

8820.9981 MINIMUM DESIGN STANDARDS: NATURAL PRESERVATION ROUTES, DESIGNATED NATIONAL FOREST HIGHWAYS WITHIN NATIONAL FORESTS, AND STATE PARK ACCESS ROADS WITHIN STATE PARKS; NEW OR RECONSTRUCTION PROJECTS.

Subpart 1. **Type I route.** New or reconstruction projects for type I natural preservation routes, designated national forest highways within national forests, and state park access roads within state parks must meet or exceed the minimum dimensions indicated in the following design chart.

Surface Type	Minimum Design Speed	Lane Width	Shoulder Width	Inslope	Clear Zone	Design Strength	Bridge to Remain
	(mph)	(feet)	(feet)	(rise: run)	(feet)	(tons)	(feet)
			(a)	(b)	(c)		(d)
Aggregate	30	11	1	1:3	3		22
Paved	30	11	2	1:3	9	9	22

Engineering judgment may be used to choose a lane-width or shoulder-width dimension other than the widths indicated in the chart for roadways. Factors to consider include safety, speed, population, land use, benefit-cost analysis, traffic mix, peak hourly traffic, farm equipment, environmental impacts, terrain limitations, bicycle traffic, pedestrian traffic, other nonmotorized uses, functional classification, or other factors. Widths less than those indicated in the chart require a variance under parts 8820.3300 and 8820.3400.

(a) If the route has scenic vistas that will require parking vehicles along the shoulder, widening the shoulder at these locations is acceptable. The designer will provide a four-foot paved shoulder if the route is a popular bicycle route.

(b) Applies to slope within the clear zone only. Other design features, such as guardrails or retaining walls, should be considered in particularly sensitive areas in lieu of reconstructing the inslope in accordance with part 8820.4060.

(c) Guardrail is required to be installed at all bridges where the design speed exceeds 40 mph, and either the existing ADT exceeds 400 or the bridge width is less than the sum of the lane and shoulder widths.

Mailbox supports must be in accordance with chapter 8818.

(d) Bridges to remain must have a load rating factor of at least 0.75 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor rating) for inventory level. A bridge narrower than these widths may remain in place if the bridge is not deficient structurally or hydraulically.

HL-93 loading in the AASHTO LRFD (load and resistance factor design) Specifications is required for new or reconstructed bridges. Rehabilitated bridges must have a load rating factor of at least 0.9 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor

rating) for inventory level. The curb-to-curb minimum width for new or reconstructed bridges is the sum of the lane and shoulder widths plus four feet.

Ditch depths and widths must be kept to the minimum required to function hydraulically and to provide for adequate snow storage when a standard ditch would negatively impact the surroundings.

The designer shall specify in the plan and special provisions that the clearing width is to be kept to the absolute minimum. In sensitive areas, the normal clearance allowed to a contractor for working room is zero unless otherwise required for special conditions.

Curb and gutter may be used in lieu of a ditch section under the paved option. The lane width, shoulder width, and clear zone must be maintained.

For designated national forest highways within national forests, and state park access roads within state parks, this subpart applies only where the projected ADT is less than 100, unless the route has been designated as a natural preservation route.

For roundabout design, the design criteria of the current edition of the Minnesota State Aid Roundabout Guide are recommended.

Subp. 2. **Type II route.** New or reconstruction projects for type II natural preservation routes, designated national forest highways within national forests, and state park access roads within state parks must meet or exceed the minimum dimensions indicated in the following design chart.

Surface Type	Minimum Design Speed	Lane Width	Shoulder Width	Inslope	Clear Zone	Design Strength	Bridge to Remain
	(mph)	(feet)	(feet)	(rise: run)	(feet)	(tons)	(feet)
			(a)	(b)	(c)		(d)
Aggregate	30	11	2	1:3	9		22
Paved (e)	40	11	3	1:4	9	9	22

Engineering judgment may be used to choose a lane-width or shoulder-width dimension other than the widths indicated in the chart for roadways. Factors to consider include safety, speed, population, land use, benefit-cost analysis, traffic mix, peak hourly traffic, farm equipment, environmental impacts, terrain limitations, bicycle traffic, pedestrian traffic, other nonmotorized uses, functional classification, or other factors. Widths less than those indicated in the chart require a variance under parts 8820.3300 and 8820.3400.

(a) The designer will provide a six-foot paved shoulder if the route is a popular bicycle route. If the route has scenic vistas that will require parking vehicles along the shoulder, widening the shoulder at these locations is acceptable.

(b) Applies to slope within clear zone only. Other design features, such as guardrail or retaining walls, should be considered in particularly sensitive areas in lieu of reconstructing the inslope in

accordance with part 8820.4060. Approach sideslopes must be 1:4 or flatter within the clear zone when the ADT exceeds 400.

(c) Guardrail is required to be installed at all bridges where the design speed exceeds 40 mph, and either the existing ADT exceeds 400 or the bridge width is less than the sum of the lane and shoulder widths.

Mailbox supports must be in accordance with chapter 8818.

(d) Bridges to remain must have a load rating factor of at least 0.75 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor rating) for inventory level. A bridge narrower than these widths may remain in place if the bridge does not qualify for federal-aid bridge funds.

(e) A 30 mph design speed may be applied only when the project is located in a suburban area.

HL-93 loading in the AASHTO LRFD (load and resistance factor design) Specifications is required for new or reconstructed bridges. Rehabilitated bridges must have a load rating factor of at least 0.9 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor rating) for inventory level. The curb-to-curb minimum width for new or reconstructed bridges is the sum of the lane and shoulder widths, but may not be less than 30 feet.

Ditch depths and widths must be kept to the minimum required to function hydraulically, to be traversable if within the clear zone, and to provide for adequate snow storage when a standard ditch would negatively impact the surroundings.

The designer shall specify in the plan and special provisions that the clearing width is to be kept to the absolute minimum. In sensitive areas, the normal clearance allowed to a contractor for working room is zero unless required for special conditions.

For designated national forest highways within national forests, and state park access roads within state parks, this subpart may be applied only where the projected ADT is less than 300, unless the route has been designated as a natural preservation route.

For roundabout design, the design criteria of the current edition of the Minnesota State Aid Roundabout Guide are recommended.

Subp. 3. **Type III route.** New or reconstruction projects for type III natural preservation routes, designated national forest highways within national forests, and state park access roads within state parks must meet or exceed the minimum dimensions indicated in the following design chart.

Surface Type	Minimum Design Speed (mph)	Lane Width (feet)	Shoulder Width (feet) (a)	Inslope (rise: run) (b)	Clear Zone (feet) (c)	Design Strength (tons)	Bridge to Remain (feet) (d)
Aggregate	30	11-12	3	1:4	10		24
Paved (e)	40	11-12	4	1:4	15	9	24

Engineering judgment may be used to choose a lane-width or shoulder-width dimension other than the widths indicated in the chart for roadways. Factors to consider include safety, speed, population, land use, benefit-cost analysis, traffic mix, peak hourly traffic, farm equipment, environmental impacts, terrain limitations, bicycle traffic, pedestrian traffic, other nonmotorized uses, functional classification, or other factors. Widths less than those indicated in the chart require a variance under parts 8820.3300 and 8820.3400.

(a) The designer will provide a six-foot paved shoulder if the route is a popular bicycle route. If the route has scenic vistas which will require parking vehicles along the shoulder, widening the shoulder at these locations is acceptable.

(b) Applies to slope within the clear zone only. Other design features, such as guardrail or retaining walls, should be considered in particularly sensitive areas in lieu of reconstructing the inslope in accordance with part 8820.4060. Approach sideslopes must be 1:4 or flatter within the clear zone when the ADT exceeds 400.

(c) Guardrail is required to be installed at all bridges where the design speed exceeds 40 mph, and either the existing ADT exceeds 400 or the bridge width is less than the sum of the lane and shoulder widths.

Mailbox supports must be in accordance with chapter 8818.

(d) Bridges to remain must have a load rating factor of at least 0.75 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor rating) for inventory level. A bridge narrower than these widths may remain in place if the bridge does not qualify for federal-aid bridge funds.

(e) A design speed of 30 mph and a clear zone of ten feet may be applied when the project is located in a suburban area.

HL-93 loading in the AASHTO LRFD (load and resistance factor design) Specifications is required for new or reconstructed bridges. Rehabilitated bridges must have a load rating factor of at least 0.9 using the AASHTO Manual for Bridge Evaluation, LRFR (load and resistance factor rating) for inventory level. The curb-to-curb minimum width for new or reconstructed bridges is the sum of the lane and shoulder widths, but may not be less than 32 feet.

Ditch depths and widths must be kept to the minimum required to function hydraulically, to be traversable if within the clear zone, and to provide for adequate snow storage when a standard ditch would negatively affect the surroundings.

The designer shall specify in the plan and special provisions that the clearing width is to be kept to the absolute minimum. In sensitive areas, the normal clearance allowed to a contractor for working room is zero unless required for special conditions.

For roundabout design, the design criteria of the current edition of the Minnesota State Aid Roundabout Guide are recommended.

Statutory Authority: *MS s 14.386; 14.389; 162.02; 162.09; 162.155*

History: *20 SR 1041; 23 SR 1455; 24 SR 1885; 29 SR 449; 32 SR 608; 36 SR 925; 42 SR 485*
Published Electronically: *November 20, 2017*