

ERRATA

Nebraska Department of Transportation

Roadway Design Manual

Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects

June 2016	③ February 2018	⑥ December 2018
① February 2017	④ June 2018	
② July/August 2017	⑤ August 2018	

The last update to the Roadway Design Manual (RDM) was in 2006. In the intervening years some design guidance has become obsolete, new/updated guidance has become available, offices of responsibility have changed, design procedures have been streamlined, etc. The NDOT is in the process of updating the *RDM* but, in the interim, the obsolete/incorrect guidance is being addressed through this document and a re-issued *RDM*. Page numbers cited in this document are referenced to the December 2018 Errata RDM. Deleted text in the December 2018 Errata RDM is in green with a strike through (~~errata~~) and new/corrected text is in red (**correct**). The following chapters have already been addressed:

- ⑥ Contents (updated in December 2018)
- ⑥ List of Exhibits (updated in December 2018)
- Chapter Three: Roadway Alignment (updated on June 17, 2011)
- Chapter Four: Intersections, Driveways and Channelization (updated on April 19, 2012)
- Chapter Six: The Typical Roadway Cross-Section (updated on February 18, 2016)
- ⑤ Chapter Seven: Earthwork (updated on August 2, 2018)
- Chapter Eight: Surfacing (updated on December 15, 2015)
- ⑥ Chapter Nine: Guardrail and Roadside Barriers (updated on December 13, 2018)
- ① Chapter Eleven: Highway Plans Assembly (updated on February 21, 2017)
- ② Chapter Twelve: Cost Estimating & Funding (updated on August 16, 2017)
- ① Chapter Fourteen: Traffic (updated on October 19, 2016)
- ③ Chapter Fifteen: Right-of-Way (updated on February 26, 2018)
- Chapter Sixteen: Pedestrian and Bicycle Facilities (added on February 8, 2016)
- Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects (added on March 26, 2014)
- ⑥ Index (updated in December 2018)

The following items pertain to the entire manual:

- June 2016 and all subsequent changes – Chapter and EXHIBIT citations have been updated to the latest edition of the *RDM*
- ② July 2017 - All references to the **Nebraska Department of Roads (NDOR)** have been changed to the **Nebraska Department of Transportation (NDOT)**
- ⑥ December 2018 – Plan Sheet numbering updated (See Chapter Eleven, EXHIBIT 11.1)

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① Entire Chapter		Every reference to Traffic has been updated to Traffic Engineering .
③ Entire Chapter		The Chapter was given section and sub-section numbers and was re-arranged to mimic the topic order of the <u>Roadway Design Manual</u> .
17-2	<p>Section 1: RESURFACING, RESTORATION AND REHABILITATION PROJECTS – “...Pavement recommendations that require removal of the entire pavement structure and the construction of a new base or the modification of the existing base will be designed to reconstruction standards (minor or incidental shaping and re-compaction of the base will be allowed under 3R, “Subgrade Preparation” is considered to be a modification).”</p>	<p>“...Pavement recommendations that require removal of the entire pavement structure and the construction of a new base or the modification of the existing base will be designed to reconstruction standards. Pavement recommendations that require pavement replacement and restoration of the base can be designed to 3R standards. Restoration of the base is defined as restoring the original condition of the base (subgrade preparation). A portion of the existing base may be removed to allow the required pavement thickness under 3R standards. Modification of the base is defined as improving (addition of a drainage layer) or strengthening the existing base through chemical (fly ash, lime, etc.) or mechanical (geofabric, geogrid, etc.) means and will require designing to reconstruction standards.”</p>

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③ 17-2

Add **Section 1.A: Bridge Work** –
 “The **Bridge Division (Bridge)** supplies the bridge recommendation which provides the scope of work on the structures for a project.”

③ 17-2 & 17-3

Add **Section 1.A.1: Bridge Preventative Maintenance Activities** –
 “Bridge preventative maintenance extends the useful life by the application of cost-effective treatments to bridges in good or fair condition. The scoped activities listed below are considered preventative maintenance activities and may be designed to Maintenance standards.

Deck:

- Overlays (Polymer, Silica Fume, and ACC with membrane)
- Approach Slabs (Repairs, Replacement)
- Slab Turndowns (Eliminate end of floor joint and encase girder ends, Replace approach slab, Remodel wing walls)
- Joints (Complete joint replacement)
- Rail Update (Update bridge rail)
- General Repairs (Deck class repairs, Rail repairs)

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③ 17-2 & 17-3

**Section 1.A.1: Bridge Preventative Maintenance
Activities** (continued)

Guardrail which attaches to the bridge rail will be reviewed for:

- Age of guardrail
- Impacts to the guardrail (has the guardrail been hit)
- NCHRP 350 or MASH compliance
- A minimum height of 28 inches for the Bridge Approach Section (BAS)
- A minimum height of 26½ inches for the W-Beam guardrail, in accordance with The Roadside Design Guide (Ref. 17.10)
- If necessary, the guardrail will be raised to meet these heights and used in place
- If the guardrail is to be used in place, a decision document requiring **Unit Head** approval will be placed in the document file
- If the guardrail is unable to meet these minimum heights or does not meet NCHRP 350 standards, the installation will be reviewed for possible replacement and upgrade to MASH standards

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<p>③ 17-2 & 17-3</p>		<p>Section 1.A.1: Bridge Preventative Maintenance Activities (continued)</p> <p><i>Superstructure:</i></p> <ul style="list-style-type: none"> • Structural Steel Retrofit (Fracture critical details, Fatigue prone details) • Painting (Zone coat girder ends, Complete re-coating of steel superstructure) • Bearings (Repairs, Replacement, Concrete girder passive zinc anodes) • General Repairs (End of girder repairs, Damaged Elements) <p><i>Substructure:</i></p> <ul style="list-style-type: none"> • Corrosion Protection & Mitigation (Passive zinc anodes, Electrochemical chloride extraction, Cathodic protection) • Piles (Repairs, Jackets w/ epoxy grout, Concrete encasement, Painting of steel bearing piles) • General Repairs (Abutment & pier, Damaged elements) <p><i>Channel:</i></p> <ul style="list-style-type: none"> • General Channel Work (Scour countermeasures, Debris removal)

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③ 17-3		<p data-bbox="1176 357 1866 389">Add Section 1.A.2: Bridge Rehabilitation (3R) Work –</p> <p data-bbox="1176 389 1866 519">“In general, the scope of work for bridge rehabilitation projects (3R) may include, but is not limited to:</p> <ul data-bbox="1176 552 1866 795" style="list-style-type: none"> <li data-bbox="1176 552 1866 617">• Partial or complete replacement of the existing deck <li data-bbox="1176 617 1866 682">• Replacement and/or strengthening of the superstructure <li data-bbox="1176 682 1866 730">• Repairs to the substructure <li data-bbox="1176 730 1866 795">• Incidental widening associated with these activities <p data-bbox="1176 828 1866 925">For additional information see the FHWA publication <u>Bridge Preservation Guide</u> (web site) (Ref. 17.11) and Section 11.B of this Chapter.”</p>
③ 17-4	Development Schedules for 3R Projects	1.B 3R Project Templates
③ 17-4	<p data-bbox="693 1023 1176 1206">Previous Development Schedules for 3R Projects – “In general, 3R projects are developed and assigned on three activity templates; the Standard 3R template, the Modified 3R template, and an M&R template.”</p>	<p data-bbox="1176 1023 1866 1206">“In general, 3R projects are developed and assigned on three activity templates; the 3R with ROW template, the 3R without ROW template, and an M&R template.”</p>

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③ 17-4	<p>Previous Development Schedules for 3R Projects – “1. The Standard 3R template is used for projects where there is a substantial level of design. These projects are usually assigned to one of the Interstate, Expressway, or Resurfacing units or to a Consultant.”</p>	<p>“1. The 3R with ROW template is used for projects which require a substantial level of design and where updating the roadway to 3R standards will require the purchase of right-way. These projects are usually assigned to a unit in Roadway or to a Consultant.”</p>
③ 17-4	<p>Previous Development Schedules for 3R Projects – “2. The Modified 3R template is used for projects where the majority of the design tasks are assigned to the Bridge Division (Bridge), Traffic, and M&R and the activities assigned to Roadway are limited to the design of a couple of runs of roadside barrier, coordination with other divisions, and completion of agreements and environmental tasks. These projects are usually assigned to a Consultant Coordination Unit in Roadway.”</p>	<p>“2. The 3R without ROW template is used for projects which require a substantial level of design but where updating the roadway to 3R standards can be accomplished within the existing right-of-way. These projects are usually assigned to a unit in Roadway or to a Consultant.”</p>
③ 17-5	National Highway System (NHS):	Remove this text

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③ 17-5

Interstate NHS Projects

③ 17-5

Previous **Interstate NHS Projects** – “Interstate projects will be designated as Interstate 3R. The bridge width, cross slope, superelevation, lateral offset to obstruction, and vertical clearance will be designed to new and reconstructed guidance as cited in the **American Association of State Highway and Transportation Officials (AASHTO’s)** publication A Policy on Design Standards Interstate System (Ref. 17.1). The remaining thirteen controlling design criteria (See Chapter One: Roadway Design Criteria, Section 13.A) may be designed to the **AASHTO** Interstate guidance that was in effect at the time of the latest new and reconstructed project on the section of the project. Deviation from either the new or existing guidance will require a design exception (See Chapter One: Roadway Design Criteria, Section 13.B). In addition, 3R type work on Interstates must conform to the Nebraska Minimum Design Standards (MDS) (web site) (Ref. 17.3) or a design relaxation must be obtained from the **Board of Public Roads Classifications and Standards (Board of Public Roads)** (See Chapter One: Roadway Design Criteria, Section 13.C).”

2.A Interstate NHS Projects

“Interstate projects will be designated as Interstate 3R. The bridge width, cross slope, superelevation, lateral offset to obstruction, and vertical clearance will be designed to new and reconstructed guidance as cited in the **American Association of State Highway and Transportation Officials (AASHTO’s)** publication A Policy on Design Standards Interstate System (Ref. 17.1). The remaining controlling design criteria (See Appendix H, “Application of Design Standards”) may be designed to the **AASHTO** Interstate guidance that was in effect at the time of the latest new and reconstructed project on the section of the project. Existing shoulder widths will be retained. Deviation from either the new or existing guidance will require a design exception (See Appendix H, “Application of Design Standards”). In addition, 3R type work on Interstates must conform to the Nebraska Minimum Design Standards (MDS) (web site) (Ref. 17.3) or a design relaxation must be obtained from the **Board of Public Roads Classifications and Standards (Board of Public Roads)** (See Appendix H, “Application of Design Standards).”

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③ 17-5	Non-Interstate Freeway NHS Projects	2.B <u>Non-Interstate Freeway NHS Projects</u>
③ 17-5	<p>Previous Non-Interstate Freeway NHS Projects – “The federal design criteria for work in excess of pavement preservation (maintenance) on non-Interstate freeways regardless of project funding are the thirteen controlling criteria (See Chapter One: <u>Roadway Design Criteria</u>, Section 13.A) as detailed in <u>A Policy on Geometric Design of Highways and Streets</u> (the <i>Green Book</i>) (Ref. 17.2). Work on non-Interstate freeways on the NHS must conform to the thirteen controlling criteria or a design exception will be required (See Chapter One: <u>Roadway Design Criteria</u>, Section 13.B). 3R type work on non-Interstate freeways on the NHS must also conform to the <i>MDS</i> (Ref. 17.3) or a design relaxation must be obtained from the Board of Public Roads (See Chapter One: <u>Roadway Design Criteria</u>, Section 13.C).”</p>	<p>“The federal design criteria for work in excess of pavement preservation (maintenance) on non-Interstate freeways regardless of project funding are the controlling criteria (See Appendix H, “Application of Design Standards”) as detailed in <u>A Policy on Geometric Design of Highways and Streets</u> (the <i>Green Book</i>) (Ref. 17.2). Work on non-Interstate freeways on the NHS must conform to the controlling criteria or a design exception will be required (See Appendix H, “Application of Design Standards”). 3R type work on non-Interstate freeways on the NHS must also conform to the <i>MDS</i> (Ref. 17.3) or a design relaxation must be obtained from the Board of Public Roads (See Appendix H, “Application of Design Standards”).”</p>

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③ 17-5	Non-Interstate, Non-Freeway NHS Projects	2.C <u>Non-Interstate, Non-Freeway NHS Projects</u>
③ 17-5	Previous Non-Interstate, Non-Freeway NHS Projects – “3R work on NHS highways which are not designated as either Interstate or freeway work must conform to the recommendations presented in <u>Special Report 214: Designing Safer Roads – Practices for Resurfacing, Restoration, and Rehabilitation (TRB SR-214)</u> (Ref. 17.4) as cited in the <i>Green Book</i> (Ref. 17.2). Deviations from this requirement will require a design exception (See Chapter One: <u>Roadway Design Criteria</u> , Section 13.B) and will be documented in the project file (and in Falcon). If the project does not meet the standards found in the <i>MDS</i> (Ref. 17.3) the procedure for the relaxation of the minimum design standards will be followed (See Chapter One: <u>Roadway Design Criteria</u> , Section 13.C).”	“3R work on NHS highways which are not designated as either Interstate or freeway must conform to the recommendations presented in <u>Special Report 214: Designing Safer Roads – Practices for Resurfacing, Restoration, and Rehabilitation (TRB SR-214)</u> (Ref. 17.4) as cited in the <i>Green Book</i> (Ref. 17.2). Deviations from this requirement will require a design exception (See Appendix H, “Application of Design Standards”) and will be documented in the project file. If the project does not meet the standards found in the <i>MDS</i> (Ref. 17.3) the procedure for the relaxation of the minimum design standards will be followed (See Appendix H, “Application of Design Standards”).”
③ 17-6	Non-NHS State Highway System	2.D <u>Non-NHS State Highway System</u>
③ 17-6	<u>ADDITIONAL GUIDANCE FOR THE DESIGN OF 3R PROJECTS</u>	3. DESIGN CONTROLS
③ 17-6	Design Year:	3.A <u>Design Year</u>
③ 17-6	Design Speed:	3.B <u>Design Speed</u>

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③ 17-6		4. DESIGN PROCESS
③ 17-6	Plan-in-hands:	4.A <u>Plan-in-Hands</u>
③ 17-6	Previous Plan-in-hands: - first bullet	<ul style="list-style-type: none"> • “The designer will transmit plan-in-hand plans and the “Plan-In-Hand Checklist” (EXHIBIT J of the <u>Design Process Outline (DPO)</u>, Ref. 17.5) (web site) to the District...”
	<ul style="list-style-type: none"> • “The designer will transmit plan-in-hand plans and the “Plan-In-Hand Checklist for 3R Projects” (EXHIBIT J of the <u>Design Process Outline (DPO)</u>, Ref. 17.5) (web site) to the District...” 	<ul style="list-style-type: none"> • “The designer will transmit plan-in-hand plans and the “Plan-In-Hand Checklist” (EXHIBIT J of the <u>Design Process Outline (DPO)</u>, Ref. 17.5) (web site) to the District...”
③ 17-6	Previous Plan-in-hands: - second bullet	<ul style="list-style-type: none"> • “In general, plan-in-hand inspections will not be conducted on projects being developed with a M&R development schedule...”
	<ul style="list-style-type: none"> • “In general, plan-in-hand inspections will not be conducted on projects being developed on a modified 3R or M&R development schedule...” 	<ul style="list-style-type: none"> • “In general, plan-in-hand inspections will not be conducted on projects being developed with a M&R development schedule...”
③ 17-6	Previous Plan-in-hands: - third bullet	<ul style="list-style-type: none"> • “Before the plan-in-hand, the designer should review raised medians on high-speed roadways ($V \geq 50$ mph) with Traffic Engineering to determine if they should remain in place, be modified, or be removed (See Raised Medians in this section).”
	<ul style="list-style-type: none"> • “Before the plan-in-hand, the designer should review raised medians on high-speed roadways ($V \geq 50$ mph) with Traffic Engineering to determine if they should remain in place, be modified, or be removed (See Raised Medians in this section).” 	<ul style="list-style-type: none"> • “Before the plan-in-hand, the designer should review raised medians on high-speed roadways ($V \geq 50$ mph) with Traffic Engineering to determine if they should remain in place, be modified, or be removed (See Section 6.B of this Chapter).”

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④ 17-6 & 17-7	<p>Previous Plan-in-hands: - fifth bullet</p> <p>“1. List segments of the roadway which are on the low side of superelevated curves and/or which have grades between 2% and 3.5% and evaluate erosion control techniques for these segments with the Roadside Stabilization Manager in the Planning and Project Development Division (P&PD).”</p>	<p>“1. List segments of the roadway which are on the low side of superelevated curves and/or which have grades between 2% and 3.5% and evaluate erosion control techniques for these segments with the Roadside Development & Compliance Unit Manager in the Project Development Division (PDD).”</p>
③ 17-7	<p>Previous Plan-in-hands: - third bullet</p> <ul style="list-style-type: none"> • “...For additional information, see ADA and Lighting in this section and DOR-OI 60-11, “Municipal Cost Sharing” (Appendix F, “Selected NDOR Operating Instructions”).” 	<ul style="list-style-type: none"> • “...For additional information, see Sections 11.D and 12 in this Chapter and DOT-OI 60-11, “Municipal Cost Sharing” (Appendix B, “Selected NDOT Operating Instructions”).”
① 17-7	<p>Previous Plan-in-hands: - fourth bullet</p> <ul style="list-style-type: none"> • “...For further guidance, see ADA in this section and Chapter Sixteen: <u>Pedestrian and Bicycle Facilities</u>, Section 12.” 	<ul style="list-style-type: none"> • “...For further guidance, see Section 12 in this Chapter and Chapter Sixteen: <u>Pedestrian and Bicycle Facilities</u>, Section 12.”
① 17-7	<p>Previous Plan-in-hands: - fifth bullet</p> <ul style="list-style-type: none"> • “The designer should review the project with the Utility Coordinator in P&PD before the plan-in-hand for possible utility conflicts and after the plan-in-hand to determine if additional survey for utilities is required.” 	<ul style="list-style-type: none"> • “The designer should review the project with the Utility Coordinator in Roadway before the plan-in-hand for possible utility conflicts and after the plan-in-hand to determine if additional survey for utilities is required.”

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17-7	<p>Previous Plan-in-hands: - last bullet</p> <ul style="list-style-type: none"> “See Chapter Two: <u>Roadway Design Process</u>, Sections 7 and 8, for further information.” 	<ul style="list-style-type: none"> “See the <i>DPO</i> (Ref. 17.5), Activity 5300, Clarity Task Codes 5380 & 5388 and <u>EXHIBITS J & K</u> for further information.”
③ 17-8		5. ALIGNMENT
③ 17-8	<u>Vertical Alignment Design</u>	5.A <u>Vertical Alignment Design</u>
③ 17-9	<u>Horizontal Alignment Design</u>	5.B <u>Horizontal Alignment Design</u>
③ 17-9	<p>Previous <u>Horizontal Alignment Design</u> – “The following guidance applies to non-freeway / non-Interstate 3R projects with roadway on or off the NHS, regardless of funding. Design Considerations That Apply”</p>	Remove this text
③ 17-9	Policy	5.B.1 Policy
③ 17-9	A. <u>Roadways With A Design Year Traffic Of Less Than Or Equal To 750 vpd</u>	5.B.1.a <u>Roadways With A Design Year Traffic Of Less Than Or Equal To 750 vpd</u>
③ 17-10	B. <u>Roadways With A Design Year ADT Greater Than 750 vpd</u>	5.B.1.b <u>Roadways With A Design Year ADT Greater Than 750 vpd</u>
③ 17-11	Analysis Of Benefit – Cost Relationship	5.B.2 Analysis Of Benefit – Cost Relationship
③ 17-11		5.B.2.a Horizontal Curve Correction Warranted
③ 17-12		5.B.2.b Horizontal Curve Correction Not Warranted

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③ 17-12	5.B.2.b Horizontal Curve Correction Not Warranted	New text “F. Increase pavement friction G Rumble strips”
③ 17-14	Radius of Curve:	5.C <u>Radius of Curve</u>
③ 17-14	Pavement Widening on Curves:	5.D <u>Pavement Widening on Curves</u>
③ 17-14	Superelevation:	5.E <u>Superelevation</u>
③ 17-15		6. INTERSECTIONS, DRIVEWAYS AND CHANNELIZATION
③ 17-16	Driveways and Intersections:	6.A <u>Driveways and Intersections</u>
③ 17-16	Previous Driveways and Intersections: - first bullet <ul style="list-style-type: none"> “...For Modified and M&R template projects, the existing driveway and intersection geometry will be matched.” 	<ul style="list-style-type: none"> “...For M&R template projects, the existing driveway and intersection geometry will be matched.”
③ 17-16	Previous Driveways and Intersections: - third bullet <ul style="list-style-type: none"> “For projects assigned a 3R or a Modified template, Traffic will review the crash history for the entire project including intersections and driveways and, if necessary, identify mitigation methods for reducing the potential for or severity of crashes.” 	<ul style="list-style-type: none"> “For projects assigned a 3R template, Traffic Engineering will review the crash history for the entire project including intersections and driveways and, if necessary, identify mitigation methods for reducing the potential for or severity of crashes.”

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③ 17-16	<p>Previous Driveways and Intersections: - ninth bullet</p> <ul style="list-style-type: none"> “On pavement preservation projects produced in M&R and on 3R Modified development template projects designed by M&R and managed by Roadway, M&R will provide the quantities and locations of the driveways and intersections.” 	<ul style="list-style-type: none"> “On pavement preservation projects produced in M&R, M&R will provide the quantities and locations of the driveways and intersections.”
① 17-17	<p>Previous Driveways and Intersections: - last bullet</p> <ul style="list-style-type: none"> “Work on railroad right-of-way must conform to <u>Title 415, Nebraska Administrative Code, Chapter 6 (Highway-Rail Crossings – Construction, Repair and Maintenance)</u> and requires a special provision prepared by the Railroad Liaison Office. Chapter 6 may be found at (web site).” 	<ul style="list-style-type: none"> “Work on railroad right-of-way must conform to <u>Title 415, Nebraska Administrative Code, Chapter 6 (Highway-Rail Crossings – Construction, Repair and Maintenance)</u> and requires a special provision prepared by the Railroad Liaison Office in the Intermodal Planning Division. Chapter 6 may be found at (web site).”
③ 17-17	Raised Medians:	6.B <u>Raised Medians</u>
③ 17-17	<p>Previous Raised Medians: - second bullet</p> <ul style="list-style-type: none"> “Raised medians with 6 inch curb on 2-lane high-speed roadways ($V \geq 50$ mph) should be modified or removed. If Traffic determines that the raised curb median should be retained, the median curb height will be reduced to 4 inches or less (See Plan-in-Hands in the section). The slope of the curb face will not be altered.” 	<ul style="list-style-type: none"> “Raised medians with 6 inch curb on 2-lane high-speed roadways ($V \geq 50$ mph) should be modified or removed. If Traffic Engineering determines that the raised curb median should be retained, the median curb height will be reduced to 4 inches or less (See Section 4.A in this Chapter). The slope of the curb face will not be altered.”

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③ 17-18		7. THE TYPICAL ROADWAY CROSS-SECTION
③ 17-18	Typical Roadway Cross-Sections:	7.A <u>Typical Roadway Cross-Sections</u>
③ 17-18	Previous Typical Roadway Cross-Sections:	new fifth bullet <ul style="list-style-type: none"> • “For 3R projects on the Priority Commercial System, the minimum shoulder width shall follow the <i>MDS</i> (Ref. 17.3).”
③ 17-19	Fill Slopes:	7.B <u>Fill Slopes</u>
③ 17-19	Previous Fill Slopes: - first bullet <ul style="list-style-type: none"> • “Earth dikes built with the project within the appropriate clear-zone distance (See Typical Roadway Cross-Sections in this section) which are perpendicular to the traffic will have a 1:10 slope facing the traffic.” 	<ul style="list-style-type: none"> • “Earth dikes built with the project within the appropriate clear-zone distance which are perpendicular to the traffic will have a 1:10 slope facing the traffic.”
③ 17-19	Earthwork/Shoulder Construction:	8. EARTHWORK
④ 17-19	Previous Earthwork/Shoulder Construction: - first bullet <ul style="list-style-type: none"> • “...The required roadway grading details will be shown on the Typical Sections or on the 2N Sheet.” 	<ul style="list-style-type: none"> • “...The required roadway grading details will be shown on the Typical Cross-Sections or on the General Information Sheet (See Chapter Eleven: <u>Highway Plans Assembly</u>, Section 4).”
③ 17-19		9. SURFACING
③ 17-19	Mainline Surfacing Taper Rate:	9.A <u>Mainline Surfacing Taper Rate</u>

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③ 17-19	<p>Previous Mainline Surfacing Taper Rate: - first bullet</p> <ul style="list-style-type: none"> “For an overlay on a high-speed ($V \geq 50$ mph) roadway, the taper rate at the end of the project is 50 feet to each inch of change in grade (e.g. for a 2 inch mill with a 4 inch overlay: $2 \times 50 = 100$ feet).” 	<ul style="list-style-type: none"> “For an overlay on a high-speed ($V \geq 50$ mph) roadway, the minimum taper rate at the end of the project is 33 feet to each inch of change in grade (e.g. for a 2 inch mill with a 4 inch overlay: $2 \times 33 = 66$ feet). The preferred taper rate is 50 feet to each inch of change in grade (e.g. for a 2 inch mill with a 4 inch overlay: $2 \times 50 = 100$ feet).”
③ 17-20	<p>Safety Improvements:</p>	<p>9.B <u>Safety Improvements</u></p>
17-20	<p>Previous <u>Safety Improvements: - fifth bullet</u></p> <ul style="list-style-type: none"> “...Shoulder rumble stripes should be constructed on rural high-speed two-way two-lane highways with a 28 feet top width and an ADT in excess of 1500.” 	<ul style="list-style-type: none"> “...Shoulder rumble stripes should be constructed on rural high-speed two-way two-lane highways with a 28 feet top width and an ADT in excess of 500.”
17-20	<p>Previous Safety Improvements: - eighth bullet</p> <p>“1. The project includes 3 inches or greater of surfacing placement”</p>	<p>“1. The project includes 2 inches or greater of surfacing placement”</p>
③ 17-20	<p>Previous Safety Improvements: - last bullet</p> <ul style="list-style-type: none"> “Guardrail connections and bridge rail on the project will be evaluated and, if necessary, upgraded to current criteria.” 	<ul style="list-style-type: none"> “Guardrail connections and bridge rail on the project will be evaluated and, if necessary, upgraded to current criteria. For additional information see Section 10 in this Chapter.”
③ 17-21	<p>Roadside Barrier Design:</p>	<p>10. GUARDRAIL AND ROADSIDE BARRIERS</p>

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⑥ 17-21

Previous **Roadside Barrier Design: - first bullet**

- “Existing roadside barriers must be reviewed for compliance with the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) 2009 and, if necessary, upgraded to current criteria.”

- “Existing roadside barriers must be reviewed for compliance with the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH). If guardrail work is necessary, the guardrail will be upgraded to the MASH criteria.”

⑤ 17-21

Previous **Roadside Barrier Design: - second bullet**

- “Check existing fill slopes within the applicable 3R obstacle clearance for barrier desirability using EXHIBIT 17.1. The **Unit Head** or his/her designee should run a “Roadside Safety Analysis Program” (RSAP) cost effectiveness analysis to determine the desirability for barrier installation for other obstacles within the applicable 3R obstacle clearance.”

- “The *MDS* (Ref. 17.3) allows existing fill slopes within the applicable 3R obstacle clearance. The **Unit Head** or his/her designee should run a “Roadside Safety Analysis Program” (RSAP) cost effectiveness analysis to determine the need or warrant for barrier installation for other obstacles within the applicable 3R obstacle clearance.”

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Seventeen**

17-21

Previous **Roadside Barrier Design: - sixth bullet**

- “If a culvert is within the 3R fixed obstacle clearance and a cost-effectiveness analysis indicates that the culvert should be used in place without shielding (shielding is less than a 1:1 benefit to cost), a note should be placed in the project file (and in Falcon) stating: “Use in Place – Not cost effective to extend to fixed obstacle clearance or shield” (include the analysis data in the project file).”

- “If a culvert is within the 3R fixed obstacle clearance and a cost-effectiveness analysis indicates that the culvert should be used in place without shielding, a note should be placed in the project file stating: “Use in Place – Not cost effective to extend to fixed obstacle clearance or shield” (include the analysis data in the project file).”

© 17-21

Previous **Roadside Barrier Design:**

New eighth bullet

- “If existing guardrail was built for a hazard which has been removed/ mitigated prior to the current project, the designer will prepare a decision document for the **ADEs**’ approval and signature stating that the hazard no longer exists and the guardrail should be removed.”

Page	Existing Text	Updated Text
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17-21	<p>Previous Roadside Barrier Design: - tenth bullet</p> <ul style="list-style-type: none"> • “When it is not possible to install sufficient roadside barrier length to shield either the clear zone distance or the fixed obstacle clearance, as appropriate (e.g. a railroad access drive which cannot be relocated and is within the development length of the guardrail), the designer will obtain the concurrence of the Unit Head and document the reason in the project file (and in Falcon).” 	<ul style="list-style-type: none"> • “When it is not possible to install a roadside barrier of sufficient length to shield either the clear zone distance or the fixed obstacle clearance, as appropriate (e.g. a railroad access drive which cannot be relocated and is within the development length of the guardrail), the designer will obtain the concurrence of the Unit Head and document the reason in the project file.”
© 17-22	<p>Previous Roadside Barrier Design: - third bullet</p> <ul style="list-style-type: none"> • “Whenever practicable and acceptable, cable guardrail should be installed at the locations that warrant a roadside barrier, including culvert locations.” 	Remove this text
⑤ 17-23	Exhibit 17.1	Removed this exhibit, it may be found in the <u>Roadside Design Guide</u>
③ 17-24		11. MISCELLANEOUS DESIGN ISSUES
③ 17-24	Railroads:	11.A <u>Railroads</u>

Page	Existing Text	Updated Text
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① 17-24	<p>Previous Railroads: - first bullet</p> <ul style="list-style-type: none"> “Work on railroad right-of-way must conform to <u>Title 415, Nebraska Administrative Code</u>, Chapter 6 (Highway-Rail Crossings – Construction, Repair and Maintenance) and requires a special provision prepared by the Railroad Liaison Office.” 	<ul style="list-style-type: none"> “Work on railroad right-of-way must conform to <u>Title 415, Nebraska Administrative Code</u>, Chapter 6 (Highway-Rail Crossings – Construction, Repair and Maintenance) and requires a special provision prepared by the Railroad Liaison Office in the Intermodal Planning Division.”
① 17-24	<p>Previous Railroads: - second bullet</p> <ul style="list-style-type: none"> “The designer should e-mail the Rail and Public Transportation Division, Railroad Liaison Engineer with the Project C.N., Project No., Designer, and Designer’s Phone Number for the initiation of the “Railroad Project Information Sheet” (Form DR-95) after the plan-in-hand.” 	<ul style="list-style-type: none"> “The designer should e-mail the Intermodal Planning Division Railroad Liaison Engineer with the Project C.N., Project No., Designer, and Designer’s Phone Number for the initiation of the “Railroad Project Information Sheet” (Form DR-95) after the plan-in-hand.”
③ 17-24	Bridges:	11.B <u>Bridges</u>
⑥ 17-24	<p>Previous Bridges: - second bullet</p> <ul style="list-style-type: none"> “If the project includes an overlay of the bridge deck, the bridge rail will be a minimum 29 inches in height.” 	Remove this text, refer to the BOPP Manual
③ 17-24	Temporary Roads:	11.C <u>Temporary Roads</u>
③ 17-24	Lighting:	11.D <u>Lighting</u>
③ 17-24	Cost Sharing:	11.E <u>Cost Sharing</u>
③ 17-25	Americans with Disabilities Act (ADA):	12. PEDESTRIAN AND BICYCLE FACILITIES

Page	Existing Text	Updated Text
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③ 17-25	12. PEDESTRIAN AND BICYCLE FACILITIES: - Entire Section	Replace “(PROWAG)” with “the <i>Proposed Guidelines (2011)</i> ”
③ 17-25	Previous Americans with Disabilities Act (ADA) : – Below the title “The NDOR has adopted the guidance in the <u>2011 Draft Public Rights-of-Way Accessibility Guidelines (PROWAG)</u> (Ref. 17.6), issued by the Public Right-of-Way Access Advisory Committee (PROWAAC) (web site).…”	“The NDOT has adopted the guidance in the <u>Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (Proposed Guidelines (2011))</u> (Ref. 17.6), issued by the Architectural and Transportation Barriers Compliance Board (web site).…”
⑤ 17-25	Previous Americans with Disabilities Act (ADA) : - third bullet “1. That part of a roadway at an intersection included within the connections of the lateral lines if the sidewalks on opposite sides of such roadway measured from the curbs or, in the absence on curbs, from the edge of the roadway; or”	“1. That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of such roadway measured from the curbs or, in the absence on curbs, from the edge of the roadway; or
17-26	Previous Americans with Disabilities Act (ADA) : - fourth bullet • “An exemption to the construction of a curb ramp requires the Roadway Design Engineer’s written approval in the project file as well as noted in the Falcon environment ADA, Project, District #, City/Village name.…”	• “An exemption to the construction of a curb ramp requires the Roadway Design Engineer’s written approval in the project file.…”

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17-26	<p>Previous Americans with Disabilities Act (ADA): - fifth bullet</p> <ul style="list-style-type: none"> • “If curb ramps are not provided, the designer must document in the plan-in-hand report or in a decision document in the project file (and in Falcon) that there are no pedestrian facilities crossing the area of the project that will be altered.” 	<ul style="list-style-type: none"> • “If curb ramps are not provided, the designer must document in the plan-in-hand report or in a decision document in the project file that there are no pedestrian facilities crossing the area of the project that will be altered.”
① 17-27	<p>Previous Americans with Disabilities Act (ADA): - second bullet</p> <ul style="list-style-type: none"> • “If traffic signals are being modified, the designer will coordinate the alteration/inclusion of accessible pedestrian signals at crosswalks with Traffic (See the Nebraska Department of Roads Operating Instruction 60-10, “ADA Accessibility Requirements in Transportation Projects”, Appendix F, “Selected NDOR Operating Instructions”).” 	<ul style="list-style-type: none"> • “If traffic signals are being modified, the designer will coordinate the alteration/inclusion of accessible pedestrian signals at crosswalks with Traffic Engineering (See the Nebraska Department of Transportation Operating Instruction 60-10, “ADA Accessibility Requirements in Transportation Projects”, Appendix B, “Selected NDOT Operating Instructions”).”
③ 17-27		<p>13. DRAINAGE DESIGN AND EROSION CONTROL</p>
③ 17-27	<p>Culverts and Hydraulic Considerations:</p>	<p>13.A <u>Culverts and Hydraulic Considerations</u></p>

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① 17-28	<p>Previous Culverts and Hydraulic Considerations: - first bullet</p> <ul style="list-style-type: none"> • “The certification of compliance with floodplain regulations will be forwarded to the Environmental Permits Manager in P&PD for.” 	<ul style="list-style-type: none"> • “The certification of compliance with floodplain regulations will be forwarded to the Environmental Permits Manager in PDD for.”
17-28	<p>Previous Culverts and Hydraulic Considerations: - fifth bullet</p> <ul style="list-style-type: none"> • “To reduce channel and right-of-way impacts, a 3 feet or less increase in earthwork elevation on a concrete box culvert can generally be handled by raising the parapet and wing heights rather than by extending the box. The designer should contact the Special Projects Unit in Bridge for additional guidance.” 	<ul style="list-style-type: none"> • “There are instances where limitations to impacts in channels/wetlands or absence of time in the schedule to acquire property rights prohibits extending concrete box culverts to the appropriate clear zone. In these instances it may be possible to extend the parapet and wings vertically to account for a raise in grade. The ability to increase the height of the parapet and wings is structure dependent and requires the approval of the Bridge Special Projects Unit prior to the plan-in-hand visit. The designer shall contact the Bridge Special Projects Engineer prior to the plan-in-hand visit to discuss the needs of the project and, if appropriate and following analysis, gain the written concurrence of the Bridge Special Projects Engineer to raise the parapets and walls on each culvert or bridge sized box culvert prior to assuming that the parapets will be raised. In the event none of these options are feasible, an acceptable solution may be to remove the wings and a portion of the box and extend back the same distance with a taller parapet and wings designed to handle the increased soil pressures.”

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③ 17-29	Wetland Impacts and Environmental Permits:	13.B <u>Wetland Impacts and Environmental Permits</u>
① 17-29	<p>Previous Wetland Impacts and Environmental Permits: - first bullet</p> <ul style="list-style-type: none"> • “The designer will provide sufficient information to the Environmental Program Manager in P&PD to determine if wetland delineation is required (e.g. culvert extensions or grading).” 	<ul style="list-style-type: none"> • “The designer will provide sufficient information to the Environmental Program Manager in PDD to determine if wetland delineation is required (e.g. culvert extensions or grading).”
③ 17-29	Erosion Control:	13.C <u>Erosion Control</u>
③ 17-29	Seeding:	13.D <u>Seeding</u>
③ 17-30	Section 3 REFERENCES	Section 14 REFERENCES
③ 17-30	Previous Section 3: REFERENCES	<p>Replace Reference 17.6 - Public Right-of-Way Access Advisory Committee (PROWAAC), “2011 Draft Public Rights-of-Way Accessibility Guidelines” (<i>PROWAG</i>), Washington, D.C., 2011 (web site)</p> <p>With Reference 17.6 - Architectural and Transportation Compliance Board, <u>Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way</u> (<i>Proposed Guidelines (2011)</i>), Washington, D.C., 2011 (web site)</p>
③ 17-30	Previous Section 3 REFERENCES	<p>Add Reference 17.11 - Federal Highway Administration, <u>Bridge Preservation Guide</u>, U.S. Department of Transportation, FHWA, Washington, D.C., 2011. (web site)</p>