

## **SECTION 10 GRADING**

**10-1 GENERAL REQUIREMENTS** -- Grading shall conform to Sacramento County Code Chapter 16.04 and 16.44, except as modified by these Improvement Standards.

**10-2 PLAN SHEET DETAILS** -- In addition to the requirements of Section 3, the following items shall be included on grading plans:

- A. Slope symbols for 3:1 slopes or steeper, where grade difference exceeds one foot.
- B. Ridge and/or valley delineation.
- C. Typical lot grading details.
- D. Proposed spot and/or pad elevations.
- E. Flow directional arrows (off-site, around perimeter of development when adjacent to developed areas) and perimeter elevations at the property line.
- F. Existing spot elevations and/or contour lines on-site and off-site around perimeter of development. Where the existing terrain is not relatively flat, contour lines shall be mandatory. The spot elevations or contour lines shall be extended off-site for a minimum distance of 50 feet (flat terrain – 100 feet minimum) when adjacent to undeveloped areas.
- G. Existing trees (variety, size and elevation at base of all trees nine inches or larger).
- H. Retaining wall details (symbols, construction details, limits, and top and bottom of wall elevations).
- I. Back of sidewalk or curb elevations.
- J. Location and grate elevation storm drainage inlets.
- K. 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.
- L. Names of adjacent subdivisions.

- M. Off-site intersection property lines.
- N. Signature block for certification of pad elevations and geotechnical statement stating that the grading was performed in substantial conformance with the geotechnical report, and subsequent updates, by Consulting Engineer for subdivision projects.
- O. For all export projects:
  - 1. Location of spoiled disposal
  - 2. Spoil slopes to be 3:1 or flatter
  - 3. Finish spoil heights of 3 feet or less
  - 4. No spoil within 5' of property lines
  - 5. Spoil shall not block drainage
  - 6. Spoil shall be leveled and stabilized prior to acceptance of project
- P. Erosion control details as required in Section 11.

**10-3 ROLLING TERRAIN GRADING** -- Rolling terrain grading 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 permitted by conditions of approval, approved tentative grading plan or 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 reduced to an absolute minimum. Fills and cuts adjacent to the exterior perimeter property line shall be designed in accordance with the following:

- A. Fills -- Fills in excess of 2 foot shall not be allowed unless permitted by conditions of approval, approved tentative grading plan or approved by the County Engineer. When fills are unavoidable, they shall conform to Standard Drawing 10-1. If possible, fill slopes shall be constructed off-site, with the property line being situated at the top of the fill. A right of entry shall be required for all off-site fills prior to plan approval. A note shall be placed on the plans listing the name of the grantor and the date obtained. Suggested rights of entry forms are available at the Site Improvement and Permits Section.
- B. Cuts -- Cuts shall be constructed in accordance with Standard Drawing 10-2, except that the slope setback from the property line to the slope hinge point shall be a minimum of 2 feet for all slopes steeper than 5:1.

- C. Fences -- When fences are required, they shall be placed within one foot of the property line. The height of a fence shall be measured from the highest ground adjacent to the fence, regardless of the side that is developing.

**10-5 INTERIOR GRADING** -- Grading at interior property lines within shall conform to Standard Drawing 10-2 and the following:

- A. Property Lines -- Property lines shall be situated at the top of fill and cut slopes. Grading shall be such that surface runoff will not be allowed to sheet flow at the top of slopes, but will be allowed to sheet flow down the slopes. Property lines shall be situated at the top sides of retaining walls with a minimum setback of 1.0 foot from the property line to the retaining wall. See Standard Drawing 10-3.
- B. Slopes -- The maximum earth slopes allowed shall be 2:1 (horizontal to vertical) and the minimum shall be 1 percent. Minimum asphalt concrete surface slopes shall be 1 percent and minimum cement concrete slopes shall be 0.25 percent. All proposed slopes that are 3:1 or steeper shall be shown on the plans by some type of slope symbol delineation.
- C. Cross Lot Surface Flow -- Grading of residential or duplex lots shall be such that surface flow shall be restricted to a maximum of one lot flowing across another lot. Developments with situations that mandate grading which allows more than one lot to drain across another lot shall be required to provide a pipe system to maintain the one-lot rule. Any deviation from the above shall receive specific approval by the County Engineer.
- D. Lots on the low side of streets 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.
- E. Commercial developments shall not be allowed to “sheet drain” more than twenty five feet of site frontage to a public street. Area outside the 25-foot strip shall be graded to drain into an on-site drainage system.

**10-6 RETAINING WALLS** -- Retaining walls shall be in accordance with the following:

- A. Redwood retaining walls for interior property lines shall conform to Standard Drawing 10-3 as a minimum design. Construction details of redwood retaining walls on the plans shall not be required when reference to Standard Drawing 10-3 is made. When fences are to be constructed atop redwood retaining walls, 4" x 6" posts at 4' centers shall extend above the retaining wall and act as fence posts.
- B. Masonry or concrete retaining walls for boundary or phase lines shall conform to Standard Drawing 10-4 as a minimum design. Construction details of redwood retaining walls on the plans shall not be required when reference to Standard Drawing 10-4 is made.
- C. Design calculations stamped and signed by the Consulting Engineer shall be required for all walls exceeding 24 inches in height (excluding footing height) or when a fence is greater than 6 feet high is an integral part of the wall.
- D. All retaining wall within 8 feet of the boundary, phase, or right of way lines shall be either concrete or masonry.
- E. Grading shall be such that on-site runoff will not flow over retaining walls.
- F. Where pads on adjacent lots are 10 feet apart or less and the difference in elevation exceeds 2.5 feet, a retaining wall will required as per Standard Drawing 10-3 or 10-4.

**10-7 GRADING AT TREES** -- Grading near trees shall be in accordance with the follows:

- A. Grading under trees with aesthetic value (trees with a 9-inch diameter trunk or larger, measured 4-1/2 feet above the ground, in healthy condition, and all oak trees) shall be given special attention. Every reasonable effort shall be made to avoid removing trees or creating conditions adverse to the tree's health.
- B. The natural ground within the drip line of trees, especially oak trees, shall remain as undisturbed as possible. Grading within the drip line of oak trees requires a tree permit.
- C. Trees with 6-inch or larger trunk diameters that are questionable as to health, safety, or aesthetic value shall be reviewed by the County Tree coordinator. If a tree is found to be not worthy of saving, the County Engineer can approve its removal.

- D. Cross sections may be required where trees are located adjacent to roadways, new slopes or critical areas. In addition, a dimension from the face of a tree to some critical point or line may be required.
- E. The following comments regarding oak trees shall be included on all improvement plans where oak trees are to be saved;
  - 1. Only those oak trees marked with an “X” are to be removed during construction. (A Tree Removal permit and/or environmental document are required for removal of any oak tree with a 6-inch diameter trunk or larger, measured at 4-1/2 feet above the ground.)
  - 2. During construction, there shall be not grading, trenching, earth removal or addition, building pad formation or earth alteration of any kind within the drip line of any oak tree not marked with an “X”.
  - 3. Prior to the construction phase of the project, a physical barricade shall be erected and maintained coincidental to the drip lines of all oak trees not marked with an “X”. 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 hogwire fencing or orange fabric mesh.
  - 4. No trenching whatsoever shall be allowed within the driplines of oak trees. If it is absolutely necessary to install underground utilities within the driplines of an oak tree, they shall be either bored or drilled.
  - 5. Paving within the driplines of oak trees shall be stringently minimized. When it is absolutely necessary, porous paving material such as turfstone, interlocking pavers, or others material specifically approved by the County Engineer shall be used and no paving shall occur within 5 feet of their trunks. When asphalt or concrete paving is installed within 6 feet of the original ground elevation. The piped aeration systems shall not be installed any deeper than 1 foot, from the original ground elevation. The County Tree Coordinator shall approve the piped aeration system prior to construction. No aeration systems shall be constructed within the County right of way.

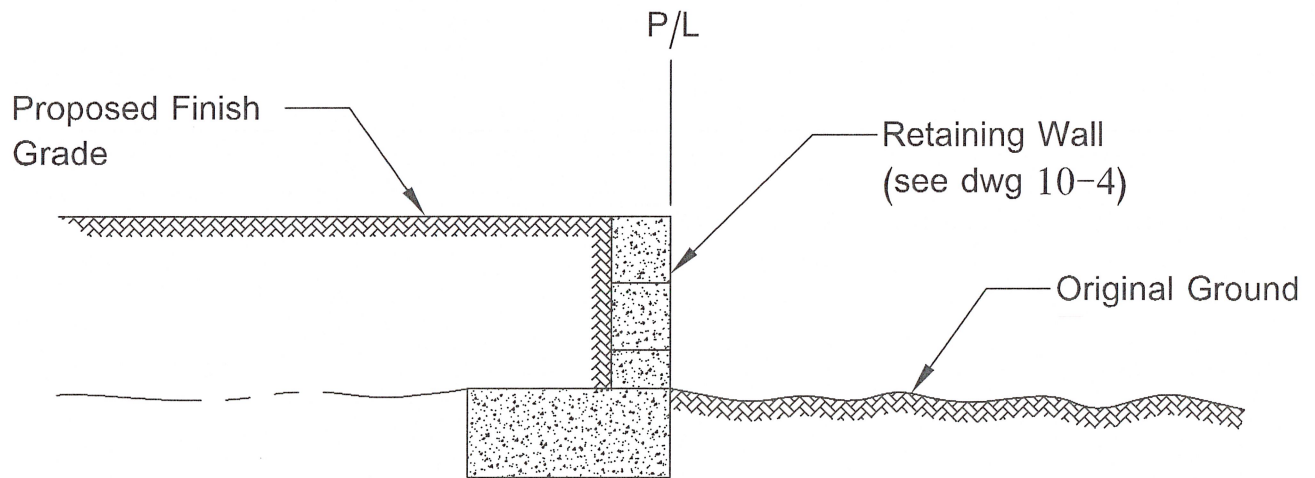
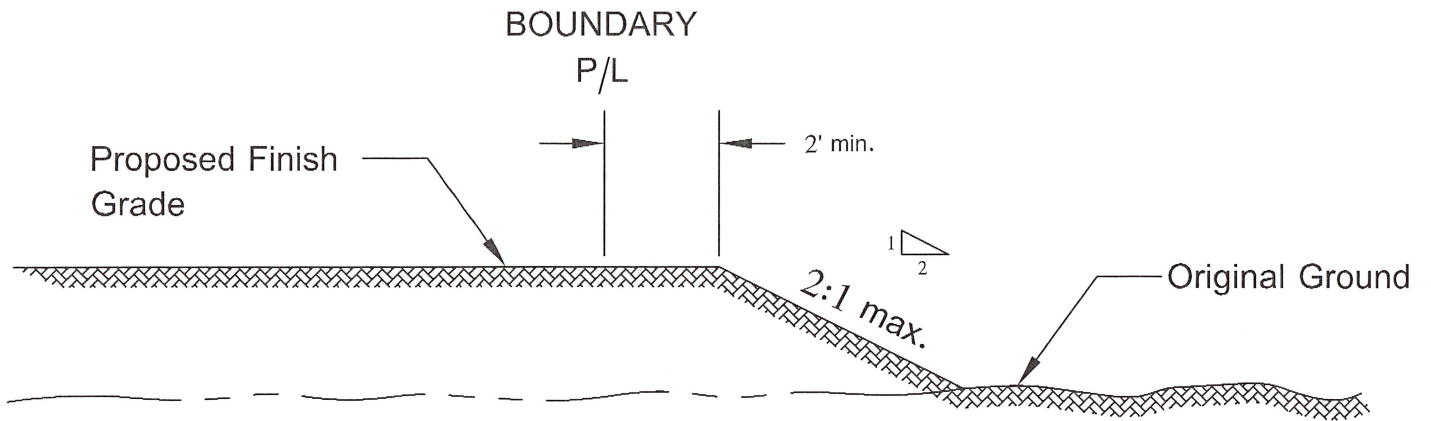
**10-8 CERTIFYING PAD ELEVATIONS & GEOTECHNICAL STATEMENT**

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

A signature block, certifying that final graded elevations in the field are the same as those shown on the plans, shall be included on the tracings of the subdivision grading plans. Also a signature block, stating that the subdivision was graded in substantial conformance with the geotechnical report and subsequent updates, shall be included on the plan sheets of the subdivision grading plans. The Consulting Engineer shall sign the signature block, certifying to the above, and shall provide three sets of record (as-built) grading plans to the County Engineer.

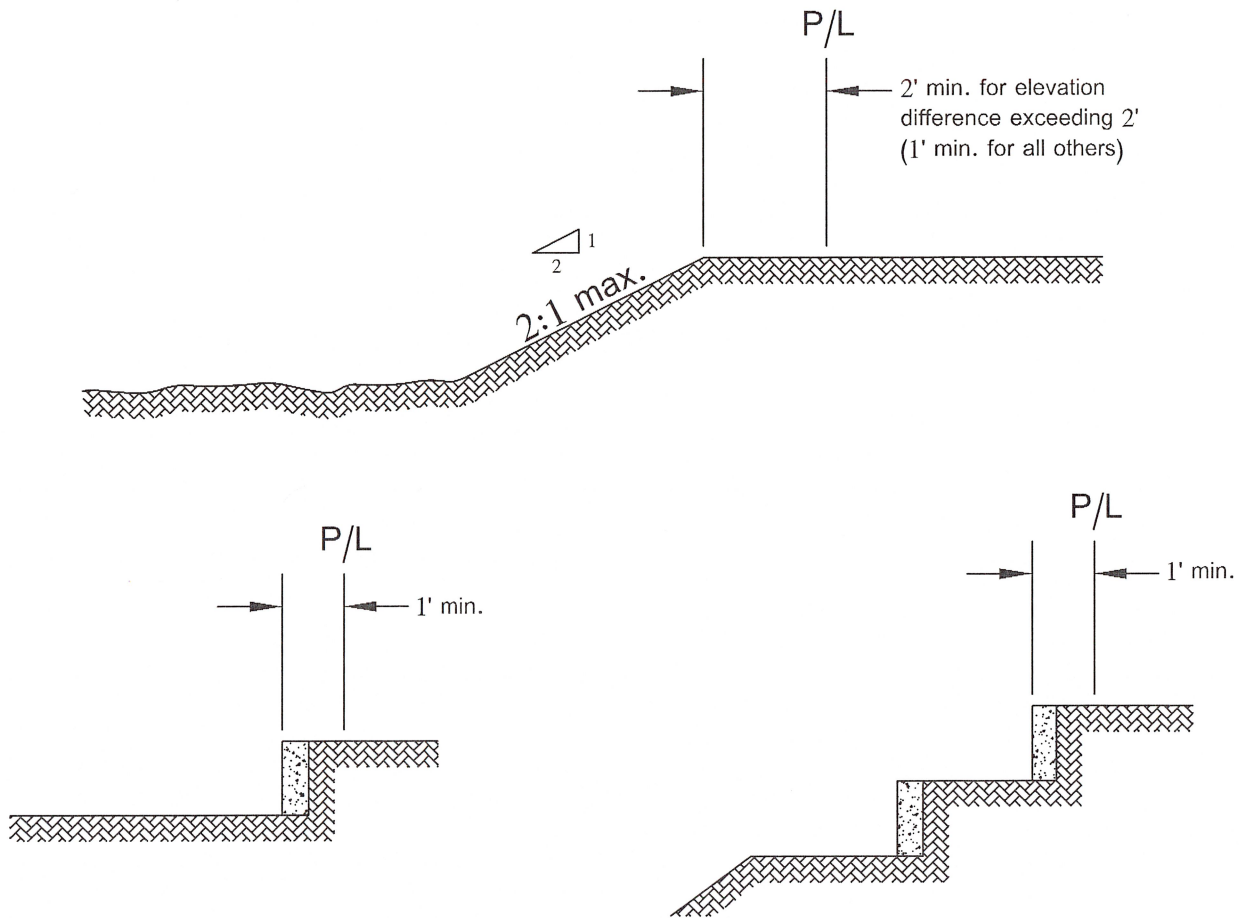
#### **10-9 MAINTENANCE OF ACCESS TO UTILITY FACILITIES**

Continuous, suitable access shall be maintained during all stages of construction of any facility owned or operated by a utility/district providing essential services, i.e. sanitary sewer, water, drainage, electricity, gas, telephone, etc.



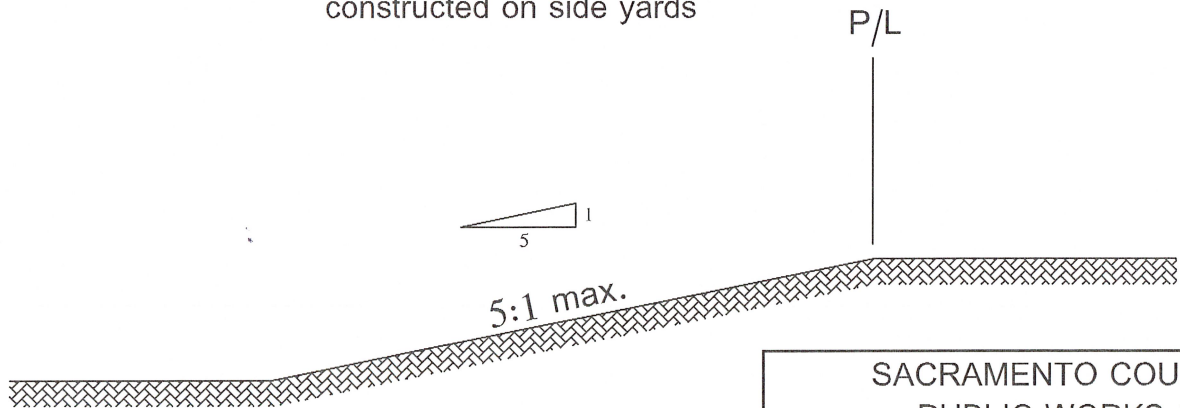
*Robert D. Davis*  
 COUNTY ENGINEER

SACRAMENTO COUNTY PUBLIC WORKS & INFRASTRUCTURE AGENCY	
Exterior Perimeter Property Line Grading for Fill Areas	
DATE: April 2018	10-1



**RETAINING WALL**  
(see dwg 10-3 and 10-4)

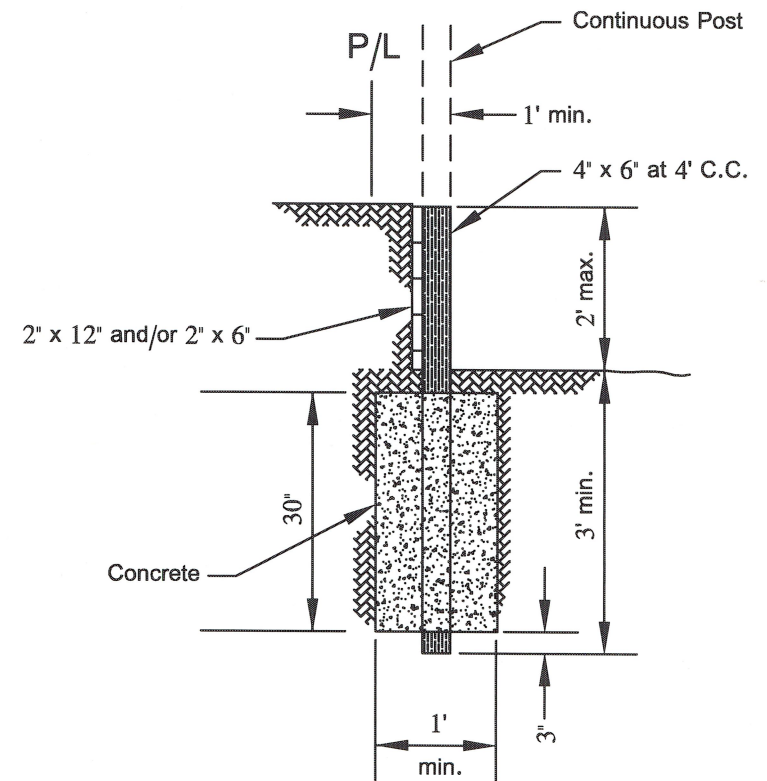
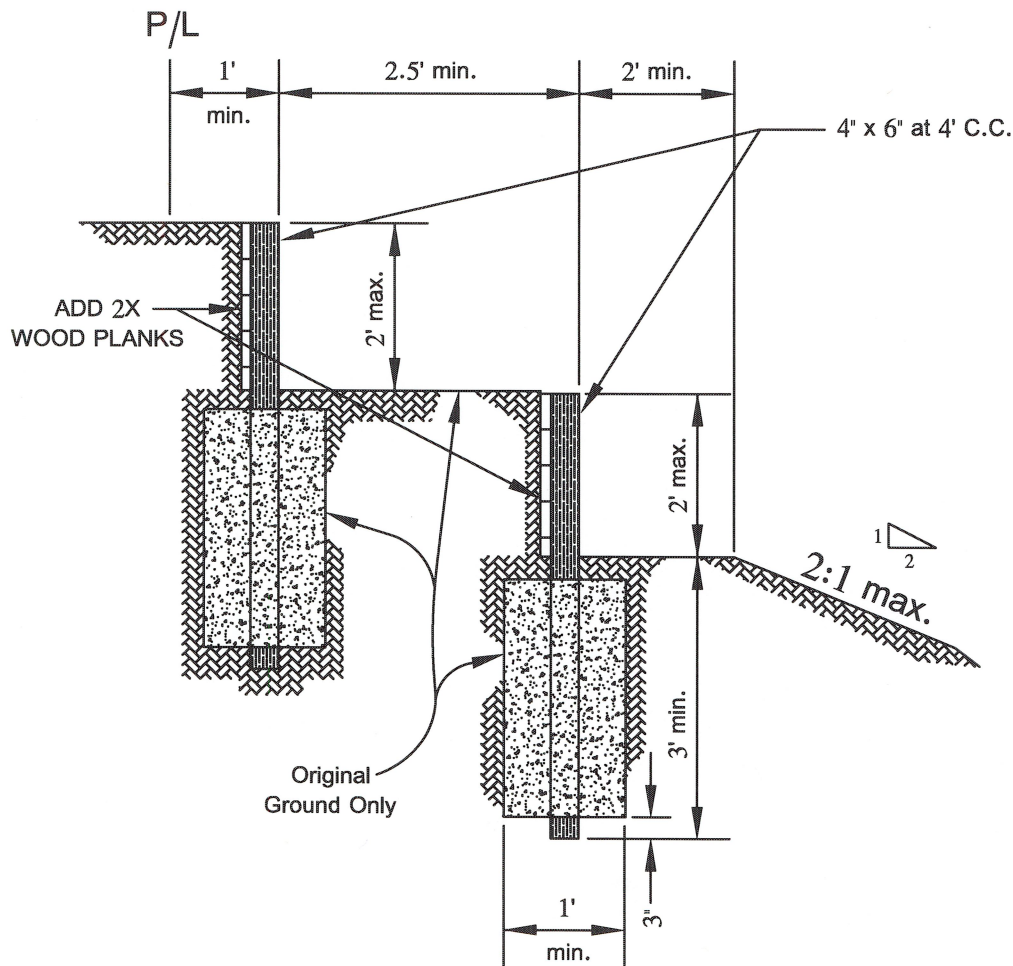
Note: No double retaining walls shall be constructed on side yards



*Robert A. De...*  
COUNTY ENGINEER

SACRAMENTO COUNTY PUBLIC WORKS & INFRASTRUCTURE AGENCY	
Grading for Interior Property Lines and Perimeter Property Lines in Cut Aresa	
DATE: April 2018	10-2





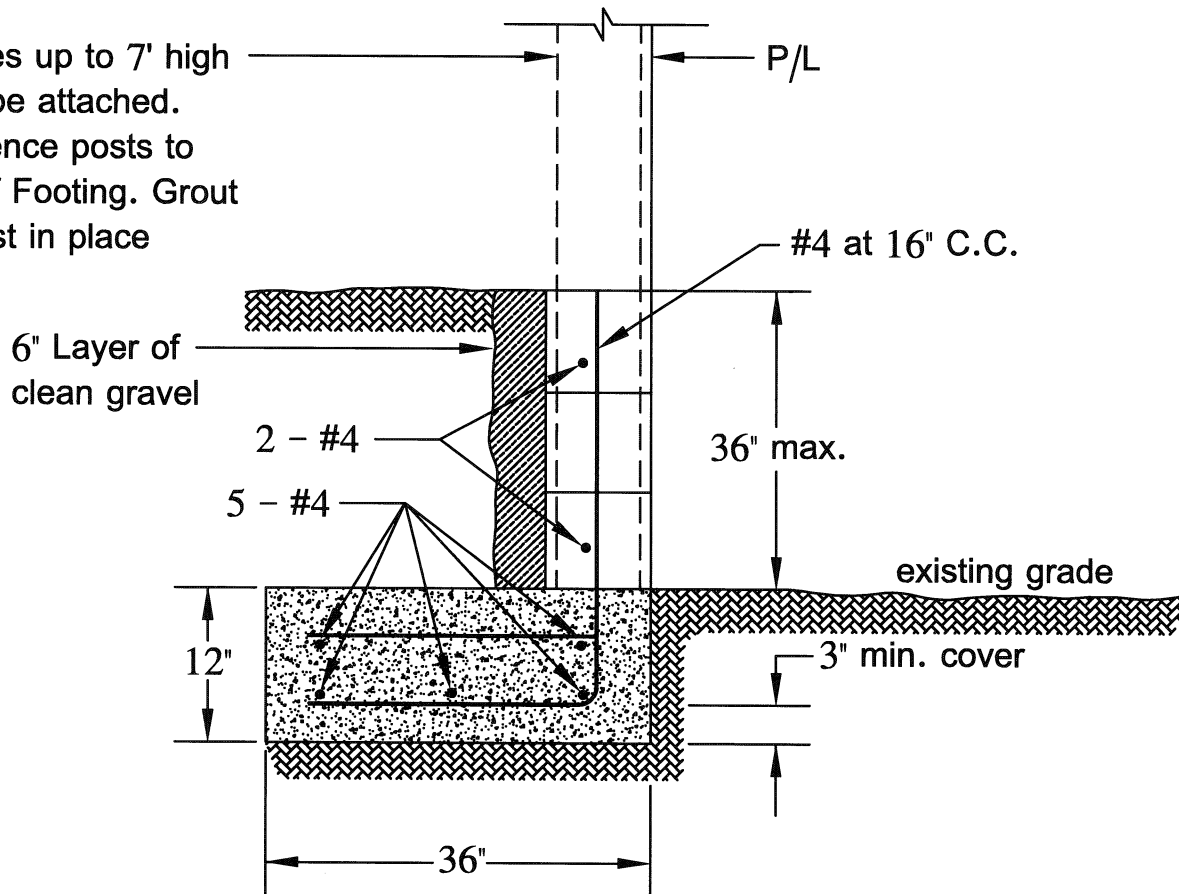
**NOTES:**

1. Material for walls shall be grade No. 2 or better redwood with no open grain material
2. Wood walls shall not be used adjacent to public rights-of-way.
3. All walls within 8 feet of a boundary or project phase line shall be constructed with masonry or concrete.
4. 4-inch by 6-inch posts at 4-foot on center shall be used as fence posts when fences are attached to retaining walls.
5. No double retaining walls shall be constructed on side yards.

*R.A. Paul*  
 COUNTY ENGINEER

SACRAMENTO COUNTY PUBLIC WORKS & INFRASTRUCTURE AGENCY	
Wood Retaining Wall Details For Interior Property Lines	
DATE: April 2018	10-3

Fences up to 7' high may be attached. Set fence posts to top of Footing. Grout or cast in place



$f'_c = 2,000$  psi

$f'_m = 1,500$  psi

$f'_y = 60,000$  psi

**NOTES:**

1. 8-inch, normal weight block with full grouting required
2. A 6-inch wide cast-in-place concrete stem wall may be used in lieu of masonry
3. Special inspection is not required
4. A building permit is required for walls exceeding 36-inches in height when construction details are not shown on approved improvement plans

*Robert A. Decker*  
 COUNTY ENGINEER

SACRAMENTO COUNTY PUBLIC WORKS & INFRASTRUCTURE AGENCY	
Masonry/Concrete Retaining Wall Detail for Fill Areas at Boundary and Project Phase Lines	
DATE: April 2018	10-4