, see Std. Drgs. RD420, RD425, RD430, RD435 & RD440.
3. Use "Alternate Initial Installation", at bridge ends (See Std. Drg. RD440), adjacent to P.C.C. pvmt., for temporary guardrail, to match existing guardrail, for Type 1 rail or as directed.
4. See Std. Drg. RD701 for drainage curbs, where required.
5. Lap guardrail in direction of adjacent traffic.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13-JAN-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

GUARDRAIL AND METAL MEDIAN BARRIER

2015

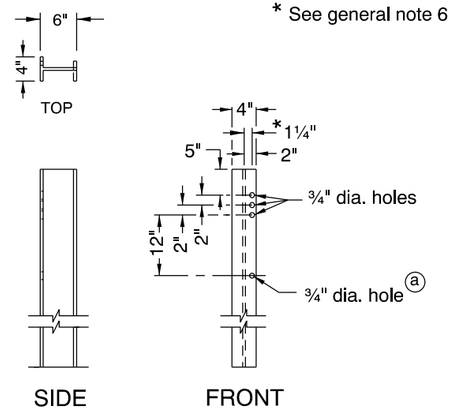
DATE	REVISION DESCRIPTION

RD400

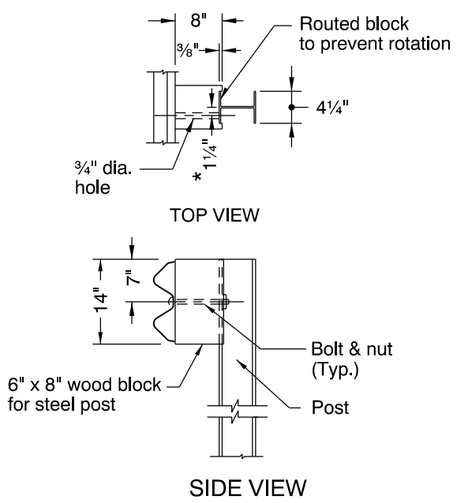
Effective Date: February 1, 2015 - May 31, 2015

POSTS

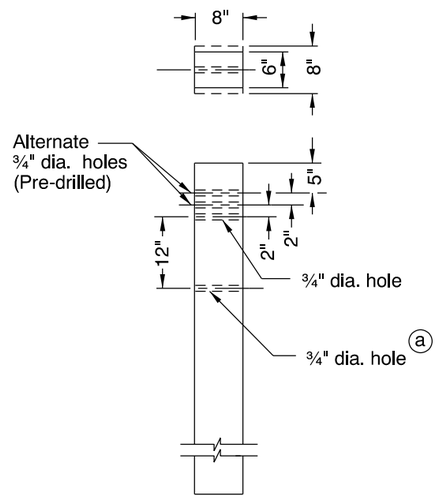
STEEL



TYPE 2A, 3 OR METAL MEDIAN BARRIER

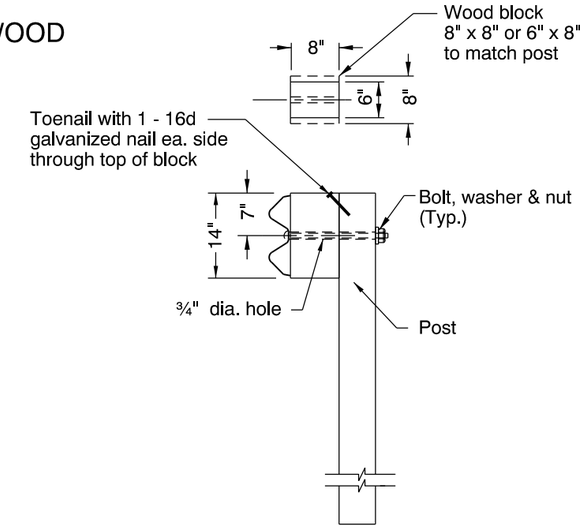


TYPE 2A, 3 OR METAL MEDIAN BARRIER
WOOD BLOCK FOR STEEL POST

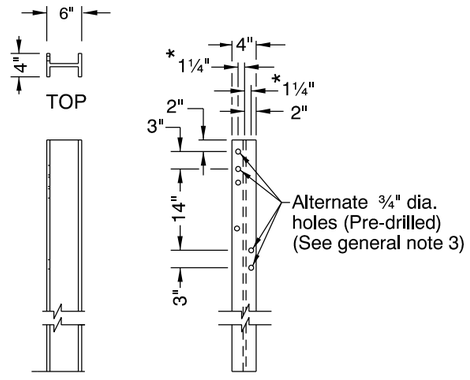


TYPE 1, 2A, 3 OR
METAL MEDIAN BARRIER

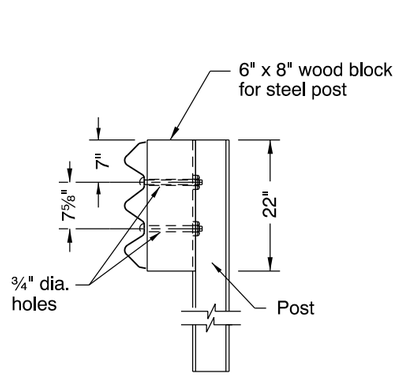
WOOD



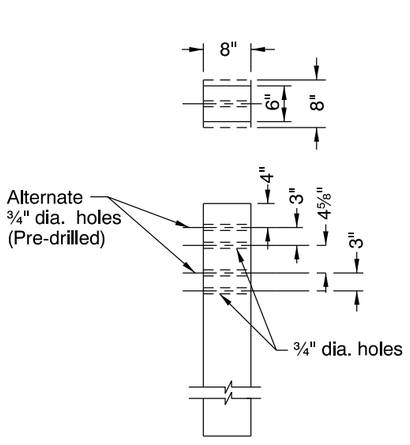
TYPE 2A, 3 OR
METAL MEDIAN BARRIER



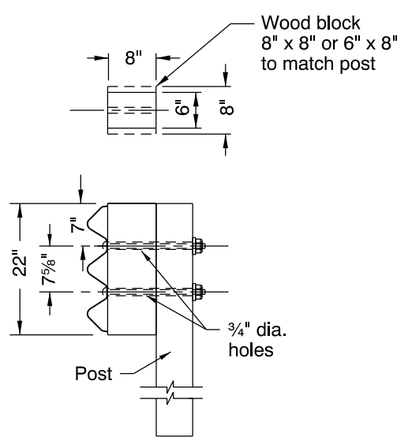
TYPE 4 OR TYPE 4 (TRANSITION) POST



TYPE 4 OR TYPE 4 (TRANSITION) BLOCK
(Routing not required)



TYPE 4 OR TYPE 4 (TRANSITION)
POST



TYPE 4 OR TYPE 4 (TRANSITION) BLOCK

ⓐ Lowest hole(s) required only where channel rail is to be installed. Drill 12" below top ¾" hole(s) used. (See general note 4)

GUARDRAIL POST TABLE				
GUARDRAIL TYPE	POST SIZE		POST LENGTH	
	WOOD	STEEL *	WOOD	STEEL
1	6" x 8" or 8" x 8"	—	6'-0"	—
2A	6" x 8" or 8" x 8"	W6 x 9	6'-0"	6'-6"
3	8" x 8"	W6 x 9	6'-0"	6'-6"
Metal median barrier	8" x 8"	W6 x 9	6' 6"	6'-6"
4	6" x 8" or 8" x 8"	W6 x 9	7'-0"	7'-0"
4 (Transition)	8" x 8"	W6 x 9	6'-0"	6'-9"

GENERAL NOTES FOR ALL DETAILS:

1. See Std. Drg. RD400 for alternate hole useage requirements.
2. For assembly, installation, and appurtenance details, see Std. Drgs. RD400, RD410, RD415, RD420, RD425, RD430, RD435, RD440.
3. See Bridge Drgs. for bridge transition guardrail post & block requirements. Multiple holes are not required in bridge transition rail posts.
4. Posts and blocks to be pre-drilled for the intended guardrail installation.
5. Post and block dimensions are nominal.
6. Steel posts are shifted to accomodate bolt holes.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13-JAN-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

GUARDRAIL AND METAL MEDIAN BARRIER PARTS

2015

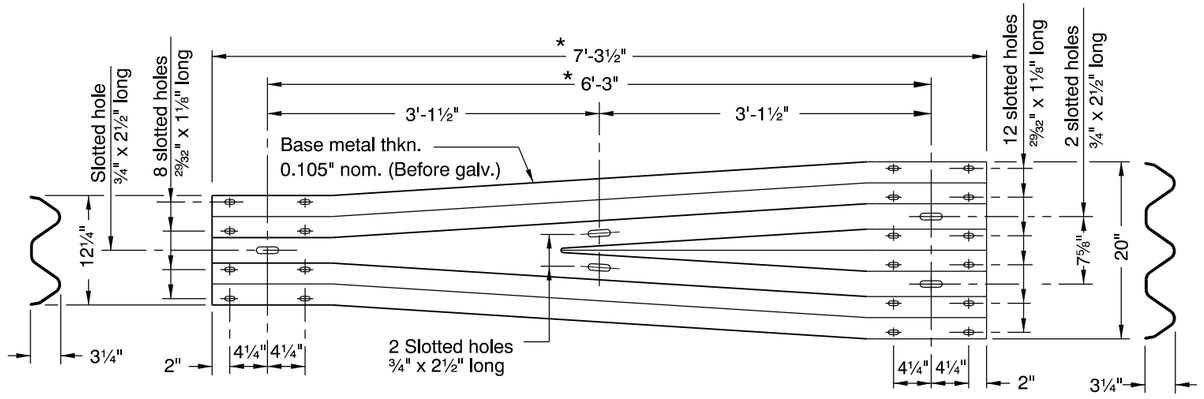
DATE	REVISION DESCRIPTION

rd405.dgn 14-JUL-2014

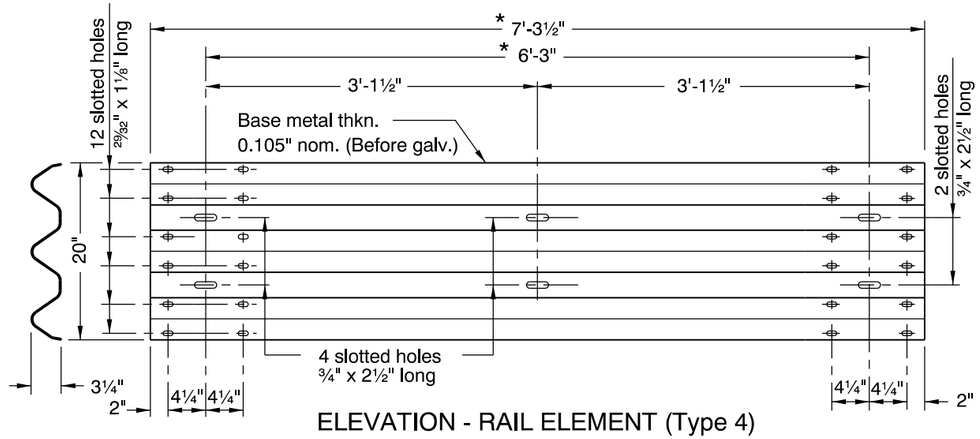
RD405

Effective Date: February 1, 2015 - May 31, 2015

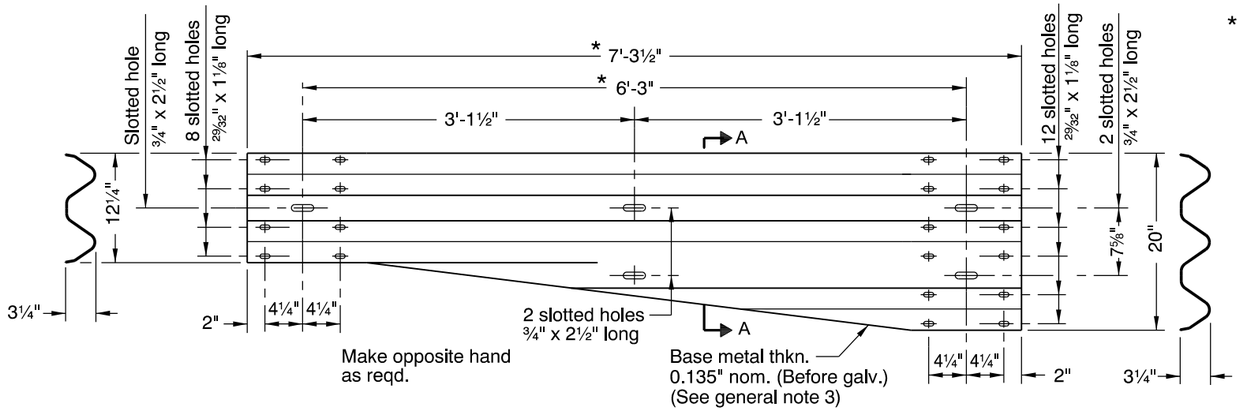
rd410.dgn 14-JUL-2014



ELEVATION - SYMMETRICAL TRANSITION ELEMENT

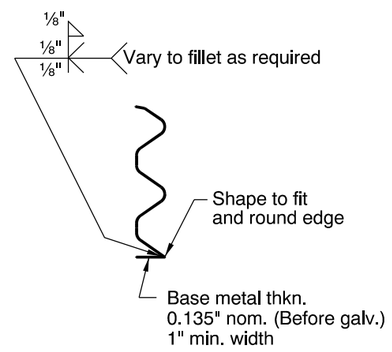


ELEVATION - RAIL ELEMENT (Type 4)

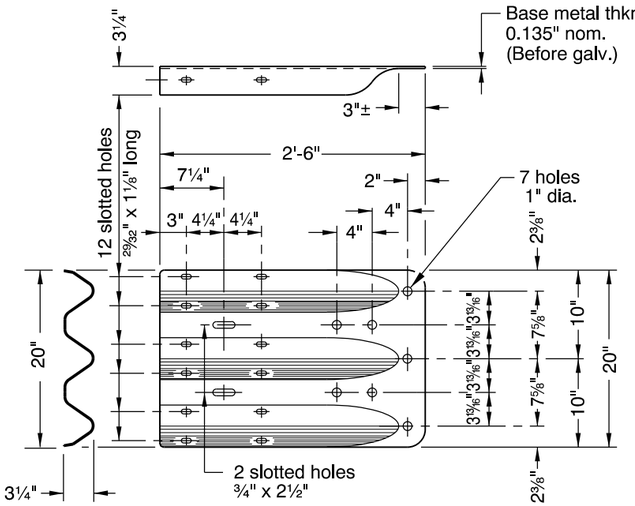


ELEVATION - ASYMMETRICAL TRANSITION ELEMENT

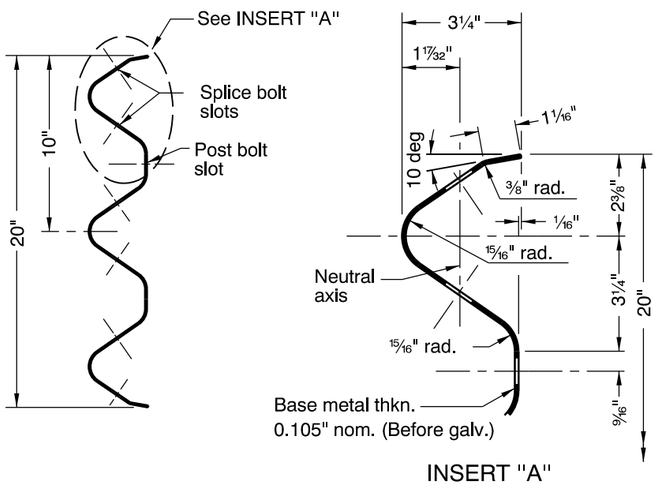
* See general note 5



SECTION A-A

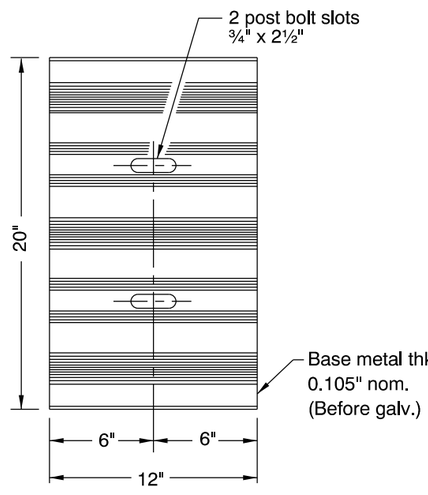


TERMINAL CONNECTOR



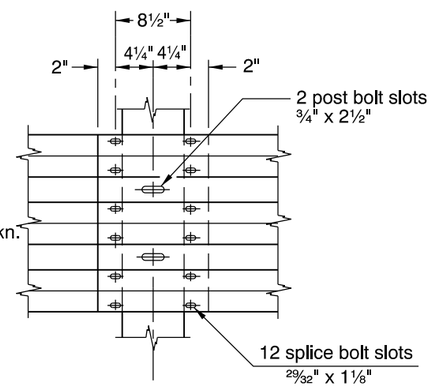
SECTION THRU RAIL ELEMENT

INSERT "A"



THRIE BEAM BACK-UP PLATE

For detail not shown, see "Section Thru Rail Element"



BEAM SPLICE

GENERAL NOTES FOR ALL DETAILS:

1. For bolt and washer details, see Std. Drg. RD415.
2. For installation details, see Std. Drgs. RD400 & RD405.
3. For locations, see Std. Drgs. BR233 & BR286.
4. Lap guardrail in direction of adjacent traffic.
5. For additional rail element data, see Std. Drg. RD400.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13-JAN-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

GUARDRAIL PARTS (THRIE BEAM)

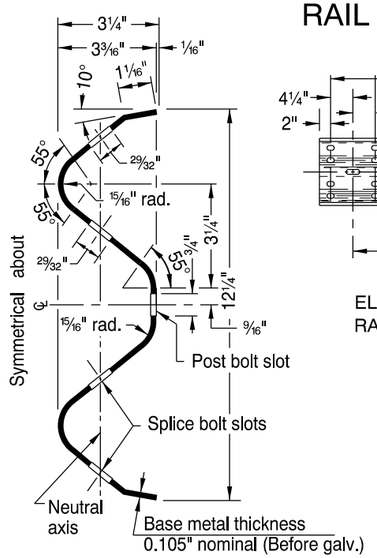
2015

DATE	REVISION DESCRIPTION

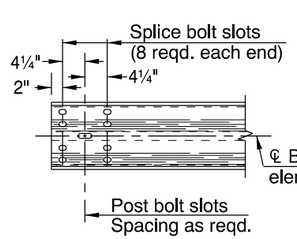
RD410

rd415.dgn 14-JUL-2014

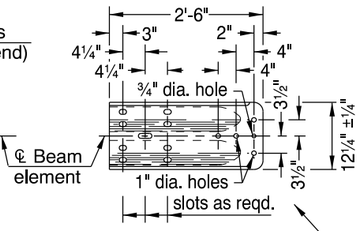
RAIL MEMBERS



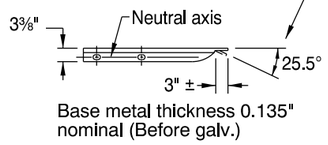
SECTION THRU RAIL ELEMENT



ELEVATION OF
RAIL ELEMENT



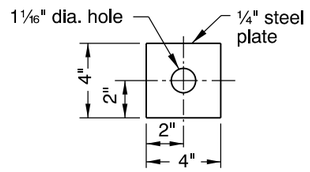
25.5° bend and hole reqd. only for use with alternate Type "C" end piece.



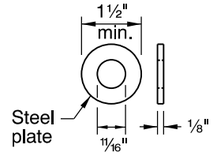
Base metal thickness 0.135"
nominal (Before galv.)

TERMINAL CONNECTOR

APPURTENANCES

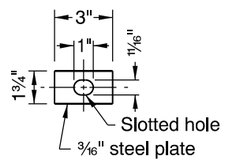


SNOW LOAD (OPTIONAL)
(In area of heavy snow,
as directed by the engineer)



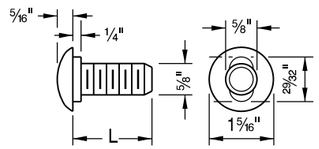
PLAIN ③

USE ON BACK OF POST



RECTANGULAR

USE ON RAIL ELEMENT FACE
ON TYPE C END PIECE ④

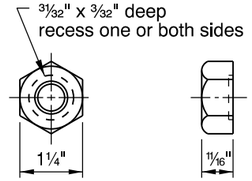


ALTERNATIVE No. 1

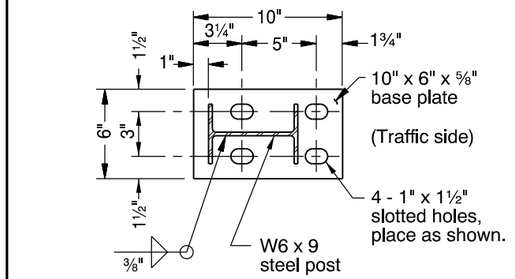
ALTERNATIVE NO. 2

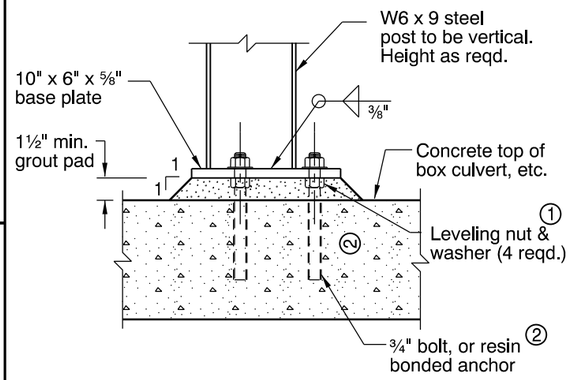
WASHERS

L (in.)	Thread Length
1¼	Full length
2	1½" min.
9½	2" min.
18	3½" min.
25	3" min.



POST OR SPLICE BOLT AND NUT

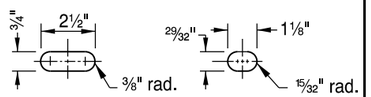




BASE PLATE DETAILS
(For additional details, see Std. Drg. BR266)
(Use when depth of cover is less
than normal for post installation.)

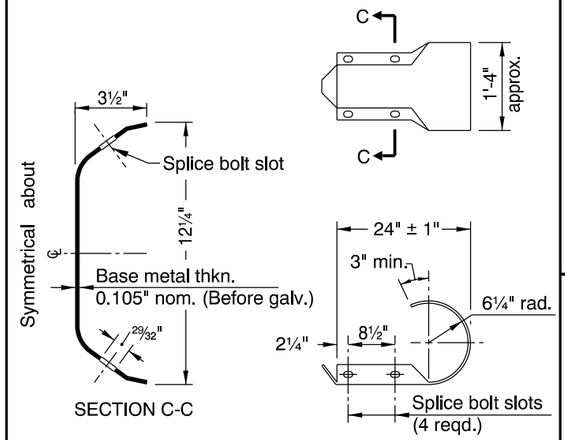
NOTES:

1. For guardrail installed on radii of 150' or less (5' min. radius) use rail elements pre-curved to industry standard. Install "Radius Identification Plate" (See detail right).
2. Effective length of rail sections shall be 12'-6".



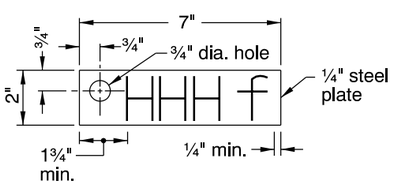
POST BOLT SLOT

SPLICE BOLT SLOT

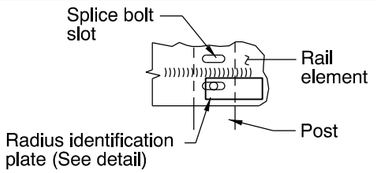


SECTION C-C

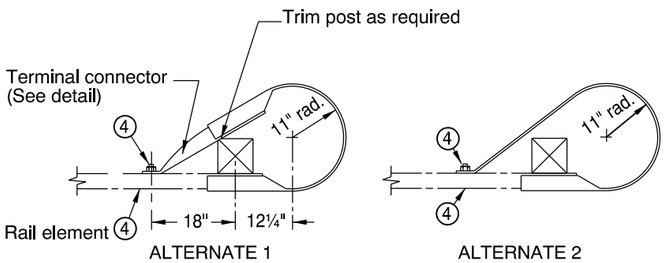
TYPE B END PIECE



RADIUS IDENTIFICATION PLATE
(See general note 4)

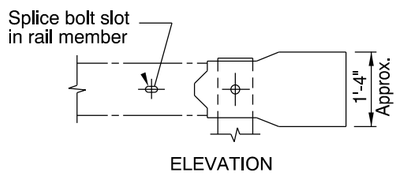


RADIUS IDENTIFICATION PLATE
MOUNTING DETAIL
(See general note 5)



ALTERNATE 1

ALTERNATE 2



ELEVATION

TYPE C END PIECE
(For details not shown, see Type B End Piece)

NOTES:

① Furnished & installed by structure contractor when shown on structure plans.

② 6" min. penetration into concrete slabs other than bridge decks. Cast in place or core and install using approved resin bonding system.

③ Not required if "Snow Load" washer option is used.

④ Use rectangular washer under bolt head and nut on Type C End Piece as shown.

GENERAL NOTES FOR ALL DETAILS:

1. For assembly and installation details, see Std. Drgs. RD400, RD405, RD420, RD425, RD430, RD435 & RD440.
2. For details of guardrail connections to structural handrails, see special details or Standard Drawings as called for on plans.
3. All indicated welds shall attain the full strength of the section welded.
4. Radius dimensions, in feet to the nearest 0.5 foot, shall be placed on the plate with a raised weld bead replacing the letters "HHH", shown on the Radius Identification Plate detail. Digits shall be 1½" min. height and ¾" max. width. Plate shall be galvanized after placement of digits.
5. The guardrail radius identification plate is to be mounted on the back side of the rail element with the lowest splice bolt nearest the P.C. of the guardrail radius.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JAN-2010

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

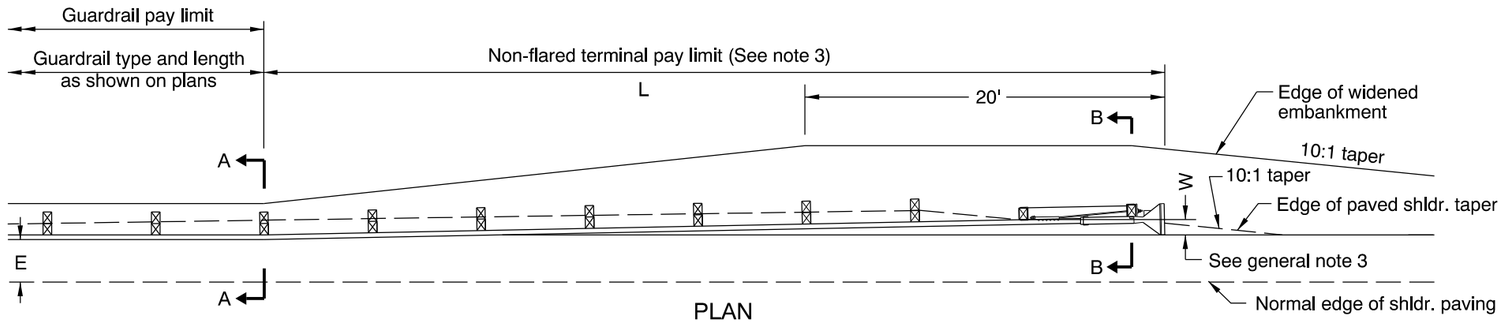
OREGON STANDARD DRAWINGS

GUARDRAIL AND METAL MEDIAN BARRIER PARTS

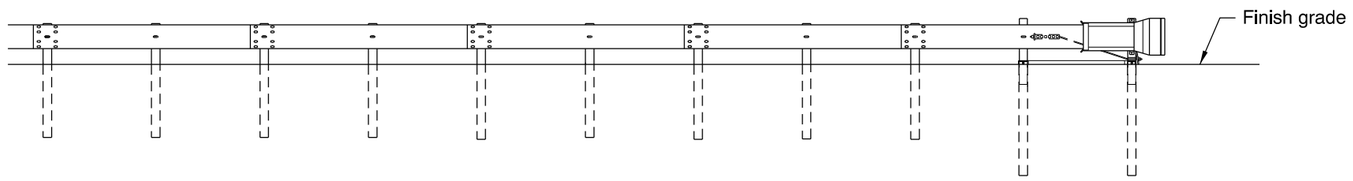
2015

DATE	REVISION DESCRIPTION

RD415



PLAN

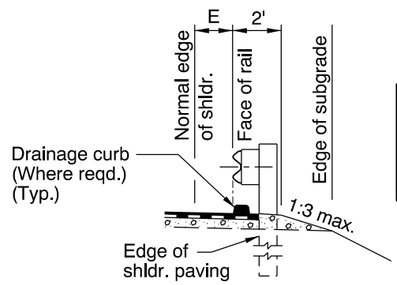


ELEVATION

NON-FLARED OPTION

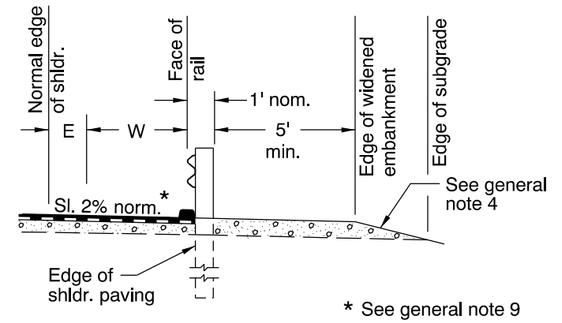
TEST LEVEL	L (ft)	W (ft)
2 (≤ 45 mph)	25	1 to 2 **
3 (> 45 mph)	37.5 or 50	1 to 2 **

** See general note 3



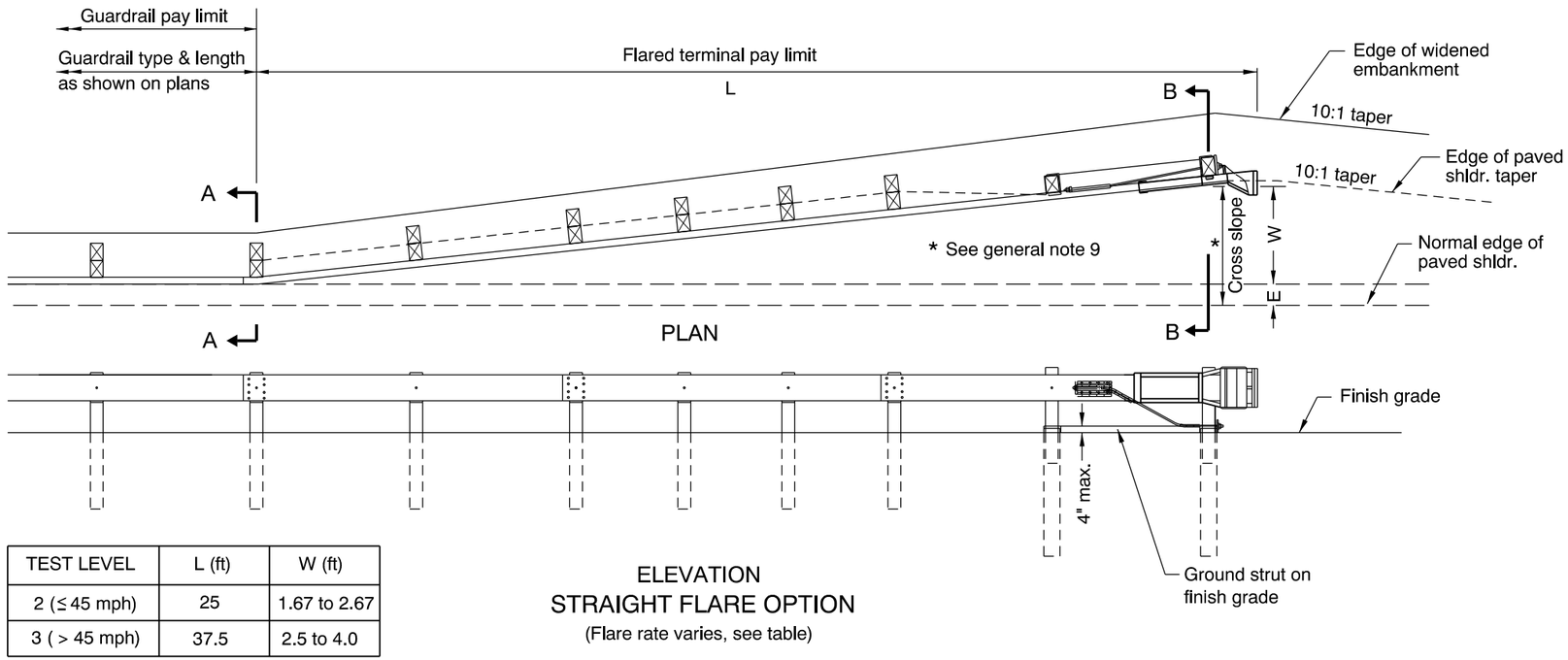
SECTION A-A

NOTES:
1. E=2', where shown on plans.
2. Drainage curb alignment same as face of guardrail.



* See general note 9

SECTION B-B



PLAN

ELEVATION

STRAIGHT FLARE OPTION

(Flare rate varies, see table)

TEST LEVEL	L (ft)	W (ft)
2 (≤ 45 mph)	25	1.67 to 2.67
3 (> 45 mph)	37.5	2.5 to 4.0

GENERAL NOTES FOR ALL DETAILS:

1. For details not shown, see Std. Drgs. RD400, RD405, RD410, RD415 & RD435.
2. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shldr. on both ends of guardrail runs is required.
3. Non-flared terminal shall be installed with a min. 1-foot offset ensuring that the end piece is entirely off normal shldr.
4. 1:4 slope or flatter preferable, 1:3 max.
5. Provide terminal from ODOT's QPL. Install according to manufacturer's recommendations. Provide Shop Drawings to Engineer.
6. Install fixed object marker on head of every terminal with "W" 4 feet or less.
7. "W" distance is measured to face of guardrail at end post, exclusive of end piece.
8. See Std. Drg. RD701 for drainage curbs, where required.
9. Cross slope to match adjacent roadway cross slope (preferred). If required, maximum shoulder slope 10% for guardrail widening. If required, maximum grade break at normal edge of shoulder 8%.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 10-JAN-2012

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

ENERGY ABSORBING TERMINAL

2015

DATE	REVISION DESCRIPTION

rd420.dgn 14-JUL-2014

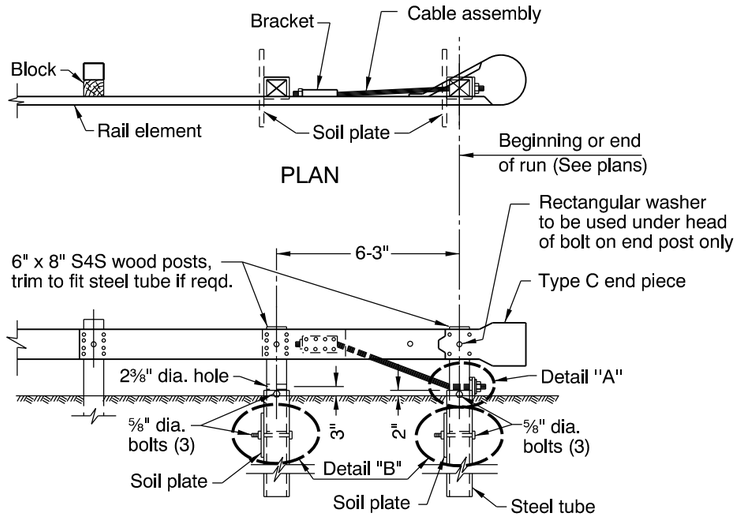
RD420

Effective Date: February 1, 2015 - May 31, 2015

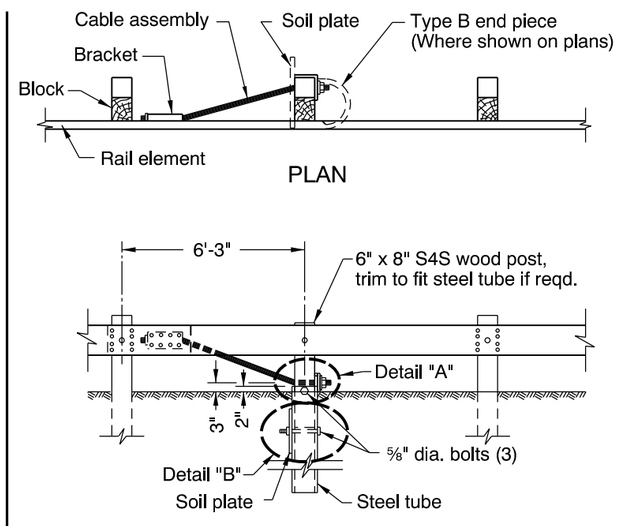
ANCHORS (Steel)

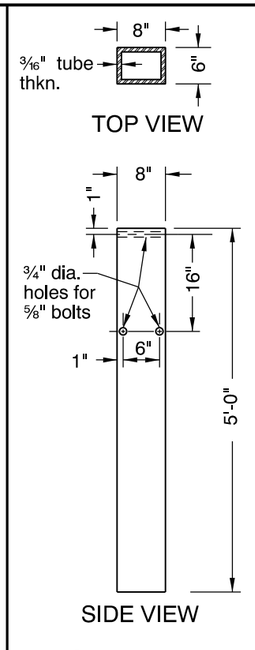
(Where shown on plans)

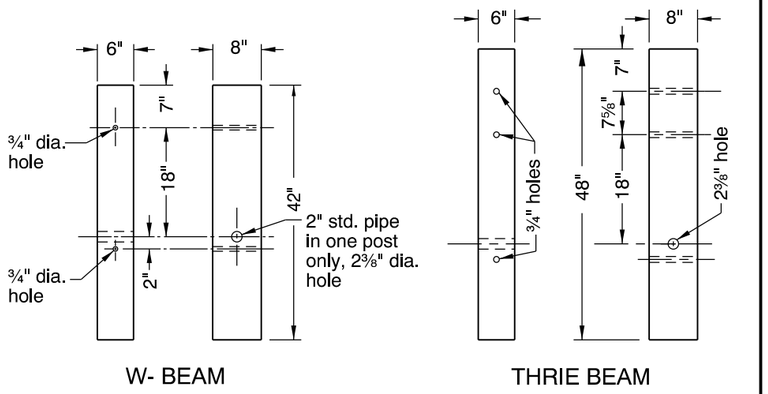
TYPE 1



TYPE 1 MODIFIED

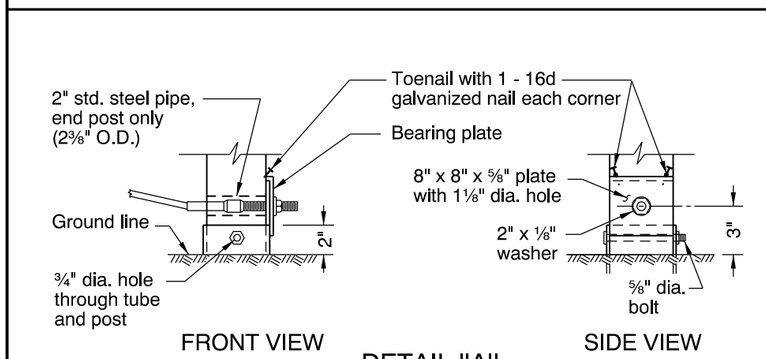




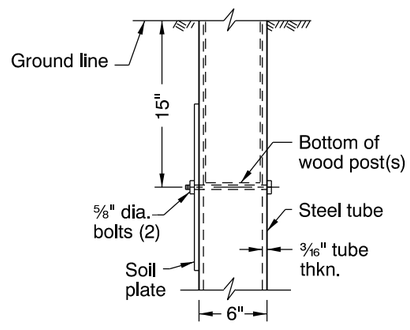


WOOD BREAKAWAY POSTS

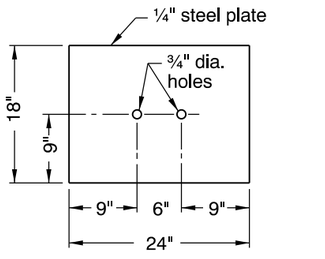
(6" x 8" posts only)



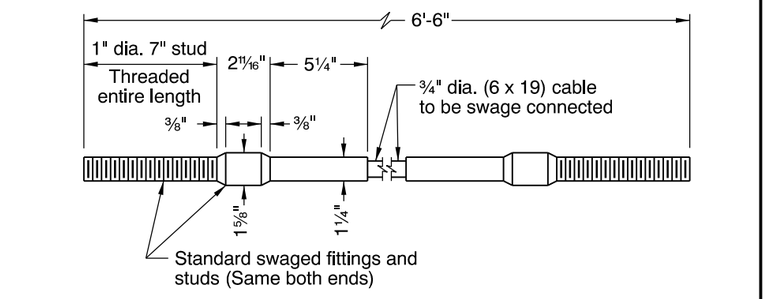
DETAIL "A''



DETAIL "B''



SOIL PLATE



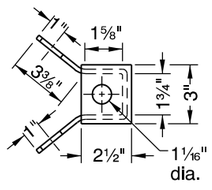
CABLE ASSEMBLY

GENERAL NOTES FOR ALL DETAILS:

1. (a.) Cable assembly to be tightened to a taut condition on initial installation.

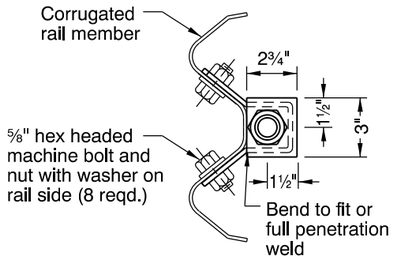
   (b.) Final tension check and tightening of cable assembly as required to be done 30 days following initial installation.

2. See Std. Drgs. RD400 & RD405 for details not shown.



END VIEW

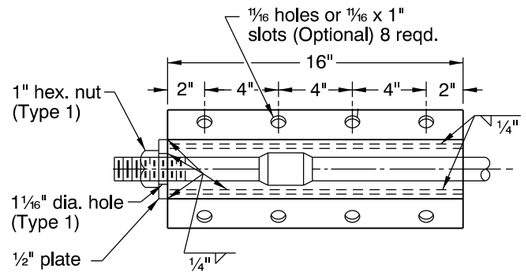
Alternate No. 1



END VIEW

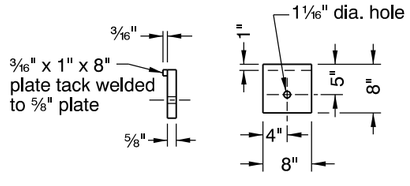
Alternate No. 2

BRACKET



BACK VIEW

NOTE:
All plate for bracket to be ¼" thick steel, unless otherwise noted.



BEARING PLATE

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13-JAN-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

GUARDRAIL ANCHORS (STEEL)

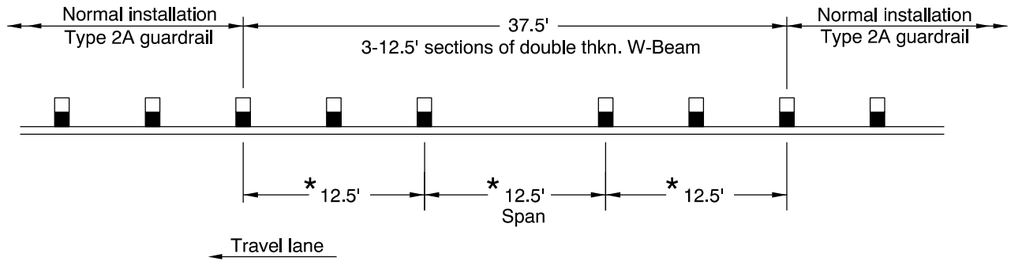
2015

DATE	REVISION DESCRIPTION

rd450.dgn 14-JUL-2014

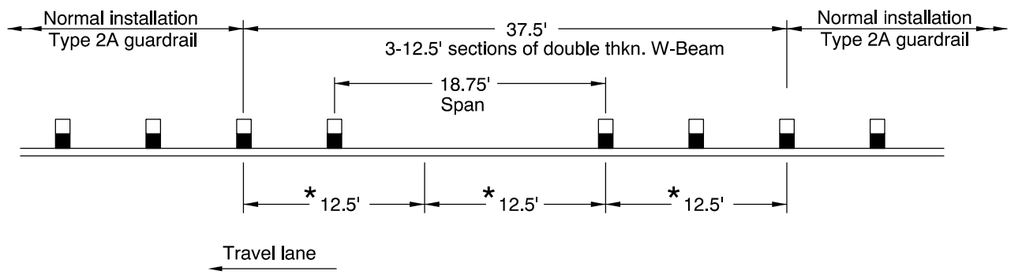
RD450

Effective Date: February 1, 2015 - May 31, 2015



Modified Type 2A Guardrail
DETAIL "A"
12.5' span

* = Double thkn. (2 rail elements)



Modified Type 2A Guardrail
DETAIL "B"
18.75' span

GENERAL NOTES FOR ALL DETAILS:

1. See Std. Drgs. RD400 & RD405 for details not shown.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JAN-2010

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

GUARDRAIL OVER LOW-FILL CULVERTS

2015

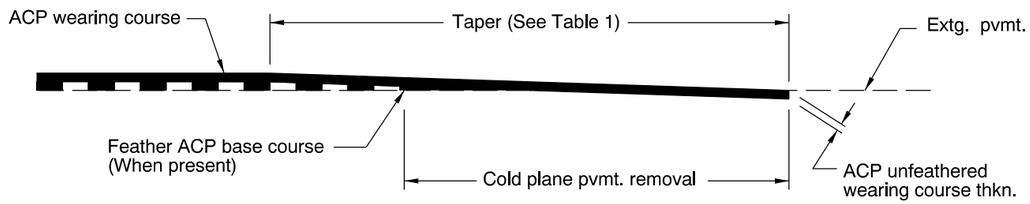
DATE	REVISION DESCRIPTION

rd470.dgn 14-JUL-2014

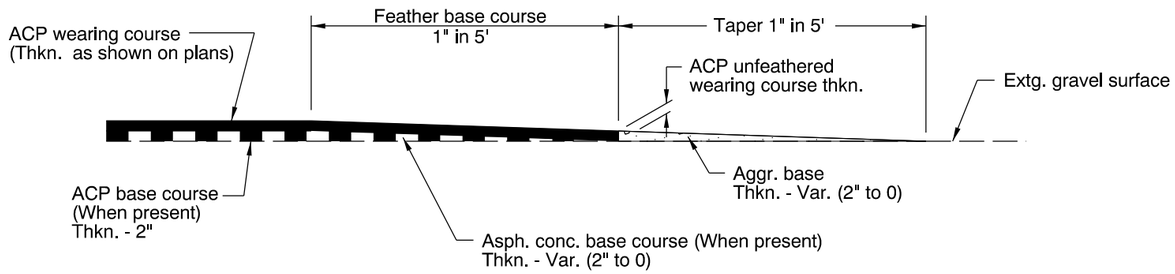
RD470

TABLE 1

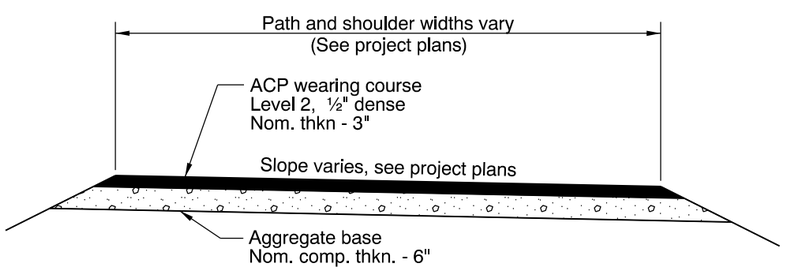
TAPER LENGTHS	
Posted Speed	Taper Length
< 45 mph	1" per 50'
≥ 45 mph	1" per 100'



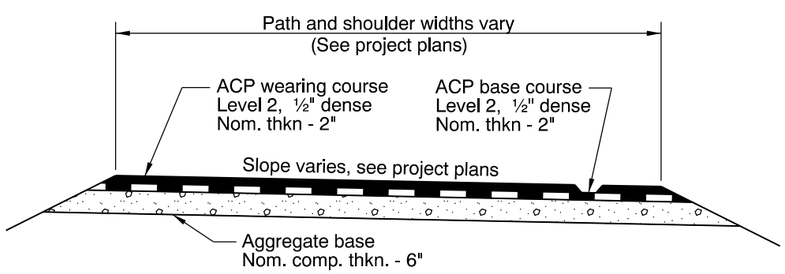
ACP PAVEMENT MATCH AT PROJECT ENDS OR BRIDGE ENDS WHEN NOT OVERLAYING THE BRIDGE



METHOD OF FEATHERING ACP PAVEMENT AT GRAVEL APPROACHES

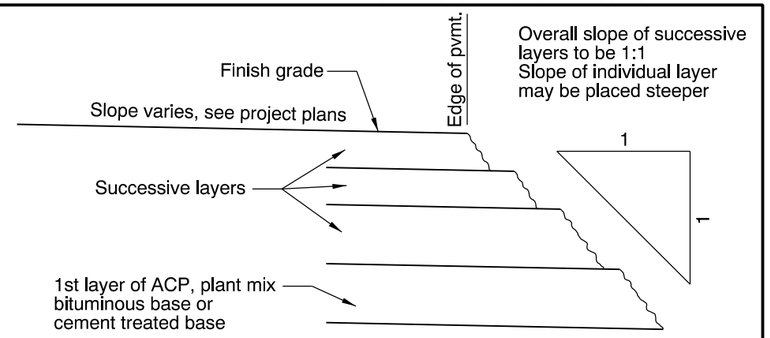


INACCESSIBLE TO MAINTENANCE VEHICLES

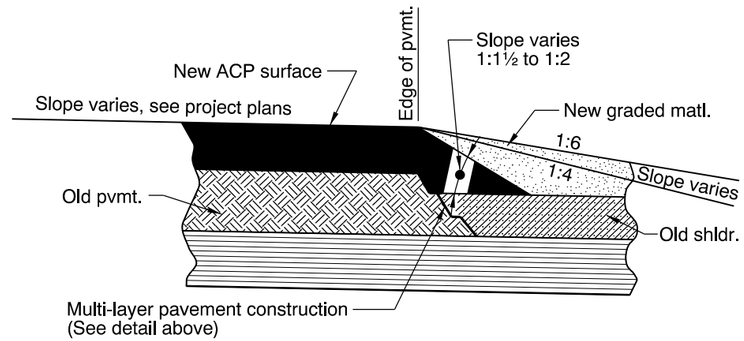


ACCESSIBLE TO MAINTENANCE VEHICLES

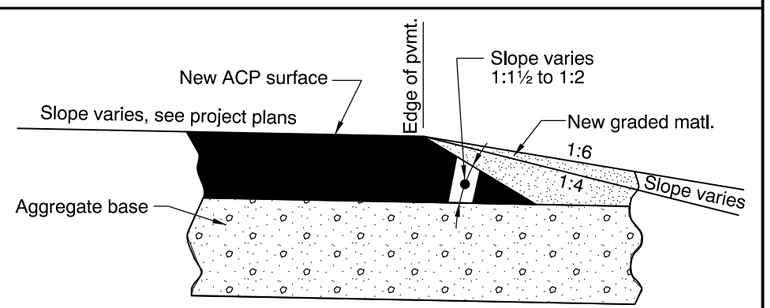
SHARED USE PATH



MULTI-LAYER PAVEMENT CONSTRUCTION



SAFETY EDGE (RECONSTRUCTION INCLUDING MILL & INLAY)



SAFETY EDGE (NEW CONSTRUCTION)

CALC. BOOK NO. N/A

BASELINE REPORT DATE 14-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

ASPHALT CONCRETE PAVEMENT (ACP) DETAILS

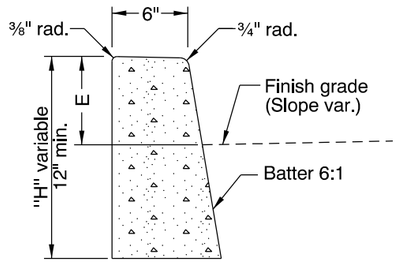
2015

DATE	REVISION DESCRIPTION

14-JUL-2014

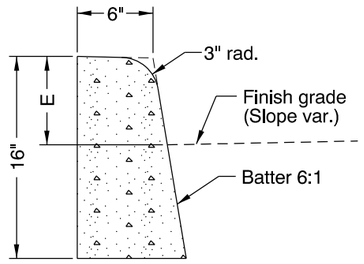
rd610.dgn

RD610

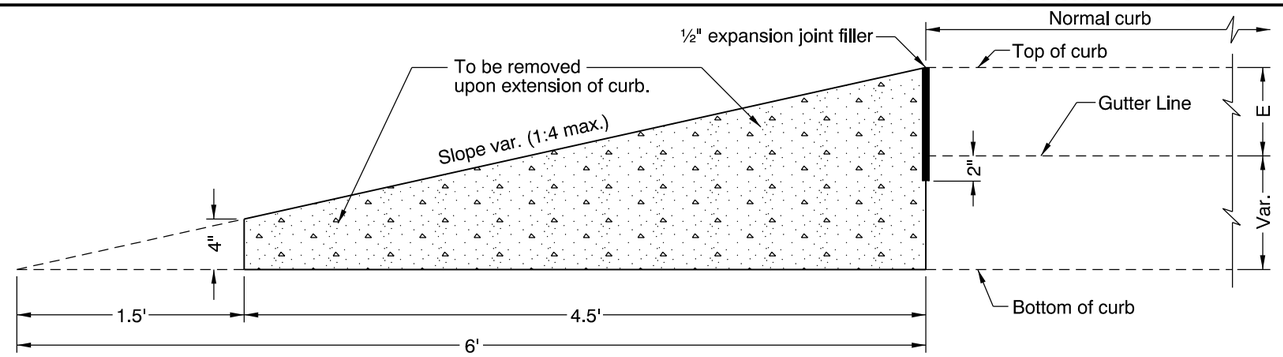


O.D.O.T. & City of Portland Standard "H"=16"

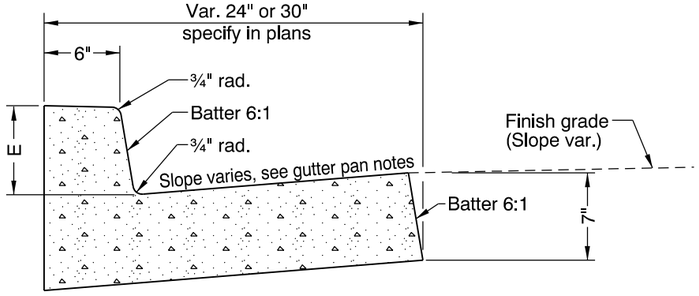
STANDARD CURB



MOUNTABLE CURB

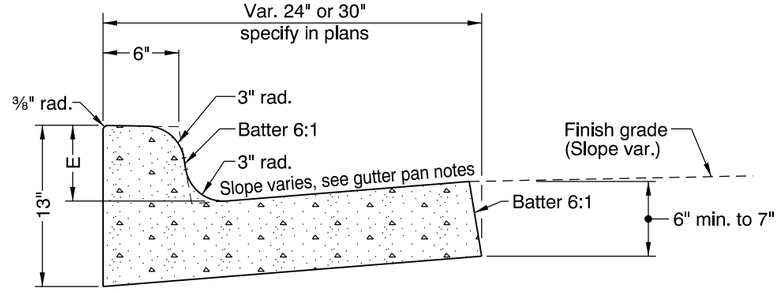


CURB ENDING DETAIL

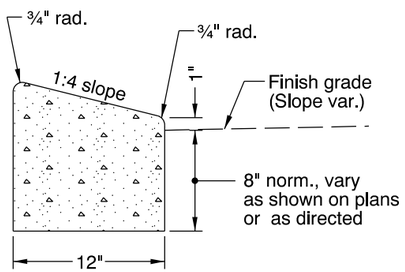


CURB AND GUTTER

GUTTER PAN NOTES:
Slope 8% normal.
Use 5% slope for gutter width greater than 24".
Slope 4% at ramps. Vary slope as reqd. for drainage.
Vary where shown on plans, and allowed by jurisdiction.

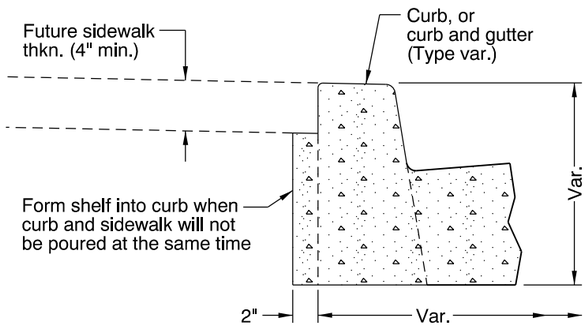


MOUNTABLE CURB AND GUTTER



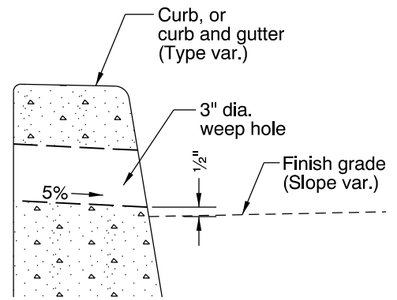
LOW PROFILE

MOUNTABLE CURB



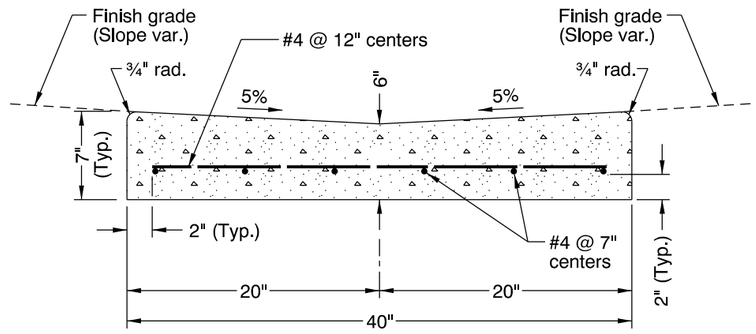
MODIFICATION FOR KEYWAY

(Where shown on plans)



WEEP HOLE DETAIL

(Where shown on plans, and allowed by jurisdiction)



VALLEY GUTTER

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

GENERAL NOTES FOR ALL DETAILS:

1. Curb exposure "E" = 6" to 9", as measured vertically from flowline to highest point on curb. Vary as shown on plans or as directed. O.D.O.T standard "E"=7".
2. Const. expansion joints at 200' maximum spacing, and at points of tangency, and at ends of each driveways.
3. Const. contraction joints at 15' maximum spacing, and at ends of each inlet and ramp.
4. Transitions shall be used to connect curbs of different exposures "E". ("E" Is the total vertical dimension of those curb surfaces having a slope of 1:1 or steeper). Minimum desirable transition length shall be 20' for each 1" difference in "E".
5. Tops of all curbs shall slope toward the roadway at 2% normal, unless otherwise shown, or as directed.
6. Dimensions are nominal, vary to conform with curb machine approved by the engineer.
7. Dimensions adjacent to radii are measured to the point of intersection of curb surfaces.
8. For sidewalk details, and monolithic curb & sidewalk, see Std. Drg. RD720.
9. For drainage curbs, see Std. Drg. RD701.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CURBS

2015

DATE	REVISION DESCRIPTION

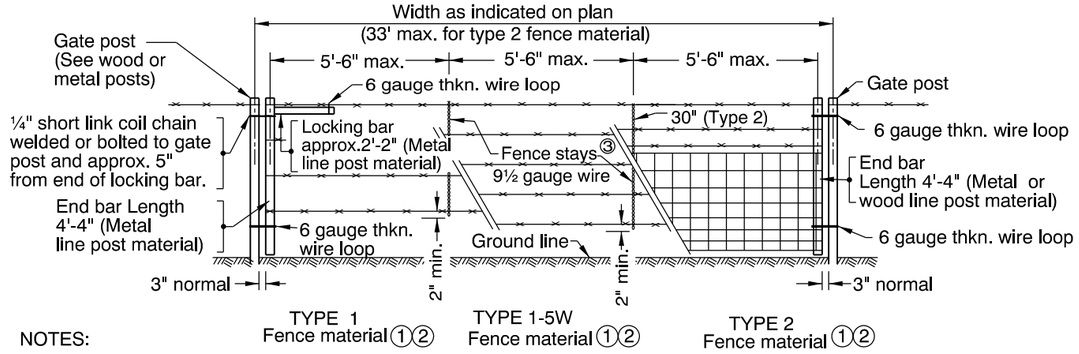
RD700

14-JUL-2014

rd700.dgn

Effective Date: February 1, 2015 - May 31, 2015

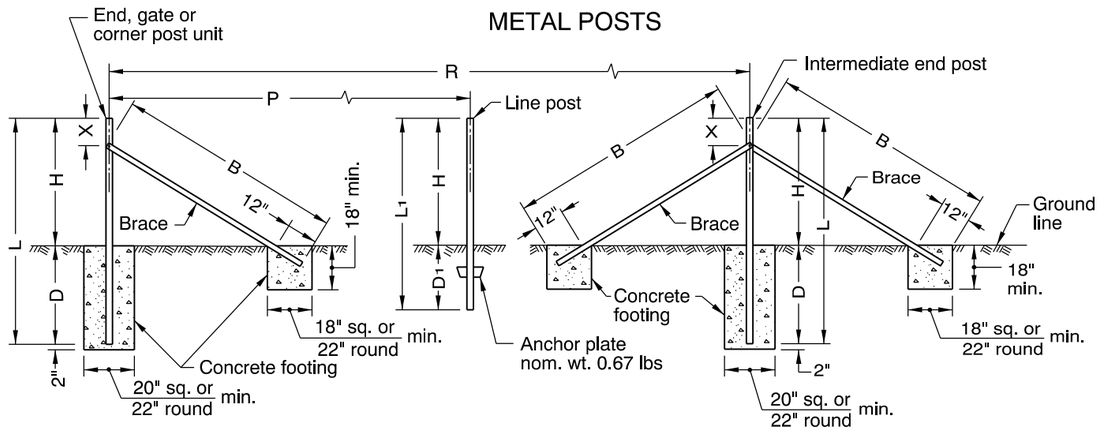
GATEWAY



NOTES:

① Match adjointing fence type.
② For details not shown see fence type.
③ For wooden stays, see Type 1 fence details.

METAL POSTS



GENERAL NOTES FOR ALL DETAILS:

1. For dimensions indicated by letter see Table 2.
2. Line post spacing same as dimension P.
3. For shapes, weights and dimensions of members see Table 3.
4. All concrete shall be commercial grade concrete.
5. See Std. Drg. RD820 for fence gates.

TYPES 1 , & 1-5W

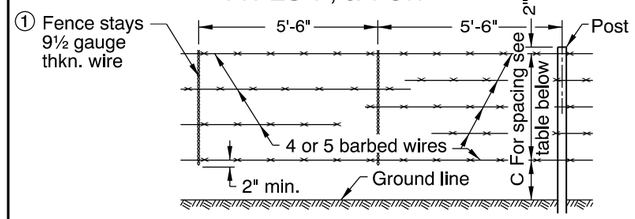
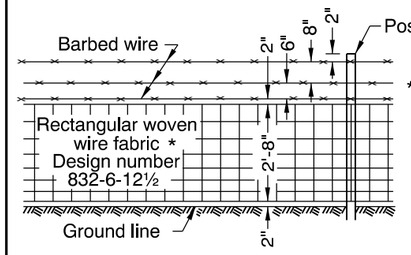


TABLE OF DIMENSIONS

FENCE	C	SPACING	NO. OF WIRES
Type 1	14"	12"	4
Type 1-5W	10"	10"	5

① NOTE:
Wooden Stays to be used in areas of heavy snowfall or snow drifts over 36". Stays to be 2" x 2" x 52" min. length, sound, untreated Douglas Fir, Western Hemlock or Western Pine, spaced as shown for wire stays and to rest firmly on the ground. Horizontal wires to be stapled are: single wires and a minimum of 4 wires for woven wire fabric.

② TYPE 2



* U.S. Dept. of Commerce Simplified Practice Recommendation R9-47.

② NOTE:
For wooden stays, see Type 1 fence details

TABLE 1 (For wood posts)

FENCE	R (ft)	UNITS REQUIRED
Types 1, 1-5W & 2	20 or Less	* None
	20-330	A
	Over 330	A & B

* Unit A required at gate post.
Either Unit A or Units A & B are required in existing fence line at intersection with new fence line.

BRACE RAIL CONNECTION

TABLE 2

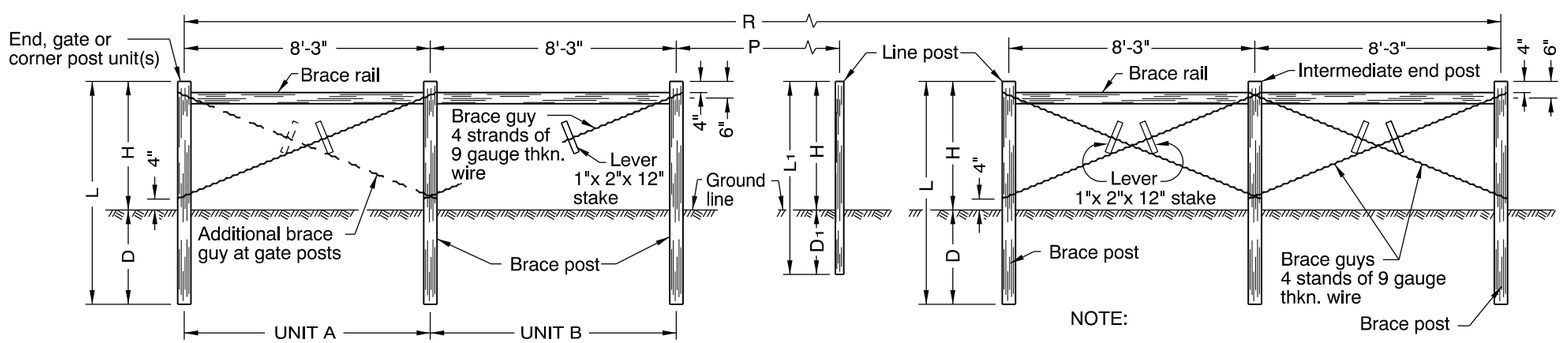
FENCE	R max.	P	L min.	L_1 min.	H	D min.	D_1 min.	B min.	X min.-max
All Types	660'	16'-6"	7'-6"	6'-6"	4'-4"	3'-2"	2'-2"	7'-8"	9"-22"

TABLE 3

MEMBER	WOOD			METAL		
	* ROUND		SQUARE	SHAPE	WEIGHT PER (ft) nominal	SIZE nominal
	DIAMETER OF SMALL END (in)		SIZE nominal (in)			
	min.-max.	min. avg.				
Line Post	3" to 4"	3"	‡ 3" x 3"	Tee Channel ⓐ or U-bar	1.33 lb	ASTM A-702
Brace or Brace Rail	3½" to 5½"	4"	4" x 4"	Tubular	ⓑ	1½" +/- O.D.
				ⓐ Angle	3.19 lb	2" x 2" x ¼"
Other Post	4" to 7"	5"	‡ 5" x 5"	Tubular	ⓑ	2⅜" O.D.
				ⓐ Angle	4.1 lb	2½" x 2½" x ¼"

* Max. taper 1":48".
‡ Max. allowable size 1" additional in each dimension.

ⓐ In accordance with ASTM A 702.
ⓑ In accordance with AASHTO M 181.



For units required see Table 1

NOTE:

1. For dimensions indicated by letter see Table 2.
2. Line post spacing same as dimension P.
3. For cross sectional dimensions of members see Table 3.

WOOD POSTS

CALC. BOOK NO. N/A

BASELINE REPORT DATE 18-JAN-2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

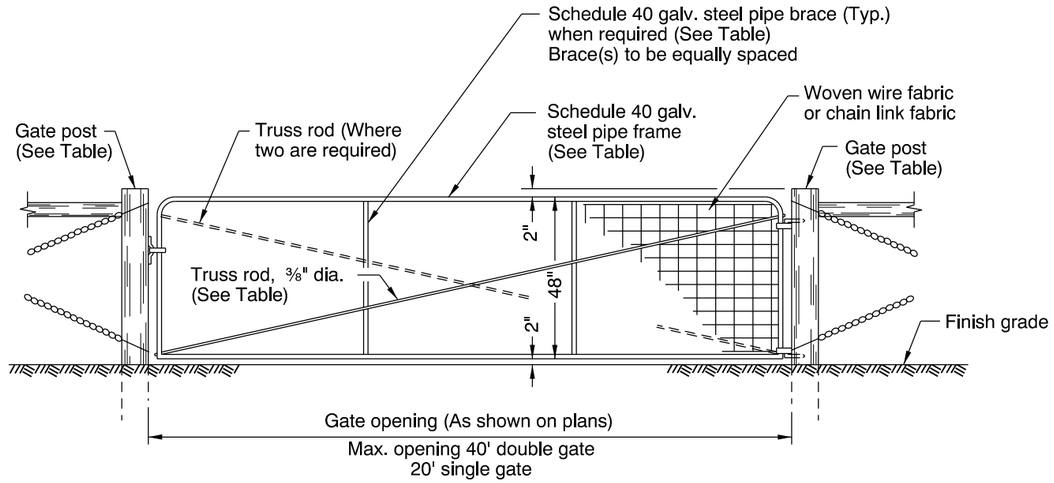
OREGON STANDARD DRAWINGS

BARBED AND WOVEN WIRE FENCES

2015

DATE	REVISION DESCRIPTION

14-JUL-2014
rd810.dgn
RD810



GATE COMPONENTS								GATE POSTS ① ②					
								WOOD				STEEL	
GATE OPENING (ft)		SCHEDULE 40 GALV. STEEL PIPE FRAME		SCHEDULE 40 GALV. STEEL PIPE BRACE			TRUSS RODS	* ROUND			SQUARE	SCHEDULE 40 GALV. STEEL PIPE	
								DIA. OF SMALL END (in)					
SINGLE GATE	DOUBLE GATE	NOM. DIA. (in)	MIN. WT. (lb/ft)	NUMBER	NOM. DIA. (in)	MIN. WT. (lb/ft)		Min.	Max.	Min. Avg.	NOM. SIZE (in)	NOM. DIA. (in)	MIN. WT. (lb/ft)
UP thru 6	UP thru 12	1	1.68	-	-	-	-	5	7	6	6x6	2½	5.79
7 thru 11	13 thru 22	1¼	2.27	1	1	1.68	1	5	7	6	6x6	3½	9.11
12 thru 16	23 thru 32	1½	2.72	2	1¼	2.27	2	7	9	8	8x8	6	18.97
17 thru 20	33 thru 40	2	3.65	2	1¼	2.27	2	9	11	10	10x10	6	18.97

* Max. taper 1" in 4'

① Gate posts on each side of a gate opening to be the same size. At a double gate installation with unequal width gates, size of both posts to be as indicated for single gate installation of the wider gate width.

② For length, setting and bracing details see end posts, Std. Drg. RD810.

GENERAL NOTES FOR ALL DETAILS:

1. Gates shown are for use with Fence Types 1, 1-5W and 2.
2. See Std. Drg. RD810 for details not shown.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 17-JAN-2012

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

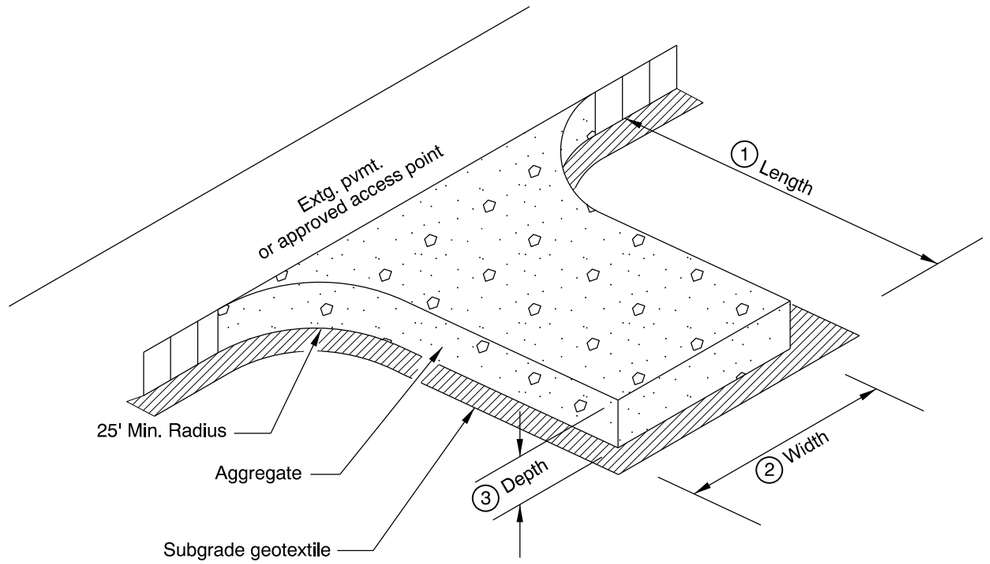
FENCE GATES

2015

DATE	REVISION DESCRIPTION

rd820.dgn 14-JUL-2014

RD820



Notes:

1. Length:
   50' min. - for less than 1 acre exposed soil
   100' min. - for greater than 1 acre exposed soil
2. Width:
   20' - or width of extg. approach, whichever is greater.
3. Depth:
   8" min

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

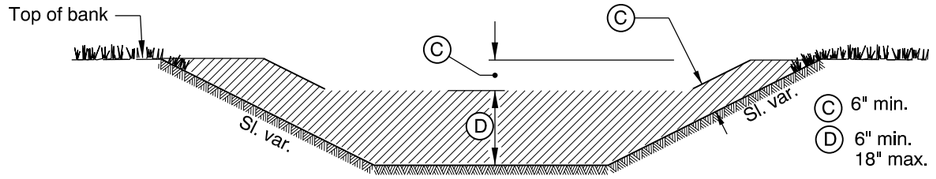
OREGON STANDARD DRAWINGS

CONSTRUCTION ENTRANCES

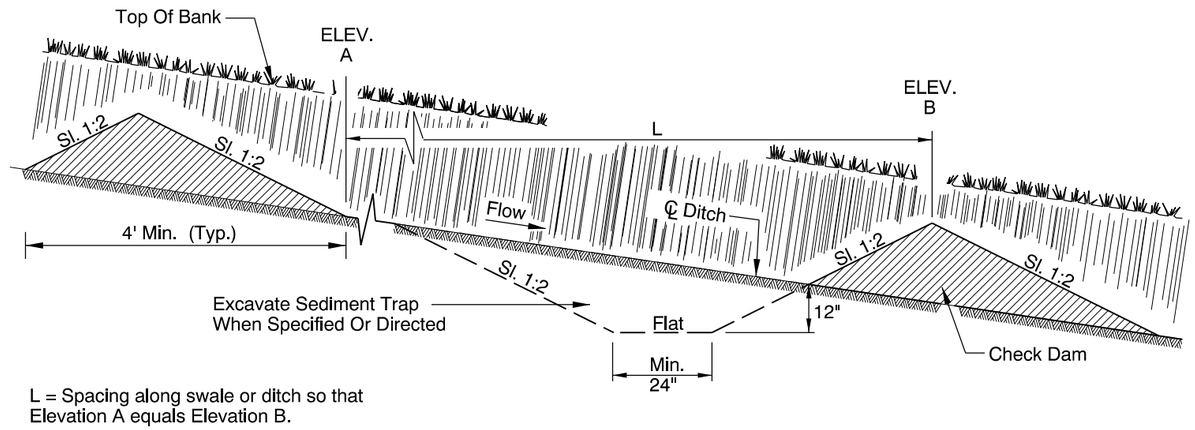
2015

DATE	REVISION DESCRIPTION

RD1000



DITCH X-SECTION
AT CHECK DAM



L = Spacing along swale or ditch so that Elevation A equals Elevation B.

DITCH PROFILE SECTION
WITH CHECK DAMS

Note:
When bid item is "Check Dams" the following materials may be used, as appropriate to meet the functional requirements of the control.
Type 1. aggregate
Type 2. straw bales with aggregate weir
Type 3. biofilter bags
Type 4. sand bags
Type 5. prefab. check dam system

CHECK DAM
Approximate Spacing

Ditch Grade	D = Dimension		
	6"	12"	18"
6%	* *	15' O.C.	25' O.C.
5%	* *	20'	30'
4%	* *	25'	40'
3%	15'	30	50'
2%	25'	50'	80'

* * Not Allowed

Notes:

(1) Type 2 only - - - -
Entrench bales and aggr. a min. of 4" into the soil. Toe of last bale is highest water control point.

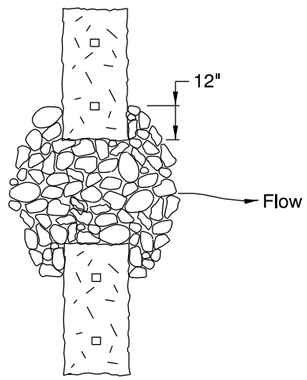
(2) Type 2 only - - - -
Place bales so wire/twine binding matl. is not in contact with the soil.

(3) Type 2 or 3 **- - - -**
Drive 2 stakes min. per bale or bag flush with top and into undisturbed ground a min. of 4". Stakes may be omitted if placed over paved surfaces.

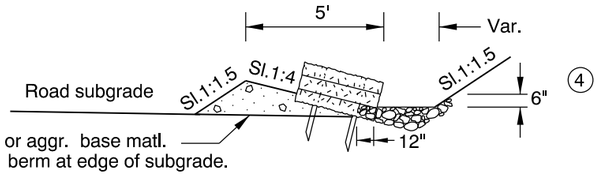
(4) Type 2, 3or 4 - - - -
Const. top of aggr. a min. of 6" lower than the toe of last bale or bag.

(5) Type 2 or 4 - - - -
Tightly abut or overlap ends of bales or bags at each joint.

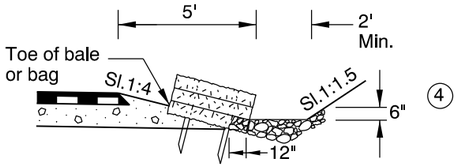
(6) Type 3 - - - -
Overlap bags 6" min. at each joint.



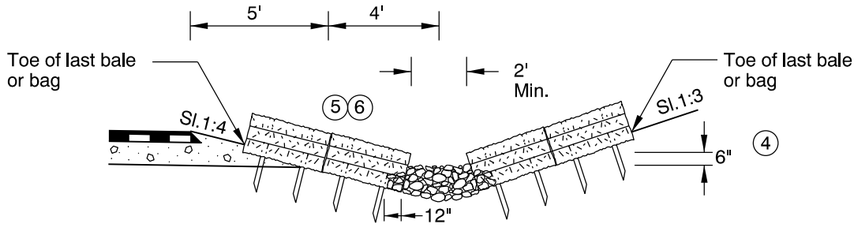
TOP VIEW
TYPE 2, 3 & 4



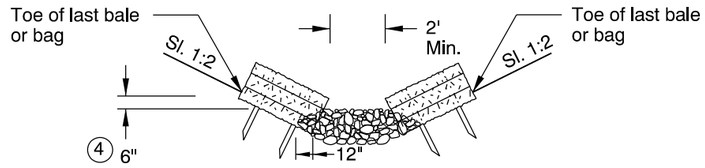
SUBGRADE SECTION



STEEP BACKSLOPE SECTION



VARIABLE BACKSLOPE SECTION - 1:3 TO 1:6



FLAT BOTTOM DITCH SECTION CHECK DAM
TYPE 2, 3 & 4

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

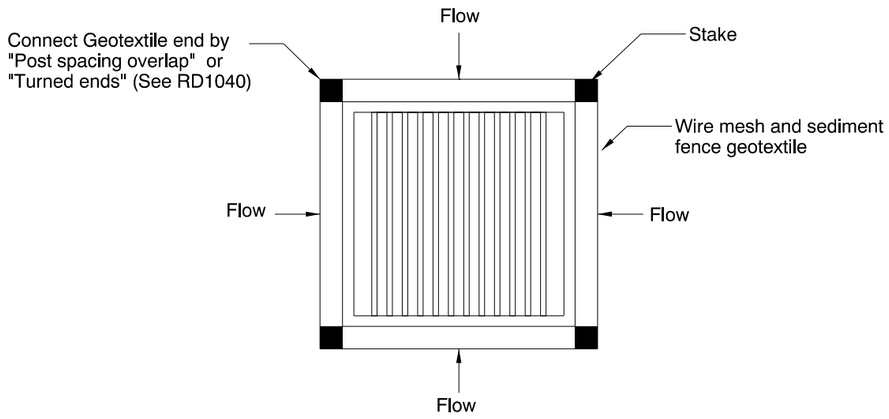
CHECK DAMS

2015

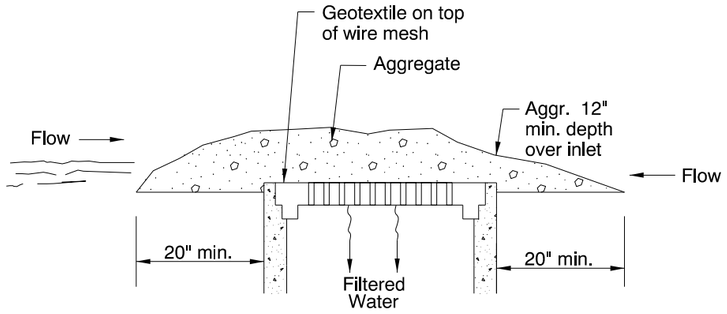
DATE	REVISION DESCRIPTION

rd1005.dgn 12-31-2008

RD1005



PLAN

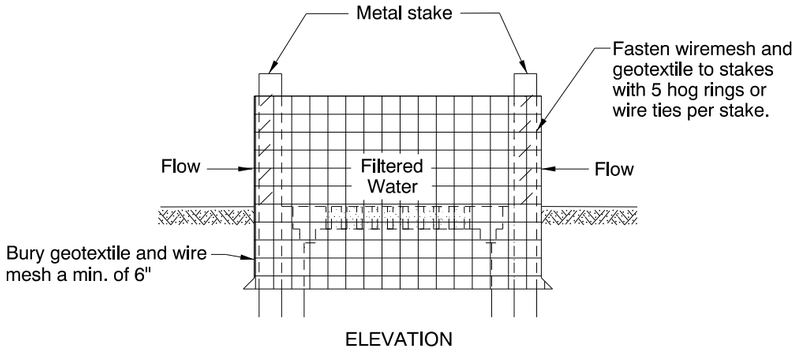


GEOTEXTILE/WIREMESH/AGGREGATE

TYPE 2

INLET PROTECTION						
Site Conditions Where Types Are Appropriate	TYPE					
	1	2	3	4	5	6
Area Drain, Soil	Y	Y	Y	Y	Y	Y
Area Drain, Pavement	N	Y	Y	Y	Y	N
Ditch Inlet, Soil	Y	N	Y	Y	N	Y
Ditch Inlet, Pavement	N	N	Y	Y	N	N
Grate Inlet Along Curb, Soil	N	Y	Y	Y	Y	Y
Grate Inlet Along Curb, Pavement	N	Y	Y	Y	Y	N
Curb Opening Inlet, Soil	N	N	N	Y	Y	Y
Curb Opening Inlet, Pavement	N	N	N	Y	Y	N

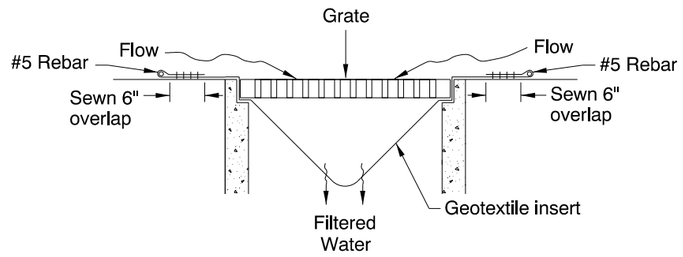
For Inlet Protection Types 4 and 5
see RD1015 and RD1020.



ELEVATION

SEDIMENT FENCE

TYPE 1



PREFABRICATED FILTER INSERT

TYPE 3

Note:
Type 1 Sediment Fence
Type 2 Geotextile/wire mesh/aggregate
Type 3 Prefabricated filter insert
Type 4 Biofilter bags
Type 5 Masonry/aggregate
Type 6 Sod

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

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The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

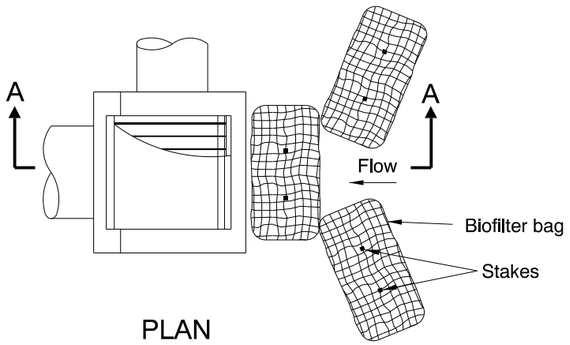
INLET PROTECTION
(TYPE 1, 2 & 3)

2015

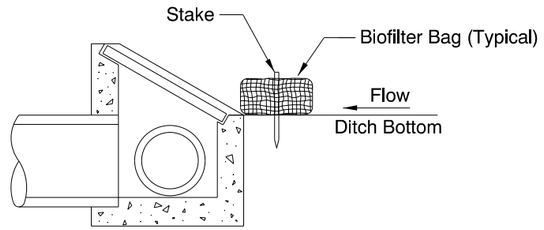
DATE	REVISION DESCRIPTION

rd1010.dgn 12-31-2008

RD1010



PLAN

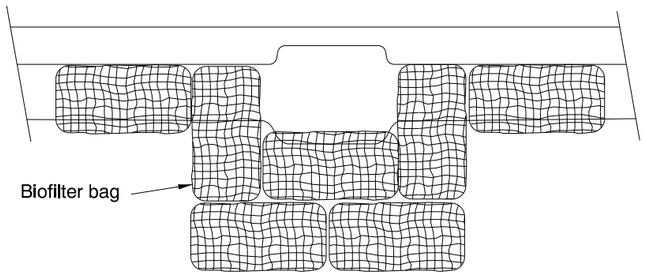


SECTION A-A

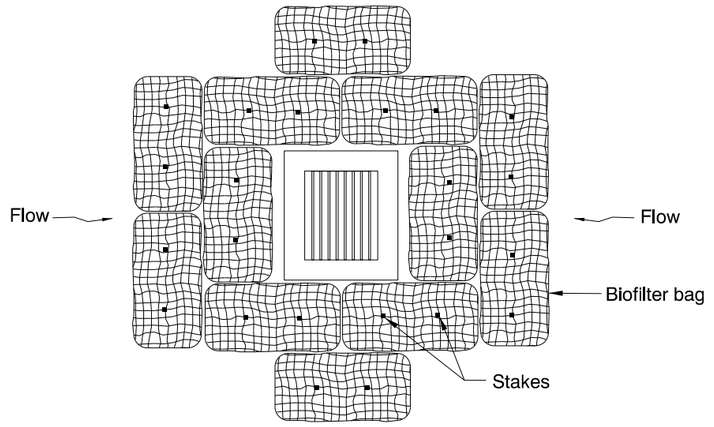
DITCH INLET

Note:

1. Use 2 stakes per bag. Stakes may be omitted if bags are placed on pavement surface.
2. Overlap all bag joints 6".



PLAN
CATCH BASIN



AREA DRAIN

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

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OREGON STANDARD DRAWINGS

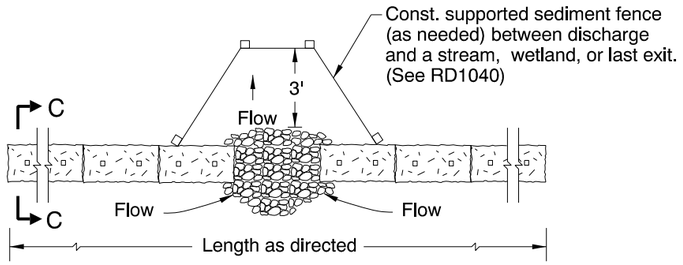
INLET PROTECTION
(TYPE 4)
BIOFILTER BAGS

2015

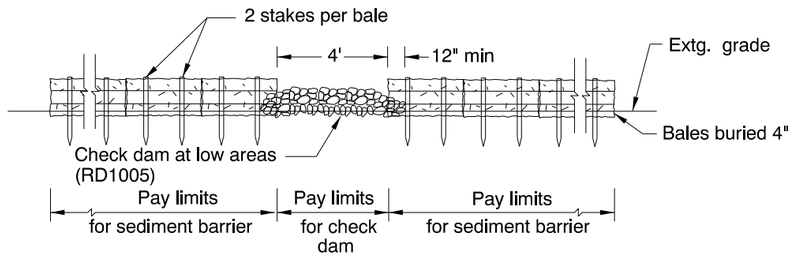
DATE	REVISION DESCRIPTION

rd1015.dgn 12-31-2008

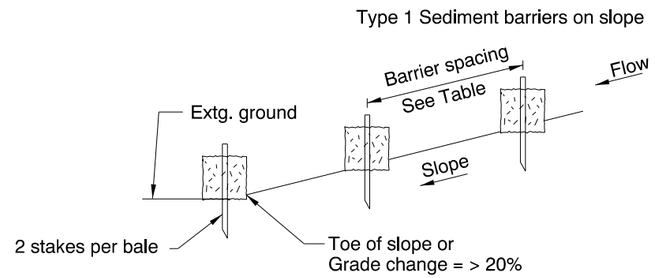
RD1015



PLAN



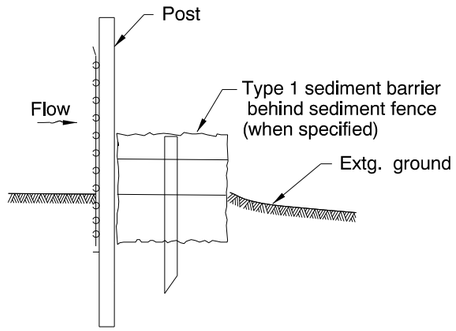
ELEVATION



PROFILE

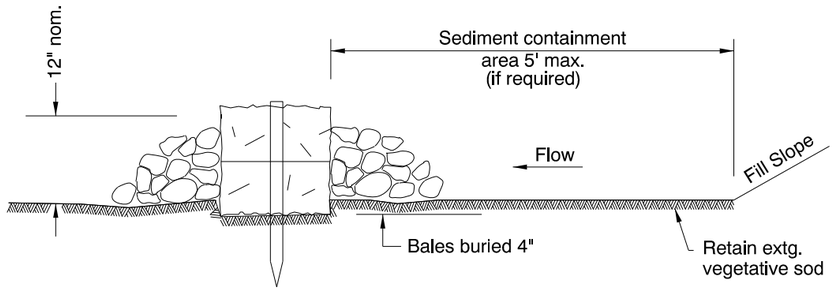
GENERAL APPLICATION

(Perimeter and overland flow)

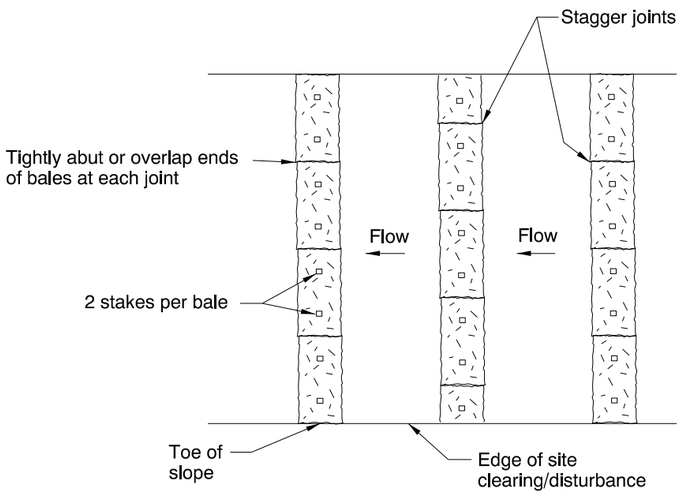


SEDIMENT FENCE
AND BARRIER

(Sediment Barrier when used as
structural backing for Sediment Fence)



SECTION C-C



PLAN
Slope Application

NOTES: Sediment Barrier (Type 1)

1. Entrench bales and aggr. a min. of 4" into the soil. Toe of last bale is highest water control point.
2. Place bales so wire/twine binding matl. is not in contact with the soil.
3. Drive stakes flush with top of bale and into undisturbed ground a min. of 12"
4. Const. top of aggr. a min. of 6" lower than the toe of last bale.
5. Sediment fence and check dam paid for seperately or per special provisions.

BARRIER SPACING
FOR GENERAL APPLICATION

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	% SLOPE	MAXIMUM SPACING ON SLOPE
10% Flatter	1:10 or Flatter	300'
10 > % ≥ 15	10 > X ≥ 7.5	150'
15 > % ≥ 20	7.5 > X ≥ 5	100'
20 > % ≥ 30	5 > X ≥ 3	50'
Steeper than 30%	Steeper than 1:3	25'

NOTES:
Type 1 Straw Bales
Type 2 Biofilter Bags
Type 3 Wattles
Type 4 Sand Bags
Type 5 Brush Barrier
Type 6 Filter Berm
Type 7 Prefabricated Barrier System
Type 8 Compost Filter Berm

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

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OREGON STANDARD DRAWINGS

SEDIMENT BARRIER
(TYPE 1)

2015

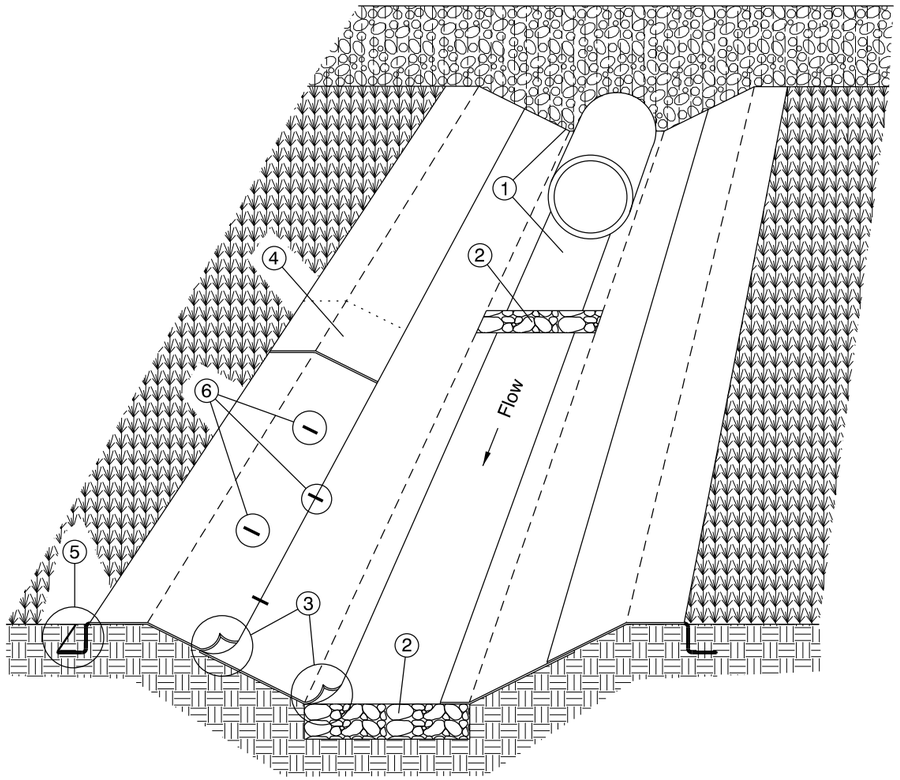
DATE	REVISION DESCRIPTION

rd1025.dgn 12-31-2008

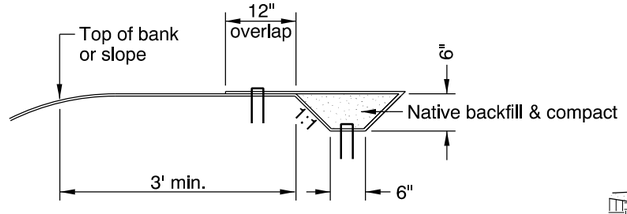
RD1025

Effective Date: February 1, 2015 - May 31, 2015

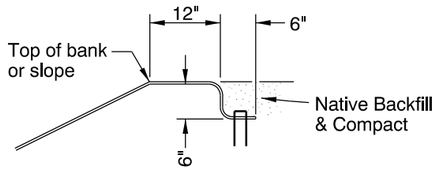
rd1055.dgn 12-31-2008



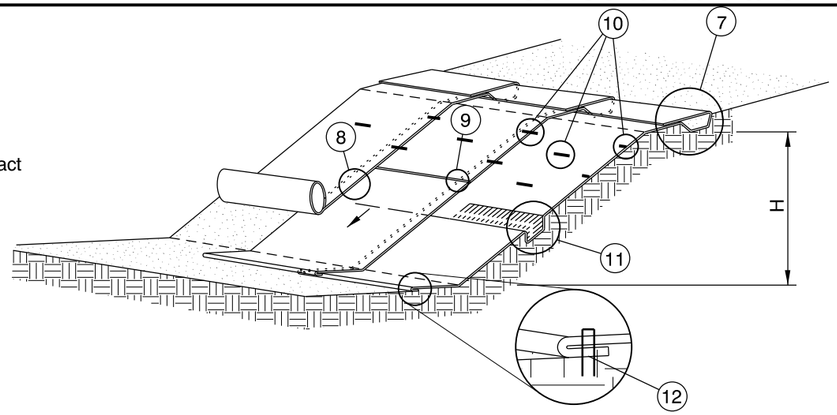
CHANNEL APPLICATION



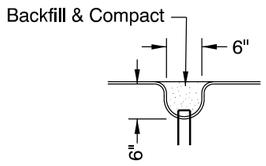
(TRENCH, H > 3')
FIGURE A1



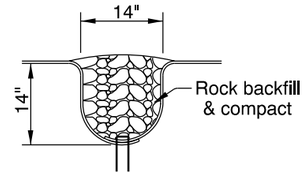
(TRENCH, H ≤ 3')
FIGURE A2



SLOPE APPLICATION



(CHECK SLOT, SLOPE)
FIGURE A3



(CHECK SLOT, CHANNEL)
FIGURE A4

All applications

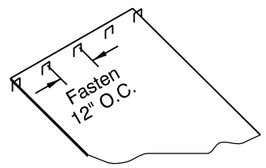
All information shown is minimum criteria for matting installation. All manufacturer's recommendations which are more stringent must be applied.

Channel application:

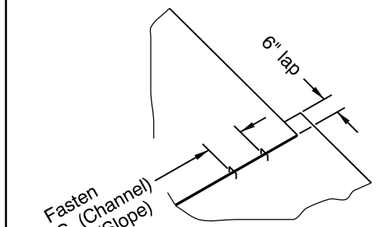
1. Install mat in center of channel, in the direction of water flow. Anchor upstream end of mat with check slot (Fig. B1 & A4). Backfill check slot with rock. For culvert outfalls, place mat under pipe 12" minimum upstream from pipe outlet.
2. Construct check slots across channel bottom at 50' spacings and at the end of each mat (Fig. A4). Fasten mat at bottom of check slot (Fig. A4 & B1). Backfill check slot with rock.
3. Overlap side channel mat edges 6" over the center channel mat and fasten edges 12" O.C. (Fig. B2). Continue overlap and stapling pattern for each additional side mat.
4. Lap upstream mat end 12" over beginning edge of downstream mat. fasten 12" O.C. (Fig. B3).
5. Anchor top edge of side channel mats in trench and fasten 12" O.C. (Fig. A2 & B1)
6. Fasten mat interior at 24" O.C. staggered spacing.

Slope application:

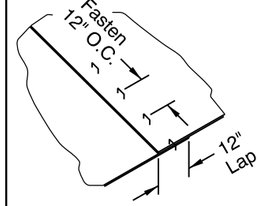
7. Anchor matting at top of slope (Fig. A1 & A2) Fasten in trench and at overlap 12" O.C. (Fig. B1)
8. Overlap mat edges 6" and fasten (Fig. B2). Install matting so edge overlaps are shingled away from prevailing winds. Fasten edges 24" O.C.
9. Overlap mat ends 12", upper mat over lower mat, and fasten (Fig. B3).
10. Stagger alternate rows of fasteners placed at 24" O.C.
11. Construct check slot when specified or as recommended by the manufacturer (Fig A3). Fasten mat in bottom of check slot (Fig. A3 & B1)
12. Extend mat 24" beyond toe of slope; fold mat back under 4" and fasten (Fig. B1)



(BEGINNING EDGE)
FIGURE B1



(EDGE LAPS)
FIGURE B2



(END LAPS)
FIGURE B3

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JAN-2013

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OREGON STANDARD DRAWINGS

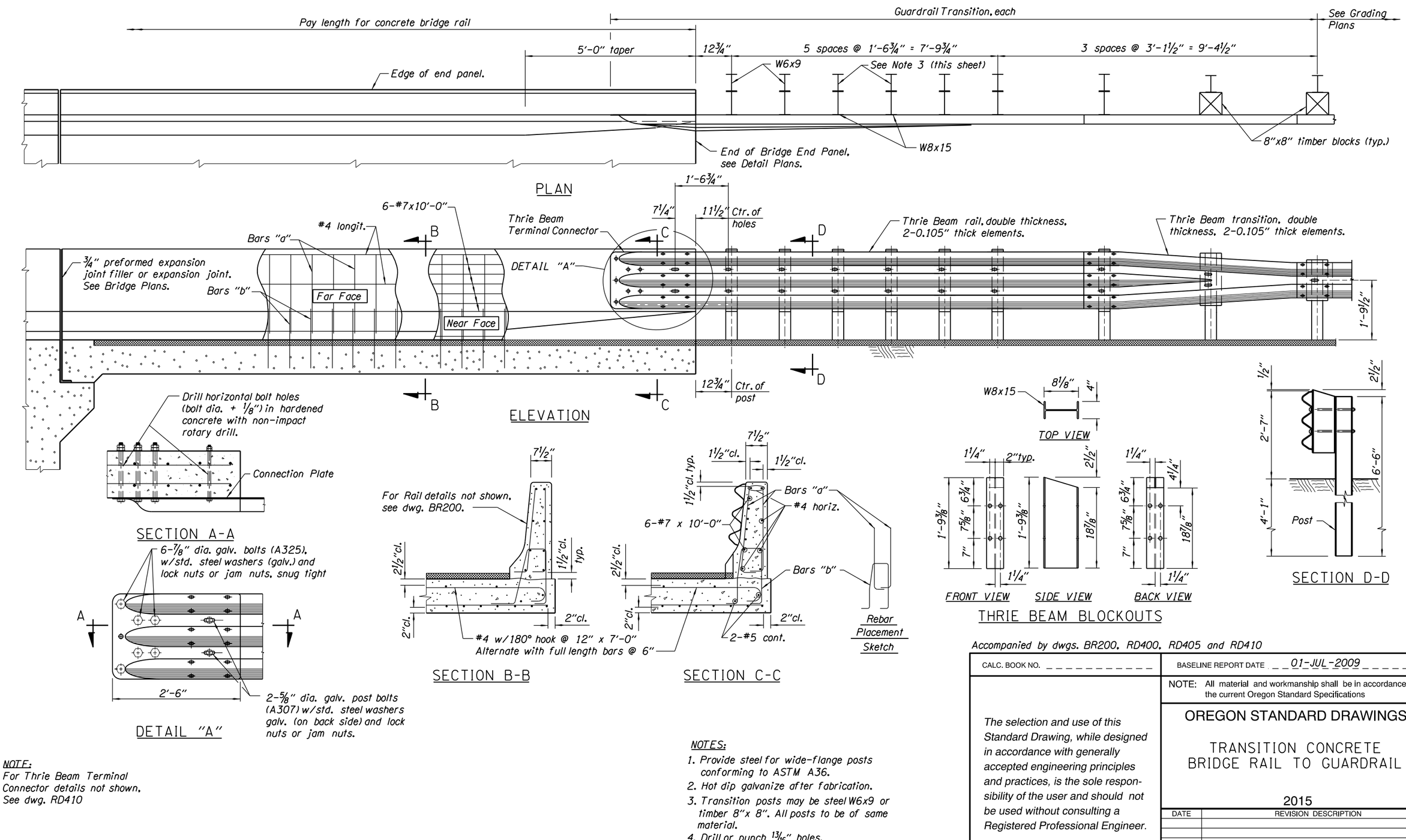
MATTING

2015

DATE	REVISION DESCRIPTION

RD1055

Effective Date: February 1, 2015 - May 31, 2015



NOTE:
For Thrie Beam Terminal Connector details not shown, See dwg. RD410

NOTES:
1. Provide steel for wide-flange posts conforming to ASTM A36.
2. Hot dip galvanize after fabrication.
3. Transition posts may be steel W6x9 or timber 8"x 8". All posts to be of same material.
4. Drill or punch 13/16" holes.

Accompanied by dwgs. BR200, RD400, RD405 and RD410

CALC. BOOK NO. _____

BASELINE REPORT DATE 01-JUL-2009

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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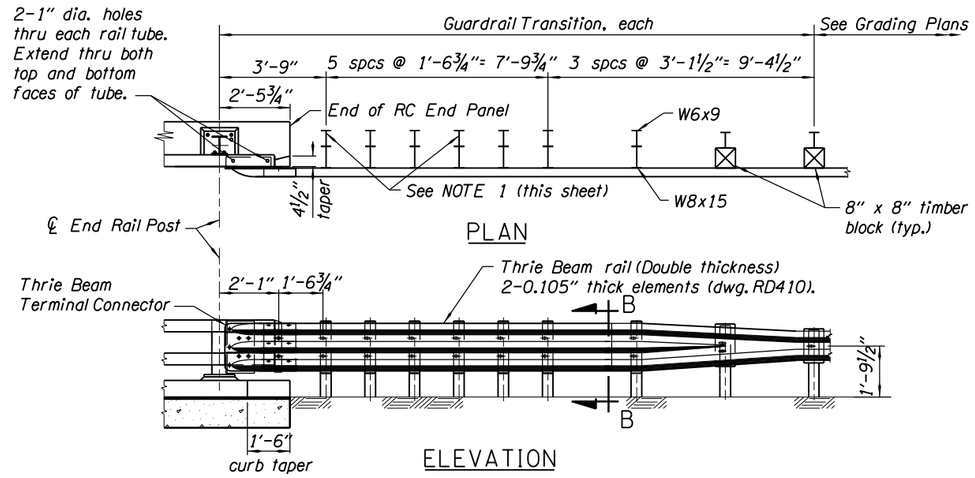
OREGON STANDARD DRAWINGS

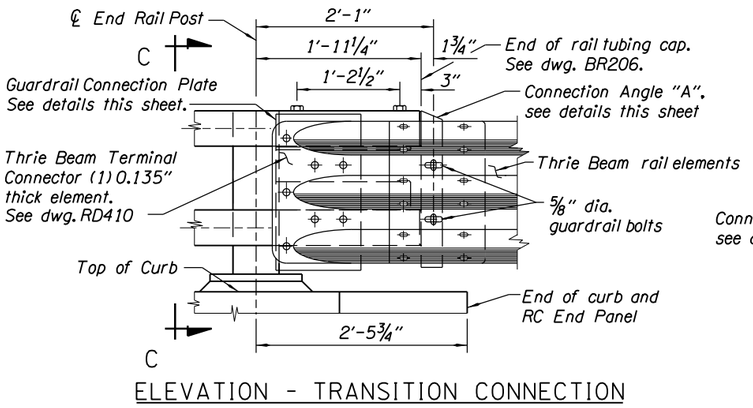
TRANSITION CONCRETE BRIDGE RAIL TO GUARDRAIL

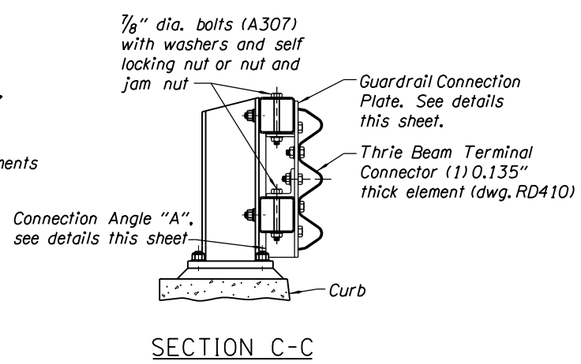
2015

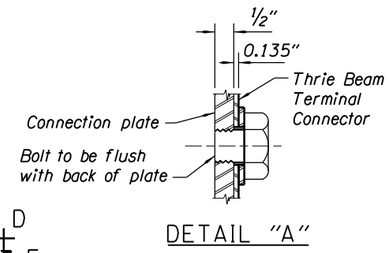
DATE	REVISION DESCRIPTION

BR203

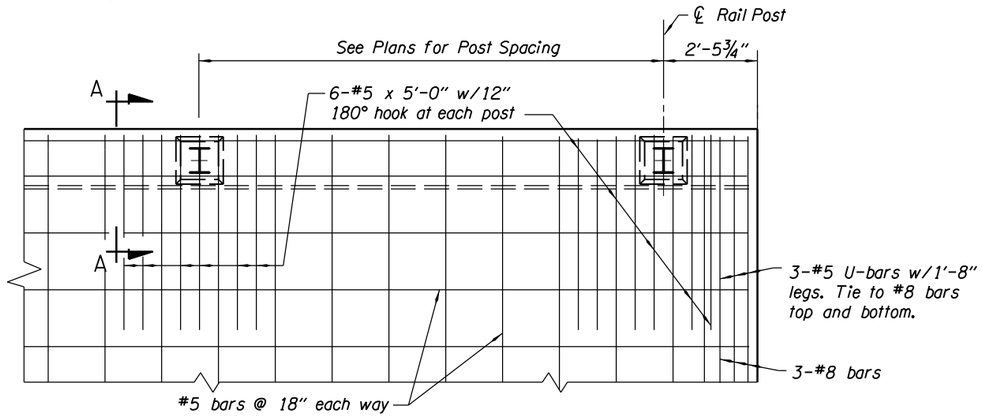




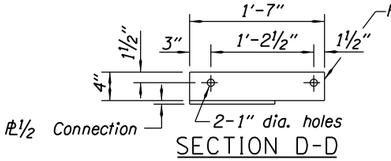


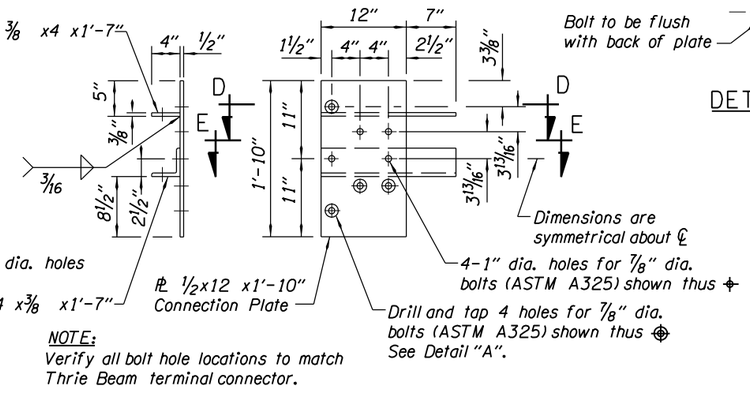


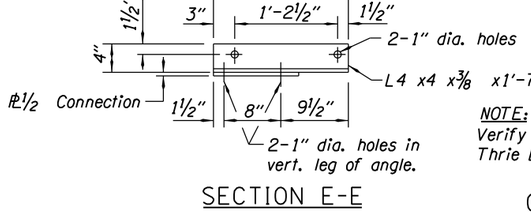
NOTE 1:
Transition posts may be steel W6x9 or timber 8"x 8". All posts to be of same material. See dwg. BR203 "Thrie Beam Blockouts"

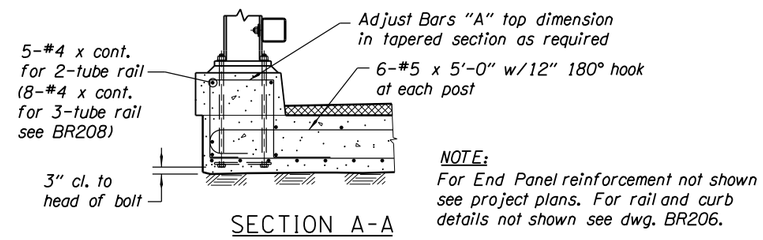


END PANEL TOP REBAR AT RAIL POSTS

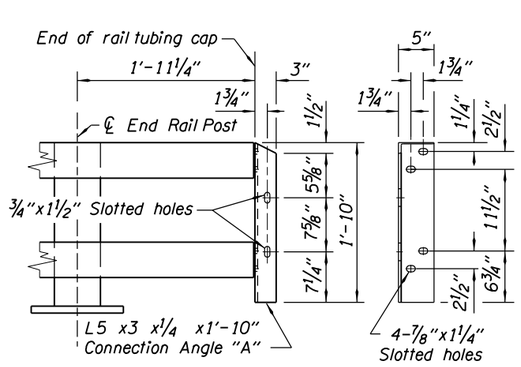


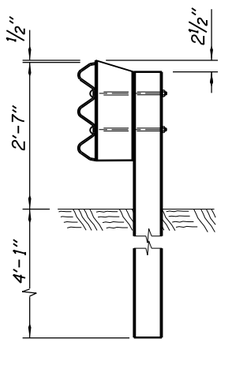






NOTE:
For End Panel reinforcement not shown see project plans. For rail and curb details not shown see dwg. BR206.





Accompanied by dwgs. BR203, BR206, RD400, RD405 and RD410

CALC. BOOK NO. _____

BASELINE REPORT DATE 01-JUL-2009

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

2-TUBE CURB MOUNT RAIL TRANSITION

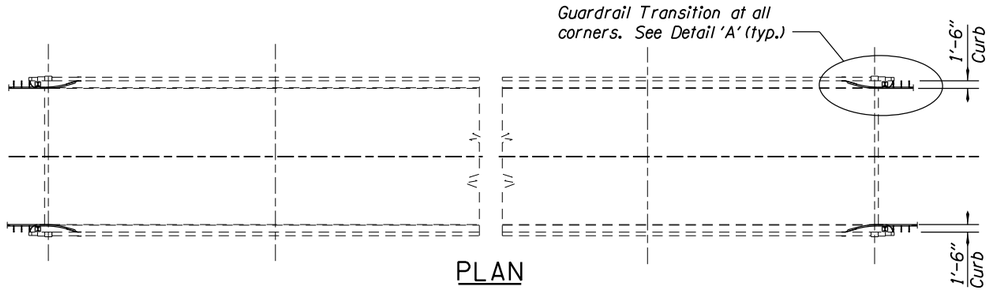
2015

DATE	REVISION DESCRIPTION

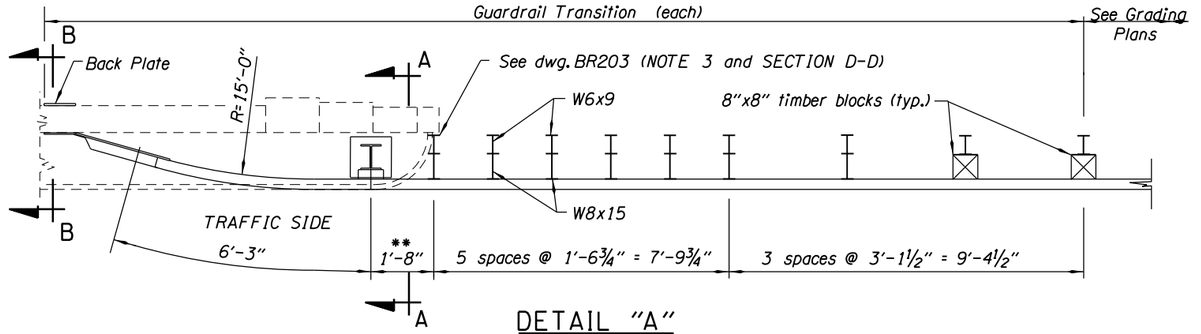
br207.dgn 04-2014

BR207

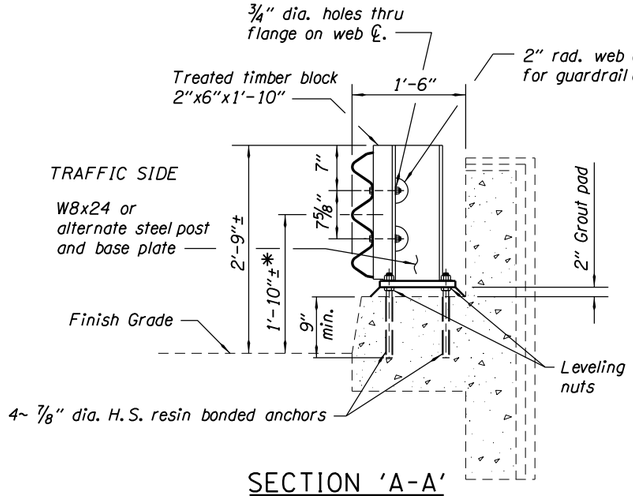
br270.dgn 04-2014



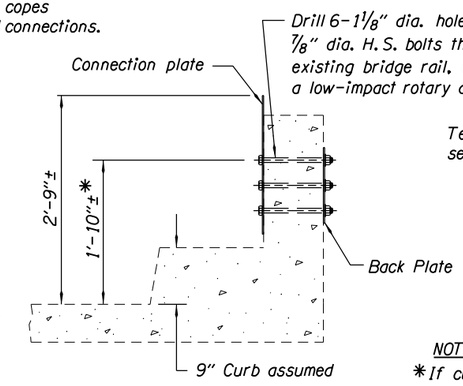
PLAN



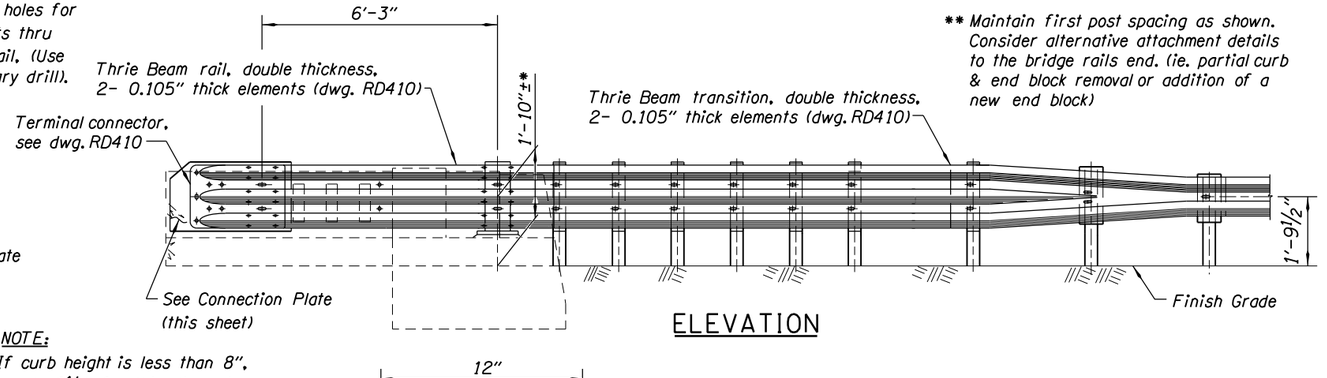
DETAIL "A"



SECTION 'A-A'

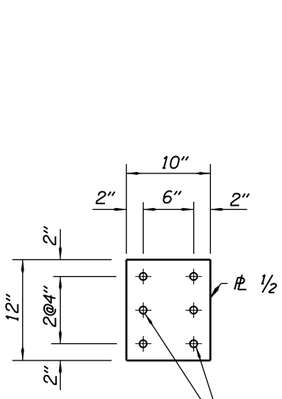


SECTION 'B-B'

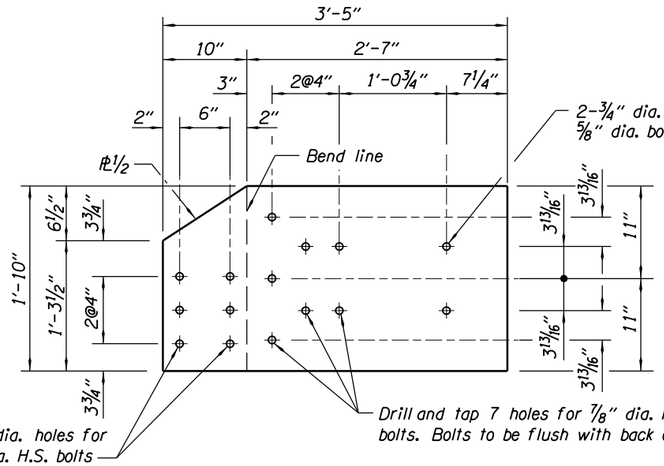


ELEVATION

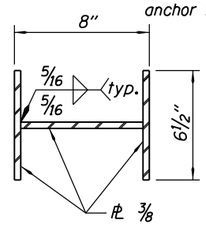
NOTE:
* If curb height is less than 8", use 1'-9½" for this dimension.



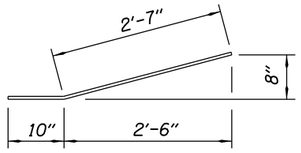
BACK PLATE



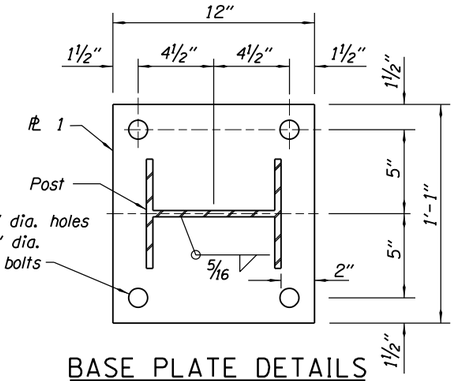
DEVELOPED VIEW: CONNECTION PLATE



ALTERNATE POST



CONNECTION PLATE BEND DETAILS



BASE PLATE DETAILS

GENERAL NOTES:

Provide non-epoxy grout for the 2" nominal grout pads as noted in Section 02080.
Provide structural steel conforming to AASHTO Specification M183 (ASTM A36).
Provide all H.S. bolts conforming to AASHTO M164 (ASTM A325).
Provide and install High Strength resin bonded anchors (Grade 105) according to ODOT Specification 00535.
Hot-dip galvanize all anchor rods, washers, and nuts after fabrication.
Hot-dip galvanize all connection plate bolts, plates, and washers after fabrication of plates.
Field verify before fabrication.

Accompanied by dwgs. BR203, RD405, RD410

CALC. BOOK NO. _____

BASELINE REPORT DATE 01-JUL-2009

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

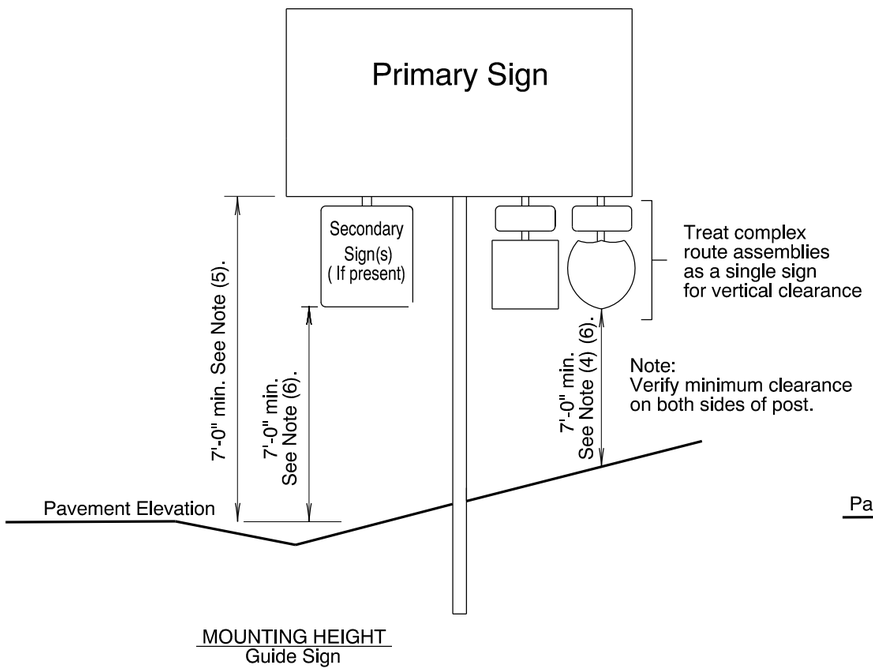
OREGON STANDARD DRAWINGS

RAIL TRANSITION FROM FLEX BEAM RAIL TO CURB AND PARAPET RAIL

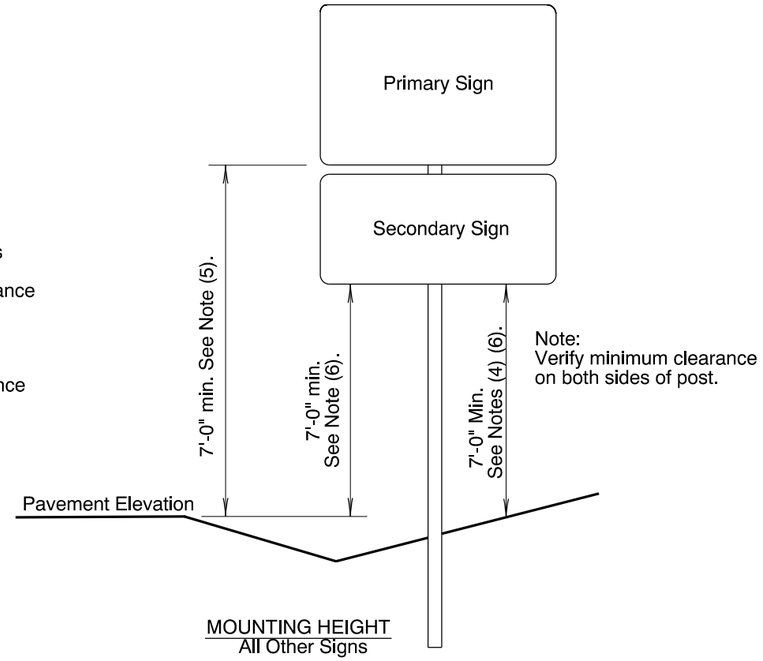
2015

DATE	REVISION DESCRIPTION

BR270



MOUNTING HEIGHT
Guide Sign



MOUNTING HEIGHT
All Other Signs

General Installation Notes:

a. Signing details shown on this sheet are intended to convey "typical" conditions only. Individual locations may require installation different from those shown.
For guidance regarding unique installations or exceptions call the Project Sign Designer or Region Traffic Section.

b. Locate breakaway supports away from ditches to avoid problems with erosion, corrosion, debris, maintenance and breakaway performance. See Dwg. No. TM635 for more information.

c. For wood post support details see Dwg. No. TM670.

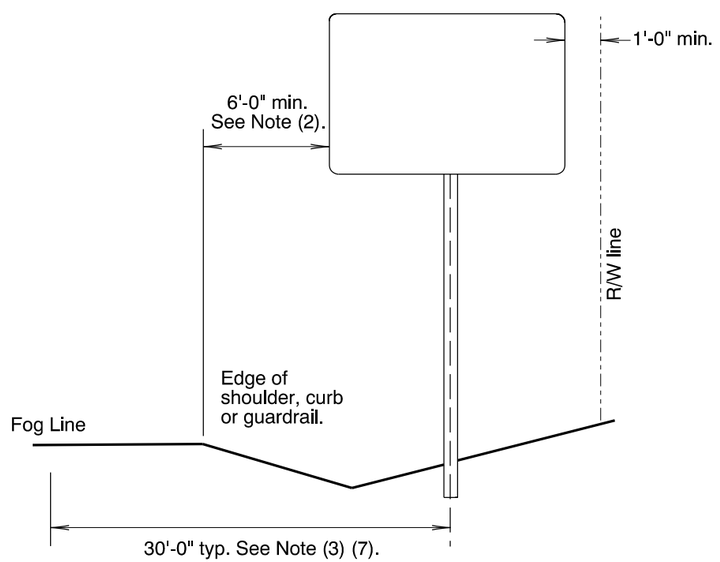
d. For perforated steelsquare tube support details see Dwg. No. TM681.

e. For triangular base breakaway support details see Dwg. No. TM602.

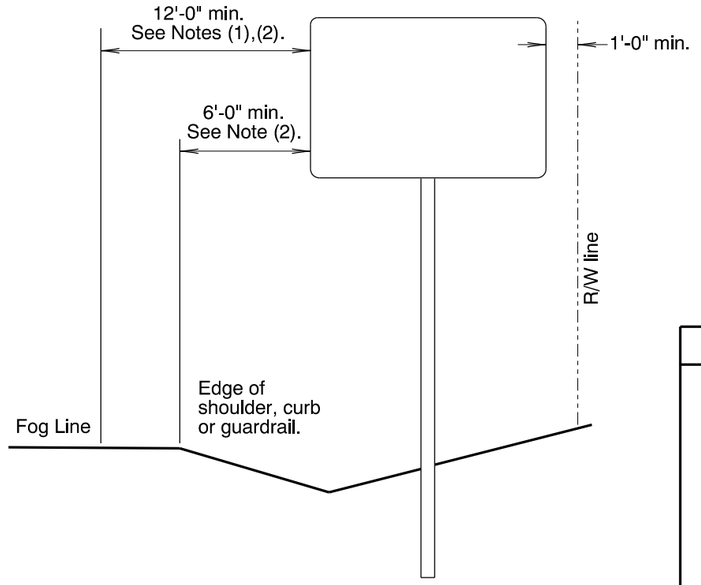
f. For multi-post breakaway support details see Dwg. No. TM600.

g. Mounting heights should not be more than 3 inches more than the minimum heights shown, where practical.

h. 2" vertical spacing between all signs.



LATERAL OFFSET
Guide Signs



LATERAL OFFSET
All Other Signs

Notes:

1). 6' minimum if behind barrier.

2). 2' minimum if restricted R/W.

3). 20' for ramp terminals.

4). 8' minimum if bicycle path underneath.

5). 8' minimum if secondary signs attached.

6). 5' minimum if outside clearzone, in rural areas and no pedestrians underneath.

7). For multi-post installations measure distance from post closest to roadway.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01/06/2012

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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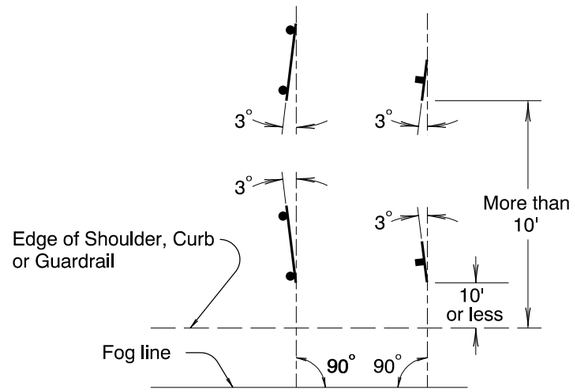
OREGON STANDARD DRAWINGS

SIGN INSTALLATION DETAILS

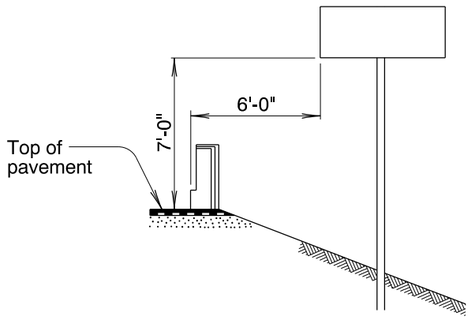
2015

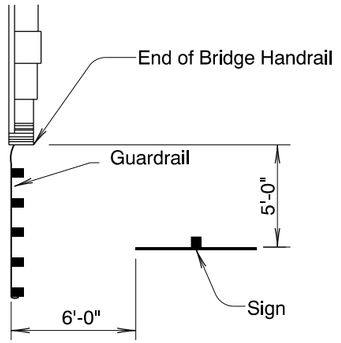
DATE	REVISION DESCRIPTION

Effective Date: February 1, 2015 - May 31, 2015



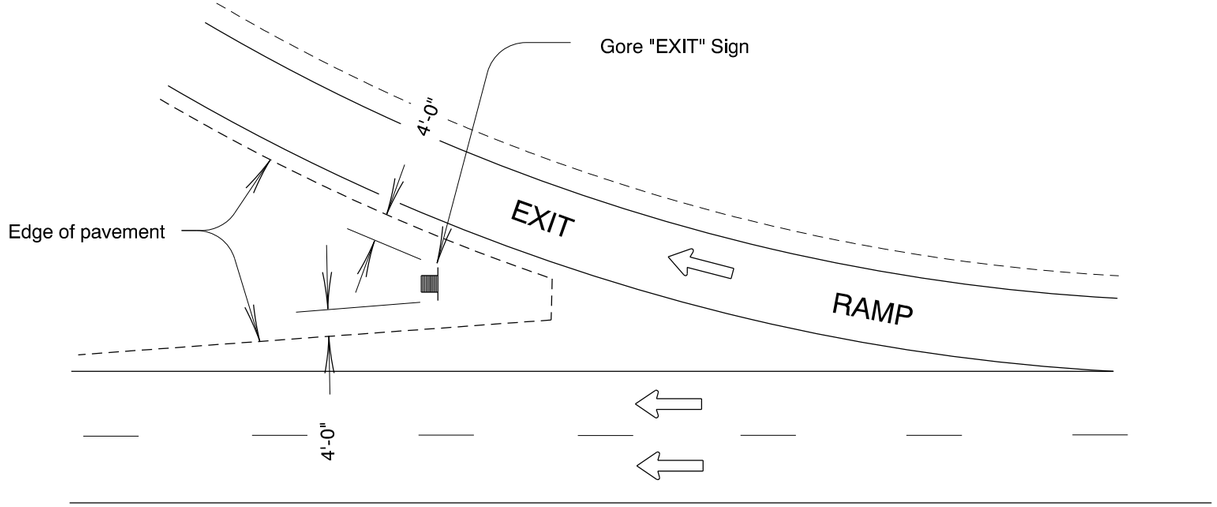
SIGN PLACEMENT





ELEVATION PLAN

SIGN LOCATION FOR FREEWAY OVERCROSSING
(MINIMUM VALUES)



TYPICAL "EXIT" SIGN INSTALLATION

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12-10-09

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MISCELLANEOUS SIGN PLACEMENT DETAILS

2015

DATE	REVISION DESCRIPTION

TM201.dgn 12-10-2009

TM201

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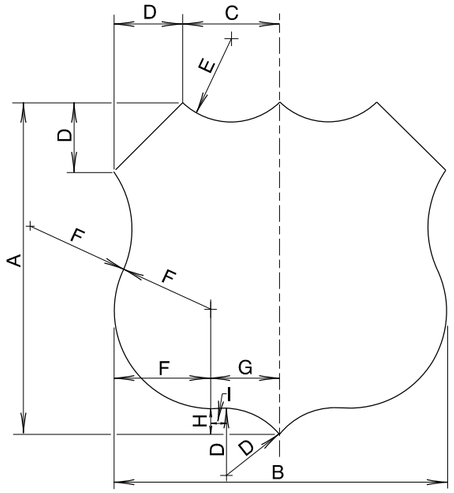
Effective Date: February 1, 2015 - May 31, 2015

U.S. ROUTE MARKERS



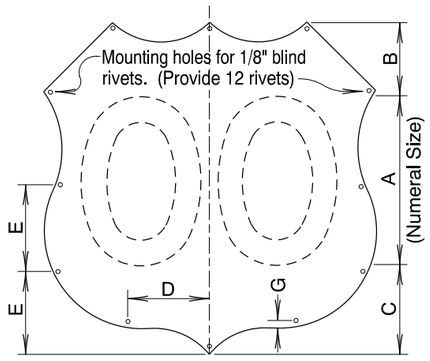
BASIC U.S. ROUTE DESIGN

SIZE	A	B	C	D	E	F	G	H	I
18	18	18	5¼	3¾	3¾	5¼	3¾	1½	¾
18	18	22½	7½	3¾	6¾	5¼	6	1½	2¾

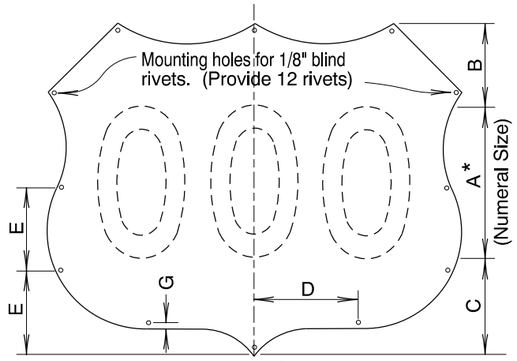
NOTE: Use sheet aluminum overlay with rivet holes for mounting on extruded aluminum panel signs.

TYPE "W1" or "W7" 2- OR 3-DIGIT U.S. ROUTE MARKERS

SHIELD SIZE		NO. OF	A*	B	C	D	E	G
HEIGHT	WIDTH	DIGITS						
18	18	2	9" D	4 1/8	4 7/8	4½	4½	⅜
18	22½	3**	9" D	4 1/8	4 7/8	5 5/8	4½	⅜

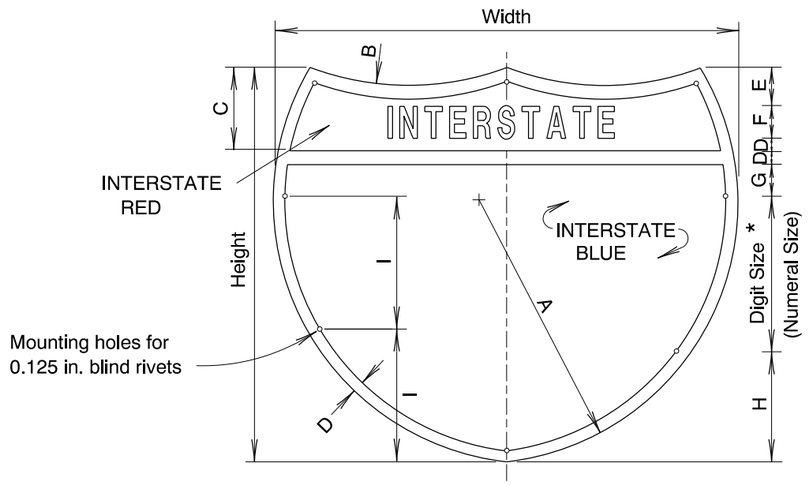


For 2 Digit U.S. Routes



For 3 Digit U.S. Routes

INTERSTATE ROUTE MARKERS



TYPE "F" or "F1" INTERSTATE ROUTE MARKERS

Shield Size	Digit Size *	No. of Digits	Height	Width	A	B	C	D	E	F	G	H	I
18	9" D	1, 2	18	18	11¼	11¼	3¾	3/8	1½	1 7/8C	¾	4 1/8	6
	9" D	3**	18	22½	12¾	18	3¾	3/8	1½	1 7/8C	¾	4 1/8	6

Notes: The Federal Highway Administrations standard rounded capital letter alphabets and letter spacing shall be used. The series for the numeral and the size and series for the letter suffix of the route number shall be as shown hereon. The letter shall be placed beside the numerals.

All signs on this sheet shall be Type "W1", "W7", "F", or "F1" as noted. Types "F1" and "W7" shall be used for overhead installations. The US Route Markers shall have non-reflectorized black letters, symbols and borders on a Silver-white ASTM Type III or Type IV retroreflective sheeting background (Type "W1") unless indicated otherwise on the plans. The Interstate Route Marker shall have Silver-white ASTM Type III or Type IV retroreflective sheeting overlayed with Standard Interstate Red and Blue transparent paste background with Silver-white ASTM Type III or Type IV retroreflective sheeting letters and symbols (Type "F") unless indicated otherwise on the plans.

* In a few cases numerals cannot be accommodated within the space available. For these situations, the Standard Series "D" numeral may be reduced to Series "C", or as a second choice to the next smaller height commonly available. Where the numerals are reduced in height the reduction shall be divided equally and added to the dimensions "B" & "C".

** If at least 2 of the 3 digits are "1", then use shield size corresponding to a 2 digit number.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01/06/2012

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OREGON STANDARD DRAWINGS

SIGNING DETAILS

US & INTERSTATE ROUTE SHIELDS

2015

DATE	REVISION DESCRIPTION

TM211.dgn 1-6-2012

TM211

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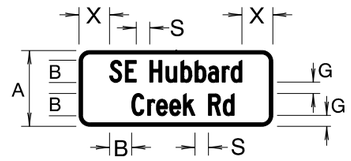
Effective Date: February 1, 2015 - May 31, 2015

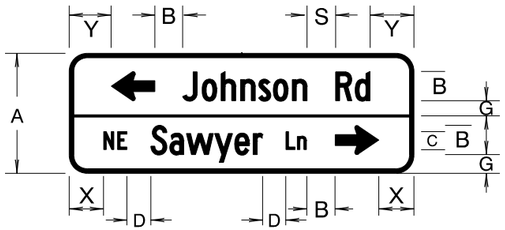
E = BORDER WIDTH F = BORDER RADIUS

* = USE FOR TEXT INCLUDING LOWER-CASE g, j, p, q and y

	A	A*	B	C	D	E	F	G	G*
GROUND-MOUNTED SIGN (2-3 LANE HWYS)	12"	15"	6"	4"	2½"	1"	1½"	3"	5"
GROUND-MOUNTED SIGN (4+ LANES AND > 40 MPH)	15"	18"	8"	5"	3⅛"	1"	1½"	3½"	6"
GROUND-MOUNTED SIGN (LOCAL ROAD, 25 MPH OR LESS)	9"	12"	5"	3"	1⅞"	½"	1½"	2"	4"
MAST ARM MOUNTED SIGN (12" STANDARD)	21"	24"	12"	8"	5"	1"	3"	4½"	7½"
MAST ARM MOUNTED SIGN (10" ALTERNATE)	21"	21"	10"	6"	3¾"	1"	3"	5½"	7"
STACKED LEGEND SIGN (GROUND-MOUNTED)	21"	24"	6"	N/A	N/A	1"	3"	3"	4"
STACKED LEGEND SIGN (MAST ARM MOUNTED)	30"	33"	8"	5"	3⅛"	1"	3"	3½"	5"



STACKED LEGEND FOR STREET NAME SIGN (GROUND-MOUNTED)



STACKED LEGEND FOR STREET NAME SIGN (MAST ARM MOUNTED)

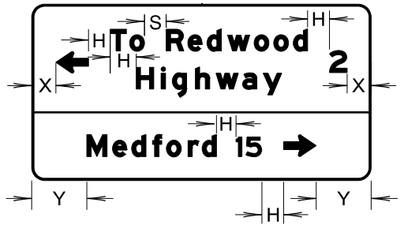
Notes: If 12"C font on mast arm mounted sign yields signs larger than 21 square feet, the 10" Alternate may be used.

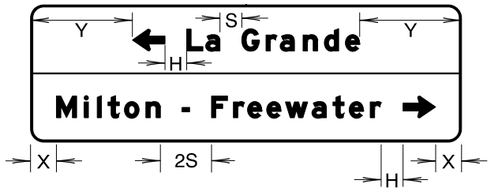
White border and legend on mast-arm signs are to be ASTM Type IX retroreflective sheeting. Borders shall be flush with edge of sign. Dividers, where used, shall be same width as border.

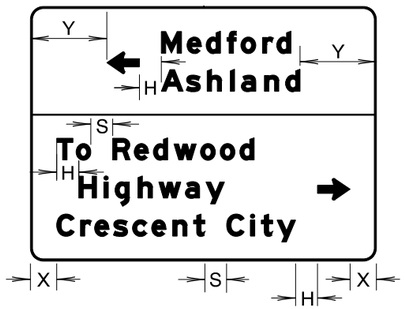
New Projects: Include mast-arm signs on Signing Plans.

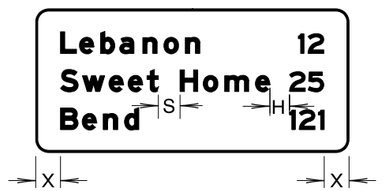
Existing Poles: Perform pole analysis prior to adding or enlarging signs.

STREET NAME SIGN DETAILS

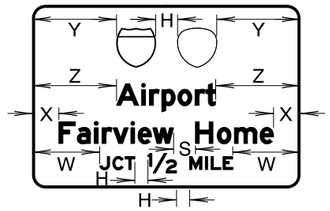




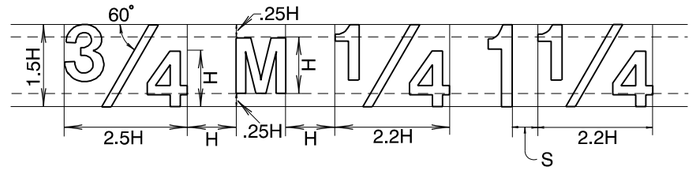




DIRECTIONAL SIGN DETAILS



Vertically center arrow between lines of legend.



FRACTIONAL LAYOUT

SERIES (FONT)				
	B	C	D	E
S	.531 H	.625 H	.836 H	1.00 H

SPACING BETWEEN WORDS

H = Letter Height
S = Space between words
W,X,Y & Z = ½ of remaining space

X-Dimension should be approximately the same dimension as the letter Height (H). At a minimum the X-Dimension shall be no less than one-half the letter height (1/2 H)

Sign examples shown here are not drawn to scale, but to illustrate the layout of the legend items.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 7/06/12

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS
CONVENTIONAL ROADS
DIRECTIONAL SIGN LAYOUT
STREET NAME SIGNS
2015

DATE	REVISION DESCRIPTION

TM223.dgn 7-6-2012

TM223

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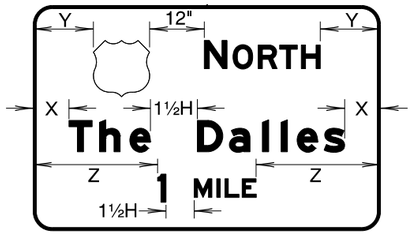
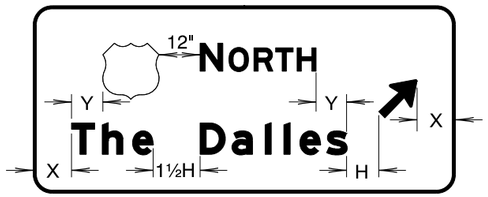
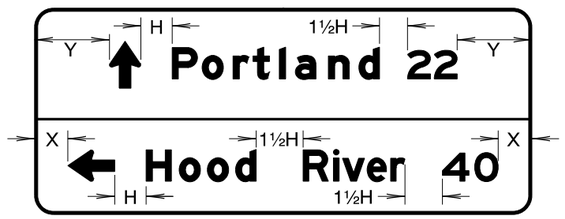
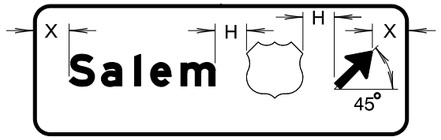
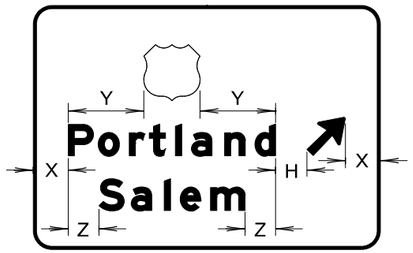
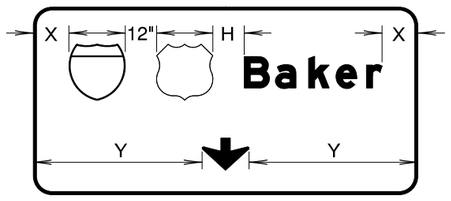


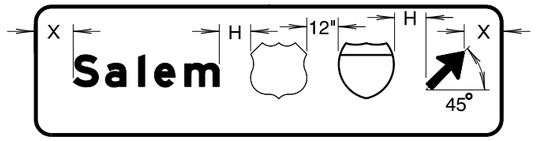


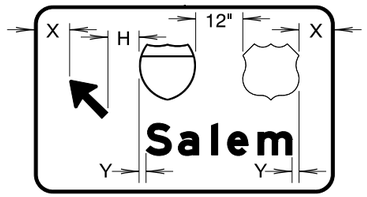


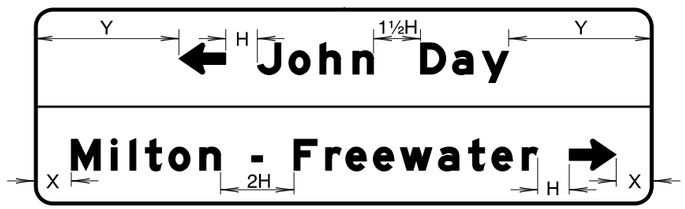


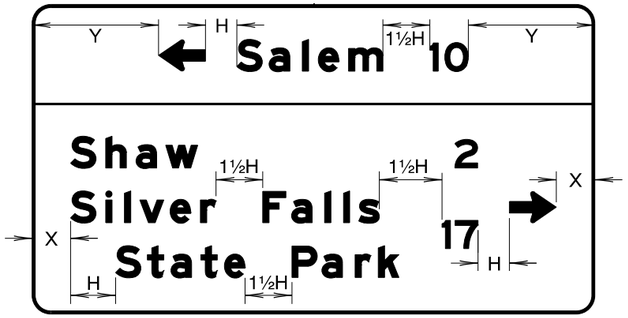


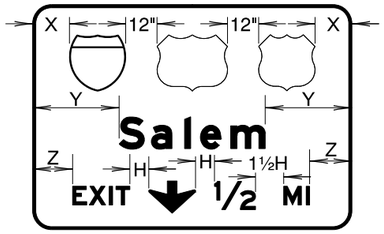


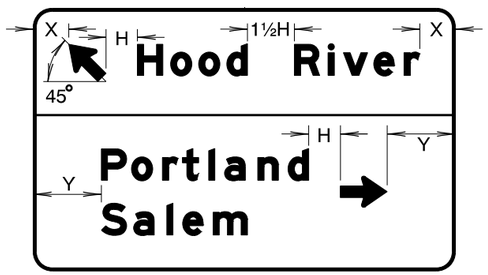


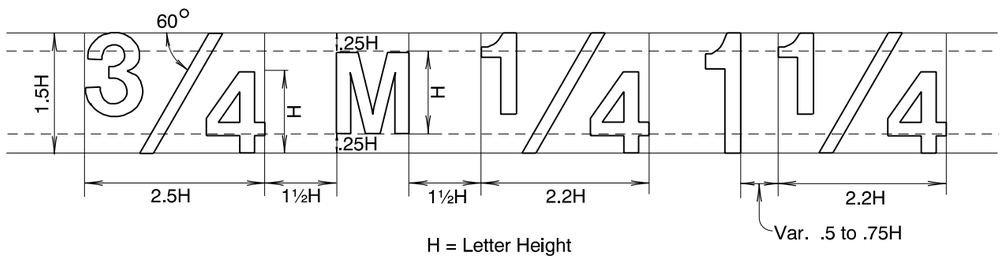












H = Letter Height

FRACTIONAL LAYOUT

Notes:

H = Height of upper case letter (not numeral) in each line of copy

X, Y, Z = ½ of remaining space

Sign examples shown here are not drawn to scale; but to illustrate the layout of the legend items.

X-Dimension should be approximately the same dimension as the letter Height (H). At a minimum the X-Dimension shall be no less than one-half the letter height (1/2 H)

Legends on freeway and expressway guide signs shall be all upper-case, or lower-case with initial upper-case series "E" modified letters as provided in the "Standard Alphabets for Highway Signs and Pavement Markings".

CALC. BOOK NO. N/A

BASELINE REPORT DATE 7/06/12

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

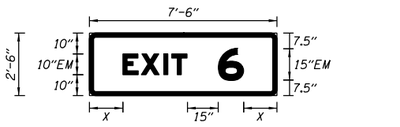
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

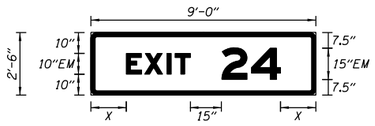
OREGON STANDARD DRAWINGS

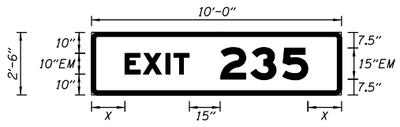
FREEWAY/EXPRESSWAY DIRECTIONAL SIGN LAYOUT

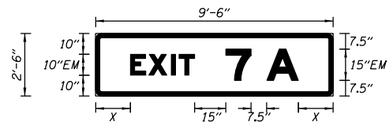
2015

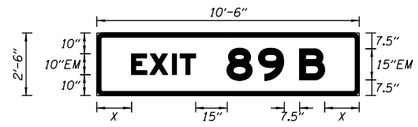
DATE	REVISION DESCRIPTION

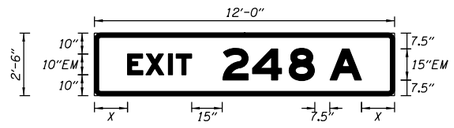








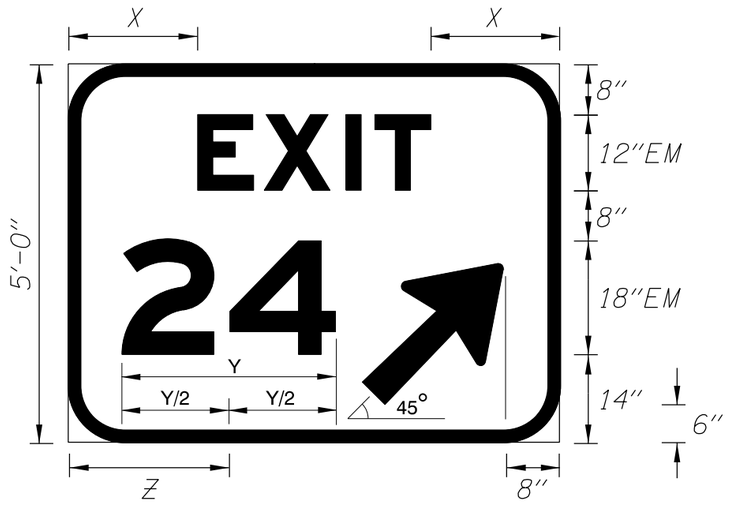


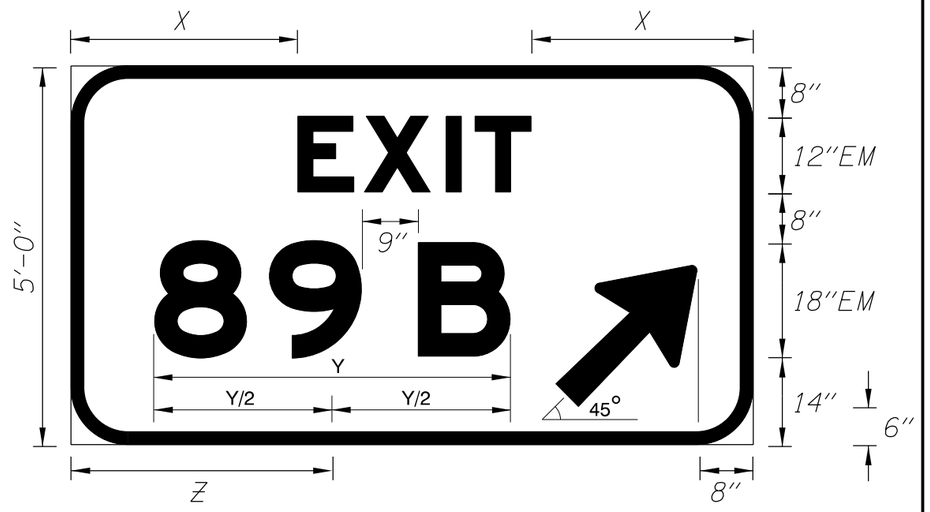


EXIT NUMBER SIGN DETAILS

Note: Use a 2" border with a 3" corner radius on all exit number signs.

Note:
Legends on freeway and expressway guide signs shall be all upper-case, or lower-case with initial upper-case series "E" modified letters as provided in the "Standard Alphabets for Highway Signs and Pavement Markings".





SIGN SPECIFICATIONS			
NO. OF DIGITS	WITH SUFFIX ?	SIGN SIZE	Z
1	No	78" x 60"	26"
1	Yes	90" x 60"	32"
2	No	78" x 60"	26"
2	Yes	108" x 60"	41"
3	No	96" x 60"	35"
3	Yes	126" x 60"	50"

EXIT GORE SIGN DETAILS

Notes: Use a 2" border with a 9" corner radius on all exit gore signs.

Use 18¼" x 29¼" type A-2 arrows on all exit gore signs. See TM233 for details.

The numberless exit gore sign detail has been deleted from this standard drawing. Use FHWA sign #E5-1 instead.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07/01/2010

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

EXIT NUMBER AND GORE SIGNING DETAILS

2008

DATE	REVISION DESCRIPTION
07/01/2010	Added Arrow Type To Sign Specifications. Referenced TM233
07/06/12	New sign images using wider design standards & showing "E"-Mod font.
01/03/14	Deleted numberless exit gore sign detail and referenced FHWA standard.

Note:

In severe wind areas the number of fasteners and mounting holes may be increased as directed by the Engineer.

Place holes for rivets a minimum of ¼" from outside of letter or numbers.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07-01-09

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MOUNTING DETAILS FOR REMOVABLE LEGEND 4" THROUGH 8" LETTERS & NUMBERS

2015

DATE	REVISION DESCRIPTION

TM230.dgn 7-1-2009

TM230

F:\mgk\Traffic\Standard Drawings\2014_July_Update\plotfile_TM200s_500s.dgn :: Default 7/8/2014 10:43:13 AM hwyr20m

Effective Date: February 1, 2015 - May 31, 2015

TM231.dgn 7-1-2009

Note:

In severe wind areas the number of fasteners and mounting holes may be increased as directed by the Engineer.

Place holes for rivets a minimum of ¼" from outside of letter or numbers.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07-01-09

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MOUNTING DETAILS FOR REMOVABLE LEGEND 10" THROUGH 12" LETTERS & NUMBERS

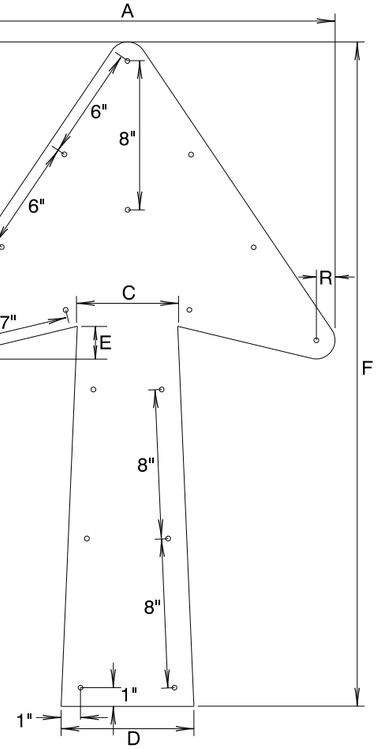
2015

DATE	REVISION DESCRIPTION

TM231

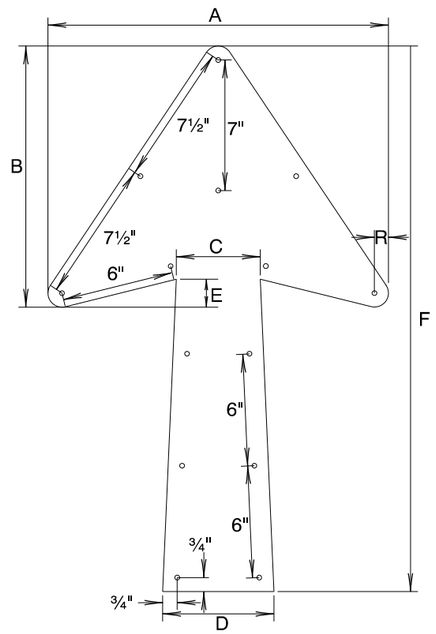
TM233.dgn 1-6-2012

TYPE "A-1"



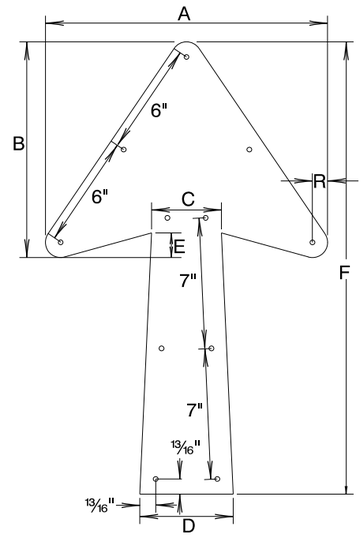
ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
22¼	17	5⅜	7⅛	1¾	35⅝	1

TYPE "A-2"



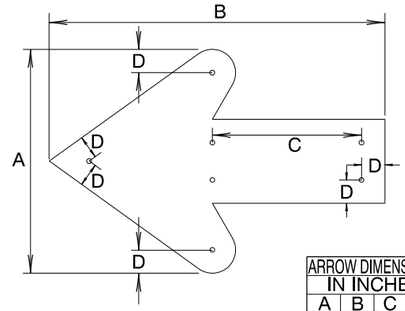
ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
18¼	14	4½	6	1½	29¼	¾

TYPE "A-3"



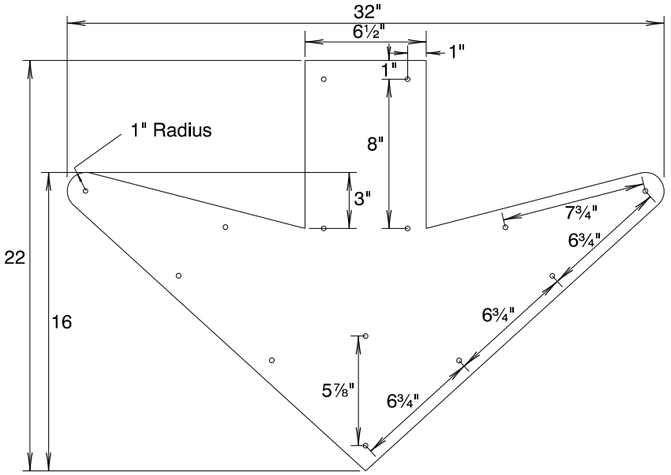
ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
15⅛	11⁹⁄₁₆	3¾	5	1⁵⁄₁₆	24¼	1⁄16

TYPE "D"



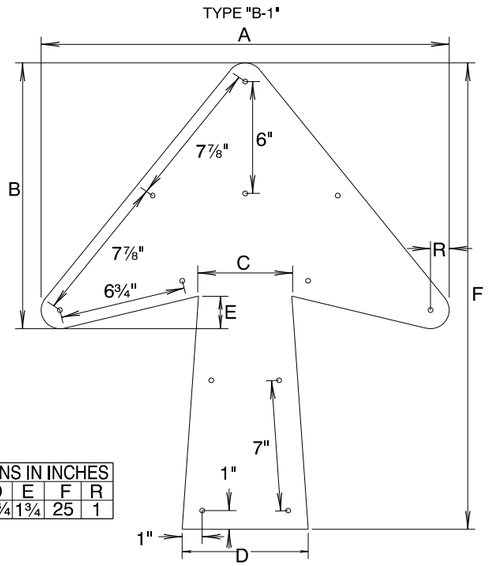
ARROW DIMENSIONS IN INCHES			
A	B	C	D
5	7	3¼	⅝
6	9	4	⅝
8	12	5½	⅝
10	16	7¾	⅝

"DOWN" ARROW



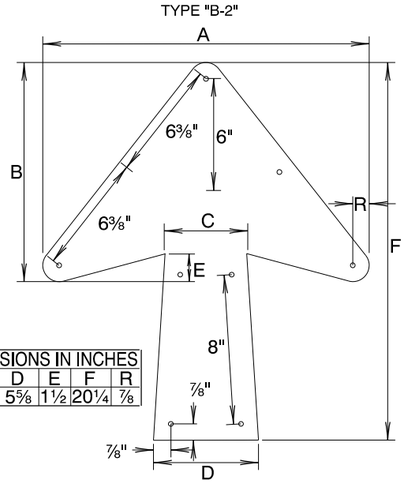
Note: In severe wind areas the number of fasteners and mounting holes may be increased as directed by the Engineer.

TYPE "B-1"



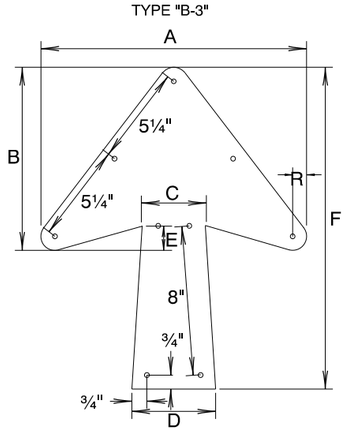
ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
21⅞	14¼	5	6¾	1¾	25	1

TYPE "B-2"



ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
17½	11¾	4⅜	5⅝	1½	20¼	⅞

TYPE "B-3"



ARROW DIMENSIONS IN INCHES						
A	B	C	D	E	F	R
14¼	9⁹⁄₁₆	3⅜	4½	1⁵⁄₁₆	17¼	¾

CALC. BOOK NO.	BASELINE REPORT DATE 01/06/2012
	NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MOUNTING DETAILS FOR REMOVABLE LEGEND VARIOUS ARROW SIZES

2015

DATE	REVISION DESCRIPTION

TM233

TM500.dgn 06-10-2014

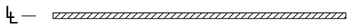
W

4" WHITE LINE

W-2

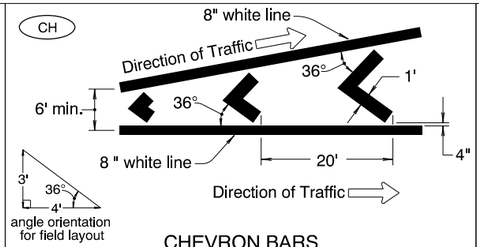
8" WHITE LINE

Y



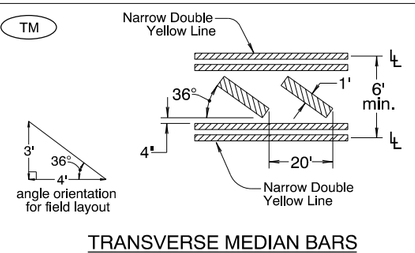
4" YELLOW LINE

CH



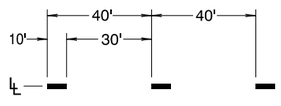
CHEVRON BARS
1' WHITE BARS AT 20' SPACING

TM



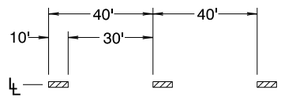
TRANSVERSE MEDIAN BARS
1' YELLOW BARS AT 20' SPACING

WB



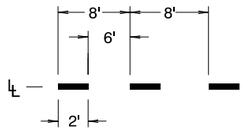
4" WHITE BROKEN LINE

YB



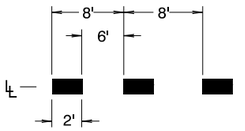
4" YELLOW BROKEN LINE

WD



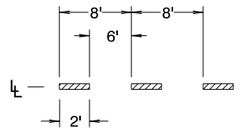
4" WHITE DOTTED LINE
For lane extensions

WD-2



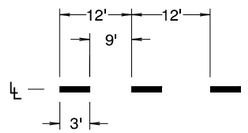
8" WHITE DOTTED LINE
For lane extensions and bike lane extensions

YD



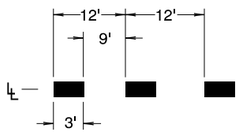
4" YELLOW DOTTED LINE
For lane extensions

DLL



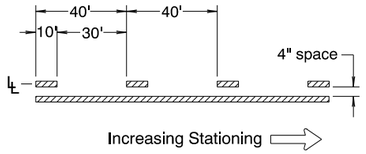
4" WHITE DOTTED LANE LINE
For lane lines in acceleration/deceleration lanes

DLL-2



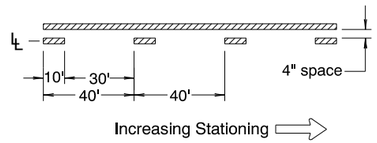
8" WHITE DOTTED LANE LINE
For lane lines in drop lanes

NPR



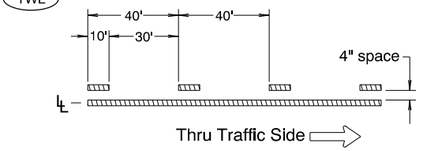
NO-PASS RIGHT
4" YELLOW LINES

NPL



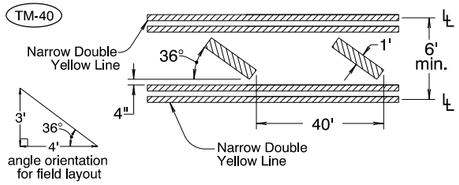
NO-PASS LEFT
4" YELLOW LINES

TWL



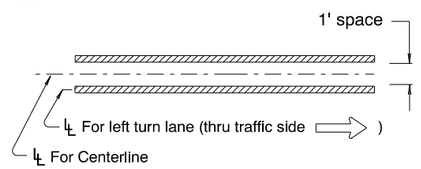
TWO-WAY LEFT TURN
4" YELLOW LINES

TM-40



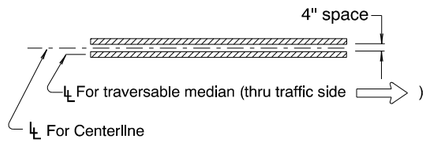
TRANSVERSE MEDIAN BARS
1' YELLOW BARS AT 40' SPACING
For use at painted medians where
distance between left turn refuges exceeds 200'

D



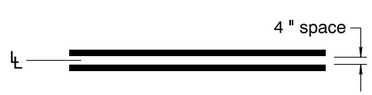
DOUBLE NO-PASS
TWO 4" YELLOW LINES

ND



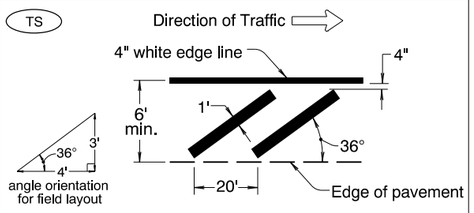
NARROW DOUBLE NO-PASS
TWO 4" YELLOW LINES

NDW



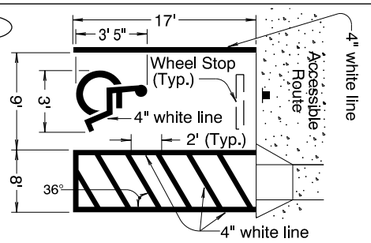
NARROW DOUBLE NO-LANE CHANGE
TWO 4" WHITE LINES

TS



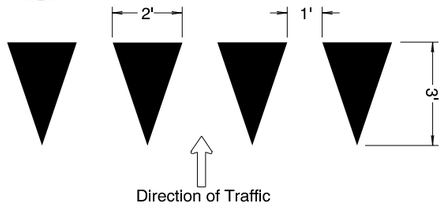
TRANSVERSE SHOULDER BARS
1' WHITE BARS AT 20' SPACING

HC



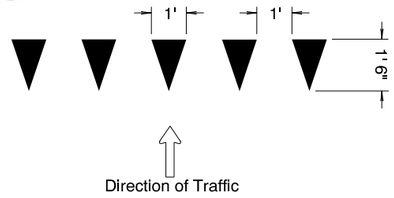
DISABLED PARKING DETAIL (white)

YLD



YIELD LINE (white)

BYLD



BIKE PATH YIELD LINE (white)

LEGEND

Direction Of Traffic, Increasing Stationing Or Thru Traffic Side

Lane line dimensions are shown on the striping plans

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12/19/2012

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

PAVEMENT MARKING
STANDARD DETAIL BLOCKS
2015

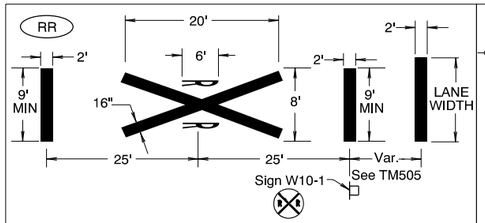
DATE	REVISION DESCRIPTION

TM500

R:\PAVEMENT MARKINGS\SECURE\STANDARD DRAWINGS\2015Standards\14 June\plotfile_TM500s.dgn :: Default 6/9/2014 9:17:42 AM hwyr30c

Effective Date: February 1, 2015 - May 31, 2015

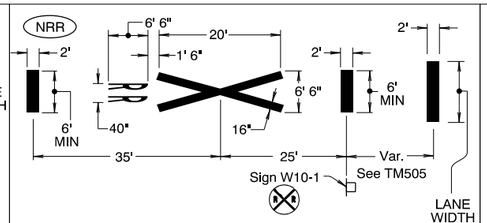
RR



RAILROAD CROSSING (white)

Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

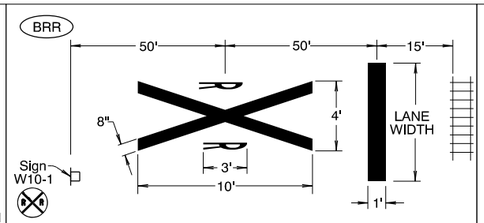
NRR



NARROW RAILROAD CROSSING (white)

Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

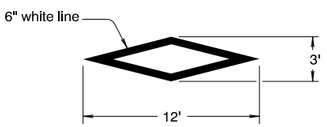
BRR



BIKE PATH RAILROAD CROSSING (white)

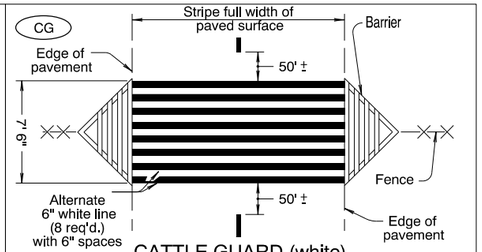
Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

HOV



HIGH-OCCUPANCY VEHICLE DIAMOND DETAIL (white)

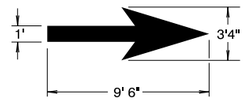
CG



CATTLE GUARD (white)

For barrier and fence details, see Std. Dwg. RD110

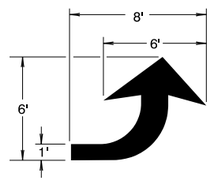
SA



STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

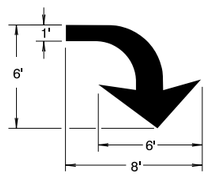
LA



LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

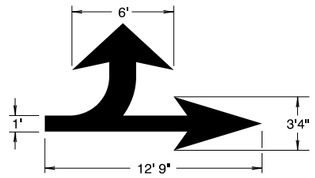
RA



RIGHT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

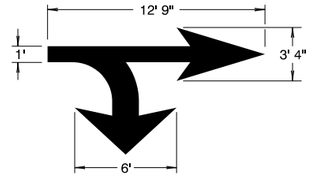
LSA



LEFT TURN STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

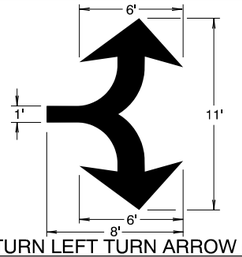
RSA



RIGHT TURN STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

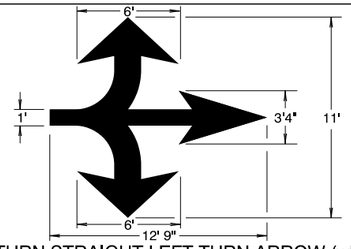
RALA



RIGHT TURN LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

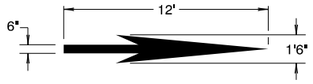
RSLA



RIGHT TURN STRAIGHT LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

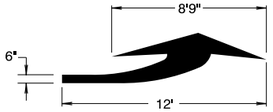
E-SA



ELONGATED STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

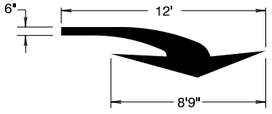
E-LA



ELONGATED LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

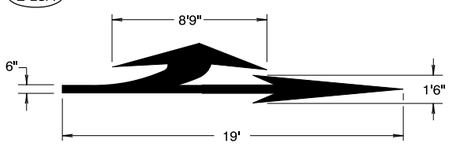
E-RA



ELONGATED RIGHT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

E-LSA



ELONGATED LEFT TURN STRAIGHT ARROW (white)

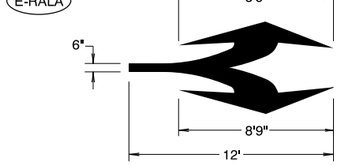
For arrow proportion details, see current version of Standard Highway Signs

E-RSA

ELONGATED RIGHT TURN STRAIGHT ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

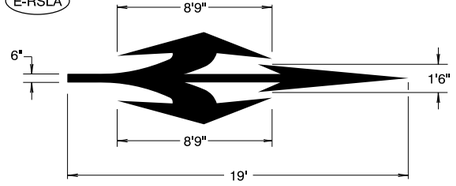
E-RALA



ELONGATED RIGHT TURN LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

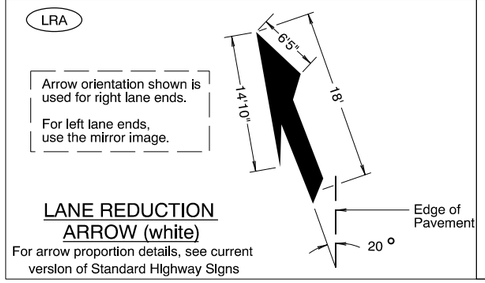
E-RSLA



ELONGATED RIGHT TURN STRAIGHT LEFT TURN ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

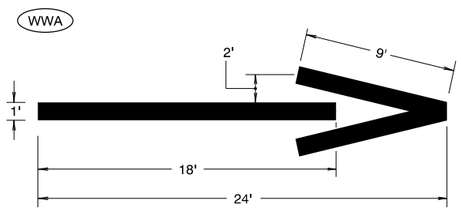
LRA



LANE REDUCTION ARROW (white)

For arrow proportion details, see current version of Standard Highway Signs

WWA



WRONG-WAY ARROW (white)

General Note:

1. Center pavement markings within the lane width.
2. Arrow and letter dimensions nominal, excluding WWA.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12/16/2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

PAVEMENT MARKING STANDARD DETAIL BLOCKS

2015

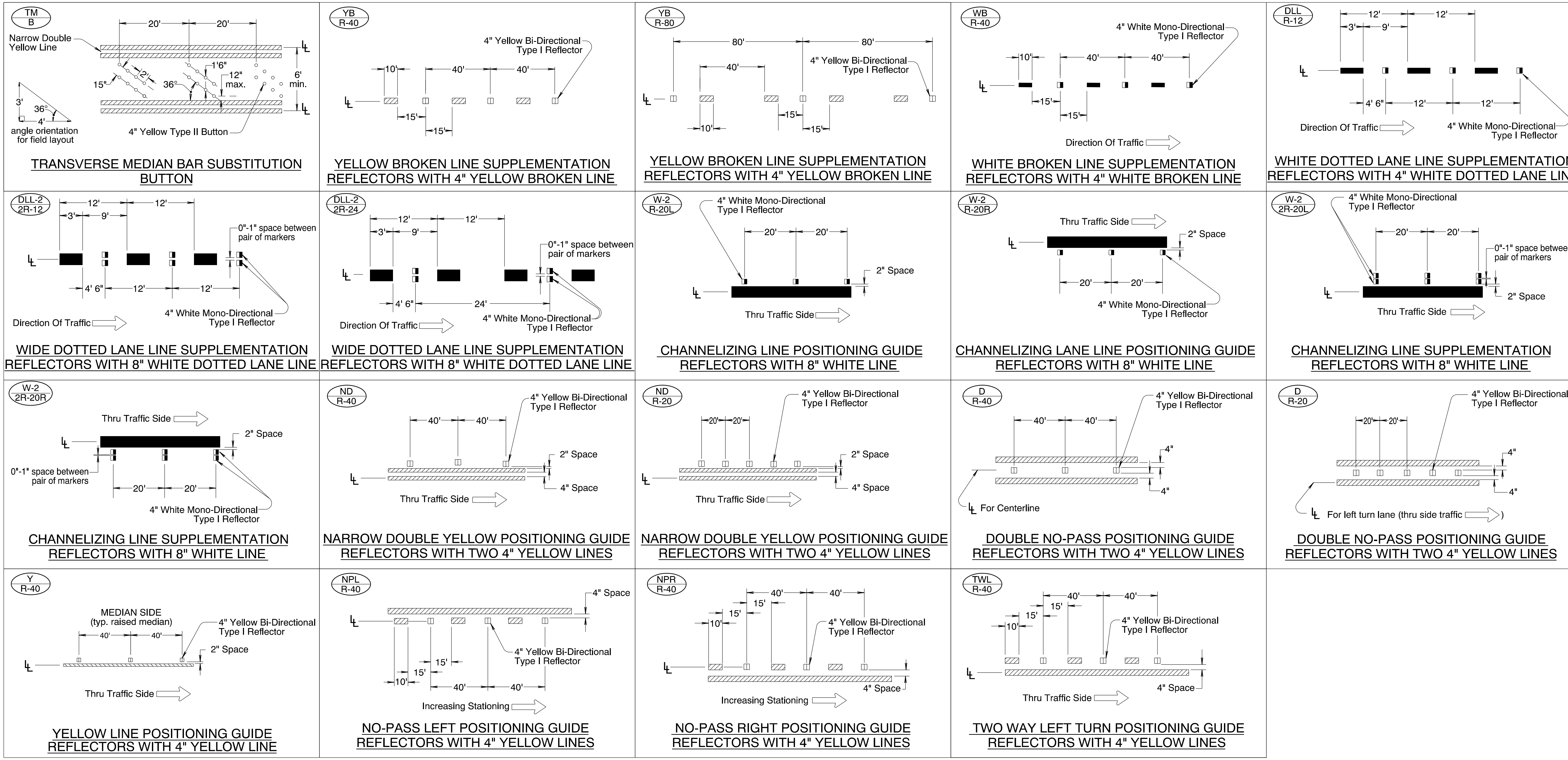
DATE	REVISION DESCRIPTION

TM501.dgn 06-10-2014

TM501

R:\PAVEMENT MARKINGS\SECURE\STANDARD DRAWINGS\2015Standards\14 June\plotfile_TM500s.dgn :: Default 6/9/2014 9:17:43 AM hwyr30c

Effective Date: February 1, 2015 - May 31, 2015



TM B
Narrow Double Yellow Line
4" Yellow Type II Button
angle orientation for field layout
TRANSVERSE MEDIAN BAR SUBSTITUTION BUTTON
YB R-40
4" Yellow Bi-Directional Type I Reflector
YELLOW BROKEN LINE SUPPLEMENTATION REFLECTORS WITH 4" YELLOW BROKEN LINE
YB R-80
4" Yellow Bi-Directional Type I Reflector
YELLOW BROKEN LINE SUPPLEMENTATION REFLECTORS WITH 4" YELLOW BROKEN LINE
WB R-40
4" White Mono-Directional Type I Reflector
Direction Of Traffic
WHITE BROKEN LINE SUPPLEMENTATION REFLECTORS WITH 4" WHITE BROKEN LINE
DLL R-12
Direction Of Traffic
4" White Mono-Directional Type I Reflector
WHITE DOTTED LANE LINE SUPPLEMENTATION REFLECTORS WITH 4" WHITE DOTTED LANE LINE
DLL-2 2R-12
0"-1" space between pair of markers
4" White Mono-Directional Type I Reflector
Direction Of Traffic
WIDE DOTTED LANE LINE SUPPLEMENTATION REFLECTORS WITH 8" WHITE DOTTED LANE LINE
DLL-2 2R-24
0"-1" space between pair of markers
4" White Mono-Directional Type I Reflector
Direction Of Traffic
WIDE DOTTED LANE LINE SUPPLEMENTATION REFLECTORS WITH 8" WHITE DOTTED LANE LINE
W-2 R-20L
4" White Mono-Directional Type I Reflector
2" Space
Thru Traffic Side
CHANNELIZING LINE POSITIONING GUIDE REFLECTORS WITH 8" WHITE LINE
W-2 R-20R
Thru Traffic Side
2" Space
4" White Mono-Directional Type I Reflector
CHANNELIZING LANE LINE POSITIONING GUIDE REFLECTORS WITH 8" WHITE LINE
W-2 2R-20L
4" White Mono-Directional Type I Reflector
0"-1" space between pair of markers
2" Space
Thru Traffic Side
CHANNELIZING LINE SUPPLEMENTATION REFLECTORS WITH 8" WHITE LINE
W-2 2R-20R
Thru Traffic Side
2" Space
0"-1" space between pair of markers
4" White Mono-Directional Type I Reflector
CHANNELIZING LINE SUPPLEMENTATION REFLECTORS WITH 8" WHITE LINE
ND R-40
4" Yellow Bi-Directional Type I Reflector
2" Space
4" Space
Thru Traffic Side
NARROW DOUBLE YELLOW POSITIONING GUIDE REFLECTORS WITH TWO 4" YELLOW LINES
ND R-20
4" Yellow Bi-Directional Type I Reflector
2" Space
4" Space
Thru Traffic Side
NARROW DOUBLE YELLOW POSITIONING GUIDE REFLECTORS WITH TWO 4" YELLOW LINES
D R-40
4" Yellow Bi-Directional Type I Reflector
For Centerline
DOUBLE NO-PASS POSITIONING GUIDE REFLECTORS WITH TWO 4" YELLOW LINES
D R-20
4" Yellow Bi-Directional Type I Reflector
For left turn lane (thru side traffic)
DOUBLE NO-PASS POSITIONING GUIDE REFLECTORS WITH TWO 4" YELLOW LINES
Y R-40
MEDIAN SIDE (typ. raised median)
4" Yellow Bi-Directional Type I Reflector
2" Space
Thru Traffic Side
YELLOW LINE POSITIONING GUIDE REFLECTORS WITH 4" YELLOW LINE
NPL R-40
4" Space
4" Yellow Bi-Directional Type I Reflector
Increasing Stationing
NO-PASS LEFT POSITIONING GUIDE REFLECTORS WITH 4" YELLOW LINES
NPR R-40
4" Yellow Bi-Directional Type I Reflector
4" Space
Increasing Stationing
NO-PASS RIGHT POSITIONING GUIDE REFLECTORS WITH 4" YELLOW LINES
TWL R-40
4" Yellow Bi-Directional Type I Reflector
4" Space
Thru Traffic Side
TWO WAY LEFT TURN POSITIONING GUIDE REFLECTORS WITH 4" YELLOW LINES

General note:

1.) Surface mount Raised Pavement Markers (RPMs) unless otherwise specified.

LEGEND

- Direction Of Travel, Increasing Stationing or Thru Traffic Side
- ℄ — Lane line dimensions are shown on the striping plans
- Mono-directional crystal white marker reflects white to the left in this symbol
- Bi-directional yellow marker reflects yellow both left and right in this symbol

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12/16/2011

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OREGON STANDARD DRAWINGS

PAVEMENT MARKING STANDARD DETAIL BLOCKS

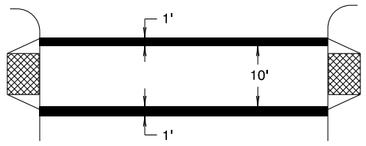
2015

DATE	REVISION DESCRIPTION

TM502.dgn 06-10-2014

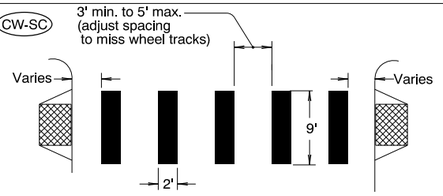
TM502

CW



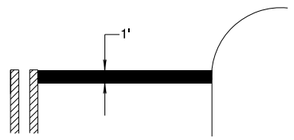
STANDARD CROSSWALK
TWO 1' WHITE BARS
Install per Standard Drawing TM530

CW-SC



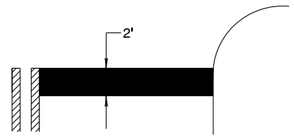
STAGGERED CONTINENTAL CROSSWALK
2' WHITE BARS
Install per Standard Drawing TM530

S



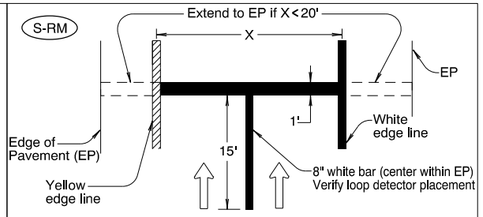
STOP BAR
1' WHITE BAR
Install per Standard Drawing TM530

S-2



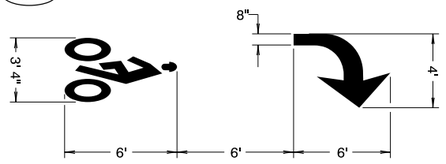
STOP BAR - LARGE
2' WHITE BAR
Install per Standard Drawing TM530

S-RM



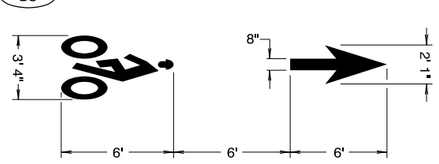
RAMP METER STOP BAR
1' & 8" WHITE BARS
For multi-lane ramp meter applications

BSR



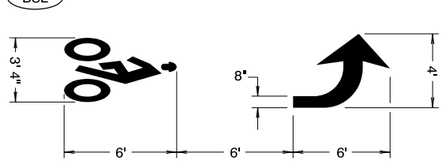
BIKE RIGHT TURN STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

BS



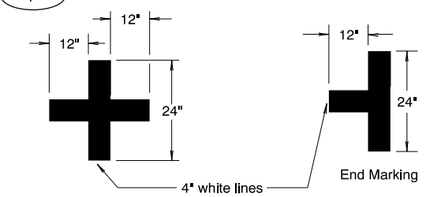
BIKE LANE STANDARD STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

BSL



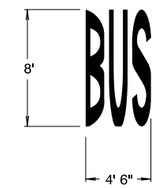
BIKE LEFT TURN STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

P



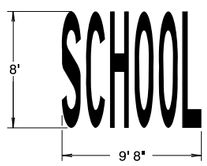
ON-STREET PARKING DETAIL (white)

BUS



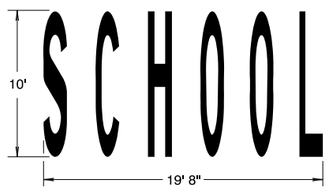
BUS (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

SCH



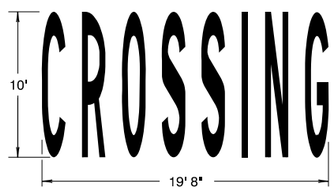
SCHOOL (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

SCH-LG



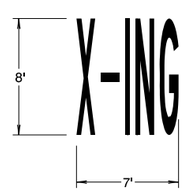
SCHOOL - LARGE (white)
Center marking within width of two lanes
For letter proportion details, see current version of Standard Highway Signs

CRS-LG



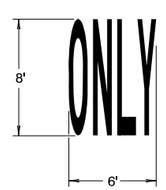
CROSSING - LARGE (white)
Center marking within width of two lanes
For letter proportion details, see current version of Standard Highway Signs

XNG



X-ING (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

ON



ONLY (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

General Note:

1. Arrow, letter, and bike symbol dimensions nominal.

LEGEND

Direction of Travel

CALC. BOOK NO. N/A

BASELINE REPORT DATE 7/6/2009

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

PAVEMENT MARKING
STANDARD DETAIL BLOCKS
2015

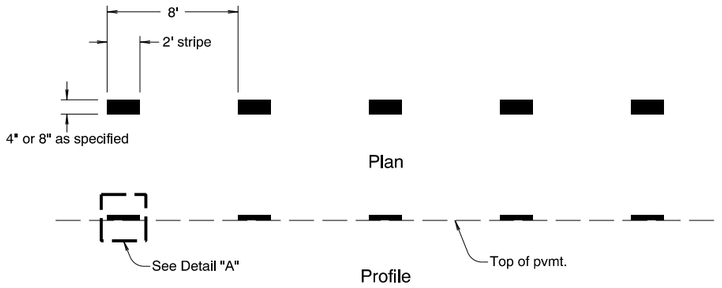
DATE	REVISION DESCRIPTION

TM503.dgn 06-10-2014

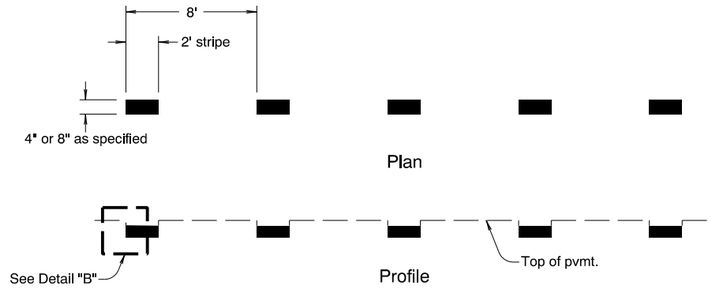
TM503

R:\PAVEMENT MARKINGS\SECURE\STANDARD DRAWINGS\2015Standards\14 June\plotfile_TM500s.dgn :: Default 6/9/2014 9:17:45 AM hwyr30c

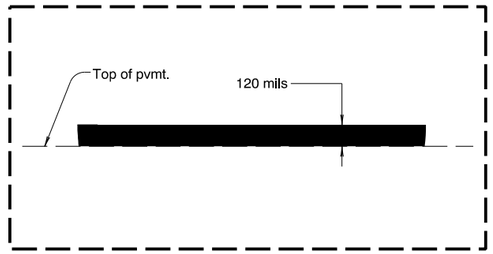
Effective Date: February 1, 2015 - May 31, 2015



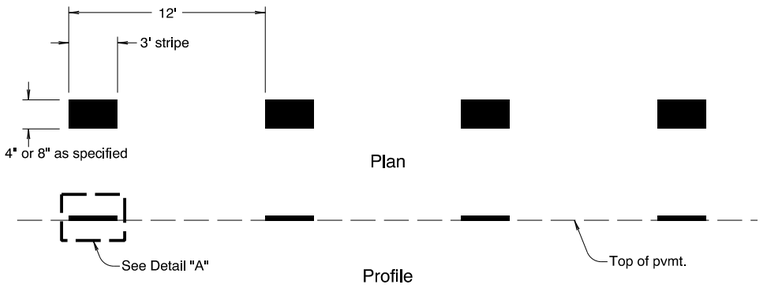
DOTTED LINE
SURFACE INSTALLED



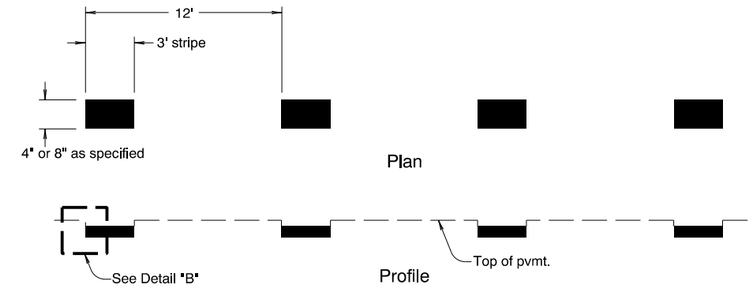
DOTTED LINE
GROOVE INSTALLED



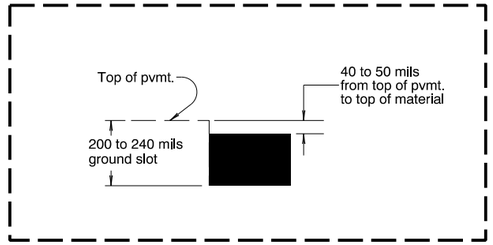
DETAIL "A"
SURFACE INSTALLED



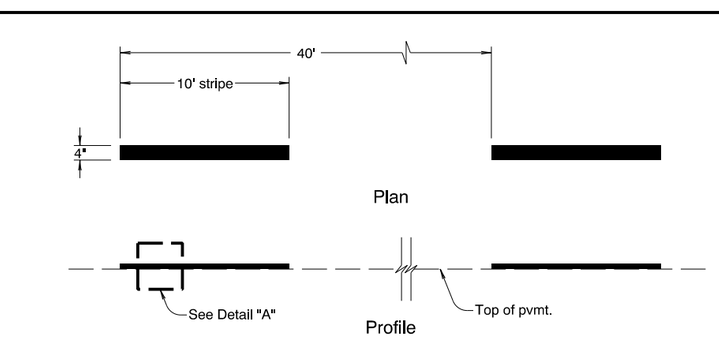
DOTTED LANE LINE
SURFACE INSTALLED



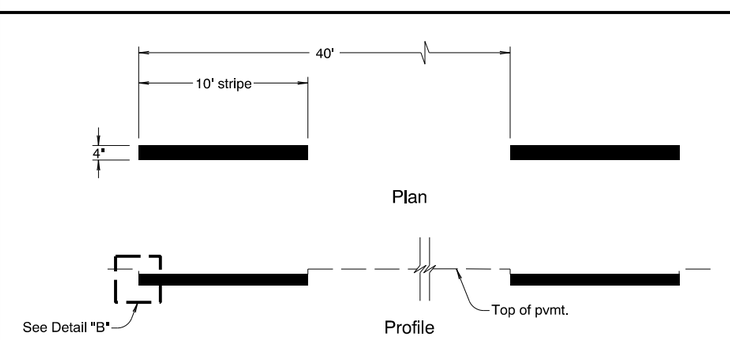
DOTTED LANE LINE
GROOVE INSTALLED



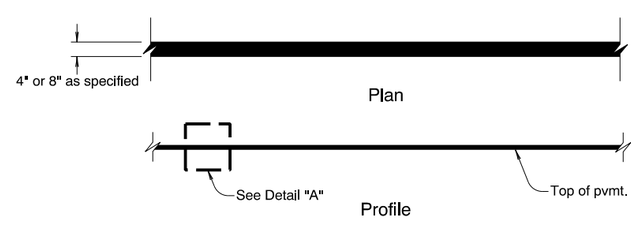
DETAIL "B"
GROOVE INSTALLED



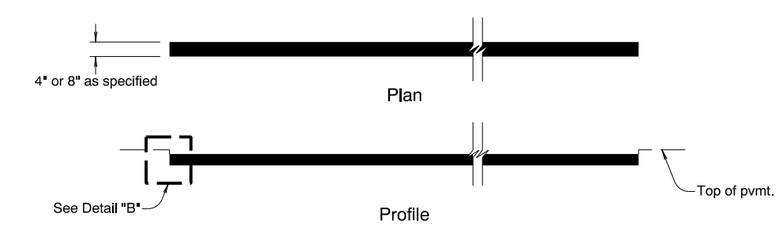
BROKEN LINE
SURFACE INSTALLED



BROKEN LINE
GROOVE INSTALLED



SOLID LINE
SURFACE INSTALLED



SOLID LINE
GROOVE INSTALLED

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07/05/2013

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS
DURABLE PAVEMENT MARKINGS METHOD 'A' & METHOD 'B' SURFACE & GROOVE INSTALLED NON-PROFILED
2015

DATE	REVISION DESCRIPTION

TM521.dgn 06-10-2014

TM521

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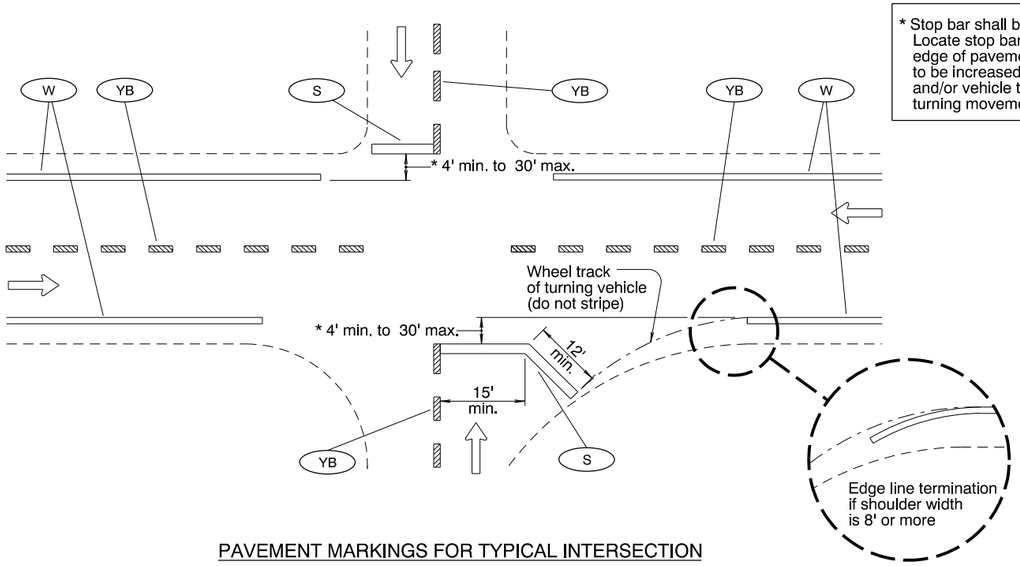
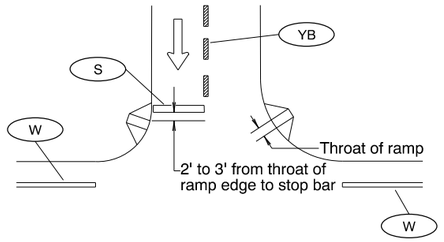
Effective Date: February 1, 2015 - May 31, 2015

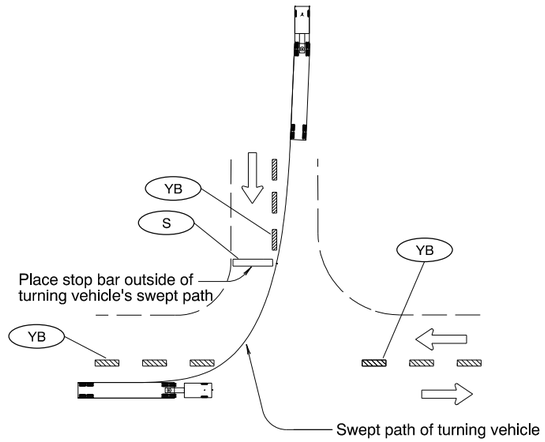


PAVEMENT MARKINGS FOR TYPICAL INTERSECTION

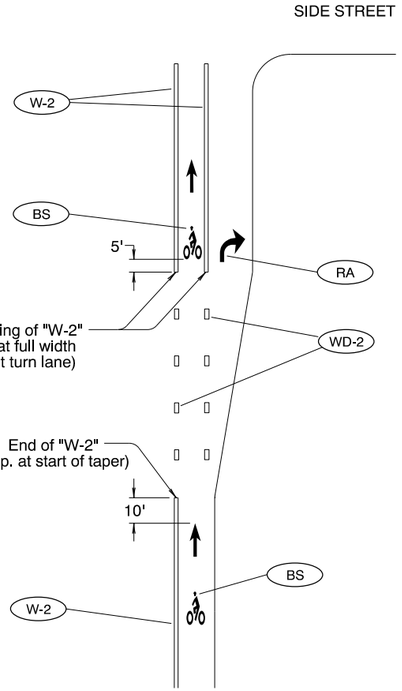
* Stop bar shall be placed as near as possible to the intersecting traveled way. Locate stop bar 4' min. to 30' max. in advance of the extended fog line, edge of pavement, or curb face. Minimum stop bar distance may need to be increased, depending on location of pedestrian ramps (see Detail "A") and/or vehicle turn radii (see Detail "B"). Field verify sight distance and truck turning movements.



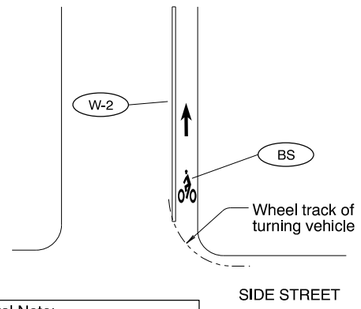
Detail "A"
STOP BAR PLACEMENT WITH
RESPECT TO PEDESTRIAN RAMPS



Detail "B"
STOP BAR PLACEMENT WITH
RESPECT TO TURN RADII



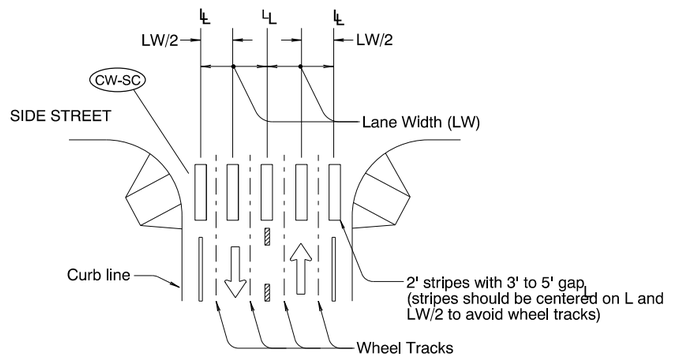
INSTALLATION OF BIKE LANE STENCILS
FOR BIKE LANE SEPARATED BY RIGHT TURN LANE



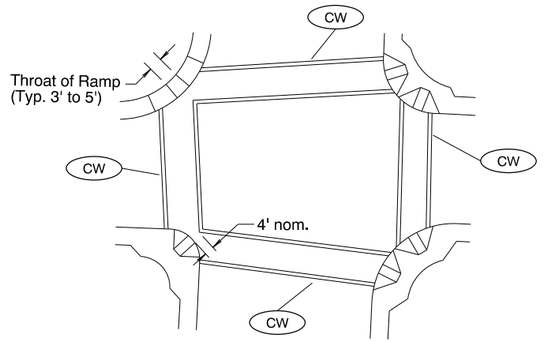
General Note:

Install bike lane stencil to avoid right turning vehicle wheel tracks.

INSTALLATION OF BIKE LANE STENCILS
FOLLOWING INTERSECTIONS



STAGGERED CONTINENTAL LAYOUT



STANDARD CROSSWALK BARS
AT INTERSECTION

General Note:

1. Install crosswalk bars such that the throat of the ADA ramp is entirely within crosswalk markings, or 5' back of extended fog line, edge of pavement, or curb face.

LEGEND

Direction of Travel

L - Lane line dimensions are shown on the striping plans

To be accompanied by Standard Dwg. Nos. TM500 thru TM503

CALC. BOOK NO. _____

BASELINE REPORT DATE July 1, 2010

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

INTERSECTION PAVEMENT MARKINGS (CROSSWALK, STOP BAR & BIKE LANE STENCIL)

2015

DATE	REVISION DESCRIPTION

TM530.dgn 7-1-2010

TM530

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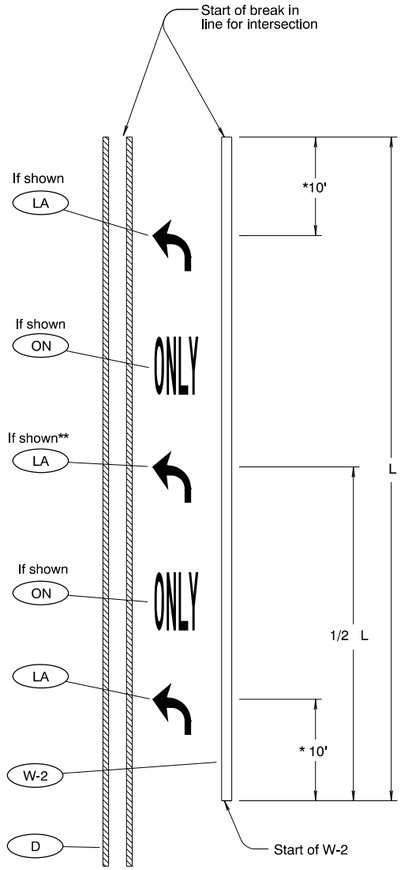
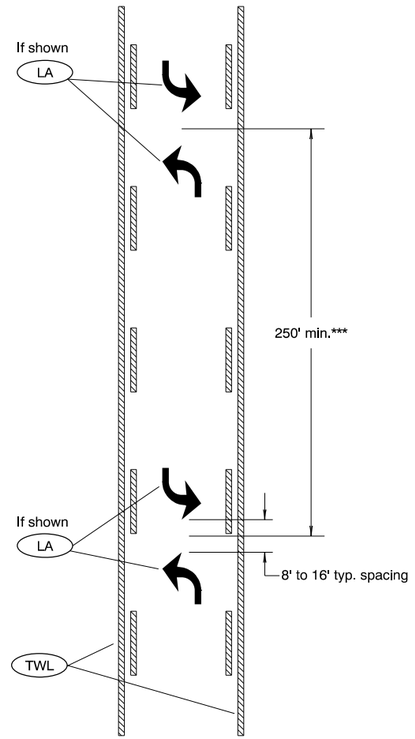
Effective Date: February 1, 2015 - May 31, 2015



LANE USE ARROW PLACEMENT FOR TURN LANE

DETAIL "A"



TWO-WAY LEFT TURN LANE ARROW PLACEMENT

DETAIL "B"

General Notes:

1.) Center pavement marking legends within the lane.

2.) Placement of lane use arrows with respect to the 8" wide white line (W-2) channelization shown in Detail "A" applies to both left and right turn lanes.

3.) Center "ONLY" markings between lane use arrows.

* 15' when installing elongated arrows.

** When L is greater than 400', install 3rd lane use arrow at ½ L as shown in Detail "A".

*** Double arrows to be placed at even intervals, proportioned within block or as shown.

To be accompanied by Standard Dwg. Nos. TM500 thru TM503

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12/16/2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

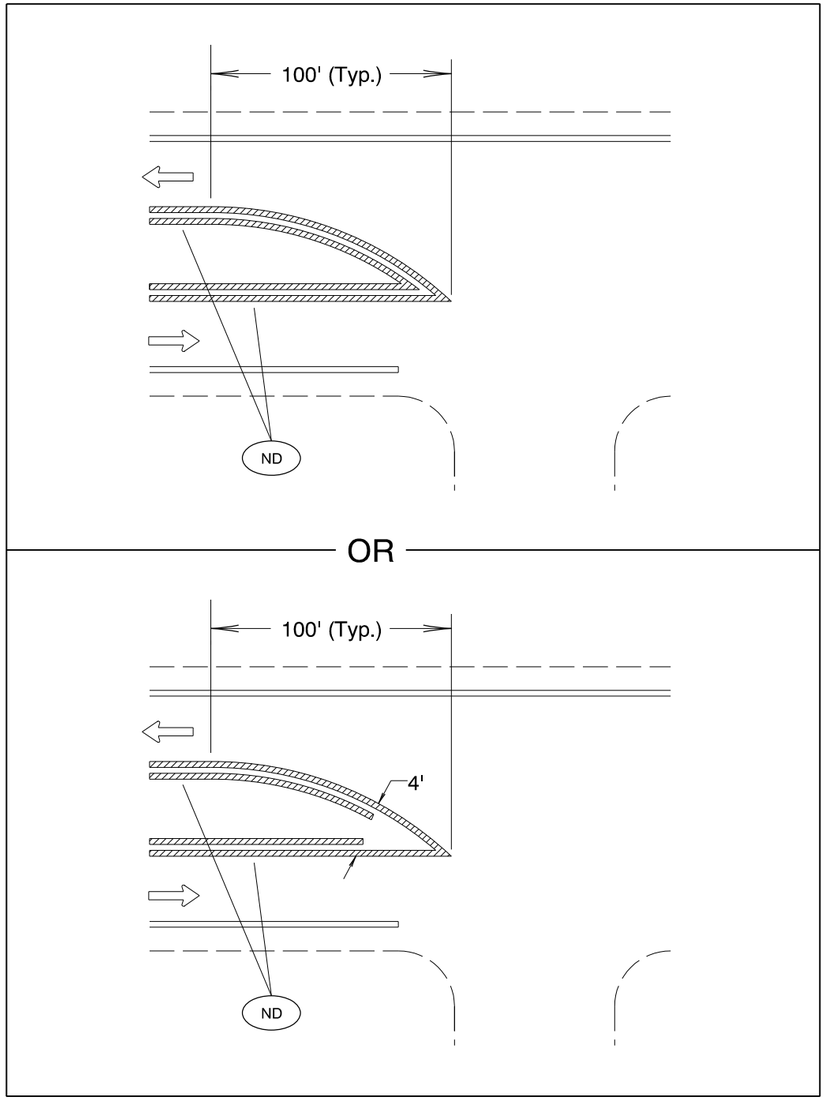
OREGON STANDARD DRAWINGS

TURN ARROW MARKING DETAILS

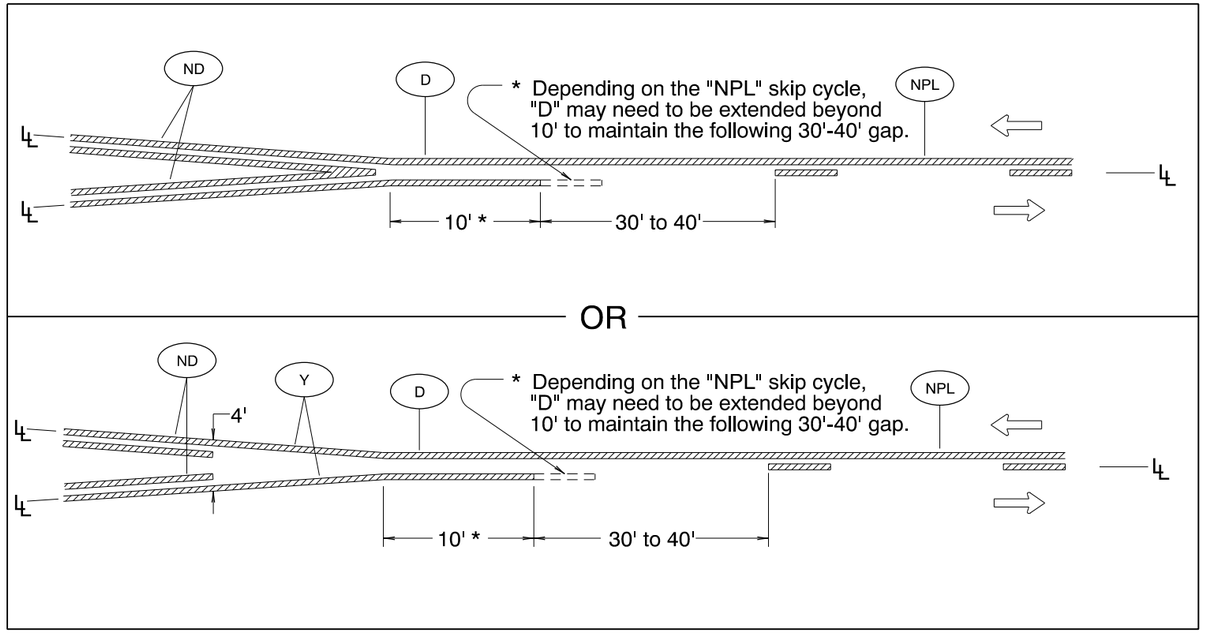
2015

DATE	REVISION DESCRIPTION

TM531



MEDIAN BULLNOSE DETAIL



MEDIAN WIDTH TRANSITION

(TWO NARROW DOUBLE YELLOW LINES TO ONE-DIRECTION NO-PASSING LINE)

LEGEND

Increasing stationing from left to right

Direction of Travel

℄ — Lane line dimensions are shown on the striping plans

To be accompanied by Standard Dwg. Nos. TM500 thru TM503

CALC. BOOK NO. N/A

BASELINE REPORT DATE 12/16/2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

MEDIAN AND LEFT TURN CHANNELIZATION DETAILS

2015

DATE	REVISION DESCRIPTION

TM539.dgn 06-10-2014

TM539

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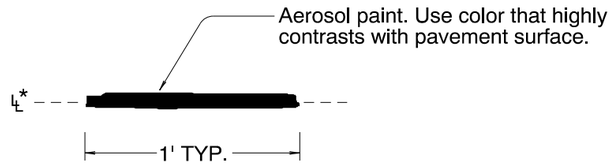
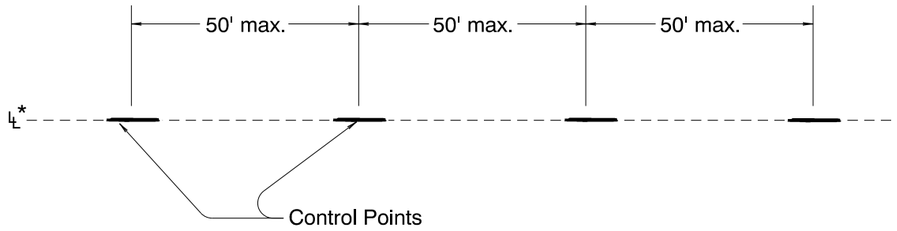
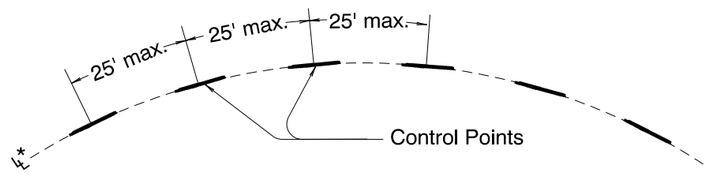
Effective Date: February 1, 2015 - May 31, 2015



CONTROL POINT



CONTROL POINT LAYOUT - TANGENT SECTIONS



CONTROL POINT LAYOUT - CURVE SECTIONS

General note:

1.) Use control points to make continous narrow guideline as specified.

* Control points are placed along the lane line for all longitudinal lines except:

a) A control point layout 8" offset from the lane line is required for following lines:

TWL	ND For traversable medians only	D For left turn refuges only	Y For non-traversable medians on undivided highways only

See Std. Dwg. No. TM561 for additional details.

b) A control point layout 4" offset from the lane line is required for the following line:

ND For center lines only

LEGEND

℄ — Lane line dimensions are shown on the striping plans.

To be accompanied by Standard Dwg. Nos. TM500 thru TM503

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07/08/2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

ALIGNMENT LAYOUT: GENERAL

2015

DATE	REVISION DESCRIPTION

TM560.dgn 06-10-2014

TM560

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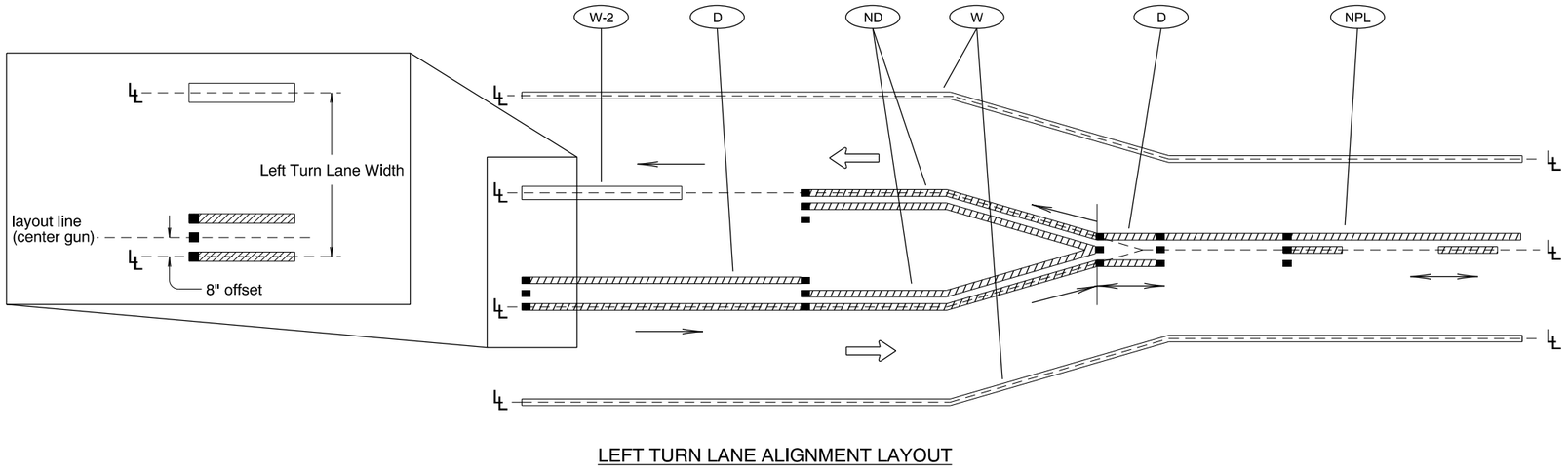
Effective Date: February 1, 2015 - May 31, 2015



LEFT TURN LANE ALIGNMENT LAYOUT

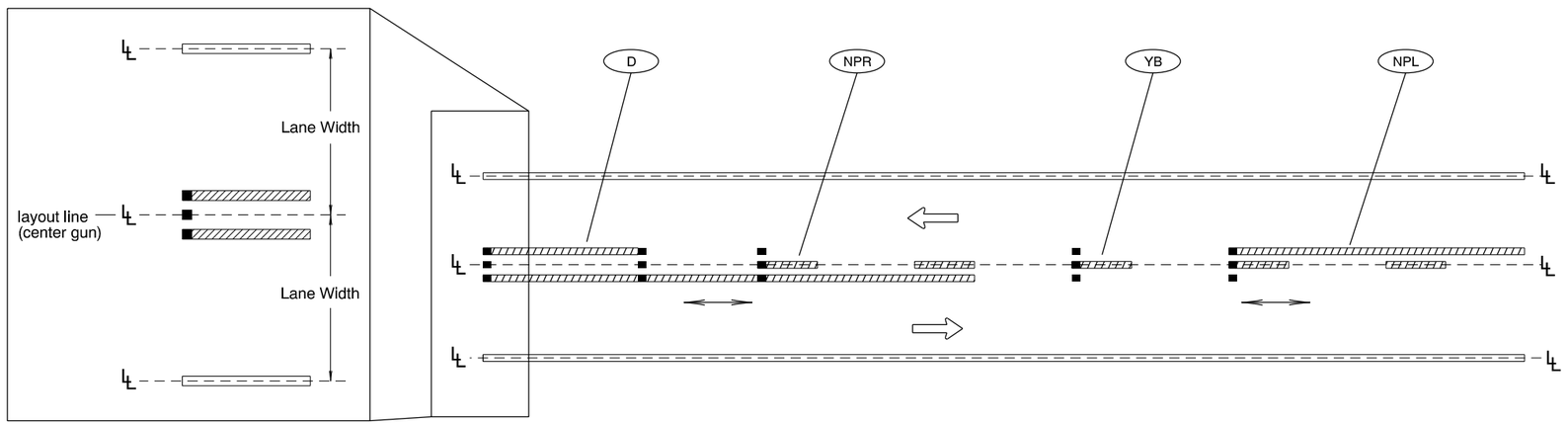
General note:

1.) Install control points for pavement marking alignment layout along the center gun location.

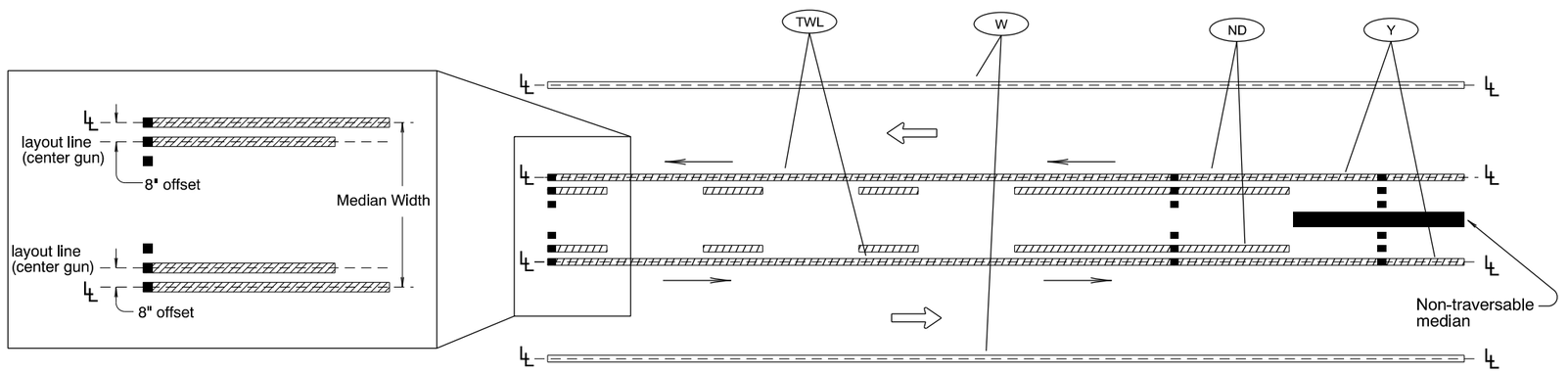
2.) Increasing stationing from left to right

LEGEND

- Direction Of Travel and Thru Traffic Side.
- Lane line dimensions are shown on the striping plans.
- Direction of striping truck (may go either direction)
- Direction of striping truck (may go one direction only)
- Three gun installation system (center dot represents center gun)



CENTERLINE ALIGNMENT LAYOUT



MEDIAN ALIGNMENT LAYOUT

Line Types requiring control points to be 8" offset from lane line:

TWL

ND *

For traversable medians only

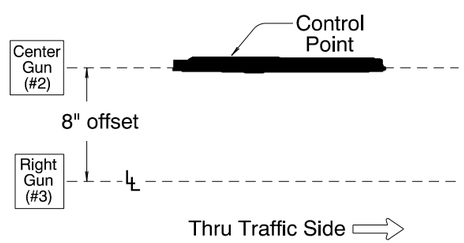
D

For left turn refuges only

Y

For non-traversable medians on undivided highways only. Right gun (#3) to be used.

Median/left turn refuge side



8" Offset of Lane Line and Center Gun

* When ND is used as centerline markings, a control point layout 4" offset from the lane line is required.

To be accompanied by Standard Dwg. Nos. TM500 thru TM503

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07/08/2011

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

ALIGNMENT LAYOUT: LEFT TURN LANE, CENTERLINE & MEDIANS

2015

DATE	REVISION DESCRIPTION

TM561.dgn 06-10-2014

TM561

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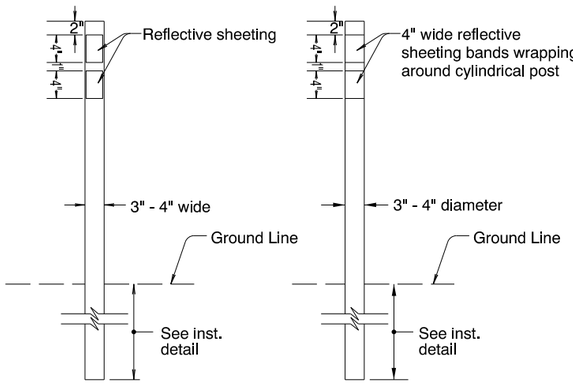
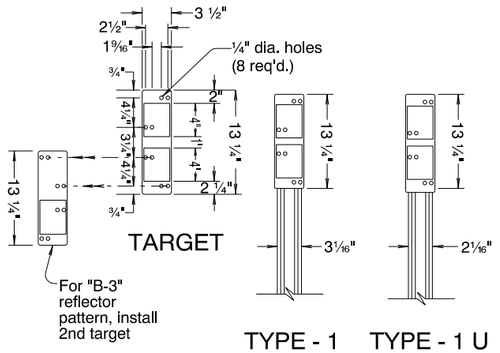
Effective Date: February 1, 2015 - May 31, 2015



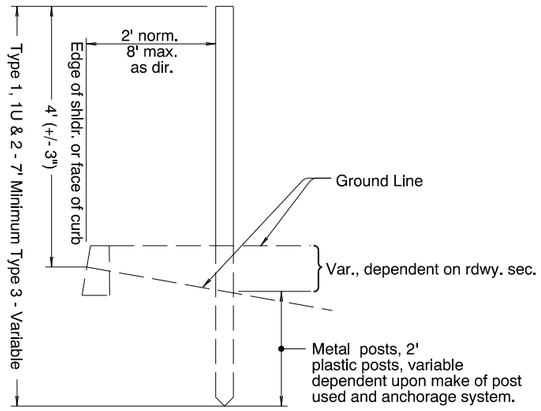
TYPE - 2 TYPE - 3

FLEXIBLE PLASTIC POSTS

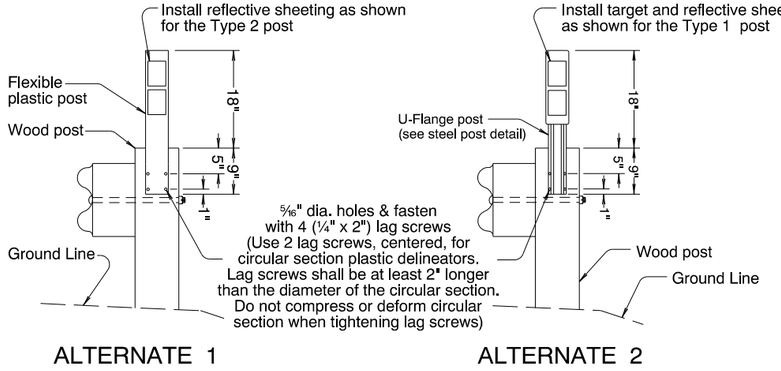


TYPE - 1 TYPE - 1 U

STEEL POSTS



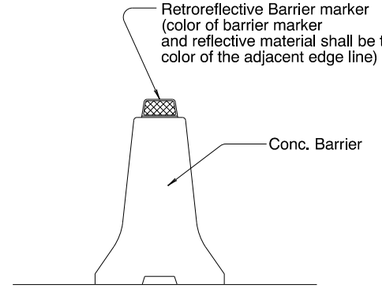
INSTALLATION DETAIL



ALTERNATE 1 ALTERNATE 2

TYPE - 4

GUARDRAIL AREAS (WITH WOOD POSTS)



TYPE - 5

CONCRETE BARRIER AREAS

(Install barrier markers at 50' spacing unless otherwise noted in plans)

NOTES:

POST:
Galv. steel, nominal weight Type 1, 2 lb/ft, Type 1 U, 1.12 lb/ft.

See Standard Drawing TM571 for steel post dimensions and details.

TARGET:
Aluminum sheet, nominal thickness .050". Fasten to post with ³⁄₁₆" dia. aluminum blind rivets and washers.

For "B-3" reflector pattern, top target shall overlap bottom target.

REFLECTORS:
3" x 4" reflective sheeting unless otherwise shown.
(3½" x 4" reflective sheeting is an acceptable alternate unless otherwise shown.)
Acrylic prismatic reflectors acceptable on Type 1, 1 U, 2 and 4 posts and Type 5 barrier mounts.
Place required number in sequence from top of target.

GENERAL NOTES:

1. Spacing shall be measured along the shoulder.
2. On roads with less than 500 vehicle ADT, delineators are not to be used except where situations such as sharp horizontal curves, etc. exist.
3. To clear driveways, crossroads etc., or for required adjustments at ramps and at intersections, either:
   (a) vary placement of that post up to 25% of spacing shown, or;
   (b) eliminate said post if limit of variation must be exceeded.
4. Judgement should be exercised in the installation of delineators in cut section, particularly on roads constructed to older standards where ditches are narrow and where delineators tend to hamper maintenance operations.
5. On horizontal curves place delineators nearly opposite each other.
6. At guard rail locations the delineators are to be installed behind the rail and shall be located adjacent to guard rail posts as shown for Type 4 Delineators.
7. Install all delineators with reflectors facing adjacent oncoming traffic.
8. Offset delineators an additional 4' in areas of heavy snow removal operations.
9. Backside Delineators may be used in frequently snow plowed areas where use of snow poles is not justified. When Backside Delineators are specified, substitute "W-1" and "W-2" with "W-1B" and "W-2B" respectively, on Type 1 steel posts. Do not install Backside Delineators on one-way sections of roadway, freeways and ramps, or on radius sections.
10. Refer to TM 222 for bracket assembly details for Backside Reflector Pattern.

REFLECTOR PATTERN TABLE					
	Color Type	Color Of Reflector And Target Or Post	Number Of Reflectors	Color Of Reflector And Target Or Post On Backside	Number Of Reflectors On Backside
Standard Pattern	"W-1"	White	1	Not Applicable	Not Applicable
	"W-2"	White	2		
	"Y-1"	Yellow	1		
	"Y-2"	Yellow	2		
	"B-1"	Blue	1		
	"B-2"	Blue	2		
	"B-3"	Blue	3		
	"R-1"	Red	1		
Backside Pattern	"W-1B"	White	1	White	2
	"W-2B"	White	2	White	2

TANGENT	HORIZONTAL CURVES				
▲MAX. SPACING EACH SIDE OF ROADWAY IN FEET	▲ MAX. SPACING EACH SIDE OF ROADWAY IN FEET				
	DEGREE OF CURVE	ON CURVE	IN ADVANCE OF & BEYOND CURVE		
			FIRST SPACE	SECOND SPACE	THIRD SPACE
400	Lower Than 1	300	300	300	300
	1	230	300	300	300
	2	160	300	300	300
	3	130	260	300	300
	4	110	220	300	300
	5	100	200	300	300
	6	90	180	270	300
	7 - 8	80	160	240	300
	9 - 11	70	140	210	300
	12 - 16	60	120	180	300
	17 - 22	50	100	150	300
	23 - 34	40	80	120	240
	35 - 53	30	60	90	180
	54 & Higher	20	40	60	120

(Min. spacing 20 feet)

(▲Install "W-1" reflective pattern unless otherwise noted. See Standard Drawings TM575 thru TM577 for spacing, layout, and reflective pattern of delineators at interchange ramps, channelized intersections, lane reductions, emergency escape ramps and freeway crossovers.)

DELINEATOR SPACING TABLE FOR TYPES 1, 1U, 2, and 4

To be accompanied by Drg. No. TM571, TM575, TM576, and/or TM577 as specified.

CALC. BOOK NO. _ _ _ _ _ _ _ _ _ _ _ _

BASELINE REPORT DATE 01/06/2012

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

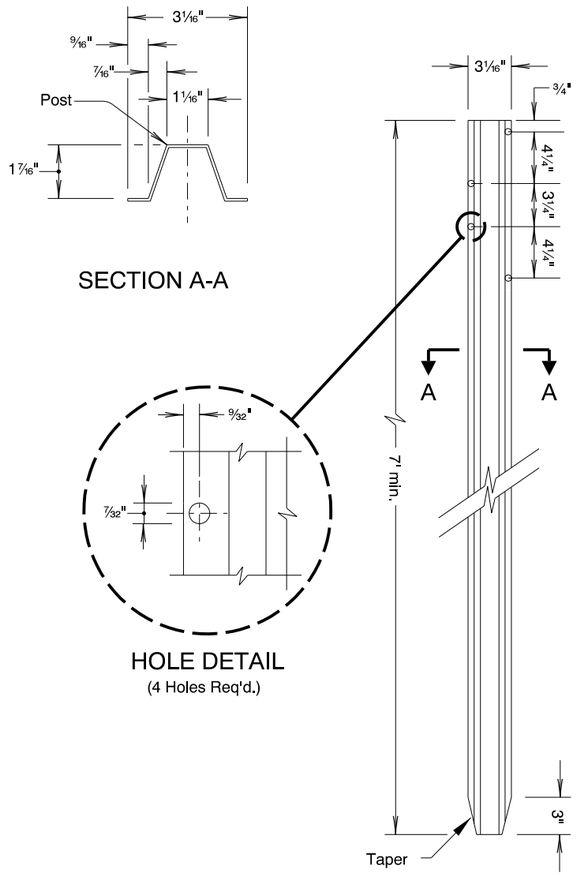
OREGON STANDARD DRAWINGS

TRAFFIC DELINEATORS

2015

DATE	REVISION DESCRIPTION

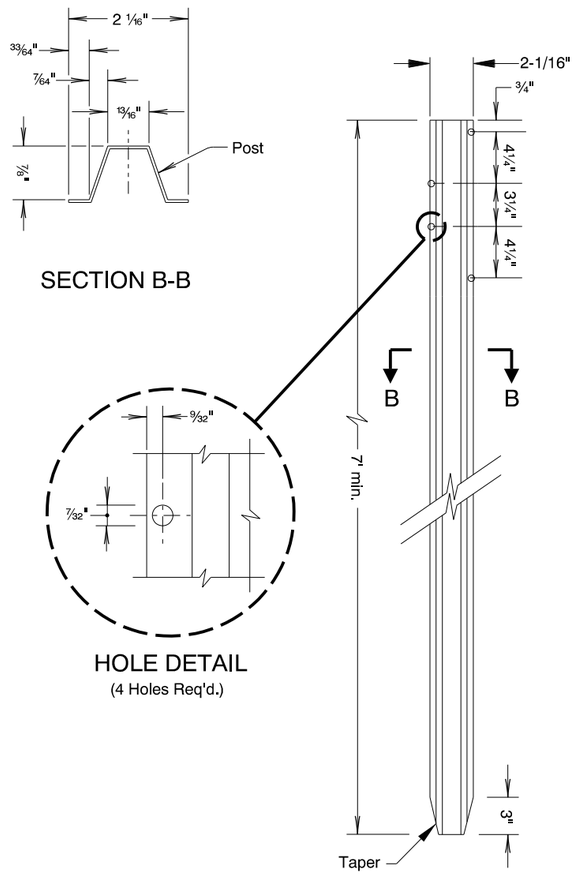
Effective Date: February 1, 2015 - May 31, 2015



Notes:

1. Galv. steel, nominal weight 2 lb. per ft.

TYPE - 1 STEEL POST DIMENSIONS



Notes:

1. Galv. steel, nominal weight 1.12 lb. per ft.

TYPE - 1 U STEEL POST DIMENSIONS

To be accompanied by Drg. No. TM570

CALC. BOOK NO. _ _ _ _ _ _ _ _ _ _ _	BASELINE REPORT DATE December 10, 2009
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.	NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

TRAFFIC DELINEATORS
STEEL POST DETAILS
2015

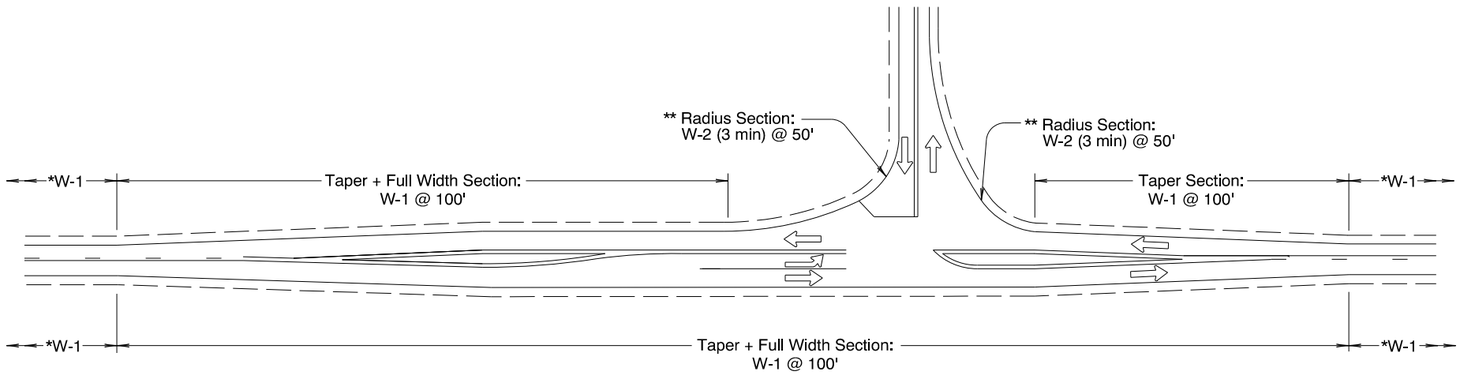
DATE	REVISION DESCRIPTION

TM571.dgn 12-10-2009

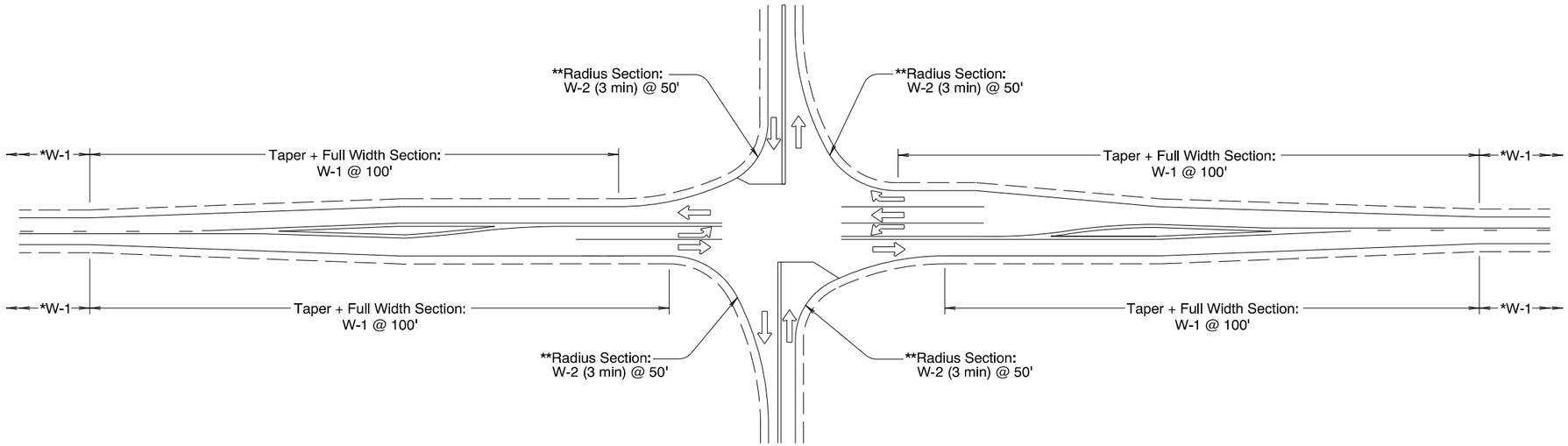
TM571

F:\mgk\Traffic\Standard Drawings\2014_July_Update\plotfile_TM200s_500s.dgn :: Default 7/8/2014 10:43:17 AM hwyr20m

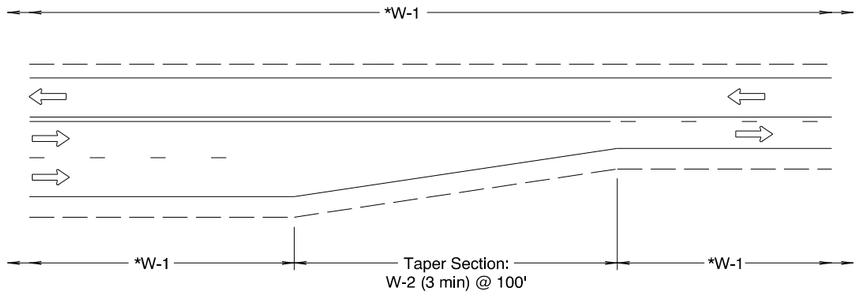
Effective Date: February 1, 2015 - May 31, 2015



THREE-LEG CHANNELIZED



FOUR-LEG CHANNELIZED



LANE REDUCTION

NOTES:

1.) For post types see Standard Drawing TM570

*For delineator spacing, see "Delineator Spacing Table" located on Standard Drawing TM570.

**For Radius Sections at channelized Intersections:
Regions 1, 2, and 3, install Type 3 flexible plastic posts.
Regions 4 and 5 install Type 1 delineators.

LEGEND

⇦ Direction of Travel

To be accompanied by Drg. No. TM570

CALC. BOOK NO. _____

BASELINE REPORT DATE December 10, 2009

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

TRAFFIC DELINEATOR INSTALLATION FOR NON-FREEWAYS

2015

DATE	REVISION DESCRIPTION

TM576.dgn 12-10-2009

TM576

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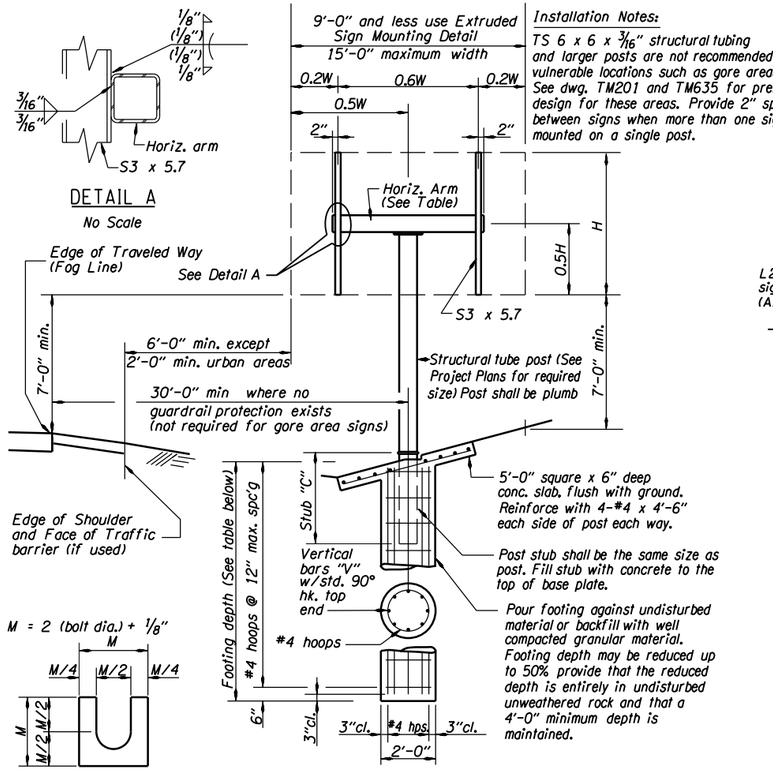
Effective Date: February 1, 2015 - May 31, 2015

tm602.dgn 11-JUL-2014

DETAIL A

No Scale



BREAKAWAY SIGN POST

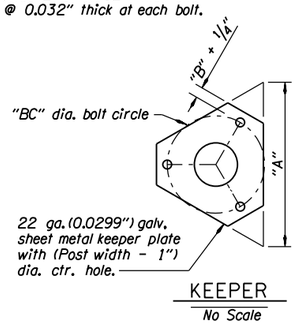
No Scale

Installation Notes:

TS 6 x 6 x 3/16" structural tubing and larger posts are not recommended in vulnerable locations such as gore areas. See dwg. TM201 and TM635 for preferred design for these areas. Provide 2" space between signs when more than one sign is mounted on a single post.

BRASS SHIM DETAIL

Provide 2 @ 0.012" thick and 2 @ 0.032" thick at each bolt.



KEEPER

No Scale

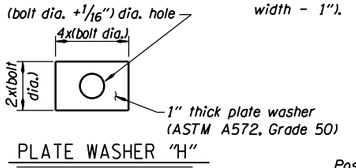
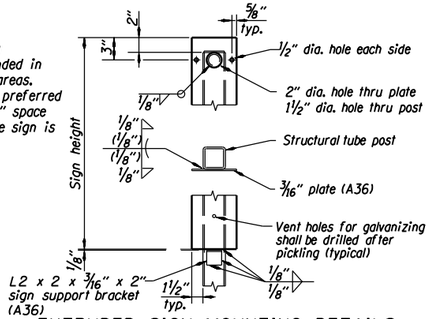


PLATE WASHER "H"

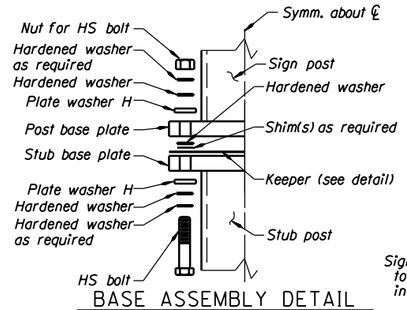
No Scale



EXTRUDED SIGN MOUNTING DETAILS

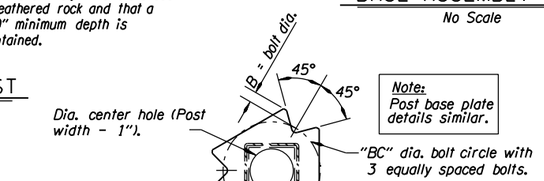
No Scale

For signs 9'-0" or less in width



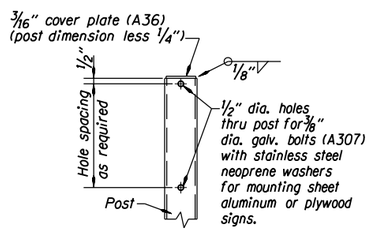
BASE ASSEMBLY DETAIL

No Scale



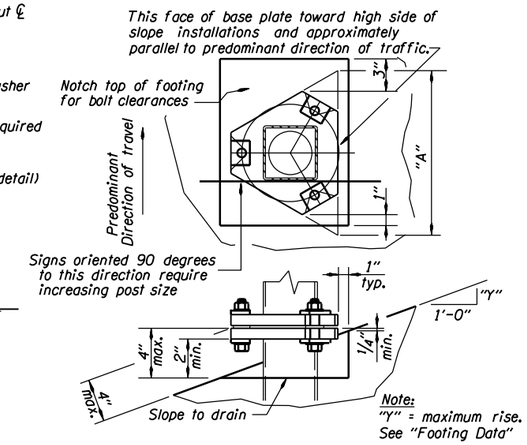
POST STUB DETAILS

No Scale



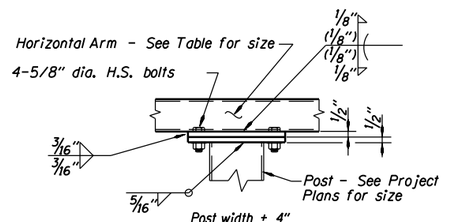
SIGN MOUNTING DETAILS FOR PLYWOOD & SHEET ALUMINUM SIGNS

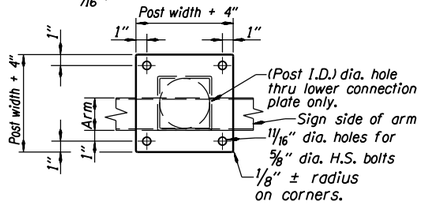
No Scale



BASE PLATE ORIENTATION

No Scale





HORIZONTAL ARM TO POST CONNECTION DETAIL

No Scale

GENERAL NOTES:

1. *Sign supports are designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals 1994. Use a wind velocity with a 10-year mean reccurrence interval.*
2. *All concrete shall be Commercial Grade Concrete (f'c = 3000 psi)*
3. *All reinforcing steel shall conform to AASHTO Specification M31, Grade 60, or ASTM A706.*
4. *The following splice lengths shall be used unless otherwise shown:*

Bar Size	#4	#5
Splice Length (mm)	1'-1"	1'-5"

5. *Structural steel shall conform to AASHTO M223 (ASTM A572) Grade 50, unless shown otherwise.*
6. *Structural tubing shall conform to ASTM Specification A500, Grade B, or A501.*
7. *Shims shall be fabricated from brass shim stock conforming to ASTM B36.*
8. *All bolts shall be high strength bolts conforming to to ASTM Specification A325 (AASHTO M164). Nuts for high strength bolts shall be well lubricated heavy hexagon nuts conforming to ASTM Specification A563, (AASHTO M291), Grade DH. Hardened steel washers shall conform to ASTM Specification F436 (AASHTO M293).*
9. *Steel sheet for keepers shall conform to ASTM Specification A653.*
10. *Base plate holes shall be sub-drilled and reamed to size. Base plate slot shall be saw cut or machine guided flame cut.*
11. *Keeper sheet metal shall be galvanized in accordance with ASTM A653, Coating G165. All other steel including fasteners shall be hot-dip galvanized after fabrication. Remove galvanizing runs and beads on all slip surfaces. Nuts for high strength bolts may be retapped after galvanizing.*
12. *The use of post larger than required by design will not be permitted.*
13. *See Dwg. TM675 for sign and sign mounting details.*

BASE PLATE BOLTING PRODEDURE:

1. *Assemble post to stub as shown in Base Assembly Detail.*
2. *Shim as required to plumb post. (+/- 1/16"/vert. 12") (2 shims maximum per bolt)*
3. *Tighten bolts in a systematic order to the "T1" ft-lbs torque.*
4. *Loosen and retighten bolts to the "T2" ft-lbs torque. Use the same order as the intitial tightening and DO NOT OVER TIGHTEN!*
5. *Burr threads at junction with nut using a center punch.*

Structural Tubing Post and Post Stub Size	Structural Tubing Horiz. Arm (if req'd)	Slip Base Data: Base Plate "t"	Base Plate "A"	Bolt Dia. "B"	Bolt Length	Bolt Circle "BC"	Bolt "T1" ft-lbs torque	Bolt "T2" ft-lbs torque	Bolt Num. of additional washers	Footing Data: Post Stub Length	Vert. Reinf. Bars "V"	Footing Depth 2'-0" Dia.	Footing Depth 4'-0" Dia.	Max. Slope Rise per ft. "Y"
TS 3 x 3 x 3/16	TS 3 x 3 x 3/16	3/4"	10"	1/2"	5"	6"	50	30	2	1'-6"	8-#4	3'-0"	—	6.3"
TS 3 1/2 x 3 1/2 x 3/16	TS 3 x 3 x 3/16	3/4"	11 5/8"	5/8"	5"	6 3/4"	150	50	-	1'-9"	8-#4	3'-6"	—	5.5"
TS 4 x 4 x 3/16	TS 3 x 3 x 3/16	1"	1'-0 3/8"	5/8"	5 1/2"	7 1/2"	150	50	-	2'-0"	8-#4	4'-0"	—	5.2"
TS 5 x 5 x 3/16	TS 3 x 3 x 3/16	1"	1'-2 5/8"	3/4"	5 1/2"	9"	280	70	-	2'-3"	8-#4	4'-6"	4'-0"	4.4"
TS 6 x 6 x 3/16	TS 3 x 3 x 3/16	1 1/4"	1'-4 1/8"	7/8"	6 1/2"	10 1/2"	450	75	1	2'-6"	8-#5	5'-0"	4'-0"	3.8"
TS 7 x 7 x 3/16	TS 4 x 4 x 3/16	1 1/4"	1'-6 1/4"	7/8"	6 1/2"	12"	450	75	1	3'-0"	8-#5	6'-0"	4'-6"	3.5"
TS 8 x 8 x 3/16	TS 5 x 5 x 3/16	1 3/8"	1'-8 1/2"	1"	7"	1'-1 1/2"	680	75	1	3'-6"	12-#5	7'-0"	5'-0"	3.1"

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
1493		TM200, TM201, TM635, TM675	1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

TRIANGULAR BASE BREAKAWAY MULTI-DIRECTIONAL SLIP BASE DESIGN

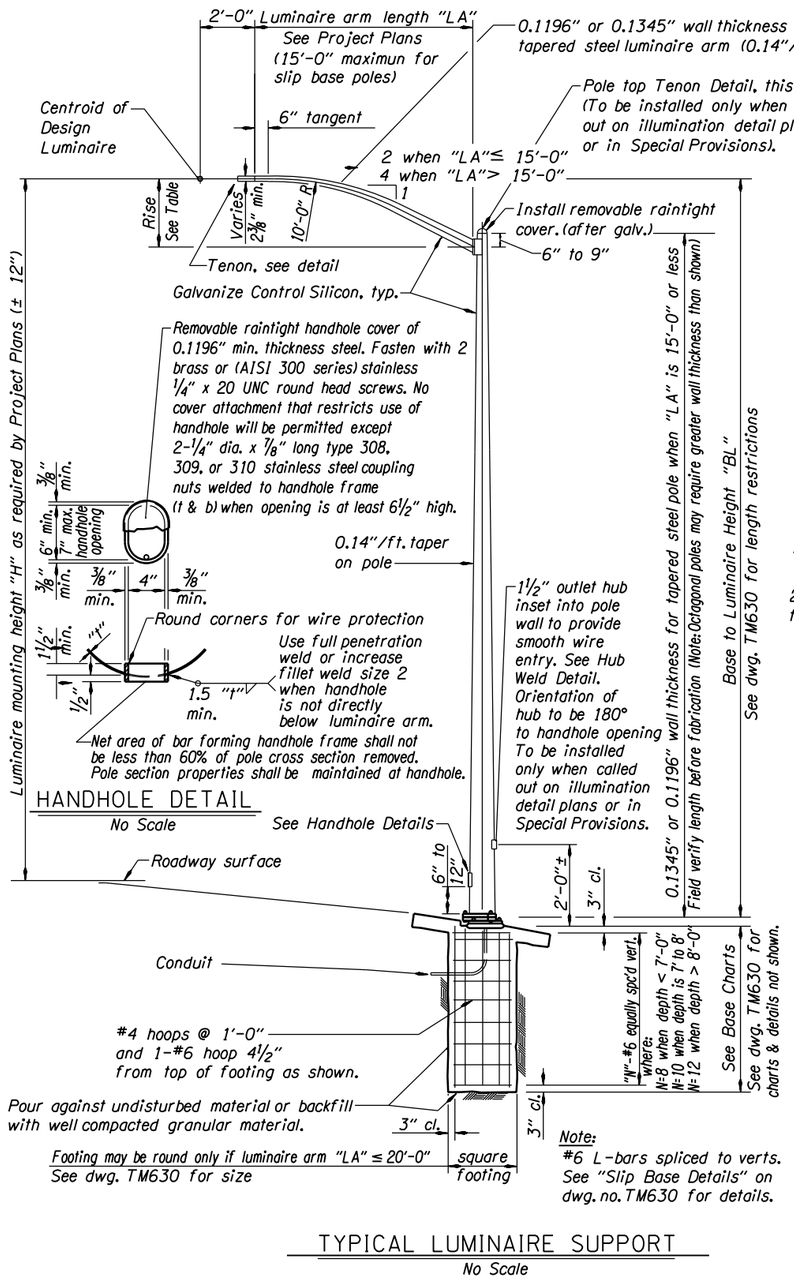
2015

DATE	REVISION DESCRIPTION

TM602

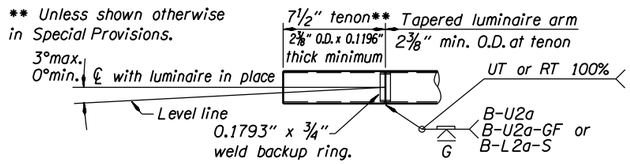
Effective Date: February 1, 2015 - May 31, 2015

tm629.dgn 11-JUL-2014



TYPICAL LUMINAIRE SUPPORT

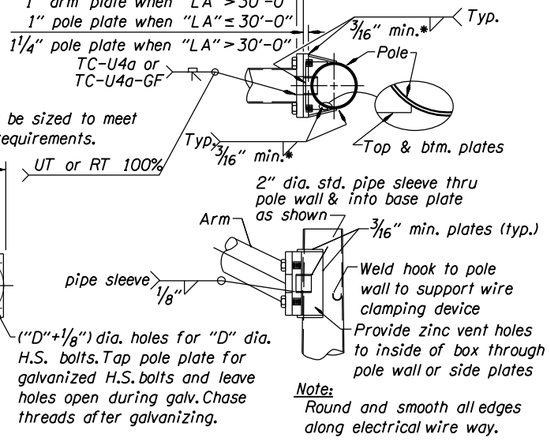
No Scale



LUMINAIRE TENON DETAILS

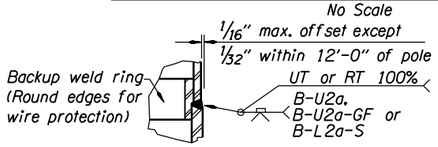
No Scale

DESIGN LUMINAIRE (ROUNDED)		
Projected Area	Weight	Area for Ice
3.3 ft.²	60 lbs.	8.7 ft.²



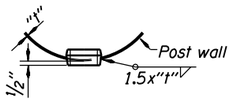
LUMINAIRE ARM CONNECTION DETAILS

No Scale

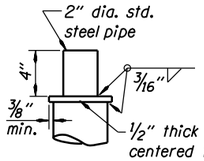


POLE AND ARM SPLICE WELD DETAILS

No Scale



HUB WELD DETAIL



POLE TOP TENON DETAIL

No Scale

Tenon dimensions are indicative of general config. desired and may be varied depending on manufacturer's requirements for head frame. Variations from that shown shall be allowed as approved by the Engineer.

LUMINAIRE ARM DESIGN DATA				
Arm Length "LA"	Allowable Dead Load Deflection	Bolt Circle Dia. "BC"	Bolt Dia. "D"	Approx. Rise (Arm fully loaded)
6'-0"	½"	7"	⅝"	1'-6½"
8'-0"	⅞"	7"	⅝"	2'-6"
10'-0"	1⅜"	7"	⅝"	3'-5½"
12'-0"	2"	7"	⅝"	4'-5"
15'-0"	3⅛"	7"	⅝"	5'-10"
20'-0"	4¼"	8"	¾"	4'-3"
25'-0"	6½"	9"	¾"	5'-3"
30'-0"	9¼"	10"	¾"	6'-3"
35'-0"	12½"	11"	⅞"	7'-3"
40'-0"	16"	1'-0"	⅞"	8'-3"

GENERAL NOTES:

Luminaire supports shall be designed in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (1994).

The design wind velocity shall be 100 mph unless shown otherwise in the Special Provisions for the project.

All pole shafts may be round or hexdecagonal. Octagonal pole shafts may be used for fixed base poles only. Luminaire arm shafts shall be the same shape as the pole shaft except that octagonal arms may be used with hexdecagonal poles if the arm tip diameter does not exceed 3" and the maximum weight limitations are not exceeded.

Steel sheet for poles and arms shall conform to ASTM A 595, Grades A or B, or approved equal. All other steel sheet and plate shall conform to AASHTO specification M223 (ASTM A572), or approved equal. Supplement S18 of ASTM A6 regarding maximum tensile strength shall apply.

Anchor bolts for Slip Base Luminaire Supports and for structure mounted Fixed Base Luminaire Supports shall be ASTM 449, Type 1. Anchor bolts for Fixed Base Luminaire Supports (except structure mounts) shall be ASTM A307.

Nuts for anchor rods and slip base bolts shall conform to ASTM Specification A563, Grade DH.

High strength bolts shall conform to ASTM Specification A325 (AASHTO M164).

All structural steel including fasteners shall be hot-dip galvanized after fabrication unless noted otherwise.

Galvanize-Control silicon, typical. Silicon content of the base metal shall be in the range of 0 to 0.04% or 0.15 to 0.25%

Footing concrete shall be Commercial Grade Concrete. (f'c = 3000 psi) unless shown otherwise in the Special Provisions. Grout in grout pads shall be non-shrink high early strength grout (non-ferrous) with a minimum strength of 5000 psi.

Reinforcing steel shall conform to AASHTO M31 (ASTM A615), grade 60. A minimum lap splice of 32 bar diameters shall be used unless shown otherwise.

Flat washers shall be hardened steel washers conforming to ASTM Specification F-436.

Longitudinal seam welds shall be complete penetration within 6" of a circumferential weld. 60 percent minimum penetration required for the remainder of the seam weld. Weld inspection shall comply with the special provisions.

The weight of the slip base pole and its attachments above the anchor plate shall be kept to a minimum and shall never exceed 1000 lbs.

Pole lengths shall be field verified before fabrication. Top of footing may be substantially above or below roadway surface. Design shall be adjusted as neccessary for increase or decreased pole length.

The computed deflection of the poles at full design loading shall be limited to 5% of pole length for fixed base poles and 7% of pole length for slip base poles. The computed dead load deflection of the poles shall be limited to 1% of the pole length. Poles shall be raked to offset the computed dead load deflection. Computed deflection (ignoring pole bending and/or rotation) of the luminaire arms shall not exceed that listed in the Luminaire Arm Design Data table.

Hubs shall be 3000# threaded forged carbon steel flat weld hubs by Anvil Products Inc., Phoenix Forging Co., Bonney Forge & Tool Works or approved equal. Grounding terminal shall be ½" UNC dia. x 1½" Type 308, 309 or 310 threaded stainless steel weld studs.

See dwg. TM635 for guidelines in locating slip base poles.

Luminaire pole foundation shall meet minimum embankment requirements shown on TM653.

Assemble support and tighten anchor bolts and arm connection bolts according to 00962.46(j)(2).

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
2076, 2247	10-JAN-2014	TM630, TM653	1 OF 2

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

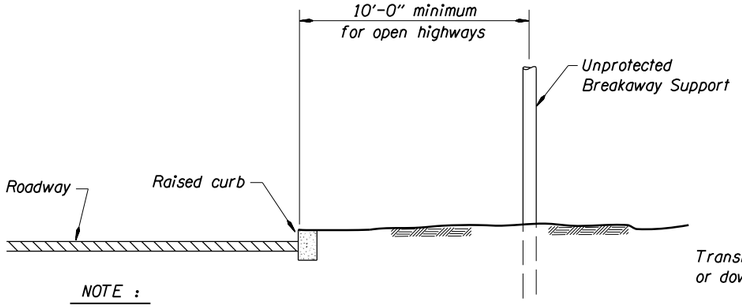
OREGON STANDARD DRAWINGS

SLIP BASE AND FIXED BASE LUMINAIRE SUPPORTS GENERAL DETAILS AND DESIGN CRITERIA

2015

DATE	REVISION DESCRIPTION

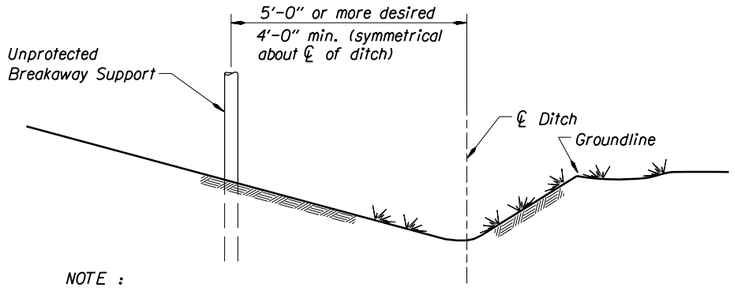
tm635.dgn 11-JUL-2014



NOTE :

Locate supports far enough behind curb to allow vehicle to stabilize before impacting support.

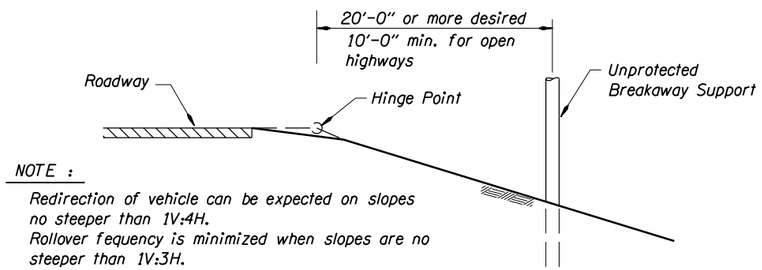
BREAKAWAY SUPPORTS BEHIND RAISED CURBS



NOTE :

Locate breakaway supports away from ditches to avoid problems with erosion, corrosion, debris, maintenance, and breakway preformance.

BREAKAWAY SUPPORTS NEAR DITCHES

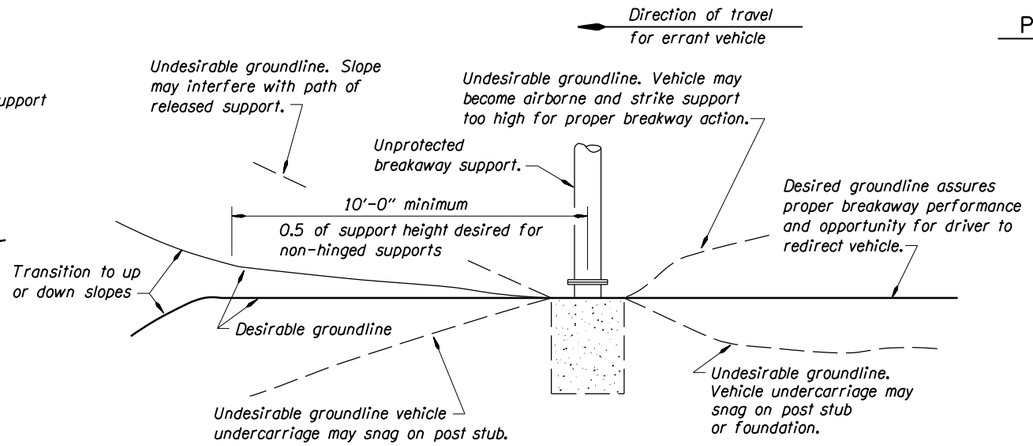


NOTE :

Redirection of vehicle can be expected on slopes no steeper than 1V:4H.
Rollover fequency is minimized when slopes are no steeper than 1V:3H.

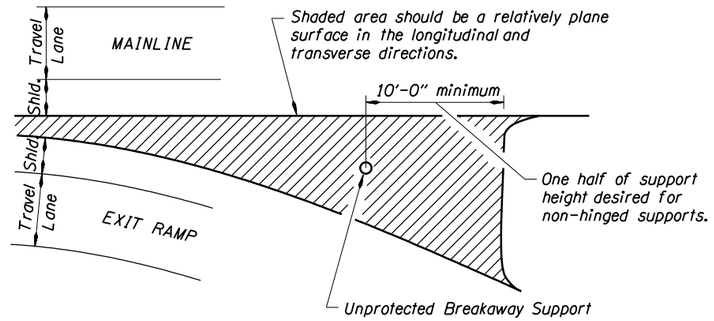
Locate support beyond hinge point as shown to allow vehicle to stabilize before impact.

BREAKAWAY SUPPORT ON FILL SLOPE

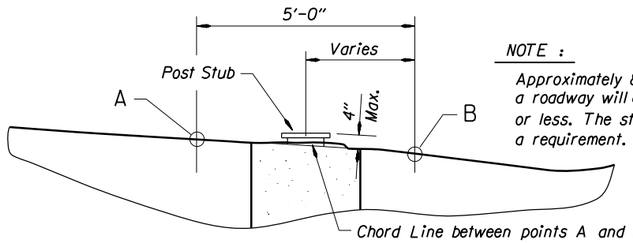


BREAKAWAY SUPPORT - PARTIAL ELEVATION

(Along possible paths of errant vehicles)



GORE AREA BREAKAWAY SUPPORT LOCATION



NOTE :

Approximately 80% of vehicles leaving a roadway will do so at an angle of 15° or less. The stub projection limitation is a requirement.

UNPROTECTED BREAKAWAY SUPPORT CLEARANCE DIAGRAM

Section perpendicular to assumed path of errant vehicle. (Most likly path is a 15° angle from adjacent traffic flow)

PLACEMENT OF UNPROTECTED BREAKAWAY SUPPORTS:

The location of unprotected breakaway supports with respect to the travel lane(s) and the roadside terrain and other geometric conditions over which the vehicle travels before impacting the support will affect the support's breakaway performance.

Breakaway supports located in gore areas are particularly vulnerable to vehicle impacts. Breakaway supports located across tee intersections, at the end of lane drop or on the ouside of horizontal curves are also likely to be struck. Locating breakaway supports in these areas should be avoided if possible. If the breakaway support must be located in these areas, locate them to produce an impact situation that is as forgiving as possible while assuring adequate recovery space beyond the support(s).

Breakaway supports placed up on cut slopes generally result in a safer impact situation than for those placed down on fill slopes. The support placed on a cut slope will be lighter than a support placed on fill slope. The momentum of a vehicle traversing a cut slope will generally be less than that for a vehicle traversing a fill slope. A vehicle going up a cut slope is generally more stable and more easily redirected than a vehicle going down a fill slope.

Placement of breakaway supports in or near ditches should be avoided. Breakaway supports should not be located near raised curbs or near the hinge point ot the fill slope.

Where possible, supports should be located behind established barriers.

The guidelines contained herein should be used if possible. However, adjustments to the guidleines may be necessary because of right-of-way and/or other constraints.

See TM200 requirements when signs are mounted on unprotected Breakaway Supports.

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET 1 OF 1

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

BREAKAWAY SIGN & LUMINAIRE SUPPORTS - SUPPORT LOCATION GUIDELINES

2015

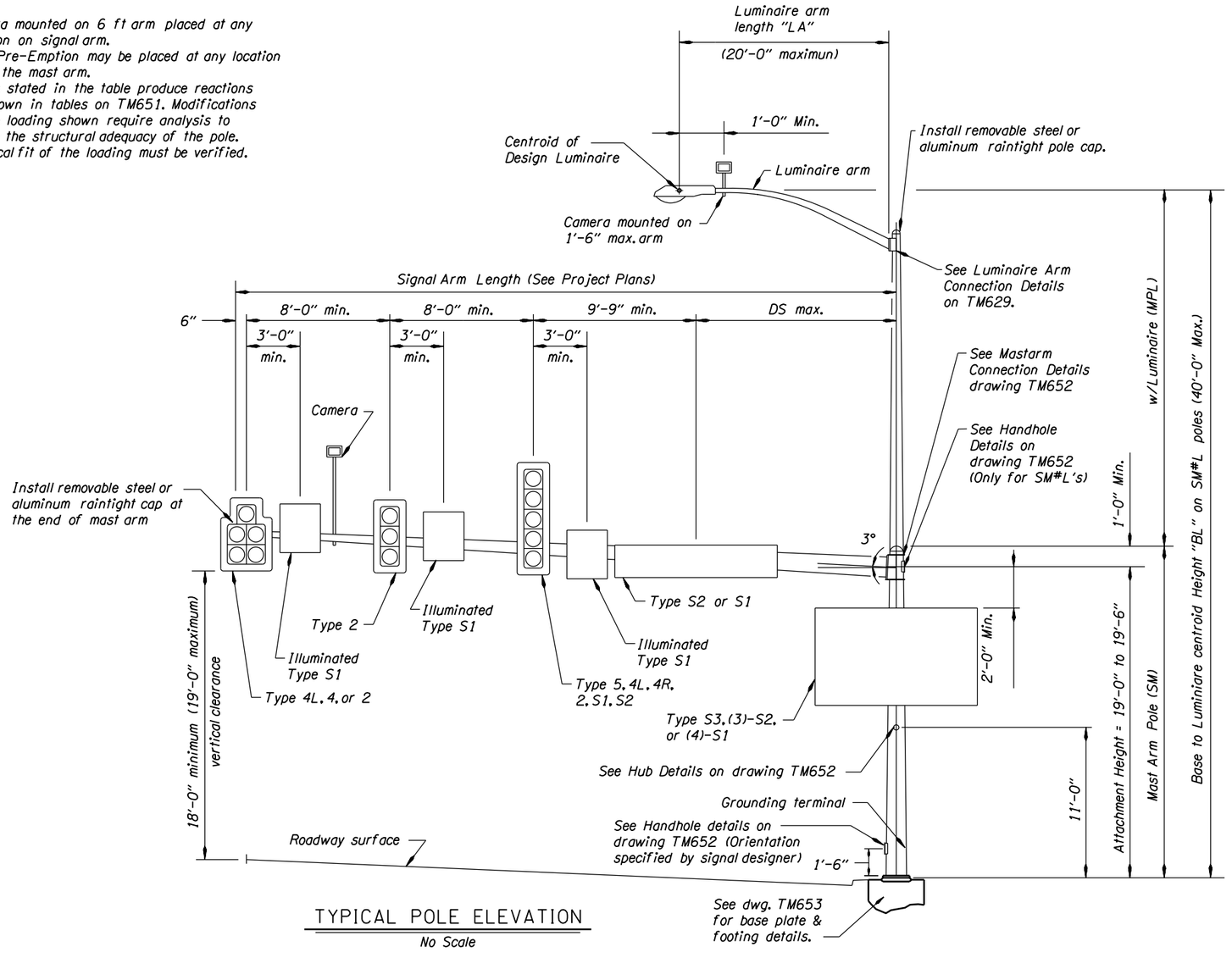
DATE	REVISION DESCRIPTION

STANDARD SIGNAL ARM LOADS							
Signal Pole Type	Signal Arm Length	Signals			Sign		DS Max. for S2
		4L Qty.	2 Qty.	5 * Qty.	S1 Qty.	S2 * Qty.	
SM1 or SM1L	15'	1	0	1	2	0	N/A
SM2 or SM2L	20'	1	1	1	3	0	N/A
	25'	1	1	1	3	0	
SM3 or SM3L	30'	1	1	1	3	1	9'-1"
	35'	1	1	1	3	1	
SM4 or SM4L	40'	1	2	1	4	1	11'-1"
	45'	1	2	1	4	1	
SM5 or SM5L	50'	1	2	1	4	1	21'-1"
	55'	1	2	1	4	1	

* - Load location is the closest sign or signal of that type to the vertical post.

1. Camera mounted on 6 ft arm placed at any location on signal arm.
2. Fire Pre-Emption may be placed at any location along the mast arm.
3. Loads stated in the table produce reactions as shown in tables on TM651. Modifications to the loading shown require analysis to verify the structural adequacy of the pole.
4. Physical fit of the loading must be verified.

SIGNAL ARMS DEFLECTION		
Signal Arm Length "SA"	Allowable Dead Load Deflection	Allowable Total Load Deflection
15' or less	0.01"SA"	0.05"SA"
20'	2 1/2"	12"
25'	3 1/2"	15"
30'	5"	21"
35'	7"	29"
40'	9 1/2"	38"
45'	1'-1/2"	48"
50'	1'-4"	60"
55'	1'-8"	74"

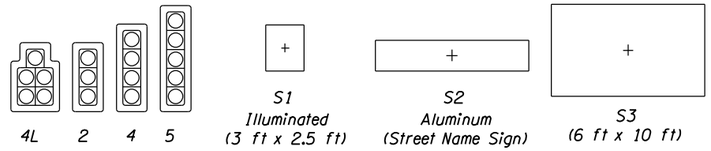


TYPICAL POLE ELEVATION

No Scale

VERTICAL POST LOADS								
Description	Maximum Centerline Elevation	Height (Each)	Width (Each)	Depth (Each)	Area Front (sq.ft)	Area Side (sq.ft)	Area Bottom (sq.ft)	Weight 0" Ice (lbs)
2-Ped. Push Buttons	3'-6"	7 3/4"	5"	3 3/8"	0.27	0.18	0.12	3.0
Controller Cabinet	5'-9"	46"	24"	22"	7.67	7.03	3.67	300
2-Pedestrian Signals	8'-3 1/2"	18 3/4"	19"	19"	2.47	2.47	2.51	25.0
Terminal Cabinet	10'-9"	18 1/8"	6 3/4"	8 3/8"	0.85	1.05	0.39	25.0
Guide Sign (S3)	15'-0"	72"	120"	8 3/8"	60.0	1.00	1.67	395
Photoelectric Cell	38'-4"	2 1/4"	3 1/4"	3 1/4"	0.05	0.05	0.07	5.0

1. Physical fit of the loading must be verified.



SIGNAL POLE APPURTENANCE TYPES

APPURTENANCE LOADS				
Type	Area Front (sq.ft)	Area Side (sq.ft)	Area Bottom (sq.ft)	Weight 0" Ice (lbs)
4L	12.4	6.61	3.64	145
2	8.67	6.61	1.95	85.0
4	11.0	8.49	1.95	97.0
5	13.3	10.36	1.95	142
S1	7.50	2.38	1.72	71.0
S2	21.0	0.00	1.67	105

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5301	07-JAN-2011	TM651, TM652, TM653, TM679	1 OF 4

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS
TRAFFIC SIGNAL SUPPORTS
GENERAL DETAILS & DESIGN CRITERIA

2015

DATE	REVISION DESCRIPTION

tm650.dgn 11-JUL-2014

TM650

tm651.dgn 11-JUL-2014

GENERAL NOTES:

1. Signal supports shall be designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals 4th edition, 2001, 2002, and 2003 interim revisions.
2. All traffic signal supports shall conform to the design criteria and details shown on these drawings except as approved by the Engineer.
3. The design basic wind speed (3 second gust) shall be 110 mph, gust factor G = 1.14, Ir = 1.0 (50 yr recurrence interval), Fatigue Category II, no galloping, and truck speed = 55 mph.
4. Signal poles from this standard are not allowed over highways I-5, I-84, I-205, I-405, US 26 (Sunset Hwy) between mile points 64.3 - 73.0, I-105, and I-82. Signal poles on these highways require a Fatigue Category I.
5. Pole and arm shafts may be either round, hexdecagonal, dodecagonal, or octagonal but shapes shall not be mixed on a project. Dimensional tolerances of ASTM A595 shall apply to all tapered steel tubing members. Additionally, the diameter of round tapered steel tubing members or the dimensions across the flats of octagonal tapered steel tubing members shall not vary more than 2% from specified dimension. Two ply and fluted poles or arms are not permitted.
6. Pole taper shall be equal to .0117 in/in.
7. Anchor rods shall conform to ASTM Specification F1554 Gr. 55, Supplemenetary Requirement "S2" that include grade and manufacturer's identification.
8. High strength bolts shall conform to ASTM Specification A325 Type 1.
9. Nuts for high strength bolts shall be heavy hex and conform to ASTM A563 Grade DH with supplmentary requirements "S1" and "S2".
10. Hardened steel washers shall conform to ASTM F436 Type 1.
11. Direct Tension Indicators (DTI) shall be the compressible-washer type, mechanically galvanized, conforming to ASTM F959.
12. Steel sheet for poles and arm shall conform ASTM A595, Grades A or B, ASTM A572 Gr. 50, or approved equal. All other steel sheet and plate shall conform to AASHTO specification M223 (ASTM A572), or approved equal. Supplement S18 of ASTM A6 regarding maximum tensile strength shall apply.
13. All structural steel including fasteners shall be hot dip galvanized after fabrication unless otherwise noted.
14. Galvanize-Control Silicon, typical. Silicon content of the base metal shall be in the range of 0 to 0.04% or 0.15 to 0.25%.
15. Footing concrete shall be Commercial Grade Concrete (fc=3000 psi) per Specification Section 440. Grout in grout pad shall be non-shrink high early strength grout (non-ferrous) with a minimum strength of 5000 psi. Footing concrete may be used as an alternate to grout.
16. Reinforcing steel shall conform to AASHTO M31, Grade 60 (ASTM A615 or A706). A min. lap splice length of 32 bar diameters shall be used unless shown otherwise.
17. Computed deflection of these poles at full design loading shall be limited to 5% of the pole length. Computed dead load deflection of the poles shall be limited to 1% of the pole length. Pole shall be raked to offset the computed dead load deflection. Computed deflection (ignoring pole bending and/or rotation) of signal arms shall not exceed that listed in the Signal Arm Deflection Table on TM650. Additionally, the amplitude (maximum up to maximum down as measured at the tip of the arm) of wind induced vertical oscillations shall not exceed 1.5% of the signal arm length. Luminaire arms and pole extensions to support luminaire arms shall meet requirements of drawing TM629.
18. Hubs for cabinets and/or other appurtenances shall be welded into the pole prior to galvanizing. Poles may be tapped for up to 1" galvanized bolts after pole has been galvanized.
19. Longitudinal seam welds within 6" of a cirumferential weld shall be complete penetration welds. Weld inspection shall be in accordance with AWS D1.1 and the special provisions. Inspect seam welds using cyclically loaded criteria. Hubs shall be 3000# threaded forged carbon steel flat weld hubs by Anvil Products Inc., Phoenix Forging Co., Bonney Forge & Tool Works or approved equal.
20. Grounding terminal shall be ½" UNC x 1½" Type 308, 309 or 310 threaded stainless steel weld studs.
21. Tighten 4 bolt arm connection bolts and tighten anchor rods in accordance with 962.46(jX2).
22. Tighten 8 bolt arm connection bolts in accordance with 930.40(d).
23. Round and smooth all edges along electrical way.
24. The Minimum arm flange thickness shall be equal to the value where prying action is not included in the bolt calculation.

Standard Maximum Base Reactions								
Signal Pole Type	Signal Arm Lengths	Wind Load Case II				Controlling Fatigue		
		Axial (Kips)	Shear (Kips)	Moment (Kip-ft)	Torque (Kip-ft)	Shear (Kips)	Moment (Kip-ft)	Torque (Kip-ft)
SM1	15′	2.10	5.15	80.39	16.95	0.68	10.39	2.13
SM2	20′, 25′	2.66	6.23	105.41	42.54	0.82	13.35	5.37
SM3	30′, 35′	3.49	7.77	138.43	82.87	1.00	17.10	10.31
SM4	40′, 45′	4.51	9.00	173.46	132.72	1.16	20.54	16.50
SM5	50′, 55′	5.69	9.23	190.91	181.60	1.18	21.62	22.55
SM1L	15′	2.96	6.09	113.28	23.22	0.79	14.08	2.84
SM2L	20′, 25′	3.69	7.23	139.41	48.81	0.94	17.17	6.08
SM3L	30′, 35′	4.39	8.80	176.51	87.88	1.14	21.43	11.02
SM4L	40′, 45′	5.94	10.14	215.11	136.97	1.31	25.27	17.21
SM5L	50′, 55′	7.34	10.56	241.17	187.96	1.34	26.49	23.26

Standard Maximum Mast Arm Reactions						
Signal Pole Type	Signal Arm Lengths	Wind Load Case II			Controlling Fatigue	
		Axial (Kips)	Shear (Kips)	Moment (Kip-ft)	Shear (Kips)	Moment (Kip-ft)
SM1, SM1L	15′	0.06	1.98	18.44	0.23	2.18
SM2, SM2L	20′, 25′	0.10	3.14	46.20	0.37	5.48
SM3, SM3L	30′, 35′	0.15	4.51	89.42	0.53	10.51
SM4, SM4L	40′, 45′	0.23	5.91	146.67	0.67	16.82
SM5, SM5L	50′, 55′	0.34	6.78	211.94	0.70	22.99

Luminaire Arm Reactions					
Arm Lengths	Wind Load Case II			Controlling Fatigue	
	Axial (Kips)	Shear (Kips)	Moment (Kip-ft)	Shear (Kips)	Moment (Kip-ft)
6′	0.03	0.31	1.49	0.03	0.15
10′	0.06	0.38	2.85	0.04	0.29
15′	0.08	0.47	4.96	0.05	0.51
20′	0.05	0.55	7.24	0.06	0.74

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5301	07-JAN-2011	TM650, TM652, TM653	2 OF 4

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

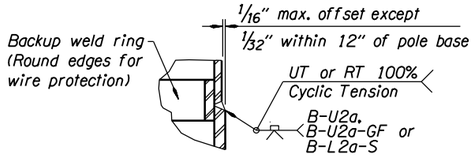
TRAFFIC SIGNAL SUPPORTS NOTES AND REACTIONS

2015

DATE	REVISION DESCRIPTION

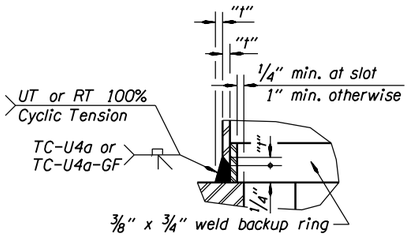
TM651

tm652.dgn 11-JUL-2014



POLE AND ARM SPLICE WELD DETAILS

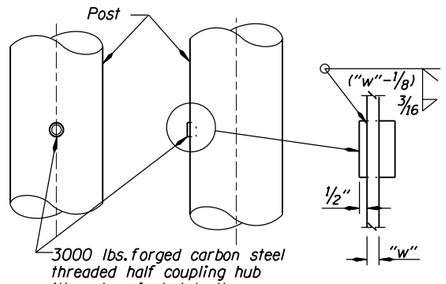
No Scale



TC-U4a WELD DETAIL

No Scale

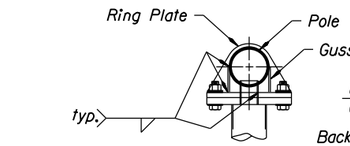
Mast arm Connection				
Signal Arm Lengths	N Number	D Bolt Diam.	BC Bolt Circle	V Bolt Spacing
15'	4	1"	9 1/2"	——
20', 25'	4	1 1/4"	14"	——
30', 35'	4	1 1/2"	15 1/2"	——
40', 45'	8	1 "	——	5"
50', 55'	8	1 1/4"	——	6"

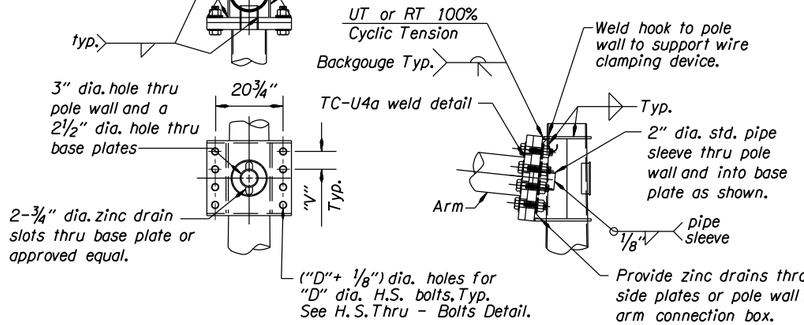


3000 lbs. forged carbon steel threaded half coupling hub (threads oriented to the outside of post) by "Bonney Forge", "Phoenix Forge" or approved equal. Inside edge of conduit hub shall be smooth

HUB WELD DETAIL

No Scale





8 BOLT ARM CONNECTION DETAILS

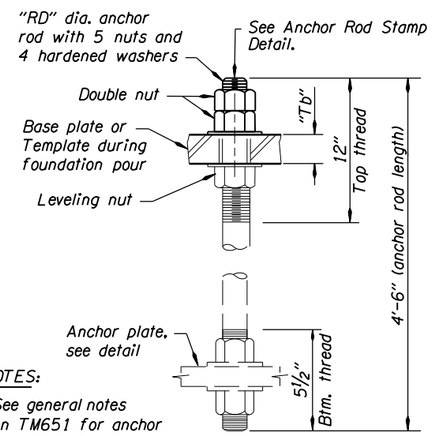
No Scale

ARM CONNECTION NOTES:

Gusset plates are 1/4" min. thickness.

Ring plates are 3/8" min. thickness.

See general notes on TM651 for bolt tightening.

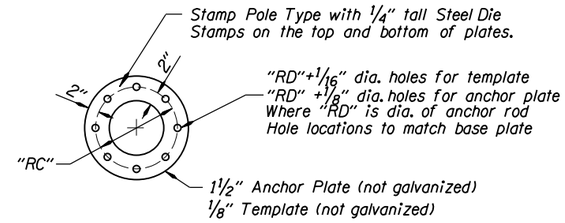


NOTES:

- See general notes on TM651 for anchor rod tightening.
- "Tb" determined by manufacturer.

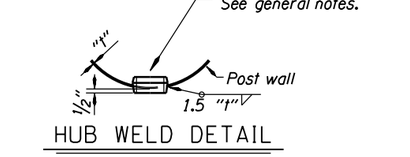
ANCHOR ROD DETAIL

No Scale



ANCHOR PLATE AND TEMPLATE DETAIL

No Scale



HUB WELD DETAIL

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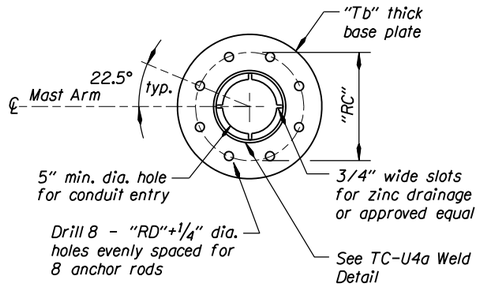
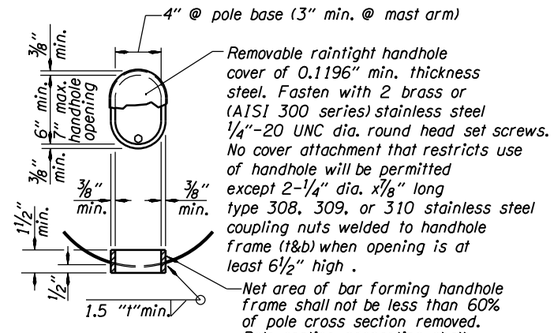


PLAN - BASE PLATE

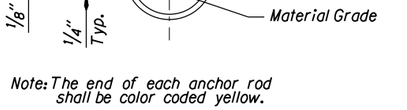
No Scale

Anchor Rods and Base Plate Data			
Mastarm Pole Type	Strain Pole Type	RD Rod Diam.	RC Rod Circle
SM1	-----	1 1/4"	16 1/2"
SM2, SM1L	-----	1 1/2"	17"
SM3, SM2L	STP1, STP1L, STP2, STP2L	1 1/2"	20"
SM4, SM3L	STP3, STP3L, STP4, STP4L	1 3/4"	22"
SM5, SM4L	-----	1 3/4"	23"
SM5L	STP5, STP5L, STP6, STP6L, STP7, STP7L	2"	23 1/2"



HANDHOLE DETAIL

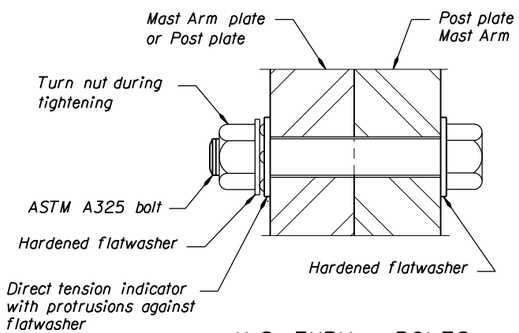
No Scale



Note: The end of each anchor rod shall be color coded yellow.

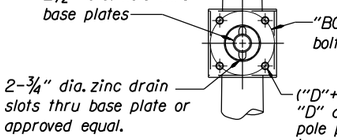
ANCHOR ROD STAMP DETAIL

No Scale



H.S. THRU - BOLTS

No Scale



4 BOLT ARM CONNECTION DETAILS

No Scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5301	10-JAN-2014	TM650, TM651, TM653	3 OF 4

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

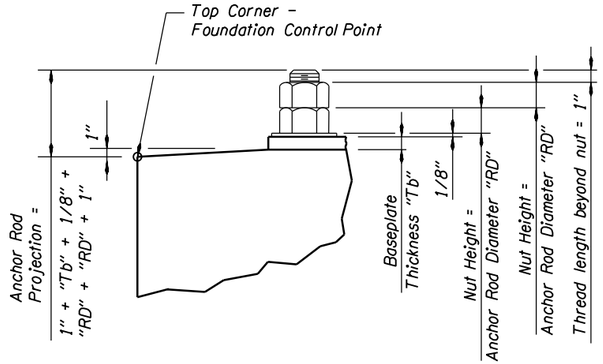
OREGON STANDARD DRAWINGS

TRAFFIC SIGNAL SUPPORTS STEEL DETAILS

2015

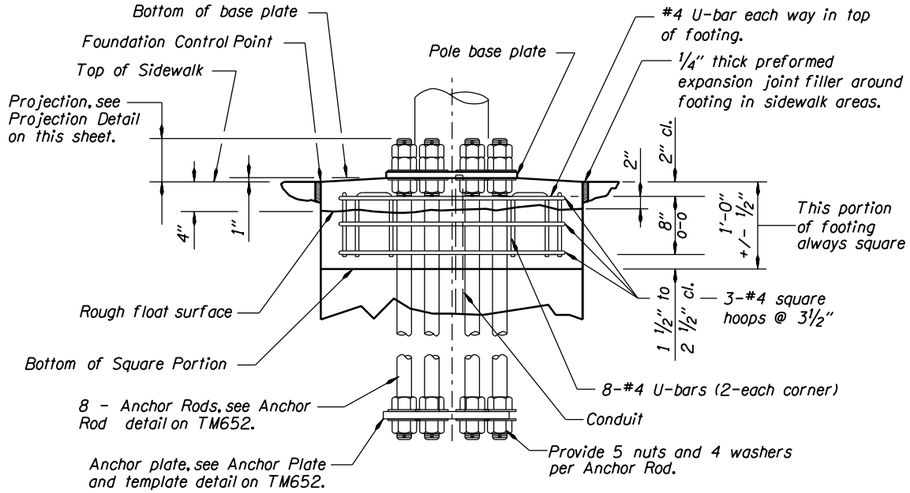
DATE	REVISION DESCRIPTION

Standard Foundations						
Foundation Number	Mastarm Pole Types	Strain Pole Types	"FD" Diameter Min.	Vertical Rebar	Hoop Size and Spacing	Hoop Lap Length
1	SM1	-----	36"	8-#8	#4 at 6"	18"
2	SM2,SM1L	-----	36"	8-#8	#4 at 6"	18"
3	SM3, SM2L	STP1, STP1L	36"	8-#8	#4 at 6"	18"
4	SM4, SM3L	STP2, STP2L	42"	10-#8	#5 at 6"	21"
5	SM5, SM4L	STP3, STP3L	42"	10-#9	#5 at 6"	21"
6	SM5L	STP4, STP4L	42"	10-#9	#5 at 6"	21"
7	-----	STP5, STP5L	42"	TBD	TBD	TBD
8	-----	STP6, STP6L	42"	TBD	TBD	TBD
9	-----	STP7, STP7L	42"	TBD	TBD	TBD



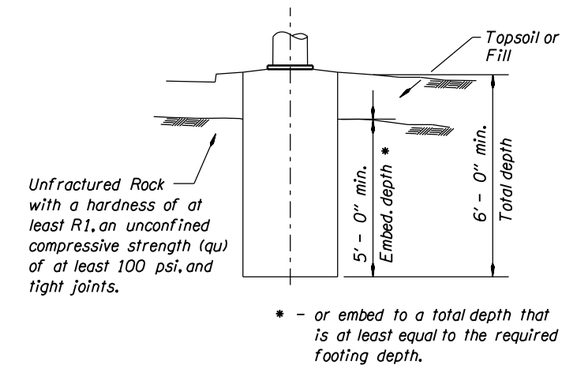
PROJECTION DETAIL

No Scale



ELEVATION - TOP OF FOOTING

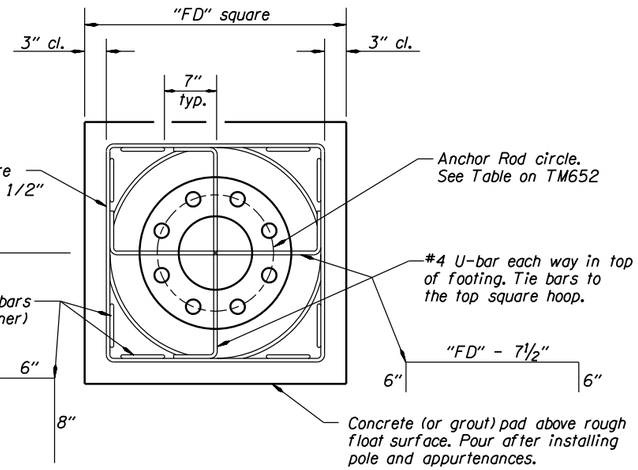
No Scale



* - or embed to a total depth that is at least equal to the required footing depth.

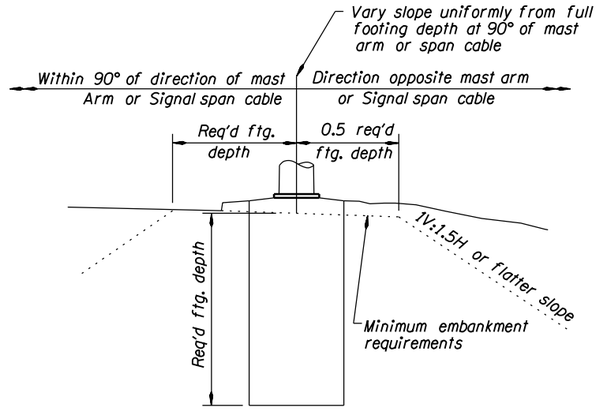
ROCK INSTALLATION REQUIREMENTS

No Scale



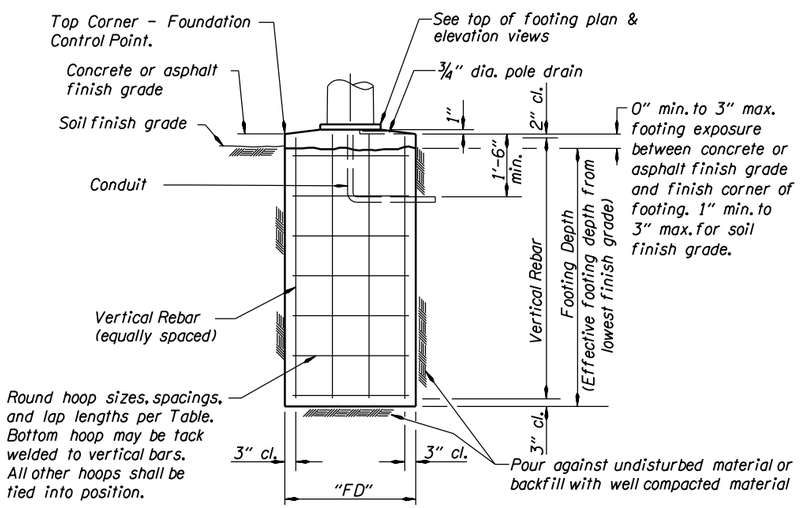
PLAN - TOP OF FOOTING

No Scale



MINIMUM EMBANKMENT REQUIREMENTS

No Scale



TYPICAL FOOTING ELEVATION

No Scale

NOTES:

See TM651 for general notes.
The pier torsional forces have been designed according to the ACI 318.
Shafts 7,8, and 9 do not include torsion rebar.

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5323	10-JAN-2014	TM650, TM651, TM652	4 OF 4

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

TRAFFIC SIGNAL SUPPORTS FOUNDATION REQUIREMENTS

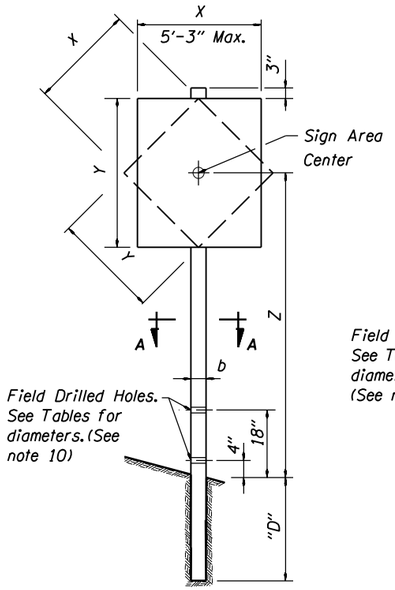
2015

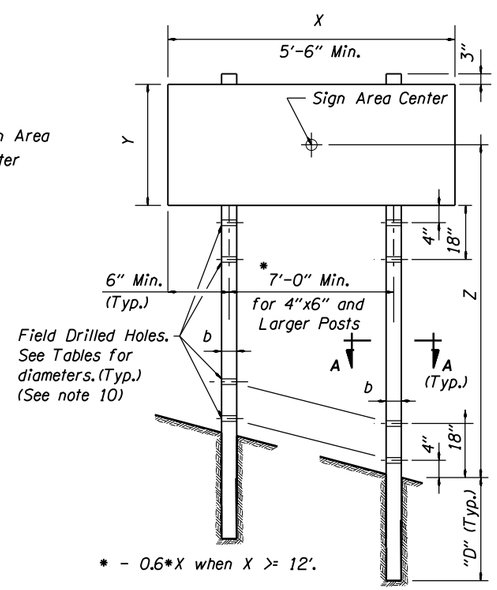
DATE	REVISION DESCRIPTION

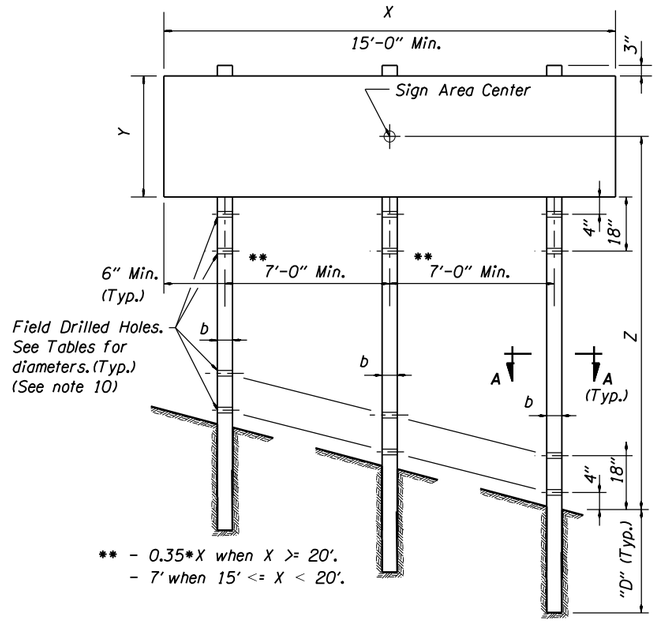
tm653.dgn 11-JUL-2014

TM653

tm670.dgn 11-JUL-2014







ELEVATION

No scale

		(X * Y * Z) in ft³												Field Drilled Hole Diameters	Post Embedment Depth "D"
		3 Second Gust Wind Speed (TM671)													
		85 MPH				95 MPH				105 and 110 MPH					
		Number of Posts				Number of Posts				Number of Posts					
		1	2	3* X=15'	3* X>=20'	1	2	3* X=15'	3* X>=20'	1	2	3* X=15'	3* X>=20'		
POST SIZE b x d	4" x 4"	77	154	165	231	62	124	132	186	56	112	120	168	Not Req'd	4' - 0"
	4" x 6"	162	324	347	486	130	260	278	390	117	234	250	351	1½"	5' - 0"
	6" x 6"	270	540	578	810	216	432	462	648	195	390	417	585	2"	5' - 0"
	6" x 8"	494	988	1058	1482	395	790	846	1185	356	712	762	1068	3"	7' - 0"

PERMANENT WOOD POST TABLE **

* - Linear Interpolate X*Y*Z 3 post values for signs greater than 15' and less than 20'.

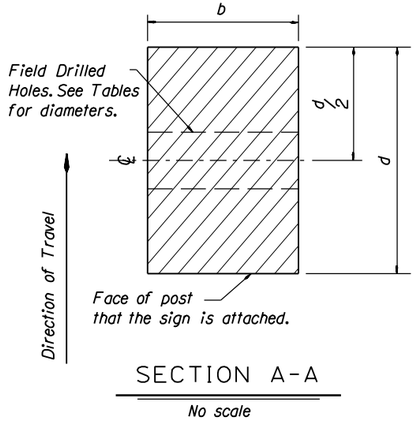
** - See note 8

		(X * Y * Z) in ft³												Field Drilled Hole Diameters	Post Embedment Depth "D"
		3 Second Gust Wind Speed (TM671)													
		85 MPH				95 MPH				105 and 110 MPH					
		Number of Posts				Number of Posts				Number of Posts					
		1	2	3* X=15'	3* X>=20'	1	2	3* X=15'	3* X>=20'	1	2	3* X=15'	3* X>=20'		
POST SIZE b x d	4" x 4"	122	244	261	366	98	196	210	294	88	176	188	264	Not Req'd	4' - 0"
	4" x 6"	257	514	550	771	205	410	439	615	185	370	396	555	1½"	5' - 0"
	6" x 6"	426	852	912	1278	341	682	730	1023	308	616	660	924	2"	5' - 0"
	6" x 8"	779	1558	1669	2337	624	1248	1337	1872	563	1126	1206	1689	3"	7' - 0"

TEMPORARY WOOD POST TABLE **

* - Linear Interpolate X*Y*Z 3 post values for signs greater than 15' and less than 20'.

** - See note 9



SECTION A-A

No scale

General Notes:

1. Wood posts are available in the following commercial lengths: 12', 14', 16', 18', 20', 22', 24', 26'.
2. Material shall be Douglas Fir No. 1 and according to Section 02110.40.
3. For horizontal and vertical clearances of permanent signs refer to TM200 and of temporary signs refer to TM821.
4. Wood post design in accordance with the 5th Edition 2009 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.
5. Use the 3 second gust wind speeds shown on TM671 for the site specific sign location.
6. General design parameters are Kz = 0.87, SIF (duration factor) = 1.6, Cd (sign) = 1.20, and G = 1.14.
7. The sign width to sign height or sign height to sign width ratio shall not exceed 5.0.
8. Permanent signing uses an Ir = 0.71 for a recurrence interval of 10 years.
9. Temporary signing uses an Ir = 0.45 for a recurrence interval of 1.5 years.
10. Posts protected by barrier or guardrail do not require field drilled holes.
11. 4" x 4" posts should not be used in snow plow areas.

Post Embedment Installation:

1. Excavate the hole at least 12" larger in diameter than the diagonal dimension of the post. Maintain at least 6" of space around the edges of the post to accomodate compaction equipment.
2. Align the post in the hole to a vertical position.
3. The space around the wood post shall be backfilled to finished ground surface.
4. Backfill with selected general backfill meeting the requirements of 00330.13.
5. Place in layers not greater than 6 inches.
6. Solidly ram and tamp the layers into the excavation area around the post.
7. Dampen during placement if too dry to compact properly.
8. Replace and finish the surface around the post to match the surrounding surface.

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5850	08-JAN-2010	TM200, TM671, TM821	1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

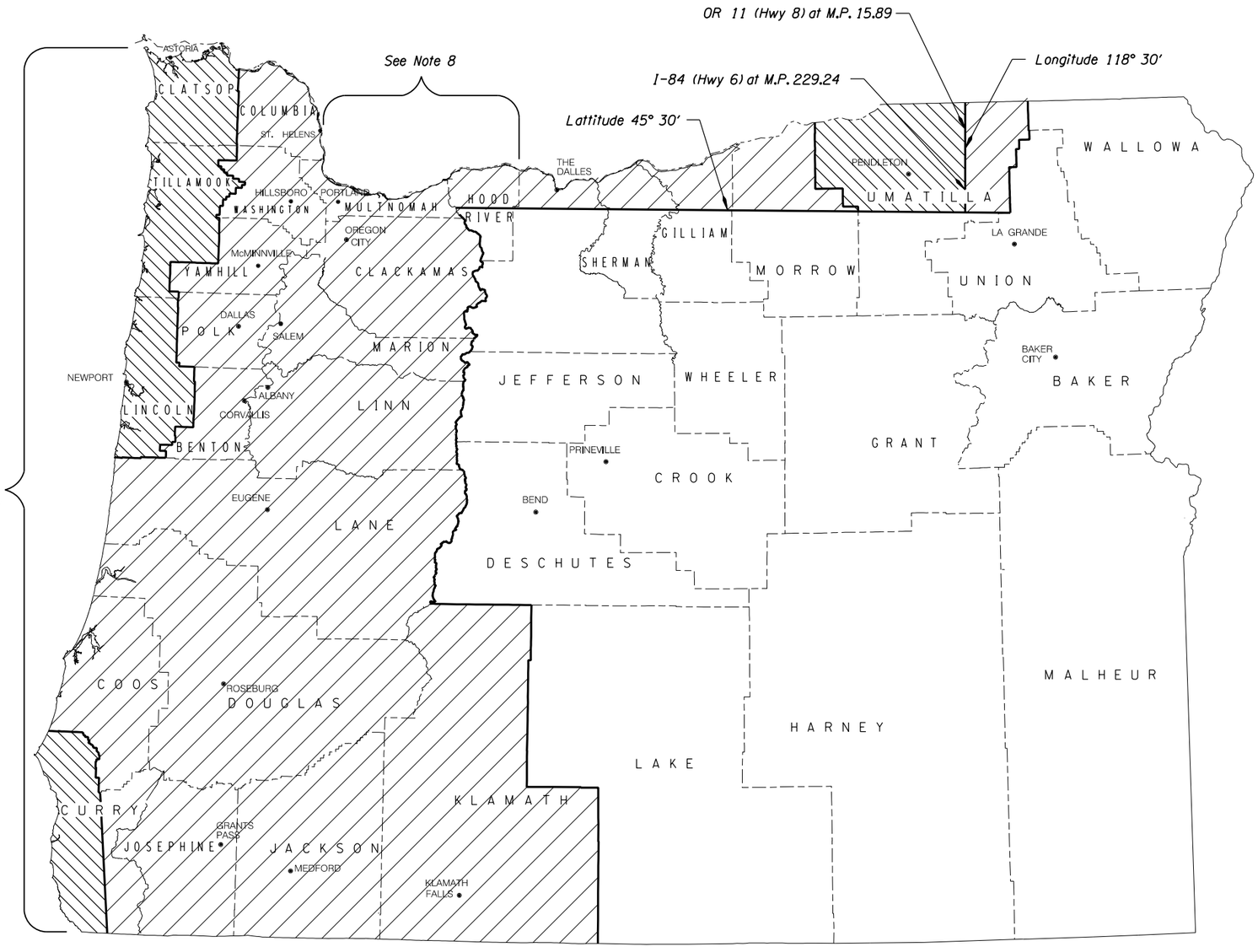
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

WOOD POST SIGN SUPPORTS

2015

DATE	REVISION DESCRIPTION



NOTES:

1. The wind velocity map as shown is adapted from AASHTO 2001 4th Edition - "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", Appendix C, Figure C-3 and Section 3, Figure 3-2. It uses the wind speed map shown in Figure 1609 of the 2007 Oregon Structural Code to account for locations in the State with special wind regions.
2. The wind velocities shown above are 3-Second Gust wind velocities.
3. The Exposure Catagory is C.
4. The mean recurrence interval is 50-Years.
5. Mountanious terrain, gorges, and ocean promontories are classified as special wind regions and shall be examined for unusual wind conditions.
6. The Interval Height (Kz) is 30 ft.
7. All areas with full exposure to ocean winds shall be designated 110 mph areas.
8. Areas in Multnomah and Hood River counties with full exposure to Columbia River Gorge winds shall be designated 110 mph areas.
9. Localities may have adopted wind speed higher that shown on this map. Those higher wind speed shall be used.

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
	06-JAN-2012		1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

3 SECOND GUST WIND SPEED MAP

2015

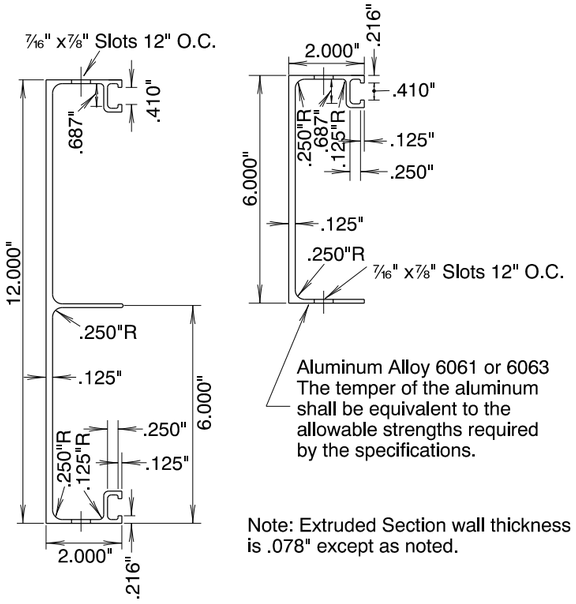
DATE	REVISION DESCRIPTION

tm671.dgn 11-JUL-2014

TM671

Effective Date: February 1, 2015 - May 31, 2015

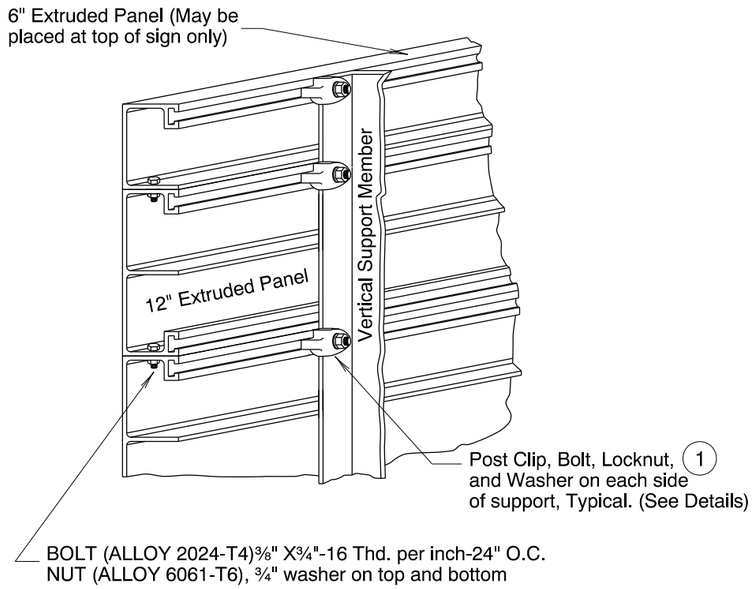
tm675.dgn 11-JUL-2014



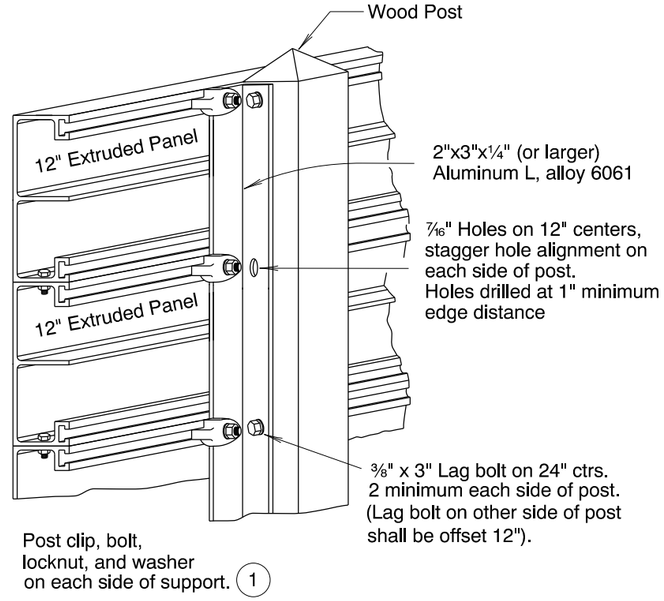
Aluminum Alloy 6061 or 6063
The temper of the aluminum shall be equivalent to the allowable strengths required by the specifications.

Note: Extruded Section wall thickness is .078" except as noted.

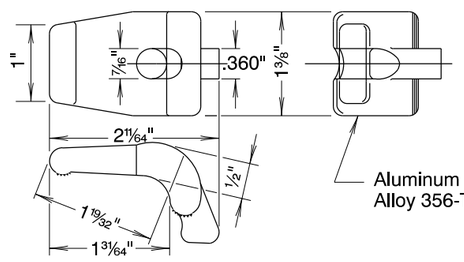
SIGN PANELS & DETAILS



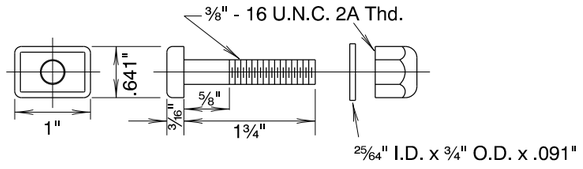
SIGN PANELS ON METAL STRUCTURES
No Scale



SIGN PANELS ON WOOD POSTS
No Scale

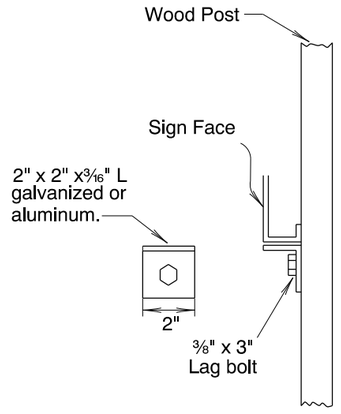


POST CLIP DETAIL



ALUMINUM ALLOYS; BOLT 2024-T4 (1)
LOCKNUT 6061-T6
WASHER (No alloy specified)

POST CLIP BOLT, NUT, & WASHER DETAIL



SIGN SUPPORT BRACKET DETAIL
1 Required per post

(1) Note:
The locking feature of the nut shall be a nylon insert.

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
	10-JAN-2014		1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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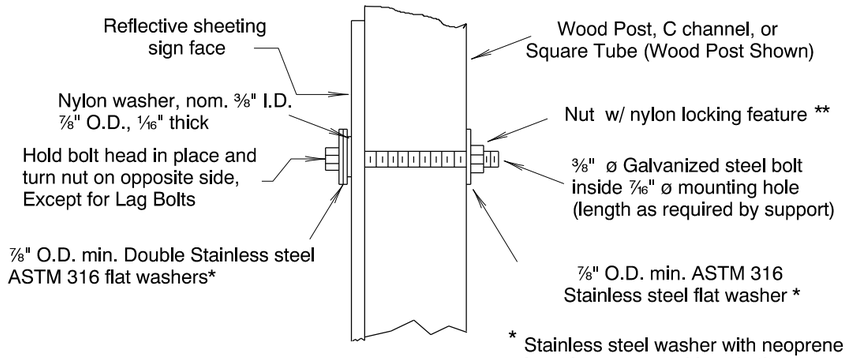
OREGON STANDARD DRAWINGS

EXTRUDED ALUMINUM PANELS

2015

DATE	REVISION DESCRIPTION



Note:
1)When signs are placed on opposing sides of post, ⅜" x 3" lag bolts can be used instead of through bolt.
2) Use nylon and stainless steel washers when signs are placed on both sides of post.
3) Burr threads at junction with nut when locknuts are not used.
4) Post bolts to extend beyond the tightened nuts within the limits of ¼" to 1".

* Stainless steel washer with neoprene layer is an acceptable substitue

** Acceptable substitute for nylon locking nuts:
ANCO PIN-LOC ®
TRI-LOC ® Top Lock Locknut

SIGN ATTACHMENT DETAIL

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET 1 OF 1

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

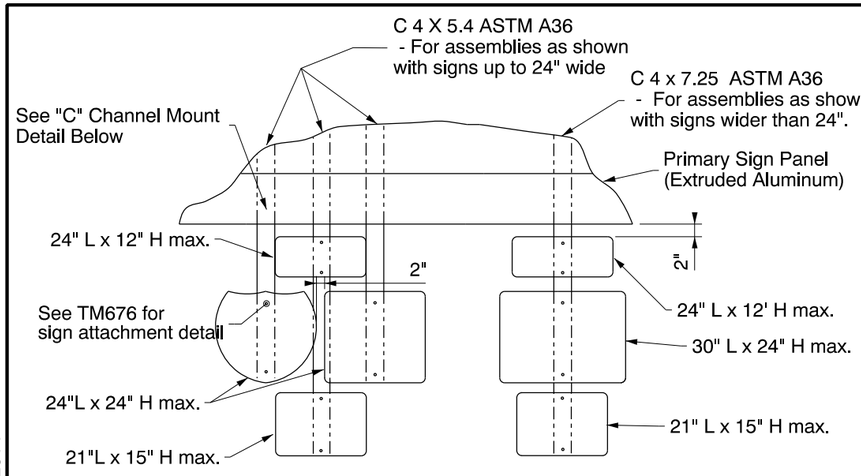
SIGN ATTACHMENTS

2015

DATE	REVISION DESCRIPTION

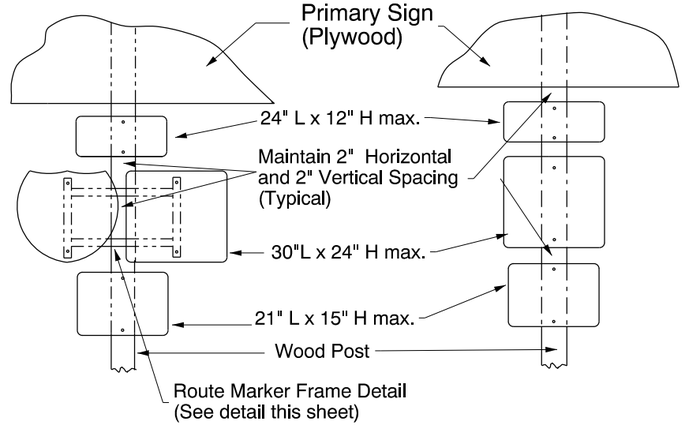
tm676.dgn 11-JUL-2014

TM676

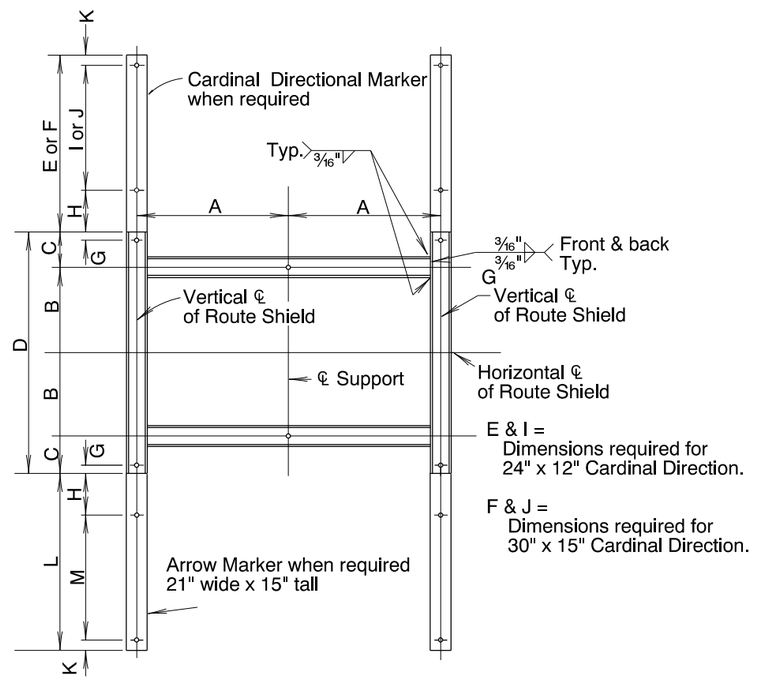


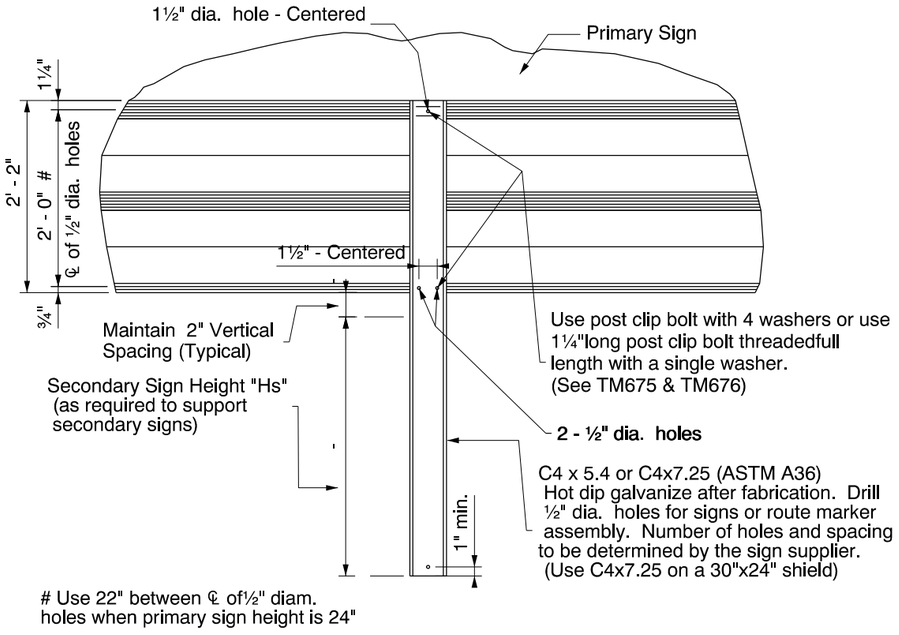
Note: Maintain 2" Horizontal and 2" Vertical Spacing (Typical)

ROUTE MARKER MOUNTS UNDER EXTRUDED PANELS
Scale: None



ROUTE MARKERS MOUNTED ON WOOD POSTS
Scale: None





Use 22" between ℄ of½" diam. holes when primary sign height is 24"

"C" CHANNEL CONNECTION DETAIL
SCALE: None

Shield Sizes (in inches)	A	B	C	D	E	F	G	H	I	J	K	L	M
2 - 24" x 24"	13	8	3½	23	14	17	¾	4	9	12	1	17	12
1 - 24" x 24" & 1-30" x 24"	14½	8	3½	23	14	17	¾	4	9	12	1	17	12
2 - 30" x 24"	16	8	3½	23	14	17	¾	4	9	12	1	17	12
2 - 36" x 36"	19	12	5½	35	14	17	1⅜	4	9	12	1	17	12
1 - 36" x 36" & 1-45" x 36"	21¼	12	5½	35	14	17	1⅜	4	9	12	1	17	12
2 - 45" x 36"	23½	12	5½	35	14	17	1⅜	4	9	12	1	17	12

Note: Route Marker frames shall be constructed from 2" x 2" x 3/16" ASTM A53 GR B tubing, galvanized after fabrication. Provide 7/16" holes for mounting signs to sign frame and sign frame to post. Use 3/8" bolts, washers and lock-nuts for mounting signs and sign frame. When mounting signs to wood posts use a nylon washer and a stainless steel washer. All hardware shall be galvanized steel, stainless steel or aluminum alloy.

ROUTE MARKER FRAME DETAIL
Scale: None

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
			1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

SECONDARY SIGN MOUNTING DETAILS

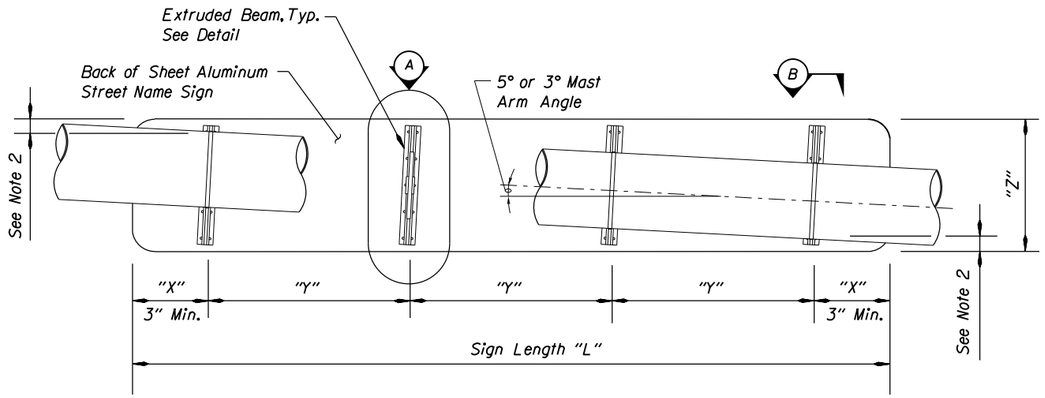
2015

DATE	REVISION DESCRIPTION

tm678.dgn 11-JUL-2014

TM678

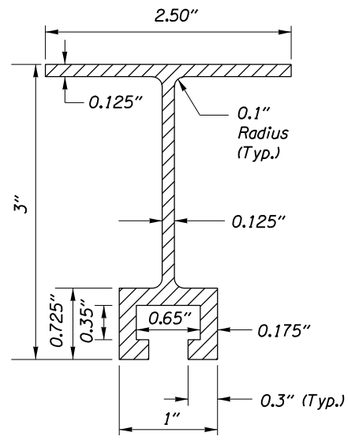
tm679.dgn 11-JUL-2014



Mast Arm Street Name Mount Requirements				
Sign Length "L"	Maximum Sign Height "Z"	Maximum Edge Distance "X"	Maximum Support Spacing "Y"	Number of Extruded Beam Locations
"L" Less than or Equal to 4'-0"	30"	"L"/4	"L"/2	2
"L" Greater than > 4'-0" and "L" less than or Equal to 8'-0"	30"	1'-0"	3'-0"	3
"L" Greater than > 8'-0" and "L" less than or Equal to 10'-0"	21"	1'-0"	2'-8"	4
"L" Greater than > 10'-0" and "L" less than or Equal to 12'-0"	21"	1'-0"	2'-6"	5

MAST ARM STREET NAME SIGN MOUNT

No Scale

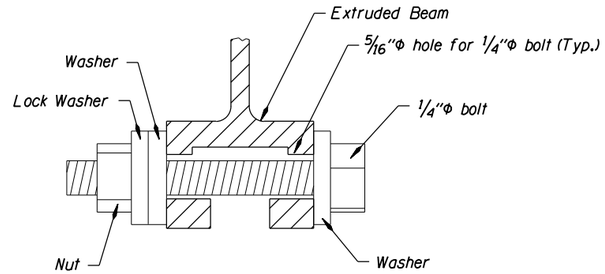


EXTRUDED BEAM DETAIL

No Scale

GENERAL NOTES:

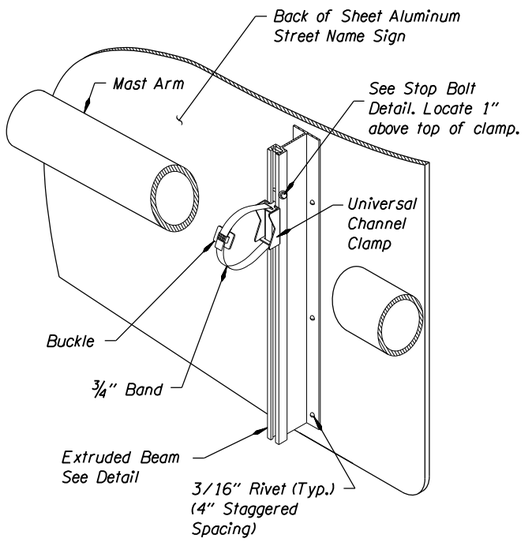
1. Physical fit of the sign must be verified. The edges of the street name sign shall not be within 6" of other signs or the mast arm connection flanges.
2. Equal spaces top and bottom.
3. The top pf the street name sign shall be leveled.
4. Extruded Beams are to be set at an angle perpendicular to the mast arm.
5. Material for extruded beam shall be ASTM B 221 6061-T6 Aluminum.
6. Material for ¾" Band shall be ¾" wide, 0.03" thick, and ASTM A 666, Type 201 Stainless Steel.
7. Material for the Sign Bracket, Universal Channel Clamp, and buckle shall be ASTM A 666, Type 201 Stainless Steel.
8. Existing signal poles must be analyzed to verify that the pole and foundation can support the new street name sign loading. See TM650 for allowable street name sizes on new installations.



1. All hardware to be Type 316 Stainless Steel.
2. Locate 1" above the top of the Universal Channel Clamp.

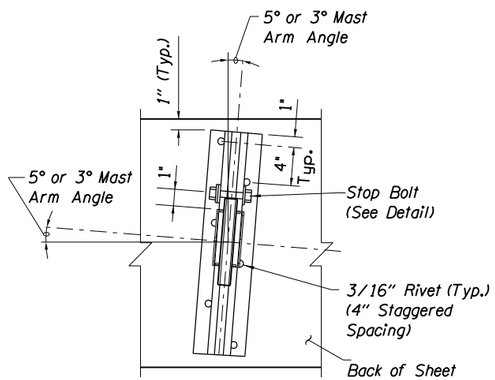
STOP BOLT DETAIL

No Scale



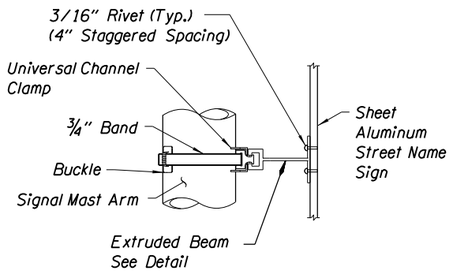
TYPICAL MAST ARM INSTALLATION

No Scale



DETAIL (A)

No Scale



DETAIL VIEW (B)

No Scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
	06-JAN-2012		1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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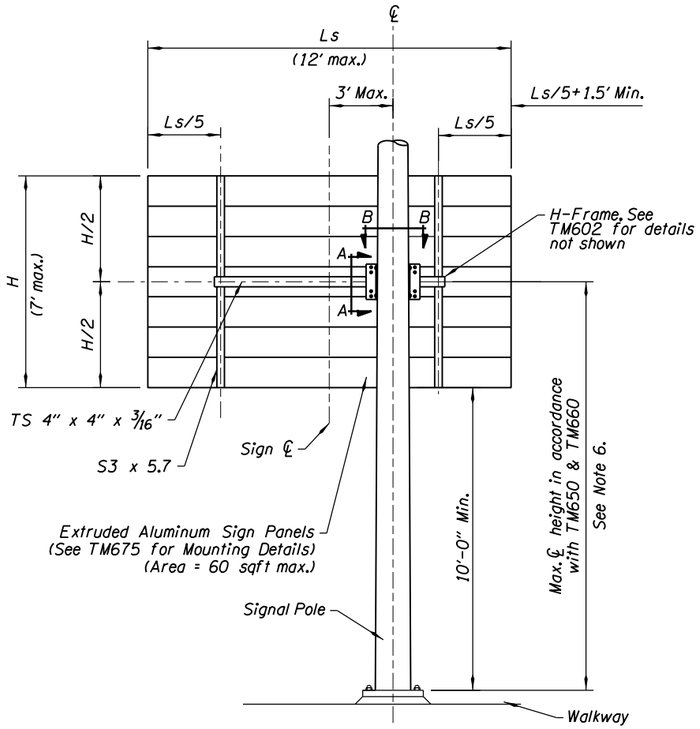
OREGON STANDARD DRAWINGS

SIGNAL MAST ARM STREET NAME SIGN MOUNTS

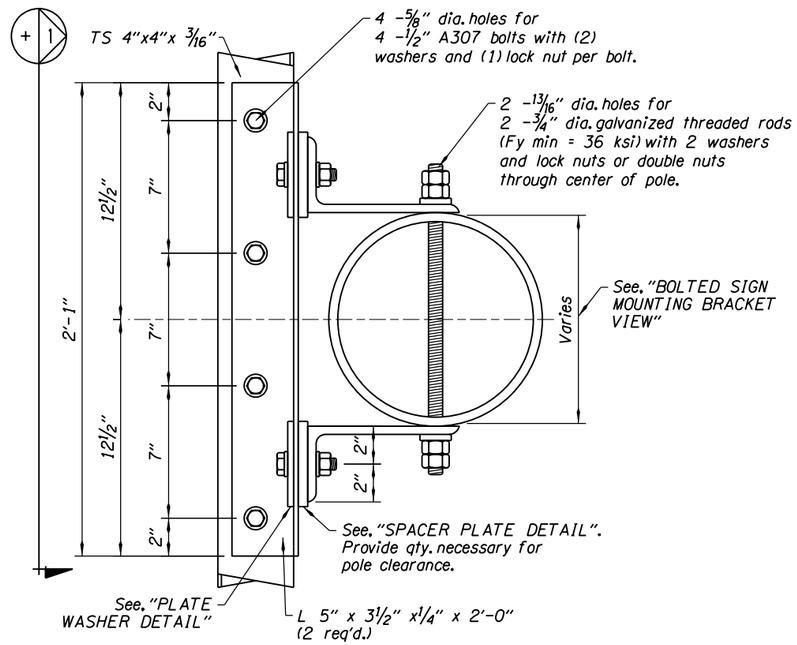
2015

DATE	REVISION DESCRIPTION



SIGNAL POLE MOUNT ELEVATION

No Scale



SECTION B-B

No Scale

GENERAL NOTES:

1. High strength bolts shall conform to ASTM specification A325. All other bolts shall conform to ASTM specification A307.
2. Structural steel shall conform to ASTM A36.
3. All steel and bolts shall be hot-dip galvanized after fabrication.
4. Surfaces of holes drilled in poles shall be galvanized according to ASTM A780.
5. Maximum sign size is 60 sq.ft. for this signal pole mount.
6. Any signal pole intended to support one of these mounts must first be analyzed to determine if the load-bearing capacity is sufficient to support this extra load.
7. Structural tubing shall conform to ASTM specification A500, Grade "B" or A501.
8. Cantilever sign to meet lateral clearance requirements and must be kept entirely within the Right-of-Way.
9. Field check pole diameters at mounting heights and cut upper and lower attachment plates to fit.

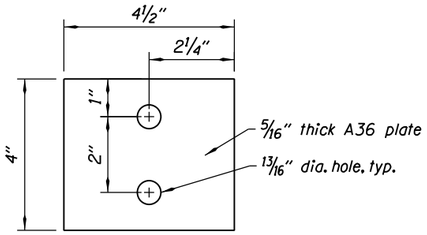
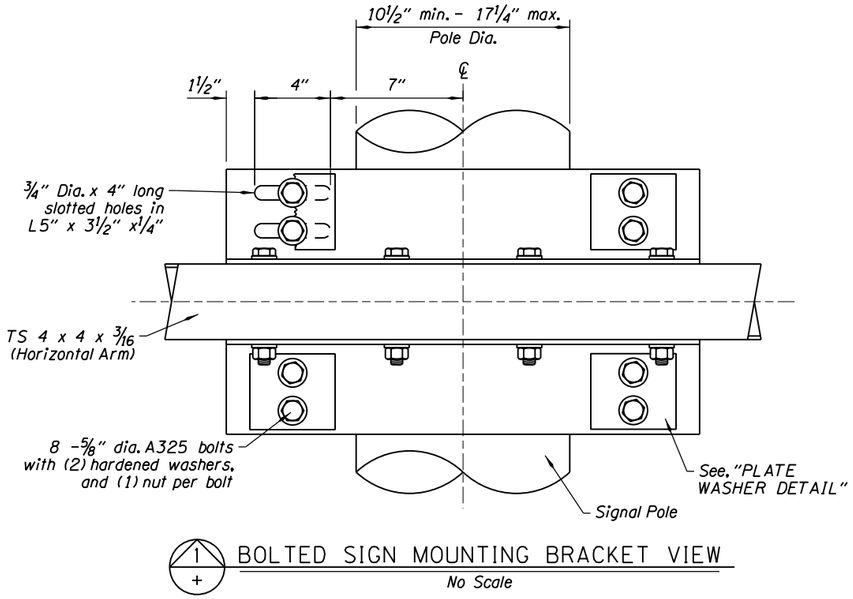


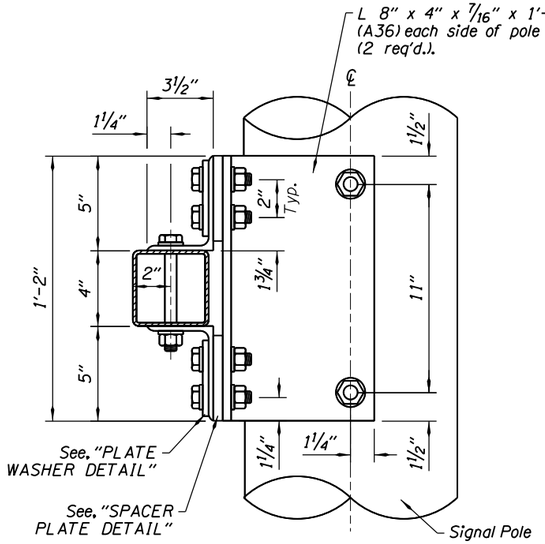
PLATE WASHER DETAIL

No Scale



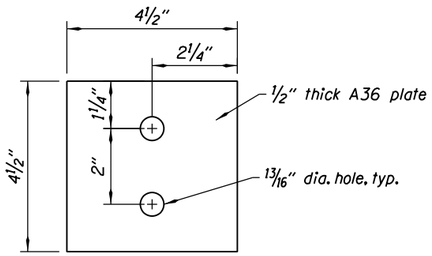
1 BOLTED SIGN MOUNTING BRACKET VIEW

No Scale



SECTION A-A

No Scale



SPACER PLATE DETAIL

No Scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
	07-JAN-2013		1 OF 1

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SIGNAL POLE MOUNTS

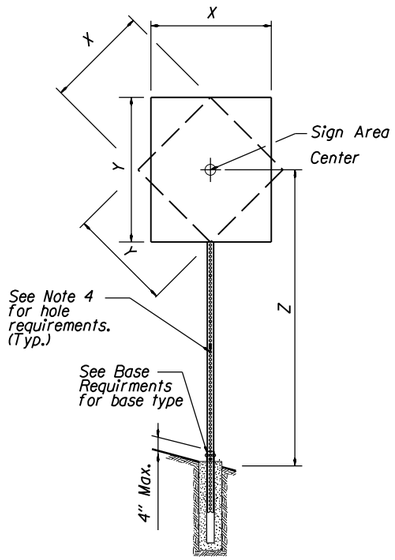
2015

DATE	REVISION DESCRIPTION

tm680.dgn 11-JUL-2014

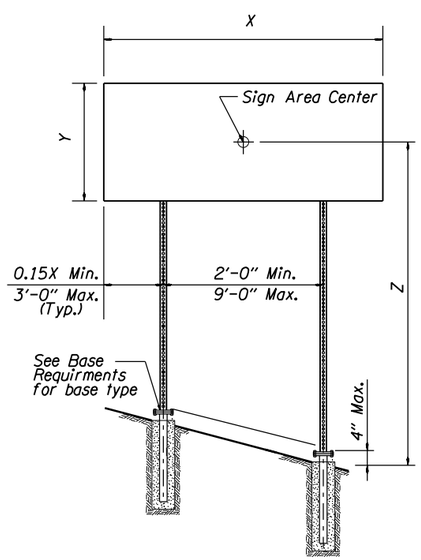
TM680

tm681.dgn 11-JUL-2014



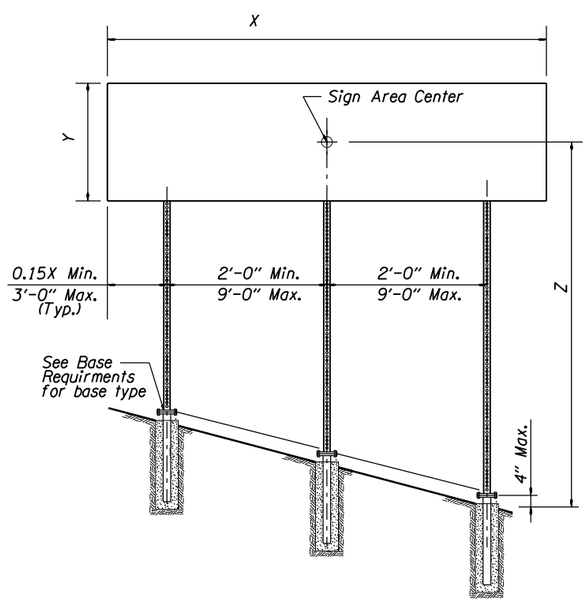
SINGLE POST ELEVATION

No scale



TWO POST ELEVATION

No scale



THREE POST ELEVATION

No scale

GENERAL NOTES:

1. Perforated Steel Square Supports are designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals 4th Edition, 2001, 2002, 2003, and 2006 interim revisions.
2. The design basic wind speed (3 second gust) shall be according to the wind map shown on TM671.
3. Material grade for base hardware connection shall be according to the manufacturer's recommendation and based on crash testing.
4. Use 7/16" diameter holes at 1" spacing on each of the 4 sides.
5. Steel post shall have a minimum yield stress of 50 ksi.
6. Steel shall be galvanized according to ASTM A653 with coating designation G140.
7. General design parameters are Kz = 0.87, Cd (sign) = 1.20, and G = 1.14.
8. Permanent signing uses an Ir = 0.71 for a recurrence interval of 10 years.
9. Temporary signing uses an Ir = 0.45 for a recurrence interval of 1.5 years.
10. The sign width to sign height or sign height to sign width ratio shall not exceed 5.0.
11. For horizontal and vertical clearances of permanent signs refer to TM200 and of temporary signs refer to TM821.
12. Posts protected by barrier or guardrail do not require slip bases.

	(X * Y * Z) in ft 3								
	3 Second Gust Wind Speed (TM671)								
	85 MPH			95 MPH			105 or 110 MPH		
	Number of Posts			Number of Posts			Number of Posts		
Square Tube Size	1	2	3	1	2	3	1	2	3
2"-12 ga.	79	158	237	63	126	189	57	114	171
2½"-12 ga.	136	272	408	109	218	327	98	196	294
2½"-10 ga.	165	330	495	132	264	396	119	238	357
2¼" & 2½"-12 ga.*	231	462	693	185	370	555	167	334	501

PERMANENT PERFORATED STEEL SQUARE TUBE TABLE

	(X * Y * Z) in ft 3								
	3 Second Gust Wind Speed (TM671)								
	85 MPH			95 MPH			105 or 110 MPH		
	Number of Posts			Number of Posts			Number of Posts		
Square Tube Size	1	2	3	1	2	3	1	2	3
2"-12 ga.	125	250	375	100	200	300	90	180	270
2½"-12 ga.	215	430	645	172	344	516	155	310	465
2½"-10 ga.	261	522	783	209	418	627	189	378	567
2¼" & 2½"-12 ga.*	364	728	1092	292	584	876	263	526	789

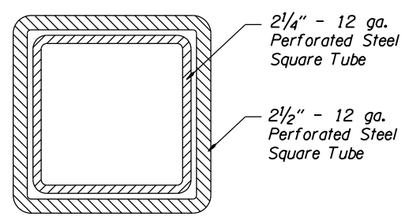
TEMPORARY PERFORATED STEEL SQUARE TUBE TABLE

* - See 2¼" & 2½" - 12 ga. detail.

	Number of Posts		
Square Tube Size	1	2	3
2"-12 ga.	Anchor	Anchor	N/A
2½"-12 ga.	Anchor	Slip	Slip
2½"-10 ga.	Slip	Slip	Slip
2¼" & 2½"-12 ga.*	Slip	Slip	Slip

1. Anchor - See Drawing TM687 for PSST anchor foundation details.
2. Slip - See Drawing TM688 for PSST slip base foundation details.
3. N/A - Do not use this option.

BASE REQUIREMENTS



2¼" - 12 ga. PSST to extend entire length inside of the 2½" - 12 ga. PSST.

2¼" & 2½" - 12 GA. DETAIL

No scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5752	06-JAN-2012	TM200, TM671, TM687, TM688, TM775	1 OF 3

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

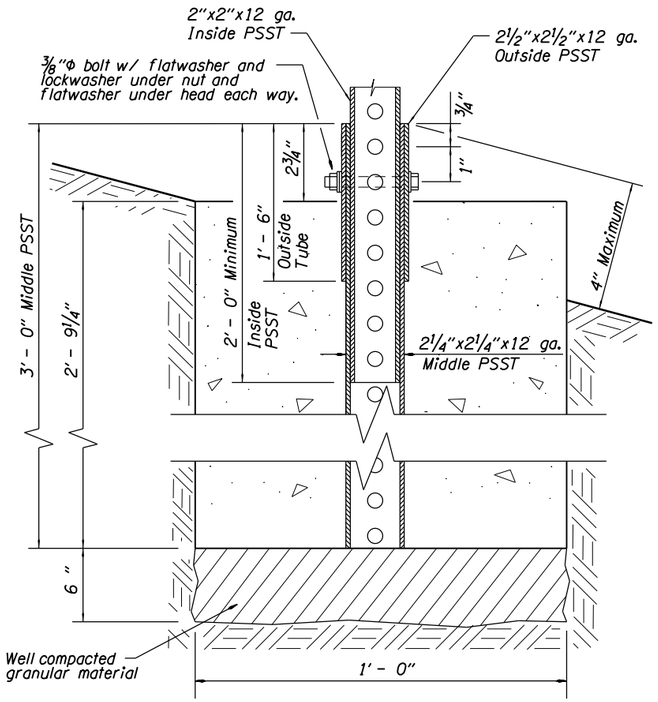
PERFORATED STEEL SQUARE TUBE (PSST) SIGN SUPPORT INSTALLATION

2015

DATE	REVISION DESCRIPTION

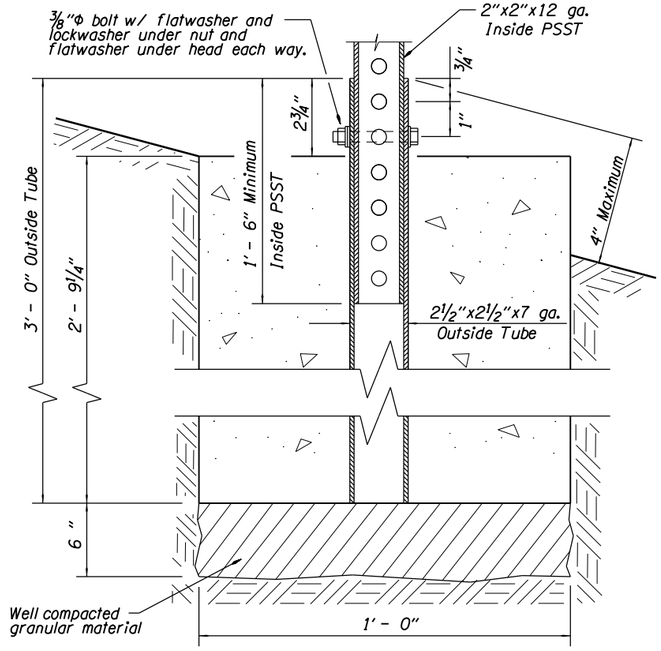
TM681

tm687.dgn 11-JUL-2014



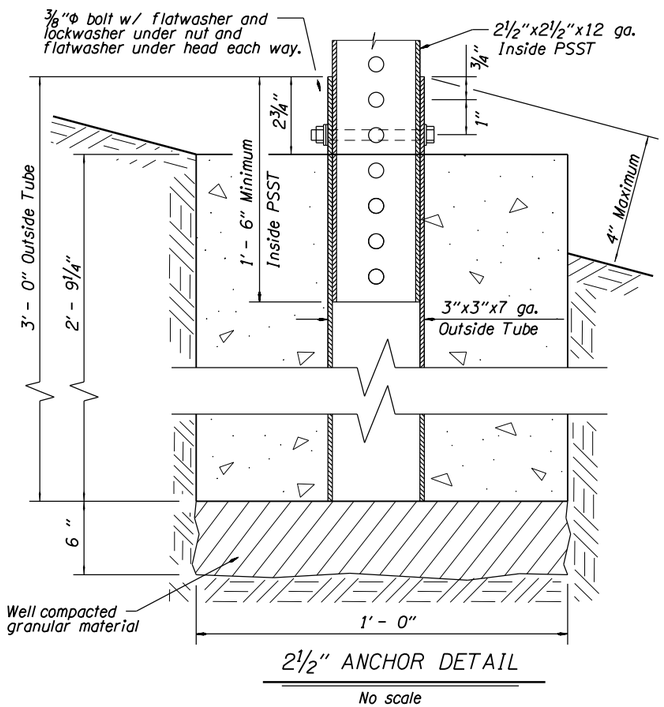
2" ANCHOR DETAIL

No scale



2" OPTIONAL ANCHOR DETAIL

No scale

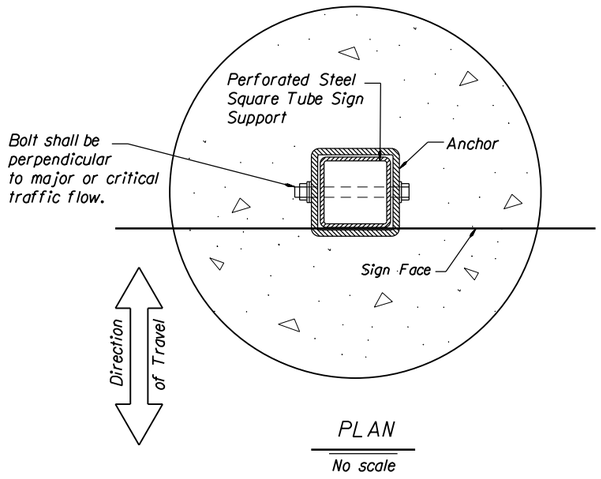


2½" ANCHOR DETAIL

No scale

General Notes:

1. Material grade for base hardware connection shall be according to the manufacturer's recommendation and based on crash testing.
2. Anchor steel shall be hot dipped galvanized or approved equal.
3. Footing concrete shall be Commercial Grade Concrete (fc = 3000 psi) per Specification 00440. The CGC mixture may be accepted at the site of placement according to 00440.14.
4. The estimated concrete volume is .09 cubic yards.



PLAN

No scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5752	06-JAN-2012	TM681, TM688	2 OF 3

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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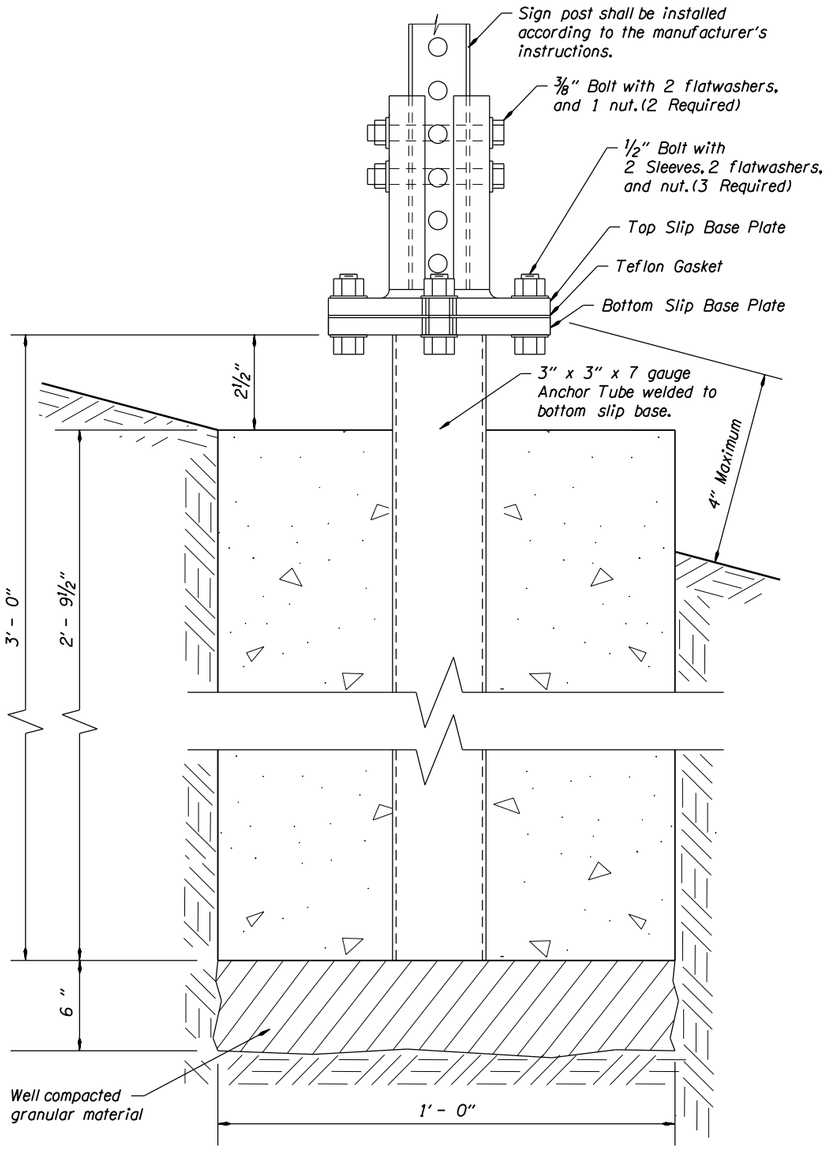
OREGON STANDARD DRAWINGS

PERFORATED STEEL SQUARE TUBE (PSST) ANCHOR FOUNDATION

2015

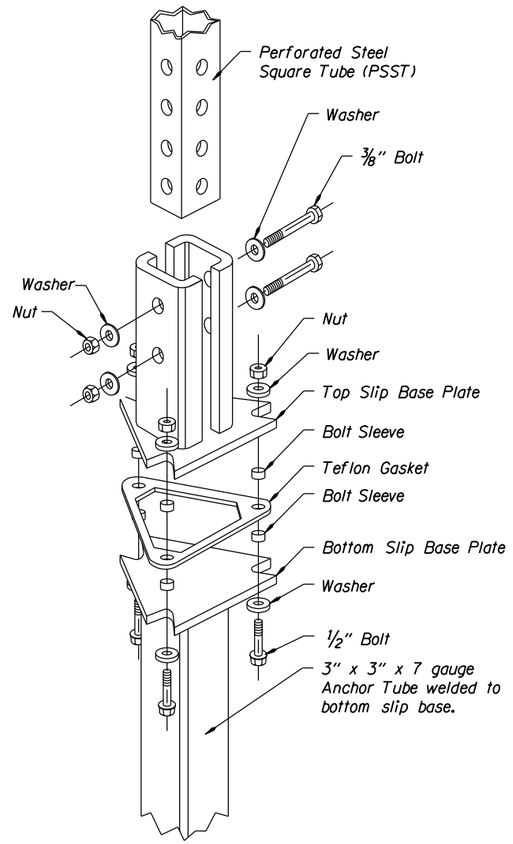
DATE	REVISION DESCRIPTION

tm688.dgn 11-JUL-2014



SLIP BASE ELEVATION

No scale

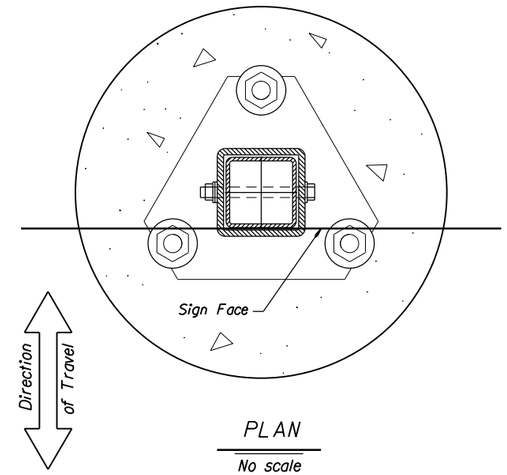


SLIP BASE EXPLODED VIEW

No scale

General Notes:

1. Material grade for base hardware connection shall be according to the manufacturer's recommendation and based on crash testing.
2. Slip base steel shall be hot dipped galvanized or approved equal.
3. Footing concrete shall be Commercial Grade Concrete (fc = 3000 psi) per Specification 00440. The CGC mixture may be accepted at the site of placement according to 00440.14.
4. Material grade for base hardware connection shall be according to the manufacturer's recommendation and based on crash testing.
5. All slip bases shall be pre-assembled by the manufacturer and shall be installed according to the manufacturer's instructions.
6. Use slip bases listed on the ODOT Qualified products list or submit crash testing data, installation instructions, and unstamped working drawings according to 00150.35.
7. Slip base details shown are not for a specific manufacturer and are only shown to convey general pieces of a slip base system. Specific slip base material will be acccording to the manufacturer's documentation.



PLAN

No scale

CALC. BOOK NO.	BASELINE REPORT DATE	ACCOMPANIED BY DWGS.	SHEET
5752	06-JAN-2012	TM681, TM687	3 OF 3

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

PERFORATED STEEL SQUARE TUBE (PSST) SLIP BASE FOUNDATiON

2015

DATE	REVISION DESCRIPTION

TM688

TAPER TYPES & FORMULAS	
TAPER	**FORMULA**
Merging (Lane Closure)	"L"
Shifting	"L"/2 or ½"L"
Shoulder Closure	"L"/3 or ⅓"L"
Flagging (See Drg. TM850)	50' - 100'
Downstream (Termination)	Varies (See Drawings)

★ Use Pre-Construction Posted Speed to select the Speed from the Tables below:

CONCRETE BARRIER FLARE RATE TABLE	
★ SPEED (mph)	**MINIMUM FLARE RATE**
≤ 30	8:1
35	9:1
40	10:1
45	12:1
50	14:1
55	16:1
60	18:1
65	19:1

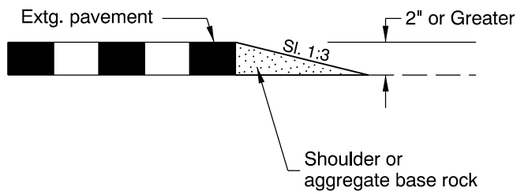
MINIMUM LENGTHS TABLE					
	"L" VALUE FOR TAPERS (ft)				BUFFER "B" (ft)
★ SPEED (mph)	W = Lane or Shoulder Width being closed or shifted				
	W ≤ 10	W = 12	W = 14	W = 16	
25	105	125	145	165	75
30	150	180	210	240	100
35	205	245	285	325	125
40	265	320	375	430	150
45	450	540	630	720	180
50	500	600	700	800	210
55	550	660	770	880	250
FREEWAYS					
55	1000	1000	1000	1000	250
60	1000	1000	1000	1000	285
65	1000	1000	1000	1000	325

NOTES:
- For Lane or Shoulder closure where W < 10', use "L" value for W = 10'.

TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE				
★ SPEED (mph)	Sign Spacing (ft)			Max. Channelizing Device Spacing (ft)
	A	B	C	
20 - 30	100	100	100	20
35 - 40	350	350	350	20
45 - 55	500	500	500	40
Freeway	1000	1500	2640	40

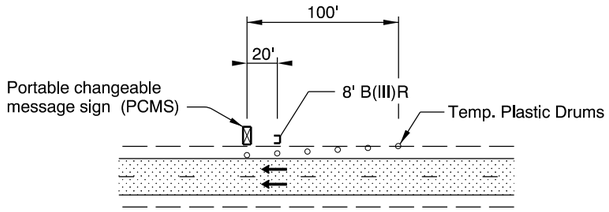
NOTES:
- Place traffic control devices on 10 ft. spacing for intersection and access radii.
- When necessary, sign spacing may be adjusted to fit site conditions.
  Limit spacing adjustments to 20% of the "A" dimension for speeds < 45 mph.
  Limit spacing adjustments to 10% of the "A" dimension for speeds ≥ 45 mph.

NOTES:
- When paved shoulders adjacent to excavations are less than four feet wide protect longitudinal abrupt edge as shown.
- Use aggregate wedge when abrupt edge is 2 inches or greater.



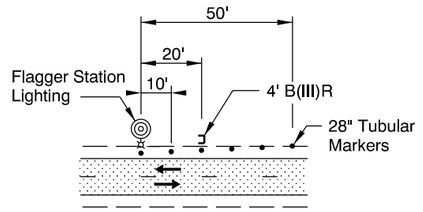
EXCAVATION ABRUPT EDGE

NOTES:
- Install PCMS beyond the outside shoulder, when possible.
- Use the appropriate type of barricade panels for PCMS location.
  Right shoulder, use Type B(III)R
  Left shoulder, use Type B(III)L
- Use six drums in shoulder taper on 20' spacing.
- Detail as shown is also used for Portable Traffic Signal installation and Portable Traffic Management System.



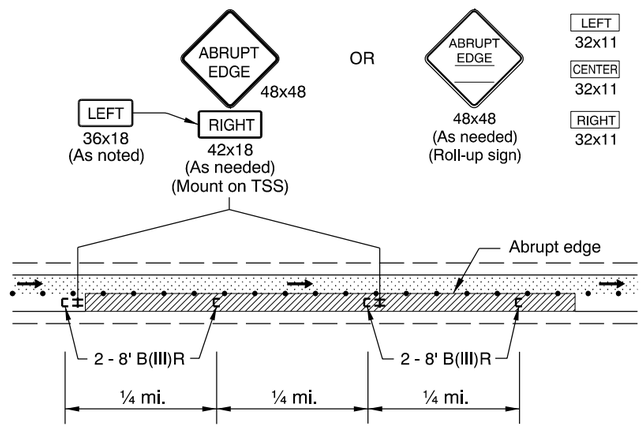
PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION

NOTES:
- Install Flagger Station Lighting beyond the outside shoulder, where practical.
- Use six tubular markers in shoulder taper on 10' spacing.
- Place cart / generator / power supply off of the shoulder, as far as practical.



FLAGGER STATION LIGHTING DELINEATION

NOTES:
- Abrupt edges may be created by paving, operations, excavations or other roadway work. Use abrupt edge signing for longitudinal abrupt edges of 1 inch or greater.
- If the excavation is located on left side of traffic, replace the 8' B(III)R barricades with 8' B(III)L barricades and replace the "RIGHT" (CW21-8C-18) riders with "LEFT" (CW21-8A-18) riders.
- Continue signing and other traffic control devices throughout excavation area at spacings shown.
- If roll-up signs are used, attach the correct (CW21-9-11) plaques to the sign face using hook and loop fasteners. Place roll-up signs in advance of barricades.



TYPICAL ABRUPT EDGE DELINEATION

GENERAL NOTES FOR ALL TCP DRAWINGS:
- Signs and other Traffic Control Devices (TCD) shown are the minimum required.
- Place Temporary Sign Support (TSS) approx. 10' behind barricade.
- Place Portable Changeable Message Sign (PCMS) approx. 20' behind barricade.
- Place sequential arrow approx. 20' behind barricade.
- Arrows shown in roadway are not pavement legends, but directional arrows to indicate traffic movements.
- All signs are type "O4" flourescent orange, unless otherwise shown.

○ ○ ○ Temp. Plastic Drums See TCD Spacing Table for max. spacing.

• • • 28" Tubular Markers See TCD Spacing Table for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

To be accompanied by Drg. Nos. TM820 & TM821

CALC. BOOK NO. TM09-01

BASELINE REPORT DATE 01-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

TABLES, ABRUPT EDGE AND PCMS DETAILS

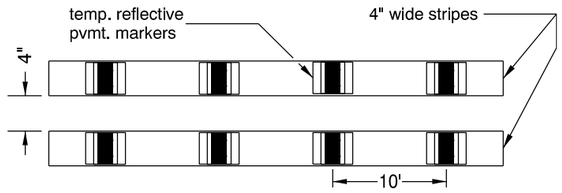
2015

DATE	REVISION DESCRIPTION

tm800.dgn 01-JUL-2014

TM800

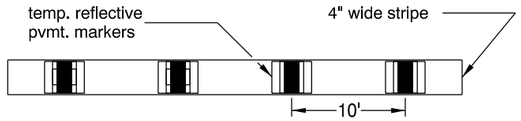
Effective Date: February 1, 2015 - May 31, 2015



LAYOUT "A"
(Supplemented double solid lines)

TYPICAL APPLICATIONS:

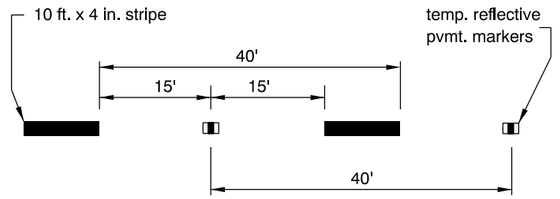
- To prohibit lane changes or passing (include appropriate regulatory signs).
- Freeway or multilane shifts and crossovers.
- For projects in place through winter months.
- Two-lane, two-way centerlines.



LAYOUT "B"
(Supplemented solid line)

TYPICAL APPLICATIONS:

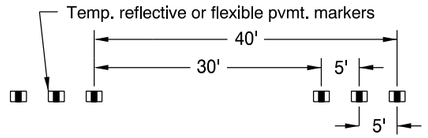
- Alignment shifts or crossovers.
- To discourage lane changes in multilane sections.
- For projects in place through winter months.



LAYOUT "C"
(Supplemented broken lines)

TYPICAL APPLICATIONS:

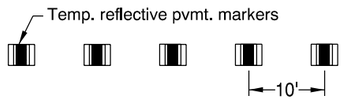
- Freeway and multilane broken lines.
- High ADT 2 lane roads (greater than 10,000).
- For projects in place through winter months.



LAYOUT "D"
(Simulated broken lines)

TYPICAL APPLICATIONS:

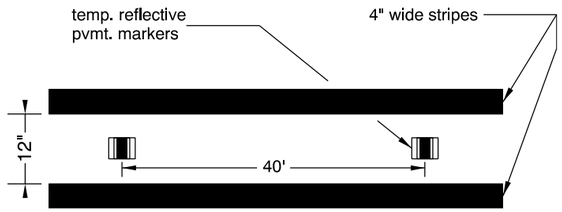
- During staging on finished/existing surfaces.
- HMAC intermediate surfaces.
- Emulsified asphalt surface treatments (chip seals) where permanent pavement markings cannot be placed within two weeks.



LAYOUT "E"
(Simulated solid lines)

TYPICAL APPLICATIONS:

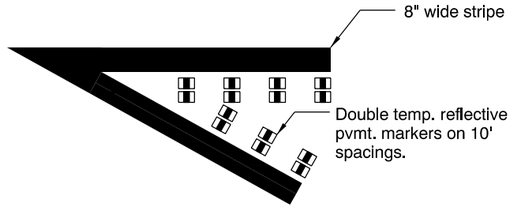
- Alignment shifts or crossovers.
- To discourage lane changes in multilane sections.
- Edge lines for short durations, less than 14 days.



LAYOUT "F"
(Supplemented double solid lines)

TYPICAL APPLICATIONS:

- To prohibit lane changes or passing (include appropriate regulatory signs).
- 2 lane, 2 way centerlines.
- 2 lane, 1 way alignments on freeways or multi-lane highways.



LAYOUT "G"
(Supplemented solid 8" line)

TYPICAL APPLICATIONS:

- Gore areas
- Alignment splits (bifurcations)

GENERAL NOTES FOR ALL DETAILS:

- Yellow Bi-Directional Pavement Markers required for Two-Way Traffic.
- White Mono-Directional Pavement Markers are required for one-way traffic or edge lines.
- Supplemented lines are painted lines enhanced with Reflective Pavement Markers.
- Simulated lines are Reflective Pavement Markers placed in a pattern to substitute for a painted line.
- Pavement marking colors shall conform to the MUTCD.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

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OREGON STANDARD DRAWINGS

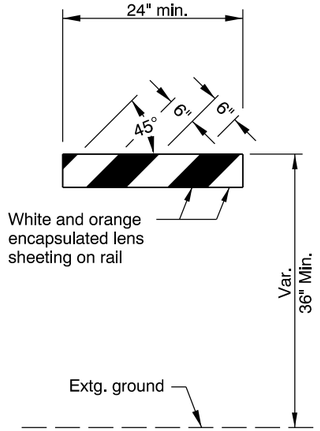
TEMPORARY PAVEMENT MARKINGS

2015

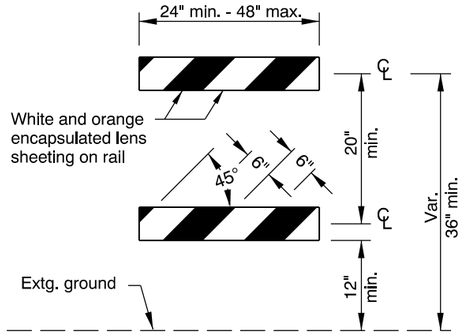
DATE	REVISION DESCRIPTION

Effective Date: February 1, 2015 - May 31, 2015

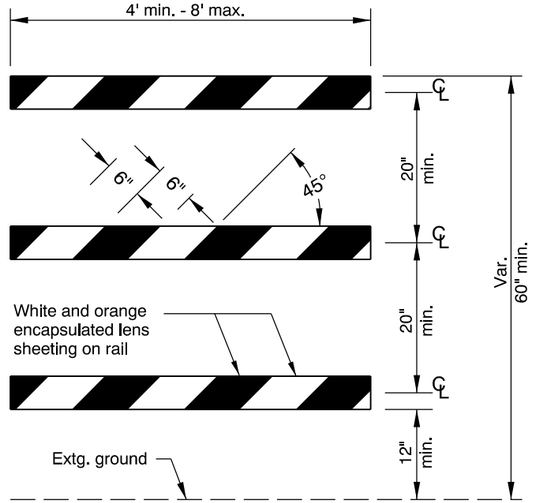
tm820.dgn 01-JUL-2014



TYPE I



TYPE II



TYPE III

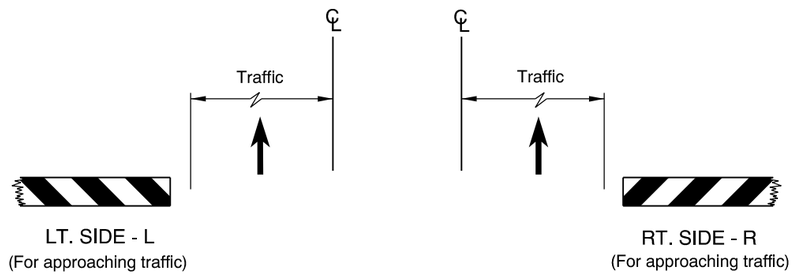
BARRICADE RAIL LAYOUT

GENERAL NOTES FOR ALL DETAILS:

- All non-reflectorized surfaces shall be white.
- Sandbags (approximately 25 lb sack filled with sand) may be placed on lower frame to provide additional ballast.
- Ballast shall not extend above bottom rail or be suspended from barricade.
- For rails less than 36" long, 4" wide stripes shall be used.
- Rails must be 8" min. to 12" max. in height.
- Use barricades from ODOT Qualified Products List (QPL).
- Use 4' Type III barricades where horizontal space is limited.
- Do not block bike lanes or shoulders used by bicycles unless facility is properly closed and signed.
- Do not place barricades in sidewalks unless sidewalk is closed and signed according to the TCP. See Dwg. No. TM 844

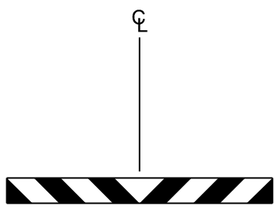
NOTES:

- Markings for barricade rails shall slope downward at an angle of 45° in the direction traffic is to pass.
- Where a barricade extends entirely across a roadway, it is desirable that the stripes slope downward in the direction toward which traffic must turn in detouring.
- Where both right and left turns are provided for, slope the chevron striping downward in both directions from the center of the barricade.
- For full roadway closures, the C or LR barricade may be used. Extend barricades completely across roadway unless access is required for local road users.

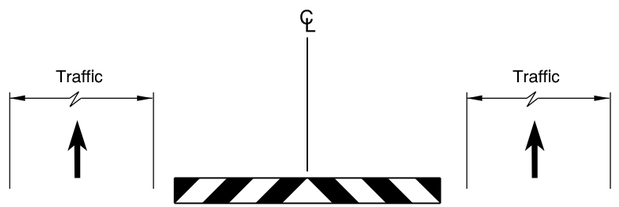


LT. SIDE - L
(For approaching traffic)

RT. SIDE - R
(For approaching traffic)

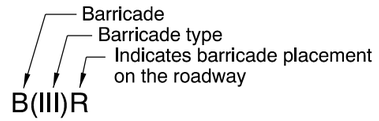


CLOSED - C
(For approaching traffic)



LT. / RT. - LR
(For approaching traffic)

DIAGRAM FOR BARRICADE PLACEMENT AND SLOPE MARKING



BARRICADE NOTATION

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

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OREGON STANDARD DRAWINGS

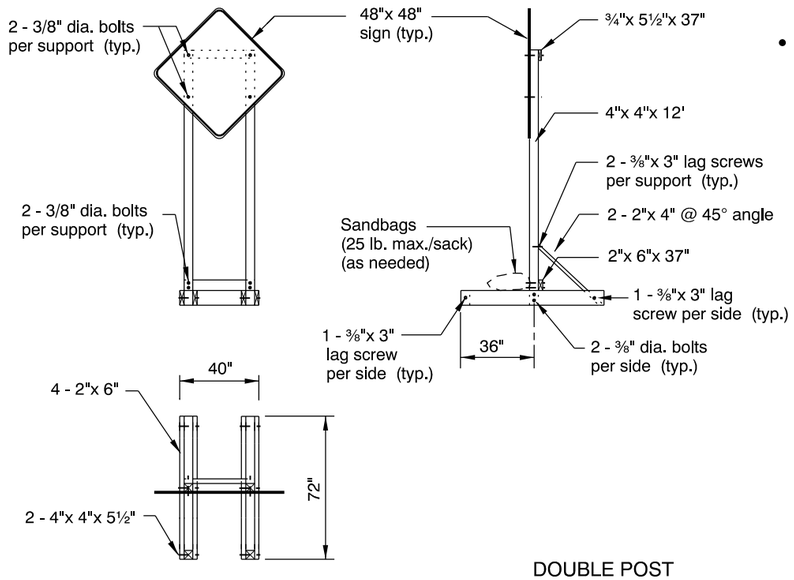
TEMPORARY BARRICADES

2015

DATE	REVISION DESCRIPTION

TM820

tm821.dgn 01-JUL-2014

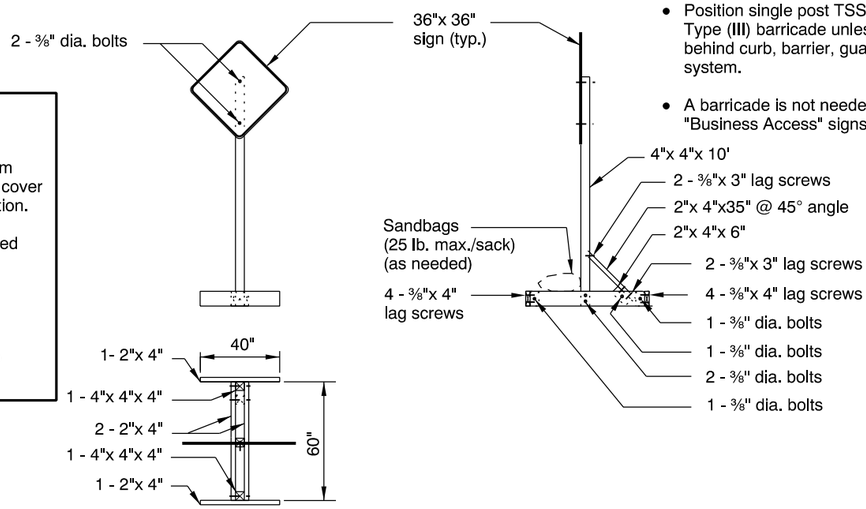


NOTES:

- Use Double Post TSS for a total sign area of 40 sq. ft. or less.
- Position double post TSS 10' behind an 8' (4' - where space is limited) Type (III) barricade, unless otherwise shown, or if TSS is located behind curb, barrier, guardrail, or other rigid system.

- DO NOT TIP OVER TSS AT ANY TIME.
- When not in use, locate TSS a minimum of 30' from the roadway and turn away from traffic; or, turn or cover sign and retain the Type (III) barricade for delineation.
- Use either Douglas Fir or Hem Fir, which is surfaced four sides (S4S) and free of heart center (FOHC).
- See "Temporary Sign Placement" detail for sign installation heights.
- Do not place or stack ballast more than 24" above the ground.

DOUBLE POST
TEMPORARY SIGN SUPPORT (TSS)



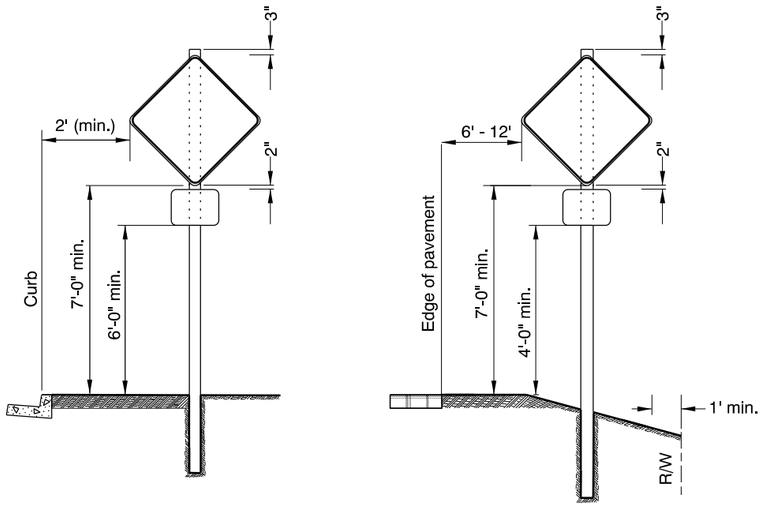
NOTES:

- Use Single Post TSS for a total sign area of 9 sq. ft. or less.
- Position single post TSS 10' behind a 4' Type (III) barricade unless TSS is located behind curb, barrier, guardrail, or other rigid system.
- A barricade is not needed for installation of "Business Access" signs on single post TSS's.

SINGLE POST
TEMPORARY SIGN SUPPORT (TSS)

NOTE:

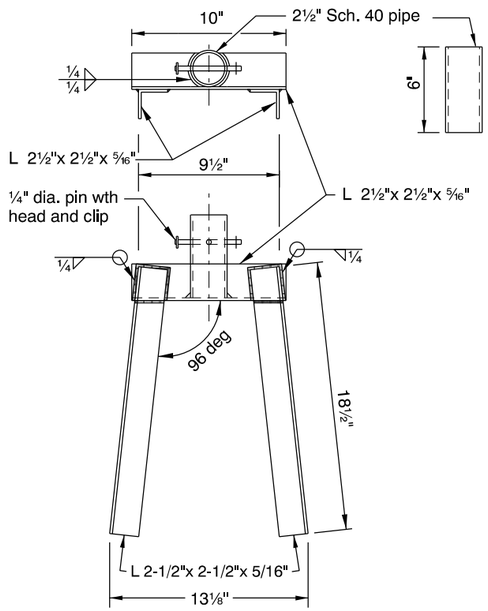
- Avoid locating sign supports in areas designated for bicycle or pedestrian traffic. When TSS or post mounted signs are located adjacent to or on a sidewalk or bicycle facility, install secondary sign (rider) at a minimum height of 7'-0" from top of sidewalk or bicycle facility to bottom of rider.

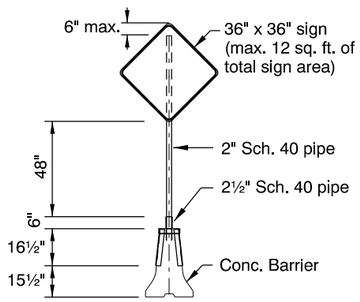


URBAN AREAS WITH CURB

URBAN AREAS - NO CURB
RURAL AREAS - CURB OR NO CURB

TEMPORARY SIGN PLACEMENT





NOTES:

- Drill additional holes so sign can be rotated 90 degrees and pinned when not in use.
- All structural steel shall conform to ASTM A36.
- Support fits both 32" and 42" tall "F" barrier.
- Use for supporting a maximum 12 sq. ft. of total sign area.
- Place support at connection between two concrete barrier sections.
- Weld steel according to American Welding Society (AWS) D.1.1.
- Do not use clipped signs.

CONCRETE BARRIER SIGN SUPPORT

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

TEMPORARY SIGN SUPPORTS

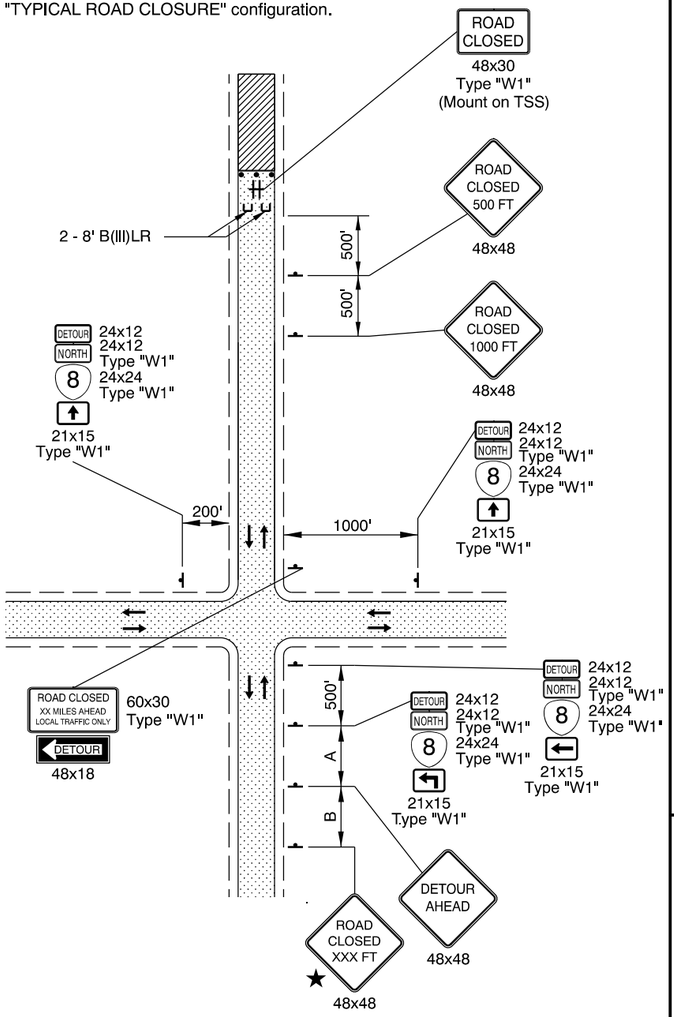
2015

DATE	REVISION DESCRIPTION

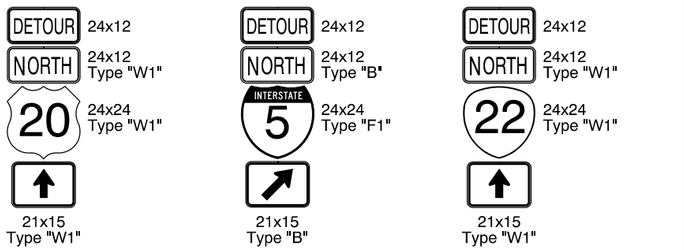
TM821

Effective Date: February 1, 2015 - May 31, 2015

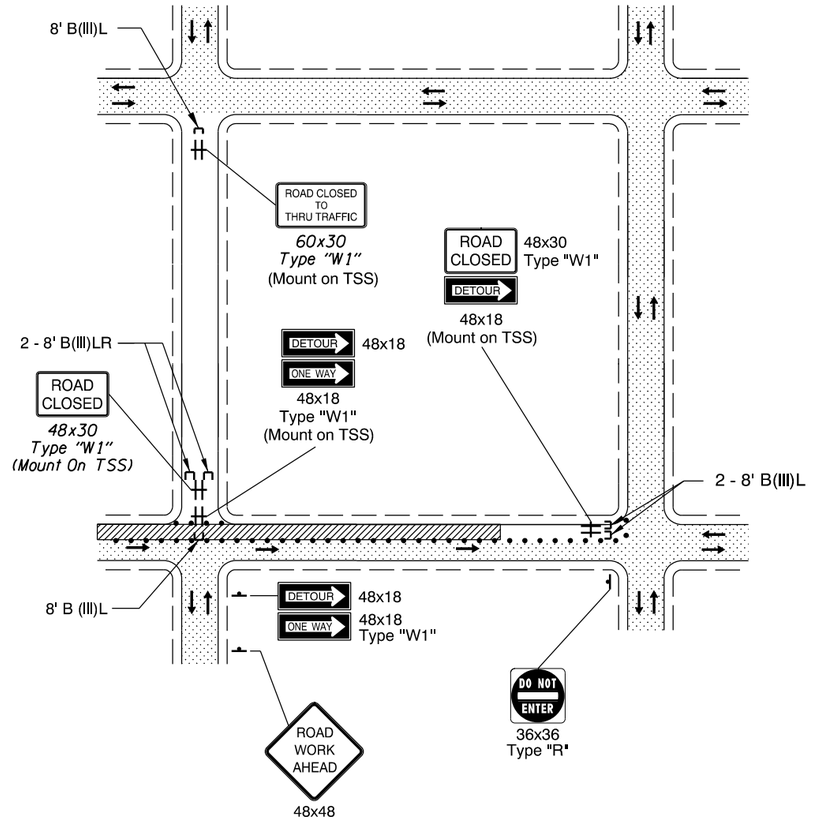
NOTE:
If closure is less than 1500 ft. from intersection, install "ROAD CLOSED TO THRU TRAFFIC" sign, as shown on the "TYPICAL ROAD CLOSURE" configuration.



TYPICAL ROAD CLOSURE WITH DETOUR



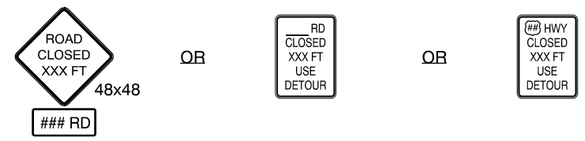
TYPICAL TRAILBLAZER ASSEMBLY



TYPICAL PARTIAL ROAD CLOSURE

GENERAL NOTES FOR ALL DETAILS:

★ A "Street Name" rider may be used to enhance Road Closure signing; or provide a project specific design; or, as shown in the traffic control plan.



##x18 Rider
Rider width to be determined by width of street name.

48 x 60 (nom.)
Project Specific Design

48 x 60 (nom.)
Project Specific Design

- Use a minimum of two Type III barricades for a road closure. For roads ≥ 36' wide between curbs or edge of pavement, use a minimum of three Type III barricades for the closure point.
- For full road closures, the C or LR barricade may be used.
- Place additional signing as directed.
- To determine sign spacing A, B, & C, use the "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. TM800.

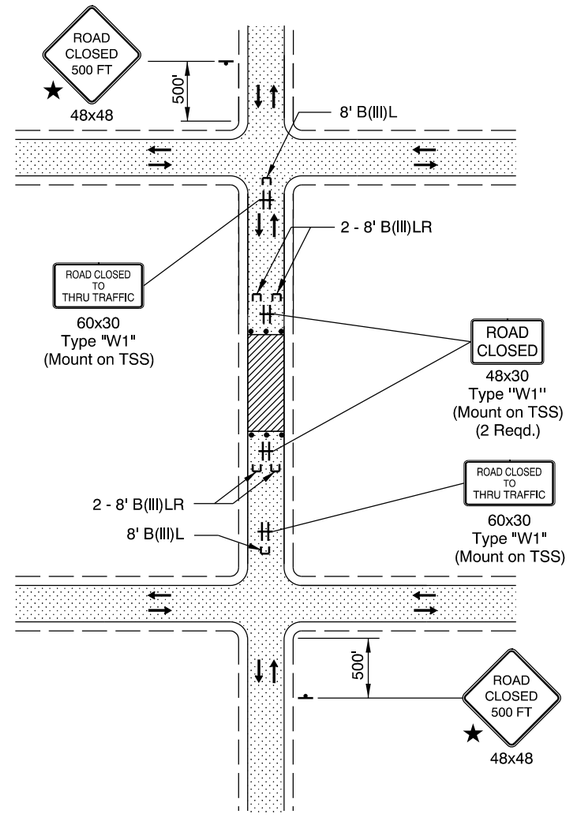
• • • • • 28" Tubular Markers
See TCD Spacing Table on TM800 for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

To be accompanied by Drg. Nos. TM820 & TM821

NOTE:
If accesses exist between intersection and point of closure, install "ROAD CLOSED TO THRU TRAFFIC" sign as shown.



TYPICAL ROAD CLOSURE

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

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OREGON STANDARD DRAWINGS

CLOSURE DETAILS

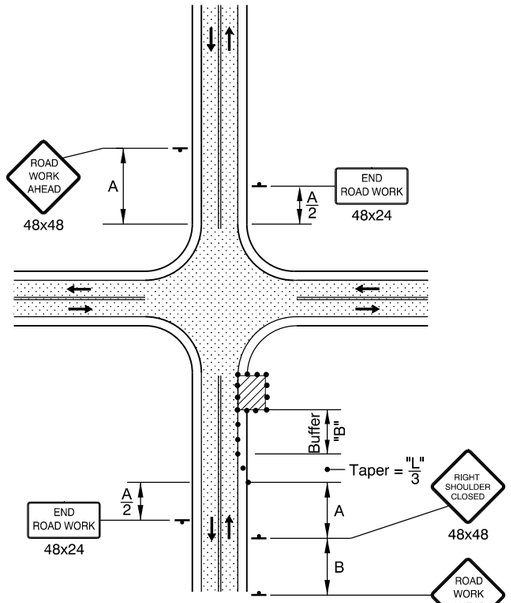
2015

DATE	REVISION DESCRIPTION

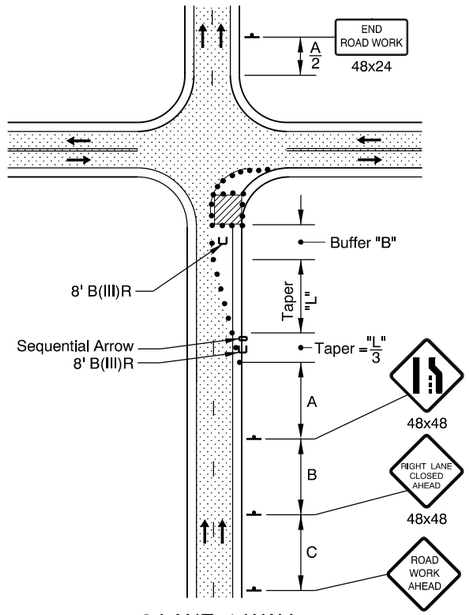
tm840.dgn 01-JUL-2014

TM840

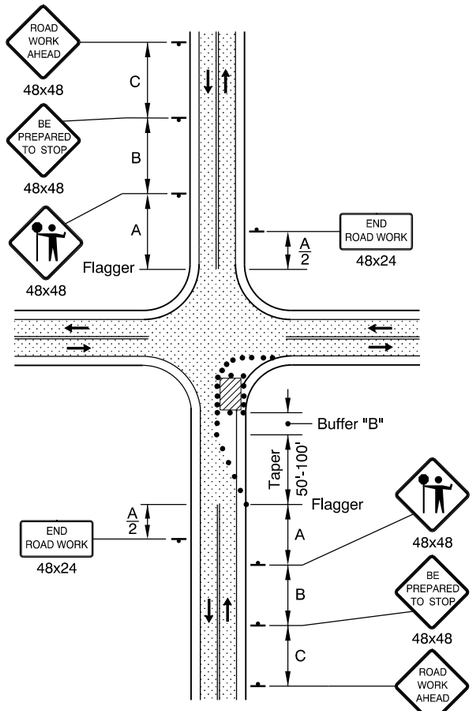
tm841.dgn 01-JUL-2014



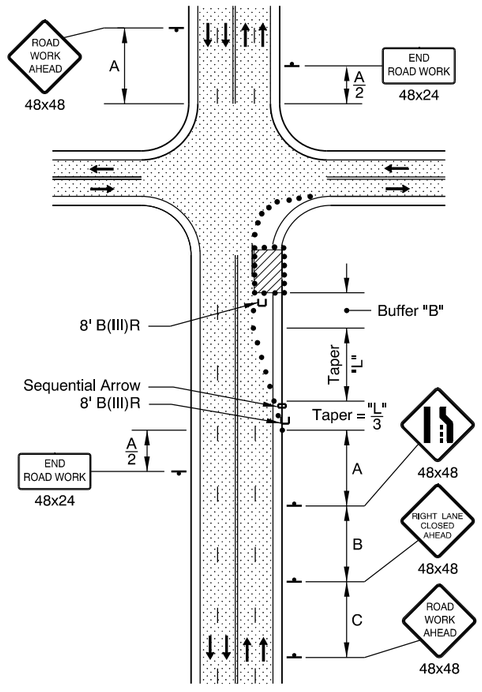
2-LANE, 2-WAY
SHOULDER CLOSURE



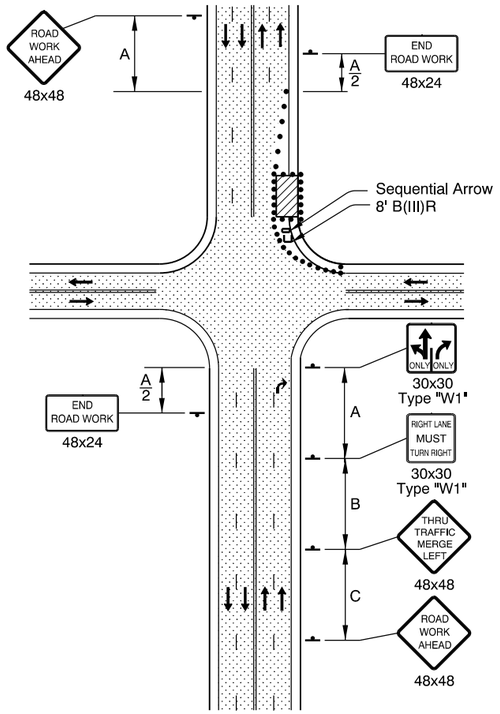
2-LANE, 1-WAY
RIGHT LANE CLOSURE



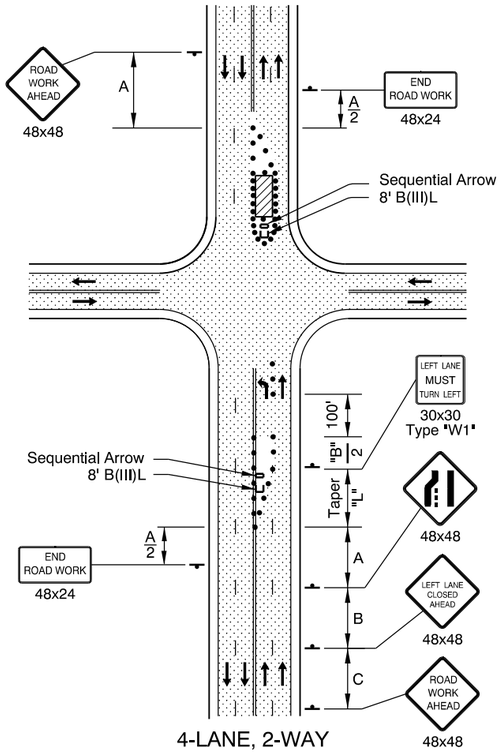
2-LANE, 2-WAY
ONE LANE CLOSURE



4-LANE, 2-WAY
RIGHT LANE CLOSURE, NEAR SIDE



4-LANE, 2-WAY
RIGHT LANE CLOSURE, FAR SIDE



4-LANE, 2-WAY
LEFT LANE CLOSURE, FAR SIDE

GENERAL NOTES FOR ALL DETAILS:

- Additional Traffic Control Measures (TCM) may be required for all legs of the intersection.
- The "BE PREPARED TO STOP" sign shall be used only in conjunction with the FLAGGER symbol sign.
- To determine Taper Length ("L") and Buffer Length ("B"), use the "MINIMUM LENGTHS TABLE" on Drg. TM800.
- For left lane or shoulder work, place TCD to close left lane or shoulder. Use "LEFT LANE CLOSED AHEAD" sign, "LEFT LANE ENDS" (W4-2L) symbol sign, or "LEFT SHOULDER CLOSED" sign, where applicable.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. TM800.
- When a through road intersects within the work zone, place a "ROAD WORK AHEAD" sign in advance of the intersection at sign spacing A.
- Use plastic drums in lane closure tapers when the posted speed is 45 mph or greater.
- Where shoulder width is limited, Sequential Arrow may be placed within the lane closure taper.
- Place channelizing devices around intersection radii and construction areas at 10' spacing.

• • • • 28" Tubular Markers
See TCD Spacing Table on TM800 for max. spacings.

• • • 28" Tubular Markers
See TCD Spacing Table on TM800 for max. spacings.

UNDER TRAFFIC

UNDER CONSTRUCTION

To be accompanied by Drg. Nos. TM820, TM821 & TM840

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

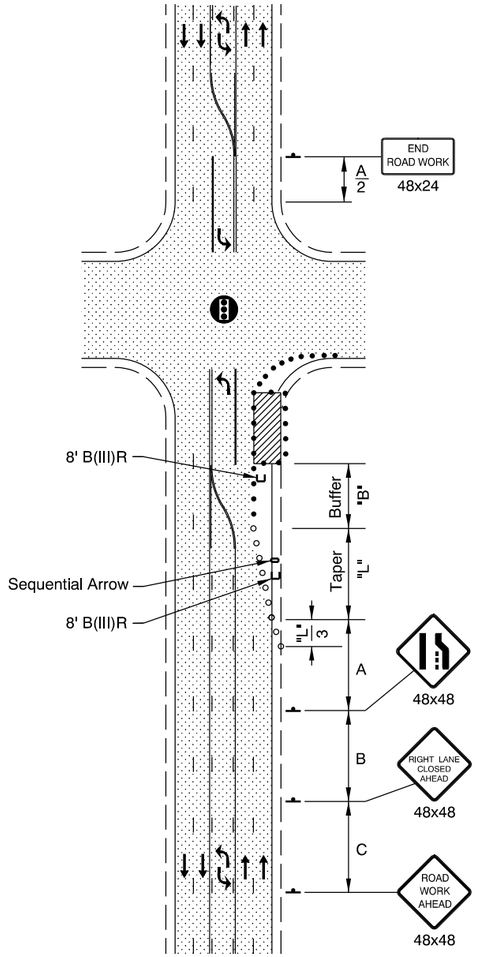
INTERSECTION WORK ZONE DETAILS

2015

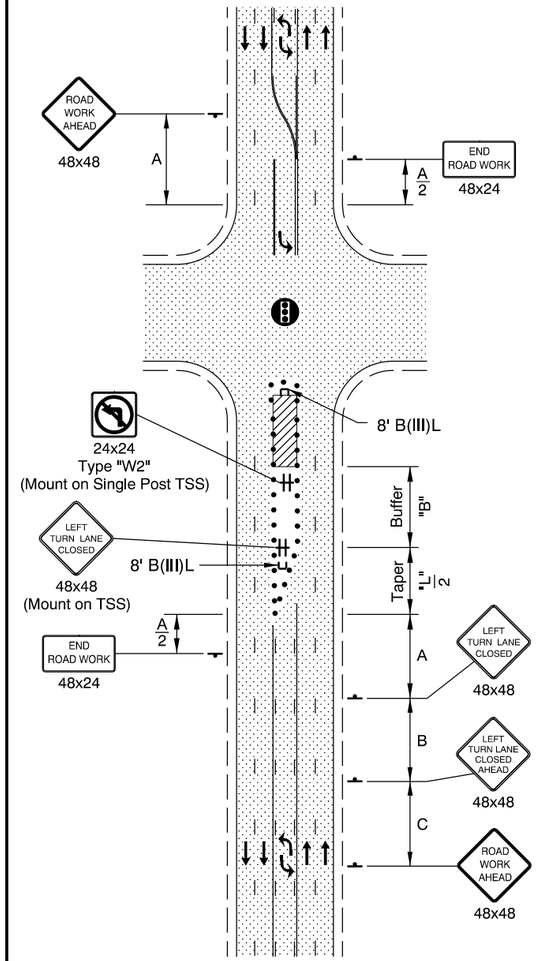
DATE	REVISION DESCRIPTION

Effective Date: February 1, 2015 - May 31, 2015

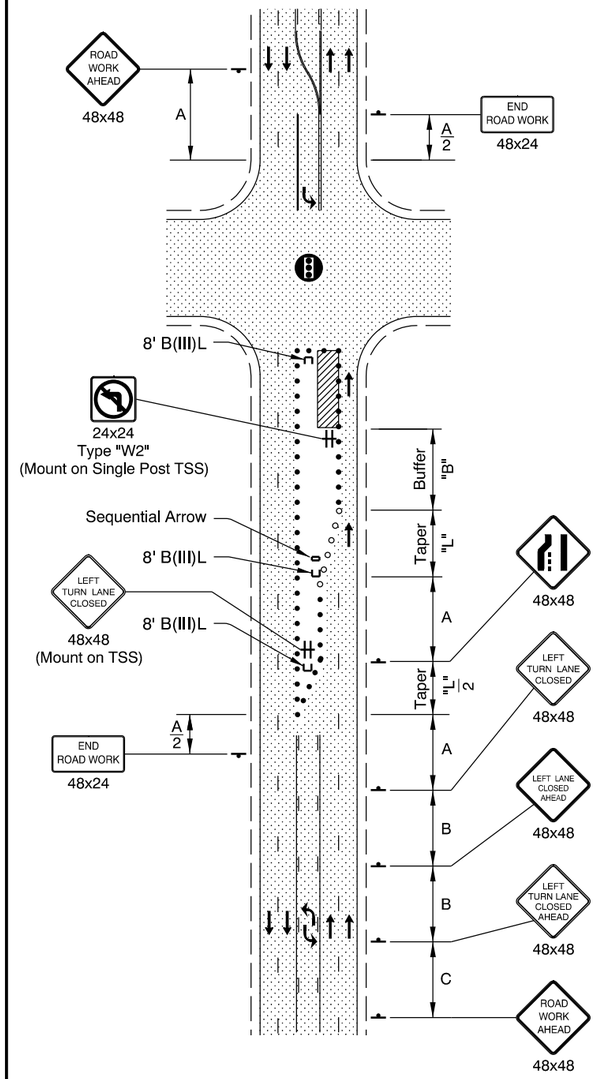
tm843.dgn 01-JUL-2014



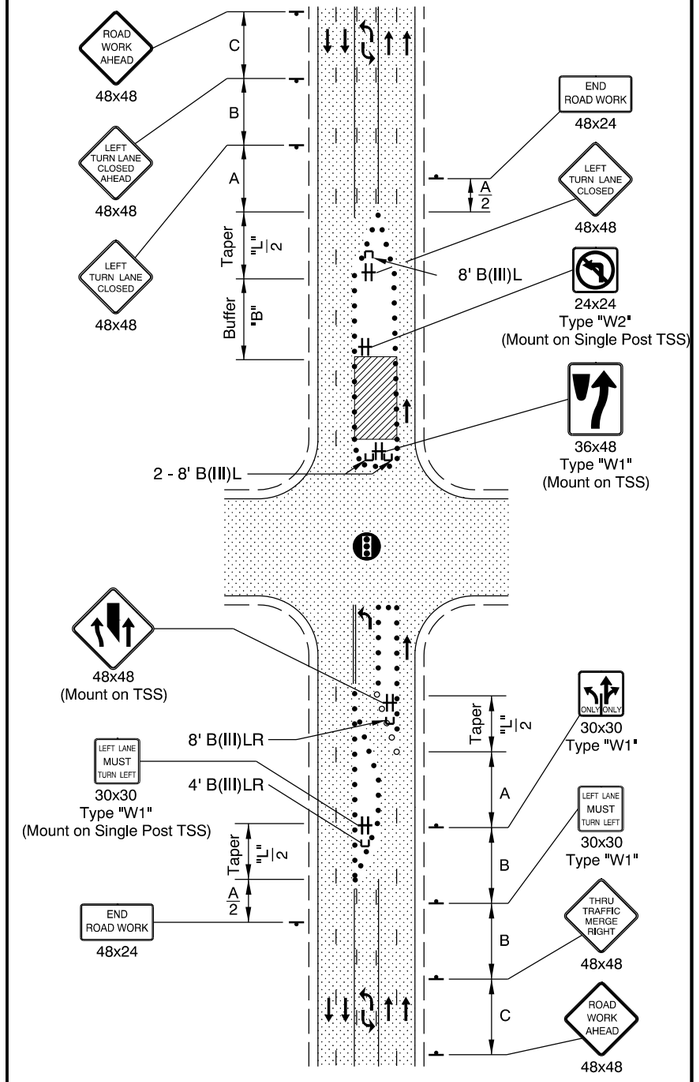
4-LANE, 2-WAY ROADWAY WITH LEFT TURN MEDIAN
RIGHT LANE CLOSURE



4-LANE, 2-WAY ROADWAY WITH LEFT TURN MEDIAN
LEFT TURN MEDIAN CLOSURE



4-LANE, 2-WAY ROADWAY WITH LEFT TURN MEDIAN
LEFT TURN MEDIAN AND LEFT LANE CLOSURE



4-LANE, 2-WAY ROADWAY WITH LEFT TURN MEDIAN
LEFT TURN MEDIAN & LEFT LANE CLOSURE, FAR SIDE

GENERAL NOTES FOR ALL DETAILS:

- Additional Traffic Control Measures (TCM) may be required for all legs of the intersection.
- To determine Taper Length ("L") and Buffer Length ("B") shown on this sheet, use the "MIMIMUM LENGTHS TABLE" on Drg. TM800.
- When a through road intersects within the work zone, place a "ROAD WORK AHEAD" sign in advance of the intersection at sign spacing A.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. TM800.
- Tubular markers may be used in lane closure tapers where the posted speed is less than 45 mph.
- Taper Length of "L" for the through-lane shift tapers may be used for higher speed roads.
- Taper Length of "**l**"/2 for center turn lane closure may be used in areas with high number of accesses within the work zone.
- Place channelizing devices around intersection radii and construction accesses at 10' spacing.

Signal

• • • • • 28" Tubular Markers
See TCD Spacing Table on TM800 for max. spacing.

○ ○ ○ ○ ○ Temp. Plastic Drums
See TCD Spacing Table on TM800 for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

To be accompanied by Drg. Nos. TM820 & TM821

CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

MULTI-LANE SIGNALIZED INTERSECTION DETAILS

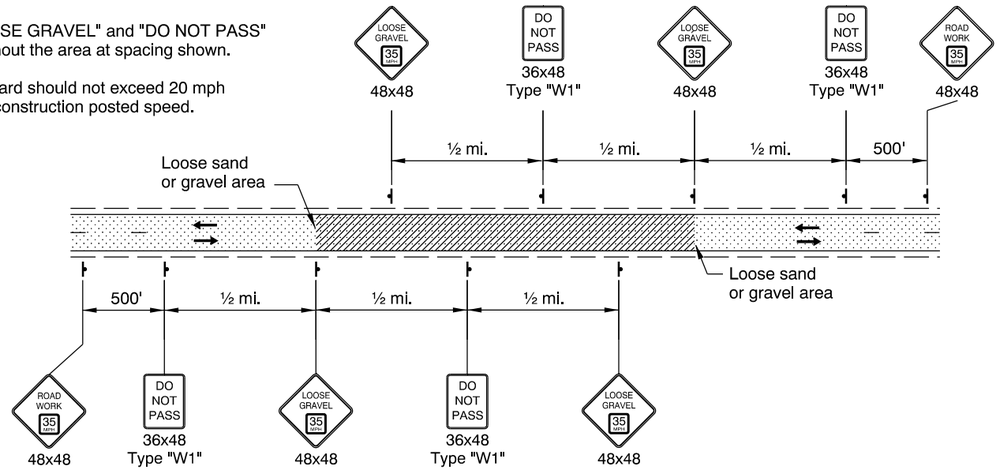
2015

DATE	REVISION DESCRIPTION

TM843

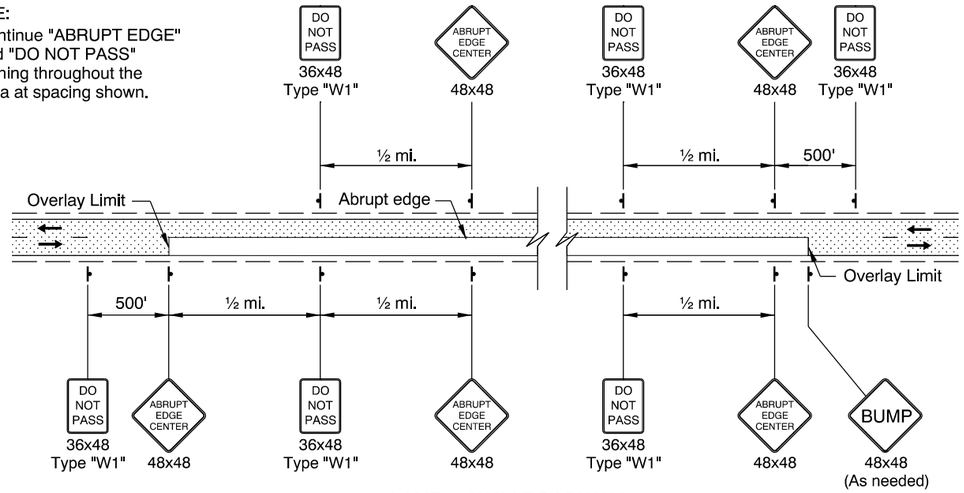
Effective Date: February 1, 2015 - May 31, 2015

NOTE:
- Continue "LOOSE GRAVEL" and "DO NOT PASS" signing throughout the area at spacing shown.
- "XX MPH" placard should not exceed 20 mph below the pre-construction posted speed.



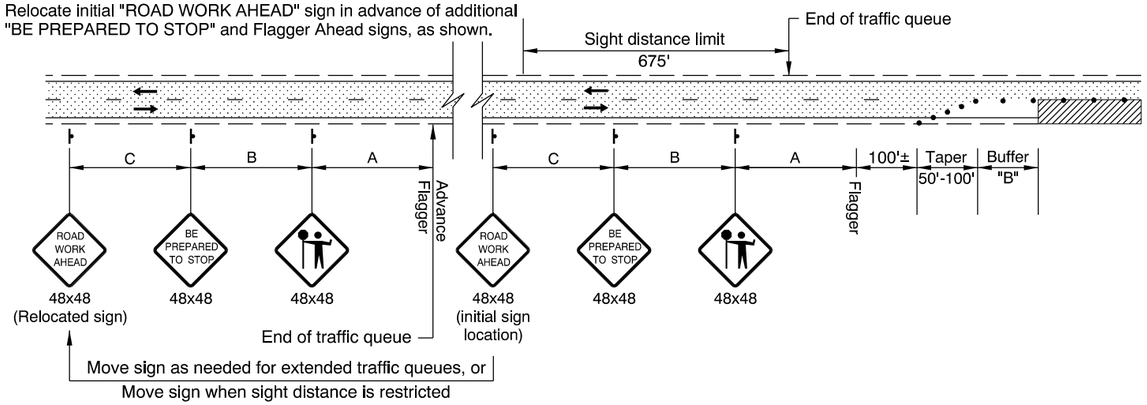
2-LANE, 2-WAY ROADWAY
LOOSE GRAVEL IN ROADWAY SIGNING

NOTE:
- Continue "ABRUPT EDGE" and "DO NOT PASS" signing throughout the area at spacing shown.



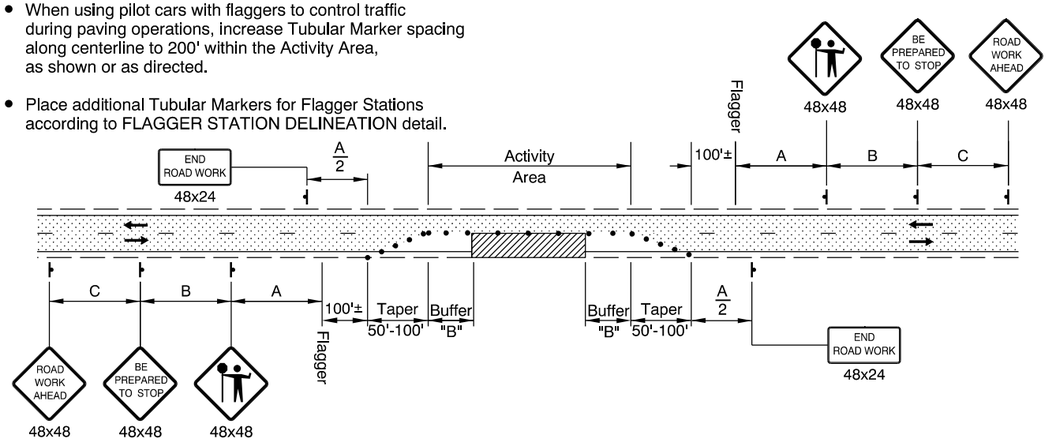
2-LANE, 2-WAY ROADWAY
OVERLAY AREA SIGNING

NOTES:
- Place Advance Flagger and additional signing when traffic queues extend beyond initial warning signing OR when sight distance is restricted.
- Relocate initial "ROAD WORK AHEAD" sign in advance of additional "BE PREPARED TO STOP" and Flagger Ahead signs, as shown.



ADVANCE FLAGGER FOR EXTENDED TRAFFIC QUEUES

NOTE:
- When using pilot cars with flaggers to control traffic during paving operations, increase Tubular Marker spacing along centerline to 200' within the Activity Area, as shown or as directed.
- Place additional Tubular Markers for Flagger Stations according to FLAGGER STATION DELINEATION detail.



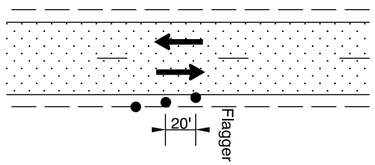
2-LANE, 2-WAY ROADWAY
ONE LANE CLOSURE

GENERAL NOTES FOR ALL DETAILS:
- The "FLAGGER" symbol sign shall be used only in conjunction with the "BE PREPARED TO STOP" sign.
- Cover existing passing zone signing, as directed.
- Install temporary striping as required.
- To determine Taper Length ("L") and Buffer Length ("B"), use the "MINIMUM LENGTHS TABLE" shown on Drg. No. TM800.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. No. TM800.

- • • • • 28" Tubular Markers on 20' max. spacing for flagger tapers and stations
- • • 28" Tubular Markers See TCD Spacing Table on TM800 for max. spacing.
- UNDER TRAFFIC
- UNDER CONSTRUCTION
- CONSTRUCTION UNDER TRAFFIC

To be accompanied by Drg. Nos. TM821

NOTE:
- Use a min. of 3 Tubular Markers to delineate each Flagger Station.



FLAGGER STATION DELINEATION

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CALC. BOOK NO. N/A

BASELINE REPORT DATE 01-JUL-2014

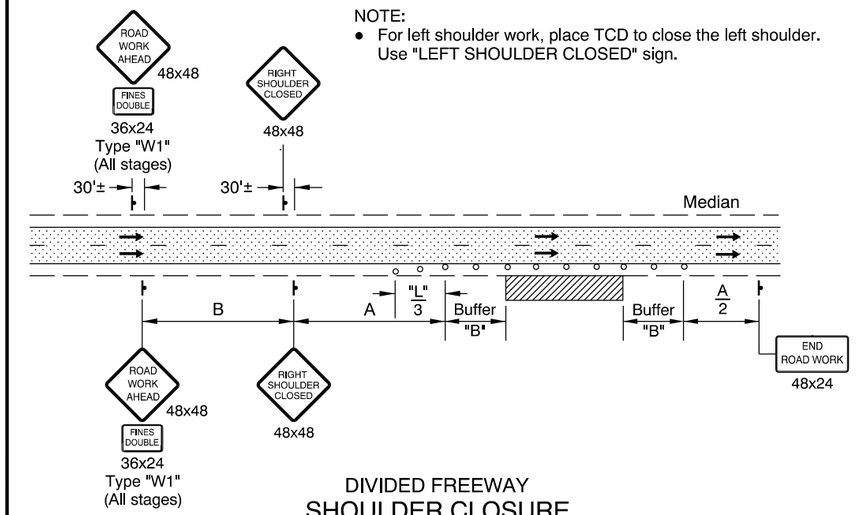
NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

2-LANE, 2-WAY ROADWAYS

2015

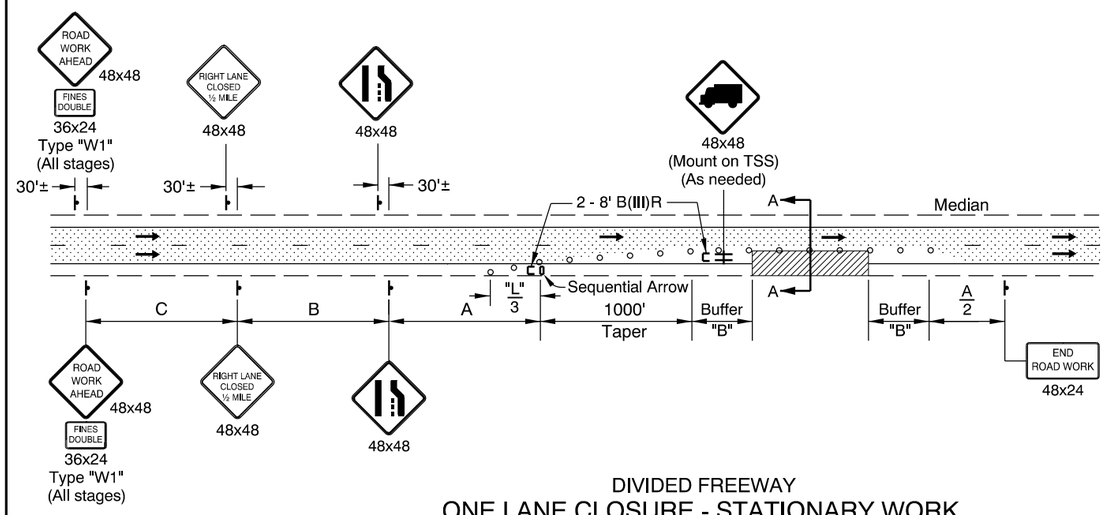
DATE	REVISION DESCRIPTION



NOTE:

- For left shoulder work, place TCD to close the left shoulder. Use "LEFT SHOULDER CLOSED" sign.

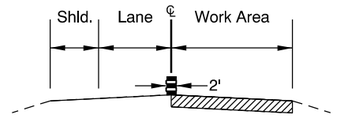
DIVIDED FREEWAY
SHOULDER CLOSURE



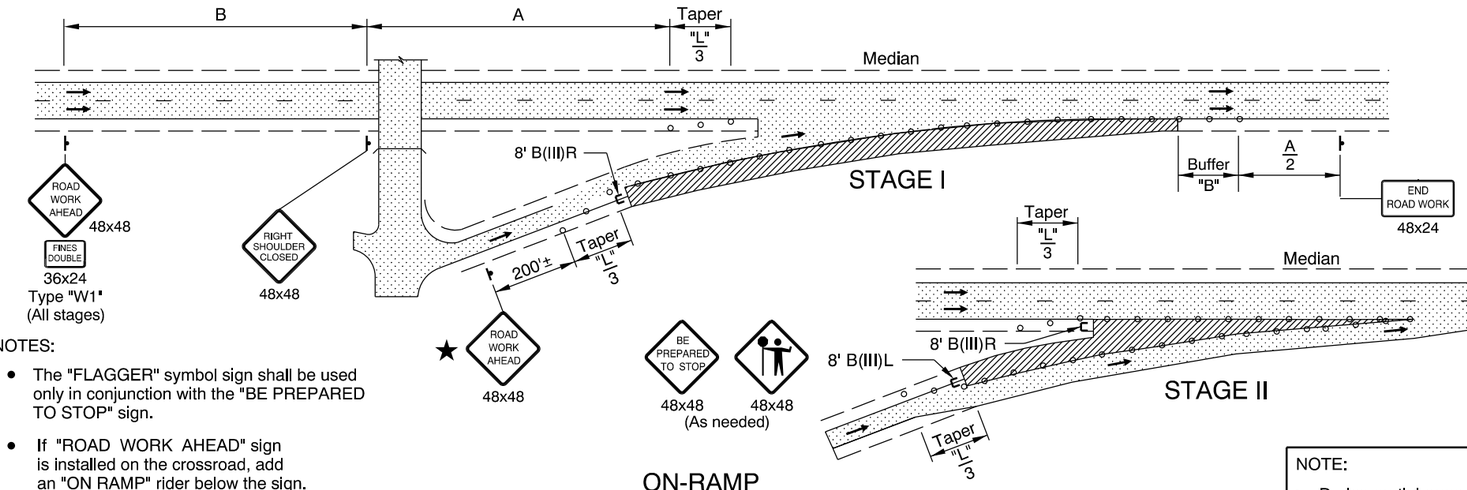
NOTES:

- Additional traffic control devices may be used to enhance the work zone, including
  - Portable Changeable Message Signs
  - Radar Speed Trailers
  - Advisory Speed signing
  - *Temp. Regulatory Speed Zone Reductions

  *Regulatory speed reductions on State Highways require a Speed Zone Order signed by the State Traffic Engineer.
- For left lane work, place TCD to close the left lane. Use "LEFT LANE CLOSED ½ MILE" and appropriate "LEFT LANE ENDS" signs.



DIVIDED FREEWAY
ONE LANE CLOSURE - STATIONARY WORK



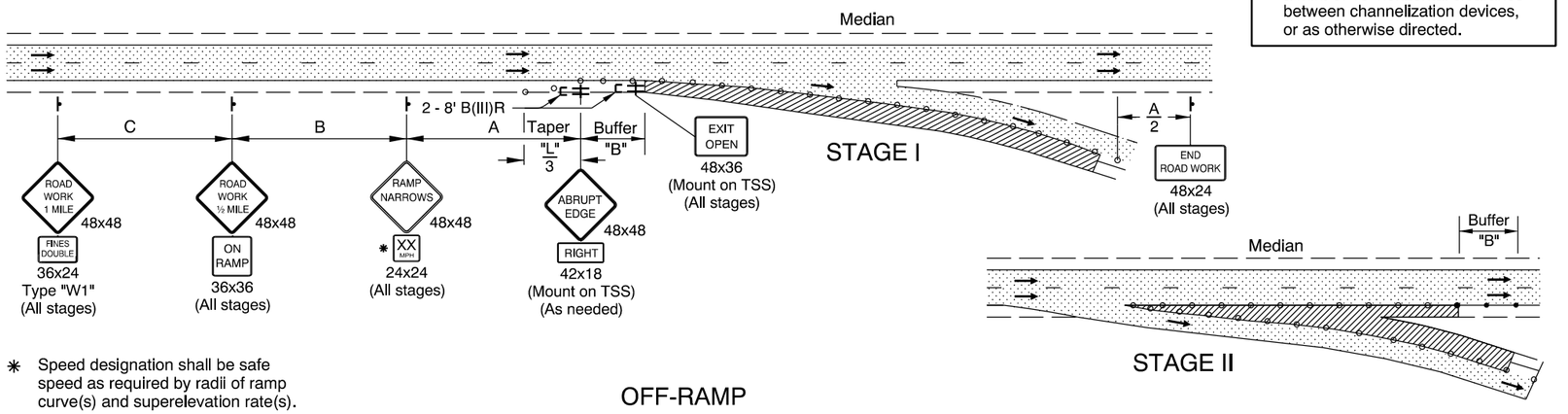
NOTES:

- The "FLAGGER" symbol sign shall be used only in conjunction with the "BE PREPARED TO STOP" sign.
- If "ROAD WORK AHEAD" sign is installed on the crossroad, add an "ON RAMP" rider below the sign.

ON-RAMP

NOTE:

- During partial ramp closure provide a min. of 16' horizontal clearance between channelization devices, or as otherwise directed.



✳ Speed designation shall be safe speed as required by radii of ramp curve(s) and superelevation rate(s).

OFF-RAMP

GENERAL NOTES FOR ALL DETAILS:

- Signing and other TCD shown to be installed in conjunction with the work areas, shall move with the work areas.
- Use Concrete Barrier Sign Supports for mounting signs with a maximum 9 sq. ft. of total sign area. (See Drg. No. TM821 for Concrete Barrier Sign Support Details)
- Unless otherwise shown, use the "MINIMUM LENGTHS TABLE" on Drg. No. TM800 to determine Taper Length ("L") and Buffer Length ("B").
- Flaggers are not permitted to stop or hold freeway traffic.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. No. TM800.
- Speeds shown on signing shall be in MPH. Distances shown on signing shall be in feet or miles.
- Truck mounted attenuator (TMA) should be used to protect the active work area. Locate TMA as per manufacturer's instructions, or as directed.

○ ○ ○ Temporary Plastic Drums See TCD Spacing Table on TM800 for max. spacing.

▮ Temporary Plastic Drums

UNDER TRAFFIC

UNDER CONSTRUCTION

To be accompanied by Drg. Nos. TM820 & TM821

CALC. BOOK NO. TM09-01	BASELINE REPORT DATE 01-JUL-2014

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NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

FREEWAY SECTIONS

2015

DATE	REVISION DESCRIPTION