



**TM400 Series: Signals**

- TM450 – Mast Arm Pole Details
- TM452 – Temporary Wood Strain Pole Details
- TM453 – Temporary Pedestrian Wood Post, Guy Wire/Anchor, & Luminaire Arm Details
- TM454 – Temporary Controller Cabinet, Service Cabinet, Meter Base, & Terminal Cabinet
- TM456 – Temporary Spanwire Mounting Details For Vehicle Signals, Signs & Fire Preemption
- TM457 – Pedestal Foundation and Traffic Signal Assembly
- TM460 – Vehicle Signal Details
- TM462 – Vehicle Signal Bracket & Sign Bracket (Type B) Details
- TM466 – Radar Mounting Details
- TM467 – Pedestrian Signal Mount and Pedestrian Pushbutton Details
- TM470 – Wire & Cable Installation
- TM471 – Trenching & Conduit Installation
- TM472 – Junction Boxes/Hand Holes
- TM482 – Controller Cabinet & Service Cabinet Foundation Details
- TM485 – Service Cabinet Wiring Details
- TM492 – Ramp Meter Assemblies
- TM493 – Rectangular Rapid Flashing Beacon (RRFB) Assemblies

**TM600 Series: Sign, Illumination, and Signal Support Structures**

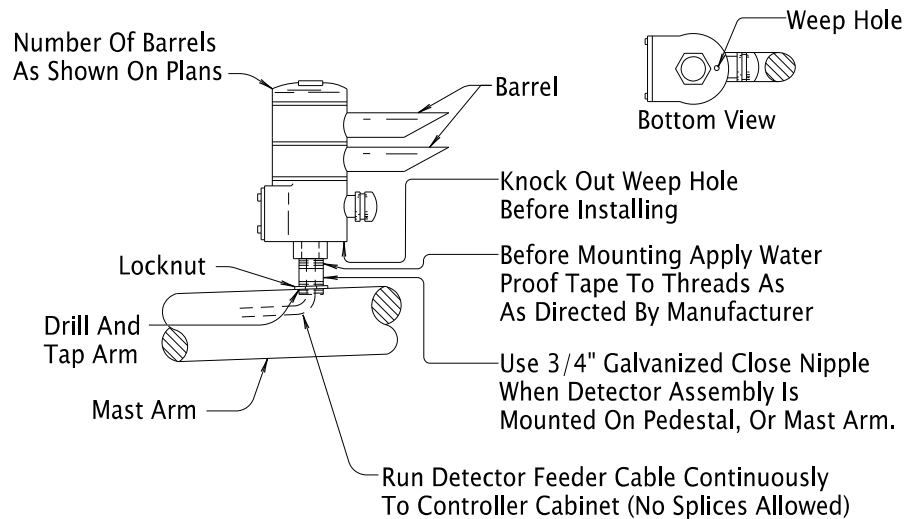
- TM650 – Traffic Signal Supports General Details & Design Criteria
- TM651 – Traffic Signal Supports Notes and Reactions
- TM652 – Traffic Signal Supports Steel Details
- TM653 – Traffic Signal Supports Foundation Requirements
- TM654 – Traffic Signal Pole Recessed Terminal Cabinet
- TM655 – Traffic Signal 60’ through 75’ Mast Arm Supports General Details & Design Criteria
- TM656 - Traffic Signal 60’ through 75’ Mast Arm Supports Notes
- TM657 – Traffic Signal 60’ through 75’ Mast Arm Supports Steel Details (SH. 1)
- TM658 - Traffic Signal 60’ through 75’ Mast Arm Supports Steel Details (SH. 2)
- TM628 – Std. Monotube Sign/VMS Support Drilled Shaft Details (only used for 60’ through 70’ mast arms supports)

**RD700 Series: Curbs, Islands, Sidewalks, and Driveways**

- RD720 – Curb Line Sidewalks

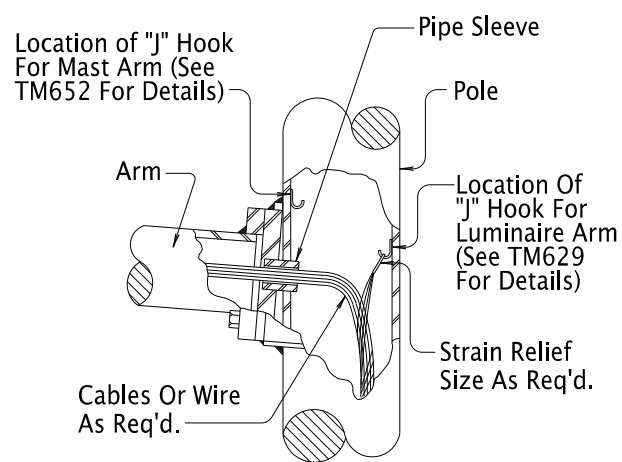
12-JUL-2024

TM450.dgn



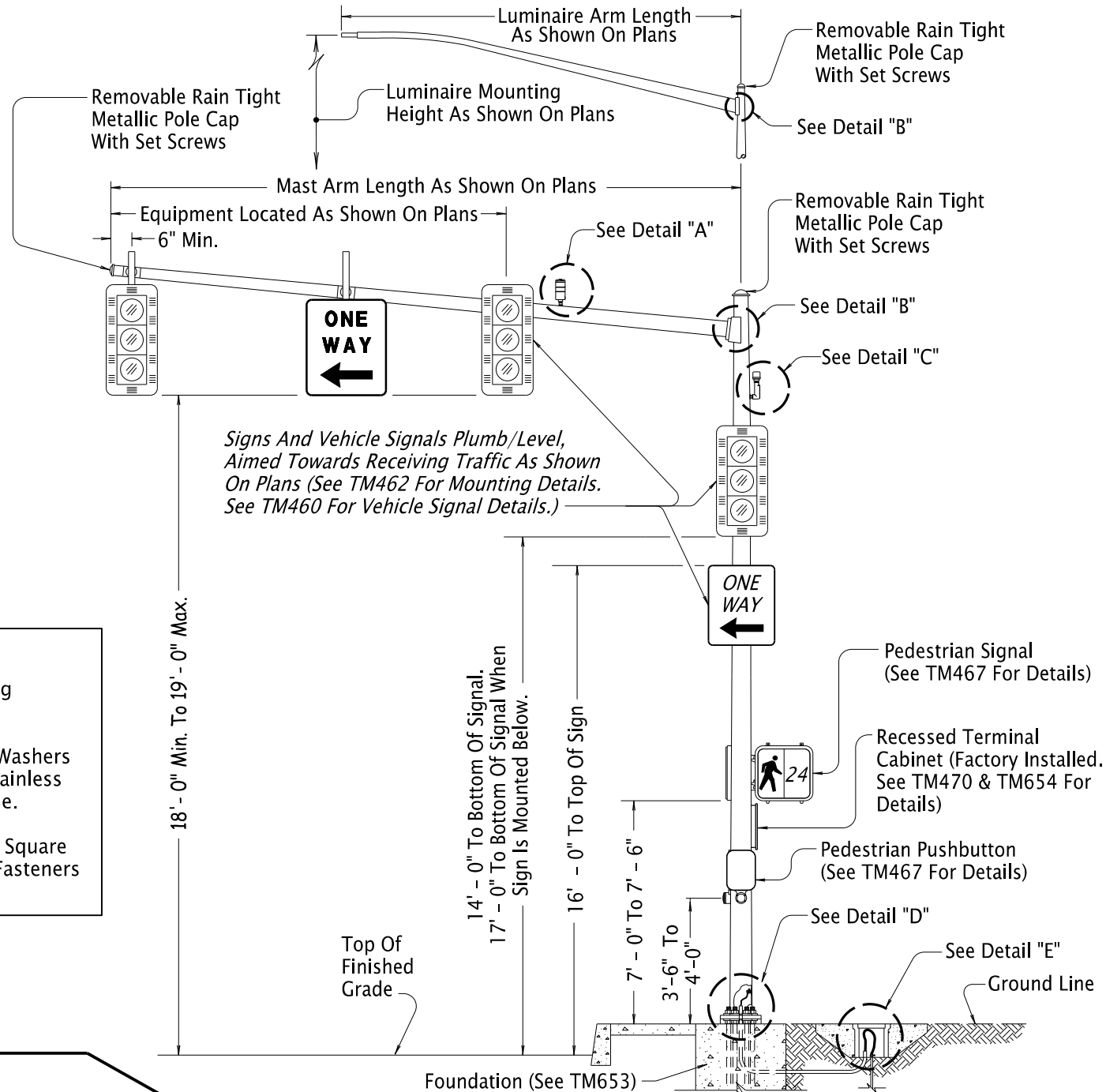
### DETAIL "A" FIRE PREEMPTION INSTALLATION

Emitter Units For Vehicles Provided By Others

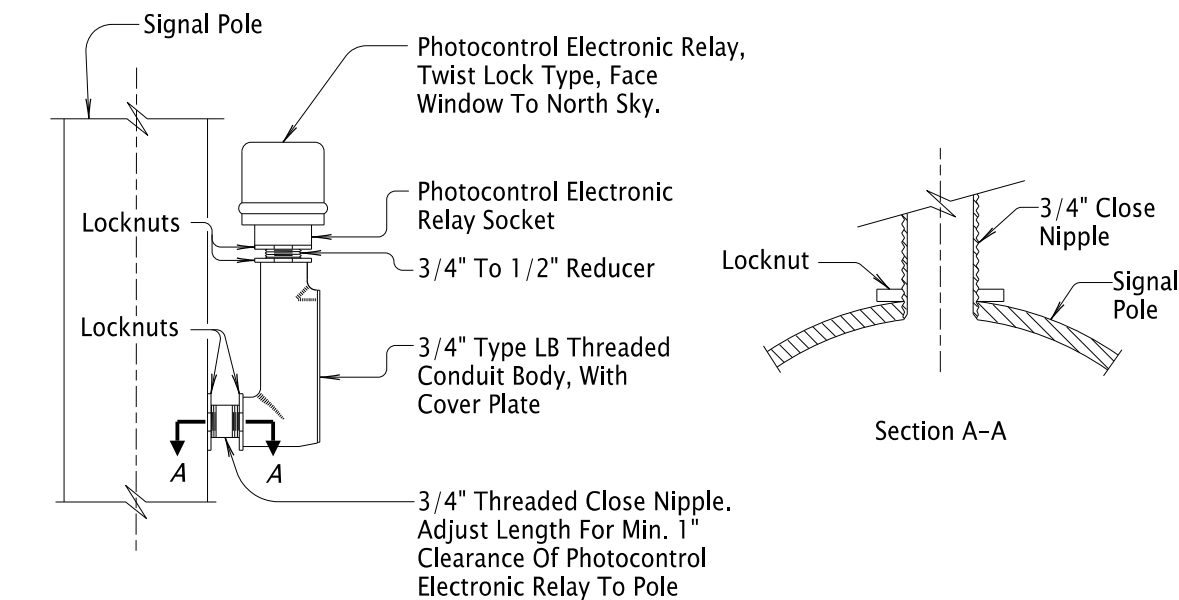


### DETAIL "B" ARM CONNECTION

Preinstalled "J" Hooks In Poles For Strain Relief (Cable Grips) At All Access Entrances For Luminaire & Mast Arms



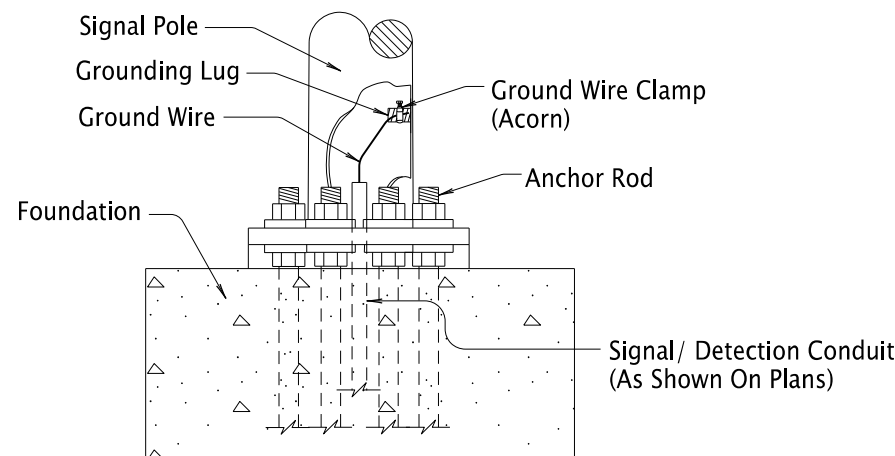
### MAST ARM POLE



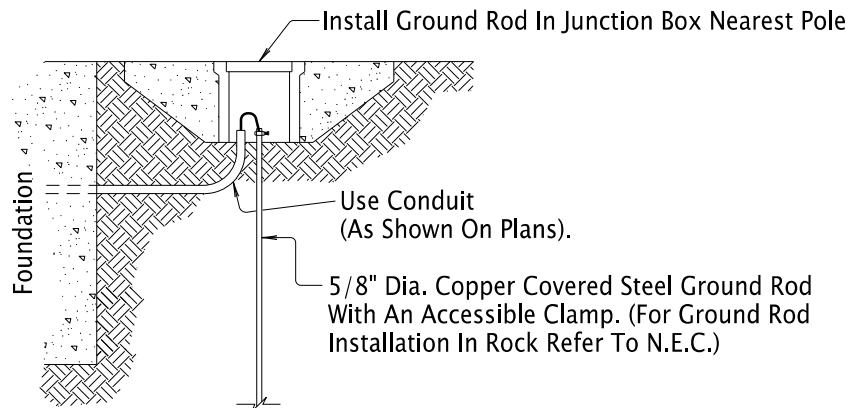
### DETAIL "C" PHOTOCONTROL ELECTRONIC RELAY INSTALLATION

#### General Notes:

1. All Pole Entrances Containing Wiring Shall Be Smooth.
2. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
3. Bolts And Screws Shall Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.



### DETAIL "D" INTERIOR GROUND INSTALLATION



### DETAIL "E" GROUND ROD INSTALLATION

Not Applicable For Structure Mounted Poles. See Specifications.

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All materials shall be in accordance with the current Oregon Standard Specifications.

#### OREGON STANDARD DRAWINGS

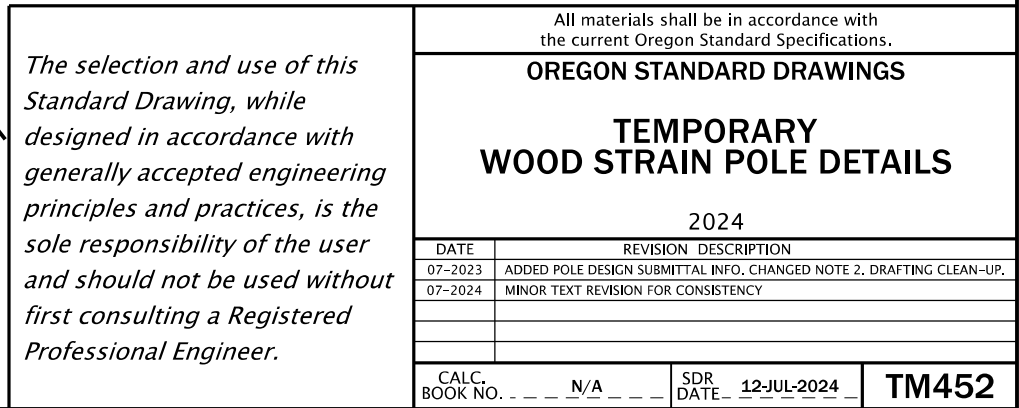
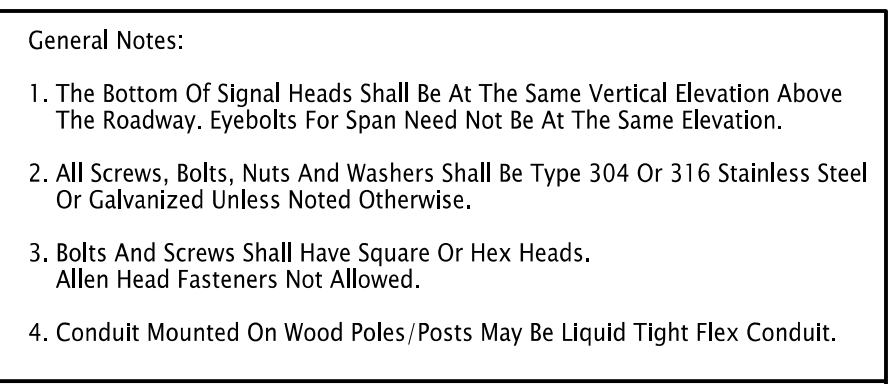
#### MAST ARM POLE DETAILS

2024

DATE	REVISION	DESCRIPTION
01-2021	CORRECTED STD. DWG. REFERENCE	
07-2023	ADDED STD. DWG. REFERENCE	
01-2024	MINOR TEXT REVISION FOR CONSISTENCY	
07-2024	MINOR TEXT/ILLUSTRATION REVISIONS FOR CONSISTENCY & CLARITY	

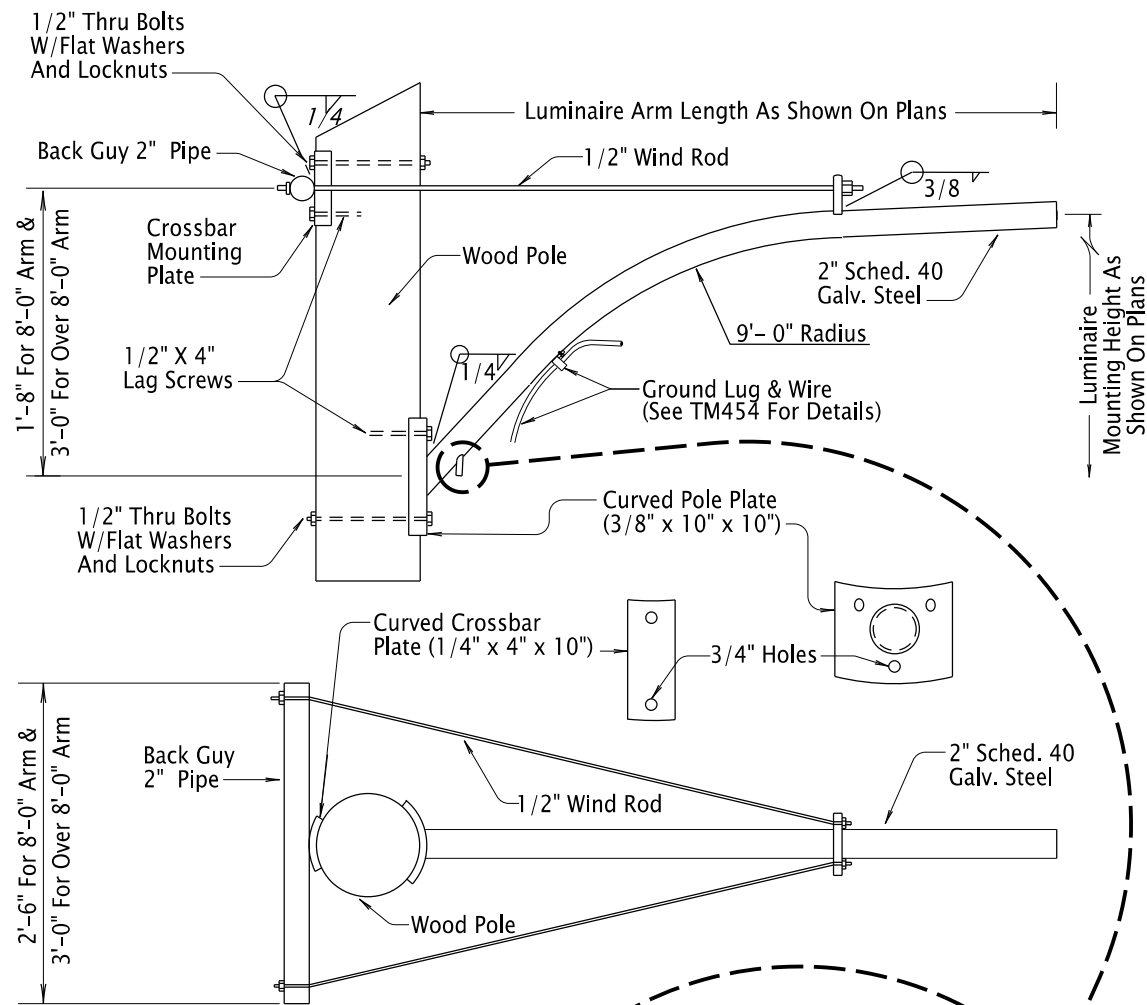
CALC. BOOK NO.	N/A	SDR DATE	12-JUL-2024	TM450
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Effective Date: December 1, 2024 – May 31, 2025



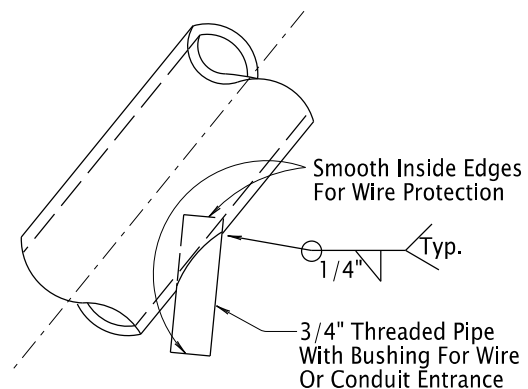


ARM LENGTH	LUM. MAX. WT.	MAX. PROJ. AREA
8'-0" thru 20'-0"	65 lbs.	2 sq. ft.

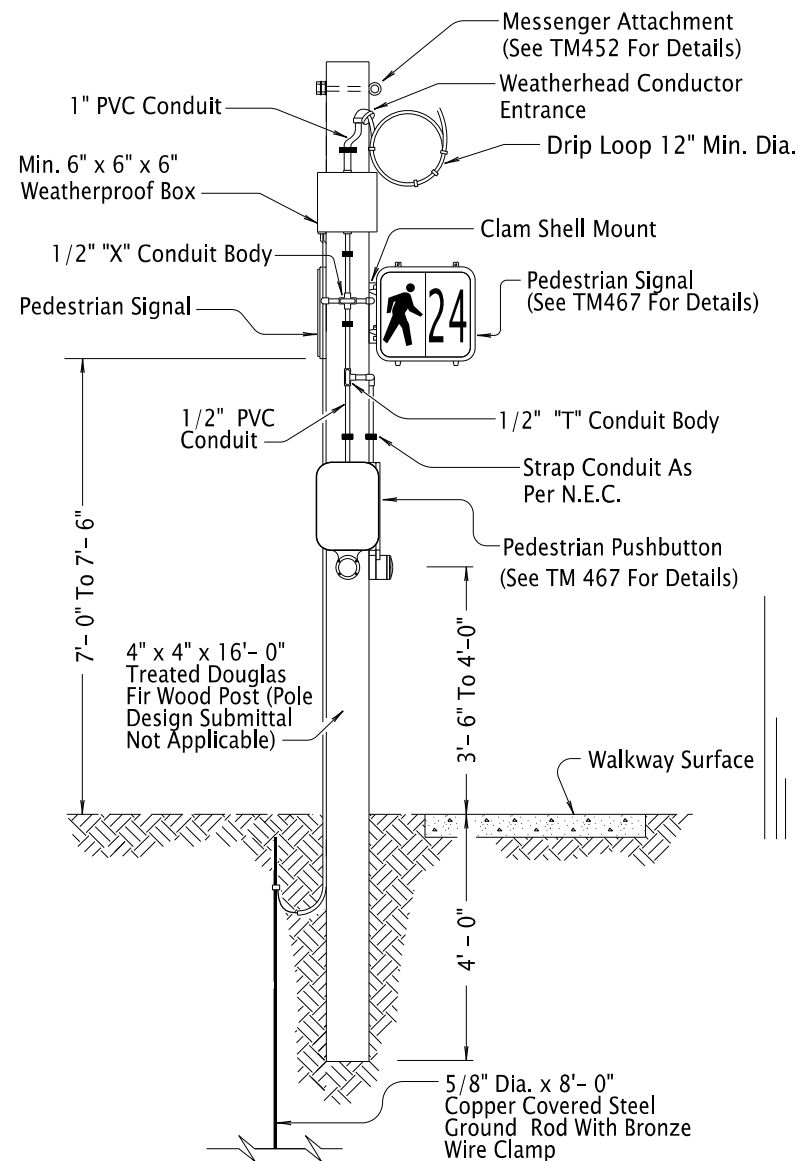


## NOTES:

1. Bolts Shall Conform To ASTM Specification A307
2. Steel Sheet And Plate Shall Be Merchant Quality
3. All Structural Steel, Including Washers And Nuts, Shall Be Hot Dip Galvanized After Fabrication

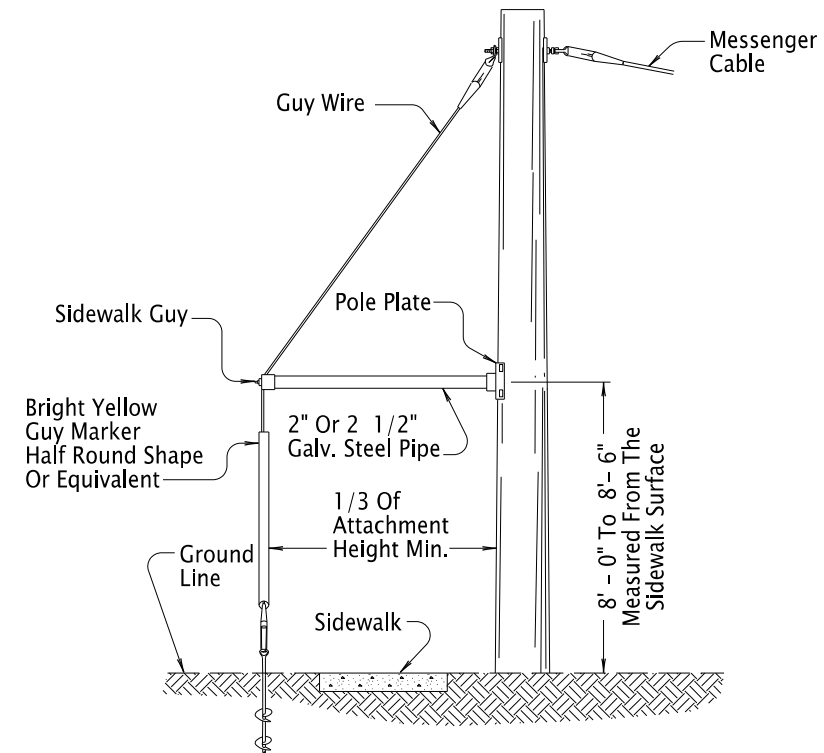


LUMINAIRE ARM INSTALLATION ON WOOD POLE

PEDESTRIAN WOOD POST INSTALLATION  
OVERHEAD CONDUCTORS

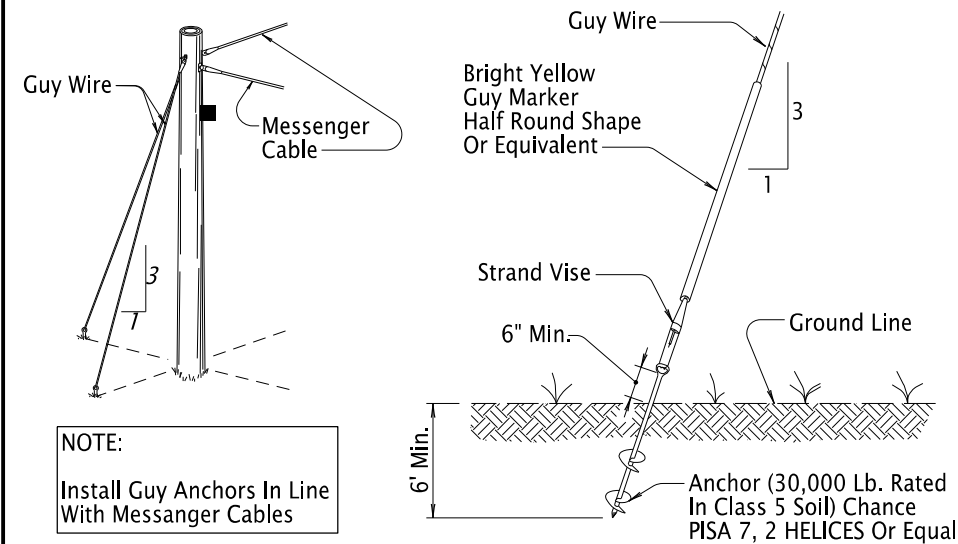
## GENERAL NOTES:

1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 or 316 Stainless Steel Or Galvanized Unless Noted Otherwise.
2. Bolts And Screws Shall Have Hex Or Square Heads. Allen Head Fasteners Not Allowed.
3. Conduit Mounted On Wood Poles/Posts May Be Liquid Tight Flex Conduit.



TYPICAL SIDEWALK GUY ANCHOR ASSEMBLY

Install As Per Approved Pole Design Submittal



TYPICAL GUY ANCHOR ASSEMBLY

Install As Per Approved Pole Design Submittal

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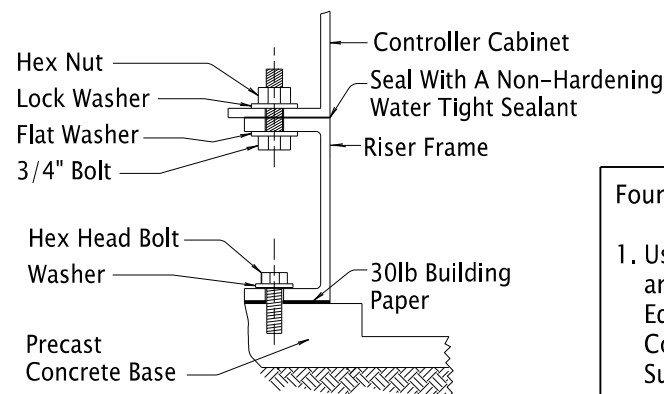
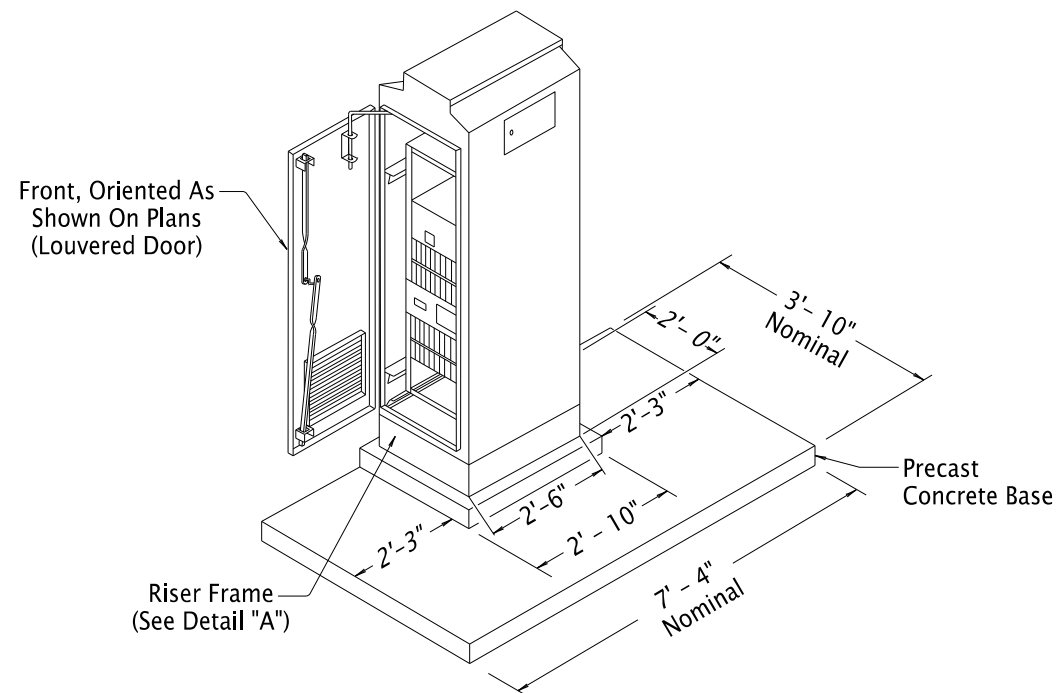
**OREGON STANDARD DRAWINGS**  
**TEMPORARY**  
**PEDESTRIAN WOOD POST,**  
**GUY WIRE/ANCHOR, &**  
**LUMINAIRE ARM DETAILS**  
 2024

DATE	REVISION	DESCRIPTION
07-2023	ADDED	POLE DESIGN SUBMITTAL INFO, ADDED POST INFO, CHANGED NOTE 1.
CALC. BOOK NO.	N/A	SDR DATE

14-JUL-2023

TM453

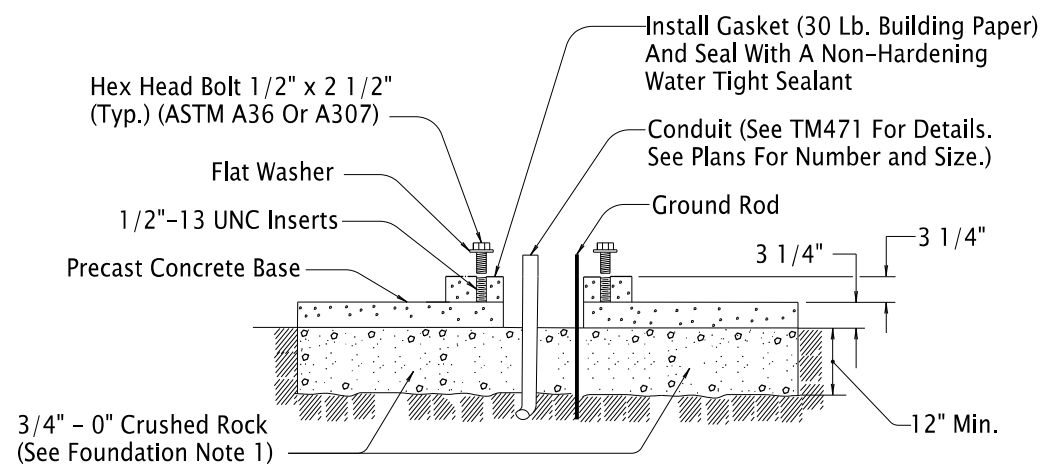
Effective Date: December 1, 2024 – May 31, 2025



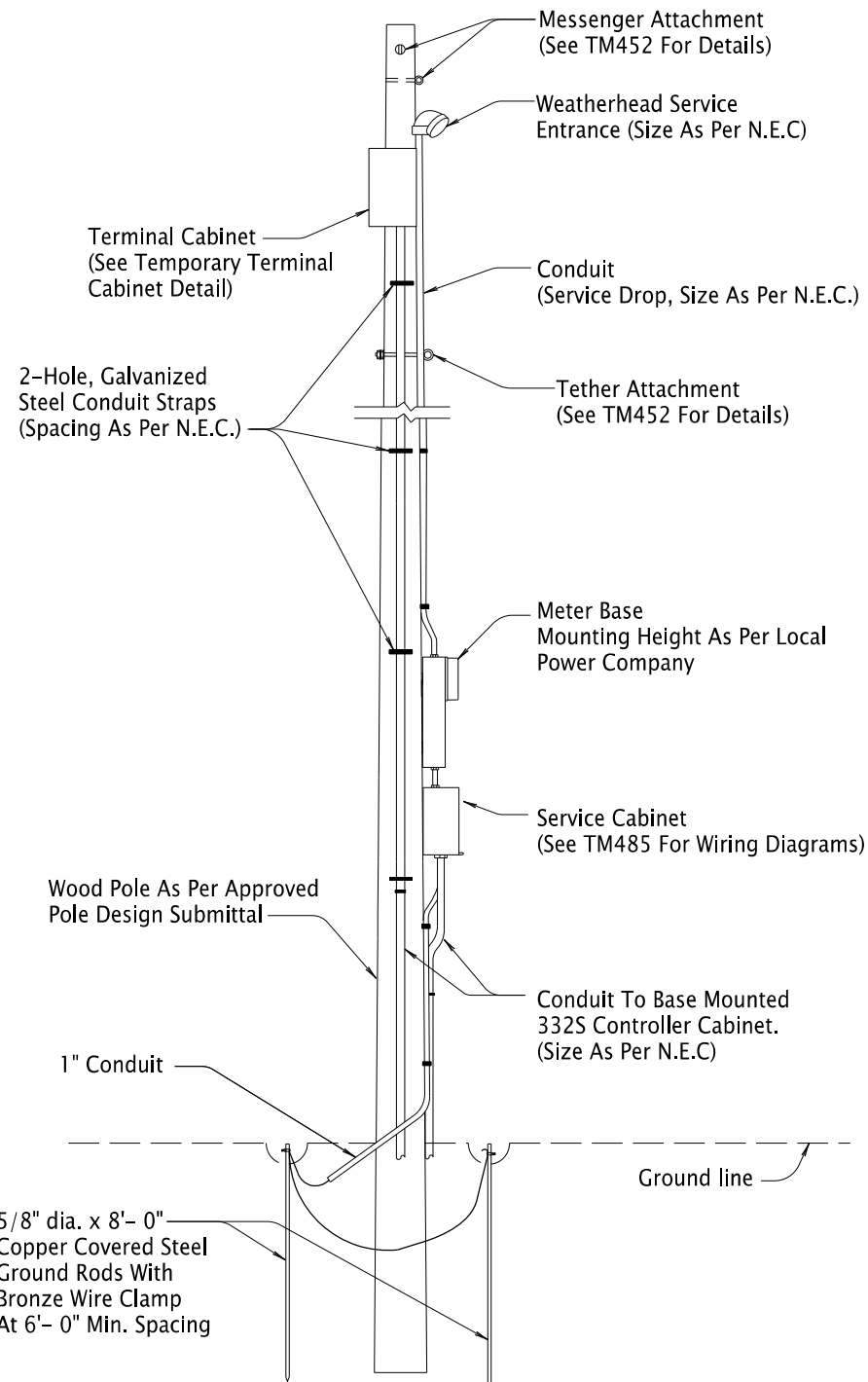
**DETAIL "A"**  
**RISER FRAME CONNECTION**

**Foundation Note:**

1. Use Materials According To 00640.10 and 00640.16. Use Compaction Equipment Suitable For Area And Compact Each Six Inch Layer With Sufficient Coverages To Produce A Firm Unyielding Surface.



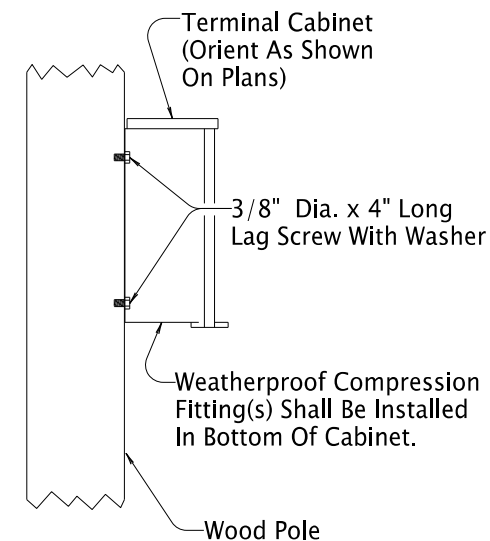
**TEMPORARY CONTROLLER CABINET FOUNDATION**  
**(Model 332, 334, And 340 Cabinets)**



**TEMPORARY SERVICE CABINET AND METER BASE**

**General Notes:**

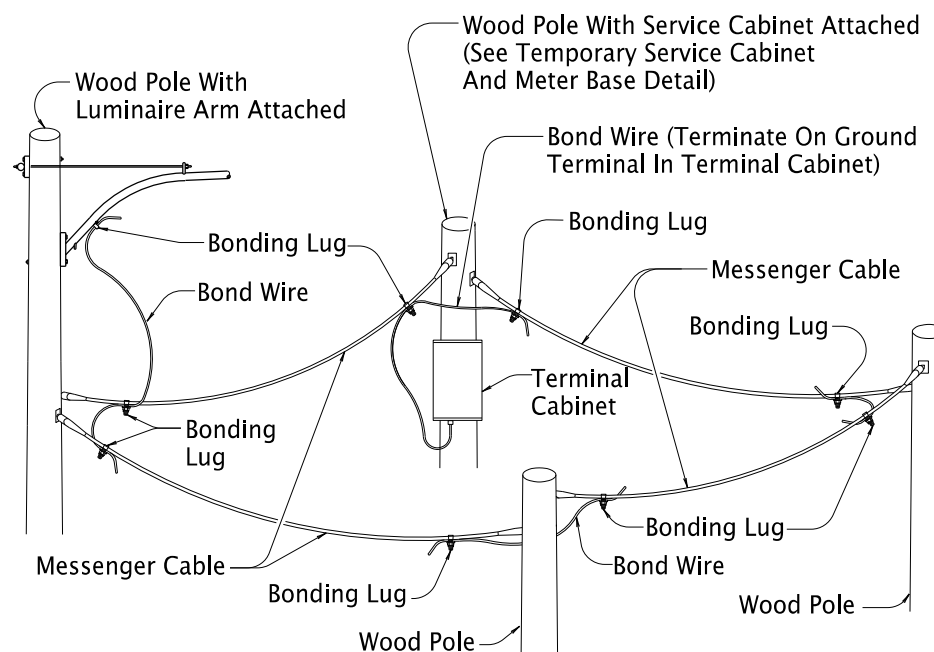
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Or Galvanized Unless Noted Otherwise.
2. Bolts And Screws Shall Have Hex Or Square Heads. Allen Head Fasteners Not Allowed.
3. Conduit Mounted On Wood Poles/Posts May Be Liquid Tight Flex Conduit.



**Terminal Cabinet General Notes:**

1. Install The Number Of Terminal Blocks Needed For The Circuits. Evenly Distribute All The Terminal Blocks Among The Mounting Brackets.
2. Terminate Only One Wire In Each Termination Point. Use Additional Terminals With A Factory Jumper Between The Terminals If Additional Taps Are Necessary.
3. Label The Marking Strip In The Terminal Cabinet With The Wire Number And/OR Letter As Coded In The Controller Cabinet Terminal Block. Use Only Mechanically Printed Labels.

**TEMPORARY TERMINAL CABINET**



**TEMPORARY GROUNDING/BONDING**

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All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**  
**TEMPORARY**  
**CONTROLLER CABINET,**  
**SERVICE CABINET, METER BASE, &**  
**TERMINAL CABINET**  
2024

DATE	REVISION	DESCRIPTION
07-2023	ADDED	POLE DESIGN SUBMITTAL INFO. DRAFTING REVISIONS. CHANGED NOTE 1.
CALC. BOOK NO.	N/A	SDR DATE: 14-JUL-2023

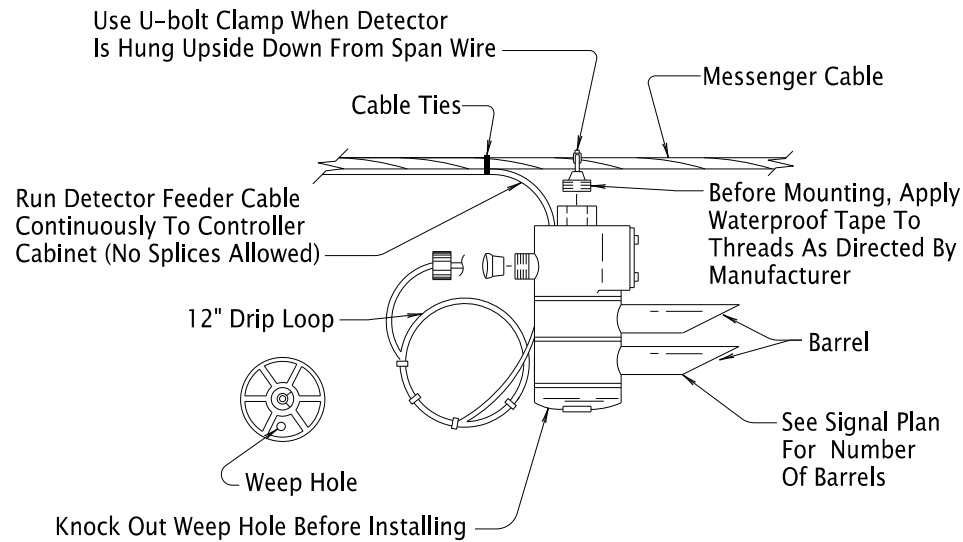
**TM454**

Effective Date: December 1, 2024 – May 31, 2025

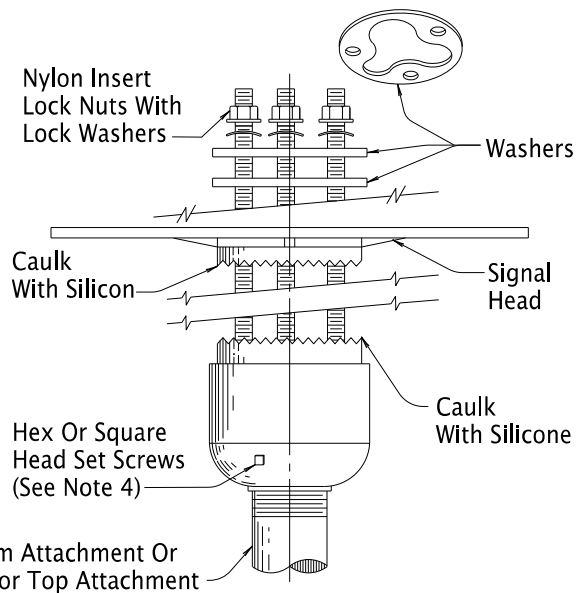


14-JUL-2023

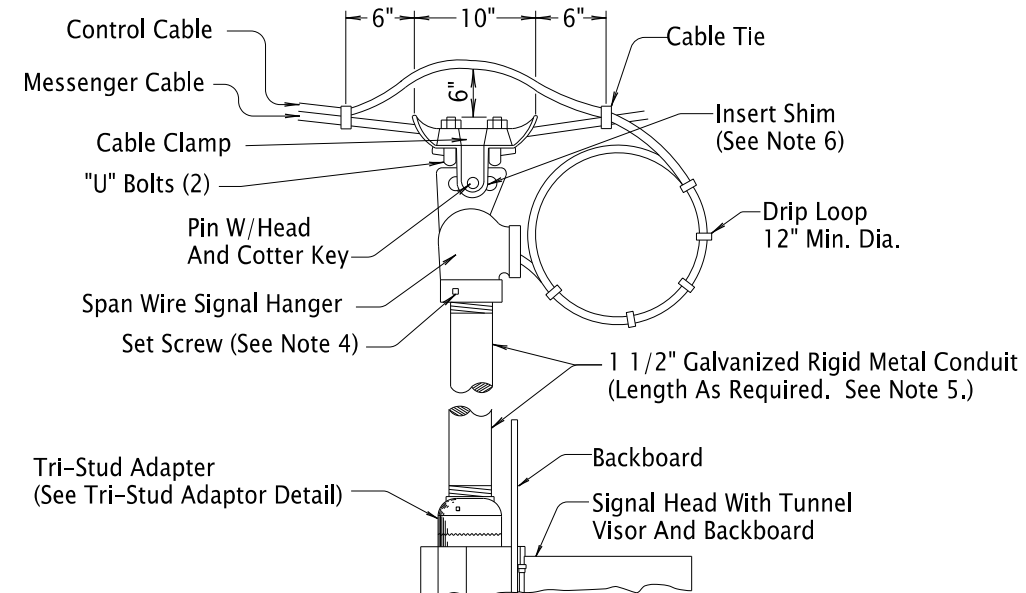
TM456.dgn



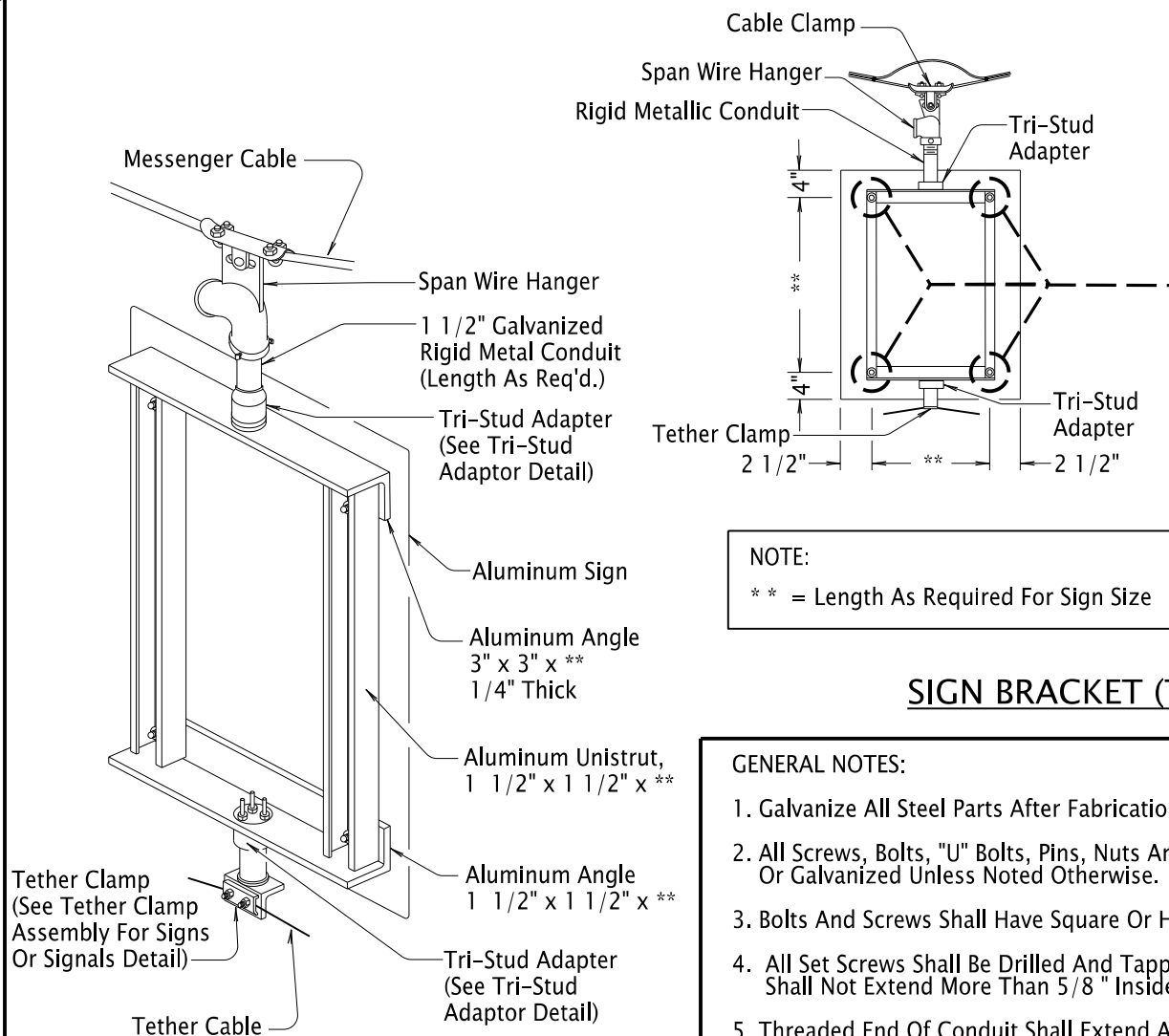
**FIRE PREEMPTION INSTALLATION**  
(Emitter Units For Vehicles Provided By Others)



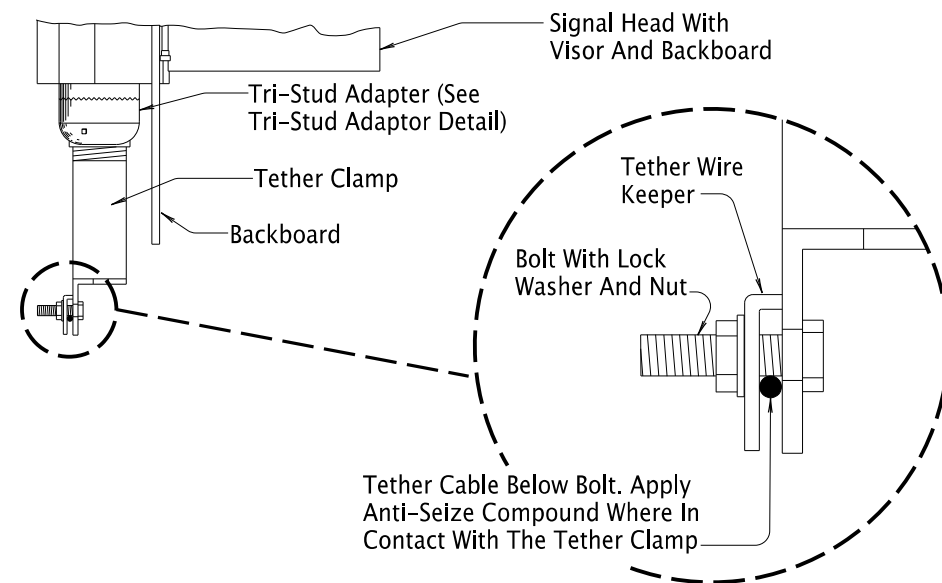
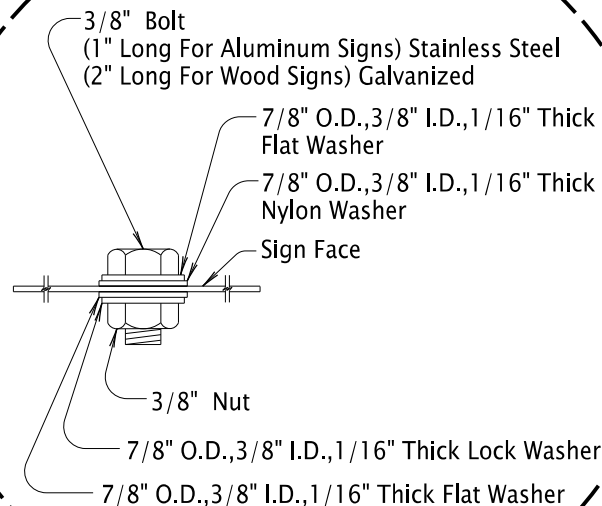
**TRI-STUD ADAPTOR DETAIL**  
(Bottom Attachment Shown, Rotate 180 Degrees For Top Attachment)



**MESSENGER CABLE ATTACHMENT FOR SIGNAL OR SIGNS**



**SIGN BRACKET (TYPE "A", SPANWIRE INSTALLATION)**



**TETHER CLAMP ASSEMBLY FOR SIGNALS OR SIGNS**

**GENERAL NOTES:**

1. Galvanize All Steel Parts After Fabrication.
2. All Screws, Bolts, "U" Bolts, Pins, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Or Galvanized Unless Noted Otherwise.
3. Bolts And Screws Shall Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
4. All Set Screws Shall Be Drilled And Tapped Through The First Wall Of Conduit/Tether Clamp. Set Screw Shall Not Extend More Than 5/8" Inside Conduit And Be Installed With Anti-Seize Compound.
5. Threaded End Of Conduit Shall Extend A Minimum Of 5/8" Into Span Wire Signal Hanger.
6. Install Shim Between Cable Clamp And Span Wire Hanger To Eliminate Excess Movement Yet Allow For Moderate Sway.

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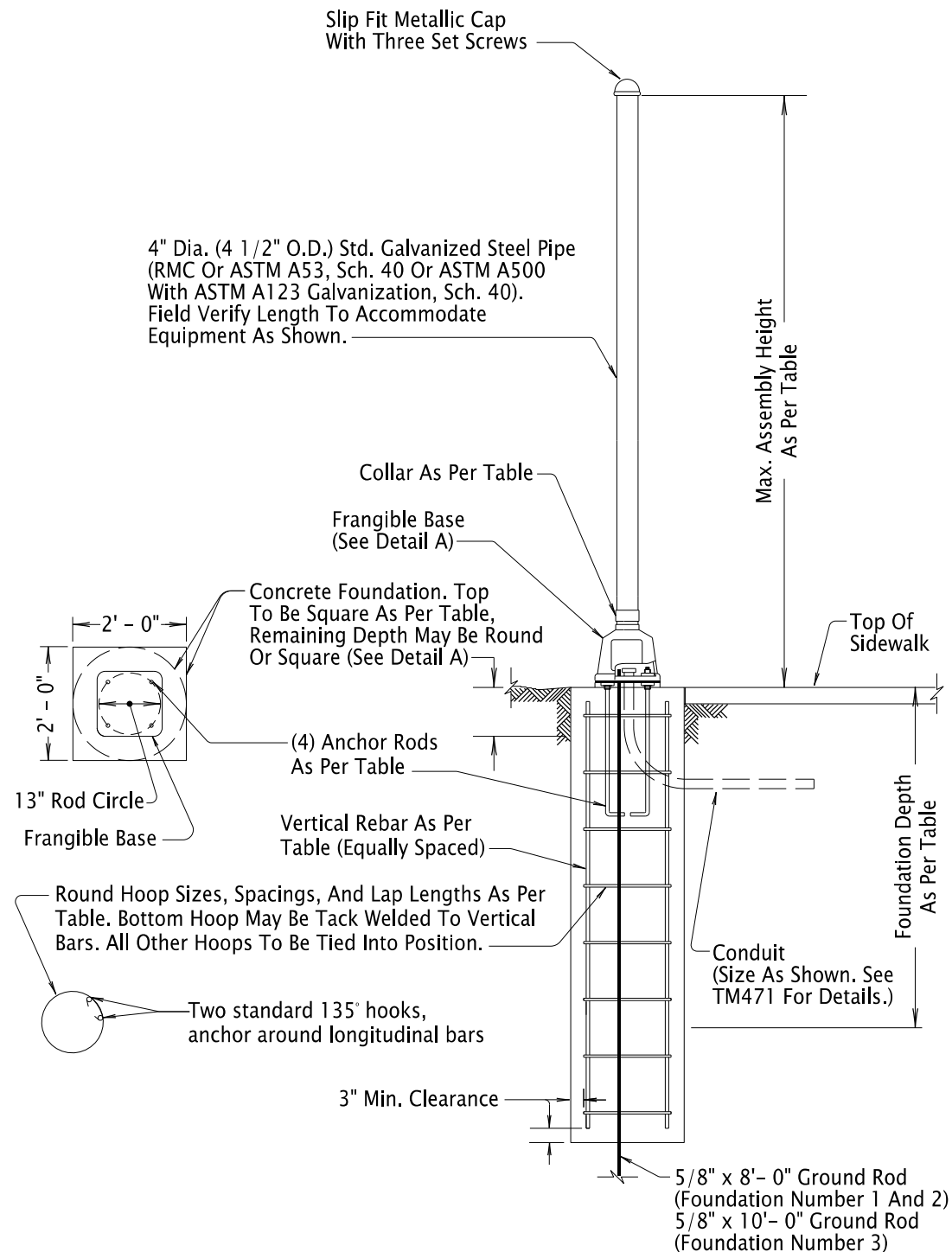
All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**  
**TEMPORARY**  
**SPANWIRE MOUNTING DETAILS FOR**  
**VEHICLE SIGNALS, SIGNS, &**  
**FIRE PREEMPTION**  
2024

DATE	REVISION	DESCRIPTION
07-2023	CHANGED TO ANTI-SEIZE COMPOUND FOR TETHER CLAMP, CHANGED NOTE 2.	

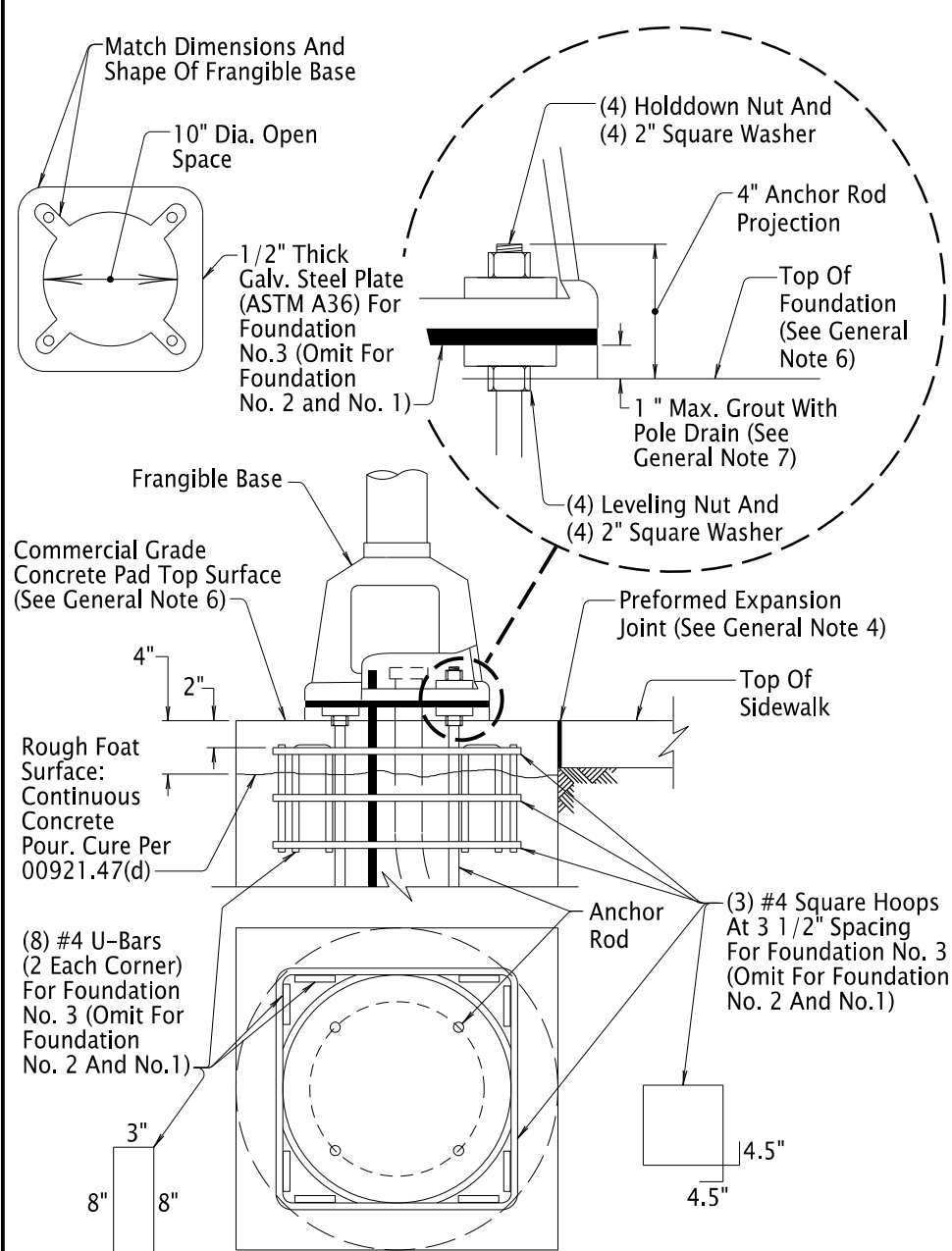
CALC. BOOK NO. - - - N/A - - - SDR DATE- 14-JUL-2023 - **TM456**

Effective Date: December 1, 2024 – May 31, 2025



Pedestal Foundation Number	Max. Assembly Height	Foundation Depth	Depth of Square Foundation	Anchor Rods (ASTM F 1554 Grade 36)	Reinforcing Steel			Collar
					Vertical Rebar	Hoop Size & Spacing	Hoop Lap Length	
1	6' - 0"	2' - 0"	4"	3/4" x 18" x 4" (6" Thread)	N/A	N/A	N/A	N/A
2	10' - 0"	3' - 0"	4"					
3	20' - 6"	8' - 0"	12"	1" x 36" x 4" (6" Thread)	8-#6	#4-12"	6" with 2 hooks	Req'd

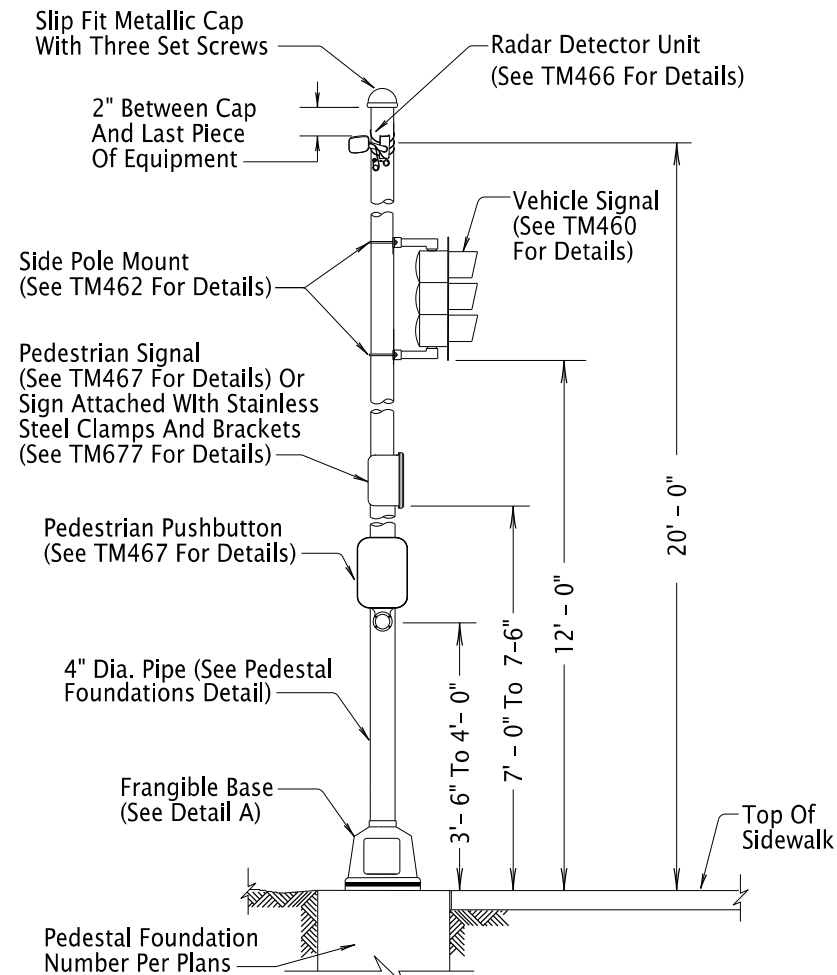
### PEDESTAL FOUNDATIONS



### DETAIL A - FRANGIBLE BASE

#### General Notes:

1. All Bolts, Nuts And Washers To Conform To 02560.20 And Be Galvanized Steel According To 02560.40 Unless Noted Otherwise.
2. All Anchor Rods To Be Galvanized Steel Conforming To 02560.30.
3. All Pole Entrances Containing Wiring To Be Smooth.
4. Install 1/4" Thick Preformed Expansion Joint Filler Around Footing In Sidewalk Areas.
5. The Entire Foundation To Be Located On A Single Plane With Less Than 2% Slope. The Flat Edge(s) Of The Foundation May Be Adjacent To The Turn Space, Back Of Walk, Or A Curb Ramp Grade Break Line.
6. Install Commercial Grade Concrete Pad Above Rough Float Surface With Top Surface Matching Sidewalk Grade And Less Than 1/4" Vertical Exposure From Adjacent Grade. Clean Rough Float Surface Prior To Placing Fresh Concrete By Removing All Scum, Laitance, Loose Gravel, And Sediment. Pour During Sidewalk Installation After Installing Pipe And Appurtenances.
7. Non-Shrink High Early Strength Grout (Non-Ferrous) with 3/4" Diameter Pole Drain And A Minimum Strength of 5000 psi. Do Not Use Footing Concrete.



#### Notes:

1. Equipment Shown In The Assembly Detail Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
2. See TM492 For Ramp Meter Pedestal Mounting Details.
3. See TM493 For RRFB Pedestal Mounting Details.

### TRAFFIC SIGNAL PEDESTAL ASSEMBLY

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#### OREGON STANDARD DRAWINGS

### PEDESTAL FOUNDATION AND TRAFFIC SIGNAL ASSEMBLY

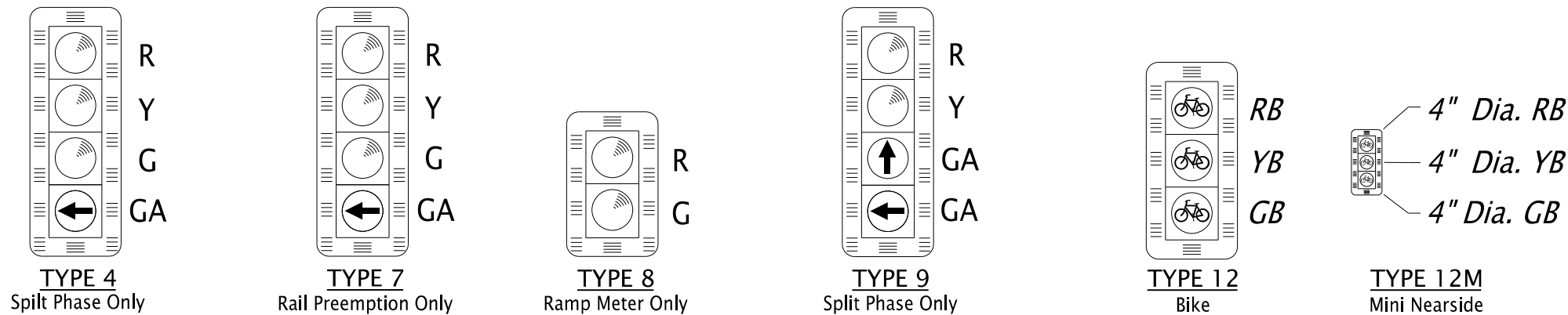
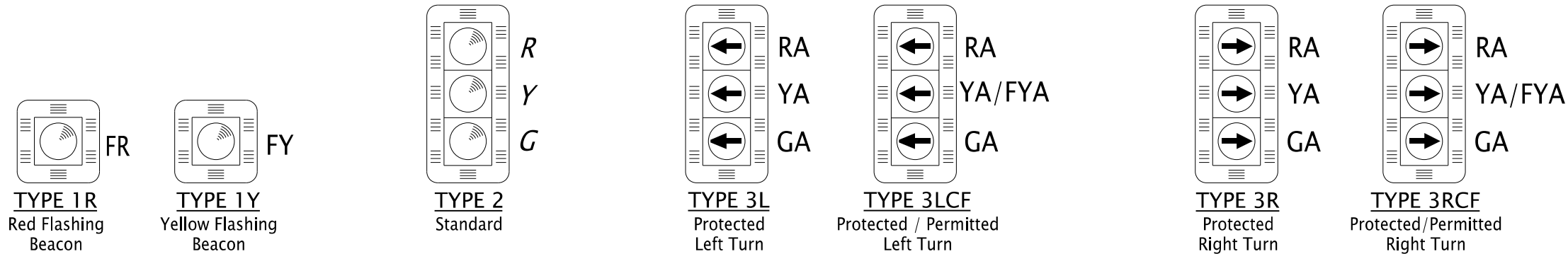
2024

DATE	REVISION	DESCRIPTION
01-2021	1	UPDATED ALL ANCHOR ROD DETAILS. CORRECTED STD. DWG. REFERENCE
07-2022	2	COMPLETE REDESIGN OF FOUNDATION AND INSTALLATION PROCEDURE
07-2023	3	NOTE 5 - CHANGED TO 2% SLOPE, ADDED RMC AS PIPE OPTION, MINOR TEXT CHANGES FOR CLARITY.

CALC. BOOK NO.	N/A	SDR DATE	14-JUL-2023	TM457
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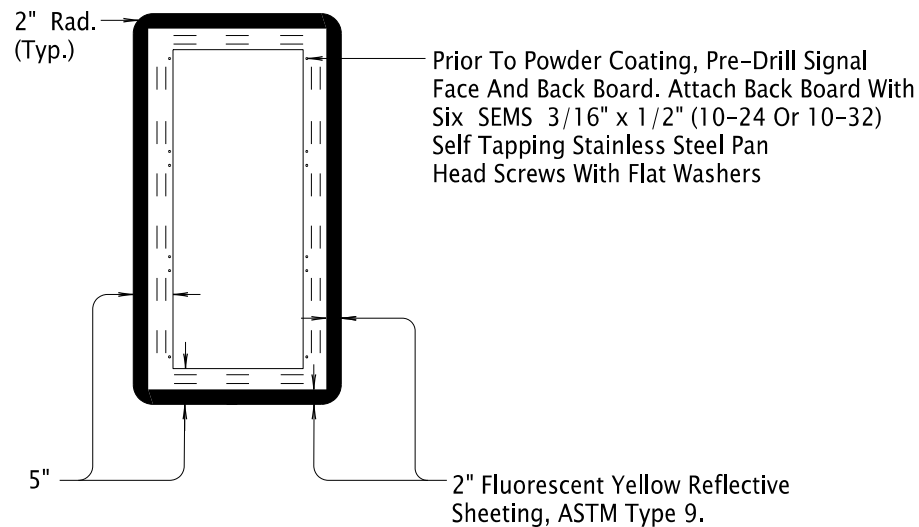
Effective Date: December 1, 2024 – May 31, 2025





Color Indications All Indications Are 12" Diameter Unless Otherwise Shown	
R	Red Circular Ball
Y	Yellow Circular Ball
G	Green Circular Ball
RA	Red Arrow
YA	Yellow Arrow
GA	Green Arrow
FYA	Flashing Yellow Arrow
FR	Flashing Red Circular Ball
FY	Flashing Yellow Circular Ball
RB	Red Bike Symbol
YB	Yellow Bike Symbol
GB	Green Bike Symbol

VEHICLE SIGNAL HEAD DESIGNATIONS AND LENS ARRANGEMENT



BACKBOARD

(3) - Carriage Bolts  
1/4 " x Length As Req'd. For  
Three Fully Exposed Threads

Washers 1/8" Thick

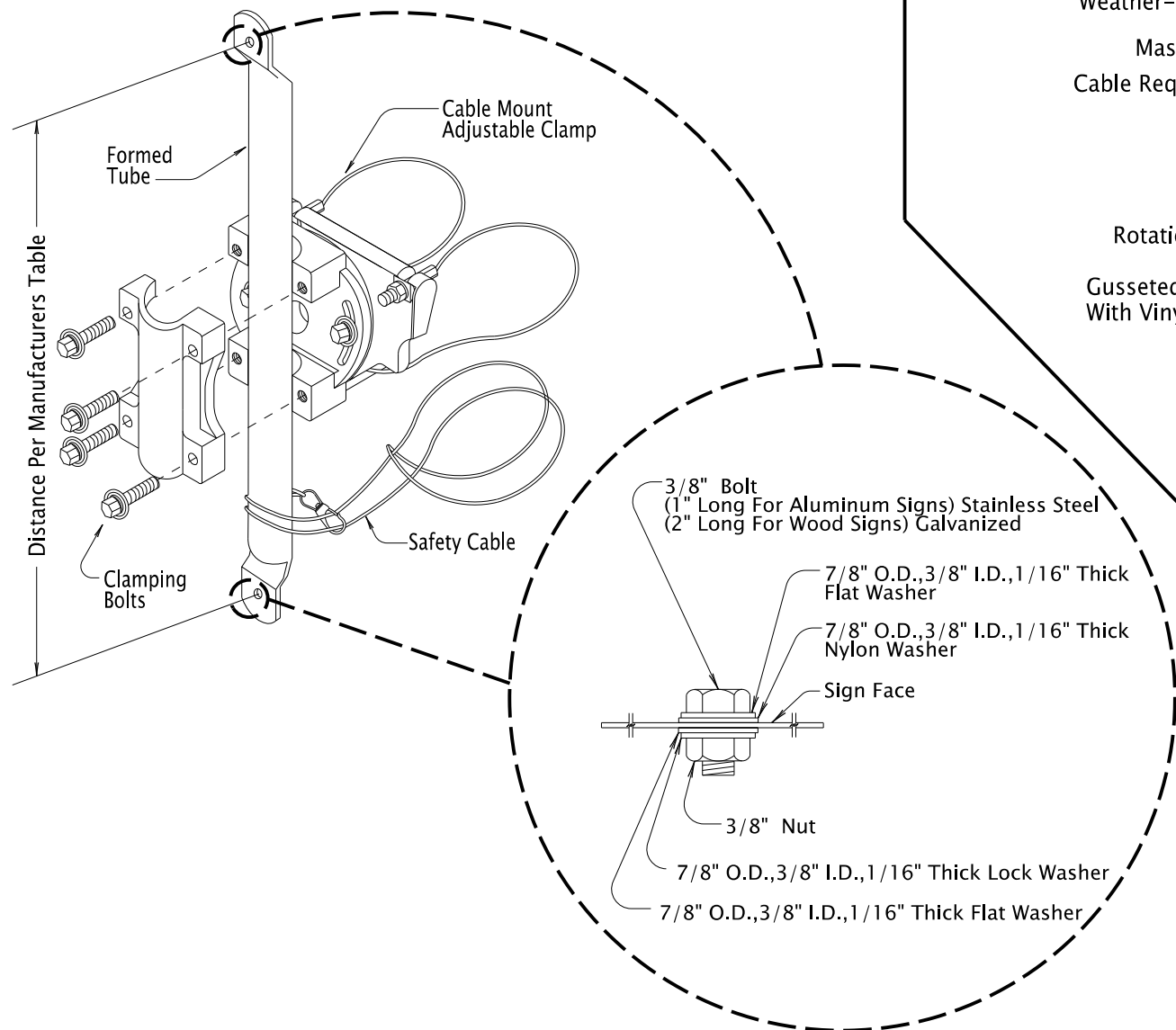
Nylon Insert  
Lock Nuts 5/16" Tall

VEHICLE HEAD ASSEMBLY

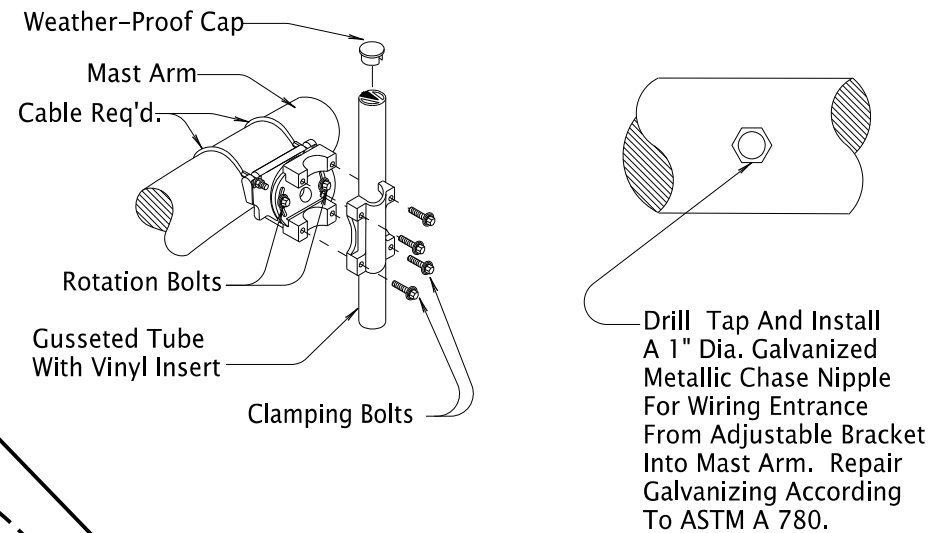
- General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
  2. Bolts And Screws Shall Have Square Or Hex Heads Unless Otherwise Noted. Allen Head Fasteners Not Allowed.
  3. Assemble The Heavy Duty Polycarbonate Vehicle Signal, Visor, And Backboard With Bolted Connections, Stainless Steel Reinforcing Strips And Stainless Steel Plates.
  4. Apply Anti-Seize Compound On All Hardware.

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 first consulting a Registered Professional Engineer.

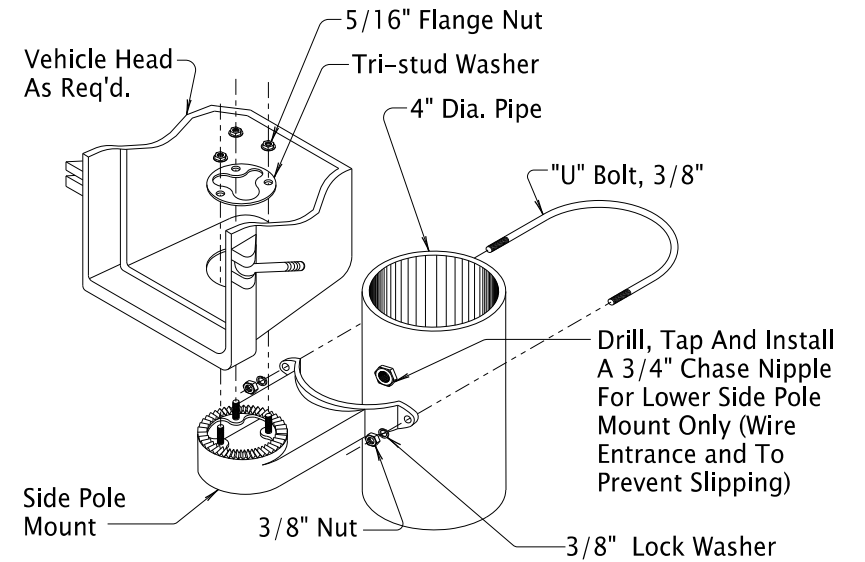
All materials shall be in accordance with the current Oregon Standard Specifications.			
OREGON STANDARD DRAWINGS			
VEHICLE SIGNAL DETAILS			
2024			
DATE	REVISION	DESCRIPTION	
01-2024	ADDED TYPE 12 AND 12M.	REMOVED TYPE 3LBF, 5, 6L, AND 10.	
07-2024	ADDED GENERAL NOTE 4		
CALC. BOOK NO.	N/A	SDR DATE	12-JUL-2024
			TM460



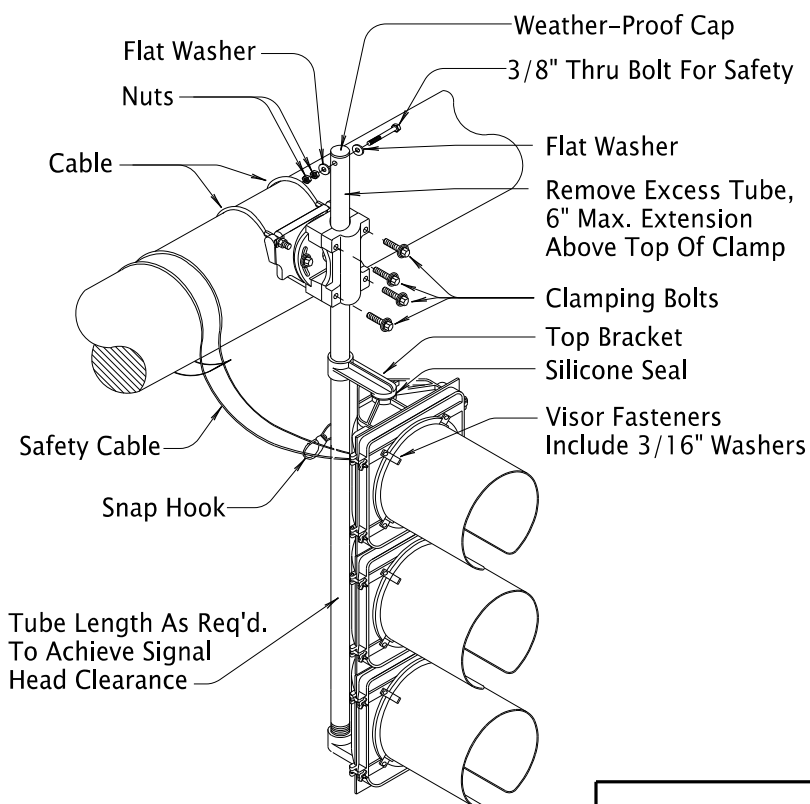
**SIGN BRACKET (TYPE "B"),MAST ARM/POLE INSTALLATION)**



**VEHICLE SIGNAL  
MAST ARM INSTALLATION**



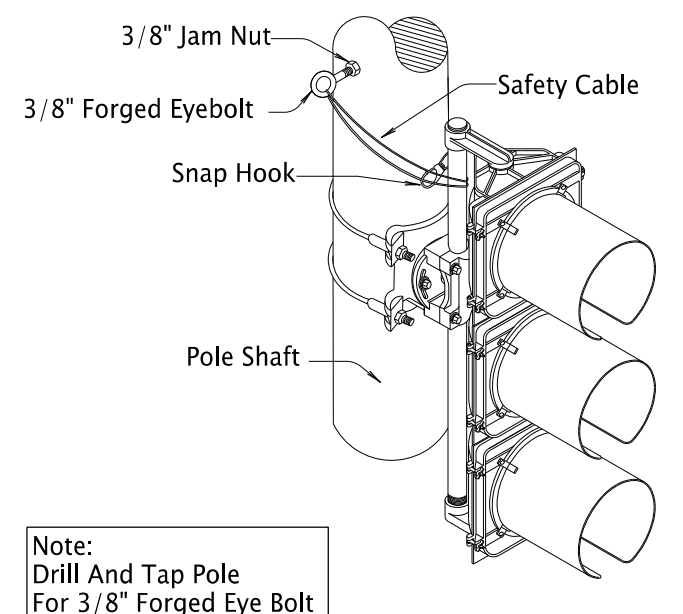
**4" SIDE POLE MOUNT INSTALLATION**  
(For Mounting Signal Heads to Pedestal Pipe)



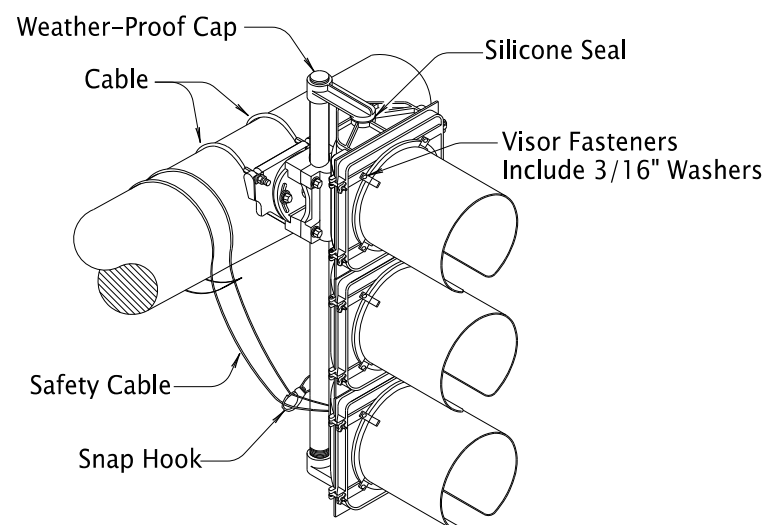
**NOTE:**  
This Detail Can Be Applied To Any Signal Head Configuration. If The Extension Between The Center Line Of The Mast Arm And The Top Bracket Exceeds 18" Consult Engineer For Guidance.

**MOUNTING VEHICLE SIGNAL ABOVE BRACKET ARMS**

- General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
  2. Bolts And Screws Shall Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
  3. Follow Manufacturers Recommendations For Installation.



**POLE SHAFT INSTALLATION**

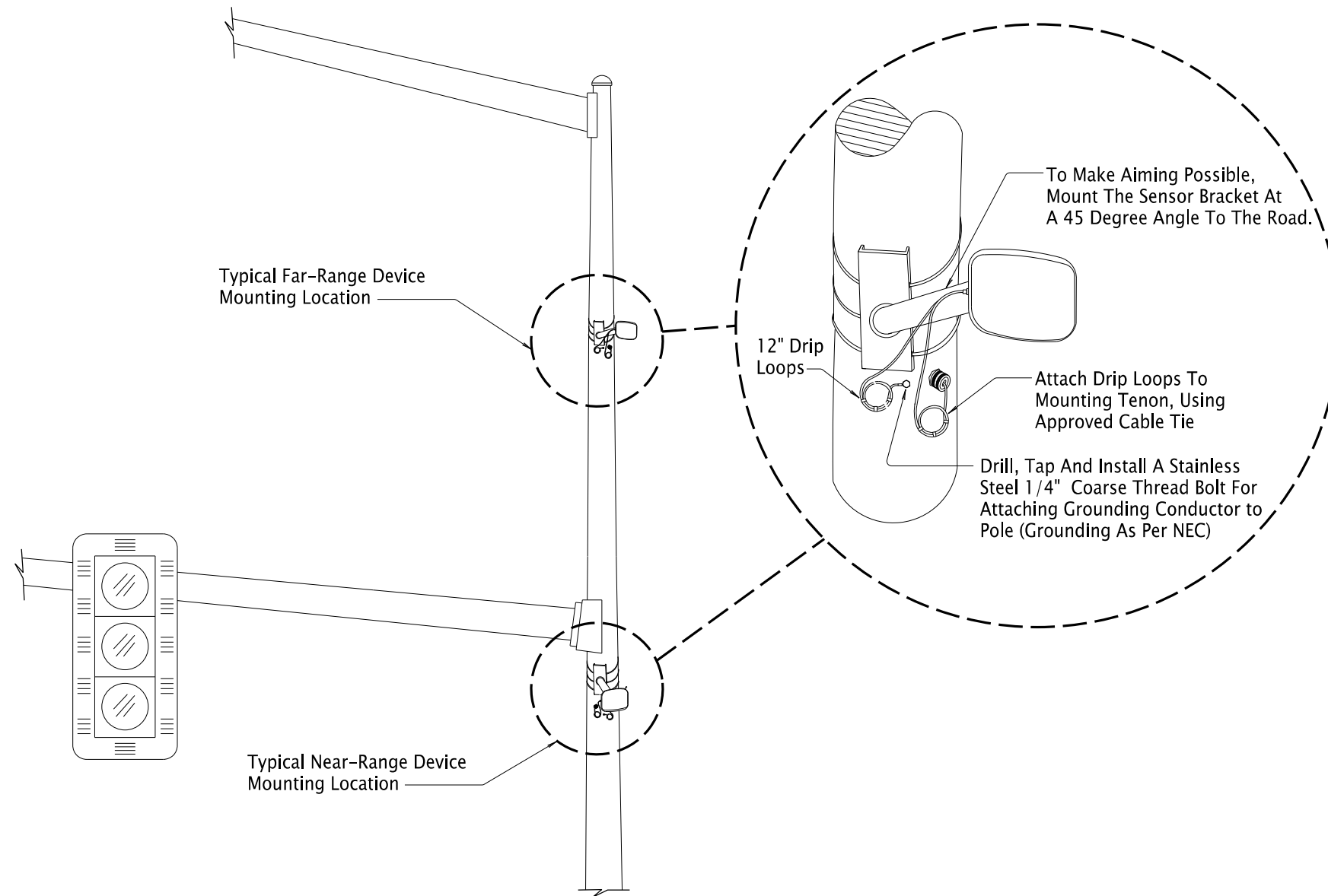


**MOUNTING VEHICLE SIGNAL  
BETWEEN BRACKET ARMS**

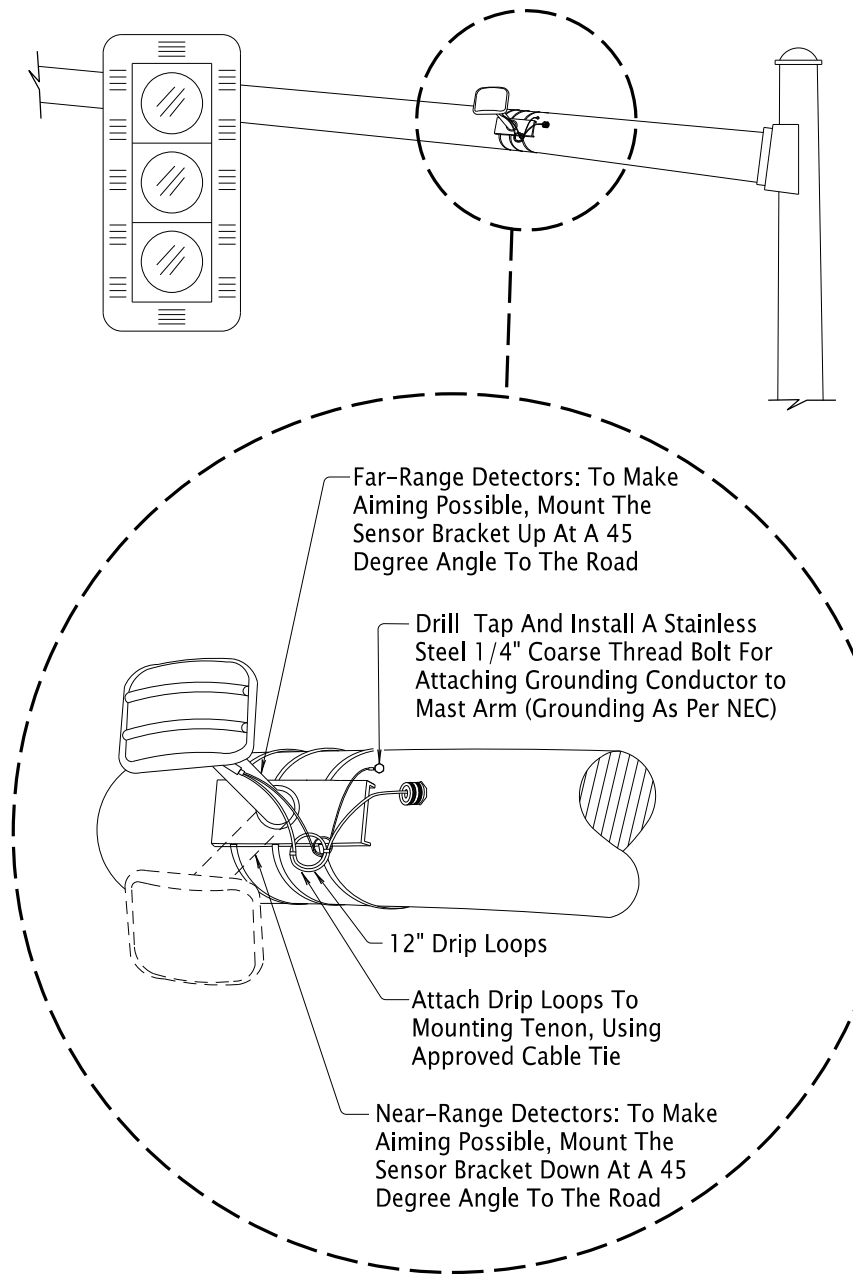
*The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.			
OREGON STANDARD DRAWINGS			
VEHICLE SIGNAL BRACKET & SIGN BRACKET (TYPE B) DETAILS			
2024			
DATE	REVISION DESCRIPTION		
01-2024	MINOR TEXT REVISION FOR CONSISTENCY		
CALC. BOOK NO.	N/A	SDR DATE	19-JAN-2024
			TM462





VERTICAL SIGNAL POLE MOUNT

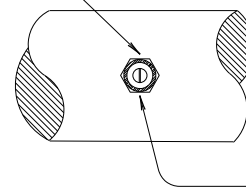


HORIZONTAL MAST ARM MOUNT

GENERAL NOTES:

1. All Bolts, Nuts And Washers Shall Be 304, Or 316 Stainless Steel Unless Noted Otherwise.
2. Mount Radar Detector Assembly As Per Manufacturers Recommendations.

Drill, Tap And Install A Galvanized Metallic Watertight Compression Entrance Fitting For Wiring Entrance From Radar Detector Into Mast Arm Or Pole



CABLE GRIP

*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 first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**

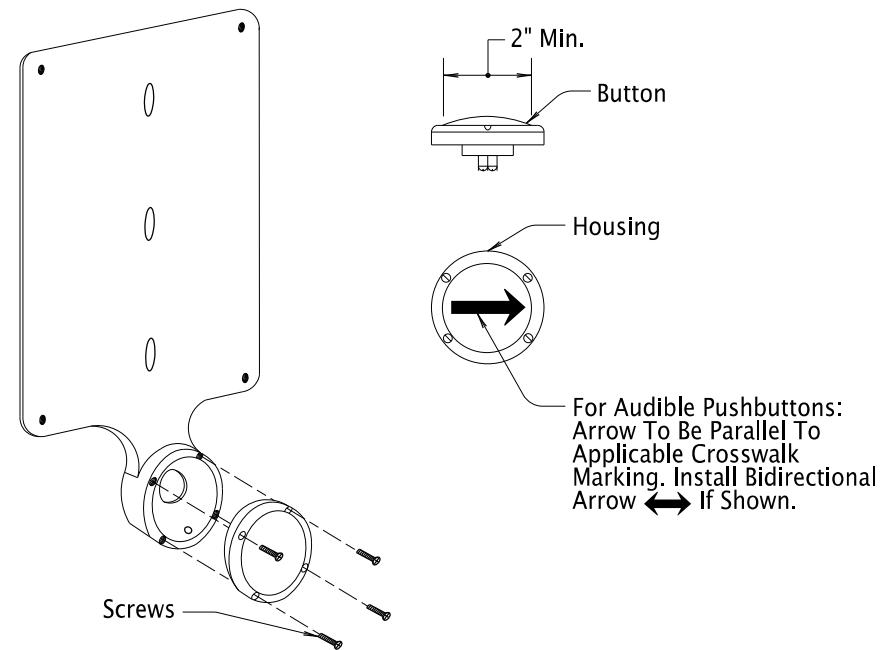
**RADAR MOUNTING DETAILS**

2024

DATE	REVISION	DESCRIPTION
01-2023	ADDED NEAR RANGE DETECTOR INFORMATION	
07-2024	REVISED NAME OF EQUIPMENT PART FOR CONSISTENCY	

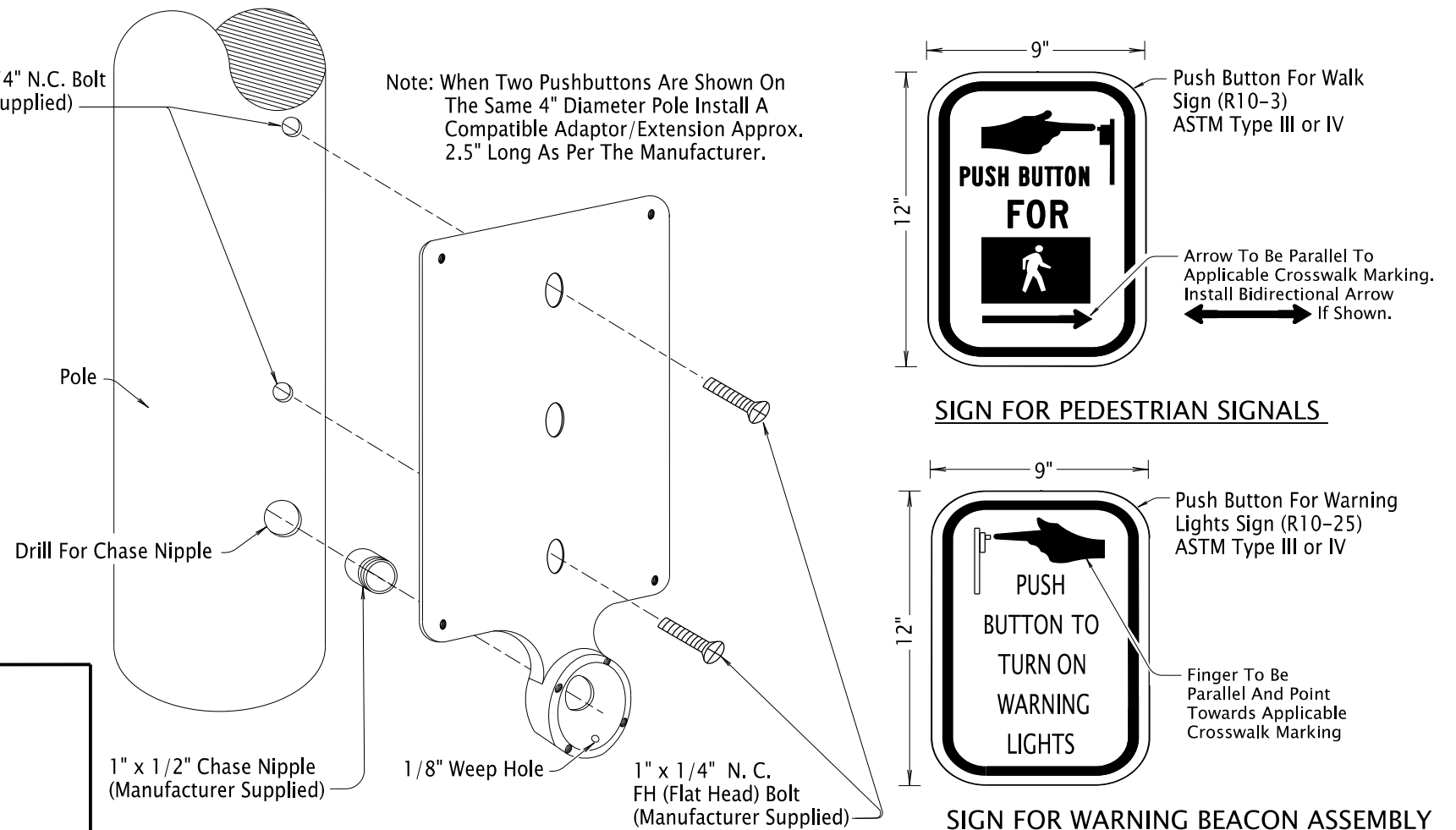
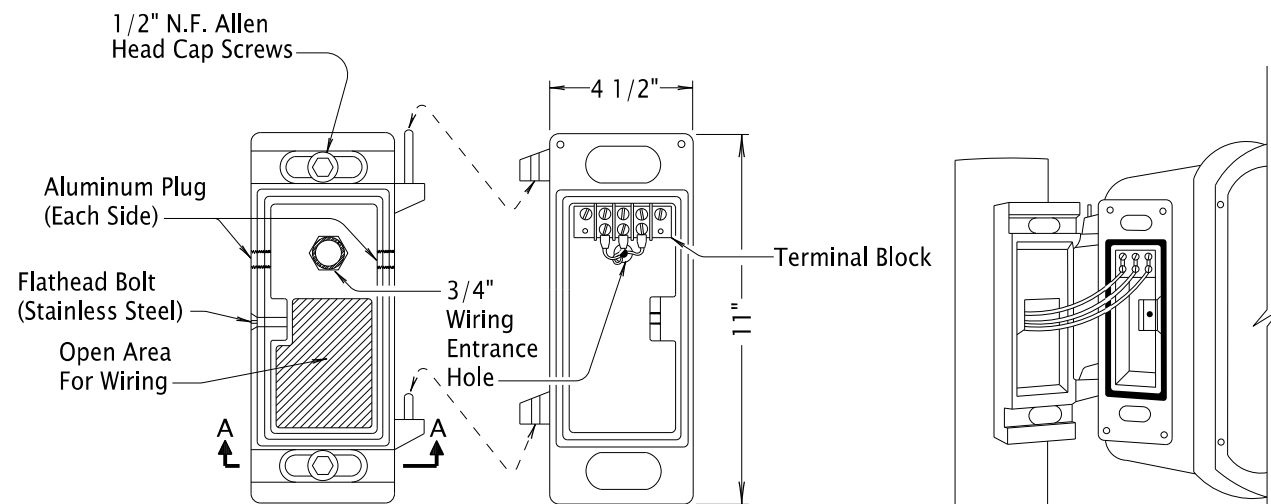
CALC. BOOK NO.	N/A	SDR DATE	12-JUL-2024	TM466
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Effective Date: December 1, 2024 – May 31, 2025

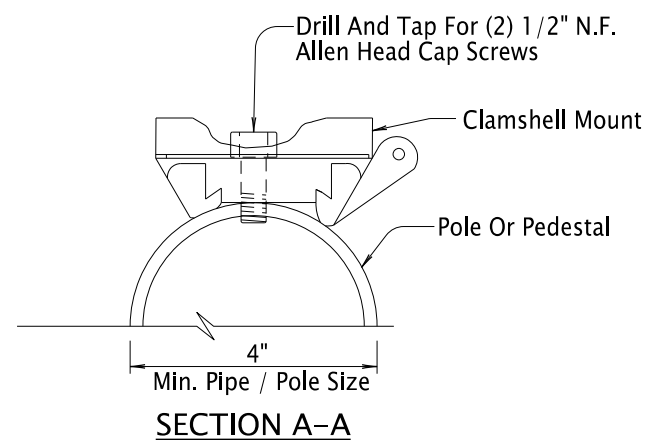
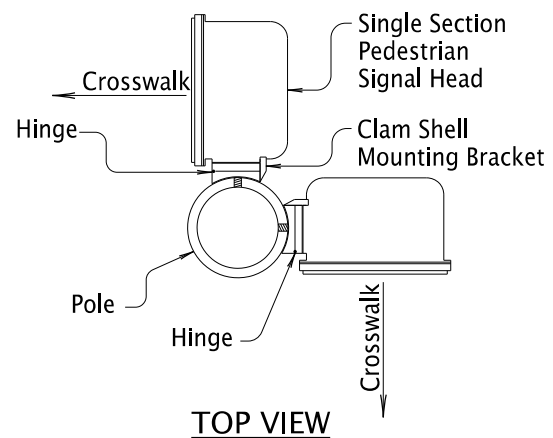
**STANDARD PUSHBUTTON**

Drill, Tap For 1/4" N.C. Bolt  
(Manufacturer Supplied)

Note: When Two Pushbuttons Are Shown On  
The Same 4" Diameter Pole Install A  
Compatible Adaptor/Extension Approx.  
2.5" Long As Per The Manufacturer.

**STANDARD PUSHBUTTON STATION  
AND INSTRUCTION SIGN****PEDESTRIAN SIGNAL MOUNT (CLAM SHELL)****NOTES:**

- Where Two Heads Are Side Mounted On 4" Conduit, Proper Clearance To Be Maintained To Allow Legend To Be Fully Visible.
- Clam Shells To Be Orientated So That The Heads Can Be Opened For Maintenance. (Verify Hinge Placement Of Clamshell).

**CLAM SHELL ORIENTATION****General Notes:**

- All Screws, Bolts, Nuts And Washers To Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
- Bolts And Screws To Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
- Drill And Tap Pole As Per Orientation Shown On Plans.
- Horizontal Reach To The Pushbutton To Be 10 Inches Maximum. See Plans Or Consult Engineer To Ensure Compliance.

*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 first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.

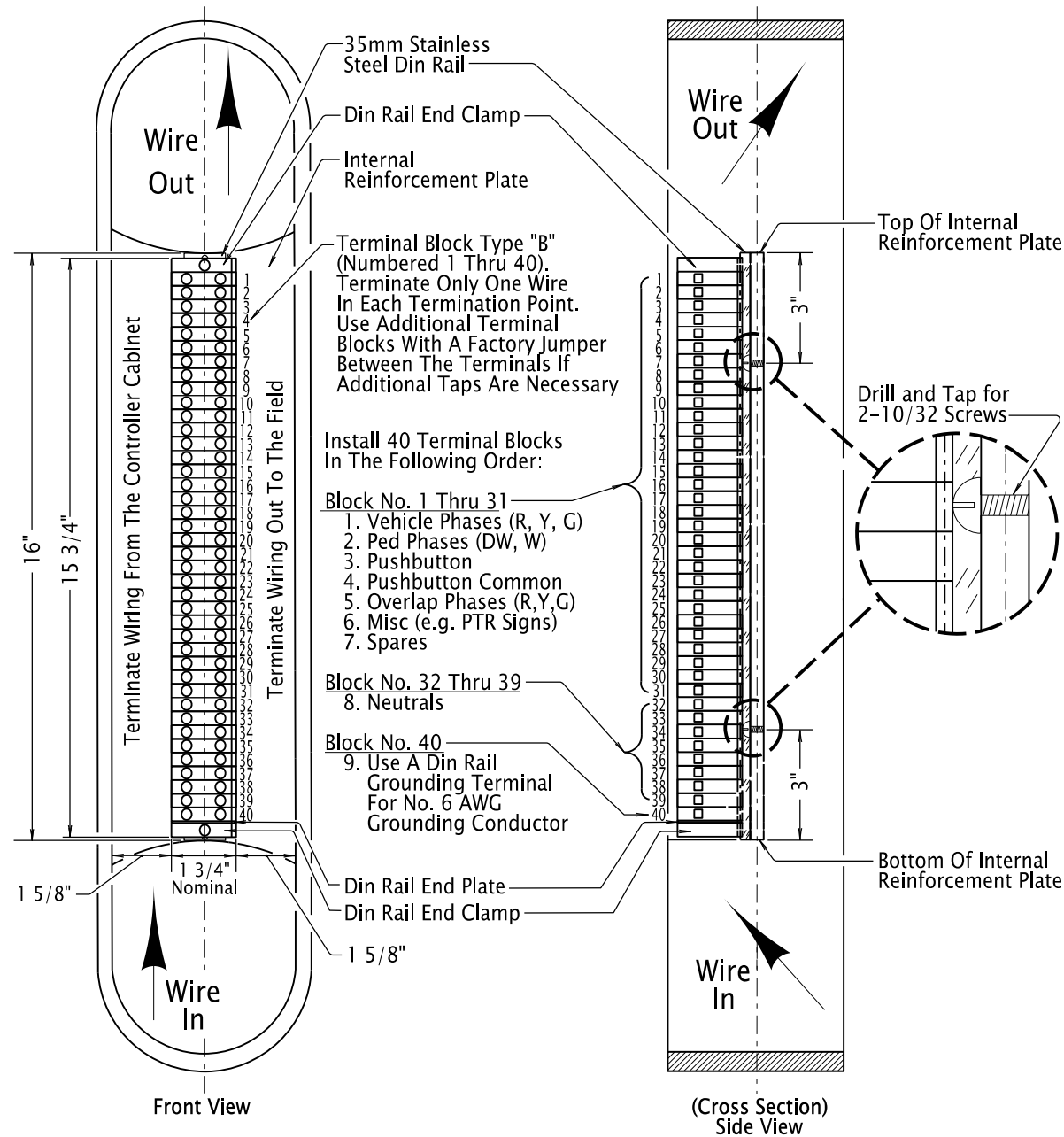
**OREGON STANDARD DRAWINGS  
PEDESTRIAN SIGNAL MOUNT  
AND  
PEDESTRIAN PUSHBUTTON  
DETAILS  
2024**

DATE	REVISION	DESCRIPTION
07-2022	ADDED R10-25 SIGN. ADDED EXTENSION MOUNTING NOTE FOR 2 PUSHBUTTONS ON SAME 4" DIA. POLE.	
07-2024	ADDED ARROW TO PUSHBUTTON. ADDED BI-DIRECTIONAL ARROW.	
CALC. BOOK NO.	N/A	SDR DATE- 12-JUL-2024

**TM467**

Effective Date: December 1, 2024 – May 31, 2025

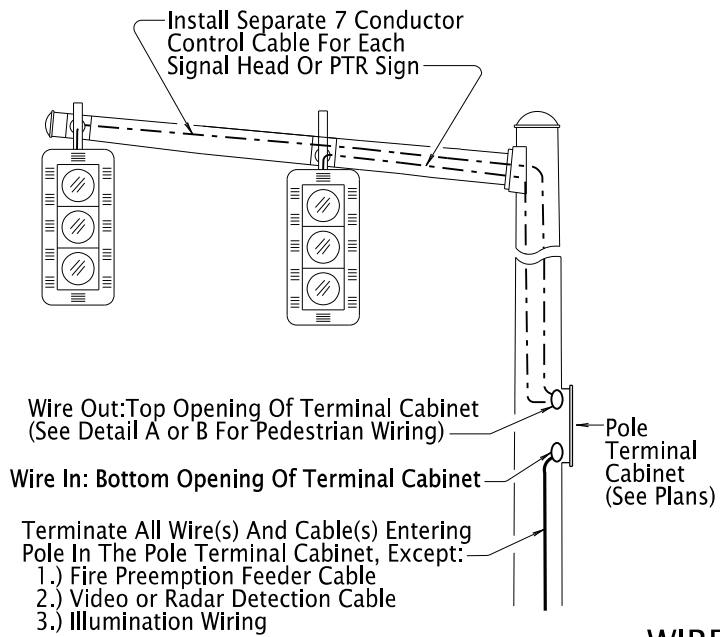




DIN RAIL, TERMINAL BLOCKS, & WIRING IN POLE RECESSED TERMINAL CABINET

7 Conductor Control Cable			Pedestrian Phases	Vehicle Phases	Signal Head Types			
Conductor Number	Base Color	First Tracer	1 Pedestrian Phase	1 Vehicle Phase	6L or 3LBF	4L, 5, or 7	1R, 1Y, 2, 3L, 3LCF, 3U, 3R, 4, 9, 12, or 12M	10
1	White	—	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
2	Black	—	Walk	Yellow	Yellow	Yellow	Yellow	Yellow
3	Red	—	Dont Walk	Red	Red	Red	Red	Red 1
4	Orange	—	P.B. Common	Spare	Flashing Yellow	Turn Yellow	Spare	Red 2
5	Green	—	Pushbutton	Green	Green	Green	Green	Spare
6	Blue	—	Spare	Spare	Spare	Turn Green	Spare	Spare
7	White	Black	Spare	Spare	Spare	Spare	Spare	Spare

COLOR CODE CHART CONTROL CABLE



Ped Phase	Function	Base Color	First Tracer	Second Tracer
2	Walk	Black	White	—
2	Dont Walk	Blue	Black	—
6	Walk	Black	—	—
6	Dont Walk	Blue	—	—
4	Walk	Tan	—	—
4	Dont Walk	Purple	—	—
8	Walk	Tan	Blue	—
8	Dont Walk	Purple	Blue	—
2	Pushbutton	Tan	White	—
6	Pushbutton	Purple	White	—
4	Pushbutton	Brown	—	—
8	Pushbutton	Brown	Blue	—
All	Pushbutton Common	Brown	White	—
All	Signal Head Neutral	White	—	—

For Odd Pedestrian Phases 1, 3, 5, & 7 Use The Following:

Ph. 1 Ped	Ph. 2 Ped	Color Code With The Addition Of A Yellow Second Tracer
Ph. 3 Ped	Ph. 4 Ped	
Ph. 5 Ped	Ph. 6 Ped	
Ph. 7 Ped	Ph. 8 Ped	

Color Code Chart Pedestrian Single Conductors (See Detail B)

WIRE & CABLE IN POLES

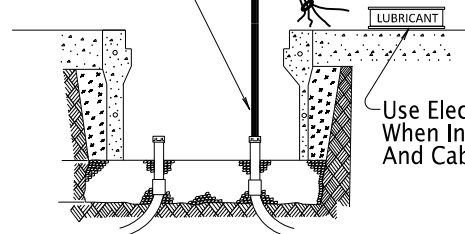
General Notes:

1. Install All Wire And Cable Between Terminal Blocks Without Splicing.
2. Mark Phase Number Or Identification On All Cable In Junction Boxes, Terminal Cabinets, Service Cabinets, And Controller Cabinets With Permanent Tags. Use Handheld Labeler (Brady M210 Label Maker With Vinyl B-595 Tape). Overlaps Shall Be Labeled (OLA,OLB,OLC,OLD).
3. Mark Phase Number & Function Or Identification On All Wires Terminated In Controller Cabinet And Terminal Cabinet With Permanent Tags. Use Handheld Labeler (Brady M210 Label Maker With Vinyl B-595 Tape). Overlaps Shall Be Labeled (OLA,OLB,OLC,OLD).
4. Install No. 16 AWG TFFN Orange Base With Blue Tracertone Wire In All Conduits As A Locate Wire. Leave Slack As Required In General Note 5 And Install A Wire Nut. Do Not Join Multiple Locate Wires Under A Common Wire Nut Unless Otherwise Shown.
5. Tape The Ends Of Unsued Conductors With Insulated Vinyl Plastic Tape.
6. Leave Slack In Each Wire And Cable As Follows:  
A.) 2 Feet In Junction Boxes And Poles  
B.) 6 Feet In The First Junction Box Nearest The Controller Cabinet  
C.) 6 Feet In Controller Cabinet And Service Cabinet
7. Install Polyethylene Pull Line In All Conduits Noted On The Plans For Future Use (No Wires/Cables In Conduit). Leave 6 Feet Of Slack Pull Line.
8. At Existing Installations Re-wire And Re-label New And Existing Control Cables And Wires, In All Junction Boxes, Terminal Cabinets, Service Cabinets, And Controller Cabinets.

Pull All Wires And Cables By Hand Only

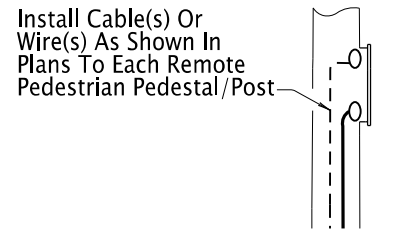
Temporarily Bundling Cables Or Wire (Tapes, Straps, Ties, Or Other Binding Material) Allowed Only At The Terminating End Points For Pulling Only

Pull In A Straight Line With The Conduit Opening\*

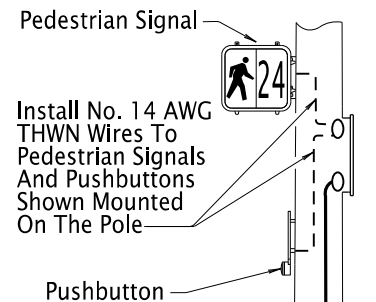


\* Use A Pulley Device To Achieve A Straight Line If Pulls Are Made With Poles Or Controller Cabinets In Place

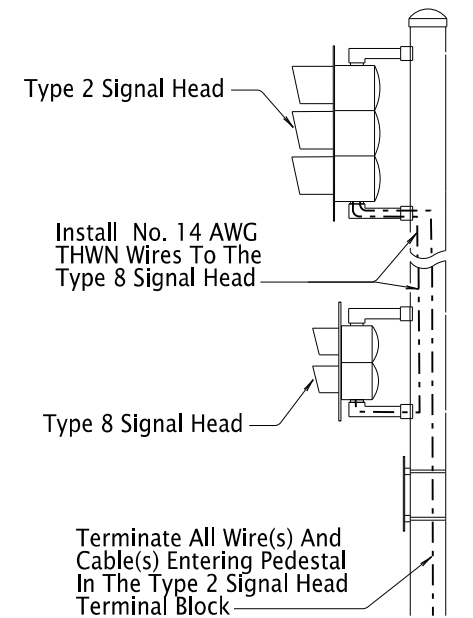
WIRE & CABLE IN CONDUITS



Detail A



Detail B



WIRE & CABLE IN RAMP METER PEDESTALS

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

WIRE & CABLE INSTALLATION

2024

DATE	REVISION	DESCRIPTION
01-2024	REVISED SIGNAL HEAD TYPES IN COLOR CODE CHART CONTROL CABLE DETAIL	
07-2024	ADDED GEN. NOTE 3, ADDED PED COLOR CODE, ADDED FACTORY JUMPERS	
CALC. BOOK NO.	N/A	SDR DATE

12-JUL-2024

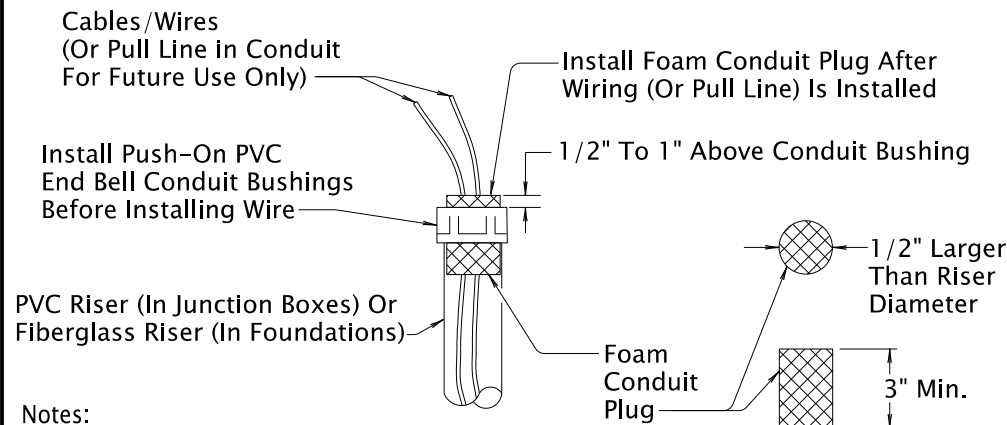
TM470

12-JUL-2024  
TM471.dgn

	Minimum Cover From Top of Finished Surface (Use Permit Depth If Greater Than These)	
Type Of Conduit	Roadway & Shoulders	Other Areas
Metallic	24"	18"
Non-Metallic	30"(See Note 2)	18"

- Notes:
- 1.) Additional Cover Depth May Be Necessary Near Foundations And Junction Boxes To Accommodate The Minimum Radius ("R") Of The Conduit Elbow. See "Conduit Elbow", "Conduit Installation In Foundations" And "Conduit Installation In Junction Boxes" Details For More Information.
  - 2.) For Non-Metallic Conduit Under Roadway & Shoulders Installed Horizontally Into Fiber Optic Hand Hole As Per TM472, The Minimum Cover Depth Is 24 Inches.

### MINIMUM COVER FROM FINISHED SURFACE

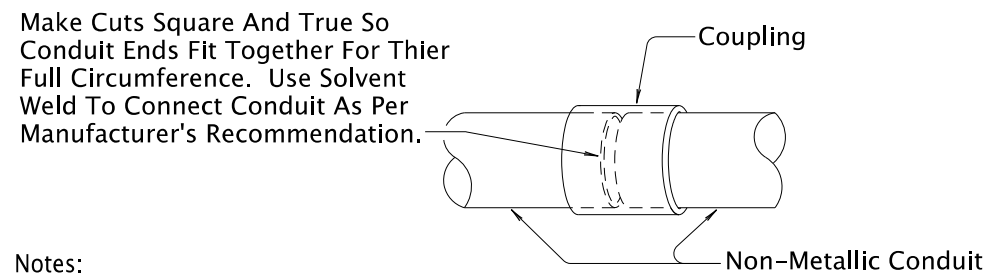


- Notes:
- 1.) Ream Conduit Ends To Remove Rough Edges And Burrs
  - 2.) Temporarily Plug Or Cap Conduit Ends At All Times To Keep Debris Out

### CONDUIT ENDS AND BUSHINGS

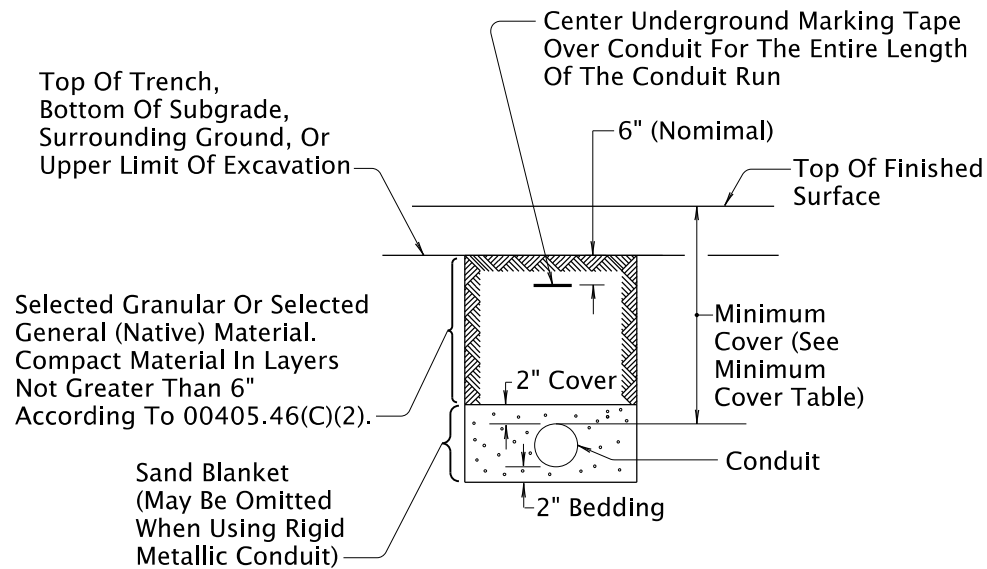
Standard Factory Fiberglass Bend (No Crimping, Flattening, Field Manipulation, Or Cutting In The Field)		
	Conduit Diameter	R (min.)
	1 1/2"	10"
	2"	12"
	2 1/2"	15"
	3"	18"

### CONDUIT ELBOWS

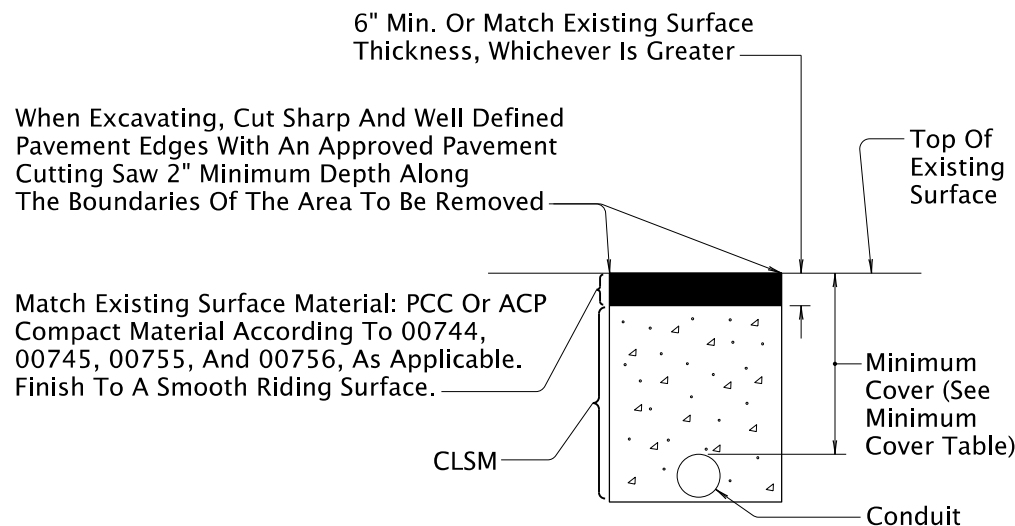


- Notes:
- 1.) Slip Joints, Running Threads Or Reducing Couplings Not Allowed. Use The Same Size Conduit For The Entire Length, Outlet To Outlet.

### CONDUIT COUPLINGS



### UNSURFACED AREAS (new roadway prior to paving, shoulders, under sidewalk, landscaped areas, etc.)

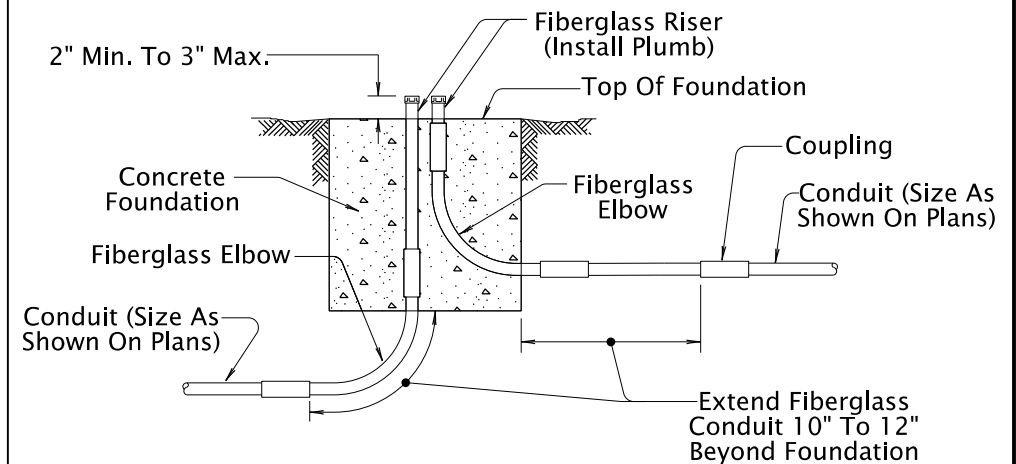


### EXISTING PAVED AREAS

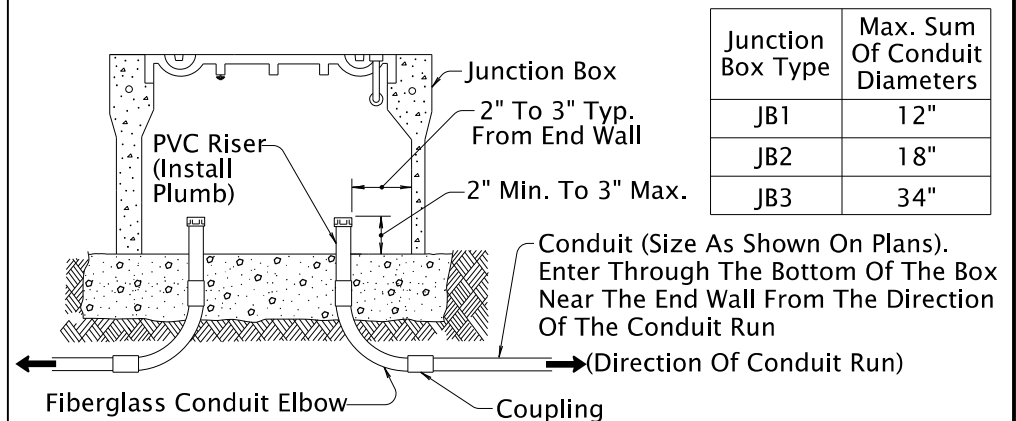
Trenching & Backfill Notes:

1. Excavate According To 00960.40. In Areas To Be Paved Or Landscaped, Place All Conduit Before Paving Or Landscaping.
2. Hold Trench Width To A Practical Minimum
3. Do Not Backfill Trenches Until Inspected By The Engineer
4. Furnish Backfill Materials According To 00960.10

### CONDUIT OPEN TRENCH EXCAVATION & BACKFILL



### CONDUIT INSTALLATIONS IN FOUNDATIONS (Applicable for Pole, Pedestal, Post, Service Cabinet and Controller Cabinet Foundations)



### CONDUIT INSTALLATION IN JUNCTION BOXES

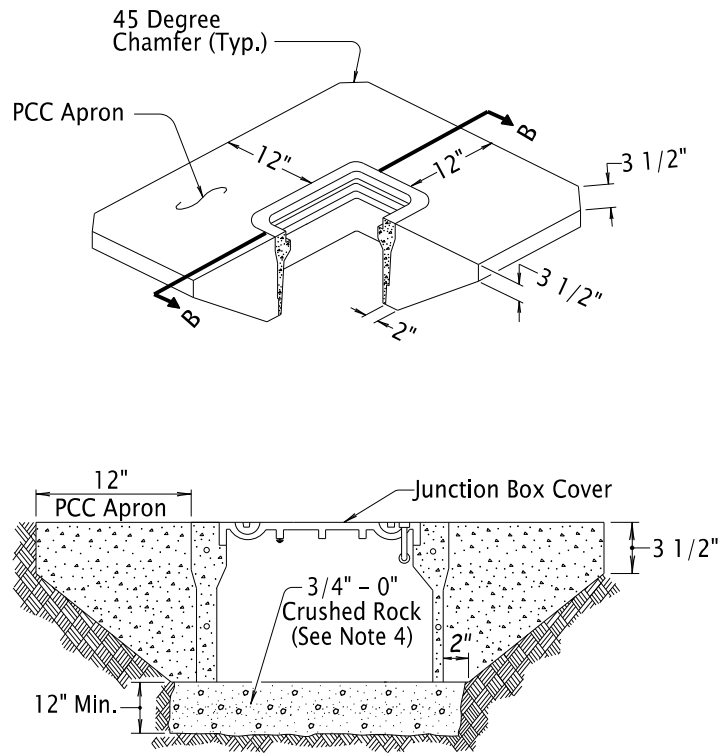
General Notes:

1. Install Non-Metallic Conduit Unless Otherwise Shown. Conduit Runs Shall Be Continuous Between Any Pole, Junction Box, Or Cabinet.
2. Install Conduit By Open Trench Method, Horizontal Directional Drilling, Or As Shown
3. Conduit Runs Shown On Plans Are For Bidding Purposes Only. Locations May Be Changed To Avoid Obstructions.
4. Larger Conduit Than Specified May Be Used At The Option And Cost Of The Contractor If Max. Sum Of Conduit Diameters In Junction Box Is Not Exceeded.

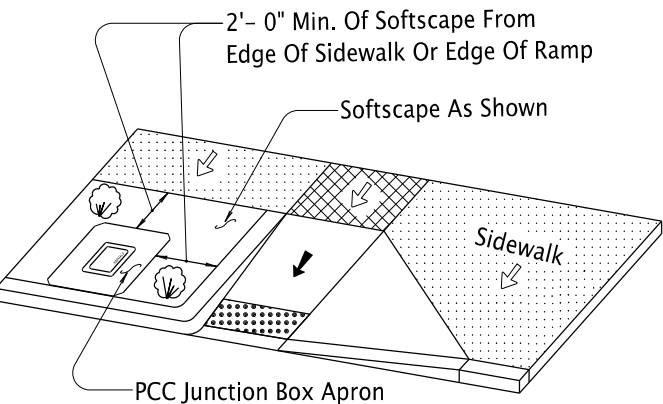
*The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.			
OREGON STANDARD DRAWINGS			
TRENCHING & CONDUIT INSTALLATION			
2024			
DATE	REVISION	DESCRIPTION	
01-2021	ADDED NOTE 1 TO "MINIMUM COVER FROM FINISHED SURFACE" DETAIL		
07-2024	ADDED NOTE 2 TO "MINIMUM COVER FROM FINISHED SURFACE" DETAIL		
CALC. BOOK NO.	N/A	SDR DATE	12-JUL-2024
			TM471

Effective Date: December 1, 2024 – May 31, 2025

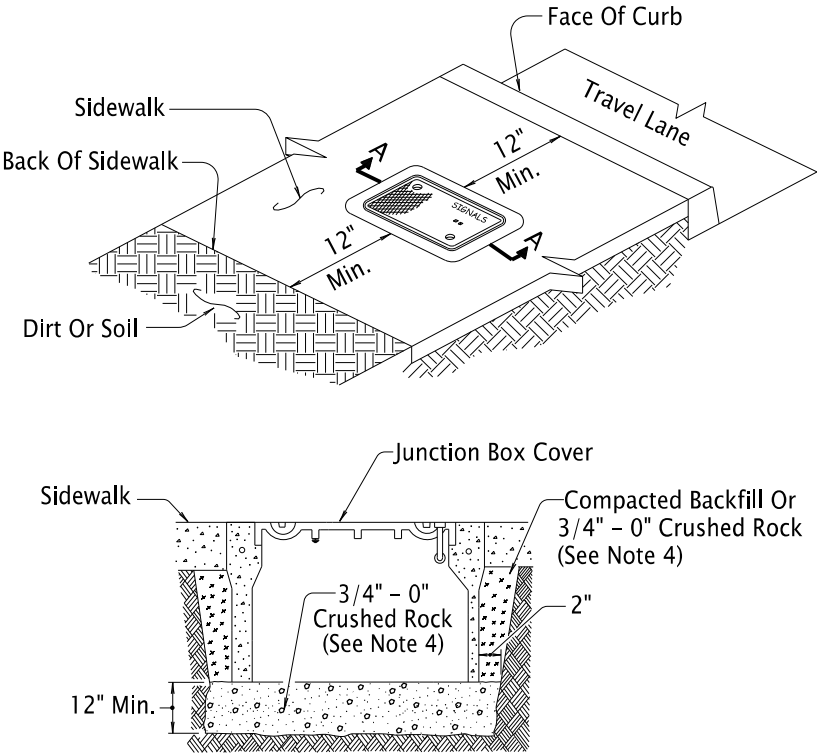


SECTION B-B



**JUNCTION BOX INSTALLATION  
IN UNSURFACED AREA**

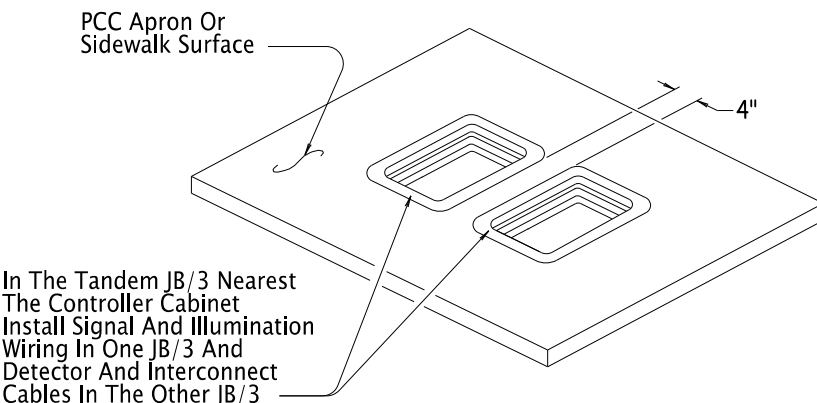
(This Detail Only Applicable for Junction Boxes Located In Incidental Travel Areas; Gravel Shoulders, Behind Guardrail, Etc. Do Not Install In Travel Lanes, Paved Shoulders, Or Other Areas Exposed To Traffic.)



SECTION A-A

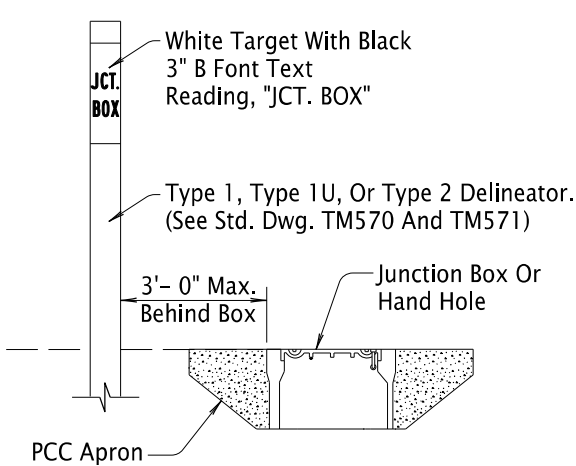
**JUNCTION BOX INSTALLATION IN PCC SIDEWALK**

(This Detail Only Applicable for Junction Boxes Located In Flat Areas Of Sidewalks. Do Not Install In Slopes Of Ramps Or Driveways)

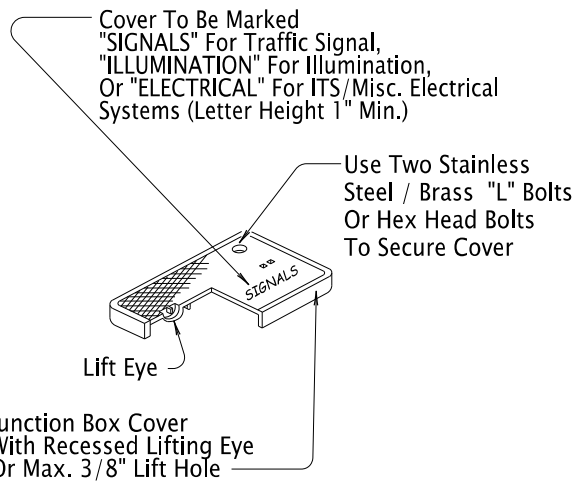


In The Tandem JB/3 Nearest The Controller Cabinet Install Signal And Illumination Wiring In One JB/3 And Detector And Interconnect Cables In The Other JB/3

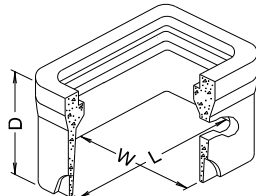
**TANDEM JB/3A JUNCTION BOX DETAILS**



**DELINEATION OF JUNCTION BOX & HAND HOLE IN UNSURFACED AREA**



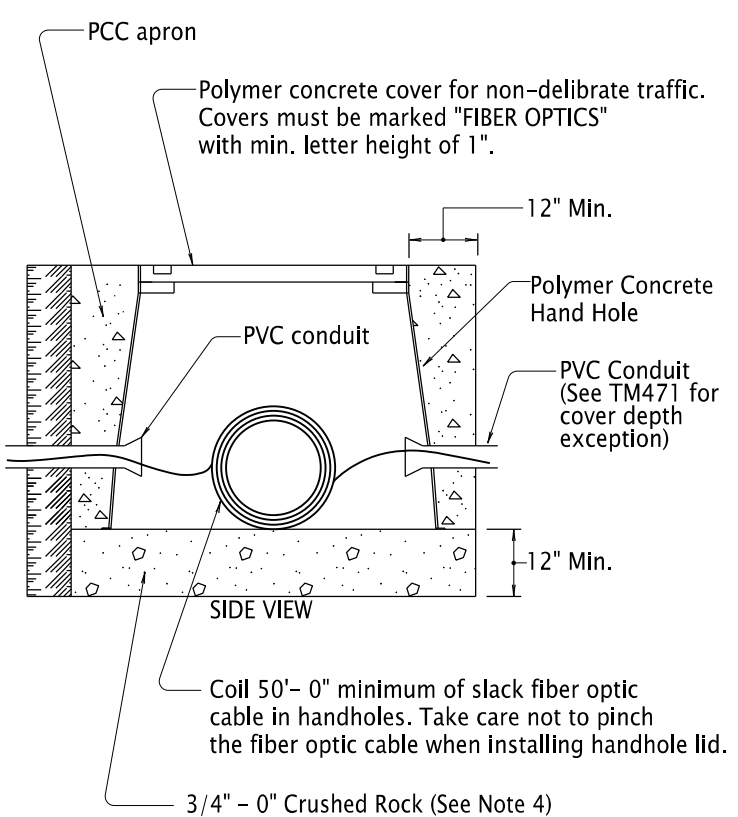
**JUNCTION BOX  
COVER DETAILS**



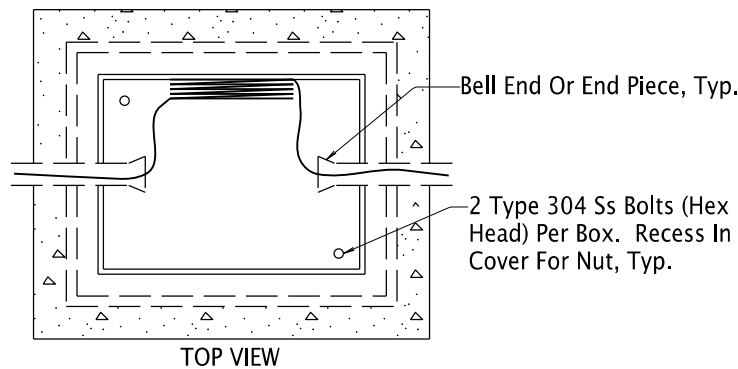
Type*	L	W	D
JB1	17"	10"	12"
JB2	22"	12"	12"
JB3	30"	17"	12"
HH-1	24"	30"	24"
HH-2	30"	48"	24"
HH-3	30"	48"	36"

\*Junction Box Or Handhole Type As Shown On Plans

**DIMENSION TABLE**



SIDE VIEW



TOP VIEW

**FIBER OPTIC CABLE HAND HOLE INSTALLATION**

**GENERAL NOTES:**

1. Install Top of Junction Box And Hand Hole Flush With The Sidewalk, Surrounding Grade, Or Top Of Curb. For Hand Holes Installed In The Roadway Or Shoulder, Leave The Top Of The Hand Hole 1/2" Below The Pavement Surface.
2. Install Junction Boxes And Hand Holes At The Approximate Locations Shown, Or If Not Shown, No More Than 300 Feet Apart For Junction Boxes And No More Than 1000 Feet Apart For Hand Holes.
3. More Junction Boxes And Hand Holes Than Specified May Be Installed To Facilitate The Work At The Option And Cost Of The Contractor
4. Use Materials According To 00640.10 and 00640.16. Use Compaction Equipment Suitable For Area And Compact Each Six Inch Layer With Sufficient Coverages To Produce A Firm Unyielding Surface. Do Not Install Conductors Until Surface Has Been Constructed.

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**

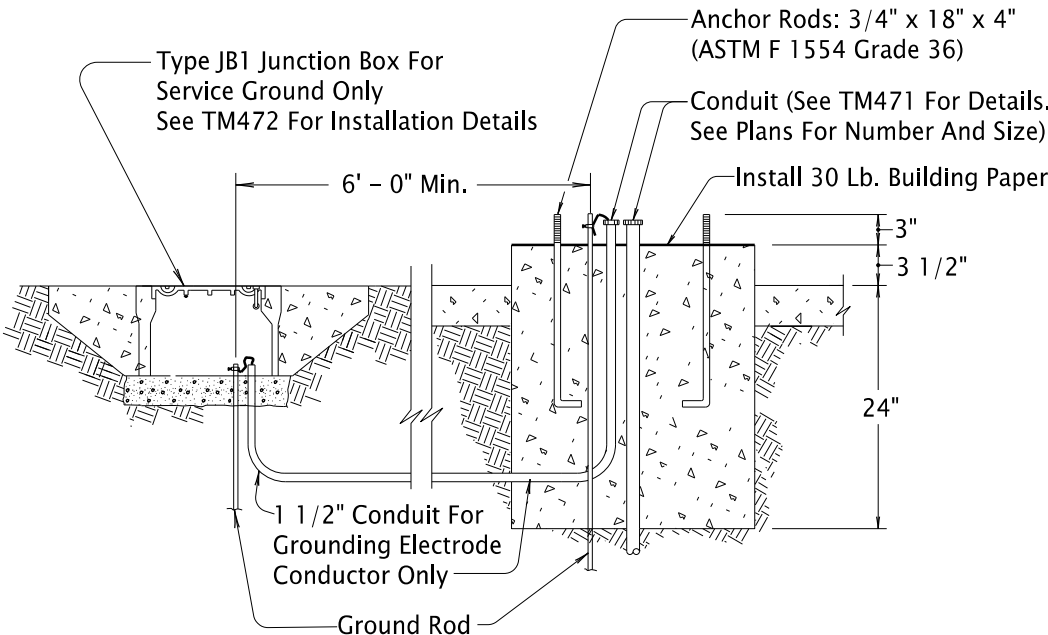
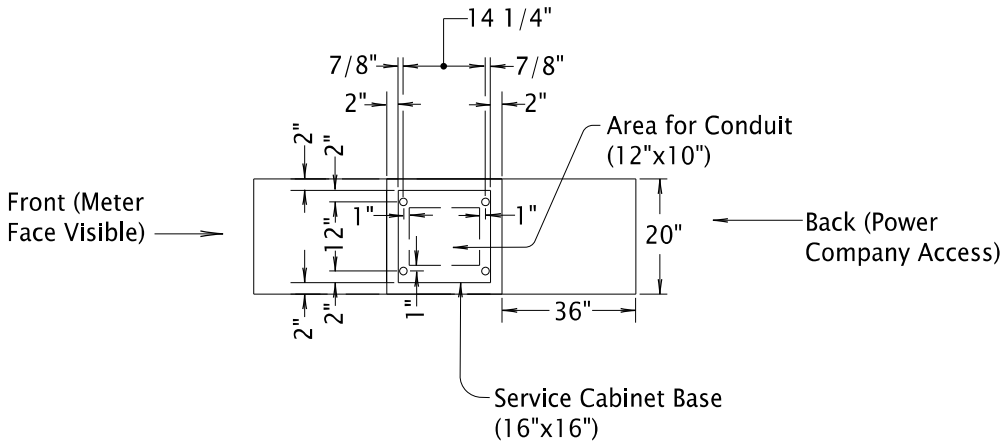
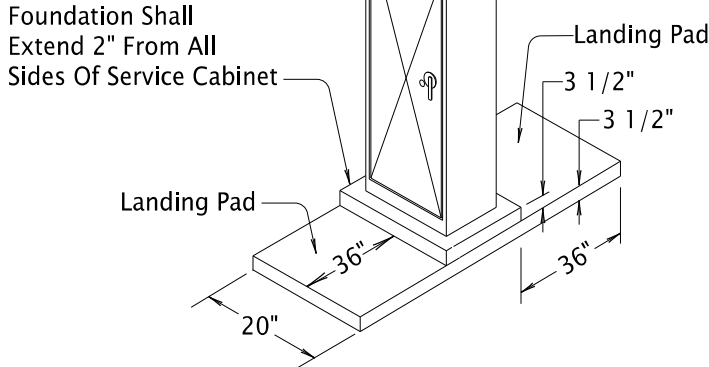
**JUNCTION BOXES/HAND HOLES**

2024

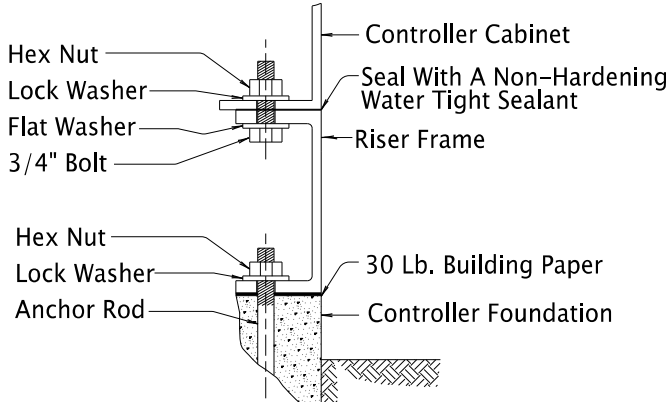
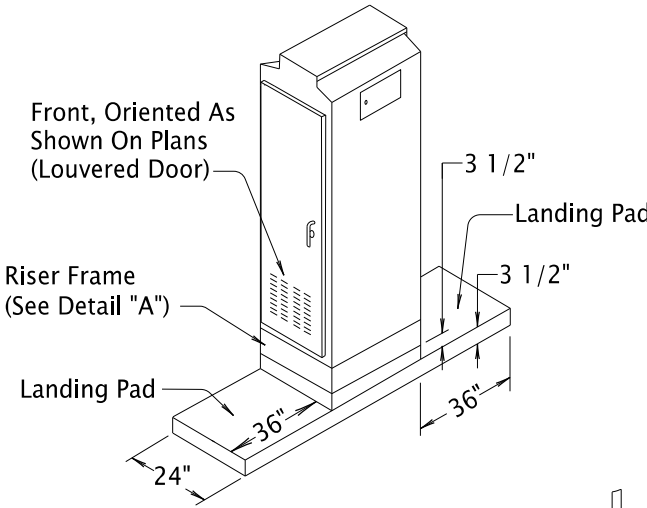
DATE	REVISION	DESCRIPTION
07-2022	ADDED NEW MARKING (ILLUMINATION & ELECTRICAL) FOR JB COVER	
01-2024	CHANGED DIMENSION FOR JB DELINEATION	
07-2024	CHANGED SOFTSCAPE MIN. FROM 3' TO 2'. ADDED HAND HOLE CONDUIT NOTE	

CALC. BOOK NO.	N/A	SDR DATE	12-JUL-2024	TM472
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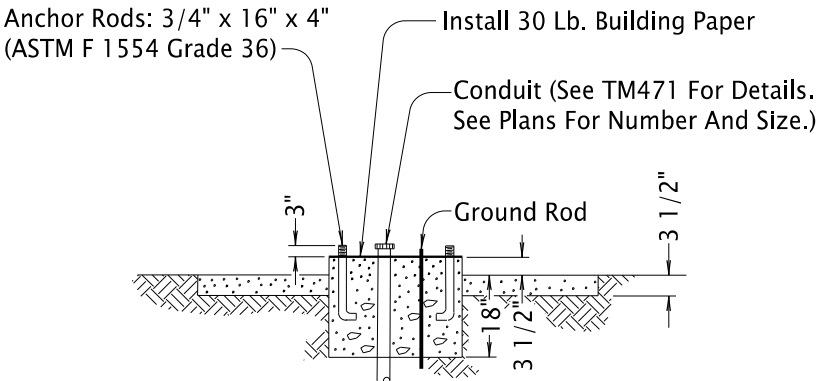
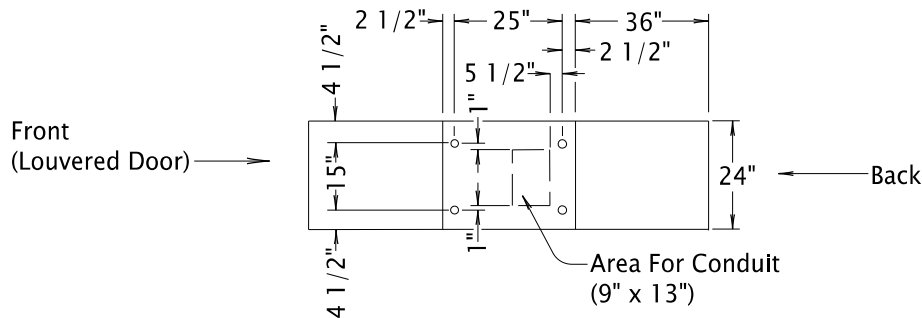




**BASE MOUNTED SERVICE CABINET FOUNDATION**

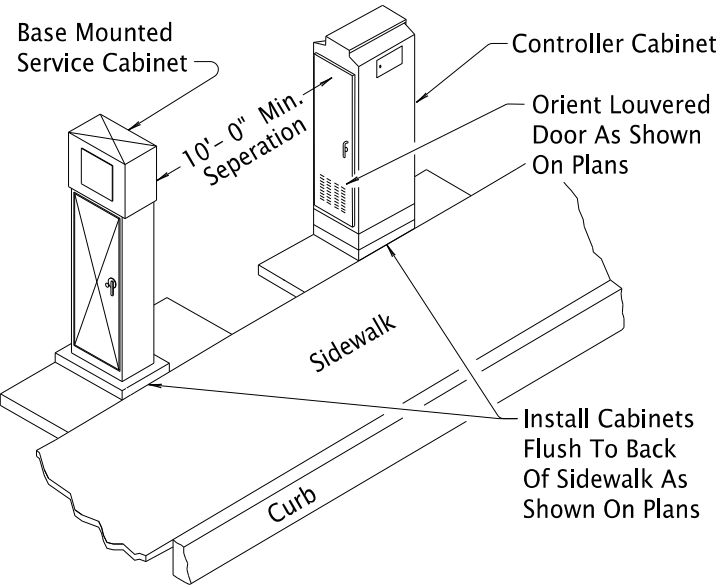


**DETAIL "A"  
RISER FRAME CONNECTION**

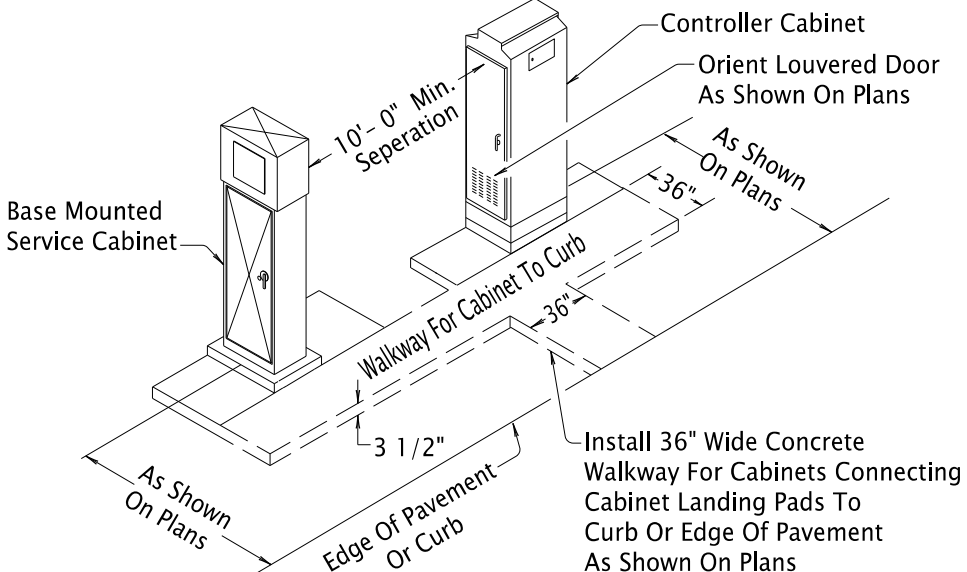


**CONTROLLER CABINET FOUNDATION DETAILS**  
(Model 332S, 332, 334, And 340 Cabinets)

- General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
  2. Bolts And Screws Shall Have Square Or Hex Heads. Allen Fasteners Not Allowed.
  3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.
  4. Provide A 3/4" Chamfer On All Exposed Concrete Edges.



**WITH SIDEWALK**



**WITHOUT SIDEWALK**

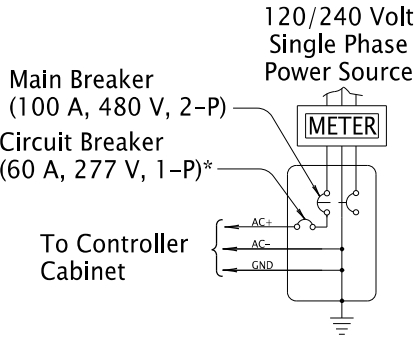
**CABINET FOUNDATION LOCATIONS**

Note: Verify Base Mounted Service Cabinet Location And Meter Placement Is Acceptable To Local Power Company

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 first consulting a Registered Professional Engineer.

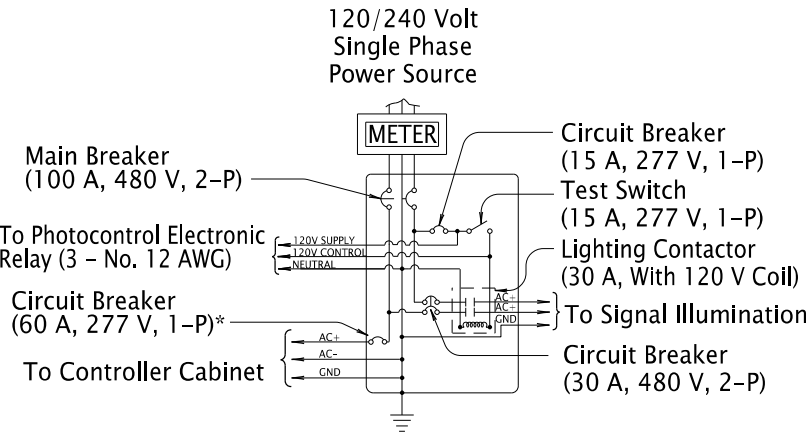
All materials shall be in accordance with the current Oregon Standard Specifications.			
OREGON STANDARD DRAWINGS			
CONTROLLER CABINET & SERVICE CABINET FOUNDATION DETAILS			
2024			
DATE	REVISION DESCRIPTION		
01-2021	UPDATED ALL ANCHOR ROD DETAILS		
CALC. BOOK NO.	N/A	SDR DATE	04-JAN-2021
			TM482

\* When installing the service cabinet for an RRFB use a 20 A, 277 V, 1-P circuit breaker

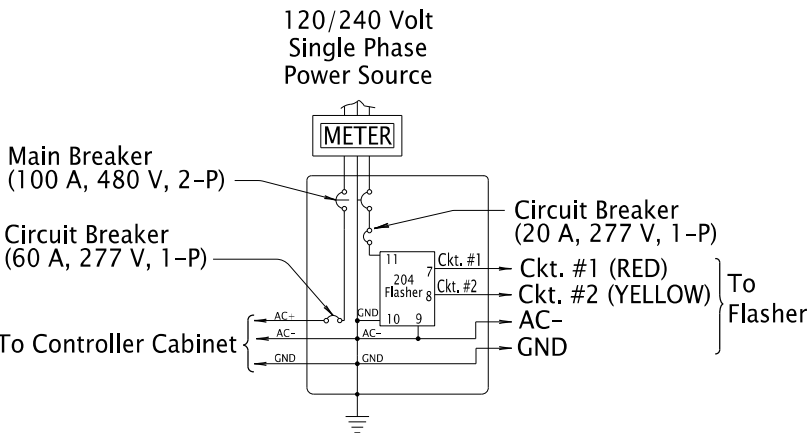


**SERVICE CABINET WIRING:** (BMC SC)  
(Signal System)

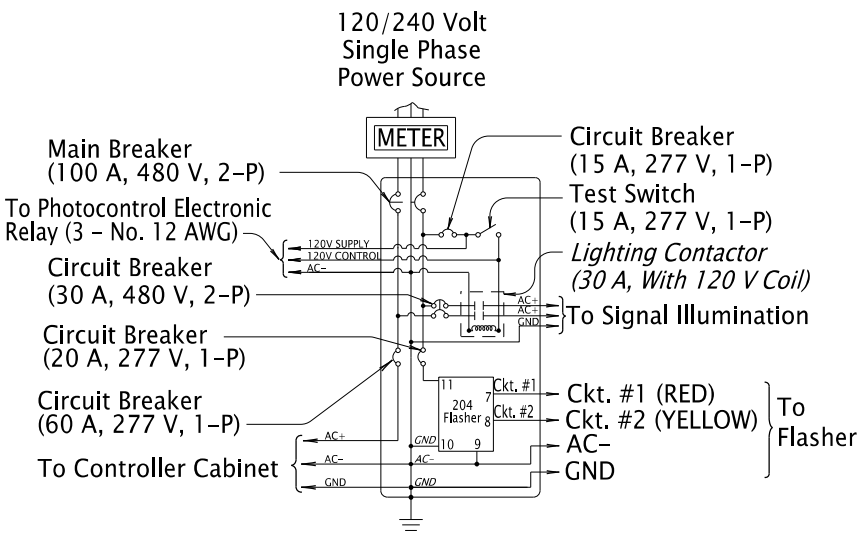
\* When installing the service cabinet for an RRFB use a 20 A, 277 V, 1-P circuit breaker



**SERVICE CABINET WIRING:** (BMCL SCL)  
(Signal + Illumination System)

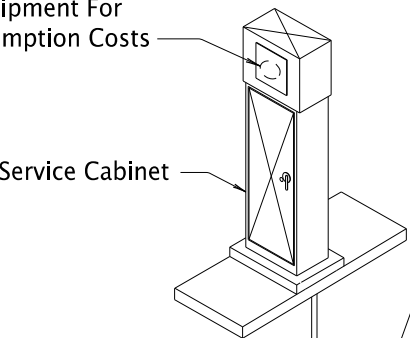


**SERVICE CABINET WIRING:** (BMCF)  
(Signal + Flashing Beacon System)



**SERVICE CABINET WIRING:** (BMC FL)  
(Signal + Flashing Beacon + Illumination System)

Utility Provider To Supply And Install Meter Or Required Equipment For Flat-Rate Power Consumption Costs



Install Utility Conduit As Per The Size, Material, Depth, And Mounting Requirements Of The Utility Provider. Utility Provider To Install Wiring.

To Commercial Power Source. Service Point Shown On Plans Is Approximate Only. Exact Location Shall Be Verified In The Field.

**UTILITY PROVIDER DETAILS**

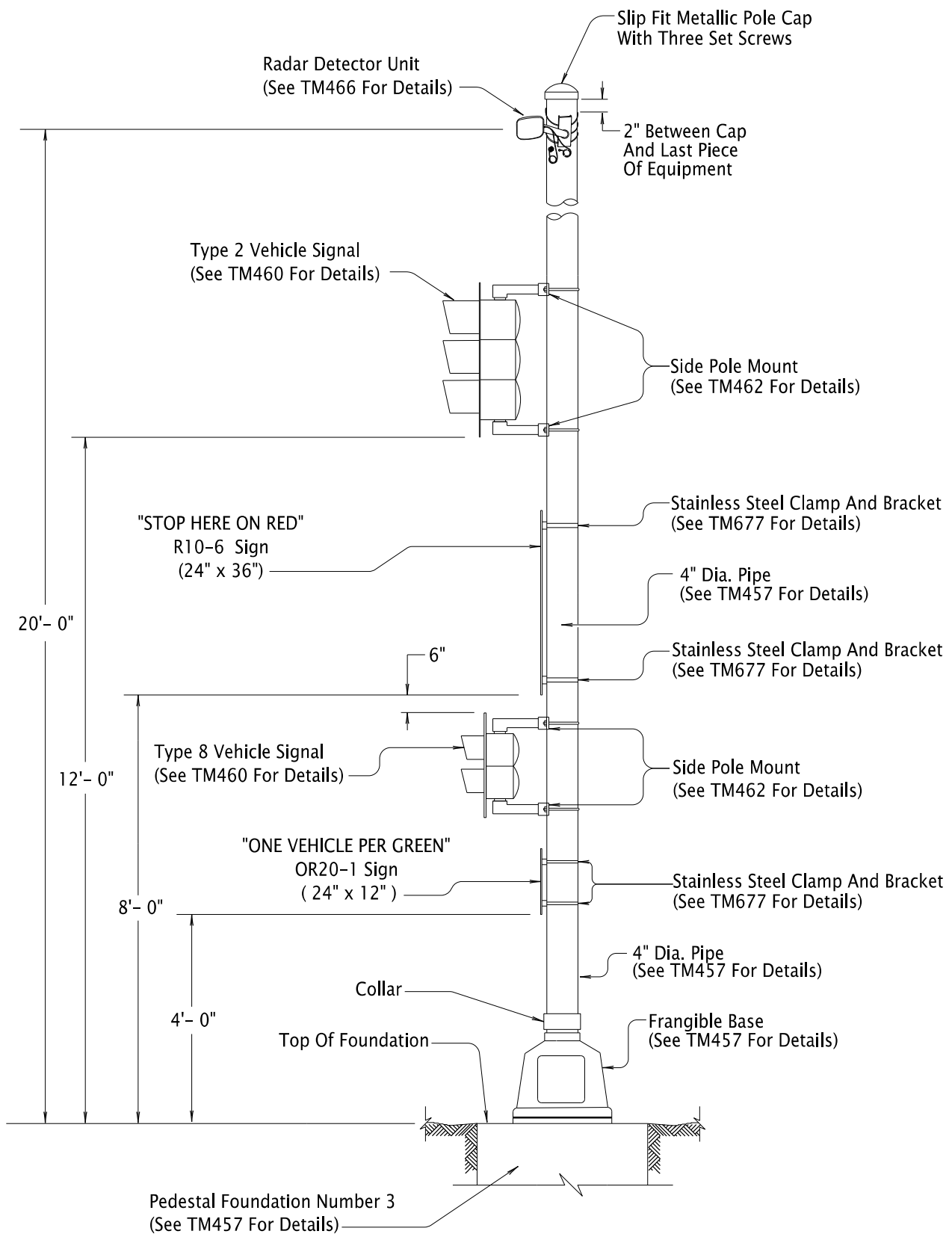
- General Notes:
1. Notify Utility Before Making Any Connections To Utility Poles.
  2. Service Cabinet Shall Have A Solid Copper Neutral Bus And The Number And Size Of Switches Or Circuit Breakers As Shown. Service Cabinet Can Accommodate A Maximum Of 10 Circuit Breakers.
  3. Wiring Connections To The Terminal Screws On The Circuit Breakers And Contactors Shall Make Full Contact Under The Screw Head.
  4. Circuit Breakers Shall Be UL489 Listed, Unenclosed, Molded Case Bolt-On Type With End Conductor Terminals Suitable For Surface Mounting In The Cabinet On A False Back Or Bracket.
  5. Label Circuit Breakers And Equipment With An Engraved Permanent Label On The Dead Front Panel To Indicate The Circuit Controlled.
  6. Fill Out Manufacturer Provided Arc Flash Stickers Using A Permanent Handheld Labeler (Brady IDXPRT with XC-1500-580-WT-BK Tags Or Approved Equal).

*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 first consulting a Registered Professional Engineer.*

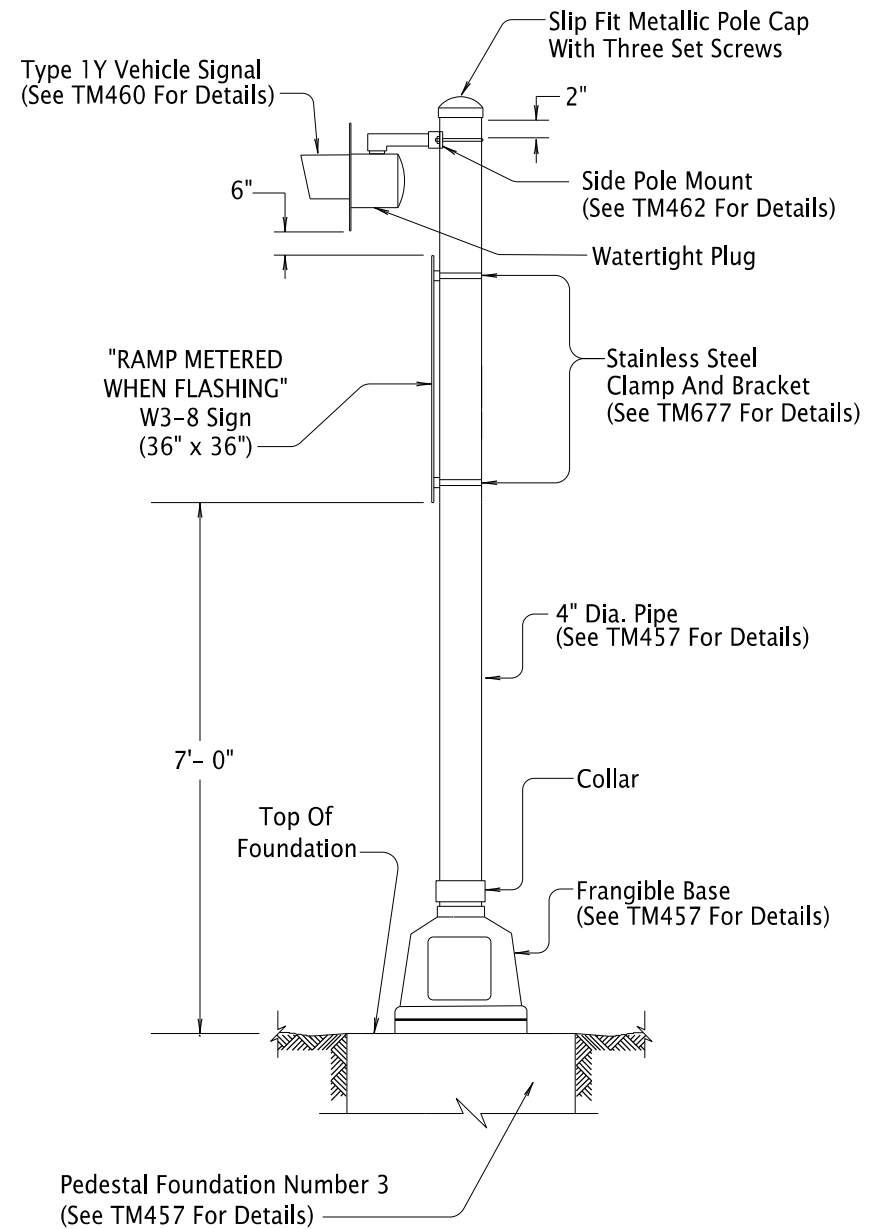
All materials shall be in accordance with the current Oregon Standard Specifications.			
OREGON STANDARD DRAWINGS			
SERVICE CABINET WIRING DETAILS			
2024			
DATE	REVISION DESCRIPTION		
07-2023	REVISED SERVICE CABINET WIRING TITLES, ADDED NOTE 6.		
01-2024	ADDED NOTE FOR RRFB 20 AMP BREAKER IN BMC & BMCL DETAILS		
07-2024	MINOR TEXT REVISIONS FOR UNIFORMITY		
CALC. BOOK NO.    _ _ _ _ N/A _ _ _ _		SDR DATE    12-JUL-2024 _ _	TM485

14-JUL-2023

TM492.dgn



**RAMP METER SIGNAL ASSEMBLY**



**RAMP METER ADVANCE WARNING SIGN ASSEMBLY**

**General Notes:**

- Equipment Shown In the Assembly Details Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
- Do NOT Install Assemblies Within Paved Gore Area.
- Locate Ramp Meter Signal Assembly 25'- 0" Beyond Stop Line Or As 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 first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**

**RAMP METER ASSEMBLIES**

2024

DATE	REVISION	DESCRIPTION
01-2021	REVISED DRAFTING, ADDED RADAR MOUNT REFERENCE, ADDED SLOPED	
		GROUND DETAILS, CHANGED NOTE 2 FROM 10 TO 25 FEET.
01-2022	REFERENCED TM457 FOR ALL PIPE INFO	
07-2022	REVISED TO MATCH TM457 REVISIONS/FORMAT	
07-2023	MINOR TEXT CHANGES FOR CLARITY	
CALC. BOOK NO.	N/A	SDR DATE

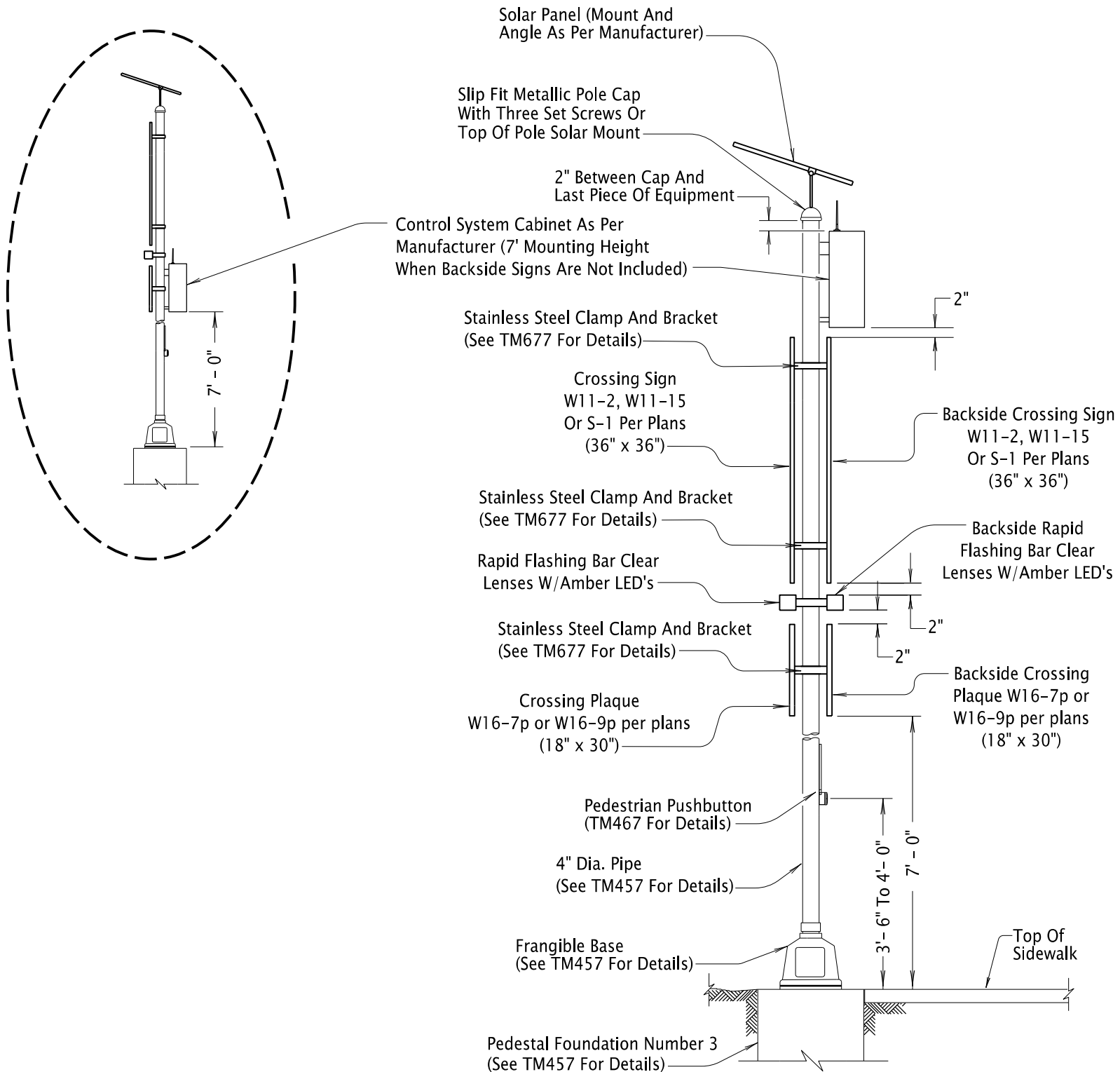
14-JUL-2023

**TM492**

Effective Date: December 1, 2024 – May 31, 2025

14-JUL-2023

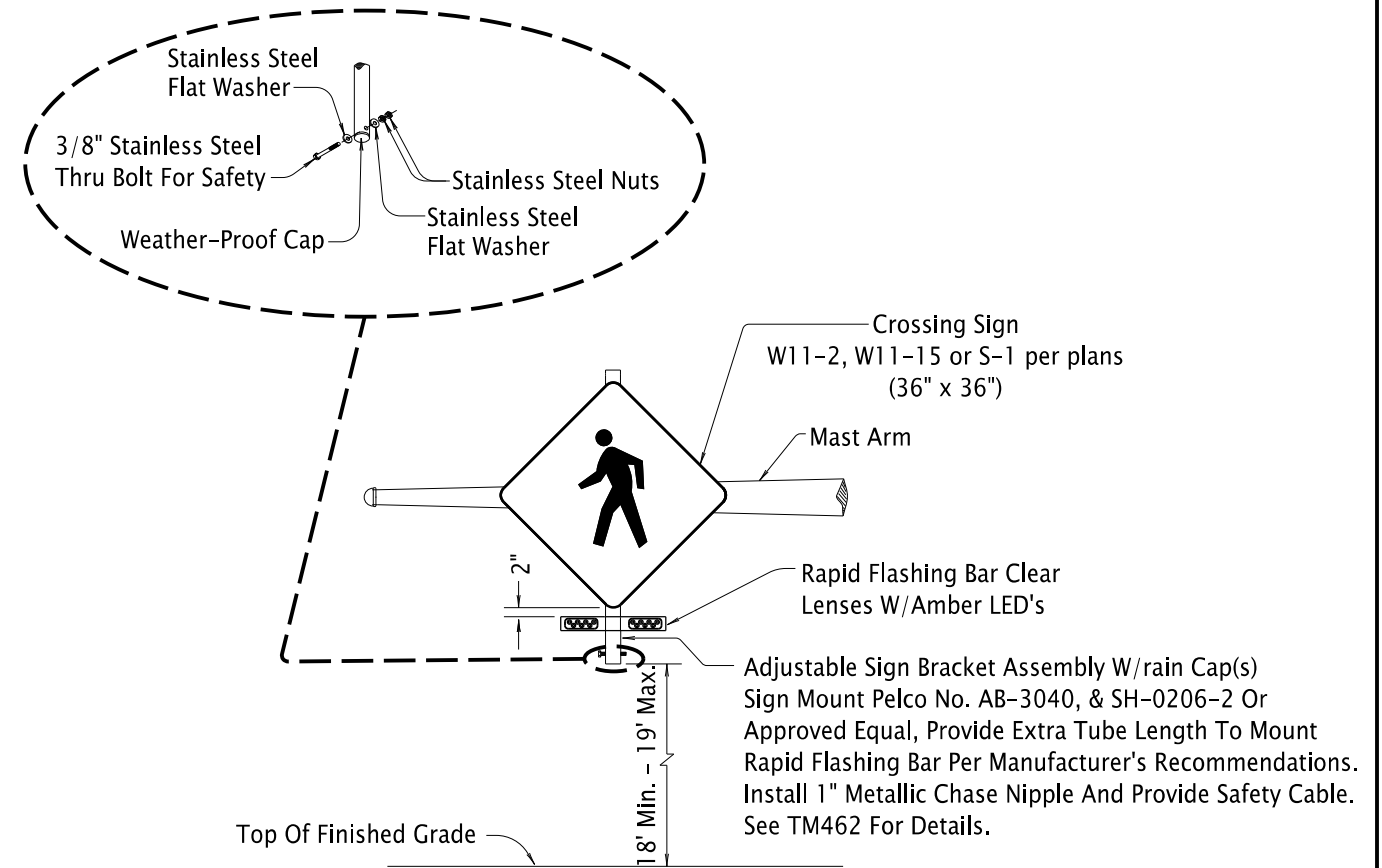
TM493.dgn



Note:

1. Equipment Shown In The Assembly Detail Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
2. Equipment Mounting Details Shown Are Also Applicable When Mounting Equipment To A Large Signal Pole.

### RECTANGULAR RAPID FLASHING BEACON PEDESTAL ASSEMBLY (Use Green Sheet Listed Items Only)



### RECTANGULAR RAPID FLASHING BEACON MAST ARM ASSEMBLY (Use Green Sheet Listed Items Only)

*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 first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.

#### OREGON STANDARD DRAWINGS

### RECTANGULAR RAPID FLASHING BEACON (RRFB) ASSEMBLIES

2024

DATE	REVISION	DESCRIPTION
07-2022	NEW DRAWING	
07-2023	MINOR TEXT CHANGES FOR CLARITY	

CALC. BOOK NO.	N/A	SDR DATE	14-JUL-2023	TM493
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Effective Date: December 1, 2024 – May 31, 2025





06-JAN-2023  
TM651.dgn

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  $G = 1.14$ ,  $I_r = 1.0$  (50 year 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 milepoints 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 percent 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, Supplementary Requirement "S2" that include grade and manufacturer's identification.

8. High strength bolts shall conform to ASTM F3125 Grade A325 Type 1.

9. Nuts for high strength bolts shall be heavy hex and conform to ASTM A563 Grade DH with supplementary 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 percent or 0.15 to 0.25 percent.

15. Footing concrete shall be Commercial Grade Concrete ( $f_c=3000$  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.

16. Reinforcing steel shall conform to AASHTO M31, Grade 60 (ASTM A615 or A706). A minimum 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 percent of the pole length. Computed dead load deflection of the poles shall be limited to 1 percent 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 percent of the signal arm length. Luminaire arms and pole extensions to support luminaire arms shall meet requirements of standard 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 inches of a circumferential 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 1/2" UNC x 1 1/2" Type 308, 309 or 310 threaded stainless steel weld studs.

21. Assemble support, tighten anchor bolts, tighten HS thru bolts and tighten HS bolts in tapped holes according to 00962.46(j)(2).

22. Round and smooth all edges along electrical way.

23. 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 (Unfactored)								
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

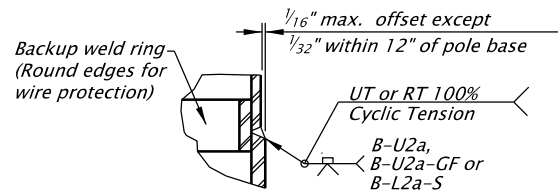
Standard Maximum Mast Arm Reactions						
Signal Pole Type	Signal Arm Lengths	Wind Load Case II			Controlling Fatigue	
		Axial (Kips)	Shear (Kips)	Moment (Kip-ft)	Shear (Kips)	Moment (Kip-ft)
SM1, SM1L	15'	0.06	1.98	18.44	0.23	2.18
SM2, SM2L	20', 25'	0.10	3.14	46.20	0.37	5.48
SM3, SM3L	30', 35'	0.15	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

Accompanied by drawings TM650, TM652, TM653, TM654

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 first consulting a Registered Professional Engineer.	All materials shall be in accordance with the current Oregon Standard Specifications.				
	OREGON STANDARD DRAWINGS				
	TRAFFIC SIGNAL SUPPORTS NOTES AND REACTIONS				
	2024				
	DATE	REVISION DESCRIPTION			
	07-2020	ADDED ACCOMPANIED BY STANDARD DRAWING TM654			
	07-2021	ADDED "(UNFACTORED)" TO THE TABLE HEADING			
	01-2023	CHANGED HIGH STRENGTH BOLT TIGHTENING TO 00962.46(j)(2)			
	CALC. BOOK NO.	5301	SDR DATE	06-JAN-2023	TM651

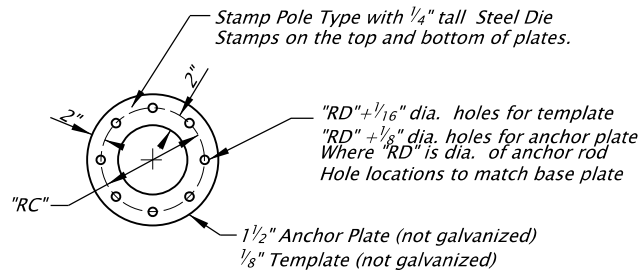
Effective Date: December 1, 2024 – May 31, 2025



### POLE AND ARM SPLICE

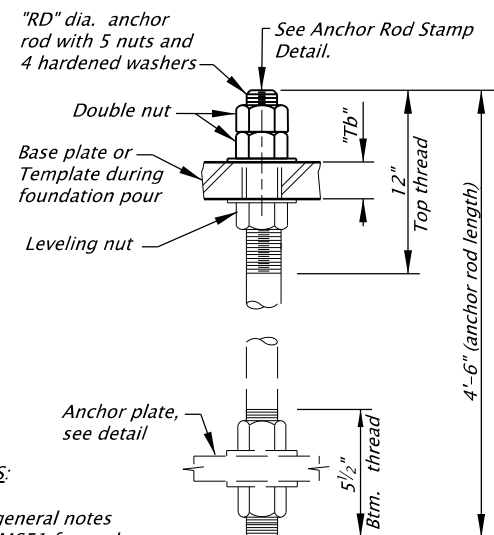
#### WELD DETAILS

No Scale



### ANCHOR PLATE AND TEMPLATE DETAIL

No Scale



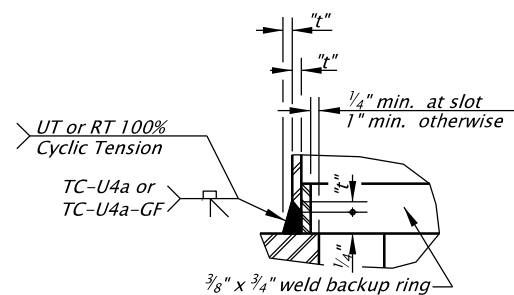
#### NOTES:

- See general notes on TM651 for anchor rod tightening.
- Tb determined by manufacturer.

### ANCHOR ROD DETAIL

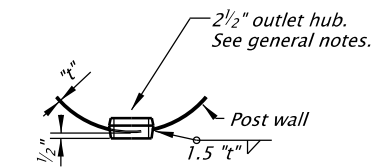
No Scale

Anchor Rods and Base Plate Data		
Mastarm Pole Type	RD Rod Diam.	RC Rod Circle
SM1	1 1/4"	16 1/2"
SM2, SM1L	1 1/2"	17"
SM3, SM2L	1 1/2"	20"
SM4, SM3L	1 3/4"	22"
SM5, SM4L	1 3/4"	23"
SM5L	2"	23 1/2"



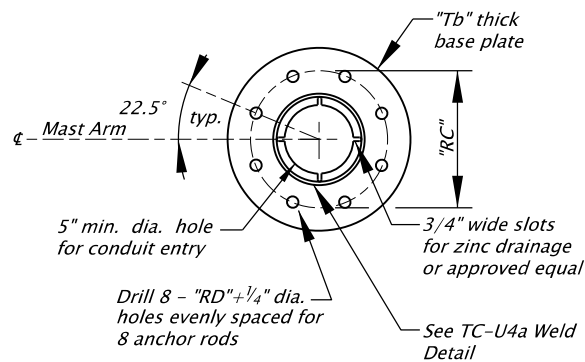
### TC-U4a WELD DETAIL

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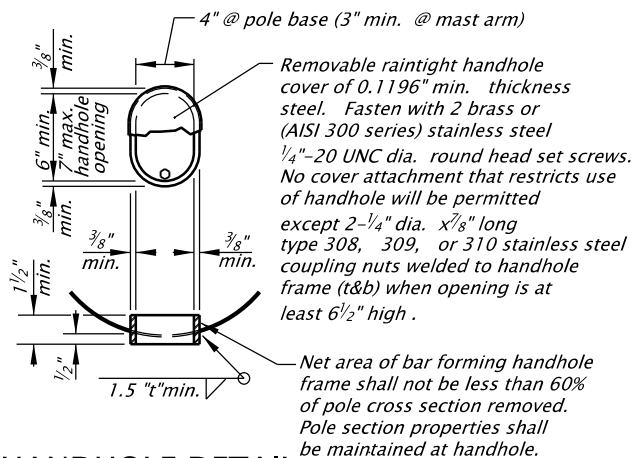
### HUB WELD DETAIL

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### PLAN - BASE PLATE

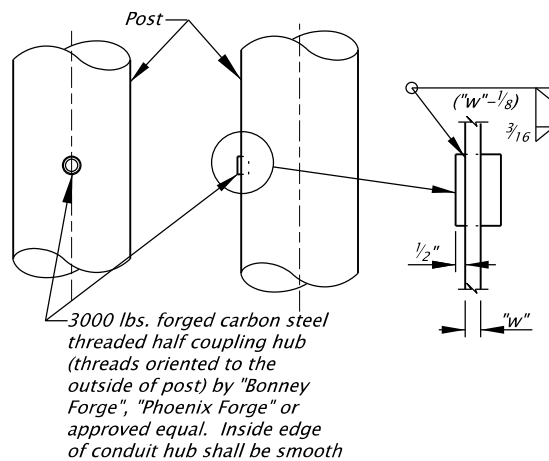
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### HANDHOLE DETAIL

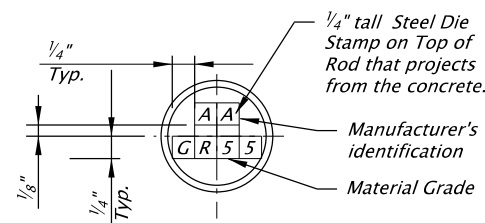
No Scale

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"



### HUB WELD DETAIL

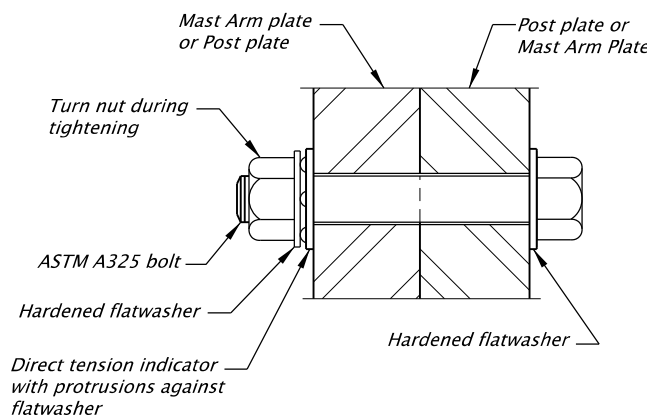
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Note: The end of each anchor rod shall be color coded yellow.

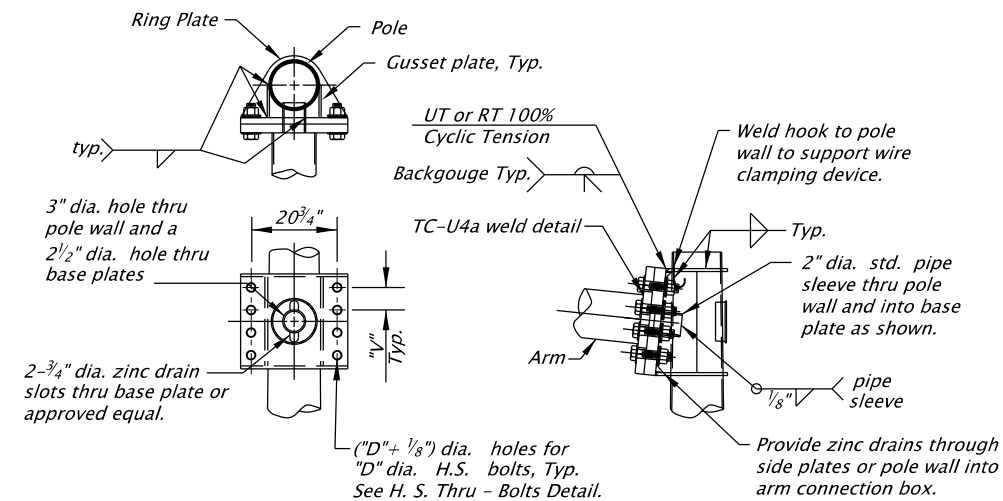
### ANCHOR ROD STAMP DETAIL

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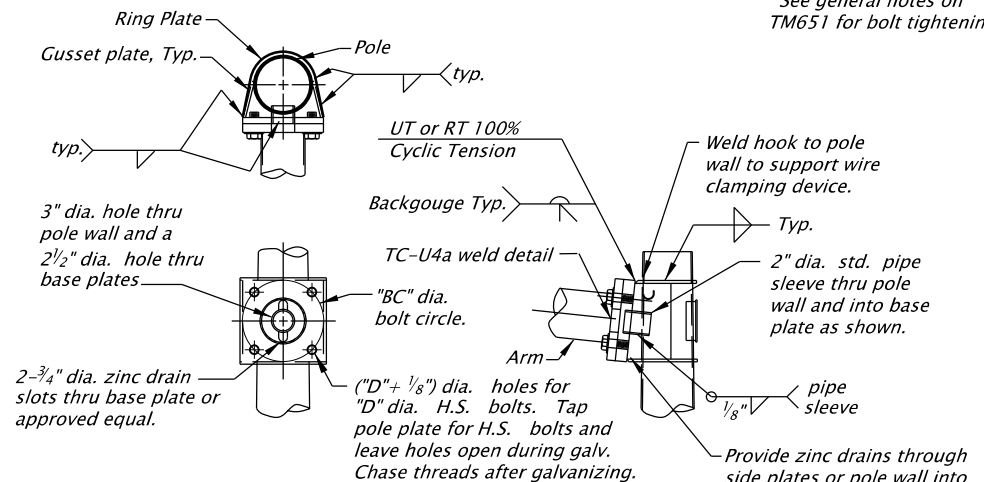
### H.S. THRU - BOLTS

No Scale



### 8 BOLT ARM CONNECTION DETAILS

No Scale



### 4 BOLT ARM CONNECTION DETAILS

No Scale

Accompanied by dwgs. TM650, TM651, TM653, TM654

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

### OREGON STANDARD DRAWINGS

### TRAFFIC SIGNAL SUPPORTS STEEL DETAILS

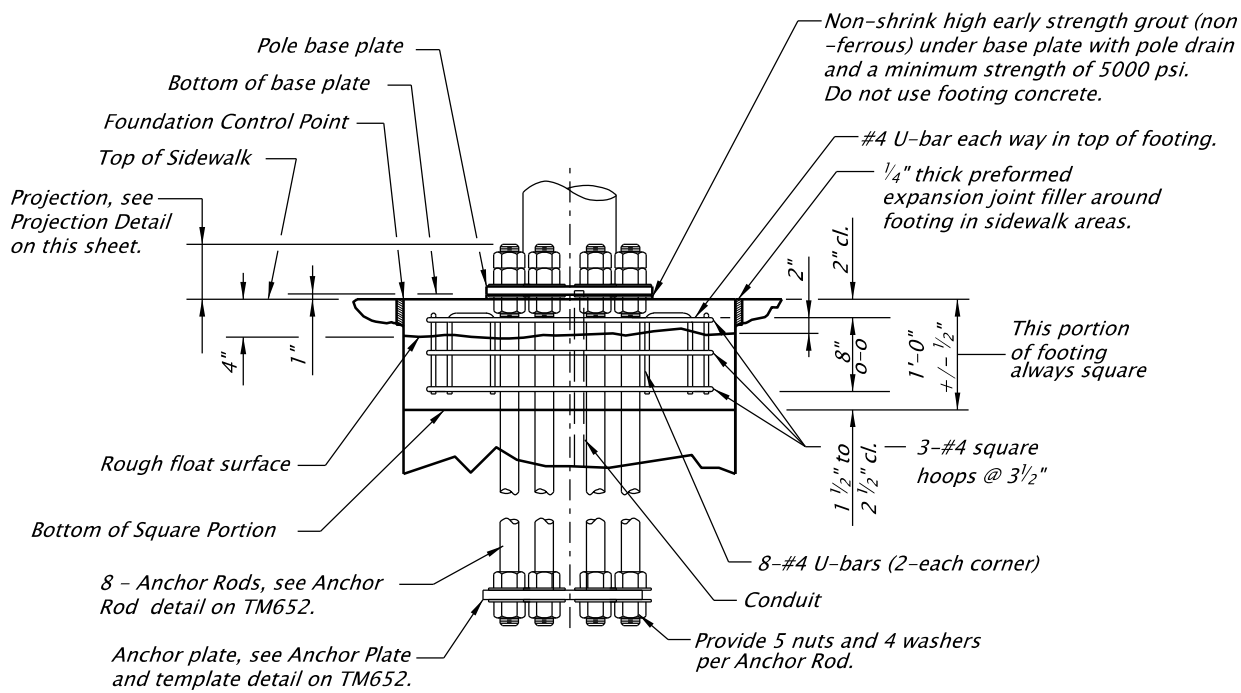
2024

DATE	REVISION	DESCRIPTION
07-2020	ADDED	ACCOMPANIED BY DRAWING TM654
01-2024	REMOVED	STRAIN POLE TYPES FROM TABLE
CALC. BOOK NO.	5301	SDR DATE- 19-JAN-2024

TM652

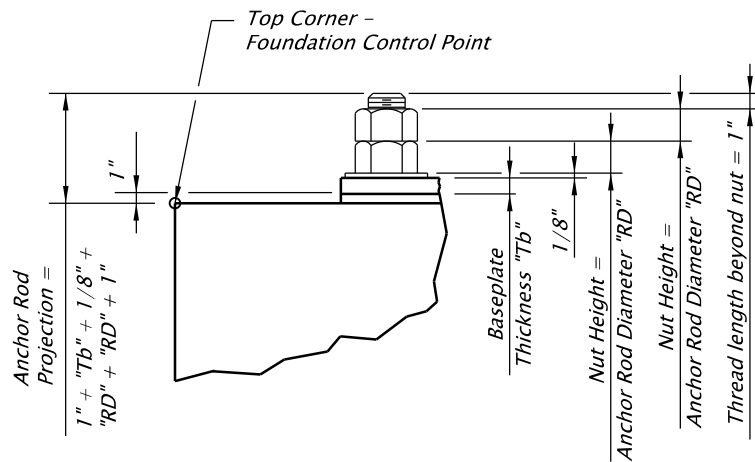
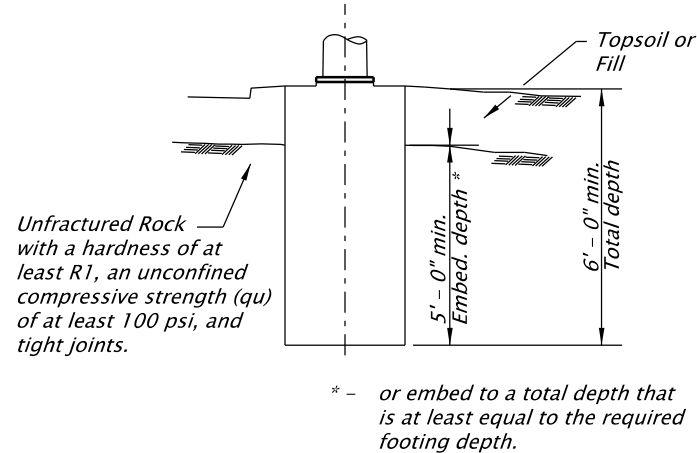
Effective Date: December 1, 2024 – May 31, 2025

Standard Foundations					
Foundation Number	Mastarm 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	36"	8-#8	#4 at 6"	18"
4	SM4, SM3L	42"	10-#8	#5 at 6"	21"
5	SM5, SM4L	42"	10-#9	#5 at 6"	21"
6	SM5L	42"	10-#9	#5 at 6"	21"

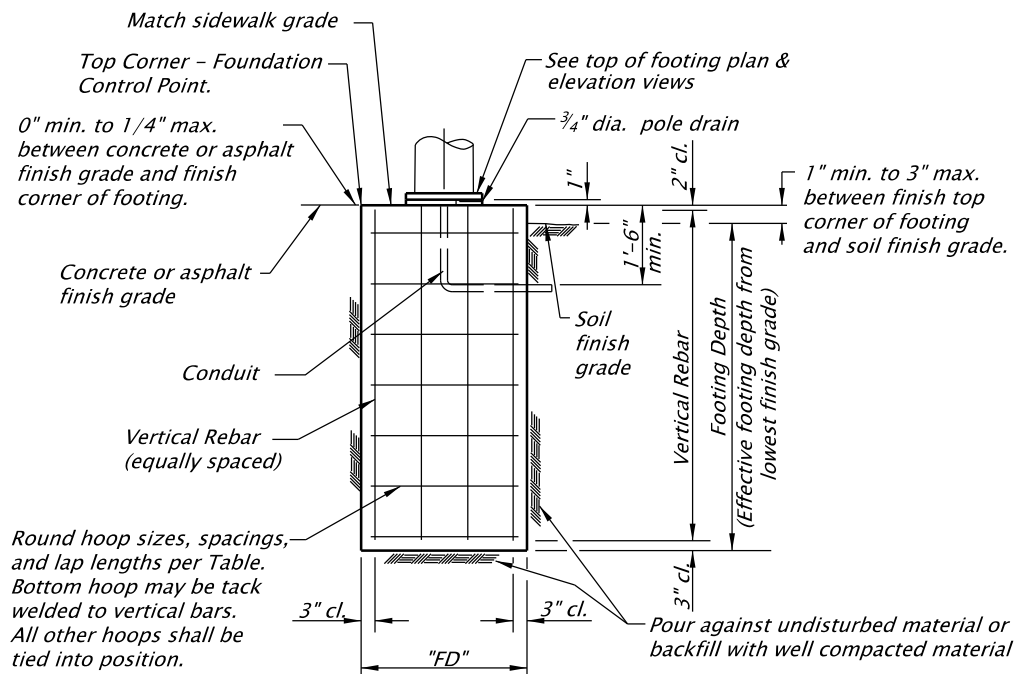


**ELEVATION - TOP OF FOOTING**  
No Scale

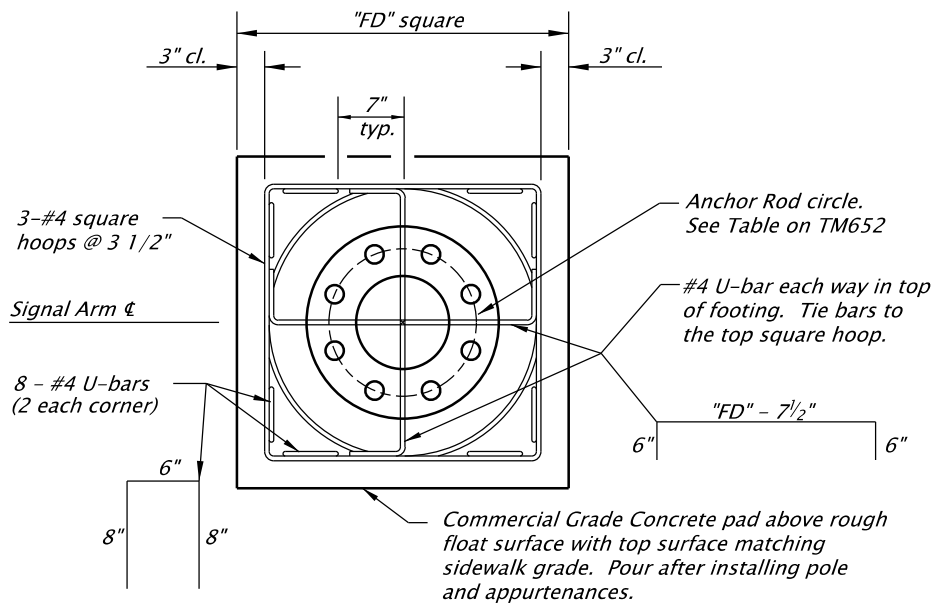
**ROCK INSTALLATION REQUIREMENTS**  
No Scale



**PROJECTION DETAIL**  
No Scale



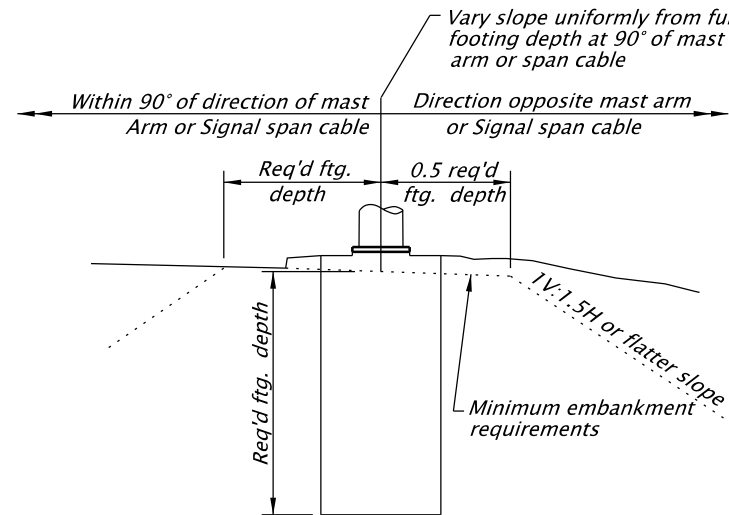
**TYPICAL FOOTING ELEVATION**  
No Scale



**PLAN - TOP OF FOOTING**  
No Scale

**NOTES:**

See TM651 for general notes.  
The pier torsional forces have been designed according to the ACI 318.



**MINIMUM EMBANKMENT REQUIREMENTS**  
No Scale

Accompanied by dwgs. TM650, TM651, TM652, TM654

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**

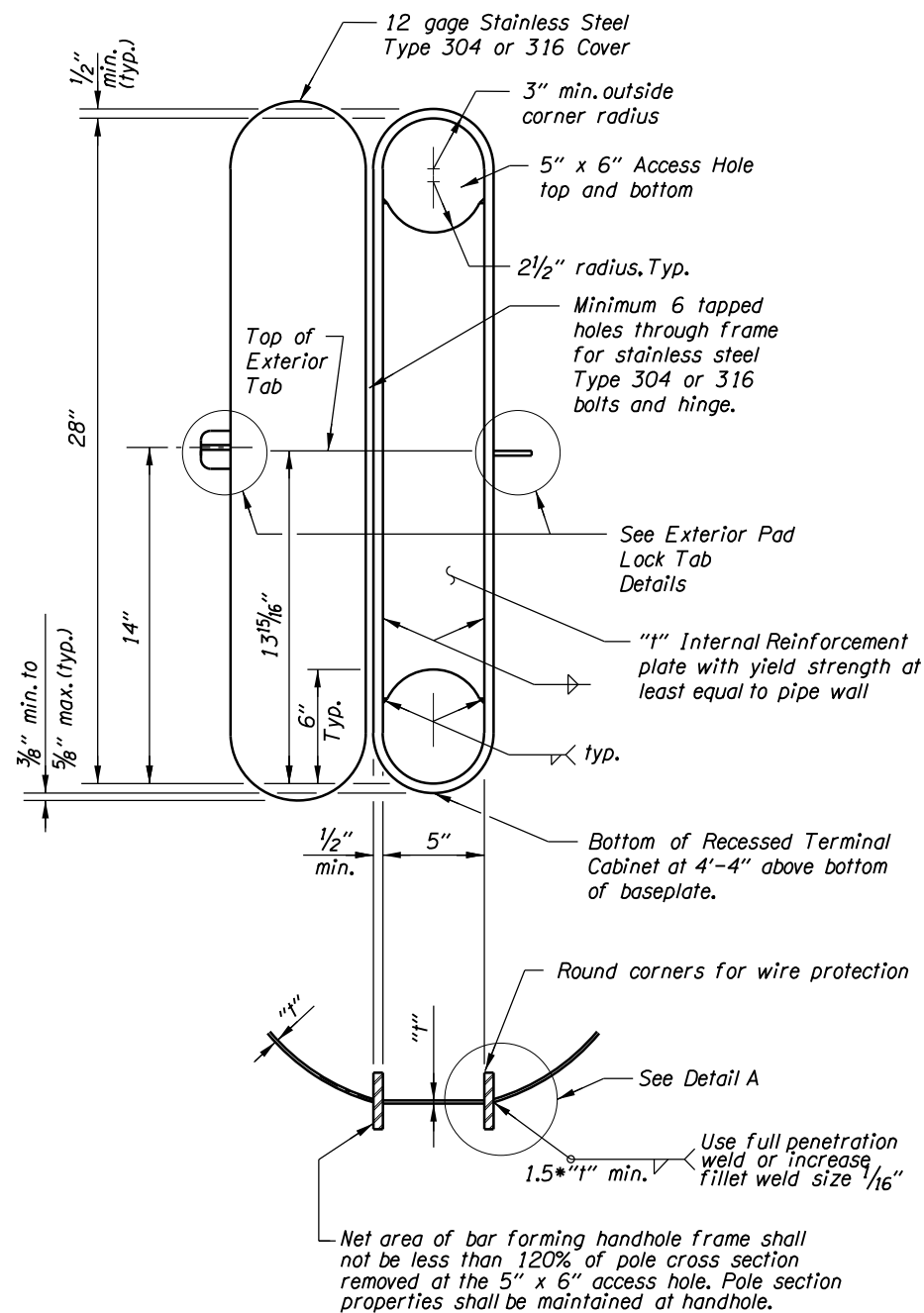
**TRAFFIC SIGNAL SUPPORTS  
FOUNDATION REQUIREMENTS**

2024

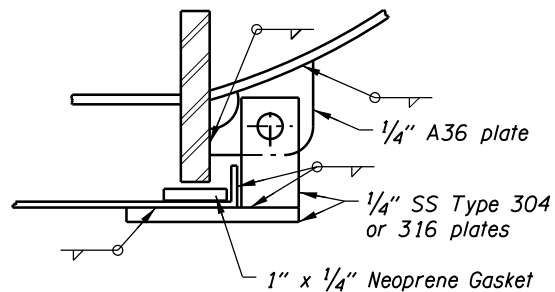
DATE	REVISION	DESCRIPTION
07-2020	ADDED	ACCOMPANIED BY DRAWING TM654
CALC. BOOK NO.	5323	SDR DATE
		10-JUL-2020

**TM653**

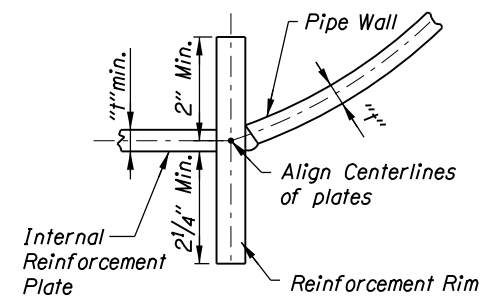
Effective Date: December 1, 2024 – May 31, 2025

RECESSED TERMINAL CABINET DETAIL

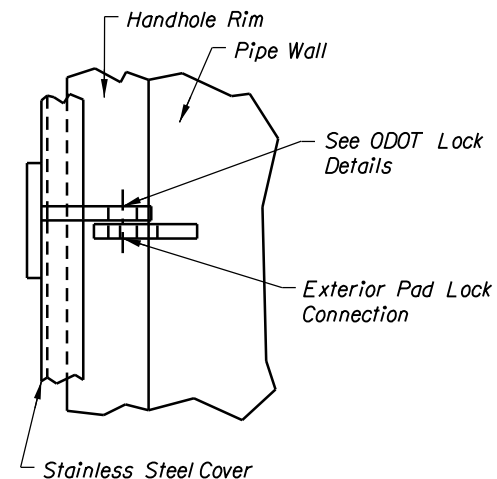
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SECTION A-A

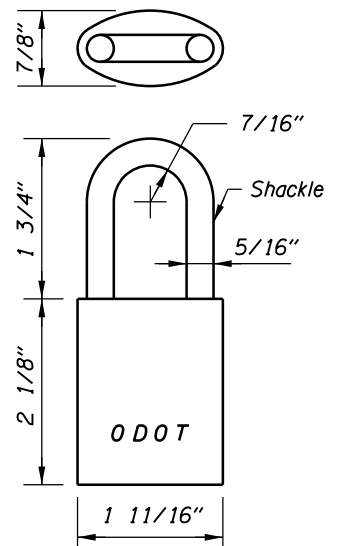
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DETAIL A

No scale

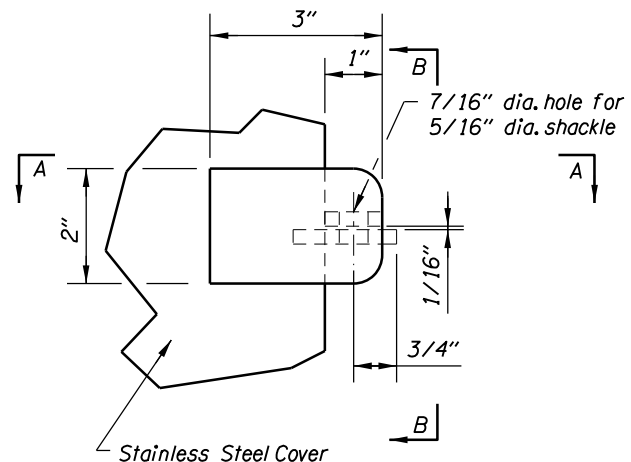
SECTION B-B

No scale

ODOT LOCK DETAILS

No scale

(ODOT Supplied Post Construction)

EXTERIOR PAD LOCK DETAILS

No scale

Accompanied by dwgs. TM650, TM651, TM652, TM653, TM655, TM656, TM657, TM658, TM679

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS****TRAFFIC SIGNAL POLE  
RECESSED TERMINAL CABINET**

2024

DATE	REVISION	DESCRIPTION
07-2020	DRAWING CREATED	

CALC. BOOK NO.	5301	SDR DATE	10-JUL-2020	TM654
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Effective Date: December 1, 2024 – May 31, 2025





## GENERAL NOTES

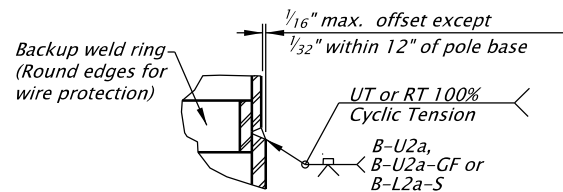
1. Signal supports shall be designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals LRFD 1st edition with 2017 and 2018 interim revisions.
2. All traffic signal supports shall conform to the design criteria and details shown on these drawings except as approved by the Engineer.
3. The design basic wind speed (3 second gust) shall be 145 mph, gust factor  $G = 1.14$ , 50 year recurrence, Fatigue Category I, no galloping, and truck speed = 65 mph.
4. The design service basic wind speed (3 second gust) shall be 91 mph.
5. Signal poles from this standard are not allowed over highways I-5, I-84, I-205, I-405, US 26 (Sunset Hwy) between milepoints 64.3 - 73.0, I-105, and I-82.
6. Pole and arm shafts must be round. Dimensional tolerances of ASTM A595 shall apply to all tapered steel tubing members. Additionally, the diameter of round tapered steel tubing members shall not vary more than 2 percent from specified dimension. Two ply and fluted poles or arms are not permitted.
7. Pole taper shall be equal to .0117 in/in.
8. Anchor rods shall conform to ASTM Specification F1554 Gr. 55, Supplementary Requirement "S2" that include grade and manufacturer's identification.
9. High strength bolts shall conform to ASTM F3125 Grade A325 Type 1.
10. Nuts for high strength bolts shall be heavy hex and conform to ASTM A563 Grade DH with supplementary requirements "S1" and "S2".
11. Hardened steel washers shall conform to ASTM F436 Type 1.
12. Direct Tension Indicators (DTI) shall be the compressible-washer type, mechanically galvanized, conforming to ASTM F959.
13. 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.
14. All structural steel including fasteners shall be hot-dip galvanized after fabrication unless otherwise noted.
15. Galvanize-Control Silicon, typical. Silicon content of the base metal shall be in the range of 0 to 0.06 percent or 0.13 percent to 0.25 percent.
16. Footing concrete shall be according to TM628.
17. Reinforcing steel shall conform to AASHTO M31, Grade 60 (ASTM A615 or A706). A minimum lap splice length of 32 bar diameters shall be used unless shown otherwise.
18. Computed deflection of these poles at full design loading shall be limited to 5 percent of the pole length. Computed dead load deflection of the poles shall be limited to 1 percent of the pole length. Rake pole, apply mast arm and appurtenance loads, and verify final pole position is plumb.
19. Luminaire arms and pole extensions to support luminaire arms shall meet requirements of drawing TM629.
20. 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.
21. Longitudinal seam welds within 6 inches of a circumferential 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.
22. Grounding terminal shall be  $\frac{1}{2}$ " UNC x  $1\frac{1}{2}$ " Type 308, 309 or 310 threaded stainless steel weld studs.
23. Assemble support, tighten anchor bolts, tighten HS thru bolts, and tighten HS bolts in tapped holes according to 00962.46(j)(2).
24. Round and smooth all edges along electrical way.

	Reaction At Base Plate (Factored)				Reaction At Base Plate (Service)			
Signal Pole Type	Axial (lb)	Shear (lb)	Moment (ft-lb)	Torsion (ft-lb)	Axial (lb)	Shear (lb)	Moment (ft-lb)	Torsion (ft-lb)
SM6L	7,430	13,000	301,000	322,000	6,520	5,200	163,000	127,000
SM7L	8,860	13,100	349,000	385,500	8,080	5,190	212,720	153,000

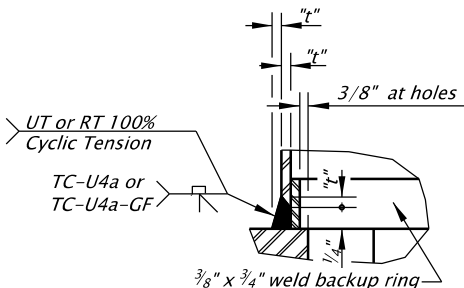
*Note:  
The base plate reactions shown in the table are worst case Extreme I and Service I loads. Engineer of Record to specify shaft depth and confirm shaft design for local soil conditions based on a site specific geotechnical study and loads shown in table. If shaft size or reinforcement shown in the table on TM628 for the required design number are not adequate for local soil conditions, Engineer of Record must adjust the shaft design accordingly.*

Accompanied by drawings TM628, TM654, TM655, TM657, TM658

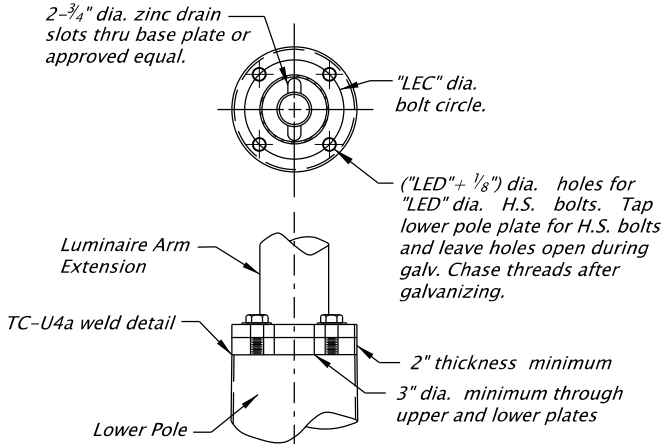
<p><i>The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.</i></p>	All materials shall be in accordance with the current Oregon Standard Specifications.		
	<b>OREGON STANDARD DRAWINGS</b>		
	<b>TRAFFIC SIGNAL 60' THROUGH 75'</b>		
	<b>MAST ARM SUPPORTS</b>		
	<b>NOTES AND REACTIONS</b>		
	2024		
DATE	REVISION DESCRIPTION		
07-2020	ADDED ACCOMPANIED BY STANDARD DRAWING TM654		
07-2022	ADDED REACTIONS TO TITLE AND ADDED REACTIONS TABLE		
01/2023	CHANGED HIGH STRENGTH BOLT TIGHTENING TO 00962.46(J)(2)		
CALC. BOOK NO. _ _ _ _ 7088 _ _ _ _	SDR DATE_ 06-JAN-2023 _ _ _ _	TM656	



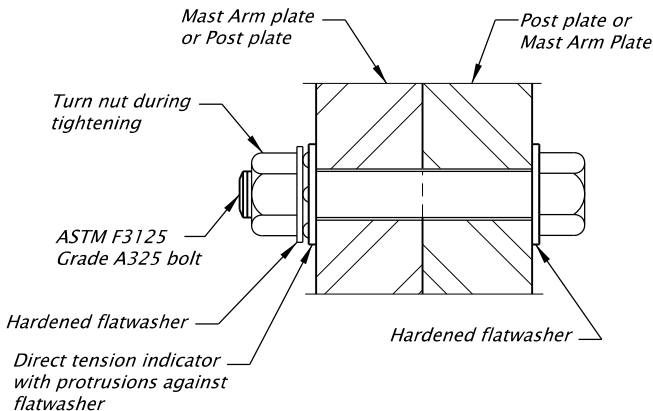
**POLE AND ARM SPLICE WELD DETAILS**  
No Scale



**TC-U4a WELD DETAIL**  
No Scale

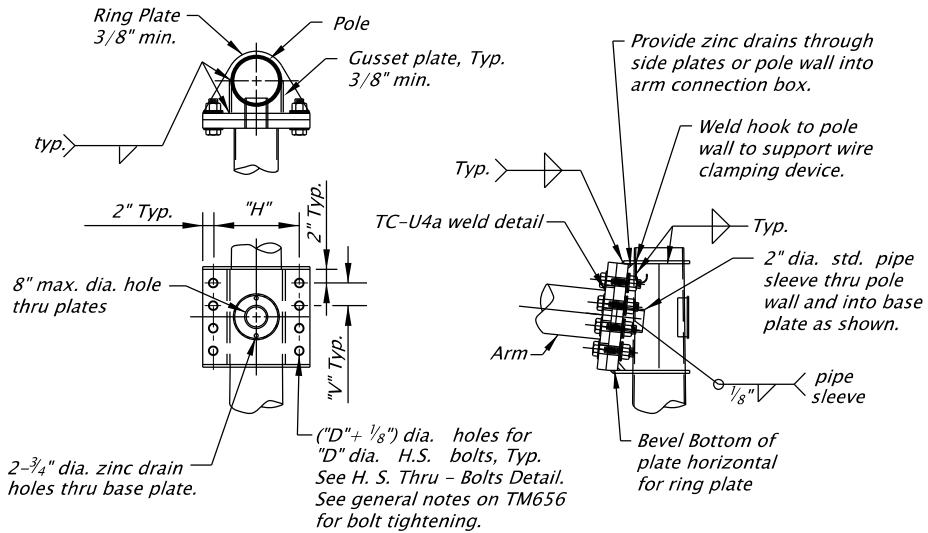


**4 BOLT POLE CONNECTION DETAILS**  
No Scale

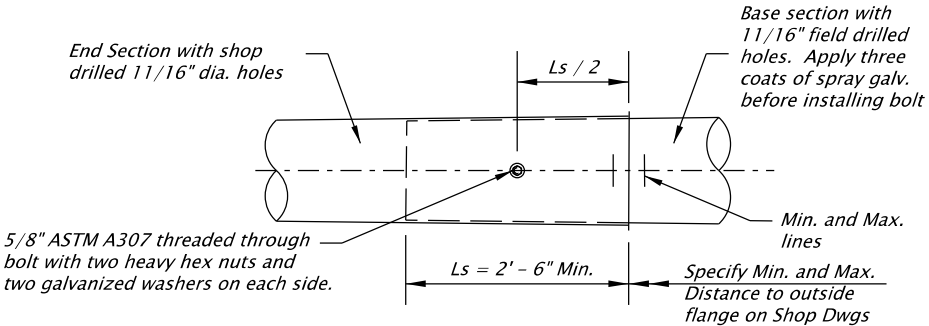


**H.S. THRU - BOLTS**  
No Scale

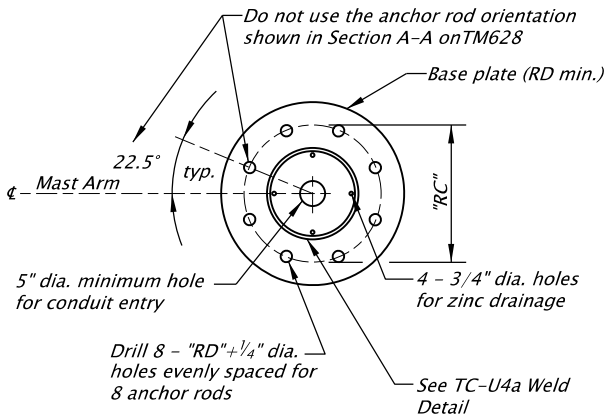
Mastarm Pole Type	Anchor Rod			Arm Connection			Luminaire Arm Extension Connection	
	RD Rod Diam.	RC Rod Circle	"PR"	"D"	"H"	"V"	LED Bolt Diam.	LEC Bolt Circle
SM6L	2"	28"	9"	1 1/2"	24"	8"	1"	12"
SM7L	2"	30"	9"	1 1/2"	27"	9"	1"	12"



**8 BOLT ARM CONNECTION DETAILS**  
No Scale



**MAST ARM SLIP-JOINT SPLICE DETAILS**  
No Scale



**PLAN - BASE PLATE**  
No Scale

Accompanied by dwgs. TM654, TM655, TM656, TM658, TM628

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

**OREGON STANDARD DRAWINGS**

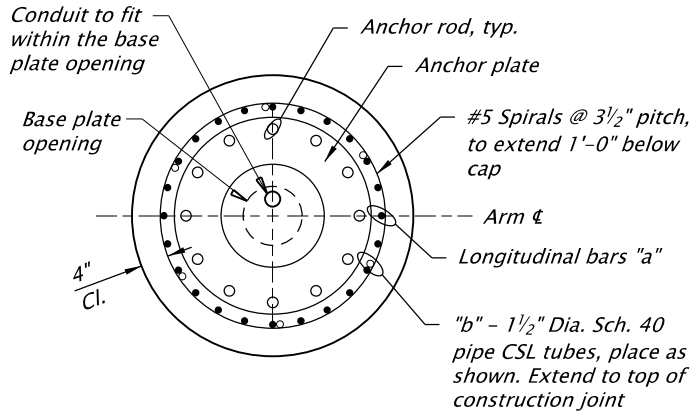
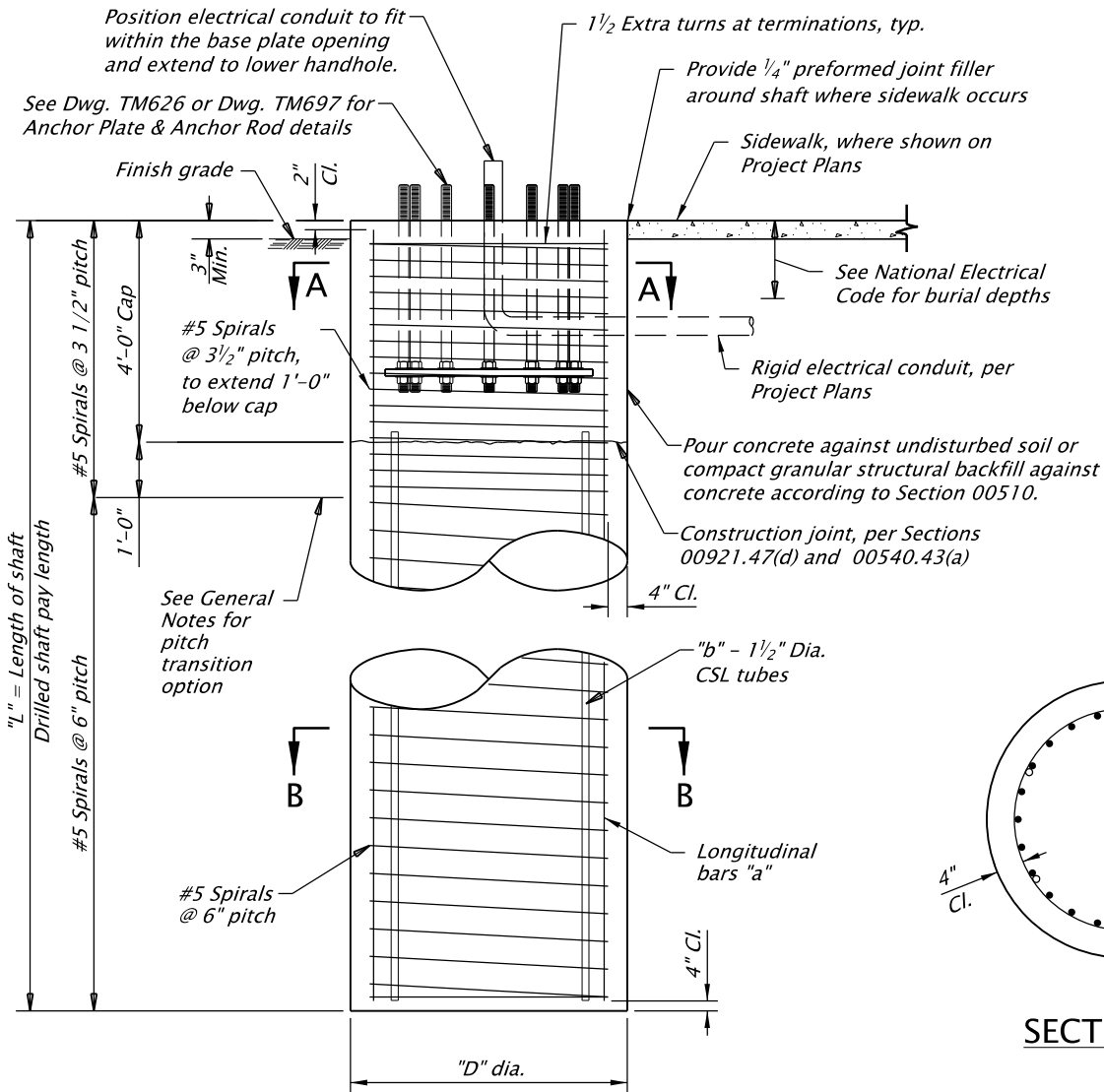
**TRAFFIC SIGNAL 60' THROUGH 75' MAST ARM SUPPORTS STEEL DETAILS (SH. 1)**

2024

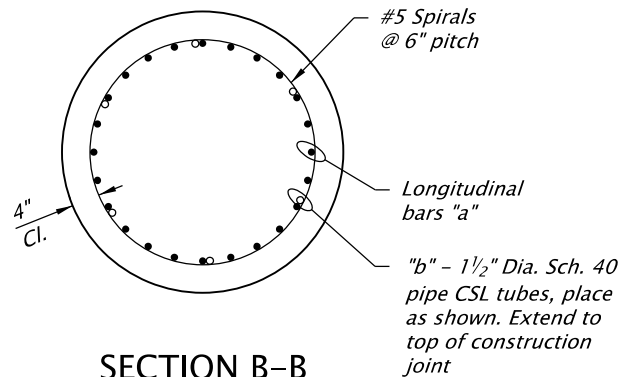
DATE	REVISION	DESCRIPTION
07-2020	ADDED	ACCOMPANIED BY DRAWING TM654

CALC. BOOK NO.	7088	SDR DATE	10-JUL-2020	TM657
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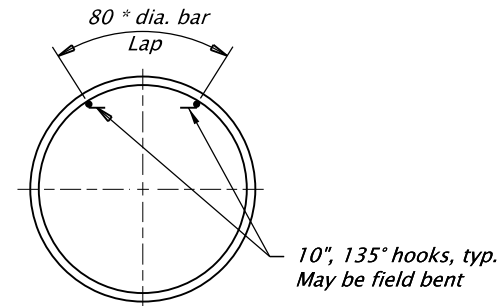




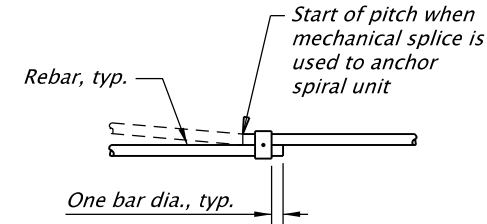
SECTION A-A



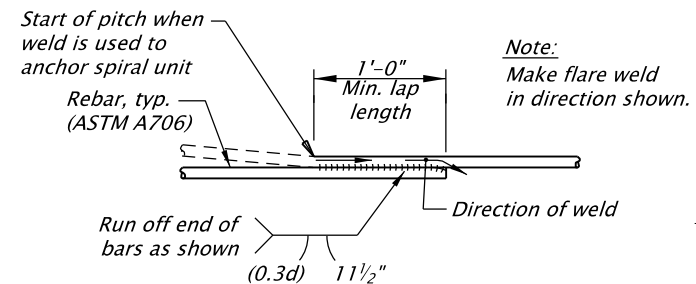
SECTION B-B



LAPPED SPLICE



MECHANICAL SPLICE  
(Not allowed for ASTM A82 spirals)



WELDED SPLICE

SPIRAL SPLICE DETAIL  
No Scale

## GENERAL NOTES:

Use ASTM A706 for all welded splices, except ASTM A615 Grade 60, ASTM A82 or ASTM A496 may be used if copies of the chemical composition analysis are submitted and approved as weldable by the Engineer.

Anchor spirals at each end or discontinuity with one extra turn and a splice to itself as shown. Where permitted on plans, provide closed hoops conforming to the requirements of this detail.

Securely tie CSL tubes to reinforcement.

Use temporary casing as required. Permanent casing not permitted.

Cap concrete shall be Class 3600 - 3/4" commercial grade, classified as a structural item. Remainder of shaft shall be Class 4000 - 3/8" without air entrainment and with 8 1/2" ± 1 1/2" slump.

Contractor shall field verify elevations prior to installation.

The transition between the 3 1/2" to 6" pitches may use two separate spiral cages with 1 1/2" horizontal turns at the start and end of each cage and the lapped splice details between the cages.

**Note:**  
The base plate reactions shown in the table are worst case Extreme I and Service I loads. Engineer of Record to specify shaft depth and confirm shaft design for local soil conditions based on a site specific geotechnical study and loads shown in table. If shaft size or reinforcement shown in table are not adequate for local soil conditions, Engineer of Record must adjust the shaft design accordingly.

The shafts designs shown in table were based on an analysis to encompass worst case soil conditions by applying Extreme I loads to the top of shaft and analyzing below ground shaft forces using Brom's method for two different soil types. The assumed cohesive soil minimum undrained shear strength, *c*, is 600 psf. The assumed non-cohesive soil friction angle is 25 degrees and bulk weight is 100 pcf.

## DRILLED SHAFT DETAILS

No Scale

Monotube Cantilever Design No.	Monotube VMS/Sign Bridge Design No.	Reinf. Steel	Shaft Dia.	No. of CSL Tubes	Reaction At Base Plate (Factored)				Reaction At Base Plate (Service)			
					Axial (lb)	Shear (lb)	Moment (ft-lb)	Torsion (ft-lb)	Axial (lb)	Shear (lb)	Moment (ft-lb)	Torsion (ft-lb)
		"a"	"D"	"b"								
1	-	30 - #9	5'-0"	6	22,600	26,200	839,000	672,000	20,500	10,100	384,000	259,000
2	-	30 - #9	5'-0"	6	28,100	20,000	784,200	707,000	25,500	8,500	501,200	279,000
3	-	30 - #9	5'-0"	6	18,400	19,600	622,000	517,000	16,700	7,700	293,000	204,000
4	-	30 - #9	5'-0"	6	21,800	13,200	500,800	430,000	19,800	5,200	339,200	169,000
5	-	30 - #9	5'-0"	6	16,900	13,400	431,600	357,000	15,300	5,300	222,000	140,000
6	-	24 - #9	4'-6"	5	12,800	12,300	381,000	240,000	11,600	4,900	171,000	94,000
7	-	24 - #9	4'-6"	5	13,000	7,200	268,000	222,000	11,800	2,800	181,000	87,000
8	-	20 - #9	4'-0"	5	7,800	5,600	170,000	110,000	7,100	2,200	86,000	44,000
9	-	30 - #9	5'-0"	6	26,900	26,500	884,000	745,000	24,400	10,500	498,000	294,000
-	1	30 - #9	5'-0"	6	36,800	40,700	952,600	396,000	33,400	27,000	449,600	156,000
-	2	30 - #9	5'-0"	6	28,500	30,300	754,700	252,000	25,900	17,900	343,500	99,500
-	3	30 - #9	5'-0"	6	23,200	22,900	592,300	128,700	21,100	12,100	261,700	51,000

Accompanied by dwgs. TM621, TM622, TM623, TM624, TM625, TM626, TM627

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 first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

## OREGON STANDARD DRAWINGS

## STD. MONOTUBE SIGN/VMS SUPPORT DRILLED SHAFT DETAILS

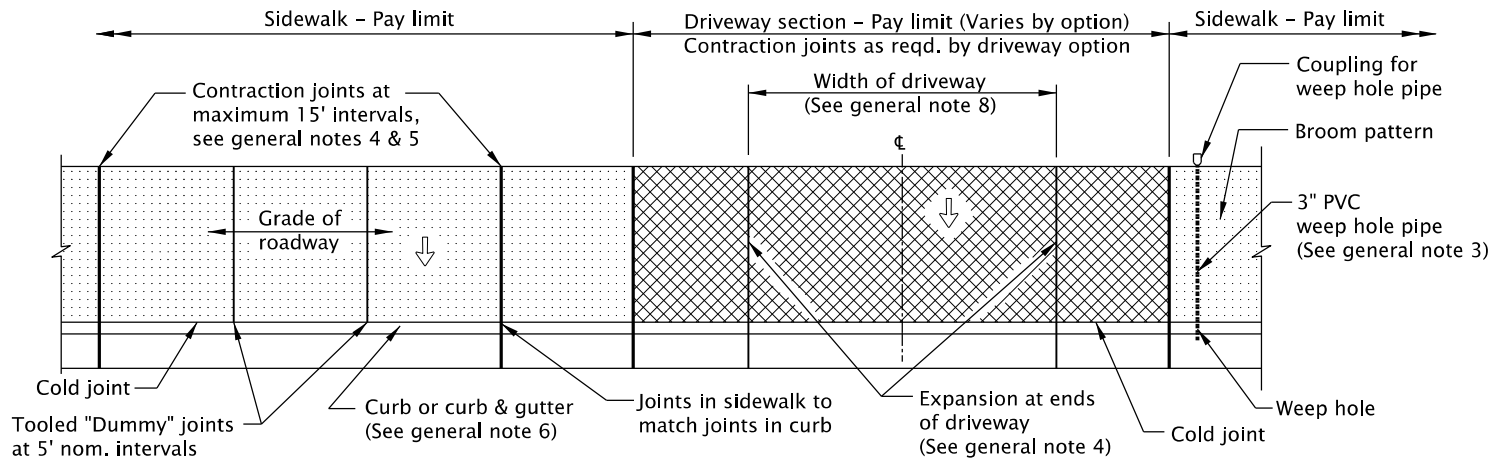
2024

DATE	REVISION	DESCRIPTION
07-2020	ADDED "MONOTUBE" TO THE DESIGN NUMBER COLUMNS	
01-2021	CHANGED CONDUIT NOTE	
01-2022	SLUMP WAS 8" +/- 1/2"	
07-2022	ADDED SPIRAL TIE NOTES AND CONDUIT BASE PLATE NOTE	
CALC. BOOK NO.	6921-6930, 6969-6972, 6974	SDR DATE- 08-JUL-2022
		TM628

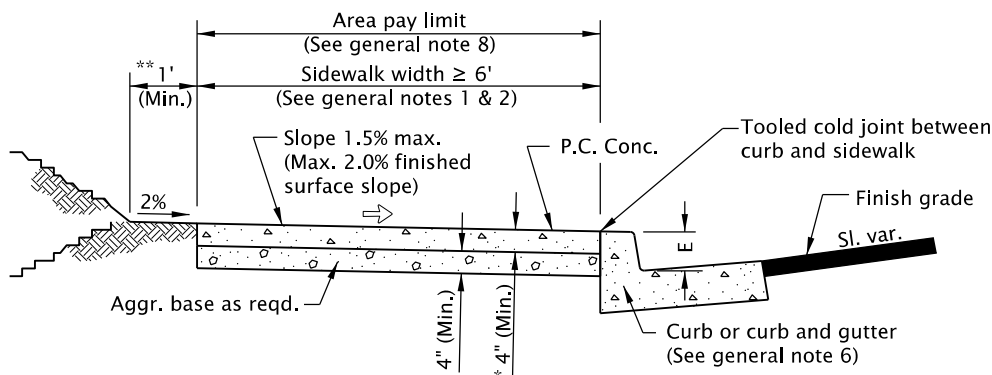
Effective Date: December 1, 2024 – May 31, 2025

20-JUL-2020

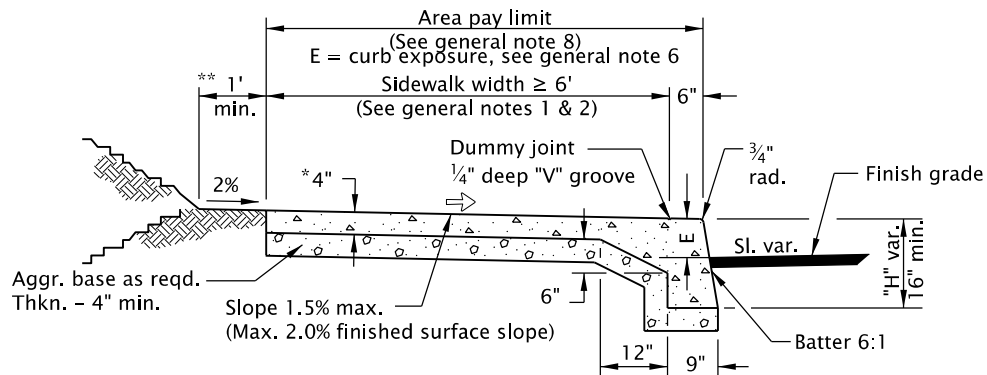
RD720.dgn



TYPICAL PLAN VIEW - CURB LINE SIDEWALK



TYPICAL CURB SIDEWALK CROSS SECTION



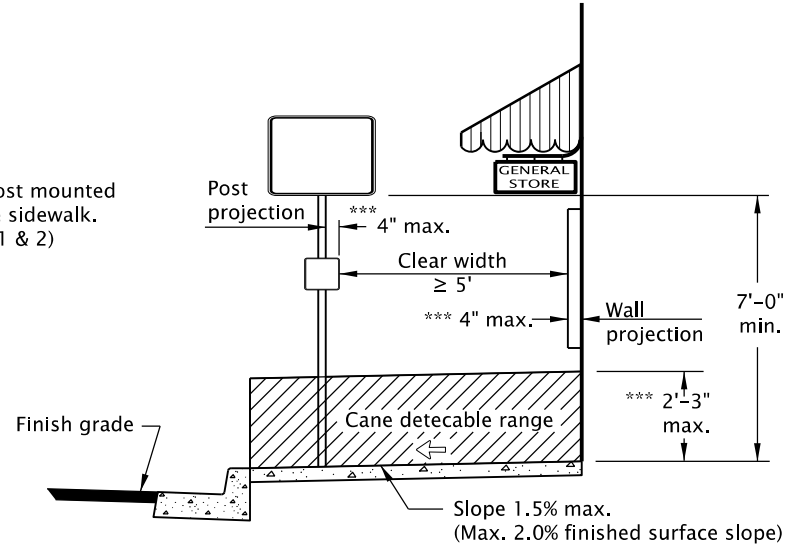
TYPICAL MONOLITHIC CURB & SIDEWALK CROSS SECTION

E = curb exposure, see general note 6

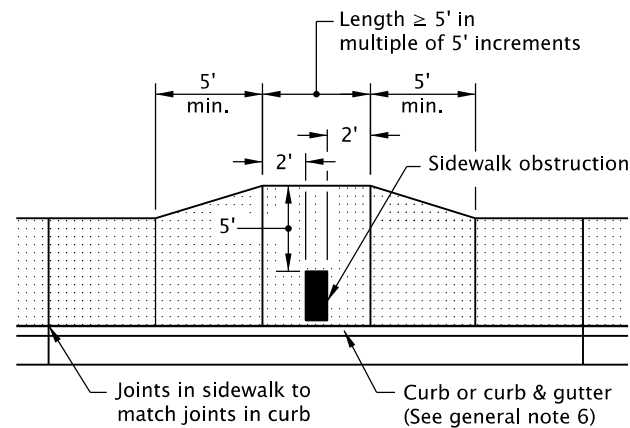
- \* Min. 4" or as specified in plans. A thickness ≥ 6" if sidewalk is intended as portion of a driveway or mountable curb is used.
- \*\* Provide compacted backfill adjacent to curb and sidewalk

\*\*\* Objects with base below 2'-3" may protrude any distance as long as the 5' circulation path is maintained. When an object with a base higher than 2'-3" protrudes further than 4" provide a detection below protrusion to delineate edge.

Building, wall, or post mounted obstruction outside sidewalk. (See general notes 1 & 2)



CLEAR CIRCULATION PATH



REQUIRED SIDEWALK WIDENING AROUND OBSTRUCTIONS

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Include additional paved or unpaved 2' shy distance to vertical faces higher than 5' such as retaining walls, sound walls, fences and buildings.
2. Curb type and sidewalk width as shown on plans or as directed. On sidewalks 8' and wider, provide a longitudinal joint at the midpoint.
3. Install 3" pvc weep hole pipes in sidewalks where shown on plans, and allowed by jurisdiction. Place contraction joint over top of pipe. See Std. Dwg. RD700 for weep hole details.
4. Provide expansion joints around poles, posts, boxes, at ends of each driveway, and other fixtures which protrude through or against the structures. For sidewalk, monolithic curb & sidewalk, const. expansion joints at 45' maximum spacing. See Std. Dwg. RD722 for expansion joints details.
5. Const. contraction joints at 15' maximum spacing, and at ends of each curb ramp. See Std. Dwg. RD722 for contraction joints details.
6. For curb details, see Std. Dwgs. RD700 & RD701. ODOT standard E=7".
7. Sidewalk details are based on applicable ODOT standards.
8. Fully lowered sidewalk shown; see project plans for the driveway design specified. For driveway details not shown, see Std. Dwgs. RD725, RD730, RD735, RD740, RD745 & RD750.
9. See project plans for details not shown.

LEGEND

- ▨ Sidewalk pay limit.
- ▨ Driveway pay limit, varies by option, (See general note 8).
- ← Cross slope 1.5% max. (Max. 2.0% finished surface slope) (Normal sidewalk cross slope)

*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 first consulting a Registered Professional Engineer.*

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CURB LINE SIDEWALKS

2024

DATE	REVISION	DESCRIPTION
CALC. BOOK NO. - - -	N/A - - -	SDR DATE- 21-JUN-2019 -
RD720		


Effective Date: December 1, 2024 – May 31, 2025




# EXAMPLE 1


LEGEND


CONTROLLERS

 Install model ATC controller. (Agency furnished)


CABINETS


 Install a model 332S cabinet & control equipment with riser frame, orient lowered door as shown


 Install base mounted service cabinet, 120/240 volt metered, for signal and signal pole mounted illumination systems


 Install recessed terminal cabinet


POLES

 Install (T=type) standard traffic signal mast arm pole (See, "Pole Entrance Chart")


 Install (L=length) foot traffic signal mast arm


 Install pedestal with frangible base on (N=number) foundation. See TM457 for details.

 Install (L=length) foot luminaire arm


 Retain and protect existing power pole (Power source)


SIGNALS


 Install phase (Ph=phase) vehicle signal

 Install phase (Ph=phase) pedestrian signal with clamshell mount and pushbutton with mount


SIGNS


 Install aluminum (30"x36") left and through arrow sign (R3-6L), ASTM type IX sheeting


 Install aluminum (30"x36") right arrow "ONLY" sign (R3-5R), ASTM type IX sheeting

 Install street name sign (See signing plans for details on sign and attachment type)


JUNCTION BOXES

 Install 22"x12"x12" (min. dimension) precast concrete junction box


 Install tandem 30"x17"x12" (min. dimension) precast concrete junction boxes (See TM472 for details)

 Junction box (See Detector Plan)

WIRES


 Install (N=number) No. (G=AWG wire size) type THWN wires


 Install (N=number) No. (G=AWG wire size) type XHHW wires

 Install (X=number of cables) control cable(s) with (N=number) (G= AWG wire size) AWG conductors


LEGEND CONTINUED

CONDUITS


 Install (S=size) inch electrical conduit


 Install 2" conduit stub (For future use-cap ends)

 Detector conduit (See Detector Plan)


 Install conduit and wire as required by power company


LUMINAIRES

 Install light emitting diode luminaire, (See special provisions). Bond luminaire to pole grounding terminal


 Install photocontrol electronic relay on pole, as per Std. Drg. No. TM450

FIRE PREEMPTION

 Install channel (Ch=channel), (N=number) barrel fire preemption detector unit

 Install channel (Ch=channel) fire preemption detector feeder cable

MISCELLANEOUS

 Install removable bollard

 Detection Camera, See Detection Plans.

SIGNAL HEAD TYPES

2 = R:Y:G

3LCF = RA:YA:FYA:GA

LEGEND  
PACIFIC HWY EAST AT YOUNG ST.  
OR99E, M.P. 32.87  
WOODBURN

NOTE:

See T.R.S. Dwg. 18251 for Signal Plan

Traffic Section Approval

OREGON DEPARTMENT  
OF TRANSPORTATION



OR99E: YOUNG ST. SAFETY (WOODBURN) SEC.  
PACIFIC HIGHWAY EAST  
MARION COUNTY

Designer: ARLO BONES

Review: VERN GEORGE

Drafter: ARLO BONES

Checker: N/A

LEGEND

SHEET NO.

M-01

ACCOMPANIED BY DWGS.: TM450, TM457,  
TM460, TM462, TM467, TM470, TM471,  
TM472, TM482, TM485, TM650, TM651,  
TM652, TM653, TM654, RD130 and  
TRS Dwgs 18251 - 18254

HWY: 081  
M.P.: 32.87

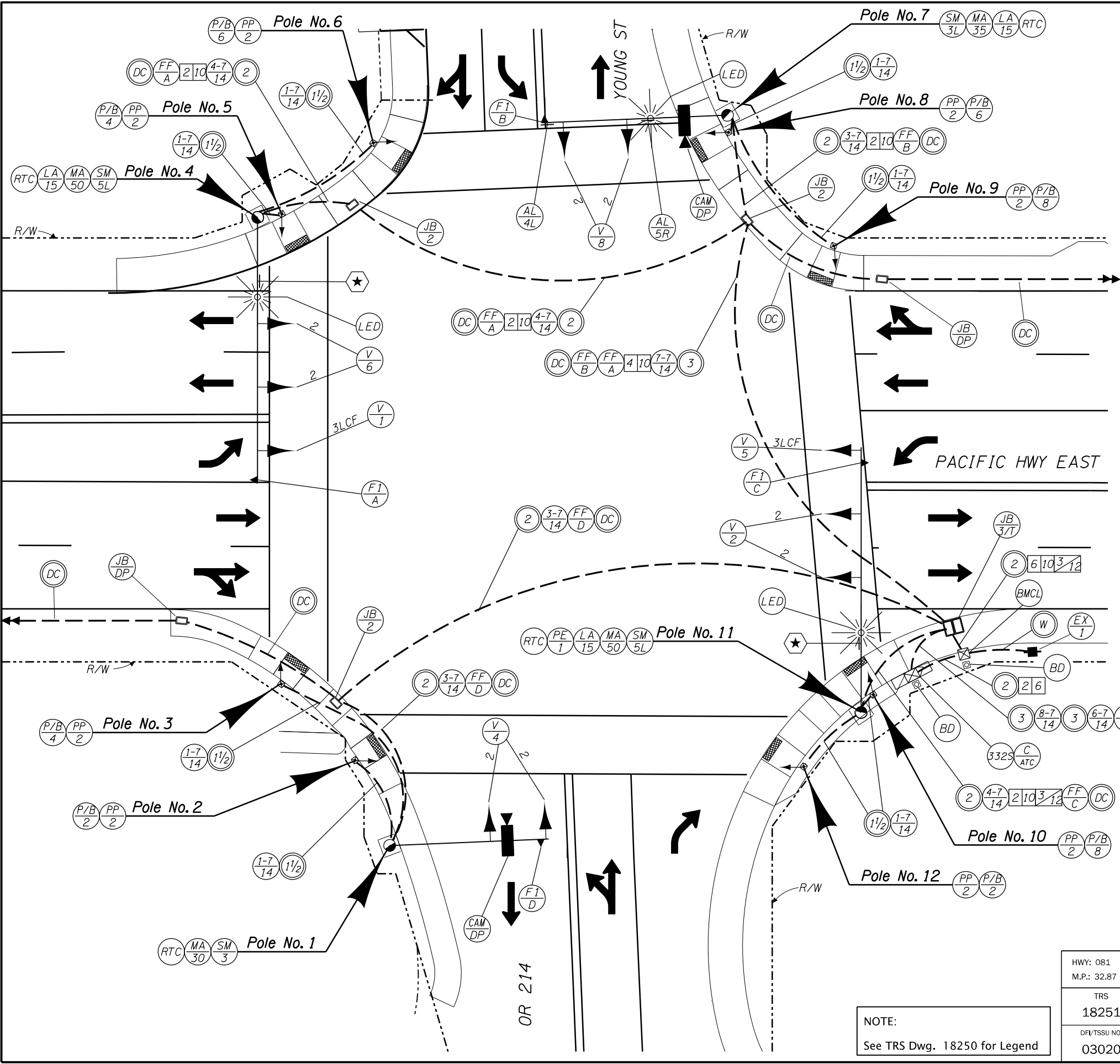
TRS  
18250

DFI/TSSU NO.  
03020

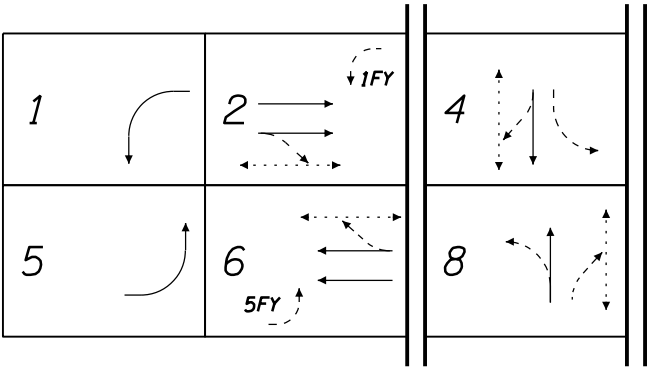
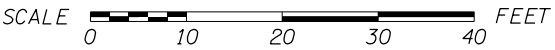


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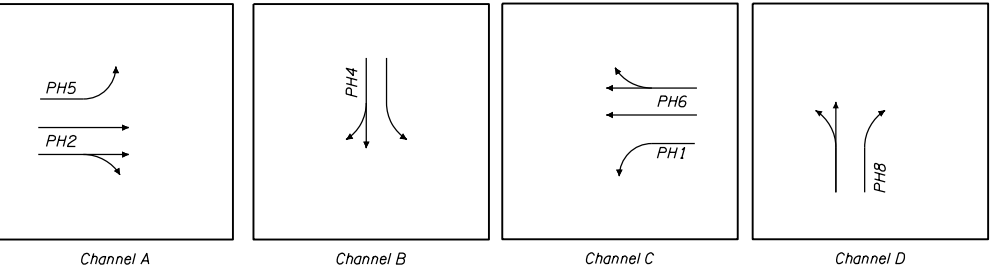
FINAL ELECTRONIC DOCUMENT  
AVAILABLE UPON REQUEST



SIGNAL PLAN  
PACIFIC HWY EAST AT YOUNG ST.  
OR99E, M.P. 32.87  
WOODBURN



NORMAL PHASE ROTATION



FIRE PREEMPTION

NOTE:  
Ground/Bond Wire and Tracer/Locate Wire Not Shown on Plan Sheets. See Specifications and Standard Drawings for installation information.

NOTE:  
Field Verify Measurements Before Construction

"UTILITIES NOT SHOWN"  
Contractor to contact utility companies for field locations.



HWY: 081  
M.P.: 32.87  
TRS  
18251  
DFI/TSSU NO.  
03020

NOTE:  
See TRS Dwg. 18250 for Legend

OREGON DEPARTMENT OF TRANSPORTATION

OR99E: YOUNG ST. SAFETY (WOODBURN) SEC.  
PACIFIC HIGHWAY EAST  
MARION COUNTY

Designer: ARLO BONES  
Review: VERN GEORGE  
Drafter: ARLO BONES  
Checker: N/A

SIGNAL PLAN

SHEET NO.  
M-02

POLE ENTRANCE CHART

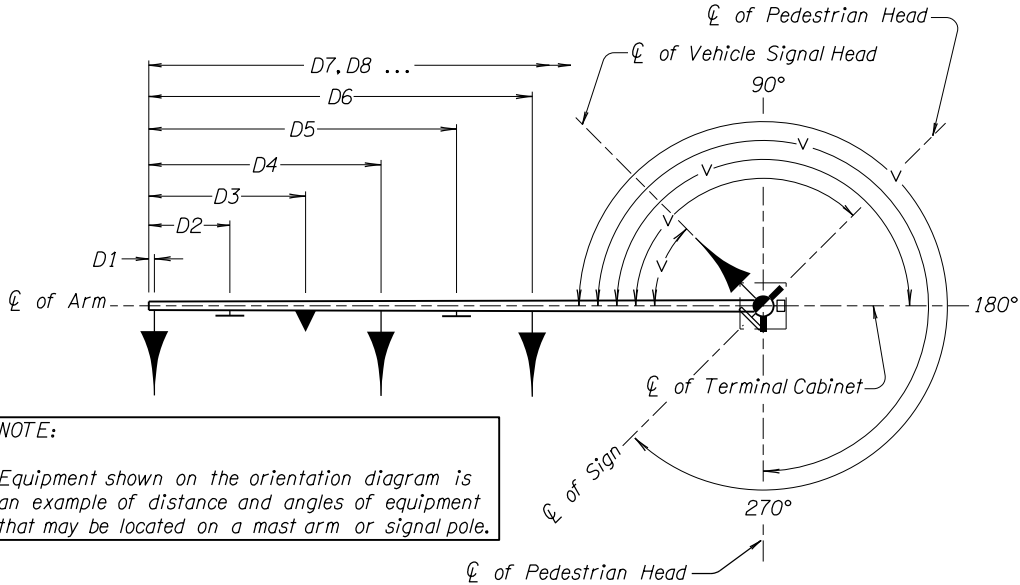
SIGNAL PLAN DETAILS  
PACIFIC HWY EAST AT YOUNG ST.  
0R99E, M.P. 32.87  
WOODBURN

See TM650 thru TM653			EQUIPMENT ON POLE					EQUIPMENT ON MAST ARM (Length in Feet and Equipment Type)								FOUNDATION INFORMATION (See Std. Drg. TM653)		LUMINAIRES				VIDEO DETECTION EQUIPMENT	
POLE NO.	DWG. NO.	TYPE	PED. SIGNAL & PUSHBUTTON DEG.	TERM. CABINET DEG.	SIGN DEG.	TRAFFIC SIGNAL DEG.	PHOTO ELECTRIC CELL	ARM LENGTH	D 1	D 2	D 3	D 4	D 5	D 6	D 7	D 8	FOUNDATION NUMBER	REQUIRED FOUNDATION DEPTH	ARM LENGTH	ARM DEG.	MOUNTING HEIGHT	TYPE	LUMINAIRE ARM MOUNT
1	18251	SM-3		180				30	0.5 V2	1.5 F	7.0 CAM	11.0 V2					3	18' - 0"					
2	18251	PP-2	180																				
3	18251	PP-2	270																				
4	18251	SM-5L		180				50	0.5 F	6.0 V3LCF	18.0 V2	30.0 V2	38.0 SNS				6	20' - 0"	15.0	0	35.0	LED	
5	18251	PP-2	90																				
6	18251	PP-2	180																				
7	18251	SM-3L		180				35	0.5 F	1.0 SA	4.0 V2	16.0 V2	20.0 SA				4	18' - 0"	15.0	0	35.0	LED	CAM
8	18251	PP-2	180																				
9	18251	PP-2	270																				
10	18251	PP-2	90																				
11	18251	SM-5L		180			180	50	0.5 V3LCF	3.0 F	12.5 V2	24.0 V2	37.0 SNS				6	20' - 0"	15.0	0	35.0	LED	
12	18251	PP-2	0																				

NOTE  
Refer To Geotechnical Memo Dated August 5,20XX For Subsurface Information

BRACKET MOUNT  
V2 = Traffic Signal Type 2,Vehicle Signal Bracket Mount  
V3LCF = Traffic Signal Type 3LCF,Vehicle Signal Bracket Mount  
SA = Sign,30" x 36" Aluminum w/Sign Bracket Mount

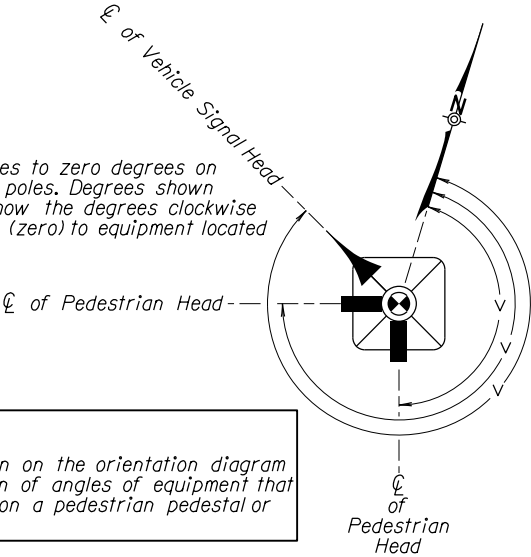
MISC.ITEMS  
F = Fire Preemption  
CAM = Thermal Detection Camera  
SNS = Street Name Sign



NOTE:  
Equipment shown on the orientation diagram is an example of distance and angles of equipment that may be located on a mast arm or signal pole.

MAST ARM POLE ORIENTATION DIAGRAM

The north arrow shown relates to zero degrees on Pedestrian and Vehicle signal poles. Degrees shown in the pole entrance chart show the degrees clockwise from plan sheet north arrow (zero) to equipment located on the pole.



NOTE:  
Equipment shown on the orientation diagram is a clarification of angles of equipment that may be located on a pedestrian pedestal or vehicle pedestal.

PEDESTRIAN PEDESTAL / VEHICLE PEDESTAL  
ORIENTATION DIAGRAM

HWY: 081  
M.P.: 32.87  
TRS  
18252  
DFI/TSSU NO.  
03020



OREGON DEPARTMENT  
OF TRANSPORTATION



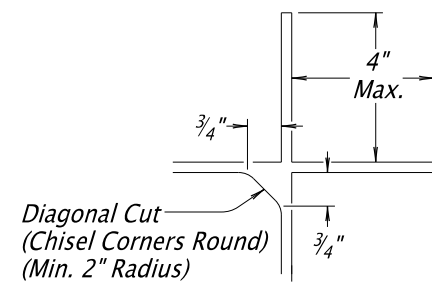
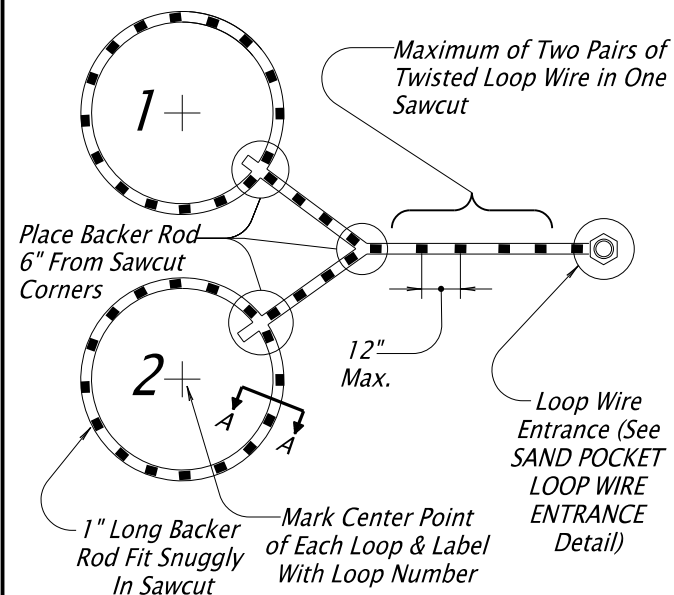
OR99E: YOUNG ST. SAFETY (WOODBURN) SEC.  
PACIFIC HIGHWAY EAST  
MARION COUNTY

Designer: ARLO BONES  
Draftsman: ARLO BONES  
Review: VERN GEORGE  
Checker: N/A

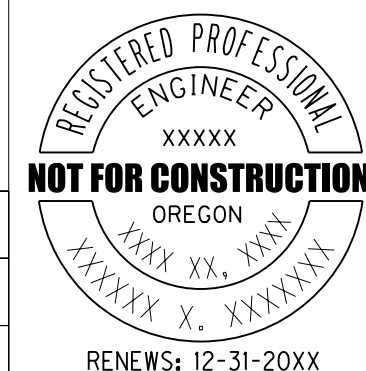
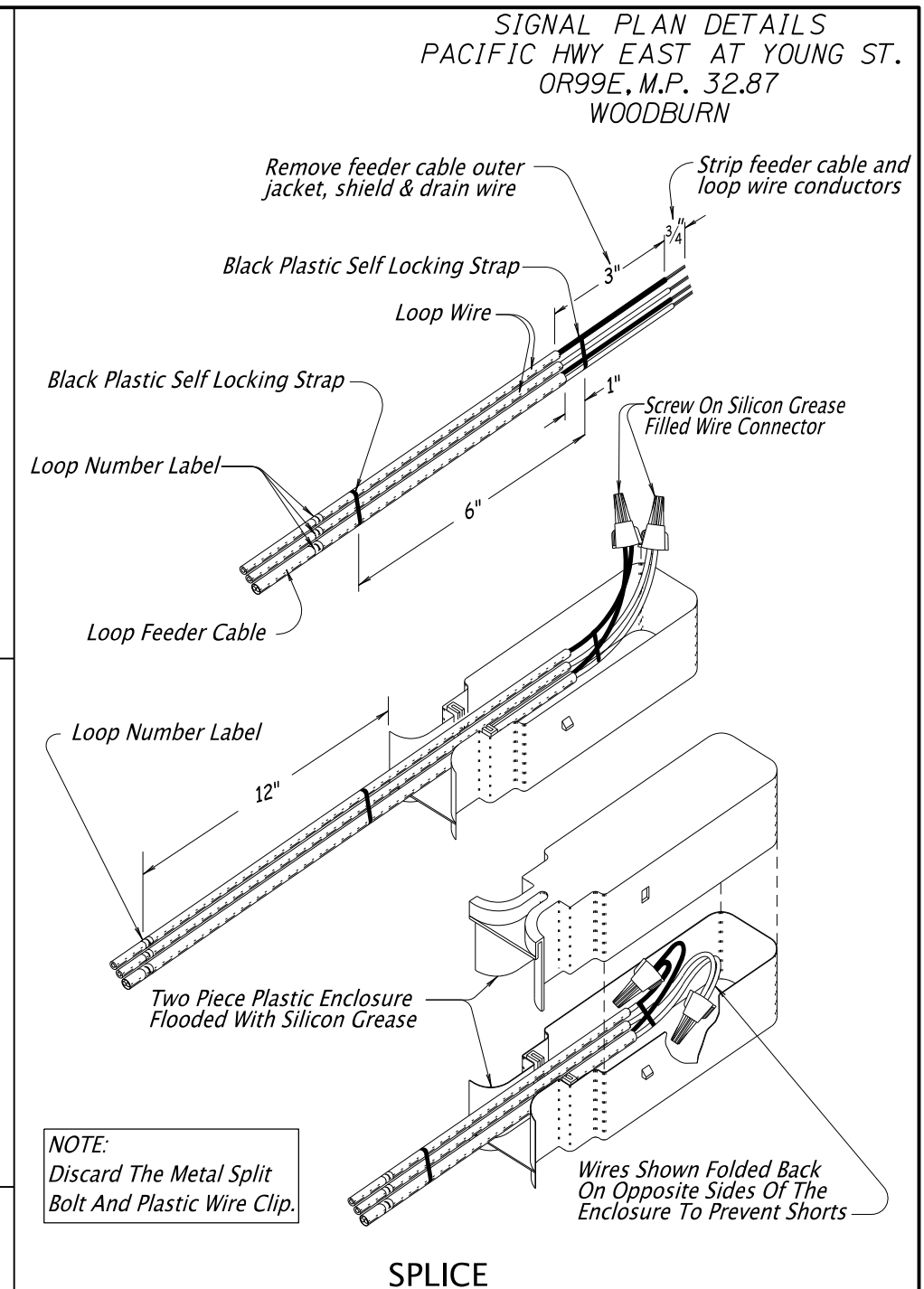
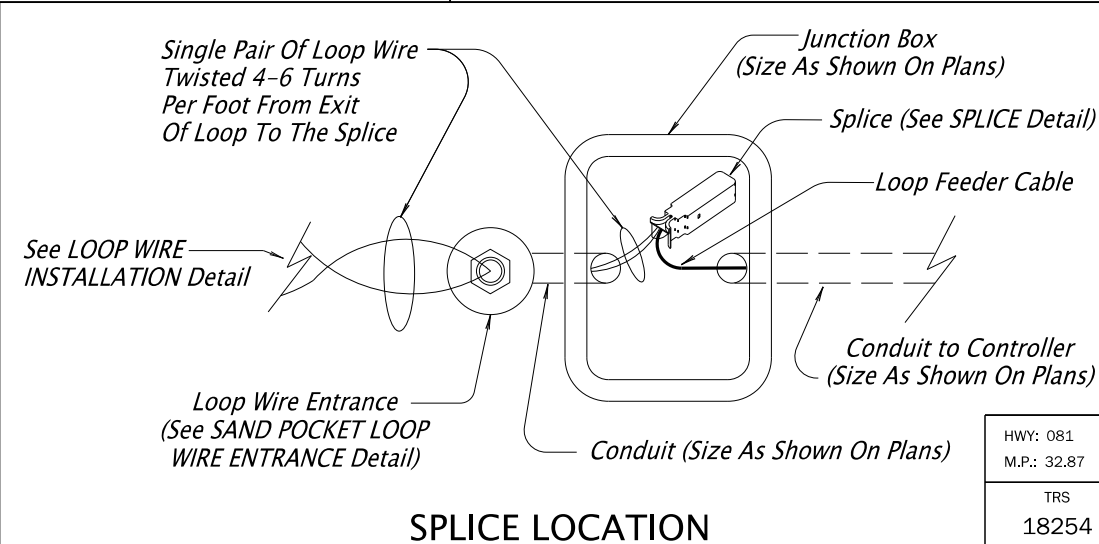
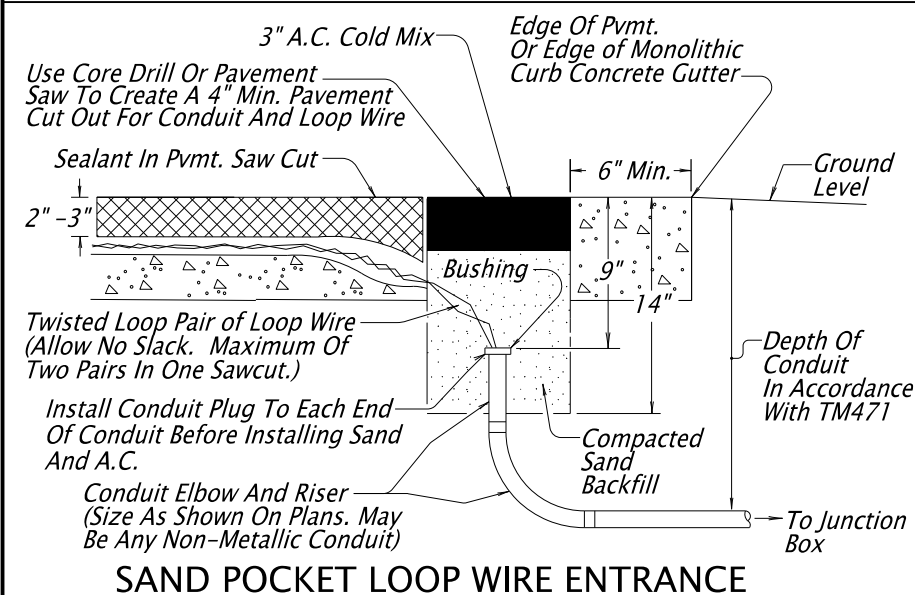
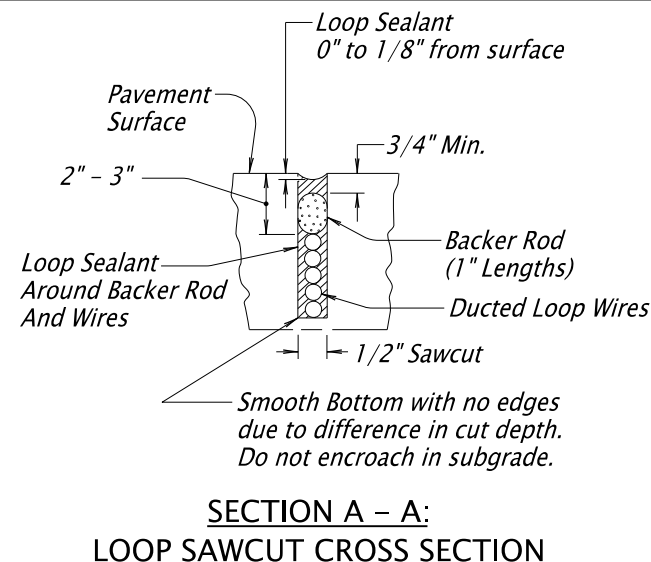
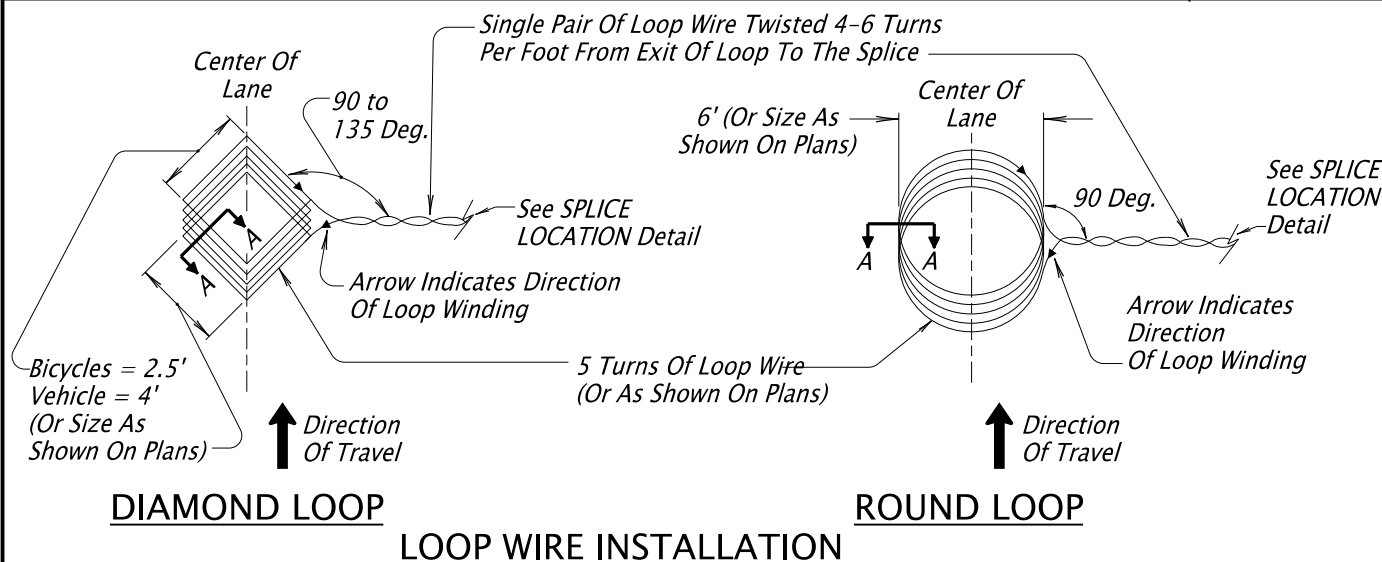
DETAILS

SHEET NO.  
M-03





- General Notes:*



OREGON DEPARTMENT  
OF TRANSPORTATION

Designer: ARLO BONES  
Drafter: ARLO BONES

Review: VERN GEORGE

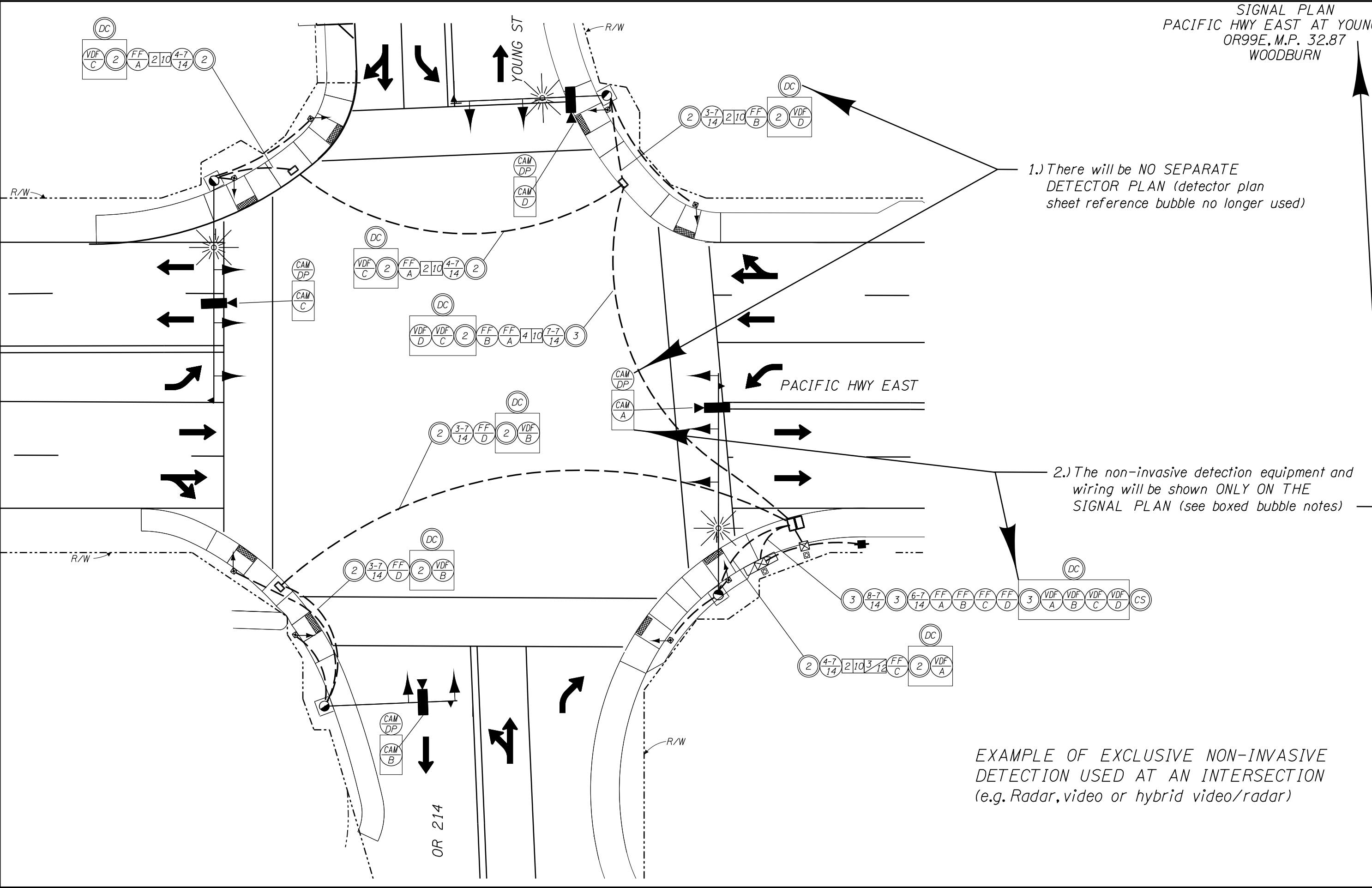
Checker: N/A

## DETAILS

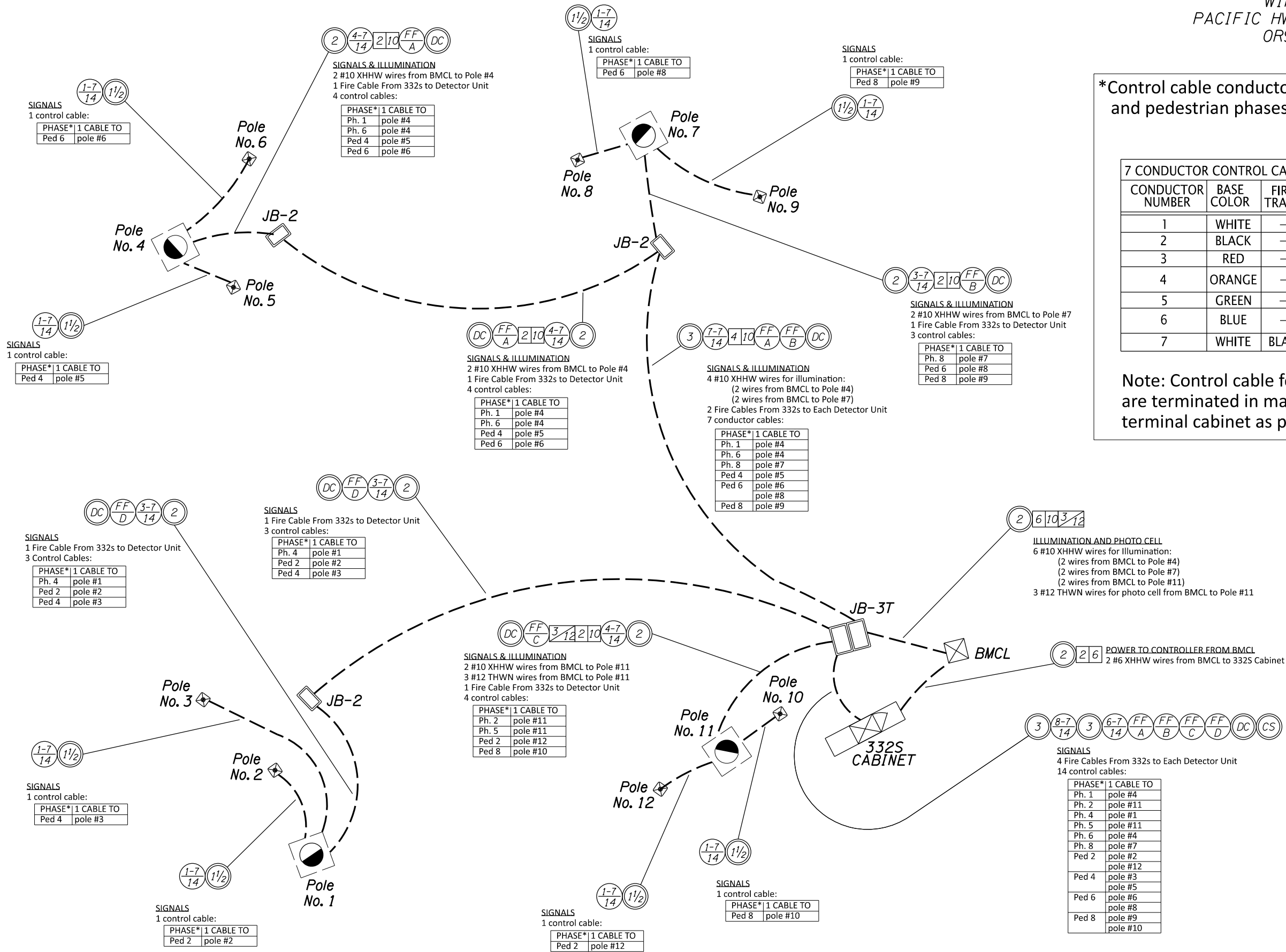
SHEET NO.  
M-05



SIGNAL PLAN  
PACIFIC HWY EAST AT YOUNG ST.  
OR99E, M.P. 32.87  
WOODBURN



WIRING DETAILS  
PACIFIC HWY EAST AT YOUNG ST.  
OR99E, M.P. 32.87  
WOODBURN



\*Control cable conductor use for vehicle phases and pedestrian phases as per TM470

			PEDESTRIAN PHASES	VEHICLE PHASES
7 CONDUCTOR CONTROL CABLE			1 Pedestrian Phase	1 Vehicle Phase
CONDUCTOR NUMBER	BASE COLOR	FIRST TRACER		
1	WHITE	—	NEUTRAL	NEUTRAL
2	BLACK	—	WALK	YELLOW
3	RED	—	DONT WALK	RED
4	ORANGE	—	P.B. COMMON	SPARE
5	GREEN	—	PUSHBUTTON	GREEN
6	BLUE	—	SPARE	SPARE
7	WHITE	BLACK	SPARE	SPARE

Note: Control cable for pedestrian phases are terminated in mast arm pole terminal cabinet as per TM470

## EXAMPLE 2



(TRAFFIC CONTROL STAGE 3)  
WIRING DETAILS  
ROGUE VALLEY HWY. AT BOLZ RD.  
OR99, M.P. 11.25  
(PHOENIX)

