

MONTROSE COUNTY

STANDARDS

AND

SPECIFICATIONS

FOR

ROADS AND BRIDGES

Adopted by the Board of County Commissioners
Montrose County, Colorado

April 18, 2005

Revision No. 1 – August 21, 2006

\$10.00



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Resolution No. 114-2006

**RESOLUTION
OF
THE MONTROSE COUNTY
BOARD OF COUNTY COMMISSIONERS
TO
ADOPT CHANGE NO. 1 TO THE
MONTROSE COUNTY STANDARDS AND SPECIFICATIONS
FOR ROADS AND BRIDGES**

WHEREAS, the Board of County Commissioners for Montrose, County Colorado found that it was necessary that the County adopt uniform minimum standards and specifications for planning, design and construction of new roads and bridges and the improvement of existing roads and bridges in Montrose County; and

WHEREAS, such standards were adopted by Resolution No. 31-2005 on April 18, 2005 to provide for a minimum acceptable level of performance and to provide for compliance with applicable federal, state and county resolutions for roads and bridges in Montrose County; and

WHEREAS, the Montrose County Engineer has found it necessary to clarify, amend or change some of the minimum standards and specifications contained in the current Montrose County Standards and Specification for Roads and Bridges; and

WHEREAS, after review by the Land Use Department and Legal Department staff as well as consultation with and review by local engineering professionals, utility companies and contractors, a copy of these changes have been incorporated into the Montrose County Standards and Specifications for Roads and Bridges and attached to this resolution; and

WHEREAS, the Board finds that the Montrose County Standards and Specifications for Roads and Bridges, to include Change 1, will serve to protect the public health safety and welfare.

NOW, THEREFORE, the Board of County Commissioners for Montrose County, Colorado resolves as follows:

1. That the Board hereby adopts Change No. 1 dated August 21, 2006 to the Montrose County Standards and Specifications for Roads and Bridges dated April 18, 2005, a copy of which has been incorporated into the original document and attached to this Resolution and, as set forth therein, such Standards and Specifications shall apply to all roads and bridges subject to County jurisdiction that are improved or constructed in Montrose County.



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2. That any inconsistent provisions of prior Board Resolutions adopting other road and bridge standards are hereby repealed and shall be replaced with the Montrose County Standards and Specifications for Roads and Bridges to include Change No. 1 that are adopted by and attached to this Resolution.
3. That such changes to the Montrose County Standards and Specifications for Roads and Bridges shall take effect immediately upon passage of this Resolution.
4. That such changes to the Montrose County Standards and Specifications for Roads and Bridges are necessary to protect the public health, safety and welfare.

Adopted this 21st day of August 2006.

BOARD OF COUNTY COMMISSIONERS:

Willie N. Patte
Bill Patterson, Chairman

Allan J. Belt
Allan J. Belt, Commissioner

Absent
David A. Ubell, Commissioner



ATTEST:

By: Francine Tipton-Long
Francine Tipton-Long
Deputy Clerk and Recorder

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Article I. GENERAL PROVISIONS

Section 1.01 Title

This document may be cited as the Montrose County Standards and Specifications for Roads and Bridges or Road and Bridge Regulations.

Section 1.02 Purpose and Intent

The general purpose of this document is to provide for the uniform planning, design and construction of new roadways and related facilities, and improvements to existing roadways and related facilities, and further, to provide for the administration of the Montrose County Road System in a manner consistent with applicable federal, state and local statutes, ordinances and regulations. The intent of this document is to provide for a minimum acceptable level of performance to be protective of the public health, safety and welfare and for compliance with pertinent Federal, State and County regulations.

Section 1.03 Level of Performance

This document defines minimum standards for planning, design and construction for roads and bridges in the County. If and only if it can be shown to the satisfaction of the Engineer that an alternate plan, design or construction will provide an outcome equal to or better than the required design, material, or procedure, then such alternate may be approved by the Board. Plans and specifications shall be submitted to the Engineer for review and approval. Such alternate plans and specifications shall be prepared, signed, sealed and dated by a Registered Professional Engineer.

Section 1.04 Scope and Application

This document applies to all roads and bridges which are subject to County jurisdiction, and applies to construction of new roads and bridges, and improvements to existing roads and bridges. Single Family Residential driveways and agricultural roads are exempt from this document except that the former require driveway access permits as set forth herein. Access roads serving large tract projects in which lot sizes are thirty-five (35) acres or more shall conform to the minimum standards established in this document in order to be protective of the public health, safety and welfare and specifically to provide adequate access for emergency services. Section 30-28-110(3) et.seq., C.R.S. Such roads shall be reviewed and approved by the Board of County Commissioners prior to recording.

Section 1.05 Authority

Montrose County is authorized by state statute to plan, design, construct and administer road facilities by virtue of Sections 43-2-201, 43-2-114 et. seq. (highways); 30-28-11 (zoning plans) and 30-28-133 (subdivision regulations) of the Colorado Revised Statutes (C.R.S.), as amended.

Section 1.06 Amendments

These Regulations may be amended by Resolution of the Board at any regularly scheduled Board Meeting.

Section 1.07 Meanings of “Shall”, “Should” and “May”

The language set forth in the text of these Regulations shall be interpreted in accordance with the following rules of construction:

SHALL:

A mandatory condition. Where certain requirements are described with the “shall” stipulation, it is mandatory that these requirements be met.

SHOULD:

An advisory condition. Where the word “should” is used, it is considered to be advisable usage, recommended but not mandatory.

MAY:

A permissive condition. No requirement for any part of any article is intended.

Section 1.08 Severability

If any section, clause, provision, or portion of this document should be found to be unconstitutional or otherwise invalid by a court of competent jurisdiction, the remainder of these Regulations will not be affected thereby and is hereby declared to be necessary for the purposes set forth in Section 1.02 of this document. Nor will such a finding affect the validity of any permit previously issued, financial security previously accepted, or action previously taken by the County, except as specifically adjudicated by the court.

Section 1.09 Appeal

Any person, applicant and/or permittee aggrieved by a decision of the Engineer made pursuant to the provisions of these Regulations may appeal such decision in writing within ten (10) days of said decision, to the Board of County Commissioners. The written decision of the Board shall be deemed final action for purposes of initiating court action.

Section 1.10 Liability of County

These Regulations shall not be construed as imposing upon the County or any official or employee of the County any liability or responsibility for damages to any person injured or property damaged by reason of the performance of any work within the public way, or under a permit issued pursuant to these Regulations. Neither shall the County or any official or employee thereof be deemed to have assumed any such liability or responsibility by reasons of random inspections discussed here under, the issuance of any permit, or the approval or disapproval of any work.

These Regulations shall not be construed as imposing upon the County or any official or employee of the county, any liability or responsibility for damages to persons or property resulting from any inspection herein provided or resulting from any failure to so inspect; or resulting from the issuance, suspension, or denial of a permit authorized hereunder; or resulting from the approval or disapproval of any work under these Regulations or a permit issued in accordance therewith; or resulting from the institution of court action as hereinabove set forth or the forbearance by the Board to so proceed.

Any County official, employee, or agent charged with the administration, supervision and enforcement of these Regulations, acting in good faith and without malice on behalf of said County in the discharge of his official duties, shall not thereby render himself personally liable for any damages which may accrue to

persons or property resulting from any such act or omission committed in the discharge of such duties. Any suite or proceeding instituted against such official or employee, stemming from any act or omission performed by him in the enforcement or attempted enforcement of any provision of these Regulations shall be defended by the legal officers of the County until final termination of the proceedings.

Article II. ABBREVIATIONS AND DEFINITIONS

Section 2.01 Abbreviations

AASHTO:	American Association of State Highway and Transportation Officials.
ACI:	American Concrete Institute
ADA:	Americans with Disabilities Act
ADT:	Average Daily Traffic
ASTM:	American Society for Testing and Materials
CDOT:	Colorado Department of Transportation
CSP:	Corrugated Steel Pipe
FHWA:	Federal Highway Administration
HMA:	Hot Mix Asphalt
HUTF:	Highway Users Tax Fund
ITE:	Institute of Transportation Engineers
MUTCD:	Manual on Uniform Traffic Control Devices
NRCS:	Natural Resources Conservation Service (a.k.a. SCS)
SCS:	Soil Conservation Service

Section 2.02 Definitions

The following words and terms, wherever they occur in these Regulations shall be construed as herein defined. Words and terms that occur in these Regulations, but that are not defined herein shall be construed as defined in Webster's New Collegiate Dictionary published by Merriam-Webster, Eleventh Edition.

ACCESS PERMIT –

A permit issued by the County, authorizing the connection of a road, street or driveway to an existing County road.

AGRICULTURAL ROAD –

Any road whose primary use is to serve an agricultural operation and is not a public road.

ARTERIAL ROAD –

A primary roadway for which the principal objective is moving goods and services and the collection of traffic from or providing access to lower classified roadways in Montrose County. Major arterials are the principal State Highways and minor arterials are the principal County roads (i.e., LaSalle Rd, Chipeta Rd., etc). These roads typically carry the highest traffic volumes.

AVERAGE DAILY TRAFFIC –

The average number of vehicles using a given street/road in a 24 hr. period calculated as the total number of vehicles during a defined period, divided by the number of days in that period. Normally the period is one (1) week (seven (7) consecutive days). The term is commonly abbreviated as ADT.

AXLE LOAD –

The total load transmitted by all wheels on a single axle extending across the full width of the vehicle. Tandem axles forty inches (40”) or less apart shall be considered as a single axle.

BACKFILL –

Material used to replace, or the act of replacing, material removed during construction; also may denote material placed, or the act of placing, material adjacent to structures.

BARRIER –

Any thing or device which can restrain or obstruct the movement of vehicles.

BASE COURSE –

A layer of specified gravel or crushed stone of designated thickness placed on a subbase or a subgrade to support the surface course.

BOARD –

The Board of County Commissioners of Montrose County.

BRIDGE –

A structure, including supports, erected over a depression or an obstruction, such as water, highway or railway and having a track or passageway for carrying traffic or other moving loads, and having an overall clear span greater than ten feet (10’).

CBR – THE CALIFORNIA BEARING RATIO (AASHTO T 193) –

A test to determine the bearing capacity of soils and aggregates when a representative sample is compacted in the laboratory at optimum moisture content to varying degrees of density.

CERTIFIED –

To present in formal communication and attest as being true and/or as represented and/or as meeting a standard.

CHANNELIZATION/CHANNELIZED –

The separation or regulation of conflicting traffic movements into definite paths of travel by use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movement of traffic, both vehicular and pedestrian.

CITY STREET –

Roads that are within the boundaries of an incorporated municipality that are dedicated to the public and that are maintained by that municipality.

COLLECTOR ROAD –

Regional road that provides access to and collects traffic from other roads of lower functional class. Efficient movement of traffic is important and private access should be limited whenever practical. To maintain functional integrity, access control is utilized wherever practical, and on street parking is discouraged.

COMMERCIAL DRIVEWAY –

A private access (to a public road) serving commercial enterprise(s), which shall be designed and constructed to safely serve the type and volume of traffic the business(es) will generate.

COMMON SHARE RESIDENTIAL ACCESS –

An authorized private access to a public road for which reciprocal easements establish a mutual right of use between independent landowners.

CONSISTENT –

Free from variation or contradiction.

COUNTY –

Montrose County.

COUNTY ROAD –

For the purposes of these Regulations, a County road is a public road which has been deeded to or dedicated to and accepted by the County or a road which the county identifies as a County road by inclusion in the County Road System, either as a primary or secondary road (Section 43-2-108 et seq., C.R.S.). NOTE: Pursuant to Section 43-4-201 et seq., C.R.S., those roads included on the Highway Users Tax Fund (HUTF) and listed as funded roads are on the Primary Road System. Those roads included on the HUTF and listed as unfunded are on the Secondary Road System.

CROSS SLOPE –

The slope of a road perpendicular to the direction of travel, used to facilitate surface drainage.

CUL-DE-SAC –

A local road open at one end only, and with special provisions for turning around.

CULVERT –

A drainage structure beneath a roadway.

DEDICATION –

A grant by the Owner to the public through a public agency for a right to use land which involves a transfer of property rights and an acceptance of the dedicated property by the appropriate public agency.

DELINEATORS –

Devices used to define the roadway, and used as an aid to alert drivers of hazardous conditions.

DEPARTMENT –

The Montrose County Road and Bridge Department.

DESIGN PERIOD –

The length of time during which a road or structure is intended to accommodate anticipated traffic under prevailing conditions without major repair. Local roads in Montrose County shall be designed with a service life of at least twenty (20) years. Collector and arterial roads shall be designed for a service life of twenty-five (25) to thirty (30) years. Bridges shall be designed for a service life of at least fifty (50) years.

DEVELOPER –

Any person who shall participate as Owner, Promoter, Developer, Contractor, Applicant or Permittee in the planning, platting, development or promotion of a subdivision, planned development, exemption, division of property or project within the Right of Way. Any or all of the above shall be acceptable points of contact for the purpose of implementation of these standards and specifications.

DRAINAGE –

Surface water runoff under existing conditions and the removal of surface water runoff from lands proposed for development utilizing pipes, channels, drains, grading, or other means to minimize erosion and sedimentation during and after construction or development and the prevention or alleviation of flooding.

DRIVEWAY –

A private road that provides access to a public road. Driveway categories are as follows: Field Approach, Single Family Residential, Common Share Residential, Commercial and Industrial.

EASEMENT –

A right of use over the property of another created by grant, reservation, agreement, prescription or necessary implication. It is either for the benefit of adjoining land (“appurtenant”), such as the right to cross A to get to B., or for the benefit of a specific individual (“in gross”), such as a public utility easement.

ENGINEER –

The Montrose County Engineer or designee, which may include but not limited to, the County Road Supervisor, the County Road and Bridge Superintendent, or the Construction Inspector.

EROSION –

The wearing away of land features by detachment and transporting of soil and rock particles by the action of water, wind, or other agents.

FEDERAL HIGHWAY –

A road that is within the County and dedicated to the public, has a U.S. highway number designation, and is maintained by CDOT.

FEE SIMPLE –

An estate in real property, by which the owner has the greatest power over the title which it is possible to have, being an absolute estate; an estate of inheritance belonging to the owner, that he may dispose of, trade, or will, as he chooses.

FIELD APPROACH –

A private driveway providing access to agricultural ground from a public road. A field approach shall be located, configured, and constructed to safely accommodate movement of agricultural equipment to and from a public road.

GEOMETRIC DESIGN –

The arrangement of the visible elements of a road, such as alignment, grades, sight distances, widths, slopes, etc.

GRADE –

The inclination of a roadway, usually expressed in terms of percent.

GUARDRAIL –

A fabricated roadway barrier intended to prevent vehicles from leaving a roadway, or intended to shield a roadside hazard.

HIGHWAY, STREET, OR ROAD –

General terms denoting a public way for vehicular travel, including the entire area within the right-of-way.

HORIZONTAL ALIGNMENT –

The plan of a roadway in the horizontal plane, utilizing interconnected tangents, curves and angle points.

HOT MIX ASPHALT –

A bituminous aggregate mix used in surfacing roads (a.k.a. asphaltic concrete).

HUTF – HIGHWAY USERS TAX FUND –

As defined (Section 43-4-201 et. seq., C.R.S.) Monies collected as motor fuel tax and paid out by the state to aid in funding of the statewide transportation system including County roads.

HVEEM STABILIMETER –

A laboratory device to measure the performance of soil, aggregate, or pavement being subjected to a vertical load. The results are used to design pavement structural sections to carry the expected traffic.

INDUSTRIAL DRIVEWAY –

A private access (to a public road) serving industrial enterprise(s), which shall be designed and constructed to safely serve the type and volume of traffic the business(es) will generate.

INSPECTOR –

The County Engineer or designee who closely and critically monitors and examines work being performed to ensure that said work conforms to relevant construction standards.

INTERSECTION –

The connection point of two or more roads, streets, or highways. Single family residential driveway or field approach is not considered an intersection for the purpose of these Regulations.

LOCAL ROAD –

A road designed to provide access to individual lots in a project containing lots of one (1) acre or more in size where on street parking is discouraged. Local roads intersect with other local roads, with collectors, and only where necessary, with arterials.

LOCAL STREET –

These are streets designed to provide access to individual lots in a project with lots less than one (1) acre in size, where on street parking is accommodated by wider street cross-section. Local streets intersect with other local roads, with collectors, and only where necessary, with arterials. To maintain the functional integrity of the collector and arterial road network and to create desirable neighborhoods, local streets are designed to connect to neighboring subdivisions, and to limit speeds. Private roads and/or easements serving 4 or more residential dwellings or generating more than 25 ADT shall be also considered a local street.

LOW WATER CROSSING –

A stream crossing that is subject to inundation and is only usable during dry periods or low water flows.

MINIMUM COVER –

The least amount of fill material over a culvert or other structure, either a designated or an actual amount.

PASSING SIGHT DISTANCE –

The minimum sight distance on highways that must be available to enable the driver of one vehicle to safely and comfortably pass another vehicle without interfering with the speed or passage of an oncoming vehicle traveling at the design speed, should it come into view after the overtaking maneuver is started.

PAVEMENT –

The asphalt or concrete surface of a road, street, or highway.

PERMITTEE –

The person who obtains a permit.

PERSON –

An individual, Partnership, Corporation, Association, Unincorporated Organization, Trust, joint venture, affiliated ownership or any other legal entity.

PLANNED DEVELOPMENT –

As defined in the Montrose County Subdivision Regulations.

PRIMARY TRANSPORTATION SYSTEM –

In accordance with (Section 43-2-109, C.R.S.), the County Primary Transportation System consists of those roads of greatest general importance as evidenced in the Montrose County Master Plan as those roads classified as Arterial, Collector, Local and Rural, and/or those roads placed upon the HUTF Roll as maintained and funded.

PRIME COAT –

A low viscosity liquid bituminous material applied to a gravel base prior to paving to stabilize the surface and promote adhesion between the base and the pavement.

PRIMITIVE ROAD –

Unimproved public roads managed by the County. Legal public access is provided, but the road is not physically maintained.

PRIVATE ROAD –

Any road that is not a public road.

PROFESSIONAL ENGINEER (P.E.) –

An engineer duly registered and licensed pursuant to Section 12-25-101 et. seq., C.R.S.

PROFESSIONAL LAND SURVEYOR (PLS) –

A land surveyor duly registered and licensed pursuant to Section 12-25-201 et. seq., C.R.S.

PROJECT –

The design, layout, planning and/or construction of any subdivision, planned development, exemption, division of property, or construction of any type within a public ROW or other off ROW activity that will intensify the usage of the public way including, but not limited to, oil and gas exploration/extraction and mineral excavation, mining and hauling over more than a thirty (30) day period..

PROJECT ENGINEER –

A Professional Engineer (P.E.) retained by the developer as the Engineer of Record being in direct responsible charge for the project design and construction quality assurance/quality control.

PROOF ROLL –

A load test of a subgrade or base course using and observing a loaded tandem axle truck carrying approximately 36,000 lbs. to 40,000 lbs. on the tandem axle. The progress of which fully covers the entire surface to demonstrate the stability and load bearing capacity of the section.

PUBLIC ROAD –

For the purposes of these Regulations, a public road is (a) a road dedicated to public use by a deed or other instrument, (b) a road that has been declared a public road by any court, (c) a road over private lands which has become public by adverse possession, (d) a road over the public domain made a public road by law, and (e) a toll road or portions thereof which may be purchased by the Board of County Commissioners of any County from the incorporators or charter holders thereof and opened to the public.

QUALITY ASSURANCE (QA) –

All actions taken to ensure that Policy, Standards and Procedures are adhered to and that finished products or services meet requirements. For Public Works construction, this predominately takes the form of Inspections, Review of QC Data, oversight and verification testing by the Project Engineer.

QUALITY CONTROL (QC) –

The process whereby the quality control of raw materials, construction inspection and testing is used to prevent the undetected construction of a defective product. For public works construction this predominately takes the form of Owner/Developer initiated inspection and testing as construction progresses.

R VALUE–RESISTANCE R-VALUE AND EXPANSION, PRESSURE OF COMPACTED SOILS – (AASHTO T 190)

This method covers the procedure for testing both treated and untreated laboratory compacted soils or aggregates with the stabilometer and expansion pressure devices to obtain results indicative of performance when placed in the base, subbase, or subgrade of a road subjected to traffic.

RED LINED DRAWINGS –

A set of “Record Drawings” based upon the original “Approved For Construction” drawings containing all original signatures and approvals. The record drawings shall be hand written annotated in red ink when variations in the design are required by actual field conditions. The red inked changes shall be noted with reason for change, name of person who authorized the change, time and date of actual change.

RESIDENTIAL DRIVEWAY –

A private driveway connection to a public road, typically subject to the engineering control of the public entity responsible for operation and maintenance of the road.

RIGHT OF WAY (ROW) –

A general term denoting land or property, or interest therein, acquired by Dedication or Process of Law for or devoted to transportation purposes, including the traveled way and all land necessary for the support/construction and maintenance of the traveled way and safety of the public.

RIGID PAVEMENT –

A rigid concrete surface course on a street or highway, designed and intended to bridge over small defects in the underlying base structure, and remain on a true plane.

ROAD –

An open way for travel or transportation.

ROADSIDE –

That portion of the public way that is necessary for supporting features either safety related or structural and is outside of the travel lane(s). Typically containing drainage features, guardrail, clear zones, recovery zones, signage and other similar items.

ROAD SIGN –

A traffic control device mounted on a support above the level of the roadway that conveys a specific message by means of words or symbols.

ROADWAY –

The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

ROADWAY PRISM –

The area of a road bounded by the traveled surface, the shoulders and lines projecting downward and away from the outside edge of the shoulder and intersecting the ground surface at an angle of forty-five (45) degrees to horizontal.

RURAL ROAD –

A road that provides access from higher classification roads to local points of interest. They typically do not experience a high volume of traffic, but are of great importance as they provide the primary or only route of access to public lands.

SECONDARY TRANSPORTATION SYSTEM -

All roads not on the Primary Transportation System that are shown on the County Road Map and listed on the HUTF roll as unfunded.

SHOULDER –

The portion of a roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of base and surface courses.

SIGHT DISTANCE –

The distance between the driver of a vehicle, measured along normal travel path of a roadway, to an object of specified height above the roadway or to an approaching vehicle, when the view is unobstructed by traffic.

SLOPE EASEMENT -

An easement adjacent to a right of way for earthwork cuts or fills.

SPECIAL DISTRICT -

As defined in the Montrose County Subdivision Regulations

STABILIZATION –

Modification of soils or aggregate by incorporating materials and/or utilizing methods that will increase load bearing capacity, firmness and resistance to weathering or displacement.

STATE HIGHWAY –

A road that is within the County and dedicated to the public, has a State highway number designation, and is maintained by CDOT.

STOPPING SIGHT DISTANCE –

The distance required by a driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the roadway becomes visible. It includes the distance traveled during the perception and reaction times and the vehicle braking distance.

SUBBASE –

The layer or layers of gravel or crushed stone of designed thickness placed on a subgrade to support a base course.

SUBGRADE –

The prepared earth surface on which a roadway or structure is constructed.

SUBSTRUCTURE –

The foundation and support elements of a bridge, used to transfer loads from the superstructure to the ground.

SUPERELEVATION –

The transverse inclination of a roadway, intended to counteract the outward centrifugal force exerted on a vehicle at speed in a horizontal curve.

SUPERSTRUCTURE –

All portions of a bridge spanning a stream or canyon, and used for transferring applied loads to the substructure.

SUSTAINED GRADE –

A section of road/street with a continuous, uniform change in elevation.

TOPOGRAPHY –

The configuration of the earth surface including the shape and position of its natural and man-made features.

TRAFFIC CONTROL DEVICE –

Any sign, signal, marking or installation placed or erected under public authority, for the purpose of regulating, warning, or guiding traffic.

TRAVELED WAY –

The portion of the roadway for the movement of vehicles, exclusive of shoulders.

VERTICAL ALIGNMENT –

The centerline profile of a roadway in the vertical plane, utilizing interconnected tangents and curves.

Article III. ADMINISTRATION

Section 3.01 Road Systems

The road system in Montrose County consists of federal and state highways, County roads, city streets, and other public and private roads.

A. The State Highway System

The State Highway System in Montrose County is administered by the Colorado Department of Transportation (CDOT) under the direction of the Executive Director and the State Highway Commission.

The Colorado Department of Transportation has full responsibility for the construction and maintenance of all Federal and State highways within the unincorporated areas of Montrose County. Within incorporated areas, maintenance responsibilities may be assumed by a municipality under a maintenance agreement. Traffic signs on County road approaches to State and Federal highways are also under the jurisdiction of the Colorado Department of Transportation.

Access to the State Highway System in Montrose County is administered by the Colorado Department of Transportation through the State Highway Access Code.

Planning for federal and state highways is conducted by the Colorado Department of Transportation in cooperation with the County, local municipalities and other agencies.

B. The County Road System

The State of Colorado, by statute, authorizes the Board of County Commissioners to administer the County Road System, including, but not limited to, planning, design, construction, acceptance, maintenance and traffic regulation. County jurisdiction extends to all public roads other than state or federal roads within unincorporated lands of Montrose County, as further described below.

Unless declared otherwise by the Board, since June 6, 1996, the County will assume no maintenance responsibility for any roads within or created for new projects within the County.

C. The County Road Map

The Board of County Commissioners will adopt and periodically revise a Montrose County Road Map showing all roads that have been incorporated into the County Road System (See Appendix I – Maps, Figure 3-1). Copies of the County Road Map are available from the Montrose County Engineering Department or Land Use Department.

D. County Road Administration

The Board, by statute, determines the general policies of the County as to County road matters. The Engineer is responsible for design, oversight, implementation and regulation of construction activities and the permit process for management of the County Right of Ways (ROW). The County Road and Bridge Department is responsible for the maintenance, repair and improvement of designated roads and bridges in the County.

E. City Streets

Maintenance and improvements of street systems within each incorporated city and town in the County is the responsibility of the respective municipality.

F. Mixed Jurisdiction

When both the County and a municipality or other government (State or Federal i.e., BLM or U.S. Forest, etc.) agency have ownership and/or jurisdiction over portions of the same road (e.g., a municipality annexes

to the centerline of a County road), the responsibility of each entity in such situations shall be determined on a case-by-case basis by the authorities involved. It is the policy of Montrose County to oppose partial width annexations.

G. Other Public Roads

The Board of County Commissioners has determined that the retention and re-establishment of public access to public lands is in the best interest of the public health, safety and welfare in Montrose County.

Colorado Revised Statutes, Section 43-2-201 declares the following to be public highways:

- (a) *All roads over private lands dedicated to the public use by deed to that effect, filed with the County Clerk and Recorder of the county in which such roads are situated, when such dedication has been accepted by the Board of County Commissioners. A certificate of the County Clerk and Recorder with whom such deed is filed, showing the date of the dedication and the lands so dedicated, shall be filed with the County Assessor of the county in which such roads are situated;*
- (b) *All roads over private or other lands dedicated to public uses by due process of law and not heretofore vacated by an order of the Board duly entered of record in the proceedings of said Board;*
- (c) *All roads over private lands that have been used adversely without interruption or objection on the part of the owners of such lands for twenty (20) consecutive years;*
- (d) *All toll roads or portions thereof which may be purchased by the Board of any county from the incorporators or charter holders thereof and thrown open to the public;*
- (e) *All roads over the public domain, whether agricultural or mineral.*

H. Private Roads

Private roads may be established by prescriptive use, a recorded easement, plat dedication, or deed. Montrose County assumes no maintenance responsibility on private roads, and does not regulate utilities therein. For the protection of public health, safety, and welfare, the construction of private roads that serve more than three (3) lots, or three (3) separate parcels, or three (3) single family residences, or which serve more than twenty-five (25) ADT of unspecified traffic shall be built to public road standards in order that access by public emergency service providers shall not be compromised. The use of private roads for non essential services such as postal delivery or school pickups must be arranged by the Owner(s) with the appropriate agency. Erection and maintenance of signs on private roads will be the responsibility of the Owner(s). Signs regulating access to public roads and naming of Private Roads shall be a condition of the Access Permit.

Section 3.02 Road System Regulations

A. Legislative Authority

The Board of County Commissions is authorized to regulate traffic on County roads pursuant to Section 42-4-101 et. seq., C.R.S. The Board is further authorized by Section 42-4-101 et. seq. and Section 43-2-101 et. seq., C.R.S. to regulate vehicular access to or from any public highway under their respective jurisdiction from or to adjoining property in order to protect the public health, safety and welfare, to maintain smooth traffic flow, to maintain highway ROW drainage and to protect the functional levels of public highways. Sections 43-5-301 through 304, and 43-2-111, C.R.S. prohibit anyone from causing or permitting a highway to become obstructed by damaging it in any way, or causing inconvenient travel upon, or permitting water, waste water or other substance from any ditch, lateral, canal, reservoir, drain or flume or

other artificial course to flow across such a road. Dams may not cause water to flow across or otherwise obstruct a public road.

B. Access Control

Prior to commencing any public road or driveway construction that attaches to a public road under County jurisdiction; an access permit must be obtained from the County. Failure to obtain or construct such improvements authorized or required shall be sufficient cause to withhold any and all additional permission requested or required by the County until such time that the condition is resolved.

Driveways and intersections with County roads created by development approved by another governmental or quasi-governmental entity, shall meet all permit obligations for access established by these Regulations prior to making connection to the subject public road.

Any project using existing or historic access that increases the burden upon a public road under County jurisdiction by more than twenty percent (20%) over the current use shall be required to obtain an access permit, may be required to conduct a traffic study, and make improvements at identified points to the public system to maintain the Level of Service (LOS). Class 2 Roads (Section 4.03) may be required to meet the minimum standards established in Section 4.08.

C. Traffic Control Devices

All new traffic control devices installed on or regulating access to County roads shall conform to the latest edition of the *Manual On Uniform Traffic Control Devices (MUTCD)*, published by the U.S. Department of Transportation, Federal Highway Administration. Said manual is available for review at the office of the Engineer. The County may conduct or require accident studies, traffic analyses, traffic control studies, or any other engineering studies required by state law or by the MUTCD, which are prerequisite for the installation of traffic control devices on County roads.

Existing traffic control devices that are not fully in conformance with the MUTCD, on existing roads, shall remain in service on a contingent basis. As funding becomes available, traffic control devices under the jurisdiction of Montrose County shall be upgraded to current MUTCD standards.

D. County Road System Additions and Improvements

The Board may authorize the layout, alteration, or modification to any County road or bridge, and may acquire lands for County roads. The Engineer has the authority for planning, design, identification of ROW needs, construction and inspection of all additions and improvements to the County Road System in conformance with this document.

Any road proposed by persons other than the County for addition to the existing County Road System shall be planned, designed, and constructed in conformance with this document.

E. Planning

The planning or layout of any new road subject to this document and any improvements to any existing roads subject to this document shall be in accordance with these Regulations, as amended. Extensions of existing public roads to enhance the existing transportation network shall be encouraged and/or required. The County shall control access points and driveways along roads to improve traffic carrying capacity and to enhance the safe and efficient movement of traffic.

Access approaches to roadways under the jurisdiction of Montrose County shall meet the Design Standards in Sections 3 and 4 of the *Colorado State Highway Access Code, 2 CCR 601-1 (the Access Code)*. Montrose County roads classified as Arterials shall meet the requirements of R-A access category. Montrose County roads classified as Collectors shall meet the requirements of R-B access category. Montrose County roads classified as Local Roads shall meet the requirements of F-R access category.

Any new County roads proposed under the Montrose County Subdivision Process which includes connection to the State Highway System must obtain a CDOT State Highway Access Permit. The

application for the Permit shall be prepared by the Developer, listing Montrose County as the Permittee and the Developer as the Applicant. The Developer shall bear all costs associated with the application, review process and construction. The County Engineer is authorized to conduct reviews and sign the application on behalf of the County.

F. Design

The design of any new road subject to this document and any improvements to any existing roads subject to this document shall be in accordance with these Regulations.

Road and/or bridge plans shall be prepared, signed, sealed and dated by a Colorado Registered Professional Engineer in accordance with this document and must be approved in writing by the Engineer before any construction activity whatsoever commences. Any such written approval shall expire without further notice one year from the date it is issued. Any amendment or revision to road and/or bridge plans, and any resubmission of road and/or bridge plans must conform to this document as it exists at the time of the amendments, revision or resubmission.

G. Construction and Maintenance

Construction and maintenance of new or existing County roads, bridges and public utilities within the ROW shall conform to the provisions of these Regulations.

H. Inspection

Inspections and testing of new construction and improvements shall be performed to ensure compliance with this document, the project plans and specifications, and any other requirements. Such inspections and testing shall be complete and acceptable to the Engineer before any recommendation is made to the Board for acceptance of the work and/or release of any financial security. Requirements for inspections and testing are found in Article VI. Quality control (QC) inspection duties during construction are the sole responsibility of the Developer or Permittee; quality assurance (QA) inspections for benefit of the County are the responsibility of the Engineer. Quality assurance inspections on behalf of the county shall in no way reduce or remove obligations of the Developer for quality assurance and quality control of the project.

The Engineer is authorized and directed to inspect and examine the use, occupation, or development of, or activity in, any area or activity subject to this document for the purpose of determining whether any use, occupation, development or activity is in violation of any of the provisions of this document or of any permit issued or required pursuant to this document.

If a violation is found, the Engineer may, by written order, direct that such remedial action be taken forthwith as will result in full compliance with the applicable standards. The issuance of such order is not a prerequisite to the initiation of any enforcement process set forth in this document. Compliance with such order is not a defense to any alleged violation of this document in any hearing or court action instituted seeking permit suspension or revocation, full compliance with this document, or any other applicable remedy, sanction or enforcement mechanism.

I. Enforcement

Any person or entity in an activity subject to this document who does not comply with this document, who does not obtain any permit required by this document, who does not comply with any permit requirements on conditions, or who acts outside the authority of the permit shall cease such activity immediately upon written direction from the Engineer. Such person also may be enjoined by the County from engaging in any such activity subject to this document, until full compliance is met. Such person may also be subject to such other criminal or civil liability as may be prescribed by law.

Section 3.03 Acceptance of Roads for Dedication to the County

A. Public Roads Not Maintained by the County

Ownership of a road offered to the County may be dedicated to and accepted by the County by action of the Board, provided no County maintenance of said road is required (unless declared otherwise by the Board). The County shall manage the legal right to public access for such road, (unless properly vacated by the Board).

Prior to acceptance of such road, the Board may direct the Engineer to evaluate any transportation health, safety and welfare concerns that may be anticipated. Priority shall be given to the need for emergency service access and the ability of the road to support such services. The evaluation shall be based upon the minimum standards for new public roads (Section 4.07), while giving consideration for the existing use and condition of the road. Upgrades to the road may or may not be required by the Board after giving consideration to the findings of the Engineer. The evaluation shall be presented to the Board for decision at a regular scheduled meeting of the Board.

B. Existing Public Roads Maintained by the County

An existing road offered to the County may be dedicated to and accepted by the County by action of the Board. The road shall be listed on the HUTF list of funded and maintained roads, and maintained in accordance with statutory requirements for such funding. The continuation of the road upon the HUTF list shall be at the sole discretion of the Board. The County shall manage the legal right to public access for such road, (unless properly vacated by the Board).

Prior to acceptance of such road, the Board may direct the Engineer to evaluate any transportation health, safety and welfare concerns that may be anticipated. Priority shall be given to the need for emergency service access and the ability of the road to support such services. The evaluation shall be based upon the minimum standards for existing public roads (Section 4.08), while giving consideration for the existing use and condition of the road. Upgrades to the road may be required by the Board after giving consideration to the evaluation of the Engineer. The evaluation shall be presented to the Board for decision at a regular scheduled meeting of the Board.

C. Creation of New Public Roads

A new road offered to the County may be dedicated to and accepted by the County by action of the Board, provided no County maintenance of said road is required (unless declared otherwise by the Board).

Road dedication plats shall be designated as being a “Plat of Survey.”

New roads shall be accepted for maintenance only when they have significant value to the Primary Transportation System and shall further the development of a uniform and effective network of collector and arterial County roads. If accepted for maintenance the road shall be listed on the HUTF list of funded and maintained roads, and maintained in accordance with statutory requirements for such funding. The continuation of the road upon the HUTF list shall be at the sole discretion of the Board. The County shall manage the legal right to public access for all new roads dedicated to the County and accepted by the Board, (unless properly vacated by the Board).

Prior to acceptance of such road, the Board shall direct the Engineer to evaluate any transportation health, safety and welfare concerns that may be anticipated. Priority shall be given to public safety, transportation system effectiveness, the need for emergency services and the ability of the road to support such services. The evaluation shall be based upon the minimum standards for new public roads (Section 4.07). The evaluation shall be presented to the Board for decision at a regular scheduled meeting of the Board.

Section 3.04 Abandoned Roads

A. Abandoned State Highways

When a portion of a highway is relocated and, because of such relocation, a portion of the route as it existed before such relocation is to be abandoned, the County may incorporate some or all of the abandoned roadway into the County Road System upon adoption of a resolution by the Board. If some portion of the abandoned road is not needed as a public road, title to it shall revert to the Owners of the land through which such abandoned portion may lie.

B. Abandoned County Roads

When a portion of the County Road System is relocated and because of such relocation a portion of the route as it existed before such relocation is, in the opinion of the Board, no longer necessary as part of the County Road System, such portion shall not be considered abandoned until it has been **vacated** by Board action subject to State Statutory Requirements and Section 3.05. Title to the land so vacated shall pass to the appropriate parties provided in the resolution of the Board pursuant to the provisions of Sections 43-2-302, -303, C.R.S.

Section 3.05 Vacation of Public Roads and Easements

On occasion, Vacation of County ROW or easements may be warranted. The Board may vacate any County ROW or any portion thereof subject to the provisions of Section 43-2-301 to 303, C.R.S. and Appendix G. (See BOCC Resolution 14-2004.) No road or part thereof shall be vacated so as to leave any parcel adjoining said roadway without an established public road connecting said land with another established public road or roads.

Section 3.06 Road Name and/or Number Changes

The name and/or numeric designator of any road dedicated to public use, or to the County, may only be changed by resolution of the Board. Requests for name changes shall be submitted in writing to the Engineer. If the request is consistent with the County's road naming convention, the Engineer will forward it to the Board for public hearing and Board action.

New road names or designators shall conform to the County's road naming convention and not duplicate, or be easily confused with, existing names of City streets, County roads, or geographic identifiers. If the road name or number change is proposed for a road that has not been accepted by the County, the Applicant, Homeowners' Association, or the Developer of the affected Subdivision is responsible for paying to the County adequate funds to cover all (labor, equipment and materials) costs of required signage changes.

Section 3.07 Financial Security for New Public Works

A. Uncompleted Public Works

As a condition of acceptance of any new road and associated required public infrastructure (i.e., bridges, drainage, signage, etc.) being dedicated to and/or required by the County, prior to completion of construction and final inspection by the Engineer, an Improvements Agreement and financial security shall be required to guarantee the satisfactory completion of construction of all public improvements. The amount of the financial security shall be equal to one hundred percent (100%) of the estimated cost of construction of all remaining improvements plus a contingency of fifty percent (50%), based upon either the actual contract prices of the work and accepted by the Engineer, or upon an estimate prepared sealed and dated by the Registered Professional Engineer for the project, and accepted by the Engineer.

The financial security shall be in the form of cash, federally-insured certificates of deposit, irrevocable letters of credit issued by a bank acceptable to the Board, surety bonds issued by a company authorized to do business in Colorado, written guarantees backed by collateral acceptable by the Board, or any other form or combination of forms, acceptable to the Board. Public improvements required as part of a subdivision or planned development process shall be collateralized pursuant to the subdivision or planned development regulations of Montrose County.

B. Warranty of Completed Public Works

As a condition of acceptance of any new road and associated required public infrastructure (i.e, bridges, drainage, signage, etc.) being dedicated to and/or required by the County, an Improvements Agreement and financial security shall be required to warrant satisfactory completion of performance of all public improvements for a two (2) year warranty period. The amount of the financial security shall be equal to ten percent (10%) of the full cost of construction of all warranted improvements, based upon either the actual contract prices of the work and accepted by the Engineer, or upon an estimate prepared sealed and dated by the Registered Professional Engineer for the project, and accepted by the Engineer.

The financial security shall be in the form of cash, federally-insured certificates of deposit, irrevocable letters of credit issued by a bank acceptable to the Board, surety bonds issued by a company authorized to do business in Colorado, written guarantees backed by collateral acceptable by the Board, or any other form or combination of forms, acceptable to the Board.

Section 3.08 Snowplowing

Montrose County shall not plow snow on any road unless and until such road has been determined to be a public road and accepted for County maintenance by the Board. It shall be in the sole discretion of the Board to determine from time to time which such public roads will be plowed by the County.

Those public roads that are claimed for maintenance but do not receive winter maintenance should be listed and published each year. Requests to extend County snow plowing services or requests to allow private plowing by Permit shall be made in accordance with the Policies and Procedures established in Article VIII and Appendix C.

Article IV. PLANNING AND DEVELOPMENT

Section 4.01 Montrose County Master Plan

The Montrose County Master Plan was prepared to guide the County's growth without compromising its citizens' quality of life or standard of living. It provides guidelines for the location and type of proposed projects complement existing land uses. Conformance with the Master Plan will likely result in orderly and desirable growth by providing a coordinated balance between the environment, the economy and the needs of residents and visitors. Lack of conformance will likely result in incompatible adjoining uses and oversteering of existing infrastructure.

Section 4.02 Functional Classification of Roads

All roads in Montrose County have been given a functional classification by the State, County or a municipality within Montrose County. The functional classifications assigned to the County Road System by the Montrose County Master Plan are intended to serve as a guide and/or goal for future projects such that comprehensive traffic management may be maintained and/or enhanced. Not all roads meet all the stated criteria for their assigned functional classification but future upgrades should strive to meet the stated classification goal. The classifications are first and foremost assigned based upon the routes' current, then future anticipated function within the overall traffic management scheme for Montrose County. The fundamental premise is that high capacity roads are fed by lower capacity roads. Road Design and Construction Standards are detailed in Articles V and VI, and in Appendix E and F.

Classification Goals

Major Arterial Road (100' ROW) + additional as necessary to construct and maintain

These are inter-regional roads conveying traffic between cities, towns, and other urban and rural activity centers. Efficient movement of traffic is the primary function of principal arterials; hence private access shall be limited to high-volume traffic generators or not allowed, and intersections should be limited to collector roads and other arterials. To maintain functional integrity, access control, channelized intersections, and restricted parking are utilized.

ADT = 3,000+
Minimum ROW = 100' – up to 200' within the Montrose City Urban Growth Boundary
Number of Lanes = 2 or more
Surfacing = Paved
Example = U.S. 50 (CDOT) or Planned future Beltway around City of Montrose

Minor Arterial Roads (80' ROW) + additional as necessary to construct and maintain

These are regional roads conveying traffic between urban and rural activity centers. Efficient movement of traffic is the primary function of minor arterials; but private access is not as limited as with principal arterials. Minor arterials should connect with other arterials. To maintain functional integrity, access control is utilized wherever possible and on-street parking is prohibited.

ADT = 500 to 5000
Minimum ROW = 80' – up to 100' within the Montrose City Urban Growth Boundary
Number of Lanes = 2 or more
Surfacing = Paved
Example = LaSalle Road

Collectors Roads (60' ROW) + additional as necessary to construct and maintain

These are regional roads that collect traffic from local roads and connect to other local roads, and with arterials. Efficient movement of traffic is an important function of collector roads, and private access

should be limited wherever practical. To maintain functional integrity, access control is utilized wherever practical, and on street parking is discouraged.

ADT = 20 to 3000
Minimum ROW = 60' – up to 80' within the Montrose City Urban Growth Boundary
Number of Lanes = 2 to 3
Surfacing = Paved or Gravel
Example = Government Springs Road

Local Road (60' ROW)

These are roads designed to provide access to individual lots in a project containing lots of one (1) acre or more in size where on street parking is discouraged. Local roads intersect with other local roads, with collectors, and only where necessary, with arterials. To maintain the functional integrity of the collector and arterial road network and to create desirable neighborhoods, local roads are designed to connect to neighboring subdivisions, and to limit speeds.

ADT = 20 to 1000
Minimum ROW = 50' – 60' varies due to elevation and location
Number of Lanes = 2
Surfacing = Paved or Gravel
Example = 69.00 Road

Local Street (50' ROW)

These are streets designed to provide access to individual lots in a project with lots less than one (1) acre in size, where on street parking is accommodated by wider street cross-section. Local streets intersect with other local roads, with collectors, and only where necessary, with arterials. To maintain the functional integrity of the collector and arterial road network and to create desirable neighborhoods, local streets are designed to connect to neighboring subdivisions, and to limit speeds.

ADT = 20 to 1000
Minimum ROW = 50'
Number of Lanes = 2
Surfacing = Paved or Gravel
Example = Nancy Way

Rural Road (60' ROW)

These are rural roads of local nature. They provide access from higher classification road to local points of interest. They typically do not experience a high volume of traffic, but are of great importance as they provide the primary or only route of access to public lands. Access control is not a high priority.

ADT = 1 to 500
Minimum ROW = 60' (40' for old existing ROW)
Number of Lanes = 1 or 2
Surfacing = Gravel or Native Material
Example = Rim Road and Forest Service Level II Roads

Primitive Road (Varies)

These are unimproved public roads where legal public access may be managed by the County although not physically maintained.

ADT = unknown
Minimum ROW = varies (use width to 60')
Surfacing = Native
Example = Mailbox Park Road

Section 4.03 Level of Service (LOS)

A. Design LOS

Design LOS is intended to set minimum design standards for new construction/reconstruction or improvement to existing roads in accordance with the design guidance established in the Highway Capacity Manual, based upon twenty (20) year traffic projections of design hour volume (DHV) developed through detailed traffic studies.

For determining LOS; Class 1 roads shall be those roads designated in the County Master Plan as (Major/Minor) Arterial or Collector. They shall be roadways connecting major traffic generators and/or serving as commuter routes at moderate to high speeds (45 to 60 mph). Class 2 roads shall be all other roads.

The 20th year LOS for new roadway design or for capacity and/or intersection improvements for Class 1 roads shall not be less than LOS – B and shall not be less than LOS – C for Class 2 roads.

Any project that proposes to increase the 20th year DHV on an existing or proposed public road by more than 10% must demonstrate that the increase in burden upon the public road shall not reduce the LOS below LOS – C. Roadways currently LOS – D must be maintained at this level or improved upon based on the 20th year build out conditions. Roadways with a current or design LOS of E or F are considered inadequate for further development.

B. Maintenance LOS

The Road and Bridge Department and Special Districts are expected to provide a consistent level of service throughout the County Road System. Maintenance needs will be identified and addressed in an orderly manner, with a minimal amount of undue political influence. Maintenance by the County is generally not performed on local subdivision roads that have been dedicated to the County, but rather is the responsibility of the Developer or Homeowners. (Exceptions may be provided to pre-June 6, 1996 Subdivisions.)

Maintenance Service Levels on County roads vary according to functional classification, with higher levels of maintenance assigned to higher road classifications. Routine and special maintenance activities are performed in the following six (6) distinct areas common to all classifications:

- **Roadway.** The travel surface including shoulders, for vehicular use. Typical activities include blading of native or gravel surface courses and shoulders, and crack sealing, pothole repair and seal coating of paved surfacing. Overlay and reconstruction of paved roads are normally identified as a Capital Maintenance Repair.
- **Roadside.** The area adjoining the travel surface, normally between the outside shoulder edges and the right of way (ROW) lines. Maintenance activities are usually limited to vegetation removal and control, and minor structures and hazard mitigation.
- **Drainage.** Surface drainage structures including ditches, swales, culverts and other minor structures. Typical maintenance work includes erosion prevention and repair, along with culvert and ditch cleaning.
- **Structures.** All bridges and other major structures. Maintenance work includes decks and expansion device cleaning and repair, superstructure painting and repair, substructure repair, and channel cleaning.
- **Traffic Control Equipment.** All signs, signals, markings or other devices used to regulate, warn or guide traffic. Maintenance activities include sign repair or replacement and pavement marking renewal.
- **Winter Maintenance.** All winter maintenance work, including snow plowing and application of abrasives and deicing agents.

Section 4.04 Maintenance Service Levels

In order to adequately distribute available public funding, Maintenance Service Levels have been assigned to each road segment in order to help assure the minimum level of effort to be provided in all 6 maintenance categories. A map depicting these assignments is provided in Appendix I – Maps, Figure 4-1.

A. Level 1

This level is basic custodial care as required to protect the ROW and road investment on low use access routes to public lands, and to see that damage to adjacent land and resources is held to a minimum. This level is on roads that are open to public travel but rarely, if ever, receive physical maintenance. This level is basic care as required to protect very low use access routes to public lands from closure or purposeful damage and to see that damage to adjacent land and resources is held to a minimum. This level is on roads that are open to the public, however traffic volume and physical condition are not monitored by county staff.

- (1) Roadway – Dozer or Blade maintenance sufficient to maintain passage for high clearance and 4x4 vehicles.
- (2) Roadside – No maintenance required. Routine or intermittent removal of brush and trees from the roadway is not included in this level.
- (3) Drainage – All drainage is functioning properly; no major erosion or sedimentation visible at time of inspection. Road may or may not have roadside ditches.
- (4) Structures – Structures should be adequate for historic use.
- (5) Traffic Control Devices – none.
- (6) Winter Maintenance – Not provided, the route may be gated closed during winter periods to minimize road damage.

B. Level 2

This level is basic custodial care as required to protect the road investment on low use access routes to public lands, and to see that damage to adjacent land and resources is held to a minimum. Level 2 maintenance often requires an annual inspection to determine what work, if any, is needed to keep drainage functional and the road stable. Level 2 is to maintain drainage facilities and runoff patterns. This level is on roads that are open to the public however traffic is less than 50 ADT.

- (1) Roadway – Generally no maintenance required, however dozer or blade maintenance sufficient to accommodate use by 2WD vehicles during dry conditions. High clearance and 4x4 vehicles are generally recommended for adverse conditions.
- (2) Roadside - Occasional light maintenance, including blading, required to restore road as necessary to be as erosion-free as practicable and passable. Routine or intermittent removal of brush and trees from the roadway is not included in this level.
- (3) Drainage – All drainage is functioning properly; does not cause erosion or sedimentation and shows no potential to do so.
- (4) Structures – Structures should be adequate for historic use.
- (5) Traffic Control Devices – Route number and destination information posted. Known hazardous conditions should be marked.
- (6) Winter Maintenance – Not provided.

C. Level 3

This level is used on low use roads that are routinely open for public traffic and generally applies when use does not exceed 300 ADT. ADT should be used as a guide in determining the maintenance level and not as the sole criterion. A road may receive only ten or twenty vehicles a day for most of the year; however, during a brief period, such as hunting season, the road may receive 200 to 500 vehicles a day. Total traffic types and planned land use are important criteria for selection maintenance requirements will be met:

- (1) Roadway – Sub-base and base course materials are load supporting. The road location and structural depth shall be maintained as constructed. Sub-grade deformation is not acceptable and should be corrected. Surface blading as necessary to provide moderately convenient travel. Surface roughness is tolerated. Traveled-way crown, or cross slope is maintained. Roads in Level 3 receive a minimum of one blading per year.
- (2) Roadside – Existing shoulder maintenance during blading operation. Usable material pulled onto traveled-way and boulders and debris removed and deposited in designated areas.
- (3) Drainage – Drainage structures are to be maintained to their as-constructed condition. Ditches cleaned as required to drain. Ditch pulling may be specified when it is justifiable. Surface maintenance normally should occur after ditch pulling on aggregate surfaced roads. Specific consideration should be given to the disposal of materials excavated and the erosion potential caused.
- (4) Structures – All structures currently repaired and maintained as needed for safe passage of the road users. Routine maintenance will be scheduled periodically. Example: Bridges would be maintained for such items as defective bridge rails, running planks, and bridge guide posts. Painting of bridge rails may be deferred to a logical project cycle. Structures that present potential safety hazard or loss of investment will be given maintenance priority.
- (5) Traffic Control Devices
 - Warning, regulatory signs and traffic-control devices should be managed per MUTCD regulations.
 - Directional and guide signs should be in place and properly maintained.
- (6) Winter Maintenance – School routes shall be plowed first, and then Level 3 roads will be plowed after primary collectors (Level 4). Plowing frequency will be at a maximum of one (1) time per day between hours of 5am and 9pm, and may be as infrequently as once a week.

D. Level 4

This level generally applies to moderate use roads serving 200 to 500 ADT. At this level, more consideration is given to the comfort of the user. Level 4 roads are frequently surfaced with aggregate material, but some routes may be paved to meet economical consideration of the limited aggregate resource and the surface replacement cost factors. Level 4 roads may also be paved to provide more user comfort or to alleviate dust concerns.

- (1) Roadway – Surfacing replacement sufficient to allow economical blade maintenance (formal project; scarify, water, add road base gravel and compact), and to maintain the historic level of serviceability.
 - a. Surface Grading: Potholes and wash boarding will be repaired in spot locations as they develop. Traveled-way maintenance of the entire facility will be accomplished at frequencies dictated by road condition, use and travel speeds, as necessary for safety and comfort of users.
 - b. Dust abatement: To be performed as necessary to maintain fines content in the surface course for economical road maintenance. Some local dust abatement in residential districts may be performed during dry years if budgets permit.
 - c. Pavement Maintenance
 - Repaired to provide skid-resistant wearing course
 - Repair of potholes
 - Elimination of surface depressions which trap water on the pavement
 - Crack repair
 - Seal coating
- (2) Roadside – Graded and maintained to the as-constructed standard. Brush control accomplished on scheduled basis for safe sight distance, and appearances.
- (3) Drainage – Structures are to be maintained to their as-constructed condition. Ditches cleaned as required for runoff. Ditch pulling may be specified. Surface maintenance normally should occur after ditch pulling on aggregate surfaced roads. Specific consideration must be given to the disposal of materials excavated and the erosion potential caused.

- (4) Structures – More consideration to be given to the appearance of a structure. Painting will be accomplished on a scheduled basis. Bridges, bridge rails, cattleguards, and fences shall be maintained in fully serviceable condition.
- (5) Traffic Control Devices
 - Warning, regulatory signs and traffic-control devices are managed per MUTCD regulations
 - Directional and guide signs are in place and properly maintained.
 - Signing on Schedule-A roads will be done by the Forest Service and/or Montrose County per Schedule-A Agreement.
 - Markings – Centerline, edge stripping and similar types of markings painted on pavement and curbs shall be repainted as needed for effectiveness in periods of poor visibility.
- (6) Winter Maintenance – School routes shall be plowed first, and then Level 4 roads will be plowed, after or concurrent with arterials. Plowing will generally occur between the hours of 5am and 9pm, a maximum of two (2) times per day, and possibly as infrequent as one (1) time per day, depending on storm severity.

E. Level 5

This level is generally maintained for routes serving 500 ADT and greater. Roads in this category include both paved and aggregate surfaces. Safety and comfort are important considerations. Abrupt changes in maintenance will be posted to warn a traveler until these deficiencies are corrected.

- (1) Road Way Activities
 - a. Surface Maintenance – Surface is maintained to provide smooth, dust-controlled, skid-resistant (paved surfaces) surfaces at design speed.
 - b. Pavement Maintenance
 - Repaired to improve skid-resistant wearing course
 - Repair of potholes
 - Elimination of surface depressions which trap water on the pavement
 - Crack repair
 - Seal coating
 - c. Aggregate Surfaces
 - Blading as required to provide a comfortable ride
 - Dust control at County's discretion
 - Surface depths maintained for economical blading – two inch (2") minimum. (Does not apply to roads maintained under a Schedule A road.)
 - Gravel replacement will be provided when depths fall below minimum standards; however, replacement to be accomplished to provide not less than a total depth of three inches (3").
- (2) Roadside – Graveled or paved shoulders shall be maintained in the same basis as paved traveled way. Brush control shall be provided on scheduled basis for safe sight distance, and appearances.
- (3) Drainage – Drainage structures are to be maintained to their as-constructed condition. Ditches cleaned as required for runoff. Ditch pulling may be specified when it is justifiable. Surface maintenance normally should occur after ditch pulling on aggregate surfaced roads. Specific consideration must be given to the disposal of materials excavated and the erosion potential caused.
- (4) Structures – More consideration shall be given to the appearance of a structure. Painting will be accomplished on a scheduled basis. Bridges, bridge rails, cattleguards, and fences shall be maintained to their as constructed condition.
- (5) Traffic Control Devices
 - a. Warning, regulatory signs and traffic-control devices are managed per MUTCD regulations.
 - b. Directional and guide signs are in place and properly maintained.
 - c. Signing on Schedule-A roads will be done by the Forest Service and/or Montrose County per Schedule-A Agreement.

- d. Markings – Centerline, edge stripping and similar types of markings painted on pavement and curbs shall be repainted as needed for effectiveness in periods of poor visibility.
- (6) Winter Maintenance – School routes will be plowed first, and then scheduled winter maintenance will occur between the hours of 5am and 9pm.

Section 4.05 Land Use Changes and ROW Acquisitions

Land use changes may include residential subdivision development, establishment of commercial or industrial facilities, expansion of recreational facilities or any other projects which change or intensify the use of land. All such changes should comply with the Montrose County Master Plan and, as applicable, the Montrose County Zoning and Subdivision Regulations. The centerline of ROW dedications resulting from a land use change should be made in conformance with the functional classification assigned to the facility by the Engineer in conformance with the Master Plan, and should align with the centerline of existing ROW. When precise alignment is not possible additional ROW dedication shall be provided such that safe and adequate design transitions can be made. ROW dedications should be based from section or aliquot division lines. Where the existing centerline of the road is more than ½ (one-half) of the traveled way out of alignment with the division line, the road centerline may be used as the baseline for the dedication. This exception is conditioned on a safe and gradual transition back to the division line being provided. The dedication should consider topographic or other physical constraints, and finally should include any adverse portion currently and/or historically managed within the public way. Where entirely new alignments are proposed, detailed site planning and alignment studies are required.

Section 4.06 Planning Principles

Basic factors in the design of a road system include:

- Safety - for both vehicular and pedestrian traffic.
- Efficiency of Service - for all users.
- Livability - route selection and design should consider the effects of traffic on adjoining property Owners.
- Economy - of construction, maintenance, and use of land.
- Service Life – new roads shall be designed to provide a useable service life of at least twenty (20) years before major resurfacing or capacity increase is needed.

Each of the following principles is an elaboration on one or more of these factors. The principles are not intended as absolute criteria, since instances may appear where certain principles conflict. These principles should be used as guides to proper system layout.

Provide Vehicular and Pedestrian Access

Road widths, placement of ADA compliant sidewalks or pathways, patterns of roads and number of intersections shall be designed for safe and efficient use of the road and access to adjacent lands.

Discourage Speeding

Residential roads and streets should be designed to discourage excessive vehicle speed, i.e., transverse concrete valley pans on local roads can be effective in reducing vehicle speeds while assisting in the routing of surface drainage.

Control Access to Arterials

Local road systems and land development patterns should not detract from the efficiency of arterial and collector roads. Ideally, land development should be planned so that no parcels require direct access to arterial or collector routes. The number of access points between the local road system and an arterial system should be minimized. Intersections along arterial routes should be properly spaced for efficient and safe traffic flow. Collector roads that intersect an arterial system will tend to have high traffic volumes

since they are the only access points. New residential lots directly accessing arterial roads should be avoided on existing routes, and allowed only when absolutely necessary.

Intersections

New roads should be designed with perpendicular intersections to enhance traffic safety. Extreme site conditions may require variance from perpendicular but, in no case shall the Engineer authorize intersections meeting at less than forty-five degrees (45°).

Courts and Cul-de-Sacs

A road ending with a cul-de-sac should be no longer than fifteen hundred feet (1500') to limit the number of residences having only a single emergency service route per Subdivision Regulations. All cul-de-sacs should have a minimum driving surface radius of forty feet (40') as measured to the outside edge of the traveled surface. Roads longer than fifteen-hundred feet (1500') shall terminate in a functional cul-de-sac having a driving surface of no less than fifty foot (50') radius and ROW of sixty foot (60') radius. Paved roads shall have a paved turn around, gravel roads shall have a gravel turn around. Roads without outlets should have a cul-de-sac or loop design. A "Y" or a "T" turn around at the end of the road segment may be authorized under special circumstances upon approval of the Engineer. Cul-de-sacs that may be vacated in the future should be improved to the functional classification standard of the road of which it will become a part. All turn arounds shall be designed to accommodate full size fire protection equipment and/or full size school bus.

Curves and Grades

Roads shall be designed with curve radii suitable for the intended design speed, and with grades suitable for the intended use of the adjoining land.

Section 4.07 Minimum Standards for New Public Roads

- Location and extent of new roads must be approved pursuant to Section 30-28-101 et.seq, C.R.S. unless it was shown as part of a Subdivision or Planned Development.
- Road dedication plats shall be designated as being a "Plat of Survey."
- The road shall be designed and constructed in accordance with this document.
- All new roads within a project shall be paved as a condition of approval when the total design traffic volume for the project, in accordance with the ITE manual, exceeds one hundred fifty (150) ADT. The Project Engineer must adequately justify the trip generation estimate with the concurrence of the County Engineer.
- Irrespective of the design traffic volume, a new road shall be paved when newly developed land (exclusive of road ROW, declared open space, or retained land) is four (4) units per acre or greater.
- The road must connect to another County road, State or Federal highway, or City street of the same or higher functional classification.
- All required road signs and traffic control devices shall have been installed in accordance with the MUTCD.
- All structures, culverts, bridges, utilities and all utility service laterals, etc. crossing the roadway shall have been installed per County standards and specifications and/or repaired prior to the road acceptance.
- A plat showing the Dedicated ROW, in format and detail satisfactory to the Engineer, shall have been prepared by a Professional Land Surveyor (PLS), and shall be submitted to the Engineer on reproducible mylar suitable for recording. All necessary survey monuments defining the ROW shall have been set by a PLS.
- A copy of "Red Lined" as-built record drawings shall have been submitted to the Engineer. The drawings shall accurately show all road construction details, utility locations, property boundaries and corners, and any other pertinent information as required. Upon its submission to the Engineer, the copy shall become and remain the property of the County.
- The applicant shall have submitted a request for acceptance of the road to the County. The County shall perform a final inspection within two (2) weeks from the date of submission of the

application, unless, at the sole discretion of the Engineer, weather conditions prohibit a complete inspection.

- The Engineer shall have completed a final inspection and shall have determined the road has been constructed in accordance with County Specifications and the approved plans, and shall have recommended acceptance, in writing.
- The Developer shall warrant all required public improvements (road, drainage, etc.) to be free of defects in materials and workmanship for a period of two years from the date of acceptance by the County, and shall promptly repair any defects during the warranty period. The Board may, at its discretion, require the Developer to post a bond, or other financial security acceptable to the Board, to guarantee performance under the warranty in accordance with Section 3.08. At the end of the warranty period, the applicant may request a final inspection and release of the bond. Upon inspection of the road by the Engineer, and correction of any deficiencies identified by such inspection, the Board shall release the applicant's security.
- No hazardous conditions have been constructed or developed in the clear zone that have not been mitigated.
- Such other conditions, as the Board deems necessary for public health, safety, welfare, or budget constraints.
- The County recognizes it may be to the benefit of the general public to accept roadways which may not meet the specifications outlined herein.
- New roads accessing onto a paved County road serving industrial or commercial activity or serving more than three (3) residential units or generating more than twenty-five (25) ADT shall have paved aprons extending the full width of the road going back thirty feet (30') from the edge of pavement on the public road.
- For a project that is accessed via a dedicated and undeveloped County right-of-way, the required road section to be constructed shall be based upon the average daily traffic (ADT) projected for the project. For 20 ADT or less, a temporary driveway shall be constructed within the right-of-way as directed by the County Engineer. For 20 to 50 ADT, a rural single-lane road shall be constructed within the right-of-way. For greater than 50 ADT, a two-lane road conforming to current County Standards for Roads and Bridges shall be constructed within the right-of-way.
- Design of the new road shall be based upon the accepted future classification of the proposed roadway.
- The design shall provide for open circulation of traffic through the project connecting to adjoining lands as directed by the County staff.

Section 4.08 Minimum Standards for Existing Public Roads

The minimum standards for an existing road to be considered adequate to serve as, or to support access for development are set forth below. The County Engineer shall determine if the minimum standards are complied with. A road accessing a proposed project that meets these minimum standards does not preclude the imposition of additional minimum road standards as may be determined by the Board to be necessary to preserve the public health, safety and welfare.

An evaluation and analysis of the road shall be provided to the County as part of the project proposal. All evaluations and analysis shall be conducted, signed and sealed by the Project Engineer. The evaluation, analysis and assumptions made shall be reviewed and concurred with by the County Engineer, prior to declaration by the County Engineer that the road accessing the proposed project is either adequate or inadequate.

Minimum Standards:

- Adequate sub-grade with no significant points of surface soil or geologic instability.
- Adequate drainage with no significant ponding of water, having drainage bar ditches of ten inches (10") or more in depth graded to drain.
- Minimum of nine inches (9") of compacted subbase aggregate as a constructed structural section.
- Minimum driving course of two inches (2") crushed aggregate sufficient for road maintenance.

- Maximum grade shall not exceed eight percent (8%).
- Minimum of twenty-four feet (24') driving surface with forty feet (40') of historic and usable existing ROW.
- Hazardous conditions identified within the clear zone shall be mitigated.
- In the event that the project will increase the traffic burden on an existing roadway in accordance with the ITE Manual by more than ten percent (10%), and will contribute to an overall traffic burden above two hundred forty-nine (249) ADT, the roadway is considered inadequate unless upgraded to meet current County standards. The Project Engineer shall adequately justify the trip generation estimate and obtain concurrence by the County Engineer.
- Rural roads serving the proposed project shall accommodate a design speed between twenty-five (25) and forty miles per hour (40 mph) to be proposed by the Project Engineer based upon design guidance provided in the Design Documents listed in Article IX, and concurred with by the County Engineer
- Local roads serving the proposed project shall accommodate a design speed between twenty-five (25) and thirty-five miles per hour (35 mph) to be proposed by the Project Engineer based upon design guidance provided in the Design Documents listed in Article IX, and concurred with by the County Engineer.
- Collector roads serving the proposed project shall accommodate a design speed between thirty-five (35) and forty-five miles per hour (45 mph) to be proposed by the Project Engineer based upon design guidance provided in the Design Documents listed in Article IX, and concurred with by the County Engineer.
- Minor arterial roads serving the proposed project shall accommodate a design speed between forty (40) and fifty-five miles per hour (55 mph) to be proposed by the project Engineer based upon design guidance provided in the Design Documents listed in Article IX, and concurred with by the County Engineer.
- Major arterial roads serving the proposed project shall accommodate a design speed between fifty-five (55) and sixty-five miles per hour (65 mph) to be proposed by the Project Engineer based upon design guidance provided in the Design Documents listed in Article IX, and concurred with by the County Engineer.

Roads that meet or exceed the above characteristics, but are judged inadequate due to other reasons, including excessive traffic at all times or specific peak periods, shall be further evaluated by traditional traffic engineering methods for structural adequacy, geometry, surface condition, traffic volume and level of service. All such evaluations of the adequacy of the roadway shall be conducted to the satisfaction of the County Engineer by the Colorado Registered Professional Engineer. The Project Engineer, who shall be experienced in Civil, Geotechnical and/or Traffic Engineering as it is appropriate to the evaluation being performed. Such evaluation shall be conducted utilizing the Design Documents listed in Article IX as specific guidance. In the event of conflicts between the design documents, such conflicts shall be resolved in accordance with direction from County Engineer.

Section 4.09 Access Policy

In accordance with Section 43-2-147 (1), C.R.S.; Montrose County controls access to County roads. All persons are required to obtain a County Access Permit prior to constructing a new connection to a County road. Application shall be submitted to the Engineer. The application shall provide evidence of adjacent land ownership to the public road or provide other right to trespass evidence. Such evidence must be reviewed and accepted by the Engineer. The application shall also describe the proposed use of the access, and include a design of the proposed access that conforms to these specifications and access policy. At the discretion of the Engineer, when the proposed access occurs where unusual conditions exist, the applicant may be required to provide an engineered design in conformance with *the State Highway Access Code* and/or *AASHTO "Green Book" (A Policy on Geometric Design of Highways and Streets, 2001)*, signed and sealed by a Registered Professional Engineer.

In the event that a new access triggers access improvements or modifications to the State Highway System or to other roads not under the jurisdiction of Montrose County, these access improvements shall be the full responsibility of the Developer/Permittee and/or agency that has administration jurisdiction over the new improvements.

Driveways: No more than one (1) Driveway access shall be allowed for each parcel or property unless it can be demonstrated that the access causes no harm or benefits public safety. Driveways are defined in three (3) distinct categories, Commercial/Industrial Driveway, Residential Driveway and Field Approach.

- A **Commercial/Industrial Driveway** shall be designed in accordance with estimated traffic type and volume but shall meet minimum standards established in Section 5.16.
- A **Residential Driveway** shall not serve more than three (3) residential dwellings or exceed more than twenty-five (25) ADT for two-way traffic and shall be constructed to meet the minimum standards as established in Section 5.17. The fourth residential dwelling shall require the conversion and consolidation of all existing access to a common new public road per Section 4.07.
- A **Field Approach** access may be permitted to access vacant land, undeveloped agricultural property or an isolated intermittent use structure. A field approach access shall not exceed an average annual ADT of one (1) vehicle per day (2 vehicle trips – 1 in and 1 out). A field approach shall be constructed to meet the minimum standards as established in Section 5.18.

Intersections with functionally classified roads and streets: New public roads and streets shall be established only by acceptance by the Board of County Commissioners. Construction of new public roads or street connections shall require an Access Permit and engineered design in accordance with the functional classification of the respective roads. To minimize conflicts and to provide for anticipated crossing and turning movements, geometric design of each intersection must be given careful consideration. Intersection locations shall be chosen to accommodate topography, to provide adequate sight distance, to minimize traffic hazards, and shall generally extend the pattern of existing roads.

Section 4.10 Connections with Existing Roadways

Proposed new road and street connections to existing roadways shall be designed in conformance with County Access Policy. Requests for access in conjunction with projects will be addressed as part of the subdivision process. Requests for access that arise independent of the subdivision process shall be directed to the County Engineer. Persons proposing to construct new access onto existing County roads outside of the County's Subdivision Process shall submit plans directly to the Engineer for review. Citizens are encouraged to discuss their intentions with the Engineer prior to investing in design work. Plans should include:

Permit Application: A completed access permit application and payment of application fee.

Topography: Include topographic mapping with two foot (2') contour intervals within five hundred feet (500') of the intersection, unless waived by the Engineer. The purpose of the mapping is to facilitate the design, and to demonstrate the intersection can be designed and constructed without creating unsafe conditions for traffic at the proposed intersection.

Plan and Profile: The design shall illustrate existing and proposed roadway improvements in sufficient detail for the Engineer to evaluate the design.

Road connections planned as part of projects under the County Subdivision Process may be constructed after approval of the Preliminary Plan by the Board of County Commissioners upon completion of an Access Permit. Connections planned outside of the subdivision process may be constructed only after the applicant receives written authorization from the Engineer.

Section 4.11 Off Site Design Requirements

When a roadway within a project terminates without connecting through to the next existing roadway due to intervening land ownership, project phasing, project boundaries, or similar factors, and where it would be prudent public policy to eventually connect the proposed new road through to an existing road, then the applicant proposing the new road may be required to design a connection across the intervening property to ensure that the future connection can eventually be built. The design need not be fully detailed, but shall be

sufficient to demonstrate that the connecting road can be constructed to comply with County minimum requirements governing curves, grades, intersections, and alignments. The proposed connection shall continue existing road patterns, provide adequate drainage, match existing intersections, respect existing land use, and generally conform to best engineering practices.

The County acknowledges that there are obvious practical limitations to the question of how far such a design extension may be required. The County has no intent or desire to place an undue burden on any Developer. The limits of such a design extension shall be negotiated on a case by case basis with the Engineer. In general, design extensions that extend more than thirteen hundred-twenty feet (1320') per every one hundred (100) ADT of new project traffic would be considered to be unduly burdensome on a Developer and beyond the scope of this section.

Section 4.12 Connection to Existing Substandard Road

A project having a total traffic impact of 140 ADT or more and fronting a County Road that does not meet current standards shall be required to improve the half of the County Road that fronts the project to current County Standards. The frontage improvements shall be designed and constructed inside the right-of-way to the proposed project property lines with a taper transition section outside the project property lines on either side to connect back to the existing roadway section. These transition improvements shall conform to current County Standards as required by the County Engineer.

The frontage improvements shall be designed and approved at the time of Subdivision Preliminary Plat approval or prior to issuance of an Access Permit. Construction shall be insured through an Improvements Agreement with the County. Frontage improvement construction for non-subdivision projects shall be completed prior to final construction approval of the Access Permit. Frontage improvement construction for subdivisions shall commence prior to Final Plat Approval according to the following schedule:

<u>Subdivision Size</u>	<u>Construction Required</u>
1 – 60 Lots	50% of the lots final platted
Greater than 60 Lots	30 lots final platted

Section 4.13 Right-of Way Dedications

In accordance with Subdivision Regulations, newly dedicated right-of-way resulting from the subdivision process for use as County roads shall be approved by the Board of County Commissioners and accepted with the following note attached to the recorded final plat:

This plat is approved by the Board of County Commissioners of Montrose County, for filing with the Clerk and Recorder of Montrose County and for conveyance to the County of public dedications shown hereon; subject to the provisions that approval in no way obligates Montrose County for maintenance of roads hereon dedicated to the public. This approval does not guarantee that the size, soil conditions, subsurface geology, groundwater conditions or flooding conditions of any lot shown hereon are such that a building permit, sewage disposal permit or any other required permit will be issued. This approval is with the understanding that all expenses involving required improvements for utility services, paving, grading, road signs, flood protection devices, drainage structures, and all other improvements that may be required, shall be the responsibility of the subdivider and not the County of Montrose.

All road dedication plats shall be designated as being a “Plat of Survey.”

Article V. DESIGN

Section 5.01 Application of Design Standards

These design standards shall apply to all new road construction intended for public use and/or dedication to Montrose County, and shall apply in general terms to reconstruction and improvement of existing public roads subject to Montrose County jurisdiction.

Section 5.02 Minimum Standards

The requirements described herein generally represent minimum or threshold values.

Section 5.03 Departure from Standards

Design standards are not inflexible. Higher standards may be used or required by the Engineer when circumstances warrant. If an alternate design or material or procedure can be shown to provide performance equal to or better than the required design, material or procedure, said alternate may be approved by the Engineer. Approval from the Engineer shall be provided in writing before the alternate design, material or procedure is implemented.

Section 5.04 Use of AASHTO and CDOT Publications

The latest editions of these State and National specifications are incorporated herein by reference to supplement this specification:

AASHTO Guidelines for Geometric Design of Very Low-Volume Roads (ADT ≤ 400)
AASHTO Geometric Design of Highways and Streets
AASHTO Standard Specifications for Highway Bridges
CDOT Standards and Specifications for Roads & Bridges.
CDOT Standard Plans, M & S Standards
CDOT State Highway Access Code
CDOT Design Code
CDOT Pavement Design Manual

In the event a conflict exists between the foregoing publications and this document, the more rigorous specification shall govern unless otherwise determined by the Engineer.

Section 5.05 Terrain Classification

For the purpose of this document, the terrain in Montrose County is divided into two categories:

Flat or Rolling Terrain: Average cross slope less than fifteen percent (15%), with ridges and draws not well defined. Most of the land in the Uncompahgre Valley falls into this category.

Mountainous Terrain: Average cross slope greater than fifteen percent (15%), with ridges and draws steep and well defined.

Section 5.06 Road Classification

The functional classifications used herein are defined in Article IV. When not specified on the Road Classification map, a functional classification designation shall be based on projected traffic volumes and/or as specified by County planning documents, or County Engineer.

Section 5.07 Design Speed

The choice of a design speed is influenced primarily by the terrain classification, functional classification of the road, and land use. The design speed is generally slightly higher than the posted speed. Acceptable ranges of minimum design speeds are as follows:

Functional Classification	Flat or Rolling		Mountainous	
	Design Speed	Posted Speed	Design Speed	Posted Speed
Major Arterial	70	50 – 65	65	45 – 60
Minor Arterial	65	45 – 60	60	40 – 55
Collector	50	30 – 45	50	30 – 45
Local Road	(25*) 35	20 – 35	35	30
Local Street	(25*) 30	20 – 30	30	25
Rural	30 - 45	25 – 45	30 - 40	20 – 35

*Lower Design Speed may be authorized by the Engineer based on project type, characteristics for safety considerations

Section 5.08 Alignment Transition Taper

When circumstances preclude precisely aligning a new road with an existing road it will join, then the following formula shall be used to determine the length of the horizontal transition or taper needed to match the alignments at the connection:

$$L = \frac{WS^2}{60}$$

Where: L = Length in feet
 W = width of offset, in feet
 S = Speed Limit, or 85th percentile speed, as directed by the Engineer.

Section 5.09 Geometric Standards of Horizontal Alignment

General Considerations

The major considerations in horizontal alignment are topography, road classification, design speed, grade profile, subsurface conditions, safety, and sight distance. All of these must be balanced to create an alignment that is safe and adequate for the functional classification of the road.

Stopping and Passing Sight Distance

The minimum stopping sight distance is the distance required by the driver of a vehicle traveling at design speed to bring the vehicle to a stop after an object on the road becomes visible. Horizontal alignment must provide at least minimum stopping sight distance for the design speed (not posted speed). Unless otherwise known, the design speed shall be estimated at five miles per hour (5 mph) above posted speed. This includes visibility at intersections, as well as around curves with roadside obstructions. Sight distance shall be measured within the horizontal confines of the ROW to ensure that sight distances can be maintained after adjoining landowners plant or build visual obstructions along the roadway.

Stopping sight distance is measured between the driver's eye, which is assumed to be three and one-half feet (3.5') above the roadway surface, and an object six inches (6") high on the roadway ahead.

MINIMUM STOPPING SIGHT DISTANCES
(from the CDOT State Highway Access Code)

<u>Design Speed (MPH)</u>	<u>Stopping Sight Distance (ft.)</u>
25	150
30	200
35	250
40	325
45	400
50	475
55	550
60	650
65	725

In some cases, passing sight distance may be required on collectors or arterials. The CDOT Design Guide should be used in determining passing sight distance. In the event that adequate passing sight distance cannot be provided, auxiliary passing or climbing lanes may be required.

Standards for Curvature

Tables 5-1 through 5-4 set the permissible minimum curve radii and the permissible maximum allowable rate of superelevation for the various functional classifications. The tables are based on design speed, friction factors, and superelevation, and do not consider sight distance.

Sudden reductions in standards introduce the element of surprise to the driver and should be avoided. Where physical restrictions cannot be overcome and it becomes necessary to design curvature of a lower standard than the design speed for the project, the design speed between successive curves shall not change by more than ten mile per hour (10 mph) increments. Under no conditions shall a curve for a design speed lower than the design speed of the project be introduced at the end of a long tangent or at other locations where high approach speeds may be anticipated. Use of lower than standard curve radii is subject to approval by the Engineer.

Angle points less than one degree require no curve radius. Compound curves (two contiguous curves of different radii with no tangent between them) will not be permitted. Broken-back curves (two curves in the same direction joined by a short tangent) will not be permitted.

A reduction in the centerline horizontal curve radii may be authorized by the Engineer for local roads within a new project for which the posted traffic speed shall be twenty-five (25) mph or less. Horizontal centerline radii may be reduced to between one hundred feet (100') and two hundred feet (200'), based on topography, traffic volume and safety concerns. Guidance is provided in that curve radii for local access roads (\leq 249 ADT) may be in the range of one hundred (100) to one hundred twenty-five feet (125') and

that radii for local roads rating as “Sub Collector” ($249 \geq 400$ ADT) could be reduced to one hundred-fifty feet (150’) to two hundred feet (200’) Radii.

Superelevation

One of the most important factors to consider in highway safety is the centrifugal force generated when a vehicle traverses a horizontal curve. Centrifugal force increases as the velocity of the vehicle and/or degree of curvature increases. The standard superelevation rates shown on Table 5-1 through Table 5-4 are designed to hold the side friction factor within tolerable limits for those operating speeds expected for the range of curve radii given.

For undivided roads, the axis of rotation of superelevation is usually the centerline. Where curves are preceded by long, relatively level tangents, the plane of superelevation may be rotated about the edges of the pavement to improve the perception of the curve.

A superelevation transition is variable in length depending upon the amount of superelevation. Two-thirds of the transition is normally in the tangent approach or departure at the beginning and the end of the curve, and one-third of the transition to or from full superelevation is at the beginning and at the end of the curve.

Coordination with Vertical Alignment

To avoid the possibility of introducing traffic hazards, coordination is required between horizontal and vertical alignment. Particular care must be exercised to maintain proper sight distance at all times. Sharp horizontal curves introduced at or near the top of a pronounced crest, or at the bottom of a sag vertical curve, should be avoided.

Section 5.10 Geometric Standards of Vertical Alignment

General Considerations

The centerline profile is designed to accommodate topography, primary usage of the road, drainage, structure clearances, horizontal alignment, safety, sight distance, design speed, and the performance of heavy vehicles on a grade.

Minimum and Maximum Grades

To provide for adequate drainage, the minimum value for sustained grades shall be no less than one-half percent (0.5%) on roadway sections with curb and gutter. Flat and level grades on uncurbed pavements are acceptable when pavement is adequately crowned to drain laterally, and the ditches are graded to drain. (Ref: CDOT Design Guide, AASHTO Chapters.)

Maximum permissible sustained grades (expressed in percents) for new roads are related to design speed and should conform to Table 5-5.

Table 5 - 1

MINIMUM CURVE RADIUS FOR DESIGN SPEED ON PAVED LOCAL ROADS

(without superelevation)

V	e	f	Radius
20	0	.18	150
25	0	.17	250
30	0	.16	375

Where $e + f = \frac{0.067V^2}{R}$ (e = superelevation, f = side friction factor, V = design speed, and R = curve radius)

Table 5-2

**MINIMUM CURVE RADIUS FOR DESIGN SPEED ON PAVED COLLECTORS
AND ARTERIALS**

From CDOT / AASHTO

Design Speed V Mph	E			f			e		
	E	Max f	Min R Ft	E	Max f	Min R ft	e	Max f	Min R ft
30	0.04	0.16	302	0.06	0.16	273	0.08	0.16	252
35	0.04	0.15	432	0.06	0.15	388	0.08	0.15	358
40	0.04	0.15	573	0.06	0.15	509	0.08	0.15	468
45	0.04	0.14	764	0.06	0.14	674	0.08	0.14	619
50	0.04	0.14	955	0.06	0.14	849	0.08	0.14	764
55	0.04	0.13	1206	0.06	0.13	1042	0.08	0.13	955
60	0.04	0.12	1528	0.06	0.12	1348	0.08	0.12	1206

Table 5 – 3

MAXIMUM SUPERELEVATION RATES

Road Type	Rural	Urban
Arterial	0.08	0.06
Collector	0.06	0.06
Local	0.06	0.04

Table 5 – 4

SIDE FRICTION FACTORS
FOR PAVED ROADS
 (From CDOT / AASHTO)

V mph	f
20	0.17
25	0.16
30	0.16
35	0.15
40	0.15
45	0.14
50	0.14
55	0.13
60	0.12

Table 5 – 5

MAXIMUM ROAD GRADES, %

Terrain Classification	Design Speed						
	15	20	25	30	40	50	60
Flat & Rolling:	6%	6%	6%	6%	6%	5%	4%
Mountainous:	11%	10%	9%	9%	8%	7%	6%

The maximum design grade should be used infrequently rather than as a design standard to be used commonly. For short grades less than two hundred feet (200'), the maximum gradient may be increased by one percent (1%), with the approval of the Engineer. Also, terrain factors or other variables may require that steeper grades be used in certain situations. Any exceptions to the values shown in the table must be approved by the Engineer, and under no circumstances shall a grade steeper than fifteen percent (15%) be used.

In flat or rolling terrain, all grades shall flatten to four percent (4%) or less for at least one hundred feet (100') approaching intersections, and for at least fifty feet (50') entering and leaving turn-arounds or cul-de-sacs. In mountainous terrain, all grades shall flatten to six percent (6%) or less for at least seventy-five feet (75') approaching intersections and entering switchbacks or cul-de-sacs.

Vertical Curves

All vertical curves shall be designed to provide adequate stopping and passing sight distance, comfortable driving, good drainage, and a pleasing appearance. Vertical curves shall be parabolic.

Vertical curves are not required where the algebraic difference of grades is less than two percent (2%) for design speeds less than thirty-one miles per hour (31 mph), or less than one percent (1%) for design speeds above thirty miles per hour (30 mph). In general, the minimum length of a vertical curve shall be the greater of three hundred feet (300'), or the sight stopping distance, or the vertical curve minimums derived from Table 5-6. Unequal tangent vertical curves are permitted only in special circumstances as approved by the Engineer.

Vertical curves that are long and flat may develop poor drainage at the level section. This must be overcome by providing positive drainage at the flow line of the ditch section.

Table 5 – 6

DESIGN CONTROLS FOR VERTICAL CURVES

(From CDOT Design Manual Table 202.4)

Design Speed MPH	Sight Stopping Distance		"K" Factors (Length = "K" Times Algebraic Difference in Grades)			
	Minimum Ft	Desirable Ft	Crest		Sag	
			Minimum	Desirable	Minimum	Desirable
20	125	125	10	10	20	20
25	150	150	20	20	30	30
30	200	200	30	30	40	40
35	225	250	40	50	50	50
40	275	325	60	80	60	70
45	325	400	80	120	70	90
50	400	475	110	160	90	110
55	450	550	150	220	100	130
60	525	650	190	310	120	160
65	550	725	230	400	130	180
70	625	850	290	540	150	220

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

Sight Distance

Minimum lengths of crest vertical curves are often controlled by stopping sight distance requirements as shown in Table 5-6.

Minimum lengths of sag vertical curve are often controlled by headlight sight distance, and should be nearly the same as stopping sight distance.

Section 5.11 Cross Section Standards

Typical Sections

Typical sections for each functional classification are given in the attached standard details. Variations from these typical sections may be approved by the Engineer when there is sufficient evidence that certain design elements can be modified without compromising the performance of the facility.

Right of Way (ROW) Width

The basic minimum ROW width for each typical section is specified in Article IV. This width is sufficient only to accommodate the specific geometric cross-sectional elements that are required. Cut and fill slopes beyond the hinge point and ROW may require slope easements or wider ROWs.

Cross Slope

On most County roads the high point of the crown shall be at the centerline of the pavement and the pavement shall slope downward toward the edges at a uniform rate. A standard cross slope of two percent

(2%) shall be used on the traveled way for pavements and treated earth/gravel surface types. A cross slope of three percent (3%) shall be used for gravel roads.

In mountainous terrain, local roads may be insloped or outsloped on a constant two percent (2%) slope to alleviate surface erosion due to runoff, provided safe speed requirements are met.

At intersections, or in unusual situations, the crown position may vary depending upon drainage or other factors.

Side Ditches (Borrow Ditches)

Side ditches are required in cut sections without curbs and gutters. The slope from the edge of the shoulder to the bottom of the ditch shall not be steeper than 3:1.

Curbs and Gutters

Curbs and gutters may be required on urban roads or when drainage, traffic, or public safety necessitates. All curbs and gutters are to be constructed with Class B concrete (CDOT Specifications) and shall conform to the Standard Details in Appendix F (Misc Standards), unless otherwise approved by the Engineer.

Side Slopes

Cut and fill slopes shall not be steeper than 2:1 unless the design is based upon the recommendations of the Project Geotechnical Engineer. Cut slopes less than five feet (5') high shall be 3:1.

The tops of all cut slopes shall be rounded with a minimum of a four foot (4') radius where the material is other than solid rock, and shall be reseeded with vegetation native to the area or as recommended by the NRCS. The ditch at the lower end of the cut shall discharge away from the base of adjacent fill slopes, or be satisfactorily riprapped, in order to avoid erosion and improve appearance.

Section 5.12 Ramps for Physically Handicapped

All newly constructed, repaired or replaced sidewalks and curbs shall provide access for physically handicapped persons in conformance with ADA Guidelines.

Section 5.13 Horizontal and Vertical Clear Zone

Minimum horizontal clearance from the edge of the traveled way (including gravel shoulders, if any) to any obstruction shall eight feet (8'), unless greater clearance is required to meet sight distance minimums (official signage and bridge structures will be considered individually.) Horizontal clear zone distance shall not be less than that identified by Figure A.

Minimum vertical clearance from the high point on the traveled surface shall be sixteen feet (16'). Exceptions may be granted by the Engineer to accommodate special circumstances.

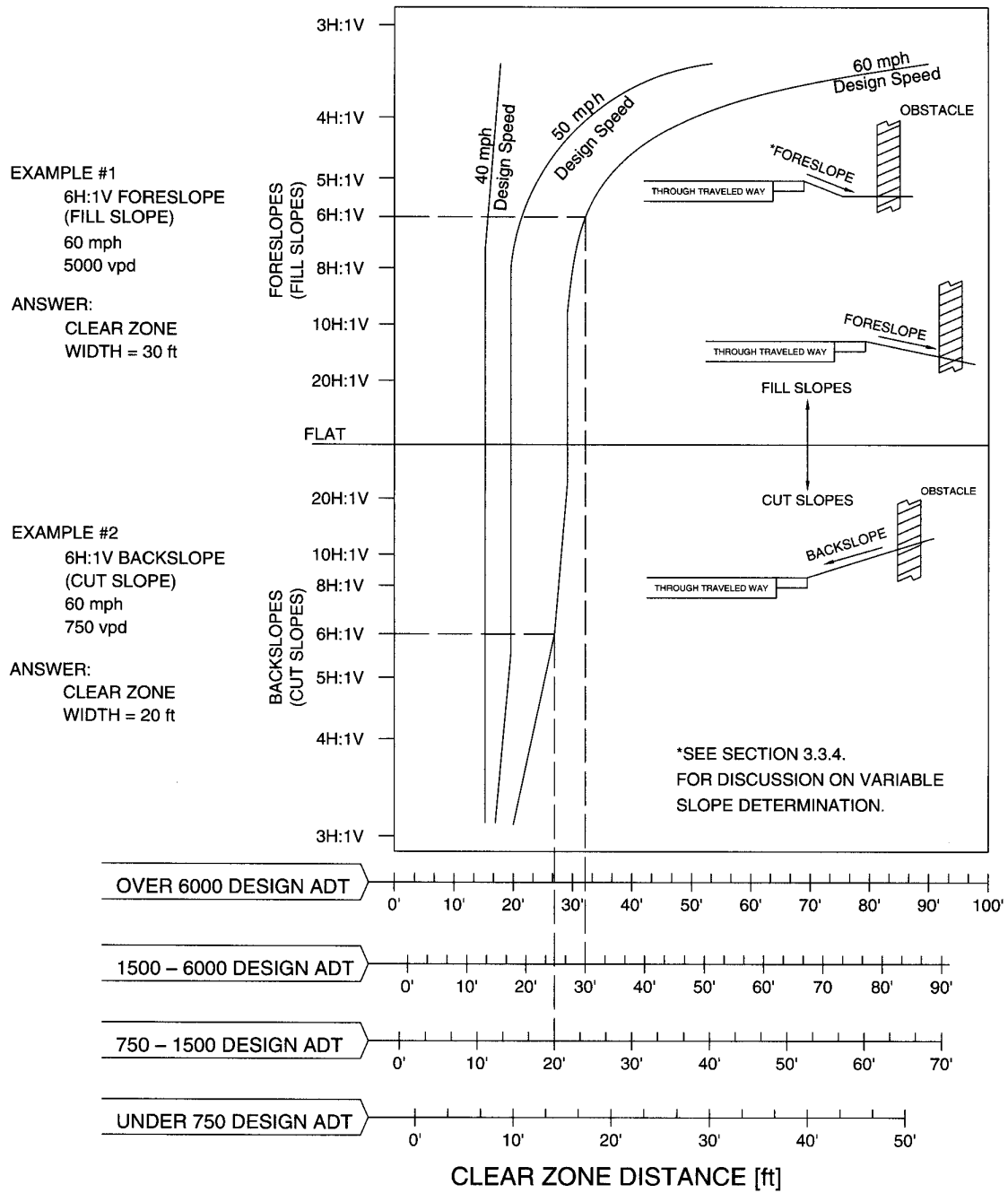


FIGURE A
Clear-zone distance curves

(From CDOT Roadside Design Guide)

Section 5.14 Landscaping

Any and all landscaping within the ROW shall be of a type that is readily maintained by Montrose County Road and Bridge Department mechanized equipment. Drainage flow in roadside ditches shall not be compromised by landscaping features, including trees, shrubs, boulders or cobbles. Owners of abutting properties are prohibited from installing any landscaping elements within the ROW which can adversely affect the maintenance or performance of any roadway or drainage component. Any such installations within County ROW may be removed from same as deemed necessary by the Engineer; costs incurred by such removals will be billed directly to the Owner(s).

Section 5.15 Access Design General Requirements

All access to County or State controlled roads and highways shall be required to obtain the proper access permits. Adequate sight distance shall be maintained by all vehicles in the vicinity of the access.

In addition to stopping and entering sight distance as described in the CDOT State Highway Access Code, there is a special situation on a horizontal curve that needs to be analyzed in a Sight Distance Report. This distance is for a left-turning vehicle entering the proposed access. Stopping sight distance shall be measured to this turning vehicle (represented by the 4.25' height) as it crosses the centerline into the lane of travel of the vehicle traveling at design speed.

A. Intersections with Public and Private Roads

- (1) **Intersections:** New roads joining existing roads shall be designed with perpendicular intersections extending at least one hundred feet (100') away from the edge of travel way of the intersection (the Engineer may authorized variations under extreme conditions). Intersections should be located on sections of the existing road that provide for at least the entering sight distance for the posted speed plus five miles per hour (5 mph) in each direction, and shall be located across from each other or at least stopping sight distance (sight distance along highway) for posted speed plus five miles per hour (5 mph) away from other existing intersections. Intersections should be located to continue existing street patterns, and shall provide adequate safe sight distance for traffic entering and leaving the new road. Auxiliary turn lanes shall be constructed when warranted in accordance with the State Access Code.

Intersections occurring on horizontal curves or crest vertical curves can create hazards for traffic. Proposals for intersections on curves will be evaluated by the Engineer on a case by case basis, and may be allowed if adequate sight distance can be achieved. Realignment of the existing road, at the applicant's expense, may be required to mitigate traffic hazards.

- (2) **Drainage:** Surface drainage from new roads and adjoining property shall not be carried onto existing road surfaces. Drainage at historic rates may be conveyed into historic drainage systems in existing ROWs, but in general the County's policy shall be to encourage the conveyance of surface drainage into streams, ditches, and designated drainage corridors outside of the ROW. Culverts shall be installed in any drainage crossed by a road. Any road culvert within the County ROW shall be at least fifteen inch (15") diameter unless otherwise approved by the Engineer. The culvert size should be capable of passing the 25 yr-24 hr storm event. The drainage discharge rate from a 25 year-24 hr. precipitation event from a new project into existing ROW shall not exceed the historic drainage discharge rate from the site to the ROW.
- (3) **Residential Development:** New roads providing access to Residential and Planned Unit Developments for more than thirty-five (35) individual units should provide at least two (2) connections to the public road system when possible, in order to provide redundant access for emergency service providers, and for emergency egress purposes.

B. Vertical Alignment at Intersections

Within the ROW of the existing County road, maximum grades for intersecting new roads shall be four percent (4%). The new intersecting road shall slope downward and away from the existing County road surface at a two percent (2%) grade for at least ten feet (10') from the edge of the traveled way to ensure that the new connecting road runoff does not flow onto the surface of the existing County road and there is a landing for stopped vehicles waiting to enter the travel lanes. The vertical curve for the new intersecting road shall begin at this point.

C. Driveways

All driveways (Field Approach, Residential Driveway, Commercial/Industrial Driveway) shall be designed to provide safe and convenient access to the road, without impeding the normal flow of traffic.

- (1) Mountainous Terrain: Residential Driveways and Field Approaches for lots in proposed projects on mountainous terrain shall be designed to ensure that access to each lot is possible and practical. No driveway shall exceed eight percent (8%) grade within twenty feet (20') of the traveled way nor ten percent (10%) grade from a point twenty feet (20') from edge of traveled way to within forty feet (40') outside of the ROW.
- (2) Cuts and Fills: Driveways requiring significant earthwork shall be discouraged. Applicants are encouraged to plan projects to avoid access through areas requiring heavy earthwork. In circumstances where heavy earthwork or retaining walls will be required within the public road ROW to provide access to a lot, the applicant shall define a building envelope, and shall design and construct the driveway to serve that building site. The same shall be clearly shown on the Preliminary and Final Plat.
- (3) Three Unit Limitation: Where characteristics of a site require sharing a common driveway, no more than three (3) units shall be served by the common driveway. Accessory dwelling units are considered individual residences for purposes of this section.
- (4) Not Encroach: Driveways shall be designed and located so that the flared portion adjacent the public roadway shall not encroach on the adjoining property.
- (5) Connection to Public Roads: Driveways shall be generally perpendicular to the public road for a distance of at least forty feet (40') from the edge of the traveled way. The Engineer may grant exemption to this requirement on a case by case basis where terrain and topography present unusual difficulty meeting the requirement.
- (6) Corners: Driveways should not connect to public roads in curves unless authorized by the Engineer when there is no practical alternative.
- (7) Safe Sight Distance: Driveways shall be located and constructed so that drivers entering the public roadway can see and be seen by drivers on the public roadway for a safe distance in each direction. Sight distance assessments shall not be made using a speed of less than the posted speed, but may be increased up to the eighty-fifth (85th) percentile speed, provided data is available or the posted limit plus ten miles per hour (10 mph) when data is not available, based on the Engineer's judgment.
- (8) Easements: Shared driveways, and driveways across lands owned by others, shall be located in recorded easements. The cost of driveway maintenance within such easements shall be borne by the beneficial users thereof.

- (9) **Culverts** shall be installed in any drainage crossed by a driveway. Any driveway culvert within the County ROW shall be at least twelve inch (12") diameter CSP set on a minimum one-half percent (½%) grade unless otherwise approved by the Engineer.

Section 5.16 Commercial/Industrial Driveways

General: Improvements within the County ROW must conform to County specifications and Permit requirements. Commercial/Industrial Driveways shall be located opposite existing driveways where possible, or be offset by a minimum of five hundred feet (500') or as necessary to accommodate completing left turn movements. All such driveways shall be designed and constructed to accommodate the all weather passage of Emergency Service vehicles.

Dimensions: All Commercial/Industrial Driveways that access a County road or ROW shall have a minimum surface width of forty feet (40') (not including curb return radii) at the edge of the pavement or road surface, and may taper to a minimum surface width of twenty-four feet (24') at a distance of forty feet (40') from the edge of the public road. Access approach radii shall not be less than thirty feet (30') and shall not be greater than justified by design vehicle performance.

Surfacing: Commercial/Industrial Driveways, when adjacent to a paved roadway, shall be surfaced with asphalt (3" minimum on 6" DOT Class 6 gravel), or concrete (5" minimum) for a minimum of forty feet (40') back from edge of the public road.

Approach to County Road: Driveway designs which only allow for backing off of, or onto a County road or street shall not be allowed.

Grades: Maximum grades within the ROW or for a minimum of forty feet (40') from edge of traveled way for Commercial/Industrial Driveways shall be four percent (4%). The driveway shall slope downward and away from the County road surface at two percent (2%) for at least ten feet (10') from edge of the traveled way to ensure that driveway drainage does not flow onto the surface of the County road. The Engineer may authorize variation under extreme conditions.

Design for Adverse Weather: In order to facilitate access by emergency vehicles, commercial and truck traffic during adverse weather, a maximum grade of four percent (4%) and minimum centerline curvature radii of eighty feet (80') is required for north facing slopes, and a maximum grade of six percent (6%) with a minimum centerline curvature radii of sixty feet (60') is required for south facing slopes.

Drainage: All Commercial/Industrial Driveways and approaches shall be constructed so that they shall not interfere with the drainage system of the roadway. The applicant will be required to install, at his own expense, culverts or drainage structures where the driveway crosses a roadside drain ditch. The dimensions of all drainage structures must be approved by the Engineer prior to installation. The minimum size of culvert will be twelve inch (12") diameter CSP unless otherwise approved by the Engineer. Pipe must extend a minimum of eighteen inches (18") beyond the 3H:1V fill section on both sides.

Alignment: Commercial/Industrial Driveways shall be generally perpendicular to the County road for a distance of at least forty feet (40') beyond the edge of the traveled way. The Engineer may grant exemption to this requirement where topographic constraints exist. No more than one driveway shall be allowed on any parcel of property when there is less than one hundred feet (100') of property frontage. In the case of flared driveways, the flared portion adjacent to the traveled way shall not encroach upon adjoining property.

Gates: An access approach or driveway that is gated shall be designed so that the longest vehicle normally using it can completely clear the traveled way when the gate is closed. In no event shall the distance between the closed gate and the edge of the traveled way be less than forty feet (40').

Auxiliary Lanes: Auxiliary Turn Lanes shall be constructed when warranted in accordance with the State Access Code.

Section 5.17 Residential Driveways

General: Improvements within the County ROW must conform to County specifications and permit requirements. New Residential Driveways shall be spaced or located opposite existing Residential Driveways where possible, or be offset by a minimum of one hundred feet (100'), and five hundred feet (500') if opposite or adjacent a Commercial/Industrial Driveway. All such driveways shall be designed and constructed to accommodate the all weather passage of Emergency Service vehicles.

Dimensions: All driveways that access a County road or ROW shall have a minimum surface width of twenty feet (20') at the edge of the pavement or road surface, and taper to a minimum surface width of twelve feet (12') at a distance of ten feet (10') from the edge of the road, and maintain this surface width to the edge of the County ROW. Access approach radii shall be twenty-five feet (25') for Arterial roads and twenty feet (20') for Collector and Local roads.

Surfacing: Driveways within the County ROW shall be surfaced with crushed ¾" road base (6" minimum), asphalt (2" minimum on 6" of gravel), or concrete (5" minimum.)

Approach to County Road: Driveway designs which only allow for backing off of, or onto a County road or street will not be approved, except when approved by the Engineer for local roads or streets designed and constructed to serve a series of individual residential lots of 15,000 ft² or less.

Grades: Within the ROW, maximum grades for driveways shall be four percent (4%). The driveway shall slope downward and away from the County road surface at two percent (2%) for at least ten feet (10') from edge of the traveled way to ensure that driveway drainage does not flow onto the surface of the County road. The Engineer may authorize variation under extreme conditions.

Design for Adverse Weather: In order to facilitate access by emergency vehicles during adverse weather, a maximum grade of six percent (6%) and minimum centerline curvature radii of eighty feet (80') is recommended for north facing slopes, and a maximum grade of eight percent (8%) with a minimum centerline curvature radii of sixty feet (60') is recommended for south facing slopes.

Drainage: All driveways and approaches shall be constructed so that they shall not interfere with the drainage system of the roadway. The applicant will be required to install, at his own expense, culverts or drainage structures where the driveway crosses a roadside drain ditch. The dimensions of all drainage structures must be approved by the Engineer prior to installation. The minimum size of culvert will be twelve inch (12") diameter CSP unless otherwise approved by the Engineer. Pipe must extend a minimum of eighteen inches (18") beyond the 3H:1V fill section on both sides.

Alignment: Driveways shall be generally perpendicular to the County road for a distance of at least thirty feet (30') beyond the edge of the traveled way. The Engineer may grant exemption to this requirement where topographic constraints exist. No more than one driveway shall be allowed on any parcel of property when there is less than one hundred feet (100') of property frontage except in subdivisions or on local streets with lot sizes of ½ acre or less. In the case of flared driveways, the flared portion adjacent to the traveled way shall not encroach upon adjoining property.

Gates: An access approach or driveway that is gated shall be designed so that the longest vehicle normally using it can completely clear the traveled way when the gate is closed. In no event shall the distance between the closed gate and the edge of the traveled way be less than thirty feet (30').

Auxiliary Lanes: Auxiliary Lanes shall be constructed when warranted in accordance with the State Access Code.

Section 5.18 Field Approach

General: Improvements within the County ROW must conform with County specifications and permit requirements. New Field Approaches shall be located opposite other access points where possible, or be offset by a minimum of one hundred feet (100').

Dimensions: All Field Approaches that access a County road or ROW shall have a minimum surface width of twenty feet (20') at the edge of the pavement or road surface, and may taper to a minimum surface width of twelve feet (12') at a distance of ten feet (10') from the edge of the road, and maintain this surface width to the edge of the County ROW. Access approach radii shall not be less than required for design vehicle. Minimum radii is twenty feet (20') on Arterial and Collector Roads and fifteen feet (15') on Local roads.

Surfacing: Field Approaches shall be unsurfaced or surfaced with crushed ¾" road base gravel.

Approach to County Road: Field Approach designs which only allow for backing off of, or onto a County road or street will not be allowed.

Grades: Within the ROW, maximum grades for driveways shall be six percent (6%). The driveway shall slope downward and away from the County road surface at two percent (2%) to four percent (4%) for at least ten feet (10') from edge of the traveled way to ensure that driveway drainage does not flow onto the surface of the County road. The Engineer may authorize variation under extreme conditions.

Design for Adverse Weather: Not applicable.

Drainage: All Field Approaches and approaches shall be constructed so that they shall not interfere with the drainage system of the roadway. The applicant will be required to install, at his own expense, culverts or drainage structures where the approach crosses a roadside drain ditch. The dimensions of all drainage structures must be approved by the Engineer prior to installation. The minimum size of culvert will be twelve inch (12") diameter CSP unless otherwise approved by the Engineer. Pipe must extend a minimum of eighteen inches (18") beyond the 3H: 1V fill section on both sides. In some instances the Engineer may allow the Field Approach to cross the roadside drainage ditch by fording.

Alignment: Field Approaches shall be generally perpendicular to the County road for a distance of at least thirty feet (30') beyond the edge of the traveled way. The Engineer may grant exemption to this requirement where topographic constraints exist. No more than one Field Approach shall be allowed on any parcel of property when there is less than one hundred feet (100') of property frontage.

Gates: An access approach or driveway that is gated shall be designed so that the longest vehicle normally using it can completely clear the traveled way when the gate is closed. In no event shall the distance between the closed gate and the edge of the traveled way be less than the distance to the edge of ROW.

Section 5.19 Access to Arterial Roads

A. Driveway Access

Driveway access to arterial roads shall be permitted only when the property in question has no other access to the County road system. New projects serving multiple parcels shall provide access to each parcel via a local road or street. When direct access must be provided, the following conditions apply:

- (1) Access directly onto an arterial shall be temporary, and may continue only until such time that some other reasonable access to a lower functional classification road or highway becomes available. The access permit shall specify the future reasonable access location and, if known, the date the change will be made. Projects should be designed, if possible, to provide for alternative

access at a future date. All costs associated with future changes to a temporary access shall be the responsibility of the accessing landowner.

- (2) No more than one access shall be provided to an individual parcel or to contiguous parcels under the same ownership unless it can be shown that additional accesses would be significantly beneficial to the safety and operation of the road or the local circulation system or that there is no long term (20 year) foreseeable adverse impact to the additional access. Any second access permit for an individual parcel or owner shall be conditional, and may be revoked at any time based upon changing traffic loads and/or public safety concerns. Subdivision of a parcel should not result in additional access unless shown to be necessary for safety or operational reasons. Low usage Field Approach access roads are exempt from this requirement.
- (3) Driveway access locations are subject to the approval of the Engineer. Residential Driveways joining arterials shall generally be located at least three hundred feet (300') away from existing public road intersections with the arterial (500' for Commercial/Industrial Driveways), unless a greater offset is required to provide safe sight distance for traffic on the arterial, or for vehicles entering the arterial from the driveway. Field approaches shall be discouraged unless no other access is available.

B. Intersections with Arterial Classified Roads and Streets

The frequency of road and street intersections along arterial roads shall be limited to promote efficient movement of traffic. For rural arterial road sections where significant development is not expected in the foreseeable future, minimum spacing of all intersecting public roads, roads and highways should generally be on one-half (1/2) mile intervals, plus or minus approximately two-hundred feet (200'). Where topography makes such spacing inappropriate, location of public approaches shall be determined by topography, property ownerships, property lines and physical design constraints. The final location should serve as many properties and interests as possible to minimize the need for direct private access to the road system.

In areas where development accesses an arterial road, a traffic engineering study shall be required to properly locate all proposed access points. These studies shall be submitted to the Engineer for review prior to the issuance of an Access Permit. Signed and sealed Engineered Designs in accordance with the *State Access Code* and the *AASHTO "Green Book"* are required and shall meet the minimum standards as established with these specifications. Minimum spacing for new intersections shall not be less than five hundred feet (500') spacing, when it can be demonstrated by a traffic study to be safe and acceptable to the Engineer.

Section 5.20 Access to Collector Roads

A. Driveway Access

In general, driveways shall connect to local roads and streets, and those local roads and streets shall connect to collector roads. Driveways connecting directly to collectors may be permitted for individual parcels by the Engineer when no reasonable alternative exists. New projects serving multiple parcels shall provide access to each parcel via a local road or street which then connects to an existing local road or to a collector.

No more than one access to a collector road shall be provided to an individual parcel or to contiguous parcels under the same ownership unless it can be shown that additional access approaches would not be detrimental to the safety and operation of the road, and are necessary for the safe and efficient use of the property. Driveway designs that only allow for backing off of or onto a County collector road are not permitted.

Subdivision of a parcel does not create a right to directly access a collector road. Access requests will be evaluated under the subdivision process, and shall be authorized in accordance with County Access Policy and good engineering practice.

Driveways located on a collector, and near an intersection shall be constructed so that the edge nearest the intersection is no less than three hundred feet (300') from the center line of the intersecting road for Commercial/Industrial driveways and two hundred fifty feet (250') for residential driveways.

A single Field Approach shall be allowed to each site/property as requested, unless determined to be unsafe. Minimum set back from an intersecting public road shall be one hundred feet (100').

B. Intersections with Collector Classified Roads

The frequency of road and street intersections along collector roads shall be limited to promote efficient movement of traffic. For rural collector road sections where significant development is not expected in the foreseeable future, minimum spacing of all intersecting public roads, roads and highways should generally be on one-quarter (1/4) mile intervals, plus or minus approximately two-hundred feet (200'). Where topography makes such spacing inappropriate, location of public approaches shall be determined by topography, property ownerships, property lines and physical design constraints. The final location should serve as many properties and interests as possible to minimize the need for direct private access to the road system. Minimum spacing for new intersections shall not be less than three hundred feet (300') spacing, when it can be demonstrated by a traffic study to be safe, and acceptable to the Engineer.

In areas where projects access a collector road, a traffic engineering study shall be required to properly locate all proposed access points. These studies shall be submitted to the Engineer for review prior to the issuance of an Access Permit. Signed and sealed Engineered Designs in accordance with the *State Access Code* and the *AASHTO "Green Book"* are required and shall meet the minimum standards as established with these specifications.

Section 5.21 Access to Local Roads

A. Driveway Access

No more than one access approach shall be provided to an individual parcel or to contiguous parcels under the same ownership except adjacent platted subdivision lots unless it can be shown that additional access approaches would not be detrimental to the safety and operation of the road, and are necessary for the safety and efficient use of the property. Driveways located near an intersection shall be constructed so that the side nearest the intersection is no less than two hundred feet (200') from the center line of the intersecting road for Commercial/Industrial Driveways and seventy-five feet (75') for residential driveways.

A single Field Approach shall be allowed to each site/property as requested, unless determined to be unsafe. Minimum set back from an intersecting public road shall be seventy-five feet (75'). A greater distance may be required by the Engineer based on site specific conditions.

B. Intersections with Local Classified Roads

The frequency of local road and street intersections along local roads shall be limited to promote efficient movement of traffic. Where significant development is not expected in the foreseeable future, minimum spacing of all local public roads should generally be no less than five hundred foot (500') intervals. Where topography makes such spacing inappropriate, location of public approaches shall be determined by topography, property ownerships, property lines and physical design constraints. The final location should serve as many properties and interests as possible to minimize the need for direct private access to the road system. New local roads joining local roads shall be spaced no closer than two hundred foot (200') intervals unless otherwise approved by the Engineer during the subdivision process.

In areas where projects access an existing local road, a traffic engineering study may be required to properly locate all proposed access points. These studies shall be submitted to the Engineer for review

prior to the issuance of an Access Permit. Signed and sealed Engineered Designs in accordance with the *State Access Code* and the *AASHTO "Green Book"* are required and shall meet the minimum standards as established with these specifications.

Section 5.22 Intersection and Access Approach Radii

The travel surface at intersections shall be flared to accommodate turning movements of the largest vehicle expected to use the access on a regular basis, see AASHTO "Green Book". Minimum radii of curvature for curb returns shall be twenty feet (20') for local roads, twenty-five feet (25') for collectors, and thirty-five feet (35') for arterials, unless otherwise required by the Engineer. The intersecting road with the highest classification shall determine the required radii.

Property corner lines adjacent to intersections shall be curved or clipped at forty five degrees (45°) to preserve at least the same clearance between the edge of the traveled way and the ROW line that exists on straight sections of the roadways.

Section 5.23 Sight Distance at Intersections and Driveways

A. Clear Vision Areas

A clear vision area shall be designed and maintained at the corners of all new projects adjoining roadway intersections, including driveways and railroads, to preserve required minimum sight distances for vehicles. Property lines and/or vision easements shall be established to facilitate clear vision areas. The horizontal extent of the clear vision area shall be designed in accordance with the AASHTO Green Book.

For single-way or multiple-way stop or signal controlled intersections, the sight triangle shall be sufficient to allow a driver of the second vehicle in queue thirty feet (30') from the stop line to clearly see the driver of the second vehicle in queue of the adjacent road.

B. Prohibited Structures

The clear vision area shall contain no planting, fence, wall, sign, utility appurtenance, structure, or other obstruction exceeding thirty inches (30") in height, measured from the top of the curb or the finished grade at the centerline of the street. Traffic control devices installed in accordance with the MUTCD are exempt from this provision.

C. Intersections and Driveways

Through Traffic: Intersections and driveways shall be designed to provide the minimum required stopping sight distance at the intersection, for through traffic on the through street, in accordance with these standards and the State Access Code (See Section 5.11).

Stopped Traffic: Intersections and driveways shall be designed to provide the minimum required sight distance along the through street for stopped traffic on the cross street, as measured from a point fifteen feet (15') back from the edge of the traveled way, and from a height of three and one-half feet (3.5') above the road surface at that point.

The Engineer may require ancillary measures to preserve that sight distance from future encroachment. Unobstructed line of sight easements may be required on corner lots on the plats of newly developed property.

Vehicles may not be parked along the through street within the required line of sight for vehicles on the cross street that are stopped at the intersection. "No Parking" regulatory signs may be required at the discretion of the Engineer.

Section 5.24 Pavement Structure Design

A. General Design Procedure and Requirements

Pavement structural sections shall be designed by a Colorado Registered Professional Engineer (“design engineer”) in general conformance with current CDOT / AASHTO procedures to provide a useful service life of at least twenty (20) years for local roads, twenty-five (25) years for Collector roads and thirty (30) years for Arterial roads.

B. Pavement Structure Design Report

A pavement structure design report, prepared, signed, dated and stamped by the Project Engineer, shall be submitted to the Engineer in conjunction with plan submittal for all new roads, to demonstrate that the design was based upon actual conditions on the site, and prepared in conformance with these specifications. The report shall include the following information:

- (1) Traffic Analysis: The Project Engineer shall estimate the 20th year or greater, future daily traffic, by volume and type of vehicle, for the purpose of estimating design loadings on the pavement structural section during the design service life of the pavement section.
- (2) Equivalent Single Axle Loadings (ESAL): The Project Engineer shall calculate the design service life cumulative ESAL’s for each road segment from the projected average daily traffic volumes (ADT) for each road, based on one-hundred percent (100%) of full development at build-out and/or the traffic analysis for the design service life, whichever is greater. The design service life ESAL estimates shall include all truck, school bus, and local service traffic that can reasonably be expected to utilize the road, including construction traffic expected during construction build-out, and, where appropriate, construction traffic passing through the project to serve subsequent projects.

In no case shall the design ESAL* be less than the following:

- Local roads – Class II Total ESAL \geq 0.3 million
Exception for Local without through traffic to 100,000
- Collector roads – Class III Total ESAL \geq 0.5 million
- Arterial roads – Class IV Total ESAL \geq 1 million

** for more information on this subject refer to the Asphalt Institutes Publication “Thickness Design – HMA Pavement for Highways and Streets” (MS-1) and “HMA Pavement Thickness Design” (IS-181).*

- (3) Soil Sample Data: Soil conditions shall be evaluated at representative locations along the proposed roadway alignment at four hundred foot (400’) intervals (but in any event at least two (2) samples) shall be evaluated by the Geotechnical Engineer, and reported in soil logs illustrating the soil profile to a depth of at least four feet (4’) below proposed subgrade elevation.
- (4) Soil Sample Classification: Representative soil samples for pavement design from each sample location shall be taken from within two feet (2’) below proposed subgrade elevation, and shall be visually classified and grouped according to the AASHTO Unified Soil Classification Table by the geotechnical engineer. Atterberg Limits and Gradation (sieve analysis) tests may be performed as necessary to verify soil classifications, at the discretion of the Geotechnical Engineer.
- (5) Subgrade Support Characteristics: The load bearing capacity of each soil type in the road alignment shall be measured in a qualified laboratory either by the California Bearing Ratio (CBR value)(ASTM D1883 or AASHTO T 193), or the Hveem Stabilimeter (“R” value) (ASTM D2844 or AASHTO T 190) methods to determine the load bearing capacity of the subgrade.
- (6) Street Structural Section: Alternatives structural sections for ranges of ESAL’s shall be prepared by the Project Geotechnical Engineer, based upon the measured subgrade CBR or R Values, in accordance with the procedures contained in the current edition of the CDOT Pavement Design

Manual. For projects of modest scope, the structural section shall be designed to accommodate the least satisfactory soil type. For more extensive projects, separate structural section recommendations may be provided for the different soil types identified in the soil boring logs. The Geotechnical Engineer shall identify the sections of the project for which each structural section is recommended.

- (7) Selection of Street Structural Section: The Project Engineer shall select the most appropriate structural section(s) for estimated ESAL for each street from among the alternatives provided by the Geotechnical Engineer but shall not be less than the full structural equivalent of the County minimum section..

C. Small Project Exclusion

The cost of pavement structural “design” may be unduly burdensome on small projects. The Engineer may grant a waiver from the pavement structural design requirements for local roads or streets serving less than twenty five (25) residential units across land which has, in the judgment of the Engineer, adequate bearing capacity. In that situation, the County minimum structural section requirements may be substituted for rigorous testing and design.

D. Minimum Structural Sections

The minimum structural section for local paved roads on fine grained (silts and clays) soils shall consist of three inches (3”) of Hot Mix Asphalt, four inches (4”) of crushed CDOT Class 6 aggregate, and twelve inches (12”) of CDOT Class 2 aggregate, or the structural equivalent thereof. The Engineer may approve lesser sections where the underlying soil is native gravel, sandstone, or rock, upon recommendation by the Project Geotechnical Engineer.

Subgrade – Shall be natural ground capable of supporting the proposed roadway. Wet, unstable or soft subgrade will require design by a Colorado Registered Professional Engineer. One CBR test (ASTM D1883 or AASHTO T 193) or R value test (ASTM D2844 or AASHTO T 190) shall be taken for each soil type to be encountered in the alignment of the proposed roadway, within five feet (5’) of the native ground surface. Submittal of test results shall occur prior to County acceptance of the road plan and profile. Minimum acceptance criteria for CBR = 5 or for R value = 10. Results lower than the minimum acceptance criteria shall require the roadway to be designed by and constructed under the direct quality assurance supervision of a Colorado Registered Professional Engineer. Subgrade shall be compacted to ninety percent (90%) “modified proctor” density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

Subbase - A minimum of twelve inches (12”) compacted thickness of aggregate subbase meeting the gradation and plasticity requirements of CDOT Class 2 aggregate is required. Crushed CDOT Class 1 aggregate may be specified in substitution by the Project Engineer based on professional judgment in consideration of actual site conditions. Subbase gravel shall be compacted to ninety-three percent (93%) “modified proctor” density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

Base Course – For residential local roadways that are to be paved prior to acceptance by the County, a minimum of 4 inches (4”) of compacted aggregate base material is required. The materials shall meet the gradation, fracture and plasticity requirements of CDOT Class 6 aggregate, and the fracture and plasticity requirements of these specifications. CDOT Class 6 base course gravel shall be compacted to ninety-five percent (95%) “modified proctor” density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

For gravel roads a minimum of 6 inches (6”) of compacted crushed aggregate base material is required. CDOT Class 6 base course gravel shall be compacted to ninety-five percent (95%) “modified proctor” density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture. The materials shall meet the gradation, and fracture of CDOT Class 6 aggregate. Plasticity and fines content (- #200 sieve size only!) may be higher, contact County Engineer for detailed specifications.

All other roadways shall be designed utilizing actual site soils and estimated traffic data. The design shall be performed by a Colorado Registered Professional Engineer.

Montrose County (MC) Surface Course Gravel – Gravel surfaced roads shall be topped with four inches (4”) of ¾” minus crushed gravel meeting the base course gravel standards but having plasticity index between 4 to 10 and a #200 (75µm) sieve fines content between 10-16%. This product is similar to that specified by the U.S. Forest Service for their gravel-surfaced roads.

Section 5.25 Grade Preparation

Geotechnical Requirements:

Subgrade preparation shall conform to project specific recommendations by the Project Geotechnical Engineer. In the absence of specific geotechnical recommendations, the following general requirements shall apply.

Stripping:

Strip all vegetation, sod, and organic materials from the cut and fill zones. Strip topsoil when directed by the Project Engineer. In timbered areas, remove all wood larger than three-fourth inch (3/4”) diameter or more than two feet (2’) long. Dispose of all organic materials outside of the work area.

Fill Sections:

Moisture condition the top twelve inches (12”) of native, undisturbed subgrade soil in fill zones, by wetting or drying as needed, to +/- two percent (2%) of optimum moisture, and compact to ninety percent (90%) “modified proctor,” (AASHTO T 180). Scarifying to twelve inches (12”) deep may be required to adequately moisture condition the soil.

Where cross slopes exceed ten percent (10%), cut horizontal benches into the native soil prior to beginning fill placement operations.

Place fill in shallow lifts, moisture condition to +/- two percent (2%) of optimum moisture, and compact to ninety percent (90%) “modified proctor,” (AASHTO T 180). Lift depths are subject to the approval of the Project Engineer, and are dependent upon the type, weight, and power of the compaction equipment in use. In general, full depth compaction cannot be achieved if lift depth exceeds twelve inches (12”).

The top lift of a fill section shall be scarified, moisture conditioned, and recompacted if it has been left unworked long enough for weather or traffic to materially degrade the density and moisture content of the previously compacted fill.

Cut Sections:

In fine grained (silts and clays) soils, scarify the subgrade to twelve inches (12”) deep, moisture condition to +/- two percent (2%) of optimum moisture, and compact to ninety percent (90%) “modified proctor,” (AASHTO T 180), unless otherwise directed by the Project Engineer. When soil moisture conditions are near optimum, simple compaction of the subgrade without scarifying may be approved by the Project Engineer.

In native gravel, compact the subgrade with heavy rubber-tired equipment until all loose gravel disturbed by grading operations has been compacted back to its original density. Proof rolling with fully loaded tandem 10 yd³ dump truck may be approved by the Engineer as substitute for density testing in native gravels, when directly observed and documented by the Project Engineer. Such documentation shall be certified to the Engineer.

In native shale, cut down to subgrade elevation and leave the shale undisturbed. Do not scarify undisturbed native shales. Shale that has been disturbed by construction operations shall be removed and replaced with material that can be reliably compacted.

Unstable Subgrade:

If unstable conditions are encountered at subgrade elevation, the Project Engineer shall determine remedial measures.

Density Testing Locations:

Density testing frequency will be determined by County standards, unless increased by the Project Engineer.

Density testing is required when constructing a roadway that will be dedicated to the County or modifying an existing public road under County jurisdiction. Density tests are to be taken on subgrade, subbase and base course materials. Test results shall be submitted to the Engineer during construction for review. The Engineer may grant waiver to this regulation for some public road modifications under specific considerations.

Subgrade – One (1) test every two hundred lineal feet (200 lf) as measured along the centerline of the road. The approximate test location should be taken alternating from left to right hand lanes. It is desired to have the tests taken at the apparent weakest/softest location as determined by visual observation in the outside 1/3 of each lane. A minimum of two (2) tests are required per road.

When subgrade consists of materials that, in the opinion of the Project Engineer, can not be adequately tested for compaction by conventional test methods, proof rolling of the subgrade may be substituted when concurrence is obtained from the County Engineer. Combined methods may be required.

Subbase - One (1) test every one hundred lineal feet (100 lf) as measured along the centerline of the road. The approximate test location should be taken alternating from left lane to center to right lane. It is desired to have the tests taken at the apparent weakest/softest location as determined by visual observation in the outside 1/3 of each lane and near centerline. A minimum of three (3) tests are required per road or filing of road. When authorized by the Engineer, proof rolling may be substituted for density testing when subbase is Class 2 or Class 3 gravel. The Project Engineer must be willing to certify that nuclear density testing equipment will not yield reliable results and further certify proof rolling observations as being unyielding, providing photographs and written field reports to the Engineer.

Base Course – One (1) test every lineal feet (100 lf) as measured along the centerline of the road. The approximate test location should be taken alternating from the right lane to center to left lane. It is desired to have the tests taken at the apparently weakest/softest location as determined by visual observation in the outside 1/3 of each lane and near centerline. It is desirable to have this testing pattern opposite of that performed for the subbase. A minimum of three (3) tests are required per road.

Proof Roll:

Upon completion of subgrade, subbase and base preparation, the Developer shall proof roll each layer with heavy (minimum fully loaded +10 yd³ tandem dump truck or equivalent) rubber-tired equipment in the presence of the Project Engineer to demonstrate the stability, uniformity, and load carrying capacity of the subgrade. Any soft area identified during proof rolling will be repaired and proof rolled again prior to placement of the next layer.

Section 5.26 Structural Section Aggregates

Aggregate for Street Structural Sections

All Aggregate shall be of uniform quality, hard, durable crushed stone or gravel, free from clay balls, vegetable matter, or other deleterious substances, meeting the requirements in the following sections.

Paving Aggregate shall meet CDOT grading S, SG or SX requirements for Superpave Hot Mix Asphalt (HMA) mix designs. Aggregates meeting the requirements in the properties table shall be used to develop

the Job Mix Formula for the HMA mixture. The aggregate should be composed of angular, coarse textured, cube shaped particles. Natural fine material ($\frac{3}{4}$ " minus) shall be screened out and discarded before crushing. Sand may be used to obtain gradation of the blended aggregate mixture but should not exceed more than fifteen percent (15%). If the percent of aggregate passing the #4 sieve is greater than ten percent (10%) by weight of the individual aggregate sample, plasticity will be determined in accordance with AASHTO T 90. The gradation of the aggregates used in the mixture shall meet the criteria shown in the Aggregate Master Range Table, and shall be well graded from coarse to fine. The nominal size aggregate used in the HMA mixture shall not be more than one-third ($\frac{1}{3}$) the thickness of the HMA lift being constructed.

Base Course Gravel shall be $\frac{3}{4}$ " minus crushed gravel or rock conforming to CDOT Class 6 gradation requirements, with an R value of seventy-eight (78) or greater. At least fifty percent (50%) of the #4 plus fraction of the aggregate shall have at least two (2) fractured faces. Aggregate must meet a minimum hardness requirement defined by the L.A. Abrasion Test: Material loss during the test shall not exceed forty-five percent (45%) at five hundred (500) revolutions (AASHTO T 96). CDOT Class 6 base course gravel shall be compacted to ninety-five percent (95%) "modified proctor" density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

Hot Mix Asphalt Aggregate Properties

Property	Test Procedure	Coarse Retained on #4 Sieve	Fine Passing the #4 Sieve
Fine Aggregate Angularity	CP ¹ -L5113 Method A		45% Minimum
Fractured Faces (minimum of 2)	CP-45	70% Minimum	
LA Abrasion	AASHTO ² T 96	45% Minimum	
Flat and Elongated Pieces	AASHTO M 283	10% Maximum	
Sodium Sulfate Soundness	AASHTO T 104	12% Maximum Combined Coarse and Fine	
Adherent Coating (Dry Sieve)	ASTM ³ D 5711	0.5%	45% Minimum
Sand Equivalent	AASHTO T 176		45% Minimum

¹CP designates Colorado Department of Transportation material Testing Procedures

²AASHTO designates American Association of State Highway and Transportation Officials testing procedures

³ASTM designates American Society for Testing and Materials

CDOT Aggregate Master Range Table for Hot Mix Asphalt Mixtures

Sieve Size	Percent by Weight Passing Square Mesh Sieves		
	Grading S	Grading SG	Grading SX
1½"		100	
1"	100	90 – 100	
¾"	90 – 100		100
½"			90 – 100
3/8"			
#4			
#8	23 – 49	19 – 45	28 – 58
#30			
#200 ¹	2 – 8	1 – 7	2 – 10

¹These limits include the weight of lime at 1% if used.

Montrose County (MC) Surface Course Gravel. Gravel surfaced roads shall be topped with four inches (4") of ¾" minus crushed gravel meeting the above base course gravel standards but having placidity index between 4 to 10 and a - #200 (75µm) sieve fines content between 10-16%. This product is similar to that specified by the U.S. Forest Service for their gravel-surfaced roads.

Natural Fines Prohibited: The ¾" minus fraction of any aggregate that is screened off as a first step in producing paving aggregate may not, without further processing and testing, be used in street structural sections.

Subbase Gravel shall be crushed gravel or rock conforming to CDOT Class 1 or Class 2 gradation requirements, with an R value of sixty-nine (69) or greater. At least fifty percent (50%) of the #4 plus fraction of the aggregate shall have at least one (1) fractured face. Aggregate must meet a minimum hardness requirement defined by the L.A. Abrasion Test: Material loss during the test shall not exceed forty-five (45%) at five-hundred (500) revolutions (AASHTO T 96). Subbase gravel shall be compacted to ninety-three percent (93%) "modified proctor" density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

Class 3 (Pit Run, River Run, Bank Run) Gravel may be substituted for crushed Class 2 gravel when recommended by the Geotechnical Engineer based upon laboratory testing of the proposed source. Thicker structural sections will be required when pit run is substituted for crushed Class 2 base course gravel. Pit run sources are subject to the approval of the Engineer. CDOT Class 3 pit run gravel shall be compacted to ninety-three percent (93%) "modified proctor" density, AASHTO T 180, between minus two percent (-2%) and plus three percent (+3%) of optimum moisture.

Section 5.27 Asphalt Paving

Asphalt paving will be performed in conformance with *CDOT Standards and Specifications for Road & Bridges*, latest edition, supplemented as necessary with technical details from the Colorado Asphalt Pavement Association's *Guide Contract Documents and Specifications for Hot Mix Asphalt Pavement on Colorado Roadways*, and with these Standards and Specifications.

Section 5.28 Hot Mix Asphalt Mix Design

Mix designs for Hot Mix Asphalt Pavement shall be prepared in a qualified laboratory under the direct supervision of a Colorado Registered Engineer practicing in this field, in conformance with CDOT methods and procedures for 75 design gyration Superpave HMA. An individual mix design shall be prepared for each aggregate source. Mix designs shall be submitted to the Project Engineer for review at least ten (10) days prior to paving, and must be approved by the Project Engineer prior to commencement of paving operations. A copy of the mix design shall be provided to the Engineer.

The mixture design shall include the following items:

1. Source(s) of materials.
2. Aggregate gradation, specific gravity, source and description of individual aggregates and the final mixture blend.
3. Aggregate physical properties.
4. Source and grade of Performance Graded binder along with certification of binder.
5. Proposed Job Mix Formula: aggregate and additive blending, final gradation shown on a 0.45 power graph, optimum binder content.
6. Mixing and compaction temperatures.
7. N_{ini} , N_{des} , and N_{max}
8. Mixture properties measured at a minimum of four trial binder contents, interpolated to select optimum binder content, and graphs showing mixture properties versus binder content.
9. Anti-stripping agent - product name and manufacturer (if used).
10. Percent of Recycled Asphalt Pavement if used in the mixture.

Section 5.29 Asphalt Requirements

Asphalt Binder

Recommended Performance Graded asphalt binders are listed in the following table, and shall meet the requirements listed in subsequent table, Properties for Performance Graded Binders. Any asphalt binder supplied must be from an approved source certified by the Colorado Department of Transportation.

Recommended Asphalt Binders for Colorado

Traffic Condition	Non-modified Binders	Modified Binders
Low	PG 58-28	PG 58-34
Moderate	PG 64-22	PG 64-28
High		PG 76-28
Trails and Pathways	PG 58-28	
Parking Lots	PG 64-22	

Properties of Performance Graded Binders

Property	PG Graded Binder Requirements					AASHTO Test No.
	58-34	58-28	64-22	64-28	76-28	
Original Binder Properties						
Flash Point Temperature, °C, minimum	230	230	230	230	230	T 48
Viscosity at 135 °C, Pa•s, maximum	3	3	3	3	3	TP 48
Dynamic Shear, Temperature °C, where G*/Sin @ 10 rod/sec. 1.00 kPa	58	58	64	64	76	TP 5
Ductility, 4°C (5cm/min) cm, minimum				50		T 51
Toughness, joules, minimum				12.4		CP L-2210 ¹
Tenacity, joules, minimum				8.5		CP L-2210 ¹
RTOF Residue Properties AASHTO T 240						
Mass Loss, percent maximum	1	1	1	1	1	T 240
Dynamic Shear, Temperature °C where G*/Sin @ 10 rads. 2.20 kPa	58	58	64	64	76	TP 5
Elastic Recovery, 25 °C, percent minimum					50	CP L-2211 ¹ Method A
Ductility, 4 °C (5 cm/min) cm, minimum				25		T 51
Pressure Aging Vessel Residue Properties, Aging Temperature 100 °C PP 1						
Dynamic Shear, Temperature °C where G*/Sin @ 10 rads. 5000 kPa	16	19	25	22	28	TP 5
Creep Stiffness, @ 60 s, test Temp. In °C	-24	-18	-12	-18	-18	
S, maximum, Mpa	300	300	300	300	300	TP 1
m-value, minimum	0.3	0.3	0.3	0.3	0.3	TP 1
Direct Tension, Temp. in °C, @ 1 mm/min. where failure strain 1.0%	-24	-18	-12	-28	-18	TP 3

¹CDOT Test Method

The Developer shall provide upon request to the Engineer, acceptable "Certification of Compliance" of each applicable asphalt binder grade that will be used on the project. Binder grades other than those shown above shall not be used unless the proposed binder and the mix design are approved by the Engineer.

Mixture Binder Selection

The asphalt binder to be used in the HMA mixture will depend on the local traffic, elevation, and climate conditions. PG 64-22 will generally be satisfactory for projects below 7000' elevation in Montrose County.

Prime Coat Requirements

Prime coat is not required in Montrose County when paving occurs immediately (less than 14 calendar days) after placement and compaction of the base course gravel. If there is to be a significant delay between preparation of the base and paving operations, or if the base will be subject to traffic or adverse weather prior to paving, then a prime coat may be required by the Engineer. Prime coat material shall either be an Emulsified Asphalt Prime Coat or a Penetrating Priming Stabilizer conforming to the requirements in the following Table:

Requirements for Prime Coat Materials

Asphalt Emulsion Prime			Penetrating Priming Stabilizer			
Property	Requirement	AASHTO Test #	Property	Requirement		AASHTO Test #
				Max.	Min.	
Saybolt Furol Viscosity at 50 °C (122 °F), s	15 –150	T 59	Flash (T.O.C.). °C (°F)	38 (100)		T 79
Settlement	1% Max.	T 59	Saybolt Furol Viscosity at 50 °C (122 °F), s	30	100	T 72
% Residue	65% Min.	T 59 to 260 °C (500 °F)	Kinematic Viscosity at 60 °C, mm/s (140 °F, centistokes)	60	212	T 201
Oil Distillate by Volume %	7% Max.	T 78	Residue by evaporation, %	55		T 59
Test on Residue from Distillation:			Tests on Residue:			
Solubility in Trichloroethylene, %	97.5 Min.	T 44	Penetration, 25 °C (77 °F), 5 sec, mm	25		T 49
Tests on Residue from Cutback Distillation to 360 °C (680 °F):			Softening Point Ring & Ball, °C (°F)		71 (160)	7 53
Viscosity, 60 °C, mm/s (140 °F, centistokes)	3000 (3000) Min.	T 202				

Tack Coat Requirements

Tack coat is required between lifts of asphalt pavement. Tack Coat material shall be an emulsified asphalt conforming to AASHTO M 140 or M 208 for the designated grades.

Material Acceptance

Prior to the delivery of materials to the job site, the Developer shall submit certification tests to the Project Engineer, for his approval, showing all materials to be used on the project meet the appropriate specification. This requirement may be waived by the Project Engineer for stationary asphalt plants in regular production in this area. The certification shall show the appropriate test(s) for each material, the test results and a statement that the materials meet the appropriate specification. If the Engineer request

samples of the materials for verification testing prior to and/or during the production of the HMA mixture, the Developer shall deliver the requested materials to the owner's designated representative within two (2) days of receiving the request.

Section 5.30 Hot Mix Asphalt Mixture Composition

The HMA mix shall be composed of well-graded aggregate, mineral filler, anti-stripping agent (if required and approved) and asphalt binder. Recycled Asphalt Pavement can be incorporated into the mix if so stated and allowed in the Special Provision.

The mix design(s) shall meet the requirements of the CDOT Aggregate Master Range Table for Hot Mix Asphalt Mixtures, Recommended Asphalt Binders for Colorado Table, Properties of Performance Graded Binders Table, Superpave Mixture Properties Table and Voids in Mineral Aggregate Table. The HMA mixture(s) will be designed for the traffic level, nominal aggregate size and binder grade designated in the Special Provisions.

Superpave Mixture Properties

Test Property	Traffic Levels		
	Local and Collector Roads	Minor Arterials	Arterials
Traffic Level - Design period ESALs	< 100,000	< 3 million	>3 million
Initial Gyration, N _{ini}	6	7	8
Air voids @ N _{ini}	> 8.5	> 9.5	> 11.0
Design gyration, N _{des}	50	75	100
Hveem Stability, CP-L 5106	NA	28 min.	30 min.
Voids Filled w/Asphalt, VFA, MS-2	70 - 80	65 - 78	65- 75
Lottman, Tensile Strength Ratio, % retained CP-L 5109	80 min.	80 min.	80 min.
Lottman, Dry Tensile Strength, psi, CP-L 5109	30 min.	30 min.	30 min.

Voids in Mineral Aggregate

Nominal Maximum Particle Size ¹	Minimum VMA - %		
	Design Air Voids - %		
	3	4	5
½"	13	14	15
¾"	12	13	14
1"	11	12	13

¹The nominal maximum particle size is one sieve size larger than the first sieve to retain more than 10 percent

Recycled Asphalt: If the Developer proposes to use Recycled Asphalt Pavement (RAP) in the HMA mixture(s), the resulting mixture(s) must meet the same requirements as a mixture(s) that do not contain RAP. The RAP shall be of uniform quality. The maximum size of the RAP shall be 1½" prior to the introduction into the mixer. The maximum aggregate size contained in the combination of RAP and new

aggregate shall not exceed the maximum specified in the CDOT Aggregate Master Range Table for Hot Mix Asphalt Mixtures.

Plant Mix Production Verification

Hot Mix Asphalt mixtures produced for use on roads in Montrose County shall be tested to verify the volumetric properties prior to the start of the placement on a road. This testing shall be performed by qualified technicians working under the supervision of a Colorado Registered Professional Engineer. If the mixture(s) has been produced for another project within the last ninety (90) days, verification results from that project can be submitted for this verification. Superpave mix design volumetric tolerances for the approved HMA mixture(s) shall be within the limits shown in Tolerances Table:

HMA Mixture Design Verification Tolerances

Property	Tolerance
Air Voids	± 1.2%
VMA	± 1.2%
Binder content	± 0.3%
Stability	Mix design minimum

Section 5.31 Weather Restrictions

The HMA mixture shall be placed only on properly constructed surfaces that are dry and unfrozen, and only when weather conditions allow for proper handling and compacting of the mixture. The HMA shall be placed in accordance with the temperature limits shown in the following Table, and only when weather conditions permit the pavement to be properly placed and compacted as determined by the Project Engineer. Placement and compaction of the HMA may be accomplished at temperatures below that shown in the table only when the compaction requirements stated herein can be obtained.

HMA Pavement Placement Temperature Limitations

Paving Course	Thickness	Minimum Air Temperature °F	Surface Temperature °F
Surface	All	40- 50	40 - 55
Subsurface	< 3"	40	40 - 44
Subsurface	>3"	32	36

Section 5.32 HMA Temperature Restrictions

The temperature of the HMA mixture, for different asphalt binder grades, when discharged from the plant shall be within the maximum and minimum limits shown in the following table. The HMA mixture shall be produced at the lowest temperature within the specified temperature range that produces a workable mix and provides for uniform coating of aggregates (ninety-five percent (95%) minimum in accordance with AASHTO T 195), and allows the required compaction to be achieved.

HMA Mixture Mixing Temperature Limits

Asphalt Binder Grade	Minimum Discharge Temperature	Maximum Discharge Temperature
PG 58 – 28	275° F	305° F
PG 64 – 22	290° F	320° F
PG 76 – 28	320° F	350° F

Section 5.33 HMA Acceptance Testing

Pavement shall be compacted to **92% to 96% of the maximum theoretical density**, measured in accordance with AASHTO T 209. Compaction shall begin immediately after the mixture is placed and continue without interruption until the required density is obtained. **Compaction shall be substantially completed before the temperature of the mat falls below 185° F.**

Acceptance Testing Frequency

Test	Procedure	Specification Tolerance Limits	Frequency
Asphalt Content (QC)	AASHTO T 308-01 (CP-L 5120)	+/- 0.3%	1 per 1000 Tons or 1 per day min.
Gradation (QC)	AASHTO T 27-99 (CP 31A)	Gradation Limits Table	1 per 1000 Tons or 1 per day min.
Air Voids (QA)	AASHTO T 269-97	+/- 1.2%	1 per 1000 Tons or 1 per day min.
Void in Mineral Aggregate (QA)	CP 48-95	+/- 1.2%	1 per 1000 Tons or 1 per day min.
Percent Relative Compaction (QA)	CP 51-98	94% ± 2%	1 per 500 Sq Yd

Section 5.34 Concrete

Concrete used to construct infrastructure within Montrose County ROW shall conform to the following minimum requirements unless higher standards are imposed by project plans. ACI and CDOT concrete specifications, latest editions, are incorporated herein by reference.

Developer shall submit a concrete mix design to the Project Engineer for approval at least ten (10) days prior to the first concrete placement. The mix design submittal shall include recent test data demonstrating the performance of the design. Admixtures are subject to the approval of the Project Engineer. Copies of approved mix design(s) shall be provided to the Engineer upon request.

Concrete shall achieve a minimum 4,000 psi compressive strength at twenty-eight (28) days. Slump shall not exceed four inches (4"). Entrained air shall conform to the approved mix design, generally five percent (5%) to eight percent (8%). Wetting of the surface during finishing is prohibited. Freshly placed concrete surfaces shall be protected from rain for twenty-four (24) hours. Concrete shall be protected with curing compound approved by the Project Engineer, applied immediately after finishing work is complete.

Concrete shall be protected from freezing for at least five (5) days after placement. If daytime temperatures are consistently below sixty degrees Fahrenheit (60° F), and fall below freezing at night, ACI specifications for cold weather concrete placement will be implemented.

Quality assurance testing, including measuring slump, air content, and compressive strength, shall be provided by the Developer. Testing frequency shall conform generally to CDOT standards, subject to modification by the Project Engineer and approval of the Engineer. Test results shall be provided to the Project Engineer, with copies to the Engineer.

Forming and finishing tolerances are subject to the approval of the Engineer. In general, line and grade shall be within +/- 1/4" of true in any ten foot (10') section unless otherwise specified by approved project plans. Concrete which fails to meet forming and finishing tolerances shall be removed and replaced at no cost to the County.

Reinforcing for structural concrete shall be installed in accordance with the engineered design. Reinforcing inspection by the Project Engineer or his representative is required on all structural concrete. Records of each reinforcing inspection shall be prepared at the time of inspection, and copies thereof shall be submitted to the Engineer upon request.

Structural concrete shall be consolidated using suitable vibrating equipment. The Project Engineer shall inspect structural concrete immediately upon removal of the forms. Prior approval of the Project Engineer is required before any surface repairs are undertaken. Any concrete which, in the opinion of the Project Engineer, is not adequately consolidated during placement shall be removed and replaced at no cost to the County.

All concrete surfaces shall be finished to drain minimum flowline grade of 0.5%. Any area that retains water more than 1/2" deep, or which covers more than 2 ft², shall be repaired or reconstructed as determined by the Engineer.

Concrete surfaces which are subject to pedestrian or vehicular traffic shall be surfaced with a light broom finish unless otherwise specified in the approved plans.

Concrete curb, gutter, sidewalk, and pan shall be cast upon base course gravel and subgrade compacted to project specifications. Subgrade and gravel shall be tested for density on a frequency determined by the Project Engineer with approval of the Engineer. For continuous runs of concrete flatwork more than one hundred lineal feet (100 lf) long, the subgrade and base course gravel shall be proof rolled using a fully loaded truck, in the presence of the Project Engineer, prior to forming and casting concrete. The purpose of the proof roll is to verify the load bearing capacity of the subgrade and the base. Any portion of the subgrade or the base which fails to carry the proof roll load without yielding shall be removed, reworked, replaced, retested, and proof rolled again.

Section 5.35 Drainage

A. Applications

This section presents minimum required standards for the design of road drainage systems. Design of ditches, storm sewers, drainage courses and drainage crossings shall be performed by a Colorado Registered Professional Engineer. Proper and adequate accommodation of drainage shall be provided for the protection of the roadway facilities and the safety of the public.

B. Design Criteria

Facilities for the collection and movement of water through public ROW shall be designed to safely pass the flow from a one hundred (100) year two (2) hour storm (or runoff) event.

C. Hydrology

The Project Engineer shall prepare a detailed hydrologic analysis/report of the drainage basin(s) contributing to the flow passing through primary drainage facilities and structures, and shall size those facilities to safely pass the peak flow and associated debris from a 100 year, 24 hour storm..

Minor culverts serving modest drainage basins less than or equal to twenty (20) acres may be sized by the Project Engineer's experience and judgment without numerical analysis but must be sufficient to pass the same event.

Major culverts (4 foot diameter or larger) and bridges (10 foot or more in span) and/or serving drainage basins larger than twenty (20) acres shall be designed with full hydraulic analysis of the storm and routing.

The Project Engineer shall provide a signed/sealed and dated copy of assumptions and analysis as a Drainage Report and Analysis to the Engineer for review and acceptance of methods, assumptions, conclusions and concurrence. The conclusion of the Report shall contain the following statement: "There will be no detrimental impact to adjacent or downstream properties as a result of this project."

The following methods are routinely used in Montrose County.

Rational Method - The rational method is recommended for storm sewer, culvert design, and overland flow of minor drainage basins. It is simple, and when used with adequate input parameters it provides reasonable results for use in project design for basins less than two-hundred (200) acres. The basic equation is $Q=CIA$, where:

Q = Peak discharge in cubic feet per second (cfs)

C = Coefficient of runoff (dimensionless)

I = Average rainfall intensity for a duration equal to the time of concentration of the watershed (inches/hour)

A = Drainage area of the watershed (acres)

Soil Conservation Service (SCS) Unit Hydrograph Method and SCS Tabular Hydrograph Method (TR-55) - In most drainage basins, rainfall runoff data from which unit hydrographs can be derived is unavailable, and a synthetic unit hydrograph must be developed. The USDA Soil Conservation Service has developed a method of hydrograph syntheses which is now being widely used. The Tabular Hydrograph Method provides a tabular approach to estimating peak discharges from urban areas using the time of concentration and travel time. This method can readily predict the increase in peak flow when all or a portion of the watershed is to be developed.

Soil Conservation Service (SCS) Method (TR-20) - The SCS method was developed particularly for agricultural watersheds. This widely-used method is applicable to the mountainous regions on areas from two hundred (200) acres up to ten (10) square miles, and above six thousand feet (6,000') in elevation. The method is presented in *Procedures for Determining Peak Flows in Colorado - 1980 Edition* (U.S. Department of Agriculture, Soil Conservation Service), or the most recent update.

Regional Analysis - A statistical or regional approach may be most appropriate for those areas in Montrose County where peak flows occur from seasonal snow melt. Also, where large watersheds are expected to undergo significant urbanization, computer simulation techniques should be utilized, such as the HEC I, HEC II and HEC RAS Programs, as developed by the FHWA.

Section 5.36 Drainage and Irrigation Structures within County Road Right of Way

Materials

Culverts shall be constructed from corrugated steel or reinforced concrete. ADS or other polymer pipe may be utilized for drainage only when both ends of the pipeline are enclosed in concrete boxes or concrete end

sections to prevent the pipe from damage should the organic matter in the ditch burn. The minimum pipe size shall be a fifteen inch (15") diameter round pipe or other shape with an equivalent cross sectional area.

Corrugated steel pipe less than twenty-four inches (24") shall be 16 gauge or greater; spiral or annular in rib design. Corrugated steel pipe twenty-four inches (24") and larger shall be annular, 12 gauge or greater. Large diameter pipe forty-eight inches (48") and larger shall be specified on a case by case basis and approved by the Engineer.

Culverts shall be bedded and backfilled with structural backfill consisting of crushed Class 6 road base gravel, flowfill, or an alternate approved by the Engineer. The extent of structural backfill required around the pipe is dependent upon conditions on the site, but generally will extend below the pipe to solid, undisturbed native soil, the full width of the excavation for the pipe, and generally to at least one foot (1') above the pipe, unless otherwise required or permitted by the Engineer.

Particular care shall be taken to ensure that the pipe is installed on a solid foundation. For pipe under deep fills, the Engineer may require the pipe be installed with a positive camber to counter the effect of settlement under the fill.

Inlets and Outlets

Culvert inlets and outlets shall be designed to protect the embankment and channel from erosion. Headwalls, wing walls, cut off walls, flared end sections, and/or riprap may be required depending upon channel conditions.

Velocity

A minimum culvert velocity of three feet (3') per second is recommended in order to promote self-cleaning.

Expected maximum culvert velocity determines channel protection requirements at the outlet. If anticipated outlet velocities are less than seven (7) fps for grassed channels, then only a minimal amount of protection is usually required. Higher outlet velocities may require additional protection. The maximum outlet velocity shall be twelve (12) fps, and will require proper erosion protection.

Structure

All culverts shall be designed in accordance with the procedures of *AASHTO's Standard Specifications for Highway Bridges*, the *AASHTO Highway Drainage Guidelines*, and/or with the culvert manufacturer's recommendations

Section 5.37 Natural and Designed Drainage Easements

All natural and designed drainage features within a subdivision shall be dedicated to the County. Drainage easements shall be designated for these natural drainage features and shown on the construction plans and recorded plat plan. The easements shall be continuous across the property for the full extent of the drainage. The easement width shall be capable of containing/routing the 100 year, 24 hour flood event.

Section 5.38 Roadside Ditches

Roadside ditches shall be sized to drain the roadway from a minimum of the twenty-five (25) year, two (2) hour storm event. They shall also be sized adequate to isolate the roadway from drainage from adjoining property. Ditches shall convey drainage to natural watercourses in an expeditious fashion. Erosion protection shall be provided where ditch grades are steep enough to cause erosion problems.

Section 5.39 Bridges

A. Acceptance of Bridges

All new bridges on roads proposed for acceptance into the County Road System shall have a sufficiency rating greater than eighty (80) when evaluated by FHWA and CDOT standards, and shall be neither structurally deficient nor functionally obsolete. Acceptance will be determined based on the following policies:

New structures – All new structures shall be designed by a Colorado Registered Professional Engineer in accordance with the *AASHTO Standard Specifications for Highway Bridges*, latest edition. Design plans shall be reviewed and approved by the Engineer prior to commencement of construction. All costs of construction, including quality assurance costs, shall be the responsibility of the Developer.

Existing structures – All existing structures shall be evaluated by a Colorado Registered Professional Engineer in accordance with the requirements of the *National Bridge Inspection Standards (NBIS)*, the *AASHTO Manual for Maintenance Inspection of Bridges* (current edition) and the *FHWA Bridge Inspector's Training Manual 90*. Included in the evaluation shall be a comprehensive inspection report performed by properly qualified individuals which accurately describes all physical features which may have an effect on the structure performance and carrying capacity. Only structures with an operating rating greater than or equal to HS 20 (without impact) and a sufficiency rating of not less than 60 shall be considered for acceptance onto the County Road System and/or be determined to be sufficient to support further development loading without rehabilitation. Any and all rehabilitation efforts or corrective actions recommended in the evaluation or inspection report shall have been satisfactorily performed prior to acceptance. The Engineer shall have the final authority in recommending acceptance to the Board.

B. Standards for Bridges

The following minimum standards shall apply to all bridges. . No bridge (new to the Public Road System) shall be opened or accepted for public travel that is structurally deficient or functionally obsolete:

Bridge Decks:

Widths for new structures shall conform to AASHTO standards. Required minimum width for acceptance of an existing structure shall be the width of the traveled way (pavement width if paved) plus ten feet (10') for two (2) lane roadway and plus five feet (5') for one (1) lane roadway.

Grade Criteria:

Minimum = 0.5 percent

Maximum = 4.0 percent

New bridges shall be designed to withstand an HS 20 or greater loading.

Hydraulic Criteria:

1) The Project Engineer shall estimate scour depths, and provide sufficient cover and protection for all substructure members in accordance with AASHTO standards.

2) The design shall minimize stream flow obstruction by substructure elements.

3) On local and rural classified roads, the elevation of the structure shall provide a minimum freeboard of two feet (2'), measured to the water surface elevation of the one hundred (100) year storm event considering peak flow from the 24 hr event.

4) On collector and arterial roads, the elevation of the structure shall provide a minimum freeboard of two feet (2'), measured to the water surface elevation of the one hundred (100) year storm event considering peak flow from the 2 hr and 24 hr events and provide specific design consideration to structure stability during a five hundred (500) year event.

Utilities:

Utilities attached to bridges shall conform with the two feet (2') freeboard requirement, and shall not impair a structure's load-carrying capacities. Utilities shall be installed in a manner that does not interfere with bridge inspection, painting, or other structural maintenance. Upgrades to and maintenance of all utility crossings on bridge shall be required upon request of the Engineer.

C. Low Water Crossings

Low water vehicular crossings may be allowed by the Engineer on a case by case basis. Low water crossings may be allowed on low use rural or primitive roads which provide access to agricultural lands, public lands, isolated existing dwellings, large tracts (35 or more acres), or private inholdings within public lands.

The County discourages the installation of low water crossings, and assumes no responsibility for the maintenance or repair of such crossings. Users of low water crossings assume all risks, and shall be responsible for any needed repair or maintenance.

Low water crossings will not be approved for new projects. Low water crossings will not be approved where all weather emergency vehicle access is required to provide for public safety. Low water crossings will not be approved for new dwellings where the density is more than one (1) unit per thirty-five (35) acres or the ADT is greater than fifty (50).

Low water crossings shall be designed and constructed in such a fashion as to preclude the crossing from being washed out by high water, and to prevent the crossing from becoming impassible due to mud during low flow periods.

Any crossing which requires a pipe or multiple pipes larger than eighteen inch (18") diameter to accommodate routine base flows will not be considered eligible for a low water crossing.

Downstream channel stabilization will generally be required to ensure the crossing will survive high water conditions. Such channel stabilization shall be approved and authorized by the Engineer and the Army Corps of Engineers for all jurisdictional crossings.

A durable hard surface of stone or concrete will be required in the crossing. The travel surface must remain stable and retain its load carrying capacity when wet.

The travel surface of the crossing, parallel to stream flow, shall slope sufficiently to ensure the crossing is self cleaning, and does not routinely accumulate mud and debris. Approaches to the crossing shall be on shallow grades to accommodate vehicular passage when wet or icy. Warning signs may be required at the discretion of the Engineer.

Low water crossing are allowed only site specific design approval by the Engineer in general conformance with the minimum design standards as set forth here in:

A minimum clear roadway width sufficient to provide service for proposed use.

Grade criteria:

Minimum = 0.5 percent
Maximum = 10.0 percent

Side Slopes:

Side slopes shall not be steeper than 3:1 and shall be protected by a six inch (6") thick concrete facing or by rip-rap, sized for flood velocities (minimum 18" Ø).

Culverts:

The culverts used must be a minimum of fifteen inches (15") in diameter.

Minimum cover over culverts will be as follows:

- Round pipe - fifteen inches (15"), or as recommended by the manufacturer.
- Arch pipe - eighteen inches (18"), or as recommended by the manufacturer.

Hydraulic Criteria: Culverts shall have the capacity to carry the ten-year peak stream discharge with a Head Water to Diameter (HW/D) ratio not to exceed 1.5. At no time shall the waterway section at the crossing cause a significant rise (one foot or more) in the intermediate regional flood elevation or cause flows to accelerate to velocities greater than those expected during the intermediate regional flood.

Section 5.40 Slope Protection

Slope protection shall be provided around the ends of all culverts. Acceptable types of protection include loose rock riprap, grouted rock riprap, or reinforced riprap.

Stone used for riprap shall be dense and hard enough to withstand exposure to air, water, and freezing temperature. Rough angular stone reasonably well graded in size, as commonly produced in quarries, is the preferred type of material. Smooth rounded surface stone does not interlock or resist movement as well as quarry stone. The placement of loose riprap should result in a reasonably well-graded mass, with sufficient small stone to fill the voids between the large rock. Minimum thickness shall be eight inches (8").

Channel or ditch protection shall be provided where velocities exceed three feet (3') per second.

Section 5.41 Road Signs and Traffic Control Devices

Unless otherwise required by the County Engineer, required road signage, striping, delineators, signals and other traffic control devices shall be in accordance with the latest edition of *the Manual on Uniform Traffic Control Devices*, (<http://mutcd.fhwa.dot.gov/HTM/2003/html-index.htm>).

All signs and barricades shall be in place prior to road acceptance. In the event no criteria exist for the installation of certain unique road signs or traffic control devices, plans for the proposed installation shall be submitted to the County Engineer for approval.

All new permitted developments shall furnish MUTCD/County approved signing at the developer's expense. Signs will be supplied and installed by County forces in accordance with Resolution #71-2005. (Appendix D, Miscellaneous Permits and Programs.)

Guide signage shall be as specifically required by the County Engineer with the exception of the Street/Road name sign shall be in accordance with MUTCD Section 2D.38 and Resolution #74-2005. (Appendix F, Miscellaneous Standards.

Pavement marking (striping) centerline and edge marking shall be provided on all two-way paved roads with through traffic. Local subdivision roads with less than 249 ADT may omit pavement markings. (Refer to MUTCD 3B.01 for referenced.)

Section 5.42 Guardrail

Guardrail or other traffic barrier may be required by the Engineer based on the following criteria:

- To protect a fixed object or to deflect an errant vehicle from a fixed object.
- To protect bystanders and pedestrians.

- To protect occupants of vehicles at locations with a high accident rate (vehicles accidentally leaving the traveled roadway).
- To protect occupants of vehicles in areas of steep terrain or high embankments.
- To protect occupants of vehicles on isolated sharp curves on roads otherwise built for higher speeds.
- To protect occupants of vehicles on curves requiring a reduction in approach speeds where one or more of the following conditions exist:
 - The height of embankment is more than ten feet (10')
 - The side slope is steeper than 4:1
 - Substandard pavement and shoulder widths exist
 - Other roadside hazards
- All bridge approaches.

When a determination is made that guardrail shall be installed, the installation shall conform to current *CDOT Roadside Design Guide* and be approved by the Engineer. The Developer shall bear all expenses of guardrail installations.

Section 5.43 Cattle Guards and Fencing

The State of Colorado is an Open Range/Fence Out State. Due to the inherent hazards of livestock/vehicle interactions, new public roads or upgrades to public roads should provide for ROW Livestock fencing (4-wire legal fence). Cattle guards may be installed on low use roads at the discretion of the Engineer where they are necessary for the control of livestock. The clear opening of the cattle guard shall extend from edge of shoulder to edge of shoulder for the applicable roadway section. Each cattle guard location shall have an adjacent gate installed to allow livestock passage. All cattle guards shall be installed flush with and parallel to final roadway grades.

Cattle guard and gate designs shall be approved by the Engineer prior to installation and shall be in conformance with CDOT standard plans for minimum HS-20 loading.

Section 5.44 Mail Box Turnouts

Multiple mail box units in new developments shall be provided with parking areas sufficient to allow residents to stop their vehicles off the traveled lane. Turn out areas shall be located within the dedicated ROW. One parking space shall be provided for each ten (10) residences or fraction thereof served by the mail box unit. Parking spaces shall be at least ten feet (10') wide by twenty-five (25') long for parallel parking, or nine feet (9') wide by twenty-two feet (22') long for angle parking. The turn out area plus the road or street shall be wide enough to permit the mail carrier to make a U turn to exit the subdivision.

Mail box units shall be located so they are convenient for the mail carrier to access, and convenient for residents coming home. They shall be located on straight sections of road, and shall provide adequate sight distance from the parking area so vehicles can safely enter and exit the turn out zone. If located near the entrance, the turnout shall be set back a minimum of seventy-five feet (75') from the ROW line of the intersecting road.

Transition zones into and out of parallel parking spaces shall be at least twenty-five feet (25') long.

Turn outs for individual mail boxes shall be constructed in accordance with the standard detail allowing the mail carrier to pull off the traveled way to deliver mail.

Section 5.45 Utilities

Utilities are allowed inside County ROW in accordance with State Statute and as a courtesy and convenience to the utility provider to minimize long term costs to the citizens of Montrose County by avoiding the costs of acquiring private easements. Other ROW uses may be approved by the Engineer on a case by case basis providing that, in the opinion of the Engineer, the health, safety and welfare of the public or county is not jeopardized.

Utility installers are required to obtain a Right of Way Use permit (See Appendix A) for all utility installations from the Engineer. The permit will define utility location within the ROW, appropriate backfill and compaction standards, and required compaction testing standards. Permits are normally issued within 48 hours of submission of a request for a permit, to allow the Engineer to make a field inspection of the proposed site. The cost of the permit shall include the estimated cost of inspection of the work by the Engineer or his representative. Major utility installations occupying new easements or ROW for which no similar size, type or density of installation has been made may require a Special Use Permit through the Land Use Office prior to authorization to issue a Right of Way Use Permit is available to the Engineer.

Article VI. CONSTRUCTION

Section 6.01 Document/Specification Priorities

All projects/permits, herein known as work, within County Right of Way and related work on private property authorized by the County under a permit or by any other means, all materials, performance and quality of work shall conform to the requirement of this document, specific permit requirements and the applicable sections for the most current edition of *CDOT Standard Specifications for Road and Bridge Construction*, *CDOT's M & S Standard Plans*, and the *AASHTO Standard Specification for Highway Bridges and Guide Specifications for Highway Construction*. Unauthorized work within the County Right of Way is not allowed.

If this document or the foregoing references do not cover a specific situation during the course of work, applicable specifications must be approved by the Engineer. In the event that there is conflict between any reference specifications, the more rigorous specification shall apply.

The County Engineer shall be the final authority on the meaning or interpretation of all specifications.

Section 6.02 The County Engineer

All projects or work within County Right of Way and related work done on private property may be inspected and documented by Montrose County to ensure compliance with this document and the approved plans or project agreement. The Engineer shall have the authority to decide all questions which may arise as to the quality and acceptability of materials furnished, the adequacy of work performed, the interpretation of the plans and specifications, the manner and frequency of quality assurance testing, and the applicability of County specifications, in order to safeguard the long term best interests of the citizens of Montrose County.

The Engineer may, in writing, suspend the work wholly or in part due to the failure of the Developer/Permittee to correct conditions unsafe for the workmen or the general public; for failure to carry out provisions of this document and approved plans; for failure to carry out written or verbal orders as a result of unsatisfactory work found during inspections; for periods of time due to unsuitable weather conditions; for conditions considered unsuitable for the execution of the work; or for any other reason determined to be in the public interest.

Section 6.03 The Project Engineer

The Project Engineer shall be a Colorado Registered Professional Engineer engaged by the Developer/Permittee or Owner to design the project, and to direct the quality assurance/quality control effort during construction for all projects not directly authorized by a Right of Way Use or Access Permit. While the Developer/Permittee has primary responsibility for control of the quality of his work, the Project Engineer shall have primary responsibility for quality assurance (quality verification) to protect the Developer/Permittee and the County.

When a Project Engineer is not required, all obligations and responsibilities of the Project Engineer referenced in this document shall be borne by the Developer/Permittee. However, the County Engineer may require a Project Engineer for complex or non-routine projects authorized under a Right of Way Use or Access Permit.

The Project Engineer shall make such observations, evaluate the work, and direct the performance of such tests as are necessary to determine to the Project Engineer's satisfaction that the work is properly performed and satisfactorily completed in conformance with the plans and specifications.

Upon completion of the work, the Project Engineer shall provide the County with a signed, stamped, sealed and dated statement confirming that the work has been completed in substantial conformance with the plans, the project specifications, and this document. Receipt of this statement by the County shall be a prerequisite for acceptance of any new road, bridge, or other facility by the County. When the work involves dedication of new facilities to the County, this statement shall be memorialized by the Project Engineer by signing, sealing and dating on the Final Plat.

As the Engineer of Record, I was in direct responsible charge of the design and construction quality assurance for the _____ project. To the best of my knowledge, information, belief, and construction quality assurance, the project has been completed in substantial conformance with Montrose County Standards, Specifications and Codes and with the approved Plans & Specifications.

Project Engineer

Section 6.04 The Developer/Permitee

The Developer/Permitee is responsible:

- To perform the work in conformance with the plans and specifications;
- To engage a Project Engineer as and when required to provide quality assurance during construction;
- To engage a qualified laboratory to provide materials testing, and to ensure all quality control inspection and testing is performed as specified (the materials testing laboratory shall not be employed by the Contractor, to avoid conflicts of interest);
- To engage a Surveyor to set construction stakes establishing all lines, grades, and measurements necessary for the proper prosecution of the work;
- To ensure all survey monuments disturbed or removed are replaced in kind at their original locations by a Professional Land Surveyor;
- To schedule materials testing at appropriate intervals consistent with the specifications, to ensure the tests are performed, and to promptly correct any deficiencies identified by the testing;
- To provide the Project Engineer with copies of test results as the work progresses, and to advise the Project Engineer of deficiencies or unexpected conditions;
- To provide to the Project Engineer (for written approval by the Engineer) any proposed alterations to the approved plans and specifications prior to construction;
- To provide the Engineer with “red lined,” “as-built,” “record drawing” plans upon completion of all work to document any variations from the design. Delivery of formal “Record Drawings” to the Engineer shall be required as a condition of final approval of the work. (Routine permitted utility repairs and service installations are exempt.)

Section 6.05 Quality Assurance

Project Engineer: Primary quality assurance (QA) inspection, testing and documentation shall be the responsibility of the Project Engineer. Developers/Permittees and Owners are advised to make appropriate arrangements with their Project Engineer(s) for inspection and testing prior to commencement of the work.

County Engineer: Secondary responsibility for quality assurance resides with the County Engineer (Engineer). The Engineer or his representative shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Project Engineer and Developer as the Engineer deems necessary. The Engineer's QA responsibility shall be to ensure that the Project Engineer, the Developer, and the testing laboratory are performing their functions in conformance with County specifications. Quality assurance inspection and testing by the County shall not relieve the Project Engineer or the Developer/Permittee of the responsibility to control the work and ensure compliance with the approved plans, specifications and warranty performance.

Verification: The Engineer or his representative may, at any time before acceptance of any work, direct the Developer/Permittee to remove or uncover any such portion of the work which may be suspect as being non-compliant with the plans and specifications. After examination, testing, and approval of any re-work required by the Engineer, the Developer/Permittee shall restore the portions of work to the condition required by the specifications.

Section 6.06 Quality Control

To ensure compliance with this document and approved plans, adequate quality control inspection and testing is required. The Project Engineer shall be responsible for construction quality assurance thereby documenting that construction quality control is performed by the Developer/Permittee. The Developer/Permittee is further responsible for ensuring all work is completed in accordance with the approved plans, specifications, and quality control testing and shall authorize the performance of all quality control inspection and testing as required herein. All quality control testing shall be performed by an independent laboratory, under the supervision of a Colorado Registered Professional Engineer. All such testing shall be at the expense of the Developer/Permittee. For minimum requirements for compacting of embankments, subgrades, and utility trenches, see Table 6-1. For testing frequency, see Table 6-2.

Table 6-1
Minimum Compaction Requirements*

			ASTM Test	AASHTO Test
Embankment, < 10' deep	90%	Modified Proctor	D-1557	T 180
Embankment, > 10' deep **	95%	Modified Proctor	D-1557	T 180
Base	95%	Modified Proctor	D1557	T 180
Subbase	93%	Modified Proctor	D-1557	T 180
Subgrade	90%	Modified Proctor	D-1557	T 180
Trenches, native soils	90%	Modified Proctor	D-1557	T 180
Trenches, aggregate backfill	95%	Modified Proctor	D-1557	T 180
CDOT Class 2 or 3 BCG	95%	Modified Proctor	D-1557	T 180
CDOT Class 6 BCG	95%	Modified Proctor	D-1557	T 180
Hot Mix Asphalt Paving	92 to 96%	Max Theo Density		

* Alternate standards may be approved based on project specific geotechnical recommendation

** Deep fills may require project specific geotechnical recommendations.

When the construction specifications of other jurisdictions are involved in the work, written approval shall be provided by the other jurisdictions and made available to the Engineer prior to final acceptance of the work.

Table 6-2
Required Quality Control Tests

Item	Type of Test	Minimum Test Frequency
Subgrade and Embankment	Moisture-Density Curve	1 per soil type
Compaction	In-Place Density	1 per 350 sy per lift
Aggregate Base Course or Subbase Course	Gradation	1 per 1000 tons or fraction thereof on each class
	Moisture-Density Curve	1 per source on each class
	In-Place Density	1 per 200 ton*
Hot Bituminous	Asphalt Content**	1 per 1000 tons or 1 per day, or 2 per project, whichever is the greater
	Aggregate Gradation**	Minimum of 2 per source
Sidewalks and Curbing (Concrete)	Compressive Strength	1 set cylinders (4) per 500 sq yds. of sidewalks and/or 1,000 lf. of Curbing, minimum 1 set per Project per day
	Slump & Air Content	1 per set of cylinders and as Often as needed for quality control
Utility Trench Backfill	In-Place Density	1 per 400 lf. of trench per lift
		(First test \leq 2 ft. above the pipe, Last test at pavement subgrade or 6 in. below ground surface on Unpaved areas)
Manholes/Structures Compaction	In-Place Density	1 per structure per 2 ft. vertical lift (Note – Compacted lift thickness around manholes & structures shall not exceed 8 in.)

* Failing areas are to be retested

All testing shall be done in accordance with the most recent edition of AASHTO Test Standards.

**May be waved or reduced in number by Engineer when using Small Project Exclusion (5.24.c).

Section 6.07 Commencement and Completion

No project or work within County ROW shall commence prior to issuance of a fully endorsed and validated permit, or other specific authorization by the County.

Developer/Permittee shall notify the Montrose County Engineer:

- 1) Two working days before commencing work in ROW;
- 2) When suspending operations for 5 or more working days;
- 3) Two working days before resuming suspended work;
- 4) Upon completion of work and ready for a Final Inspection.

Section 6.08 Plans, Plan Revisions, Altered Work

Plans or work sketch are subject to Montrose County approval. A copy of the approved permit(s) and plans or sketches must be available on site during work.

Permit and plan revisions, or altered work differing in scope or nature from that authorized are subject to Montrose County approval. Developer/Permittee shall promptly notify the Montrose County Engineer of changed or unforeseen conditions which may occur on the job.

Section 6.09 The Use of Approved Plans and Specifications

Any work performed under County jurisdiction without approved plans and specifications shall be considered unauthorized and may be ordered removed and the pre-existing conditions restored.

In the event an apparent error or omission is discovered in the plans and specifications, the Project Engineer and the Engineer shall be notified. The Developer/Permittee, acting through the Project Engineer, shall make any corrections required, subject to approval by the Engineer.

Section 6.10 Inspection and Acceptance of Work

Montrose County will determine the extent of inspection services necessary for a given installation. Developer/Permittee may be charged the cost of inspection services at \$50.00/hr or per inspection as directed by the County Engineer for significant projects. Estimate of Permit and Inspection fees shall be paid for at time of permit issuance. Final rebates or payments shall be made prior to final inspection and closeout. Developer/Permittee shall attend final inspection when requested.

Unacceptable work shall be promptly removed and replaced in an acceptable manner. Final acceptance does not relieve Developer/Permittee of maintenance obligations toward those elements of the highway facility constructed.

Partial Acceptance:

Immediately after a section of the work is completed (i.e., a section of the subgrade, structures, trench backfill, etc.), acceptance of that element may be required prior to proceeding with the next element. An example would be acceptance of subgrade prior to the placement of subbase. If, after partial acceptance of an element of work, conditions change and the next element is not constructed for a period of time, the Engineer may require a re-inspection and acceptance.

Final Acceptance:

Upon due notice from the Developer/Permittee, or Project Engineer of the completion of all work, the Engineer shall make a final inspection. The request for final inspection shall be submitted in writing with the “red-marked” changes, if any, to the previously approved construction plans. During final inspection the County Engineer may identify items in need of repair, revision or correction. These “punch list” items shall be completed prior to Final Acceptance.

Acceptance/Conditional Acceptance:

If all construction provided for in the approved plans, performance guarantee, and/or project agreement is found by the Engineer to be satisfactory, the procedure for acceptance by the Board of County Commissioners or release of the performance guarantee may be initiated.

If, however, the inspection discloses any work, in whole or part as being unsatisfactory or uncompleted, the Engineer will notify the Developer/Permittee or Project Engineer of the deficient items, in writing. The Board of County Commissioners may then, at its discretion, accept, decline to accept, or grant a conditional acceptance of the project to become effective upon completion of the remedial work to the satisfaction of the Engineer.

Following completion of remedial punch list items identified during the final acceptance inspection, any changes shall be incorporated into the final record As-Built drawings. The Developer/Permittee shall submit an As-Built Drawing to the County Engineer reflecting any approved changes that have been made during construction. This Drawing shall be signed and certified as correct by the Developer/Permittee's Project Engineer. The As-Built Drawing shall be in electronic form in a PDF (non-changeable) format. Final project approval will not be given until the As-Built record drawing is received by the Engineering Department.

Section 6.11 Insurance

As a condition of work authorization under these Regulations, each and every Developer/Permittee shall purchase, and upon authorization, each and every Developer/Permittee shall maintain in full force and effect for the duration of the permit/project, such insurance as will protect the Developer/Permittee and the County, its officers, employees, and servants from claims set forth below which may arise out of or result from the Developer/Permittee's operations, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- 1) Claims under worker's or workmen's compensation, disability benefit and other similar employees benefit acts;
- 2) Claims for damages because of bodily injury, occupational sickness or disease, or death of the Developer/Permittee's employees;
- 3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than Developer/Permittee's employee.
- 4) Claims for damages insured by usual personal injury liability coverage which are sustained (a) by any person as a result of an offence directly or indirectly related to the employment of such person by the Developer/Permittee, or (b) by any other person;
- 5) Claims for damages, other than the authorized work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;
- 6) Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle;
- 7) Claims for damages associated with explosive, collapse, and other underground hazards;
- 8) Claims for damages arising from completed operations.

The general liability insurance required under Section 5.11.01 shall be written for not less than (1) the sum of one hundred fifty thousand dollars (\$150,000.00) for any injury to one person in any single occurrence, and (2) the sum of six hundred thousand dollars (\$600,000.00) for an injury to two or more persons in any single occurrence. All other insurance required hereunder shall be written for not less than the maximum amounts required by law. The County Attorney may, in his sole discretion, require increased insurance coverage for specific permits.

Certificates of Insurance acceptable to the County Attorney shall be filed with the County Engineer prior to issuance of any work authorization under these Regulations. At a minimum, such Certificates shall name the County as an additional insured, and shall obtain a provision that coverages afforded under the policies will not be canceled until at least thirty (30) days prior written notice has been given to the County.

A Public Utility Company may be relieved of the obligation of submitting certificates of insurance if it shall submit satisfactory evidence in advance that is insured, or has adequate assets and provisions for self insurance. A letter signed by the President of the Company will meet this requirement. A Public Utility Company may submit annually evidence of insurance coverage in lieu of individual submissions for each permit/project.

Section 6.12 Hold Harmless

The Developer/Permittee shall agree to indemnify and save the County, its officers, employees, and agents harmless from any and all costs, damages, and liabilities which may accrue or be claimed to accrue by reason of any work performed under a permit to construct in the public way. The acceptance of any permit under these Regulations shall constitute such an agreement by the Developer/Permittee whether the same is expressed or not, except to the extent of any liability resulting from the willful or intentional act on the part of the County, its officers, employees or agents.

Section 6.13 Work Where County Lacks Authority

Work within municipal boundaries (pursuant to Section 43-2-135, C.R.S.), or on certain public lands, may require separate approval of the appropriate jurisdictional agency or property owner.

Section 6.14 Underground Utility Location Assistance

Developer/Permittee may be required to identify the installation with suitable markers and/or tape and at locations as specified or otherwise approved. Markers shall be maintained by Developer/Permittee for the life of the installation. Warning ribbon and detection wire are required for buried facilities, "As Constructed" lines with grades will be furnished as directed.

Owners of the underground facilities should participate in notification association information filed pursuant to Section 9-1.5-103, C.R.S.

Section 6.15 Cooperation with Utilities

The Developer/Permittee shall be responsible for coordinating the location, relocation, installation or removal of all utilities involved with the construction of the project.

The construction plans for the proposed project should be submitted to the affected utilities as soon as possible. Adequate notice shall be given to utilities for selecting utility locations and for coordinating the relocation of any utilities which may be required by the proposed work.

Utilities, including Special Districts, located within County ROWs are subject to the authority of the County to regulate and improve County roads. Utility relocations outside of existing ROW necessitated by County road improvements, including regrading or realignment, shall be made and paid for in accordance with a contract for each project, which shall be negotiated by and between the Utility/Special District and the County or Developer/Permittee as may be appropriate.

Section 6.16 Attachment to Highway Structures

Developer/Permittee is responsible for designing structures and attachments, subject to the approval of the Montrose County Engineer.

Section 6.17 Drainage Ways and Watercourses

In no case, shall the flow of water be impaired or interrupted. Where possible, crossings of ditches, canals or water carrying structures shall be bored beneath. Irrigation ditch or canal crossings require approval of the ditch company or owner. Damage to any drainage facility shall be repaired by the Developer/Permittee to the satisfaction of the owner.

Section 6.18 Traffic Control

Traffic Control Plan: Whenever the work will affect the movement or safety of traffic, Developer/Permittee shall develop and implement a traffic control plan and utilize traffic control devices as necessary to ensure the safe and expeditious movement of traffic around and through the work site and the safety of the work force.

The traffic control plan and the application of traffic control devices will conform to the latest edition of the *Manual on Uniform Control Devices*. Developer/Permittee’s traffic control plan is subject to Montrose County review and/or approval prior to commencing work. A copy of the approved traffic control plan must be available on site during work. The Developer/Permittee shall take all necessary measures, including flagmen, signs, barricades, and flashing lights, to protect the traveling public during performance of work.

Road Closures: When a road closure due to utility installation becomes necessary, the Developer/Permittee shall notify the Road and Bridge Department (970-249-5424), Montrose County Sheriff’s Office and/or State Patrol, ambulance, fire department, and appropriate school district, stating duration of all road closures and noticed in the local newspaper (Montrose Daily Press, East end of County and San Miguel Basin Forum, West end of County). All road closures must be approved by the Engineer in writing in advance of said closure.

Section 6.19 Clear Roadside Considerations

Hazards and Objects: Montrose County is committed to provide a roadside area that is as free as practical from nontraversable hazards and fixed objects (“clear zone”). Developer/Permittee should remove materials and equipment from the highway ROW at the close of daily operations. The traffic control plan must include protective measures where materials and equipment may be stored on ROW. Open trenches and other excavations within road ROW shall be addressed in the Developer/Permittee’s traffic control plan. Developer/Permittee agrees to promptly undertake mitigating or corrective actions acceptable to the County upon notification by Montrose County that the installation permitted herein had resulted in an otherwise unforeseen hazardous situation for highway users.

New Above Ground Installations: New above ground installations may be allowed within the clear zone only upon showing that no feasible alternate locations exist. Developer/Permittee must utilize appropriate countermeasures to minimize hazards.

Section 6.20 Adjustments Due to Road Construction

In the event a utility must be relocated to accommodate improvements to the County road, the utility owner shall promptly move its facilities upon request by the County, and the utility owner shall bear the full cost of such relocation

Section 6.21 General Construction Requirements

Work Period: No work shall be allowed at night or thirty (30) minutes before sunset, on Saturday, Sunday, or on holidays recognized by the County without prior authorization or unless specified in the permit or project authorization. Montrose County may restrict work on ROW during adverse weather conditions or during periods of high traffic volume. Those areas within ROW, which must be disturbed, shall be kept to a practical minimum.

Facility Design: The facility shall be of a durable material in conformity with accepted practice or industry standards, designed for long service life, and relatively free from routine services or maintenance. Thrust blocks or other lateral restraints will be required on all vertical and horizontal bends in pressure pipes. All meters should be placed upon private property. Where not feasible it shall be within three feet (3') of the edge of ROW.

Equipment and Method: Construction or compaction by means of jetting, puddling, or water flooding is prohibited within all road ROW. No cleated or tracked equipment may work on or move over paved surfaces without mats.

Misc. Damage: Damage to or alteration of any survey monumentation shall be repaired or placed by a Colorado Licensed Professional Surveyor at Developer/Permittee's sole expense. Records of repair to documentation shall be filed in accordance with State Law. Damage to any adjacent structures or facility shall be repaired or replaced.

Pavement Cuts: When open cut road crossings are allowed, or when co-linear trenches proceed through existing asphalt, the existing pavement shall be saw cut full depth. The width of the asphalt removal shall be at least twenty-four inches (24") greater than the width of the excavation (12" each way.) Pavement replacement upon completion of the work shall match the surface elevation of the existing pavement and be at least three inches (3") in thickness. New pavement shall conform to the paving specifications in this document.

Backfill Materials: Material removed from any portion of the roadway prism must be replaced in like kind with equal or better compaction. No segregation of materials will be permitted. Backfill of the earth section of the trench with mixed dirt and gravel from road section is prohibited because there is no practical means to determine a compaction value for the mixed material. Utility installers shall either separate gravel and dirt during excavation, or shall remove all mixed, contaminated material from the site and replace it with select imported structural backfill. Salvaged dirt, free of rock, may be used for trench backfill up to subgrade elevation.

Discard Mixed Gravels: Mixed pit run gravel, Class 2 gravel, and Class 6 gravel from a trench excavation through a street structural section shall not be re-used for trench backfill, and shall be removed from the work area because it is not possible to accurately measure density in mixed gravels.

To protect roads, drainage facilities, and natural drainage features during the construction phase of a project, the Developer/Permittee shall construct temporary erosion/sedimentation control facilities to mitigate the impact of construction as required by the County Engineer. These temporary facilities shall be shown on the construction plans and shall be compatible with the NPDES Stormwater Management Plan and the CDPS General Permit required by the Colorado Department of Public Health and Environment.

Section 6.22 Alignment, Cover, Clearance

Alignment: Location and alignment of Developer/Permittee's facilities shall only be as specified in the permit or as otherwise indicated in the approved project plans or work sketch .

Where no feasible alternate locations exist, parallel installations may be permitted along roadside areas within fifteen feet (15') from edge of shoulder or back of curb. In these cases, the facilities must be so located and safeguarded as to avoid potential conflict with necessary highway appurtenances (signs,

guardrail, delineators, etc.) Parallel installations should be located as near as practical to the ROW line. Crossings should be as nearly perpendicular to the highway as feasible.

Parallel installations shall follow a uniform alignment, wherever practical. Due consideration must be given to conserving space available for future utility accommodations. The standard allowable deviation from the approved horizontal alignment is +/- eighteen inches (18").

Cover/Clearance: Minimum cover shall be as per Special Provisions authorized in the permit. Normal specified cover shall be thirty-six inches (36") or greater; reduced cover, twenty-four inches (24") absolute minimum, may be approved where site conditions warrant.

Minimum overhead clearance shall be sixteen feet (16') or as per Special Provisions authorized on the permit or project authorization.

Location: Any utility within a road ROW must be designed and located primarily to maximize public safety and secondarily to minimize road maintenance costs. Where practical, all utilities requiring above-ground risers or boxes shall locate them at the maximum practical distance from the roadway and its associated ditches, and generally just inside the ROW line. The County shall not be responsible or liable for damage to any utility facility within County ROW when said damage results from maintenance operations performed by the County and not installed in accordance with County Permit requirements. No utility shall be buried in the ROW with less than three feet (3') of cover at all points, including borrow ditches. A reduced cover to twenty-four inches (24") may be authorized by the Engineer under special conditions or within easements established for the sole purpose of the utility. Clear zones shall be maximized by keeping all above grade structures as far from the traveled way as reasonably feasible in the opinion of the Engineer.

Utility Upgrade and Consolidation: When underground utilities located within the County ROW are upgraded to increase capacity, the existing cable(s) or pipe(s) shall be removed from the ROW upon request of the Engineer to prevent the accumulation of multiple parallel facilities. The purpose of this requirement is to ensure that underground facilities can be adequately located and protected when additional work occurs in the ROW, and to prevent buried facilities from becoming spread all over the ROW.

Exception: parallel cables or pipes physically banded together so they are effectively one unit may be approved by the Engineer.

Section 6.23 Road Cuts and Repairs

Pavement Cuts: Pavement cuts permitted only when subsurface conditions will not permit boring or unless otherwise specified in this permit. Pavement shall be saw cut to a neat line. Pavement will be replaced to a design equal or greater than that of the surrounding undisturbed pavement structure. Pavement repair shall be as per the County's Standards, Special Provisions and/or the approved plans. Repair pavement a minimum of one foot (1') beyond excavation onto undisturbed soil.

Flowfill: Full depth flowable fill may be used, in lieu of compacted fill if installed in compliance with Appendix A, Section 3.7 of the Montrose County Right-of-Way Use Permit Application and Construction Standards.

Trench Backfill and Compaction: All road cuts shall be repaired with full depth flow fill or in six inch (6") compacted lifts with class 6 or ¾ crushed road base gravel and will be done with introduced moisture. Lifts will be compacted to ninety-five percent (95%) AASHTO T 180 or as otherwise specified in the County Standards, with proof of such compaction available upon request. Pit Run gravel may be used as a part of the reconstruction as approved by the Montrose County Engineer. Earth backfill, where authorized within the County ROW shall be moisture conditioned to within +/- two percent (2%) of optimum moisture, and compacted to ninety percent (90%) of "modified proctor" density, AASHTO T 180. Any portion of the

gravel structural section disturbed by utility trenching operations shall be replaced, to match or exceed existing structural section depth, with crushed CDOT Class 6 base course gravel compacted to ninety-five percent (95%) “modified proctor” density, AASHTO T 180, at +/- two percent (2%) of optimum moisture.

Density Testing: Density testing of the backfill will be performed at the Developer/Permittee’s expense by an independent testing laboratory acceptable to the Engineer. It shall be the utility installer’s responsibility to arrange testing of its backfill in a timely manner, at the depths and intervals specified in the permit, and to have the results reported daily as the work is in progress. Upon completion of the work, the utility installer shall arrange for the testing firm to provide the County with a letter, signed by a Colorado Registered Engineer, stating that the testing frequency and results are substantially in conformance with the permit requirements with a summary of the test results.

Testing Frequency: Testing intervals will be specified in the permit by the Engineer. In general, density tests will be required at two foot (2') vertical intervals and one hundred foot (100') horizontal intervals for extended runs. The Engineer will specify a minimum number of tests for short runs or small excavations.

Section 6.24 Driveway Crossings

Trenches across driveways shall be backfilled full depth flowfill or with crushed Class 6 base course gravel compacted to ninety-five percent (95%) “modified proctor” density, AASHTO T 180, for the width of the driveway plus five feet (5') each side of the driveway for field approaches. Driveway surfaces shall be restored to prior condition.

Section 6.25 Boring, Jacking, Encasement

Unless otherwise specified, buried crossings shall be bored or jacked beneath the roadway, at least from toe of slope to toe of opposite slope. All boring shall be cased with a minimum SDR-35; PVC or better from portal to portal. Portals for untrenched crossings more than five feet (5') in depth will be bulkheaded. Minimum lateral dimensions from portal to edge of pavement is six feet (6'), but in any case shall not be less than the vertical. Boring shall not exceed five percent (5%) oversize. Resultant voids shall be grouted or otherwise backfilled, subject to Montrose County approval. Ends of bored sections shall not be covered before being inspected.

Jetting/Tunneling: Water jetting or tunneling is not permitted. Water assisted boring may be allowed as determined by the Montrose County Engineer.

Open Trench Cuts: When open trench road crossings are allowed by the Engineer, the trench shall be backfilled with flowfill extending five feet (5') beyond the edges of the structural section of the road, and shall be resurfaced promptly in conformance with the requirements of the permit.

Section 6.26 Restoration of Right of Way

Prior to final acceptance, all disturbed portions of highway ROW shall be cleaned up and restored to their original or better condition, subject to Montrose County approval.

Seeding, sodding, and/or planting may be required for disturbances larger than five hundred square feet (500 sq. ft.) as specified or otherwise approved by Montrose County. Where landscape restoration must be delayed due to seasonal requirements, such work may be authorized by separate permit.

Restoration: Developer/Permittee shall protect adjoining pavement from damage. Damaged pavement shall be replaced for the full width of the paved lane. Piecemeal repairs will not be allowed. Waste material shall be removed from the ROW daily. The Engineer may require the road to be swept and washed upon completion of the work. All existing features and improvements shall be restored to their prior condition upon completion of the work.

Section 6.27 Emergency Operations

Notification: Should a facility failure emergency arise, contact the Montrose Sheriff's Office (911). The company shall notify the Engineer within forty-eight (48) hours, and repair the site in conformance with this specification as soon as possible. (A permit to document the repair is still required.)

Emergency Repairs: When a utility company must make an emergency repair on a County road to restore service, they may do so without obtaining prior permission. Application for appropriate permits shall be completed during office hours of the first business day following emergency. Provisions for inspections shall be reviewed with the Montrose County Engineer.

Section 6.28 Suspension and Cancellation

Suspension: The Montrose County Engineer may suspend operations due to:

- 1) Non-compliance with the provisions of a permit;
- 2) Adverse weather or traffic conditions;
- 3) Concurrent highway construction or maintenance in conflict with permit work;
- 4) Any condition deemed unsafe for workers or for the general public.

Work may resume upon disposal of grounds for suspension.

Cancellation: Permit/Project Authorization is subject to cancellation due to:

- 1) Persistent noncompliance with permit provisions;
- 2) Abandonment or transfer of ownership;
- 3) Superseded by new permit or project authorization covering the same installation;
- 4) Conflict with necessary planned road construction;
- 5) Unforeseen conflicts with adjacent lands;
- 6) Permit or project authorization shall automatically cancel if construction has not commenced and remains actively in progress within six (6) months from date of issue.

Developer/Permittee must promptly terminate occupancy upon notice of cancellation of permit or project authorization unless a new permit is applied for and granted.

County to Complete Work: Where Developer/Permittee does not fulfill an obligation to repair or maintain any portion of the highway facility, or control and safely maintain the flow of traffic thereon. Montrose County reserves the right, in lieu of canceling the permit or authorization, to accomplish the required work by any other appropriate means and Developer/Permittee shall be liable for the actual cost thereof. The County shall withhold issuance of further permits or project authorizations until such time as the conditions of previous permits have been met. This procedure shall not restrict the County from pursuing all remedies available by law.

Violation of Permit or Project Authorization: Under no circumstance will the Developer/Permittee be allowed to backfill a trench without compacting the backfill to the designated standard. Should the Engineer determine that a trench was backfilled without proper compaction, the Developer/Permittee shall be deemed to have violated its permit or project authorization. The Engineer shall issue a cease and desist order, stopping any further work by the Developer/Permittee within the ROW. No other permits or authorizations shall be issued to that Developer/Permittee until the deficiency has been remedied. If necessary to protect the integrity of a paved surface, the County may obtain a court injunction requiring immediate remedial measures by the Developer/Permittee or any other measures allowed by law.

Section 6.29 Removal of Unacceptable or Unauthorized Work

All work which does not conform to these Specifications or approved plans for a permit or project shall be considered unacceptable, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause found to exist prior to final acceptance of the work.

Unacceptable work shall be removed and replaced, at the Developer/Permittee's sole expense, according to these Specifications, prior to acceptance of the work.

Section 6.30 Operation and Maintenance

Ownership: Developer/Permittee agrees to own and maintain the installation allowed herein or transfer such ownership as authorized by the permit or project. The facility shall be kept in an adequate state of repair and maintained in such a manner as to not interfere with the normal operation and maintenance of the highway.

Warranty: If any element of the highway facility, constructed or replaced as a condition of a permit/project authorization, fails within two (2) years from date of completion of construction due to improper construction or materials, Developer/Permittee will be responsible to make all repairs immediately as notified in writing by Montrose County.

Maintenance: Routine, periodic maintenance and emergency repairs may be performed under the general terms and conditions of a permit. Montrose County shall be given proper advance notice whenever maintenance work will affect the movement for safety or traffic. In an emergency, the Road District Office and the County Sheriff shall immediately be notified of possible traffic hazards. Emergency procedures shall be coordinated beforehand, when possible.

Maintenance activities requiring new excavation or other disturbances within highway ROW require a separate permit.

County Road Maintenance: Where road construction or maintenance operations so require, Developer/Permittee will shut off lines, remove all combustible materials from the road ROW, or provide other temporary safeguards.

Abandonment: Should any of the Developer/Permittee's facilities be abandoned, Developer/Permittee agrees to promptly notify the Engineer's office and to remove any or all portion of such facilities, as may be directed by Montrose County.

Section 6.31 Surety

Performance Surety: Developers/Permittees installing underground utilities shall be required to post a performance surety with the County prior to installation of utilities in the County ROW. The performance bond shall be posted to guarantee compliance with the County's standards for a period of two (2) years from the date of completion of the work. Surety shall be as set forth in Article VIII.

Section 6.32 Road and Bridge Maintenance

Montrose County does not regulate "routine" maintenance of post June 6, 1996 local subdivision/development public roads and bridges. However, for the benefit of subdivisions and persons responsible for maintenance Montrose County does suggest the *AASHTO Maintenance Manual: The Maintenance and Management of Roadways and Bridges*, as guidance in maintaining these facilities. For

the benefit of this statement, routine maintenance refers to non-invasive or non-structural repair and maintenance activities.

Montrose County does not have a gravel road maintenance standard but does suggest the utilization of the *Gravel Roads Maintenance and Design Manual* (by the USDOT; FHWA; and the South Dakota LTAP) as guidance in maintaining gravel roads. Good gravel road maintenance or rehabilitation depends on two basic principles: proper use of a motorgrader (or other grading device) and use of good surface gravel. The use of the grader to properly shape the road is obvious to almost everyone, but the quality and volume of gravel needed is not as well understood. It seems that most gravel maintenance/rehabilitation problems are blamed on the grader operator when the actual problem is often material related. This is particularly true when dealing with the problem of corrugation or “washboarding.” The problem is often perceived as being caused by the grader but is primarily caused by the material itself.

Article VII. TRAFFIC STUDIES

Section 7.01 Trip Generation/Distribution – Letter Report

A traffic analysis shall be required for proposed new projects to determine whether improvements may be needed to existing roads and intersections that will serve a new project, and to aid in the design of new connections to existing roads. A Trip Generation/Distribution – Letter Report shall be required:

- when a proposed project can be expected to increase the traffic load on existing streets by 150 ADT, but not exceed 10% of the existing traffic load, or
- when the traffic on the existing roads at proposed connection points is presently at speeds and/or volumes that, in the opinion of the Engineer, will create unnecessary hazards and/or unreasonable delays, or
- when unusual intersection conditions exist, or
- when street and intersection deficiencies currently exist in the streets that will receive the additional traffic, or
- when new County road connections to CDOT facilities are planned.

Traffic consultants are invited to discuss projects with the Project Engineer and Engineer prior to initiation of the study. Early meetings can help to identify existing constraints so the Developer can make informed decisions before large investments are made in planning and design.

The purpose of a traffic study is to foster the development of a safe, efficient, and economical transportation system.

Traffic studies should be based upon projected twenty (20) year traffic volume, or full project traffic volume, whichever is greater. The traffic manual, *Trip Generation*, published by the Institute of Transportation Engineers, should be used to guide the analysis. Trip Generation data may be used to convert projected daily traffic volumes to design hourly volumes unless otherwise required by the Engineer.

Traffic analysis is to be performed by a Colorado Registered Professional Engineer with training and experience in traffic analysis, and shall be submitted with the preliminary plans.

A traffic study should contain, as a minimum, the following information:

Site Location Map:

Illustrate the location of the proposed project.

Network Map:

Illustrate existing and proposed roads that will serve the project.

Project Description:

Provide a general description of the site; the intended land usage(s) and build-out densities within the project; existing usage of adjoining lands; proposed connection points for new roads; and a discussion of any site specific design constraints that may exist.

Traffic Count Data:

Summarize traffic count data on existing streets and intersections serving the project. If data from other sources or previous studies is used, identify the date and source of the data.

Summary Table:

Provide an inventory of each type of land use within the project, the number of units served, trip generation rates used, and the resultant design traffic loadings at key locations.

Traffic Graphics:

Illustrate the traffic loads coming in, out, and on adjacent facilities, at each connection point to existing roads, plus at key nearby intersections in the existing road system, for:

- Peak hour site generated traffic at full development.
- Peak hour total traffic (existing traffic plus site generated traffic).
- Peak hour total traffic, twenty (20) year projection.
- Total daily site generated traffic at full development.
- Total daily traffic, current and twenty (20) year projection.
- Turning movements before and after project completion at principal intersections in and near the project.

Traffic Engineer's Recommendations:

Based upon the analysis of projected traffic loads and existing roadway capacities, the traffic engineer shall identify existing or projected traffic constraints or substandard service levels, and recommend current and/or future road and intersection improvements, accel/decel lanes, and intersection controls, internal and external to the project, as needed to properly serve the citizens using the routes in question. The Traffic Engineer shall provide phasing recommendations, if appropriate, and identify trigger points for future improvements. The recommendations shall include preliminary design schematics for intersections. Recommendations shall also include a statement as to whether or not a Detailed Traffic Access and Impact Study is necessary.

At the discretion of the Engineer a detailed traffic study in full compliance with *CDOT Guidelines and Standards* may be required. A detailed study may be required when the limited analysis of a letter report would be inadequate to assess the projects impact. Such detailed study may require computer based modeling to adequately demonstrate traffic loading and movement.

Section 7.02 Detailed Traffic Access and Impact Study

This section is modified from the "General Guidelines for Traffic Access and Impact Studies for Site Development, July 2000, produced by the Access Management Unit of CDOT Safety and Traffic Engineering Branch."

A. General

A traffic impact analysis is a specialized study which assesses the effects that a particular project's traffic will have on the surrounding transportation network. A traffic impact study will vary in range and complexity depending on the type and size of the proposed project.

Traffic impact studies should be an essential part of the project review process where the proposal may have a measurable negative impact on traffic and transportation operations. Ultimately, traffic impact studies are used to aide in determining what improvements may be necessary, on and off the site, to provide safe and efficient access and traffic flow and to mitigate the negative impacts of development on the public roadways. Section 2.3(5) of the *State Highway Access Code, August 31, 1998* should be consulted in conjunction with these guidelines.

Traffic Impact analysis provide an objective assessment of both the anticipated impacts and needs of the proposed project. A detailed traffic impact analysis shall accurately describe, analyze, and assess the impact of specific projects regarding, the adequacy of the site access, the off-site system impacts, and the suitability of on-site circulation and parking. The depth of any analysis shall be based on the magnitude of the proposal and the urban or rural nature of the area. The following general guidelines have been prepared to:

- Aid Developers, Property Owners and Consultants in preparing traffic impact analysis when requesting access to the Montrose County Road System.
- Provide consistency in the request, preparation, and review of traffic impact studies and traffic operations analyses.
- Ensure that transportation and development impacts are addresses.
- Assist and expedite the review process by the County and provide staff with guidance and a checklist in the review process.
- Promote increased understanding of transportation impact issues among those involved in the development process.

B. Warrants for Traffic Impact Studies

One of the key indicators for identifying when an impact study should be required is “trip generation.” A trip is defined as “a single or one direction vehicle movement with either the origin or destination inside a study site.” The trip generation of a proposed development is basically the number of inbound and outbound vehicle trips that are expected to be generated by the development during an average day or during a peak hour. A complete detailed traffic access and impact study should be conducted whenever a proposed project will generate either four hundred (400) ADT, exceed ten percent (10%) of existing traffic load, and/or fifty design hour volume (50 DHV) or more additional (new) peak direction (inbound or outbound) trips to or from the site during the adjacent roadways’ peak hours or the project’s peak hour or when considered necessary or desirable by the County Engineer for exceptional reasons. This site trip generation threshold is appropriate for the following reasons:

- 50 Vehicles per hour represents approximately 10% of the capacity of a curb travel lane under signalized control,
- 50 vehicles per hour are of a magnitude that can change the level of service of an intersection approach, and
- Left or right turn lanes may be needed to satisfactorily accommodate site traffic without adversely impacting through (non-site) traffic.

Judgment must also enter into the process. In some cases, although a project might generate fewer trips than the peak hour, peak direction 50 trips threshold, a localized safety or capacity deficiency may necessitate a study for the following reasons:

- The existence of any current traffic problems in the local area such as a high accident location, confusing intersection, or an intersection in need of a traffic signal.
- The current or projected level of service of the roadway system adjacent to the project, which will be significantly affected.
- The sensitivity of the adjacent neighborhoods or other areas that may be perceived as impacted.
- The proximity of site driveways to the other access points or intersections.
- The ability of the adjacent existing or planned roadway system to handle increased traffic, or the feasibility of improving the roadway system to handle increased traffic.
- Other specific problems or deficiencies that may be affected by the proposed project or affect the ability of the project to be satisfactorily accommodated.

C. Extent of Study

The contents and extent of a traffic access and impact study depend on the location and size of the proposed project and the conditions prevailing in the surrounding area. Larger projects proposed in congested or poorly accessible areas require more extensive traffic analysis, whereas smaller sites may only require a minimum analysis of traffic on site and at immediately adjacent intersections.

A decision process similar to that used to determine when a traffic access and impact analysis should be performed should be used to determine how extensive a traffic study should be depending on the type and size of the proposed project. It is recommended that the Developer and the Engineer meet at the earliest

possible point in the study process to determine the extent of the study. An understanding as to the level of detail and the assumptions required for the analysis can be determined at this time.

D. Study Area

One critical issue is to determine the geographic area which the traffic impact study should analyze and particularly which intersections to include. The determination of the study area should consider the characteristics of the project in relation to the amount of traffic on the roadway system.

Typically, the larger the project, the larger the study area. Generally, the study area should include all site access points, roadway segments, and critical intersections (unsignalized and signalized), where traffic generated by the project may have a measurable impact.

In determining how large a study area to include, a general rule of thumb is to carry the analysis out at least as far as those areas where newly generated site traffic represents five percent (5%) or more of roadway's peak hour volume. More than five percent (5%) of roadway's volume represents an impact that is noticeable to most driveways. Where site generated traffic is less than five percent (5%) of the roadway capacity, the intersections adjacent to the site or on the opposing side should, at a minimum, be analyzed. The study area boundaries may also be influenced by impacts other than pure capacity relationships such as short cuts and traffic noise. For multi-phased projects, the study area size should be based on cumulative traffic generated up through the phase being reviewed. For example, the limits of the phase 1 study area would be based on where its "5 percent" ends. A later phase, with a larger cumulative generation, might have its 5 percent impact extended further. Care should be taken to include in the study all known congested locations that may be impacted by the proposed project. The study should also include an analysis of all reasonable alternatives and scenarios including no build or direct highway access alternative.

E. Study Horizon Years

The horizon year is the date in the future for which traffic impacts associated with the project should be evaluated. Traffic impact studies are to address conditions in the current year plus the anticipated completion year of the proposed project assuming full build-out and occupancy. If the proposed project is to be implemented in phases, it may be appropriate to analyze each major phase (i.e., initial phase, one intermediate phase, and full project build-out). Additional horizon years, ranging from a minimum of ten (10) years after the study date to a maximum of full build-out of the defined study area, will be required.

F. Time Periods To Be Analyzed

For each defined horizon year, specific time periods are to be analyzed. In most cases only analyses of street peak hours will be required. However, land use classifications which experience their highest trip generation levels during periods other than street peak hours may require analysis for such periods to determine proper site access and turn lane/storage requirements. Analysis of transportation impacts should always include weekday A.M. and P.M. street peak hours if the proposed projects generate significant activity during these periods.

Examples of land use classifications which typically have substantially higher site trip generation peaks at times other than weekday street peak hours are:

- Shopping Centers (Saturday afternoon)
- Discount Stores (Saturday afternoon)
- Recreational Uses (e.g., theaters, zoos, theme parks, stadiums, arenas) (various times)
- Schools (at start and finish time)
- Churches (on Sunday or Saturdays, before and after largest service)
- Garden Centers (on weekends)

G. Data Availability and Requirements

Data collected regarding the existing traffic volumes in the study area is a vital piece of information to ensure an accurate study. This data must be obtained correctly since it becomes the base for all of the subsequent roadway conditions analysis and the end results of the study. In some cases, the Department may have available data. However, since accurate count data is critical, use of any existing data should be discussed with the Department. Requirements regarding the age of the data may vary. Traffic count data used in the study should generally not be older than two years prior to the date of report. Peak-hour counts should typically be performed between 7-9 A.M. and 4-6 P.M. on a weekday (Tuesday through Thursday) unless the type of project or local conditions call for different data (i.e., for some commercial projects Saturday mid-day peak-hour data may need to be analyzed.) Twenty-four (24) hour growth rates should not be used to update old peak-hour turning movement volumes.

H. Review Process

The Department review process should encourage and ensure:

- A realistic awareness of other projects pending, approved, or allowed.
- A thorough, objective review of the material presented in the traffic access and impact study report.
- Recommendations regarding development of a comprehensive site access system, including complementary, effective, off-site improvements and/or developer participation (if needed), to achieve an efficient and safe transportation system within and adjacent to the project site.
- Open Department –Developer discussions regarding transportation aspects of site development.
- Fair assessment of impacts and need for improvements.

If there are discrepancies, errors, or assumptions in a completed report that the Department does not agree with, the extent of corrections required by the Department should be based on the effects of such errors or assumptions on the results and conclusions of the study.

I. Overview of Traffic Impact Analysis and Site Access Study Process

The traffic impact analysis and site access study process is briefly identified in the following five phases.

Phase I: Establish Study Design And Verify Existing Peak Hour Traffic

- Conform site development program
- Meet with the department to establish study area and parameters
- Establish study design parameter
- Evaluate data needs
- Collect new data (if required)
- Tabulate data; calculate LOS
- Identify site access/circulation constraints and opportunities

Phase II: Project Future Peak Hour Traffic Situation Without Site Developed

- Establish past growth rate in key corridor(s)
- Identify changes in road network and land use type/density
- Project Phase I peak hour traffic to future study year
- Calculate level of service
- Identify changes between existing and future situation

Phase III: Project Peak Hour Site Development Traffic

- Select and apply appropriate trip generation rates
- Determine trip distribution pattern and assigned trips to road network

Phase IV: Project Future Peak Hour Traffic Situation With Site Developed

- Combine Phase II background traffic with Phase III assigned traffic to achieve total peak hour traffic
- Calculate LOS: and compare to Phase I and Phase II LOS results
- Identify Changes between Phase I Phase II and Phase IV Results

Phase V: Develop Site Access Related Solutions

- Evaluate alternative solutions to achieve acceptable levels of service
- Select preferred solution; document findings

J. Typical Traffic Impact Analysis Contents

(1) **Executive Summary** – A brief discussion of the site location and study area, type and size of the proposed project, findings of the report, conclusions, and proposed recommendations.

(2) **Introduction** – A brief description of

- the purpose and scope of the study,
- the type and size of the proposed project,
- the project time tables,
- the characteristics of the site and adjacent roadway system (functional, classification, existing/planned right-of-way (ROW), lanes, traffic control devices, driveway/intersection locations, signals, speed limits, etc.), and
- the site location within the general area should be included in this section of the report.

This description should also include surrounding land uses, expected development in the vicinity of the site which could influence future traffic conditions, special site features and a description of any committed roadway improvements. A vicinity map along with a site plan that shows the locations of access to all public roads and private accesses and the site in relation to the surrounding transportation system and the development is essential and should be included in this section of the report.

(3) **Existing Conditions** – The limits of the study area should be shown and should be based on the type of land use, the size of the project, and an understanding of existing and future traffic conditions. The general terrain and road network features should be included in this section. A complete description of the existing land uses in the vicinity of the site, as well as their current zoning and use, or the likely use in the case of vacant tracts, should be included. Roadway characteristics should be described and illustrated, as appropriate. Features to be addressed include current roadway system characteristics, roadway functional classification, access control, ROW, lane configurations, geometrics, traffic signal locations including coordination and timing, traffic control devices, posted speed limits, average running speeds, travel times, and any sight distance limitations. The report should also identify, evaluate, and describe the existing traffic, roadways, and intersections conditions, including problems, if any.

Traffic impact analysis should examine the capacity and Level of Service (LOS) of existing traffic flow for both highway segments and intersections. A table illustrating the results of the existing capacity calculations should be included in the report. Within this table, levels of service should be shown along with their corresponding delays or reserved capacities for each of the turning movements. The State Highway Access Category should be noted as set forth in the *State Highway Access Category Assignment Schedule*. Current peak hour and daily traffic volume data should be included in the report. Peak hour traffic volumes, separated into individual movements, should be indicated at all critical intersections (signalized and un-signalized) adjacent to or in

close proximity to the site. Daily traffic volumes should be included on the major roadways within the study area, including trips to and from adjacent or opposite developments and activity centers. Traffic count data for both daily and peak hours and analysis worksheets should be provided in the report.

- (4) **Proposed Site Uses and Access Requirements** – The proposed use or uses of the site should be identified in terms of type and size of the proposed projects. For any access proposal involving a Highway Category 1, 2 or 3, the report should demonstrate that reasonable access to the State Highway does not already exist by way of local street network.
- (5) **Projected Traffic Volumes** - Existing traffic volumes provide background data from which projected traffic volumes can be estimated. Depending on: the type and size of a project, whether or not phase development is planned, and when full build-out is anticipated, horizon years should be determined. Horizon years may also depend on local planning schedules of major transportation system changes. The background traffic should include traffic to and from adjacent developments and activity centers. It should also reflect traffic flows for projects under construction, approval, or submitted for application. With respect to projected traffic volumes, the data should include the total of site generated traffic volumes plus background traffic that cause the most critical impacts. Accordingly, the following should be estimated and presented in the report: (a) site traffic including A.M. and P.M., and when appropriate, (for retail projects) Saturday and Sunday peak hours; (b) total traffic including A.M. and P.M., and when appropriate, (for retail projects) Saturday and Sunday peak hours. The background traffic portion of total traffic volumes should be non-site traffic adjusted for a horizon year or for several horizon years. Post population, vehicle registration, travel trends in a project influence area, and traffic growth trends on boundary roads can provide a basis for projecting the total and peak hour background traffic to the horizon years(s). Traffic data projection methods and analysis worksheets should be provided in the report.
- (6) **Site Generated and Design Hour Volumes** – Site Generated traffic volumes vary with the type and intensity of the proposed project. A summary table listing each type of land use, the size proposed, the average vehicle trip generation rates used (total daily traffic, A.M. and P.M. peaks of the generator and the peak hours of development), and the resultant total trips generated should be provided. Trip generation volumes are most commonly calculated from the latest data contained within the Institute of Transportation Engineers (ITE) *Trip Generation Guide*. In the event that data is not available or appropriate for the proposed land use, documentation should be provided in the report as to the source of such data. The following are the recommended trip factors for different types of land uses.

Residential uses – trips per dwelling unit
Office uses – trips per gross floor area
Retail uses trips per gross leasable floor area
Industrial uses – trips per gross floor area or employees

Trips per acre are usually the least accurate though they may be beneficial when estimating traffic on a broad scale.

Some trips to a project will be attracted from the passing traffic stream. Pass-by trips are made by traffic already on the roadway(s) that enter the site as an intermediate stop on the way from an origin and primary destination. For example, a driver may stop at a convenience market on his/her way home from work. If this market is located along the roadway the driver normally uses to get home, then the trip “generated by the market” is not a new trip added to the roadway system. This trip generated does not impact nearby intersections, but does impact traffic flow at the site entrance. These “pass-by” trips should be deducted from the generated traffic volumes. The procedures described in the *ITE Trip Generation Manual* and *ITE Trip Generation Handbook* should be used to account for these trips. Most “pass-by” or “intercepted” trips are associated with uses such as service stations, convenience stores, or general retail establishments. The

“intercepted” or “pass-by” trips may be deducted from the background traffic volumes when assigning site generated traffic volumes to surrounding roads. However, these trips should not be deducted when evaluating traffic operation on the highway segments, at access points, at intersections, or at points between where the access points and the diversion takes place. All trips must be counted in assessing impacts and needs, such as turn lane designs.

Some trips made within a mixed use project may be internal trips. Common current practice is to consider internal trip reductions only where mixed use projects consisting of at least two major complementary uses exist. This includes such complementary use combinations as office-retail, office-hotel, office-residential, and office-restaurant. Other combinations may be considered. Reductions for internal trip making will only be accepted if based on actual surveys of similar projects and approved by the Department.

- (7) **Trip Distribution** – Once the forecast trip generation is identified, the expected direction of approach and departure needs to be estimated (i.e., the percentage of trips oriented to the north, south, east and west). The directions from which traffic will approach and depart the site can vary depending on several location specific factors, including:
- Size of the proposed project.
 - Type of the proposed project.
 - Surrounding and, in some cases, competing land uses, population, and employment distributions.
 - Prevailing conditions on the existing street system.

To help the distribution of traffic, an influence area (area within which most site trips are made) may be defined. The influence area should be large enough to include most of the trip ends attracted to the site. Ideally, an existing market study could be used to establish the influence area.

The projected traffic generated should be distributed (inbound v. outbound, left turn v. right turn) onto the existing street network to project turning movements at site access points and nearby intersections. Projected turning movements and trip distribution should be illustrated in the report. The engineering procedures, technical analysis steps, basic methods, and assumptions used in estimating the directions of approach, departure, and movements at critical intersections, at each access drive, and the roadway network should be clearly and concisely identified. Where a market analysis is available, as is common for large retail projects, a table should be prepared showing how the directions of approach and departure relate to the effective trade area of the proposed project.

- (8) **Traffic Assignment** – After estimating the directional distribution of traffic on roadway network and intersections, a map showing the traffic assignment to the roadway network should be prepared and be included in the report. Trip assignment involves determining the amount of traffic that will use each access point and certain routes on the roadway network. The product of the trip assignment process is the total project generated trips, by direction and turn movement, on each segment of the study area roadway network. Trip assignment should be made considering logical routings, available and projected roadway capacities, projected transportation improvements to be in place by the analysis year, left turns at critical intersections, and projected minimum travel times.
- (9) **Future Capacity Analysis** – Describe the impacts on traffic flow, by analyzing future capacity and Level of Service (LOS). The capacity of critical intersections (signalized and un-signalized) adjacent to and in the vicinity of the site, the capacity of the access drives, and the capacity of the mainline highways should be summarized together with the analysis procedures used. The report should show the projected levels of service for all movements at signalized intersections and for all critical movements at un-signalized intersections. It is recommended that a table illustrating the results of the future capacity calculations be included in the report. Within this table, levels of service should be shown with their corresponding delays or reserved capacities for each of the

turning movements. When calculating the capacities, assume full build-out of the property. If the proposed project is phased over long periods of time, the evaluation may be broken down into different horizon years or impact phases. Methods used to calculate the level of service of street intersections, driveways, or highway segments should conform to the techniques described in the *Highway Capacity Manual* or the *Highway Capacity Software*. Because of the assumptions involved in estimating project traffic and background traffic growth, planning types of capacity analysis may be appropriate. Detailed calculations including input and output worksheets should be included in the Appendix.

When traffic signals are involved, the report should examine the conditions for spacing and the signalization of the access as required in the *State Highway Access Code*. In addition, where traffic signals exist or are proposed within the study area, a traffic engineering analysis such as PASSER II-90 should be made of the two-way progression at various combinations of cycle lengths, splits, and speeds. The report should include the input and output data worksheets of the analysis in the Appendix. The signal analysis should compare three conditions: (a) existing traffic and geometrics; (b) proposed access without the signal; and (c) proposed access with signal(s) in place.

- (10) **Signalization Warrants** – If it is anticipated that the project’s driveways will satisfy signalization warrants soon after the project has been completed, a warrant analysis should be conducted in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD)*, using the projected traffic volumes determined from the trip generation analysis. The results of such an analysis shall be tabulated and included in the Appendix.
- (11) **Traffic Crash Analysis** – An Access Related Traffic Conflict Point Analysis should be prepared. Traffic crash data at the access points, intersections, and along roadways in the study area and adjacent to the site should be analyzed using three (3) years of accident history to determine if the proposed project will contribute to an already existing problem or if the proposed roadway or traffic control improvements might help alleviate the problem. A field inspection of the horizontal and vertical alignment of the site should be made to determine if the proposed location and design of access along with intersection sight distance restrictions will create a traffic accident potential.
- (12) **Other Analyses** – Additional analyses may be needed depending on the characteristics of the proposed project, its impacts, and the transportation system within the study area. These analyses will be stipulated by the Department and may include traffic control, sight distance, clear zone, parking, or other analyses appropriate to the particular situation.
- (13) **Traffic Improvement Recommendations** – Recommendations should be developed to address the conclusions resulting from the analyses of the proposed project’s access needs and impacts on the transportation system. Recommendations for improvements should include both off-site and on-site locations. They should also address feasible transportation system improvements needed to satisfactorily accommodate site and non-site traffic, respectively. Changes at existing intersections should be specifically identified (e.g., extend left turn lane, add channelized right turn lane, changes in signal operation, etc.) together with proposed signals, ROW widening, or other improvements. The report should also include the proposed access plan and pertinent traffic control features as well as the features of the recommended access plan.
- (14) **Illustrative Site Plan** - An illustrative site plan should show how the site access is coordinated with the internal road system. It should indicate the traffic, public transport, and pedestrian adequacy of the overall site and access.
- (15) **Maps** – The following maps should be included in the report to aid with reviewing the report:
 - a. An area map showing the site location and area of influence. The map should include all streets and junctions where the site traffic represents five percent (5%) or more of roadway’s peak hour approach capacity.

- b. A scaled map showing the existing roadway system serving the site. It should show all major streets, minor streets adjacent and opposite to the site, and site boundaries. It should include all accesses that are existing and possible future access locations including signal locations for at least one-half mile in each direction along the highway. This map should also show transit, bicycle, and major pedestrian routes, if applicable, along with ROW widths and signal locations.
- c. A scaled map showing the existing and anticipated land uses/developments in the study area.
- d. Traffic volume maps with existing Average Daily Traffic (ADT) and peak hour volumes shown on the roadway network along with turning movements at existing intersections and driveways.
- e. Traffic volume maps with projected Average Daily Traffic (ADT) and peak hour volumes shown on the roadway network along with turning movements at existing intersections, driveways, and proposed access points.
- f. A scaled map showing the recommended off-site transportation improvements, on-site circulation and parking features, and proposed access point(s) to the State Highway and any other public roadways. Details of turning radii for both inbound and outbound turning vehicles, driveway width, driveway length, and the length of acceleration and deceleration lanes should also be shown on this map. Access locations should be referenced to existing intersecting streets or property boundaries.

(16) **Tables and Diagrams** – The following tables and diagrams should be included in the report to aid with reviewing the report:

- a. Estimated traffic generation, showing generation rates by traffic zone or land use type, as well as external trips and peak hour trip rates.
- b. Traffic distribution showing roadway segments and assigned traffic volumes.
- c. Capacity analysis showing the existing and projected Level of Service (LOS), volume/capacity ratio, and delay (where applicable) for each roadway segment as well as all intersections, whether signalized or un-signalized.
- d. Where signals are proposed, a Time Space Diagram for signal progression should be prepared.
- e. Other miscellaneous tables and diagrams as required to clarify or document the study report.

(17) **Conclusions and Summary of Findings** – The conclusions should include a clear and concise statement of the findings and recommendations. All conclusions should be supported by the body of the report.

Article VIII. PERMITS AND SURETY

Section 8.01 Issuance of Permits

The County Land Use Department, working with the Engineer, administers the issuance of access permits in Montrose County. All other permits listed here are issued by the Engineer's office. Permit fees for any permit named in this section shall be set by Resolution of the Board. No administrative fees may be imposed on special districts; however, such districts shall be required to obtain all necessary permits and pay all associated service/inspection fees. Financial security for permit work may be required as per Section 8.10.

Section 8.02 Right of Way Use Permit (for Utilities)

Underground and overhead utilities may generally be installed in the County Right of Way (ROW) if adequate room exists within the ROW without unreasonably interfering with, or creating hazards to, the present or future usage of the ROW for transportation. Persons desiring to install utilities in a County ROW shall apply for a permit from the Engineering Department. The County Engineer shall evaluate the site and determine whether or not the ROW can safely and effectively accommodate the utility. If the proposed installation can be accomplished without adversely affecting transportation or drainage in the ROW, the Engineer will issue a permit for the installation. All utility installations shall conform with County specifications, and with any special conditions stated in the permit by the Engineer.

A new permit will be required prior to undertaking material changes or improvements to an existing utility. Emergency repairs may be made without a permit, provided the utility provider repairs any damage to the road in compliance with County specifications, and provided that the Engineer is notified within 48 hours of the event.

Applicants for simple and routine installations are advised to apply for permits at least 72 hours in advance of the planned installation. Unusual or extended installations may require more lead time for County evaluation.

Section 8.03 Right of Way Use Permit (for Structures and Misc.)

Any individual, company or corporation, or public agency wishing to install within the ROW a structure or object (including landscaping) or attach the same to an existing County bridge or drainage structure shall first obtain a Right of Way Use Permit from the County. Applications for such permits shall include adequate sketches or drawings which depict the extent and means of attachment, the size and shape of members used, the amount of anticipated loads applied to the existing structure by the attachment, and any other information necessary to evaluate the proposed installation and its impact upon the Transportation System. No installation shall be approved which adversely affects the Transportation System's safe carrying capacity, which compromises the future performance or which may hinder maintenance operations performed within the ROW or on any structure.

Section 8.04 Right of Way Use Permit (Non-Invasive Maintenance of Existing Facilities – Includes Tree Trimming)

Any individual, company or corporation, or public agency wishing to perform non-invasive maintenance of existing facility, including tree trimming within the ROW shall first obtain a Right of Way Use Permit from the County. Applications for such permits shall include adequate traffic control plans and written depiction of the extent and means maintenance to be performed and any other information necessary to evaluate the proposed maintenance and its impact upon the Transportation System. No maintenance shall be approved

which adversely affects the Transportation System's safe carrying capacity, which compromises the future performance or which may hinder maintenance operations performed within the ROW or on any transportation structure. Maintenance permits may be issued on an occurrence basis or bi-annually.

Section 8.05 Access Permit

The location and construction of driveway connections to County roads is governed by County Access Policy. Persons desiring to construct a driveway connecting a County road are required to obtain a permit prior to commencing construction. Application may be made in the Land Use Department. A visit to the proposed site by the Engineer is generally required to ensure the connection can be made without creating unnecessary traffic hazards, and to ensure compliance with County Access Policy.

The Engineer may, based on actual site conditions, specify certain conditions, in addition to those set forth in this document, for issuance of an access permit.

Section 8.06 Winter Maintenance and Snowplow Policy and Procedures

A. Primary Conditions

Montrose County shall not plow snow on any road unless and until such road has been determined to be a public road and accepted for County maintenance by the Board. It shall be in the sole discretion of the Board to determine from time to time which such public roads will be plowed by the County.

Those public roads that are claimed for maintenance but do not receive snowplowing services shall be listed and published each year.

B. Permit Application

To begin the snow plow permit process, a letter requesting to perform Winter Maintenance/Snowplowing should be sent to the County Engineer's office. This letter shall state as to the location the permit is being requested (road name, section, township and range, if available), total distance requested and time period requested. If there are other property owners along this route, their names and addresses should also be included.

Upon review of the Snow Plow Permit request, Montrose County will review road conditions and send a letter stating damage estimate and request a bond or a cash deposit to secure performance. The amount of security required will be relative to the distance being plowed, and the surface of the road.

Proof of insurance will be required sufficient to protect the County as determined by the County on a case by case basis naming Montrose County as Additional Insured.

A plowed public road shall be considered open for public travel and shall not be gated for private use.

After all application conditions are met, the Snow Plow Permit will be scheduled at the next regular Board of County Commissioners meeting for decision in accordance with Appendix C.

Section 8.07 Over-weight/Over-length/Over-width Permit

(Reserved Section)

Section 8.08 Suspension or Revocation of Permits and/or Project Authorization

Should it come to the attention of the Engineer that the provisions or conditions of any Permit or project authorization have been violated by the developer/permittee, upon written or oral notice to the developer/permittee or an agent or employee of the developer/permittee, the Engineer may immediately suspend the permit and order cessation of all further work under jurisdiction of the permit until such time as the developer/permittee corrects the deficiencies. The suspension order shall list the details of the violation. If such notice was oral, written notice shall be mailed forthwith to developer/permittee by first class mail. If the developer/permittee fails to remedy the deficiencies within seven (7) days, the Engineer may, at his discretion, revoke the permit.

If the developer/permittee does not concur that it is in violation, it must, within forty-eight (48) hours of the issuance of the suspension, request in writing a hearing before the Board. A hearing shall be held by the Board at its next regularly scheduled meeting following receipt of such request. At such hearing, the Engineer shall have the burden to demonstrate, by a preponderance of evidence that the developer/permittee is not in compliance with the applicable requirements, regulations, standards and conditions.

The Board may, after such hearing, further suspend or permanently revoke a permit/project authorization, require immediate remedy including forfeiture of security to cure the deficiency.

Section 8.09 Transfer of Permits and/or Project Authorization

A permit/project authorization may be transferred only with the written consent of the Engineer. The Engineer, before consenting to any transfer, may condition or restrict such transfer to ensure that the health, welfare and safety of the public are protected. Each prospective transferee must ensure, before approval of any transfer, that the proposed transferee can and will comply with all of the applicable requirements, regulations, standards, and condition.

Section 8.10 Collateral for Faithful Performance

As a condition of the issuance of any permit or project authorization, the Engineer, may require the developer/permittee to provide Montrose County with collateral as surety for the faithful performance of all provisions of these Regulations. The dollar amount of said surety will be reasonably related to the nature and extent of the proposed work, and sufficient to allow the County to engage an independent third party to repair any potential harm done to County infrastructure by the developer/permittee.

The developer/permittee may appeal the collateral requirement or the amount thereof to the Board.

Said collateral shall be a cash deposit, irrevocable letter of credit, certificate of deposit issued by a bank within the State of Colorado, or surety bond as approved by the County Attorney. Facilities already collateralized by a Subdivision Improvements Agreement the County's Land Use Regulations are exempt from these collateral requirements. Work in public irrigation & utility easements shall be excluded from the collateral requirements of this Section 8.12.

The amount or collateral shall be as specified below:

- When the work to be done by the applicant will be confined to that portion of the public way which is exclusive of the roadway prism the base amount of the collateral shall be one hundred dollars (\$100.00), provided, however, that whenever the work to be done will affect in excess of fifty lineal feet (50 lf) of the public way the amount of one dollar (\$1.00) per lineal foot of the excess will be added to the above mentioned base amount.

- When the work to be done by the applicant will affect the portion of the public way including the roadway prism, the base amount of the collateral shall be two hundred-fifty dollars (\$250.00) when the driving surface within the affected roadway prism is graveled and two thousand dollars (\$2,000.00) when the driving surface within the effected roadway prism is paved, provided, however, that whenever the work to be done will affect in excess of twenty five lineal feet (25 lf) of driving surface as measured in any direction horizontally the amount of five dollars (\$5.00) per lineal foot of the excess will be added to the base amount for graveled driving surfaces and fifty dollars (\$50.00) per lineal foot of the excess will be added to the base amount for paved driving surfaces.

For any calendar year the first two thousand dollars (\$2,000.00) of collateral required by these Regulations must be in the form of a cash deposit, irrevocable letter of credit or certificate of deposit issued by a bank within the State of Colorado. Any additional collateral for one permit, or the cumulative requirements of multiple permits may be in the form of a surety bond, binding the surety with and for the applicant to the County, for the faithful performance of all provisions of these Regulations and the conditions of the permit, specifically including the two season correction period. It is a specific condition of this paragraph that the cash collateral may be applied , in accordance with the collateral conditions of these Regulations, to any and all of the applicant's permits for the construction season.

Public Utility Companies may submit for collateral requirements a yearly corporate bond without sureties. Private Utility Companies may submit for collateral requirements a yearly corporate bond without sureties, subject to approval by the Board, based up on that private utility company's financial strength.

The term of the surety shall run coincident with the term of the applicant's permit or project and in addition, shall be in force for the full term of the correction period. Such Surety shall provide that recovery may be made thereon if noted deficiencies have not been cured after ten (10) days notice of defective installation or restoration, is given by the Engineer, in writing, to the developer/permittee. Surety shall remain in full force for two (2) years from the date of each permit/project completion. In the event of non-payment of any costs or fees associated with any permit/project the County shall be authorized to recover such costs and fees from the surety ahead of any other unpaid parties.

It shall be the sole responsibility of the developer/permittee to periodically update and ensure that the aforementioned surety remains in force and effect, and insures to the benefit of the County.

Montrose County shall return or relinquish the surety to the developer/permittee two (2) years after completion of the work, upon request of the developer/permittee, after correction of any deficiencies identified by the Engineer, and after a final inspection of the work by the Engineer determines that the work for which the security was provided has performed satisfactorily for the two (2) year warranty period. It may be refunded earlier if, in the opinion of the Engineer, it is determined that the work is stable and no further work will be needed.

Section 8.11 Payment of Fees and Collateral

The method of payment for permit fees shall be cash. The method of payment for collateral shall be cash, irrevocable letters of credit or certificates of deposit. Collateral submitted as a cash deposit shall be deposited with the Office of the County Treasurer, and shall be non-interest bearing. Irrevocable letters of credit, and certificates of deposit, shall be held by the Office of the County Attorney. The use of bonds shall be as approved by the County Attorney.

Article IX. REFERENCED REPORTS/DOCUMENTS

- A. *Montrose County Subdivision Regulations (MESR) 2003*, 161 S. Townsend, Montrose, CO 81401
- B. *Colorado Standard Plans*, Division of Highways M and S Standards.
- C. The current editions of the following manuals and standards of the Colorado Department of Transportation.
- *Roadway Design Manual*
 - *Materials Manual*
 - *Construction Manual*
 - *Standard Specifications for Road and Bridge Construction*
 - *Colorado Standard Plans*
 - *Drainage Design Manual*
 - *Flagging Booklet*
- D. *Highway Capacity Software, Release 2.3, 1994*, A computerized capacity and Level of Service analysis software for highways and intersections, McTrans Center, University of Florida, Gainesville, Florida.
- E. The following editions of manuals and guidelines from the American Association of State Highway and Transportation Officials, Washington, D.C.
- *Roadside Design Guide, 1996*
 - *Highway Drainage Guidelines, 3rd Edition 1999*
- F. *Driveway and Street Intersection Spacing, Transportation Research Circular Number 456*, Transportation Research Board, Washington, D.C., March 1996.
- G. *Traffic Access and Impact Studies for Site Development*, Institute of Transportation Engineers, Washington, D.C., 1988.
- H. *A Policy on Geometric Design of Highways and Streets, Fourth Edition*, American Association of State Highway and Transportation Officials (AASHTO). Washington D.C. 2001.
- I. *Guidelines for Geometric Design of Very Low Volume Local Roads (ADT ≤ 400)*, American Association of State Highway and Transportation Officials (AASHTO). Washington D.C. 2001.
- J. *U.S. Department of Transportation, Federal Highways Administration. Gravel Roads Maintenance and Design Manual*, South Dakota Local Transportation Assistance Program (LTAP), Washington D.C.: November, 2000.
- K. *Manual on Uniform Traffic Control Devices for Streets and Highways*; U.S. Department of Transportation, Federal Highways Administration. Washington D.C.: 2000
- L. *Standard Specifications for Road & Bridge Construction. Denver CO.: 1999* (using first decimal roundup English equivalence). Colorado Department of Transportation (CDOT).
- M. *Institute of Transportation Engineers (ITE). Trip Generation 6th Edition Volumes 1, 2, & 3*, Washington D.C.: 1997.

- N. *Institute of Transportation Engineers (ITE). Trip Generation Handbook, an ITE Recommended Practice*, Washington D.C.: 1998.
- O. *Roadside Design Guide 2002*, AASHTO; 44 North Capitol Street N.W., Suite 249, Washington, D.C. 20001
- P. *2005 Pavement Design Manual*, CDOT; 4201 East Arkansas Ave Denver, CO 80222
- Q. *Standard Specifications for Highway Bridges, 17th Edition 2002*; AASHTO
- R. *Highway Capacity Manual 2000*, Transportation Research Board, national Research Council; 2101 Constitution Ave. N.W., Washington, D.C., 2418
- S. *State Highway Access Code; Volume 2*, State of Colorado; Code of Colorado Regulations 601-1; Aug 31, 1998