DESIGN STANDARDS

SECTION DS 11

GRADING PLAN

DS 11-01 GENERAL: A Grading Plan shall be included in the Project Plans for subdivisions and for other projects as required by the City of Vacaville Grading Ordinance.

The **City Engineer's authority** for grading includes any grading performed with private development projects where any one of the three following conditions exists:

1. The total volume of earth moved is more than 5,000 cubic yards.
2. Where any quantity of earth is moved within a proposed subdivision development for any lot owned by the subdivision developer.
3. Where any quantity of earth is moved within the proposed or existing public right-of-way.

Exception: Any finish grading that is not located within the public right-of-way shall be reviewed and approved by the City Building Official.

The **Director of Public Work's authority** includes any grading performed under the direction of the City Engineer's authority as well as any grading performed as a component of City maintenance or a City Capital Improvement Project.

The **City Building Official's authority** for grading includes all other situations outside of the City Engineer's and Director of Public Work's authority.

A. INTENT: The intent of these Design Standards is to provide minimum standards for the design of grading and preparation of Grading Plans for private development projects. The volume of earth moved related to excavation for building foundations is not to be considered in the 5,000 cubic yard threshold described in the paragraph above. These standards are intended to establish uniform engineering standards for grading and Grading Plans and ensure that the City of Vacaville, State, and Federal codes, ordinances and other requirements are complied with.

Additionally these Design Standards are intended to provide minimum standards for erosion and sedimentation control in the design of City Capital Improvement Program (CIP) projects. Only Section DS 11-03, Erosion Control and Sedimentation Control Plan, shall apply to the design and Project Plans for CIPs. These standards are not intended to require that the City Engineer will review or approve the design or Project Plans for CIPs.

B. GOVERNING CRITERIA: These Design Standards in conjunction with the City of Vacaville's Grading Ordinance (Grading Ordinance), Floodplain Management Ordinance (See Title 14 of the Land Use and Development Code), Stormwater Management Plan, and Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) permit shall govern the design of grading and the preparation of Grading Plans as required by the Grading Ordinance. In the event that there is a conflict between these documents or with other "Current Standards", so defined hereafter, the Director of Public Works shall determine which document governs. These Design Standards are minimum standards and are intended to assist the Design Engineer, but not substitute for "standard of care" or competent work. The City Engineer/Director of Public Works at their sole discretion may require more stringent requirements for unusual circumstances, special conditions, and/or environmental constraints.

C. CURRENT STANDARDS: Grading design shall be completed in accordance with all current applicable laws, standards, and regulations, including but not limited to the current adopted California Building Standard regulating grading on private property found in the California Building Code and the *City of Vacaville Municipal Code*, and City Standard Specifications which include the Design Standards, Construction Standards, and the Standard Drawings.

DS 11-02 GRADING PLAN: The requirements for the preparation of the Grading Plan are as follows:

A. Grading Plans shall be prepared by a Registered Civil Engineer in accordance with aforementioned "Current Standards" and the Project Geotechnical Report, when a report is required with the Grading Plan or Permit.

B. When a Geotechnical (Soils) Report is prepared for the project, the Grading Plans shall include a certificate signed by the licensed Geotechnical Engineer indicating that he/she has reviewed the Grading Plan and finds it in conformance with the Geotechnical Report prepared by (insert the firm's name) and dated (insert date of report).

C. The Grading Plan must be approved by the City Engineer, and the Contractor, owner, or developer must obtain a grading permit prior to commencing grading or any other construction activity on the project site, including but not limited to clearing and grubbing. Disking or other measures for weed abatement are not considered an element of clearing and grubbing and is therefore exempt from the requirement of obtaining a Grading Permit. Tree removal is allowed prior to the approval of the Grading Plan if a Tree Removal Permit is obtained from the Community Development Department.

D. Before a Grading Plan is approved and/or a Grading Permit is issued, the Developer or Contractor shall prepare and submit an Erosion and Sedimentation Control (ESC) Plan for review and approval by the City Engineer. Additionally, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and submitted by the Developer or Contractor as required by the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge Associated with Construction and the requirements of the State Regional Water Quality Control Board (RWQCB). A copy of the SWPPP shall be submitted to the City Engineer for review solely for compliance to the ESC plan. The SWPPP and ESC plan must be in complete conformance with each other. No clearing and grubbing or any other grading operation shall occur on the project site until the ESC and Grading Plan have been approved by the City Engineer, a SWPPP has been submitted to the RWQCB and City Engineer, and a Grading Permit has been issued.

E. The Grading Plan shall be prepared and submitted on plan sheets of the same format, quality and size as required for the Project Plans.

F. The Grading Plan shall show each lot number, how each lot drains, and the pad elevation of each lot.

G. Each lot must drain to the street without crossing the property line of any other lot, unless otherwise approved by the City Engineer.

H. The differential in elevations at the property line between rear and abutting lot lines shall not exceed twelve (12) inches without constructing a retaining wall unless the City Engineer approves the use of graded slopes to address the differential in elevations.

I. If retaining walls are required, the design shall be included as a component of the Grading Plan and the walls shall be constructed of concrete or masonry block material in accordance with the City Standard Specifications. The walls shall have continuous footings or shall have grade beams or masonry courses embedded a minimum of eight (8) inches below the bottom of the retained soil to prevent sloughing under the wall. Wall profiles and/or cross sections shall be provided on the plans showing top of wall, bottom of wall and top of footing elevations at each step and at each change in horizontal direction.

J. There shall be no slopes steeper than 5:1 or walls constructed between the back of walk and the right-of-way line unless otherwise approved by the Director of Public Works.

K. Drainage from undeveloped areas must be picked up in a ditch or swale and collected into the City storm drain piping system at the right-of-way line, rather than spilling over the sidewalk unless otherwise approved by the Director of Public Works.

L. Every part of the project or subdivision must be designed with a stormwater overland release. The overland release shall be such that if any

portion of the storm drain system fails, water from a 100 year storm event will stand in the street no deeper than 1.0' below the pad elevation of any house, and no deeper than six (6) inches above the crown of the road. See Standard Drawing 4-01.

M. The Grading Plan shall clearly show (by contours, elevations, typical cross sections, etc.) the relationship of the Grading Plan to the existing ground and drainage pattern of adjacent properties.

N. Existing drainage patterns on adjacent properties must remain the same (or be improved to the satisfaction of the City Engineer) by the Grading Plan for the subdivision or other development.

O. The Grading Plan shall show all drainage facilities being installed labeling high and low points and curb elevations.

P. The Grading Plans shall identify trees to be removed with an"X" or other denotation approved by the City Engineer. Any trees not so marked on the Grading Plans are to remain and be protected from disturbance during construction. The Grading Plans shall label the common name for each tree and the trunk diameter measured from a height of four (4) feet above the ground surface.

Q. Lots shall be graded within 0.1feet of the elevations shown on the approved Project Plans.

R. The Grading Plan shall include the following note: "The Contractor shall not deviate in grading or any other component of construction without first obtaining approval of revised Grading Plans and/or Project Plans from the City Engineer".

S. The Grading Plan shall contain a note indicating that the Design Engineer will provide written verification to the Director of Public Works that entire project site including each individual lot drains in accordance with the intent of the Project Plans prior to the City acceptance of the work.

T. Prior to the City accepting the work included with the Grading Plan or Grading Permit and /or the Project Plans, the Geotechnical Engineer shall furnish the Inspector with a letter indicating that the construction was completed in accordance with the final Geotechnical Report and approved Grading Plan prepared for the project.

DS 11-03 EROSION AND SEDIMENTATION CONTROL PLAN:

A. PLAN: The purpose of the Erosion and Sedimentation Control (ESC) Plan is to provide best management practices or equivalent measures designed to control surface runoff and erosion, retain sediment on the project site, and prevent pollution of the site runoff during the period in which preconstruction and construction related grading and/or soil storage occur, and before final improvements or permanent structures are completed. The ESC Plan shall include sufficient engineering analysis to show that the

proposed erosion and sedimentation control measures are satisfactory for the period of preconstruction and construction. The ESC Plan must be in compliance with the Governing Criteria and Current Standards cited in these City Standards and the requirements of the RWQCB. The ESC Plan shall be included as a component of the Grading Plans and shall conform to the following criteria:

1. An ESC Plan must be submitted and approved for all projects prior to the Contractor performing any work on the site.

2. The ESC Plan shall be shown on a separate plan sheet unless in the opinion of the City Engineer the erosion and sedimentation control measures can be adequately described by reference to notes on the Grading Plans. The Design Engineer shall consult the City Engineer regarding the need for a separate Erosion Control Plan prior to commencing preparation of the Project Plans.

3. Attention is directed to the Grading Ordinance for the requirements for preparation of the ESC Plan. The Developer and/or Design Engineer shall comply with the requirements of the Grading Ordinance in preparation of the ESC Plan. The Grading Ordinance requires that preconstruction/construction and post construction conditions are addressed in an ESC Plan. If the erosion and sedimentation control can not be adequately denoted on a single plan to the satisfaction of the City Engineer, a separate preconstruction/construction plan and post construction plan shall be prepared and submitted to the City Engineer.

4. The Preconstruction/Construction ESC plan shall address the requirements to include but shall not limited to dust control, planting or seeding and maintenance of the erosion and sedimentation control measures and areas for concrete wash, storage, waste disposal, and parking.

5. Best Management Practice (BMP) solutions to be included on the plans must be approved by the City Engineer/Director of Public Works.

6. The ESC Plan(s), details, notes and calculations, must be a part of the plan check submittal package for issuance of the Grading Permit.

B. NOTES: The following are typical notes which shall be placed on the ESC Plan:

1. Erosion and sediment control measures shall be effective for the duration of the construction activity.

2. Earth berms or other appropriate methods of containment as approved by the City Engineer and provisions for runoff shall be constructed and maintained along the limits of disturbed soil upon which grading is not in progress to prevent erosion.

3. Storm drain improvements that are constructed and not connected to the existing system, including all structures and pipe inlets shall be protected from inflow or silt by installation of sand bag silt barriers or other measures approved by the City Engineer per the construction details shown on the ESC plan.

4. Adjacent properties which are or would be impacted by storm water generated by the grading of the project shall be protected from storm water, mud, silt, etc. on a daily basis.

5. Where construction will occur between October 1st and April 30th, and outside that period of time when rain is forecasted, temporary erosion and sedimentation control and storm drain measures shall be installed by the Developer and/or Contractor and shall be operational to ensure that downstream properties and City facilities will not be impacted by storm water run off or sedimentation. These measures may include temporary retention, detention, or siltation basins. The temporary erosion and sedimentation control and storm drain measures shall be in place before October 1st. The Grading Permit Permitee shall furnish the Director of Public Works with a letter of certification that all erosion and sedimentation control and storm drain measures are in compliance with the Grading Ordinance.

6. A minimum of 24 foot width and 50'length of drain rock, 1-1/2" diameter or larger, at a minimum depth of 6", shall be installed at all unpaved entrances to the site. This does not apply to any driveways closed by immovable barricades during construction.

7. All erosion and sedimentation control measures shall he maintained until disturbed areas are stabilized. Minor changes to the ESC Plan may be made to meet field conditions as long as the changes comply with the intent of the ESC Plan.

8. All sidewalk and paved areas shall be kept clear of earth material and debris. The site shall be maintained so as to prevent sediment laden runoff from entering any storm drainage system.

9. The ESC Plan(s) covers only the first winter during which construction is to take place. The ESC plan(s) are to be updated, resubmitted by a qualified representative of the developer, and approved prior to September 1 of each subsequent year until the City accepts the site improvements.

10. It is the responsibility of the Permitee to clean out sediment basins whenever the level of sediment reaches the sediment clean out level indicated on the plans.

11. It is the responsibility of the Permitee to protect temporary borrow areas and/or stockpiles with appropriate erosion control measures satisfactory to the City Engineer/Director of Public Works.

12. The Permitee shall clean paved streets with mechanical sweepers during and at the completion of construction. The use of water trucks to "wash down" the street is prohibited.

13. The minimum level of maintenance to be performed is as follows:

a. It is the responsibility of the Permitee and/or Contractor to inspect and repair all erosion control facilities at the end of each work day during the rainy season.

b. The Permitee shall inspect the erosion and sedimentation control measures every day of the storm event and immediately after each storm event. All repairs shall be made immediately when the measures are not functioning as intended. The Contractor shall notify the Inspector of any repairs or corrections made to the erosion or sedimentation control measures.

c. Sediment shall be removed and sediment traps restored to original dimensions when the sediment has accumulated within one (1) foot of the outlet elevation.

C. CITY CAPITAL IMPROVEMENT PROJECTS: The Director of Public Works will evaluate and determine the requirement to include an ESC plan with the Project Plans on a case by case basis for City CIP projects. Necessary erosion and sedimentation control measures shall be addressed by the Project Plans and/or project Special Provisions. In general, the Project Plans and/or project Special Provisions shall include measures to control surface runoff and erosion, retain sediment on the project site, and prevent pollution of the site runoff during the period in which construction related grading and/or soil storage occur. The ESC measures shall comply with the requirements of the Grading Ordinance.

The Design Engineer shall consider Best Management Practices in the preparation of the Project Plans to address post construction erosion and sedimentation due to storm water runoff.