

**CUYAHOGA COUNTY
DEPARTMENT OF PUBLIC WORKS**

**CUYAHOGA COUNTY ENGINEER
DESIGN STANDARDS**



Supplement to
O.D.O.T Location and Design Manual
Volume I – Roadway Design

June 22, 2011

Revisions to the August 26, 2008 edition
are noted by a vertical line in the right page margin.

Preface

Volume One of the Ohio Department of Transportation (ODOT) Location and Design (L&D) Manual, except as modified herein, is considered applicable to all Cuyahoga County sponsored Highway/Bridge improvements. In order to facilitate cross-referencing, the topic headings and section numbers used in this manual correspond to those in the L&D Manual. Where references are made to the State, Bureau/Engineer of Location and Design, or any other term designating any representative or employee of the State, or the Department of Transportation, as found in Volume I of the O.D.O.T. L&D Manual, such references shall mean Cuyahoga County, the Cuyahoga County Department of Public Works, the Cuyahoga County Engineer, the Cuyahoga County Chief Highway Design Engineer and the Cuyahoga County Chief Bridge Design Engineer.

For the purposes of applying design standards, the Cuyahoga County Department of Public Works' Cuyahoga County Engineer projects shall be grouped into three (3) categories as follows:

1. Maintenance Resurfacing
2. Resurfacing, Restoration and Rehabilitation (3R) Projects
3. New Construction

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* O.D.O.T. Pavement Design and Rehabilitation Manual

I. Maintenance Resurfacing Projects

The purpose/scope of a maintenance-resurfacing project is to restore pavement structure and smoothness while retaining the existing line, grade and geometrics of the facility.

For each project of this type the Cuyahoga County Traffic Engineer shall field verify that any potential safety hazards are properly signed and that sufficient warning devices and protective barriers exist. The project must correct any deficient signing, pavement marking, warning devices and/or protective barriers.

II. Resurfacing, Restoration and Rehabilitation (3R) Projects

The purpose/scope of a 3R project is as stated in Section 900 of the ODOT L&D Manual, Volume I. The design standards utilized for these types of projects shall be as stated in Section 900 of the L&D Manual with the following exceptions:

(900) Non-Freeway Resurfacing, Restoration and Rehabilitation (3R) Improvements

903 - 3R Horizontal Alignment

903.1 - Horizontal Curves

- B. The existing horizontal curve may be retained if the existing degree of curve provides an actual design speed that is not lower than ten (10) MPH below the legal speed limit for the facility.

903.2 - Superelevation

- Existing superelevation may be retained.

904 - 3R Vertical Alignment

904.2 - Crest Vertical Curves

- The existing crest vertical curve may be retained if the existing crest vertical curve design speed based on minimum sight distance is ten (10) MPH or less below the legal speed limit of the facility and the existing crest vertical curve does not hide from view a potential problem area, such as: an intersection, a sharp horizontal curve or a narrow bridge.

905 - 3R Cross-Section Elements

905.11 - Lane Width

- The minimum lane width for both curbed and uncurbed pavement shall be ten (10) feet regardless of functional classification. The curbed shoulder (offset) width shall be one (1) foot desirable, zero (0) feet minimum.

905.12 - Shoulder Width

- Minimum graded shoulder width for uncurbed pavements (with or without guardrail) shall be four (4) feet for facilities with an ADT of 7,500 or more and two (2) feet for facilities with an ADT less than 7,500. Minimum guardrail (face) offset distance shall not be less than the minimum graded shoulder widths noted above.

905.13 - Pavement Cross Slopes

- As stated except that parabolic cross-slopes may be retained if prior history indicates an absence of drainage or accident problems.

906 - 3R Special Considerations

906.1 - Clear Zone

- The clear zone width shall not be less than the minimum graded shoulder widths as stated in 905.12 above for uncurbed pavement.

907 - Pavement Rehabilitation

- Pavement repair/replacement sections shall be constructed as specified by the Designer and approved by the Cuyahoga County Engineer.

III. New Construction Projects

The design standards for new construction projects including pavement replacement projects shall be as stated in the ODOT L&D Manual, Volume 1 with the following exceptions:

(300) Cross Section Design

301 - Roadway Criteria

301.1.2 - Lane Width

- Lane widths for both curbed and uncurbed roads shall be twelve (12) feet desirable, eleven (11) feet minimum. Curbed shoulder width (offset) shall be two (2) feet desirable, one (1) foot minimum.

301.2.3 - Shoulder Width

- Graded shoulder widths shall be eight (8) feet desirable, four (4) feet minimum without barrier, foreslope 4:1 or flatter.
- Graded shoulder widths shall be ten (10) feet desirable, six (6) feet minimum with barrier, or foreslope steeper than 4:1.
- Minimum treated shoulder width shall be four (4) feet.
- Face of guardrail (where required) shall be placed at the back edge of graded shoulder.

306 - Pedestrian Facilities

306.2.3 – Obstacles and Protruding Obstructions

- A minimum of four (4) foot clear/unobstructed sidewalk width shall be maintained at all times.

306.2.5 – Grade and Cross Slope

- Transverse slopes shall be 0.02 typical/maximum and 0.01 minimum.

306.2.6 - Surface Treatments

- A two (2) inch compacted screenings bed shall be furnished and placed beneath all concrete walks.

(400) Geometric Design

401 – Intersections at Grade

401.6.1 – Left Turn Lanes

- Condition (A) from Figure 401-9 shall be used to determine storage length. Desirable minimum storage length shall be one hundred ten (110) feet. Absolute minimum storage length shall be eighty (80) feet.

(800) Access Control, Right-of-Way Use Permits and Drive Design

801 – Access Control

802 - Highway Use Permits

Not Applicable

- Access control, including the issuance of use permits, on county roads within a municipality is under the jurisdiction of the municipality.
- Access control, including the issuance of use permits, on county roads within townships is under the jurisdiction of the Cuyahoga County Engineer.

803 - Drive Geometric Design

804 - Drive Profile Design

Not Applicable

- Drive design on county roads within a municipality is under the jurisdiction of the municipality. The information contained in sections 803 and 804 is applicable as a “design guide” only.
- Drive design on county roads within a township is under the jurisdiction of the Cuyahoga County Engineer. The information contained in sections 803 and 804 is applicable as a “design guide” only.

805 - Drive Pavement Design

Not Applicable

- Residential and commercial drive pavement design on county roads within a municipality shall be designed/developed in accordance with any and all applicable municipal design standards and/or ordinances.
- Residential and commercial drive pavement design on county roads within a township shall minimally conform to the Cuyahoga County Engineer’s Construction Drawing BP-4.1C.

***Pavement Design**

Pavement design for Cuyahoga County roads shall be determined using The O.D.O.T. Pavement Design and Rehabilitation Manual. Updated traffic counts should be taken on projects involving high truck volumes in order to obtain an accurate B:C ratio for design purposes.

The minimum pavement thickness for Cuyahoga County sponsored new construction projects shall be as follows:

A) Rigid Pavement

Arterials

Collectors w/ $(ADT \times T24) \geq 750$

Item 451 – Reinforced Concrete Pavement 10 inches (**)

Item 304 – Aggregate Base, As Per Plan 6 inches

All Other County Roads

Item 451 – Reinforced Concrete Pavement 9 inches (**)

Item 304 – Aggregate Base, As Per Plan 6 inches

** At the approval of the involved municipality(ies), an equal depth of Item 452-Non-Reinforced Concrete Pavement may be used in lieu of the 451 pavement.

B) Flexible Pavement

Arterials

Collectors w/ $(ADT \times T24) \geq 750$

Item 448 – Asphalt Concrete 3 inches

Item 302 – Asphalt Concrete Base 9 inches

Item 304 – Aggregate Base, As Per Plan 6 inches

All Other County Roads

Item 448 – Asphalt Concrete 3 inches

Item 302 – Asphalt Concrete Base 8 inches

Item 304 – Aggregate Base, As Per Plan 6 inches

* O.D.O.T. Pavement Design and Rehabilitation Manual