

GEOLOGIC HAZARD DEVELOPMENT ORDINANCE

*{The information in italics is for discussion and explanation and will not be included in the final draft of the ordinance. In addition to this ordinance, several references in the Development Code will need to be changed to reference this code rather than the existing language. Asterisks **** indicate either needed information or new text that needs to be discussed further.}*

3. PURPOSE.

{The "3." before each section is the Development Code section number and will be numbered once we have a final draft.}

The purpose of the Geologic Hazard and Hillside Development Ordinance is to minimize building hazards and threats to life and property that may be created by landslides, erosion, weak foundation soil, and other hazards as identified and mapped by the City and others, and impacts created by human development in geologically sensitive areas. This purpose is achieved by basing City decisions on accurate geologic and soil information prepared by certified professionals and requiring the application of engineering principles in any development that occurs where such studies indicate potential hazards. This ordinance shall not act as a guarantee that hazard risk will be eliminated, nor as an implication that there is a higher risk of hazard at any location.

3. DEFINITIONS.

The following definitions shall be applicable for this ordinance:

{There are more terms here than used in the ordinance. They are included here until we determine who is to complete the various reports. We may need to add other geologic positions or terms to the ordinance based on these definitions.}

Areas of High Water and Past Slides Map: A map indicating the location of known geologic hazard areas and areas of known high water as recorded and mapped by the City Engineer. The map shall be maintained and regularly updated in the office of the City Engineer.

{This map is currently prepared by the City Engineer. It is updated as needed. It is not scientific and only identifies the areas that the City is aware to have slid since about 1950's. The areas of the slides noted on the map are approximate. The map needs to be updated possibly with the approximate date of the slide if known. In addition, the map should be updated with information from existing geologic reports on file with the City that are not reflected on the existing map. The map has been entered into the City's GIS mapping system. The map should be updated to include liquefiable areas, lateral spreading potential areas, and areas of known fill. The LIDAR map may show these areas.}

Building Envelope: An area identified for the outside boundaries for construction of any structure greater than 12” in height above grade, excluding retaining walls, fences, and arbors. ****

Development Area: The total area of alteration of the naturally occurring ground surface resulting from construction activities whether permanent or temporary. The development area shall include the areas altered for infrastructure and roads.

DOGAMI: Department of Geology and Mineral Industries.

Engineering Geologist: A registered geologist who is certified in the specialty of engineering geology under provisions of ORS 672.506 to 672.705.

Excavation: Removal of topsoil, gravel, sand, rock, or any other type of soil material.

Fill: Placement of topsoil, gravel, sand, rock, or any other type of soil material.

Geologic Hazard Area: Area potentially subject to land instability as identified in the Geologic Hazard and Hillside Development Ordinance that can potentially cause damage to property and loss of life and within which further site-specific review shall be completed before development may occur.

Geologist, Registered: A person who is registered as a geologist under the provisions of ORS 672.505 to 672.705.

Geologist, Registered Certified Specialty: A person who is certified as a specialty geologist under the provisions of ORS 672.505 to **672.705.

Geology, Public Practice of: The performance for another of geological service or work such as consultation, investigation, surveys, evaluation, planning, mapping and inspection of geological work, that is related to public welfare or safeguarding of life, health, property, and the environment, except as specifically exempted by ORS 672.505 to 672.705.

Geological Assessment Report: A geologic assessment prepared and stamped by an Oregon Certified Engineering Geologist detailing the surface and subsurface conditions of a site and delineating areas of a property that might be subject to specified geologic hazards.

Geotechnical Engineer: A registered professional engineer who passes a geotechnical engineering examination recognized by the Oregon State Board of Geologist Examiners and meets the other necessary qualifications for registration under ORS 672.002 to 672.325.

Geotechnical Engineering: The investigation and the evaluation of the physical and engineering properties of earth materials, such as soil and rock, including impacts of ground water and earthquakes, and their application to the design

and construction of civil engineering works, such as foundations, earth dams, retaining walls, and similar, using soil and rock mechanics and earthquake engineering principles and related engineering laws, formula, and procedures. Further, the practice involves the application of soil and rock mechanics and related engineering laws and procedures to an evaluation of the performance of constructed civil engineering works as influenced by earth materials, groundwater, and earthquakes and to an evaluation of the performance, including stability, of natural and man-made slopes, including man-made fills and embankments, and for the design of mitigation measures to reduce risk and/or hazards as disclosed by the evaluation.

Geotechnical Report: A report prepared and stamped by an Oregon certified Engineer Geologist or registered Geotechnical Engineer evaluating the site conditions and recommending design and mitigation measures necessary to reduce the risks associated with development in geologically hazardous areas. A geotechnical report must be prepared in accordance with the report requirements identified in this Ordinance.

Grade: The natural level of the ground within a lot or development area, not the finished level of ground. **

LIDAR Map: ***

Mudflow: A fast-moving downhill flow of mud and soil loosened by rainfall or melting snow.

Mudslide: A slow-moving and often destructive mass of mud flowing down a slope. ***

Peer Review: Review of a Geological Assessment Report or Geotechnical Report by a qualified professional or professional firm prior to approval of the development permit application. Such review shall include examination to ensure required elements or guidelines have been completed, report procedures and assumptions are generally accepted and all conclusions and recommendations are supported and reasonable.

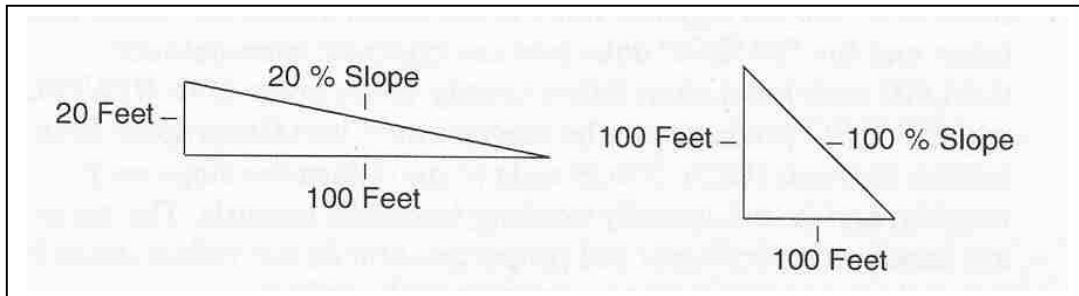
Should: A requirement, unless it can be shown that to comply with the requirement would be unreasonable, impractical, or unfeasible. Economic hardship alone shall not be justification for noncompliance with the requirement, but may be considered in conjunction with other reasons for noncompliance.

Shall: A requirement that is mandatory. **

{The definition of “should” versus “shall” is to note the difference of when it is not mandatory if it can be proven that the development can comply with the factors in the definition for approval.}

Slope: Slope is an inclined earth surface, the inclination of which is expressed as the ratio of horizontal (H) distance to vertical (V) distance. In this Code,

slope is expressed as a percentage, with percentage of slope referring to a given rise in elevation over a given distance multiplied by 100. For example, a 20% slope refers to a 20 foot rise over a distance of 100' (20' H divided by 100' V = .20 x 100 = 20%). A 100% slope equals a 45 degree angle. Slopes are measured across a horizontal rise and run calculation within **** any horizontal 25 foot distance.****



3. GEOLOGIC HAZARD AREAS IDENTIFIED.

The following areas are identified as Geologic Hazard Areas and subject to the requirements of the Geologic Hazard and Hillside Development Ordinance.

{This section identifies the areas that are considered as hazard or hillside areas for the purposes of this code. When determining if an area is subject to review under this ordinance, this is the list anyone could use and check. While it is intended to be a thorough list, originally we included an Item 11 to allow the City the ability to apply the code if other circumstances warrant it; however, it was agreed that if there are other areas of concern, they should be identified on the City maps and not left up to the discretion of the City Engineer and/or Building Inspector.}

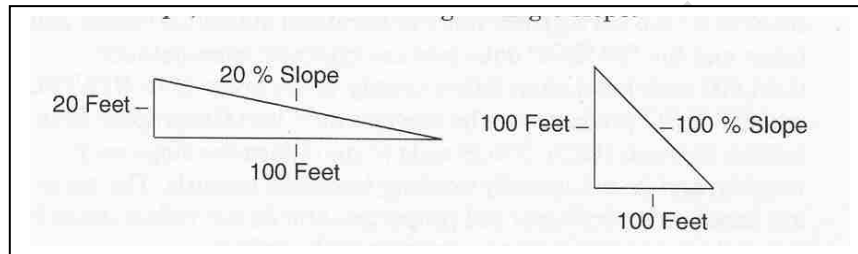
1. Active landslides identified in Oregon Department of Geology and Mineral Industries (DOGAMI) Bulletins 74 and 79.
2. Inactive landslides, landslide topography and mass movement topography identified in DOGAMI bulletins 74 and 79 where slopes are greater than 10%.
3. Areas prone to mudflows identified in DOGAMI Bulletin 79.
4. Areas of known land composition that is conducive to sliding or containing weak foundation soil as identified in the City of Astoria Soil Map of the CREST Buildable Lands Inventory Project dated June 2003, the DOGAMI LIDAR maps, or by a professional in the geological field.

{Actual weak soil was not identified but could be listed based on information provided by a geologist etc. in reviewing the soil composition of Astoria.}

5. Areas within a known geologic hazard area or within 100' of a known geologic hazard area as indicated on the Astoria "Areas of High Waters and Past Slides"

map as prepared and updated by the City Engineering Department. The mapped areas may be indicated on the paper map or in the City's Geographical Information System (GIS). ****

6. Slopes of 20% or greater. Slope is based on the individual platted lot at slope to run calculation. For larger projects of three or more lots, the slope is based on the topography of the entire slope within the combined lot area. **



7. Areas of known fill or landslide debris.
8. Areas of known potential liquefaction and/or lateral spreading.
9. Areas of **** as indicated on the DOGAMI LIDAR maps as adopted by the City.
10. Tsunami inundation areas as indicated on the "Open File Report O-95-10, Tsunami Hazard Map of the Astoria Quadrangle, Clatsop County, Oregon" DOGAMI, dated October-November 1995.

{The inclusion of Tsunami areas differed greatly among those reviewing the draft and needs to be discussed further.}

3. REGULATED ACTIVITIES.

- A. Except when exempt under Section 3.*** (B), no person shall engage in any of the following regulated activities in areas designated as geologic hazard areas as defined in this Code unless the required report, as specified in this Code is provided to and approved by the City:
 1. Excavation;
 2. Fill;
 3. Construction, reconstruction, structural alteration, relocation or enlargement of any building or structure for which permission is required pursuant to this Code, other than an accessory structure listed in Section (4) below;
 4. Installation or construction of an accessory structure greater than 500 square feet in area; or

5. Partition, subdivision, planned unit development, cluster housing, or manufactured dwelling park.

B. The following activities are exempt from the provisions of this Code **:

1. An excavation which is less than two feet in depth except at the base of a known slide, or which involves less than 25 cubic yards of volume;
2. A fill which does not exceed two feet in depth or 25 cubic yards of volume;
3. Structural alteration of any structure of less than 500 square feet that does not involve grading as defined in this Code;
{Need to clarify if this means 500 sqft alteration or 500 sqft structure.}
4. Emergency actions which must be undertaken immediately to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property. The person undertaking emergency action shall notify the Building Official on all regulated activities associated with any building permit, or the City Engineer on all other actions within one working day following the commencement of the emergency activity. If the Building Official or City Engineer determines that the action or part of the action taken is beyond the scope of allowed emergency action, enforcement action may be taken;
5. Maintenance, operation, or reconstruction of public and private roads, streets, driveways, and utility lines, and associated utility buildings or structures existing on January 1, 2010, provided that such maintenance, operation, or reconstruction does not extend outside the previously disturbed area;
6. Installation, construction, reconstruction, or replacement of utility lines in City right-of-way, or public easement, not including electric substations.
7. Site investigative work required by the City, County, State, or Federal agency, or any other applicant such as surveys, test borings, percolation tests, and other related activities provided disturbed areas are restored to the pre-existing conditions promptly after tests are concluded. Such work may be subject to obtaining a City Grading and Erosion Control Permit.

3. TYPE OF REPORT REQUIRED.

The following indicates the type of geologic report required based on the degree of development and the condition of the site.

A. Report Not Required

A report is not required for the following development located within a Geologic Hazard Area:

1. Decks, stairs, and porches less than 30" above grade that do not require excavation or fill of more than 2' depth or pile supported foundations.

{This does not require a building permit, but still must comply with zoning regulations.}

2. Accessory buildings of less than 200 square feet that do not require excavation or fill of more than 2' depth or pile supported foundations.

{This does not require a building permit, but still must comply with zoning regulations.}

3. Unique site or development circumstances with the joint approval of the City Engineer, Building Official, and Community Development Director. These circumstances include, but are not limited to, the following:

- a. Limited alterations to an existing building on existing flat areas of the lot (less than 10% slope) that do not require excavation or fill of more than 2' depth or pile supported foundations.
- b. Foundation repair where the repair has been designed by an engineer registered with the State of Oregon.
- c. Reconstruction of a building that has been partially destroyed and meets the following requirements:

- 1) Destroyed by other than known geologic impacts; and
- 2) Destroyed no more than two years prior to reconstruction; and
- 3) The footprint and mass of the building will be the same as the building destroyed; and

{With the same footprint and number of stories (mass), the impact of the new construction should be the same as the former structure.}

- 4) The existing foundation may be used as approved by a Civil Engineer registered in the State of Oregon or approved by the Building Official in accordance with prescriptive measures as identified in the International Building Codes.

4. Carports and other non-enclosed structures that do not require excavation or fill of more than 2' depth or pile supported foundation.
5. Fences, patios, arbors that do not require excavation or fill of more than 2' depth or pile supported foundation.
6. Interior alterations, plumbing, mechanical, or electrical work.
7. Any development with a Tsunami Inundation Zone if construction complies with requirements of the International Building Code with Oregon Amendments (Oregon Structural Specialty Code) for location in this Zone as adopted by the City.

{The inclusion of Tsunami areas differed greatly among those reviewing the draft and should be discussed.}

B. Geological Assessment Report Required

{A Geological Assessment Report is less expensive and for the following situations, may be sufficient to allow the Building Inspector and City Engineer to approve permits. If there are any concerns raised in the Geological Assessment Report, they can then require a geotechnical report.}

A Geological Assessment Report is required for the following development:

1. Within a geologic hazard area:
 - a. Addition to existing building which does not require excavation or fill of more than 2' depth or pile supported foundations.
 - b. Accessory structures of less than 200 square feet, decks, stairs, and porches that are greater than 30" above grade and that require excavation or fill of more than 2' depth or pile supported foundations.
 - c. Exterior plumbing, mechanical, or electrical work that requires disturbance of land area 3' deep or greater if disturbed area is 2' wide or greater.
2. In any area of the City that is not identified as a geologic hazard area:
 - a. Preliminary Plat applications for subdivisions or land partitions, planned unit developments, cluster development areas, or manufactured dwelling parks.
 - b. Proposed development of four or more pre-existing residential lots within a platted block or single development where construction of infrastructure is required to develop the lots.

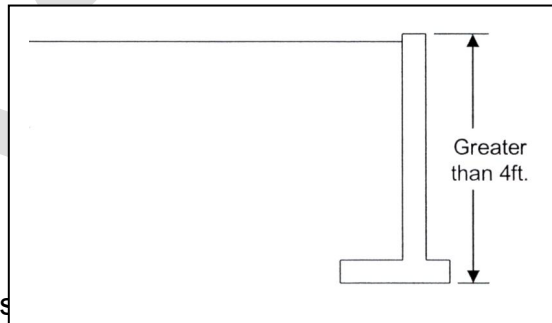
{Even if a project site is flat, the potential impacts of larger developments on an area should be evaluated. The flat site could be fill and/or old landslide material. This is not intended for small developments.}

D. Geotechnical Report Required

A Geotechnical Report is required for the following development:

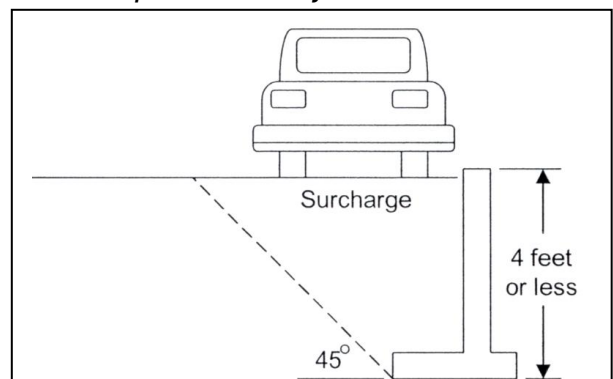
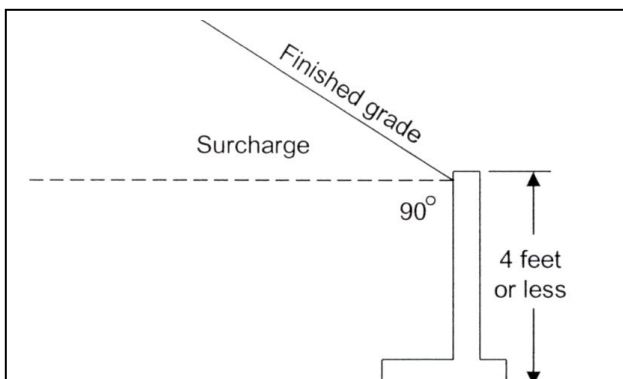
{With the costs associated with the geotechnical report, the City needs to balance the impact of the potential development versus the public safety benefited from the requirements for this report.}

1. Within a geologic hazard area:
 - a. All new construction except as noted in Section 3.*this section**(A and B.1) above
 - b. Any addition to an existing structure that requires excavation or fill of more than 2' depth or pile supported foundations.
 - c. Retaining walls as follows:
 - 1) Wall 4' or greater in height measured from the bottom of the footing to the highest point of any portion of the wall.

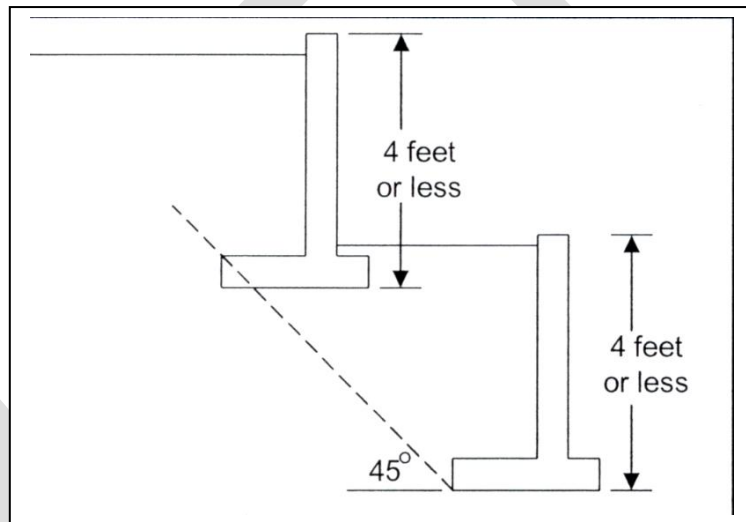


- 2) Wall less than 4 feet in height measured from the bottom of the footing to the highest point of any portion of the wall with a surcharge of 50% (2H:1V) slope land retained by the wall, or supporting vehicle loads within 4' of the wall.

{City Engineer suggested the above. Building Official suggested the following "Wall with any amount of surcharge from either soil, other structures, public right-of-way, or vehicular way retained by the wall." We need to determine the extent of report needed.}



- 3) Wall less than 4' in height measured from the bottom of the footing to the highest point of any portion of the wall located within 45 degrees of an existing structure measured from the base of the wall to the bottom of the building footing. The Building Official and/or the City Engineer shall determine the extent of report needed.



- d. Any excavation at the base of a known slide.

2. In any area of the City regardless of its location relative to a geologic hazard area as recommended in a geologic report or by the architect or engineer of a project. *****

{The intent is to consider recommendations by professionals in the field as a requirement for additional testing.}

3. REPORT CONTENTS.

A. Geological Assessment Report

The Geological Assessment Report is intended as an overview of site conditions. Its purpose is to identify geologic hazards and considerations, and to provide an assessment of the suitability of the site for the proposed project.. The Geological Assessment Report shall be of sufficient detail to describe the geologic conditions of the parcel and immediate vicinity and evaluate the

potential geologic hazards associated with the parcel. In addition to any Federal or State Code requirements of a Geological Assessment Report as indicated in ***name the code or standards ??****, at a minimum, the Geological Assessment Report shall be formatted to generally follow the City requirements outline below, and shall include the following:

1. An Executive Summary.
2. General Information including:
 - a. Client or party that commissioned the report.
 - b. Name(s), address, and phone number of Certified Geologist(s), Engineering Geologist(s), and/or Geotechnical Engineer(s) who did the mapping and other investigation on which the report is based, and dates when the work was done.
 - c. Location and size of areas, and the general setting with respect to major or regional geographic and geologic features.
 - d. Purpose and scope of the report and geologic investigation, including the proposed use of the site. Also, identify level of the study, i.e., feasibility, preliminary, final, etc.
 - e. Topography and drainage within or affecting the area.
 - f. General nature, distribution, and abundance of exposures of earth materials within the area.
 - g. Nature and source of available subsurface information and geologic reports or maps. Suitable explanations of the available data shall be provided to allow a technical reviewer the means of evaluating the reliability. Reference to cited works or field observations shall be made, to substantiate opinions and conclusions.
 - h. Disclosure of known or suspected geologic hazards affecting the area, including a statement regarding past performance of existing facilities (such as buildings or utilities) in the immediate vicinity.
 - i. Locations of test holes and excavations (drill holes, test pits, and trenches) shown on maps and sections and described in the text of the report. The actual data, or processed data upon which interpretations are based, shall be included in the report to permit technical reviewers to make their own assessments regarding reliability and interpretation.

- j. All field and laboratory testing procedures (by American Standards Testing Methods designation, if appropriate) and test results.
 - k. Disclosure statement of geologist's or engineer's financial interest, if any, in the project or the client's organization.
 - l. The signature and seal of the Registered Geologist, Certified Engineering Geologist, and/or the Geotechnical Engineer who prepared the report.
3. Soil and geologic map and investigation in sufficient detail to describe the geology of the parcel, and evaluate and describe existing or potential geologic hazards associated with the parcel. The scope of the investigation and level of detail will depend in part on the size of the parcel, slope, existing geologic conditions and hazards, and the proposed development.
4. Soil and geology description. The report shall contain brief but complete descriptions of all natural materials and structural features recognized or inferred within the subject area.
5. Assessment. Assessment of existing soil and geologic conditions with respect to the intended use of the site constitutes the principal contribution of the report. It involves the effects of the soil and geologic features upon the proposed grading, construction, and land use; and the effects of the proposed modifications upon future geologic conditions and processes in the area. The following checklist includes, at a minimum, the topics that shall be considered in discussions, conclusions, and recommendations in the Geological Assessment Report:
- a. General suitability of proposed land use to the soil and geologic conditions.
 - b. Identification and extent of known or probable geologic conditions that may result in risk to the proposed land use (such as flood inundation, shallow groundwater, surface and groundwater pollution, landslide, debris flow, rock fall, expansive soil, collapsible soil, subsidence, erosion, deposition, earthquake shaking, fault rupture, tectonic deformation, liquefaction, tsunami).
 - c. Recommendations for site grading.
 - d. Drainage considerations.
 - e. Limitations of study, and recommendations for additional investigations. Considering the scope of work and intended use of the site, provide a statement of the limitations of the study and the need for additional studies outside the stated scope of work.

6. Inspection schedule for the installation of the grading, drainage, and erosion control measures.
7. Summary of findings and recommendations. Opinions and recommendations shall be described in a manner that would allow implementation through conditions of approval on the proposed development.
8. Conclusion on the overall suitability of the site for the proposed development.

B. Geotechnical Report

The Geotechnical Report shall be of sufficient detail to describe the geologic conditions of the parcel and immediate vicinity and evaluate the potential geologic hazards associated with the parcel as required in the Geological Assessment Report noted above. In addition to any Federal or State Code requirements of a Geotechnical Report as indicated in ***** name of code or standard that governs these reports???*****, the Geotechnical Report shall also include the following:

1. The proposed construction methods to be followed to mitigate landslides, or other forms of earth movements, liquefaction, lateral spreading, minimize erosion, and maintain slope stability.
2. How the proposed construction and design techniques will minimize cuts, fills, and potential adverse impacts to existing vegetation so as to not have adverse impacts to existing drainage ways, water quality and slope stability. The recommended techniques may include mitigation measures to address potential adverse impacts. *****
3. The signature, seal, and expiration date of the Engineering Geologist and/or Geotechnical Engineer who prepared the report.
4. For the purpose of compliance with the International Building Code with Oregon Amendments (Oregon Structural Specialty Code), soil reports shall be in compliance with OSSC Section 1802.6.

The soil classification and design load-bearing capacity shall be shown on the construction document. Where required by the building official, a written report of the investigation shall be submitted that includes, but need not be limited to, the following information:

- a. A plot showing the location of test borings and/or excavations.
- b. A complete record of the soil samples.
- c. Logs of the soil bores and cross-section(s) at a suitable scale to

- depict the soil profile across the site.
- d. Elevation of the water table, if encountered.
 - e. Recommendations for footings or foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soil; mitigation of the effects of liquefaction and lateral spreading, differential settlement and varying soil strength; and the effects of adjacent loads.
 - f. Expected total and differential settlement from building loads, fills, and seismically induced..
 - g. Pile and pier foundation information in accordance with OSSC Section 1808.2.2.
 - h. Slope stability analyses, circular and translational, for the “critical slopes” on the site. Stability issues include off-site conditions that may impact the site.
 - i. All stability and foundation related recommendations shall be based upon the site specific soil engineering properties derived from appropriate soil tests or soil samples removed from beneath the property.
 - j. Compacted fill material properties and testing in accordance with OSSC Section 1803.5.

{There were varying opinions on whether to include a list of requirements in this document or to refer to published guidelines. However, many agreed it was best to refer to the guidelines in addition to the minimum requirements of the City. Many cities use a list similar to the one above.}

C. Report Guidelines for Shoreline Protective Structures. *****

In addition to the applicable requirements of the geologic and geotechnical reports listed in this Code, the following shall be required for reports required on regulated activities within the shoreland areas.

{This information was recently provided to communities from the State concerning review in oceanfront and shoreline areas. This should be evaluated by CREST for appropriateness specific to Astoria’s shoreland areas. Also, clarify what is “protective structures”. Should this include any development in shoreland areas?}

- 1. Project Need

- a. Analysis of the types of hazards affecting the property.
 - b. Estimated rate of erosion based on visual observations, aerial photo analysis, published reports, such as DOGAMI hazard risk zone studies, and DOGAMI beach monitoring data.
 - c. Description of the type of property, improvements, or structures that are threatened, and describe the nature of the threat.
2. Evaluation of Alternatives for Wave Attack
- a. Description of preferred alternative.
 - b. Evaluation of hazard avoidance options (siting or relocation).
 - c. Evaluation of soft stabilization methods (~~foredune enhancement~~, ****?? beach nourishment, cobble berms.)
 - d. Evaluation of hard stabilization (riprap, seawalls).
 - e. Evaluation of bio-engineered structures (clay burritos and vegetated terraces).
 - f. Description of alternatives that have been attempted prior to designation of the preferred alternative.
3. Evaluation of Alternatives for Mass Wasting
- a. Vegetation management.
 - b. Drainage controls.
 - c. Slope regrading.
 - d. Reinforcing building structures.
4. Analysis of Impacts from Preferred Alternative
- a. Potential for flank scour.
 - b. Potential toe scour.
 - c. Shoreline alignment impacts to adjoining properties and non-armored neighbors, including impacts to properties not eligible for shoreline protective structures.

- d. Potential for the preferred alternative to cause rip embayments or prolong existing embayment patterns.
- ~~e. Reduction in sand supply caused by preferred alternative. ****?~~
- ~~f. Quantify Narrowing or loss of beach area. *****?~~
- g. Impacts from expected maintenance of the project over the lifetime of the structure (include history of maintenance of similar projects nearby if possible and analysis of local sea level rise, and trends in littoral sand movement. Describe the expected maintenance methods that could occur.
- ~~h. Impacts to existing public beach access routes, and provisions to keep access route in a useable condition. *****???~~
- ~~i. Impacts to sites of geologic interest, such as fossil beds or ancient forest remnants. *****??~~

3. DEVELOPMENT STANDARDS.

All development within geologic hazard areas shall comply with the following standards:

1. A Geological Assessment Report and/or Geotechnical Report shall be submitted as noted below.
2. For standards and requirements in Flood Prone Areas, see the Flood Overlay Ordinance.
3. All erosion control methods shall comply with the Erosion Control and Stormwater Management section of the Development Code.
4. Recommendations contained in a Geological Assessment Report, Geotechnical Report, and/or other reports required by this Section shall become requirements of development.
5. Areas of active recordable movement as indicated by approved geotechnical instrumentation shall not be developed until the following have been met:
 - a. A remediation method has been designed, implemented and approved by a qualified, licensed geotechnical engineer;
 - b. Movement has been monitored for at least two years;
 - c. Movement ceased during monitoring period; and

- d. A certified engineering geologist or registered geologist or geotechnical engineer has declared that the monitoring interval is an adequate testing period for the remediation solution.

{This would reduce liability of City for allowing construction in areas of known movement that could cause damage to structures. The “shall” would allow construction if the applicant provides sufficient evidence that construction is feasible and safe.}

6. The burden of proof shall be upon the applicant to show development feasibility.
7. A report relied upon for a regulated activity shall remain valid for a period of no more than five years from the date of its preparation, unless new geologic movement or activity has occurred on the site since the date of the report. The continued reliance on a report that is more than five years old requires the following new information:
 - a. An on-site re-inspection of the site by an individual with the same qualifications or greater as the person preparing the original report to determine if there has been any change in circumstances.
 - b. If no changes in circumstances is found, a short report noting or including:
 - 1) A description of site conditions and any changes between the date of the original report and the date of re-inspection;
 - 2) Any additional maps, aerial photography or other documents consulted; and
 - 3) Conclusions regarding the accuracy of the original report.
8. The encroachment of structures into required setbacks to avoid development in hazard areas shall be considered a hardship for the purposes of granting a variance to setbacks.

{The “hardship” criteria for variances is hard to justify. This is being added as a factor since objections from neighbors are expressed on variances for new construction stating that the applicant is creating the hardship by choosing to develop the site. However, the applicant does have the right to develop private property.}

9. Site disturbance such as grading, clearing, fill, cut, and other site disturbance including that proposed for rights-of-way, utilities, development areas, and driveways shall be minimized. In order to meet this requirement, applicants are encouraged to pursue innovative site design techniques such as the following:

- a. Limiting grading on building lots only to that area needed for driveways and building pads.
 - b. Limiting the total area of the site dedicated to roadways while maintaining adequate connectivity and providing for adequate emergency access consistent with the City roadway standards.
 - c. Locating roads on less steeply sloped areas to minimize the width of graded areas needed for road construction.
 - d. Designing and locating structures so that they fit into the contour of the hillside rather than altering the hillside to fit the structure.
 - e. Using retaining structures as an alternative to cuts and fills.
 - f. Building designs, which require less grading, such as split-level and stair-stepping foundations and the use of piers.
 - g. Placing structures as close as possible to the street so as to minimize driveway construction in the sloped areas.
 - h. Focusing development on slopes less than 10%.
 - i. Vegetation removal shall be the minimum necessary to accommodate the use. Disturbed areas shall be revegetated as soon as practical. Disturbed areas shall be covered in an approved manner and not remain open during the rainy season (refer to the Development Code Section on Erosion Control and Stormwater Management). *****
10. Unless otherwise provided, the Geologic Hazard and Hillside Development Ordinance regulations are in addition to generally applicable standards provided elsewhere in this and other City and State codes. Where the provisions of this ordinance conflict with other provisions of the City Code, Development Code, or Building Code, the provisions that are the more restrictive of regulated development activity shall govern. *****
11. Applications for Subdivisions, Partitions, Planned Developments, Cluster Developments, or Manufactured Dwelling Parks shall comply with the following:
- a. Each newly created lot shall contain a geotechnical recommended building envelope. Development shall be allowed only within the identified building envelopes for newly created lots.

{This is for newly created lots, not existing lots. The intention is that the City not allow the creation of new steep lots for future construction that may be difficult to develop.}

- b. Roads and driveways shall be designed to take advantage of the natural topography reducing the need for major fill, cuts, and/or retaining walls. No driveway shall exceed a slope of 16%.
12. Meteoric (runoff) water that is prevented from infiltrating into the ground by manmade structures such as paved driveways and buildings must be directed into City storm drains or other approved drainage systems. Drainage systems must direct such water out of unstable or potentially unstable slopes.

{Permeable hard surfaces allow water to penetrate to the ground and in unstable areas can cause additional slippage. In areas not prone to slide, permeable hard surfaces are acceptable.}
 13. When pile driving or other construction method is used that potentially would create vibrations, sensors shall be installed on properties within 1,000' to monitor any impacts to these properties. Placement of the sensors shall be determined by the geotechnical consultant and approved by the City Engineer.
 14. When a geotechnical report has been submitted, the geotechnical engineer shall review the proposed grading plans, construction plans, and structural calculations as related to the report, to assure the plans were prepared in conformance with the recommendations and geotechnical requirements contained in the report.

~~3. DEVELOPMENT STANDARDS FOR SLOPES GREATER THAN 35%.~~

~~In addition to other standards in this Ordinance, limited development on slopes of greater than 35% (before development) may be permitted for the following purposes:~~

~~A. Public Facilities and Utilities~~

~~1. Public facilities (including streets) and utilities may be allowed on slopes greater than 35% (before development), if designed such that these improvements avoid slopes exceeding 35% (before development) to the maximum extent possible. Public streets or access ways may be developed on slopes over 35% (before development) if the street location is necessary to provide street connectivity or for emergency vehicle access. Construction of public streets shall comply with maximum grades as specified in the Astoria Street Standards.~~

~~2. Public facilities (including streets) and utilities may be constructed as described above if the following specific determination is made in the Geological Assessment Report and/or Geotechnical Report:~~

~~a. That these facilities can be constructed given the geologic condition of the area of development; and~~

~~b. That these facilities can be constructed in a manner to mitigate any potential for earth movement and erosion.~~

~~B. Open Space Development~~

~~Open spaces may be improved with public or private walking/hiking trails, or with public or private multi-use paths, subject to the determinations in the Geological Assessment Report and/or Geotechnical Report.~~

~~C. Preservation of Slopes Greater than 35%~~

~~All areas exhibiting slopes of 35% or greater (before development), not approved for development shall be preserved as open space. If preservation as open space is proposed, it should be made by dedication of public or private tracts. Acceptance of the proposed dedication of open space shall be at the City's discretion. Any proposal to dedicate open space may be considered for a portion of the calculation of site development such as lot coverage, landscaping, or density with the approval of the Community Development Director.~~

~~D. Residential Dwellings on Slopes Greater than 35%~~

~~*{This section is for residential development only.}*~~

~~Legally lots created prior to January 1, 1980 in residential zones may be improved on slopes over 35% (before development) with a finding that there is not a sufficient, and accessible, land area on the lot of less than 35% slope (before development) for the proposed development.~~

~~The findings shall include an analysis of the Geological Assessment Report and/or Geotechnical Report to indicate the following:~~

- ~~1. The sloped areas of 35% or more (before development) are not susceptible to earth movement or landslide hazard; and~~
- ~~2. The proposed development and design techniques will minimize cuts, fills, and potential adverse impacts to existing vegetation; and~~
- ~~3. The proposed development and design techniques will have no adverse impacts to existing drainage ways, water quality, and slope stability.~~
- ~~4. The report shall identify the approved building envelope area and all construction shall remain within that identified area.~~

~~E. Private Roads and Driveways~~

~~The impacts of any private road or driveway crossing slopes of 35% or greater (before development) shall be addressed in a Geotechnical Report.~~

{This section was intended to avoid development in steep areas over 35% slope. There was mixed comments as to whether to include this in the Code. It is eliminated in this draft, but noted as an item for future discussion.}

3. PERMIT PROCESS.

In addition to any other required permits or City procedures for site disturbance and/or development, the following shall apply:

1. Required reports as noted above shall be submitted as part of the development application such as building permit, grading permit, subdivision, etc. to the Community Development Director, City Engineer, or Building Official.
2. Reports shall be reviewed by the City Engineer, Building Official, and Community Development Director. A development permit application will not be issued until written approval is obtained from all three reviewers. The Community Development Director shall coordinate the reviews and written decisions on permit applications. ****

{The requirement for all three approvals is similar to the Erosion Control Ordinance as each department reviews the request against different code requirements. This allows a better overall review of projects and their impacts, and the coordination among departments. Identifying the CDD as coordinator allows for a final written decision for appeals as noted later in this document.}

3. Review of reports shall include examination to ensure that the following criteria are met:
 - a. Required elements are completed.
 - b. Report procedures and assumptions are generally accepted.
 - c. Conclusions and recommendations are supported and reasonable.
 - d. The report has been completed by a certified professional as required in the Code.
3. Exceptions to the Geologic Hazard and Hillside Development Ordinance may be granted in accordance with the Administrative Variance procedures as noted in Article 12 of the Development Code.

{Most sections above include statements that would allow some flexibility in application of the ordinance. However, in cases where the applicant wants to deviate from the code, the variance process would give the public opportunity to express their concerns and give staff an opportunity to look at the request on a case by case basis. Specific allowable variance items and criteria are included at the end of this code to be included as part of Article 12 on Variances.}

4. A fee schedule for review of permits shall be established in a Fee Resolution.

3. ADDITIONAL REVIEW.

Where staff determines that a report fails to meet one or more of the review criteria, that it lacks the qualifications or expertise to fully review a report, or if the City believes it is necessary in the interest of public safety, the following additional review may be required:

1. If a report is not approved, the City may ask for a Peer Review of the report. The Peer Review shall be conducted as follows:

- a. Completed by an independent Oregon Registered Geologist, Oregon Certified Engineering Geologist, or Geotechnical Engineer. The Peer Review shall be made by someone who holds at least the same certifications and licenses as the preparer of the original report;
- b. The Peer Review shall be in writing and shall contain the signature and seal of the reviewer;
- c. The reviewer shall be selected from a list of prequalified consultants maintained by the City to review the original report;
- d. The Peer Review shall be made at the applicant's expense.

{ However, the City may require a bond or other acceptable financial deposit in the amount of the anticipated City expenses prior to the initiation of the new report. The deposit may be withheld by the City in the event that the project does not proceed; and *****

If it is determined that the City should pay for the peer review, a bond should be considered. The bond is intended to avoid frivolous peer review requirements due to insufficient reports from developers who do not complete the project.

- e. The findings, recommendations, and conclusions of the Peer Review report shall be incorporated into the final administrative decision on the permit.

{This can be used when the City either does not agree with the report, questions the methods of testing, questions the information in the report, or has additional information that is not addressed in the report. At that point, the Peer Review would allow a qualified second party to confirm or refute the information in the report.}

2. Where the applicant disagrees with the results of the Peer Review, a determination by staff that a report fails to meet the review criteria, or

disagrees with the conditions of approval imposed on the project as a result of the Peer Review report, the applicant may have an additional report and/or review performed. This additional Peer Review report shall be conducted as follows:

- a. The applicant shall employ an independent Oregon Registered Geologist, Oregon Certified Engineering Geologist, or Geotechnical Engineer from a list of prequalified consultants maintained by the City. The Peer Review shall be made by someone who holds at least the same certifications and licenses as the preparer of the original report;
- b. The Peer Review shall be at the expense of the applicant;
- c. The results of the Peer Review shall be reviewed by the City; and
- d. The findings, recommendations, and conclusions of the Peer Review report shall be incorporated into the final administrative decision on the permit.

3. APPEALS.

A decision of the Community Development Director under this ordinance may be appealed to the Astoria Planning Commission by the applicant or any party to the record of any applicable staff decision or public hearing by filing an appeal within 15 days of the mailing of the written decision. The appeal shall be in accordance with the procedures in Article 9.

3. ENFORCEMENT.

1. In addition to any other method of enforcement available to the City, including City Code Section 1.010, the provisions of this ordinance may be enforced by the issuance of citations by duly appointed officers of the City pursuant to Astoria City Code Section 6.135.

{City Attorney Snow questioned if we wanted to do 6.135. We may want to decide what other form of enforcement we want.}

2. The City Engineer or Community Development Director may require that the applicant furnish to the City a performance bond up to, and not to exceed, the value of the cost of the required improvements necessary to maintain the stability of the site in order to assure that the conditions imposed are completed in accordance with the plan and specifications as approved by the City and that the standards established in granting the permit are observed. The amount of the bond shall be reviewed and approved by the City Engineer based on proposed development costs provided by the applicant or estimated costs calculated by City staff.

{This would allow the City to impose a bond to complete a retaining wall or construction project to stabilize an area should the developer not complete the required improvements.}

3. DISCLAIMER OF LIABILITY.

The degree of protection from problems caused by geologic hazards which is required by this Ordinance is considered reasonable for regulatory purposes. This Ordinance does not imply that uses or development permitted will be free from geologic hazards. This Ordinance shall not create a liability on the part of the City or by any officers, employee, or third party consultants acting in the capacity of Building Official, or official thereof for any damages due to geologic hazards that result from reliance on this Ordinance or any administrative decision lawfully made hereunder.

OTHER COMMENTS *{These comments were left here for further discussion. Need to consider the in-house department procedures.}*

JOHN NIELSON - see his geological/geotechnical report requirements matrix

{This matrix goes beyond the code as drafted above and does not seem to tie together with the code. However, it may be desirable to have some matrix for everyday use.}

GEORGE PRIEST – DOGAMI

1. **Adopt Appendix J (grading codes) in the IBC 2003.**
2. **Review Salem landslide ordinance and American Planning Association guidelines.**
3. **Global stability should not be overlooked. Developers should not look at just “adjacent property” but at properties that could be impacted in larger landslide masses that enclose so many parts of Astoria. Uncontrolled drainage down slope can destabilize these larger slide areas.**

BOB MCWIRTER –ASST. CITY ENGINEER

1. PRACTICAL APPLICATION

1. **A person comes to the Public Works office and tells them he wants to buy a lot that is for sale, it is not level but it doesn't look too steep but he wants to know if he can build on it. Who is he directed to? How is he answered?**
2. **Same scenario only it is a person who has a lot or two that he has owned for some time and he wants to sell and needs to know what to tell a prospective buyer about buildability?**
3. **If the subject of slope comes up and they want to know how to determine if they are under 20%, or under 35% and want to know how**

to determine this after they have found the corners. Know the lot dimensions, and have found the corner elevations?

4. In either case what do you say if there is an over 35% slope on part of the lot but the slope from lot line to lot line is less?

5. Clarify how to do %slope if two different areas.

{We would need to set up a procedure for review, application, etc. in response to Bob's question. We need to coordinate the process through the various departments. I would not think that we would be telling anyone if their property would need the reports but rather give them the code and tell them to have a professional view the lot to determine if it meets the slope or other factors requiring reports. It could get tricky if we start making that decision on speculations.}

ARTICLE 12 - VARIANCES

{Not sure if variances should be considered. If so, criteria need to be developed. The following are some initial thoughts on possible criteria. Variances should be few and should not be made from requirements of the reports, technical expertise, and safety issues.}

12.****

CRITERIA FOR VARIANCES FROM HILLSIDE DEVELOPMENT ORDINANCE.

Variances from quantitative requirements of the Hillside Development Ordinance may be granted only upon a finding that all of the following criteria are met:

1. The variance shall not create a potential threat to public health or safety and shall not create a potential hazard to adjacent properties.
2. Variance for other than a quantitative requirement shall not be permitted. The variance shall not be from technical expertise requirements, minimum report requirements, or from recommendations included in any geological or geotechnical report on the site.
3. Reasonable development of the site cannot be accomplished that would avoid the geologic hazard areas of the site.
4. Mitigation measures, if applicable, have been recommended by a certified professional as noted in the Hillside Development Ordinance, and approved by the City Engineer, Building Inspector, and Community Development Director.
5. The variance shall not result in a visual impact to adjacent properties such as the construction of retaining walls greater than 8' tall in close proximity to property lines.
6. Financial hardship relative to completion of site reports and/or compliance with the recommendations of any reports shall not be a consideration in granting a variance.

7. The City Engineer, Building Inspector, and Community Development Director have provided written statements supporting the requested variance.

OTHER CODE SECTIONS TO AMEND OR VERIFY COMPLIANCE WITH DRAFT CODE

“Other Applicable Use Standards” in all zones.

9.090 concerning Administrative “Additional Costs”

11.030(4) concerning “Basic Conditional Use Standards”

12.030(B.2.a) concerning “Variance General Criteria”

3.310 concerning “Information Required” on Grading Permits

3.315(A.2 and B.2) concerning “Grading Standards”

13.110(C.6) concerning Subdivision Preliminary Plat “Supplemental Information”

13.220(B.3) concerning Major Land Partition Preliminary Plat “Supplemental Information”