

Powell County Road Standards Revision 1

January 2008

Section I **Resolution**

WHEREAS, the Board of County Commissioners of Powell County are charged with the protection of the health, safety and welfare of the people of Powell County; and

WHEREAS, growth and development within Powell County results in new roadways, approaches and bridges being built to provide access to subdivision and lots for residential and commercial use; and

WHEREAS, these roadways, approaches, and bridges will be privately built and maintained for the public use, they must be constructed adequately for several types of transportation and safe for all users; and

WHEREAS a standard is also needed to which existing county roads should be upgraded and improved as time and resources permit, normal maintenance and upkeep excluded;

NOW, THEREFORE, BE IT RESOLVED that the Board of County Commissioners of Powell County hereby adopts the following Road Standards:

Dwight O'Hara, Chair

Gail Jones, Vice Chair

Ralph E. Mannix, Member

ATTEST:

Clerk & Recorder

Date: _____, 2008

Section II **Roads and Streets**

Road design standards can be complex. Developers and the public are encouraged to contact the Powell County Road Department for additional information or clarification.

Design

1. The arrangement, type, extent, width, grade and location of all roads and streets shall be considered in their relation to existing and planned roads and streets, to topographical conditions and to public convenience and safety, and in their relation to the proposed uses of the land to be served by them. Refer to Appendix A for Typical Sections.
2. Any and all public access road construction or reconstruction, in Powell County must be designed in accordance with the Powell County Road Standards Revision 1 and stamped by a Professional Engineer registered in the State of Montana. Reconstruction generally classified as maintenance is excluded from this requirement. The public access road design plans are to be submitted to the County for review and approval after the Preliminary Plat application has been approved by the County and prior to any construction activities for the proposed project. At a minimum, the plans shall contain the following information:
 - All road construction or reconstruction work must be certified by a licensed engineer as having been completed according to the Powell County Road Standards Revision 1.
 - Plan View: Topographic information, right-of-way (R.O.W.) lines, horizontal alignment of roadway in relation to R.O.W., horizontal curve information (radius, length, Dc, PC, PT, PI, etc.), angle and point of intersection of connecting streets or roads, underground and overhead utilities, and stormwater drainage/detention facilities.
 - Profile View: Finished grade lines (centerline and one or both flow lines), vertical curve information (VPC, VPI, VPT, k value, curve length, etc.), location of underground utilities, and proposed culverts/ drainage structures.
 - Typical Section: R.O.W. width, street width, base course type and thickness, surface course type and thickness, subgrade compaction density, super elevation or crown slope, cut/fill slopes, borrow ditches, number of driving lanes, driving lane width and shoulder width.
3. Roads in low-density areas will meet the design specifications in Table 2.
4. Streets and roads in high density and commercial areas shall meet the design specifications in Table 3.

5. All streets or roads within a new development shall be located in an easement of appropriate width (per Road Standards) dedicated to public use. The lot boundaries shall extend to the center of the road easement, with the easement being dedicated to public access. Refer to Powell County Subdivision Regulations for the requirements for roadway maintenance.
6. Any public access roads within a high density development or a development area with a minimum projected average daily traffic (ADT) of 400 or greater must be hard surfaced with an approved material such as a minimum 3” of hot asphalt paving. All public access roads shall be built with the minimum standard road base course material per these Road Standards.
7. Any development that proposes further development to an adjacent property or to an existing development that will access or utilize public access roads within the existing development will be required to meet the standard in 6 above for all roads in the existing subdivision that have a resulting ADT of 400 or greater. All public access roads shall be built with the minimum standard road base course material per these Road Standards.
8. Residential driveways shall not have direct access to primary highways.
9. Specific requirements for depth of road base, aggregate materials, compaction, and type and depth of surface materials shall be as follows:
 - Grading: All roads, streets and alleys shall be excavated or filled to within one tenth (0.1) of a foot of the grade established by an approved design plan.
 - Subgrades: Roadway subgrades must be free of topsoil, sod, vegetation, organic matter, or other unsuitable soil foundation material which is not able to be adequately compacted. Subgrades must be properly bladed, shaped, and rolled to the minimum specified compaction and subject to approval by Powell County.
 - Base Course: Base course material shall meet the requirements of Section IV of these Road Standards and the approved design.
 - Surface Course: Aggregate surface course material shall consist of crushed gravel, stone, or other similar material consisting of hard, durable particles or fragments of stone, free of excess or flat, elongated, soft or disintegrated pieces, dirt or other deleterious matter. This is the surface course on gravel roads and streets. The material shall meet the requirements of Section IV of these Road Standards and the approved design.
 - Asphalt Paving: Asphalt shall consist of a bituminous hot plant mix asphalt concrete consisting of mineral aggregate and asphalt material mixed at a central hot plant. The mineral aggregate and asphalt material

shall meet the requirements of the appropriate sections of the latest addition of the Montana Public Works Standard Specifications (MPWSS).

- Compaction efforts for subgrade and all aggregate base and surface courses on all public access road construction shall be a minimum of 95% of standard maximum density. Density testing shall be at the developer/contractor's expense and performed by an independent agency as approved by Powell County.
 - Road Surface: The entire roadway shall consist of material meeting the requirements of Section IV of these Road Standards. The surfacing will be shaped, watered, and rolled to obtain the minimum specified compaction. Refer to the Typical Sections in Appendix A.
 - In the extreme case that a double hot chip-seal road surfacing is authorized by the Commission, it shall meet the requirements of Section IV of these Road Standards placed over a minimum of 6" of ¾" minus crushed aggregate base course material properly bladed, shaped, watered, and rolled to the minimum specified compaction. Use of 1" minus or 1-1/2" minus crushed aggregate base course material may be used in an approved design.
 - Paved Roads: Refer to Typical Section A in Appendix A.
 - Gravel Roads: Refer to Typical Section B in Appendix A.
 - Ditch in-slopes shall be between 3:1 and 6:1 (4:1 preferred) with a maximum back-slope of 2:1. The ditch shall be a minimum of 1 foot in depth from the edge of subgrade elevation. Minimum ditch grade is 0.50% (1/2-ft in 100-ft).
10. All new public access roads, including subdivisions, will be inspected for compliance with the approved design and these Road Standards at the developers cost by an independent licensed professional engineer approved by Powell County.
 11. Whenever a subdivision abuts or contains an existing or proposed arterial roadway or major thoroughfare, the County Commission may require frontage roads.
 12. Dead-end roads and streets are discouraged. Where a future street extension is proposed, a cul-de-sac or other approved turnaround is required. Streets ending in a cul-de-sac or other approved turnaround will be no longer than 1,000 feet.
 13. Half road or half street construction is prohibited except when essential to the development and where the County Commission is assured that it will be possible to require the dedication of the other half of the road or street when the adjoining property is subdivided. County Commission permission is required prior to construction. Whenever an existing half road or street is adjacent to a tract to be subdivided, the other half of the road or street shall be platted within such a tract.

14. Horizontal alignment of roads and streets must ensure adequate sight distances. When road and street centerlines deflect more than five degrees, connection must be made by horizontal curves.
15. Intersections. The following items apply to intersections:
 - Streets must intersect at 90-degree angles, except when topography precludes and has been approved by Powell County, and in no case will the angle of intersection be less than 80 degrees to the centerline of roadway being intersected.
 - Two streets meeting a third street from opposite sides must meet at the same point.
 - No more than two streets may intersect at one point (four legs maximum).
 - Intersections of local streets with major arterial or highways must be kept to a minimum.
 - Intersection design must provide acceptable visibility for traffic safety as dictated by the designed operating speeds on the individual roadways.
 - When a new road intersects an existing principal arterial, collector or local road at an inclining or declining angle greater than three percent, the new road approach will include a thirty-foot landing for sight distance and drainage. A culvert may be required.
 - Hilltop or lowpoint intersections are prohibited, except where no alternatives exist. Intersections on local roads within 100 feet of a hilltop or a lowpoint are prohibited. Intersections on arterial and collector roads within 200 feet of a hilltop or a lowpoint are prohibited.
 - Approach permits will be required for construction of approaches to county roads prior to any construction.
16. Where new streets are added, all signs required by the latest Manual on Uniform Traffic Control Devices must be provided at the expense of the developer. All signs must be laid out and/or designed according to the latest edition of the Manual on Uniform Traffic Control Devices. A sign plan must be submitted for approval before installing any new signs. Names of new streets aligned with existing streets will be named the same as those of the existing streets. Proposed street names will not duplicate or cause confusion with existing street names, in conformance with the county addressing system. Street names must be approved by the Powell County Planning Department prior to installation.
17. Driveways to building sites must access ingress/egress roads at right angles from the easement line and should have a 12' minimum traffic lane with a 13' 6" height clearance. The ends of driveways exceeding 500' should be able to demonstrate adequate turnaround for a single unit truck (AASHTO vehicle classification SU).

Refer to Figure C in Appendix A. A driveway provides vehicle access to a single property. A road provides access to more than one property.

Section III **Minimum Design Standards**

Roadway Classifications

The following act as definitions for roadway classifications:

- **Principal Arterial:** a through road or predominant route between major activity centers, interstate or intrastate significance with long trip lengths and heavy travel densities.
- **Minor Arterial:** link cities and larger towns, spaced at intervals so that all developed areas are within a reasonable distance of an arterial, and interconnects network of arterial highways.
- **Collector Roads:** land access to channel local street traffic to arterials, service to travel of primarily intra county importance.
- **Local Road:** These roads are not classified under a higher system. The purpose of local roads is to provide land access and serve short distance travel.

Roadway widths and ADT's

Table 1
Minimum Roadway Widths

Roadway width according to Average Daily Traffic Count (ADT) and Topography			
ADT Count	Flat	Rolling	Mountainous
0-400	24 ft.	24 ft.	24 ft.
400-700	24 ft.	24 ft.	24 ft.
700+	28 ft.	28 ft.	28 ft.
For design speeds in excess of 40 mph	28 ft.	28 ft.	28 ft.

Note: ADT counts are available from the Montana Department of Transportation, Planning Section, for most on-system routes.

Right-of-way and road width requirements shall be specified by the County Commission at the time of Preliminary Plat approval based upon site conditions and project design within the design specification ranges outlined in these regulations. The standards presented should be considered “minimum standards,” and may be increased if conditions warrant.

Low Density Areas:

A low density area is defined as an area in which the density of development is not more than one dwelling unit per acre exclusive of public roadways, and which is located one mile or more from a third class city, two miles or more from a second class city, or three miles or more from a first class city. **All minimums shall conform with the latest addition of American Association of State Highway and Transportation Officials Guidelines for Highways and Streets (AASHTO), design of very low-volume local roads (ADT < 400).** The minimum that governs shall be the one that provides greater safety to the roadway.

**Table 2
Road and Street Design Standards for Low Density Areas**

Minimum Design Standards	Minor Arterial	Collector	Local Road
Minimum easement or right-of-way width*	120 ft.	100 ft.	60 ft.
Minimum roadway width	Refer to Table 1.		
Minimum curb radius or edge of pavement at intersection	30 ft.	25 ft.	15 ft. (25 ft for ADT >400)
Minimum design speed	40 mph	35 mph	25 mph
Maximum grades			
- flat and rolling terrain	6%	8%	8%
- mountainous terrain	8%	10%	10%
Flat and rolling terrain is land with a cross slope of less than 15%.			
Mountainous terrain is land with a cross slope of 15% or greater.			
Maximum Rate of Vertical Curvature – per AASHTO for all roads. Vertical curves will not be required when the algebraic grade difference is 1% or less.			
Minimum stopping sight distance	300 ft.	200 ft.	150 ft.
Minimum curve radius	460 ft.	250 ft.	125 ft.
Minimum intersection spacing	500 ft.	250 ft.	250 ft.
Minimum encroachment/ approach spacing	---	150 ft.	150 ft.

* Easement or right-of-way widths may be wider than the minimums presented above to accommodate side slopes on steep terrain or for snow removal and maintenance.

High Density Areas:

A high density area is defined as an area in which the density of development is greater than one dwelling unit per acre exclusive of public roadways, or which is located within one mile of a town or third class city, two miles of a second class city, or three miles of a first class city.

**Table 3
Road and Street Design Standards for High Density, Major and Commercial Areas**

Minimum Design Standards	Minor Arterial	Collector	Local Road
Minimum easement or right-of-way width*	120 ft.	100 ft.	60 ft.
Minimum roadway width	Refer to Table 1.		
Minimum curb radius or edge of pavement at intersection	30 ft.	30 ft.	25 ft.
Minimum design speed	40 mph	35 mph	25 mph
Maximum grades			
- flat and rolling terrain	6%	8%	9%
- mountainous terrain	8%	9%	9%
Maximum Rate of Vertical Curvature – per AASHTO for all roads. Vertical curves will not be required when the algebraic grade difference is 1% or less.			
Minimum intersection spacing	500 ft.	250 ft.	150 ft.
Minimum stopping sight distance	375 ft.	200 ft.	150 ft.
Minimum curve radius	560 ft.	300 ft.	125 ft.
Minimum encroachment/ approach spacing	100 ft.	100 ft.	100 ft.

* Easement or right-of-way widths may be wider than the minimums presented above to accommodate side slopes on steep terrain or for snow removal and maintenance.

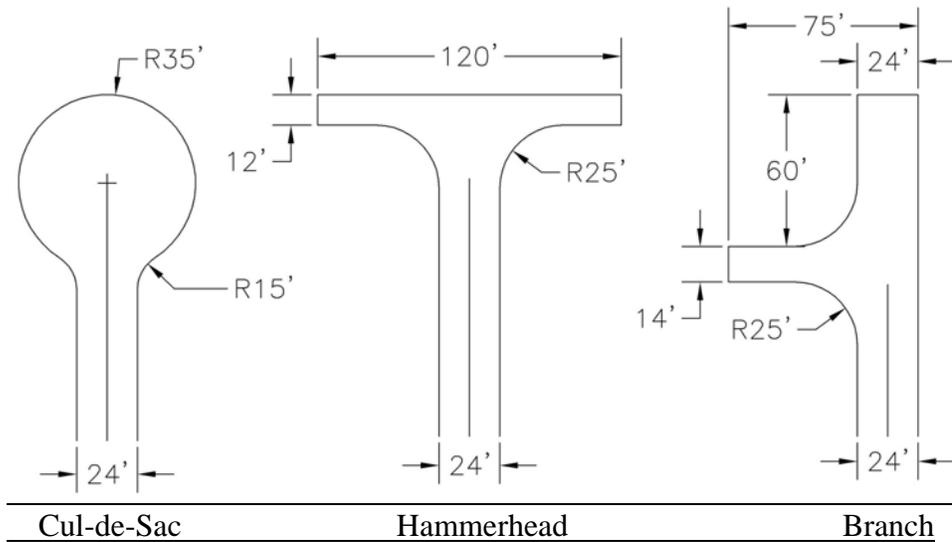
Cul-de-Sacs and Turnarounds:

Cul-de-Sacs and Turnarounds are only permitted on Local Roads and are subject to the minimum standards presented below. Center islands are permitted within the Cul-de-Sac provided that the island may be driven on. Landscaping that may limit larger vehicles from driving on this center island is not permitted. Cul-de-Sacs and Turnarounds are not permitted at locations where semitrucks with trailers greater than 42.5 ft. are anticipated.

Table 4 Road and Street Design Standards for Cul-de-Sacs	
Minimum Design Standards	Local Road
Cul-de-sacs	
- Maximum length for all turnarounds	1000 ft.
- Min. outside right-of-way radius	45 ft.*
- Cul-de-sac minimum roadway radius	35 ft.*
- Minimum entering radius	15 ft**

48 ft. minimum radius for locations servicing semitrucks with 42.5 ft trailer (WB_50); a 60 ft. right-of-way radius is required for this larger cul-de-sac.
 ** - 25 ft. minimum entering radius for 48 ft. or larger radius cul-de-sacs.

Standard turnarounds are presented below:



Other Turnarounds:

Other turnarounds may be acceptable without a variance, pending a design review by Powell County. Submit to Powell County in the plan set or separate document, details showing the turnaround with dimensions and the turning movement of the design vehicle. The minimum design vehicle is a Single Unit Truck (designated by AASHTO as SU). This vehicle has a bumper to bumper length of 30-ft. and an axel spacing of 20-ft. Larger design vehicles may be required, depending on expected usage. Examples of optional turnarounds include the partial cul-de-sac (eyebrow), L-Type, T-Type (hammerhead), Y-Type, and the branch.

New bridges

Bridges shall be designed and constructed in accordance with the adopted Powell County Bridge Standards.

**Table 5
Bridge Design Standards**

	Arterial	Collector	Local Road
Curb to curb widths	36 ft.	28 ft.	24 ft.
AASHTO design	HS-20-44	HS-20-44	HS-20-44
Vertical clearance	14.5 ft.	14.5 ft.	14.5 ft.

Notes:

- If guardrail installation is required or a shoulder is desired, the curb to curb widths listed above will be the useable width of the bridge.
- Bridge and roadway widths shown are minimums. Depending on Average Daily Traffic (ADT) count, the width may be increased.
- Horizontal curvature is based on a maximum super elevation of 0.08/ft.
- Width of the roadway surface on the bridge should match the width of the roadway system it connects to.

American Association of State Highway Transportation Officials may be used as a further authority. Right-of-way and road width requirements shall be specified by the County Commission at the time of Preliminary Plat approval based upon site conditions and project design within the design specifications ranges outlined in these regulations. The standards presented should be considered “minimum standards,” and may be increased if conditions warrant.

Road Improvements

1. All roadway improvements including pavement, curbs, gutters, sidewalks, and drainage features shall be constructed in accordance with the specifications in these Road Standards, using materials approved by Powell County or an approved independent agency at the developers cost.

2. Where access to a development will be by an easement across privately owned property, the developer must provide evidence that the necessary easement has been acquired and that the easement encompasses the nature and intensity of the use which will result from development. All appropriate documentation will be filed separately at the county court house at the developer's expense.
3. Street or road signs and traffic control devices shall be placed at all intersections and other applicable locations by the developer in accordance with the "Manual of Uniform Traffic Control Devices for Streets and Highways". See Appendix B for example sign locations.

Mail Delivery

1. Coordinate with the Local Postmaster for mail service during county road reconstruction work.
2. Refer to Powell County Subdivision Regulations for requirements related to mail delivery.

Encroachment and Approaches

1. Any person or entity, including utility companies, who encroaches upon any county road right-of-way within Powell County must obtain a permit from the Powell County Commissioners prior to any construction.
2. All approaches will enter the county road with a negative degree of slope not more than three percent (3%) for a minimum of 30 feet back from the edge of roadway of the county road. Variances to be approved by the County Commission on an individual basis, but can not exceed a positive slope of three percent (3%) for a minimum of 30 feet back from the edge of roadway of the county road.
3. All approaches shall be a minimum of 24 feet wide within the county right-of-way. Minimum approach widths outside of the county right-of-way are as follows:
 - a. All residential approaches shall be a minimum of 12 feet wide.
 - b. All other approaches shall be a minimum of 20 feet wide for one way traffic.
 - c. Approaches designed for two way traffic shall be a minimum of 24 feet wide.
4. On paved roads, the approaches shall include a 3 foot wide strip of asphalt placed parallel to the roadway along the width of the approach (including tapers and radii) to avoid edge breakaway.
5. Any encroachment upon state owned and maintained roads must be authorized by the Montana Department of Transportation. The developer must obtain an approach permit and comply with state standards prior to Final Plat approval.

Drainage Features

1. The drainage features required for any surface runoff or runoff affecting the development shall meet the minimum standards of the Montana Department of Environmental Quality and all regulations adopted pursuant thereto, and are subject to the approval of the governing body. The intent of these regulations is to assure that proper drainage facilities are provided for any runoff in addition to historic amounts, caused by the development of the property.
2. Public access roads shall be designed to ensure proper drainage.
3. Culverts shall be designed of an adequate size and spacing to pass the flow from a 25-year storm event for arterials and collectors. A 10-year storm event shall be used in the design of culverts for local roads. They shall be provided and installed by the developer where any proposed roadway intersects a drainage channel or feature. Minimum culvert size shall be 18" in diameter or an equivalent sized arched pipe (squash pipe) for all driveways and public access roads. Under special circumstances the County may approve the use of 15" culverts for interior roads and/or driveways. A 15" culvert must be approved on a case by case basis and shall not constitute a normal minimum culvert size. Culverts shall extend a minimum of 1' beyond the toe of the roadway fill. The minimum or maximum fill cover over culverts shall be determined by the manufacturer's recommendations for HS-20-44 loading.
4. Bridges shall be designed and constructed in accordance with the adopted Powell County Bridge Standards. They shall be provided and installed by the developer where any proposed roadway intersects a drainage channel or feature of sufficient size and flow to warrant the use of a bridge. Bridges shall meet the design standards as specified in Tables 2 and 3 of these Road Standards and will not be narrower than the approaching roadways.
5. Drainage facilities shall be located in County road rights-of-way or in perpetual drainage easements of appropriate widths and are subject to approval by Powell County.
6. Drainage features shall not discharge into any sanitary sewer facility or any identified hazardous materials.
7. Drainage ditches shall have a minimum grade of 1.0%. A minimum grade of 0.5% may be used for distances of 200 feet or less.
8. The grading and drainage features shall be designed in accordance with these Road Standards and applicable regulations, and stamped by a Professional Engineer registered in the State of Montana, except where a property is at the head of the

drainage area and all natural historic drainage channels will be protected by perpetual easements as approved by Powell County.

Cattle Guards

1. Cattle guards will be reviewed on a case by case basis and are generally discouraged. Where approved, cattle guards are required to support HS 20-44 loading.

Variances:

1. Situation

The County Commission may grant a variance from the Powell County Road Standards Revision 1 when strict compliance may not be essential to the public welfare. Such variances shall not have the effect of nullifying the intent and purpose of these regulations. An innovative alternative proposal, which does not circumvent the purpose of these regulations, may be reason for granting a variance by the County Commission. The County Commission shall not approve variances unless it makes findings based upon the evidence in each specific case that:

- The granting of the variance will not be detrimental to the public health, safety, or general welfare, and
- The variance will not cause an increase in public costs.

2. Procedure

The developer shall include with the submission of the Preliminary Plat a written statement describing the requested variance and the facts upon which the request is based. The County Commission shall consider each requested variance at the noticed meeting on the Preliminary Plat.

3. Conditions

In granting variances, the Powell County Commission may impose such conditions that will, in its' judgment, substantially secure the objectives of these Road Standards Revision 1. Reasons for approval must be documented by the Commission.

Section IV **Materials**

Aggregates

1. Aggregate for Road Mix Bituminous Base

- Aggregates for road mix bituminous base construction shall be crushed stone, crushed slag, or crushed or natural gravel meeting the quality requirements of this Section unless shown otherwise in the approved specific project specifications.
- The gradation shall be as described in this Section or in the approved specific project specifications. When crushed gravel is used, not less than 50 percent by weight of the particles retained on the Number 4 sieve shall have at least one fractured face.

2. Aggregate for Base or Surface Courses

- Aggregate materials shall conform to the requirements shown below unless shown otherwise in the approved specific project specifications.
 - Pit-Run Aggregate. Pit-run aggregates shall consist of native materials of a size and grading that can be taken directly from the source and placed on the road without crushing or screening. No gradation, other than a maximum size, will be required. The maximum size is limited to 4” or shall be as shown in the approved specific project specifications. Material larger than 4” may be Grid-Rolled as defined below.
 - Grid-Rolled Aggregate. Grid-rolled aggregate shall consist of native materials of a quality that can be taken directly from the source, without crushing or screening, and broken down on the road by grid rolling. No gradation other than a maximum size will be required. The maximum size is limited to 4” or shall be as shown in the approved project specifications.
 - Screened Aggregate. Material shall consist of gravel, talus, rock, sand, shale, or other suitable material, and be reasonably hard and durable and reasonably free of organic material, mica, clay lumps, or other deleterious materials. The gradation requirements shall be as shown on the approved project specifications.
 - Crushed Aggregate. Aggregate for crushed base or surface courses shall be crushed stone, slag, or gravel meeting the requirements shown in this Section or in the approved project specifications.
- Aggregate shall be well graded from coarse to fine within the gradation band.

**Table 6
Crushed Aggregate Quality Requirements for Base or Surface Courses**

Description	AASHTO Test Method	Requirement	
		Base	Surfacing
Approved specific project specifications	T 96	50 max.	50 max.
Durability Index, Coarse and Fine	T 210	35 min.	35 min.
Liquid Limit	T 89	25 max.	25 max.
Plasticity Index	T 90	6 max.	2-9 max.
Dust Ratio: % Passing No. 200	T 11	2/3 max.	2/3 max.
% Passing No. 30	T 27		
Sand Equivalent (Alternate Method Number 2)	T 176	35 min.	

- When crushed gravel is used, at least 40 percent by weight of the particles retained on the Number 4 sieve shall have at least one fractured face. Naturally fractured faces may be included in the 50 percent requirement, provided the roughness and angularity produce strength characteristics equivalent to mechanically fractured faces.

**Table 7
Specification for Crushed Surface Course**

Table of Gradations Percentage by Weight Passing Square Mesh Sieve	
Sieve Size	Grade 2
1 inch Sieve	
3/4 Inch Sieve	100%
1/2 Inch Sieve	
No. 4 Sieve	40-80%
No. 10 Sieve	25-60%
No. 200 Sieve	8-20%

**Table 8
Specification for Crushed Base Course**

Table of Gradations Percentage by Weight Passing Square Mesh Sieve			
Passing	1 1/2" Minus	1" Minus	3/4" Minus
2 Inch Sieve	—		
1 1/2 Inch Sieve	100%		
1 Inch Sieve	—	100%	
3/4 Inch Sieve	—	—	—
No. 4 Sieve	25-60%	40-70%	40-70%
No. 10 Sieve	—	25-55%	25-55%
No. 200 Sieve	0-8%	2-10%	2-10%

**Table 9
Specification for Select Sub-Base Material**

Table of Gradations Percentage by Weight Passing Square Mesh Sieve					
Passing	4" Minus	3" Minus	2 1/2" Minus	2" Minus	1 1/2" Minus
4 Inch Sieve	100%				
3 Inch Sieve	—	100%			
2 1/2 Inch Sieve	—	—	100%		
2 Inch Sieve	—	—	—	100%	
1 1/2 Inch Sieve	—	—	—	—	100%
No. 4 Sieve	25-60%	25-60%	25-60%	25-60%	25-60%
No. 200 Sieve	2-12%	2-12%	2-12%	2-12%	2-12%

Specifications for Chip Seal Surfacing and Cover

1. Material Requirements:

- The chip seal surfacing design shall be a double bituminous surface treatment (double shot) consisting of a first application of 0.40 – 0.50 gallons per square yard of MC800 or equal and 25 pounds of 1/2" chips per square yard. The second application shall be 0.40 – 0.50 gallons per square yard of MC3000 or equal and 25 pounds of 1/2" chips per square yard. Where applicable a prime coat of MC70 at a rate of 0.25 - 0.38 is to

be used prior to the application of MC800. The prime coat is to be allowed to cure per the manufactures recommendation before the MC800 application is applied. All spread rates to be verified by the manufacture prior to construction. Any variation from this spec must be an engineered design.

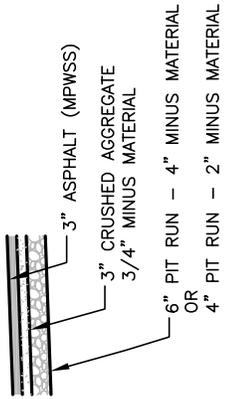
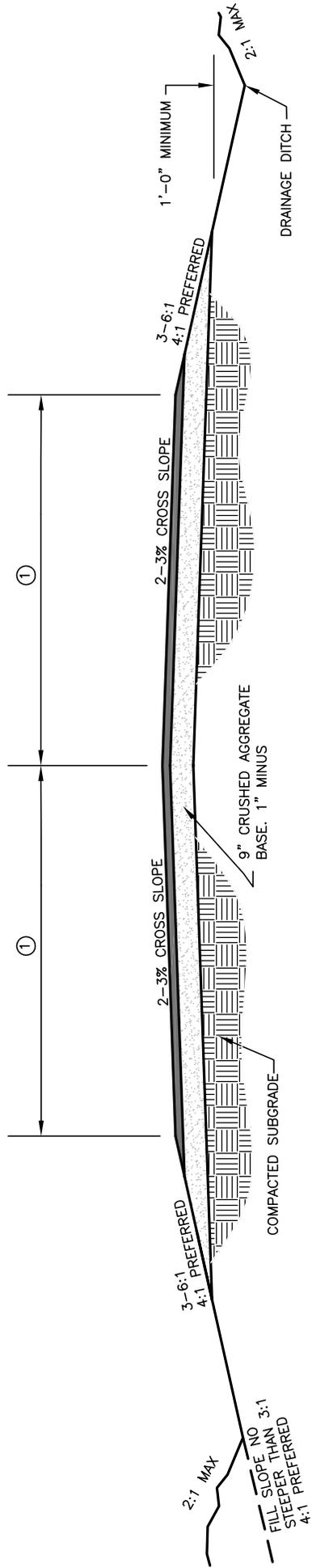
2. Construction Requirements:

- Sampling, Testing and Acceptance.
 - Furnish at least 2 aggregate sampling pans, each a minimum of 2 feet x 2 feet x 2 inches. Leg mount or support the pans to prevent disturbing the fresh asphalt when sampling.
 - Take samples while spreading chips at locations randomly selected by the project manager. Place 2 sample pans on the roadway immediately ahead of the spreader between the spreader wheel paths. Stagger the pans 3 to 6 feet apart. Once the spreader passes, retrieve the sample pans and turn them over to the project manager for review.
 - Replace or correct all asphalt removed or disturbed by the sampling and place cover aggregate over the sampling area at the specified rate.
- Seasonal and Weather Limitations.
 - Performance chip seal operations between June 1 and August 30.
 - Do not perform chip seal work during the 48-hour period immediately preceding a holiday or a holiday weekend.
 - Do not perform chip seal work if local weather forecasts includes a predicted temperature lower than 45°F (70° C) within 12 hours after the intended close of the work for the day.
 - Do not perform chip seal work if the local weather forecast includes a probability of precipitation greater than 45% within the intended schedule of operations for the day. Chip seal work may be suspended if impending adverse weather conditions occur in the vicinity of the work site.
 - Do not apply chip seal to damp or wet road surfaces.
 - Immediately stop chip seal work if the wind velocity affects the distribution of chips and oil or if current weather conditions prevent providing the specified results.
 - Stop chip seal work at least ½ hour before sunset.
- Rolling Requirements.
 - Begin rolling immediately behind the spreader. Provide the number of rollers needed to cover the full width of the aggregate spread in one pass.

- Make at least 4 complete passes with each roller. Do not allow the speed to exceed 7 mph on the initial coverage. Additional rolling may be required.
- Opening to Traffic.
 - Open the roadway to traffic within one week after the chip seal work is completed.
 - Broom within 48 hours of the completion of chip seal work. Broom in the early morning to minimize dust and reduce loosening or displacing of embedded aggregate. Provide water for dust control. Provide additional rolling if necessary.
 - If the chip seal fails to cure properly, or inclement weather interrupts the 48-hour curing period, continue traffic control as appropriate.
 - Correct surface irregularities affecting the ride quality at contractor's expense.
- Traffic Control.
 - Traffic Control is the contractor's responsibility and must be in accordance with Manual on Uniform Traffic Control Devices (MUTCD) standards.
 - All flaggers must have a current certification.

Appendix A
Typical Sections

MINIMUM STANDARDS
COUNTY AND SUBDIVISION
PAVED STREET



NOTES

- ① ROAD WIDTHS
12' FOR \leq 700 ADT
14' FOR $>$ 700 ADT
- ② RIGHT-OF-WAY WIDTHS
LOCAL ROAD 60 FEET
COLLECTOR 100 FEET
MINOR ARTERIAL 120 FEET
- ③ MINIMUM ROADWAY TYPICAL SECTION
APPROVAL BASED ON ADEQUATE SUBGRADES.



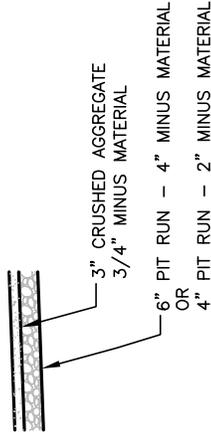
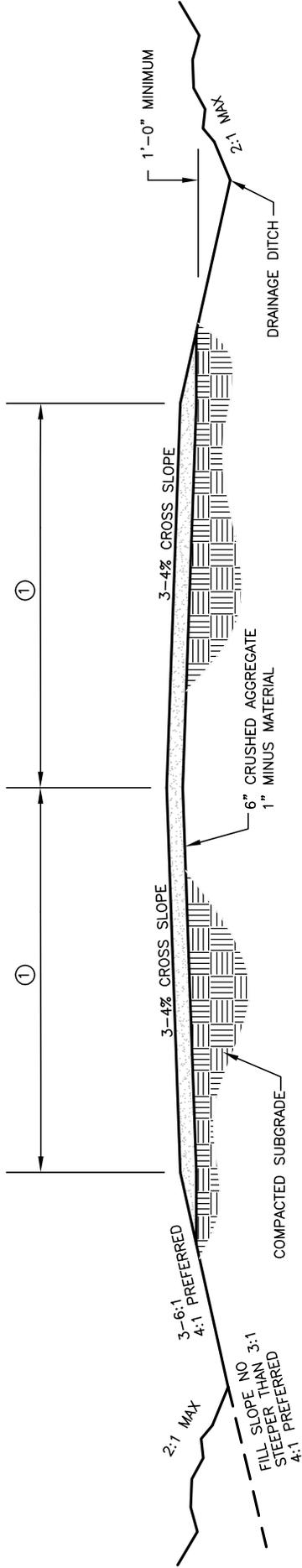
ALTERNATE SECTION
(REQUIRES COUNTY ROAD FOREMAN OR
PROFESSIONAL ENGINEER APPROVAL)

APPROVED _____ DATE _____

CHAIR-COUNTY COMMISSION

TYPICAL SECTION A

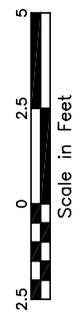
MINIMUM STANDARDS
COUNTY AND SUBDIVISION
GRAVEL ROADS



NOTES

- ① ROAD WIDTHS
12' FOR \leq 700 ADT
14' FOR $>$ 700 ADT
- ② MINIMUM ROADWAY TYPICAL SECTION.
APPROVAL BASED ON ADEQUATE SUBGRADES.

ALTERNATE SECTION
(REQUIRES COUNTY ROAD FOREMAN OR
PROFESSIONAL ENGINEER APPROVAL)

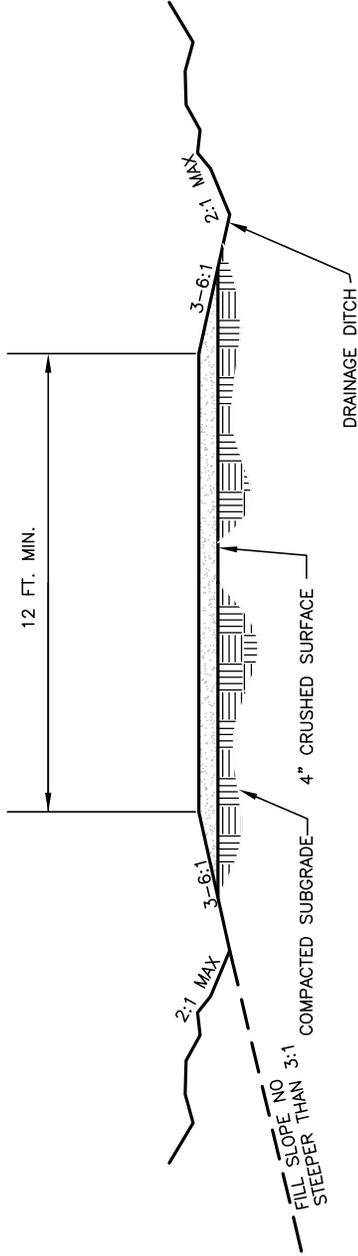


APPROVED _____ DATE _____

CHAIR-COUNTY COMMISSION _____

TYPICAL SECTION B

RECOMMENDED STANDARD FOR
COUNTY AND SUBDIVISION
DRIVEWAYS



NOTES

- ① MINIMUM ROADWAY TYPICAL SECTION APPROVAL BASED ON ADEQUATE SUBGRADES.

APPROVED _____ DATE _____

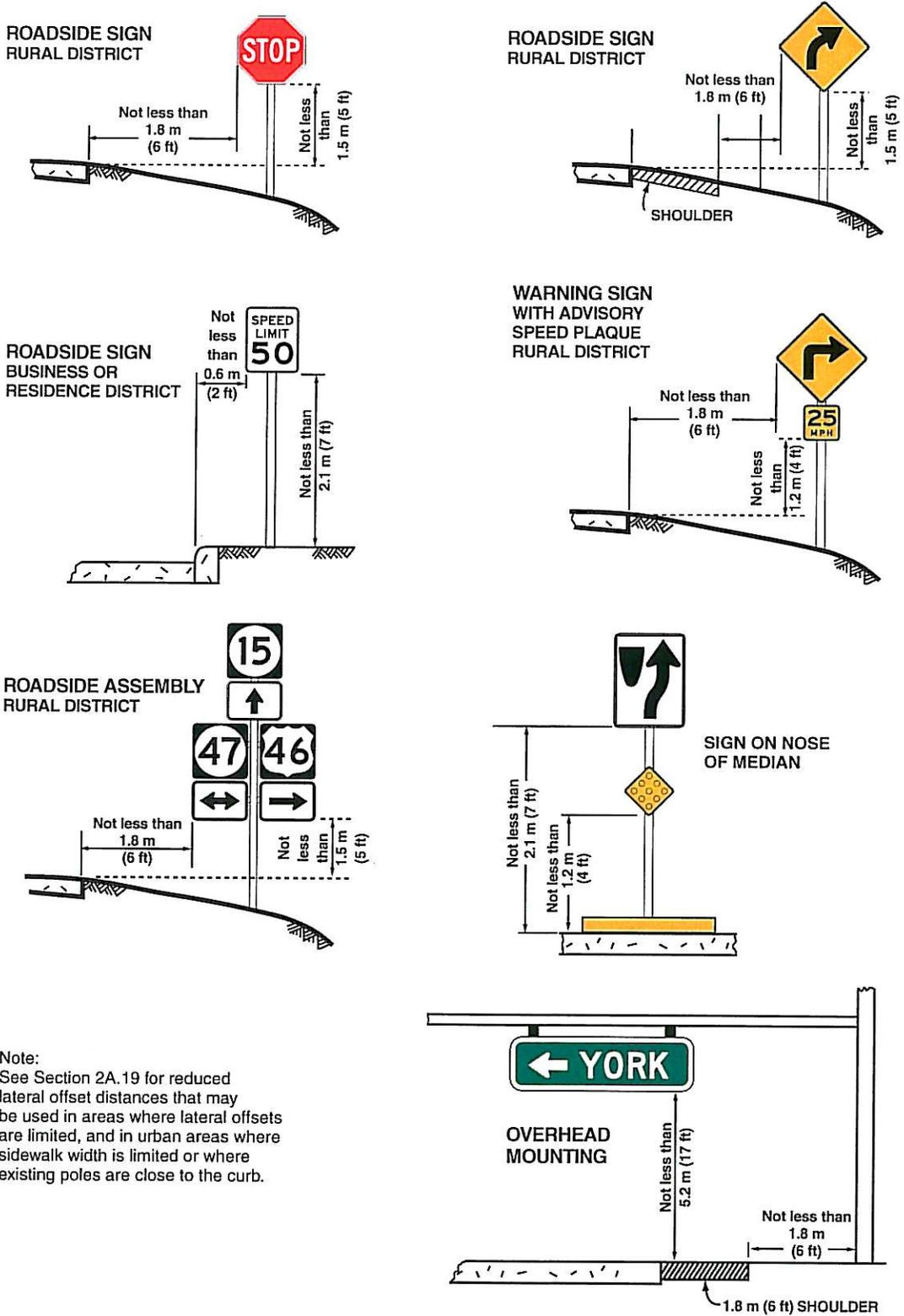
CHAIR-COUNTY COMMISSION



TYPICAL SECTION C

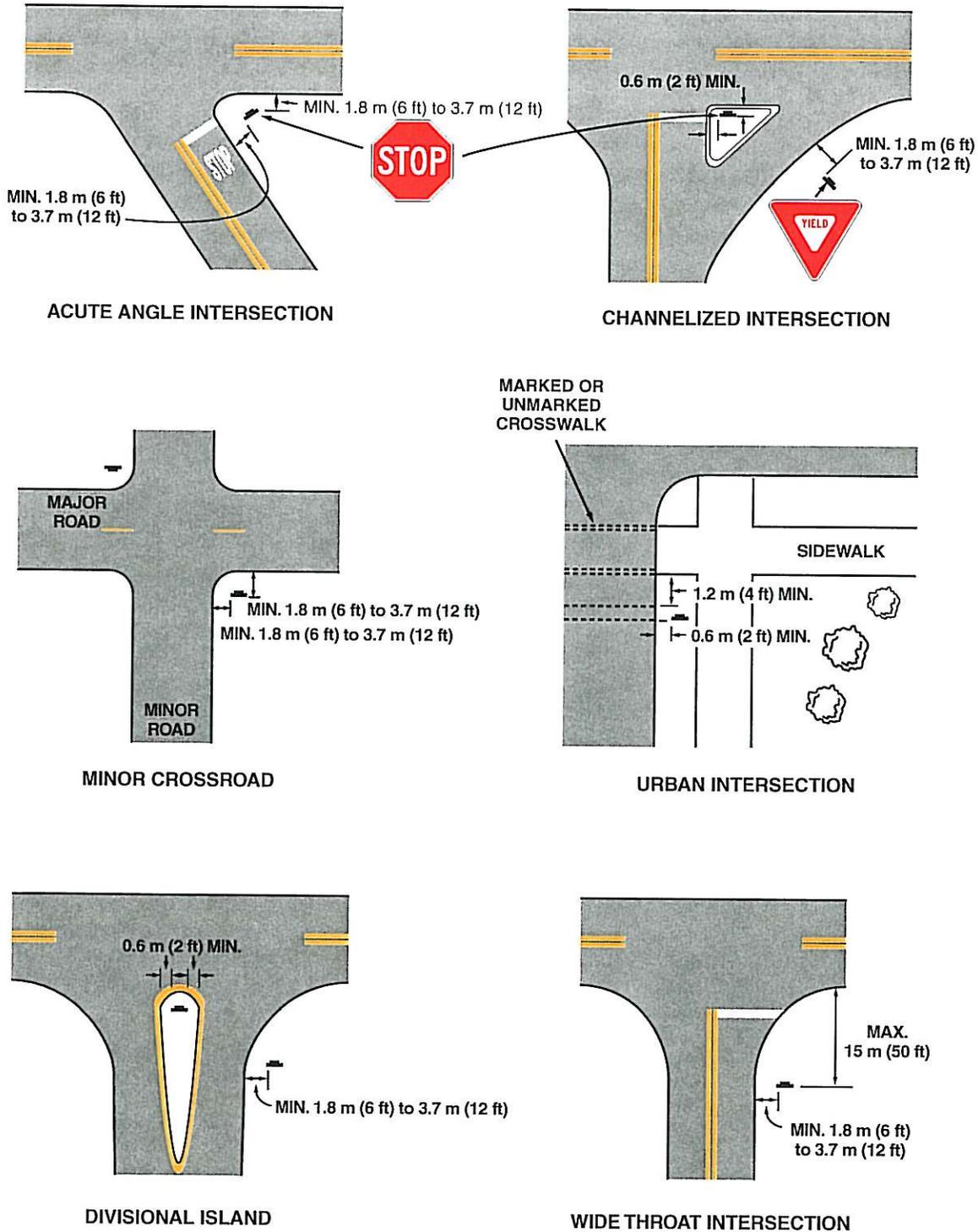
Appendix B
Example Sign Locations

Figure 2A-1. Examples of Heights and Lateral Locations of Signs for Typical Installations



Note:
 See Section 2A.19 for reduced lateral offset distances that may be used in areas where lateral offsets are limited, and in urban areas where sidewalk width is limited or where existing poles are close to the curb.

Figure 2A-2. Examples of Locations for Some Typical Signs at Intersections



Note: Lateral offset is a minimum of 1.8 m (6 ft) measured from the edge of the shoulder, or 3.7 m (12 ft) measured from the edge of the traveled way. See Section 2A.19 for lower minimums that may be used in urban areas, or where lateral offset space is limited.