



# Table of Contents

## Chapter 5 - Roadway Design

### 5A General Information

5A-1-----General Information	1
A. Concept.....	1
B. References.....	1

### 5B Street Classifications

5B-1-----Street Classifications	1
A. General.....	1
B. Arterial Streets.....	1
C. Collector Streets.....	2
D. Local Streets.....	2
E. Private Streets.....	2

### 5C Geometric Design Criteria

5C-1-----Geometric Design Tables	1
A. General.....	1
B. Design Controls and Criteria.....	1
C. Roadway Design Tables.....	3
D. References.....	9
5C-2-----Geometric Design Elements	1
A. Level of Service.....	1
B. Sight Distance.....	2
C. Horizontal Alignment.....	6
D. Vertical Alignment.....	9
E. Pavement Crowns.....	12
F. Lane Width.....	12
G. Two-way Left-turn Lanes.....	12
H. Raised Median Width.....	13
I. Bridges.....	13
J. Clear Zone.....	13
K. Object Setback.....	15
L. Border Area.....	15
M. Curbs.....	15
N. Parking Lane.....	16
O. Cul-de-sacs.....	16
P. Shoulder Width.....	16
Q. Intersection Radii.....	17
R. Pavement Thickness.....	17
S. References.....	17

**5D HMA Pavement Mixture Selection**

5D-1-----HMA Pavement Mixture Selection	
A. Scope.....	1
B. Definitions.....	1
C. Design Checklist.....	2
D. Material Properties.....	5
E. Use of Mixture Selection Guide and Design Criteria Tables.....	6
F. Example Plans.....	6
G. Examples for Determination of Traffic ESALs.....	7
H. Tables and Figures.....	8

**5E PCC Pavement Mixture Selection**

5E-1-----PCC Pavement Mixture Selection	
A. General Information.....	1
B. Cementitious Materials.....	1
C. Supplementary Cementitious Materials.....	3
D. Aggregates.....	6
E. Chemical Admixtures.....	9
F. Water.....	10
G. Air-entrainment.....	10
H. Slump.....	11
I. Concrete Mixtures.....	12
J. References.....	15

**5F Pavement Thickness Design**

5F-1-----Pavement Thickness Design	
A. General.....	1
B. Pavement Thickness Design Parameters.....	2
C. Calculating ESAL Values.....	9
D. Determining Pavement Thickness.....	14
E. Example Pavement Thickness Design Calculations.....	19
F. References.....	22

**5G PCC Pavement Joints**

5G-1-----General Information for Joints	
A. General Information.....	1
B. Crack Development.....	2
C. Crack Control.....	3
D. Considerations for Good Pavement Jointing.....	4
E. Load Transfer.....	5
5G-2-----Types of Joints	
A. Jointing.....	1
B. Joint Spacing.....	1
C. Joint Types.....	1
D. Transverse Dowel Bar Size and Length.....	14
E. Joint Reinforced Concrete Pavements.....	14
F. Miscellaneous PCC Pavement Jointing Figures.....	17
G. References.....	22

5G-3-----	Jointing Urban Intersections	
A.	Jointing Urban Transition Areas.....	6
B.	Jointing Cul-de-sacs.....	15
5G-4-----	Jointing Rural Intersections	
A.	Example 1: T-Intersection.....	1
B.	Example 2: Intersection at a Divided Highway.....	4
5G-5-----	Jointing Concrete Overlays	
A.	General Information.....	1
B.	Bonded Concrete Overlays.....	1
C.	Unbonded Concrete Overlays.....	2
D.	References.....	4
<b>5H</b>	<b>Railroad Crossings</b>	
5H-1-----	Railroad Crossings	
A.	Railroad Crossing Improvements.....	1
B.	Railroad Crossing Construction.....	1
C.	Working with a Railroad.....	1
D.	Railroad Related Agencies in Iowa.....	2
E.	Railroad Companies in Iowa.....	2
<b>5I</b>	<b>Access Management</b>	
5I-1-----	General Access Management	
A.	General Information.....	1
B.	Access Permit Procedure.....	1
C.	Definitions.....	1
D.	Entrance Type.....	2
E.	Access Management Principles.....	2
F.	References.....	3
5I-2-----	Transportation System Considerations	
A.	Provide a Specialized Roadway System (Principle 1).....	1
B.	Limit Direct Access to Major Roadways (Principle 2).....	1
C.	Promote Intersection Hierarchy (Principle 3).....	1
D.	Locate Signals to Favor through Movements (Principle 4).....	1
E.	Provide a Supporting Street and Circulation System (Principle 10).....	2
5I-3-----	Access Location, Spacing, Turn Lanes, and Medians	
A.	Preserve the Functional Area of Intersections and Interchanges (Principle 5).....	1
B.	Limit the Number of Conflict Points (Principle 6).....	2
C.	Separate Conflict Areas (Principle 7).....	2
D.	Remove Turning Traffic from Through-traffic Lanes (Principle 8).....	7
E.	Use Nontraversable Medians to Manage Left Turn Movements (Principle 9).....	8
F.	References.....	10

5I-4-----Driveway Design Criteria

- A. General.....1
- B. Width Measurement.....1
- C. Dimensions.....2
- D. Sight Distance.....4
- E. Driveway Grades.....5
- F. Other Criteria.....7
- G. References.....8

**5J Traffic Impact Studies**

5J-1-----Traffic Impact Studies

- A. General.....1
- B. Study Process.....1
- C. Iowa DOT Access Permits.....3
- D. References.....3