PoDI / NHS	Other Project Information:	As Constructed
FHWA PROJECT OF DIVISION INTEREST (PoDI)? ■ NO ☐ YES	P. E. UNDER PROJECT: Project Number STA 0243-084 Project Code 19723	No Revisions:
NATIONAL HIGHWAY SYSTEM? ☐ NO ■ YES	Construction Project Name: US 24: EL PASO-ELBERT COUNTY LINE EAST PT. 2	Revised: Void:

DEPARTMENT OF TRANSPORTATION
STATE OF COLORADO

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED

FEDERAL AID PROJECT NO. STA 0243-087

STATE HIGHWAY NO. 24

ELBERT COUNTY

CONSTRUCTION PROJECT CODE NO. 20856

SHEET NO.	INDEX OF SHEETS
1	INDEX OF PLANS
2	PROJECT LOCATION MAP
3	STANDARD PLANS LIST
4	TABULATION OF LENGTH & DESIGN DATA
5-7	TYPICAL SECTIONS
8	PROJECT DESCRIPTION & GENERAL NOTES
9-10	ENVIRONMENTAL NOTES
11-13	SUMMARY OF APPROXIMATE QUANTITIES
14	SUMMARY OF EARTHWORK
15	TABULATION OF ROAD AND FIELD APPROACHES
16	SURFACING TABULATION
17	SIMLA H.M.A. DETAIL
18	CURB RAMP DETAILS
19	MANHOLE LOCATIONS
20-29	CORE DATA
30-37	STORMWATER MANAGEMENT PLAN
38	SURVEY TAB SHEET
39-40	CONTROL DIAGRAM
41	TABULATION OF TRAFFIC ENGINEERING ITEMS
42	SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES
43	TABULATION OF PAVEMENT MARKINGS
44	ADVANCED AREA SIGNING
45	TYPICAL PROJECT SIGNING

Sheet Revisions				Contract Information
	Date:	Comments	Init.	Contractor:
				Resident Engineer:
				Project Engineer:
				PROJECT STARTED: ACCEPTED:
				Comments:

Print Date: 2/9/2017	INDEX OF SHEETS			Project No./Code
File Name: 01-19314DES_TitleSht.dgn				STA 0243-087
Horiz. Scale: 1:1				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: ROADWAY		Sheet:	Sheet Number 1

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No Revisions:
Revised:
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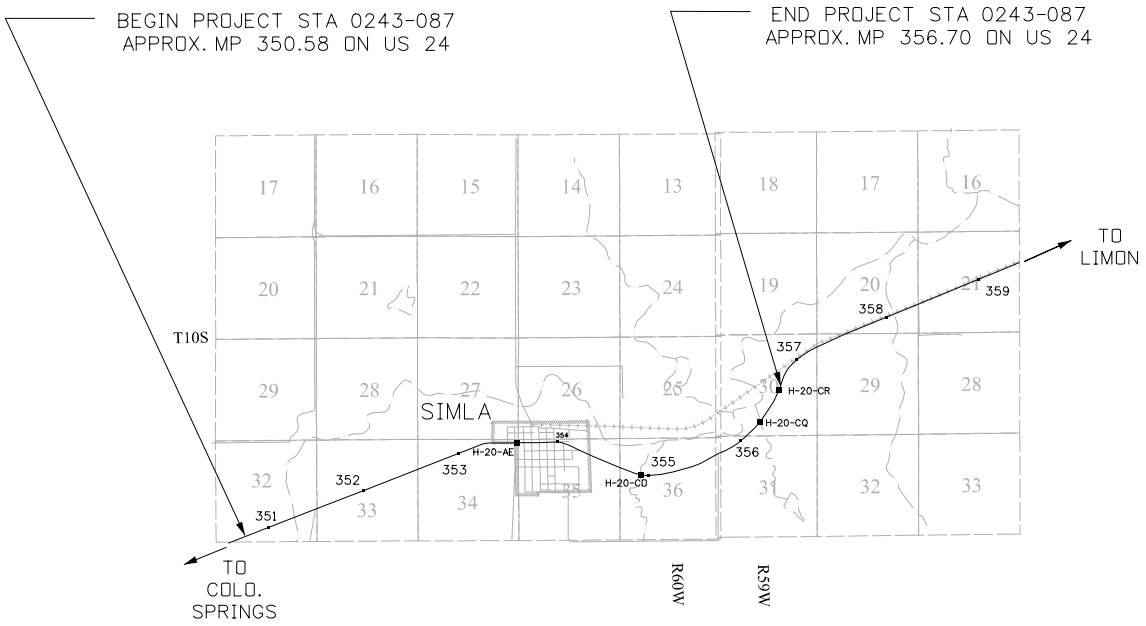
ELBERT COUNTY



SCALE IN MILES

Print Date: 2/7/2017	PROJECT LOCATION MAP			Project No./Code
File Name: 02 Project Location Map.dgn				STA 0243-087
Horiz. Scale: 1:100	Designer: J.D. MILLER	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
Vert. Scale: As Noted	Detailer: J.D. MILLER		Unit Leader: TAM	
Unit Information	Sheet Subset: ROADWAY		Sheet:	Sheet Number 2
Unit Leader Initials				

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As Constructed
No Revisions: mm/dd/yy
Revised: mm/dd/yy
Void: mm/dd/yy

PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER
M-100-1		STANDARD SYMBOLS (3 SHEETS)	1-3
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M-206-2		EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS)	17-18
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M-214-1		PLANTING DETAILS	33
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M-412-1	▭	CONCRETE PAVEMENT JOINTS (5 SHEETS) (REVISED ON JULY 24, 2012)	~~34-38~~
M-510-1		STRUCTURAL PLATE PIPE H-20 LOADING	39
M-601-1	▭	SINGLE CONCRETE BOX CULVERT (2 SHEETS) (REVISED ON NOVEMBER 25, 2015)	~~40-41~~
M-601-2	▭	DOUBLE CONCRETE BOX CULVERT (2 SHEETS) (REVISED ON NOVEMBER 25, 2015)	~~42-43~~
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M-603-4	▭	CORRUGATED POLYETHYLENE PIPE (AASHTO M294) (REVISED ON OCTOBER 02, 2014)	~~56~~
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M-603-6	▭	STEEL REINFORCED POLYETHYLENE RIBBED PIPE (AASHTO MP 20) (NEW ON APRIL 30, 2015)	
M-603-10		CONCRETE AND METAL END SECTIONS (2 SHEETS)	58-59
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M-608-1	■	CURB RAMPS (7 SHEETS) (REVISED ON JUNE 16, 2014)	~~120-125~~
M-609-1	■	CURBS, GUTTERS, AND SIDEWALKS (4 SHEETS) (REVISED ON JULY 24, 2012)	~~126-129~~
M-611-1		CATTLE GUARD (2 SHEETS)	130-131
M-611-1	▭	DEER GUARD (2 SHEETS) (NEW ON APRIL 30, 2015)	
M-613-1		ROADWAY LIGHTING (4 SHEETS)	132-135
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S-614-1	■	GROUND SIGN PLACEMENT (2 SHEETS) (REVISED ON DECEMBER 12, 2014)	~~158-159~~
S-614-2	■	CLASS I SIGNS (REVISED ON JUNE 24, 2016)	~~160~~
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S-614-6	■	CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS (2 SHEETS) (REVISED ON SEPT. 16, 2013)	~~167-168~~
S-614-8	■	TUBULAR STEEL SIGN SUPPORT DETAILS (6 SHEETS) (REVISED ON DECEMBER 1, 2016)	~~169-173~~
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S-614-10		MARKER ASSEMBLY INSTALLATIONS	175
S-614-11		MILEPOST SIGN DETAIL FOR HIGH SNOW AREAS	176
S-614-12		STRUCTURE NUMBER INSTALLATION	177
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S-614-40A	▭	ALTERNATIVE TRAFFIC SIGNAL INSTALLATION DETAILS (4 SHEETS) (REVISED ON JUNE 17, 2016)	~~189-192~~
S-614-41	▭	TEMPORARY SPAN WIRE DETAILS (REVISED ON APRIL 2, 2015)	~~193~~
S-614-42		CABINET FOUNDATION DETAIL (4 SHEETS)	194-197
S-614-43		TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS (10 SHEETS)	198-207
S-614-44	■	PEDESTAL POLE SIGNALS (2 SHEETS) (REVISED ON JUNE 17, 2016)	
S-614-50	■	STATIC SIGN MONOTUBE STRUCTURES (12 SHEETS) (REVISED ON JUNE 17, 2016)	~~208-219~~
S-614-60	■	DYNAMIC SIGN MONOTUBE STRUCTURES (14 SHEETS) (REVISED ON JUNE 17, 2016)	~~220-233~~
S-627-1	■	PAVEMENT MARKINGS (5 SHEETS) (REVISED ON JUNE 10, 2014)	~~234-238~~
S-630-1	■	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION (24 SHEETS) (REVISED ON JUNE 23, 2016)	~~239-258~~
S-630-2	■	BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP) AND VERTICAL PANELS (REVISED ON JUNE 23, 2016)	~~259~~
S-630-3		FLASHING BEACON (PORTABLE) DETAILS	260
S-630-4		STEEL SIGN SUPPORT (TEMPORARY) INSTALLATION DETAILS (2 SHEETS)	261-262
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S-630-6		EMERGENCY PULL-OFF AREA (TEMPORARY)	265
S-630-7		ROLLING ROADBLOCKS FOR TRAFFIC CONTROL (3 SHEETS)	266-268

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

NEW OR REVISED STANDARD PLAN SHEETS APPLICABLE TO THIS PROJECT, INDICATED BY A MARKED BOX ■, WILL BE ATTACHED TO THE PLANS.

COLORADO
DEPARTMENT OF TRANSPORTATION

STANDARD PLANS LIST
M&S STANDARDS
JULY 4, 2012

DECEMBER 1, 2016

Standard Plans List

Designer: J.D. Miller
Detailer: J.D. Miller
Sheet Subset: XXXXX

Region: 4
Unit Leader: TAM
Sheet: XX of XX

Computer File Information

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Last Modification Date: mm/dd/yy Initials: XXX
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Drawing File Name: XXXXXXXX.XXX
MicroStation Version: Scale: NA Units: English

Project No./Code
STA 0243-087
20856
Sheet Number: 03

As Constructed
No Revisions:
Revised:
Void:

TABULATION OF LENGTH & DESIGN DATA

STATION	FEET ROADWAY US 24	
BEGIN PROJ. STA 0243-087		
M.P. 350.58 ON US 24		
END PROJ. STA 0243-087	32,314	
M.P. 356.70 ON US 24		
TOTAL	32,314	
SUMMARY OF PROJECT LENGTH	FEET	MILES
MAJOR STRUCTURE		
PROJECT GROSS LENGTH	32,314	6.12

DESIGN DATA	US 24
MAXIMUM RADIUS OF CURVE	N/A
MAXIMUM GRADE	N/A
MINIMUM S.S.D. HORIZONTAL	N/A
MINIMUM S.S.D. VERTICAL	N/A
MAXIMUM DESIGN SPEED	N/A
2035 DESIGN TRAFFIC	DHV = 557
	ADT = 4,644
DHV TRUCK %	16%

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Vert. Scale: As Noted	Designer: J.D. MILLER	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
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Unit Leader Initials	Sheet Subset:		Sheet: of	Sheet Number 4

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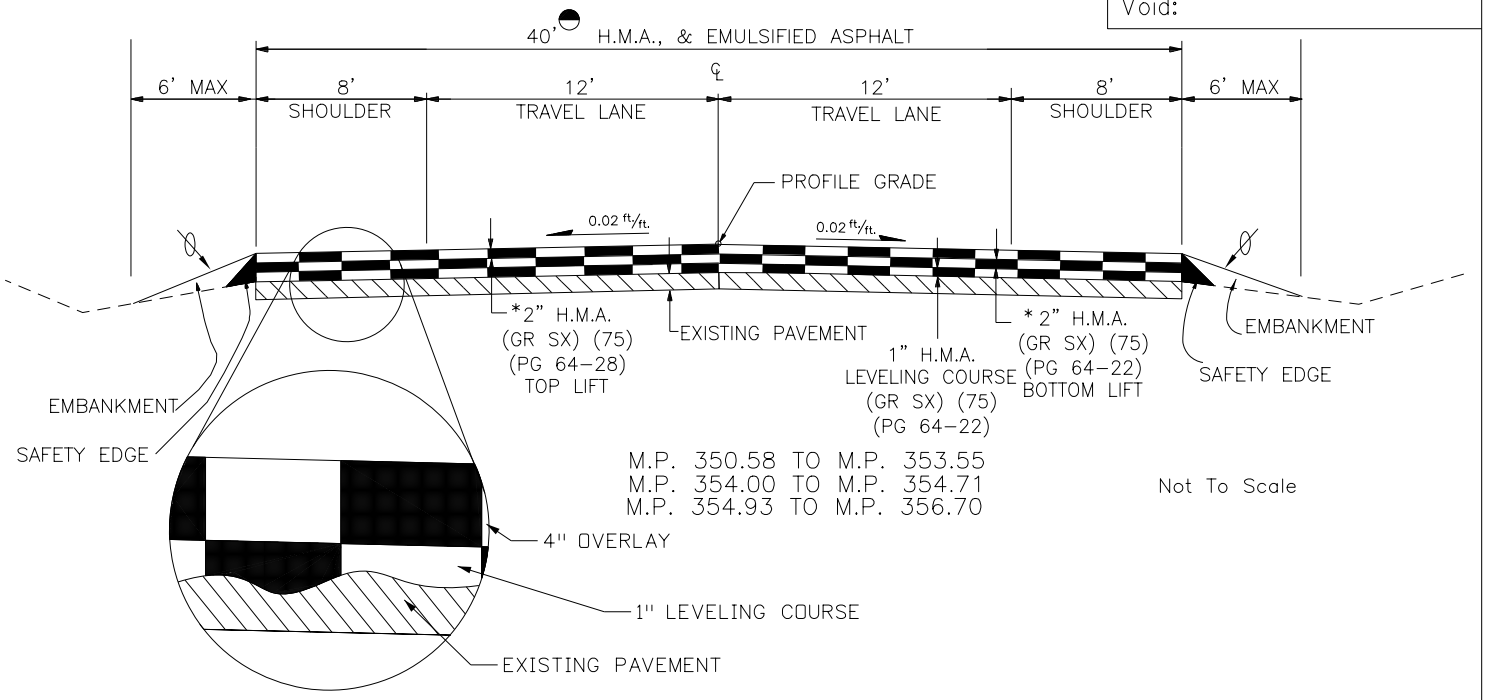
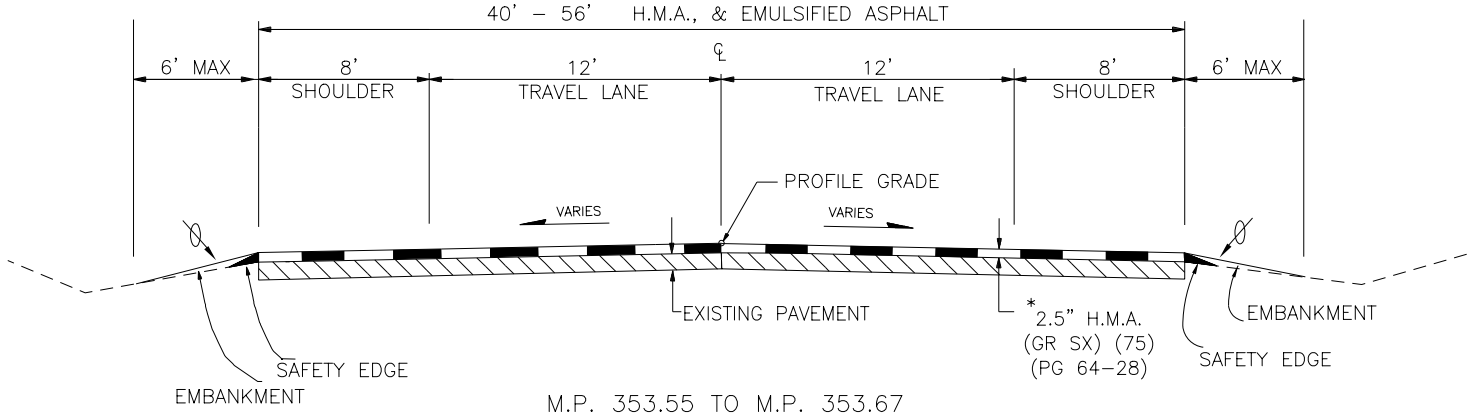
US 24



M.P. 350.58 TO M.P. 353.55
M.P. 354.00 TO M.P. 354.71
M.P. 354.93 TO M.P. 356.70

Not To Scale



M.P. 353.55 TO M.P. 353.67

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GENERAL NOTES

EMBANKMENT (CIP) SHALL HAVE A P.I. OF 5-15 AND WILL BE REQUIRED ON THIS PROJECT FOR SHOULDERING UPON COMPLETION OF PAVING. THE SHOULDERING OPERATION SHALL BE ACCOMPLISHED WITHIN THREE WORKING DAYS OF THE COMPLETION OF TOP MAT PAVING OPERATIONS ON ANY THREE-MILE SECTION OF ROADWAY. SHOULDERING MATERIAL SHALL BE PLACED WITH A SHOULDERING MACHINE TO THE TOP OF NEW GRADE USING EMBANKMENT (CIP).

ALL ACTIVITIES REQUIRED TO ACCOMPLISH THE SHOULDERING OPERATIONS SHALL BE INCLUDED IN THIS COST OF WORK AND WILL NOT BE PAID FOR SEPARATELY.

ROADWAY WIDTH VARIES

* APPROXIMATE THICKNESS OF HMA

Print Date: 2/7/2017	TYPICAL SECTIONS			Project No./Code
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Horiz. Scale: 1:100				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset:		Sheet: 1 of 3	Sheet Number 5

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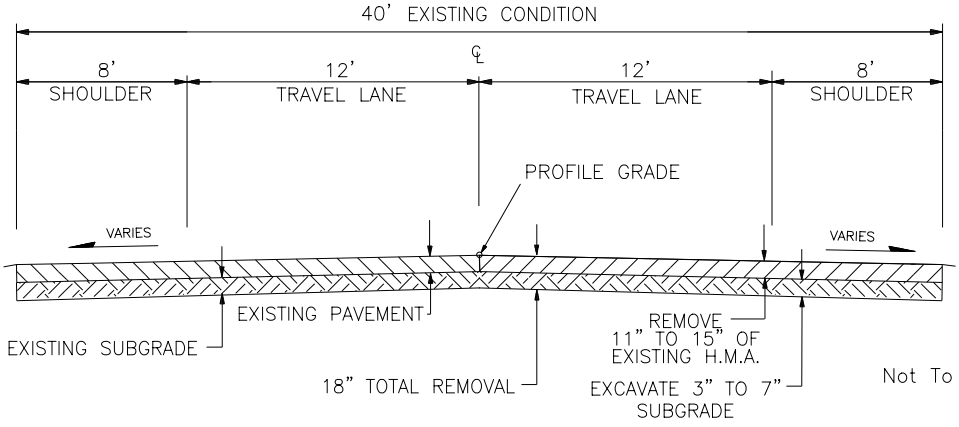
US 24 (FLOODPLAIN)

M.P. 354.71 TO M.P. 354.93



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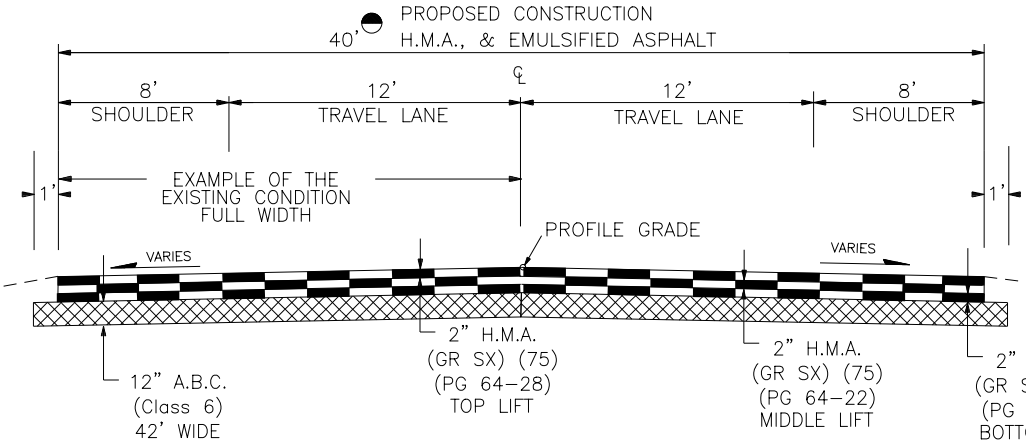

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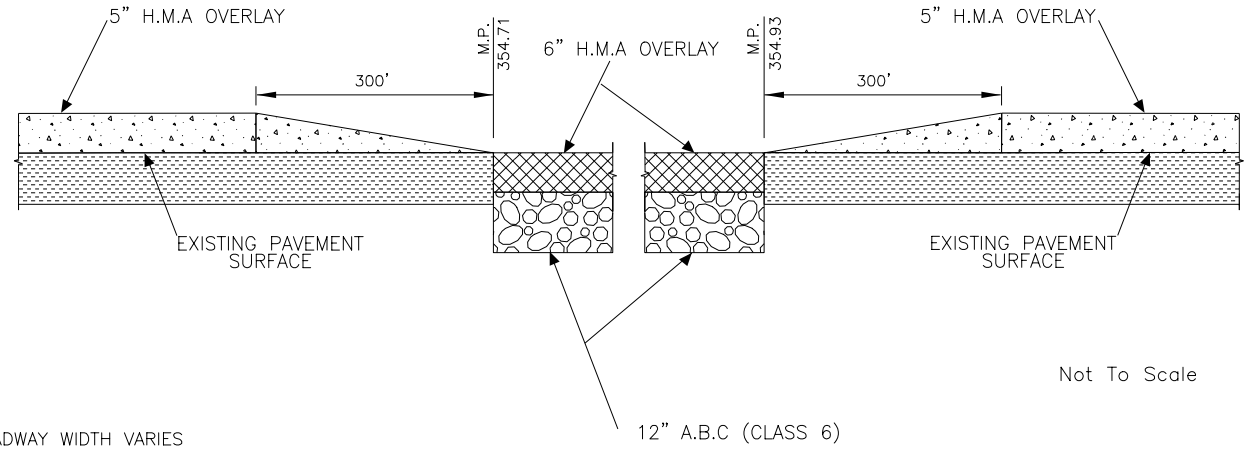
TRANSITION TO FLOOD PLAIN



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ROADWAY WIDTH VARIES

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File Name: 05-07 Typicals.dgn				STA 0243-087
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Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset:		Sheet: 2 of 3	Sheet Number 6

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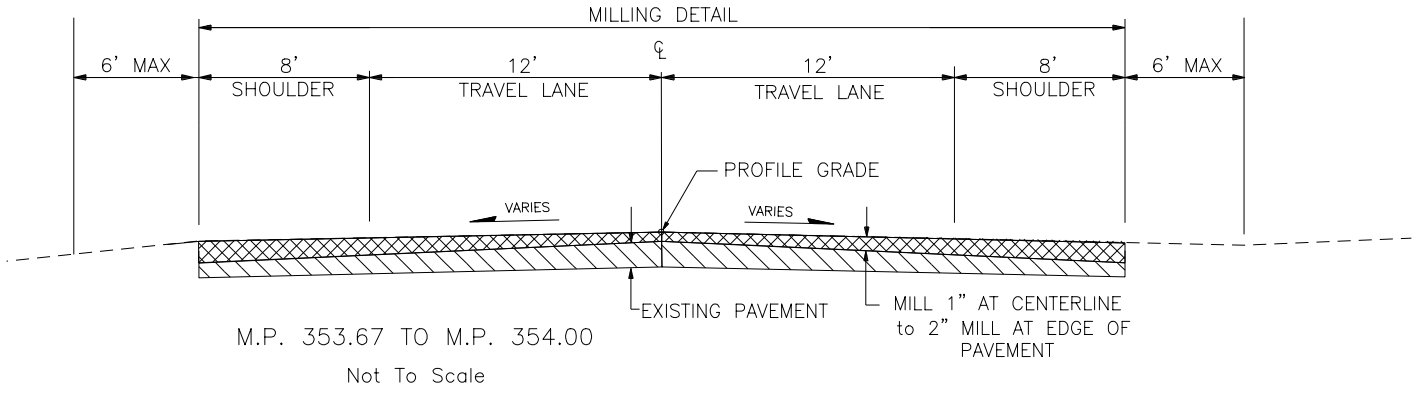
US 24 TOWN OF SIMLA



M.P. 353.67 TO M.P. 354.00

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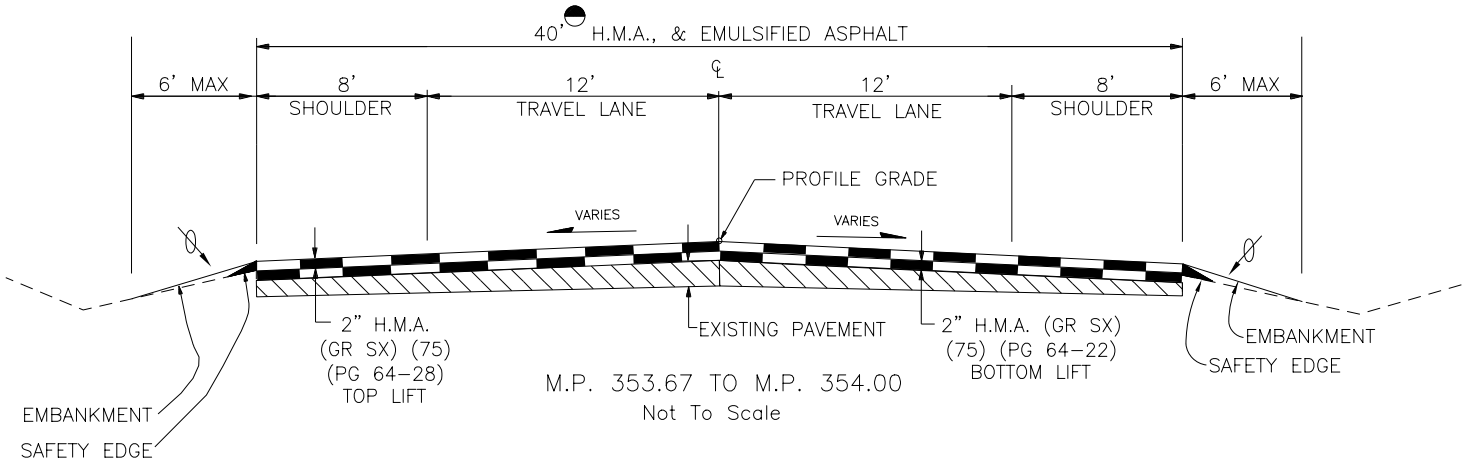
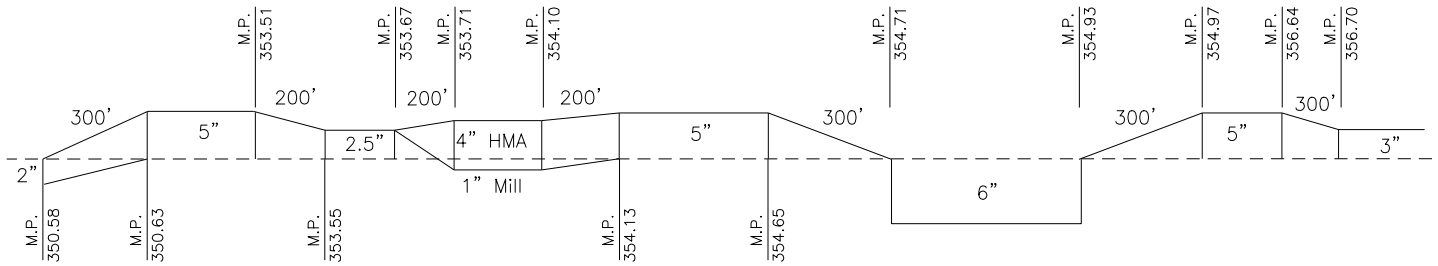


M.P. 353.67 TO M.P. 354.00

Not To Scale

PROJECT TRANSITIONS



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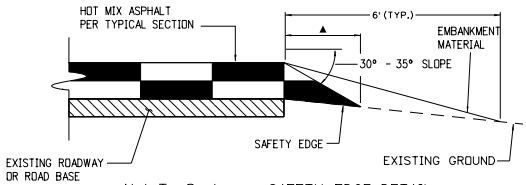
GENERAL NOTES

1. THE SAFETY EDGE WILL BE CONSTRUCTED AS PART OF THE ROADWAY PAVEMENT. A SHOULDER WEDGE DEVICE WILL BE ADDED TO THE SCREED OF THE PAVING MACHINE.
2. THE CONTRACTOR MAY USE A SHOULDER WEDGE MAKER OR A SIMILAR DEVICE THAT PRODUCES THE SAME COMPACTION RESULTS.
3. SHORT SECTIONS OF HANDWORK WILL BE ALLOWED WHEN NECESSARY FOR TRANSITIONS AND TURNOUTS.

◓ ROADWAY WIDTH VARIES



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SAFETY EDGE DETAIL

▲ - SAFETY EDGE WITH A 30°-35° SLOPE AND SHOULDER MATERIAL (SEE SAFETY EDGE DETAILS).

Print Date: 2/9/2017	TYPICAL SECTIONS			Project No./Code
File Name: 05-07 Typicals.dgn				STA 0243-087
Horiz. Scale: 1:100				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset:		Sheet: 3 of 3	Sheet Number 7

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As Constructed
No Revisions:
Revised:
Void:

PROJECT DESCRIPTION:
THIS PROJECT CONSISTS OF HOT MIX ASPHALT OVERLAY FROM M.P. 350.58 TO M.P. 356.70 ON US 24.

200

BORROW WITHIN CDOT RIGHT OF WAY SHALL NOT BE PERMITTED.
DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:
FULL DEPTH OF ALL EMBANKMENT
BASE OF FILLS – 6", BASE OF CUTS – 6"
EXCAVATION REQUIRED FOR COMPACTION OF BASES AND CUTS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPERATELY.

THE SULFATE LEVEL IS CLASS 1.

IT IS ESTIMATED THAT THERE SHALL BE 168 EACH OF ITEM REMOVAL OF DELINEATORS.

400

FOR PRELIMINARY PLAN QUANTITIES OF PAVEMENT MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:

TACK COAT EMULSIFIED ASPHALT (SLOW SETTING)...@ 0.1 GALS./SQ. YD.(DILUTED)
HOT MIX ASPHALT.....@ 110 LBS./SQ. YD./INCH

DILUTED EMULSIFIED ASPHALT FOR TACK COAT SHALL CONSIST OF 1 PART EMULSIFIED ASPHALT AND 1 PART WATER. RATES OF APPLICATION SHALL BE DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION

A TACK COAT WILL BE REQUIRED BETWEEN LAYERS OF BITUMINOUS PAVEMENT. RATES OF APPLICATION MAY BE ADJUSTED BY THE ENGINEER AT THE TIME OF APPLICATION.

THE FOLLOWING SHALL BE FURNISHED WITH EACH BITUMINOUS PAVER.
1. A SKI TYPE DEVICE AT LEAST 30 FEET IN LENGTH.
2. SHORT SKI OR SHOE.
3. 6 INCH SHOE IS REQUIRED.

THE CONTRACTOR SHALL PROVIDE A CERTIFIED SCALE AND CERTIFIED WEIGHER AT THE POINT OF LOADING FOR ALL ASPHALT DELIVERED TO THE PROJECT.

PRIOR TO PLACING HOT MIX ASPHALT, SWEEPING OF DIRT AND GRAVEL FROM THE EXISTING MAT SHALL BE DONE, THIS WORK SHALL NOT BE PAID FOR SEPERATELY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE WORK.

THE SMOOTHNESS INCENTIVE FOR THIS PROJECT SHALL BE MRI PAVEMENT SMOOTHNESS CATEGORY II EXCEPT IN SIMLA BETWEETN M.P. 353.55 AND M.P. 353.67 WHERE TYPICAL SECTION IS 2.5 INCH OVERLAY THE SMOOTHNESS INCENTIVE SHALL BE MRI PAVEMENT SMOOTHNESS CATEGORY III.

600

IT IS ESTIMATED THAT THE FOLLOWING WILL BE REQUIRED ON THIS PROJECT:

612	DELINEATOR (DRIVABLE CONCRETE INSTALLATION)(TYPE I)	122 EACH
612	DELINEATOR (TYPE III)	46 EACH
620	FIELD LABORATORY (CLASS 2)	1 EACH
620	FIELD OFFICE (CLASS 1)	1 EACH
620	SANITARY FACILITIES	2 EACH
625	CONSTRUCTION SURVEYING	1 LS
626	MOBILIZATION	1 LS
626	PUBLIC INFORMATION SERVICES (TIER IV)	1 LS
630	FLAGGING	2,025 HOURS
630	TRAFFIC CONTROL MANAGEMENT	60 DAY
630	TRAFFIC CONTROL INSPECTION	30 DAY

DELINEATOR (DRIVABLE CONCRETE INSTALLATION)(TYPE I) SHALL BE PLACED 4 FEET FROM THE EDGE OF PAVEMENT.

IT IS ESTIMATED THAT 100 LF OF FENCE (PLASTIC) SHALL BE REQUIRED ON A TEMPORARY BASIS FOR SIDEWALK AND CURB RAMP CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE COST FOR METAL POSTS AND REMOVAL OF FENCE SHALL BE INCLUDED IN THE WORK.

MISC

THE CONTRACTOR SHALL SUBMIT A METHOD STATEMENT FOR CONSTRUCTING THE A.B.C.(CLASS 6) AND HMA WORK IN THE FLOODPLAIN (M.P. 354.71 TO 354.93) TO THE ENGINEER FOR APPROVAL AT LEAST TWO WEEKS BEFORE PERFORMING THE WORK. THE CONTRACTOR SHALL KEEP A MINIMUM OF ONE LANE OPEN DURING DAYLIGHT HOURS AND HAVE THE ROADWAY FULLY BACK OPEN DURING NON-DAYLIGHT HOURS.

THE CONTRACTOR SHALL BE REQUIRED TO ESTABLISH AND MAINTAIN ROADWAY REFERENCE STATIONING AT A MINIMUM INTERVAL OF 200 FEET, AT NO ADDITIONAL COST TO THE PROJECT.

MATERIALS SUPPLIED TO AND HAULED FROM THE PROJECT SHALL BE TRANSPORTED BY UTILIZING INTERSTATE OR STATE HIGHWAYS ONLY, UNLESS APPROVED IN WRITING BY THE PROJECT ENGINEER.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO PARAGRAPH 105.11 OF THE STANDARD SPECIFICATIONS CONCERNING UTILITIES.

811 Know what's below. Call before you dig.

CALL THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 TWO BUSINESS DAYS, NOT INCLUDING THE DAY YOU CALL, BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGOUND MEMBER UTILITIES.

Print Date: 2/9/2017	PROJECT DESCRIPTION & GENERAL NOTES			Project No./Code
File Name: 08 GeneralNotes.dgn				STA 0243-087
Horiz. Scale: 1:100	Designer: J.D. MILLER	CDOT DEPARTMENT OF TRANSPORTATION	Region: 04	20856
Vert. Scale: As Noted	Detailer: J.D. MILLER		Unit Leader: TAM	
Unit Information	Sheet Subset: ROADWAY		Sheet: of	Sheet Number 8
Unit Leader Initials				

millerjd 12:45:30 PM C:\Projects\20856 - US 24-ElPaso Elbert Co Line East Part 2\Plot_Sets\AD\08 GeneralNotes.dgn

GENERAL ENVIRONMENTAL NOTES

Wetlands, Threatened and Endangered Species, and Black-Tailed Prairie Dog Habitat

Work activities including the movement and placement of vehicles and equipment shall not disturb wetlands, threatened and endangered species (or their habitat), or black-tailed prairie dog colonies. If any such sites are encountered, CDOT Region 4 Environmental Unit shall be notified so that all applicable clearances and permits may be obtained. Orange construction fencing should be erected to protect these sensitive areas when they are in close proximity to construction activities.

Containment and cleanup of equipment fuel, oil and lubricant leaks for projects in sensitive areas

Contractor shall inspect equipment and vehicles as often as is necessary to insure that petroleum, oils, and lubricants (POL) are not leaking onto the soil or pavement. Absorbent materials or containers approved by the Engineer shall be used to prevent leaking POL from reaching the soil or pavement. Contractor shall have ready approved absorbent materials or containers of sufficient capacity to contain any leak of POL that can reasonably be foreseen. All materials resulting from POL leakage control and cleanup remain the property of the Contractor. The cost for control and cleanup of POL leaks will not be paid for separately, but will be included in the cost of work.

Waste Materials

There shall be no stockpiling or side casting of waste materials including but not limited to paint chips, asphalt, or concrete adjacent to any drainages (including dry drainages). Paint material removed in the course of restriping shall be properly contained and disposed of to prevent such materials from entering waters of the state.

Materials stockpile locations for projects in sensitive areas

All stockpiled project materials shall be located away from sensitive areas and confined so that no material(s) or their runoff enter waters of the US/State, including, but not limited to, wetlands, gullies, seeps, irrigation canals/water, dry washes, ponds, lakes, or streams (ephemeral, intermittent or permanent), whether flowing or dry.

Noxious Weeds

Noxious weeds may persist on or adjacent to the project location. CDOT mandates that all Weed species on the State Weed Law List A and B be addressed according to statute. Information regarding noxious weeds is available through the CDOT R-4 Environmental office.

Environmental Walkthrough

Once construction has been completed the CDOT Project Manager, the CDOT Region 4 Water Pollution Control Manager, and the contractor will conduct a walkthrough of the project site. The purpose of the walkthrough is to identify any areas where BMPs need to be removed or maintained. Please contact **(970)350-2264** at least 7 days prior to final acceptance to schedule the walkthrough.

CDPS/Water Quality

It is estimated that a CDPS Stormwater Construction Permit (SCP) will not be required for this project. The Contractor shall comply with all requirements of Sections 101, 107, and 208 of the 2011 Standard Specifications for Road and Bridge Construction and Revision of Sections 107 and 208 Water Quality Control Under One Acre of Disturbance ssued February 3, 2011. If construction activities result in ground surface disturbance of at least one acre, including haul roads, staging and equipment storage areas, and as defined by the Colorado Department of Health and Environment (CDPHE) the Contractor shall obtain a CDPS permit and will be responsible for all costs associated with its full implementation. Obtaining this permit removes the Revision of Sections 107 and 208 Water Quality Control Under One Acre of Disturbance issued February 3, 2011 from this project.

MBTA

The Migratory Bird Treaty Act (MBTA) protects migratory birds and their nests and eggs. For projects that could potentially have an impact, the following conditions apply:

1) Tree Trimming/Removal

Tree trimming and/or removal activities shall be completed before birds begin to nest or after the young have fledged. In Colorado, most nesting and rearing activities occur between April 1 and August 31. However, since some birds nest as early as February, a nesting bird survey shall be conducted by a biologist before any tree trimming or removal activities begin.

2) Birds of Prey

For birds of prey that could potentially nest near the project site, please contact the CDOT R-4 biologist and/or refer to the Colorado Division of Wildlife's "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" guidelines available at Colorado Division of Wildlife district offices.

Bald Eagles

Nest Site: Bald Eagles are protected by the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. The CDOW recommends no surface occupancy (beyond that which historically occurred in the area) within ¼ mile radius of active nests. No human encroachment within ½ miles radius on active nests from October 15 through July 31.

Winter Night Roost: No human encroachment from November 15 through March 15 within ¼ mile radius of an active winter night roost if there is no direct line of sight between the roost and the encroachment activities. No human encroachment from November 15 through March 15 within ½ mile radius of an active winter roost if there is a direct line of sight between the roost and the encroachment activities. If Bald Eagles are spotted on or adjacent to the project, CDOT R4, Environmental Unit shall be notified immediately.

Burrowing Owls

Burrowing owls are a state threatened species and are protected under the Migratory Bird Treaty Act. No human encroachment or disturbance within 150 feet of the nest site from March 15 through October 31. If project activities are to take place between these times, a burrowing owl survey must be completed before construction activities take place. If burrowing owls are identified on or adjacent to the project, CDOT R4 Environmental Unit shall be notified immediately.

Golden Eagle

Golden eagles are protected by the Bald and Golden Eagle Protection Act, Endangered Species Act and Migratory Bird Treaty Act. No surface occupancy (beyond that which historically occurred in the area) within 1/4 mile radius of active nests. No human encroachment within 1/2 mile radius of active nests site and associated alternate nests from December 15 to July 15. If Golden Eagles are identified on or adjacent to the project, CDOT R4 Environmental Unit shall be notified immediately.

Ferruginous Hawk

Ferruginous hawks are protected under the Migratory Bird Treaty Act. No surface occupancy (beyond that which historically occurred in the area) within 1/2 mile radius of active nests. No human encroachment within 1/2 mile radius of active nests from February 1 to July 15. If Ferruginous hawks are identified on or adjacent to the project, CDOT R4 Environmental Unit shall be notified immediately.

Swainson's Hawk

Swainson's hawks are protected by the Migratory Bird Treaty Act. No surface occupancy (beyond that which historically occurred in the area) within 1/4 mile radius of the nest site and associated alternate nests. No human encroachment within 1/4 mile of the nest and any alternate nests from April 1 to July 15. If Swainson's hawks are identified on or adjacent to the project, CDOT R4 Environmental Unit shall be notified immediately.

Red-Tailed Hawk

Red-tailed hawks are protected by the Migratory Bird Treaty Act. No surface occupancy (beyond that which historically occurred in the area) within 1/3 mile radius of active nests. No human encroachment within 1/3 mile radius of active nests from February 15 through July 15. If red-tailed hawks are identified on or adjacent to the project, CDOT R4 Environmental Unit shall be notified immediately.

Print Date: 2/7/2017	ENVIRONMENTAL NOTES			Project No./Code
File Name: 08 GeneralNotes.dgn				STA 0243-087
Horiz. Scale: 1:100	Designer: J.D. MILLER	CDOT DEPARTMENT OF TRANSPORTATION	Region: 04	20856
Vert. Scale: As Noted	Detailer: J.D. MILLER		Unit Leader: TAM	
Unit Information	Sheet Subset: ROADWAY		Sheet: 2 of 2	Sheet Number 10
Unit Leader Initials				

COLORADO PROJECT
STA0243-087

As Constructed
No Revisions:
Revised:
Void:

INDEX			CONTRACT ITEM NUMBER	CONTRACT ITEM	PROJECT TOTALS		
BOOK	PAGE	SHEET			UNIT	PLAN QUANTITY	AS CONST.
			202-00002	Removal of Structure (Special)	EACH	1	
			202-00090	Removal of Delineator	EACH	168	
			202-00200	Removal of Sidewalk	SY	6	
			202-00220	Removal of Asphalt Mat	SY	5,163	
			202-00240	Removal of Asphalt Mat (Planing)	SY	11,374	
			203-00050	Unsuitable Material	CY	500	
			203-00060	Embankment Material (Complete In Place)	CY	2,992	
			208-00035	Aggregate Bag	LF	500	
			208-00103	Removal and Disposal of Sediment (Labor)	HOUR	10	
			208-00105	Removal and Disposal of Sediment (Equipment)	HOUR	4	
			208-00106	Sweeping (Sediment Removal)	HOUR	144	
			208-00107	Removal of Trash	HOUR	40	
			210-04010	Adjust Manhole	EACH	8	
			212-00006	Seeding (Native)	ACRE	0.15	
			212-00032	Soil Conditioning	ACRE	0.15	
			216-00101	Soil Retention Blanket (Straw-Coconut)			
				(Photodegradable Class 1)	SY	730	
			304-06007	Aggregate Base Course (Class 6)	CY	1,808	
			403-00720	Hot Mix Asphalt (Patching) (Asphalt)	TON	500	
			403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	TON	23,652	
			403-34751	Hot Mix Asphalt (Grading SX) (75) (PG 64-28)	TON	21,268	
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	23,662	
			601-01000	Concrete Class B	CY	0.3	
			603-10120	12 Inch Corrugated Steel Pipe	LF	10	
			607-11525	Fence (Plastic)	LF	100	
			608-00010	Concrete Curb Ramp	SY	16	
			608-00015	Detectable Warnings	SF	42	

Computer File Information		SUMMARY OF APPROXIMATE QUANTITIES			Project No./Code
Creation Date: 07-Feb-2017	Initials:				STA0243-087
Last Modification Date:	Initials:				
Full Path: \tsclient\C\Projects?56 - US 24-El Paso Elbert\...		Designer: J.D. Miller	CDOT DEPARTMENT OF TRANSPORTATION	Region: 4	20856
Drawing File Name: 20856_Sheet11		Detailer: J.D. Miller		Unit Leader: TAM	Sheet Number: 11
AutoCAD by Autodesk					

COLORADO PROJECT
STA0243-087

As Constructed
No Revisions:
Revised:
Void:

INDEX			CONTRACT ITEM NUMBER	CONTRACT ITEM	PROJECT TOTALS		
BOOK	PAGE	SHEET			UNIT	PLAN QUANTITY	AS CONST.
			612-00003	Delineator (Type III)	EACH	46	
			612-00101	Delineator (Drivable Concrete Installation) (Type			
				I)	EACH	122	
			620-00001	Field Office (Class 1)	EACH	1	
			620-00012	Field Laboratory (Class 2)	EACH	1	
			620-00020	Sanitary Facility	EACH	2	
			625-00000	Construction Surveying	L S	1	
			626-00000	Mobilization	L S	1	
			626-01104	Public Information Services (Tier IV)	L S	1	
			627-00008	Modified Epoxy Pavement Marking	GAL	395	
			627-00013	Pavement Marking Paint (High Build)	GAL	1,186	
			627-30405	Preformed Thermoplastic Pavement Marking			
				(Word-Symbol)	SF	130	
			627-30410	Preformed Thermoplastic Pavement Marking			
				(Xwalk-Stop Line)	SF	786	
			630-00000	Flagging	HOUR	2,025	
			630-00007	Traffic Control Inspection	DAY	30	
			630-00012	Traffic Control Management	DAY	60	
			630-80001	Flashing Beacon (Portable)	EACH	2	
			630-80338	Barricade (Type 3 M-D) (Temporary)	EACH	8	
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	53	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	74	
			630-80343	Construction Traffic Sign (Panel Size C)	EACH	8	
			630-80344	Construction Traffic Sign (Special)	SF	168	
			630-80350	Vertical Panel	EACH	50	
			630-80355	Portable Message Sign Panel	EACH	2	
			630-80360	Drum Channelizing Device	EACH	100	

Computer File Information		SUMMARY OF APPROXIMATE QUANTITIES			Project No./Code
Creation Date: 07-Feb-2017	Initials:				STA0243-087
Last Modification Date:	Initials:				
Full Path: \tsclient\C\Projects?56 - US 24-El Paso Elbert\...		Designer: J.D. Miller	DOT DEPARTMENT OF TRANSPORTATION	Region: 4	20856
Drawing File Name: 20856_Sheet12		Detailer: J.D. Miller		Unit Leader: TAM	Sheet Number: 12
AutoCAD by Autodesk					

COLORADO PROJECT
STA0243-087

As Constructed
No Revisions:
Revised:
Void:

INDEX			CONTRACT ITEM NUMBER	CONTRACT ITEM	PROJECT TOTALS		
BOOK	PAGE	SHEET			UNIT	PLAN QUANTITY	AS CONST.
			630-80380	Traffic Cone	EACH	400	
			630-80520	Mobile Pavement Marking Zone	DAY	4	
				FORCE ACCOUNT			
				==========			
			700-70010	F/A Minor Contract Revisions	F A	1	
			700-70011	F/A Partnering	F A	1	
			700-70016	F/A Fuel Cost Adjustment	F A	1	
			700-70018	F/A Roadway Smoothness Incentive	F A	1	
			700-70019	F/A Asphalt Cement Cost Adjustment	F A	1	
			700-70023	F/A On-The-Job Trainee	F A	1	
			700-70025	F/A Quality Incentive Payment	F A	1	
			700-70035	F/A High Speed Internet	F A	1	
			700-70380	F/A Erosion Control	F A	1	

Computer File Information		SUMMARY OF APPROXIMATE QUANTITIES			Project No./Code
Creation Date: 07-Feb-2017	Initials:				STA0243-087
Last Modification Date:	Initials:				
Full Path: \tsclient\C\Projects?56 - US 24-El Paso Elbert\...		Designer: J.D. Miller	CDOT DEPARTMENT OF TRANSPORTATION	Region: 4	20856
Drawing File Name: 20856_Sheet13		Detailer: J.D. Miller		Unit Leader: TAM	Sheet Number: 13
AutoCAD by Autodesk					

As Constructed
No Revisions:
Revised:
Void:

SUMMARY OF EARTHWORK

INDEX			ITEM	PROJECT TOTALS	
BOOK	PAGE	SHEET			
			EMBANKMENT MATERIAL (COMPLETE IN PLACE) (NET)	CU.YD.	FINAL
			EMBANKMENT (SHOULDERING)	2,992	
			TOTAL FOR PAY QUANTITY	2,992	
			FOR INFORMATION ONLY		
			UNCLASSIFIED EXCAVATION		
			US 24 (FLOODPLAIN)	682	
			TOTAL	682	
			TOTAL EMBANKMENT (NET)	2,992	
			TOTAL	2,992	
			EARTHWORK QUANTITIES BALANCE		
			UNCLASSIFIED EXCAVATION		
			TOTAL UNCLASSIFIED EXCAVATION	682	
			TOTAL FROM CONTRACTOR'S SOURCE	3,058	
			TOTAL	3,740	
			EMBANKMENT (NET)		
			TOTAL	2,992	
			EMBANKMENT (NET) TIMES COMPACTION FACTOR (1.25)		
			TOTAL	3,740	

IT IS ESTIMATED THAT 500 CU YD OF UNSUITABLE MATERIALS WILL BE REQUIRED ON THIS PROJECT AS DIRECTED BY THE ENGINEER.

Print Date: 2/7/2017	SUMMARY OF EARTHWORK			Project No./Code
File Name: SummaryOfEarthwork.dgn				STA 0243-087
Horiz. Scale: 1:200				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset:		Sheet:	Sheet Number 14

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TABULATION OF ROAD AND FIELD APPROACHES					
MILE POST	APPROACH	WIDTH (Ft)	AREA(SQFT)		
REGION 4					
351.26	RD	35	1750	RT	
351.26	Field	20	80		
351.5	(Driveway)	55	2750	LT	5" Thinckness
351.5	RD	45	2250	RT	**HBP(TONS):**
352.54	(Driveway)	30	1500	RT	
352.55	Field	40	160	LT	3380.666667
352.81	(Driveway)	35	1750	LT	
352.86	(Driveway)	35	1750	LT	**EM.ASP.(GAL)**
352.9	Field	25	100	RT	
352.9	Field	35	140	LT	1844
352.99	(Driveway)	65	3250	RT	
353.09	Field	35	140	RT	
353.34	Field	50	200	LT	
353.38	Field	40	160	LT	
353.41	(Driveway)	50	2500	RT	
353.45	(Driveway)	65	3250	RT	
353.45	(Driveway)	40	2000	LT	
353.47	RD	35	1750	LT	
353.49	(Driveway)	25	1250	LT	
353.51	RD	60	3000	LT	
353.53	(Driveway)	50	2500	LT	
353.55	(Alley)	20	1000	LT	
353.56	(Driveway)	26	1300	LT	
353.57	(Driveway)	25	1250	LT	
353.58	RD	35	1750	RT	
353.58	RD	35	1750	LT	
353.599	(Driveway)	90	4500	LT	
353.62	(Driveway)	25	1250	LT	
353.66	RD	35	1750	LT	
361.2	RD	35	1750	RT	
353.67	(Driveway)	25	1250	LT	
353.69	(Driveway)	35	1750	LT	
353.7	(Alley)	20	1000	LT	
362.6	(Alley)	20	1000	RT	
353.73	RD	60	3000	RT	
353.73	RD	45	2250	LT	
353.75	(Driveway)	45	2250	LT	
353.77	RD	30	1500	RT	
353.81	RD	40	2000	RT	
353.81	RD	35	1750	LT	
353.85	(Alley)	20	1000	LT	
353.85	(Alley)	20	1000	RT	
353.88	RD	35	1750	RT	
353.88	RD	35	1750	LT	
353.89	(Driveway)	25	1250	LT	
353.92	(Driveway)	35	1750	RT	
353.94	(Driveway)	35	1750	RT	
353.95	(Driveway)	40	2000	LT	
353.97	RD	40	2000	LT	
353.97	RD	40	2000	RT	
353.97	Field	35	140	LT	
353.98	Field	20	80	RT	
353.99	RD	60	3000	RT	
354.06	(Driveway)	80	4000	LT	
354.09	RD	55	2750	RT	
354.16	Field	20	80	LT	
354.28	Field	35	140	LT	
354.29	(Driveway)	45	2250	RT	
354.34	Field	25	100	LT	
354.41	(Driveway)	60	3000	LT	
354.45	(Driveway)	25	1250	RT	
354.62	(Driveway)	30	1500	LT	
354.67	(Driveway)	40	2000	RT	
354.95	(Driveway)	45	2250	LT	
354.95	Field	25	100	RT	
355.47	Field	30	120	RT	
355.74	RD	35	1750	RT	
355.77	(Driveway)	30	1500	RT	
355.84	Field	25	100	LT	
356.16	(Driveway)	40	2000	LT	
		TOTAL	**110640**		

FOR INFORMATION ONLY, CARRIED TO SURFACING TABULATION.

As Constructed

No Revisions:

Revised:

Void:

ALL ROAD AND FIELD APPROACHS SHALL BE
HOT MIX ASPHALT (GRADING SX) (75) (PG 64-28)

Print Date: 2/1/2017

File Name: 14-15 Surfacing Tab.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

TABULATION OF ROAD AND FIELD APPROACHES

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

DEPARTMENT OF TRANSPORTATION

Region: 04

Unit Leader: TAM

Sheet:

Project No./Code

STA 0243-087

20856

Sheet Number 15

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Print Date: 2/3/2017
File Name: 14-15 Surfacing Tab.dgn
Horiz. Scale: 1:100
Vert. Scale: As Noted
Unit Information
Unit Leader Initials

Designer: J.D. MILLER
Detailer: J.D. MILLER
Sheet Subset: ROADWAY

DEPARTMENT OF TRANSPORTATION

Region: 04
Unit Leader: TAM
Sheet:

SURFACING TABULATION

Tabulation of Surfacing

Location		Removal of Asphalt Mat (Planing)		Leveling Course Hot Mix Asphalt (Grading SX) (75) (PG 64-22)			Hot Mix Asphalt (Grading SX) (75) (PG 64-22)			Hot Mix Asphalt (Grading SX) (75) (PG 64-28)			Removal of Asphalt Mat		Emulsified Asphalt (Slow-Setting)		* Unclassified Excavation		Embankment	A.B.C. (CLASS 6)	Notes
From	To	Wid (ft)	SY	Wid (ft)	Thk (in)	TON	Wid (ft)	Thk (in)	TON	Wid (ft)	Thk (in)	TON	Wid (ft)	SQ YD	Wid (ft)	GAL	Wid (ft)	CU YD	CU YD	CU YD	
2" - 5" Approach to Project		40	**1,333**	40		**37**	40		**73**	40		**147**									2" Mill to a 5" Overlay
350.63	353.51			40	1	**3,717**	40	2	**7,434**	40	2	**7,434**									5" Overlay
Transition 5' - 2.5"				40		**25**	40		**73**	40		**110**									
353.55	353.67									56	2.5	**542**									2.5" Overlay
Transition 2.5" - 4"							46		**56**	46		**127**									
353.71	354.10	40	**10,041**				40	2	**1,007**	40	2	**1,007**									1" Mill with 4" Overlay
Transition 4" - 5"				40		**24**	40		**98**	40		**98**									
354.13	354.65			40	1	**671**	40	2	**1,342**	40	2	**1,342**									5" Overlay
Transition 5" - 0"				40		**37**	40		**73**	40		**73**									Approach to Floodplain
354.71	354.93						40	4	**1,136**	40	2	**568**	40	**5,163**			40	**682**		**1,808**	6" H.M.A Floodplain
Transion 0" - 5"				**40**		**37**	40		**73**	40		**73**									Departure of Floodplain
354.97	356.64			40	1	**2,155**	40	2	**4,311**	40	2	**4,311**									5" Overlay
5" -3" Departure of Project							40		**147**												Ties into Project STA 2043-064
350.58	356.70															**21,588**			**2,992**		
Irregularities (Overlay) 5%				**335**			**791**			**791**											
Safety Edge												**1,264**				**230**					
Road and Field Approaches												**3,381**				**1,844**					
SubTotals		11,374		7,038			16,614			21,268			5,163		23,662		682		2,992	1,808	
Project Totals		**11,374**		**23,652**						**21,268**			**5,163**		**23,662**		**682**		**2,992**	**1,808**	

IT IS ESTIMATED THAT THIS PROJECT SHALL REQUIRE 500 TONS OF HOT MIX ASPHALT(PATCHING) (ASPHALT) AS DIRECTED BY THE PROJECT ENGINEER.

* FOR INFORMATION ONLY

Project No./Code
STA 0243-087

20856

Sheet Number 16

As Constructed
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As Constructed
No Revisions:
Revised:
Void:

2.5 Inch Overlay

5 Inch Overlay

1 - 2 Inch Mill with 4 Inch Overlay

N.T.S.

Print Date: 2/7/2017	SIMLA H.M.A. DETAILS			Project No./Code
File Name: 17 Simla HMA Detaill.dgn				STA 0243-087
Horiz. Scale: 1:1215				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: XXXXXXX		Sheet: 1 of 1	Sheet Number 17

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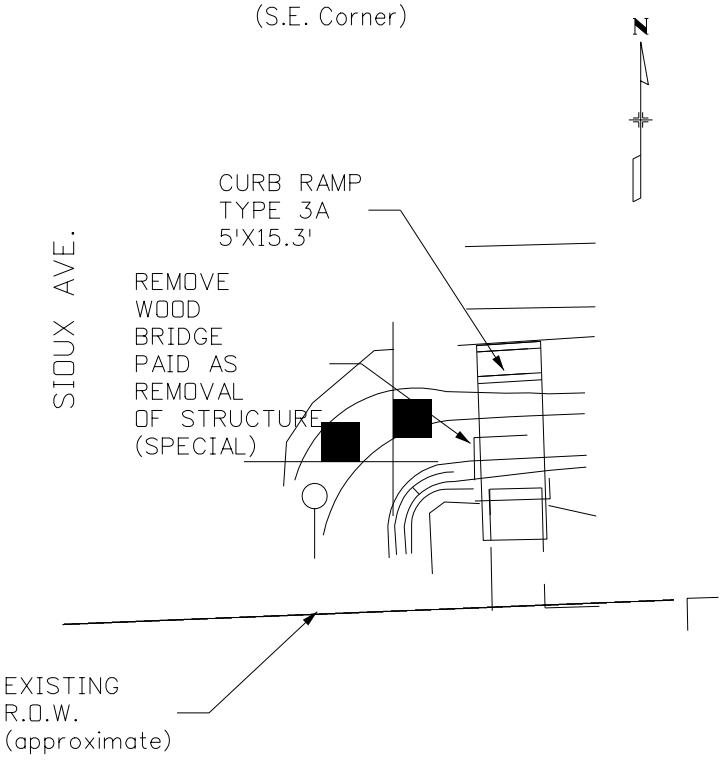
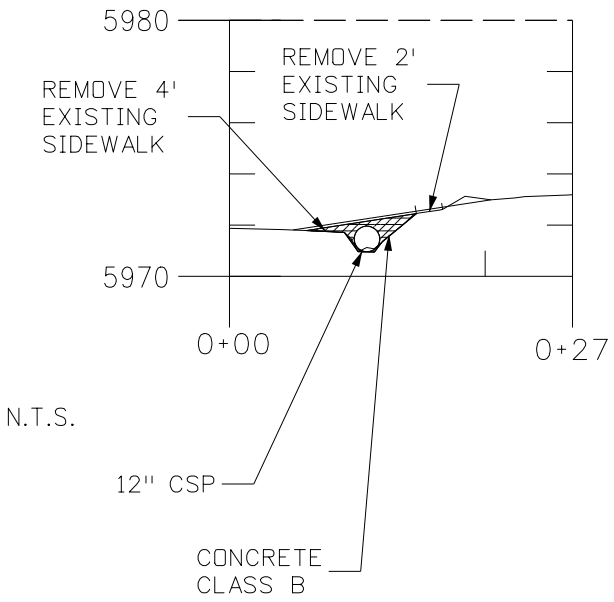
As Constructed
No Revisions:
Revised:
Void:

SIOUX AVE.
(S.E. Corner)



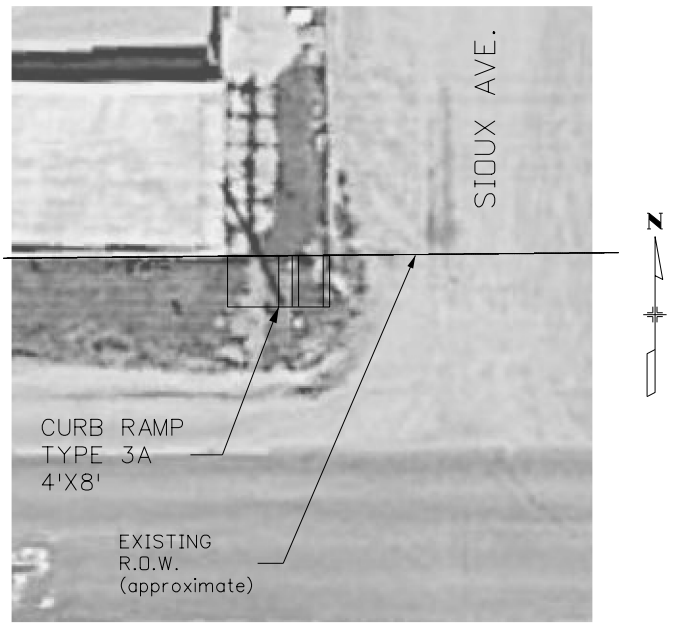


N.T.S.

REMOVAL OF SIDEWALK - 3 SY
CONCRETE CURB RAMP - 9 SY
DETECTABLE WARNINGS - 15 SF
12 INCH C.S.P. - 10 LF
REMOVAL OF STRUCTURE (SPECIAL) - 1 EACH
CONCRETE CLASS B - 0.5 CY

SEE CROSS HATCH AREA FOR LIMITS OF CONCRETE CLASS B, FOR INCASING C.S.P AND TIE INTO CONCRETE CURB RAMP.

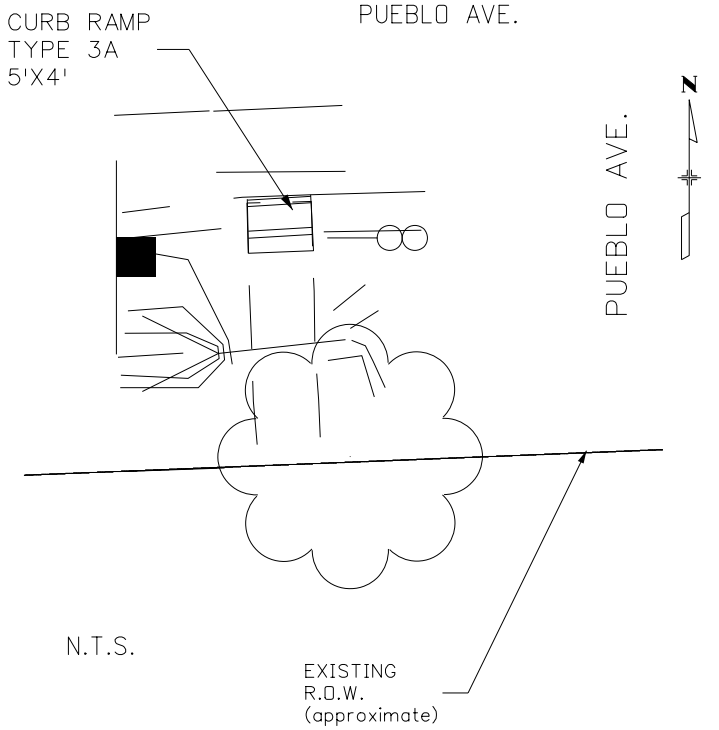
SIOUX AVE.
(N.W. Corner)



CONCRETE CURB RAMP - 4 SY
DETECTABLE WARNINGS - 12 SF

N.T.S.

PUEBLO AVE.



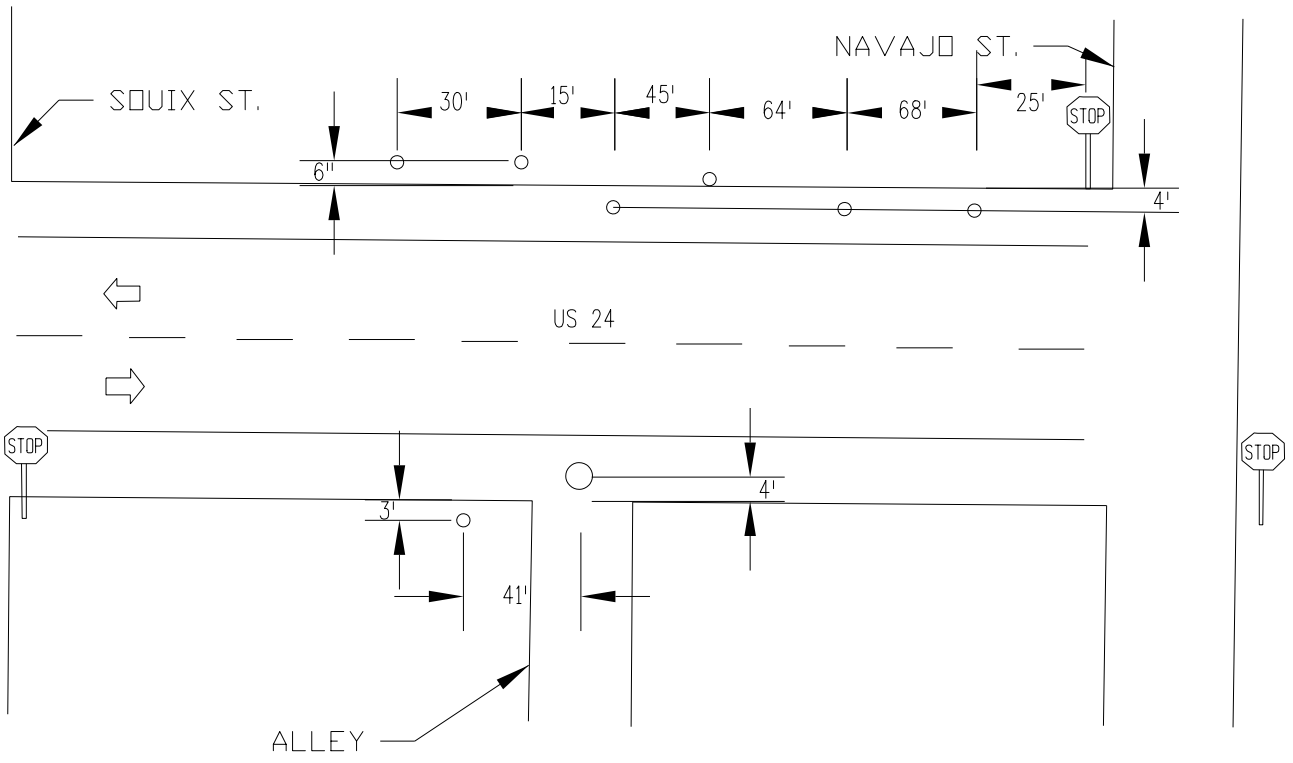
N.T.S.

REMOVAL OF SIDEWALK - 3 SY
CONCRETE CURB RAMP - 3 SY
DETECTABLE WARNINGS - 15 SF

Print Date: 2/7/2017	CURB RAMP DETAILS			Project No./Code
File Name: 18 Curb Detail.dgn				STA 0243-087
Horiz. Scale: 1:15				
Vert. Scale: As Noted	Designer: J.D. Miller	DEPARTMENT OF TRANSPORTATION CDOT CO	Region: 04	20856
Unit Information	Detailer: J.D. Miller		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: XXXXXXX		Sheet: 1 of 1	Sheet Number 18

millerjd 3:26:53 PM C:\Projects\20856 - US 24-ElPaso Elbert Co Line East Part 2\Plot_Sets\AD\18 Curb Detail.dgn

As Constructed
No Revisions:
Revised:
Void:



N.T.S.

IT IS ESTIMATED THAT THIS PROJECT SHALL REQUIRE 8 EACH OF ADJUST MANHOLE. 7 WILL BE MONITORING WELLS AND 1 WILL BE A MANHOLE

WHEN ADJUSTING MONITORING WELLS, CONTACT APPLIED ENVIRONMENTAL SCIENCES, INC. REMEDIATION SYSTEMS (303)910-8497

Print Date: 2/7/2017	MANHOLE LOCATIONS			Project No./Code
File Name: 19 Manhole locates.dgn				STA 0243-087
Horiz. Scale: 1:1				
Vert. Scale: As Noted	Designer: J.D. MILLER	CDOT DEPARTMENT OF TRANSPORTATION	Region: 4	20856
Unit Information	Detailer: W. BROWN		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: XXXXXXX		Sheet: XXX of XXX	Sheet Number 19

millerjd 3:30:23 PM C:\Projects\20856 - US 24-ElPaso Elbert Co Line East Part 2\Plot_Sets\AD\19 Manhole locates.dgn

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 1 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M_R P.S.I.
B-1 MP 350.93 (01-C)																	
0" - 10.5"	1A	HMA- Dergraded at 3.5" and below 6"															
10.5" - 13.5"	1B	ABC															
13.5" - 5'	1C	Bulk Sample, Clayey Sand	0.00					100	98	92	71	30	26	13	A-2-6(0)	0.9	4195
		SPT 2.5'-4' Blow count 5/6/4															
B-2 MP 351.00 (02-C)																	
0" - 7.75"	2A	HMA															
7.75" - 9.5"	2B	ABC															
9.5" - 5'	2C	Bulk Sample, Clayey Sand to Sandy Clay	0.03					100	97	85	64	29	27	14	A-2-6(1)	1.0	3929
		SPT 2.5'-4' Blow count 3/2/3															
B-3 MP 351.20 (01-C)																	
0" - 9"	3A	HMA- Dergraded below 5.25"															
N/A	3B	No ABC observed during drilling															
9" - 5'	3C	Bulk Sample, Clayey Sand	0.00					100	98	91	67	24	23	8	A-2-4(0)	0.7	8610
		SPT 2.5'-4' Blow count 4/4/4															

Remarks:

2014

☐ Original - Staff Materials & Geotechnical. ☐ 1 st copy - Resident Engineer, ☐ 2nd copy - Region Materials Engineer

CDOT Form #555 9/03

CORE DATA

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No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 1 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 20

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 2 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	Mn P.S.I.
B-4 MP 351.40 (02-C)																	
0" - 9.5"	4A	HMA- Dergraded 5"															
9.5" - 11"	4B	ABC															
11" - 4'	4C	Bulk Sample, Clayey, Gravelly Sand	0.03					100	96	83	58	25	28	15	A-2-6(0)	0.9	3929
4' - 5'	4D	Bulk Sample (Comb. w/5D,6D) -Clay	0.00					100	99	95	84	42	28	15	A-6(4)	2.1	3126
		SPT 2.5'-4' Blow count 3/4/5															
B-5 MP 351.60 (01-C)																	
0" - 9.75"	5A	HMA- Dergraded below 2.25"															
9.75" - 10.5"	5B	ABC															
10.5" - 3'	5C	Bulk Sample (Comb. w/6C) -ClaySand	0.03					100	95	81	56	26	NV	NP	A-2-4(0)	1.1	4060
3' - 5'	5D	Bulk Sample (Comb. w/4D)- Similar to 4D													A-6(4)		3126
		SPT 2.5'-4' Blow count 3/2/2															
B-6 MP 351.80 (02-C)																	
0" - 9"	6A	HMA- Dergraded below 2"															
9" - 12"	6B	ABC															
1' - 4.5'	6C	Bulk Sample (Comb. w/5C) - Similar to 5C													A-2-4(0)		4060
4.5' - 5'	6D	Similar to 4D													A-6(4)		3126
		SPT 2.5'-4' Blow count 3/2/2															

Remarks:

2014

❑ Original - Staff Materials & Geotechnical, ❑ 1st copy - Resident Engineer, ❑ 2nd copy - Region Materials Engineer

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CORE DATA

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No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 2 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 21

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 3 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M_R P.S.I.
B-7 MP 352.00 (01-C)																	
0" - 5"	7A	HMA- Dergraded below 4"															
5" - 11"	7B	ABC															
11" - 4.5'	7C	Similar to 5C													A-2-4(0)		4060
4.5' - 5'	7D	Similar to 4D													A-6(4)		3126
		SPT 2.5'-4' Blow count 2/2/2															
B-8 MP 352.20 (02-C)																	
0" - 10.5"	8A	HMA- Dergraded below 6.5"															
10.5" - 12.75"	8B	ABC															
1.75' - 3.5'	8C	Similar to 5C													A-2-4(0)		4060
3.5' - 5'	8D	Similar to 4D													A-6(4)		3126
		SPT 2.5'-4' Blow count 2/2/3 SPT 5'-6.5' Blow Count 3/3/5															
B-9 MP 352.40 (01-C)																	
0" - 12"	9A	HMA															
12" - 14.5"	9B	ABC															
14.5" - 3.5'	9C	Bulk Sample, Clayey Sand to Sandy Clay	0.16				100	98	94	82	65	30	34	20	A-2-6(2)	2.1	4060
		SPT 2.5'-4' Blow count 3/2/2															

Remarks:

2014

❑ Original - Staff Materials & Geotechnical, ❑ 1 st copy - Resident Engineer, ❑ 2nd copy - Region Materials Engineer

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CORE DATA

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Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset:ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 3 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 22

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 4 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	Mr P.S.I.
B-10 MP 352.60 (02-C)																	
0" - 8.5"	10A	HMA- Dergraded below 3"															
8.5" - 10.5"	10B	ABC															
10.5" - 5'	10C	Similar to 9C													A-2-6(2)		4060
		SPT 2.5'-4' Blow count 2/2/2															
B-11 MP 352.80 (01-C)																	
0" - 9.75"	11A	HMA- Dergraded below 4.5"															
9.75" - 12"	11B	ABC															
1' - 4.5'	11C	Similar to 9C													A-2-6(2)		4060
4.5' - 5'	11D	Bulk Sample (Comb. w/15D) -Clay	0.00						100	96	86	54	41	26	A-7-6(10)	2.4	2834
		SPT 2.5'-4' Blow count 2/2/2															
B-12 MP 353.00 (02-C)																	
0" - 10.5"	12A	HMA- Dergraded below 4.75"															
N/A	12B	No ABC observed during drilling															
10.5" - 5'	12C	Bulk Sample, Clay with Sand	0.00					100	97	87	68	32	28	15	A-2-6(1)	1.1	3929
		SPT 2.5'-4' Blow count 3/3/2															

Remarks:

2014

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Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset:ROADWAY

DEPARTMENT OF TRANSPORTATION

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 4 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 23

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 5 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M_R P.S.I.
B-13 MP 353.20 (01-C)																	
0" - 11.75"	13A	HMA- Dergraded below 5.5"															
11.75" - 14.5"	13B	ABC															
14.5" - 5'	13C	Bulk Sample, Clayey Sand	0.00					100	98	91	70	24	21	6	A-2-4(0)	0.8	8610
		SPT 2.5'-4' Blow count 3/3/4															
B-14 MP 353.40 (02-C)																	
0" - 13.5"	14A	HMA- Dergraded below 6.75"															
13.5" - 14.5"	14B	ABC															
14.5" - 5'	14C	Similar to 13C													A-2-4(0)		8610
		SPT 2.5'-4' Blow count 3/5/5															
B-15 MP 353.60 (01-C)																	
0" - 5.25"	15A	HMA															
5.25" - 7.5"	15B	ABC															
7.5" - 2'	15C	Bulk Sample (Comb. w/17C) -Clayey, Gravelly Sand	0.00				100	99	97	89	70	30	24	11	A-2-6(0)	1.0	4195
2' - 5'	15D	Bulk Sample (Comb. w/11C) Similar to 11D													A-7-6(10)		2834
		SPT 2.5'-4' Blow count 2/2/3															

Remarks:

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CORE DATA

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Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset:ROADWAY

DEPARTMENT OF TRANSPORTATION

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 5 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 24

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 6 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Mois-ture %	M R P.S.I.
B-16 MP 353.80 (02-LWP)																	
0" - 13.25"	16A	HMA- Dergraded below 5"															
13.25" - 15"	16B	ABC															
15" - 5'	16C	Bulk Sample, Sandy Clay	0.00					100	98	93	79	48	37	23	A-6(7)	2.1	3126
		SPT 2.5'-4' Blow count 2/4/4															
B-17 MP 354.00 (01-C)																	
0" - 12"	17A	HMA- Dergraded below 5"															
12" - 14"	17B	ABC															
14" - 5'	17C	Bulk Sample (Comb. w/15C) Similar to 15C													A-2-6(0)		4195
		SPT 2.5'-4' Blow count 6/5/4															
B-18 MP 354.20 (02-C)																	
0" - 11.75"	18A	HMA-Degraded below 6.5"															
11.75" - 14"	18B	ABC															
14" - 5'	18C	Similar to 15C													A-2-6(0)		4195
		SPT 2.5'-4' Blow count 8/6/6															

Remarks:

2014

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CDOT Form #555 9/03

CORE DATA

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No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

Region: 04

Unit Leader: TAM

Sheet: 6 of 10

CORE DATA

Project No./Code

STA 0243-087

20856

Sheet Number 25

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 7 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Mois-ture %	M_R P.S.I.
B-19 MP 354.40 (01-C)																	
0" - 5.75"	19A	HMA- Dergraded between 2.5"-4"															
5.75" - 8"	19B	ABC															
8' - 5'	19C	Similar to 15C													A-2-6(0)		4195
		SPT 2.5'-4' Blow count 8/5/3															
B-20 MP 354.60 (02-C)																	
0" - 10.5"	20A	HMA- Dergraded 2.5"-3.5" and below 6.25"															
10.5" - 15"	20B	ABC															
15" - 5'	20C	Similar to 15C													A-2-6(0)		4195
		SPT 2.5'-4' Blow count 7/7/5															
B-21 MP 354.80 (01-C)																	
0" - 13.25"	21A	HMA- Dergraded 2"-3"															
13.25" - 15.5"	21B	ABC															
15.5" - 5'	21C	Bulk Sample, ClayeySand	0.03						100	98	83	33	22	7	A-2-4(0)	0.9	5104
		SPT 2.5'-4' Blow count 4/3/2															

Remarks:

2014

❑ Original - Staff Materials & Geotechnical, ❑ 1 st copy - Resident Engineer, ❑ 2nd copy - Region Materials Engineer

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CORE DATA

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No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset:ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 7 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 26

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 8 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M. P.S.I.
B-22 MP 355.00 (02-C)																	
0" - 11.5"	22A	HMA- Dergraded below 6"															
N/A	22B	No ABC observed during drilling															
11.5" - 5'	22C	Bulk Sample, Clayey Sand	0.00					100	97	87	70	39	31	18	A-6(3)	1.6	3025
		SPT 2.5'-4' Blow count 3/2/2															
B-23 MP 355.20 (01-C)																	
0" - 8.25"	23A	HMA- Dergraded below 3"															
N/A	23B	No ABC observed during drilling															
8.25" - 5'	23C	Bulk Sample, Clayey Sand	0.00					100	97	90	71	30	NV	NP	A-2-4(0)	1.2	4060
		SPT 2.5'-4' Blow count 3/3/3															
B-24 MP 355.40 (02-C)																	
0" - 10.75"	24A	HMA- Dergraded below 3"															
10.75" - 12"	24B	ABC															
1' - 5'	24C	Bulk Sample, Sandy Clay	0.00					100	99	93	79	40	27	13	A-6(1)	1.5	4060
		SPT 2.5'-4' Blow count 2/3/2															

Remarks:

2014

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CDOT Form #555 9/03

CORE DATA

FOR INFORMATION ONLY

As Constructed

No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 8 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 27

CORE DATA

FOR INFORMATION ONLY

As Constructed
No Revisions:
Revised:
Void:

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 9 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M_R P.S.I.
B-25 MP 355.60 (01-C)																	
0" - 10.75"	25A	HMA															
N/A	25B	No ABC observed during drilling															
10.75" - 5'	25C	Similar to 23C													A-2-4(0)		4060
		SPT 2.5'-4' Blow count 3/2/2															
B-26 MP 355.80 (02-C)																	
0" - 12.25"	26A	HMA															
12.25" - 14"	26B	ABC															
14" - 5'	26C	Similar to 23C													A-2-4(0)		4060
		SPT 2.5'-4' Blow count 3/3/3															
B-27 MP 356.00 (01-C)																	
0" - 12.75"	27A	HMA- Degraded below 2.5"															
12.75" - 15"	27B	ABC															
15" - 5'	27C	Similar to 23C													A-2-4(0)		4060
		SPT 2.5'-4' Blow count 3/2/2															

Remarks:

2014

☐ Original - Staff Materials & Geotechnical, ☐ 1 st copy - Resident Engineer, ☐ 2nd copy - Region Materials Engineer

CDOT Form #555 9/03

Print Date: 1/27/2017	CORE DATA			Project No./Code
File Name: 20-29 Core Data.dgn				STA 0243-087
Horiz. Scale: 1:100				20856
Vert. Scale: As Noted	Designer: J.D. MILLER	DOT DEPARTMENT OF TRANSPORTATION	Region: 04	
Unit Information	Detailer: J.D. MILLER		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: ROADWAY		Sheet: 9 of 10	Sheet Number 28

millerjd 3:30:51 PM C:\Projects\20856 - US 24-ElPaso Elbert Co Line East Part 2\Plot_Sets\AD\20-29 Core Data.dgn

COLORADO DEPARTMENT OF TRANSPORTATION

PRELIMINARY SOIL SURVEY

Note: If samples are submitted leave sieve analysis section blank

Form #157 Report No. 216955 | Sheet No. 10 of 24

Project No. STA 0243-084, EL Paso County Line East on 24G

Station and Log	Test No.	Description	Sulfates	Max Size	Percent passing 3"	1"	3/4"	3/8"	#4	#10	#40	#200	Liquid limit	Plastic Index	Classification & Group Index	Moisture %	M_R P.S.I.
B-28 MP 356.20 (02-C)																	
0" - 7.5"	28A	HMA-Degraded from 2.5"- 4.5"															
7.5" - 8.5"	28B	No ABC observed during drilling															
8.5" - 5'	28C	Similar to 23C													A-2-4(0)		4060
		SPT 2.5'-4' Blow count 3/3/3															
B-29 MP 356.40 (01-C)																	
0" - 12"	29A	HMA-Degraded below 6"															
12" - 16"	29B	ABC															
16" - 5'	29C	Bulk Sample, Clayey Sand	0.00					100	99	94	76	26	22	6	A-2-4(0)	0.8	16553
		SPT 2.5'-4' Blow count 3/3/4															
B-30 MP 356.60 (02-C)																	
0" - 10.5"	30A	HMA- Dergraded below 5"															
10.5" - 12"	30B	ABC															
1' - 5'	30C	Similar to 29C													A-2-4(0)		16553
		SPT 2.5'-4' Blow count 2/2/2															

Remarks:

2014

☐ Original - Staff Materials & Geotechnical, ☐ 1 st copy - Resident Engineer, ☐ 2nd copy - Region Materials Engineer

CDOT Form #555 9/03

CORE DATA

FOR INFORMATION ONLY

As Constructed

No Revisions:

Revised:

Void:

Print Date: 1/27/2017

File Name: 20-29 Core Data.dgn

Horiz. Scale: 1:100

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

Designer: J.D. MILLER

Detailer: J.D. MILLER

Sheet Subset: ROADWAY

CORE DATA

Region: 04

Unit Leader: TAM

Sheet: 10 of 10

Project No./Code

STA 0243-087

20856

Sheet Number 29

SWMP TEMPLATE FOR PROJECTS WITH LESS THAN AN ACRE OF DISTURBANCE

1. SITE DESCRIPTION

A. PROJECT SITE LOCATION: US 24, between MP 350.8 and MP 356.7.

B. PROJECT SITE DESCRIPTION: This is a resurfacing project on US 24 through the Town of Simla, between MP 350.8 and MP 356.7. There will be no replacing or adding guardrails, replacing CBS/pipes or bridge work as part of the project scope.

C. ACRES OF DISTURBANCE:

1. Total area of construction site (LOC): 41.4 acres
2. Total area of disturbance (LDA): 34.32 acres
3. Acreage of seeding: .15 acres
4. Total area of new impervious surface: 0 acres

D. RECEIVING WATER:

1. Outfall locations: See SWMP Site Map
2. Names of receiving water(s) Big Sandy Creek within 1 mile.
3. Ultimate receiving water: Arkansas River
4. Horizontal distance nearest water of the state is from project: 136 miles

E. EXISTING SOIL DATA: Nunn clay loam, natural drainage class- well drained, runoff class-medium, hydrologic soil group-C.

F. EXISTING VEGETATION, INCLUDING PERCENT COVER:

Vegetative transects are *not required*, by permit, on projects with under an acre of disturbance. However, it is advised that transects be completed prior to construction, as a quality control for post construction revegetation assessment. If transects are not completed on a project, at a minimum describe the quality of the existing vegetation.

Pre-Construction: Date of survey: _____ %Density: _____
Description of existing vegetation:
Map or table showing transect locations in SWMP Notebook:
Post-Construction: Date of survey: _____ %Density: _____
Description of existing vegetation:
Map or table showing transect locations in SWMP Notebook:

2. STORMWATER MANAGEMENT CONTROLS FIRST CONSTRUCTION ACTIVITIES

THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

A. POTENTIAL POLLUTANT SOURCES

1. Evaluate, identify and describe all potential sources of pollutants at the site in accordance with subsection 107.25 and place any BMPs/Control Measures required to contain potential pollutants.

B. OFFSITE DRAINAGE (RUN ON WATER)

1. Place BMPs/Control Measures to address run-on water in accordance with subsection 208.03.

C. CONSTRUCTION DEWATERING:

1. Obtain a dewatering permit from CDPHE if conditions of their low risk guidance for Discharges of Uncontaminated Groundwater to Land are not met; see subsection 107.25(b) 8.

D. VEHICLE TRACKING PAD

1. BMPs/Control Measures shall be implemented in accordance with subsection 208.04.

E. PERIMETER CONTROL

1. Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.
2. Perimeter control may consist of vegetation buffers, berms, silt fence, erosion logs, existing landforms, or other BMPs/Control Measures as approved.
3. Perimeter control shall be in accordance with subsection 208.04.

3. SWMP ADMINISTRATOR:

A. SWMP ADMINISTRATOR FOR DESIGN:

Name/Title	Contact Information
Greg Fischer / Landscape Specialist	303-757-9507 Greg.fischer@state.co.us

B. SWMP ADMINISTRATOR FOR CONSTRUCTION: (See Subsection 208 Under an Acre Specification) The Contractor shall designate a SWMP Administrator for Construction upon ownership of the SWMP. The SWMP Administrator shall become the owner/operator and assume responsibility for all design changes to the SWMP implementation and maintenance in accordance to 208.03. The SWMP Administrator shall be responsible for implementing, maintaining and revising SWMP, including the title and contact information. The activities and responsibilities of the SWMP administrator shall address all aspects of the projects SWMP. (Update the information below for each new SWMP Administrator) (Copy of TECS Certification must also be included in the SWMP Notebook.) ***The SWMP Administration for construction is not a separate pay item but is included in the cost of the work.***

Name/Title	Contact Information	Certification #	Start Date	Engineer Approval

4. DURING CONSTRUCTION

The SWMP should be considered a "living document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the Contractor in accordance with Section 208

A. MATERIALS HANDLING AND SPILL PREVENTION: prior to construction commencing the Contractor shall submit a Spill Prevention, Control and Countermeasure Plan, see subsection 208.06. Materials handling shall be in accordance with subsection 208.06.

B. STOCKPILE MANAGEMENT: shall be done in accordance with subsection 107.25 and 208.07

C. CONCRETE WASHOUT: Concrete wash out water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.

D. SAW CUTTING: shall be done in accordance with subsection 107.25, 208.04, 208.05
E. STREET SWEEPING: shall be done in accordance with subsection 208.04

5. BMP/CONTROL MEASURE MAINTENANCE

A. Maintenance shall be in accordance with subsection 208.04 (f).

6. INTERIM AND FINAL STABILIZATION

A. SEEDING PLAN

Soil conditioning, seeding (native) and soil retention blanket will be required for disturbed areas. The following types and rates shall be used:

% of Mix	COMMON NAME	SCIENTIFIC NAME	LBS. PLS PER ACRE	SEEDS PER POUND	SEEDS PER S.F. BASED ON PROPOSED SEEDING RATE (PLS PER ACRE)
13%	Inland Saltgrass	Distichlis spicata	1	520,000	11.94
10%	Blue grama	Bouteloua gracilis	0.5	825,000	9.47
13%	Western wheatgrass	Pascopyrum smithii	5	110,000	12.63
22%	Alkali sacaton	Sporobolus airoides	0.5	1,758,000	20.18
6%	Little bluestem	Schizachyrium scoparium	1	260,000	5.97
3%	Prairie sandreed	Calamovilfa longifolia	0.5	273,000	3.13
32%	Sand Dropseed	Sporobolus cryptandrus	0.25	5,298,000	30.41
N/A	Blanket flower	Gaillardia aristata	0.5	132,000	N/A
N/A	Prairie coneflower	Ratibida columnifera	0.5	737,000	N/A
100%		**TOTAL**	**9.75**	9,913,000	93.72

B. SEEDING APPLICATION: Drill seed 0.25 inch to 0.5 inch into the soil. In small areas not accessible to a drill, hand broadcast at double the rate and rake 0.25 inch to 0.5 inch into the soil.

C. MULCHING APPLICATION: Install biodegradable soil retention blanket.

D. SPECIAL REQUIREMENTS:

1. Due to high failure rates, hydroseeding will not be allowed for permanent stabilization.

E. SOIL CONDITIONING AND FERTILIZER REQUIREMENTS: Minimum requirements for all disturbances to receive seeding (native).

Soil conditioner paid for as Item 212- Soil Conditioning (Acre)		
Biological nutrient organic based fertilizer (lbs/acre)*	Humate (lbs/acre)	Compost (cys/acre) **All areas <2:1** (1/2 inch depth)
300	200	65

*Biological nutrient shall not exceed 8-8-8 (N-P-K).

Humate based material shall be in accordance to Standard Special Provision 212 and compost shall be in accordance to Standard Special Provision 212.

F. BLANKET APPLICATION: On slopes and ditches requiring a blanket, the blanket shall be placed in lieu of mulch and mulch tackifier.

7. PRIOR TO FINAL ACCEPTANCE

A. Partial Acceptance shall be in accordance with subsection 107.25 (d) and 208.10 At the Partial Acceptance of the project, it shall be determined by the SWMP Administrator and the Engineer which temporary BMPs/Control Measures shall remain until 70% reestablishment or which shall be removed.

B. At the end of the project, all ditch checks shall either consist of temporary erosion logs (or equivalent) or permanent rip-rap.

C. All storm drains shall be cleaned prior to the Final Acceptance of the project.

8. NARRATIVES:

A. ADDITIONAL BMPS/CONTROL MEASURES AND NARRATIVES:

BMP/Control Measure details and narratives not covered by the SWMP or Standard Plan M-208, M-216 shall be added to the SWMP notebook by the SWMP Administrator. **BMP Matrix:**

1. M-Standards have been included along with standard BMP narratives. If a Non-Standard BMP will be used or the standard narrative does not apply, the SWMP Administrator shall write a Non-Standard BMP narrative, place an "X" in the column and complete a Non-Standard BMP Specification and Narrative for the SWMP notebook.
2. The SWMP Administrator shall place an "X" in the column In Use on Site when the BMP/Control Measure has been installed.

1. currently located on SWMP Plans but are anticipated to be used during construction (i.e. Vehicle Tracking Pad, Batch Plants, etc.). The SWMP Administrator shall locate these prior to or during construction and reflect on SWMP Map.
2. Place an "X" in the column Installation BMP/Control Measure Pre-Construction if the BMP/Control Measure is to be installed prior to construction activity.

STRUCTURAL BMPs/Control Measures that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:

APPLICATION, BMP/CONTROL MEASURE	NARRATIVE	M-STANDARD/NON-STANDARD	IN USE ON SITE	BMP/CONTROL MEASURE TO BE LOCATED BY SWMP ADMINSTRATOR	INSTALLATION BMP/CONTROL MEASURE PRE-CONSTRUCTION	BMP/CONTROL MEASURE PHASING		
						FIRST/INITIAL CONSTRUCTION ACTIVITIES	INTERIM CONSTRUCTION ACTIVITIES	PERMANENT STABILIZATION
PROTECTION OF EXISTING WETLANDS Fence (plastic) and erosion logs	Fence (plastic) shall be placed in combination with erosion logs to prevent encroachment of construction traffic and sediment into state waters prior to start of construction disturbances. Fence (plastic) shall be placed adjacent to the wetlands; erosion logs shall be placed between the plastic fence and disturbance area. Logs shall be placed to direct flows away from or filter water running into wetlands from disturbance areas.					X	X	
PROTECTION OF EXISTING TREES/LANDSCAPING Fence (plastic)	Fence (plastic) shall be used in areas indicated in the plans to prevent encroachment of construction traffic and sediment for the protection of mature trees and/or existing landscaping prior to start of construction disturbances.					X	X	
CHECK DAM/DITCH CHECK Erosion log, silt berm, silt dike, rock check dam	Placed in ditches immediately upon completion of ditch grading to reduce velocity of runoff in ditch. For existing ditches, place prior to start of construction disturbances.	M-208				X		
TYPE R AND TYPE 16 INLET PROTECTION Storm drain inlet protection (Type 1,2 and 3)	Placed prior to construction disturbances as detailed in M-208-1, to protect existing inlets or immediately upon completion of new inlets to prevent sediment from entering the inlet throughout construction.	M-208				X		
CULVERT INLET/OUTLET PROTECTION Erosion logs, aggregate bags	Placed at mouth of culvert inlets and over top of culvert at inlet and outlet where disturbance may be occurring adjacent to pipe to prevent sediment laden water from entering pipe or drainage. Place prior to start of construction disturbances.	M-208			X	X	X	X
TYPE C, TYPE D AND TYPE 13 PROTECTION Erosion logs, aggregate bags, erosion bales	Placed around inlet grate or slope and ditch paving to prevent sediment from entering inlet. Place prior to start of construction disturbances.	M-208				X		
*STOCKPILE PROTECTION Temporary berm, erosion logs, aggregate bags**	Placed within specified distance, in accordance with subsection 208.06, from toe to contain sediment around stockpile. *Aggregate bags are easily moved and replaced for access during the work day. Place prior to start of stock pile, increase control as stock pile increases size.	M-208					X	
TOE OF FILL PROTECTION	Place prior to slope/embankment work to capture sediment and protect and delineate	M-208				X	X	

*TOE OF FILL PROTECTION Erosion logs, temporary berm, silt fence, topsoil windrow**	Place prior to slope/embankment work to capture sediment and protect and delineate undisturbed areas. *Can be used to stockpile topsoil for salvage.	M-208				X	X	
*PERIMETER CONTROL Erosion logs, silt fence, temporary berm, topsoil windrow**	Placed prior to construction commencing to address potential run-on water from off site, and to divert around disturbed area. *Can be used to stockpile topsoil for salvage.	M-208				X	X	
SEDIMENT CONTROL/ SLOPE CONTROL Silt fence, erosion logs	Placed on the contour of a slope to contain and slow down construction runoff. Place prior to start of construction disturbances.	M-208				X	X	
TEMPORARY SEDIMENT TRAP (SWMP Administrator shall add locations to SWMP site maps)	Used to capture sediment laden runoff from disturbed areas < 5 acres during construction. Place prior to start of construction disturbances.	M-208				X		
PERMANENT SEDIMENT BASIN Extended detention basin or other Permanent Water Quality features	Constructed early in project, prior to storm sewer/ditches to capture storm flow as a temporary sediment trap. Outlet structure shall be modified for contaminants of construction runoff a non-standard detail is needed.					X		
EMBANKMENT PROTECTION OR TEMPORARY SLOPE DRAIN	Placed as a conduit or chute to drain runoff down slope and to prevent erosion of slope.	M-208				X	X	
OUTLET PROTECTION Riprap, or approved other	Material placed as energy dissipater to prevent erosion at outlet structure.						X	X
CONCRETE WASHOUT In-ground or fabricated	Construction control, used for waste management of concrete and concrete equipment cleaning. Place prior to start of concrete activities.	M-208				X	X	
VEHICLE TRACKING PAD	Source control, placed to prevent tracking of sediment from disturbed area to offsite surface. Place prior to start of construction disturbances.	M-208			X	X	X	
SWEEPING	Source control, used to remove sediment tracked onto paved surfaces and to prevent sediment from entering drainage system. Sweep daily and at the end of the construction shift as needed. Kick brooms shall not be permitted.					X	X	
DEWATERING (Contractor is responsible for obtaining a permit from Colorado Department of Health and Environment.)	Shall be done in such a manner to prevent potential pollutants from entering state waters.					X		
TEMPORARY STREAM CROSSING (SWMP Administrator shall add locations to SWMP site maps)	Constructed over stream or drainage to prevent discharge of pollutants from construction equipment into water.					X		
CLEAN WATER DIVERSION	Placed to divert clean surface or ground water around disturbance area to prevent it from mixing with construction runoff.				X	X		
OTHER								

NON-STRUCTURAL BMPs/Control Measures that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:
Erosion control devices are used to limit the amount of soil loss on site
Sediment control devices are designed to capture sediment on the project site.
Construction controls are BMPs/Control Measures related to construction access and staging.
BMP/Control Measure locations are indicated on the SWMP site map.

APPLICATION, BMP/CONTROL MEASURE	NARRATIVE	M-STANDARD	IN USE ON SITE	BMP/CONTROL MEASURE TO BE LOCATED BY SWMP ADMINSTRATOR	INSTALLATION BMP/CONTROL MEASURE PRE-CONSTRUCTION	BMP/CONTROL MEASURE PHASING		
						FIRST/INITIAL CONSTRUCTION ACTIVITIES	INTERIM CONSTRUCTION ACTIVITIES	PERMANENT STABILIZATION
VEGETATIVE BUFFER STRIP Fence (plastic)	Filter sediment laden runoff from disturbance area. Area to be identified on SWMP prior to construction starting.					X	X	X
LANDFORM (SWMP Administrator shall add locations to SWMP site maps)	Existing landforms may be used as a BMP/Control Measure if they prevent sediment from entering or leaving the disturbance area. If a landform directs flow of water to a concentrated outfall point, the outfall point shall be protected to prevent erosion. Area to be identified on SWMP prior to construction starting.					X	X	
TOPSOIL MANAGEMENT STOCKPILE/SALVAGE Windrow or stockpile	Prior to embankment work commencing, existing topsoil shall be scraped to a depth of 4 inches, and placed in stockpiles or windrows. Upon completion of slope work/final grading (less 4 inches), topsoil shall be evenly distributed over embankment to a depth of 4 inches.					X	X	
SURFACE ROUGHENING / GRADING TECHNIQUES Blading, Backhoe, Dozing, Combination Loader	Temporary stabilization of disturbance and to minimize wind and erosion.						X	
SEEDING (TEMPORARY)	Temporary stabilization used for over wintering of disturbance or used to control erosion for areas scheduled for future construction.						X	
BONDED FIBER MATRIX/HYDRAULIC MULCH	Not to be used in areas of concentrated flows, i.e. ditch lines. To be used in combination with surface roughening for temporary stabilization of disturbed soils, when work is temporarily halted and as approved by the Engineer. May be used as surface cover for temporary topsoil stockpiles					X	X	
MULCH/MULCH TACKIFIER	Temporary or Final Stabilization placed as a surface cover for erosion control and or seeding establishment. To be installed as temporary surface cover when work is temporarily halted and as approved by the Engineer						X	
SPRAY-ON MULCH BLANKET (Not to be used in areas of concentrated flows, i.e. ditch lines.)	Temporary or Final Stabilization placed as a surface cover for erosion control and or seeding establishment. To be installed as temporary surface cover when work is temporarily halted and as approved by the Engineer					X	X	
SEEDING PERMANENT (NATIVE)	Final Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.						X	X

Print Date: 1/25/2017	SWMP PLAN SHEET			Project No./Code
File Name: -				STA 0243-087
Horiz. Scale: N/A				
Vert. Scale: As Noted	Designer: GAF		Region: 04	20856
Unit Information	Detailer: GAF		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: SWMP		Sheet: 5 of 8	Sheet Number 34

SOIL RETENTION BLANKET (SRB)	Final Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.	M-216					X	X
TURF REINFORCEMENT MAT (TRM)	Final Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas. Placed in channels or on slopes for erosion control, channel liner and seeding establishment.	M-216					X	
OTHER								

12. TABULATION OF STORMWATER QUANTITIES

A. BMP/Control Measure sediment removal and disposal shall be paid for as: 208 Removal and Disposal of Sediment (Equipment) and 208 Removal and Disposal of Sediment (Labor). All other BMP/Control Measure maintenance shall be included in the cost of the BMP/Control Measure.

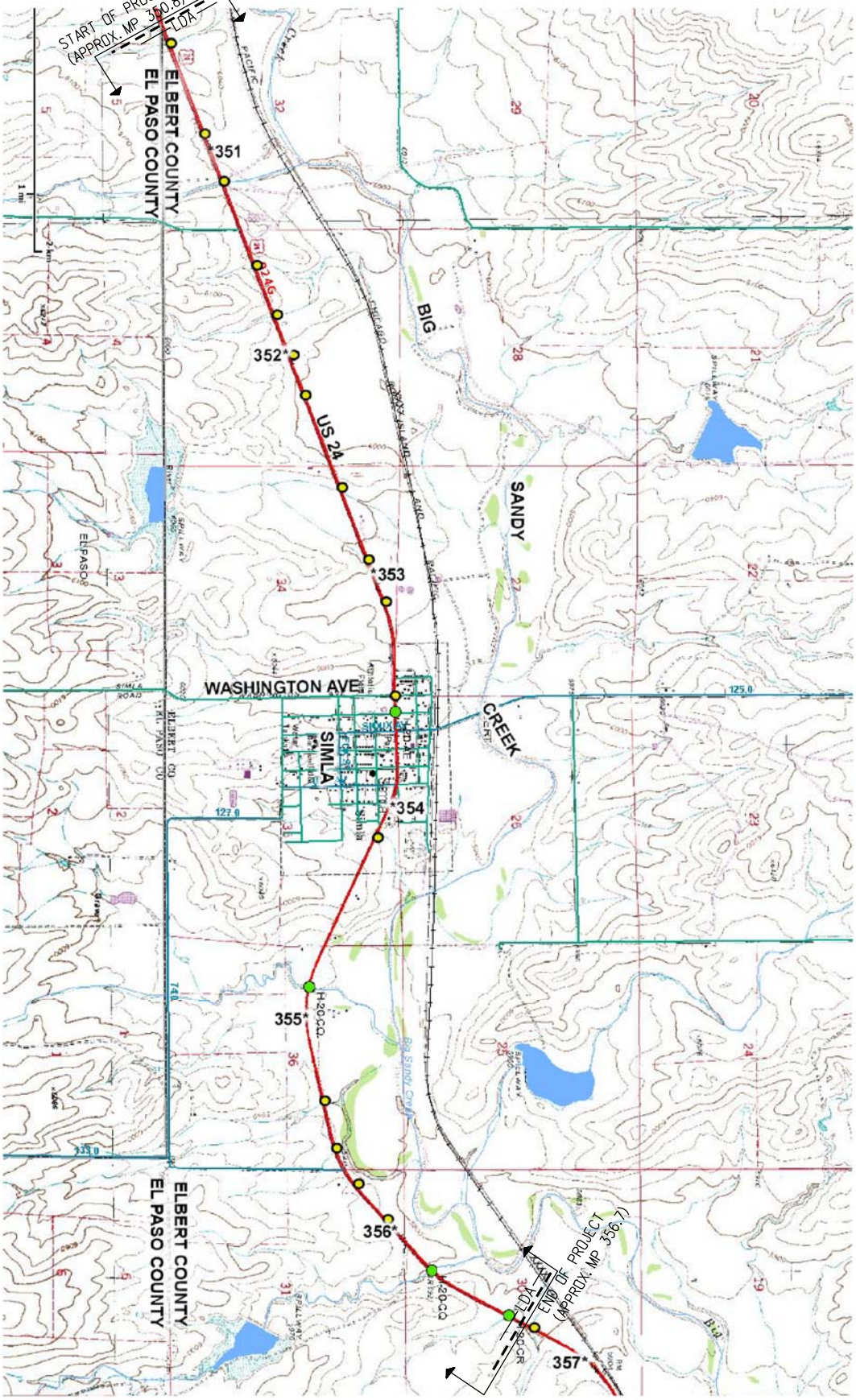
	Pay Item	Description	Pay Unit	Initial Const.	Interim Const.	Permanent Stabilization	*Total Quantity
	208-00035	Aggregate Bag	LF		500 (b)		500
	208-00103	Removal and Disposal of Sediment (Labor)	Hour		10		10
	208-00105	Removal and Disposal of Sediment (Equipment)	Hour		4		4
	208-00106	Sweeping (Sediment Removal)	Hour		144 (c)		144
	208-00107	Removal of Trash	Hour	40			40
	212-00006	Seeding (Native)	Acre			.15	.15
	212-00032	Soil Conditioning	Acre			.15	.15
	216-00101	Soil Retention Blanket (Straw/Coconut) (Photodegradable Class 1)	SY			730	730

*It is anticipated that additional BMPs/Control Measures and BMP/Control Measure quantities not shown on the SWMP Site Maps shall be required on the project for unforeseen conditions and replacement of items that are beyond their useful service life, see subsection 208.03 and 208.04. **Quantities for all BMPs/Control Measures shown above are estimated, and have been increased for unforeseen conditions and normal BMP/Control Measure life expectancy.** Quantities shall be adjusted according to the conditions encountered in the field as directed and approved by the Engineer. Payment shall be for the actual work completed and material used

(a) Labor hours are anticipated to maintain the minimum 4" vertical grade separation to provide perimeter control of reconstructed area.
(b) Aggregate bags are anticipated for stockpile management and adjacent to minor and major structures.
(c) Sweeping has been estimated as on average days a week during active construction.
(d) Engineers estimate to complete the work is 45 days.

13. BIOLOGIC IMPACTS

A. ENVIRONMENTAL IMPACTS:
1. Wetland Impacts: NO
2. Stream Impacts: NO
3. Threatened and Endangered Species: No species are anticipated to be impacted by the project.



SWMP NOTES:

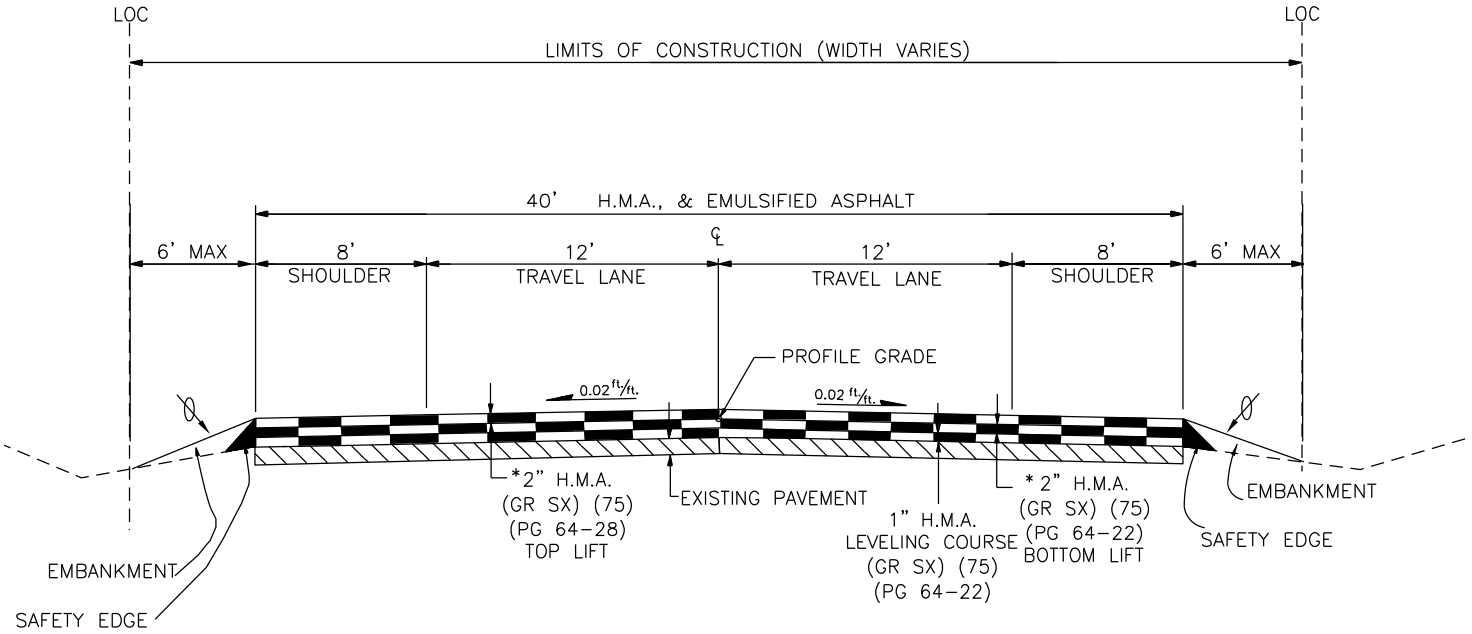
1. SEE TYPICAL SWMP SECTION FOR LIMITS OF CONSTRUCTION.
2. USE THIS SITE MAP TO SHOW THE LOCATIONS OF ALL INSTALLED BMPS THROUGHOUT THE CONSTRUCTION OF THE PROJECT.

NORTH

LEGEND

- *354 — MILE POST
- MINOR STRUCTURE
- MAJOR STRUCTURE
- DRAINAGE
- LIMITS OF CONSTRUCTION
- LDA — LIMITS OF DISTURBANCE

Print Date: 1/25/2017	SWMP SITE MAP			Project No./Code
File Name: -				STA 0243-087
Horiz. Scale: N.T.S.				
Vert. Scale: As Noted	Designer: GAF	CDOT	Region: 04	20856
Unit Information	Detailer: GAF		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: SWMP		Sheet: 7 of 8	Sheet Number 36



US 24 TYPICAL SECTION

Not To Scale

SWMP TYPICAL SECTION NOTES:

1. SHOULDERING MATERIAL ALONG THE SAFETY EDGE SHOULD BE ADDED ON TOP OF UNDISTURBED GRADE.

Print Date: 1/25/2017	SWMP TYPICAL SECTION			Project No./Code
File Name: SWMP_Sheets _over an acre.dgn				STA 0243-087
Horiz. Scale: N.T.S.				
Vert. Scale: As Noted	Designer: GAF	CDOT CO	Region: 04	20856
Unit Information	Detailer: GAF		Unit Leader: TAM	
Unit Leader Initials	Sheet Subset: SWMP		Sheet: 8 of 8	Sheet Number 37

TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:

	Format *
■ Horizontal Control	Plans / Existing roadway
■ Vertical Control	Plans / Existing roadway
■ Roadway Alignment	Existing roadway
☐ Original Terrain Data	
☐ Other:	

* Specify the information format, ie., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

TYPE OF PROJECT

- ☐ Landscaping
- ☐ Signalization
- ☐ Safety Improvement
- ■ Asphalt Overlay
- ☐ Concrete Overlay
- ☐ Minor Widening
- ☐ Major Reconstruction
- ☐ New Roadway Construction
- ☐ Bridge Replacement
- ☐ Bridge Widening
- ☐ New Bridge
- ☐ Other: _____

SURVEY WORK TO BE PERFORMED BY OTHERS: _____

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:

- ___ ■ Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)
- ___ ■ Verification and Maintenance of Horizontal and Vertical Control
- ___ ■ Verify or Determine existing grades and alignments
- ___ ☐ Verify or Determine existing topography
- ___ ☐ GPS/RTS (Global Positioning System/Robotic Total Station) Construction Machine Control
- ___ ☐ Clearing and Grubbing Limits (Section 201)
- ___ ☐ Removal Limits (Section 202)
- ___ ☐ Reset Items (Section 210)
- ___ ■ Excavation and Embankment (Section 203)
  - ___ ■ Excavation
    - ___ ■ Unclassified
    - ___ ☐ Stripping
    - ___ ☐ Muck
    - ___ ☐ Rock
    - ___ ☐ Borrow
    - ___ ☐ Other: _____
    - ___ ☐ Potholing
  - ___ ☐ Embankment
  - ___ ☐ Site Grading
  - ___ ☐ Erosion Control (Perm)
  - ___ ☐ Other: _____
  - ___ ☐ As Staked Earthwork Quantities (See General Notes)

	Slope Staking (Y/N)	Grid (Y/N)	Grade Stakes	Special Interval
Excavation	Y	-	-	50 FT
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
Embankment	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- ___ ☐ Landscaping
  - ___ ☐ Top Soil (Section 207)
  - ___ ☐ Seeding (Section 212)
  - ___ ☐ Mulching (Section 213)
  - ___ ☐ Planting (Section 214)
  - ___ ☐ Herbicide (Section 217)
  - ___ ☐ Other: _____
- ___ ☐ Erosion Control (Section 208)
  - ___ ☐ Seeding (Temp)
  - ___ ☐ Silt Fence
  - ___ ☐ Erosion Bales
  - ___ ☐ Erosion Logs
  - ___ ☐ Riprap (Temp)
  - ___ ☐ Other: _____
- ___ ■ Roadway Bases
  - ___ ■ Untreated Subgrade
  - ___ ☐ Treated Subgrade
  - ___ ■ Aggregate Base Course (Section 304)
  - ___ ☐ Reconditioning
  - ___ ☐ PMBB - Plant Mix Bituminous Base
  - ___ ☐ Other: _____

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	Y	50 FT	-
	-	-	-	-
	-	Y	50 FT	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- ___ ■ Pavements
  - ___ ☐ HMA - Hot Mix Asphalt (Section 403)
  - ___ ☐ Concrete (Section 412)
  - ___ ☐ Heating & Scarifying Treatment
  - ___ ☐ Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)
  - ___ ☐ Seal Coat or Chip Seal (Section 409)
  - ___ ■ Other: H.M.A in Floodplain

	Grid (Y/N)	Special Interval	Special Offset
Pavements	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	50 FT	-

- ___ ■ Roadway Elements
  - ___ ☐ Curb and Gutter (Section 609)
  - ___ ☐ Drop inlets - alignment and grades (Section 604)
  - ___ ☐ Retaining Walls
  - ___ ☐ Guard Rail (Section 606)
  - ___ ■ Sidewalk (Section 608)
  - ___ ■ Overlay Stationing
  - ___ ■ Other: See Revised Section 625

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	-	-	-

	Left Interval	Center Interval	Right Interval
Stationing	200	-	-

- ___ ☐ Riprap (Perm) (Section 506)
- ___ ☐ Slope and Ditch Paving (Section 507)
- ___ ☐ Minor Structures
  - ___ ☐ Structure Excavation limits (Section 206)
  - ___ ☐ Culverts (Section 603)
  - ___ ☐ Culverts w/ Headwalls and Wingwalls (Section 601)
  - ___ ☐ Concrete Box Culverts w/ Headwalls and Wingwalls
  - ___ ☐ Pipes (Section 603)
    - ___ ☐ Sanitary Sewer
    - ___ ☐ Storm Sewer
    - ___ ☐ Water
    - ___ ☐ Irrigation
    - ___ ☐ Miscellaneous
  - ___ ☐ Manholes (Section 604)
  - ___ ☐ Inlets (Section 604)
  - ___ ☐ Permanent Water Quality BMP (Section 208)
  - ___ ☐ Other: _____
- ___ ☐ Fencing (Section 607)
  - ___ ☐ Temporary
  - ___ ☐ Permanent
  - ___ ☐ Sound Barrier
  - ___ ☐ Other: _____
- ___ ☐ Delineators (Section 612)
  - ___ ☐ Temporary
  - ___ ☐ Permanent
- ___ ☐ Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)
  - ___ ☐ Signal pole locations and elevations
  - ___ ☐ Light pole locations and elevations
  - ___ ☐ Sign locations
  - ___ ☐ Field verify sign post locations, elevations, and lengths before fabrication.
  - ___ ☐ Other: _____
- ___ ■ Pavement Marking (Section 627)
  - ___ ☐ Striping (Temp)
  - ___ ■ Striping (Perm)
  - ___ ■ Symbols
  - ___ ☐ Other: _____
- ___ ☐ Temporary Lighting and Construction Traffic Control Devices (Section 630)
  - ___ ☐ Signal pole locations and elevations (Temp)
  - ___ ☐ Light pole locations and elevations (Temp)
  - ___ ☐ Sign Locations (Temp)
  - ___ ☐ Other: _____
- ___ ☐ Easements (Temp Staking by P.L.S. Only)
- ___ ☐ Right of Way (Temp Staking by P.L.S. Only)

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:

- ___ ☐ Monumentation (Section 629)
  - ___ ☐ Control
  - ___ ☐ Right of Way
  - ___ ☐ Land corners, Aliquot corners
  - ___ ☐ Easements
  - ___ ☐ Reference the specified existing monuments:** _____
  - ___ ☐ Replace the specified existing monuments: ** _____
  - ___ ☐ Locate monuments. It is estimated__ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.

** A Tabulation of Survey Monuments may be provided on the plans.

GENERAL NOTES:

1. Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDOT Survey Manual.
2. Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
3. The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer 3 days prior to the Presurvey Conference - Construction Survey.
4. Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
5. The Contractor shall furnish an As Staked (or GPS/RTS Construction Machine Control) Earthwork Quantity report to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDOT Survey Manual. A printed copy of the As Staked (or GPS/RTS Construction Machine Control) Earthwork data report and a computer disk with that information on it, in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
6. Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
7. The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
8. The Contractor shall coordinate construction staking on the project with any utility work.
9. Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
10. The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
    - ■ Horizontal Control (Primary & Secondary)
    - ■ Vertical Control (i.e. Benchmarks)
    - ☐ Property Pin Ties
    - ■ Horizontal Alignment
    - ■ Grading
    - ■ Slope Staking
    - ☐ Minor Structures
    - ☐ Major Structures
    - ☐ One fieldbook for each work category shown on this sheet
    - ■ Other Fieldbook(s): Floodplain Staking and As Construction

As Constructed
No Revisions: mm/dd/yy
Revised: mm/dd/yy
Void: mm/dd/yy

Survey Tabulation Sheet			Computer File Information	Project No./Code
Designer: J.D. Miller	CDOT DEPARTMENT OF TRANSPORTATION	Region: 04	Creation Date: mm/dd/yy Initials: XXX	Number: STA 0243-087
Detailer: J.D. Miller		Unit Leader: TAM	Last Modification Date: mm/dd/yy Initials: XXX	Code: 20856
Sheet Subset: XXXXX		Sheet:	Full Path: XXXXXXXXXXXXXXXXX Drawing File Name: XXXXXXXX.XXX	Sheet Number: 38

Colorado Department of Transportation
10601 W. 10th Street
Greeley, CO 80634
Phone: 970-350-2161
Region 4 MDG

Sheet Revisions		
Date	Description	Initials

Sheet Revisions		
Date	Description	Initials

Sheet Revisions		
Date	Description	Initials

Project Control Diagram
Title Sheet
Project Number: STA 0243-087
Project Location: US24 ElPaso-Elbert ClEast Part 2

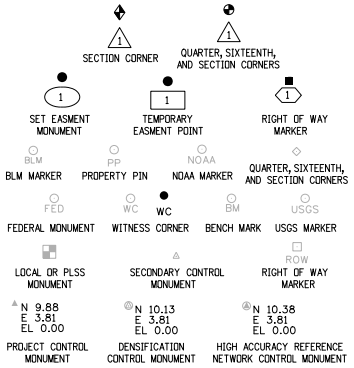
Project Code:	Last Mod. Date	Subset	Sheet No.
20856	11-16-16	3.01 of 3.02	3.01

DEPARTMENT OF TRANSPORTATION
STATE OF COLORADO

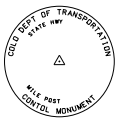
PROJECT CONTROL DIAGRAM

State Highway 24 MP 353.34 to 354.34
Section 35
Township 10 South, Range 60 West
of the 6th Principal Meridian
County of Elbert

SHEET NO. INDEX OF SHEETS



Note: For a complete listing of symbololgy used within this set of plans, please refer to the M-100-1 Standard Symbols of the Colorado Department of Transportation M&S Standards Publication dated July 2012. Existing features are shown as screened weight (gray scale). Proposed or new features are shown as full weight without screening.

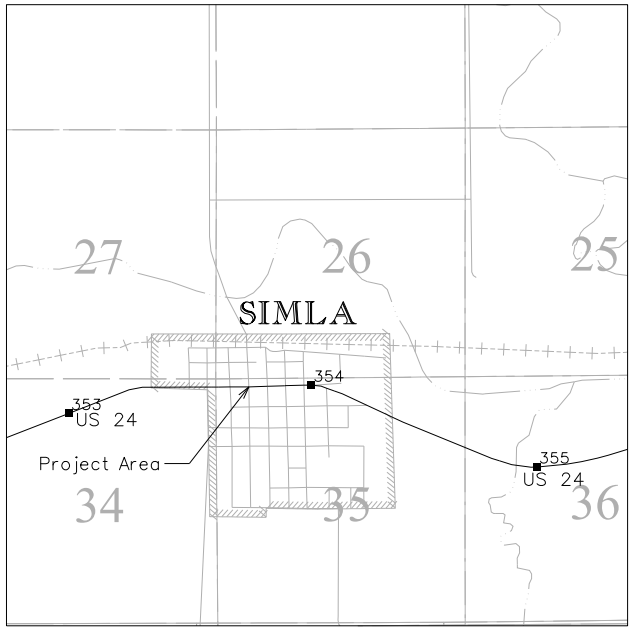


Typical Control Monument Cap
Not to Scale

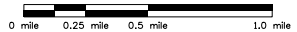
▲ CM-MP - Control Point Monuments set by CDOT. They are CDOT Type 2 monuments, a 3¼" dia. aluminum control monument cap (as shown) on a 3' x¾" dia. aluminum security rod on a 3' x¾" dia. smooth aluminum rod.

General Notes:

1. This Project Control Diagram is not a boundary survey of the adjoining property and is prepared for the Colorado Department of Transportation purposes only.
2. This plan set is subject to change and may not be the most current set. It is the user's responsibility to verify with CDOT that this set is the most current. The information contained on the attached drawing is not valid unless this copy bears an original signature of the Professional Land Surveyor hereon named.
3. Refer to the M-629-1 Survey Monuments of the Standard Plans dated July, 2012 found in The Colorado Department of Transportation, M & S Standards for typical survey monument descriptions.



PROJECT LOCATION MAP



Basis of Bearings: Bearings used in the calculations of coordinates are based on a grid bearing of S 93°16' 37" E from the Control Monument "CM 5370" (CDOT Type 2 Monument, MP 353.70), Section 35, Township 10 South, Range 60 West, Sixth P.M. and the Control Monument "CM 5379" (CDOT Type 2 Monument, MP 353.79), Section 35, Township 10 South, Range 60 West, Sixth P.M. as obtained from a Global Positioning System (GPS) survey based on the National Spatial Reference System (NSRS).

Basis of Elevations: Project elevations are GPS derived, using GEOID 12, based on a NAVD 88 elevation of 1820.123m on NGS Horizontal Control Disk "SWAYNE" (Stamped "SWAYNE 1996" NGS cap set in a concrete post).

COORDINATE DATUM: Project coordinates are modified Colorado State Plane Central Zone NAD 83(2011) coordinates. The project seed point (CM 5379) coordinates are: Northing = 451091.896m, Easting = 1036840.922m, and Elevation = 1800.739m. The ground scale factor used to modify the coordinates is 1.00034580316768. Project Coordinates are truncated by 400,000m in the Northing and 1,00,000m in the Easting.

To get from Project to State Plane coordinates: convert project coordinates to metric, add the truncation, subtract the seed point northing and easting, divide by the ground scale factor, then add the seed point northing and easting.

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

SURVEYOR STATEMENT (PROJECT CONTROL DIAGRAM)

I, Mark Leroy Angell, a professional land surveyor licensed in the State of Colorado, do hereby state to the Colorado Department of Transportation this Project Control Diagram was prepared and the field survey it represents was performed under my responsible charge and, based upon my knowledge, information and belief is in accordance with applicable standards of practice defined by Colorado Department of Transportation publications. This statement is not a guaranty or warranty, either expressed or implied.

PLS No. 38340

1/20/2017 angellm 9:23:02 AM C:\Users\angellm\Documents\ACAD\20856 Simla Intersections\Project Control Diagram\20856_SimlaSURV_PCD-Title01.dgn

Colorado Department of Transportation

10601 W. 10th Street
Greeley, CO 80634
Phone: 970-350-2161

Region 4 MDG

Sheet Revisions			Sheet Revisions			Sheet Revisions		
Date	Description	Initials	Date	Description	Initials	Date	Description	Initials

Project Control Diagram
Coordinate Tables and Plan Sheet
Project Number: STA 0243-087
Project Location: US24 ElPaso-Elbert ClEast Part 2

Project Code:	Last Mod. Date	Subset	Sheet No.
20856	11-16-16	3.02 of 3.02	3.02

CHARN GEODETIC COORDINATE TABLE

(adjusted field data) (meters)

NAME	COORDINATES NAD 83(2011)		ELLIPS.	MAPPING	SCALE	NAD 83(2011) ZONE 0501		DESCRIPTION
	LATITUDE	LONGITUDE	HEIGHT	ANGLE		NORTHING	EASTING	
RAMAH	39°07'00.44306" N	104°10'09.52466" W	1853.027	0°50'21"	0.999935948	448116.357	1029473.281	USGS Disk on Steel Rod "RAMAH ET 1970"
SWAYNE	39°07'42.51784" N	104°03'07.41335" W	1801.211	0°54'48"	0.999936024	449568.678	1039590.786	NGS Disk in Conc Mon "SWAYNE 1996"

GEODETIC COORDINATE TABLE

(adjusted field data) (meters)

NAME	COORDINATES NAD 83(2011)		ELLIPS.	MAPPING	SCALE	NAD 83(2011) ZONE 0501		DESCRIPTION
	LATITUDE	LONGITUDE	HEIGHT	ANGLE		NORTHING	EASTING	
CM 5370	39°03'33.66453" N	104°05'07.09330" W	1801.974	0°53'32"	0.999936173	451100.387	1036692.617	CDOT Type 2 Monument (MP 353.70)
CM 5379	39°03'33.31426" N	104°05'00.92353" W	1800.739	0°53'36"	0.999936172	451091.896	1036840.922	CDOT Type 2 Monument (MP 353.79)

PROJECT COORDINATE SUMMARY TABLE (feet)

NAME	PROJECT COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING	(NAVD 88)	
CM 5370	167651.864	120382.194	5973.70	CDOT Type 2 Monument (MP 353.70)
CM 5379	167623.996	120868.926	5969.66	CDOT Type 2 Monument (MP 353.79)
RAMAH	157858.372	96688.566	6140.60	USGS Disk on Steel Rod "RAMAH ET 1970"
SWAYNE	162624.844	129893.891	5971.52	NGS Disk in Conc Mon "SWAYNE 1996"

SECONDARY PROJECT CONTROL (feet)

CM 5467	166082.360	125299.190	5934.03	CDOT Type 2 Monument (MP 354.67)
CM 5495	165705.372	126704.443	5925.35	CDOT Type 2 Monument (MP 354.95)

As Constructed
No Revisions:
Revised:
Void:

Know what's below. Call before you dig.

TABULATION OF TRAFFIC ENGINEERING ITEMS

ITEM	DESCRIPTION	UNIT	Project Total
627-00013	PAVEMENT MARKING PAINT(HIGH BUILD)	GAL	1186
627-30405	PREFORMED THERMO-PLASTIC PAVEMENT MARKING (WORD-SYMBOL))	SF	130
627-30410	PREFORMED THERMO-PLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SF	786
627-00008	MODIFIED EPOXY PAVEMENT MARKING	GAL	395
630-00000	FLAGGING	HOUR	2025
630-00007	TRAFFIC CONTROL INSPECTION	DAY	30
630-00012	TRAFFIC CONTROL MANAGEMENT	DAY	60
630-80001	FLASHING BEACON (Portable)	EACH	2
630-80338	BARRICADE (TYPE 3 M-D) (TEMPORARY)	EACH	8
630-80341	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE A)	EACH	53
630-80342	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE B)	EACH	74
630-80343	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE C)	EACH	8
630-80344	CONSTRUCTIONTRAFFIC SIGN (SPECIAL)	SF	168
630-80350	VERTICAL PANEL	EACH	50
630-80355	PORTABLE MESSAGE SIGN PANEL	EACH	2
630-80360	DRUM CHANNELIZING DEVICE	EACH	100
630-80380	TRAFFIC CONE	EACH	400
630-80520	MOBILE PAVEMENT MARKINGZONE	DAY	4

NOTE:

1	Some items are calculated cumulatively and others consider only the maximum number need for the phases which are estimated to occur at one time
2	The contractor shall maintain access to all properties at all times. The contractor shall be responsible for notifying all affected property owners in advance of any work in front of their property.
3	The Contractor shall mask all signs conflicting with construction signing.
4	It is estimated that 1186 gallons of Pavement Marking Paint (high build) will be required for temporary striping.
5	All temporary or permanent pavement markings shall be in "full compliance" by the end of the day and before reopening the roadway to traffic.
6	"FINES DOUBLE" sign shall only be used when work is in progress or hazards exist in the clear zone of the project area.
7	For placement of signs and other devices refer to the MUTCD (part 6- Temporary Traffic Control) and CDOT standard plans (S-630-1 and S-630-2).
8	Mobile Pavement Marking Zone for Epoxy only.

Print Date: 2/2/2017	TABULATION OF TRAFFIC ENGINEER ITEMS		Project No./Code
File Name: Traffic Item.dgn			STA 0243-087
Horiz. Scale: 1:6512.07	Designer: J.D.MILLER	Region: 4	20856
Vert. Scale: As Noted	Detailer: Esayas Butta	Unit Leader: TAM	
Limon Residency	Sheet Subset:	Sheet: 1 of 5	Sheet Number 41
TAM			

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As Constructed
No Revisions:
Revised:
Void:

SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES

SIGN CODE	LEGEND	SIGN PANEL SIZE			PANEL SIZE A	PANEL SIZE B	PANEL SIZE C
		W	x	H	EACH	EACH	EACH
G20-1	ROAD WORK NEXT xx MILES	60	x	24		2	
G20-10	XYZ / CONSTRUCTION / THANKS / YOU / XXX-XXX-XXXX	48	x	48		2	
G20-11	(CONSTRUCTION INFORMATION - DATE -PHONE)	48	x	48		2	
G20-5P	WORK ZONE	36	x	30	18		
R2-1	SPEED / LIMIT / 65	36	x	48		4	
R2-1	SPEED / LIMIT / 55	36	x	48		4	
R2-1	SPEED / LIMIT / 45	36	x	48		4	
R2-1	SPEED / LIMIT /35	36	x	48		4	
R2-6P	FINES / DOUBLE	36	x	24	6		
R4-1	DO NOT PASS	36	x	48		2	
R9-9	SIDEWALK CLOSED	24	x	12	9		
R9-11	SIDEWALK CLOSED AHEAD CROSS HERE	24	x	18	6		
R9-11a	SIDEWALK CLOSED CROSS HERE	24	x	12	6		
R11-2	ROAD / CLOSED	48	x	30		4	
R52-6a	BEGIN / FINES / DOUBLE / IN WORK / ZONE	48	x	60			4
R52-6b	END / FINES / DOUBLE / IN WORK / ZONE	48	x	60			4
M4-10(L)	DETOUR LEFT ARROW	48	x	18	2		
M4-10(R)	DETOUR RIGHT ARROW	48	x	18	2		
W1-6	ONE DIRECTION	48	x	24	4		
W3-4	BE/PREPARED/TO STOP	48	x	48		4	
W8-1	BUMP	48	x	48		4	
W8-2	DIP	48	x	48		2	
W8-3	PAVEMENT ENDS	48	x	48		2	
W8-9a	SHOULDER DROP-OFF	48	x	48		4	
W8-11	UNEVEN LANE	48	x	48		4	
W8-15	GROOVED PAVEMENT	48	x	48		2	
W20-1	ROAD / WORK / AHEAD	48	x	48		12	
W20-1	ROAD / WORK / 1/2 MILE	48	x	48		4	
W20-4	ONE LANE/ ROAD/1000FT	48	x	48		4	
W20-7	FLAGGER (SYMBOL)	48	x	48		4	
TOTALS					**53**	**74**	**8**

CONSTRUCTION TRAFFIC SIGN (SPECIAL)

LEGEND	#	SIGN PANEL SIZE (FT) W	x	H	SF
BEGINNING (MONTH DAY)	1	9	x	1.5	13.5
BEGINNING (MONTH DAY)	1	7.5	x	1.5	11.25
ROAD WORK US 24 WEST OF MATHESON	1	9	x	3.5	31.5
ROAD WORK US 24 EAST OF RAMAH	1	7.5	x	3.5	26.25
ROAD WORK US 24 WEST OF MATHESON DELAYS EXPECTED	1	9	x	5	45
ROAD WORK US 24 EAST OF RAMAH DELAYS EXPECTED	1	8	x	5	40
TOTALS (SQ.FT)					**167.5**

NOTE:

1. SEE ALSO CASE 17, 18, 19 AND 24 OF THE COLORADO STANDARD PLANS FOR BASIC PLACEMENT DETAILS OF CONSTRUCTION TRAFFIC CONTROL DEVICES.
2. QUANTITIES FOR CONSTRUCTION TRAFFIC CONTROL DEVICES ARE SUFFICIENT FOR TWO SET-UPS AT A TIME TO ACCOMMODATE FOR PAVING AND SHOULDERING OPERATIONS.
3. THE CONTRACTOR SHALL MASK ALL SIGNS CONFLICTING WITH CONSTRUCTION SIGNING. MASKING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
4. CONTRACTOR SHALL VERIFY ALL SIGNS WITH THE ENGINEER BEFORE ORDERING.

Print Date: 2/2/2017	**TABULATION OF CONSTRUCTION TRAFFIC CONTROL DEVICES**	Project No./Code
File Name: Traffic device.dgn		STA 0243-087
Horiz. Scale: 1:6512.07	Designer: J.D.MILLER	Region: 4
Vert. Scale: As Noted	Detailer: Esayas Butta	20856
Limon Residency	Unit Leader: TAM	Sheet Number 42
TAM	Sheet Subset:	Sheet: 2 of 5

As Constructed
No Revisions:
Revised:
Void:

TABULATION OF PAVEMENT MARKINGS

	STATION		MODIFIED EPOXY										PREF.THERMOPLASTIC							
			EDGE LINE (LF)		CENTER LINE (LF)					CHANNELIZING LANE(LF)			WHITE STOP BAR 24 INCH (LF)		WHITE XWALK 2' x 8' (#)		WORD (SCHOOL) 33 SF (#)		TURN ARROW 15.5 SF	
			WHITE SOLID 4"		YELLOW SKIP 4"		YELLOW SOLID 4 "		DOUBLE YELLOW CENTER LINE 4"		CHANNELIZING LANE 8"									
LOCATION	BEGIN	END	Plan	As-Built	Plan	As-Built	Plan	As-Built	Plan	As-Built	Plan	As-Built	Plan	As-Built	Plan	As Built	Plan	As Built	Plan	As-Built
US 24	350.58	356.7	64,627		26,281		13,343		7,025		100		225		21		3		2	
TOTAL LINEAR FEET			64,627	-	26,281	-	13,343	-	7,025	-	100	-	225	-	21	-	3	-	2	
TOTAL SQUARE FEET			21,542		2,190.08		4,448		4,683		66.67		450		336		99		31.0	
EPOXY (GAL)			253		26		52		55		1									
TOTAL EPOXY (GAL)			395																	
TOTAL PERFORMED THERMOPLASTIC (SF)													786				99		31	

PROJECT SUMMARY OF PAVEMENT MARKING QUANTITIES

	MODIFIED EPOXY (GAL)	PREFORMED THERMOPLASTIC (XWALK-STOPLINE)(SF)	TOTAL PREFORMED THERMOPLASTIC PAVEMENT MARKING (Word-Symbol)(SF)
PROJECT TOTAL	395	786	130

NOTE:

1. FOR DETAILS OF PAVEMENT MARKING LINES AND LINE PLACEMENT SEE STANDARD S-627-1.
2. STRIPING SHALL BE FULL COMPLIANCE AT THE END OF EACH DAYS WORK.
3. FOR THE PURPOSES OF QUANTITY TABULATIONS, AN APLLICATION RATE OF 85 SF/GAL WAS USED.
4. MULTIPLE MOBILIZATIONS ARE ANTICIPATED FOR INSTALLATION OF EPOXY PAVEMENT MARKING DURING THE PROJECT. THE FINAL NUMBER REQUIRED IS DEPENDENT ON THE PROJECT CPM SCHEDULE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

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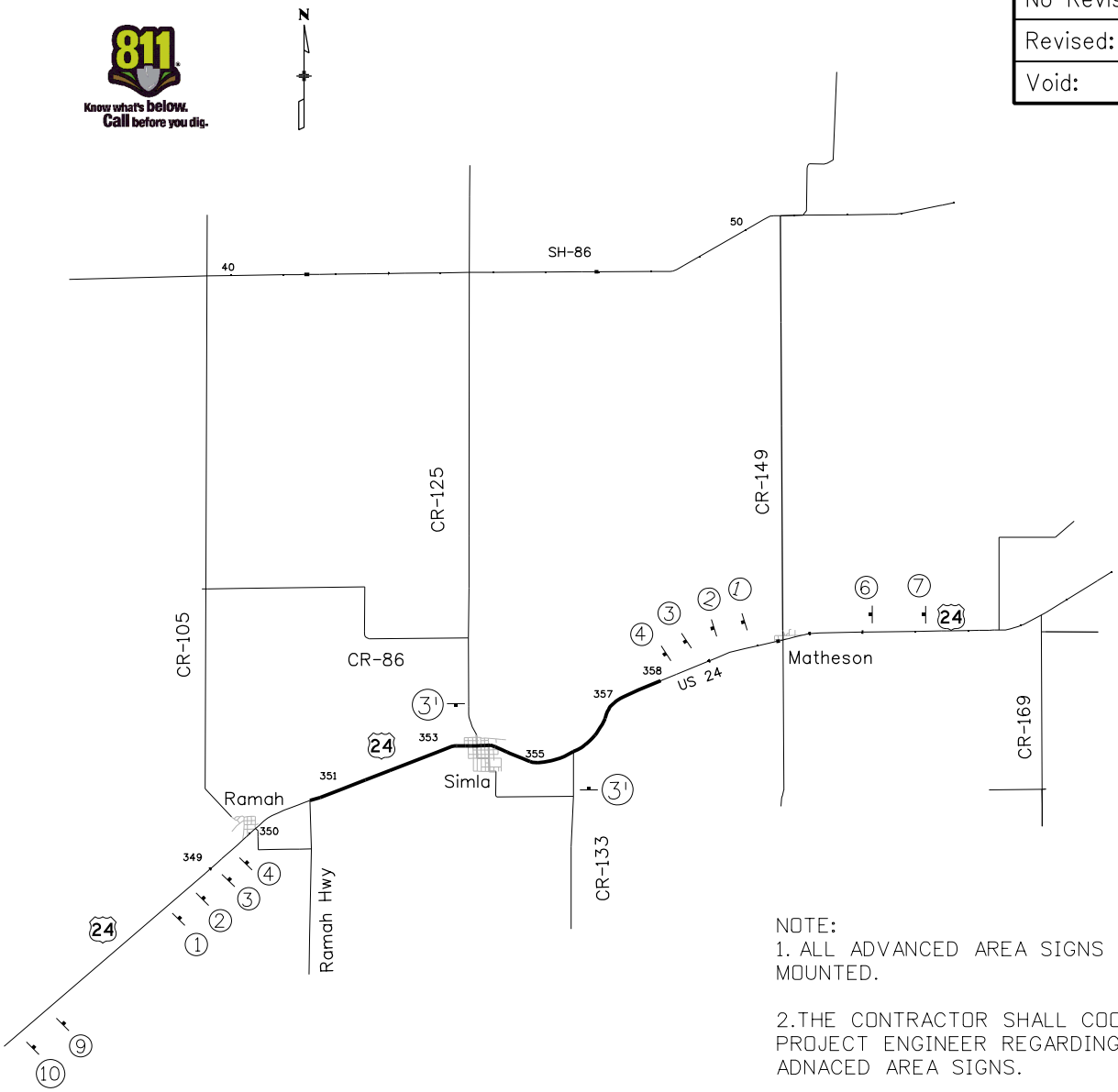
Print Date: 1/27/2017	TABULATION OF PAVEMENT MARKINGS	Project No./Code
File Name: Striping.dgn		STA 0243-087
Horiz. Scale: 1:6512.07	Designer: J.D.MILLER	Region: 4
Vert. Scale: As Noted	Detailer: Esayas Butta	20856
Limon Residency	Unit Leader: TAM	Sheet Number 43
TAM	Sheet Subset:	Sheet: 3 of 5

As Constructed
No Revisions:
Revised:
Void:



NOTE:
1. ALL ADVANCED AREA SIGNS SHALL BE POST MOUNTED.

2.THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER REGARDING THE PLACEMENT OF ADNACED AREA SIGNS.

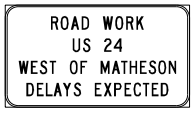
VMS
①

G20-11
②

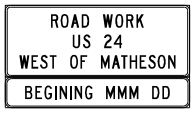
W20-1
③

G20-1
④

W20-1
3'



⑥



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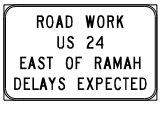

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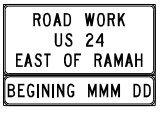

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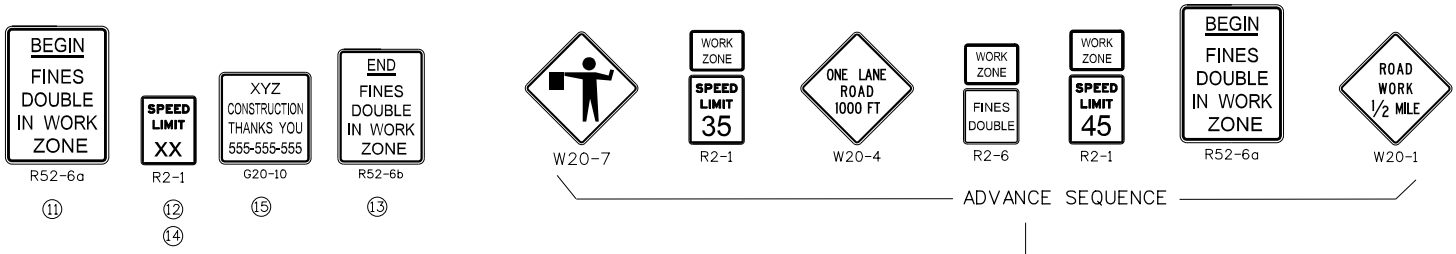
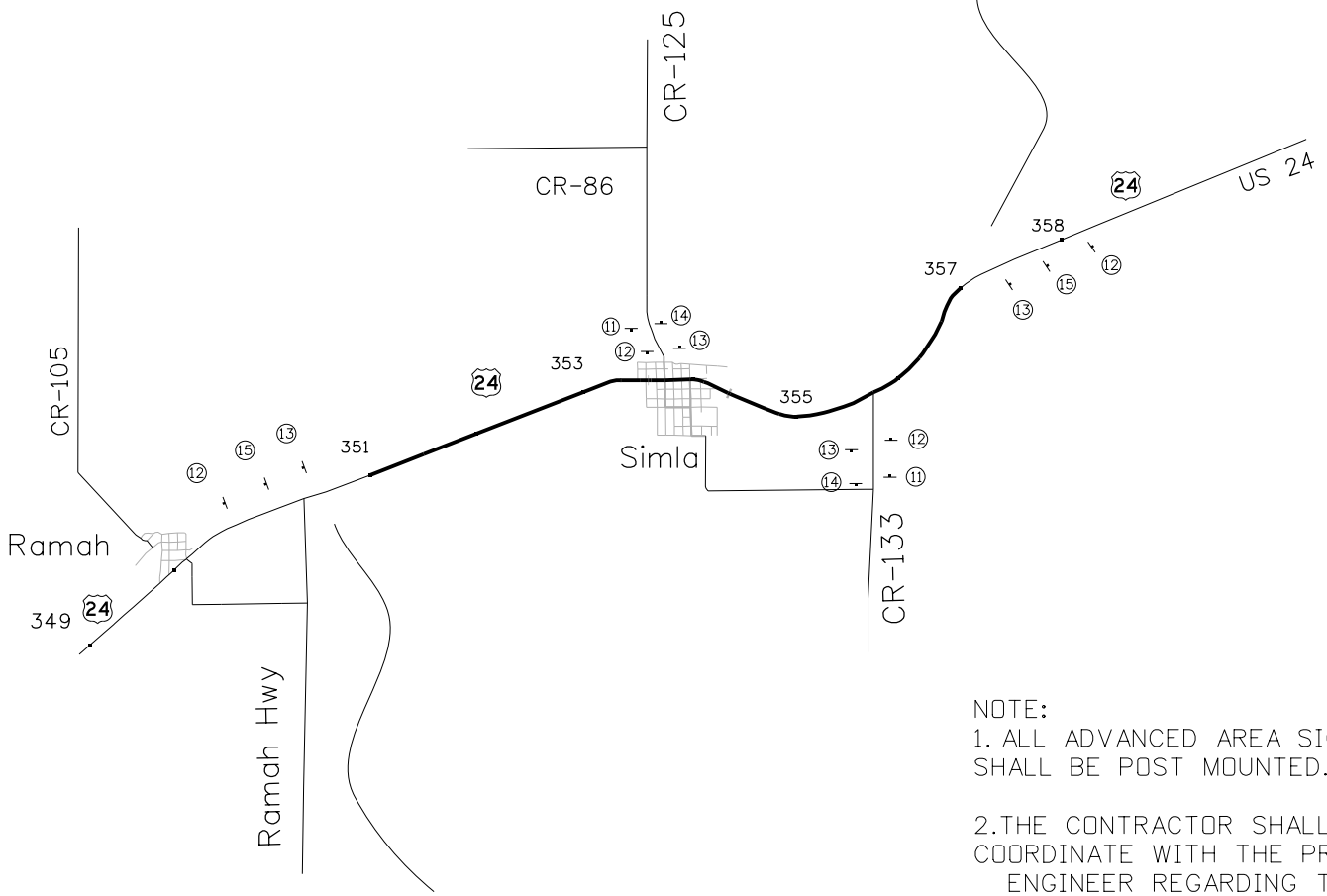
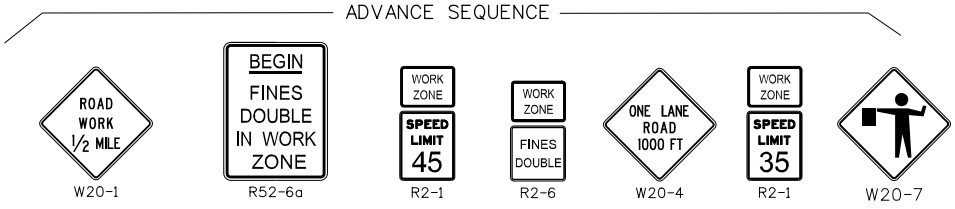
Print Date: 1/27/2017	ADVANCED AREA SIGNING			Project No./Code
File Name: Advance signing.dgn				STA 0243-087
Horiz. Scale: 1:6512.07	Designer: J.D.MILLER		Region: 4	20856
Vert. Scale: As Noted	Detailer: Esayas Butta		Unit Leader: TAM	
Limon Residency	Sheet Subset:		Sheet: 4 of 5	Sheet Number 44
TAM				

buttae 1:05:19 PM G:\Old Computer Hard Drive\Project\US 24\Phase 2\FOR\Advance signing.dgn

As Constructed
No Revisions:
Revised:
Void:





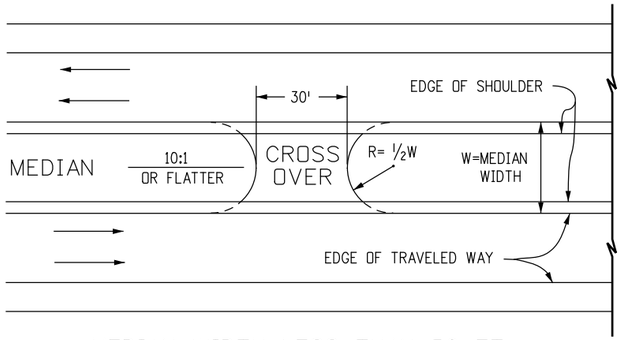


NOTE:
1. ALL ADVANCED AREA SIGNS SHALL BE POST MOUNTED.

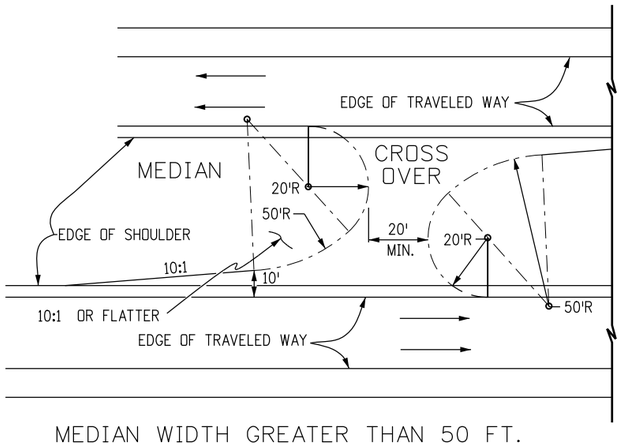
2. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER REGARDING THE PLACEMENT OF ADNACED AREA SIGNS.

Print Date: 1/27/2017	TYPICAL PROJECT SIGNING	Project No./Code
File Name: Typical project signing.dgn		STA 0243-087
Horiz. Scale: 1:6512.07		20856
Vert. Scale: As Noted	Designer: J.D.MILLER	Region: 4
Limon Residency	Detailer: Esayas Butta	Unit Leader: TAM
TAM	Sheet Subset:	Sheet: 5 of 5
		Sheet Number 45

buttae 1:20:50 PM G:\Old Computer Hard Drive\Project\US 24\Phase 2\FOR\Typical project signing.dgn



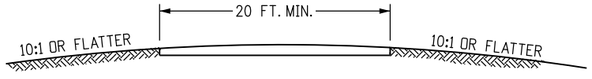
MEDIAN WIDTH LESS THAN 50 FT.



MEDIAN WIDTH GREATER THAN 50 FT.

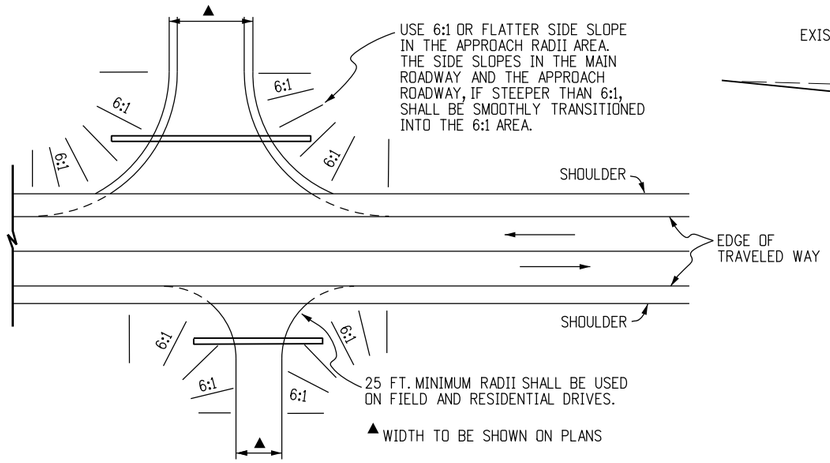
TYPICAL PLANS FOR EMERGENCY MEDIAN CROSS OVER

LOCATION OF RADIUS POINTS MAY BE ADJUSTED FOR BEST FIT



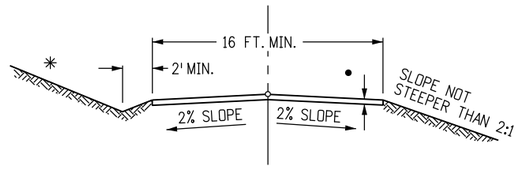
TYPICAL SECTION FOR MEDIAN CROSS OVER

ANY REQUIRED PIPE OR INLET FOR MEDIAN DRAINAGE SHALL HAVE A TRAVERSABLE DESIGN AS SPECIFIED ON THE PLANS



SIDE DRAINS SHALL BE LOCATED BEYOND THE CLEAR ZONE, OR WHEN WITHIN THE CLEAR ZONE, THEY SHALL BE INSTALLED WITH END SECTIONS CONFORMING TO A 6:1 SLOPE. FIFTY FT. RADII SHALL BE USED ON INTERSECTING ROADS, EXCEPT FOR FIELD AND RESIDENTIAL DRIVES OR UNLESS OTHERWISE SPECIFIED ON PLANS. RADII MAY BE VARIED TO SUIT FIELD CONDITIONS.

TYPICAL PLANS FOR SIDE APPROACH ROAD

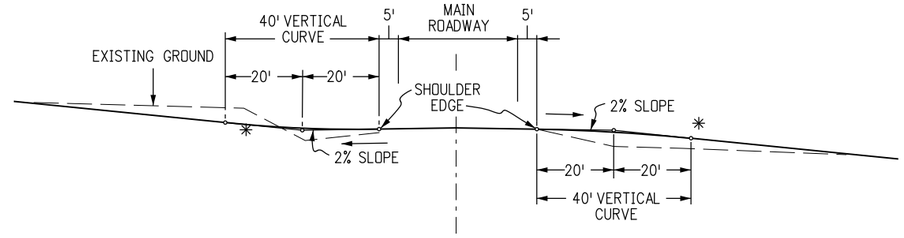


1/2 CUT SECTION 1/2 FILL SECTION

TYPICAL SECTION FOR APPROACH (ACCESS) ROAD

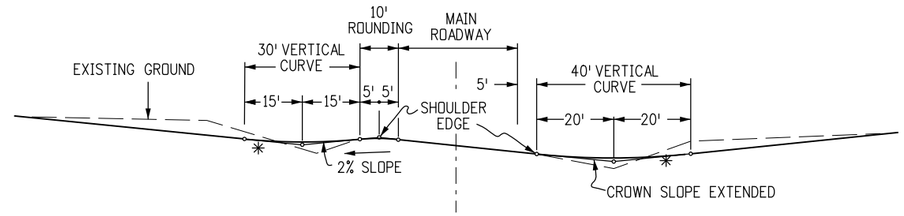
NOTE: ROAD APPROACHES WHICH REQUIRE HMA (ASPHALT) PAVEMENT SHALL BE PLACED AT THE FOLLOWING DISTANCES BACK FROM THE ROADWAY EDGE OF PAVEMENT:

1. RESIDENTIAL OR AGRICULTURAL FIELD ENTRANCES - PAVE 4 FEET BACK.
2. THREE OR MORE RESIDENCES OR COMMERCIAL PROPERTY - PAVE 20 FEET BACK OR TO ROW LINE, WHICHEVER IS LESS.
3. PUBLIC STREET - PAVE 50 FEET BACK OR TO ROW LINE, WHICHEVER IS LESS.
4. IF EXISTING ACCESS IS PAVED, THEN FEATHER NEW ASPHALT OVERLAY A MINIMUM OF 2 FEET BACK OR AS DIRECTED BY THE ENGINEER.

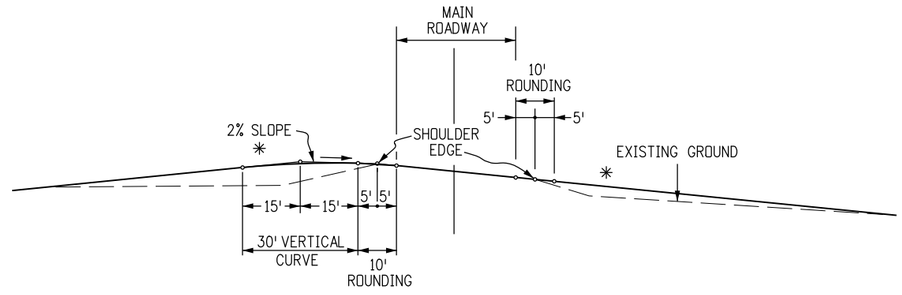


1/2 CUT SECTION 1/2 FILL SECTION

STANDARD CROWNED SECTION



SUPERELEVATED CUT SECTION



SUPERELEVATED FILL SECTION

VERTICAL ALIGNMENT SIDE APPROACH ROADS INTERSECTING MAIN ROADWAY

* TANGENT SLOPE NOT STEEPER THAN 8% BEYOND THE VERTICAL CURVE. THE SLOPE MAY BE STEEPER, IF REQUIRED, TO MEET EXISTING APPROACH SLOPE. HOWEVER, APPROACH ROAD SLOPE SHOULD NOT BE STEEPER THAN EXISTING SLOPE.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: DD		Date:	Comments
Last Modification Date: 07/08/13 Initials: LTA	(R-X)	07/08/13	Added notes to Approach Road Typ. Sec. detail.
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: 203010101.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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Fax: (303) 757-9820
Project Development Branch DD/LTA

APPROACH ROADS

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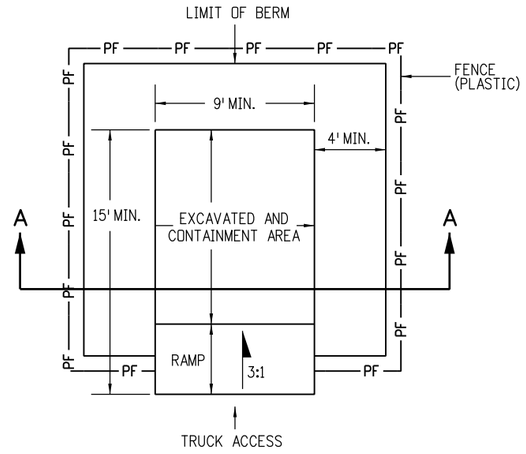
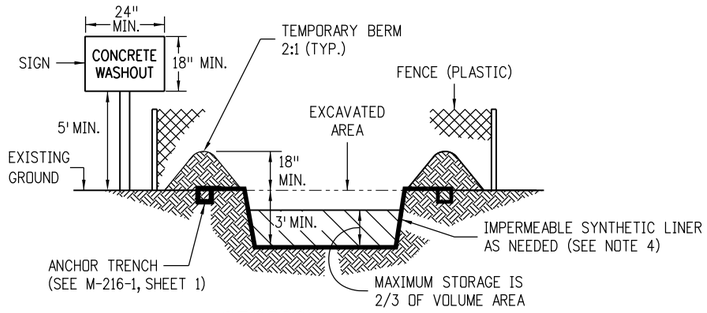
STANDARD PLAN NO.

M-203-1

Sheet No. 1 of 1



PLAN VIEW



SECTION A-A

NOTES:

1. A FENCE (PLASTIC) CONFORMING TO SECTION 607 SHALL BE INSTALLED AROUND THE CONCRETE WASHOUT AREA, EXCEPT AT THE OPENING.

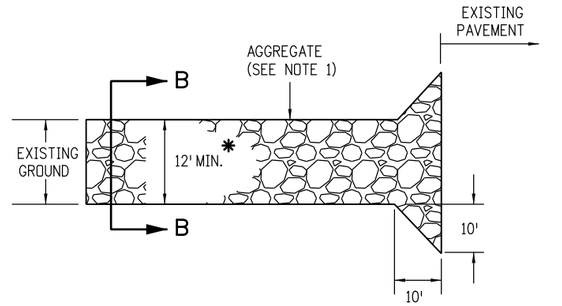
2. THE CONCRETE WASHOUT SIGN SHALL HAVE LETTERS AT LEAST 3 INCHES HIGH AND CONFORM TO SUBSECTION 630.02.

3. ALL MATERIALS AND LABOR TO COMPLETE THE CONCRETE WASHOUT STRUCTURE SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.

4. THE BOTTOM OF EXCAVATION SHALL BE A MINIMUM OF FIVE FEET ABOVE GROUND WATER. IF NOT, IT SHALL BE LINED WITH AN IMPERMEABLE SYNTHETIC LINER THAT IS DESIGNED TO CONTROL SEEPAGE AT A MAXIMUM RATE OF 6 TO 10 CENTIMETERS PER SECOND.

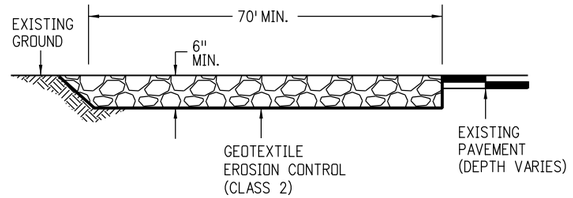
5. THE PAY ITEM NUMBER FOR CONCRETE WASHOUT STRUCTURE (EACH) IS 208-00045.

CONCRETE WASHOUT STRUCTURE

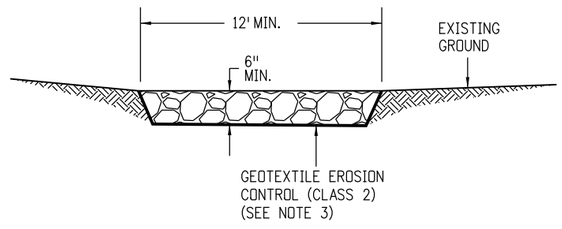


PLAN VIEW

* SHALL EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION.



ELEVATION SECTION



SECTION B-B

NOTES:

1. AGGREGATE SHALL CONFORM TO SUBSECTION 208.02 (K).

2. THE CONTRACTOR SHALL PROTECT CURB AND GUTTER THAT CROSSES THE ENTRANCE FROM DAMAGE. PROTECTION OF THE CURB AND GUTTER SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.

3. GEOTEXTILE SHALL CONFORM TO SUBSECTION 712.08.

4. ALL MATERIALS AND LABOR TO COMPLETE THE VEHICLE TRACKING PAD SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.

5. THE PAY ITEM NUMBER FOR VEHICLE TRACKING PAD (EACH) IS 208-00070.

VEHICLE TRACKING PAD

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JBK		Date:	Comments
Last Modification Date: 03/29/16 Initials: LTA	(R-X)	07/16/15	Deleted the two Soil Retention Blanket detail sheets. They are now standard M-216-1 Soil Retention Covering.
Full Path: www.coloradodot.info/business/designsupport	(R-X)	03/29/16	Minor revisions to some dimensions and General Notes.
Drawing File Name: 2080101011.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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TEMPORARY EROSION CONTROL

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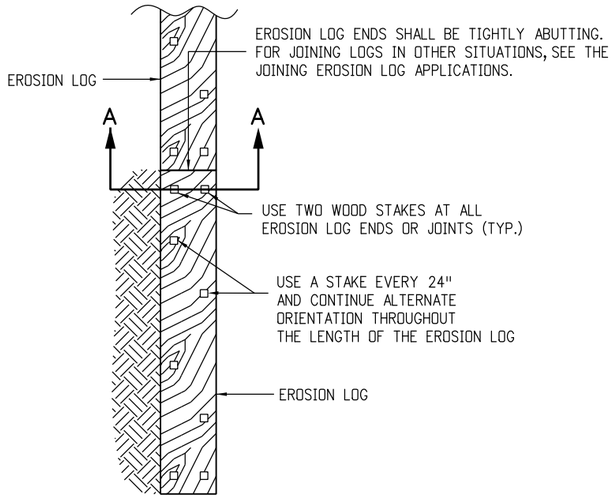
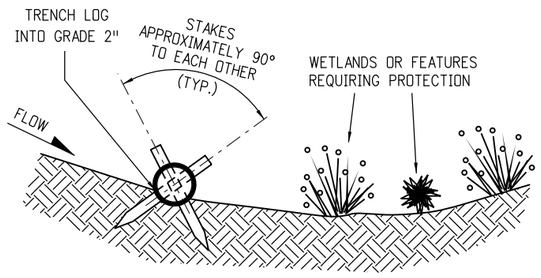
STANDARD PLAN NO.
M-208-1
Sheet No. 1 of 11



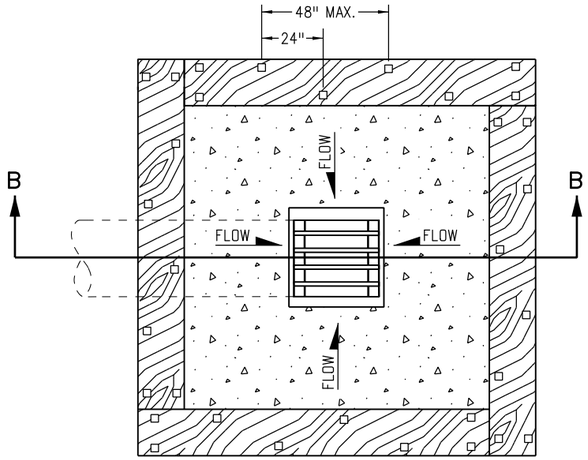
PLAN VIEW



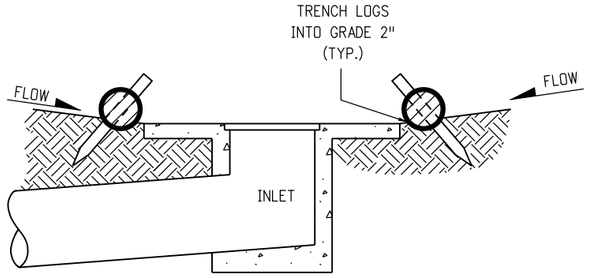
SECTION A-A

TYPICAL STAKE INSTALLATION

EROSION LOGS PAY ITEMS	
NUMBER	DESCRIPTION
208-00012	TYPE 1 (9")
208-00002	TYPE 1 (12")
208-00013	TYPE 1 (20")
208-00007	TYPE 2 (8")
208-00008	TYPE 2 (12")
208-00009	TYPE 2 (18")



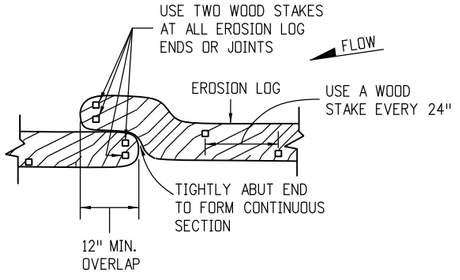
PLAN VIEW



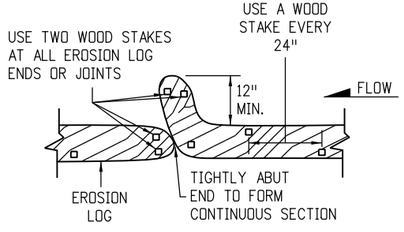
SECTION B-B

NOTE: LOCATE EROSION LOGS AT THE OUTSIDE EDGE OF THE CONCRETE APRON.

EROSION LOG FILTER AT DROP INLET



OVERLAP JOINING DETAIL

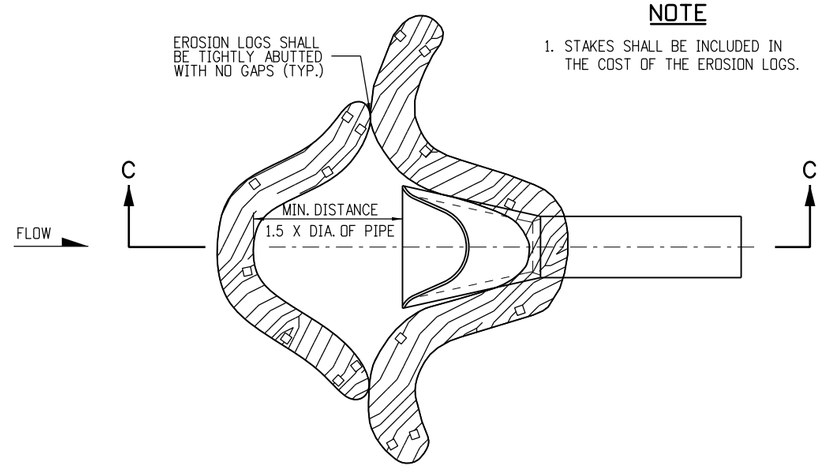


J-HOOK JOINING DETAIL

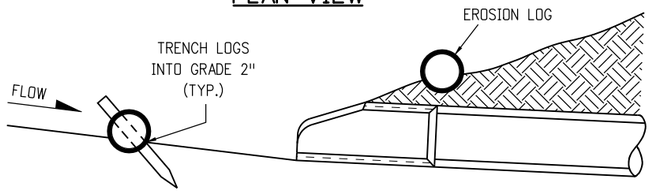
JOINING EROSION LOG APPLICATIONS

NOTE

1. STAKES SHALL BE INCLUDED IN THE COST OF THE EROSION LOGS.

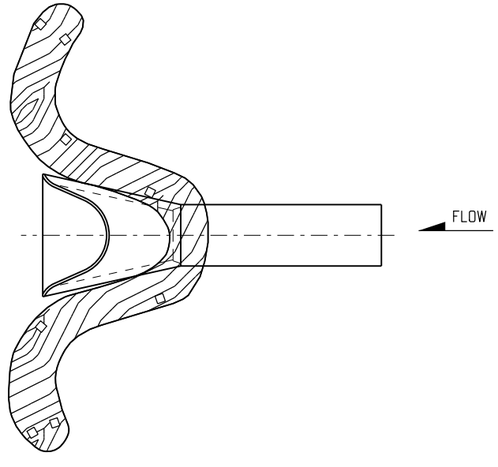


PLAN VIEW



SECTION C-C
(NOT ALL LOGS SHOWN)

EROSION LOG CULVERT INLET PROTECTION



EROSION LOG CULVERT OUTLET PROTECTION

EROSION LOG APPLICATIONS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JBK		Date:	Comments
Last Modification Date: 03/29/16 Initials: LTA	(R-X)	03/29/16	Minor revisions to some dimensions. Added Erosion Logs Pay Item table.
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: 2080102011.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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TEMPORARY EROSION CONTROL

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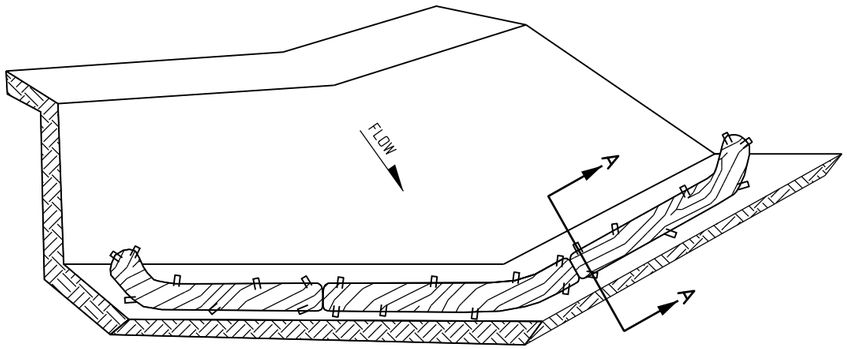
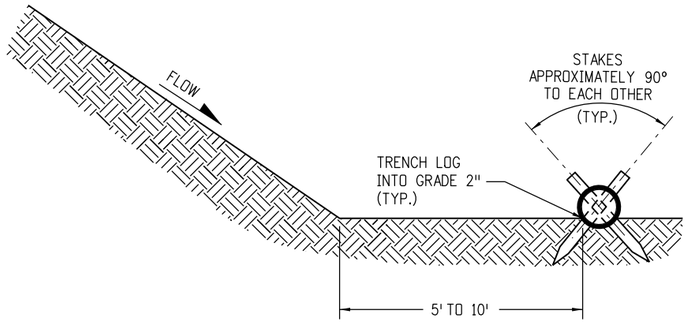
STANDARD PLAN NO.
M-208-1



ISOMETRIC VIEW



SECTION A-A

NOTES:

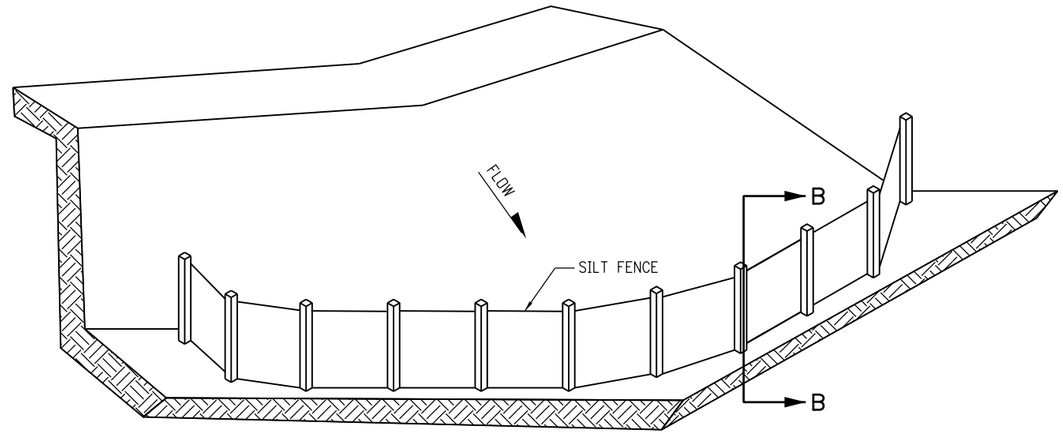
1. EROSION LOGS USED AT TOE OF SLOPE SHALL BE PLACED 5 TO 10 FEET BEYOND TOE OF SLOPE TO PROVIDE STORAGE CAPACITY.
2. EROSION LOGS SHALL BE PLACED ON THE CONTOUR WITH ENDS FLARED UP SLOPE.
3. SEE SHEET 2 OF 11 FOR JOINING LOGS DETAIL.

EROSION LOGS PAY ITEMS	
NUMBER	DESCRIPTION
208-00012	TYPE 1 (9")
208-00002	TYPE 1 (12")
208-00013	TYPE 1 (20")
208-00007	TYPE 2 (8")
208-00008	TYPE 2 (12")
208-00009	TYPE 2 (18")

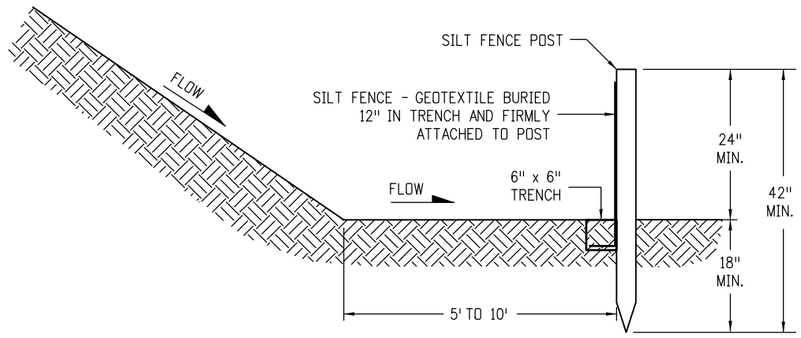
EROSION LOG TOE OF SLOPE PROTECTION

NOTES

1. SILT FENCE SHALL HAVE A MAXIMUM DRAINAGE AREA OF ONE-QUARTER ACRE PER 100 FEET OF SILT FENCE LENGTH; MAXIMUM SLOPE LENGTH BEHIND BARRIER IS 100 FEET; MAXIMUM GRADIENT BEHIND THE BARRIER IS 2:1.
2. SILT FENCE USED AT TOE OF SLOPE SHALL BE PLACED 5 TO 10 FEET BEYOND TOE OF SLOPE TO PROVIDE STORAGE CAPACITY.
3. SILT FENCE SHALL BE PLACED ON THE CONTOUR WITH ENDS FLARED UP SLOPE.
4. THE MAXIMUM LENGTH OF EROSION LOGS OR SILT FENCES WITHOUT A FLARED END TURNING UPSLOPE IS 150 FEET.



ISOMETRIC VIEW



SECTION B-B

SILT FENCE TOE OF SLOPE PROTECTION

NOTE: THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.

TOE OF SLOPE PROTECTION APPLICATIONS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JBK		Date:	Comments
Last Modification Date: 03/29/16 Initials: LTA	R-X	03/29/16	Minor revisions to some dimensions. Added Erosion Logs Pay Item table.
Full Path: www.coloradodot.info/business/designsupport	R-X		
Drawing File Name: 2080103011.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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TEMPORARY EROSION CONTROL

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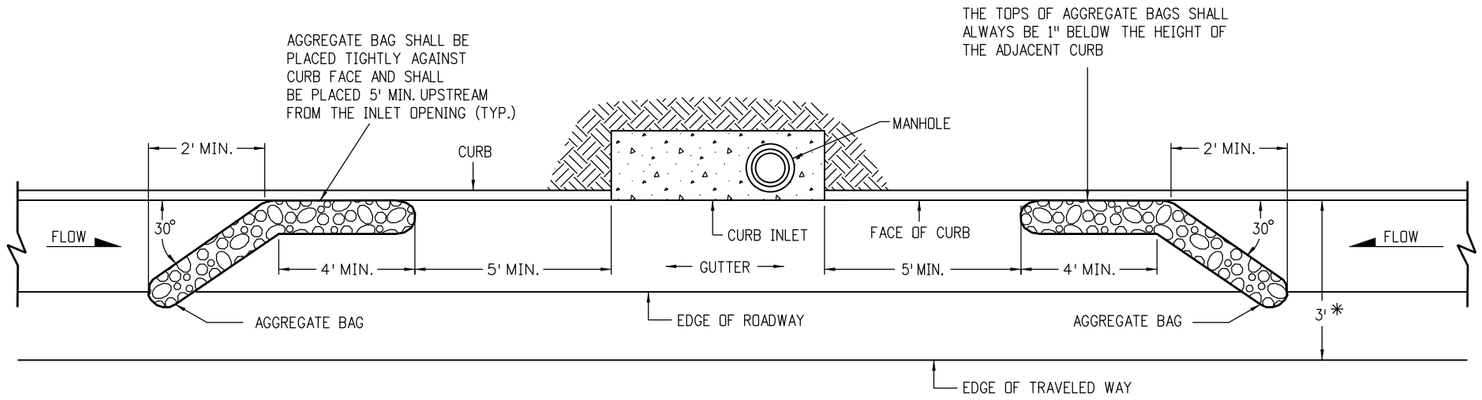
STANDARD PLAN NO.
M-208-1
Sheet No. 3 of 11

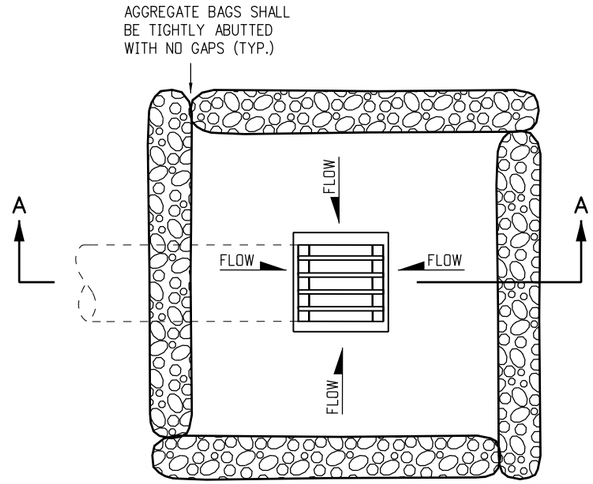


PLAN VIEW

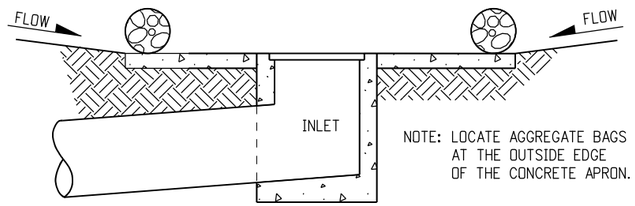
* NOTE: USE AGGREGATE BAGS ONLY WHEN THERE IS A MINIMUM CLEARANCE OF 3 FEET FROM THE EDGE OF THE TRAVELED WAY TO THE FACE OF CURB.

LENGTH OF INLET (L)	NUMBER OF AGGREGATE BAGS UPSTREAM OF INLET
0' - 5'	1
6' -10'	2
L > 10'	3

AGGREGATE BAGS AT STORM DRAIN INLET (TYPE I)



PLAN VIEW



SECTION A-A

AGGREGATE BAGS AT DROP INLET

AGGREGATE BAG APPLICATIONS

NOTE: THE PAY ITEM NUMBER FOR AGGREGATE BAG (LF) IS 208-00035

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JBK		Date:	Comments
Last Modification Date: 03/29/16 Initials: LTA	(R-X)	03/29/16	Added some dimensions and Note.
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: 2080104011.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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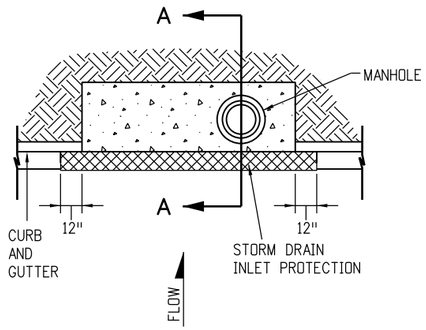
Division of Project Support JBK/LTA

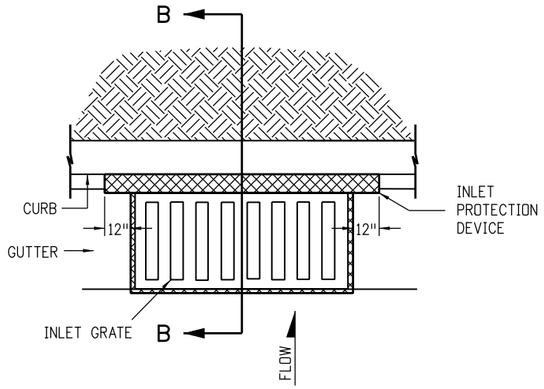
TEMPORARY EROSION CONTROL

Issued By: Project Development Branch on July 4, 2012

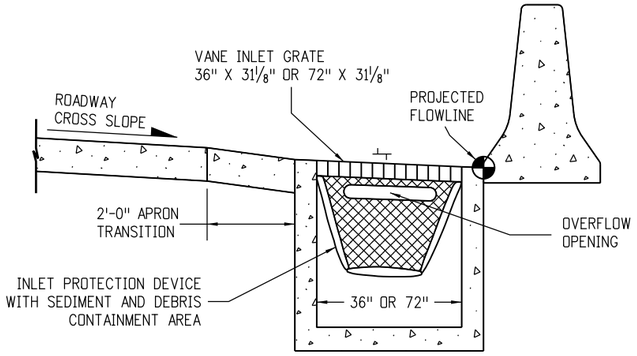
STANDARD PLAN NO.
M-208-1



PLAN VIEW

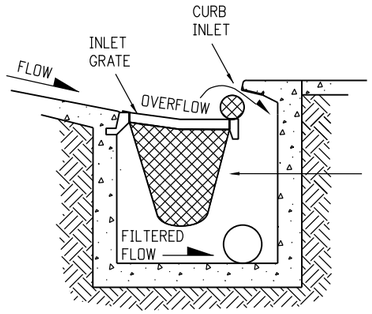


PLAN VIEW



OPTION A

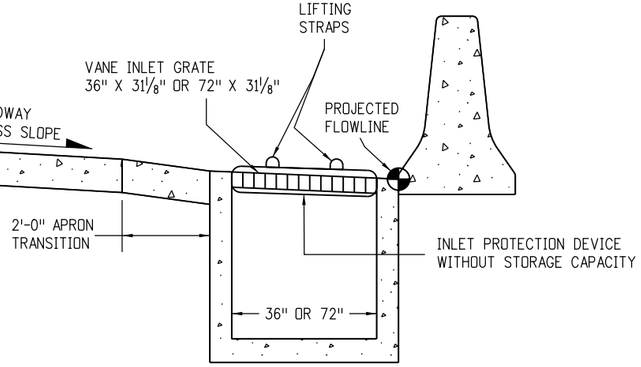
STORM DRAIN INLET PROTECTION (TYPE III)



SECTION B-B

OPTION A

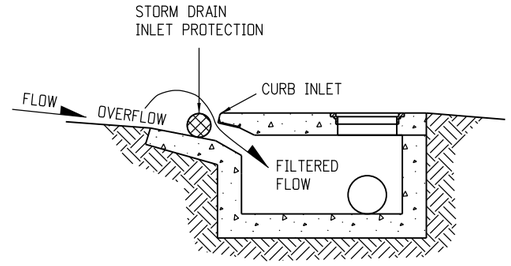
STORM DRAIN INLET PROTECTION (TYPE II)



OPTION B

STORM DRAIN INLET PROTECTION (TYPE III)

NOTE: THE PAY ITEM NUMBER FOR STORM DRAIN INLET PROTECTION (TYPE III) (EACH) IS 208-00056.

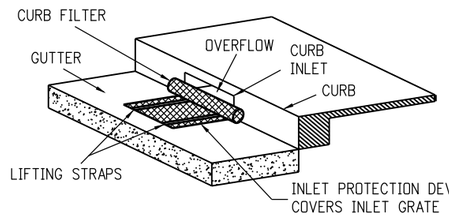


SECTION A-A

STORM DRAIN INLET PROTECTION (TYPE I)

NOTES

1. INLET PROTECTION DEVICE SHALL EXTEND 12 INCHES PAST EACH END OF THE INLET.
2. THE PAY ITEM NUMBER FOR STORM DRAIN INLET PROTECTION (TYPE I) (EACH) IS 208-00051.
3. FOR STORM DRAIN INLET TYPES I AND II, IF THERE IS A MINIMUM CLEARANCE OF 3 FEET FROM THE EDGE OF THE TRAVELED WAY TO THE FACE OF CURB, USE THE AGGREGATE BAGS AT STORM DRAIN INLET (TYPE I) DETAIL ON SHEET 4 INSTEAD.



ISOMETRIC VIEW

OPTION B

STORM DRAIN INLET PROTECTION (TYPE II)

NOTE: THE PAY ITEM NUMBER FOR STORM DRAIN INLET PROTECTION (TYPE II) (EACH) IS 208-00052.

STORM DRAIN INLET PROTECTION TYPES

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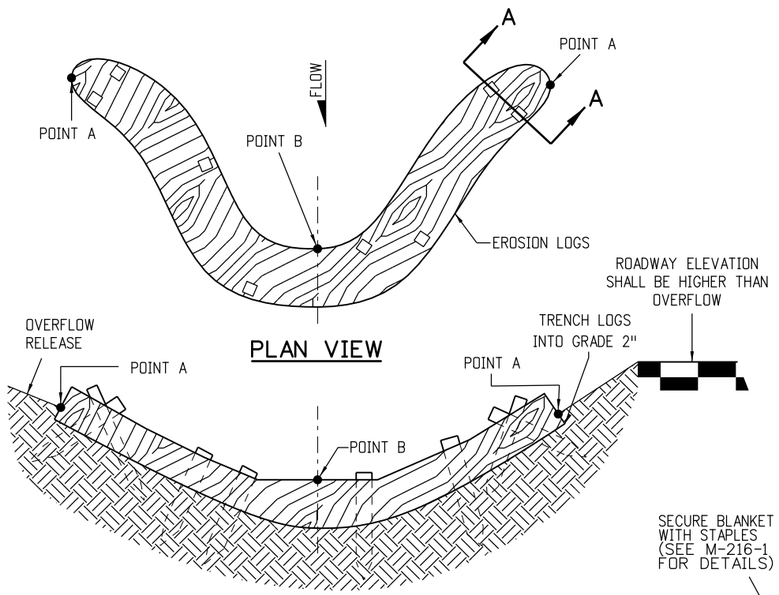
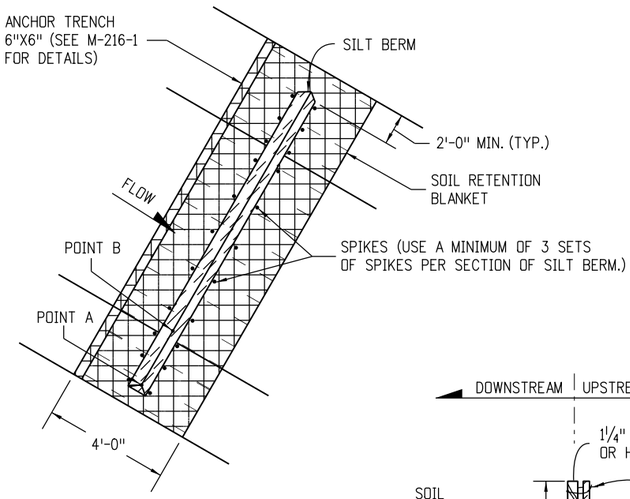


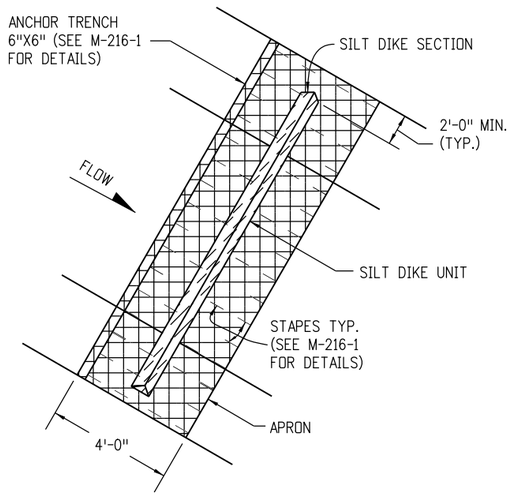
PLAN VIEW

ELEVATION

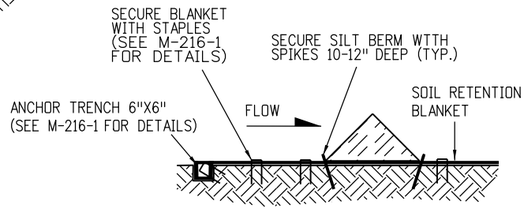
NOTE: POINTS "A" SHALL BE A MINIMUM 4" HIGHER THAN POINT "B".



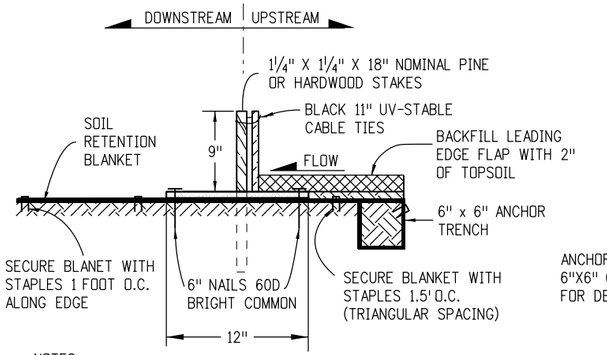
PLAN VIEW



PLAN VIEW

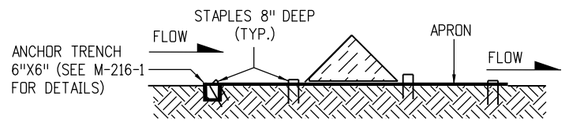


SILT BERM (1) SECTION VIEW

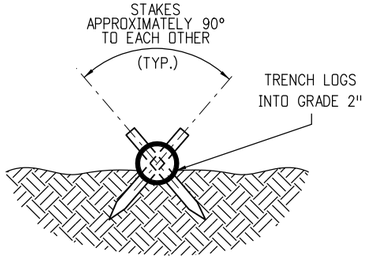


NOTES:
1. MINIMUM 4 NAILS PER SEGMENT (UPSTREAM).
2. MINIMUM 2 NAILS PER SEGMENT (DOWNSTREAM).

SILT BERM (2) SECTION VIEW



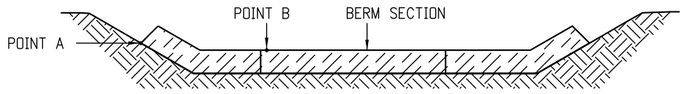
TYPICAL SECTION



SECTION A-A

NOTES
1. EROSION LOGS SHALL BE EMBEDDED 2 INCHES INTO THE SOIL.
2. STAKES SHALL BE EMBEDDED TO A MINIMUM DEPTH OF 12 INCHES.
3. EROSION LOGS SHALL BE TIGHTLY ABUTTED WITH NO GAPS.
4. V-SHAPED TEMPORARY DITCHES SHALL NOT BE USED. DITCHES SHAL BE GRADED IN A PARABOLIC OR TRAPEZOIDAL SHAPE.

EROSION LOG INSTALLATION

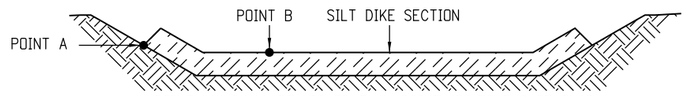


POINT "A" SHALL BE HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE BERM AND NOT AROUND THE ENDS.

FRONT VIEW

NOTES
1. ANCHOR SOIL RETENTION BLANKET INTO TRENCH WITH 8 INCHES MIN. STAPLES PLACED AT 1 FOOT INTERVALS ALONG EDGE.
2. FILL AND COMPACT TRENCH.
3. SECTIONS OF THE SILT BERM SHALL BE OVERLAPPED WITH NO GAPS.
4. FOR SLOPE AND CHANNEL SPACING SEE THE "SECTION VIEW ALONG DITCH FLOWLINE" DETAIL ON SHEET 11 OF 11.
5. SOIL RETENTION BLANKET SHALL ALWAYS BE REQUIRED.
6. THE PAY ITEM NUMBER FOR SILT BERM (LF) IS 208-00004.

SILT BERM INSTALLATION



POINT "A" SHALL BE HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

FRONT VIEW

NOTES
1. ANCHOR APRON INTO TRENCH WITH 8 INCH MINIMUM STAPLES PLACED AT 1 FOOT INTERVALS ALONG EDGE.
2. FILL AND COMPACT TRENCH.
3. THE APRON SHALL EXTEND A MINIMUM OF 2 FEET BEYOND EACH SIDE OF THE TRIANGLE.
4. FOR SLOPE AND CHANNEL SPACING SEE THE "SECTION VIEW ALONG DITCH FLOWLINE" DETAIL ON SHEET 11 OF 11.
5. THE PAY ITEM NUMBER FOR SILT DIKE (LF) IS 208-00001.

SILT DIKE INSTALLATION

DRAINAGE DITCH APPLICATIONS

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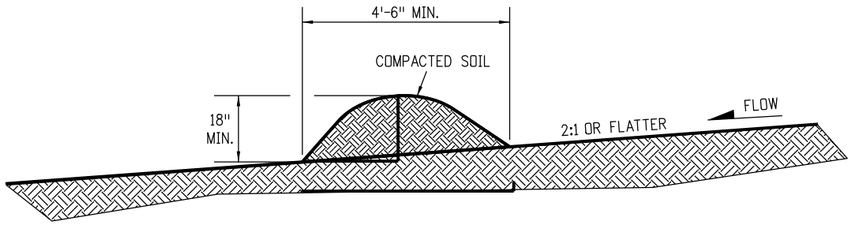
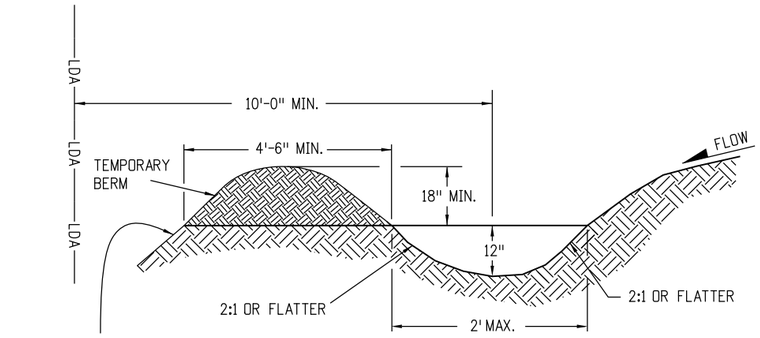


NOTES:

1. BERMS SHALL HAVE A HEIGHT OF 18 INCHES, SIDE SLOPES OF 2:1 OR FLATTER AND A MINIMUM BASE WIDTH OF 4'-6" FEET.
2. BERMS SHALL BE USED TO INTERCEPT AND DIVERT DRAINAGE TO A DESIGNATED OUTLET.
3. BERMS SHALL NOT BE USED WHERE DRAINAGE AREA EXCEEDS 10 ACRES.
4. BERMS SHALL BE CONSTRUCTED OUT OF MATERIAL COMPACTED WITH AT LEAST A MINIMUM OF ONE WHEEL ROLLED COMPACTION.
5. THE PAY ITEM NUMBER FOR TEMPORARY BERM (LF) IS 208-00300.
6. BERMS SHALL BE CONSTRUCTED OUT OF ACCEPTABLE MATERIAL THAT CAN BE COMPACTED AND RECEIVE AT A MINIMUM HEAVY EQUIPMENT WHEEL ROLLED COMPACTION.

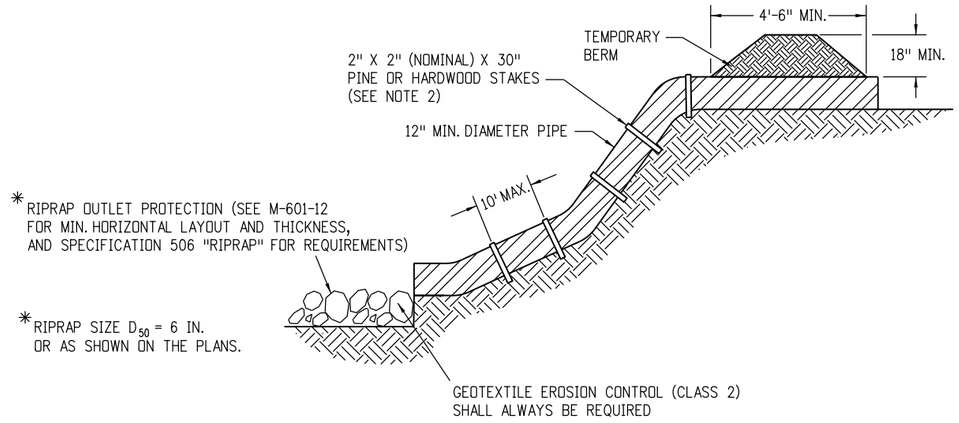
TEMPORARY BERM



NOTES

1. TEMPORARY DIVERSION DITCHES SHALL BE CONSTRUCTED ACROSS THE SLOPE TO INTERCEPT RUNOFF AND DIRECT IT TO A STABLE OUTLET OR SEDIMENT TRAP.
2. USE THE TEMPORARY DIVERSION DITCH IMMEDIATELY ABOVE A NEW CUT, FILL SLOPE, OR AROUND THE PERIMETER OF A DISTURBED AREA.
3. THE GRADIENT ALONG THE FLOW PATH SHALL HAVE A POSITIVE GRADE TO ASSURE DRAINAGE, BUT SHALL NOT BE SO STEEP AS TO RESULT IN EROSION DUE TO HIGH VELOCITY.
4. THE DIVERSION FLOWLINE SHALL ALWAYS BE LOCATED A MINIMUM 10 FEET FROM THE OUTSIDE LIMITS OF DISTURBED AREA BOUNDARY.
5. THE PAY ITEM NUMBER FOR TEMPORARY DIVERSION (LF) IS 208-00301.

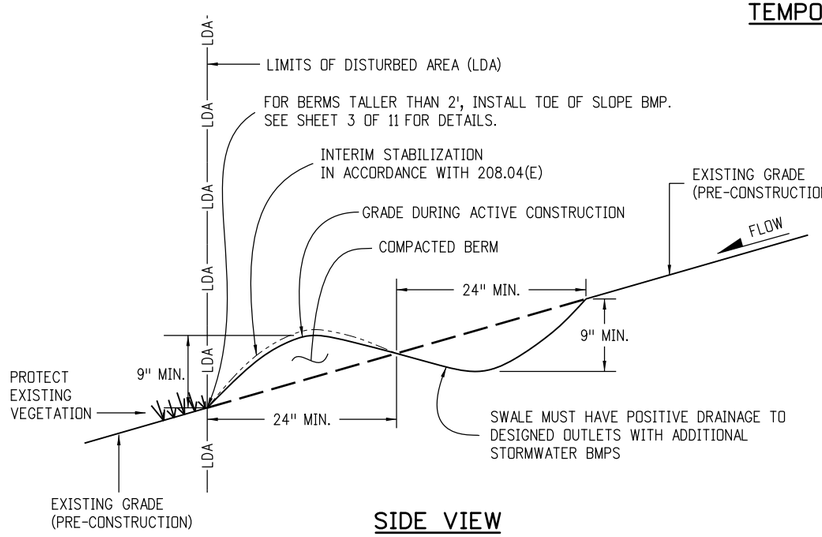
TEMPORARY DIVERSION



NOTES

1. ANCHOR SIZE VARIES ACCORDING TO PIPE SIZE
2. TO SECURE THE PIPE, DRIVE STAKES INTO GROUND, THEN TIE A 12 GUAGE WIRE BETWEEN THEM ABOVE AND ACROSS THE PIPE'S WIDTH.
3. THE OUTLET SHALL BE ALIGNED WITH THE FLOW DIRECTION OF THE EXISTING GRADE. PERPENDICULAR DISCHARGE TO A CHANNEL SHALL NOT BE ACCEPTABLE.
4. THE GRADE AROUND THE INLET TO THE PIPE SHALL BE COMPACTED.
5. THE PAY ITEM NUMBER FOR TEMPORARY SLOPE DRAINS (LF) IS 208-00060.

TEMPORARY SLOPE DRAINS



SIDE VIEW

NOTES:

1. BERMS CAN ONLY BE USED IF CONDITIONS ALLOW UNINTERRUPTED POSITIVE GRADE (MAXIMUM GRADIENT 3%) TO AN OUTLET PROTECTED WITH ADDITIONAL BMPS.
2. MAXIMUM DRAINAGE AREA FOR EACH OUTLET FROM THE SWALE SHALL BE LIMITED TO 2 ACRES.
3. CONTRACTOR SHALL SALVAGE TOPSOIL AND PLACE AFTER BERM IS REMOVED FOR FINAL SEEDING OF ALL DISTURBED AREAS.
4. ALL ACTIVITIES REQUIRED TO ACCOMPLISH TEMPORARY BERM (EXCLUDING SURFACE MULCHING) SHALL BE INCLUDED IN THE COST OF WORK AND WILL NOT BE PAID FOR SEPARATELY.
5. BERMS SHALL BE CONSTRUCTED OUT OF ACCEPTABLE MATERIAL THAT CAN BE COMPACTED AND RECEIVE AT A MINIMUM HEAVY EQUIPMENT WHEEL ROLLED COMPACTION.
6. THE PAY ITEM NUMBER FOR TEMPORARY BERM (LF) IS 208-00300.

TEMPORARY BERM (AT EDGE OF DISTURBANCE)

GRADING APPLICATIONS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JBK		Date:	Comments
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STANDARD PLAN NO.
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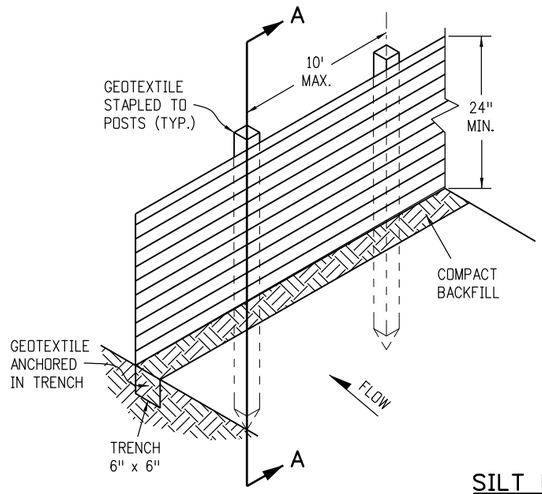
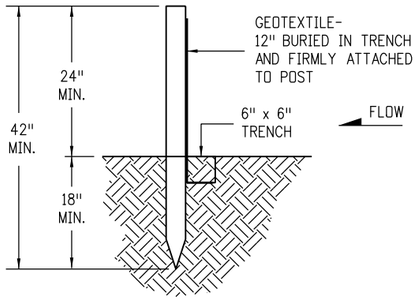
Sheet No. 7 of 11



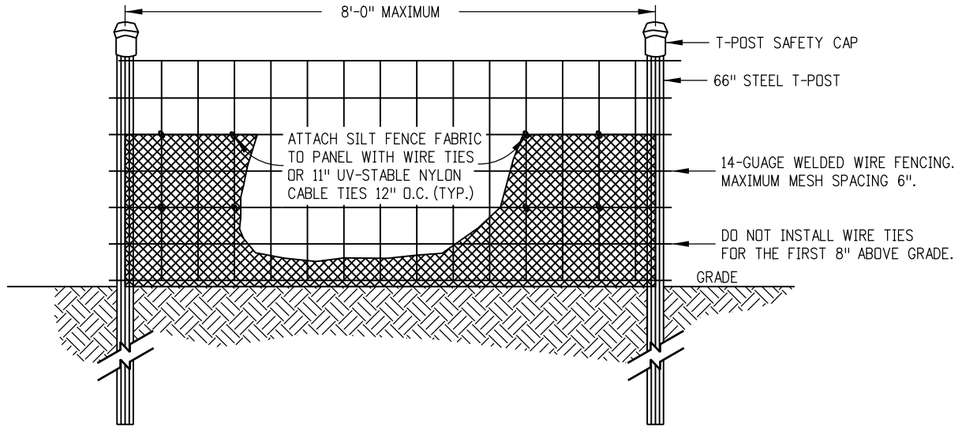


SECTION A-A

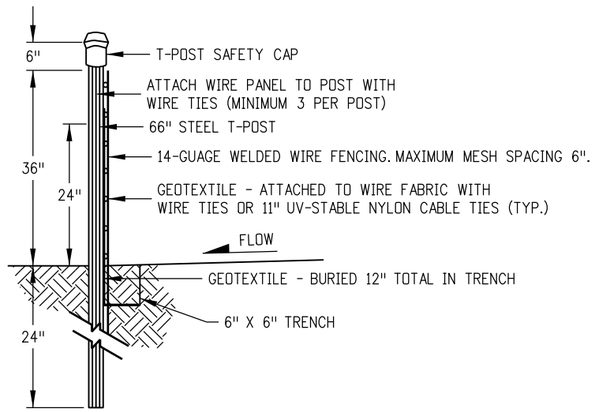
SILT FENCE

NOTES

1. GEOTEXTILE SHALL BE ATTACHED TO WOOD POSTS WITH THREE OR MORE STAPLES PER POST. STAPLES SHALL BE HEAVY DUTY WIRE AND AT LEAST 1" INCH LONG
2. WOOD POST SHALL BE 1½" X 1½" NOMINAL.
3. THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.
4. THE SILT FENCE SHALL BE PLACED ON THE CONTOUR (AT THE SAME ELEVATION ±6"). THE ENDS SHALL BE FLARED UP SLOPE (MINIMUM ELEVATION GAIN OF 18").



ELEVATION VIEW

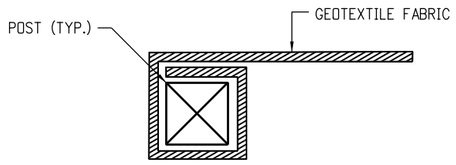


SIDE VIEW

NOTES

1. THE ENDS OF THE SILT FENCE FABRIC SHALL BE JOINED TOGETHER BY WRAPPING APPROX. 6 INCHES OF EACH END AROUND A WOODEN POST ONE FULL TURN, THEN SECURED ALONG THE POST WITH 6 HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG.
2. SILT FENCES SHALL NOT BE USED FOR CHECK DAMS.
3. THE PAY ITEM NUMBER FOR SILT FENCE (REINFORCED) (LF) IS 208-00021.

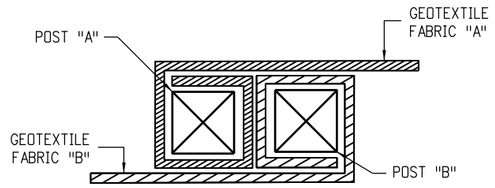
SILT FENCE (REINFORCED)



END SECTION DETAIL (PLAN VIEW)

NOTE

1. THE END OF THE SILT FENCE FABRIC SHALL BE WRAPPED APPROX. 6 INCHES AROUND A WOODEN POST ONE FULL TURN, THEN SECURED ALONG THE POST WITH 6 HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG.



JOINING SECTION DETAIL (PLAN VIEW)

NOTES

1. THE ENDS OF THE SILT FENCE FABRIC SHALL BE JOINED TOGETHER BY WRAPPING APPROX. 6 INCHES OF EACH END AROUND A WOODEN POST ONE FULL TURN, THEN SECURED ALONG THE POST WITH 6 HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG.
2. POSTS SHALL BE TIGHTLY ABUTTED WITH NO GAPS TO PREVENT POTENTIAL FLOW-THROUGH OF SEDIMENT AT JOINT.

SILT FENCE APPLICATIONS

Computer File Information		Sheet Revisions	
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Last Modification Date: 03/29/16 Initials: LTA	(R-X)	03/29/16	Minor revisions to some dimensions and Notes.
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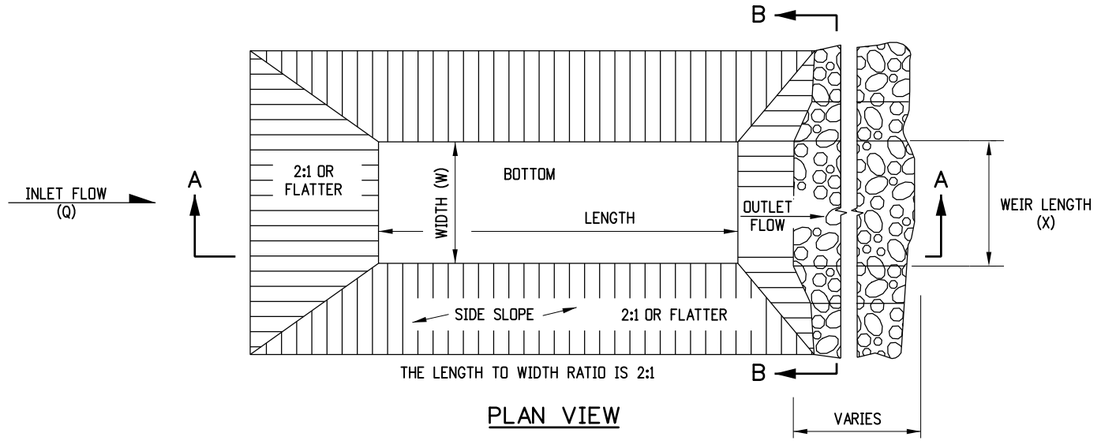
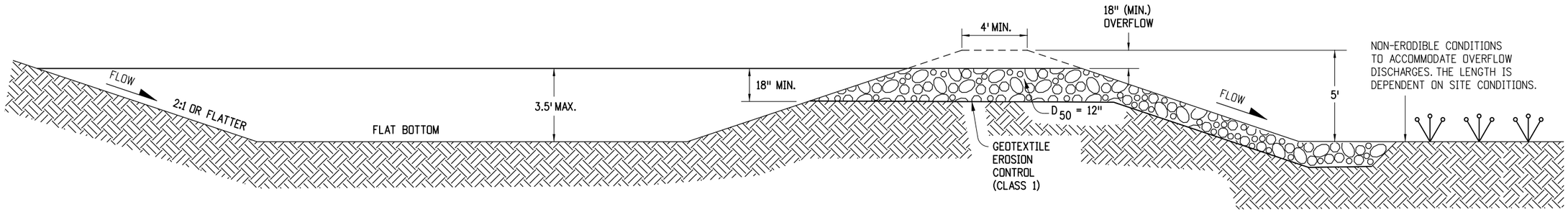


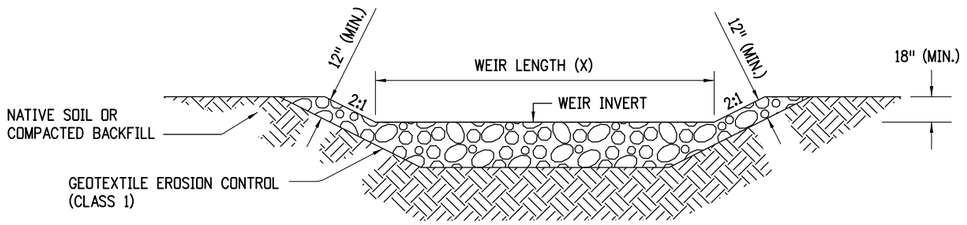
PLAN VIEW

NOTES

1. THE MAXIMUM DRAINAGE AREA IS 5 ACRES.
2. THE MAXIMUM STRUCTURE LIFE IS 2 YEARS.
3. THE STORAGE AREA IS 1800 CUBIC FEET PER ACRE.
4. THE MAXIMUM EMBANKMENT HEIGHT SHALL BE 5 FT. MEASURED ON THE DOWNSTREAM SIDE.
5. THE LENGTH/WIDTH RATIO MAY BE ADJUSTED TO MEET SITE CONDITIONS WHEN APPROVED BY THE ENGINEER.
6. WIDTH (W) OF SEDIMENT TRAP IS APPROXIMATELY EQUAL TO THE WEIR LENGTH (X).
7. SEDIMENT TRAP DESIGN SHALL BE APPROVED BY THE ENGINEER.
8. THE DOWN GRADE FROM WEIR SHALL BE STABLE AND NON-ERODIABLE.
9. THE PAY ITEM NUMBER FOR SEDIMENT TRAP (LF) IS 208-00033.



SECTION A-A



SECTION B-B

DRAINAGE AREA (ACRES)	WEIR LENGTH (FEET)
1	4
2	6
3	8
4	10
5	12

WEIR LENGTH TABLE

SEDIMENT TRAP

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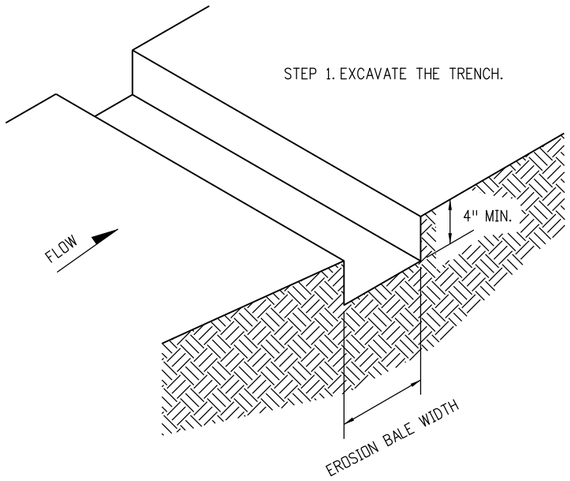
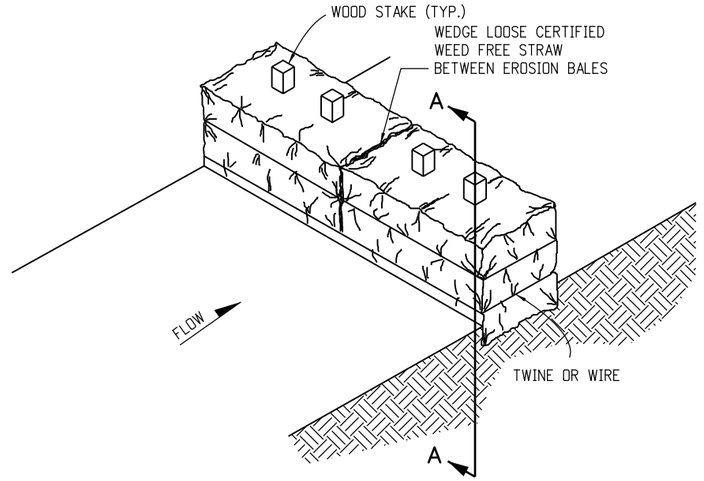
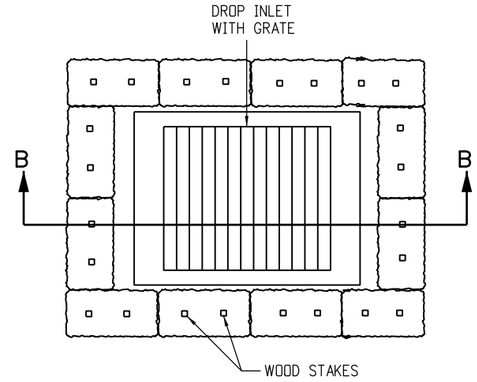


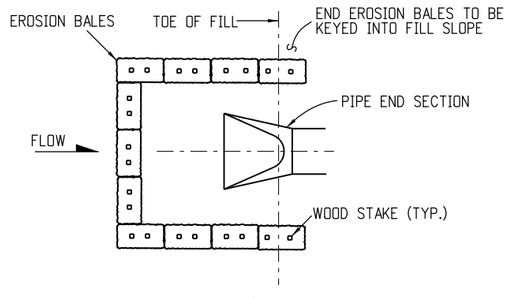


NOTES

1. STAKES SHALL BE WOOD AND SHALL BE 2" X 2" X 30" NOMINAL.
2. EROSION BALES SHALL BE 18" X 18" X 36".
3. EROSION BALES SHALL BE ENTRENCHED 4 IN. MINIMUM INTO THE SOIL, THIGHTLY ABUTTED WITH NO GAPS, STAKED, AND BACKFILLED AROUND THE ENTIRE OUTSIDE PERIMETER.
4. EROSION BALES CANNOT BE USED FOR CHECK DAMS.
5. THE PAY ITEM NUMBER FOR EROSION BALES (WEED FREE) (EA) IS 208-00011.

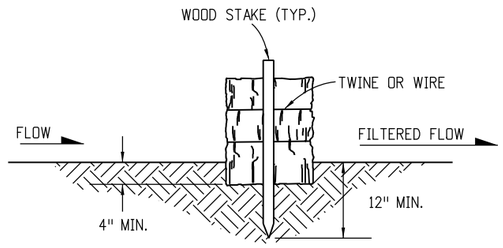


PLAN VIEW



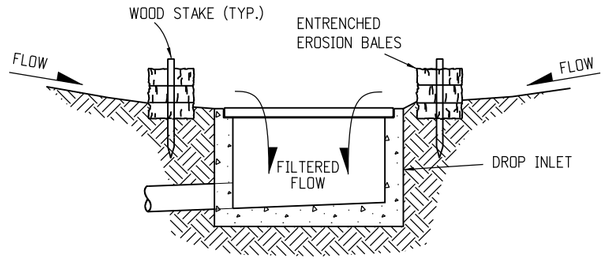
PLAN VIEW

EROSION BALE CULVERT INLET PROTECTION



SECTION A-A

EROSION BALE TRENCHING AND STAKING



SECTION B-B

EROSION BALE FILTER AT DROP INLET

EROSION BALE APPLICATIONS

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Creation Date: 07/04/12 Initials: JBK		Date:	Comments
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TEMPORARY EROSION CONTROL

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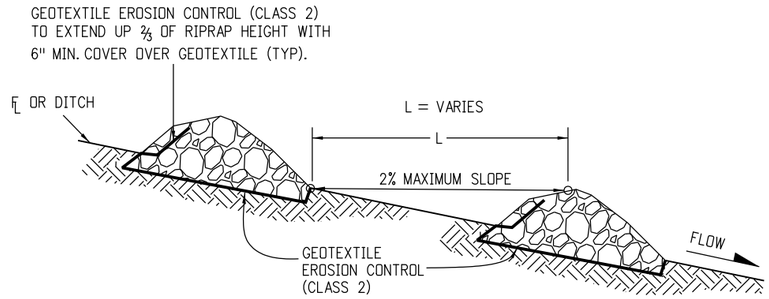
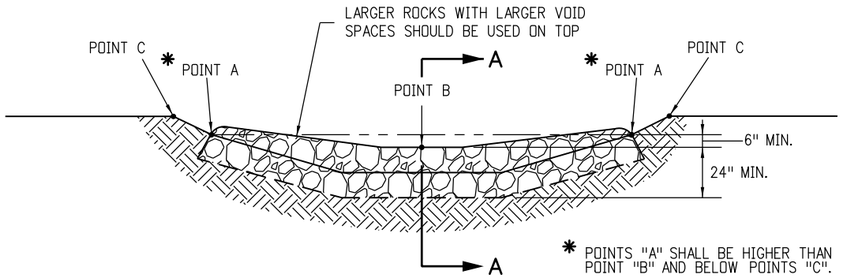
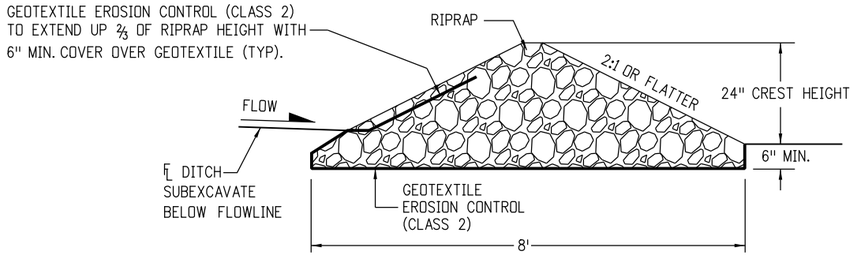


SECTION VIEW ALONG DITCH FLOWLINE



TYPICAL SECTION VIEW



SECTION A-A

NOTES:

1. RIPRAP SIZE D_{50} = 6" OR AS SHOWN ON THE PLANS.
2. THE GEOTEXTILE EROSION CONTROL SHALL BE CLASS 2 AND CONFORM TO THE REQUIREMENTS OF SUBSECTION 712.08.
3. THE ENDS OF RIPRAP CHECK DAM SHALL BE A MINIMUM OF 6 IN. HIGHER THAN CENTER OF CHECK DAM.
4. FOR USE AS TEMPORARY CHECK DAMS ONLY AND NOT FOR PERMANENT INSTALLATIONS.
5. THE PAY ITEM NUMBER FOR ROCK CHECK DAM (EA) IS 208-00041.

ROCK CHECK DAM

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TEMPORARY EROSION CONTROL

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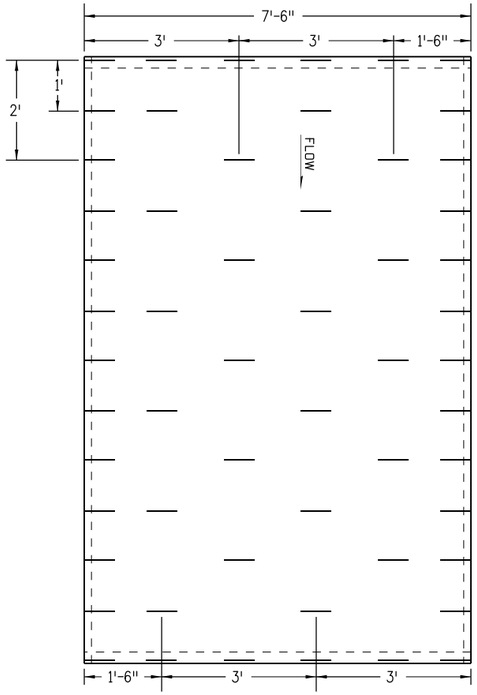
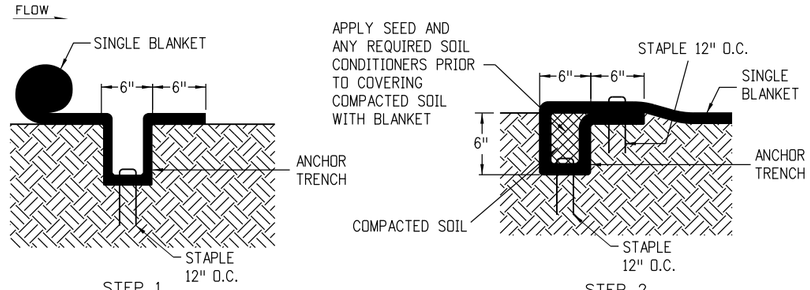


TYPICAL STAPLE PATTERN FOR CHANNEL APPLICATION

SEE SUBSECTION 216.05.

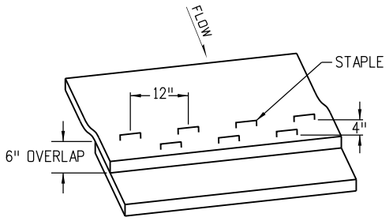
SOIL FILLED TRM APPLICATION

1. PLACE 3" TOPSOIL OR SOIL AMENDED WITH SOIL CONDITIONING.
2. APPLY SEED AND RAKE INTO SOIL.
3. INSTALL TRM.
4. PLACE 0.5" TO 1" TOPSOIL OR SOIL AMENDED WITH SOIL CONDITIONING.
5. APPLY SEED AND RAKE INTO SOIL.
6. INSTALL SOIL RETENTION BLANKET (CLASS 1).



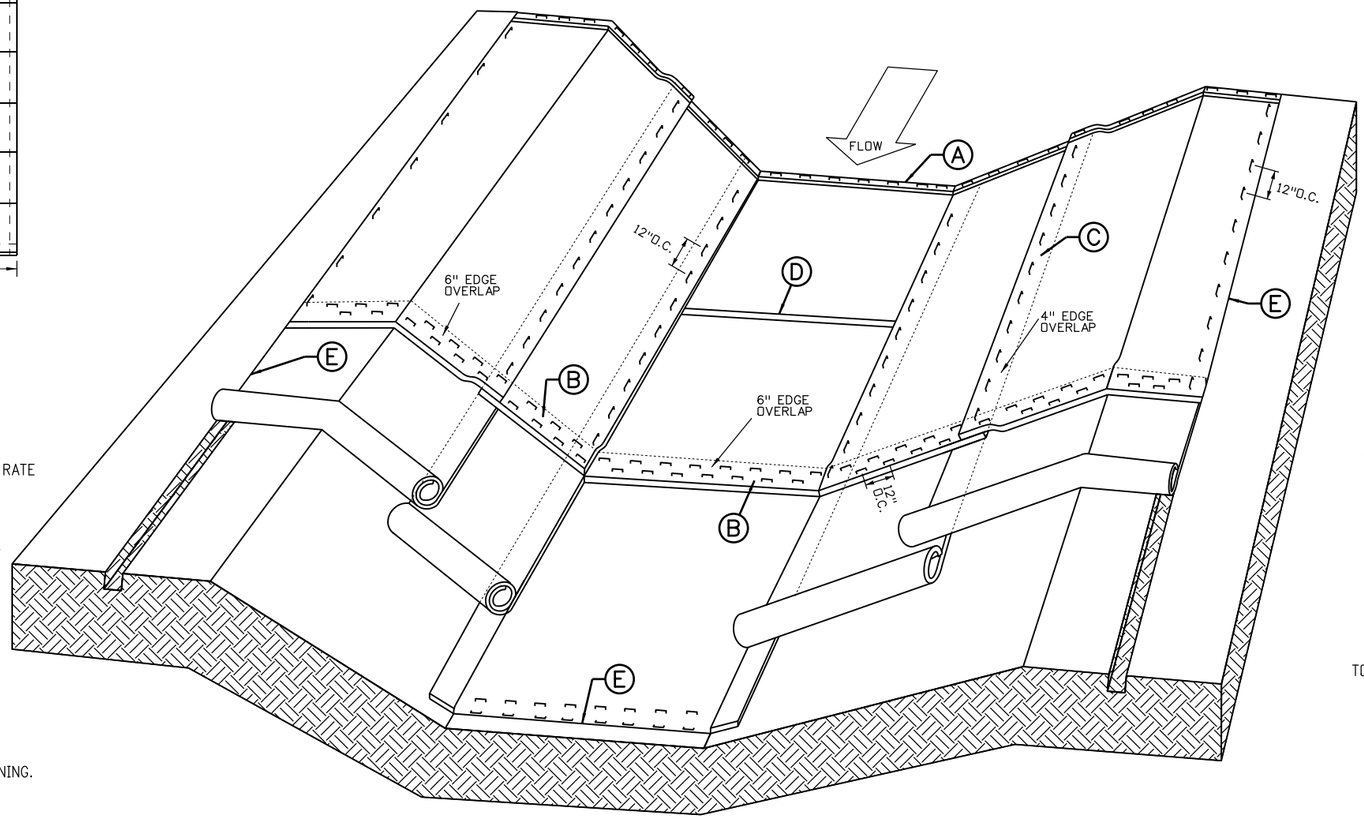
ANCHOR TRENCH (A)

TO BE USED AT THE BEGINNING AND END OF THE CHANNEL ACROSS IT'S ENTIRE WIDTH.



CONSECUTIVE ROLL OVERLAP (B)

TO BE USED WHEREVER ONE ROLL OF BLANKET ENDS AND ANOTHER BEGINS WITH UPSTREAM BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNSTREAM SIDE.

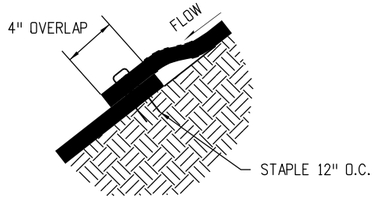


SOIL RETENTION BLANKETS/TURF REINFORCEMENT MATS (TRM) CHANNEL APPLICATION

IN ACCORDANCE WITH SECTION 216.

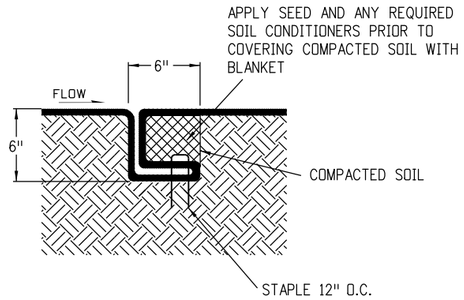
GENERAL NOTES

1. Z SHAPED FOLD TO BE USED ON SLOPE EVERY 35 FEET MAXIMUM.
2. STAPLE CHECK LOCATIONS SHOULD BE AT LEAST 15 FEET FROM THE BOTTOM OF SLOPE.



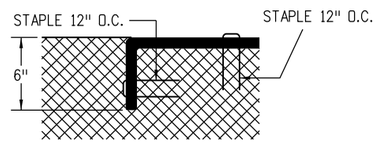
SIDE SEAM OVERLAP (C)

TO BE USED FOR OVERLAP WHEN 2 WIDTHS OF BLANKET ARE APPLIED SIDE BY SIDE WITH THE UPHILL BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNHILL SIDE.



CHANNEL CHECK SLOT (D)

TO BE USED AT 30' INTERVALS IN CHANNEL FLOWLINE.



TERMINATION OF CHANNEL (E)

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SOIL RETENTION COVERING

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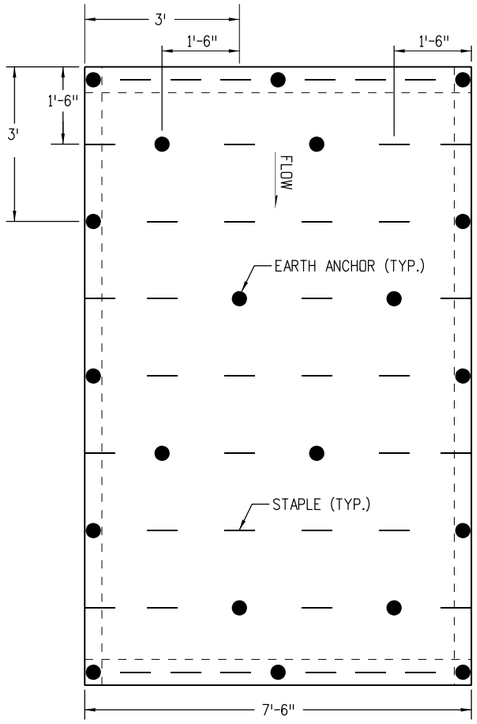
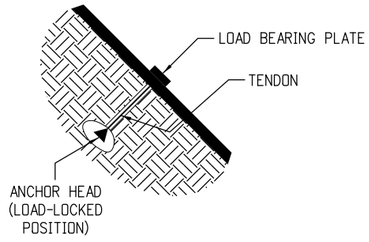


TYPICAL STAPLE OR EARTH ANCHOR PATTERN FOR SLOPE APPLICATION

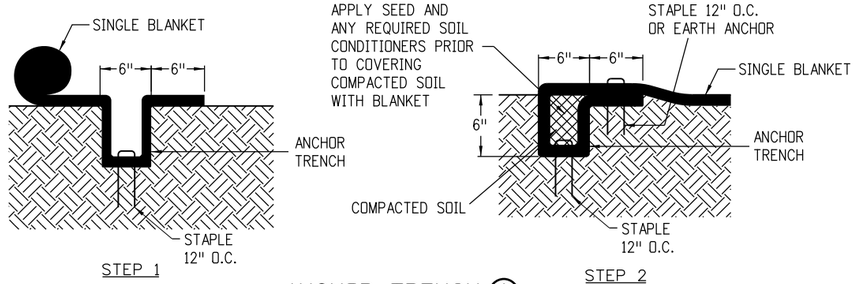
IF EARTH ANCHORS ARE NOT SPECIFIED ON THE PLANS, ONLY STAPLES SHALL BE USED.
SEE SUBSECTION 216.04



EARTH ANCHOR

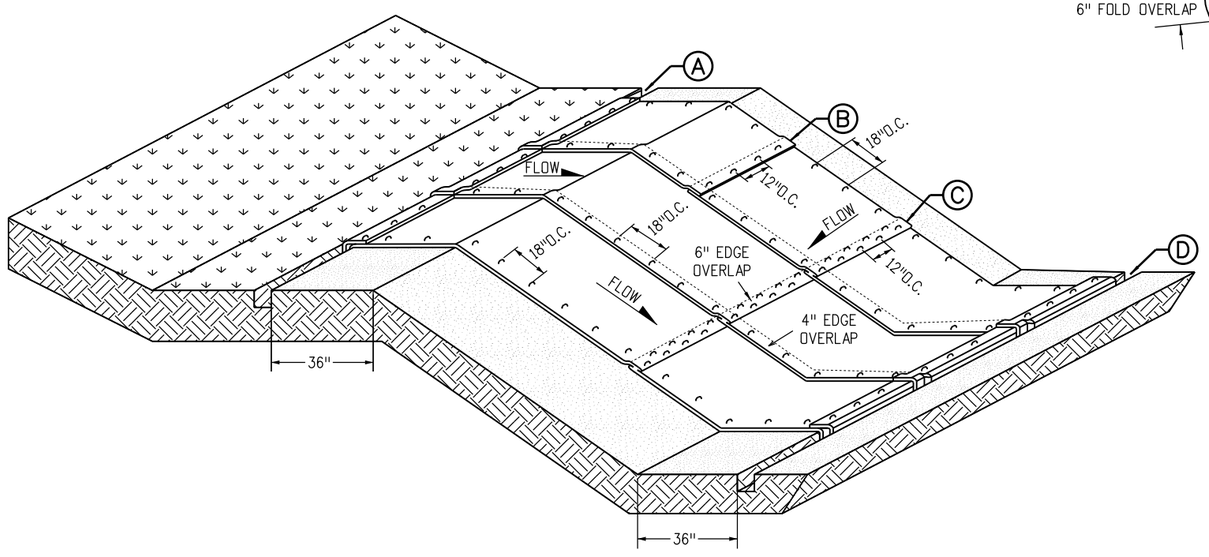
NOTES: 1. EARTH ANCHORS WILL BE USED INSTEAD OF STAPLES WHEN SPECIFIED IN THE PLANS.

2. EARTH ANCHORS SHALL BE PAID FOR SEPERATLY AS SPECIFIED IN SECTION 216.



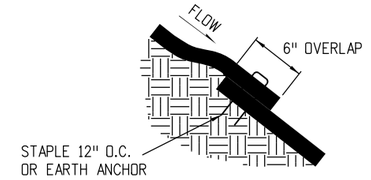
ANCHOR TRENCH (A)

TO BE USED AT THE UPSLOPE AND DOWNSLOPE ENDS OF BLANKET ACROSS THE ENTIRE WIDTH OF SLOPE UNLESS SLOPE RUNS INTO RECEIVING WATER. (SEE DOWNSLOPE END STAPLE CHECK).



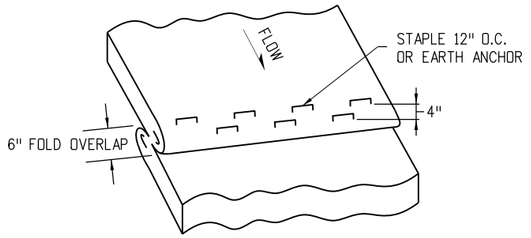
SOIL RETENTION BLANKETS/TURF REINFORCEMENT MATS (TRM) SLOPE APPLICATION

IN ACCORDANCE WITH SECTION 216.

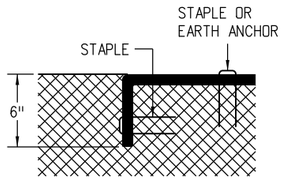


CONSECUTIVE ROLL OVERLAP (B)

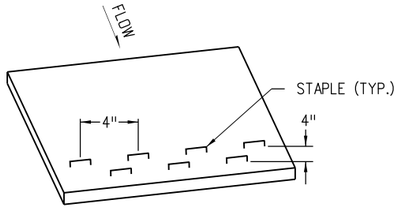
TO BE USED WHEREVER ONE ROLL OF BLANKET ENDS AND ANOTHER BEGINS WITH THE UPHILL BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNHILL SIDE.



STAPLE CHECK (C)



TERMINATION OF CHANNEL (D)



DOWNSLOPE END STAPLE CHECK

TO BE USED WHEN SLOPE RUNS INTO A RECEIVING WATER AND CANNOT BE EXTENDED 3 FEET BEYOND SLOPE.

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SOIL RETENTION COVERING

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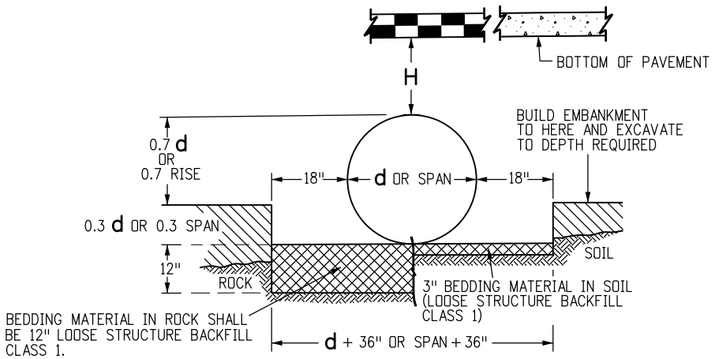
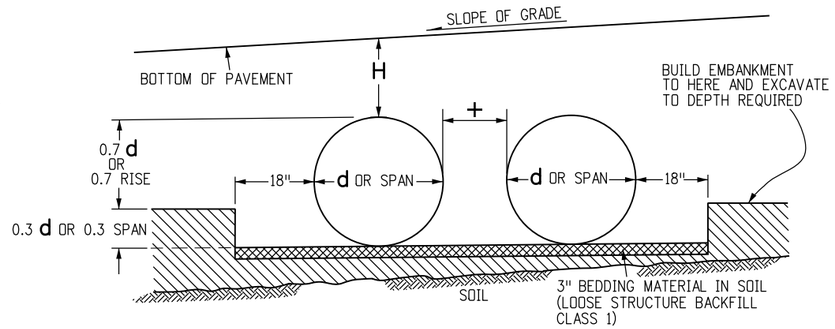


INSTALLATION OF METAL PIPE



INSTALLATION OF MULTIPLE METAL PIPES

GENERAL NOTES

1. STEEL PIPES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M36. ALUMINUM PIPES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M196. ALUMINIZED STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M274.
2. MINIMUM COVER SHALL BE PROVIDED DURING CONSTRUCTION TO PROTECT THE STRUCTURE FROM DAMAGE.
3. PIPE SHALL BE PLACED WITH LONGITUDINAL SEAMS AT THE SIDES OR QUARTER POINTS BUT NOT ALONG TOP OF VERTICAL AXIS.
4. STRUCTURAL PLATE PIPES OF EQUAL OR GREATER DIAMETER THAT CONFORM TO SECTION 510 MAY BE SUBSTITUTED FOR THE PIPES ON THESE SHEETS AT THE CONTRACTOR'S EXPENSE.
5. WHEN A PIPE IS TO BE EXTENDED, THE SAME PIPE MATERIAL AND SIZE AS IN THE ORIGINAL INSTALLATION SHALL BE USED.
6. EXTENSIONS FOR CMP ARCH PIPE SHALL MATCH THE CORRUGATIONS, AND THE SPAN AND RISE DIMENSIONS OF THE PIPE TO BE EXTENDED.
7. WHEN INSTALLING A GUARDRAIL OR A SIGN POST DIRECTLY ABOVE A PIPE, THE BOTTOM OF THE POST MUST BE AT LEAST 1 FOOT ABOVE THE TOP OF THE PIPE. THE HOLE FOR THE POST SHALL BE DRILLED INTO THE SOIL.
8. PIPE ARCH WITH EQUAL PERIPHERY AND WITH SPAN AND RISE DIMENSIONS APPROXIMATELY EQUAL TO THOSE SPECIFIED ON THE PLANS WILL BE PERMITTED.
9. PIPE ARCH IS INTENDED FOR USE WHERE MINIMUM COVER REQUIREMENTS FOR ROUND PIPE CANNOT BE MET. WHEN COVER EXCEEDS 11 FT. USE ROUND PIPE.
10. PIPE COVER GREATER THAN 90 FT. SHALL REQUIRE AN INVESTIGATION OF THE FOUNDATION MATERIAL.

	MINIMUM COVER (IN.) FOR INDICATED AXLE LOADS, kips			
PIPE SPAN (IN.)	18.0 - 50.0	50.0 - 75.0	75.0 - 110.0	110.0 - 150.0
12.0 - 42.0	24	30	36	36
48.0 - 72.0	36	36	42	48
78.0 - 120.0	36	42	48	48
126.0 - 144.0	42	48	54	54

MINIMUM COVER FOR CONSTRUCTION LOADS

LEGEND

H = THE MAXIMUM ALLOWABLE HEIGHTS OF FILL OVER THE TOP OF THE PIPE, EXCLUDING PAVEMENT THICKNESS, ARE SHOWN IN THE TABLES OF THIS STANDARD.

THE MINIMUM COVER SHALL BE AS SHOWN ON THESE TABLES OR CONFORM TO AASHTO REQUIREMENTS, WHICHEVER IS GREATER.

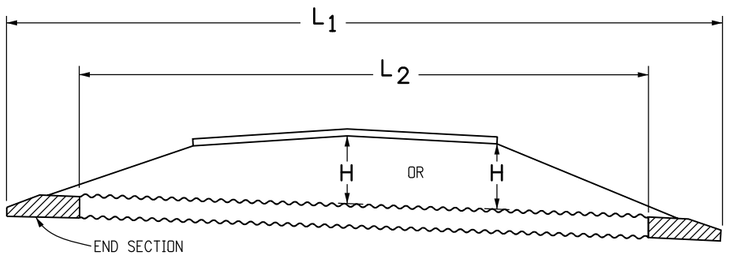
THE MINIMUM COVER FOR PIPE IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT: HMA OR PCCP.

THE MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE SUBGRADE FOR CONSTRUCTION LOADS.

L_1 = LENGTH OF PIPE TO BE MEASURED WHEN PLACED IN ACCORDANCE WITH SECTION 624.

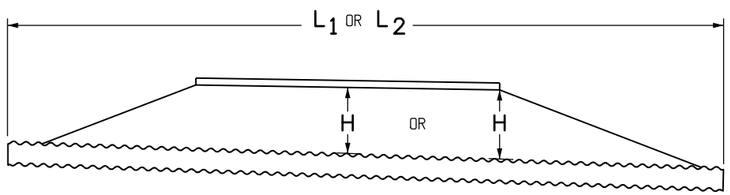
L_2 = LENGTH OF PIPE TO BE MEASURED WHEN PLACED IN ACCORDANCE WITH SECTION 603.

\+ = THE MINIMUM SPACING BETWEEN THE OUTSIDE WALLS OF MULTIPLE PIPES OR END SECTIONS IS 18" OR ½ d, WHICHEVER IS GREATER, BUT NOT TO EXCEED 36".



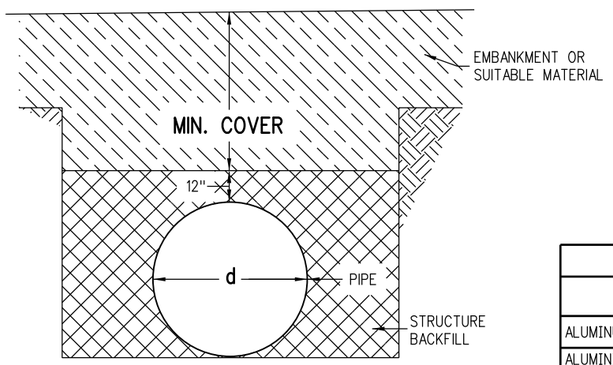
METAL PIPE WITH END SECTIONS

NOTE: USE THE H THAT IS GREATER FOR MAXIMUM ALLOWABLE FILL HEIGHT.



METAL PIPE WITHOUT END SECTIONS

NOTE: USE THE H THAT IS GREATER FOR MAXIMUM ALLOWABLE FILL HEIGHT.



CONSTRUCTION MINIMUM COVER FOR PIPE

CONVERSION OF NOMINAL GAGE TO THICKNESS					
GAGE NO.	16	14	12	10	8
ALUMINUM THICKNESS - IN.	0.060	0.075	0.105	0.135	0.164
ALUMINIZED OR GALVANIZED STEEL THICKNESS - IN.	0.064	0.079	0.109	0.138	0.168

ALLOWED WALL THICKNESS

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METAL PIPE

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THESE TABLES ARE APPLICABLE FOR THE FOLLOWING LIST OF CORRUGATED STEEL PIPE:

1. GALVANIZED CORRUGATED STEEL PIPE (CSP)
2. ALUMINIZED CORRUGATED STEEL PIPE TYPE 2 (ALT2 CSP)
3. BITUMINOUS COATED CORRUGATED STEEL PIPE (BIT. CO. CSP)
4. ARAMID FIBER BONDED CORRUGATED STEEL PIPE (A.F. BO. CSP)
5. PRECOATED CORRUGATED STEEL PIPE (PCSP- BOTH SIDES)

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE				
		H MAXIMUM OF COVER (FT.)				
		16	14	12	10	8
12	24	207	259			
15	24	165	207			
18	24	138	172	242		
21	24	118	148	207		
24	24	103	129	181		
30	24	82	103	145		
36	24	68	86	120	155	
42	24	58	73	103	133	163
48	36	51	64	90	103	142
54	36		57	80	93	126
60	36			72	84	114
66	36				77	103
72	36					94
78	36					84
84	36					72

2-⅔" X ½" CORRUGATIONS
CORRUGATED STEEL PIPE

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
17 X 13	15	24	16	13
21 X 15	18	24	16	12
24 X 18	21	24	16	13
28 X 20	24	24	16	12
35 X 24	30	24	16	12
42 X 29	36	24	16	12
49 X 33	42	24	14	12
57 X 38	48	36	12	12
64 X 43	54	36	12	12
71 X 47	60	36	10	12
77 X 52	66	36	8	12
83 X 57	72	36	8	12

2-⅔" X ½" CORRUGATIONS *
CORRUGATED STEEL PIPE ARCH

* CORNER BEARING PRESSURE OF 2 TONS PER SQ. FT.

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	
		H MAXIMUM OF COVER (FT.)	
		16	14
6	24	408	509
8	24	306	382
10	24	244	305

1-½" X ¼" CORRUGATIONS
CORRUGATED STEEL PIPE

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE				
		H MAXIMUM OF COVER (FT.)				
		16	14	12	10	8
48	36	59	74	104	134	164
54	36	52	65	92	119	146
60	36	47	59	83	107	131
66	36	42	53	75	97	119
72	36	39	49	69	89	109
78	36		45	63	82	101
84	36		42	59	76	93
90	36			55	71	87
96	36			51	66	81
102	36			48	62	77
108	36				59	72
114	36				56	68
120	36				53	65
126	42					62

3" X 1" CORRUGATIONS
CORRUGATED STEEL PIPE

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
53 X 41	48	36	14	12
60 X 46	54	36	14	20
66 X 51	60	36	14	20
73 X 55	66	36	14	20
81 X 59	72	36	14	17
87 X 63	78	36	14	16
95 X 67	84	36	14	16
103 X 71	90	36	12	16
112 X 75	96	36	12	16
117 X 79	102	36	12	16

3" X 1" CORRUGATIONS *
CORRUGATED STEEL PIPE ARCH

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Drawing File Name: 603010204.dgn (R-X)
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Sheet Revisions

Date:	Comments
03/05/14	Revised detail titles and added "H" to tables.

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METAL PIPE

Issued By: Project Development Branch on July 4, 2012

STANDARD PLAN NO.
M-603-1

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE				
		H MAXIMUM OF COVER (FT.)				
		16	14	12	10	8
54	36	46	58	82	106	129
60	36		52	74	95	116
66	36		47	66	86	106
72	36			61	79	97
78	36			56	73	89
84	36			53	68	83
90	36				63	77
96	36				59	72
102	36				55	68
108	36					64

5" X 1" CORRUGATIONS
CORRUGATED STEEL PIPE

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE			
		H MAXIMUM OF COVER (FT.)			
		16	14	12	10
18	24	90	126		
21	24	77	108	181	
24	24	67	95	158	
30	24	54	75	126	
36	24	45	63	105	
42	24	38	54	90	
48	36	33	47	78	114
54	36	29	41	70	101
60	36		37	63	91
66	36		34	57	83
72	36			52	76
78	36			48	70
84	36			44	65
90	36				60
96	36				56
102	36				50

¾" X ¾ 7-½" CORRUGATIONS
CORRUGATED STEEL PIPE

THESE TABLES ARE APPLICABLE FOR THE FOLLOWING LIST OF CORRUGATED STEEL PIPE:
1. GALVANIZED CORRUGATED STEEL PIPE (CSP)
2. ALUMINIZED CORRUGATED STEEL PIPE TYPE 2 (ALT2 CSP)
3. BITUMINOUS COATED CORRUGATED STEEL PIPE (BIT. CO. CSP)
4. ARAMID FIBER BONDED CORRUGATED STEEL PIPE (A.F. BO. CSP)
5. PRECOATED CORRUGATED STEEL PIPE (PCSP- BOTH SIDES)

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
81 X 59	72	36	12	17
87 X 63	78	36	12	16
95 X 67	84	36	12	16

5" X 1" CORRUGATIONS
CORRUGATED STEEL PIPE ARCH *

* CORNER BEARING PRESSURE OF 2 TONS PER SQ. FT.

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
20 X 16	18	24	16	16
23 X 19	21	24	16	15
27 X 21	24	24	16	13
33 X 26	30	24	16	13
40 X 31	36	24	16	14
46 X 36	42	24	12	13
53 X 41	48	36	12	13
60 X 46	54	36	12	20
66 X 51	60	36	12	20

¾" X ¾ 7-½" CORRUGATIONS
CORRUGATED STEEL PIPE ARCH *

Computer File Information	
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CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English

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R-X	03/05/14	Revised detail titles and added "H" to tables.
R-X		
R-X		
R-X		

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METAL PIPE

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STANDARD PLAN NO.
M-603-1

THESE TABLES ARE APPLICABLE FOR THE FOLLOWING LIST OF CORRUGATED STEEL PIPE:

1. GALVANIZED CORRUGATED STEEL PIPE (CSP)
2. ALUMINIZED CORRUGATED STEEL PIPE TYPE 2 (ALT2 CSP)
3. BITUMINOUS COATED CORRUGATED STEEL PIPE (BIT. CO. CSP)
4. ARAMID FIBER BONDED CORRUGATED STEEL PIPE (A.F. BO. CSP)
5. PRECOATED CORRUGATED STEEL PIPE (PCSP- BOTH SIDES)

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE
		H MAXIMUM OF COVER (FT.)
		16
6	24	247
8	24	185
10	24	148

1-½" X ¼" CORRUGATIONS
CORRUGATED ALUMINUM PIPE

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE			
		H MAXIMUM OF COVER (FT.)			
		16	14	12	10
18	24	43	61		
21	24	38	52	84	
24	24	33	45	73	
30	24	26	36	58	
36	24	21	30	49	69
42	24		25	41	59
48	36			36	51
54	36			32	46
60	36			29	41
66	36				37
72	36				34

¾" X ¾" 7-½" CORRUGATIONS
CORRUGATED ALUMINUM PIPE

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE			
			H MAXIMUM OF COVER (FT.)			
			16	14	12	10
20 X 16	18	24	16			
23 X 19	21	24	15			
27 X 21	24	24	13	13		
33 X 26	30	24	13	13	13	
40 X 31	36	24		13	13	
46 X 36	42	24			13	13
53 X 41	48	36			13	13
60 X 46	54	36			20	20
66 X 51	60	36				20

¾" X ¾" 7-½" CORRUGATIONS
CORRUGATED ALUMINUM PIPE ARCH *

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE				
		H MAXIMUM OF COVER (FT.)				
		16	14	12	10	8
12	24	125	157			
15	24	100	125			
18	24	83	104			
21	24	71	89			
24	24	62	78	109		
27	24		69	97		
30	24		62	87		
36	24		51	73	94	
42	24			62	80	
48	36			54	70	85
54	36			48	62	76
60	36				52	64
66	36					52
72	36					43

2-⅔" X ½" CORRUGATIONS
CORRUGATED ALUMINUM PIPE

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
17 X 13	15	24	16	13
21 X 15	18	24	16	12
24 X 18	21	24	16	13
28 X 20	24	24	16	12
35 X 24	30	24	16	12
42 X 29	36	24	16	12
49 X 33	42	24	14	12
57 X 38	48	36	12	12
64 X 43	54	36	12	12
71 X 47	60	36	10	12

2-⅔" X ½" CORRUGATIONS
CORRUGATED ALUMINUM PIPE ARCH *

* CORNER BEARING PRESSURE OF 2 TONS PER SQ. FT.

DIAMETER (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE				
		H MAXIMUM OF COVER (FT.)				
		16	14	12	10	8
30	24	57	72	101	135	159
36	24	47	60	84	112	132
42	24	40	51	72	96	113
48	36	35	44	62	84	99
54	36	31	39	55	74	88
60	36	28	35	50	67	79
66	36	25	32	45	61	72
72	36	23	29	41	56	66
78	36		27	38	51	61
84	36			35	48	56
90	36			33	44	52
96	36			31	41	49
102	36				39	46
108	36				37	43
114	36					39
120	36					36

3" X 1" CORRUGATIONS
CORRUGATED ALUMINUM PIPE

SPAN X RISE (IN. X IN.)	ROUND EQUIVALENT (IN.)	H MINIMUM COVER (IN.)	PIPE GAGE	H MAXIMUM COVER (FT.)
60 X 46	54	36	14	20
66 X 51	60	36	14	20
73 X 55	66	36	14	20
81 X 59	72	36	12	16
87 X 63	78	36	12	16
95 X 67	84	36	12	16
103 X 71	90	36	10	16
112 X 75	96	36	8	16

3" X 1" CORRUGATIONS
CORRUGATED ALUMINUM PIPE ARCH *

Computer File Information	
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Full Path: www.coloradodot.info/business/designsupport	(R-X)
Drawing File Name: 603010404.dgn	(R-X)
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METAL PIPE

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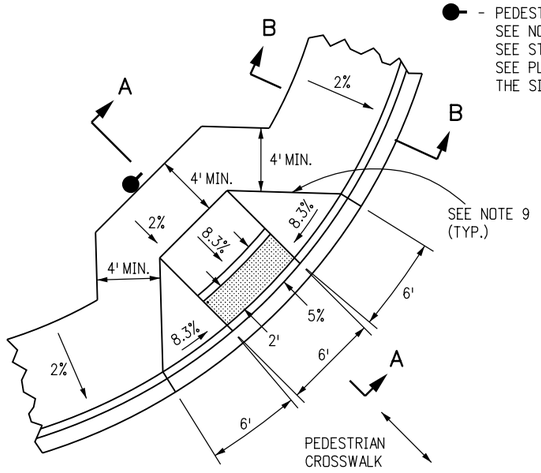
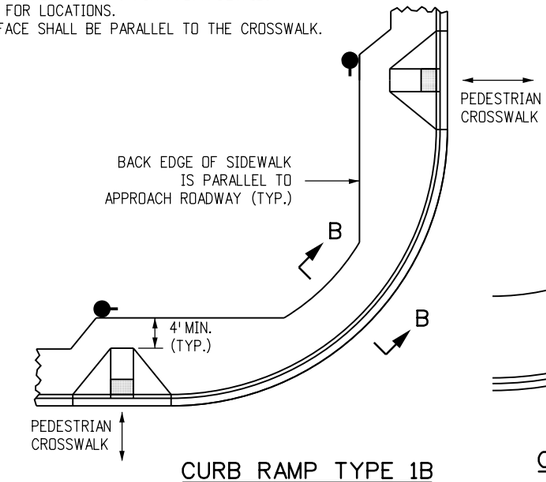
M-603-1



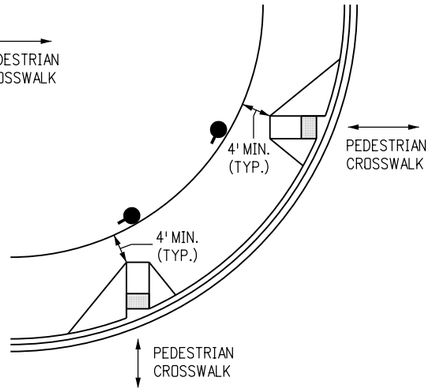
CURB RAMP TYPE 1A

- PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA).
  SEE NOTE 8.
  SEE STANDARD PLAN S-614-9 FOR PPBPA DETAILS.
  SEE PLANS FOR LOCATIONS.
  THE SIGN FACE SHALL BE PARALLEL TO THE CROSSWALK.



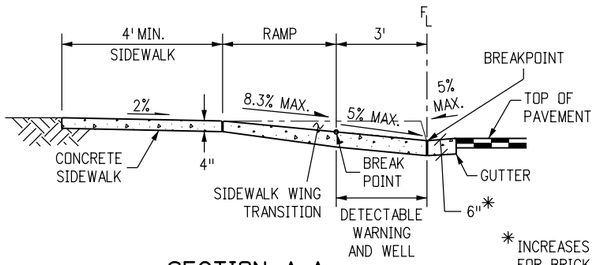
CURB RAMP TYPE 1B

SEE NOTE 11



CURB RAMP TYPE 1B MODIFIED

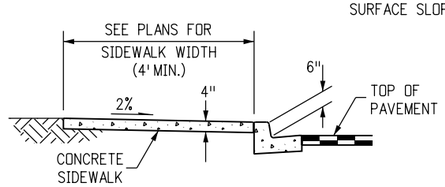
USE ONLY IF EXISTING ROW DICTATES.
GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF THE RAMP RUNS AND TURNING SPACES.
SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.
SEE NOTE 11.



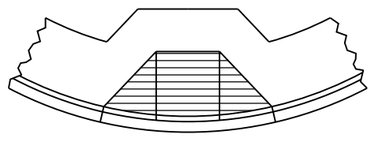
SECTION A-A

(PPBPA NOT SHOWN IN SECTION VIEWS AS IT MAY NOT BE REQUIRED.)

* INCREASES TO 8" FOR BRICK PAVERS.

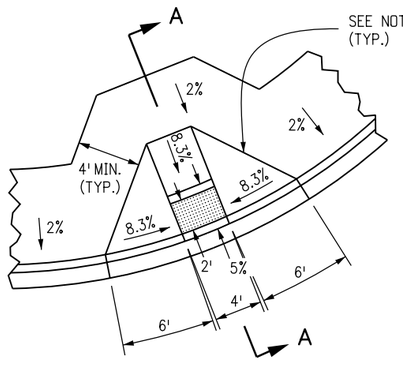


SECTION B-B



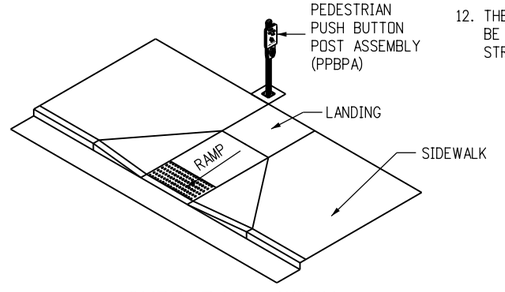
RAMP PAY AREA

FOR CURB RAMPS
TYPES 1A AND 1B



RAMP DETAIL

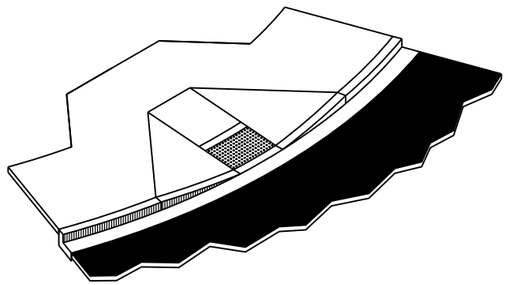
FOR CURB RAMP
TYPE 1B



CURB RAMP WITH
PEDESTRIAN PUSH BUTTTON POST

GENERAL NOTES

1. THE DETECTABLE WARNINGS SHALL BE INSTALLED AT SIDEWALK TO STREET TRANSITIONS. THEY SHALL HAVE A TRUNCATED DOME SURFACE. THE DOMES SHALL BE IN A SQUARE GRID PATTERN.
2. ALL DETECTABLE WARNING AREAS SHALL START A MINIMUM OF 6 IN. FROM THE FLOW LINE OF THE CURB AND NOT BE MORE THAN A MAXIMUM OF 8 IN. (WITH EXCEPTION FOR THE TYPE 1B MODIFIED AND TYPE 3B MODIFIED AS THIS DIMENSION MAY BE GREATER THAN 8 INCHES ON ONE SIDE OF THE RADIUS) FROM ANY POINT ON THE FLOW LINE OF THE CURB. ALL DETECTABLE WARNING AREAS SHALL BE 2 FT. IN LENGTH AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.
3. RAMP SLOPES SHALL BE 8.3% OR FLATTER. THE DETECTABLE WARNING SLOPES SHALL BE 5% OR FLATTER.
4. MINIMUM SIDEWALK WIDTH IS 4 FT.
5. DO NOT INSTALL DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, AND OTHER OBSTRUCTIONS IN FRONT OF THE RAMP ACCESS AREAS.
6. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB ADJACENT TO THE RAMP AREAS SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE CURB RAMP.
7. DETECTABLE WARNINGS SHALL MEET SECTION 705 OF THE USDOT ADA STANDARDS FOR TRANSPORTATION FACILITIES.
8. IF THE PLACEMENT OF A PEDESTRIAN PUSH BUTTON ASSEMBLY ON A TRAFFIC SIGNAL MAST POLE WILL NOT BE WITHIN EASY REACH (10" OR LESS AND UNOBSTRUCTED) OF PEDESTRIANS (IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT), THEN A SEPERATE PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA) SHALL BE INSTALLED WITHIN EASY REACH. THE PPBPA SHALL MEET THE PROVISIONS FOUND IN "SECTION 4E.08 THROUGH 4E.13 - PEDESTRIAN DETECTORS" OF THE 2009 MUTCD MANUAL WITH REVISIONS 1 AND 2.
9. WHERE SPACE IS LIMITED OR GRADE IS AN ISSUE, A 10% SLOPE MAY BE USED ON FLARED SIDES.
10. THE SLOPES CAN BE LOWER THAN WHAT IS SHOWN BUT THEY SHALL NOT EXCEED THESE VALUES.
11. CURB RAMP TYPE 1A DIAGONAL (ON THE APEX) IS UNACCEPTABLE IN NEW CONSTRUCTION. TYPICALLY, TWO CURB RAMPS AS IN TYPE 1B, MUST BE PROVIDED AT EACH STREET CORNER.
    ADA TITLE II 28 C.F.R. SECTION 35.151(B) STATES:
    ALTERATIONS HAVE TO BE MADE READILY ACCESSIBLE, WITHIN THE IMPACTING PROJECT, TO THE MAXIMUM EXTENT FEASIBLE (MEF).
    THEREFORE, A SINGLE, DIAGONAL CURB RAMP TYPE 1A WILL ONLY BE PERMITTED ON ALTERATION PROJECTS WITH MEF JUSTIFICATION DOCUMENTATION IN ACCORDANCE TO CDOT PROCEDURAL DIRECTIVE 605.1 AND IN COORDINATION WITH THE ADA TITLE II COORDINATOR.
12. THE CURB RAMP (EXCLUDING ANY FLARED SIDES) OR BLENDED TRANSITION SHALL BE CONTAINED WHOLLY WITHIN THE WIDTH OF THE CROSSWALK AND/OR PEDESTRIAN STREET CROSSING THE RAMP SERVES.



ISOMETRIC VIEW

Computer File Information		Sheet Revisions	
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CURB RAMPS

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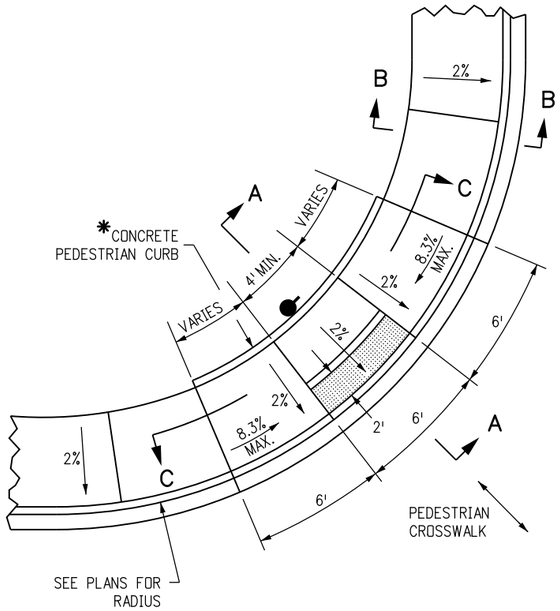
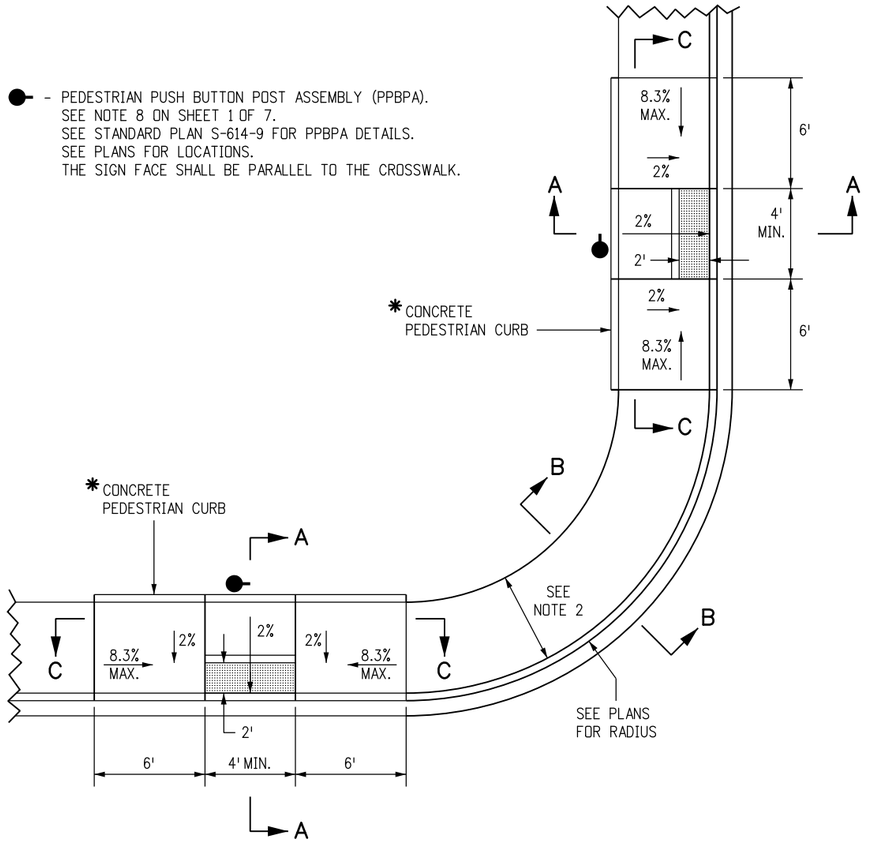
STANDARD PLAN NO.
M-608-1
Sheet No. 1 of 7



CURB RAMP TYPE 2A

SEE NOTE 3.

● - PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA).
SEE NOTE 8 ON SHEET 1 OF 7.
SEE STANDARD PLAN S-614-9 FOR PPBPA DETAILS.
SEE PLANS FOR LOCATIONS.
THE SIGN FACE SHALL BE PARALLEL TO THE CROSSWALK.



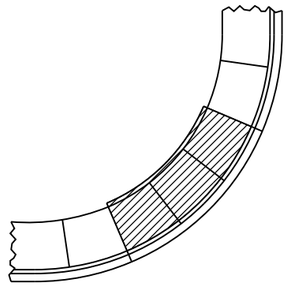
CURB RAMP TYPE 2B

SEE NOTE 3.

PEDESTRIAN
CROSSWALK

NOTES

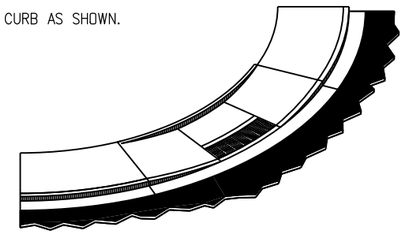
1. CURB RAMP TYPE 2A MAY BE USED IN MID-BLOCK.
2. SEE PLANS FOR SIDEWALK WIDTH. THE MINIMUM SIDEWALK WIDTH IS 4 FT.
3. CURB RAMP TYPE 2A DIAGONAL (ON THE APEX) IS UNACCEPTABLE IN NEW CONSTRUCTION. TYPICALLY, TWO CURB RAMPS AS IN TYPE 2B, MUST BE PROVIDED AT EACH STREET CORNER.
   ADA TITLE II 28 C.F.R. SECTION 35.151(B) STATES:
   ALTERATIONS HAVE TO BE MADE READILYACCESSIBLE, WITHIN THE IMPACTING PROJECT, TO THE MAXIMUM EXTENT FEASIBLE (MEF).
   THEREFORE, A SINGLE, DIAGONAL CURB RAMP TYPE 2A WILL ONLY BE PERMITTED ON ALTERATION PROJECTS WITH MEF JUSTIFICATION DOCUMENTATION IN ACCORDANCE TO CDOT PROCEDURAL DIRECTIVE 605.1 AND IN COORDINATION WITH THE ADA TITLE II COORDINATOR.



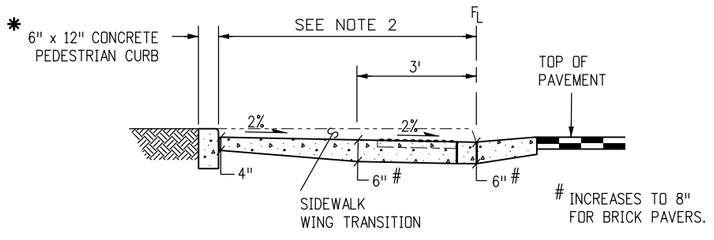
RAMP PAY AREA

FOR CURB RAMP TYPES 2A AND 2B.

*INCLUDES CONCRETE PEDESTRIAN CURB AS SHOWN.

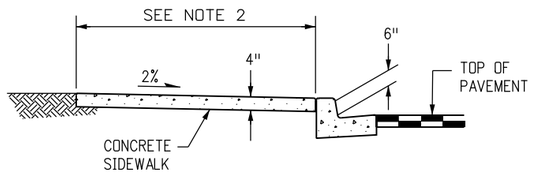


ISOMETRIC VIEW

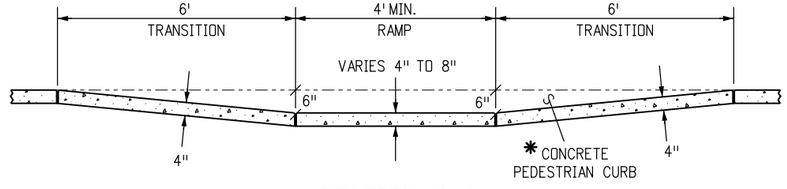


SECTION A-A

(PPBPA NOT SHOWN IN SECTION VIEWS AS IT MAY NOT BE REQUIRED.)



SECTION B-B



SECTION C-C

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: DLM		Date:	Comments
Last Modification Date: 04/28/14 Initials: LTA	(R-X)	04/22/14	Made ramps perpendicular in 2B. Added note 3.
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: 608010207.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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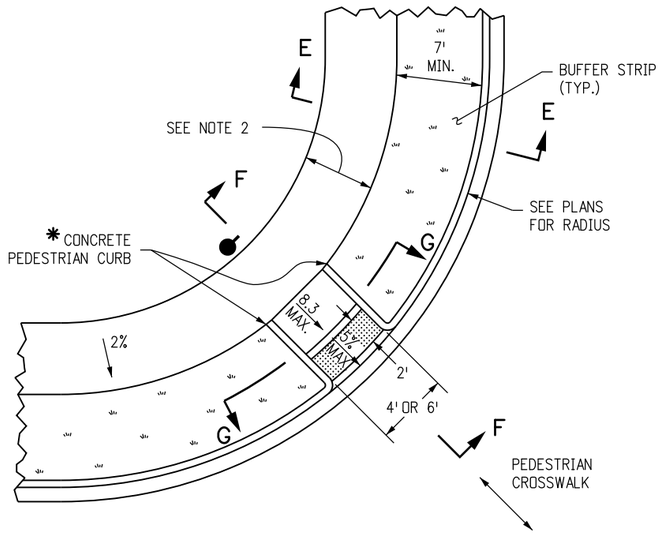
CURB RAMPS

Issued By: Project Development Branch on July 4, 2012

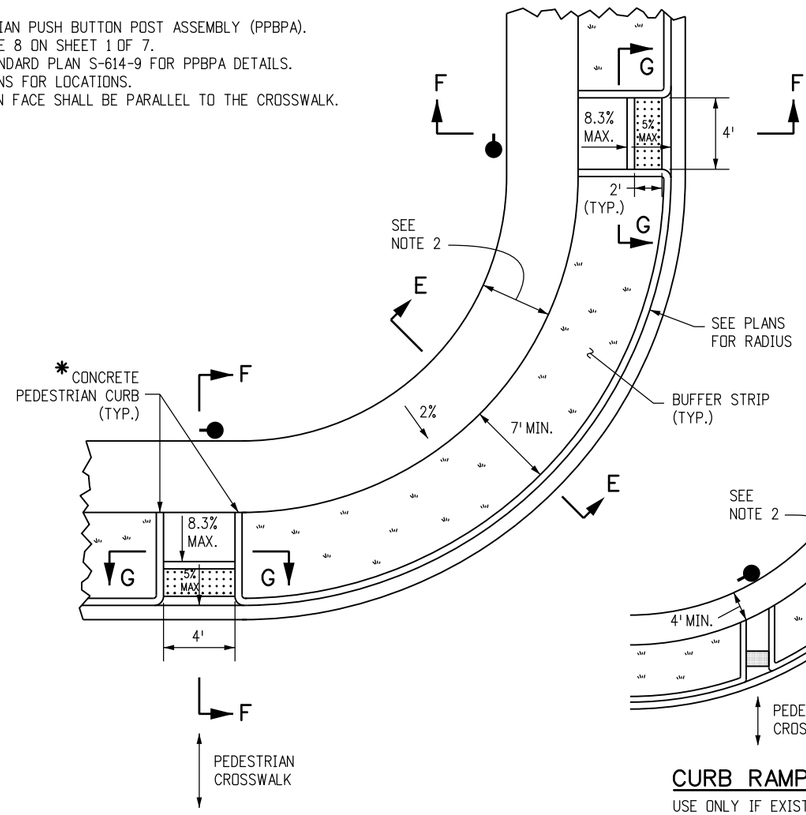
STANDARD PLAN NO.
M-608-1
Sheet No. 2 of 7

● - PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA).
SEE NOTE 8 ON SHEET 1 OF 7.
SEE STANDARD PLAN S-614-9 FOR PPBPA DETAILS.
SEE PLANS FOR LOCATIONS.
THE SIGN FACE SHALL BE PARALLEL TO THE CROSSWALK.



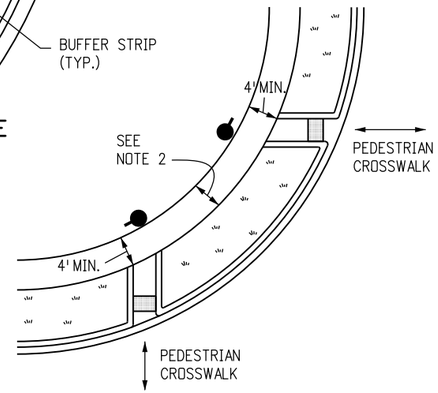
CURB RAMP TYPE 3A

SEE NOTE 3.



CURB RAMP TYPE 3B

SEE NOTE 3.

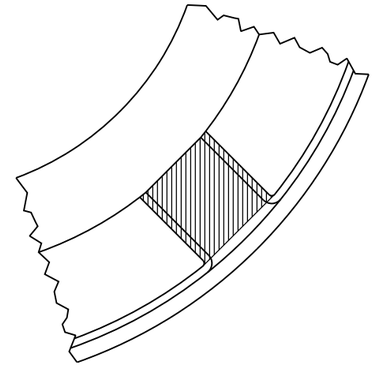


CURB RAMP TYPE 3B MODIFIED

USE ONLY IF EXISTING ROW DICTATES.
GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF THE RAMP RUNS AND TURNING SPACES.
SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH. SEE NOTE 3.

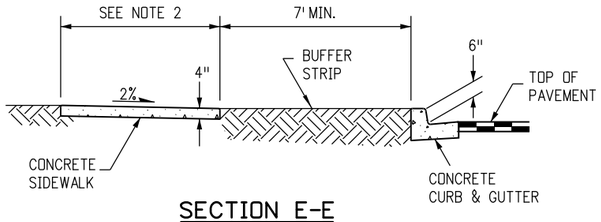
NOTES

1. CURB RAMP TYPE 3A MAY BE USED IN MID-BLOCK.
2. SEE PLANS FOR SIDEWALK WIDTH. THE MINIMUM SIDEWALK WIDTH IS 4 FT.
3. CURB RAMP TYPE 3A DIAGONAL (ON THE APEX) IS UNACCEPTABLE IN NEW CONSTRUCTION. TYPICALLY, TWO CURB RAMPS AS IN TYPE 3B, MUST BE PROVIDED AT EACH STREET CORNER.
   ADA TITLE II 28 C.F.R. SECTION 35.151(B) STATES:
   ALTERATIONS HAVE TO BE MADE READILYACCESSIBLE, WITHIN THE IMPACTING PROJECT, TO THE MAXIMUM EXTENT FEASIBLE (MEF).
   THEREFORE, A SINGLE, DIAGONAL CURB RAMP TYPE 3A WILL ONLY BE PERMITTED ON ALTERATION PROJECTS WITH MEF JUSTIFICATION DOCUMENTATION IN ACCORDANCE TO CDOT PROCEDURAL DIRECTIVE 605.1 AND IN COORDINATION WITH THE ADA TITLE II COORDINATOR.

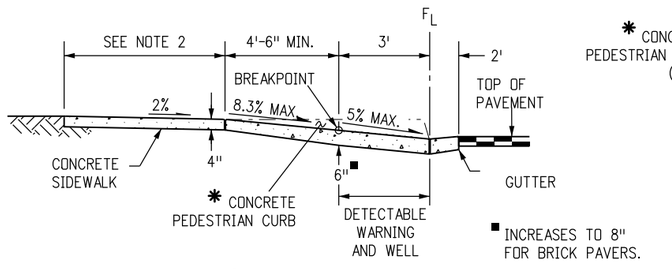


RAMP PAY AREA

FOR CURB RAMP TYPES 3A AMD 3B.
* INCLUDES CONCRETE PEDESTRIAN CURB AS SHOWN.

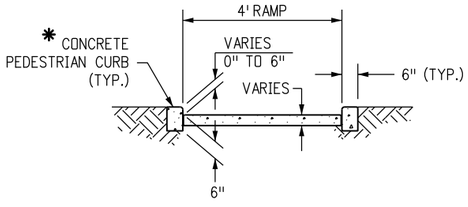


SECTION E-E

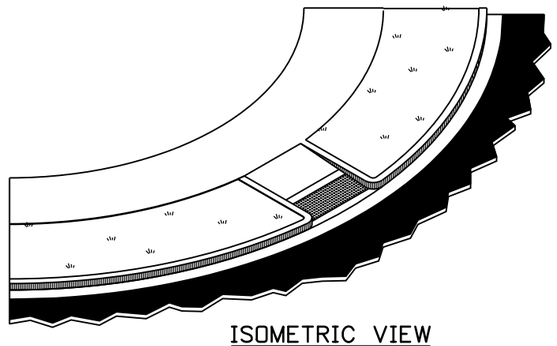


SECTION F-F

(PPBPA NOT SHOWN IN SECTION VIEWS AS IT MAY NOT BE REQUIRED.)



SECTION G-G



ISOMETRIC VIEW

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CURB RAMPS

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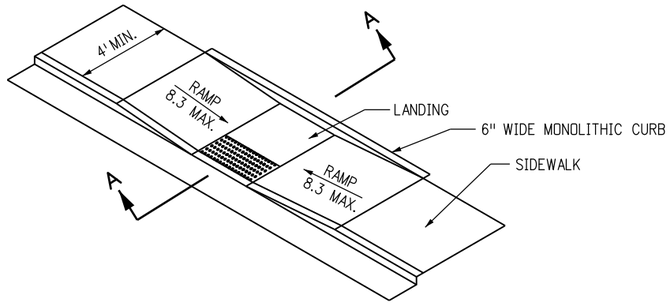
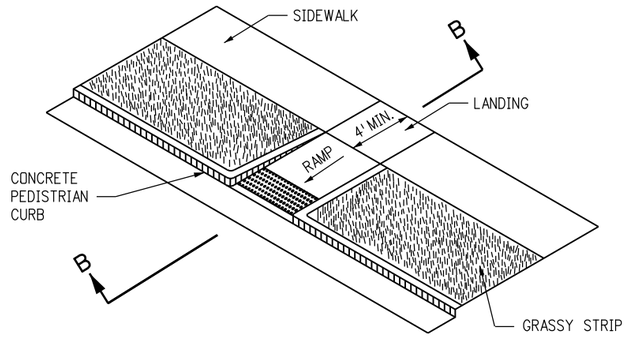
NOTES

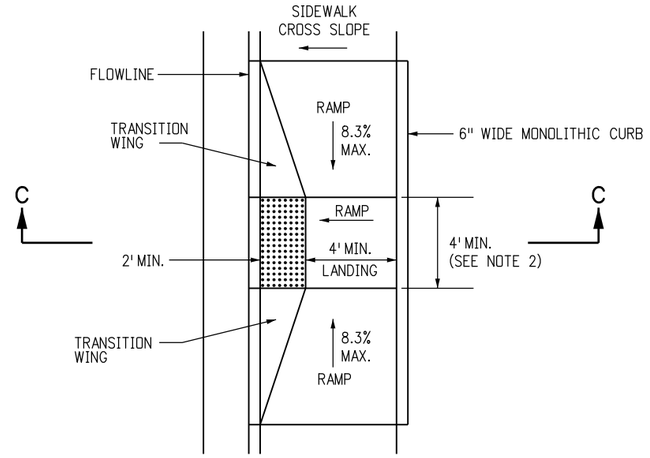
1. PERPENDICULAR AND PARALLEL CURB RAMPS SHOWN ON THIS DRAWING ARE ACCEPTABLE FOR USE AT MID-BLOCK INSTALLATIONS.
2. SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMPS, LANDINGS, AND TRANSITIONS MAY BE CHANGED BUT THEY MUST MEET THE DIMENSIONS AND SLOPES SHOWN HERE. THE USE OF FLARES, CURBWALLS, ETC. ARE AT THE DISCRETION OF THE ENGINEER.
3. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT. SEE "PLAN VIEW OF DETECTABLE WARNING" DETAIL ON SHEET 5 FOR DETECTABLE WARNING SURFACE DIMENSIONS.
4. LOCATE CURB CUT WITHIN CROSSWALK.
5. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.



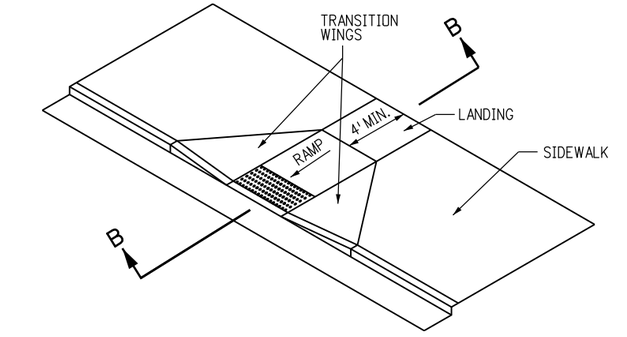
PARALLEL CURB RAMP WITHIN 4 FT. MIN. SIDEWALK



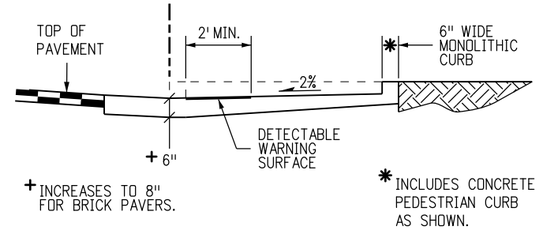
PERPENDICULAR CURB RAMP



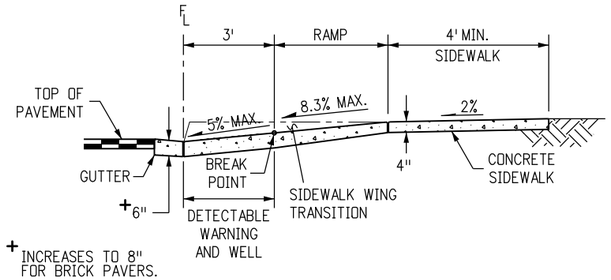
CURB RAMP WITHIN 6 FT. MIN. SIDEWALK



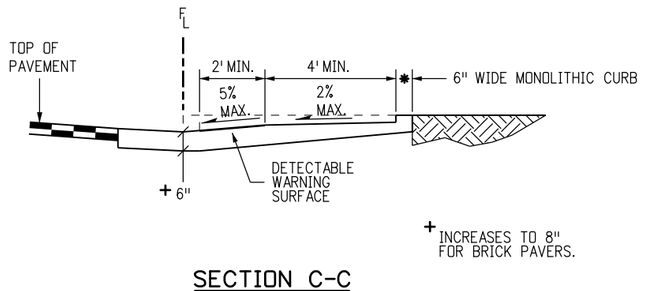
PERPENDICULAR CURB RAMP WITHIN SIDEWALK



SECTION A-A



SECTION B-B



SECTION C-C

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CURB RAMPS

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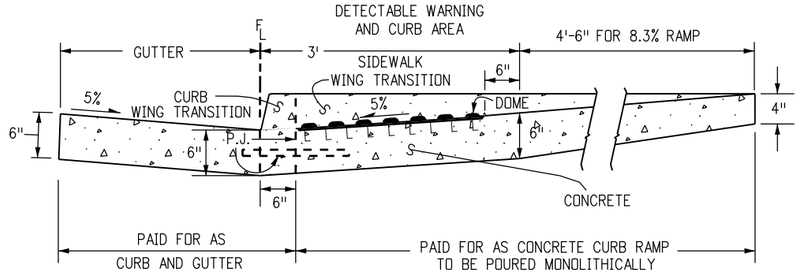
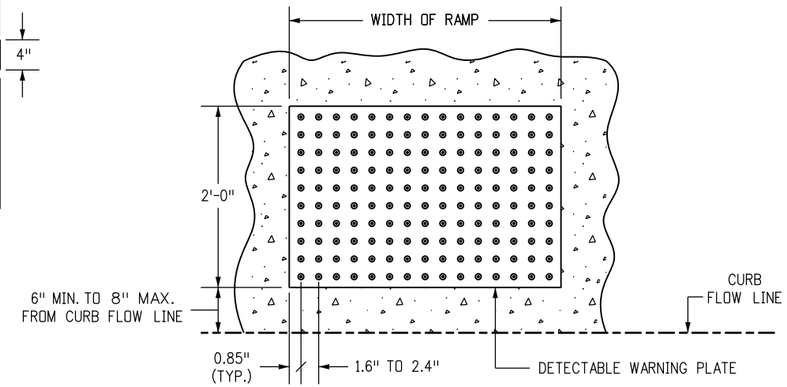


DETAIL FOR TYPES 1 AND 3 CURB RAMPS

P.J. = PERMISSIBLE JOINT WITH EPOXY-COATED DEFORMED NO. 4 BY 18 IN. BARS CONFORMING TO AASHTO M 284 AT 18 IN. SPACING.

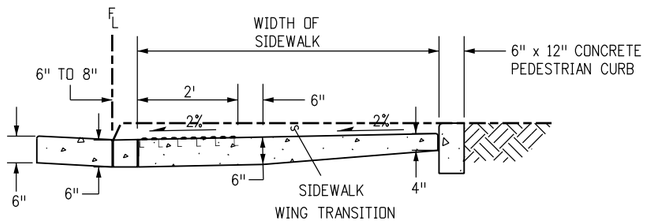
SIDE CROSS SECTION VIEW OF DETECTABLE WARNING, CURB, AND GUTTER



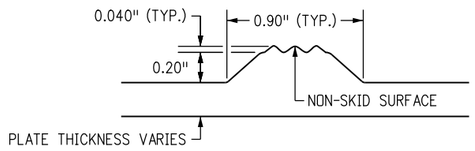
PLAN VIEW OF DETECTABLE WARNING

NOTES

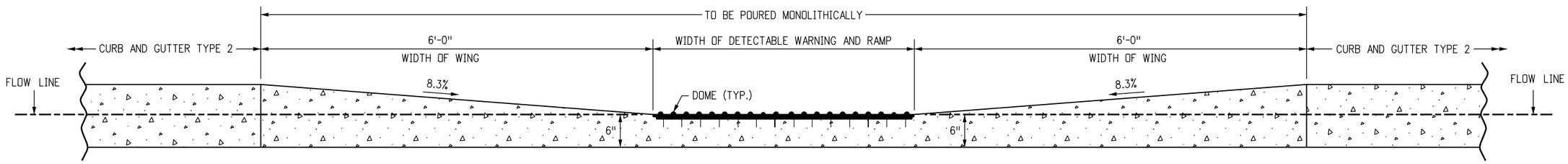
1. THE TRUNCATED DOME PLATE SHALL BE EMBEDDED IN THE CONCRETE CURB RAMP WHILE CONCRETE IS PLASTIC.
2. THE TRUNCATED DOME PLATE TO BE USED SHALL BE ON THE CDOT APPROVED PRODUCT LIST.
3. WHEN THE DETECTABLE WARNING SURFACE IS CUT, GRIND OFF REMAINING PORTION OF ANY CUT DOMES. SEAL ALL CUT PANEL EDGES TO PREVENT WATER DAMAGE.
4. THE DETECTABLE WARNING SURFACE SHALL SPAN THE ENTIRE WIDTH OF THE RAMP. IF CONDITIONS DO NOT ALLOW THE ENTIRE SPAN, THE DECTECTABLE WARNING SURFACE SPAN SHALL NOT BE MORE THAN 2 INCHES AWAY FROM EACH SIDE OF RAMP.



DETAIL FOR TYPE 2 CURB RAMP



ELEVATION VIEW OF DETECTABLE WARNING PLATE



FRONT SECTION VIEW OF DETECTABLE WARNING, CURB, AND GUTTER

CURB RAMP WITH A TRUNCATED DOME SURFACE PLATE

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CURB RAMPS

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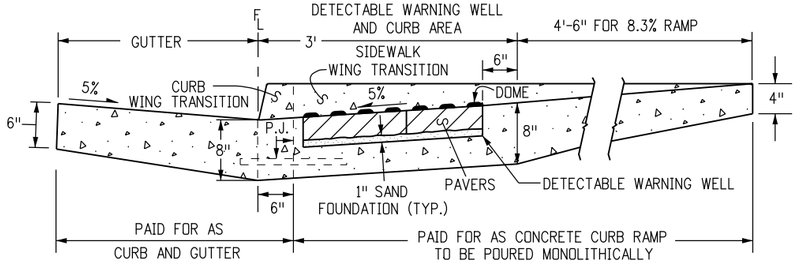
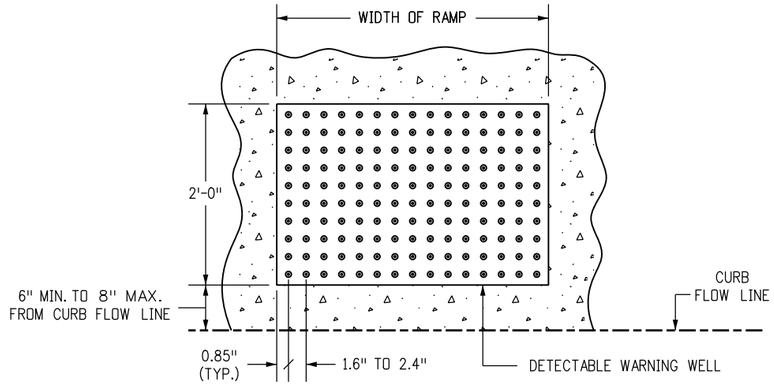


DETAIL FOR TYPES 1 AND 3 CURB RAMPS

P.J. = PERMISSIBLE JOINT WITH EPOXY-COATED DEFORMED NO. 4 BY 18 IN. BARS CONFORMING TO AASHTO M 284 AT 18 IN. SPACING.

SIDE CROSS SECTION VIEW OF DETECTABLE WARNING, WELL, CURB, AND GUTTER

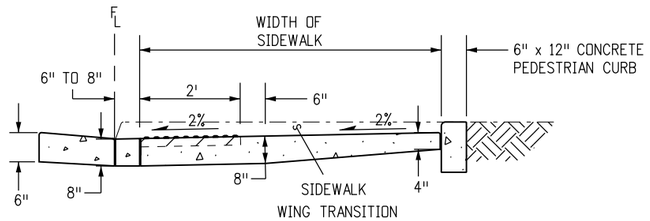


PLAN VIEW OF DETECTABLE WARNING AND WELL

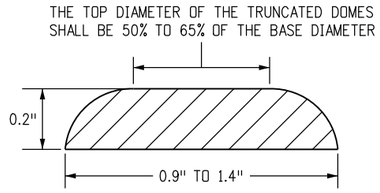
(PAVERS NOT DRAWN TO SCALE)

NOTES

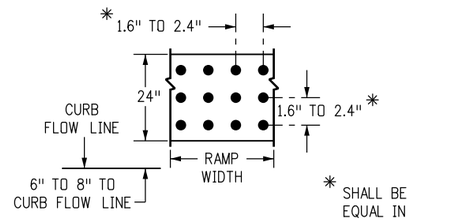
1. THE DETECTABLE WARNINGS SHALL BE BE MADE OF PAVERS WITH A TRUNCATED DOME SURFACE.
2. THE TOP OF THE DRAINAGE WEEP HOLE SHALL BE LOCATED AT THE LOWEST POINT OF THE DETECTABLE WARNING WELL.
3. RAMP SLOPES SHALL BE 12:1 OR FLATTER. THE DETECTABLE WARNING AND WELL AREA SLOPES SHALL BE 20:1 OR FLATTER.
4. THE DETECTABLE WARNING SURFACE SHALL SPAN THE ENTIRE WIDTH OF THE RAMP. IF CONDITIONS DO NOT ALLOW THE ENTIRE SPAN, THE DECTECTABLE WARNING SURFACE SPAN SHALL NOT BE MORE THAN 2 INCHES AWAY FROM EACH SIDE OF RAMP.



DETAIL FOR TYPE 2 CURB RAMP

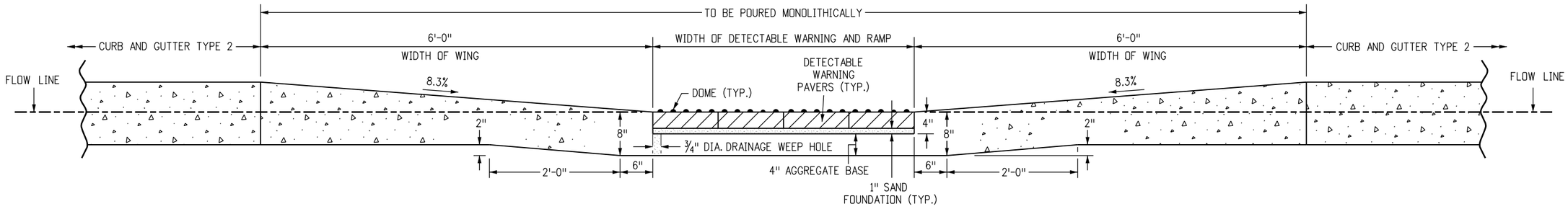


ELEVATION VIEW OF SINGLE DOME



PLAN VIEW

DOME AND DETECTABLE WARNING DETAILS



FRONT SECTION VIEW OF DETECTABLE WARNING, WELL, CURB, AND GUTTER

CURB RAMP WITH DOME PAVER OPTION

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CURB RAMPS

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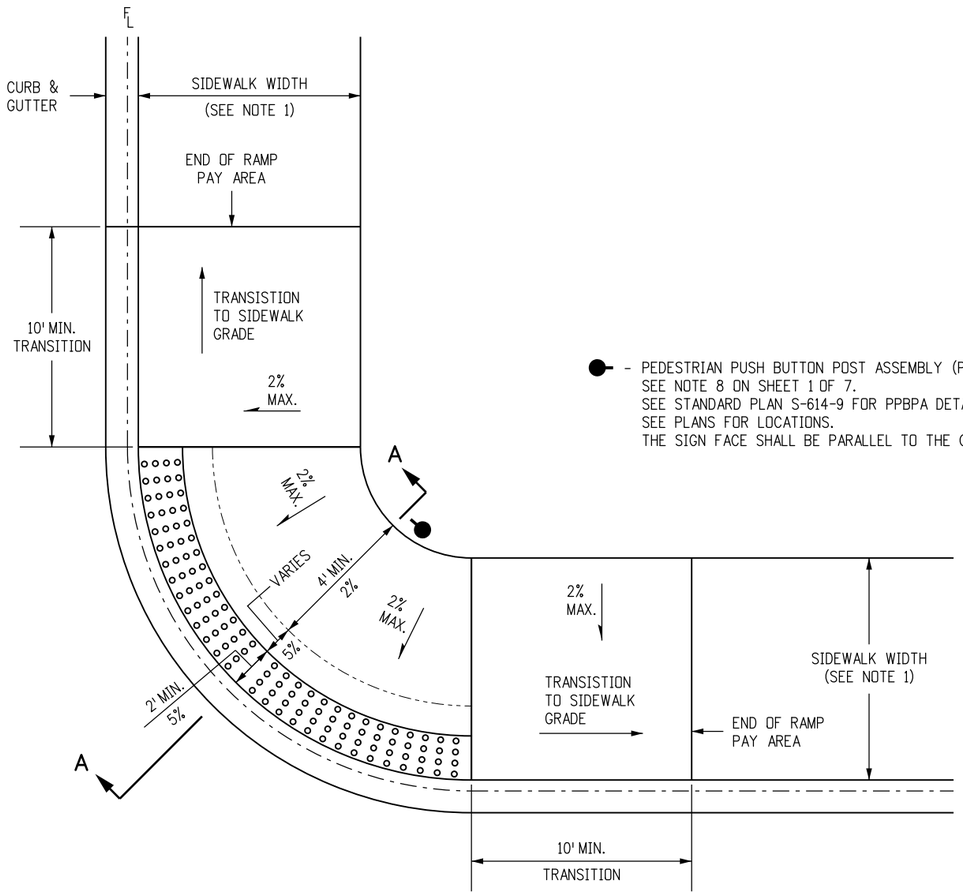
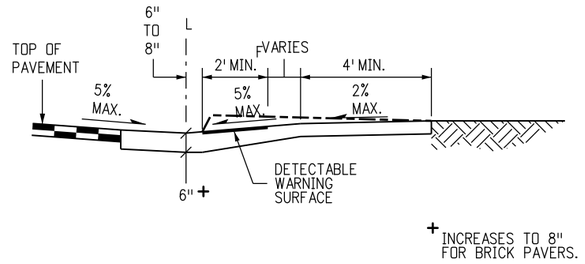


● - PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA).
SEE NOTE 8 ON SHEET 1 OF 7.
SEE STANDARD PLAN S-614-9 FOR PPBPA DETAILS.
SEE PLANS FOR LOCATIONS.
THE SIGN FACE SHALL BE PARALLEL TO THE CROSSWALK.

CORNER BLENDED TRANSITION CURB RAMP

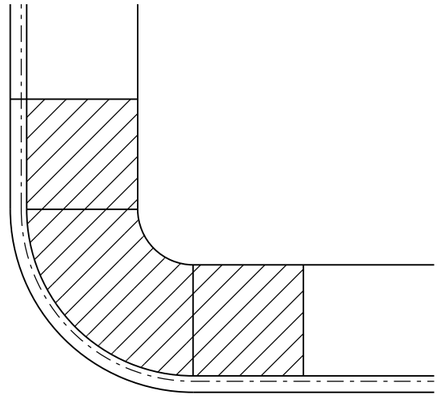
NOTES

1. IF THE EXISTING SIDEWALK WIDTHS ARE DIFFERENT, MATCH THE SMALLEST WIDTH TO 4 FT. MIN.
2. SLOPES SHOWN AS TYPICAL IN SECTION A-A MAY BE ADJUSTED IF NECESSARY TO FIT EXISTING CONDITIONS, BUT MAY NOT EXCEED 5% SLOPE UNDER ANY CONDITIONS.
3. ALL TRUNCATED DOME PANELS OR PAVERS PLACED AT THE SAME CORNER SHALL BE MADE UP OF THE SAME UNIFORM MATERIAL TYPE.



SECTION A-A

(PPBPA NOT SHOWN IN SECTION VIEWS AS IT MAY NOT BE REQUIRED.)



RAMP PAY AREA

FOR CORNER BLENDED TRANSITION CURB RAMP

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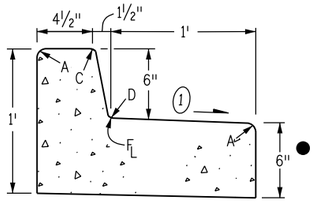
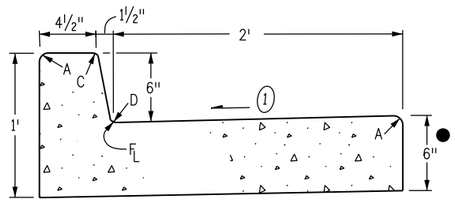
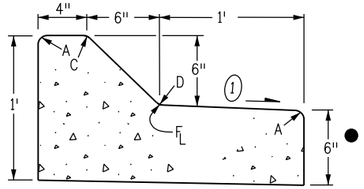


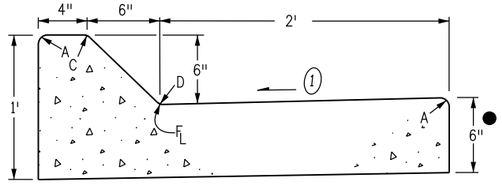
CURB AND GUTTER TYPE 2
(SECTION IB)
(6 IN. BARRIER - 1 FT. GUTTER)



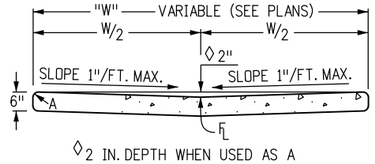
CURB AND GUTTER TYPE 2
(SECTION IIB)
(6 IN. BARRIER - 2 FT. GUTTER)



CURB AND GUTTER TYPE 2
(SECTION IM)
(6 IN. MOUNTABLE - 1 FT. GUTTER)

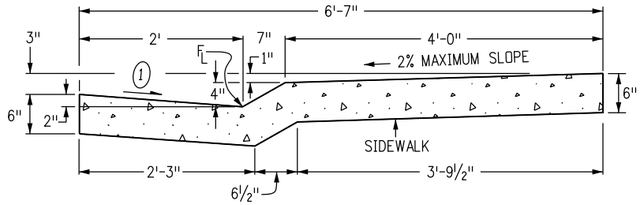


CURB AND GUTTER TYPE 2
(SECTION IIM)
(6 IN. MOUNTABLE - 2 FT. GUTTER)



◊ 2 IN. DEPTH WHEN USED AS A CROSSPAN IN AN INTERSECTION

GUTTER TYPE 2



CURB AND GUTTER TYPE 2
(SECTION MS)
(4 IN. MOUNTABLE WITH SIDEWALK)

GENERAL NOTES

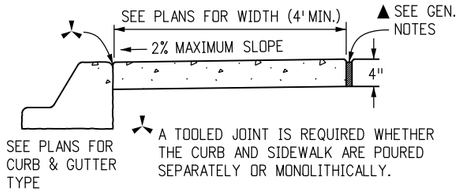
1. ON ROADWAY CURVES WITH A RADIUS OF 1,900 FT. OR LESS, CURBS AND GUTTERS ARE TO BE PLACED ON THE ARC OF THE CURVE, UNLESS OTHERWISE NOTED ON THE PLANS. A MAXIMUM CHORD LENGTH OF 10 FT. MAY BE USED WHEN THE CURVE RADIUS IS GREATER THAN 1,900 FT.
2. CONCRETE SHALL BE CLASS B.
3. PROFILE GRADE OF CURBS AND GUTTERS SHALL BE LOCATED AT THE FLOW LINE.
4. CURB TYPE 4 (KEY-WAY) MAY BE USED IN LIEU OF CURB AND GUTTER TYPE 2 (SECTIONS IB AND IM) UNLESS OTHERWISE SPECIFIED ON THE PLANS.
5. GUTTER CROSS SLOPES MAY BE ADJUSTED TO FACILITATE DRAINAGE FOR PROFILE GRADES AS SHOWN ON THE PLANS.
6. THICKNESS OF CURB AND GUTTER SECTION SHALL MATCH CONCRETE PAVEMENT THICKNESS IF SHOWN ON THE PLANS. CURB AND GUTTER SHALL BE CLASS P CONCRETE IF PLACED MONOLITHICALLY WITH CONCRETE PAVEMENT.
7. INCREASE SIDEWALK THICKNESS TO 6 IN. AT LOCATIONS SHOWN ON THE PLANS.
8. MINIMUM SIDEWALK WIDTH IS 4 FT.

▲ EXPANSION JOINTS SHALL BE INSTALLED WHEN ABUTTING EXISTING CONCRETE OR FIXED STRUCTURE. EXPANSION JOINT MATERIAL SHALL BE ½ IN. THICK AND SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE.

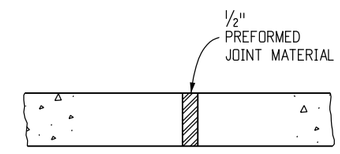
(1) GUTTER CROSS SLOPES SHALL BE ½ IN./FT. WHEN DRAINING AWAY FROM CURB AND 1 IN./FT. WHEN DRAINING TOWARD CURB (WITH EXCEPTION TO IMMEDIATELY ADJACENT TO CURB RAMPS - SEE STANDARD PLAN M-608-1 FOR SLOPE REQUIREMENTS).

● WHEN TIE BARS ARE REQUIRED, THE GUTTER THICKNESS SHALL BE INCREASED TO THE PAVEMENT THICKNESS (T). BARS SHALL BE EPOXY-COATED #4 CONFORMING TO AASHTO M 284 AND SPACED AT 3 FT. INTERVALS. THEY SHALL BE INSERTED T/2 AND 1#2 LENGTH INTO THE GUTTER.

LEGEND FOR RADII
A = 1/8" TO 1/4"
B = 1"
C = 1½"
D = 1½" TO 2"



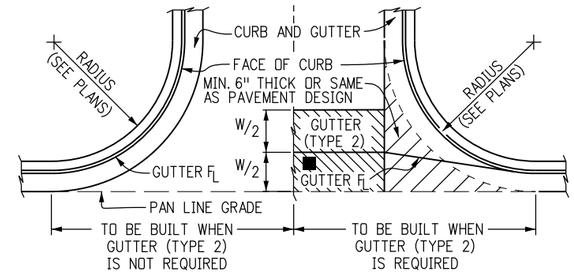
CONCRETE SIDEWALK



NOTES: 1. EXPANSION JOINTS SHALL BE PLACED IN THE SIDEWALK AT INTERVALS OF NOT MORE THAN 500 FT.

2. EXPANSION JOINTS MAY BE SEALED WHEN SPECIFIED ON THE PLANS.

SIDEWALK EXPANSION JOINT



▨ THIS AREA SHALL BE POURED MONOLITHICALLY WITH CURB AND GUTTER AND PAID FOR AS "CONCRETE PAVEMENT".

■ FLOW LINE LOCATION WILL BE ESTABLISHED BY W/2 SHOWN ON PLANS.

CONSTRUCTION OF CONCRETE GUTTERS AT INTERSECTION

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Sheet Revisions	
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07/24/12	Changed Tie Bar spacing from 30" to 36".
05/16/14	Revised Gutter Cross Slope Note to exclude ADA Ramp

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CURB, GUTTERS, AND SIDEWALKS

Issued By: Project Development Branch on July 4, 2012

STANDARD PLAN NO.
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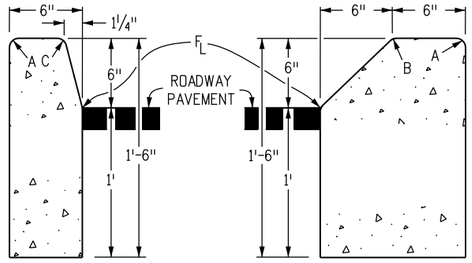
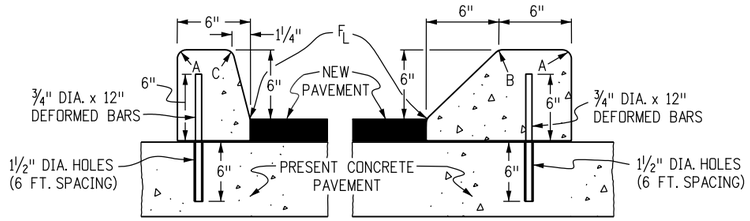
Sheet No. 1 of 4



CURB TYPE 2
(SECTION B)
6 IN. BARRIER

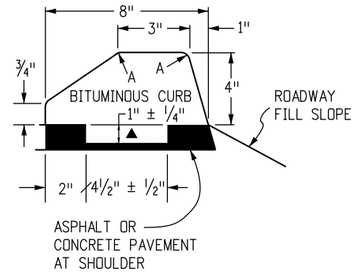
CURB TYPE 2
(SECTION M)
6 IN. MOUNTABLE

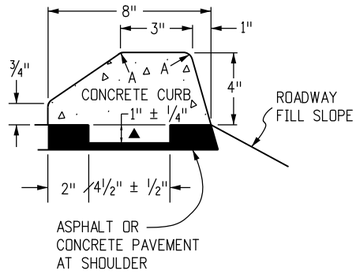


¾" DIA. x 12" DEFORMED REINFORCING BARS AT 6 FT. SPACING SHALL BE GROUTED IN 1¼" DIA. HOLES IN EXISTING CONCRETE. GROUT SHALL CONSIST OF 2 PARTS CLEAN SAND AND 1 PART CEMENT. COST OF INSTALLATION SHALL BE INCLUDED IN THE PRICE BID FOR CURB.

CURB TYPE 4
(SECTION B)
6 IN. BARRIER

CURB TYPE 4
(SECTION M)
6 IN. MOUNTABLE

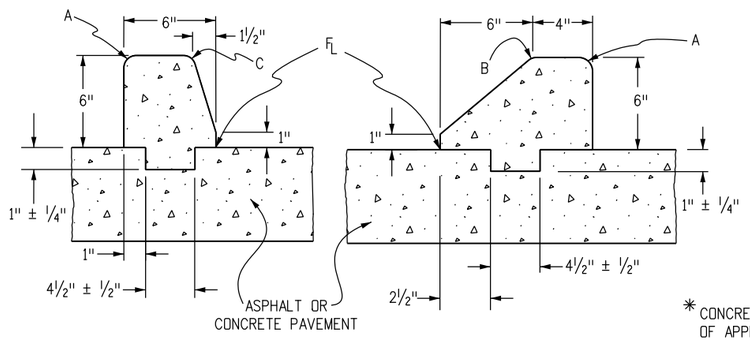




CURB TYPE 6
(SECTION M)
4 IN. MOUNTABLE

NOTE: BITUMINOUS OR CONCRETE * UNLESS OTHWISE SPECIFIED ON THE PLANS.

▲ KEY-WAY MAY BE OMITTED WHEN PLACED UNDER GUARDRAIL.



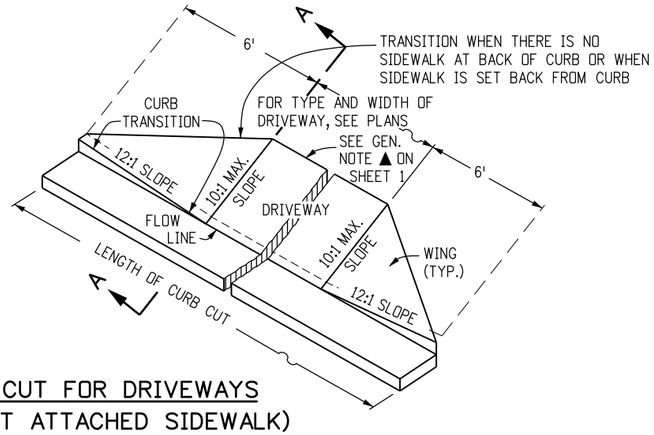
(SECTION B)

(SECTION M)

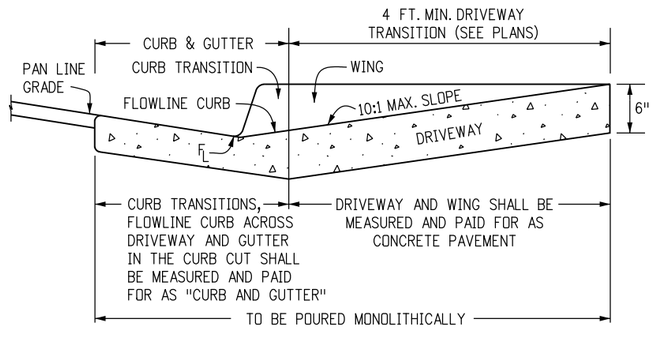
CURB TYPE 4 (KEY-WAY)*

LEGEND FOR RADII
A = ⅛ TO ¼"
B = 1"
C = 1½"
D = 1½" TO 2"

* CONCRETE CLASS B SHALL CONTAIN 1.5 POUNDS PER CUBIC YARD OF APPROVED POLYPROPYLENE FIBERS AND MAY HAVE A NOMINAL AGGREGATE SIZE OF ⅜ IN.

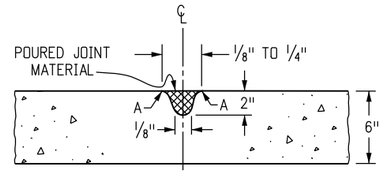


CURB CUT FOR DRIVEWAYS
(WITHOUT ATTACHED SIDEWALK)



SECTION A-A

CONCRETE PAVEMENT (DRIVEWAYS)



NOTE: RECOMMENED JOINT SPACING IS EVERY 8 FOOT ALONG THE WIDTH AND LENGTH OF DRIVEWAY. FOR DRIVEWAYS WIDER THAN 12 FEET, JOINTS ARE REQUIRED.

TRANSVERSE CONTRACTION JOINT
FOR CONCRETE PAVEMENT (DRIVEWAYS)

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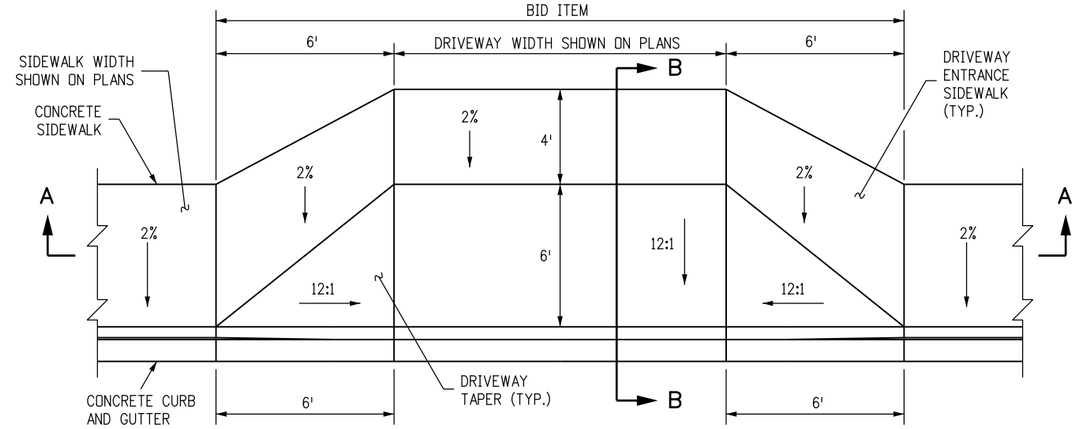
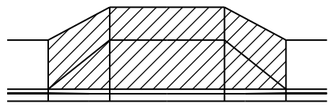
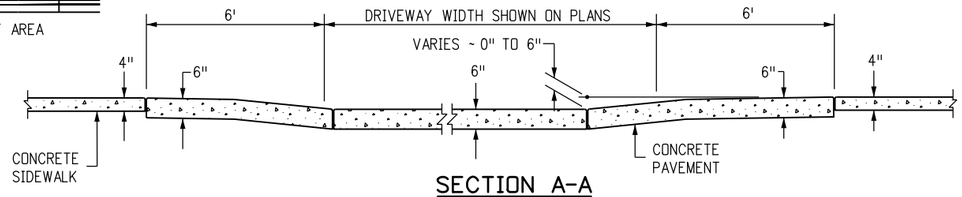
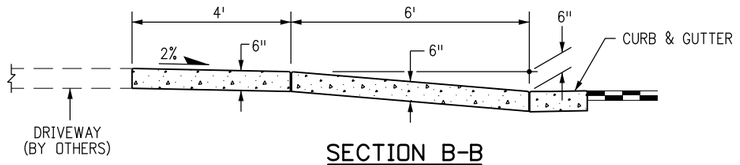


CONCRETE DRIVEWAY ENTRANCE TYPE 1

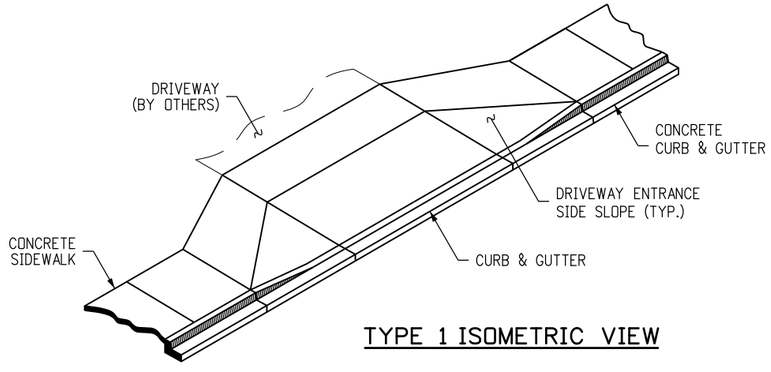




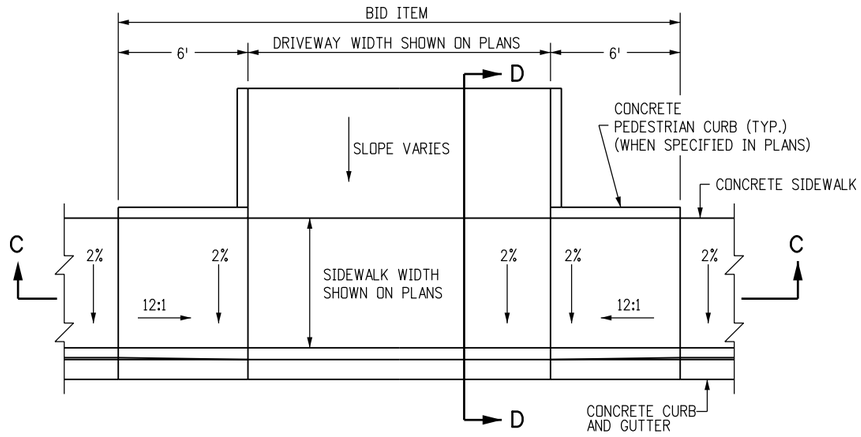
SECTION A-A



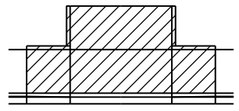
SECTION B-B

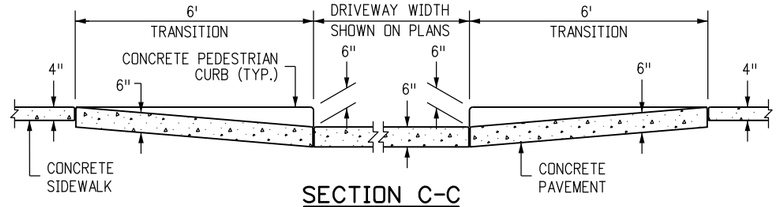


TYPE 1 ISOMETRIC VIEW

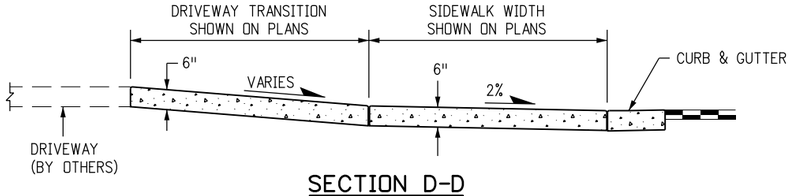


CONCRETE DRIVEWAY ENTRANCE TYPE 2

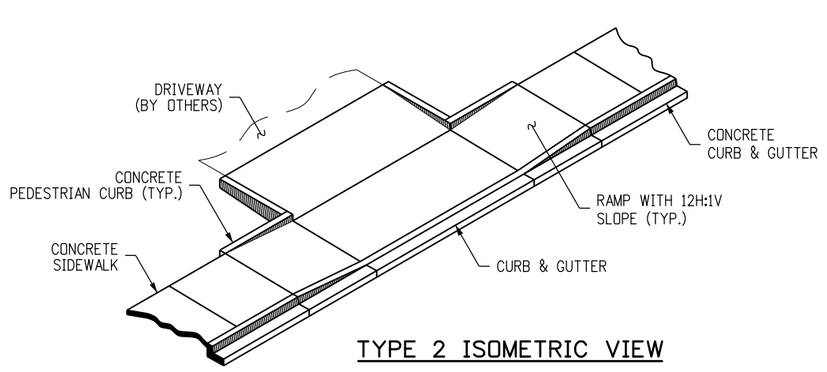




SECTION C-C



SECTION D-D



TYPE 2 ISOMETRIC VIEW

NOTES

1. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, AND OTHER OBSTRUCTIONS SHOULD NOT BE PLACED IN FRONT OF THE DRIVEWAY RAMP ACCESS AREAS.
2. FOR THE CURB AND GUTTER SHOWN, SEE PLANS FOR CURB TYPE.
3. RAMP SLOPES SHALL BE 12:1 OR FLATTER.
4. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE PAVEMENT.

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Drawing File Name: 609010304.dgn	(R-X)		
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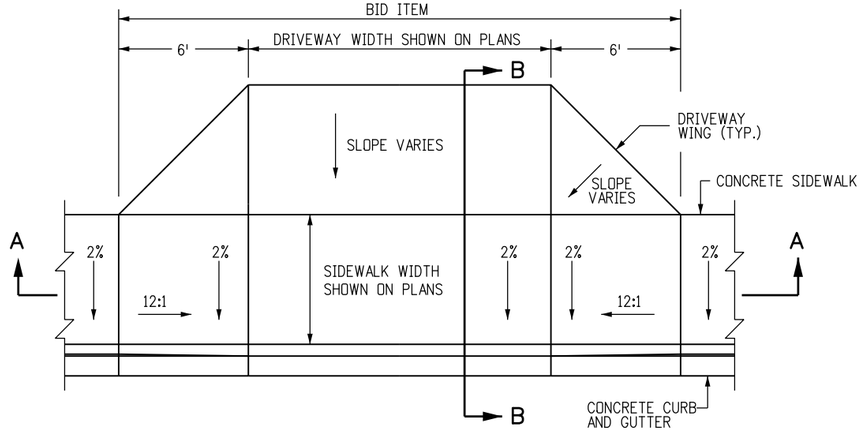
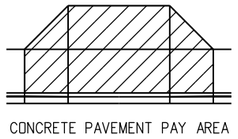


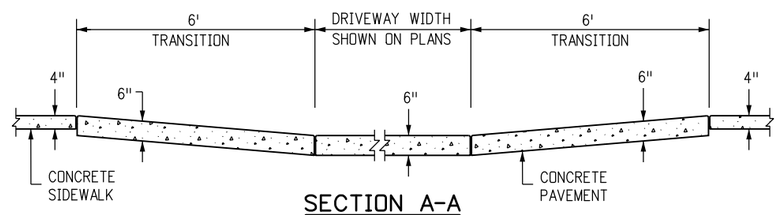
CONCRETE DRIVEWAY ENTRANCE TYPE 3



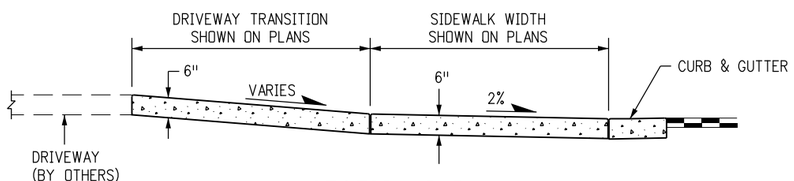
CONCRETE PAVEMENT PAY AREA

NOTES

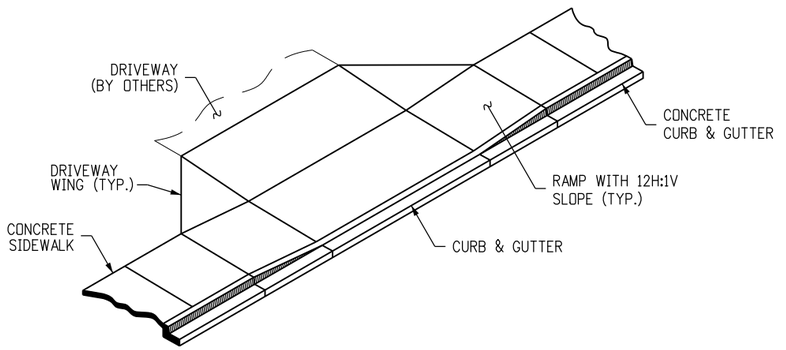
1. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, AND OTHER OBSTRUCTIONS SHOULD NOT BE PLACED IN FRONT OF THE DRIVEWAY RAMP ACCESS AREAS.
2. FOR THE CURB AND GUTTER SHOWN, SEE PLANS FOR CURB TYPE.
3. RAMP SLOPES SHALL BE 12:1 OR FLATTER.



SECTION A-A



SECTION B-B



TYPE 3 ISOMETRIC VIEW

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CURB, GUTTERS, AND SIDEWALKS

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STANDARD PLAN NO.
M-609-1

SPACING FOR DELINEATOR POSTS ON HORIZONTAL CURVES

'R' RADIUS (FEET)	'D' DEGREE OF CURVE	✳ - ● SPACING ON CURVE (FEET)	✳ SPACING IN ADVANCE OF AND BEYOND CURVE (FEET)		
			FIRST SPACE	SECOND SPACE	THIRD SPACE
20000	0° 17'	300	300	300	300
17000	0° 20'	300	300	300	300
14000	0° 25'	300	300	300	300
12000	0° 29'	300	300	300	300
10000	0° 34'	299	300	300	300
8000	0° 43'	267	300	300	300
6000	0° 57'	231	300	300	300
5000	1° 09'	211	300	300	300
4000	1° 26'	189	300	300	300
3500	1° 38'	176	300	300	300
3000	1° 55'	163	300	300	300
2500	2° 18'	148	297	300	300
2000	2° 52'	132	265	300	300
1800	3° 11'	125	251	300	300
1600	3° 35'	118	236	300	300
1400	4° 06'	110	220	300	300
1200	4° 47'	102	203	300	300
1000	5° 44'	92	185	277	300
900	6° 22'	87	175	262	300
800	7° 10'	82	164	246	300
700	8° 11'	76	153	229	300
600	9° 33'	70	141	211	300
500	11° 28'	64	127	191	300
450	12° 44'	60	120	180	300
400	14° 20'	56	112	168	300
350	16° 22'	52	104	156	300
300	19° 06'	47	95	142	285
250	22° 55'	42	85	127	255
200	28° 39'	37	73	110	220
150	38° 12'	30	60	90	180
100	57° 18'	21	42	64	127
75	76° 24'	20	30	45	90

✳ ON CONVENTIONAL ROADWAYS OMIT THE "THIRD SPACE" AND DOUBLE THE SPACING "ON THE CURVE" AND "IN ADVANCE OF AND BEYOND THE CURVE" (300' MAX.)

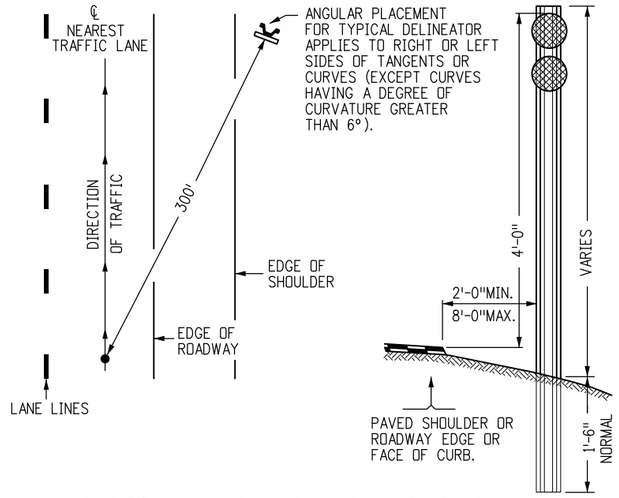
● SPACING FOR CURVES NOT SHOWN MAY BE COMPUTED FROM THE FORMULA: $S = 3\sqrt{R-50}$

SPACING IN ADVANCE OF AND BEYOND THE CURVE IS: FIRST SPACE = 2S, SECOND SPACE = 3S AND THIRD SPACE = 6S. SPACES SHOULD NOT BE LESS THAN 20 FT. OR GREATER THAN 300 FT.

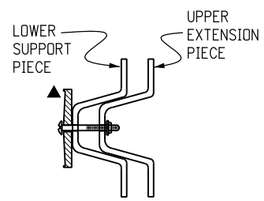
RESIDUAL SPACE AFTER "ON CURVE" SPACING IS APPLIED, SHALL BE DIVIDED EQUALLY AMONG ALL OF THE "ON CURVE" SPACES SO THAT THE LAST DELINEATOR FALLS AT THE P.T. OR C.S. OF THE CURVE.

GENERAL NOTES

1. SEE THE TABULATION OF QUANTITIES INCLUDED IN THE PLANS FOR THE NUMBERS AND LOCATIONS OF DELINEATORS REQUIRED.
2. THE COLOR OF DELINEATORS SHALL, IN ALL CASES, CONFORM TO THE COLOR OF EDGE LINES, EXCEPT:
   A. RED, GREEN AND BLUE DELINEATORS
   B. TYPE III DELINEATORS (3 YELLOW).
3. THE COLOR OF DELINEATOR POSTS AND ALL SPECIAL MOUNTING BRACKETS SHALL BE INTERSTATE GREEN.
4. DELINEATORS ARE MANDATORY ON ALL ROADWAYS ON THE STATE HIGHWAY SYSTEM. THEY ARE OPTIONAL WHERE FIXED SOURCE LIGHTING IS IN OPERATION: HOWEVER, ALL CONCRETE BARRIER AND TYPE 3 GUARDRAIL SHALL HAVE REFLECTORS OR SUPPLEMENTAL TABS.
5. TYPE I (YELLOW) DELINEATORS ARE MANDATORY ON THE LEFT SIDE OF EXPRESSWAY ROADWAYS (MEDIAN).
6. RED DELINEATORS MAY BE INSTALLED ON THE REVERSE SIDE OF ANY DELINEATOR AND/OR A SEPARATE POST ON ONE-WAY ROADWAYS OR RAMPS WHERE INVESTIGATION SHOWS A NEED FOR WRONG-WAY MOVEMENT PROTECTION.
7. TYPE III (3-YELLOW) DELINEATORS ARE TO BE INSTALLED TO WARN OF THE EXISTENCE OF OBJECTS NOT ACTUALLY IN THE ROADWAY BUT THAT MAY BE SO CLOSE TO THE EDGE OF THE ROADWAY THAT THEY NEED A MARKER. THESE INCLUDE UNDERPASS PIERS, BRIDGE ABUTMENTS, HANDRAILS, AND CULVERTS HEADS. THE INSIDE EDGE OF THE MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION.
8. INTERCHANGE RAMPS SHALL BE DELINEATED ON THE RIGHT SIDE, THE LEFT SIDE, OR BOTH SIDES WITH TYPE I DELINEATORS OF THE APPROPRIATE COLOR (CRYSTAL OR YELLOW) AS ILLUSTRATED ON SHEET NUMBER 3.
9. FRONTAGE ROAD DELINEATORS ARE NOT TO BE INSTALLED WHERE THEY MIGHT BE MISLEADING TO MAINLINE TRAFFIC.
10. SPACING OF DELINEATORS FOR TUNNELS AND SNOW SHEDS SHALL BE AS SHOWN ON THE PLANS.
11. WHERE PRACTICABLE, THE APPROACH ENDS OF ISLANDS AND MEDIANS SHOULD BE DELINEATED.
12. TYPICAL INSTALLATION LOCATIONS FOR ALL TYPE I DELINEATORS ON TAGENT SECTIONS SHALL BE ON 1/10TH MILE INTERVALS IN RELATION TO THE HIGHWAY MILE MARKERS. A 200 FOOT MINIMUM WILL APPLY TO THE "LAST SPACE" EXITTING A HORIZONTAL CURVE AND THE FOLLOWING DELINEATOR SHALL BE INSTALLED ON THE NEXT 1/10TH MILE LOCATION (MAXIMUM SPACING IS ALSO 528 FEET). AT ALL OTHER LOCATIONS, SUCH AS A & D LANES, RAMPS, WIDTH TRANSITIONS, AND TURN LANES, A "LAST SPACE" SHOULD NOT BE LESS THAN 50% OF HTE SPACING SHOWN FOR THAT LOCATION.
13. TYPE II DELINEATORS SHALL BE INSTALLED AT 100 FOOT SPACING ON ALL ACCELERATION LANES AND TAPERS, DECELERATION LANES AND TAPERS, AND LANE TRANSITIONS INVOLVING PAVEMENT WIDTH REDUCTIONS IN THE DIRECTION OF TRAFFIC. TYPE II DELINEATORS ARE NOT REQUIRED FOR REDIRECT TAPERS, FOR TRAFFIC MOVING IN THE DIRECTION OF WIDER PAVEMENT OR ON THE SIDE OF THE ROADWAY WHERE THE ALIGNMENT IS NOT AFFECTED BY THE LANE REDUCTION. TYPE II (YELLOW) DELINEATORS SHALL ONLY BE USED WHEN A RAISED OR DEPRESSED MEDIAN IS PRESENT. FOR WIDTH TRANSITIONS WHERE TRAFFIC MOVES IN THE DIRECTION OF WIDER PAVEMENT, THE NORMAL SPACING SHALL BE ADJUSTED SO THERE IS A DELINEATOR AT EACH OF THE ANGLE POINTS OF THE WIDTH TRANSITION.
14. TYPE I DELINEATORS SHALL BE INSTALLED AT 100 FOOT SPACING ON INTERCHANGE RAMP TANGENT SECTION AND BY THE SPACING TABLE ON RAMP CURVES. SPACING "IN ADVANCE OF AND BEYOND CURVE" DOES NOT APPLY TO RAMP CURVES.
15. FOR SPACING ON A CURVE THAT FOLLOWS A TANGENT SECTION WITH SPACES SHORTER THAN THOSE SHOWN IN THE CURVE SPACING TABLE: MODIFY THE TABLE SO THAT THE CURVE SPACING IS NO GREATER THAN THE TANGENT SPACING.
16. WHERE GUARDRAIL INTRUDES INTO THE SPACE BETWEEN THE PAVEMENT EDGE AND THE LINE OF DELINEATORS, PLACE THE DELINEATORS IMMEDIATELY ABOVE OR BEHIND THE RAIL FACE, AND DELINEATOR SPACING SHALL BE THE SAME BEHIND THE RAIL FACE.
17. WHEN NORMAL SPACING FALLS ON AN INTERSECTING ROADWAY, DRIVEWAY, ETC. THE DELINEATOR MAY BE MOVED EITHER DIRECTION A DISTANCE NOT EXCEEDING ONE-QUARTER OF THE NORMAL SPACING.
18. THE ANGULAR PLACEMENT FOR ALL DELINEATORS SHOULD BE BY THE "TRAFFIC ORIENTING" METHOD: AIM THE FACE OF THE DELINEATOR AT THE CENTERLINE OF THE NEAREST LANE OF APPROACHING TRAFFIC AT A POINT 300 FEET AWAY (OR AS DIRECTED BY THE ENGINEER FOR SPECIAL OR LOCATIONS AND CURVES HAVING A DEGREE OF CURVATURE GREATER THAN 6 DEGREES).
19. TYPE III (YELLOW-BLUE-YELLLOW) DELINEATORS ARE TO BE INSTALLED TO WARN OF THE EXISTENCE OF AN ASPHALT CURB INSTALLED BELOW GUARDRAIL. THE DELINEATOR SHALL BE PLACED IN LINE WITH THE ASPHALT CURB.



TYPICAL DELINEATOR PLACEMENT



SECTION B-B

POST NOTES

1. POSTS SHALL BE A UNIFORM FLANGED CHANNEL SECTION (U-SHAPE) MADE FROM HOT ROLLED STRUCTURAL STEEL, RE-ROLLED RAIL STEEL, OR NEW BILLET STEEL, HAVING A MINIMUM YIELD STRENGTH OF 30,000 PSI AND A MINIMUM TENSILE STRENGTH OF 50,000 PSI.
2. POSTS SHALL BE SET IN DRILLED OR EXCAVATED HOLES, PLACED PLUMB AND FIRMLY TAMPED IN PLACE; OR MAY BE DRIVEN PLUMB.
3. A MINIMUM OF 3 HOLES OF 3/16" DIAMETER, SPACED AS SHOWN, ARE REQUIRED FOR ALL DELINEATOR POSTS.

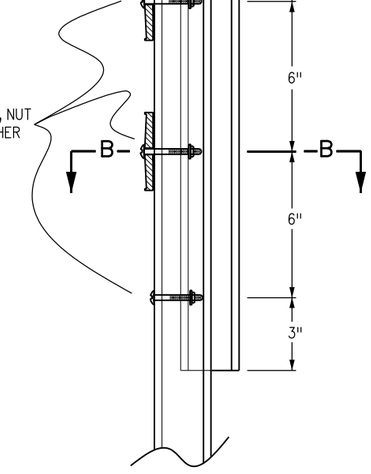
⬢ AN ADDITIONAL HOLE IS REQUIRED WHEN THE ADJUSTABLE REFLECTOR BRACKET IS USED.

DOUBLE HEIGHT POSTS

4. THE LOWER SECTION OF THE 2-POST COMBINATION SHALL BE INSTALLED ACCORDING TO THE SAME PLACEMENT SPECIFICATIONS AS A TYPICAL SINGLE POST INSTALLATION.

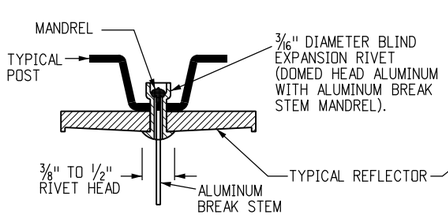
▲ 5. REFLECTORS SHALL BE MOUNTED AT THE CONNECTION OF THE POSTS AND AT THE TOP OF THE UPPER POST IN ACCORDANCE WITH THE APPROPRIATE CONFIGURATION FOR THE APPLICATION.

6. THE LENGTH OF THE UPPER EXTENSION PIECE SHALL NOT EXCEED 7 FEET.

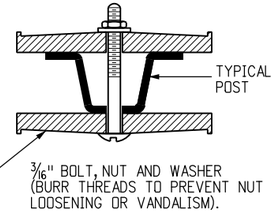


TYPICAL DOUBLE HEIGHT INSTALLATION

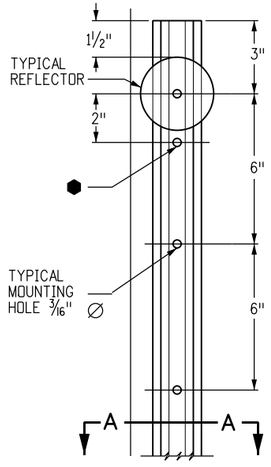
TYPICAL INSTALLATION SINGLE DIRECTION



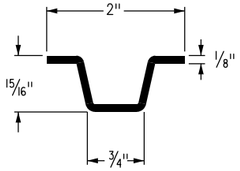
TYPICAL INSTALLATION BACK - TO - BACK



TYPICAL DELINEATOR FABRICATION DETAILS



TYPICAL 1,12# DELINEATOR POST



SECTION A-A

ALLOWABLE TOLERANCE DIMENSION:

1" AND UP	± 1/8"
1/2" TO 1"	± 1/16"
1/2" AND BELOW	± 1/32"

WEIGHT:

MINUS 3 1/2% OF THE WEIGHT OF ANY ONE POST.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: KEN	Date:	Comments
Last Modification Date: 12/01/16	Initials: RPR	12/01/2016	UPDATED NOTE 12 AND ADDED NOTE 19
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-612-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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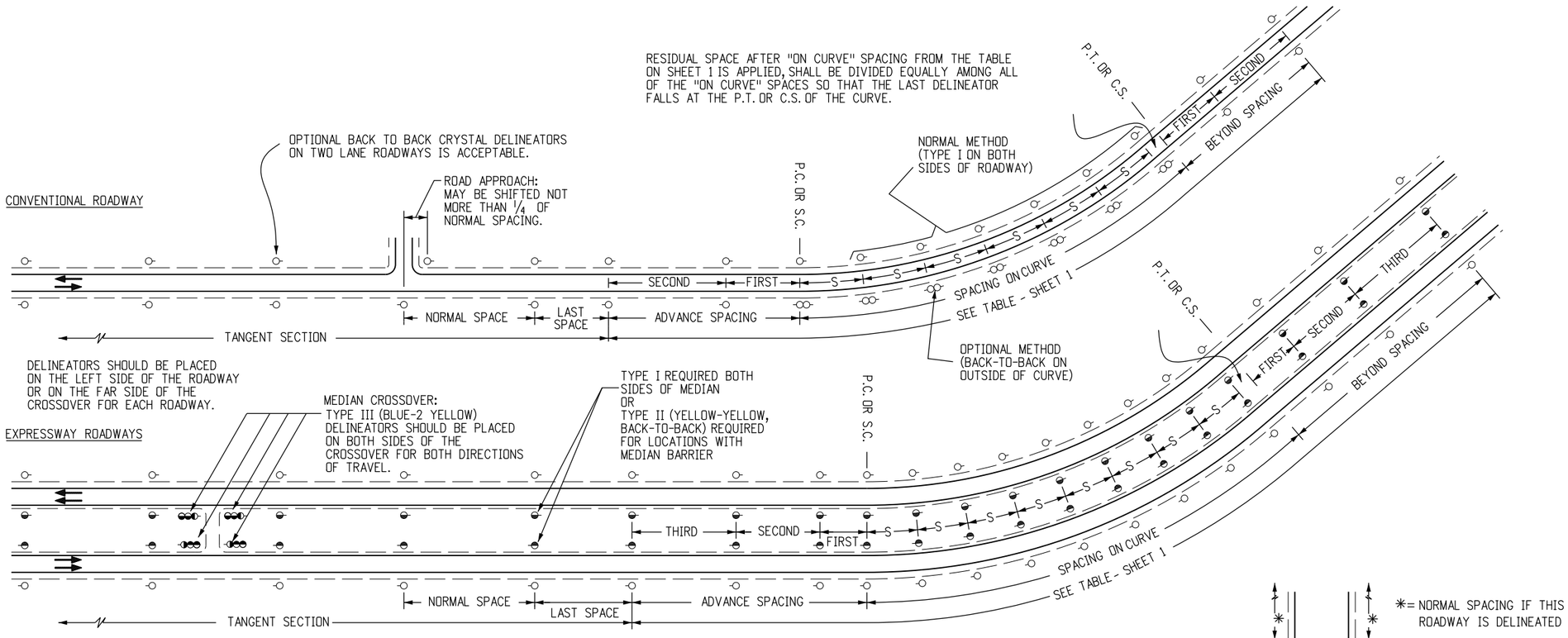
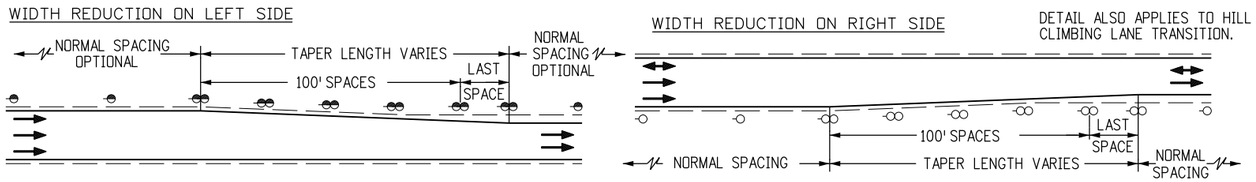
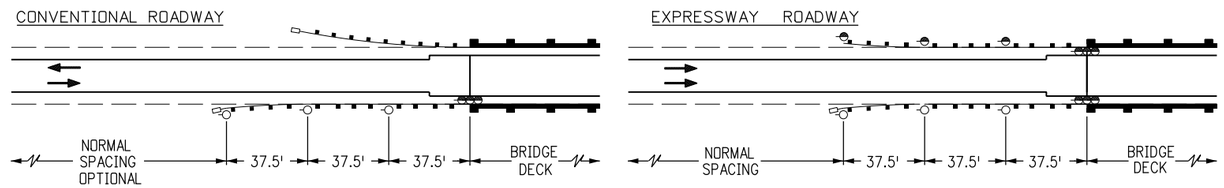


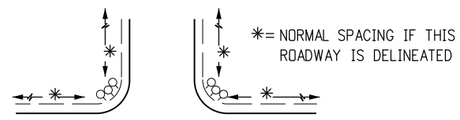
TYPICAL INSTALLATION FOR TANGENT SECTION AND CURVES

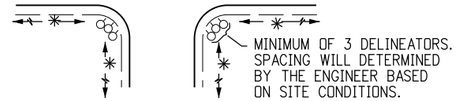


TYPICAL INSTALLATION FOR LANE TRANSITION



TYPICAL INSTALLATION FOR BRIDGE APPROACHES





TYPICAL INSTALLATION FOR MINOR INTERSECTION

DELINEATOR SYMBOLS AND TYPICAL CONFIGURATION

- TYPE I (CRYSTAL)
- TYPE I (YELLOW)
- TYPE I (RED)
- TYPE I (GREEN) (MAINTENANCE MARKER)
- TYPE I (BLUE) (MAINTENANCE MARKER)
- TYPE II (2 CRYSTAL)
- TYPE II (2 YELLOW)
- TYPE II (CRYSTAL-CRYSTAL BACK-TO-BACK)
- TYPE II (YELLOW-YELLOW, BACK-TO-BACK)
- TYPE II (CRYSTAL-RED, BACK-TO-BACK)
- TYPE II (YELLOW-RED, BACK-TO-BACK)
- TYPE III (3 YELLOW)
- TYPE III (2 CRYSTAL-RED, BACK-TO-BACK)
- TYPE III (2 YELLOW-RED, BACK-TO-BACK)
- TYPE III (GREEN)
- TYPE III (BLUE)
- TYPE III (BLUE-2 YELLOW)
- TYPE III (YELLOW-BLUE-YELLOW)

BRIDGE NOTES

1. WHERE CURB TO CURB WIDTH OF BRIDGE IS EQUAL TO OR GREATER THAN ROADWAY WIDTH PLUS USABLE SHOULDER WIDTH, USE THE TYPE III DELINEATOR (3 YELLOW) ONLY AND OMIT ALL THE TYPE I DELINEATORS.
2. FOR GUARD RAIL INSTALLATIONS WHERE APPROACH END IS NOT FLARED, PLACE A TYPE III DELINEATOR (3 YELLOW) IMMEDIATELY IN ADVANCE OF APPROACH END.
3. ALL TYPE I DELINEATORS ARE TO BE MOUNTED ABOVE OR IMMEDIATELY BEHIND GUARD RAIL AND ARE NOT A CONSTANT DISTANCE FROM THE ROADWAY.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RPR		Date:	Comments
Last Modification Date: 12/01/2016 Initials: RPR	R-1	12/01/16	ADDED YELLOW-BLUE-YELLOW CRYSTAL
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-612-01.dgn			
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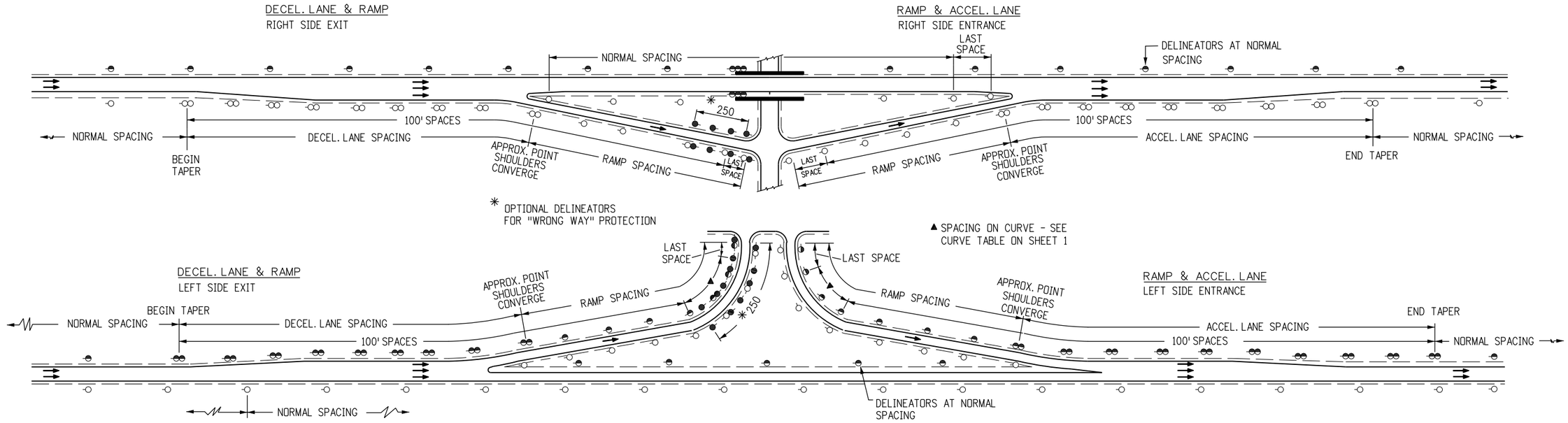
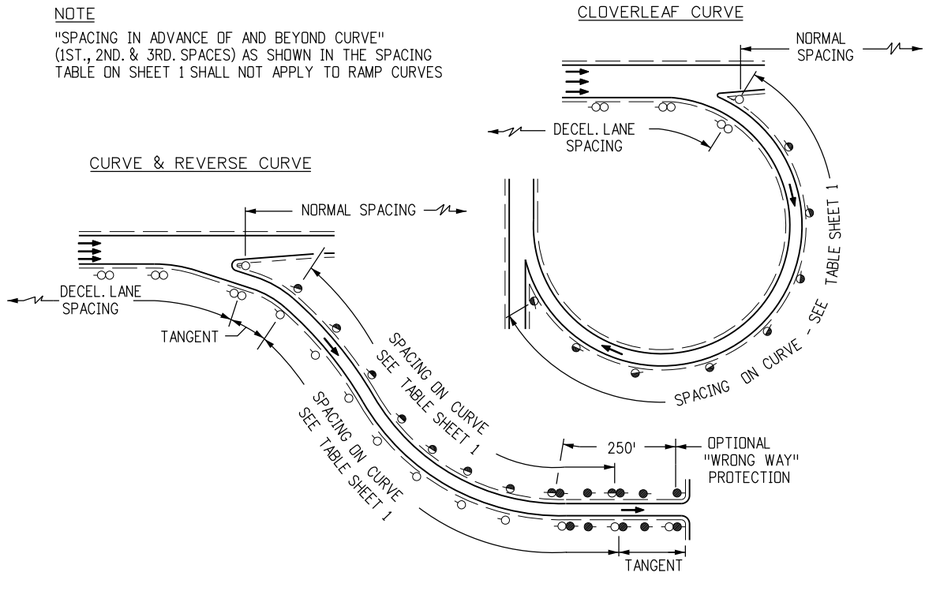


TYPICAL INSTALLATION FOR INTERCHANGES

NOTE

"SPACING IN ADVANCE OF AND BEYOND CURVE" (1ST., 2ND. & 3RD. SPACES) AS SHOWN IN THE SPACING TABLE ON SHEET 1 SHALL NOT APPLY TO RAMP CURVES



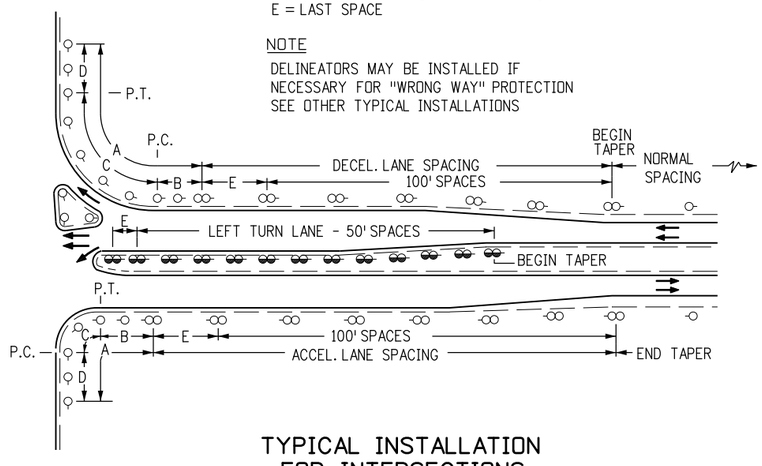
TYPICAL INSTALLATION FOR RAMP CURVES

LEGEND

A = SEE CURVE SPACING TABLE
B = ADVANCE SPACES (FIRST & SECOND)
C = SPACING ON CURVE
D = BEYOND SPACES (FIRST & SECOND)
E = LAST SPACE

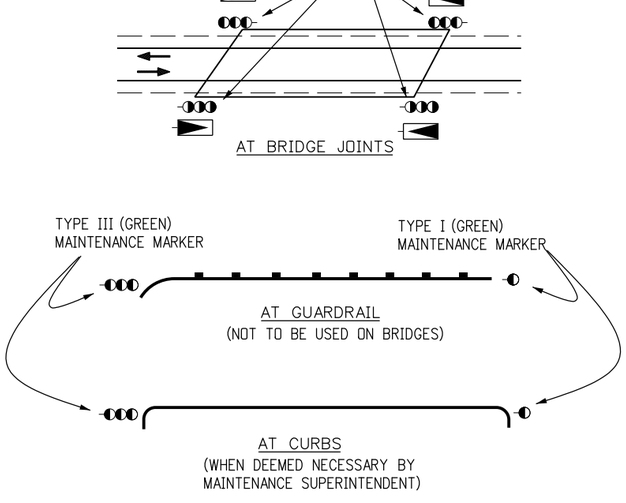
NOTE

DELINEATORS MAY BE INSTALLED IF NECESSARY FOR "WRONG WAY" PROTECTION SEE OTHER TYPICAL INSTALLATIONS



TYPICAL INSTALLATION FOR INTERSECTIONS

WITH ACCEL. & DECEL. LANES



MAINTENANCE MARKER LOCATIONS FOR OBSTRUCTIONS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: RPR	Date:	Comments
Last Modification Date: 12/01/16	Initials: NNC	12/01/16	ADDED BRIDGE JOINT MARKER
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-612-01.dgn			
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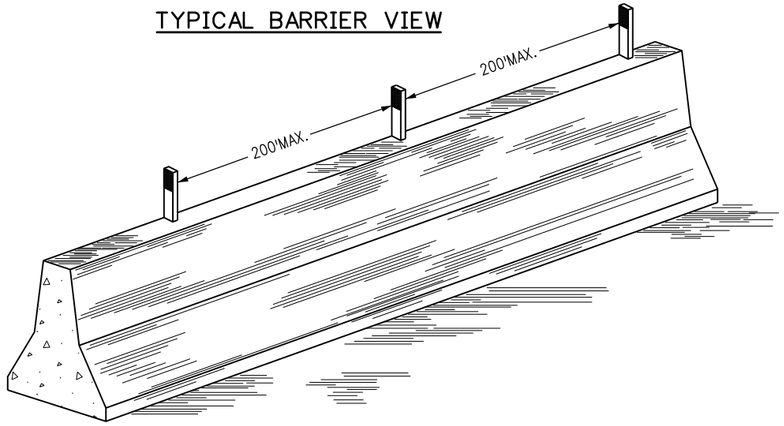
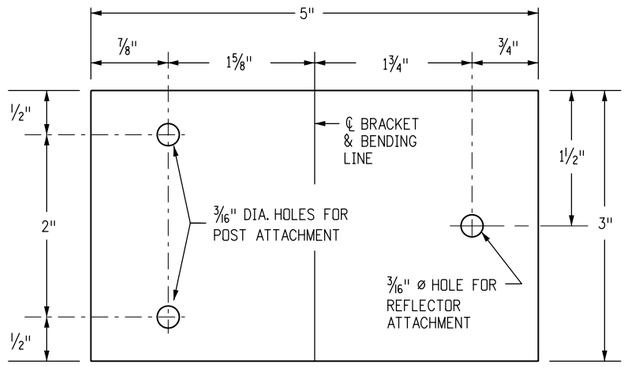
TYPICAL BARRIER VIEW

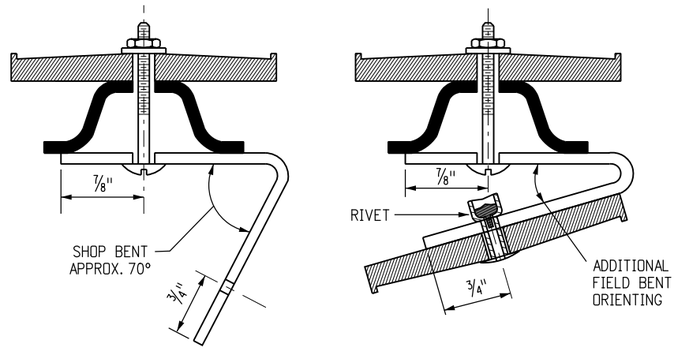


TYPICAL REFLECTOR DETAILS FOR CONCRETE BARRIER

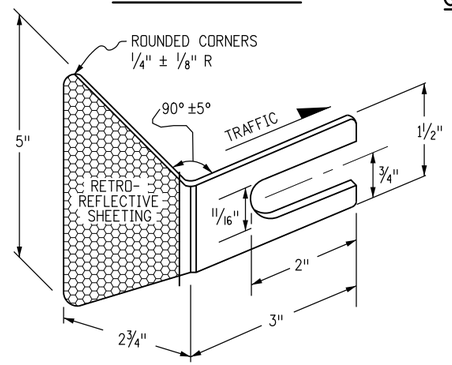
PLAN VIEW



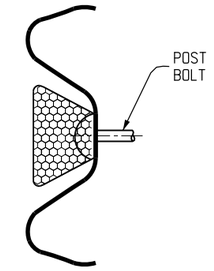
TYPICAL ADJUSTABLE REFLECTOR BRACKET



REFLECTOR TAB



MOUNTING POSITION ON GUARD RAIL TYPE 3

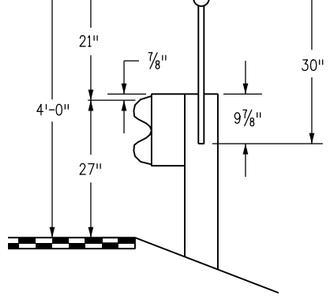


TYPICAL GUARDRAIL REFLECTOR TAB

SEE THE APPROPRIATE GUARDRAIL STANDARD PLANS FOR REFLECTOR TAB FABRICATION AND PLACEMENT DETAILS.

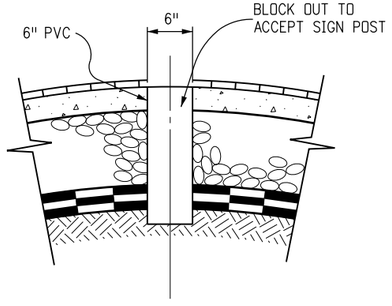
BARRIER REFLECTOR NOTES

1. BARRIER REFLECTORS, REGARDLESS OF TYPE, SHALL MEET THE RETROREFLECTIVE QUALTITIES SPECIFIED IN SECTION 713 OF THE STANDARD SPECIFICATIONS FOR DELINEATOR REFLECTORS, AND BE PAID FOR AS DELINEATOR (TYPE _) (BARRIER) (EACH). USE OF THESE REFLECTORS IS MANDATORY.
2. THE COLOR OF REFLECTIVE SURFACE SHALL MATCH THE COLOR OF THE ADJACENT EDGE LINE.
3. CONCRETE SURFACE PREPARATION, ADHESIVE, AND METHOD OF APPLICATION SHALL BE AS RECOMMENDED BY THE REFLECTOR MANUFACTURER.
4. UNLESS OTHERWISE NOTED IN THE PLANS OR DIRECTED BY THE ENGINEER, A 200 FOOT MAXIMUM TANGENT AND CURVE SPACING APPLIES TO BARRIER REFLECTORS.
5. TOP MOUNT REFLECTORS ARE STANDARD. SIDEMOUNT BARRIER REFLECTORS OR 6 INCH WIDE REFLECTOR STRIPS MAY BE REQUIRED IF SPECIFIED IN THE PLANS.
6. MEDIAN BARRIER REFLECTORS SHALL BE TYPE II (YELLOW-YELLOW, BACK-TO-BACK).
7. FOR A TWO-WAY ROADWAY BARRIER, REFLECTORS SHALL BE TYPE II (CRYSTAL-CRYSTAL, BACK-TO-BACK).
8. FOR TEMPORARY CONCRETE BARRIER, RELFECTORS SHALL BE INSTALLED THAT MEET THE MINIMUM REQUIREMENTS OF STANDARD TYPICAL DELINEATOR INSTALLATIONS, EXCEPT THE MAXIMUM SPACING SHALL BE 50 FT., AND THEY WILL NOT BE PAID FOR, BUT ARE INCLUDED IN THE WORK.



TYPICAL GUARDRAIL POST MOUNT DELINEATORS

POST MOUNT DELINEATORS SHALL BE ATTACHED BY A METHOD APPROVED BY THE ENGINEER OR A METHOD REQUIRED BY THE DEVICE MANUFACTURER.



TYPICAL SLEEVE INSTALLATION FOR MEDIAN DELINEATOR POSTS

TYPICAL BRACKET FABRICATION DETAILS

BRACKET NOTES

1. THE ADJUSTABLE REFLECTOR BRACKET IS TO BE USED TO "TRAFFIC ORIENT" BACK-TO-BACK DELINEATORS USED ON CURVES.
2. REFLECTOR BRACKETS SHALL BE FABRICATED FROM EITHER GALVANIZED STEEL NOT LESS THAN 16 GAGE, OR ALUMINUM NOT LESS THAN 0.100 INCH THICKNESS.
3. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
4. ALL BRACKET HOLES ARE 3/16 IN. DIAMETER AND DELINEATOR POSTS REQUIRE AN ADDITIONAL HOLE 2 IN. BELOW THE TOP HOLE PROVIDED IN THE POST.
5. SHOP BEND THE BRACKET APPROX. 70 DEGREES AS SHOWN, ATTACH TO THE DELINEATOR POST WITH 3/16 IN. BOLTS AND FIELD BEND AS NECESSARY TO TRAFFIC ORIENT. THEN THE BRACKET REFLECTOR CAN BE ATTACHED WITH A 3/16 IN. BLIND EXPANSION RIVET OR A BOLT.
6. BURR THE THREADS OF ALL BOLTS TO PREVENT NUT LOOSENING OR VANDALISM.

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Last Modification Date:	Initials:		
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CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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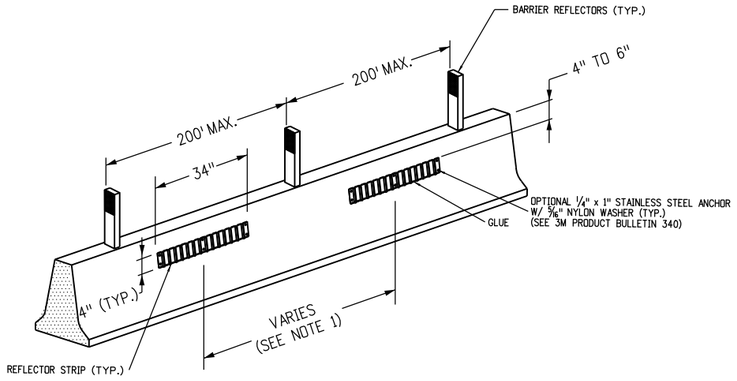
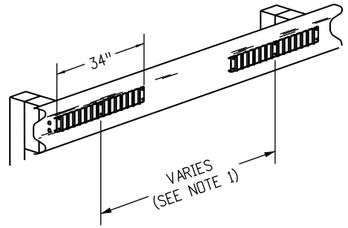
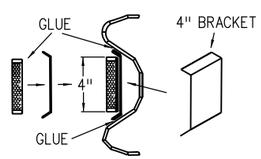
TYPICAL INSTALLATION DETAIL FOR CONTINUOUS CONCRETE BARRIER



TYPICAL INSTALLATION DETAIL FOR GUARDRAIL TYPE 3





ATTACHMENT DETAILS

TYPICAL REFLECTOR STRIP INSTALLATION

1. REFLECTOR STRIPS SHALL BE SPACED AT INTERVALS OF 20' O.C. FOR TANGENT SECTIONS OF BARRIER AND 10' O.C. FOR CURVED SECTIONS OF BARRIER.
2. THIS DEVICE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. IT IS THE RESPONSIBILITY OF THE INSTALLER TO CONTACT THE MANUFACTURER REPRESENTATIVE WHENEVER THERE IS A QUESTION REGARDING APPLICATION PROCEDURES OR SUBSTRATE CONDITIONS.
3. THE COLOR OF THE RELECTIVE SURFACE SHALL MATCH THE COLOR OF THE ADJACENT ROADWAY EDGE LINE.
4. AT THE TIME OF INSTALLATION, THE CONTACTING SURFACE SHALL BE DRY AND MOISTURE-FREE.
5. AFTER REFLECTOR STRIP INSTALLATION, SURFACES SHOULD STAY DRY WITHOUT RAIN IN THE FORECAST FOR AT LEASAT 8 HOURS.
6. SURFACE PREPARATION, BRACKETS, BOLTS, AND GLUE (OR EQUIVALENT) SHALL BE INCLUDED IN THE COST OF EACH DELINEATOR STRIP.

CONCRETE BARRIER NOTES

1. CONCRETE SURFACE PREPARATION, ADHESIVE, AND METHOD OF APPLICATION SHALL BE AS RECOMMENDED BY THE REFLECTOR MANUFACTURER.
2. TO ASSUME A STRAIGHT, LEVEL APPLICATION, SNAP A CHALK LINE ACROSS THE BARRIER.
3. FOR MOUNTING THE REFLECTOR STRIP TO CONCRETE BARRIER, INCLUDING THE BRACKETS, THE USE OF 3M WINDO-WELD SUPER FAST URETHANE GLUE OR EQUIVALENT APPLIED AT 60 DEGREES FAHRENHEIT IN DRY WEATHER IS RECOMMENDED. THIS PRODUCT IS AVAILABLE IN A STANDARD CAULKING TUBE AND SHOULD BE APPLIED TO THE BRACKETS AND PANELS WITH A CONSTRUCTION STYLE CAULKING GUN, AND/OR USE 1/4" x 1" STAINLESS STEEL ANCHOR WITH 5/16" NYLON WASHER, AS SPECIFIED IN 3M PRODUCT BULLETIN 340.
4. UNLESS OTHERWISE NOTED IN THE PLANS OR DIRECTED BY THE ENGINEER, A 200-FOOT MAXIMUM TANGENT AND CURVE SPACING APPLIES TO BARRIER REFLECTORS ALONG THE TOP OF THE BARRIER.

GUARDRAIL TYPE 3 NOTES

1. THE USE OF REFLECTOR STRIPS ON GUARDRAIL TYPE 3 IS SUPPLEMENTAL TO THE REFLECTOR TAB.
2. TWO DIFFERENT STYLES OF MOUNTING BRACKETS ARE AVAILABLE. THERE IS ONE TYPE FOR THE 4" REFLECTOR STRIP AND ANOTHER FOR THE 6" REFLECTOR STRIP. THE BRACKETS MUST BE MATCHED TO FIT THE EXACT 4" OR 6" REFLECTOR STRIP PANEL. THE 4" REFLECTOR STRIP SIZE IS TYPICAL, HOWEVER, 1.5" OR 6" REFLECTOR STRIPS MAY BE INSTALLED AS SPECIFIED IN THE PLANS.
3. METAL GUARDRAIL SHALL BE WIRE BRUSHED/SANDED, THEN CLEANED WITH ISOPROPYL ALCOHOL WHERE THE BRACKETS WILL ADHERE TO THE GUARDRAIL.
4. FOR MOUNTING THE REFLECTOR STRIP TO GUARDRAIL, INCLUDING THE BRACKETS, THE USE OF 3M WINDO-WELD SUPER FAST URETHANE GLUE OR EQUIVALENT APPLIED AT 60 DEGREES FAHRENHEIT IN DRY WEATHER IS RECOMMENDED. THIS PRODUCT IS AVAILABLE IN A STANDARD CAULKING TUBE AND SHOULD BE APPLIED TO THE BRACKETS AND PANELS WITH A CONSTRUCTION STYLE CAULKING GUN, AND/OR USE 1#4" x 1" STAINLESS STEEL ANCHOR WITH 5#16" NYLON WASHER, AS SPECIFIED IN 3M PRODUCT BULLETIN 340.
5. INSTALLATION REQUIRES THE USE OF THREE BRACKETS (MIN.) PER REFLECTOR STRIP CORRESPONDING TO THE PRE-DRILL REFLECTOR STRIP HOLES.

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Last Modification Date: 12/01/16 Initials: TCD	R-1	12/01/16	ADDED SPACING REQUIREMENTS DELETED 6" REFLECTOR STRIP
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Drawing File Name: S-612-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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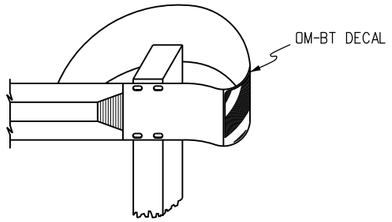
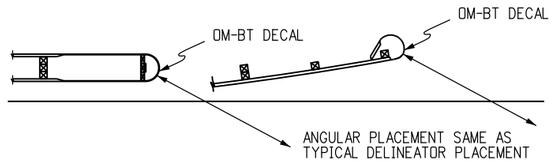
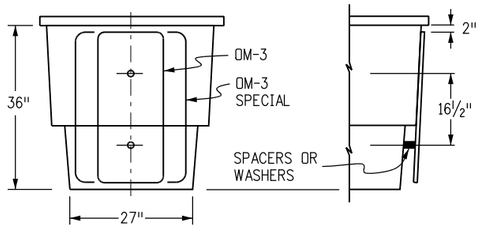


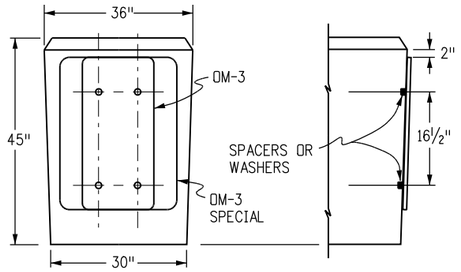
SIDE VIEW



TOP VIEWS

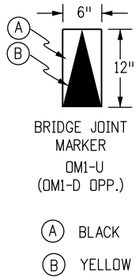
BUFFER TERMINALS (BT)





FRONT VIEWS SIDE VIEWS

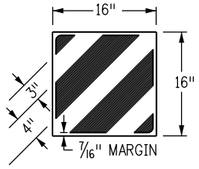
IMPACT ATTENUATOR (SAND FILLED)



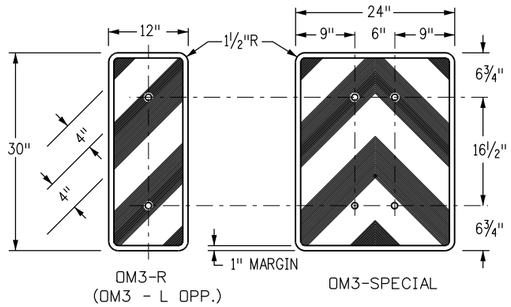
BRIDGE JOINT
MARKER
OM1-U
(OM1-D OPP.)

(A) BLACK

(B) YELLOW



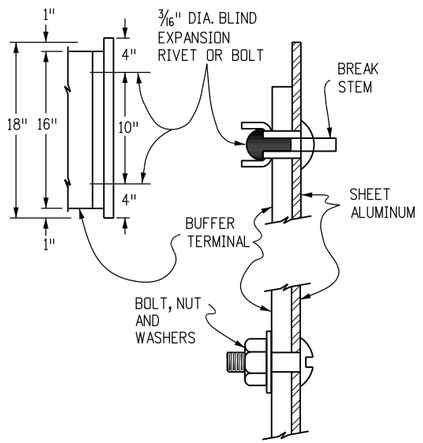
OM-BT DECAL
(OPTIONAL)



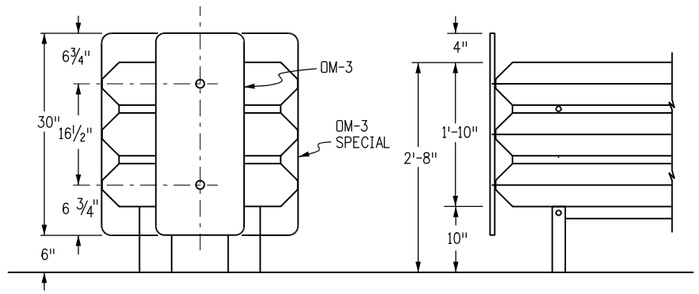
OM3-R
(OM3 - L OPP.)

OM3-SPECIAL

SUPPLEMENTAL DELINEATION DETAILS

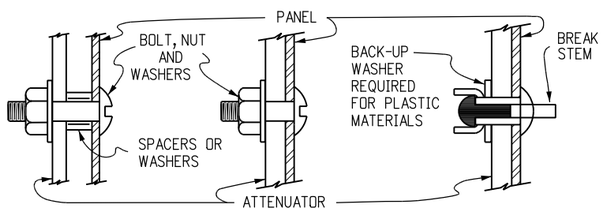


BUFFER PANEL ATTACHMENT DETAILS



FRONT VIEW SIDE VIEW

IMPACT ATTENUATOR (MODULAR)



ATTENUATOR PANEL ATTACHMENT DETAILS

SUPPLEMENTAL PANEL NOTES

1. ALL SUPPLEMENTAL DELINEATION PANELS SHALL BE SINGLE SHEET ALUMINUM, 0.080" MINIMUM THICKNESS.
2. A) PANELS SHALL BE FASTENED DIRECTLY TO THE IMPACT ATTENUATOR WITH 2 OR 4-3/16 IN. DIA. BLIND EXPANSION RIVETS, OR 2 OR 4-3/16 IN. BOLTS, NUTS AND WASHERS.
   B) EXPANSION RIVETS SHALL BE DOMED HEAD ALUMINUM WITH ALUMINUM BREAK STEM MANDREL, AND SHALL HAVE A BACK-UP WASHER WHEN USED WITH PLASTIC MATERIALS.
   C) BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
   D) SPACERS, OR SPACING WASHERS SHALL BE USED AS NECESSARY FOR SAND FILLED ATTENUATORS.
3. OM-BT DECAL (BUFFER TERMINAL OBJECT MARKER) SHALL BE PRESSURE SENSITIVE REFLECTIVE SHEETING AND SHALL BE APPLIED DIRECTLY TO THE GUARDRAIL END TREATMENT (FLARED OR NON-FLARED).
4. RETROREFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956, TYPE III. THE SHEETING SHALL BE YELLOW FOR PERMANENT INSTALLATIONS.
   OM-BT DECAL AND OM-3 PANELS SHALL HAVE YELLOW SHEETING BACKGROUND WITH STENCIL BLACK STRIPES.
   THE SHEETING FOR TEMPORARY (CONSTRUCTION ZONE) INSTALLATIONS SHALL BE AS FOLLOWS:
   OM-BT DECAL AND OM-3 PANELS SHALL HAVE ALTERNATING ORANGE AND WHITE REFLECTORIZED STRIPES.
5. SUPPLEMENTAL DELINEATION PANELS OR PRESSURE SENSITIVE RETROREFLECTIVE SHEETING DECALS SHALL BE INCLUDED IN THE COST OF THE GUARDRAIL END ANCHOR OR THE IMPACT ATTENUATOR ITEM.
6. REFERENCE SHEET S-612-1 SHEET 7 OF FOR BASE DETAIL

SUPPLEMENTAL DELINEATION FOR GUARD RAIL BUFFER TERMINALS AND IMPACT ATTENUATORS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RPR		Date:	Comments
Last Modification Date: 12/01/16 Initials: NNC	R-1	12/01/16	ADDED BRIDGE JOINT MARKER
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-612-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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DELINEATOR INSTALLATIONS

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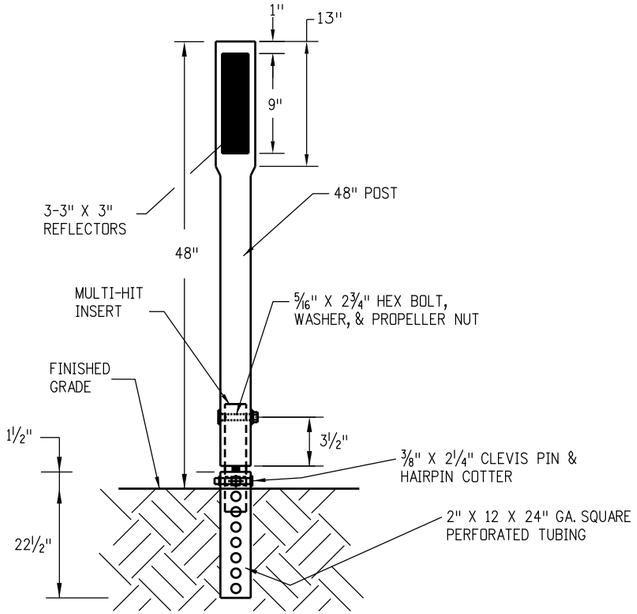
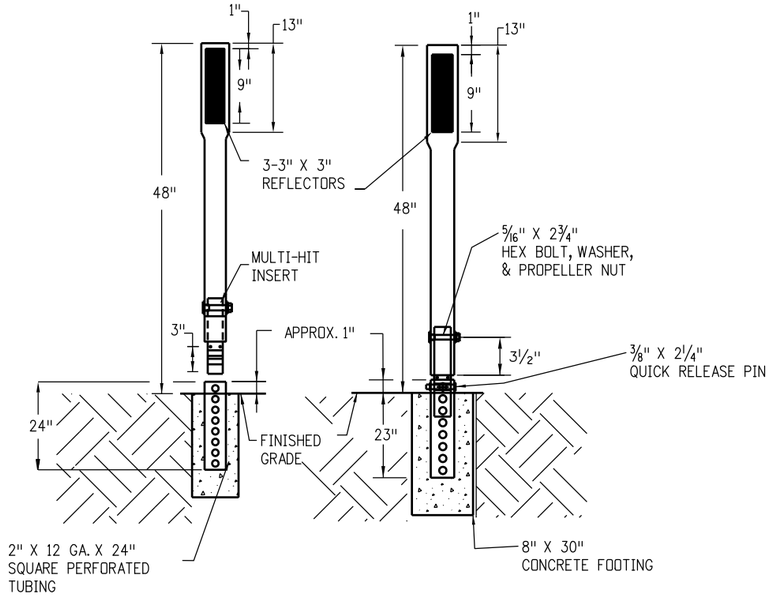
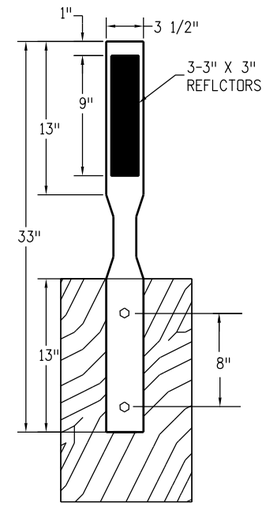
STANDARD PLAN NO.
S-612-1
Sheet No. 6 of 7



TYPICAL CONDITIONS



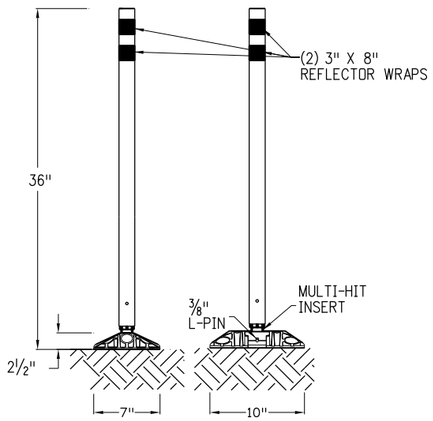
SOFT SOIL CONDITIONS

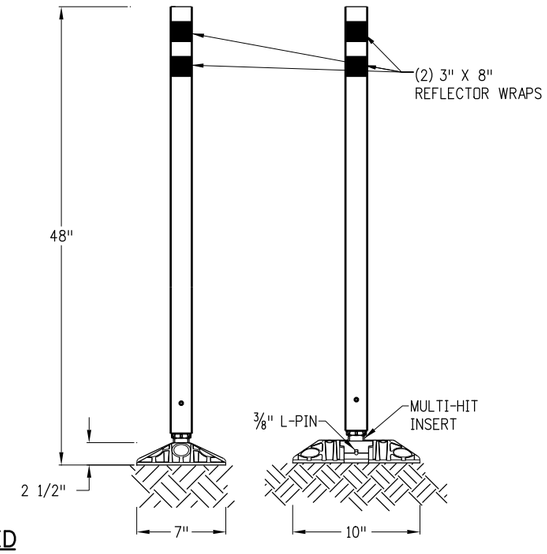


POST MOUNTED

GUARDRAIL MOUNTED

DRIVEABLE METHOD





SURFACE MOUNTED

GENERAL NOTES

1. FLEXIBLE,33", IMPACT RESISTANT, DELINEATOR POSTS, COMPRISED OF RUBBER COMPOSITE, INCLUDING, 80% BY VOLUME, POST COMSUMER RECYLED HDPE, WITH AN INTERSTATE GREEN, PREMIUM U.V. INHIBITED, CO-EXTRUDED HDTP SHELL.
2. THE TOP OF TUBULAR POSTS SHALL BE PERMANENTLY CLOSED TO PREVENT MOISTURE OR DEBRIS FROM ENTERING.
3. THE SIDE OF THE POST FACING TRAFFIC, UPON WHICH THE DELINEATOR IS TO BE MOUNTED. SHALL HAVE A FLAT SURFACE WITH MINIMUM DIMENSIONS OF 3.25 INCHES IN WIDTH BY 13 INCHES IN LENGTH. THE TEXTURE OF THE PROJECTED SURFACE SHALL BE SMOOTH AND SUITABLE FOR THE ADHERENCE OF REFLECTIVE SHEETING WITHOUT PREPARATION OTHER THAN WIPING WITH A CLEAN CLOTH DAMPENED WITH MINERAL SPIRITS TO REMOVE OIL-TYPE CONTAMINANTS.
4. THE BOTTOM OF THE POST SHALL HAVE A MINIMUM 13 INCH LENGTH FLAT MOUNTING SURFACE WITH MINIMUM DIMENSION OF 3 1/4 INCHES IN WIDTH.
5. THE WIDTH OF THE POST AT ANY POINT (EXCLUDING THE BASE, IF ANY) SHALL BE A MAXIMUM OF 4 1/8 INCHES.
6. THE OUTSIDE DIAMETER OF THE TUBULAR POST SHALL BE A MAXIMUM OF 2 3/8 INCHES.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: RPR	Date:	Comments
Last Modification Date: 12/01/2016	Initials: RPR	12/01/2016	REMOVED "SHURFLEX" FROM DETAIL AND UPDATED "INTERSTATE GREEN" TO NOTE 1
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-612-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

R-1

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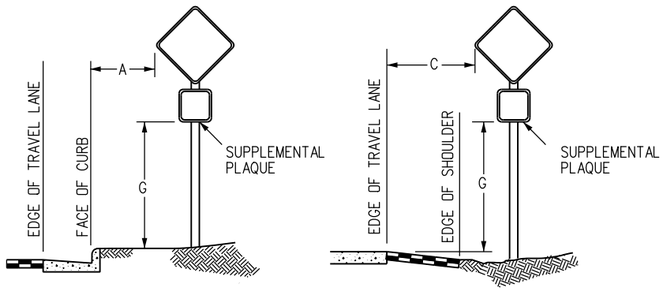
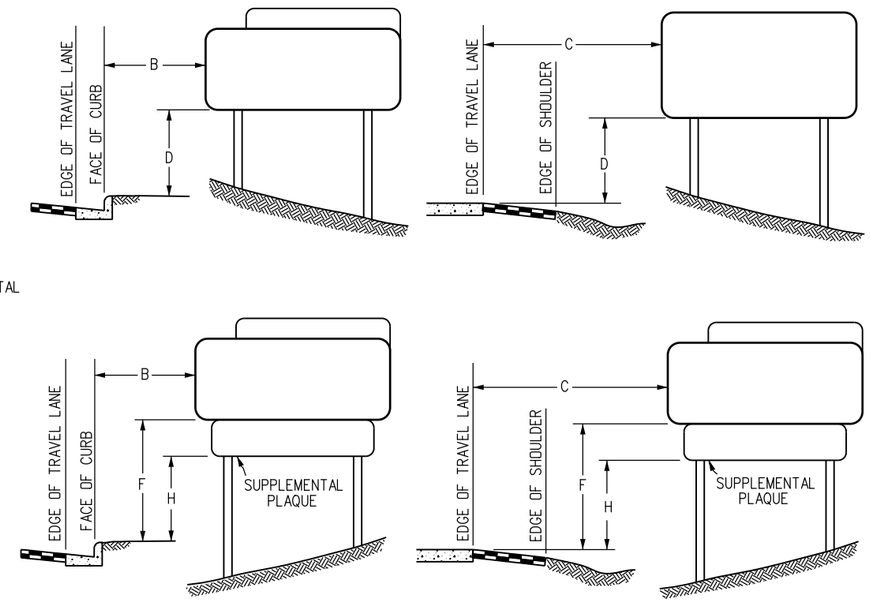
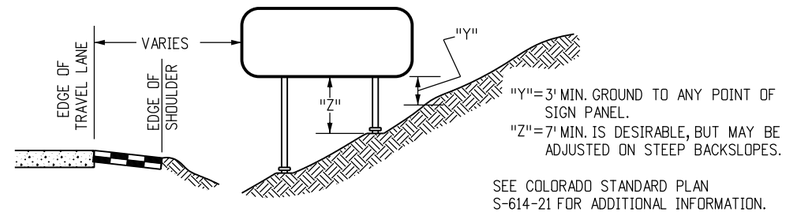


WARNING SIGN PLACEMENT



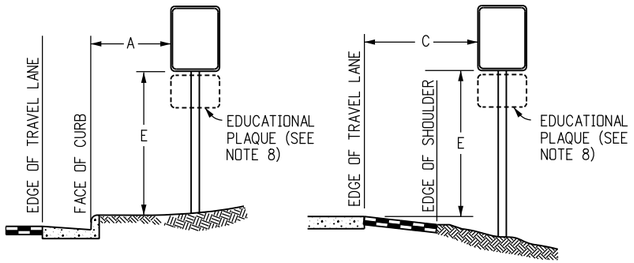
CLASS III SIGN PLACEMENT



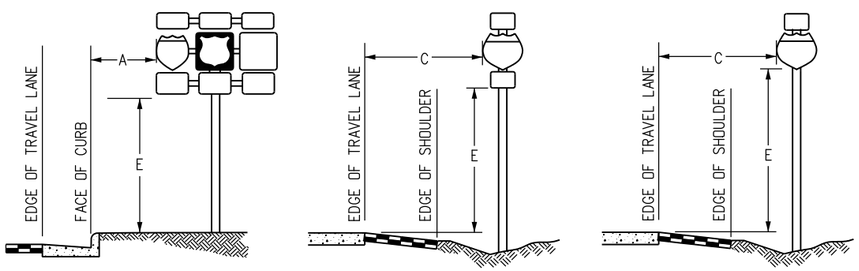
CLASS III SIGNS, PANEL GROUND CLEARANCE

GENERAL NOTES

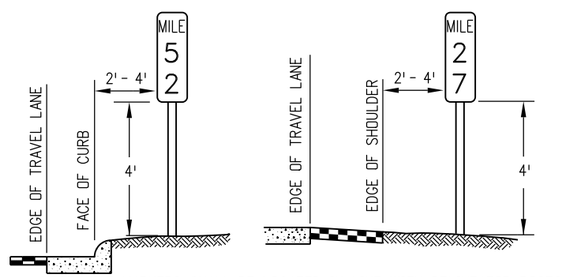
1. THE ENGINEER WILL ESTABLISH GRADES AND LOCATIONS FOR ALL SIGN POSTS IN ACCORDANCE WITH DETAILS SHOWN ON THE PLANS.
2. SPECIAL CARE SHALL BE TAKEN IN SIGN LOCATION TO ENSURE AN UNOBSTRUCTED VIEW OF EACH SIGN.
3. MINIMUM POST EMBEDMENT SHALL BE 3 FT. FOR U-2 POSTS AND 4 IN. X 4 IN. TIMBER POSTS, AND 5 FT. FOR 6 IN. X 6 IN. TIMBER POSTS. FOR FOOTING DEPTH SEE THE APPLICABLE STANDARD.
4. IF A SHOULDER IS WIDER THAN 6 FEET, THE MINIMUM LATERAL OFFSET DISTANCE SHOULD BE 6 FEET FROM EDGE OF SHOULDER, EXCEPT FOR MILE MARKER SIGNS. SEE FIGURE 2A-2(B) OF THE 2009 MUTCD.
5. NORMAL LATERAL PLACEMENT IS MEASURED FROM THE EDGE OF TRAVEL LANE.
6. IN URBAN AREAS, A LATERAL CLEARANCE OF 1 FT. FROM THE CURB FACE IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
7. TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 7, OR 8 FEET. OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
8. "EDUCATIONAL PLAQUES" FOR SYMBOL SIGNS WILL NOT BE CONSIDERED WHEN DETERMINING VERTICAL PLACEMENT. FOR INFORMATION OF EDUCATIONAL PLAQUE, SEE PAGE 3 OF THE 2012 CDOT GUIDE SIGNING POLICIES & PROCEDURES, AND SECTION 2M.06 OF THE 2009 MUTCD.
9. WHEN LATERAL PLACEMENT IS 30 FT. OR MORE FOR SIGNS WITHOUT A SUPPLEMENTAL PLAQUE, VERTICAL PLACEMENT D MAY BE REDUCED TO 5 FT. WHEN LATERAL PLACEMENT IS 30 FT. OR MORE, FOR SIGNS WITH A SUPPLEMENTAL PANEL, VERTICAL PLACEMENT E DOES NOT APPLY - USE ONLY VERTICAL PLACEMENT H.
10. NORMAL ANGULAR PLACEMENT IS 0 DEG. SIGNS CLOSER THAN 30 FT. SHOULD BE TURNED SLIGHTLY AWAY TO MINIMIZE SPECULAR REFLECTION. SIGNS PLACED 30 FT. OR MORE SHOULD GENERALLY BE TURNED TOWARD THE ROAD.
11. THE EXIT PANEL IS MOUNTED ON THE RIGHT HAND SIDE FOR RIGHT HAND EXITS AND THE LEFT SIDE FOR LEFT HAND EXITS.
12. POST SHALL BE INSTALLED PLUMB, VERTICAL DEVIATION SHALL NOT EXCEED ½ IN. IN 10 FT.
13. ON ALL TWO-LANE, UNDIVIDED HIGHWAYS, THE MILE MARKER AND POST SHALL BE INSTALLED ON THE RIGHT SHOULDER IN THE ASCENDING DIRECTION, WITH THE MILE MARKER PANELS DISPLAYED ON THE FRONT AND BACK SIDE OF THE POST.
14. ON ALL UNDIVIDED MULTI-LANE AND DIVIDED HIGHWAYS, AND INTERSTATES, THE MILE MARKER AND POST SHALL BE INSTALLED ON THE OUTSIDE SHOULDER (OR SIDEWALK IF APPLICABLE) IN BOTH DIRECTIONS OF TRAVEL.
15. VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1 TO 1½ IN., TYPICAL.



REGULATORY, RECREATIONAL AND CULTURAL INFORMATION SIGN PLACEMENT



ROUTE MARKER ASSEMBLY PLACEMENT



NOTE: MILE MARKERS SHALL BE LOCATED IN LINE WITH DELINEATOR POSTS.

MILE MARKER PLACEMENT

PLACEMENT TABLES

KEY	LATERAL PLACEMENT: ALL CLASSES OF STREETS AND HIGHWAYS	
	MINIMUM	NORMAL
A	2'-0"	15'-0"PLUS CURB
B	2'-0"	30'-0" OR MORE INCLUDES CURB
C	2'-0"	6'-0"PLUS EDGE OF 6'+ WIDE SHOULDER. IF NONE, 15'-0" FROM EDGE OF TRAVEL LANE.

KEY	VERTICAL PLACEMENT: FREEWAYS AND EXPRESSWAYS		CONVENTIONAL STREETS AND HIGHWAYS			
			URBAN		RURAL	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
D	7'-0" OR NOTE NO. 9	12'-0"	7'-0"	8'-0"	5'-0"	8'-0"
E	7'-0"	8'-0"	7'-0"	8'-0"	5'-0"	8'-0"
F	8'-0" OR NOTE NO. 9	12'-0"	8'-0"	9'-0"	5'-0"	9'-0"
G	6'-0"	7'-0"	6'-0"	7'-0"	4'-0"	7'-0"
H	5'-0"	10'-0"	6'-0"	7'-0"	4'-0"	7'-0"

Computer File Information	
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Last Modification Date:12/12/14	Initials: KEN
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-01_1of2.dgn	
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English

	Sheet Revisions	
	Date:	Comments
R-1	07/24/12	ADDED NOTES 14 AND 15 ON SHEET 1
R-2	03/07/14	SHEET 1 - UPDATED DIMENSIONS TO MUTCD STDS.
R-3	12/12/14	SHEET 1 - CORRECTED BOTTOM PANELS TO 'PLAQUES'
R-X		

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GROUND SIGN PLACEMENT

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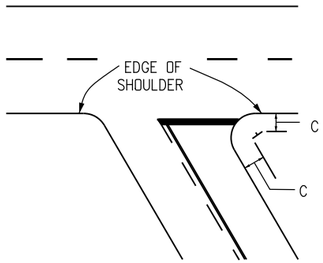
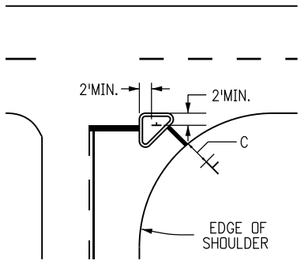
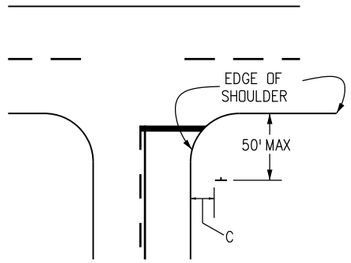


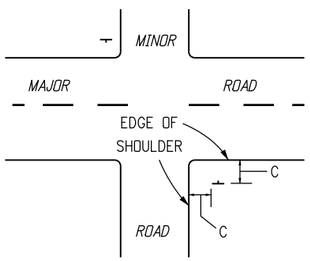
ACUTE ANGLE INTERSECTION



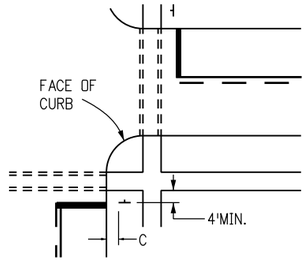
CHANNELIZED INTERSECTION



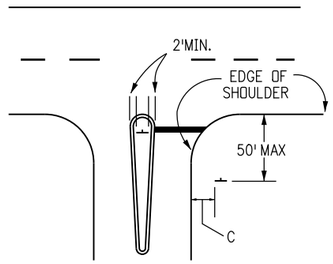
WIDE THROAT INTERSECTION



MINOR CROSSROAD

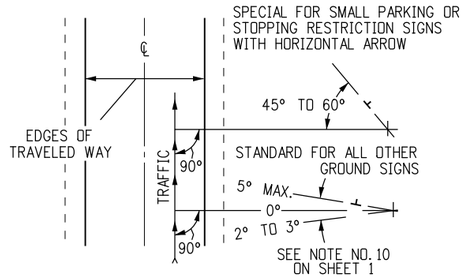


URBAN INTERSECTION



DIVISIONAL ISLAND

TYPICAL LOCATIONS-STOP SIGNS AND YIELD SIGNS



NORMAL ANGULAR PLACEMENT IS 0°. SIGNS CLOSER THAN 30 FT. SHOULD BE TURNED SLIGHTLY AWAY TO MINIMIZE SPECULAR REFLECTION. SIGNS PLACED 30' OR MORE SHOULD GENERALLY BE TURNED TOWARD THE ROAD.

ANGULAR PLACEMENT

PLACEMENT TABLES

LATERAL PLACEMENT		
KEY	ALL CLASSES OF STREETS AND HIGHWAYS	
	MINIMUM	NORMAL
*A	2'-0" & NOTE NO.4	15'-0"PLUS CURB OR SHOULDER WIDTH
*B	2'-0" & NOTE NO.4	30'-0" OR MORE INCLUDES CURB OR SHOULDER
*C	2'-0" & NOTE NO.4	6'-0"PLUS CURB OR SHOULDER WIDTH OR IF NONE 15'-0"

VERTICAL PLACEMENT (MINIMUM) (9' MAXIMUM)			
KEY	FREEWAYS AND EXPRESSWAYS	CONVENTIONAL STREETS AND HIGHWAYS	
		URBAN	RURAL
D	7'-0" OR NOTE NO. 10	7'-0"	5'-0"
E	6'-0"	7'-0"	5'-0"
F	8'-0" OR NOTE NO. 10	7'-0"	5'-0"
G	6'-0"	6'-0"	4'-0"
H	5'-0"	6'-0"	4'-0"

* SEE NOTE NO. 6 ON SHEET 1

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12	Initials: KCM		Date:	Comments
Last Modification Date:	Initials:	R-X		
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		R-X		
Drawing File Name: S-614-01_2of2.dgn		R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English	R-X		

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GROUND SIGN PLACEMENT

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STANDARD PLAN NO.
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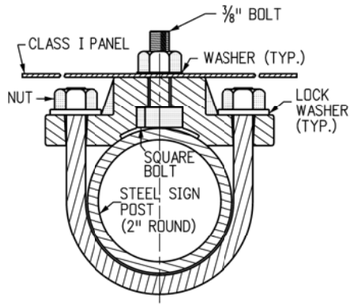
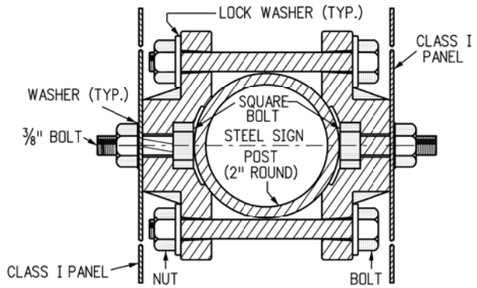
Sheet No. 2 of 2

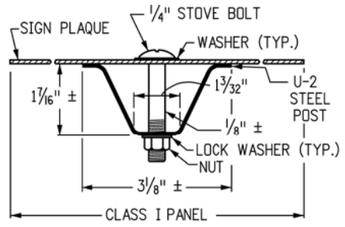
TYPICAL SINGLE BRACKET



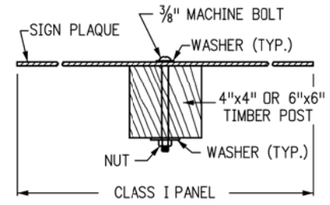
TYPICAL BACK TO BACK



TYPICAL ROUND STEEL POLE SECTION



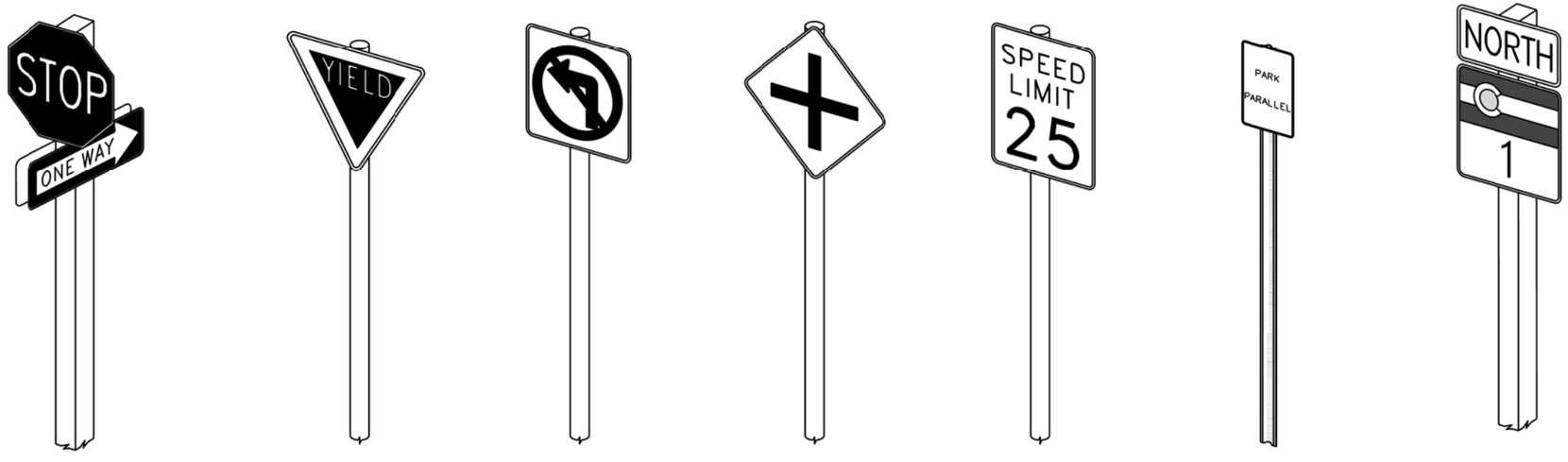
TYPICAL U-2 POST SECTION



TYPICAL TIMBER POST SECTION

GENERAL NOTES

1. CLASS I SIGN PANELS ARE ALL THOSE THAT DO NOT REQUIRE BACKING ZEES. CLASS I PANELS SHALL GENERALLY BE 0.100" MINIMUM THICKNESS SINGLE SHEET ALUMINUM, BUT 0.080" THICKNESS MAY BE USED FOR SIGN PANELS WHERE BOTH THE HORIZONTAL AND VERTICAL DIMENSIONS ARE LESS THAN 36 IN.
2. CLASS I SIGN PANELS SHALL BE FASTENED TO THE U-2 POST WITH 2-1/4 IN. STOVE BOLTS AND TO TIMBER POSTS WITH 2-3/8 IN. MACHINE BOLTS. SEE STANDARD PLANS S-614-20 AND S-614-22 FOR EXCEPTIONS.
3. A WASHER SHALL BE PLACED BETWEEN THE BOLT HEAD AND THE FACE OF THE SIGN PANEL. A 1½ IN. DIA. WASHER SHALL BE PLACED UNDER THE NUT ON THE BACK OF THE TIMBER POST.
4. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
5. ALL SIGNS SHALL BE FABRICATED USING RETROREFLECTIVE SHEETING CONFORMING TO ASTM D4956. THE TYPE SHALL BE AS DESCRIBED IN THE STANDARD SPECIFICATIONS AND/OR AS SHOWN ON THE PLANS.
6. FOR SIGN PLACEMENT SEE STANDARD PLAN S-614-1.
7. U-2 POSTS MAY ONLY BE USED FOR DELINEATORS, MILE MARKERS AND STRUCTURE NUMBER PLAQUES. "U" SHAPE STEEL POSTS SHALL BE A UNIFORM FLANGED CHANNEL SECTION MADE FROM HOT ROLLED STRUCTURAL STEEL, RE-ROLLED RAIL STEEL, OR NEW BILLET STEEL HAVING A MINIMUM YIELD STRENGTH OF AT LEAST 30,000 PSI, AND A MINIMUM TENSILE STRENGTH OF AT LEAST 50,000 PSI. U" SHAPE POSTS SHALL WEIGH 2 LBS/FT, EXCEPT THAT A MILL TOLERANCE OF MINUS 3½% OF THE WEIGHT OF ANY ONE POST WILL BE ALLOWED. "U" SHAPE POSTS SHALL HAVE 5/16 IN. HOLES DRILLED OR PUNCHED ON 1IN. OR 2 IN. CENTERS FOR THE TOP 4 FEET OF THE POST AS A MINIMUM, WITH THE FIRST HOLE 1½ IN. FROM THE TOP OF THE POST. COLOR OF POSTS SHALL BE INTERSTATE GREEN.
8. VERTICAL SPACING BETWEEN PANELS ON THE SAME POST SHALL BE 1 IN. TO 1½ IN.
9. TIMBER SIGN POSTS MAY ONLY BE USED FOR TEMPORARY SIGNAGE DURING CONSTRCTION. TUBULAR STEEL SHALL BE USED FOR PERMANENT INSTALLATIONS.



TYPICAL CLASS I GROUND SIGNS

Computer File Information		Sheet Revisions	
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Last Modification Date: 06/24/2016 Initials: RRR	(R-1)	6/24/16	ADD NOTE 9
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-X)		
Drawing File Name: S-614-02_1of1.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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CLASS I SIGNS

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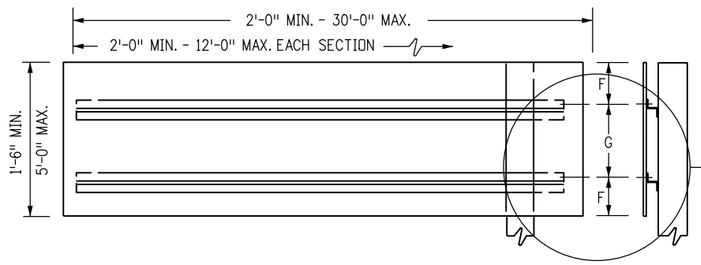
STANDARD PLAN NO.
S-614-2
Sheet No. 1 of 1

HORIZONTAL SECTIONS



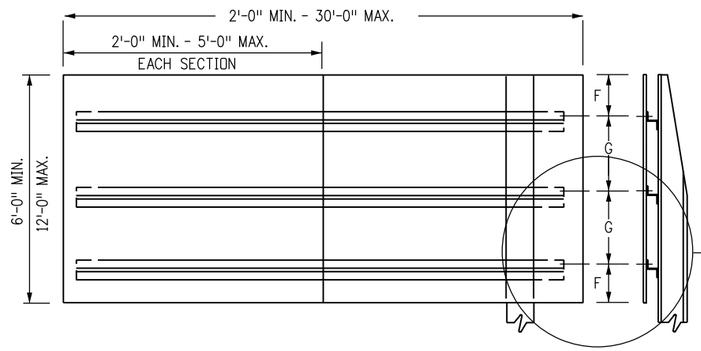
SECTIONS REQUIRED

WIDTH	*SECTIONS
2'-0" TO 12'-0"	1
12'-6" TO 24'-0"	2
24'-6" TO 30'-0"	3

*NUMBER OF SECTIONS SHALL NOT EXCEED MAXIMUM SHOWN IN TABLE

SEE TYPICAL DETAIL ON SHEET 2

VERTICAL SECTIONS



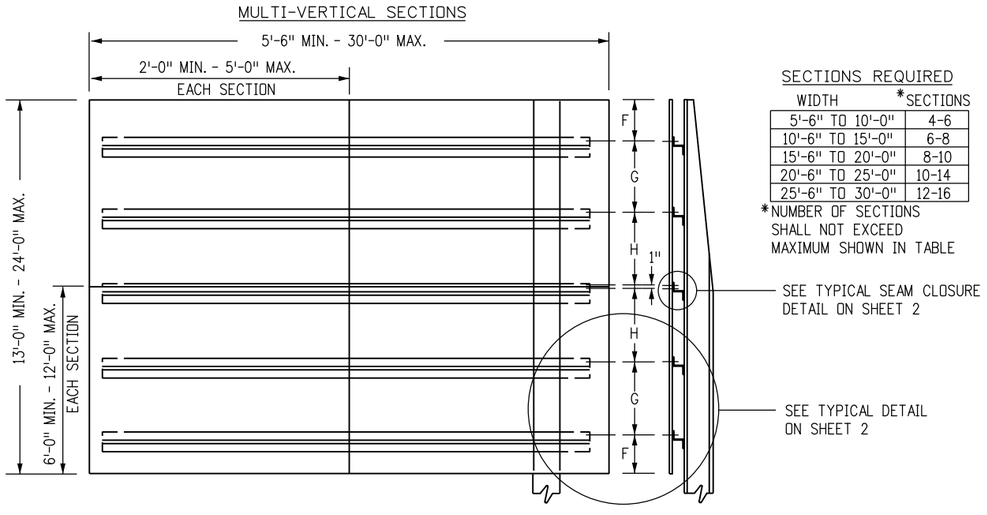
SECTIONS REQUIRED

WIDTH	*SECTIONS
2'-0" TO 5'-0"	1
5'-6" TO 10'-0"	2-3
10'-6" TO 15'-0"	3-4
15'-6" TO 20'-0"	4-5
20'-6" TO 25'-0"	5-7
25'-6" TO 30'-0"	6-8

*NUMBER OF SECTIONS SHALL NOT EXCEED MAXIMUM SHOWN IN TABLE

SEE TYPICAL DETAIL ON SHEET 2

MULTI-VERTICAL SECTIONS



SECTIONS REQUIRED

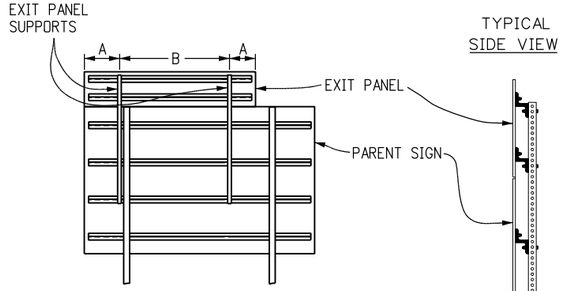
WIDTH	*SECTIONS
5'-6" TO 10'-0"	4-6
10'-6" TO 15'-0"	6-8
15'-6" TO 20'-0"	8-10
20'-6" TO 25'-0"	10-14
25'-6" TO 30'-0"	12-16

*NUMBER OF SECTIONS SHALL NOT EXCEED MAXIMUM SHOWN IN TABLE

SEE TYPICAL SEAM CLOSURE DETAIL ON SHEET 2

SEE TYPICAL DETAIL ON SHEET 2

TYPICAL PANEL ELEVATIONS



SUPPORT SPACING TABLE

EXIT PANEL WIDTH	OVERHANG "A"	SPACING "B"
7'	1'-0"	5'
8'	1'-6"	5'
9'	2'-0"	5'
10'	2'-6"	5'
11'	2'-6"	6'
12'	2'-6"	7'

TYPICAL EXIT PANEL INSTALLATION FOR GROUND SIGNS

EXIT PANEL NOTES

1. THE EXIT PANEL SHALL BE MOUNTED WITH TWO SUPPORTS. RIGHT HAND EXITS REQUIRE THE EDGE OF THE EXIT PANEL TO BE MOUNTED EVEN WITH THE RIGHT EDGE OF THE PARENT SIGN. LEFT HAND EXITS REQUIRE THE LEFT EDGE OF THE EXIT PANEL TO BE MOUNTED EVEN WITH THE LEFT EDGE OF THE PARENT SIGN.
2. THE SUPPORTS SHALL BE SQUARE STEEL TUBING A MINIMUM WIDTH OF 2-1/4" WITH 7/16" INCH HOLES PUNCHED OR DRILLED ON 1" CENTERS ALONG THE LENGTH OF EACH SIDE WHILE MAINTAINING A MINIMUM SECTION MODULUS OF 0.499 CUBIC INCHES. THE STEEL MUST HAVE A MINIMUM YIELD STRESS OF 33 KSI. ALTERNATELY, ZEE BAR MAY USED FOR THE SUPPORT MEMBERS WITH 7/8" HOLES PUNCHED WHERE NEEDED.
3. THE SUPPORTS SHALL BE FASTENED TO THE BACKING ZEE USING 3/8" BOLTS.
4. THE EXIT PANEL SUPPORT MAY BE MOVED 6" IF IT CONFLICTS WITH THE PARENT SIGN SUPPORT.
5. EXIT PANEL MOUNTING WILL BE PAID FOR AS PART OF THE CLASS III SIGN PANEL.
6. EXIT PANEL SUPPORTS SHALL BE ATTACHED TO A MINIMUM OF THREE BACKING ZEES.

GENERAL NOTES

1. CLASS III SIGN PANELS ARE ALL THOSE WHERE A SINGLE PANEL REQUIRES 3 OR MORE BACKING ZEES (THESE WILL BE SIGN PANELS THAT ARE 72 IN. OR MORE IN HEIGHT) AND ANY PANELS THAT ARE PART OF A CLASS III ASSEMBLY SUCH AS EXIT PANELS. ALL CLASS III PANELS SHALL BE 0.125 IN. MINIMUM THICKNESS SHEET ALUMINUM.
2. SEE THE APPLICABLE STANDARDS FOR SIGN PLACEMENT, FOOTING DETAILS AND POST SPACING TABLES.
3. A 3/8 IN. 90° COUNTERSUNK HUCKBOLT AND COLLAR SHALL BE USED TO FASTEN THE SIGN PANEL TO THE BACKING ZEE. A HEX-HEAD BOLT WITH NUT AND WASHERS SHALL BE USED TO FASTEN THE BACKING ZEE TO A TIMBER POST OR TO A STEEL POST.
4. A FLAT WASHER SHALL BE PLACED BETWEEN THE BOLT HEAD AND THE POST FLANGE. A LOCK WASHER SHALL BE PLACED UNDER THE NUT ON A STEEL POST OR A BACKING ZEE. A 1 1/2" DIAMETER WASHER SHALL BE PLACED UNDER THE BOLT HEAD ON A TIMBER POST.
5. ALL EXPOSED SIGN PANEL SECTION JOINTS, EXCEPT THE MULTI-VERTICAL SECTIONS HORIZONTAL SEAM, SHALL BE COVERED ON THE BACKSIDE OF THE SIGN PANEL WITH AN ALUMINUM CLOSURE STRIP. CLOSURE STRIPS SHALL BE RIVETED OR TAPED. SEE FABRICATIONS NOTES.
6. SECTIONS ILLUSTRATED BASED ON UTILIZING 12' X 5' STOCK. 4' WIDE STOCK MAY BE USED WITH APPROPRIATE ADJUSTMENT IN NUMBER OF SECTIONS.
7. ALL SIGNS SHALL BE FABRICATED USING RETROREFLECTIVE SHEETING CONFORMING TO ASTM D4956. THE TYPE SHALL BE AS DESCRIBED IN THE STANDARD SPECIFICATIONS AND/OR AS SHOWN ON THE PLANS.

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12 Initials: KCM			Date:	Comments
Last Modification Date: 12/17/14 Initials: KEN	R-1		12/17/14	SHEET 2 - ADDED TWO "TYPICAL BOTTOM PLAQUE INSTALLATION FOR GROUND SIGNS" DETAILS
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X			
Drawing File Name: S-614-04_1of3.dgn	R-X			
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X			

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CLASS III SIGNS

Issued By: Safety & Traffic Engineering Branch July 4, 2012

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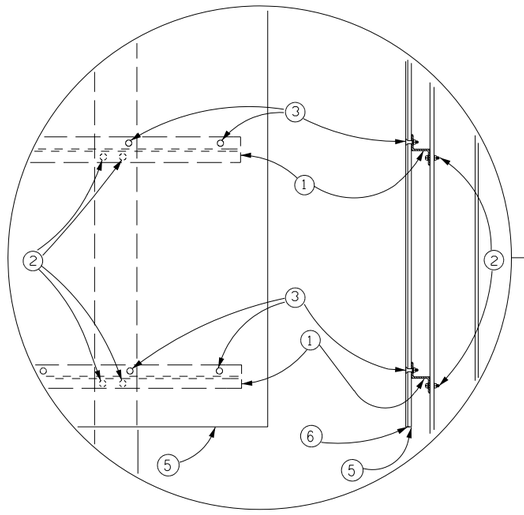
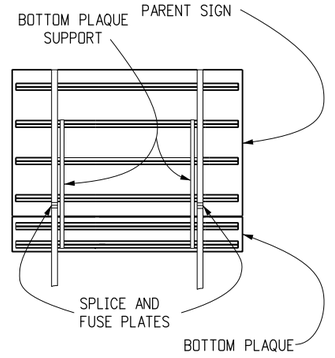
S-614-4
Sheet No. 1 of 3

FABRICATION NOTES

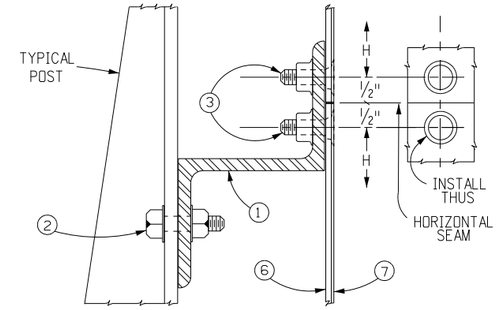
1. BACKING ZEE. SEE "ZEE SPACING TABLE" ON SHEET 3. ALUMINUM ALLOY 6061-T6. EACH ZEE TO BE PROVIDED WITH A 9/16 IN. X 2 IN. HORIZONTAL SLOT FOR EACH POST MOUNTING BOLT.
2. 3/8 IN. HEX-HEAD BOLT WITH NUT AND WASHERS; 2 PER BACKING ZEE PER POST REQUIRED. WASHERS ON POST SHALL BE 1 1/2 IN. DIA.
3. 3/8 IN. (NO. 6) 90 DEG. COUNTERSUNK HUCKBOLT WITH COLLAR.
4. 2 IN. X 0.025 IN. ALUMINUM CLOSURE STRIP RIVETED ABOVE THE TOP Z AND BELOW THE BOTTOM Z OR ALUMINUM CLOSURE STRIPS ATTACHED ABOVE, BETWEEN, AND BELOW THE ZEES WITH A VERY HIGH BOND (VHB) DOUBLE ACRYLIC FOAM TAPE, OR APPROVED EQUIVALENT. MANUFACTURER'S RECOMMENDATIONS SHALL BE ADHERED TO FOR THIS APPLICATION.
5. SHEET ALUMINUM: 0.125 IN. MINIMUM THICKNESS.
6. ADHESIVES SHALL BE CLASS I OR CLASS II ADHESIVES OF ASTM D4956.
7. BACKING ZEES SHALL EXTEND TO THE EDGE OF THE PANEL ON 6 FT., 7 FT. & 8 FT. WIDE SIGNS.



TYPICAL ELEVATION DETAIL



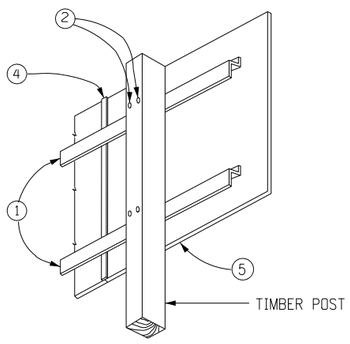
***TYPICAL BOTTOM PLAQUE INSTALLATION FOR GROUND SIGNS (FULL WIDTH PLAQUE SUPPORT)**



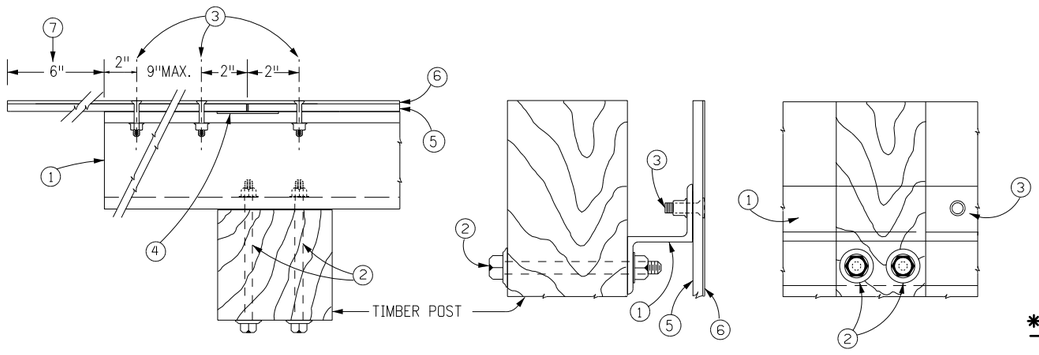
TYPICAL DETAIL SEAM CLOSURE ZEE

(MULTIPLE-VERTICAL SECTIONS, HORIZONTAL SEAMS)

* IN NO CASE SHALL ANY PORTION OF A SIGN PANEL OR PLAQUE BE ATTACHED TO A BREAKAWAY POST BELOW THE FUSE AND SPLICE PLATES.

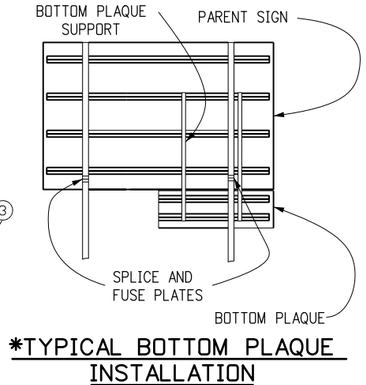


TYPICAL VIEW

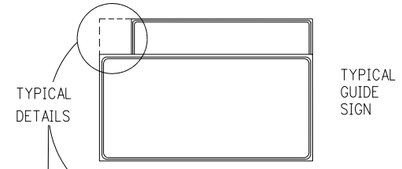


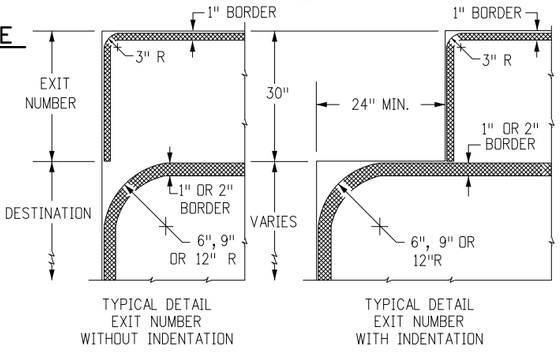
TYPICAL TIMBER POST INSTALLATION

PANEL FABRICATION AND MOUNTING DETAILS

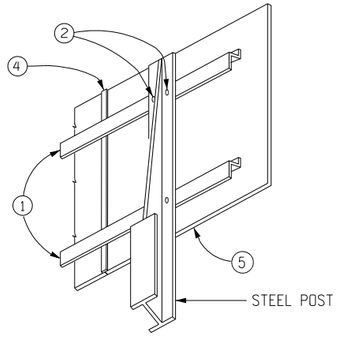


***TYPICAL BOTTOM PLAQUE INSTALLATION FOR GROUND SIGNS (PARTIAL WIDTH PLAQUE SUPPORT)**

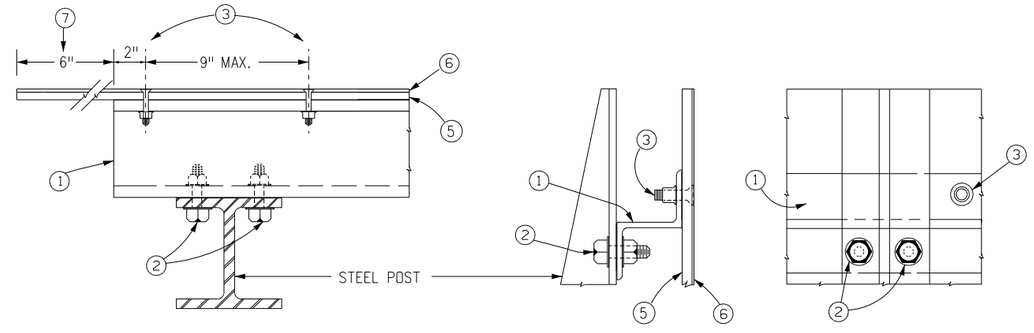




TYPICAL BORDER DETAILS WITH EXIT NUMBER



TYPICAL VIEW



TYPICAL STEEL POST INSTALLATION

PANEL FABRICATION AND MOUNTING DETAILS

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CLASS III SIGNS

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POST SPACING TABLE
FOR SHEET ALUMINUM SIGN PANELS

WIDTH OF SIGN	NO. OF POSTS	OVERHANG "A"	POST SPACING "B"
1'-6"	1	0'-9"	
2'-0"	1	1'-0"	
2'-6"	1	1'-3"	
3'-0"	1	1'-6"	
4'-0"	1	2'-0"	
5'-0"	1	2'-6"	
6'-0"	2	0'-3"	5'-6"
7'-0"	2	0'-3"	6'-6"
8'-0"	2	0'-3"	7'-6"
9'-0"	2	0'-9"	7'-6"
10'-0"	2	1'-3"	7'-6"
11'-0"	2	1'-9"	7'-6"
12'-0"	2	2'-3"	7'-6"
13'-0"	2	2'-6"	8'-0"
14'-0"	2	2'-6"	9'-0"
15'-0"	2	3'-0"	9'-0"
16'-0"	2	3'-3"	9'-6"
17'-0"	2	3'-3"	10'-6"
18'-0"	2	3'-6"	11'-0"
19'-0"	2	3'-9"	11'-6"
20'-0"	2	4'-0"	12'-0"
21'-0"	3	2'-6"	8'-0"
22'-0"	3	3'-0"	8'-0"
23'-0"	3	3'-6"	8'-0"
24'-0"	3	3'-8"	8'-4"
25'-0"	3	4'-0"	8'-6"
26'-0"	3	4'-0"	9'-0"
27'-0"	3	4'-0"	9'-6"
28'-0"	3	4'-0"	10'-0"
29'-0"	3	4'-0"	10'-6"
30'-0"	3	4'-0"	11'-0"

(1), (2)
(1), (2)
(1)

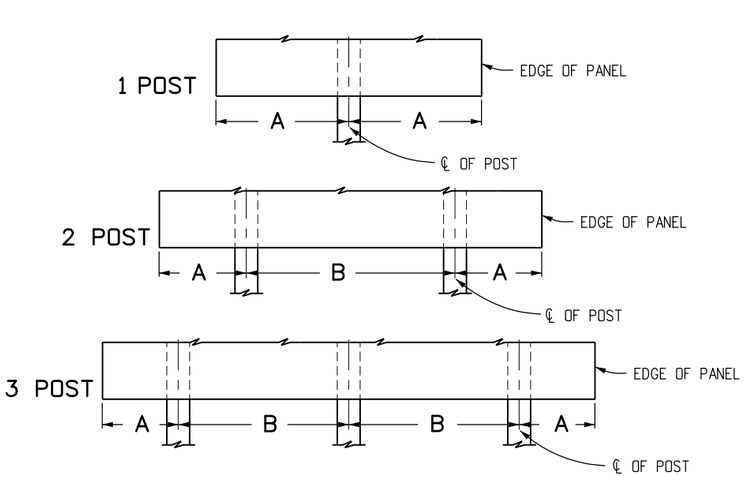
(1) BACKING ZEE SHALL EXTEND TO THE EDGE OF THE PANEL, EXCEPT FOR EXIT PANELS ATTACHED BY SQUARE STEEL TUBING.

(2) 6" X 6" TIMBER POSTS WILL NOT BE USED FOR THESE SIZES OF PANEL.

ZEE SPACING TABLE
FOR 3" X $2^{11}/_{16}$ X 2.33 ALUMINUM BACKING ZEES

SIGN PANEL HEIGHT	NUMBER OF ZEES	OVERHANG "F"	SPACING "G"	SIGN PANEL HEIGHT	NUMBER OF ZEES	OVERHANG "F"	SPACING "G"	SPACING "H"
1'-6"	2	0'-4"	0'-10"	13'-0"	7	1'-0"	1'-10"	1'-9½"
2'-0"	2	0'-5"	1'-2"	14'-0"	7	0'-6"	2'-2"	2'-1½"
2'-6"	2	0'-6"	1'-6"	15'-0"	7	1'-0"	2'-2"	2'-1½"
3'-0"	2	0'-7"	1'-10"	16'-0"	7	0'-6"	2'-6"	2'-5½"
4'-0"	2	0'-11"	2'-2"	17'-0"	7	1'-0"	2'-6"	2'-5½"
5'-0"	2	1'-3"	2'-6"	18'-0"	9	0'-4"	2'-2"	2'-1½"
6'-0"	3	0'-10"	2'-2"	19'-0"	9	0'-10"	2'-2"	2'-1½"
7'-0"	3	1'-0"	2'-6"	20'-0"	9	1'-4"	2'-2"	2'-1½"
8'-0"	4	0'-9"	2'-2"	21'-0"	9	0'-6"	2'-6"	2'-5½"
9'-0"	4	1'-3"	2'-2"	22'-0"	9	1'-0"	2'-6"	2'-5½"
10'-0"	4	1'-3"	2'-6"	23'-0"	11	0'-8"	2'-2"	2'-1½"
11'-0"	5	1'-2"	2'-2"	24'-0"	11	1'-2"	2'-2"	2'-1½"
12'-0"	5	1'-0"	2'-6"					

NOTES: - FOR F, G & H. SEE DETAILS ON SHEET 1.



TYPICAL POST SPACING

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Last Modification Date: Initials:	R-X		
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CLASS III SIGNS

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STANDARD PLAN NO.
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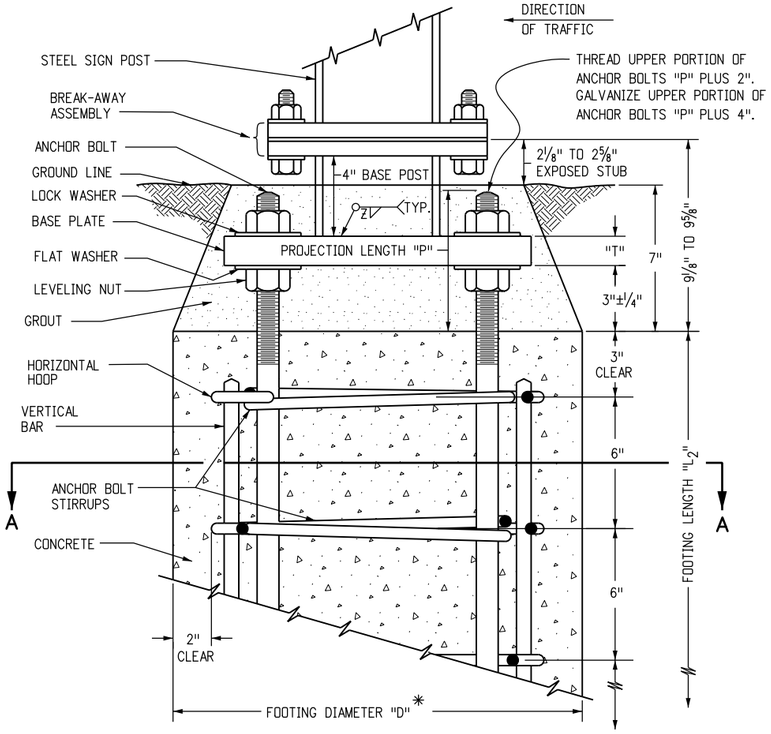
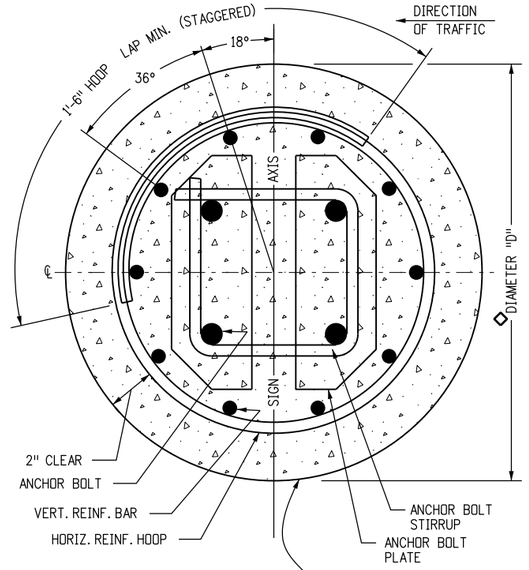
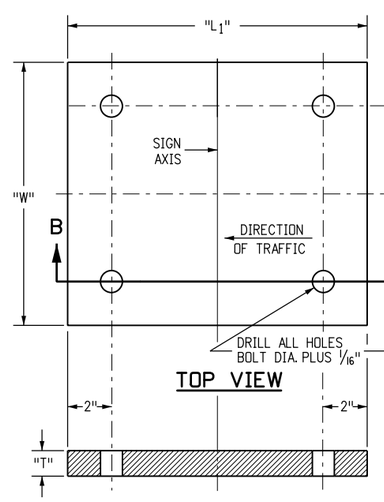


TYPICAL CONCRETE FOOTING ASSEMBLY



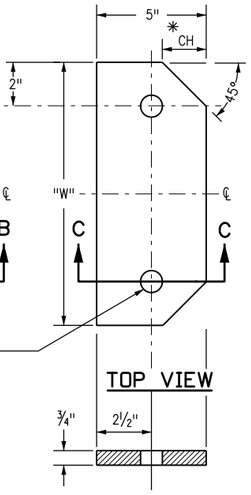
EXCAVATION PROCEDURE
DRILL TO O.D. OF FOOTING NEAT LINE AND TO DEPTH SHOWN, AND IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR DRILLED CAISSONS. (FOOTINGS SHALL BE CAST IN PLACE AGAINST UNDISTURBED MATERIAL.)

SECTION A-A



TOP VIEW

SECTION B-B



TOP VIEW

SECTION C-C

* OUTSIDE CORNERS OF BOLT PLATES CHAMFERED AS SHOWN FOR FOOTING TYPES 1-4 ONLY. PLATES FOR TYPES 5-7 HAVE SQUARE CORNERS.

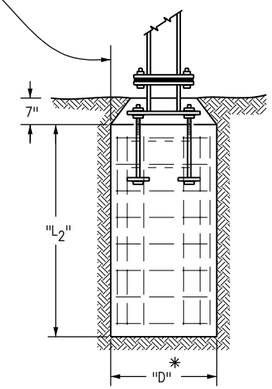
BASE PLATE TYPICAL DETAILS

BOLT PLATE TYPICAL DETAILS

CONCRETE FOOTING TABLE

POST BASE STRUCTURAL DATA										FOOTING STRUCTURAL DATA				
SIZE	MAXIMUM ALLOWABLE MOMENT	POST TO BASE ℄ WELD Z	BASE PLATE			ANCHOR COMPONENTS				SIZE			REINFORCING	
			"L1"	"W"	"T"	ANCHOR BOLTS	BOLT PLATES	"CH"	STIRRUPS	"P"	TYPE	◇ "D"	"L2"	VERT. BAR	HORIZ. HOOP
W 12X26	46.5 KIP FT.	⅜" FILLET	20¼"	14"	1⅜"	4-1¼"ØX2'-6"	2-5"X¾"X14"	N/A	2-½"Ø	6⅝"	7	36"	10'	10-#9X9'-6"	20-#4@6"
W 10X26	38.9 KIP FT.	⅜" FILLET	17"	14"	1¼"	4-1"ØX2'-6"	2-5"X¾"X14"	N/A	2-½"Ø	6¼"	6	30"	9'	10-#9X8'-6"	18-#4@6"
W 10X22	32.3 KIP FT.	⅜" FILLET	16¼"	14"	1¼"	4-1"ØX2'-6"	2-5"X¾"X14"	N/A	2-½"Ø	6¼"	5	30"	8'	10-#8X7'-6"	16-#4@6"
W 8X21	24.4 KIP FT.	⅜" FILLET	15"	13¼"	1⅛"	4-⅞"ØX2'-0"	2-5"X¾"X13¼"	2-½"	2-½"Ø	6"	4	24"	7'	10-#8X6'-6"	14-#4@6"
W 8X18	20.4 KIP FT.	⅜" FILLET	14"	13¼"	1⅛"	4-⅞"ØX2'-0"	2-5"X¾"X13¼"	2-½"	2-½"Ø	6"	3	24"	6'	10-#7X5'-6"	12-#4@6"
W 6X15	13.8 KIP FT.	⅜" FILLET	14"	12¼"	1"	4-¾"ØX1'-6"	2-5"X¾"X12¼"	2"	2-½"Ø	5¾"	2	24"	5'	10-#6X4'-6"	10-#4@6"
W 6X12	8.3 KIP FT.	¼" FILLET	13"	12"	⅞"	4-¾"ØX1'-6"	2-5"X¾"X12"	2"	2-½"Ø	5⅝"	1	24"	4'	10-#5X3'-6"	8-#4@6"
6X6 TIMBER	5.0 KIP FT.	TIMBER POSTS SHALL BE SET IN DRILLED OR EXCAVATED HOLES--DEPTH SHALL BE 5 FT. FOR 6X6 POSTS AND 3 FT. FOR 4X4 POSTS UNLESS OTHERWISE NOTED ON THE TABULATION OF SIGNS IN THE PLANS. POSTS SHALL BE PLACED PLUMB, BACKFILLED WITH EXCAVATED MATERIALS, AND THOROUGHLY TAMPED INTO PLACE.													
4X4 TIMBER	1.4 KIP FT.														

* FOR MULTI-DIRECTIONAL BREAKAWAY ONLY: TYPE 1 THRU TYPE 6 FOOTINGS REQUIRE A 6 IN. INCREASE IN DIAMETER ("D") TO ACCOMMODATE ANCHORS SHOWN ON THE DETAILS INCLUDED IN THE PLANS. ALSO, HORIZONTAL REINFORCING HOOP DIAMETER WILL BE INCREASED TO MAINTAIN A 2 IN. CLEARANCE FROM THE FOOTING SIDES. VERTICAL BARS AND OTHER STRUCTURAL DATA REMAIN THE SAME. TYPE 7 FOOTINGS REQUIRE NO CHANGES.



TYPICAL FOOTING INSTALLATION

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Drawing File Name: S-614-06_1of2.dgn	R-X		
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CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS

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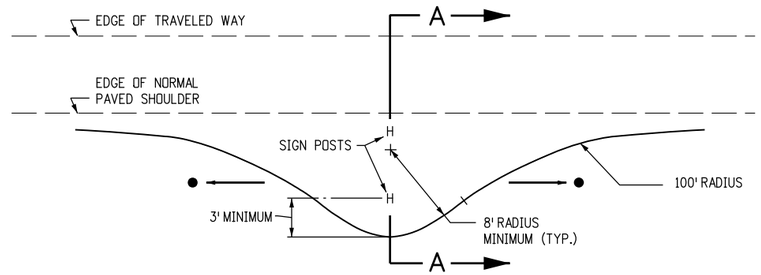
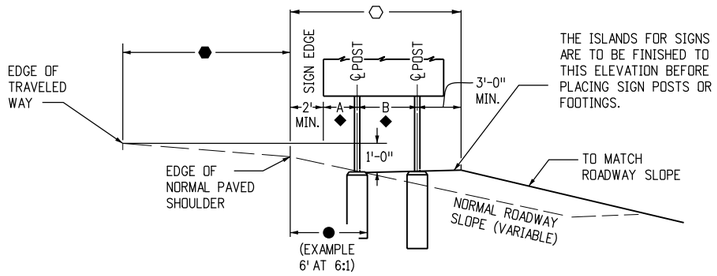
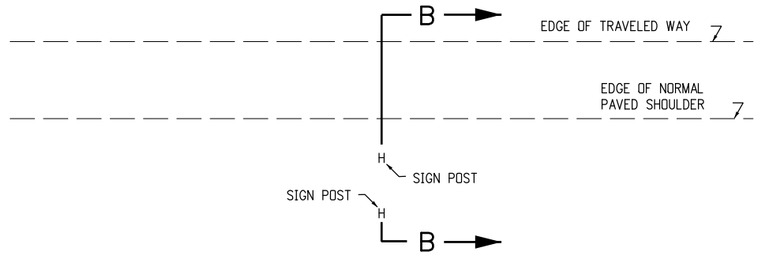
S-614-6
Sheet No. 1 of 2



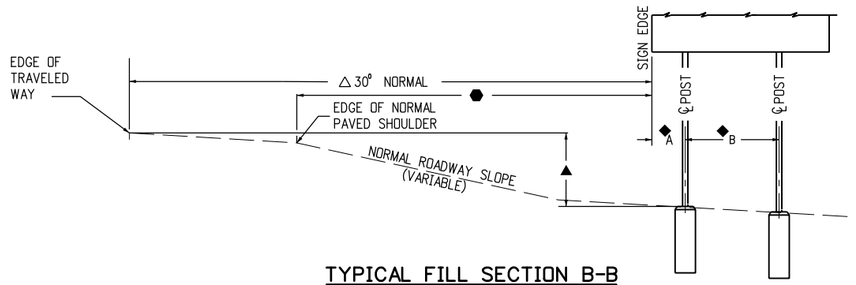
TYPICAL SIGN ISLAND PLAN



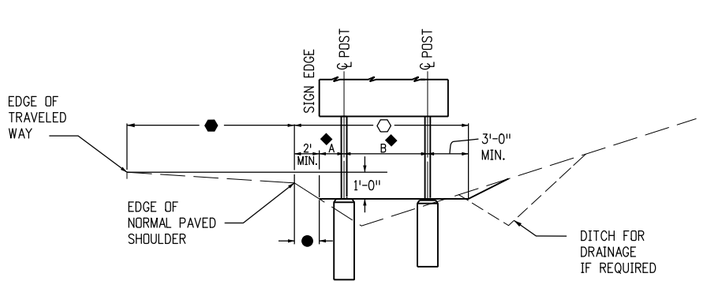
TYPICAL FILL SECTION A-A



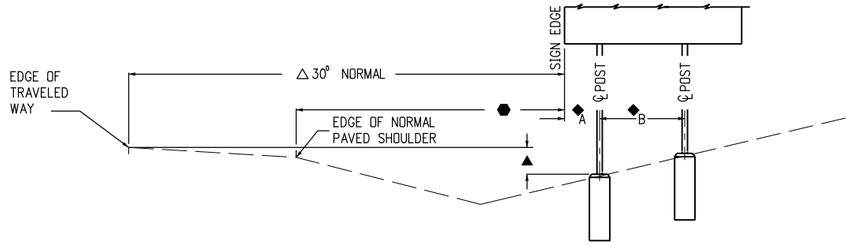
NORMAL CLEARANCE PLAN



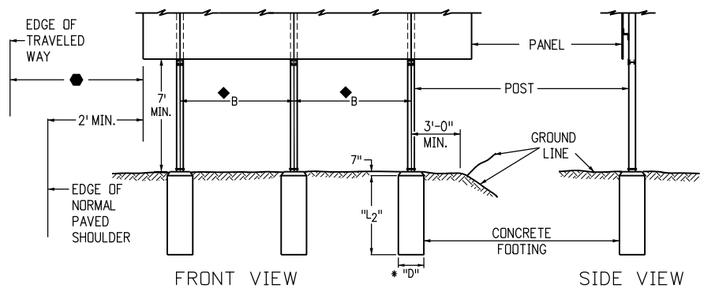
TYPICAL FILL SECTION B-B



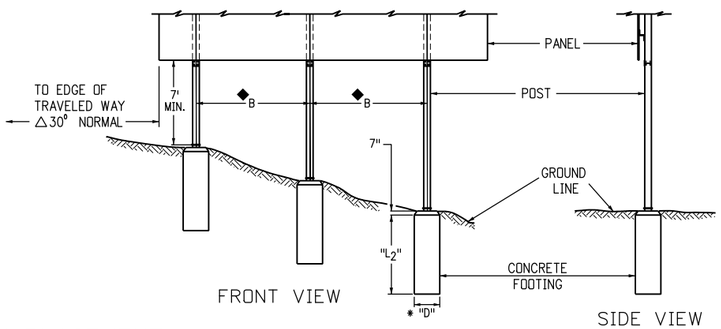
TYPICAL CUT SECTION A-A



TYPICAL CUT SECTION B-B



TYPICAL SIGN ISLAND ELEVATIONS



DETAILS OF SIGN PLACEMENT

TYPICAL ELEVATIONS

GENERAL NOTES

1. ALL CONCRETE IS TO BE CLASS "BZ" AIR ENTRAINED. GROUT SHALL CONFORM TO "JOINT MORTAR".
2. USE AASHTO M270 (ASTM A709) GRADE 36 STEEL FOR BASE PLATES AND BOLT PLATES. USE ASTM-A307 STEEL FOR ANCHOR BOLTS.
3. USE GRADE 60 FOR REINFORCING STEEL VERTICAL BARS, HORIZONTAL HOOPS, AND ANCHOR BOLT STIRRUPS.
4. FOR ALL STEEL WORK ABOVE THE BASE PLATE, AND FOR ANGULAR PLACEMENT OF SIGNS, SEE APPLICABLE STANDARDS INCLUDED IN THE PLANS.
5. FOR ADDITIONAL INFORMATION, REFER TO "TABULATION OF SIGNS" AND "CROSS SECTIONS FOR CLASS III SIGNS" INCLUDED IN THE PLANS.
6. ◆ FOR "A" AND "B" DIMENSIONS. SEE COLORADO STANDARD PLAN S-614-4.
7. ● THE SIGN ISLAND SIDE SLOPE PARALLEL TO THE ROADWAY SHALL BE 6:1 OR FLATTER. sEE TYPICAL SECTIONS.
8. ⬡ THE SIGN ISLAND SIDE SLOPE PARALLEL TO THE ROADWAY SHALL BE 6:1 OR FLATTER. sEE TYPICAL SECTIONS.
9. ⬢ VARIABLE DIMENSIONS. SEE CROSS SECTIONS.
10. ▲ VARIABLE FOOTING ELEVATIONS. SEE CROSS SECTIONS FOR PLACEMENT.
11. △ THE LATERAL PLACEMENT MAY BE REDUCED TO A MINIMUM OF 2 FT. FROM THE EDGE OF NORMAL PAVED SHOULDER TO FIT FIELD CONDITIONS WHEN 30 FT. FROM THE EDGE OF THE TRAVELED WAY IS NOT FEASIBLE. SEE THE CROSS SECTIONS AND/OR TYPICAL GROUND SIGN PLACEMENT STANDARD.
12. EMBANKMENT FOR SIGN ISLANDS IS TO BE COMPACTED AS REQUIRED UNDER ITEM 203 OF THE STANDARD SPECIFICATIONS.
13. FOR ANGULAR PLACEMENT OF SIGNS, SEE COLORADO STANDARD PLAN S-614-1.
14. THE 4-INCH "BASE POST" AND LOWER "BREAK-AWAY PLATE" SHALL BE PAID FOR AS PART OF THE FOOTING.

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12	Initials: KCM		Date:	Comments
Last Modification Date: 09/16/13	Initials: NNC	R-1	8/26/2013	REVISED NOTE 1
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		R-X		
Drawing File Name: S-614-06_2of2.dgn		R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		R-X		

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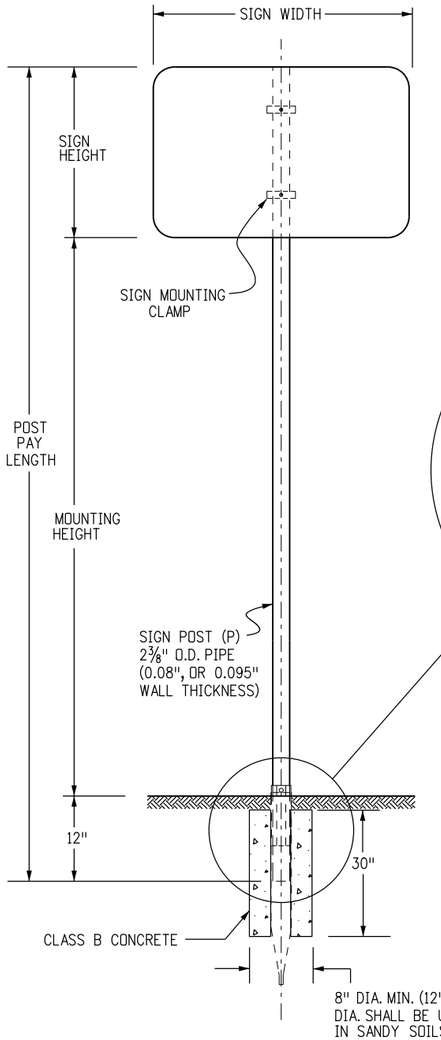
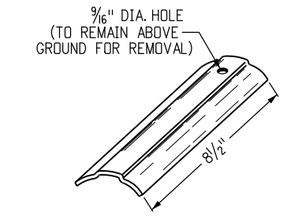
CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS

Issued By: Safety & Traffic Engineering Branch July 4, 2012

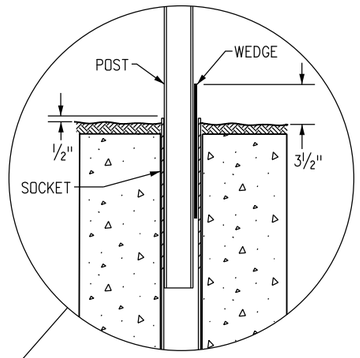
STANDARD PLAN NO.
S-614-6
Sheet No. 2 of 2

TUBULAR STEEL POSTS
(SOCKET SYSTEM) (FOR USE WITH ALL P-POST INSTALLATIONS)
(SEE SHEET 2 FOR P1 AND P2 POST INSTALLATIONS)

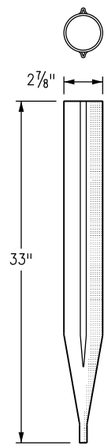




WEDGE
11 GA. GALVANIZED STEEL
ASTM A-526 G-90



NOTE: WEDGE SHALL BE INSTALLED ON SIDE OF POST FACING TRAFFIC.



TUBULAR CONCRETE FOOTING
12 GA. GALVANIZED
STEEL ASTM - 787

POST NOTES

THE POST MAY BE PRE-PUNCHED WITH ⅜" DIA. HOLES AND THE SIGN MOUNTED DIRECTLY TO THE POST, OR AN APPROVED MOUNTING CLAMP MAY BE USED TO MOUNT THE SIGN TO THE POST. IF THE POST IS PRE-PUNCHED, THE HOLES SHALL BE SPACED THE FOLLOWING DISTANCES FROM THE TOP:

1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39", AND 45"

SIGNPOST SELECTION GUIDE (90 MPH WIND LOAD DESIGN)
(FOR SOCKET SYSTEM AND SLIPBASE INSTALLATIONS USING P, P1 OR P2 POSTS)

7' MOUNTING HEIGHT

SIGN HEIGHT (FT) \ SIGN WIDTH (FT)	1	2	2.5	3	4	5	6	7	8	9
1	P	P	P	P	P	P1	SIZES NOT USED			
2	P	P	P	P	P	P1	TWO P1'S			
2.5	P	P	P	P	P1	P1				
3	P	P	P	P1	P1	P1				
4	P	P1	P1	P1	P1	P1				
5	SIZES NOT USED		P1	P1	P1	P1				
6			P1	P1	P1	▼P2	TWO P2'S			
7			P1	P1	▼P2	TWO P1'S		TWO P2'S	SIZE NOT USED	

8' MOUNTING HEIGHT

SIGN HEIGHT (FT) \ SIGN WIDTH (FT)	1	2	2.5	3	4	5	6	7	8	9
1	P	P	P	P	P	P1	SIZES NOT USED			
2	P	P	P	P	P1	P1	TWO P1'S			
2.5	P	P	P	P1	P1	P1				
3	P	P	P1	P1	P1	P1				
4	P	P1	P1	P1	P1	P1				
5	SIZES NOT USED		P1	P1	P1	▼P2				
6			P1	P1	P1	▼P2	TWO P2'S			
7			P1	P1	TWO P1'S	TWO P1'S		TWO P2'S	SIZES NOT USED	

9' MOUNTING HEIGHT

SIGN HEIGHT (FT) \ SIGN WIDTH (FT)	1	2	2.5	3	4	5	6	7	8	9
1	P	P	P	P	P	P1	SIZES NOT USED			
2	P	P	P	P	P1	P1	TWO P1'S			
2.5	P	P	P	P1	P1	P1				
3	P	P	P1	P1	P1	P1				
4	P	P1	P1	P1	P1	P1				
5	SIZES NOT USED		P1	P1	P1	▼P2			TWO P2'S	
6			P1	P1	▼P2	TWO P1'S		TWO P2'S		
7			P1	P2	TWO P1'S	TWO P1'S		TWO P2'S	SIZES NOT USED	

▼ SEE CHART NOTE 4.

CHART NOTES

1. TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 7, 8 OR 9 FEET. OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
2. FOR SIGNS MOUNTED ON TWO POSTS, THE MINIMUM DISTANCE BETWEEN POSTS SHALL BE 2 FEET AND THE MAXIMUM DISTANCE SHALL BE 8 FEET. DISTANCE FROM POST TO EDGE OF SIGN PANEL(S) SHALL BE 0 TO 4 INCHES. WHEN BACKING ZEES ARE USED, POSTS SHALL BE INSTALLED WITH A MINIMUM OF 2 INCHES TO THE EDGE OF THE BACKING ZEE.
3. ALL SIGN PANELS GREATER THAN 60 INCHES IN WIDTH MUST BE MOUNTED ON TWO POSTS TO PREVENT TURNING.
4. THE POST SIZES SHOWN ARE THE MINIMUM SIZES REQUIRED. TWO P1 POSTS MAY BE SUBSTITUTED WHERE ONE P2 POST IS INDICATED. P2 POSTS MAY SUBSTITUTED FOR P1 POSTS WHEN DIRECTED BY THE ENGINEER.

GENERAL NOTES

1. SIGNS BETWEEN 37 IN. AND 60 IN. WIDTH WITH ONE POST INSTALLATION REQUIRE A T OR U SIGN SUPPORT BRACKET IN ADDITION TO THE BACKING ZEE REQUIREMENTS. WHEN DIRECTED BY THE ENGINEER, SIGN PANELS LESS THAN 48 IN. IN WIDTH MAY ATTACHED DIRECTLY TO T OR U BRACKETS WITHOUT ZEES.
2. U-BRACKETS MAY BE USED FOR MULTIPLE SIGN INSTALLATIONS.
3. FOR BACKING ZEE REQUIREMENTS AND DETAILS, SEE STANDARD PLANS S-614-3 AND S-614-4.

POST SPECIFICATIONS

POST SIZE	OUTSIDE DIAMETER	WALL THICKNESS	MATERIAL	**COATING	MAX ALLOW MOMENT	PAID FOR AS:
P	2.375"	.080"	ASTM-513	ASTM A-653 G-210 WITH 3.0 MIL POLYMER COATING PER ASTM A123 CLEAR COATING	1.47 KIP FT	STEEL SIGN SUPPORT (2 INCH ROUND)
P1	2.875"	.160"	ASTM-513		4.02 KIP FT	STEEL SIGN SUPPORT (2½ INCH ROUND NP-40)
P2	2.875"	.276"	ASTM-500	GC HOT DIPPED PER ASTM-123	5.13 KIP FT	STEEL SIGN SUPPORT (2½ INCH ROUND SCH 80)

** COLOR POWDER COATING MAY BE ADDED ACCORDING TO MANUFACTURER SPECIFICATIONS FOR SPECIAL LOCATIONS WHEN SHOWN ON THE PLANS.

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
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Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-08.dgn	
CAD Ver.: MicroStation V8i Scale: Not to Scale	Units: English

	Sheet Revisions	
	Date:	Comments
R-1	03/05/13	SHTS 1 & 2 - UPDATED DETAIL TITLES
R-2	10/23/14	SHT 2 - MOVED SLIPBASE DETAILS TO SHEET 3, AND ADDED 4" BASE PLATE DETAIL TO NEW SHEET 3

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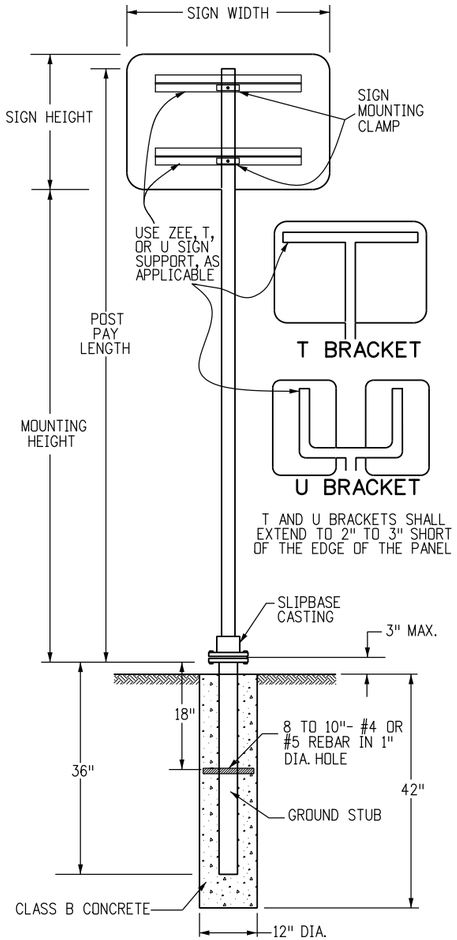
Safety & Traffic Engineering KCM

TUBULAR STEEL SIGN SUPPORT DETAILS

Issued By: Safety & Traffic Engineering Branch July 4, 2012

STANDARD PLAN NO.
S-614-8
Sheet No. 1 of 6



TUBULAR STEEL POST (WITH SLIPBASE) (FOR USE WITH ALL P1 AND P2 POST INSTALLATIONS) (SEE SHEET 1 FOR P-POST INSTALLATIONS)

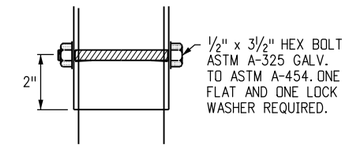
GENERAL NOTE

THE CONTRACTOR SHALL INSTALL THE POSTS PER THE MANUFACTURER'S RECOMMENDATIONS WITHOUT ADDITIONAL COMPENSATION.

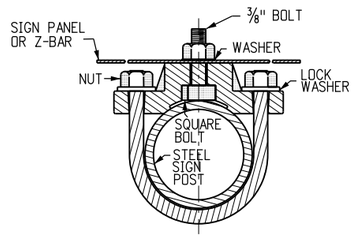
DIMENSIONS FOR MOUNTING CLAMP (ALL DIMENSION ARE IN INCHES)

STANDARD PIPE SIZE	A	B	C	D	E	F	G	K	L	R_1	R_2
2	3 3/4	2 3/4	1 1/2	1 1/8	1/2	3/16	1	2 11/16	1 7/32	1 1/4	1 3/16
2 1/2	4 1/4	3 1/4	2	1 1/4	1/2	1/4	1	3 3/16	1 15/32	1 1/2	1 7/16

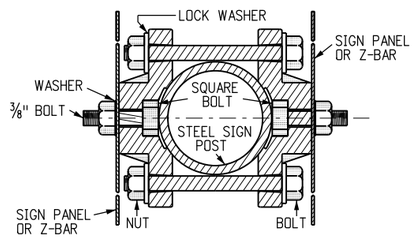
T AND U BRACKET ATTACHMENT



TYPICAL SINGLE BRACKET



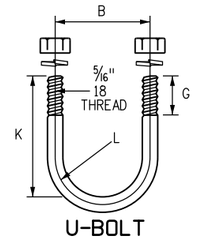
TYPICAL BACK TO BACK



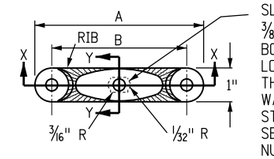
DETAILS FOR SIGN PANEL ATTACHMENT

PIPE CLAMP CASTING

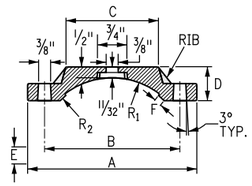
PIPE CLAMP CASTING SHALL BE ASTM B26 OR B108 ALUMINUM ALLOY A444.0-T4 OR 356.0-F. ALL SIGN MOUNTING CLAMP PARTS NOT MADE FROM ALUMINUM SHALL BE GALVANIZED STEEL IN CONFORMANCE WITH ASTM A153 OR STAINLESS STEEL.



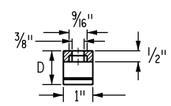
U-BOLT TO BE MADE IN ACCORDANCE WITH STANDARD MANUFACTURING PROCEDURE. 1/4" OR 5/18" DIAMETER STOCK IS PERMISSIBLE. AMERICAN STANDARD REGULAR SEMI-FINISHED HEX NUTS AND SPRING LOCKWASHERS.



SLOT TO HOLD HEAD OF 3/8" HEX HEAD BOLT. THE BOLT SHALL BE 1 1/4" LONG, WITH FULL THREADS, A MEDIUM WASHER, AND GALVANIZED STEEL OR ALUMINUM SELF-LOCKING HEX HEAD NUT. THE BOLT HEAD MUST NOT TURN IN THE SLOT.



SECTION X-X



SECTION Y-Y

MOUNTING CLAMP FOR SOCKET OR SLIPBASE

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12 Initials: SCL			Date:	Comments
Last Modification Date: 10/23/14 Initials: KEN	R-1		03/05/13	UPDATED DETAIL TITLES
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-2		10/23/14	MOVED SLIPBASE DETAILS TO SHEET 3
Drawing File Name: S-614-08.dgn				
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English				

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TUBULAR STEEL SIGN SUPPORT DETAILS

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STANDARD PLAN NO.
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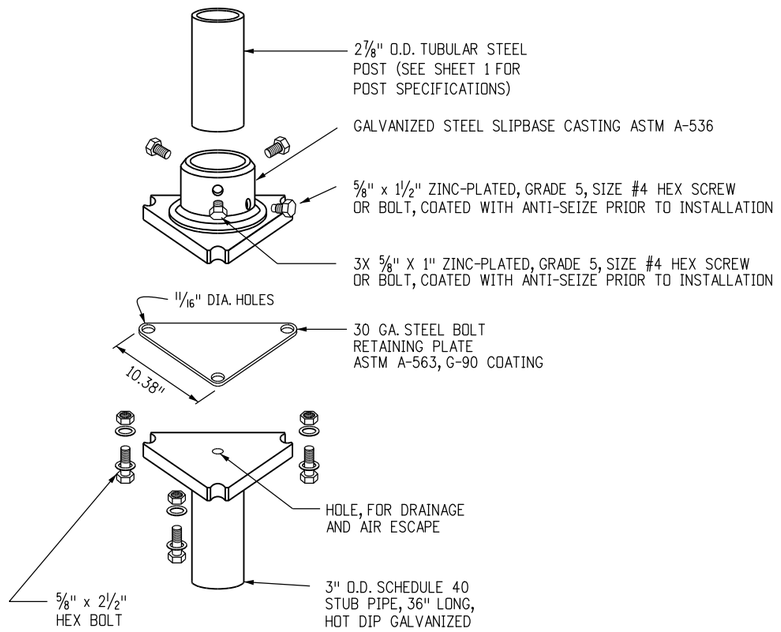
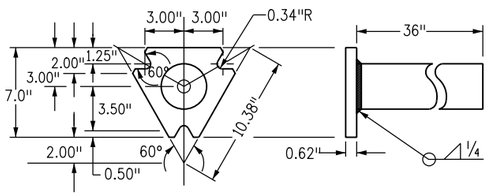
Sheet No. 2 of 6



TYPICAL ASSEMBLY

CAST-IN-PLACE SLIPBASE INSTALLATION



SLIPBASE STUB POST

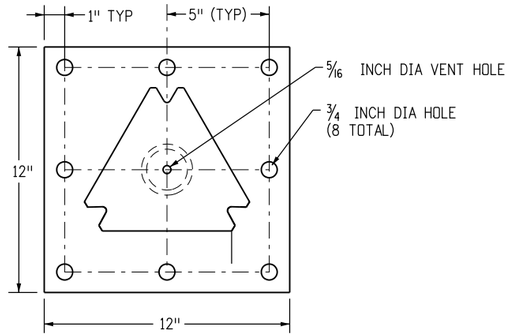
BASE PLATE FABRICATION REQUIREMENTS:

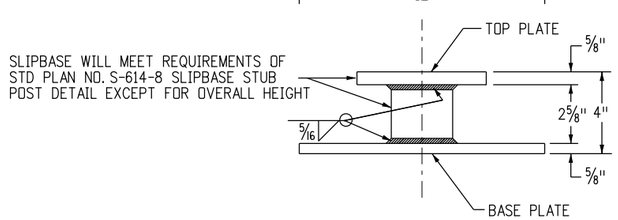
BASE PLATE: 3/4 INCH ASTM A 36 PLATE STEEL

PIPE STUB: 3 INCH NOMINAL SCHEDULE 80, ASTM A 500 GR B

TOP PLATE: MEET REQUIREMENTS OF STD PLAN NO. S-614-8, SHT 2 OF 5

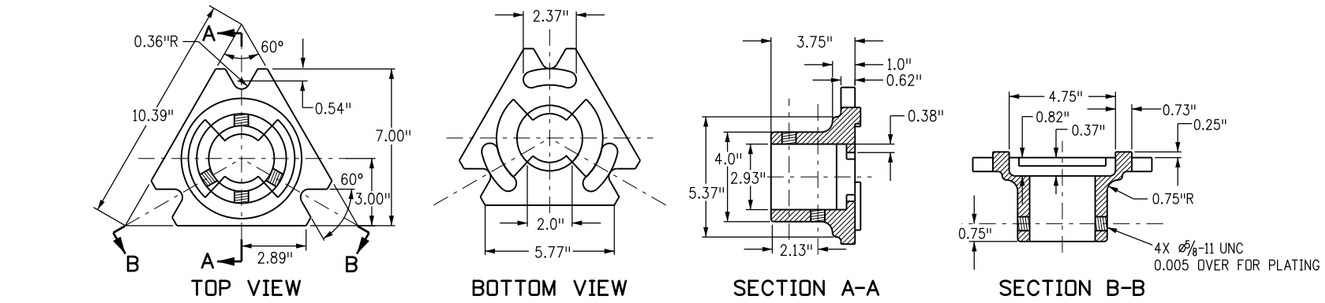
MEET ASTM A 123 GALVANIZING AFTER FABRICATION IS COMPLETED.





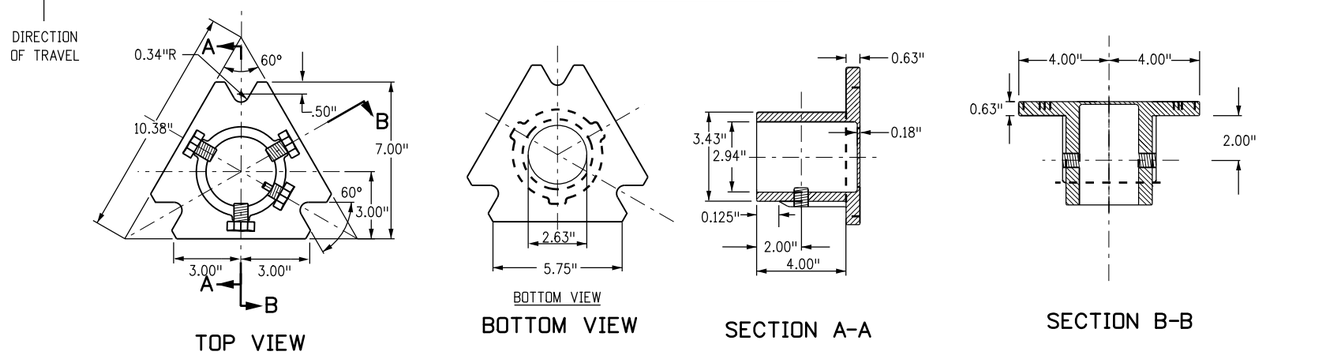
SLIPBASE WILL MEET REQUIREMENTS OF STD PLAN NO. S-614-8 SLIPBASE STUB POST DETAIL EXCEPT FOR OVERALL HEIGHT

BASE PLATE DETAIL



SLIPBASE CASTING 1

DIRECTION OF TRAVEL



SLIPBASE CASTING 2

SURFACE MOUNT SLIPBASE TUBULAR STEEL SIGN BASE REQUIREMENTS

FOR 2-7/8 INCH POSTS (P1 OR P2 POSTS)
FOR CONCRETE SURFACES GREATER THAN 7 INCHES THICK
FOR CONCRETE SURFACES GREATER THAN 12 INCHES IN WIDTH

MOUNTING HARDWARE

- 8 - EACH ⅝ x 5½ INCH LONG "HILTI KWIK HUS-EZ SCREW ANCHORS
- 16 - EACH ⅝ INCH FLAT WASHERS
- 8 - EACH ⅝ INCH LOCK WASHERS
- 8 - EACH ⅝ INCH NUTS

ALL HARDWARE WILL BE GALVANIZED OR ZINC PLATED.

INSTALLATION REQUIREMENTS:

DRILL: (8) - ⅝ INCH HOLES 6 INCH DEEP, CLEAN HOLE PRIOR TO INSTALLING ANCHORS

USE ADDITIONAL WASHERS FOR SHIMMING TO LEVEL BASE PLATE.

SURFACE MOUNT SLIPBASE TUBULAR STEEL SIGN BASE NOTES

1. REFER TO SIGNING PLANS FOR SIGN LOCATIONS AND HEIGHT
2. MINUMUM ALLOWABLE TENSION CAPACITY FOR WEDGE ANCHORS = 3000 LBS.
3. MAXIMUM ALLOWABLE MOMENT FOR SIGN BASE = 5.13 kip-ft.

RETRO-FIT SLIPBASE INSTALLATION

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: KEN		Date:	Comments
Last Modification Date: 12/01/16 Initials: RPR	R-1	10/23/14	NEW SHEET. INCLUDES SLIP BASE DETAILS PLUS 4" BASE PLATE DETAIL
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-2	04/01/16	UPDATES TO RETRO-FIT HARDWARE
Drawing File Name: S-614-08.dgn	R-3	12/01/16	ADDED DETAILS FOR SLIPBASE 2
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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TUBULAR STEEL SIGN SUPPORT DETAILS

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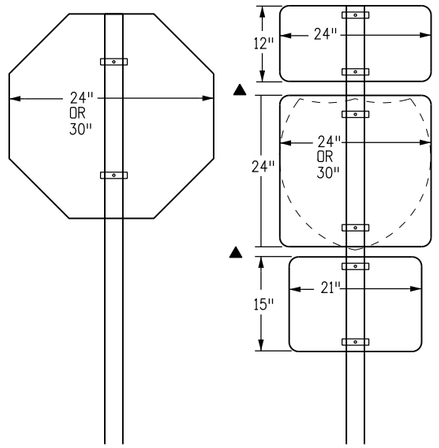
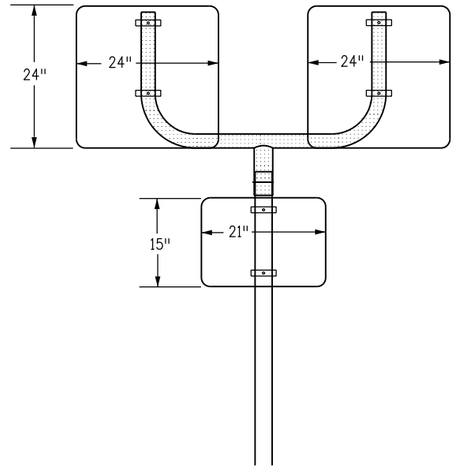
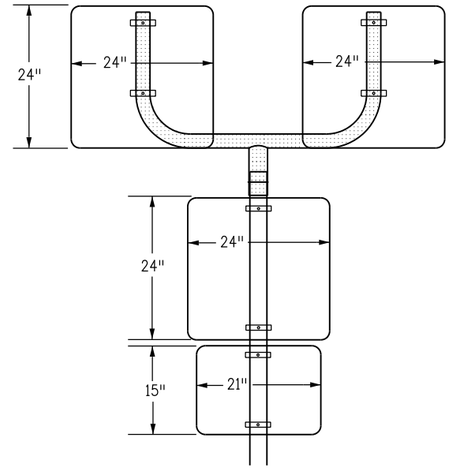
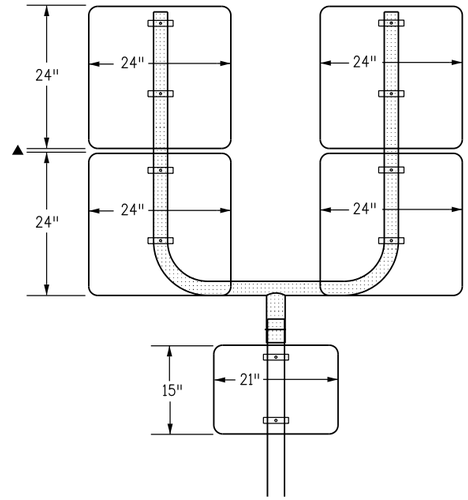
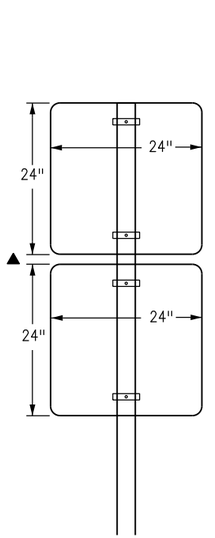
S-614-8

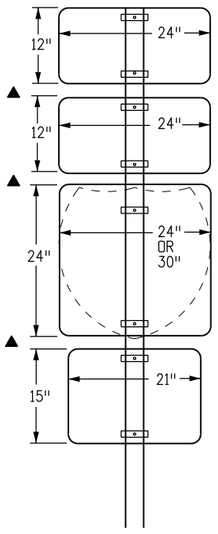


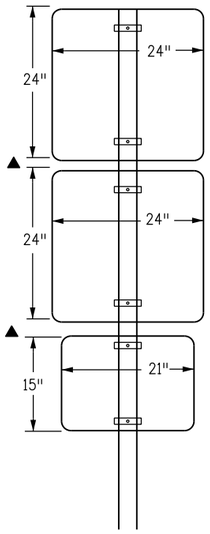




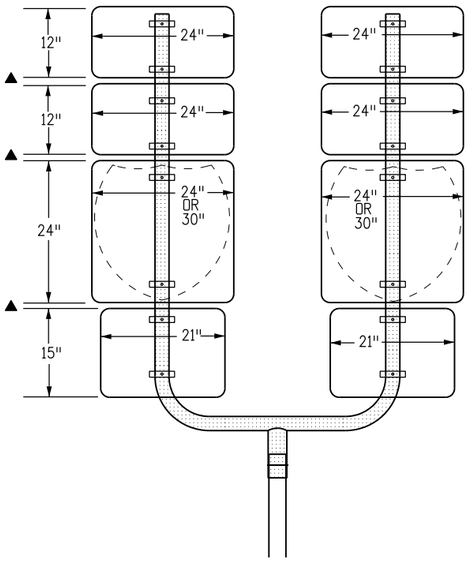








CLASS I SIGN COMBINATIONS (DIRECT ATTACHMENT)



CLASS I SIGN COMBINATIONS USING U-BRACKETS

▲ SEE NOTE 6 ON SHEET 5

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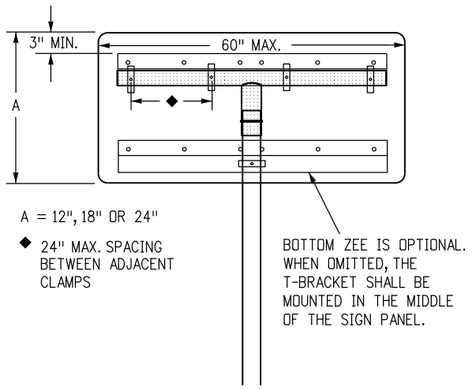
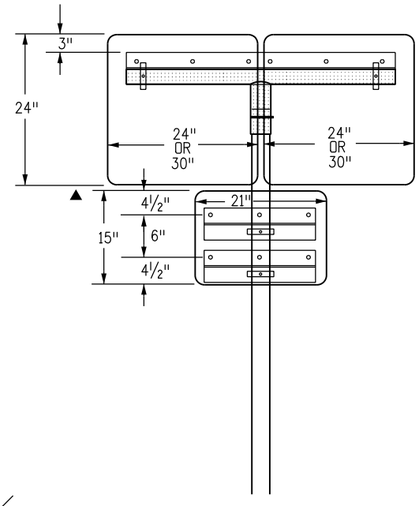
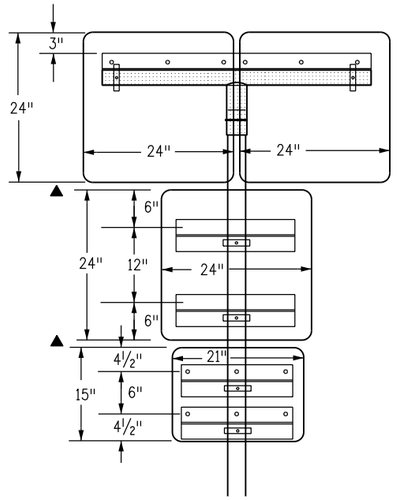
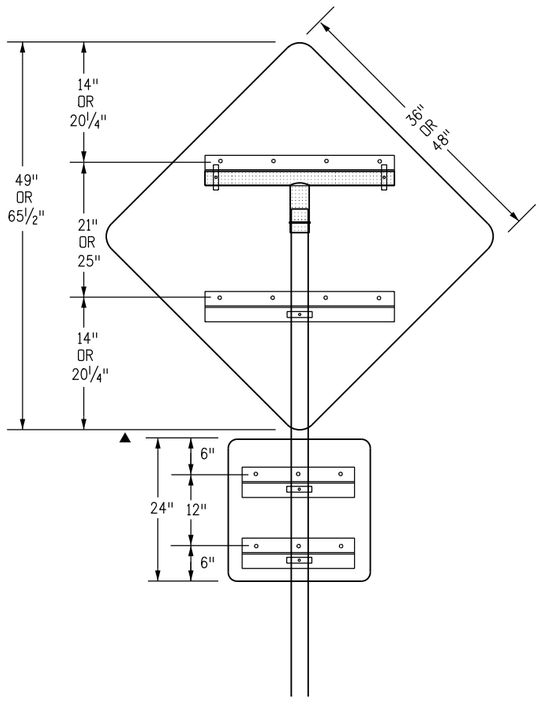
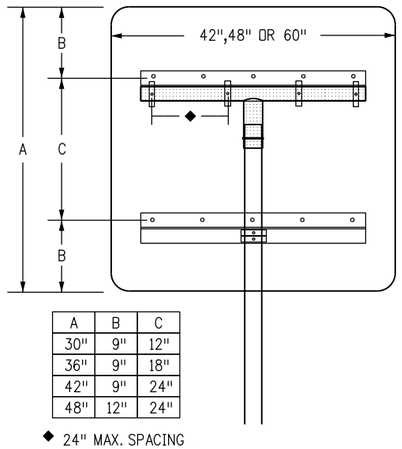










A	B	C
30"	9"	12"
36"	9"	18"
42"	9"	24"
48"	12"	24"

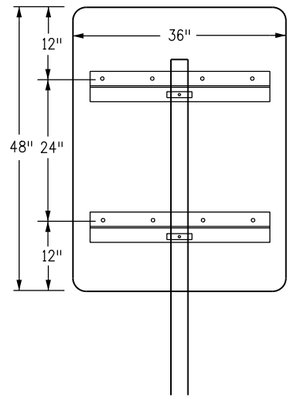
◆ 24" MAX. SPACING BETWEEN ADJACENT CLAMPS

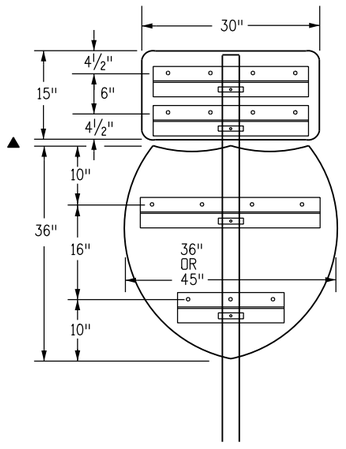
CLASS II SIGN COMBINATIONS USING T-BRACKETS WITH Z-BAR

PANEL WIDTHS	ZEE LENGTH
21"	15"
24"	18"
30"	24"
36"	30"
42"	36"
45"	39"
48"	42"
54"	48"
60"	54"
36" DIAMOND	22"
48" DIAMOND	36"
24" & 24"	43"
24" & 30"	49"
30" & 30"	55"
36" & 36"	67"
45" & 36"	76"
24" & 24" & 24"	68"
24" & 24" & 30"	74"
24" & 30" & 24"	74"
30" & 24" & 30"	80"
24" & 30" & 30"	80"
30" & 30" & 30"	86"

GENERAL NOTES

1. Z-BAR LENGTH SHALL BE 3 IN. (± ½ IN.) SHORT OF THE EDGE OF THE SIGN OR ROW OF SIGNS ON BOTH SIDES. THE ACCOMPANYING TABLE GIVES THE Z-BAR LENGTH FOR MOST TYPICAL PANEL COMBINATIONS.
2. FIRST AND LAST HOLES SHALL BE 2 IN. FROM EDGE OF Z-BAR. THE HOLES IN BETWEEN SHALL BE 6 IN. TO 8 IN. APART.
3. T AND U BRACKETS SHALL TERMINATE 2 IN. TO 3 IN. FROM EDGE OF SIGN PANEL. WHEN A ZEE IS CONNECTED TO A T-BRACKET, THEY SHALL BE THE SAME LENGTH EXCEPT WHEN THE ZEE MUST EXTEND BEYOND THE MAXIMUM LENGTH OF A T-BRACKET.
4. TWO MOUNTING CLAMPS ARE REQUIRED ON ZEES WHERE THERE IS ONLY ONE ZEE FOR THE PANEL AND THE ZEE IS ATTACHED TO ONLY ONE POST.
5. ZEES SHALL BE ATTACHED TO T-BRACKETS AND U-BRACKETS WITH U-BOLTS OR MOUNTING CLAMPS.
6. ▲ VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1 IN. TO 1½ IN. TYPICAL.
7. IN SPECIAL CASES U-BRACKETS MAY BE USED TO MOUNT SIGNS THAT FACE DIFFERENT DIRECTIONS. THE ENGINEER SHALL DETERMINE THE ORIENTATION OF THE SIGN PANELS AND VERIFY THAT THE MAXIMUM ALLOWABLE WIND LOADS FOR THE POST ARE NOT EXCEEDED.





SINGLE POST CLASS II SIGNS USING Z-BAR

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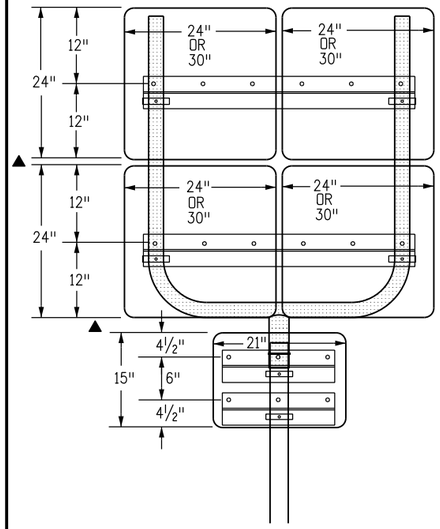
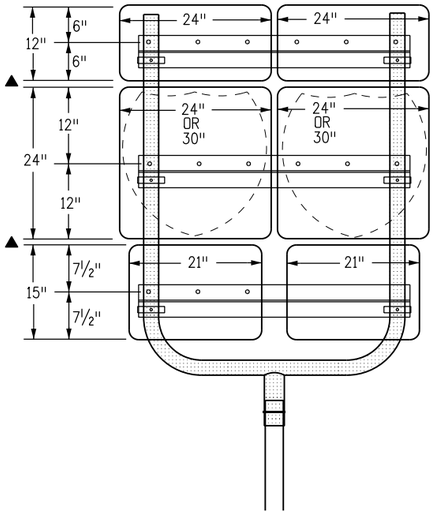
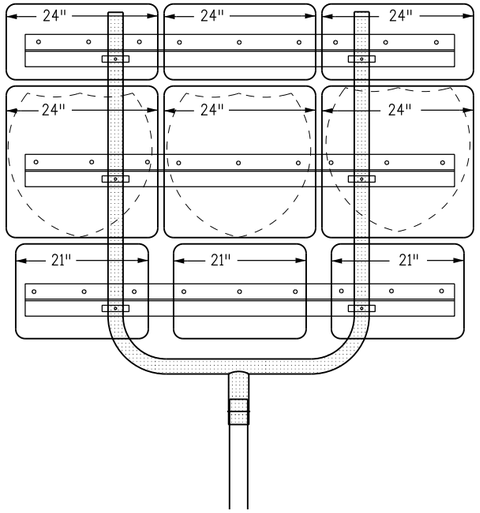
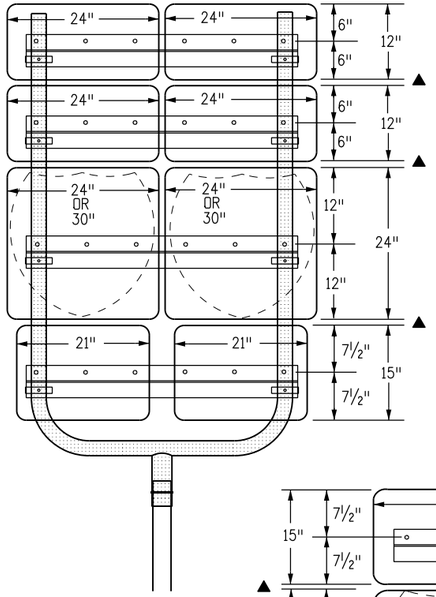
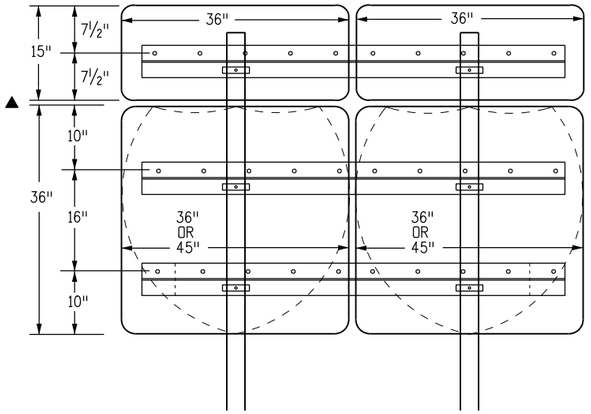




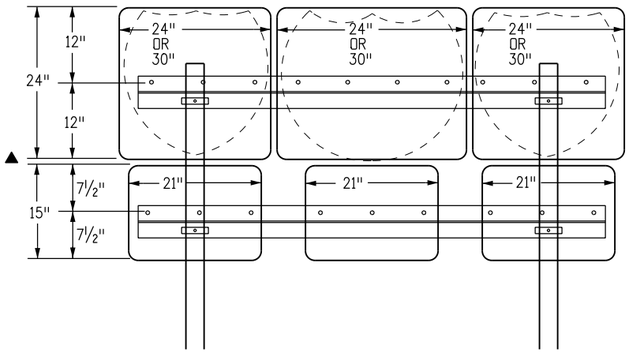




CLASS II SIGN COMBINATIONS USING U-BRACKETS



NOTE: THIS CONFIGURATION IS PREFERABLE TO USING TWO SEPARATE SIGNS.



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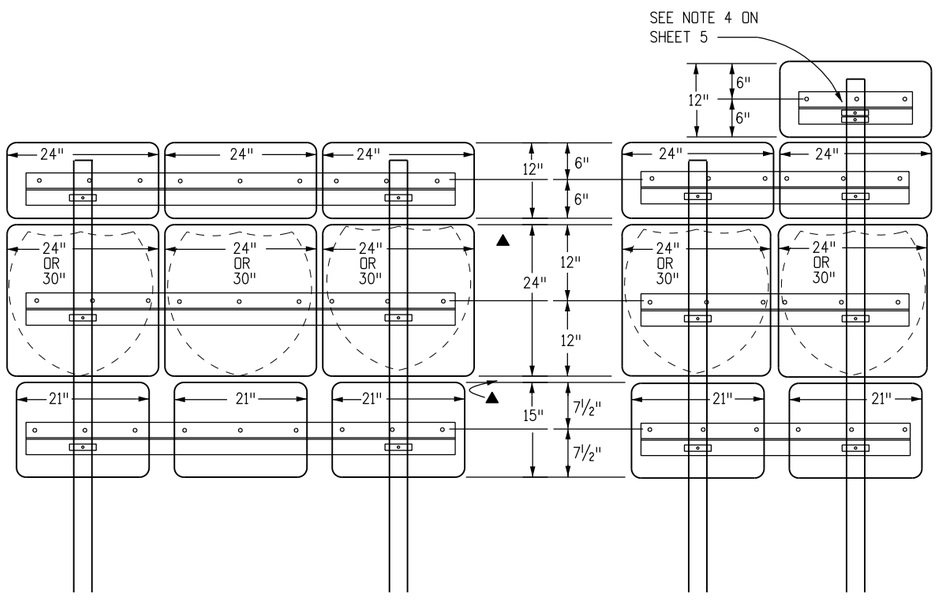

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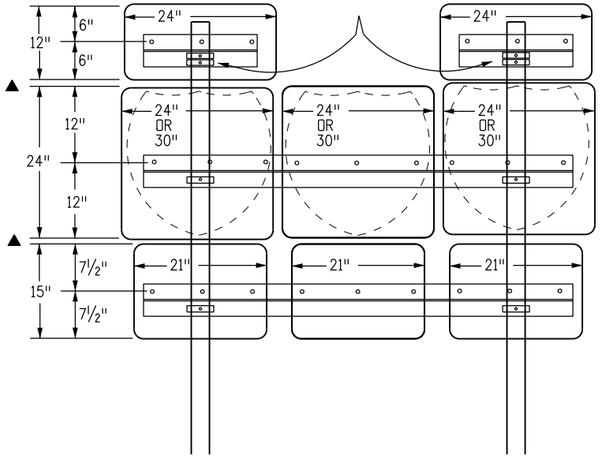

▲ SEE NOTE 6 ON SHEET 5

CLASS II SIGN COMBINATIONS USING TWO POSTS

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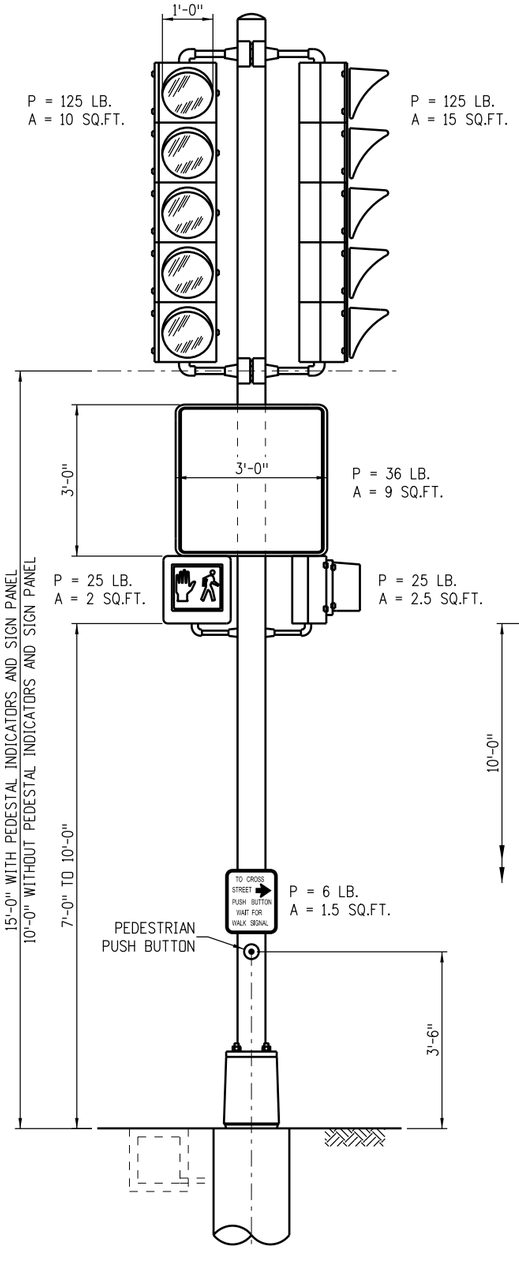
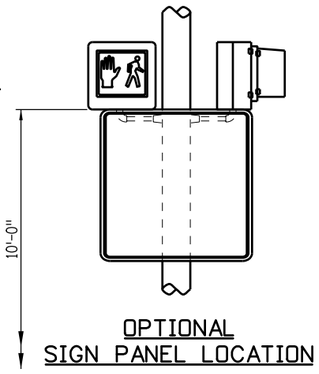
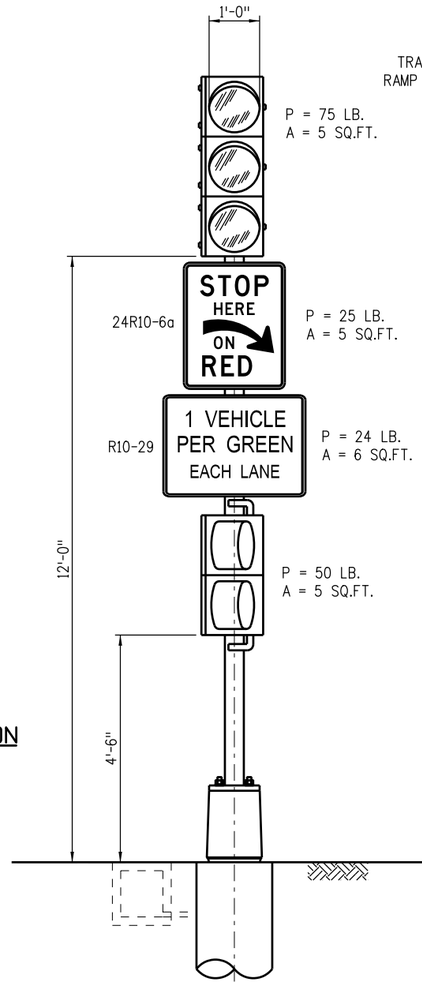
-PEDESTAL POLE CONFIGURATIONS-



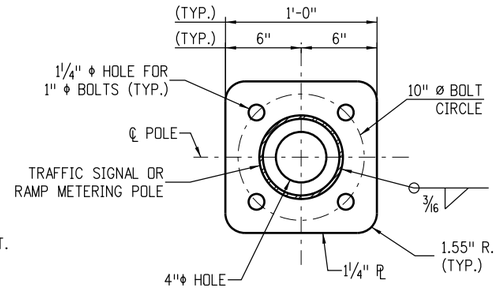
TRAFFIC SIGNAL
PEDESTAL POLE DETAIL



OPTIONAL
SIGN PANEL LOCATION



RAMP METERING
PEDESTAL POLE DETAIL
(LEFT SIDE INSTALLATION SHOWN)



BASE PLATE

INDEX

GENERAL NOTES

1. ALL PEDESTAL POLE STEEL SHALL BE ASTM A53 GRB AND SHALL BE HOT DIP GALVANIZED INSIDE AND OUTSIDE ACCORDING TO ASTM A123.
2. MOUNTING HARDWARE FOR EACH TRAFFIC SIGNAL WILL BE FURNISHED BY THE MANUFACTURER, INCLUDING POLE PLATES FOR SIDE POLE MOUNTING.
3. PEDESTAL POLES SHALL HAVE A FRANGIBLE BASE: AKRON FOUNDRY TB2-17 OR APPROVED EQUAL.
4. ALL POLES, PEDESTALS AND CABINETS SHALL BE PLACED A MINIMUM OF 2 FEET OFF THE ROADWAY MEASURED FROM THE EDGE OF SHOULDER OR FACE OF CURB.
5. 12-12-12 TRAFFIC SIGNAL FACES FOR RAMP METERING LOCATIONS SHALL BE ALUMINUM TYPE.
6. TWO-SECTION 12" RED AND GREEN SIGNAL HEADS SHALL BE "ANGLED IN" AND SHALL BE EQUIPPED WITH VISORS THAT MAY BE POSITIONED TO EITHER SIDE OF THE LENS, ALLOWING ONLY THE FIRST MOTORIST BEHIND THE STOP BAR TO SEE THE SIGNAL INDICATION.
7. REGULATORY SIGNING SHALL BE AS SHOWN ON THE PLANS. 24R10-6a FOR LEFT SIDE POLE INSTALLATIONS SHALL CONTAIN A RIGHT-POINTING ARROW. 24R10-6a FOR RIGHT SIDE POLE INSTALLATIONS SHALL CONTAIN A LEFT-POINTING ARROW. TYPICAL SPECIAL SIGN MESSAGES ARE "1 VEHICLE PER GREEN" FOR SINGLE-LANE METERED RAMPS, AND "1 VEHICLE PER GREEN EACH LANE" FOR TWO-LANE METERED RAMPS.
8. ALL SIGNAL HEADS SHALL BE APPROVED LED TYPE.
9. IF THE PLACEMENT OF A PEDESTRIAN PUSH BUTTON ASSEMBLY ON A TRAFFIC SIGNAL MAST POLE WILL NOT BE WITHIN EASY REACH BY PEDESTRIANS (10" OR LESS AND UNOBSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT), THEN A SEPARATE PEDESTRIAN PUSH BUTTON POST ASSEMBLY (PPBPA) SHALL BE INSTALLED WITHIN EASY REACH. THE PPBPA SHALL MEET THE PROVISIONS FOUND IN CDOT STANDARD PLAN S-614-9 AND "SECTION 4E.08 THROUGH 4E.13 - PEDESTRIAN DETECTORS" IN THE 2009 MUTCD WITH REVISIONS 1 AND 2.

POLE AND CAISSON INFORMATION

MEMBER	ATTRIBUTES AND LOADS	TRAFFIC SIGNAL POLE	RAMP METERING POLE
POLE	SIZE	6" ϕ SCH 40	4" ϕ SCH 40
	SERVICE MOMENT	14.72 k.ft.	4.23 k.ft.
	SERVICE SHEAR	0.97 kip	0.45 kip
CAISSON	SIZE	18" ø	18" ø
	ULT. MOMENT	20.55 k.ft.	5.90 k.ft.
	ULT. SHEAR	1.36 kip	0.63 kip

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PEDESTAL POLE SIGNALS

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-PEDESTAL POLE FOUNDATION DETAILS-

FOUNDATION NOTES

1. CAISSON CONCRETE SHALL BE AIR ENTRAINED CLASS BZ IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS.
2. REINFORCING STEEL SHALL BE GRADE 60 IN ACCORDANCE WITH SECTION 602 OF THE STANDARD SPECIFICATIONS.
3. ALL REINFORCING STEEL SHALL BE NON COATED.
4. CAISSON CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,700 PSI BEFORE INSTALLING THE PEDESTAL POLE; VERIFY CONCRETE STRENGTH WITH MATURITY METER.
5. CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH.

DESIGN DATA

CAISSON CONCRETE:
CLASS BZ CONCRETE:f'c = 4,000 psi
REINFORCING STEEL:fy = 60,000 psi

DESIGN WIND SPEED = 90 mph

THE DESIGNS HEREIN ASSUME THAT THE PEDESTAL POLES ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING PARAMETERS:

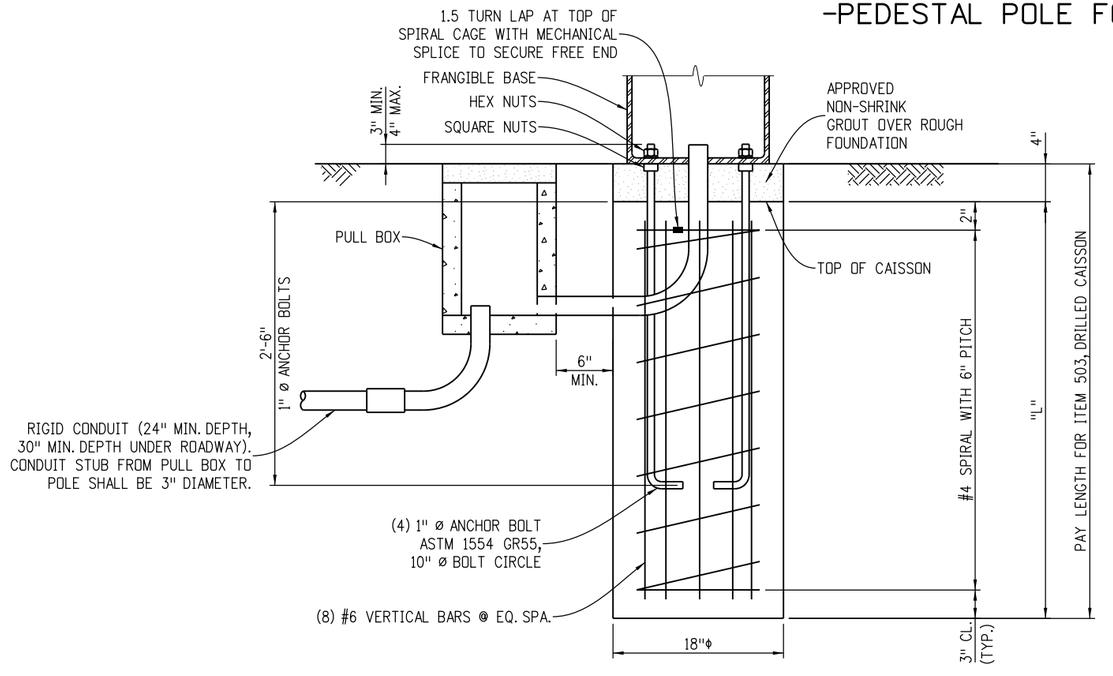
MEDIUM DENSE COHESIONLESS SOIL:
SOIL DENSITY, γ = 110 pcf
SOIL ϕ ANGLE = 30°
SF = 1.25 FOR FLEXURAL RESISTANCE

MEDIUM STIFF COHESIVE SOIL:
SOIL DENSITY, γ = 110 pcf
SOIL COHESION = 750 psf
SF = 1.25 FOR FLEXURAL RESISTANCE

CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:

(A) SIGNALS WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM.
(B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
(C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
(D) THE FOUNDATION SOILS ARE NOT HOMOGENOUS.
(E) FIRM BEDROCK IS ENCOUNTERED.

UNFACTORED GROUP LOAD II COMBINATION LOADS FOR THE DESIGN OF POLES WERE GENERATED WITH THE STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 5TH EDITION INCLUDING THE 2010 & 2011 INTERIMS.
LOAD FACTORS FOR GENERATING ULTIMATE CAISSON LOADS ARE FOR THE STRENGTH III LOAD COMBINATION AS SPECIFIED IN THE 6TH EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.



PEDESTAL POLE CAISSON

CAISSON DATA TABLE

	TRAFFIC SIGNAL PEDESTAL POLE CAISSON	RAMP METERING PEDESTAL POLE CAISSON
"L"	4'-8"	3'-2"
PAY LENGTH	5'-0"	3'-6"

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PEDESTAL POLE SIGNALS

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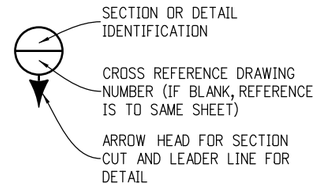
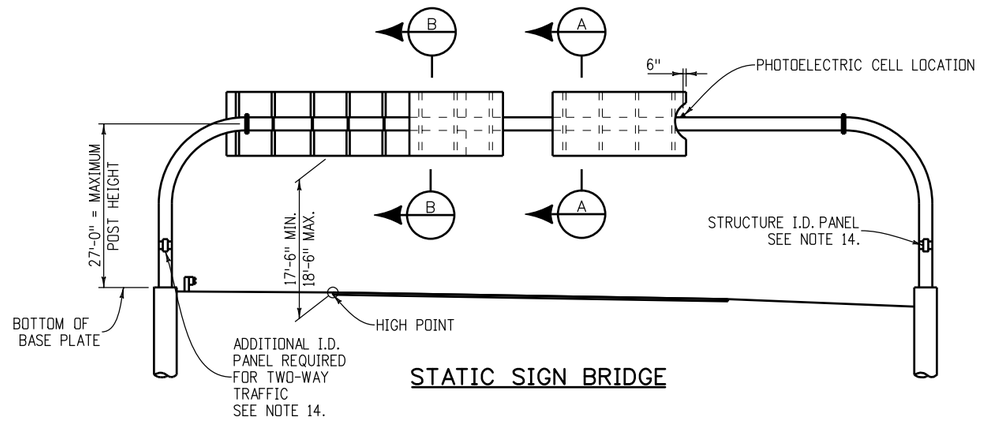
GENERAL NOTES

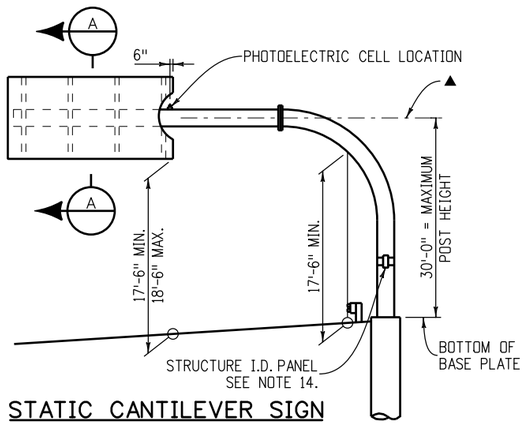
1. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS SHOWN IN THE MATERIALS TABLE ON SHEET 2.
2. SIGN STRUCTURES SHALL BE CONSTRUCTED TRUE TO THE SPECIFIED DIMENSIONS, SHALL BE FREE FROM KINKS, TWISTS OR BENDS, AND SHALL BE UNIFORM IN APPEARANCE. THE COMPLETED SECTIONS SHALL BE ASSEMBLED IN THE SHOP AND SHALL BE CHECKED FOR STRAIGHTNESS, ALIGNMENT, AND DIMENSIONAL ACCURACY. ANY VARIATIONS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER.
3. MAST ARMS SHALL BE TEMPORARILY SUPPORTED TO TAKE ALL LOAD OFF OF THE FIELD SPLICES WHILE BOLTS ARE BEING TIGHTENED IN ORDER TO FIRMLY SEAT THE FLANGE PLATES.
4. POSTS FOR TUBULAR SIGN STRUCTURES SHALL BE FORMED TO THE RADII SHOWN ON THE PLANS BY HEAT TREATMENT OR BY FABRICATION TO SUCH RADII BY METHODS WHICH WILL NOT CRIMP OR BUCKLE THE INTERIOR RADIUS OF THE PIPE BEND.
5. CLIPS, EYES, OR REMOVABLE BRACKETS SHALL BE AFFIXED TO ALL POSTS AND MAST ARMS, AS NECESSARY, TO SECURE THE SIGN DURING SHIPPING AND FOR LIFTING AND MOVING DURING ERECTION. THIS IS TO PREVENT DAMAGE TO THE FINISHED GALVANIZED OR PAINTED SURFACES. BRACKETS ON TUBULAR SIGN STRUCTURES SHALL BE REMOVED AFTER ERECTION. DETAILS OF SUCH DEVICES SHALL BE SHOWN ON THE SHOP DRAWINGS.
6. HIGH-STRENGTH BOLTED CONNECTIONS SHALL CONFORM TO THE PROVISIONS IN SECTION 509.28 OF THE STANDARD SPECIFICATIONS. ASSEMBLY OF HIGH-STRENGTH BOLTED CONNECTIONS FOR SIGN STRUCTURES MAY BE MADE WITH GALVANIZING OR PAINT ON THE CONTACT (FAYING) SURFACES.
7. ALL SIGN STRUCTURES SHALL BE FABRICATED INTO THE LARGEST PRACTICAL SECTIONS PRIOR TO GALVANIZING. SPLICE LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AND THE CONTRACTOR SHALL NOT COMMENCE FABRICATION UNTIL SUCH SPLICE LOCATIONS ARE APPROVED.
8. ALL PIPE MEMBERS SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION AS PER ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM. WALKWAY GRATINGS, WALKWAY BRACKETS, SAFETY RAILINGS, ACCESS LADDER AND CAGE, STEEL MOUNTINGS FOR LIGHT FIXTURES AND ALL NUTS, BOLTS AND WASHERS FOR SIGN STRUCTURES SHALL BE GALVANIZED AFTER FABRICATION PER ASTM A123 OR ASTM A153, AS APPROPRIATE AND SHALL NOT BE PAINTED. BOLTS SHALL BE LUBRICATED PRIOR TO INSTALLATION. TENSION CONTROL BOLTS OR DIRECT TENSION INDICATING WASHERS USED IN HIGH-STRENGTH BOLTED CONNECTIONS SHALL BE MECHANICALLY GALVANIZED PER ASTM B695, COATING CLASS 55.
9. ALL CONCRETE SHALL BE CLASS BZ WITH AIR ENTRAINMENT; REINFORCING STEEL SHALL BE GRADE 60. CAISSON CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,700 PSI BEFORE INSTALLING THE SIGN STRUCTURE; VERIFY CONCRETE STRENGTH WITH MATURITY METER.
10. STRUCTURES SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES.
11. SHEETS IN THE INDEX MARKED WITH A ■ PROVIDE INSTRUCTIONS TO DESIGNERS FOR THEIR USE IN THE PREPARATION OF THE SIGN X-SECTION SHEETS IN THE ROADWAY PLANS.
12. NPS = NOMINAL PIPE SIZE; O.D. = OUTSIDE DIAMETER.
13. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH SUBSECTION 105.02 OF THE STANDARD SPECIFICATIONS.
14. INSTALL STRUCTURE IDENTIFICATION PANEL IN ACCORDANCE WITH M AND S STANDARD S-614-12 USING TWO 1#2" WIDE STAINLESS STEEL BANDS AND STAINLESS STEEL FLARED LEG BRACKETS WITH HEX HEAD BOLTS (BAND-IT D315 OR EQUIVALENT).
15. CAISSON, STEEL SUPPORTS AND SURVEY WORK SHALL BE PAID FOR IN ACCORDANCE WITH BID ITEMS 503, 614 AND 625 RESPECTIVELY.
16. CANTILEVER ARMS MARKED WITH A ▲ MUST BE LEVEL OR TILTED UPWARD NO MORE THAN 1° MAXIMUM AFTER INSTALLATION OF THE SIGN.
17. THERE SHALL BE NO PENETRATIONS OF THE TUBE MEMBERS OTHER THAN AS SHOWN IN THESE PLANS UNLESS APPROVED BY THE ENGINEER PRIOR TO FABRICATION.

INDEX

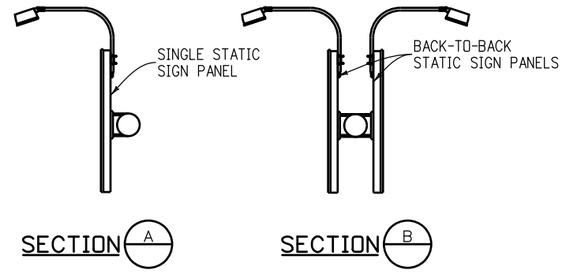




STATIC SIGN BRIDGE



STATIC CANTILEVER SIGN



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GENERAL NOTES (CONTINUED)

18. WELDING OF STEEL SHALL CONFORM TO THE REQUIREMENTS OF AWS D 1.1. ALL AREAS TO BE WELDED SHALL BE GROUND TO BRIGHT METAL. NO BUTT WELD SPLICES WILL BE PERMITTED. ALL WELDING AND REQUIRED TESTING SHALL BE COMPLETE BEFORE ANY MATERIAL IS GALVANIZED.

    ENHANCED MAGNETIC PARTICLE TESTING SHALL BE PERFORMED ON AREAS DEFINED IN AWS D1.1 AND HEREIN. ENHANCED MAGNETIC PARTICLE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM E 709 AND AWS D 1.1, EXCEPT AS AMENDED HEREIN. ALTERNATING CURRENT SHALL BE USED. THE YOKE SPACING SHALL BE BETWEEN 2 AND 4 INCHES. THE MINIMUM LIFTING POWER SHALL BE 10LBS. RED DRY PARTICLES SHALL BE USED. THE LIGHT INTENSITY SHALL MEET ASTM E 709, SECTION 7. PARTICLE APPLICATION AND SPECIMEN PREPARATION SHALL MEET THE REQUIREMENTS OF ASTM E 709 SECTIONS 9 AND 15, EXCEPT WHITE NON-AQUEOUS DEVELOPER MEETING ASTM E 165, TYPE 3, SHALL BE APPLIED TO THE TEST SURFACE PRIOR TO TESTING.

    THE YOKES SHALL BE SET IN TWO POSITIONS WHEN TESTING THE WELD OR BASE METAL. THEY SHALL BE POSITIONED BOTH NORMAL AND PARALLEL WITH RESPECT TO THE WELD AXIS AND ROLLING DIRECTION OF THE BASE METAL.

    ENHANCED MAGNETIC PARTICLE TESTS SHALL BE PERFORMED AT THE FOLLOWING LOCATIONS:

    (1) BASE METAL. ALL AREAS CONTACTED BY THE CARBON ARC GOUGE ELECTRODE, THE ELECTRODE CUP, AND THE WELDING ELECTRODE. ALL THREE CONDITIONS ARE ARC STRIKES.

    (2) FILLET WELDS. EACH DESIGN WELD SIZE ON MAIN MEMBER TO MAIN MEMBER AND SECONDARY MEMBER TO MAIN MEMBER WELDMENTS. ALL STOP-STARTS AND WELD TERMINI. ALL LINEAR INDICATIONS SHALL FURTHER BE EVALUATED WITH 10X OR 30X MAGNIFICATION. VERIFICATION SHALL BE RESOLVED BY EXCAVATION.

    (3) GROOVE WELDS. ALL THROUGH THICKNESS EDGES ON TRANSVERSE BUTT JOINT WELDMENTS IN TENSION AREAS.

    (4) REPAIRS. ALL REPAIR WELDS TO CORRECT DEFECTS IN GROOVE AND FILLET WELDS, PLATE CUT EDGES, CORRECTION OF FABRICATION ERRORS IN CUTTING, PUNCHING, DRILLING, OR FITTING, AND MEMBERS WHICH ARE TACKED OR WELDED AND SUBSEQUENTLY CUT APART AND REWELDED.

19. ALL CIRCUMFERENTIAL AND ALL LONGITUDINAL PIPE SEAM WELDS WITHIN 5" OF FULL PENETRATION CIRCUMFERENTIAL GROOVE WELDS SHALL BE FULL PENETRATION GROOVE WELDS AND SHALL BE INSPECTED AS SPECIFIED HEREIN. THE ACCEPTABLE MAXIMUM WELD UNDERCUT IS 0.01".

MATERIALS

ELEMENT	SPECIFICATION ASTM	AASHTO	CLARIFICATIONS
POSTS, MAST ARMS	A53		#1
BARS, PLATES AND SHAPES	A709	M-270	#2
HOLLOW STRUCTURAL SECTIONS (HSS)	A500		#3
HIGH-STRENGTH BOLTS (H.S. BOLTS)	A325	M-164	#4
HIGH-STRENGTH NUTS	A563	M-291	
HIGH-STRENGTH WASHERS	F436	M-292	#5
U-BOLTS (RODS)	F1554	M-314	GRADE 55 STEEL
ANCHOR BOLTS	F1554	M-314	GRADE 55 STEEL

#1 PIPESS SHALL BE WELDED OR SEAMLESS STEEL PIPE CONFORMING TO THE SPECIFICATIONS OF ASTM DESIGNATION: A53, GRADE B.

#2 GRADES 36 OR 50 STEEL. ASTM A992 SHAPES MAY BE SUBSTITUTED.

#3 HOLLOW STRUCTURAL SECTION SPECIFICATIONS APPLY TO THE STRUCTURAL TUBING SECTIONS (TS) USED AT HANDHOLES AND STATIC SIGN LIGHTING LOCATIONS.

#4 TENSION CONTROL (TC) BOLTS CONFORMING TO ASTM F1852 MAY BE SUBSTITUTED FOR ASTM A325 BOLTS. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO THE SPECIFICATIONS OF ASTM DESIGNATION: A307. INSTALL A307 BOLTS WITH COMMERCIAL QUALITY WASHERS.

#5 ASTM F959, COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS MAY BE SUBSTITUTED FOR ASTM F436 WASHERS AT HIGH-STRENGTH BOLTED CONNECTIONS.

DESIGN DATA

SPECIFICATIONS:

DESIGN: "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (1994 AASHTO).

"FATIGUE-RESISTANT DESIGN OF CANTILEVERED SIGNAL, SIGN AND LIGHT SUPPORTS", NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 412, 1998.

SUBSECTION 17.4, SIGNS, IN THE STAFF BRIDGE BRANCH BRIDGE DESIGN MANUAL.

CONSTRUCTION: CDOT STANDARD SPECIFICATIONS, THESE STANDARD SHEETS AND THE PROJECT PLANS.

WIND LOADING: 80, 90 OR 100 MPH VELOCITY AS PER THE SELECTION TABLES.

OVERHEAD SIGN X-SECTION SHEET(S) SHALL SHOW:

1. SIGN STRUCTURE LOCATION (HIGHWAY, STATION AND DIRECTION)
2. LENGTH OF STRUCTURE SPAN
3. PANEL SIZE AND LOCATION ON STRUCTURE
4. OFFSET FROM SHOULDER
5. POST HEIGHT(S) FROM TOP OF CAISSON TO ℄ MAST ARM
6. CAISSON DIAMETER AND MINIMUM EMBEDMENT
7. TOP OF CAISSON ELEVATION
8. CAISSON PAY LENGTH
9. STATIONS AND OFFSETS TO CAISSON
10. GUARDRAIL PROTECTION LIMITS
11. LANE LINE LOCATION(S)
12. AS CONSTRUCTED BLOCK
13. PHOTOELECTRIC CELL LOCATION IF REQUIRED

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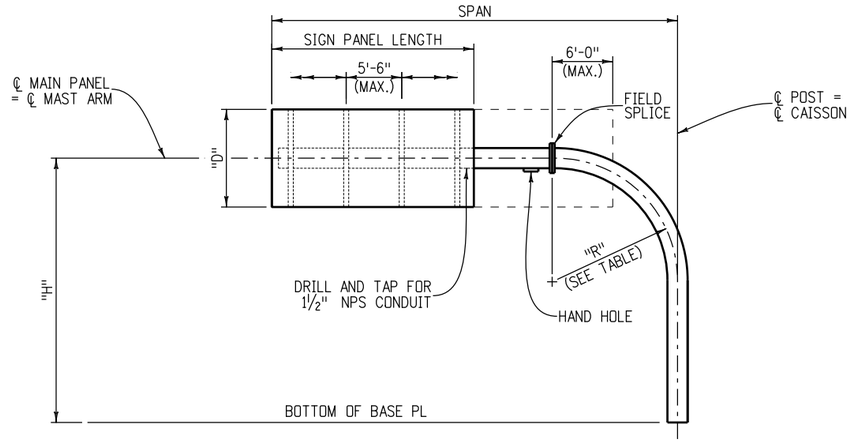

CANTILEVER

CANTILEVER NOTES

1. THE MAXIMUM SIGN PANEL OVERLAP ONTO ELBOW SHALL NOT EXCEED 6'-0" FROM THE FIELD SPLICE.
2. ALL POSTS BETWEEN BASE PLATE AND FIELD SPLICE SHALL HAVE A TUBE WALL THICKNESS OF ½". ALL MAST ARMS SHALL HAVE A TUBE WALL THICKNESS OF ⅜".
3. SEE SHEET 7 FOR FIELD SPLICE DETAILS.

PIPE POST	
PIPE OD (IN.)	"R" (FT.)
12.75	8
14	8
16	8
18	8
20	8
24	10

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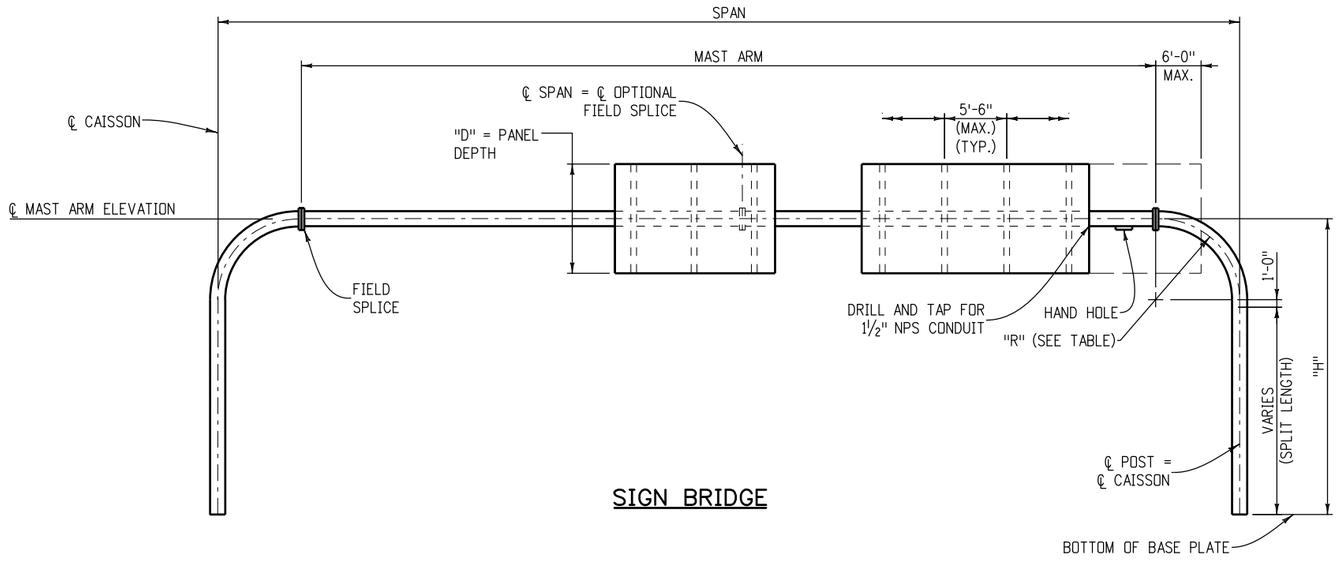
-SIGN BRIDGE INSTALLATION DETAILS-



SIGN BRIDGE

NOTES

1. THE MAXIMUM SIGN PANEL OVERLAP ONTO ELBOW SHALL NOT EXCEED 6'-0" FROM THE FIELD SPLICE.
2. ALL POSTS BETWEEN BASE PLATE AND FIELD SPLICE SHALL HAVE A TUBE WALL THICKNESS OF ½". ALL MAST ARMS SHALL HAVE A TUBE WALL THICKNESS OF ⅜".
3. BEFORE ANY PORTION OF THE SIGN FRAMES ARE ASSEMBLED IN THEIR FINAL POSITIONS THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER BY PREASSEMBLY OR OTHER APPROVED METHODS THAT THE SPAN LENGTHS OF THE FRAMES IN THE NO LOAD CONDITION MATCH WITHIN ½" OF THE FIELD MEASURED SPAN LENGTHS BETWEEN FOUNDATIONS.
4. IF THE SIGN FRAMES ARE ERECTED AS ONE UNIT, THEY SHALL BE ADEQUATELY SUSPENDED TO AVOID DISTORTIONS OR CHANGES IN SPAN LENGTH BETWEEN BASE PLATES.
5. FOR MAST ARMS WITH LENGTHS BETWEEN 40'-0" AND 80'-0" A BOLTED FIELD SPLICE WILL BE PERMITTED AT ℄ OF THE ARM TO FACILITATE GALVANIZING AND HAULING OPERATIONS. FOR MAST ARMS WITH LENGTHS GREATER THAN 80'-0", TWO BOLTED FIELD SPLICES WILL BE PERMITTED AT THE ⅓ POINTS TO FACILITATE GALVANIZING AND HAULING OPERATIONS.
6. SEE SHEET 7 FOR FIELD SPLICE DETAILS.

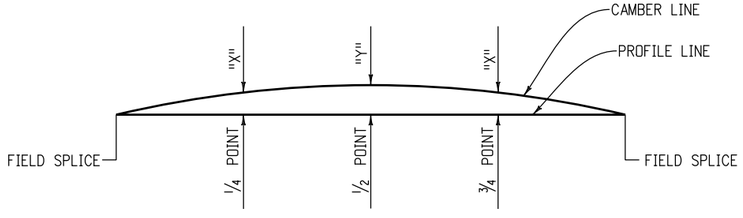
✳ PIPE POST

PIPE OD (IN.)	"R" (FT.)	CAMBER TYPE
12.75	8	Ⓐ
14	8	Ⓐ
16	8	Ⓑ
18	8	Ⓒ
20	10	Ⓒ
24	12	Ⓓ•

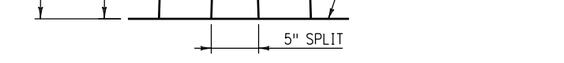
- USE CAMBER TYPE E FOR 130' - 140'.
✳ MAST ARM DIAMETER SAME AS POST.
◯ INDICATES CAMBER TYPE, SEE TABLE.

CAMBER

TYPE	"X"	"Y"
Ⓐ	1½"	2"
Ⓑ	2¼"	3"
Ⓒ	2¾"	4"
Ⓓ	3½"	5"
Ⓔ	4½"	6"



CAMBER DIAGRAM



POST SPLIT DETAILS

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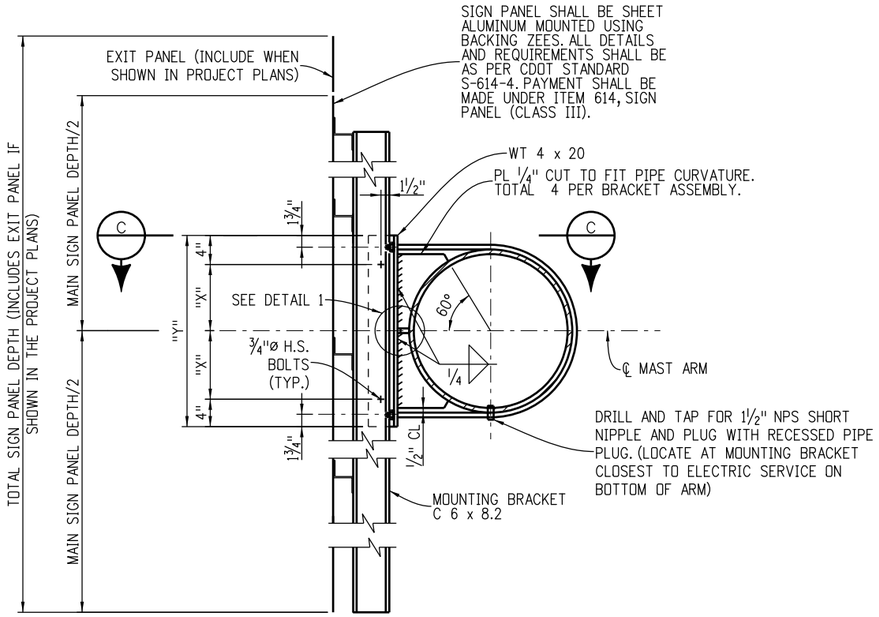
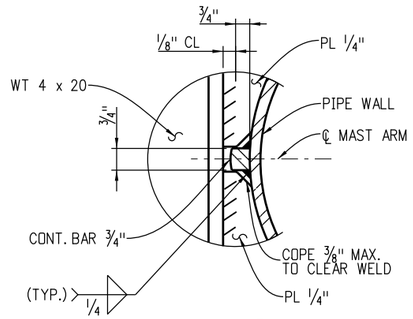
-SIGN MOUNTING BRACKET DETAILS-

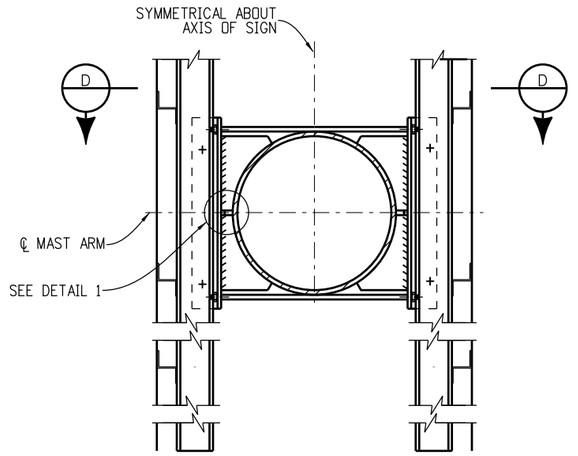


SINGLE SIGN PANEL



DETAIL 1

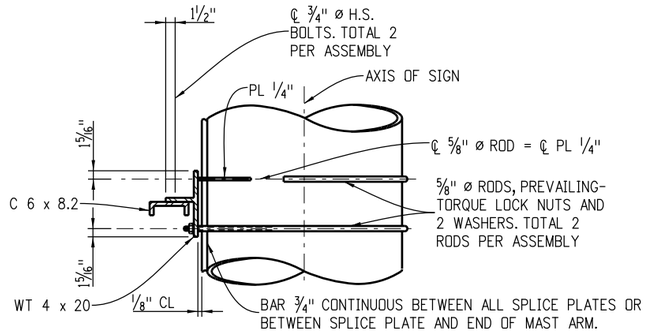
PIPE OUTSIDE DIAMETER (IN.)	DISTANCE "X" (IN.)	DISTANCE "Y" (IN.)
12.75	4 7/16	16 7/8
14	5 1/16	18 1/8
16	6 1/16	20 1/8
18	7 1/16	22 1/8
20	8 1/16	24 1/8
24	10 1/16	28 1/8



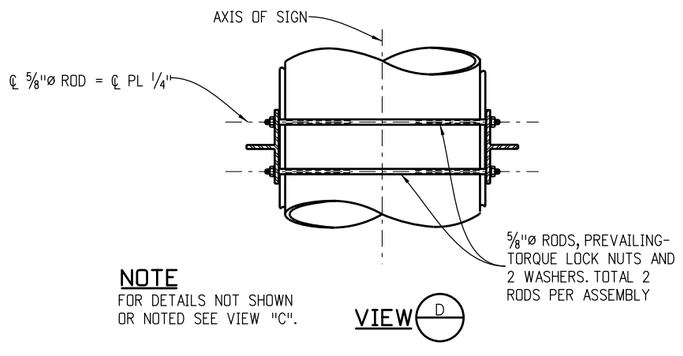
NOTES

FOR DETAILS NOT SHOWN OR NOTED SEE "SINGLE SIGN PANEL". ASSEMBLY DETAILS SHOWN APPLY TO TANGENT PORTION OF PIPE ONLY. FOR MOUNTING BRACKET ON ELBOW SEE DETAIL 2.

BACK-TO-BACK SIGN PANELS

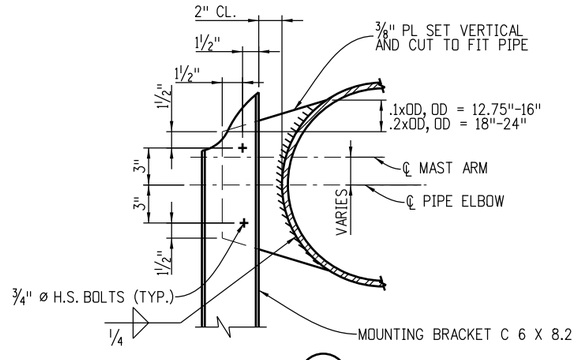


VIEW C



NOTE
FOR DETAILS NOT SHOWN OR NOTED SEE VIEW "C".

VIEW D



DETAIL 2

MOUNTING BRACKET ON ELBOW

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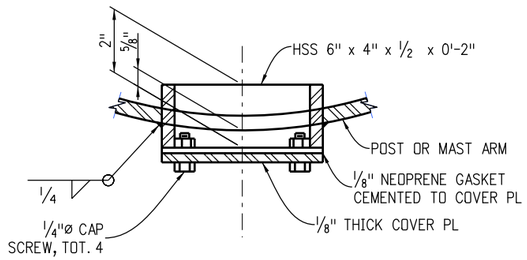
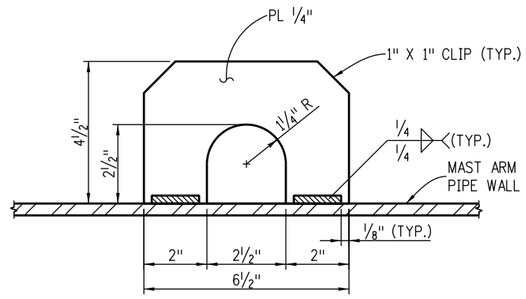
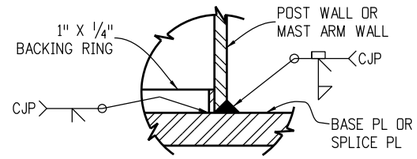
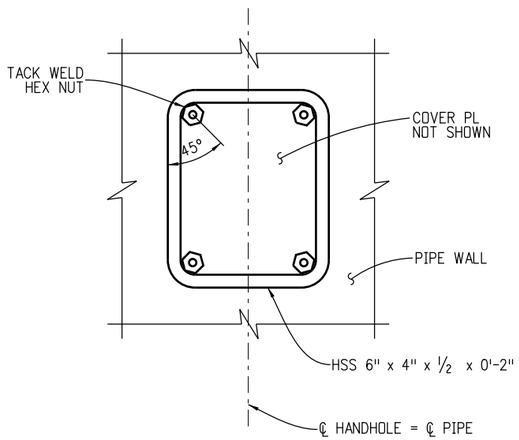




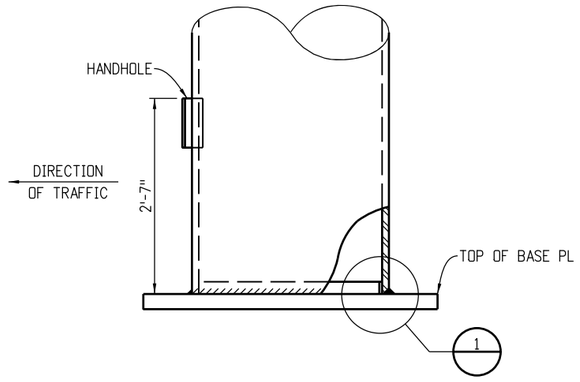
LIFTING EYE DETAIL



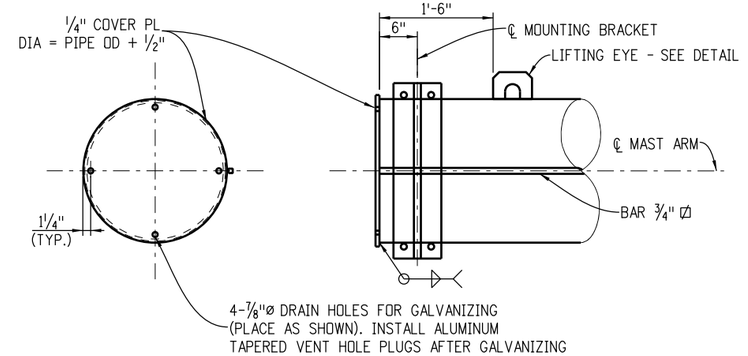
DETAIL 1



HANDHOLE AND COVER DETAILS



POST BASE ELEVATION
(FOR BASE PL DETAILS SEE SHEET 8)

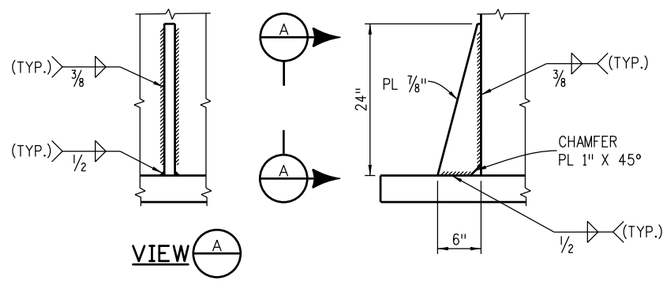


MAST ARM END DETAIL
(FOR CANTILEVER ARMS)

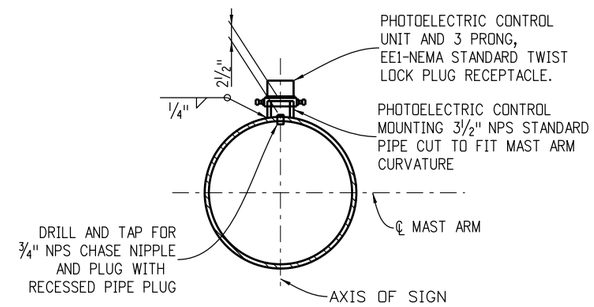
NOTES:

1. STIFFENERS ARE TO BE PLACED AT THE BASE OF ALL POSTS. SEE SHEET 8 FOR THE LOCATION OF STIFFENERS. STIFFENERS ARE NOT SHOWN ELSEWHERE IN THESE SHEETS FOR CLARITY.

2. TERMINATE WELD 1/2" SHORT OF THE TOP OF THE STIFFENER PLATE. AT THE OTHER 3 WELD TERMINATIONS ON THESE TWO TYPICAL WELDS STOP THE WELD 1/4" SHORT OF THE END OF THE PLATE.



STIFFENER DETAILS
(AT POLE BASE - SEE NOTES)



PHOTOELECTRIC CONTROL DETAILS
(SEE "LAYOUT" SHEET FOR LOCATION WHEN REQUIRED)

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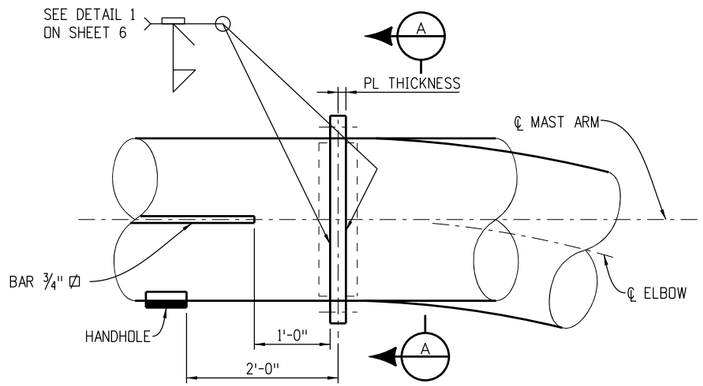
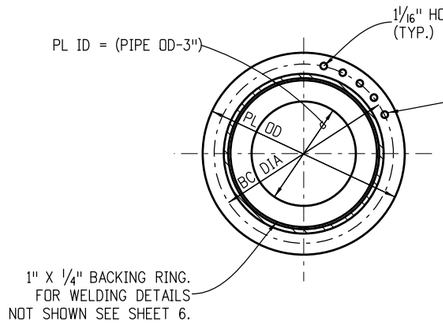


FIELD SPLICE

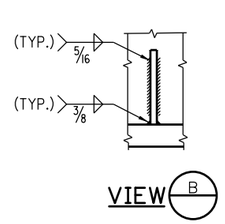


SECTION A

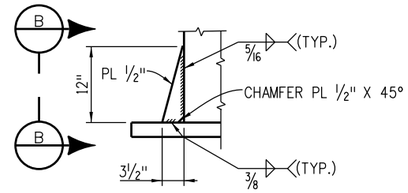
1" Ø H.S. BOLTS (GALVANIZED) EQUALLY SPACED. BOLTS SHALL BE SEQUENTIALLY TIGHTENED. ASSUMING 12 BOLTS AND A CLOCK FACE, THE TIGHTENING SEQUENCE WOULD BE 12, 6, 1, 7 ETC. THIS PROCESS SHALL BE CONTINUED UNTIL NO LOOSE BOLTS ARE FOUND AFTER ALL BOLTS HAVE BEEN INITIALLY TIGHTENED. SEE THE FIELD SPLICE TABLE FOR OTHER DETAILS

FIELD SPLICE					
PIPE OUTSIDE DIAMETER (IN.)	PL THICKNESS (IN.) *	BC DIAMETER (IN.)	PL OD (IN.)	# OF STIFF.	# OF BOLTS
12.75	1¼	16	21	6	14
14	1¼	17	22	6	16
16	1¼	21	24	6	20
18	1⅜	23	26	10	22
20	1⅜	25	28	10	24
24	1½	29	32	12	28

* MINIMUM THICKNESS AFTER MACHINING AS CALLED FOR IN NOTE 4.



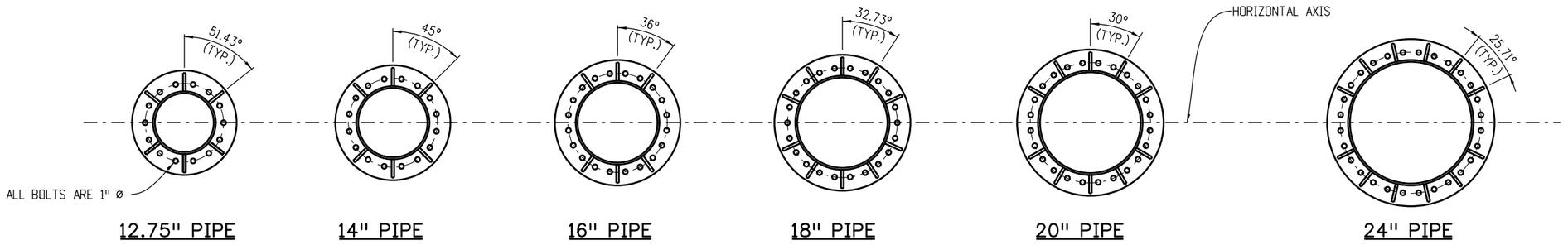
VIEW B



STIFFENER DETAILS
(AT FIELD SPLICE)

NOTES:

1. STIFFENERS ARE TO BE PLACED ON ALL FIELD SPLICES. STIFFENERS ARE NOT SHOWN ELSEWHERE IN THESE SHEETS FOR CLARITY.
2. TERMINATE WELD ½" SHORT OF THE TOP OF THE STIFFENER PLATE. AT THE OTHER 3 WELD TERMINATIONS ON THESE TWO TYPICAL WELDS, STOP THE WELD ¼" SHORT OF THE END OF THE PLATE.
3. SPLICE DESIGN BASED ON ARM CAPACITY.
4. THE MATING SURFACES OF THE FLANGE SPLICE PLATES SHALL BE MACHINED TO A COMMON PLANE WITHIN A TOLERANCE OF 1/64" USING A PORTABLE FLANGE FACER AFTER WELDING AND PRIOR TO GALVANIZING.



12.75" PIPE | 14" PIPE | 16" PIPE | 18" PIPE | 20" PIPE | 24" PIPE

FIELD SPLICE DETAILS

STIFFENERS SHALL BE LOCATED ON BOTH SIDES OF THE FIELD SPLICE.
CLIP WASHERS AS NEEDED TO AVOID INTERFERENCE WITH STIFFENER WELDS.

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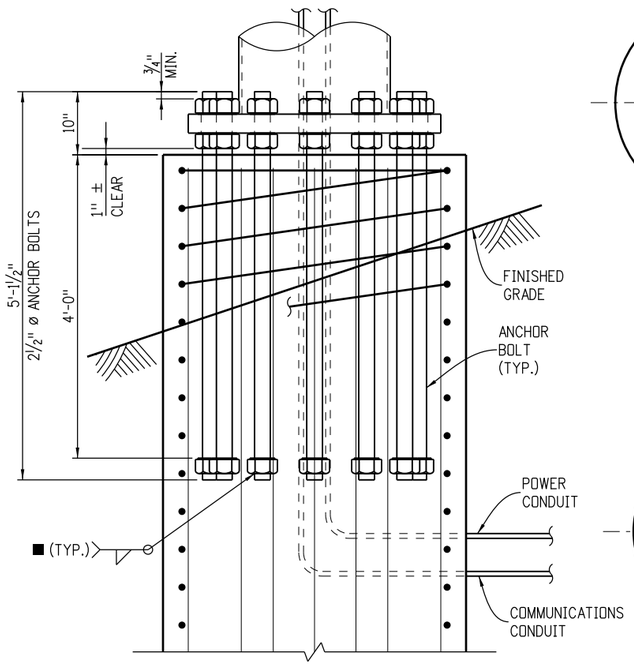
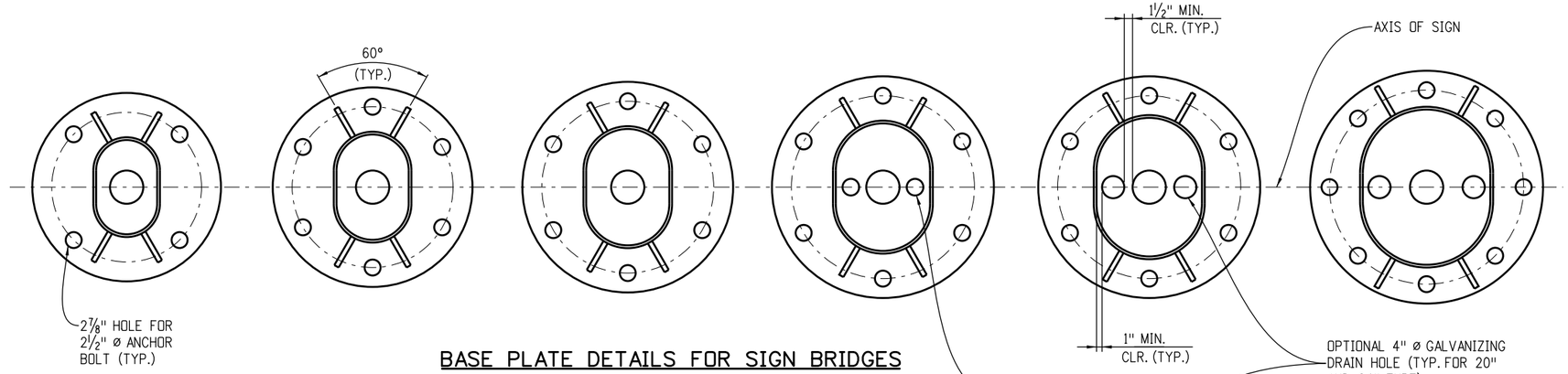
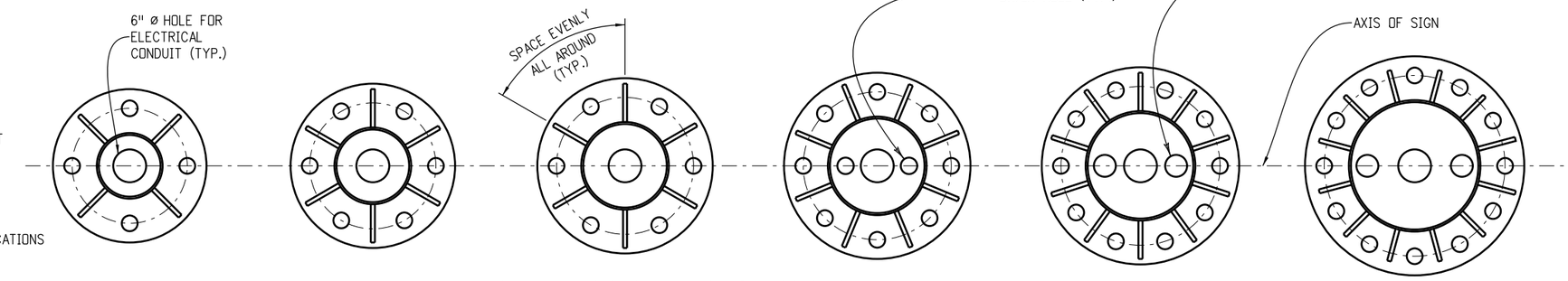


ANCHOR BOLT DETAIL

■ WELDING PROCEDURE IS NOT REQUIRED FOR THIS WELD



BASE PLATE DETAILS FOR SIGN BRIDGES



BASE PLATE DETAILS FOR CANTILEVERS

12.75" PIPE | 14" PIPE | 16" PIPE | 18" PIPE | 20" PIPE | 24" PIPE

CANTILEVERS

PIPE OD (IN.)	SPLIT (IN.)	BASE PL SIZE (DIAM. X THICK.) (IN.)	BOLT CIRCLE (IN.)	# OF ANCHOR BOLTS	# OF STIFF.
12.75	-	28" x 2.5"	21"	4	4
14	-	30" x 2.5"	23"	6	6
16	-	32" x 2.5"	25"	6	6
18	-	34" x 2.75"	27"	8	8
20	-	36" x 3.0"	29"	10	10
24	-	40" x 3.0"	33"	12	12

SIGN BRIDGES

PIPE OD (IN.)	SPLIT (IN.)	BASE PL SIZE (DIAM. X THICK.) (IN.)	BOLT CIRCLE (IN.)	# OF ANCHOR BOLTS	# OF STIFF.
12.75	5	34" x 2.5"	27"	4	4
14	5	36" x 2.5"	29"	6	4
16	5	38" x 2.5"	31"	6	4
18	5	40" x 2.75"	33"	6	4
20	5	40" x 3.0"	33"	6	4
24	5	42" x 3.0"	35"	8	4

NOTES

1. THREAD UPPER 10" AND GALVANIZE UPPER 1'-3" OF THE ANCHOR BOLTS.
2. ANCHOR BOLTS SHALL BE SET WITH A STEEL TEMPLATE UNTIL THE CONCRETE HAS CURED AT LEAST TWO DAYS.
3. THERE SHALL BE NO GROUT PAD INSTALLED ON TOP OF THE EXISTING FOUNDATIONS.
4. THE ANCHOR BOLTS SHALL BE TIGHTENED USING THE TURN-OF-NUT METHOD. THE BOLTS SHALL FIRST BE TIGHTENED TO SNUG TIGHT, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE UPPER AND LOWER NUTS ARE IN FIRM CONTACT WITH THE BASE PLATE. WITH THE MAST ARM FREE TO DEFLECT, THE UPPER AND LOWER NUTS SHALL EACH THEN BE ROTATED AN ADDITIONAL $^{1}/_{12}$ TURN (30° ± 5°) USING A SLUGGING WRENCH.
5. STIFFENERS ARE NOT SHOWN ELSEWHERE IN THESE SHEETS FOR CLARITY. ALL POST BASES ARE TO HAVE STIFFENERS.

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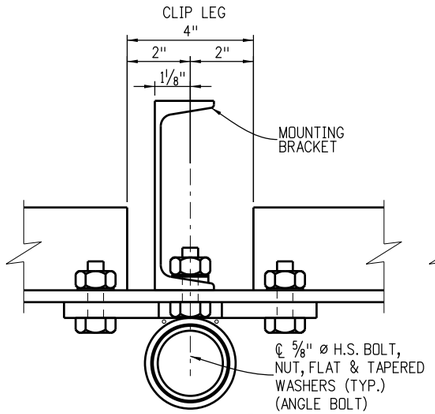
-SIGN LIGHTING DETAILS-

LIGHTING NOTES

1. FIXTURES SHALL BE WATERTIGHT, DUSTPROOF AND DESIGNED FOR EASE OF LAMP AND BALLAST REPLACEMENT.
2. WHEN LIGHTS ARE REQUIRED, LAMP SHALL BE OF HIGH PRESSURE SODIUM TYPE (85 WATT OR 250 WATT AS DIRECTED BY THE ENGINEER). LAMPS AND BALLAST SHALL BE DESIGNED TO OPERATE OVER AN AMBIENT TEMPERATURE RANGE OF -20° F TO +120° F.
3. BALLASTS SHALL BE OF THE MAGNETIC REGULATOR TYPE SPECIFICALLY MANUFACTURED FOR USE WITH HIGH PRESSURE SODIUM LAMPS, AND SHALL OPERATE AT A MINIMUM OF 90% POWER FACTOR. OPERATION SHALL BE SUITABLE WITH A LINE VOLTAGE VARIATION OF ±10%.
4. THE TYPE, NUMBER AND SPACING OF FIXTURES SHALL BE PER MANUFACTURER'S SPECIFICATIONS TO MAINTAIN A MAXIMUM INITIAL ILLUMINATION OF THE SIGN FACE OF 30 FOOTCANDLES TO 60 FOOTCANDLES WITH A MAXIMUM UNIFORMITY RATIO (MAXIMUM ILLUMINATION / MINIMUM ILLUMINATION) OF 5:1.
5. FIXTURE AND MOUNTING DETAILS WILL BE SUBJECT TO APPROVAL BY THE ENGINEER.
6. DRILL AND TAP 1½" NPS CHASE NIPPLES AND PLUG WITH RECESSED PIPE PLUGS. PLACE PERPENDICULAR TO SIGN PANEL AXIS AND AWAY FROM APPROACHING TRAFFIC.



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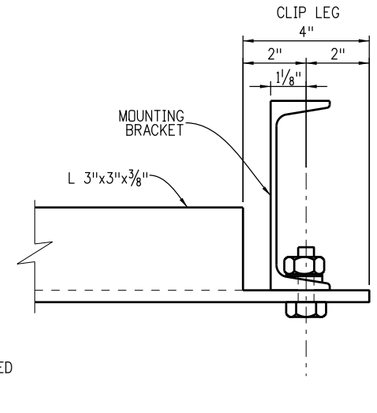

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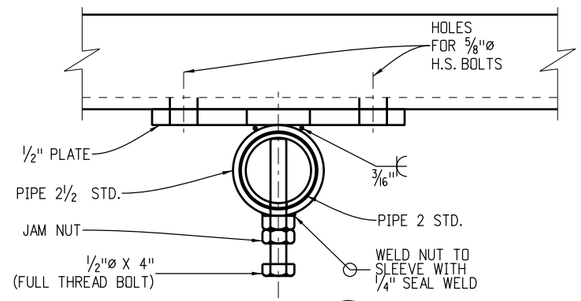

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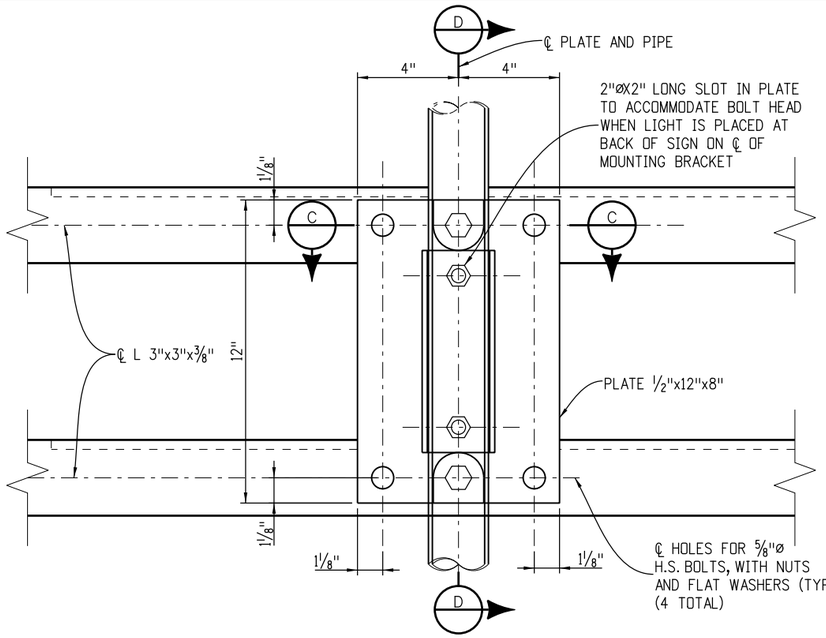
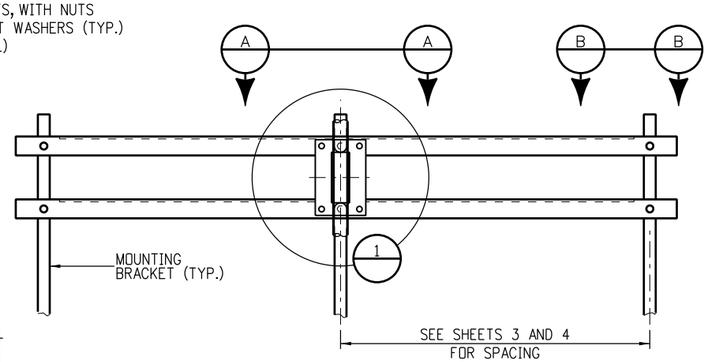
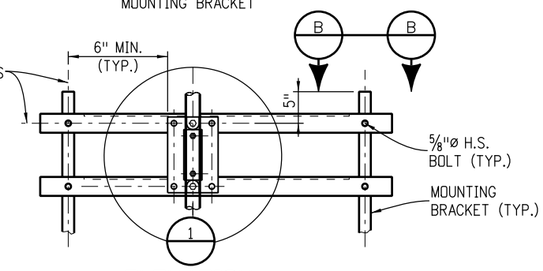


DETAIL 1



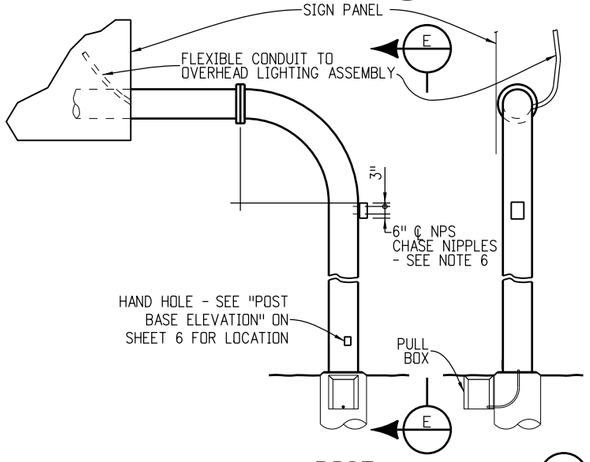
ELEVATION

LIGHT CONNECTION PLACED AT BACK OF SIGN ON ℄ OF MOUNTING BRACKET

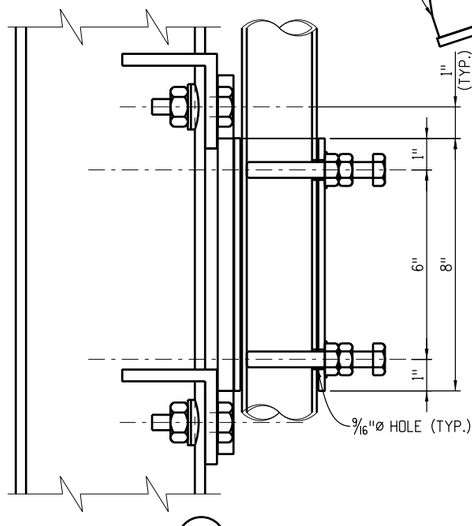


ELEVATION

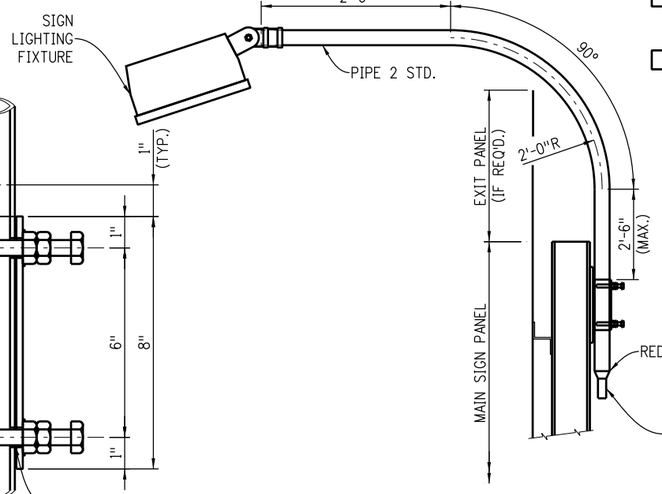
LIGHT CONNECTION PLACED AT BACK OF SIGN BETWEEN MOUNTING BRACKETS



POST VIEW E



SECTION D



OVERHEAD LIGHTING ASSEMBLY

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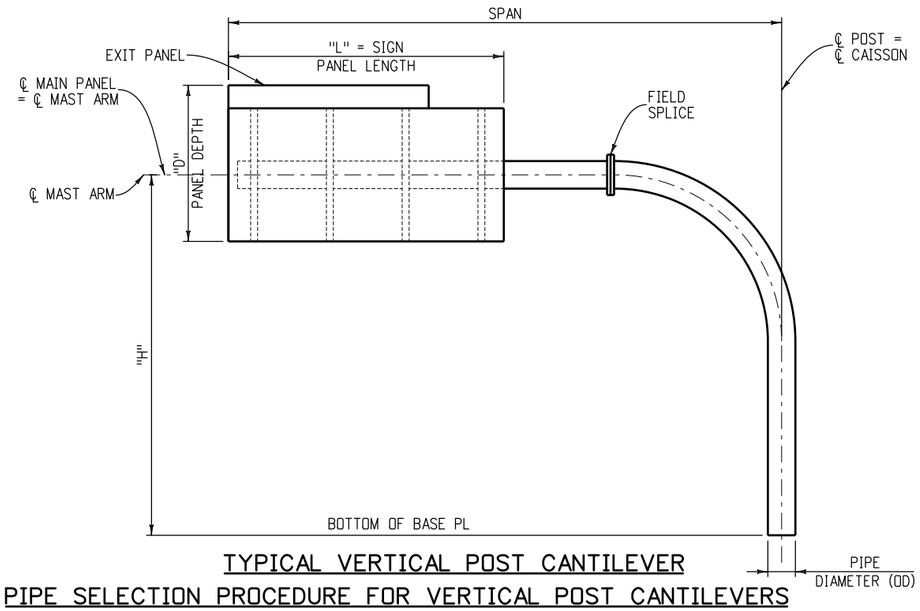

TYPICAL VERTICAL POST CANTILEVER

PIPE SELECTION PROCEDURE FOR VERTICAL POST CANTILEVERS

A. COVERAGE PERCENTAGE = $\frac{\text{SIGN PANEL LENGTH}}{\text{SPAN}}$ FOR THE SPAN LENGTH USE THE SPAN FROM ONE OF THE CHARTS (25', 35', ETC.), NOT THE ACTUAL SPAN

B. PICK THE PIPE OUTSIDE DIAMETER (OD) FROM THE 0-50% OR THE 51-80% CHART. THE COVERAGE PERCENTAGE CHOSEN SHOULD BE HIGH ENOUGH TO INCLUDE ANY SIGN PANELS WHICH MAY POTENTIALLY BE PLACED ON THIS SIGN IN THE FUTURE.

C. TO DETERMINE "D" FOR THE SELECTION CHARTS ADD THE AREA OF THE EXIT PANEL, IF PRESENT, TO THE MAIN SIGN PANEL AREA. DIVIDE BY THE MAIN PANEL LENGTH TO OBTAIN "D".

D. IF NO PIPE IS SHOWN FOR A CERTAIN SPAN THIS INDICATES THAT THIS SPAN/SIGN PANEL/HEIGHT COMBINATION EXCEEDS THE LIMITS OF THIS STANDARD.

E. ON THE OVERHEAD SIGN X-SECTION SHEET INDICATE THE DIAMETER OF THE PIPE, THE HEIGHT "H" AND THE SPAN.

F. OBTAIN THE DESIGN WIND SPEED FROM THE OVERHEAD SIGN X-SECTION SHEETS IN THE ROADWAY PLANS.

80 MPH WIND

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	12.75	14	14	14	14	16
	25	14	16	16	16	16	18
	30	16	18	18	18	18	20
	35	18	20	20	20	24	24
	40	20	24	24	24	24	24
	45	24	24	24	24		

UP TO 50% COVERAGE CHART

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	16	16	16	18	18	20
	25	18	18	18	20	18	24
	30	20	20	20	24	24	24
	35	24	24	24	24	24	
	40	24	24	24			
	45						

51-80% COVERAGE CHART

90 MPH WIND

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	14	14	16	16	16	18
	25	16	18	18	18	18	20
	30	18	20	20	20	24	24
	35	20	24	24	24	24	24
	40	24	24	24			
	45						

UP TO 50% COVERAGE CHART

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	16	18	18	20	20	20
	25	20	20	20	24	24	24
	30	24	24	24	24	24	
	35	24					
	40						
	45						

51 - 80% COVERAGE CHART

100 MPH WIND

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	16	16	16	18	18	18
	25	18	18	20	20	20	24
	30	20	24	24	24	24	24
	35	24	24	24			
	40						

UP TO 50% COVERAGE CHART

"D" (FT.) →		10'		12'		14'	
"H" (FT.) →		H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30	H ≤ 25	25 < H ≤ 30
SPAN ≤ (FT.)	20	18	20	20	24	24	24
	25	20	24	24	24	24	
	30	24	24				
	35						

51 - 80% COVERAGE CHART

PROCEDURE TO DETERMINE THE DESIGN WIND SPEED

80 MPH IS THE STANDARD DESIGN WIND SPEED FOR THE STATE OF COLORADO. THE STANDARD DESIGN WIND SPEED OF 80 MPH IS TO BE USED AT ALL LOCATIONS EXCEPT THE FOLLOWING:

1. USE THE 90 MPH WIND SPEED FOR LOCATIONS WITHIN 4 MILES OF EITHER SIDE OF THE BASE OF THE FOOTHILLS ALONG THE FRONT RANGE OF THE EASTERN SLOPE.
2. USE THE 100 MPH WIND SPEED FOR LOCATIONS IN BOULDER COUNTY.

IF THERE ARE QUESTIONS CONCERNING THE PROPER DESIGN WIND SPEED CONTACT THE STAFF BRIDGE BRANCH.

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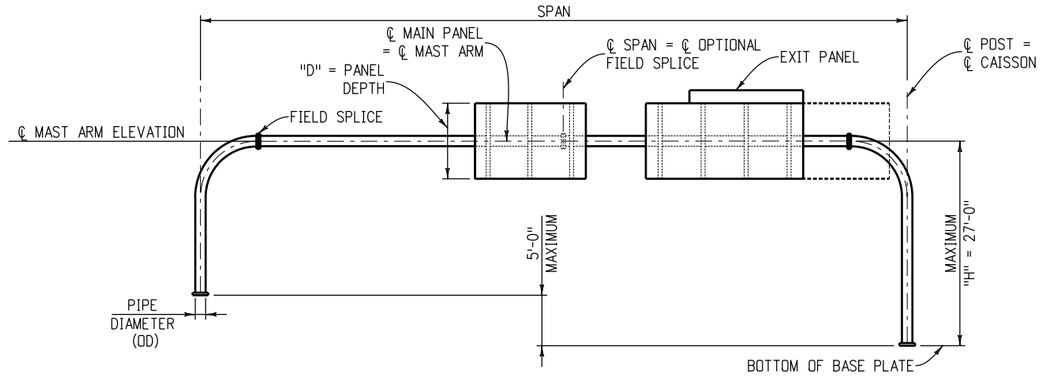
-SIGN BRIDGE PIPE SELECTION TABLES-



TYPICAL VERTICAL POST SIGN BRIDGE

STRUCTURE SELECTION PROCEDURE FOR SIGN BRIDGES

A. DESIGN IS BASED ON A SIGN HEIGHT OF 15' WITH 50% OF THE SPAN LENGTH COVERED UP UNTIL THE CAPACITY OF THE LARGEST POLE SHOWN IS REACHED. BEYOND THIS POINT THE COVERAGE PERCENTAGE DECREASES.

B. THE MAXIMUM PRIMARY PANEL HEIGHT IS 14'. ADD THE AREA OF ALL EXIT PANELS TO THE AREA OF ALL PRIMARY PANELS TO CHECK AGAINST MAXIMUM SIGN PANEL AREA.

C. OBTAIN THE DESIGN WIND SPEED FROM THE OVERHEAD SIGN X-SECTION SHEETS IN THE ROADWAY PLANS.

D. PICK PIPE OD AND SPLIT SIZE FROM THE APPROPRIATE CHART. INCLUDE THE AREA OF ALL SIGN PANELS SHOWN IN THE OVERHEAD SIGN X-SECTION SHEETS WHICH MAY POTENTIALLY BE PLACED ON THE SIGN IN THE FUTURE.

E. IF NO PIPE POST/ARM SIZE IS SHOWN FOR A CERTAIN SPAN THIS INDICATES THAT THIS SPAN/SIGN PANEL/HEIGHT COMBINATION EXCEEDS THE LIMITS OF THIS STANDARD.

F. THE OVERHEAD SIGN X-SECTION SHEETS INDICATE THE HEIGHT "H", THE SPAN AND THE SIGN PANEL SIZES.

80 MPH WIND

SPAN ≤	MAXIMUM SIGN PANEL AREA (SQ. FT.)	* PIPE POST	
		PIPE OD (IN.)	SPLIT (IN.)
50'	375	12.75	5
60'	450	14	5
70'	525	16	5
80'	600	18	5
90'	675	20	5
100'	750	20	5
110'	825	24	5
120'	900	24	5
130'	780	24	5
140'	700	24	5

90 MPH WIND

SPAN ≤	MAXIMUM SIGN PANEL AREA (SQ. FT.)	* PIPE POST	
		PIPE OD (IN.)	SPLIT (IN.)
50'	375	14	5
60'	450	16	5
70'	525	18	5
80'	600	20	5
90'	675	24	5
100'	750	24	5
110'	775	24	5
120'	650	24	5
130'	585	24	5
140'	525	24	5

100 MPH WIND

SPAN ≤	MAXIMUM SIGN PANEL AREA (SQ. FT.)	* PIPE POST	
		PIPE OD (IN.)	SPLIT (IN.)
50'	375	16	5
60'	450	18	5
70'	525	20	5
80'	600	24	5
90'	675	24	5
100'	660	24	5
110'	580	24	5
120'	500	24	5
130'	450	24	5
140'	400	24	5

PROCEDURE TO DETERMINE THE DESIGN WIND SPEED

80 MPH IS THE STANDARD DESIGN WIND SPEED FOR THE STATE OF COLORADO. THE STANDARD DESIGN WIND SPEED OF 80 MPH IS TO BE USED AT ALL LOCATIONS EXCEPT THE FOLLOWING:

1. USE THE 90 MPH WIND SPEED FOR LOCATIONS WITHIN 4 MILES OF EITHER SIDE OF THE BASE OF THE FOOTHILLS ALONG THE FRONT RANGE OF THE EASTERN SLOPE.
2. USE THE 100 MPH WIND SPEED FOR LOCATIONS IN BOULDER COUNTY.

IF THERE ARE QUESTIONS CONCERNING THE PROPER DESIGN WIND SPEED CONTACT THE STAFF BRIDGE BRANCH

* MAST ARM DIAMETER SAME AS POST.

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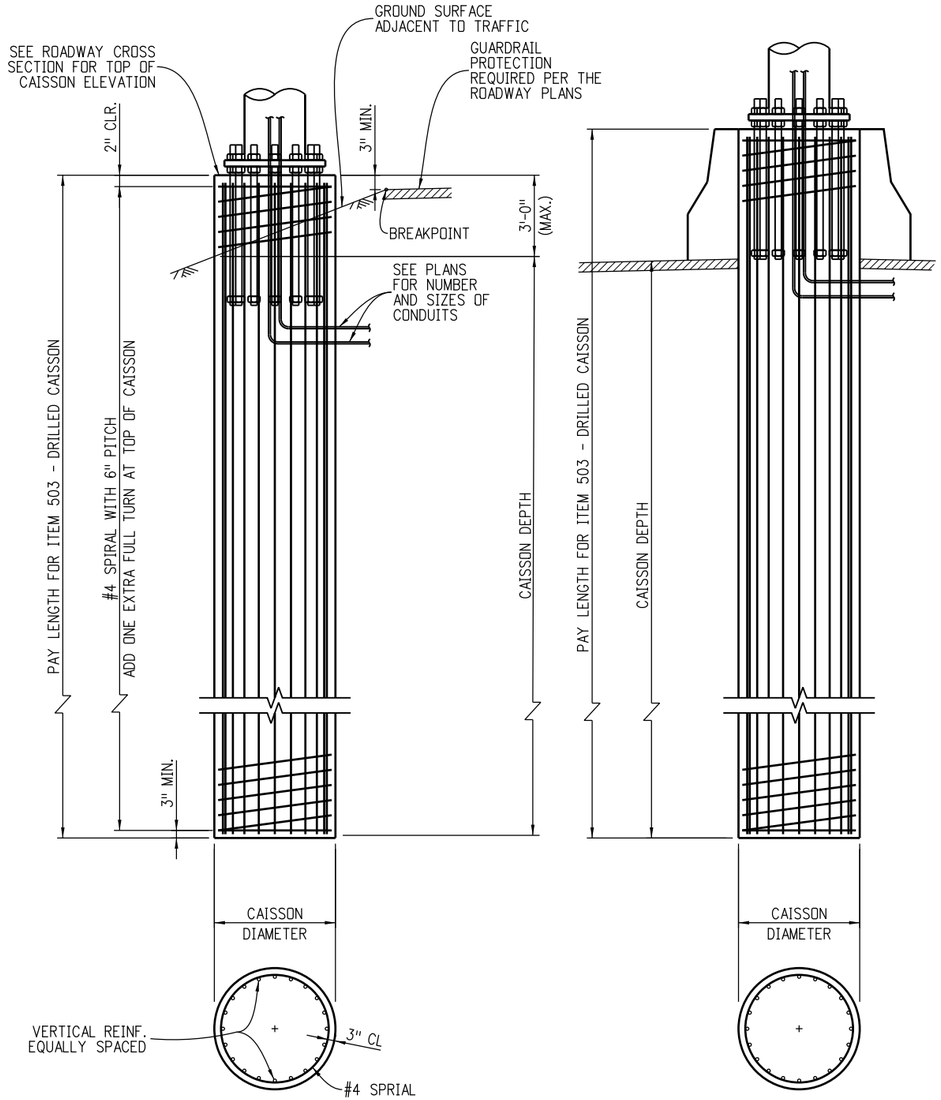

ROADSIDE SHOULDER INSTALLATION

MEDIAN RAIL INSTALLATION
(SEE ROADSIDE SHOULDER INSTALLATION FOR ADDITIONAL INFORMATION)

CAISSON FOUNDATION DETAILS

CAISSON DRILLING AND INSTALLATION NOTES

1. CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
   - A) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
   - B) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
   - C) THE FOUNDATION SOILS ARE NOT HOMOGENOUS.
   - D) FIRM BEDROCK IS ENCOUNTERED.
2. CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH. WET OR CAVING HOLES SHALL BE BACKFILLED WITH FLOW-FILL AND REDRILLED AFTER A THREE DAY CURING PERIOD WITHOUT THE USE OF A CASING.
3. THE FOLLOWING SOIL PARAMETERS WERE USED FOR DESIGN:
   - A) LOOSE GRANULAR SOIL WITH A UNIT WEIGHT OF 100 PCF AND A 28 DEGREE ANGLE OF INTERNAL FRICTION (PHI ANGLE).
   - B) SOFT COHESIVE SOIL WITH A UNIT WEIGHT OF 100 PCF AND A UNIT COHESION OF 500 PSF.
4. THE CONTRACTOR SHALL PROVIDE A SURVEY OF EACH OVERHEAD SIGN FOUNDATION TO VERIFY PLACEMENT SOON AFTER WORK ON THE FOUNDATION HAS BEEN COMPLETED. THE SURVEY SHALL CONFORM TO THE REQUIREMENTS OF SECTION 625, CONSTRUCTION SURVEYING. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COPY OF THE SURVEY NOTES DETAILING THE FOUNDATION LOCATION AND ELEVATION AND THE ANCHOR BOLT LOCATIONS, PROJECTIONS, AND ORIENTATIONS, AND IN THE CASE OF SIGN-BRIDGE TYPE OF OVERHEAD SIGNS, THE DISTANCE MEASURED BETWEEN THE CENTERLINE OF THE ANCHOR BOLT GROUPS. THE ELEVATION OF THE GROUND SURROUNDING EACH FOUNDATION SHALL ALSO BE PROVIDED. THE CONTRACTOR SHALL COMPARE THE SURVEY INFORMATION TO THE REVIEWED SHOP DRAWINGS AND RECONCILE ANY DIFFERENCES BETWEEN THEM. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ADJUSTMENTS OR MODIFICATIONS TO THE ENGINEER FOR APPROVAL.

BRIDGES

PIPE OUTSIDE DIAMETER (INCHES)	SPLIT (INCHES)	CAISSON DIAMETER (INCHES)	CAISSON DEPTH (FEET)	VERTICAL REINF.
12.75	5	48	17	18 - #8
14	5	48	19	24 - #8
16	5	48	20	24 - #8
18	5	54	21	24 - #9
20	5	54	22	24 - #9
24	5	54	24	24 - #9

CANTILEVERS

PIPE OUTSIDE DIAMETER (INCHES)	SPLIT (INCHES)	CAISSON DIAMETER (INCHES)	CAISSON DEPTH (FEET)	VERTICAL REINF.
12.75	-	36	13	13 - #8
14	-	42	15	18 - #8
16	-	42	16	18 - #8
18	-	42	17	18 - #8
20	-	48	18	24 - #8
24	-	48	20	24 - #8

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Sheet Revisions	
Date:	Comments

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STATIC SIGN MONOTUBE STRUCTURES

Issued By: Safety and Traffic Engineering Branch on July 4, 2012

STANDARD PLAN NO.
S-614-50
Sheet No. 12 of 12

GENERAL NOTES

1. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS SHOWN IN THE MATERIALS TABLE ON SHEET 2.
2. HIGH-STRENGTH BOLTED CONNECTIONS SHALL CONFORM TO THE PROVISIONS IN SECTION 509.28 OF THE STANDARD SPECIFICATIONS. ASSEMBLY OF HIGH-STRENGTH BOLTED CONNECTIONS FOR SIGN STRUCTURES MAY BE MADE WITH GALVANIZING OR PAINT ON THE CONTACT (FAYING) SURFACES.
3. ALL SIGN STRUCTURES SHALL BE FABRICATED INTO THE LARGEST PRACTICAL SECTIONS PRIOR TO GALVANIZING. SPLICE LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AND THE CONTRACTOR SHALL NOT COMMENCE FABRICATION UNTIL SUCH SPLICE LOCATIONS ARE APPROVED.
4. ALL CONCRETE SHALL BE CLASS BZ WITH AIR ENTRAINMENT; REINFORCING STEEL SHALL BE GRADE 60. CAISSON CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,700 PSI BEFORE INSTALLING THE SIGN STRUCTURE; VERIFY CONCRETE STRENGTH WITH MATURITY METER.
5. A DISCONNECT FOR THE POWER SUPPLY TO THE DMS SHALL BE PROVIDED AS SHOWN IN THE ROADWAY PLANS.
6. STRUCTURES SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES.

GENERAL NOTES (CONTINUED)

7. SHEETS IN THE INDEX MARKED WITH A ■ PROVIDE INSTRUCTIONS TO DESIGNERS FOR THEIR USE IN THE PREPARATION OF THE SIGN X-SECTION SHEETS IN THE ROADWAY PLANS.
8. NPS = NOMINAL PIPE SIZE; O.D. = OUTSIDE DIAMETER; DMS = DYNAMIC MESSAGE SIGN.
9. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH SUBSECTION 105.02 OF THE STANDARD SPECIFICATIONS.
10. CAISSONS, STEEL SUPPORTS AND SURVEY WORK SHALL BE PAID FOR IN ACCORDANCE WITH BID ITEMS 503, 614 AND 625 RESPECTIVELY.
11. THERE SHALL BE NO PENETRATIONS OF MAST/CROSS ARMS OR POST OTHER THAN AS SHOWN ON THESE PLANS UNLESS APPROVED BY THE ENGINEER PRIOR TO FABRICATION.
12. ATTACH REMOTE ACCESS CABINET(S) TO POST WITH TWO ½" WIDE STAINLESS STEEL BANDS AND STAINLESS STEEL FLARED LEG BRACKETS WITH HEX HEAD BOLTS (BAND-IT D315 OR EQUIVALENT).
13. INSTALL STRUCTURE IDENTIFICATION PANEL IN ACCORDANCE WITH M AND S STANDARD S-614-12 USING TWO ½" WIDE STAINLESS STEEL BANDS AND STAINLESS STEEL FLARED LEG BRACKETS WITH HEX HEAD BOLTS (BAND-IT D315 OR EQUIVALENT).

GENERAL NOTES (CONTINUED)

14. WELDING OF STEEL SHALL CONFORM TO THE REQUIREMENTS OF AWS D 1.1. ALL AREAS TO BE WELDED SHALL BE GROUND TO BRIGHT METAL. NO BUTT WELD SPLICES WILL BE PERMITTED. ALL WELDING AND REQUIRED TESTING SHALL BE COMPLETE BEFORE ANY MATERIAL IS GALVANIZED.

    ENHANCED MAGNETIC PARTICLE TESTING SHALL BE PERFORMED ON AREAS DEFINED IN AWS D1.1 AND HEREIN. ENHANCED MAGNETIC PARTICLE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM E 709 AND AWS D 1.1, EXCEPT AS AMENDED HEREIN. ALTERNATING CURRENT SHALL BE USED. THE YOKE SPACING SHALL BE BETWEEN 2 AND 4 INCHES. THE MINIMUM LIFTING POWER SHALL BE 10 LBS. RED DRY PARTICLES SHALL BE USED. THE LIGHT INTENSITY SHALL MEET ASTM E 709, SECTION 7. PARTICLE APPLICATION AND SPECIMEN PREPARATION SHALL MEET THE REQUIREMENTS OF ASTM E 709 SECTIONS 9 AND 15, EXCEPT WHITE NON-AQUEOUS DEVELOPER MEETING ASTM E 165, TYPE 3, SHALL BE APPLIED TO THE TEST SURFACE PRIOR TO TESTING.

    THE YOKES SHALL BE SET IN TWO POSITIONS WHEN TESTING THE WELD OR BASE METAL. THEY SHALL BE POSITIONED BOTH NORMAL AND PARALLEL WITH RESPECT TO THE WELD AXIS AND ROLLING DIRECTION OF THE BASE METAL.

    ENHANCED MAGNETIC PARTICLE TESTS SHALL BE PERFORMED AT THE FOLLOWING LOCATIONS:

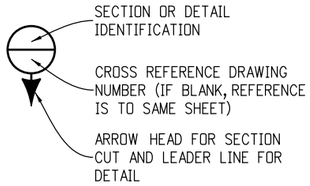
    (1) BASE METAL. ALL AREAS CONTACTED BY THE CARBON ARC GOUGE ELECTRODE, THE ELECTRODE CUP, AND THE WELDING ELECTRODE. ALL THREE CONDITIONS ARE ARC STRIKES.

    (2) FILLET WELDS. EACH DESIGN WELD SIZE ON MAIN MEMBER TO MAIN MEMBER AND SECONDARY MEMBER TO MAIN MEMBER WELDMENTS. ALL STOP-STARTS AND WELD TERMINI. ALL LINEAR INDICATIONS SHALL FURTHER BE EVALUATED WITH 10X OR 30X MAGNIFICATION. VERIFICATION SHALL BE RESOLVED BY EXCAVATION.

    (3) GROOVE WELDS. ALL THROUGH THICKNESS EDGES ON TRANSVERSE BUTT JOINT WELDMENTS IN TENSION AREAS.

    (4) REPAIRS. ALL REPAIR WELDS TO CORRECT DEFECTS IN GROOVE AND FILLET WELDS, PLATE CUT EDGES, CORRECTION OF FABRICATION ERRORS IN CUTTING, PUNCHING, DRILLING, OR FITTING, AND MEMBERS WHICH ARE TACKED OR WELDED AND SUBSEQUENTLY CUT APART AND REWELDED.

15. ALL CIRCUMFERENTIAL AND ALL LONGITUDINAL PIPE SEAM WELDS WITHIN 5" OF FULL PENETRATION CIRCUMFERENTIAL GROOVE WELDS SHALL BE FULL PENETRATION GROOVE WELDS AND SHALL BE INSPECTED AS SPECIFIED HEREIN. THE ACCEPTABLE MAXIMUM WELD UNDERCUT IS 0.01".
16. SEE TABLE ON SHEET 4 FOR CABINET ROTATION ADJUSTMENTS TO VERTICAL CLEARANCES MARKED WITH A ● .



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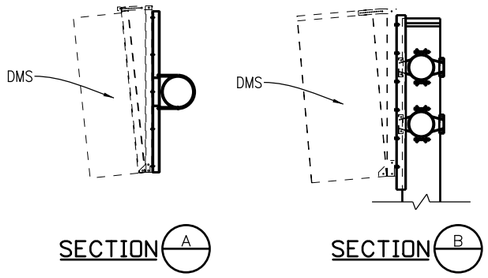
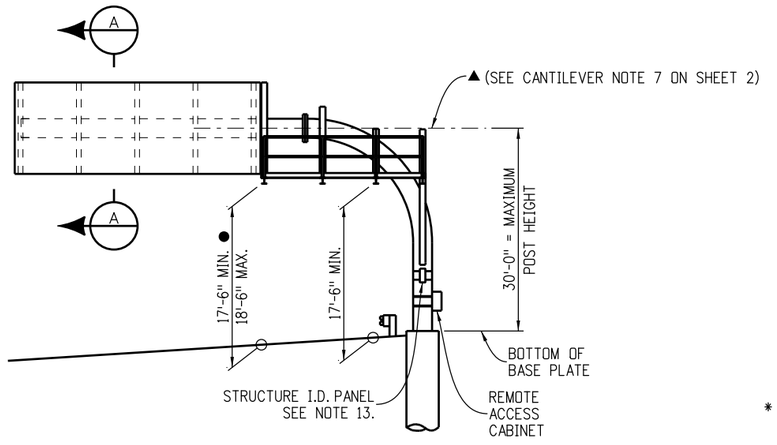
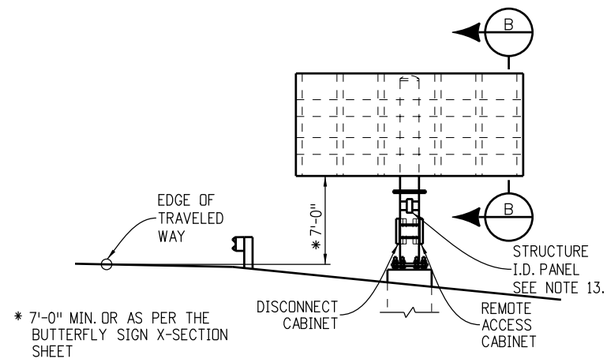
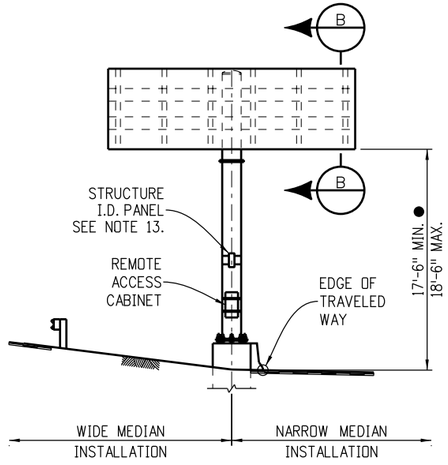




CANTILEVER SIGN



BUTTERFLY SIGN (ROADSIDE INSTALLATION)
(SEE SIGN X-SECTION SHEET IN TRAFFIC PLANS)



BUTTERFLY SIGN (MEDIAN INSTALLATION)
(SEE SIGN X-SECTION SHEET IN TRAFFIC PLANS)

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DYNAMIC SIGN MONOTUBE STRUCTURES

Issued By: Safety and Traffic Engineering Branch on July 4, 2012

STANDARD PLAN NO.
S-614-60
Sheet No. 1 of 14

CANTILEVER NOTES

1. SIGN STRUCTURES SHALL BE CONSTRUCTED TRUE TO THE SPECIFIED DIMENSIONS, SHALL BE FREE FROM KINKS, TWISTS OR BENDS, AND SHALL BE UNIFORM IN APPEARANCE. THE COMPLETED SECTIONS SHALL BE ASSEMBLED IN THE SHOP AND SHALL BE CHECKED FOR STRAIGHTNESS, ALIGNMENT, AND DIMENSIONAL ACCURACY. ANY VARIATIONS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER.

2. MAST ARMS SHALL BE TEMPORARILY SUPPORTED TO TAKE ALL LOAD OFF OF THE FIELD SPLICES WHILE BOLTS ARE BEING TIGHTENED IN ORDER TO FIRMLY SEAT THE FLANGE PLATES.

3. POST MEMBERS SHALL BE FORMED TO THE RADII SHOWN ON THE PLANS BY HEAT TREATMENT OR BY FABRICATION TO SUCH RADII BY METHODS WHICH WILL NOT CRIMP OR BUCKLE THE INTERIOR RADIUS OF THE PIPE BEND.

4. CLIPS, EYES, OR REMOVABLE BRACKETS SHALL BE AFFIXED TO POST AND MAST ARM, AS NECESSARY, TO SECURE THE SIGN DURING SHIPPING AND FOR LIFTING AND MOVING DURING ERECTION. THIS IS TO PREVENT DAMAGE TO THE FINISHED GALVANIZED OR PAINTED SURFACES. BRACKETS ON TUBULAR SIGN STRUCTURES SHALL BE REMOVED AFTER ERECTION. DETAILS OF SUCH DEVICES SHALL BE SHOWN ON THE SHOP DRAWINGS.

5. WALKWAYS SHALL LEAD UP TO THE CABINET ACCESS DOOR AS SPECIFIED ON THE SIGN X-SECTION SHEETS IN THE ROADWAY PLANS.

6. ALL PIPE MEMBERS SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION AS PER ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM. WALKWAY GRATINGS, WALKWAY BRACKETS, SAFETY RAILINGS AND ALL NUTS, BOLTS AND WASHERS FOR SIGN STRUCTURES SHALL BE GALVANIZED AFTER FABRICATION AS PER ASTM A123 OR ASTM A153, AS APPROPRIATE, AND SHALL NOT BE PAINTED. TENSION CONTROL BOLTS OR DIRECT TENSION INDICATING WASHERS USED IN HIGH-STRENGTH BOLTED CONNECTIONS SHALL BE MECHANICALLY GALVANIZED PER ASTM B695, COATING CLASS 55.

7. CANTILEVER ARMS MARKED WITH A ▲ MUST BE LEVEL OR TILTED UPWARD NO MORE THAN 1° MAXIMUM AFTER INSTALLATION OF THE SIGN.

BUTTERFLY NOTES

1. SIGN STRUCTURES SHALL BE CONSTRUCTED TRUE TO THE SPECIFIED DIMENSIONS, SHALL BE FREE OF KINKS, TWISTS OR BENDS, AND SHALL BE UNIFORM IN APPEARANCE. THE POST TO CROSS ARM CONNECTIONS SHALL BE PREASSEMBLED IN THE SHOP AFTER GALVANIZING. ASSEMBLIES WITH THE OPTIONAL FIELD SPLICE SHALL BE PREASSEMBLED ABOVE THE SPLICE FOR SHIPPING TO THE JOB SITE.

2. POST AND CROSS ARMS SHALL BE FABRICATED IN SINGLE SECTIONS PRIOR TO GALVANIZING. SPLICING OF SECTIONS IS NOT PERMITTED.

3. CLIPS, EYES, OR REMOVABLE BRACKETS SHALL BE AFFIXED TO POST AND CROSS ARMS, AS NECESSARY, TO SECURE FOR SHIPPING AND FOR LIFTING AND MOVING DURING ERECTION IN ORDER TO PREVENT DAMAGE TO THE FINISHED GALVANIZED SURFACES. TEMPORARY BRACKETS ON SIGN STRUCTURE SHALL BE REMOVED AFTER ERECTION. DETAILS OF SUCH DEVICES SHALL BE SHOWN ON THE SHOP DRAWINGS. ERECTION LUGS ARE REQUIRED ON ONE END OF THE CROSS ARMS TO FACILITATE PULLING OF THE CROSS ARMS THROUGH THE POST. THE ERECTION LUGS SHALL BE POSITIONED TO FORCE THE "PULL" TO OCCUR ON THE CENTERLINE OF THE CROSS ARM. ERECTOR SHALL SUPPORT THE POST ON EITHER SIDE OF THE CROSS-ARM PRIOR TO PULLING THE CROSS-ARM THROUGH THE HOLE IN THE POST.

4. ALL PIPE MEMBERS SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION AS PER ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM. ALL NUTS, BOLTS AND WASHERS FOR SIGN STRUCTURES SHALL BE GALVANIZED AFTER FABRICATION AS PER ASTM A123 OR ASTM A153, AS APPROPRIATE, AND SHALL NOT BE PAINTED. TENSION CONTROL BOLTS OR DIRECT TENSION INDICATING WASHERS USED IN HIGH-STRENGTH BOLTED CONNECTIONS SHALL BE MECHANICALLY GALVANIZED PER ASTM B695, COATING CLASS 55.

5. SEE THE BUTTERFLY MOUNTED SIGN X-SECTION SHEET IN THE TRAFFIC PLANS FOR THE DMS PANEL WIDTH, HEIGHT, DEPTH, AND WEIGHT; TOP OF CAISSON ELEVATION, STATION AND OFFSET; DMS PANEL OFFSET FROM SHOULDER; SUPPORT POST HEIGHT, ANGLE θ, AND GUARDRAIL PROTECTION LIMITS. DO NOT USE ANY POST HEIGHT WHICH EXCEEDS THE MAXIMUM POST HEIGHT SHOWN IN THE POST AND CROSS ARM PIPE DATA TABLE ON SHEET 11. STRUCTURES OVER TRAFFIC AND STRUCTURES THAT COULD FALL INTO THE TRAVELED WAY OR ONTO THE SHOULDER SHALL BE ASSIGNED A STAFF BRIDGE GENERATED STRUCTURE NUMBER.

CANTILEVER DESIGN DATA

SPECIFICATIONS:

DESIGN: "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (2001 AASHTO). (R-1)

SUBSECTION 17.4, SIGNS, IN THE STAFF BRIDGE BRANCH BRIDGE DESIGN MANUAL.

CONSTRUCTION: CDOT STANDARD SPECIFICATIONS, THESE STANDARD SHEETS AND THE PROJECT PLANS.

WIND LOADING: 100 MPH VELOCITY

BUTTERFLY DESIGN DATA

SPECIFICATIONS:

DESIGN: "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (2009 AASHTO).

SUBSECTION 17.4, SIGNS, IN THE STAFF BRIDGE BRANCH BRIDGE DESIGN MANUAL.

CONSTRUCTION: CDOT STANDARD SPECIFICATIONS, THESE STANDARD SHEETS AND THE PROJECT PLANS.

WIND LOADING: 110 MPH VELOCITY (3-SECOND GUST).

MATERIALS

ELEMENT	SPECIFICATION ASTM	AASHTO	AISI	CLARIFICATIONS
POSTS, MAST/CROSS ARMS	A53			#1
BARS, PLATES AND SHAPES	A709	M-270		#2
HOLLOW STRUCTURAL SECTIONS (HSS)	A500			#3
HIGH-STRENGTH BOLTS (H.S. BOLTS)	A325	M-164		#4
HIGH-STRENGTH NUTS	A563	M-291		
HIGH-STRENGTH WASHERS	F436	M-292		#5
U-BOLTS (RODS)	F1554	M-314		GRADE 55 STEEL
ANCHOR BOLTS	F1554	M-314		GRADE 55 STEEL
SPHERICAL WASHER SETS	A29		4140	#6
COLLAR NUTS	A29		4140	#6, #7

#1 PIPE POSTS AND MAST/CROSS ARMS SHALL BE WELDED OR SEAMLESS STEEL PIPE CONFORMING TO THE SPECIFICATIONS OF ASTM DESIGNATION: A53, GRADE B.

#2 GRADES 36 OR 50. ASTM A992 SHAPES MAY BE SUBSTITUTED.

#3 HOLLOW STRUCTURAL SECTION SPECIFICATIONS APPLY TO THE STRUCTURAL TUBING SECTIONS (TS) USED AT HANDHOLES AND SAFETY RAILINGS.

#4 TENSION CONTROL (TC) BOLTS CONFORMING TO ASTM F1852 MAY BE SUBSTITUTED FOR ASTM A325 BOLTS. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO THE SPECIFICATIONS OF ASTM DESIGNATION: A307. INSTALL A307 BOLTS WITH COMMERCIAL QUALITY WASHERS.

#5 ASTM F959, COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS MAY BE SUBSTITUTED FOR ASTM F436 WASHERS AT HIGH-STRENGTH BOLTED CONNECTIONS.

#6 SPHERICAL WASHER SETS AND COLLAR NUTS SHALL BE HARDENED IN ACCORDANCE WITH ASTM F436 AND HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

#7 A SPHERICAL WASHER SET AND AN A325 NUT MAY BE SUBSTITUTED FOR A COLLAR NUT.

OVERHEAD SIGN X-SECTION SHEET(S) SHALL SHOW:

1. SIGN STRUCTURE LOCATION (HIGHWAY, STATION AND DIRECTION)
2. LENGTH OF STRUCTURE SPAN
3. DMS SIZE (WIDTH, HEIGHT, DEPTH AND WEIGHT) AND LOCATION ON STRUCTURE
4. OFFSET FROM SHOULDER
5. POST HEIGHT FROM TOP OF CAISSON TO ℄ MAST ARM
6. CAISSON DIAMETER AND MINIMUM EMBEDMENT
7. TOP OF CAISSON ELEVATION
8. CAISSON PAY LENGTH
9. STATIONS AND OFFSETS TO CAISSON
10. ANGLE θ FOR BUTTERFLY INSTALLATIONS
11. GUARDRAIL PROTECTION LIMITS
12. WALKWAY LOCATION IF REQUIRED
13. LANE LINE LOCATION(S) IF STRUCTURE IS OVER TRAFFIC
14. LOCATION OF DISCONNECT FOR THE POWER SUPPLY
15. LOCATION OF REMOTE ACCESS CABINET ON POLE
16. AS CONSTRUCTED BLOCK

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(R-X)		
(R-X)		

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DYNAMIC SIGN MONOTUBE STRUCTURES

Issued By: Safety and Traffic Engineering Branch on July 4, 2012

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S-614-60
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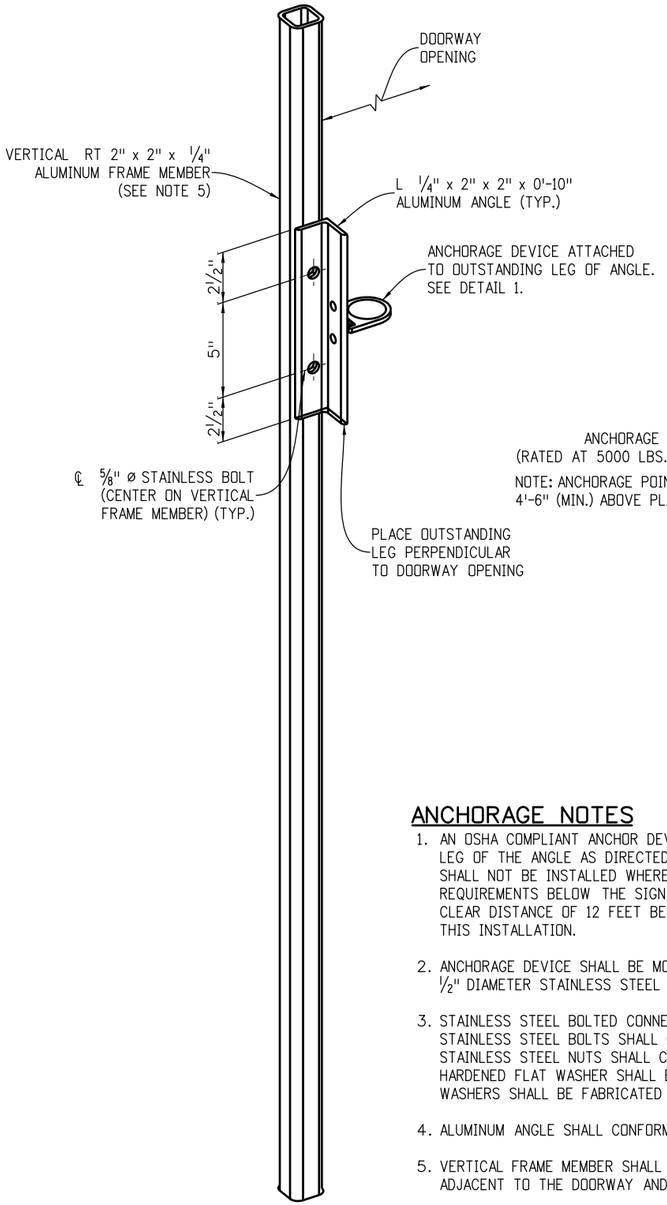
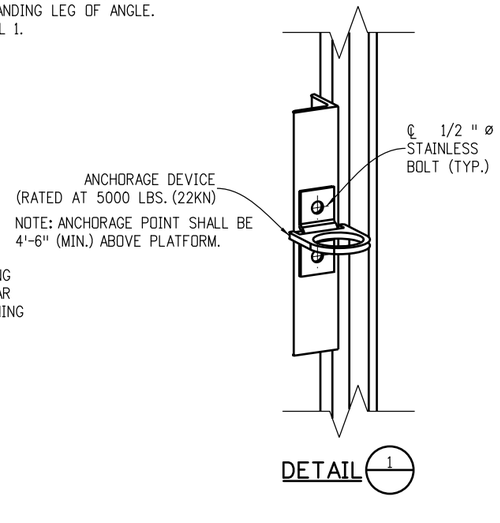
-CANTILEVER INSTALLATION DETAILS-

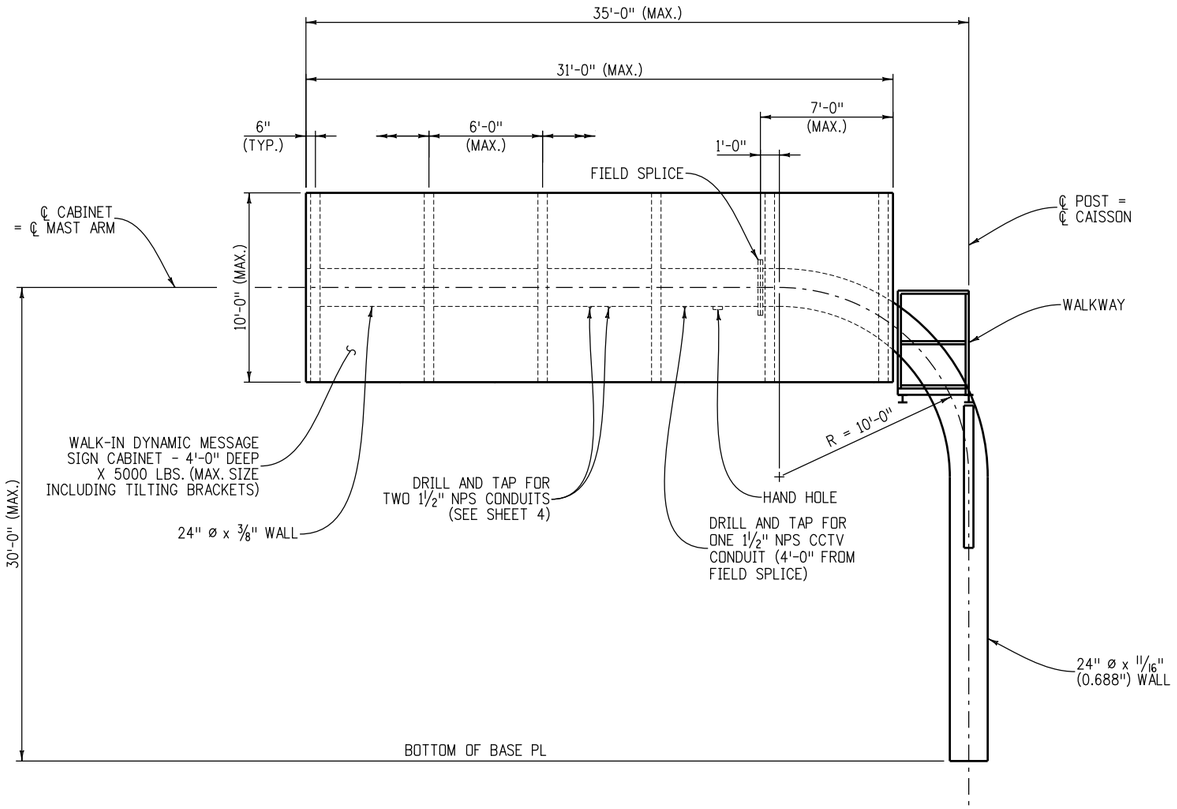




DETAIL 1

ANCHORAGE NOTES

1. AN OSHA COMPLIANT ANCHOR DEVICE SHALL BE MOUNTED TO THE OUTSTANDING LEG OF THE ANGLE AS DIRECTED BY THE ENGINEER. ANCHORAGE DEVICES SHALL NOT BE INSTALLED WHERE MINIMUM FALL PROTECTION CLEARANCE REQUIREMENTS BELOW THE SIGN ARE NOT MET. A MINIMUM UNOBSTRUCTED CLEAR DISTANCE OF 12 FEET BELOW THE SIGN CABINET IS REQUIRED FOR THIS INSTALLATION.
2. ANCHORAGE DEVICE SHALL BE MOUNTED WITH A MINIMUM OF TWO 1/2" DIAMETER STAINLESS STEEL BOLTS.
3. STAINLESS STEEL BOLTED CONNECTIONS SHALL CONFORM TO ASTM A962. STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM F593, GROUP 1. STAINLESS STEEL NUTS SHALL CONFORM TO ASTM F594, GROUP 1. A HARDENED FLAT WASHER SHALL BE PROVIDED UNDER THE NUT. FLAT WASHERS SHALL BE FABRICATED FROM THE SAME MATERIAL AS THE NUTS.
4. ALUMINUM ANGLE SHALL CONFORM TO ASTM B308.
5. VERTICAL FRAME MEMBER SHALL BE A PRIMARY FRAMING COMPONENT, ADJACENT TO THE DOORWAY AND ON THE SUPPORT FACE OF THE CABINET.



CANTILEVER NOTES

1. THE MAXIMUM CABINET OVERLAP ONTO ELBOW SHALL NOT EXCEED 7'-0" FROM THE FIELD SPLICE.
2. ALL POSTS BETWEEN BASE PLATE AND FIELD SPLICE SHALL HAVE A TUBE WALL THICKNESS OF 11/16" (0.688"). ALL MAST ARMS SHALL HAVE A TUBE WALL THICKNESS OF 3/8".
3. SEE SHEET 6 FOR FIELD SPLICE DETAILS.

OSHA COMPLIANT ANCHORAGE DETAILS

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DYNAMIC SIGN MONOTUBE STRUCTURES

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STANDARD PLAN NO.
S-614-60
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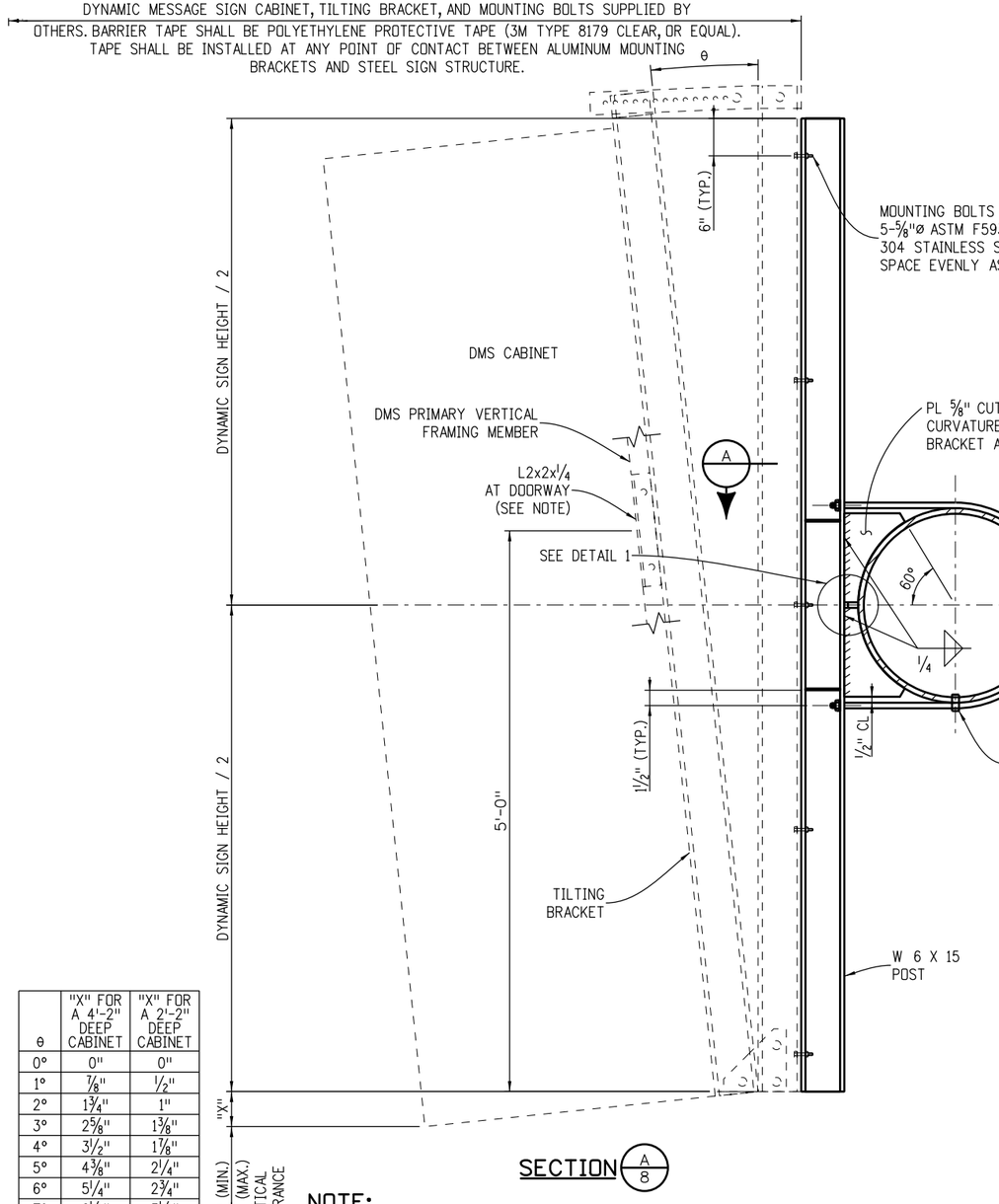
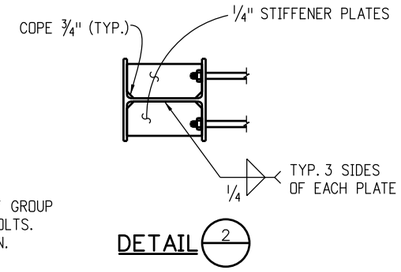
-CANTILEVER SIGN MOUNTING BRACKETS-

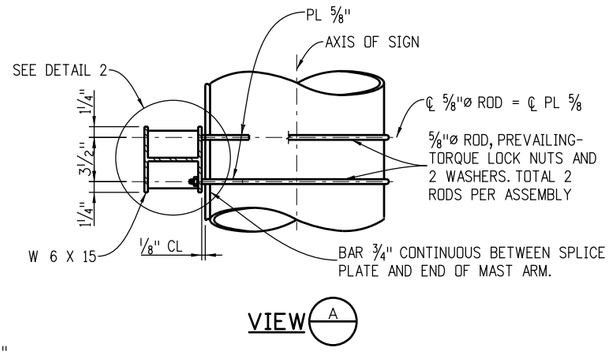


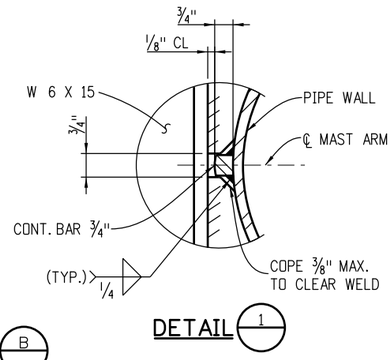
θ	"X" FOR A 4'-2" DEEP CABINET	"X" FOR A 2'-2" DEEP CABINET
0°	0"	0"
1°	7/8"	1/2"
2°	1¾"	1"
3°	2⅝"	1⅜"
4°	3½"	1⅞"
5°	4⅜"	2¼"
6°	5¼"	2¾"
7°	6⅛"	3¼"
8°	7"	3¾"
9°	7⅞"	4⅛"

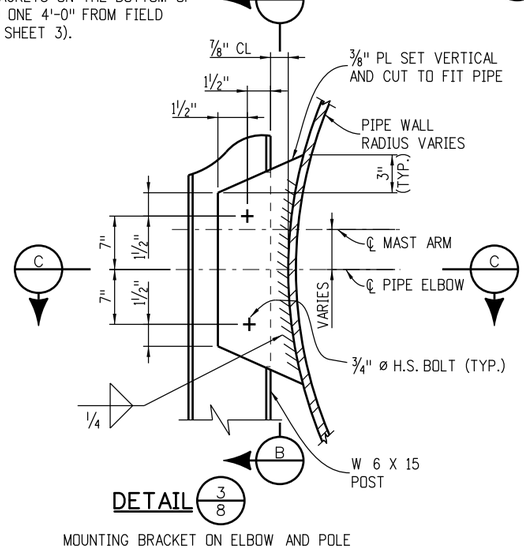
NOTE:

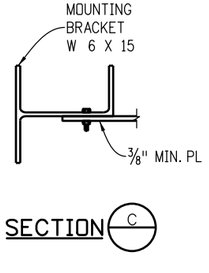
DMS CABINET FABRICATOR SHALL FASTEN AN ALUMINUM ANGLE TO THE PRIMARY VERTICAL FRAME MEMBER ADJACENT TO THE DOOR AS SHOWN. ANGLE PLACEMENT SHALL PRESENT A BLANK VERTICAL FACE PARALLEL TO THE FRONT FACE OF THE DMS CABINET FOR FIELD MOUNTING AN OSHA COMPLIANT ANCHORAGE POINT. A MINIMUM OF TWO 5/8" DIAMETER STAINLESS STEEL BOLTS ARE REQUIRED TO FASTEN ANGLE TO FRAME AS SHOWN IN THE OSHA COMPLIANT ANCHORAGE DETAILS ON SHEET 3 OF 14.

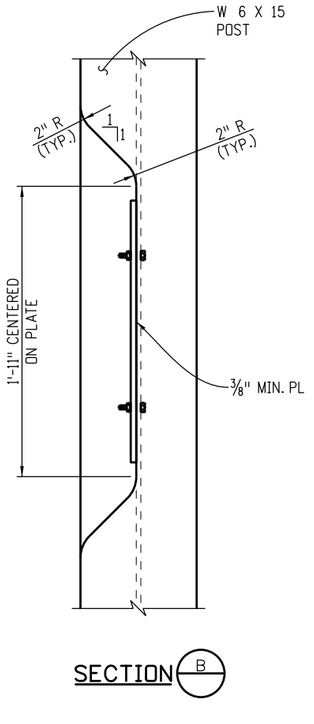












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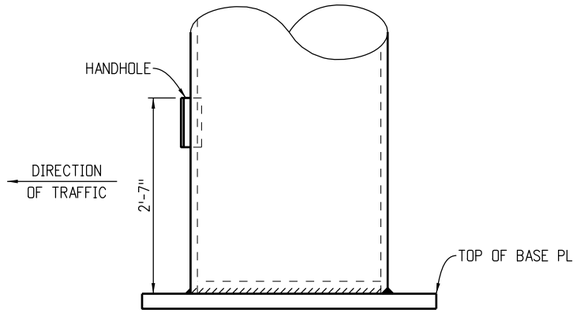
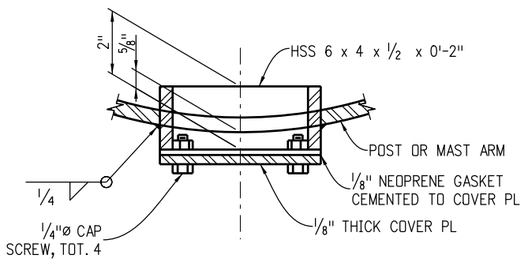
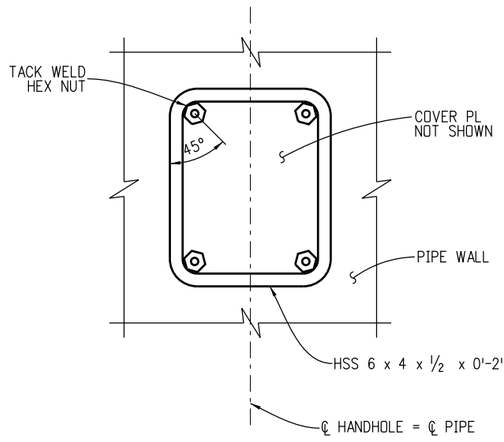
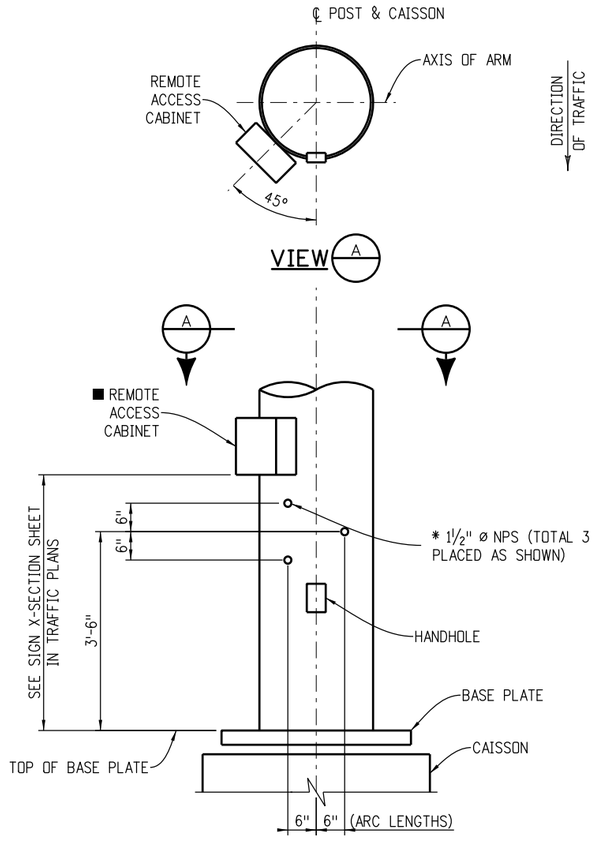


POST BASE ELEVATION
(FOR BASE PL DETAILS SEE SHEET 7)

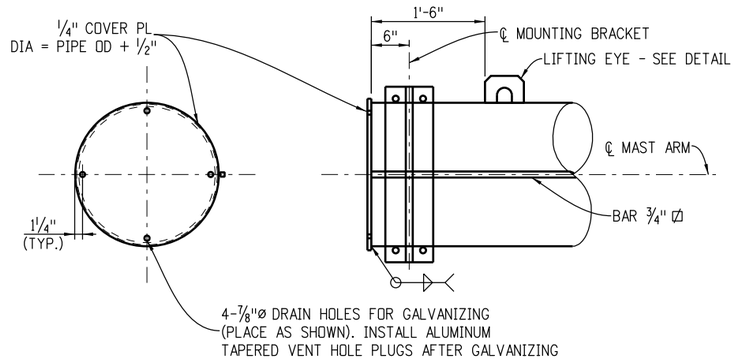




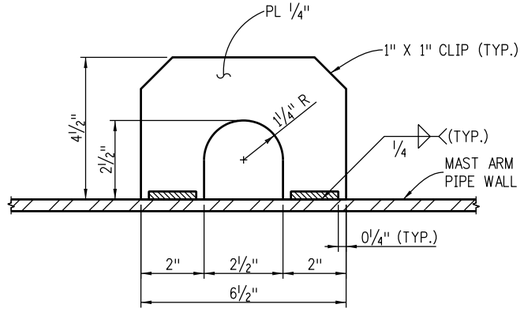
HANDHOLE AND COVER DETAILS



CONDUIT PENETRATION DETAILS
* PLUG WITH RECESSED PIPE PLUGS
■ DISCONNECT CABINET FOR THE POWER SUPPLY SHALL BE LOCATED OUTSIDE OF THE CLEAR-ZONE.



MAST ARM END DETAIL



LIFTING EYE DETAIL

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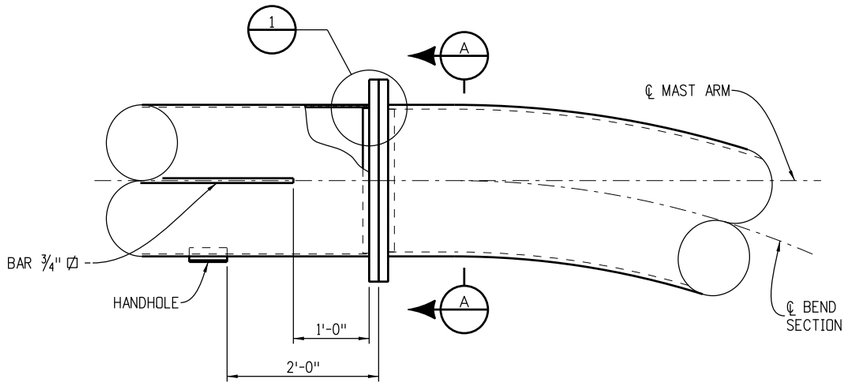
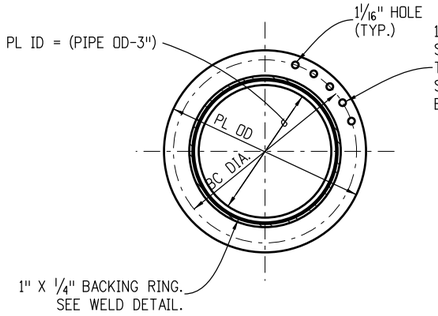
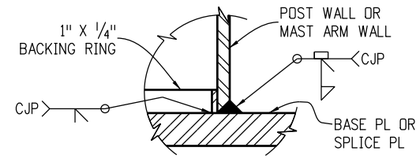


FIELD SPLICE

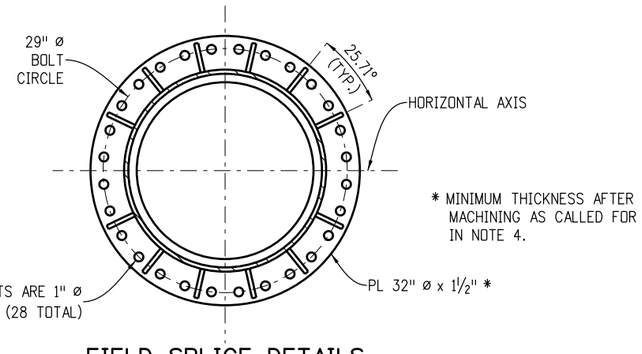


1" ø H.S. BOLTS (GALVANIZED) EQUALLY SPACED. BOLTS SHALL BE SEQUENTIALLY TIGHTENED. ASSUMING 12 BOLTS AND A CLOCK FACE, THE TIGHTENING SEQUENCE WOULD BE 12, 6, 1, 7 ETC. THIS PROCESS SHALL BE CONTINUED UNTIL NO LOOSE BOLTS ARE FOUND AFTER ALL BOLTS HAVE BEEN INITIALLY TIGHTENED.

SECTION A

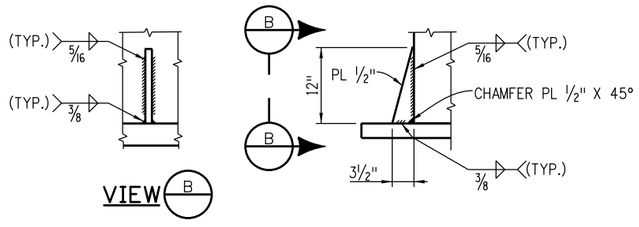


DETAIL 1



FIELD SPLICE DETAILS

STIFFENERS SHALL BE LOCATED ON BOTH SIDES OF THE FIELD SPLICE.
CLIP WASHERS AS NEEDED TO AVOID INTERFERENCE WITH STIFFENER WELDS.



STIFFENER DETAILS

NOTES:

1. STIFFENERS ARE TO BE PLACED ON ALL CANTILEVER FIELD SPLICES. STIFFENERS ARE NOT SHOWN ELSEWHERE IN THESE SHEETS FOR CLARITY.
2. TERMINATE WELD ½" SHORT OF THE TOP OF THE STIFFENER PLATE. AT THE OTHER 3 WELD TERMINATIONS ON THESE TWO TYPICAL WELDS, STOP THE WELD ¼" SHORT OF THE END OF THE PLATE.
3. SPLICE DESIGN BASED ON ARM CAPACITY.
4. THE MATING SURFACES OF THE FLANGE SPLICE PLATES SHALL BE MACHINED TO A COMMON PLANE WITHIN A TOLERANCE OF 1/64" USING A PORTABLE FLANGE FACER AFTER WELDING AND PRIOR TO GALVANIZING.

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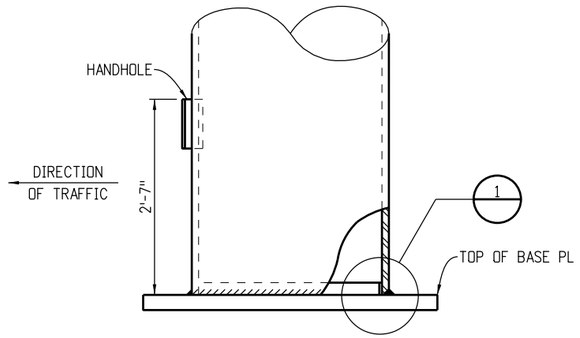
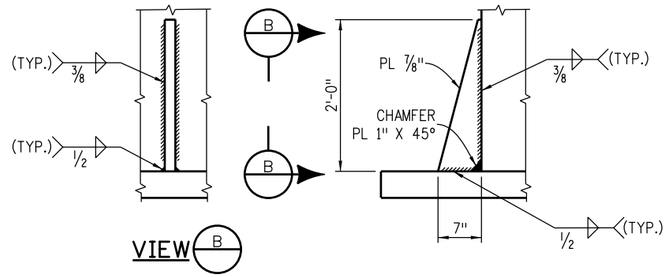
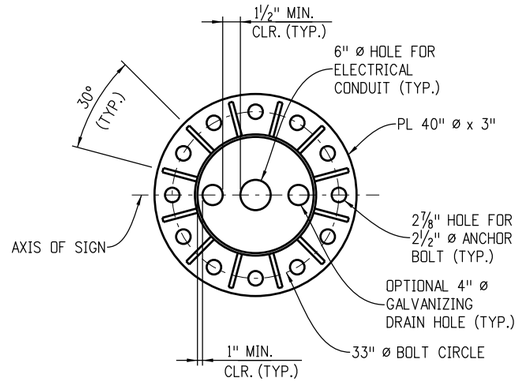


POST BASE ELEVATION

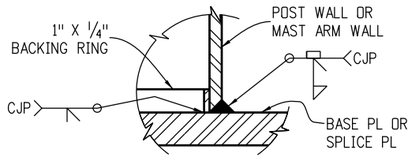


VIEW B

STIFFENER DETAILS
(AT POST BASE - SEE NOTES)



BASE PLATE DETAILS



DETAIL 1

NOTES:

1. STIFFENERS ARE NOT SHOWN ELSEWHERE IN THESE SHEETS FOR CLARITY.
2. TERMINATE WELD 1/2" SHORT OF THE TOP OF THE STIFFENER PLATE. AT THE OTHER 3 WELD TERMINATIONS ON THESE TWO TYPICAL WELDS STOP THE WELD 1/4" SHORT OF THE END OF THE PLATE.

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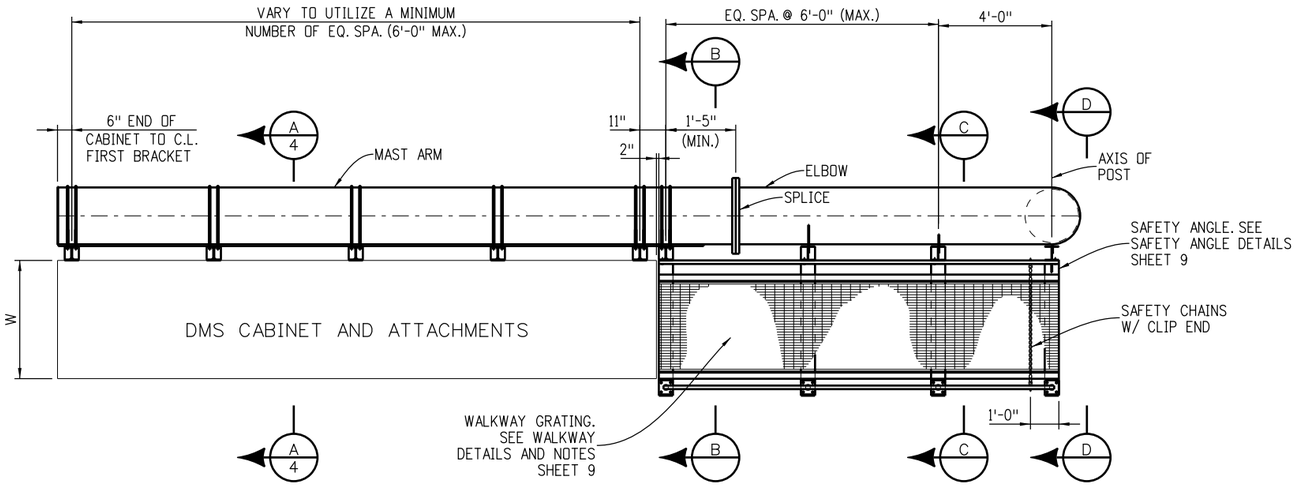
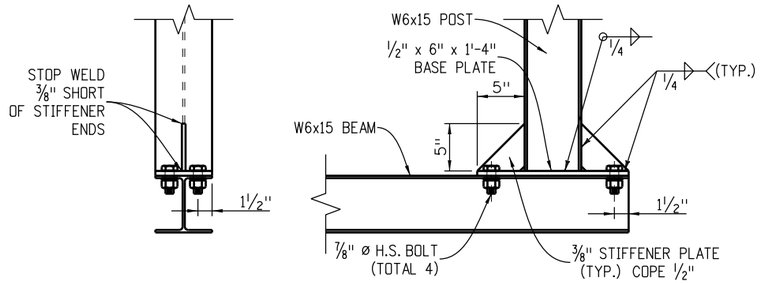


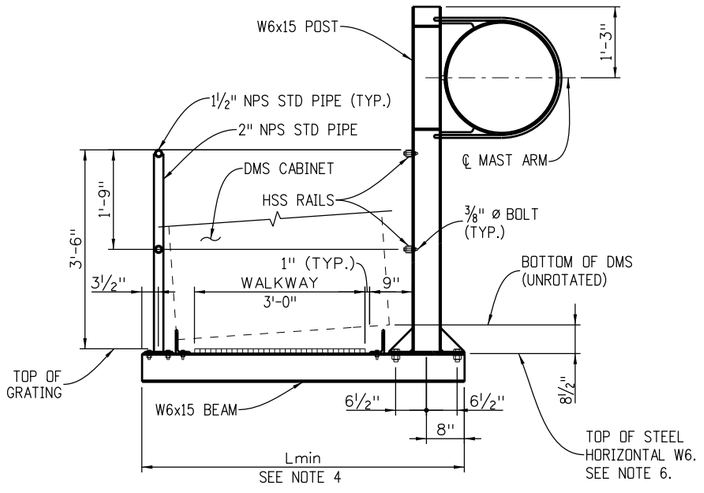
WALKWAY PLAN
WALKWAY LEADING TO CABINET



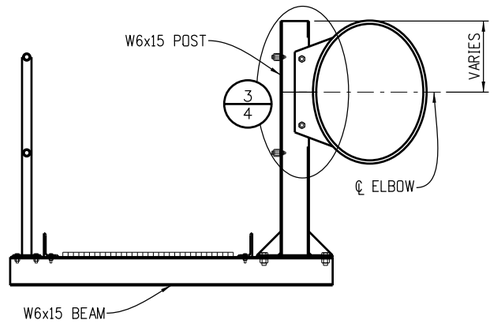
BEAM TO POST CONNECTION DETAIL

NOTES

1. MAINTAIN UNIFORM POST SPACING WHERE POSSIBLE.
2. MAXIMUM POST SPACING SHALL NOT EXCEED 6'-0".
3. SEE SHEETS 4 AND 9 FOR ADDITIONAL DETAILS NOT SHOWN HEREON.
4. LENGTH OF BEAM SHALL BE BASED ON DMS WIDTH (W) TO PERMIT CLEARANCE BETWEEN RAILS FOR UNOBSTRUCTED OPENING OF DMS ACCESS DOOR. Lmin = W+27 INCHES.
5. SAFETY CHAIN SHALL BE 1/4" GALVANIZED STEEL COIL CHAIN, APPROXIMATELY 36 LINKS PER YARD.
6. TOP OF HORIZONTAL W6x15 ELEVATION SHALL BE 8 1/2" BELOW BOTTOM OF DMS CABINET WITH THE TILTING BRACKET IN THE 0° (UNROTATED) POSITION.



SECTION B



SECTION C

VIEW D

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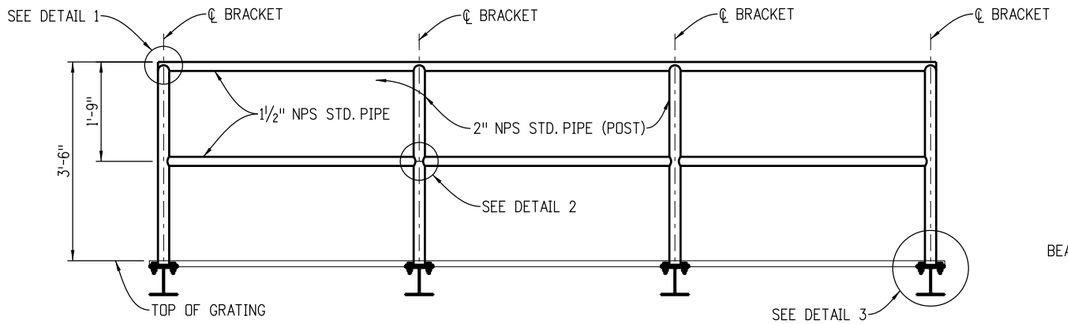
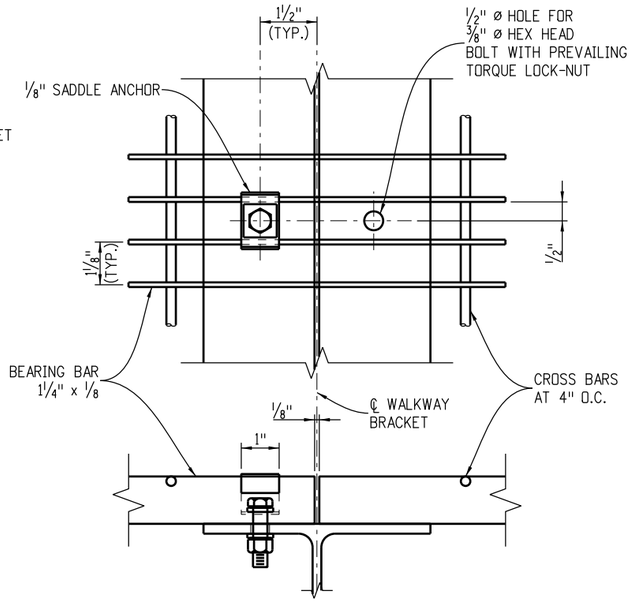
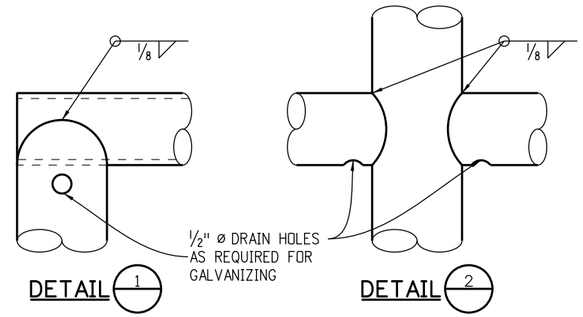


SAFETY RAILING ELEVATION

(OUTSIDE SAFETY RAILING LOCATION - SAFETY ANGLES NOT SHOWN FOR CLARITY)

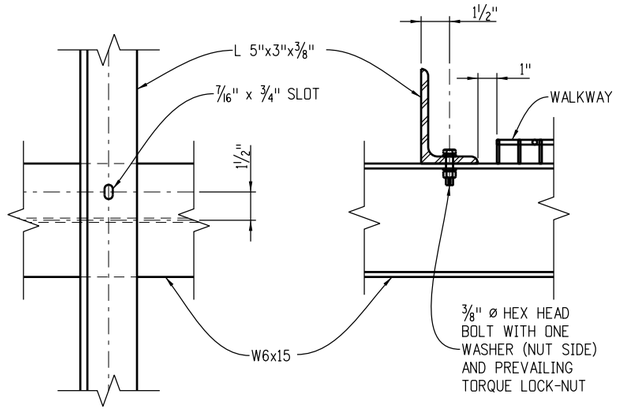


WALKWAY DETAILS

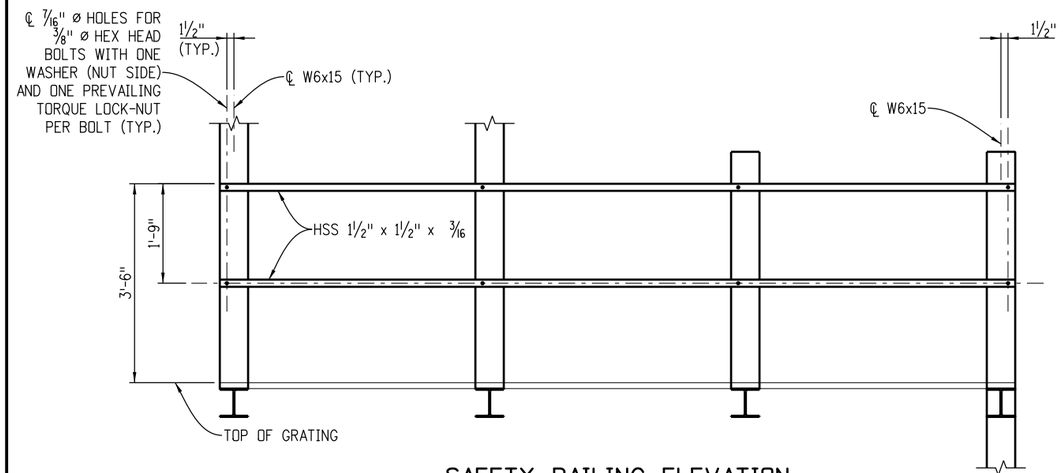


NOTES

ALTERNATIVE VENTING METHODS MAY BE USED IF APPROVED BY THE ENGINEER

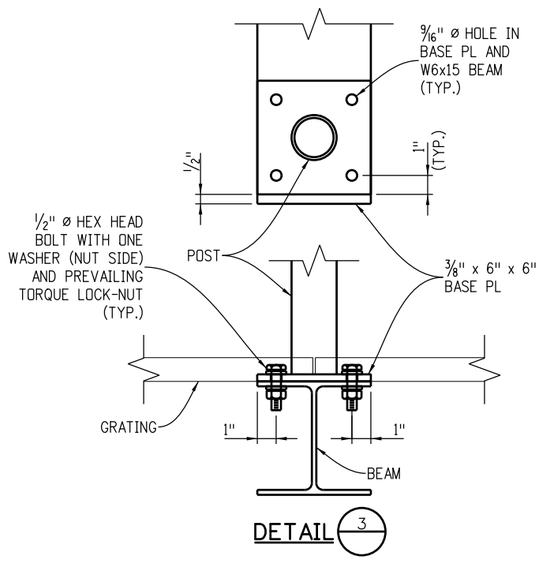


SAFETY ANGLE DETAILS



SAFETY RAILING ELEVATION

(INSIDE SAFETY RAILING LOCATION - SAFETY ANGLES NOT SHOWN FOR CLARITY)



DETAIL 3

NOTES

1. WELDED TYPE GRATING SHALL HAVE 1 ¼" x ⅛" BEARING BARS AT 1 ⅛" CENTERS WITH ¼" DIAMETER (OR EQUAL) CROSS BARS AT 4" CENTERS. IF MECHANICAL LOCK GRATING IS USED, IT SHALL BE EQUAL IN STRENGTH TO THE WELDED TYPE. ALTERNATE HOLD-DOWN CLIPS MAY BE SUBMITTED FOR APPROVAL.

2. WALKWAY GRATING TO BE CONTINUOUS (NO SPLICES) OVER AS MANY WALKWAY BRACKETS AS PRACTICAL CONSISTENT WITH FABRICATION, EASE OF HANDLING AND ASSEMBLY.

3. ALL BOLTS SHOWN ON THIS SHEET SHALL BE ASTM A-307. THE TIGHTENING TORQUE IS 16 FT-LBS. FOR ⅜" ø BOLTS AND 40 FT-LBS. FOR 1/2 " ø BOLTS. DO NOT OVER TIGHTEN BOLTS AT WALKWAY SADDLE ANCHOR LOCATIONS.

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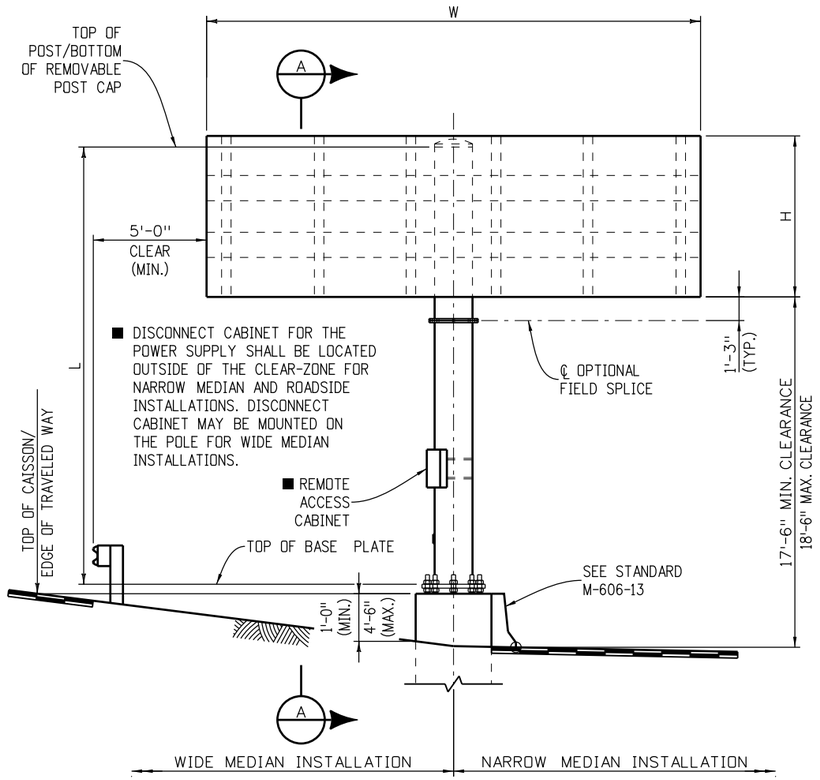
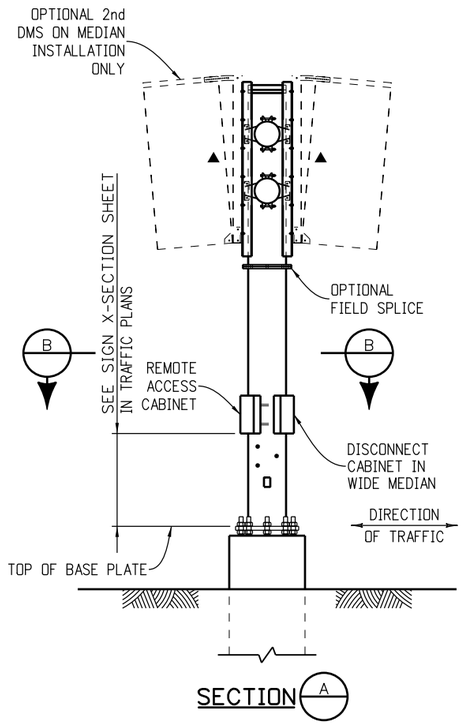
-BUTTERFLY INSTALLATION DETAILS-

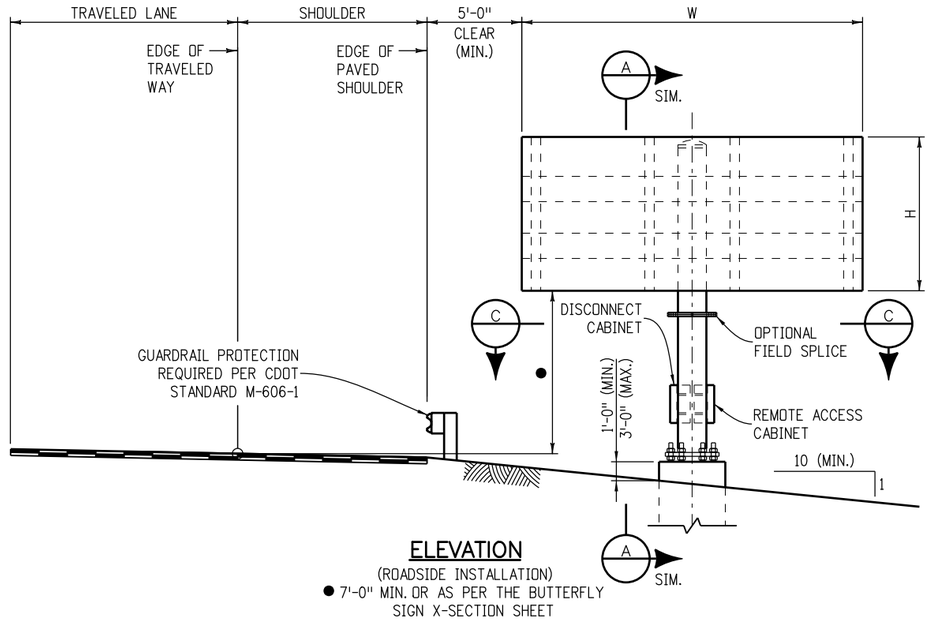


ELEVATION
(MEDIAN INSTALLATION)

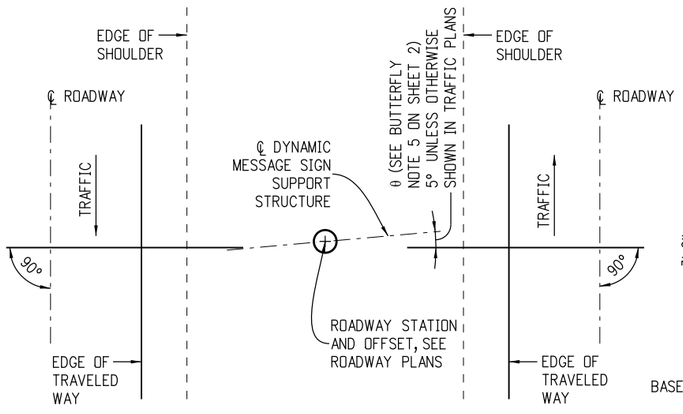


SECTION

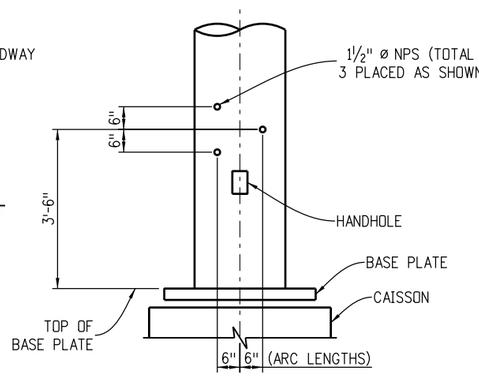
▲ PROVIDE OSHA COMPLIANT ANCHORAGE POINT AS DIRECTED BY THE ENGINEER. SEE SHEETS 3 & 4 FOR MOUNTING INFORMATION.



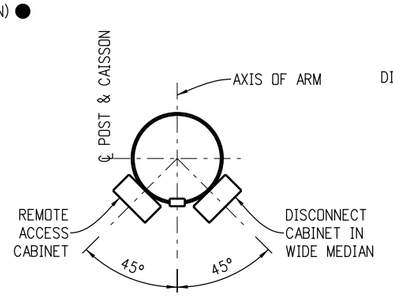
ELEVATION
(ROADSIDE INSTALLATION)
● 7'-0" MIN. OR AS PER THE BUTTERFLY SIGN X-SECTION SHEET



MEDIAN INSTALLATION PLAN



CONDUIT PENETRATION DETAILS
● PLUG WITH RECESSED PIPE PLUGS



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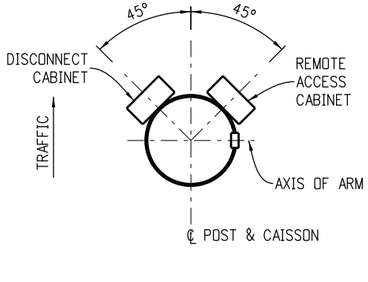

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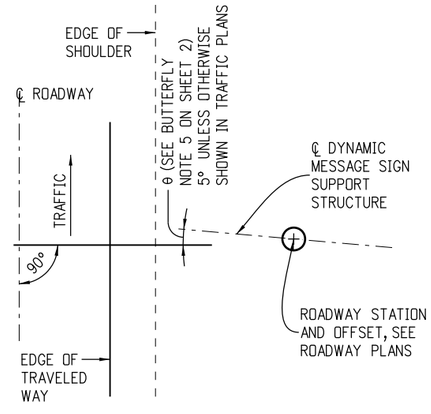

ROADSIDE INSTALLATION PLAN

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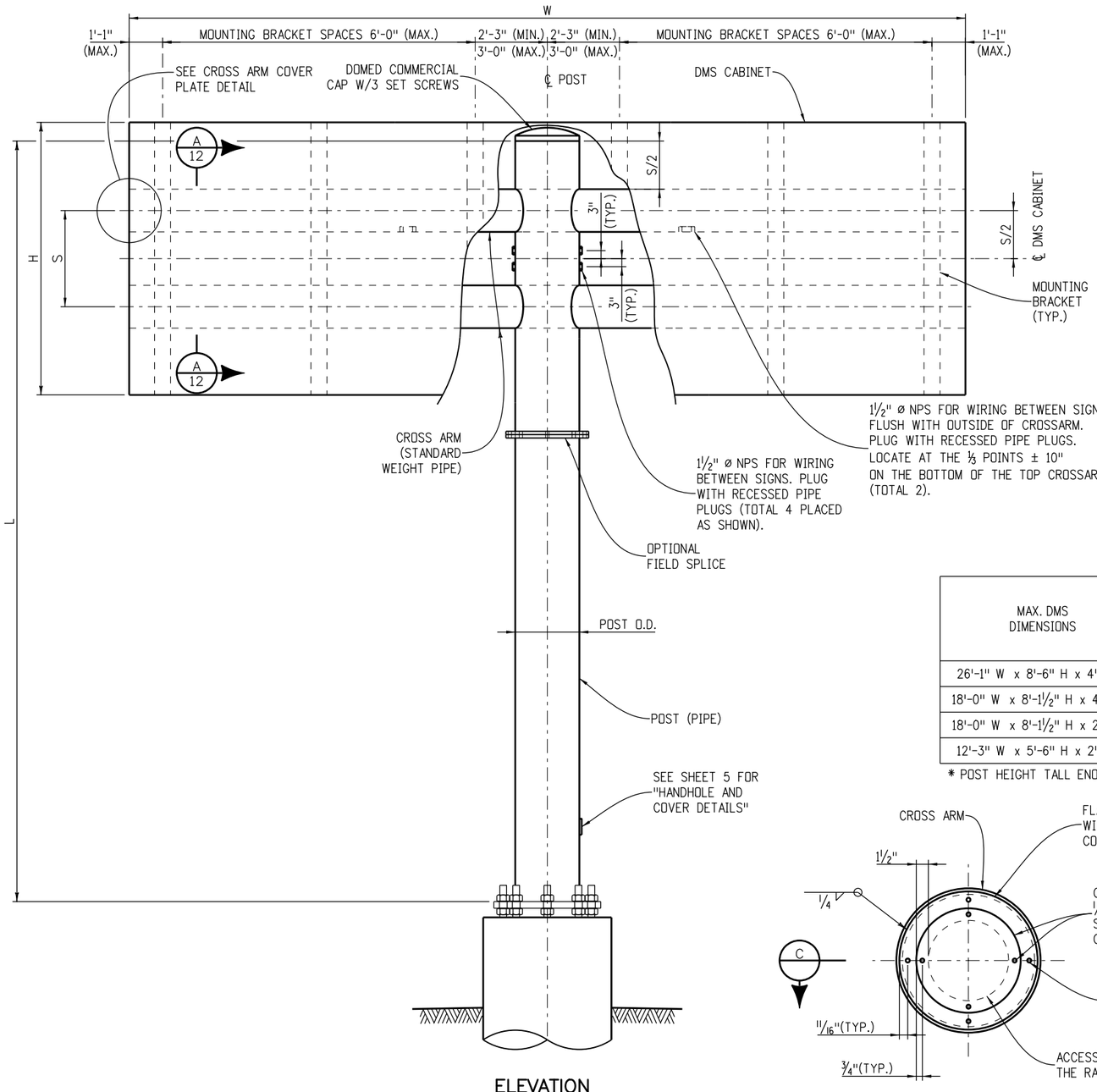
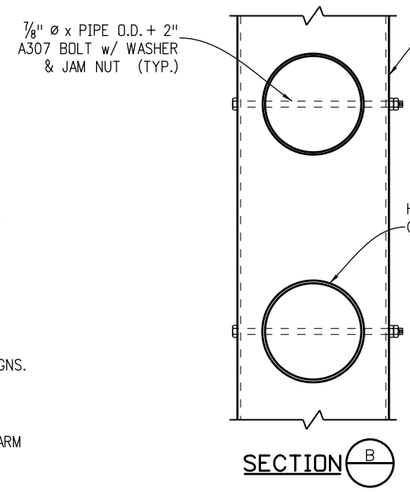
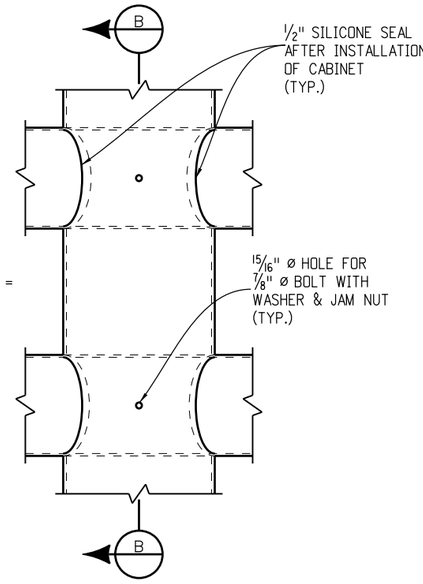
-BUTTERFLY ASSEMBLY DETAILS-



ELEVATION



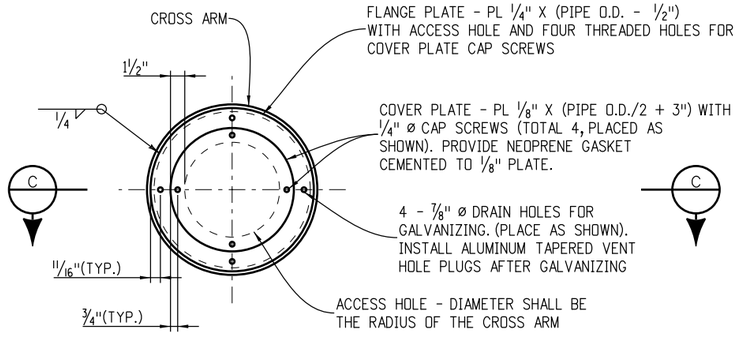
SECTION B



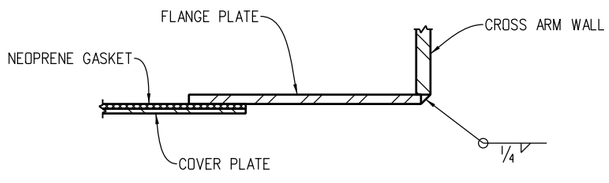
ARMS TO POST CONNECTION

MAX. DMS DIMENSIONS	MAX. DMS WEIGHT	POST PIPE DATA			CROSS ARM PIPE DATA			
		PIPE O.D. (IN)	MIN. WALL THICKNESS (IN)	MAX. POST HEIGHT (FT) "L"	PIPE O.D. (IN)	MIN. WALL THICKNESS (IN)	CROSS ARM LENGTH (FT) "W"	CROSS ARM SPACING (FT) "S"
26'-1" W x 8'-6" H x 4'-2" D	4100 LBS.	24.0	0.50	24.0 *	16.0	0.375	26.0	3.0
18'-0" W x 8'-1½" H x 4'-2" D	3000 LBS.	18.0	0.50	17.0	12.75	0.375	18.0	3.0
18'-0" W x 8'-1½" H x 2'-2" D	2280 LBS.	18.0	0.375	17.0	12.75	0.375	18.0	3.0
12'-3" W x 5'-6" H x 2'-2" D	1520 LBS.	18.0	0.375	14.0	12.75	0.375	12.25	2.5

* POST HEIGHT TALL ENOUGH TO ACCOMMODATE TRAFFIC UNDERNEATH SIGN.



CROSS ARM COVER PLATE DETAIL



SECTION C

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CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R=X		

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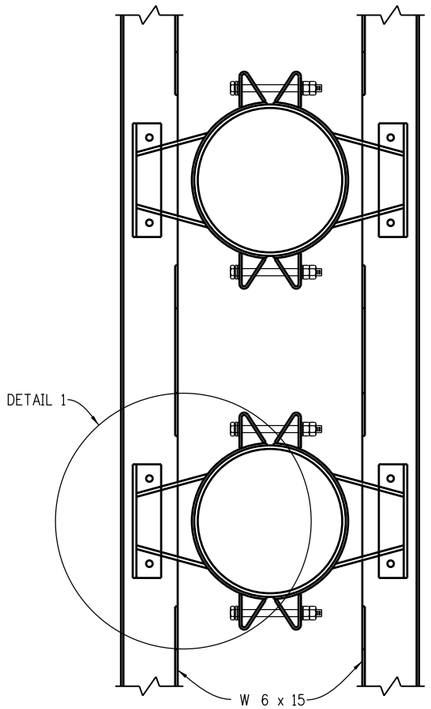
-BUTTERFLY SIGN MOUNTING DETAILS-



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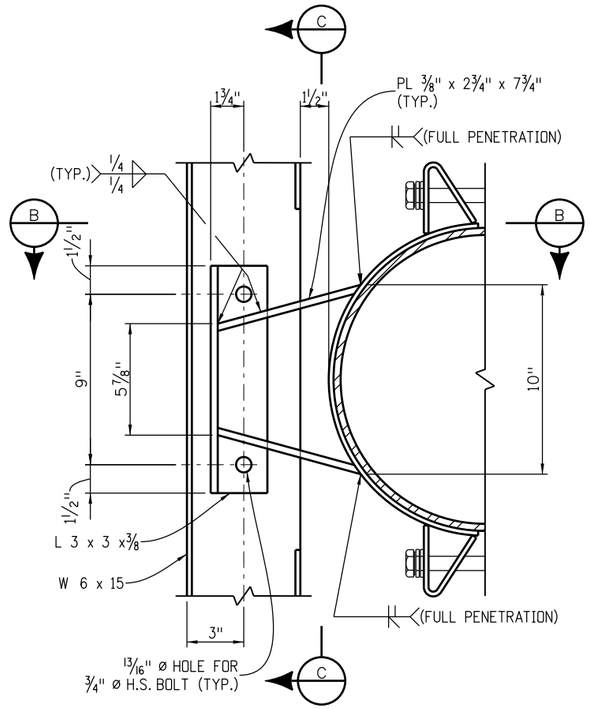

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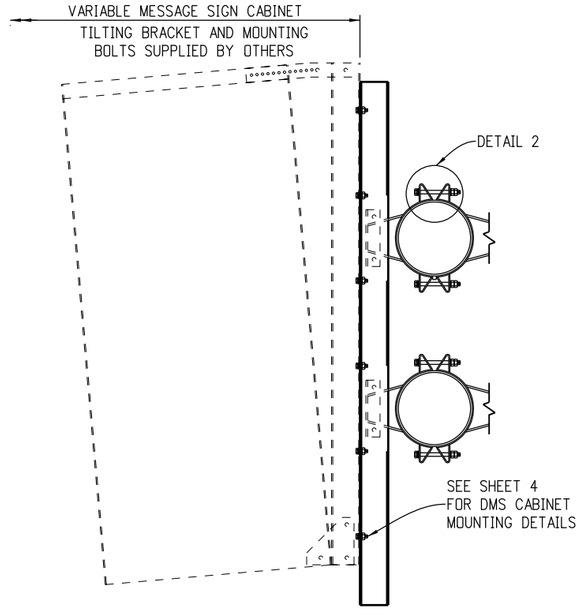
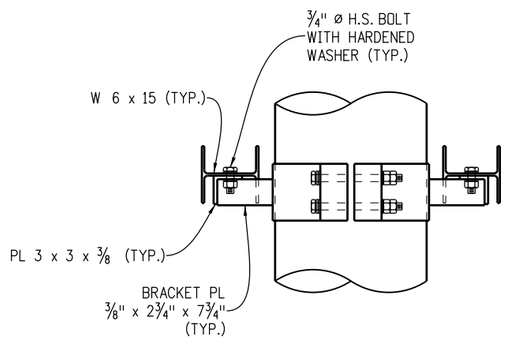
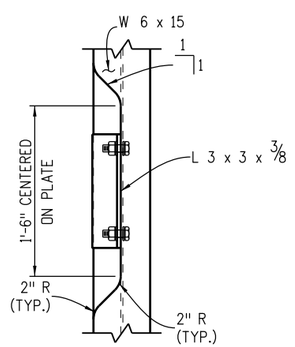


TYPICAL BRACKET CONNECTION

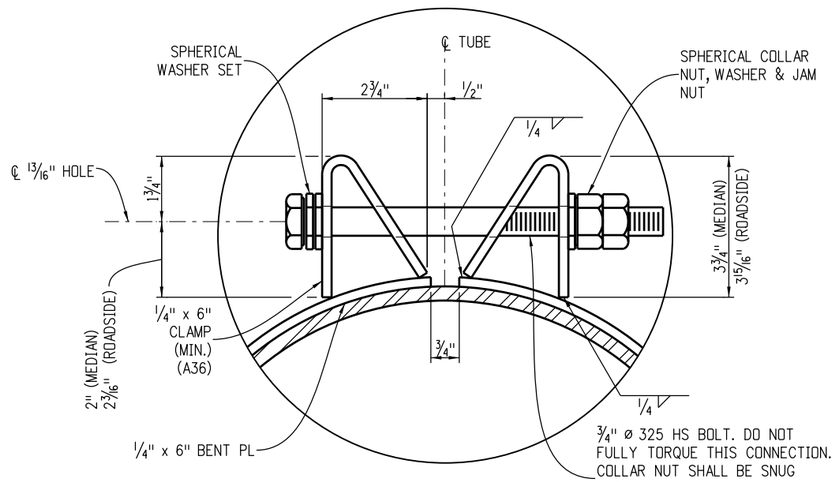


SECTION B

SEE DETAIL 2 FOR CLAMP DETAILS.



SECTION C



DETAIL 2

Computer File Information		Sheet Revisions	
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Last Modification Date: 07-04-12 Initials: JRM	R-X		
Full Path: www.coloradodot.info/business/designsupport	R-X		
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CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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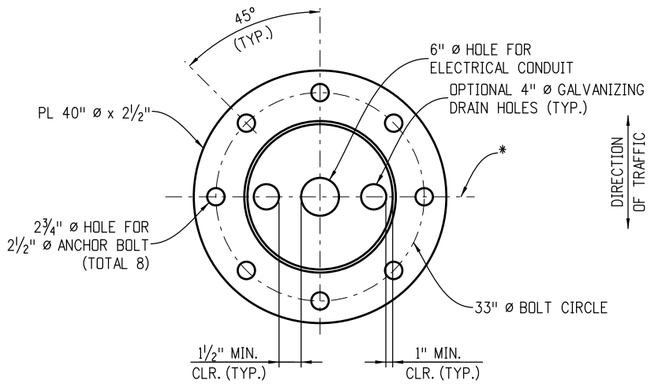
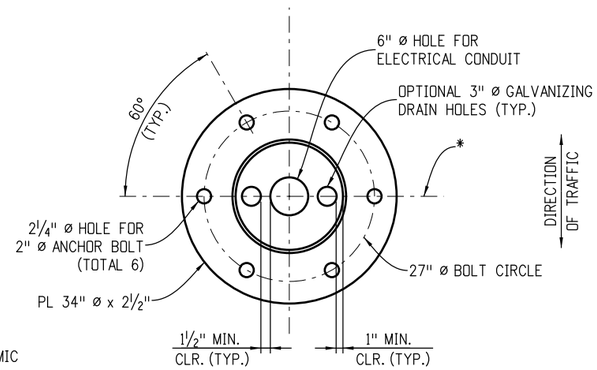
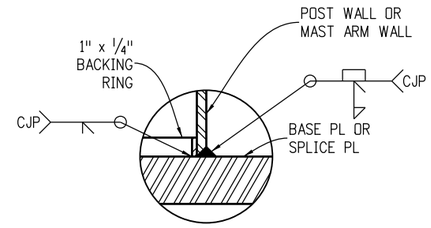


BASE PLATE DETAIL
24" PIPE POST

* CENTERLINE OF DYNAMIC MESSAGE SIGN SUPPORT STRUCTURE, SEE SHEET 10.



BASE PLATE DETAIL
18" PIPE POST



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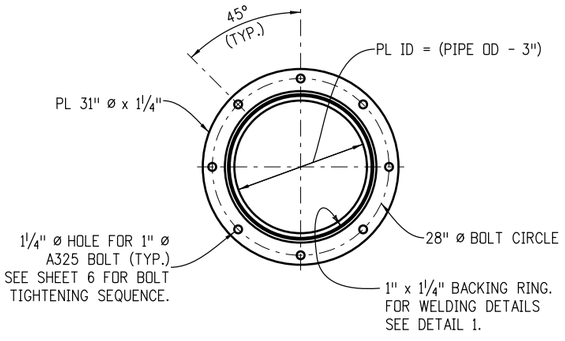
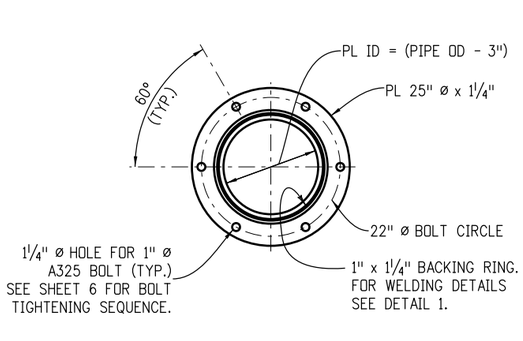
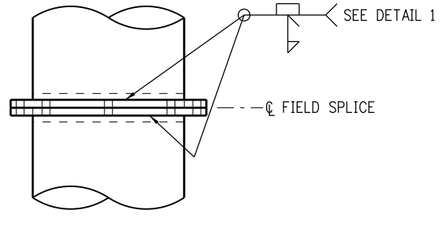


OPTIONAL FIELD SPLICE
24" PIPE POST



OPTIONAL FIELD SPLICE
18" PIPE POST



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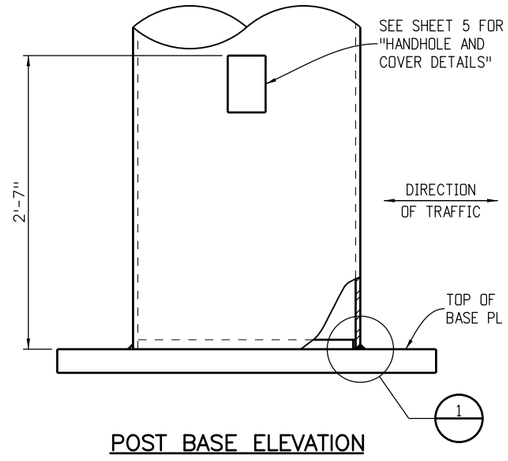

POST BASE ELEVATION

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Last Modification Date: 07-04-12 Initials: JRM	R-X		
Full Path: www.coloradodot.info/business/designsupport	R-X		
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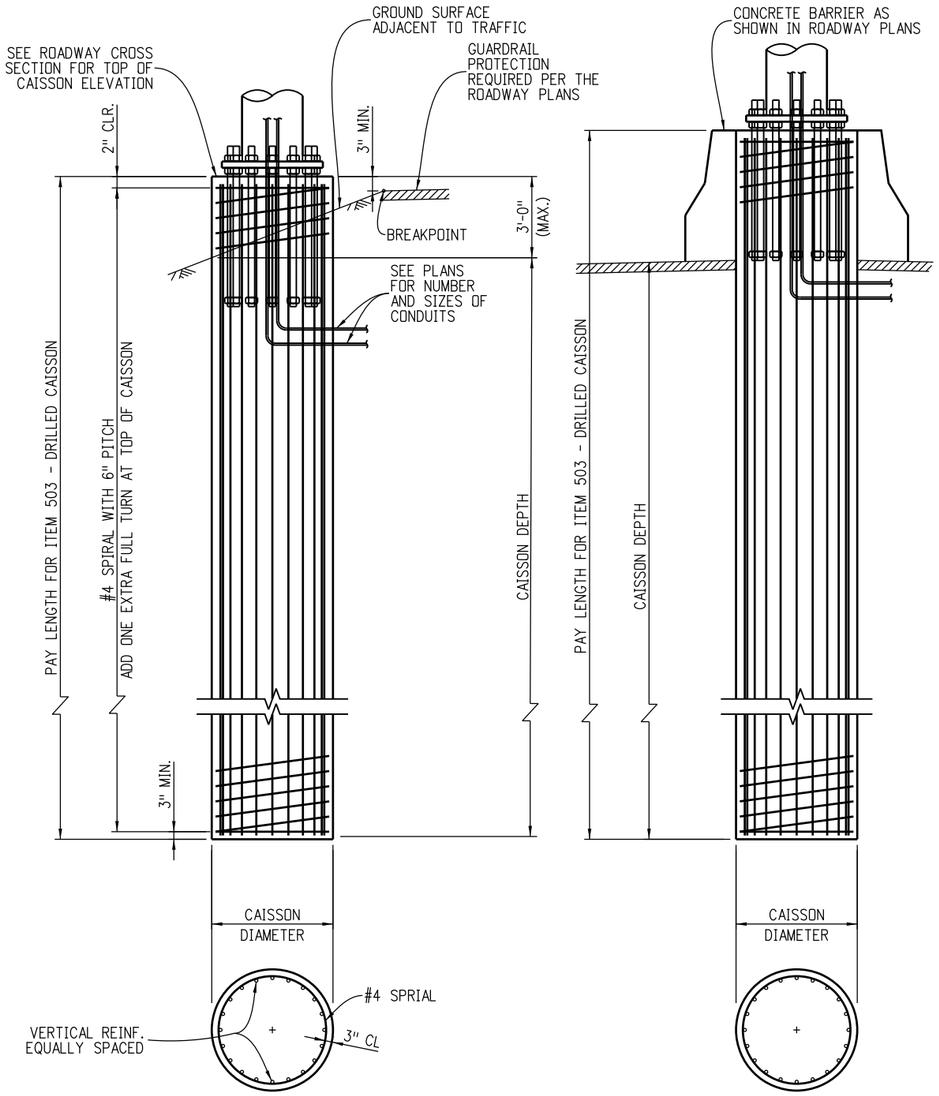


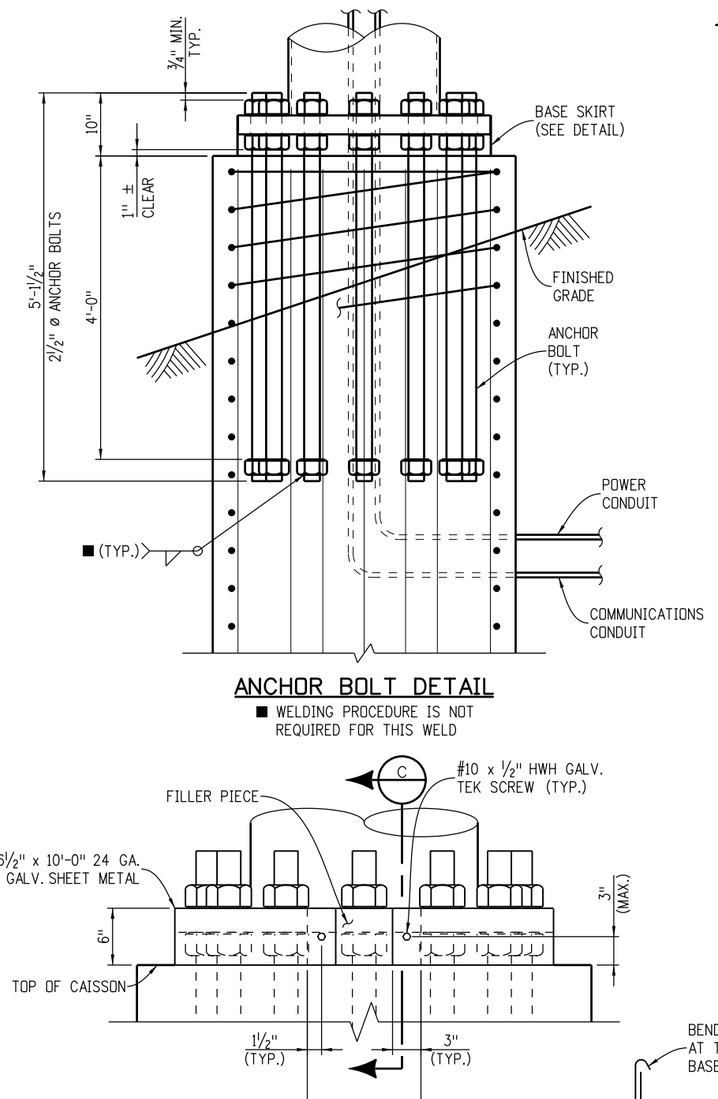
ROADSIDE SHOULDER INSTALLATION

MEDIAN RAIL INSTALLATION

(SEE ROADSIDE SHOULDER INSTALLATION FOR ADDITIONAL INFORMATION)

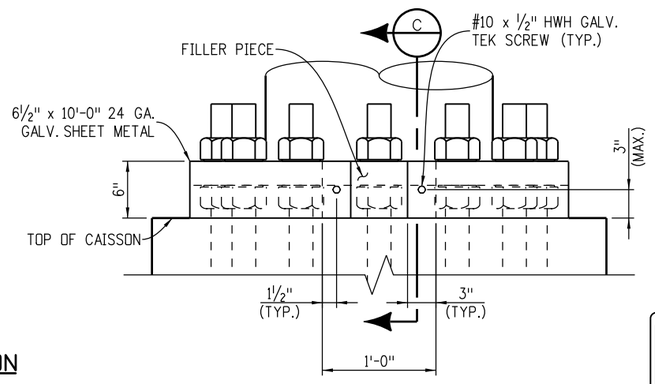
CAISSON FOUNDATION DETAILS

STRUCTURE TYPE	PIPE O.D. (IN)	CAISSON DIAMETER (IN)	CAISSON DEPTH (FT)	VERTICAL REINF.
CANTILEVER	24	48	29	18 - #9
BUTTERFLY	24	48	21	18 - #9
BUTTERFLY	18	42	16	14 - #9



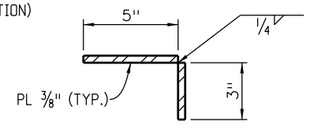
ANCHOR BOLT DETAIL

■ WELDING PROCEDURE IS NOT REQUIRED FOR THIS WELD

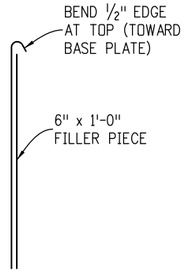


BASE SKIRT DETAIL

NOTE: USE BAND-IT STRAPS TO TIGHTEN SKIRT ONTO BASE PLATE PRIOR TO INSTALLING SELF TAPPING SCREWS.



SECTION B



SECTION C

-FOUNDATION & ANCHOR BOLT DETAILS-

CAISSON DRILLING AND INSTALLATION NOTES

1. CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH. WET OR CAVING HOLES SHALL BE BACKFILLED WITH FLOW-FILL AND REDRILLED AFTER A THREE DAY CURING PERIOD WITHOUT THE USE OF A CASING.

2. THE DESIGN HEREIN ASSUMES THAT DMS SUPPORTS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING SOIL PARAMETERS:

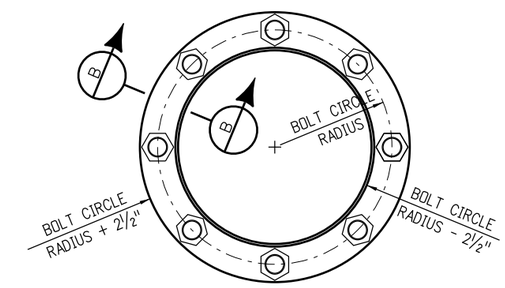
   SOIL DENSITY = 110 LB./CU. FT.
   SOIL COHESION = 750 LB./SQ. FT. FOR MEDIUM STIFF COHESIVE SOIL
   SOIL ϕ ANGLE = 30° FOR MEDIUM DENSE COHESIONLESS SOIL
   SF = 3.0 FOR FLEXURAL RESISTANCE.

3. CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
   (A) DMS SUPPORT WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM.
   (B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
   (C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
   (D) THE FOUNDATION SOILS ARE NOT HOMOGENOUS.
   (E) FIRM BEDROCK IS ENCOUNTERED.
   (F) HIGH GROUNDWATER IS ENCOUNTERED.
   (G) LARGE BOULDERS ARE ENCOUNTERED.

4. THE CONTRACTOR SHALL PROVIDE A SURVEY OF THE DMS FOUNDATION TO VERIFY PLACEMENT SOON AFTER WORK ON THE FOUNDATION HAS BEEN COMPLETED. THE SURVEY SHALL CONFORM TO THE REQUIREMENTS OF SECTION 625, CONSTRUCTION SURVEYING. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COPY OF THE SURVEY NOTES DETAILING THE FOUNDATION LOCATION AND ELEVATION AND THE ANCHOR BOLT LOCATIONS, PROJECTIONS, AND ORIENTATIONS. THE ELEVATION OF THE GROUND SURROUNDING THE FOUNDATION SHALL ALSO BE PROVIDED. THE CONTRACTOR SHALL COMPARE THE SURVEY INFORMATION TO THE REVIEWED SHOP DRAWINGS AND RECONCILE ANY DIFFERENCES BETWEEN THEM. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ADJUSTMENTS OR MODIFICATIONS TO THE ENGINEER FOR APPROVAL.

NOTES

1. THREAD UPPER 10" AND GALVANIZE UPPER 1'-3" OF THE ANCHOR BOLTS.
2. ANCHOR BOLTS SHALL BE SET WITH A STEEL TEMPLATE UNTIL THE CONCRETE HAS CURED AT LEAST TWO DAYS.
3. THERE SHALL BE NO GROUT PAD INSTALLED ON TOP OF THE EXISTING FOUNDATIONS.
4. THE ANCHOR BOLTS SHALL BE TIGHTENED USING THE TURN-OF-NUT METHOD. THE BOLTS SHALL FIRST BE TIGHTENED TO SNUG TIGHT, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE UPPER AND LOWER NUTS ARE IN FIRM CONTACT WITH THE BASE PLATE. WITH THE MAST ARM FREE TO DEFLECT, THE UPPER AND LOWER NUTS SHALL EACH THEN BE ROTATED AN ADDITIONAL ½ TURN (30° ± 5°) USING A SLUGGING WRENCH.



BOLT TEMPLATE

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Last Modification Date: 07-04-12 Initials: JRM	R-1	06-17-16	ADD BASE SKIRT DETAILS AND NOTE
Full Path: www.coloradodot.info/business/designsupport	R-X		FOR ANCHOR BOLTS EXTEND FROM NUT
Drawing File Name: S-614-60_14of14 REV1.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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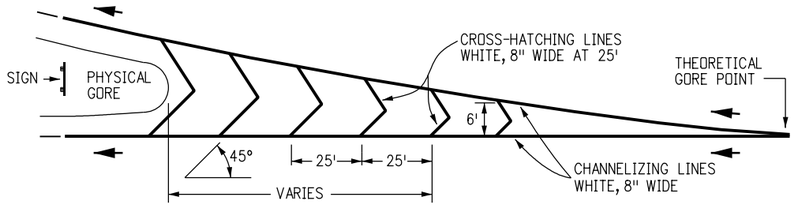
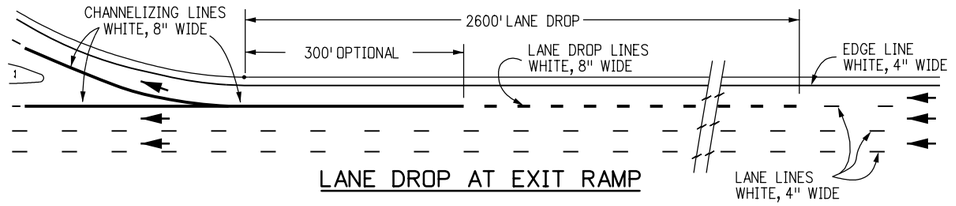
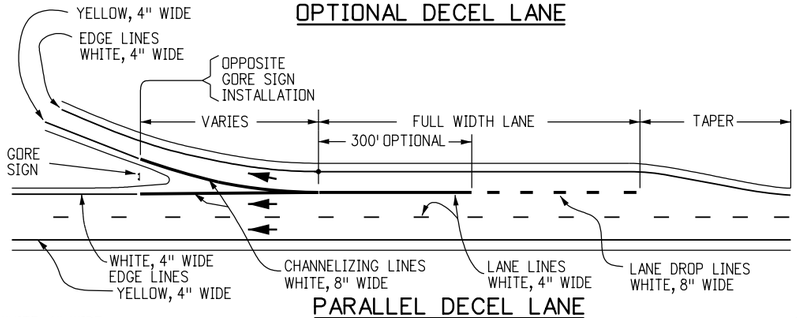


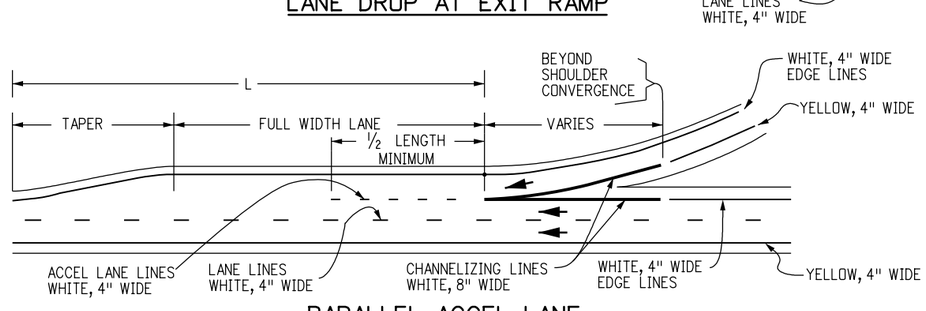
OPTIONAL DECEL LANE



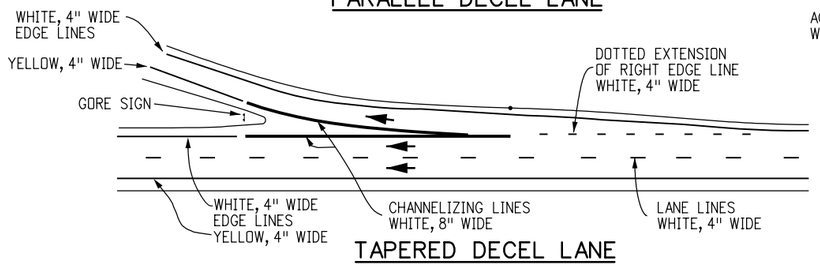
LANE DROP AT EXIT RAMP



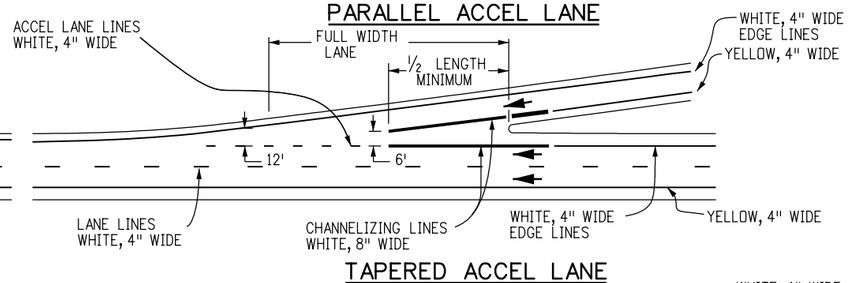
PARALLEL DECEL LANE



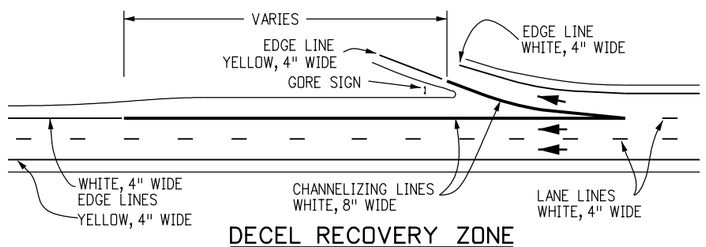
PARALLEL ACCEL LANE



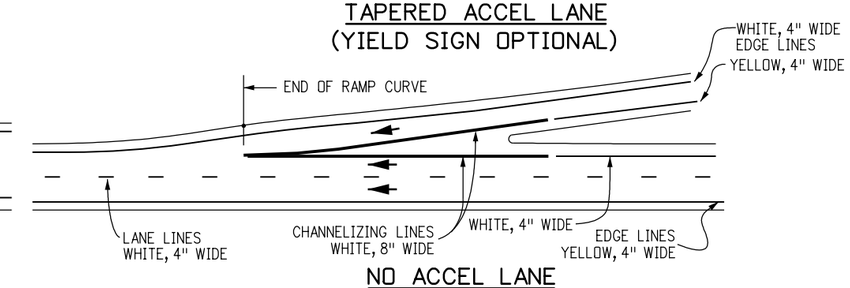
TAPERED DECEL LANE



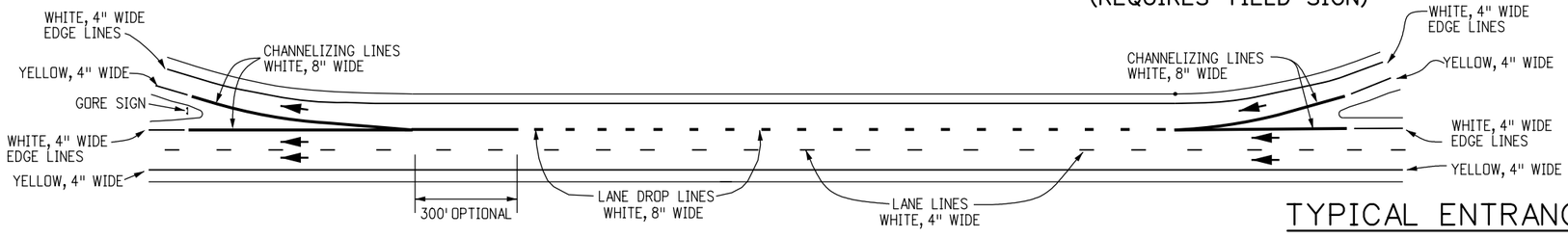
TAPERED ACCEL LANE (YIELD SIGN OPTIONAL)



DECEL RECOVERY ZONE



NO ACCEL LANE (REQUIRES YIELD SIGN)



COMBINATION ACCEL-DECEL LANE

TYPICAL ENTRANCE AND EXIT RAMP MARKINGS

GENERAL NOTES

1. CENTER LINES

   BROKEN YELLOW, 4 IN. WIDE - 10 FT. SEGMENTS WITH 30 FT. GAPS.

   SOLID YELLOW, 4 IN. WIDE. THESE LINES SEPARATE ADJACENT-OPPOSITE DIRECTION TRAFFIC LANES. DOUBLE LINES SHALL BE SPACED 4 IN. APART.

2. LANE LINES

   BROKEN WHITE, 4 IN. WIDE - 10 FT. SEGMENTS WITH 30' GAPS.

   SOLID WHITE, 4 IN. WIDE. THESE LINES SEPARATE ADJACENT-SAME DIRECTION TRAFFIC LANES. A SOLID LINE MAY BE USED TO DISCOURAGE LANE CHANGING, WHILE TWO PARALLEL SOLID WHITE LINES ARE REQUIRED TO PROHIBIT LANE CHANGING.

3. EDGE LINES

   SOLID WHITE OR YELLOW EDGE LINES SHALL BE 4 IN. WIDE. YELLOW EDGE LINES SHALL BE USED ONLY FOR LEFT EDGE, IN THE DIRECTION OF TRAVEL OF DIVIDED STREETS AND HIGHWAYS (SEPARATED BY OTHER THAN A PAINTED MEDIAN) AND ONE-WAY ROADWAYS (INCLUDING RAMPS).

   EDGE LINES ARE NOT CONTINUED THROUGH INTERSECTIONS AND ARE NOT BROKEN FOR DRIVEWAYS. CARE MUST BE TAKEN TO AVOID EDGE LINE APPEARING AS LANE LINE ALONG ROADWAYS WITH WIDE SHOULDERS AND/OR CLOSELY SPACED DRIVEWAYS.

4. DOTTED EXTENSION LINES

   BROKEN WHITE, WIDTH MATCHING THE LINE BEING EXTENDED-2 FT. SEGMENTS WITH 4 FT. GAPS. THESE LINES ARE USED TO DELINEATE THE EXTENSION OF A LINE THROUGH AN INTERSECTION OR INTERCHANGE AREA.

5. CHANNELIZING LINES

   SOLID WHITE, 8 IN. WIDE. THESE LINES ARE USED WITH ACCELERATION-DECELERATION LANES, PAVEMENT WIDTH TRANSITIONS, AND LEFT-RIGHT TURN SLOTS OR ISLANDS.

6. CROSS-HATCHING LINES

   SOLID WHITE OR YELLOW, 8 IN. WIDE-45 DEGREE DIAGONAL, SPACED AT 25 FT. INTERVALS. THESE LINES ARE OPTIONAL AND MAY BE PLACED AT LOCATIONS INDICATED ON THE PLANS OR DETERMINED BY THE ENGINEER. YELLOW SHALL BE USED FOR PAINTED MEDIANS OR PAVEMENT WIDTH TRANSITIONS ONLY.

   OPTIONAL DIAGONAL SHOULDER MARKINGS SHALL BE SOLID WHITE, 8 IN. WIDE, SPACED AT INTERVALS OF 20 FT. MINIMUM TO 100 FT. MAXIMUM.

7. PARKING LINES

   SOLID WHITE, 3 IN. WIDE-DIAGONAL OR PARALLEL AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.

8. STOP LINES

   SOLID WHITE, 24 IN. WIDE-EXTEND PARALLEL TO INTERSECTED ROADWAY ACROSS ALL APPROACH LANES OR AS INDICATED AT LOCATIONS ON THE PLANS. LOCATE AT THE DESIRED STOPPING POINT, NOT MORE THAN 30 FT, NOR LESS THAN 4 FT. FROM THE NEAREST EDGE OF THE INTERSECTED TRAFFIC LANE.

9. LANE DROP / AUX LINES

   BROKEN WHITE, 8 IN. WIDE - 3 FT. SEGMENTS WITH 12 FT. GAPS. THESE LINES SHOULD BEGIN 2600 FT. IN ADVANCE OF THE THEORETICAL GORE POINT TO DISTINGUISH THE LANE DROP FROM A CONTINUOUS LANE. THE CHANNELIZING LINE MAY BE EXTENDED APPROXIMATELY 300 FT. UPSTREAM.

(CONTINUED ON SHEET NO. 2)

Computer File Information		Sheet Revisions	
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Last Modification Date: 02/08/17 Initials: MBhat	R-5	02/08/17	UPDATED #9 IN GEN. NOTES FROM 9' TO 12' UPDATED #9 TITLE TO INCLUDE "AUX LINES" UPATED LANE DROP TO ACCEL LANE DELETED DIMENSION IN COMB. ACCEL-DECEL DRAWING ADDED DIMENSIONS IN PARALLEL ACCEL LANE DRAWING
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-627-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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Safety & Traffic Engineering KCM

PAVEMENT MARKINGS

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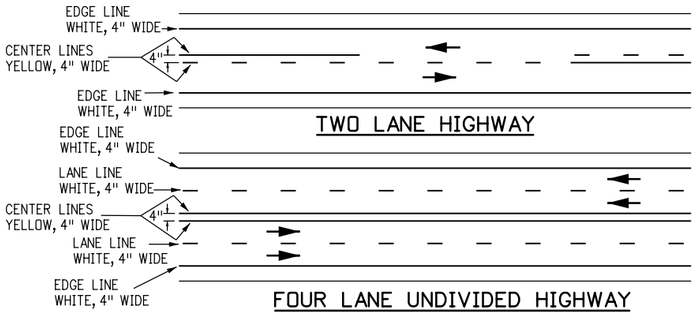
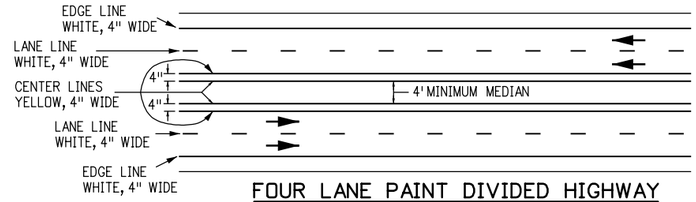
STANDARD PLAN NO.

S-627-1

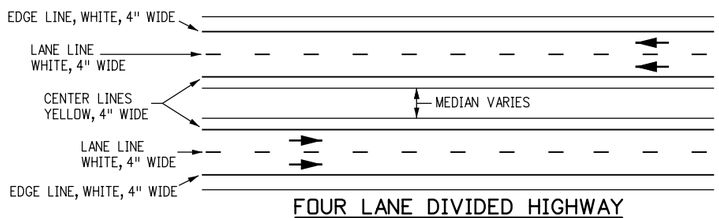


TWO LANE HIGHWAY

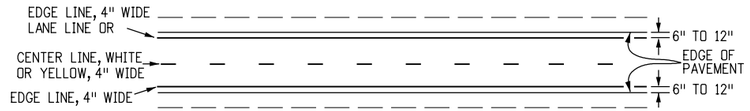
FOUR LANE UNDIVIDED HIGHWAY



FOUR LANE PAINT DIVIDED HIGHWAY



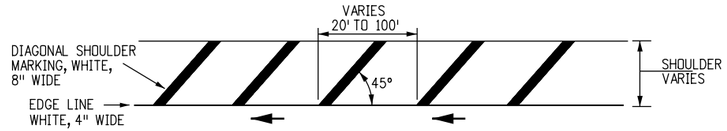
FOUR LANE DIVIDED HIGHWAY



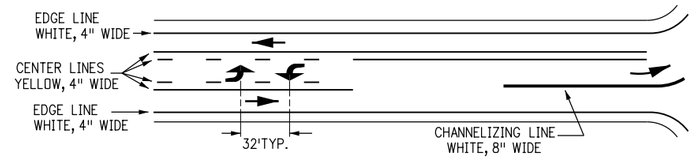
NOTE: EDGE LINES ARE NOT TO BE USED WHEN TRAVELED WAY IS LESS THAN 20 FEET.

NO SHOULDER OR UNSURFACED SHOULDER

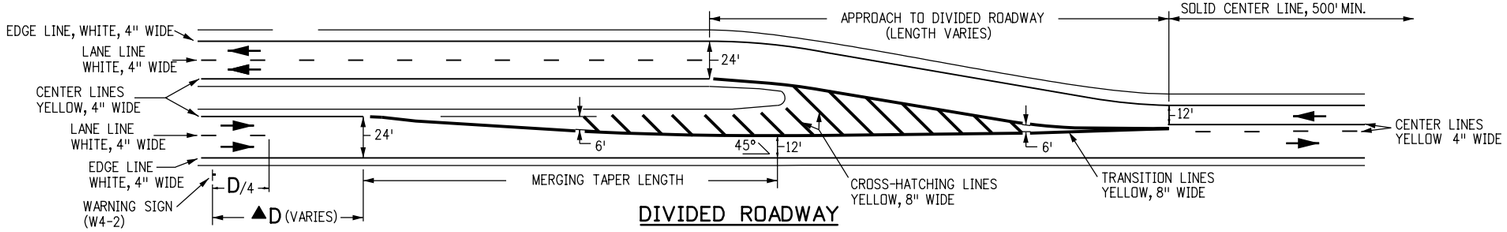
SHOULDER SURFACED



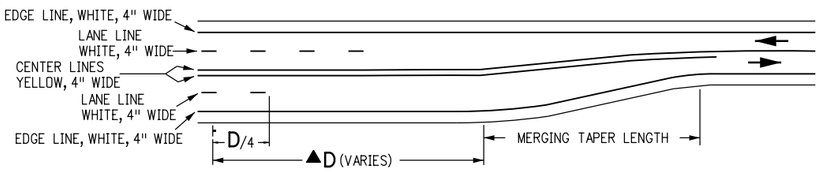
EDGE LINE WITH OPTIONAL DIAGONAL SHOULDER MARKING



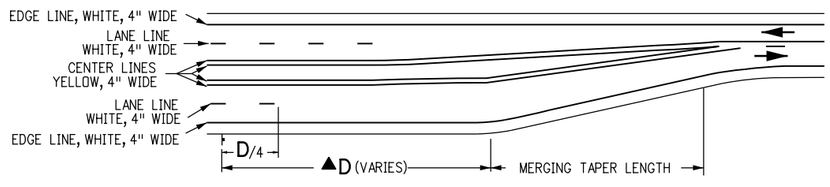
TYPICAL TWO WAY LEFT TURN LANE



DIVIDED ROADWAY



UNDIVIDED ROADWAY - CASE 1



UNDIVIDED ROADWAY - CASE 2

GENERAL NOTES

(CONTINUED FROM SHEET NO. 1)

10. ACCEL LANE LINES

BROKEN WHITE, 4 IN WIDE - 3 FT SEGMENTS WITH 12 FT GAPS. THESE LINES WOULD BE USED WHERE TWO THRU LANES OR AN ACCEL LANE MERGE INTO ONE THRU LANE.

11. CROSSWALK LINES

SOLID WHITE, 12 IN. WIDE FOR TRANSVERSE LINE TYPE - EXTEND ACROSS ENTIRE WIDTH OF PAVEMENT. IF NO ADVANCE STOP LINE IS PROVIDED, INCREASE THE WIDTH OF THE CROSSWALK LINES TO 24 IN. THE DISTANCE BETWEEN THE LINES IS USUALLY DETERMINED BY THE WIDTH OF THE SIDEWALKS SO CONNECTED, HOWEVER, IN NO CASE SHALL THIS BE LESS THAN 6 FT.

COMPLICATED AND/OR CHANNELIZED INTERSECTIONS AND MID-BLOCK CROSSWALKS SHALL BE SOLID WHITE, 12 IN. TO 24 IN. WIDE AND 8 FT. TO 10 FT. LONG FOR LONGITUDINAL LINE TYPE AS DETAILED IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

12. WORD, ARROW AND SYMBOL MARKINGS

ALL LETTERS, ARROWS AND SYMBOLS SHALL BE IN CONFORMANCE WITH "THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" ADOPTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

13. MERGING TAPER LENGTH

L = MINIMUM LENGTH OF TAPER.

S = DESIGN SPEED FOR NEW CONSTRUCTION OR NUMERICAL VALUE OF THE POSTED SPEED LIMIT OF THE 85TH PERCENTILE SPEED OF EXISTING TRAFFIC.

W = WIDTH TRANSITIONED

FORMULA: FOR SPEED 45 MPH OR MORE, $L = S \times W$

FOR SPEED 40 MPH OR LESS, $L = \frac{WS^2}{60}$

14. TRANSITION LINES

SOLID YELLOW, 8 IN. WIDE. THESE LINES ARE USED WHERE ADDITIONAL EMPHASIS OR VISIBILITY IS DESIRABLE AT PAVEMENT WIDTH TRANSITIONS. PLACE AT LOCATIONS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

15. SPEED MEASURING MARKING

SOLID WHITE, 24 IN. - EXTEND 4 FT. FROM OUTSIDE OF EDGE LINES ON SHOULDERS.

▲ NOTE:

D = THE DISTANCE FROM THE LANE ENDS SIGN (W4-2) TO THE BEGINNING OF THE MERGING TAPER. FOR MORE INFORMATION ON THE "D" VALUE REGARDING SIGN AND PAVEMENT MARKING PLACEMENT, SEE THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", TABLE 2C-4, CONDITION A: SPEED REDUCTION AND LANE CHANGING IN HEAVY TRAFFIC AND FOOTNOTE 2 REGARDING TYPICAL CONDITIONS.

LEGEND

→ Direction of Travel

TYPICAL PAVEMENT WIDTH TRANSITION MARKINGS

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date: 02/08/17	Initials: MBhat
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-627-01.dgn	
CAD Ver.: MicroStation V8i Scale: Not to Scale	Units: English

Sheet Revisions	
Date:	Comments
10/18/12 (R-1)	ADDED MORE NOTES ON "D" VALUE
02/08/17 (R-2)	ADDED LEGEND UPDATED WORD "TRANSITION" TO "MERGING" UPDATED ▲NOTE ADDED NEW NOTE 10 RENUMBERED NOTES FOLLOWING 10

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PAVEMENT MARKINGS

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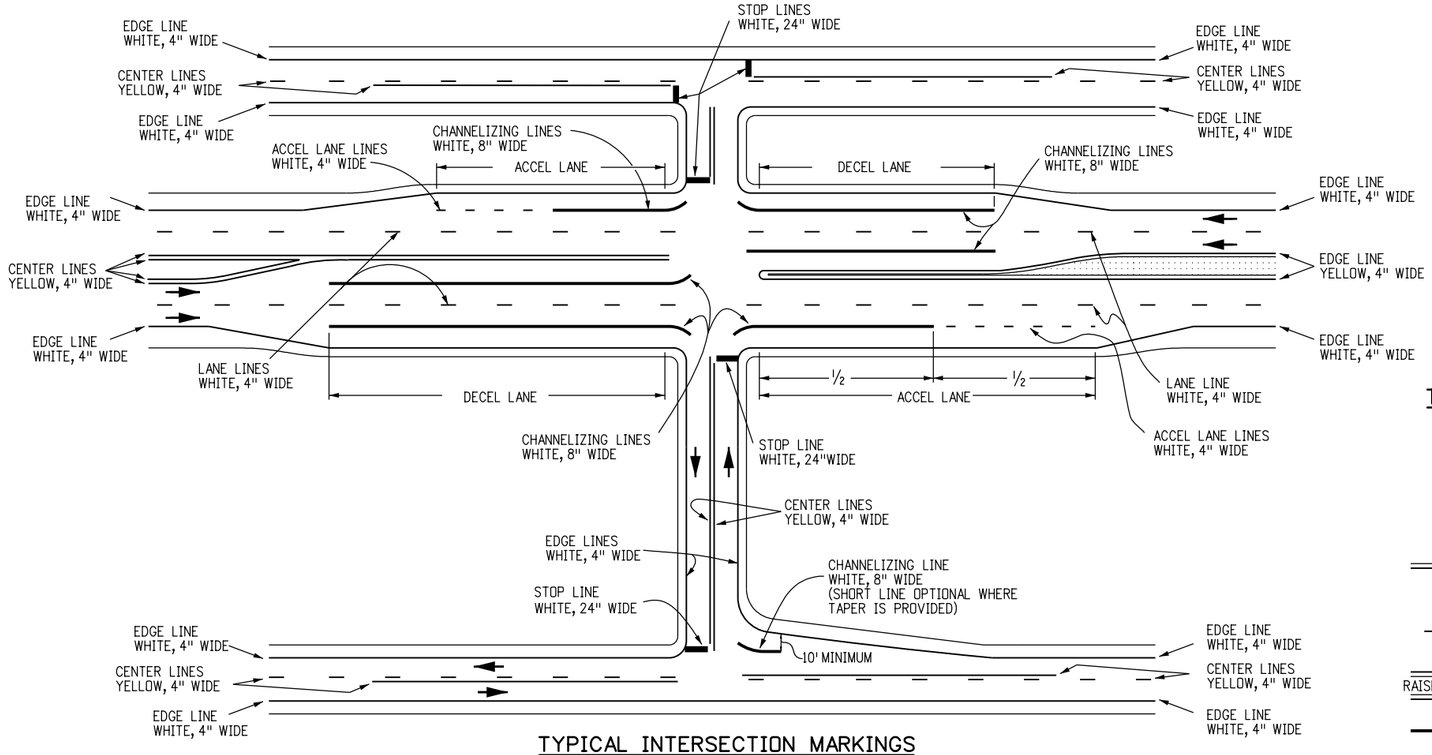
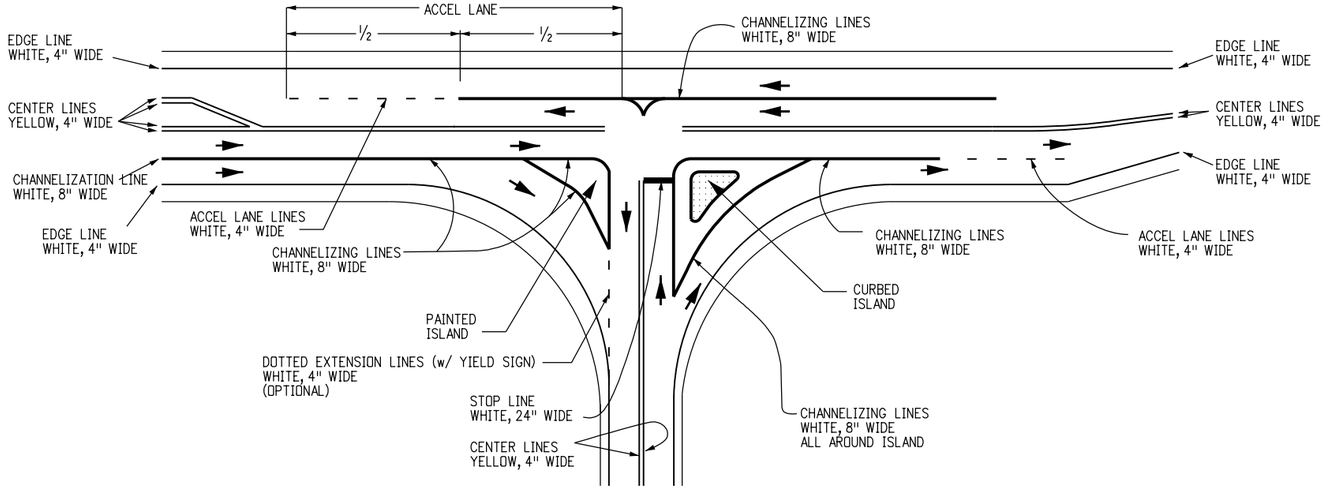
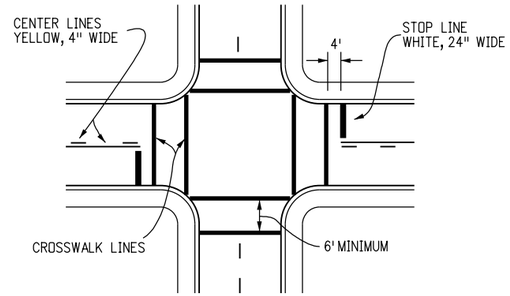


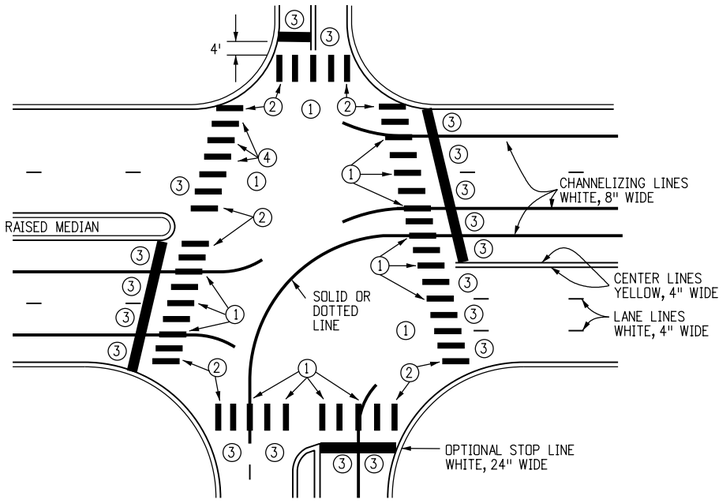
TYPICAL INTERSECTION MARKINGS



TYPICAL ISLAND MARKINGS

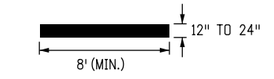


TYPICAL TRANSVERSE LINE CROSSWALK MARKINGS



TYPICAL CONTINENTAL CROSSWALK MARKINGS

CROSSWALK LINE DETAIL



LEGEND

→ Direction of Travel

CROSSWALK NOTES

1. CENTER CROSSWALKS ON CURB RAMPS. IF SUCH RAMPS ARE NOT PROVIDED CENTER ON SIGNAL POLES WHEREVER PRACTICAL.
2. CENTER ON LANE, CENTER OR CHANNELIZING LINE.
3. CENTER OR EXTENDED FLOW LINE.
4. CENTER BETWEEN ADJACENT LINES.
5. LINES AND SPACES TO APPROXIMATE ADJACENT PATTERN.

INTERSECTIONS, ISLANDS AND CROSSWALKS

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: JSW		Date:	Comments
Last Modification Date: 02/08/17 Initials: MBhat	R-5	02/08/17	UPDATE LANE DROP LINES TO ACCEL LANES ADDED LEGEND UPDATE LANE ISLAND MARKINGS & ADDED ADDED DIMENSIONS TO ACCEL LANE LINES
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-627-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			UPDATED "LONGITUDINAL" TO "CROSSWALK"

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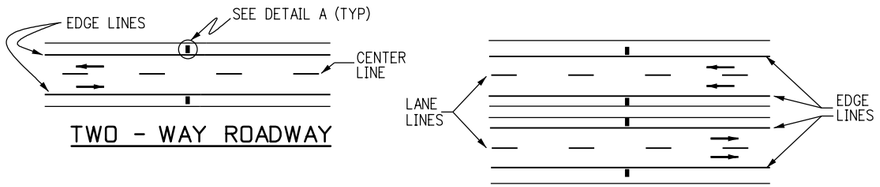
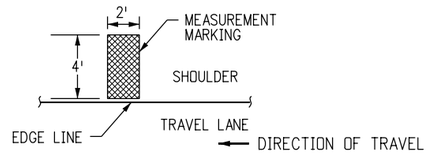


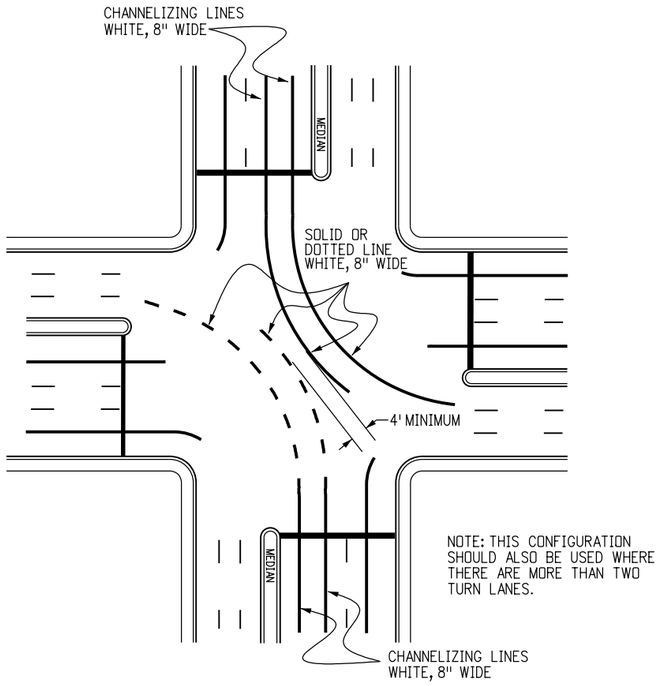
TWO - WAY ROADWAY

MULTI - LANE DIVIDED HIGHWAY

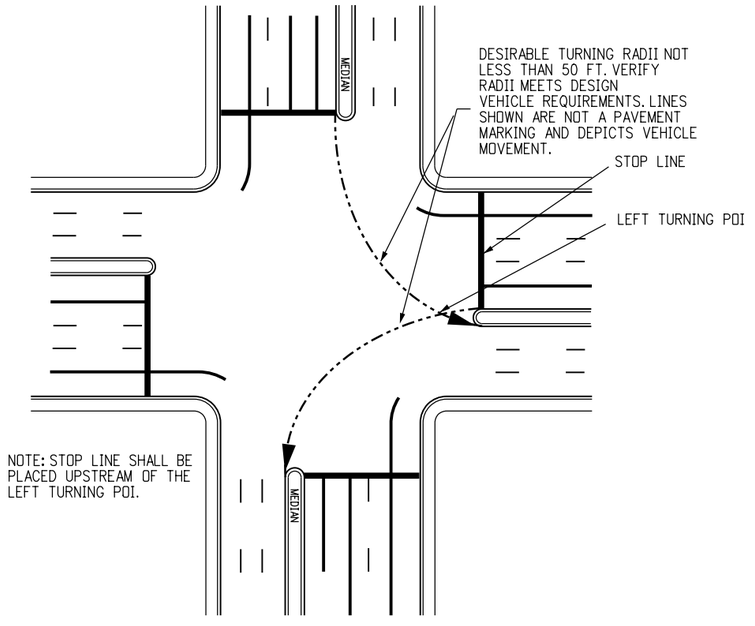


DETAIL A

TYPICAL SPEED MEASUREMENT MARKING



TYPICAL DOUBLE LEFT TURN MARKINGS



TYPICAL STOP LINE PLACEMENT

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: SCL		Date:	Comments
Last Modification Date: 02/08/17 Initials: MBhat	R-1	02/08/17	UPDATE "TYPICAL STOP BAR PLACEMENT" TITLE TO "TYPICAL STOP LINE PLACEMENT"
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-627-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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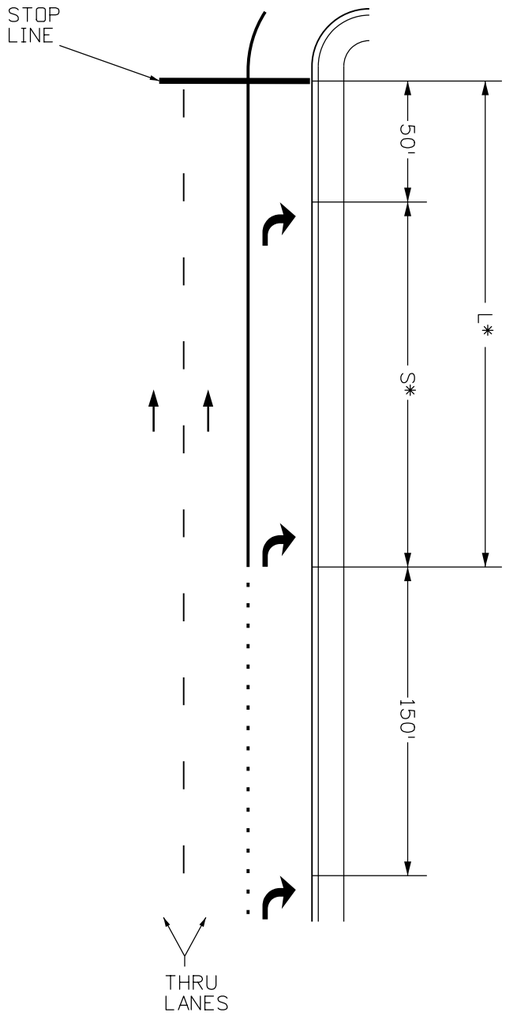
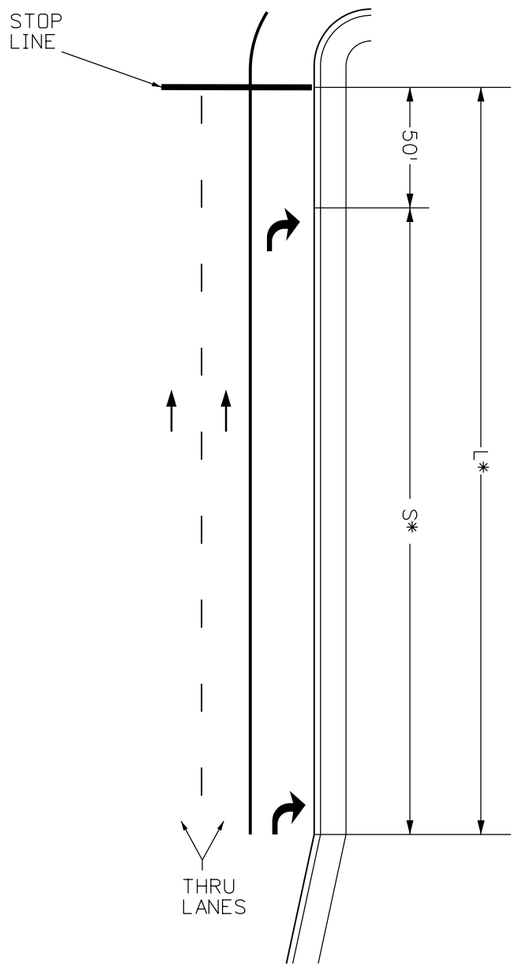
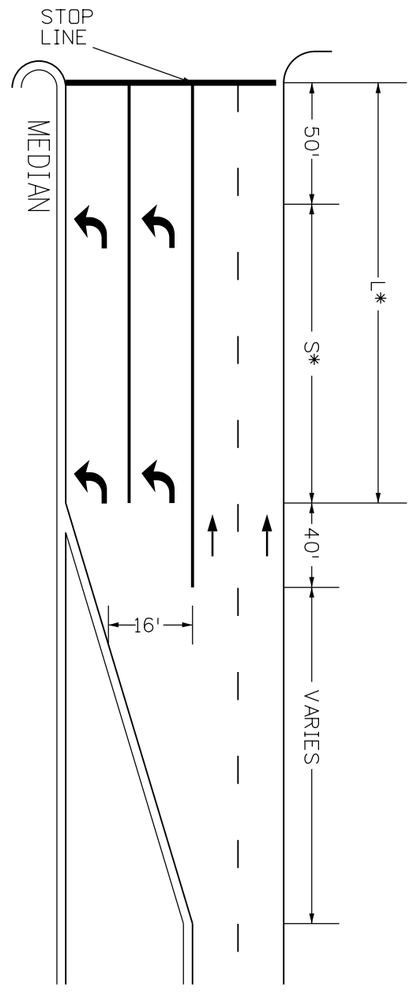


LANE DROP



POCKET LANE



DOUBLE TURNING

GENERAL NOTES

1. THE SPACING, IN THE TABLE APPLIES TO LEFT & RIGHT TURN LANES.
2. WHEN ONE (1) ARROW IS USED, IT SHALL BE PLACED AT THE BEGINNING OF THE FULL WIDTH TURN LANE, OTHERWISE USE THE TABLE BELOW FOR ARROW PLACEMENT.

LENGTH (L)	NO. OF ARROWS PER LANE	SPACING (S)
L < 200'	1	NA
200' - 350'	2	EVENLY SPACED BETWEEN 150'-300'
350' - 650'	3	
650' - 950'	4	
950' ≤	≥5	

*L (LENGTH) AND *S (SPACING) PROVIDED IN THE TABLE ABOVE WILL HELP DETERMINE THE NUMBER OF ARROWS NEEDED PER LANE.

LEGEND

→ Direction of Travel

ARROW PLACEMENTS AT INTERSECTIONS

Computer File Information		Sheet Revisions	
Creation Date: 02/08/17	Initials: MBhat	Date:	Comments
Last Modification Date:	Initials:		
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-627-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English			

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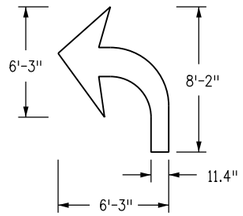
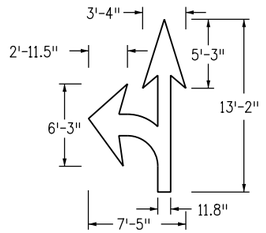
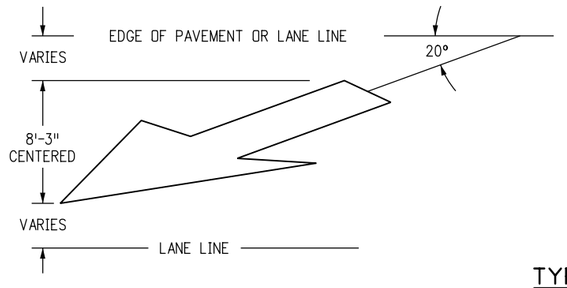
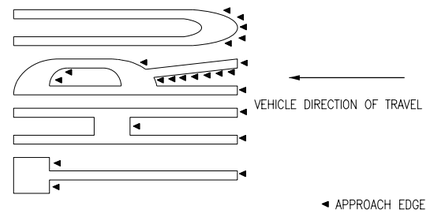


AREA = 16.1 SQ.FT.

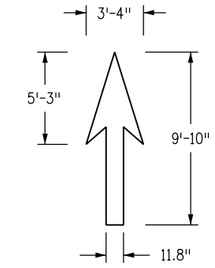


AREA = 27.5 SQ.FT.

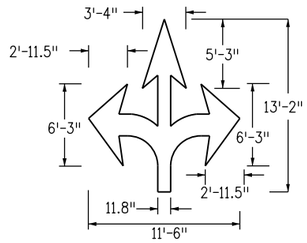




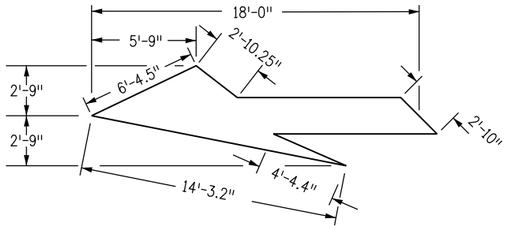
TYPICAL APPROACH EDGE TAPERING VIEW



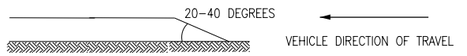
AREA = 12.1 SQ.FT.



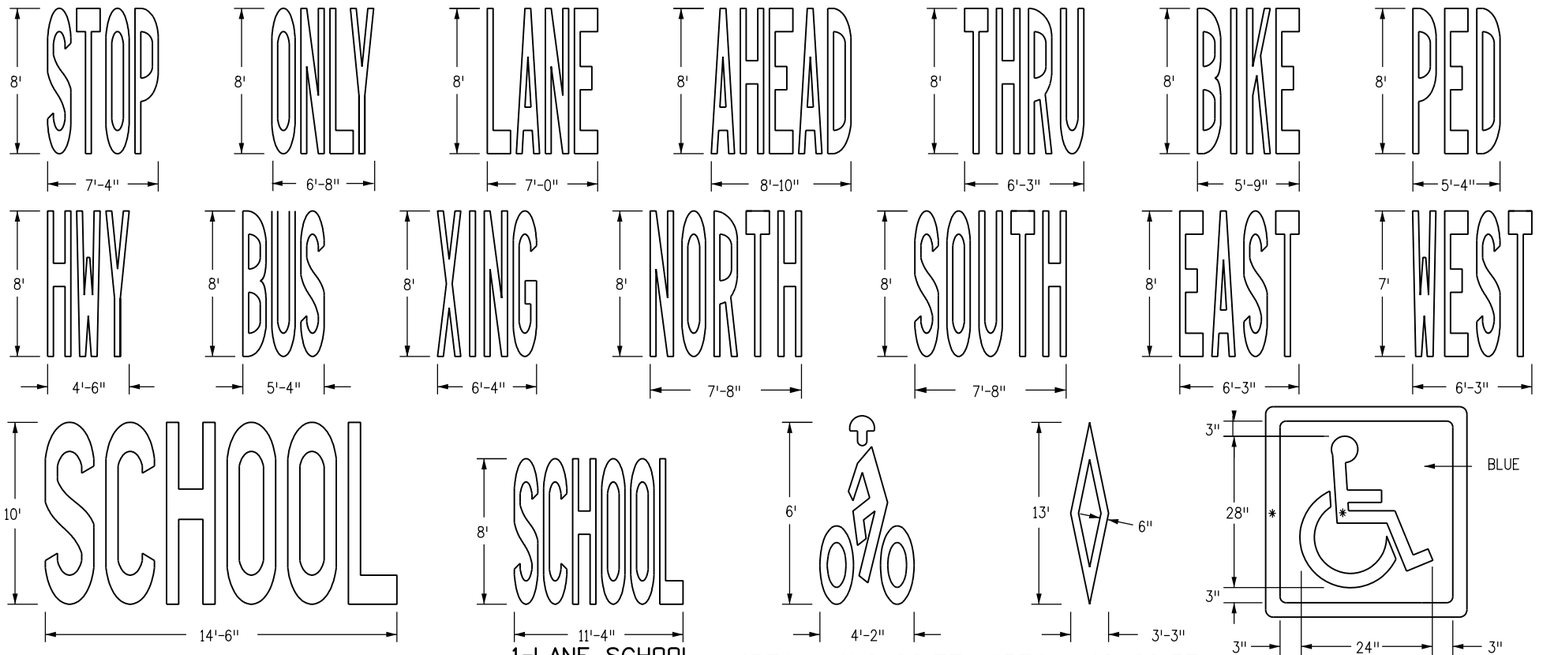
AREA = 39.8 SQ.FT.



AREA = 58 SQ.FT.



TYPICAL APPROACH EDGE TAPERING PROFILE VIEW



STROKE = 8"
2-LANE SCHOOL

1-LANE SCHOOL

AREA = 11.9 SQ.FT. AREA = 10 SQ.FT.

* WHITE 3" STROKE WIDTH (BORDER MAY BE 4" STROKE WIDTH)

PAVEMENT MARKING WORDS AND SYMBOLS

WORD AND SYMBOL NOTES

IF HEIGHT IS INCREASED OR DECREASED THEN ALL MEASUREMENTS CHANGE PROPORTIONATELY. EXAMPLE: "H" MEASUREMENT FOR STOP IS REDUCED TO 4' FROM 8' THEN SQUARE FEET = 5.75 (1/4 OF 23.0 SQ. FT.).

PAVEMENT WORD AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

LETTER SPACING SHALL BE 8 INCHES EXCEPT FOR THE LETTER "A' WHICH IS 6 INCHES.

USE THE MARKING WORD "BIKE" IF 6 FT TO 8 FT BIKE LANES ARE INSTALLED.

TAPERING NOTES

ALL PAVEMENT MARKING APPROACH EDGES FROM THE VEHICLE DIRECTION OF TRAVEL SHALL BE TAPERED USING A PUTTY KNIFE OR SIMILAR TOOL.

DESIGNATED PAYMENT AREAS

FOR THE FOLLOWING H, W, AND S DIMENSIONS PAY:

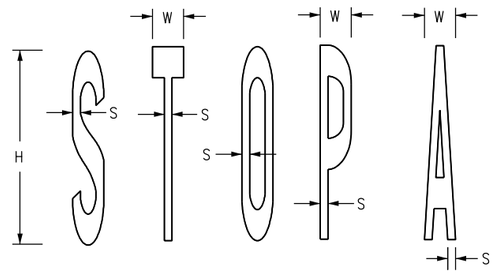
H = 4' WORDS

BIKE - 5.5 SQ.FT.	LANE - 6.0 SQ.FT.
ONLY - 6.0 SQ.FT.	XING - 5.0 SQ.FT.

H = 8' WORDS

STOP - 23.0 SQ.FT.	XING - 20.0 SQ.FT.
ONLY - 22.5 SQ.FT.	LANE - 22.5 SQ.FT.
AHEAD - 29.0 SQ.FT.	BIKE - 21.0 SQ.FT.
BUS - 18.5 SQ.FT.	HWY - 16.5 SQ.FT.
SCHOOL(1L) - 33.0 SQ.FT.	THRU - 22.0 SQ.FT.
SCHOOL(2L) - 85.0 SQ.FT.	PED - 17.5 SQ.FT.
NORTH - 30.6 SQ.FT.	SOUTH - 28.5 SQ.FT.
EAST - 22.1 SQ.FT.	WEST - 23.7 SQ.FT.

TYPICAL LETTER MEASUREMENTS



H = HEIGHT	H = 8'	H = 4'
W = WIDTH	W = 1'-3.4" TO 1'-4"	W = XX TO XX
S = STROKE	S = 3.8" TO 4"	S = 1.9" TO 2"

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: SCL	Date:	Comments
Last Modification Date: 02/08/17	Initials: MBhat	02/08/17	UPDATED BICYCLIST SYMBOL ADDED NOTE REGARDING "BIKE" MARKING WORD RELOCATED ELONGATED ROUTE SHIELDS TO PAGE 7 OF 8 ADDED CARDINAL STENCILS & UPDATED STENCIL DIMENSIONS ADDED 3 HEAD COMBINATION ARROW & UPDATED ARROW DIMENSIONS AND AREAS
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-627-01.dgn			
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English	R-3		

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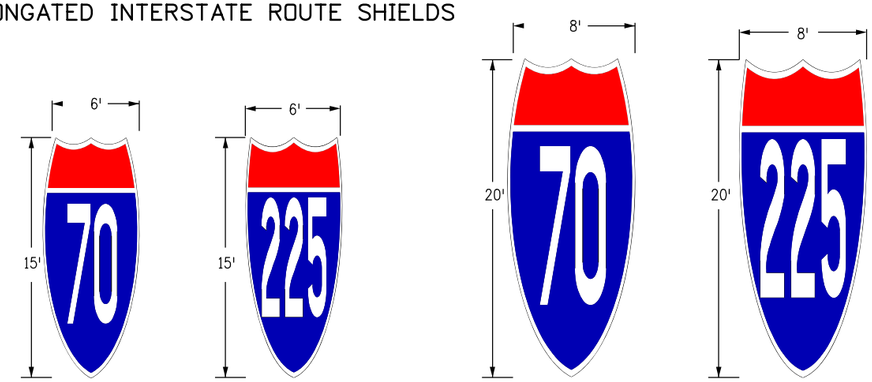
ELONGATED INTERSTATE ROUTE SHIELDS



DESIGNATED PAYMENT AREAS

FOR THE FOLLOWING ROUTE SHIELDS
& CARDINAL DIRECTIONS DIMENSIONS PAY:

INTERSTATE

6' X 15' - 75 SQ.FT. 8' X 20' - 128 SQ.FT.

COLORADO STATE

6' X 15' - 90 SQ.FT. 8' X 20' - 160 SQ.FT.

US HIGHWAYS

7' X 16' - 112 SQ.FT. 9' X 21' - 189 SQ.FT.

CARDINAL

8' X 10' - 80 SQ.FT. 9' X 10' - 90 SQ.FT.

GENERAL NOTES

1. DIMENSIONS

   ELONGATED ROUTE SHIELDS SHALL BE AT LEAST 8'x20' WHEN USED ON HIGH SPEED ROADWAYS (55 MPH OR MORE).

   PER FIGURE 3B-25 OF THE 2009 MUTCD ELONGATED ROUTE SHIELD COLORS SHALL CONFORM WITH THE STANDARD HIGHWAY SIGNS AND MARKINGS BOOK.

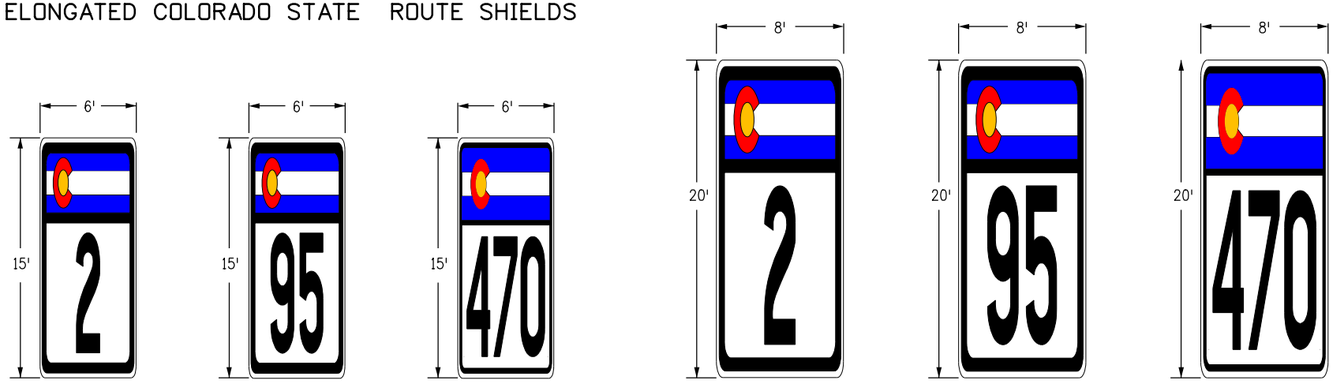
2. CARDINAL DIRECTIONS

   USE CARDINAL DIRECTIONS WITH WHITE ON BLUE WHEN USING INTERSTATE ROUTE SHIELDS

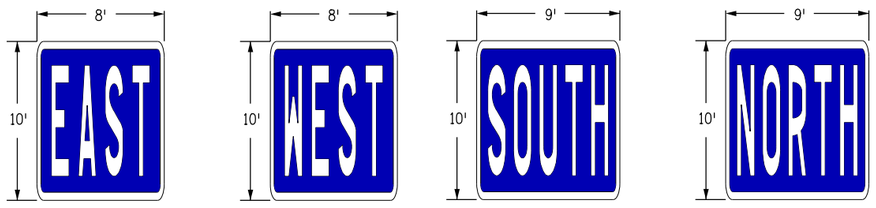
   USE CARDINAL DIRECTIONS WITH BLACK ON WHITE WHEN USING EITHER COLORADO STATE OR US HIGHWAY ROUTE SHIELDS.

   CARDINAL DIRECTION MARKING WORD SYMBOL FROM PAGE 7 OF 8 MAY BE USED INSTEAD OF PLAQUE.

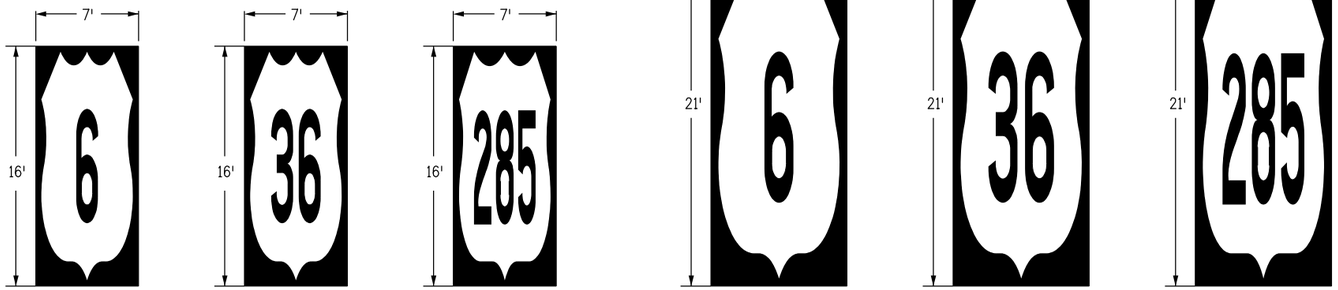
ELONGATED COLORADO STATE ROUTE SHIELDS



CARDINAL DIRECTIONS (WHITE LETTERING ON BLUE BACKGROUND)



ELONGATED US HIGHWAY ROUTE SHIELDS



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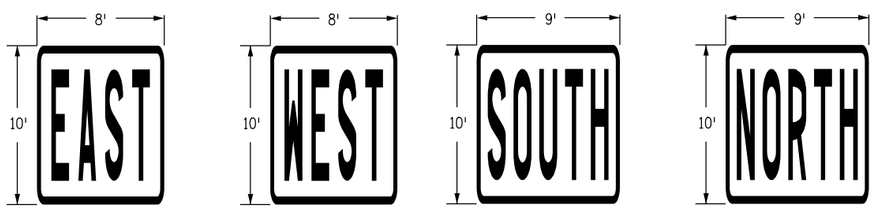

ELONGATED ROUTE SHIELDS & CARDINAL DIRECTION MARKINGS

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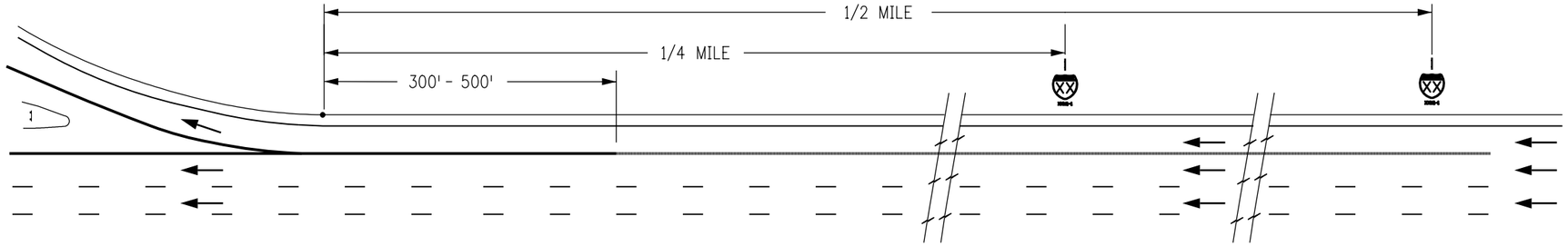
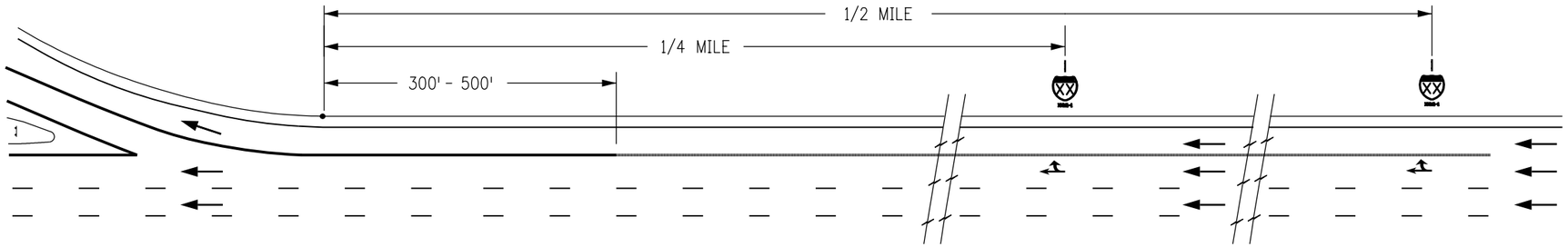


TYPICAL SHIELD PLACEMENT

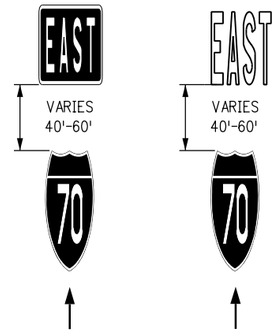
*AS DIRECTED BY THE ENGINEER



TYPICAL SHIELD & OPTION ARROW PAVEMENT MARKING PLACEMENT

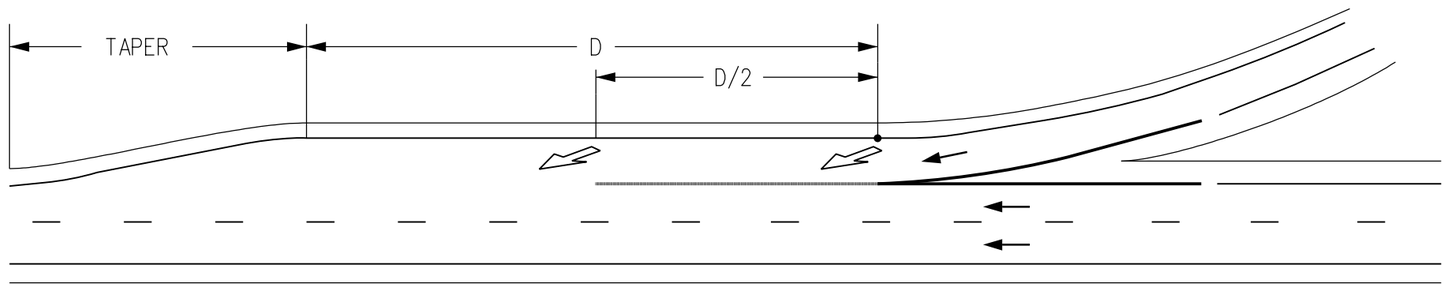
*AS DIRECTED BY THE ENGINEER

SHIELD LAYOUT DETAIL

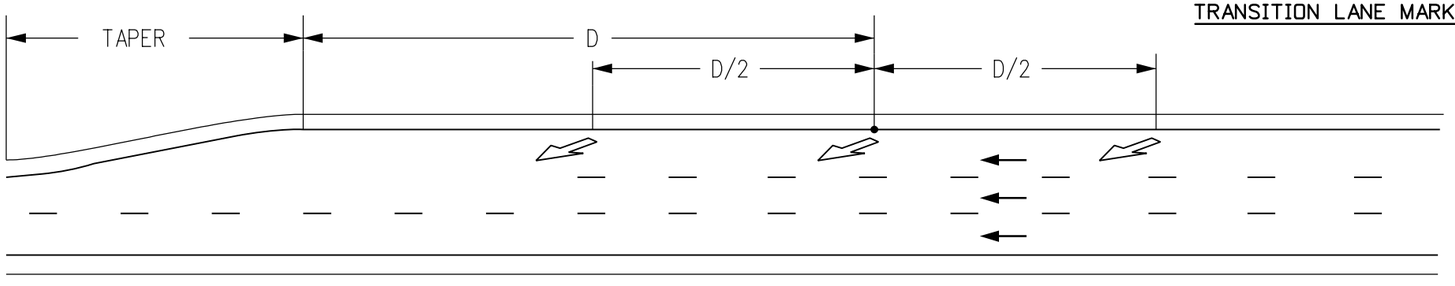


LEGEND

→ Direction of Travel



TRANSITION LANE MARKINGS



D = THE DISTANCE FROM THE PAVEMENT WIDTH TRANSITION SIGN (W4-2) TO THE BEGINNING OF THE TRANSITION TAPER

THRU LANE DROP MARKINGS

LANE REDUCTION TRANSITION MARKINGS

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STANDARD PLAN NO.

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GENERAL NOTES

1. ALL CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES, INCLUDING BUT NOT LIMITED TO BARRICADES, SIGNS, ARROW PANELS, FLASHING BEACON (PORTABLE), AND CHANNELIZING DEVICES, SHALL BE FURNISHED, INSTALLED, MAINTAINED (INCLUDING WASHING), REPLACED IF DAMAGED, REMOVED WHEN TEMPORARILY NOT IN USE AND RETURNED WHEN REQUIRED, RESET AS NECESSARY DURING THE PROGRESS OF CONSTRUCTION, AND REMOVED ENTIRELY WHEN THE PROJECT IS COMPLETED. ALL DEVICES SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE ATSSA "QUALITY GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES & FEATURES".

2. WORK ON THE PROJECT SHALL NOT BE STARTED UNTIL ALL REQUIRED TRAFFIC CONTROL DEVICES ARE IN PLACE, AND APPROVED BY THE ENGINEER.

3. WHEN SPEED LIMIT REDUCTION IS REQUIRED, SUCH REDUCTION SHALL BE IN ACCORDANCE WITH CDOT FORM 568, "AUTHORIZATION AND DECLARATION OF TEMPORARY SPEED LIMITS."

   WHEN A CHANGE IN AN EXISTING SPEED LIMIT IS REQUIRED, THE R2-1 SIGNS, SHOWN ON THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES, SHOULD BE INSTALLED AT THE LOCATIONS SHOWN ON THE TYPICAL CASES BY R2-1 (OPTIONAL) SIGNS.

   AN ADVISORY SPEED PLATE (W13-1P) MAY BE USED WITH A WARNING SIGN WHEN THE MAXIMUM RECOMMENDED SPEED FOR CONDITION NAMED IS LOWER THAN THE POSTED SPEED LIMIT.

   THE REGULATORY OR ADVISORY SPEED REDUCTION DISPLAYED SHALL NOT EXCEED 15 MPH PER SIGN INSTALLATION.

4. ANY TRAFFIC CONTROL DEVICE THAT IS DAMAGED, WEATHERED, WORN, OR OTHERWISE DEEMED UNACCEPTABLE BY THE ENGINEER, SHALL BE REPLACED.

5. CONTRACTOR AND PERSONAL VEHICLE PARKING IS PROHIBITED WITHIN THE RIGHT-OF-WAY UNLESS DESIGNATED ON THE PLANS, OR APPROVED BY THE ENGINEER.

6. CONSTRUCTION TRAFFIC SIGNS SHALL BE MEASURED BY THE FOLLOWING SIZES AND DESCRIPTIONS:

PANEL SIZE A	0.01 TO 9.00 SQ. FT. (INCLUDING TYPE 1 AND TYPE 2 BARRICADES).
PANEL SIZE B	9.01 TO 16.00 SQ. FT.
PANEL SIZE C	GREATER THAN 16 SQ. FT.

   CONSTRUCTION TRAFFIC SIGN (SPECIAL), SQ. FT., MAY BE USED FOR SOME PROJECT SPECIFIC INFORMATION SIGNS.

   FOR DETAILED DIMENSIONS OF SIGNS WITH SIGN CODE NUMBERS, SEE "STANDARD HIGHWAY SIGNS" AND THE "COLORADO SUPPLEMENT" THERETO. SIGN LAYOUTS FOR OTHER SIGNS WILL BE FURNISHED IN THE PLANS, TRANSMITTED TO THE ENGINEER AFTER AWARD, OR MAY BE AVAILABLE UPON REQUEST.

   W20-5 WARNING SIGNS SHALL BE FURNISHED WITH EXCHANGEABLE PLAQUES READING "RIGHT", "LEFT", "CENTER", "RIGHT 2", ETC. AT NO ADDITIONAL COST.

7. ALL WARNING AND REGULATORY SIGNS SHALL BE POSTED ON BOTH SIDES OF THE ROADWAY ON DIVIDED HIGHWAYS, MULTI-LANE RAMPS, ONE-WAY STREETS, AND AS DIRECTED BY THE ENGINEER, EXCEPT WHERE ONLY ONE SHOULDER IS CLOSED (EX: CASE 11 ON SHEET 7).

8. ADDITIONAL TRAFFIC CONTROL DEVICES ADDRESSING FLAGGING, SPEED REDUCTION, ETC. WILL BE NECESSARY FOR SET-UP AND TAKE-DOWN OF MOST CASE APPLICATIONS; DAILY WORK SITE ACCESS; AND PAVEMENT MARKING REMOVAL AND INSTALLATION OPERATIONS.

9. BASED ON SIGHT DISTANCE AND OTHER CONSIDERATIONS, THE FINAL LOCATIONS OF SIGNS ARE SUBJECT TO APPROVAL OF THE ENGINEER.

10. IF CONSTRUCTION RELATED TRAFFIC CONGESTION BACKS UP BEYOND THE INSTALLED ADVANCE SIGN SEQUENCE, ADDITIONAL ADVANCE SIGNING SHALL BE PLACED BEYOND THE CONGESTION.

11. ALL SIGN MATERIAL SHALL BE SOUND AND DURABLE TO THE DEGREE NECESSARY FOR MAINTAINING EFFECTIVE AND NEAT APPEARING TRAFFIC CONTROLS, AND:

    a. SIGN PANELS MAY BE FABRICATED FROM PLYWOOD, STEEL, ALUMINUM, OR OTHER SUITABLE MATERIAL.
    b. REFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956. THE TYPE SHALL BE AS DESCRIBED IN THE STANDARD SPECIFICATIONS AND/OR AS SHOWN ON THE PLANS.
    c. SYMBOLS AND LEGEND SHALL BE OF GOOD WORKMANSHIP (UNEVEN OR HAND LETTERING WILL NOT BE ACCEPTED).
    d. PORTABLE OR TEMPORARY MOUNTING SHALL NOT BE CONSTRUCTED OR WEIGHTED BY ANY METHOD OR MATERIAL THAT MAKES THEM HAZARDOUS TO TRAFFIC.
    e. CERTAIN POST SIZES AND SHAPES REQUIRE A "BREAK-AWAY" DEVICE. SEE THE APPLICABLE STANDARD PLAN. OTHER POST DESIGNS OR SYSTEMS REQUIRE THE SUBMITTAL OF AN FHWA LETTER OF ACCEPTANCE TO THE ENGINEER, AND MUST BE APPROVED BY THE ENGINEER PRIOR TO THEIR USE.

12. ALL CONSTRUCTION SIGN PLACEMENT SHALL BE IN ACCORDANCE WITH STANDARD PLAN "TYPICAL GROUND SIGN PLACEMENT" UNLESS OTHERWISE APPROVED.

    SIGNS APPROVED TO BE MOUNTED ON PORTABLE SUPPORTS, OR APPROPRIATE SIGNS MOUNTED ON BARRICADES, MAY BE AT LOWER HEIGHTS, BUT THE BOTTOM OF THE SIGNS SHALL NOT BE LESS THAN ONE FOOT ABOVE THE PAVEMENT ELEVATION.

13. SIGNS MOUNTED ON THE MEDIAN OF DIVIDED HIGHWAYS WHERE MEDIAN BARRIER IS IN PLACE MAY BE MOUNTED ON THE BARRIER WITH A SADDLE TYPE BRACKET. IF THE BRACKET ALLOWS THE SIGN PANEL TO BE TURNED PARALLEL TO THE ROADWAY, THE SIGN MAY REMAIN IN PLACE WHEN NOT APPLICABLE, BUT LAYING THE SIGN PANEL DOWN IN A HORIZONTAL POSITION IS NOT PERMITTED.

14. TRAFFIC CONES SHALL BE AT LEAST 28 INCHES IN HEIGHT. HOWEVER, THE MINIMUM SIZE SHALL BE 36 INCHES WHEN THEY ARE USED ON FREEWAYS AND EXPRESSWAYS, OR DURING NIGHT TIME WORKING HOURS. THEY SHOULD ALSO BE 36 INCHES WHEN USED ON OTHER HIGH SPEED ROADWAYS (45 MPH OR MORE) WITH AN ADT OF 6,000 OR MORE.

15. TYPE 1 BARRICADES SHALL NOT BE USED ON FREEWAYS, EXPRESSWAYS, OR OTHER HIGH SPEED ROADWAYS (55 MPH OR MORE).

16. WHEN TWO-WAY TRAFFIC IS PLACED ON ONE ROADWAY OF A NORMALLY DIVIDED HIGHWAY, OPPOSING TRAFFIC SHALL BE SEPARATED EITHER WITH CONCRETE BARRIER (TEMPORARY), OR WITH CHANNELIZING DEVICES APPROVED FOR THIS APPLICATION, THROUGHOUT THE LENGTH OF TWO-WAY OPERATION. THE TRANSITION ZONES SHALL HAVE CONCRETE BARRIER (TEMPORARY). THE BARRIER SHALL BE TIED TO AN EXISTING STRUCTURE OR GUARD RAIL, FLARED OR EXTENDED, TO MEET CLEAR ZONE REQUIREMENTS, OR FITTED WITH AN IMPACT ATTENUATION DEVICE.

17. CHANNELIZING DEVICE SPACING, IN FEET, SHALL BE AS FOLLOWS:
    a. FOR TAPERS AND TRANSITIONS, SPACING EQUALS THE NUMERICAL VALUE OF THE SPEED LIMIT. (e.g. 45 MPH = 45 FEET)
    b. FOR TANGENTS ALONG THE BUFFER SPACE OR WORK AREA, SPACING MAY NOT BE GREATER THAN TWO TIMES THE SPEED LIMIT. (e.g. 50 MPH = 50 FEET TO 100 FEET MAXIMUM)

18. FOR DETAILS ON BARRICADES, CONCRETE BARRIER (TEMPORARY), VERTICAL PANELS, AND FLASHING BEACON (PORTABLE), SEE THE APPLICABLE STANDARD PLANS.

19. FLOOD LIGHTS SHALL BE USED TO ILLUMINATE FLAGGER STATIONS DURING THE HOURS OF DARKNESS UNLESS OTHERWISE APPROVED. A TYPICAL LIGHT SHOULD PROVIDE THE FOLLOWING: A FULLY DIRECTIONAL SWIVEL MOUNT QUARTZ LIGHT SOURCE (500 WATT MINIMUM), SELF-SUPPORTING STAND WITH VARIABLE LIGHT HEIGHT FROM A MINIMUM OF EIGHT FEET ABOVE THE ROADWAY, AND A POWER SOURCE. IT SHALL ILLUMINATE THE STATION AREA AND A FLAGGER ESCAPE PATH, BUT SHALL NOT PRESENT ANY GLARE TO TRAFFIC.

20. FOR TEMPORARY PAVEMENT MARKINGS AND CONTROL POINTS FOR INSTALLING THOSE PAVEMENT MARKINGS FOR UNDIVIDED ROADWAYS THAT ARE BEING CONSTRUCTED UNDER TRAFFIC, FULL COMPLIANCE CENTER LINE, LANE LINE, AND EDGE LINE TEMPORARY MARKINGS SHALL BE IN PLACE AT THE END OF EACH WORK DAY IN ACCORDANCE WITH SECTION 627.03(d)2.

    FOR ADDITIONAL PAVEMENT MARKING DETAILS, SEE STANDARD PLAN "TYPICAL PAVEMENT MARKINGS".

21. BUFFER SPACE IS OPTIONAL. NEED MUST BE DETERMINED ON A PROJECT OR SITE SPECIFIC BASIS AS DIRECTED BY THE ENGINEER. WHEN A BUFFER SPACE IS USED, DIMENSIONS AND/OR DEVICES USED ARE TO BE INCORPORATED IN THE TRAFFIC CONTROL PLAN (TCP) OR THE CONTRACTOR'S METHOD OF HANDLING TRAFFIC (MHT).

22. ADDITIONAL VMS SIGNAGE SHOULD BE CONSIDERED AT LEAST A MILE IN ADVANCE OF THE SIGNING SHOWN IN THE DETAIL FOR ANY LANE CLOSURES ON INTERSTATE AND OTHER HIGH SPEED FACILITIES ESPECIALLY WHEN THE LEVEL OF SERVICE IS SIGNIFICANTLY REDUCED AS A RESULT OF CONSTRUCTION. THE LEGENDS SHOULD BE CHANGED TO ADVISE MOTORISTS OF UPCOMING TRAFFIC CONDITIONS AND TO ALERT THEM OF UPCOMING LANE USAGE.

    ADDITIONAL ADVANCE WARNING SIGNAGE IS ENCOURAGED IN ALL CASES WHERE TRAFFIC VOLUMES AND SPEEDS ARE HIGH AND/OR WHERE THERE ARE INFREQUENT EXITS. ADDITIONAL SIGNAGE IS ALSO ENCOURAGED IN LOCATIONS WHERE DRIVERS' LINE OF SIGHT TO ADVANCE WARNING SIGNS IS OBSTRUCTED.

23. WHEN ARROW BOARDS ARE USED TO CLOSE MULTIPLE LANES, A SEPARATE ARROW BOARD SHALL BE USED FOR EACH CLOSED LANE.

    IF ARROW BOARDS ARE USED FOR SHOULDER WORK, BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, USE THE ARROW BOARDS ONLY IN THE CAUTION MODE.

24. RAISED PAVEMENT MARKERS MAY BE USED TO SUPPLEMENT TEMPORARY STRIPING DURING NON-SNOW PERIODS. THEIR USE IS ENCOURAGED ON HIGHER SPEED FACILITIES WHEN TRAFFIC IS BEING DIVERTED FROM ITS USUAL COURSE.

25. THE TYPICAL CASES DEPICTED IN THIS STANDARD REFLECT THE MINIMUM REQUIREMENTS, UNLESS AS OTHERWISE DIRECTED BY THE PROJECT PLANS AND SPECIFICATIONS, AND/OR THE PROJECT ENGINEER.

26. A SIGNIFICANT PROJECT IS DEFINED AS ONE THAT, ALONE OR IN COMBINATION WITH OTHER CONCURRENT PROJECTS NEARBY, IS ANTICIPATED TO CAUSE SUSTAINED WORK ZONE IMPACTS AT A LOCATION FOR THREE OR MORE CONSECUTIVE DAYS WITH EITHER INTERMITTENT OR CONTINUOUS LANE CLOSURES.

Sheet Revisions

	Date:	Comments
R-1	02/06/13	SHEET 13 - UPDATE TO 2009 MUTCD STD
R-2	02/26/13	SHEET 1 - UPDATE TO NOTE 1
R-3	02/27/13	SHEET 4 - UPDATE TAPER TO MUTCD STD
R-4	07/26/13	SHTS 9, 10, 15 & 20 - CORRECTED SIGN CODE DESIGNATION
R-5	**03/27/14**	SHTS 17 & 18 - UPDATED SIGNS AND TMA'S
R-6	**07/22/14**	SHEET 1 - UPDATE TO NOTE 20
R-7	**12/8/14**	SHEETS 17 TO 24 - ADDED AND RENUMBERED SHEET 22 - SIGN CODE UPDATE, W5-4D & W21-5a

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TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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CLOSURE OF HALF OF 4-LANE UNDIVIDED HIGHWAY	2	4
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LANE #2 CLOSURE, MULTI-LANE FREEWAY	6	6
LANE #3 CLOSURE, MULTI-LANE FREEWAY	7	
LANE #4 CLOSURE, MULTI-LANE FREEWAY	8	
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R-X		
R-X		

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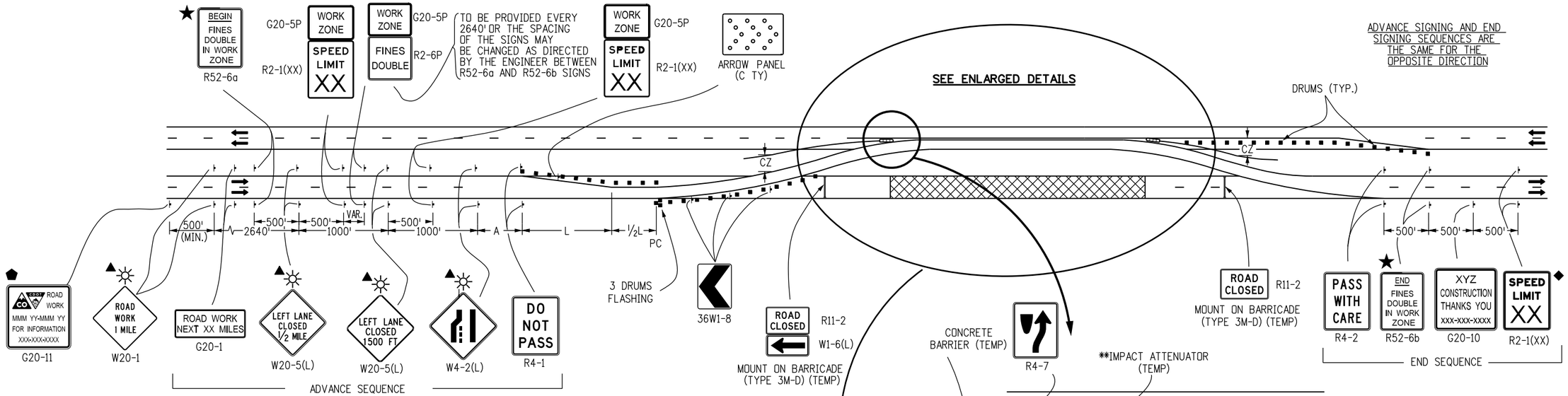
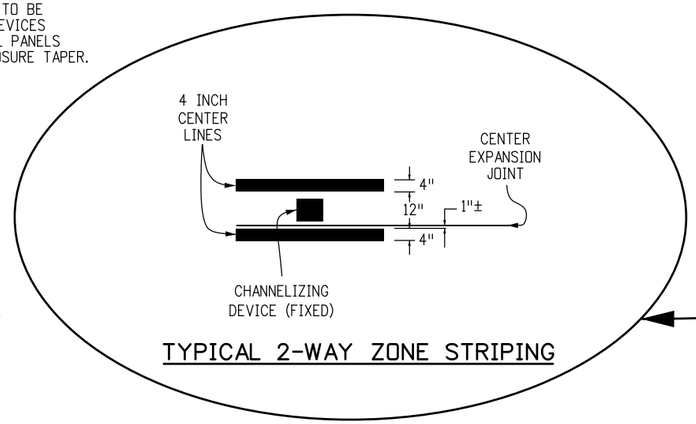


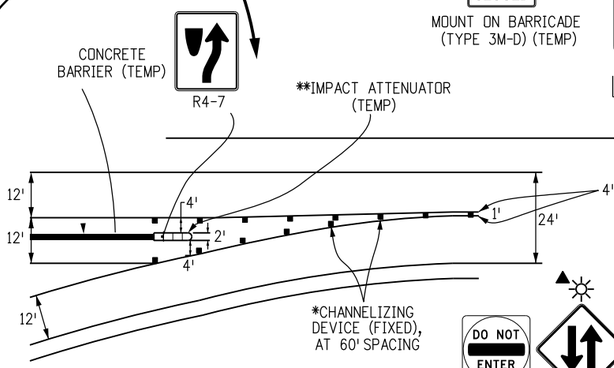
LEGEND

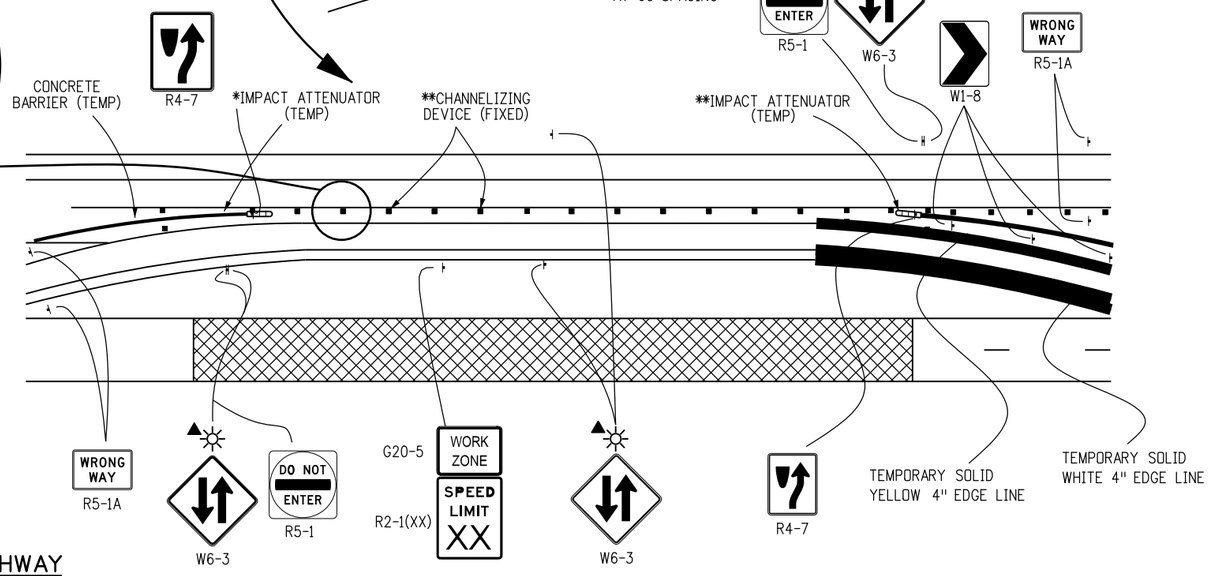
- ▪ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- A = 100' (URBAN LOW SPEED)
  - 350' (URBAN HIGH SPEED)
  - 500' (RURAL)
  - 1,000' (EXPRESSWAY / FREEWAY)
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- VAR. BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- IMPACT ATTENUATOR AS DETAILED ON THE PLANS
- FLASHING BEACON



TYPICAL 2-WAY ZONE STRIPING

- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- * THESE ITEMS ARE NOT REQUIRED WHEN CONTINUOUS CONCRETE BARRIER IS USED FOR CHANNELIZATION.
- ** SEE GENERAL NOTE 16 ON SHEET 1.
- ⬟ G20-11 SIGN IS REQUIRED IF SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.





CASE NO. 1
TYPICAL APPLICATION
CLOSURE OF ONE ROADWAY 4-LANE DIVIDED HIGHWAY

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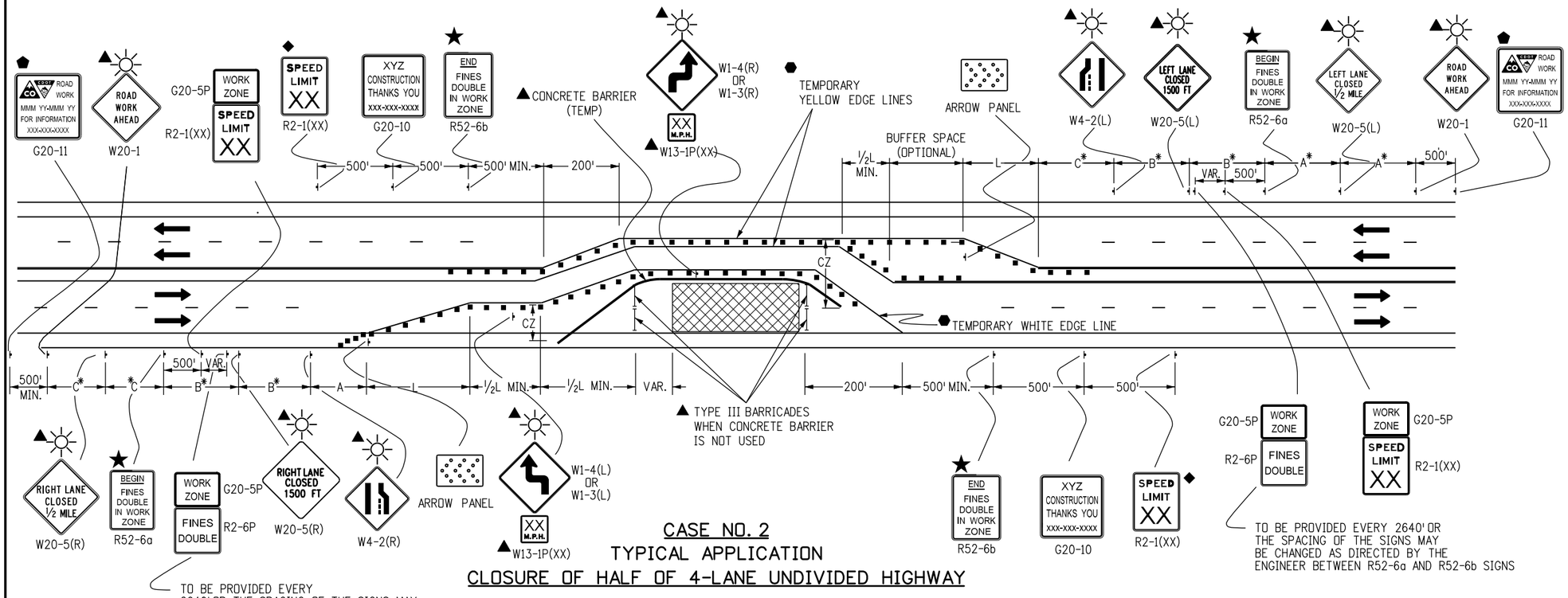
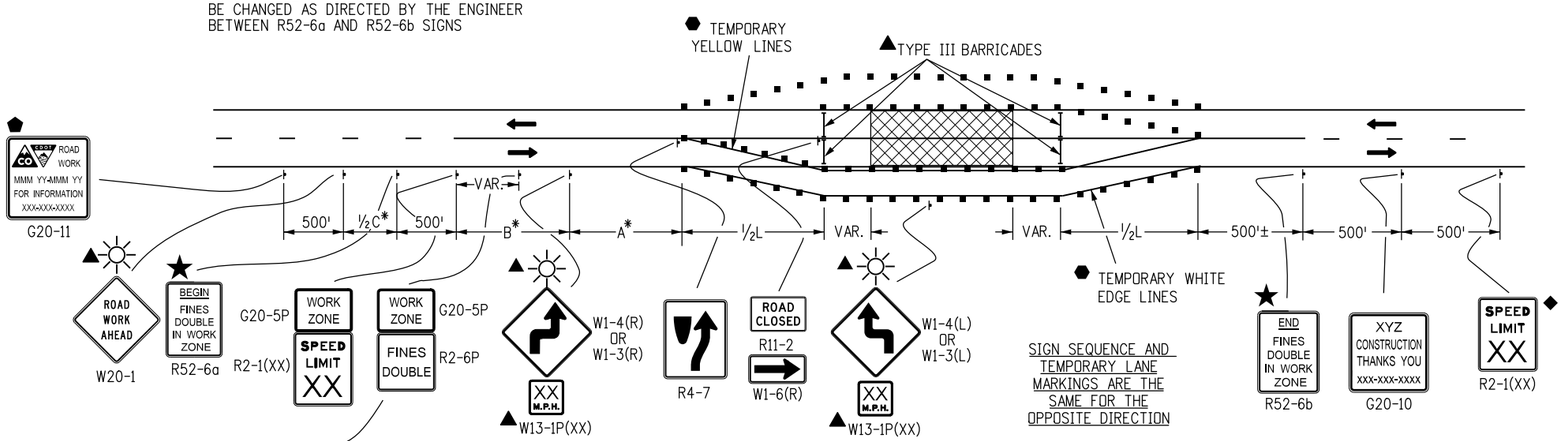


CASE NO. 2
TYPICAL APPLICATION
CLOSURE OF HALF OF 4-LANE UNDIVIDED HIGHWAY



CASE NO. 3
TYPICAL APPLICATION
ROAD CLOSURE, USE OF ADJACENT SHOULDERS

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L — TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
- A = 100' (URBAN LOW SPEED)
  350' (URBAN HIGH SPEED)
  500' (RURAL)
  1,000' (EXPRESSWAY / FREEWAY)
- CZ — CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1)
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- VAR. BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

* KEY TO ADVANCE SIGNING DISTANCES

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<=40 MPH)	100	100	100
URBAN (>=45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information	
Creation Date: 07/04/12	Initials: RRR
Last Modification Date: 02/27/13	Initials: KEN
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-630-01_4of24.dgn	
CAD Ver.: MicroStation V8 Scale: Not to Scale	Units: English

Sheet Revisions		
	Date:	Comments
R-3	02/27/13	UPDATE TAPER TO MUTCD STD
R-X		
R-X		
R-X		

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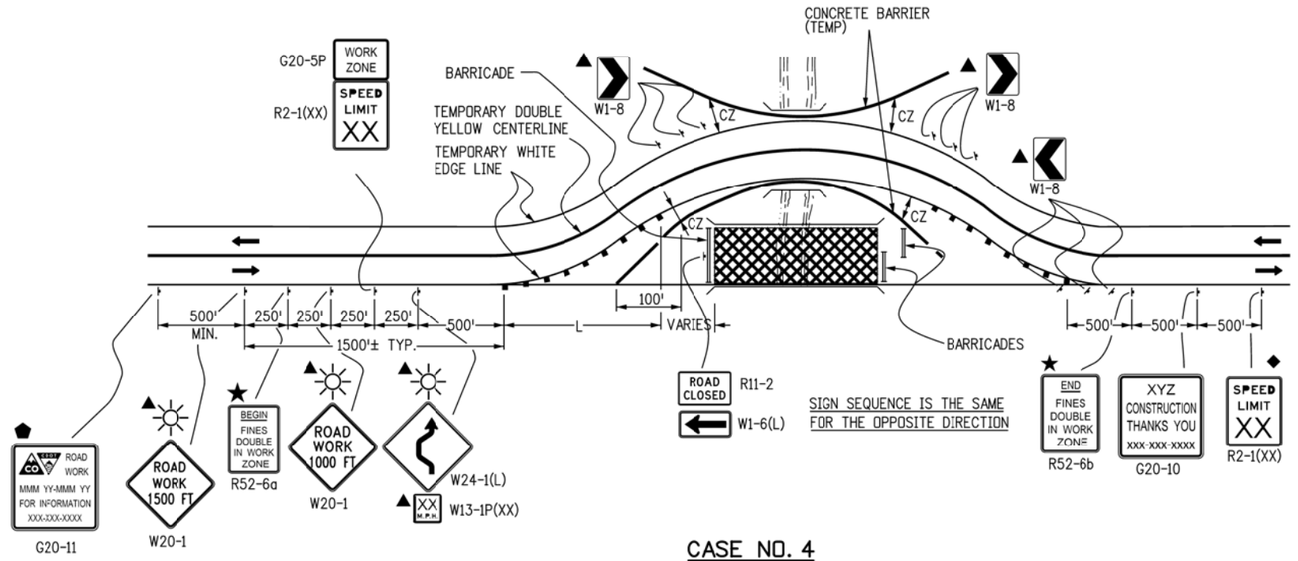
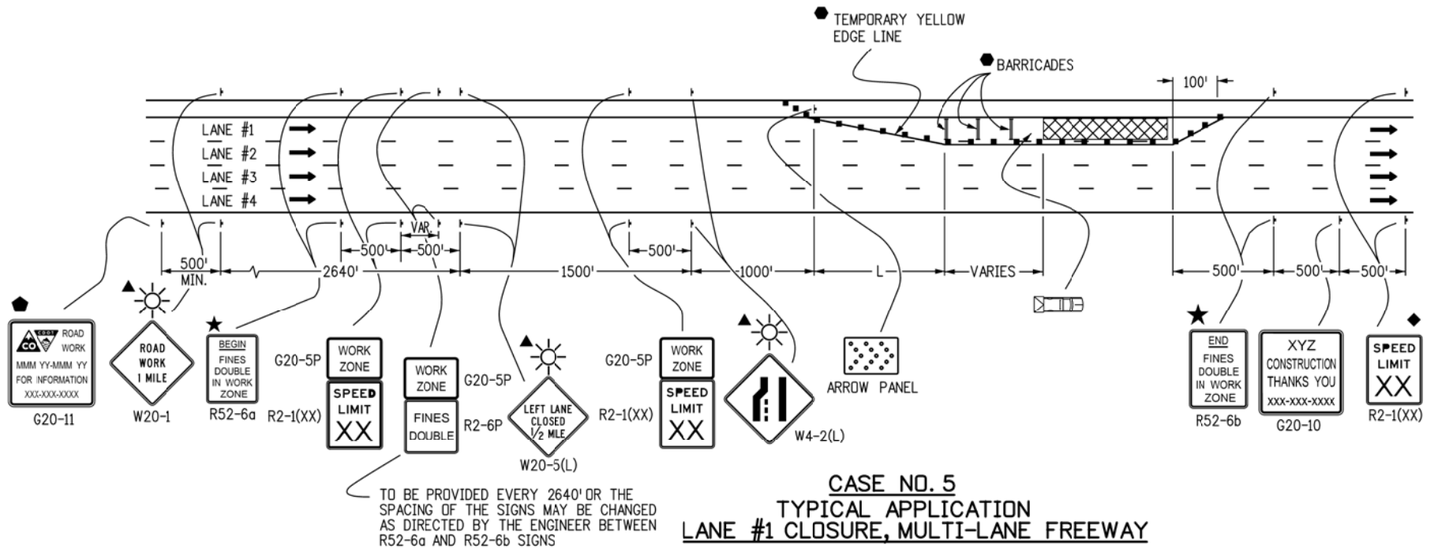


CASE NO. 4
TYPICAL APPLICATION
ROAD CLOSURE, BYPASS DETOUR PROVIDED



TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

CASE NO. 5
TYPICAL APPLICATION
LANE #1 CLOSURE, MULTI-LANE FREEWAY

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L — TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ — CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ — THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ — THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- VARIES — BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ⬟ — REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ — G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- MOBILE ATTENUATOR
- FLASHING BEACON
- ★ — SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: Initials:	R=X		
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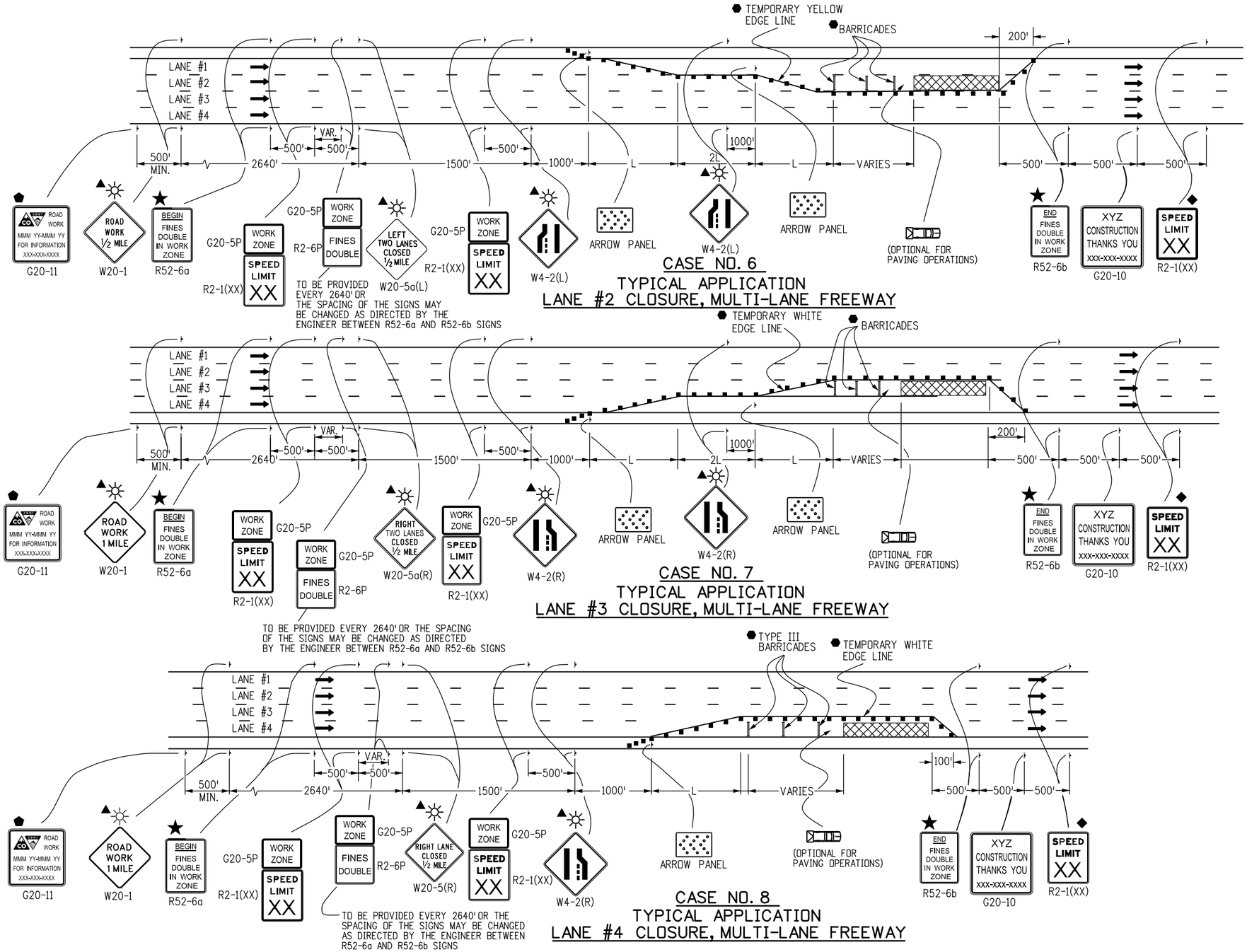

CASE NO. 6
TYPICAL APPLICATION
LANE #2 CLOSURE, MULTI-LANE FREEWAY

CASE NO. 7
TYPICAL APPLICATION
LANE #3 CLOSURE, MULTI-LANE FREEWAY

CASE NO. 8
TYPICAL APPLICATION
LANE #4 CLOSURE, MULTI-LANE FREEWAY

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L — TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ — CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- VARIES — BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- MOBILE ATTENUATOR
- FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: Initials:	R-1	05/19/16	ADDED "OPTIONAL FOR PAVING OPERATIONS" CHANGED TMA TO "MOBILE ATTENUATOR"
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X		
Drawing File Name: S-630-01_6of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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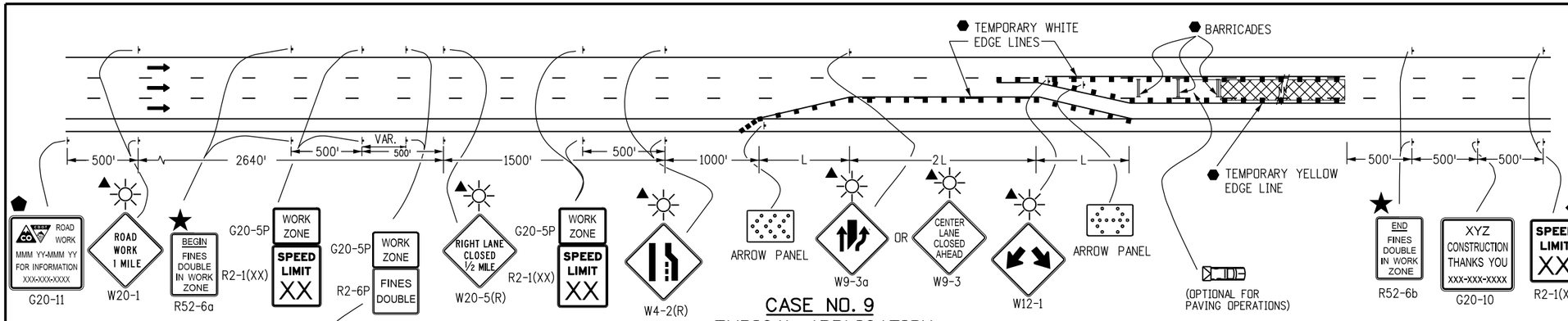
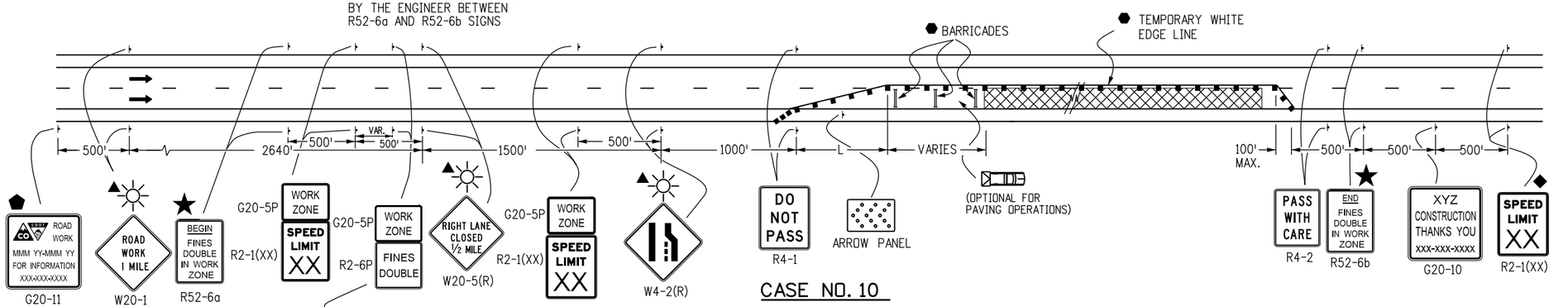


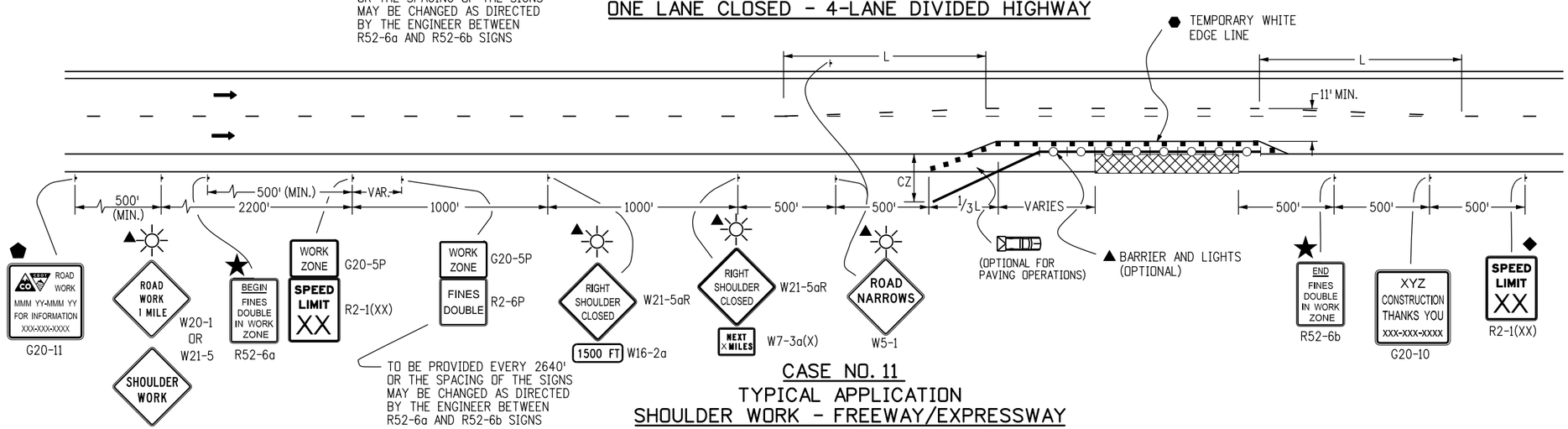
TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

CASE NO. 9
TYPICAL APPLICATION
CENTER LANE CLOSURE - MULTI-LANE FREEWAY



TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

CASE NO. 10
TYPICAL APPLICATION
ONE LANE CLOSED - 4-LANE DIVIDED HIGHWAY



TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

CASE NO. 11
TYPICAL APPLICATION
SHOULDER WORK - FREEWAY/EXPRESSWAY

LEGEND

- ■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA

L TRANSITION TAPER LENGTH:

L = MINIMUM LENGTH OF TAPER

SPEED 45 MPH OR MORE: $L = S \times W$

SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$

S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED

W = WIDTH OF OFFSET

SHOULDER TAPER = 1/3 L

- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- FLASHING BEACON
- VARIES BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- MOBILE ATTENUATOR
- CONCRETE BARRIER (TEMPORARY) WITH LIGHTS
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information	
Creation Date: 07/04/12	Initials: RRR
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
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CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions		
	Date:	Comments
R-1	05/19/16	ADDED "OPTIONAL FOR PAVING OPERATIONS" CHANGED TMA TO "MOBILE ATTENUATOR"
R-X		
R-X		
R-X		

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STANDARD PLAN NO.
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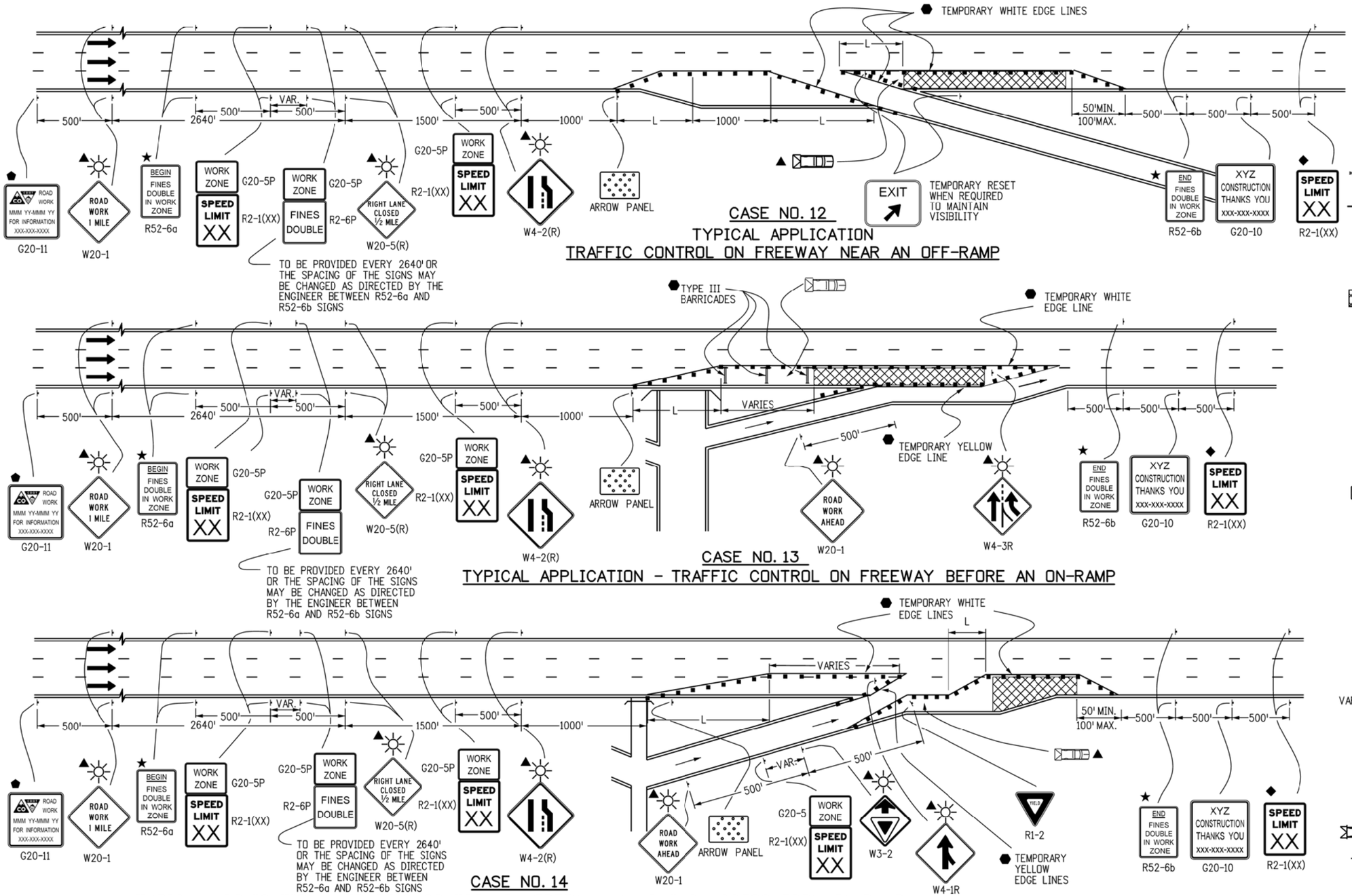

LEGEND

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- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
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  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
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- VARIES — BUFFER SPACE (SEE GENERAL NOTE 21).
- ⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- MOBILE ATTENUATOR
- FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information		Sheet Revisions	
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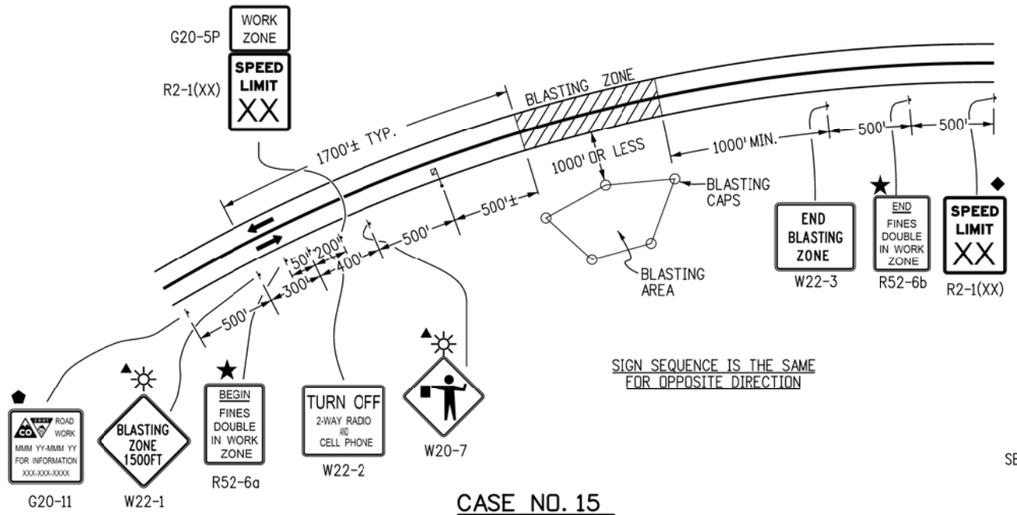
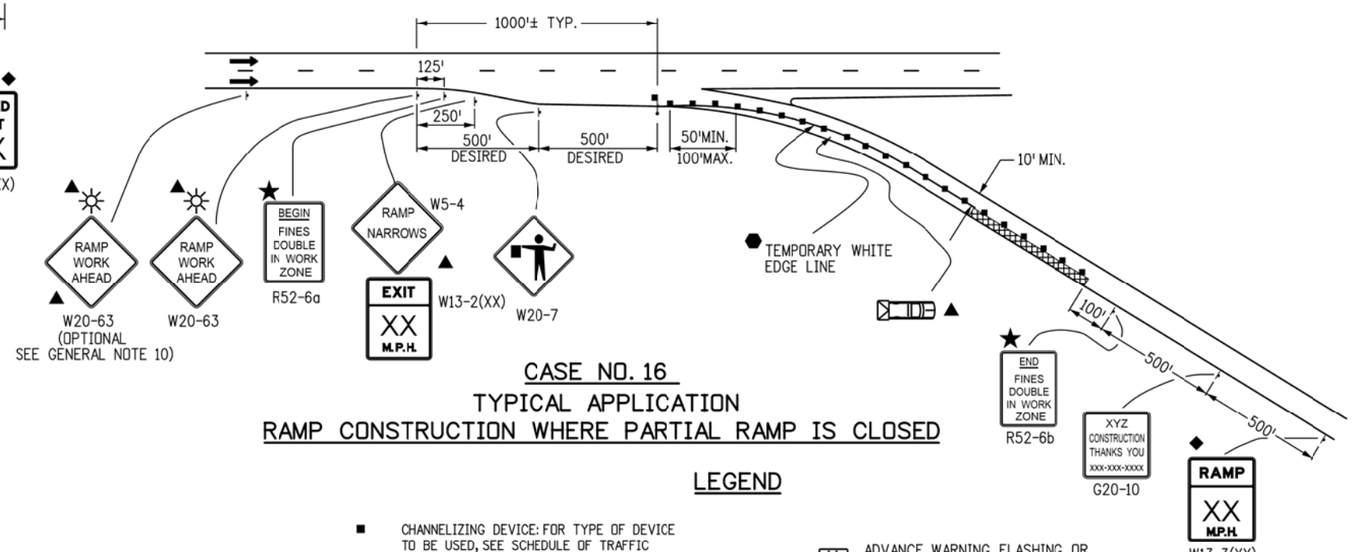
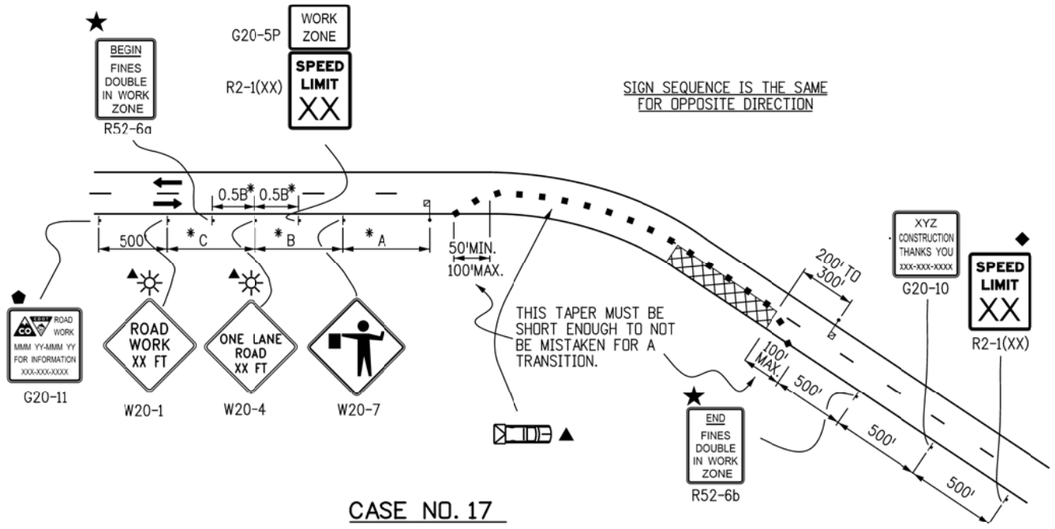


SIGN SEQUENCE IS THE SAME FOR OPPOSITE DIRECTION

CASE NO. 15
TYPICAL APPLICATION
BLASTING ZONE



CASE NO. 16
TYPICAL APPLICATION
RAMP CONSTRUCTION WHERE PARTIAL RAMP IS CLOSED



SIGN SEQUENCE IS THE SAME FOR OPPOSITE DIRECTION

CASE NO. 17
TYPICAL APPLICATION
LANE CLOSURE, 2-LANE HIGHWAY, AT CURVE

LEGEND

- ■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- MOBILE ATTENUATOR
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- FLASHING BEACON
- ● REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

*KEY TO ADVANCE SIGNING DISTANCES

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information		
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Last Modification Date: 07/26/13	Initials: KEN	R-4
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Sheet Revisions	
Date:	Comments
07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7

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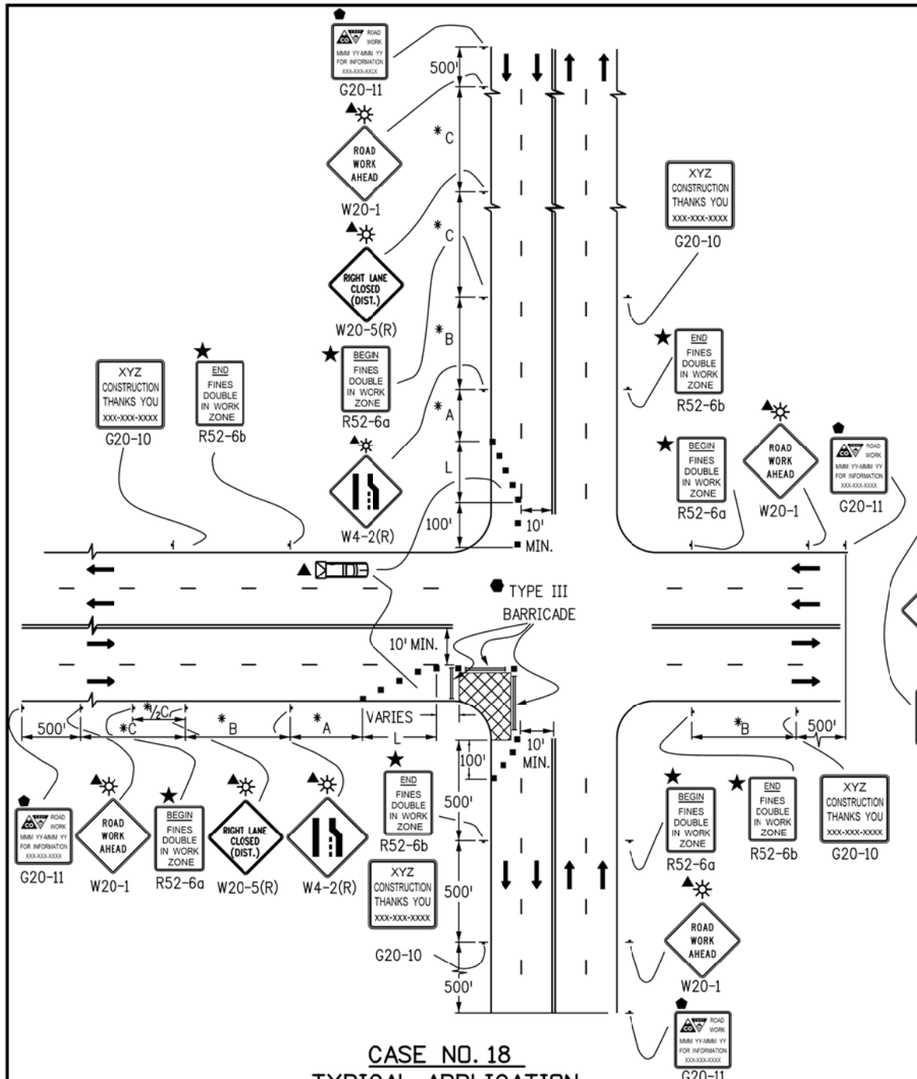
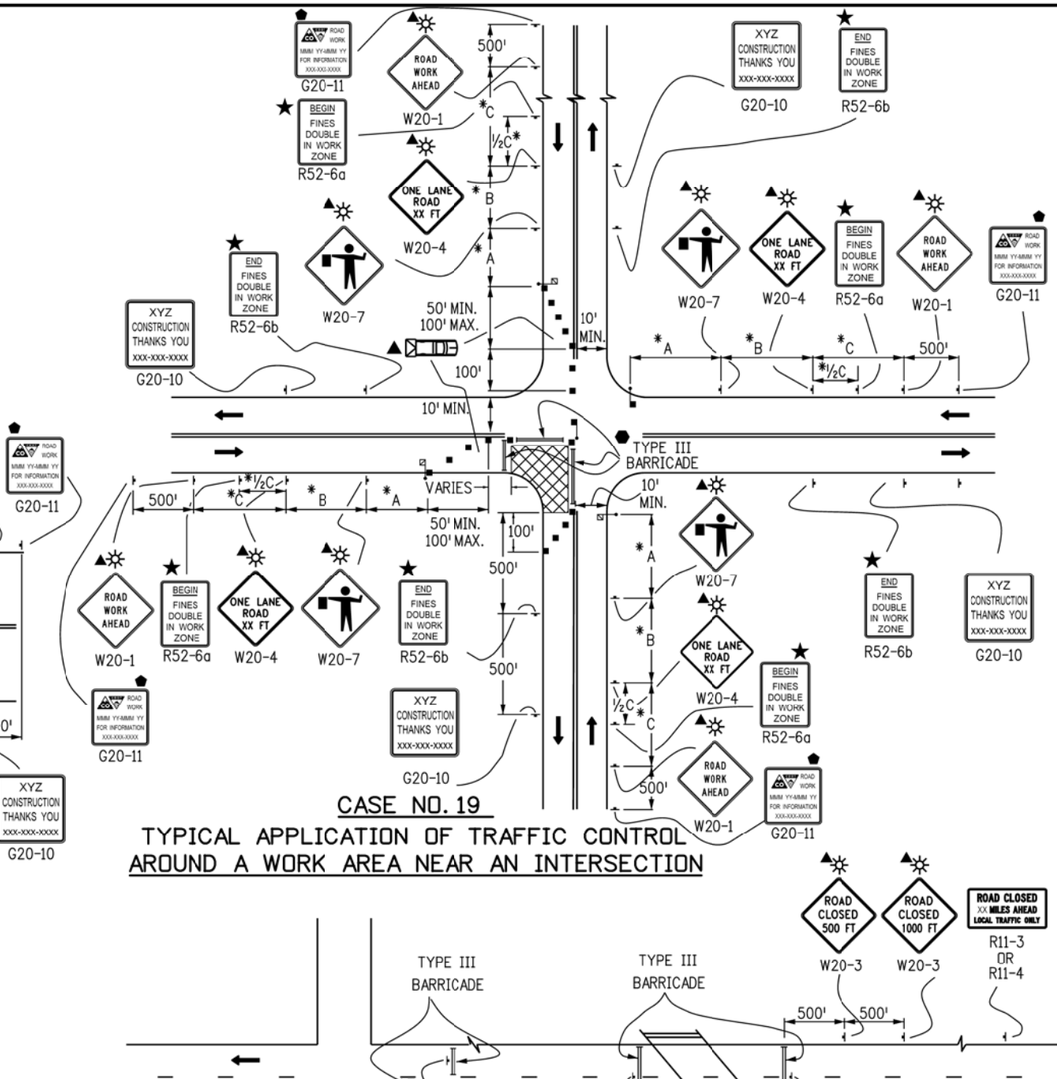


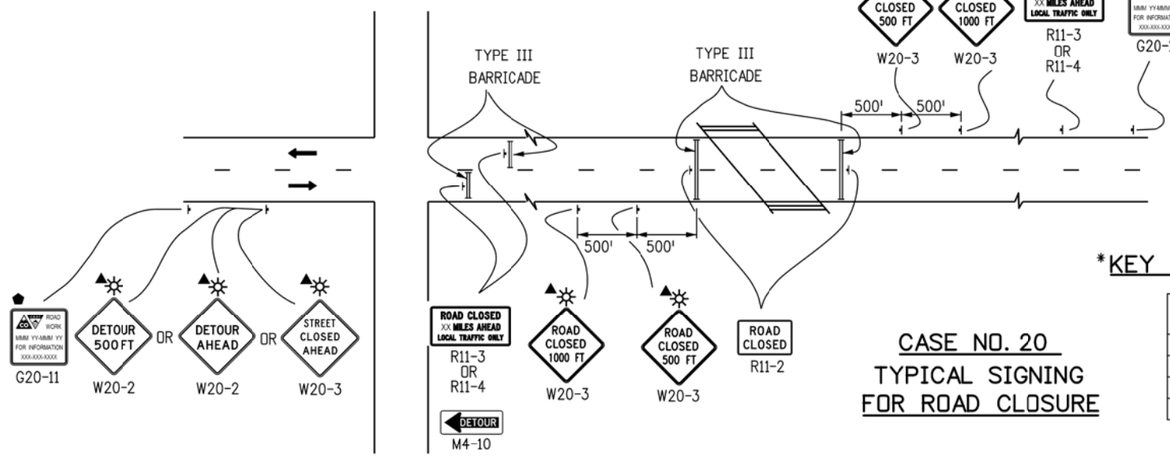
CASE NO. 18
TYPICAL APPLICATION TRAFFIC CONTROL AROUND A WORK AREA NEAR AN INTERSECTION, ONE LANE CLOSED



CASE NO. 19
TYPICAL APPLICATION OF TRAFFIC CONTROL AROUND A WORK AREA NEAR AN INTERSECTION

NOTES:

1. SIGN PLACEMENT SHOWN ON CASES 18 AND 19 TYPIFIES RURAL APPLICATIONS. URBAN APPLICATIONS REQUIRE THE SIGNS TO BE PLACED WITHIN ONE, OR PERHAPS TWO, BLOCKS.
2. TRUCK-MOUNTED ATTENUATORS (TMA) OPTIONAL FOR ALL CASES AS DETERMINED BY THE ENGINEER.



CASE NO. 20
TYPICAL SIGNING FOR ROAD CLOSURE

LEGEND

- ■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: L = S x W
  - SPEED 40 MPH OR LESS: L = $\frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- MOBILE ATTENUATOR
- CZ CLEAR ZONE (SEE GENERAL NOTE 16).
- FLASHING BEACON
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- VARIES BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ⬟ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

*KEY TO ADVANCE SIGNING DISTANCES

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
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EXPRESSWAY/FREEWAY	1000	1500	2640

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	Sheet Revisions	
	Date:	Comments
R-4	07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7
R-5	04/02/20	CORRECTED SIGN CODE DESIGNATION FOR ROAD WORK AHEAD SIGN TO W20-1
R-X		
R-X		

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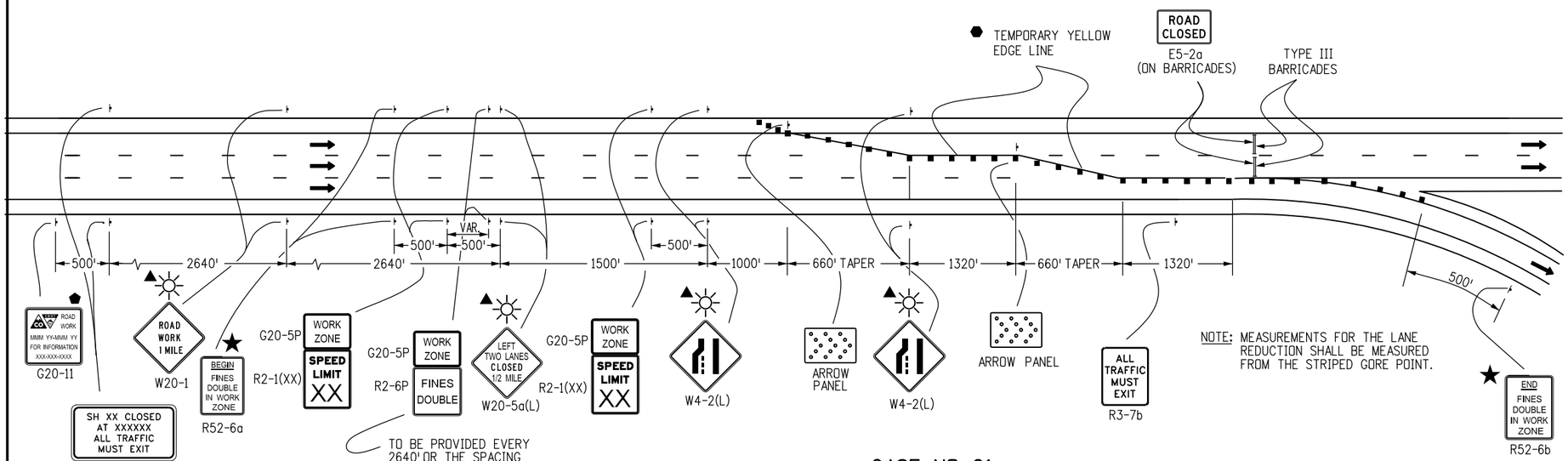
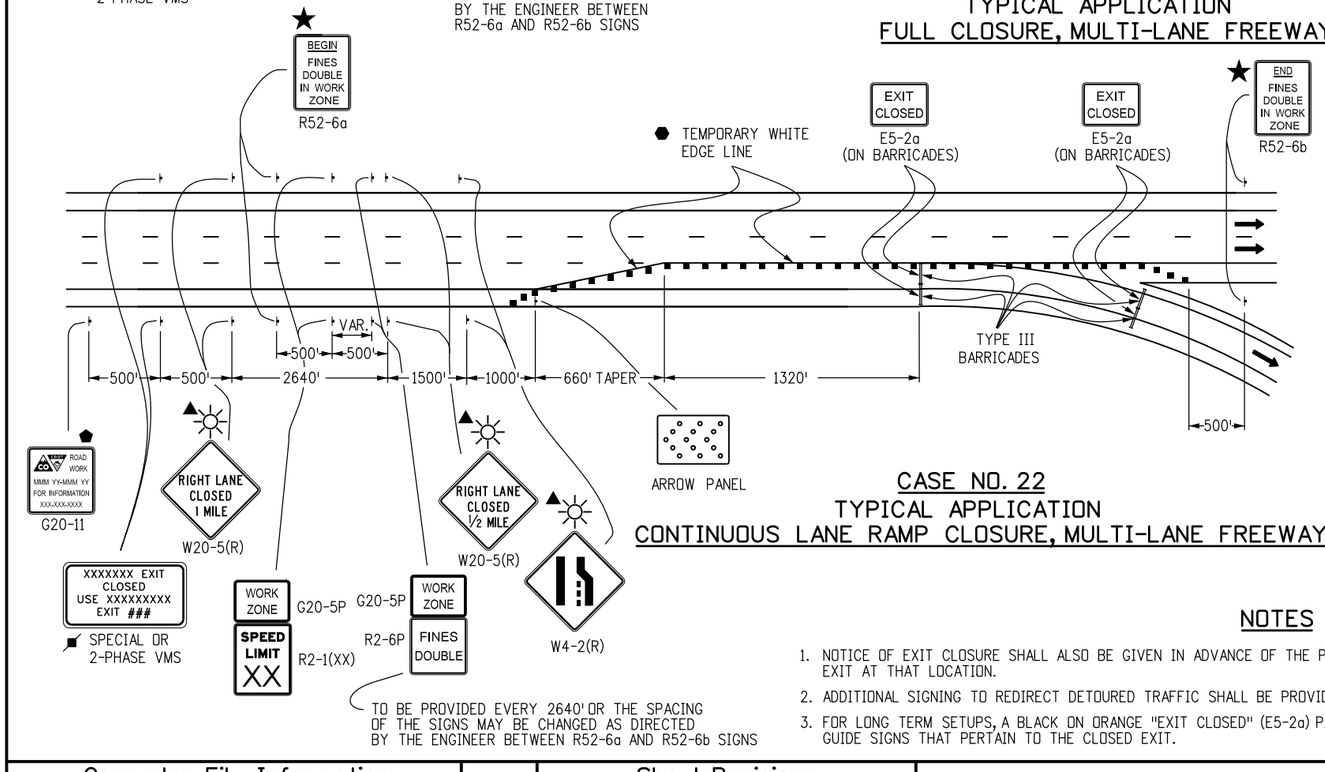
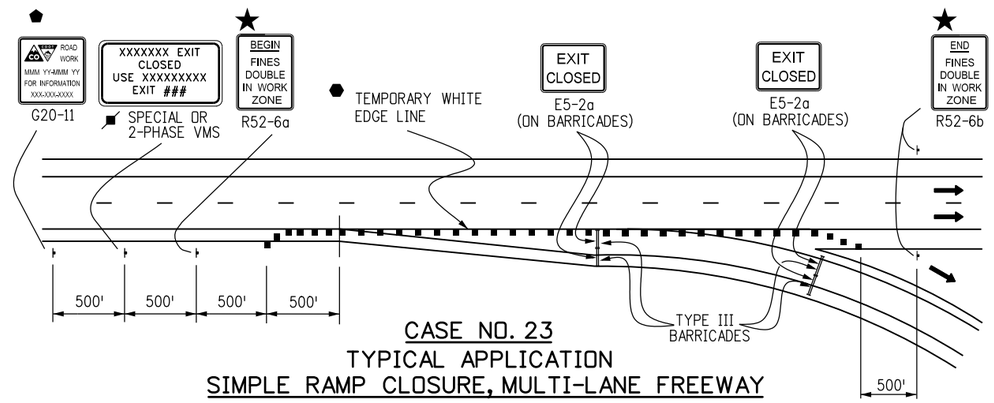


NOTE: MEASUREMENTS FOR THE LANE REDUCTION SHALL BE MEASURED FROM THE STRIPED GORE POINT.

CASE NO. 21
TYPICAL APPLICATION
FULL CLOSURE, MULTI-LANE FREEWAY



CASE NO. 22
TYPICAL APPLICATION
CONTINUOUS LANE RAMP CLOSURE, MULTI-LANE FREEWAY



CASE NO. 23
TYPICAL APPLICATION
SIMPLE RAMP CLOSURE, MULTI-LANE FREEWAY

LEGEND

- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED WILL BE DETERMINED BY THE DESIGNER BASED ON DETOUR DESIGN AND/OR SCOPE OF THE CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE PLANS.
- ⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- ■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- DIRECTION OF TRAVEL
- L TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- CLOSURE AND EXIT MESSAGES ON SIGN LEGEND(S) SHOULD BE MODIFIED TO FIT THE SITUATION.
- FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

NOTES

1. NOTICE OF EXIT CLOSURE SHALL ALSO BE GIVEN IN ADVANCE OF THE PREVIOUS EXIT TO PROVIDE MOTORISTS WITH THE OPTION TO EXIT AT THAT LOCATION.
2. ADDITIONAL SIGNING TO REDIRECT DETOURED TRAFFIC SHALL BE PROVIDED FOR IN THE PROJECT'S METHOD OF HANDLING TRAFFIC.
3. FOR LONG TERM SETUPS, A BLACK ON ORANGE "EXIT CLOSED" (E5-2a) PANEL SHALL BE MOUNTED DIAGONALLY ACROSS ALL EXISTING GUIDE SIGNS THAT PERTAIN TO THE CLOSED EXIT.

Computer File Information		Sheet Revisions	
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Last Modification Date: Initials:	R-X		
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Drawing File Name: S-630-01_11of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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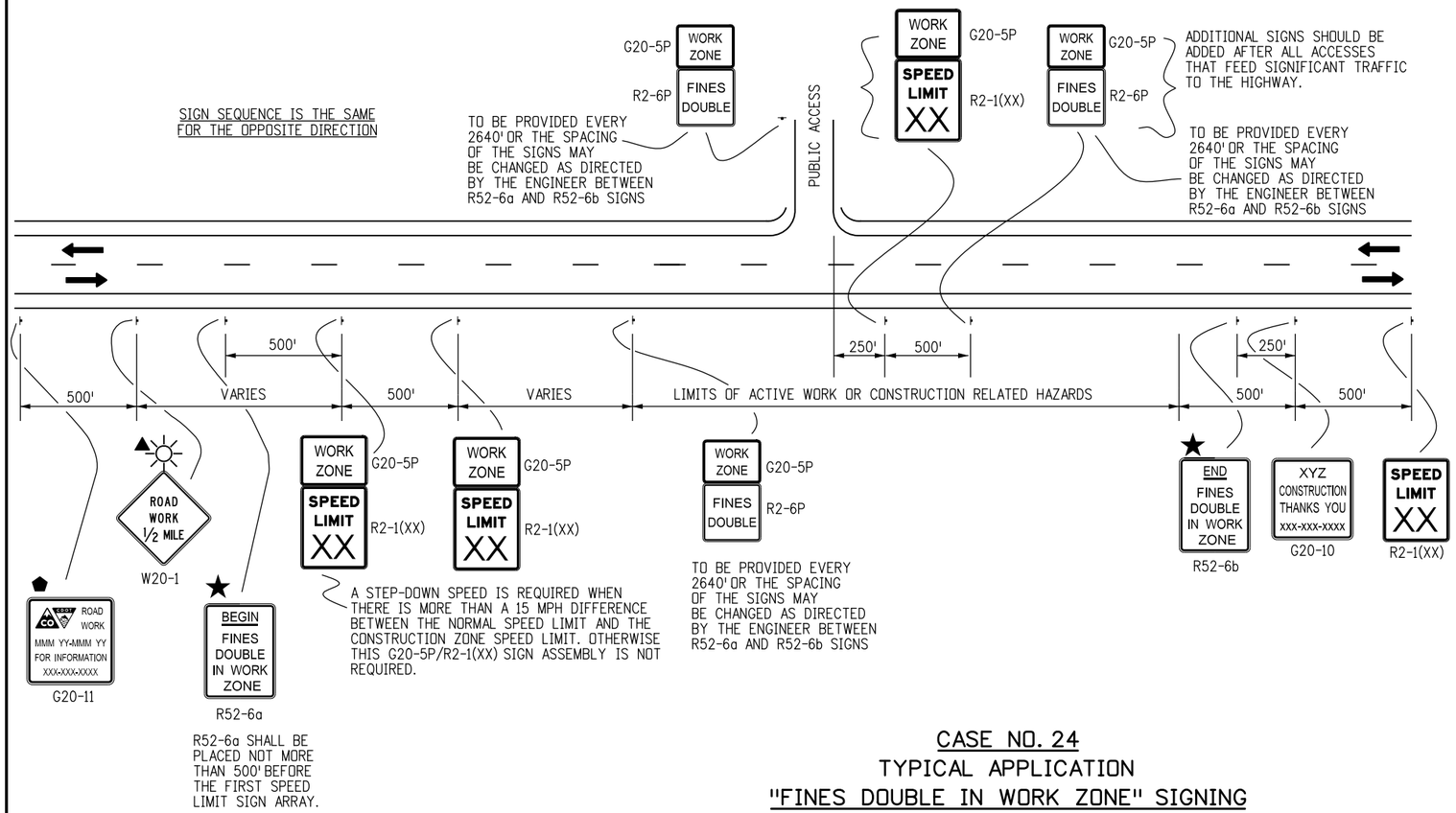

LEGEND

- DIRECTION OF TRAVEL
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED WILL BE DETERMINED BY THE DESIGNER BASED ON DETOUR DESIGN AND/OR SCOPE OF THE CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE PLANS.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- FLASHING BEACON
- ★ FINES DOUBLE SIGNING NOTES, SEE BELOW

FINES DOUBLE SIGNING NOTES:

1. SIGNS SHALL NOT BE PLACED SOONER THAN FOUR HOURS BEFORE WORK IS TO BEGIN AND SHALL BE REMOVED AS SOON AS WORK ACTIVITIES ARE CONCLUDED, UNLESS POTENTIAL HAZARDS INTRODUCED AS A RESULT OF THE WORK ARE STILL PRESENT AT THE END OF THE WORK DAY. IF SIGNS ARE LEFT IN PLACE AFTER WORK ACTIVITIES, THE TRAFFIC CONTROL SUPERVISOR SHALL MAKE AN ENTRY IN THEIR DAILY DIARY THAT JUSTIFIES THEIR USE.

   "HAZARDS" INCLUDE BUT ARE NOT LIMITED TO:
   - EDGE DROP OFFS
   - EQUIPMENT, WORKERS OR NON-SHIELDED OBJECTS IN THE CLEAR ZONE
   - ROUGH PAVEMENT
   - MAJOR CHANGE IN ALIGNMENT
   - REDUCED SHOULDER WIDTH
   - TEMPORARY GUARD RAIL OR BARRIER
   - LANE CLOSURE

2. SIGNS SHALL ONLY BE PLACED WHERE WORKERS ARE PRESENT IN THE ROADWAY OR CLEAR ZONE OR ARE AT RISK, OR WHERE THERE ARE HAZARDS IN THE TRAVELWAY, SHOULDERS OR CLEAR ZONE.

3. SIGNS SHOULD BE PLACED SO THAT MOTORISTS IMMEDIATELY ASSOCIATE THE SIGNS WITH PRESENT WORK ACTIVITIES. IF THE ZONE OF WORK ACTIVITY MOVES, THE SIGNS SHOULD BE MOVED ACCORDINGLY.

4. SIGNING SHOWN IS REQUIRED TO ENFORCE DOUBLE FINES IN A WORK ZONE. ADDITIONAL SIGNING SHALL BE IN ACCORDANCE WITH THAT NORMALLY REQUIRED FOR THE PARTICULAR WORK ZONE. PLACEMENT OF "FINES DOUBLE" SIGNING MAY BE ADJUSTED AS NEEDED TO PROVIDE A MINIMUM 250' SPACING BETWEEN OTHER SIGNING REQUIRED FOR THE SPECIFIC WORK ZONE SETUP.

CASE NO. 24
TYPICAL APPLICATION
"FINES DOUBLE IN WORK ZONE" SIGNING
(WITH SPEED REDUCTION)

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: Initials:	R-X		
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X		
Drawing File Name: S-630-01_12of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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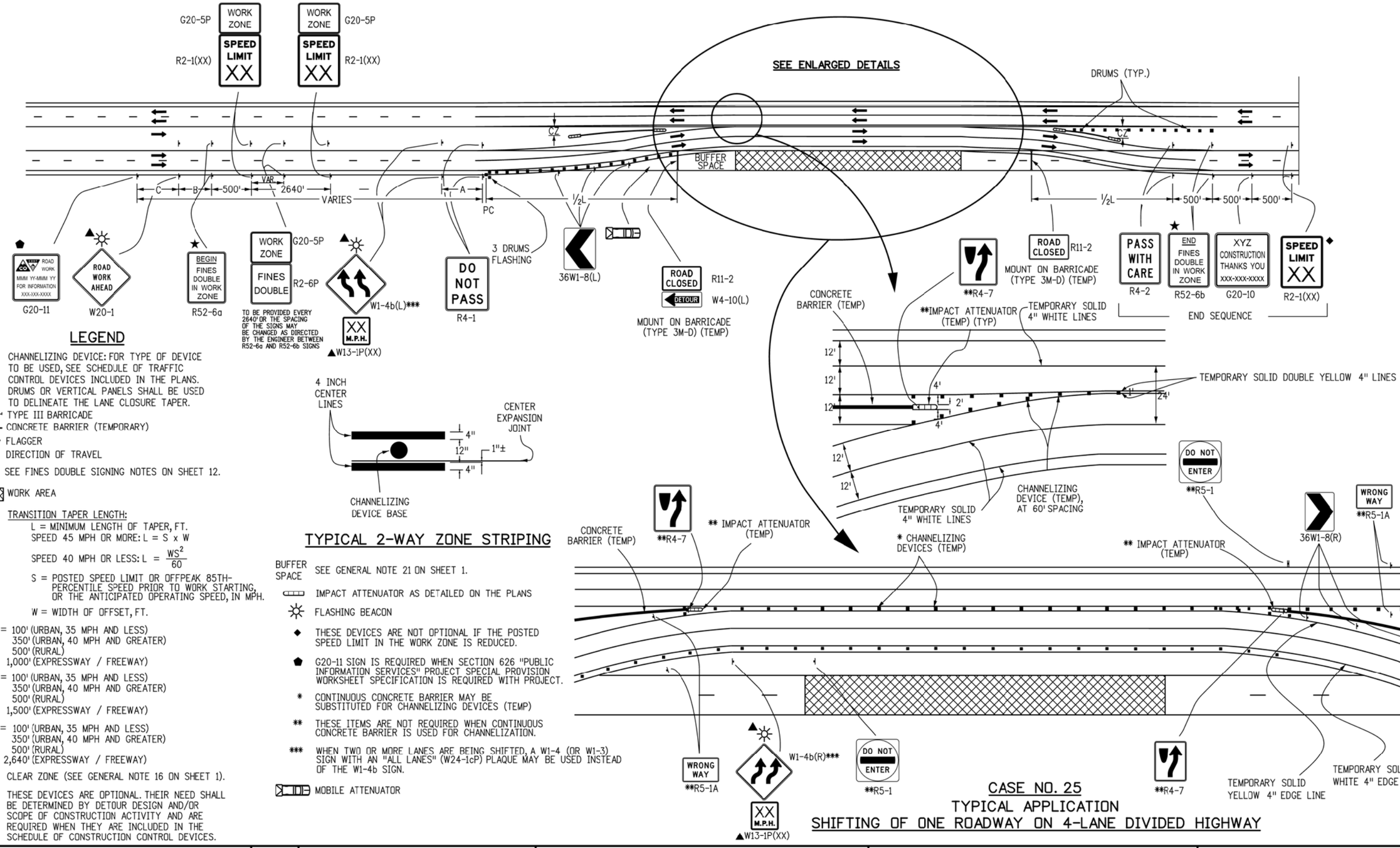

LEGEND

- ▪ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
- WORK AREA

L TRANSITION TAPER LENGTH:

L = MINIMUM LENGTH OF TAPER, FT.

SPEED 45 MPH OR MORE: $L = S \times W$

SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$

S = POSTED SPEED LIMIT OR OFFPEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED, IN MPH.

W = WIDTH OF OFFSET, FT.

A = 100' (URBAN, 35 MPH AND LESS)
350' (URBAN, 40 MPH AND GREATER)
500' (RURAL)
1,000' (EXPRESSWAY / FREEWAY)

B = 100' (URBAN, 35 MPH AND LESS)
350' (URBAN, 40 MPH AND GREATER)
500' (RURAL)
1,500' (EXPRESSWAY / FREEWAY)

C = 100' (URBAN, 35 MPH AND LESS)
350' (URBAN, 40 MPH AND GREATER)
500' (RURAL)
2,640' (EXPRESSWAY / FREEWAY)

CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).

▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.

TYPICAL 2-WAY ZONE STRIPING

BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.

IMPACT ATTENUATOR AS DETAILED ON THE PLANS

FLASHING BEACON

◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.

⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

* CONTINUOUS CONCRETE BARRIER MAY BE SUBSTITUTED FOR CHANNELIZING DEVICES (TEMP)

** THESE ITEMS ARE NOT REQUIRED WHEN CONTINUOUS CONCRETE BARRIER IS USED FOR CHANNELIZATION.

*** WHEN TWO OR MORE LANES ARE BEING SHIFTED, A W1-4 (OR W1-3) SIGN WITH AN "ALL LANES" (W24-1cP) PLAQUE MAY BE USED INSTEAD OF THE W1-4b SIGN.

MOBILE ATTENUATOR

CASE NO. 25
TYPICAL APPLICATION
SHIFTING OF ONE ROADWAY ON 4-LANE DIVIDED HIGHWAY

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: RRR	Date:	Comments
Last Modification Date: 02/06/13	Initials: KEN	02/06/13	UPDATE TO 2009 MUTCD STANDARD
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans			
Drawing File Name: S-630-01_13of24.dgn			
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

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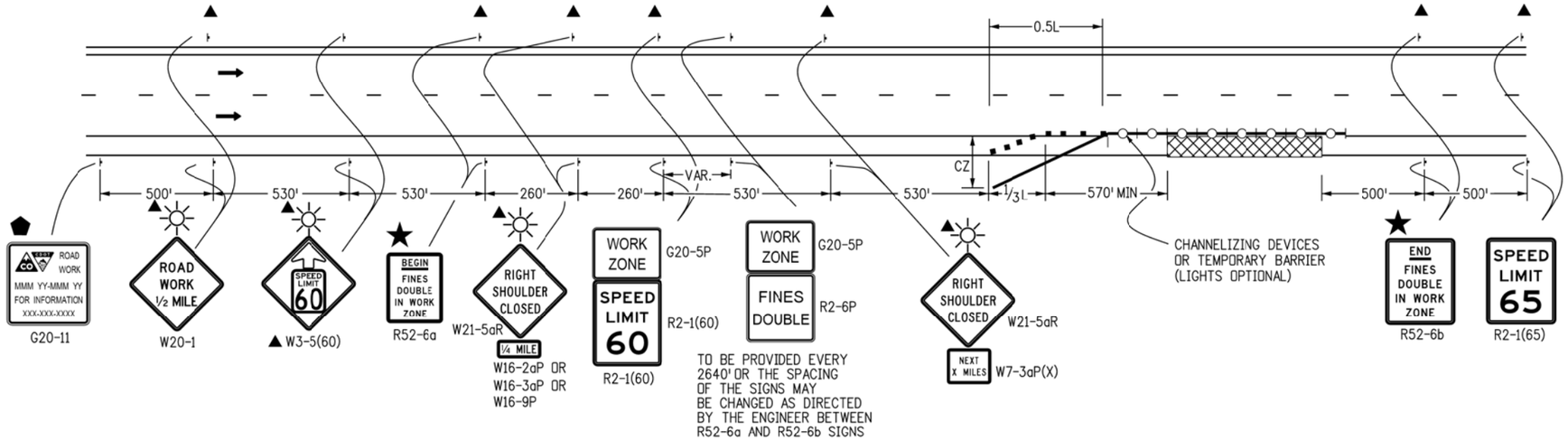
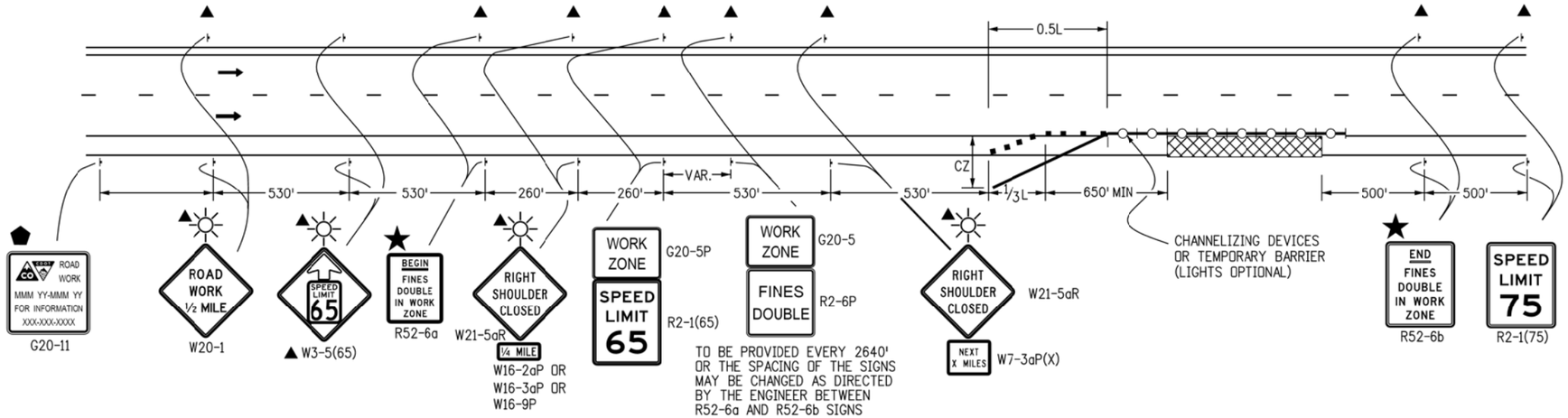


CASE NO. 26
TYPICAL APPLICATION
SHOULDER WORK - FREEWAY/EXPRESSWAY w/ 65 MPH SPEED LIMIT

WHEN HAZARDS (WORKERS, EQUIPMENT, OR TEMPORARY BARRIER) ARE WITHIN 8 FT OF TRAVEL WAY



CASE NO. 27
TYPICAL APPLICATION
SHOULDER WORK - FREEWAY/EXPRESSWAY w/ 75 MPH SPEED LIMIT

WHEN HAZARDS (WORKERS, EQUIPMENT, OR TEMPORARY BARRIER) ARE WITHIN 10 FT OF TRAVEL WAY

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- L — TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: L = S x W
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ — CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY TRAFFIC VOLUMES AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- MOBILE ATTENUATOR
- FLASHING BEACON
- SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: Initials:	R-X		
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X		
Drawing File Name: S-630-01_14of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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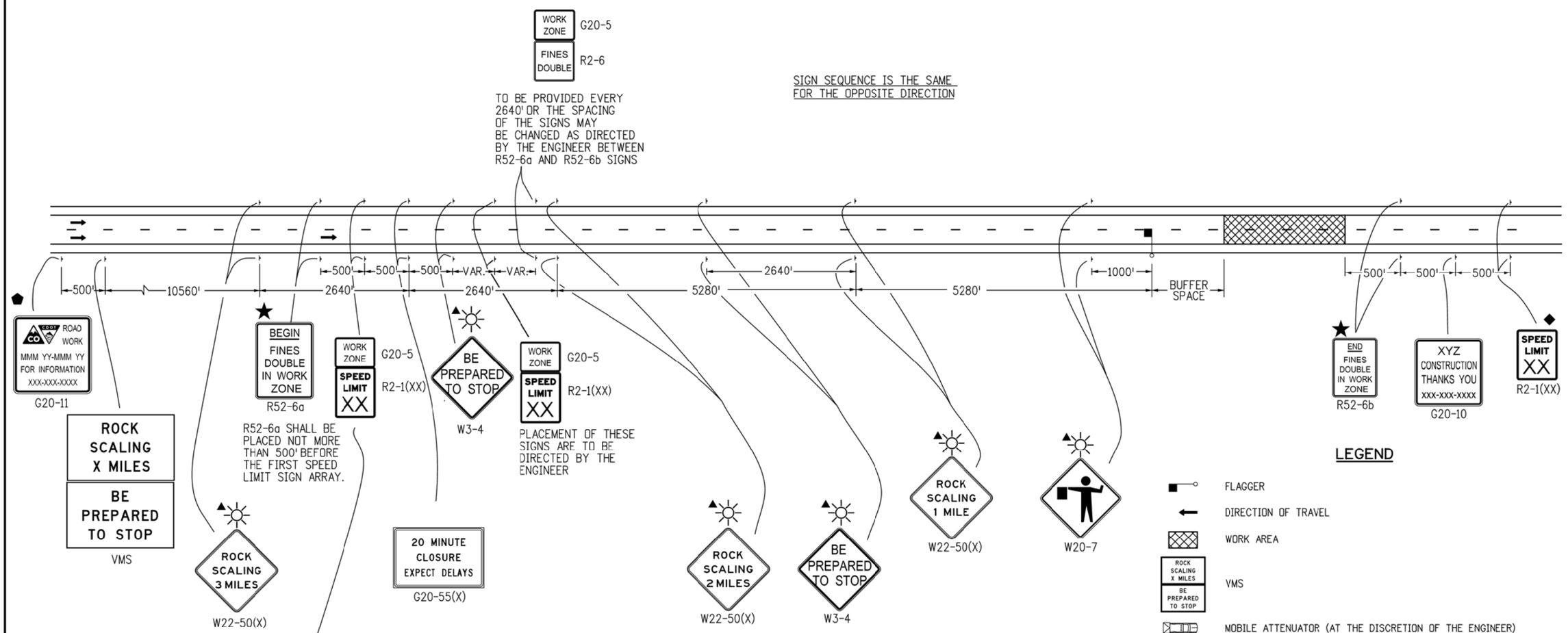

LEGEND

- FLAGGER
- DIRECTION OF TRAVEL
- WORK AREA
- ROCK SCALING X MILES / BE PREPARED TO STOP — VMS
- MOBILE ATTENUATOR (AT THE DISCRETION OF THE ENGINEER)
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- BUFFER SPACE — SEE GENERAL NOTE 21 ON SHEET 1.
- FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

CASE NO. 28
TYPICAL APPLICATION
ROCK SCALING - ROAD CLOSURE, 4-LANE DIVIDED HIGHWAY

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: 07/26/13 Initials: KEN	R-4	07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X		
Drawing File Name: S-630-01_15of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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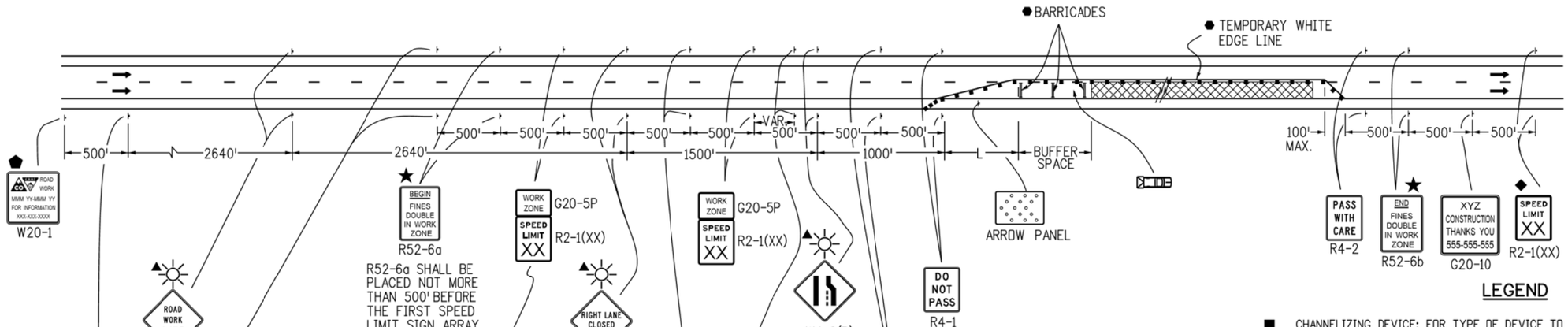

LEGEND

- ■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 26), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.
- TYPE III BARRICADE
- DIRECTION OF TRAVEL
- WORK AREA
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- FLASHING BEACON
- ● REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
- MOBILE ATTENUATOR
- L TRANSITION TAPER LENGTH:

  L = MINIMUM LENGTH OF TAPER

  SPEED 45 MPH OR MORE: $L = S \times W$

  SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$

  S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED

  W = WIDTH OF OFFSET

  SHOULDER TAPER = 1/3 L
- BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.

CASE NO. 29
TYPICAL APPLICATION
LATE MERGING - ONE LANE CLOSED, 4-LANE DIVIDED HIGHWAY

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: RRR		Date:	Comments
Last Modification Date: Initials:	R-1	06/23/16	IN LEGEND UNDER CHANNELIZING DEVICE UPDATED "NOTE 25" TO "NOTE 26"
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-X		
Drawing File Name: S-630-01_16of24.dgn	R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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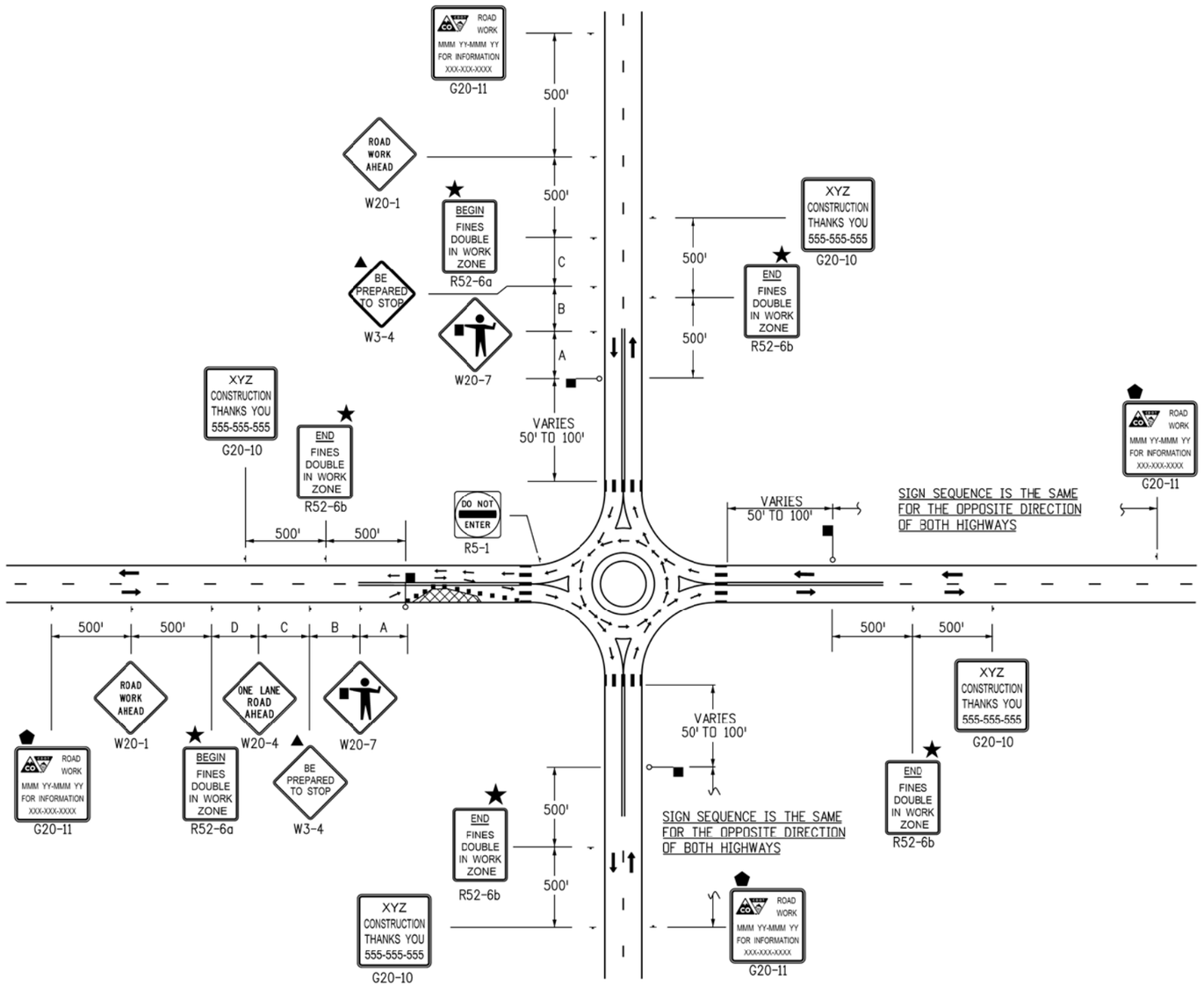

CASE NO. 30
TYPICAL APPLICATION
ROUNDABOUT - PARTIAL CLOSURE NEAR ONE-LANE ROUNDABOUT

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 26), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.
- TYPE III BARRICADE
- DIRECTION OF TRAVEL
- WORK AREA
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- ⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- FLASHING BEACON
- ⬟ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
- MOBILE ATTENUATOR
- L TRANSITION TAPER LENGTH:
  - L = MINIMUM LENGTH OF TAPER
  - SPEED 45 MPH OR MORE: $L = S \times W$
  - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
  - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
  - W = WIDTH OF OFFSET
  - SHOULDER TAPER = 1/3 L
- BUFFER SPACE — SEE GENERAL NOTE 21 ON SHEET 1.
- FLAGGER

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12	Initials: KEN		Date:	Comments
Last Modification Date: 12/08/14	Initials: KEN	R-7	12/08/14	NEW SHEET 17. OLD SHEET 17 NOW SHEET 21
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		R-2	06/23/16	IN LEGEND UNDER CHANNELIZING DEVICE UPDATED "NOTE 25" TO "NOTE 26"
Drawing File Name: S-630-01_17of24.dgn		R-X		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		R-X		

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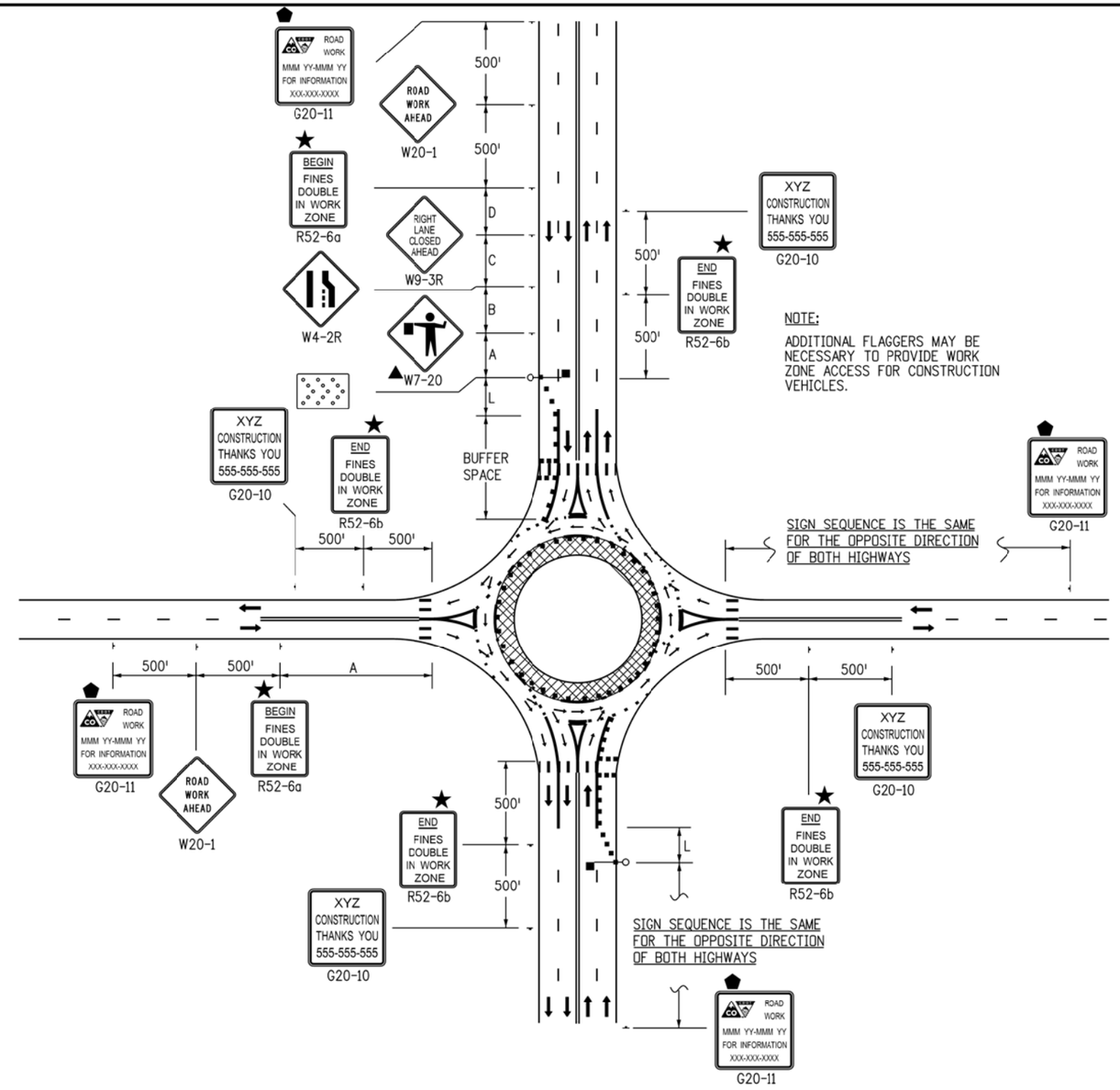

CASE NO. 31

TYPICAL APPLICATION *

ROUNDABOUT - INSIDE LANE CLOSURE FOR TWO-LANE ROUNDABOUT

LEGEND

* A TRUCK DETOUR ROUTE MAY BE NECESSARY TO DIVERT TRUCKS AWAY FROM THE ROUNDABOUT CIRCLE. ALSO NECESSARY IS A STREET NAME AND/OR ROUTE NUMBER SIGN, INFORMING MOTORISTS WHERE THEY NEED TO EXIT THE ROUNDABOUT CIRCLE TO ENTER THE DESIRED STREET AND/OR ROUTE NUMBER.

■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 26), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.

TYPE III BARRICADE

DIRECTION OF TRAVEL

WORK AREA

ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.

▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.

◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.

⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

FLASHING BEACON

⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.

★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

MOBILE ATTENUATOR

L TRANSITION TAPER LENGTH:

L = MINIMUM LENGTH OF TAPER

SPEED 45 MPH OR MORE: $L = \frac{WS^2}{60}$

SPEED 40 MPH OR LESS: $L = \frac{WS^2}{2}$

S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED

W = WIDTH OF OFFSET

SHOULDER TAPER = 1/3 L

BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.

FLAGGER

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information		
Creation Date: 07/04/12	Initials: KEN	
Last Modification Date: 12/08/14	Initials: KEN	R-7
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		R-8
Drawing File Name: S-630-01_18of24.dgn		R-X
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		R-X

Sheet Revisions	
Date:	Comments
12/08/14	NEW SHEET 18. OLD SHEET 18 NOW SHEET 22
06/23/16	IN LEGEND UNDER CHANNELIZING DEVICE UPDATED "NOTE 25" TO "NOTE 26"

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TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

Issued By: Safety & Traffic Engineering Branch July 4, 2012

STANDARD PLAN NO.

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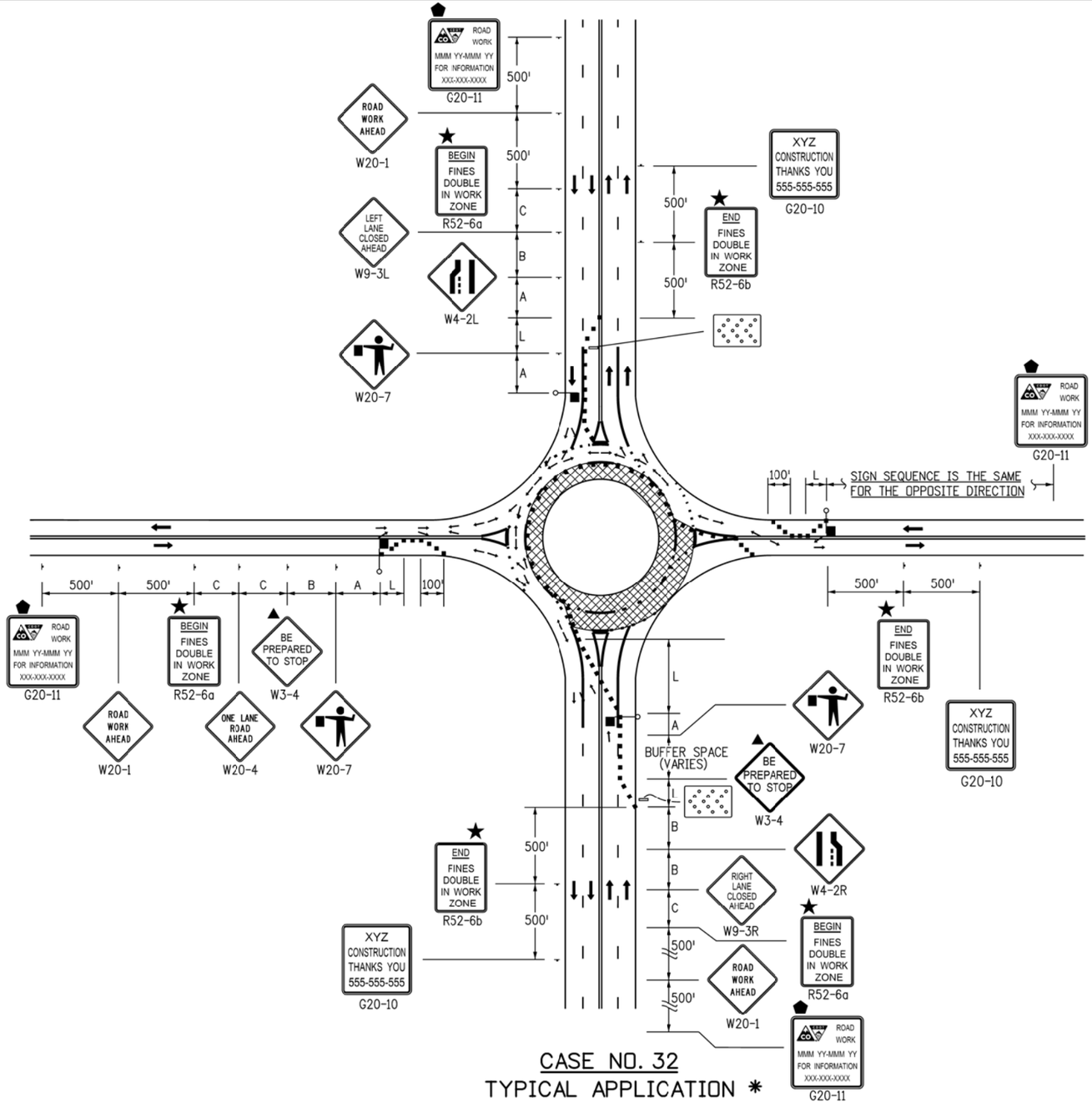

CASE NO. 32

TYPICAL APPLICATION *

ROUNDABOUT - OUTSIDE LANE CLOSURE FOR TWO-LANE ROUNDABOUT

LEGEND

* A TRUCK DETOUR ROUTE MAY BE NECESSARY TO DIVERT TRUCKS AWAY FROM THE ROUNDABOUT CIRCLE. ALSO NECESSARY IS A STREET NAME AND/OR ROUTE NUMBER SIGN, INFORMING MOTORISTS WHERE THEY NEED TO EXIT THE ROUNDABOUT CIRCLE TO ENTER THE DESIRED STREET AND/OR ROUTE NUMBER.

■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 26), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.

TYPE III BARRICADE

DIRECTION OF TRAVEL

WORK AREA

ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.

▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.

◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.

⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

FLASHING BEACON

⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.

★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

MOBILE ATTENUATOR

L TRANSITION TAPER LENGTH: =

L = MINIMUM LENGTH OF TAPER $\frac{WS^2}{60}$

SPEED 45 MPH OR MORE: L = S x W

SPEED 40 MPH OR LESS: L

S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED

W = WIDTH OF OFFSET

SHOULDER TAPER = 1/3 L

BUFFER SPACE — SEE GENERAL NOTE 21 ON SHEET 1.

FLAGGER

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information		
Creation Date: 07/04/12	Initials: KEN	
Last Modification Date: 12/08/14	Initials: KEN	(R-7)
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		(R-8)
Drawing File Name: S-630-01_19of24.dgn		(R-X)
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		(R-X)

Sheet Revisions	
Date:	Comments
12/08/14	NEW SHEET 19. OLD SHEET 19 NOW SHEET 23
06/23/16	IN LEGEND UNDER CHANNELIZING DEVICE UPDATED "NOTE 25" TO "NOTE 26"

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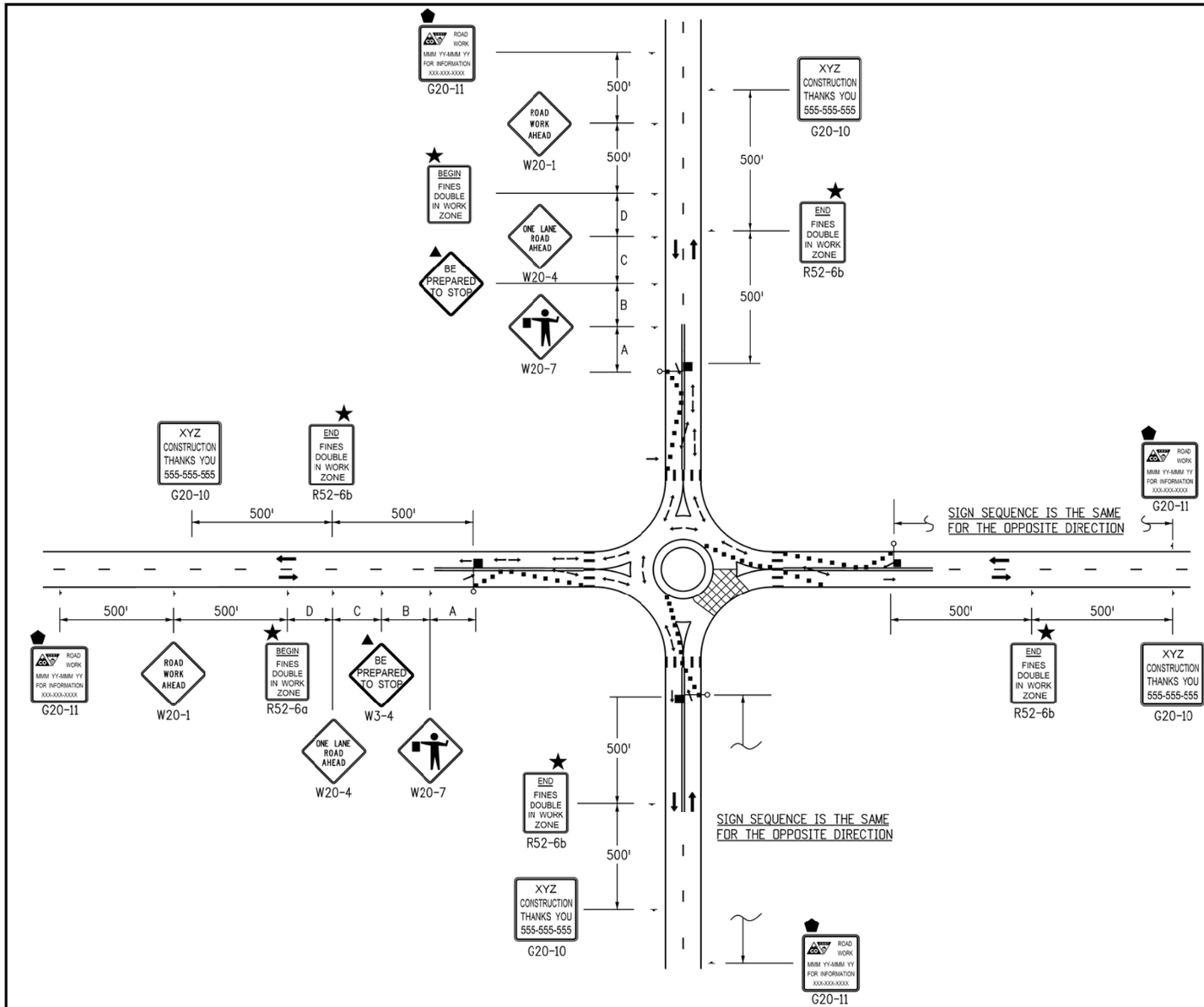

CASE NO. 33

TYPICAL APPLICATION *

ROUNDABOUT - PARTIAL CLOSURE FOR ONE-LANE ROUNDABOUT

LEGEND

* A TRUCK DETOUR ROUTE MAY BE NECESSARY TO DIVERT TRUCKS AWAY FROM THE ROUNDABOUT CIRCLE. ALSO NECESSARY IS A STREET NAME AND/OR ROUTE NUMBER SIGN, INFORMING MOTORISTS WHERE THEY NEED TO EXIT THE ROUNDABOUT CIRCLE TO ENTER THE DESIRED STREET AND/OR ROUTE NUMBER.

■ CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 26), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.

TYPE III BARRICADE

DIRECTION OF TRAVEL

WORK AREA

ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.

▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.

◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.

⬟ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

FLASHING BEACON

⬢ REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.

★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

MOBILE ATTENUATOR

L TRANSITION TAPER LENGTH: =

L = MINIMUM LENGTH OF TAPER

SPEED 45 MPH OR MORE: $L = \frac{WS^2}{60}$

SPEED 40 MPH OR LESS: $L = \frac{WS}{60}$

S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED

W = WIDTH OF OFFSET

SHOULDER TAPER = 1/3 L

BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.

FLAGGER

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date: 12/08/14	Initials: KEN
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-630-01_20of24.dgn	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	

	Sheet Revisions	
	Date:	Comments
R-7	12/08/14	NEW SHEET 20. OLD SHEET 20 NOW SHEET 24
R-8	**06/23/16**	IN LEGEND UNDER CHANNELIZING DEVICE UPDATED "NOTE 25" TO "NOTE 26"
R-X		
R-X		

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LEGEND

MOBILE ATTENUATOR VEHICLE, TWO 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.

VMS — VARIABLE MESSAGE SIGN (VMS).

▲ WHEN VMS IS USED, THE "SHOULDER CLOSED" SIGN BECOMES OPTIONAL.

■ THE "PICK-UP VEHICLES" OR "WARNING VEHICLE" MAY ENCROACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.

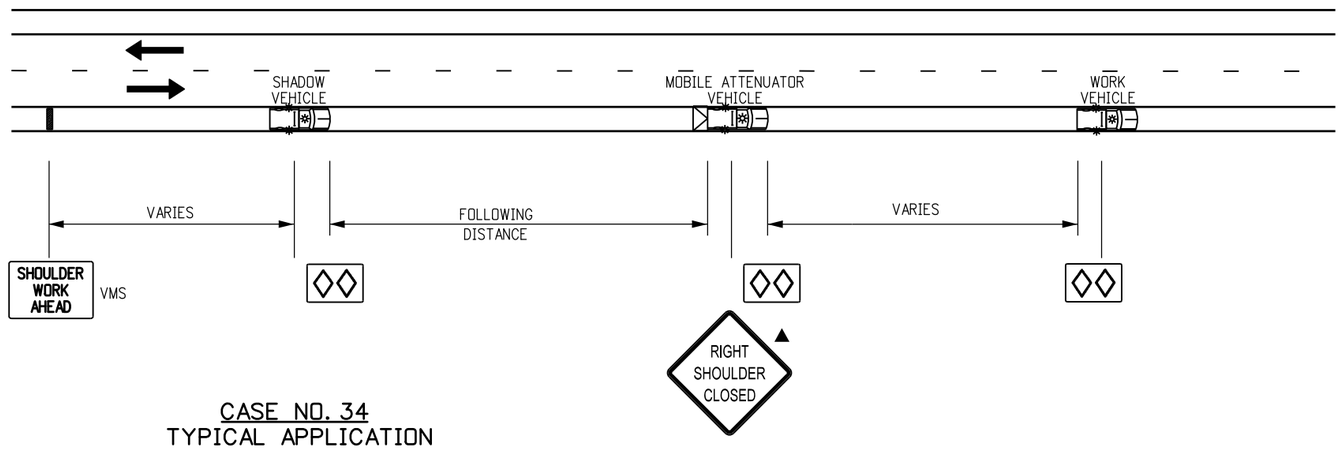
● IF TRACKING OF THE WET PAINT IS ANTICIPATED, THE USE OF CONES OR STATIONARY "WET PAINT" SIGNS SHALL BE POSTED.

⬢ THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.

⬬ OPTIONAL

FOLLOWING DISTANCE CHART FOR WARNING AND MOBILE ATTENUATOR (OR CONE PICKUP) VEHICLE

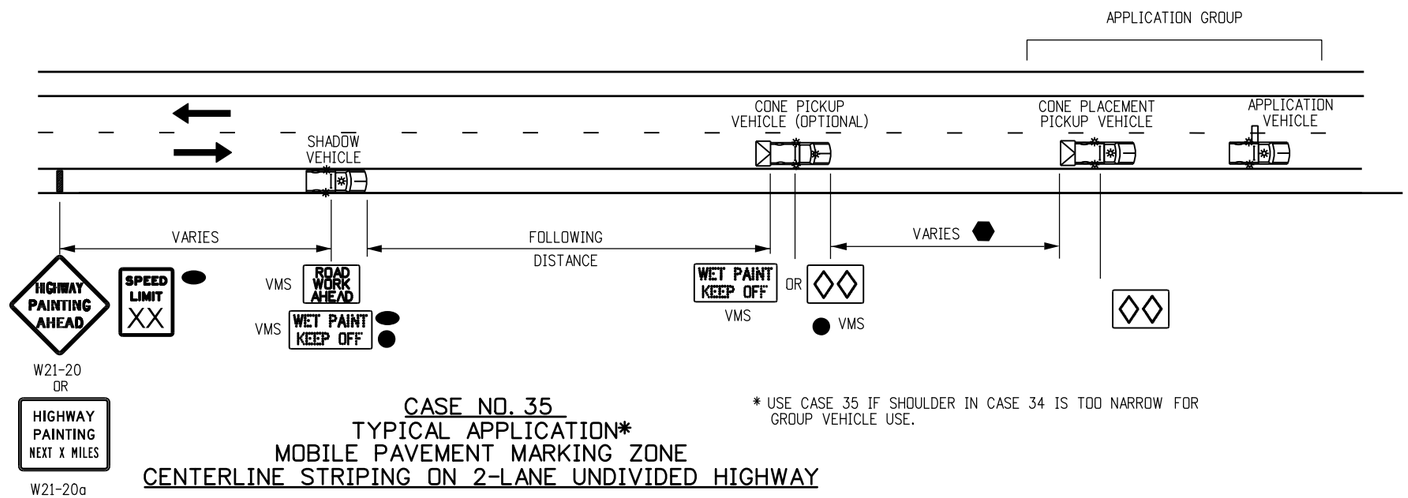
POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600



CASE NO. 34
TYPICAL APPLICATION
MOBILE WORK ZONE
MOBILE SHOULDER CLOSURE ON 2-LANE UNDIVIDED HIGHWAY

NOTE

THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.



CASE NO. 35
TYPICAL APPLICATION*
MOBILE PAVEMENT MARKING ZONE
CENTERLINE STRIPING ON 2-LANE UNDIVIDED HIGHWAY

* USE CASE 35 IF SHOULDER IN CASE 34 IS TOO NARROW FOR GROUP VEHICLE USE.

Computer File Information		
Creation Date: 07/04/12	Initials: KEN	
Last Modification Date: 03/16/2016	Initials: NNC	R-5
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		R-7
Drawing File Name: S-630-1_21of24.dgn		R-8
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		R-9

Sheet Revisions	
Date:	Comments
3/27/14	REDUCED NUMBER OF TMA VEHICLES, REVISE VMS AND ADD STATIONARY SIGNS
12/8/14	FORMERLY SHEET 17.
5/20/16	VEHICLE TITLE CHANGE, SIGN REMOVAL NOTE CHANGE FROM 31 TO 34
6/23/16	UPDATED NOTE ON BOTTOM RIGHT FROM 34 TO 35 AND 30 TO 34

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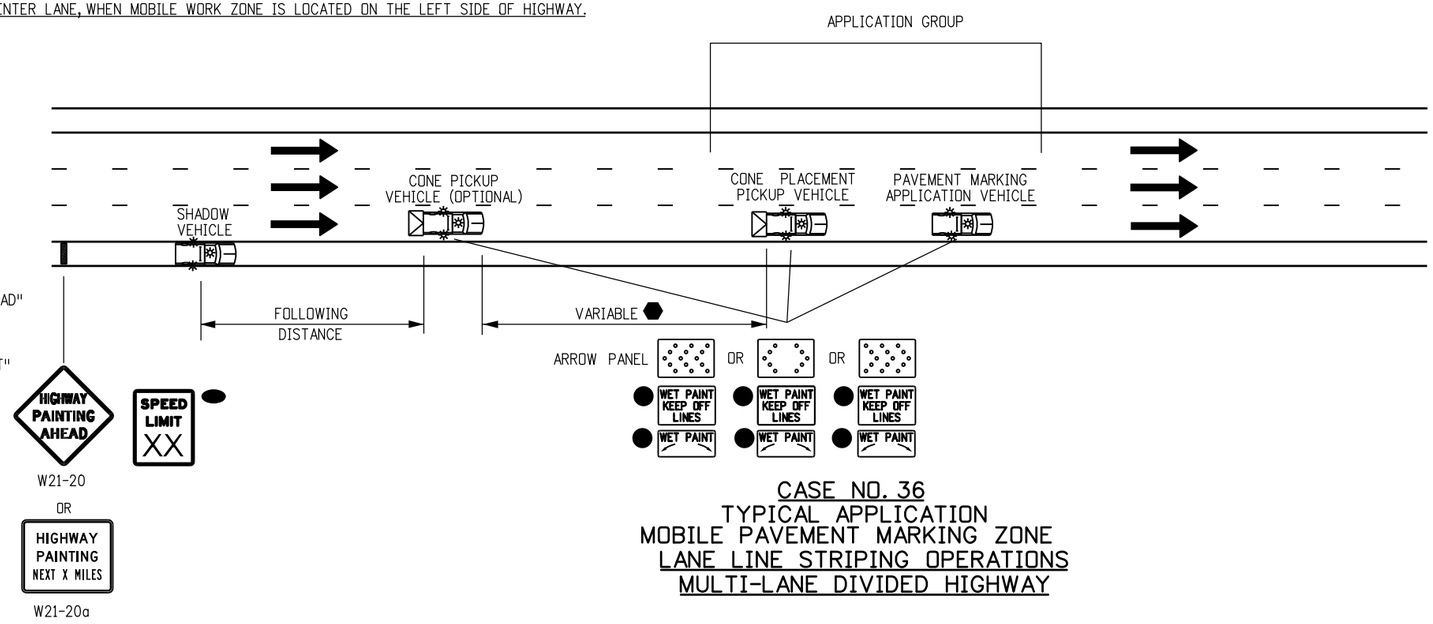
FOR CASE #36, VEHICLE/SIGN SEQUENCE IS THE SAME FOR THE LEFT SIDE OF HIGHWAY, WHILE TAPER IS MIRRORED ABOUT THE CENTER LANE, WHEN MOBILE WORK ZONE IS LOCATED ON THE LEFT SIDE OF HIGHWAY.

LEGEND

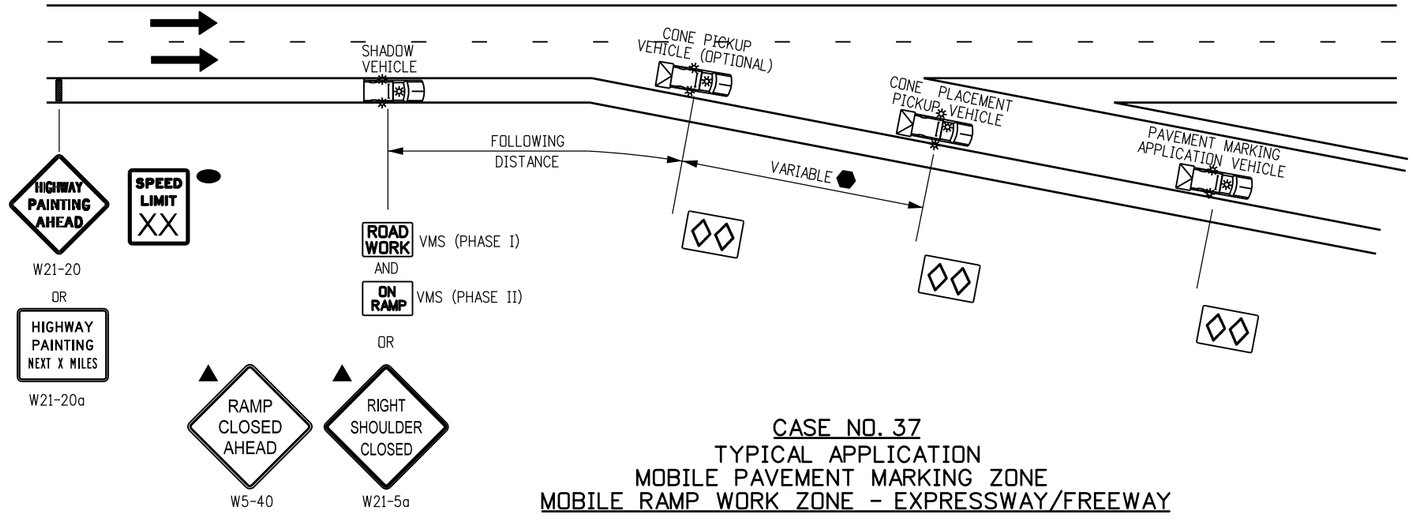
- MOBILE ATTENUATOR VEHICLE, TWO 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
- AHEAD / LANE CLOSED — PORTABLE VARIABLE MESSAGE SIGN (VMS).
- ▲ WHEN THE VMS IS USED, THE "SHOULDER CLOSED" (W21-5aX) OR W21-5bX), AND "RAMP CLOSED AHEAD" SIGNS BECOME OPTIONAL.
- ● IF TRACKING OF THE WET PAINT IS ANTICIPATED, THE USE OF CONES OR STATIONARY "WET PAINT" SIGNS SHALL BE POSTED.
- ⬢ THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.
- ⬬ OPTIONAL



CASE NO. 36
TYPICAL APPLICATION
MOBILE PAVEMENT MARKING ZONE
LANE LINE STRIPING OPERATIONS
MULTI-LANE DIVIDED HIGHWAY

FOLLOWING DISTANCE CHART FOR WARNING VEHICLE AND CONE PICKUP VEHICLES

POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600



CASE NO. 37
TYPICAL APPLICATION
MOBILE PAVEMENT MARKING ZONE
MOBILE RAMP WORK ZONE - EXPRESSWAY/FREEWAY

NOTES

1. THE SIGNING VEHICLES MAY ENCROACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.
2. IF THE RAMP CANNOT BE REOPENED WITHIN 15 MINUTES, USE CASE NO. 22 OF THE S-630-1 STANDARD PLAN.

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12 Initials: KEN		Date:	Comments	
Last Modification Date: 3/16/16 Initials: NNC	R-5	3/27/14	REDUCE NUMBER OF TMA VEHICLES, REVISE VMS, AND ADD STATIONARY SIGNS	
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-7	12/8/14	FORMERLY SHEET 18. SIGN CODE UPDATE. W5-40 & W21-5a.	
Drawing File Name: S-630-1_22of24.dgn	R-8	5/20/16	REVISED NOTE 32 TO 36, CHANGE VEHICLE TITLE, REMOVE SIGNS	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-9	6/23/16	UPDATED LEGEND FROM "TRUCK MOUNTED ATTENUATOR" TO "MOBILE ATTENUATOR VEHICLE"	

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LEGEND

MOBILE ATTENUATOR TRUCK, TWO 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.

ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.

LANE CLOSED — PORTABLE VARIABLE MESSAGE SIGN (VMS).

▲ WHEN THE VMS IS USED, THE "RIGHT LANE CLSED AHEAD" (W9-3X) SIGN BECOMES OPTIONAL.

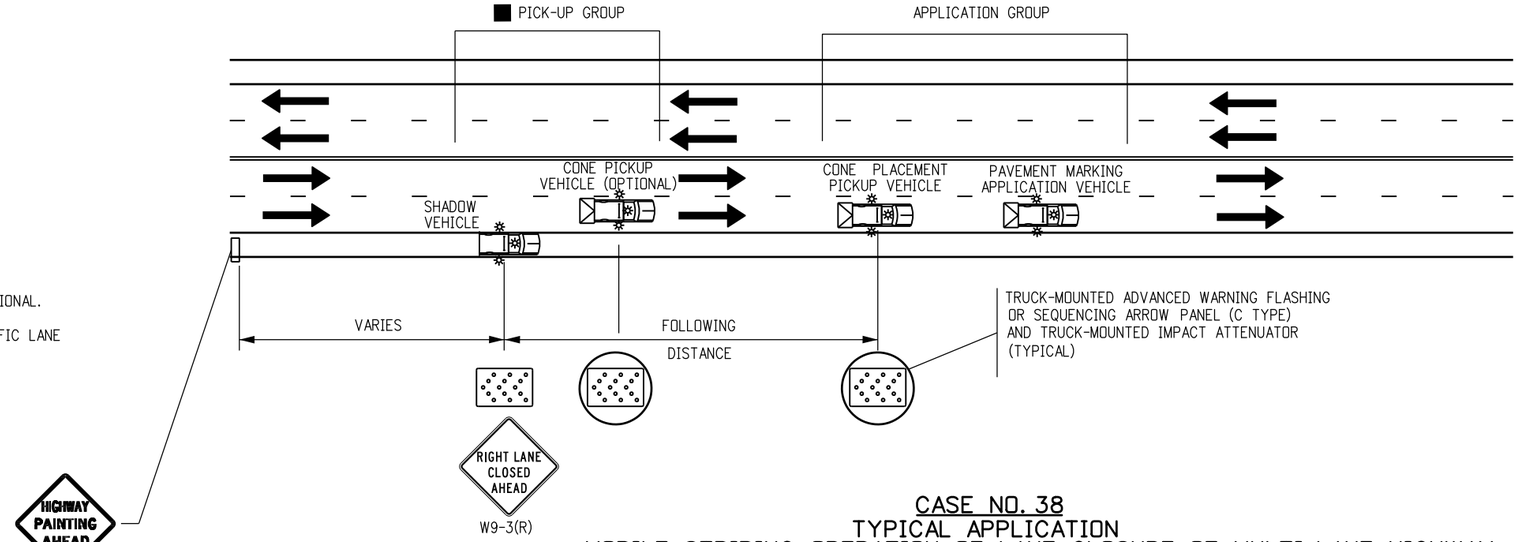
■ THE "CONE PICK-UP VEHICLE" OR "WARNING VEHICLE" MAY ENCROACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.

NOTES

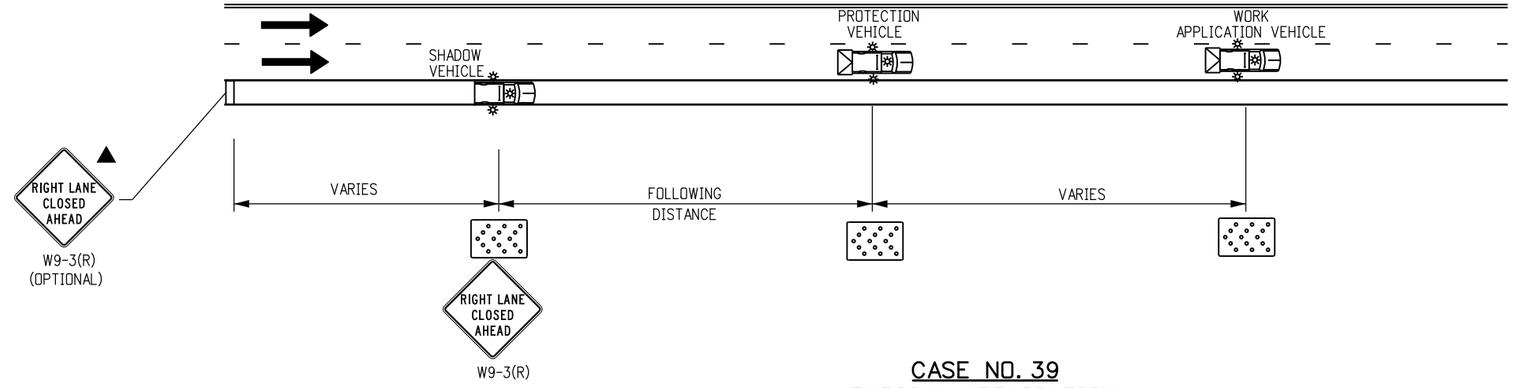
1. IN ROADWAY WHERE THE AADT IS 2,000 OR LESS, A SINGLE WORK VEHICLE WITH APPROPRIATE WARNING DEVICES ON THE VEHICLE MAY BE USED.
2. RADIO COMMUNICATIONS BETWEEN THE WORKCREW AND THE MOVING BLOCKADE ARE REQUIRED TO ADJUST THE BLOCKADE TO INCREASE OR DECREASE THE CLOSURE TIME. RELEASE TRAFFIC ONLY AFTER CONFIRMATION THAT ALL WORKERS AND THEIR VEHICLES ARE CLEAR OF THE ROADWAY.
3. IF APPLICABLE, ALL RAMPS AND ACCESS BETWEEN THE MOVING BLOCKADE AND WORK OPERATION AREA SHALL BE TEMPORARILY CLOSED USING TRAFFIC CONTROL EQUIPMENT AND PERSONNEL. EACH RAMP MUST REMAIN CLOSED UNTIL THE CREW DOING THE WORK GIVES THE "ALL CLEAR" SIGNAL OR UNTIL THE FRONT OF THE MOVING BLOCKADE PASSES THE CLOSED RAMP(S).

FOLLOWING DISTANCE CHART FOR WARNING VEHICLE AND SIGNING VEHICLES

POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600



CASE NO. 38
TYPICAL APPLICATION
MOBILE STRIPING OPERATION OF LANE CLOSURE OF MULTI-LANE HIGHWAY
(NOT FOR USE ON FREEWAYS)



CASE NO. 39
TYPICAL APPLICATION
MOBILE OPERATION OF LANE CLOSURE OF MULTI-LANE HIGHWAY

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12 Initials: KEN		Date:	Comments
Last Modification Date: 05/17/16 Initials: NNC	R-7	12/8/14	FORMERLY SHEET 19.
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	R-8	05/20/16	CHANGED VEHICLE TITLES; CHANGED SIGN TEXT; ADDED W21-20 & W21-21a
Drawing File Name: S-630-1_23of24.dgn	R-9	06/23/16	UPDATED LEGEND FROM "TRUCK MOUNTED ATTENUATOR" TO "MOBILE ATTENUATOR VEHICLE"
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	R-X		

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TYPICAL CONSTRUCTION ZONE SIGNS

THESE SIGNING NOTES ARE INTENDED AS A QUICK REFERENCE
FOR TYPICAL SIGN USE AND PLACEMENT IN CONSTRUCTION ZONES.

G20-1 "ROAD/WORK/NEXT XX MILES" - THIS SIGN SHALL BE ERECTED AT THE LIMITS OF ANY ROAD CONSTRUCTION OR MAINTENANCE PROJECT OF MORE THAN TWO (2) MILES IN LENGTH WHERE TRAFFIC IS MAINTAINED THROUGH THE PROJECT.

G20-4 "PILOT CAR/FOLLOW ME" - THIS SIGN SHALL BE MOUNTED IN A CONSPICUOUS POSITION ON THE REAR OF A VEHICLE USED FOR GUIDING ONE-WAY TRAFFIC THROUGH OR AROUND THE PROJECT.

G20-5P "WORK ZONE" - THIS PLAQUE SHALL BE MOUNTED JUST ABOVE THE WORK ZONE SPEED LIMIT SIGNS PRIOR TO THE WORK ZONE AREA.

G20-10 THANK YOU SIGN - THIS SIGN SHOULD BE ERECTED APPROXIMATELY 500 FEET BEYOND THE END OF THE PROJECT.

G20-11 CONSTRUCTION PROJECT INFORMATION SIGN - THIS SIGN SHOULD BE ERECTED AS DESCRIBED IN THE SECTION 626 STANDARD SPECIFICATION.

G20-55(X) "X MINUTE CLOSURE. EXPECT DELAYS" - THIS SIGN IS INTENDED FOR USE 500 FEET PAST THE "WORK ZONE"/SPEED LIMIT SIGN.

M4-9( ) "DETOUR/<<<<" - THIS SIGN IS USED FOR UNNUMBERED ROUTES; FOR USE IN EMERGENCY SITUATIONS; FOR PERIODS OF SHORT DURATION; OR WHERE, OVER RELATIVELY SHORT DISTANCES. IT IS NOT NECESSARY TO SHOW ROUTE MARKERS TO GUIDE TRAFFIC ALONG THE DETOUR AND BACK TO ITS AUTHORIZED ROUTE.

M4-10( ) "DETOUR ARROW" - THIS SIGN SHOULD BE MOUNTED JUST BELOW THE ROAD CLOSED SIGN AT THE POINT WHERE THE DETOUR ROADWAY OR ROUTE HAS BEEN ESTABLISHED DUE TO THE CLOSURE OF THE STREET OR HIGHWAY TO THROUGH TRAFFIC.

R2-1( ) "SPEED/LIMIT/XX" - THESE SIGNS ARE INTENDED TO REDUCE TRAFFIC SPEED IN ADVANCE OF THE DAILY WORK AREA WITHIN THE OVERALL PROJECT LIMITS.

R2-1(XX) "SPEED/LIMIT/XX" - THIS SIGN IS INTENDED FOR USE 500 FEET PAST THE "THANK YOU" SIGN TO BRING TRAFFIC BACK TO ORIGINAL POSTED SPEED.

R2-6P "FINES DOUBLE" - THIS SIGN IS INTENDED FOR USE WITHIN WORK ZONES TO PROVIDE NOTICE OF INCREASED FINES FOR TRAFFIC VIOLATIONS WITHIN WORK ZONES.

R4-1 "DO NOT PASS" - THIS SIGN SHOULD BE PLACED AT TRANSITION TAPER POINT.

R4-2 "PASS WITH CARE" - THIS SIGN SHOULD BE PLACED AT TRANSITION TAPER POINT.

R11-2 "ROAD/CLOSED" - THIS SIGN IS TO BE MOUNTED ON THE BARRICADE THAT IS PLACED BEFORE THE WORK ZONE ENTRANCE TO PROHIBIT TRAFFIC FROM ENTERING THE WORK ZONE.

R11-3 "ROAD CLOSED/X MILES AHEAD/L.T.O. - THIS SIGN SHOULD BE PLACED WHERE THROUGH TRAFFIC MUST DETOUR TO AVOID THE CLOSURE OF THE ROAD SOME DISTANCE BEYOND, BUT WHERE THE ROAD IS OPEN TO LOCAL TRAFFIC UP TO THE POINT OF CLOSURE.

R11-4 "ROAD CLOSED/TO/THRU TRAFFIC" FOR URBAN USE - THIS SIGN SHOULD BE PLACED WHERE THROUGH TRAFFIC MUST DETOUR TO AVOID THE CLOSURE OF THE ROAD SOME DISTANCE BEYOND, BUT WHERE THE ROAD IS OPEN TO LOCAL TRAFFIC UP TO THE POINT OF CLOSURE.

R52-6a "BEGIN FINES DOUBLE IN WORK ZONE" SIGN IS PLACED AT THE BEGINNING OF THE ADVANCED WARNING AREA OF THE TRAFFIC CONTROL ZONE.

R52-6b "END FINES DOUBLE IN WORK ZONE" SIGN IS PLACED AFTER WORK ZONE AREA, PAST DOWNSTREAM TAPER SECTION.

W1-1( ) "TURN ARROW" - THIS SIGN IS INTENDED FOR USE WHERE ENGINEERING INVESTIGATIONS OF ROADWAY CONDITIONS SHOW THE RECOMMENDED SPEED ON THE TURN TO BE 30 MPH OR LESS.*

W1-2( ) "CURVE ARROW" - THIS SIGN IS INTENDED FOR USE WHERE ENGINEERING INVESTIGATIONS OF ROADWAY CONDITIONS SHOW THE RECOMMENDED SPEED ON THE CURVE TO BE IN THE RANGE BETWEEN 30 AND 60 MILES PER HOUR.*

W1-3( ) "REVERSE TURN ARROW" - THIS SIGN IS INTENDED FOR USE WHERE TWO TURNS OR THE CURVE AND A TURN IN OPPOSITE DIRECTIONS ARE SEPARATED BY A TANGENT OF LESS THAN 600 FEET.*

W1-4( ) "REVERSE CURVE ARROW" - THIS SIGN IS INTENDED FOR USE WHERE TWO CURVES IN OPPOSITE DIRECTIONS ARE SEPARATED BY A TANGENT OF LESS THAN 600 FEET.*

W1-6( ) "ARROW" - THIS SIGN SHOULD BE MOUNTED JUST BELOW THE ROAD CLOSED SIGN AT THE POINT WHERE THE DIVERSION HAS BEEN ESTABLISHED DUE TO THE LANE CLOSURE.

W3-2 "YIELD AHEAD" - THIS SIGN IS INTENDED FOR USE AT THE APPROACH TO THE YIELD SIGN THAT IS NOT VISIBLE FOR A SUFFICIENT DISTANCE TO PERMIT THE DRIVER TO BRING HIS VEHICLE TO A STOP AT THE YIELD SIGN.*

W3-4 "BE PREPARED TO STOP" - THIS SIGN TO BE PLACED 1.5 MILES IN ADVANCED OF A FLAGGER.

W4-2(X) "LEFT (RIGHT) LANE TRANSITION SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE REDUCTION IN THE NUMBER OF TRAFFIC LANES IN THE DIRECTION OF TRAVEL ON THE MULTILANE HIGHWAY.*

W4-50 "USE BOTH LANES DURING CONGESTION" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE "ROAD WORK X MILE" ADVANCED WARNING SIGN.

W4-51 "USE BOTH LANES TO MERGE POINT" - THIS SIGN IS INTENDED TO DIRECT MOTORISTS TO USE BOTH TRAVEL LANES UNTIL THE LANES ARE REDUCED TO ONE LANE.

W4-52 "TAKE TURNS MERGE HERE" - THIS SIGN IS INTENDED TO WARN MOTORISTS IN ADVANCED TO MOVE FROM THE CLOSED TRAVEL LANE TO THE OPEN TRAVEL LANE, USUALLY 500 FEET IN ADVANCED OF THE START OF THE TRANSITION TAPER .

W5-1 "ROAD NARROWS" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE TRANSITION ON THE ROAD WHERE THE PAVEMENT WIDTH IS REDUCED ABRUPTLY TO A WIDTH SUCH THAT TWO CARS CANNOT PASS WITHOUT REDUCING SPEED.*

W5-2a "NARROW BRIDGE SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A BRIDGE OR CULVERT HAVING A CLEAR TWO-WAY ROADWAY WIDTH OF 16 TO 18 FEET OR ANY BRIDGE OR CULVERT HAVING A ROADWAY CLEARANCE LESS THAN THE WIDTH OF THE APPROACH PAVEMENT.*

W5-3 "ONE LANE/BRIDGE" - THIS SIGN SHOULD BE PLACED ON TWO-WAY ROADWAYS IN ADVANCE OF THE BRIDGES OR CULVERTS WHERE THE ROADWAY WIDTH IS LESS THAN 16 FEET (18 FEET FOR COMMERCIAL VEHICLES) OR WHEN THE ALIGNMENT IS POOR ON THE APPROACH TO THE STRUCTURE HAVING A CLEAR ROADWAY WIDTH OF 18 FEET OR LESS.*

W6-1 "DIVIDED HIGHWAY SYMBOL" - THIS SIGN SHOULD BE PLACED ON THE APPROACHES TO THE SECTION OF HIGHWAY WHERE OPPOSING FLOWS OF TRAFFIC ARE SEPARATED BY A PHYSICAL MEDIAN.

W6-2 "DIVIDED HIGHWAY ENDS SYMBOL" - THIS SIGN SHOULD BE PLACED AT THE END OF THE SECTION OF PHYSICALLY DIVIDED HIGHWAY AS A WARNING OF TWO-WAY TRAFFIC AHEAD.

W6-3 "TWO-WAY TRAFFIC SYMBOL" - THIS SIGN IS INTENDED FOR USE TO GIVE WARNING OF TRANSITION FROM A SEPARATED ONE-WAY ROADWAY TO A TWO-WAY ROADWAY.*

W7-1 "HILL SYMBOL" - THIS SIGN SHOULD BE PLACED AT A POINT IN ADVANCE OF THE DOWNGRADE WHERE THE LENGTH, PERCENT OF GRADE, HORIZONTAL CURVATURE, OR OTHER PHYSICAL FEATURES REQUIRE SPECIAL CONSIDERATION ON THE PART OF DRIVERS.*

W8-1,W8-2 "BUMP"/"DIP" - THESE SIGNS ARE INTENDED FOR USE TO GIVE WARNING OF A SHARP RISE OR DEPRESSION IN THE PROFILE OF THE ROAD THAT IS SUFFICIENTLY ABRUPT TO AFFECT VEHICLE OPERATION OR CAUSE CONSIDERABLE DISCOMFORT TO PASSENGERS.*

W8-3a "PAVEMENT ENDS SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE THE PAVEMENT SURFACE CHANGES FROM A HARD-SURFACED PAVEMENT TO THE LOW-TYPE SURFACE OR EARTH ROAD.*

W8-4 "SOFT SHOULDER" - THIS SIGN IS INTENDED FOR USE TO WARN OF A SOFT SHOULDER CONDITION THAT COULD PRESENT A PROBLEM TO VEHICLES THAT MAY GET OFF THE PAVEMENT.*

W8-5 "SLIPPERY WHEN WET SYMBOL" - THIS SIGN SHOULD BE PLACED IN ADVANCE OF THE CONDITION WHERE THE HIGHWAY SURFACE IS SLIPPERY BEYOND WHAT IS ORDINARY WHEN WET.*

W8-9a "SHOULDER DROP-OFF" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A SHOULDER DROP-OFF THAT EXCEEDS THREE INCHES IN HEIGHT.*

W8-11 "UNEVEN LANES" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF AN UNEVEN ADJACENT LANE SITUATION THAT EXCEEDS ONE INCH IN HEIGHT.*

W9-1( ) "LEFT (RIGHT) LANE ENDS" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE PAVEMENT WIDTH TRANSITION SIGN (W4-2).

W9-2( ) "LANE ENDS/MERGE LEFT (RIGHT)" - THIS SIGN IS INTENDED FOR USE AS A SUPPLEMENT TO THE PAVEMENT WIDTH TRANSITION SIGN (W4-2).

W9-3 OR W9-3a( ) "CENTER LANE CLOSED AHEAD" - THIS SIGN SHOULD BE USED IN ADVANCE OF THE POINT WHERE WORK OCCUPIES THE CENTER LANE AND TRAFFIC IS DIRECTED TO THE RIGHT OR LEFT OF THE WORK ZONE.*

W12-1 "DOUBLE ARROW SYMBOL" - THIS SIGN SHOULD BE PLACED AT THE POINT OF THE OBSTRUCTION IN THE ROADWAY, WHERE TRAFFIC IS PERMITTED TO PASS ON EITHER SIDE OF THE OBSTRUCTION.

W12-2 "LOW CLEARANCE SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF AN OBSTRUCTION TO WARN VEHICLE OPERATORS OF CLEARANCES LESS THAN THE MAXIMUM VEHICLE HEIGHT PERMITTED PLUS 12 INCHES.*

W13-1P( ) "ADVISORY SPEED PLAQUE" - THIS PLAQUE IS INTENDED TO SUPPLEMENT WARNING SIGNS ONLY AND SHALL NOT BE MOUNTED ALONE. IT IS USED TO INDICATE THE MAXIMUM RECOMMENDED SPEED FOR THE INDICATED CONDITION.

W13-3 "ADVISORY RAMP SPEED" - THIS SIGN IS TO BE POSTED TO INFORM MOTORISTS WHAT THE SUGGESTED SPEED LIMIT IS ON A RAMP.

W20-1 "ROAD/WORK/AHEAD" - THIS SIGN IS TO BE LOCATED IN ADVANCE OF THE INITIAL ACTIVITY OR DETOUR A DRIVER MAY ENCOUNTER, AND IS INTENDED TO BE USED AS A WARNING OF OBSTRUCTIONS OR RESTRICTIONS.

W20-2 "DETOUR/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE POINT AT WHICH TRAFFIC IS DIVERTED OVER A TEMPORARY ROADWAY OR ROUTE.

W20-3 "ROAD/CLOSED/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT AT WHICH A ROADWAY IS CLOSED TO ALL TRAFFIC OR TO ALL BUT LOCAL TRAFFIC.

W20-4 "ONE LANE/ROAD/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE TRAFFIC IN BOTH DIRECTIONS MUST USE A SINGLE LANE.

W20-5( ) "XXX LANE/CLOSED/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE ONE LANE OF A MULTIPLE-LANE ROADWAY IS CLOSED. IT SHOULD BE PROVIDED WITH INTERCHANGEABLE PLAQUES READING "RIGHT", "LEFT", AND "CENTER" AT NO ADDITIONAL COST TO THE PROJECT.

W20-7 "FLAGGER SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF ANY POINT AT WHICH A FLAGGER HAS BEEN STATIONED TO CONTROL TRAFFIC THROUGH OR AROUND THE PROJECT.*

W20-52 "GROOVED/PAVEMENT/AHEAD" - THIS SIGN IS INTENDED TO BE USED IN ADVANCE OF A ROADWAY THAT HAS BEEN GROOVED AND/OR ROTO MILLED.

W21-1a "WORKER SYMBOL" - THIS SIGN IS INTENDED FOR USE IN CONJUNCTION WITH MINOR MAINTENANCE AND PUBLIC UTILITY OPERATIONS FOR THE PROTECTION OF MEN WORKING IN OR NEAR THE ROADWAY.

W21-2 "FRESH/OIL" - THIS SIGN IS INTENDED FOR USE WHERE RE-SURFACING OPERATIONS HAVE RENDERED THE SURFACE OF THE PAVEMENT TEMPORARILY WET, AND OBJECTIONABLE SPLASHING ON VEHICLES MAY OCCUR.*

W21-3 "ROAD/MACHINERY/AHEAD" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE AREAS WHERE HEAVY EQUIPMENT IS OPERATING IN OR ADJACENT TO THE ROADWAY.*

W21-4 "ROAD/WORK/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF MAINTENANCE FOR MINOR RECONSTRUCTION OPERATIONS IN THE ROADWAY.

W21-5 "SHOULDER/WORK" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE PROJECT INVOLVING THE SHOULDER, WHERE THE TRAVELED WAY REMAINS UNOBSTRUCTED.

W21-6 "SURVEY/CREW" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE A SURVEYING CREW IS WORKING IN OR ADJACENT TO THE ROADWAY.*

W21-20 "HIGHWAY PAINTING AHEAD" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE A PAINT CREW IS WORKING IN OR ADJACENT TO THE ROADWAY.

W21-20a "HIGHWAY PAINTING NEXT X MILES" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF PAINT CREW WORKING IN OR ADJACENT TO THE ROADWAY.

W22-1 "BLASTING/ZONE/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF ANY POINT OR WORK SITE WHERE THERE ARE EXPLOSIVES BEING USED. THE W22-2 AND W22-3 SIGNS MUST BE USED IN SEQUENCE WITH THIS SIGN.

W22-2 "TURN OFF/2-WAY RADIOS/AND/CELLULAR/PHONES" - THIS SIGN IS TO BE USED IN SEQUENCE WITH THE W22-1 AND W22-3 SIGNS AND PLACED AT LEAST 1000 FEET FROM THE BEGINNING OF THE BLASTING ZONE.

W22-3 "END/BLASTING/ZONE" - THIS SIGN IS TO BE USED TO DENOTE THE END OF THE RADIO INFLUENCE AREA AND SHALL BE PLACED A MINIMUM OF 1000 FEET FROM THE BLASTING ZONE, EITHER WITH OR PRECEDING THE END CONSTRUCTION SIGN.

W22-50(X) "ROCK SCALING X MILE(S)" - THIS SIGN IS INTENDED TO BE USED IN ADVANCE OF A FLAGGER IN ADVANCED OF THE WORK ZONE AREA.

ADVANCE PLACEMENT OF WARNING SIGNS

POSTED OR 85TH PERCENTILE SPEED	CONDITION A +	ADVANCE PLACEMENT DISTANCE (FEET) ++ CONDITION B: DECLARATION TO THE LISTED ADVISORY SPEED (MPH) FOR THE CONDITION							
		MPH							
		0	10	20	30	40	50	60	70
20	225	●	●	--	--	--	--	--	--
25	325	●	●	●	--	--	--	--	--
30	450	●	●	●	--	--	--	--	--
35	550	●	●	●	●	--	--	--	--
40	650	125	●	●	●	--	--	--	--
45	750	175	125	●	●	●	--	--	--
50	850	250	200	150	100	●	--	--	--
55	950	325	275	225	175	100	●	--	--
60	1100	400	350	300	250	175	●	--	--
65	1200	475	425	400	350	275	175	●	--
70	1250	550	525	500	425	350	250	150	--
75	1350	650	625	600	525	450	350	250	100

+ CONDITION A: SPEED REDUCTION AND LANE CHANGING IN HEAVY TRAFFIC. TYPICAL SIGNS ARE "MERGE" AND "RIGHT LANE ENDS".

++ CONDITION B: TYPICAL CONDITIONS ARE THE WARNING OF A POTENTIAL STOP SITUATION AND LOCATIONS WHERE THE ROAD USER MUST DECREASE SPEED TO MANEUVER THROUGH THE WARNED CONDITION. TYPICAL SIGNS ARE "STOP AHEAD", "SIGNAL AHEAD", "YIELD AHEAD", "CURVE", "REVERSE CURVE", "TURN".

● NO SUGGESTED DISTANCES ARE PROVIDED AT THESE SPEEDS, AS THE PLACEMENT IS DEPENDENT ON SITE CONDITIONS AND OTHER SIGNING.

A SUPPLEMENTAL PLAQUE MAY BE USED WITH WARNING SIGNS SPECIFYING THE DISTANCE TO THE CONDITION IF THERE IS AN IN-BETWEEN INTERSECTION THAT MIGHT CONFUSE THE MOTORIST.

* PLACEMENT SHOULD BE IN ACCORDANCE WITH WARNING SIGN PLACEMENT TABLE.

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	Sheet Revisions	
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R-4	07/26/13	CHANGE W20-7a SIGN CODE TO W20-7
R-7	12/8/14	FORMERLY SHEET 20.
R-8	05/20/16	ADDED SIGN W21-20 & W21-20a
R-X		

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TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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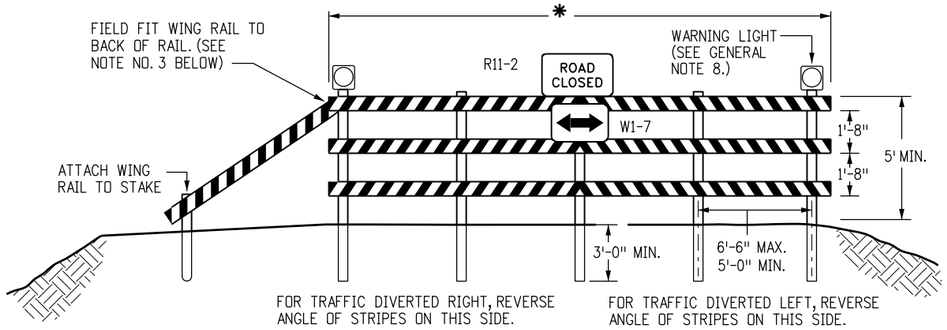
STANDARD PLAN NO.
S-630-1
Sheet No. 24 of 24



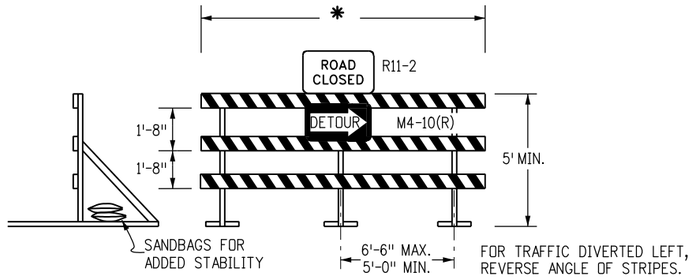
FIXED

* RAIL LENGTH TABLE

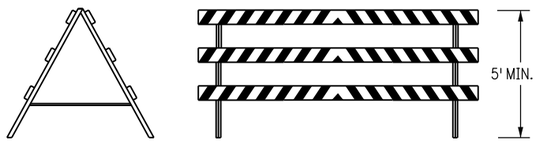
TYPE 3 BARRICADE		LENGTH
FIXED	MOVABLE	
F - A	M - A	8'- 14'
F - B	M - B	15'- 24'
F - C	M - C	25'- 35'
F - D	M - D	> 35'

NOTES

1. TYPE 3 BARRICADES HAVE 3 REFLECTORIZED RAIL FACES IF FACING TRAFFIC IN ONE DIRECTION AND 6 IF FACING TRAFFIC IN TWO DIRECTIONS.
2. THE PORTION OF THE POST ABOVE THE GROUND LINE SHALL BE PAINTED IN ACCORDANCE WITH THE APPROPRIATE GENERAL NOTE.
3. DETACHABLE EXTENSION WING RAILS FOR BYPASSING OF CONSTRUCTION EQUIPMENT ARE PERMITTED, WHEN NECESSARY, ON FIXED OR MOVABLE TYPE 3 BARRICADES. THE LENGTH SHALL BE ADEQUATE TO CLOSE THE BORROW PIT AND/OR SHOULDER AS REQUIRED.



MOVABLE-SKIDS

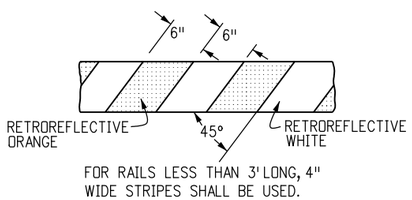


MOVABLE-HINGED

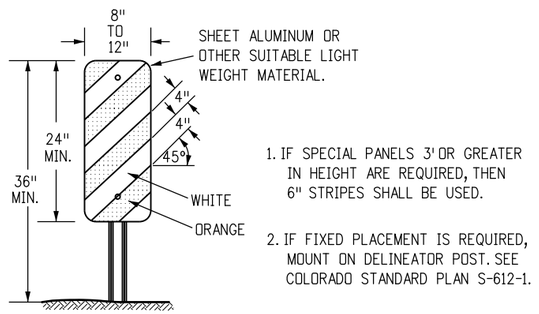
TYPICAL TYPE 3 BARRICADES

TYPICAL BARRICADE CHARACTERISTICS

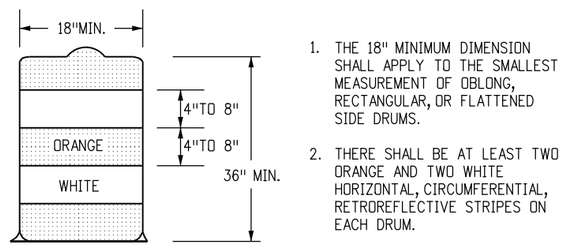
	BARRICADE DESIGNATIONS
	TYPE 3
RAIL WIDTH	8" MIN.-12" MAX.
RAIL LENGTH	AS REQUIRED, SEE RAIL LENGTH TABLE
HEIGHT	5' MIN.
USE	TEMPORARY OR PERMANENT
STRIPES	SEE DETAIL OF BARRICADE STRIPING AND APPROPRIATE GENERAL NOTES.



RAIL STRIPING DETAIL



TYPICAL VERTICAL PANEL



TYPICAL DRUM

GENERAL NOTES

1. THE VARIOUS TYPES, COMBINATIONS AND APPLICATIONS OF SIGNS AND WARNING LIGHTS FOR BARRICADES REQUIRED FOR EACH PROJECT SHALL BE:
   A. AS SPECIFIED OR DETAILED IN THE PLANS.
   B. AS SHOWN IN APPLICABLE TYPICAL ILLUSTRATIONS.
   C. AS CALLED FOR AND SUBJECT TO APPROVAL BY THE ENGINEER.
2. TEMPORARY AND PERMANENT BARRICADES TYPE 3 SHALL BE FABRICATED FROM APPROVED CRASH TESTED MATERIALS. SEE SECTION 614 AND 630 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION FOR ADDITIONAL REQUIREMENTS.
3. ALL PAINTING SHALL CONFORM WITH THE FOLLOWING:
   A. THE APPLICABLE SECTION OF 508 OF THE STANDARD SPECIFICATIONS.
   B. ALL SKIDS, BRACES AND POSTS SHALL BE PAINTED WITH 2 COATS OF EXTERIOR WHITE PAINT
   C. THE BACKSIDES OF RAILS AND VERTICAL PANEL CHANNELIZING DEVICES FACING ONE DIRECTION OF TRAFFIC ONLY SHALL BE PAINTED WITH "EXTERIOR WHITE PAINT.
   D. ALUMINUM OR GALVANIZED STEEL SKIDS, BRACES AND POSTS SHALL NOT BE PAINTED.
4. ALL STRIPED SURFACES SHALL CONFORM WITH THE FOLLOWING:
   A. THE ENTIRE AREA OF ORANGE AND WHITE STRIPES SHALL BE FABRICATED AS ONE PIECE.
   B. HORIZONTAL RAILS, WING RAILS AND VERTICAL PANEL CHANNELIZING DEVICES SHALL HAVE ORANGE AND WHITE STRIPES ON THE FACE SIDE(S) SLANTING DOWNWARD AT A 45° ANGLE TOWARD THE SIDE(S) TO WHICH TRAFFIC IS TO PASS OR TURN.
   C. PERMANENT BARRICADES SHALL HAVE RETROREFLECTIVE RED AND WHITE STRIPES. THEY MAY BE USED AT LOCATIONS TO MARK THE END OF A ROAD, STREET OR HIGHWAY THAT ENDS AT A "T" INTERSECTION, OR WHERE THERE IS NO CROSSROAD OR OUTLET.
   D. ALL RETROREFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956:
      1. ORANGE AND WHITE SHALL BE TYPE II, III OR IV.
      2. RED AND WHITE SHALL BE TYPE II, III OR IV.
5. FOR ALL WOODEN BARRICADE COMPONENTS NOMINAL LUMBER DIMENSIONS ARE SATISFACTORY.
6. ALL SCREWS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
7. STABILITY OF BARRICADES AND CHANNELIZING DEVICES SHALL CONFORM WITH THE FOLLOWING:
   A. SKIDS (BASES) OF MOVABLE BARRICADES SHALL BE WEIGHTED WITH SANDBAGS ONLY WHERE NECESSARY TO PROVIDE STABILITY
   B. NO MOVABLE OR PORTABLE DEVICE SHALL BE WEIGHTED BY ANY METHOD OR WITH ANY MATERIAL THAT WOULD MAKE THEM HAZARDOUS TO MOTORISTS.
8. WARNING LIGHTS USED WITH BARRICADES, DRUMS AND VERTICAL PANELS SHALL CONFORM WITH THE FOLLOWING:
   A. USE FLASHING WARNING LIGHTS WHEN DEVICES ARE USED SINGLY, AND STEADY BURN LIGHTS WHEN THEY ARE USED IN A SERIES FOR CHANNELIZATION.
   B. THEY SHALL BE POSITIONED ABOVE THE TOP RAIL OF BARRICADES OR ON TOP OF DRUMS AND VERTICAL PANELS.
9. CONCRETE BARRIER (TEMPORARY) SHALL CONFORM WITH:
   A. PRECAST CONCRETE BARRIER AS SHOWN ON COLORADO STANDARD PLAN M-606-14.
   B. BARRIER REFLECTORS SHALL BE INSTALLED THAT MEET THE REQUIREMENTS OF STANDARD TYPICAL DELINEATOR INSTALLATIONS, EXCEPT THE MAXIMUM SPACING SHALL BE 50', AND THEY WILL NOT BE PAID FOR BUT ARE INCLUDED IN THE COST OF THE BARRIER.
   C. CONCRETE BARRIER END TREATMENT SHALL BE IN ACCORDANCE WITH CLEAR ZONE CRITERIA, AND PLACED AS SHOWN ON THE PLANS.
10. SIGN PANELS MOUNTED ON BARRICADES WILL BE PAID FOR SEPARATELY.

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BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP) & VERTICAL PANELS

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