

**Delaware County Supplement to the
ODOT Location and Design Manual,
Bridge Design Manual,
CADD Standards Manual, and
Traffic Engineering Manual**

Delaware County Engineer's Office
50 Channing Street
Delaware, Ohio 43015

Latest Revision Date

July 22, 2016

General

Highway construction plans for capital improvement projects designed for the Delaware County Engineer's Office are to meet the requirements of the ODOT Location and Design Manual, Bridge Design Manual, Pavement Design Manual, Traffic Engineering Manual and CADD Standards Manual, which shall be collectively referred to as the "**ODOT Manuals**", except as specified in this Delaware County Supplement which denote changes applicable to DCEO projects.

References to the Ohio Department of Transportation shall be assumed to mean the Delaware County Engineer's Office.

Location and Design Manual, Volume 1

100 Design Controls and Exceptions

105 Design Exceptions

105.5.2 Processing and Approval Authority

Design exceptions for locally funded projects do not require ODOT approval. Design exception requests shall be prepared by the designer and submitted to the County Engineer for approval.

300 Cross Section Design

301.1.5 Pavement Cross Slope

For county and township maintained roads, standard cross slope is to be 0.02 ft/ft.

301.1.2 Lane Width

Minimum lane width for urban arterial streets shall be 12 feet; otherwise lane width shall conform with *Figures 301-2 and 301-4*.

301.2.2 Shoulder Type

Stabilized aggregate or bituminous surface treated shoulders should be designed the same thickness as the adjacent pavement.

301.2.3 Shoulder Width

Treated shoulder width and type should conform to *Figures 301-3 and 301-4* except where revised as follows:

All Roads and Streets (Rural and Urban):

If a future bike lane is planned, a minimum of 4 ft. of the treated or curbed shoulder shall be paved if the design speed is 45 mph or less; otherwise it shall be paved for a minimum width of 5 ft. Concrete gutters may be included in the paved width.

Arterial and Collector Roads:

(TWLTL = Two Way Left Turn Lane)

For 2 lane roads a minimum of 4 ft. of the treated shoulder shall be paved.

For multi-lane roads or 2 lane roads including a TWLTL a minimum of 2 ft. of the shoulder shall be paved.

If the current year AADT includes less than 250 B & C trucks, the remainder of the treated width shall be turf; otherwise the remainder shall be paved.

Local Roads:

2 ft. of the shoulder shall be stabilized aggregate and the remainder shall be turf.

400 Intersection Design

403.4 Geometric Design (Roundabouts)

403.4.1 Design Process

Generally, roundabout approaches should be deflected to the left of center to achieve desired entry speed.

Exit radii of the pavement edge lines shall be 250 feet minimum, 800 feet or larger preferred.

403.4.3 Inscribed Diameter (Outside Limits of Circulatory Roadway)

For single lane roundabouts, an inscribed circle diameter of 130 to 150 ft. is preferred, not including concrete gutter, if present.

403.4.6 Truck Aprons

The truck apron should use a 4-inch Type 3 (mountable) curb. Surface treatment for the truck apron will typically be a decorative stamped and colored concrete. The County Engineer will specify the requirements for the truck apron material.

Landscaping

Landscaping features in the central island are an integral component in the design of a roundabout. Raised features in the central island provide visual cues to the drivers that they are approaching a feature that requires slowing down. Landscaping also helps block oncoming headlights at night.

A separate landscaping plan will typically be required for roundabouts. Raised planting beds or shrubs shall be placed a minimum of 6 ft. from the central island curb. Trees in the central island should be placed near the center of the island and should be of a type that do not exceed 20 feet in height within 20 years.

Trees in splitter islands will not be permitted.

Location and Design Manual, Volume 2

1002 Pipe Criteria

1002.1 Introduction

Designers shall specify all conduits and drainage structures in accordance with SS 1203 on County funded projects.

CMS 611 items shall only be used on state or federally funded projects when required by ODOT.

1002.1.2 Deviation by Local

For locally funded projects, the **designer shall specify a single conduit material type** as directed by the County Engineer.

The designer should give consideration to specifying smooth lined pipe (non-corrugated, and non-metallic) for any culvert or storm sewer that may be subject to debris accumulation, such as locations downstream of wooded areas or cultivated fields, or exposed to high wear sites.

The following conduit materials are allowed for the following conduit types:

Type A Conduit – Culverts (Designer shall obtain approval of the County Engineer prior to specifying metallic conduit).

Reinforced concrete pipe	706.02
Reinforced concrete pipe, epoxy coated	706.03
Reinforced concrete elliptical pipe	706.04
Precast reinforced concrete box sections	706.05
Precast reinforced concrete 3-sided flat topped culverts	706.051
Precast reinforced concrete arch sections	706.052
Precast reinforced concrete round sections	706.053
Corrugated steel conduits (aluminized type 2 only)	707.01 or 707.02
Structural plate corrugated steel structures (aluminized type 2 only)	707.03
Precoated, galvanized steel culverts	707.04
Bituminous coated corrugated steel pipe and pipe arches with paved invert (aluminized type 2 only)	707.05 or 707.07
Corrugated aluminum alloy pipe	707.21 or 707.22
Aluminum alloy structural plate conduits	707.23
Corrugated steel box culverts	707.15
Corrugated aluminum box culverts	707.25
Polypropylene corrugated double wall pipe	707.65
Polypropylene triple wall pipe	707.69

Type B Conduit – Storm or sanitary sewers under pavement

Reinforced concrete pipe	706.02
Reinforced concrete elliptical pipe	706.04
Precast reinforced concrete box sections	706.05
Polyvinyl chloride corrugated smooth interior pipe	707.42
Polyvinyl chloride profile wall pipe	707.43
Polyvinyl chloride solid wall pipe	707.45
Polypropylene corrugated double wall pipe	707.65

Delaware County Supplement

Polypropylene triple wall pipe 707.69

Type C Conduit – Storm or sanitary sewers not under pavement

Reinforced concrete pipe 706.02
Reinforced concrete elliptical pipe 706.04
Precast reinforced concrete box sections 706.05
Corrugated polyethylene smooth lined pipe 707.33
Polyvinyl chloride corrugated smooth interior pipe 707.42
Polyvinyl chloride profile wall pipe 707.43
Polyvinyl chloride solid wall pipe 707.45
Polypropylene corrugated double wall pipe 707.65
Polypropylene triple wall pipe 707.69

Type D Conduit – Drive pipes and bikeways

Reinforced concrete pipe 706.02
Reinforced concrete elliptical pipe 706.04
Corrugated polyethylene smooth lined pipe 707.33
Polyvinyl chloride corrugated smooth interior pipe 707.42
Polyvinyl chloride profile wall pipe 707.43
Polyvinyl chloride solid wall pipe 707.45
Polypropylene corrugated single wall pipe 707.62
Polypropylene corrugated double wall pipe 707.65
Polypropylene triple wall pipe 707.69

Type E Conduit – Miscellaneous small drain connections and headers

Reinforced concrete pipe 706.02
Reinforced concrete elliptical pipe 706.04
Corrugated polyethylene smooth lined pipe 707.33
Polyvinyl chloride corrugated smooth interior pipe 707.42
Polyvinyl chloride profile wall pipe 707.43
Polyvinyl chloride solid wall pipe 707.45
Polypropylene corrugated single wall pipe 707.62
Polypropylene corrugated double wall pipe 707.65
Polypropylene triple wall pipe 707.69

Type F Conduits – Conduits on steep slopes; underdrain outlets

Corrugated aluminum alloy pipe (steep slope conduit) 707.21 or 707.22
Corrugated polyethylene smooth lined pipe
(underdrain outlets) 707.33
Smooth-wall polyvinyl chloride underdrain pipe
(non-perforated underdrain outlets) 707.41
Polyvinyl chloride corrugated smooth interior pipe 707.42
Polyvinyl chloride solid wall pipe (underdrain outlets) 707.45

1008.5 Precast Reinforced Concrete Box Culverts

Cast in place reinforced concrete wingwalls should be designed according to ODOT Box Culvert Headwall Design Data Sheets. 45 degree wingwalls are typically preferred except in cases where the culvert skew exceeds 10 degrees relative to the centerline of construction. Plan preparation for cast in place footings is preferred to follow the ODOT Sample Highway Plans and the CADD Manual

1008.6 Precast Reinforced Concrete Three-Sided Flat Topped Culverts

Cast in place reinforced concrete wingwalls should be designed according to ODOT Box Culvert Headwall Design Data Sheets. 45 degree wingwalls are typically preferred except in cases where the culvert skew exceeds 10 degrees relative to the centerline of construction. Plan preparation for cast in place footings is preferred to follow the ODOT Sample Highway Plans and the CADD Manual

1008.7 Precast Reinforced Concrete Arch Culverts

Precast wingalls and headwalls are preferred. The plans shall include non-proprietary details defining the dimensions of the wingwalls and headwalls and shall show limits of backfill from any anchoring devices. Plan preparation shall follow the ODOT Sample Highway Plans and the CADD Manual guidelines rather than incorporating proprietary manufacturer drawings into the plans. Manufacturers should be consulted in developing plans to ensure that the design does not conflict with the manufacturer's requirements. Manufacturer design may be used to assist with plan development.

1008.6 Precast Reinforced Concrete Round Sections

Precast wingalls and headwalls are preferred. The plans shall include non-proprietary details defining the dimensions of the wingwalls and headwalls and shall show limits of backfill from any anchoring devices. Plan preparation shall follow the ODOT Sample Highway Plans and the CADD Manual guidelines rather than incorporating proprietary manufacturer drawings into the plans. Manufacturers should be consulted in developing plans to ensure that the design does not conflict with the manufacturer's requirements. Manufacturer design may be used to assist with plan development.

Location and Design Manual, Volume 3

1500 Plan Related Actions

1504.1.2 Projects Administered through the Local Public Agency (LPA) Policy

The final plan submission shall conform to 1504.1.1 except as follows.

- LD-33, County Engineer Approval Form not required for County Engineer projects.
- LD-4 Estimating Form is not required. Design estimate shall be prepared in Estimator or other format acceptable to the County Engineer and included in final plan submission.
- Electronic image format shall be PDF with all plan sheets in one file, set up for 11" x 17" printing without adjustment to scale.

Appendix B

In addition to the applicable ODOT notes, include applicable Delaware County roadway, erosion control, drainage, pavement, maintenance of traffic, structure and other notes listed on the Design Resource Page at www.co.delaware.oh.us/engineer/drp.htm.

Traffic Engineering Manual

300 Markings

301-4 Longitudinal Markings

The standard width for centerlines on **County or Township**-maintained highways shall be 5 inches. The standard width for channelizing lines on **County or Township**-maintained highways shall be 10 inches.

All other markings shall be as specified in the ODOT TEM.