



GRADING DESIGN STANDARDS

This check list establishes uniform procedures for the design and the minimum requirements for the preparation of Grading Plans in the City of San Marcos. It is intended as a guideline to uniformity and to provide the designer with sufficient information to prepare the desired plans with a minimum of uncertainty.

Completed	N/A	Description
		The project is located in the City of San Marcos and the limits of work are clearly identified
		Benchmark information is provided on the plans. The engineer-of-work shall confirm the proposed benchmark of the plan(s), exists, is not disturbed, and will not be disturbed or destroyed by the proposed grading and/or improvements. A different benchmark shall be referenced if this is a possibility.
		Include a LOCATION MAP showing a measured distance from the Project Site to nearest intersection. Direct the north orientation of the map towards the top of sheet or include a north arrow.
		Property owner's contact information with signature line for endorsement by property owner.
		A statement referencing the source of the existing topography as shown on the plans shall be included on the title sheet.
		A statement referencing the source of the basis of bearing as shown on the plans shall be included on the title sheet.
		The Declaration of Responsible Charge and Geotechnical Engineer's Declarations are provided and signed.
		The grading consists of the following work to be done in accordance with the latest edition of the following documents: San Diego Area Regional Standard Drawings, Standard Specifications for Public Works Construction ("Green Book"), City of San Marcos Grading and Excavation Ordinance, State of California Department of Transportation (CalTrans) Standards Plans, State of California Department of Transportation (CalTrans) Standard Specifications, State of California Traffic Control Manual, Vallecitos Water District Standard Drawings and Specifications.
		Legal description for the affected property is included.
		The Hydrology/Hydraulic Report is referenced on the title sheet
		Listed or graphical sheet index is provided.
		City of San Marcos standard Grading Notes are provided.
		Water District General Notes are provided, as applicable.
		Name, address and telephone number of engineering firm preparing the plans is provided.
		List of referenced as-built drawings used to depict existing conditions is included.



		Plans are prepared to an appropriate engineering scale (typically 10, 20, 30 or 40 scale horizontally).
		North arrow, scale and graphic bar scale are on all sheets with north arrow oriented up or to the right
		Plans comply with requirements of Safety Overlay Ordinance if in a FEMA identified flood plain (EIS and calculations by Engineer-of-Work that floodwaters won't be increased by more than one foot on adjacent properties).
		Underground storm drain systems have a surface flow "escape" route (in case of system failure) with "escape" flowline elevations lower than adjacent building pad elevations.
		Detail drawing and notes for any site specific (non-standard) structures (e.g. drain inlets, catch basins, clean-outs, outlet structures, headwalls, etc.) are provided
		Identify and dimension property including centerline, (also City limit line if applicable), right-of-way, easement lines, property lines and assessor's parcel numbers of adjacent parcels. If site improvements (e.g. curb, gutter, water, sewer, storm drain, etc.) are to be constructed based on these plans <u>and no other</u> (i.e. no improvement plans), all necessary data (bearing, length, delta, arc, size and type of material, etc.) shall be shown on the grading plan adjacent to the improvement or identified in a data table.
		Standard line types and line weights are used (e.g. centerline is a line-dash-line; property lines and right-of-way lines are line-dash-dash-line; new curb, gutter, and sidewalk are solid; storm drain lines are double dashed).
		Cut and fill ratios on proposed slopes are provided (2:1 Max). Note: The 2:1 slopes shall begin at the property or easement line (right-of-way) and "daylight" on site.
		Existing structures, trees, plants, shrubs, and contours on the entire property and within a minimum 50 feet of property lines as dashed lines or screened background to clearly designate from proposed work are shown. Contour labels shall be provided on major contour lines at minimum 100' intervals
		Specifically identify any existing facilities [e.g. existing fire hydrants, meters, poles, utility pedestals, overhead wires and/or underground conduits (electrical, telephone and cable television), vaults, water mains and laterals, sewer mains and laterals, valves, manholes, guardrails/barricades, street lights, driveway locations, curb and gutter, sidewalk, drainage inlets with channels and pipes, walls, fences, etc.] and whether the facility is "to remain," "to be relocated," or "to be removed."
		Designer shall acquire and reference as-built drawings from all local agencies (City, Water District(s), San Diego Gas & Electric, Pacific Bell, Cox Communications and/or Daniels Cablevision) to minimize conflict with existing facilities. POTHOLING shall be done as part of the design process as necessary to avoid conflicts.
		Specifically identify any proposed facilities (e.g. proposed fire hydrants, meters, water mains and laterals, sewer mains and laterals, valves, manholes, guardrails/barricades, street lights, driveway locations with widths, grades and types, curb and gutter, sidewalk, drainage inlets with channels and pipes, walls and fences with size and type, etc.).
		Show clearly how grading will affect areas at the lot lines. No off-site grading adjacent to lot lines is permitted unless a notarized letter of permission from adjacent property owner is on file at the City.



		Show the centerline station on all property lines at the point where said property line intersects the street right-of-way. Also show a spot elevation at said point based on the centerline elevation at the given station and the typical street section differential.
		Show typical drawing of berm or swale at top of slope with dimensions.
		Show top of curb or flow line elevations and percent of grade (or vertical curve data including length, B.V.C., E.V.C., G1, G2, K value, PVI elevation/station, and high or low point) of streets and driveways (desirable grades between 2% and 10%). Grades over 15% require specific approval from both the Engineering Division and Fire Department. (Note: Stationing shall be based on a centerline with either perpendicular or radial offset distance references).
		Applicable driveway details are provided. Radius-type driveways (see City's Radius Type Driveway handout) are shown for new or replaced driveways in commercial/industrial areas
		Concrete cross gutters are provided at street crossings where applicable.
		The City of San Marcos Master Trails Plan has been reviewed and trail improvements and trail easements have been incorporated consistent with the plan.
		Profile storm drain facilities (18" diameter and larger)
		Pipe slope (as percentage, minimum slope = 0.5%)
		Pipe D-load is specified (e.g. 2000-D or Class 4). Minimum standard for RCP is 1350-D.
		100 year quantity and volume of water ($Q_{100} = \underline{\hspace{1cm}}$ and $V_{100} = \underline{\hspace{1cm}}$)
		Unpressurized pipe capacity ($Q_{cap} = \underline{\hspace{1cm}}$)
		Hydraulic grade line (in profile)
		Existing grade at storm drain centerline (in profile)
		Finish grade at storm drain centerline (in profile)
		Location of adjacent surface and sub-surface improvements (e.g. water and sewer main, and lateral crossings, gas, electric, telephone and cable TV conduits)
		Strength classification and invert design alternative if a reinforced concrete box (RCB).
		Engineer-of-Work shall submit D-load design calculations for storm drain pipes which will have less than 2 feet or more than 40 feet of cover.
		Outside edge of proposed curb inlet (or wings) are at least 10' from any PCR or driveway wing (or other curb & gutter modification) so the 10" curb face at the curb inlet has sufficient length to transition back to a 6" curb face.
		The radius of the curb return shall be governed by the more highly classified street at the intersection (i.e. if a residential street intersects a prime arterial, the curb return radius will be 35' because the prime arterial has a higher classification). Also, the street right-of-way (typically 10' behind the curb) at the curb return shall follow the chord from right-of-way return to right-of-way return (not concentric to the return).