



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0903(97)172	C1	C11

**ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
633E1400	Pavement Marking Paint, 4" White	1,423	Ft
633E1405	Pavement Marking Paint, 4" Yellow	1,138	Ft
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	1,028	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	6	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	5,760	Ft
634E0420	Type C Advance Warning Arrow Board	3	Each
634E0640	Temporary Pavement Marking	3,414	Ft

**SEQUENCE OF OPERATIONS**

The Contractor shall submit a proposed sequence of operations for the Engineer's review and approval at least two weeks prior to the preconstruction meeting.

Traffic shall be maintained through the project at ALL times.

Once work that inconveniences traffic has commenced on a structure site, it shall be pursued in a near continuous, expeditious manner to its completion. Any work that restricts the motorist from driving the posted speed limit, reduces existing roadway width, or causes a potentially unsafe condition due to Contractor operations such as frequent movement of equipment or materials on or through the project, is considered to be an inconvenience to traffic.

The Contractor may elect to work on all five sites simultaneously by utilizing three separate lane closure set-ups. The sign tabulation quantities were calculated based on three separate lane closures for this project. See "Traffic Control Layout" sheets elsewhere in the plans.

The Contractor may perform work on the roadway during daylight hours only, unless additional hours are approved by the Engineer.

**TRAFFIC CONTROL**

The Contractor shall designate an employee who will be available 24 hours/day, 7 days/week to be responsible for the maintenance of traffic during periods of repair work. The name and phone number of person(s) shall be provided to the SD Department of Transportation (605-773-5294), SD Highway Patrol (Pierre State Radio (605-605-842-0810)), Jackson County Sheriff Department (605-837-2285), and Jones County Sheriff Department (605-669-7111).

Channelizing devices in a series shall be of the same type. Channelizing drums shall be of a two part construction with breakaway bases. The cost of additional channelizing devices shall be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

All traffic control devices shall be in "like new" condition.

Type 3 Barricades 8' wide shall mark one end of the construction work zone. In addition, Type 3 Barricades 8' wide shall be placed in the lanes that are closed to traffic at the discretion of the Engineer.

**COORDINATION BETWEEN CONTRACTORS**

A separate contract for Project IM 0904(57)189 - PCN 035E has been awarded to Knife River Midwest LLC for PCC Surfacing on I-90 from MRM 189.00 to MRM 198.04. Their contact information is: (Address -718 Steele Avenue Rapid City, SD 57701, Phone - (605)-335-4043).

The Contractor shall schedule the work so as not to interfere with or hinder the progress of the work performed by other Contractors on the other projects. Conflicting traffic control devices may need to be temporarily adjusted or removed as directed by the Engineer at no additional cost to the contract. If the projects are occurring simultaneous, the work zone of the bridge deck polymer chip seals shall be extended to the PCC overlay project. The Contractor shall install the lane shift signs (W1-4L) as directed by the Engineer.

**GENERAL MAINTENANCE OF TRAFFIC**

All traffic control sign locations shall be set in the field by the Contractor and verified by the Engineer prior to installation.

Certified flaggers properly attired and preceded by FLAGGER symbol signs, will be required where work activity and/or equipment present a hazard to the workers, a hazard to through traffic, or encroaches into a driving lane.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

All non-fixed location signs may be mounted on portable supports. The portable supports shall be constructed to yield upon impact to minimize hazards to motorists, and shall be of proper height. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall meet the minimum mounting heights of 5 foot for rural areas and 7 foot for urban areas.

Erect only those signs that are applicable to the work in progress. When the Contractor is working at specific work spaces within the project, only those traffic control devices applicable to that operation should be displayed. Non-applicable signs and/or devices shall be removed from view by the Contractor and stored a minimum of 30 feet from the driving lanes during periods of in-activity. All costs to do this work shall be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

A shadow vehicle, equipped with flashing amber light and a ROAD MACHINERY AHEAD sign prominently displayed, shall be used in advance of

landscaping, clean up, and other mobile work activities. Highway equipment working within traffic or adjacent to traffic shall, at all times, display a flashing or revolving amber light to warn the traveling public. The Contractor shall maintain the driving surface on the project to eliminate hazards to the traveling public. The driving surface is defined as both Driving Lanes along with both outside shoulders on the project.

The cost for additional signs shall be paid for at the contract unit price per square foot for "Traffic Control Signs". Additional Flagger hours shall be paid for at the contract unit price per hour for "Flagging".

Traffic Control signs, as shown in the Estimate of Quantities, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

**TEMPORARY PAVEMENT MARKING**

The Contractor shall place and maintain temporary pavement marking in accordance with the Specifications.

After completion of applicable site work, temporary pavement markings shall be as per the Specifications until the application of permanent pavement markings.

Temporary Flexible Vertical Markers shall be used in lieu of Temporary Pavement Marking Paint/Tape in transition and mainline areas throughout the lane closures. Enough quantity has been included in these plans to account for the 6 expected taper changes. Measurements will be made and quantities will be paid for on the actual quantities used.

The Contractor will be required to remove the Temporary Flexible Vertical Markers. The Contractor shall use equipment that is not detrimental to the roadway surface for removing temporary road markers, as approved by the Engineer. The amount bid for the Temporary Flexible Vertical Markers shall include the cost of removing the markers installed on the project by the Contractor.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers during the installation of temporary pavement markers. The traffic control device used shall be moved to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

**PERMANENT PAVEMENT MARKING**

The Contractor shall be responsible for placing Permanent Pavement Markings. The length of application shall be throughout the structure length along with 50 feet off of each structure. This will require a total for the project of 1,138 feet center line painted with a 4" white skip, 4" white edge line, and 4" yellow edge line.

It is estimated that 1,423 feet of 4" white paint and 1,138 feet of 4" yellow paint will be needed to place these markings at the structure location sites. All costs associated with this work shall be incidental to the contract unit price per foot for "Pavement Marking Paint, 4" White" and "Pavement Marking Paint, 4" Yellow".

All materials shall be applied as per manufacturer's recommendations.

**ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS**

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	60" x 60"	25	50
R2-1	SPEED LIMIT __	20	36" x 48"	12	240
R2-6aP	FINES DOUBLE (plaque)	3	36" x 24"	6	18
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16	32
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16	32
W3-5	SPEED REDUCTION AHEAD (__ MPH)	9	48" x 48"	16	144
W4-1	MERGE (symbol)	4	48" x 48"	16	64
W4-2	LEFT or RIGHT LANE ENDS (symbol)	6	48" x 48"	16	96
W20-1	ROAD WORK AHEAD	8	48" x 48"	16	128
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	6	48" x 48"	16	96
W20-7	FLAGGER (symbol)	3	48" x 48"	16	48
SPECIAL	EXIT __ with 45° ARROW	5	36" x 32"	8	40
G20-2	END ROAD WORK	5	48" x 24"	8	40
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			<b>1028</b>

**TYPE 3 BARRICADES**

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	6 Each

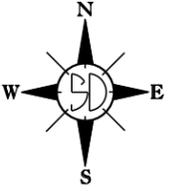
**ARROW BOARDS**

ITEM DESCRIPTION	QUANTITY
Type C Advance Warning Arrow Board	3 Each

# Traffic Control Layout - Exit 201 Driving Lane

Plotting Date: 12/10/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0903(97)172	C4	C11



Work Zone continues till the end of Structure #s 38-290-178 & 38-290-179

## Legend:

-  - WORK AREA
-  - TRAFFIC FLOW
-  - CHANNELING DEVICE

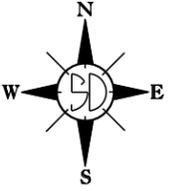
## Notes:

This drawing is not to scale.  
All taper lengths shall conform to the standard plates.

# Traffic Control Layout - Exit 201 Passing Lane

Plotting Date: 12/10/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0903(97)172	C5	C11



Work Zone continues till the end of Structure #s 38-290-178 & 38-290-179

## Legend:

- WORK AREA
- TRAFFIC FLOW
- CHANNELING DEVICE

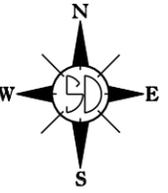
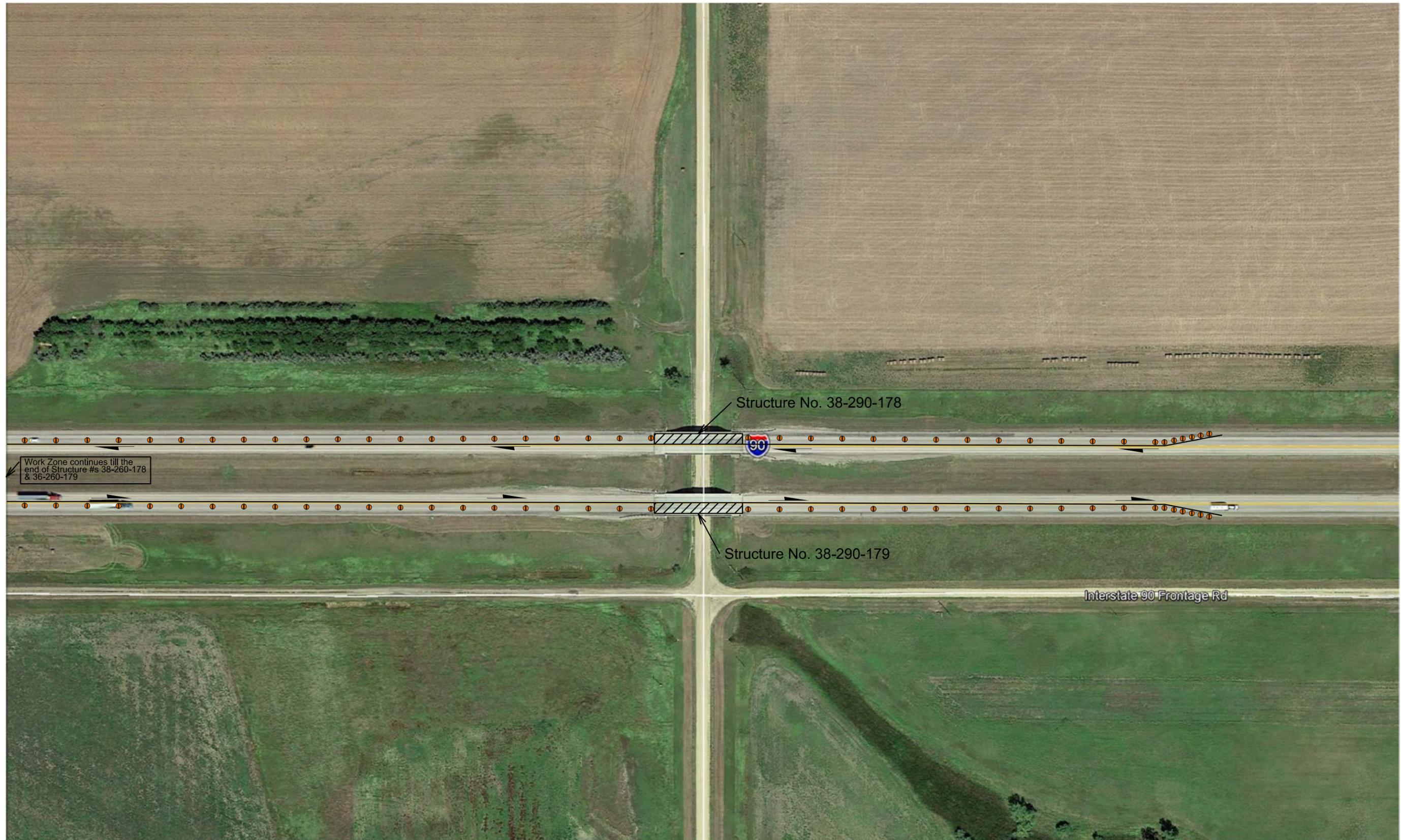
## Notes:

This drawing is not to scale.  
All taper lengths shall conform to the standard plates.

# Traffic Control Layout - Driving Lane

Plotting Date: 12/10/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0903(97)172	C6	C11



## Legend:



- WORK AREA



- TRAFFIC FLOW



- CHANNELING DEVICE

## Notes:

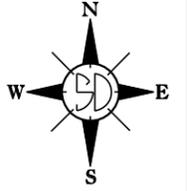
This drawing is not to scale.

All taper lengths shall conform to the standard plates.

# Traffic Control Layout - Passing Lane

Plotting Date: 12/10/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0903(97)172	C7	C11



## Legend:



- WORK AREA



- TRAFFIC FLOW



- CHANNELING DEVICE

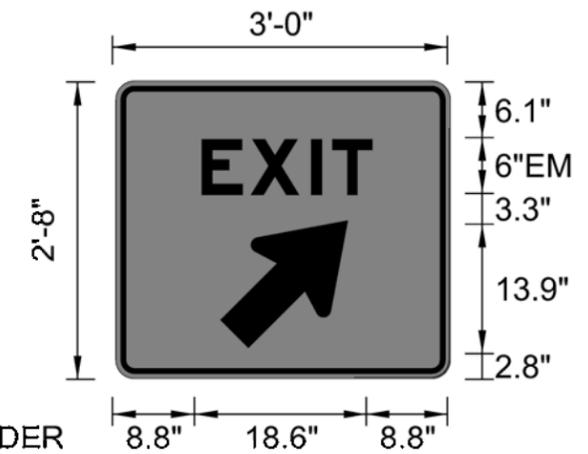
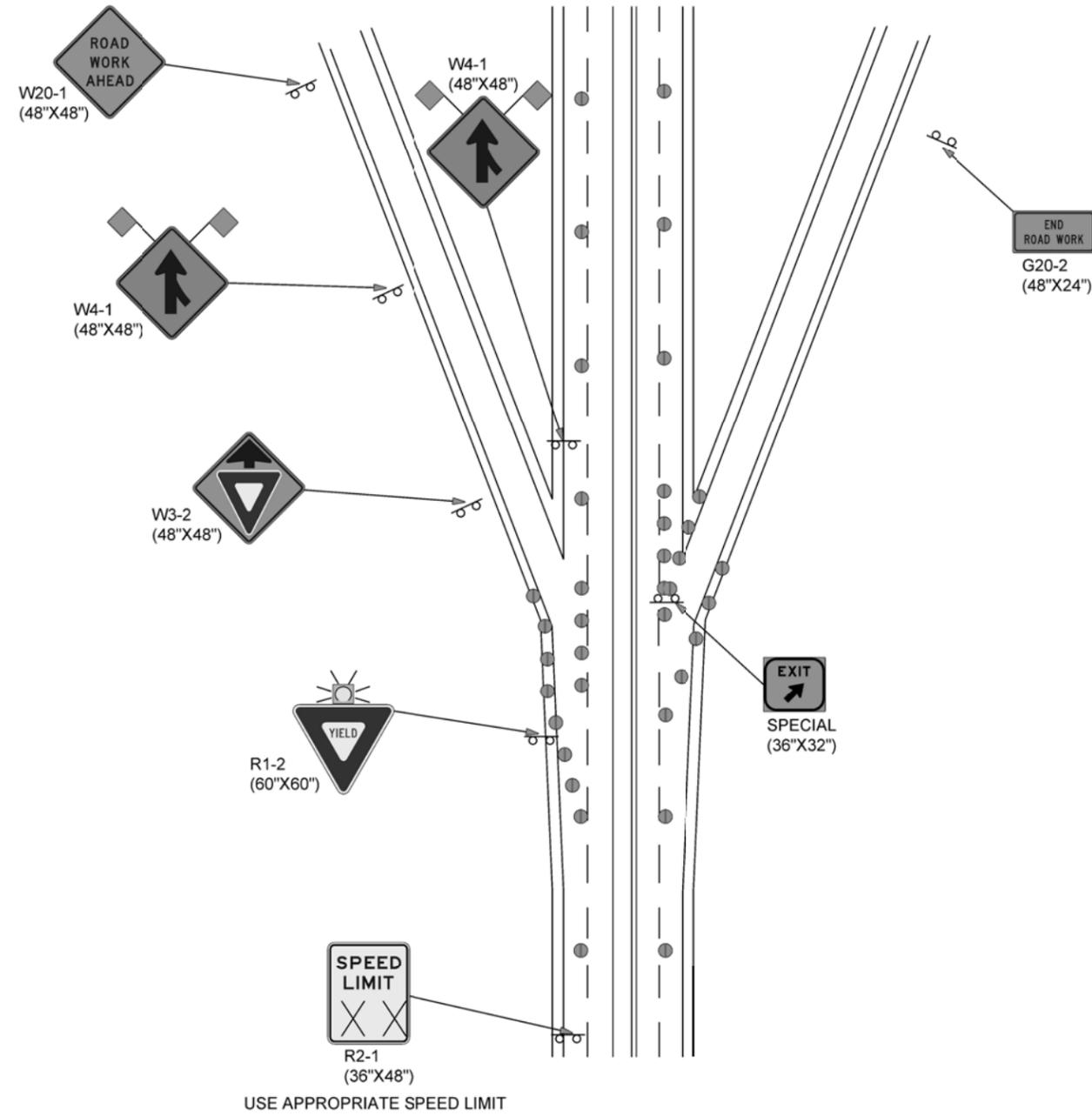
## Notes:

This drawing is not to scale.

All taper lengths shall conform to the standard plates.

# TRAFFIC CONTROL

## RAMP ENTRANCE AND EXIT DRIVING LANE CLOSURE



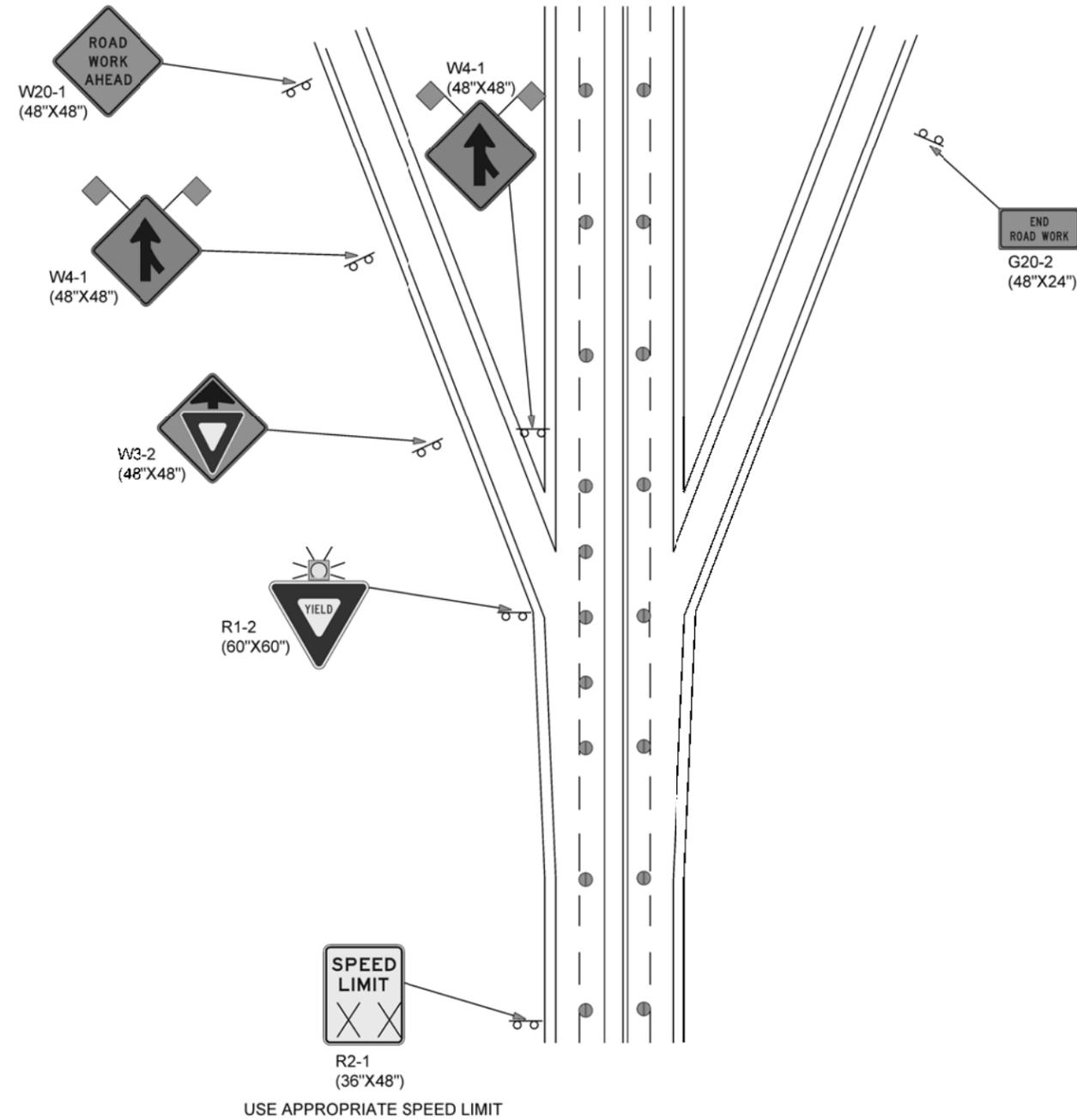
BORDER  
R=1.5"  
TH=0.63"  
IN=0.47"

Panel Style: construction\_guide.ssi  
M.U.T.C.D.: 2009 Edition

 -- THE WARNING LIGHT SHALL BE A SHIELDED TYPE B, IN ACCORDANCE WITH THE MUTCD AND SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER SQUARE FOOT FOR "TRAFFIC CONTROL SIGNS"

# TRAFFIC CONTROL

## RAMP ENTRANCE AND EXIT PASSING LANE CLOSURE



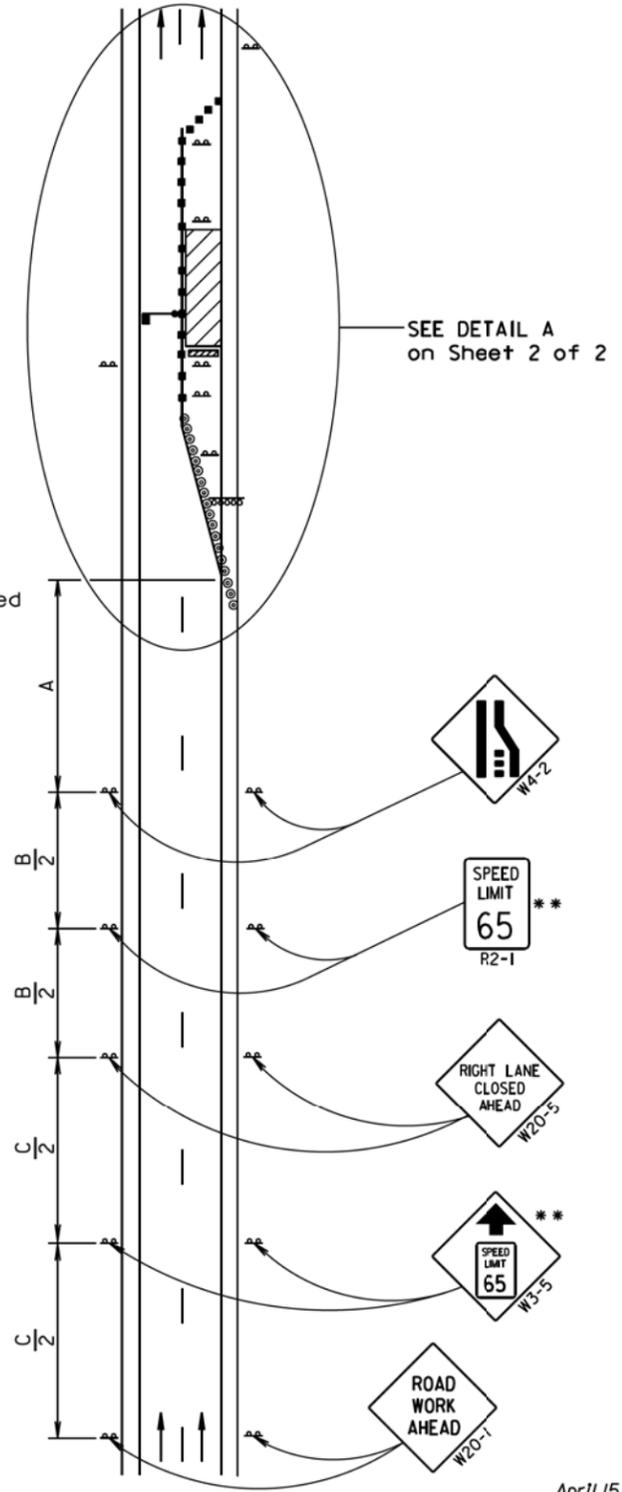
 -- THE WARNING LIGHT SHALL BE A SHIELDED TYPE B, IN ACCORDANCE WITH THE MUTCD AND SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER SQUARE FOOT FOR "TRAFFIC CONTROL SIGNS"

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
	(A)	(B)	(C)
70 - 80	1000	1500	2640

- \*\* Speed appropriate for location.
- Reflectorized Drum
- Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



SEE DETAIL A on Sheet 2 of 2

April 15, 2015

<b>S D D O T</b>	<b>WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS</b>	PLATE NUMBER <b>634.63</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45 - 50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

- \* Spacing is 40' for 42" cones.
- \*\* Speed appropriate for location.
- \*\*\* Use speed limit designated for the condition when workers are present in the work space. Signs shall be covered or removed when workers are not present.

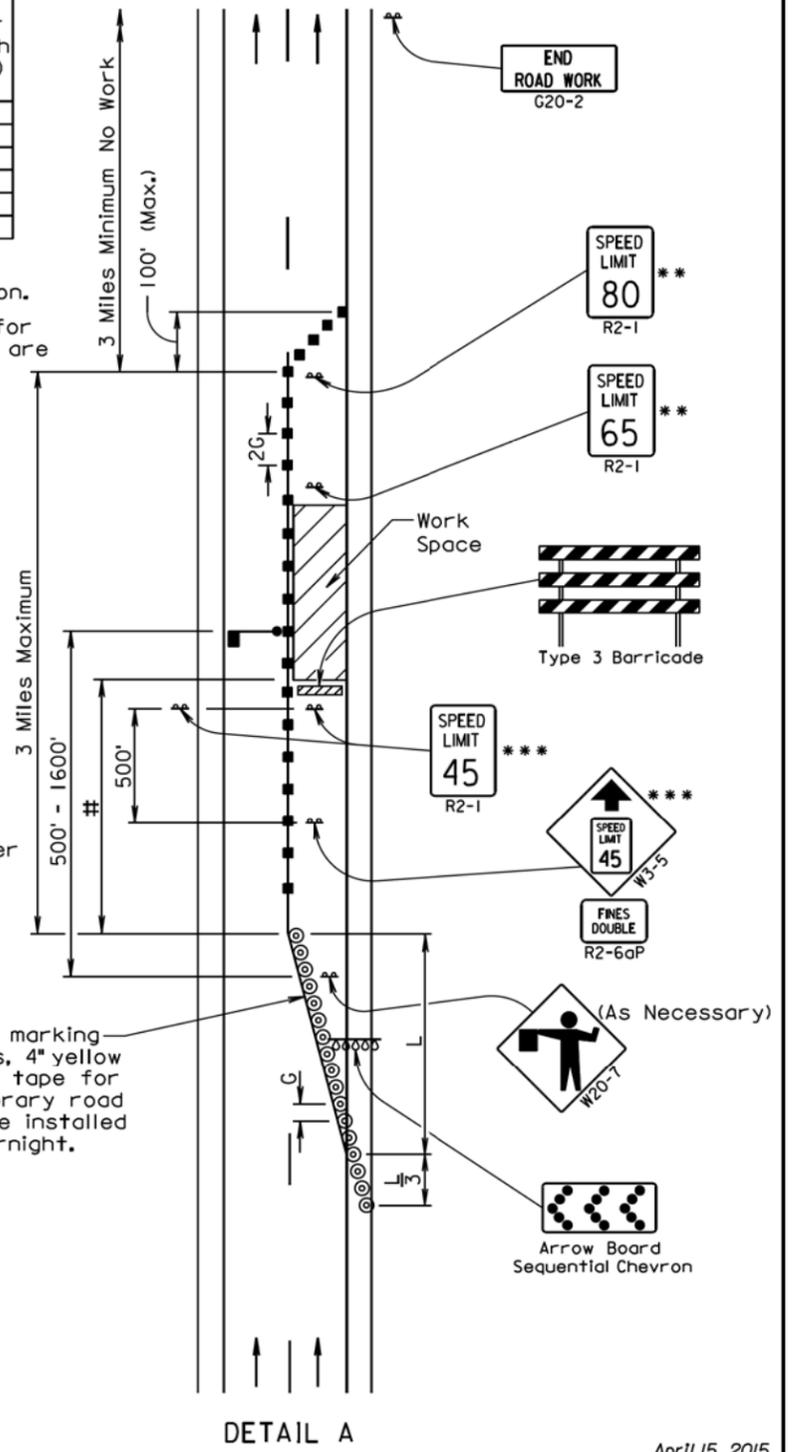
- Flagger (As Necessary)
- Reflectorized Drum
- Channelizing Device
- # The Work Space shall be a minimum of 500' from the end of the taper.

The FLAGGER sign shall be used whenever there is a Flagger present.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

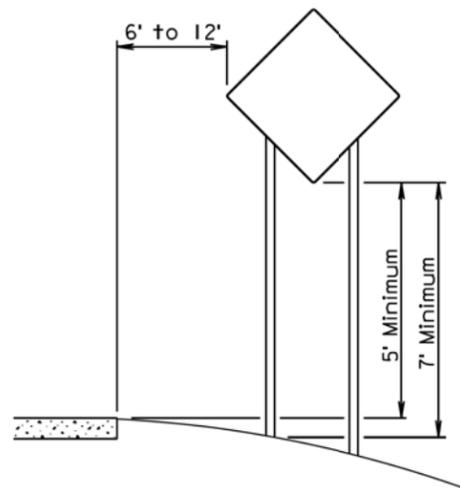
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.



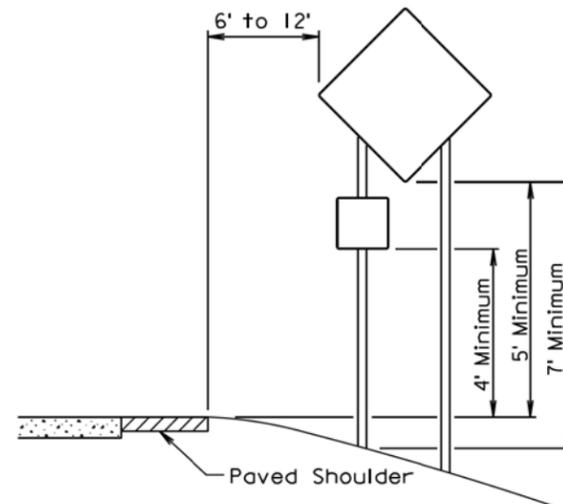
DETAIL A

April 15, 2015

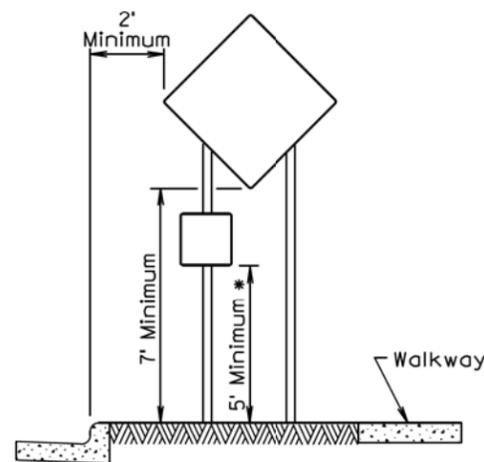
<b>S D D O T</b>	<b>WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS</b>	PLATE NUMBER <b>634.63</b>
	Published Date: 4th Qtr. 2015	Sheet 2 of 2



RURAL DISTRICT

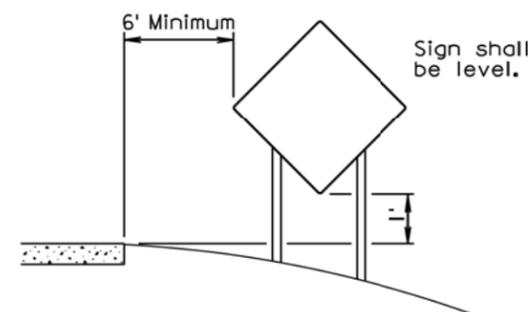


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



RURAL DISTRICT  
3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

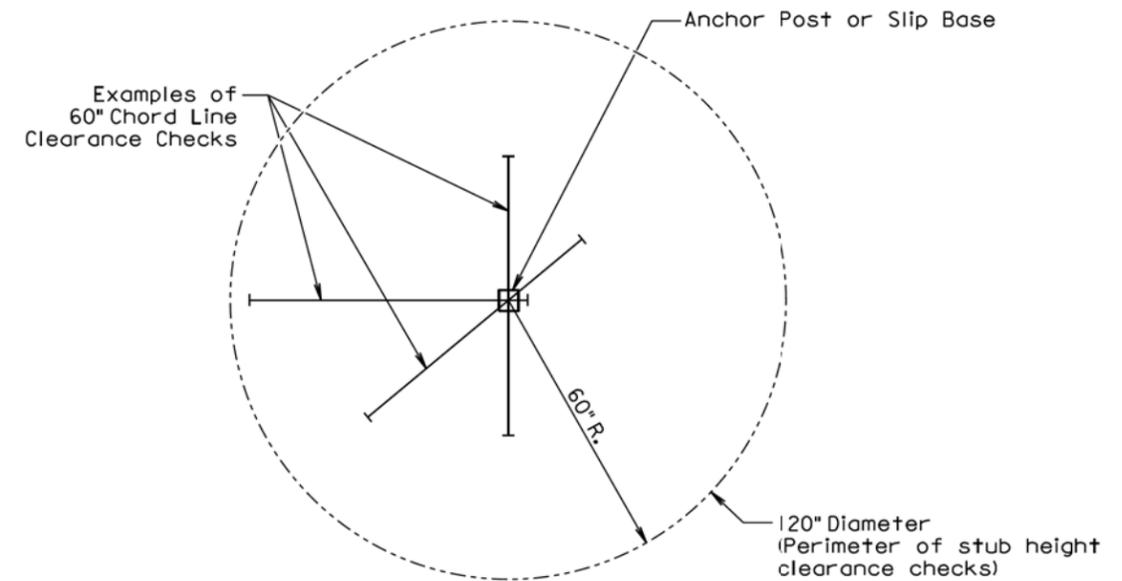
Published Date: 4th Qtr. 2015

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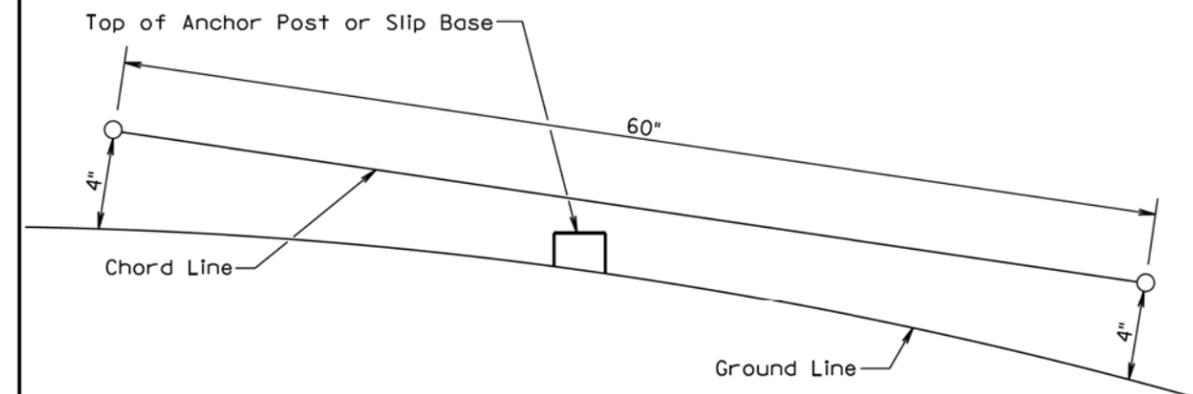
**CRASHWORTHY SIGN SUPPORTS**  
(Typical Construction Signing)

PLATE NUMBER  
634.85

Sheet 1 of 1



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

**GENERAL NOTES:**

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 4th Qtr. 2015

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**BREAKAWAY SUPPORT STUB CLEARANCE**

PLATE NUMBER  
634.99

Sheet 1 of 1