



Chandler · Arizona
Where Values Make The Difference

Civil Engineering Improvements Plan Review Checklist

DATE: Plan check No:

PROJECT NAME:
LOCATION:

CIVIL PLAN REVIEWER:
PHONE NO:
E-MAIL:

Submittal No.

Standard comments are in black ink, see reviewer comment for additional clarification on requirements

**(red) denotes additional reviewer comment 1st submittal*

*** (green) denotes additional reviewer comment 2nd submittal*

**** (purple) denotes additional reviewer comment 3rd submittal*

The requirements referred to on the checklist can be found in [International Building Code](#), [International Plumbing Code](#), [City's Zoning Code](#), [Subdivision Code \(Chapter 48\)](#), [Technical Design Manuals \(TDM\)](#), [Maricopa Association of Government \(MAG\)](#), [Standard Details](#), and [Specifications](#).

Your application has been reviewed for completeness and has been deemed incomplete in accordance with SB1598. The following comments will need to be addressed to deem the plans correct and approvable.

GENERAL

1. Show the name of the proposed development or Capital Improvement (CIP) on the cover sheet.
2. Show the developer's or owner's name, address, phone number, and email on the coversheet.
3. Show the engineer's name, address, phone number, and email on the coversheet.
4. Add the following on the lower right of the cover sheet over the title block:

C. O. C. Log No.
5. Place a vicinity or site location map on the cover sheet. Show adjacent jurisdictions.
6. Place a legend identifying the symbols used on the cover sheet or detail sheet.
7. Place a sheet index with the following information on the coversheet.
 - a. Sheet Numbers
 - b. Drawing Number
 - c. Description
8. Place an index map with the following information on the cover sheet or in the plans:
 - a. Street names

- b. Lot, tracts, and parcel numbers
- c. Sheet numbers
- d. Phase limits and numbers if applicable

9. Add the following approval block to the cover sheet:

- a. For Capital Improvement Projects:

APPROVED:

TRANSPORTATION & DEVELOPMENT DIRECTOR	DATE
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CITY ENGINEER	DATE
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DEVELOPMENT SERVICES MANAGER	DATE
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- b. For all other projects:

APPROVED FOR COMPLIANCE WITH CITY CODE:

CITY ENGINEER	DATE
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DEVELOPMENT SERVICES MANAGER	DATE
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10. A portion of the improvement shown on your plans is within the jurisdiction of the state/county. Acquire the appropriate permit. Indicate the permit number on the cover sheet.

11. The development is adjacent to a current City project/Improvement District. Coordinate your plans with the City Project /Improvement District Engineer. Add the following approval block to the coversheet and acquire the engineer's signature.

APPROVED FOR COORDINATION (Add Project Name and Number)	DATE
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12. Add the following certification block to the cover sheet:

AS-BUILT CERTIFICATION:

I HERBY CERTIFY THAT THE "AS-BUILT" INFORMATION AS SHOWN HEREON WAS MADE UNDER MY SUPERVISION, OR AS NOTED, AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED LAND SURVEYOR SIGNATURE

PRINTED NAME

DATE

REGISTERED CIVIL ENGINEER SIGNATURE

PRINTED NAME

DATE

REGISTRATION NO.

EXPIRATION DATE

15. Add the following certification block to the cover sheet:

ADA COMPLIANCE CERTIFICATION:

I HERBY CERTIFY THAT THE EXISTING AND PROPOSED CURB RAMPS, SIDEWALKS AND ACCESIBLE ROUTE WITHIN THE R/W OR SIDEWALK EASEMENT MEET CURRENT FEDERAL ADA REQUIREMENTS AND THE CITY OF CHANDLER REQUIREMENTS AS SET FORTH IN TECHNICAL DESIGN MANUALS AND STANDARD DETAILS AND SPECIFICATIONS.

REGISTERED CIVIL ENGINEER SIGNATURE

PRINTED NAME

DATE

REGISTRATION NO.

EXPIRATION DATE

16. The following City of Chandler standard notes must be shown or updated to the most current version on the coversheet.
- a. [General Notes](#)
 - 1. Complete utility coordination block
 - 2. Complete benchmark information in note 4
 - b. [Water Notes](#)
 - c. [Reclaim Water Notes](#)
 - d. [Sewer Notes](#)
 - e. [Paving Notes](#)
 - f. [Grading and Drainage Notes](#)
 - g. [Signing and Striping Notes](#)
 - h. [Fire Department General Notes](#)
17. Each sheet of the improvement plans must be sealed, with signature, by the engineer preparing the plans.
18. The minimum height of all text and lettering shall be 0.1" (one tenth of one inch).
19. Surface shading and hatching must not obscure the proposed construction work.
20. Show the north arrow on each sheet.
21. Show phase limits and numbers on each applicable sheet.
22. Show match lines and sheet references on each sheet. Show stationing if applicable.
23. Show scale on plans. See City's technical design manuals for requirements.
24. Show existing buildings and other significant structures. If appropriate, note the removal of these items.
25. Perimeter traverse data is required for the project boundaries. This is the information required to define the land parcel legal description.

26. Provide the [FEMA](#) flood zone information on the cover sheet, including zone and map information. If any portion of the development is within a flood plain, submit plans and drainage report to the [Flood Control District of Maricopa County](#). FCDMC approval is required.

a. Add the following approval block to the cover sheet:

FLOOD CONTROL DISTRICT DATE
OF MARICOPA COUNTY

b. Acquire Flood Control District of Maricopa County approval and signature

27. Submit a completed [Civil Improvement/Encroachment Permit & Street Cut Application](#).

a. Provide separate applications for onsite vs. offsite plans

b. If trenching within an improved r/w, complete page 4 of the application and submit a separate folded plan sheet(s) showing all street cut locations

28. Complete and submit the following forms, if applicable:

a. [Certificate of Quantities](#)

1. Submit one for each phase

2. Submit separate forms for onsite vs offsite plans

b. [Offsite Construction Estimate](#) (include all work within r/w for performance bond purposes)

c. [Waste Water Discharge Questionnaire](#)

d. [New Non-Residential Water Use Plan](#)

e. [Water Meter Certificate](#)

29. Show construction of or upgrade to any curb ramp(s) adjacent to project including connections to curb ramps across the street, see [TDM#4](#) Sect. 3.12 for all requirements.

30. All existing sidewalk adjacent to development project is required to be evaluated and updated based on criteria called out in [TDM#4](#) Sect. 3.13.

31. Provide a traffic sequencing plan or traffic sequencing notes on the plans when a project will impact more than adjacent outside lane on an arterial street frontage. This is NOT a traffic barricade plan. The following items must be addressed within the sequencing plans/notes:

a. Detail all necessary lane closures with the minimal impact on traffic

b. Show or call out work to be completed in each phase

c. Provide a time frame for each phase

d. Include note, "Any deviations from approved sequencing plan/notes will require the City Engineer 's approval."

e. Install temporary pavement or millings in lieu of closing a lane.

32. An easement is required by separate instrument. Submit a completed Checklist for Processing Separate Instruments with all required information.

FIRE

1. For all commercial sites with a fire line add the following note:

All fire line thrust blocks shall comply with N.F.P.A. 24

2. For all commercial sites, show fire line backflow (double detector check assembly), buried swing check, fire department connection, fire riser line, fire hydrant line and post indicating valves as required, see [Fire Department Details](#) for requirements.

3. For all commercial sites, add the following note to the plans:

All underground fire lines must be DIP within 10' of double check detector, buried swing check, post indicator valve, fire department connection and the building, including vertical and above grade piping. The remainder of the line may be PVC C900 or C905.

4. All proposed commercial drive aisles must have adequate fire truck turning radius per [TDM#4](#), Figure 6 and meet the fire department minimum width called out in the Fire Department Details.
5. Show all existing fire hydrants adjacent to the property and within 500 feet of the property boundary.
6. Cul-de-sac dead end lines must have a fire hydrant installed at the end of the line. Locate the fire hydrant 6' from the back of curb and the valve in the pavement one foot from the lip of the gutter.
7. Fire hydrant installations must comply with the following requirements:
 - a. 500' maximum spacing along local, collector or private streets
 - b. 1000' maximum spacing along arterial street frontages (staggered at 500')
 - c. Fire hydrant installation must conform to [C-303](#) with type (color code) called out, [C-305](#) and [FD123](#)
 - d. Fire hydrants must be stationed or located with survey data
 - e. Onsite private hydrant(s) are required if the farthest corner of the structure (equipped with an automatic fire sprinkler system) is farther than 600' from an existing hydrant. The 600' must be measured along a hose-laying distance without crossing a wall, river rock or other structures
 - f. When an existing public fire hydrant is required to be relocated, a new hydrant is required and the existing one must be returned to the City

GRADING & DRAINAGE

1. The grading and drainage plans must encompass the entire development and all adjacent half streets to the monument line. Show all lots, tracts and parcel in their entirety.
2. Show the existing topography by contours. Spot elevations are required when the site's topography cannot be clearly defined by contours. Show existing spot elevations at all property corners and at a reasonable spacing, typically 50-ft intervals, throughout the site. Spot elevations are required immediately off-site adjacent to the project boundary in order to permit analysis of grade differentials and drainage. On large sites with significant natural slope, contours may be required.
3. Show spot elevations for all existing curb and gutter adjacent to the development and beyond the site limits to permit analysis of offsite drainage impacts on the project. Elevations must be shown adjacent to each property corner, at all grade breaks and at all scupper/catch basins.
4. Existing storm drain facilities such as retention basins, catch basin, scuppers and storm drain pipes must be shown and identified by type on plans.
5. Show the finished floor elevation of all buildings. The lowest finished floor elevation shall be 14" above the developments low outfall elevation, see [TDM #3](#) Sect. 3.7. Identify the finished floor and low outfall elevations on the plans, drainage exhibit, and within the drainage report narrative.
6. Storm drainage systems must comply with [TDM#3](#) and meet the following requirements:
 - a. All catch basins located within the right of way must be per MAG Standard Detail [533-1](#)

- b. Grated catch basin within a bike lane on the right of way must be equipped with a bicycle safe grate.
 - c. Trash rack per City Detail [C-503](#) is required for all pipe 12" and larger
 - d. All storm drain pipe size and material must comply with current [List of Approved Products](#)
7. Show construction details, cross-section and/or profiles for all proposed drainage facilities such as:
- a. Scupper profiles must include elevations at grade breaks with dimensions and elevations demonstrating no ponding within the right of way
 - b. Catch basins
 - c. Storm drain pipe (not including roof drains or equalizer pipes)
 - d. Underground retention system tanks
 - e. Hydraulic profile must be shown
8. Show existing and proposed top of wall elevations and finished grade elevations along both sides of walls. This is required in order to verify if wall is a retaining wall.
9. If one or more of the following wall conditions exist, a separate building permit for wall construction will be required:
- a. Retaining wall where the finished grade differential is in excess of 48 inches
 - b. Screen wall where the maximum exposed height is in excess of 7 feet
 - c. Retaining walls that support a surcharge load
10. Retention basin requirements must meet [TDM #3](#) Sect 6.11.1 and the following:
- a. A scaled cross-section is required for each retention basin.
 - b. Provide 1' contours for all retention basins
 - c. Show bottom of basin elevation and High Water Elevation of proposed basin(s) and any existing basin(s) to remain
 - d. Maximum design storm depth shall not exceed 3 feet
 - e. Maximum side slope are 4:1 for all retention basins
 - f. Show required and proposed volumes for each basin on grading and drainage plan
11. Show berm as required by Site Development. 1' contour elevations are required.
12. Water lines, including fire lines and water services are not allowed to pass under retention basin. This does not apply to paved parking areas used for retention.
13. Drainage of recessed loading docks must conform to the requirements of [TDM #3](#) Sect 6.11.5.4.
14. Cross-sections must be shown across commercial developments' property line boundary. All cross-sections must be to scale. Include all pertinent information on each cross-section (i.e. top of wall elevations, retention basin information, curb/gutter information etc.)
15. Provide a drainage report. Requirements for the hydrology report are presented within [TDM #3](#). The drainage report shall include the following as a minimum:
- a. Onsite retention must accommodate the 100-year 2 hour storm event onsite, all adjacent half street runoff, and an additional 10% volume for sedimentation. This must be retained entirely on private property and not within the r/w
 - b. An exhibit delineating each drainage area with the corresponding retention basins, and drainage structures. Provide arrows delineating drainage flow directions
 - c. Calculations showing the volume of retention required for each drainage area including an extra 10%
 - d. Calculations showing the volume of retention provided for each drainage area
 - e. Calculation determining the depth of ponding within each retention basin. The depth must include the required extra 10% noted above and not exceed 3'.

- f. A discussion concerning the low outfall elevation for each drainage area, including the effects of an overflow situation or back to back storms. The elevation must be called out in the report and shown on the exhibit and plans
 - g. A discussion concerning the minimum finished floor elevation within the development. This elevation cannot be below the appropriate low outfall elevation noted previously
 - h. Provide certified double-ring infiltrometer test results for each proposed retention basin. **Under no circumstance will testing be deferred to after completion of site grading**
 - i. Provide retention basin drain time calculations for each basin based on 50% attenuation of the infiltration rate. **ONLY** If the basin will not drain within 36 hours based on 50% of the percolation rate, then drywells will be required. Show calculations for the number of drywells required for each basin. The drywell design drainage rate shall not exceed 0.1 cfs until percolation tests are performed on drywell
 - j. Maximum depth of storm water retention on pavement shall not exceed 0.5ft
 - k. Street hydraulic calculations showing that the 10-year storm runoff is retained within the curbs.
 - l. Provide storm drainage inlet and pipe sizing/capacity calculations
 - m. Show all calculations, formulas and charts used
16. Underground retention storage tanks must comply with [TDM #3](#) Sect. 6.11.3 and the following criteria:
- a. Installation and backfill
 - i. The installation of the corrugated metal pipe for underground retention tank systems shall be in accordance with [MAG](#) Section 621. Excavation, bedding and backfill shall be in accordance with [MAG](#) Section 601, material per [MAG](#) Section 760
 - ii. For other systems, show a manufacturer approved backfill detail on the plans. The detail shall include the material and compaction requirements and must address backfill and compaction under the pipe haunches, to the spring line of the pipe.
 - iii. Provide a foundation footing detail for polypropylene chambers
 - b. Provide a geotechnical report showing information at each proposed location of the underground storage system. The report must include:
 - i. Soils boring results to a depth of at least 10 feet below the bottom of the proposed storage system, at each location, showing the depth of the proposed installation and noting the depth to groundwater.
 - ii. If permeable backfill system is proposed, a double-wall infiltration test shall be performed at the foundation level of the system. The soils engineer shall additionally evaluate whether the soils are suitable as a foundation in the saturated condition.
 - iii. For corrugated metal tanks, include in the report the following data:
 - 1. Soils pH
 - 2. Resistivity in ohm-cm
 - c. Submit documentation demonstrating that the design life of the underground retention system will be greater than 75 years, see Figure 6.3 in [TDM #3](#).
 - d. Show details for the lining and coating of the corrugated metal pipe storage tank(s) on the plans.
 - e. Submit calculations showing traffic and load bearing capacity of the underground retention system.
 - i. Show the pipe gauge and corrugation size for CMP on the plans
 - ii. Show the D-load for RCP on the plans
 - iii. Meet the manufacturer's minimum cover requirements for HDPE pipe. These minimum cover requirements may have to be exceeded in order to install the required access manholes

- f. Provide a minimum of two access points for each underground retention storage tanks.
 - g. The access shall consist of 48-inch manholes shafts with 30-inch manhole frames and covers at grade, per [C-400](#), except cover should show "RETENTION TANK". In lieu of solid covers, a grated lid may be used to allow for the inlet of surface storm water run-off.
 - h. The access must include a fixed ladder, anchored to the end wall of the storage tank. A structural engineer or the manufacturer must certify the structural integrity of the ladder installation.
 - i. Provide concrete collars, per [C-401](#), for all manholes located in pavement areas or subject to wheel loads.
 - j. Provide a minimum of 3 feet of cover, measured from the top of the tank to the bottom of the base of the pavement when located in traffic areas. Provide a minimum of 3 feet of cover over the tank in non-pavement areas.
 - k. Include a note on the plans specifying that all joints in the underground retention storage tanks system will be water-tight, manufactured joints unless the foundation has been approved for saturated foundation conditions, and an infiltration test has been performed.
 - l. Provide a detail on the plans showing the connection of the storage tank drain pipe into the interceptor of the drywell system. The invert of the drain pipe must be at or above the elevation of the inlet to the 4-inch cross over pipe to the drywell chamber. For projects with multiple drywells, provide a table showing these elevations.
 - m. The drain pipe from the storage tank to the drywell interceptor chamber cannot be used to convey water from a retention basin into the underground storage tanks.
17. Provide structural calculations for all drainage pipes subject to wheel loads, see [TDM #3](#) Sect. 6.6
18. Drywells must comply with [TDM #3](#) Sect. 6.11.5.3 and meet the following requirements:
- a. All drywell(s) must conform to the City details
 - b. All drywells involving petroleum based materials must include the "ENVIBRO" drainage system or equal
 - c. All drywell must be registered with the Arizona Department of Environmental Quality ([ADEQ](#)). A copy of the registration letter from ADEQ with Registration numbers is **required** prior to plan approval.
 - d. Identify existing drywells and label with ADEQ registration number(s)
 - e. Drywells must be located more than 20' from inlet and 100' apart.
19. A safety rail in accordance [TMD #4](#) Sect. 6.2, MAG 145 is required:
- a. Along the top edge of a structures adjacent to public pedestrian access ways where the grade difference is 30" or greater
 - b. Along structure which present a fall hazard of 48" or greater
20. Provide an Erosion and Sediment Control Plan. Refer to City's Stormwater Quality Protection Manual and [TDM # 3](#) Sect 3.6 for additional information.

COMMERCIAL

1. Show all existing buildings, transformers, cabinets, power poles, canals, irrigation ditches, septic systems, easements and other like significant structures. If any of these items are to be removed or relocated, they must be noted as such.
2. Improvements to existing and proposed public street, alleys, water lines, sewer lines and reclaim water lines will be required to be shown as a separate offsite improvement plan set. Deceleration lanes can be included with onsite plans.

3. Show all existing wells and their Arizona Department of Water Resources registration numbers on the plans. If not registered, so note on the plans. Register wells with the ADWR prior to any disposition. Provide documentation of registration to the City. Water wells are to be abandoned using standard abandonment method, per ADWR "Well Abandonment Handbook". Contact Sandy Story at 480-782-3588 to coordinate well registration and disposition.
4. Approval per [FAA](#) Regulation Part 77 is required. Written Approval to Construct from the FAA is required prior to City plan approval.
5. Complete and submit an avigation easement form for review for the following airport
 - a. Stellar Airpark
 - b. Chandler Municipal Aiport
6. Submit an infrastructure study.
7. The following information is required for existing utility lines in the streets/alley surrounding the development:
 - a. Location and size of water lines
 - b. Location and size of sewer lines
 - c. Location and size of reclaim water lines
 - d. Location of all power poles
 - e. Dimensional ties to utility lines being tied into
8. Potable water meters:
 - a. Show the location and size of all existing and proposed potable meters
 - b. All proposed water meters must comply with City Standards
 - c. Provide a water analysis for all domestic water meters that are 3" and larger. Meter sizing will be based on AWWA Standards for "Continuous Duty" in GMP.
 - d. Backflow prevention devices are required on the potable water services per City Standard Details and shall be located on private property immediately following the water meter box.
9. Reclaim water lines/meters:
 - a. Show the location and size of all existing and proposed reclaim meters
 - b. Provide reclaim water service connection per City Standards
10. All proposed drive aisles must have adequate fire truck turning radius per [TDM#3](#), Figure 6 and meet the fire department minimum width called out in the Fire Department Details.
11. Sewer lines:
 - a. All existing and proposed manholes shall be adjusted per [C-401](#) and Mag Spec 345
 - b. A waste water sampling manhole is required per City Standards for industrial projects
12. Traffic Signal Conduit:
 - a. If development is located on an arterial street, a traffic signal interconnect conduit is required to be installed per City Standard Details and [TDM # 4 & 5](#)
 - b. Any existing traffic signal conduit and associated pull boxes must be reconstructed per current City requirements in the case of street widening or installation of a deceleration lane
13. Payment of Buy-in fees is required prior to plan approval.

SUBDIVISION

1. Show a grading detail for a typical lot and a corner lot on the detail sheet. This detail must satisfy the following requirements:
 - a. The building finished floor elevation must be at least 14" above the subdivision's low outfall elevation
 - b. The lot grading must be sufficiently sloped to prevent storm water from ponding on the lot.
 - c. The maximum allowable elevation difference between adjacent yard elevations must be less than or equal to one foot.
 - d. Typical swale location and grade
2. Show the following information for each lot:
 - a. Proposed elevations at front lot corners
 - b. Proposed elevations at rear lot corners
 - c. Proposed finished pad elevations
 - d. Proposed finished floor elevations
 - e. Top and bottom elevations on retaining walls
 - f. All existing block walls on and adjacent to subdivision and retention basin perimeters, with top of wall elevations.
 - g. All proposed block walls on and adjacent to subdivision and retention basin perimeters, with top of wall elevations
3. Show all existing wells and their Arizona Department of Water Resources registration numbers on the plans. If not registered, so note on the plans. Register wells with the ADWR prior to any disposition. Provide documentation of registration to the City. Water wells are to be abandoned using standard abandonment method, per ADWR "Well Abandonment Handbook". Contact Sandy Story at 480-782-3588 to coordinate well registration and disposition.
4. Payment of Buy-in fees is required prior to plan approval.

PAVING

1. Submit a soils report containing the following information and profile views
 - a. Atterberg Limits test results
 - b. Sieve analysis, gradations, test results
2. The following information is required for existing streets:
 - a. Street name or "alley" label
 - b. Right-of-way width
 - c. Driveway locations on both sides of the street with dimensional ties to the centerline unless there is a divided median
 - d. Street light locations on both sides of the street with dimensional ties
 - e. Location of the curb, gutter and sidewalk. This is normally provided by the dimensional ties from the street centerline
 - f. Width of the sidewalk must be noted.
 - g. Extend and type of pavement with dimensional ties to the edge of pavement. Clearly show all areas of asphalt or concrete. Unimproved alleys should be noted as such.
3. Show on the detail sheet the typical sections for each street to be improved. The sections must include the following: and profile views:
 - a. Right-of-way widths
 - b. Width of sidewalk
 - c. Width of improved surface
 - d. Type of curb and gutter with standard detail called out
 - e. Pavement cross-sections, include preservative seal coat for local and collector streets
 - f. Minimum allowable pavement cross-section, inverted crowns are not allowed under any circumstance

- ii. 8' (mid-block) valley gutter per [C-233](#) is to be used where there is no stop controlled
 - b. Curb transitions, with standard detail number call-out
 - c. Curb return radii for streets intersection per [TDM#4](#) Table 4
 - d. Curb return radii for driveway intersection per [TDM#4](#) Table 7
 - e. Curb radii at cul-de-sacs per [C-232](#)
 - f. Curb radii at bubbles per [TDM#4](#) Figure 1
 - g. Survey monument with standard detail number called out
 - h. City limits where applicable
11. Show construction details, plan and profile views for all proposed drainage facilities, such as:
- a. Storm drains
 - b. Catch basins
 - c. Hydraulic profile must be shown
 - d. Scuppers, profile must include elevations at grade breaks and r/w line in order to demonstrate no ponding within the r/w
 - e. When catch basin are proposed within the r/w, the plans must also call out:
 - i. Catch basin per MAG 533-1
 - ii. Grated catch basins within a bike line must be equipped with a bicycle-safe grate, see [TMD#3](#) Sect. 6.5.2
 - f. Storm drain marker per [C-508](#)
 - g. Trash rack with hinges on bottom are required at all open ends of pipe 12" and larger per [C-503](#)
 - h. All storm drain pipe size and material must be per the [Approved Products List](#)
12. Show the following survey design items on each sheet:
- a. Station numbers with sheet references at all match line in plan or profile
 - b. Centerline survey data
 - c. Station number at all changes in street alignment, intersections, curb returns, and grade breaks in profile
 - d. Gutter and centerline spot elevations at all intersections
 - e. Centerline spot elevations at all intersections
 - f. Show grade break in plan view
13. Street geometrics must meet City standards for the following items:
- a. Centerline radii
 - b. Tangent lengths between curves
 - c. Tangent lengths at intersections
 - d. Pavement tapers
 - e. Intersections angles
 - f. Vertical curves lengths
 - g. Maximum longitudinal slope changes
 - h. Barrier median construction
 - i. Driveway installations
14. Sufficient existing off-site elevations are required to determine grade and direction of slope.
15. Structural design calculations are required for all storm drains subject to wheel loads.
16. Maximum allowable block length is 1200'.
17. Maximum length of cul-de-sac is 400'.

PUBLIC WATER

1. Include the following signature block on the cover sheet:

DOMESTIC WATER APPROVED:

**MARICOPA COUNTY
ENVIRONMENTAL SERVICES DEPT.**

DATE

2. Acquire Maricopa County Environmental Services Department approval and signature.
3. Provide a completed Approval To Construct application ([ATC](#)) for City Engineer's signature.
4. Place an index map with the following information on the cover sheet or succeeding sheets:
 - a. Existing water system including fire hydrants and valves
 - b. Proposed water systems including fire hydrants and valves
 - c. Pipe sizes
 - d. Sheet numbers
 - e. City limit lines were applicable
 - f. phase limits and numbers if applicable (including model phase)
5. The water line sizes must conform to the *City of Chandler Water Master Plans*.
6. Water lines shall be constructed in accordance with [MAG 610](#), bedding shall conform to [C-308](#) and locator wire and ID tape per [C-408](#).
7. All public water mains must be located in the r/w, a dedicated 16' water easement or a dedicated 24' water and sewer easement.
8. Show all existing public water lines and the nearest public fire hydrants.
9. Provide dimension ties for all water lines being tied into. Providing both station number and a dimensional tie from centerline usually satisfies these requirements.
10. Show proposed water lines with dimensional ties to the centerline. Water lines are required adjacent to all streets.
11. Install water lines in standard location per COC standard details [C-200](#), [C-201](#) and [C-202](#).
12. Provide a minimum of 48" of cover over all public water mains.
13. Show all existing and proposed public reclaim water lines on the plans.
14. Show stub-outs for all adjacent undeveloped property, unless otherwise justified. Also, provide water stub-outs for all major parcels within, or adjacent to, the development.
15. Install ductile iron pipe (mechanical-joint or restrained joint) through dip sections, including transitions to normal depth. Show all dip sections in profile view, include the following items:
 - a. Minimum vertical clearance of 2' from obstructions
 - b. Concrete encasement per MAG 404 if applicable
 - c. Thrust blocks or joint restraint with standard detail call-outs
 - d. Vertical and horizontal location of fittings
16. Show all crossing of existing or proposed utility lines in both plan and profile views.
 - a. Water and sewer crossings
 - b. Potable water and reclaim water (4" and larger) crossings
 - c. CIP projects also must include telephone, electric, gas, cable, and other buried lines where appropriate

4. Provide a completed [Sanitary Facilities for Subdivision](#) (aka Health Cert) Application for City Engineer's signature if providing sanitary sewer services and new public sewer.
5. Place an index map with the following information on the cover sheet or succeeding sheets:
 - a. Existing sewer system
 - b. Proposed sewer system
 - c. Direction of flow
 - d. Pipe sizes
 - e. Sheet numbers
 - f. City limit lines were applicable
 - g. Phase limits and numbers if applicable (including model phase)
6. A portion of the improvements shown on this set of plans is within the jurisdiction of the state/county. Acquire the appropriate permit. Indicate the permit numbers on the cover sheet.
7. Sanitary sewer pipe material must be the [List of Approved Products](#) located on the UDM.
 - a. The sewer line size must conform to the City's Wastewater Master Plan, both size and depth.
 - b. Provide 12" minimum sewer at ½ and ¼ section lines
 - c. Provide 8" minimum sewer at all other locations
 - d. All sewer main must have a minimum of 5' of cover
8. All public sewer mains must be located within the right of way, a dedicated 16' sewer easement or a dedicated 24' water and sewer easement.
9. Show all existing and proposed sewer lines being tied into in both plan and profile views.
10. Dimensional ties must be provided for all existing sewer lines being tied into. Provide both the street centerline station and the perpendicular distance (offset) from the street centerline usually satisfies this requirement.
11. Install the sewer line in the standard location per [C-200, C-201 and C-202](#). Where the sewer alignment is not parallel to the street centerline, the following requirements must be met:
 - a. Sewer lines are only permitted to cross and re-cross the street centerline for a short distance, providing that the sewer line maintains a horizontal clear distance of 3' or more from the lip of the gutter on the side of the street of the standard locations.
 - b. Manholes shall be located outside of the vehicular wheel path. Select a horizontal alignment that satisfies this requirement.
 - c. The sewer does not encroach more than 4' past the street centerline.
 - d. Maintain the standard distance of the sewer from the street centerline at each manhole.
12. Construct a manhole wherever the sewer changes slope, horizontal alignment, size, or intersects another sewer. The following conditions also must be met:
 - a. Sewer lines of different sizes entering the same manhole must not have their soffits lower than the soffit of the largest pipe
 - b. Sewer intersections must be between 90° and 180° inclusive
 - c. Sewer lines intersecting at an angle from 90° to less than 120° must have a 0.10' minimum drop across the manhole
 - d. For sewers greater than 15" in diameter, design inverts at junctions to maintain the energy gradient across the junction and to prevent backflow
13. Show the following items on the plans:
 - a. For existing and proposed manholes:
 - i. Rim elevation to the nearest 0.1'
 - ii. Invert elevation
 - iii. Sewer station

- iv. Dimensional ties i.e. station and offset from street center line to manhole
 - v. Where proposed manhole is constructed on an existing sewer, horizontal distance from the nearest downstream manhole and the slope of the existing sewer
 - b. Sewer station, invert and rim elevation of cleanout
 - c. Distance from centerline to centerline of manholes
 - i. 400' for lateral sewer less than 18" diameter
 - ii. 600' for interceptor sewer (18" and larger diameter)
 - d. Distance from centerline of manhole to centerline of cleanout
 - i. 150' for lateral sewer less than 18" diameter
 - e. Standard detail number for manholes (MAG 420 and [C-400 and C-401](#))
 - f. Standard detail number for cleanout MAG 441
 - g. Show the following street centerline survey data:
 - i. Stations at changes in horizontal alignment of the street
 - ii. For tangents: bearing and distance
 - iii. For curves: radius, central angle, arc length, and radial bearing for non-tangent curves
14. The minimum cover for a sewer line shall be 5'.
15. The minimum cover a sewer service line is 4 ½'. If cover on the sewer service tap is less than 4 ½' at the property line, the service must be sleeved with ductile iron pipe and further coordinate with dry utilities.
16. All sewer manhole installation must meet the following requirements:
- a. Manhole cover must be called out per [C-400](#) with collar per [C-401](#)
 - b. Manholes must be precast concrete per MAG 420 with a 5' diameter shaft modified without steps and a 30" diameter cover
 - c. Manholes in arterial streets and for sewers 18" and larger shall include corrosion protections. Specify corrosion protection and pesticide coatings in accordance with the list of approved products
17. Sewer line bedding must conform to [C-402 and C-408](#) for all types of pipe at all depths.
18. The sewer line slope must be shown and it must meet the minimum requirements per [TDM #1&2](#). The uphill terminal slope must be 0.52% or greater.
19. Show all crossings of existing utility lines in both plans and profile views
- a. Water and sewer
 - b. Sewer and Reclaim water 4" or larger
 - c. CIP projects also must include telephone, electric, gas, cable, and other buried lines where appropriate
20. Protection of waterlines consisting of concrete encasement is required; see MAG 404 for applicability. Ductile iron pipe is not allowed for sewer construction.
21. Cap all abandoned sewer taps.
22. Show a sewer service tap with station, either sewer station or station in relation to the nearest downstream manhole, for each lot.
23. Show a sewer stub-out at each manhole adjacent to undeveloped property, unless otherwise justified. Also, provide sewer stub-outs for all major parcels within, or adjacent to, the development. Whenever possible, extend sewer stub-outs sufficiently beyond paved surfaces to avoid pavement cutting at time of future connection. Show stub-out in both plans and profile views.

PUBLIC RECLAIM WATER

1. Include the following signature block on the cover sheet:

RECLAIM WATER APPROVED:

MARICOPA COUNTY	DATE
ENVIRONMENTAL SERVICES DEPT.	

2. For reclaimed water service submit the following applications to the appropriate agencies:
 - a. [Reclaimed Water Use Application](#) – Submit to Bob Goff, COC at Robert.Goff@chandleraz.gov
 - b. [Approval to Construct](#) – Submit to Maricopa County Treatment Program. Send signed Certificate of Approval to Construct to COC Civil Reviewer & Bob Goff.
 - c. [NOI, Type 2 Reclaimed Water General Permit](#) – Submit to ADEQ. Send approval to Bob Goff.
 - d. Reclaimed Water Agreement (provided to developer when all paperwork is in place) – Submit to Bob Goff, COC
 - e. [Water Meters Certificate](#) - Include both the reclaimed and potable meters for the project. Submit with construction plans.
3. Acquire Maricopa County Environmental Services Department signature on plans.
4. Reclaim water lines are required on this project. Add the following note to the coversheet:
This site plan will not be approved, nor will a Certificate of Occupancy be issued until the Reclaim Water Use Agreement is executed by the developer and approved by the City.
5. Reclaim water lines are required in street r/w adjacent to all projects south of the monument line of Pecos Road. The following requirements apply: and profile views
 - a. Install a 12” public reclaim line in arterial streets (south of Pecos)
 - b. Install an 8” public reclaim line in collector or local streets (south of Pecos)
 - c. Reclaim water mains must be installed in the standard location; see COC [C-200, C-201 and C-202](#)
 - d. Show all existing and proposed reclaim water lines on the plan. A minimum of 6’ separation is required between reclaim water and sewer line
 - e. Crosses must be at intersections of an arterial street with another arterial street
 - f. Extend laterals sufficiently beyond paved surfaces to avoid pavement cutting at the time of future connection
 - g. Two (2) valves are required on each tee and three (3) valves are required on each cross
 - h. Valve box installation must conform to [COC C-406](#)
 - i. Plans must refer to valve blocking per MAG 301
 - j. Valves are not permitted within a sidewalk or curb ramp
 - k. All valves must be stationed
 - l. Install a blow off valve per [C-300](#) at the end of main line
 - m. Show all reclaim water lines and utility crossing in both plans and profile view

STREETLIGHTS

1. Add the following approval block to the cover sheet:

APPROVED:

TRANSPORTATION ENGINEER	DATE
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DEVELOPMENT SERVICES MANAGER DATE

- 2. The following current City standard notes are required on the coversheet and profile views
 - a. [General Notes](#)
 - i. Complete utility coordination block
 - ii. Complete benchmark information in note 4
 - b. [Streetlight Notes \(APS\)](#)
 - c. [Streetlight Notes \(SRP\)](#)
- 3. Provide quantity tabulation on the coversheet, include the following: and profile views
 - a. Quantities must be tabulated separately by phases
 - b. Separate private streetlight quantity from public streetlight quantity
 - c. Clarify between relocated streetlights and new streetlights
- 4. The following block must be shown on the coversheet:

Utility Job Description

SRP/APS Job Order Number _____
DDC/Designers: _____
Job Name: _____
Job Address: _____

Type (Hype, LED, other): _____
New or Existing Cabinet: _____
Existing Cabinet Number: _____
Consumption (system watts): _____

- 5. Include the following certification on plans coversheet.

I hereby certify that setbacks for streetlights on all streets shall be a minimum of 2.5 feet back of curb and 1 foot from sidewalks.

REGISTERED CIVIL ENGINEER SIGNATURE PRINTED NAME DATE

REGISTRATION NO. EXPIRATION DATE

- 6. Provide a legend on the plans identifying the following items: and profile views
 - a. Luminaire description (LED)
 - i. Refer to section 2 of [TDM#6](#) for luminaire requirements. Specify wattage, initial lumens, manufacturer etc.
 - ii. Provide manufacturer's cut sheet on the plans (min text size 0.1")
 - b. Provide a light level or point by point calculations showing illumination requirements are met per [TDM#6](#) Appendix A on the plans.
 - c. Luminaire mounting heights
 - d. City Standard Detail number for type of pole (SL-1 for most installations, SL-10 for City Center area, SL-16 for decorative pole on local or collector streets or SL-17 where necessary along arterial streets for clearances from overhead power lines).
- 7. The following information is required for each existing street within and adjacent to your development: and profile views
 - a. Name
 - b. Right-of-way width
 - c. Improved width of street, typically street centerline to back of curb dimensions

8. The following information is required for each proposed street within and adjacent to your development: and profile views
 - a. Name
 - b. Right-of-way width
 - c. Improved width of street, typically street centerline to back of curb dimensions
9. All existing and proposed waterlines and fire hydrants must be shown.
10. Provide dimensional ties to waterlines and fire hydrants where potential conflicts may occur.
11. Provide locations of existing streetlights within 300' from the first proposed streetlight include details of luminaire type, output, wattages, mounting heights and pole types.
12. Streetlights on lot frontages in residential areas must be located at property lines. Lights on non-frontage conditions may be located by station only. Provide station and offset dimension from centerline of street for all streetlights.
13. Streetlights must be located at all intersections per [TDM#6](#).
14. Arterial/arterial intersections must have four lights.
15. Street light spacing requirement is 180-200 feet between lights.
16. Private streetlights must be labeled as such and must meet public street light illumination standards per [TDM#6](#).
17. Coordinate the street light plan with the engineer preparing other improvement plans.
18. Lights in elbows and cul-de-sacs (anywhere other than standard street locations) require radial ties.
19. Survey data is required for street centerlines (bearing and distance).
20. Provide stations at all intersections and changes of alignment.

LANDSCAPING

1. Existing landscape within the City right of way shall be protected in place or replace. Contact Bart Brown with the City of Chandler Street Department at 480-782-3428 prior to the start of construction.
2. Existing trees within the City right of way shall be protected in place or replace. Contact Bart Brown with the City of Chandler Street Department at 480-782-3428 prior to the start of construction.
3. Landscape design plans are required for the adjacent arterial median.
 - a. New median
 - b. Existing median requires upgrades
 - c. Submit landscape plans with next civil submittal

EROSION AND SEDIMENT CONTROL PLAN (ESCP) REQUIREMENTS

Erosion and Sediment Control Plan (ESCP) – A site plan or map identifying erosion and sediment control measures, stormwater best management practices, and site conditions and activities that may prevent and/or minimize the discharge of pollutants. A site plan or map is a required component of the site specific Stormwater Pollution Prevention Plan (SWPPP), as outlined in the AZPDES General Permit for Discharge from Construction Activities, administered by the Arizona Department of Environmental Quality (ADEQ).

Stormwater Pollution Prevention Plan (SWPPP) – A written plan that meets the requirements of the AZPDES General Permit for Discharge from Construction Activities, administered by the Arizona Department of Environmental Quality. The SWPPP is a site specific plan that includes but is not limited to, the identification and description of potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction activity, stormwater best management practices that will be implemented and maintained to prevent and/or reduce discharges of pollutants, erosion and sediment control measures, stabilization practices, structural practices, housekeeping, site description, activity schedule, maintenance procedures, post construction management, inspections (frequency, scope, and compliance evaluation reporting), and recordkeeping.

1. Add a cover sheet and submit the ESCP into the construction plan set. See [ESCP Checklist](#), the [ESCP Example Cover Sheet](#), and the [ESCP Example Sheet 2](#) for examples.
2. Show the name of the proposed development on the cover sheet.
3. Show the developer's name, address, phone number, and email on the cover sheet.
4. Show the engineer's name, address, phone number, and email on the cover sheet.
5. Place a vicinity or site location map on the cover sheet.
6. Place an index map with the following information on the cover sheet:
 - a. Existing storm drainage system components
 - b. Proposed storm drainage system components
 - c. Sheet numbers
 - d. City limits where applicable
 - e. Phase limits and number if applicable
7. Show Erosion and Sediment Control Plan notes, as outlined in the [Erosion and Sediment Control Site Plan example](#).
8. Add the following on the lower right of the cover sheet over the title block:

C.O.C. Log No. _____

9. Insert an [index sheet](#) with the following information succeeding the cover sheet:
 - a. Project Description
 - b. Hydrologic Information
 - c. Soil Stabilization Measures
 - d. Erosion/Sediment Control Measures
 - e. Certification of Compliance With Federal, States and Local Regulations
 - f. Schedule of Major Activities
 - g. Inventory of Pollutants
 - h. Spill Prevention, Response and Cleanup
 - i. Stormwater Pollution Prevention Plan Certification
10. The minimum height of all text and symbols must be 0.1" (one tenth of one inch).
11. The engineer preparing the ESCP must seal, sign, and date each sheet of the improvement plans.

12. Show phase lines and sheet references on each sheet.
13. Show construction ingress/egress locations.
14. Show location of structural and non-structural controls identified in the ESCP.
15. Show the approximate slopes anticipated following major grading events.
16. Show locations of off-site material, waste, borrow areas, or equipment storage areas.
17. Show areas of soil disturbance.
18. Show areas not to be disturbed.
19. Show areas where final stabilization practices are expected to occur.
20. Show locations of all surface water bodies.
21. Show locations where stormwater may discharge to a surface water or MS4.
22. Show areas where final stabilization has been accomplished.
23. Details, standards and specifications for applicable Best Management Practices (BMP's) to be implemented on-site shall be illustrated In the ESCP.