

Standards and Specifications for Design and Construction



Amended: May 1, 2012

Table of Contents

CHAPTER 1: INTRODUCTION	2
1.1 SHORT TITLE	2
1.2 PURPOSE AND APPLICATION	2
1.3 AUTHORITY	2
1.4 JURISDICTION	2
1.5 AMENDMENT AND REVISIONS	2
1.6 REVIEW AND APPROVAL	2
1.7 INTERPRETATION	3
1.7.1 MEANINGS OF “SHALL”, “SHOULD”, AND “MAY”	3
1.8 RELATIONSHIP TO OTHER STANDARDS	3
1.9 REGULATORY COMPLIANCE	3
CHAPTER 2: DRAWING AND DEVELOPMENT SUBMITTAL REQUIREMENTS	5
2.1 CONSTRUCTION PLANS	5
2.1.1 COVER	5
2.1.2 GENERAL NOTES	6
2.1.3 PLAN	7
2.1.4 PROFILE	8
2.1.5 GRADING AND DRAINAGE PLAN	8
2.1.6 REVEGETATION, EROSION AND SEDIMENT CONTROL PLAN	8
2.1.7 SIGNAGE AND STRIPING PLAN	9
2.2 SKETCH PLAN	9
2.3 PRELIMINARY PLAT	9
2.3.1 CONSTRUCTION PLANS	9
2.3.2 COST ESTIMATE	9
2.3.3 REQUESTED VARIANCES	10
2.3.4 SURVEY PLAT	10
2.3.5 LANDSCAPE / REVEGETATION PLAN	10
2.3.6 PRELIMINARY GEOTECHNICAL REPORT	10
2.3.7 TRAFFIC IMPACT STUDY (T.I.S.)	10
2.3.8 PHASING PLAN	10
2.4 FINAL PLAT	10
2.5 CONSTRUCTION	11
2.6 POST CONSTRUCTION	11
2.6.1 PRELIMINARY ACCEPTANCE	12
2.6.2 FINAL ACCEPTANCE	12
2.6.3 CERTIFICATIONS	13
2.7 AS-BUILT DRAWINGS	14
2.7.1 ROADWAY PROJECTS	14
2.7.2 WATERLINE PROJECTS	15
2.7.3 SANITARY SEWER PROJECTS	15
2.7.4 STORM DRAINAGE PROJECTS	15
2.7.5 DRY UTILITY PROJECTS	15
CHAPTER 3: ROADWAY DESIGN STANDARDS	17
3.1 BASIC DESIGN POLICIES	17
3.2 TRIP GENERATION	17
3.3 ROAD CLASSIFICATIONS	17
3.3.1 COLLECTOR ROAD SYSTEM	17
3.3.2 LOCAL ROAD SYSTEM	17
3.3.3 LOW-VOLUME ROAD SYSTEM	18
3.4 HORIZONTAL ALIGNMENT	18
3.4.1 CENTERLINE CURVE RADIUS	18
3.4.2 ACCESS	18

3.4.3	DEAD-ENDS AND TURNAROUNDS	19
3.4.4	SWITCHBACKS	19
3.5	CROSS SECTIONS	20
3.5.1	SURFACING REQUIREMENTS	20
3.5.2	CROWN / SUPERELEVATION	20
3.5.3	CLEAR ZONE	20
3.5.4	GUARDRAIL	20
3.5.5	PEDESTRIAN FACILITIES	21
3.6	VERTICAL ALIGNMENT	21
3.6.1	GRADES	21
3.6.2	VERTICAL CURVES	21
3.6.3	STOPPING SIGHT DISTANCE	22
3.7	INTERSECTIONS	23
3.7.1	SKEW ANGLES	23
3.7.2	EDGE OF SHOULDER RADII	23
3.7.3	HORIZONTAL OFFSET	24
3.7.4	GRADES	25
3.7.5	CORNER SIGHT DISTANCE	25
3.7.6	SIGHT TRIANGLE	25
3.8	SIGNAGE AND STRIPING	26
3.9	PARKING REQUIREMENTS	26
3.9.1	GENERAL	26
3.9.2	AMERICANS WITH DISABILITIES ACT (A.D.A) COMPLIANCE	26
3.9.3	OFF-STREET PARKING AND LOADING SPACE REQUIREMENTS	26
3.10	MULTI-FAMILY DEVELOPMENT	30
3.10.1	RIGHT-OF-WAY / EASEMENT	30
3.10.2	INTERSECTIONS	30
3.10.3	REVEGETATION, EROSION AND SEDIMENT CONTROL	30
3.10.4	PARKING	30
3.10.5	LIGHTING	30
3.10.6	PEDESTRIAN FACILITIES	30
3.10.7	SNOW OPERATIONS	30
3.11	SNOW OPERATIONS	31
3.12	TRAFFIC IMPACT ANALYSIS (T.I.A.)	31
3.13	TRAFFIC IMPACT STUDY (T.I.S)	32
3.14	PAVEMENT DESIGN	33
3.14.1	DESIGN	33
3.14.2	CONSTRUCTION / TESTING REQUIREMENTS	33
3.15	BRIDGE DESIGN	33
CHAPTER 4: DRIVEWAY DESIGN STANDARDS		35
4.1	BASIC DESIGN POLICY AND PERMITTING	35
4.2	DRIVEWAY PERMITS	35
4.3	ACCESS	36
4.3.1	NUMBER OF ACCESS POINTS	36
4.3.2	DRIVEWAY SETBACK FROM PROPERTY LINE	36
4.3.3	DRIVEWAY LOCATION AND APPROACH	36
4.3.4	STATE HIGHWAY ACCESS	37
4.3.5	ACCESS ROADWAYS FOR EMERGENCY VEHICLES	37
4.4	ALIGNMENT	37
4.5	STRUCTURES	37
4.6	SURFACING	37
4.7	DRIVEWAY CULVERTS	38
4.8	GRADING	38
4.9	REVEGETATION, EROSION AND SEDIMENT CONTROL	38
4.10	SNOW OPERATIONS	38

4.11	ABANDONED DRIVEWAYS	38
4.12	UTILITY REPLACEMENT.....	38
CHAPTER 5: UTILITIES		40
5.1	TRASH DUMPSTER.....	40
CHAPTER 6: GRADING AND DRAINAGE.....		42
6.1	GRADING.....	42
6.1.1	PERMITS REQUIRED	42
6.1.2	EXEMPTED WORK	42
6.1.3	APPLICATION FOR A GRADING PERMIT.....	42
6.1.4	HAZARDS	43
6.1.5	ENVIRONMENTAL HAZARDS	43
6.1.6	FILL MATERIAL	43
6.1.7	EROSION AND SEDIMENTATION CONTROL	43
6.1.8	VALID PERIOD	43
6.1.9	DISPLAY OF PERMIT.....	43
6.1.10	SURETY DEPOSIT	43
6.1.11	PENALTIES.....	44
6.2	DRAINAGE	44
6.2.1	REVIEW PROCESS.....	44
6.2.2	PHASE I DRAINAGE REPORT	44
6.2.3	PHASE II DRAINAGE REPORT	46
6.2.4	PHASE III DRAINAGE REPORT.....	49
6.2.5	DRAINAGE POLICY	49
6.2.6	RAINFALL.....	56
6.2.7	RUNOFF	56
6.2.8	STREETS AND ROADS	56
6.2.9	STORM SEWERS.....	58
6.2.10	CULVERTS.....	60
6.2.11	OPEN CHANNELS.....	61
6.2.12	DETENTION.....	63
6.2.13	WATER QUALITY ENHANCEMENT	66
CHAPTER 7: REVEGETATION, EROSION AND SEDIMENT CONTROL		69
7.1	INTRODUCTION	69
7.2	REGULATORY REQUIREMENTS.....	69
7.3	BEST MANAGEMENT PRACTICES (BMP's)	69
7.3.1	EROSION CONTROL BMP's.....	70
7.3.2	SEDIMENT CONTROL BMP's	71
7.4	REVEGETATION.....	72
7.5	LANDSCAPING	73
7.6	REFERENCES AND DESIGN AIDS.....	74
CHAPTER 8: POLICIES AND PROCEDURES		76
8.1	VARIANCES	76
8.1.1	VARIANCE REQUEST.....	76
8.1.2	VARIANCE REVIEW AND ACCEPTANCE CRITERIA	76
8.2	CONTINUATION OF ROADWAYS AND TRAILS	76
8.3	INSPECTIONS.....	77
8.4	PAYMENT OF COSTS FOR ROAD CONSTRUCTION.....	77
8.5	UPGRADING EXISTING ROADS	77
8.6	ROAD MAINTENANCE.....	77
8.6.1	TOWN OWNED AND MAINTAINED ROADS	78
8.6.2	TOWN OWNED ROADS, BUT MAINTAINED BY OTHERS.....	78
8.6.3	MAINTENANCE CLASSIFICATIONS.....	78

8.7	QUALITY CONTROL.....	79
8.8	SITE TRIANGLE MAINTENANCE.....	79
8.9	RIGHT-OF-WAY.....	80
8.9.1	OBSTRUCTION.....	80
8.9.2	DEPOSITS ON PUBLIC WAYS.....	80
8.10	ROAD HEARING PROCEDURES.....	80
8.11	ROAD VACATION.....	81
8.12	TRACKED EQUIPMENT.....	81
CHAPTER 9: ROAD CUT STANDARDS, REGULATIONS AND RIGHT-OF-WAY PERMIT.....		83
9.1	STATEMENT AND PURPOSE.....	83
9.2	PERMIT AND REGULATIONS.....	83
9.2.1	BORING/JACKING.....	83
9.2.2	ASPHALT CUTS.....	83
9.3	PROCEDURES FOR OBTAINING A PERMIT.....	84
9.3.1	DRIVEWAY PERMIT.....	84
9.3.2	RIGHT-OF-WAY PERMIT APPLICATION.....	84
9.3.3	APPLICANT'S STATEMENT OF RESPONSIBILITY.....	85
9.3.4	SURETY BONDS - TERMS AND CONDITIONS.....	86
9.3.5	WARRANTS.....	86
9.4	GENERAL POLICIES.....	86
9.5	ROAD CLOSURE.....	87
9.6	SAFETY AND PUBLIC CONVEYANCE.....	87
9.6.1	TRAFFIC CONTROL PLAN.....	87
9.7	ROAD CHANGES.....	88
9.8	INSPECTIONS.....	88
9.9	EMERGENCY.....	88
CHAPTER 10:FINES & FEES.....		90
10.1	STATEMENT AND PURPOSE.....	90
10.2	FEES.....	90
CHAPTER 11:ACCEPTED PUBLICATIONS.....		92
CHAPTER 12:REFERENCES.....		94
CHAPTER 13:DEFINITIONS.....		96

SPECIFICATIONS

Storm Drainage
Earthwork
Flexible Paving
Rigid Paving

FIGURES

FIGURE 1	Road Templates – Major Collector
FIGURE 2	Road Templates – Minor Collector
FIGURE 3	Local Street and Driveway
FIGURE 4	Curb and Gutter Details
FIGURE 5	Cul-de-sac and Turnarounds for Roadways
FIGURE 6	Curb Ramps 1 of 2
FIGURE 7	Curb Ramps 2 of 2
FIGURE 8	Intersection Sight Triangles / Corner Site Distance
FIGURE 9	Parking Configuration
FIGURE 10	Construction Stabilized Access
FIGURE 11	Single Family Driveway Grading Criteria
FIGURE 12	Typical Utility Layout
FIGURE 13	Rainfall Intensity – Frequency Curves Annual Precipitation
FIGURE 14	Typical Intersection Crossspan
FIGURE 15	Storm Sewer Pipe Bedding
FIGURE 16	Typical Storm Sewer Manhole
FIGURE 17	Type 13 Field Inlet
FIGURE 18	Type 13 Combination Inlet
FIGURE 19	Emergency Overflow Spillway
FIGURE 20	Vehicle Tracking Control

PERMIT APPLICATIONS / FORMS

Right-of-Way Use Permit
Driveway Permit
Grading Permit
Notice of Change to Approved Construction Plans
Development Improvements Agreement Request for Release of Funds Checklist
Development Improvements Agreement Inspection Request Form
Town of Winter Park Requirements for Submittal of Digital Final Plat.

Chapter 1

Introduction



CHAPTER 1: INTRODUCTION

1.1 SHORT TITLE

These regulations, together with all future amendments shall be known as the Town of Winter Park Standards and Specifications for Design and Construction (hereinafter called Design Standards) being part of the Town of Winter Park Zoning Regulations (hereafter called Regulations).

1.2 PURPOSE AND APPLICATION

Presented in these Design Standards are the minimum design and technical criteria. All condominium, commercial development, resubdivisions, planned unit developments, or any other proposed construction submitted for approval under the provisions of the Regulations shall include adequate engineering design. Such analysis and design shall conform to the criteria set forth herein. Options to the provisions of these Design Standards may be suggested by the Applicant. It shall be the responsibility of the Applicant to demonstrate that the options meet or exceed the minimum criteria contained herein. Policies and technical criteria not specifically addressed in this document shall follow the provisions of the American Association of State Highway and Transportation Officials' *Policy on Geometric Design of Highways and Streets, 2004*, and the Standard Construction Specifications of the Colorado Department of Transportation. All design and construction of these items, commencing after May 1, 2012, shall meet or exceed the criteria set forth herein, unless a variance is granted in accordance with SECTION 8.1.

1.3 AUTHORITY

The Regulations have been adopted pursuant to the authority conferred with Chapter 1, Section 1, of Title 8 of the Town Code of Winter Park.

1.4 JURISDICTION

These Design Standards shall apply to all land within the Town of Winter Park (Town) except where superseded by State of Colorado (Department of Transportation) jurisdiction. The requirements of these Standards shall apply to all development permits, as that term is defined under C.R.S. §29-20-103 and §13-51.5-102, and further upon all subdividers, building permit applicants, applicants, developers, or other landowners, and their employees, agents and contractors, designing and constructing of any public or private improvement, street, road, driveway, or vehicular access of any kind or duration, as such are subject to review and approval by the Town, pursuant to the Town Land Use Regulations and requirements. The Land Use Regulations shall include the applicable sections of the Town Subdivision Regulations, Zoning Regulations, and Building Code.

1.5 AMENDMENT AND REVISIONS

These policies and criteria may be amended as new technology is developed and/or experience gained in the use of these Design Standards which indicates a need for revision. The Town Council, following the recommendations of the Town Engineer, and the Planning and Zoning Department, may consider amendments to these Design Standards.

1.6 REVIEW AND APPROVAL

The Town Engineer will review all submittals for general compliance with these Standards in a timely manner. Any approval by the Town does not relieve the owner, engineer, or designer from responsibility

of ensuring that the calculations, plans, specifications and construction are in compliance with the Design Standards and accepted engineering practices.

1.7 INTERPRETATION

In its interpretation and application, these Standards shall be regarded as the minimum requirements for the protection of public health, safety, comfort, morals, convenience, prosperity, and welfare of the residents and visitors of the Town. These Design Standards shall therefore be regarded as remedial and shall be liberally construed to further its underlying purpose.

Whenever a provision of these Standards and any other provision(s) of the Town or any provision in any law, ordinance, resolution, rule, or regulation of any kind, contain any restrictions covering any of the same subject matter, whichever restrictions are more restrictive or impose higher standards or requirements shall govern.

These Standards shall not modify or alter any permits or approved reports, construction plans, easements, or covenants issued before the effective date of these Standards. This exception shall be subject to the conditions and limitations under which the Town accepted said plans.

1.7.1 MEANINGS OF “SHALL”, “SHOULD”, AND “MAY”

The definitions below explain the use and intent for the words “shall”, “should”, and “may”.

Shall – A mandatory condition. Any Standard or Specification using the term “shall” must meet or exceed the requirement for which the term is used.

Should – An advisory condition. The word “should” is used as a suggested condition for a particular Standard or Specification. The usage of “should” is not a requirement, but a recommended condition to aid design.

May – A permissive condition. The use of the word “may” does not imply a Standard or Specification requirement. May is considered optional in design.

1.8 RELATIONSHIP TO OTHER STANDARDS

Since the Town is the approval authority for land use changes, these Design Standards which stipulate certain minimum conditions for land use changes, shall apply. If a state, federal government or special districts impose more stringent criteria than that in these Standards, this difference is not considered a conflict, the more stringent standard shall apply. If the State or Federal Government imposes stricter criteria, standards, or requirements, these may be incorporated into the Town’s requirements after due process and public hearings needed to modify the Town’s regulations and standards.

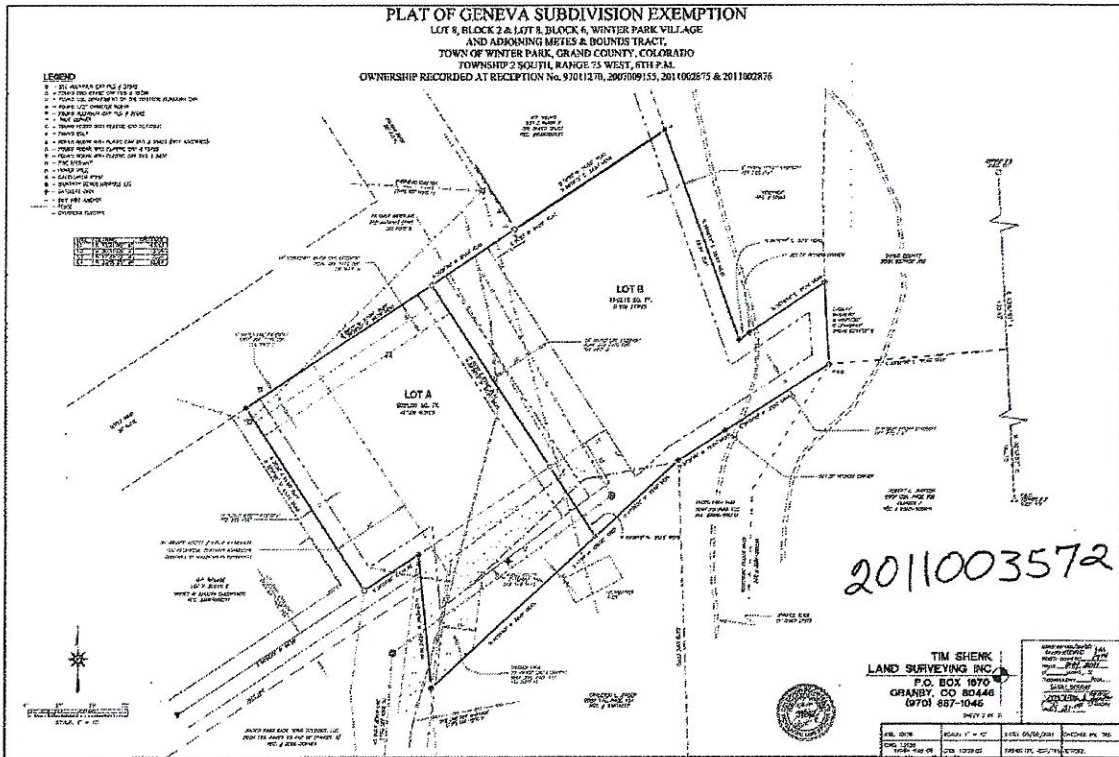
1.9 REGULATORY COMPLIANCE

All work shall comply with all applicable federal, state, county, and local regulations.

Chapter 2

Drawing & Development

Submittal Requirements



CHAPTER 2: DRAWING AND DEVELOPMENT SUBMITTAL REQUIREMENTS

2.1 CONSTRUCTION PLANS

All construction plans, drainage reports, soils reports and pavement designs shall be prepared by, or under the direction of, a Colorado Licensed Professional Engineer, and shall be part of the submittal process, as defined per the applicable Land Use Regulations previously identified in SECTION 1.4. Throughout the preliminary and final plat review process, any of the documents listed above that are submitted to the Town shall contain the date, the seal, and signature of the Engineer. If the signed and sealed documents are not final, they can be identified as “preliminary”, “for review” or “not for construction”. The engineer should be aware that whenever unusual or serious problems are anticipated in conjunction with a proposed design or construction, additional information and analysis beyond the minimum requirements of these specifications and criteria shall be required.

The Town is not responsible for the accuracy and adequacy of the design or dimensions and elevations on the plans. The Town, through the acceptance of the construction plans, assumes no responsibility for the completeness and/or accuracy of the construction plan.

Each drawing shall be 24" x 36" and shall contain a title block, sheet number, scale, north arrow, date and the seal and signature of the Colorado Licensed Professional Engineer responsible for plan preparation. In addition, an electronic copy (.pdf format) shall be provided on a CD or other acceptable electronic format.

Existing and proposed contours shall be at two (2') minimum intervals. Other intervals may be allowed or required by the Town, in developments with flat or steep terrain.

The drawing shall be based or transformed to a known coordinate system, not an assumed local coordinate system. If GPS Lat/Long is not used for this reference, the Geographic Coordinate Data Base should be used to obtain relative coordinates available from the BLM at www.BLM.gov/GCDB. A permanent survey benchmark shall be shown on the plans.

2.1.1 COVER

The plans must include a statement on the cover sheet:

“These construction plans for (name of development or project) were prepared by me (or under my direct supervision) in accordance with the requirements of the Town of Winter Park Standards and Specifications for Design and Construction.”

Name of Engineer
Name of Firm

The statement shall be signed and stamped by the Colorado Licensed Professional Engineer who prepared or directed preparation of the construction plans.

1. A vicinity map, at the appropriate scale, which shows the location and name of all arterial streets/roads within one mile of the proposed development and all streets/roads within the proposed development.
2. Index of sheets.

3. Agency List.
4. A Utilities Notification Center note with phone number shall be on the plans.

2.1.2 GENERAL NOTES

The following general notes shall appear on the construction plans for all submittals containing roadway plans:

1. The Town signature affixed to this document indicates the Town has reviewed the document and found it in general conformance with the Town of Winter Park Standards and Specifications for Design and Construction or approved variances to those regulations. The Town, 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 Licensed Professional Engineer whose stamp and signature is affixed to this document.
2. All roadway construction shall conform to Town of Winter Park Standards and Specifications for Design and Construction.
3. All materials and workmanship shall be subject to inspection by the Town. The Town reserves the right to accept or reject any such materials and workmanship that does not conform to its Standards and Specifications. This may result in a "stop work order" that will remain in effect until appropriate corrections are made to the satisfaction of the Town of Winter Park.
4. The contractor prior to actual construction shall verify the location of existing utilities.
5. The contractor shall provide all lights, signs, barricades, flagmen, or other devices necessary to provide for the safety in accordance with the Manual of Uniform Traffic Control Devices.
6. The contractor shall be solely and completely responsible for conditions at and adjacent to the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.
7. The duty of the Town to conduct construction inspections and review of the contractor's performance is not intended to include review of the contractor's safety measures in, on, or near the construction site.
8. It shall be the contractor's responsibility to notify the owner/applicant of any problem in conforming to the approved plans for any element of the proposed improvements prior to its construction.
9. If construction has not commenced within two (2) years of approval, the construction plans may be considered invalid. These plans may be subject to re-review and re-approval by the Town.
10. Paving shall not start until a soils report and pavement design is accepted by the Town and subgrade compaction tests are taken and accepted by the geotechnical engineer.
11. If dewatering is used to install utilities, culverts, etc., then a State Construction Dewatering Wastewater Discharge Permit is required for discharge into a storm sewer, channel irrigation ditch, or any water of the United States. A copy of the permit shall be kept on site and filed with the Town Planning Department.

2.1.3 PLAN

The plan view shall include but not be limited to, the following:

1. The scale shall be a minimum of 1" = 100'.
2. Locations and dimensions of existing and proposed property lines, setbacks, easements, and Right-of-Way.
3. Names of streets / roads (existing and proposed).
4. Survey line ties to Section or Quarter corners.
5. Survey lines, including the chord bearing and distances for all line and curve data, and centerline stationing/coordinates. Curb and gutter stationing /coordinates shall be equated to flowline stationing/coordinates at horizontal radius curves, cul-de-sacs, and other departures from normal roadway cross-sections.
6. Centerline stations/coordinates for all intersecting roadways and commercial driveways.
7. Existing and proposed street / road improvements, including shared driveways (sidewalk, curb, gutter, pavement limits, bridges, culverts, guardrails, handicap ramps, etc.). A dashed line shall depict existing improvements and a solid line shall depict proposed improvements.
8. Elevations and station/coordinates shall be noted for all curb returns, points of curvature, and points of tangency, high or low point of all vertical curves.
9. The rate of superelevation and all pertinent superelevation information shall be shown on the construction plans, as applicable.
10. Typical template(s) for streets / roads.
11. Match lines and consecutive sheet numbers.
12. Key map.
13. A legend to identify existing (dashed) and proposed (solid) utilities and structures, including but not limited to (include: size, type, height, and location, as applicable):

water	fence line
fire hydrants	ditches or swales
sanitary sewer	gas
storm sewer	electric
telephone	cable television
mailboxes	trash enclosures
snow storage	signs
14. Stations/coordinates and critical elevations of all utility and drainage appurtenances.
15. Major road intersection design at a scale of 1" = 20'. This shall depict all pertinent information including sight triangles (See SECTION 3.7.6). When a new road intersects an existing road, the existing road data (grades, width, etc.) shall be shown within 500' of the intersection.
16. All existing curbs, gutters, sidewalks, and asphalt or gravel roads adjacent to the proposed design. Basis for existing grades shall be as-built elevations at intervals not to exceed 50'. Previously approved designs are not an acceptable means of establishing existing grades.
17. All on-site slopes greater than 30% shall be shown on plans.
18. All proposed driveway centerlines will be shown on plans. The driveway length shall extend to the center of the building envelope or actual building location.

19. The design speed for all roads within the development.
20. Snow storage areas (dimensions, area, etc.) See SECTION 3.11.

2.1.4 PROFILE

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

1. The vertical scale shall be a minimum of 1" = 5' for roadway profiles.
2. Existing (dashed) and proposed (solid) grades.
3. Continuous stationing/coordinates for the entire portion of the roadway shown in the plan view with the centerline station/coordinates for all intersecting roadways and commercial driveways clearly labeled.
4. Vertical curve data including length of curve, P.V.C., P.V.T., P.V.I., beginning and end grades. All vertical curves shall be symmetrical.
5. Separate flowline or top of curb profiles shall be provided for design of cul-de-sacs and any other departure from normal roadway cross slope.
6. Existing (dashed) and proposed (solid) utilities.
7. A profile will be required for all driveways when grades exceed five percent (5%).

2.1.5 GRADING AND DRAINAGE PLAN

The grading plan should include supporting data and a construction sequence outlining the grading and revegetation (See CHAPTER 6 and 7). The plans shall contain the following information:

1. Property Limits, accurate contours of existing ground, details of existing terrain, and existing drainage patterns.
2. Location of all natural features, such as watercourses and wetlands, on the proposed site or within 100' of the disturbed grading area.
3. Location and size of all existing utilities and easements on the proposed site.
4. Limits of disturbance.
5. Final elevations (including spot elevations when applicable) and contours to be achieved by the proposed grading, to include all drainage way information and details (including cross-sections, detention ponds, outlet structures, etc).
6. Location and final elevations of any buildings or structures on the property where the work is to be performed and the location of any buildings or structures on adjacent land that are within 15' of the property or that may be affected by the proposed grading operations.
7. All recommendations included in the soils engineering report that are related to, or directly affect grading operations, shall be incorporated in the grading plans and specifications.

2.1.6 REVEGETATION, EROSION AND SEDIMENT CONTROL PLAN

A construction sheet shall contain the following:

1. Detention Pond/Water Quality Pond (See SECTION 6.2.12)
2. Erosion Control: size, type, location (See SECTION 7.3.1).
3. Sediment Control: size, type, location (See SECTION 7.3.2).
4. Revegetation: type, location (See SECTION 7.4).

See CHAPTER 7 for all Revegetation, Erosion, and Sediment Control Plan requirements.

2.1.7 SIGNAGE AND STRIPING PLAN

A construction sheet shall contain the following (See SECTION 3.8):

1. Existing and proposed striping: size, type, color, location
2. Existing and proposed signage: size, type, color, location

2.2 SKETCH PLAN

The following minimum requirements are to be provided as part of the Sketch Plan submittal and process, as defined per the applicable Land Use Regulations identified in SECTION 1.4. The information shall be submitted to the Town Planning Department. Each submittal shall contain, at a minimum, the following information:

1. A general site plan view of proposed roads within the development and all accesses to Town roads.
2. An analysis of the proposed project and the effects of the project on existing infrastructure. This analysis, at a minimum, shall include the following:
 - a. A description of the proposed project, existing site conditions and existing off-site conditions of all pertinent infrastructure (roads, bridges, drainage, etc.) and describe how they will be affected by the proposed development.
 - b. A statement verifying the existing infrastructure impacted by the proposed project is adequate for the improvements proposed. If improvements are necessary or existing infrastructure is questionable, the engineer shall submit recommendations for potential improvements.
3. A Transportation Impact Analysis (TIA) shall be required for all developments (see SECTION 3.12).
4. A letter from CDOT verifying that a Highway Access Permit may or may not be required. The Applicant may be responsible for any improvement required in the Highway Access Permit.

2.3 PRELIMINARY PLAT

The construction plans submitted at the preliminary plat stage must contain sufficient information to determine that all Town standards can be satisfied.

Construction plans must be submitted as part of the preliminary plat submittal and process, as defined per the applicable Land Use Regulations identified in SECTION 1.4. The submittal and all re-submittals shall be submitted to the Town Planning Department. Each submittal shall, at a minimum, contain the following information, although more information may be required at the discretion of the Town:

2.3.1 CONSTRUCTION PLANS

See SECTION 2.1 for requirements.

2.3.2 COST ESTIMATE

This shall include an overall cost estimate for all proposed construction as required by these Standards and a separate cost estimate for each phase of construction. The cost

estimate shall include a 20% contingency. The CDOT Standard Specifications for Road and Bridge Construction shall be used as a guide for all cost estimates. This shall include, but is not limited to, individual line descriptions and measurement of qualities shown in these CDOT specifications.

This cost estimate shall be used to determine the security required as part of the Development Improvements Agreement.

2.3.3 REQUESTED VARIANCES

Each variance shall be numbered sequentially and address the requirements in SECTION 8.1.

2.3.4 SURVEY PLAT

A survey plat shall be submitted along with the construction plans. The survey plat shall be reviewed by the Town to verify proper correlation between construction plans and the plat.

2.3.5 LANDSCAPE / REVEGETATION PLAN

See SECTION 7 and the Town of Winter Park Landscape Design Regulations and Guidelines for requirements.

2.3.6 PRELIMINARY GEOTECHNICAL REPORT

The preliminary geotechnical report shall address and recommend the maximum allowable slopes, pavement cross section design, and any other pertinent information for site construction. The geotechnical report shall include data regarding recommendations for grading procedures, design and opinion on adequacy for the intended use of site to be developed by the proposed grading as affected by soils engineering factors, including the stability of slopes.

2.3.7 TRAFFIC IMPACT STUDY (T.I.S.)

Shall be required for all developments proposing ADT's ≥ 400 .

The Town, at its discretion, may require a T.I.S. (see SECTION 3.13).

2.3.8 PHASING PLAN

A phasing plan shall be required for all projects utilizing phased construction or projects that cannot be completed within one construction season. The cost estimate shall reflect the phases of construction.

2.4 FINAL PLAT

The final plat submittal and process shall address the applicable Land Use Regulations identified in SECTION 1.4. The submittal and all re-submittals shall be submitted to the Town Planning Department. Each submittal, at a minimum, shall contain the following information:

1. All material required at preliminary plat. Any changes to the approved preliminary plat construction plans shall be reviewed, before the final plat review, by the Town. If in the opinion of the Town, the change has significant impact upon the approved preliminary plat, the change will be sent back to the Planning Commission and Town council for review and approval.
2. Final geotechnical report shall include final sub-grade structure, resulting road structure design, slope stability and retaining wall design.
3. A stormwater management plan (if applicable).

All materials submitted for final plat shall be signed, stamped, and sealed by the Colorado Registered Professional Engineer.

After final plat acceptance, the following shall be required after the appropriate changes, if any, are made:

1. A complete copy of the final plat and construction drawings shall be submitted to the Town using electronic media in AutoCAD format (.dwg or .dxf file) that contains the physical features and property boundary information of the development required. The drawing shall follow the format as found in - Town of Winter Park Requirements for Submittal of Digital Final Plat.
1. Two (2) hard copy sets of the entire final plat submittal.
2. An electronic copy (.pdf, word, excel) of the entire final plat submittal in the appropriate format, as determined by the Planning Department.

2.5 CONSTRUCTION

The Applicant is responsible and shall obtain all necessary permits (local, state, and/or federal) for construction.

PRIOR TO UTILITY OR ROADWAY INSTALLATION, THE APPLICANT SHALL INSTALL NECESSARY EROSION CONTROL MEASURES INCLUDING FUNCTIONING DETENTION PONDS.

STORMWATER MAINTENANCE CHECKS WILL BE MADE WEEKLY BY THE TOWN DURING CONSTRUCTION.

PRIOR TO WINTER SHUT-DOWN, THE APPLICANT SHALL CONTACT THE TOWN TO PERFORM A WALKTHROUGH OF THE CONSTRUCTION SITE TO VERIFY EROSION CONTROL MEASURES ARE IN PLACE FOR SPRING RUNOFF.

Before Preliminary or Final Acceptance, the Town may review the construction. The Town should be notified of any significant deviation from the approved construction plans and the Applicant shall file the following form with the Town – Request for Change to Approved Construction Plans.

The Town shall approve any change to the construction plans approved at final plat that will result in a variance, prior to starting any construction that will be impacted by the change.

2.6 POST CONSTRUCTION

The Town shall review and compare all construction with the construction plans approved at final plat and any design revisions made during construction. A request for construction review shall not be submitted between October 1st and April 1st due to variable weather conditions in the Town. A request for review may be denied if snow accumulation is present.

2.6.1 PRELIMINARY ACCEPTANCE

Security releases will only occur if improvements associated with construction plans are 100% complete (unless phased) with the exception of utilities.

Utilities are permitted three releases:

1. Water
2. Sewer
3. Dry utilities

Prior to Preliminary Acceptance the following items shall be supplied to the Town:

1. A letter requesting Preliminary Acceptance from engineer/landscape architect/geotechnical engineer (see SECTION 2.6.3)
2. Record drawings (as-builts) for the improvements shall be submitted at the time the letter requesting monies release is submitted. Release of monies shall not occur if the Town determines deviations are present which have not received prior approval.
3. A letter or letters of acceptance and responsibility for maintenance of the improvements by the appropriate utility company, special district, or town for all utilities and roads.
4. A letter from the East Grand Fire District stating that fire hydrants are in place, in accordance with the approved plans. The letter shall also state that the fire hydrants are operational and provide the results of the fire flow tests.
5. Quality control test results shall be submitted for all phases of the project in accordance with the schedule for minimum materials sampling, testing and inspection as found in *CDOT's Materials Test Procedure Module*.
6. Photos (if applicable)
7. Field Notes (if applicable)
8. Any addendums/changes to the final plat submittal.
9. Any other pertinent information associated with the construction.

If any substantial variations or discrepancies are discovered between the approved construction plans and the improvements actually constructed, the Applicants engineer shall propose and recommend a solution or alternative solutions to the Town for review and approval. If no proposed alternative will satisfy the requirements of these Standards, the engineer shall submit a variance request or the Applicant shall reconstruct the deficient public improvements to comply with the approved construction plans.

The release of monies shall be contingent on Town review and acceptance as outlined in the Developments Improvements Agreement.

2.6.2 FINAL ACCEPTANCE

Consideration of Final Acceptance shall be no less than two (2) years from Preliminary Acceptance. Prior to Final Acceptance the following items shall be supplied to the Town:

1. A letter or letters stating that the improvements have been free of defects for the past two years by the appropriate utility company, special district, or town for all utilities and roads.
2. A letter from the East Grand Fire District stating that fire hydrants are still

operational.

3. A letter requesting Final Acceptance from engineer/landscape architect/geotechnical engineer shall be signed, stamped and sealed (see SECTION 2.6.3).

If upon final inspection of the improvements, the Town finds the improvements are not substantially free of defects in materials and workmanship or have not been repaired or maintained as required under the Development Improvements Agreement, the Town shall issue a written notice of noncompliance within 14 days after the final inspection specifying the respects in which the improvements are not substantially free of defects in materials and workmanship or have not been repaired and maintained as required under the Developments Improvements Agreement.

The Applicant shall thereupon take such action as is necessary to cure any noncompliance and, upon curing the same, shall request a new final re-inspection from the Town. A re-inspection fee shall apply.

The release of monies shall be contingent on Town review and acceptance as outlined in the Developments Improvement Agreement.

2.6.3 CERTIFICATIONS

The following certifications shall be required on letterhead with stamp, seal, date and shall address the appropriate construction plans / documents that the professional is approving. Such certifications shall be submitted to the Town upon request for Preliminary and Final Acceptance.

ENGINEER

The licensed engineer of record shall review the information required above and state that the actual construction and materials used are in substantial compliance with the Town accepted construction design plans.

“I _____, A DULY LICENSED PROFESSIONAL ENGINEER IN THE STATE OF COLORADO, STATE THAT CONSTRUCTION HAS BEEN COMPLETED IN SUBSTANTIAL COMPLIANCE WITH THE CONSTRUCTION PLANS APPROVED BY THE TOWN OF WINTER PARK, AS DETERMINED BY REVIEW OF THE RECORD DRAWINGS AND DURING PERIODIC ON-SITE OBSERVATIONS DURING AND AFTER THE COURSE OF CONSTRUCTION AS DETERMINED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____.”

GEOTECHNICAL ENGINEER

The geotechnical engineer of record shall supply the Town with a letter stating that, based on the results of the quality control test results; construction was completed in substantial compliance with the pavement design and geotechnical recommendations approved by the Town.

“I _____, A DULY LICENSED PROFESSIONAL ENGINEER IN THE STATE OF COLORADO, STATE THAT CONSTRUCTION HAS BEEN COMPLETED IN SUBSTANTIAL COMPLIANCE WITH THE FINAL GEOTECHNICAL REPORT APPROVED BY THE TOWN OF WINTER PARK, AS DETERMINED BY COMPLETION AND REVIEW OF THE QUALITY CONTROL TEST RESULTS

AND DURING PERIODIC ON-SITE OBSERVATIONS DURING AND AFTER THE COURSE OF CONSTRUCTION AS DETERMINED BY ME OR UNDER MY DIRECT SUPERVISION. DATE:_____.”

LANDSCAPE ARCHITECT

The Landscape Architect of record will supply the Town with a letter stating that, based on the actual landscaped plans on site; the landscape was in substantial compliance with the Town accepted construction design plans.

“I _____, A DULY LICENSED LANDSCAPE ARCHITECT IN THE STATE OF COLORADO, STATE THAT CONSTRUCTION HAS BEEN COMPLETED IN SUBSTANTIAL COMPLIANCE WITH THE LANDSCAPE PLANS APPROVED BY THE TOWN OF WINTER PARK, AS DETERMINED BY PERIODIC ON-SITE OBSERVATIONS DURING AND AFTER THE COURSE OF CONSTRUCTION AS DETERMINED BY ME OR UNDER BY DIRECT SUPERVISION. DATE:_____.”

2.7 AS-BUILT DRAWINGS

The record drawing submittal shall accompany the request for Preliminary Acceptance of the construction improvements.

Identify and show on the "As-Built Drawings" all existing or abandoned utilities that were encountered during construction that were not shown on the design plans or that were shown on the design plans incorrectly.

The method to show locations (both for proposed construction and As-Built drawings) is by the use of centerline stations/coordinates as depicted on the construction plans with suitable distances and offsets given relative to these lines.

All elevation information shall be based upon an existing on-site benchmark as depicted on the approved construction plans.

As-Built drawings are to be provided by a State of Colorado Licensed Professional Surveyor. All required As-Built drawing information shall be clearly shown with the original approved design information and all field design revisions made during the construction process (design information should be shaded back). A stamped hardcopy of the As-Built Drawings shall be submitted along with an electronic copy in ACAD format. Each sheet of the As-Built Drawings shall include the following statement along with the licensed professional surveyor's stamp and date of execution.

"I, _____, A DULY LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, STATE THAT THE INFORMATION CONTAINED IN THESE AS-BUILT DRAWINGS ARE THE RESULTS OF A FIELD SURVEY AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF, AS DETERMINED BY ME OR UNDER MY DIRECT SUPERVISION ON THIS DATE:_____."

The following information shall be shown/corrected on the As-Built Drawings:

2.7.1 ROADWAY PROJECTS

1. Road locations: Locations of road centerline, intersection radii, edge of asphalt, edge of gravel shoulder, and flowline of ditch, at 200-foot maximum intervals, and at all

beginning and end of horizontal curves. Vertical information should be included in order to determine centerline grades, cross-slope grades, superelevation rates, flowline grades, and side slopes.

2. All existing infrastructure in road including, but not limited to: drainage appurtenances, vaults, manholes, inlets, catch basins, water valves, fire hydrants, etc. (see below for further requirements).
3. Guardrail: locations, types, alignment.
4. Retaining Walls: locations, type, height, alignment.
5. Clear Zone obstructions: location, type, alignment.
6. All signage within the RIGHT-OF-WAY: location, type, alignment.
7. Verification of snow storage areas, per the plans, has been met.
8. Public Utility Easements/RIGHT-OF-WAY: locations, widths, and location of road appurtenances within the Easement/RIGHT-OF-WAY

2.7.2 WATERLINE PROJECTS

Refer to Grand County Water and Sanitation District No.1 or Winter Park Water and Sanitation District for specifications.

2.7.3 SANITARY SEWER PROJECTS

Refer to Grand County Water and Sanitation District No.1 or Winter Park Water and Sanitation District for specifications.

2.7.4 STORM DRAINAGE PROJECTS

1. Manholes/Inlets/Catch Basins: locations, types, rims & invert elevations.
2. Storm Lines: locations, materials, lengths, slopes, diameter, location of catch basins and side sewer tees, and invert elevations.
3. Public Utility Easements: locations, widths, and location of storm drainage appurtenances within the easements.
4. Retention/Detention Systems: volume of constructed system, pond storage and construction limits, overflow elevations and locations, discharge orifice diameters and locations.
5. Drainage Swales: location, width, depth, side slopes, lengths, elevations of inlet and outlet locations.

2.7.5 DRY UTILITY PROJECTS

1. Public Utilities including gas, electric, cable, etc. and the associated easements: locations, widths, and location of appurtenances within the easements.

NOTE: IN ACCORDANCE WITH SECTION 7-10-8 OF THE WINTER PARK TOWN CODE, THE APPLICANT SHALL BE RESPONSIBLE FOR THE TOWN ENGINEERS COST FOR PLAN REVIEW AND SITE INSPECTIONS.

Chapter 3

Roadway Design



CHAPTER 3: ROADWAY DESIGN STANDARDS

3.1 BASIC DESIGN POLICIES

All new road designs (public and private) and related information must meet the minimum standards within the Town of Winter Park Standards and Specifications for Design and Construction. Any design standards not included within the Town of Winter Park Standards and Specifications for Design and Construction will be subject to the minimum standards set forth in the most up to date publications found in Chapter 12.

All road construction in other jurisdictions must meet the minimum standards set forth by that jurisdiction.

The design speed of any road shall not be less than 20 mph (C.R.S. §42-4-1101).

3.2 TRIP GENERATION

Trip generations for proposed development should be based on the type of occupancy for which the development is designed and shall be formulated from the following:

<u>DEVELOPMENT TYPE</u>	<u>TRIPS GENERATED</u>
Single Family	8 ADT/Unit
Multifamily	5 ADT/Unit

Other uses not listed above shall use the *ITE Trip Generation Manual* for trip generation. Other acceptable data sources may be acceptable in cases where the *ITE Manual* does not provide the information necessary.

3.3 ROAD CLASSIFICATIONS

Town roads are classified according to function and ADT's. Functional classifications shall be established by the Town. The Town has the authority to determine which classification applies to any given road. The Applicant may be required to conduct existing traffic counts at the direction of the Town to establish existing roadway classifications.

The minimum road design standards are based on the following road classifications and can be found in TABLE 3.3.

3.3.1 COLLECTOR ROAD SYSTEM

Collector roads provide a link between arterials and local roads and therefore serve travel from developments to towns. More moderate speeds may be typical on collector roads.

3.3.2 LOCAL ROAD SYSTEM

The local road system, in comparison to collectors and arterial systems, primarily provides access to land adjacent and provides travel through developments. A local road is a road whose primary function is to provide access to residences, businesses, or abutting property, rather than to serve through traffic.

3.3.3 LOW-VOLUME ROAD SYSTEM

A low-volume road has the same characteristics of a local road, in that its primary use is as an access road, not a through road, and it primarily serves drivers who are familiar with the roadway.

TABLE 3.3 – ROADWAY CLASSIFICATION AND MINIMUM DESIGN CRITERIA

CLASS	# LANES	ADT LEVELS	DESIGN SPEED (mph)	LANE WIDTH	CLEAR ZONE	RIGHT-OF-WAY
MAJOR COLLECTOR	2	>2500	30 – 35	12'	12'	80'
MINOR COLLECTOR	2	1000 – 2500	30 - 35	12'	10'	60'
LOCAL	2	450 - 1000	20 - 30	12'	8'	60'
LOW VOLUME	2	< 450	20 - 30	12'	N/A	60'
DRIVEWAY	1	≤ 20	15	12'	N/A	N/A

NOTE: The minimum RIGHT-OF-WAY/easement widths may be increased by the Town to accommodate for drainage improvements, excessive cut/fill slopes, intersections, clear zones, or snow storage.

Typical cross-sections for local and collector roads can be found in FIGURES 1-4.

3.4 HORIZONTAL ALIGNMENT

3.4.1 CENTERLINE CURVE RADIUS

Superelevation is not required on local or low volume roads if the minimum requirements in TABLE 3.4.1 can be met. The minimum curve radius is ultimately determined by the stopping sight distance.

TABLE 3.4.1 – MINIMUM CENTERLINE CURVE RADIUS AND TANGENT LENGTH WITHOUT SUPERELEVATION

Based on Exhibit 3-16 A Policy on Geometric Design of Highways and Streets (2004)

Design Speed (mph)	Radius (ft)	Tangent Length (ft)
15	75	50
20	107	75
25	198	100
30	333	150
35	510	200

This table shall be applicable for local and low volume roads.

3.4.2 ACCESS

Roadway systems shall provide at least two (2) access points to the development. All edges of roads (measured from edge of shoulder) must be a minimum of seven feet (7') from the adjacent property line. All single-family and multi-family developments may not be required to provide two (2) points of access if all of the following conditions are met.

1. The total development is ≤ 9 units.
2. The dead end street is no more than 600' (may be increased to 1000' with Fire District approval).
3. A turnaround is provided as shown in FIGURE 5.

Lane widening may be necessary on sharper curves and where large vehicle traffic is expected, and should satisfy the requirements within the *A Policy of Geometric Design of Highways and Streets*. At the discretion of the Town, turning templates may be required for roads and/or parking lot designs (See TABLE 3.4.2).

Any access that is proposed to multiple lots shall be constructed by the land developer (i.e. a proposed shared driveway to two lots will require that the driveway be constructed through the first lot and in conjunction with the adjacent site improvements).

TABLE 3.4.2 – DESIGN VEHICLE TURNING TEMPLATE

Based on Exhibit 2-2 A Policy on Geometric Design of Highways and Streets (2004)

Vehicle	AASHTO Designation	Minimum Design Radius (ft)
Passenger Car	Passenger Vehicle (P)	24
Fire Truck	Fire District Standard	
Garbage Truck	Single Unit Truck (SU)	42
Semi-Trailer	Intermediate Semi-Trailer (WB-50)	45

3.4.3 DEAD-ENDS AND TURNAROUNDS

Dead end roads exceeding 200' that do not have turnarounds are not allowed in the Town. Using cul-de-sac streets shall be avoided. Where cul-de-sac streets are the only alternative, turnarounds shall be provided per FIGURE 5. All turnarounds shall provide ten feet (10') of flat, treeless ground around the perimeter and within the island. The internal island may not be used as part of the open space calculation and shall not be used for utilities. All turnarounds shall be signed accordingly (to restrict parking, dead-end, etc.).

The maximum length of roads ending in turnarounds shall be 600'. With the approval from the Fire District, the maximum distance may be increased to 1000'. When a variance from this standard is requested, approval from East Grand Fire District is required and may include the following:

- a) Central water service.
- b) An alternative water supply acceptable to the Fire District.
- c) Additional turnouts to be installed.

All turnarounds shall be subject to Fire District review and approval.

3.4.4 SWITCHBACKS

A switchback is defined as a curve with a delta greater than 120° and a radius $\leq 100'$. On all roadways when other alternatives may cause significant adverse impacts, the use of switchbacks may be allowed on a case-by-case basis, with approval from the Town. Switchbacks shall be designed with a minimum centerline radius of 60'. Maximum

centerline grades within 25' of a switchback curve and throughout the curve shall not exceed four percent (4%). Special attention should be given to provide adequate snow storage and sight distance. Widening of the roadway around the curve may be necessary to allow for wide turning vehicles (i.e. fire trucks, snow plows, trash trucks, etc.).

3.5 CROSS SECTIONS

Typical cross-sections can be found in FIGURES 1-4.

3.5.1 SURFACING REQUIREMENTS

All roads in a development shall be asphalt / concrete paved in accordance with the Specifications.

3.5.2 CROWN / SUPERELEVATION

The maximum desirable superelevation rate is 0.060 foot per foot, but 0.080 can be used where the grade of the road is less than five percent (5%). Where superelevation is used, the minimum tangent lengths between curves shall be consistent with the design guidelines outlined in *A Policy of Geometric Design of Highways and Streets*.

3.5.3 CLEAR ZONE

The minimum clear zone required for Town roads are shown in TABLE 3.3, the clear zone required should be based on ADT's, speed, horizontal and vertical alignments. Slopes of 3:1 or steeper are considered critical slopes, on which a vehicle is likely to overturn. Therefore, all newly constructed roads shall provide a minimum clear zone with a maximum 4:1 slope as defined in TABLE 3.3. The clear zone is measured from the outside edge of the adjacent driving lane.

The clear zone width should be increased on the outside of curves to accommodate the path of an errant vehicle. Determination of the width of the clear zone should take into consideration right-of way availability, environmental concerns, economic factors, safety needs, and accident histories. If these minimum clear zone widths are not feasible, guardrail installation may be necessary.

3.5.4 GUARDRAIL

The use of guardrail is discouraged within the Town and should not be used when it is economically feasible to remove the obstruction, correct the hazardous condition, or where it is determined that the guardrail would create a more serious hazard than the feature it would shield. The *Roadside Design Guide* shall be used as the most recent guide to guardrail implementation. The use of guardrail may be necessary if any of the following conditions exist:

- a) Roadside hazards are present within the "clear zone".
- b) A road built to Town Standards contains an isolated sharp curve in conjunction with a side slope steeper than 4:1.
- c) A section of road has a history of vehicular accidents.

When guardrails are considered for installation, especially for extended lengths,

provisions shall be made for adequate snow storage and removal.

3.5.5 PEDESTRIAN FACILITIES

Sidewalks, pedestrian, and bicycle paths shall be constructed in accordance with the roadway templates and/or the Town's Master Trail Plan. It is encouraged that all trails be linked to the Headwaters Trails Alliance Trail System whenever possible. Sidewalk curb ramps shall be designed in accordance with FIGURES 6 & 7.

3.6 VERTICAL ALIGNMENT

3.6.1 GRADES

The minimum centerline grade for all roads is one percent (1%). A minimum flowline grade of one percent (1%) shall be maintained around all full and partial cul-de-sac bulbs. If curb and gutter are proposed, the minimum flowline grade may be one half percent (0.5%).

Continuous grade changes shall not be permitted. The use of grade breaks in lieu of vertical curves is discouraged; however, if a grade break is necessary and the algebraic difference in grade (A) does not exceed one half percent (0.5%) along the street / road, the grade break will be permitted.

The maximum grade for all roads is seven percent (7%). Where roads approach intersections see TABLE 3.7.4. A local or low volume road may have sections with a grade of seven percent (7%) to eight point, nine, nine percent (8.99%) provided all of the following conditions are met:

- a) The section shall be no longer than 500'.
- b) The section shall have a horizontal radius of 1000' or greater.
- c) Grades shall not exceed seven percent (7%) for 500' on either end of the section.
- d) Curves with a horizontal radius of less than 600' shall not be within 500' on either end of the section.

Each side of the road section (RIGHT-OF-WAY) must be designated with a restricted access line.

For a grade of more than nine percent (9%), (10% is the maximum) the previous conditions must be met along with the following:

- a) The section of road will not serve more than 40 ADTs.
- b) The design speed is 30 MPH or lower.

3.6.2 VERTICAL CURVES

The Town standard for rate of vertical curvature ('k' value) and minimum lengths is controlled by standards shown in *A Policy of Geometric Design of Highways and Streets* and by stopping sight distances. (See TABLE 3.6.2).

TABLE 3.6.2 – DESIGN CONTROLS FOR VERTICAL CURVES AND STOPPING SIGHT DISTANCE

Exhibits 3-72 and 3-75, A Policy on Geometric Design of Highways and Streets (2004)

SAG VERTICAL CURVES			
Design Speed (mph)	Stopping Sight Distance (ft)	Rate of vertical curvature, K^a	
		Calculated	Design
15	80	9.4	10
20	115	16.5	17
25	155	25.5	26
30	200	36.4	37
35	250	49	49
CREST VERTICAL CURVES			
Design Speed (mph)	Stopping Sight Distance (ft)	Rate of vertical curvature, K^a	
		Calculated	Design
15	80	3	3
20	115	6.1	7
25	155	11.1	12
30	200	18.5	19
35	250	29	29

^a Rate of vertical curvature, K, is the length of the curve (ft) per percent algebraic difference intersecting grades (A). $K=L/A$

See *A Policy on Geometric Design of Highways and Streets* for “k” values associated with vertical curve designs based on passing sight distance.

3.6.3 STOPPING SIGHT DISTANCE

See Table 3.6.3-A and B for stopping sight distances.

TABLE 3.6.3A – STOPPING SIGHT DISTANCE

Exhibit 3-1 - A Policy on Geometric Design of Highways and Streets (2004)

Design Speed (mph)	Brake Reaction Distance (ft)	Braking Distance on level (ft)	Stopping Sight Distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250

Note: Brake reaction distance predicated on a time of 2.5s; deceleration rate of 11.2 ft/s² used to determine calculated sight distance

TABLE 3.6.3B – STOPPING SIGHT DISTANCE ON GRADES
Exhibit 3-2 - A Policy on Geometric Design of Highways and Streets (2004)

Design Speed (mph)	Stopping Sight Distance (ft)					
	Downgrades			Upgrades		
	3%	6%	9%	3%	6%	9%
15	80	82	85	75	74	73
20	116	120	126	109	107	104
25	158	165	173	147	143	140
30	205	215	227	200	184	179
35	257	271	287	237	229	222

See *A Policy on Geometric Design of Highways and Streets* for Decision Sight Distance where unexpected vehicular maneuvers are required. (i.e. intersections, changes in cross section, etc.)

3.7 INTERSECTIONS

All connections to existing asphalt roads will require an asphalt sawcut and be paved according to SECTION 3.5.1 SURFACING REQUIREMENTS.

3.7.1 SKEW ANGLES

All new road/driveway connections shall intersect existing roads at 90°. Where this is not possible the following maximum skew angles and distances (measured from edge of shoulder) must be met:

- a) a maximum skew angle of 10° for 20' on local/low volume roads
- b) a maximum skew angle of 10° for 50' on collector roads.
- c) a maximum skew angle of 25° for 20' on driveways.

3.7.2 EDGE OF SHOULDER RADII

All new road/driveway connections shall meet the minimum design standards for intersection edge of shoulder radii (TABLE 3.7.2). The width of intersection should be limited to accommodate the turning radii of vehicles anticipated to use the intersection. Oversized intersections are discouraged.

The maximum fall, in feet, around the radii return shall be equal to the steepest grade coming into or out of the return multiplied by the return length plus 0.2'.

**TABLE 3.7.2 – MINIMUM EDGE OF SHOULDER RADII
FOR INTERSECTING ROADWAYS**

E X I S T I N G A C C E S S		NEW ACCESS					
		ARTERIAL	MAJOR COLLECTOR	MINOR COLLECTOR	LOCAL	LOW VOL.	DRIVE
	HIGHWAY	See <i>State Highway Access Code (CDOT)</i> for design requirements					
	MAJOR COLLECTOR	----	50'	50'	30'	*	*
	MINOR COLLECTOR	----	----	50'	25'	20'	10'
	LOCAL	----	----	----	20'	20'	10'
	LOW VOL.	----	----	----	----	20'	10'

* Access is discouraged. Variances will be required.

3.7.3 HORIZONTAL OFFSET

All new road/driveway connections shall meet the minimum design standards for intersection offsets (measured centerline to centerline) to existing roads/driveways (TABLE 3.7.3).

TABLE 3.7.3 – MINIMUM INTERSECTION OFFSETS

		NEW ACCESS			
		MAJOR COLLECTOR	MINOR COLLECTOR	LOCAL/ LOW VOL.	DRIVE
E X I S T I N G	MAJOR COLLECTOR				
	⊥ MINOR COLLECTOR	1000'	800'	500'	*
	⊥ LOCAL/LOW VOL.	800'	500'	500'	*
	⊥ DRIVE	500'	200'	200'	*
I N T E R S E C T I O N S	MINOR COLLECTOR				
	⊥ MINOR COLLECTOR	-	N/A	500'	200'
	⊥ LOCAL/LOW VOL.	-	500'	200'	125'
	⊥ DRIVE	-	200'	125'	100'
	LOCAL/ LOW VOL.				
	⊥ LOCAL/LOW VOL.	-	-	200'	125'
	⊥ DRIVE	-	-	125'	50'

* Access is discouraged. Variances will be required unless there is only one point of

access and no other roads adjacent to property.

When a new development can access two different roads, access shall always be to the road with the lowest classification.

3.7.4 GRADES

All intersections shall utilize vertical curves unless SECTION 3.6.1 is met. The minimum design speed for all vertical curves (See TABLE 3.6.2) at intersections shall be 15 MPH.

TABLE 3.7.4 – MAXIMUM GRADE AT INTERSECTIONS

T H R O U G H S T R E E T		MAJOR COLLECTOR	MINOR COLLECTOR	LOCAL	LOW VOL.	DRIVE
	MAJOR COLLECTOR	3% - 150'	3% - 150'	3% - 100'	3% - 100'	*
	MINOR COLLECTOR	-----	3% - 100'	3% - 100'	3% - 100'	5% - 50'
	LOCAL	-----	-----	3% - 50'	3% - 50'	5% - 50'
	LOW VOLUME	-----	-----	-----	3% - 50'	5% - 50'

NOTE: Distance Measurement starts from edge of shoulder of the through street. The vertical curve may be included if the maximum values shown above are not exceeded.

* Access is discouraged. Variances will be required unless there is only one point of access and no other roads adjacent to property.

3.7.5 CORNER SIGHT DISTANCE

The minimum corner sight distance is defined in FIGURE 8. Using the plan and profile of the intersection the design engineer shall verify these minimum sight distances can be attained.

When the criteria for sight distance cannot be met, the Town may deny the access, prohibit right or left turns by vehicles entering the road, or require speed change lanes.

3.7.6 SIGHT TRIANGLE

For safety and visibility purposes, a sight distance triangle shall be maintained at street intersections and where driveways intersect streets. Development layouts shall pay particular attention to the size and shape of their corner lots in order to maintain these minimum sight triangles. Any object within the sight triangle that is greater than 12" in diameter between three feet (3') and eight feet (8') above the roadway elevation of the adjacent street shall constitute a sight obstruction, and shall be removed. Such objects include: snow, buildings, cut slopes, hedges, trees, bushes, utility cabinets or tall crops.

This criteria also requires the elimination of parking within the sight triangle and applies whether the intersecting roads are level or on grades.

All intersections within a proposed roadway shall depict the necessary sight triangles on the intersection plan sheet and the plat (FIGURE 8).

3.8 SIGNAGE AND STRIPING

Refer to the Specifications for additional information.

3.9 PARKING REQUIREMENTS

3.9.1 GENERAL

Parking on Town roads or within the Right-of-Way is illegal (C.R.S §43-5-301) except where designated. The backing of parked vehicles onto Town roads is discouraged; exceptions may be made on Local and Low Volume Roads. The number of parking stalls required shall conform to SECTION 3.9.3 of these Standards.

Typical Parking Stall Dimensions	Maximum Grade in Parking Area	Minimum Grade in Parking Area
10' x 20'*	5% parallel to parking stalls 5% for cross slope**	1%

* Special Design will be needed for parallel parking. Underground/covered parking may use 9' x 18'.

** Minimum/Maximum grade requirements are considered to be average grades at the middle of the parking area.

3.9.2 AMERICANS WITH DISABILITIES ACT (A.D.A) COMPLIANCE

A.D.A parking shall provide an additional four feet (4') in unobstructed width to accommodate the operation of wheel chairs between vehicles and must be clearly signed. Two (2) adjacent stalls may utilize the same additional width. The maximum grade in designated A.D.A areas shall not exceed five percent (5%) in one direction or two percent (2%) in the cross direction.

Article 5, C.R.S. §9-5-101 et. seq. shall apply for all A.D.A parking and access.

3.9.3 OFF-STREET PARKING AND LOADING SPACE REQUIREMENTS

These parking requirements are the minimum, and, based on individual circumstances, may be increased or decreased at the discretion of the Town. All land uses shall provide off-street parking in accordance with following criteria:

- (a) Single-family, 2 spaces per dwelling unit.
- (b) Multi-family dwellings (including apartments and condominiums) with one (1) bedroom, one (1) space per dwelling unit
- (c) Multi-family dwellings (including apartments and condominiums) with two (2)

bedrooms, one and one half (1 ½) spaces per dwelling unit.

- (d) Multi-family dwellings (including apartments and condominiums) with three (3) bedrooms or more, two (2) spaces per dwelling unit.
 - (e) Dormitories, bunkhouses and similar group sleeping quarters, one (1) space for every three (3) beds.
 - (f) Hotels, motels, lodges, studio units, three spaces for every four (4) units.
 - (g) Rest homes, hospitals, sanitariums, one (1) space per bed.
 - (h) Offices (professional, non-professional, including real estate, condominium rental offices), one (1) space for each four hundred (400) square feet of gross floor area.
 - (i) Eating and drinking establishments, one (1) space for each one hundred (100) square feet of gross floor area.
 - (j) Retail sales - one (1) space for every four hundred (400) square feet of gross floor area excluding areas devoted exclusively to storage and building maintenance.
 - (k) Auditoriums, churches, theaters - one (1) space for every four (4) seats if fixed seating or one (1) space for each fifty (50) square feet of floor room in the seating area.
 - (l) Place of manufacturing, processing, assembling and similar industrial use, one space for each four hundred (400) square feet of gross floor area exclusive of restrooms and building maintenance areas, provided further that such parking not occupy space provided in satisfaction of loading area requirements.
 - (m) Employee parking in addition to those parking requirements mentioned above, one (1) parking space for every three (3) employees shall be provided and designated for those employees.
 - (n) For uses not listed or not fitting within one (1) of the above categories, the Town Manager shall determine the off-street parking requirements subject to the approval by the Town Council.
 - (o) Additional apron or peripheral parking may be required if the Town Planner, Planning and Zoning Commission and Town Council find it necessary.
- (2) Off-Street Parking Stall Configuration
- (a) Except as may be provided for compact cars, minimum size of off-street parking space and parking lot drives shall be in accordance with FIGURE 9.
 - (b) No parking shall be permitted in side yard or front yard setbacks.

- (c) Required parking spaces must be provided on the same property as the principal building or use.
 - (i) In multi-family developments, parking shall be within two hundred (200) feet of the principal use. Details regarding ownership of the parking areas shall be based on the homeowner's association covenants.
 - (ii) In commercial or industrial developments, the parking area shall be within six hundred (600') feet of the principal building or use, provided (in either case) the zoning for the parking area is the same as the principal use or a more intensive classification.
 - (iii) All parking areas shall be owned by the owner of the principal use for which parking spaces are being provided or said owners shall have a long-term lease on the land so that all required parking will be provided for any particular development.
 - (d) All parking areas shall be surfaced with asphalt, or concrete.
 - (e) Where a surface parking area of five (5) spaces or more is situated such that less than one half (1/2) the perimeter of the total area abuts a required yard that can be used for snow storage, then the total size of the parking area shall be increased by five (5%) percent.
 - (f) All parking areas shall be properly maintained and be completely free of snow so as to not reduce the required number of parking spaces.
 - (g) Refer to the Landscape Design Guidelines and Regulations for landscape requirements for parking areas.
 - (h) Parking areas shall be designed to manage stormwater drainage that will result from increase runoff from the site, designed to prevent non-point source pollution.
 - (i) A land owner with access to a state highway will be required to contact the Colorado Department of Transportation regarding specific permit and design requirements.
 - (j) Parking shall comply with all applicable federal and state accessibility requirements.
 - (k) All parking areas shall be separated from adjacent property by the use of open space areas of a minimum dimension of seven feet (7) and setback fifteen feet (15) from all rights-of-way. Such open space areas shall define the parking area and help define traffic flow so as to allow snow removal from parking areas without trespass upon or interference with adjacent property owners. The open space shall comply with the Landscape Design Regulations and Guidelines.
- (3) Permitted Reductions in Off-Street Parking Requirements

It is the intent of this Section to establish parking requirements based on the differing parking demands and time use characteristics in cases where commercial, residential, cultural or civic uses are intermixed on the same lot. The end product shall be a more efficient use of surface area with less land area devoted to parking.

- (a) In districts where multiple-family dwellings, hotel or similar residential uses are erected above or on the same lot as commercial uses of any kind permitted without a use permit, the off-street parking requirements for said retail and service uses may be reduced by the Town Council but not less than one space for each eight (8) fixed seats or one space for each one hundred (100) square feet of gross floor area of auditoriums, churches, and theaters, whichever is appropriate.

Type of Development	Minimum Spaces Unit
Offices	One (1) space for each eight hundred (800) square feet gross floor area
Eating and drinking establishments	One (1) space for each two hundred (200) square feet gross area
Retail Sales	One (1) space for every eight hundred (800) square feet of gross floor area excluding areas devoted exclusively to storage and building maintenance
Auditorium, churches, theaters	One (1) space for every eight (8) seats if fixed seating, or one (1) space for each one hundred (100) square feet of floor room in the seating area

- (b) In considering the amount of deduction it should permit, the Town Council shall take into account the magnitudes and times of operation of all uses proposed, availability of other public or private parking structures or areas at reasonable distances within the district, availability of remote employee parking in this or other districts where permitted, and other factors as the Town Council deems pertinent. The Town Council may request of any Applicant a plan showing all planned or proposed parking spaces and an analysis of the parking demand for the specific uses proposed. In the D-C and R-C districts, a payment-in-lieu of providing required parking may be accepted by the Planning and Zoning Commission. The amount shall be equal to the actual cost of providing hard-surfaced parking stalls (10' x 20'), plus access drive (10' x 12').
- (c) Any reduction in parking requirements as provided for in this Section shall be granted upon the adoption of a resolution by the Town Council.

(4) Off-Street Loading Area Requirements

In all applicable districts, the following off-street loading requirements shall apply. All loading spaces must be snow-plowed and permanently maintained.

Type of Development	Loading Requirements
Residential uses	None required
Commercial use less than 25,000 gross square feet.	One (1) space (may be eliminated if off-street loading space for the handling of all materials and equipment is provided)
Commercial use greater than 25,000 gross square feet	One (1) space for each 25,000 gross square feet plus one space for any portion exceeding a multiple of 25,000 (i.e., 60,000 gross square feet requires three loading spaces)

3.10 MULTI-FAMILY DEVELOPMENT

Multi-family development shall meet the requirements of all applicable sections noted in SECTION 1.4 and within these regulations.

Limited deviation in design requirements may be permitted based on urban design sections within AASHTO *Geometric Design of Very Low-Volume Local Roads*. The minimum design speed for all internal roadways shall be 15 mph. Particular attention should be made to meet the minimum stopping sight distance requirements. All structures within multi-family development (i.e. buildings, garages, dumpsters, etc.) shall be located at least ten (10') feet from the edge of all driving surfaces, or as determined by the Town based on setback requirements.

3.10.1 RIGHT-OF-WAY / EASEMENT

The minimum Right-of-Way/easement width should comply with TABLE 3.3. The road Right-of-Way/easement shall accommodate all utilities, roads, drainage, and snow storage requirements or separate easements shall be required.

3.10.2 INTERSECTIONS

At the discretion of the Town, driveway offsets to roads may be reduced to fifty (50') feet (measured centerline to centerline) on internal roadways which are classified Local or Low Volume. This design criteria does not reduce other design criteria required in these Standards (i.e. site triangles, intersection site distance, setbacks, etc.).

3.10.3 REVEGETATION, EROSION AND SEDIMENT CONTROL

See CHAPTER 7 for requirements.

3.10.4 PARKING

See SECTION 3.9 for requirements.

3.10.5 LIGHTING

All lighting requirements shall be according to appropriate land use regulations listed in SECTION 1.4.

3.10.6 PEDESTRIAN FACILITIES

See SECTION 3.5.5 for requirements.

3.10.7 SNOW OPERATIONS

See SECTION 3.11 for requirements.

3.11 SNOW OPERATIONS

All sites shall provide snow storage on-site. The use of the Town Right-of-Way for development snow storage shall not be permitted (C.R.S. §43-5-301, 43-5-303 & Winter Park Town Code 4-1-7).

Driving surfaces (including gravel shoulders), parking areas, and pedestrian walkways shall be required to provide snow storage. The snow storage area required is 25% of the total area as mentioned in the previous sentence and shall be a minimum of four feet (4') measured from the edge of road. Shoulders, cut slopes exceeding 3:1, center islands and private land not maintained by a homeowners association shall not be used as snow storage. Snow storage shall not be shown within three feet (3') of all surface utilities. Designated snow storage areas shall be placed in practical locations (as determined by the Town) throughout the site and shall not interfere with the intersection site triangle (See FIGURE 8). Designated snow storage areas should be located to ensure that runoff from these areas will drain to the appropriate drainage facility (inlets, detention ponds, etc.).

If the 25% snow storage requirement cannot be met, a variance may be granted for heated hard surfaces or sites with a long-term maintenance program for hauling snow to predetermined offsite locations. Both of these options may be required to meet current water quality and drainage detention standards.

The Town shall not be responsible for any snow removal required to gain access to any utility or other infrastructure within the Town Right-of-Way.

3.12 TRAFFIC IMPACT ANALYSIS (T.I.A.)

T.I.A. shall be based on the projected traffic needs twenty (20) years after construction and shall encompass the needs from existing development, future development, and the proposed development.

Trip generations from future development over the design period shall be based on zoning, existing land use, proximity to developed areas, historic growth, and other factors expected to influence development. See SECTIONS 3.2 & 3.3 for vehicle trip calculations and road classifications. The T.I.A. shall be prepared by a Colorado Licensed Professional Engineer and should contain, but not be limited to:

- a) A description of the proposed land use, a site plan and an overall plan view of proposed roads within the development and all accesses to Town roads with offset distances to other intersections (including driveways) within 1,500'.
- b) A determination stating if the proposed increase in traffic will result in a road classification change. All costs associated with the road improvements required by the change in road classification, including accel/decel lanes and signalization may be the responsibility of the developer.
- c) On-site issues including number and location of driveways, parking needs/layout, circulation, pedestrians, truck access and operations, transit and safety.
- d) Description of and maps depicting existing roadway/transportation conditions affected by the development.
- e) Identification of traffic congestion, roadways classifications, safety issues, and possible deficiencies of the existing transportation system affected by the development. This should address and anticipate "seasonal" traffic volumes, affects of phased construction, and opening day/planned special events.
- f) Anticipated nearby land development (planned or under construction) and associated traffic, along with the anticipated trip generation, and daily and peak-hour traffic volumes of the proposed development at full build and at any interim construction phase.
- g) The impacts of the development on the existing road and transportation system and the need for potential improvements to existing roads, in order for these roads to be in compliance with the

Town of Winter Park Standards and Specifications for Design and Construction, including, but not limited to horizontal alignment, vertical alignment. All costs associated with any improvements may be the responsibility of the developer.

Based on the results of this analysis, a Traffic Impact Study (T.I.S.) including traffic counts may be required by the Town at its discretion. Coordination with CDOT may be required, see State Highway Access Code for more information.

3.13 TRAFFIC IMPACT STUDY (T.I.S)

See SECTIONS 3.2 & 3.3 for vehicle trip calculations and road classifications. When a T.I.S. is required, a Colorado Licensed Professional Engineer shall prepare the T.I.S. and it should include but not be limited to the following information:

- a) A scaled map of the vicinity showing all roadways and highways adjacent to the site, a scaled map of the study area including land uses, and a map of the immediate access area, a plan showing on-site anticipated vehicular circulation patterns.
- b) Map identification and textual consideration of all accesses that are existing and possible future access locations including signal locations for at least one half (1/2) mile in each direction along the roadway as well as all potential roadway and signal improvements.
- c) Evaluation of current daily and peak hour traffic data and 20th year projections including turning movements at all intersections and any key year midpoints assuming a build out of the study area based upon zoning, comprehensive plans and growth estimates.
- d) A determination stating if the proposed increase in traffic will result in a road classification change. All costs associated with a change in road classifications may be the responsibility of the developer.
- e) An evaluation of the level of service and capacity for all design and traffic operation elements including mainline roadway and affected intersections.
- f) An analysis of the clear zone and the horizontal and vertical sight distances.
- g) Accurate and understandable diagrams.
- h) All assumptions and adjustment factors.
- i) An analysis of all reasonable alternatives including no build or alternative roadway access.
- j) Current and projected travel speed, travel time and delay time within the study area that will be impacted by the access proposal.
- k) Site traffic generation rate estimates and resulting trip generation distribution and assignments.
- l) Analysis of queue lengths for all turn lanes affected to the 20th year.
- m) A safety analysis including conflict points, turning movements and three (3) years of accident history.
- n) A conceptual design showing all geometric elements and their approximate dimensions with analysis of any element of the access that will be below Standard.
- o) Sources of information, data and references.
- p) 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.
- q) The current projected level of service of the roadway system adjacent to the development, which will be significantly affected.
- r) The sensitivity of the adjacent neighborhoods or other areas that may be perceived as impacted.
- s) The proximity of the site driveways to the other access points or intersections.
- t) 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.

- u) Other specific problems or deficiencies that may be affected by the proposed development or affect the ability of the development to be satisfactorily accommodated (seasonal traffic volumes, phased construction, opening day/special events).

3.14 PAVEMENT DESIGN

3.14.1 DESIGN

Structural sections shall be designed for all new roadways or existing roadways being upgraded due to increased traffic. The Applicant shall provide the Town a pavement design report performed by an approved geotechnical engineer licensed in the State of Colorado, prior to approval of the final road design. The geotechnical engineer shall decide the number of tests required based on the consistency of the soils being tested.

3.14.2 CONSTRUCTION / TESTING REQUIREMENTS

Refer to the Specifications (Earthwork, Flexible Paving, and Ridged Paving) for testing requirements.

3.15 BRIDGE DESIGN

Vehicular bridges are to conform to the AASHTO *Standard Specifications for Highway Bridges* requirements and specifications. All bridges shall satisfy HS20 load design ratings as minimum requirements. Plans are to be prepared by a Colorado Licensed Professional Engineer and are to be submitted to the Town for review and approval.

Clear deck width must accommodate the full width of the traveled lanes and shoulders of approach roads. Pedestrian walkways and railings shall be required as warranted. Guardrail end sections shall be provided on the approach and opposing sides of traffic flow and shall comply with the CDOT *M&S Standards*. All bridges shall be designed and provide conduits for all shallow utilities (gas, electric, cable, etc...). The waterway area shall accommodate the 100-year storm. A minimum of one foot (1') freeboard is required. Additional freeboard shall be required when debris laden flow is anticipated.

Chapter 4

Driveway Design



CHAPTER 4: DRIVEWAY DESIGN STANDARDS

4.1 BASIC DESIGN POLICY AND PERMITTING

A driveway shall be designed to provide safe ingress and egress to structures and is defined as an access serving ≤ 20 ADT's (See SECTION 3.2). Driveway policy and permitting shall be managed by the Town.

If an access serves more than 20 ADT's, it shall be classified as a roadway rather than a driveway and must meet the Town's standards and requirements for roadway construction (See CHAPTER 3). A variance request must be submitted to allow more than 20 ADT's to utilize a driveway if it minimizes road cuts and/or site disturbance.

If driveway designs meet or exceed these current Driveway Design Standards, a Colorado Licensed Professional Engineers stamp may not be necessary.

All driveways shall be a minimum of 12' in width.

No driveway shall be built to allow the flow of water to drain onto a Town ROW.

All driveways shall submit a Driveway Access Permit to the Town (See attached Driveway/Access permit requirements and instructions).

4.2 DRIVEWAY PERMITS

Application for a Driveway Permit:

1. One (1) application must be completed for **each** driveway.
2. Applications must be completed and signed, incomplete applications will be denied.
3. This application must be submitted to the Town before or simultaneously with a building permit application.
4. A deposit of \$1,000.00 shall be submitted with the application to insure completion of the driveway in accordance with approved plans. The deposit will be returned once the driveway has been completed by the Applicant and inspected by the Town.
5. A detailed sketch of the work site must accompany the application and must show the placement of the driveway in relation to the property. The driveway shall conform with the stabilized construction access plan (See FIGURE 10).
6. A driveway profile will be required. If profile shows that the driveway meets standards, the permit may be issued. If the profile shows that the driveway does not meet standards, a variance may be required.
7. A permit fee is required with the submittal of this application.
8. Once a completed application is received by the Town, a site inspection will be conducted within 5 business days.
9. No work shall begin until an approved permit has been issued by the Town: this application is **not** a valid permit and is not a guarantee that a permit will be issued. Any construction started prior to permit issuance, will result in a penalty to the property owner (Refer to Chapter 10).
10. All construction must comply with the Town of Winter Park Standards and Specifications for Design and Construction and all requirements listed in the "Requirements" section of the application.
11. Variance requests must be engineered and stamped by a professional engineer. All requests must include written approval from the local emergency responders (IE. fire, EMS and/or law

enforcement). Once variance requests have been received and reviewed by the Town Engineer they will be forwarded to the Town Manager for variance approval.

12. The approved permit must accompany all building permit applications for new construction.
13. All permits expire one (1) year from date of issuance.
14. No Certificate of Occupancy will be issued by the Town without a constructed driveway meeting Design Standards, including all permits, variances, fees, and any other requirements set forth in the Standards.

Requirements for a Driveway Permit:

1. Applicant must mark the centerline of the driveway prior to submitting the application.
2. Applicant is required to call for all utility locates from the appropriate agency.
3. A copy of this approved permit application shall be available for inspection at the work site at all times.
4. If work site fails inspection upon completion of construction, the property owner has ten (10) calendar days after notification to repair the work site to Town Standards.
5. Photo Documentation may be required.
6. Consideration shall be given to placement of construction items such as dumpsters, portable toilets, equipment, building materials, etc. These items shall **not** be placed within a Town Right-of-Way.

4.3 ACCESS

4.3.1 NUMBER OF ACCESS POINTS

Single family and duplex residences may only have one access point onto the Town road system. Multi-family residential access shall be determined by information provided by the owner/developer in the Traffic Impact Study and by comments generated during the Town of Winter Park's review and acceptance of that study. Commercial property having less than one hundred fifty (150') feet of frontage and located midblock shall be limited to one access point to the street. An exception to this rule may be where a building is constructed in the middle of a lot and parking is provided on each side of the building. A second access point may be allowed for commercial property having more than 150 feet of frontage. For commercial property located on a corner, one access to each street may be permitted.

4.3.2 DRIVEWAY SETBACK FROM PROPERTY LINE

All edges of driveways shall be a minimum of seven feet (7') from the adjacent property line. The seven foot (7') minimum does not apply if two adjacent lots share the same driveway. The portion of the driveway located within the side yard setback cannot be used to meet the parking requirement. Multi-family and commercial projects are encouraged to use shared driveways. Single family and duplex driveways may be placed in the side yard setback.

4.3.3 DRIVEWAY LOCATION AND APPROACH

Driveways shall not access roads that are greater than seven percent (> 7%) in grade. When a lot can access two different roads, driveway access shall always be onto the road with the lowest classification. Driveways connecting onto a major collector are considered a detriment to the safety and capacity of the road and will require a variance from the Town. Backing onto Town roads for access shall not be permitted on arterials or collector roads and is discouraged on other road classification based on site restrictions.

Driveway approaches, where the driveway is to serve as an entrance only or as an exit only, shall be appropriately signed and maintained by and at the expense of the property owner. The property owner shall be required to provide some means of ensuring that the motorists will use the driveway as either an entrance only or an exit only but not both.

4.3.4 STATE HIGHWAY ACCESS

Access to state highways is governed by the Colorado Department of Transportation through State Highway Access Code.

4.3.5 ACCESS ROADWAYS FOR EMERGENCY VEHICLES

Driveway design shall accommodate emergency vehicle access. Emergency access for large vehicles may be restricted if proper widening, overhead clearances, and surfacing are not considered in the design.

4.4 ALIGNMENT

The entrance of the driveway shall have an edge of shoulder radii in accordance with (TABLE 3.7.2) and entrance grades in accordance with (TABLE 3.7.4). The access design shall provide: minimum corner sight distance (FIGURE 8), minimum offset distances to other intersections (TABLE 3.7.3), and the maximum skew angle (SECTION 3.7.1).

Unless otherwise required by the Town Subdivision Process, the first twenty four feet (24') shall not exceed 5% and after the first twenty four feet (24') the following is required for all driveways (see FIGURE 11):

1. A ten foot (10') transition zone from five percent (5%) to ten percent (10%).
2. A minimum horizontal curve radius of 35' at centerline.
3. A maximum grade of ten percent (10%) on straight sections and a maximum grade of eight percent (8%) for curves with radius of $\leq 50'$ at centerline.
4. If the length of the driveway exceeds 200', a turn-around shall be provided in accordance with (FIGURE 5).
5. When a horizontal curve turns greater than 120° the maximum centerline grade within 25' and through this section will not exceed six percent (6%).
6. Driveway intersections shall comply with (SECTION 3.7.3).

4.5 STRUCTURES

All driveways that utilize a bridge or box culvert to cross a waterway shall be designed and signed by a Colorado Licensed Professional Engineer and shall conform to the AASHTO *Standard Specifications for Highway Bridges*.

4.6 SURFACING

All driveways shall be paved. It is recommended that a geotechnical engineer should be used to recommend minimum surface depths to accommodate heavy truck access (i.e. fire trucks) or normal vehicle traffic. Driveway entrance width shall be minimized whenever possible.

Prior to a foundation inspection being performed by the Building Department, the Applicant shall install a stabilized construction entrance in conformance with the construction stabilized access plan (See FIGURE 10). The stabilized construction entrance shall be maintained throughout the construction

period. Failure to maintain the entrance will result in the Building Department no longer performing inspection until such entrance is repaired.

4.7 DRIVEWAY CULVERTS

The minimum driveway culvert size is 18" with a minimum of 12" of cover. The use of 15" driveway culverts may be installed, with Town approval. Refer to the Storm Drainage Specifications for culvert type.

Driveway culverts shall be installed prior to on-site construction.

The property owner shall be responsible for the maintenance and replacement of driveway culverts.

4.8 GRADING

See CHAPTER 6 for requirements.

4.9 REVEGETATION, EROSION AND SEDIMENT CONTROL

See CHAPTER 7 for requirements and the *Erosion and Sediment Control for Construction Activities Guidance Handbook*.

4.10 SNOW OPERATIONS

Snow storage for driveways shall be provided onsite and not permitted on Town Right-of-Way (See SECTION 3.11). Driveway intersections should be designed and constructed with gradual side slopes when intersecting a Town roadway to allow for sufficient on-site snow storage.

4.11 ABANDONED DRIVEWAYS

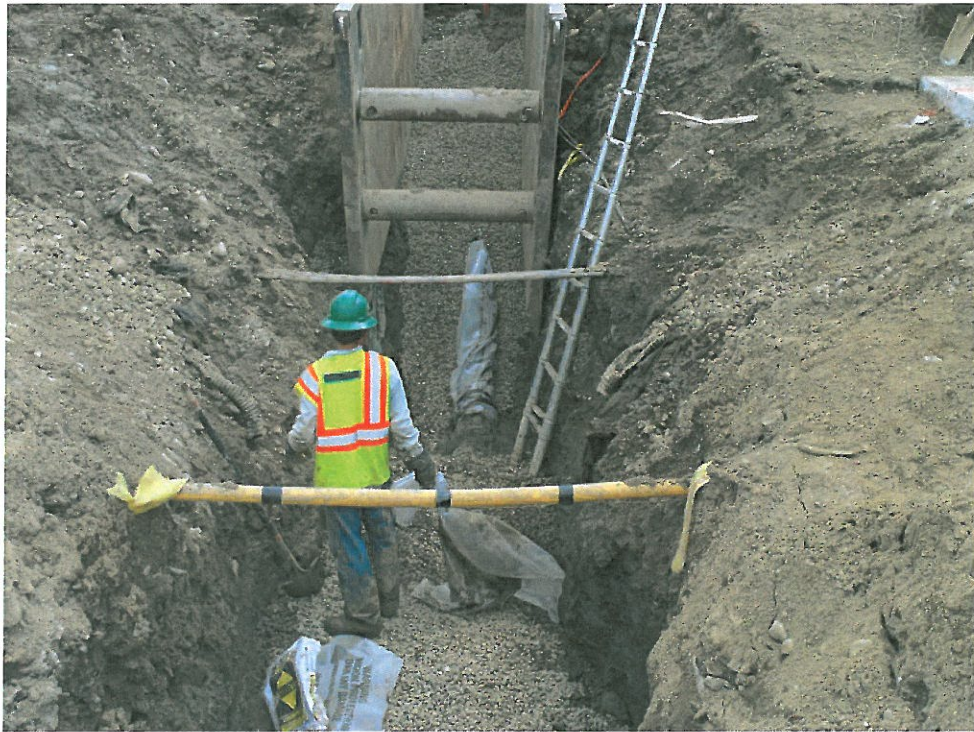
Any driveway which has been abandoned shall be restored by the property owner except where such abandonment has been made at the request or the convenience of the Town.

4.12 UTILITY REPLACEMENT

Adjustments which must be made to utility poles, street lights, fire hydrants, catch basins or intakes, traffic signs and signals, or other public improvements or installations which are necessary as the result of the driveway location shall be accomplished without any cost to the Town of Winter Park.

Chapter 5

Utilites



CHAPTER 5: UTILITIES

All utility installation within the Town Right-of-Way shall require a Right-of-Way Permit prior to any installation activity. See CHAPTER 9 for Road Cut Standards, Regulations and Right-of-Way Permit.

All utility installation outside of the Town Right-of-Way (private property) shall require a Grading Permit prior to any installation activity. See CHAPTER 6 for Grading Standards, Regulations and Grading Permit.

All utility lines shall be designed according to the governing utility company or district standards. All utilities must be clearly labeled on the plans and include the type, size, height, etc. Whenever possible, utilities shall be designed according to the typical utility layout plan (FIGURE 12).

The Town shall not maintain any utilities within the Town Right-of-Way, this includes but not limited to snow removal to gain access.

5.1 TRASH DUMPSTER

The Town does not allow any trash dumpsters within the public Right-of-Way and is in violation of C.R.S. §43-5-301 found in SECTION 8.8.1 of these Standards.

Chapter 6

Grading and Drainage



CHAPTER 6: GRADING AND DRAINAGE

6.1 GRADING

6.1.1 PERMITS REQUIRED

No person shall do any grading, excavation or fill without first obtaining a grading permit from the Town. A separate permit shall be obtained for each site and may cover both excavations and fills, including excavations for utility installation outside a public right-of-way.

6.1.2 EXEMPTED WORK

A grading permit is not required for an excavation below finished grade for basements and footings of a building, retaining wall or other structure authorized by a valid building permit issued by the Town Building Department. This shall not exempt any fill made with the material from this excavation.

6.1.3 APPLICATION FOR A GRADING PERMIT

A grading application shall be submitted at least 5 working days prior to any grading, excavation or fills in the Town of Winter Park (See Chapter 10 for permit fees). Each application shall be accompanied by two (2) sets of plans and specifications, supporting data and the following information:

1. The address of the location of the work, the name of the owner, the name of the person who prepared the plan and the contactor performing the work.
2. A construction sequence outlining the proposed time-table for completion of the grading and revegetation.
3. General vicinity map of the proposed site.
4. Property limits and accurate contours of existing ground and details of terrain and area drainage.
5. Limiting dimensions, elevations and finished contours to be achieved by the grading, and proposed drainage channels and related construction.
6. Location of any buildings or structures on the property where the work is to be performed and the location of any buildings or structure on the land of adjacent owners that are within fifteen (15) feet of the property or that may be affected by the proposed grading operations.
7. Location, size and depth of all existing utilities and easements on the proposed site.
8. Location of all natural features, such as watercourses and wetlands, on the proposed site or within one hundred (100) feet of the disturbed graded area.
9. A soils engineering report (if required by the Town). Recommendations included in the soils engineering report shall be incorporated in the grading plans and specifications.
10. A revegetation and erosion control plan (see Chapter 7).
11. A special wetlands study (if required by the Town). The outcome of the study may necessitate the Applicant obtaining a Corps of Engineer permit.

The grading permit shall be issued by the Town within five (5) working days unless the permit is complex and requires additional review time which could take up to two (2) weeks. The permit may have conditions placed upon it in accordance with these Standards.

6.1.4 HAZARDS

Whenever the Town determines that any existing excavation or embankment or fill has become a hazard to life or limb, or endangers property, or adversely affects the safety, use or stability of a public way or drainage channel, the owner of the property upon which the excavation or fill is located, or other person or agent in control of said property, upon receipt of notice in writing from the Town, shall within the period specified therein repair or eliminate such excavation or embankment to eliminate the hazard and to be in conformance with the requirements of these Standards.

6.1.5 ENVIRONMENTAL HAZARDS

Offsite fill material shall be free of environmental hazardous materials. Applicants for a permit shall ensure the Town that fill material hauled from an offsite location is free of environmental contaminants. The source of fill material shall be identified prior to application for a grading permit. If directed by the Town, the Applicant shall have testing performed on a representative sample(s) of the fill material to determine if environmentally hazardous materials are present in the fill.

6.1.6 FILL MATERIAL

Refer to the Earthwork Specifications.

6.1.7 EROSION AND SEDIMENTATION CONTROL

The Applicant conducting the grading activity shall install and maintain temporary and permanent erosion and sedimentation control measures in compliance with Chapter 7 of these Standards.

6.1.8 VALID PERIOD

All grading permits shall be valid for twelve (12) months from the date the permit is issued, provided that the approved application and the conditions of its approval have not changed. No more than one (1) grading permit shall be issued for one parcel of land within a three (3) year period.

6.1.9 DISPLAY OF PERMIT

Each permit issued shall be kept at the grading site while the work is in progress and shall be exhibited upon request to any employee of the Town.

6.1.10 SURETY DEPOSIT

The Town shall require a \$1,000 surety deposit for minor utility installation (service lines) or any grading less than twenty (20) cubic yards. For projects grading larger than twenty (20) cubic yards, the Town may require a surety deposit (cash or letter of credit)

in the amount of 150% of the cost estimate to complete the work. The surety deposit is required to ensure that the work, if not completed in accordance with the approved plan and specifications, will be completed or corrected to eliminate hazardous conditions. The surety deposit shall not be required if the applicant has signed a Single Family/Duplex Dwelling Deposit Agreement with the Town.

6.1.11 PENALTIES

Every person convicted of a violation of any provision of this Chapter shall be punished in accordance with Chapter 10 of these Standards. Additionally, the convicted person may be required to replace the graded, excavated, or filled land to its original condition.

6.2 DRAINAGE

6.2.1 REVIEW PROCESS

All Drainage Reports and plans, construction drawings, specifications and as-built information shall be submitted, reviewed and approved as required by the Regulations. All submitted information shall be in a clear, concise and legible form. Drainage reports shall contain a declaration of the level of report being submitted (i.e. Phase I, Phase II or Phase III). Incomplete or absent information may result in the report being rejected.

6.2.2 PHASE I DRAINAGE REPORT

A Phase I Drainage Report is required to be submitted with all Sketch Plan submittals, as required by the Regulations. A Phase I Drainage Study may also be required with other submittals as determined by the Planning and Zoning Department.

This report will review the feasibility and design characteristics of the proposed development, at a conceptual level. The Phase I shall address the entire subdivision, not just one phase. The Phase I drainage report shall include the following:

- I. General Location and Description of Site
 - A. Location (include vicinity map in report)
 1. Section, township and range.
 2. General location in relation to towns and roads.
 3. Names of surrounding developments.
 4. Major drainage ways
 - B. Description of Site
 1. Area in acres.
 2. Soil classifications.
 3. Existing vegetation and approximate density.
 4. Minor and major drainage ways.
 5. Existing irrigation facilities.
 6. Existing and proposed land uses.
- II. Drainage Basins and Sub-basins
 - A. Major Basin Description

1. Discuss any and all major drainage basins associated with the site.
2. Discuss any and all previous drainage studies associated with the site.
3. Discuss the flood potential of the site and how this may affect or be affected by the proposed development.

B. Sub-basin Description

1. Discuss historic drainage patterns associated with the site.
2. Discuss off-site drainage flow patterns and the impact on the development under existing and developed conditions.

III. Drainage Facility Design

A. General Concept

1. Discussion of concept and typical drainage patterns.
2. Discuss minor and major recurrence of interval rainfall.
3. Discuss any previous studies and/or assumptions made.
4. Discuss historic and developed discharge points and effects of concentrating flows on downstream properties.
5. Discuss any proposed phasing of development and how drainage infrastructure construction will be effected.
6. Discuss maps, tables, charts and/or nomographs presented in report.

B. Specific Details (optional information)

1. Discussion of the maintenance aspects of the design.
2. Discussion of detention storage and outlet design.
3. Discussion of hydrologic and/or hydraulic calculations.

IV. Phase I Drawing Requirements

A. General Location Map: All drawings shall be 24" x 36" in size. A map shall be provided in sufficient detail to identify drainage flows entering and leaving the development and general drainage patterns. The map should be at a scale of 1"= 1000' to 1"= 4000' and show the path of all drainage from the upper end of any off-site basins to the defined major drainage ways.

B. Floodplain Information: A copy of any applicable floodplain mapping shall be included with the report. If no flood plain maps are available a statement stating what sources were researched shall be provided.

C. Drainage Plan: Map(s) of the proposed development at a scale 1" = 20' to 1" = 200' shall be included. The plan shall show the following:

1. Existing topography at 5' intervals maximum. Contours shall extend a minimum of 100' beyond project limits.
2. Existing drainage facilities and infrastructure.
3. Approximate flooding limits, when available.
4. Significant off-site features.
5. Major basin and sub-basin delineation.

6. Conceptual proposed drainage facilities and infrastructure including detention basins, storm sewers and flow arrows.
7. Legend and title block

6.2.3 PHASE II DRAINAGE REPORT

A Phase II Drainage Report is required to be submitted with all Preliminary Plat submittals, as required by the Regulations. The purpose of the Phase II Drainage Report is to identify and/or refine conceptual solutions to the problems, which may occur on-site and off-site, as a result of the development and provide calculations that support the proposed solutions. All reports must be on 8½" x 11" paper and bound. The drawings, figures, exhibits, tables and other reference information utilized in the report shall be bound with the report or included in a pocket attached. The report shall include a statement by the professional engineer that prepared the report and shall state:

“THIS REPORT WAS PREPARED BY ME, OR UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH THE TOWN OF WINTER PARK STANDARDS AND SPECIFICATIONS AND WAS DESIGNED TO COMPLY WITH THE PROVISIONS THEREOF. I UNDERSTAND THAT THE TOWN DOES NOT AND WILL NOT ASSUME LIABILITY FOR DRAINAGE FACILITIES DESIGNED BY OTHERS.”

Registered Professional Engineer
State of Colorado No.
Affix Seal

The report shall conform to the following outline and contain applicable information listed:

- I. General Location and Description of Site
 - A. Location
 1. Vicinity map.
 2. Section, township and range.
 3. General location in relation to towns and roads.
 4. Names of surrounding developments.
 5. Major drainage ways
 - B. Description of Site
 1. Area in acres.
 2. General project description
 3. Soil classification.
 4. Existing vegetation and approximate density.
 5. Minor and major drainage ways.
 6. Existing irrigation facilities.
- II. Drainage Basins and Sub-basins
 - A. Major Basin Description
 1. Discuss of flooding potential from major basins.

2. Discuss any and all previous drainage studies associated with the site.
3. Discuss major basin characteristics, existing and planned land uses.
4. Discuss of all irrigation facilities within the basin which will influence or be influenced by the local drainage.

B. Sub-basin Description

1. Discuss historic drainage patterns of the property in question.
2. Discuss off-site drainage flow patterns and impact a development under existing and fully developed basin conditions.

III. Drainage Design Criteria

A. Regulations: Discuss any deviations from the CRITERIA, if any, and its justification.

B. Development Criteria Reference and Constraints

1. Discuss any previous studies associated with the site.
2. Discuss impacts to adjacent developments and town.
3. Discuss constraints such as streets, utilities, etc.

C. Hydrological Criteria

1. Identify design rainfall.
2. Identify runoff calculation method.
3. Identify detention discharge and storage calculation method.
4. Identify storm recurrence interval.
5. Intensity/duration frequency curves.

D. Hydraulic Criteria: Identify capacity references used.

E. Stormwater Quality Criteria: Identify permanent and temporary water quality measures implemented on the site.

F. Waivers from Criteria

1. Identify provisions by section number for which a waiver is requested.
2. Provide justification why each waiver is being requested.

IV. Drainage Facility Design

A. General Concept: Discuss Rationale and Methodology used to Analyze and Design the Drainage Facilities and Infrastructure On-site as well as Off-site.

B. Specific Details

1. Discuss each Sub-basin delineated.
 - a. Area.
 - b. Runoff Coefficients / Estimated Imperviousness.
 - c. Time of Concentration.

- d. Runoff Quantity.
 - e. Conveyance.
2. Discuss each Design Point delineated.
 - a. Conveyance Routing and Infrastructure requirements, Connection to Major Drainage way.
 - b. Maintenance Requirements including delineated Easements, Tracks and/or Outlots for drainage facilities.
 3. Discuss each Detention Facility
 - a. Allowable Release Rates.
 - b. Required Storage.
 - c. Water Surface elevations.
 - d. Downstream Conveyance, Major Drainage way.
 - e. Comparison of Historic and Developed Discharge at Critical Design Points around the periphery of the site.
 - f. Maintenance Requirements including delineated Easements, Tracks and/or Outlots for drainage facilities.

V. Conclusions

- A. Compliance with Criteria
- B. Effectiveness of Design

VI References: Cite any and all References in Bibliography format

VII Appendices

- A. Hydrologic Calculations
 1. Historic Coefficients, Imperviousness, Tc, Q Minor and Major.
 2. Developed Coefficients, Imperviousness, Tc, Q Minor and Major.
 3. Detention Volumes and Release Rates.
- B. Hydraulic Calculations
 1. Street design.
 2. Roadside Ditch and/or Culvert design.
 3. Storm Sewer and/or Inlet design.
 4. Open Channel design.
 5. Outlet Structure design.
- C. Drainage Exhibit
 1. Existing Topography @ 5' intervals maximum. Contours shall extend a minimum of 100' beyond project limits. Finished Floor elevations for all Structures.
 2. Existing Drainage Facilities and Infrastructure.
 3. Existing known flood limits.
 4. Significant off-site features.
 5. Major basin and Sub-basin delineation including Area, C-major and C-minor and Design Points.
 6. Property lines, Easements and ROW.

7. Proposed Topography. Finished Floor elevations for all Structures.
8. Proposed Drainage Facilities and Infrastructure.
9. Detention Pond information including Required Volumes and corresponding Water Surface elevations, Freeboard elevation and design of Outlet works.
10. Proposed Outfall point for each Major Basin and Downstream Conveyance capacity.
11. Summary Runoff Table including Design Point, Contributing Area, Minor Runoff and Major Runoff.

6.2.4 PHASE III DRAINAGE REPORT

A Phase III Drainage Report is required to be submitted with all Final Plat submittals, as required by the Regulations. The purpose of the Phase III Drainage Report is to elaborate on the concepts, and to provide design details for the facilities and infrastructure presented with the Phase II Drainage Report. Any corrections and/or changes to the Phase II Report shall be presented as well.

In addition to the requirements set forth in SECTION 6.2 of these CRITERIA, the Phase III Drainage Report shall contain a signed developer certification section as follows:

“I (*DEVELOPER*) HEREBY CERTIFY THAT THE DRAINAGE FACILITIES FOR (*NAME OF DEVELOPMENT*) SHALL BE CONSTRUCTED ACCORDING TO THE DESIGN PRESENTED IN THIS REPORT. I UNDERSTAND THAT THE TOWN DOES NOT AND WILL NOT ASSUME LIABILITY FOR DRAINAGE FACILITIES DESIGNED OR REVIEWED BY MY ENGINEER. I ALSO UNDERSTAND THAT THE TOWN RELIES ON THE REPRESENTATIONS OF OTHERS TO ESTABLISH THAT DRAINAGE FACILITIES ARE DESIGNED AND BUILT IN COMPLIANCE WITH APPLICABLE GUIDELINES, STANDARDS AND SPECIFICATIONS. REVIEW BY THE TOWN CAN THEREFORE IN NO WAY LIMIT OR DIMINISH ANY LIABILITY WHICH I OR ANY OTHER PARTY MAY HAVE WITH RESPECT TO THE DESIGN OR CONSTRUCTION OF SUCH FACILITIES.”

Name of Developer

6.2.5 DRAINAGE POLICY

The provisions for adequate drainage in urban areas are necessary to preserve and promote the general health, welfare and economic wellbeing of the Town. As land use changes from agricultural and rural to urban in character the need for adequate drainage facilities becomes increasingly significant. Watersheds and corresponding watercourses know no jurisdictional boundaries and therefore affect all governmental jurisdictions and all parcels of land. This characteristic of drainage makes it necessary to formulate a program that balances both public and private involvement.

When planning drainage facilities, certain underlying principals provide direction for the

effort. These principals are made operational through this set of policy statements. The application of the policy is in turn facilitated by technical criteria and data.

I. Drainage Sub-system

Planning of drainage facilities must be included in the development process. Incorporating drainage design into an overall development plan in the early stages is essential to eliminate possible conflicts and competition concerning land allocation or other necessary infrastructure improvements.

THE POLICY OF THE TOWN SHALL BE TO CONSIDER STORM DRAINAGE A SUB-SYSTEM OF AN OVERALL DEVELOPMENT SYSTEM AND TO REQUIRE STORM DRAINAGE PLANNING FOR ALL DEVELOPMENT TO INCLUDE ADEQUATE ALLOCATION OF LAND FOR DRAINAGE FACILITIES.

II. Multi-Purpose Resource

Stormwater runoff and associated facilities can be considered a liability; however they have the potential for beneficial use. The drainage sub-system should be a multi-purpose system that helps satisfy the increasing demand placed on water within the environment. This system however must be compatible with adjacent land use and Colorado Water Law. Examples of beneficial uses of drainage facilities are recreation facilities, parking lots and use in landscape features. Innovative stormwater facility design is encouraged to maximize this multi-purpose resource.

THE POLICY OF THE TOWN SHALL BE TO CONSIDER STORMWATER RUNOFF AND ASSOCIATED FACILITIES AS A MULTI-PURPOSE RESOURCE AND TO ENCOURAGE MULTI-PURPOSE USE.

III. Water Rights

Drainage ways and storage facilities often interrelate with existing water rights. Drainage improvements may alter the quantity or quality available for existing water rights. When the drainage sub-system interferes with existing water rights, the value and use of the water rights are affected. Planning and design of drainage facilities must account for existing water rights.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE THAT ANALYSIS OF IMPACTS ON WATER RIGHTS BE INCLUDED IN THE PLANNING AND DESIGN OF PROPOSED DRAINAGE FACILITIES.

IV. Major Drainage Ways

A definition of a major drainage way is necessary for clarification and implementation of these CRITERIA.

THE POLICY OF THE TOWN SHALL BE TO DEFINE A MAJOR DRAINAGE WAY AS ANY FLOWPATH WITH A TRIBUTARY AREA IN EXCESS OF 400 ACRES.

- V. Post Development Flow Conditions
The development process has the potential to significantly alter predevelopment (historic) drainage conditions. During the development process, if water is allowed to flow into the development in its historic quantity and manner, and is discharged in the historic quantity and manner, the alterations are generally acceptable. When development impedes the historic flow into the development it violates the rule of Colorado law that property is subject to the historic drainage from upper lands. In addition, if the development does not return the drainage to historic conditions, then the rule that drainage water cannot be sent down to do more harm than was formerly done to lower lands, is violated. Development proposals that are in violation of either of these principles will not be approved, unless the developer can obtain approval from the affected owner(s).

THE POLICY OF THE TOWN SHALL BE FOR POST DEVELOPMENT FLOW CONDITIONS TO BE IN A MANNER AND QUANTITY (FLOW RATE) AS TO NOT DO ANY MORE HARM THAN THE PREDEVELOPMENT (HISTORIC) FLOWS, UNLESS THE DEVELOPER CAN OBTAIN APPROVAL FROM THE AFFECTED OWNER(S).

- VI. Drainage Master Planning
Drainage design and planning is required for all development. The Town encourages Drainage Master Planning for larger or multi-phased developments. The Town, at its discretion may require a Master Drainage Plan during the planning stages of large development, or those developments that substantially increase imperviousness.

THE POLICY OF THE TOWN SHALL BE TO ENCOURAGE DRAINAGE MASTER PLANNING FOR LARGER OR MULTI-PHASED DEVELOPMENTS.

- VII. Public Improvements
Public improvements associated with drainage may include improvements to both the local drainage system and the major drainage system. The local drainage system consists of curb and gutter, inlets, storm sewers, culverts, bridges, swales, ditches, channels, detention/retention areas, and other drainage facilities required to convey the minor and major storm runoff to the major drainage way. The major drainage way system consists of channels, storm sewers, bridges, detention/retention areas, and other facilities serving more than the development or property in question that may be impacted by the development.

THE POLICY OF THE TOWN SHALL BE THAT ALL DEVELOPMENT IS REQUIRED TO CONSTRUCT THE IMPROVEMENTS TO THE LOCAL AND MAJOR DRAINAGE WAY AS DEFINED BY THE APPROVED PHASE III DRAINAGE REPORT AND PLAN.

- VIII. Basin Transfer
Colorado drainage law recognizes the inequity in transferring the burden on managing storm drainage from one location or property to another. Liability questions also arise when the historic drainage continuum is altered. The

diversion of storm runoff from one basin to another should be avoided unless specific and prudent reasons justify and dictate such a transfer. Prior to selecting a solution, alternatives should be reviewed. Planning and design of stormwater drainage systems should not be based on the premise that problems can be transferred from one location to another.

THE POLICY OF THE TOWN SHALL BE TO DISCOURAGE THE INTER-BASIN TRANSFER OF STORM DRAINAGE RUNOFF AND TO MAINTAIN THE HISTORIC DRAINAGE PATH WITHIN THE DRAINAGE BASIN. THE TRANSFER OF DRAINAGE FROM BASIN TO BASIN IS A VIABLE ALTERNATIVE IN CERTAIN INSTANCES AND WILL BE REVIEWED ON A CASE-BY-CASE BASIS. WHEN BASIN TRANSFER IS PERMITTED, THE PLAN MUST ACHIEVE HISTORIC FLOW CONDITIONS AT THE CONFLUENCE OF THE BASIN AND MEET THE REQUIREMENTS OF POST DEVELOPMENT CONDITIONS.

IX. Floodplain Management

Naturally occurring floodplains and associated floodways are vital for continued conveyance and storage of runoff. Urban land use can often compete with areas that historically have served this conveyance and storage function. In general, floodplains should be left in historic condition whenever possible.

THE POLICY OF THE TOWN SHALL BE TO LEAVE FLOODPLAINS IN A NATURAL STATE WHENEVER POSSIBLE.

X. Stormwater Detention

The value of storm runoff detention has been explored by many individuals, agencies and professional societies. Detention is considered a viable method to reduce urban drainage costs. Temporarily detaining storm runoff associated with the increase in impervious areas caused by urban development can sufficiently reduce downstream hazards as well as infrastructure requirements. Storage also provides for sediment and debris collection, which helps to keep streams and rivers cleaner thus helping to protect the natural resources of the Town.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE ON-SITE DETENTION FACILITIES FOR ALL DEVELOPMENT, EXPANSIONS AND REDEVELOPMENT, UNLESS A VARIANCE IS GRANTED, AS NOTED IN THE VARIANCE PROCEDURE BELOW. THE REQUIRED MINIMUM VOLUME AND MAXIMUM RELEASE RATES FOR THE 10-YEAR AND 100-YEAR STORM EVENTS WILL BE DETERMINED IN ACCORDANCE WITH THESE CRITERIA.

Variance Procedure:

The Town may grant an administrative variance of the Stormwater Detention requirement. The variance will only be granted if it is determined by Planning and Zoning that there are no cumulative effects from previous variances in the development proximity and the Applicant demonstrates one of the following:

Impervious area, including structures, streets/roads/driveways/parking areas (paved or unpaved) will not total more than 10,000 square feet. If this limit to

the impervious area is used in granting a variance, the development proposal shall restrict the allowable impervious area at the time of building permit issuance so that the maximum impervious area established in the variance request is not exceeded.

In order for the variance report to be approved, the Applicant must display that water quality issues have been addressed.

XI. Stormwater Quality

Land development and human activities affect both the quantity and the quality of stormwater discharge to receiving waters. Development increases the volume of stormwater and the pollutants leaving the project property. To remove pollutants, the collection and conveyance infrastructure must be supplemented with collection and infiltration best management practices. Refer to the MANUAL, Volume 3, for BMP's and design specifications.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE USE OF BMP'S TO REDUCE STORMWATER QUALITY POLLUTION CAUSED BY DEVELOPMENT, UNLESS A VARIANCE IS GRANTED AS NOTED IN THE VARIANCE PROCEDURE BELOW.

Variance Procedure:

The Town may grant an administrative variance of the Stormwater Quality requirement if the Applicant can demonstrate one of the following:

1. The project disturbs less than one-half acre (1/2) of ground and is not part of a larger common plan or master plan.
2. Regional water quality facilities have been used in satisfying the BMP requirements and it can be demonstrated that the facility provides the required water quality capture volume.

XII. Operations and Maintenance

To ensure storm drainage facilities function as they are designed to, continued maintenance is required. Maintenance of drainage facilities may include clearing debris from inlets, culverts, channels, ditches, or detention facilities. Responsibility for maintenance of drainage improvements lies with the property owner, except as modified by specific agreement. Maintenance responsibility will be delineated on all Final Plats.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE THAT THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL DRAINAGE FACILITIES, INCLUDING INLETS, PIPES, CULVERTS CHANNELS, DITCHES, HYDRAULIC STRUCTURES, AND DETENTION BASINS LOCATED ON THEIR LAND, EXCEPT AS MODIFIED BY SPECIFIC AGREEMENT; AND THAT THIS RESPONSIBILITY SHALL BE NOTED ON THE FINAL PLAT. SHOULD THE OWNER FAIL TO ADEQUATELY MAINTAIN SAID FACILITIES, THE TOWN SHALL HAVE THE RIGHT TO ENTER SAID LAND FOR THE PURPOSE OF OPERATIONS AND MAINTENANCE. ALL SUCH COSTS WILL BE ASSESSED TO THE

PROPERTY OWNER.

XIII. Drainage Easement Requirements

The easement requirements are indicated on the following table:

DRAINAGE FACILITY	EASEMENT WIDTH
<u>Storm Sewer</u> (a.) Less than 36" dia. (b.) Equal to or greater than 36" dia.	(a.) 20' (b.) width of pipe plus twice the pipe invert depth with sewer placed in the middle third of the easement.(min. 20')
<u>Swales / Open Channels</u> (a.) Q-100 less than, or equal to 20 cfs (b.) Q-100 greater than 20 cfs	(a.) 15' minimum (b.) 15' minimum (Must accommodate Q100 plus one-foot freeboard)
<u>Detention Pond</u>	Use engineering discretion – as required to contain storage, plus one foot of freeboard, and associated facilities as well as access around the perimeter of the pond.
Along side lot lines for single family residential subdivisions	The easement will be a minimum of 5' centered on the lot line.

Additionally, access easements shall be required for all drainage facilities and they must be adequate for the required maintenance. All required easements must be show on the Final Plat.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE DRAINAGE EASEMENTS FOR ALL ONSITE DRAINAGE FACILITIES. ALL DRAINAGE EASEMENTS SHALL BE DEDICATED TO THE TOWN IN A FORM ACCEPTABLE TO THE TOWN ATTORNEY AND MUST BE SHOWN ON THE FINAL PLAT. THE TOWN HAS THE RIGHT TO ACCESS DRAINAGE EASEMENTS, AND THE RIGHT, BUT NOT THE OBLIGATION, OF CONSTRUCTION AND/OR MAINTENANCE WITHIN DRAINAGE EASEMENTS.

XIV. Minor and Major Drainage System

Every urban area has two separate and distinct drainage systems, whether or not they actually planned or designed. One is the Minor Drainage System and the other is the Major Drainage System, which are combined to make the Total Drainage System.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE THAT ALL DEVELOPMENT INCLUDE THE PLANNING, DESIGNING, AND IMPLEMENTATION FOR BOTH THE MINOR AND MAJOR DRAINAGE SYSTEMS.

I. Minor Drainage System:

The Minor Drainage System shall be designed to transport the run-off from the 10-year recurrence interval storm with minimal disruption to the urban environment. The Minor Drainage System may consist of any combination of curb and gutter, roadside ditches and culverts, storm

sewers and inlets, swales and channels, or other drainage facilities proposed by the design engineer.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE THAT ALL MINOR STORM DRAINAGE FACILITIES BE DESIGNED AND SIZED WITHOUT ACCOUNTING FOR PEAK FLOW REDUCTIONS CAUSED BY ON-SITE DETENTION.

II. Major Drainage System:

The design objective of the Major Drainage System is to minimize life and health hazards, damage to structures or improvements, and interruption of emergency vehicular traffic and services. The Major Drainage System may consist of any combination of curb and gutter, roadside ditches and culverts, storm sewers and inlets, swales and channels, or other drainage facilities proposed by the design engineer.

THE POLICY OF THE TOWN SHALL BE TO REQUIRE THAT ALL MAJOR STORM DRAINAGE FACILITIES BE DESIGNED AND SIZED TO MINIMIZE LIFE AND HEALTH HAZARDS, DAMAGE TO STRUCTURES OR IMPROVEMENTS AND INTERRUPTION OF EMERGENCY VEHICULAR TRAFFIC AND SERVICES.

XV. Floodproofing Existing Structures

Floodproofing can be described as measures that reduce the potential for flood damages to existing property and/or structures within a floodplain. The floodproofing measures can range from the elevating of structures to intentional flooding of noncritical building spaces to minimize structural damages. Floodproofing measures are only a small part of good floodplain management, which encourages wise floodplain development to minimize the adverse effects of floods.

THE POLICY OF THE TOWN SHALL BE TO ENCOURAGE THE FLOODPROOFING OF EXISTING STRUCTURES BY UTILIZING THE CRITERIA PRESENTED IN THE HOMEOWNERS GUIDE TO RETROFITTING, FEMA, 1998.

XVI. Storm Runoff

THE POLICY OF THE TOWN SHALL BE TO REQUIRE STORM RUNOFF TO BE DETERMINED BY THE RATIONAL METHOD, WITHIN THE LIMITATIONS SET FORTH BY THESE CRITERIA, UNLESS A VARIANCE IS GRANTED AS NOTED IN THE VARIANCE PROCEDURE BELOW.

Variance Procedure:

The Town may grant an administrative variance of the Storm Runoff requirement if the Applicant can demonstrate and substantiate that a different Methodology is more appropriate than the one required.

6.2.6 RAINFALL

For the purposes of these CRITERIA, the “NOAA Precipitation-Frequency Atlas 2 of the Western United States, Volume III for Colorado”, published by the US Department of Commerce, National Oceanic and Atmosphere Administration, 1973 (hereafter NOAA Atlas) (FIGURE 13) shall be utilized for determining rainfall values. For further information or to obtain a copy, visit NOAA’s website at www.nws.noaa.gov

6.2.7 RUNOFF

The information presented in this section shall be used for the determination of stormwater runoff design peaks and volumes. The design engineer is referred to the MANUAL for specific details pertaining to basic method concepts and technicalities. The purpose of this section is to define acceptable methods to be used within the Town.

Standard forms and spreadsheets are available in the MANUAL. For additional information or to obtain a copy, visit the Urban Drainage and Flood Control District's website, www.udfcd.org .

- I. On-site Flow Analysis
When analyzing the flood peaks and volumes, the proposed fully developed land use plan shall be used to determine applicable runoff coefficients. In addition, consideration to the changes in developed flow patterns shall be mitigated.
- II. Off-site Flow Analysis
When analyzing the flood peaks and volumes from off-site tributary areas, the minor storm shall be calculated assuming fully developed conditions according to anticipated future land use, with no credit for detention. The major storm can be calculated assuming historic conditions for the major event.

6.2.8 STREETS AND ROADS

6.2.8.1 INTRODUCTION

The primary purpose of streets in the urban environment is for vehicular and pedestrian circulation. Streets may be utilized as an integral part of the urban total drainage system, transporting runoff from the Minor and Major recurrence intervals, however use must be restricted.

The purpose of this chapter is to define the limits to which the design engineer may use the streets for conveyance of stormwater runoff generated as a result of urban development.

Except as modified herein, design of streets for use as drainage conveyance shall be in accordance with the MANUAL. The design engineer is referred to the MANUAL or other references cited for basic design concepts or technicalities.

6.2.8.2 DRAINAGE FUNCTION

The curb and gutter of an urban street or the roadside ditch of a rural street can be used as part of the Minor drainage system (FIGURE 4). Stormwater discharge associated with the Minor storm may be conveyed up to the design limitations as set forth in these CRITERIA. When the street capacity begins to exceed the allowed parameters some other form of conveyance must be used in conjunction to adequately convey these nuisance flows.

Streets' function in the Major drainage system are to provide an emergency drainageway to convey these larger, less frequent flows with minimum disruption and damage to the urban environment.

6.2.8.3 DRAINAGE CLASSIFICATION

For efficient and convenient use of these CRITERIA, the following drainage classifications are assigned to roadway sections, as designated by average daily traffic values to be used within the Town.

**Table 6.2.8.3A
STREET CLASSIFICATION**

<u>TRAFFIC CLASSIFICATION</u>	<u>DRAINAGE CLASSIFICATION</u>
Urban Local	A
Rural Local	A
Urban Collector	B
Rural Collector	B

**Table 6.2.8.3B
ALLOWABLE ENCROACHMENT**

<u>CLASSIFICATION</u>	<u>MINOR STORM</u>	<u>MAJOR STORM</u>
A	Urban – Flow may spread to crown. Rural – Flow must not encroach shoulder.	Urban – Flow must not encroach ROW. Rural – Flow must not encroach structures at ground line.
B	Urban – Flow must leave <u>one</u> 10' drive lane free of inundation w/ no curb overtopping. Rural – Flow must not encroach shoulder.	Urban – Flow must not encroach ROW. Rural – Flow must not encroach structures at ground line.

Table 6.2.8.3C identifies the maximum allowable encroachment of stormwater within the street section.

**Table 6.2.8.3C
ALLOWABLE ENCROACHMENT**

<u>CLASSIFICATION</u>	<u>MINOR STORM</u>	<u>MAJOR STORM</u>
A	Urban – Flow may spread to crown. Rural – None.	Urban - Flow must not encroach ROW or exceed 6" depth at crown (whichever is more restrictive). Rural - 6" depth at crown.
B	Urban – Flow must leave <u>one</u> 10' drive lane free of inundation w/ no curb overtopping. Rural – None	Urban - Flow must not encroach ROW or exceed 6" depth at crown (whichever is more restrictive). Rural - 6" depth at crown.

Cross street flow occurs under three conditions, when runoff spreads across the crown to the opposite gutter, when cross pans are used, or when culverts are overtopped. (See FIGURE 14)

6.2.9 STORM SEWERS

6.2.9.1 INTRODUCTION

Storm sewers serve as part of the Minor Drainage System. The use of storm sewers are necessary when other facilities designed to convey stormwater associated with the Minor storm are approaching, or at capacity.

Except as modified herein, design of storm sewers shall be in accordance with the MANUAL. The design engineer is referred to the MANUAL or other references cited for basic design concepts or technicalities.

6.2.9.2 CONSTRUCTION MATERIALS

All storm sewer construction shall be either RCP or HDPE. CMP shall not be allowed for use in storm sewers.

6.2.9.3 PIPE SIZE

Minimum pipe size to be used in storm sewers is dictated by hydraulic efficiency, however in no case shall be less than 18 inches in diameter.

6.2.9.4 VERTICAL ALIGNMENT

Storm sewers shall be designed to withstand HS-20 loadings as defined by AASHTO. Minimum cover constraints are dictated by pipe size, type, class and bedding material and thickness, however in no case shall be less than 12" (FIGURE 15).

Minimum vertical separation from water lines shall be 18". If 18" of separation cannot be maintained, the water line shall be encased 10' either side of crossing.

Minimum vertical separation from sanitary sewer lines shall be 18". If 18" of separation cannot be maintained, the sanitary sewer line shall be encased 10' either side of crossing.

6.2.9.5 HORIZONTAL ALIGNMENT

- Curvilinear alignment is not allowed for storm sewers less than 48" in diameter.
- Minimum horizontal separation from water lines shall be maintained at 10'.
- Minimum horizontal separation from sanitary sewer lines shall be maintained at 10'.

6.2.9.6 MANHOLES

Manholes shall be required for maintenance access to the storm sewer whenever there is a change in size, direction, elevation, grade or where there is a junction of two or more pipes (FIGURE 16). Maximum spacing for manholes shall be 400' for storm sewer runs less than 48" in diameter, and 500' for runs greater than 48" diameter. Minimum drop through a manhole shall be 0.2' and matching crown elevations is encouraged whenever feasible.

Required minimum manhole size shall be as follows:

**Table 6.2.9.6
MANHOLES**

SEWER DIAMETER	MANHOLE DIAMETER
15" – 18"	4'
21" – 42"	5'
48" – 54"	6'
60" and larger	Special Design

Larger diameter manholes may be required if horizontal alignment is not straight through, or more than one sewer goes through the manhole. Engineering discretion should be used when designing large or complex storm sewer networks.

6.2.9.7 INLETS

Storm sewer inlets can be classified by the operating condition, being continuous grade or sump. The type of inlets permitted for use within the Town along with

appropriate reduction factors are described as follows:

**Table 6.2.9.7
INLETS**

<u>CONDITION</u>	<u>INLET TYPE</u>	<u>PERCENT OF THEORETICAL CAPACITY PERMITTED</u>
Sump or Continuous Grade	Type R	
	5' (single)	88
	10' (double)	92
	15' (triple)	95
Sump or Continuous Grade	Grated Type 13 (FIGURE 17)	50
Continuous Grade	Combination Type 13 (FIGURE 18)	66
Sump	Combination Type 13	65
Sump	Grated Type C	50

Theoretical inlet capacity shall be designed in accordance with the MANUAL along with the design limitations as set forth in these CRITERIA.

Adequate provisions shall be designed for inlets located in sumps pertaining to potential clogging or larger than expected storms in the form of emergency overflow conveyance.

6.2.10 CULVERTS

6.2.10.1 INTRODUCTION

A culvert is defined as a conduit under an embankment such as a roadway, railroad, or a canal that allows the passage of surface waters.

Except as modified herein, design of culverts shall be in accordance with the MANUAL. The design engineer is referred to the MANUAL or other references cited for basic design concepts or technicalities.

6.2.10.2 CONSTRUCTION MATERIALS

Permitted materials for construction of culverts within the Town shall be reinforced concrete pipe (RCP), corrugated metal pipe (CMP), as well as high-density polyethylene pipe (HDPE).

6.2.10.3 PIPE SIZE

Minimum culvert size in the Town right-of-way shall be dictated by hydraulic efficiency, however in no case shall be less than 15". The Town recommends

minimum size be 18", however under certain circumstances 15" will be allowed. For shapes other than round, the minimum cross sectional area shall be equivalent to that of a minimum round culvert.

Driveway culverts shall be designed to convey stormwater associated with the Minor storm with no overtopping. Minimum diameter for a driveway culvert shall be 15".

6.2.10.4 MINIMUM COVER

All culverts shall be designed for HS-20 loadings. Minimum cover over the pipe shall not be less than 12" measured from the crown of the pipe to the top of the pavement sub-grade.

6.2.10.5 HEADWATER CONSIDERATIONS

The maximum design headwater depth shall be 1.5 times the diameter, or 1.5 times the rise for shapes other than round. When culverts are used for road crossings, the maximum cross-street flow discussed in Chapter 6 of these CRITERIA may dictate allowable headwater depths.

6.2.10.6 VELOCITY CONSIDERATIONS

A minimum velocity of 2 fps should be maintained at the outlet of the culvert, to serve as a cleansing velocity. Maximum velocity through a culvert should be less than 7 fps to limit the effects of erosion. Adequate erosion control measures shall be taken at the inlet and outlet of all culverts. Energy dissipaters may be necessary on steep slopes when velocities exceed acceptable parameters.

6.2.11 OPEN CHANNELS

6.2.11.1 INTRODUCTION

An open channel can be defined as any watercourse, natural or artificial in nature, where runoff is concentrated along a defined path.

Except as modified herein, design of open channels shall be in accordance with the MANUAL. The design engineer is referred to the MANUAL or other references cited for basic design concepts or technicalities.

6.2.11.2 NATURAL CHANNELS

Natural channels can be defined as all watercourses that have occurred over time as a result of the erosion process. As development occurs in an urbanizing basin, the altered flow regime due to stormwater runoff peaks and volumes most likely will cause significant erosion or sedimentation along a particular reach. Detailed hydraulic analysis is necessary consisting of cross sections, water surface profiles for the minor and major events and bed and bank stability calculations to assure that degradation will not occur as a result of development. Some in-stream modifications may be necessary to insure a stabilized condition. If however, calculations by the design engineer conclude that degradation of a natural

channel will not occur under developed conditions then, the channel can be left in a natural state.

6.2.11.3 ARTIFICIAL CHANNELS

For the purposes of these CRITERIA, three types of artificial channels will be permitted for conveyance of stormwater associated with urban development. Grass lined channels are most desirable whenever feasible. Rock lined channels will be permitted, however their use should be restricted. Concrete lined channels will only be allowed in instances where other options have been exhausted.

6.2.11.3.1 GRASS LINED CHANNELS

This channel type is the most desirable of the artificial channels. Grasses generally slow runoff facilitating both infiltration and biological uptake. A properly designed vegetated channel will effectively eliminate the potential for erosion by stabilizing the soil. Velocities shall be limited to 7 fps and Froude numbers restricted to 0.8. Side slopes of 3:1 or greater flatter shall be maintained throughout the reach.

6.2.11.3.2 ROCK LINED CHANNELS

A riprap lined channel will be permitted when design parameters cannot be met for the construction of a grass lined channel. Rock channels can effectively decrease the velocity and energy of a watercourse to within acceptable levels. Rock lined channels can also be used in areas where there is high potential for erosion due to soil properties and gradient, proper sizing and bedding parameters are essential.

Velocities shall be limited to 9 fps and Froude numbers restricted to 0.8. Side slopes of 3:1 or greater shall be maintained throughout the reach.

6.2.11.3.3 CONCRETE CHANNELS

A concrete lined channel will only be allowed when no other channel type's design parameters can be met and other options are not feasible. Detailed structural analysis will be required addressing heaving and undermining in addition to hydraulic design.

6.2.11.4 ROADSIDE DITCHES

Roadside ditches shall be designed to adequately convey stormwater associated with the Minor storm within allowable parameters as defined in these CRITERIA. Particular attention must be given to prevent the adverse effects of erosion.

6.2.11.5 MAJOR DRAINAGEWAYS

Major drainageways as defined in these CRITERIA shall be planned and

designed in accordance with the MANUAL.

Adequate freeboard shall be provided for all major drainageways, and maintenance access shall be designed into the cross section. A low flow or trickle channel is encouraged with the design of a major drainageway and should have capacity for approximately two percent of the Major storm recurrence interval. A combination of channel linings, or a composite lining is recommended when designing a major drainageway.

A standard backwater analysis shall be required, delineating the 100-year water surface and associated properties of the channel proposed to handle runoff as a result of urban development. Although a floodplain delineation is not required, engineering discretion should be utilized when routing these flows adjacent to structures.

6.2.12 DETENTION

6.2.12.1 INTRODUCTION

Stormwater detention facilities within the Town shall be designed in accordance with the procedures and data as set forth in these CRITERIA. Detention facilities will be required for all urban development.

Temporarily detaining excess storm water as a result of urban development can decrease flood potential in downstream conveyances. As land use changes from agricultural and rural to urban in character, historic imperviousness is generally increased. The construction of roads, sidewalks, driveways parking lots and structures generally prohibit the stormwater infiltration processes and leads to higher rates of runoff as compared to historic conditions.

The purpose of this section is to address these issues and provide solutions and procedures for calculating required stormwater detention volumes as well as allowable release rates to be utilized within the Town.

6.2.12.2 DETENTION VOLUME

Detention pond facilities within the Town shall be designed to adequately detain excess runoff associated with both the Minor and Major recurrence interval.

6.2.12.3 RATIONAL PROCEDURE

For basins in which the Rational Method is utilized to estimate runoff, typically basins less than 160-Acres, the detention volume shall be calculated by determining the difference in runoff between historic and developed conditions. The equation to be used with the Rational Method does not take into consideration release volumes or timing elements associated with larger basins where significantly more accuracy is essential and justified considering the complexity and cost of the drainage facilities design. For simplified basins, detention volumes can be calculated as follows:

$$V_{\text{required}} = V_d - V_h$$

Where:

V_d = Developed Volume

V_h = Historic Volume

$$V_{10} = (C_{10})(P_{10})(A)$$

Where:

V_{10} = Volume from the Minor Storm (Ac-ft)

C_{10} = 10 -Year Runoff Coefficient

P_{10} = 10 -Year 24-Hour Precipitation (ft)

A = Area of Developed Basin (Ac)

$$V_{100} = (C_{100})(P_{100})(A)$$

Where:

V_{100} = Volume from the Minor Storm (Ac-ft)

C_{100} = 100 -Year Runoff Coefficient

P_{100} = 100 -Year 24-Hour Precipitation (ft)

A = Area of Developed Basin (Ac)

These equations will provide reasonable attenuation of flood peaks. The volume calculated for both the Minor and Major recurrence interval shall be considered the minimum required detention volume. For calculating the water surface elevations for a given area and corresponding volume, the Prismoidal Formula may be used, expressed as follows:

$$V = (H/3) * (A_1 + (A_1 * A_2)^{.5} + A_2)$$

6.2.12.4 OTHER METHODOLOGY

No other methodology is permitted.

6.2.12.5 RELEASE RATES

Maximum allowable release from a developed basin shall not be greater than the historic basin discharge for both the Minor and Major recurrence interval. Allowable discharge rates shall be calculated and compared as set forth in the procedures contained in Chapter 6 of these CRITERIA for both design storms. Offsite discharge accepted by a detention basin will be allowed to flow through the pond undetained at historic rates. These discharge values can be considered additional flows to be incorporated into the design and analysis of the outfall structure.

The outfall structure shall be designed to discharge both the Minor and Major recurrence interval at less than historic rates.

6.2.12.6 ORIFICE EQUATION

Regulating the discharge from a detention basin through the use of an orifice may be calculated with the following equation:

$$\begin{aligned} &\text{Orifice:} \\ &Q = C_d * A * \sqrt{2gh} \\ &\text{Where:} \\ &C_d = \text{Orifice Coefficient} = 0.60 \\ &A = \text{Area (ft}^2\text{)} \\ &G = \text{Gravitational Constant} = 32 \text{ ft/s}^2 \\ &H = \text{Head Measured From Center of Orifice (ft)} \end{aligned}$$

6.2.12.7 WEIR EQUATION

Regulating the discharge from a detention basin through the use of a weir may be calculated with the following equation:

$$\begin{aligned} &\text{Broad Crested Weir:} \\ &Q = CLH^{3/2} \\ &\text{Where:} \\ &C = \text{Weir Coefficient} = (\text{See Fig. 1000}) \\ &L = \text{Length (ft)} \\ &H = \text{Head (ft)} \end{aligned}$$

6.2.12.8 DETENTION FACILITIES DESIGN

The design and implementation of detention facilities can enhance the urban environment. Detention basins can serve as a buffer to environmentally sensitive areas, the water storage function can provide for consumptive and conjunctive uses, and the upper areas of a large basin can be utilized for passive recreation activities.

6.2.12.9 PERMITTED FACILITIES

A grass lined earthen basin is the most desirable method for detaining stormwater runoff within the Town and is the focus of this section. Other methods of detaining stormwater runoff as a result of urban development, including but not limited to underground or parking lot facilities will be permitted, however engineering discretion shall be used. Rooftop detention facilities shall be prohibited within the Town.

6.2.12.10 GRADING REQUIREMENTS

Storage facilities meeting the specifications in Colorado Revised Statutes 37-87-105 as amended shall require approval by the Office of the State Engineer. Generally, stormwater detention facilities designed for urban stormwater runoff attenuation will not be regulated by the State, and shall be designed in

accordance with the provisions and data as set forth in these CRITERIA.

Earthen embankments of less than 10 feet in height shall be designed and constructed with maximum side slopes of 4:1. In certain circumstances, a variance may be requested and granted if slope stability is shown to be maintained.

Grass lined detention basins shall be designed and constructed to promote positive drainage to the bottom stage and outlet areas, generally a 0.5 percent gradient shall be provided throughout.

6.2.12.11 FREEBOARD REQUIREMENTS

A minimum of 1.0 feet of freeboard shall be required, measured from the calculated 100-year water surface elevation.

6.2.12.12 EMERGENCY OVERFLOW REQUIREMENTS

To protect from catastrophic failure of the detention basin as a result of a larger magnitude storm or failed outlet works, an emergency overflow must be provided. Incorporating an overflow weir into the embankment is the most desirable method. This weir shall have an invert above the calculated 100-year water surface elevation and the design head shall be the top of the berm providing the freeboard requirement. The weir shall be designed to discharge at a rate of 1.5 times the calculated 100-year allowable release rate. The entire length down to the toe of the embankment shall be protected from potential erosion. (See FIGURE 19)

6.2.12.13 MAINTENANCE ACCESS

As provided these CRITERIA, maintenance access shall be provided to detention facilities. This access shall include vehicular access for maintenance purposes to the outlet structure.

6.2.12.14 PERFORMANCE REQUIREMENTS

To assure that the detention facility has been constructed according to the approved plans, an as-built survey shall be required. This pond certification shall be submitted to the Town, showing the detention facility has at least 95 percent of the design capacity at the calculated 100-year water surface elevation and the required freeboard.

6.2.13 WATER QUALITY ENHANCEMENT

6.2.13.1 INTRODUCTION

The Town recognizes the necessity to address stormwater quality issues that may arise as a result of urban development. Non-point source pollution continues to be one of the major contributors affecting the aesthetic values of receiving waterways, ecological benefits for fish and wildlife populations and environmental public health concerning contamination of drinking waters.

Stormwater runoff across lawns, roofs, and impervious roadways facilitates the transport of sediment laden with fertilizers, nutrients, oil, grease and other contaminants. The most desirable method for treating this sediment laden runoff within the Town is to effectively slow and control the release of this stormwater to facilitate deposition prior to discharge into the receiving downstream conveyance.

In recognition that stormwater hydrology is regional in nature, these CRITERIA are written to be in substantial compliance with the Northwest Colorado Council of Governments – Water Quality Protection Standards. The design engineer should be familiar with the intent of those Standards, as well as Local, State and Federal Regulations concerning the treatment of stormwater runoff.

The purpose of this Section is to identify acceptable design procedures pertaining to permanent water quality control measures incorporated into the design of a detention basin. Except as modified herein, design of Structural BMP's shall be in accordance with the MANUAL. The design engineer is referred to the MANUAL or other references cited for basic design concepts or technicalities.

6.2.13.2 WATER QUALITY CAPTURE VOLUME

The Town encourages design of water quality control ponds to be calculated as an extended detention basin sedimentation facility (EDB). The EDB is easily incorporated into the design of a stormwater detention basin designed for attenuation of flood peaks.

6.2.13.3 WQCV

The water quality capture volume is determined based on developed watershed imperviousness and is expressed as watershed inches. The design engineer is referred to Figure EDB-2 as provided in the MANUAL to determine the WQCV required based on the EDB's 40-hour drain time.

6.2.13.4 DESIGN VOLUME

The design volume is described as a storage volume equal to 120 percent of the WQCV based on watershed area and can be calculated as follows:

$$V_{\text{design}} = (\text{WQCV}/12) * \text{Area} * 1.2$$

6.2.13.5 OUTLET WORKS

The design engineer shall refer to the Urban Design and Flood Control District Volume 3, latest edition (MANUAL).

Chapter 7

Revegetation, Erosion and Sediment Control



CHAPTER 7: REVEGETATION, EROSION AND SEDIMENT CONTROL

7.1 INTRODUCTION

Erosion and resulting sedimentation is a naturally occurring process which has the potential to be rapidly accelerated as a result of land disturbing activities associated with development. The purpose of establishing and implementing these Revegetation, Erosion and Sediment Control Criteria is to prevent degradation to downstream properties and receiving waterways as a result of the site disturbance process within the Town.

See the *Erosion and Sediment Control for Construction Activities Guidance Handbook*. This handbook is available through the East Grand Water Quality Control Board and the Town Planning Department.

7.2 REGULATORY REQUIREMENTS

The Federal Clean Water Act (CWA), implemented through the Environmental Protection Agency (EPA) requires authorization to discharge stormwater associated with construction activities through the National Pollutant Discharge Elimination System (NPDES). In Colorado, the NPDES is administered through the Colorado Department of Public Health and Environment – Water Quality Control Division (CDPHE-WQCD). Currently any and all construction activities disturbing more than one acre are required to comply with the provisions stipulated in a General Permit for Stormwater Discharges Associated with Construction Activity. The owner or operator of the construction activity shall submit this General Permit Application at least 10 days prior to the anticipated date of land disturbing activities to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-Permits
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
(303) 692-3517

The main provision with the Permit is the development and implementation of the Stormwater Management Plan (SWMP).

ACCEPTANCE OF THE SWMP (if required) BY THE TOWN IS REQUIRED PRIOR TO FINAL PLAT ACCEPTANCE. SWMP APPLICATION TO THE STATE MUST BE APPROVED PRIOR TO COMMENCING ANY CONSTRUCTION.

THE TOWN SHALL HAVE AUTHORIZATION TO ISSUE A STOP WORK ORDER FOR FAILURE TO COMPLY WITH THE PROVISIONS OF THE PERMIT AND/OR THESE CRITERIA. TOWN STAFF SHALL REQUIRE EMERGENCY MITIGATION MEASURES.

7.3 BEST MANAGEMENT PRACTICES (BMP's)

As the SWMP is the main requirement of the Permit, the BMP's are the main provision of the SWMP. The purpose of this section of these Criteria is to provide a guideline for acceptable practices to be utilized within the Town. Although many references are available to the design engineer with respect to selection and design of appropriate BMP's, the Urban Storm Drainage Criteria Manual – Volume 3, Best Management Practices, is the basis for these Criteria.

The Erosion and Sediment Control industry has experienced rapid progress over the last decade and is continuing to expand. As such, the design engineer is strongly encouraged to utilize the latest advances in selection methodology and information now available. The greatest benefits to enhancing the water resources of the Town are realized if Erosion Control is thought of as preventative in nature whereas Sediment Control is treatment.

The NPDES requirements are strict and the penalties associated with non-compliance are severe. Planning, designing and implementing a thorough SWMP are the most effective way to protect the water resources within the Town, thereby complying with the NPDES requirements. These Erosion and Sediment control BMP's are intended to eliminate non-point source pollution to receiving waterways as a result of the land development process during construction activities. Establishing vegetated cover capable of providing equal or greater erosion control benefits as compared to historic conditions is the goal of the Erosion Control BMP's. The maintenance requirements of the Sediment Control BMP are described in these Criteria cannot be overemphasized, that is to say if they are functioning properly, accumulated sediment will need to be removed. As construction phases progress, the SWMP and associated BMP's will need to adapt to the changing conditions of the site. In addition to these construction BMP's, Administrative Control BMP's are equally as important. Administrative BMP's include ideas and methodology concerning the manner in which construction occurs. Education, training and coordination of all involved parties is an effective way to limit the erosion on a project, thereby limiting the need for sediment control, and is a prime example of an Administrative Control BMP.

7.3.1 EROSION CONTROL BMP's

1. Exposed soil shall be stabilized and protected from erosive forces as soon as possible, but no later than 14 days of achieving finished grade or if the area will remain dormant (disturbed, but not at finished grade). Appropriate soil stabilization techniques include:
 - Mulching
 - Rolled Erosion Control Products or Turf Reinforcement Mats (RECP's or TRM's)
 - Proprietary Geosynthetics
 - Bonded Fiber Matrix (BFM's)
2. In addition to the soil stabilization techniques applied, Temporary Revegetation is required on all disturbed areas having a period of exposure of one year or longer prior to final stabilization. Temporary seeding shall consist of an annual grass cover crop and may be applied:
 - Hydraulically
 - Drilled
 - Broadcast
3. Permanent Revegetation is required on all disturbed areas that are either at finished grade or expected to remain dormant for a period longer than one year (1yr). Permanent seeding shall consist of an appropriate native perennial cover crop as recommended by the Natural Resource Conservation Service (NRCS) office in Kremmling Colorado, or approved equal.
4. Other Erosion Control BMP's recommended by the Town include:
 - Limiting areas of disturbance
 - Limiting Directly Connected Impervious Areas (DCIA)
 - Establishing buffer strips

- Planning, scheduling & phasing construction around times of heaviest expected precipitation and snowmelt
- Transitioning changes in slope
- Terracing long slopes
- Surface roughening and contour furrowing

7.3.2 SEDIMENT CONTROL BMP's

1. Temporary Diversion Dikes or Continuous Berms controls shall be required on all disturbed slopes of 3:1 and greater than 20' in length or as soil condition and tributary area dictates. These dikes or berms must divert stormwater to a properly stabilized channel, slope drain or rundown to limit rill and gully erosion. This BMP can be designed at the top, mid and/or base of a disturbed slope, following the contour, to effectively limit sediment transport from the disturbed area and may be constructed of the following materials:
 - Compacted Soil
 - Straw Wattles
 - Aggregate Bags
 - Proprietary Geosynthetics

2. Sediment Barriers are perimeter controls designed to pond sediment laden stormwater as a result of overland sheet flow and slowly allows this stormwater to filter through the media as sediment settles out. This BMP shall be required around the perimeter of disturbed areas, at the base of disturbed slopes or as soil condition and tributary area dictates. Proper design of this BMP limits the tributary area to ¼ Acre per 100 lf of barrier, following the contour, to effectively limit the transport of sediment laden stormwater. Sediment barriers may be constructed of the following materials:
 - Silt Fence
 - Straw Wattles
 - Aggregate Bags
 - Geotextile wrapped Brush Barriers
 - Proprietary Geosynthetics

3. Channel stabilization controls shall be required in all drainage ways where Froude numbers are expected to exceed 0.8 for the minor storm recurrence interval rainfall or as soil condition and tributary area dictates. Proper design of these BMP's either limits stormwater velocities or armors the channel to limit erosion from occurring therefore eliminating sediment transport. Techniques, materials and methods for channel stabilization within the Town include:
 - Check Dams
 - a) Aggregate
 - b) Straw Wattles
 - c) Proprietary Geosynthetics
 - Channel Linings
 - a) Aggregate
 - b) RECP/TRM
 - c) Proprietary Geosynthetics

4. Energy dissipation controls shall be required at all culvert inlets and outlets. Additionally, energy dissipation controls may be necessary at the terminus of

drainage ways, slope drains and/or rundowns to effectively limit erosive forces and sediment transport. Proper design and selection of these BMP's reduce turbulent flow and limit hydraulic jumps within a stabilized area. Techniques, materials and methods for channel stabilization within the Town include:

- Riprap
 - Aggregate Drop Structures
 - Level Spreaders
 - Proprietary Geosynthetics
5. Inlet protection controls shall be required at all storm, sewer and/or culvert inlets. The intent of this BMP is to pond sediment laden runoff, allowing sediment to settle out prior to entering the conveyance structure. Proper design and selection of this BMP must allow the conveyance structure to accept the design flow prior to any major inundation as well as have the structural stability to withstand the forces generated by these focused flows. Inlet protection may be constructed of the following materials:
- Block and Aggregate
 - Aggregate Bags
 - Proprietary Devices
6. Vehicle tracking controls shall be required wherever construction traffic will enter onto an improved road from a construction site. Additionally, as sediment is tracked onto an improved road, the road shall be removed of accumulated sediment at the end of each workday. Proper design and placement of this BMP limits construction access to controlled points of ingress and egress before and after construction of the road base. Vehicle tracking controls shall be constructed of the following materials:
- Geosynthetic Fabric overlain by Course Aggregate (FIGURE 20)
7. Sediment entrapment facilities shall be required on all construction sites of one acre or larger. The minimum required volume of the sediment basin shall be calculated based on 1800 cubic feet per tributary acre. The sediment basin shall incorporate a stabilized spillway capable of passing stormwater flows generated by the one hundred year recurrence interval rainfall. The sediment basin can easily be incorporated into the design of a permanent stormwater detention facility and generally provides the most functional and economical solution to implementing this BMP. The sediment basin is designed to effectively slow the velocity of stormwater runoff and allow the suspended sediment to settle; as such the basin shall be dredged of accumulated sediment prior to becoming half full. Proper design and placement of this BMP serves as the final measure in eliminating sediment laden stormwater runoff from leaving the construction site.

7.4 REVEGETATION

All areas disturbed during construction that require revegetation shall receive a minimum of four inches (4") topsoil replacement or an approved design from a landscape architect.

Revegetating disturbed areas of construction is critical to prevent soil erosion. Establishing vegetative cover capable of limiting erosion potential to that of pre-disturbed levels is necessary. Effective revegetation limits raindrop impact erosion, facilitates infiltration, reduces runoff and reduces negative impacts caused by noxious weeds (such as root establishment and out-competing native vegetation). The

following seed mix is recommended by the Grand County Natural Resource Conservation Service and shall be implemented on all sites disturbing soil:

TEMPORARY SEED MIX				
LAND USE	% OF MIX	SPECIES	VARIETY	APPLICATION RATE (LBS/AC)
DRY LAND NON-IRRIGATED RECLAMATION	50	SMOOTH BROOME	MANCHAR	8
	50	PUBESCENT WHEATGRASS	LUNA	8
NOTES:				
<ol style="list-style-type: none"> 1. The applied seed shall not be covered by a soil thickness greater than 0.5" in depth. 2. Seeding shall take place on all disturbed areas and stockpiles expected to remain dormant for a period greater than 30 days. 3. To provide temporary erosion control prior to seed application, utilize surface roughening (on the contour or perpendicular to prevailing winds) and apply mulch. 4. Seed shall be planted with drill seeding equipment, whenever possible. 5. Areas that require broadcast seeding shall be mulched and tackified. 				

7.5 LANDSCAPING

The objective of a Landscape Plan is to provide a sustainable approach to ensure revegetation of the disturbed site, and to improve aesthetics of the built facilities in a sustainable manner upon completion of a new development. A multi-family development will include landscape features for all open space tracts, and areas disturbed during installation of utilities. A single-family development may include landscape features at the point the development enters a Town road, as well as areas disturbed during installation of utilities. Landscaping shall be designed anticipating mature vegetation and shall not interfere with roadway site distances or overhead lines. If necessary, irrigation designs and costs shall be included in the construction plans and cost estimate.

The design shall be completed and signed by a Landscape Architecture, Horticulturist, or revegetation specialist (resource specialist, engineer, etc.) approved by the Town. The construction cost shall include all features shown in the landscape plan, maintenance requirements for established plantings, and a two-year warranty.

All landscaping shall not interfere with the intersection site triangle (See SECTION 3.7.6). The landscaping plan shall be designed anticipating fully mature plantings.

7.6 REFERENCES AND DESIGN AIDS

Environmental Protection Agency www.epa.gov

Colorado Department of Public Health & Environment www.cdphe.state.co.us

Urban Drainage & Flood Control District www.udfcd.org

Erosion Control Technology Council www.ectc.org

International Erosion Control Association www.ieca.org

International Stormwater BMP Database www.bmbdatabase.org

National Resource Conservation Service (NRCS) www.nrcs.usda.gov

Northwest Colorado Council of Governments (NWCCOG) www.nwc.cog.co.us

Chapter 8

Policies and Procedures



CHAPTER 8: POLICIES AND PROCEDURES

8.1 VARIANCES

8.1.1 VARIANCE REQUEST

If an Applicant responsible to the Town for public improvements desires to design and construct such improvements in variance to criteria in these Standards, such variance(s) should be identified in the initial submittal of construction plans at preliminary plat stage. The variance request(s) shall consist of:

- a) Name.
- b) Project.
- c) Identification of the criteria provision to be waived or varied.
- d) Identification of the alternative design or construction criteria to be adhered to.
- e) A thorough justification of the variance request addressing the items in SECTION 8.1.2.

All variance requests shall be signed and stamped by a Colorado Licensed Professional Engineer and signed by the Applicant.

8.1.2 VARIANCE REVIEW AND ACCEPTANCE CRITERIA

Variations from the design criteria and construction specifications contained in these regulations shall be reviewed by the Town and may be granted by Town Staff under the following circumstances:

- a) Where, by reason of exceptional situations or conditions, the strict application of these regulations would result in peculiar practical difficulties, or undue hardship upon an individual provided the conditions in SECTION 8.1.2c are met.
- b) Where an individual is proposing to construct a low volume or local access road and the strict application of these regulations would result in excessive cut and fill slopes, visual scarring, or other environmental damage, variances in road design standards may be granted if granting the variance will result in lessened environmental damage, and the conditions in SECTION 8.1.2c are met.
- c) Variations from the difficulties or hardships described in SECTION 8.1.2a&b may be granted provided relief will not result in substantial detriment to public health, safety and welfare, substantial impairment of the road design and construction standards, or the granting of any special privilege or use.

8.2 CONTINUATION OF ROADWAYS AND TRAILS

Streets, bike pathways, walkways and easements shall be aligned to join with the planned or existing public ways adjacent to the subdivision. The Planning and Zoning Commission may require public ways to provide direct, continuous routes to all adjacent lands, whether such adjacent lands have been subdivided or not. The location of public ways providing access to adjacent lands shall be selected by the Applicant provided such location shall be reasonably calculated to provide usable access to the adjacent lands. The cost of such public ways leading to and within a subdivision shall be borne by the Applicant.

Streets shall be extended to boundaries of the property, except where such extension is prevented by topography or other physical conditions, or where the connection of streets with existing or probably

future streets is deemed unnecessary for the advantageous development of adjacent properties. Where future extensions of a street are anticipated, a temporary turn-around, meeting Town cul-de-sac standards may be required.

8.3 INSPECTIONS

Prior to the commencement of construction within the Town Right-of-Way, the Applicant must notify the Town of their intent, obtain a Right-of-Way Use Permit and submit a proposed schedule of construction activities. The Town, or their representative, shall inspect the work throughout the construction period to verify that Town standards and regulations are being complied with. In cases where Right-of-Way is not publicly dedicated, the Town shall, by the Development Improvements Agreement, be allowed to inspect the construction of streets and drainage appurtenances to insure that it complies with the approved plat. The Town shall be notified as to any changes in scheduling or in the approved design.

8.4 PAYMENT OF COSTS FOR ROAD CONSTRUCTION

Any and all costs of new road construction in new developments are the responsibility of the Applicant. The Applicant is responsible for constructing the new roads according to the Road Standards.

Existing Town Roads serving a new development or an area proposed for either platting or replatting may be upgraded to the Road Standards when existing roads do not meet the Standards & Specifications for the road classification or for the projected traffic volume.

The participation of the Applicant in the design and construction of new roads, and improvements to existing roads, shall be determined by the relative impacts identified in the Traffic Impact Study and at the discretion of the Town Council.

8.5 UPGRADING EXISTING ROADS

In many instances, older roads in the Town are substandard because they were built prior to the Town having an adequate system for enforcing design and construction standards. These instances could include correcting a grade, road width or drainage problem. It might include upgrading the roadway to pavement surface, asphaltic or concrete. Chip and Seal roads will not be considered for acceptance for maintenance by the Town. Grade, drainage and road width issues will be addressed under current Standards and Specifications and an engineer stamped drawing addressing the specific issues will be required.

A Development Improvement Agreement (DIA) and Town Council approval must be in place prior to any roadway pavement upgrading, either asphaltic or concrete. It is the HOA or homeowners responsibility to provide an engineer stamped soil test, drainage, design pavement, striping and any other requirements. Roadway design in accordance with the Standards and Specifications such as drainage, road width, and revegetation will apply. A warranty security shall be in place for a two year period from the HOA contractor once preliminary acceptance has been granted in accordance with the provisions contained within the SIA. Upgrading existing roads to correct these problems shall be at the expense of the property owners served by each road. Completion of the improvements does not in itself constitute acceptance for maintenance.

8.6 ROAD MAINTENANCE

An application for Town maintenance requires a letter of interest for Town maintenance, signed by all people or the HOA having ownership interest in the road along with a copy of the meeting minutes,

requesting consideration by the Town Council. The Town will not consider acceptance of roads for maintenance until Final Acceptance has been granted, after the two (2) year warranty period has been satisfied. The Town Council shall base their decision upon recommendation from the Town Public Works Director, Town Planner and the Town Engineer that the roadway(s) have met the following minimum requirements:

- a) Roads have been constructed according to Town regulations and Standards.
- b) All drainage criteria as outlined in the Town regulations and Standards have been satisfied.
- c) Proper easement for drainage requirements and pedestrian movements, both offsite and onsite have been identified and are shown on the plans.
- d) The included roads are properly connected to the existing Town road system.
- e) All necessary road Right-of-Ways have been dedicated to the Town.
- f) All combustible or objectionable material is cleared from the roadside and all required signing is properly installed. All areas requiring seeding and/or foliage producing the proper stand as outlined in SECTION 7.4.

NOTE: Acceptance of platted developments by the Town does not constitute acceptance of the roads and Right-of-Ways for maintenance. Until each road is specifically accepted for maintenance by the Town Council at a road hearing, as defined in SECTION 8.10, maintenance, construction repair and snow removal are the responsibility of the owners of the land within the development.

8.6.1 TOWN OWNED AND MAINTAINED ROADS

Under this category, the Town holds either a deed or an easement for the road Right-of-Way and has assumed responsibility for the road maintenance. These roads are listed in the annual inventory filed with the State of Colorado and the Town receives an annual allotment of highway users' fees to defray maintenance costs, based on the mileage of roads listed.

8.6.2 TOWN OWNED ROADS, BUT MAINTAINED BY OTHERS

In certain cases, private property owners using Town owned roads for access desire a higher level of service than the Town can provide (i.e. winter plowing). In such cases, the Town and the property owners have reached an agreement assigning maintenance responsibilities to the property owners.

In other cases, Town owned roads might be maintained by an adjacent town. Such arrangements have been made when it makes more sense for the town to plow a portion of a Town road because of its location and its connection to town streets in exchange for the Town plowing sections of outlying town roads.

8.6.3 MAINTENANCE CLASSIFICATIONS

- a) FULL - This category includes roads where the Right-of-Way, or recreational pathway easement has been dedicated to the Town, the road meets Town design and construction standards, the Town Council has accepted the Right-of-Way, or recreational pathway easement dedication, and the road has passed any required probationary period. It also includes roads which may or may not meet current Town design and construction standards, but which were dedicated to and accepted by the Town for full maintenance before road

standards were adopted or enforced. Full maintenance status assigns complete responsibility to the Town for snowplowing, grading, resurfacing, ditch maintenance and repair as necessary. For snowplowing, priorities are assigned which reflect the use of the road and its relative importance to traffic flow.

b) PROBATIONARY - When roads are dedicated to the Town as public roads, the Town Council may consider probationary maintenance for a two year probationary period provided the roads meet the requirements outlined in SECTION 8.4.

During this period, any repairs are the responsibility of the property owners or Applicant seeking final acceptance from the Town. The procedures for converting a road from probationary to final acceptance follow the same guidelines outlined in SECTION 8.4.

c) LIMITED - This category includes roads which do not meet current Town standards with respect to widths, curves, or grades, but which were dedicated to and accepted by the Town prior to road standards being adopted or enforced. Such roads may receive seasonal maintenance. This maintenance level is low priority and is dependent on the availability of funds, manpower and equipment.

d) NO MAINTENANCE - This category includes any and all public or private roads that are not maintained by the Town under any circumstances.

8.7 QUALITY CONTROL

Tests ordered by the Town to ascertain compliance with specifications shall be the most recent standard methods of AASHTO or ASTM and shall be made by an independent testing firm at the expense of the Applicant. Where the Applicant or owner maintains his own testing equipment and qualified personnel, the requirement for an independent testing firm may be waived by the Town. Copies of test data are to be furnished to the Town.

The roadway and roadside areas wherein construction work has been performed shall be thoroughly cleared of all debris and extraneous material and shall be restored to a condition at least as good as the original condition. Example: clean-up of pavement and all roadway appurtenances, pavement failures, broken concrete, damaged signs and fencing, debris on adjacent private property, etc. All deficiencies must be resolved to the satisfaction of the Town. The Town may bring a civil action to collect for damages from any person causing damage to any public road or highway (C.R.S. §42-4-512).

8.8 SITE TRIANGLE MAINTENANCE

When the Town receives a complaint of a sight obstruction on public land the appropriate jurisdiction will be responsible for removing the obstruction. If the obstruction is on private land the property owner will be given 30 days to remove the obstruction unless the structure was built prior to these Standards, the owner was previously granted a waiver, or the obstruction is due to the natural topography and not by earthwork undertaken by the current property owner. Where a building permit application is filed for property which was platted or replatted after the effective date of these Standards, no building permit shall be issued for any structure which would interfere with the maintenance of a sight triangle for such property. If the property was platted or replatted prior to the effective date of these Standards a sight triangle must be maintained unless application of the requirements would result in peculiar and

exceptional practical difficulties to the individual proposing development of the property.

8.9 RIGHT-OF-WAY

8.9.1 OBSTRUCTION

C.R.S. §43-5-301 “No person or corporation shall erect any fence, house, or other structure, or dig pits or holes in or upon any highway, or place thereon or cause or allow to be placed thereon any stones, timber, or trees or any obstruction whatsoever. No person or corporation shall tear down, burn, or otherwise damage any bridge of any highway, or cause waste water or the water from any ditch, road, drain, flume, agricultural crop sprinkler system, or other source to flow or fall upon any road or highway so as to damage the same or to cause a hazard to vehicular traffic...”

8.9.2 DEPOSITS ON PUBLIC WAYS

Refer to the Winter Park Town Code, SECTION 4.1.7.

8.10 ROAD HEARING PROCEDURES

The Town of Winter Park Road Hearings are held as requested.

The Town Council will consider the following:

- Requests for maintenance on existing dedicated Town roads
- Requests to increase or decrease the level of existing road maintenance on a dedicated Town road
- Requests for acceptance of a dedicated Town road after the two year warranty period

The following will be required for the Town Council to consider any request for maintenance:

An application for Town road maintenance requires a letter of interest signed by all people having ownership interest in the road. The Town will not consider acceptance of publicly dedicated roads for maintenance until Final Acceptance has been granted by the Council in accordance with a DIA. The Council shall base their decision upon recommendation from the Town Engineer and Town Planner that the roadways have met the following minimum requirements:

- a) Roads have been constructed according to Town regulations and standards.
- b) All drainage criteria as outlined in the Town regulations and standards have been satisfied.
- c) Proper easement for drainage requirements and pedestrian movements, both offsite and onsite have been identified and are shown on the plans.
- d) The included roads are properly connected to the existing Town road system.
- e) All necessary road Right-of-Ways have been dedicated to the Town.
- f) All combustible or objectionable material is cleared from the roadside and all required signing is properly installed. All areas requiring seeding and/or foliage producing the proper stand prescribed by the plan.

NOTE: Acceptance of platted developments by the Town does not constitute acceptance of the roads and Right-of-Ways for maintenance. Until each road is specifically accepted for maintenance by the Town Council, maintenance and construction repair are the responsibility of

the owners of the land within the development.

8.11 ROAD VACATION

Road vacations are a separate procedure following State Statute and Town Council action and are not a part of these Standards. Please refer to the Winter Park Town Code, SECTION 8.1.5 and C.R.S. §43-2-301 for procedural information.

8.12 TRACKED EQUIPMENT

Tracked equipment (excluding rubber tracked equipment) shall not be allowed at any time to cross or travel on any Town Road without prior written authorization from the Town. Once written approval has been granted, the Applicant must protect the road surface at all times. Any damage to the road surface shall be repaired immediately by the parties damaging the road surface. A party who does not receive written authorization will be in violation of C.R.S. §43-5-301 and Winter Park Town Code, SECTION 4-1-7, and may be prosecuted as provided therein.

Chapter 9

Road Cut Standards and Regulations



CHAPTER 9: ROAD CUT STANDARDS, REGULATIONS AND RIGHT-OF-WAY PERMIT

9.1 STATEMENT AND PURPOSE

The purpose of this section is to prescribe the standards and procedures to be followed by the contractor and/or his representative in making proper excavations and backfilling of installations within the Town Road Right-of-Way (RIGHT-OF-WAY or ROW), and to define the position of the Town in administering this regulation. No permit shall be required for work including, but not limited to, maintaining ditches, conducted in the Right-of-Way exclusively for purposes of Husbandry.

9.2 PERMIT AND REGULATIONS

The Right-of-Way use permit must be obtained at least five (5) days prior to any commencement of construction. Applications may be downloaded from the Town website at www.winterparkgov.com. The Applicant shall submit construction plans, specifications, and a written schedule covering the general sequence and staging of the work to be performed on large scale projects. The Right-of-Way Use Permit may contain stipulations and must be adhered to or the permit shall be revoked. Applications will not be accepted between October 15th and May 1st. After October 15th each request will be dealt with on a case by case basis. All construction shall be completed by October 31st.

Work authorized by this permit shall be performed between the hours of seven o'clock (7:00) am and seven o'clock (7:00) pm, Monday through Friday, unless the Applicant obtains written permission from the Public Works Superintendent to do the work earlier or later than the stated hours or on a weekend. .

Once the Permit is approved, no change shall be allowed to the schedule or plans, without the consent of the Town. Permits must be available at the work site, on demand to Town personnel at all times. Construction Permits expire at the approved scheduled ending date and must be renewed in advance if the bond is not to default.

Any person conducting work within the Right-of-Way without an approved Right-of-Way use Permit shall be fined five hundred (**\$500.00**) §C.R.S. 43-5-301.

9.2.1 BORING/JACKING

Where the installation crosses a asphalt surfaced roadway five (5) years old or newer, the installation shall be made by boring or jacking beneath the roadway surface; however open cutting shall be allowed to the edge of the shoulder portion of the road. No water shall be used in boring and no tunneling shall be permitted. Any variance to this will require Town approval.

9.2.2 ASPHALT CUTS

Pavement cuts are permitted only when unsuccessful attempt(s) has been made to bore or jack the installation or site constraints exists. (i.e. attachment to manholes).

All road cut backfill should use flowable fill material during construction. Any road cuts within paved Right-of-Ways older than five (5) years shall require proof of density test meeting the requirements of CDOT's *Materials Test Procedure Module* by compaction or flowable fill.

All cuts made in asphalt or concrete surfacing shall be made by mechanically cutting to a true horizontal and vertical line, and shall be cut one foot wider than the top of the trench excavation.

All excavations made in paved streets must be completely restored within 48 hours after acceptance of the backfill by the Town. In hot mix asphaltic concrete, temporary repairs shall be made by tamping and rolling into place a cold mix asphaltic concrete. Such cold mix patches shall be removed and replaced by a permanent hot mix asphaltic concrete as soon as weather and availability of materials permit. Permanent hot mix asphaltic concrete patches shall be one and a half (1 ½) times the depth of the existing asphalt, but no less than 2", and shall be installed in accordance with good construction practice.

Damaged pavement shall be repaired by appropriate methods as approved by the Town. In general, cracks are to be filled with the proper asphaltum product and the surface properly seal coated. An asphalt concrete overlay 1 1/4" thick for the full width of the paved surface shall be required in those instances, which in the opinion of the Town, the ride quality, or the appearance of the finished roadbed has been impaired. Subgrade failures caused by the Applicant's operation of heavy equipment shall be rectified by reconstructing the subgrade layers and replacing the subbase, base and asphalt pavement.

In the event that asphaltic concrete base, soil cement or other base course materials are encountered during excavation, restoration shall be made in kind or as otherwise specified by the Town.

All excavation work will expressly warrant and guarantee that the compaction and rebuild work on the road/Right-of-Way for a period of two (2) years will not fail. If the compaction/rebuild work fails at any time during that two (2) year period, the Applicant will be responsible for beginning repairs within forty-eight (48) hours of being notified that such repairs are needed and if those repairs are not made, the Town may make repairs at the Applicant's expense.

9.3 PROCEDURES FOR OBTAINING A PERMIT

9.3.1 DRIVEWAY PERMIT

Refer to Chapter 4

9.3.2 RIGHT-OF-WAY PERMIT APPLICATION

- a) One (1) application must be completed for **each** installation.
- b) Each application must be completed and signed by the construction Applicant, incomplete applications will be denied.
- c) The application must be submitted to the Town **at least 5 working days prior** to the anticipated start of the installation. Applications may also be downloaded from the Town website at www.winterparkgov.com
- d) Except in cases of emergency, (See SECTION 9.9) no work shall begin until a valid permit has been issued by the Town.
- e) The application is not a valid permit and is not a guarantee that a permit will be issued.
- f) Any construction started prior to permit issuance, will result in a penalty of **\$500.00** to the Applicant and/or criminal charges.

- g) A permit fee is required with the submittal of this application.
- h) A job cost estimate must accompany this application.
- i) A detailed sketch of the work site must accompany this application and must show the placement of the utility or Town road access.
- j) A detailed traffic control plan, including signage and distances, must accompany the RIGHT-OF-WAY application.
- k) Applicant must mark the work site prior to submitting application.
- l) Utilities must be buried to the minimum depth. See SECTION 5.
- m) Applicants are required to call for all utility locates.
- n) Roadway must be capable of re-opening for emergency vehicles at all times.
- o) Applicants shall contact Grand County's Sheriff Dispatch office and the Town prior to closing any road and in case of emergencies.
- p) A copy of the permit application shall be available for inspection at the work site at all times.
- q) If the work site fails inspection upon completion of installation, Applicant has ten (10) calendar days after notification to repair the work site to Town of Winter Park Standards and Specifications for Design and Construction and a re-inspection fee shall be assessed.
- r) Failure to perform under any one (1) permit issued to Applicant, may result in the suspension or revocation of any and all other open permits and permit applications pending for Applicant.
- s) Compaction tests are required and must be certified by a professional Geo-Tech engineer. Any failure in the first two years will go against the Bond and after that, the utility owner will be responsible.
- t) Photo documentation may be required.
- u) All flaggers must be CDOT Certified (including appropriate apparel).

9.3.3 APPLICANT'S STATEMENT OF RESPONSIBILITY

- a) The Applicant for a Right-of-Way use permit understands that they have certain responsibilities.
- b) The Applicant shall return the road/Right-of-Way to its original condition including placement of vegetation, or they may incur additional fees and construction requirements.
- c) The Applicant shall be responsible for any and all damage occurring to the roadway during the installation.
- d) The Applicant shall call the Town upon completion of the construction project to schedule an inspection. If the work site fails inspection, the Applicant shall be responsible for repairing the work site to Town of Winter Park Standards and Specifications for Design and Construction within ten (10) calendar days of being notified that repairs are needed and the Applicant shall be responsible for payment of a re-inspection fee.
- e) The Applicant shall comply with all standards listed in this document.
- f) The Applicant shall take any and all measures to ensure the safety of all travelers over, around, and through the construction site, including, but not limited to, certified flaggers, barricades and signage.
- g) The Applicant shall not close any road to traffic without the authority/permission from the Town.
- h) The Applicant shall not store any excavated materials at the work site that will obstruct traffic in any manner.
- i) The Applicant shall remove contaminated materials and replace with new Class 6

- j) The Applicant shall expressly warrant and guarantee the compaction and rebuild work on the road/Right-of-Way for a period of two (2) years. If the compaction and/or rebuild work fails at any time during that two (2) year period the Applicant will be responsible for beginning repairs within forty-eight (48) hours of being notified that repairs are needed and if the Applicant does not perform repairs, the Applicant shall authorize the Town to file a claim against the surety bond submitted with the Right-of-Way application.
- k) The Town is hereby released from liability for any damages to utilities not buried at the proper minimum depth or not installed in compliance with these Standards. If during normal maintenance/grading, the Town damages a utility that is not at the proper minimum depth, the Applicant shall be responsible for the damages during the bond period. The Applicant agrees to indemnify and hold harmless the Town, its employees and affiliates, from all liability for any and all damage to property or person resulting from improper installation of utilities under the Right-of-Way permit.
- l) The Applicant shall be required to sign the Right-of-Way permit application.

9.3.4 SURETY BONDS - TERMS AND CONDITIONS

- a) All surety bonds will be in the amount of 150% of the projected project costs that are supplied with the application (a surety bond is required for each permit application).
- b) An annual general contractor liability bond in the amount of \$1 million dollars (\$1M) will be acceptable for meeting the bond requirements.
- c) The surety bond shall be ongoing and have a termination date of two (2) years after notification to the Town by the Applicant that he has completed all Right-of-Way work in the Town.
- d) Annual renewal notification of the surety bond shall be provided by the bonding company to the Town. Failure to follow this requirement will result in suspension or revocation of any and all other open permits and future applications will not be approved.
- e) The bond may be called at the option of the Public Works Superintendent to defray the cost of repairing defective work.
- f) The bonding company shall promptly notify the Public Works Superintendent of any circumstances which affect the status of the bond. Failure to follow this requirement will result in suspension or revocation of any and all other open permits and future applications will not be approved.

9.3.5 WARRANTS

The Applicant shall be responsible for the repair of all failed road cuts for a period of two (2) years following completion of the work. A failed road cut which will require repair shall be defined as a settlement or breakdown of the cut area whereby the riding surface is visibly impaired and/or the structural integrity of the installation and its backfill is impaired.

9.4 GENERAL POLICIES

Construction work is to be planned so as not to create safety hazards, maintenance problems, render portions of Right-of-Way infeasible for future road improvement or to obstruct drainage ways. Where feasible, parallel installations are to be placed outside the roadbed within the Right-of-Way and transverse

installations shall be “jacked” or bored under the road in lieu of trenching. No cuts will be permitted on Town roads that have been overlaid (pavement) without the consent of the Town. The Town shall be advised 48 hours prior to the start of construction as to when construction will begin and shall be advised when construction is completed.

No cleated or track equipment shall work on or move over asphalt surfaces without mats. Any damage to asphalt due to equipment operation shall be repaired immediately (to the satisfaction of the Town) at the expense of the permittee.

9.5 ROAD CLOSURE

In general, road closures are not permitted unless justified on the basis of Safety or the overall benefit to the general public. When road closures are deemed necessary, the Applicant must:

1. Verify the road closures specified on the permit with the Town and with their approval, notify one week in advance the appropriate fire protection district, school district, E.M.S. and Sheriff's office of the exact location, date and time, and duration traffic will be impeded.
2. Erect and maintain, at Applicant's own expense, necessary barricades, flashers, construction signs and CDOT approved flaggers (per Manual on Traffic Control Devices - Work Zone Traffic Control), and take all necessary precautions for public safety and convenience. Road closures will be permitted only:
 - a) If explicitly specified on the approved Permit.
 - b) Between the hours of 8:30 A.M. and 3:30 P.M. When closures of more than one day are approved, a suitable detour must be provided and be adequately marked and signed to accommodate night traffic.
 - c) May notify appropriate public notifications (i.e. newspapers), if time allows.

9.6 SAFETY AND PUBLIC CONVEYANCE

CDOT approved flaggers shall be required when restricting travel to one-lane or otherwise unsafe operations. Adequate warning signs, barricades, lighting and other devices as specified in the Manual on Uniform Traffic Control Devices (MUTCD) and as approved by the Town shall be provided, maintained and paid for by the Applicant. The Applicant's operations are to conform to the applicable requirements established by the Industrial Commission of Colorado and the Occupational Safety and Health Act (OSHA), as well as any other applicable State or Federal laws.

9.6.1 TRAFFIC CONTROL PLAN

A traffic control plan following MUTCD guidelines shall be submitted as part of the Right-of-Way use application for all road cuts. A Colorado Registered Professional Engineer or other applicable State of Colorado certification shall be responsible for the Traffic Control Plan. All traffic control plans shall include the following:

- a) Name of preparer
- b) Date prepared
- c) North arrow
- d) Number of devices and type
- e) Number of flaggers if needed
- f) Distance between devices

- g) Statement “NOT TO SCALE” if applicable
- h) Drawing of the work zone & roadway
- i) Work hours
- j) Posted speed limit
- k) Reference to MUTCD typical applications

9.7 ROAD CHANGES

In the event any changes are made in a Town road Right-of-Way that would necessitate the removal or relocation of an installation made by a permit Applicant, the relocation or removal shall be at the utility owner’s expense upon written request by the Town. The relocation or removal shall be completed within 30 (thirty) days after notification or for projects that do require extensive design, securing of contracts or material orders, the relocation or removal shall be within 90 days. To avoid the necessity for such changes, the Applicant is encouraged to locate his facility consistent with future plans for the roadway where they exist.

9.8 INSPECTIONS

The Town Manager and/or his authorized representative are empowered to:

1. Review the methods specified for road repair and restoration on all permits.
2. Review the alignment of all utilities within the Town Right-of-Way.
3. Direct that unsatisfactory material be removed and replaced.
4. Direct that special conditions warrant higher standards than contained herein, or that special precautions be taken to promote the safety and welfare of the public and to protect all property.
5. Inspect all completed road cuts before two (2) year warranty completion and acceptance.

If it is determined that the design or construction is unsatisfactory and the Applicant or his representative does not respond to the direction in a timely manner, the Town is authorized to stop work immediately. Notification shall be given to the responsible contractor by the most expedient means when an emergency repair is apparent. If the contact cannot be made, Town work forces will make the repair and charge the contractor. If the failure is not an immediate hazard to safety and property, a period of 72 hours will be allowed the contractor for repair after notification.

Re-inspections for work within the Right-of-Way shall be charged a re-inspection fee.

9.9 EMERGENCY

For true emergency situations where time is not available to follow the procedures outlined herein, work may be approved by calling the Town Public Works Supervisor and then the Applicant must follow normal permit procedure within five (5) working days.

An emergency will be defined as “the immediate threat to the loss of life, property or the overall health to the public”.

Chapter 10

Fines & Fees



CHAPTER 10: FINES & FEES

10.1 STATEMENT AND PURPOSE

Any person, firm, or corporation violating any provisions of these regulations, or any amendment thereof, is guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than five hundred dollars (\$500.00), or by imprisonment in the county jail for not more than ten (10) days, or both such fine and imprisonment.

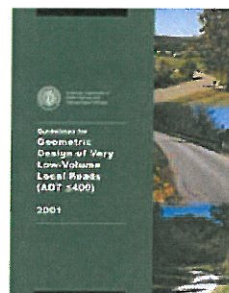
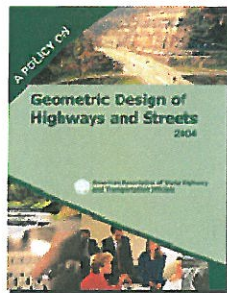
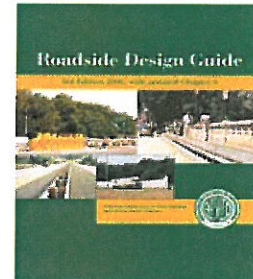
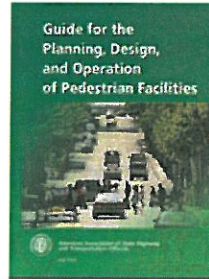
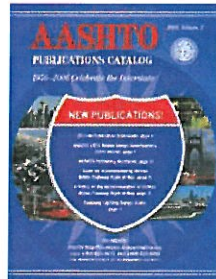
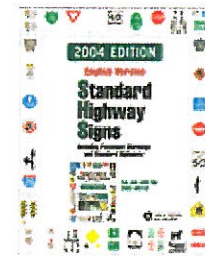
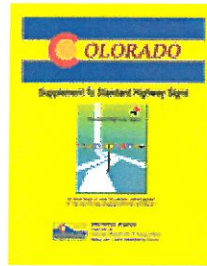
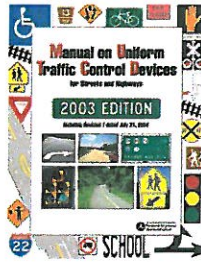
10.2 FEES

- Road Cut Permit - \$50.00 plus Town Engineer Plan Review Fee
- Driveway Permit - \$50.00 plus Town Engineer Plan Review Fee
- Grading Permit - \$50.00 plus Town Engineer Plan Review Fee
- Inspection Fee - Town Engineer Site Inspection Fee
- Re-Inspection Fee - \$100.00 plus the Town Engineer Site Inspection Fee
- Town Engineer Plan Review Fee & Site Inspection Fee - Current Year Hourly Billing Rate Schedule

NOTE: IN ACCORDANCE WITH SECTION 7-10-8 OF THE WINTER PARK TOWN CODE, THE APPLICANT SHALL BE RESPONSIBLE FOR THE TOWN ENGINEERS COST FOR PLAN REVIEW AND SITE INSPECTIONS.

Chapter 11

Accepted Publications



CHAPTER 11: ACCEPTED PUBLICATIONS

The most up to date publications listed below are acceptable sources for design information not found in these Standards. These publications may be useful for variance request submittals. A publication not listed below may be used at the discretion of the Town.

1. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO)
2. Colorado State Forest Service Wildfire Safety
3. Colorado Supplement to the MUTCD
4. Design Manual, Division of Highway State of Colorado
5. Design of Pavement Structures, (AASHTO)
6. Erosion And Sediment Control For Construction Activities Guidance Handbook, East Grand Water Quality Control Board (EGWQCB)
7. Town of Winter Park Subdivision Regulations, Planning Department
8. Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO
9. Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT<400), AASHTO
10. M&S Standard Plans, Colorado Department of Transportation (CDOT)
11. Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration
12. Roadside Design Guide, AASHTO
13. Rules and Regulations of the Colorado Department of Transportation, Pertaining to Transport Permits for the movement of extra-legal vehicles or loads.
14. Standard Specifications for Highway Bridges, AASHTO
15. Standard Specifications for Road and Bridge Construction, CDOT
16. Transportation Engineering Handbook, Institute of Transportation Engineers (ITE)
17. Trip Generation, ITE

Chapter 12

References



CHAPTER 12: REFERENCES

These publications listed below have been referenced for the preparation/revision of these Standards.

1. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO) (2004)
2. Article 4: Site Development Standards, Eagle County (January 4, 2005)
3. Colorado Revised Statutes
4. Erosion And Sediment Control For Construction Activities Guidance Handbook, East Grand Water Quality Control Board (EGWQCB) (Spring 2005)
5. Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO (July 2004)
6. Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT<400), AASHTO (2001)
7. Land Use and Development Code Chapter 5: Road and Bridge Standards, Summit County (October 1, 1998)
8. Larimer County Road Manual, Larimer County (January 1, 2000)
9. M&S Standards Plans, Colorado Department of Transportation (CDOT) (October 2000)
10. Manual on Uniform Traffic Control Devices, Federal Highway Administration (2003 Ed.)
11. Road and Bridge Standards, Department of Planning and Zoning (Adopted September 11, 1985)
12. Road and Bridge Specifications, Mesa County Public Works (February 1, 2006)
13. Roadside Design Guide, AASHTO (January 1996)
14. Rules and Regulations of the Colorado Department of Transportation, Pertaining to Transport Permits for the movement of extra-legal vehicles or loads.
15. Transportation Engineering Handbook, Institute of Transportation Engineers (ITE) 5th Ed.
16. Grand County Road and Bridge Standards (August 2010)

Chapter 13

Definitions



CHAPTER 13: DEFINITIONS

Applicant - person responsible for the development and/or improvements being proposed.

Average Daily Traffic (ADT) - the average 24-hour volume, being the total number during a stated period, divided by the number of days in the period. Unless otherwise stated, the period is a year.

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.

Base Course - the layers of specified or selected material of selected thickness placed on a subbase or a subgrade to support a surface course.

Bridge - a structure including walls or abutments erected over a depression or an obstruction, as water, highway or railway, and having a track or passageway for carrying traffic or other moving loads.

Clear Zone - is used to designate the unobstructed, relatively flat area beyond the edge of the roadway for the recovery of errant vehicles. Recoverable slope are defined as 4:1 or flatter, and a non-recoverable slope between 4:1 and 3:1.

Contour - a line, as shown on the plans that connects points of equal elevation on a land surface

Corner Sight Distance - the necessary distance needed to accelerate enough so as to not slow the travel speed of other cars by more than 10 MPH. The corner sight distance is measured from a point on the minor road at 15' (ten (10') feet for Local-Local intersection) back from the edge of the major road pavement (flowline) and measured from a height of eye at three and a half feet (3 ½') on the minor road to a height of object at three and one half feet (3 ½') on the major road.

Criteria (CRITERIA) – The Town of Winter Park Standards and Specifications for Design and Construction.

Critical Flow - a condition which exists at the critical depth; under this condition, the sum of the velocity head and static head is a minimum.

Crown/Cross Slope - on roads, each lane of the pavement may be sloped separately or have a unidirectional slope across the entire width of pavement, almost always downward to the outer edge

Cul-de-sac - a local street open at one end only, and with special provisions for turning around (bulb, hammerhead, "T", etc.)

Culvert - a closed conduit, other than a bridge, which conveys water carried by a natural channel or waterway transversely under the roadway

Decision Sight Distance - the distance needed for a driver to detect an unexpected or otherwise difficult-to-perceive information, source or condition in a roadway environment that may be visually cluttered, recognize the condition or potential threat, select an appropriate speed and path, and initiate and complete the maneuver safely and efficiently

Design Speed - a speed determined for design and correlation of the physical features of a highway that

influence vehicle operation. It is the maximum safe speed that can be maintained over a specific section of highway when conditions are so favorable that the design features of the highway govern.

Driveways - an access point onto the Town road system from a home, garage or other structure.

Drainage Appurtenances - inlets, storm sewer, curb and gutter, drain pipes, culverts, valley pans, etc.

Easements - a right to use or control the property of another for designated purposes.

Engineer - a Colorado Licensed Professional Engineer.

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

Flowable Fill - liquid soil which is placed as a flowable liquid, yet hardens and rapidly develops excellent load-bearing properties with no compaction.

Grade - the rate expressed in terms of percent of ascent or descent divided by the length

Grading Plan - a drawing showing an arrangement of contours intended to integrate construction and topography, improve appearance, retard erosion and improve drainage

Gross Floor Area – Refer to the definition in Title 7, Zoning, in the Winter Park Town Code.

Guardrail - a protective device intended to make roadways safer by reducing accident severity.

Husbandry - The act or practice of cultivating crops or breeding or raising livestock; agriculture.

Horizontal Alignment - horizontal geometries for safe and continuous operation at a uniform design speed for substantial lengths of roadway and shall afford at least the minimum stopping distance for the design speed at all points on the roadway.

Implement of Husbandry - An “Implement of Husbandry” is a vehicle which is used exclusively in the conduct of agricultural operations.

Intersection - the area embraced within the prolongation or connection of the lateral curb lines or if none then the lateral boundary lines of the roadways of two (2) roadways which join on another at, or approximately at right angles, or the area within which vehicles traveling on different roadways joining at any other angle may come in conflict.

Mailbox - any receptacle used to receive mail, newspapers, packages, etc. from any type of delivery service.

Minimum Turning Radius - the radius of a minimum turning path of the outside of the outer front tire or overhang.

Manual – The Urban Storm Drainage Criteria Manuals – Volumes 1-3.
http://www.udfed.org/downloads/down_critmanual.htm

MUTCD - Manual on Uniform Traffic Control Devices.

Plowing - utility installation by the use of ripping or cutting the surface for utility placement, does not involve major excavation

Point of Curvature (PC) - beginning of horizontal curvature, tangent to previous segment

Point of Tangency (PT) - end of horizontal curvature, tangent to next segment

Point of Vertical Curvature (PVC) - beginning of vertical curvature, tangent to previous segment

Point of Vertical Inflection (PVI) - a point of two intersecting grades

Point of Vertical Tangency (PVT) - end of vertical curvature, tangent to next segment

Regulations – Refer to Section 1.4 of the Standards and Specifications for Design and Construction

Right-of-Way (ROW) - a general term denoted land, property, or interest therein, usually in a strip, acquired for or devoted to transportation purposes.

Roadway - a portion of a roadway including shoulders for vehicular use. A divided highway has two or more roadways.

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.

Stopping Sight Distance (SSD) - the sum of the brake reaction distance and the braking distance. SSD is measured from the driver's eyes, three and a half feet (3 ½') above the road surface, to an object two feet (2') high on the road.

Subbase - the layer or layers of specified or selected material of designed thickness placed on a subgrade to support a base course.

Subgrade - the top surface of a roadbed upon which the pavement structure and shoulders, including curbs, are constructed.

Superelevation - the vertical distance between the heights of inner and outer edges of roadway pavement used to prevent vehicle from sliding outward, or to counteract all the centrifugal force of a vehicle traveling at an assumed speed, or roadway banking.

Town - employees and/or representatives of the Town of Winter Park. Includes but not limited to the Planning and Zoning Department, Public Works, Town Council, Town Attorney, Town Engineer, Town Surveyor, etc.

Traffic Control Device - any sign, signal marking, or installation placed or erected under public authority, for the purpose of regulating, warning, or guiding.

Vertical Alignment - element of road design intended to provide adequate sight distance, safety, comfortable driving, good drainage, and pleasing appearance. Stopping sight distance requirements controls minimum lengths of crest vertical curves.