



Grading & Drainage Checklist

This checklist is a guide for submitting complete and accurate plans to the city. See your project's DR, PP, ZN, UP, the Design Standards & Policies Manual (DS&PM), and contact your Project Coordinator for specific requirements.

A. General Requirements

- 1. Cover sheet requirements per Plans Cover Sheet & Typical Sheet Checklist and DS&PM Section 1-2.
- 2. Basic plan requirements per DS&PM Section 1-2.
- 3. Show existing ground surface in profile. Show existing contours and topographic features in plan view.
- 4. Include drainage structures with stations and offsets.
- 5. Show street names.
- 6. Provide construction details for catch basins and drainage structures other than COS, MAG, or ADOT standard details.
- 7. Catch basins, inlets and outlets shall be compatible with pipe sizes.
- 8. Show headwall details
- 9. Show collar, transition and manhole details
- 10. Show design flows (discharge and velocity for 100-year event) at concentration points.
- 11. Show and label all rights-of-way and easements, such as Drainage, PUE, Water, NAOS, VNAE, etc.
- 12. Cross reference sheet numbers to grading plan and street and utility plans.
- 13. Provide erosion protection.
- 14. Provide volumes for detention basins. (As-Built drawings including capacity calculations must be certified by an Engineer Registered in the State of Arizona at the completion of construction.)
- 15. Provide minimum clearance (horizontal & vertical) from other utilities or underground structures. Show utilities in plan and profile.
- 16. Exclude storm drain hardscape from calculated NAOS areas. Show adjustments on exhibit.
- 17. Design must comply with Floodplain and Stormwater Regulation.
- 18. Provide FEMA information block and statement of certification. (All portions of the development within the 100 yr. flood zones must be identified.)
- 19. No public utility lines are permitted to pass under drainage basins.

B. Open Channel Structures

- 1. Provide design/construction details and specifications for drop structures, energy dissipaters, etc.
- 2. Show flowlines and slope.
- 3. Provide typical cross sections for each channel reach.
- 4. Show lining material below design invert
- 5. Detail all transitional areas.
- 6. Freeboard shall be provided.

Planning & Development Services Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ♦ Phone: 480-312-7080 ♦ Fax: 480-312-7088

Grading & Drainage Checklist (continued)

C. Box Culvert/Bridge

- 1. Show culvert profile with vertical alignments, stations, elevations, clearances, hydraulic gradeline, existing ground, design flow, frequency event, and headwater elevation.
- 2. Show culvert size, length, and material.
- 3. Provide trench and bedding details with reference to MAG specifications 601 as modified by COS.
- 4. Show proposed finished grade over culvert.
- 5. Provide structural calculations.
- 6. Provide cost estimate, certified by Civil Engineer.
- 7. Provide two (2) additional sets of plans for ADOT bridge maintenance program.

D. Pipe Culvert

- 1. Show pipe profile with vertical alignments, stations, elevations, clearances, and hydraulic gradeline.
- 2. Show pipe size, length, material, class. (Minimum pipe size in R.O.W. or public facility is 18" diameter.)
- 3. Provide trench and bedding details with reference to MAG specifications 601 as modified by COS.
- 4. Call out private facilities on the plans.

E. Storm Sewer

- 1. Show catch basins, scuppers, inlets, and manholes with construction notes, stations, and offsets.
- 2. Show pipe size, length material, class. (Minimum pipe size for public facility is 18" diameter.)
- 3. Provide pipe profile with vertical alignments, stations, elevations, clearances, conflicts, and hydraulic gradelines. Show finish grade above pipe.
- 4. Manholes shall be shown in plan and profile at all junctions and bends. Spacing per DS&PM, Section 5.102-E.
- 5. Catch basins and curb inlets shall be referenced to COS, MAG, ADOT, or COP standards.

D. At Grade Crossing

- 1. Provide flow capacity under roadway in accordance with City Code 37-42, #3.
- 2. Show limits of inundation of 100 yr. storm event.
- 3. Flow depth not exceed maximum allowable for 100 yr. storm event per City Code 37-42. Provide actual depth on plans as well as supporting calculations.

E. Drainage Basins

- 1. Provide drainage basin volume required (VR), volume provided (VP) on plans. (Final certification form including capacity calculations to be provided by an Engineer Registered in the State of Arizona.)
- 2. Demonstrate method of draining basin.
- 3. Provide overflow channel for drainage structures above grade.
- 4. Provide 3' maximum water depth.
- 5. Provide maximum side slope of 4:1.
- 6. Drainage basins to be located outside of rights-of-way and public easements.
- 7. Provide easement dedication, legal description, and exhibit for all ordinance basins and access to said basins.
- 8. Provide cross sections for clarity. See plan for location(s)

F. Drainage Report

- 1. Prepare drainage report according to DS&PM Chapter 4, Grading & Drainage.
- 2. Reference all applicable hydrology or hydraulic studies and improvement plans.
- 3. Show peak flow calculations.
- 4. Provide street capacity calculations.
- 5. Calculations shall demonstrate that 10- year storm in street does not exceed top of curb, and storm water runoff for 100 year storm to remain in ROW at a maximum depth of 8" above gutter flowline elevation.
- 6. Provide pipe capacity calculations
- 7. Provide inlet capacity calculations and flow-by calculations
- 8. Provide computer runs showing hydraulic gradeline, flow rates, and velocity calculations.
- 9. Provide floodwall structural calculations if applicable.
- 10. Provide structural calculations for headwalls if not COS, MAG, or ADOT standard details.
- 11. Provide drainage basin calculations that demonstrate volumes required and provided.
- 12. Provide 100-year water surface elevation calculation.

G. Drainage Report Exhibits

- 1. Provide a topographic map showing contributory drainage areas, site or parcel boundary, peak flows (Q100 for existing and proposed) entering and exiting the parcel.
- 2. Provide an aerial photo (city quarter section aerials) showing site or parcel boundary.
- 3. The detailed site plan shall show limits of inundation for the 100 yr. event, including retention/detention basins and point(s) of storm water outflow.

F. Permits

- 1. Provide proof of US Army Corps 404 Permit and /or complete Scottsdale 404 Certification form signed by the Owner or Engineer of Record.
- 2. Provide proof of ADEQ 401 Permit.
- 3. Provide copy of NOI and maintain SWPPP on site.
- 4. Provide haul route permit.
- 5. Obtain Maricopa County Dust Control Permit

G. Miscellaneous

- 1. Provide Storm Water Retention Waiver Form. See DS&PM Chapter 4.
- 2. Provide In-Lieu Fee Form for Storm Drainage Facilities per DS&PM Chapter 4.
- 3. Release or abandonment of easements.
Fee required \$_____
- 4. See Grading & Drainage Checklist

Planning & Development Services Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ♦ Phone: 480-312-7080 ♦ Fax: 480-312-7088