

CHAPTER 7 GRADING & EXCAVATION

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LIST OF ATTACHMENTS – APPENDIX E

APPROVED SEED MIXES

7.1 PURPOSE

Development sites within the Town of Breckenridge's mountain environment frequently contain steep slopes, wetland areas, and perennial streams and may be located close to the Blue River. This chapter establishes standards and regulations for development to protect the environment and public health and safety. The standards in this section provide the minimum regulations for grading, excavation, and drainage. Special site conditions or constraints may justify additional requirements from the Town Engineer.

7.2 OTHER STANDARDS

This section provides standards and regulations for general grading, excavation, and drainage for all construction and property development, including work in the right-of-way, single family home development, large residential developments, and commercial property development. Additional grading and excavation standards are provided in the following standards:

1. Chapter 2 of these Standards provides submittal requirements for various types of grading and excavation projects.
2. Chapter 5 of these Standards provides grading requirements within or near streets and driveways.
3. Chapter 6 of these Standards provides information on grading of open channels, detention facilities, and stormwater features.
4. The Subsurface Infiltration Facilities Fact Sheet, included as an attachment to Chapter 6, provides additional requirements for subsurface infiltration facilities.
5. Chapter 8 of these Standards provides requirements and procedures for inspection and acceptance of grading and excavation work.
6. Chapter 9 of these Standards provides construction specifications pertaining to grading and excavation.
7. OSHA provides requirements for temporary trenching, grading, shoring, and other construction requirements.

7.3 PERMITS

Any grading or excavation work of any kind requires a permit prior to commencing work. An infrastructure permit, right-of-way permit, or building permit is required before beginning any grading or excavation activities. Additional Town, County, State, or Federal permits may be required as well. See Chapter 2 (Section 2.4) of these Standards for additional guidance on permits.

7.4 GRADING

The sections below set minimum grading requirements, including geotechnical engineering requirements, slope stability, maximum slopes, earthen berm requirements, detention ponds, retaining walls, and revegetation requirements.

7.4.1 Geotechnical Engineer

Sites with existing grades exceeding a 3H:1V slope will require a geotechnical report analyzing slope stability that is stamped by a geotechnical engineer licensed in the State of Colorado. The geotechnical engineer shall analyze the slope stability for the existing site, proposed structures, and driveways, and examine any impacts to adjacent structures or properties.

Sites with unique conditions, high groundwater, poor or expansive soils, previously mined areas, or any other geotechnical concerns shall require a geotechnical report stamped by a geotechnical engineer licensed in the State of Colorado.

7.4.2 Maximum Slope

A maximum slope of 3H:1V is recommended and preferred for all development in the Town. If existing topography makes it infeasible to provide 3H:1V slopes, slopes of 2H:1V may be allowed. Slopes exceeding 3H:1V require erosion netting or other erosion control systems as approved by the Town Engineer. Slopes should be designed at a maximum of 2.5H:1V, as 2H:1V design slopes often result in localized areas with slopes steeper than 2H:1V, which will not meet code nor pass inspection.

7.4.3 Earthen Berms

Earthen berms constructed for landscaping, screening, or sound mitigation shall be constructed at a maximum slope of 3H:1V. Berms shall be designed to appear natural and match surrounding topography; this should be accomplished through the following design standards:

1. Berms shall be designed with vertical and horizontal undulation. Vertical undulations shall be 50% of the maximum berm height and horizontal undulations shall be 25% of the maximum berm width. A variance may be granted for berms shorter than 100 feet.
2. Maximum height of berm shall be 10 feet.
3. Berms shall be connected to the existing grades at the bottom gradually with a vertical curve to make the berm more natural appearing.
4. Berms shall flatten near the top to appear more natural.

7.4.4 Detention and Water Quality Features

Detention and water quality feature grading shall be designed to balance aesthetics and maintenance. Grading shall be designed to add horizontal undulations so the features appear more natural and match the natural landscape, provided that the undulations do not negatively impact maintenance of the facility.

7.4.5 Retaining Walls

The maximum slope of unretained finished grades shall be 2H:1V. Slopes with proposed grading that will result in grades steeper than 2H:1V will require retaining walls. All retaining walls taller than 4 feet (measured from finished grade at bottom of wall to top of wall) shall be engineered. Engineered walls require the following to be submitted to the Engineering Division from a professional engineer licensed in the State of Colorado:

1. Detailed plan by Colorado professional engineer showing retaining wall details and stamped
2. Inspections during construction certifying all aspects of retaining wall construction meet plan requirements and good engineering practices
3. Final certification of the retaining wall construction by Colorado professional engineer

Multiple retaining walls constructed close to each other will be treated as a single wall for height calculation purposes unless the horizontal distance between the walls exceeds the height of the taller wall. For example, two 4-foot walls separated by only 3 horizontal feet will be treated as a single 8-foot wall and must meet the requirements for an engineered wall.

Walls designed to be less than 4 feet tall and not engineered, but ultimately constructed over 4 feet tall due to site grading, shall be documented, inspected, and certified by a registered professional engineer during construction. A single inspection post-construction will not meet the certification requirements for retaining walls over 4 feet tall.

All retaining walls, including walls less than 4 feet tall, shall be designed with free-draining, granular material for wall backfill. On walls over 4 feet tall, drain pipes shall be installed behind the wall.

Retaining walls connected to buildings or building egresses shall have railings installed and meet requirements of Title 8 of the Town Code (Building Regulations).

See Chapter 5 of these Standards for additional information on retaining walls. See Town Code for planning requirements related to retaining walls.

7.4.6 Site Stabilization

All disturbed areas shall be stabilized prior to final acceptance by Town and should be stabilized as soon as possible after completion of earth disturbance activities and no longer than 14 days after completion of earth work. For larger projects, grading shall be completed in phases and stabilized immediately after completion of a phase. Final stabilization must be a permanent feature designed and installed to prevent erosion and sediment runoff. Final stabilization methods shall be installed and maintained following good engineering, hydrologic, and pollution control practices. The following is a list of acceptable site stabilization methods in Breckenridge. Additional methods not listed below may be submitted to and approved by the Town Engineer.

1. Revegetation with native grass achieving an individual plant density of at least 70% of pre-disturbance levels. Pre-disturbance levels refer to pre-disturbance vegetation that would represent the naturally supported vegetation density in the area. See Section 6.12.1.7 below for additional information on revegetation.
2. Permanent Pavement and Buildings, including roofed buildings, concrete, and hot mix asphalt are considered final stabilized surfaces. Aggregate base course, fine gravel, and asphalt millings are generally not considered permanent pavement and shall not be used for final stabilization.
3. Hardscape surfaces, such as flagstone pavers.
4. Rip-rap, cobble, and large rock. A scour analysis shall be included in the drainage report when required for rock installed on steep slopes.
5. Other landscaping materials, including trees, shrubs, perennials, wood mulch, rock mulch, and turf grass. It is recommended that a landscape architect be used to design landscaping plans.

7.4.7 Revegetation

It is recommended that a revegetation plan be developed by a licensed professional landscape architect to develop a site specific revegetation and landscaping plan. The Town shall be consulted for approval of site specific topsoil and native seed requirements. A list of pre-approved seed mixes are included in Appendix G.

To achieve the highest likelihood of establishment of the specified vegetation, a 2-year maintenance plan from a certified landscaping company that understands native vegetation is required. Plantings shall be completed in the fall or late winter to provide the best odds of establishment. Irrigation is generally required for trees, shrubs, and perennials. Temporary irrigation systems are recommended to establish native grasses. The Town shall be consulted for approval of site specific topsoil and native

seed requirements. General requirements to improve successful vegetation establishment include the following:

1. Seeding all disturbed areas with an approved weed free native seed mix. Approved seed mixes for most sites in the Town of Breckenridge include the Middle Park Conservation District "Forest Mix" and the NRCS "Forest Mix." Alternative seed mixes may be required near environmentally sensitive areas, such as wetlands and the Cucumber Gulch Wildlife Preserve. Diverse early-serial seed mixes with the potential to fully occupy the site's botanical niches shall be selected. Alternate seed mixes shall be approved by Town Engineer.
2. Adequate seeding rates and seeding techniques coupled with soil amendments and fertilizer as determined by proper soil testing and Town construction specifications.
3. Preparing disturbed areas with a minimum depth of 3 inches of topsoil. Topsoil shall be free of rocks, weeds, and other invasive plant species.
4. Pretreating disturbed areas to remove invasive or noxious species.
5. Minimizing or eliminating the use of nitrogen as exotic weeds are often preferentially stimulated over native species.
6. Monitoring for non-target species and noxious weed seeds that are often present in a seed mix.
7. Developing an iterative weed management plan based on regularly scheduled monitoring.

See Chapter 9 for additional information on revegetation specifications.

7.5 DRAINAGE

The sections below set minimum grading and excavation requirements pertaining to drainage and stormwater flow patterns. These sections provide general guidance for site drainage and do not provide standards for water quality or detention requirements. See Chapter 6 of these Standards for water quality, detention, and other drainage requirements.

7.5.1 Positive Drainage

All residential and commercial buildings shall be graded with positive drainage away from building foundations. Positive drainage is defined as a minimum 2% grade perpendicular away from the building foundation for a minimum of 10 feet. Where pavement is adjacent to a building, the minimum slope may be reduced to 1%. Drainage swales, drywells, infiltration facilities, foundation drain pipe daylights, detention and water quality facilities, and all other drainage structures shall be a minimum of 10 feet from the edge of any building foundation or structural element. Foundation drains shall not daylight in roadside ditches, on adjacent parcels, or areas that will drain directly onto adjacent parcels.

7.5.2 Offsite Drainage

Drainage from new development shall be designed to discharge to an infiltration facility, drainage swale, storm sewer, regional detention facility, stream, or other drainage conveyance. Grading shall be designed to prevent any developed drainage or altered drainage flows from crossing onto a neighboring property parcel unless a drainage easement exists on that parcel. Subdivisions shall be platted to add drainage easements for all areas where runoff drainage flows onto another parcel. In no case shall development worsen drainage issues for any downstream properties. Grading shall be designed to prevent erosion and any damage to adjacent structures, streets, or storm sewer infrastructure. Infiltration may be utilized in areas where applicable. Stormwater may drain into an approved location in the Town right-of-way, but it shall not drain directly onto streets, sidewalks, pedestrian paths, trails, or other areas where it could create public safety hazards. Infiltration facilities

shall be used in areas where drainage would otherwise cross a street, sidewalk, or other facility. See the subsurface infiltration facility fact sheet attached to Chapter 6 for additional information.

Drainage from existing developments shall be designed with preliminary stormwater treatment prior to discharging directly to a stream, wetland, or other body of water.

Snow storage areas for all development, including single family homes, shall be designed to drain away from foundations, roadways, sidewalks, pedestrian paths, trails, or other areas where it could create public safety hazards. Snow storage shall be designed to drain into a permanent water quality facility or onto a vegetated area prior to discharging to a stormwater conveyance facility.

New development and redevelopment are both required to analyze and correct any existing inadequate drainage, including insufficient drainage away from buildings, runoff adversely affecting downstream properties, inadequately sized drywells, drainage exceeding storm sewer inlets, pipes, or other conveyance, or other drainage concerns identified by the Town Engineer.

7.5.3 Spa and Pool Drainage

Spas, swimming pools, and other water features installed through new development (existing homes replacing existing spas are exempted) shall meet the following drainage requirements:

1. Pools and spas shall be connected to a drywell meeting all requirements of these Standards. Pools and spas shall not drain into storm sewers, roads, or surface flow off property. Pools, spas, and their drainage shall not be located near environmentally sensitive areas. Within the Cucumber Gulch Protected Management Area (PMA), the Upper Blue Sanitation District may allow spas to be connected to the sanitary sewer. If the sanitary sewer connection is allowed, a drywell is not required.
2. Drains shall be designed to maintain a maximum flow rate of 10 gallons per minute. Drywell infiltration rate shall be designed to exceed the drainage flow rate.
3. Prior to draining a pool or spa, no chlorine, salts, or other chemicals shall be added to the water for a period of at least five days.

7.6 ENVIRONMENTALLY SENSITIVE AREAS (ESA)

Environmentally sensitive areas (ESA) are defined as wetlands, streams, lakes, ponds, Cucumber Gulch Wildlife Preserve, and other special wildlife habitat areas. These areas require special requirements to protect their sensitive nature during development. The Town and the developer shall work in conjunction with the Environmental Protection Agency (EPA), Army Corps of Engineers (USACE), State Engineer's Office Water Commissioner, and the Natural Resource Conservation Service (NRCS). For floodplain development regulations, see Title 10 of the Town Code.

7.6.1 Setbacks

No structures or soil disruption shall be located within 25 feet of the top of the banks or delineated boundary of all ESAs. The setback requirements also apply to all channels draining 20 acres or more. Exceptions to the setback requirements may be allowed if one of the following conditions is met and approved by the Town Engineer:

1. Development sites with the most recent plat being recorded prior to January 1, 1986 and platted in a manner which does not allow a feasible development option meeting the 25-foot disturbance setback. This exception only applies if the disturbance setback prohibits any feasible development and the developer demonstrates there are no feasible alternatives to

eliminate disturbance within the setback. Additionally, sites that were platted prior to January 1, 1986, but that were re-platted after January 1, 1986, do not qualify for this exemption.

2. The ESA has previously been mined or extensively disturbed in the area adjacent to the proposed development, resulting in dredge tailings in the area. In this case, the setback may be waived if the developer submits a plan to implement channel, wetland, environmental, or other water body improvements which serve to reclaim, stabilize, revegetate, or enhance the ESA.
3. Work is proposed in the 25-foot setback area (but not within the ESA boundary), the work is considered minor (no permanent structures) in the setback area, and acceptable measures are implemented to prevent an increase of sediment or other contaminants that exceeds historical rates as determined by the Town Engineer.
4. Areas where there are no other feasible methods for development without encroachment into the ESA setback and the encroachment is necessary for critical infrastructure. To meet this exemption, the developer must demonstrate there are no feasible alternatives to eliminate disturbance within the setback. Only infrastructure, such as roads and utilities, will be considered within the ESA. Residences and structures will generally not be granted an exemption to be constructed within an ESA.
5. The wetlands or other environmentally sensitive areas have encroached into a detention, stormwater quality, or another type of stormwater feature since the development of the feature. Maintenance activities within the stormwater feature shall be allowed in these cases.

If any of the above exemptions to the setback requirement is granted by the Town Engineer, the following requirements shall be met:

1. Acceptable measures shall be designed, installed, and maintained to prevent an increase of sediment or other contaminants that exceeds historical rates, both during construction and in the final condition.
2. If ESA improvements are approved per condition 2 above, the water body shall be hydrologically contained to limit impacts until the improvements are completed. For stream restoration improvements, a bypass channel shall be designed for the 25-year storm and for a minimum distance of 25 feet above and below the channel restoration work. The bypass channel shall either be a plastic, metal, or concrete culvert or shall be an open channel stabilized with scour protection designed for the 25-year storm.
3. If wetlands are disturbed, wetland mitigation shall be completed at a minimum of a 1:1 ratio or the ratio required by the USACE, whichever is greater. Wetland mitigation for Waters of the US shall meet all requirements of the USACE. A financial guarantee shall be submitted to the Town guaranteeing the wetlands mitigation for a minimum period of 3 years to ensure successful plant establishment for all wetland plantings. A wetland mitigation plan shall be submitted which includes the following:
 - a. The amount, location, and acreage of wetland fill, removal or other alteration proposed.
 - b. The proposed mitigation improvements.
 - c. A grading, erosion control, and revegetation plan, including plant material to be used for revegetation and soil stabilization measures.
 - d. A narrative explaining how there are no feasible alternatives to disturbing the wetlands, how the wetland disturbance is being minimized to the extent possible, how the wetlands will be mitigated, and how the project will not violate an applicable laws or regulations.

- e. Other applicable permits such as a USACE 404 permits (if site is determined to be a jurisdictional wetland).
4. Disturbed areas within the ESA or ESA setback shall be revegetated with an appropriate seed mix. Revegetation of ESA and ESA setbacks shall be monitored and certified at revegetation.

7.6.2 Wetland Delineation Surveys

Wetland boundaries shall be shown on all subdivision plats within the Town of Breckenridge. If the Town believes there is any evidence that a site subject to any development may contain wetlands, either not shown on the plat or with an incorrect boundary, the Town may require the developer to obtain and submit a wetlands delineation survey completed in accordance with Corps of Engineers Wetlands Delineation Manual and all USACE guidelines.

If a developer believes that a wetland shown on a plat is incorrect, the developer may obtain a wetlands survey in accordance with the Corps of Engineers Wetlands Delineation and submit it to the Town Engineer for review. The wetlands survey shall be conducted during the months of June, July, or August.

Wetland delineations shall be updated after 5 years to reflect current wetland conditions. Wetland boundaries shown on plats and other locations will be considered outdated after 5 years and will require a new wetlands survey delineation completed in accordance with the Corps of Engineers Wetlands Delineation Manual.