GENERAL NOTES:

1. Any changes from approved plans must be submitted to EPCOR for written approval prior to installation.
2. Contractor shall keep a clean, current set of contract drawings as a record of the location of all work completed as part of the project. Revisions, additions, and deletions shall be annotated on the record set of drawings in Red. Contractor shall ensure that survey-grade GPS equipment is used to record northing, easting, and elevation data for certain buried appurtenances. For water mains, appurtenances to be located include valves, crosses, tees, bends, reducers, and other fittings as required by the construction inspector. For sewer mains, appurtenances include the rim and invert elevations of manholes, clean-outs and other features as required. GPS coordinates will utilize the North American Datum (NAD) 1983, State Plane Arizona Central Zone in Maricopa and Santa Cruz counties, and State Plane Arizona West Zone in Mohave County. All units will be in US feet. Prior to completion of the work, provide the red-lined drawings to the Engineer of record for preparation of the project Record Drawings. Final completion will not be made until the Engineer of Record receives satisfactory red-lined drawings.
3. Contractor shall notify EPCOR Construction Inspections Department 48 hours in advance of any construction. Use the Contact List in EPCOR's Developer Guide to schedule inspection (EPCOR general phone number is 623-445-2400). When appointments for inspection are arranged at least 48 hours in advance, the inspection/test will be conducted as scheduled, otherwise the request will be scheduled based on availability.
4. Contractor shall be responsible for obtaining required permits and inspections from appropriate governmental agencies for all work in public rights-of-way (Maricopa County Department of Transportation, City Engineering Department, etc.). Inspections by EPCOR do not relieve contractor of responsibility to obtain required inspections from other interested governmental agencies (Building Safety, Fire District, etc.).
5. All work and testing shall be in accordance with Maricopa Association of Governments (MAG) Standard Specifications and Details unless otherwise stated on plans.
6. All potable waterlines and fittings shall have NSF-PW seal. All materials and products used in the potable water system shall conform to NSF Standards 60 and 61 in accordance with AAC R18-4-213. All materials shall be lead-free as defined in AAC R18-4-101 and R18-4-107.
7. Pipe Separation:
   a. Separation between water and sewer lines will be a minimum of 6 feet from outside edge to outside edge of pipe. Two feet separation is required between water lines, storm drains, and dry utilities.
   b. Vertical and Horizontal separation of pipes and pipe crossings of varying degrees of water quality shall be in accordance with State & local government requirements.
8. Dip Section: All dip sections shall be constructed of restrained ductile iron pipe (DIP) per EPCOR's STD. DET. 370-1. All dip sections shall be joint restrained DIP with polyethylene wrap for the entire length per MAG SEC. 610.6. Joint restrained lengths will follow MAG STD. DET. 303-1 and 303-2. Anchor blocks/thrust blocks must be installed for vertical bends per MAG STD. DET. 381. Air/Vacuum release valves are required at all highpoints and at vertical realignments of the water line.
9. Concrete Encasement: All water and sewer encasements shall follow MAG STD. DET. 404-1. When a water line must be constructed under a sewer or reclaimed water line, the water line must be a minimum of 2' below the sewer or reclaimed water line and extra protection is required. Protection for the sewer main should be constructed with mechanical joint or restrained joint ductile iron pipe for a distance of ten feet on both sides of the water main. A full length of DIP will be centered over/under the water main. When DIP is not used for the sewer main, both the water and sewer lines will be encased in concrete for a length of 10' on both sides of the crossing, per MAG STD. DET. 404-2. Refer to MAG STD. DET. 404-1 regarding force mains. All encasements require rebar and class "C" concrete.
10. Gate valves shall be resilient seated in accordance with EPCOR's "Water Material Specifications" and MAG SEC. 630.3.
11. Valve supports shall be in accordance with MAG STD. DET. 301.
12. Valve boxes shall be in accordance with MAG STD. DET. 391-1, type C. Note: Valve box lids used in City of Surprise shall be Bingham & Taylor, Model # CULSLHVTSK4WCL35
13. Water Valve Debris Caps: Debris caps are required when water valves are constructed within 2 feet of the edge of gutter, in areas that are unpaved, and areas prone to flooding. Valves should be set 2-tenths above finish grade in all unpaved areas. Concrete collar with carsonite marker is required on all valve locations outside of right-of-way.
14. Concrete thrust blocks shall be in accordance with MAG STD. DET. 380. Thrust blocks are NOT allowed in Right-of-ways (ROWs). Restrained joints per MAG STD. DET. 303-1 & 2 shall be used in ROWs in place of concrete thrust blocks. 90-degree fittings are NOT allowed in ROW's, but may be used in other areas as approved by EPCOR.
15. Field lock gaskets are not allowed.
16. Water services 2 inches and smaller shall be in accordance with EPCOR STD. DET. 342-2.
17. Fire hydrants located on "Dead End" water mains shall have a blow-off, in accordance with EPCOR STD. DET. 390-1, installed at the end of the water main.
18. Hydrant coating: "Safety Yellow". Complete hydrant preparation prior to inspection for painting. Inspection is also required after painting for contractor to receive final acceptance.
19. Pumper nozzle shall be oriented to provide best accessibility for fire truck. All hydrant ports must be lubricated with a food-grade lubricant, or NSF 60 product.
20. Fire hydrants shall be in accordance with EPCOR STD. DET. 360-1 or 360-2 as indicated on the Plan. In Mohave County, fire hydrants shall be in accordance with EPCOR STD. DET. 360-2.

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	GENERAL NOTES 100-1

GENERAL NOTES (CONTINUED)

21. Reclaimed waterlines shall be installed in accordance with MAG SEC. 601, 610 and 616. Testing shall be in accordance with MAG SEC. 610 and 611 including disinfection/chlorination. Final flushing and bacteriological testing as specified in MAG SEC 611.15 shall not be required.
22. Any shutdown to EPCOR's system requires a minimum of 48 hours notice to EPCOR's Inspector. Shutdowns will only be allowed on Tuesdays, Wednesdays and Thursdays. Time restrictions may also apply.
23. Concealed Pick-hole Manhole Covers: Concealed Pick-hole manhole covers are required when the edge of the manhole covers are constructed within 3 feet of the edge of gutter, in areas that are unpaved, and areas prone to flooding. Manholes should be set 2-tenths above finish grade in all unpaved areas. Concrete collar with carsonite marker is required on all manhole locations outside of right-of-way. Concealed Pick-hole manhole covers are required for all manholes in Mohave County.
24. Water Pressure Testing: All water lines will be tested per MAG SEC. 610.15. Modifications to these specifications include; the testing to be at a minimum of 200 psi, higher test pressures may be required in certain circumstances, and loss/leakage calculations will be based upon a maximum of 1500-feet, starting with the smallest diameter pipe.
25. The Contractor is required to uniform slope test all sewer lines by video and vacuum test all manholes in accordance with A.A.C. R18-9-E301. Deflection testing shall be performed per MAG SEC. 615.11. Testing documentation and flash drives shall be submitted to EPCOR Development Services Project Manager for approval prior to acceptance. All required repairs are the responsibility of the contractor and must be coordinated with EPCOR inspectors.
26. Sewer Testing: All sewer mains and laterals shall be pressure tested and video tested. All sewer mains shall also be mandrill tested. The maximum allowable sag is 0.5 inches.
27. When using mechanical plugs to test sewer mains/manholes contractor must follow EPCOR STD. DET. 420.
28. In Mohave County, solid sleeves are not allowed as a remedy to a failed pressure test on a new line.

BACKFLOW PREVENTION GENERAL NOTES:

1. Backflow Prevention Devices: All landscape and commercial water services require backflow prevention devices, meeting the requirements of EPCOR. Backflow devices shall be in place prior to meters being set. Testing of the backflow devices may be completed after the installation of the meter.
2. Contact Utility Cross-Connection Specialist (Backflow Prevention) at (623) 445-2411 for approved assembly list, inspections and testing.
3. Use only a University Of Southern California Foundation For Cross-Connection Control and Hydraulic Research (USC) APPROVED assembly.
4. Backflow prevention assemblies shall have a certificate of approval issued by USC-FCCCHR, or other approved third-party certifying entity unrelated to the product manufacturer or vendor, in accordance with AAC R18-4-215. All assemblies shall be installed in accordance with EPCOR standard details. No assembly shall be placed in service unless it has been tested and is functioning as designed. A certified test must be submitted to EPCOR Cross Connection Specialist (Backflow Prevention) for approval. Approval of water facilities will not be granted prior to backflow prevention approval.
5. Locate assembly within 36 inches of water meter unless otherwise directed by Utility's Cross-Connection Specialist.
6. All Pressure Vacuum Breaker Assemblies shall be installed a minimum of 12 inches above all downstream piping and outlets.
7. Use lead free solder only.
8. CLEARANCES:
   a. Wall or structure: Minimum 36"
   b. Above finish grade: Minimum 12" – Maximum 24"
9. Fire Lines: provide usage-tamper switches & wiring to alarm system where required by fire department. Note: Fire Lines longer than 75' require backflow assembly at property line or EPCOR approved location. Such Fire Lines must have backflow prevention assemblies with a metered bypass.

APPROVAL PROCESS FOR BACKFLOW PREVENTION ASSEMBLIES:

1. All new backflow prevention assemblies (BPAs) shall be tested and functioning as designed prior to Approval in accordance with AAC R18-4-215.
2. Developer/Contractor/Customer shall forward passing test report with required BPA information to EPCOR Cross Connection Specialist, marked pending approval.
3. EPCOR Cross Connection Specialist (Backflow Prevention) will notify Developer Services that an approved backflow prevention assembly test has been received, and this project is ready for an approval inspection.
4. A Construction Inspector then schedules an Approval Inspection with the Developer/Contractor/Customer.
5. EPCOR Construction Inspector confirms presence of BPA, and confirms proper installation guidelines have been followed.
6. Backflow Prevention approval process complete.
7. Approval may be granted provided all other required Operation Inspection items have no deficiencies.

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	GENERAL NOTES (CONTINUED) BACKFLOW PREVENTION GENERAL NOTES BACKFLOW PREVENTION APPROVAL PROCESS NOTES 100-2

WATER SYSTEM MATERIAL SPECIFICATION

DISTRIBUTION PIPING
- C900 Polyvinyl Chloride (PVC): In accordance with American Water Works Association (AWWA) Standard C900 for pipe diameters thru 12": DR=14, elastomeric-gasket bell-end.
- Ductile Iron Pipe, mortar-lined (DIP) shall be used for pipe diameters greater than 12".
- Ductile Iron Pipe, mortar-lined (DIP): In accordance AWWA Standards C150 & C151 Mortar lining shall be in accordance with AWWA C104. All Ductile Iron Pipe shall be polyethylene wrapped for the entire length in accordance with MAG SEC. 610.6. 6" through 14" diameter must be Pressure Class 350 minimum: 16" through 24" must be Pressure Class 250 Minimum, 30" and larger must be Pressure Class 150 minimum.
- In Paradise Valley and Chaparral (Fountain Hills) Districts, Ductile Iron Pipe only. PVC is not permitted.
- Concrete Pressure Pipe, Steel Cylinder Type: In accordance with AWWA Standard C303 and MAG SEC. 758 for pipe diameters greater than 24". Manufacturer's technical data sheets shall be submitted to EPCOR for review and approval. Service taps are not permitted on concrete pressure pipe.

DISTRIBUTION FITTING
- Push-on or mechanical joint in accordance with AWWA C111 and MAG SEC. 750.4. Joint restraints, where required, shall be Mechanical Restrained Joint with product approved by EPCOR or flanged joint for lengths in accordance with MAG STD. DET. 303-2. Field lock gaskets are not allowed.

WATER LINE VALVE
- Mueller, Clow, Kennedy, or M&H resilient wedge seated Gate Valve in accordance with MAG SEC. 630.3 with valve box and cover in accordance with MAG STD. DET. 391-1 Type "C" minimum lid weight of 16lbs. Valves installed outside the pavement or in the flow line of a roadway shall have a debris cap installed per MAG STD. DET. 392. Butterfly valves are not allowed without EPCOR Approval.

CONTROL VALVES (MOHAVE COUNTY ONLY)
- The external tubing needs to be stainless steel, not copper. CLA-VAL is the only acceptable manufacturer.

TAPPING SLEEVE & VALVE
- Stainless Steel - Approved manufacturers are Cascade, JCM, and Smith-Blair.
- Paradise Valley District may require a bypass on valves on 12" or larger pipe. Contact EPCOR for approval on a case-by-case basis.

WATER SERVICE
- For taps, pipe and fittings for water services through 2", the size shall be in accordance with EPCOR's STD. DET. 342-2. Requests for larger sizes must be submitted for review and approval. Minimum water service line size diameter shall be 1".
- Tubac District requires meter setters on all projects.
- 2" meter setters are required for critical service developments in Paradise Valley and Anthem Districts.
- Approved Saddles, all Iron Pipe Thread Tap and bronze strap: For PVC, Jones J-995, Jones J-996, Mueller H-13000 Series; For Ductile Iron Pipe, Ford 202B, Jones J-979, Mueller BR2B Series, Mueller BR2S Series.
- All brass fittings must be manufactured by Ford, Mueller, or James Jones. All angle meter stops must include locking wings.
- All corp stops and angle valves must be ball style. All fittings must be "pac-joint" type.
- All brass must be lead free.

FIRE HYDRANTS
- All hydrants will be Wet Barrel (unless Dry Barrel hydrants are required by local jurisdiction) and be manufactured by Clow or Jones. Break-off check valve shall be Clow.
- All hydrants shall be equipped with national standard hose threads.

TRACER WIRE
- See EPCOR's STD. DET. 350-1. Tracer wire must be used for all water lines.

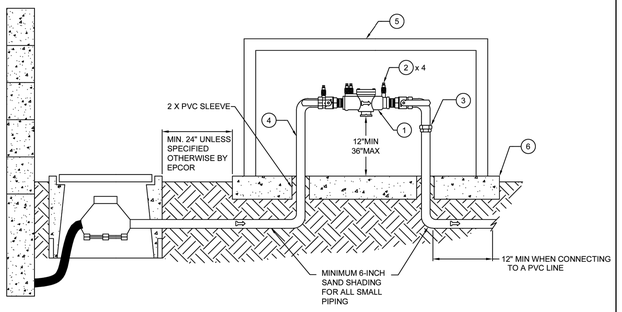
DIP SECTIONS
- All dip sections shall be constructed of restrained ductile iron pipe (DIP) per EPCOR's STD. DET. 370-1. All dip sections shall be joint restrained DIP with polyethylene wrap for the entire length per MAG SEC. 610.6. Joint restrained lengths will follow MAG STD. DET. 303-1 and 303-2. Anchor blocks/thrust blocks must be installed for vertical bends per MAG STD. DET. 381.

MARKING TAPE
- See EPCOR's STD. DET. 350-1. Marking tape must be used for all water lines and services.

MARKING POSTS
- Carsonite marking posts are required for all water valves located outside of ROW and outside of paved areas, installed with concrete collar.

ALL OTHER ITEMS
- In accordance with MAG Specifications.
- Where MAG standards are specified, those standards are applicable.

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	WATER SYSTEM MATERIAL SPECIFICATION 100-3



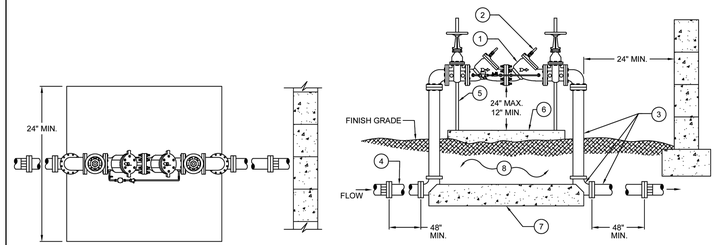
NOTES:

1. SEE EPCOR'S STD. DET. 100-2 FOR BACKFLOW PREVENTION GENERAL NOTES.
2. TO CONNECT TO GALVANIZED LINES, USE A BRASS FITTING. FOR PVC LINES USE A COPPER FEMALE ADAPTER X PVC MALE ADAPTER FITTING (OR A SCH 80 PVC NIPPLE).

MATERIAL LIST:

1. USC APPROVED ASSEMBLY, (SUBMIT TO EPCOR FOR APPROVAL).
2. TEST COCKS WITH BRASS PLUGS (4).
3. 3 PC BRASS UNION 12" MAX FROM ASSEMBLY
4. ALL COPPER FITTINGS, TYPE 'K' COPPER TUBING
5. VANDALISM AND/OR FREEZE PROTECTION ENCLOSURE ~~(OPTIONAL)~~
6. 4" CONCRETE SLAB W/PVC SLEEVES FOR ENCLOSURE ~~(OPTIONAL)~~

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	½" - 2" REDUCED PRESSURE PRINCIPLE ASSEMBLY 310-1



PLAN VIEW

SECTION VIEW

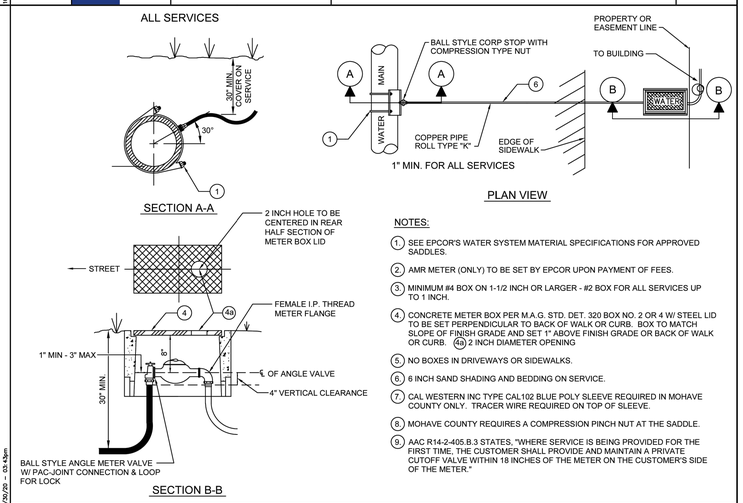
NOTES:

1. SEE EPCOR'S STD. DET. 100-2 FOR BACKFLOW PREVENTION GENERAL NOTES.
2. FOR FIRE LINES, A REDUCED PRESSURE DETECTOR ASSEMBLY WITH METER IS REQUIRED. METER SHALL HAVE AN AMR REGISTER.

MATERIAL LIST:

1. U.S.C. (ALSO UL/FM FOR FIRELINES) APPROVED ASSEMBLY, (SUBMIT TO EPCOR FOR APPROVAL).
2. TEST COCKS WITH BRASS PLUGS (4).
3. FLANGED DUCTILE IRON PIPE & FITTINGS ABOVE GROUND MEGALUG RECOMMENDED BELOW GROUND.
4. MEGALUG M.J. FITTING-FOR AC PIPE USE F.C.A.
5. ADJUSTABLE PIPE SUPPORTS (2)
6. CONCRETE SLAB MINIMUM 6" THICK x 24" WIDE
7. CONCRETE THRUST BLOCK-12" WIDE x 12" THICK MINIMUM TO UNDISTURBED EARTH. USE 2-3/4" ZINC COATED, THREADED RODS, BOLTED TO FLANGES, BOTH SIDES TYPICAL; (4 TOTAL). NOTE: IN LIEU OF CONCRETE THRUST BLOCK, A 3x3x1/4" STEEL ANGLE, AS SHOWN IN EPCOR STD. DET. 345-2, MAY BE USED.
8. JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	1" - 10" DOUBLE CHECK DETECTOR ASSEMBLY 320-1



NOTES:

1. SEE EPCOR'S WATER SYSTEM MATERIAL SPECIFICATIONS FOR APPROVED SADDLES.
2. AMR METER (ONLY) TO BE SET BY EPCOR UPON PAYMENT OF FEES.
3. MINIMUM #4 BOX ON 1-1/2 INCH OR LARGER - #2 BOX FOR ALL SERVICES UP TO 1 INCH.
4. CONCRETE METER BOX PER M.A.G. STD. DET. 320 BOX NO. 2 OR 4 W/ STEEL LID TO BE SET PERPENDICULAR TO BACK OF WALK OR CURB. BOX TO MATCH SLOPE OF FINISH GRADE AND SET 1" ABOVE FINISH GRADE OR BACK OF WALK OR CURB. 4a 2 INCH DIAMETER OPENING
5. NO BOXES IN DRIVEWAYS OR SIDEWALKS.
6. 6 INCH SAND SHADING AND BEDDING ON SERVICE.
7. CAL WESTERN INC TYPE CAL102 BLUE POLY SLEEVE REQUIRED IN MOHAVE COUNTY ONLY. TRACER WIRE REQUIRED ON TOP OF SLEEVE.
8. MOHAVE COUNTY REQUIRES A COMPRESSION PINCH NUT AT THE SADDLE.
9. AAC R14-2-405.B.3 STATES, "WHERE SERVICE IS BEING PROVIDED FOR THE FIRST TIME, THE CUSTOMER SHALL PROVIDE AND MAINTAIN A PRIVATE CUTOFF VALVE WITHIN 18 INCHES OF THE METER ON THE CUSTOMER'S SIDE OF THE METER."

DATE:			DETAIL NO.
July '20	EPCOR	2355 W Pinnacle Peak Rd, Ste 300 Phoenix, AZ 85027 P 623.445.2400 F 623.587.1044	POTABLE WATER SERVICE CONNECTION 1" THRU 2" SERVICE W/ CORRESPONDING METER 342

REVISIONS

PROJECT NO. 121.044
DRAWN C. DAHM
CHECKED D. PHILLIPS
SUBMITTAL DATES

OTB DATE –

JSACIVIL
Engineering | Planning | Management
111 TUMWATER BLVD.SE, SUITE B203
TUMWATER, WA 98512

STAMP
Registered Professional Engineer (Civil) CERTIFICATE NO. 42724 DAVID R. SEVERS Date Signed ARIZONA, U.S.A.
03/10/2025

CRASH CHAMPIONS
COMMERCIAL DEVELOPMENT PROJECT
303 AUTOSHOW DRIVE
SURPRISE, ARIZONA

HillSide architecture plc

SHEET TITLE
WATER DETAILS

SHEET
C8.1

FSXX-XXXX

Mar 13, 2025 2:07:29pm – User CarrDuhm
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001 C8.1 WATER DETAILS