

**SPANISH FORK CITY
ORDINANCE 17-19**

**AN ORDINANCE AMENDING HILLSIDE DEVELOPMENT STANDARDS AS PART OF
THE SPANISH FORK MUNICIPAL CODE**

WHEREAS, Spanish Fork City has enacted a land use ordinance to regulate the development of land within the City in order to protect its residents and enhance property values; and

WHEREAS, the land use ordinance contains regulations for hillside areas with steep slopes so they can be safely developed; and

WHEREAS, newer technology and methods are now available such that the hillside standards should be amended to continue to safely build on hillsides with steep slopes; and

WHEREAS, a public hearing was held before the Planning Commission on Wednesday, the 7th day of August, 2019, whereat public comment was received; and

WHEREAS, the Planning Commission has recommended amendment of the hillside development standards; and

WHEREAS, a public hearing was held before the Spanish Fork City Council on Tuesday, the 20th day of August, 2019, whereat additional public comment was received;

NOW THEREFORE, be it enacted and ordained by the Spanish Fork City Council as follows:

SECTION 1: **AMENDMENT** “15.4.16.170 Hillside Development” of the Spanish Fork Municipal Code is hereby *amended* as follows:

A M E N D M E N T

15.4.16.170 Hillside Development

- A. **Slopes.** Any land or parcel having a slope greater than 10% shall be deemed to be land having a "steep slope" within the meaning of this section. Close proximity to a steep slope shall be defined as the horizontal distance from the slope which is less than or equal to the vertical distance from the crest of the slope to the toe of the slope. No person shall be permitted to grade, excavate, fill, or to erect any structure on undisturbed hillside areas that exceed a slope of 30%. Any person proposing to grade, excavate, fill or to erect any structure on any slope or hillside with a slope between 10% and 30%, or within close proximity to a slope greater than 10%, shall be required to submit a site specific geotechnical report. The geotechnical report shall include sufficient subsurface exploration (soil borings), laboratory testing, and geotechnical engineering analysis, as outlined in the Construction Standards, to render professional recommendations and opinions regarding slope stability and required mitigation to protect planned or future construction above and below the slope(s) from earth deformations and other adverse soil or geologic conditions on or adjacent to the lot. The City will have that report reviewed by its own geotechnical engineer. The cost of that review will be borne by the applicant.

Prior to any excavation, cutting, or filling on slopes in excess of 10%, a land disturbance permit shall be obtained from the City. Prior to issuing the permit, the City will have qualified professionals review the plans to assure public safety and to take precautions against potential slides. The type and number of professionals will be determined by the City Engineer on a case by case basis. The cost of the professional review will be borne by the applicant. In no case will construction be allowed in, above, below, or laterally within 200 feet of a landslide, debris flow, or potential debris flow.

Cut and fill slopes shall be constructed to eliminate sharp angles of intersection with the existing terrain and shall be rounded and contoured as necessary to blend with existing topography to the maximum extent possible, as determined in the sole discretion of the City Engineer. The City will not accept the dedication and maintenance of cut and fill slopes except those within the required street right-of-way. Maintenance of cut and fill slopes outside of street rights-of-way are the responsibility of the individual property owner. Where a cut or fill slope occurs between two (2) lots, the slope shall normally be made a part of the downhill lot. Cut and fill slopes shall not be allowed to disrupt existing drainage channels.

The current version of the Building Code adopted by the Utah Uniform Building Code Commission regulating excavation and grading shall be complied with: Introduction. The procedures contained in this section are provided to give direction to consultants as to when slope stability analysis should be completed and minimum general guidelines for completing the analysis. Additional effort above and beyond these requirements may be required based on site specific constraints and characteristics.

- B. **Building Sites.** Each building lot shall contain a buildable area of not less than 4,000 square feet with a natural slope that is less than 30%. The buildable area shall have minimum length and depth dimensions of 50 feet.

No structure, primary or accessory, shall be located within 10 feet of a 30% slope. No slope

~~in excess of 10% shall be disrupted without first obtaining a land disturbance permit, described in paragraph A.~~

~~An exception to these building site requirements is granted for existing building lots in platted and recorded subdivisions, provided that each lot, prior to construction, provide the geotechnical report required in paragraph A, and as described in more detail in the Construction Standards.~~**Purpose and Intent.** The standards, guidelines and criteria of this section are intended to:

1. Protect the public from flooding, erosion and other environmental hazards that may result from the development of sensitive hillsides;
2. Minimize the threat and consequential damage of fire in hillside areas;
3. Preserve natural vegetation, geologic features, wildlife habitat and open space;
4. Minimize the amount of grading and earthwork, including street excavation and site grading;
5. Design and construct roads, where necessary, in such a way as to minimize scars from cuts and fills and to avoid permanent scarring of hillsides and other sensitive land areas, and to make them easily accessible for fire protection, snow removal, school buses, and emergency vehicles; and
6. Preserve and enhance visual and environmental quality.

C. Slopes. Any land or parcel having a slope greater than or equal to 3H:1V shall be deemed to be land having a "steep slope" within the meaning of this section. Close proximity to a steep slope shall be defined as the horizontal distance from the slope which is less than or equal to the vertical distance from the crest of the slope to the toe of the slope. No person shall be permitted to grade, excavate, fill, erect any structure, or otherwise disturb an undisturbed hillside area that exceeds a 3H:1V slope. Any person proposing to grade, excavate, fill or to erect any structure on any slope or hillside with a slope between 4H:1V and 3H:1V, or within close proximity to a slope greater than or equal to 4H:1V, shall be required to submit a site-specific geotechnical report with a slope stability analysis. Other areas that require a slope stability analysis are discussed in paragraph H below. The City will have that report reviewed by its own geotechnical engineer. The cost of that review will be borne by the applicant.

Prior to any excavation, cutting, or filling on slopes in excess of 10H:1V, a land disturbance permit shall be obtained from the City. Prior to issuing the permit, the City will have qualified professionals review the plans to ensure public safety and to take precautions against potential slides. The type and number of professionals will be determined by the City Engineer on a case by case basis. The cost of the professional review will be borne by the applicant. In no case will construction be allowed in, above, below, or laterally within 200 feet of a landslide, debris flow, or potential debris flow. Cut and fill slopes shall be constructed to eliminate sharp angles of intersection with the existing terrain and shall be rounded and contoured as necessary to blend with existing topography to the maximum extent possible, as determined in the sole discretion of the City Engineer. The City will not accept the dedication and maintenance of cut and fill slopes except those within the required street right-of-way. Maintenance of cut and fill slopes outside of street rights-of-way are the responsibility of the individual property owner. Where a cut or fill slope occurs between two (2) lots, the slope shall normally be made a part of the downhill lot. Cut and fill slopes shall not be allowed to disrupt existing drainage channels.

The current version of the Building Code adopted by the Utah Uniform Building Code Commission regulating excavation and grading shall be complied with.

D. Building Sites. Each building lot shall contain a buildable area of not less than 4,000 square feet with a natural slope that is less than 30% 3H:1V. The buildable area shall have minimum length and depth dimensions of 50 feet.

No structure, primary or accessory, shall be located within 10 20 feet of a 3H:1V slope. No slope in excess of 10H:1V shall be disrupted without first obtaining a land disturbance permit, described in paragraph D.

An exception to these building site requirements is granted for existing building lots in platted and recorded subdivisions, provided that each lot, prior to construction, provide the geotechnical report required in paragraph A, and as described in more detail in the Construction Standards.

E. Drainage. Required storm water runoff collection facilities shall be designed so as to retain storm water runoff on development sites for a sufficient length of time so as to prevent flooding and erosion during storm water runoff flow periods. Retainage amounts and times shall mirror historical amounts and times.

Required storm water runoff collection facilities shall be so designed as to divert surface water away from natural slopes, cut faces, or sloping surfaces of a fill. French drains are not acceptable.

Storm water detention or retention facilities should not be placed near the crest of natural or manmade slopes.

Curb, gutter, and pavement designs shall be such that water on roadways is prevented from flowing off the roadways.

Natural drainage shall be rip-rapped or otherwise stabilized to the satisfaction of the City Engineer below drainage and culvert discharge points for a distance sufficient to convey the discharge without channel erosion.

Waste material from construction, including soil and other solid materials, shall not be deposited within a natural or manmade drainage course nor within irrigation channels.

Sediment catchment ponds shall be constructed downstream from each development, unless sediment retention facilities are otherwise provided.

F. Vegetation and Revegetation. Every effort shall be made to conserve topsoil which is removed during construction for later use on areas requiring vegetation or landscaping, e.g., cut and fill slopes.

Areas not contained within lot boundaries shall be protected with adapted, fire-resistant species of perennial vegetation cover after all construction is completed. New planting shall be protected with organic cover.

All disturbed soil surfaces shall be stabilized before final acceptance of the development by the City. The developer shall be fully responsible for any destruction of native vegetation which is required to be retained in all areas under the ownership and control of the developer. The developer shall carry the responsibility for such areas both for the developer's own employees and for all subcontractors from the first day of construction until final acceptance of the development by the City. The developer shall be responsible for replacing such destroyed vegetation.

Prior to the termination of the development improvements bond, any dead plant materials required to be installed by the developer shall be replaced and a new bond issued to assure establishment of the replaced materials.

G. Areas Requiring Slope Stability Analysis. Slope stability analysis shall be performed for all sites meeting the following criteria:

1. Cut or fill slopes at or steeper than 3H:1V and 20 feet or taller in vertical height.

2. Natural slopes at or greater than 4H:1V but less than 3H:1V, and 20 feet or taller in vertical height. Natural slopes at or steeper than 3H:1V shall not be disturbed without the Development Review Committee's approval. A slope exceeding 3H:1V may be disturbed if the hillside is determined to have existing, potentially adverse geologic conditions, in which case the City Engineer or his/her designee may approve remediation efforts.
3. Natural and cut slopes with potentially adverse geologic conditions such as bedding, foliation, or other features that could present slope stability issues.
4. Natural and engineered slopes that are potentially impacted by a geologic hazard such as a landslide, irrespective of the slope height or gradient.
5. Buttresses and stability fills.
6. Cut, fill or natural slopes for water retention basins or flood-control channels.

H. Slope Stability Analysis Requirements.

1. Slope stability analyses should consider off-property conditions above and below the slope being evaluated. Analysis should demonstrate that the proposed hillside development will not affect adjacent sites or limit adjacent property owner's ability to develop their site.
2. A licensed, experienced geotechnical engineer and licensed, experienced geologist should be used to complete all slope stability analyses. The geologist and geotechnical engineer should collaborate their efforts to develop a rational subsurface model, ground motion parameters and soil strengths. The geotechnical engineer should perform the stability calculations, the geologist shall interpret geologic data and prepare the subsurface model (geologic cross section), and both shall stamp the final report.
3. Except for the derivation of the input ground motion for pseudo-static and seismic deformation analyses, slope stability analysis and evaluations should be performed in general accordance with Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California (Blake et al. 2002).
4. Static and pseudo-static slope stability should be completed using limit-equilibrium software such as SLIDE, SLOPE/W or another similar program. Analysis method chosen (circular, block, etc.) should be best suited toward the specific site and geologic conditions. Subsurface conditions in the model should represent worst-case anticipated conditions with regards to groundwater elevation and moisture content characteristics of the soil.
5. Design ground motions for use in the pseudo-static and seismic deformation analysis should be based on the PGA as determined from probabilistic analysis for the maximum credible earthquake (MCE), with spectral acceleration factored for site conditions in accordance with the currently adopted IBC. Seismic analysis of a slope may be performed using the pseudo-approach. An appropriate seismic coefficient should be selected based on a rational approach, such as Blake et. al 2002, Hynes and Franklin 1984, or a similar published and generally accepted procedure. A rational basis for selection of seismic coefficient (e.g. probabilistic ground motion, Site Class, etc.) shall be clearly presented in the final report.

6. For situations where unacceptable factors of safety are determined or when the site contains other constraints such as long shallow failures, a permanent slope deformation analysis should be performed. Estimates of permanent seismic displacement should be performed using the procedures outlined in Bray and Travesarou (2007). For this and other screening procedures, the calculated seismic displacements shall be 5 cm or less for a slope or proposed mitigation measure.
7. The minimum acceptable factor of safety for static slope stability is 1.5. The minimum acceptable factor of safety for pseudo-static slope stability is 1.0. These are the minimums required by the City; based on actual conditions and the uncertainties associated with the site, the Geotechnical Engineer may select higher factors of safety, as deemed appropriate.
8. Adequate evaluation of slope stability for a given site requires a thorough and comprehensive geologic and geotechnical engineering investigation. The investigation should include but may not be limited to the following; review of available published geologic information (including maps, reports, and historic air photos), geologic field mapping, subsurface exploration, groundwater elevation determination and accurate soil profile characterization. Borings should extend to a depth of at least $\frac{3}{4}$ of the height of the slope at a minimum and preferably the full height of the slope (this requirement may be waived if the geology is clearly exposed on the slope face). Deeper borings may be required based on the site conditions and proposed construction. Test pits may be allowed, particularly for shorter slopes, if access can be obtained to allow placement of the test pits near the top, bottom and middle of the slope so as to provide an accurate characterization of the soil profile, and geologic conditions allow a reasonable geologic interpretation of the entire slope based on the earth materials exposed in the test pits.
9. Accurate soil parameters are critical to providing a reliable slope stability analysis. Samples should be obtained from each soil strata of reasonably different engineering characteristics and appropriate laboratory tests completed to determine parameters for shear strength (friction angle and cohesion) and unit weight for each layer. In the case of landslide deposits tests to assess residual shear strengths should be performed in suspected shear zones to obtain accurate soil information. Direct shear, ring shear, simple shear, or triaxial shear tests (as appropriate) should be completed to obtain shear strength parameters. For unconsolidated granular soils, in-situ testing (e.g. SPT, CPT) may also be used to develop soil strength profiles.
- I. **Streets and Driveways.** All streets within a hillside area shall be designed to meet the standards required for streets in all other areas of the City. Street and driveway grades shall not exceed ~~eight percent (8%)~~, unless authorized by the City Engineer. The City Engineer may not authorize street or driveway grades in excess of 12%.
- J. **Submittals.** Submittals for review shall include report text that should contain a summary of the analysis along with conclusions and recommendations based on the data presented. As a minimum, all reports should include the following element:
 1. Slope stability modeling – basis for model, input data, and graphic output.
 2. Boring and/or test pit logs.

3. Geologic cross sections prepared by a licensed geologist (graphic output from a limit equilibrium software will not be accepted as a substitute for a geologic cross section). Subsurface geologic and groundwater conditions must be illustrated on geologic cross sections and must be utilized by the Geotechnical Engineer for the slope stability analyses.
4. A local geology map presenting the results of field mapping and literature review. The map should be prepared at an appropriate scale (generally no smaller than 1"=100', larger is preferred), and should show geologic units, geologic structures/orientations, proposed and existing grades, and the location of the geologic cross-sections.
5. Laboratory data including shear strength plots.
6. Computer input and output files for the slope stability analysis.

K. Fire Protection. Lot size and potential placement of buildings thereon shall be such that adequate clearance from combustible materials is provided, as determined by the City's Fire Marshal.

All easements for firebreaks for safety of built-up areas shall encompass access for firefighting personnel and equipment and such easements shall be dedicated for this specific purpose by being recorded with the plat, or by easement if there is no plat.

The inability to provide water pressure at fire hydrants consistent with the standards set by the Insurance Service Organization for fighting fires shall be justification for denial of a development request.

(Ord. No. 07-15, Enacted 02/17/2015)

SECTION 2: **EFFECTIVE DATE** This Ordinance shall be in full force and effective twenty days after passage and publication.

PASSED AND ADOPTED BY THE SPANISH FORK CITY COUNCIL SEPTEMBER 02, 2019.

	AYE	NAY	ABSENT	ABSTAIN
Council member Chad Argyle	<u> X </u>	<u> </u>	<u> </u>	<u> </u>
Council member Stacy Beck	<u> X </u>	<u> </u>	<u> </u>	<u> </u>
Council member Brandon Gordon	<u> X </u>	<u> </u>	<u> </u>	<u> </u>
Council member Mike Mendenhall	<u> X </u>	<u> </u>	<u> </u>	<u> </u>
Council member Keir Scoubes	<u> X </u>	<u> </u>	<u> </u>	<u> </u>

Presiding Officer

Attest



STEVE LEIFSON, MAYOR, Spanish Fork City



KENT R. CLARK, CITY RECORDER
Spanish Fork City

