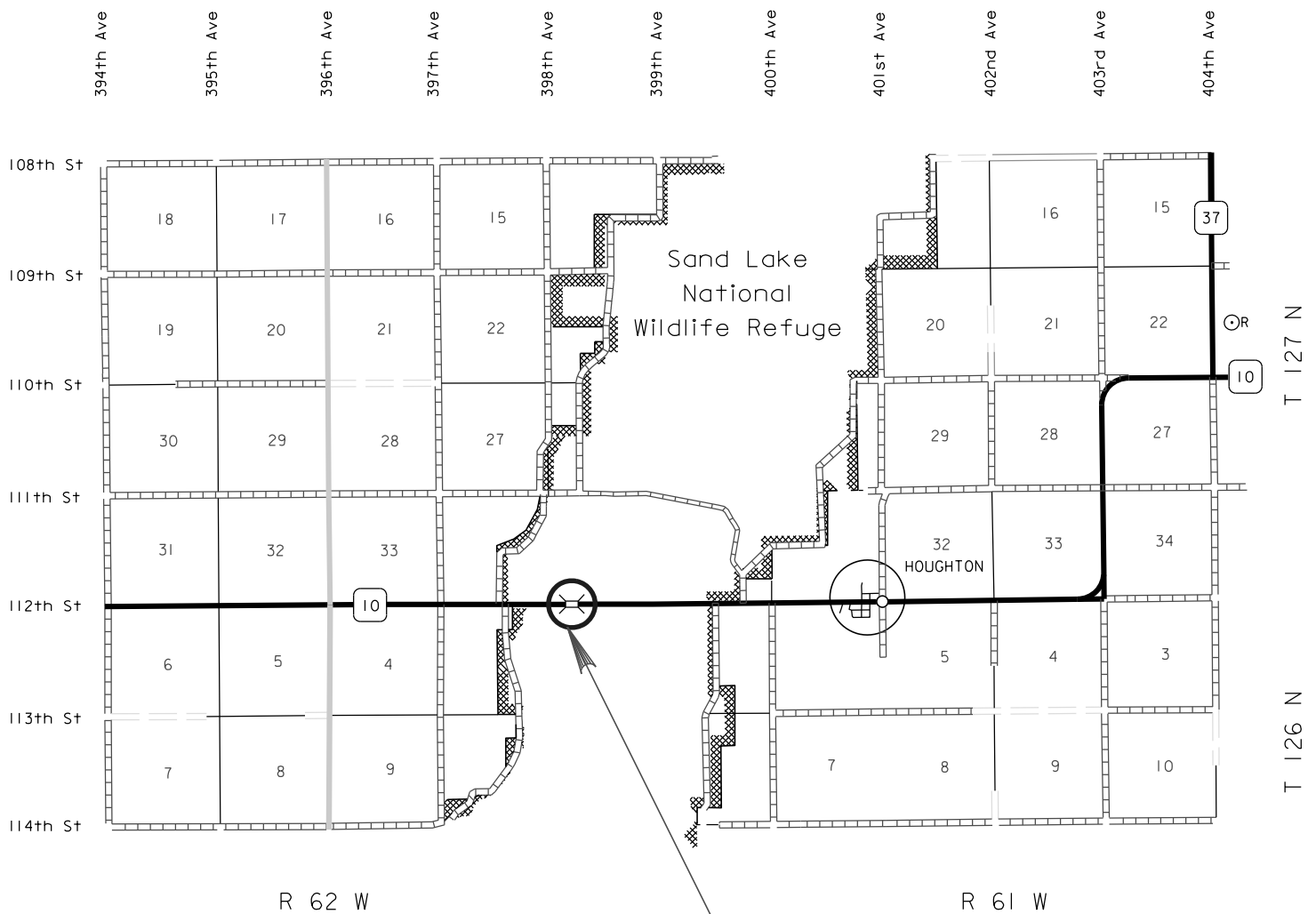
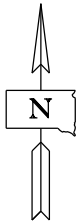


**STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED**

**PROJECT 010-168  
SD HIGHWAY 10  
BROWN COUNTY**

Replace Wood Spacer Blocks  
on the Bridge Railing

PCN 12VT



**Design Designation**

ADT 2012 - 460  
ADT 2032 - 623  
DHV - 67.3  
D - 50  
T DHV - 9.7  
T ADT - 98  
V - 65

Project 010-168  
Str. 07-223-120  
SD 10 - MRM 294.54  
Over James River

## INDEX OF PLAN SHEETS

Sheet No.	1	Layout Maps
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Sheet No.	2	Estimate of Quantities and Traffic Control
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Sheet No.	7 – 8	Pictures of Existing Conditions
Sheet No.	9 – 14	Project Detail Sheets
Sheet No.	15 – 16	Standard Plates

## ESTIMATE OF QUANTITIES

Bid Item	Item	Quantity	
009E0010	Mobilization	Lump Sum	LS
110E6230	Remove W Beam Guardrail for Reset	484	Feet
630E1210	Straight Class B W Beam Rail – 12.5' sections	25	Feet
630E5160	Reset W Beam Rail	484	Feet
632E2220	Guardrail Delineator	12	Each
634E0010	Flagging	80	Hour
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

## ESTIMATE OF TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD ##### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
<b>TOTAL UNITS</b>					<b>238</b>

If a sign is required on the project and not listed in the above inventory, the units per sign will be determined as follows:

Signs 36"x 36" will be measured at 27 units each and signs 48" x 48" will be measured at 34 units each, otherwise:

If a sign measures less than 25" high and 25" wide, the units per sign will be computed as sign size (sq. ft.) x 3.

If a sign measures between 23" high and 37" high, the units per sign will be computed as sign size (sq. ft.) x 1.2 + 15.

## **SPECIFICATIONS**

South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

## **WORK SCHEDULE**

Work shall not begin before May 20, 2013 and must be completed by August 30, 2013. Final acceptance of the project will come after the work is completed.

## **WASTE DISPOSAL SITE**

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

Construction/demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction/demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction/demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

### **HISTORICAL PRESERVATION OFFICE CLEARANCES**

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

### **TRAFFIC CONTROL**

One lane of traffic shall be maintained across the bridge at all times.

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

Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. 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.

Work activities are to be performed during daylight hours only.

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 be on fixed location supports.

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP Report 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

Traffic Control units, 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.

Any guardrail rail removed shall be replaced before the end of the working day.

Traffic control devices are to be removed at the end of each working day.

**REMOVE AND RESET BRIDGE RAIL**

1. The existing guardrail wooden spacer blocks will be removed and replaced. It will be necessary to disassemble the in place W-beam guardrail in order to complete the work required by these plans. After new spacer blocks are installed, the existing W-beam guardrail shall be placed at the existing mounting height from the surface of the bridge deck.
2. Wooden spacer blocks shall be in conformance with Section 630.2.A of the Construction Specifications.
3. Timber blocks shall be Douglas Fir or Pine from sound seasoned stock. Timber blocks with checks or cracks more than 1/4" wide and deeper than three inches will not be acceptable.
4. The preservative treatment of the wood spacer blocks shall be in conformance with Section 950 of the Construction Specifications. Wood spacer blocks that are trimmed, notched, or cut in the field will have the cut surfaces retreated in accordance with AWPA Standard M-4.
5. All of the existing hardware used to attach the wood spacers to the steel channel rail and W-beam shall be salvaged for use in the new construction. If any of the existing hardware cannot be salvaged for use in the new construction, the Contractor shall immediately inform the Engineer and shall wait for instructions from the Engineer before proceeding. All of the 1/2" diameter x 6" lag bolts for the block to curb attachment will need to be replaced and should be new. The cost of furnishing and installing the lag bolts shall be incidental to the contract price per foot for "Reset W Beam Rail".

For Hardware Items Needing Replacement

- A. The 5/8" diameter bolts shall conform to ASTM A307.
- B. All bolts and washers shall be galvanized in accordance with ASTM Specifications A153, except as noted otherwise herein.
- C. It is possible that some of the existing wedge anchor bolts may need to be replaced due to broken concrete or because the bolts are loose and cannot be tightened. If the anchor bolts need replacing then the 3/4" diameter wedge-type anchor bolts, nuts, and washers shall be supplied by one of the following and with the minimum embedment noted.
  1. ITW Ramset/Redhead Trubolt Wedge Anchors  
(Galvanized or Stainless Steel)  
6 5/8" minimum embedment  
ITW Commercial Construction  
1765 Holmes Road  
Elgin, Illinois 60123  
Phone: (630) 825-7900  
Fax: (630) 893-1270  
Website: [www.ramset-redhead.com](http://www.ramset-redhead.com)
  2. Hilti Kwik Bolt II (Stainless Steel)  
4 3/4" minimum embedment  
Hilti, Inc.  
5400 South 122nd East Ave.  
Tulsa, Oklahoma 74146  
Phone: (800) 879-8000  
Fax: (800) 879-7000  
Website: [www.hilti.com](http://www.hilti.com)

**REMOVE AND RESET BRIDGE RAIL (CONT.)**

3. Power Bolt (Stainless Steel)  
7" minimum embedment  
Powers Fasteners, Inc.  
2 Powers Square  
Brewster, NY 10509  
Phone: (914) 235-6300  
Fax: (914) 576-6483  
Website: [www.powers.com](http://www.powers.com)
  4. Wej-it Wedge Anchors (Galvanized)  
Ankr-tite/Stud Anchors (Galvanized)  
3 3/4" minimum embedment  
Wej-it / TOGGLER  
110 Richards Ave  
Norwalk, CT 06854  
Phone: (888) 864-4537  
Fax: (203) 857-2201  
Website: [www.ankr-tite.com](http://www.ankr-tite.com)
  5. Wedge-All <sup>TM</sup> Wedge Anchors (Stainless Steel)  
5" minimum embedment  
Simpson Strong-Tie Company, Inc.  
4120 Dublin Blvd., Suite 400  
Dublin, CA 94568  
Phone: (925)-560-9000  
Website: [www.strongtie.com](http://www.strongtie.com)
- D. The wedge-type anchors shall be set in concrete in accordance with the recommendations of the manufacturer with the minimum embedment shown. The Contractor shall obtain from the manufacturer and submit to the Engineer, certification indicating the material is either Stainless Steel or the finish is Galvanized. The cost of furnishing and installing the anchor bolts shall be incidental to the contract price per foot for "Remove W Beam Guardrail for Reset".
- E. All holes drilled in the existing concrete curbs for the anchor bolts, which secure the fabricated support brackets, shall be to the size and depth as recommended by the Manufacturer. Holes are to be drilled true and normal to the curbs, with care taken to minimize the damage to existing reinforcing steel. Prior to the start of drilling any holes in the concrete curbs for the anchor bolts, an effort will be made by the Contractor to determine and mark on the curb surface the locations of the in place reinforcing bars. If it is found that the in-place reinforcing bars will interfere with the drilling of the holes at their plan shown locations, the entire hole group for a rail post may be shifted slightly as approved by the Engineer so that the drill bit will clear the reinforcing bars of the curb. However, in spite of the efforts made to locate the reinforcing steel, the Contractor can still expect to encounter some reinforcing steel when drilling holes for the anchor bolts. Any drilling through such reinforcing steel to satisfactorily complete this work shall be done by the Contractor at no additional compensation.
6. Removed wood spacer blocks shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Construction Specifications.
  7. Reuse the previously field drilled holes in the existing steel rail and field drill new holes in the new wood spacer blocks at locations approved by the Engineer. 5/8" diameter bolts are allowed with a 3/4" field drilled holes through the wood blocks. In locations where the 5/8" diameter bolt is "blind" (at the steel channel posts) allow either relocation of the drilled holes through the spacer blocks and the steel channel, or a larger 1" diameter drilled hole through the wooden spacer blocks and reuse of the hole through the steel channel, at the discretion of the Engineer. Any new holes drilled in the steel channel should be 11/16" diameter. Only the top field drilled hole location is allowed to be moved, the spacer blocks are to stay in the same position for attachment to the curb brackets. The hole location can be moved up to 1 1/2" horizontally from the center of the steel post.

**REMOVE AND RESET BRIDGE RAIL (CONT.)**

8. Reassembled guardrail shall have all guardrail splices lapped in the direction of traffic.
9. No measurement shall be required for the contract payment items "Remove W Beam Guardrail for Reset" and "Reset W Beam Rail". Payment shall be based on the plan shown quantity.
10. All costs associated with disassembling the existing rail, removing the existing wood spacer blocks, disposing of the existing wood spacer blocks including all labor, equipment, and incidentals shall be incidental to the contract price per foot for "Remove Bridge W Beam Guardrail for Reset".
11. All costs associated with furnishing new wood spacer blocks and notching and dapping the new wood spacers to allow for installation, including all equipment and labor, shall be incidental to the contract price per foot for "Reset Bridge W Beam Rail".
12. All costs associated with the preservative treatment of the wood spacer blocks shall be incidental to the contract price per foot for "Reset Bridge W Beam Rail".
13. Two sections of 12.5 foot long guardrail W beam are included in the Estimate of Quantities. Any guardrail sections to be replaced due to traffic damage will be at the discretion of the Engineer.



Fig 1 & 2 – Typical bolting arrangement at steel channel posts ("blind posts") – looking at the backside of steel channel and wood blocks



**REMOVE AND RESET BRIDGE RAIL (CONT.)**

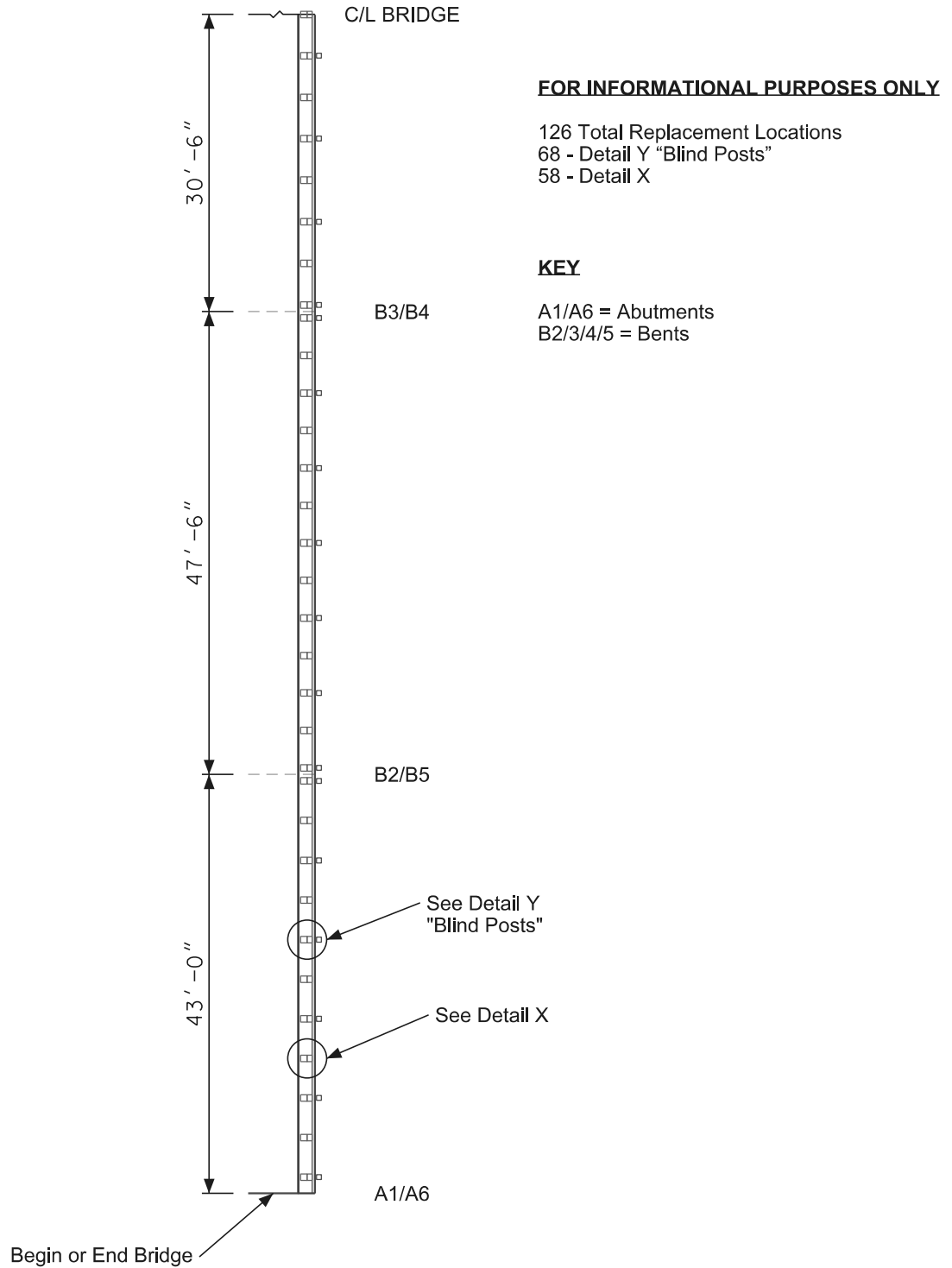


Fig 3 – Typical bolting arrangement – looking at the backside of wood blocks and steel channel

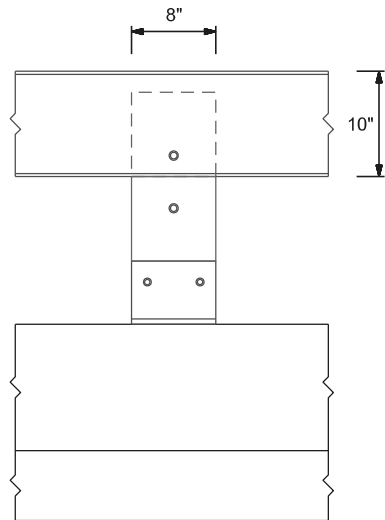


Fig 4 – Typical view of the front side of the blocks and W beam guardrail

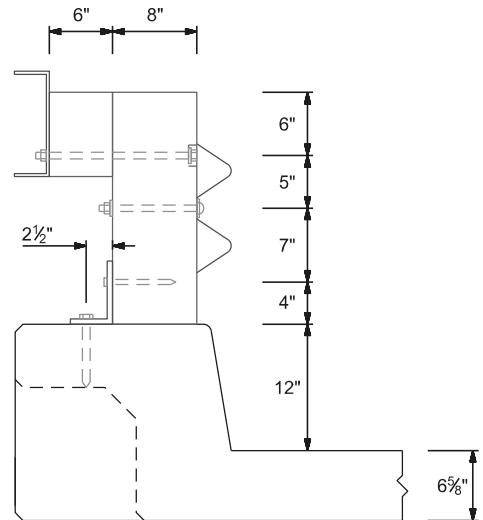




**BRIDGE LAYOUT**

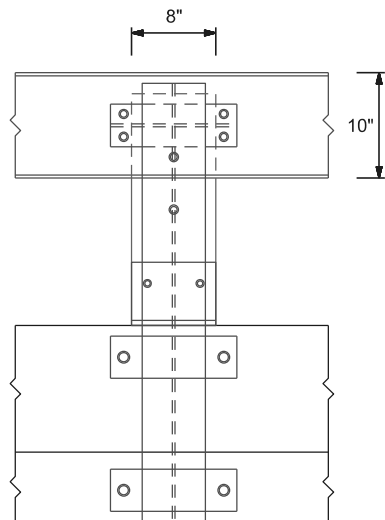


**BACK**

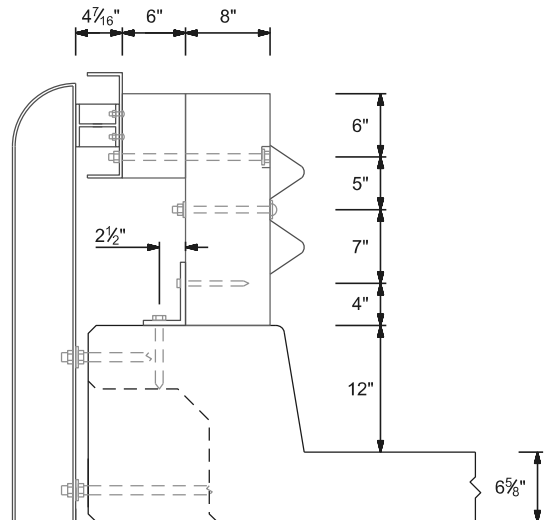


**SIDE**

**DETAIL X**



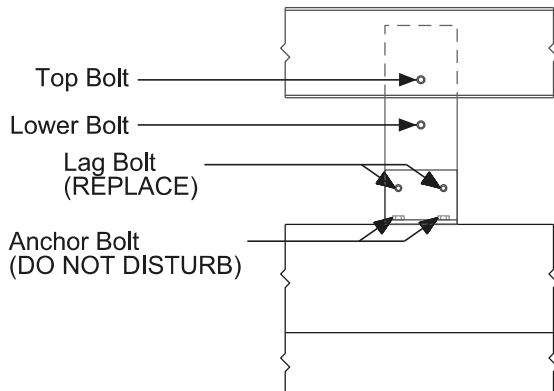
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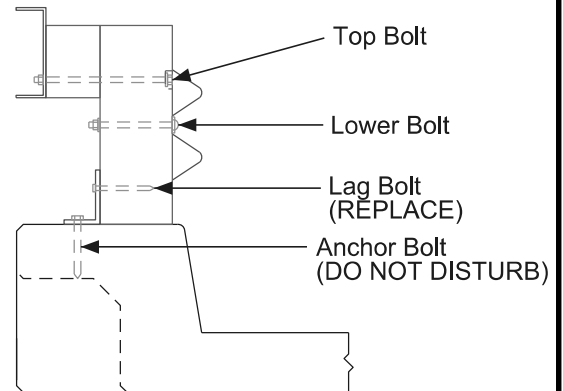
**SIDE**

**DETAIL Y  
("BLIND POST")**

**BRIDGE RAIL MODIFICATION DETAILS**

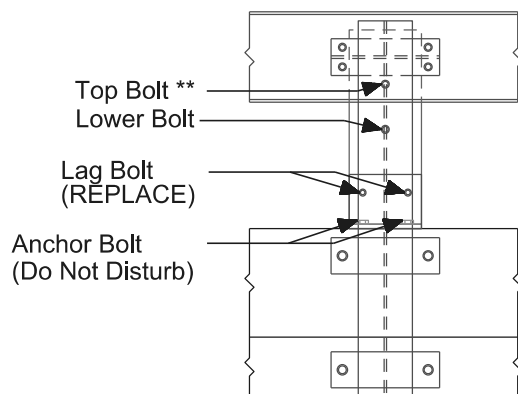


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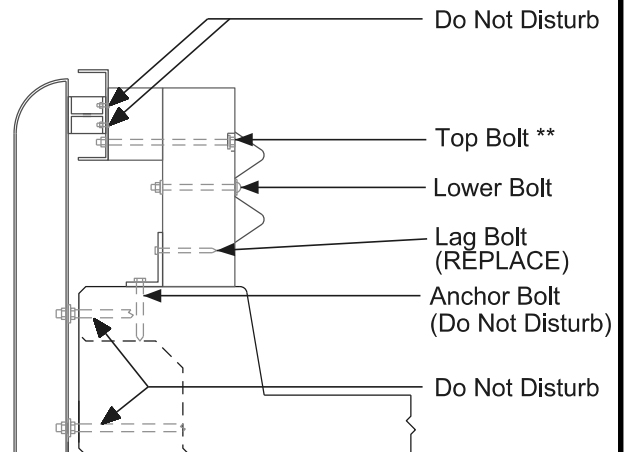


**SIDE**

**DETAIL X**



**BACK**

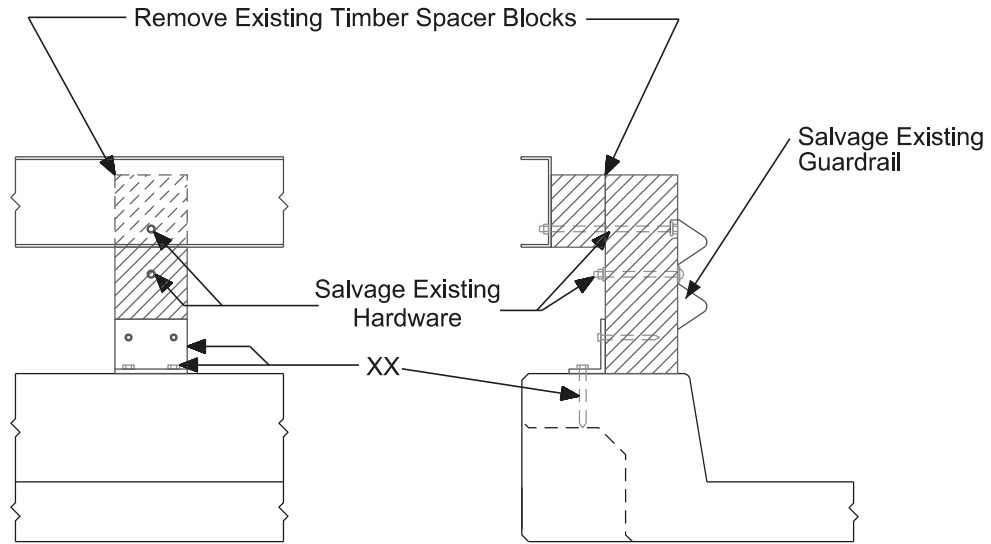


**SIDE**

**DETAIL Y**

\*\* Bolt allowed to be moved horizontally up to 1½" from the center of the post

**BOLT DETAILS FOR BRIDGE RAIL MODIFICATION**

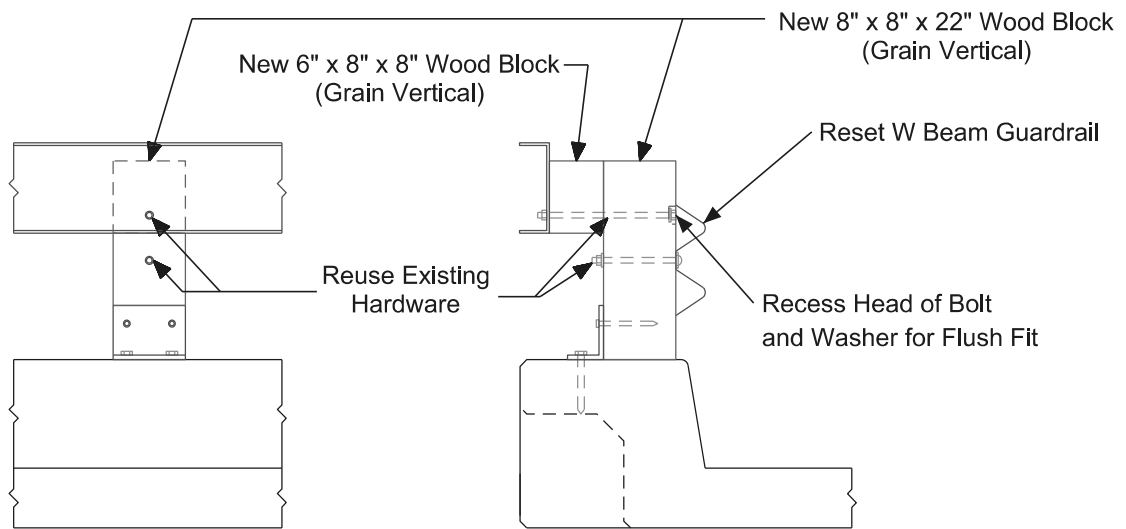


*Back*

*Side*

***Existing Spacer Block Detail***

XX - Anchor Bolts and Curb Bracket not to be disturbed unless damaged

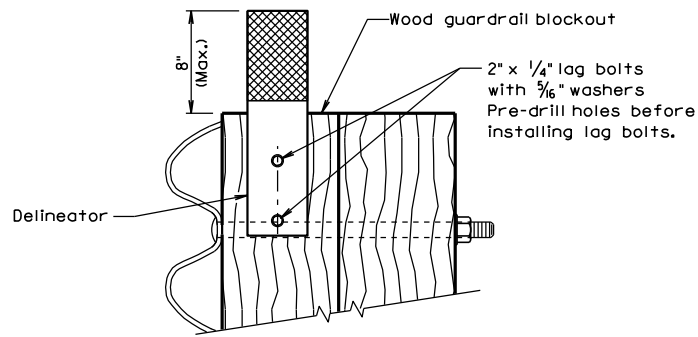


*Back*

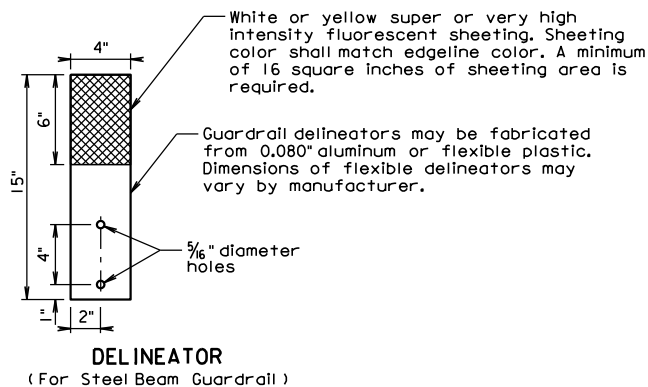
*Side*

***New Spacer Block Detail***

***BRIDGE RAIL MODIFICATION DETAILS***



**B STEEL BEAM GUARDRAIL DELINEATION**



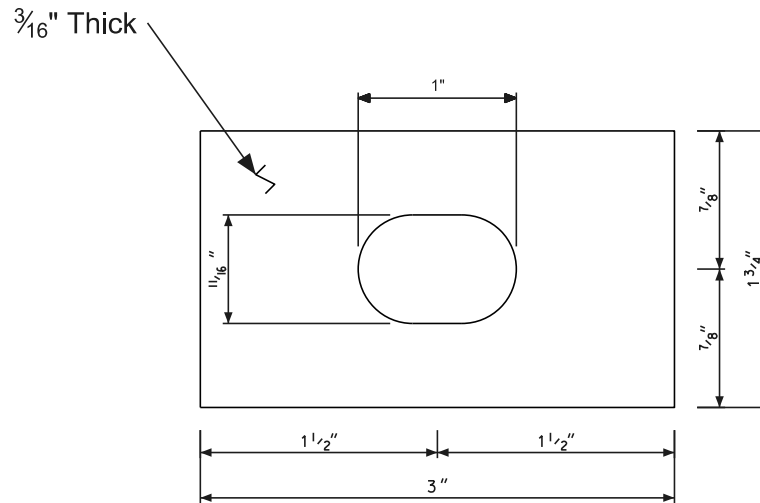
**GENERAL NOTES:**

The delineators shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be of either very high intensity or super high intensity material. For bridges along two-way roadways the sheeting shall be on both sides of the delineator and shall be white in color.

The first delineator shall be attached to the block nearest to the end of the bridge with additional delineators spaced at approximately 50 foot intervals.

All costs for furnishing and installing back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

**GUARDRAIL DELINEATION AT BRIDGES**



**RECTANGULAR WASHER**

### **Hardware Parts List - Per Block Location**

#### **Top Bolt Assembly - Block to Rail Attachment**

- 1 - 1.75" high x 3" wide rectangular washer
- 1 - 5/8" diameter x 9.5" long galvanized carriage bolt
- 1 - Heavy hex guardrail type galvanized nut
- Wood Blocks - 3/4" diameter field drilled hole, 1" diameter allowable at steel "blind" block locations

#### **Lower Bolt Assembly - W-beam to Block**

- 2 - 1.75" high x 3" wide (8 ga galvanized) rectangular washer
- 1 - 5/8" diameter x 16" long galvanized carriage bolt
- 1 - Heavy hex guardrail type galvanized nut
- Wood Blocks - 3/4" diameter field drilled hole

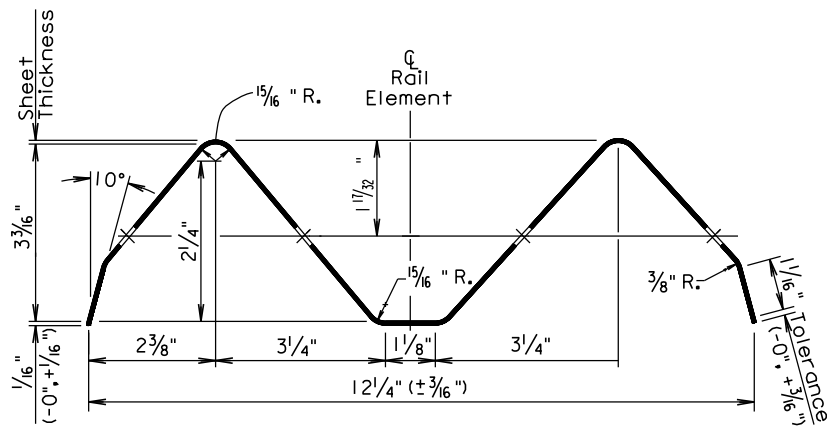
#### **Lag Bolt Assembly - Block to Curb Bracket**

- 2 - 1/2" diameter x 6" long galvanized lag bolts

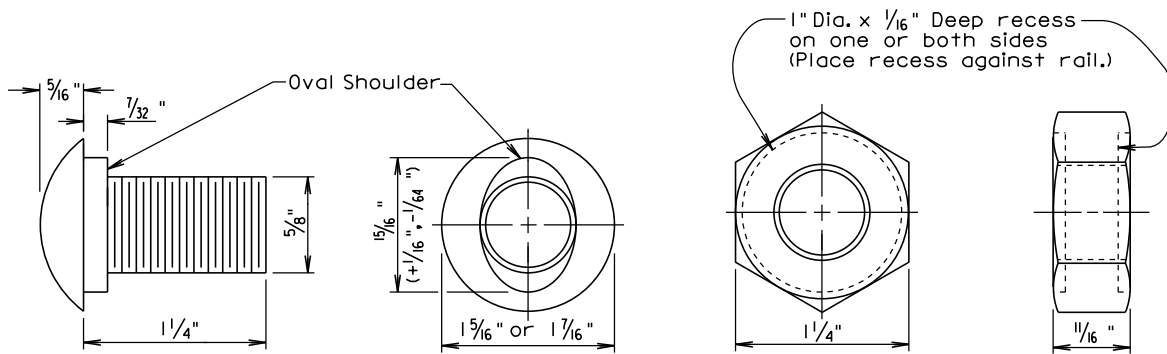
#### **Anchor Bolt Assembly - Curb Bracket to Curb**

- 2 - 3/4" diameter x 6" long wej-it or equivalent
- 2 - 3/4" inner diameter galvanized washers
- 2 - Heavy hex 3/4" galvanized nut

### **MISCELLANEOUS HARDWARE DETAILS**

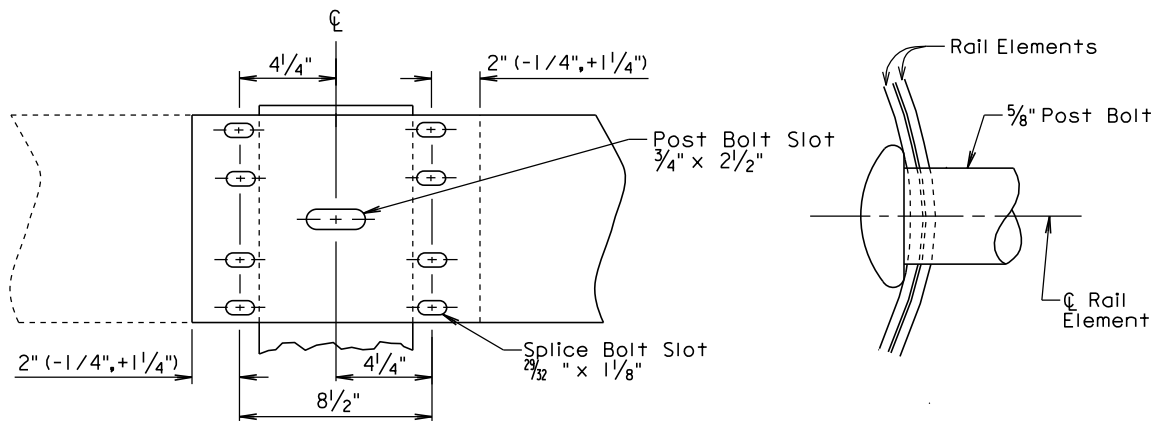


SECTION THROUGH W BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

SPICE BOLT  
(5/8" BUTTON HEAD BOLT AND RECESS NUT)



Lap in direction of traffic.  
RAIL SPLICE

December 23, 2004

Published Date: 1st Qtr. 2013

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**W BEAM RAIL, RAIL SPLICE, AND HARDWARE**

**PLATE NUMBER  
630.33**

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

- Flagger
- Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices shall be drums or 42" cones.

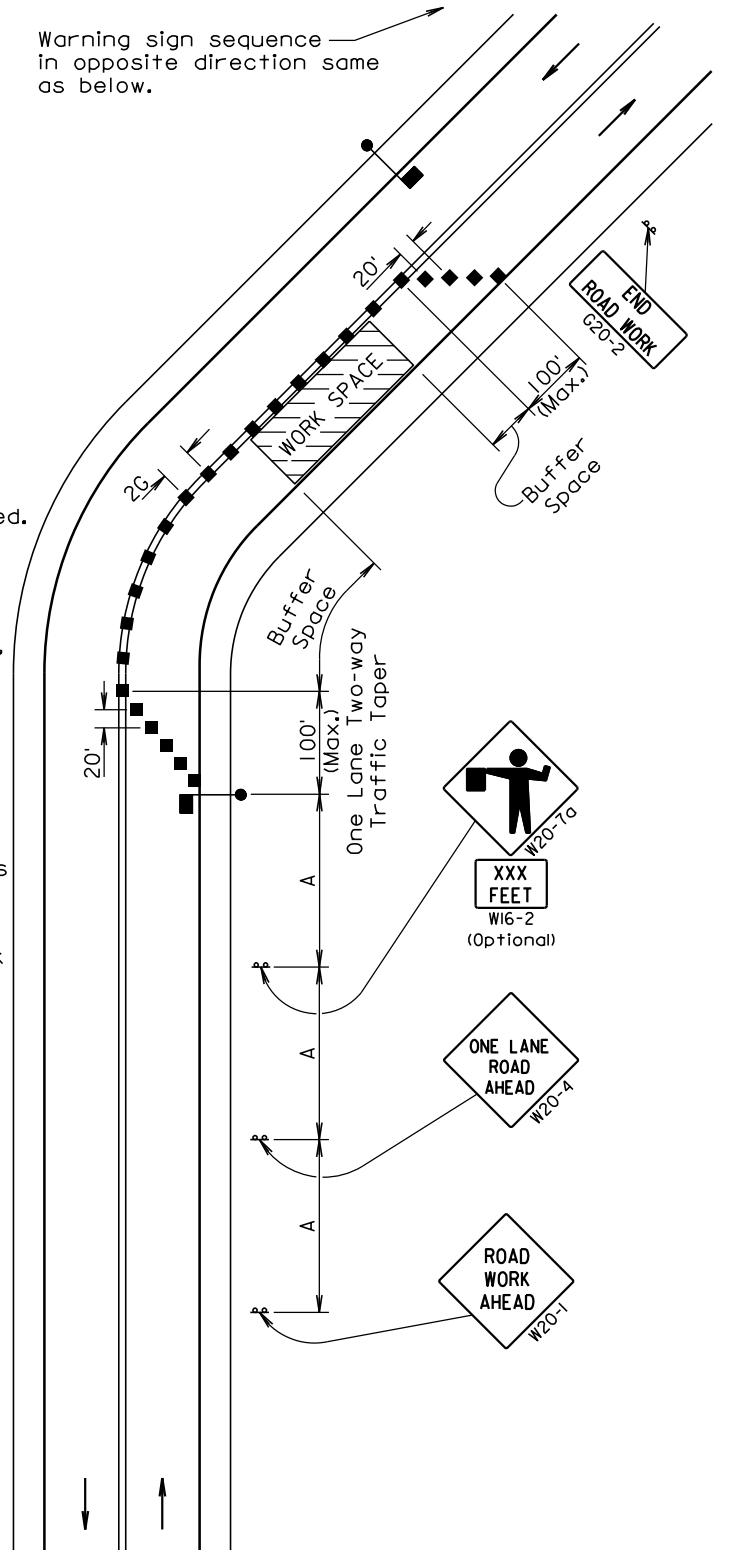
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK  
G20-2

Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

Warning sign sequence in opposite direction same as below.



February 14, 2011

Published Date: 1st Qtr. 2013

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**GUIDES FOR TRAFFIC CONTROL DEVICES  
LANE CLOSURE WITH FLAGGER PROVIDED**

PLATE NUMBER  
**634.23**

Sheet 1 of 1