

Engineering & Design Standards

Edits to 2021 Edition for New 2022 Publication

Changes in blue to be highlighted at the April 5, 2022 Development Advisory Forum

Changes in red made as a result of review comments (posted for review 4/19-5/19 2022)

Section/Chapter	Topic	Changes
105	Arizona 811	References to Blue Stake updated to Arizona 811
105.5		minor text edits
105.8	Sheet numbering	Add requirement from 105.20 that overall sheet numbering be included in the sheet index.
105.25	Master utility sheet	Add water sample stations and gas connections Add subsection requiring master utility sheet to show ATC limits for phased construction of utilities regulated by MCESD (e.g. water and sewer).
105.36	utility conflicts	Added note that engineer is required to identify and resolve utility conflicts even if the City does not require a profile be shown.
105.36	plan/profile requirements	Added reference to water and sewer plan requirements in subsequent chapters.
106.4	PUE	PUE required for pipe
106.4	PUE	minor clarification of maintenance responsibilities
204.3	Signing & Marking Procedures	minor text edits
204.3.10	Signing & Marking Notes	Correct note to show regulatory sign sheeting to be Type IV. Updated sign layout submittal timing and contact information. Signs removed but not reinstalled shall be returned to the City of Mesa sign shop.
204.4	Traffic Impact Studies	minor text edits and formatting
205.4	Cross-slope	Revised cross-slope transition to be 2% to 1% at major intersections, with a maximum transition rate of no greater than 0.01%/ft.
205.5	Longitudinal Slope	Corrected subsection numbering
205.5.3	Grade change at intersections	Changed maximum grade break requirements for arterial/arterial intersections to apply to all major intersections. Added note to maintain positive drainage and spread requirements.
205.5.4	Intersection staking diagram	Changed requirement for staking diagram to all major intersections, not just arterial/arterial. Added requirement to show contour lines.
205.7	Vertical curves	Changed requirements for local streets.
205.8	Superelevation	Add requirement for a superelevation diagram (if use of superelevation is approved by City)
208	Turn and Deceleration Lanes	formatting change and minor text edits
209.4	Pavement tapers	formatting change
212.6	Median openings	minor text edit
216	Pedestrian facilities	minor text edits
216.10	Sidewalk ramps at Tee Intersections	Updated MAG detail reference to MAG 238 series

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Section/Chapter	Topic	Changes
218.5.2	Intersection design	Added new subsection relating to pedestrian pushbutton placement as a part of intersection design.
219.2	Residential driveways	Added reference to zoning ordinance section governing number and width.
219.3.1	Commercial Property Driveways	Minor text edit
219.8	Internal site circulation	Minor text edit
308.3	MCESD ATC	Added clarification of current requirement that each phase of water line construction requires a separate ATC
312.2	Hydraulic analyses	Added requirement that hydraulic analyses must be done for single family homes greater than 3600 SF
316.4	Water easements in unpaved areas	Added requirement that the water main must be centered in the access path for the entire length
316.4	Water easements	Deleted redundant language
316, 317, 416, 312	Water mains	Replaced "waterline" with "water main" throughout
316.5	Water main plans	Add requirement to show water sampling stations
316.9	Standard water main sizes	Prohibit use of 10", 14", and 18" water mains for City mains.
316.20	Water service line	Add requirement for insulating corp stops when water main has bonded joints or corrosion protection or monitoring
316.20.7	Corrosion test stations	Reinforced that test stations shall be located outside of pavement behind curb and sidewalk. Added that box and concrete ring be 2" above finished grade. Also, added requirement for insulating corp stops at copper service lines to electrically isolate main.
316.22.3	Joint restraint calculations	minor text edits
316.23.4	Access maholes	Access required for 30-inch and larger transmission mains, changed from 36-inch
316.23.5	Connections to transmission mains	minor text edits
317.6.1	Horizontally mounted gate valves	Changed from "generally not allowed" to "not allowed" (extremely high failure rate for horizontally mounted gate valves)
317.8	Tapping sleeves & Valves	minor text edits. Added requirement that taps for ARV lines be three feet away from joints, fittings, adjacent tapping sleeves or service saddles. Reverse taps are prohibited without written permission from Water Resources Department.
317.13.1	Air release valves	minor text edits
317.13.2	Air release valves	Require calculations to be signed and sealed by a registered Professional Engineer (P.E.) licensed in the State of Arizona

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317.14	Large water meters	Replaced manifolded 6" meters with manifolded 8" meters. The City no longer has a manifolded 6" meter assembly.
317.15	Specialized vaults	Deleted section and re-numbered subsequent sections
317.18	Fire line	Minor text edit
317.19	Water service line	Clarify that service lines may not cross parcel lines; minor text edits; clarify that water services may be joint trench with City of Mesa natural gas services, not other gas providers
317.19.3	Manifolded water services	Minor text edits
317.19.12	Water service size adaption for different size meter	Clarify that the required 48 inches of service line piping on either side of the meter box must be copper
317.19.14	Water service taps	Change requirement for wet tap from services larger than 2" to services larger than 3".
317.19.20	Water service line extension	Add section stating that the possibility of extending existing service lines will be reviewed by the Water Resources Department on a case-by-case basis
317.20.3	Manifolded water services	Added requirement that two manifolded 8" meters be used in lieu of 10" meters for new or replacement installations. The City can no longer supply 10" meters.
317.27	Available water meters	Deleted water meters no longer available and added 2-8" manifolded
317.29.14	Backflow prevention	Added text allowing the review of requests to install a backflow prevention device a different size than the water meter.
317.30.4	Location/accessibility of curb stops and flushing pipes	Adequate R/W or easement must be provided for curb stops to be outside of S/W, D/W, etc.
317.31.1	Water main termination	Clarify that "a minimum of one pipe length" is intended to be a minimum of eight feet of pipe required beyond a fitting prior to installation of the curb stop
403.1	Sewer availability	Minor text edits
416.2	Pressurized sewer systems	Minor text edits
418	Sewer connections	Added sewer connection requirements table
418.4.1	Sewer easement access	Increased required access path width to 12 feet from 10 feet.
418.4.2	Sewer easement access	Clarified that approach, breakover, and departure angles shall not exceed the camera truck or vector truck clearance dimensions shown in the related figures. Added vector truck clearance dimensions, Figure 4.2.
418.4.3	Sewer easement access	Clarified that while landscaping is allowed in easements per Arizona Administrative Code, no landscaping or other obstructions in permitted in or to encroach upon the access path.
419.1	Sewer Hydraulic Design	

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Section/Chapter	Topic	Changes
419.3	Sewer Hydraulic Design	Added - Slopes for sewer service laterals must be shown on the plans
422	Minimum Separations from Water Mains	Minor text edits
424	Trench Crossings	Minor text edits
426.3.3	Air release valves	Added requirement for odor control measures
430	Sewer pipe class	Clarify pipe may be C900 DR26 or thicker
433.3	Access routes	Minor text edits
433.7	Drop manholes	Removed one reference to MAG 426, Type B drop manhole and clarified that use of this detail is prohibited without written approval. Added requirement to evaluate peak buildout flows on capacity of drop manhole. Minor text edits.
418.3	Sewer Easements	Add design vehicle for access route
Drywells - Chapter 8		Edit assumed design rate to 0.1 cfs. Keep requirements to verify in the field.
501	Gas system	Updated contact information
502	Gas service availability	Updated contact information
Figure 5.1	Gas service area	Replaced map with current version
603	Contact for service	Minor text edits. Added reference to Electric Utility revenue study and developer's pa
Figure 6.1	Electric service area	Replaced map with current version
712	Wireless Facilities in the Right of Way	Add new section referencing guidelines for wireless facilities in the right of way
806.17	Underground retention	Added subsection clarifying that pipe used for conveyance cannot be counted as reten
806.21.2.1	Direct percolation	Added reference that ADEQ prohibits drywells within 100 feet of groundwater wells
807	Off-site storm water and street drainage	Added Street Drainage to section title
807.1	Off-site storm water and street drainage	minor edits
807.3	Off-site flow storm event	minor edits
807.6	Storm drain facilities	minor edits
807.7	Off-site flow definition	Added clarification

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807.9	Capacity calculations	minor edits
807.12	Storm drain facilities	Add statement that developments with private streets shall have a stormwater management system
807.13.3	Roadway culverts	Added requirement for minimum pipe culvert diameter of 24 inches. Allow for use of box culverts 3' to 4' in height with approval from Engineering and Transportation
807.14	Applicability of storm drain facility standards	Deleted & subsequent subsection renumbered
807.15.1	Catch basins	Added reference to MAG 542-2 (Type I, without sidewalk) as approved for detached sidewalk locations Deleted "on public streets," the intent to refer in general to inlet capacity calculations, not just to calculations for inlets on public streets. Update HEC-12 reference to HEC-22. Add reference to Maricopa County clogging factor table. Minor text edit
807.16	Catch basin Intlets	Added requirement for minimum 18" diameter for storm drain mains
807.24	Storm drain main	Minor text edit
807.24.2.1	Storm drain main	Minor text edit
807.24.2.1	Shallow manholes	Clarified cover requirements: Changed "shallow manhole" to mean one with less than 24" cover over manhole barrel AND less than 48" cover over storm drain main. Hydraulic grade line in public storm drain shall be a minimum of 1' below grate elevation at each inlet, not just City maintained inlets.
807.24.3	Hydraulic grade line	Added requirement to follow requirements of Drainage Design Manual for Maricopa County - Hydraulics
807.26	Channels	
807.26.4	Concrete lined channels	Changed "gunite" to "shotcrete"
807.26.5	Concrete lined channels	Changed minimum thickness from 4" to 5" and reference to ADOT Clarified that outfall elevations are to be shown on grading plans for both the ultimate site outfall and local basin/drainage area outfalls. Add requirement to show walls on grading and drainage plans and renumber subsequent subsections in 810.5.
810.5.4	Grading plans	
	Streetlight	
908.3	luminaires	Updated reference to Streetlight Technical Manual
908.8	Pole foundations	Updated reference to Streetlight Technical Manual
908.10	Conduits	Clarified conduit routing requirement to run in a straight line from pull box to pull box, removing the pole to pole
909.3.1	Power circuits	Added requirement that wire must be at least #4 AWG and that wire #6 or smaller must be identified by a solid color outer covering
909.4	Street light circuit	Removed reference to HPS
910	Streelight POS	Minor text edit

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913	Photometrics	Stated requirement that fixture schedule must match fixtures used in lighting analysis
914	Streetlight location	Added stipulation that streetlights may be placed in a raised median only with approval from the Transportation Department
915.6	Clearance from landscaping	Minor text edit
915.7	Clearance from landscaping	Minor text edit
918.3.4	Pull boxes	Clarified the pull boxes must be installed on both sides of the street wherever conduit crosses a street
918.3.7	Pull boxes	Revised requirement that pull boxes must be installed at each street light pole to no longer be dependent on conduit size
918.3.10	Pull boxes	Pull boxes within 3' of a driveway shall be traffic-rated
1003.1	Solid waste collection routes	Added reference to M-62.07 for street width requirements where on-street parking is allowed.
1004.1.4	Barrel collection locations	Stated requirement that barrels must remain on the same street as the dwelling where they are stored.
1004.2	Solid waste bin enclosures	Bin enclosures must be evenly spaced for tenant access.