DEVELOPMENT CODE REVISIONS CHAPTER 5[1]			
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99-74	99-166	5600	12/20/99
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10-143	13-74	Entire Chapter	10/8/13
18-091	19-22	Addressing, Road Naming, and Road Numbering; Appendix 5 -1	3/26/19
18-124	19-23	Entire Chapter	3/26/19

[1] The Sections referenced above were the Sections in effect at the time the Development Code was amended. Subsequent amendments to the Development Code may have resulted in section numbers being modified and may no longer be applicable.

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5000: INTRODUCTION

5001: Purpose and Intent

The Summit County Road & Bridge Standards ("Road Standards") establish a uniform road development policy throughout Summit County and provide a clear statement of the procedures for road, bridge and recreational pathway ("recpath") construction. The purpose and intent of these policies and procedures is to provide safe attractive travel corridors, efficient traffic flow and efficient maintenance.

5002: Authority

The State of Colorado, by statute, authorizes the Board of County Commissioners ("BOCC") to administer the County road system including, but not limited to, maintenance, layout, alterations, deletions, additions, specifications, property acquisition and traffic regulation. The Engineering Department enforces road construction standards, reviews plans and conducts inspections. The Road & Bridge Department maintains and improves roads accepted by Summit County, administers work within all public rights-of-way, reviews plans and conducts inspections.

5003: Types of Roads

The roads contained in the countywide circulation system can be categorized based on whether the road right-of-way is public or private and whether the County or another party is responsible for maintenance. These categories are described below. Regardless of road categorization, all roads remain subject to the relevant and applicable rules, regulations, and laws.

5003.01: Publicly Owned and Maintained Roads

Under this category, the County has an interest of record or other claim to the road right-of-way and has assumed responsibility for the road maintenance. These roads are listed in the annual inventory filed with the State of Colorado, and the County receives an annual allotment of highway users' fees to defray maintenance costs based on the mileage of roads listed. The Road & Bridge Department will publish a list of County Maintained Roads on the County's website on a routine basis.

5003.02: Publicly Owned Roads Maintained by Others

In certain cases private property owners using public roads for access desire a higher level of service than the County can provide. In such cases, the County and the property owners have reached an agreement assigning maintenance responsibilities to the property owners. The primary examples of this situation are in the Keystone Resort and the Buffalo Mountain Metro District. In other cases, publicly-owned roads might be maintained by an adjacent town. Such arrangements have been made when it makes more sense for a town to plow a portion of a County road because of its location and its connection to town streets. In still other cases there are public roads that have not been accepted for maintenance by the County. In these latter cases the roads provide public access but the responsibility for maintenance of those roads falls to the users of the road(s), either because they do not meet County standards or applications for County maintenance have not been received or approved. In cases where roads are not maintained by the County, the owners may wish to establish a Public Improvement District ("PID") pursuant to C.R.S. Section 30-20-500 et seq. in order to provide for equitable sharing of costs and a formally established standard of maintenance and condition of the road(s). Although the County may not maintain a road, all public roads and rights-of-way are managed and regulated by the County according to the standards promulgated herein.

5003.03: County Maintained Roads, Owned by Others

A number of county roads include segments that cross National Forest lands. These segments are managed and controlled by the federal government and continued public access may be authorized through an administrative process such as the County's maintenance agreement with the USFS. In certain circumstances, the County assumes maintenance of these road segments. In addition, this category may include town streets plowed by the County by agreement and privately owned roads historically maintained by the County for various reasons.

5003.04: Privately Owned and Maintained Roads and Recreational Pathways

This category includes all roads and recpaths where a private party has ownership of the road right-of-way either through a deed, easement, covenants or other interest, and is responsible for the road maintenance. Any new development within Summit County requires the right-of-way to be dedicated to Summit County.

5004: Road Numbering & Naming

All roads within the County have been assigned a County Road Number. The numbers are used for identification purposes to help speed emergency services and to assist in locating utilities. Policies and procedures for naming County roads and assigning County road numbers are administered by the Geographical Information Systems (GIS) Department. The fact that a County Road number has been assigned does not mean the road is maintained by the County or that it is a public road. All proposed names for new or existing roads must be reviewed and approved by the GIS Department to ensure that all road names are unique and do not duplicate existing road names. *Summit County Addressing, Road Naming, and Numbering Regulations* can be found in Appendix 5-1 of this chapter.

5005: Application of Standards

All new road, bridge, and recpath construction or upgrades, whether they are maintained publicly or privately, shall adhere to the current Road & Bridge Standards unless a variance is granted in accordance with Section 5600 et seq.

5006: Upgrading of Existing County Roads and Recreational Pathways

5006.01: Upgrading Needed to Accommodate New Development

For the purposes of this section, and when considering the need for upgrading existing County roads, "development" shall have the meaning contained in Chapter 15 and shall include, but not be limited to, the creation or rezoning of residential, commercial and industrial properties, as well as mining/milling, logging and recreational activities. Where new development is proposed along existing County roads, the developer's proposal may, at the discretion of the County Engineer, be required to include a traffic impact study which shall include an analysis of the projected traffic volumes, along with information on existing road widths, curves, intersections and surface drainage. The study shall be performed by a licensed engineer, knowledgeable in traffic engineering, at the expense of the proponent and in compliance with the directives of the County Engineer. The County Engineer shall review this information and recommendations shall be made as to what improvements are necessary to accommodate the additional traffic to be generated by the new development. All plans and specifications for upgrading existing roads and recpaths shall be prepared by a Colorado Licensed Professional Engineer. A statement of substantial compliance and completion of work per the approved design shall be provided by a Colorado Licensed Professional Engineer before any release of financial guarantees covering road improvements is granted by Summit County.

These standards establish maximum design traffic volumes for certain classifications of roadways (see Table 5-1). If a proposed development will cause these maximum limits to be exceeded on the adjacent roads providing access between the development and the State Highway System, the developer shall be responsible for the cost of improving the affected roads to a classification where the maximum is not exceeded, unless otherwise provided for by the Code. In calculating whether the maximum limits will be exceeded, the cumulative traffic volume based on surrounding land uses and approved zoning, as well as counts of existing traffic levels, shall be used.

5006.02: Upgrading Requested by Property Owners

In many instances, roads and recpaths in older subdivisions in Summit County do not meet the current standards. Most of these roads and recpaths are too steep or too narrow for the County to maintain. Upgrading existing roads and recpaths within a subdivision to correct these problems shall be at the expense of the property owners served by such roads and recpaths. Upon request of the property owners, and pursuant to C.R.S Section 30-20-600 et seq., the County may assist in the formation of a Local Improvement District (LID). Such districts allow for the County to finance construction of the improvements over a fixed period of time. Completion of the improvements does not in itself constitute County acceptance for maintenance (see Section 5506 for acceptance procedures for roads and recpaths constructed through LIDs).

5007: Construction of New Roads and Recreational Pathways

5007.01: New Roads and Recreational Pathways to be Built by Developers

For purposes of this section, a developer shall be defined as any person engaging in development, including but not limited to: an individual, a group of individuals, a partnership, a corporation. a company or other business entity. Where new roads and recpaths are proposed to be built by a developer, the developer's proposal shall include:

A. An analysis of the projected traffic volumes;
B. Topographic survey covering all required disturbance limits;
C. Analysis of existing surface drainage and proposed impacts;
D. A geotechnical investigation identifying, at a minimum, soil types and groundwater conditions;
E. Extent of cuts and fills; and
F. Construction plans and specifications.

All plans and specifications for new roads and recpaths shall be prepared by a Colorado Licensed Professional Engineer. Prior to the release of any financial guarantees for road and/or recpath construction, a Colorado Licensed Professional Engineer shall provide a statement of completion in compliance with the approved plans and specifications.

The road design and construction specifications shall be reviewed and approved by the County Engineer in conjunction with the preliminary plat, or if no plat is required, prior to issuance of a permit for the improvements. If a plat is required, a permit for the construction of roads and recpaths will not be issued until after the final plat is approved by the BOCC. The entire cost of any road or recpath required to serve new development shall be borne by the developer.

5007.02: New Roads and Recreational Pathways to be Built by the County

Plans and specifications for roads and recpaths to be built by the County shall adhere to the road design and construction standards contained in these regulations, and shall be reviewed and approved by the County Engineer prior to commencement of construction.

5008: Permits for Road, Bridge and Recreational Pathway Construction

Prior to the commencement of construction or reconstruction of any road, bridge or recpath improvements, or work within public road rights-of-way, the project proponent must obtain at least one of the following permits as determined by the County:

A. An access permit (Section 5300 of these regulations).
B. A right-of-way permit (Section 5400 of these regulations).
C. A grading permit (Section 6000 of this Code).

Permits may not be required for work performed by the County.

5009: Right-of-Way Vacations

Any party wishing to initiate a right-of-way or public access easement vacation must apply to the County Engineering Department. The application must include a complete and accurate legal description, signatures of any adjacent landowners affected by the vacation and signoffs from all applicable utility companies. Notice to all interested parties shall be mailed, and the BOCC shall consider the request at an announced time and place in accordance with the Public Hearing provisions established in Chapter 13 of this Code. Right-of-way vacations shall be reviewed and processed according to the statutory provisions and procedures established in C.R.S. Title 43, Article 2, Part 3 et seq., as amended.

5100: ROAD, BRIDGE AND RECREATIONAL PATHWAY DESIGN CRITERIA

5101: Purpose and Intent

This section sets forth specific standards for roadway, bridge and recpath design in Summit County and is intended for use by design engineers.

5102: Road Classifications

County roads are classified according to function. Functional classifications shall be established by the County Engineer, who hereby has the authority to determine which classification applies to any given road. Criteria used to design roadways are based on their functional classification. For planning purposes, Summit County uses the following functional classifications:

5102.01: Principle Arterials

A principle arterial is a continuous access-controlled road that serves corridor movements having trip length and travel density characteristics indicative of statewide travel. All principle arterials in Summit County are administered by the Colorado Department of Transportation (CDOT).

5102.02: Arterials

Arterials link cities, larger towns and other traffic generators such as major resort areas and provide a means of inter- and intra-county travel. Arterials should provide for relatively high overall travel speeds with minimum interference to through movements. The Summit County arterials are Swan Mountain Rd (SCR 1), Montezuma Rd (SCR 5), Dam Rd (SCR 7), Ute Pass Rd (SCR 15), and Boreas Pass Rd (SCR 10).

5102.03: Collectors

Collectors provide a link between local roads and arterials, and allow for the movement of through traffic in neighborhoods. Collectors should be designed so they do not disrupt the activities and land uses they serve. In addition, access to collectors should be designed so as to minimize interruption of traffic flows. Examples of Summit County collectors include, but are not limited to, SCR 3 (as Barton Rd, Coyne Valley Rd and Ski Hill Rd), Baldy Rd (SCR 520), Ryan Gulch Rd (SCR 1260), Wildernest Rd (SCR 1255), Huron Rd (SCR 450), Cove Blvd (SCR 120)/Summit Drive (SCR 121), and Little Beaver Trl (SCR 50).

5102.04: Local Access Roads

Local access roads provide direct access to, and connections between, individual residences, businesses, community facilities and other land uses within neighborhoods. They also link individual properties to the collectors and arterial roadway network. This type of road is designed for use by property owners, the general public and service vehicles such as trash trucks, delivery trucks and snowplows. Roads serving neighborhoods that have been or are proposed to be subdivided into lot sizes less than 20 acres in size must meet, at a minimum, local access standards. Roads serving neighborhoods where lot sizes are at least 20 acres and projected traffic volumes for these roads exceed 500 trips per day shall also meet local access standards.

5102.05: Low Volume

Low volume roads provide direct access to individual properties that have been or are proposed to be subdivided into individual parcels of 20 acres or larger and the Average Daily Traffic (ADT) does not exceed 500. Low volume roads provide connections from these areas to roads with higher functional classifications. When an area is proposed to be subdivided into lots of 20 acres or larger, the County Engineer shall consider potential future uses of the property, and of adjacent properties, in projecting traffic volumes, and may require a higher standard for road design if necessary to accommodate future traffic volumes and to implement a coordinated, functional road system.

5102.06: Primitive Roads

A primitive road is a one- or two-lane road providing direct access to undeveloped areas, ranches, recreational and scenic areas, or backcountry properties. This type of road shall not be used to provide access to subdivided property.

5102.07: Backcountry Roads and Driveways

Road and driveway improvements and maintenance are limited to the primitive road classification in areas within the Backcountry (BC) Zoning District. Please refer to Sections 3514.03 and 3514.05.C for specific requirements regarding road and driveway standards and limitations on maintenance and improvements in the Backcountry Zone.

5103: Road Design

A Colorado Licensed Professional Engineer shall prepare all road designs, plans and specifications.

5103.01: Future Planning

Prior to commencing with the design of a new road or an upgrade of an existing road, projections of future development and densities, estimates of future traffic volumes, appropriate classifications and design speeds must be determined. The road classification determines the geometric cross section and maximum sustained grades, while the design speed determines minimum or maximum standards for elements of alignment such as stopping and passing sight distances, radii of curvature, tangent lengths and superelevation transition lengths. Standard structural sections or designed structural sections may be used.

A. **Design Period:** Roadway design will be based on the projected needs 20 years after construction.
B. **Projected Development:** Projections of development over the design period will be based on the County Master Plan in effect and on zoning, existing land use, proximity to developed areas, historic growth and other factors which can be expected to influence development.
C. **Projected Traffic Volumes:** Design engineers shall use the most recent edition of the *Trip Generation Manual* published by the Institute of Transportation Engineers to obtain appropriate ADT counts for any proposed development.

5103.02: General Design Elements

A. **Design Capacities:** Table 5-1 presents the range of ADTs anticipated for each road classification. If traffic volumes on a particular road exceed the range specified for its functional category, the road shall be reclassified to the appropriate category. Roads may carry lower volumes than stated for their functional category without being reclassified. In such cases, the function of the road rather than traffic volumes will determine design requirements.
B. **Design Speed:** Principally the character of terrain, traffic volumes and appropriate range of design speeds for each road classification influence the selection of design speed. Design speed shall be a minimum of five (5) miles per hour (mph) over the posted or proposed speed limit.
C. **Surfacing Requirement:** All new roads serving areas with projected densities of two (2) units per acre or greater, or expected to carry an ADT of 700 or greater, must be paved. Other roads may have a gravel or paved surface.
D. **Right-of-Way:** The minimum right-of-way widths required for each road classification are specified in Table 5-2. Additional right-of-way shall be provided for drainage improvements, cuts or fills, intersections, curb returns, snow storage and other road appurtenances if required, as determined by the County Engineer. When existing roads are found to cross private properties outside of their dedicated right-of-way, the affected owner may be required to dedicate right-of-way for that road, to a width matching adjacent rights-of-way for that road, prior to issuance of any access or grading permits for a proposed development. If the opportunity exists, and if the affected owner would prefer, they may be permitted to relocate that road into the existing right-of-way in a manner consistent with these regulations and after acquiring all necessary permits.
E. **One-Way Roads:** One-way roads may be allowed by the County Engineer if the following potential issues can be mitigated:
    1. Property owners at the far end of a one way loop road tend to take short cuts and drive the wrong way to reach their properties, thus increasing the chances for accidents.

2. Emergency vehicles must, in certain cases, take a more circuitous route to reach their destination.
3. One-way roads can cause confusion for people not familiar with the area.
4. In winter, snowplowing often reduces the driving surfaces of roads because snow accumulates along the edges. On one-way roads, this reduction may pose a serious safety problem because it hampers access for emergency vehicles and limits the area available for their operation.

F. **Striping:** Paved roads may be striped with appropriate centerline and/or shoulder stripes per the most recent edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) and CDOT Standard S-627-1. This specification shall apply to collector and higher functional classification roads or other roads as determined necessary by the County Engineer.

5103.03: Specific Design Elements

A. **Alignment:** The major considerations in alignment design are safety, grade, profile, road width, design speed, sight distance, topography, drainage and the maneuverability, braking and performance of heavy duty vehicles. Alignment should provide for safe and continuous operation at a uniform design speed. In high alpine areas, consideration should be given to locating the road so that southern exposure will be maximized to the extent possible. Road layout should bear a logical relationship to existing or platted roads in adjacent properties and to the principles of good engineering practice. All new roads shall be designed such that the roads are centered in the right-of-way.

1. **Horizontal Alignment:**
   a. Stopping Sight Distance: Horizontal alignment must provide at least the minimum stopping distance for the design speed at all points. This includes visibility at intersections as well as around curves and roadside encroachments. The minimum stopping sight distance is the distance required by the driver of a vehicle traveling at the design speed to bring the vehicle to stop after an object on the road becomes visible. Stopping sight distance shall be designed in accordance with the standards established in the most recent edition of the American Association of State Highway Transportation Officials' (AASHTO) publication *A Policy on Geometric Design of Highways and Streets* (hereafter PGDHS).
   b. Passing Sight Distance: Passing sight distance is the minimum sight distance that must be available to enable the driver of one vehicle to pass another safely and comfortably without interfering with oncoming traffic traveling at the design speed. Two-lane roads should provide adequate passing zones. Required passing sight distance shall be designed in accordance with the standards established in the most recent edition of the PGDHS.
   c. Curvature: Horizontal curves shall be designed in accordance with the practices and standards established in the latest edition of the PGDHS, utilizing a maximum superelevation rate of 6%. Where design superelevation rates over 6% are necessary or appropriate, the plans shall be accompanied by a statement from the design engineer justifying their design, and evidence that the design will not pose a threat of traction loss to slow-moving motorists under icy conditions.
   d. Curb Returns: Curb returns or pavement rounding minimum radii at intersection corners are as follows:

Highest Road Class	Curb Return Radius
Local	20 Feet
Collector	30 Feet
Arterial	50 Feet

Additional right-of-way will be required to provide a minimum clear distance of 15 feet between the curb or edge of pavement and the right-of-way limit.

   e. Intersections: The minimum distance between intersections, as measured from the inside edge of each right-of-way, for various road classifications is as follows:

Road Class	Distance
Local	200 Feet
Collector	500 Feet
Arterial	1000 Feet

2. **Vertical Alignment:**
   The design of a roadway's vertical alignment (grade, vertical curves, and sight distances) shall be compliant with the most recent edition of the PGDHS; except that the maximum design grade of any roadway shall not exceed 8%. If topographic conditions dictate that grades must exceed 8% to avoid significant environmental disturbance, the engineer's design shall be accompanied with a written statement from the engineer justifying the design and providing evidence of the conditions that mitigate the impacts of the steeper grades. In no case shall a roadway design including grades exceeding 9% be approved without a variance.

3. **Switchbacks:**
   A switchback is defined as a curve in a driveway, roadway or other access way with a delta greater than 120 degrees and a radius less than 100 feet.
   a. Use of Switchbacks: Switchbacks will not be allowed on new collector or arterial roadways. On local access, low volume or primitive roadways when other alternatives may cause significant adverse impacts, the use of switchbacks may be allowed on a case-by-case basis, with approval from the County Engineer.
   b. Minimum Standards: Switchbacks shall be designed with a minimum centerline radius of 60 feet. Maximum centerline grades within 25 feet of a switchback curve and throughout the curve shall not exceed four percent (4%). Curve widening shall be in accordance with Section 5103.03.B.7. Adequate snow storage must be provided.
4. **Alignment Coordination:**
   When vertical and horizontal curves are superimposed, the superelevation may cause distortion in the outer pavement edges. Where this may be the case, edge of pavement profiles shall be plotted and smooth curves introduced to remove any irregularities. Sharp horizontal curves should not be introduced at or near a pronounced crest or sag.

B. **Geometric Cross Sections:**
1. **Typical Sections:** A typical section for each road classification is shown in Figures 5-1 through 5-4. These typical sections are for use as a guideline in the design of roads, and do not in and of themselves establish any minimum standards or design criteria.
2. **Travel Lane Width:** The minimum travel lane width for arterials and collectors is eleven (11) feet, for local access, low volume and primitive roads is ten (10) feet. In addition to the 11-feet of required traveled way width for arterials and collectors, a three (3) foot wide paved shoulder shall be required.
3. **Crown Slope:** On undivided roads in tangent alignment, the high point of the crown will be centered on the pavement and the pavement sloped toward the edges on a uniform grade. In mountainous terrain, unpaved roads should slope toward the cut side of the road on a three percent (3%) slope to alleviate surface erosions. On divided multilane roads on tangent alignment, each traveled way should have a uniform cross-slope with the high point at the edge nearest the median. The design crown slope shall be a minimum of 2% for paved roads and 3% for gravel roads.
4. **Superelevation:** To account for snow and ice conditions that occur frequently in Summit County, the maximum superelevation will be limited to 0.06 feet per foot except as approved by the County Engineer per Section 5103.03.A.1 of this Code. The axis of rotation of undivided roadways is usually the centerline. For curves following long, level tangents the axis of rotation may be taken at the inside edge of the pavement. For divided roads with wide medians the axis of rotation shall be the inside edge of pavement. For divided roadways with narrow medians each roadway shall be rotated about the edge adjoining the median strip.
5. **Superelevation Transition:** Superelevation transition is the progression of the roadway from the normal crown section to a fully super elevated section. To meet the requirements of safety and comfort, the length required to effect the transition should be adequate for the likely travel speeds. Transitions shall be designed in accordance with the provisions of the most recent edition of the PGDHS.
6. **Spiral Curves:** Spiral curves may be permitted, if deemed appropriate by the Engineering Department, and where permitted shall be designed according to the provisions of the most recent edition of the PGDHS.
7. **Curve Widening:** Curves will be widened on the inside radius in accordance with the most recent edition of the CDOT Roadway Design Guide or the PGDHS, at the designers discretion.
8. **Cul-de-Sac Streets; Turnarounds:** Whenever possible, roadway systems shall provide at least two (2) access points to lots platted for development. Cul-de-sac streets shall be avoided. Where cul-de-sac streets are the only alternative, turnarounds shall be provided. Bulb type turnarounds shall have a minimum road surface of 90 feet in diameter and a minimum right-of-way of 150 feet in diameter. Other configurations of turnarounds may be permitted with the support of the local fire authority.

a. The maximum length of roads ending in turnarounds shall be 600 feet in areas with a high wildfire hazard and 1000 feet in all other areas. When a variance from this standard is requested, at least one of the following shall be provided to all residences on the cul-de-sac:
   i. Central water service.
   ii. An alternative water supply acceptable to the local fire authority.
   iii. Monitored residential sprinklers.
b. Turnouts may be required when a variance is requested.
c. Snow storage shall be provided as shown in Figure 5-6 to keep turnarounds cleared. Dead end roads that do not have turnarounds are not allowed.

C. **Structural Sections:**
1. **Design Structural Sections:** Structural sections shall be designed by a licensed engineer for all new roads, driveways or roads being upgraded due to increased traffic. The road structure will be designed in accordance with the most recent edition of the CDOT Pavement Design Manual, or the AASHTO Guide for the Design of Pavement Structures as amended, at the designers discretion.
2. **Minimum Structural Requirements:** The minimum structural sections outlined in Table 5-3 shall be met on all roads in Summit County.
3. **Concrete Paving:** Areas where a considerable amount of stopping or starting occurs, e.g. bus stops or signalized intersections, may be paved with a designed concrete section to minimize the effects of dynamic loading on the pavement.

D. **Drainage:**
1. **General:** The primary objective of drainage design is the protection of County roads and property while minimizing the possible flood damage to surrounding properties and structures. It should be emphasized that good drainage is one of the most important factors in road design. It preserves the appearance as well as the quality of the road while minimizing maintenance costs. In no case shall a design result in flows in a roadside ditch for a distance greater than 800 feet or have a flow greater than five (5) cubic feet per second with the occurrence of a 25-year design storm.
   a. Culverts under all roads shall be designed to accommodate runoff from a 25-year design storm utilizing the maximum available head. The maximum available head shall be determined by the uppermost water surface elevation chosen such that flood damage to upstream properties is prevented.
   b. Inlets and other facilities draining the road surface shall accommodate the 25-year design storm runoff. All roads shall remain free of standing water.
   c. All drainage installations shall be designed to permit free, unobstructed passage of debris and silt or provide for their deflection and/or collection at a point upstream that will not create an expensive maintenance problem. Sediment basins shall be provided when the possibility of a silting problem may occur downstream. Modification of natural channels or transferring runoff from one (1) basin to another is not permitted except where no reasonable alternative exists and where the proposal has been reviewed and approved by the County Engineer.
   d. A recurring problem on Summit County roads is ice build-up in winters of little snow. Drainage design shall anticipate areas of potential ice buildup. In areas where this problem is anticipated or has arisen, heat trace, or an alternate solution as determined by the County Engineer, shall be required.
   e. Where practicable, subsurface drains that daylight and accommodate any off right-of-way drainage problem shall be designed to provide a minimum of 50 feet of overland sheet flow before reaching any roadside ditch. Where this minimum distance cannot be achieved, the location of the discharge to daylight must be approved by the Engineering and/or Road & Bridge Departments.
2. **The following methods may be used for estimating peak flows:**
   a. Runoff from stream flow records.
   b. HEC software from the United States Army Corps of Engineers ("USACE").
   c. The Soil Conservation Service Method TR-55 or TR-20.
   d. The Rational Method may be used for areas of less than five (5) acres.
   e. Other procedures if approved by the County Engineer.
3. **Culverts:** Culverts shall be located at each natural draw or water course as conditions warrant to prevent excessive accumulation of flow in roadside ditches or along the toe of slopes. To the extent that legal access exists, draws and watercourses shall be cleared of debris for a distance of 100 feet upstream from all culvert inlets. Culverts shall be designed per the CDOT Drainage Design Manual, or the FHWA Hydraulic Design of Highway Culverts, and with the following criteria:
   a. Inverts at the inlet shall be slightly elevated above the normal flow line in steep or natural draws to avoid

plugging by debris. Inlets shall not be elevated in those instances where ponding or accumulation of backwater would be objectionable (stagnation, irrigation ditches, etc.).

b. The culvert shall slope downward in the direction of natural flow and be designed to be self-cleaning whenever possible. The outlet shall be designed to prevent discharge on unprotected fills or unstable material or at adverse angles to streams or open channels. Flowlines at outlets of culverts shall be dropped slightly below the culvert invert to allow for unrestricted flow. Riprap at outlets, if used, shall be installed such that sediment will not deposit in the culvert because of a backwater condition. Headwall, riprap or other means of protection are required at inlets or outlets where erosion might occur.

c. Corrugated metal pipe or an approved equal as specified by the Road & Bridge Director, his authorized representative, and/or the County Engineer shall be used. Steel pipe shall be asphalt coated where soils are corrosive or other conditions exist that may attack steel. HDPE culverts may be used in areas of low or moderate wildfire hazard.

d. The minimum diameter for round pipe under roadways shall be 18 inches. The minimum rise for elliptical pipes under roadways shall be fifteen (15) inches.

e. When a battery of pipes is used, a clear spacing of ½ the pipe diameter, or a minimum of one (1) foot, must be provided between pipes. Minimum and maximum cover, pipe metal gauge and strength classification shall be as specified in Section 5203.06.

f. Cleanout access shall be provided at least every 200 feet for pipes 24 inches in diameter or less and at least every 400 feet for larger pipes. Cleanout access shall also be provided at each angle point and at each change in grade. Flow-fill or some alternate self-compacting or self-consolidating fill may be required at the discretion of the Engineering and/or Road & Bridge Departments.

4. **Open Channels and Ditches:** Open channels shall be designed to accommodate flows anticipated from the 25-year design storm event at a minimum, and to prevent erosion or sediment transportation during such an event. Designs shall follow the guidelines in the CDOT Drainage Design Manual, or other procedure if approved by the County Engineer. For roadway design projects in Summit County the Manning's n-values provided in Table 5-5 shall be used.

5. **Subsurface Drainage:** Subgrades subject to poor drainage, underground seepage or a high water table shall be adequately drained for roadbed stabilization. Where practicable, drains shall be installed to maximize the separation from the road surface to high ground water. Perforated pipe shall be used to carry away collected water. French drains that contain no pipe are unacceptable. All subsurface drains shall discharge to daylight or to an approved, engineered infiltration system.

6. **Inlet Structures:** Curb openings with protection bars are preferred, however the County Engineer may permit other designs. Grates are not permitted where pedestrians, bicycles or debris-laden flows are anticipated.

E. **Side Slopes:** A licensed engineer qualified in soils analysis shall evaluate and render an opinion on the stability of slopes designed steeper than three to one (3:1). Where heavy snowfall is expected, flatter slopes in cuts on the southern side of the roadway should be used to provide maximum exposure to the sun. Flatter slopes should be used wherever possible to reduce erosion, to decrease maintenance costs, to facilitate plant growth and to provide for safer operation.

1. Transition slopes shall be provided between adjoining cuts and fills. Where cut or fill slopes intersect the original ground surface, the cross section shall be rounded to blend the slope into the natural ground surface.

2. Where the slope of the original ground approaches two to one (2:1), the embankment shall be contained with a suitable retaining wall to avoid long fill slopes. Side slopes in rock will be based on the stability of the formation. Any side-slopes proposed of native rock shall be evaluated by a geotechnical engineer with experience in rock structures, and all recommendations made by the engineer shall be considered requirements unless explicitly waived by the County Engineer. Retaining walls on the uphill side shall be a minimum of ten (10) feet from the centerline of the adjacent drainage ditch.

3. Benching of side slopes should be used sparingly and only where they are justified by sound engineering reasons, including the following:
   a. To stabilize material where benching is more economical than flattening.
   b. To intercept drainage in long and deep cuts.
   c. To intercept and store loose material.

F. **Sidewalks:** Sidewalks shall be required where in the opinion of the County Engineer, the number of pedestrians is sufficient to interfere with traffic, or significant pedestrian usage is anticipated. Where sidewalks are installed, the individual property owners shall be responsible for clearing snow and ice from the sidewalks in front of their property.

5103.04: Payment of Costs for New Road Construction

A. **Developer Responsibility:** All costs of new road construction in new developments are the responsibility of the developer. The developer is also responsible for designing and constructing new roads according to the Road Standards.
B. **Payback Agreements:** During the approval process for a proposed development, the developer may be required to construct a new road or to make improvements to an existing road that also benefits future developments. The BOCC may establish a plan of compensation to the original developer whereby subsequent beneficiaries pay a fair share for the use of those improvements. Such a plan would be administered by the County and made a condition of approval for future benefiting developments. The BOCC shall determine the equitable distribution of benefits and costs.

5104: Upgrading Existing Roads

5104.01: Design Standards

All County roads requiring upgrading or improvement, whether public or private, shall be built in accordance with the Road Standards.

A. **Existing Roads Serving New Developments:**
    1. **Requirement for Upgrading:** Existing County roads serving a new development or an area proposed for either platting or re-platting must be upgraded to the Road Standards when one or more of the following conditions occur:
        a. The existing roads do not meet the Road Standards for the classification.
        b. The existing roads meet local access standards, but the projected ADT will exceed 700, thus requiring paving of the roads.
        c. The existing roads meet local access standards, but the projected ADT exceeds the maximum for local access, thus requiring improvement to collector or arterial status.
    2. **Payment of Costs:** The developer shall be responsible for all costs incurred to upgrade existing County roads.
    3. **Payback of Costs:** Benefiting property owners along existing roads that must be upgraded shall pay back a fair share of the road improvement costs if, in the judgment of the BOCC, a pay back to the developer is appropriate.

5105: Bridge Design

5105.01: Design Standards for Bridges

A. Bridge designs shall conform to the standards and specifications in the most recent edition of the CDOT Bridge Design Manual. Plans shall be prepared by a qualified structural engineer and shall be submitted to the County Engineer for review and approval prior to construction. The clear deck width must accommodate the full width of the travel lanes and shoulders of approach roads as prescribed in Table 5-2.
B. The waterway area shall accommodate a 100-year frequency storm. Where flood studies from the USACE or the Federal Emergency Management Agency (FEMA) are available, bridges shall be designed to accommodate the "Standard Project Flood". A minimum one (1) foot of freeboard is required on new bridge designs. Additional freeboard shall be required when debris-laden flows are anticipated.

5105.02: Payment of Bridge Construction Costs

If the design of the roadway serving a new development requires construction of new bridges or upgrading existing bridges, the developer shall be required to pay the cost of such construction. Where construction of a bridge benefits future developments the BOCC may establish a plan of compensation to the original developer whereby future beneficiaries pay a fair share for use of the bridge.

5106: Traffic Safety

5106.01: Guardrails

The County Engineer and/or Road & Bridge Director may require guardrails for new construction or upgrades to existing roads subject to the following guidelines, and the criteria and standards published in the most recent edition of the AASHTO *Roadside Design Guide*. Guardrails are installed to prevent accidents by delineating the roadbed, to reduce accident severity by deflecting vehicles into safer paths and to increase the rate of deceleration in case of impending collisions with fixed objects.

A. **Design and Placement on Roadways:** Only State approved guardrails shall be used. The length of guardrail should be planned in multiples of 12.5 feet. No abrupt or projecting ends shall face toward approaching traffic, and delineators shall be installed according to CDOT specifications. Ordinarily, a guardrail is placed only on the outside of curves.
   1. When guardrail is used in conjunction with roadside curbs, the face of the guardrail shall be flush with the face of the curb regardless of shoulder width. This is to prevent a ramp effect that may overturn a vehicle. When no curb is present, the face of the guardrail shall be installed such that the distance from the edge of the shoulder to the face of the guardrail is maximized.
   2. On curves requiring a reduction in approach speeds, any one of the following conditions suggests installation of guardrail on the outside of the curves should be considered:
      a. Height of embankment is more than ten (10) feet.
      b. Side slopes are steeper than three to one (3:1).
      c. Shoulder or pavement widths are substandard.
      d. Roadside hazards are present.
   3. Whether on curves or tangents, consideration should be given to the installation of guardrails if there is a history of roadway accidents or if unusually high embankments or steep terrain give motorists a feeling of insecurity.
   4. In areas subject to low visibility or snow and ice conditions, or where traffic speed and volumes are high, guardrail may be needed where its installation would otherwise be questionable under less adverse conditions. In such conditions it is critical to maximize the distance from the traveled way to the face of the guardrail to prevent or minimize deflection of vehicles into oncoming traffic.
   5. Guardrails may also be required under the following conditions:
      a. An obstruction or sudden constriction in roadway.
      b. An isolated sharp curve on a roadway otherwise built to higher standards.
      c. Approaches to bridge piers, abutments, trees or other obstructions.

B. **Guardrail at Bridge Approaches:** Guardrail should be placed at the ends of all bridges on the right of approaching traffic. Where pedestrians are expected to use the shoulder, a walkway should be provided around the end of the guardrail outside the normal shoulder lines.

C. **Provisions for Snow Storage:** When guardrails are considered for installation, especially for extended lengths, provision shall be made for adequate snow storage and removal.

5106.02: Traffic Control Devices

A. All signs, striping, markers, delineators, signals and other traffic control devices must conform to the requirements of the most recent edition of the MUTCD, as adopted and amended in conjunction with the County's adoption of the *Colorado Model Traffic Code*.

B. All new developments shall be signed and marked in accordance with the MUTCD and such signs and markings shall be installed and paid for by the developer. Requests for nonstandard signs or other devices shall be submitted to the County Engineer along with all data required to support the request and must be approved prior to installation.

C. Any agency or individual desiring to place a sign or marking in a public right-of-way shall request such sign or marking in writing to the County Engineer. The request will be reviewed by the Engineering and Road & Bridge Departments, and may be permitted at their discretion. Any sign approved shall be installed at the expense of the applicant(s) and subject to a license agreement (if appropriate) indemnifying the County from any damages and explicitly stating the conditions of the approval.

5106.03: Sight Distance Triangle

A. **Determining Dimensions and Location of Sight Distance Triangles:** For safety and visibility purposes, a sight distance triangle shall be maintained at street intersections and where driveways intersect streets. The length of the legs of this triangle shall be determined in accordance with the practices and standards established in the latest edition of the PGDHS. The length of the legs may be increased by the County Engineer if determined to be necessary, based on standard engineering practices, to promote the public health, safety and welfare. No landscaping or improvements shall be allowed over 3.5-feet tall within the sight distance triangles. Installation of traffic control signs or signals and streetlights are exempt from this regulation. Sight distance triangles shall be shown on all roadway design plans.

B. **Incorporating Requirement for Sight Distance Triangles into Subdivision Design:** Developers shall incorporate the requirement for maintenance of a sight distance triangle at street intersections and intersections of driveways with streets in the design of subdivisions submitted for County review. Particular attention shall be given to the size and shape of corner lots.

C. **Enforcing Requirement When Building Permits are Issued:**
   1. Where a building permit is filed for property which is unplatted or was platted prior to the effective date of these regulations, no building permit shall be issued for a structure which interferes with the maintenance of a sight distance triangle unless application of the requirement would result in peculiar and exceptional practical difficulties to, or exceptional and undue hardship upon, the individual proposing development of the property. The County Engineer shall have authority to waive the requirement for maintenance of a sight distance triangle for such a property.
   2. Where a building permit application is filed for property that was platted or re-platted after the effective date of this regulation, no building permit shall be issued for any structure that would interfere with the maintenance of a sight distance triangle required by this regulation.

D. **Continuing Enforcement of Requirement:** Property owners shall be responsible for maintaining sight triangles free of visual obstructions for that portion of a triangle within the boundaries of their property. When the County Engineer receives a complaint concerning visual obstructions at a particular intersection, the Engineering Department shall be responsible for inspecting the intersection and for taking the following measures:
   1. Determining whether the visual obstruction is within the sight triangle for an intersection, and if it is on public or private property.
   2. If the visual obstruction is on public property, requesting the appropriate jurisdiction remove the obstruction; if the jurisdiction is the County, requesting assistance from the Road & Bridge Department if needed and supervising removal of the obstruction.
   3. If the visual obstruction is on private property, notifying the property owner of the requirement that visual obstructions must be removed within 30 calendar days except as follows:
      a. If the obstruction is a permanent structure which was built prior to the effective date of this regulation, or was granted a waiver as provided in Section 5106.03.C.1, the property owner shall not be required to remove the structure.
      b. Where the obstruction is caused by the natural or historic topography of the property, and not by earthwork undertaken by the current property owner or his immediate predecessors, the property owner may not be required to re-grade his property in order to remove the obstruction.

   If the property owner does not comply within 30 calendar days, further enforcement action shall be taken as provided in Section 5700 et seq. of these regulations.

5106.04: Aboveground Utility Location

All aboveground utilities including but not limited to power poles, telephone junction boxes, transformers, etc. shall be located as close to the outside edge of the right-of-way as possible but in no case shall there be less than a ten (10) foot separation between the edge of road shoulder and the utility.

5106.05: Rural Free Delivery Multi Box Modules

A. In subdivisions where provisions were not specifically made for rural free delivery multi box modules, the homeowners association, or if one does not exist, a designated individual or group from the subdivision shall be responsible for submitting a proposal to the Engineering Department. The submitted proposal shall first consider locations in front of or adjacent to the property owners requesting the installation of a multi box module.

Engineering shall evaluate all sites in front of or adjacent to property owners requesting rural mail delivery before evaluating any other sites. In evaluating the proposal, staff shall determine if the proposed site meets all the following criteria:

1. The Postal Service will provide delivery service to the area proposed.
2. The module shall be a minimum of ten (10) feet from the edge of shoulder of the road.
3. Adequate space for an eight (8) foot wide by 40-foot long pull off shall be provided.
4. The pull off shall be constructed per Summit County Road & Bridge Standards.
5. Minimum sight distance of 250 feet in all directions shall be provided.
6. The pull off shall not have a grade in excess of three percent (3%).
7. Adequate space for snow storage and removal within the right-of-way or appropriate snow stack easement shall be provided.
8. The site shall not adversely impact the normal flow of traffic or the surrounding properties.
   In addition, the following information shall be provided:
   a. If the proposed location is adjacent to private property, the affected property owner(s) shall provide a letter stating they have no objection to the module location.
   b. A letter signed by the homeowners' association president or other approved individual indemnifying Summit County from any damage that may occur due to road maintenance operations.

B. Once a site meeting these criteria has been located, the proponents shall have the right-of-way staked by a licensed land surveyor indicating the proposed location of the module and the edge of the right-of-way, unless a survey is deemed unnecessary. The right-of-way shall be staked for a distance of 50 feet on either side of the proposed location of the module. Upon completion of the staking, the Engineering Department, the Road & Bridge Department, and the Postmaster shall inspect the proposed site to ensure all the site requirements are met before giving approval. After approval, staff shall notify all property owners within a minimum of 300 feet of the proposed site and inform them of the request and allow them 14 days to appeal the staff decision. If no appeals are received in the allotted time, staff will inform the proponents by written notice that they can begin construction once they obtain a right-of-way permit (Section 5400 et seq.). In the event of an appeal, staff will schedule a hearing with the BOCC at the next available public hearing for which the required notice can reasonably be published. Property owners originally noticed for the proposed site will be re-noticed for the appeal. Proponents and opponents will have the opportunity to state their arguments supporting their respective positions. The BOCC decision will be final. After construction has been completed, a final inspection shall be done to insure the module was properly installed and the pull off was constructed to County standards. All deficiencies shall be corrected before final approval can be given to start mail service.

C. The homeowners association or other designated group from the subdivision shall be responsible for all costs associated with the construction of the module and pull off and all future maintenance including snow removal of the pull off area.

5106.06: Individual Mailboxes

Where, in unincorporated Summit County, an owner wishes to install or replace an individual mailbox that serves their residence, that installation must first be approved by the Road & Bridge Department. An example of an approved mailbox design is shown in Figure 5-10. Individual mailboxes on individual properties will not be allowed within new subdivisions requesting rural mail delivery.

5106.07: Lateral Obstructions

Lateral obstructions shall be designed and installed in accordance with the most recent published edition of the AASHTO *Roadside Design Guide*, except that lateral obstructions shall not be installed within 10-feet of the edge of the shoulder, regardless of design speed, unless it is designed with breakaway posts, or crashworthy protection is installed such as a guardrail.

5107: Driveways and Parking Areas

5107.01: Requirement for Access Permit

Whenever a property owner, developer, contractor or other individual proposes to connect a driveway or parking area to a public roadway, they must obtain an access permit from the Engineering Department prior to commencing

construction. The submittal requirements and procedure for obtaining access permits are stated in Section 5300 et seq. of this Code.

5107.02: Requirement for Grading Permit

Whenever construction of a road, Recpath, trail, driveway or parking area results in earth disturbance, the individual responsible for the construction must obtain a grading permit from the Engineering Department prior to commencing construction. The submittal requirements and procedure for obtaining grading permits are stated in Section 6300 et seq. of this Code.

5107.03: Standards for Driveway Design

A driveway is an access way for vehicles providing a connection from a public or private roadway to either 1) individual single-family or duplex dwellings; or 2) a parking lot serving multi-family dwellings, commercial development, industrial development or other non-residential development. Driveways under category 1 above may serve no more than four (4) single-family dwellings or two duplex structures (four (4) dwelling units in two (2) duplex structures). If an access way serves more than four (4) individual single-family dwellings, it shall be classified as a roadway rather than a driveway and must meet the County's standards and requirements for road construction. An access way serving a working ranch or farm and any associated residence regardless of length shall be considered a driveway, and shall meet only such standards as are necessary for public health and safety and as outlined in this Section 5107.

A. **Location of Driveways Relative to Intersections:** Driveways shall be placed so the following minimum distances are maintained to any street intersection, including a T-intersection on the opposite side of the street from a property where a driveway is proposed:
   1. Where a driveway connects to a local access or low volume road, a minimum distance of 50 feet from curve return to edge of right-of-way at the intersection shall be maintained.
   2. Where a driveway connects to a collector or larger road, a minimum distance consisting of the left turn stacking distance plus 20 feet as measured from the driveway curve return to the intersection curve return, shall be maintained. The left turn stacking distance shall be determined by the Engineering Department based on available data from an acceptable traffic study. If a traffic study is not available, or data provided is incomplete, the Engineering Department shall estimate the length of the left turn stacking distance.

B. **Spacing of Driveways**: Driveway openings shall be separated by at least 30 feet, as measured from outside edge of the flares, or else shall be combined. More spacing may be required for traffic safety and proper traffic operation.

C. **Shared Driveways:** Developers or property owners proposing the use of shared driveways shall record an easement defining the location of the driveway and either a covenant, deed restriction or plat note requiring construction of the driveway at that location. When additions or modifications requiring a Grading permit are proposed on structures for which the access crosses one (1) or more adjacent properties, an easement or other agreement acceptable to the County Engineer that provides access, shall be provided prior to the issuance of any permits.

D. **Driveway Widths:** The dimensions of driveway widths, openings and centerline curve radii, turnout spacing for driveways, and driveway turnarounds for emergency equipment shall be as shown in Table 5-6.

E. **Driveway Grades:** Driveways for single-family residences shall have a maximum grade of eight percent (8%) for the first 25-feet from the connection to the County Road, and shall not exceed ten percent (10%) after that. Minor deviations from the maximum grades of driveways for single-family residences established in this standard (up to 12% for distances of less than 10-feet) may be approved if the County Engineer determines that no detriment to public health, safety, and welfare will result and no reasonable solution exists. In determining the reasonableness of a proposed deviation, the cost shall not be a factor. Shared driveways shall not exceed eight percent (8%). Driveways for multi-family, industrial, and commercial developments shall not exceed six percent (6%). All driveways shall maintain a grade equal to or less than the crown slope of the road from the point where the driveway meets the road to where the driveway crosses the ditch line, as shown in Figure 5-7.

F. **Vehicle Turnarounds:** All driveways exiting onto collector roads or roadways with average daily counts greater than 1,000 vehicles per day shall be designed with a vehicle turnaround to avoid vehicles having to back onto the roadway when exiting. Single-family residence driveways in excess of 400 feet in length shall provide an adequate turnaround for emergency equipment within 150 feet of the dwelling unit.

Driveways that access single family residences off of the County recreational pathway system shall utilize turnarounds to the greatest extent practicable to avoid vehicles having to back onto the recpath. Driveways serving multi-family, industrial, or commercial development shall provide a turnaround as specified in Figure 5-6 if the driveways dead-end.

G. **Surfacing of Driveways:** Driveways serving single-family residences may be either graveled or paved. Where roads are paved, shared driveways serving duplexes must be paved.
   1. Where a driveway is to be graveled, the surface shall be constructed in accordance with Section 5203.08 and shall consist of a minimum four (4) inch depth of compacted aggregate base course. Alternative all-weather surfaces (e.g. recycled asphalt) may be approved with specific installation standards as deemed appropriate by the County Engineer.
   2. Where a driveway is to be paved, the surface shall consist of a minimum four (4) inch depth of compacted aggregate base course and two (2) inch mat of Hot Mix Asphalt (HMA), which can be placed in one lift. Where roads are not paved, driveway pavement shall not extend into the public right-of-way.
   3. Driveways serving multi-family residences or commercial uses must be designed and paved in accordance with Section 5103.03.C, and 5203.09.

H. **Provision for Drainage:** Driveway design shall make adequate provision for drainage and prevention of erosion.
   1. Drainage from driveways shall be diverted to roadside ditches or other appropriate drainage way(s). Drainage from driveways shall not flow onto roads.
   2. When necessary to handle roadside drainage, driveways shall use culverts, drainage pans or other devices suitable for the conveyance of roadside drainage. Final approval for the types of drainage items used and the locations of such items shall be at the discretion of the County Engineer or his delegate.
   3. Culverts shall be corrugated metal pipes, or other material types approved by the Road & Bridge Department. In addition, culvert design and installation shall be in compliance with the following:
      a. Culverts shall have either flared end sections or shall have annular ends.
      b. There shall be a minimum of four (4) inches of road-base cover over culverts serving driveways.
      c. Culverts lengths greater than 30 feet are not allowed.
      d. Culverts installed for driveways shall be sized and installed subject to the provisions of the required right-of-way access permit issued for the installation, but in all cases the minimum diameter for these culverts shall be 15-inches.
   4. Drainage pans shall be designed to accommodate flows associated with the 25-year design storm. Concrete mix designs for drainage pans shall be submitted to the Engineering Department for approval prior to installation.
   5. Property owners shall be responsible for keeping their culverts clean and ice-free. The Road & Bridge Department may require owners to heat tape their culvert to ensure flow during the winter months to minimize the potential of ice forming on roadways (see Section 5507.02).

I. **Minimum Sight Distance:** Driveways shall be designed and located to provide a minimum sight distance clear of all obstructions, natural or man-made, for at least 200 feet in either direction on local access roads and 400 feet on collector roads.

J. **Signage at Junction with Roadway:** Stop signs shall be installed at the junction of a driveway with a roadway for all driveways serving ten (10) or more multi-family residential units, commercial shopping areas, or when required by the County Engineer for the protection of public safety.

K. **Number of Driveway Accesses:** Only one (1) access point per single-family or duplex lot onto the County road system is allowed unless a minimum separation of 250 feet can be provided. Otherwise, looped driveways are not allowed. Where a lot has two (2) different roads to provide driveway access, access or accesses shall be drawn from a single roadway and always onto the road with the lowest functional classification. Where a property's access is proposed on a state highway, an approved CDOT access permit and associated notice to proceed must be provided prior to issuance of a grading and excavation permit for the project.

L. **Snow Storage:** Snow storage for driveways shall be provided on the owner's property. Use of the right-of-way for snow storage by private individuals, contractors, or companies is prohibited by County Ordinance. Snow storage is not allowed in wetland areas.

M. **Connection to Roads:** The portion of driveway through the right-of-way connecting the property with the physical roadway should be the shortest perpendicular distance possible. The Road & Bridge or Engineering Department may approve deviations from this standard where this condition would cause excessive earth disturbance and where approval of such deviation would not pose a hazard to public health, safety, or welfare.

N. **Retaining Walls:** If earth disturbance results in cut or fill slopes steeper than 2.0 feet horizontal to 1.0 feet vertical (2:1), a retaining structure or other engineered system shall be required. If the proposed retaining system

is less than 4.0 feet in height, a detail of the proposed retaining system must be provided to the County Engineer for his approval, prior to installation. If the retaining system is over 4.0 feet in height, the retaining system must be designed by a Colorado Licensed Professional Engineer and must be submitted to the County Engineer for his approval prior to installation. In addition, prior to any occupancy permits being authorized by the County Engineer, a certification from the design engineer must be submitted to the County Engineer, stating that construction of the retaining system was in conformance with the approved design and these standards.

O. **Upgrading of Driveways:** A driveway must be upgraded to meet current County standards any time that an owner proposes improvements that require modifications to a driveway or changes to a use on a property including but not limited to garage additions (detached or attached), accessory apartments, voluntary changes to access configurations, substantial improvements to structures or properties as defined by this Code, or any time a non-conforming situation is deemed to present a hazard to the public health, safety or welfare.

5107.04: Standards for Parking Areas

A. **Parking Standards:** See Section 3700 et seq. of this Code for standard parking requirements for development.
B. **Parking Area Grades:** Parking areas shall have a maximum grade of four percent (4%) and a minimum grade of one-half percent (1/2%) to facilitate drainage.
C. **Surfacing of Parking Areas:** Paving is not required for parking areas and driveways serving single-family units. Paving is not required for parking areas and driveways for duplexes where the road providing access is not paved. Where an access road to a duplex lot is paved, parking areas and drives for the duplex must be paved. Parking areas and drives for all other types of development must be paved. Paved parking areas for all other development shall be designed in accordance with Section 5103.03.C and 5203.09 et seq.
D. **Provision for Drainage in Parking Areas:** Parking area design shall make adequate provision for drainage and prevention of erosion. Drainage from parking areas shall flow to roadside ditches or other approved drainage ways. Drainage from parking areas shall not flow onto roadways. Collection points for runoff across parking areas shall be provided to minimize sheet flow.
E. **Placement of Parking Areas on Fill:** If a parking area is to be placed on fill, the fill used shall be a suitable material as specified by a licensed geotechnical engineer. The fill shall be compacted to at least 95% of the maximum dry density at +/- two percent (2%) of optimum moisture content as determined by AASHTO T-180 with slopes at no more than three to one (3:1) and protected by rip-rap to prevent erosion from snow storage. Parking areas on fill may be designed using retaining walls as an alternative in accordance with the County's Zoning Regulations and approval of the County Engineer.
F. **Snow Storage:** Snow storage for parking areas shall be provided on the associated private property as required by Section 3700 et seq. of this Code. Use of the right-of-way for snow storage by private individuals or companies is prohibited (C.R.S. Section 43-5-301 et seq.).

5107.05: Internal Roads

A road or roads within a single parcel, not meeting the criteria for a public road or a driveway, may be permitted subject to the following conditions: 1) the minimum driveway standards are met up to the required parking areas, 2) the internal roads serve a use permitted on the property, and 3) the road(s) can be constructed with limited environmental disturbance.

5108: Landscaping

A. Whenever roadways, driveways, parking areas, bridges, recpaths or other types of construction results in earth disturbance, revegetation and/or landscaping is required.
B. Revegetation and/or landscaping work shall be in accordance with Chapter 3 of this Code and in accordance with the plans and specifications approved as part of any permit issuance.
C. Earth cuts, embankment slopes and all other areas where the ground cover has been disturbed during the course of construction shall be revegetated and landscaped equal to or better than conditions existing prior to construction.
D. Landscaping and revegetation material shall be fertilized, mulched and otherwise treated to provide an established stand of vegetation by the end of the first full growing season after completion of construction.
E. The individual responsible for construction may be required to post a performance bond guaranteeing the revegetation and/or landscaping for at least two (2) full growing seasons following installation.

F. Areas not disturbed by construction shall be left in their present vegetative state, except that thinning of trees may be required. In no case shall landscaping in the right-of-way or on private property impede the normal maintenance operations of the Road & Bridge Department or the normal flow and operations of traffic.

5109: Recreational Pathways & Trails

This section covers two categories of trails: recreational pathways ("Recpath") and natural surface trails. The design of recpaths shall be in accordance with these standards and with the latest edition of AASHTO's *Guide for the Development of Bicycle Facilities*. For natural surface trails, the latest edition of the *Trail Construction and Maintenance Handbook*, published by the United States Forest Service ("USFS") shall be used. In the event there are discrepancies between standards, the more stringent standards shall govern.

A. **General Design Elements:**

The following restrictions apply to all earth disturbing activities related to the design and construction of recpaths and trails:

1. Wetlands: The construction of recpaths in wetland and stream setbacks shall conform to Chapter 7, Water Quality Control Regulations and Chapter 3, Zoning Regulations of this Code.
2. Every attempt should be made by the landowner to maintain a significant vegetative buffer along trail rights-of-way and easements. The vegetative buffer will benefit the trail users and homeowners by providing visual screening and reducing noise disturbance.

B. **Specific Design Elements for Shared Use Recpaths:**

The major considerations in alignment design are safety, grade, profile, path/trail width, design speed, sight distance, topography, drainage and environmental impacts. Path/trail layout should bear a logical relationship to existing paths/trails or platted easements in adjacent properties and to the principles of good engineering practice. To the extent practicable, all recpaths shall be designed such that the recpaths are centered in the right-of-way or easement.

1. **Alignment:** The horizontal and vertical alignment of all new recpaths shall be designed in accordance with the standards and guidelines set forth in the most recent edition of the AASHTO *Guide for the Development of Bicycle Facilities*. Where the standards in this publication cannot be achieved because of exceptional topographical or environmental conditions, a variance may be granted by the County Engineer according to the provisions in Section 5600 of this Code.
2. **Environmental Impacts:** Shared use path alignments shall be designed to fit the existing topography and vegetation. Preference will be given to those alignments which result in the least amount of environmental impact possible.
3. **Sight Distance:** Recpaths shall be designed with adequate stopping sight distances in accordance with these standards and the latest edition of the AASHTO *Guide for the Development of Bicycle Facilities*.
4. **Design Speed:** The minimum design speed for shared use paths shall be 20 mph for level, tangent sections. For down grades greater than four percent (4%), a design speed of 30 mph is required. The designer may consider the use of a series of short switchbacks to control speeds.
5. **Geometric Cross Sections:**
   a. A typical section for a recpath is shown in Figure 5-5.
   b. Travel Lane Width: The minimum width of a paved recpath is ten (10) feet. Where a particular route serves as a primary arterial pathway, the minimum width of a paved recpath is twelve (12) feet. A minimum two (2) foot wide graded area (shoulder) with a maximum 16% slope shall be maintained adjacent to both sides of the path. All lateral obstructions shall be offset a minimum three (3) feet from the recpath pavement edge where conditions allow.
   c. Soil Sterilant: A soil sterilant is required to be placed between the aggregate base course surface and the HMA pavement to prevent vegetation from growing through the pavement.
   d. Cross Slope: For recpaths, the high point of the slope will begin at the outside edge of the pavement and the pavement sloped toward the cut side of the recpath on a two percent (2%) slope. Where recpaths are constructed on fill sections, slope direction will be to side of least erosion potential, or as otherwise directed by the County Engineer or a designated representative thereof (see Figure 5-5).
   e. Pavement Structure: The minimum structural sections outlined in Table 5-3 shall be adhered to on all shared recpaths in Summit County. Pavements for recpaths shall be designed by a professional engineer licensed in the state of Colorado.
   f. Bridges and Structures: Bridges and all other structures shall conform to the latest edition of the CDOT

Bridge Design Manual and these standards. In the event there is a discrepancy between the two, the more stringent specification or standard shall apply. Plans shall be prepared by a qualified structural engineer licensed in the State of Colorado and shall be submitted to the County Engineer for review and approval prior to construction.

i. Clear deck width must accommodate the full width of the travel lanes and shoulders of approach paths/trails. Where the existing path or trail is narrower than the bridge deck, a transitional approach not less than 25 feet in length shall be constructed.
ii. The waterway area shall accommodate a 100-year frequency storm. Where flood studies from the USACE or FEMA are available, bridges shall be designed to accommodate the "Standard Project Flood". A minimum of one (1) foot freeboard is required. Additional freeboard shall be required when debris-laden flows are anticipated.
iii. Railings, fences or barriers on both sides of the bridge shall be a minimum of 1.1 meters high.
iv. Bridges shall be designed for pedestrian live loadings. Where maintenance and emergency vehicles may be expected to cross the bridge, the design shall include them as well.
v. All bridge decks shall incorporate bicycle–safe expansion joints, and shall have a non-skid surface texture.

6. **Drainage:**

a. Pavements: All path/trail surfacing shall have a minimum two percent (2%) cross slope. In addition, path/trail surfacing shall be free of depressions and excessive surface voids, which create water ponding and/or ice build-up. Such items as culverts, catch basins and drainage ditches shall accomplish positive drainage away from the path/trail surface. Final approval for the types of drainage items used and the locations of such items shall be at the sole discretion of the County Engineer.

b. Culverts: Culverts under all recpaths shall be designed, at a minimum, to accommodate a 25-year frequency storm runoff utilizing the maximum available head. The maximum available head shall be determined by the uppermost ponding elevation chosen to prevent flood damage to upstream properties.

i. Culverts shall be located at each natural draw or watercourse as conditions warrant to prevent excessive accumulation of flow in roadside ditches or along the toe of slopes. Draws and watercourses shall be cleared of debris for a distance of 100 feet upstream from all culvert inlets.
ii. Inverts at the inlet shall be slightly elevated above the normal flow line in steep or natural draws to avoid plugging by debris. Inlets shall not be elevated in those instances where ponding or accumulation of backwater curves would be objectionable (stagnation, irrigation ditches, etc.).
iii. The culvert shall slope downward in the direction of natural flow and be designed to be self-cleaning whenever possible. The outlet shall be designed not to discharge on unprotected fills or unstable material or at adverse angles to streams or open channels. Headwall, riprap or other means of protection are required at inlets or outlets where erosion might occur.
iv. Velocities of flow in culverts shall be calculated using acceptable design charts or formulas.
v. Corrugated metal pipe, HDPE, or an approved equal as specified by the Road & Bridge Director or his authorized representative and/or the County Engineer shall be used. Steel pipe shall be asphalt coated where soils are corrosive or other conditions exist that may attack steel.
vi. The minimum diameter for round pipes under recpaths shall be 18 inches. The minimum rise for elliptical pipes shall be fifteen (15) inches.
vii. The minimum cover for culvert pipe under a recpath is twelve (12) inches.
viii. When a battery of pipes is used, a clear spacing of ½ the pipe diameter (one (1) foot minimum, four (4) foot maximum) must be provided between pipes. Minimum and maximum cover, pipe metal gauge and strength classification shall be as specified in Section 5203.06.

c. Ditches: Where a shared use path/trail is constructed on a side hill, a minimum one (1)-foot v-ditch shall be placed on the uphill side to intercept the hillside drainage.

i. Where shared use paths are not constructed on hillsides, or when shared use paths are adjacent to existing highway facilities, channels and ditches shall be designed to avoid roadside safety hazards. The minimum flow line slope shall be three-quarters percent (3/4%). Maximum slopes shall be controlled by the maximum permissible velocities given in Table 5-5.
ii. Manning's equation shall be used to estimate velocities.
iii. Where the channel is comprised of a combination of the materials given in Table 5-5, the maximum permissible velocity selected should prevent undue scouring of the finer materials silting downstream.

7. **Traffic Control Devices:** All traffic control devices including signs and pavement marking shall be in

accordance with Section 5106.02 of these standards.

8. **Inspections:** Inspections of the work shall be in accordance with Section 5203.02 of these standards. Except that inspection and approval of a natural surface trail shall be performed by a representative from the Summit County Open Space & Trails Department.

5200: ROAD, BRIDGE AND RECREATIONAL PATHWAY CONSTRUCTION SPECIFICATIONS

5201: Purpose and Intent

This section sets forth specific standards for road, bridge and recpath construction in Summit County and is intended for use by the developers, property owners, contractors and others engaging in the construction or maintenance of new roads or upgrading of existing roads, building of bridges and the construction or maintenance of recpaths.

5202: Closing of Streets, Roads and Recreational Pathways

5202:01: Notice and Operation of Road Closure

A. Contractors may only close roads or recpaths after obtaining approval for an alternate route from the County, and they shall provide detour signs. Contractors shall furnish, erect and maintain, at their own expense, necessary barricades, suitable and sufficient flashers and construction signs. Contractors shall also provide a sufficient number of flagmen and take necessary precautions for the protection of the work and safety of the public around their construction operations.
B. If construction requires closure of a road or recpath, refer to Section 5405 for closure procedures.

5203: Construction of Roads and Recreational Pathways

5203.01: Permits Required for Road and Recreational Pathway Construction

Whenever road or recpath construction results in earth disturbance, the individual responsible for the construction must obtain approval for a grading and/or right-of-way permit from the Engineering Department prior to commencing construction. The submittal requirements and procedure for obtaining grading permits are stated in Section 6000 et seq. of this Code.

5203.02: Construction Inspection and Testing Requirements for Road and Recreational Pathway Construction

A. **Quality Control:** Quality control supervision of construction shall be done by a qualified geotechnical consultant at no expense to the County. The County inspector shall be permitted access to the construction site at all times to make spot checks for quality control. Any additional testing or corrective work deemed necessary shall be done within the time determined by the County Engineer at no expense to Summit County. The contractor or developer must contact the County Engineer a minimum of 48 hours in advance of the required final inspection.
B. **Sampling of Materials:** Samples for preliminary approval or production control may be submitted by the producer to the geotechnical consultant. The geotechnical consultant must use the procedure(s) established in the most recent edition of the CDOT *Field Materials Manual* to determine acceptance of proposed materials.
C. **Field Density Determination:** Proposed testing shall be in conformance with current American Society for Testing and Materials (ASTM), AASHTO, or CDOT standards, and shall be submitted as part of the design documents or proposal, and must be approved by the County Engineer prior to issuance of a notice to proceed.
D. **Periodic Inspection During Construction:** The Engineering Department or their authorized representative shall conduct periodic inspections, as well as require independent testing and inspections, during construction to assure compliance with approved grading and construction plans.
    1. The Engineering Department shall establish specific checkpoints of when inspections must be conducted and approvals granted before construction is continued as part of issuing a grading permit. The check points are as follows:
        a. Rough grading.
        b. Subgrade preparation.
        c. Utility installations.

d. Placement of road base.
e. Paving (if applicable).
f. Construction of drainage improvements (including culverts for driveways, if applicable).
g. Placement of signs (if applicable).

2. Independent testing shall be required for all subgrade, aggregate base course and paving as follows:
   a. Standard Proctors shall be required for each aggregate material used in the sub-grade.
   b. Density and moisture condition tests shall be required in accordance with the provisions of this section at intervals of one per 200-feet of roadway constructed.
   c. Relative density of asphalt placed shall be tested in accordance with the provisions of this section at a minimum frequency of one test per 200-feet of paving installed.
   d. The County Engineer may issue an explicit written waiver or alternative to these minimum standards at his sole discretion if it is determined that adequate or equivalent quality control and quality assurance can be achieved through alternative or reduced procedures.

E. **Final Inspection:**
1. Upon completion of construction and prior to County approval of the completed work, copies of the as-built plans, concrete cylinder test reports, compaction test reports, aggregate gradation, asphalt binder content, and other test data as required by the County Engineer shall be delivered to the Engineering Department. In addition a certification shall be given by the developer's engineer that construction has been completed in conformance with the approved lines, grades, specifications and standards (see Section 5007.01).
2. The Engineering Department shall conduct a final inspection to determine if the construction meets County standards and specifications. If the inspection discloses any work, in whole or in part, as unsatisfactory, the County Engineer shall give the developer's engineer the necessary instructions for correction, and the contractor shall comply with and execute such instructions. At the discretion of the County Engineer, the County may withhold the granting of further building permits or any occupancy permits for the project until all required corrective work is completed.

5203.03: Site Preparation

A. **Utilities Protection:** The developer or contractor shall at all times take proper precautions to assure the protection of utilities, service lines or other public or private installations and shall be responsible for the repair of any damage. The developer or contractor shall notify the utilities 48 hours before excavation begins, so the utilities can locate the services.
B. **Grubbing:** All large rocks, brush debris, structures and all other unsuitable material shall be cleared to a depth of at least twelve (12) inches below subgrade or as directed by the County Engineer and replaced with suitable material. Locating suitable disposal sites shall be the responsibility of the contractor or developer subject to County approval. Trees, except those designated to be saved, and all stumps shall be removed to a depth of at least 18 inches below the finished subgrade elevation. All trees designated to be saved shall be protected during clearing and subsequent construction operations. Suitable material removed from the excavation may be used in the formation of embankments, backfilling and for other such purposes. Unsuitable material must be disposed of at a location approved by the Engineering Department, as a part of the excavation or earthwork contract line item.

5203.04: Structural Embankment Construction

Embankment construction consists of constructing roadway and recpath embankments including preparation of the areas upon which they are to be placed, constructing dikes within or outside the right-of-way or recpath easement, placing and compacting of approved material within roadway areas where unsuitable material has been removed, and placing and compacting of embankment material in holes, pits and other depressions within the roadway area. Only approved materials shall be used in the construction of embankments and backfills.

A. **Benching:** When an embankment is to be placed and compacted on slopes steeper than four to one (4:1), the roadway and recpaths shall be continuously benched over those areas. A bench is required at vertical intervals of ten feet maximum or as required by the County Engineer. Benching shall be well keyed and, where practical, a minimum of eight feet wide. Each horizontal cut shall begin at the intersection of the original ground, and the vertical sides of the previous cuts. The material shall then be re-compacted along with the new embankment material as a part of the excavation or earthwork line item.
B. **Compaction:** Minimum compaction shall be at least 90% of the maximum dry density at +/- two percent (2%)

of optimum moisture content as determined by AASHTO T-180.

C. **Riprap:** Where embankments encroach on stream channels or lakes, calculations of the flows or wave action shall be made and submitted to the County. Based on these calculations, and standard engineering practices, the appropriate size riprap shall be placed along the toe of the slope to protect the embankments against erosion from the anticipated hydro-dynamic forces.
D. **Prohibited Materials:** Organic material, wet or frozen material, snow, ice or other unsuitable materials shall not be used for any structural embankment construction.

5203.05: Trench Excavation

Trenches shall be excavated so that pipes can be laid straight at uniform grade, without dips or humps, between the terminal elevations shown on the drawings. Wherever a trench passes through a fill or embankment, the fill or embankment material shall be placed and compacted to an elevation twelve (12) inches above the top of the pipe before the trench is excavated.

A. **Trench Widths:** Trenches shall be excavated to a width necessary to provide adequate working space and side clearances for proper pipe installation, jointing and embedding. Minimum trench widths at or below an elevation six (6) inches above the top of installed pipe shall not be less than the pipe's outer diameter plus 24 inches.
B. **Excavation Below Pipe Subgrade:** Except where otherwise required, pipe trenches shall be excavated below the underside of the pipe, as shown on Figure 5-8, to provide for the installation of granular pipe bedding foundation material.
C. **Bedding Material:** Bedding shall be installed according to applicable CDOT M&S standards for all RCP, HDPE, corrugated metal pipe (except where arch encasement is required), and cast iron pipelines, as shown on Figure 5-8.
D. **Placement and Compaction:** Granular bedding material shall be spread and the surface graded to provide a uniform and continuous support beneath the pipe at all points between bell holes or pipe joints. It is permissible to slightly disturb finished subgrade surface by withdrawal of pipe slings or other lifting tackle.
    1. After each pipe has been aligned, placed in final position on the bedding material and shoved home, sufficient pipe bedding material shall be deposited and compacted under and around each side of the pipe and back of the bell or end to hold the pipe in proper position and alignment during subsequent pipe jointing and embedding operations. Bedding material shall be deposited and compacted uniformly and simultaneously on each side of the pipe to prevent lateral displacement.
    2. Bedding shall be compacted to the top of the pipe in all areas where compacted backfill is specified.
    3. Whenever crushed rock is used as bedding for 36-inch and larger pipe, the portion above the bottom of the pipe shall be vibrated with a mechanical vibratory compactor during placement to ensure that all spaces beneath the pipe are filled.
E. **Backfill Over Concrete:** All backfill over concrete shall conform to the following requirements:
    1. Initial Backfill: To aid curing, no more than eight (8) inches of loose backfill shall be placed over concrete after the concrete has reached its initial set.
    2. Final Backfill: Additional backfill shall not be placed over arch encasements or blocking until the concrete has been in place at least three (3) calendar days.
F. **Compacted Backfill:** Compacted backfill shall consist of suitable job excavated-material, finely graded and free from debris, organic material, cinders, snow, ice or other unsuitable materials, and stones larger than three (3) inches in greatest dimension. Masses of moist, stiff clay shall not be used. Job-excavated materials shall be placed in uniform layers not exceeding eight (8) inches in un-compacted thickness. The method of compaction and the equipment used shall be appropriate for the material to be compacted, and shall not transmit damaging shocks to the pipe. Job excavated material shall be compacted to at least 90% of the maximum dry density at +/- two percent (2%) of optimum moisture content as determined by AASHTO T-180, except for the final two (2) feet which will be compacted to at least 95% of the maximum dry density at +/- two percent (2%) of optimum moisture content as determined by AASHTO T-180. Compacted backfill is required for the full depth of the trench above bedding in the following locations:
    1. Beneath driveways, parking areas, roads, recpaths or other construction or structures; or,
    2. In driveway and parking area shoulders; or,
    3. Beneath fills or embankments.
G. **Flow-Fill:** There may be circumstances, for example in locations where proper compaction is difficult or impractical to achieve, or where compaction is critical to the performance of surface improvements, when the

County Engineer or the Road & Bridge Department require the use of flow-fill in lieu of compacted backfill. In such cases, the use of flow-fill shall conform to CDOT's *Standard Specifications for Road & Bridge Construction*, and shall be approved by any utilities that may be affected by the use of such material prior to placement.

5203.06: Culverts

This section covers corrugated metal pipe or approved equal to be used for storm drains beneath driveways, recpaths and roads to convey storm drainage. Culvert sizing shall be in accordance with Section 5103.03.D of the Road Standards. Corrugated metal pipe or approved equal shall be furnished and installed with all jointing materials, accessories and appurtenances as indicated on the drawings and as specified.

A. **Materials:** Materials used for storm drains shall conform to the applicable AASHTO provisions of the *Standard Specifications for Highway Materials*.
   1. Corrugated metal pipe shall be AASHTO M36-78 and galvanized with two and two-thirds (2-2/3) inch x one-half (½) inch corrugations. The corrugations may be annular or spiral with annular ends.
   2. Coupling Bands: All field joints in corrugated metal pipe will be made with coupling bands, fabricated from the same material as the pipe. Coupling bands for field joints in corrugated metal pipe for all culverts shall be the pipe manufacturer's standard coupling band type and be installed in accordance with the manufacturer's specifications. Coupling bands should be installed as near as possible to the mid-span of the culvert, but shall always be installed a minimum of 6-feet away from either terminus.
   3. Flared metal end sections shall be provided on all culverts unless otherwise specified by the County Engineer. The end sections shall be fabricated from 16 gauge-galvanized sheet metal for pipe smaller than 24-inches in diameter, and 12 gauge galvanized sheet metal for pipe 24-inches in diameter or larger. The end sections shall be provided with a rolled reinforced edge and a galvanized top finish plate.

B. **Handling:** Pipe, couplings and accessories will be handled in a manner that will ensure installation in sound, undamaged condition. Equipment, tools and methods used in unloading, reloading, hauling and laying pipe will be such that the pipe is not damaged.

C. **Cleaning:** The interior of the pipe and any couplings shall be thoroughly cleaned of all foreign matter before being installed. Before jointing, all joint contact surfaces shall be wire-brushed if necessary, wiped clean and kept clean until jointing is completed.

D. **Installation:**
   1. Corrugated metal pipe shall be laid true to the grade required by the drawings, and shall be installed in accordance with the following requirements:
      a. Pipe: The pipe shall be installed in accordance with the details indicated on Figure 5-8 and the applicable standards in the excavation section. The pipe shall be protected from lateral displacement by means of a pipe bedding material as specified for trench backfill. The minimum cover for culvert pipe in a roadway is twelve (12) inches.
      b. Couplings: Sections of the corrugated metal pipe shall be joined together using metal coupling bands, centered on the joint, and with the pipe sections as close together as possible. Each coupling bank shall be bolted in place and tightened sufficiently to ensure a tight joint and to form a continuous conduit capable of resisting all stresses. Pipe shall not be laid in water or under unsuitable weather or trench conditions.
      c. End Sections: The end sections shall be attached to the culvert by threaded rod and connecting lug.
      d. Riprap: Riprap shall consist of fractured rock as nearly cubic as practicable. Slab type and flaking rocks shall not be used. Riprap shall be specified by the engineer of record on the project, and shall be sized according to the 5-year flows anticipated in the channel.
   2. Use of Culverts at Access Point to Roads: Driveways, road or recpath connections to a County road or recpath shall not be constructed in such a way as to impede the normal flow of drainage in roadside ditches, culverts, under drains, bridges or other drainage works, or to cause such drainage to flow onto or across the driving surface of a County road. In the event that such an impediment results in damage to a County road, the Road & Bridge Director will remove the impediment and bill the property owner for the costs of repairs to the road, including labor, equipment and material. In certain instances, a culvert may not be required by virtue of the topography. In that event, a written waiver must be obtained from the Road & Bridge Department. Such a waiver does not constitute a waiver of the permit fee, inspection of the access or any other requirement of the access.

5203.07: Subgrade

The bottom of the excavation or top of structural fill below compacted road base or pavement is considered the subgrade, and shall conform to the lines, grades, and cross sections shown on the plans.

A. Soft, spongy or frozen subgrade shall be removed as directed and replaced with suitable granular material placed and compacted as specified in Section 5203.04.
B. Before subbase construction begins, soils in the subgrade shall be compacted to at least 90% of the maximum dry density as determined by AASHTO Method T-180 and the moisture content must not deviate by more than three percent (3%) of the theoretical optimum.

5203.08: Gravel Roads

Gravel roads shall consist of a compacted base course to the design thickness.

A. **Gravel Specifications:** Gravel used in road construction shall be crushed to a required size and a filler of sand or other finely divided mineral matter must be used. The portion of material retained on a No. 4 sieve is considered filler. At least 50% by weight of the coarse aggregate particles shall be particles having at least two fractured faces. The gravel shall be screened if necessary to meet this requirement or to eliminate an excess of filler. The composite base course material and subbase course shall be free from organic matter, snow, ice or other unsuitable materials.
B. **Compaction of Base Course (Gravel Roads):** The base course shall be placed and spread in a uniform layer and without segregation of size to a depth not exceeding eight (8) inches of un-compacted material. The material will be compacted to at least 95% of the maximum dry density at +/- two percent (2%) of optimum moisture content as determined by AASHTO T-180.
C. **Manholes:** On gravel roads where manholes or water valve boxes are located in the roadway, they must have a minimum of five (5) inches of cover at finished grade.
D. **Dust Abatement:** The County may require an appropriate dust abatement material be applied to gravel roads in residential areas or as deemed necessary by the County Engineer and the Road & Bridge Director or his authorized representative, or as required by State or local air quality regulations.

5203.09: Hot Mix Asphalt Pavements

Hot Mix Asphalt[1] ("HMA") pavements shall be designed, installed, constructed, maintained and repaired in accordance with these standards and with the latest editions of CDOT's *Pavement Design Manual* and *Standard Specifications for Road and Bridge Construction* or the AASHTO *Guide for the Design of Pavement Structures*. In the event of discrepancies between these standards and the referenced publications, the more stringent shall take precedence.

A. **Aggregate Base Course:**
   1. Aggregate Base Course Specifications:
      a. Aggregate for bases shall be crushed stone, crushed slag, crushed gravel, natural gravel, or crushed reclaimed concrete or asphalt material which conforms to the quality requirements of AASHTO M 147, except that the requirements for the ratio of minus No. 200 sieve fraction to the minus No. 40 sieve fraction, stated in 2.2.2 of AASHTO M 147, shall not apply.
      b. Aggregate for bases shall be free from organic and frozen matter, lumps or balls of clay.
      c. Aggregate for bases shall meet CDOT specifications for Class 5 or Class 6 Aggregate Base Course.
      d. The use of mine waste or other potentially environmentally hazardous materials as aggregate base course material without the prior review and approval of the County Engineer is prohibited. The developer or contractor must identify the source of aggregate base course material to the County Engineer prior to incorporation of such material into the project (or prior to the issuance of a grading permit). The County may require analysis and testing of material proposed to be utilized as aggregate base course material for heavy metals and other environmentally damaging substances prior to incorporation of the material into the project (or prior to the issuance of a grading permit). If inspections disclose the unapproved use

[1] Within this Code HMA or "Hot Mix Asphalt" may refer to any similar bituminous paving product

of mine wastes or other potentially environmentally damaging substances as aggregate base course, the County, at the discretion of the County Engineer, may withhold the granting of any further permits or approvals to the developer or contractor for the project until at such time as the developer or contractor has completed the necessary corrective work.

2. Compaction of Aggregate Base Course (Asphalt Roads): Placement of aggregate base course material shall conform to the lines, grades, cross-sections, the thickness shown on the approved plans, and when placed and compacted, it shall result in a firm, dense, unyielding foundation.
   a. Aggregate base course material shall not be placed upon a soft, spongy or frozen subgrade.
   b. Aggregate base course material shall be deposited and spread without particle segregation in loose layers not to exceed six (6) inches in depth when compacted. If the required compacted depth of the aggregate base course exceeds six (6) inches, it shall be constructed in two (2) or more layers of approximately equal thickness.
   c. The material shall be compacted to at least 95% of the maximum theoretical dry density at +/- two percent (2%) of optimum moisture content as determined by AASHTO T-180.
   d. The surface of each layer shall be maintained during the compaction operations so that a uniform texture is produced and the aggregates are firmly keyed. Water shall be uniformly applied during compaction, in the quantity necessary for proper compaction.

B. **Hot Mix Asphalt Pavement:** Hot Mix Asphalt ("HMA") pavements shall be designed, installed, constructed, maintained and repaired in accordance with these standards and with the latest editions of CDOT's *Pavement Design Manual* or the AASHTO *Guide for the Design of Pavement Structures*, and CDOT's Standard Specifications for Road and Bridge Construction. In the event of discrepancies between these standards and the referenced publications, the more stringent shall take precedence.

1. The County Engineer or his designated representative must approve any proposed HMA mix designs prior to placement of HMA pavement.
2. Construction of Hot Mix Asphalt Pavements: The construction of Hot Mix Asphalt pavements shall be in accordance with these standards and with the latest edition of the CDOT *Standard Specifications for Road and Bridge Construction*. In the event of discrepancies between these standards and the Colorado Department of Transportation *Standard Specifications for Road and Bridge Construction*, these standards shall take precedence.
   a. General Conditions: HMA mix shall be placed only on properly constructed and accepted surfaces that are free from water, snow and ice.
   b. Financial Guarantee: Whenever paving is performed in a public right-of-way in unincorporated Summit County, a financial guarantee for the paving may be required until such time that paving occurs. After paving, any financial guarantee shall remain in place for one full year from the date of final acceptance/approval by the County to warranty the structural integrity of the road.
   c. Pavement Thickness: Pavement and lift thicknesses shall be indicated on the design plans.
3. Sampling and Testing: All sampling and testing of materials incorporated into the HMA mixture, shall be performed in accordance with the latest AASHTO *Materials Testing and Sampling Manual*, and the latest editions of the CDOT, *Field Materials Manual* and *Lab Manual of Test Procedures*. The County Engineer shall be supplied with test reports, for all materials incorporated into the HMA mixture, by a Colorado Licensed Professional Engineer with expertise in the sampling and testing of HMA materials, before any asphalt is placed. Samples shall be obtained from the back of the paver for oil content and gradation testing once per day for paving operations, and density tests shall be performed at a frequency of one per 200 linear feet of asphalt placed, both in accordance with Section 5203.02 of this standard.
4. Drainage Pans: Drainage pans may be used where approved by the County Engineer. Drainage pans shall be designed, by a professional engineer licensed in Colorado, to accommodate the 25-year design storm, and to avoid damage to vehicles.
5. Speed Bumps: Proposals for installing speed bumps shall be considered according to the Speed Bump Approval Process on file with the Engineering Department.

5300: ACCESS PERMIT REQUIREMENTS

5301: Purpose and Intent

Access permits must be obtained whenever a developer, contractor, property owner or other individual proposes to connect a driveway to an existing public or private roadway or recpath in unincorporated Summit County. Access

permits shall be considered a part of the Grading and Excavation permit for a project and shall be issued concurrently with, or prior to, building permits where applicable.

5302: Procedures/Requirements for Issuance of Access Permits

The following procedures must be followed and requirements must be met in the review of applications for access permits.

5302.01: Submittal Requirements for Access Permits

The following information must be submitted with any application for an access permit, unless specific items are waived by the Engineering Department as unnecessary.

A. Fee as required by resolution of the BOCC.
B. Completed permit form.
C. Site plan showing the following information:
    1. Well location, if any.
    2. Existing structures, if any.
    3. Proposed structures including any garages.
    4. Location of property lines.
    5. Location of required setbacks and their dimensions.
    6. Location of proposed driveways and their grades.
    7. Location of any parking area proposed.
    8. Access point to County roadway.
    9. Location of drainage culvert, if applicable.
    10. Evidence of legal access.

5302.02: Action on Access Permits

Applications for access permits shall be considered a part of a building permit application for any new construction and a part of the grading permit for any work not associated with a building permit, and shall be reviewed by the Engineering Department. Approval shall be granted only if the proposed driveway, roadway or recpath connection meets the specifications in these regulations and the required fee has been paid. Approval of an access permit may be accompanied by any conditions deemed reasonable by the Engineering Department to ensure protection of health, safety and welfare and compliance with these regulations. Applications for standalone access permits must be submitted at least three (3) business days prior to planned commencement of construction, and construction cannot commence without permit approval. Whenever an access permit is needed for a development project, building permits shall not be issued for the project until approval is granted for the needed access permit.

5302.03: Construction Specifications for Access Work

All work undertaken to connect driveways to existing County roadways shall conform to the Road & Bridge design and construction standards contained in these regulations.

5302.04: Construction Schedule for Access Work

As part of its approval of any access permit, the Engineering Department shall also approve a construction schedule. The approved schedule shall not be changed after the permit is issued without the written consent of the Engineering Department.

5302.05: Supervision of Access Work

The permittee shall at all times conduct work within County right-of-way or recpath easement so as to avoid obstruction and hazard to the traveling public. Materials necessary for construction of access points to the County roadway shall not be stored in the County right-of-way or recpath easement at any time. The roadway and roadside area where access work has been performed shall be thoroughly cleared of all debris and extraneous material and shall

be restored to a condition equal to or better than the original when construction is concluded. Where a driveway is to be paved, an inspection by the County Engineer or his designee shall be required after completion of base course compaction and prior to placement of HMA.

5302.06: Inspection and Testing of Access Work

A. Inspections of the work shall be in accordance with Sections 5203.02.C and D.
B. It is the responsibility of the permittee to contact the Engineering Department 48 hours in advance of required inspections.
C. A final inspection at the conclusion of construction is required. In making this inspection, the Engineering Department shall check for compliance with these regulations and approved plans, and also for adequate cleanup of roadway or recpath surfaces and the right-of-way, or recpath easement. Certificates of occupancy (or Certificates of completion, where applicable) shall not be issued by the Building Department until access work is determined to be satisfactory by the Engineering Department.
D. Any work or material which does not conform to these regulations, any pavement failures or broken asphalt, damaged signs or fencing, and remaining debris either in the roadway or adjacent property, or improper drainage shall be brought to the attention of the permittee both verbally and in writing. Any work in which untested or unaccepted materials are used shall be removed and replaced at the permittee's expense. Any required corrective work shall be made at the permittee's expense and shall be done to the satisfaction of the Engineering Department. If immediate corrections are not made, further project construction shall be stopped.
E. In determining whether or not the access work done by the permittee is acceptable, the Engineering Department may consult with the Road & Bridge Department. If a determination is made that testing is required, the number and location of the tests shall be determined by the Engineering Department. If the Engineering Department determines testing by an independent lab is necessary, the cost of such testing shall be paid by the permittee.

5302.07: Responsibility for Rework on Access Connections

The permittee shall be fully responsible for the maintenance and correction of any faulty construction, including unstable road cuts and potholes developed during the construction period and for a period of two (2) years following the final inspection of the access work. All deficiencies shall be resolved to the satisfaction of the Engineering Department. Failure to do so may be cause for denial of future access permits.

5400: RIGHT-OF-WAY PERMIT REQUIREMENTS

5401: Purpose and Intent

Right-of-way permits shall be obtained whenever a developer, contractor, property owner, utility company or other individual proposes to install utility lines, culverts or any other work requiring signage or disturbance to soil or temporary use within County rights-of-way or recpath easement(s), except that a right-of-way permit shall not be required for road and primary utility construction when a grading permit is issued for such work. Utilities include water, sewer, natural gas, telephone, electrical and television cable lines. Right-of-way permits are required to assure the method of installation meets the specifications in these regulations and adequate revegetation of disturbed areas outside the roadway is completed. They are also intended to assure adequate reconstruction and/or repair of any damage caused to County roads, road right-of-way or recpath easement and to provide for the public health, safety, and welfare.

5402: Requirements for Financial Guarantee

A. Any permittee proposing to install utility lines or culverts in County road rights-of-way, or recpath easement may be required to secure to the County a financial guarantee for the total amount required to restore public property. The amount of the guarantee shall be based on contract prices for performing such work, as specified and approved by the Road & Bridge Director or his authorized representative. If the work and installation are not completed as stated and in accordance with the standards and specifications determined by the Road & Bridge Director or his authorized representative, the County shall give written notice of the defects to the permittee at least 30 calendar days prior to the expiration date of the financial guarantee. The notice shall also state that the financial guarantee will be called unless satisfactory corrective work is done within 20 calendar days of the notice. If satisfactory

corrective work is not done within the required time limit, the work shall be in default and the County shall call the financial guarantee.

B. The Road & Bridge Director or his authorized representative may waive or impose the requirement for a financial guarantee for any permittee at their discretion.

5403: Procedures/Requirements for Issuance of Right-of-Way Permits

The following procedures must be followed and requirements met in the review of applications for right-of-way permits.

5403.01: Submittal Requirements for Right-of-Way Permits

The following information must be submitted with any application for a right-of-way permit, unless specific items are waived by the Road & Bridge Director or his authorized representative as unnecessary.

A. Fee as required by resolution of the BOCC.
B. Completed permit form.
C. For minor installations and disturbance, sketch plan showing the following:
    1. Location of all excavations using dashed lines.
    2. Location of road and road right-of-way, or recpath easement.
    3. Location of any driveways.
    4. Existing structures, if any.
    5. Proposed disturbance or structures including any garages.
D. For major installations, engineered construction plans and specifications.
E. Construction schedule.
F. A traffic control plan developed in conformance with the most recent edition of the MUTCD.
G. Financial guarantee covering the cost of reconstruction and/or repair of damage caused to any County road, road right-of-way or recpath easement, if required.
H. Proof of insurance with minimum coverage per state statute.

5403.02: Action on Right-of-Way Permits

A. Applications for right-of-way permits shall be submitted at least three (3) business days prior to planned commencement of construction for minor installations and five (5) business days prior for major installations. Construction cannot commence without permit approval. The Road & Bridge Department is responsible for review of applications for right-of-way permits. Consideration shall be given to how the proposed installation affects County road or recpath maintenance and improvement programs. Right-of-way permits shall not be issued any earlier than May 1st of each year and all right-of-way permit work shall be completed by October 31st of each year. These dates may be changed by the Road & Bridge Director or his authorized representative for good cause so long as the quality of work is not adversely affected. Right-of-Way permits involving staging and access during the moratorium shall be reviewed by the Road & Bridge Director or his authorized representative and granted on a case-by-case basis, based on the extent of the proposed impacts to the travelling public and the environmental or climatic conditions at the time.
B. Approval shall be granted only if the proposed installation meets the specifications in these regulations, the required fee has been paid, and the financial guarantee has been posted if required. Approval of a right-of-way permit may be accompanied by any conditions deemed reasonable by the Road & Bridge Department to ensure protection of health, safety and welfare and compliance with these regulations.
C. The right-of-way permit must be signed by applicant and the Road & Bridge Director or his authorized representative for it to be approved.

5403.03: Construction Specifications and Schedule for Right-of-Way or Recreational Pathway Easement Work

All work undertaken to install utilities or culverts within the County road right-of-way or recpath easement shall conform to the requirements contained in these regulations, and to approved plans and specifications. In issuing right-of-way permits, the Road & Bridge Department shall also approve a construction schedule. The approved construction plans, specifications and schedule cannot be changed without the consent of the Road & Bridge Director or his

authorized representative, except in emergency situations as provided in Section 5403.04.

5403.04: Emergencies

If a true emergency exists where time is not available to follow the procedures for obtaining a right-of-way permit or for making modifications to the approved plans, specifications and schedule, an excavator may proceed with right-of-way or recpath easement work after obtaining verbal approval from the Road & Bridge Department.

5403.05: Expiration of Permits

Right-of-way permits expire when the end of the approved construction schedule is reached, or at the end of the construction year, as specified on the approved right-of-way permit.

5404: Fines and Penalties

Any work performed in the public right-of-way without the required permit is subject to enforcement as set forth in Chapter 14 of this Code. The Road & Bridge Department reserves the right to deny permits to any contractor based on a history of non-compliance with these regulations.

5405: Procedures for Road or Recreational Pathway Closures During Right-of-Way or Recreational Pathway Easement Work

Road or recpath closures to accommodate right-of-way or recpath easement work are not permitted unless justified on the basis of overall benefit to the general public. Requests for road or recpath closures shall be specified on the permit form submitted by the applicant, and no road or recpath closures shall be undertaken unless approved by the Road & Bridge Director (and/or the Open Space & Trails Department, if applicable) in conjunction with the right-of-way permit issued by the Road & Bridge Department. When road or recpath closures have been approved, the permittee shall use the following procedures:

A. At least five (5) calendar days prior to actual closure, the permittee shall obtain approval from the Road & Bridge Department of a detailed traffic control plan. This plan must be based on the current CDOT "S" Standards and in compliance with Part 6 of the MUTCD. In addition, at least five (5) calendar days prior to actual closure, the permittee shall verify the schedule and location of road or recpath closures, notify the appropriate local papers and/or radio station, and/or provide a sign board to announce the upcoming road or recpath closure as determined to be appropriate by the County Engineer.
B. On the day of the anticipated closure, but prior to the installation of any devices in the right-of-way, the Summit County Communications Center must be notified so that the appropriate fire district, school district, and the County Sheriff's office can be notified of any impacts to access.
C. Road or recpath closures are only permitted between the hours of 7:30 a.m. and 5:30 p.m., unless authorized otherwise by the Road & Bridge Department. Where closures of more than one (1) day are approved, a suitable detour must be provided, and must be marked and signed to accommodate overnight traffic.

5406: Protection of Public Safety and Convenience

The permittee shall at all times conduct right-of-way or recpath easement work in a manner which ensures the least possible obstruction and hazard to the traveling public. The permittee shall provide for the safety and convenience of the residents along roads or recpath where work is being done, and for the protection of persons and property at all times. Adequate warning signs, barricades, lighting, flags and other devices as specified in Part 6 of the most recent edition of the MUTCD and the CDOT "S" Standards and, as approved by the Road & Bridge Department, shall be provided, maintained and paid for by the permittee. Flagmen shall be posted to guide the traveling public where only one (1) traffic lane remains open or through otherwise unsafe operations. Prior to approval of the right-of-way permit, a traffic control plan shall be submitted to the Road & Bridge Department for approval.

5407: Construction Procedures for Right-of-Way or Recreational Pathway Easement Work

The permittee shall plan right-of-way or recpath easement work so it does not create safety hazards or maintenance

problems, render portions of right-of-way or recpath easement unusable for future road improvement or obstruct flood flows.

5407.01: Compliance with Safety Standards

The permittee's operations shall conform to the applicable requirements established by the Industrial Commission of Colorado and the Federal Occupational Safety and Health Act ("OSHA").

5407.02: Staging of Installations

Staging of utility installations may be required by the Road & Bridge Department to produce the least disruption possible for the traveling public. A permit for any subsequent stages may not be issued until the prior stage has satisfactorily progressed or been completed.

5407.03: Installation of Utilities

All utilities shall be installed in accordance with the plans and specifications approved by the utility owner and the Road & Bridge Director or his authorized representative. Where applicable, the plans for installation must bear the name, seal and signature of a Colorado licensed Professional Engineer responsible for their preparation. The alignment and method of installation of all utilities within County rights-of-way is subject to approval by the Road & Bridge Director or his authorized representative.

A. **Underground Utilities:** All accesses to underground utilities from the road surface (e.g. manholes, vaults) shall be of heavy-duty construction capable of safely supporting anticipated maintenance equipment and vehicular traffic. The top of these accesses shall be one-half (½) inch below the finished grade and be at the same slope of the road.
   1. Seep plugs shall be installed in trenches used for underground utilities at no less than 500-foot intervals if the possibility exists that the surrounding water table will be lowered and this will have an adverse effect on surrounding wells and vegetation dependent on the water table elevation or an engineered design be provided.
   2. Underground utilities, including but not limited to electric lines, telephone lines, gas lines, cable television/ broadband internet service lines, sanitary sewer service lines, water service lines or any other type of utility, shall be installed to the depth specified in the approved plans and specifications for the utility installation, or to a depth of not less than two (2) feet, whichever is greater, when such work is located within the public right-of-way.

B. **Aboveground Utilities:** Aboveground utilities, whether extending existing or installing new services, will only be allowed by Summit County when there is no practicable alternative. All aboveground utilities shall be located and installed so they do not cause unnecessary obstruction to pedestrian and vehicular traffic or damage to the utility itself that could be harmful to the general public. The minimum overhead clearance shall be 18 feet. No pole or structure above ground shall be placed within a pedestrian walkway nor set closer than ten (10) feet to the shoulder of any County road (see Section 5106.04). In no case will a pole be permitted within ten (10) feet of the travel lane shoulder of a County road, except light and traffic control poles with breakaway bases.

C. **Utilities in Major Floodways:** All utilities within or adjacent to major floodways shall comply with the Summit County Floodplain Regulations, and shall be located and installed in a manner that will prevent objectionable damage such as land erosion, water pollution or flood diversions.

5407.04: Trenching, Backfill and Reconstruction of Road or Recreational Pathway Surfaces

The method used in trenching for underground utilities and for backfilling trenches shall comply with the requirements of these regulations (Section 5203.05). Jetting of backfill is not permitted within County roadways or recpaths. Boring of the road surface and potholing of utility lines in the road surface will be allowed with prior approval of the Road and Bridge Director or his authorized representative. Upon completion of installation, the roadway or recpath shall be reconstructed using the specifications contained in these regulations for subbase preparation, base course materials, thickness and compaction and final surfacing so as to restore the roadway to current construction standards for that type of road or recpath.

A. **Gravel Roads:** Suitable material excavated from trenches may be used for backfill subject to approval of the

Road & Bridge Department. At no time shall contaminated, wet, soggy, frozen or other unsuitable material be used as backfill. If proper backfill is not available at the site, suitable material shall be imported and unsuitable material removed from the site.

B. **Paved Roads or Recreational Pathways:** All cuts made in asphalt or concrete surfacing shall be made by mechanically cutting a transverse vertical cut, and the width and length of pavement removed shall be one (1) foot wider than the edges of the trench or the excavated area. If the existing paved surface has defects, the Road and Bridge Director or their authorized representative has the right to determine if additional surface needs to be removed to provide a clean connection.
   1. All excavations made in paved streets or recpaths shall be completely restored within fifteen (15) calendar days including pavement markings. In the event weather conditions preclude restoration by permanent hot bituminous pavement, temporary repairs may be made by tamping and rolling into place cold mix asphalt. Such cold mix patches shall be removed and replaced by a permanent hot bituminous pavement within thirty (30) calendar days or as weather and availability of materials permit.
   2. The final pavement cut shall not be made until immediately prior to patching.
   3. Permanent hot mix patches shall be no less than four (4) inches in thickness or not less than the thickness of the pavement adjacent to the excavation, whichever is thicker.
   4. Permanent patches shall be installed in accordance with Section 5203.09 and with the following:
      a. When a utility patch is located within a single roadway lane, the existing asphalt shall be cut from centerline of the road, transversely to the outside edge of asphalt of the lane containing the utility patch, and replaced with Hot Mix Asphalt of the type specified in the approved plans and specifications.
      b. When a utility patch is located within two roadway lanes, the existing asphalt shall be cut transversely across the full width of the roadway, and replaced with Hot Mix Asphalt (HMA) of the type specified in the approved plans and specifications.
      c. Infrared pavement patching will be required for all pavement patches on recpaths and when the existing asphalt surface is less than three (3) years old.
      d. The surface of the finished pavement shall be free from depression exceeding three-sixteenths (3/16) inch in ten (10) feet as measured by a ten (10) foot straight edge measured in any direction or an automobile mounted recording profilometer.
   5. Damaged pavement shall be repaired by appropriate methods as determined and approved by the Road & Bridge Department.

5408: Inspection and Testing of Right-of-Way or Recreational Pathway Easement Work

A. Adequate inspections ensure compliance with County requirements and are the basis for release of maintenance responsibility and/or for release of any financial guarantee. It is the responsibility of the permittee to contact the Road & Bridge Department one (1) day in advance of required inspections. In-progress inspections of all elements of work will eliminate the need for extensive post-testing. At least one inspection at the conclusion of right-of-way or recpath easement work is required. In performing this inspection, the Road & Bridge Department shall check for compliance with these regulations and approved plans, and also for adequate cleanup of roadway surfaces and the right-of-way or recpath easement.

B. Any work or material which does not conform to these regulations, any pavement failures or broken asphalt, damaged signs or fencing, any remaining debris either in the roadway or adjacent property, any improper drainage, or revegetation to disturbed area, shall be brought to the attention of the permittee by the Road & Bridge Department. Any work in which untested or unaccepted materials are used may be ordered removed and replaced, and if removal and replacement is required it shall be done at the permittee's expense. If immediate corrections are not made, further project construction shall be stopped.

C. In determining whether or not right-of-way or recpath easement work done by the permittee complies with these regulations, the Road & Bridge Department may consult with the Road & Bridge Director or his authorized representative. If it is decided testing is required to ascertain compliance, the most recent standard methods of AASHTO or ASTM shall be used and conducted by an independent testing firm at the permittee's expense. If the permittee maintains his own testing equipment and qualified personnel, the requirement for an independent testing firm may be waived by the Road & Bridge Director or his authorized representative. Copies of test data shall be furnished to the Road & Bridge Department in a timely manner.

5409: Responsibility for Corrective Work Upon Completion of Right-of-Way or Recreational Pathway Easement Work

The permittee shall be fully responsible for the maintenance and correction of any damage or faulty construction. The roadway, or recpath, and roadside or recpath side areas where utility work has been performed, shall be thoroughly cleared of all debris and extraneous material and shall be restored to the satisfaction of the Road & Bridge Department. Failure to do so could be cause for denial of future right-of-way permits or call of the permittee's financial guarantee.

5410: Guarantee Period for Right-of-Way or Recreational Pathway Easement Work

The permittee shall be responsible for a period of two (2) years after completion of right-of-way or recpath easement work for any maintenance or repair necessary to keep the roadway or recpath in an acceptable condition. The County shall retain the permittee's financial guarantee for the guarantee period to insure any required corrective work is done. The permittee may apply in writing to the Road & Bridge Director or his authorized representative for release of a portion of his commitment, and such release may be granted with approval of the Road & Bridge Director or his authorized representative.

5411: Changes Affecting Utilities

Future changes to County roads or recpaths may require the relocation or removal of utility installations. For minor changes, the affected utility company shall complete the relocation or removal within 30 calendar days after notification by the Road & Bridge Department. For major utility relocation projects involving extensive design, securing of contracts or materials orders, the affected utility company shall complete the relocation or removal within 90 calendar days of approval from the Road & Bridge Department for the final design. To avoid the necessity for such changes, utility companies are encouraged to locate their facilities consistent with future plans for County roadways or recpaths.

5500: ROAD ACCEPTANCE AND MAINTENANCE

5501: Purpose and Intent

The purpose of this section is to outline the County's policy regarding County road maintenance, including responsibilities of property owners. When road maintenance is contemplated it shall include maintenance of all improvements that are appurtenant to the road being considered within the dedicated road right-of-way or easement. The major components of the maintenance program are snowplowing and sanding, crack sealing, asphalt patching, overlays and replacement, grading of gravel roads and maintenance of drainage ways. In order for maintenance to be done on an efficient basis, roads must be constructed to certain standards of geometric alignment, materials quality and construction quality as described in these regulations. Before the County can consider maintenance of any roadway not already accepted for maintenance, the petitioner must meet all requirements of Section 5503 to the satisfaction of the County Engineer, and a petition must be filed with the BOCC requesting County acceptance of the road for maintenance. A minimum of one (1) year shall elapse between the times the petition is reviewed and, if approved, probationary maintenance can begin. This period of time is due to the budget process time needed to ensure funds are available to maintain the road. This section outlines the acceptance procedure and the conditions that must be met for approval. Acceptance of maintenance of a County road is a quasi-legislative decision of the Board of County Commissioners.

5502: Maintenance Categories

The County categorizes roads based on the type of maintenance they receive. These categories are as follows:

5502.01: Full Maintenance

This category includes roads where the County has an interest of record or other claim to a road, right-of-way or recpath easement, the road or recpath meets County design and construction standards, the BOCC has accepted the right-of-way or recpath, and the road or recpath has passed any required probationary period if it has been accepted for maintenance (see Section 5502.02). It also includes roads which may or may not meet current County design and

construction standards, but which were dedicated to and accepted by the County for full maintenance before road standards were adopted or enforced. Full maintenance status assigns complete responsibility and discretion to the Road & Bridge Department for snowplowing, grading, resurfacing, ditch maintenance and repair as necessary. For snowplowing, priorities are assigned which reflect the use of the road and its relative importance to traffic flow.

5502.02: Probationary Maintenance

A. When roads are accepted for maintenance by the County, the BOCC may consider probationary maintenance for a two (2) year probationary period provided the roads meet the requirements outlined in Section 5503 et seq.
B. During this period, any repairs are the responsibility of the property owners or developer seeking final acceptance from the County. The procedures for converting a road from probationary to final acceptance are stated in Section 5506 et seq.

5502.03: Provisional Summer Maintenance

This category includes roads which do not meet current County standards with respect to widths, curves or grades, but which were dedicated to and accepted by the County prior to road standards being adopted or enforced. Such roads may receive limited summer maintenance, but no winter maintenance because snow removal equipment is unable to maneuver on them. This maintenance level is low priority and is dependent on the availability of funds, manpower and equipment.

5502.04: No Maintenance

This category includes any and all public or private roads that are not maintained by the County under any circumstances. Whenever a developer proposes private maintenance of roads within a development, it shall form a new organization of property owners, or annex the development to an existing organization, that will assume financial responsibility for road maintenance. The developer shall also require through covenants or deed restrictions that all property owners within the development join the property owners' organization and assume their share of its financial obligations. Where a new organization must be formed because no existing organization is in close proximity, the developer shall form a metropolitan district, special district, homeowners association or other appropriate organization approved by the County for this purpose.

5503: Assumption of Road Maintenance

When Summit County is petitioned to assume maintenance of a road or roads in the unincorporated portion of Summit County, as outlined in Sections 5504, 5505 and 5506, the following criteria must be considered for the Board of County Commissioners to accept probationary maintenance acting in a quasi-legislative capacity:

A. The road must be built to current County standards.
B. The revenues received and the costs incurred to maintain the road must be considered and found acceptable to the County.
C. The current and projected build out of the development and adjoining neighborhoods served by the road must be considered and found acceptable to the County.
D. The proposal must be consistent with the overall goals, objectives, and budgetary considerations of Summit County in providing safe and efficient maintenance to a majority of the citizens.
E. The road being considered should provide through access to other public roadways, subdivisions, state highways, or public destinations (e.g. trailheads).

The County shall review each road individually within a development to determine if that road should receive County maintenance.

5504: Acceptance Procedure for Roads and Recpaths Constructed by Developers and Proposed for Acceptance by the County

The County Subdivision Regulations require developers to construct roads necessary to serve approved subdivisions. The following procedure shall be used to determine whether the County will accept roads built by developers for

maintenance.

5504.01: Design Review

The developer must obtain approval for the road design from the Engineering Department prior to construction of any road regulated hereunder. The Engineering Department shall determine the road classification, compliance with design criteria and construction standards in these regulations, and adequacy of right-of-way or recpath easement prior to granting approval of the road design.

5504.02: Inspections

At appropriate milestones during construction of the road, the developer's engineer shall request inspection by the Road & Bridge Department and Engineering Department. In order for the road to be considered for probationary maintenance, inspections must occur at the completion of each of the following steps:

A. Rough grading.
B. Subgrade preparation.
C. Placement of road base.
D. Paving (if applicable).
E. Construction of drainage improvements (including culverts for driveways, if applicable).
F. Placement of signs (if applicable).

Failure to schedule any of these required inspections, and any other inspections determined necessary by the County Engineer, shall be grounds for a recommendation of denial for future maintenance requests per Section 5504.04 of this Code. A final inspection shall be conducted after the completion of all improvements. The final inspection shall occur between May and October. Roads must comply with the design criteria and construction standards in these regulations, and with any approved plans. If the inspection discloses any work, in whole or in part, as unsatisfactory, the Road & Bridge Director and/or the County Engineer, or an authorized representative, shall give the developer's engineer the necessary instructions for correction, and the contractor shall comply with and execute such instructions. At the discretion of the County Engineer, the County may withhold the granting of further building permits or any occupancy permits for the project until such time corrective work is completed.

5504.03: Filing Request for County Acceptance

Developers seeking County acceptance for maintenance of roads must submit a letter to the Road & Bridge Department and Engineering Department requesting the BOCC's approval.

5504.04: Staff Evaluation and Recommendation

The Road & Bridge Director or his authorized representative and County Engineer shall determine if the road meets the requirements of these regulations. A recommendation on whether or not probationary maintenance should be provided shall be forwarded to the BOCC as a New Business item at a regularly scheduled BOCC meeting. It is the County's policy to accept roads for maintenance only if they meet the requirements of these regulations and have received design approval and inspection during construction.

5504.05: Board of County Commissioners Action on Request for Acceptance

After the BOCC has received the recommendation from the County Engineer and the Road & Bridge Director, they shall take action by resolution to either grant or deny probationary maintenance of the road as a New Business item during a regularly scheduled BOCC meeting. Such resolution and the probationary acceptance shall expire no later than 30 months from the date of approval by the BOCC.

5504.06: Guarantee Period After Probationary Acceptance

If a road is given probationary acceptance by the BOCC, the developer is responsible for making repairs and correcting failures for a period of two (2) years from the date probationary acceptance is granted. During this two (2) year period,

the County will plow those sections of road necessary to serve units that have been built.

5504.07: Final Acceptance

No earlier than 20 months after the BOCC grants probationary acceptance, the developer may request re-inspection of the road. The County Engineer and the Road & Bridge Director or his authorized representative are responsible for re-inspecting and noting any defects or required repairs. The developer shall correct the defects or required repairs. After any defects have been cured and repairs made and 24 months have elapsed since probationary acceptance was granted, the developer may submit a letter to the Road & Bridge Department and the Engineering Department requesting final acceptance of the road. The staff shall make a final recommendation as to whether or not the road should receive full maintenance and forward the recommendation to the BOCC as a Consent Agenda item at a regularly scheduled BOCC meeting.

5505: Maintenance of Private Roads or Recpaths and Existing, Non-Maintained County Roads

Summit County will generally not consider maintenance of privately owned roads or recpaths, however, there may be circumstances where a substantial public benefit may exist to justify the County's consideration of maintenance of a privately owned road or recpath. Where it is deemed appropriate to consider maintenance of a privately owned road or recpath in existing subdivisions and developments, the following procedure shall be used for consideration by the County to accept these types of roads for maintenance.

5505.01: Filing Request for County Acceptance

The property owner holding title to a road, or a group of residents along a non-maintained road or roads, must submit a letter to the Road & Bridge Department and Engineering Department requesting that the BOCC accept maintenance responsibility for the road. The letter must be signed by all persons, or their authorized representatives, having an ownership interest in the road, which may include the governing board of a homeowners association if duly authorized by the covenants.

5505.02: Staff Evaluation and Recommendation

The County Engineer and the Road & Bridge Director or his authorized representative shall inspect the road to determine whether or not it meets the applicable County criteria and standards in these regulations as outlined in Chapter 5503. It is the County's policy to accept only those roads that meet these requirements. If a road does not meet County standards, the petitioning property owners are responsible for obtaining approval and all necessary permits from the Engineering Department to improve the road to County standards prior to requesting acceptance. One method for accomplishing road improvements is formation of a LID (see Section 5506). Staff will provide a recommendation as to whether or not a road is acceptable for probationary maintenance. This recommendation will be forwarded to the BOCC as a New Business item during a regularly scheduled BOCC meeting.

5505.03: Board of County Commissioners Action on Request for Acceptance

After the BOCC has received the recommendation from the County Engineer and the Road & Bridge Director concerning acceptance of roads for probationary maintenance, they shall take action by resolution to either grant or deny probationary acceptance of the road.

5505.04: Final Acceptance

After the two (2) year probationary period, staff shall make a final determination as to whether or not the road should receive full maintenance and forward the recommendation to the BOCC as a Consent Agenda item during a regularly scheduled BOCC meeting.

5506: Acceptance Procedure for Roads Constructed Through a Local Improvement District

One of the mechanisms available for upgrading existing private or public roads to County standards is the formation of a LID. Under a LID, the County obtains or assists in providing financing on behalf of the private owners to pay

for the improvements. Such improvements may include adjusting road grades, widths and alignment, improving drainage, adding road base and/or paving. The cost is assessed against the lot owners who benefit from the improvements.

5506.01: Design and Construction Standards for Local Improvement Districts

Roads constructed through a LID shall meet all County standards unless a specific variance is approved by both the Road & Bridge Director or his authorized representative and the County Engineer. Approved variances shall be documented by a resolution of the BOCC adopted at the same time as the district is formed.

5506.02: Construction Supervision for Local Improvement Districts

During construction, the Engineering Department shall be responsible for inspecting work done by the contractor, or shall hire a consultant for this purpose, to ensure the design and construction specifications are met. At the end of construction, the County Engineer and the Road & Bridge Director or his authorized representative shall conduct a walk-through of the project to ensure work has been completed as required.

5506.03: Staff Evaluation and Recommendation

The County Engineer and the Road & Bridge Director or his authorized representative will make a recommendation for acceptance of a completed LID road for full maintenance based upon the criteria set forth in Section 5503.

5506.04: Board of County Commissioners Action on Request for Acceptance

After the BOCC has received the recommendation from the County Engineer and the Road & Bridge Director, they shall take action to either grant or deny full maintenance of the road. The fact that the upgrading of the road was accomplished through a LID does not guarantee acceptance of such road for maintenance. In addition, acceptance shall only be considered if the property owners dedicate the necessary right-of-way or recpath easement to the County. If accepted, any approved variances shall be documented in the resolution of approval. Full maintenance means the County assumes ongoing responsibility for maintenance and plowing.

5507: Responsibilities for Road Maintenance

Private individuals, including property owners, developers, contractors and others have certain responsibilities in the maintenance of County roads, as discussed in the following Sections 5507.01-5507.04.

5507.01: Providing for Parking

Parking within County rights-of-way is illegal in Summit County per County Ordinance, except in areas where it is expressly permitted between May 1st and October 1st by County approved signs. Only licensed, operable motor vehicles, as defined in Section 3815.01 and Chapter 15 of this Code, may park on County rights-of-way where parking is permitted during the summer months. No vehicle may remain parked in the right-of-way for a period longer than 7 consecutive days without being relocated. Permanent storage of motor vehicles in the right-of-way is prohibited. Adequate through access must be maintained in the traveled way at all times. It is the responsibility of every property owner to provide the minimum required private property parking necessary to accommodate their permitted use(s). Parking shall be prohibited at all times within 50-feet of intersections, as defined in Section 5107.03 of this Code. On-street parking presents particular difficulties during snow plowing season and the Sheriff's Department may order illegally parked cars to be towed at their discretion and the discretion of the Road & Bridge Director or the County Engineer. In addition, a plow operator may, at his discretion, decline to plow all or portions of a road if one (1) or more cars are parked so as to impede plowing.

5507.02: Providing for Drainage

A. Culverts are required where driveways connect to roadways unless specifically exempted by the Road & Bridge Department and these regulations. It is the responsibility of the property owners to maintain their culverts free and clear of silt, mud, debris and ice at all times. Repair of damage to a road caused by a blocked culvert or lack

of a culvert is the responsibility of the property owner. If it becomes necessary for the County to undertake repairs, costs will be billed to the property owner by the Road & Bridge Department as may be authorized by law (see C.R.S. Section 43-5-303 et seq.).

B. Water that flows out of driveways must be diverted to ditches. Repair of damage to roadways caused by such water is similarly the responsibility of the owner and repair costs will be billed accordingly.

5507.03: Keeping Right-of-Way or Recreational Pathway Easement Clear

Storage of material in any road right-of-way or recpath easement is prohibited. Any material which is stored in the road right-of-way or recpath easement which impedes snow plowing or road maintenance, or which constitutes a hazard to the general public, will be removed by the Road & Bridge Department and the owner billed for the cost of the removal as authorized by Colorado Statutes (C.R.S. Section 43-5-301 et seq.). A 10-foot minimum clear zone shall be maintained at all times between the edge of the traveled way for any road and any fixed obstruction including but not limited to utility poles, retaining walls, boulders, or structures of any kind. No fixed obstructions shall be permitted in this minimum clear zone or additional areas as deemed necessary by the County Engineer or Road & Bridge Director.

5507.04: Repairing Damage

Whenever a property owner, developer, contractor or any other individual undertakes an activity that damages a County road or road right-of-way or recpath easement, they are responsible for restoring the road to at least its original condition. This requirement explicitly includes but is not limited to damage caused by construction activities adjacent to a County road. Ultimate responsibility for performing any required restoration lies with the owner of the property where construction is occurring.

5600: VARIANCES FROM DESIGN AND CONSTRUCTION STANDARDS

5601: Circumstances when a Variance may be considered

The County Engineer may, at his discretion, grant a variance from the design criteria and construction specifications contained in these regulations under the following circumstances:

A. Where, by reason of exceptional topographic or physical conditions or other extraordinary and exceptional situations or conditions, the strict application of these regulations would result in peculiar and exceptional practical difficulties to, or exceptional and undue hardship upon, an individual proposing to construct a road, bridge, recpath or driveway.
B. For the purpose of reducing environmental damage where an individual is proposing to construct any improvement governed by these regulations (or to which the standards contained herein would apply) and, in the opinion of the County Engineer, the strict application of these regulations would result in excessive cut and fill slopes, visual scarring or other environmental damage.
C. Additional flexibility from the design criteria and construction specifications of this Chapter may be granted for projects undergoing a rural land use process, as specified in Section 8420 et seq. The flexibility may be granted by the County Engineer consistent with the intent of limiting visual and environmental impacts potentially caused by road or recpath construction, provided safe access for motor and emergency vehicles is ensured.
D. Relief will not result in substantial detriment to public health, safety and welfare, substantial impairment of the road or recpath design and construction standards or the granting of any special privilege or use.

5602: Considerations for Decision on Variances

Variances requested under Section 5600 shall be submitted for review by the County Engineer. The following shall be considered in the decision regarding a request for a variance:

A. The effect of using a lesser standard on public health and safety including the ability of emergency vehicles to gain access using the road(s), bridge(s), recpath(s) or driveway(s) built to a lesser standard.
B. The existence of alternative design options that could accomplish the same objectives with less damage and/or less departure from the Code
C. The severity of the terrain crossed by the road alignment.

D. The availability of alternative alignments or designs where the same or more stringent standards could be met with the same or less environmental damage.
E. The length of road or recpath segments which will be built to a lesser standard.
F. The amount of snowfall anticipated and degree of exposure of the road or driveway surface to sun.
G. Comments from other agencies received during the referral period.

5700: ENFORCEMENT OF DESIGN AND CONSTRUCTION STANDARDS

5701: Enforcement when Subdividing Property

Applicants shall submit the required subdivision improvements agreement in accordance with the requirements set forth in the County's Subdivision Regulations contained in Chapter 8 of this Code.

TABLES and FIGURES

TABLE 5-1 Design Capacity for Classes of Roadways

Classification	ADT
Arterial	3500-5000
Collector	2000-3500
Local Access	500-2000
Low Volume	100-500
Primitive	Less Than 100

TABLE 5-2 Summary of Road Design Elements

Design Element	Arterial	Collector	Local Access	Low Volume	Primitive
Right-of-Way (min)	100’	80’	60’(4)	50’	40’
Recommended Design Speed (mph)	40-60	35-45	25-35	20-35	20-30
Number of Lanes	2-4	2	2	2	1-2
Min. Lane Width	12’	11’	10’	10’	10’/12’ (1)
Shoulders	6’	4’	2’	2’	As Approved
Bridge Width	Per CDOT Bridge Design Manual	32’	26’	24’	Same as Roadway
Design Capacity (adt)	5000	3500	2000	500	100

(1) For roads having one lane, lane must be 12’ wide; for roads having two lanes, each lane must be 10’ wide.
(2) See Section 5103.03(A)(2)(b) for exceptions.
(3) Back Country Roads shall be designed according to the standards, guidelines and procedures in Section 3514.03
(4) A 50-foot right-of-way may be considered if additional 10-foot snow storage, utility and maintenance easements are granted

TABLE 5-3 Minimum Structural Sections

Road Class	Gravel	Paved
Primitive	Natural surface	Not Applicable
Low Volume	3" Base Course	3"Asphalt 3"Base course
Local Access	4" Base Course	4"Asphalt 4"Base course
Collector	Not Applicable	5"Asphalt 6" Base Course
Arterial	Not Applicable	6" Asphalt 6" Base Course
Shared Use Path/Trail	Not Applicable	3"Asphalt 4"Base Course
• Full depth asphalt or concrete designs will be considered and may be used with approval of the County Engineer • Sub base may be substituted with road base with prior approval		

TABLE 5-4 Coefficient of Runoff

Type of Surface	Vegetation Density	Value of C= (Rainfall)
Roofs		.97
Pavements		
Concrete or Asphalt		.97
Gravel from clean and loose, to clayey and compact		.60
Earth Surfaces		
Sand from uniform grain size, no fines to well graded, some, clay or silt	Bare Light Vegetation Dense Vegetation	.60 .45 .35
Clay, from coarse sandy or silty, to pure colloidal clay	Bare Light Vegetation Dense Vegetation	.70 .50 .40

TABLE 5-5 Prescribed Manning's "n" Values

Channel Material	"n"	Max Velocity (feet/sec)
Lines or well established grass	.05	5
Bunched grasses with exposed soil	.04	3
Fine sand or silt	.02	1
All other bare soils	.03	2

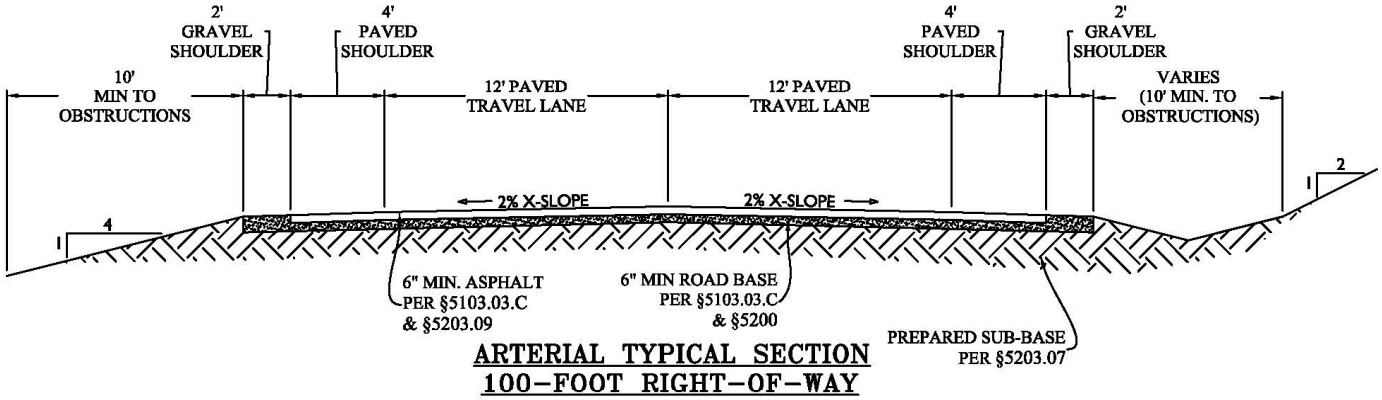
TABLE 5-6 Driveway Criteria

Type of Service	Minimum Driveway Width	Opening Width (including flares)		Minimum Centerline Radius of Curvature
		Minimum	Maximum	
COMMERCIAL	22 feet	24 feet	*	65 feet
RESIDENTIAL				
Single-Family				
< 200' in length	12 feet	18 feet	24 feet	N/A
> 200' in length	14 feet	18 feet	24 feet	40 feet
Serving two to four units				
< 200' in length	14 feet	20 feet	30 feet	N/A
> 200' in length	16 feet	20 feet	30 feet	40 feet
Multi-family	22 feet	24 feet	30 feet	65 feet

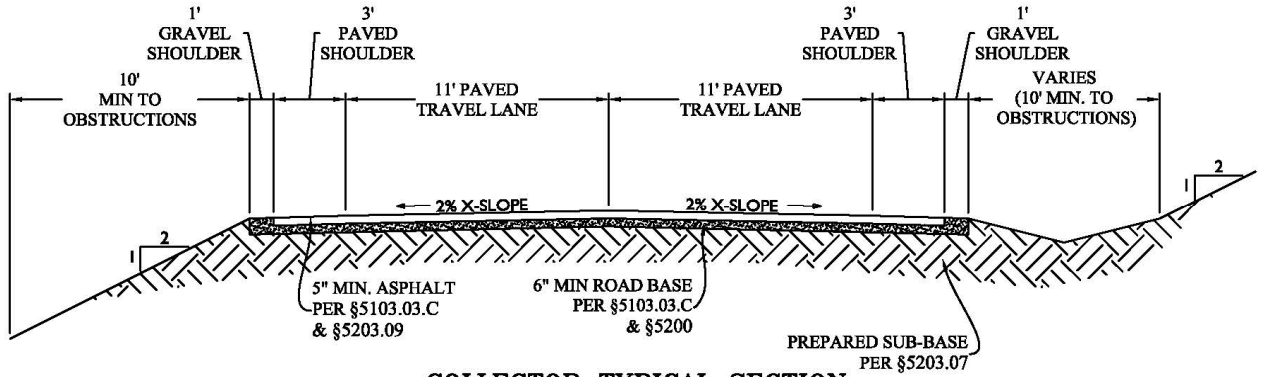
TURNOUT SPACING FOR DRIVEWAYS	
LENGTH	TURNOUTS (8' x 30')
< 400 feet	None
400 - 800 feet	One turnout at midway point of driveway
>800 feet	Every 400 feet
DRIVEWAY TURNAROUNDS FOR EMERGENCY EQUIPMENT	
LENGTH	TURNAROUNDS
RESIDENTIAL	
< 400 feet	None
> 400 feet	One to within 150 feet of dwelling unit
MULTI-FAMILY, INDUSTRIAL, COMERCIAL	One turnaround as specified in Figure 5-6 if the driveways dead end

*To be determined at time of site plan review.

FIGURE 5-1 Typical Cross-section of Arterial and Collector Roads

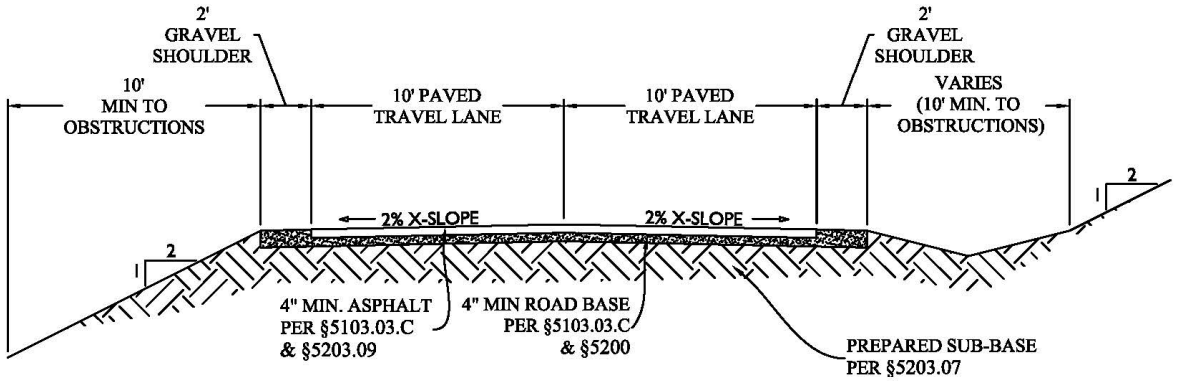


ARTERIAL TYPICAL SECTION
100–FOOT RIGHT–OF–WAY

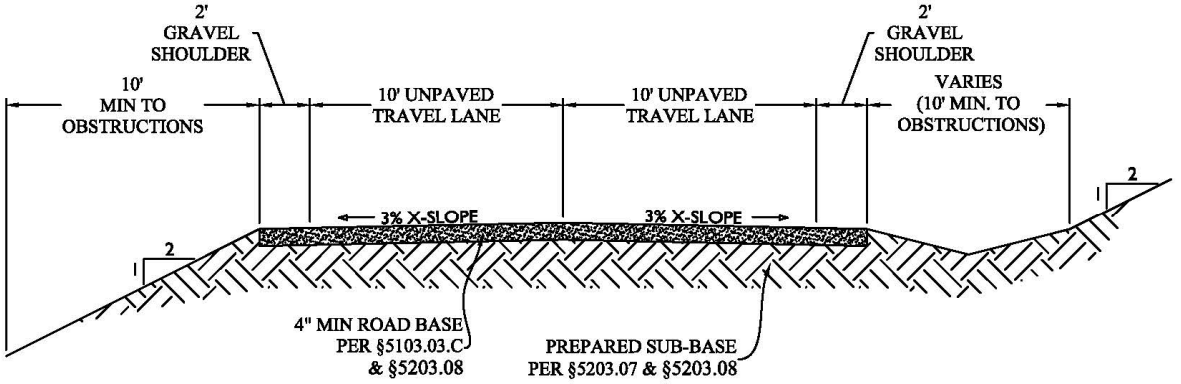


COLLECTOR TYPICAL SECTION
80–FOOT RIGHT–OF–WAY

FIGURE 5-2 Typical Cross-sections for Local Access Road

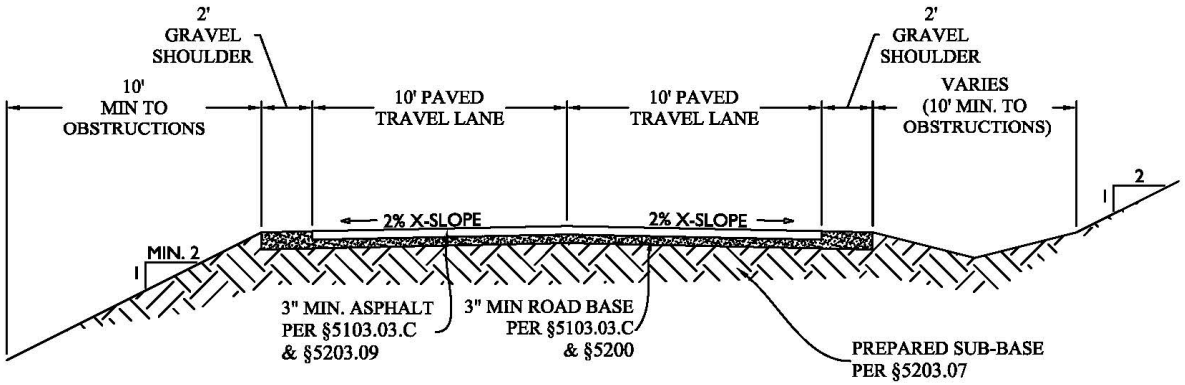


PAVED LOCAL ACCESS ROAD TYPICAL SECTION
60-FOOT RIGHT-OF-WAY

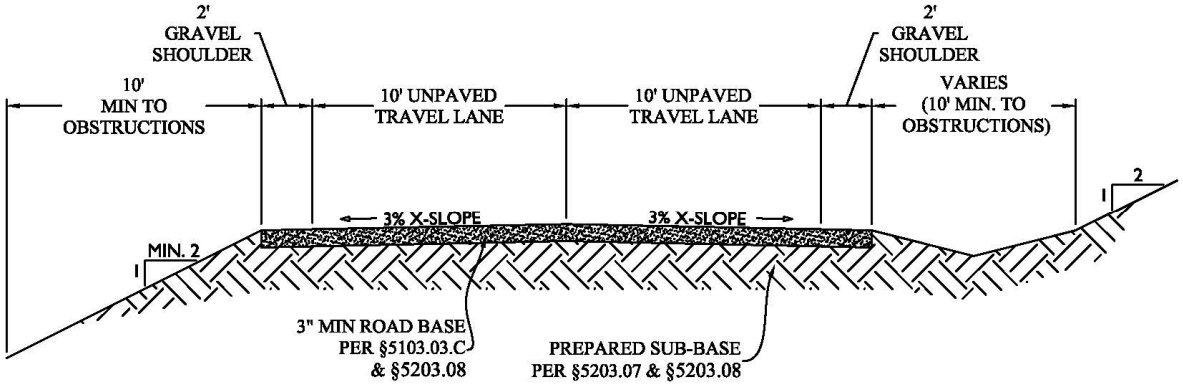


UNPAVED LOCAL ACCESS ROAD TYPICAL SECTION
60-FOOT RIGHT-OF-WAY

FIGURE 5-3 Typical Cross-sections for Low Volume Roads

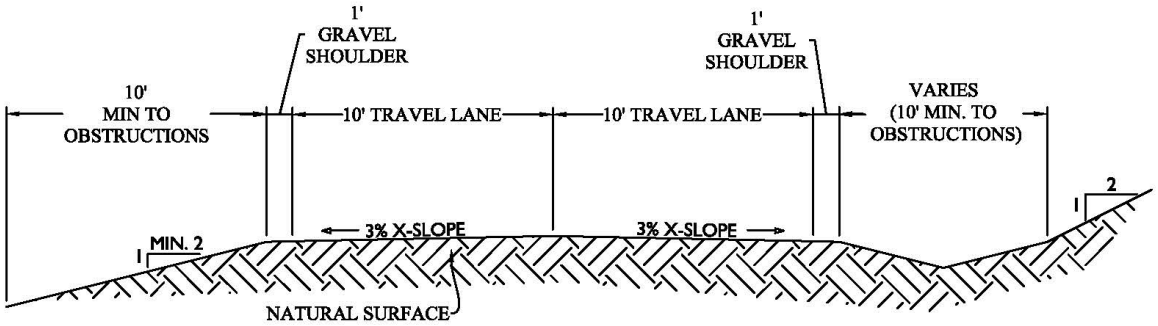


PAVED LOW VOLUME ROAD TYPICAL SECTION
50-FOOT RIGHT-OF-WAY

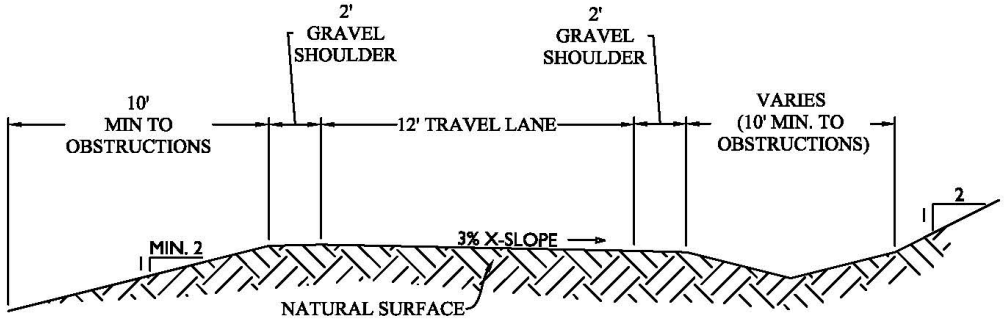


UNPAVED LOW VOLUME ROAD TYPICAL SECTION
50-FOOT RIGHT-OF-WAY

FIGURE 5-4 Typical Cross-sections for Primitive Road



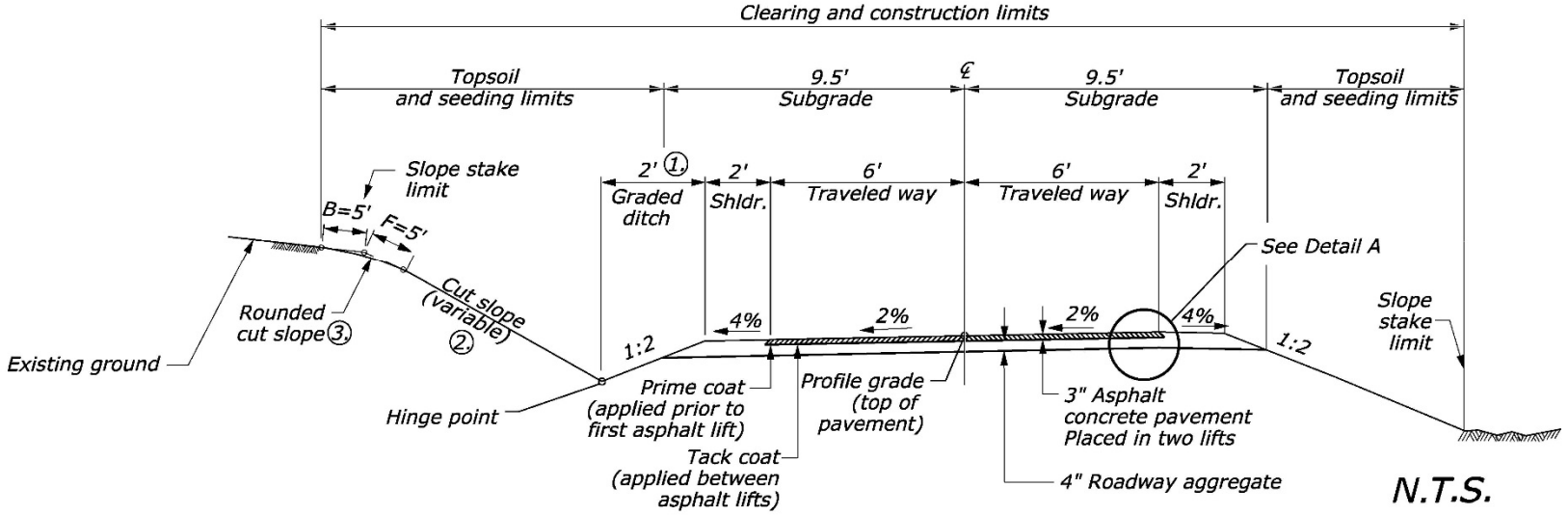
TWO–LANE PRIMITIVE ROAD TYPICAL SECTION
40–FOOT RIGHT–OF–WAY



ONE–LANE PRIMITIVE ROAD TYPICAL SECTION
40–FOOT RIGHT–OF–WAY

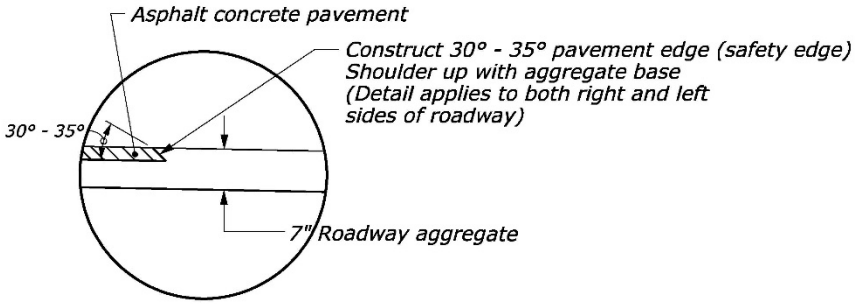
NOTES
1. TURNOUTS WITH MINIMUM DIMENSIONS OF 30-FEET LONG BY 8-FEET WIDE SHALL BE REQUIRED AT 400-FOOT INTERVALS ON NEW ONE-LANE PRIMITIVE ROADS
2. BACK-COUNTRY ROADS SHALL BE DESIGNED AS NEAR TO THE PRIMITIVE ROAD STANDARD AS IS REASONABLE, WITH EXCEPTIONS BEING ALLOWED TO MINIMIZE VISUAL AND EROSIVE IMPACTS CAUSED BY LARGE EARTH-MOVING REQUIREMENTS THAT THESE STANDARDS MAY IMPOSE

FIGURE 5-5 Typical Section of Recreational Pathway



NOTES:

1. THE MINIMUM TRAVELED WAY WIDTH ON THE SUMMIT COUNTY RECREATIONAL PATHWAY SYSTEM IS 10-FEET. 12-FOOT WIDE PATHS MAY BE REQUIRED WHERE THE SECTION IS CONSIDERED A PRIMARY ARTERIAL PATHWAY. MINIMUM SHOULDER WIDTHS SHALL BE 2-FEET, EXCEPT THAT WHERE POLES, WALLS, FENCES OR OTHER LATERAL OBSTRUCTIONS EXIST THE SHOULDER SHALL BE A MINIMUM OF 3-FEET WIDE.
2. CROSS-SLOPES ON RECREATIONAL PATHWAYS IN SUMMIT COUNTY SHALL BE A MINIMUM OF 2%, SLOPED TO THE DIRECTION OF LEAST EROSION POTENTIAL, UNLESS OTHERWISE SPECIFIED IN STAMPED ENGINEERED DRAWINGS THAT HAVE BEEN APPROVED BY THE COUNTY ENGINEER AND OPEN SPACE & TRAILS DEPARTMENT.
3. THE SHOULDER OF THE PATHWAY ON THE UPHILL SIDE OF THE CROSS-SLOPE SHALL BE SLOPED AWAY FROM THE PATH TO LIMIT RUN-ON AND EROSION OF SHOULDERS ACROSS THE PATHWAY.
4. A SOIL STERILANT IS REQUIRED BETWEEN THE AGGREGATE BASE COURSE SURFACE AND THE ASPHALTIC CONCRETE PAVEMENT TO PREVENT VEGETATION FROM GROWING THROUGH THE PAVED PATHWAY SURFACE.



DETAIL A

FIGURE 5-6 Hammerhead and Cul-de-Sac Typical Minimum Designs

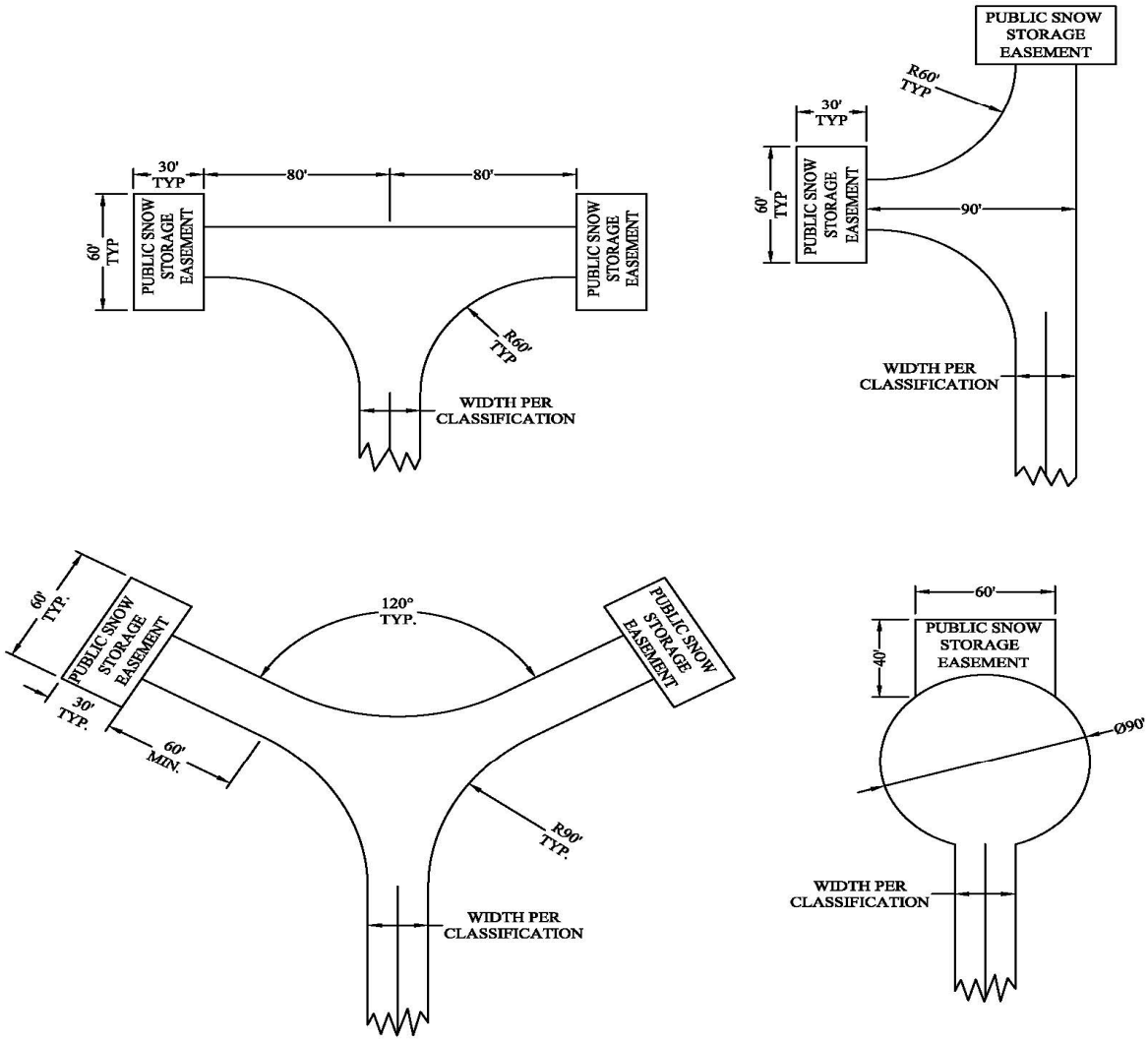
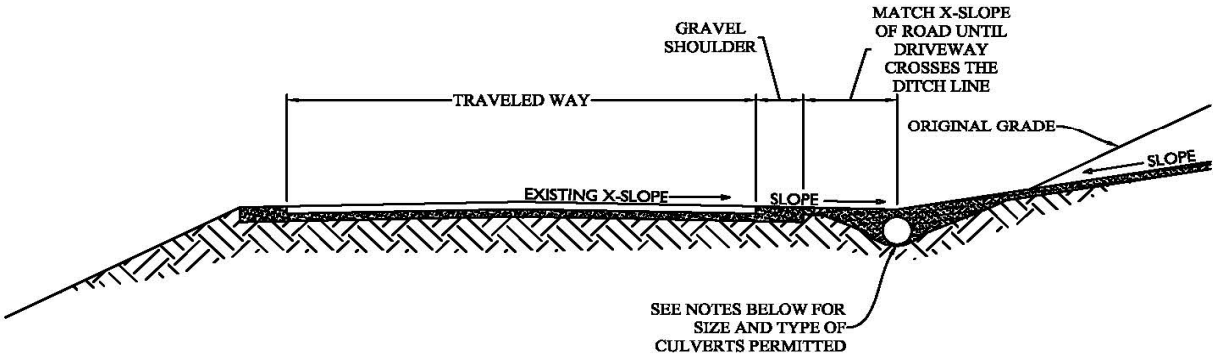


FIGURE 5-7 Typical Driveway Connection

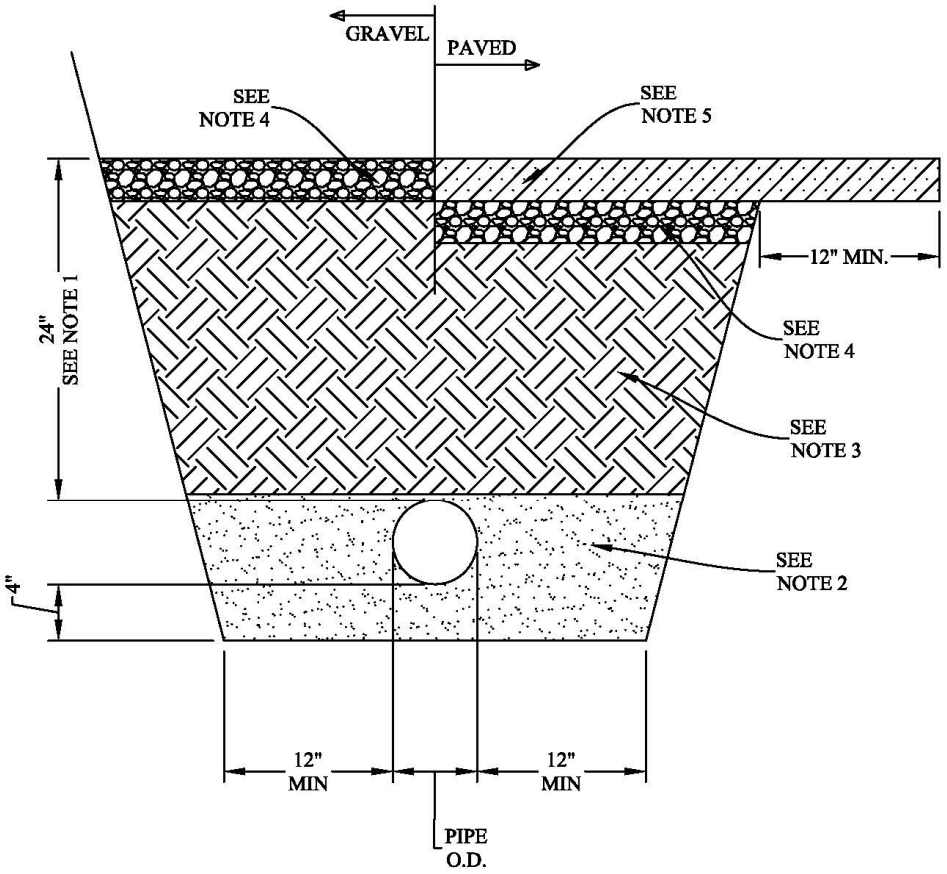


TYPICAL DRIVEWAY CONNECTION DETAIL
UPHILL CONNECTION TO ROAD

NOTES:

1. DRIVEWAYS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION 5107.03.
2. DRIVEWAYS FOR SINGLE-FAMILY RESIDENCES SHALL HAVE A MAXIMUM GRADE OF EIGHT PERCENT (8%) FOR THE FIRST 25-FEET FROM THE CONNECTION WITH THE COUNTY ROAD, AND SHALL NOT EXCEED TEN PERCENT (10%) AFTER THAT. ALL DRIVEWAYS SHALL MAINTAIN A GRADE EQUAL TO OR LESS THAN THE CROWN SLOPE OF THE ROAD FROM THE POINT WHERE THE DRIVEWAY MEETS THE ROAD TO WHERE THE DRIVEWAY CROSSES THE DITCH LINE.
3. WHERE A DRIVEWAY IS TO BE GRAVELED, THE SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 5203.09 AND SHALL CONSIST OF A MINIMUM FOUR (4) INCH DEPTH OF COMPACTED AGGREGATE BASE COURSE (ABC).
4. WHERE A DRIVEWAY IS TO BE PAVED, THE SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 5203.9 AND SHALL CONSIST OF A MINIMUM FOUR (4) INCH DEPTH OF COMPACTED AGGREGATE BASE COURSE (AB C) AND TWO (2) INCH MAT OF HOT MIX ASPHALT (HMA). WHERE ROADS ARE NOT PAVED, DRIVEWAY PAVEMENT SHALL NOT EXTEND INTO THE PUBLIC RIGHT-OF-WAY.
5. DRAINAGE FROM DRIVEWAYS SHALL BE DIVERTED TO ROADSIDE DITCHES OR OTHER APPROPRIATE DRAINAGE WAY(S). DRAINAGE FROM DRIVEWAYS SHALL NOT FLOW ONTO ROADS.
6. WHEN NECESSARY TO HANDLE ROADSIDE DRAINAGE, DRIVEWAYS SHALL USE CULVERTS, DRAINAGE PANS OR OTHER DEVICES SUITABLE FOR THE CONVEYANCE OF ROADSIDE DRAINAGE. FINAL APPROVAL FOR THE TYPES OF DRAINAGE ITEMS USED AND THE LOCATIONS OF SUCH ITEMS SHALL BE AT THE DISCRETION OF THE COUNTY ENGINEER OR HIS DELEGATE.
7. CULVERTS SHALL BE CORRUGATED METAL PIPES, OR OTHER MATERIAL TYPES APPROVED BY THE ROAD & BRIDGE DEPARTMENT. IN ADDITION, CULVERT DESIGN AND INSTALLATION SHALL BE IN COMPLIANCE WITH THE FOLLOWING:
    A. CULVERTS SHALL HAVE EITHER FLARED END SECTIONS OR SHALL HAVE ANNULAR ENDS.
    B. THERE SHALL BE A MINIMUM OF FOUR (4) INCHES OF ROAD-BASE COVER OVER CULVERTS SERVING DRIVEWAYS.
    C. CULVERT LENGTHS GREATER THAN 30 FEET ARE NOT ALLOWED.
    D. CULVERTS INSTALLED FOR DRIVEWAYS SHALL BE SIZED AND INSTALLED SUBJECT TO THE PROVISIONS OF THE REQUIRED RIGHT-OF-WAY PERMIT ISSUED FOR THE INSTALLATION, BUT IN ALL CASES THE MINIMUM DIAMETER FOR THESE CULVERTS SHALL BE 15-INCHES.
8. PROPERTY OWNERS SHALL BE RESPONSIBLE FOR KEEPING THEIR CULVERTS CLEAN AND ICE-FREE. THE ROAD & BRIDGE DEPARTMENT MAY REQUIRE OWNERS TO HEAT TAPE THEIR CULVERT TO ENSURE FLOW DURING THE WINTER MONTHS TO MINIMIZE THE POTENTIAL OF ICE FORMING ON ROADWAYS.

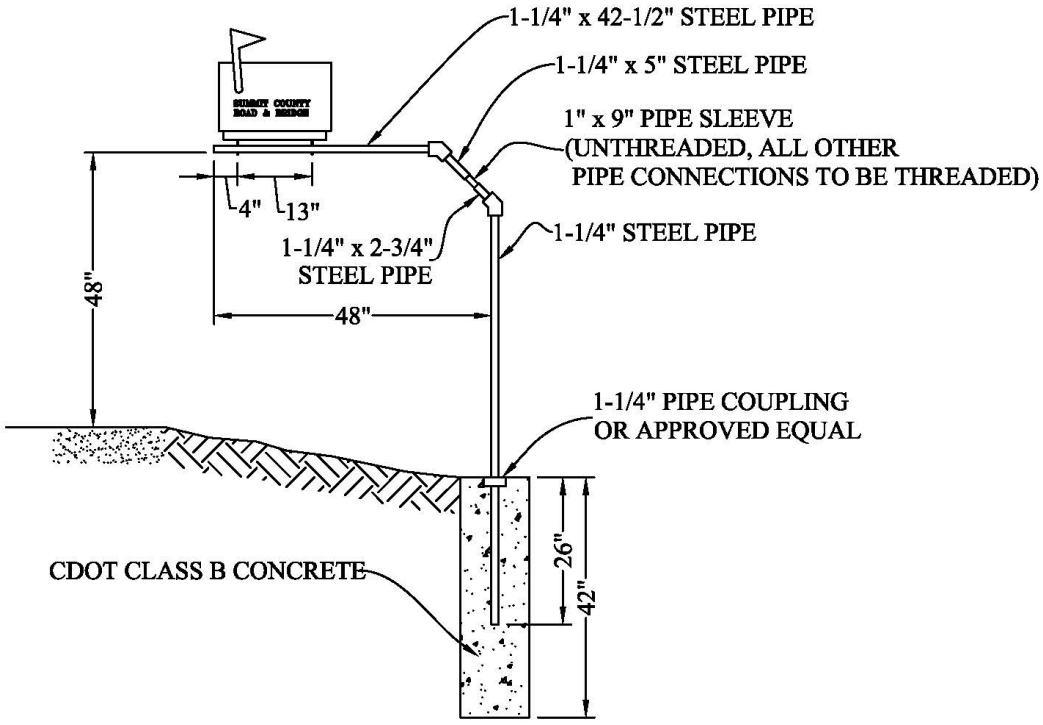
FIGURE 5-8 Minimum Requirements for Utility Trench Backfill



NOTES
1. 24" MIN. DEPTH TO UTILITIES PER COUNTY STANDARDS. OTHER CODES OR UTILITY SERVICE PROVIDERS MAY ESTABLISH A DEEPER REQUIREMENT.
2. BEDDING SHALL BE $\frac{3}{4}$" MAX Ø SCREENED ROCK.
3. APPROVED BACKFILL PER CODE AND/OR RIGHT-OF-WAY PERMIT COMPACTED TO 95% STANDARD PROCTOR AT OPTIMUM MOISTURE +/-2%.
4. CLASS VI ROAD BASE OR APPROVED ALTERNATE AT A THICKNESS PER THE STANDARDS IN THIS CODE FOR THE ROAD CLASSIFICATION.
5. ASPHALT SHALL BE INSTALLED PER THE STANDARDS IN THIS CODE FOR THE ROAD CLASSIFICATION AT A MINIMUM THICKNESS PER THAT CLASSIFICATION OR MATCHING THE EXISTING PAVEMENT THICKNESS, WHICHEVER IS GREATER.

FIGURE 5-9 Reserved

FIGURE 5-10 Sample Single Mailbox Approved Design



Appendix 5-1

Summit County Land Use and Development Code

Chapter 5: Road and Bridge Standards

SUMMIT COUNTY ADDRESSING, ROAD NAMING AND NUMBERING REGULATIONS

1. INTENT OF REGULATIONS

1.1. To establish an addressing, road naming and road numbering system for unincorporated Summit County which will improve the efficiency of locating a property by use of a street address.

1.2. To clarify the policies of the County regarding addressing new projects, re-addressing areas, naming new roads, numbering roads, naming or renaming existing roads, and road and address signage.

1.3. To establish and clarify the responsibilities of various County Departments in addressing, road naming, road numbering and road signage.

1.4. To establish addressing and road naming policies which can be applied to both the County and the towns, so that there can be more uniformity throughout the County, and improved cooperation between the County and the towns.

2. ROAD NAMING

2.1. Access routes proposed or constructed in unincorporated Summit County after the effective date of these regulations that are determined to be either arterials, collectors, local access, low volume, or primitive roads according to the Summit County Road and Bridge Standards must be identified with both a unique road name and road number.

2.1.1. Access routes proposed or constructed in unincorporated Summit County that are private access easements, or driveways (as defined in the Summit County Road and Bridge Standards) must be identified with both a unique road name and road number if the access route meets at least one of the following criteria:

- the access route is over 500 feet in length
- the access route provides access for 4 or more properties
- the access route is a frontage road along an existing highway

2.1.2. Exceptions to this rule include but are not limited to; Ski Area roads, Forest Service roads, Recreation paths, and other special cases that will be determined at the discretion of Summit County GIS department. For any of the above listed cases, the access routes must be identified uniquely with either a unique road name or road number.

2.1.3. The Board of County Commissioners are sensitive to the privacy of the access routes as described in section 2.1.2, therefore some exceptions will be allowed so that not all such routes will be required to be identified with a road name and number. The following criteria shall be used by the GIS Division staff to grant exceptions to section 2.1.2:

- the buildings and their addresses are plainly visible from the main road from which they would be addressed.
- identifying the access route does not improve the ability to locate the property.
- common access and parking shared by apartments or condominiums.

2.1.4. Once a road name is approved for a proposed road, that name must not be used for any other road in the County, even if the road is not constructed. Only the owner of the proposed road can relinquish the right to that name.

2.2. The County GIS Division is responsible for reviewing road names to ensure that the names are unique for new roads and for changing of existing road names in unincorporated Summit County. The County GIS Division will also review road names to ensure that the names are unique for roads in the towns that have agreed to this service through a cooperative agreement. It is not the County's intention to rename roads within the towns which relate to the layout of their town (e.g. First Avenue, Second Street, Main Street, etc.).

2.2.1. "Unique" means that there are no other roads in the County or towns with the same or a similar name.

- Names that sound similar are not considered unique (e.g. Beach and Peach, Bear Tree and Bearing Tree).
- Same names with a different suffix are not considered unique (e.g. Willow Road and Willow Lake Court, Lake Drive and Lake View Circle, Vail Court and Vail Circle). The County will permit exception to the same name with a different suffix when a court or cul-de-sac has the same name as the street from which it originates.

2.3. It is encouraged that the name of a new or renamed road in unincorporated Summit County have a historical, cultural, geographical, or natural significance to the area.

2.3.1. It will be encouraged that roads within a neighborhood be named using a consistent theme.

2.4. The County GIS Division will ensure that names are easily recognizable and easy to pronounce. Unique or uncommon spellings of words may not be used and will be denied so that there isn't confusion created that might delay emergency response. All Road and Project names must use mixed case as is required in the MUTCD signage standards. See also Section 4.1.

2.5. New roads or renamed roads in unincorporated Summit County will be given a suffix which indicated the type of thoroughfare (a thoroughfare designation). Refer to the United States Postal Service Publication 28 Appendix C for a list of acceptable abbreviations. The GIS Department is responsible for determining whether or not a suffix is appropriate in unincorporated Summit County. (Examples of inappropriate suffixes include; BAYOU, BEACH, HARBOR.)

2.6. Naming of roads that currently only have a County Road Number will only be considered when requested by emergency services or when there is one hundred percent agreement, by property owners taking access off of the road, on a name that has been approved by the County. If the road is County Maintained the County will replace the road sign with a new one. If the County does not maintain the road the sign will need to be replaced at the expense of the owners. See Section 4 for road identification sign specifications.

2.7. Renaming of roads will be considered if the road has a duplicated road name. Any other reason will be reviewed by the County GIS Department to determine whether there is necessity in the name change. It is intended that renaming a road will create greater ease in locating properties. Renaming of a road requires one hundred percent agreement amongst owners and approval by the Summit County GIS Department. Emergency Services may require a road name change, without one hundred percent agreement, in the case that in not doing so would put at risk the health and safety of the public.

3. ROAD NUMBERING

3.1 All new roads in unincorporated Summit County will be given a County road number. The County GIS Division is responsible for assigning County road numbers. Certain exceptions may be granted as described in section 2.1.2.

3.2 The road number assigned should indicate a general location or use of that road. Only numbers shall be used in County Road Numbers. Letters and special characters shall not be permitted as part of the County Road Number (Not Permitted: No 525A or 525.5 or 525-5). A map has been created designating appropriate County Road Number Ranches for different geographical regions of the County, see Appendix A.

3.3 The County GIS Division will have the authority to expand the road number guidelines should the need arise.

4. ROAD IDENTIFICATION SIGNS

4.1. Road identification signs will be posted on all public and private roads in unincorporated Summit County that have been identified with a name and number. The developer will be responsible for posting road signs for newly developed roads. The Summit County Road and Bridge department will replace damaged signs for roads that have been accepted by the County as a County Maintained Road. All other signs identifying roads not maintained by the County shall be maintained and replaced by the private landowner or Homeowners Association. All signs must meet the standards found in the Manual on Uniform Traffic Control Devices. All road signs must be made of noncombustible materials. When older non-complying signs need to be replaced, they must be replaced with signs that meet the above specifications.

5. ADDRESSING

5.1. All buildings in unincorporated Summit County will be addressed based on the Milepost System (also known as Century System). The Milepost System addresses indicate distances along a road and also distances between properties along a road. Distances are indicated in increments of one-thousandth of a mile. Under this system a frontage interval is 5.28 feet.

5.1.1. The County GIS Division has sole responsibility for assigning addresses in unincorporated Summit County.

5.1.2. Currently Wildernest area subdivisions are an exception to this policy. This area has been addressed by Wildernest Real Estate since the beginning of that development. Wildernest Real Estate maintained the responsibility for assigning addresses in the Wildernest area up until December 31, 1990. At that date the County GIS Department took over sole responsibility for assigning addresses in the Wildernest area. Re-addressing this area, using the County system, will occur upon request by owners or emergency service personnel.

5.1.3. In certain situations the County may collaborate with the towns in addressing properties that are within unincorporated Summit County, but are completely surrounded by a town.

5.1.4. A town may also request that the County take responsibility for addressing the town or just portions of the town. The County will assume such responsibility only if the town agrees to have the area addressed based on the milepost system, and agree to the Summit County Addressing, Road Naming, and Numbering Regulations.

5.2. All new buildings must display address characters which identify the property address and are plainly visible and legible from the street or road fronting the property. Address characters must be at least five inches in height and affixed to the side of the building facing the street on which the property is addressed. For building located more than 150 feet from the shoulder or curb of the street, address characters must be affixed to a sign or post located adjacent to the street on which the property is addressed. This sign or post must be at least six feet above the ground and shall be located at the point of access 25 feet or less from the shoulder or curve of the street and must have address characters at least five inches in height. All address characters must be of a color and/or material that contrasts with the background on which they are mounted.

5.2.1. Alternate building address signage may be approved by the building official when such signage is plainly visible and legible.

5.2.2. Failure to display the address on new buildings will be grounds for withholding issuance of a Certificate of Occupancy. The Building Department will be responsible for enforcing this policy.

5.3. Properties must be addressed in a logical and consistent manner. Most of the County has already been addressed, but certain areas were not addressed in a logical or consistent manner. The GIS Division shall create procedures to change addresses in areas that have addressing problems. The areas with addressing problems will be inventoried and prioritized for potential change. These are the following types of problems that will be reviewed by the GIS Division:

- Addresses which are not sequential.
- Addresses which were not derived from the road that provides vehicular access or from the road that has visual front door access to the property. (Examples: Corner lots and lots that have roads on both the front and rear of the lot.)
- Address numbers which were not assigned according to the regulations designated in section 6 of these regulations.

6. ASSIGNING ADDRESS NUMBERS

6.1. As numbers progress sequentially on a road, even numbers must always be on the right hand side and odd numbers must always be on the left hand side of the road. The even and odd sides of a road must be maintained throughout the entire length of road regardless of whether the road extends in a different direction that is original direction. In areas in which the even numbering and odd numbering has been previously assigned contrary to these regulations, the parity must remain consistent with what was previously assigned.

6.2. For measurement purposes the beginning of a road will be at the center of the intersection where the road begins. The distance along a road will be measured from the beginning of the road, proceeding along the centerline of the road, to the point of perpendicular to the location that needs the address. The perpendicular point will vary depending on the type of development:
Single family lots will be measured to a point perpendicular to the center of the driveway based on the information that is available at the time when the address is being assigned.

Other developments will be measured to a point perpendicular to the center of the driveway access based on the information that is available at the time when the address is being assigned. If there are multiple accesses, the measurement will be to the center of the building or unit. (i.e. Strip Malls, multifamily units, townhomes, duplexes…)

6.2.1. Measurements can be made by either measuring from the beginning of the road, as described in 6.2, or by measuring from the previous address on the road.

6.2.2. Circle streets will be addressed as if they have only one point of beginning. That point of beginning will be the entrance which is first encountered in the typical flow of traffic. If there is no apparent point of beginning for the road, the addresses will be assigned so that they proceed in a clockwise direction.

6.2.3. Addresses for corner lots may be addressed from either the access location or the front entrance of the structure. If the front entrance is not visible or obvious, the address must be assigned from the street that the structure takes access.

6.2.4. When the front lot line of a lot is on a road and the rear lot line is on an alley the lot shall be addressed off of the road, not the alley. Addressing lots from an alley should only occur if the alley is the only vehicular access to the lot.

6.3. The following are specifications for addressing certain types of developments:

Properties with No Shared/Common Elements or Land between Owners:
(Includes Single Family Homes, Duplexes, Triplexes, Fourplexes, etc.)
A separate address shall be assigned to each dwelling unit.

Properties that have Shared/Common Elements or Land between Owners:
(Includes Condominiums)
Each Building/Structure in a complex must have its own address. If there are multiple units in the structure there will be an address assigned to the building/structure and a unit designator.
-or-
The entire complex may have a common physical address but each building in the complex must have a unique identifier. (i.e. 500 Granite Street Bldg A, 500 Granite Street Bldg B…etc) If there are multiple entrances to the complex, and the entrances come off of two different roads the entire complex may not be able to have one physical address. If there are shared common elements for the development, each element will receive its own unique address.

Caretaker Units/Secondary Units/Accessory Apartments: If the unit has a separate entrance or is a separate building from the primary residence the unit must have a separate numeric address from the primary residence. If the Caretaker Unit/Secondary Unit requires its own power hookup, a second address is required. If either the Accessory Apartment or Caretaker unit/Secondary Unit is part of a primary structure, it will maintain the address of the primary structure plus "Unit A", "Unit B", and so on.

Mobile home parks/subdivisions: One address shall be given for the entire development. Individual mobile homes must use both the address for the development and the space number. In the case that the roads within a Mobile home park/subdivision receive names, the space number shall be used as the numeric address instead of one common address for the Mobile home park/subdivision.

Commercial areas, indoor: Separate addresses must be given for each building. Units within a building must use both the building address and the unit or space number.

Commercial areas, outdoor: If each unit in the commercial area has a separate outdoor entrance, the building will receive a single address number and each unit will be given a separate unit number/letter

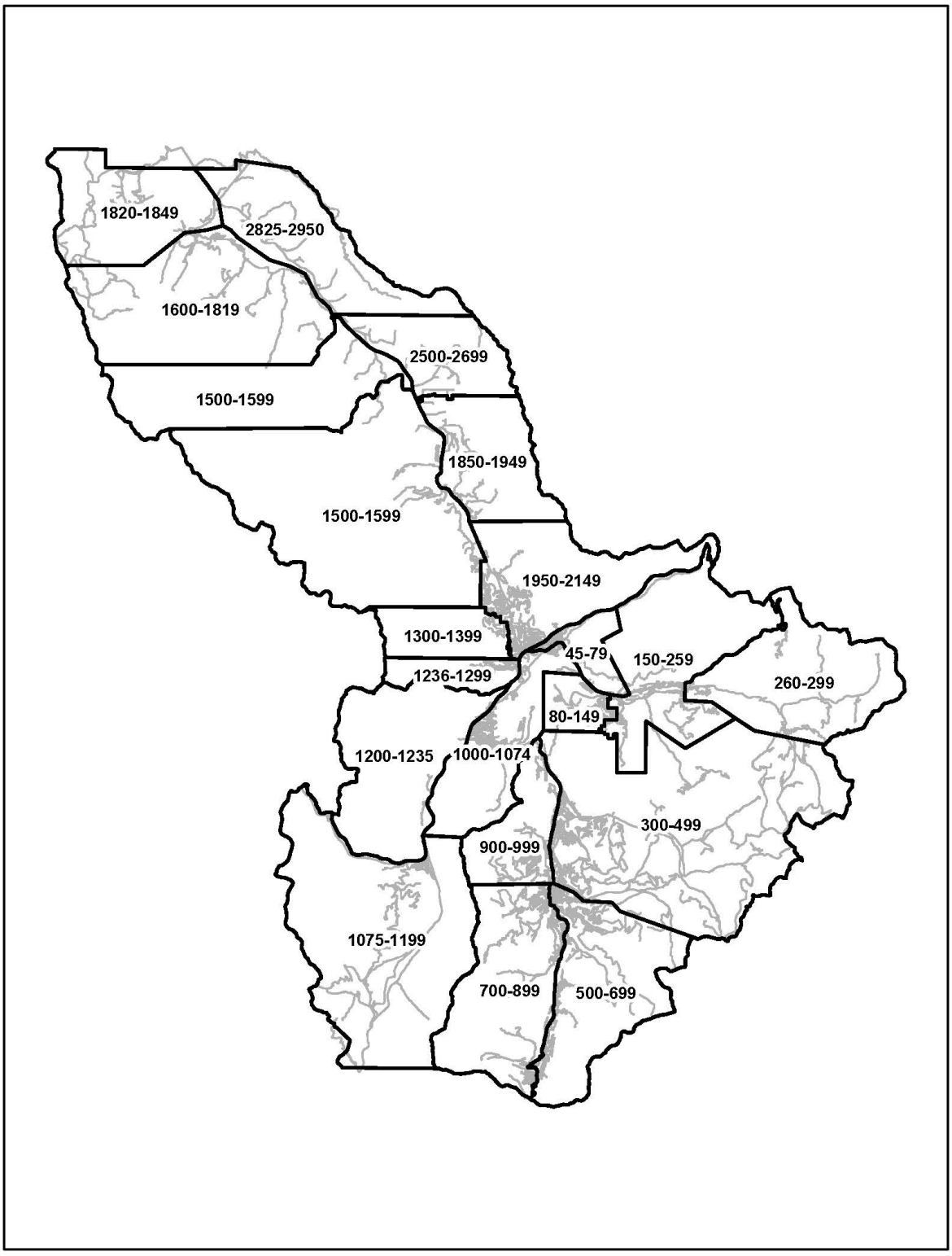
designator address. Or, each separate entrance for the building may receive its own individual address, but in this case a unique address number must also be assigned for the whole building.

7. IMPLEMENTING THESE REGULATIONS

7.1. These policies will be implemented on new projects immediately upon adoption.

8. AUTHORITY

8.1. These regulations are adopted pursuant to Colorado Revised Statutes 30-28-111 to 30-28-116 and 30-28-124.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