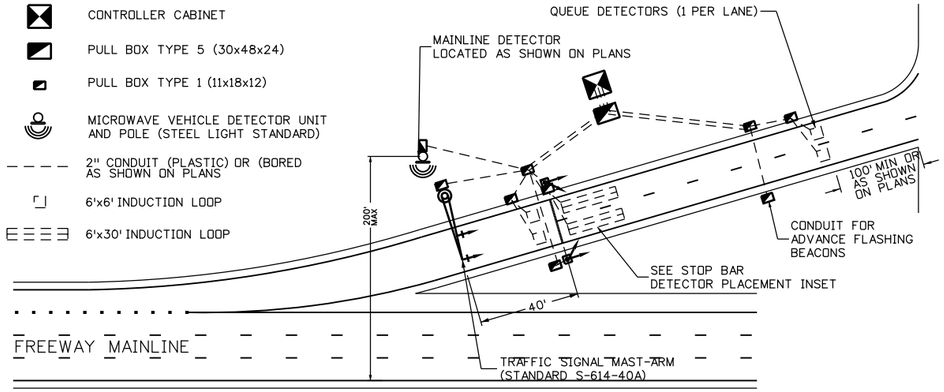
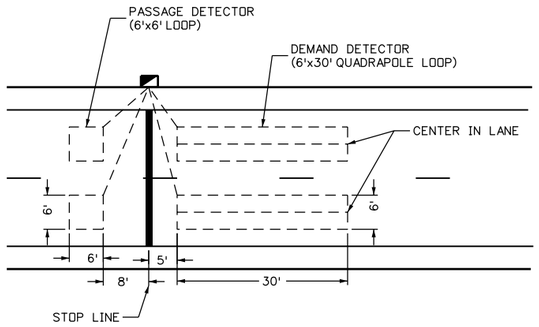
LEGEND

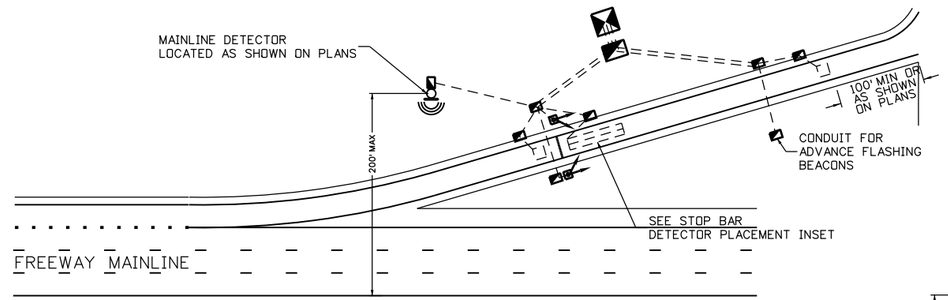
- CONTROLLER CABINET
- PULL BOX TYPE 5 (30x48x24)
- PULL BOX TYPE 1 (11x18x12)
- MICROWAVE VEHICLE DETECTOR UNIT AND POLE (STEEL LIGHT STANDARD)
- 2" CONDUIT (PLASTIC) OR (BORED AS SHOWN ON PLANS
- 6'x6' INDUCTION LOOP
- 6'x30' INDUCTION LOOP



TYPICAL METERED FREEWAY RAMP (2 LANES)



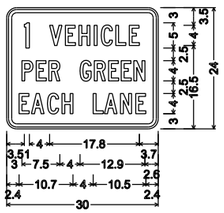
STOP BAR DETECTOR PLACEMENT



TYPICAL METERED FREEWAY RAMP (1 LANE)

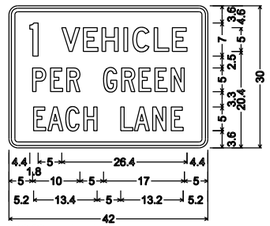
SIGN LAYOUTS FOR SPECIAL REGULATORY SIGNS

TWO-LANE RAMPS (PEDESTAL POLES)



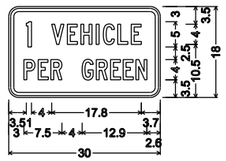
1.5" Radius, 0.6" Border, 0.4" Indent, Black on White;
"1 VEHICLE" C;
"PER GREEN" C 75% spacing;
"EACH LANE" C;

TWO-LANE RAMPS (OVERHEAD)

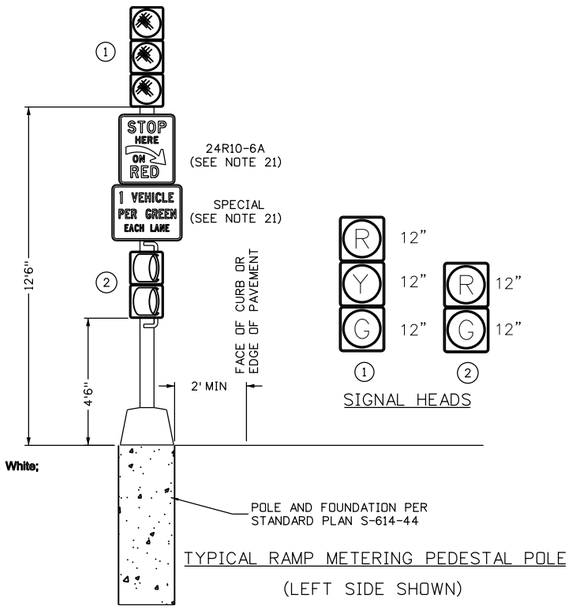


R10-29_overhead;
1.9" Radius, 0.8" Border, 0.5" Indent, Black on White;
"1 VEHICLE" D;
"PER GREEN" C;
"EACH LANE" C;

ONE-LANE RAMPS (PEDESTAL POLES)



1.5" Radius, 0.6" Border, 0.4" Indent, Black on White;
"1 VEHICLE" C;
"PER GREEN" C 75% spacing;



TYPICAL RAMP METERING PEDESTAL POLE

(LEFT SIDE SHOWN)

SIGNAL HEADS

1. All detector loops shall measure as a 6'x6' square or 6'x30' as shown on plans (within 1/2" tolerance).
2. All detector loops shall be centered in the traffic lane.
3. All detector loop slots shall be cut to a minimum depth of 4"
4. Before installation of the wire, all slots shall be cleaned of debris using compressed air or water and the surface of the roadway and slots shall be dried by the use of compressed air.
5. All saw cut loops shall include 4 turns of loop detector wire. The wires shall be seated at the bottom of the saw slot.
6. No more than four loop detector wires shall be placed in a saw slot leading to the edge of roadway.
7. No detector wire splices shall be allowed in the saw slots. All loops shall have continuous detector wiring throughout the pavement.
8. All lead-in wire shall be continuous to the controller cabinet.
9. All loop and loop lead-in wires shall be clearly labeled in each pull box.
10. Prior to the sealing of the saw slots and drill holes, an inductance and leakage test shall be performed. Loop inductance shall measure between 20 and 2500 microhenries. Leakage resistance will be greater than or equal to 100 megohms. Measurements outside of these specifications will be cause for immediate loop replacement.
11. Conduit for lead-in wire off the pavement surface shall be buried at a minimum depth of 3'.
12. For new asphalt surfaces, slots shall be saw cut and detector wire installed prior to laying of the final lift of pavement. For new concrete pavement, preformed loops shall be used, see project plan sheets, project standards and project special provisions.
13. All saw cut corners shall be rounded using a 1 1/4" hole saw drilled to a minimum depth of 4". No 45 degree angled corners will be accepted.
14. The minimum saw cut slot width shall be 3/8".
15. All saw slots and drill holes shall be sealed using an approved loop sealant. Excess sealant shall be removed to avoid unnecessary high spots.
16. Pull boxes shall contain an additional 2' of loop detector wire and lead-in wire.
17. Electrical conduit at ramp metering locations shall be as follows:
    Under the roadway, 2" Electrical Conduit (Bored) - Schedule 80 minimum.
    Elsewhere, 2" Electrical Conduit (Plastic), (Unless otherwise noted on the plans).
18. Some electrical conduit trenchs shown on this sheet shall contain multiple conduits for the separation of electrical power, loop wire and/or fiber optic cable. See project plan sheets for exact number and location of conduit runs.
19. See project plan sheets for location of conduit and advance flashing beacons.
20. 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.
21. Regulatory signing shall be as show in the plans. 24R10-6a for left side pole shall contain right-pointing arrow. 24R10-6a for right side pole shall contain left-pointing arrow. Special signs shall conform to the layouts shown in the plans or provided by the engineer.
22. Power wiring, loop detector wire and fiber optic cable shall be each installed in a separate conduit as shown on the project plans unless otherwise directed by the Engineer.
23. All signal heads shall be aluminum with approved LED type lenses.
24. Contractor shall contact Larry Herbert (303) 757-9511 48 hours prior to installing loops and 48 hours prior to terminating loops at each location.
25. Loop lead-ins shall run to Type 1 Pull Box at the edge of pavement. Concrete apron shall be included in the cost of Type 1 Pull Box.
26. Contractor shall use a 3" strip of backer rod every 3' prior to sealant to ensure that the wire stays at the bottom of the saw cut. The rest of the saw cut shall receive full depth sealant.
27. Poles and pedestals shall be designed to meet the requirements outlined in the "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", published by AASHTO, for a wind velocity of 100 mph. The contractor shall submit two sets of working drawings, signed and sealed by a Professional Engineer registered in the State of Colorado, in accordance with Section 105.02 of the Standard Specifications for Road and Bridge Construction.
28. Overhead signal faces shall be 12" with backplates. Backplates shall not include retroreflective sheeting.
29. Traffic signal mast-arm pole and foundation shall be located outside of the clear zone or shielded by guardrail.
30. Pull boxes shall be rated for a minimum service load of 20,000 pounds over a 10"x10" square.

Print Date: 12/1/2015	Sheet Revisions		
File Name: RM-detail_2014.dgn	Date:	Comments	Init.
Horiz. Scale: NOT TO SCALE Vert. Scale: As Noted			
Unit Information Unit Leader Initials			

As Constructed	RAMP METERING DETAIL			Project No./Code
No Revisions:				X
Revised:	Designer:	Structure Numbers		X
Void:	Detailer:			Sheet Number
	Sheet Subset:RM DETAIL	Subset Sheets:	1 of 1	

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