

DESIGN ELEMENTS FOR COMPLETING HIGHWAY IMPROVEMENT PLANS FOR ACCESS

February 2001

Introduction

This is a design aid listing elements that may be necessary to prepare a complete set of plans necessary to design and build access related highway improvements. The scale of the improvement project and complexity of the topography will determine, in part, the necessary elements of the plan set.

Title Sheet

- a. Provide a vicinity map showing the highway improvements location, including Township, Range, and Section.

Plan View Components

- a. Use CDOT Standard Plans sheet M-100-1 (Standard Symbols).
- b. The plans scale shall be one of the following scales: 1" = 20' or 1" = 50'. Use 1" = 20' in urban areas or as authorized.
- c. Show the existing centerline of the highway and proposed centerline, if different.
- d. Show the curve data if a portion of the project is on a curve.
- e. Provide superelevation information.
- f. Show the survey line or the base line.
- g. Use CDOT plan stationing if possible and provide survey ties to most recent project.
- h. Show the existing edge of pavement.
- i. Show the proposed edge of pavement.
- j. Show the existing signing and striping. Label signs (size, type, and legend) and striping.
- k. Include sufficient Match-line lengths to determine proper intersection alignment. (i.e. 800-1000 feet beyond project limits)
- l. Provide the proposed signing and striping. Label signs (size, type, and legend) and striping
- m. Show the lane widths, turn lane lengths, and the taper lengths.
- n. Show the access width and the access radii.
- o. Speed change lanes (auxiliary lanes) shall be designed in accordance with the State Highway Access Code (2CCR 601-1).
- p. Indicate the posted speed for the section of the highway. If there are overlapping speed zones, show the locations of the speed limit signs. The design of auxiliary lanes is based on the current posted speed, and not what it may be posted in the future.
- q. Show the top of cuts and the toe of fills (Do not use contours).
- r. Show side drain size, type, and length.
- s. Show the existing and proposed drainage facilities. Including sizes, types, flows, invert elevations, etc.
- t. Show the profile of the access. The access must slope down from the highway for a minimum of 20 feet on a 2% grade. Vertical curve data is also required.
- u. Show the existing right-of-way line and the proposed right-of-way line if a dedication of

right-of-way will be necessary. Dedication of right-of-way may be necessary to accommodate the highway improvements.

- v. If applicable, show the Access Control Lines (“A” Lines).
- w. Show all of the significant topography.
- x. Include all existing and proposed utility locations.
- y. Provide seeding and mulching plan or a landscape plan (including irrigation).

Typical Cross Section Elements

- a. Show the existing surfacing width and striping.
- b. The typical section scale shall be 1" = 5' (horizontal and vertical).
- c. Show the existing groundline a minimum of ten (10) feet past the proposed widening.
- d. Show the proposed widening and surfacing including the depth of each layer.
- e. Provide the proposed widths for median, lanes, and shoulders. Typical widths are: Median = 16', Lane = 12', and Shoulder = 4' adjacent an auxiliary lane, and 8' adjacent to through lanes.
- f. "Z" section should be 6' - 8' wide on a 6:1 slope.
- g. Use 6:1 or 4:1 slopes to the catch point or to the bottom of the ditch. With CDOT approval the slope may be steepened to 3:1 maximum.
- h. Show the location and depth of topsoil.
- i. Provide material and specification recommendations from Materials Engineer.

Structural Cross Section Elements

- a. Show the existing surfacing width.
- b. The typical section scale shall be 1" = 5' (horizontal & vertical).
- c. Show the existing pipe and the original ground line a minimum of 10' past the proposed pipe extension.
- d. Show the proposed pipe extension (including type) and proposed grading associated with the extension.
- e. Show the dimension of the section and indicate any skew of the structure.
- f. Show the Flowline elevations at inlet and outlet.

Urban Section Elements

- a. Provide any applicable elements indicated above.
- b. Show curb and gutter including type.
- c. Show the location of the existing and proposed sidewalks. Check with the local government for their sidewalk requirements. At a minimum use 4' for detached sidewalk, and 6' for attached sidewalk.
- d. Show the profile of the flowline.
- e. Show the existing and proposed locations of street lights, and traffic signal facilities.
- f. If a traffic signal needs to be relocated, provide the name of the party responsible for such relocation. If the signal is relocated by a contractor, a set of design plans and specifications must be provided.
- g. Show the existing and proposed storm drain facilities.
- h. Lane widths are exclusive of the gutter pan.

General

The final design plans must be signed, and stamped by a Colorado Registered Professional Engineer.

References

The following regulation, design guidelines, standards, and reference materials are also to be used in the development of the plans. Also listed below are selected sections from the design documents that may be used in preparation of the plans . All the necessary documents may not be listed. If there is any discrepancy between the regulation listed below and the other materials, the regulation takes precedence.

- ▶ State Highway Access Code (2 CCR 601-1). A State of Colorado regulation.
- ▶ Current edition of CDOT Roadway Design Manual.
- ▶ CDOT Materials Manual.
- ▶ CDOT Construction Manual.
- ▶ CDOT Standard Specifications for Road and Bridge Construction.
- ▶ Drainage Design Manual.
- ▶ Flagging Booklet.
- ▶ CDOT M & S Standards including the following
 - a. M-100-1, Standard Symbols
 - b. M-603-1, Metal and Plastic Culvert Pipe
 - c. M-603-10, Concrete and Metal End Sections
 - d. M-606-1 & M-606-12, Guardrail
 - e. M-607-1, Fencing
 - f. M-608-1, Curb Ramps
 - g. M-609- 1, Curbs and Gutters
 - h. S-612-1, Delineator Installation
 - i. S-614-1 & S-612-1, Ground Signs
 - j. S-627-1, Typical Pavement Markings
- ▶ A Policy on Geometric Design of Highways and Streets, AASHTO.
- ▶ AASHTO Roadside Design Guide.
- ▶ Highway Drainage Guidelines, AASHTO.
- ▶ Manual on Uniform Traffic Control Devices for Streets and Highways.
- ▶ Colorado Supplement to the Manual on Uniform Traffic Control Devices for Streets and Highways.

CDOT Publications are available for purchase from:

Colorado Department of Transportation
Bid Plans Room
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