

SECTION 10**GRADING**

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SECTION 10 GRADING

10-1 GENERAL REQUIREMENTS

Grading shall conform to Title 7 of the Yolo County Code, and these Improvement Standards. A grading permit for subdivision improvements shall not be issued prior to Yolo County Board of Supervisors' approval of the Final Map and a bonded improvement agreement.

10-2 PLAN SHEET DETAILS

In addition to the requirements of Section 3, the following items shall be included on grading plans:

- A. Street names and profile grade slopes
- B. Location and grate elevation of storm drain inlets
- C. Top of curb elevations at property line extensions, grade breaks, curb returns, and curb inlets.
- D. Typical final pad grading details, typical pad grading details for over-wintering.
- E. Proposed pad elevations, proposed lot lines and lot numbers, names of adjacent subdivisions and intersecting property lines.
- F. Typical sections across side yard property lines where the difference in finish pad elevations exceeds two feet. Delineated on the section shall be the side yard drainage swale and minimum distance between the proposed building and the side yard property line.
- G. Slope symbols for 3:1 slopes or steeper, where grade differences exceeds one foot.
- H. High points and valleys delineated.
- I. Flow directional arrows.
- J. Overland release grades and details.
- K. Existing spot elevations and/or contour lines on-site and off-site around perimeter of development. The spot elevations or contour lines shall be extended off-site for a minimum distance of 200 feet on adjacent undeveloped areas, and 500 feet for critical areas as may be required by the County Engineer.
- L. Existing vegetation including trees (variety, size and elevation at base of all trees nine inches or larger).
- M. Retaining wall details (symbols, construction details, limits, and top and bottom of wall elevations).
- N. Signature block for certification of pad elevations by Design Engineer and Geotechnical Engineer for subdivision projects, see Section 10-8.

- O. For all projects requiring import or export:
 - 1. Location and plan of borrow (cut) area or spoils (fill) disposal area.
 - 2. Cut or fill slopes as recommended by a Geotechnical Investigation Report, or:
 - i. Cut Slopes of 2:1 or flatter
 - ii. Fill slopes of 3:1 or flatter
 - 3. Finish fill heights of 3 feet or less; unless approved otherwise by County Engineer.
 - 4. Cut and fill areas shall not block or alter drainage patterns.
 - 5. All offsite cut and fill areas shall be permanently protected from erosion.
 - 6. Quantities of cut, fill, import and export.
- P. Erosion control details as required in Section 11.

10-3 ROLLING TERRAIN GRADING

Grading or rolling terrain shall be accomplished in a manner whereby the profile of the rolling terrain is maintained as close to that which exists as practically possible. Interior cuts and fills shall be no greater than 5 feet unless approved by the County Engineer.

10-4 BOUNDARY GRADING

Special attention shall be given to grading adjacent to the exterior perimeter property line of a development. All adverse effects to off-site properties adjacent to new developments shall be kept to an absolute minimum. Fills and cuts adjacent to the exterior perimeter property line shall be designed in accordance with the following.

- A. When grading along existing residential property, the grade should be, if at all possible, held equal to or lower than the existing property grades. When grades are to be raised higher than existing adjacent residential lots, a concrete or masonry retaining wall shall be used with an integral privacy fence, regardless of the difference in elevation. The exposed portion of the wall shall be architecturally surfaced. The wall shall be located as close to the property line as is feasible for construction. If permission can be obtained from the adjacent property owner(s), the wall should be placed on the property line or onto the lower lot and the fence relocated to the top of the wall. All walls higher than four (4) feet as measured from base of foundation to top of wall shall be substantiated with structural calculations stamped by a Registered Civil or Structural Engineer and a Building Permit shall be obtained from the Building Division.
- B. Fills in excess of 2 feet shall not be allowed unless indicated on planning approval documents and permitted by project conditions of approval.
- C. If possible, all exterior slopes, fill or cut, shall be constructed offsite, with the property line being situated a minimum of one (1) foot inside the higher elevation as shown on Standard Drawing 10-1. If a right of entry cannot be obtained, a retaining wall shall be placed as near to property line as practicable.
- D. A recorded notarized right of entry shall be required for all off-site fills and grading prior to plan approval.
- E. Maximum slope shall be 2:1 or as specified by the soils report.
- F. All slopes steeper than 4:1 adjacent to the public right-of-way and private streets shall be protected with permanent erosion control measures.
- G. Fill material shall achieve 90 percent relative compaction certified by a Registered Geotechnical Engineer, except that fills under structures shall achieve 95% relative compaction.

- H. When a drainage swale or ditch is proposed to run adjacent to the property line, a level area, minimum width of five (5) feet is required between the property line and the top of the slope bank.

10-5 INTERIOR GRADING

Grading at interior property lines shall conform to the following.

- A. Cross lot drainage is not allowed unless specifically approved by the County Engineer.
- B. Retaining walls shall be required whenever adjacent side lot elevations differ by more than 1.0 foot.
- C. Retaining Walls shall be shown on the plans and shall include all necessary information and details for construction. Retaining walls shall be concrete or masonry. All walls higher than four (4) feet as measured from base of foundation to top of wall shall be substantiated with structural calculations stamped by a Registered Civil Engineer and a Building Permit shall be obtained from the Building Department.
- D. Property lines shall be situated a minimum of 1.0 foot inside the top of fill slopes when pad elevations differ by ½ foot or less. When retaining walls are used on interior property lines, the wall shall be situated on the high side.
- E. Where pads on adjacent lots are 10 feet apart or less and the difference in elevation exceeds 1.5 feet, a retaining wall will be required.
- F. The maximum earth slopes allowed shall be 2:1 (horizontal to vertical). Minimum asphalt concrete surface slopes shall be 1% and minimum concrete cement surface slopes shall be 0.3%. All proposed slopes that are 3:1 or steeper shall be shown on the plans by some type of slope symbol delineation.
- G. Lots on the low side of streets and at sag points shall be graded in such a manner as to preclude flooding of the building pad area in the event of malfunction or overloading of the street drainage system. All building pad grades shall be a minimum of 1 foot above the overland release elevation.
- H. Commercial developments shall not be allowed to "sheet drain" more than twenty-five feet of site frontage to a public street. Areas more than 25 feet from the street shall be graded to drain into an on-site drainage system.

10-6 RETAINING WALLS

A. Reinforced Masonry Block or Concrete Retaining Walls:

Masonry or concrete retaining walls shall conform to Caltrans Standard Plans, or shall be designed by a licensed Civil or Structural Engineer.

All walls higher than four (4) feet as measured from base of foundation to top of wall shall be substantiated with structural calculations stamped by a Registered Civil or Structural Engineer and a Building Permit shall be obtained from the Building Department.

For walls less than 4 feet as measured from base of foundation to top of wall, manufactured, modular, inter-locking, pre-cast concrete or masonry retaining walls may be substituted for reinforced cast in place concrete or masonry block construction. Design calculations and manufacturer's cut sheets and construction details shall be provided for review and approval prior to any such substitution.

Metal fence posts are required for privacy fences that are integral with concrete or masonry retaining walls.

- B. Building Permit Requirement:** A building permit shall be obtained for all retaining walls exceeding 4 feet in height (finished ground at base of wall to finished ground at top of wall) or when a fence greater than 6 feet high is an integral part of the wall.
- C. Drainage Requirements:** Grading shall be such that on-site-runoff will not flow to or over retaining walls. Suitable concrete ditches or other drainage collection devices shall be provided along retaining walls if the adjacent ground slopes to the wall. Surface drainage water shall not be collected using any required sub-surface ground water collection system behind the wall.

10-7 GRADING NEAR TREES

- A.** All trees with a six (6) inch diameter trunk or larger, measured 4-1/2 feet above the ground, in healthy condition, shall be identified on the plans as to size and species. Every reasonable effort shall be made to avoid removing trees or creating conditions adverse to the tree's health.
- B.** Grading within the drip line of trees to remain, especially oak trees, shall not be allowed. In the event that grading is required to provide essential subdivision improvements, then the services of an arborist certified by the International Society of Arboriculture (Certified Arborist) shall be retained to investigate and recommend appropriate measures to maximize the tree's potential for continued good health.
- C.** Trees with an six (6) inch or larger trunk diameter that are questionable as to health or safety shall be reviewed by a Certified Arborist and appropriate actions recommended.
- D.** Cross sections or other detailed design and topographic information may be required where trees are located adjacent to roadways, new slopes or critical areas. This information will be used to determine the appropriateness of recommended improvements to maximize the tree's potential for continued good health.
- E.** The following development control measures shall be placed as notes and incorporated into the designs of projects that have trees to be preserved:
 - 1. Only those trees marked with an "X" in paint at the base of the trunk are to be removed during construction.
 - 2. During construction, there shall be no grading, trenching, earth removal or addition, building pad formation or earth alteration of any kind within the drip line of any tree to be preserved.
 - 3. Prior to the construction phase of the project, a physical barricade shall be erected and maintained coincidental to the drip lines of all trees to be preserved. Within this barrier no construction related activities shall be allowed including, but not limited to, vehicular parking or material storage. The physical barricade shall be T-bars and 4-foot high wire mesh fencing, or orange fabric mesh.
 - 4. No trenching shall be allowed within the drip lines of trees to be preserved. If it is absolutely necessary to install underground utilities within the drip lines of trees, then boring or drilling methods shall be used.
 - 5. Paving within the drip lines of trees shall be minimized. When it is absolutely necessary, porous paving material such as turf-stone, interlocking pavers, or other materials designed by a Certified Arborist, and approved by the County Engineer, shall be used and no paving shall occur within 10 feet of their trunks. When asphalt or concrete paving is installed, piped aeration systems can be used, as an alternate to porous paving material, only when the paving material is installed within 6 inches from the original ground elevation. The piped aeration systems shall not be installed any deeper than 1 foot from the original ground elevation. A Certified Arborist or Licensed Landscape Architect shall approve the piped aeration system

prior to construction. No aeration systems shall be constructed within the County or public right of way.

10-8 CERTIFYING PAD ELEVATIONS

Upon completion of the grading and prior to acceptance of the subdivision improvements by the County, the Design Engineer shall verify the final pad elevations. The elevations shall be verified at the center and the corner of each pad. Elevation deviations of more than 0.20 feet shall be noted on the plans.

A signature block, shown below, certifying that final graded elevations in the field are the same as those shown on the plans, shall be included on the subdivision grading plans. The Design Engineer shall sign the signature block, certifying to the above, and provide one set of mylar or polyester film original record (as-built) grading plans to the County Engineer.

CERTIFICATE OF COMPLIANCE			
I hereby certify that the grades shown on these plans and as approved by the Planning and Public Works Department have been constructed to within 2/10th of one (1) foot of their indicated elevation for all lot pads and 1/10th of one (1) foot for other improvements shown.			
<i>(signature)</i> _____			
Project Engineer (printed name)	PE Number	Expiration Date	Date
I hereby certify that the pads for the following lots for this project have been tested for compaction in accordance with generally accepted test methods, and based upon the results of these tests, the compaction of said pads conforms to the recommendations of this project's geotechnical report:			
Lots: _____			
I also state that our firm observed the grading operations to a sufficient extent to evaluate conformance with the project's geotechnical report as approved by the County, and further state that based upon our observations, the grading for this subdivision conforms to the recommendations of said geotechnical report.			
<i>(signature)</i> _____			
Engineer (printed name)	PE Number	Expiration Date	Date

In addition, stormwater detention basin volumes shall be field verified. The Design Engineer shall submit volume calculations to demonstrate that stormwater detention basins provide the volume needed to detain stormwater, as required by the hydrology study.

10-9 MAINTENANCE OF ACCESS TO UTILITY FACILITIES

Continuous, suitable access shall be maintained during all stages of construction of any facility owned or operated by the County or other public agency or a utility providing essential services, such as, but not limited to, sanitary sewer, water, drainage, electricity, gas, telephone/communications, etc.