The following documentation is required in conjunction with the submittal of construction plans for any roadway or storm drainage improvement project in unincorporated areas of Douglas County.

3.1 GENERAL

All Construction Plans and Engineering Reports shall be prepared by, or under the direction of, a Professional Engineer registered in the State of Colorado, and shall be reviewed for the minimum requirements set forth herein. The Engineering Division may require additional information and analysis beyond the minimum requirements of these specifications and criteria.

3.2 COVER SHEET

A cover sheet is required for every submittal. The cover sheet requirements are as follows:

- Vicinity Map
- Sheet Index
- Standard Notes
- Acceptance Block
- Engineering Certification Note
- Title Block
- Project Title
- Contacts of Project (Engineer, Developer and Owners Representative at a minimum)
- Benchmark and Basis of Bearing
- Overall Key Map

3.2.1 Vicinity Map

A. Minimum scale is 1"=2000' showing the location and name of all arterial roadways and major drainageways within one mile of the proposed construction, and all other roadways in the vicinity of the proposed construction. Shading shall indicate the project area. Section, Township, and Range shall also be shown. North arrow shall be included.

B. Minimum size of vicinity map shall be 6" x 6".

3.2.2 Sheet Index

The Sheet Index shall be located along the right side of the sheet and should include all sheets in the construction plan set, numbered consecutively beginning with the cover sheet. No letters shall be used for sheet numbers.

3.2.3 Standard Notes

The following Standard Notes shall be included on the Cover Sheet or a Standard Notes Sheet as applicable:

1. The Douglas County Engineering Director signature affixed to this document indicates the Engineering Division has reviewed the document and found it in general conformance with the Douglas County Roadway Design and Construction Standards and the Douglas County Subdivision Resolution or accepted variances to those *Regulations*. The Douglas County Engineering

Director, through acceptance of this document, assumes no responsibility, other than stated above, for the completeness and/or accuracy of these documents. The owner and engineer understand that the responsibility for the engineering adequacy of the facilities depicted in this document lies solely with the Professional Engineer registered in the State of Colorado whose stamp and signature is affixed to this document.

2. All construction shall conform to Douglas County Standards. Any construction not specifically addressed by these plans and specifications will be built in compliance with the latest edition of the most stringent of the following:
   - The Douglas County Roadway Design and Construction Standards
   - The Colorado Department of Highways Standard Specifications for Road and Bridge Construction
   - The Colorado Department of Transportation M Standards

3. All materials and workmanship shall be subject to inspection by the Douglas County Engineering Division as applicable. The County reserves the right to accept or reject any such materials and workmanship that does not conform to its Standards and Specifications.

4. The contractor shall notify the Douglas County Engineering Inspection Division, 303-660-7487, a minimum of 24-hours and a maximum of 72-hours prior to starting construction. Contractor shall notify Douglas County Engineering Inspection when working outside of the Public Right-Of-Way on any facility that will be conveyed to the County, Urban Drainage & Flood Control District, or other Special District for maintenance (storm sewer, energy dissipaters, detention outlet structures, or other drainage infrastructures). Failure to notify the Engineering Inspection Division to allow them to inspect the construction may result in non-acceptance of the facility/infrastructure by the County and/or Urban Drainage.

5. Construction will not begin until all applicable permits have been issued. If a Douglas County Engineering Inspector is not available after proper notice of construction activity has been provided, the permittee may commence work in the Inspector's absence. However, Douglas County reserves the right not to accept the improvement if subsequent testing reveals an improper installation.

6. The location of existing utilities shall be verified by the contractor prior to actual construction. For information contact: Colorado 811, at 1-800-922-1987 (www.Colorado811.org).

7. The contractor shall have one (1) copy of the plans signed by the Douglas County Engineering Director, one (1) copy of the Roadway Design and Construction Standards, as amended, and all applicable permits at the job site at all times.

8. All proposed street cuts to existing pavements for utilities, storm sewer or for other purposes are listed and referenced below:

   Examples: *Water tie-in* *Sheet 3*
   Storm sewer Connection *Sheet 6*

9. A Traffic Control Plan, in accordance with the Manual on Uniform Traffic

Control Devices, shall be submitted to Douglas County for acceptance with the Right-of-Way Use and Construction Permit application. A Right-of-Way Use and Construction Permit will not be issued without an accepted Traffic Control Plan for traffic control during construction.

10. The construction plans shall be considered valid for three (3) years from the date of County acceptance, after which time these plans shall be void and will be subject to re-review and re-acceptance by Douglas County.

11. Douglas County Standard Details shall not be modified. Any Non-Standard details will be clearly identified as such.

12. Paving, including construction of curb and gutter (when used), shall not start until a Pavement Design Report and subgrade compaction tests are accepted by the Engineering Inspection Division for all public and private roads.

13. Standard Douglas County Handicap Ramps are to be constructed at all curb returns and at mid-block locations opposite of one of the curb returns of all "T" intersections as identified on these plans.

14. All stationing is based on centerline of roadways unless otherwise noted.

15. All elevations are on United States Coast and Geodetic Survey (USC&GS) (NAVD-88) DATUM with date. The Range Point or Monuments shall be shown on construction drawings.

16. All Storm Sewer Improvements (public and private) including, but not limited to, inlets, pipes, culverts, channels, ditches, hydraulic structures, riprap, detention basins, forebays, micropools, and water quality facilities require permitting and inspections. Please contact the Douglas County Engineering Inspections Division at 303- 660-7487 for permitting requirements and inspections scheduling.

17. Two (2) manhole access points are required on all Type “R” curb inlets greater than or equal to ten (10) feet in length.

18. Epoxy coated rebar is required on all drainage structures.

19. Douglas County requires Class D concrete for all drainage structures.

20. All RCP storm sewers must use ASTM C443 watertight gaskets per the current Douglas County and Urban Drainage design criteria.

21. All RCP shall be Class III storm sewer pipe unless otherwise specified.

22. Joint restraints are required for a minimum of the last two pipe joints and flared end section of an RCP outfall.

23. Precast inlets and manhole bases are not allowed.

24. Toe Walls are required on flared end sections at the outlet end of culverts and storm sewer outfalls.

25. Filter Fabric is required under all riprap pads.

26. The Professional Engineer, registered in the State of Colorado, signing these plans is responsible for ensuring that the details included are compatible with the standard Douglas County details contained in the latest versions of the criteria manuals. This includes, but is not limited to:

    - Douglas County Roadway Design and Construction Standards
    - Douglas County Storm Drainage Design and Technical Criteria
    - Douglas County Grading, Erosion and Sediment Control Criteria
    - CDOT M & S Standards
    - MUTCD
    - Urban Storm Drainage Criteria Manual Volumes 1,2 & 3

27. A Temporary Construction Access Permit from Douglas County may be required for any project.

If roadways are to be dedicated on the Final Plat to an entity other than Douglas County then the following note should be included with the standard notes:

28. Douglas County shall not be responsible for the maintenance of roadway and appurtenant improvements, including storm drainage infrastructure, for the following private streets." (List street names)

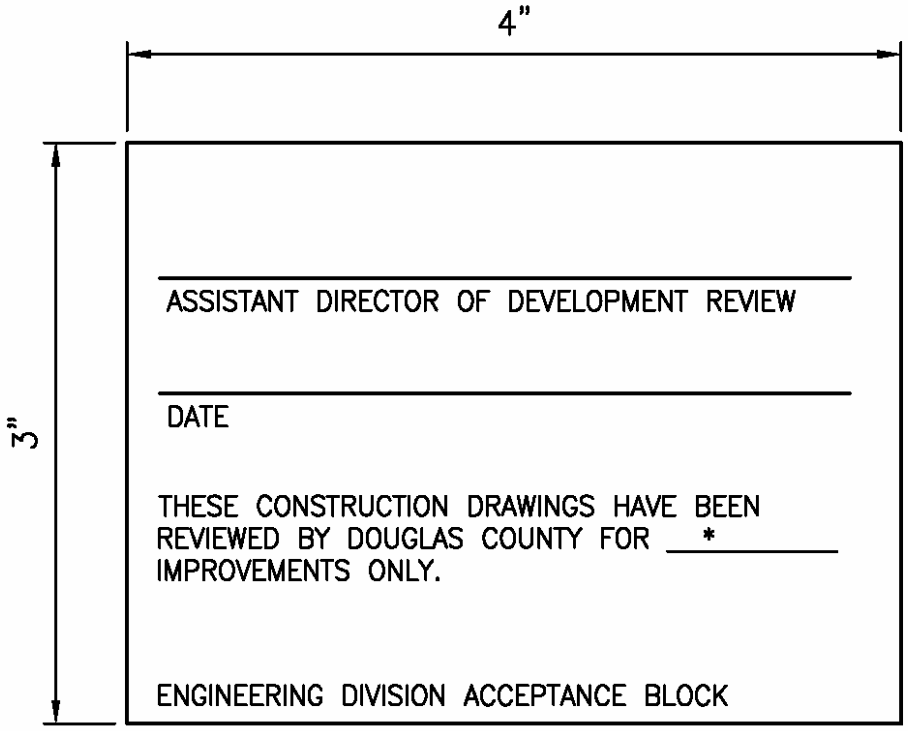
3.2.4 Acceptance Block

The Acceptance Block shall be located in the lower right hand corner of each sheet except for Douglas County Standard Detail sheets and Overall Utility sheets. (See Figure 3-1)

On all Signage & Striping Plans and Traffic Signal Plans, a signature line and a date line shall be provided in the Acceptance Block for the “Assistant Director of Development Review ” and for the “Engineering Director”. (See Figure 3-1a)

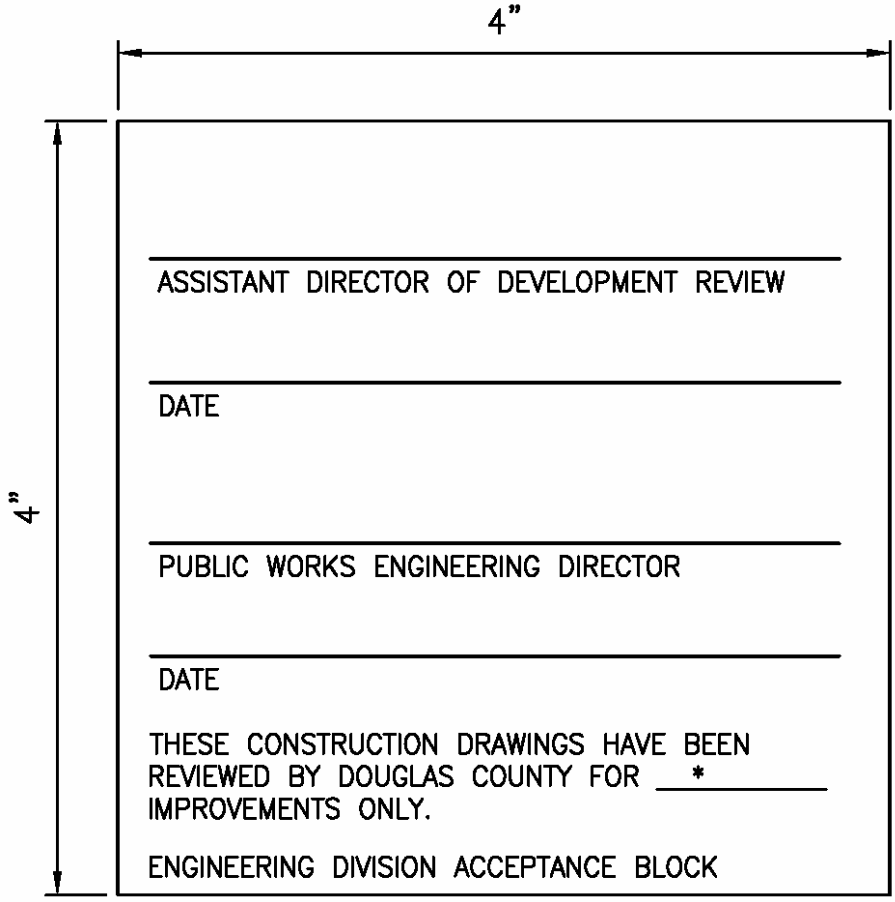
On all Construction Drawings for 35-acre land survey plats, a signature line and a date line shall be provided in the Acceptance Block for the “Building Official” and the “Assistant Director of Development Review”. (See Figure 3-1b)

FIGURE 3-1
ACCEPTANCE BLOCK



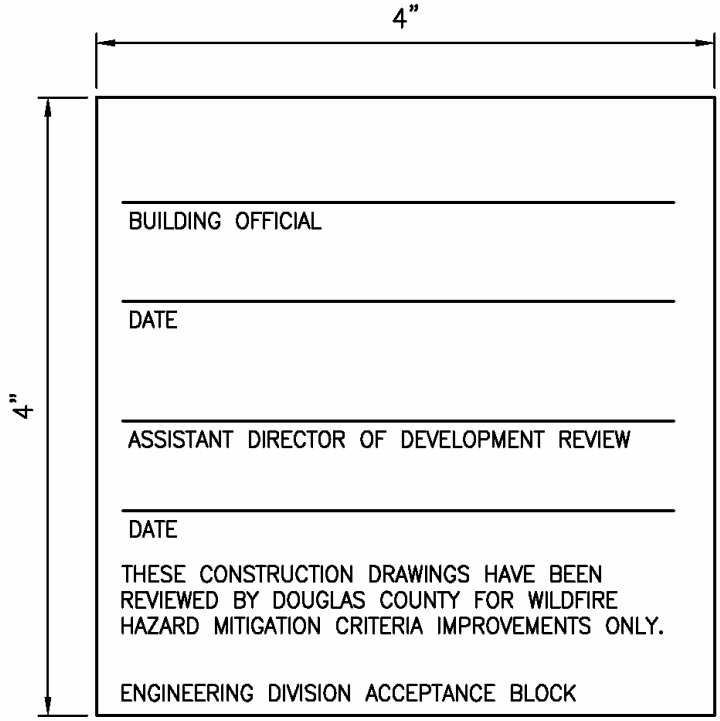
* Insert the applicable wording or combination of wording into the Acceptance Block:
  - Street and Drainage
  - Grading, Erosion and Sediment Control
  - Landscaping within the Public Right-Of-Way
  - Utilities

FIGURE 3-1a
ACCEPTANCE BLOCK FOR SIGNAGE AND STRIPING & TRAFFIC SIGNAL PLANS



* Insert the applicable wording or combination of wording into the Acceptance Block:
- Signage and Striping
- Traffic Signal

FIGURE 3-1b
ACCEPTANCE BLOCK FOR 35-ACRE LAND SURVEY PLATS



3.2.5 Engineering Certification Note

Construction Plans submitted for review and comment shall be prepared by, or under the direction of a Professional Engineer registered in the State of Colorado. All sheets must be signed and stamped by a Professional Engineer registered in the State of Colorado except for Douglas County Standard Detail sheets. The plans must include a statement on the cover sheet:

"These construction plans for (*name of subdivision, development, or project*) were prepared by me (*or under my direct supervision*) in accordance with the requirements of Douglas County's Roadway Design and Construction Standards, Storm Drainage Design and Technical Criteria, and the Grading, Erosion and Sediment Control Manual."

Name of Engineer
Name of Firm

On the Final Construction Plans submitted for acceptance the statement shall be signed and stamped by the Professional Engineer who prepared or supervised the preparation of the Construction Plans.

Douglas County, through the acceptance of the Construction Plans or Engineering Reports, assumes no responsibility for the completeness and/or accuracy of the Construction Plans or Engineering Reports.

3.2.6 Title Block

A. A title block is required on every sheet. The subdivision name and filing number; Planned Development name (if applicable); the type of improvement; name, address, including zip code, and telephone number of the consulting engineer; sheet number; and revision date and number shall all be included in the title block.

B. The title block shall be located in the extreme lower right hand corner, the right side margin, or along the bottom edge of the sheet (see Figure 3-2).

FIGURE 3-2
TITLE BLOCK LAYOUT

3.2.7 Project Title

The Project title shall be located on the top of the Cover Sheet.

3.2.8 Contacts For Project

The name; address, including zip code; telephone number and name of the consulting engineer, and owners representative shall be included at a minimum.

3.2.9 Benchmark And Basis Of Bearing

A. The Benchmark shall be shown as USC&GS NAVD 88 DATUM with date.

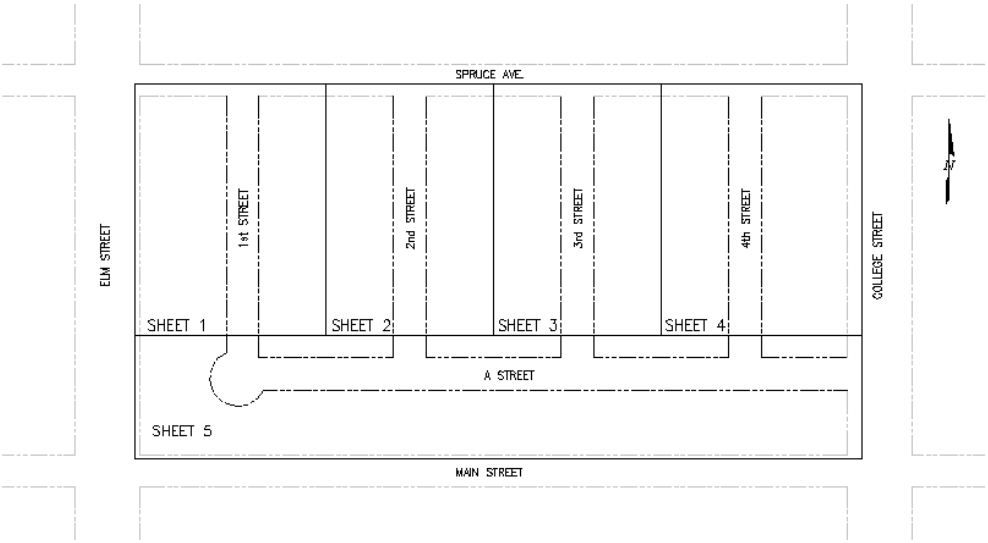
B. The Basis of Bearing and ties to the closest cadastral monument shall be included.

C. The Surveyor shall tie into a minimum of two Douglas County GIS points with the bearing and distance.

3.2.10 Overall Key Map

The Overall Key Map shall be located in the upper right hand side. Minimum scale is 1"=500' showing the location and name of all roadways within and adjacent to the proposed construction and all future roadways. Scale should be indicated. Key map should be oriented consistent with detail in the sheet, i.e. same north (See Figure 3-3).

FIGURE 3-3
OVERALL KEY MAP



3.3 REQUIREMENTS FOR CONSTRUCTION PLANS

All construction plans sheets shall include the following information:

- Acceptance Block
- Title Block
- Scale
- North Arrow
- Stationing
- Date of Plan
- Seal and Signature
- Utilities
- Key Map

Additional specific requirements are discussed in other parts of these Standards.

3.3.1 Scale

Scales listed are minimum. Larger scales may be required where necessary to clearly show details.

- Drainage Plans; Site Plans, etc.: from 1"=50' to 1"=100'.
- Plan and Profile Sheets: Horizontal 1"=50'; Vertical 1"=5'.
- Details: Scales are set as needed to adequately show detailed information.

3.3.2 North Arrow

North arrow shall point to the top or to the right margin of the sheet only; all other detail and drawings on the sheet shall be oriented consistently with the North arrow.

3.3.3 Stationing

Stationing shall be from left to right.

3.3.4 Date Of Plan

The original submittal date of the plans and any subsequent revisions must be shown in the Title block.

3.3.5 Seal And Signature

The seal and signature of the Professional Engineer registered in the State of Colorado, under whose supervision the plans were prepared shall be located next to the Acceptance Block on each sheet, except Douglas County standard detail sheets. This requirement is only on the final plans ready for acceptance.

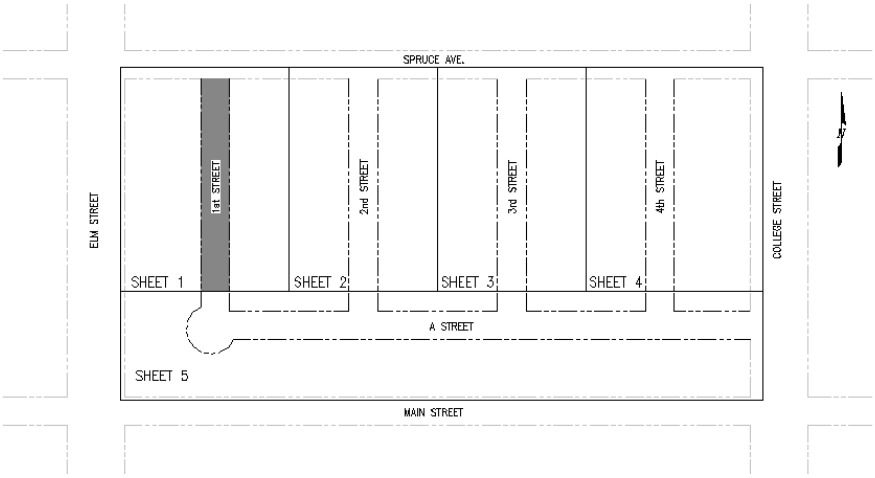
3.3.6 Utilities

The type, size, location and number of all utilities shall be shown including all utility easements. Field verified elevations (USC&GS NAVD 88 Datum and date) and locations are required on the Construction Plans for all utilities which will potentially affect the design or construction. It will be the responsibility of the engineer and contractor to verify the existence and location of all utilities along the route of work prior to commencing any new construction. Field located utilities not shown on accepted Construction Plans shall be added to the “As-Built Drawings” submitted as a condition of Preliminary Acceptance of the improvements.

3.3.7 Key Map

The Key Map shall be located in the upper right hand side of every sheet. Minimum scale is 1"=500' showing the location and name of all roadways within and adjacent to the proposed construction and all future roadways. Scale should be indicated. Key map should be oriented consistent with detail in the sheet, i.e., same North. The roadway or area that the design that the specific sheet pertains to will be shaded, as shown on the example Key Map on Figure 3-4.

FIGURE 3-4
KEY MAP



3.4 REQUIREMENTS FOR STREET PLANS

In addition to the requirements set forth in Chapter 4 of these Roadway Standards, the following information shall be shown on all roadway plans submitted for review and acceptance.

3.4.1 Plan View

The plan view shall include items shown in Section 3.3 and include, **but not be limited to**, the following:

A. Existing and proposed Property and/or ROW lines, easements and/or tracts. Type and dimension of easement or tract is to be clearly labeled. Existing and proposed widths of ROW shall be dimensioned.

B. Stations shall be based on centerline only; other profiles may be included but shall be referenced to centerline stationing. Stationing is to be equated to and from flowline stationing at departures from normal roadway cross sections. Centerline stationing is to be equated to flowline stationing at cul-de-sacs, knuckles, bubbles and curb returns.

C. All streets and roadways must show County accepted roadway names as shown on subdivision plat.

D. Existing sub-surface and surface utilities and structures, including, **but not limited to**:

Water Systems, Valves and Lines	Electric System
Fire Hydrants	Ditches or Swales
Sanitary Sewer Facilities	Curbs and Gutters
Storm Drainage Facilities	Pavement Limits
Telephone	Bridges or Culverts
Gas Systems	Guardrails and other roadway facilities
Fence Lines	CATV
Fiber Optics	Utility Boxes

E. Station and critical elevation (flowline, invert and top of pipe where applicable, etc.) of all existing and proposed utility or drainage appurtenances, in ROW or in easements. Location of utilities shall be dimensioned horizontally and vertically from roadway centerline profile grade.

F. Flow direction arrows for surface drainage, particularly at intersections and all high and low points.

G. Match lines referenced to appropriate sheets.

H. Station and elevation of all horizontal curves, PC, PT, PCR, etc.; high or low point of all vertical curves, existing and proposed; centerline bearings and distances and curve information on each sheet.

I. Curb return radii, existing and proposed. Stations and elevations of all curb

returns; mid point elevations, flowline-flowline intersection elevations, and percent of grade from the Point of Curb Return to flowline-flowline intersections of all crosspans.

J. All curb ramp locations.

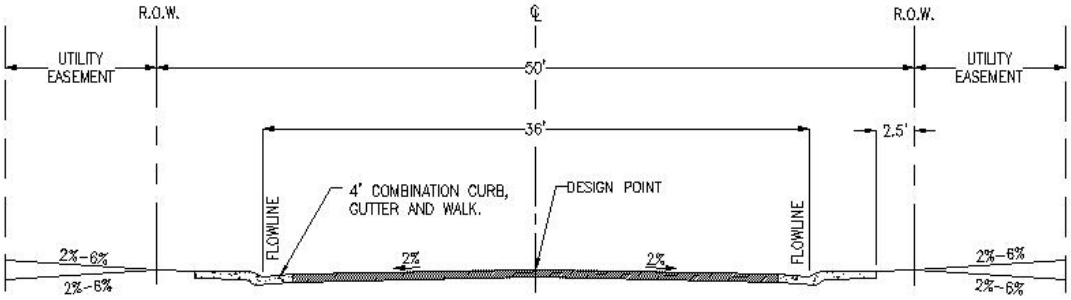
K. Centerline stations of all existing and proposed intersecting roadways and driveways, except for single-family residential driveways with rollover curbs.

L. Survey tie lines to section corners or quarter corners consistent with that shown on the Final Plat. County GPS Control Monuments shall be shown.

M. Typical roadway cross section(s) shall be shown for all roadways, existing or proposed, within and adjacent to the proposed development. These cross sections shall appear on the detail sheet, or if no detail sheet has been used, the first sheet of the submittal showing the roadway design. Show cross-slope at warped intersections where cross-slope varies from the standard 2% crown.

They shall indicate type of roadway(s), design point at centerline, roadway width, ROW width, type of curb, gutter and walk and pavement cross slope. Refer to Chapter 5 of these *Roadway Standards* for methodology of submitting preliminary and final pavement design. Final Pavement Design Report must be based on testing of finished subgrade.

EXAMPLE:



ROAD NAME(S)

N. Any roadway intersecting an arterial, or any collector intersection requiring signalized traffic control shall include construction and lane details for the new construction and existing facilities a minimum of 150' beyond the limits of construction.

O. Basis of plan view elevations and profile elevations shall reference the same. (i.e. flowline to flowline, centerline of roadway to centerline of roadway, etc.)

3.4.2 Profile

The profile shall include, **but not be limited to**, the following:

A. All design profiles shall be along the centerline and continued through the centerline of all intersecting street. Additional profiles, such as flowline, may be shown. On streets where minimal grade is proposed, an additional flowline profile shall be provided, showing that the flowline grade around the outside of all curves meets the minimum longitudinal grade, see Section 4-7. The basis for record

drawing information shall be the same as the design (centerline, flowline, etc.) when possible.

B. Existing ground (dashed) along profile stationing and design grade (heavy solid). Both grades are to be clearly labeled.

C. Stationing shall be continuous for the entire portion of the roadway shown in the plan view, with the centerline station of all existing non-single family driveways and all intersecting roadways clearly labeled.

D. All existing curbs, gutters, sidewalks, utilities and pavement adjacent to the proposed design shall be shown. Existing elevations shall be field verified at intervals not to exceed twenty-five (25) feet. Previously accepted designs are not an acceptable means of establishing existing grades. See "Connection with Existing Roadways" in Chapter 4 of these *Roadway Standards* for additional information.

E. Station and elevation of all, PC, PT, PCR, PCC, etc., existing and proposed.

F. Station and elevation of all vertical grade breaks, existing and proposed, and slope between grade breaks. See "**Grade Breaks and Vertical Curves**" in Chapter 4 of these *Roadway Standards* for additional information.

G. Vertical curves, when necessary, with PVI, PVC, and PVT, high or low point (if applicable) with stations and elevations. All vertical curves shall be labeled with length of curve (L), algebraic difference in slopes, in percent (A), and K-value where K=L/A. See "**Grade Breaks and Vertical Curves**" in Chapter 4 of these *Roadway Standards* for additional information.

H. Flowline profiles shall be shown for all curb returns. In all curb returns the profile shall be extended past the curb return until the flowline profile meets the standard cross section of the street. See "Curb Return Profiles" under Chapter 4 of these Roadway Standards for additional information.

I. Flowline profiles shall be shown for all cul-de-sac bubbles, eyebrows, knuckles, etc. see Chapter 4 for design information.

3.5 REQUIREMENTS FOR DRAINAGE AND STORMWATER MANAGEMENT FACILITY PLANS

The following sections outline requirements for Stormwater Management Facility construction.

3.5.1 Storm Sewer And Culverts

A. Plan

- Plan view showing horizontal locations of existing and proposed pipes, inlets, manholes, junction boxes, and outlet structures with outfall protection. Appropriate horizontal control shall also be shown.

- All existing and proposed roadways, property lines, ROW lines, easements and tracts.

- Utilities adjacent to or crossing the storm sewer or culvert alignment.
- Grading details at 1 foot contour intervals for all pipe and culvert inlets and outlets at 1"=20' scale.
- Maintenance access improvements.

B. Profile

- Profile of all existing and proposed pipe mains, laterals or culverts with all inverts, rim elevations, sizes, lengths, slopes, design flow rates and outfall protection with cutoff walls.
- Minor and major storm hydraulic grade lines.
- Utilities adjacent to or crossing the storm sewer or culvert alignment.
- Vertical clearance between the top or bottom of pipe and other utility crossings, pavement section, etc.

3.5.2 Open Channels and Channel Stabilization

A. Plan

- Plan view showing horizontal locations with stations of all channels, including locations of grade control structures and stabilization measures, such as check structures, drop structures, toe protection, bank stabilization, low flow or trickle channels, with appropriate horizontal control.
- All existing and proposed roadways, property lines, ROW lines, easements and tracts.
- Water Surface Limits of the Major Storm.
- Maintenance access improvements.
- Tributary channels and pipe outlets.
- Utilities adjacent to or crossing the channel alignment.

B. Profile

- Profile along channel alignments with all invert elevations and design flow rates.
- Water surface profiles for the minor storm and major storm.
- Utilities adjacent to or crossing the channel alignment.

C. Typical Sections

- As required by channel geometry as specified in the DCSDDTC and accepted drainage report.

3.5.3 Detention/Storage Facilities

A. Plan

- Plan view showing horizontal locations of the pond, including locations of low flow or trickle channels, outlet structure, emergency overflow spillway, pipe or channel inlets, etc. with appropriate horizontal control.
- All existing and proposed roadways, property lines, ROW lines, existing and proposed easements and tracts adjacent to the facility.
- Grading details at 1 foot contour interval for all pipe and culvert inlets and outlets at 1"=20' scale.
- Water surface limits for the minor storm, major storm, and emergency overflow conditions.
- Maintenance access and improvements.
- Utilities adjacent to or crossing the detention area.

B. Profile/Section

- Profile along low flow or trickle channels from all inlets/structures through the outlet structure and pipe or channel, with invert and outlet elevations, to an existing drainageway showing the opposite stream bank.
- All invert and outlet structure elevations for all pipes and channels going into the pond.
- Water surface limits for the headwater depths, minor storm, major storm, and emergency overflow conditions.
- Utilities adjacent to or crossing the detention area.
- Inlet and outlet protection.

3.5.4 Water Quality Facilities not associated with Detention/Storage Facilities

A. Plan view showing horizontal locations of the improvements.

B. All existing and proposed roadways, property lines, ROW lines, existing and proposed easements and tracts adjacent to the facility.

C. Water surface limits for the water quality capture volume, minor storm, major storm, and emergency overflow conditions.

D. Profile of improvements, as necessary to clearly define the required

improvements.

E. Maintenance access and improvements.

F. Utilities adjacent to or crossing the detention area.

3.6 REQUIREMENTS FOR GRADING, EROSION AND SEDIMENT CONTROL (GESC) PLAN

Requirements for preparation of a GESC Plan are outlined in the *Douglas County GESC Manual*.

3.7 REQUIREMENTS FOR SIGNAGE AND STRIPING PLANS

All subdivision, road improvement projects, and/or commercial developments must submit separate Signage and Striping Plan sheets with the overall Construction Plans in accordance with the following criteria and Appendix G, the Douglas County Signage and Striping Supplement, as amended:

3.7.1 Submittal

Signage and striping plan sheets are to include an overall vicinity map noting all specific use areas, such as schools, parks, recreation centers, libraries, commercial, industrial, etc. Maximum scale shall be 1”=500’.

3.7.2 Review Process

A. Plans are submitted by the Applicant for review and comment and are returned to the Applicant.

B. Applicant submits the revised plans and response letter for review. Plans may require several reviews prior to acceptance.

C. When the submittal is acceptable, the Douglas County Engineering Division will notify the Applicant to send signed and stamped copies of the plans for acceptance by the Engineering Division.

3.7.3 General Provisions

All traffic control devices shall conform to Appendix G of these *Roadway Standards*, the Federal "Manual on Uniform Traffic Control Devices" (MUTCD) and the "Colorado Supplemental to the MUTCD", as amended. Additional specifications and illustrations are located in the Colorado Department of Transportation "M and S Standard Plans”.

A. Utility Locations

- Sign contractors shall be responsible for locating all underground utilities.

B. End of Roadways

- Type III barricades shall be set at ends of roadways, separating finished and unfinished areas.

3.7.4 The Signage Plan should:

A. Show the general location of each existing and proposed sign (horizontal offset and station).

B. Specify the sign legend and sign type (from MUTCD).

C. Specify the sign size.

D. Specify design speed(s) used as basis for street design (or as constructed).

E. ROW and Easement lines

F. Existing and proposed trail/pedestrian crossings

All these requirements must meet or exceed County standards. A Right-of-Way Use and/or Construction Permit must be obtained for installation of the signs.

3.7.5 The Striping Plan must show:

A. Type, color, width and size of all pavement markings.

B. Lane width

C. All existing striping including striping on roads adjacent to the project area.

D. “Arrow” and “Only” symbols in turning lanes.

3.7.6 Douglas County Signage and Striping Supplement Plan Sheets

The Douglas County Signing and Striping Supplement Plan Sheets shall be included with all signage and striping plans.

3.8 REQUIREMENTS FOR TRAFFIC SIGNAL PLANS

If a Traffic Signal is warranted and accepted by the County at an intersection, the Developer/Owner is required to submit a Traffic Signal Plan in accordance with the following criteria:

3.8.1 Submittal

A. A separate traffic signal plan is required for proposed signalized intersections at a scale of 1”=20’. If needed, traffic signal interconnect plans shall be included at scale of 1”=50’.

B. For the preliminary submittal (and if required by the County for the final submittal), WB-62 turning templates, cone of vision and stop line distance results shall be submitted as part of the plans.

C. The following sheets shall be included:

- Cover Sheet with project location and list of sheets

- M&S Standards
- Note Sheet
- Traffic Signal Plan
- Traffic Signal Plan with turning templates, cone of vision and stop line distance layouts – PRELIMINARY PLANS ONLY UNLESS OTHERWISE REQUIRED.
- Traffic Signal Interconnect Plans (if needed as determined by Douglas County)
- Fiber Termination Diagram (if needed as determined by Douglas County)
- Summary of Approximate Quantity sheet.

3.8.2 Review Process

A. Plans are submitted by the Applicant for review and comment and returned to Applicant.

B. The Applicant submits the revised plans, the redlined comment set and response letter for review. Plans may require several reviews prior to acceptance.

C. When the submittal is acceptable, the applicant may submit a maximum of eight (8) sets of the Plans, signed and stamped by a Professional Engineer licensed in the State of Colorado, for acceptance by the Engineering Division. Douglas County will keep three (3) sets of the Plans.

3.8.3 General Provisions

All traffic signal devices shall conform to Appendix F of these standards, the Federal "Manual on Uniform Traffic Control Devices" (MUTCD) and the "Colorado Supplement to the MUTCD", as amended. Additional specifications and illustrations are located in the Colorado Division of Transportation "M and S Standards".

3.8.4 Pole and Mast Arm loading

The traffic signal engineer shall provide certification that the proposed pole and mast arm loadings do not exceed the allowable loadings provided in the Traffic Signal Specifications.

3.8.5 The Traffic Signal Plan shall:

A. Provide a signal-phasing diagram

B. Show the existing lane widths (and proposed, if applicable)

C. Show crosswalk and stop bar locations.

D. Provide a legend

E. Show details concerning the type of signal heads proposed (i.e., 3-section, 5-section, regular or countdown pedestrian heads, pedestrian signing)

F. The signal plan must show all topographic features close to the intersection and within the public ROW that are affected by the signal installation. This shall include but is not limited to:

- ROW lines and easements
- Existing topographic features
- Existing utility locations and conflicts.
- The location for each traffic signal pole
- The proposed controller location.
- The proposed power source locations and power company contact
- The mast arm layout showing traffic signal heads, signs and their locations on the arm.
- The proposed signal phasing.
- Pedestrian heads and any associated striping and signing.
- Street name signs and proposed layout.
- ADA Requirements.
- Potential street widening

All these requirements must meet or exceed County standards. A copy of the Signal Warrant Study is required for any signal proposed.

3.8.6 Traffic Signal Details and Notes

See Appendix F, the Douglas County Traffic Signal Specifications, for additional requirements including standard signal details and notes, as amended.

3.9 REQUIREMENTS FOR LANDSCAPING PLANS WITHIN COUNTY ROW OR OTHER COUNTY PROPERTIES OR EASEMENTS

Landscape Plans are required for any landscaping proposed within the Public ROW or which would affect the sight-distance of a Public/Private street. Landscape plans must show all landscaping close to, and within the ROW. This shall include, but not be limited to, location of all plants, bushes, trees, irrigation lines, proposed street-cuts, direction of drainage flows both on the street and on the proposed landscaped area, street names, vicinity & key maps, general notes, signature block, etc. Landscaping must not screen regulatory or warning signs from approaching vehicles.

Trees or large shrubs shall not be planted over buried utilities, within the sight distance triangle at intersections or accesses, or within 10' of the flowline of the public street, whichever is most restrictive. On low speed (posted 35 mph or less) minor collectors & local streets, trees may be planted to within six (6) feet of the flowline (except within 150' in either direction from an intersection, where the trees must be a minimum of 10' back from the flowline). Landscaping over 36" above the adjacent flowline shall not be allowed within the sight triangle, however, when landscaping is located within the sight-triangle, plans shall demonstrate that there is no encroachment into the Line-Of-Sight (L.O.S.). In no case shall trees, shrubs, or other landscaping, including branches from trees, be allowed to encroach either horizontally or vertically into the line-of-sight of the sight-distance triangle.

Landscaping is Public ROW or other County Property or Easements typically are not maintained by Douglas County; therefore Landscape Plans must include a completed License Agreement between the County and the maintaining entity. Contact the Engineering Division for a copy of the current License Agreement form.

3.9.1 Guidelines

A. ROW Landscape plans for streets cannot be submitted for review until the Street

Construction Plans have been submitted to the Douglas County Engineering Division and will not be accepted by Douglas County until the corresponding Street Construction Plans have been accepted.

B. A "Right-of-way Use and Construction" Permit and License Agreement is required prior to landscaping activity.

C. Douglas County does not allow installation of brick pavers in Douglas County ROW.

D. Noncompliance with any of the maintenance requirements per the License Agreement will result in the removal of the landscaping by the County.

E. Landscaping within the County ROW installed by a single family property owner typically does not require a Landscape Plan except when the proposed landscaping does not conform to these Roadway Standards as determined by the Engineering Division. (sight distance problem, landscaping blocks a sign, etc.)

3.9.2 Plans

Landscape plans must show all improvements adjacent to, and within the Public ROW. This shall include, but not be limited to;

- Project Location Vicinity Map
- Location of all plants, bushes and trees with their mature dripline.
- Irrigation Lines and Facilities
- Curb Openings
- Line-of-Sight
- Utilities and Easements
- Drainage Flows
- Existing and Proposed Trench Drains.
- ROW lines and tract boundaries with Property Ownership
- Street Centerlines & Flowlines with Street Names
- Project Limits
- Existing and Proposed Improvements
- Trails/Sidewalks
- Monumentation and Planters
- Drainage Improvements
- Floodplains
- Traffic Control Devices
- Existing and Proposed Contours
- GESC Improvements
- Construction/Maintenance Access Points
- Standard Notes
- Landscape Notes

3.9.3 Landscape Notes

The following notes are also applicable to landscape plans and shall be included on the plans:

1. All trees are to be planted a minimum of 10’ from the face of the curb of arterial and major collector roadways and a minimum of 6’ from the face of the curb of minor collector and local streets. Trees located within 150’ of an intersection with an arterial road must be planted a minimum of 10’ from the face of curb and outside of any line-of-sight requirements. The required distance of 150- feet is measured from the Right-of-Way line of the arterial roadway.

2. Trees or large shrubs shall not be located over buried utilities, within 10’ of storm sewer system or within the line-of-sight at intersections, accesses or pedestrian crossings.

3. All plantings located within the line-of-sight will have a mature height of no more than 24” above the adjacent gutter/flowline.

4. A “Right-of-Way Use and Construction” Permit is required prior to landscaping activity within Douglas County Right-of-Way, tracts or easements.

5. Any wall or monument, over four feet in height and/or under a surcharged condition, or has a rail on top of the wall requires a permit from the Douglas County Building Division prior to construction. Structural plans for any wall over four (4) feet in height (measured from bottom of footer to top of wall) or tiered walls, as determined by the Douglas County Building Division, will be submitted to the Douglas County Building Division prior to the issuance of the required building permit. No walls or monuments are allowed in the County ROW.

6. A permit must be obtained from the Douglas County Zoning Division prior to the installation of monumentation and planters outside of the public Right-of-Way, including those within the Right-of-Way of private streets. An electrical permit must be obtained from the Douglas County Building Division for lighting outside of the public ROW, including lighting for monumentation and planters.

7. A traffic control plan shall accompany the application for a Right-of-Way Use Permit.

8. Trench drains shall not have angles greater than 45 degrees. Angles greater than 45-degrees will require multiple fittings.

9. Maximum spacing between trench drain clean outs shall be 200 feet.

10. Trench drains shall not discharge into the gutter/flowline.

11. Trench drain crossings under pavement shall be installed prior to paving or shall be installed by boring under roadway.

3.10 REQUIREMENTS FOR CONSTRUCTION PLANS FOR MULTI-FAMILY SITE IMPROVEMENT PLANS

Construction Plans are separate from the Site Improvement Plan (SIP). The Construction Plans must be accepted prior to SIP approval. The following items are required:

- Cover Sheet
- Overall Utility Plan

- GESC Plan, see *Douglas County GESC Manual*
- A detailed Fine Grading Plan (20 Scale drawings with spot elevations)
- Street Plan & Profiles
- Typical Roadway Cross-sections
- Storm Sewer and Culvert Plan & Profiles
- Drainage Plan, see *Douglas County Drainage Criteria*
- Detail Sheets
- Other items as determined necessary by the Engineering Division.

3.11 REQUIREMENTS FOR CONSTRUCTION PLANS FOR NON-RESIDENTIAL SITE PLANS

Construction plans are separate from the SIP. The Construction Plans must be accepted prior to SIP approval. The following items are required:

- Cover Sheet
- Overall Utility Plan
- GESC Plan, see *Douglas County GESC Manual*
- A detailed Fine Grading Plan (20 Scale drawings with spot elevations)
- Curb Return Profiles (if necessary) see Chapter 4
- Typical Roadway Cross-sections
- Storm Sewer and Culvert Plan & Profiles
- Drainage Plan, see *Douglas County Drainage Criteria*
- Detail Sheets
- Other items as determined necessary by the Engineering Division.

3.12 REQUIREMENTS FOR CONSTRUCTION PLANS FOR SINGLE FAMILY RESIDENTIAL DEVELOPMENT

The Construction Plans must be accepted prior to Final Plat approval. The following items are required:

- Cover Sheet
- Overall Utility Plan
- GESC Plan, see *Douglas County GESC Manual*
- Street Plan & Profiles
- Curb Return Profiles (if necessary)
- Typical Roadway Cross-sections
- Drainage And Stormwater Management Facilities
- Drainage Plan, see *Douglas County Drainage Criteria*
- Detail Sheets
- Other items as determined necessary by the Engineering Division.

3.13 REQUIREMENTS FOR OVERALL UTILITY PLAN

In addition to the requirements set forth in Chapter 12 of these *Roadway Standards*, the following information shall be shown on the overall utility plan submitted for review. Maximum scale shall be 1”=200’.

- Existing and proposed Property and/or ROW lines, easements and/or tracts. Type and dimension of easement or tract is to be clearly labeled. Property lines and ROW lines are to be dimensioned.

- The type, size, location and number of all existing and proposed underground and aboveground utilities shall be shown.

3.14 REQUIREMENTS FOR UTILITY CONSTRUCTION PLANS

In addition to the requirements set forth in Chapter 12 of these *Roadway Standards*, the following documents need to be submitted for review.

- Cover Sheet
- Overall Utility Plan Sheet
- GESC Plan, see *Douglas County GESC Manual*
- Utility Plan Sheets (all utilities with the exception of water, sanitary and storm)
- Traffic Control Plan
- Temporary Construction Access Detail Sheet, if applicable
- Detail Sheets
- Other items as determined necessary by the Engineering Division.

3.14.1 Utility Plan Sheets

A. Plan view showing type, size, location, separation from other utilities and number of all existing and proposed underground and aboveground utilities shall be shown with appropriate horizontal control.

B. Existing and proposed roadways, property and/or ROW lines, easements and/or tracts. Type and dimension of easement or tract is to be clearly labeled. Property lines and ROW lines are to be dimensioned.

C. When crossing public roadways a profile of the crossing shall be provided.

3.15 REQUIREMENTS FOR DETAIL SHEETS

Applicable Douglas County Standard Details found in these *Roadway Standards* shall be included in the Construction Plans. The plans shall include adequate details of special structures not covered by Douglas County Standard Details. The document accepted by Douglas County which includes the standard detail and special structures shall be available on the job site at all times. Non-standard details shall be submitted on a separate sheet accepted by Douglas County and requires a certification by a Professional Engineer licensed in the State of Colorado.

3.16 REQUIREMENTS FOR ROADWAY CONSTRUCTION PLANS FOR 35-ACRE LAND SURVEY PLATS

A complete construction plan package shall contain, but not be limited too, all of the following plans and reports:

- A roadway and drainage improvement construction plan which has been prepared in accordance with these *Roadway Standards*.
- A supporting drainage report which has been prepared in accordance with the *Douglas County Storm Drainage Design and Technical Criteria Manual.*
- A Grading Erosion and Sediment Control Plan (GESC), which has been prepared in accordance with the *Douglas County GESC Manual*.

- Any other supporting plan or report that may be needed.

The applicant must obtain a GECS permit before commencement of any grading activity. During the grading process, Douglas County will provide inspections as applicable.

3.17 RANGE POINTS - PROPERTY MONUMENTS - BENCHMARKS

A. All survey monuments delineating property boundaries or witness thereof shall be set in accordance with this manual and all applicable State of Colorado laws and regulations.

B. Any "aliquot corner" (section corner, quarter corner, etc.), as described in the Public Land Survey System, shall be monumented per Colorado State Statutes. If such a corner falls within concrete or asphalt, a range box (as shown in Appendix A) shall be installed to protect and provide access to said corner. If corner falls outside of pavement, a monument marker must be placed next to the corner.

C. If so desired, the Developer may install additional range boxes in asphalt or concrete for property monuments, range points, benchmarks, etc., if the boxes comply with the Douglas County Range Box detail.

3.18 VARIANCES AND APPEALS

3.18.1 General

Variance(s) shall be identified in the initial submittal of Construction Plans. The variance request(s) shall consist of:

A. Identification of the criteria provision to be waived or varied.

B. Identification of the alternative design or construction criteria to be adhered to.

C. A thorough justification of the variance request including impact on capital and maintenance requirements and cost.

D. The Variance shall be stamped and signed by a Professional Engineer registered in the State of Colorado with the following note:

> "This Variance Request from the Douglas County Roadway Design and Construction Standards Manual, Section *(include the section number and name)* for *(name of subdivision, development, or project)* was prepared by me (or under my direct supervision) and is based on sound engineering practices."
>
> *Name of Engineer*
> *Name of Firm*

If more than one Variance is requested for public facilities, Alternate Roadway Standard may need to be processed (see this Chapter).

If more than one Variance is requested for private facilities, Private Roadway Standard may need to be processed (see Chapter 15).

3.18.2 Appeal of Variance Denial

If, upon denial of the Variance Request by the Engineering Division staff, the developer chooses to appeal the decision, they shall make their final appeal to the Board of Adjustment. The developer shall give the Engineering Division at least 20-working days written notification prior to date of appeal to the Board of Adjustment. The developer shall submit a written appeal request to the Board of Adjustment within 30-working days from receipt of denial from the Engineering Division.

3.19 ALTERNATE ROADWAY STANDARDS

Alternate Roadway Standards, based on Sound Engineering Criteria, may be proposed for roads that will be owned and maintained by Douglas County once accepted for maintenance by Douglas County. These Alternate Roadway Standards must be certified as to their adequacy and safety by a Colorado Registered Professional Engineer. The Alternate Roadway Standards must contain a list of all deviations from County criteria as well as references to all sources which support the adequacy of the proposed deviations. Said Standards shall be subject to acceptance by the developer, governing fire district and the Engineering Director.