

**AN ORDINANCE AMENDING AND SUPPLEMENTING CHAPTER 25 SECTION 28 OF THE REVISED GENERAL ORDINANCES OF THE TOWNSHIP OF WEST ORANGE, ENTITLED "STEEP SLOPE AND NATURAL FEATURES ORDINANCE"**

**BE IT ORDAINED BY THE TOWNSHIP COUNCIL OF THE TOWNSHIP OF WEST ORANGE,** in the County of Essex and State of New Jersey that Chapter 25 Section 28 of the Revised General Ordinances of the Township of West Orange is hereby amended and supplemented as follows:

**I. PURPOSE**

It is the purpose of this chapter to provide development controls for all lands located within the Township of West Orange that have within their boundaries topographical conditions hereinafter defined as "steep slopes." These controls are enacted to minimize the potentially adverse impacts associated with disturbance of steeply sloped areas. The most appropriate method of alleviating such conditions is through the regulation of soil disturbance, vegetation removal in steep slope areas, limitation of building and impervious coverage, reduce densities and increase lot areas. Such regulation promotes and protects the public health, safety and welfare of the Township in their existing physical state or condition as of the effective date of the enactment of this chapter.

**II. CHAPTER 25-28 SHALL BE AND HEREBY IS AMENDED AND REVISED TO READ AS FOLLOWS:**

**§ 25-28 STEEP SLOPE AND NATURAL FEATURES ORDINANCE.**

**§ 25-28.1 Background.**

Disturbances of steep slopes results in accelerated erosion processes from storm water runoff and the subsequent sedimentation of water bodies with the associated degradation of water quality and loss of aquatic life support. Related effects include soil loss, changes in natural topography and drainage patterns, increased flooding potential, further fragmentation of forest and habitat areas, and compromised aesthetic values. It has become widely recognized that disturbance of steep slopes should be restricted or prevented based on the impact disturbance of steep slopes can have on water quality and quantity, and the environmental integrity of landscapes.

**§ 25-28.2 Statement of Purpose.**

It is the purpose of this chapter to provide development controls for all lands located within the Township of West Orange that have within their boundaries topographical conditions hereinafter defined as "steep slopes." These controls are enacted to minimize the potentially adverse impacts associated with disturbance of steeply sloped areas. The most appropriate method of alleviating such conditions is through the regulation of soil disturbance and vegetation removal in steep slope areas; limitation of building and impervious coverage; and reductions of densities and increase in lot areas in areas of steep slope. Such regulation promotes and protects the public health, safety and welfare of the Township in their existing physical state or condition as of the effective date of the enactment of this chapter.

It is also the purpose of this chapter to provide for environmentally sound development of a lot with adequate area located outside of natural features for the use and enjoyment of its occupants.

**§ 25-28.3 Definitions.**

**BEDROCK** – Shall mean continuous solid rock that underlies regolith.

**CLIFF FACE** – Shall mean a sheer, nearly vertical slope of exposed bedrock.

**DISTURBANCE** – Shall mean the placement of impervious surface, the exposure or movement of soil or bedrock, or clearing, cutting, or removing of vegetation.

**EFFECTIVE LOT AREA** – Shall mean an adjustment for the natural features including steep slopes, State open waters, wetlands, wetland transition areas, floodways, and riparian zones. The effective lot area shall be either equal or greater than the minimum lot area as defined in Subsection 25-7.1 Table of Districts of Regulations.

**EXCESSIVE STEEP SLOPE** – Shall mean any steep slope 25% or greater.

**FLOOD HAZARD AREA** – Shall mean the flood hazard area associated with State open waters (streams, rivers, lakes, ponds, etc.) and regulated streams as determined in accordance with the methodologies in the NJ Flood Hazard Area Control Act rules N.J.A.C. 7:13 et seq. The flood hazard area shall be determined by NJDEP in a Flood Hazard Area Verification pursuant to these rules.

**FLOODWAY** – Shall mean the floodway area associated with certain State open waters (streams, rivers) and regulated streams as determined in accordance with the methodologies included in the NJ Flood Hazard Area Control Act rules N.J.A.C. 7:13 et seq. The floodway shall be as determined and verified by NJDEP pursuant to these rules.

**IMPERVIOUS SURFACE** – Shall mean any structure, surface, or improvement that reduces or prevents absorption of storm water into land, and includes porous paving, paver blocks, gravel, crushed stone, decks, patios, elevated structures and other similar structures, surfaces, or improvements.

**RIDGE LINE** – Shall mean the top of the First and Second Watchung Mountains as determined by an analysis of topographic maps.

**ROCK CUT** – Shall mean nearly vertical wall of rock created by or adjacent to roadway construction.

**ROCK WASTE** – Shall mean the material comprising the talus slope of sliderock.

**STATE OPEN WATER** – Shall mean streams, rivers, lakes and ponds as defined in the NJ Freshwater Wetlands Protection Act rules N.J.A.C. 7:7A. The location and extent of State open water shall be as determined by the NJ Department of Environmental Protection in a Letter of Interpretation.

STEEP SLOPE – Shall mean any slope equal to or greater than 10 percent as measured over any minimum run of 10 feet. Steep slopes are determined based on contour intervals of two feet or less.

TALUS SLOPE – Shall mean the apron, cone, or embankment of the rock waste sloping outward from the base of the cliff face that is the course of the rock waste.

TOP OF CLIFF – Shall mean the portion of a hill located above the cliff face.

WETLANDS TRANSITION AREA – Shall mean wetland transition area as defined in the NJ Freshwater Wetlands Protection Act rules N.J.A.C. 7:7A. The location and extent of wetland transition areas on a lot shall be as determined by the NJ Department of Environmental Protection in a Letter of Interpretation.

WETLANDS – Shall mean wetlands as defined in the NJ Freshwater Wetlands Protection Act rules N.J.A.C. 7:7A. The location and extent of wetland transition areas on a lot shall be as determined by the NJ Department of Environmental Protection in a Letter of Interpretation.

**§ 25-28.4 Applicability.**

- a. This section shall apply to all applications for development in the Township of West Orange.
- b. The Planning Board or Zoning Board shall review all plans submitted under this section as part of any application for site plan or subdivision approval.
- c. The Township Engineer and the Township Planner, in all cases, shall review all applications for compliance with this section.

**§ 25-28.5 Exceptions to Section 25-28.**

The terms of this section shall not apply to the following:

- a. Existing single family homes built before the date of this ordinance's approval, additions to such homes **provided that the additions do not extend any closer to the steep slope area**, or rebuilding of such homes **within the existing footprint** after a disaster.
- b. Improvements for which preliminary subdivision or site plan approval or construction permits have been issued prior to the effective date of this section.
- c. Areas which previously contained structures or other improvements, or were previously graded.
- d. Other than where the exceptions set forth herein apply, all applications for subdivision or site plan approval shall be reviewed under these requirements by the applicable land use board and its professionals to determine the presence of steep slopes and other natural features, if any, on the subject property and compliance with the provisions of this chapter. All construction permit applications that include grading or clearing of any lot,

other than those within the scope of the exceptions set forth herein, shall be reviewed under these requirements by the Township Engineer and the Township Planner.

**§ 25-28.6 Initial Procedure.**

- a. Applicants for site plan approval or subdivision approval shall submit to the Department of Planning and Development all information and documents required by this section.
- b. The Township Planner shall process all exhibits submitted under this section in the same manner as applications for subdivision approval and/or site plan approval.

**§ 25-28.7 Information Required.**

- a. For all sketch plats, sketch site plans, subdivisions and site plans, the following exhibits shall be submitted:
  1. A colored topographic map, prepared, signed and sealed by a New Jersey licensed engineer and surveyor showing existing contours at two foot intervals. **extending a minimum of 200 feet beyond the property lines.**
  2. Areas clearly noted in different colors on the topographic map showing the following slopes as measured between two-foot contour lines designated as areas one through five: Area 1. 0% to 10%; Area 2. 10% to 14.99%; Area 3. 15% to 19.99%; Area 4. 20% to 24.99%, and Area 5. 25% percent or more.
  3. Calculations, in square footage and acres, of amount of area in the various slope categories listed above.
  4. On the colored topographical map, superimpose all existing trees as defined under the tree ordinance and mark tree to be removed.
  5. On the colored topographical map, superimpose the location of the State open waters, wetlands, wetland transition areas, flood hazard areas, floodways, and riparian zones.
  6. A separate map shall be prepared showing proposed improvements overlain on the preceding color topographic map.
- b. Where development is proposed on slopes greater than 10% as part of preliminary subdivision approval, or preliminary site plan approval, the following additional exhibits, prepared, signed and sealed by a New Jersey licensed engineer shall be submitted.
  1. Identification of soil types on the property, with specific reference to highly erodible soils as identified by the United States Department of Agriculture Soil Conservation Service or other recognized authority;

2. Erodibility potential of exposed soils;
3. Length, steepness and surface roughness of exposed slopes;
4. Resistance of soil to compaction and stability of soil aggregates;
5. High water table, water infiltration capacity and capacity of soil profile;
6. Type and location of construction activity, including the amount of site grading;
7. Location of construction access roads;
8. Storm water management plan;
9. Soil erosion and sediment control plan, including but not limited to a plan explaining how the applicant will minimize adverse impacts upon existing natural features;
10. Plans and specifications for any retaining walls, steps, or other soil protective structures proposed;
11. A stabilization and revegetation plan prepared, signed and sealed by a New Jersey professional engineer, including a complete description of the existing vegetation, the vegetation to be planted and slope stabilization measures to be installed;
12. The developer of a parcel with steep slopes shall submit a geotechnical analysis of the slope stability and the need for remedial work such as shaping of the rock face, pinning and/or grouting of the exposed rock for stabilization and the installation of safety netting in areas of concern. The geotechnical analysis shall be performed by a qualified Professional Geotechnical Engineer licensed in the State of New Jersey, with a minimum of five (5) years of professional experience in the geotechnical field. The analyses of local and global, rock slide, and rock face slope stability shall be conducted by a qualified Professional Geotechnical Engineer adhering to the principles of Geotechnical Engineering for soil and rock mechanics, and utilizing conventional methods of analyses. The determination of slope stability shall include, but is not limited to, geologic research, subsurface explorations, laboratory testing to assess soil/rock properties, visual evaluations, stereoscopic analyses of the rock face, and adequate factors of safety against failure.
13. In areas where the potential for rockslides exist, a rock fall zone, or catchment area width, shall be provided at the toe of slope. The required width of the rock fall zone would be determined by the Geotechnical Engineer utilizing established criteria such as those developed by Arthur M. Ritchie and included in the Rockfall Catchment Area Design Guide. (<https://www.dot.ny.gov/mainbusiness-center/designbuildproject13/repository/Oregon%20DOT%20Rockfall%20Area%20Design%20Guide%20-%2020141211.pdf>).
14. If the parcel being developed is adjacent to a parcel with steep slopes, then the developer shall obtain the approval of the owner of the adjacent parcel to perform the

required geotechnical analysis to determine the slope stability and the potential for rockslides. If the developer is unable to obtain the approval of the owner, then the Geotechnical Engineer shall evaluate the worst case scenario and shall provide an appropriate rock fall zone as discussed above.

15. The developer of a parcel with steep slopes shall prepare a maintenance plan to ensure that the slope is maintained in a safe and stable condition over the years. The maintenance plan shall include site inspections every two (2) years which would include visual observations with pertinent photos of the slope, rock face, and vegetation status at the site. The steep slope maintenance plan must be prepared by a New Jersey Licensed Geotechnical Engineer and must be recorded against the deed of record for each property on which the steep slope is located. The steep slope maintenance plan shall address, but not be limited to, the following: monitoring movement & property condition changes, inspection & maintenance of slope drains, installation of drought-tolerant ground cover, over-irrigation of slope landscaping, direct drainage to slopes, disposal of soil or debris on slopes, ponding of water against retaining walls, monitoring movements and property condition changes. If any deficiencies are noted during the inspection, the necessary corrective action must be taken. Copies of the inspection reports must be filed with the Township of West Orange immediately following completion of the inspection.
16. For areas at the top of a steep slope or adjacent to a parcel with steep slopes, a minimum setback of 50 ft is required from the top of slope to any proposed improvements such as buildings, roads, parking lots, septic fields, swimming pools, hot tubs, ponds, or other uses at or near the top of steep slopes, except as otherwise recommended by a qualified professional. Where development is near steep slopes greater than 30%, increase setback to a minimum of 100 feet, except as otherwise recommended by a qualified professional. The minimum setback shall be established considering site-specific topographic conditions and the recommendations of the qualified Professional Geotechnical Engineer performing the slope stability analysis
17. Other engineering data deemed reasonably necessary by the Township Engineer and Planner to determine compliance with this chapter.

#### **§ 25-28.8 Limitations on Development in Steep Slope Areas.**

- a. No soil or vegetation shall be disturbed or structures constructed within 100 feet of the ridge line, cliff face, and rock cuts along the roadways or quarries as defined herein, including but not limited to those identified in Exhibit A attached hereto, dated December 4, 1989, unless otherwise recommended by a qualified Professional Geotechnical Engineer performing the geotechnical analysis stipulated in paragraph 12 above. (Exhibit A may be found on file in the Township offices.)

- b. Disturbance of steep slopes and excessive steep slopes shall not exceed the limits established in Table One.

**Table 1**

**All Districts**

Slope	Maximum Disturbed Area
1) 0 to 10%	100%
2) 10 to 14.99%	60%
3) 15 to 19.99%	40%
4) 20 to 24.99%	20%
5) 25% or greater	0%

- c. Disturbances of slopes of 25% or more is prohibited.
- d. Effective lot area for all districts (restrictions for effective lot area)

**Table 2 – Effective Lot Area**

**(All Districts)**

The area of a lot shall be reduced dependent upon the slopes present on the lot as well as the presence of other natural features including wetlands, wetland transition areas, State Open waters, floodway and riparian zones. Permitted density on the lot is based on the effective lot area. The building and impervious coverage are also computed on the effective lot area.

Slope	Useable Lot Area	Adjustment Factor
1) 0 to 10%	100%	1.0
2) 10 to 14.99%	60%	0.6
3) 15 to 19.99%	40%	0.4

4)	20 to 24.99%	20%	0.2
5)	25%-and over	0%	0.0

- e. All wetlands, wetlands transition areas, State Open waters, floodways, riparian zones, lands within 100 feet of a cliff face and lands within 100 feet of a ridge line are treated as 100% lot reduction and are excluded from effective lot area. Wetlands, wetland transition areas, State Open waters, floodways, riparian zones, lands within 100 feet of a cliff face and lands within 100 feet of a ridge line in areas of steep slopes and excessive steep slopes shall be counted once as a 0.0 area of disturbance and not result in a further reduction of useable lot area.

Example: A six-acre parcel where one acre is 0% to 10% slope has no adjustment. One acre at 10% to 14.99% is 0.6, One acre at 15% to 19.99% will be 0.4, One acre at 20% to 24.99% is 0.2 and one acre at 25% and over is 0.0. Next step is to add 1, 0.6, 0.4, 0.2, and 0 which equals 2.2. That means in the six-acre parcel the effective lot area is 2.2 acres.

- f. The land use board's review and the Municipal Engineer's review of applications for construction, soil disturbance, or vegetation removal subject to these requirements shall include a review of the submissions required by this section of this chapter. The review will include an evaluation of the following factors:
1. The proposed activity will be conducted in compliance with Hudson-Essex-Passaic Soil Conservation District requirements and Chapter 30 Soil Removal.
  2. Provisions shall be made for the proper disposition of surface water runoff so that it will not increase unstable conditions. Appropriate storm drainage facilities will be constructed.
  3. Provision shall be made for any structure of protective measures that may be required for the protection of public safety or to prevent erosion, including but not limited to, retaining walls, guide rails, headwalls and fences.
  4. Any proposed building or structure or other protective measures shall not impede the flow of surface water through any watercourse.
  5. Any proposed vehicular facilities including roads, drives or parking areas shall be designed to comply with this section and the Hudson-Essex-Passaic Soil Conservation District requirements.
  6. Grades along streets and driveways shall be governed by the Residential Site Improvement Standards. The connection of any driveway to street shall be by a vertical curve of sufficient radius to provide a smooth transition. The horizontal angle of the intersection of a driveway with a street shall not be less than 60° degrees.

7. Any fill placed on the lot shall be properly stabilized and, when found necessary, depending upon existing slopes and soil types, supported by retaining walls and other appropriate structures as approved by the Township Engineer.
8. Sidewalk, driveways, new streets and walkway slopes shall not exceed 6% unless a ramp and steps are provided, except where superseded by the Residential Site Improvement Standards.
9. There shall be no alteration of site elevations in excess of one foot within five feet of an adjoining property.
10. Changes in the grade shall not exceed slope of three to one unless supported by retaining walls.
11. Retaining walls will comply with the applicable wall height requirements for the zone in which the property is located. All retaining walls greater than four feet in height shall require a variance and certification by a professional engineer that the wall was constructed in accordance with approved plans.
12. Fill material shall not consist of or include organic material, nor rocks greater than eight inches in diameter. Fill material shall be compacted to 90% of the maximum density.
13. Reasonable efforts shall be made to conserve topsoil which is removed during construction for later use on areas requiring vegetation of landscaping; e.g. cut and fill slopes.
14. No structure on the slope shall be located within 60 feet of the bottom of the cliff.
15. Design guidelines: Structures shall be built on the lesser slopes. No structure shall be built on the talus slope of the cliff face.
16. Tree removal on the site shall be subject to the Township's Tree Protection Ordinance § 25-27.
17. Vegetation and Revegetation.
  - (a) The developer shall submit a stabilization and revegetation plan in accordance with Chapter 30.
  - (b) 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.
  - (c) Every effort shall be made to preserve the maximum number of trees and other existing vegetation on the site and to avoid disturbance of the critical upland forest area, and to preserve unique and predominant

views.

**§ 25-28.9 Adequate Contiguous Area.**

When a lot contains rock formations, wetlands, wetland transition areas, State open waters, floodway, riparian zones, slopes exceeding 10%, land within 100 feet of a cliff face, land within 100 feet of a ridge line, depth to bedrock of less than four feet, or similar constraining conditions, the appropriate Board (Planning or Zoning), after adequate investigation, shall determine whether adequate contiguous area free of restraining conditions exist. In such an instance, it must be demonstrated that there is an adequate contiguous area on the lot which is free of constraining factors and which is sufficient to accommodate the proposed development, including but not limited to, all access drives, parking areas, front, rear and side yards and the like, constructed in accordance with all the provisions of this section. The unconstrained area shall have a width as defined in § 25-4 lot width, but for a depth sufficient to build a structure, within the minimum bulk requirements.

**§ 25-28.10 Variances.**

Any applicant subject to the requirements of this chapter seeking to construct, disturb or clear in excess of the requirements of this ordinance shall require a variance under N.J.S.A 40:55D-70(c).

**III. REPEAL OF CONFLICTING ORDINANCES**

Any Ordinances of the Township that are in conflict with this Ordinance are hereby repealed to the extent of such conflict. Except that this Ordinance does not supersede Chapter 31.

**IV. SEVERABILITY**

If any part of this Ordinance shall be deemed invalid, such parts shall be severed and the invalidity thereof shall not affect the remaining parts of this Ordinance.

**V. EFFECTIVE DATE**

This Ordinance shall take effect after its final passage and publication in accordance with the law.

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**ROBERT D. PARISI, MAYOR**

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**SUSAN McCARTNEY  
COUNCIL PRESIDENT**

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**KAREN J. CARNEVALE, R.M.C.**  
**MUNICIPAL CLERK**

**INTRODUCED:** March 1, 2022

**ADOPTED:**

**Legislative History**

The Township of West Orange is located in an area of steep slopes. In addition, over recent years the Township has been experiencing severe weather conditions as a result of global warming and climate change. The purpose of the ordinance changes is to ensure that the health, safety and welfare of the residents of the Township is protected in light of the climate changes that are occurring.