

## CHAPTER 23.105 GRADING, EXCAVATION AND FILL.

### Sections

Section 23.105.101	Purpose.....	1
Section 23.105.102	Scope.....	1
Section 23.105.103	Permits required.....	1
Section 23.105.104	Hazards .....	2
Section 23.105.105	Definitions.....	3
Section 23.105.106	Grading permit requirements .....	4
Section 23.105.107	Grading fees .....	6
Section 23.105.108	Bonds .....	7
Section 23.105.109	Cuts .....	7
Section 23.105.110	Fills .....	7
Section 23.105.111	Setbacks .....	8
Section 23.105.112	Drainage and terracing.....	9
Section 23.105.113	Erosion control.....	10
Section 23.105.114	Grading inspection.....	11
Section 23.105.115	Completion of work .....	12

#### **Section 23.105.101 Purpose**

The purpose of this section is to safeguard life, limb, property and the public welfare by regulating grading on public or private property.

#### **Section 23.105.102 Scope**

This section sets forth rules and regulations to control excavation and earthwork construction, including fills and embankments; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.

The standards listed below are recognized standards.

1. Testing.
  - 1.1. ASTM D 1557, Moisture-Density Relations of Soils and Soil Aggregate Mixtures
  - 1.2. ASTM D 1556, In Place Density of Soils by the Sand-Cone Method
  - 1.3. ASTM D 2167, In Place Density of Soils by the Rubber-Balloon Method
  - 1.4. ASTM D 2937, In Place Density of Soils by the Drive-Cylinder Method
  - 1.5. ASTM D 2922 and D 3017, In Place Moisture Content and Density of Soils by Nuclear Methods

#### **Section 23.105.103 Permits required**

**23.105.103.1 Permits required.** Except as specified in section 23.105.103.2

below, no person shall do any grading without first having obtained a grading permit from the code official.

**23.105.103.2 Exempted work.** A grading permit is not required for the following:

1. When approved by the code official, grading in an isolated, self-contained area if there is no danger to private or public property.
2. An excavation below finished grade for basements and footings of a building, retaining wall or other structure authorized by a valid building permit.
3. Cemetery graves.
4. Refuse disposal sites controlled by other regulations.
5. Excavations for wells or tunnels or utilities.
6. Mining, quarrying, excavating, processing or stockpiling of rock, sand, gravel, aggregate or clay where established and provided for by law, provided such operations do not affect the lateral support or increase the stresses in or pressure upon any adjacent or contiguous property.
7. Exploratory excavations under the direction of soil engineers or engineering geologists.
8. An excavation:
  - (a) less than 2 feet (610 mm) in depth; or
  - (b) does not create a cut slope greater than 5 feet (1524 mm) in height and steeper than 1 unit vertical in 2 units horizontal (50% slope).
9. A fill less than:
  - (a) 1 foot (305 mm) in depth and placed on natural terrain with a slope flatter than 1 unit vertical in 5 units horizontal (20% slope); or
  - (b) less than 3 feet (914 mm) in depth, not intended to support structures, that does not exceed 50 cubic yards (38.3 m<sup>3</sup>) on any one lot and does not obstruct a drainage course.

Exemption from the permit requirements of this chapter shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this chapter or any other laws or ordinances of this jurisdiction.

#### **Section 23.105.104 Hazards**

Whenever the code official determines any existing excavation or embankment or fill on private property has become a hazard to life and 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 code official, 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 this code.

### **Section 23.105.105 Definitions**

For the purposes of this code, the definitions listed hereunder shall be construed as specified in this section.

**Approval** shall mean the proposed work or completed work conforms to this chapter in the opinion of the code official.

**As-graded** is the extent of surface conditions on completion of grading.

**Bedrock** is in-place solid rock.

**Bench** is a relatively level step excavated into earth material on which fill is to be placed.

**Borrow** is earth material acquired from an off-site location for use in grading on a site.

**Civil engineer** is a professional engineer registered in the state to practice in the field of civil works.

**Civil engineering** is the application of the knowledge of the forces of nature, principles of mechanics and the properties of materials to the evaluation, design and construction of civil works.

**Compaction** is the densification of a fill by mechanical means.

**Earth material** is any rock, natural soil or fill or any combination thereof.

**Erosion** is the wearing away of the ground surface as a result of the movement of wind, water or ice.

**Excavation** is the mechanical removal of earth material.

**Fill** is a deposit of earth material placed by artificial means.

**Geotechnical engineer.** See *Soils engineer*.

**Grade** is the vertical location of the ground surface.

**Grade, existing** is the grade prior to grading.

**Grade, finish** is the final grade of the site that conforms to the approved plan.

**Grade, rough** is the stage at which the grade approximately conforms to the approved plan.

**Grading** is any excavating or filling or combination thereof.

**Key** is a designed, compacted fill placed in a trench excavated in earth material beneath the toe of a proposed fill slope.

**Site** is any lot or parcel of land or contiguous combination thereof, under the same ownership, where grading is performed or permitted.

**Slope** is an inclined ground surface the inclination of which is expressed as a ratio of horizontal distance to vertical distance.

**Soil** is naturally occurring superficial deposits overlying bedrock.

**Soils engineer (Geotechnical engineer)** is an engineer experienced and knowledgeable in the practice of soils engineering (geotechnical) engineering.

**Soils engineering (Geotechnical engineering)** is the application of the principles of soils mechanics in the investigation, evaluation and design of civil works involving the use of earth materials and the inspection or testing of the construction thereof.

**Terrace** is a relatively level step constructed in the face of a graded slope surface for drainage and maintenance purposes.

## **Section 23.105.106 Grading permit requirements**

**23.105.106.1 Permits required.** Except as exempted in section 23.105.103.2, no person shall do any grading without first obtaining a grading permit from the code official. A separate permit shall be obtained for each site, and may cover both excavations and fills.

**23.105.106.2 Application.** The provisions of the Anchorage Administrative Code section 23.10.301 are applicable to grading. Additionally, the application shall state the estimated quantities of work involved.

**23.105.106.3 Grading designation.** Grading in excess of 5,000 cubic yards (3825 m<sup>3</sup>) shall be performed in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as “engineered grading.” Grading involving less than 5,000 cubic yards (3825 m<sup>3</sup>) shall be designated “regular grading” unless the permittee chooses to have the grading performed as engineered grading, or the code official determines special conditions or unusual hazards exist, in which case grading shall conform to the requirements for engineered grading.

**23.105.106.3.1 Engineered grading requirements.**

- A. Application for a grading permit shall be accompanied by two sets of plans and soils engineering reports. The plans and specifications shall be prepared by a civil engineer licensed by the State.
- B. Specifications shall contain information covering construction and material requirements.
- C. Plans shall be drawn to scale upon substantial paper or cloth and shall be of sufficient clarity to indicate the nature and extent of the work proposed and show in detail that they will conform to the provisions of this code and all relevant laws, ordinances, rules and regulations. The first sheet of each set of plans shall give location of the work, the name and address of the owner, and the person by whom they were prepared.
- D. The plans shall include the following information:
  - 1. General vicinity of the proposed site;
  - 2. Property limits and accurate contours of existing ground and details of terrain and area drainage;
  - 3. Limiting dimensions, elevations or finish contours to be achieved by the grading, and proposed drainage channels and related construction;
  - 4. Detailed plans of all surface and subsurface drainage devices, walls, cribbing, dams and other protective devices to be constructed with, or as a part of, the proposed work, together with a map showing the drainage area and the estimated runoff of the area served by any drains;
  - 5. Location of any buildings or structures on the property where the work is to be performed and the location of any buildings or structures on land of adjacent owners within fifteen (15) feet (4572 mm) of the property or that may be affected by the proposed grading operations;
  - 6. Recommendations included in the soils engineering report shall be incorporated in the grading plans and specifications. When approved by the code official, specific recommendations contained in the soils engineering report, applicable to grading, may be included by reference;
  - 7. The date of the soils engineering report together with the name, address and phone number of the firm or individual who prepared the report; and
  - 8. An engineered grading special inspection program prepared by the engineers responsible for inspection. The program shall include a scope of work outlining the special inspector's duties, per sections 23.105.114.

**23.105.106.4 Soils engineering report.** The soils engineering report required by section 23.105.106.3.1 shall include data regarding the nature, distribution and strength of existing soils, conclusions and recommendations for grading procedures and design criteria for corrective measures, including buttress fills, when necessary, and opinion on adequacy for the intended use of sites to be developed by the proposed grading as affected by soils engineering factors, including the stability of slopes.

**23.105.106.5 Liquefaction study.** The geotechnical investigation shall include a liquefaction study when the following conditions exist:

- A. Shallow ground water, 50 feet (15240 mm) or less.
- B. Unconsolidated sandy alluvium.

**23.105.106.6 Regular grading requirements.** Each application for a grading permit shall be accompanied by two sets of plans in sufficient clarity to indicate the nature and extent of the work and compliance with the provisions of this code. The plans shall give the location of the work, the name of the owner and the name of the person who prepared the plan. The plan shall include the following information:

- A. General vicinity of the proposed site.
- B. Limiting dimensions and depth of cut and fill.
- C. Before and after contours
- D. Location of any buildings or structures where work is to be performed, and the location of any buildings or structures within fifteen (15) feet (4572 mm) of the proposed grading.

**23.105.106.7 Issuance**

- A. The provisions of the Anchorage Administrative Code section 23.10.303 are applicable to grading permits. The code official may require grading operations and project designs be modified if delays occur which incur weather-generated problems not considered at the time the permit was issued.
- B. The code official may require special inspection and testing. The code official may require the grading to conform to engineered grading.

## **Section 23.105.107 Grading fees**

**23.105.107.1 General.** Fees shall be assessed in accordance with the provisions of this section or shall be as set forth in the fee schedule adopted by the jurisdiction.

**23.105.107.2 Plan review fees.** When a plan or other data are required to be submitted, a plan review fee shall be paid at the time of submitting plans and specifications for review. Said plan review fee shall be as set forth in the

Anchorage Administrative Code chapter 23.10, Table 3B. Separate plan review fees shall apply to retaining walls or major drainage structures. For excavation and fill on the same site, the fee shall be based on the volume of excavation or fill, whichever is greater.

**23.105.107.3 Grading permit fees.** A fee for each grading permit shall be paid to the code official as set forth in the Anchorage Administrative Code chapter 23.10, Table 3H. Separate permits and fees shall apply to retaining walls or major drainage structures. There shall be no separate charge for standard terrace drains and similar facilities.

**Section 23.105.108 Bonds**

- A. The code official may require bonds in such form and amounts as may be deemed necessary to ensure the work, if not completed in accordance with the approved plans and specifications, shall be corrected to eliminate hazardous conditions.
- B. In lieu of a surety bond, the applicant may file a cash bond or instrument of credit with the code official in an amount equal to that required in the surety bond.

**Section 23.105.109 Cuts**

**23.105.109.1 General**

- A. Unless otherwise recommended in the approved soils engineering report, cuts shall conform to the provisions of this section. Cuts shall not cause a net increase in surface runoff or concentrated flow across property lines. Runoff shall discharge to approved locations or be retained on site.
- B. These provisions may be waived for minor cuts not intended to support structures.

**23.105.109.2 Slope.** The slope of cut surfaces shall be no steeper than 1 unit vertical in 2 units horizontal (50% slope) unless the permittee furnishes a soils engineering report, stating the site has been investigated and giving an opinion that a cut at a steeper slope is stable and does not create a hazard to public or private property.

**Section 23.105.110 Fills**

**23.105.110.1 General**

- A. Unless otherwise recommended in the approved soils engineering report, fills shall conform to the provisions of this section. Fills shall not cause a net increase in surface runoff or concentrated flow across property lines. Run-off shall discharge to approved locations or be retained on site.
- B. In the absence of an approved soils engineering report, these provisions may be waived for minor fills not intended to support structures.

**23.105.110.2 Preparation of ground.** Fill slopes shall not be constructed on natural slopes steeper than 1 unit vertical in 2 units horizontal (50% slope).

The ground surface shall be prepared to receive fill by removing vegetation, noncomplying fill, topsoil and other unsuitable materials and scarifying to provide a bond with the new fill.

Where slopes are steeper than one (1) unit vertical in five (5) units horizontal (20% slope) and the height is greater than five (5) feet (1524 mm), by benching into sound bedrock or other competent material as determined by the soils engineer. The bench under the toe of a fill on a slope steeper than one (1) unit vertical in five (5) units horizontal (20% slope) shall be at least ten (10) feet (3048 mm) wide.

**Exception:** When based on a geotechnical engineer's recommendation and designed by a civil engineer, parking lots may be constructed by placing structural fill over peat. A geotechnical site investigation is required prior to future buildings being constructed on such sites to determine the amount of peat to be removed below the building footprint.

**23.105.110.3 Fill material.** Fill material shall not include organic, frozen, or other deleterious material. No rock or similar irreducible material with a maximum dimension greater than twelve (12) inches (305 mm) shall be buried or placed in fills.

**23.105.110.4 Compaction.** All fills shall be placed in lifts not exceeding 12 inches and compacted to a minimum of ninety percent (90%) of maximum density. Fills under building footprints, driveways, and parking lots shall be placed in lifts not exceeding 12 inches and compacted to ninety-five percent (95%) of maximum density.

**23.105.110.5 Slope.** The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes shall be no steeper than one (1) unit vertical in two (2) units horizontal (50% slope).

### **Section 23.105.111 Setbacks**

**23.105.111.1 General.** Cut and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

**23.105.111.2 Top of cut slope.** The top of cut slopes shall not be made nearer to a site boundary line than one-fifth of the vertical height of cut with a minimum of two (2) feet (610 mm) and a maximum of ten (10) feet (3048 mm). The setback may need to be increased for any required interceptor drains.

**23.105.111.3 Toe of fill slope.** The toe of fill slopes shall be made not nearer to the site boundary line than one-half the height of the slope with a minimum of two (2) feet (610 mm) and a maximum of twenty (20) feet (6096 mm). Where a fill slope is to be located near the site boundary and the adjacent off-site property is developed, special precautions shall be incorporated in the work as the code official deems necessary to protect the adjoining property from damage as a result of such grading.

These precautions may include but are not limited to:

- A. Additional setbacks.
- B. Provision for retaining or slough walls.
- C. Mechanical or chemical treatment of the fill slope surface to minimize erosion.
- D. Provisions for the control of surface waters.

**23.105.111.4 Modification of slope location.** The code official may approve alternate setbacks. The code official may require an investigation and recommendation by a qualified engineer to demonstrate the intent of this section has been satisfied.

## **Section 23.105.112 Drainage and terracing**

**23.105.112.1 General.** Unless otherwise indicated on the approved grading plan, drainage facilities and terracing shall conform to the provisions of this section for cut or fill slopes steeper than one (1) unit vertical in three (3) units horizontal (33.3% slope).

### **23.105.112.2 Terrace**

- A. Terraces at least six (6) feet (1829 mm) in width shall be established at not more than thirty (30) foot (9144 mm) vertical intervals on all cut or fill slopes to control surface drainage and debris except where only one terrace is required, it shall be at midheight. For cut or fill slopes greater than sixty (60) feet (18 288 mm) and up to one hundred twenty (120) feet (36 576 mm) in vertical height, one terrace at approximately midheight shall be twelve (12) feet (3658 mm) in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet (36 576 mm) in height shall be designed by the civil engineer and approved by the code official. Suitable access shall be provided to permit proper cleaning and maintenance.
- B. Swales or ditches on terraces shall have a minimum gradient of five percent (5%). They shall have a minimum depth at the deepest point of one (1) foot (305 mm).
- C. A single run of swale or ditch shall not collect runoff from a tributary area exceeding 13,500 square feet (1254.2 m<sup>2</sup>) (projected) without discharging into a down drain.

**23.105.112.3 Subsurface drainage.** Cut and fill slopes shall be provided with subsurface drainage as necessary for stability.

**23.105.112.4 Disposal**

- A. All drainage facilities shall be designed to carry waters to the nearest practicable drainage way approved by the code official or other appropriate jurisdiction as a safe place to deposit such waters. Erosion of ground in the area of discharge shall be prevented by installation of nonerosive down-drains or other devices.
- B. Footing drains or sump pumps shall discharge to a ditch or storm sewer for new construction where available. Backup emergency systems may discharge to the surface. Primary systems shall not discharge onto adjacent properties. Where sump pumps or footing drains discharge on the soil surface, the effluent shall be directed toward drainage easements, street gutters, ditches or other approved locations. Effluent may be retained on site to prevent impacts to neighboring properties.
- C. Building pads shall have a drainage gradient of two percent (2%) toward approved drainage facilities, unless waived by the code official.

**Exception:** The gradient from the building pad may be one percent (1%), if all of the following conditions exist throughout the permit area:

- 1. No proposed fills are greater than ten (10) feet (3048 mm) in maximum depth; and
- 2. No proposed finish cut or fill slope faces have a vertical height in excess of ten (10) feet (3048 mm); and
- 3. No existing slope faces steeper than one (1) unit vertical in ten (10) units horizontal (10% slope) have a vertical height in excess of ten (10) feet (3048 mm).

**23.105.112.5 Drainage across property lines.** Drainage across property lines shall not exceed that which existed prior to grading. Excess or concentrated drainage shall be contained on site or directed to an approved drainage facility. Erosion of the ground in the area of discharge shall be prevented by installation of nonerosive down drains or other devices.

**23.105.112.6 Interceptor drains.** Interceptor drains shall be installed along the top of all cut and fill slopes where the tributary drainage area above slopes toward the cut or fill and has a drainage path greater than forty (40) feet (12 192 mm) measured horizontally. The slope of the drain shall be 5% unless otherwise approved by the code official.

**Section 23.105.113 Erosion control**

**23.105.113.1 Slopes.** The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective

planting. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.

**23.105.113.2 Other devices.** Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety.

#### **Section 23.105.114 Grading inspection**

**23.105.114.1 General.** Grading operations requiring a permit shall be subject to inspection by the code official. Engineered grading requires special inspection in accordance with the International Building Code section 1704.7. Regular grading may require special inspection as deemed necessary by the code official.

##### **23.105.114.2 Permittee**

- A. The permittee shall be responsible for the work to be performed in accordance with the approved plans and specifications, and in conformance with the provisions of this code.
- B. The permittee shall act as a coordinator between consultants, the contractor and the code official.
- C. In the event of changed conditions, the permittee shall be responsible for informing the code official of such change and shall provide revised plans for approval.
- D. The permittee shall monitor the progress of the work.
- E. For engineered grading, the permittee shall schedule inspections at the start of work, fifty percent (50%) completion, one hundred percent (100%) completion, and at significant stages outlined by the design consultants.
- F. For regular grading, the permittee shall schedule inspections at fifty percent (50%) completion and one hundred percent (100%) completion.
- G. For engineered grading, the permittee shall provide the special inspection reports to the Building Safety inspector during required inspections.

**23.105.114.3 Building Safety inspector.** The Building Safety inspector shall inspect the project at the various stages of work requiring approval to determine adequate control is being exercised. The Building Safety inspector may require a survey to be performed or test holes to be dug or soils tests to be performed to verify the work complies with the approved plans and applicable code requirements.

**23.105.114.4 Notification of noncompliance.** If a special inspector finds that the work is not being done in conformance with this chapter or the approved grading plans, the discrepancies shall be reported immediately in writing to the permittee and to the Building Safety inspector.

**Section 23.105.115 Completion of work**

**23.105.115.1 Notification of completion.** The permittee shall notify the Building Safety inspector when the grading operation is ready for final inspection. Final approval shall not be given until all work, including installation of all drainage facilities, their protective devices, and all erosion-control measures, are completed in accordance with the final approved grading plan, and the required reports have been submitted.