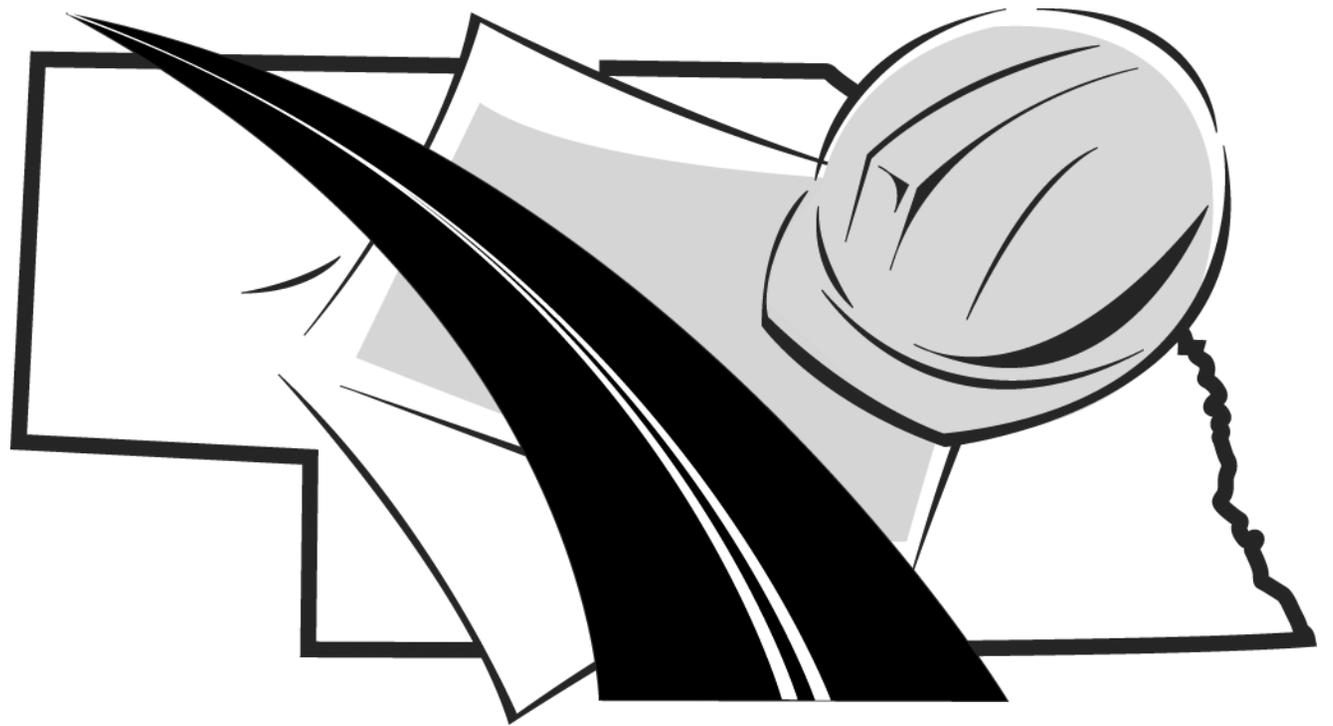


**Board of Public Roads  
Classifications &  
Standards**

**2 0 0 8**



# **Nebraska Minimum Design Standards**



**Counties, Municipalities, State**

This manual is distributed as a service to county highway and city street superintendents, county and municipal clerks, state officials, and other interested persons. For additional information, please contact:

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**NEBRASKA ADMINISTRATIVE CODE**

**Title 428 - BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS**

**Chapter 2 - Procedures for Standards**

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Title 428 - BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
Chapter 2 - Procedures for Standards

001 MINIMUM DESIGN STANDARDS.

Copies of the most current editions of the following documents referred to in the Standards are on file in the NDOR Central Administration Complex, 1500 Highway 2, Lincoln, Nebraska:

- AASHTO "A Policy on Geometric Design of Highways and Streets"
- AASHTO "A Policy on Design Standards — Interstate System"
- NDOR "Nebraska National Highway Functional Classification" Map
- NDOR "Nebraska State Highway Functional Classification" Map
- NDOR "State Functional Classification" Maps (Counties and Municipalities)
- NDOR "Nebraska Interstate and Priority Commercial Systems" Map

The following abbreviations and symbols are used in the Standards:

3R	Resurfacing, Restoration and Rehabilitation
'	foot or feet
AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
Board	Board of Public Roads Classifications and Standards
⊕	centerline
Div.	divided
ft	foot or feet
HL93	AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specification
Lt.	left
mph	miles per hour
N/A	not applicable
NDOR	Nebraska Department of Roads
RSAP	Roadside Safety Analysis Program
Rt.	right
%	percent

The following definitions apply only to the State Highway System:

- Soft conversion: Changing to the exact calculated metric number.
- Reconstructed bridge work includes replacement of the entire superstructure.



**Part One**  
**State Highway System**

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

**MINIMUM DESIGN STANDARDS - PART ONE  
STATE HIGHWAY SYSTEM**

**001.01 MINIMUM DESIGN STANDARDS — NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS**

Any relaxation of these standards must have written approval by the Board.

For metric units, use a soft conversion of the English unit.

(1) Design Year Traffic	Design Number	(2) State Functional Classification	(3) National Functional Classification	Terrain	Maximum Grade	(4) Design Speed	(5) Horizontal Curve Radius	Number of Lanes	Lane Width	Median Width	Shoulder Width	Shoulder Surfacing Width	(6) Lateral Obstacle Clearance and Hinge Point Distance
N/A	DR1	Interstate	Interstate	Level Rolling	3% 4%	70 mph	1810'	4 Div. C	12'	36'	6' Lt. 12' Rt.	4' Lt. 10' Rt.	35'
N/A	DR2	Expressway	Arterial	Level Rolling	3% A 4% A	65 mph	1480'	4 Div. C	12'	36' E	5' Lt. 10' Rt.	3' Lt. 8' Rt.	30'
4,000 ADT & Over	DR3	Major Arterial	Arterial Arterial Collector Collector	Level Rolling Level Rolling	3% A 4% A 5% B 6% B	60 mph	1200'	2 D	12'	None	10'	8'	30'
2,000 - 3,999 ADT	DR4	Major Arterial	Arterial Arterial Collector Collector	Level Rolling Level Rolling	3% A 4% A 5% B 6% B	60 mph	1200'	2	12'	None	8'	2' G	30'
400 - 1,999 ADT	DR5	Major Arterial	Arterial Arterial Collector Collector	Level Rolling Level Rolling	3% A 4% A 5% B 6% B	60 mph	1200'	2	12'	None	6' F	None G, H	23'
Under 400 ADT	DR6	Major Arterial	Arterial Arterial Collector Collector	Level Rolling Level Rolling	3% B 4% B 5% B 6% B	60 mph	1200'	2	12'	None	4'	None H	16'

Note: The Board's "Section 001.12 Minimum Design Standards - New and Reconstructed Municipal State Highways" and "Section 001.13 Minimum Design Standards - Bridges on Municipal State Highways" may be used in areas inside the municipal zoning boundaries outside the corporate limits, or in rural areas that demonstrate urban traffic characteristics.

- (1) "Design Year" shall be year of initial construction plus 20 years.
  - (2) Refer to NDOR "Nebraska State Highway Functional Classification" Map.
  - (3) Refer to NDOR "Nebraska National Highway Functional Classification" Map.
  - (4) The design speed should be equal to or greater than the anticipated posted speed limit.
  - (5) Based on the 2004 edition of AASHTO "A Policy on Geometric Design of Highways and Streets" e max = 8%.
  - (6) This area, measured from the edge of the through driving lane, shall have 6:1 side slopes or flatter which may have crashworthy or break-away obstacles and shall be free of non-shielded obstacles except:
    - (a) Traffic signal poles, railroad signals, railroad tracks, bridge rails, ditches, driveways, intersections, bike/pedestrian paths, earth dikes, curbs, raised islands, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts with flared end sections, erosion control devices, fire hydrants, and traffic control devices;
    - (b) Other obstacles if the NDOR, in its sole discretion, determines based upon an accident review and a Roadside Safety Analysis Program (RSAP) review or a comparable AASHTO approved economic analysis, that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
- A Maximum grade may be one percent steeper for tangent lengths less than 500 ft.  
 B Maximum grade may be two percent steeper for tangent lengths less than 500 ft.  
 C Over 30,000 ADT the appropriate number of lanes will be determined by a special study.  
 D Over 9,000 ADT the appropriate number of lanes will be determined by a special study. If 4 lanes are required, use DR2 standards.  
 E Median widths of 16 ft are allowed with the approval of the Director or his/her designee based on NDOR Traffic Division recommendation.  
 F 8 ft if on Priority Commercial System, refer to NDOR "Nebraska Interstate and Priority Commercial Systems" Map.  
 G 6 ft if on Priority Commercial System, refer to NDOR "Nebraska Interstate and Priority Commercial Systems" Map.  
 H 2 ft in Sandhills, as designated in NDOR Pavement Management System.

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

001.02 MINIMUM DESIGN STANDARDS — BRIDGES ON RURAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.

For metric units, use a soft conversion of the English unit.

(1) Design Year Traffic	Design Number	(2) State Functional Classification	(3) National Functional Classification	NEW BRIDGES			RECONSTRUCTED BRIDGES			(4) BRIDGES TO REMAIN IN PLACE	
				Roadway Width	Design Loading	Vertical Clearance	Roadway Width	Design Loading	Vertical Clearance	Roadway Width	Vertical Clearance
N/A	DR1	Interstate	Interstate	42'	HL93	16'	42'	HL93	16'	38'	16'
N/A	DR2	Expressway	Arterial	39'	HL93	16'	39'	HL93	16' C	35'	16' C
4,000 ADT & Over	DR3	Major Arterial	Arterial or Collector	44' A	HL93	16'	44' A	HL93	14.5'	30'	14.5'
2,000 - 3,999 ADT	DR4	Major Arterial	Arterial or Collector	40' A	HL93	16'	40' A	HL93	14.5'	28'	14.5'
400 - 1,999 ADT	DR5	Major Arterial	Arterial Collector	36' B 32'	HL93	16'	36' B 32'	HL93	14.5'	28' 26'	14.5'
Under 400 ADT	DR6	Major Arterial	Arterial Collector	32' 28'	HL93	16'	32' 28'	HL93	14.5'	28' 24'	14.5'

Note: The Board's "Section 001.12 Minimum Design Standards - New and Reconstructed Municipal State Highways" and "Section 001.13 Minimum Design Standards - Bridges on Municipal State Highways" may be used in areas inside the municipal zoning boundaries outside the corporate limits, or in rural areas that demonstrate urban traffic characteristics.

- (1) "Design Year" shall be year of initial construction plus: (a) 20 years for new and reconstructed bridges, or (b) the expected life of the surfacing up to 20 years for bridges to remain in place.
- (2) Refer to NDOR "Nebraska State Highway Functional Classification" Map.
- (3) Refer to NDOR "Nebraska National Highway Functional Classification" Map.
- (4) Structural Capacity - A bridge can remain in place if the operating rating capacity can safely service the system for an additional 20 years of service life (*i.e. bridge does not require load posting*).
  - A 36 ft allowed for bridges over 200 ft in length.
  - B 40 ft if on Priority Commercial System; 36 ft when over 200 ft in length. Refer to NDOR "Nebraska Interstate and Priority Commercial Systems" Map.
  - C 14.5 ft for non-freeway.

Section 001.03 Standards do not apply to Curbed Urban Highways or Reduced Speed Zone Highways. See Section 001.14.

001.03 MINIMUM DESIGN STANDARDS — RESURFACING.

RESTORATION AND REHABILITATION (3R) PROJECTS ON RURAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.

For metric units, use a soft conversion of the English unit.

Interstate – The standards used for horizontal alignment, vertical alignment, and widths of median, traveled way, and shoulders for projects may be the AASHTO interstate standards that were in effect at the time of the latest new and reconstructed project on the section of Interstate.

(1) Design Year Traffic	Grade	(2) Horizontal Curve	Number of Lanes	Lane Width	Shoulder Width	Shoulder Surfacing Width	(3) Fixed Obstacle Clearance	Stopping Sight Distance	(4) Fill Slopes
4,000 ADT & Over	Existing	Existing	2	12'	8' A	6' A	25'	B	Existing
2,000 - 3,999 ADT	Existing	Existing	2	12'	6' A	2' A	20'	C	Existing
750 - 1,999 ADT	Existing	Existing	2	12'	3' A	Existing A	12'	D	Existing
Under 750 ADT	Existing	Existing	2	11'	2'	Existing	12'	D	Existing

- (1) "Design Year" shall be year of initial construction plus the expected life of the surfacing up to 20 years.
- (2) Horizontal curves not providing posted speed may have advisory curve and speed reduction signs.
- (3) This area, measured from the edge of the through driving lane, may have crashworthy or break-away obstacles and shall be free of non-shielded obstacles except:
  - (a) Traffic signal poles, railroad signals, railroad tracks, bridge rails, ditches, side slopes, driveways, intersections, bike/pedestrian paths, earth dikes, parallel drainage culverts, curbs, raised islands, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts with flared end sections, erosion control devices, fire hydrants, and traffic control devices;
  - (b) Other obstacles if the NDOR, in its sole discretion, determines based upon an accident review and a Roadside Safety Analysis Program (RSAP) review or a comparable AASHTO approved economic analysis, that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.  
For Scenic-Recreation projects, this width is the shoulder width.
- (4) Fill slopes shall be shielded if warranted by a cost-benefit analysis.
  - A If a 4-lane divided facility exists, the minimum inside shoulder width is 3 ft with 2 ft surfaced.
  - B An average of one vertical curve per mile will be allowed below 55 mph minimum AASHTO stopping sight distance, however, no sag vertical less than 40 mph or crest vertical below 45 mph will be allowed.
  - C An average of two vertical curves per mile will be allowed below 55 mph minimum AASHTO stopping sight distance, however, no sag vertical less than 35 mph or crest vertical below 40 mph will be allowed.
  - D 40 mph minimum AASHTO stopping sight distance for crest vertical curves and existing conditions for sag vertical curves.

Chapter 2 — Procedures for Standards (Continued)

001.04 MINIMUM DESIGN STANDARDS — SCENIC - RECREATION - RURAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.

For Scenic - Recreation - Internal — Minimum design standards within the scenic - recreation area shall be consistent with the established speed limits according to the 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” and the topography and use of the facility.

Bridges and 3R projects refer to the Board’s “Section 001.02 Minimum Design Standards - Bridges on Rural State Highways” and “Section 001.03 Minimum Design Standards - Resurfacing, Restoration and Rehabilitation (3R) Projects on Rural State Highways.”

For metric units, use a soft conversion of the English unit.

(1) Design Year Traffic	(2) Maximum Grade	Design Speed	(3) Horizontal Curve Radius	Number of Lanes	Lane Width	Shoulder Width	(4) Lateral Obstacle Clearance
2,000 ADT & Over	6%	50 mph	758'	2	12'	8'	10'
400 - 1,999 ADT	6%	50 mph	758'	2	12'	6'	8'
Under 400 ADT	7%	40 mph A	444' A	2	11'	4'	6'

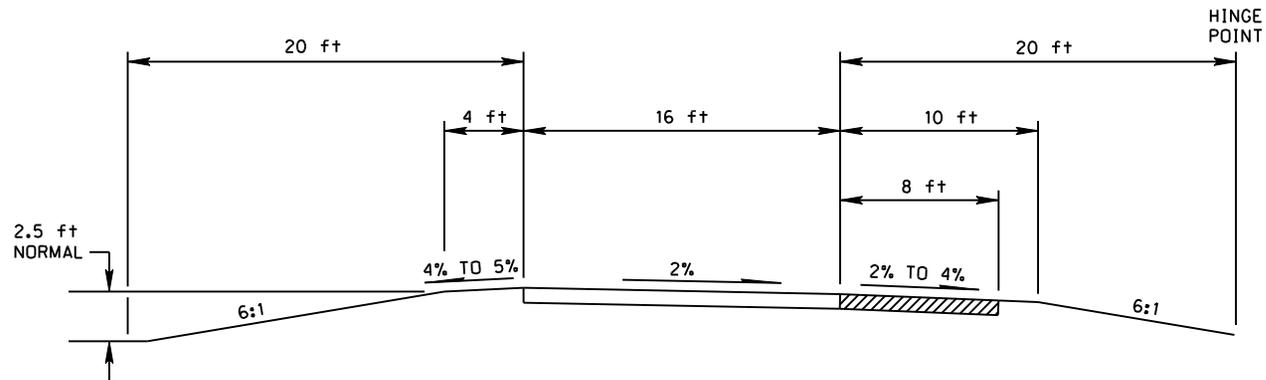
Note: The 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” should be used for other design criteria.

Speed limits established for these routes shall be those as determined through an engineering and traffic investigation of the area by the Department of Roads.

Effort shall be made to preserve the natural environment to the extent possible without compromising the safety of those using the facility, at the speed limits that apply.

- (1) “Design Year” shall be year of initial construction plus: (a) 20 years for new and reconstructed, or (b) the expected life of the surfacing up to 20 years for 3R.
  - (2) The maximum grade for rolling terrain may be two percent steeper for tangent lengths less than 500 ft and one-way downgrades. For extreme cases, at some underpass and bridge approaches, steeper grades for relatively short lengths may be used.
  - (3) Based on the 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” e max = 8%.
  - (4) This area, measured from the edge of the through driving lane, shall have 6:1 side slopes or flatter which may have crashworthy or break-away obstacles and shall be free of non-shielded obstacles except:
    - (a) Traffic signal poles, railroad signals, railroad tracks, bridge rails, ditches, driveways, intersections, bike/pedestrian paths, earth dikes, curbs, raised islands, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts with flared end sections, erosion control devices, fire hydrants, and traffic control devices;
    - (b) Other obstacles if the NDOR, in its sole discretion, determines based upon an accident review and a Roadside Safety Analysis Program (RSAP) review or a comparable AASHTO approved economic analysis, that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
- A Minimum design standards for speed and horizontal curve radius within the scenic - recreation area shall be consistent with the established speed limits according to the 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” and the topography and use of the facility.

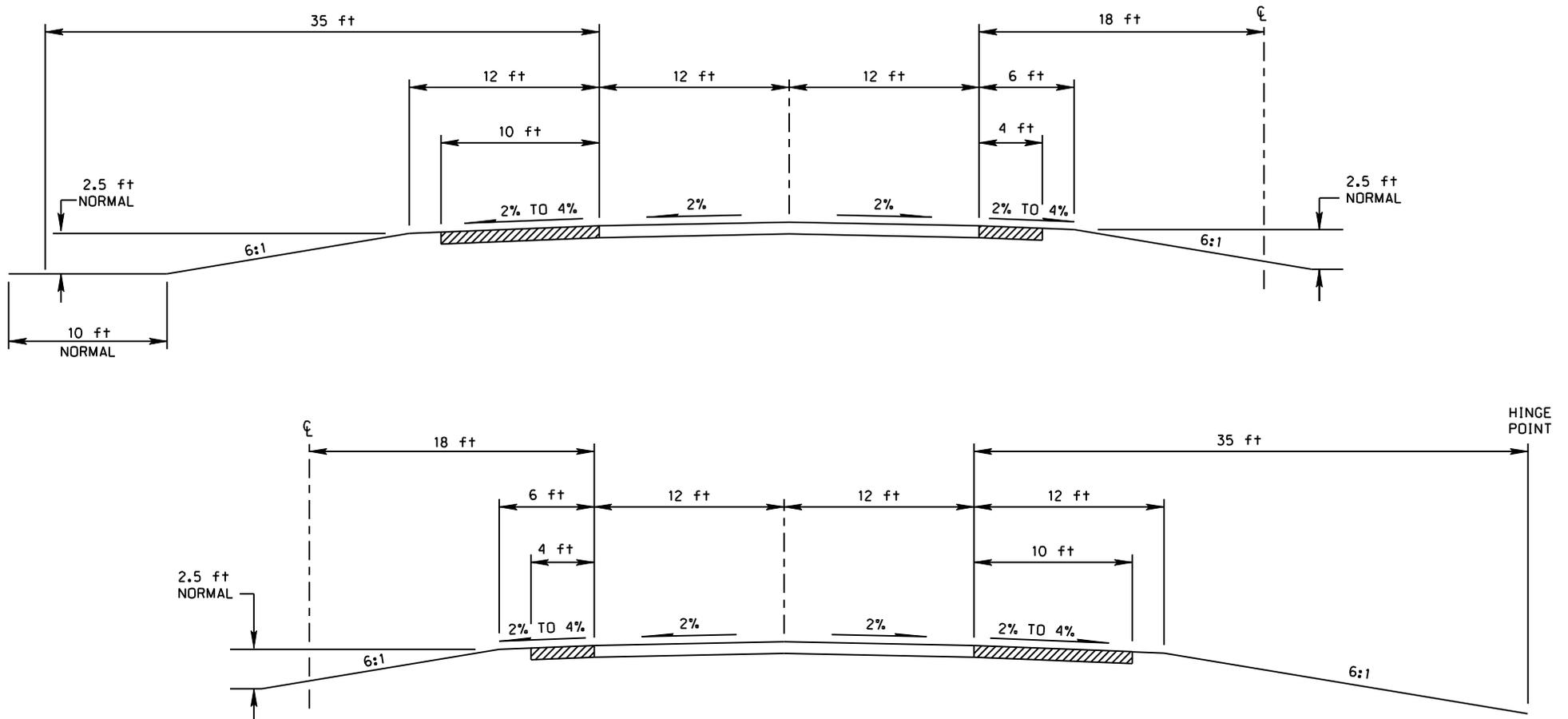
001.05 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED STATE HIGHWAYS : INTERSTATE INTERCHANGE RAMP



INTERSTATE INTERCHANGE RAMP

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 CHAPTER 2 -- Procedures For Standards (Continued)

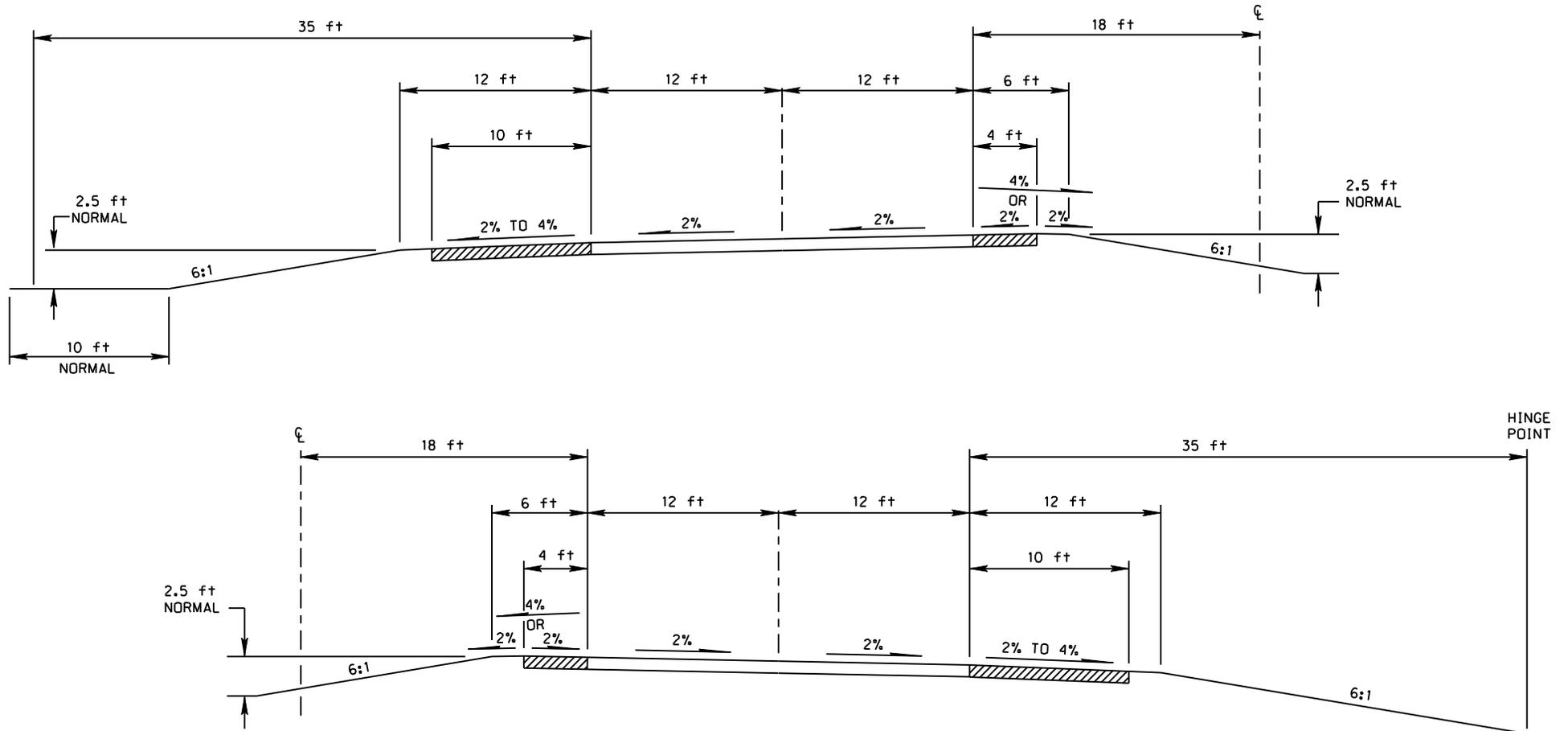
001.06 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR1 (CROWNED)



DR 1 (CROWNED)

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 CHAPTER 2 -- Procedures For Standards (Continued)

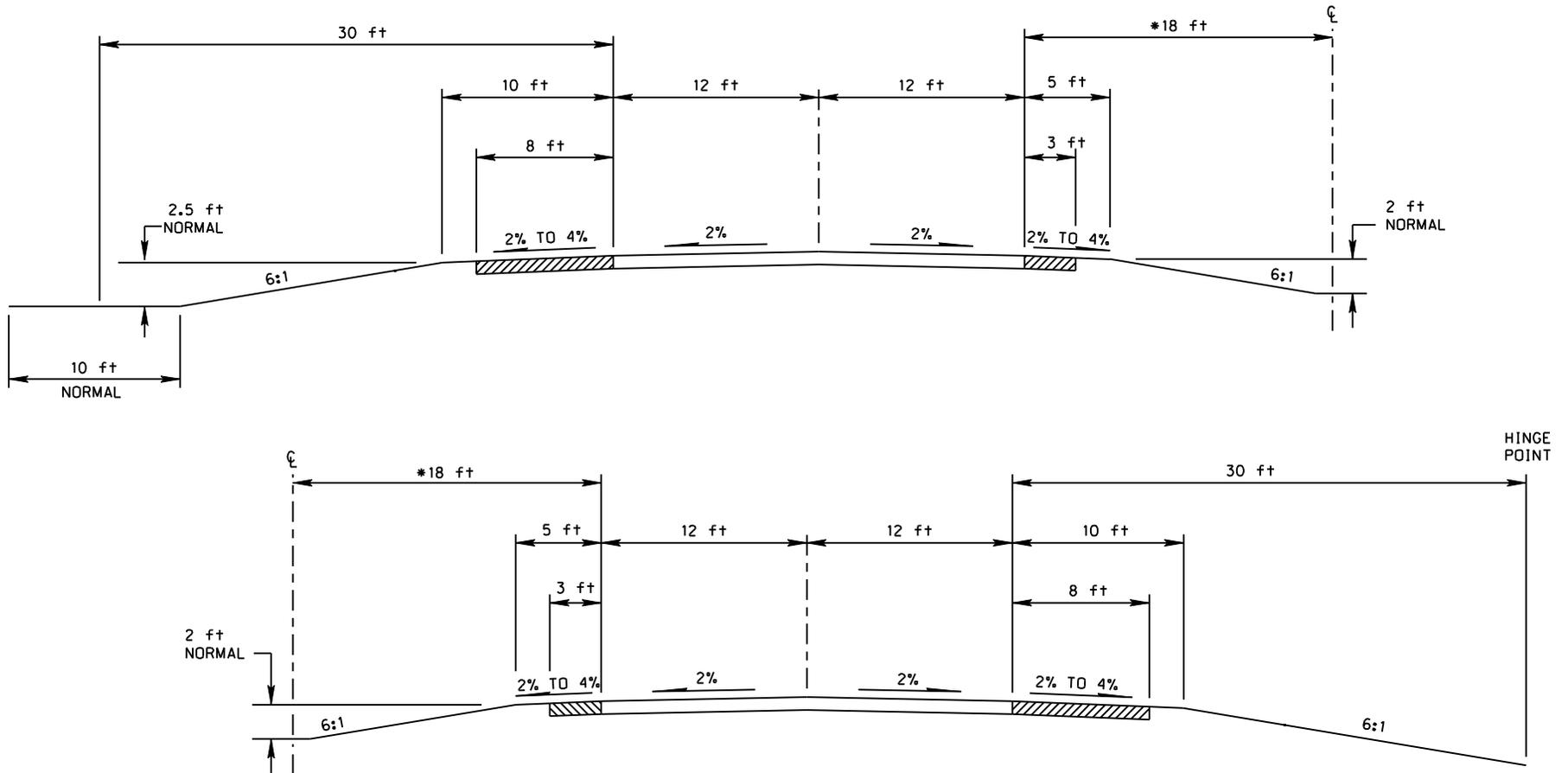
001.06A - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR1 (TANGENT)



DR 1 (TANGENT)

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
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001.07 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR2 (CROWNED)



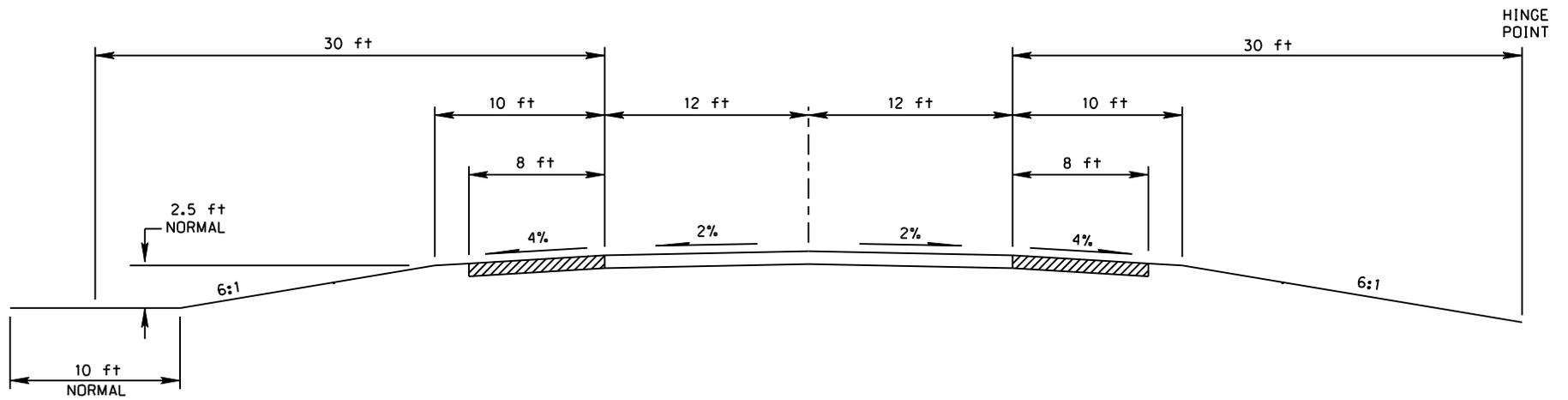
\* REFER TO THE BOARD'S "SECTION 001.1 MINIMUM DESIGN STANDARDS - NEW & RECONSTRUCTED RURAL STATE HIGHWAYS". FOOTNOTE E

DR 2 (CROWNED)



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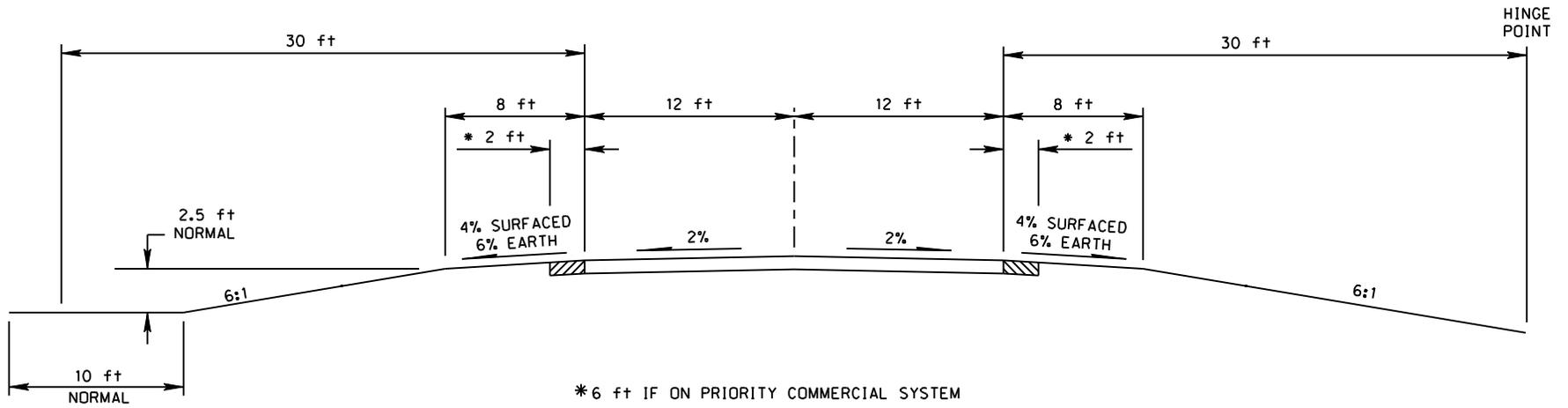
001.08 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR3



DR 3

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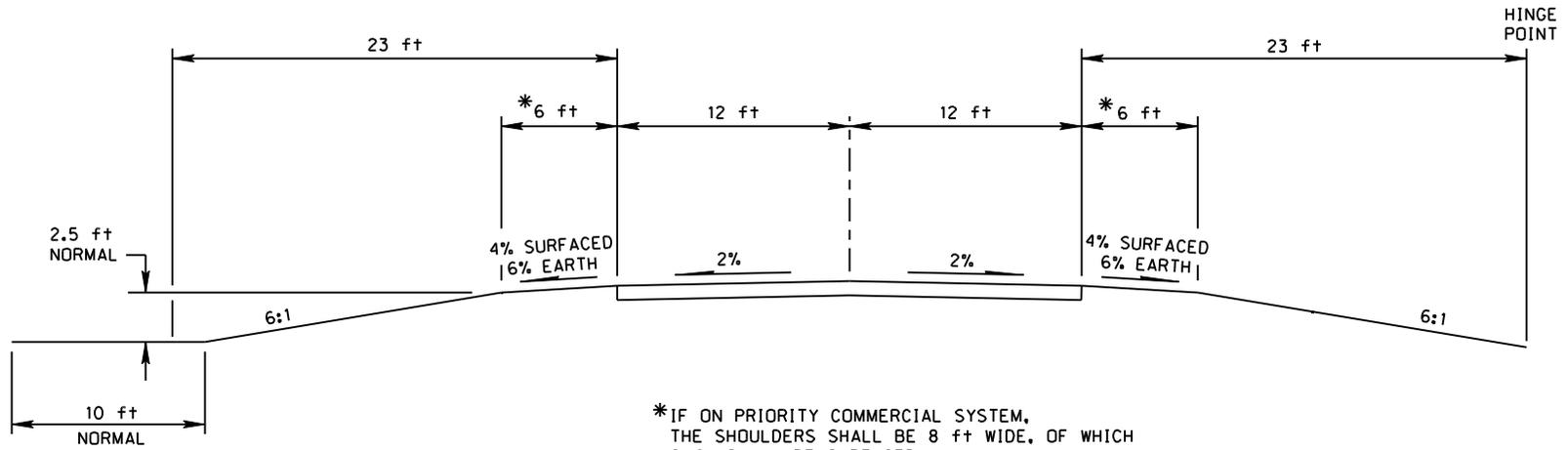
001.09 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR4



DR 4

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
 CHAPTER 2 -- Procedures For Standards (Continued)

001.10 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR5



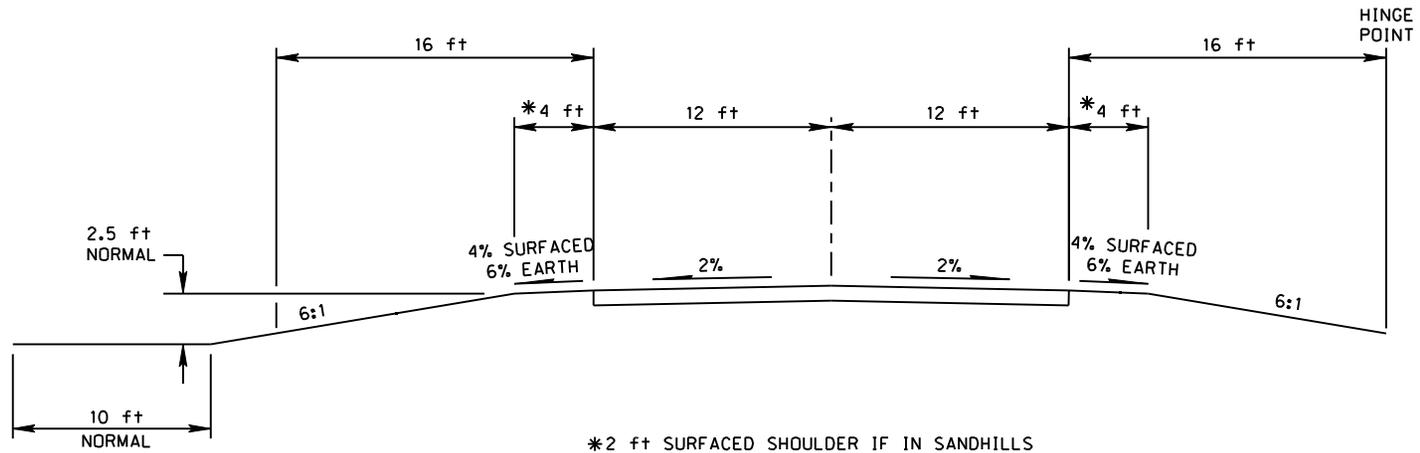
\*IF ON PRIORITY COMMERCIAL SYSTEM,  
 THE SHOULDERS SHALL BE 8 ft WIDE, OF WHICH  
 6 ft SHALL BE SURFACED

\* 2 ft SURFACED SHOULDER IF IN SANDHILLS

FOOTNOTE:  
 EXISTING SURFACING ALLOWED

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
CHAPTER 2 -- Procedures For Standards (Continued)

001.11 - TYPICAL CROSS SECTION OF IMPROVEMENT FOR NEW AND RECONSTRUCTED RURAL STATE HIGHWAYS: DR6



\*2 ft SURFACED SHOULDER IF IN SANDHILLS

FOOTNOTE:  
EXISTING SURFACING ALLOWED

DR 6

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

001.12 MINIMUM DESIGN STANDARDS — NEW AND RECONSTRUCTED MUNICIPAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.  
For metric units, use a soft conversion of the English unit.

(1) State Functional Classification	(2) National Functional Classification	(3) Design Speed	Horizontal Curve Radius	Terrain	Maximum Grade	(4) Number of Lanes	Median Width	Lane Width	Shoulder Width	Shoulder Surfacing Width	(5) Lateral Clearance	
											Posted Speed Below 50 mph	Posted Speed 50 mph and Above
Interstate	Interstate	50 mph	758' A	Level Rolling	4% C 5% C	4	10'	12'	6' Lt., 12' Rt.	4' Lt., 10' Rt.	N/A	30'
Expressway	Arterial	50 mph	758' A	Level Rolling	4% C 5% C	4	10'	12'	5' Lt., 10' Rt.	3' Lt., 8' Rt.	N/A	30'
Major Arterial	Arterial	30 mph	250' B	Level Rolling	8% C 9% C	2	None	11' E	F	F	15' G	F, G
Major Arterial	Collector	30 mph	250' B	Level Rolling	9% D 11% D	2	None	11' E	F	F	15' G	F, G

- (1) Refer to NDOR “Nebraska State Highway Functional Classification” Map.
- (2) Refer to NDOR “Nebraska National Highway Functional Classification” Map.
- (3) The design speed should be equal to or greater than the anticipated posted speed limit.
- (4) The actual number of lanes for design shall be based on a capacity analysis using design year traffic and the selected level of service to be obtained. “Design Year” shall be year of initial construction plus 20 years.
- (5) This area, measured from the edge of the through driving lane, shall have 6:1 side slopes or flatter which may have crashworthy or break-away obstacles and shall be free of non-shielded obstacles except:
  - (a) Traffic signal poles, railroad signals, railroad tracks, bridge rails, ditches, driveways, intersections, bike/pedestrian paths, earth dikes, curbs, raised islands, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts with flared end sections, erosion control devices, trash cans, parking meters/facilities, fire hydrants, handrails, concrete barrier, barrier curb, and traffic control devices;
  - (b) Other obstacles if the NDOR, in its sole discretion, determines based upon an accident review and a Roadside Safety Analysis Program (RSAP) review or a comparable AASHTO approved economic analysis, that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
- A Based on the 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” e max = 8%.
- B Based on the 2004 edition of AASHTO “A Policy on Geometric Design of Highways and Streets,” Exhibit 3-16. Minimum Radii and Superelevation for Low-Speed Urban Streets e max = 4%.
- C Maximum grade may be one percent steeper for tangent lengths less than 500 ft.
- D Maximum grade may be two percent steeper for tangent lengths less than 500 ft.
- E These values do not include width of curb or curb offset.
- F Curbed: None. Non-Curbed: Refer to the Board’s “Section 001.01 Minimum Design Standards - New and Reconstructed Rural State Highways.”
- G Curbed: 6 ft measured from the edge of the through driving lane or 2 ft measured from the back of curb, whichever is the greater distance from the edge of the through driving lane.

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

001.13 MINIMUM DESIGN STANDARDS — BRIDGES ON MUNICIPAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.  
For metric units, use a soft conversion of the English unit.

(1) State Functional Classification	(2) National Functional Classification	Type of Roadway Section	NEW BRIDGES			RECONSTRUCTED BRIDGES			(3) BRIDGES TO REMAIN IN PLACE	
			Roadway Width	Design Loading	Vertical Clearance	Roadway Width	Design Loading	Vertical Clearance	Roadway Width	Vertical Clearance
Interstate	Interstate	N/A	42'	HL93	16'	42'	HL93	16'	38'	16'
Expressway	Arterial	N/A	39'	HL93	16'	39'	HL93	16'	28'	16'
Major Arterial	Arterial	Curbed Non-Curbed	A B	HL93	16'	A B	HL93	14.5'	23' A 28'	14.5'
Major Arterial	Collector	Curbed Non-Curbed	A B	HL93	15'	A B	HL93	14.5'	23' A 28'	14.5'

(1) Refer to NDOR “Nebraska State Highway Functional Classification” Map.

(2) Refer to NDOR “Nebraska National Highway Functional Classification” Map.

(3) Structural Capacity - A bridge can remain in place if the operating rating capacity can safely service the system for an additional 20 years of service life (*i.e. bridge does not require load posting*).

A The clear roadway width of bridge shall be 1 ft wider than the gutter line to gutter line width of the approach roadway. The gutter line is defined as being 1 ft inside the back of the approach roadway curb.

B Refer to the Board’s “Section 001.02 Minimum Design Standards – Bridges on Rural State Highways.”

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

001.14 MINIMUM DESIGN STANDARDS — RESURFACING, RESTORATION AND REHABILITATION (3R) PROJECTS ON MUNICIPAL STATE HIGHWAYS

Any relaxation of these standards must have written approval by the Board.

For metric units, use a soft conversion of the English unit.

Interstate – The standards used for horizontal alignment, vertical alignment, and widths of median, traveled way, and shoulders for projects may be the AASHTO interstate standards that were in effect at the time of the latest new and reconstructed project on the section of Interstate.

(1) Design Year Traffic	Grade	(2) Horizontal Curve	Number of Lanes	Type of Roadway Section	Lane Width	Shoulder Width	Shoulder Surfacing Width	(3) Fixed Obstacle Clearance	
								Posted Speed Below 50 mph	Posted Speed 50 mph and Above
4,000 ADT & Over	Existing	Existing	2	Curbed	11' A	N/A	N/A	3'	3'
				Non-Curbed	11'	8' B	6' B	10'	C
2,000 - 3,999 ADT	Existing	Existing	2	Curbed	11' A	N/A	N/A	3'	3'
				Non-Curbed	11'	5'	Existing B	10'	C
Under 2,000 ADT	Existing	Existing	2	Curbed	11' A	N/A	N/A	3'	3'
				Non-Curbed	11'	2'	Existing	10'	C

- (1) "Design Year" shall be year of initial construction plus the expected life of the surfacing up to 20 years.
- (2) Horizontal curves not providing posted speed as stated in the 2004 edition of AASHTO "A Policy on Geometric Design of Highways and Streets," may have advisory curve and speed reduction signs. Existing right angle turns in the central business district or at stop sign or signal controlled intersections are acceptable.
- (3) This area, measured from the edge of the through driving lane, may have crashworthy or break-away obstacles and shall be free of non-shielded obstacles except:
  - (a) Traffic signal poles, railroad signals, railroad tracks, bridge rails, ditches, side slopes, driveways, intersections, bike/pedestrian paths, earth dikes, parallel drainage culverts, curbs, raised islands, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts with flared end sections, erosion control devices, trash cans, parking meters/facilities, fire hydrants, handrails, concrete barrier, barrier curb, and traffic control devices;
  - (b) Other obstacles if the NDOR, in its sole discretion, determines based upon an accident review and a Roadside Safety Analysis Program (RSAP) review or a comparable AASHTO approved economic analysis, that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
- A These values do not include width of curb or curb offset.
- B If a 4-lane divided facility exists, the minimum inside shoulder width is 3 ft with 2 ft surfaced.
- C Refer to the Board's "Section 001.03 Minimum Design Standards – Resurfacing, Restoration and Rehabilitation (3R) Projects on Rural State Highways."

# **Part Two**

## **Local Roads and Streets**

**Explanatory Statement**  
**For Fixed Obstacle Clearance Footnotes**  
**To Minimum Design Standards (County Roads and Municipal Streets)**  
*Adopted 9/20/02*

The Board of Public Roads Classifications and Standards was asked to clarify the meaning and application of the Fixed Obstacle Clearance footnote, item (b) in the Minimum Design Standards for county roads and municipal streets. The Rules and Regulations citations are: 428 NAC 2, § 001.15 footnote 8 (b), § 001.16 footnote 9 (b), and § 001.17 footnote 8 (b). The specific concern was whether ditches and slopes always require an engineering study and, where one is required, what kind of study is necessary.

The Board offers the following explanation to clarify this matter.

1. For county projects, slopes and ditches meeting or exceeding the profiles set in the Typical Cross Sections of the Minimum Design Standards, 428 NAC 2, § 001.18 - § 001.22, constitute allowable obstacles – by definition. The only engineering study required in such cases is the application of engineering principles and sound judgment in the design.
2. Although the Board has not established Typical Cross Sections for municipal streets, the Board will apply the test in Explanation (1) to projects in municipalities.
3. “Engineering Study” means a determination by a qualified person. The level and type of qualifications depends on the task at hand. Statutory and regulatory requirements, including the *Manual on Uniform Traffic Control Devices* (MUTCD) and the Nebraska Engineering and Architecture laws, should also be considered.
4. Whenever a county or municipality invokes the (b) clause in the Fixed Obstacle Clearance footnote, a written notation should be made in the project file. The notation should be backed by appropriate engineering documentation.

**MINIMUM DESIGN STANDARDS - PART TWO  
LOCAL ROADS AND STREETS**

001.15 MINIMUM DESIGN STANDARDS — MUNICIPAL STREETS <sup>(1)</sup>

(2) State Functional Classification	(3) Design Year Traffic	(4) Design Speed (mph)	(5) Maximum Horizontal Curve (Degree)	Maximum Grade (Percent)	(6) Number of Lanes	(7) Lane Width (Feet)	Median Width (Feet)	Non-Curbed Section Shoulder Width (Feet)	(8) Fixed Obstacle Clearance (Feet)	Lighting	New and Reconstructed Bridge Design Loading
Other Arterial	–	30	15	8	2	11	0 - As Required	8	–	Full	HL93
Collector	–	25	20	10	2	11	None	6	–	Desirable	HL93
Local	–	25	30★	10	2	11	None	6	–	Desirable	HL93

(1) The 2001 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” should be used for other design criteria.

(2) Refer to NDOR “State Functional Classification Maps.”

(3) “Design Year” shall be year of initial construction plus 20 years.

(4) The design speed should be equal to or greater than the anticipated posted speed limit. Stopping sight distance is a critical component of design speed.

(5) 0.06 feet per foot maximum superelevation rate. The superelevation rate should match the design speed.

(6) The actual number of lanes for design shall be based on a capacity analysis using design year traffic and the selected level of service to be obtained.

(7) Lane width shall not include width of curb or curb offset.

(8) Minimum fixed obstacle clearance for a curbed section shall be 2 feet as measured from the back of the curb, or for a non-curbed section shall be 8 feet as measured from the edge of the through driving lane. This area shall be free of obstacles except: (a) Traffic signals, railroad signals and railroad tracks; (b) Other obstacles including, but not limited to: ditches, slopes, driveways, intersections, earth dikes, curbs, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts, bridges, roadway lighting, and traffic control devices if the municipality, through an engineering study, has determined that such obstacles are acceptable and are necessary for the operation and use of the street system; (c) Other obstacles if the municipality, through an engineering study and based upon a cost benefit analysis, has determined that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment. Fixed obstacle clearance for a non-curbed section may be reduced further for a turn-out lane, provided a minimum clearance of 2 feet is maintained from any paved surface.

★ Local street radii can be reduced to 100 feet if compatible with overall development and a design speed study.

Title 428 — BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS

Chapter 2 — Procedures for Standards (Continued)

001.16 MINIMUM DESIGN STANDARDS — RURAL ROADS <sup>(1)</sup>

(2) Roadway Classification	Design Number	(3) Current Year ADT	(4) Design Speed (mph)	(5) Maximum Horizontal Curve (Degree)	(6) Maximum Grade (Percent)	(7) Number of Lanes	(8) Lane Width (Feet)	Shoulder Width (Feet)	(9) Fixed Obstacle Clearance (Feet)	(10) New and Reconstructed Bridges		(11) Bridges to Remain in Place (100 Feet and Under in Length) Roadway Width	New and Reconstructed Bridge Design Loading	(12) Surfacing Type
										(100 Feet and Under in Length) Roadway Width	(Over 100 Feet in Length) Roadway Width			
Other Arterial	ROA1	401 - 750	50	7.5	7	2	12	6	12	30'	28'+†	24'	HL93	Aggregate or Paved
	ROA2	251 - 400	50	7.5	7	2	11	4	10	30'	28'	22'	HL93	Aggregate or Paved
	ROA3	51 - 250	50	7.5	7	2	10	4	10	28'	28'	20'	HL93	Aggregate or Paved
	ROA4	0 - 50	40	8.0	8	2	10	3	8	26'	26'	20'	HL93	Aggregate★
Collector	RC1	251- 400	50	7.5	7	2	11	4	10	30'	28'	22'	HL93	Aggregate or Paved
	RC2	51- 250	50	7.5	7	2	10	4	10	28'	28'	20'	HL93	Aggregate or Paved
	RC3	0- 50	40	10.0	9	2	10	3	5	24'	24'	20'	HL93	Aggregate★
Local	RL1	251- 400	50	7.5	7	2	11	4	8	26'	26'	22'	HL93	Aggregate or Paved
	RL2	51- 250	50	7.5	7	2	10	4	8	24'	24'	20'	HL93	Aggregate or Paved
	RL3	0- 50	30	23.0	10	2	10	3	5	20'+	20'+	20'	HL93	Aggregate★
Scenic-Recreation	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★
Minimum Maintenance	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★

- (1) The Typical Cross Sections (sections 001.18 through 001.22) in these regulations and the 2001 edition of AASHTO “A Policy on Geometric Design of Highways and Streets” should be used for other design criteria. Municipal Streets Design Standards (Sec. 001.15, above) may be used in residential and commercial areas lying outside municipal boundaries. This may be particularly appropriate for Sanitary and Improvement Districts and for developed areas under municipal zoning jurisdiction.
- (2) Refer to NDOR “State Functional Classification Maps.”
- (3) “Current year” shall mean year of initial construction. Minimum design criteria for ADT volumes over 400 in the “Collector” and “Local” classifications shall conform to the minimum standards set forth in the “Other Arterial” classification. Minimum design criteria for ADT volumes over 750 in the “Other Arterial” classification shall conform to the minimum standards set forth in AASHTO “A Policy on Geometric Design of Highways and Streets.”
- (4) The design speed should be equal to or greater than the anticipated posted speed limit. Stopping sight distance is a critical component of design speed. New or reconstructed roads that are designed for a speed less than the statutory speed limit require an engineering and traffic investigation to determine the appropriate speed limit. Reference 60-6,190 Neb.Rev.Stat.
- (5) 0.08 feet per foot maximum superelevation rate. The superelevation rate should match the design speed.
- (6) Maximum grades may be exceeded by 2 percent for tangent distance of up to 500 feet in rough terrain.
- (7) The actual number of lanes for design shall be based on a capacity analysis using design year traffic and the selected level of service to be obtained.
- (8) Lane width shall not include width of curb or curb offset. See Typical Cross Sections (001.18 through 001.22) for cross slope.
- (9) Minimum fixed obstacle clearance for a curbed section shall be 2 feet as measured from the back of the curb. Minimum fixed obstacle clearance for a non-curbed section shall be measured from the edge of the through driving lane. This area shall be free of obstacles except: (a) Traffic signals, railroad signals and railroad tracks; (b) Other obstacles including, but not limited to: ditches, slopes, driveways, intersections, earth dikes, curbs, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts, bridges, roadway lighting, and traffic control devices if the county, through an engineering study, has determined that such obstacles are acceptable and are necessary for the operation and use of the road system; (c) Other obstacles if the county, through an engineering study and based upon a cost benefit analysis, has determined that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
- (10) Low water stream crossings may be constructed on very low volume (0 - 50 ADT) county roads functionally classified as Local or Minimum Maintenance, provided a relaxation of standards has been granted by the Board. New low water stream crossings shall not be constructed on county roads functionally classified as Other Arterial and Collector. All proposed construction or reconstruction shall be submitted to the Board for review in accordance with the rules and regulations for relaxation of standards.
- (11) Existing bridges over 100 feet must be evaluated in accordance with AASHTO guidelines to determine the suitability of leaving them in place.
- (12) A road graded to meet or exceed ROA1, ROA2, ROA3, RC1, RC2, RL1 or RL2 Minimum Design Standards in effect between September 2, 1970 and January 1, 2003 may be paved without being graded to current minimum design standards.
- ★ The paving of roads built to ROA4, RC3 and RL3 Minimum Design Standards, except for “Sandhills” soils, is prohibited. Such roads (0 - 50) ADT in “Sandhills” soils may require paving because of the light, granular nature of the soils involved. It shall also be permissible to pave one 12-foot lane on roads built to RL3 Minimum Design Standards in “Sandhills” soils.
- ★★ See Section 001.17 of these regulations for standards applicable to the functional classification category “Scenic-Recreation.”
- ★★★ All proposed construction or reconstruction on Minimum Maintenance Roads shall be submitted to the Board for review in accordance with the rules and regulations for relaxation of standards. There are no set design standards for Minimum Maintenance Roads.
- † 24 feet desirable
- †† 30 feet desirable

Chapter 2 — Procedures for Standards (Continued)

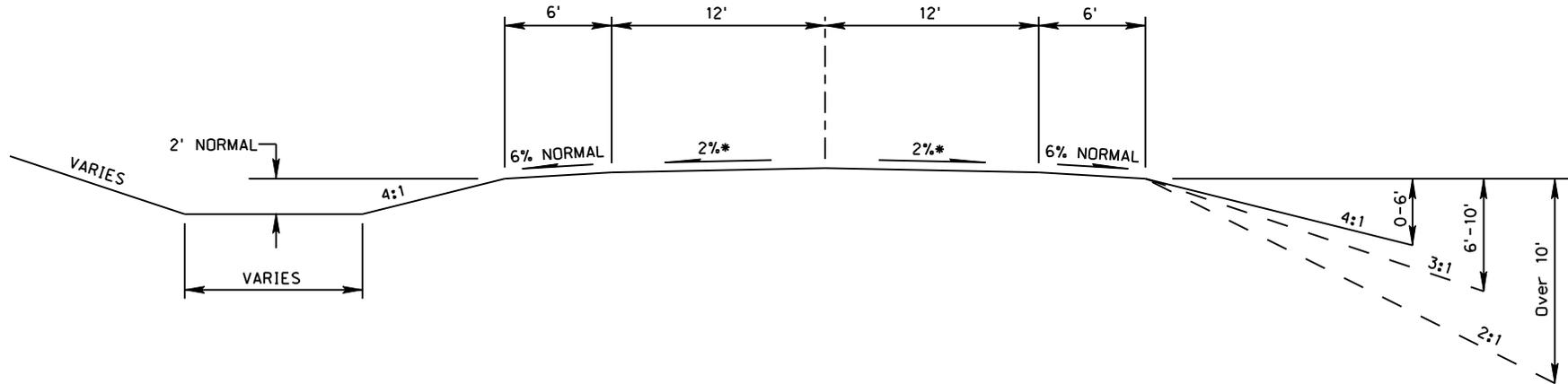
001.17 MINIMUM DESIGN STANDARDS — SCENIC-RECREATION — RURAL ROADS <sup>(1)</sup>

Roadway Sub-Classification	Design Number	(2) Current Year ADT	(3) Design Speed (mph)	(4) Maximum Horizontal Curve (Degree)	(5) Maximum Grade (Percent)	(6) Number of Lanes	(7) Lane Width (Feet)	Shoulder Width (Feet)	(8) Fixed Obstacle Clearance (Feet)	(9) New and Reconstructed Bridges		(10) Bridges to Remain in Place (100 Feet and Under in Length) Roadway Width	New and Reconstructed Bridge Design Loading	(11) Surfacing Type
										(100 Feet and Under in Length) Roadway Width	(Over 100 Feet in Length) Roadway Width			
Other Arterial	ROA2	401 - 750	50	7.5	7	2	11'	4'	10'	30'	28'	22'	HL93	Aggregate or Paved
	ROA3	251 - 400	50	7.5	7	2	10'	4'	10'	28'	28'	20'	HL93	Aggregate or Paved
	ROA4	0 - 250	40	8.0	8	2	10'	3'	9'	26'	26'	20'	HL93	Aggregate★
Collector	RC2	251 - 400	50	7.5	7	2	10'	4'	10'	28'	28'	20'	HL93	Aggregate or Paved
	RC3	0 - 250	40	10.0	9	2	10'	3'	5'	24'	24'	20'	HL93	Aggregate★
Local	RL2	251 - 400	50	7.5	7	2	10'	4'	6'	24'	24'	20'	HL93	Aggregate or Paved
	RL3	0 - 250	30	23.0	10	2	10'	3'	5'	20'+	20'+	20'	HL93	Aggregate★
Internal	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★	★★

- (1) Refer to NDOR "State Functional Classification Maps." Effort shall be made to preserve the natural environment to the extent possible without compromising the safety of those using the facility at the speed limits that apply. The Typical Cross Sections (Sections 001.19 through 001.22) in these regulations and the 2001 edition of AASHTO "A Policy on Geometric Design of Highways and Streets" should be used for other design criteria.
  - (2) "Current year" shall mean year of initial construction. Minimum design criteria for ADT volumes over 400 in the "Collector" and "Local" classifications shall conform to the minimum standards set forth in the "Other Arterial" classification.  
Minimum design criteria for ADT volumes over 750 in the "Other Arterial" classification shall conform to the minimum standards set forth in AASHTO "A Policy on Geometric Design of Highways and Streets."
  - (3) The design speed should be equal to or greater than the anticipated posted speed limit. Stopping sight distance is a critical component of design speed. New or reconstructed roads that are designed for a speed less than the statutory speed limit require an engineering and traffic investigation to determine the appropriate speed limit. Reference 60-6,190 Neb.Rev.Stat.
  - (4) 0.08 feet per foot maximum superelevation rate. The superelevation rate should match the design speed.
  - (5) Maximum grades may be exceeded by 2 percent for tangent distance of up to 500 feet in rough terrain.
  - (6) The actual number of lanes for design shall be based on a capacity analysis using design year traffic and the selected level of service to be obtained.
  - (7) Lane width shall not include width of curb or curb offset. See Typical Cross Sections (001.19 through 001.22) for cross slope.
  - (8) Minimum fixed obstacle clearance for a curbed section shall be 2 feet as measured from the back of the curb. Minimum fixed obstacle clearance for a non-curbed section shall be measured from the edge of the through driving lane. This area shall be free of obstacles except: (a) Traffic signals, railroad signals and railroad tracks; (b) Other obstacles including, but not limited to: ditches, slopes, driveways, intersections, earth dikes, curbs, guardrails, median barriers, crash cushions, drainage inlets, drainage flumes, culverts, bridges, roadway lighting, and traffic control devices if the county, through an engineering study, has determined that such obstacles are acceptable and are necessary for the operation and use of the road system; (c) Other obstacles if the county, through an engineering study and based upon a cost benefit analysis, determines that the cost to remove or treat such obstacle exceeds the benefits from such removal or treatment.
  - (9) Low water stream crossings may be constructed on very low volume (0 - 50 ADT) county roads functionally classified as Local or Minimum Maintenance, provided a relaxation of standards has been granted by the Board. New low water stream crossings shall not be constructed on county roads functionally classified as Other Arterial and Collector. All proposed construction or reconstruction shall be submitted to the Board for review in accordance with the rules and regulations for relaxation of standards.
  - (10) Existing bridges over 100 feet must be evaluated in accordance with AASHTO guidelines to determine the suitability of leaving them in place.
  - (11) A road graded to meet or exceed ROA1, ROA2, ROA3, RC1, RC2, RL1 or RL2 Minimum Design Standards in effect between September 2, 1970 and January 1, 1993 may be paved without being graded to current minimum design standards.
- ★ The paving of roads built to ROA4, RC3 and RL3 Minimum Design Standards, except for "Sandhills" soils, is prohibited. Such roads (0 - 50 ADT) in "Sandhills" soils may require paving because of the light, granular nature of the soils involved. It shall be permissible to pave one 12-foot lane on roads built to RL3 Minimum Design Standards in "Sandhills" soils.
  - ★★ Minimum design standards within the recreational area shall be consistent with the established speed limits, the topography and use of the facility. Design may be to either municipal or rural standards depending on terrain conditions. Minimum design speed permissible 20 mph.
  - + 24' desirable

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
 CHAPTER 2 -- Procedures For Standards (Continued)

001.18 - TYPICAL CROSS SECTIONS OF IMPROVEMENT FOR RURAL ROADS

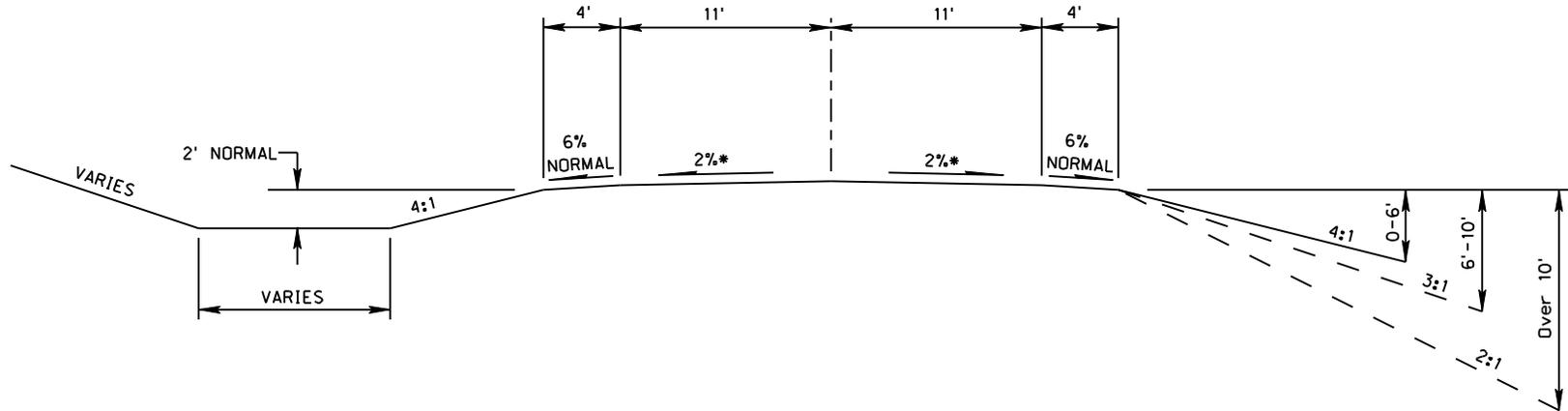


\* Unpaved roads: 2% minimum; consult AASHTO guidelines for appropriate cross slope.

ROA1	COLLECTOR	LOCAL
OTHER ARTERIAL	OVER 400 ADT	OVER 400 ADT
401 - 750 ADT		

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
 CHAPTER 2 -- Procedures For Standards (Continued)

001.19 - TYPICAL CROSS SECTIONS OF IMPROVEMENT FOR RURAL ROADS

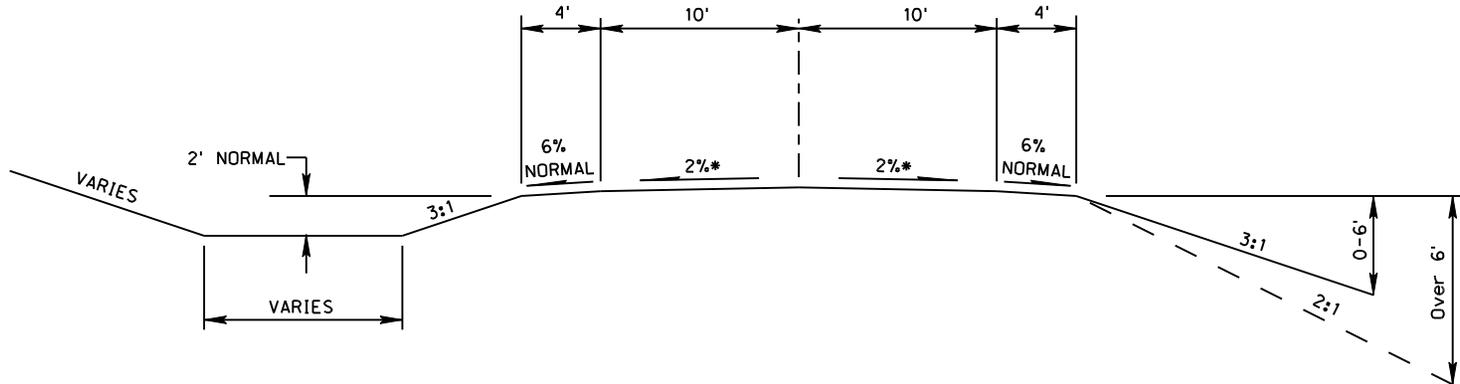


\* Unpaved roads: 2% minimum; consult AASHTO guidelines for appropriate cross slope.

ROA2	RC1	RL1
OTHER ARTERIAL	COLLECTOR	LOCAL
251 - 400 ADT	251 - 400 ADT	251 - 400 ADT

(401 - 750 ADT FOR SCENIC-RECREATION)

001.20 - TYPICAL CROSS SECTIONS OF IMPROVEMENT FOR RURAL ROADS

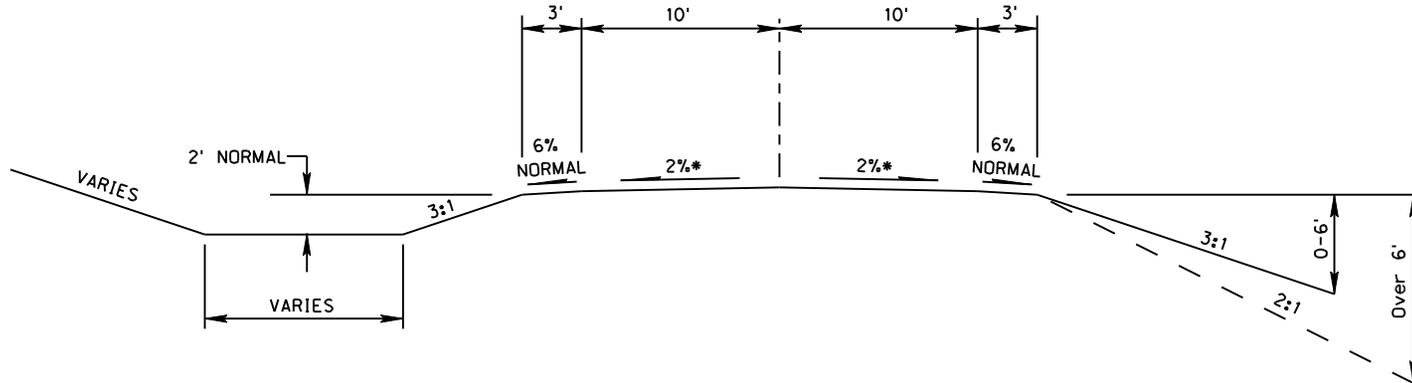


\* Unpaved roads: 2% minimum; consult AASHTO guidelines for appropriate cross slope.

	ROA3	RC2	RL2
	OTHER ARTERIAL	COLLECTOR	LOCAL
	51 - 250 ADT	51 - 250 ADT	51 - 250 ADT
FOR SCENIC-RECREATION:	251 - 400 ADT	251 - 400 ADT	251 - 400 ADT

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
 CHAPTER 2 -- Procedures for Standards (Continued)

001.21 - TYPICAL CROSS SECTIONS OF IMPROVEMENT FOR RURAL ROADS

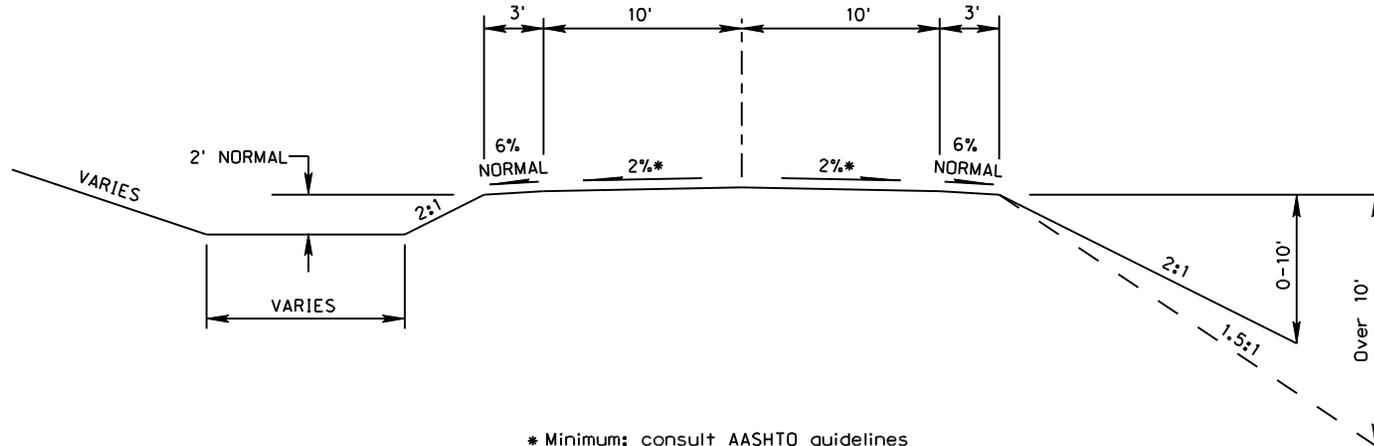


\* Unpaved roads: 2% minimum; consult AASHTO guidelines for appropriate cross slope.

	ROA4	RC3
	OTHER ARTERIAL	COLLECTOR
	0 - 50 ADT	0 - 50 ADT
FOR SCENIC-RECREATION:	0 - 250 ADT	0 - 250 ADT

TITLE 428 -- BOARD OF PUBLIC ROADS CLASSIFICATIONS AND STANDARDS  
CHAPTER 2 -- Procedures For Standards (Continued)

001.22 - TYPICAL CROSS SECTIONS OF IMPROVEMENT FOR RURAL ROADS



\* Minimum; consult AASHTO guidelines for appropriate cross slope.

RL3  
LOCAL  
0 - 50 ADT

FOR SCENIC-RECREATION: 0 - 250 ADT