

SECTION 300 DESIGN CRITERIA

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301. General Design Criteria

301.01. All designs shall be based on criteria listed in the Highway Standards for the Associated Highway Districts. Any variance from these Standards and/or use of other standards or design criteria must be submitted and reviewed in accordance with Section 500 of these Standards prior to use.

Reference Manuals for design criteria (latest editions):

- MUTCD
- AASHTO Manuals
- ITD Standard Drawings & Standard Specifications
- ISPWC Standard Specifications and Standard Drawings
- AASHTO Bridge Design Manual
- LHTAC Manuals

302. Roadway Classification

302.01. All roadways within each District shall be classified in accordance with the current year of the Federal Highway Act. All roads shall be classified as Rural or Urban Arterials, Collectors or Local Residential Roads. It shall be the prerogative of the Highway District having jurisdiction over the area to define in the subdivision which roads are classed as Arterials, Collectors or Local Residential Roads.

303. Public Right-of-Way

303.01. Arterial routes shall have a right-of-way between 80 and 120-feet in width with additional right-of-way or easement as needed to accommodate cut and fill sections.

303.02. Collectors shall have a right-of-way width of 60-120-feet with additional right-of-way or easement as needed to accommodate cut and fill sections.

303.03. Local residential roads shall have a right-of-way width of 60-80 feet with additional right-of-way or easement as needed to accommodate cut and fill sections.

303.04. Cul-de-sacs shall have a minimum right-of-way radius of 60-foot with additional right-of-way or easement as needed to accommodate cut and fill sections and a snow storage area. Cul-de-sacs of a temporary nature may be allowed

providing each right-of-way is shown on the plat and approved by the Highway District. A standard cul-de-sac layout is shown in the Appendix of these Standards.

303.05. All intersecting rights-of-way lines at road intersections shall be connected by a curve having a radius of 30-feet. All intersecting rights-of-way lines at cul-de-sac bulbs and private driveway approaches shall be connected by a curve having a radius of 30-feet or as directed by the Highway District.

303.06. There shall be a perpetual and exclusive minimum 10-foot roadway, drainage, and utility easement on each side of the right-of-way in addition to the right-of-way widths required in Sections 303.01 through and including 303.04.

304. Alignment

304.01. The following table is intended to show the minimum and maximum values for various parameters used in design criteria for the three classes of roads to be designed. Modification by each Highway District on an individual project by project basis may be accomplished under the appropriate procedures outlined in Section 200 of these Standards.

Design Parameters	Arterial	Collector	Local Roads and Streets
Vertical Grades	Min. 0.5% Max. 6%	Min. 0.5% Max. 6%	Min. 0.5% Max 6% Max 2% for Cul-de-sac Mountainous Terrain Max. 10%
Horizontal Curvature On Centerline	7° Min. Radius 830'	11.5° Min. Radius 510'	25° Min. Radius 200' Mountainous Terrain Min. Radius 110'
Design Speed	35-55 mph	35-45 mph	25-35 mph Mountainous Terrain 20 mph
Superelevation	Max 0.06-foot per foot	Max. 0.06-foot per foot	Max 0.06-foot per foot
Minimum Runoff Length	150-feet	120-feet	110-feet
Angles of Intersection	80-90°	80-90°	80-90°

305. Stopping and Passing Sight Distance

305.01. The stopping and passing sight distances shall be at least the minimum shown in the following table for the design speed used on the roadway.

MINIMUM SIGHT DISTANCES IN FEET

Design Speed, MPH	20	25	30	35	40	50	60
Stopping sight distance:							
Stopping distance, ft.	115	155	200	250	305	425	570
K value for:							
Crest Vertical Curve	7	12	19	29	44	84	151
Sag Vertical Curve	17	26	37	49	64	96	136
Passing sight distance:							
Passing distance, ft.							
2 lane	710	900	1090	1280	1470	1835	2135
K value for:							
Crest Vertical Curve	180	289	424	585	772	1203	1628

Notes

1. K value is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve, which will provide minimum sight distance.

2. According to AASHTO .A Policy on Geometric Design of Highways and Streets. (latest edition), the following values are assumed in sight distance design:

- a) Drivers eye height: 3.50 ft. for computation of stopping sight distance and passing sight distance.
- b) Object height: 3.50 ft. for computation of passing sight distance and 2.00 ft. for computation of stopping sight distance.
- c) Perception/reaction time: assumed equal to 2.5 sec(s) for stopping sight distance.

306. Roadway Cross Section

306.01. The Roadway Standard Drawing sheets in the Appendix depict the cross section characteristics for arterial, collector, and local residential roads. The pavement width for the class of road will be set by the individual Highway District.

306.02 Local residential roads are intended to provide access to local properties and provide connectivity or alternative access to nearby subdivisions or parcels of land. The Highway District will determine the paved surface width based on the following criteria:

1. A 22 foot paved surface width may be allowed if:
 - Topographical constraints limit construction of a 28 foot paved surface width or the local residential road serves a subdivision of less than 30-lots and there is no potential for future connectivity to adjacent parcels.
2. A 24 foot paved surface width may be allowed if:
 - Topographical constraints limit construction of a 28 foot paved surface width or the local residential road within a subdivision or travel shed has no potential to be classified as a collector.
3. A 28 foot paved surface width will be required if:
 - Local residential road functions as a collector and is funneling traffic to main roadways and existing collectors or serves a travel shed that warrants a wider roadway.

The applicant is encouraged to meet with the Highway District early in the project development process to discuss potential reductions in paved surface width for local residential roads. The pavement width determination will be at the sole discretion of the Highway District Board of Commissioners.

306.03. Collector roads are intended to link neighborhoods or areas of homogeneous land use with the arterial roadway system. These roadways not only serve traffic movements between arterials and local roads, but also serve through traffic within local areas.

The Highway District will determine the paved surface width for collector roads based on the following criteria:

1. A 24 foot paved surface width may be allowed if:
 - Topographical constraints limit construction of a 28 foot paved surface width, and the Highway District determines that the roadway alignment and cross section proposed are consistent with the anticipated traffic volume and composition.
2. A 28 foot paved surface is the standard width for a rural collector within the Associated Highway District jurisdiction.

3. A pavement width greater than 28 feet may be required at the Highway District's discretion to provide an acceptable level of service to accommodate the anticipated traffic volume and composition, considering the area topography, roadway alignment, and other design factors.

306.04. For industrial type subdivisions, the typical curb and gutter section shall be used with a 40-foot face of curb and gutter to face of curb and gutter dimension. The asphalt thickness shall be increased to 4-inch minimum compacted depth.

306.05. The typical curb and gutter section shown on the Roadway Standard Drawing SD-2 may be required on subdivisions with a density greater than one home per acre. Individual Highway Districts shall make that determination at the time of Plat Review by the Highway District.

306.06. Approaches shall be in conformance with the Local Highway Technical Assistance Council, "Manual for Use of Public Right-of-Way Standard Approach Policy", latest edition with the following exceptions. All approaches serving primarily truck traffic shall use a "curb return approach" in accordance with Fig. IV, C. The radii shall be adequate to accommodate the truck turning movements and the maximum approach width shall be 40-feet. See Figure IV, C in the Appendix SD-7.

307. Drainage

307.01. All drainage for the development shall be designed by a Professional Engineer licensed in Idaho and approved by the Highway District in conjunction with the roadway plans. The design shall be based on the Kootenai County Stormwater Ordinance. Any disruption of the normal drainage pattern of the area to be developed must have special consideration to facilitate future drainage of this area. It shall be the responsibility of the Developer to secure a Grading Permit from Kootenai County.

307.02. Culverts used for drainage purposes shall be of corrugated steel, or Corrugated High-density Polyethylene Pipe Type C or Type S with the thickness and cover over the top of the pipe to the road finish grade in conformance with the following table and as approved by the Highway District.

Diameter (in.)	Steel Thickness (in.)	Minimum Cover Required (in.)	Apron Required
12	0.064	12	NO
15	0.064	12	NO
18	0.064	12	Yes
21	0.064	12	Yes
24	0.064	12	Yes
30	0.064	24	Yes
36	0.064	24	Yes

Corrugated metal pipe shall have 2-2/3-inches x 1/2-inch corrugations. Culverts or multiplate installations larger than 36-inches in diameter or any structure under extreme fills shall be designed by a Professional Engineer licensed in the State of Idaho.

All culvert installations shall be in accordance with the manufacturer's requirements. The installer shall provide a copy of the installation requirements to the Highway District prior to installing culvert.

307.03. Culverts under the roadways in developments shall be a minimum of 18-inches in diameter or the size necessary to take care of the design volume of water. Culverts under approach roads or driveways shall have a minimum diameter of 12-inches, a minimum length of 40-feet (or as directed by the Highway District), and shall meet the requirements of 307.02.

307.04. All necessary drainage easements for maintenance of drainage structures shall be shown and recorded on the plat as a part of the approved plat. Drainage easements necessary for draining storm water across private property shall be shown on the plat with language requiring the underlying property owner to maintain said easement in a manner that will not impede or change the water velocity.

307.05. Disruption of natural drainage ditches and subsequent use of the roadway ditch to convey the natural drainage will not be acceptable.

307.06. Drywells may be used in special circumstances where all other possibilities of taking care of storm drainage water have been explored and there is no feasible alternate to drywell installation. Should drywells be necessary they will be constructed to the standards as shown in the Appendix. It shall be the responsibility of the Developer to secure all permits and pay all fees for installation of the drywells.

307.07. When a curb and gutter roadway section is proposed, a complete storm sewer system must be designed and constructed under the supervision of a Professional Engineer licensed in the State of Idaho.

307.08. The increase in runoff rate generated by developments shall comply with any and all applicable county ordinances. The developer shall be responsible for obtaining all necessary permits.

308. Structures

308.01. Bridge structures shall be designed in accordance with the "Standard Specifications for Highway Bridges", latest edition, with supplements thereto. These specifications are prepared by the American Association of State Highway and Transportation Officials. The minimum width of a bridge structure from the face-to-face of curb or the face-to-face of the guardrail or bridgerail should match the approach roadway guardrail. The vertical clearance above waterways should be 2-feet above the

design flood surface and 16-feet over other roadway surfaces. Only structures of steel or reinforced concrete shall be used.

308.02. Retaining walls shall be reinforced concrete, bin walls, or concrete crib walls or other approved retaining wall system. All retaining wall structures shall be designed by a Professional Engineer licensed in the State of Idaho and shall be approved by the applicable Highway District prior to construction.

309. Signing, Traffic Control and Construction

309.01. All traffic control signing shall be included in the design plans, shall be in conformance with the Manual on Uniform Traffic Control Devices (MUTCD) latest edition, and be installed by the developer in accordance with the MUTCD.

309.02. All construction signing shall conform to the MUTCD, latest edition.

309.03. Sign-posts shall be metal square tubing type E-1 with type E-1 anchor post sleeve or 4 x 4 treated wood to be decided by each Highway District. See appendix for standard drawing.

310. Guardrail

310.01. Guardrail may be necessary in certain areas depending upon the warrants for protecting the traveling public. The Highway District reserves the right to determine the need for guardrail under each separate circumstance. The warrants for determining the need for guardrail shall be made using the Idaho Transportation Department Design Manual or using the American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide for Selecting, Locating, and Designing Traffic Barriers, latest edition.

310.02. The type of guardrail to be installed shall be approved by each individual Highway District as the location dictates.

311. Striping or Pavement Markings

311.01. Each Highway District will determine where pavement markings will be required. Should centerline striping or other pavement markings be required, they will be constructed in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition. The spacing, location, and width of markings will be determined on an individual basis by the appropriate Highway District. Paint quality shall be the same as that used by the Idaho Transportation Department for their pavement marking.