DESIGN AND CONSTRUCTION STANDARDS MANUAL

FOR

WATER, WASTEWATER, AND IRRIGATION SYSTEMS

FOR

DECEMBER 2013

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LIST OF ABBREVIATIONS

AAC	Arizona Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ABC	Aggregate Base Course
AC	Acre
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
ANSI	American National Standards Institute
AOC	Approval of Construction
ARS	Arizona Revised Statutes
ARV	Air Release Valve
ASTM	American Society for Testing and Materials
ATC	Approval to Construct
AWG	American Wire Gauge
AWWA	American Water Works Association
CC&N	Certificate of Convenience and Necessity
CD	Compact Disc
CFR	Code of Federal Regulations
CI	Cast Iron
DCSM	Design and Construction Standards Manual
DDCVM	Double Detector Check Valve with Meter
DIP	Ductile Iron Pipe
DIPRA	Ductile Iron Pipe Research Association
DU	Dwelling Unit
EPA	Environmental Protection Agency
FH	Fire hydrant
FT	Foot / Feet
FT/S	Feet per second
GDACS	Global Disaster Alert and Coordination System
GPCD	Gallons Per Capita Per Day
GPH	Gallons Per Hour
GPM	Gallons Per Minute
GRD	Groundwater Replenishment District
HDPE	High-Density Polyethylene
HR/HRS	Hour/Hours
IBC	International Building Code
ID	Inside Diameter
IFC	International Fire Code
IN	Inch
LB	Pound(s)
LEB	Large End Bell
LF	Linear Foot / Feet
MAG	Maricopa Association of Governments
MCESD	Maricopa County Environmental Services Department
MH	Manhole
MJ	Mechanical Joint
MM	Millimeter(s)
MXU	Meter Transceiver Unit
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
NSF	National Science Foundation
OC	On-Center
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
OS&Y	Outside Screw and Yoke
PC	Point of Curvature
PDF	Portable Document Format
PIP	Protective Industrial Products
PIV	Post Indicator Valve
PPM	Parts Per Million
PSI	Pounds per Square Inch
PT	Point of Tangency
PUE	Public Utilities Easement
PVC	Polyvinyl chloride
RLS	Registered Land Surveyor
RP	Reduced Pressure
R/W	Right-of-Way
SDR	Standard Dimension Ratio
SEB	Small End Bell
STD DTL	Standard Detail
TOQC	Town of Queen Creek
UL	Underwriters Laboratories
UPC	Uniform Plumbing Code
US	United States
USA	United States of America
USC	University of Southern California
VFD	Variable Frequency Drive

SECTION 1 - INTRODUCTION

The TOQC's Utility Services Department is composed of the Water and Wastewater Divisions. This document provides design guidance and construction criteria for the modification and construction of water system improvements, wastewater collection system improvements, and irrigation system improvements within the TOQC's service area. It is intended for use during the planning, design, plans preparation, and construction phases of the project.

All improvements shall conform to the latest TOQC Design and Construction Standards Manual for the Water System, Wastewater Collection System, and Irrigation System or by the latest MAG Standards and Specifications for items not covered by the DCSM at the time the plans were approved. The design shall conform to ADEQ, MCESD, IFC, State and Federal Standards and regulations.

Applicable Town Council approved building codes include but are not limited to:

- International Building Code, 2006 edition, third printing
- Uniform Plumbing Code, 2006 edition, sixth printing
- International Mechanical Code, 2006 edition, third printing
- International Fire Code, 2006 edition, third printing

The TOQC defines the following terms from the Arizona Administrative Code, Title 18 Environmental Quality Chapter 9; Department Environmental Quality Water Pollution Control, Article 3; Aquifer Protection Permits-General Permits, Part E; Type 4 General Permits, R18-9-E301.4.01; General Permit: Sewage Collection Systems.

Applicant: the Project Owner, Developer, Engineer of record for the project, or Authorized Representative.

Engineer: Engineer of record for the project.

1.1 SUBDIVISION DEFINITION

A residential or commercial development project that has a number of lots greater than what is shown below is considered a subdivision in the respective municipality.

Table 1.1.1 – Municipality Parcel Requirements

Municipality	Number of Parcels
Maricopa	5
Pinal	4
TOQC	4

1.2 WATER & IRRIGATION SYSTEM BASIC REQUIREMENTS

"Will Serve Letter"
This will be required by MCESD or ADEQ when submitting plans for water service, as well as ADWR when applying for an assured water supply. This letter can be obtained by requesting it from the Water Division (Greg Homol, greg.homol@queencreek.org).

"100 Year Assured Water Supply"
A water supply consultant prepared a hydrology study to demonstrate the availability of an assured water supply in the Town's service area. ADWR states that the hydrology study "satisfies the requirements of A.R.S. 45-577(B) and may be cited in lieu of the hydrologic study requirement in assured water supply applications when individual Developers in the TOQC's certified area are ready to file applications for Certificate of Assured Water Supply at appropriate times".

"Central Arizona Ground Water Replenishment District (CAGRD)": In the case of a developer proposing to develop land in or near the Company's certified are, the developer may cite ADWR's findings regarding the above-referenced hydrology study, enroll his proposed development in the Groundwater Replenishment District ("GRD") pursuant to A.R.S. 45-576.01.02, and established that the developer's lands are located in the Town boundaries or service area. Or if you are found exempt from an assured water supply requirement, than a letter from the ADWR given you the exemption are required.

In the case of a Developer proposing to develop land in or near the Town's service area, the Developer may cite ADWR's findings regarding the above-referenced hydrology study, enroll his proposed development in the Groundwater Replenishment District ("GRD") pursuant to A.R.S. 45-576.01.02, and establish that the Developer's lands are located in the Town's service area. If the proposed development is found exempt from an assured water supply requirement, then an exemption letter from ADWR will be required.

An "Approval to Construct (ATC)" letter from MCESD or ADEQ is required if the project is located within or partially in Pinal County. An ATC may not be required for water lines if the project is less than $50,000 as defined by MCESD, or the proposed system is a private fire hydrant or fire sprinkler system that is downstream of a blackflow preventer and does not have domestic service connections. An "ATC Not Submitted Letter" signed by the Engineer of Record shall be submitted to the Water Division detailing why an ATC will not be submitted for the project.

MCESD does not review private water systems, including systems that only serve fire hydrants or fire sprinkler systems, as long as they are downstream of backflow preventers and do not have any domestic service connections. If they do not have backflow prevention units at the property line, they will be required to be reviewed by MCESD.

An "Approval of Construction (AOC)" letter from MCESD or ADEQ is required if the project is located within or partially in Pinal County. An AOC may not be required at the project completion if an "ATC Not Submitted Letter" was submitted to the Water Division during plan review. If an AOC is not required, a "Notice of Compliance Letter" per MCESD requirements must be submitted to MCESD and the Water

Division when the project is completed. The "Notice of Compliance Letter" shall include, the fair market value cost estimate for the project, name of the design engineer and review engineer, project completion date and the total construction time.

The Developer shall install, at their expense, all on-site and off-site improvements necessary to service the development. This may include pump stations, reservoirs, transmission mains, distribution mains, pressure reducing valves, and other facilities necessary to service the development.

For subdivisions, each lot shall be supplied with safe, reliable, and potable water in sufficient volume and pressure for domestic use and fire protection. Modeling and/or performance of flow test(s) may be verified by the TOQC's Engineer at the request of the Water Division. The flows and pressure must meet the minimum requirements for domestic and fire flow requirements as outlined in these standards.

The TOQC requires water mains to be installed along the entire length of the property line frontage of the property to be developed, where future extension of the line is possible. The property line frontage is that portion of the property along a public right of way and/or public utility easement. If a parcel to be developed has more than one property line frontage, the TOQC shall require water improvements to be installed along the north and east frontages.

Extensions of the water system to serve potential customers are generally constructed and paid for by those companies or individuals developing land or otherwise building within the TOQC's service area.

Preparation of Construction Documents and acquiring permits such as ATC prior to pre-construction is the responsibility of the Developer's Engineer. Construction shall be performed by an Arizona licensed contractor (General Contractor or A12) of the Developer's choosing and shall be approved by the Water Division. Inspection and testing shall be performed by the Town's Inspector.

1.3 WASTEWATER SYSTEM BASIC REQUIREMENTS

The Developer shall install, at their expense, all on-site and off-site improvements necessary to service the development. These shall include mains, manholes, lift stations and other facilities necessary to service the development.

The TOQC requires sewer mains to be installed along the entire length of all property line frontage of the property to be developed, where future extension of the line is possible with service laterals to the edge of right-of-way. The property line frontage is that portion of the property along a public right-of-way and/or public utility easement. If a parcel to be developed has more than one property line frontage, the TOQC shall require wastewater improvements to be installed along the south and west frontages.

Extensions of the sewer collection system to serve potential customers are generally constructed and paid for by those companies or individuals developing land or otherwise building within the TOQC's service area.

Preparation of construction documents and acquiring permits, such as the ATC, prior to pre-construction meeting is the responsibility of the Developer's Engineer. Construction shall be performed by an Arizona licensed contractor (General Contractor or A12) of the Developer's choosing and shall be approved by the Wastewater Division. Inspection and testing shall be performed by the Town's Inspector.

An "Approval to Construct (ATC)" from MCESD or ADEQ is required if the project is located within or partially in Pinal County. An ATC may not be required for sewer lines if the project is a single line without manholes, lift stations or force mains, from a building with a flow of less than 3,000 gallons per day and it is connected directly to a Town sewer main per MCESD requirements. An "ATC Not Submitted Letter" signed by the Engineer of Record shall be submitted to the Wastewater Division detailing why an ATC will not be submitted for the project.

A "Sanitary Facilities for Subdivision" letter for MCESD or ADEQ is required if the project is located within or partially in Pinal County.

An "Approval of Construction (AOC)" letter from MCESD or ADEQ is required if the project is located within or partially in Pinal County. An AOC may not be required at the project completion if an "ATC Not Submitted Letter" was submitted to the Wastewater Division during plan review. If an AOC is not required, a "Notice of Compliance Letter" per MCESD requirements must be submitted to MCESD and the Wastewater Division when the project is completed. The "Notice of Compliance Letter" shall include, the fair market value cost estimate for the project, name of the design engineer and review engineer, project completion date and the total construction time.

1.4 SEPTIC SYSTEMS

Connection to the Town sewer collection system is preferred, however, if the Town's sewer collection system has not been extended to the project, septic may be allowed. Additional information, setback requirements, and permits are obtained from MCESD or ADEQ directly depending on the projects respective county, Maricopa or Pinal. Minimum lot sizes have been established by the respective county based on setback requirements, see **Table 1.4.1 - Minimum Lot Size Allowable for Septic**.

Table 1.4.1 – Minimum Lot Size Allowable for Septic

County	Minimum Lot Size
Maricopa	35,000 SF
Pinal	43,560 SF

1.5 REIMBURSEMENTS

Pursuant to article 16-2 of the Town Code, the Developer may request to enter into a reimbursement agreement for installation of improvements in excess of that needed to serve the development.

1.6 SUBMITTALS

The TOQC Utility Department requires submittals of the following:

1.6.1 PRELIMINARY APPLICATION

- Site Plan – Drawn to scale with north arrow and vicinity map
- Calculations indicating gross and net acreage and proposed number of lots
- If existing project, previously approved water and sewer plans and reports

1.6.2 PRELIMINARY PLAT

- Preliminary Plat
- Preliminary water and sewer layout
- Preliminary water report
- Preliminary sewer report, sewer exhibit shall include shaded sewer drainage basins

1.6.3 FINAL PLAN SUBMITTAL CHECKLIST

- New Submittals will require the following:
    - 1 Set – Water Plan
    - 1 Set – Sewer Plan
    - 1 Set – Paving Plan
    - 1 Set – Improvement or Off-site Plans
    - 1 CAD Disk to Transfer to Sunrise Engineering, Inc.
    - 1 Copy of Water and/or Sewer Report Study

- Re-Review Submittal Requirements:
    - 1 Set – Original Redline Plans from Town
    - 1 Set – 2nd or 3rd Submittal Plans
    - 1 Set – Other redlines Plan Sets
    - Review fees shall be paid when picking up 1st review comments.

- Final Submittal
    - 1 copy of cover sheet(s) on mylar for signatures
    - 2 full sets on bond for signatures
    - 1 CD with pdf of plans
    - 1 CAD disk with plans

- ATC Approval
    - ATC applications will be signed after plan approval.
    - ATC's are required prior to the pre-construction meeting.
    - AOC's are required before final acceptance of the project.
    - An ATC or an "ATC Not Submitted Letter" if an ATC is not required.
    - Sanitary Facility for Subdivision Letter

1.7 FORMAT OF PLANS

This section is an overview of how plans will be prepared for submittal to the TOQC Utility Services Department for approval. All construction plans for the water, irrigation, and wastewater collection systems shall be prepared in accordance with the standards set forth in these guidelines.

The water and irrigation plan review checklist and wastewater plan review checklist located in **Section 1.7** can aid the applicant in the plan preparation process.

1.7.1 GENERAL STANDARDS

The First Submittal shall include, at a minimum, water and/or wastewater plan sheets, details, and an Engineer's Water and/or Wastewater Design Report.

Final Submittal shall include:

- A quantities table of estimated construction materials, and a completed Certificate of Quantities Form, signed and sealed by the Engineer.
- All plans submitted for review shall have the appropriate professional (State of Arizona) seal, signature, and date on each sheet.
- Standard sheet size shall be 22x34 inches, stapled in complete sets.
- A north arrow and bar scale [at least two (2) inches long and placed adjacent to each north arrow] shall be provided on all sheets when applicable.
- A key map shall be provided on each sheet.
- Plan view shall be oriented such that north is either at the top or the right side of the sheet.
- Blue Stake graphic shall be provided on each sheet.
- Minimum lettering and numbering size shall be 0.1 inches for letters, numbers, and symbols. Lettering, numbering, and line work must be uniform and sharp.
- Drawing symbols shall be as shown in the legend on Standard Detail QW100c, QI900c or QS100c or as presented in MAG Standard Detail #110-1 and 2.
- The required Town specifications with General, Construction, and Specific Utility (Water and/or Wastewater) notes.
- Plans shall show water and/or wastewater system improvements in bold. All other existing infrastructure, including buildings and other significant structures, shall be shown in grayscale (screened). Line weight and screening percentage shall be adjusted such that existing infrastructure is clearly subordinate to proposed improvements yet clearly visible on prints.
- Future improvements shall be shown similar to existing but with dashed lines or otherwise clearly indicated as future.
- Plan layout, graphics, and call-outs shall be presented clearly in an uncluttered manner.
- Call-outs shall be numeric style “key notes”. Each number shall relate to the same topic or note for the entire plan set.
- Horizontal control for improvements shall follow defined alignments and controls as specified on the final plat.
- Construction centerline or roadway centerline stationing shall increase from South to North or West to East.
- Match lines, with stationing and sheet references, shall be shown on each sheet as applicable.
- Phase limits and numbers, if applicable, shall be shown on each sheet.
- Plans submitted to the Utility Services Department for review shall be black line (photo-copy) prints only.
- Existing contours shall be shown with adequate spot elevations as necessary to clarify drainage patterns if relevant to design.
- Exiting utilities - aerial and underground
- Existing irrigation facilities
- TOQC limits where they appear
- City and County limits where they appear
- 100-year floodplain limits where they appear
- 100-year floodway limits where they appear

- Plans shall show existing and proposed right-of-ways, easements, construction easements, view easements and property lines. Dimensions of these shall be clearly indicated for clarity. Easements to the Utility Services Department not shown on the face of a plat shall be by separate instrument and indicated as such on the plans (see easement requirements in **Sections 2.13 and 5.7**).
- A trench detail shall be included showing; width of trench, depth of bedding below and above the pipe, type of bedding, bedding compaction requirements, backfill type, and minimum backfill density, position of tracer wire and locator tape, and type of proposed pipe (see Standard Detail QW606, QS442 AND QI905 for reference).
- Dimensional ties or stations and offset from the street centerline, shall be provided for all existing utility lines being tied to.
- Existing storm drainage facilities such as retention basins, catch basins, scuppers and storm drain pipes
- Sewer manholes shall be numbered consecutively and the numbers indicated on the plans.
- Sewer tap locations shall be shown with stations called out for each.

Typical construction plan package shall contain all of the following:

- Cover Sheet
- General Notes and Legend Sheet
- Index of Sheets (For plan sets containing five or more plan view only or plan and profile sheets)
- Detail Sheet(s)
- Conflict Sheet
- Plan View Only Sheets or Plan and Profile Sheets

1.7.2 COVER SHEET

An individual cover sheet with the following information shall be required for each plan set (See Detail QW100a, QI900a, or QS100a for sample cover sheets):

- At the top of the sheet: “Town of Queen Creek Utility Services Department”
- Project name below TOQC Utility Services Department
- Vicinity map and TOQC Service Area Map showing the project site location
- Developer’s name, address, and telephone number with a contact person and mobile phone number
- Developer’s Engineer’s name, address, and telephone number with contact person and mobile phone number
- Professional Engineer’s seal and signature
- State location map showing the location of TOQC Utility Services Department within the State of Arizona
- List of at least two benchmarks in local proximity to the project
- Datum; All Utility Services Department projects shall be on the GDACS Datum (Equivalent to current Maricopa County Datum).
- Approval block for the Town’s Engineering Manager, Town’s Utility Services Department Director and Maricopa County Environmental Services or ADEQ when in Pinal County

(county approval and signature required prior to the Town's Utility Services Department Director's signature)

- A "Utility Coordination" block showing the names of the utility companies servicing the area of development, contact names, phone numbers, and the date plans were submitted.
- Estimate of Quantities; if the project is to be developed in phases, the estimate of quantities shall indicate quantities for each phase.
- Sheet Index

1.7.3 GENERAL NOTES AND LEGEND SHEET

This sheet shall show the latest TOQC General Notes, water and/or wastewater notes as applicable, a reference to the Town's Design and Construction Standards Manual, and a Legend as shown on Detail QW100c, QI900c, or QS100c (only atypical or non-MAG symbols are required).

1.7.4 INDEX OF SHEETS

This sheet shall show the entire project, including street names, typically 1"=200' scale and the location of all sheets and phasing clearly indicated.

- Water system or irrigation projects, shall show water lines with sizes, fire hydrants, water line appertuances, lot numbers, road names, pipe locations and sizes, and street locations at such a scale as to be clear to the reviewer where all items for the project are located (see QW1006).
- Wastewater projects shall show flow arrows, existing and proposed sewer system pipe sizes, manholes, clean-outs, lot numbers, road names, street locations, and sewer basin delineation (see QS1006).

1.7.5 DETAIL SHEET

For water system projects a Detail Sheet shall be included on all projects showing the following details: QW301, QW302, QW403, QW602, QW603 and QW606. See Standard Detail QW100d for an example of an approved detail sheet.

For wastewater projects a Detail Sheet shall be included on all projects showing the following Details: QS420-1, QS420-2, QS440 and QS442. See Detail QS100d for an example of an approved detail sheet.

For irrigation projects a Detail Sheet shall be included on all projects showing the following details: QW302, QI901, QI902, QI903, QI904 and QI905. See Detail QI900d for an example of an approved detail sheet.

Special details may be required as follows:

- Special construction required where utility locations conflict
- Others determined by the Consultant and/or the Utility Services Department as needed to clarify construction
- Non-standard details of any kind

1.7.6 CONFLICT SHEET

The purpose of this sheet is to show those locations where storm drain and sewer pipes cross water pipes (See standardDetail QW100f).

1.7.7 PLAN VIEW ONLY SHEETS

Plan view only construction plans are allowed for water lines for new subdivisions that do not include a public sewer conveyance system AND that have water lines less than 12 inches in diameter.

For plan view only subdivision plans, water improvements shall be shown on a separate set of plans at one of the following scales: 1 inch=20 feet, 1 inch=40 feet or 1 inch=50 feet, see Standard Detail QW100h for an example of an approved plan sheet.

Plan view only drawings shall be annotated "water cross under" or "water cross over" at ALL conflicting utility crossings. Plans will NOT BE APPROVED unless a determination is made and annotated for all utility conflicts with the water line (See Detail QW100f).

Double plan view sheets, for water line improvements along a roadway, shall be permitted for pipe sizes less than 12 inches (See Detail QW100g).

The following information is required on plan view only sheets:

- The size and location of all water services and meters
- All proposed improvements including but not limited to pipe, fittings, valves, hydrants, blow-offs, air and vacuum release valves etc. Pipe shall be shown with text incorporated into the line type. The text shall indicate size and type (Example: 6"W, 8"S, 12"W).
- Pipe material type

1.7.8 PLAN AND PROFILE SHEETS

Acceptable horizontal scales for Plan and Profile sheets are: 1 inch=20 feet, 1 inch =40 feet, or 1 inch=50 feet.

Acceptable vertical scales for Plan and Profile sheets are 1 inch=2 feet, 1 inch=4 feet, or 1 inch=5 feet.

The following information is required in addition to the General Standards (**Section 1.7.1**):

- General Information:
  - Profile elevation and stationing grid clearly indicated
  - Profile of existing ground
  - Profile of proposed ground if different than existing ground
  - Existing utility crossings and encasement limits with pipe elevations to indicate clearances
  - Proposed construction

  - All utility crossing conflicts shall be shown and designed in accordance with QW605
  - Keynote Callouts

- Water and Irrigation Service Specific Details (See Standard Detail QW100d):
  - Plan view shall be prepared in accordance with **Section 1.7.7**

- Wastewater Service Specific Information:
  - All existing sewer lines
  - Profile of proposed sewer lines
  - Manholes with stations and elevations at centerlines

1.7.9 AS-BUILT PLANS AND FINAL ACCEPTANCE

Final Acceptance will not be provided until the final approved as-built plans and AOC are received. No exceptions shall be granted. For approval by TOQC, As-built plans must be submitted for review and revised if comments are necessary.
As-built plans shall be identical to the design plans except for the following:

- For changed conditions the as-built plans will be revised accordingly.
- "AS-BUILT" and the date shall be added vertically to the right hand margin of all drawings in the as-built set.
- An as-built certification shall be added to the front cover as follows:

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

_____

ENGINEER REGISTRATION NUMBER

Submit the following to the TOQC Utility Department:

1. One full size (22"x34") paper copy of the as-built plans
2. Copy of AOC from MCESD and/or ADEQ

After approval:

1. One full size (22"x34") 4-mil Mylar set of the as-built plans
2. CD with as-built plans in PDF format

1.7.10 WATER SYSTEM & IRRIGATION PLANS REVIEW CHECKLIST

TOQC WATER & IRRIGATION PLAN REVIEW CUT SHEET

Refer to the latest updated Design & Construction Standards Manual
Town of Queen Creek www.queencreek.org

PROJECT NAME: _____

ITEM REQUIREMENT COMMENTS:

Plans adhere to all format standards presented in **Section 1.7** Must have materials index (i.e. pipe, hydrants, services, etc.)

- ❑ Town of Queen Creek, Utility Services Director Paul T. Gardener signature line
- ❑ Approval by Authorized Health Agency
- ❑ Must have complete project page showing water lines, valves and hydrants
- ❑ Only C-909 Ultra-Blue pipe may be used (except ductile on fire lines)
- ❑ Four (4) foot minimum cover to finish grade
- ❑ Include the following DCSM details in plans=QW301, QW302, QW403, QW602, QW603, QW606 (For commercial projects you must add QW203 & QW204 to detail sheet
- ❑ All service lines shall be one (1) inch service regardless of meter size for residential meters (except those requiring 1-1/2 inch or larger meters)
- ❑ Commercial meter/service will be at property lines and based on size determined by Engineer of project
- ❑ Easements are required, must be 15 feet wide, and recorded prior to approval of plans
- ❑ Meter spacing must be to DCSM guide lines (maximum three (3) feet from property corners only)
- ❑ Meter boxes placed 16 inches into PUE
- ❑ Must use dual trench method for as many services as possible
- ❑ Valve placement must be ten (10) feet to 18 feet from fitting all at equal distance apart
- ❑ No valves in driveways or valley gutters
- ❑ Fittings require full stick in and out unless continuing another mechanical restraint device
- ❑ All reductions in pipe sizes must be made at fittings with SEB or LEB reducers
- ❑ Fire hydrant valves are to be flanged at the tees
- ❑ Hydrant Tee's and Valves must be spaced to abide for full stick in and full stick out of fittings
- ❑ Mechanical restraints required on all fittings
- ❑ Must show all landscape services and meter sizes

- ❑ Shut off valves required for all future tie-ins as to insure no services will be interfered with
- ❑ Deflection is the recommended form for crossing under conflicts, one (1)-foot separation required for storm drains
- ❑ Follow MAG specifications for all other separation requirements
- ❑ All deflections and dip's must be shown in profile form on separate conflicts sheet and show all other utilities
- ❑ No dip's allowed for storm drains, the storm drains must be re-engineered for smaller pipe sizes or use deflection method
- ❑ For all commercial sites the TOQC potable water lines will stop at property line and must then have a "Reduced Pressure Backflow Device" within five (5) feet of meter, installed at any connection point to the main line
- ❑ Hydrants shall be placed before property line in order for TOQC to accept responsibility for them, if onsite they will be private
- ❑ All hydrants placed inside property line are private and must be ordered in "RED" color only (**not red painted over yellow**)
- ❑ All onsite commercial lines fall under TOQC Building & Fire Marshall guidelines (except dedicated fire lines & hydrant coloration).
- ❑ All onsite fire lines will require a "Double Check Detector Check with 5/8 inch bypass meter (see Standard Detail QW409)
- ❑ More Information is need before proceeding with review:

_____

_____

More Information is required prior to being re-submitted:

_____

_____

Other Comments:

_____

_____

_____

TOQC REVIEWER: _____

DATE: _____

If you have any questions feel free to contact
Bill Lawrence (480) 748-3952, bill.lawrence@queencreek.org
Kenny Secrist (480) 226-1414, kenny.secrist@queencreek.org
Mike Johnson (480) 358-3452, mike.johnson@queencreek.org

1.7.11 WASTEWATER PLANS REVIEW Checklist

TOQC WASTEWATER PLAN REVIEW CUT SHEET

Refer to the latest updated Design & Construction Standards Manual
Town of Queen Creek www.queencreek.org

PROJECT NAME: _____

ITEM REQUIREMENT COMMENTS:

Plans adhere to all format standards presented in **Section 1.7**

- ❑ Must have materials index (i.e. pipe, manholes, etc.) If an easement or right-of-way (R/W) dedication or abandonment is required by separate instrument, the following exhibits and/or information must be provided with the easement document.
  - o The subdivision name
  - o The type of easement
  - o The reason or purpose of the easement or R/W and why it is required
  - o A Vicinity Map showing the major cross streets
  - o The legal description sealed by an RLS
  - o A Detail or Plot Map showing the easement or R/W location and alignment with dimensions and bearings, true Point of Beginning, Section, Township, and Range
  - o Current Title Report
- ❑ Sewer Payback Fees are required if a reimbursement agreement exists.
- ❑ Note the type of sewer pipe used
- ❑ Note that all materials used and installation shall conform to TOQC Standards
- ❑ Provide a detail that show the separation requirements between sewer and water lines which conform to State Health Code Standards
- ❑ Include a sewer trench detail showing at a minimum the following information: width of trench, depth of bedding below and above pipe, type of bedding (conform to TOQC Standards & Specifications), bedding compaction requirements, backfill type, minimum backfill density, position of locator tape, and type of proposed pipe.
- ❑ Sewer laterals shall be installed per TOQC Standard Detail QS430-1
- ❑ Provide a Quantities Table of estimated construction materials. A completed Certificate of Quantities Form, signed and sealed by the Engineer, shall be submitted for final approval.
- ❑ Provide or reference a Sewer Service Tap Detail and a Sewer Lateral Detail (example TOQC Detail QS430-1)
- ❑ Service stubs to platted lots within the subdivision for underground utilities shall be placed to the right-of-way line or the public utility easement whichever is greater
- ❑ Sanitary sewer lines shall be extended to the boundaries of the plat to provide service connections to abutting un-subdivided land. A sewer stub-out must be shown at each manhole adjacent to undeveloped property, unless otherwise justified.

- ❑ All sewer lines shall be parallel to property lines or the center line on the south and west, or as close to parallel as possible. They shall be located six (6) feet from centerline, as a guideline, and shall not cross the street centerline except in special cases approved by the Town Engineer.
- ❑ All sewer lines shall have a minimum of four (4) feet of cover
- ❑ All sewer lines shall not be placed in less than a 20-foot easement
- ❑ Unless otherwise specified, all gravity sewer lines shall be constructed of pipe on the Town's approved materials list
- ❑ A sewer line shall be constructed of an unbroken length of ductile iron pipe or concrete encasement for a distance of at least six (6) feet in each direction when the sewer line crosses a water pipe that is less than two (2) feet above the sewer line. See TOQC Standard Detail QW605 for applicability.
- ❑ Manholes shall be constructed as follows:
    - o At all changes in grade
    - o At all changes in alignment
    - o At all connections from Private Sewers
    - o At lateral connections from some commercial buildings (at Town Engineer's discretion)
    - o At all connections where the sewer line size changes
- ❑ The maximum manhole spacing for all sewers is 500 feet. Manholes shall be numbered consecutively and the numbers indicated on the plans.
- ❑ Manhole elevation drops shall be at a minimum the following:
    - o 0.00 foot drop across manholes
    - o 0.10 foot drop on angles
- ❑ Manhole size to be as follows: All sewer main lines (8 inch and larger) require a five (5)-foot diameter manhole with a 30-inch frame and cover per TOQC standards
- ❑ Connecting sewers in a manhole should match flow line
- ❑ Manholes shall never be located in retention basins
- ❑ All manholes in unpaved areas shall be a minimum of six (6)-inches above finished grade.
- ❑ All manholes in wash areas shall be a minimum of six (6) inches above finished grade. However, the actual wash topography and flow characteristics may dictate final height. Town inspector shall approve final height.
- ❑ Water tight manhole covers conforming to Standard Detail QS422 shall be provided for all manholes in surcharge or sump condition or where the Town determines is necessary
- ❑ Service lateral manhole connections, service lateral inverts shall match top of highest incoming pipe.
- ❑ When sewer lines of different sizes enter the same manhole, match inverts All sewer laterals shall be constructed per Standard Detail QS430-1
- ❑ No sewer lateral shall have less than three (3) feet of cover over its crown at the property line or easement line

- ❑ Proposed sewer tap locations with stations are to be shown for each lot on all plans, but may be changed in the field with Town Engineer approval
- ❑ All abandoned sewer taps must be capped.
- ❑ All crossing of the following existing and proposed utility lines must be shown in both plan and profile views. The outside pipe elevations should be shown to indicate available clearances.
    - o Water and sewer
    - o Reclaimed water (4 inch or larger)
    - o Telephone, electric, gas, cable, and other buried utilities where appropriate
- ❑ The sewer line slope must be shown and shall meet the minimum state (ADEQ) requirements.
- ❑ The following statement shall be a standard Engineering Stipulation on projects not abutting to an existing Town Sewer Main:
    - o If the Developer wishes to proceed with development prior to the time that adequate funding is available to Town to complete the design and construction of the Sewer Collection System, the Developer may elect to design and construct the Sewer Collection System at the Developer's sole cost, and request to enter into a reimbursement agreement pursuant to Article 16-3 of the Town Code.
- ❑ More Information is need before proceeding with review:

_____

_____

_____

- ❑ More Information is required prior to being re-submitted:

_____

_____

_____

- ❑ Other Comments:

_____

_____

_____

TOQC REVIEWER: _____

DATE: _____

If you have any questions feel free to contact
Bill Lawrence (480) 748-3952, bill.lawrence@queencreek.org
Greg Homol (480) 352-3549, greg.homol@queencreek.org

1.7.12 WATER PLAN REVIEW WORKSHEET

QUEEN CREEK WATER DEPARTMENT
WATER PLAN REVIEW WORKSHEET

Refer to the latest updated Design & Construction Standards Manual Town of Queen Creek www.queencreek.org

Permit Number: _____

All fees established in Resolution 735-08 effective July 1, 2008.

RESIDENTIAL AND OFFSITE FEES FOR: _____

Per Sheet: $125.00 @ _____(# Sheets) = $ _____ (Total)

COMMERCIAL SITE FEES FOR: _____

1st 1,000 Feet	$625.00	=	$	_____
Per foot over 1,000 feet _____(length) @	$ 0.25	=	$	_____
Administrative Review Fee (Per Submittal)	$ 70.00	=	$	_____
TOTAL			$	_____

Signature: _____ Date: _____

SECTION 2 - WATER SYSTEM DESIGN GUIDELINES

2.1 PRESSURE AND FLOW REQUIREMENTS

The following criteria shall be used for water system modeling and design unless otherwise approved:

Table 2.1.1 – Pressure and Flow Criteria

Minimum Pressures	40 psi @ Peak Hour 20 psi @ Max Day plus fire flow
Land Use Demands	Age Restricted = 140 gpcd Multi-family = 110 gpcd Single Family = 125 gpcd, high density 200 gpcd, low density Commercial = 1,700 g/ac/day
Maximum Pressures	80 psi @ Average Day 100 psi Static
Persons per Dwelling Unit	Age Restricted = 2.00 persons/du Multi-family = 2.00 persons/du Single Family = 3.20 persons/du
Peaking Factors Used	Maximum day = 1.8 x Average Day Peak hour = 3.0 x Average Day

Fire flow requirements shall be in accordance with the latest edition of the International Fire Code. The Engineer is encouraged to review the requirements as set forth in the IFC for proper fire flow requirements for the type and size of development and buildings under consideration (See Appendix B).

2.2 PIPE

2.2.1 ALIGNMENT

Water shall be maintained within County or Town right-of-ways. Hydrants, meters, blow-offs, and valves shall NOT be located in washes, detention/retention areas, driveways, or sidewalks.

All new water mains shall be designed in a looped configuration whenever feasible to provide circulation and redundancy.

Water lines shall primarily be located on the North and East side of roadways. Crossing back and forth across the centerline of winding streets to meet this criterion is not required or permitted. In those areas where sanitary sewer is present, the water line shall be located on the opposite side of the roadway whenever possible regardless of directional preference and shall maintain a minimum six (6) feet wall to wall separation per Standard Detail QW605-1.

All water lines which cross golf courses or other open areas shall do so within established or proposed travel-ways. If dedicated roads are not practical, then crossing must be within a permanent easement 15 feet wide, or as directed by the Water Division. All other waterlines outside dedicated right-of-ways shall be within permanent easements not less than 15 feet wide or as directed by the Water Division. No walls shall cross these easements and no permanent structures shall be erected. Per Standard Detail QW606, #12 AWG tracer wire is required on all water lines.

2.2.2 DIPPED SECTIONS

Dipped sections using bends shall be avoided whenever possible. Instead, water lines shall be gradually deflected to provide the required separation from other utilities as specified elsewhere in these standards.

When unavoidable, a dipped section shall be accomplished with 45-degree bends on one side of the crossing and vertical realignment on the other using pipe deflection. An Air & Vacuum relief valve shall be required on the 45-degree side of the dip.

When dipped section must be constructed using bends, the pipe material shall be ductile iron per **Section 4.1** and shall be done using 45-degree vertical bends only, per Standard Detail QW611. HDPE deflections are allowed per Standard Detail QW611.

2.2.3 SEPARATION

Reference ARS R-18-5-502, water and sewer mains shall be separated in order to protect public water systems from possible contamination. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. Separation requirements are as follows:

1. A water main shall not be placed:

    a. Within 6 feet, horizontal distance, and below 2 feet, vertical distance, above the top of a sewer main unless extra protection is provided. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided.

    b. Within 2 feet horizontally and 2 feet below the sewer main.

Minimum separation of water lines from sanitary sewer and reclaimed water lines shall be as specified by Standard Detail QW605-1. Water lines shall always be above sewer mains and laterals. Separation of water from electrical or gas lines shall conform to Standard Detail QW605-4.

The minimum clearance under culverts and storm drains shall be one (1) foot.

PVC pipe shall never be encased in concrete to mitigate separation conflicts. Only ductile iron pipe, per **Section 4.1**, shall be encased in concrete for that purpose.

2.2.4 DEPTH

Cover over all sizes of pipe shall be 48 inches to final finished grade. Cover outside this range will not be permitted without specific approval by the Water Division.

In all cases, the proposed depth shall be clearly noted on each plan sheet. Any changes in depth required to avoid conflicting utilities, etc., shall be clearly noted.

Ductile iron pipe, per **Section 4.1**, may be required in cases where pipelines could be subjected to heavy external loads. Most notably, these include, but are not limited to, deep pipelines and pipelines in the roadway alignment which would be exposed to heavy construction traffic prior to paving,

2.2.5 DEFLECTION

Pipe should be deflected whenever possible to turn a corner and the use of bends minimized (See Standard Detail QW608).

Allowable deflection on C909, per **Section 4.1**, pipe is two (2) degrees per joint or eight (8) inch end deflection for a 20-foot length of pipe. The equivalent radius for design is 573 feet. Deflection of push-on joint ductile iron pipe varies by diameter. Refer to Standard Detail QW608 for more information on allowable pipe deflection. Follow manufacturer's recommendations for deflecting pipe of different material and size.

2.2.6 SIZING

The size of proposed water lines shall be such that pressure and flow requirements as specified in these standards, and further detailed in the TOQC Water Master Plan, are met.

Minimum allowable size for water line extensions shall be eight (8) inches unless smaller diameter is verified by modeling to be acceptable. Fire hydrant laterals shall have a minimum size of six (6) inches.

2.3 HYDRANTS

Fire hydrants shall be located outside of street improvements but within the right-of-way or easement. See TOQC Standard Details for Hydrants and Fire Protection (Details QW201, QW202, and QW203). Hydrant valves shall be flanged to tee.

A three (3)-foot minimum clear and level area shall be designed around the fire hydrant.

Hydrants shall be placed along sidewalks and curb per Standard Detail QW202. The minimum dimension from back of curb or sidewalk to face of hydrant shall be 12 inches.

A finished grade elevation shall be shown for the break line or bury line on each proposed fire hydrant.

Fire hydrants shall be installed in accordance with Standard Detail QW201.

Any fire hydrant laterals extending over 18 feet shall require a field locking gasket at all joints and shall be specifically called out on the plans.

The spacing of fire hydrants is to be measured along the street or roadway on which a fire hose would be laid. Generally, this spacing is measured along the curb line. In general spacing for fire hydrants shall be as follows:

- For one (1) and two (2) family dwellings not over 500 feet apart measured along street lines.
- Not over 1,500 feet when water lines are being placed in roadways with no adjacent development.
- Town of Queen Creek fire hydrants shall be a minimum distance of 40 feet from structures.
- All fire hydrants located on commercial private water lines shall be ordered and installed red, indicating that they are on a private system. Painting of private hydrants shall not be allowed.

2.4 BACKFLOW PREVENTION

2.4.1 COMMERCIAL SITES WITH FIRE PROTECTION

All on-site fire hydrant runs or fire protection loops are required to have a Double Detector Check Valve with Meter (DDCVM) at all connection points to the Water Division's system. The following table summarizes the types of water lines and associated requirements for commercial sites per Standard Detail QW203:

- Domestic meter(s) shall be clustered together whenever possible and shall be located in the right-of-way.
- The number and size of meters servicing a multi-unit commercial site is determined by the Developer but must be approved by the TOQC Water Division.
- The only allowable design for manifolds is as follows: Two, two (2) inch meters with a three (3) inch service
- On-site private fire protection improvements are the responsibility of the Developer's Engineer and will not be reviewed or inspected by the Water Division.

2.4.2 LANDSCAPE METERS & BACKFLOW

In addition to the above requirements the following shall be observed:

- Landscape meters shall include a reduced pressure principle backflow assembly after and within five (5) feet of the meter. Meter shall be located inside the right-of-way.
- Landscape meter(s) shall be clustered together whenever possible and shall be located in the right-of-way.
- The number and size of meters servicing a multi-unit commercial site is determined by the Developer but must be approved by the TOQC Water Division.

Table 2.4.1.1 – Commercial and Fire Lines

Type	Description	Inspection	Chlorination & Pressure Testing	Design Requirements
Dedicated Fire Line (Type 1)	Runs directly off main line to building with dual check backflow device at fire riser.	TOQC & Queen Creek Fire Department (Building Inspector's Inspection Log Sheet to be signed)	TOQC	TOQC & Queen Creek Fire Department
Private Fire Line (Type 2)	Fire suppression only, no meters allowed after DDCVM. DDCVM required at all tie-ins and shall be placed on private property. DDCVM and hydrants shall be privately owned and maintained.	TOQC to property line, Queen Creek Fire Department after property line	Queen Creek Fire Department & TOQC	TOQC or Queen Creek Fire Department
Dual Purpose Line (Type 3)	Used for both fire protection and potable water.	TOQC. Queen Creek Fire Department for fire lines only	TOQC	TOQC. Queen Creek Fire Department on fire lines only
Distribution Main Line	In roadways of large commercial developments such as industrial parks. Subject to tie-ins like Types 1-3.	TOQC except private property side	TOQC	TOQC. On-site facilities TOQC or Queen Creek Fire Department
Meter tie-in or changes	N/A	Must be approved and inspected by TOQC for all commercial and residential	N/A	N/A

2.5 VALVES AND VALVE BOXES

Water valves that control the Water Division's energized water lines shall only be operated by TOQC personnel.

The maximum spacing of valves in industrial/commercial and multi-family neighborhoods shall be 500 feet. In single-family residential, the maximum spacing shall be 700 feet.

Valves shall not be located within a driveway.

The minimum number of valves required to isolate an area is equal to the number of mains connecting to an intersection minus one. Tees or crosses at main arterial intersections shall have a valve on all mains.

Valves shall be set a minimum of 10 feet and a maximum of 18 feet from any tee, cross, or 90-degree bend with the exception of hydrant valves which shall be flanged to the main line tee. All valves shall be set a uniform distance from the common fitting unless otherwise directed by a representative of the TOQC Water Division (see Standard Detail QW301).

Valves shall be placed for maximum ease of operation and maintenance of the system by the Water Division personnel.

For distribution lines 12 inches and smaller, a valve shall be placed on each side of major canals, washes, railroads, highways and other places as may be deemed necessary by the Water Division.

A valve shall be provided at the tee for each hydrant branch in accordance with Standard Detail QW201.

Valves 16 inches or larger require valves on by-pass lines.

In important installations and for deep pipe cover, pipe entrance access manholes shall be provided so that the internal valve parts can be serviced.

All mains branching from feeder mains or loops shall have valves adjacent to the feeders so that the branch mains can be taken out of service without interrupting the supply to other locations.

Any water line that will be extended in the future shall have a valve, along with an 18-foot minimum stub (one pipe length) with cap and two (2)-inch corp stop, at the end. The intent is that the tie-in for the future extension will not be under pavement when the future tie-in is made.

Locking lids shall be required in high traffic areas at inspector's discretion.

All valves require dust plugs.

Butterfly valves shall not be permitted on mains less than 16 inches in diameter. On larger pipe, butterfly valves shall be required.

2.6 SERVICES AND METERS

Water service lines and meters shall not be located in parking lots, driveways, sidewalks, washes, or retention/detention areas. Water meters shall be placed in pairs as allowed. See Standard Details QW203 and QW403 for location and configuration of services and meters.

Construction plans shall indicate location of meter service lines and sewer taps to each unit or lot referenced with station and offset from the street center or monument line.

No service connections shall be made to water lines 16 inches or larger in diameter or to water lines designed solely to transmit water from one pressure zone to another pressure zone.

All galvanized iron and polyethylene water service lines in sizes ¾-inch through two (2)-inch which are exposed during construction shall be replaced in their entirety with Type K copper tubing. This will include the replacement of iron service saddles with bronze saddles and the replacement of both the corp stop and the meter stop in all cases.

If water meter services are located incorrectly by the Developer and must be moved to avoid conflicts, the Water Division will allow relocation with specific approval of the Inspector. If the desired relocation is greater than ten (10) feet, the old service must be shut off at the main and a new service installed by the Developer at his expense. Both services shall be noted on the "as-built" plan.

Existing water meters shall be relocated by the Water Division only after the Developer pays the prevailing fees.

Water meters shall be sized and designed in accordance with the requirements of the Uniform Plumbing Code.

The size of the meter will correspond to the size of the tap, except the minimum tap size shall be one (1)-inch. Extra attention is recommended when sizing services for custom home lots where meter sizes often exceed one (1)-inch.

All meters shall not be fenced in, enclosed or located in driveways, and must be accessible to Water Division personnel at all times.

Some meters in subdivisions may require the purchase of individual remote read units (MXU's).

Manifold and branch services shall be in accordance with Detail QW405.

2.7 BACKFLOW PROTECTION

An approved backflow prevention method shall be used at every service connection to a customer's water system when the Water Division determines that their potable water system may be subject to

contamination, pollution, or other deterioration in sanitary quality, by conditions within the customer's water system.
The following types of backflow prevention methods are recognized by the Water Division:

- Air Gap
- Reduced Pressure Principle
- Double Check Valve
- Pressure Vacuum Breaker
- Double Detector Check Valve with Meter (DDCVM), (See **Section 4.9**).

The actual device used shall be approved by the Water Division prior to installation.

A Double Detector Check Valve shall be used for backflow prevention on sites that provide Fire Flow protection.

A reduced pressure valve shall be used for backflow prevention on residential sites. Approved reduced pressure valves shall be on the USC List of Approved Assemblies.

2.8 JOINT RESTRAINT

Thrust on pipeline joints occurs wherever a change in direction, bend or branch exists.

The TOQC Water Division requires mechanical thrust restraint instead of conventional concrete thrust blocks. Thrust blocks may be allowed if conditions warrant AND approval is specifically granted by the Inspector.

The Engineer shall design thrust restraint using an approved computer program such as that available from the Ductile Iron Pipe Research Association (DIPRA) or derive values from Standard Detail QW502-2. Either way it is the Engineer's responsibility to ensure that the thrust restraint designed is sufficient.

All thrust restraint shall be designed for a safety factor of not less than 1.50 at a static test pressure of 200-psi.

2.9 BLOW-OFFS

Capped dead end lines shall be tapped with a flushing device (as per Standard Detail QW602) not less than two (2) inches in diameter. Blow-off valves, fire hydrants, or other suitable means shall be installed at the end of dead-end mains to allow periodic flushing of the lines.

Flushing devices shall not be located in washes, detention/retention areas, sidewalks, or driveways etc.

2.10 AIR/VACUUM RELEASE VALVES

Air release valves shall be installed at all local high points for water mains (See Standard Detail QW603).

2.11 SAMPLING STATIONS

Sampling stations will be required for all subdivisions. The quantity of sampling stations required is based on the number of main entrances to the subdivision. The number required is equal to the number of main entrances minus one, but in no case shall be less than one.

Sampling stations shall not be located at a dead-end. Location of sampling stations shall be as directed by the Water Division at time of first review (See Standard Detail QW609).

2.12 EASEMENTS

No water lines shall be installed in an easement unless the Water Division has approved in writing the placement of the line(s) in an easement(s) and the property owner has granted the necessary easement(s) and/or right(s)-of-way.

If approved, water lines outside of public rights-of-way shall be placed in easements not less than 15 feet wide or at the discretion of the Water Division. The water lines shall be centered in the easement and shall be accessible from a public right-of-way.

Easements larger than 15 feet in width may be required if other utilities are also located in the easement or if additional area is needed for maintenance equipment access due to the size and/or depth of the line(s).

Easements shall be free of obstructions, shall not be located in a fenced area, and shall at all times be accessible to Water Division service equipment such as trucks, backhoes, etc. Areas in question shall be approved in writing by the Water Division.

Easements shall be completed, executed and approved by the Water Division prior to any construction.

Easements to the Water Division not shown on the face of a plat shall be by separate instrument. Separate instrument shall include legal description and exhibit on 8 ½ x 11 inch paper, signed and sealed by a professional Engineer or surveyor registered in the State of Arizona. The recorded documents shall be sent to the Water Division.

SECTION 3 - WATER SYSTEM CONSTRUCTION

The Contractor shall stay fully informed of all Federal and State laws, County and Town Ordinances, regulations and codes which in anyway affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations and codes, and shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees. All construction shall be in accordance with the latest DESIGN and CONSTRUCTION STANDARDS MANUAL of the TOWN of QUEEN CREEK UTILITY SERVICES DEPARTMENT, construction not specifically addressed in that manual shall be completed in accordance with the latest edition of MAG Standard Specifications and Details at the time for the plans are approved. The Town's Inspector shall have final authority on all matters related to installation, repair and/or maintenance of the Town's Water Division facilities.

All excavations shall comply with the requirements of OSHA Excavation Standards 29 CFR, Part 1926, Subpart P and/or MAG Section 601. **Under no circumstances will workers be allowed in a trench without proper shoring and excavation methods.**

All deviations from MAG and OHSA shoring and excavation requirements shall require submittal of a copy of the Contractor's details (with Engineer's stamp). The details shall be furnished to the Town Engineer staff at least 24 hours prior to beginning excavation.

The Contractor's Field Representative shall remain on-site during construction activities and inspections. The Town's Inspector will deal with the Field Representative only, unless prior approval is granted by the Inspector.

3.1 PRE-CONSTRUCTION MEETING

Before any construction or installation of main lines can begin, a pre-construction meeting between the Developer, Contractor's Field Representative and the TOQC Water Division is required. One set of fully approved plans, an ATC or "ATC Not Submitted Letter" and a pdf of all plans on a CD shall be submitted to the TOQC Utilities Department prior to scheduling the meeting.

The Contractor's Field Representative for the project shall attend the pre-construction meeting WITHOUT EXCEPTION or the meeting will be cancelled.

The Contractor shall contact the TOQC Water Division at least 48 hours prior to beginning construction to schedule a pre-construction meeting.

3.2 CONSTRUCTION WATER

It is TOQC policy to require the use of a fire hydrant meter by the Contractor to obtain construction water. The Contractor shall complete a hydrant meter agreement (See Appendix C for copy of Agreement). Whenever possible, the new water line shall be filled through the hydrant meter. The Contractor shall obtain a fire hydrant meter from the Water Division Office and pay all necessary fees and water bills. If the use of a fire hydrant meter is not possible, the Inspector will tabulate the number of times the water line is filled and estimate the amount of water used and the Contractor will be charged accordingly. There is usually a waiting list for hydrant meters so some upfront planning should be considered.

3.3 INSPECTIONS

It is not the function of the Town's Inspector to educate or otherwise instruct Contractor personnel on how to perform the work - THIS INCLUDES TESTING. Competent personnel shall be on-site at all times depending on the work at hand.

Inspections should be coordinated with Bill Lawrence at (480) 748-3952 or Mike Johnson at (480) 797-3894. Inspections are on a day to day first come first serve basis.

The Contractor must call 24 hours in advance to request an inspection.

A copy of the Bill of Lading must be given to the Inspector once said material has reached the site but prior to installation.

A Contractor's field representative must accompany the Inspector during all inspections and have the ability to communicate in fluent English.

An approved set of plans must be on site at all times and readily available to Inspector.

Any failed inspection must be re-inspected prior to backfilling.

When starting a new job, it is recommended that an Inspector be on site so that crews get comfortable with the proper procedures for installing pipe in accordance with Water Division requirements.

Contractor will perform all Blue-Staking for other contractors and utility companies prior to final walk through. The TOQC Water Division will assume Blue-Staking responsibility of all water lines once the final walk-through has been performed and signed off by the Inspector.

Contractor is responsible for warranting the construction for one year after final acceptance. Conditions of final acceptance are located in **Section 3.16**.

Any changes or repairs to the water lines must be approved before hand and inspected by the Inspector. Failure to follow this procedure will make the Contractor liable for taking over full warranty of the entire project whether related to repair or changes, and may result in a longer warranty period.

3.4 LAYING PIPE

All black bell insert lines are to be visible and within one (1) inch of the preceding bell in accordance with manufactures Warranty Specifications (Center loading is recommended to help in this requirement).

No pipe pieces shorter than five (5) feet in length are allowed to be used in any application that cannot be adjusted into line and where short pieces are used they must be at least a full stick away from any fittings including but not limited to tees, bends, valves etc.

All pipes shall have a minimum of 48 inches of cover to the finished grade.

Any reductions in lines shall be made at fittings (Tee's, 90's or Valves etc.) with a Small End Bell (SEB) reducer or a Large End Bell (LEB) unless otherwise approved by the Water Division.

Locator Tape if indicated on the plans or requested by a representative of the TOQC shall be in accordance with MAG Standard Specifications Section 616.4.

Tracer wire shall be in accordance with **Section 4.10** and placed in accordance with Standard Detail QW606.

The interior of all pipe and fittings shall be kept clean of all dirt and foreign material at all times.

If the Contractor cannot install the pipe in the trench without getting debris into it, the TOQC Water Division may require a plug be installed after lowering the pipe into the trench. The plug shall be left in the pipe until connection to adjacent pipe is made.

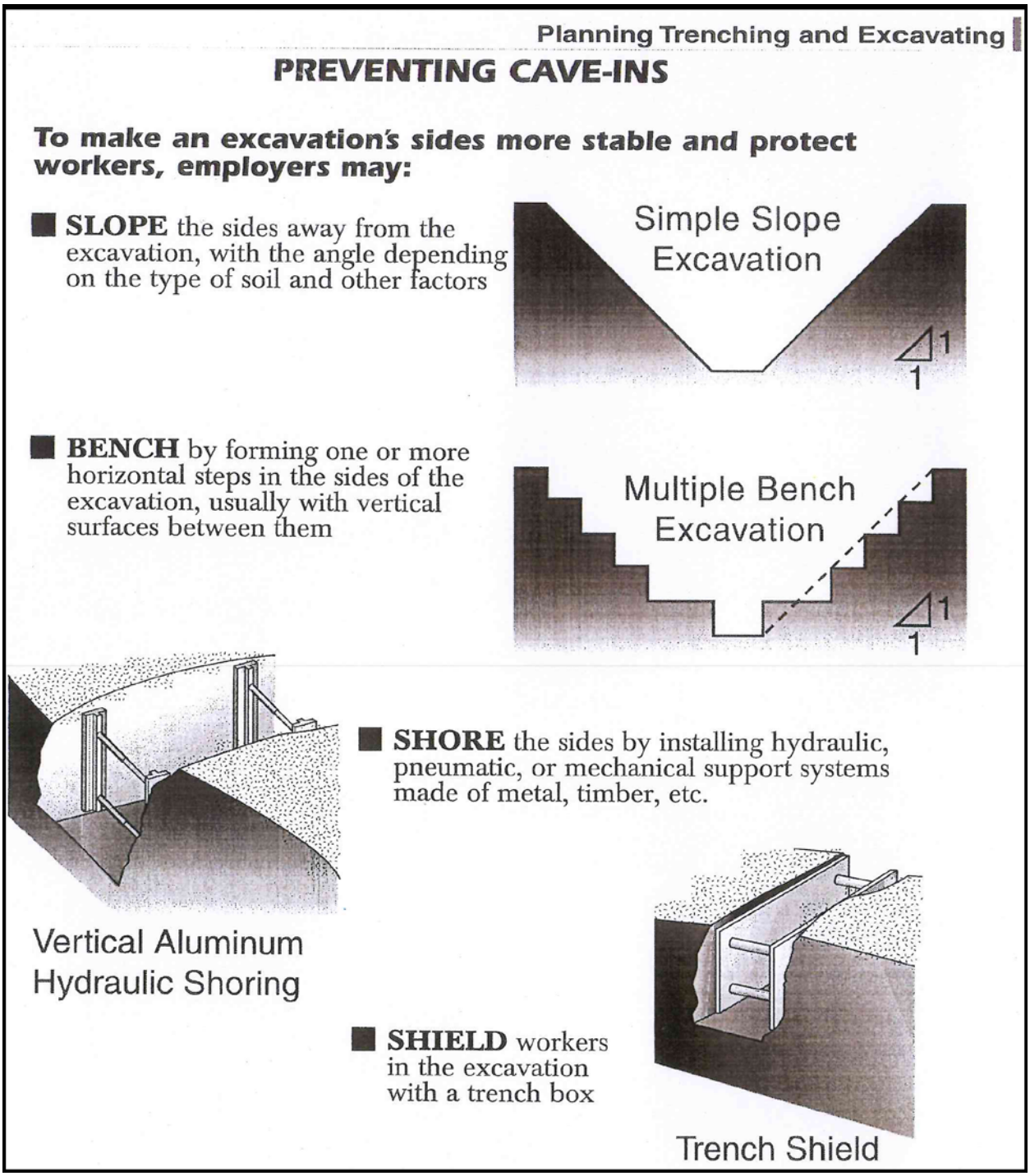
When trenching or excavating, cave-ins shall be prevented through sloping, benching, shoring, and/or shielding (**See Figure 3.4.1 – Trenching Safety**).

At the close of each day's work, the end of the last lain section of pipe shall be sealed to prevent the entry of foreign material of any nature.

At times when pipe laying is not in progression, all open ends of the pipe shall be closed by a watertight plug or other means if approved by TOQC Water Division. If water is in the trench, the seal shall remain in place until the trench is pumped dry.

Special consideration for additional inspections will be made in special cases such as deep laying conditions, sand pockets, trench boxes etc.

Figure 3.4.1 – TRENCHING SAFETY



3.5 DEFLECTION OF PIPE

The preferred method of gradually changing pipe direction is to deflect each pipe joint and minimize the use of bends whenever possible.

Allowable deflection on C909, per **Section 4.1**, pipe is two (2) degrees per joint or an eight (8) inch end deflection for a 20 foot length of pipe. The equivalent radius for design is 573 feet. Deflection of push-on joint ductile iron pipe varies by diameter. Refer to Standard Detail QW608 for more information on allowable pipe deflection. Follow manufacturer's recommendations for deflecting pipe of different material and size.

Contractor shall verify tie-in points to existing system prior to beginning construction so that transition to proposed improvements can be made without the use of bends and by pipe deflection only. The use of bends for transitioning is not allowed unless specifically approved by the Inspector.

Where deflections cannot be used and dips are required they must be of Ductile Iron Pipe only.

3.6 FUTURE TIE-IN POINTS

All future tie-in points should be isolated with a valve at the tee or 90. The tie-in shall be extended a minimum of one full pipe length from the valve and terminate with an MJ cap or plug and a temporary two (2) inch blow-off assembly per Standard Detail QW602 Type B.

Future lines longer than 20 feet must be restrained at all joints or thrust blocked at end cap.

3.7 HYDRANTS

All hydrant assemblies shall be ductile Iron pipe from hydrant valve to hydrant riser. Hydrant valves shall be flanged to tee. See Detail QW201 and QW202 for additional installation requirements.

Inspection of rocks or gravel at all hydrants weeps shall be required. Heights must be set such that weld mark or bury line, is at finish grade (flange approximately four (4) inches above the finished grade).

All hydrant ports shall remain plugged at all times unless a hydrant meter is in use. The turning of hydrant nut is not allowed (exception when blowing-off or settling is being done under the approval of the Inspector). Only the gate valve attached to a hydrant meter is to be used for turning water on and off. Refer to Hydrant meter agreement form in Appendix C for all other restrictions.

The five and on-half (5½) inch port must be facing the nearest street.

Any fire hydrant run extending over 18 feet shall require a field locking gasket at all joints.

IMMEDIATELY PRIOR TO FINAL INSPECTION:

- A fresh coat of paint will be required for all hydrants except private hydrants.
- All hydrants shall be oiled in the operating body with Clario Food Grade mineral oil or white mineral oil 90.
- All hydrant cap threads shall be greased using Nevastane HT/AW2.

All fire hydrants located on commercial parcels shall be ordered red. Painting of private hydrants shall **not** be allowed.

3.8 VALVES AND VALVE BOXES

Valves shall be set a minimum of ten (10) feet and a maximum of eighteen feet from any tee, cross or 90 degree bend with the exception of hydrant valves which shall be flanged to the main line tee. Regardless of selected distance, all valves shall be set a uniform distance from the common fitting unless otherwise directed by a representative of the TOQC Water Division.

In addition to the above requirement a full length of pipe is required after the valve.

All inline valves require mechanical joint restraint.

All valves that are tied into live lines are to remain closed at all times and should only be opened with approval of the TOQC Water Division.

All valve companion flanges are to be tightened with a **standard half inch drive ten (10) inch ratchet only. With no exception shall any other device be used i.e. cheaters, pipes, impact wrenches or torque wrenches etc.** this is to be done as the pipe is lain and should be back filled as soon as possible following a passed inspection.

Valve boxes are to be adjusted to finish grade and have six (6) inch to eight (8) inches of aggregate base (crush) between the two pieces. Concrete collar surrounding valve shall be 40 inch diameter class “AA” concrete with fiberglass reinforcement.

Valve boxes not set in pavement or curb shall be centered within a six (6) inches thick, two (2) foot minimum diameter concrete pad.

Locking lids shall be required in high traffic areas at inspector’s discretion.

All valves require dust plugs.

Tracer wire at valve boxes shall be provided with sufficient extra length so as to extend 12 inches above final finished grade in accordance with Standard Detail QW302.

3.9 SERVICES AND METERS

Service lines must be inspected prior to back filling.

Final setting of services and boxes shall only be completed after curb has been set or blue top staking of final grade is complete.

Meter box shall be set such that the center of the box is three (3) to five (5) feet from the property corner and the angle stop valve is 18 inches outside the right-of-way. See Standard Detail QW403 for clarification).

Meter boxes will be vertical and top of box must be at least two (2) to three (3) inches above grade or equal to top of curb. See Standard Detail QW403 for clarification.

Water must be energized to system before meters can be installed.

Service Taps shall be a minimum of three (3) feet from the pipe bell. There shall be at least one (1) foot between taps.

Taps must be made at a 90-degree angle horizontally from the main.

Existing service lines shall not be reused on new main taps. Existing service lines shall be removed. New service lines shall be installed to main.

3.10 HOT TAPS

A pressure test of 200-psi for two (2) hours on the tapping sleeve is required to be performed before cutting into pipe, this can be performed by the Contractor or the company hired to perform the tapping service.

All Hot Taps shall be a minimum of three (3) feet from the pipe bell.

The Town's Inspector must be present when the tapping and retrieval of coupon is being done.

"Cascade variable sleeves" are not allowed.

3.11 JOINT RESTRAINT

The TOQC Water Division requires mechanical thrust restraint instead of conventional concrete thrust blocks. Thrust blocks may be allowed if conditions warrant AND approval is specifically granted by the Inspector.

Thrust blocks if allowed in conjunction with mechanical joint restraint must be isolated from all fittings and pipe by a barrier of four (4) pound building felt or approved equal by the Water Division, to facilitate future removal if necessary. Thrust blocks must conform to Standard Detail QW503 and shall not be in direct contact with bolts, flanges, pipe or iron of any kind.

Mechanical joint restraint shall be used on all main line fittings and fire hydrant runs. Flanged (not mechanical joint) fittings are an acceptable method of joint restraint commonly used on fire hydrant assemblies and are an acceptable alternative method of joint restraint for fire hydrant runs only.

See Materials section for acceptable joint restraint materials.

Companion flanges are to be tightened with a standard half inch drive ten (10) inch ratchet only. With no exception shall any other device be used i.e. cheaters, pipes, impact or torque wrenches etc.

After companion flange has been tightened, restraint bolts should be tightened by hand as tight as possible until bolts are uniformly secure around pipe. The restraint bolts can then be broken to ensure a uniform clamp and proper seat on pipe.

Once all of the above has passed inspection the Contractor shall backfill immediately.

It may be necessary to install pipe joint restraints or thrust-blocks near fittings as deemed necessary by the Inspector, at any time during the installation of the water line in which soil conditions change.

3.12 FLUSHING

Preliminary Flushing: All mains 12 inches and smaller shall be flushed, prior to chlorination as thoroughly as possible with the water pressure and outlets available. Additional flushing may be done after the pressure test has been completed.

Lines shall be filled slowly with potable water at a maximum velocity of one (1) foot per second while venting all air. Precautions shall be taken to prevent trapping air in the lines. After filling, lines shall be flushed at blow-offs and dead ends at a minimum velocity of three (3) feet per second. A minimum of three changes of treated water shall be used in flushing operations. Valves shall be closed slowly to prevent excessive surges while maintaining positive pressure at all times throughout the new line. Flushing water shall be discharged without causing erosion damage, nuisance, or interruption of traffic. A special pipeline pig may be required when the necessary flushing velocity cannot be achieved or when water needs to be conserved. The Contractor shall make provisions for launching and retrieving the pig.

If, in the opinion of the TOQC Water Division, the pipe contains dirt that will not be removed during the flushing operation the interior of the pipe shall be cleaned, swabbed and/or pigged, as necessary, with a 0.005 to 0.010 percent chlorine solution.

It must be understood that flushing removes only the lighter solids and cannot be relied upon to remove the heavy material that may have entered the main during pipe laying. It is difficult to flush mains exceeding a 12- inch diameter, so in such instances the requirements for keeping foreign material out of the pipeline prior to and during construction, as outlined above, must be firmly adhered to.
The couplings, at high points and disinfection points, shall be left exposed during backfilling until testing is complete. Couplings and corporation stops shall be left on the mains.

Valve Damage by Foreign Material: Unless proper care and thorough inspection are practiced during the laying of water mains, small stones, pieces of concrete, particles of metal, or other foreign material may gain access to mains newly laid or repaired. If it is believed that such foreign material(s) may be in the main, all hydrants on the line shall be thoroughly flushed and carefully inspected after flushing to see that the entire valve operating mechanism of each hydrant is in good condition.

Following chlorination, all treated water in the newly lain pipeline shall be thoroughly flushed until the replacement water throughout the new pipeline can be proved, by laboratory testing, comparable to the quality of water served to the public from the existing water system. Prior to sampling for laboratory testing, the residual chlorine throughout the length of the pipeline shall be reduced to 1.0 ppm or less. Once the required residual chlorine level in the pipeline is achieved, samples shall be taken as outlined below.

The Contractor will be responsible for testing of new water mains. Contractor shall collect samples and deliver them to the laboratory for analysis.

State Wide Disinfection 344 S. Hawes Rd. Mesa, AZ 85208	or	Test America 4625 E. Cotton Center Blvd. #189 Phoenix, AZ 85040

TOQC Water Division will deliver the samples for a fee of $50 per sample.

Samples shall be taken from a tap and riser located and installed in such a way as to prevent outside contamination. Samples shall never be taken from an un-sterilized hose or fire hydrant, because such samples will seldom meet bacteriological standards. The number of sampling locations shall be as follows: Water lines up to but less than 150 feet in length require one sampling riser installed as near to the end as possible; lines 150 feet to 300 feet in length, require two sampling risers, one near each end of the line; lines 300 to 3,000 feet in length, require a minimum of three sampling risers. In addition, dead ends on main lines should be represented with a sampling riser.

The contractor shall provide the results of analysis to the TOQC.

3.12.1 REPETITION OF CHLORINATION PROCEDURE

Should the initial treatment fail to result in the conditions specified above, the original chlorination procedure shall be repeated until satisfactory results are obtained.

Should repetition of the chlorination procedure be required, the installing Contractor may be charged for excessive water use.

3.13 PRESSURE AND LEAKAGE TESTING

Pressure and leakage testing shall be performed only after the pipeline has been properly filled, flushed, and purged of all air. The specified test pressure shall be applied by means of an approved pumping assembly connected to the pipe in a manner satisfactory to the Inspector.

The pressure gauge used for testing purposes shall have a maximum pressure limit of 300 psi.

During the pressure test, all hydrant valves shall be closed.

Test pressure shall be maintained at 200 psi for two (2) hours. If the pressure test is done separately from the leakage test, a time duration of one (1) hour will be required for the pressure test and two (2) hours for the leakage test. If necessary, the test pressure shall be maintained by additional pumping for the specified time.

The Contractor shall furnish the gauges and measuring device for the leakage test, pump, pipe, connections, and all other necessary apparatus, unless otherwise specified, and shall furnish the necessary assistance to conduct the test.

Leakage is defined as the quantity of water that must be supplied into the tested pipe section in order to maintain a pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air in the pipeline has been expelled. No installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND\sqrt{P}}{7{,}400}$$

Where: L = allowable leakage in gallons per hour
N = number of joints in the length of pipeline tested
D = nominal diameter of the pipe in inches
P = average test pressure in psi.

When testing against closed metal seated valves, an additional leakage per closed valve of 0.078-gph/in of nominal valve size shall be allowed.

All visible leaks shall be repaired regardless of the amount of leakage.

3.14 DISINFECTING

Chlorine shall be used to disinfect all new water mains.

3.14.1 METHODS OF APPLYING CHLORINE

Any of the following methods of chlorine application (arranged in order of preference) may be used, subject to the approval of the Engineer.

- Direct chlorine feed
- Calcium or sodium hypo chlorite and water mixture

3.14.2 CHLORINE-BEARING COMPOUNDS IN WATER

On approval of the Engineer, a mixture of water and chlorine-bearing compound of known chlorine content may be substituted for liquid chlorine.

The chlorine-bearing compounds that may be used are: Calcium hypochlorite, and sodium hypochlorite.

Any chlorine product must be ANSI / NSF Standard 60, 61 approved and in accordance with Arizona Administrative Code R18-4-119.

Preparation of Mixture: High-test calcium hypochlorite must be prepared as a water mixture for introduction into the water mains. The powder should first be made into a paste and then thinned to approximately a one (1) percent chlorine solution (10,000-ppm).

3.14.3 POINT OF APPLICATION

The point of application can be done in two ways:
Method One: point of application of the chlorinating agent is at the beginning of any valve section of the pipeline extension and through a corporation stop inserted in the top of the newly lain pipe. The water injector for delivering the chlorine-bearing water into the pipe should be applied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension.

Method Two: at the nearest service line located closest to point of entry to new system.

3.14.4 RATE OF APPLICATION

Water from the existing distribution system or other source of supply shall be controlled so the rate of flow shall not exceed 500 gpm, unless approved by the TOQC Water Division, through a suitable measuring device into the newly lain pipeline during the application of chlorine. The rate of chlorine solution's addition to the water flow should be in proportion, such that the residual chlorine in the newly lain pipe shall be at least ten (10) ppm after standing in the pipe for 24 hours.. This may be achievable with the addition of 50 ppm chlorine to the water flow, although some conditions may require more.

For lines 12 inches in diameter or less, the flow rate of water into the line that needs to be treated can be determined by starting with the line full of water and measuring the rate of discharge at the hydrant located at the end of the pipe farthest away from the point of chlorine application.

For lines larger than 12 inches in diameter, the disinfecting procedure is generally started with the line empty.

3.14.5 CHLORINE RESIDUAL

Before being placed in service, all new mains and repaired portions of, or extensions, to existing mains shall be chlorinated so that a chlorine residual of not less than ten (10) ppm remains in the water after 24 hours standing in the pipe.

3.14.6 PREVENTING REVERSE FLOW

Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. **Valves are to only be operated by employees of TOQC Water Division.**

3.14.7 RETENTION PERIOD

Treated water shall be retained in the pipe long enough to destroy all spore-forming bacteria. This period should be at least 24 hours and should produce no less than ten (10) ppm residual chlorine at the outermost end of the line at the end of the retention period.

NOTE: If the circumstances are such that less than a 24 hour retention period must be used, the chlorine concentration shall be increased to 100 ppm. Under these conditions, special care should be taken to avoid chlorine corrosion of pipes, valves, hydrants and other appurtenances.

3.14.8 CHLORINATING VALVES AND HYDRANTS

In the process of chlorinating newly lain pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

3.15 AS-BUILT PLANS

The Developer will be held responsible for submitting as-built drawings that are accurate, complete and delivered in accordance with **Section 1.7.9** of these standards.

The Town's Inspector shall periodically verify that the Contractor is in possession of and updating as necessary as-built drawings that document all improvements not constructed according to plan.

3.16 FINAL ACCEPTANCE LETTER AND WARRANTEE PERIOD

Final Acceptance by the Water Division shall be granted after all testing is successfully completed, Punch-list items are complete and as-built information is provided to the satisfaction of the Water Division. In addition a completed main line extension agreement is required.

The Water Division shall provide a Final Acceptance Letter to the Contractor.

Contractor's One Year Warranty Period shall begin from the date of the Final Acceptance Letter.

For partial completions due to construction phasing, a bond may be required in the amount necessary to complete the work. The one (1) year maintenance period does not begin until such work is completed and the bond is extinguished.

AOC must be completed prior to Final Acceptance, if an ATC has been granted.

SECTION 4 - WATER SYSTEM MATERIALS

Any material not called-out shall conform to the latest MAG Standards and Specifications at the time of submittal.

All materials within the potable water distribution system shall be lead free per Section 1417 of the Safe Drinking Water Act (42 U.S.C. 300g-6) as amended by "The Reduction of Lead in Drinking Water Act" January 15, 2010.

4.1 PIPE

"Ultra-Blue" Molecularly Oriented PVC Pressure Pipe (PVCO), IPS O.D.'s in 6-inch to 12-inch sizes, PC235 or approved equal conforming to ASTM F1483 and AWWA C909 is the preferred water pipe of the TOQC Water Division.

Class 350 ductile iron pipe shall be used for all construction requiring the use of ductile iron pipe. Ductile iron pipe may be required in cases where pipelines could be subjected to heavy external loads. Most notably, these include, but are not limited to, deep pipelines and pipelines in the roadway alignment which would be exposed to heavy construction vehicle loads prior to final cover or paving. Ductile iron pipe is also required on all dipped sections of water lines as specified in **Section 2.2.2** of these standards and fire hydrant runs. Ductile iron pipe shall meet the requirements of ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/121.11. Rubber gasket joints shall meet the requirements of ANSI/AWWA C111.121.11. Outside coating shall be an asphaltic coating approximately one mil thick. Pipe shall be cement-mortar lined per ANSI/AWWA C104/A21.4.

For some applications high density polyethylene pipe (HDPE) may be used with prior approval of the Water Division. HDPE pipe shall meet the requirements of AWWA C906 and ASTM F714 (sizes > 4-inch). DR 11, working pressure = 160 psi, 80 psi surge allowance.

Fire line connection off of service lines (four inches and larger), and all hydrant connections shall be constructed of ductile iron pipe, minimum Class 350 or equal to or greater than the supply line class.

4.2 HYDRANTS

Acceptable fire hydrant manufacturers and types are as follows:

Table 4.2.1 – ACCEPTABLE HYDRANTS

Manufacturer	Model
Waterous	WB-67
Mueller	Super Centurion 200
Kennedy	(no number)
AVK	27/00 Dry Barrel, Modern Style pumper nozzle size
US Pipe	Sentinel 250

All hydrants shall be dry barrel type hydrants.

All hydrants shall conform to the following specification:

NST Hydrant OL (Open Left) with six (6) inch MJ Shoe
1½ inch Pent Operating Nut
(2) - 2½ inch NST Hose Nozzle
(1) - 4½ inch NST Pumper Nozzle
Painted Yellow

Hydrant Paint shall be PP6 Safety Yellow. For private hydrants, the hydrant shall be ordered red. Painting of private hydrants shall not be allowed.

4.3 VALVES AND VALVE BOXES

Acceptable valve manufacturers and valve types are as follows:

Table 4.3.1 – ACCEPTABLE VALVES AND VALVE BOXES

Manufacturer	Model
Waterous	500
Mueller	A-2360 Resilient Wedge
Ford	Resilient Wedge
Kennedy	Resilient Seat
AVK	Series 25/ resilient wedge

Valve boxes shall be Type “C” with a drop in lid. Locking lids shall be required in high traffic areas at inspector’s discretion.

4.3.1 VALVE BOX DEBRIS PLUGS

All valves require a valve box debris plug. Acceptable Valve Box Debris Plugs are Mud Plug by InFact Corporation.

4.4 FITTINGS

Fittings shall meet the requirements of ANSI/AWWA C110/A21.10 and/or AWWA C-153. Acceptable fitting manufacturers are Tyler, Sigma and Star. Acceptable fitting types are as follows:

Table 4.4.1 – ACCEPTABLE FITTINGS

Type	Standard
Mechanical Joint	C110 & C153ssb 350psi
Flange	C110

Fittings shall be cement-mortar lined, asphalt coated and domestic.

All reduction in pipe sizes shall be made using small end bell (SEB) or large end bell (LEB) reducers unless specifically allowed otherwise by the Water Division.

4.5 TAPPING SLEEVES

Tapping sleeves shall be installed per the manufacturer's specifications.

4.6 SERVICES AND METERS

All Brass fittings shall be one of the following:

Table 4.6.1 – ACCEPTABLE BRASS FITTINGS

Brand
Mueller
Waterous
Ford
A.Y McDonald

Service lines shall be type K Copper tubing made in USA. Alternate material service lines may be allowed only with the permission of the Inspector. See Standard Detail QW403.

All service pipe from corp stop to angle stop shall be one inch diameter unless otherwise approved by the TOQC Water Division.

All angle stops and corp stops must be “Ball Valve” type.

Meter boxes shall be as follows:

Table 4.6.2 – ACCEPTABLE METER BOXES

Meter Size	Meter Box
¾ & 1-inch	#2 concrete with bent steel lid/w hole
1 1/2-inch B/O	#2 concrete with bent steel lid/w hole
2-inch	#3 concrete with bent steel lid/w hole

4.7 JOINT RESTRAINT

Thrust blocks are NOT allowed without prior approval. If approved by the Water Division, thrust blocks must conform to TOQC Standard Detail QW503. Direct contact between concrete and bolts, flanges or iron shall not be permitted.

Hydrant lines may use field locking gaskets.

Field assembled joint restraint systems are to be used on all main line fittings, including hydrant lines, unless fully flanged. Acceptable materials are as follows:

Table 4.7.1 – ACCEPTABLE JOINT RESTRAINTS

Manufacturer	Model	Standard Meeting	Color
EBBA	PVC-2000 series 4 inch to12 inch pipe	ASTM F1674-96	Brown
EBBA	Ductile Iron 1100 series	AWWA C151/ A21.51	Black
Star Pipe Products	PVCGRIP 3500 series 360-degree Restraint System	ASTM F1674	Brown
TUFGrip	TUFGrip PVC TLP*	ASTM F1674-5	Red
TUFGrip	MJ TUFGrip TLD*		Black
Tyler Union	PVC Pipe Restrainer 300C DIOD Serrated Clamp (4 inch to 24 inch sizes)	ASTM A536	Black
SIGMA	SIGMAFLANGE model SFA Restraint Flange Adaptor	ASTM A536	Red
SIGMA	ONE-LOK Series SLC Mechanical Joint Restraining Gland	ASTM D2241	Silver

*Need to remove washer after installation.

4.7.1 BELL RESTRAINTS

Bell restraints shall be Star only.

4.8 AIR/VACUUM RELEASE VALVE

Acceptable combination air valves are as follows:

Table 4.8.1 – ACCEPTABLE COMBINATION AIR VALVES

Manufacturer	Size	Model
Val-Matic	1 inch	201C.2
Val-Matic	2 inch	202C.2
ARI Flow Control Accessories	2 inch	D-040
ARI Flow Control Accessories	2 inch	D-0960-CHF

4.9 DOUBLE CHECK DETECTOR CHECK ASSEMBLY WITH METER

All connection points to the Water Division's system from a commercial site with a private fire service main will require check valves per Standard Detail QW204 and **Section 2.4**. Check valves shall be one of the following or pre-approved equivalents:

Table 4.9.1 – ACCEPTABLE CHECK VALVES

Manufacturer	Model
FEBCO	876 / 876V
Watts Regulator Company	700 Series 709DCDA with meter
Wilkens	450DA or 350ADA with meter

Additional Requirements:

- No RP device will be allowed unless system is designed by a qualified professional.
- Double check detector assemblies with bypass meter shall be UL listed or Fire Marshall approved for fire protection use, and they shall be as approved USC Foundation for cross-connection control and hydraulic research. This assembly is to be used for pollution hazards only as per recommended in the AWWA-M14 manual.
- OS&Y valve shall be approved for fire protection use and installed per NFPA #24.
- On single riser systems, the OS&Y valve assembly shall be signed as a riser control valve with two (2) inch letters in a color contrasting to that of the background sign color. On multi riser systems, additional PIV's may be required to be installed as riser control valves.

- The entire assembly shall be secured with chain and lock or supervised per NFPA #13

- All piping, valves, fittings, and appurtenances downstream of the service line side are Town jurisdiction.

4.10 TRACER WIRE

Tracer wire shall be copperhead reinforced tracer wire #12 AWG and shall be purchased in minimum 2500 foot rolls to minimize the need for splicing.

Approved connections shall be made using DS-100, DS-400 and DS-500 Hughes Dri-Splice wire connectors.

Soloshot Extra High Strength #12 AWG shall be used for dips and bores.

4.11 PRESSURE REDUCING VALVES

Pressure reducer valves may be installed after the water meter on private property.

Acceptable pressure reducing valves are as follows:

Table 4.11.1 – ACCEPTABLE PRESSURE REDUCING VALVES

Manufacturer	Size	Model
Wilkins	½ inch, ¾ inch, 1 inch	70
Watts	½ inch, 1 inch	Series N55B-M1

SECTION 5 - WASTEWATER SYSTEM DESIGN GUIDELINES

Design shall conform to this manual, ADEQ, MCESD, MAG Section 745-PVC Sewer Pipe and Fittings, and Federal standards and regulations.

5.1 FLOW REQUIREMENTS

Sewer flow criteria, specific to the Town was developed in the Interceptor Sewer Modeling & Wastewater Master Plan, July 2011. The master plan was reviewed and accepted by MCESD for use in sizing future sewer facilities within the Town.

Table 5.1.1 – FLOW CRITERIA

Flow per Capita	75 gpcd
Land Use Density	Actual Project Density (Or Number of Units)
Persons per Dwelling Unit	2.7 persons/du
Peaking Factors Used	Per ADEQ Table 1, R18-9-E301D

5.2 PIPE

All sewer lines shall be parallel to property lines or the center line, or as close to parallel as possible. They shall be located 6 feet from centerline and not cross centerline except in special cases approved by the Town. All sewer lines shall have at least four (4) feet of cover.

5.2.1 ALIGNMENT

Mains must be within the Town or County right-of-way, or in a utility easement (**Section 5.9**) with Town's prior approval.

Mains shall be located primarily on the south and west side of roadways. It is not permissible to cross back and forth across the centerline of a winding street to meet the criteria.

In areas where the water main is present, the sewer main shall be located on the opposite side of the roadway whenever possible, and it shall maintain a minimum 6 foot wall to wall separation per ADEQ Bulletin 11 Chapter IV Section B and Standard Detail QW605-4.

Sewer lines shall be extended to the boundaries of the plat to provide service connections to abutting un-subdivided land. A stub-out must be shown at each manhole adjacent to undeveloped property.

Wherever possible, there shall be no 90-degree bends in the sewer mains on pipes 15 inches or larger.

5.2.2 SEPARATION

Reference ARS R-18-5-502, water and sewer mains shall be separated in order to protect public water systems from possible contamination. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. Separation requirements are as follows:

1. A water main shall not be placed:

    a. Within 6 feet, horizontal distance, and below 2 feet, vertical distance, above the top of a sewer main unless extra protection is provided. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided.

    b. Within 2 feet horizontally and 2 feet below the sewer main.

Minimum separation of water lines from sanitary sewer and reclaimed water lines shall be as specified by Standard Detail QW605-1. Water lines shall always be above sewer mains and laterals.

5.2.3 DEFLECTION

Maximum allowable deflection at pipe joint is 5 percent per MAG Section 615.11.C.

5.2.4 SLOPE

Sewer lines require a minimum slope according to size. Sewer lines slopes shall conform to these standards set forth in ADEQ Bulletin 11 Chapter IV Section D.

Service laterals require a minimum slope of one (1) to two (2) percent.

5.2.5 MATERIAL

PVC SDR-35 is the preferred sewer pipe of the Town of Queen Creek Sewer Division. See **Section 7.1.1, PVC**. Alternative pipe materials and/ or thicknesses may be required in cases where pipe lines could be subjected to heavy external loads. Most notably these include, but are not limited to, deep pipe lines, pipe lines in the roadway alignment which would be exposed to heavy construction traffic prior to paving, and point loading. The Engineer shall submit calculations supporting the selected pipe material and thickness.

Ductile iron pipe per **Section 7.1.3** shall be used for extra protection at water and sewer crossings and wash/ channel crossings. See **Section 5.2.2** for separation requirements.

Sewer pipe material changes shall occur at manholes. The entire run manhole to manhole shall be the same pipe type. “Fernco” or similar pipe couplers shall not be used.

5.3 SERVICE LATERALS

Service laterals shall be installed per the Town's standards Detail QS430. Where service laterals cross water mains, the lateral shall cross under the water main with one (1) inch minimum vertical separation..

Service laterals to platted lots within the subdivision shall be placed to the right-of-way line or the public utility easement, whichever is greater. Service laterals shall be centered on the front property line.

Service laterals require a minimum cover of three (3) feet at the property line or easement line.

For mains up to 12 inches, a maximum of two (2) four (4) inch service laterals may go directly into a manhole, with a minimum separation of two (2) feet, and the inverts shall match invert of service lateral to top of highest incoming pipe.

Tracer wire shall be installed from main line to house on all services. The tracer wire will be #12 AWG wire, with no splicing allowed.

All abandoned sewer taps must be capped.

5.4 GREASE INTERCEPTORS

An interceptor is required for all food preparation establishments, including, but not limited to: restaurants, cafeterias, fast food outlets, schools, hospitals, churches, and day care centers, which connect to the Town's sewer collection system. The minimum size allowed is 500-US gallons and the maximum size is 1,500-US gallons, unless written approval from the Wastewater Division is granted prior to construction. The following design guidelines apply:

- Gang interceptors are not allowed.
- Three chamber concrete units or engineered units are allowed with prior approval from the Wastewater Division.
- Covers must have an appropriate traffic rating and must NOT be marked with any wording to indicate it is owned by the Town.
- See Standard Detail QS445 for grease interceptor details.
- Interceptor sizing as follows:
  - For the purpose of interceptor sizing, a value of 3 gallons per minute (gpm) is assigned for each connec ted fixture unit determined from application of Table 7-3 or Section 702. (Fixture and pipe size shall be as required elsewhere in the 2006 Uniform Plumbing Code)

    Alternative: The actual maximum waste flow rate of individual fixtures may be substituted for the standard three (3) gpm per fixture unit flow rate when substantiated by engineering calculations and manufacturer's data for such individual, specified fixtures.
  - Floor sinks and trench drains (trough drains) are assigned fixture unit values based upon trap and trap arm sizes or as shown in UPC Table 7-3.
  - Interceptors shall have a minimum number of compartments, capacity and retention time per **Tables 5.4.1A and 5.4.1B**.

Table 5.4.1A – Minimum Grease Interceptor Size

Number of Compartments	Minimum Interceptor Size
2	500 gallons
3	750 gallons

Table 5.4.1B – Minimum Retention Time

System Has Garbage Disposal	Minimum Retention Time
No	12 minutes
Yes	17 minutes

- Grease Interceptor Sizing Example:

  A grease interceptor installed to receive wastes from multiple fixtures including: one (1) dish washing machine floor sink, a grease extracting hood, one (1) tilt kettle floor trough, one (1) mop sink, a three (3) compartment pot sink, one (1) pre-rinse sink with disposal, and four (4) floor drains. No solids interceptor is used; therefore a 17 minute retention time is required.

  Step 1 - Determine the Hydraulic Loading of each Fixture in Fixture Units (FU)

  1. Dish machine receptor (floor sink) with four (4) inch trap and trap arm = eight (8) FU (See Section 702)
  2. Grease exacting hood receptor [two (2) inch floor sink] = three (3) FU (See Table 7-3)
  3. Tilt Kettle trough [minimum two (2) inch trap and trap arm] = four (4) FU (See Section 702) Mop (service) sink = three (3) FU (See Table 7-3)
  4. Three (3) compartment commercial sink = three (3) FU (See Table 7-3)
  5. Pre-rinse sink with garbage disposal [two (2) inch trap and trap arm] = four (4) FU
  6. Four (4) Floor drains x two (2) FU each = eight (8) FU

  Step 2 - Establish the Total Hydraulic Loading on the Interceptor in Fixture Units

  8 FU + 3 FU + 4 FU + 3 FU + 4 FU + 8 FU = 33 Fixture Units

  Step 3 - Determine the Minimum Size Interceptor Required in Gallons

The 17 minute retention time applies to all fixtures even though all fixtures may not discharge simultaneously.
(33 FU) x (3 gpm) x (17 minute) retention time = 1683 gallons minimum capacity required

Solution

Choose the next larger available size 3-compartment interceptor (i.e.: 1700, 1750, 1800, or 2000 gallon capacity)

5.4.1 GREASE TRAPS

Traps are allowed only when there are four or fewer fixtures used for food preparation. Establishments that may install a grease trap in lieu of an interceptor may include delicatessens, sandwich shops, pizza take-outs, and ice cream parlors. A grease trap shall be installed whenever a three compartment sink is required by Maricopa County or a dishwasher is installed.

- The minimum size allowed is 50-gpm, with a 100-lb grease capacity.
- A vented flow restriction device is required upstream of the trap.

5.5 MANHOLES

All sanitary sewer manholes shall be polymer, five (5) feet diameter, with 30- inch lids, per Standard Detail QS420

Manholes shall not be located in a retention basin.

Manholes shall be installed at:

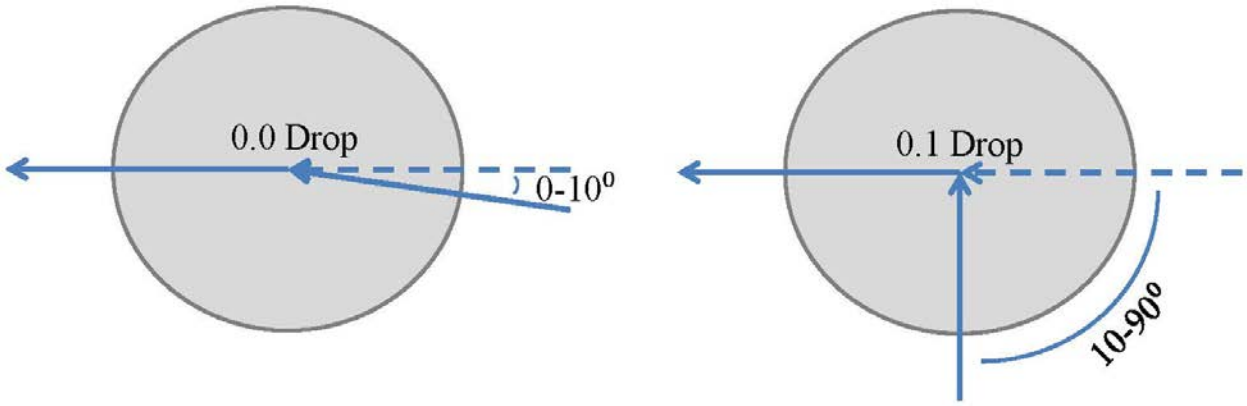
- All changes in grade
- All changes in alignment
- At all main line sewer pipe connections
- At all connections where the sewer line size changes
- At lateral connections from some commercial buildings (at the Town's discretion)
- And at distances not exceeding the following:
- All dead-end lines that will not be extended by planned future phases, require a manhole at the end of the line.

Table 5.5.1 – MANHOLE SPACING

Pipe Size (inch)	Maximum Manhole Spacing (feet)
8-60	500

When different size lines enter a manhole, match inverts.

Manholes require no drop across the base when the angle of the incoming and outgoing pipe is straight to ten (10) degrees. Manholes require a minimum 0.1 foot of fall across the base when the angle of the incoming and outgoing pipe is between 10- 90-degrees (Refer to image below). Angles above 90-degrees are not permitted.



Whenever there is a difference in the inverts of a main line more than five (5) feet, the manhole shall conform to Standard Detail QS431 – Drop Sewer Connections.

Whenever a manhole is required to have a watertight cover it shall conform to the Standard Detail QS422. A manhole is required to have a watertight cover when it is surcharge or sump condition or where the Town determines it is necessary.

The top of the manhole cone shall be installed two feet below the future road grade. Temporary grade rings may be stacked greater than the 24-inch maximum as approved by the Town Inspector.

5.5.1 INDUSTRIAL WASTE MANHOLE

Industrial Waste manhole shall be required at the outfall point of commercial and industrial sites that require flow measurement. The wastewater division shall determine applicability for sites (See Standard Detail QS424).

5.6 MAIN LINE CLEANOUTS

Main line sewer cleanouts shall not be used within the public right-of-way.

5.7 LIFT STATIONS

Lift stations shall be a “package plant” design with written approval by the Wastewater Division before installation.

5.8 FORCE MAINS

Sewer force mains shall be constructed of ductile iron pipe.

5.9 EASEMENTS

When a sewer main must be installed outside of the public street right-of-way, it must be approved by the Wastewater Division prior to plan submittal and include written documentation from the property owner granting necessary easements and access.

Minimum easement width is 20 feet with access for trucks and equipment to maintain and repair the system, subject to approval based on sewer depth and future maintenance.

Easements shall be free of obstructions, shall not be located in a fenced area, and shall at all times be accessible to Wastewater Division service equipment such as trucks, backhoes, etc. Areas in question shall be approved in writing by the Wastewater Division.

The easement shall be on the construction plans and shall include a legal description signed and sealed by a surveyor registered in the State of Arizona.

If an easement or right-of-way dedication or abandonment is required by separate instrument, the following exhibits and/or information must be provided with the easement document:

- Subdivision name
- Type of easement
- Reason it is required
- Vicinity map with major cross streets
- Legal description sealed by a RLS
- A Detail or Plot Map showing the easement or R/W location and alignment with dimensions and bearings, true Point of Beginning, Section, Township and Range.
- Current Title Report

5.10 ODOR TANK

The Wastewater Division controls sewer odor with chemical injection. The Wastewater Division shall, at their discretion require a development to provide land and/ or a fully equipped odor tank site (See Standard Detail QS44).

5.11 AUTO FLUSHING DEVICE

The Wastewater Division controls sewer odor with automated flushing devices. The Wastewater Division shall at their discretion require auto flushing devices to be installed throughout the site (See Standard Detail QS443).

SECTION 6 - WASTEWATER SYSTEM CONSTRUCTION

The Contractor shall stay fully informed of all Federal and State laws, County and Town Ordinances, regulations and codes which in anyway affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations and codes, and shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees. All construction shall be in accordance with the latest DESIGN and CONSTRUCTION STANDARDS MANUAL of the TOWN of QUEEN CREEK UTILITY SERVICES DEPARTMENT, construction not specifically addressed in that manual shall be completed in accordance with the latest edition of MAG Standard Specifications and Details at the time this construction permit was applied for. The Town's Inspector shall have final authority on all matters related to installation, repair and/or maintenance of the Town's sanitary sewer collection system.

All excavations shall comply with the requirements of OSHA Excavation Standards 29 CFR, Part 1926, Subpart P and/or MAG Section 601 and 603 for HDPE pipe. **Under no circumstances will workers be allowed in a trench without proper shoring and excavation methods.**

All deviations from MAG and OHSA shoring and excavation requirements shall require submittal of a copy of the Contractor's details (with Engineer's stamp). The details shall be furnished to the Town Engineer staff at least 24 hours prior to beginning excavation.

The Contractor's Field Representative shall remain on-site during construction activities and inspections. The Town's Inspector will deal with the Field Representative only, unless prior approval is granted by the Inspector.

6.1 GUIDELINES / RESPONSIBILITIES

- The Contractor is responsible to conform to the Town's Design and Construction Standards Manual, local, state, and federal regulations including those set forth by MAG, OSHA, and the EPA and any other applicable authorities with regard to environmental, health, and safety during all work.
- Confined space entry, flow diversion and/or bypass plans shall be presented by the Contractor as necessary before work can begin.
- Asphalt replacement will be done in accordance with MAG specifications and the Town's Engineering Standards with the Inspector's approval.
- Contractor shall warrant all work against defects in material and workmanship for a period of one year starting on the date of Final Approval Letter issued by the Town, with the exception of manhole coatings which require a five (5)-year warranty and composite manholes which require a 20-year warranty.
- Contractor shall be responsible, upon receipt of a written notice, for repair of defects and/or damages caused by those defects that occurred during the warranty period at their own expense and without cost to the Town.

6.2 PRE-CONSTRUCTION MEETING

Before any construction or installation of main lines can begin, a pre-construction meeting between the Developer, Contractor's Field Representative and the TOQC Water Division is required. One set of fully approved plans, ATC or "ATC Not Submitted Letter" and a pdf of all plans on a CD shall be submitted to the TOQC Wastewater Division prior to scheduling the meeting.

The Contractor's Field Representative for the project shall attend the pre-construction meeting WITHOUT EXCEPTION or the meeting will be cancelled.

The Contractor shall contact the TOQC Wastewater Division at least 48 hours prior to beginning construction to schedule a pre-construction meeting.

6.3 CONSTRUCTION WATER

It is TOQC policy to require the use of a fire hydrant meter by the Contractor to obtain construction water. The Contractor shall complete a hydrant meter agreement (See Appendix C). The Contractor shall obtain a fire hydrant meter from the Water Division Office and pay all necessary fees and water bills. There is usually a waiting list for hydrant meters so some upfront planning should be considered.

6.4 INSPECTIONS

It is not the function of the Town's Inspector to educate or otherwise instruct Contractor personnel on how to perform the work - THIS INCLUDES TESTING. Competent personnel shall be on-site at all times depending on the work at hand.

The Contractor must call 24 hours in advance to request an inspection.

Separate inspections are required for trench bottom preparation and for the haunches area of the pipe.

A copy of the Bill of Lading must be given to the Inspector once said material has reached the site but prior to installation.

A Contractor's field representative must accompany the Inspector during all inspections and have the ability to communicate in fluent English.

An approved set of plans must be on site at all times and readily available to the Inspector.

Any failed inspection must be re-inspected prior to backfilling.

When starting a new job, it is recommended that an Inspector be on site so that crews get comfortable with the proper procedures for installing pipe in accordance with Wastewater Division requirements.

Contractor will perform all Blue-Staking for subcontractors and utility companies prior to final walk through. The TOQC Wastewater Division will assume Blue-Staking responsibility of all sewer lines once the final walk-through has been performed and signed off by the Inspector.

Contractor is responsible for warranting the construction for one (1) year after final acceptance. Conditions of final acceptance are located in **Section 6.14**.

Any changes or repairs to the plans must be approved before hand and inspected by the Inspector. Failure to follow this procedure will make the Contractor liable for taking over full warranty of the entire project whether related to repair or changes, and may result in a longer warranty period.

6.4.1 REQUIRED INSPECTIONS

- All connections to existing facilities
- Trench bottom preparation
- Haunch consolidation
- All trench after placement of shading material
- All manhole base sub-grade after compaction and pipe installed with water stops on
- Verification of fall across manhole base prior to setting cone
- All stub-out plugs prior to backfill
- All service laterals prior to backfill
- All utility crossings prior to backfill

6.5 LAYING PIPE

Prior to any construction, the first manhole downstream from any existing live sewer main shall be plugged on the downstream side of the manhole, these plugs shall be maintained in place until all testing has been accepted by the Inspector and the Contractor shall verify elevation and location of the sewer main stub-out before proceeding with sewer excavation.

- All trench excavation, backfilling and compaction shall be in accordance MAG Uniform Standards Section 601 and/or OSHA Excavation Standards 29 CFR, Part 1926, Subpart P.
- Pipe alignment shall be in compliance with plans.
- Caution tape shall be placed over all sewer mains, three (3) feet above the pipe or as approved by the Inspector.
- Trenches shall not be backfilled until pipe, bedding, and placement of tracer wire have been approved by the Town's Inspector. The pipe can be center loaded only to prevent movement of pipe after placement of wire.
- All mains are to have water stops at every inlet and outfall of every manhole per MAG Section 615.6.2.
- Minimum slope per ADEQ Bulletin 11 Chapter IV Section D, no exceptions.
- Couplers must be solid sleeve type - "Fernco" couplers may not be used.
- Sewer pipe material changes shall occur at manholes. The entire run manhole to manhole shall be the same pipe type.

6.5.1 BEDDING MATERIALS

ABC Granular Material per MAG Specifications Section 702, six (6) inch minimum below pipe to one (1) foot above pipe.

6.6 BACKFILL REQUIREMENTS

- Trenches shall not be backfilled until pipe and bedding are approved by the Inspector.
- Contractor may "center load" pipe only after approval from the Inspector to backfill.
- Bedding shall be consolidated in the haunch area of the pipe.

6.7 COMPACTION REQUIREMENTS

MAG Specification Section 601, Table 601-2, minimum trench compaction densities are as follows:

- Type one (1) shall be 95 percent for granular backfill in all cases, except the top two (2) feet which shall be 100 percent; and 95 percent for non-granular backfill in all cases.
- Type two (2) shall be 90 percent compaction in all cases except the pipe zone, which shall be ABC material per MAG Specifications Section 702 compacted to 100 percent from six (6) inch minimum below pipe to one (1) foot above pipe. This will be done in two (2) lifts per MAG Specifications Section 615.4.

Additional Requirements:

- Bedding for manhole bases shall be six (6) inch ABC compacted to 95 percent or as approved by Utility Director.
- Compaction tests taken around structures shall be taken as close as possible to the structure.
- Backfill around manholes will be done in maximum two (2) foot lifts.
- Moisture control range for compaction tests on non-granular soils shall be determined by standard proctor test AASHTO T99 or ASTM D698, and not deviate more than minus three (-3) percent to plus two (+2) percent from optimum moisture unless otherwise noted on approval geotechnical report.
- The Town's Inspector, on an as needed basis, may require additional material testing and/or sampling at his/her discretion.
- All testing personnel shall be certified for the required tests to be performed. Documentation of the certifications for each onsite testing technician must be supplied to the Town's Inspector prior to performing any tests.
- A geotechnical trainee shall be under the direct supervision of a certified testing technician at all times.
- The Contractor shall be responsible for all necessary barricading, trench shoring, and safety requirements needed by testing personnel to perform the required tests as needed.
- It is mandatory that the testing technician or the testing company notify the Town's Inspector on the same day of any failed test relating to trench backfill, sub grade, concrete, ABC, or asphaltic concrete. Verbal testing updates shall be given to the Town's Inspector on at least a weekly basis to discuss any concerns and review documentation. All field reports shall be provided to the Town's Inspector weekly.

- Additional testing will be required when sloping or benching of trenches is used. One additional test per lift per 500 feet will be required for every four (4) feet of additional trench width.
- All trench backfill compaction tests shall be at staggered depths and at random locations throughout each 500 foot length of the trench.
- If asphalt millings are allowed to be used for bedding, they shall meet the specification requirements of virgin aggregate base course.
- An additional sample and proctor test shall be required where any compaction test result is greater than plus four (+4) percent of maximum dry density.
- The nuclear gauge shall be calibrated against the sand cone a minimum of every ten tests.
- All correlation testing documentation for sand cone and nuclear testing shall be provided in the final testing booklet submittal.
- Rock correction per MAG Detail No. 190 shall be used for any number four (4) and above material.
- Soil samples taken to determine the standard proctor for trench backfill and compaction shall be taken directly from the trenched spoil piles as a representation of the blended soil types from the excavation process.
- Significant compaction test failures shall be retested using a sand cone. Any resulting failure will be re-worked before any retesting.
- Compaction tests taken around structures shall be taken as close to the structure as possible and are separate from the required one test per lift per 500 lf.
- Compaction requirements are located in **Table 6.7.1** below.

Table 6.7.1 – FIELD DENSITY TESTING

Backfill Item	% Compaction Required	Depth	Notes	Frequency
Manhole base SG	95%	6 inch	See Trench Specifications	All Manholes
Manhole backfill	95% All Cases Except Top 2-ft 100% if Granular Material	12 inch	MAG 601.4.4 (Table 601-2)	One test at 2 foot lift increment At various locations around manhole Within 3 feet of manhole
Pipe Bedding	100%	6 inch	See Trench Specifications	One test per 500 lf
Trench Backfill	95% All Cases Except Top 2 feet 100% if Granular Material	12 inch	MAG 601.4.4 (Table 601-2)	One test per 500 lf per 1 foot lift

6.8 MAINLINE TESTING

TESTING SHALL BE FOR 100 PERCENT OF MAIN LINES INSTALLED AND VERIFIED BY THE TOWN'S INSPECTOR WHO MUST BE PRESENT FOR ALL TESTING.

No testing shall start until after installation of all "dry utilities" and all compaction for the mains and dry utilities have passed. The mains must also be flushed of **all** debris prior to any testing. Any failed section of main will be repaired and retested until it passes.

6.8.1 LOW PRESSURE TESTING

This will be in accordance with MAG Section 615.11 A. Where possible the Contractor should set-up the testing so that two tests can be done at the same time from one manhole. Plugs will be removed as directed by the Town's Inspector to verify the section tested.

6.8.2 DEFLECTION TESTING

This will be in accordance with MAG Section 615.11.C. The Contractor will have string line though each main line run before calling for the testing.

6.8.3 VIDEO

The main line shall be videoed per **Section 6.12** The main line shall conform to the following.

- The depth of pooling water in sewer pipes 12 inches and under is greater than 5/8 of an inch, or greater than 1¼ inch for pipes larger than 12 inches
- Debris in pipe; soil, rocks, construction items, etc.
- Visible defects in pipe such as open joints, pinched gaskets, cracked bell, etc.

6.9 MANHOLES

- Each base must be verified and inspected for depth; compaction, water stops and slope across the manhole base (pipe to pipe) before placement of precast base.
- All joints shall be caulked using Superior Environmental Products ER-1500R, Sewer Shield caulk, or other approved by the Town.
- Saw cut in streets shall be a "Round" cut per Standard Detail QS421 for finishing manhole adjustment.
- Manhole collars shall be placed with fiberglass reinforced concrete to resist breaking and cracking.
- Manhole frame shall be grouted to polymer or expanded polypropylene grade rings with Armor Rock non-shrink vinyl ester grout or approved equal.

6.9.1 PROTECTIVE COATINGS

Concrete sewer manholes shall be 100 percent coated with a protective coating.

- All exposed metal inside the manhole shall receive an SSPC-SP5 White Metal Blast Cleaning and coated with an approved protective coating per **Section 7.2.2**.
- Application equipment shall be specifically designed and approved by the manufacturer of the coating used, and Contractor shall be certified on this equipment for applying.
- Surface Preparation
  - Remove existing coatings prior to application of the new coating. All waste material generated during surface preparation is the responsibility of the Contractor for proper handling and disposal.
  - All concrete or mortar that is not sound or has been damaged by chemical exposure shall be removed to a sound concrete surface.
  - Surfaces to receive protective coating shall be cleaned with a high pressure water cleaning system using 5,000 psi at four (4) gpm. If necessary detergent water and hot water blasting will be used to remove oils, grease or other hydrocarbon residues from the concrete to provide a uniform, clean neutralized surface that is not excessively damaged.
  - All surfaces shall be repaired as required by the protective coating system manufacturer requirements used.
  - In no event shall debris or material removed from the manhole surface be allowed into the sanitary sewer system.
  - An epoxy primer/sealer coat shall be applied to all surfaces after preparation work is completed prior to protective coating being applied.

- Application of Repair Materials
  - Areas where structural steel has been exposed or removed shall be repaired in accordance with the Engineer's recommendations.
  - The repair materials shall be trowel applied utilizing the proper equipment to the thickness specified by the Engineer.
  - If using a cementitious repair material, such shall be toweled to provide a smooth surface with an average profile equivalent to coarse sandpaper. No bug holes or honeycomb surfaces should remain after the final trowel procedure.
  - The repair materials shall be permitted to cure according to the manufacturer's recommendations. All materials must be approved for the specific coating system used.
  - All surfaces should be inspected by the Inspector prior to coating.

- Application of Protective Coating
  - Contractor shall NOT apply any coating until after the Inspector approves the manhole.
  - Contractor shall conform to and follow all recommendations and requirements of the manufacturer of coating system used.

6.9.2 MANHOLES IN PAVED AREAS

Manholes constructed within pavement shall:

- Have a clean circular cut in the asphalt to avoid tearing up the surface.
- Have the lid adjusted to finished grade with concrete ring per Standard Detail QS421.
- All adjustment rings will be fully grouted and coated per Standard Detail QS421.

6.9.3 MANHOLES IN UNPAVED AREAS

Manholes constructed in unpaved areas shall:

- Be a minimum of six (6) inches above finished grade but shall not exceed two (2 feet). The actual wash topography and flow characteristics will dictate this height.
- Have the manhole lid adjusted to 8 inches above surrounding grade with a minimum concrete ring around it 12 inches wide and six (6) inches deep.

6.9.4 DROP MANHOLES

For drops greater than five (5) feet, use drop manhole Standard Detail QS431.

6.9.5 EXISTING MANHOLES

Existing concrete manholes require the following:

- If all of the concrete inside the manhole does not have protective coating, follow guidelines in **Section 6.9.1** and coat them accordingly.
- If the manhole has a protective coating in place the Inspector shall inspect it and determine what work will be required.
- If the manhole is outside of the pavement, whatever is missing from the following list shall be completed
  - Have the lid adjusted to 6-in above the surrounding grade with a minimum concrete ring around it 12 inches wide and eight (8) inches deep.
  - All adjustment rings will be fully grouted and coated per Standard Detail QS421.
  - Install two green fiberglass reinforced plastic Carsonite Utility Markers.

6.9.6 REHABILITATION OR REPAIR OF EXISTING MANHOLES

Rehabilitation or repair of existing manholes shall conform to the standards set forth in **Sections 6.1, 6.9, 6.10**, as well as the following:

Contractor shall submit four copies of submittals for each project detailing each manhole to be rehabilitated of materials, drawings and schedule for the Town's review and approval. Two of these will be returned to the Contractor once approved by the Town. The diagram drawings and schedules must show complete work to be done. Any errors or omissions because of incomplete or erroneous drawings shall be corrected by the Contractor at his own expense, even though the work is in place.

The following items shall be submitted:

1. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
2. Material Safety Data Sheets (MSDS) for each product used.
3. Project specific guidelines and recommendations.
4. Qualification of the Contractor for the product used.
5. Evidence of the required Five (5) Year Bond.

- Bond
  - The Contractor shall provide a Five (5)Year Bond, payable to TOQC, against defects or failure in materials and workmanship from the date of Final Acceptance by the Town. The Bond amount shall cover both material and labor cost associated with applying an approved coating per manufacturer's requirements. Contractor shall, within a reasonable time after written notice from the Town, repair defects or failures in materials or workmanship which may develop during the Five (5) Year Bond period at his own expense and at no cost to the Town.
  - The definition of coating failure is that blistering, cracking, becoming brittle or softening of the coating is starting to occur, failure of the bond to the concrete surface, or failing the Holiday (Spark) Testing.
- Contractor
  - The coating applicator shall be an Arizona licensed contractor with an AE license or equivalent.
  - The Wastewater Supervisor will determine which manholes to rehab and submit a list to the Contractor. All manholes that currently have the 'T-Loc' system in them shall have the system removed and disposed of properly. This includes removing the 'T-Loc' from the concrete and then following procedures for repairing the concrete outlined in these specifications.
  - Current documentation from the coating product manufacturer certifying Contractor's training and equipment complies with the Quality Assurance requirements specified by the Town shall be submitted by the Contractor.
  - Contractor shall follow all requirements and recommendation from the manufacturer of the product is being used. This does not relive the Contractor from any obligation assumed under any other provision of this contract.
  - An approved and signed traffic control plan from the Town is required prior to any work starting. An 'Encroachment Permit' is also required for work done in the Town; this is a no cost permit.
- Quality Assurance
  - Repair products shall be fully compatible with coating product including ability to bond effectively forming a composite system.
  - Contractor shall utilize equipment for the application of the coating product which has been approved by the coating product manufacturer, and shall have received training on the operation and maintenance of said equipment and certified by the manufacturer.

- Contractor shall initiate and enforce quality control procedures consistent with the coating product manufacturer's recommendations and applicable NACE or SSPC standards and OSHA regulations.
- The Contractor is responsible to follow all recommendations of the manufacturer on product delivery, handling, storage and application.

- Adjustment Ring Repairs
  - On manholes which require only ring repair work, the Town's Utility Inspector will decide if the rings can be repaired or must be replaced. To repair or replace the rings follow the same procedures as for manhole rehab with preparation work, application of materials, application of protective coating and testing as outlined in these specifications.
  - Contractor shall ensure adjustment rings are lined-up within a ½ inch of each other vertically, before grouting.

- Clean-Up
  - The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by the operations.
  - At completion of work the Contractor shall remove all equipment, tools, and surplus materials and dispose of properly.

- Contract Acceptance
  The Town's Utility Inspector will issue a letter of acceptance for payment after:
  - All testing has been passed and approved.
  - All defects have been repaired and accepted.
  - All manholes have been check to ensure no debris was left.
  - All remaining materials have been removed and clean-up is completed.
  - Traffic Control has been removed.
  - Bond/Warranty Documents have been received.

6.10 MANHOLE TESTING

TESTING SHALL BE FOR 100% OF MANHOLES INSTALLED AND VERIFIED BY THE INSPECTOR WHO MUST BE PRESENT FOR ALL TESTING.

All manholes shall be approved by the inspector after any reconstruction or prep work before coating is applied.

Required testing includes Vacuum Testing, Wet Film Thickness Testing and Holiday (Spark) Testing. The Inspector may also have Adhesion (pull-strength) Testing done at random locations.

6.10.1 VACUUM TESTING

Vacuum testing shall be completed per ASTM C 1244-9 and shall be done prior to coating the manhole.

6.10.2 WET FILM TESTING

Wet Film Testing shall be done during application in accordance with ASTM D4414-Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages. Measurements shall be taken, documented, and attested to by the Contractor for submission to the Town.

6.10.3 HOLIDAY TESTING

Holiday (spark) Testing shall be in accordance with NACE RPO 188-99 after the coating has set in accordance with the manufacturer instructions. All coated surfaces shall be tested for holidays with high-voltage detection equipment. All detected holidays shall be marked and repaired abrading the coating surface with grit disk paper, or similar tooling method, cleaned properly and recoated. Hand application is allowed following the manufacturer's coating instructions. Documentation is required by the Inspector that they were present for, and all repairs have passed retesting.

6.10.4 ADHESION TESTING

Adhesion (pull-strength) Testing, when required, is a destructive test method and will be used to test about 10 percent of the manholes selected by the Inspector. Testing shall be done in accordance with ASTM D4541- Pull-Off Strength of Coatings Using a Portable Adhesion Tester as modified herein. Three (3) 20 mm dollies shall be affixed to the coated surface at the cone area, mid-section and lower section of the manhole. The adhesive used to attach the dollies to the coating shall be rapid setting with tensile strength in excess of the coating product and permitted to cure in accordance with manufacturer's recommendations. Failure of the dolly adhesive shall be deemed a non-test and retested. Two of the three pulls shall exceed 200 psi. Any area detected to have inadequate bond strength shall be evaluated by the Town's Engineer, and further bond testing may be required. Subsequently, Holiday Testing shall be conducted in manholes where Adhesion Testing is performed.

A visual inspection shall be made by the Inspector before final approval will be granted. This is to verify the manhole has been cleaned after all work was performed and is free of related materials, before giving the Final Acceptance Letter.

6.11 FUTURE TIE-IN POINTS

Stub-outs to be bell-end with short stub and cap per Detail QS441 unless specifically called out on the plans as a "future outlet stub with spigot end & cap", minimum slope shall be maintained to end of stub-out.

6.12 VIDEO INSPECTION

All newly constructed sewer mains and laterals shall be internally videoed twice by the Town. The permit fees include two video inspections, any additional fees for re-videoing a failed section is the responsibility of the Contractor. The first videoing will take place after all testing has be completed and passed by the Inspector. The second videoing will take place after the manhole lids and rings have been adjusted to final grade and the paving is completed.

- The Contractor is required to contact the Town's Inspector to schedule the televising a week in advance of the date requested.
- The Contractor shall place a minimum of 40 gallons per 200 feet of pipe of water into each manhole an hour before televising that section of line; this should be done with the Inspector present.
- Reasons for failure include, but are not limited to;
  - Contractor not being prepared after setting up scheduled date. This can result in a $250 call-out charge.
  - Water flushing not done properly.
  - See **Section 6.8.3** for additional information.

6.13 AS-BUILT PLANS

The Developer shall be responsible for submitting as-built drawings that are accurate, complete and delivered in accordance with **Section 1.7.9** of these standards.

The Town's Inspector shall periodically verify that the Contractor is in possession of and updating as necessary as-built drawings that document all improvements not constructed according to the approved plans for the project.

6.14 FINAL ACCEPTANCE LETTER AND WARRANTY PERIOD

Final Acceptance by the Wastewater Division shall be granted after all testing is successfully completed, Punch-list items are complete and as-built information is provided to the satisfaction of the Wastewater Division.

The Wastewater Division shall provide a Final Acceptance Letter to the Contractor.

Contractor's One (1) Year Warranty Period shall begin from the date of the Final Acceptance Letter.

For partial completions due to construction phasing, a bond may be required in the amount necessary to complete the work. The one year maintenance period does not begin until such work is completed and the bond is extinguished.

The Contractor/Developer shall provide a One Year Bond for the entire project, payable to TOQC.
An additional Five (5) Year Bond shall be provided for the protective coating in concrete sewer manholes, payable to TOQC.

An AOC must be completed prior to final acceptance, if an ATC was granted.

SECTION 7 - WASTEWATER SYSTEM MATERIALS

Any material not called-out shall conform to the latest MAG Standards and Specifications at the time of submittal.

7.1 PIPE

Materials for sewer mains over 12 inches in diameter require approval by the Wastewater Division prior to installation.

See **Section 5.2.5** for pipe material change guidance.

7.1.1 PVC

PVC, solid wall, SDR-35 pipe may be used for all gravity, 15-inch and smaller, sewer lines and laterals. Pipe, fittings, couplings and joints shall be in conformance with the requirements of ASTM Designations D3034 or F679 pipe and fitting shall be homogenous throughout the project. PVC pipe shall be made of PVC compound having a minimum cell classification of 12454 or 12364 as defined in ASTM Specification D1784. Submittals shall also include manufacturer documentation showing no leakage when gasketed pipe joints were tested in accordance with ASTM Test Method D3212.

7.1.2 POLYPROPYLENE

Polypropylene pipe may be used for gravity sewer lines that are 12-inch to 30-inch (double wall), which shall meet ASTM F2736 requirements, and 30-inch to 60-inch (triple wall), which shall meet ASTM 2764 requirements. Double wall polypropylene pipe shall have a smooth interior and annular exterior corrugations. Triple wall polypropylene pipe shall have smooth interior and exterior surfaces with annular inner corrugations. Polypropylene pipe shall have a minimum pipe stiffness of 46 PSI when tested in accordance with ASTM D2412. Polypropylene pipe shall be joined with a gasketed integral bell & spigot joints with two gaskets per ASTM F477. Joints shall be watertight per the requirements of ASTM D3212 and ASTM F1417 and /or ASTM F2487. Polypropylene pipe joints shall have a reinforced bell with polymer composite bands. Polypropylene pipe shall be manufactured with virgin impact modified copolymer polypropylene conforming to the requirements of ASTM D4101.

7.1.3 DUCTILE IRON

All ductile iron pipe for conveying sewerage shall be in accordance with AWWA C-150:

- 14” inside diameter and smaller shall be pressure class 350
- 16” inside diameter through 24” inside diameter shall be pressure class 250
- 30” inside diameter and larger shall be pressure class 150

Ductile iron pipe with a minimum wall thickness of Class 50 may be substituted in lieu of the above.

All ductile iron pipe shall be restrained joints, locking gasket or ring type.

The lining shall cover, at a minimum, the inner surfaces of the pipe and the fitting from the plain end or beveled spigot end to the rear of the gasket socket. If flanged fittings and pipe are included in the project, the lining must not be used on the face of the flange, however full face gaskets must be used to protect the ends of the pipe. At the ends of the pipe and fittings, the lining thickness shall taper for a distance of four (4) inches to a minimum thickness of ten (10) mils.

All ductile iron sewer pipe shall have a protective lining with a nominal thickness of 40 mils and a minimum thickness of 35 mils of Protecto 401 (ceramic epoxy), Polythane (polyurethane), throughout the barrel area of the pipe. However, the lining in the bell area shall transition to a minimum thickness of ten mils at the edge of the gasket socket. The ten-mil lining shall extend into the gasket socket area to a point where the gasket would overlap the lining when it is compressed due to pipe assembly during construction. The ten-mil lining shall also continue from inside the barrel area, around the spigot end of the pipe and along the outside of the pipe to a point where the center of the gasket of the next pipe section would contact the edge of the lining on the spigot end of the previous pipe section. The thickness of the linings shall be determined by using a dry film thickness magnetic gauge at four quadrants.

Each section of pipe and each fitting shall be tested and shall have an absence of holidays when tested by a suitable holiday detector. In all cases, the barrel area of the pipe shall be tested using a voltage of 2,500 volts and a dry conductive probe.

Holiday testing shall conform to ASTM G 62-87 and NACE Standards RP0274-74 and RP0188-90 (latest revision).

The pipe manufacturer shall be solely responsible for the quality of the lining and shall supply a certification as to compliance to the specification. The certification shall state specifically the following items:

(A) All ductile sewer pipe and fittings have a protective lining of 40 mils (35 mils minimum) in the barrel area, ten mils in the bell area and ten mils minimum on the exterior of the spigot end.

(B) Each section of pipe and each fitting have been tested for holidays utilizing a test voltage of 2,500 volts with a dry conductive probe in the barrel area and a test voltage of 67.5 volts with a wet sponge in both the bell area and the exterior of the spigot end, and no holidays were found.

(C) The lining material used meets the current specification and that the material was applied as required by the specification.

If the Contractor makes a field cut of the lined ductile pipe, the Contractor shall comply with the recommendations of the pipe manufacturer in applying a field coating to the pipe ends. In all cases, as a minimum, a ten (10) mil coating shall be applied to the pipe end and shall overlap the lining by four (4) inches and extend around the pipe end and along the outside of the pipe a minimum of ten (10) inches. The coating shall be allowed to dry before assembly. In addition, the overlapped surface of the lining shall be roughed up to produce a three (3) to five (5) mil profile over the entire surface. The end result of this process is to insure proper adhesion of the field coating.

Ductile Iron Liner Repair

Repair of the damaged sections of the lining shall be in accordance with the lining manufacturer's recommendation or as specified above so that the repair area is equal to the undamaged lined area in all respects. All damaged lined areas and holidays shall be repaired immediately after discovery.

Holiday testing may be required by the Engineer before pipe assembly when deemed appropriate. The testing and repair requirements shall follow the procedures called for in this specification and all cost for such repairs will be the responsibility of the Contractor.

There will be no other provision for repair of the lining of DIP.

Ductile Iron Protective Collar

In order to protect the exterior spigot end against abrasion and damage during shipping and handling, the manufacturer shall install temporary collars on the exterior of each spigot end of each pipe section. The manufacturer shall secure the collars to the pipe to prevent accidental removal during shipping and normal handling by the Contractor. The collars are not to be removed from the pipe until right before the pipe section is to be installed or field cut.

7.2 MANHOLES

7.2.1 POLYMER MANHOLES

Polymer sewer manholes shall be pre-cast acid resistant and comply with the following specifications:

1. Provide acid resistant polymer manhole sections, base sections and related components conforming to ASTM C 478. ASTM C 478 material and manufacturing is allowed compositional and dimensional differences required by a polymer product.

2. Base riser section shall be integral with floors, unless shown otherwise.

3. Riser sections shall be joined with bell and spigot/ ship-lap design seamed with butyl mastic. Manhole base, riser and top section make a continuous and uniform manhole.

4. Riser sections shall be constructed from standard polymer manhole sections of the diameter indicated on Standard Detail QS420.

5. Use various lengths of manhole sections in combination to provide correct height with the fewest joints.

6. Where polymer transition slabs are required provide precast base sections with flat polymer slab top sections used to transition to 48-inch diameter manhole access riser sections. Transition can be concentric or eccentric as shown on drawings. Locate transition to provide minimum of seven (7) foot head clearance from base to underside of transition unless otherwise approved by engineer.

7. Manhole risers, transition slabs, conical tops, grade rings and manhole base sections shall be designed, by manufacturer, to meet the intent of ASTM C 478 with allowable compositional and sizing differences required by a polymer product.

8. Polymer manholes will be designed based upon live and dead load criteria in ASTM C 857. Design load shall support HL-93 live / vehicle loading. The loading shall be applied to manhole cover and transition and base slabs.

9. Design criteria, unit soil weight of 120 pcf located above portions of manhole, including base slab projections. Internal liquid pressure based on unit weight of 63 pcf. Dead load of manhole sections fully supported by transition and base slabs.

10. Manhole risers, transition slabs, conical tops, grade rings and manhole base sections shall be designed, by manufacture, to requirements of ASTM C 478 and ASTM C 857 as modified to accept polymer construction in lieu of concrete.

11. Polymer Mixture - the mixture shall consist solely of thermosetting resin sand and aggregate. No cementitious materials shall be allowed.

12. Required wall thickness for all members will be that stated by polymer manhole manufacturer based upon loading conditions and material properties. The wall thickness of risers and conical tops shall be not less than that prescribed by the manufacturer's design by more than five (5) percent. A wall greater than the prescribed design shall not be cause for rejection.

13. Thermosetting Resin - The resin shall have a minimum of deflection temperature of 158° F when tested at 264 psi (1.820 mPa) following Test Method D 648. The resin content shall not be less than seven (7) of the weight of the sample as determined by test method D 2584. Resin selection shall be suitable for applications in the corrosive conditions to which the structures will be exposed.

14. Each manhole component shall be free of all defects, including indentations, cracks, foreign inclusions and resin starved areas that, due to their nature and degree or extent, detrimentally affect the strength and serviceability of the component part. The internal diameter of manhole components shall not vary more than 1%. Variations in height of two opposite sides of risers and conical tops shall not be more the 5/8 inch. The under run in height of a riser or conical top shall not be more than ¼ inch/foot of height with a maximum of ½ inch in any one section.

15. Marketing and Identification - Each manhole shall be marked on the outside with the following information - Manufacturer's name or trademark, Manufacturer's location and Production Date.

16. Manhole joints shall be assembled with a bell/spigot or shiplap butyl mastic joint so that on assembly, manhole base, riser and top section make a continuous and uniform manhole. Joint sealing surfaces shall be free of dents, gouges and other surface irregularities that would affect joint integrity.

17. Manhole frame shall be grouted to polymer or expanded polypropylene grade rings with Armor Rock non-shrink vinyl ester grout or approved equal.

18. Minimum clear distance between two wall penetrations shall be a minimum of six (6) inches on 48 inch to 72 inch diameter manholes and a minimum of eight (8) inches on larger diameter manholes. A clearance of three (3) inches is required between wall penetration and joint.

19. Construct invert channels to provide smooth flow transition waterway with no disruption of flow at pipe-manhole connections. Invert slope through manhole is as indicated on drawings. Provide curves for side inlets and smooth invert fillets for flow transition between pipe inverts. Polymer bench and channel are to be constructed with all resin aggregate material – no alternative fill material is allowed. Extended base footer requirements for buoyancy concerns can be addressed with cementitious concrete material.

20. Provide resilient connectors conforming to requirements of ASTM C 923 or as a required by owner. All connectors are to be water tight. Install approved resilient connectors at each pipe entering and exiting manholes in accordance with manufacturer's instructions.

21. Exceptions to ASTM C 478- components shall be designed for the intended combinations of manufacturing materials. Component designs may be as non-reinforced members or reinforced members as recommended by the manufacturer. Steel reinforcement is not required for circumferential reinforcement, joint reinforcement, base slab reinforcement or hoop reinforcement, but may be placed for the purpose of product handling.

22. Grouting, all materials needed for grouting and patching will be a polyester mortar compound provided by the manufacturer or an approved equal by the manufacture.

23. Submittals shall include, a summary of design criteria used in manhole design including, as minimum, material properties, loadings, load combinations, and dimensions assumed.

    Include certification from manufacturer that polymer manhole design meets or exceeds the load and strength requirements of ASTM C 478 (Standard Practice for Minimum Structural Design Loading for Underground Utility Structures) and ASTM C 857 (Standard Practice for Minimum Structural Design)

    Include frames, grates, rings and covers to be used, materials to be used in fabricating drop connections, materials to be used for pipe connections at manhole walls, materials to be used for stubs and stub plugs, if required.

    Submittals shall be sealed drawings by a registered Professional Engineer.

24. Polymer manholes shall be warranted that wall thickness will not corrode to less than 50 percent the original thickness for 50 years in residential and commercial sewer service. Polymer precast bases with full polymer bench shall be warranted for 50 years to not corrode in excess of two (2) inches.

7.2.2 PROTECTIVE COATINGS

Rehabilitated concrete manholes shall use one of the following protective coatings per **Table 7.2.2.1.**

Table 7.2.2 1 – Approved Protective Coatings

Brand	Model	Location
Superior Environmental Products	SP2000R or SL100	Addison, TX
Sauereisen Sewergard	N-210	Pittsburg, PA
Sewer Shield	150	Mesa, AZ
Raven Lining Systems	405	Tulsa, OK
Neopoxy	NPR-5300	Hayward, CA
COR+GARD	n/a	Johnston, IA

7.3 LIFT STATION

Lift station "Package-plant" must be approved by the Wastewater Division before installation.

7.4 FORCE MAIN

Force mains shall be constructed with ductile iron pipe or C-909 PVC pipe, as approved by the Wastewater Division.

7.5 TRACER WIRE

Tracer wire shall be #12 AWG wire and shall be purchased in minimum 2,500-foot rolls to minimize the need for splicing. All connections shall be made using DS-100, DS-400, or DS-500 Hughes Dri-Splice wire connectors. See Detail QS430-1 for tracer wire in sewer service.

7.6 GREASE INTERCEPTORS

Interceptors shall be precast concrete per Standard Detail QS445, sized per **Section 5.4**, two chamber minimum. Gang interceptors are not allowed.

SECTION 8 - IRRIGATION DESIGN & CONSTRUCTION STANDARDS

8.1 DESIGN

- All designs shall be subject to review by the TOQC Water Division.
- Pipe shall be designed with minimum of three (3) feet cover and a maximum of four (4) feet.
- ARV's shall be four (4) inches with designed location(s) subject to revision by the Water Division.
- Future tie-in points shall be extended far enough to allow easy access for future extension. Future tie-in points require a valve prior to stub-out. A temporary solvent welded cap shall be installed on all dead-end future tie-in points.
- Service Ports shall be designed in accordance with Standard Details QI901, 902 and 903.
- Stand pipes shall be designed such that the overflow elevation at the stand pipe is between five (5) feet and 18 feet higher than the highest service port valve.

8.2 CONSTRUCTION

- Trench section shall be in accordance with Standard Detail QI905.
- Valve Boxes shall be set in accordance with Standard Detail QW302.

8.3 MATERIALS

8.3.1 PIPE

- Material for main line shall be gasketed 80 psi PIP pipe (SDR-51).
- Material for service risers shall be 100 foot head pipe.
- Pipe sizes shall generally be 12-inch or 15-inch unless otherwise approved by the Water Division.

8.3.2 JOINTS

- Main line joints (12-inch and 15-inch normally) shall be gasketed.
- All other joints including those for all fittings and services shall be solvent type only. Push-on joint pipe shall not be allowed anywhere except the main line.

8.3.3 VALVES & BOXES

- Gate Valves shall be MJ (will require shim to iron pipe size).
- Valve Boxes shall be Type C and set in accordance with Standard Detail QW302.

8.3.4 FITTINGS

- All fittings shall be 80 psi PIP solvent weld type only.
- Repair Couplings shall be solid sleeve bolt-on type only.
- Transition Rings shall be MJ x Sewer (for valves).
- Transition Sleeves for OD of pipe.

8.3.5 SERVICE PORTS (RISERS)

- Tees and fittings for service ports shall be 80 psi PIP pipe.
- Overflow valves shall be waterman red-top.
- 100-foot head pipe shall be used for riser to accommodate waterman red-top valves.

8.3.6 AIR RELEASE VALVES

- Shall be four (4) inch
- Locations of ARV's shall be subject to revision by the Water Division.
- ARV lines shall be constructed using Schedule-40 solvent welded PVC in accordance with TOQC Standard Detail QI904.
- A.R.I. Flow Control Accessories, D-040, two (2) inch

8.3.7 WEIR BOXES AND GATES

- Waterman C-10 Spicket Back Gate.
- Box construction shall be per MAG standard Detail 504 or as approved by the Water Division.

8.3.8 REPAIR COUPLINGS

- Repair Couplings shall be Gheen Coupling (mechanical repair coupling for irrigation pipe).

APPENDIX A - MCESD EXAMPLE APPLICATIONS

Maricopa County
Environmental Services

Approval To Construct (ATC)

Mailing and Delivery Address:

Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite **201**
Phoenix, AZ 85004-1940

COVER / TRANSMITTAL PAGE

This packet is for submitting Approval TO Construct applications for these projects:

- Water Line Extension	- Sewer Line Extension	- Storage Tank	- Pressure Tank
- Water Booster Station	- Sewer Lift Station	- Well	- Chlorination
- Reuse Lines	- Master Plans	- Geological Reports	- Waiver Request

Use this Cover/Transmittal Page for all projects EXCEPT Geological Reports.

➢ For Geological Reports, use the Geological Report Cover Page (next page).

Detailed instructions for completing this packet are included. Our experience shows that most questions are already answered by the attached instructions or the form itself. Each transmittal page has a check list of ALL the required information for a complete submittal. **Incomplete** submittals will be **returned** to you. Also included is a fee list so that you can calculate the fees.

Project Name: _____

(PLEASE PRINT CLEARLY)

Contact Person: _____ Title _____
E-mail address of contact person _____
Company Name: _____
Phone number: _____ Ext: _____ Fax Number: _____
Address: _____
City: _____ State: _____ Zip Code: _____

Application Check List for Approval to Construct

- ☐ **Cover/Transmittal Page for MCESD Projects** – this page (or next for Geological)
- ☐ **ATC Fee's** – list attached
- ☐ **Approval to Construct application pages 1 of 3, 2 of 3 and 3 of 3** (attached)
- ☐ Full size set of plans with every page sealed and signed by engineer. (1 set only)
- ☐ Water Design Report-water projects only (must be sealed & signed by a registered engineer)
- ☐ Sewer Design Report-sewer projects only (must be sealed & signed by a registered engineer)
- ☐ Sewer Capacity Letter (must be issued by the sewer utility provider, **NOT the engineer**)

❖ **If you are submitting for a sewer line project, it will not be accepted without a sewer capacity letter if the design average daily flow is over 3,000 gallons. Date and signature cannot be more than one year old.**

➢ Sewer Capacity Letter - a statement, signed by the owner or operator of the sewage treatment facility and/or down stream collection system, **affirming compliance in accordance with R18-9-E301.C**.

➢ Operation and Maintenance Plan – there must be verification of an O&M Plan. Submittal of the O&M Plan will be upon request.

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

*** **The Department reserves the right to request any other information** ***

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Maricopa County
Environmental Services

Approval To Construct (ATC)

Mailing and Delivery Address:
Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite **201**
Phoenix, AZ 85004-1940

COVER PAGE / TRANSMITTAL PAGE FOR GEOLOGICAL REPORT

➢ ***USE THIS PAGE ONLY IF APPLYING FOR A CERTIFICATE OF GEOLOGICAL REPORT FOR ON-SITE SEWAGE DISPOSAL FOR SEPTIC SUBDIVISIONS***

Detailed instructions for completing this packet are included. Our experience shows that most questions are already answered by the attached instructions or the form itself. Each transmittal page has a check list of ALL the required information for a complete submittal. **Incomplete** submittals will be **returned** to you. Also included is a fee list so that you can calculate the fees.

Project Name: _____

Contact Person: _____ **Title** _____
E-mail address of contact person _____
Company Name: _____
Phone number: _____ Ext: _____ Fax Number: _____
Address: _____
City: _____ State: _____ Zip Code: _____

Application Check List for On-Site Sewage Disposal/Septic Subdivision submittal

☐	***Approval To Construct Application***	Check the box **Soils** on application
☐	***Cover Page***	This cover page must be submitted with the Approval To Construct application.
☐	***Soils Test Plan***	**The plan must include the following** • location on the plat where the soils testing will be performed (percolation tests and soil borings) • the method of testing • person/firm performing tests • depth to seasonal high groundwater level • site specific geology and topography • list of information that will be included in the final soils testing report (field notes, soils boring logs, etc.)
☐	***Percolation test methodology***	Must be specified and comply with the Arizona Administration Code R18-9-A310.E or F, depending on the proposed method of effluent disposal. (No mere reference to AAC Code)
☐	***All Soil Borings must be a minimum of 50 feet in depth***	Unless disposal pits deeper then 50 feet are proposed.
☐	***Statement on the plans:***	*This will allow coordination for a site visit during the field activities.* "At least five (5) working days notice will be provided to the reviewing Senior Civil Engineer for MCESD".

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

*** **The Department reserves the right to request any other information** ***

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Maricopa County
Environmental Services Department
Water and Waste Management Division

1001 N Central Ave, Suite 201
Phoenix, Arizona 85004
Phone: (602) 506-1058
Fax: (602) 506-5813
www.maricopa.gov/envsvc

PERMIT APPLICATION PROCESS NOTICE

Subdivision Infrastructure and Planning Program

1) Steps required to obtain an Approval to Construct/Approval of Construction for Water Systems, Sewer Systems and Reuse Water Lines are as follows:
   i) Submission of the complete application for Approval To Construct along with all relative items in the application check list on the Cover/Transmittal Page of the application. When the review is complete, an Approval To Construct certificate will be issued to allow construction of the system to commence.
   ii) Construction of the project.
   iii) Submission of the complete application for Approval of Construction along with all relative items in the application checklist on the Cover Page of the application. When the review and approval of the submitted documentation is complete, an Approval Of Construction certificate is issued. The system can then be put into service.

2) The Department will approve or deny the application in the number of business days listed below or less, excluding any days the application is returned to the applicant for additional information. This overall licensing timeframe is set by the Arizona Department of Environmental Quality (ADEQ) as required by A.R.S. §11-1605 and is part of the Delegation agreement between ADEQ and Maricopa county.

Permit		Overall Timeframe (Business Days)
Wastewater System		
	300 Services or less (Gravity/Force Main)	95
	More than 300 Services (Gravity)	136
	Sewer Lift Station	95
	Wastewater Master Plan or Amendment	83
	Wastewater Line Waiver	53
Drinking Water System		
	Standard - Public Water Supply Distribution Line	53
	Complex	83
	Chlorination Plan	53
	Booster Pump Station	53
	Storage Tank / Pressure Tank	53
	Drinking Water Master Plan or Amendment	53
	Drinking Water Line Waiver	53
Reclaimed Water System		
	Standard	95
	Complex	NA

3) Department contact information regarding your application
   i) Telephone: 602-506-1058
   ii) E-mail: subdivision@mail.maricopa.gov
   iii) Website: www.maricopa.gov/EnvSvc/WaterWaste

You may request a clarification from the Department of its interpretation or application of a statute, ordinance, regulation, delegation agreement or authorized substantive policy statement as provided in A.R.S. §11-1609. Contact us by e-mail or telephone, or in person or mail at the address listed at the top of the page, marked attention Subdivision Infrastructure & Planning Program.

Maricopa County
Environmental Services Department
Water and Waste Management Division

1001 N Central Ave, Suite 201
Phoenix, Arizona 85004
Phone: (602) 506-1058
Fax: (602) 506-5813
www.maricopa.gov/envsvc

PERMIT APPLICATION PROCESS NOTICE

Subdivision Infrastructure and Planning Program

1) Steps required to obtain an Approval of Soils / Hydrology Report are as follows:
   i. Submission of the complete application for Approval of Soils / Hydrology Report along with all relative items in the application check list on the Cover/Transmittal Page of the application. When the review is complete, an Approval of Soils / Hydrology Report certificate will be issued to allow construction of the system to commence.
   ii. Construction of the project.

2) The Department will approve or deny the application in the number of business days listed below or less, excluding any days the application is returned to the applicant for additional information. This overall licensing timeframe is set by the Arizona Department of Environmental Quality (ADEQ) as required by A.R.S. §11-1605 and is part of the Delegation agreement between ADEQ and Maricopa county.

Permit		**Overall Timeframe (Business Days)**
Soils / Hydrology Report		
	Standard	67

3) Department contact information regarding your application
   i. Telephone: 602-506-1058
   ii. E-mail: subdivision@mail.maricopa.gov
   iii. Website: www.maricopa.gov/EnvSvc/WaterWaste

You may request a clarification from the Department of its interpretation or application of a statute, ordinance, regulation, delegation agreement or authorized substantive policy statement as provided in A.R.S. §11-1609. Contact us by e-mail or telephone, or in person or mail at the address listed at the top of the page, marked attention Subdivision Infrastructure & Planning Program.

Maricopa County
Environmental Services

Approval To Construct Fee List

Fees for Approval To Construct (ATC) and Soils Reports

Make Checks Payable to MCESD

A $35.00 fee for all returned checks

➢ **Double The Fee For Expedited Review**

ATC FEES

Public water supply system		Sewer collection system	
		Gravity Sewer only, including manholes	
$600.	150 or less connections	$500.	Serving 50 connections or less
$1200.	151 to 300 connections	$1000.	Serving 51 to 300 connections
$1800.	301 to 450 connections	$1500.	Serving 301 or more connections
$2400.	451 to 600 connections	**Force Mains + Gravity Sewer**	
$3000.	601 to 750 connections	$800.	Serving 50 connections or less
$3600.	751 to 900 connections	$1300.	Serving 51 to 300 connections
(Every 150 connections add $600.)		$1800.	Serving 301 or more connections

Other Components

$675.	Storage Tank *(each)*	$600.	Sewer Lift Station	$500.	Master Plans - *Per Component (Water/Sewer)*
$675.	Well *(each)*	$250.	Reuse lines		
$675.	Pressure Tank *(each)*	$150.	Chlorination	$150.	Waiver *(each)*
$675.	Booster Station	➢ **Any Fee Questions Contact MCESD**			

** "An approval of plans and specifications can be renewed for one year if an application for renewal is submitted within 180 days of expiration. A fee equal to one-half (1/2) of the flat fee or initial plan review fee is paid. The approval will be effective for one year from the date of expiration". *MCESD Ch. 1, Reg. 4f.* *(Check with MCESD if questions.)*

Geological (Soils) Report Fees	
$525.	50 lots or less
$1050.	51 to 100 lots
$1575.	101 to 150 lots
$2100.	151 to 200 lots
(Every 50 lots add $525.)	

Fees ☐ Regular Fees ☐ Expedited Fees

Break down fees (fees for multiple components on the same project can be put on one (1) check)

Type of component (.i.e.: water line, sewer line, etc)	Regular Fee per component	Expedited Fee per component	Total Fee per component
		TOTAL FEE	

*** The Department reserves the right to request any other information ***

Revised July 2012 - Fillable

Maricopa County
Environmental Services

Approval To Construct Application Instructions

APPLICANT – You only need to complete those portions of the form that apply to your project. If submitting a water line, you do not need to provide information on the sewer system and vice versa.

- ***For Soils, Master Plans and Waiver Requests only – on page 1 of 3 fill out #1 only and page 3 of 3 - #4, 5, 6.***

Page 1 of 3

1. **Project Name** – must be the same as on the engineered plans. This name will appear on the ATC certificate.
   Project Address – physical location of project.
   City, AZ and Zip Code – of actual location of project.
   Section, Township, Range – information can be located in the Phoenix Metropolitan Street Atlas or on the plans.
   Project Description – what type of review you are requesting from our department.
   - You will receive an individual certificate for each component.
     (Example: water line extension, lift station, well site and/or any other component)

2. **System information required:**
   Water / Well information – Provide rest of numbers for PWS for the Public Water System and/or the DWR for the well as the case may be.
   Sewage Information – **Sewage Collection System Owner** – name of sewage collection system owner, providing sewer service to the project.
   Sewage Treatment Facility Owner – name of owner of treatment facility, may be different from the collection system owner.

3. **Quantity:**
   Number of water and sewer connections – number of service connections on the project that we are to review.
   Water and Sewer Linear Feet and Size – these totals are included on the certificate our Department issues.
   Reuse Linear Feet and Size – these totals are included on the certificate our Department issues.

Page 2 of 3 – ONLY NECESSARY IF SUBMITTAL IS FOR WATERLINE OR WATER COMPONENT

Public Water Supply number (PWS) Signature Form – if this form is not signed, your project will be denied. This agreement MUST be signed by the Public Water System Representative **NOT** the Engineer or Project owner.
PWS # - public water system number from the water supply provider.
Project Name – the name of the project
Project Address – physical location of project.
City, Zip Code – location of project
Public Water Supply Provider – name of public water supply system that will be providing water service to the project.

Page 3 of 3

4. **Name of Registered Engineer** – registered engineer who is the contact person for project. (*Please Print Clearly*)
   Phone Number, Ext and Fax – phone number, extension, and fax number of registered engineer working on the project.
   E-mail Address – e-mail address for the registered engineer working on the project.
   Name of Engineering Firm as Registered with the AZ Board of Technical Registration - a registered engineering firm that employees the project engineer.
   Mailing Address, City, State and Zip Code - mailing address of registered engineering firm.

5. **Project Owner/Responsible Party** - **MUST** be a person with fiduciary responsibilities associated with the Project or Company.
   Job Title - examples: Project Owner, President or Vice President of Corporation/Home Owners Association, Manager.
   E-mail address – e-mail address for the project owner/responsible party.
   Company Name - the name of Company who owns the Project.
   Mailing Address, City, State, Zip Code - location of Project Owner, will be put on certificate.
   Phone Number, Ext and Fax - project owner phone, extension and fax number.

6. **Authorization**–Only the named Project Owner/Responsible Party can sign for the Project Owner/Responsible Party unless there is a letter of authorization.

Maricopa County Environmental Services Department

Environmental Services Department

Application Addendum:

Supplemental Requests for Additional Information

Arizona law, A.R.S. 11-1605, limits Maricopa County Environmental Services Department (MCESD) to one request for additional information (set of review comments) when reviewing your application, unless the applicant agrees to allow additional requests.

A County Ordinance requires MCESD and the applicant to agree to extend the time frame by 25% if an agreement is made to allow MCESD to submit supplemental requests for additional information.

Please select one of the following statements to indicate your choice. This agreement will remain in place for the duration of the licensing process unless a revised agreement is approved by both parties.

Please Select One:

- ☐ I agree that MCESD may submit supplemental requests for additional information and I agree to an extension of 25% of the supplemental review and overall licensing timeframe.
- ☐ I acknowledge that MCESD is limited to one set of review comments. MCESD will approve or deny my application based on my application materials and my response to not more than one set of review comments.

Project Name/Location:_____

Applicant Name: _____ Title: _____

Signature _____ Date _____

Department Approval:

Name _____ Title _____

Signature _____ Date _____

Project Number:_____

Environmental Services Department
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning
Phone (602) 506-1058 FAX (602) 506-5813

Application for Approval to Construct (ATC) and/or Provisional Verification of General Permit Conformance ** for Water/Wastewater Facilities

☐ On-Site ☐ Off-Site ➢ ***Use separate applications for On-Site and Off-Site if submitting both.***

☐ Waterline	☐ Gravity Sewer	☐ Storage Tank	☐ Pressure Tank	☐ Reuse
☐ Well	☐ Force Main	☐ Booster Station	☐ Chlorination	☐ Lift Station
☐ Reissue	☐ Master Plan	☐ Soils	☐ Other:	

2

"On-site, Off-site, Master Plan, and Soils projects each require separate applications if submitted together."

1. ***Project Name:*** ____________________
(Physical location of Project)
Project Address ____________________ ,
City ____________________ , **AZ** ***Zip Code*** ____________
Section ____________ Township ____________ Range ____________
Project Description: ____________________

2. **System information required**

Water / Well Info

Public Water Supply Provider (PWS) 0407 ☐☐☐ *Wells Only:* DWR# 55- ☐☐☐☐☐☐

Sewage Info

Sewage Collection System Name ____________________
Sewage Treatment Facility Name (if different) ____________________

3. Quantity: Number of water connections ________ Number of sewer connections ________

Water Line		**Sewer Line**		**Reuse Line**	
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
L.F. ______	Size ____ in.	L.F. ______	Size ____ in.	L.F. ______	Size ____ in.
Total Water L.F. ______		Total Sewer L.F. ______		Total Reuse L.F. ______	

** **This application constitutes the Notice of Intent to Discharge referenced by R18-9-A301.B.**

"NO APPLICATION WILL BE ACCEPTED UNLESS FULLY COMPLETED "

Environmental Services Department
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning
(602) 506-1058
FAX (602) 506-5813

Application for Approval to Construct (ATC) and/or
Provisional Verification of General Permit Conformance **
For Water/Wastewater Facilities

Public Water Supply Number (PWS) Signature Form

PWS number 0407 __ __ __ (Public Water Supply number)

WATER SERVICE AGREEMENT - An unconditional agreement which is effective this date has been made between the owners of:

Project Name _____

(Physical location of Project)
Project Address _____ ,
City _____ , AZ Zip Code _____ ,

and the _____
(Public Water Supply Provider "PWS")

The undersigned hereby agrees to provide water to the above project with the Public Water Supply (PWS) number and they agree that the PWS is in compliance and on file with Maricopa County Environmental Services Department (MCESD).

Date _____ Print Name clearly _____
Job Title _____
Address _____
City _____
Signature _____

- **Signature must not be over one (1) year old.**
- **This agreement MUST be signed by the Public Water System Representative NOT the Engineer or Project owner.**
- **Failure to provide a Public Water Supply (PWS) number that is in compliance will result in immediate rejection of your project.**

***** The Department reserves the right to request any other information *****

Environmental Services Department
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning
Phone (602) 506-1058 FAX (602) 506-5813

Application for Approval to Construct and/or
**** Provisional Verification of General Permit Conformance ****
For Water/Wastewater Facilities

4. Name of Registered Engineer Working on Project: _____

Must be Registered with the Arizona Board of Technical Registration. Number: _____

Phone Number _____ Ext _____ Fax _____

E-mail address _____

Name of Engineer's Firm as Registered With
The AZ Board of Technical Registration: _____

Mailing Address _____

City _____ State _____ Zip Code _____

(Please print legibly)
(The information provided will be used on the ATC Certificate)

5. PROJECT OWNER NAME: _____
Can be Individual or Company

Responsible Party _____ Job Title _____
Must be a Person with fiduciary responsibilities associated directly with the project ownership

Mailing Address _____

City _____ State _____ Zip Code _____

Phone Number _____ Ext _____ Fax Number _____

E-mail address _____

6. Authorization

The Project Owner/Responsible Party hereby authorizes the review of project plans as described for approval to construct and/or provisional verification of conformance under General Aquifer Protection Permit 4.01.

_____ / _____ _____
Signature of Project Owner/Responsible Party / Please print name Date (not more than 1 year old)

Please complete and attach Letter of Authorization if Project Owner is not signing above.

Pursuant to A.R.S. § 41-1009, the Department may enter your establishment to conduct inspections. You have the right to receive a copy of the Department's inspection report at the time of the inspection, within thirty (30) days after the inspection, or as otherwise provided by federal law.

By initialing below, I agree that the Department may send me a copy of its inspection report by e-mail to the following email address: _____ or by facsimile transmission to the following fax number: _____ (Fax Number). _____ (Initials).

***** It is the responsibility of the permit holder to update the Department if there is a change in contact information. *****

"NO APPLICATION WILL BE ACCEPTED UNLESS FULLY COMPLETED"

Department use only

Waterline		Gravity Sewer		Storage Tank	
Well		Force Main		Booster Station	
Reissue		Master Plan		Other:	
Reuse		Pressure Tank			
Lift Station		Chlorination			

Check number (s) _____ Amount Paid _____

Maricopa County Environmental Services
Subdivision Infrastructure & Planning Program

LETTER OF AUTHORIZATION

Complete this form ONLY if the Project Owner/Responsible Party is <u>not</u> signing the application

This form is effective for one (1) year from date of signature.

Please Print Clearly

Date: _____

I hereby authorize _____ , of

firm to file

_____
(Engineering Firm / Organization)

and sign this application and act on my behalf for project(s) name(s) listed:

_____

Project Owner /
Responsible Party Name /
Title:

_____ / _____
NAME / ***TITLE***

<u>Signature</u> of Project Owner /
Responsible Party of Fiduciary Responsibility _____
*** ***MANDATORY*** ***

NOTES: - Project Owner's / Responsible Party's information <u>must</u> be on application for use on the certificate.

- Engineer cannot sign this form as Project Owner / Responsible Party

Department Use Only

MCESD number (s): _____

*** *The Department reserves the right to request any other information* ***

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Maricopa County
Environmental Services

Sanitary Facilities for Subdivision
(aka Health Cert) Packet

Mailing and Delivery Address:
Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite 201
Phoenix, AZ 85004-1940

COVER / TRANSMITTAL PAGE

This packet is for submitting Sanitary Facilities for Subdivision (aka Health Cert) applications.
Submittals accepted after proof of water/wastewater approval.

Select the type of Project by checking one

☐	Sanitary Facility for Subdivision for Single Family Residence (aka Health cert for Public Report)	☐	Re-issue Certificate (Any Changes)
☐	Condominium / Townhouse (aka Health cert for Public Report)	☐	Condominium Conversion ***SEE NEXT PAGE*** (aka Health cert for Public Report)

➢ Use this Cover/Transmittal Page for all projects EXCEPT Condominium Conversions.
➢ For Condominium Conversions, use the Condominium Conversions Cover Page (***next page***).

Detailed instructions for completing this packet are included. The attached instructions or the form itself already answers most questions. Each transmittal page has a checklist of ALL the required information for a complete submittal. **Incomplete** submittals will be **returned** to you. Also included is a fee list so that you can calculate the fees.

Project Name: _____

(PLEASE PRINT CLEARLY)

Contact Person: _____ Title _____
Email address of contact person _____
Company Name: _____
Phone number: _____ Ext: _____ Fax Number: _____
Address: _____
City: _____ State: _____ Zip Code: _____

Application Checklist for Sanitary Facilities for Subdivision

☐ Cover Page for MCESD Projects – this page *(or next page for Condo Conversions)*
We need to know on the cover page what you are requesting from us, even if you have spoken to one of us.

☐ Sanitary Facilities for Subdivision application (3 pages attached)

☐ Subdivision Fees (attached) - Expedited Yes ☐ No ☐ Amount _____
(Make Checks Payable To MCESD)

☐ Copy of the Final Recorded Plat (please fold to approximately 8 1/2 X 11 size)

☐ Copy of the Recorded CC&R's (only for Condominium's)

** If your Subdivision is in the City of Phoenix, you must also have the items listed below. **

☐ Signed copy of the water and sewer plans that were approved/signed by the City of Phoenix (*please fold to approximately 8 1/2 X 11 size*)

☐ Copy of the Approval to Construct Certificate (ATC) for water and sewer issued by City of Phoenix

❖ **If subdivision uses septic systems, see On Site Sewage Disposal/Septic requirements. *See ATC Packet***

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

***** The Department reserves the right to request any other information *****

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Maricopa County
Environmental Services

Sanitary Facilities for Subdivision
(aka Health Cert) Packet

Mailing Address & Delivery Address:
Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite 201
Phoenix, AZ 85004-1940

COVER / TRANSMITTAL PAGE FOR CONDOMINIUM CONVERSIONS

USE THIS PAGE ONLY IF SUBMITTING A CONDOMINIUM CONVERSION PROJECT

Detailed instructions for completing this packet are included. The attached instructions or the form itself already answers most questions. Each transmittal page has a checklist of ALL the required information for a complete submittal. **Incomplete** submittals will be **returned** to you. Also included is a fee list so that you can calculate the fees.

Project Name: _____

(PLEASE PRINT CLEARLY)

Contact Person: _____ Title _____
Email address of contact person _____
Company Name _____
Phone number: _____ Ext: _____ Fax Number: _____
Address: _____
City: _____ State: _____ Zip Code: _____

Application Checklist for Sanitary Facilities for Subdivision

- ☐ **Cover Page for MCESD Projects** – this page
- ☐ **Sanitary Facilities for Subdivision application** (3 pages attached)
- ☐ **Subdivision Fees** (attached) - **Expedited** Yes ☐ No ☐ **Amount** _____
  (Make Checks Payable To MCESD)
- ☐ **Copy of the Final Recorded Plat** (please fold to approximately 8 1/2 X 11 size)
- ☐ **Copy of the Recorded CC&R's**
- ☐ **Accurate As-Built plans, sealed and signed** (please fold to approximately 8 1/2 X 11 size)
- ☐ **Photos as a separate exhibit**
- ☐ **Copy of current Water/Sewer/Refuse bill** *****City of Phoenix must sign page 3 (Refuse Agreements) if project is in Phoenix*****
- ☐ **Complete list of unit numbers**

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

***** The Department reserves the right to request any other information *****

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Explanation of Requirements for a Condominium Conversion

- ***These requirements are <u>in addition</u> to the items needed for a regular submittal of Sanitary Facility for Subdivision.***

1) Common under-ground water lines and sewer line plans as a separate exhibit, showing water and sewer lines, clean outs and water valves, and other features in the common elements.
   - One set of accurate sealed and signed as-built plans. (A registered Land Surveyor or a registered Engineer can seal and sign). *"A copy of the <u>final</u> as-built plans must be provided to the HOA by the person working on the project"* will be a stipulation of the Health Certificate.

   (MCESD will not provide the copy to the HOA)

2) Identify on the as-built plans ALL of the water shut-off valves, backflow preventers, clean outs, etc. for the project and number them with a unique number. Take digital photographs of each one of them and put them on a separate sheet(s) with their identification number and/or provide them on CD disk with label. Include the backflow preventers for any autofill lines for pools/spas/fountain. Include a few representative photos of the exterior hose bibs with the vacuum breakers.

3) If the apartments/condominiums are still being lived in;
   - A copy of a current Water/Sewer/Refuse bill can be attached, replacing pages 2 & 3 of our Approval of Sanitary Facilities for Subdivision application.
   - Page 1 of our "Application for Approval of Sanitary Facilities for Subdivision" must be attached.

**** If the project is located in Phoenix, the City of Phoenix <u>must</u> sign the Refuse agreements ****
NO EXCEPTIONS

4) One (1) copy of the CC&R's that reflects ownership, operator and maintenance for common water and sewer lines.

5) One (1) copy of a full size Final Recorded Plat. If the plat is not recorded, we can NOT accept your project.

6) We need a complete list of the unit numbers. If there are a large number of units, you can include a copy of the list with the application packet.

7) Fees are figured by actual number of units. *Fee List follows*.

Maricopa County

Environmental Services Department
Water and Waste Management Division

1001 N Central Ave, Suite 201
Phoenix, Arizona 85004
Phone: (602) 506-1058
Fax: (602) 506-5813
www.maricopa.gov/envsvc

PERMIT APPLICATION PROCESS NOTICE

Subdivision Infrastructure and Planning Program

1) Steps required to obtain a Sanitary Facilities for Subdivision (aka Health Cert)/Approval of a Mobile Home Park are as follows:
   i) Submission of the complete application for Sanitary Facilities for Subdivision/Approval of a Mobile Home Park along with all relative items in the application check list on the Cover/Transmittal Page of the application.
   ii) The submittal will be reviewed/additional information may be requested.
   iii) The Approval of Sanitary Facilities for Subdivision/Mobile Home Park will be issued.

2) The Department will approve or deny the application in the number of business days listed below or less, excluding any days the application is returned to the applicant for additional information. This overall licensing timeframe is set by the Arizona Department of Environmental Quality (ADEQ) as required by A.R.S. §11-1605 and is part of the Delegation agreement between ADEQ and Maricopa county.

Permit		**Overall Timeframe (Business Days)**
Subdivision		
	Individual water/sewer facilities	67
	Community water/sewer facilities	58
Mobile Home Park		
	Onsite water/sewer facilities	67
	Offsite water/sewer facilities	58

3) Department contact information regarding your application
   i) Telephone: 602-506-1058
   ii) E-mail: subdivision@mail.maricopa.gov
   iii) Website: www.maricopa.gov/EnvSvc/WaterWaste

4) You may request a clarification from the Department of its interpretation or application of a statute, ordinance, regulation, delegation agreement or authorized substantive policy statement as provided in A.R.S. §11-1609. Contact us by e-mail or telephone, or in person or mail at the address listed at the top of the page, marked attention Subdivision Infrastructure & Planning Program.

Subdivision Application Instructions

1. Project Description:
   - Name of Subdivision/Condominium - must match the name on the Final Recorded Plat.
   - Individual Unit/Lot - select the type of project. (example: Single Family or Condominium/Townhome)
   - With # of units/lots - enter the total number of units/lots. (example: 100)
   - Associated lot numbers - write the lot/unit numbers (example: 101-201,101-103,105,107,109 etc). Group numbers if continuous as shown. Attach list if necessary / not enough room in space provided.
   - Project Address – physical location of project.
   - City, Zip Code – location of project
   - North, South, East and West - enter the street names that surround the actual project location.
   - Section, Township, Range - information can be located in the Phoenix Metropolitan Street Atlas.
   - RECORDER'S INFORMATION The final plat must be recorded to submit this application. – Date; Book; Page; Recorder's Number
   - Any lots that require grinder pumps - enter the lot number that the pump will be located on, if any.

2. Approved Sanitary Facilities: (MCESD numbers do not apply to the City of Phoenix projects)
   - Approved MCESD Water number - the number assigned by MCESD on the Water Approval to Construct certificate.
   - PWS Number - public water system number from the water supply provider.
   - Water Supply Provider - the water system listed and agreement signed on page 2.
   - Approved MCESD Sewer number - the number assigned by MCESD on the Sewer Approval to Construct certificate.
   - Public Sewer System - the sewer system listed and agreement signed on page 2.
   - On Lot Sewage Disposal/Septic – Check box if there is septic for this project. Include the approved MCESD number assigned on the Certificate of Approval of a Geological Report For Subdivisions.
   - Refuse Collection Agency - the refuse collection agency listed and agreement signed on page 3.
   - Approved Refuse Disposal Site - the disposal site listed and agreement signed on page 3.

3. Project Owner (RESPONSIBLE PARTY):
   - Name - MUST be a person with fiduciary responsibilities associated with the Project Company.
   - Job Title - examples: Owner, President or Vice President of Corporation/Home Owner Association, Manager.
   - Project Company Name - examples: Project Owner, Corporation, Home Owner Association.
   - Mailing Address, City, State, Zip Code - location of Project Owner/Responsible Party, will be put on the certificate.
   - Phone number, fax – project owner's phone and fax number.
   - Engineering Firm – Engineering Firm that worked on the project or is still working on the project.

Signature Line - The Project Owner / Responsible Party must sign. The engineer can not sign unless there is a letter of authorization, which must be attached.

Pages 2 and 3:

Water, Sewer, Refuse Service Agreement and Refuse Disposal Agreements -
Must be signed by authorized person of agency providing the service, not to be signed by Project Owner or engineer; can not be reused for other projects.

***** City of Phoenix projects must have signatures from City of Phoenix on page 3 – NO EXCEPTIONS. *****

Fees for Sanitary Facility for Subdivision	
Make check payable to MCESD	
Check or cash payments only	
$450.	150 lots or less
$900.	151 to 300 lots
$1350.	301 to 450 lots
$1800.	451 to 600 lots
For every 150 lots add $450.	
$200.	Transfer Ownership on Previously Approved Subdivision certificate
❖ **Double the fee for expedited review**	
➢ **$35.00 fee for all returned checks**	

***** The Department reserves the right to request any other information *****

Maricopa County Environmental Services Department

Environmental Services Department

Application Addendum:

Supplemental Requests for Additional Information

Arizona law, A.R.S. 11-1605, limits Maricopa County Environmental Services Department (MCESD) to one request for additional information (set of review comments) when reviewing your application, unless the applicant agrees to allow additional requests.

A County Ordinance requires MCESD and the applicant to agree to extend the time frame by 25% if an agreement is made to allow MCESD to submit supplemental requests for additional information.

Please select one of the following statements to indicate your choice. This agreement will remain in place for the duration of the licensing process unless a revised agreement is approved by both parties.

Please Select One:

- ☐ I agree that MCESD may submit supplemental requests for additional information and I agree to an extension of 25% of the supplemental review and overall licensing timeframe.
- ☐ I acknowledge that MCESD is limited to one set of review comments. MCESD will approve or deny my application based on my application materials and my response to not more than one set of review comments.

Project Name/Location: _____

Applicant Name: _____ Title: _____

Signature _____ Date _____

Department Approval:

Name _____ Title _____

Signature _____ Date _____

Project Number: _____

ENVIRONMENTAL SERVICES DEPARTMENT
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning Program
Phone (602) 506-1058 FAX (602) 506-5813

Application for Approval of Sanitary Facilities for Subdivision

1. PROJECT DESCRIPTION:

Name of Subdivision/Condominium _____

is an individual unit/lot (☐ Single Family ☐ Condominium/Townhome) subdivision
with # _____ units/lots, with associated lot numbers _____
(Attach list if not enough room)

Physical location of Subdivision/Condominium

Project Address _____ ,

City _____ , Zip Code _____ ,

Vicinity Location

North of _____ , South of _____ ,

East of _____ , and West of _____ **in**

Section _____ Township _____ Range _____

Recorder's Information on Final Plat

Date _____ Book _____ Page _____ Recorder's # _____

2. APPROVED SANITARY FACILITIES:

Approved Water MCESD number (s) _____
PWS Number 04-07 ___ ___ ___ , (Public Water System Number)
Water Supply Provider _____

Approved Sewer MCESD number (s) _____
Public Sewer System _____

If there are any grinder pumps, provide lot numbers _____

☐ On-lot sewage disposal system/septic (See on-site sewage disposal/septic subdivision requirements on ATC application)
Approved Geological Report For Subdivisions MCESD number. _____

Refuse Collection Agency _____

Approved Refuse Disposal Site _____

3. PROJECT OWNER / RESPONSIBLE PARTY: *This information will be used on the certificate*

Name _____ Job Title _____
*(Please print clearly) (**Must** be a person with fiduciary responsibilities associated with the Project Company)*

E-mail address of person working on project _____

Project Company Name _____

Mailing Address _____

City _____ State _____ Zip Code _____

Phone number _____ Fax _____

Engineer Working on Project

Engineer Name _____ **Registration Number** _____

Engineer Firm _____

Engineer E-mail Address _____

I verify that all information given in this application is accurate. I am informed that no construction of sanitary facilities shall commence unless and until a "Certificate of Approval to Construct" is issued by MCESD. I am informed that no operation of sanitary facilities shall commence unless and until a "Certificate of Approval of Construction" is issued by MCESD.

Project Owner's / Responsible Party Signature: _____ **Date**: _____

Pursuant to A.R.S. § 41-1009, the Department may enter your establishment to conduct inspections. You have the right to receive a copy of the Department's inspection report at the time of the inspection, within thirty (30) days after the inspection, or as otherwise provided by federal law. By initialing below, I agree that the Department may send me a copy of its inspection report by e-mail to the following email address: _____ or by facsimile transmission to the following fax number: _____ (Permit Owner/Holder initials) _____

It is the responsibility of the permit holder to update the Department if there is a change in contact information.

ENVIRONMENTAL SERVICES DEPARTMENT
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning Program
Phone (602) 506-1058 FAX (602) 506-5813

Application for Approval of Sanitary Facilities for Subdivision

- **<u>This agreement MUST be signed by the Providers NOT the Engineer or Project owner.</u>**

WATER SERVICE AGREEMENT - An **un**conditional agreement which is effective this date has been made between the owners of:

Subdivision Name _____

and the _____
(name of the water system or municipality)

to provide water service to each and every lot in accordance with the design shown on the attached plans of the subdivision.

The undersigned hereby agrees to inspect this project during construction to assure compliance with plans and specifications approved by the Maricopa County Environmental Services Department (MCESD) and upon completion and acceptance by MCESD shall be responsible for maintenance and operation of the system.

Date _____ Print Name clearly _____
Job Title _____
Address _____
City _____
Signature _____

- **<u>This agreement MUST be signed by the Providers NOT the Engineer or Project owner.</u>**

SEWER SERVICE AGREEMENT - An **un**conditional agreement has been made between the owner/s of:

Subdivision Name _____

and the _____
(name of the sewer system or municipality)

to provide sewer service to each and every lot in accordance with the design shown on the attached plans of the subdivision.

The undersigned hereby agrees to inspect this project during construction to assure compliance with plans and specifications approved by the Maricopa County Environmental Services Department (MCESD) and upon completion and acceptance by MCESD shall be responsible for maintenance and operation of the system.

Date _____ Print Name clearly _____
Job Title _____
Address _____
City _____
Signature _____

ENVIRONMENTAL SERVICES DEPARTMENT
1001 N. Central, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning Program
Phone (602) 506-1058 FAX (602) 506-5813

Application for Approval of Sanitary Facilities for Subdivision

- **<u>This agreement MUST be signed by the Providers NOT the Engineer or Project owner.</u>**

REFUSE SERVICE AGREEMENT - Agreements must be completed and signed by a representative of the collection service and the operational authority of the disposal site:

Collection Agency _____

Refuse collection service to _____
(name of the subdivision)

in accordance with applicable rules and regulations governing refuse collection.

Date _____ Print Name clearly _____
Job Title _____
Address _____
City _____
Signature _____

** IN ORDER TO APPROVE THE ABOVE COLLECTION SERVICE,
WE MUST ALSO HAVE THE INFORMATION IN THE AGREEMENT BELOW. **

- **<u>This agreement MUST be signed by the Providers NOT the Engineer or Project owner.</u>**

REFUSE DISPOSAL AGREEMENT - As required by the Arizona Department of Environmental Quality Rules and Regulations, and specifically regulation A.A.C. R18-5-409:

The Disposal Site _____

is operated by _____
(name of operational authority)

in accordance with applicable rules and regulations governing refuse and will accept refuse from persons living in:

Name of Subdivision: _____

Date _____ Print Name clearly _____
Job Title _____
Address _____
City _____
Signature _____

- **The signatures can not be more then 1 (one) year old (page 2 and page 3).**
- **IF YOUR PROJECT IS IN THE CITY OF PHOENIX - Subdivision/Condominium Refuse must be signed by the City of Phoenix. <u>No Exceptions</u>.**

Maricopa County Environmental Services
Subdivision Infrastructure & Planning Program

LETTER OF AUTHORIZATION

Complete this form ONLY if the Project Owner/Responsible Party is not signing the application

This form is effective for one (1) year from date of signature.

Date: _____

I hereby authorize _____ , of

_____ firm to file this
(engineering firm / organization)

application and act on my behalf for project(s) name(s) listed:

_____

Project Owner/Responsible Party Name / Title: _____ / _____
(Please print clearly) ***NAME*** / ***TITLE***

Signature of Project Owner / Responsible Party of Fiduciary Responsibility _____
*** ***MANDATORY*** ***

NOTES: - Project Owner's / Responsible Party's information must be on application for use on the certificate.

- Engineer cannot sign this form as Project Owner / Responsible Party

Department use only

MCESD number (s): _____

*** The Department reserves the right to request any other information ***

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Maricopa County
Environmental Services

Approval Of Construction (AOC) Application Packet

1 (One) MCESD# Per Application

Mailing and Delivery Address:
Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite 201
Phoenix, AZ 85004-1940

- Approval OF Constructions (AOCs) are applied for after the component is built and testing has been completed and passed.
- MCESD issues AOCs only for MCESD issued Approvals TO Construct (ATC).
- One (1) MCESD number per AOC application. Do not put multiple numbers on one application. ATCs are issued with one MCESD number and AOCs are issued the same way.
- For the Engineer's Certificate of Completion area on the application, the only items required are registered engineer's name, phone & fax numbers and the wet seal and signature. Nothing else is to be added.
- The engineer sealing/signing must be comfortable with the information provided on the as-built plans.
- Please make sure that the application is completed legibly. MCESD signs the bottom of the application when issued, which turns it into the issued certificate.

AOC Application Instructions

PWS# - "Public Water Supply" number – last three digits needed. Needs to be the assigned number that is providing potable water, must be the same on the ATC and the AOC.

MCESD# - located on the plans that were signed by MCESD and can be found on the Approval to Construct Certificate.

(One MCESD number per application)

Type of Component – write in the type of component the AOC application is for, **water, sewer, etc**.

DWR# - last six digits needed. FOR WELLS ONLY. Must have source approval before applying for AOC.

Project Name - as denoted on the Approval to Construct Certificate. Should be the same as on the plans.

Project Address – physical location of project.

Project Description - the description should be the same as the description on the Approval to Construct (ATC) Certificate, this will be different for each component.

Project Owner - must be a person with fiduciary responsibilities associated with the Project.(Print Name) * →

Job Title - examples: Owner, President or Vice President of Corporation/Home Owner Association, Manager.

Project Company Name – the name of Company who owns the Project.

Mailing Address, City, State, Zip Code - location of project owner, original will be mailed to this address, unless otherwise noted.

Signature of Project Owner - No one other than named project owner can sign the application unless there is a letter of authorization attached.

Engineer's Certificate of Completion – must be filled out, sealed and signed by a registered Engineer only, do NOT alter the application in any way.

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

***** The Department reserves the right to request any other information *****

Maricopa County
Environmental Services

Approval Of Construction (AOC) Application Cover Page

Mailing and Delivery Address:
Maricopa County Environmental Services Department
Subdivision Infrastructure and Planning Program
1001 N. Central Avenue, Suite 201
Phoenix, AZ 85004-1940

(***PLEASE PRINT CLEARLY***)

Project Name: _____

Contact Person: _____ **Title** _____
Email address of contact person _____
Company Name: _____
Phone Number: _____ Ext: _____ Fax Number: _____
Address: _____
City: _____ State: _____ Zip Code: _____

■ **On the AOC application ONLY, an Engineer can be the Project Owner.*→**

Application Check List for Approval of Construction

☐ **Cover Page for MCESD Projects** (*This page*)

☐ **Approval of Construction application** (*Attached*)

☐ **Cover sheet of sealed and signed As-Built plans**
(Sealed and signed by a Registered Land Surveyor ***or*** a Registered Engineer)

Full set must be available upon request in accordance with R18-4-507.2, R18-4-508 Record Drawings and Part E Type 4 General Permit R18-9-E301.E.

➢ **(If the application is for a subdivision and the cover page does not show the subdivision lots, we will need the pages that do.)**

☐ **Test Results *OR* A Letter From The City Stating The Type Of Tests That Were Run And That They Passed**

- **Potable water systems** - test results including, but not limited to pressure and bacteriological test data.
- **Sewage collection systems** - test results including, but not limited to deflection, leakage and uniform slope test data.
- **Reclaimed water distribution systems** - test results including, but not limited to pressure test data.

❖ **The Approval of Construction (AOC) application will be signed by the MCESD Program Manager or designee and will become your AOC certificate.**

❖ **Contact Person will be notified when signed unless otherwise noted**

Any questions contact Cindy Furze at 602-506-1058 or CFurze@mail.maricopa.gov

***** The Department reserves the right to request any other information *****

Visit our web page at www.maricopa.gov/EnvSvc/WaterWaste/Subdivisions/Subdivisions.aspx

Revised October 2012 - Fillable

Environmental Services Department
1001 N. Central Avenue, Suite 201
Phoenix, AZ 85004-1940

Division of Water and Waste Management
Subdivision Infrastructure & Planning
PHONE (602) 506-1058 FAX (602) 506-5813

Approval of Construction and/or Verification of General Permit Conformance

One (1) MCESD# Per Request / Application

PLEASE PRINT CLEARLY

PWS# 04-07-___ ___ ___ **MCESD #** _____ **Type of Component** _____
(WATER COMPONENTS ONLY) **(Specify water, gravity sewer, reuse, lift station, storage tank, etc.)**

- **Wells Only: DWR#** 55- ___ ___ ___ ___ ___ ___ ***Must have source approval before applying for AOC.**

Project Name: _____

Project Address: _____
(Physical location of project)

Project Description: _____

Project Owner: _____ Job Title _____

Company Name _____

Mailing Address _____

City _____ State _____ Zip Code _____

Signature of Project Owner _____ Date _____

Engineer's Certificate of Completion

I, _____ , a Professional Engineer registered in the State of Arizona; confirm that the project was completed in compliance with the plans and specifications approved by the Department, except as noted on the "as-built" plans. Attached are applicable test results as required.

Seal & Signature

Engineer's Phone _____

Engineer's Fax _____

Department Use Only

Approval of Construction and/or Verification of General Permit Conformance

For the project as described above, the Project Owner is granted an Approval of Construction and/or Verification of General Permit Conformance for operation and/or discharge under the terms of General Permit 4.01 in accordance with Title 18, Chapter 9, and Permit Article 2 (Wastewater); And/Or Title 18, Chapters 4 and 5 and Chapters IV and V of The Maricopa County Environmental Health Code (Water).

By _____
Wesley A. Shonerd, PE, Senior Civil Engineer
Subdivision Infrastructure & Planning **Date**

 (***Note: Once MCESD Signs This Application, It Becomes THE Certificate***)

Revised October 2012 - Fillable

APPENDIX B - FIRE FLOW REQUIREMENTS

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by fire walls without openings, constructed in accordance with the *International Building Code,* are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings. The minimum fire-flow requirements for one- and two-family dwellings having a fire-flow calculation area which does not exceed 3,600 square feet (344.5 m^2) shall be 1,000 gallons per minute (3785.4 L/min). Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5 m^2) shall not be less than that specified in Table B105.1.

Exception: A reduction in required fire flow of 50 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system.

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1.

Exception: A reduction in required fire-flow of up to 75 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.

SECTION B106
REFERENCED STANDARDS

ICC	IBC-06	International Building Code	B104.2, Table B105.1
ICC	IWUIC-06	International Wildland-Urban Interface Code	B103.3
NFPA	1142-01	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS[a]

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R.

b. Types of construction are based on the *International Building Code*.

c. Measured at 20 psi.

APPENDIX C
FIRE HYDRANT LOCATIONS AND DISTRIBUTION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION C101
GENERAL

C101.1 Scope. Fire hydrants shall be provided in accordance with this appendix for the protection of buildings, or portions of buildings, hereafter constructed.

SECTION C102
LOCATION

C102.1 Fire hydrant locations. Fire hydrants shall be provided along required fire apparatus access roads and adjacent public streets.

SECTION C103
NUMBER OF FIRE HYDRANTS

C103.1 Fire hydrants available. The minimum number of fire hydrants available to a building shall not be less than that listed in Table C105.1. The number of fire hydrants available to a complex or subdivision shall not be less than that determined by spacing requirements listed in Table C105.1 when applied to fire apparatus access roads and perimeter public streets from which fire operations could be conducted.

SECTION C104
CONSIDERATION OF EXISTING FIRE HYDRANTS

C104.1 Existing fire hydrants. Existing fire hydrants on public streets are allowed to be considered as available. Existing fire hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads.

SECTION C105
DISTRIBUTION OF FIRE HYDRANTS

C105.1 Hydrant spacing. The average spacing between fire hydrants shall not exceed that listed in Table C105.1.

Exception: The fire chief is authorized to accept a deficiency of up to 10 percent where existing fire hydrants provide all or a portion of the required fire hydrant service.

Regardless of the average spacing, fire hydrants shall be located such that all points on streets and access roads adjacent to a building are within the distances listed in Table C105.1.

TABLE C105.1
NUMBER AND DISTRIBUTION OF FIRE HYDRANTS

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a, b, c] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d]
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more[e]	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Reduce by 100 feet for dead-end streets or roads.

b. Where streets are provided with median dividers which can be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis up to a fire-flow requirement of 7,000 gallons per minute and 400 feet for higher fire-flow requirements.

c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

d. Reduce by 50 feet for dead-end streets or roads.

e. One hydrant for each 1,000 gallons per minute or fraction thereof.

APPENDIX C - HYDRANT METER RENTAL AGREEMENT

FIRE HYDRANT METER RENTAL AGREEMENT

Customer's Name:
ACCOUNT #(S):
Contact Name:
Meter #(s):
Hydrant ID Tag #(s):

Town of Queen Creek Water Department is providing you with a hydrant meter with the understanding that you, the undersigned will adhere to the following conditions:

1. The individual or company renting the hydrant shall only open the hydrant using the gate valve. At no time are you to use a hydrant wrench. If an employee of the water department finds that a hydrant wrench has been used, we will pull the hydrant meter immediately.
2. The individual or company renting the hydrant meter will be responsible for locking the hydrant meter gate valve to prevent anyone from stealing water. If an employee of the water department should see someone stealing water, that person will be fined accordingly.
3. A 2" female gate valve is attached to the hydrant meter, the individual or company renting the meter will need to provide their own 2" male adapter fitting.
4. Should the individual or company renting the hydrant meter want the meter moved to another location, they should contact the water company at 480-358-3450 and we will schedule the hydrant to be moved by an employee of the water department. If the renter moves the hydrant meter him or herself, there will be a $150.00 unauthorized hydrant meter move fee.
5. If the individual or company renting the hydrant meter should detect a leak, they should contact the water department immediately, and an employee of the water department will come out and repair it or exchange the hydrant meter for another if one is available at the time.
6. The Town of Queen Creek Water Department does not allow homesteading. Our field supervisor periodically checks hydrant meters. If he/she should find that there has been no usage or low usage on a meter for a one week period, the hydrant will be removed and the account final billed.
7. The individual or company renting the hydrant meter will be responsible for securing the hydrant meter to the hydrant to prevent damage to the meter or the meter being stolen.

The Town of Queen Creek Water Department will assess the following charges if any damage hydrant meter is damaged or stolen while in the possession of the individual or company renting the meter:

NON-REFUNDABLE DEPOSIT	**$100.00**
REFUNDABLE SECURITY DEPOSIT	**$1,500.00**
LOST/STOLE/ DAMAGED BREAKAWAY	**$350.00**
MONTHLY RENTAL FEE	**$100.00**
LOST/STOLEN/DAMAGED METER	**$1,775.00**
DAMAGE TO FIRE HYDRANT	**$2,220.00**
METER MOVE CHARGE	**$20.00 (Per move)**
UNAUTHORIZED METER MOVE FEE	**$150.00**
RATE PER THOUSAND GALLONS	**$4.00**

Approval of this application does not guarantee that a meter may be installed at any particular hydrant. Location and access to hydrant meters may be prohibited based on site conditions and the type of access needed. Considerations include traffic safety, dust suppression, obstruction of private property, etc. The Town reserves the right to require the removal or relocation of any hydrant meter at any time.

For projects requiring an Encroachment Permit, the Applicant may contact their assigned Town Inspector with any questions. At no time will the applicant be allowed to block or convey water across the public right-of-way without prior authorization from the Town. For Questions regarding traffic safety or vehicle access, contact the Public Works Traffic Information Line at (480) 358-3132 or email traffic@queencreek.org

I/We the company agree to the above mentioned terms on the hydrant meter that we have rented from the Town of Queen Creek Water.

Company Name _____

Signature _____

Date _____

Hydrant Meter No. _____

APPENDIX D - TYPICAL DETAILS

WATER SYSTEM PLANS

TYPICAL PLANS

QW100a	TYPICAL WATER COVER SHEET
QW100b	TYPICAL WATER INDEX OF SHEETS
QW100c	TYPICAL WATER GENERAL NOTES SHEET
QW100d	REQUIRED DETAILS FOR WATER PROJECTS
QW100e	TYPICAL PLAN SHEET FOR SUBDIVISIONS
QW100f	TYPICAL CONFLICT SHEET
QW100g	TYPICAL PLAN SHEET WITH 2 VIEWS
QW100h	TYPICAL PLAN AND PROFILE SHEET

HYDRANTS AND FIRE PROTECTION

QW201	FIRE HYDRANT INSTALLATION
QW202	NEW FIRE HYDRANT LOCATION
QW203	FIRE PROTECTION LAYOUT

VALVES

QW301	VALVE SPACING DETAIL
QW302	TYPICAL GATE VALVE

SERVICES AND METERS

QW403	WATER METER LOCATION
QW404	2-IN & SMALLER WATER METERS
QW405	MANIFOLD WATER SERVICE
QW406	2-IN WATER METERS MANIFOLDED FOR 3-IN SERVICE
QW407	BACKFLOW PREVENTION
QW408	ABOVE GROND WATER METERS 3-IN AND LARGER
QW409	DOUBLE CHECK DETECTOR ASSEMBLY WIH BYPASS METER

JOINT RESTRAINT

QW502-1, 2	JOINT RESTRAINT FOR D.I.P.
QW503	THRUST BLOCKS FOR WATER LINES

MISCELLANEOUS

QW601	TAPPING SLEEVE AND VALVE INSTALLATION
QW602	BLOW-OFF ASSEMBLY
QW603	AIR AND VACUUM RELEASE VALVE
QW604-1, 2	PIPE SUPPORT ACROSS TRENCHES
QW604-3	ALTERNATE TO PIPE SUPPORT
QW605-1, 2, 3	WATER, SEWER AND DRY UTILITY SEPARATION / PROTECTION
QW605-4	MINIMUM UTILITY SEPARATION REQUIREMENTS
QW606	TYPICAL WATER LINE TRENCH
QW607	STANDARD UTILITY LOCATION
QW608	ALLOWABLE JOINT DEFLECTION HORIZONTAL AND VERTICAL
QW609	WATER QUALITY SAMPLING STATION TYPICAL INSTALLATION
QW610	FISSURE CROSSING
QW611	VERTICAL ALIGNMENT OF WATER MAINS

WASTEWATER SYSTEM PLANS

TYPICAL PLANS

QS100a	TYPICAL WASTEWATER COVER SHEET
QS100b	TYPICAL WASTEWATER INDEX OF SHEETS
QS100c	TYPICAL WASTEWATER GENERAL NOTES SHEET
QS100d	REQUIRED DETAILS FOR ALL WASTEWATER PROJECTS
QS100e	TYPICAL WASTEWATER PLAN SHEET FOR SUBDIVISIONS

MANHOLES AND CLEANOUTS

QS420	PRE-CAST SEWER MANHOLE
QS421	SEWER MANHOLE COVER FRAME ADJUSTMENT
QS422	WATER TIGHT 30” MANHOLE FRAME AND COVER
QS423	30” MANHOLE FRAME AND COVER
QS424	INDUSTRIAL WASTE CONTROL VAULT WITH MANHOLE
QS425	SEWER CLEANOUT

CONNECTIONS

QS430	SEWER SERVICE LATERAL
QS431	DROP SEWER CONNECTIONS

MISCELLANEOUS

QS440	BROKEN SEWER LINE REPLACEMENT
QS441	STUB OUT AND PLUGS
QS442	TYPICAL SEWER LINE TRENCH
QS443	SEWER AUTOMATIC FLUSHING DEVICE
QS444-1, 2	STANDARD ODOR TANK
QS445-1	500 GALLON GREASE INTERCEPTOR
QS445-2	750-1500 GALLON GREASE INTERCEPTOR

IRRIGATION SYSTEM PLANS

TYPICAL PLANS

QI900a	TYPICAL IRRIGATION COVER SHEET
QI900b	TYPICAL INDEX OF IRRIGATION SHEETS
QI900c	TYPICAL IRRIGATION GENERAL NOTES SHEET
QI900d	REQUIRED DETAILS FOR IRRIGATION PROJECTS
QI900e	TYPICAL IRRIGATION PLAN

SERVICE PORTS

QI901	SINGLE SERVICE PORT
QI902	DUAL SERVICE PORT
QI903	QUAD SERVICE PORT

MISCELLANEOUS

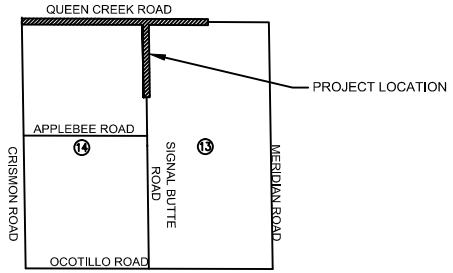
QI904	AIR VENT DETAIL
QI905	TYPICAL IRRIGATION MAIN LINE TRENCH

TOWN OF QUEEN CREEK UTILITY SERVICES DEPT

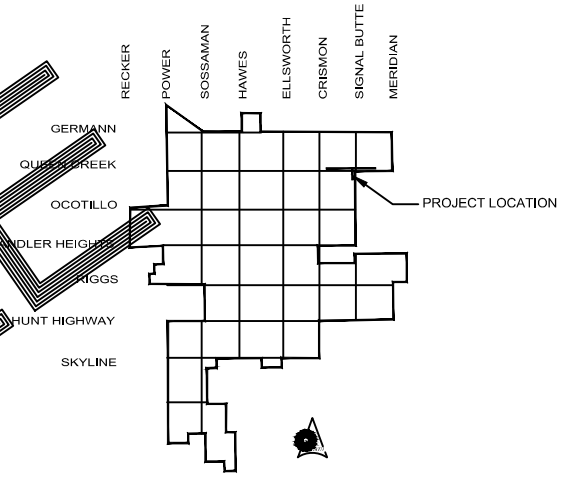
QUEEN CREEK ROAD WATER LINE EXTENSION

LEGAL DESCRIPTION

A PORTION OF SECTIONS 13 AND 14, TOWNSHIP 2 SOUTH, RANGE 7 EAST, GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, AZ



VICINITY MAP
NOT TO SCALE



TOQC SERVICE AREA
NOT TO SCALE

UTILITY LIST

DESCRIPTION	REPRESENTITIVE	PHONE	DATE PLANS SUBMITTED
SRP	RICH SEMINARA	602-236-0891	
QWEST	JOHN ODELL	602-630-0496	
SW GAS	EDWIN LONGWELL	602-484-5385	
COX CABLE	SCOTT GUSSO	623-322-7210	
TOWN OF QUEEN CREEK UTILITY DEPT	MIKE JOHNSON	480-987-3452	
QUEEN CREEK IRRIGATION COMPANY	DEAN GRIFFITH	480-987-3092	

OWNER

TOWN OF QUEEN CREEK
22350 S. ELLSWORTH RD.
QUEEN CREEK, AZ. 85242
TELEPHONE: (480) 358-3000
FAX: (480) 358-3133
CONTACT: GREG HOMOL

ENGINEER

SUNRISE ENGINEERING, INC.
2152 S. VINEYARD, SUITE 123
MESA, AZ. 85210
TELEPHONE: (480) 768-8600
FAX: (480) 768-8609
CONTACT: RICKY M HOLSTON, P.E.

BASIS OF BEARING

N 00°01'58" W BETWEEN THE NORTHWEST CORNER OF SECTION 14 AND THE NORTH 1/4 CORNER OF SECTION 14 OF TOWNSHIP 2S RANGE 7E OF THE GILA AND SALT RIVER MERIDIAN

BENCHMARK

THE NORTH QUARTER CORNER OF SECTION 13 TOWNSHIP 2 SOUTH RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN BEING AN ALUMINIUM CAP WITH AN ELEVATION OF 1442.60 NAVD 88.

APPROVALS

MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT. — DATE

TOWN OF QUEEN CREEK - UTILITY SERVICES DEPARTMENT DIRECTOR — DATE

TOWN OF QUEEN CREEK - TOWN ENGINEER — DATE

QUANTITIES

ITEM	QUANTITY
12" C909 WATER LINE	7,925 LF
8" C909 WATER LINE	1,600 LF
12" GATE VALVE	4 EA
8" GATE VALVE	2 EA
FIRE HYDRANT ASSEMBLY	3 EA
AIR RELEASE VALVE	1 EA
8" HDPE WATER LINE	110 LF
TEMPORARY BLOW OFF ASSEMBLY	1 EA

SHEET INDEX

DESCRIPTION	TITLE	SHEET #
COVER SHEET	COV	1
GENERAL NOTES, LEGEND, ABBREVIATIONS	GN1	2
WATER PLAN INDEX SHEET	IND	3
WATER PLAN AND PROFILES - QUEEN CREEK RD	W01-W08	4-11
WATER PLAN - SIGNAL BUTTE RD	W09-W10	12-13
MISCELLANEOUS DETAILS	DT1-DT2	14-15

"AS-BUILT" CERTIFICATION

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

REGISTERED PRO ENG

DATE

Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 - FAX 480.768.8609
www.sunrise-eng.com

CIRCLE G

QUEEN CREEK ROAD
WATER LINE EXTENSION

SD NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
01243	DMF	MAG		1 of 14	COV

P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QW100a - Typical Water Cover Sheet.dwg Nov 06, 2013 2:55pm hpowell

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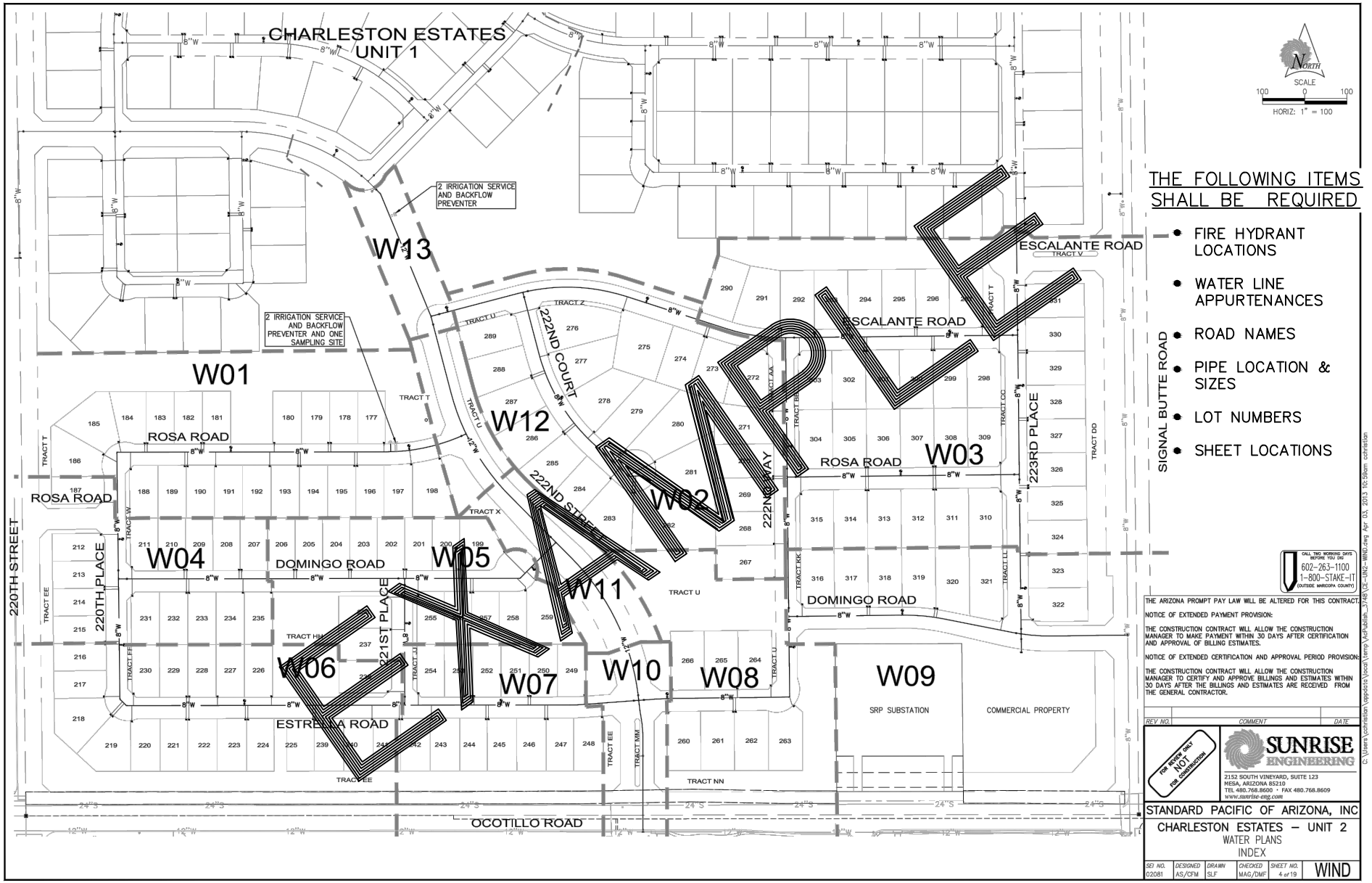
DETAIL NO.			REVISED:	DETAIL NO.
QW100a	STANDARD DETAIL	TYPICAL WATER COVER SHEET	04/30/13 DATE	QW100a



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DETAIL NO.			REVISED:	DETAIL NO.
QW100b	STANDARD DETAIL	TYPICAL INDEX OF SHEETS	03/12/13 DATE	QW100b

TOWN OF QUEEN CREEK WATER GENERAL NOTES

1. ALL WORK, TESTING AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE TOWN OF QUEEN CREEK DESIGN AND CONSTRUCTION STANDARDS MANUAL. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH STANDARDS AND DETAILS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE. THE TOWN OF QUEEN CREEK WATER DEPARTMENT REPRESENTATIVE SHALL HAVE FINAL AUTHORITY ON ALL IMPROVEMENTS REGARDLESS OF THE PLANS AND/OR SPECIFICATIONS.
2. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH DEPARTMENT REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE DEPARTMENT FROM REQUIRING CORRECTION OF ERRORS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.
3. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING PERMITS AND RENEWAL OF LAPSED PERMITS.
5. THE WATER DEPARTMENT APPROVAL IS VALID FOR A PERIOD OF ONE YEAR. CONSTRUCTION PERMITS SHALL BE OBTAINED DURING THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR REVIEW AND APPROVAL.
6. AN APPROVED SET OF PLANS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
7. DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL PERMANENT AND TEMPORARY EASEMENTS PRIOR TO BEGINNING CONSTRUCTION.
8. PRIVATE ON-SITE WATER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISION OF THE UNIFORM PLUMBING CODE AND THE LATEST REVISION OF THE UNIFORM FIRE CODE.
9. ENGINEER CERTIFIES THAT HE HAS CONTACTED ALL INTERESTED UTILITY COMPANIES AND HAS TRANSFERRED ALL EXISTING AND/OR PROPOSED UTILITY LINES AND RELATED INFORMATION ONTO THESE PLANS.
10. THE ENGINEER SHALL CERTIFY THAT ALL WATER IMPROVEMENTS HAVE BEEN INSTALLED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE APPROVED PLANS.
11. THE ENGINEER SHALL CERTIFY THAT THE MINIMUM HORIZONTAL AND VERTICAL SEPARATION BETWEEN UTILITIES HAS BEEN MAINTAINED AS REQUIRED BY LAW OR POLICY.
12. THE CONTRACTOR SHALL ARRANGE TO PROVIDE ALL CONSTRUCTION STAKING REQUIRED FOR THE PROJECT.
13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE RELOCATION OF ALL UTILITIES, POWER POLES, IRRIGATION DRY-UPS, REMOVALS BY OTHERS, ETC.
14. ALL FRAMES, COVERS, VALVE BOXES, MANHOLES, ETC. SHALL BE INSTALLED TO FINISH GRADE OR SHALL BE ADJUSTED TO FINISH GRADE PRIOR TO PLACING OF ASPHALT SURFACE COURSE BY THE CONTRACTOR AS PER MAG STANDARD DETAIL 270 AND 422.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES PRIOR TO EXCAVATION AND AVOID DAMAGE TO SAME. CALL 602-263-1100 FOR BLUE STAKE TWO WORKING DAYS PRIOR TO DIGGING.
16. CONTRACTOR WILL EXPOSE ALL TIE-IN POINTS TO VERIFY LOCATION PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES.
17. THE TOWN OF QUEEN CREEK WATER DEPARTMENT IS NOT LIABLE FOR DELAYS NOR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION; NEITHER WILL THE WATER DEPARTMENT PARTICIPATE IN THE COST OF UTILITY RECONSTRUCTION OR RELOCATION.
18. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION AND TESTING. INSPECTIONS SHOULD BE COORDINATED WITH BILL LAWRENCE (480) 748-3952. INSPECTIONS ARE ON A DAY TO DAY FIRST COME FIRST SERVED BASIS. CONSTRUCTION CONCEALED WITHOUT THE REQUIRED INSPECTION SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.
19. THE CONTRACTOR WILL FOLLOW GUIDELINES AND REGULATIONS SET FORTH BY OSHA. NEITHER THE ENGINEER OR THE TOWN WILL BE RESPONSIBLE FOR JOB-SITE SAFETY PROCEDURES OR CONDITIONS.
20. THE CONTRACTOR IS RESPONSIBLE FOR HIS OWN TAKEOFF QUANTITIES. QUANTITIES SHOWN HEREON ARE ESTIMATES ONLY AND AS SUCH ARE NOT TO BE USED FOR BID PURPOSES.
21. THE CONTRACTOR IS RESPONSIBLE FOR THE NOTIFICATION OF THE PROPER AUTHORITY(S) IF THERE ARE OBSTRUCTIONS TO PROPOSED IMPROVEMENTS AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY EXISTING ITEM REMOVED TO FACILITATE CONSTRUCTION SHALL BE REPLACED IN THE SAME OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
22. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL ON AND AROUND THE CONSTRUCTION SITE.
23. ALL WATER LINES SHALL HAVE 36" TO 48" MINIMUM COVER AS SPECIFIED IN THE TOWN OF QUEEN CREEK WATER DEPARTMENT DESIGN STANDARDS AND CONSTRUCTION MANUAL.
24. CONTRACTOR MUST MAINTAIN SLOPE OF WATER LINES TO HIGH POINTS AT COMBINATION AIR VALVES OR LOW POINTS AT BLOW OFFS OR FIRE HYDRANTS.
25. IN ACCORDANCE WITH AAC R18-4-213, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61.
26. DUCTILE IRON PIPE WHEN REQUIRED SHALL BE THICKNESS CLASS 350.
27. SERVICE CONNECTION BACK-FLOW PREVENTORS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
28. FIRE HYDRANTS SHALL RECEIVE 2 FIELD COATS OF CHROME YELLOW PAINT PRIOR TO ACCEPTANCE OF WORK BY THE WATER DEPARTMENT.
29. DEVELOPER IS TO INSTALL ALL TAPS AND METER BOXES. REFER TO THE WATER DEPARTMENT DESIGN AND CONSTRUCTION STANDARDS MANUAL FOR CLARIFICATION ON METER BOX LOCATION AND REQUIRED MATERIALS.
30. METERS SHALL BE FURNISHED AND INSTALLED BY THE WATER DEPARTMENT.
31. PAVEMENT REPLACEMENT AND TRENCH REPAIR SHALL BE DONE TO MAG STANDARD SPECIFICATIONS AND DETAILS.
32. ALL WATER SERVICE CONNECTIONS SHALL BE EXTENDED TO THE PROPOSED METER LOCATIONS AS INDICATED ON THE PLANS SUCH THAT ADDITIONAL EXTENSION WILL NOT BE REQUIRED.
33. IMPROVEMENTS SHALL NOT BE ACCEPTED UNTIL "AS-BUILT" PLANS HAVE BEEN SUBMITTED, REVIEWED AND APPROVED BY THE WATER DEPARTMENT.

MCDOT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE MOST CURRENT UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PUBLISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG), TOGETHER WITH THE MCDOT SUPPLEMENT TO THE MAG STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS. ALL WORK MUST ALSO COMPLY WITH RESOLUTION 2001-01 - MARICOPA COUNTY RESOLUTION FOR PERMITS TO WORK IN DEDICATED RIGHT-OF-WAY AND RESOLUTION 2001-02 MARICOPA COUNTY RESOLUTION FOR STREET IMPROVEMENTS, INSTALLATION OF UTILITIES AND TRAFFIC CONTROL. ANY EXCEPTIONS MUST RECEIVE EXPLICIT APPROVAL FROM MCDOT AND SHALL BE IDENTIFIED ON THE PLANS AS HAVING EXPLICIT APPROVAL FROM MCDOT.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY MCDOT IN CONCEPT AND NOT IN DETAIL. CONSTRUCTION QUANTITIES ON THESE PLANS ARE NOT VERIFIED BY MCDOT. APPROVAL OF THESE PLANS ARE FOR PERMIT PURPOSES ONLY AND SHALL NOT PREVENT MCDOT FROM REQUIRING CORRECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSEQUENTLY FOUND TO BE IN VIOLATION OF ANY LAW, ORDINANCE, HEALTH, SAFETY, MCDOT ROADWAY DESIGN MANUAL, OR OTHER DESIGN ISSUES.
3. AN APPROVED SET OF PLANS SHALL BE ON THE SITE DURING CONSTRUCTION AND AVAILABLE TO MCDOT AND OTHER INSPECTORS.
4. ALL BOX CULVERTS CONSTRUCTED IN THE PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) LATEST DESIGN SPECIFICATIONS AND STANDARDS. MINIMUM CLEAR HEIGHT OF BOX CULVERT SHALL BE 4 FEET.
5. CONTRACTOR TO OBTAIN NECESSARY MCDOT PERMITS PRIOR TO CONSTRUCTION WITHIN COUNTY RIGHT-OF-WAY AND ALL NECESSARY PERMITS FROM LOCAL GOVERNMENTS FOR WORK WITHIN THEIR JURISDICTION.
6. CONTRACTOR SHALL NOTIFY THE MCDOT INSPECTION DEPT. AT LEAST 24 HOURS IN ADVANCE OF ANY CONSTRUCTION AT (602) 506-8811.
7. CONTRACTOR PERFORMING CONSTRUCTION OR EXCAVATION OPERATIONS IS RESPONSIBLE FOR LOCATING AND RELOCATING ALL UTILITIES IN CONFLICT OR WITHIN THE CLEAR ZONE, AT NO EXPENSE TO MARICOPA COUNTY. THE CONTRACTOR SHALL CONTACT "BLUE STAKE" AT (602) 263-1100 PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY REQUIRED PERMITS FOR EARTH MOVING FROM MARICOPA COUNTY AIR QUALITY DEPARTMENT'S DUST COMPLIANCE DIVISION (602) 506-6010 PRIOR TO CONDUCTING EXCAVATION OPERATIONS. A COPY OF THE PERMIT AND DUST CONTROL PLAN SHALL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO COMMENCEMENT OF ANY EARTHMOVING ACTIVITIES.
9. PRIOR TO CONDUCTING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL OBTAIN FROM THE ARIZONA STATE HISTORICAL PRESERVATION OFFICER (602) 542-4009, RECOMMENDATIONS REGARDING THE NEED FOR CULTURAL RESOURCES (ARCHAEOLOGICAL) CLEARANCE. ALL DISCOVERIES OF HUMAN REMAINS, CULTURAL ARTIFACTS, OR PALEONTOLOGICAL REMAINS SHALL BE REPORTED TO THE ARIZONA STATE MUSEUM AND MCDOT. UPON DISCOVERY, CONTRACTOR SHALL CEASE OPERATIONS IN THE VICINITY OF THE FIND AND PROTECT THE DISCOVERY AREA FROM FURTHER DISTURBANCE UNTIL THE FIND CAN BE PROFESSIONALLY INVESTIGATED BY THE ARIZONA STATE MUSEUM AND MCDOT.
10. EXCEPT UNDER EMERGENCY CONDITIONS, ROADS SHALL NOT BE CLOSED FOR CONSTRUCTION ACTIVITY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE MCDOT TRANSPORTATION DIRECTOR OR HIS REPRESENTATIVE.
11. PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES, THE CONTRACTOR SHALL FILE A FORMAL NOTICE OF INTENT WITH THE ARIZONA DEPARTMENT OF AGRICULTURE NATIVE PLANTS (602) 542-6408.
12. PRIOR TO INSTALLATION OF CURB, GUTTER, SIDEWALK, BASE COURSE AND WEARING SURFACE, SUBMIT SOIL TEST(S) OF SUB-GRADE AND REVISED PAVEMENT DESIGN/CALCULATIONS TO MCDOT FOR REVIEW AND APPROVAL. IF SUB-GRADE STABILIZATION IS REQUIRED, THE AREA STABILIZED SHALL BE FROM BACK OF SIDEWALK TO BACK OF SIDEWALK AND MATCH THE STABILIZATION DEPTH OF THE PAVEMENT STRUCTURE.
13. ASPHALT MIX DESIGN SHALL BE SUBMITTED TO MCDOT A MINIMUM OF 48 HOURS PRIOR TO PLACING ANY ASPHALT COURSES. (TRENCH WORK EXCLUDED.) ALL PAVED TURNOUTS SHALL HAVE THE SAME ASPHALT AND BASE REQUIREMENTS AS THE ADJACENT ROADWAY UNLESS NOTED OTHERWISE.
14. ALL COMPACTION AND BACKFILL WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM TO THE MCDOT SUPPLEMENT TO MAG SPECIFICATIONS. BACKFILL UNDER EXISTING PAVEMENT, CURB AND GUTTER OR WITHIN TWO FEET (2) OR LESS FROM THE EDGE OF PAVEMENT SHALL CONSIST OF ONE-SACK (1/2) SLURRY BACK CLSM.
15. ALL STRUCTURES, SUCH AS MANHOLES, VALVE BOX COVERS, AND MONITORING WELLS MUST BE MARKED WITH AT LEAST TWO REFLECTIVE YELLOW FLEX POSTS WHEN STRUCTURES ARE LOCATED OUTSIDE THE TRAVELED WAY AND WITHIN THE RIGHT-OF-WAY. (APPLIES ONLY WHEN THERE IS NO CURB.)
16. ANY SAW CUT ALONG EXISTING ROADWAY EDGE WHICH REMOVES THE EDGE OF THE ROADWAY SHALL BE A MINIMUM OF 1' FROM THE EDGE OF THE EXISTING ROADWAY. THE CUT DISTANCE MAY BE GREATER, BASED ON PAVEMENT CONDITIONS OR ROADWAY ELEVATIONS BUT SHALL NOT BE LOCATED WITHIN A LANE WHEEL PATH, AND IF NEEDED SHALL BE IN HALF LANE INCREMENTS.
17. ALL EXISTING PAVEMENT MARKING, TRAFFIC SIGNS AND SIGNAL EQUIPMENT THAT NEEDS TO BE REMOVED, REPLACED, RELOCATED OR REPAIRED BECAUSE OF CONTRACTOR'S WORK WILL BE DONE BY THE CONTRACTOR AT HIS EXPENSE. ALL SALVAGED SIGNS SHALL BE DELIVERED TO THE TRAFFIC OPS BUILDING AT 2909 W. DURANGO ST. ARRANGEMENTS CAN BE MADE FOR DELIVERY BY CALLING (602) 506-8662. ALL NEW STREET NAME SIGNS SHALL BE PROVIDED AND INSTALLED BY PERMITTEE AT NO EXPENSE TO MARICOPA COUNTY.
18. PAVEMENT MARKING, SIGNING AND SIGNAL WORK WILL BE INSPECTED AND SHALL MEET COUNTY STANDARDS BEFORE RELEASE OF BOND.
19. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY TO A CONDITION EQUAL TO OR BETTER THAN EXISTING IMPROVEMENTS PER MAG 107.9. DISPOSAL OF ALL WASTE MATERIAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

LEGEND

W	EXISTING WATER LINE
E	EXISTING ELECTRIC
OHE	EXISTING OVERHEAD ELECTRIC
G	EXISTING GAS LINE
T	EXISTING UNDERGROUND TELEPHONE
C	EXISTING CABLE LINE
IRR	EXISTING IRRIGATION
	EXISTING PROPERTY LINE
	EXISTING BLOCK WALL
X X	EXISTING BARBED WIRE FENCE
O O	EXISTING CHAINLINK FENCE
	EXISTING STORM DRAIN PIPE
	EXISTING SIGN
	EXISTING GATE VALVE
	EXISTING FIRE HYDRANT
	EXISTING POWER POLE
	EXISTING GUY WIRE
	EXISTING MAILBOX
	EXISTING WATER METER
	EXISTING AIR/VACUUM RELEASE VALVE
	EXISTING BLOWOFF VALVE
	EXISTING CONC STANDPIPE
T	EXISTING TELEPHONE MANHOLE
	EXISTING SEWER MANHOLE
8"W	PROPOSED WATER LINE
	ROADWAY CENTERLINE
	SECTION LINE
	PROPOSED GATE VALVE
	PROPOSED FIRE HYDRANT ASSEMBLY
	BRASS CAP MONUMENT
	SURVEY CONTROL POINT
	PROPOSED AIR/VACUUM RELEASE VALVE
	PROPOSED BLOWOFF VALVE
	PROPOSED REDUCER
	PROPOSED THRUST BLOCK
	PROPOSED WATER METER
	PROPOSED SAMPLE SITE

REV NO.	COMMENT	DATE

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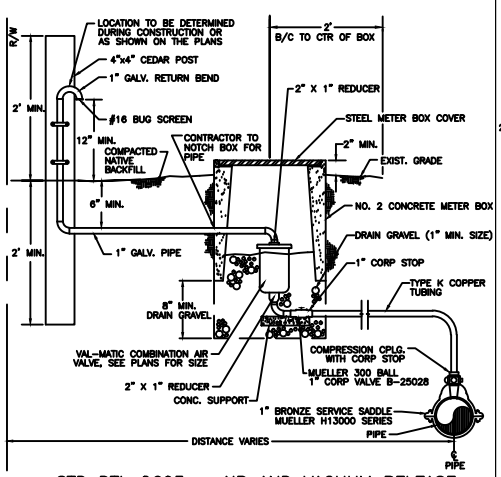
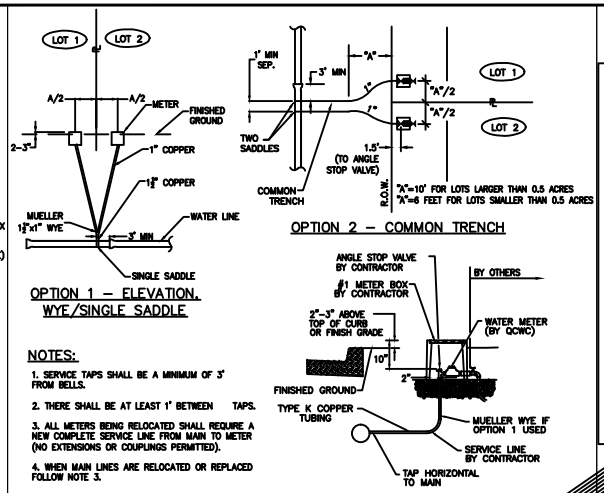
CIRCLE G

PEGASUS AIRPARK UNITS 3 AND 4
WATER IMPROVEMENT PLANS
General Notes and Legend

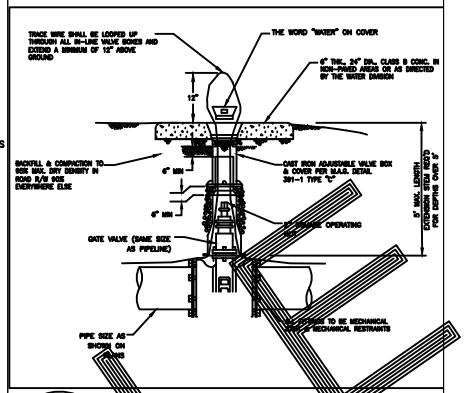
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
01243	DMF	MAG		2 of 14	GN1



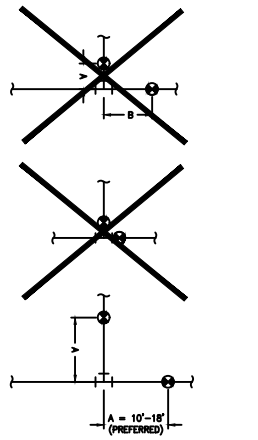
A ~ STD DTL Q603 – AIR AND VACUUM RELEASE VALVE
NOT TO SCALE



D ~ STD DTL Q403 – WATER METER LOCATION
NOT TO SCALE

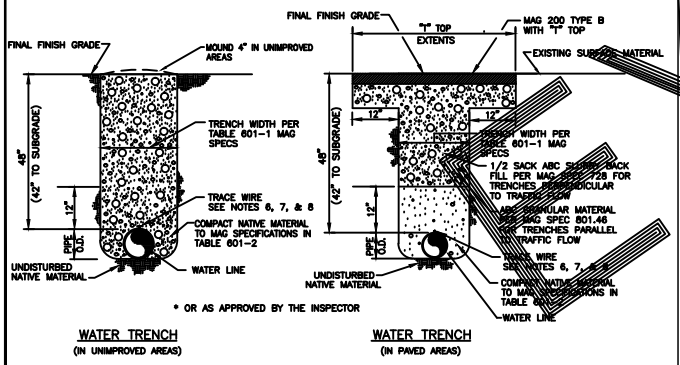


C ~ STD DTL Q302 – TYPICAL GATE VALVE
NOT TO SCALE

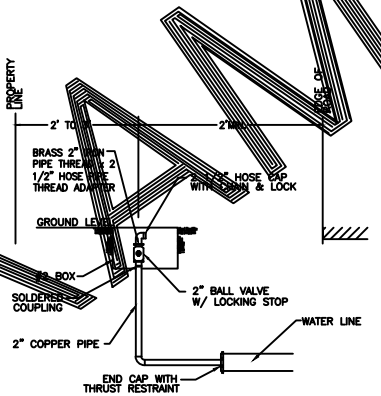


F ~ STD DTL Q301 – VALVE SPACING
NOT TO SCALE

NOTES:
1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW PIPE AND REPLACED WITH NATIVE MATERIAL.
2. MINIMUM COVER SHALL BE MEASURED FROM THE EXISTING OR PROPOSED GRADE, OR FROM NATURAL GROUND, WHICHEVER IS DEEPER.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.
4. PVC TYPE SHALL BE 1" MINUS GRANULAR MATERIAL.
5. DUCTILE IRON PIPE BEDDING SHALL BE 2" MINUS GRANULAR MATERIAL.
6. TRACER WIRE SHALL BE REQUIRED AT "OFF-SITE" INSTALLATIONS, IN UNDEVELOPED AND/OR CHANGING AREAS OR AS SPECIFICALLY REQUIRED BY THE WATER DIVISION.
7. SPLICES FOR COPPER WIRE SHALL BE MADE USING SIZE 10 & 12 BUTT CONNECTORS TO SPLICE NUMBER 12 BLUE LOCATOR WIRE.
8. BLUE INSULATED COPPER WIRE (NUMBER 12 AWG) REQUIRED DIRECTLY ON TOP OF MAIN WATER LINE & TAPED EVERY JOINT WITH DUCT TAPE.

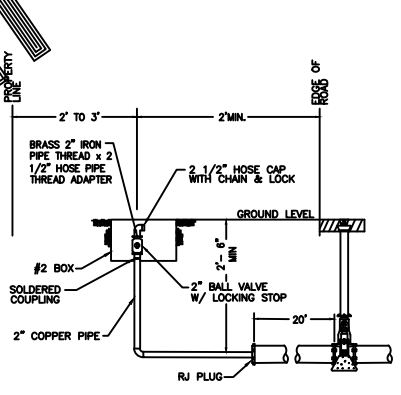


B ~ STD DTL Q606 – TYPICAL WATER LINE TRENCH
NOT TO SCALE



NOTE: THE CONTRACTOR SHALL INSTALL METER BOX A MINIMUM OF 2' FROM THE EDGE OF THE ROADWAY.

TYPE A BLOW-OFF ASSEMBLY FOR PERMANENT DEAD-END LINES



TYPE B BLOW-OFF ASSEMBLY FOR TEMPORARY DEAD-END LINES

E ~ STD DTL Q602 – BLOW-OFF ASSEMBLY
NOT TO SCALE

Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

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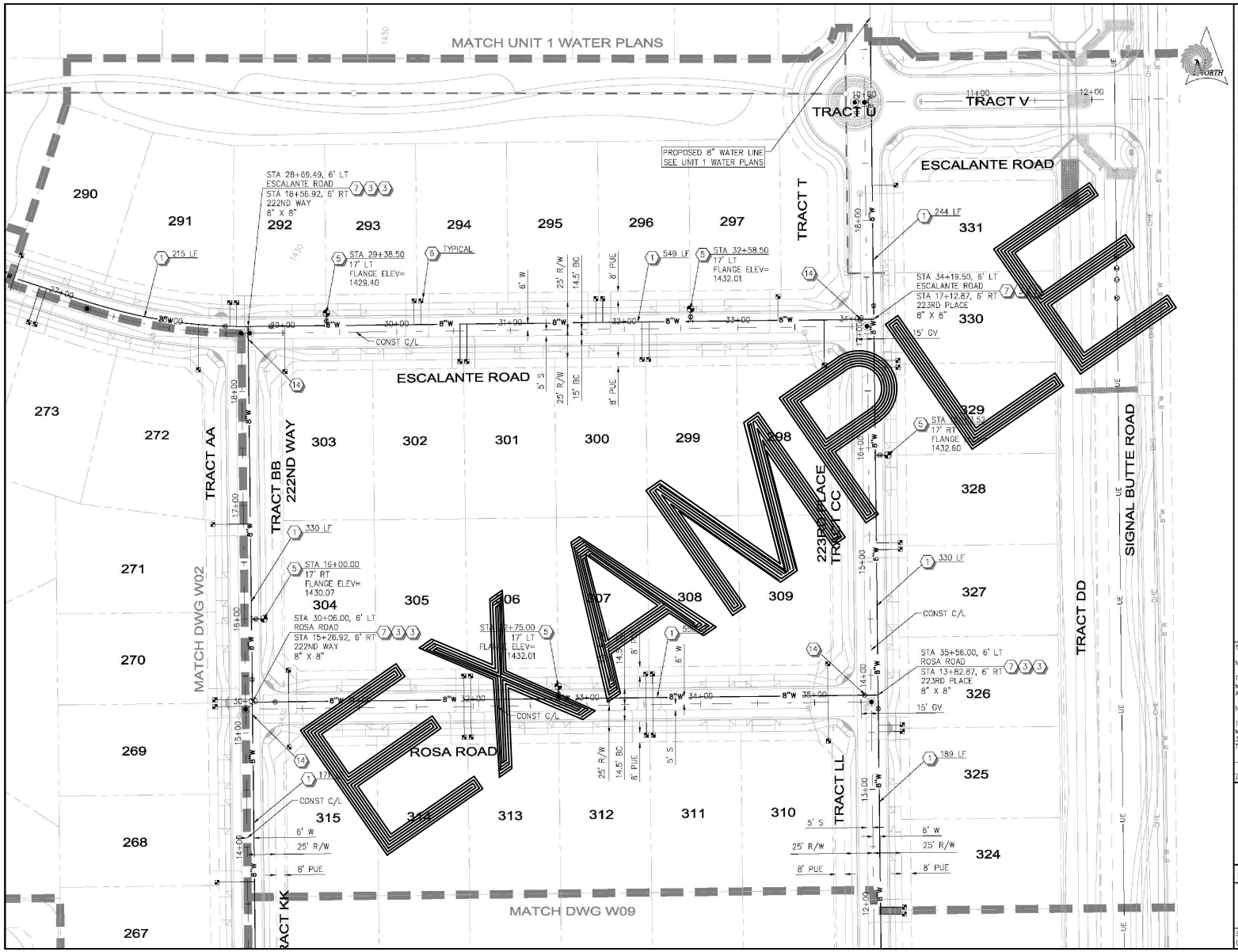
QUEEN CREEK WATER COMPANY
QUEEN CREEK VILLAGES
PHASE 2

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	DW	CY		3 of 25	D1

DETAIL NO.			REVISED:	DETAIL NO.
QW100d	STANDARD DETAIL	REQUIRED DETAILS FOR WATER PROJECTS	05/01/13 DATE	QW100d



CONSTRUCTION NOTES

1. INSTALL 8" C909 PIPE.
2. INSTALL 12" C909 PIPE.
3. INSTALL 8" GATE VALVE, 1 PIPE LENGTH FROM FITTING UNLESS OTHERWISE NOTED.
4. INSTALL 12" GATE VALVE, 1 PIPE LENGTH FROM FITTING UNLESS OTHERWISE NOTED.
5. INSTALL FIRE HYDRANT PER TOQC STD DTL Q201 AND Q202.
6. INSTALL 1" WATER SERVICE WITH 1" METER BOXES PER OPTION 2 TOQC STD DTL Q403.
7. INSTALL RESTRAINED JOINT TEE, SIZE AS NOTED.
8. INSTALL RESTRAINED JOINT 90° BEND, SIZE AS NOTED.
9. INSTALL RESTRAINED JOINT 45° BEND, SIZE AS NOTED.
10. INSTALL RESTRAINED JOINT 22.5° BEND, SIZE AS NOTED.
11. INSTALL CROSS, SIZE AS NOTED.
12. INSTALL S.E.B. REDUCER PER TOQC DESIGN STANDARDS SECTION 4, SIZE AS NOTED.
13. INSTALL END CAP AND PLUG, SIZE AS NOTED.
14. WATER AND SANITARY SEWER CROSSING PER TOQC STD DTL Q605. (NEW MAG404 DTL)
15. INSTALL 12" RESTRAINED JOINT 11.5° BEND.
16. INSTALL 12" X 12" TAPPING SLEEVE PER MAG STD DTL 340, EXCEPT THRUST RESTRAINT SHALL BE BY STARGRIPS MEGA LUG PER TOQC STANDARDS.
17. INSTALL 8" X 8" TAPPING SLEEVE PER MAG STD DTL 340, EXCEPT THRUST RESTRAINT SHALL BE BY STARGRIPS MEGA LUG PER TOQC STANDARDS.
18. INSTALL 2" IRRIGATION SERVICE WITH 1.5" METER AND BACKFLOW PREVENTER PER TOQC STD DTL Q401.
19. INSTALL 1" WATER AND METER BOX WITH SHUT OFF VALVE SERVICE FOR FUTURE SAMPLING SITE PER TOQC STD DTL Q 609.
20. COMBINATION AIR/VACUUM VALVE PER TOQC STD DTL 603.

GENERAL NOTES

1. ALL THRUST RESTRAINT SHALL BE STAR-GRIP OR EQUAL.
2. LENGTHS OF RESTRAINED JOINT PIPE IF SHOWN ARE REQUIRED MINIMUMS AND ASSUME THE TRENCH SECTION IS CONSTRUCTED AS SHOWN ON TOQC STD DTL Q502-1 AND Q502-2 USING 4 FT. MINIMUM COVER.
3. TRENCH CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOQC STD DTL Q606.
4. VALVE SPACING SHALL BE IN ACCORDANCE WITH TOQC STD DTL Q301.
5. VALVE BLOCKING SHALL BE PER MAG STD DTL 301.
6. WATER METER HAVE BEEN DOUBLED UP WHEREVER POSSIBLE. SINGLE METER LOCATIONS AS SHOWN MAY BE DUE TO DEVELOPER'S DRIVEWAY LOCATION PREFERANCE. DRIVEWAYS ARE SHOWN FOR REFERENCE ONLY.
7. MAXIMUM BENDING RADIUS FOR PVC C900 IS 190° FOR 8" AND 275° FOR 12".

SCALE
40 0 40
HORIZ: 1" = 40

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

THE ARIZONA PROMPT PAY LAW WILL BE ALTERED FOR THIS CONTRACT.

NOTICE OF EXTENDED PAYMENT PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO MAKE PAYMENT WITHIN 30 DAYS AFTER CERTIFICATION AND APPROVAL OF BILLING ESTIMATES.

NOTICE OF EXTENDED CERTIFICATION AND APPROVAL PERIOD PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO CERTIFY AND APPROVE BILLINGS AND ESTIMATES WITHIN 30 DAYS AFTER THE BILLINGS AND ESTIMATES ARE RECEIVED FROM THE GENERAL CONTRACTOR.

REV NO.	COMMENT	DATE

FOR BIDDING ONLY NOT FOR CONSTRUCTION DATE

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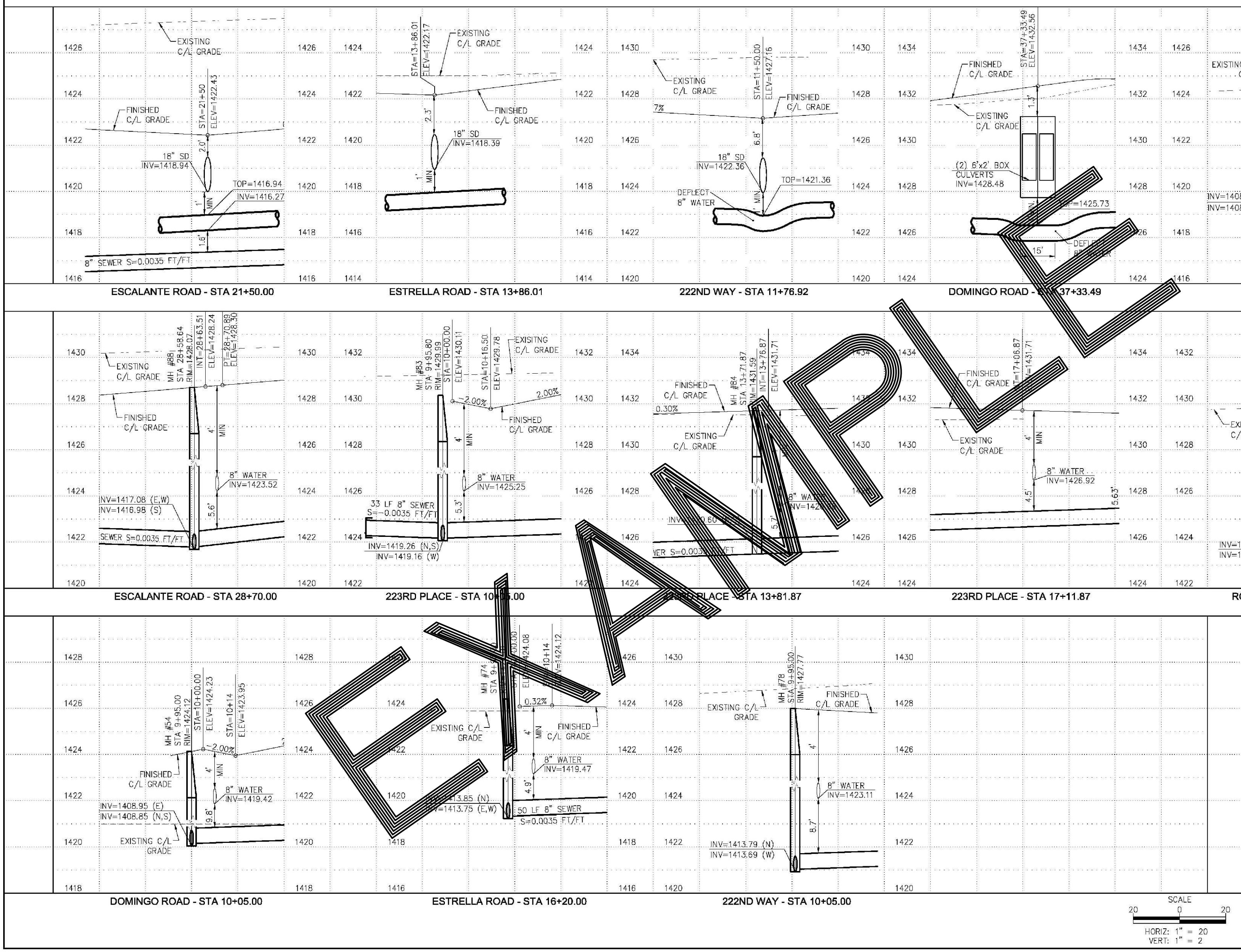
PORCHLIGHT LAND & CATTLE, L.L.C.

CHARLESTON ESTATES – UNIT 2
WATER PLANS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
02081	AS	SLF	MAG/DMF	8 of 18	W03

P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QW100e - Typical Water Plan Sheet.dwg Nov 06, 2013 3:01pm hpowell

DETAIL NO.		STANDARD DETAIL	TYPICAL PLAN SHEET FOR SUBDIVISIONS PIPE DIAMETERS LESS THAN 12"	REVISED:	DETAIL NO.
QW100e	TOWN OF QUEEN CREEK ARIZONA			12/02/11 DATE	QW100e



THE ARIZONA PROMPT PAY LAW SHALL BE ALTERED FOR THIS CONTRACT.

NOTICE OF EXTENDED PAYMENT PROVISION:

THE CONSTRUCTION CONTRACT SHALL ALLOW THE CONSTRUCTION MANAGER TO MAKE PAYMENT WITHIN 30 DAYS AFTER CERTIFICATION AND APPROVAL OF BILLING ESTIMATES.

NOTICE OF EXTENDED CERTIFICATION AND APPROVAL PERIOD PROVISION:

THE CONSTRUCTION CONTRACT SHALL ALLOW THE CONSTRUCTION MANAGER TO CERTIFY AND APPROVE BILLINGS AND ESTIMATES WITHIN 30 DAYS AFTER THE BILLINGS AND ESTIMATES ARE RECEIVED FROM THE GENERAL CONTRACTOR.

REV NO.	COMMENT	DATE

FOR REVIEW ONLY — NOT FOR CONSTRUCTION — DATE

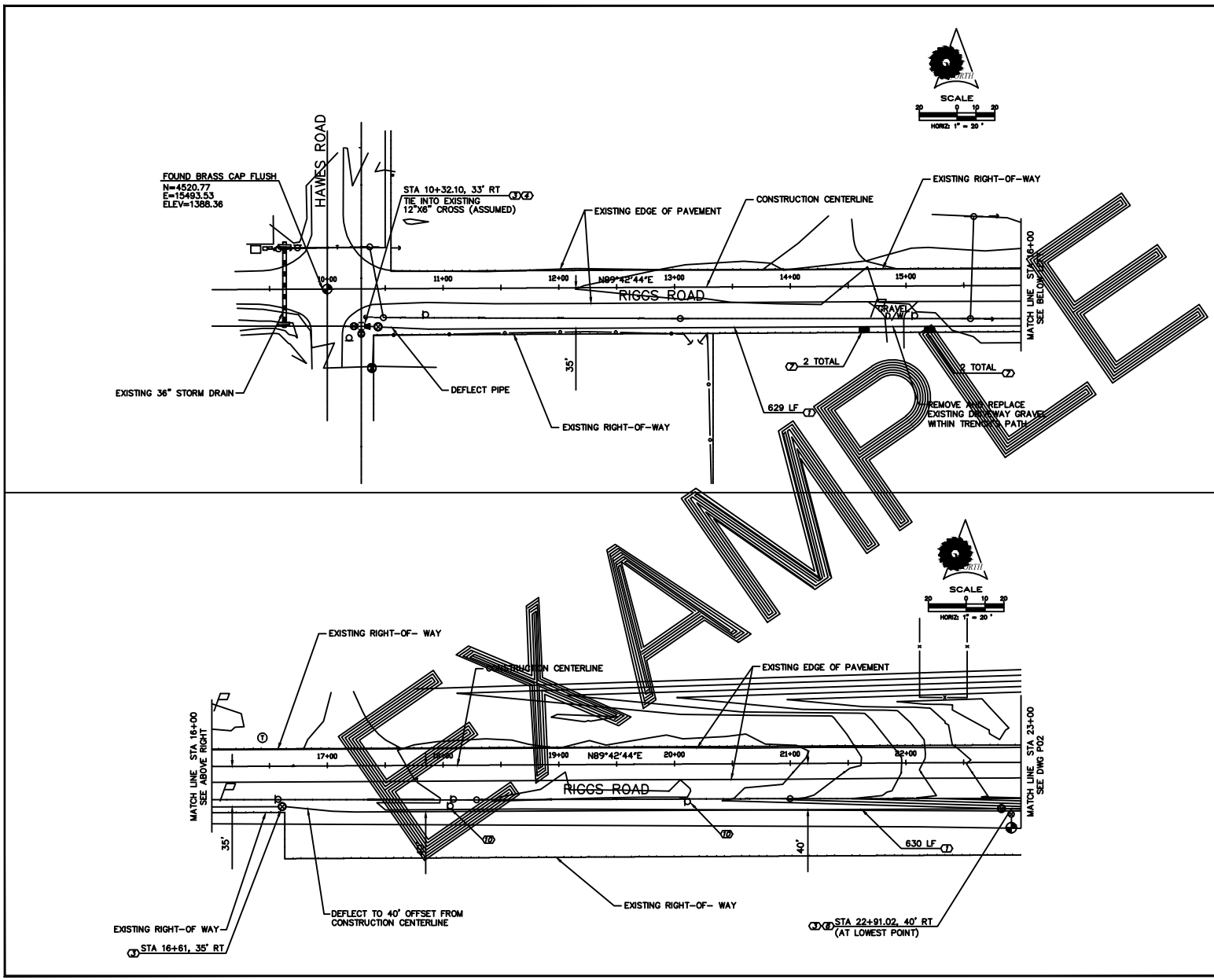
SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

PORCHLIGHT LAND & CATTLE, L.L.C.

CHARLESTON ESTATES – UNIT 2
WATER PLANS
STORM DRAIN CONFLICTS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
02081	AS	SLF	MAG/DMF	17 of 18	SD01

DETAIL NO.			REVISED:	DETAIL NO.
QW100f	TOWN OF QUEEN CREEK ARIZONA — STANDARD DETAIL	TYPICAL CONFLICT SHEET Storm and Sewer Conflicts	12/02/11 DATE	QW100f



CONSTRUCTION NOTES

1. INSTALL 8" C900 PVC WATER LINE. LENGTH AS INDICATED ON PLANS
2. INSTALL 8" C900 PVC RESTRAINED JOINT WATER LINE. LENGTH AS INDICATED ON PLANS
3. INSTALL 8" GATE VALVE PER M.A.G. STD. DET. 301
4. INSTALL 8" X 6" REDUCER
5. INSTALL 8" END CAP, RJ
6. INSTALL FIRE HYDRANT ASSEMBLY PER M.A.G. STD DET. 360 AND 362
7. RECONSTRUCT EXISTING SERVICE. TIE INTO NEW 8" WATER LINE USING 2" DOUBLE STRAP SERVICE SADDLE AND 1" "TYPE K" COPPER TUBING
8. INSTALL "TYPE A" 2" CURB STOP WITH FLUSHING PIPE AT LOW POINT PER M.A.G. STD. DET. 390
9. RELOCATE EXISTING MONUMENT
10. RELOCATE EXISTING SIGN

GENERAL NOTES

1. LENGTHS OF PIPE ARE TO CENTER OF FITTING CLUSTER OR VALVE.
2. ALLOWABLE END DEFLECTION FOR 8" C900 PIPE IS 2.1° FOR 20' LAYING LENGTH.
3. ALL THRUST RESTRAINT SHALL BE MEG-A-LUG OR EQUAL.
4. LENGTHS OF RESTRAINED JOINT PIPE SHOWN ARE REQUIRED MINIMUMS AND ASSUME THE TRENCH SECTION IS CONSTRUCTED AS SHOWN.

811 Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

FOR BIDDING ONLY NOT FOR CONSTRUCTION DATE

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2152 SOUTH VINEYARD, SUITE 123
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TEL 480.768.8600 • FAX 480.768.8609
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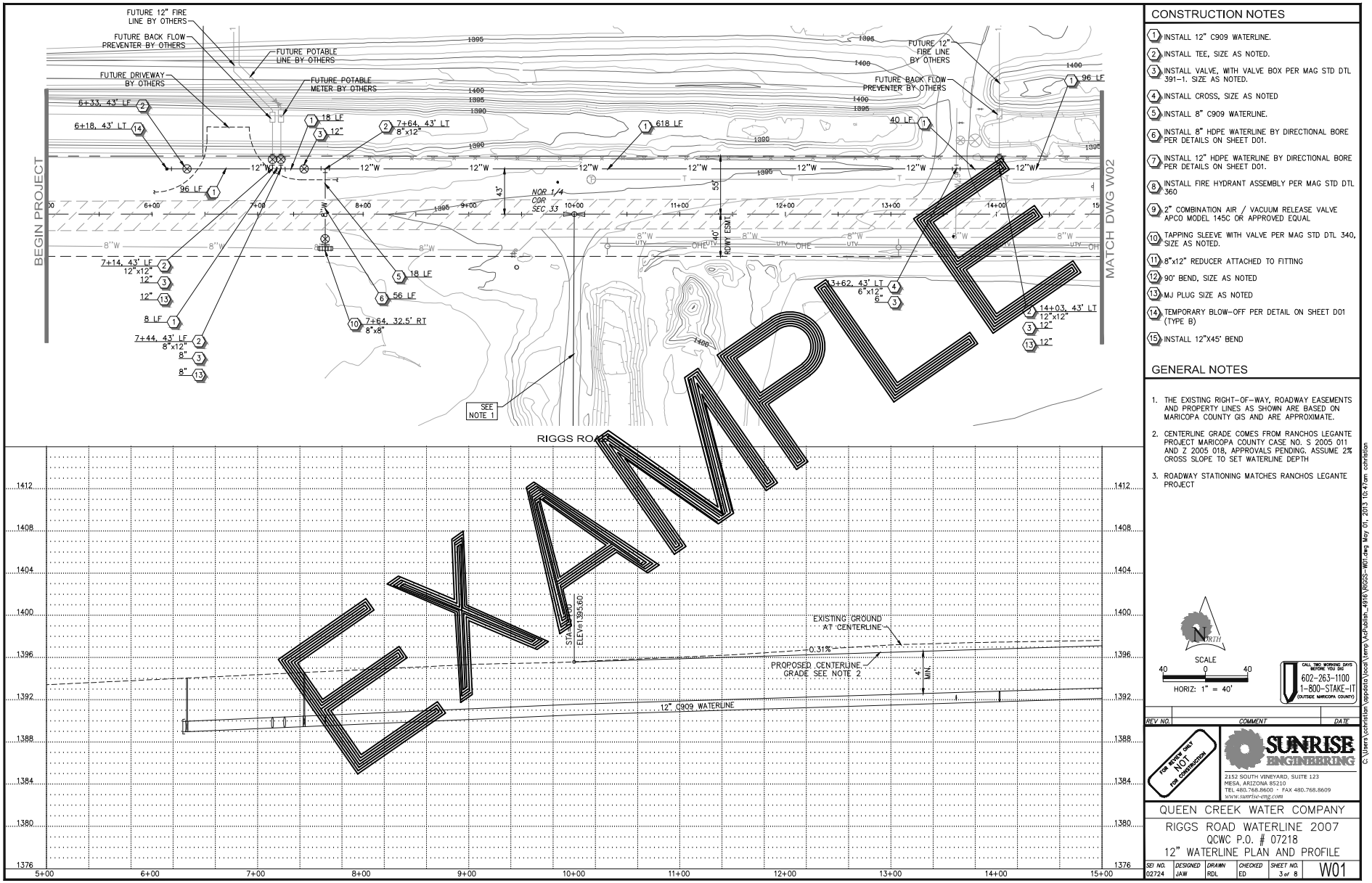
TOWN OF QUEEN CREEK WATER DIVISION

QUEEN CREEK VILLAGES
WATER PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	JW	CY		5 of 25	P1

DETAIL NO.			REVISED:	DETAIL NO.
QW100g	STANDARD DETAIL	TYPICAL PLAN SHEET WITH 2 VIEWS on roadways for pipe smaller than 12"	04/30/13 DATE	QW100g



CONSTRUCTION NOTES

1. INSTALL 12" C909 WATERLINE.
2. INSTALL TEE, SIZE AS NOTED.
3. INSTALL VALVE, WITH VALVE BOX PER MAG STD DTL 391-1. SIZE AS NOTED.
4. INSTALL CROSS, SIZE AS NOTED
5. INSTALL 8" C909 WATERLINE.
6. INSTALL 8" HDPE WATERLINE BY DIRECTIONAL BORE PER DETAILS ON SHEET D01.
7. INSTALL 12" HDPE WATERLINE BY DIRECTIONAL BORE PER DETAILS ON SHEET D01.
8. INSTALL FIRE HYDRANT ASSEMBLY PER MAG STD DTL 360
9. 2" COMBINATION AIR / VACUUM RELEASE VALVE APCO MODEL 145C OR APPROVED EQUAL
10. TAPPING SLEEVE WITH VALVE PER MAG STD DTL 340, SIZE AS NOTED.
11. 8"x12" REDUCER ATTACHED TO FITTING
12. 90° BEND, SIZE AS NOTED
13. MJ PLUG SIZE AS NOTED
14. TEMPORARY BLOW-OFF PER DETAIL ON SHEET D01 (TYPE B)
15. INSTALL 12"X45° BEND

GENERAL NOTES

1. THE EXISTING RIGHT-OF-WAY, ROADWAY EASEMENTS AND PROPERTY LINES AS SHOWN ARE BASED ON MARICOPA COUNTY GIS AND ARE APPROXIMATE.
2. CENTERLINE GRADE COMES FROM RANCHOS LEGANTE PROJECT MARICOPA COUNTY CASE NO. S 2005 011 AND Z 2005 018, APPROVALS PENDING. ASSUME 2% CROSS SLOPE TO SET WATERLINE DEPTH
3. ROADWAY STATIONING MATCHES RANCHOS LEGANTE PROJECT

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

REV NO.	COMMENT	DATE

FOR REVIEW ONLY NOT FOR CONSTRUCTION

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2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
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QUEEN CREEK WATER COMPANY

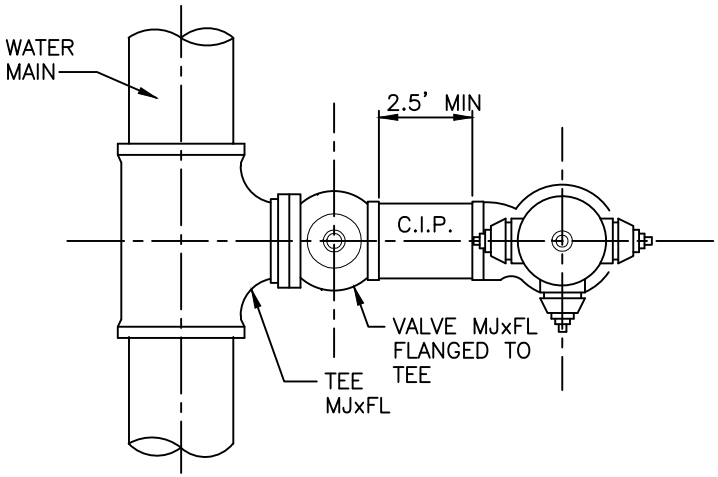
RIGGS ROAD WATERLINE 2007
QCWC P.O. # 07218
12" WATERLINE PLAN AND PROFILE

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
02724	JAW	RDL	ED	3 of 8	W01

C:\Users\cchristian\appdata\local\Temp\AcPublish_4916\RIGGS-W01.dwg May 01, 2013 10:47am cchristian

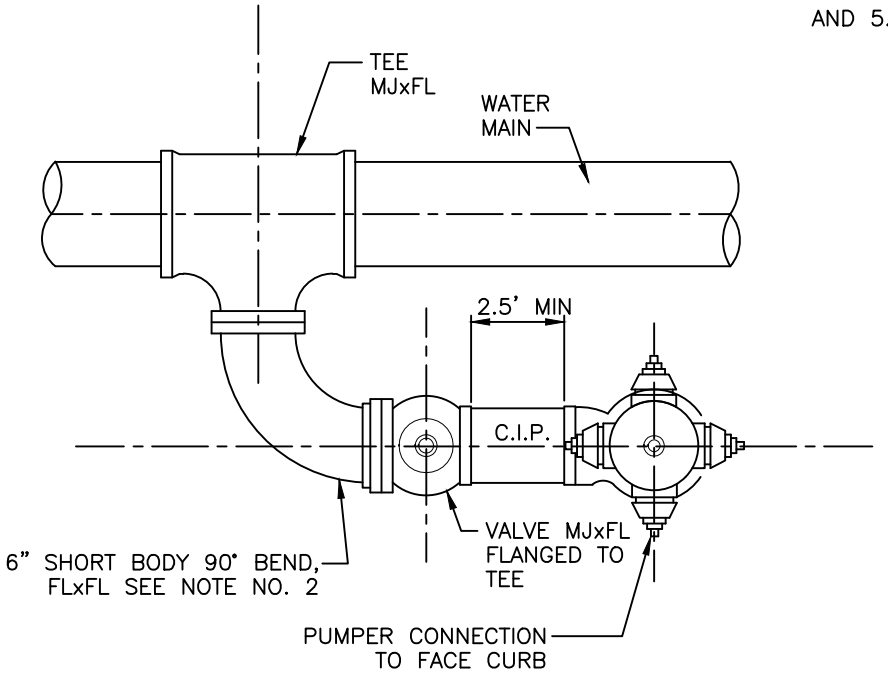
P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QW100h - Typical Plan and Profile Sheet.dwg Nov 06, 2013 3:05pm hpowell

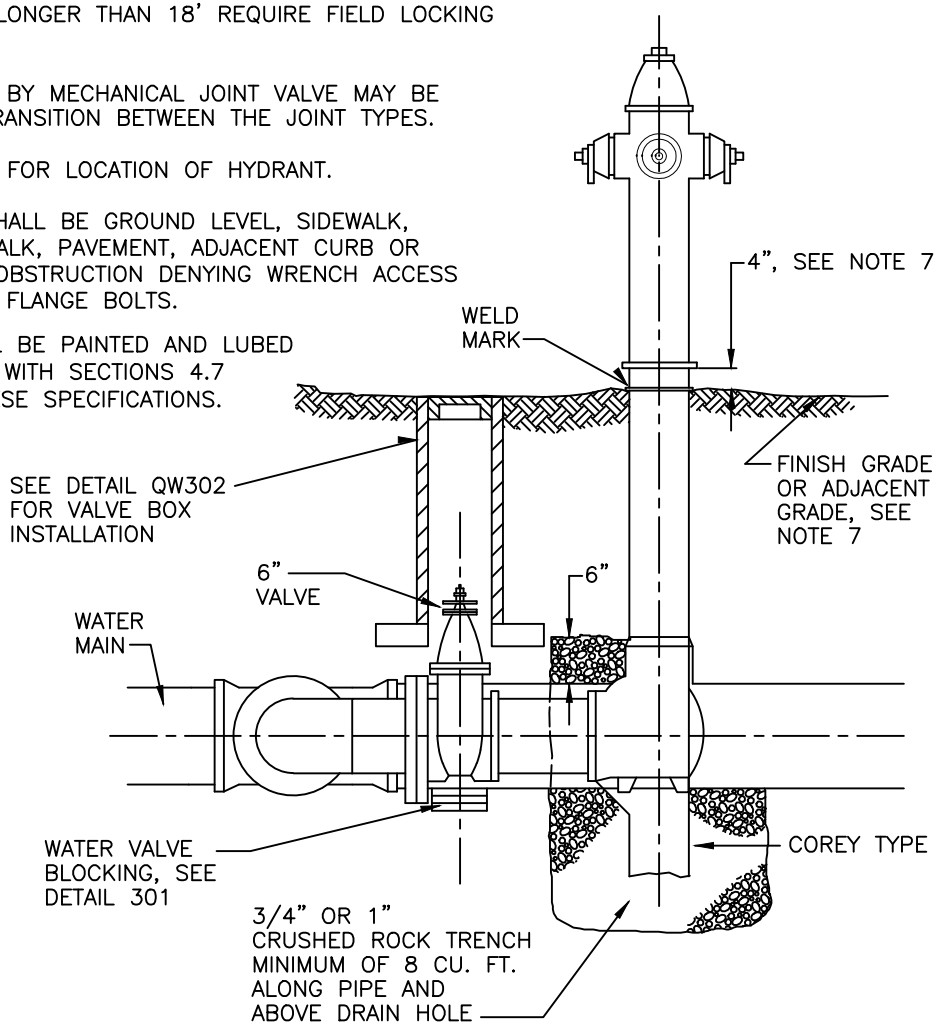
DETAIL NO.		STANDARD DETAIL	TYPICAL PLAN AND PROFILE SHEET	REVISED:	DETAIL NO.
QW100h	TOWN OF QUEEN CREEK ARIZONA			05/01/13 DATE	QW100h



NOTES:

1. FIRE HYDRANT RUNS SHALL BE DUCTILE IRON CLASS 350
2. JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE LOCKING GASKET TYPE.
3. 90° BEND NOT REQUIRED IF SUFFICIENT ROOM FOR PERPENDICULAR INSTALLATION.
4. HYDRANT RUNS LONGER THAN 18' REQUIRE FIELD LOCKING GASKETS
5. A FLANGE JOINT BY MECHANICAL JOINT VALVE MAY BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
6. SEE DETAIL 202 FOR LOCATION OF HYDRANT.
7. FINISH GRADE SHALL BE GROUND LEVEL, SIDEWALK, ADJACENT SIDEWALK, PAVEMENT, ADJACENT CURB OR OTHER NEARBY OBSTRUCTION DENYING WRENCH ACCESS TO THE BOTTOM FLANGE BOLTS.
8. HYDRANTS SHALL BE PAINTED AND LUBED IN ACCORDANCE WITH SECTIONS 4.7 AND 5.2 OF THESE SPECIFICATIONS.

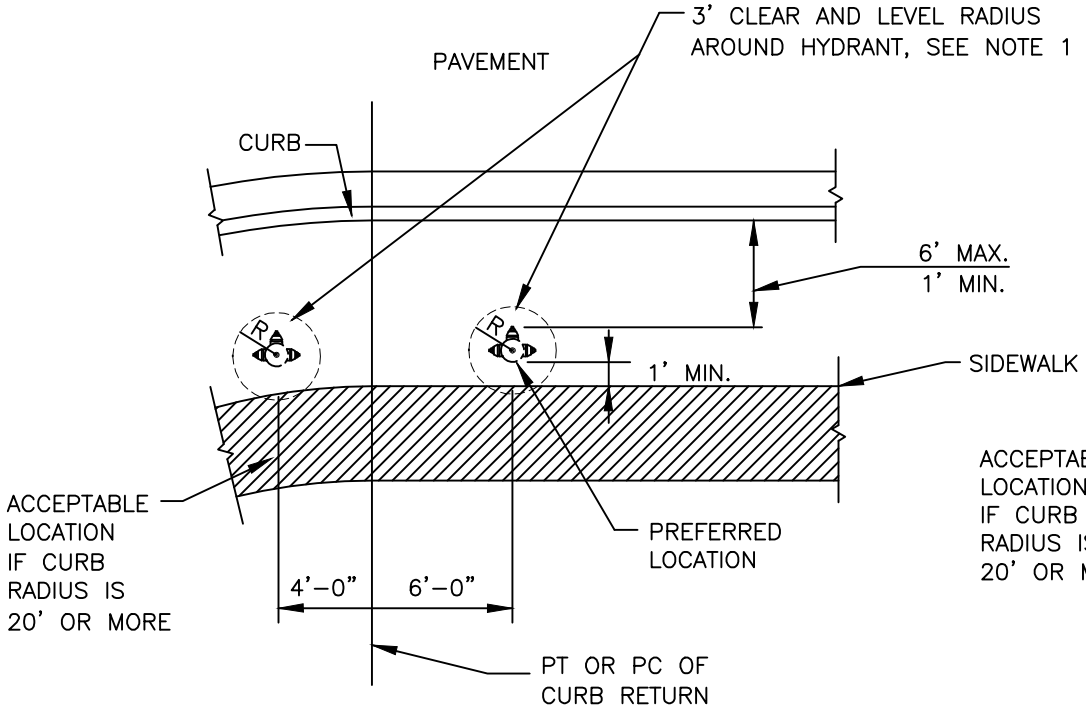




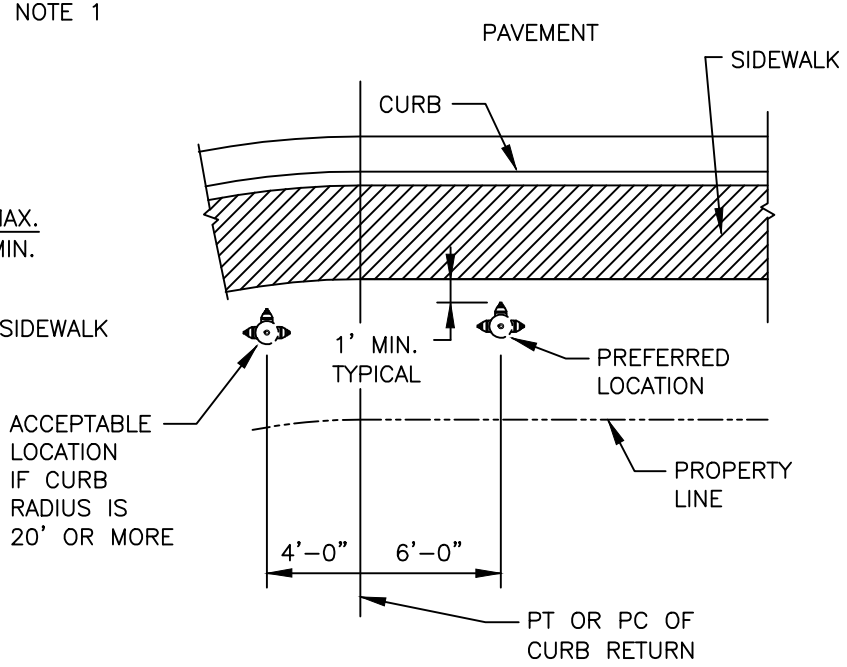
DETAIL NO.			REVISED:	DETAIL NO.
QW201	STANDARD DETAIL	FIRE HYDRANT INSTALLATION	03/12/13 DATE	QW201

NOTES:

1. OBSTRUCTIONS SUCH AS UTILITY POLES, STREET SIGNS, IRRIGATION BOXES, FENCES, ETC., SHALL NOT BE PLACED BETWEEN CURB AND HYDRANT AND WITHIN THE RADIUS FOR FIRE DEPT. ACCESS.
2. DIMENSIONS SHOWN ON CONSTRUCTION DRAWINGS SUPERSEDE LOCATIONS SHOWN HERE.
3. ON LOCATIONS IN MIDBLOCK, THE FIRE HYDRANT SHALL BE ALIGNED WITH A PROPERTY LINE.

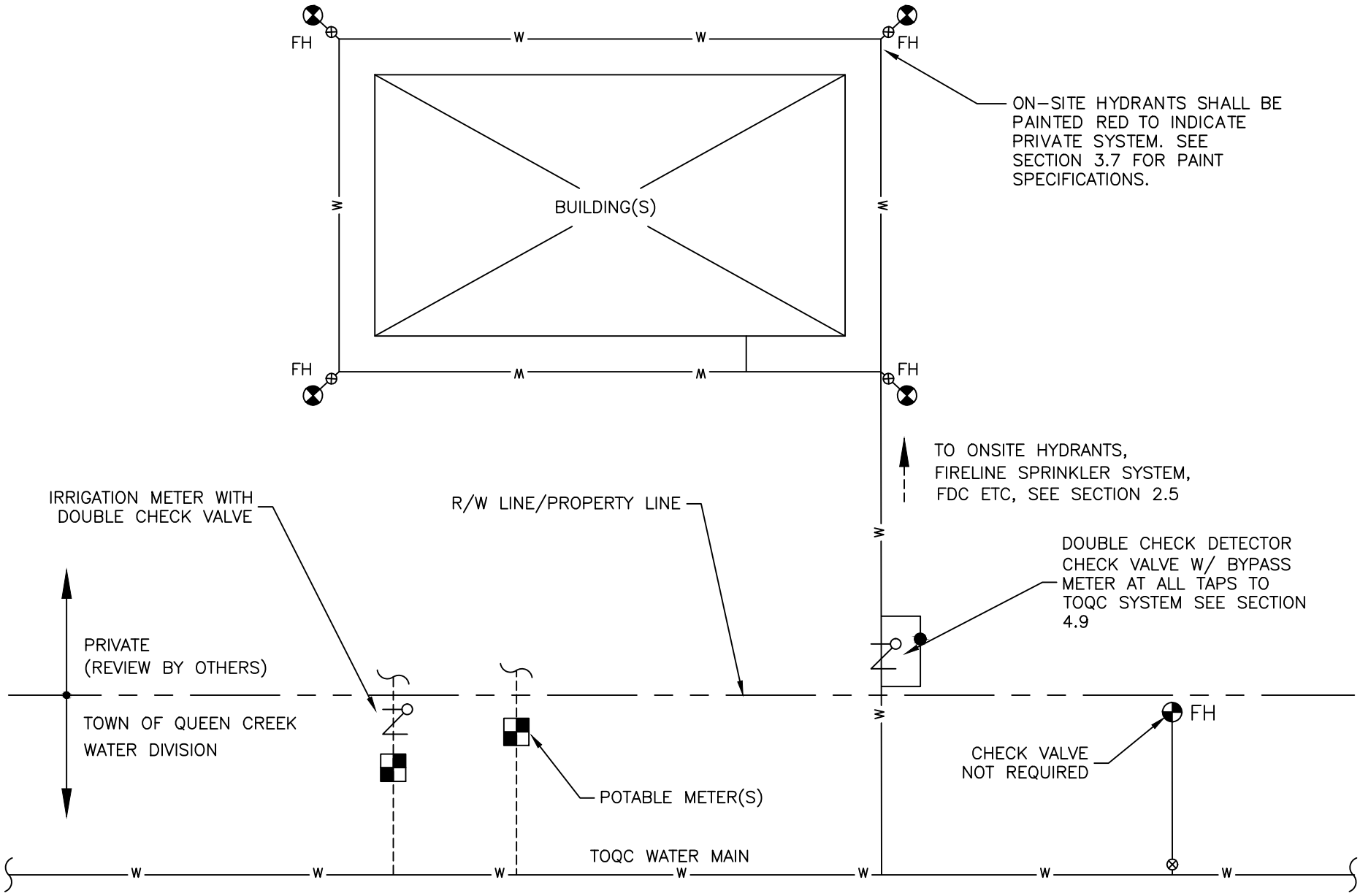


PARKWAY AREA WITH PLANTER OR NO SIDEWALK



AREA WITH SIDEWALK

DETAIL NO.			REVISED:	DETAIL NO.
QW202	STANDARD DETAIL	LOCATIONS FOR NEW FIRE HYDRANTS	12/02/11 DATE	QW202



DETAIL NO.			REVISED:	DETAIL NO.
QW203	STANDARD DETAIL	FIRE PROTECTION LAYOUT COMMERCIAL SITE SERVICE	12/02/11 DATE	QW203

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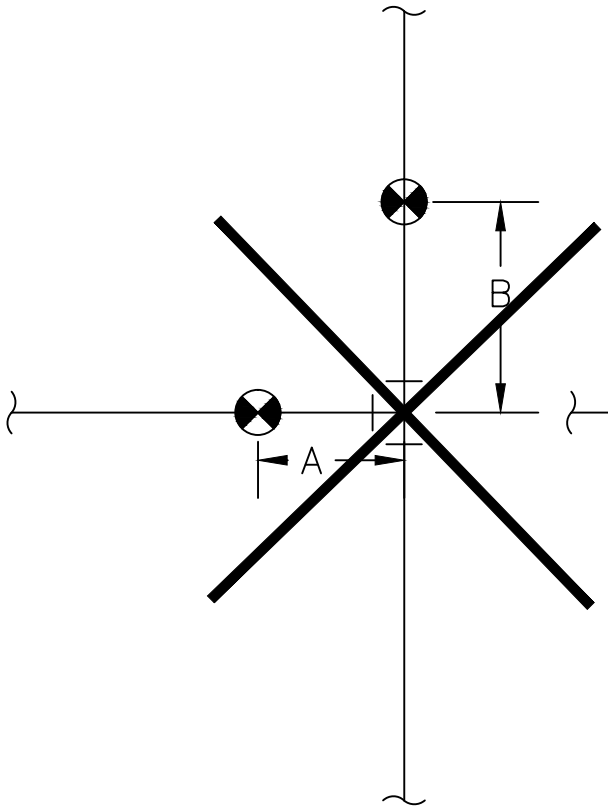
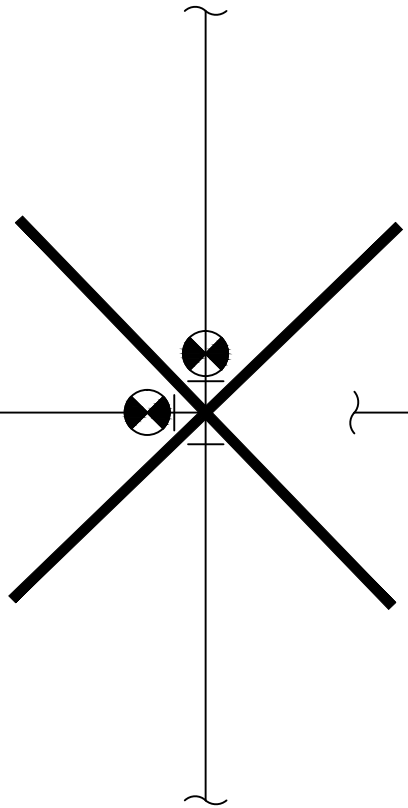
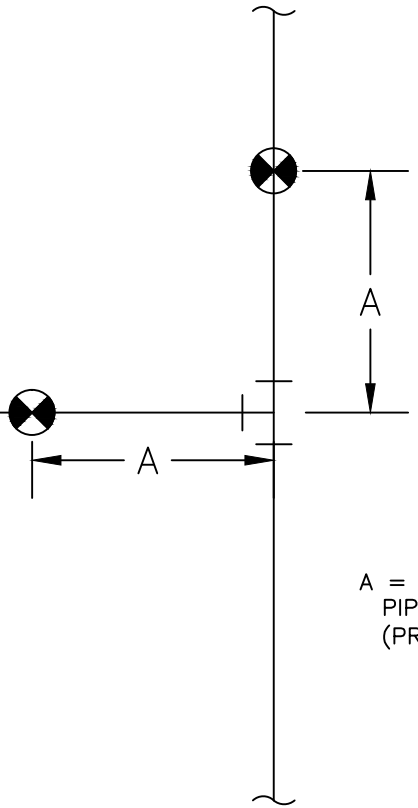


DIFFERENT OFFSETS – NOT PERMITTED



BOLTED TO TEE – ONLY PERMITTED IF APPROVED



A = 10' TO ONE PIPE LENGTH (PREFERRED)

EQUAL OFFSETS – PERMITTED

NOTES:

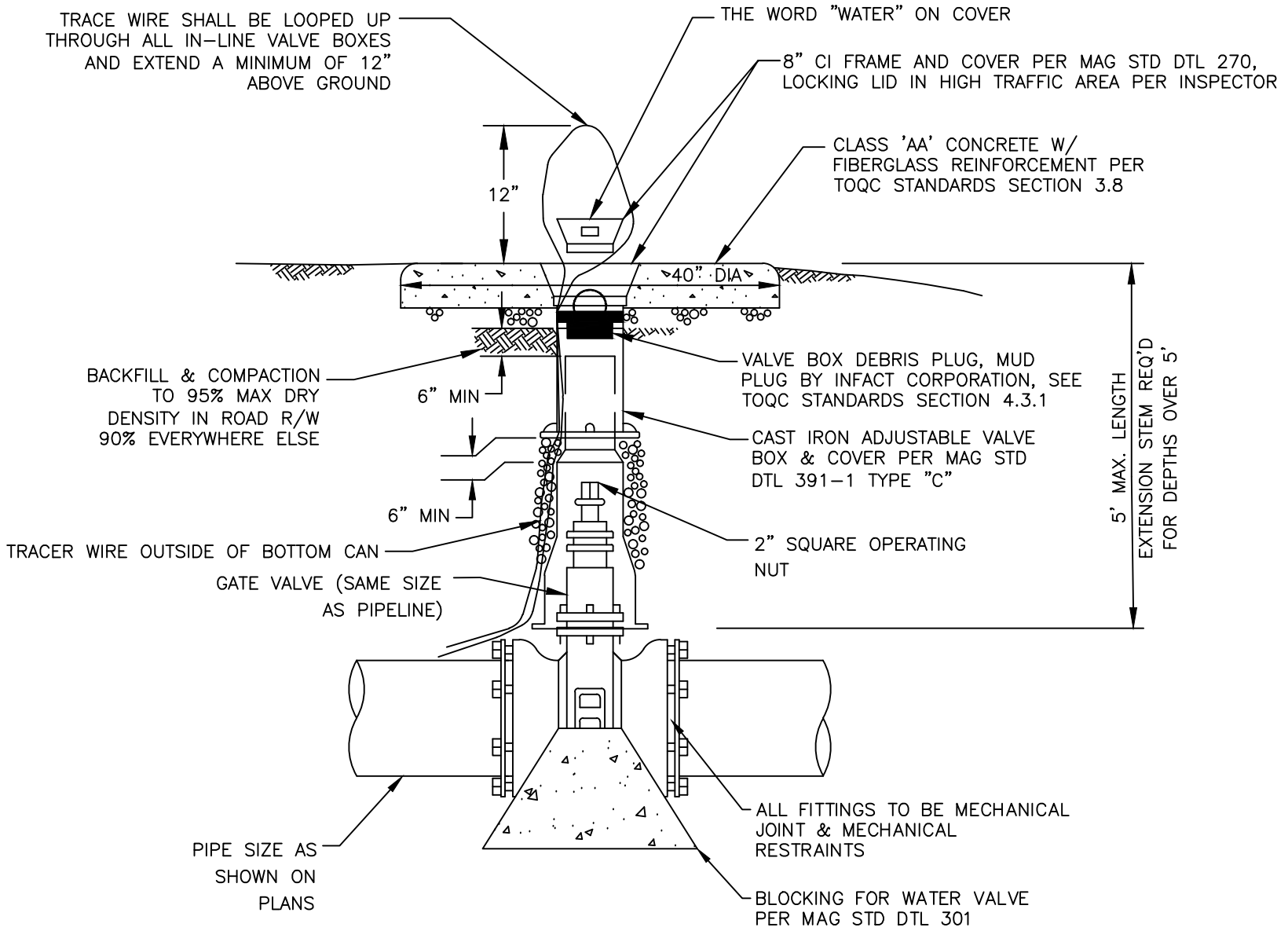
1. SPACE VALVES AN EQUAL DISTANCE FROM COMMON FITTING. PREFERRED DISTANCE IS 10'–18' DEPENDING ON SURFACE FEATURES (CURBS, VALLEY GUTTERS, ETC..).

2. UNEQUAL SPACING OF VALVES REQUIRES APPROVAL BY THE WATER DIVISION.

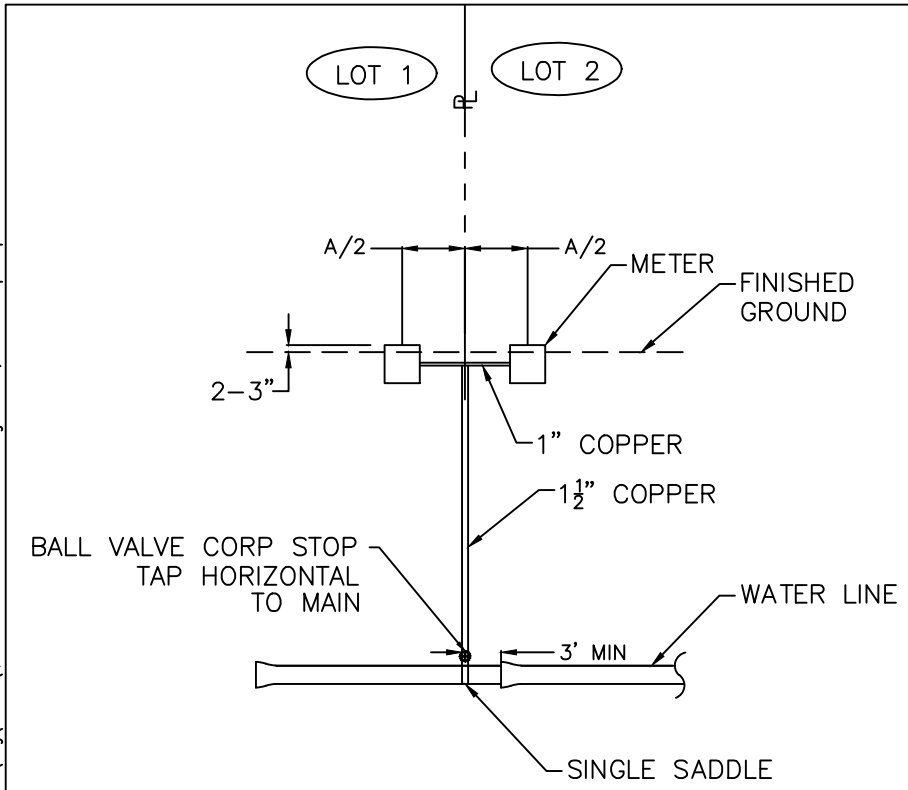
3. ALL JOINTS AT VALVES AND TEES SHALL BE RESTRAINED APPROVED JOINT RESTRAINTS USING "STAR–GRIP" OR MEG–A–LUG JOINT RESTRAINT

4. A FULL LENGTH OF PIPE SHALL EXTEND AWAY FROM EACH VALVE AND SHALL BE RESTRAINED AT THE VALVE.

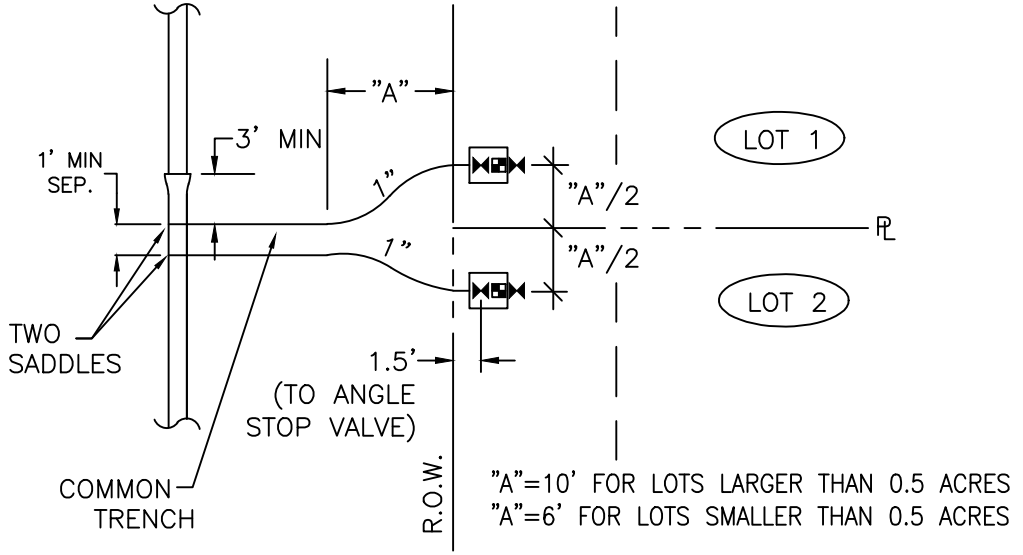
DETAIL NO.			REVISED:	DETAIL NO.
QW301	STANDARD DETAIL	VALVE SPACING DETAIL	12/02/11 DATE	QW301



DETAIL NO.			REVISED:	DETAIL NO.
QW302	STANDARD DETAIL	TYPICAL GATE VALVE	03/12/13 DATE	QW302



OPTION 1 – ELEVATION, WYE/SINGLE SADDLE



OPTION 2 – COMMON TRENCH

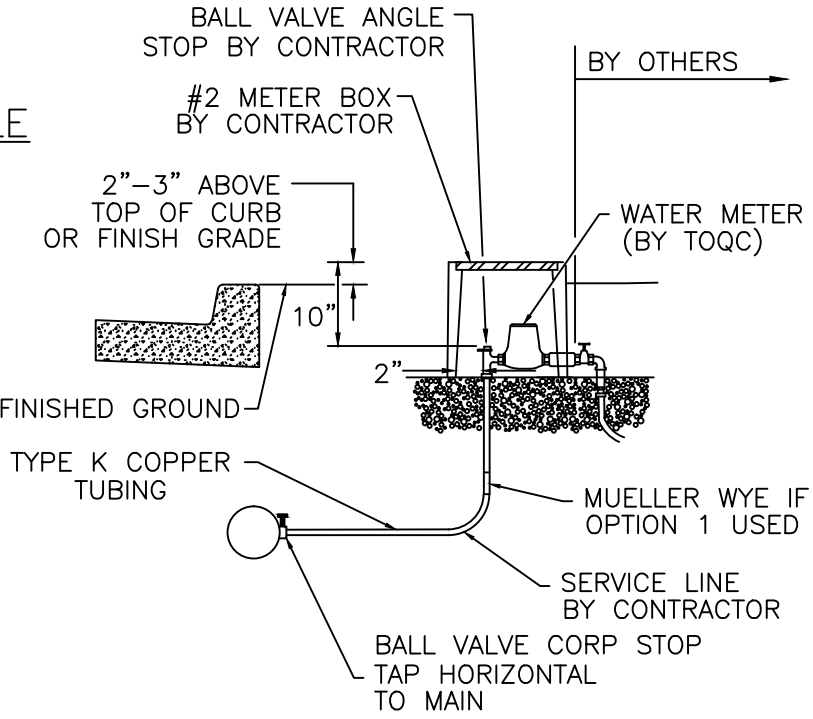
NOTES:

1. SERVICE TAPS SHALL BE A MINIMUM OF 3' FROM BELLS.

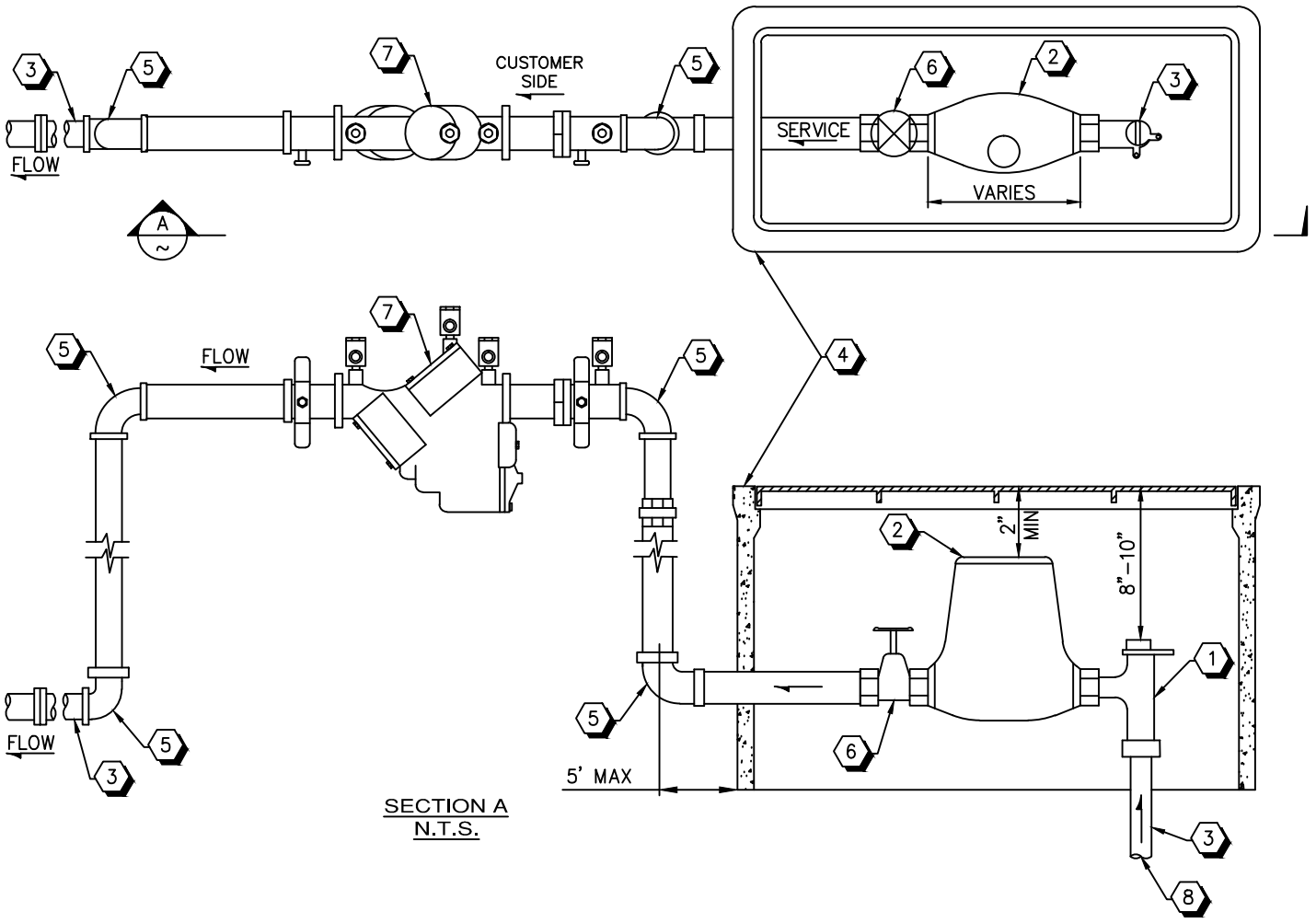
2. THERE SHALL BE AT LEAST 1' BETWEEN TAPS.

3. ALL METERS BEING RELOCATED SHALL REQUIRE A NEW COMPLETE SERVICE LINE FROM MAIN TO METER (NO EXTENSIONS OR COUPLINGS PERMITTED).

4. WHEN MAIN LINES ARE RELOCATED OR REPLACED FOLLOW NOTE 3.



DETAIL NO.		STANDARD DETAIL	3/4" THRU 2" WATER METER LOCATION	REVISED:	DETAIL NO.
QW403	TOWN OF QUEEN CREEK ARIZONA			11/06/13 DATE	QW403



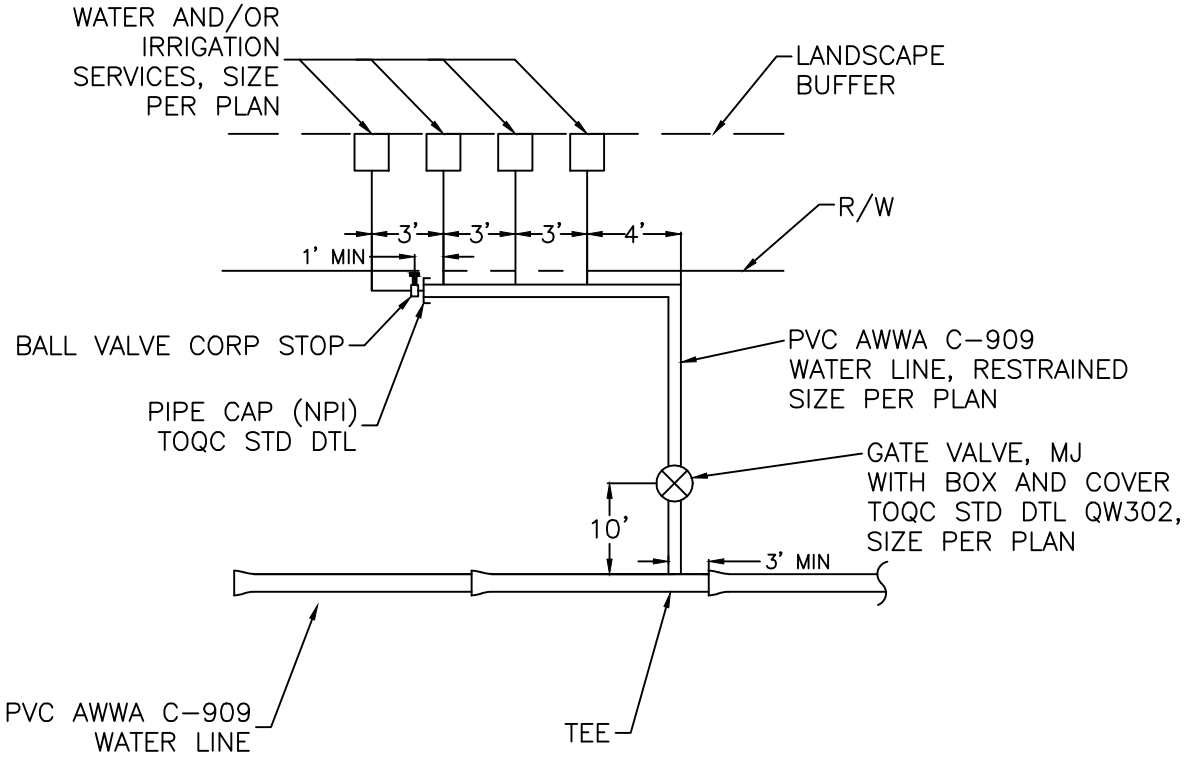
NOTES

1. TOP OF WATER METER SHALL BE A MINIMUM OF 2" BELOW UNDERSIDE OF COVER.
2. METERS SHALL NOT BE INSTALLED IN DRIVEWAYS OR IN A LOCATION INACCESSIBLE FOR MAINTENANCE.
3. ALL METERS SHALL BE SET BY THE TOQC WATER DIVISION.

LIST OF MATERIALS

1. ANGLE METER VALVE (LOCKING TYPE) SIZE TO MATCH SERVICE– TOQC SIDE OF INLET SERVICE LINE.
2. TOQC WILL PROVIDE AND INSTALL WATER METER. SEE NOTE 3 ABOVE.
3. TYPE K COPPER
4. METER BOX AND COVER PER DCSM TABLE 4.6.2
5. 2" COPPER 90° BEND SOLDERED
6. BALL VALVE
7. REDUCED PRESSURE BACKFLOW PREVENTION DEVICE PER TOQC STD DTL QW407
8. WATER SERVICE PER QW403–1

DETAIL NO.			REVISED:	DETAIL NO.
QW404	STANDARD DETAIL	2" & SMALLER WATER METERS	11/06/13 DATE	QW404

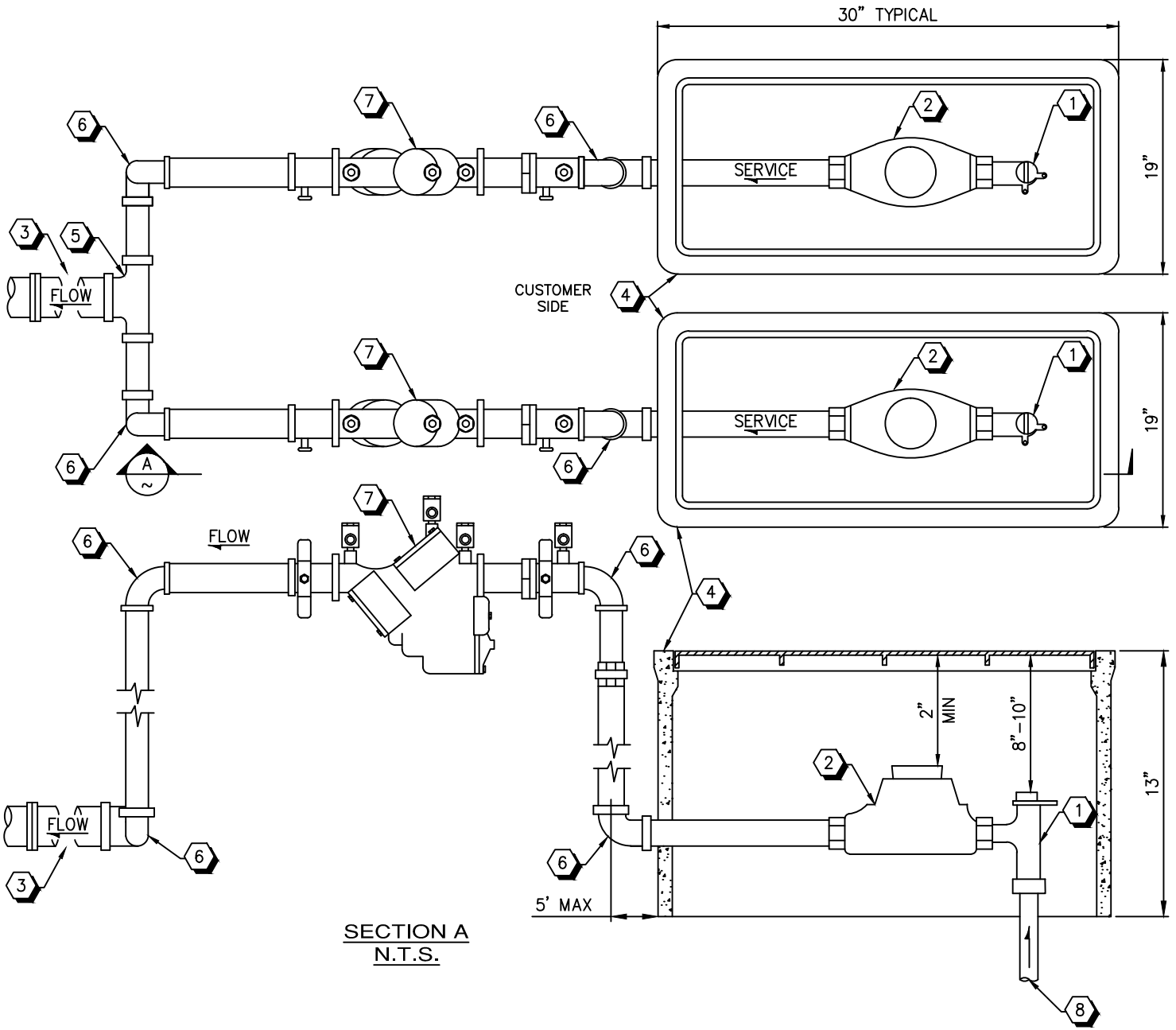


NOTES:

1. "CLUSTERED SERVICES" SHALL INCLUDE ANY LOCATION WITH 3 OR MORE WATER AND/OR IRRIGATION SERVICES IN THE IMMEDIATE VICINITY

2. WATER AND IRRIGATION SERVICES LONGER THAN 40 FEET SHALL BE POLYETHYLENE IN ACCORDANCE WITH TOQC REQUIREMENTS. SERVICES SHORTER THAN 40' SHALL BE TYPE K COPPER.

DETAIL NO.			REVISED:	DETAIL NO.
QW405	STANDARD DETAIL	MANIFOLD SERVICE	04/02/13 DATE	QW405



SECTION A
N.T.S.

NOTES

1. TOP OF WATER METER SHALL BE A MINIMUM OF 2" BELOW UNDERSIDE OF COVER.
2. METERS SHALL NOT BE INSTALLED IN DRIVEWAYS OR IN A LOCATION INACCESSIBLE FOR MAINTENANCE.
3. ALL METERS SHALL BE SET BY THE TOQC WATER DIVISION.

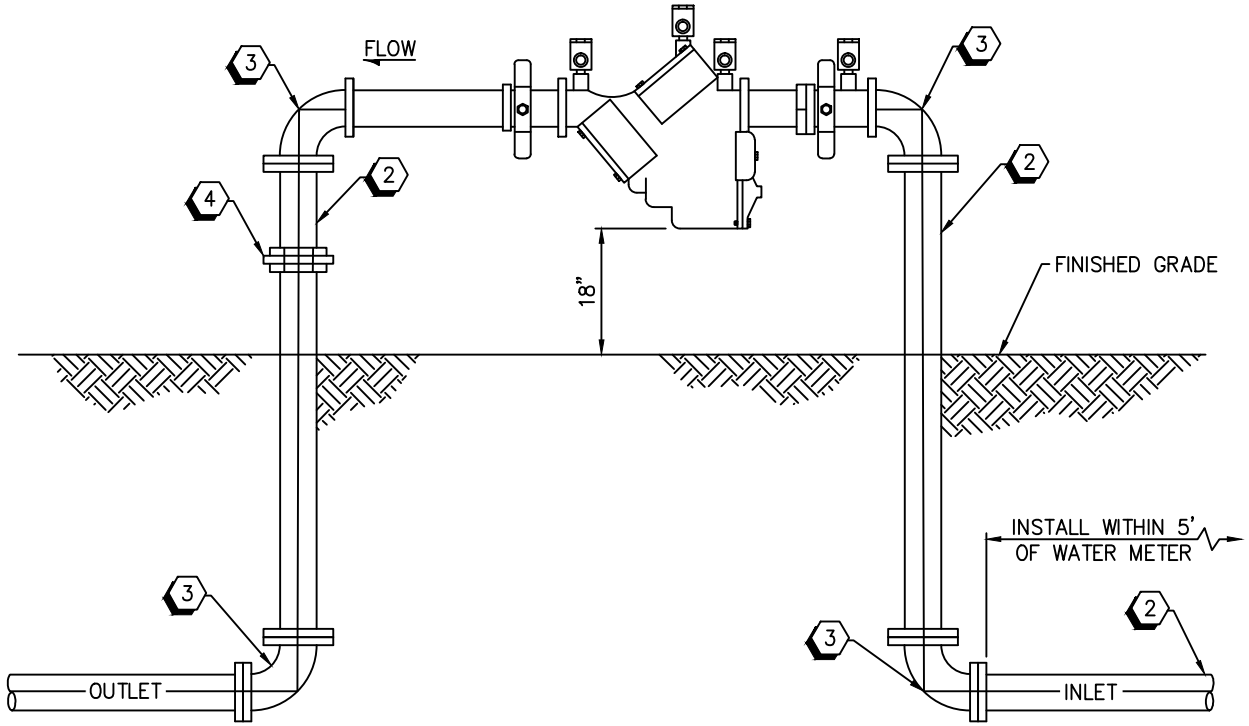
LIST OF MATERIALS

1. 2" ANGLE METER VALVE (LOCKING TYPE) – TOQC SIDE OF INLET SERVICE LINE
2. TOQC WILL PROVIDE AND INSTALL WATER METER. SEE NOTE 3 ABOVE.
3. 3" DIA. TYPE K COPPER WATER SERVICE PIPE
4. WATER METER BOX AND COVER #3 CONCRETE WITH BENT STEEL LID AND HOLE
5. 2"X3"X2" COPPER TEE SOLDERED
6. 2" COPPER 90° BEND SOLDERED
7. REDUCED PRESSURE BACKFLOW PREVENTION DEVICE PER TOQC STD DTL QW407
8. 2" WATER SERVICE PER QW403-1

DETAIL NO.			REVISED:	DETAIL NO.
QW406	STANDARD DETAIL	2" WATER METERS MANIFOLDED FOR 3" WATER SERVICE	11/06/13 DATE	QW406

LIST OF MATERIALS

1. APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY.
2. TYPE "L" COPPER PIPE 3/4" THRU 2"
3. 90° ELBOW COPPER 3/4" THRU 2"
4. PIPE UNION, BRASS OR COPPER

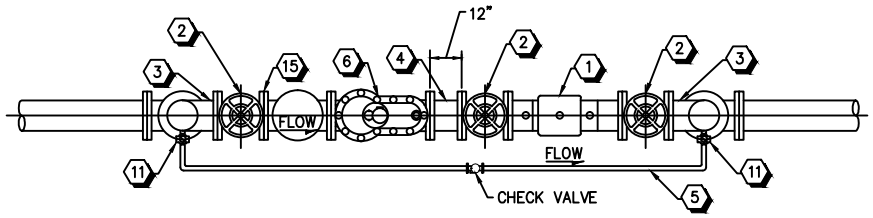


REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY

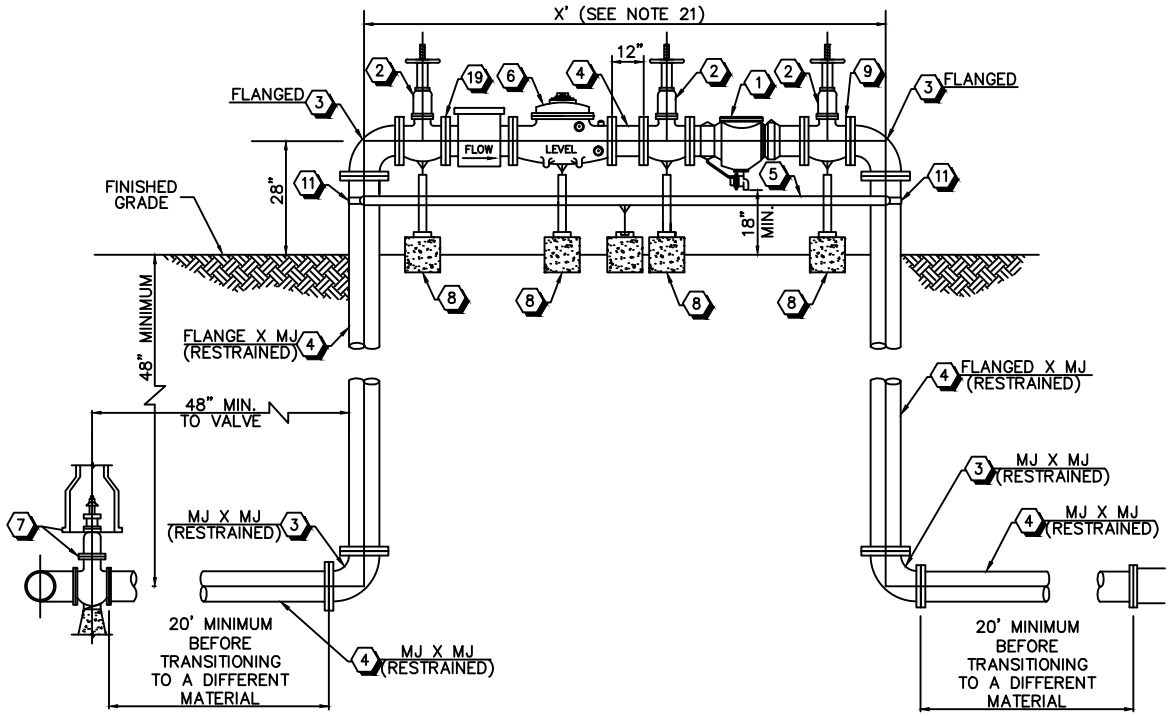
NOTES

1. THE BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED AND APPROVED BY A CERTIFIED TECHNICIAN DESIGNATED IN THE CURRENT TOQC LIST OF APPROVED INSPECTORS PRIOR TO THE REQUEST FOR FINAL INSPECTION.
2. ALL COPPER PIPE JOINTS SHALL BE SOLDERED. THE SOLDERED ALLOY SHALL COMPLY WITH ASTM B32 HAVING A SILVER CONTENT OF NOT LESS THAN 3.4% INTENDED FOR JOINING COPPER PIPES FOR POTABLE WATER SYSTEMS (GRADES SN 94, SN 95, OR SN 96). THE FLUX SHALL BE TYPE OA FOR GENERAL SOLDERING ON COPPER.
3. INSTALL BRASS PIPE PLUG IN EACH TESTCOCK ON THE ASSEMBLY.
4. FINISHED GRADE UNDER THE BLACKFLOW PREVENTER SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY.
5. PROVIDE 18–INCH MINIMUM CLEARANCE BETWEEN BACKFLOW PREVENTION ASSEMBLY AND PERMANENT STRUCTURES.
6. FOR OUTSIDE INSTALLATIONS, THE BACKFLOW PREVENTER AND COPPER PIPE SHALL BE PAINTED DARK GREEN (ALL EXCEPT THE NAME PLATE).
7. BACKFLOW ASSEMBLIES INSTALLED ON A CONCRETE PAD WILL HAVE THE COPPER PIPE WRAPPED OR SLEEVED WHERE IN PENETRATES THE CONCRETE.
8. SCREENING SHALL BE AS REQUIRED BY TOQC.

DETAIL NO.			REVISED:	DETAIL NO.
QW407	STANDARD DETAIL	BACKFLOW PREVENTION – FOR ASSEMBLIES 2" AND SMALLER	04/05/13 DATE	QW407



PLAN VIEW

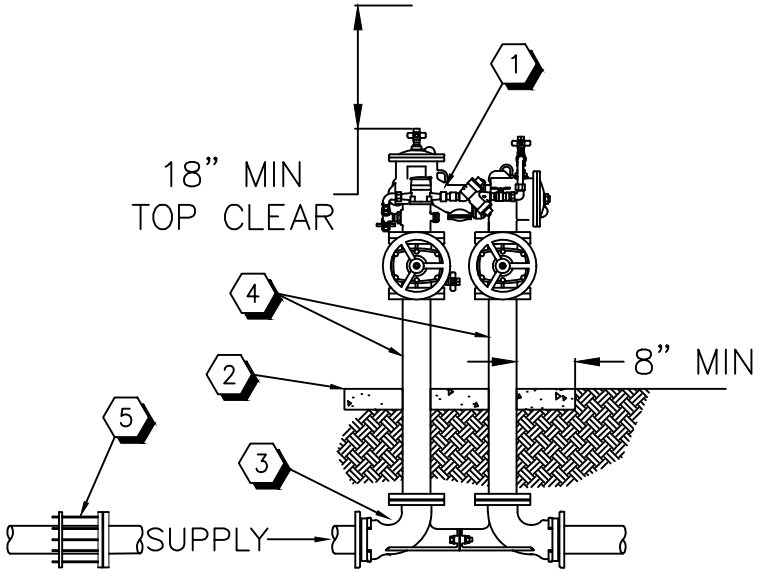


SECTION VIEW

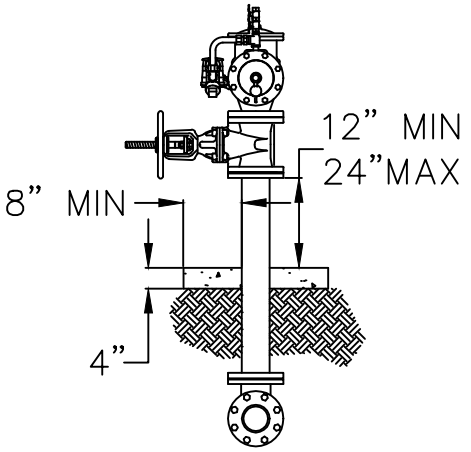
NOTES

1. REDUCED PRESSURE BACKFLOW PREVENTION DEVICE WITH FLANGE O.S. & Y. GATE VALVES (THE BACKFLOW PREVENTION DEVICE AND ONE OF THE GATE VALVES CAN BE ELIMINATED FROM THIS DETAIL IF A TOQC APPROVED BFP DEVICE HAS ALREADY BEEN INSTALLED DOWNSTREAM OF THE METER ASSEMBLY). CONTACT TOQC WATER DIVISION FOR LATEST LIST OF APPROVED BACKFLOW PREVENTERS OR CERTIFIED TESTERS. THE BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED AND APPROVED BY A CERTIFIED TECHNICIAN DESIGNATED IN THE CURRENT TOQC LIST OF APPROVED INSPECTORS PRIOR TO THE REQUEST FOR FINAL INSPECTION.
2. O.S. & Y. RISING STEM GATE VALVE, FLANGED, WITH HAND WHEEL OPENING LEFT. FOR LIST OF APPROVED VALVES SEE TOQC DCSM SECTION 4.3.
3. CIP ELBOW (FLANGED OR MJ X MJ, AS NOTED).
4. DIP SPOOL.
5. 2" COPPER BYPASS.
6. METERS SHALL BE PURCHASED FROM THE TOQC. METERS MAY NOT BE IN STOCK; DELIVERY TIME UP TO 8 WEEKS. INQUIRE ABOUT LEAD TIMES AT WATER DIVISION.
7. GATE VALVE, VALVE BOX, AND COVER PER TOQC DCSM SECTION 4.3 REQUIRED WHERE A SINGLE, DEDICATED VALVE FOR METER SET DOES NOT ALREADY EXIST.
8. ADJUSTABLE METAL PIPE SUPPORTS (POWDER COATED UNLESS OTHERWISE NOTED) ON 6" X 6" X 6" CONCRETE BASE, FIVE REQUIRED: ONE UNDER EACH METER AND VALVE AND ONE UNDER CENTER OF BY-PASS LINE.
9. ALL FITTINGS ABOVE GROUND SHALL BE FLANGED FITTINGS. ALL FLANGE BOLTS, NUTS, AND STUDS IN ALL ABOVE GROUND FLANGES TO BE 316 STAINLESS STEEL, LUBRICATED WITH FOOD GRADE ANTI-SEIZE COMPOUND.
10. ALL ABOVE-GROUND COMPONENTS SHALL BE PAINTED LIGHT TAN. DO NOT PAINT NAME PLATES, VALVE STEMS, METER DIALS, ELECTRONIC COMPONENTS, OR BACKFLOW TEST PLUGS.
11. DOUBLE STRAP BRONZE SADDLE, 2" x CLOSE BRASS NIPPLE, 2" LOCKING CURB STOP. DRILL FULL 2" HOLE UNDER SADDLE.
12. INSTALL BRASS PIPE PLUG IN EACH TESTCOCK ON THE ASSEMBLY.
13. ALL METER ASSEMBLIES SHALL BE PROTECTED BY GUARD POSTS PER MAG STD DTL 140
14. FINISHED GRADE UNDER THE METER ASSEMBLY SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY. SURFACE UNDER METER ASSEMBLY SHALL BE LEVEL AND FREE FROM TRIP HAZARDS.
15. THE COMPOUND METER IS DESIGNED TO REGISTER LOW FLOWS AND HIGH FLOWS SEPARATELY AND TOTALED TOGETHER TO REFLECT CONSUMPTION. SINGLE-JET METERS USE ONE MEASURING ELEMENT AND REGISTER.
16. SOME TYPICAL APPLICATIONS FOR THE METERS SHOWN ON THIS DETAIL INCLUDE HOTELS, MOTELS, INSTITUTIONS, FACTORIES, SCHOOLS, APARTMENT HOUSES, OFFICE BUILDINGS, ETC. WHERE THEIR FIRE PROTECTION IS PROVIDED BY A SEPARATE FACILITY SUCH AS FIRE LINE DETECTORS OR DIRECT FIRE LINE TO THE PROPERTY BEING SERVED.
17. TYPE K COPPER (HARD) MAY BE SUBSTITUTED FOR CIP FITTINGS AND DIP PIPE SIZES UP TO 4". ALL COPPER PIPE JOINTS SHALL BE SOLDERED. THE SOLDER ALLOY SHALL COMPLY WITH ASTM B 32 HAVING A SILVER CONTENT OF NOT LESS THAN 3.4% INTENDED FOR JOINING COPPER PIPES FOR POTABLE WATER SYSTEMS (GRADES SN 94, SN 95, OR SN 96). THE FLUX SHALL BE TYPE OA FOR GENERAL SOLDERING ON COPPER.
18. PROVIDE 24-INCH MINIMUM CLEARANCE BETWEEN BACKFLOW PREVENTION ASSEMBLY AND PERMANENT STRUCTURES.
19. METER IS TOQC OWNED WHILE BACKFLOW ASSEMBLY IS PRIVATELY OWNED.
20. CONTRACTOR SHALL PROVIDE AND INSTALL A 1" FLANGE SPACER BETWEEN THE GATE VALVE AND THE STRAINER ON THE WATER METER FOR 4" METER SIZE ONLY.
21. DISTANCE UPSTREAM & DOWNSTREAM TO BE DETERMINED BY METER MANUFACTURER SPECIFICATIONS.

DETAIL NO.			REVISED:	DETAIL NO.
QW408	STANDARD DETAIL	ABOVE GROUND WATER METERS 3" AND LARGER	04/30/13 DATE	QW408



FRONT VIEW

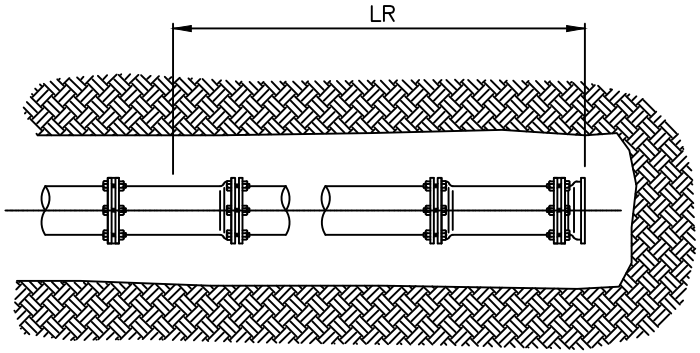


SIDE VIEW

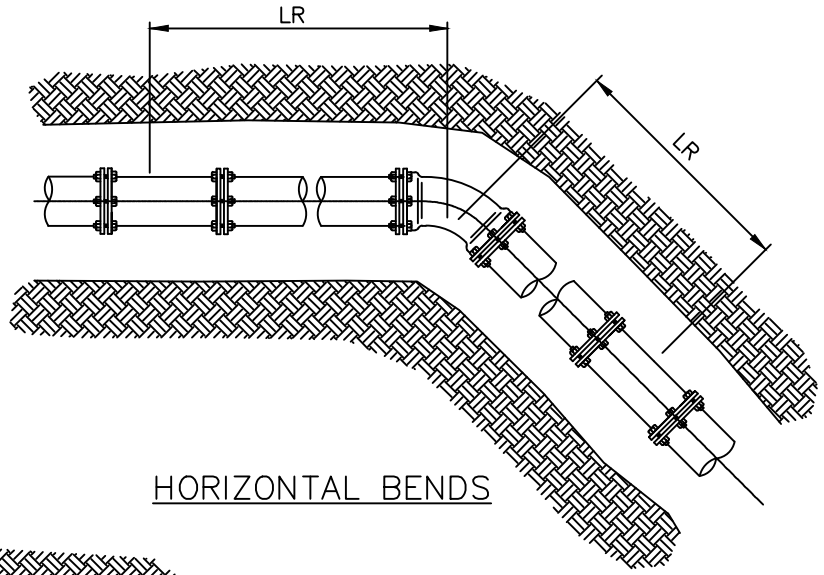
NOTES:

1. DOUBLE CHECK DETECTOR ASSEMBLY WITH BY-PASS METER PER TOQC STANDARDS SECTION 4.9
2. CLASS "B" CONCRETE PER MAG STD SPEC 725
3. 90° ELL (FLANGED DIP)
4. PIPE SPOOL (FLANGED DIP)
5. FLANGED ADAPTER (WHEN NEEDED)

DETAIL NO.			REVISED:	DETAIL NO.
QW409	STANDARD DETAIL	DOUBLE CHECK DETECTOR ASSEMBLY W/ BYPASS METER-PRIVATE FIRE LINE	04/09/13 DATE	QW409

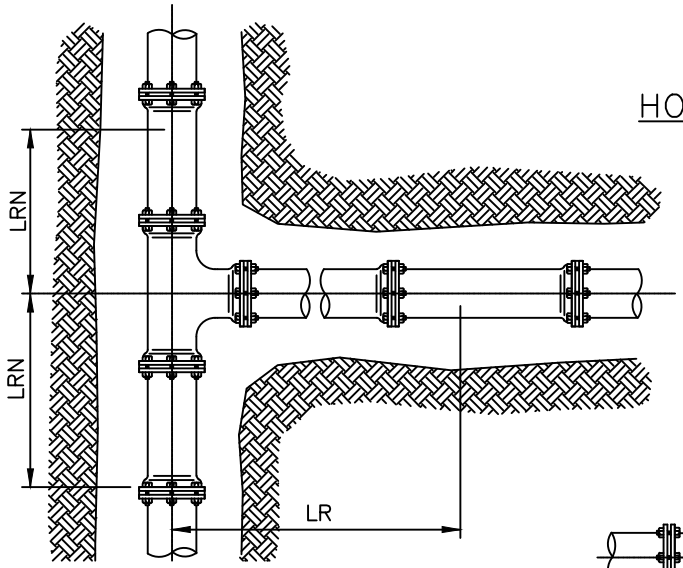


DEAD ENDS

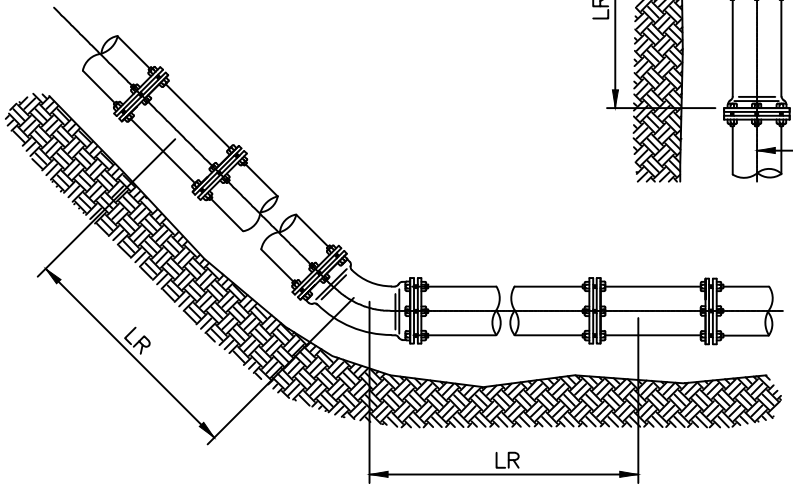


HORIZONTAL BENDS

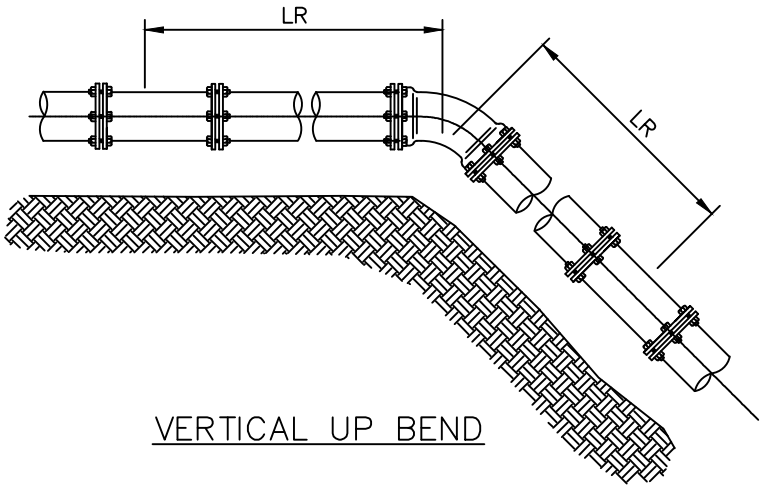
LRN = SHORTEST LENGTH OF PIPE RESTRAINED TO THE RUN OF THE TEE FITTING (BOTH SIDES OF TEE).



TEES



VERTICAL DOWN BENDS



VERTICAL UP BEND

DETAIL NO.			REVISED:	DETAIL NO.
QW502-1	STANDARD DETAIL	JOINT RESTRAINT FOR DIP	04/30/13 DATE	QW502-1

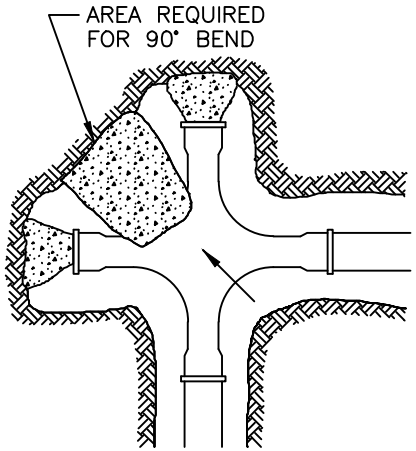
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE (D.I.P.)												
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
	90°	45°	22-1/2°	LRN=0'	LRN=10'	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	18	7	4	30	8	31	18	13	7	6	3	31
6	25	10	5	43	20	44	25	18	10	9	5	44
8	32	13	6	56	34	58	32	24	13	11	6	58
10	38	16	8	68	45	69	38	29	16	14	8	69
12	45	19	9	80	57	81	45	34	19	16	9	81
14	51	21	10	91	68	92	51	38	21	18	10	92
16	57	24	11	103	79	104	57	43	24	21	11	104
18	62	26	12	113	90	115	62	48	26	23	12	115
20	68	28	14	125	100	126	68	52	28	25	14	126
24	79	33	16	145	121	147	79	61	33	29	16	147

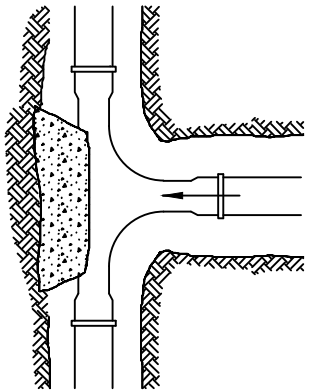
NOTES:

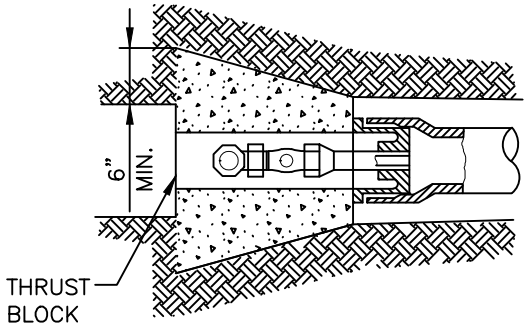
1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR SHALL BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

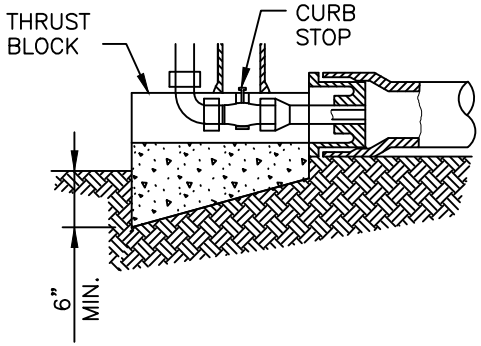
DETAIL NO.			REVISED:	DETAIL NO.
QW502-2	STANDARD DETAIL	JOINT RESTRAINT FOR DIP	04/30/13 DATE	QW502-2

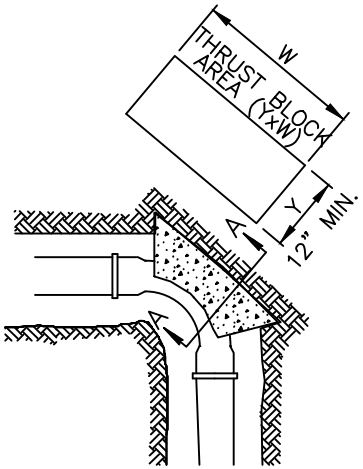
TYPICAL LOCATIONS OF THRUST BLOCKS

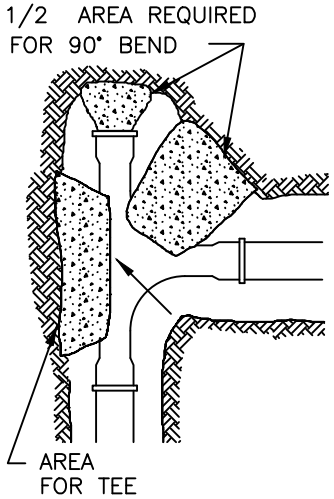


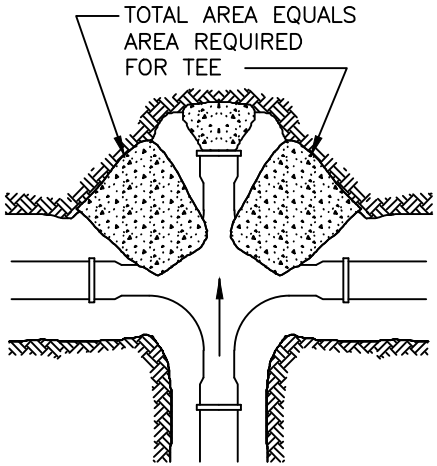


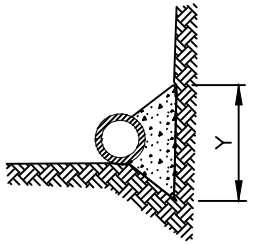












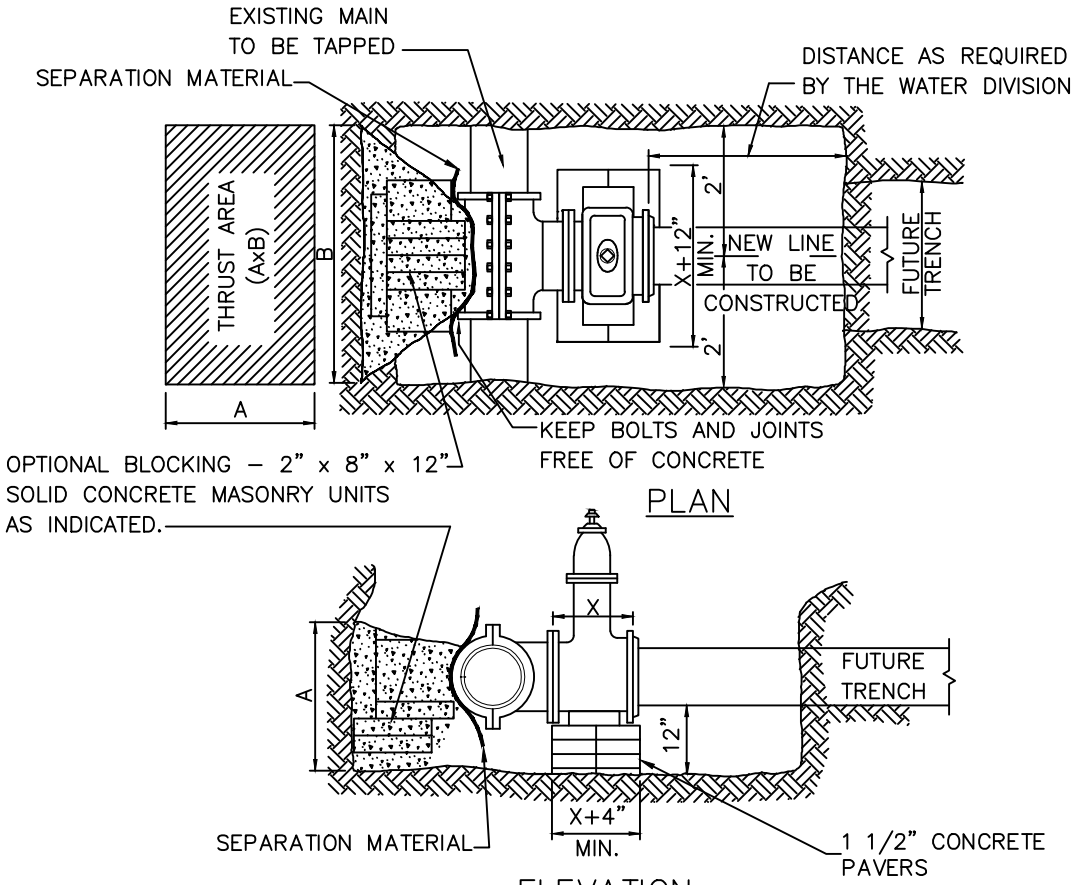
SECTION A–A

NOTES:

1. TABLE IS BASED ON 200 PSI TEST PRESSURE AND 3,000 LBS/SQ FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPES LARGER THAN 16" SHALL BE CALCULATED FOR EACH PROJECT.
3. FORM ALL NON–BEARING VERTICAL SURFACES.
4. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND. CONCRETE TO BE CLASS 'C', MAG SPEC 725.

MINIMUM THRUST BLOCK AREA REQUIRED (YxW) (SQ. FT.)		
PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° & 22 1/2° BENDS
4" OR LESS	3	3
6"	4	3
8"	6	3
10"	10	5
12"	14	7
16"	24	12

DETAIL NO.			REVISED:	DETAIL NO.
QW503	STANDARD DETAIL	THRUST BLOCKS FOR WATER LINES	12/02/11 DATE	QW503

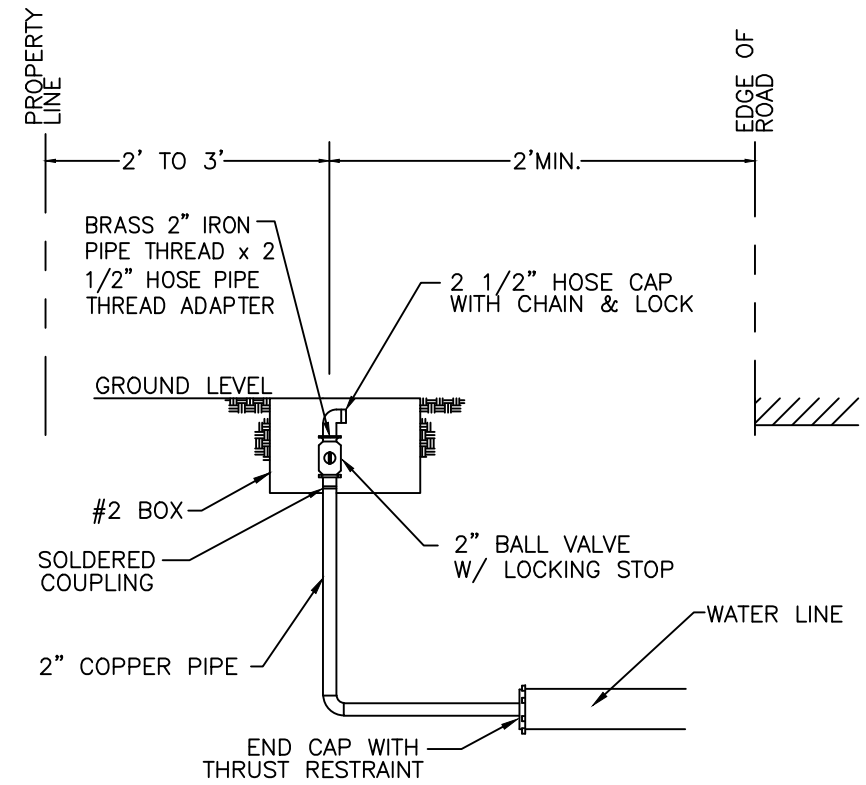


SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (AxB) (SQUARE FEET)
4" AND LESS	3
6"	4
8"	6
10"	9
12"	13
16"	23

NOTES:

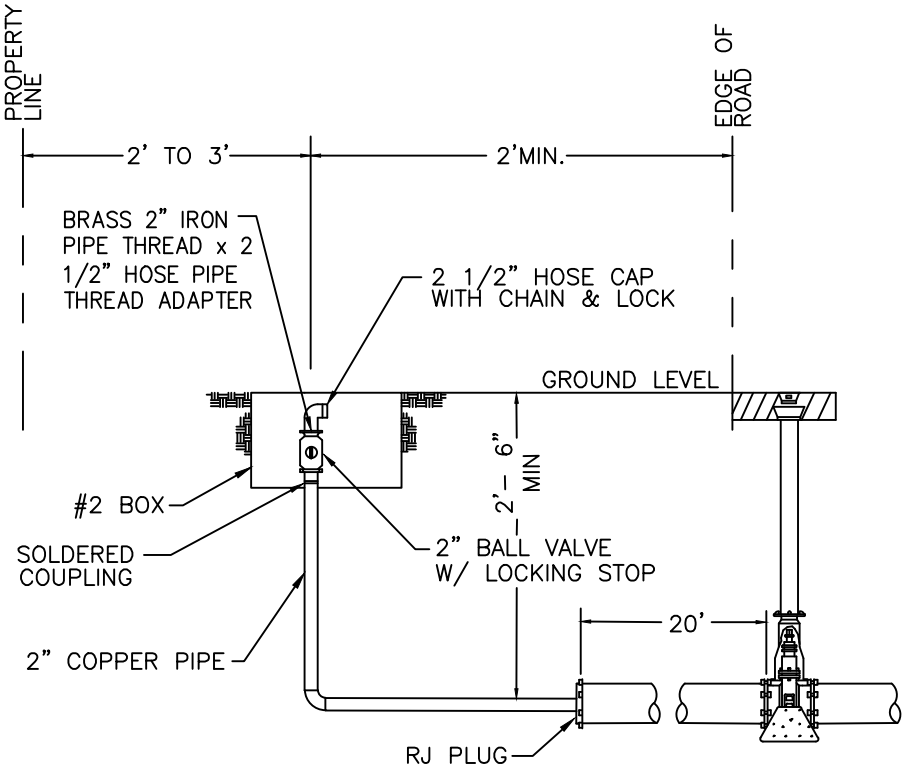
1. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 5' FROM ANY BELL COUPLING, VALVE, FITTING OR OTHER OBSTRUCTION
2. CONTRACTOR SHALL EXCAVATE AS SHOWN AND SHALL SET TAPPING SLEEVE AND VALVE AND TIGHTEN ALL BOLTS PRIOR TO THE PRESSURE TEST.
3. ALL TAPPING SLEEVES AND VALVES SHALL BE PRESSURE TESTED PRIOR TO BLOCKING OR TAPPING. THE TEST SHALL BE WITNESSED AND APPROVED BY THE INSPECTOR.
4. BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND AND BE INSTALLED BEFORE THE TAP IS MADE. ALL FLANGE BOLTS SHALL BE FREE AND CLEAR OF CONCRETE.
5. CONCRETE THRUST BLOCKS SHALL BE CLASS 'B' PER MAG SPEC 725. NORMALLY, CURE TIME FOR CONCRETE IS 24 HOURS BEFORE BACKFILLING.
6. TAPS SHALL BE MADE BY WATER DIVISION CREWS AT PREVAILING RATES OR BY APPROVED CONTRACTORS WHEN ALLOWED BY WATER DIVISION.
7. THIS DETAIL COVERS TAPPING SLEEVES 4" THROUGH 16" IN SIZE ON DUCTILE IRON, CAST IRON AND ASBESTOS CEMENT PIPE. ANY OTHER SIZE OR TYPE OF PIPE SHALL REQUIRE A SEPARATE SUBMITTAL AND APPROVAL BY THE ENGINEER.
8. NO CASCADE VARIABLE SLEEVES ARE ALLOWED

DETAIL NO.			REVISED:	DETAIL NO.
QW601	STANDARD DETAIL	TAPPING SLEEVE AND VALVE INSTALLATION	12/02/11 DATE	QW601



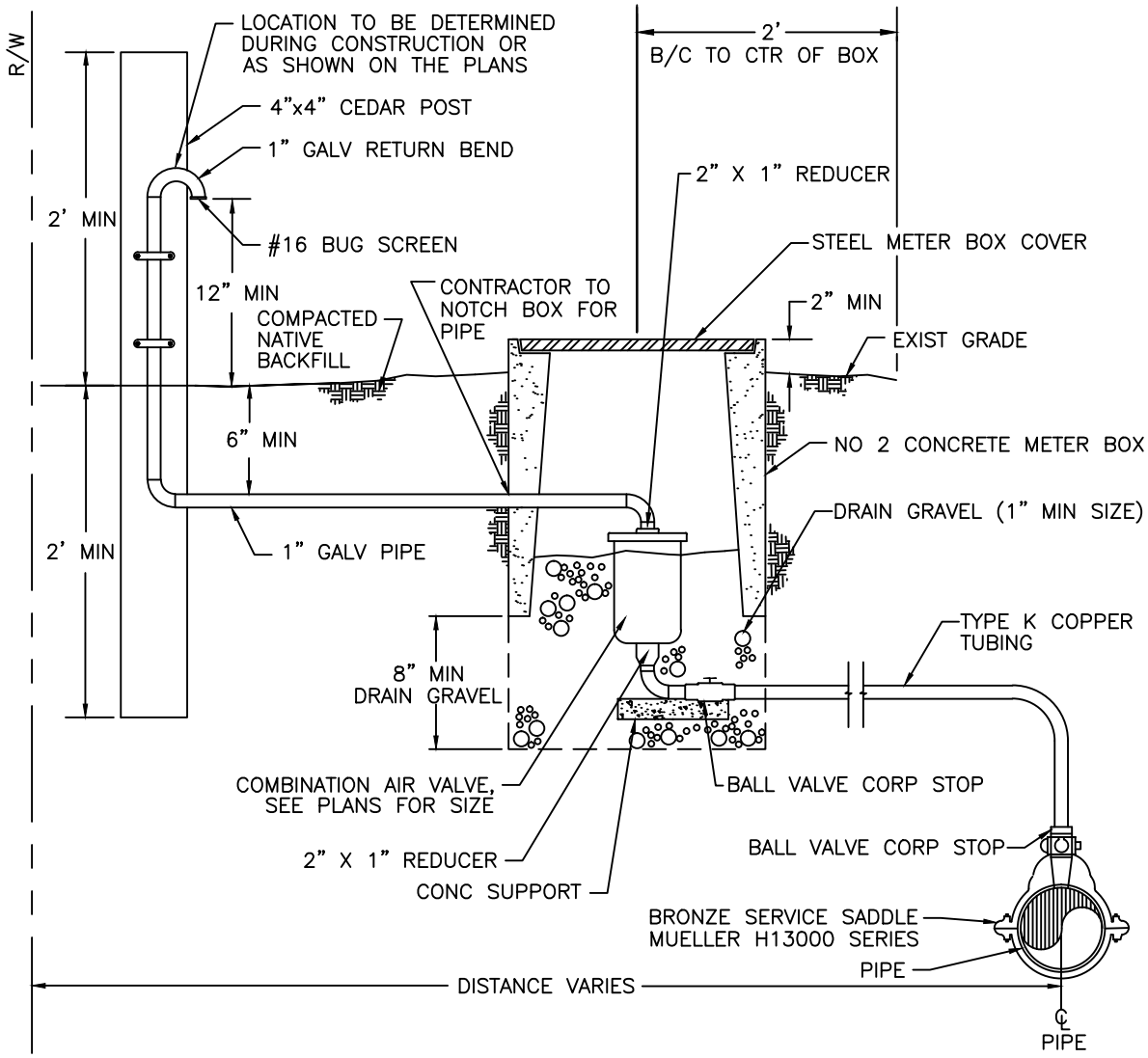
NOTE: THE CONTRACTOR SHALL INSTALL METER BOX A MINIMUM OF 2' FROM THE EDGE OF THE ROADWAY.

TYPE A BLOW-OFF ASSEMBLY FOR PERMANENT DEAD-END LINES

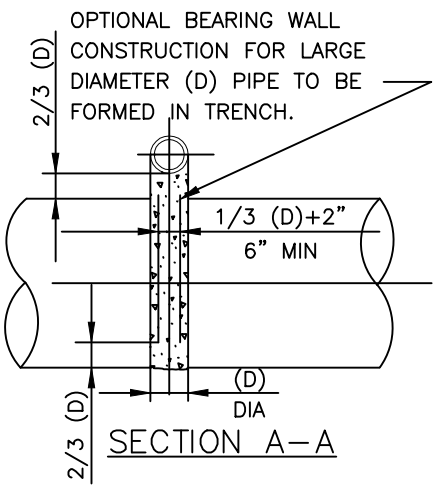


TYPE B BLOW-OFF ASSEMBLY FOR TEMPORARY DEAD-END LINES

DETAIL NO.			REVISED:	DETAIL NO.
QW602	STANDARD DETAIL	BLOW-OFF ASSEMBLY	12/02/11 DATE	QW602

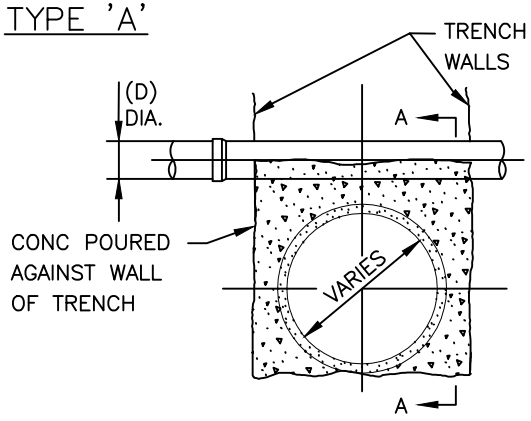


DETAIL NO.			REVISED:	DETAIL NO.
QW603	STANDARD DETAIL	AIR AND VACUUM RELEASE VALVE	04/02/13 DATE	QW603

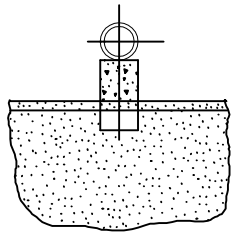


SECTION A–A

TYPE 'A'

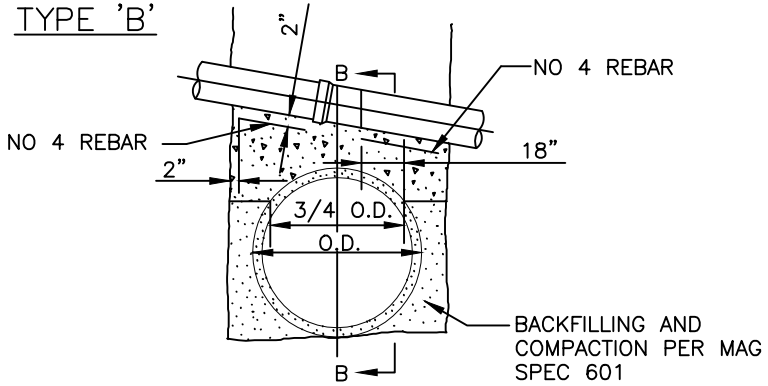


PIPE CONDUIT



SECTION B–B

TYPE 'B'



PIPE CONDUIT

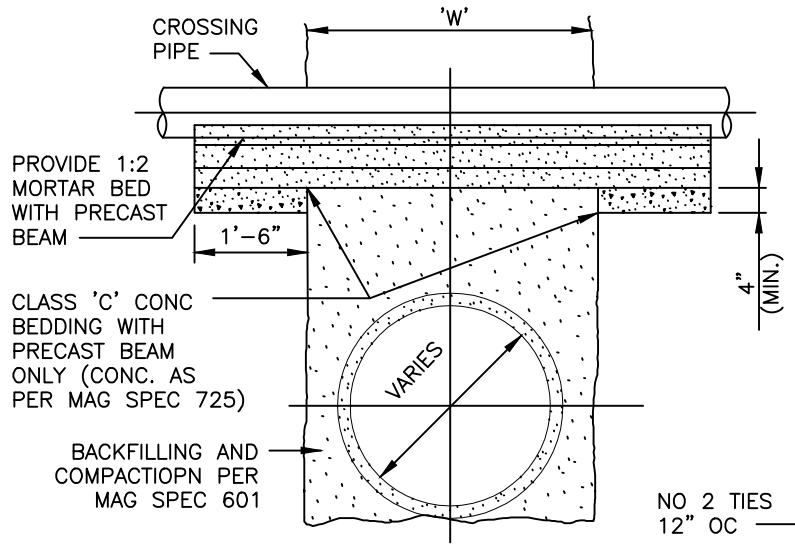
SCHEDULE OF REQUIRED SUPPORTS	
PERMANENT	TEMPORARY
SEWER LINES OTHER UTILITIES AS NOTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER AT TIME OF CONSTRUCTION.	CAST IRON PIPE CONC IRRIG PIPE BURIED TELCO GAS PIPES CONC STORM DRAIN CONC BOX CULVERT TRAFFIC CONTROL CONDUIT WATER & SEWER LINES

NOTES:

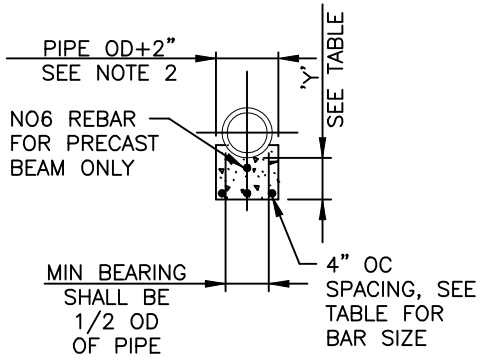
1. TYPE 'A' PIPE SUPPORT MAY BE USED FOR ANY TYPE CROSSING CONDITION.
2. TYPE 'C' PIPE SUPPORT MAY BE USED FOR CROSSING PIPES WITH A BELL DIAMETER OF 18" OR LESS IF SUFFICIENT CLEARANCE OVER STORM SEWER IS AVAILABLE AND TOTAL SPAN IS LESS THAN 34'
3. INTERMEDIATE PIPE SUPPORT SHALL BE USED IN CONJUNCTION WITH TYPE 'C' PIPE SUPPORT IF TOTAL SPAN EXCEEDS MAX 'W' IN TABLE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL SUPPORTS BOTH PERMANENT AND TEMPORARY. TEMPORARY SUPPORTS SHALL NOT BE A SEPARATE PAY ITEM.
5. PERMANENT PIPE SUPPORTS MAY BE DECREASED FROM PLAN QUANTITIES OR EXTENDED TO INCLUDE SOME LISTED BELOW AS TEMPORARY SUPPORTS IF CONDITIONS WARRANT THESE CHANGES AT THE TIME OF CONSTRUCTION. DECISION SHALL BE MADE BY THE ENGINEER.
6. WHEN TYPE 'A' PIPE SUPPORT IS USED AND WHENEVER SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PIERCE THE WALL WITH SUITABLE OPENINGS TO PREVENT UNEQUAL PRESSURE RESULTING FROM FLOODING OF THE BACKFILL. THE VOLUME OF THE PIERCED OPENING SHALL NOT EXCEED 1/2 THE VOLUME OF THE SUPPORTING WALL.
7. USE TYPE 'B' PIPE SUPPORT INSTEAD OF TYPE 'C' WHEN CLEARANCE IS LESS THAN 'Y' IN TABLE, BETWEEN PIPES.
8. CLASS 'A' CONCRETE AS PER MAG SPEC 725 UNLESS OTHERWISE NOTED.

DETAIL NO.			REVISED:	DETAIL NO.
QW604–1	STANDARD DETAIL	PIPE SUPPORT ACROSS TRENCHES	12/02/11 DATE	QW604–1

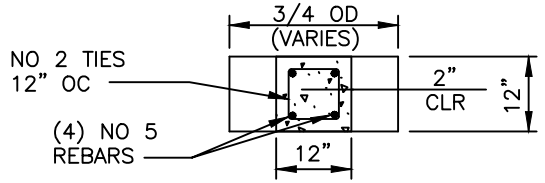
TABLE				
'W'	DEPTH OF COVER ON SUPPORTS			
	0' TO 8'		8' TO 16'	
	BAR NO	Y	BAR NO	Y
TO 6'	5	8"	6	11"
7'	5	9"	6	12"
8'	5	10"	6	13"
9'	6	11"	6	14"
10'	6	12"	7	15"
11'	6	13"	7	16"
12'	6	14"	7	17"
13'	7	15"	7	19"
14'	7	16"	8	20"
15'	7	17"	8	21"
16'	7	18"		
17'	8	19"		



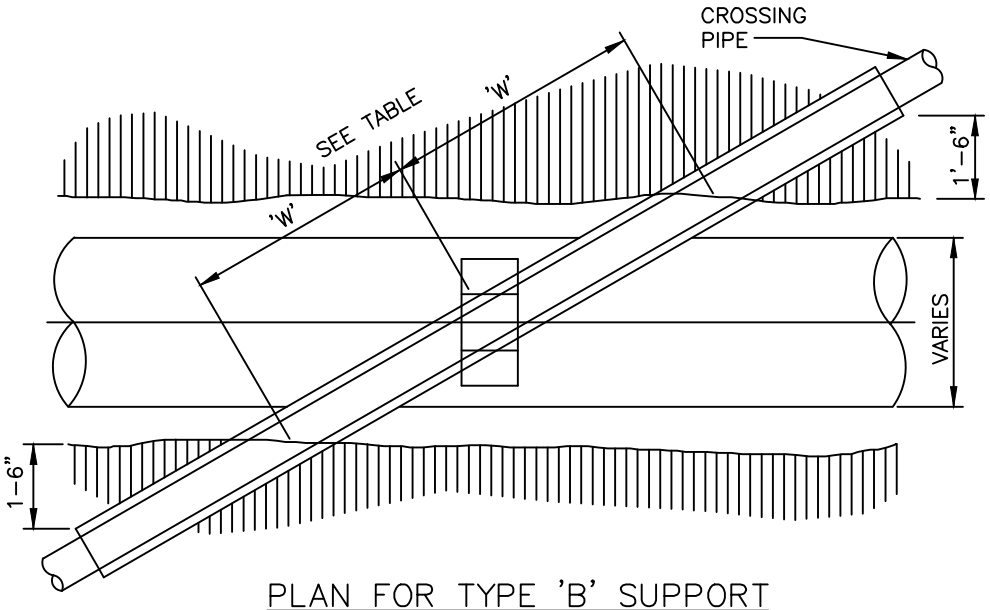
TYPE 'C'



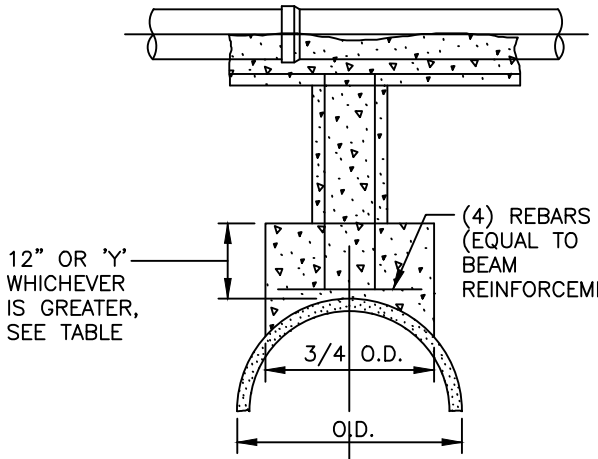
SECTION D-D



SECTION C-C

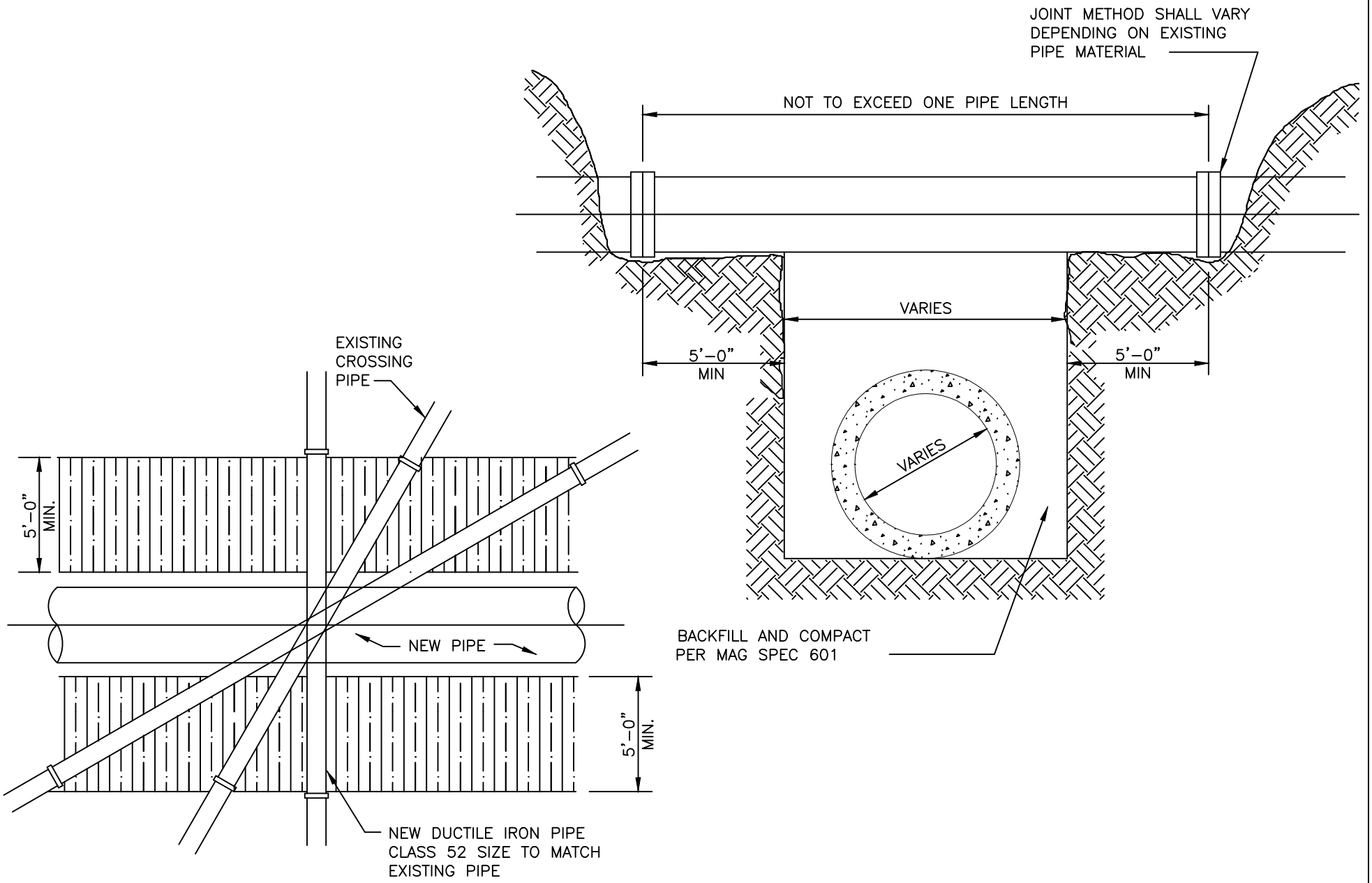


PLAN FOR TYPE 'B' SUPPORT



INTERMEDIATE SUPPORT FOR TYPE 'B' CROSSINGS

DETAIL NO.			REVISED:	DETAIL NO.
QW604-2	STANDARD DETAIL	PIPE SUPPORT ACROSS TRENCHES	12/02/11 DATE	QW604-2

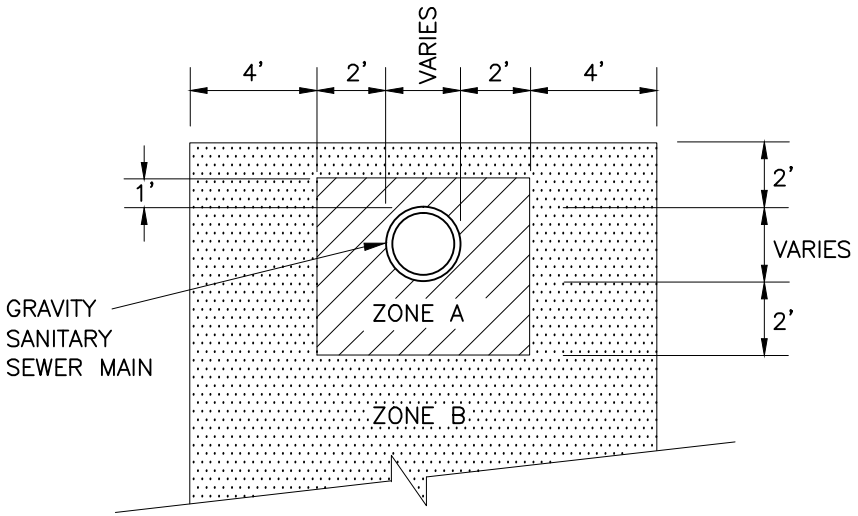


SHEET 3 OF 3

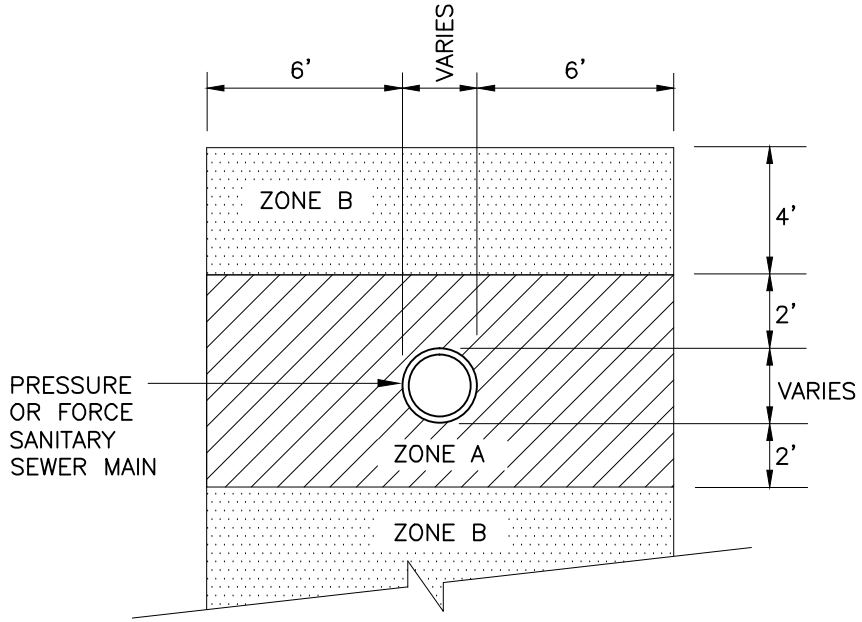
DETAIL NO.			REVISED:	DETAIL NO.
QW604–3	STANDARD DETAIL	ALTERNATE TO PIPE SUPPORT	12/02/11 DATE	QW604–3

WATER LINE EXCLUSION AND EXTRA PROTECTION ZONES

GRAVITY SANITARY SEWER



PRESSURIZED SANITARY SEWER

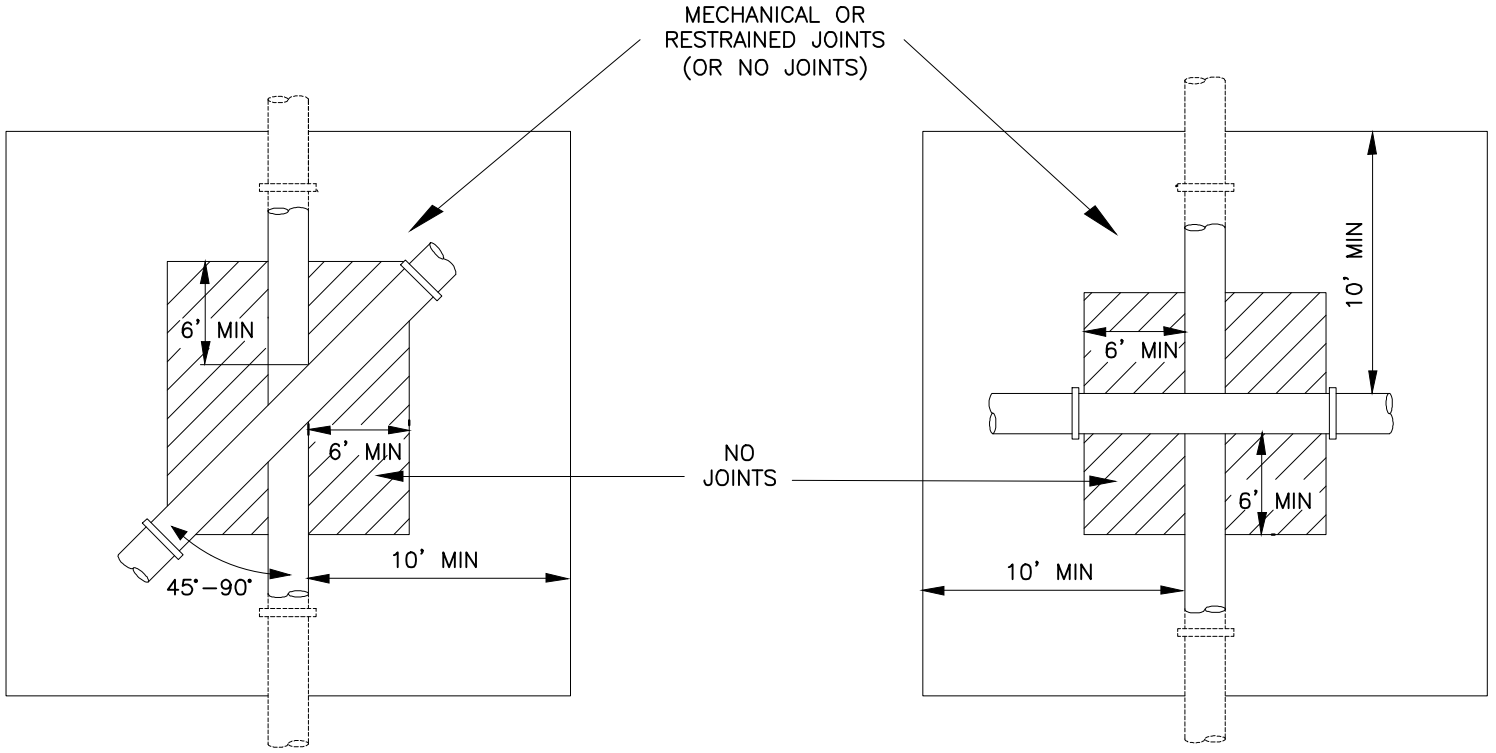


NOTES:

1. ZONE A: NO WATER LINES ALLOWED/MINIMUM SEPARATION.
2. ZONE B: EXTRA PROTECTION REQUIRED FOR WATER LINES.
3. SEE SECTION 2.2.3 AND 5.2.2 FOR WATER AND SEWER LINE SEPARATION REQUIREMENTS AND EXTRA PROTECTION.

DETAIL NO.			REVISED:	DETAIL NO.
QW605-1	STANDARD DETAIL	WATER AND SANITARY SEWER SEPARATION / PROTECTION	12/02/11 DATE	QW605-1

WATER LINE EXTRA PROTECTION
DUCTILE IRON PIPE WITH RESTRAINED OR MECHANICAL JOINTS



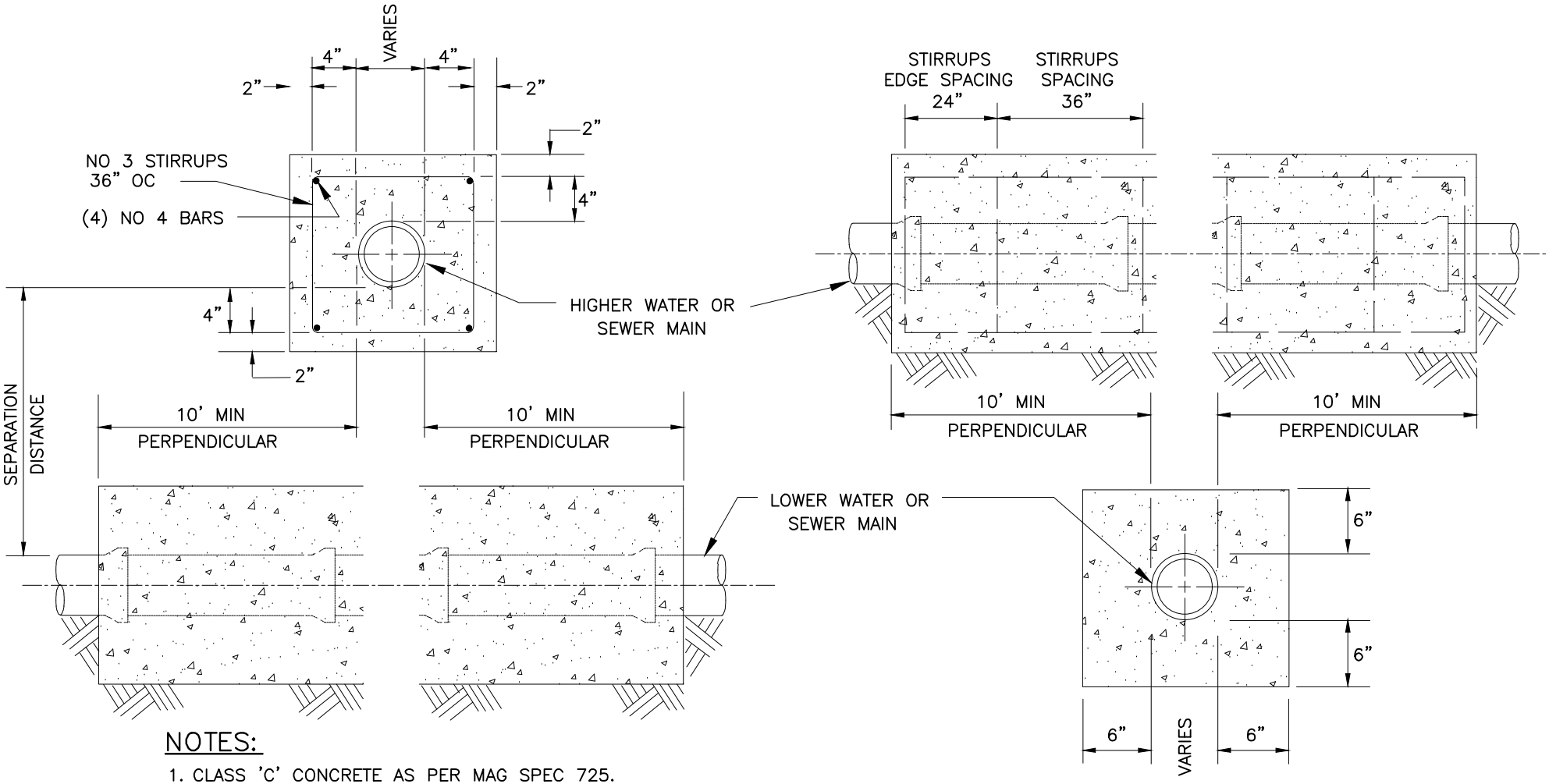
EXTRA PROTECTION DUCTILE IRON PIPE
(GRAVITY OR PRESSURIZED) SEWER LINE

NOTES:

1. SEE SECTION 2.2.3 AND 5.2.2 FOR WATER AND SEWER LINE SEPARATION REQUIREMENTS AND EXTRA PROTECTION.

DETAIL NO.			REVISED:	DETAIL NO.
QW605-2	STANDARD DETAIL	WATER AND SANITARY SEWER SEPARATION / PROTECTION	12/02/11 DATE	QW605-2

ENCASEMENT FOR PIPE CROSSING



SECTION A–A

NOTES:

1. CLASS 'C' CONCRETE AS PER MAG SPEC 725.
2. ENCASED PIPE SHALL BE DUCTILE IRON ONLY. ENCASEMENT OF PVC WATER PIPE IS NOT PERMITTED.
3. SEE SECTION 2.2.3 AND 5.2.2 FOR WATER AND SEWER LINE SEPARATION REQUIREMENTS AND EXTRA PROTECTION.
3. ENCASEMENT IS NOT ALLOWED WITHOUT PRIOR APPROVAL OF TOQC UTILITIES DEPARTMENT.

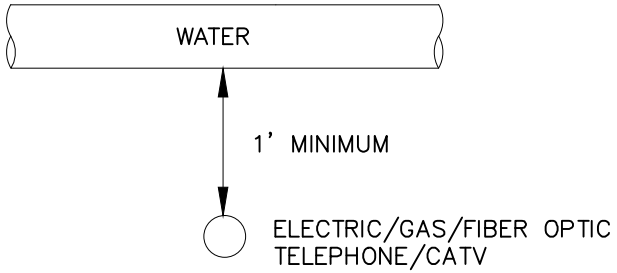
DETAIL NO.			REVISED:	DETAIL NO.
QW605–3	STANDARD DETAIL	WATER AND SANITARY SEWER SEPARATION / PROTECTION	12/02/11 DATE	QW605–3

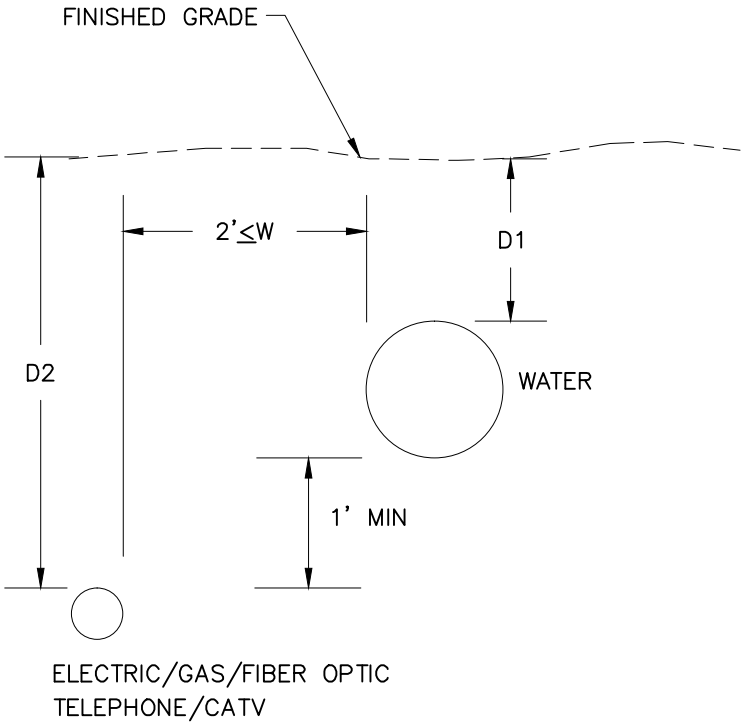
NOTES:

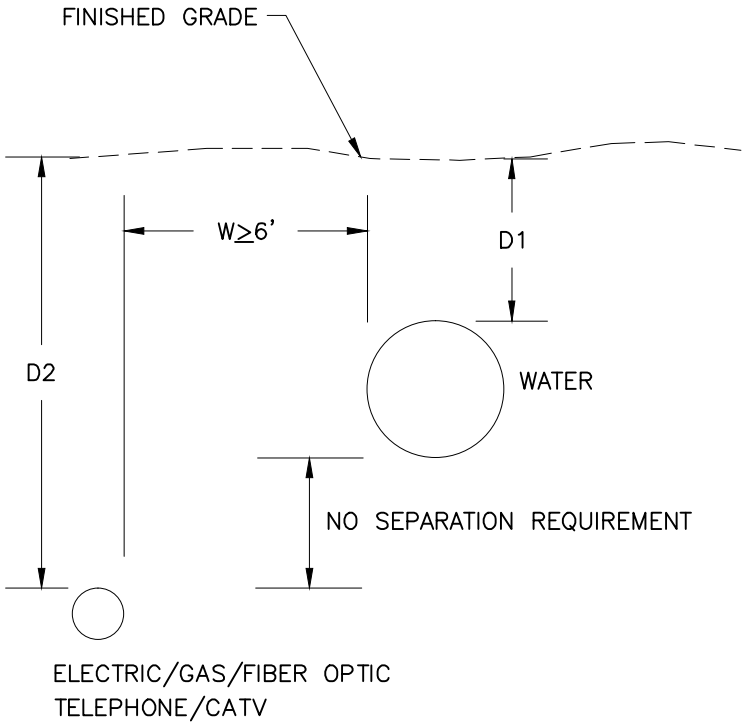
1. ELECTRIC SEPARATION REQUIREMENTS ARE FOR PRIMARY ELECTRIC CONDUCTORS ONLY.
2. PRIMARY ELECTRIC, GAS, TELEPHONE, CABLE TV OR FIBER OPTIC LINES SHALL NOT CROSS ABOVE A WATER LINE WITHOUT WRITTEN APPROVAL FROM THE WATER DIVISION.

LEGEND

D1 = 3' MIN FOR PIPE <12" DIA
D1 = 4' MIN FOR PIPE ≥12" DIA
D2 = MINIMUM COVER
W = HORIZONTAL CONTROL



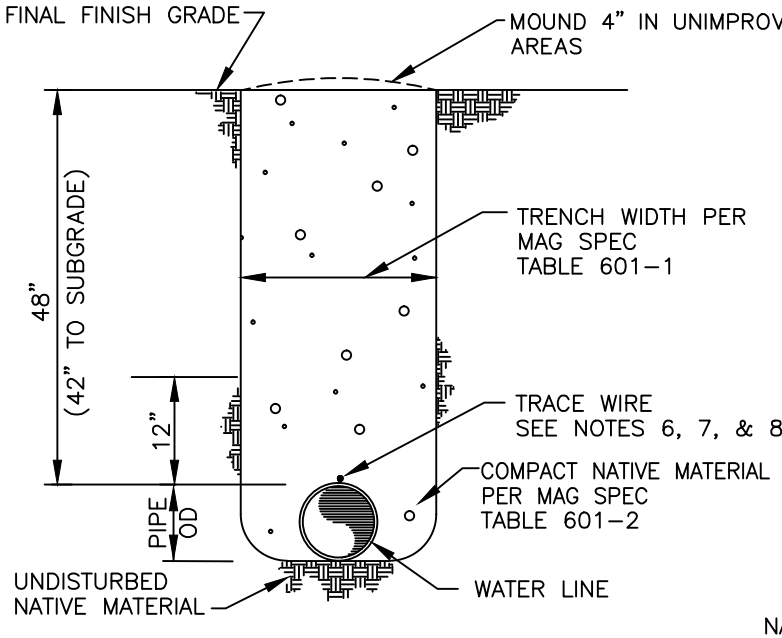


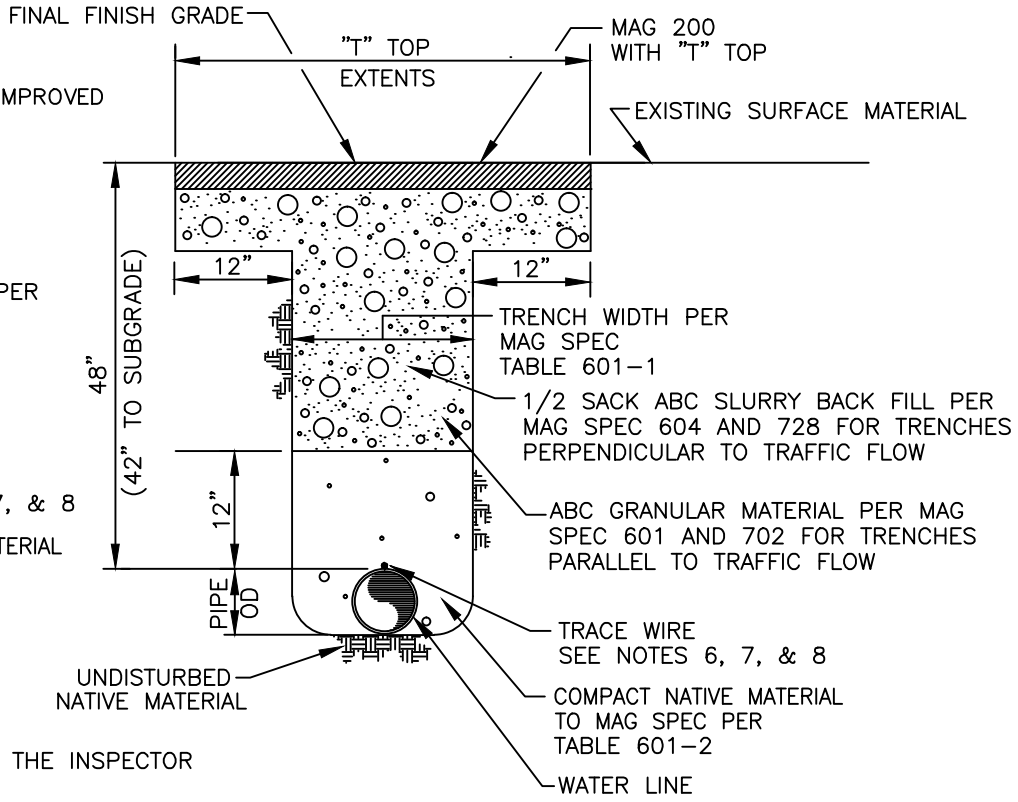


DETAIL NO.			REVISED:	DETAIL NO.
QW605-4	STANDARD DETAIL	MINIMUM UTILITY SEPARATION REQUIREMENTS	12/02/11 DATE	QW605-4

NOTES:

1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW PIPE AND REPLACED WITH NATIVE MATERIAL.
2. MINIMUM COVER SHALL BE MEASURED FROM THE EXISTING OR PROPOSED GRADE , OR FROM NATURAL GROUND, WHICHEVER IS DEEPER.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.
4. PVC PIPE BEDDING TYPE SHALL BE 1" MINUS GRANULAR MATERIAL.
5. DUCTILE IRON PIPE BEDDING SHALL BE 2" MINUS GRANULAR MATERIAL.
6. TRACER WIRE SHALL BE REQUIRED AT "OFF-SITE" INSTALLATIONS, IN UNDEVELOPED AND/OR CHANGING AREAS OR AS SPECIFICALLY REQUIRED BY THE WATER DIVISION.
7. SPLICES FOR COPPER WIRE SHALL BE MADE USING SIZE 10 & 12 BUTT CONNECTORS TO SPLICE NUMBER 12 BLUE LOCATOR WIRE.
8. BLUE INSULATED COPPER WIRE (NUMBER 12 AWG) REQUIRED DIRECTLY ON TOP OF MAIN WATER LINE & TAPED EVERY JOINT WITH DUCT TAPE.





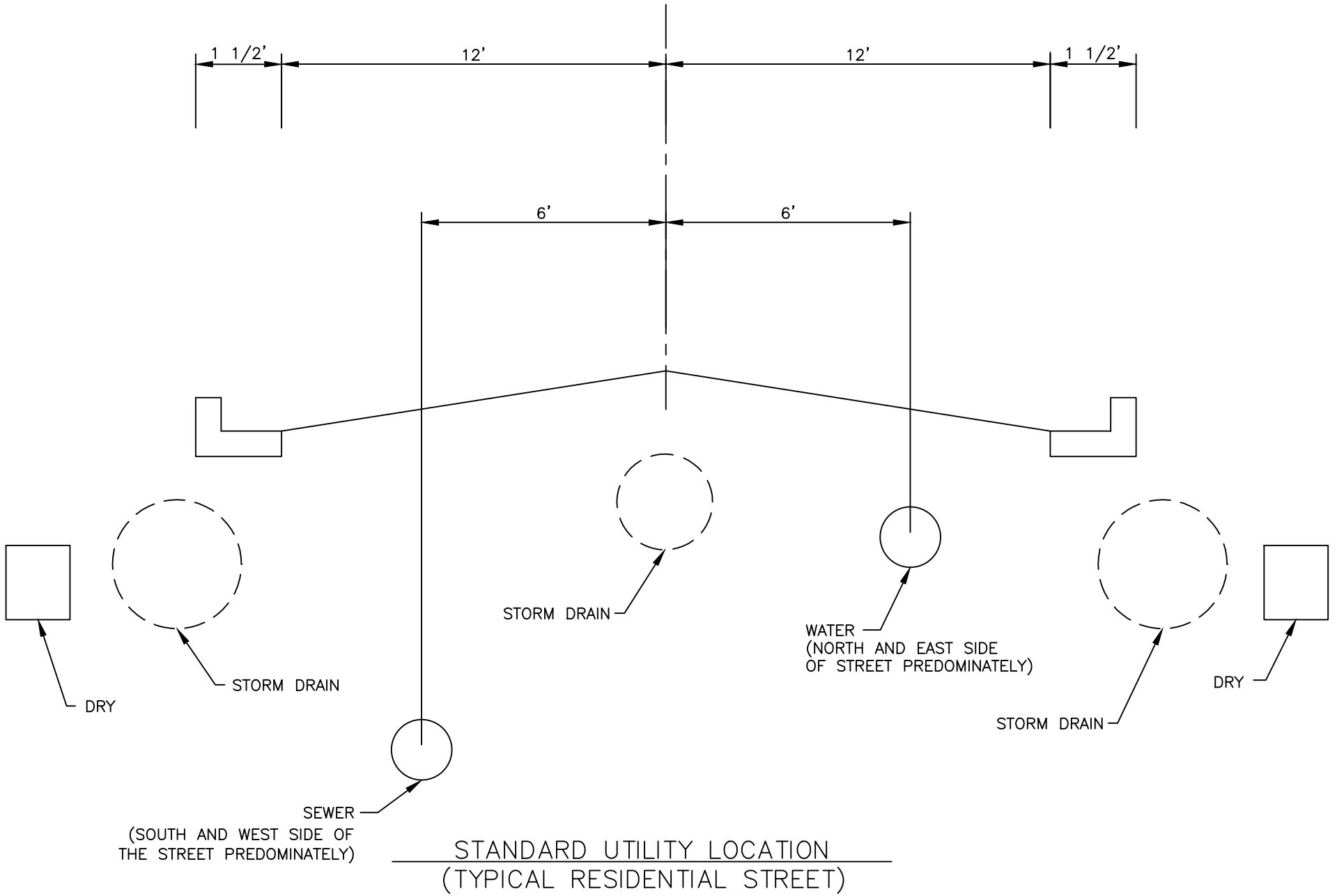
* OR AS APPROVED BY THE INSPECTOR

WATER TRENCH
(IN UNIMPROVED AREAS)

WATER TRENCH
(IN PAVED AREAS)

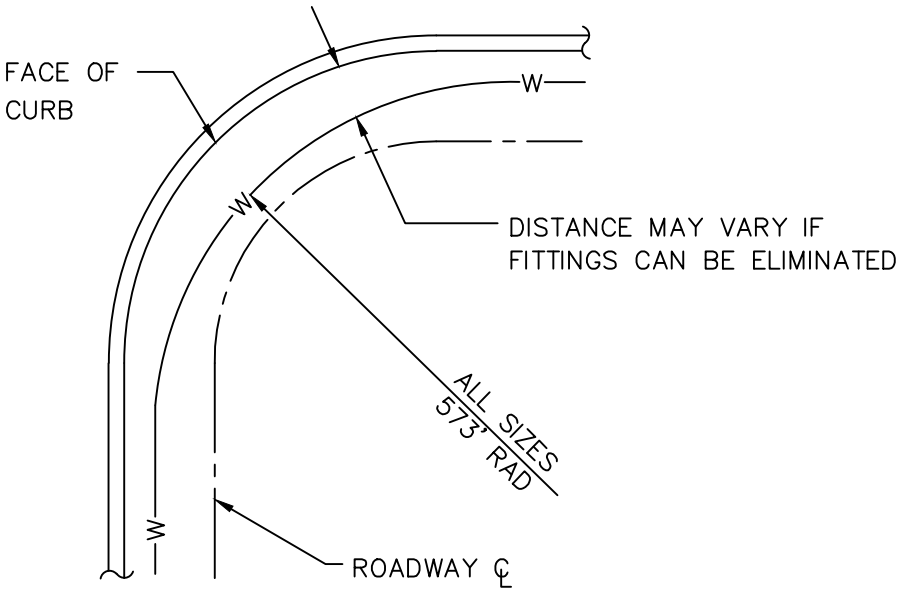
DETAIL NO.			REVISED:	DETAIL NO.
QW606	STANDARD DETAIL	TYPICAL WATER LINE TRENCH	01/31/12 DATE	QW606

P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QW606 - Typical Water Line Trench.dwg Nov 06, 2013 3:33pm hpowell

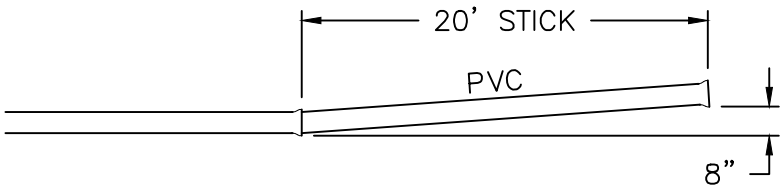


STANDARD UTILITY LOCATION
(TYPICAL RESIDENTIAL STREET)

DETAIL NO.			REVISED:	DETAIL NO.
QW607	STANDARD DETAIL	STANDARD UTILITY LOCATION	12/02/11 DATE	QW607

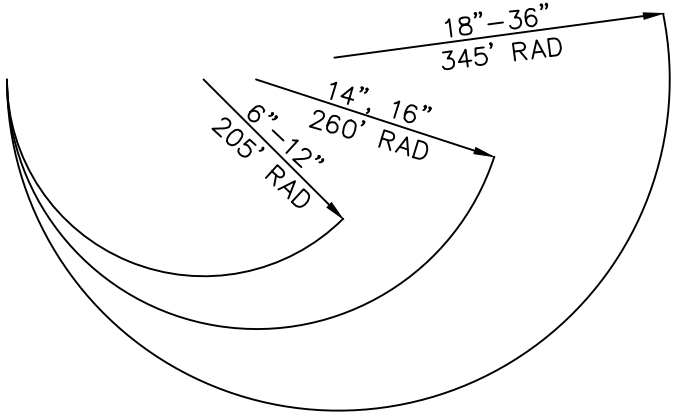


HORIZONTAL

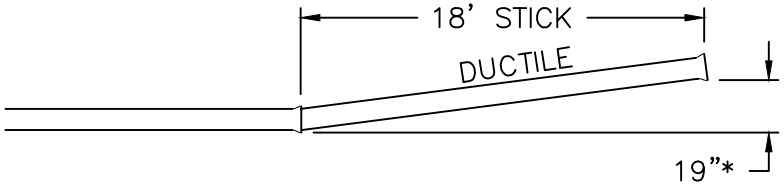


ALLOWABLE END DEFLECTION
(HORIZONTAL AND VERTICAL)

C909 PVC PIPE



HORIZONTAL

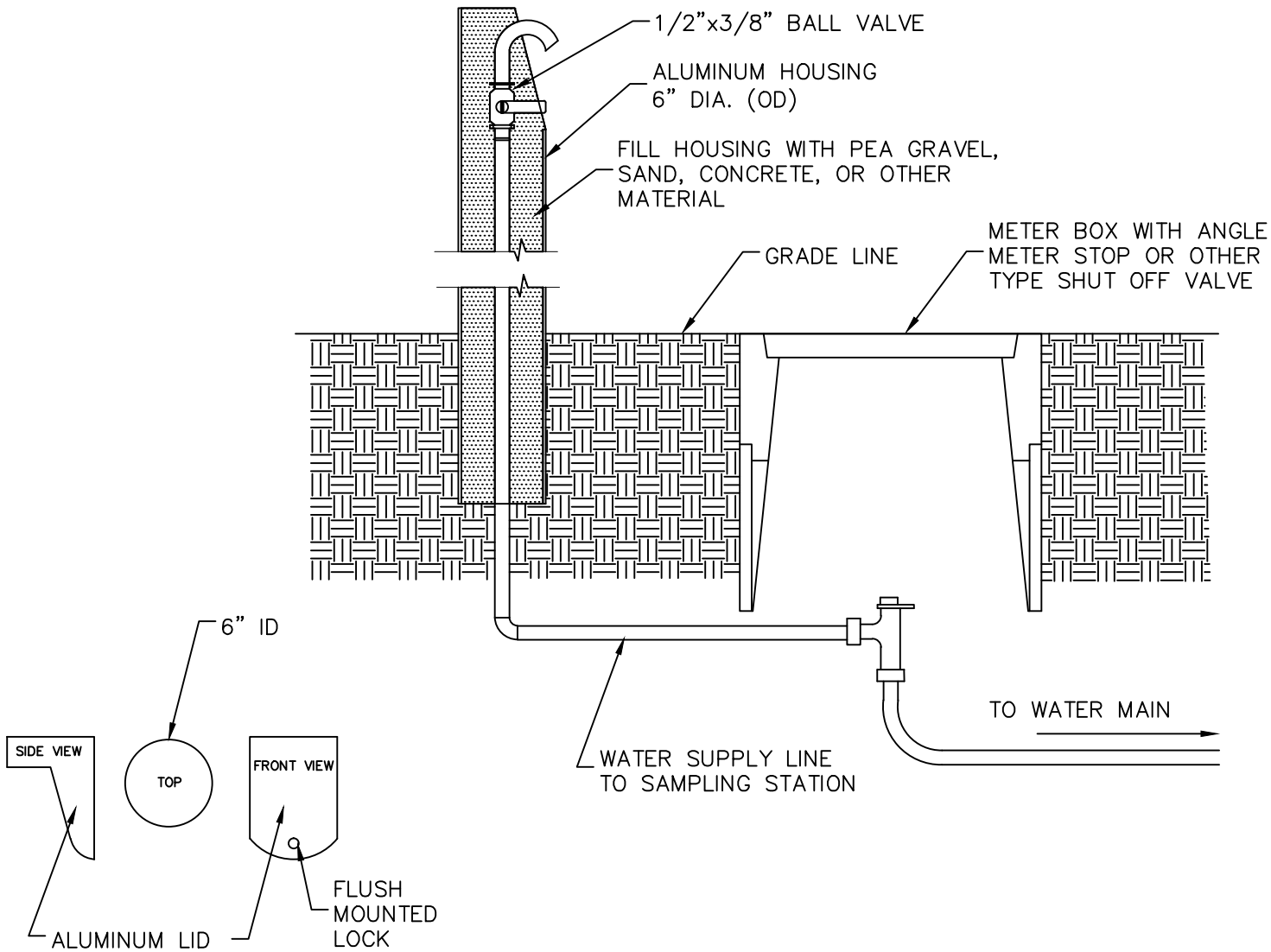


* 16" DIA PIPE = 15" MAX END DEFLECTION

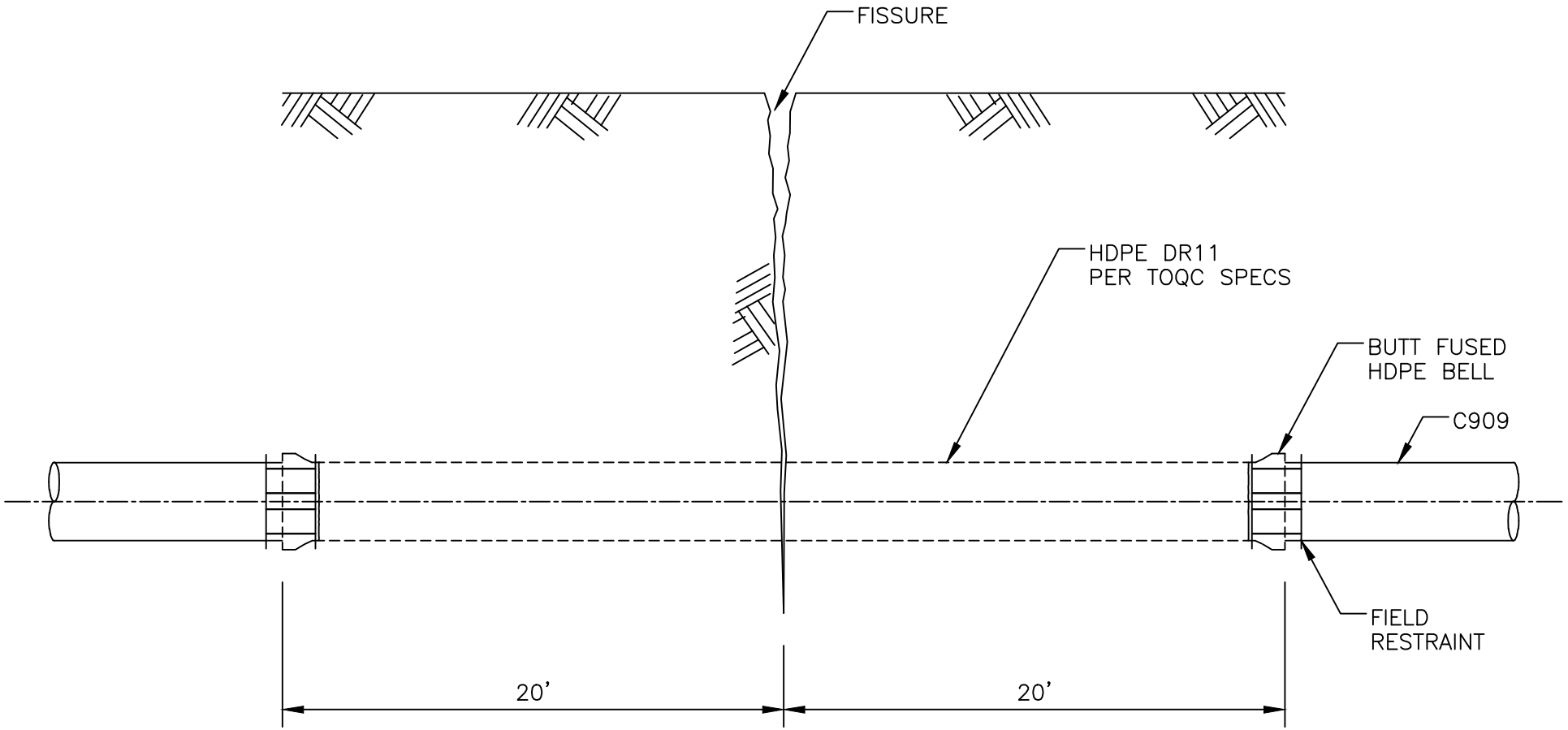
ALLOWABLE END DEFLECTION
(HORIZONTAL AND VERTICAL)

DUCTILE IRON PIPE

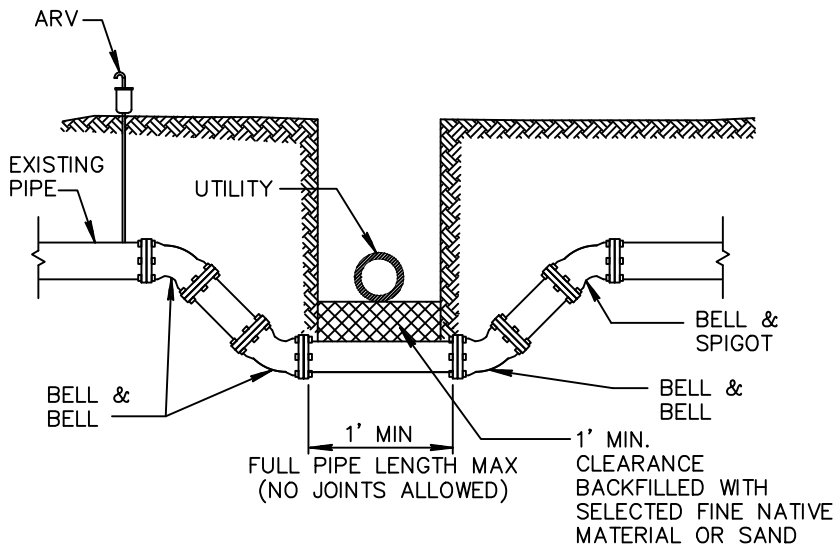
DETAIL NO.			REVISED:	DETAIL NO.
QW608	STANDARD DETAIL	ALLOWABLE JOINT DEFLECTION HORIZONTAL AND VERTICAL	12/02/11 DATE	QW608



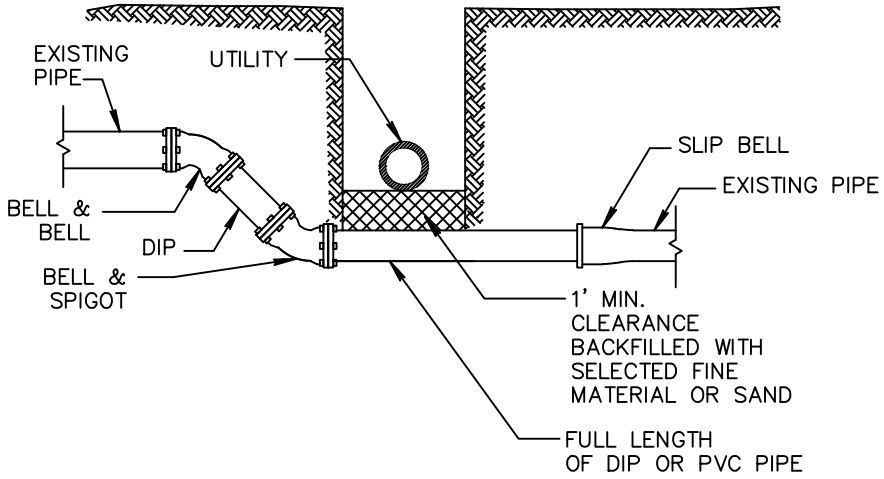
DETAIL NO.			REVISED:	DETAIL NO.
QW609	STANDARD DETAIL	WATER QUALITY SAMPLING STATION TYPICAL INSTALLATION	12/02/11 DATE	QW609



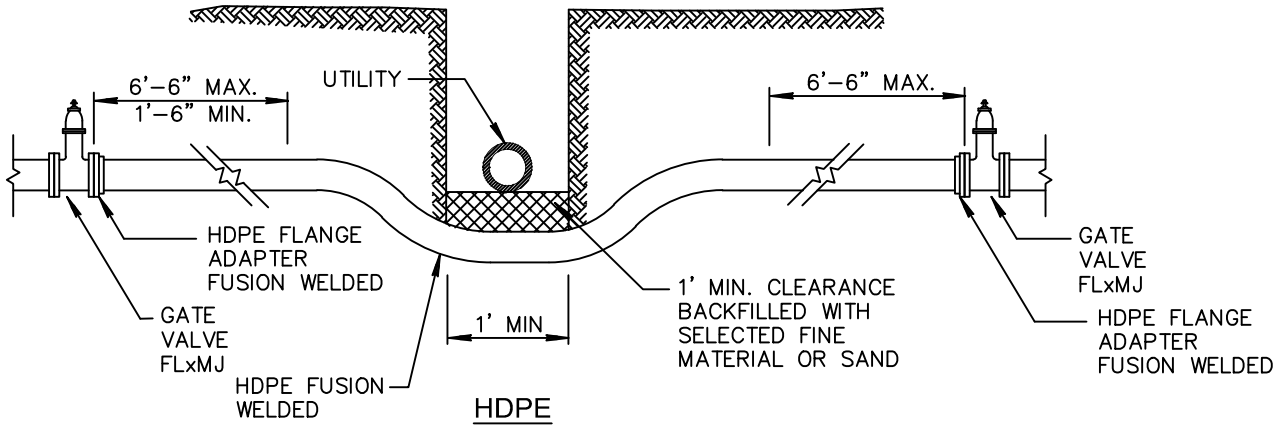
DETAIL NO.			REVISED:	DETAIL NO.
QW610	STANDARD DETAIL	FISSURE CROSSING	12/02/11 DATE	QW610



DUCTILE IRON MECHANICAL JOINT



DUCTILE IRON MECHANICAL JOINT
HALF-DIP



HDPE

NOTES:

1. THIS DETAIL COVERS MOVING OF WATER MAINS 6" TO 12" ONLY.
2. MECHANICAL THRUST RESTRAINTS PER TOQC SPECIFICATION SECTION 4.7.
3. SEE TOQC QW605 FOR WATER AND SANITARY SEWER SEPARATION/PROTECTION REQUIREMENTS.

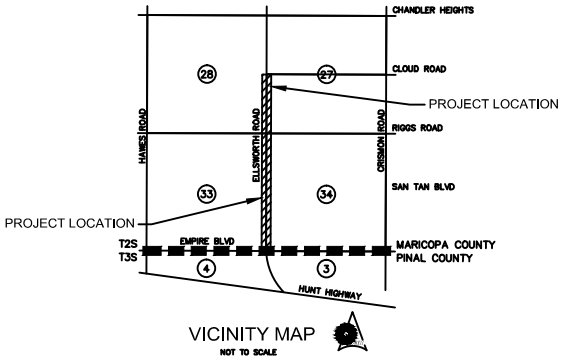
DETAIL NO.			REVISED:	DETAIL NO.
QW611	STANDARD DETAIL	VERTICAL REALIGNMENT OF WATER MAINS	04/02/13 DATE	QW611

TOWN OF QUEEN CREEK UTILITIY SERVICES DEPT

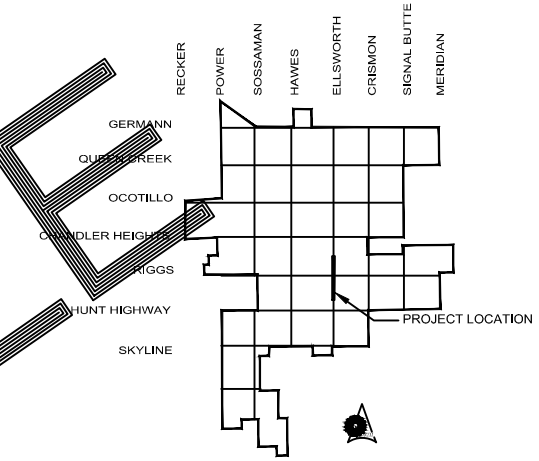
ELLSWORTH SEWER IMPROVEMENTS

LEGAL DESCRIPTION

A PORTION OF THE EAST HALF OF SECTIONS 28 AND 33, THE WEST HALF OF SECTIONS 27 AND 34, TOWNSHIP 2 SOUTH, RANGE 7 EAST, GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, AZ.



VICINITY MAP
NOT TO SCALE



TOQC SERVICE AREA
NOT TO SCALE

UTILITY LIST

DESCRIPTION	REPRESENTITIVE	PHONE	DATE PLANS SUBMITTED
SRP	RICH SEMINARA	602-236-0891	
QWEST	JOHN ODELL	602-630-0496	
SW GAS	EDWIN LONGWELL	602-484-5385	
COX CABLE	SCOTT GUSSO	623-322-7210	
TOWN OF QUEEN CREEK UTILITY DEPT	MIKE JOHNSON	480-358-3452	

OWNER

TOWN OF QUEEN CREEK
22350 S. ELLSWORTH RD.
QUEEN CREEK, AZ. 85242
TELEPHONE: (480) 358-3000
FAX: (480) 358-3133
CONTACT: GREG HOMOL

ENGINEER

SUNRISE ENGINEERING, INC.
2152 S. VINEYARD, SUITE 123
MESA, AZ. 85210
TELEPHONE: (480) 768-8600
FAX: (480) 768-8609
CONTACT: RICKY M. HOLSTON, P.E.

BASIS OF BEARING

N 00°17'58" W BETWEEN THE NORTHWEST CORNER OF SECTION 14 AND THE NORTH 1/4 CORNER OF SECTION 14 OF TOWNSHIP 2S RANGE 7E OF THE GILA AND SALT RIVER MERIDIAN

BENCHMARK

THE NORTH QUARTER CORNER OF SECTION 13 TOWNSHIP 2 SOUTH RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN BEING AN ALUMINIUM CAP WITH AN ELEVATION OF 1442.60 NAVD 88.

APPROVALS

MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT. — DATE

TOWN OF QUEEN CREEK - UTILITY SERVICES DEPARTMENT DIRECTOR — DATE

TOWN OF QUEEN CREEK - TOWN ENGINEER — DATE

QUANTITIES

ITEM	QUANTITY
DEMO EXISTING SEWER PIPE	390 LF
DEMO EXISTING SEWER MANHOLE	2 EA
8" PVC SEWER PIPE	570 LF
15" PVC SEWER PIPE	3,754 LF
5'-0" SEWER MANHOLE PER MAG 420	7 EA
30" STEEL PIPE CASING	20 LF
CONCRETE PIPE ENCASEMENT	80 LF

SHEET INDEX

"AS-BUILT" CERTIFICATION

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

REGISTERED PRO. ENG.

DATE

Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

CIRCLE G

ELLSWORTH ROAD
SEWER IMPROVEMENTS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
01243	DMF	MAG		1 of 14	COV

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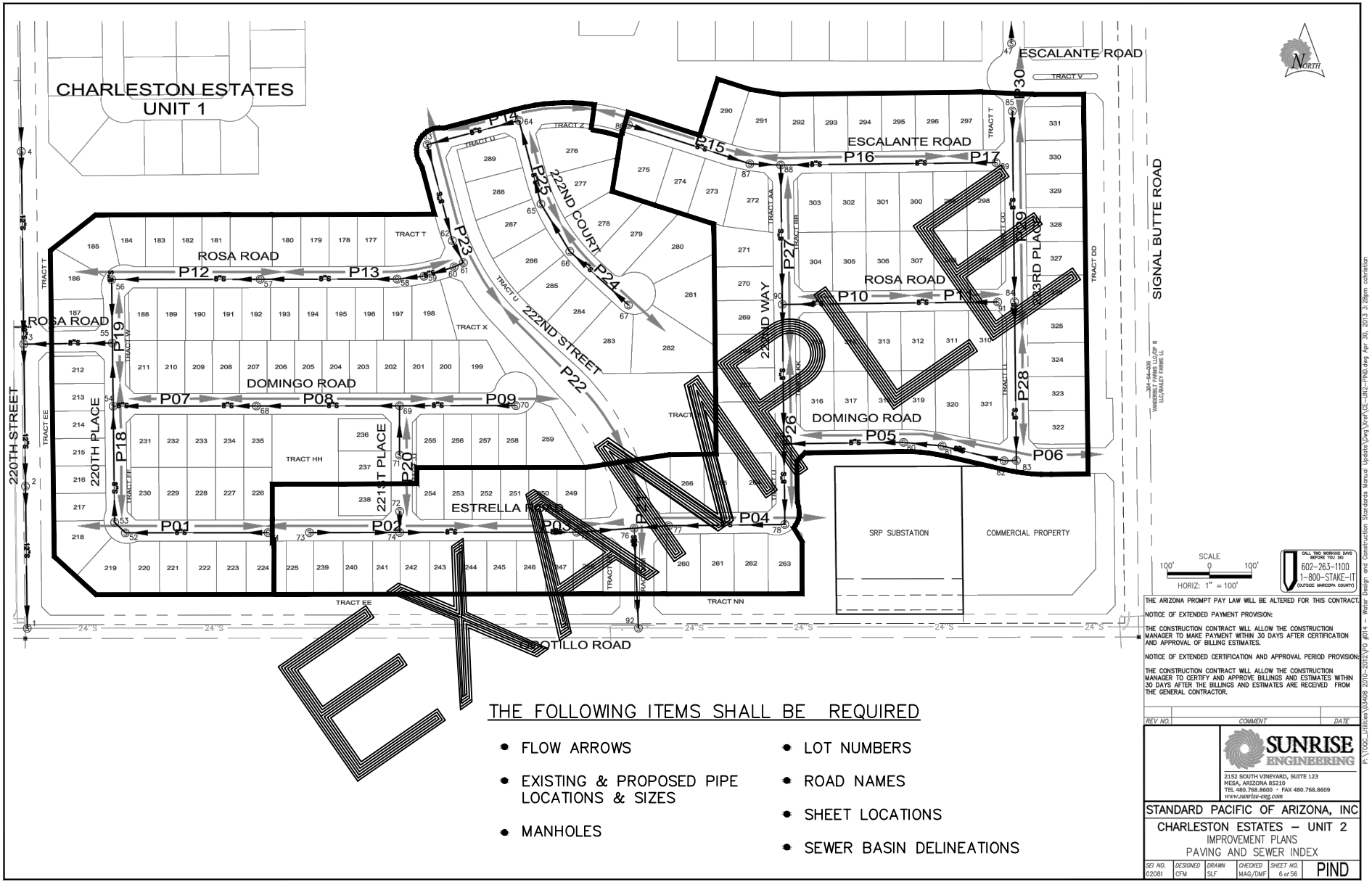
DETAIL NO.			REVISED:	DETAIL NO.
QS100a	STANDARD DETAIL	TYPICAL SEWER COVER SHEET	04/30/13 DATE	QS100a



THE FOLLOWING ITEMS SHALL BE REQUIRED

- FLOW ARROWS
- EXISTING & PROPOSED PIPE LOCATIONS & SIZES
- MANHOLES
- LOT NUMBERS
- ROAD NAMES
- SHEET LOCATIONS
- SEWER BASIN DELINEATIONS

SCALE
100' 0 100'
HORIZ: 1" = 100'

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

THE ARIZONA PROMPT PAY LAW WILL BE ALTERED FOR THIS CONTRACT.

NOTICE OF EXTENDED PAYMENT PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO MAKE PAYMENT WITHIN 30 DAYS AFTER CERTIFICATION AND APPROVAL OF BILLING ESTIMATES.

NOTICE OF EXTENDED CERTIFICATION AND APPROVAL PERIOD PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO CERTIFY AND APPROVE BILLINGS AND ESTIMATES WITHIN 30 DAYS AFTER THE BILLINGS AND ESTIMATES ARE RECEIVED FROM THE GENERAL CONTRACTOR.

REV NO.	COMMENT	DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

STANDARD PACIFIC OF ARIZONA, INC

CHARLESTON ESTATES – UNIT 2
IMPROVEMENT PLANS
PAVING AND SEWER INDEX

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
02081	CFM	SLF	MAG/DMF	6 of 56	PIND

P:\TOQC_Utilities\03408 2010-2012\PO #014 – Water Design and Construction Standards Manual Update\Dwg\Sheets\QS100b – Typical Wastewater Index of Sheets.dwg Nov 06, 2013 3:39pm hpowell

P:\TOQC_Utilities\03408 2010-2012\PO #014 – Water Design and Construction Standards Manual Update\Dwg\Xref\CE-LIN2-PIND.dwg Apr 30, 2013 3:28pm cshriston

304-64-009 VANDERBILT FARMS LLC/AP 8 LLC/BAILEY FARMS LL

DETAIL NO.			REVISED:	DETAIL NO.
QS100b	STANDARD DETAIL	TYPICAL INDEX OF SHEETS	04/30/13 DATE	QS100b

P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QS100c - Typical Wastewater General Notes Sheet.dwg Nov 06, 2013 3:39pm hpowell

TOWN OF QUEEN CREEK SEWER GENERAL NOTES

1. ALL WORK, TESTING AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE TOWN OF QUEEN CREEK DESIGN AND CONSTRUCTION STANDARDS MANUAL. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH STANDARDS AND DETAILS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE. THE TOWN OF QUEEN CREEK SEWER DEPARTMENT REPRESENTATIVE SHALL HAVE FINAL AUTHORITY ON ALL IMPROVEMENTS REGARDLESS OF THE PLANS AND/OR SPECIFICATIONS.
2. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH DEPARTMENT REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE DEPARTMENT FROM REQUIRING CORRECTION OF ERRORS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.
3. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING PERMITS AND RENEWAL OF LAPSED PERMITS.
5. THE SEWER DEPARTMENT APPROVAL IS VALID FOR A PERIOD OF ONE YEAR. CONSTRUCTION PERMITS SHALL BE OBTAINED DURING THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR REVIEW AND APPROVAL.
6. AN APPROVED SET OF PLANS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
7. DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL PERMANENT AND TEMPORARY EASEMENTS PRIOR TO BEGINNING CONSTRUCTION.
8. PRIVATE ON-SITE SEWER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISION OF THE UNIFORM PLUMBING CODE.
9. ENGINEER CERTIFIES THAT HE HAS CONTACTED ALL INTERESTED UTILITY COMPANIES AND HAS TRANSFERRED ALL EXISTING AND/OR PROPOSED UTILITY LINES AND RELATED INFORMATION ONTO THESE PLANS.
10. THE ENGINEER SHALL CERTIFY THAT ALL SEWER IMPROVEMENTS HAVE BEEN INSTALLED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE APPROVED PLANS.
11. THE ENGINEER SHALL CERTIFY THAT THE MINIMUM HORIZONTAL AND VERTICAL SEPARATION BETWEEN UTILITIES HAS BEEN MAINTAINED AS REQUIRED BY LAW OR POLICY.
12. THE CONTRACTOR SHALL ARRANGE TO PROVIDE ALL CONSTRUCTION STAKING REQUIRED FOR THE PROJECT.
13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE RELOCATION OF ALL UTILITIES, POWER POLES, IRRIGATION DRY-UPS, REMOVALS BY OTHERS, ETC.
14. ALL FRAMES, COVERS, CLEAN-OUTS, MANHOLES, ETC. SHALL BE INSTALLED TO FINISH GRADE OR SHALL BE ADJUSTED TO FINISH GRADE PRIOR TO PLACING OF ASPHALT SURFACE COURSE BY THE CONTRACTOR AS PER MAG STANDARD DETAIL 270 AND 422.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES PRIOR TO EXCAVATION AND AVOID DAMAGE TO SAME. CALL 602-263-1100 FOR BLUE STAKE TWO WORKING DAYS PRIOR TO DIGGING.
16. CONTRACTOR WILL EXPOSE ALL TIE-IN POINTS TO VERIFY LOCATION PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES.
17. THE TOWN OF QUEEN CREEK SEWER DEPARTMENT IS NOT LIABLE FOR DELAYS NOR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION; NEITHER WILL THE SEWER DEPARTMENT PARTICIPATE IN THE COST OF UTILITY RECONSTRUCTION OR RELOCATION.
18. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION AND TESTING. INSPECTIONS SHOULD BE COORDINATED WITH MIKE JOHNSON (480) 797-3894. INSPECTIONS ARE ON A DAY TO DAY FIRST COME FIRST SERVED BASIS. CONSTRUCTION CONCEALED WITHOUT THE REQUIRED INSPECTION SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.
19. THE CONTRACTOR WILL FOLLOW GUIDELINES AND REGULATIONS SET FORTH BY OSHA NEITHER THE ENGINEER OR THE TOWN WILL BE RESPONSIBLE FOR JOB-SITE SAFETY PROCEDURES OR CONDITIONS.
20. THE CONTRACTOR IS RESPONSIBLE FOR HIS OWN TAKEOFF QUANTITIES. QUANTITIES SHOWN HEREON ARE ESTIMATES ONLY AND AS SUCH ARE NOT TO BE USED FOR BID PURPOSES.
21. THE CONTRACTOR IS RESPONSIBLE FOR THE NOTIFICATION OF THE PROPER AUTHORITY(S) IF THERE ARE OBSTRUCTIONS TO PROPOSED IMPROVEMENTS AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY EXISTING ITEM REMOVED TO FACILITATE CONSTRUCTION SHALL BE REPLACED IN THE SAME OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
22. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL ON AND AROUND THE CONSTRUCTION SITE.
23. PAVEMENT REPLACEMENT AND TRENCH REPAIR SHALL BE DONE TO MAG STANDARD SPECIFICATIONS AND DETAILS.
24. IMPROVEMENTS SHALL NOT BE ACCEPTED UNTIL "AS-BUILT" PLANS HAVE BEEN SUBMITTED, REVIEWED AND APPROVED BY THE SEWER DEPARTMENT.

MCDOT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE MOST CURRENT UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PUBLISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG), TOGETHER WITH THE MCDOT SUPPLEMENT TO THE MAG STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS. ALL WORK MUST ALSO COMPLY WITH RESOLUTION 2001-01 - MARICOPA COUNTY RESOLUTION FOR PERMITS TO WORK IN DEDICATED RIGHT-OF-WAY AND RESOLUTION 2001-02 MARICOPA COUNTY RESOLUTION FOR STREET IMPROVEMENTS, INSTALLATION OF UTILITIES AND TRAFFIC CONTROL. ANY EXCEPTIONS MUST RECEIVE EXPLICIT APPROVAL FROM MCDOT AND SHALL BE IDENTIFIED ON THE PLANS AS HAVING EXPLICIT APPROVAL FROM MCDOT.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY MCDOT IN CONCEPT AND NOT IN DETAIL. CONSTRUCTION QUANTITIES ON THESE PLANS ARE NOT VERIFIED BY MCDOT. APPROVAL OF THESE PLANS ARE FOR PERMIT PURPOSES ONLY AND SHALL NOT PREVENT MCDOT FROM REQUIRING CORRECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSEQUENTLY FOUND TO BE IN VIOLATION OF ANY LAW, ORDINANCE, HEALTH, SAFETY, MCDOT ROADWAY DESIGN MANUAL, OR OTHER DESIGN ISSUES.
3. AN APPROVED SET OF PLANS SHALL BE ON THE SITE DURING CONSTRUCTION AND AVAILABLE TO MCDOT AND OTHER INSPECTORS.
4. ALL BOX CULVERTS CONSTRUCTED IN THE PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) LATEST DESIGN SPECIFICATIONS AND STANDARDS. MINIMUM CLEAR HEIGHT OF BOX CULVERT SHALL BE 4 FEET.
5. CONTRACTOR TO OBTAIN NECESSARY MCDOT PERMITS PRIOR TO CONSTRUCTION WITHIN COUNTY RIGHT-OF-WAY. OBTAIN ALL NECESSARY PERMITS FROM LOCAL GOVERNMENTS FOR WORK WITHIN THEIR JURISDICTION.
6. CONTRACTOR SHALL NOTIFY THE MCDOT INSPECTION DEPT. AT LEAST 24 HOURS IN ADVANCE OF ANY CONSTRUCTION AT (602) 506-8706.
7. CONTRACTOR PERFORMING CONSTRUCTION OR EXCAVATING OPERATIONS IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES IN CONFLICT OR WITHIN THE CLEAR ZONE, AT NO EXPENSE TO MARICOPA COUNTY. THE CONTRACTOR SHALL CONTACT "BLUE STAKE" AT (602) 263-1100 PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY REQUIRED PERMITS FOR EARTH MOVING FROM MARICOPA COUNTY AIR QUALITY DEPARTMENT'S DUST COMPLIANCE DIVISION (602) 506-6010 PRIOR TO CONDUCTING EXCAVATION OPERATIONS. A COPY OF THE PERMIT AND DUST CONTROL PLAN SHALL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO COMMENCEMENT OF ANY EARTHMOVING ACTIVITIES.
9. PRIOR TO CONDUCTING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL OBTAIN FROM THE ARIZONA STATE HISTORICAL PRESERVATION OFFICER (602) 542-4009, RECOMMENDATIONS REGARDING THE NEED FOR CULTURAL RESOURCES (ARCHAEOLOGICAL) CLEARANCE. ALL DISCOVERIES OF HUMAN REMAINS, CULTURAL ARTIFACTS, OR PALEONTOLOGICAL REMAINS SHALL BE REPORTED TO THE ARIZONA STATE MUSEUM AND MCDOT. UPON DISCOVERY, CONTRACTOR SHALL CEASE OPERATIONS IN THE VICINITY OF THE FIND AND PROTECT THE DISCOVERY AREA FROM FURTHER DISTURBANCE UNTIL THE FIND CAN BE PROFESSIONALLY INVESTIGATED BY THE ARIZONA STATE MUSEUM AND MCDOT.
10. EXCEPT UNDER EMERGENCY CONDITIONS, ROADS SHALL NOT BE CLOSED FOR CONSTRUCTION ACTIVITY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE MCDOT TRANSPORTATION DIRECTOR OR HIS REPRESENTATIVE.
11. PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES, THE CONTRACTOR SHALL FILE A FORMAL NOTICE OF INTENT WITH THE ARIZONA DEPARTMENT OF AGRICULTURE NATIVE PLANTS (602) 542-6408.
12. PRIOR TO INSTALLATION OF CURB, GUTTER, SIDEWALK, BASE COURSE AND WEARING SURFACE, SUBMIT SOIL TEST(S) OF SUB-GRADE AND REVISED PAVEMENT DESIGN/CALCULATIONS TO MCDOT FOR REVIEW AND APPROVAL. IF SUB-GRADE STABILIZATION IS REQUIRED, THE AREA STABILIZED SHALL BE FROM BACK OF SIDEWALK TO BACK OF SIDEWALK AND MATCH THE STABILIZATION DEPTH OF THE PAVEMENT STRUCTURE.
13. ASPHALT MIX DESIGN SHALL BE SUBMITTED TO MCDOT A MINIMUM OF 48 HOURS PRIOR TO PLACING ANY ASPHALT COURSES. (TRENCH WORK EXCLUDED.) NEW PAVED TURNOUTS SHALL HAVE THE SAME ASPHALT AND BASE REQUIREMENTS AS THE ADJACENT ROADWAY UNLESS NOTED OTHERWISE.
14. ALL COMPACTION AND BACKFILL WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM TO THE MCDOT SUPPLEMENT TO MAG SPECIFICATIONS. BACKFILL UNDER EXISTING PAVEMENT, CURB AND GUTTER OR WITHIN TWO FEET (2') OR LESS FROM THE EDGE OF PAVEMENT SHALL CONSIST OF ONE-HALF (1/2) SACK CLSM.
15. ALL STRUCTURES, SUCH AS MANHOLES, VALVE BOX & COVERS, AND MONITORING WELLS MUST BE MARKED WITH AT LEAST TWO REFLECTIVE YELLOW FLEX POSTS WHEN STRUCTURES ARE LOCATED OUTSIDE THE TRAVELED WAY AND WITHIN THE RIGHT-OF-WAY. (APPLIES ONLY WHEN THERE IS NO CURB.)
16. ANY SAW CUT ALONG EXISTING ROADWAY EDGE WHICH REMOVES THE EDGE OF THE ROADWAY SHALL BE A MINIMUM OF 1' FROM THE EDGE OF THE EXISTING ROADWAY. THE CUT DISTANCE MAY BE GREATER, BASED ON PAVEMENT CONDITIONS OR ROADWAY ELEVATIONS BUT SHALL NOT BE LOCATED WITHIN A LANE WHEEL PATH, AND IF NEEDED SHALL BE IN HALF LANE INCREMENTS.
17. ALL EXISTING PAVEMENT MARKING, TRAFFIC SIGNS AND SIGNAL EQUIPMENT THAT NEEDS TO BE REMOVED, REPLACED, RELOCATED OR REPAIRED BECAUSE OF CONTRACTOR'S WORK WILL BE DONE BY THE CONTRACTOR AT HIS EXPENSE. ALL SALVAGED SIGNS SHALL BE DELIVERED TO THE TRAFFIC OPS BUILDING AT 2909 W. DURANGO ST. ARRANGEMENTS CAN BE MADE FOR DELIVERY BY CALLING (602) 506-8662. ALL NEW STREET NAME SIGNS SHALL BE PROVIDED AND INSTALLED BY PERMITTEE AT NO EXPENSE TO MARICOPA COUNTY.
18. PAVEMENT MARKING, SIGNING AND SIGNAL WORK WILL BE INSPECTED AND SHALL MEET COUNTY STANDARDS BEFORE RELEASE OF BOND.
19. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY TO A CONDITION EQUAL TO OR BETTER THAN EXISTING IMPROVEMENTS PER MAG 107.9. DISPOSAL OF ALL WASTE MATERIAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

LEGEND

- EXISTING CONTOUR LINE
- SECTION LINE
- RIGHT-OF-WAY
- ROADWAY CENTERLINE
- X"W — EXISTING WATER LINE
- UGE — EXISTING UNDERGROUND ELECTRIC
- OHE — EXISTING OVERHEAD ELECTRIC
- X"G — EXISTING GAS LINE
- T — EXISTING UNDERGROUND TELEPHONE
- C — EXISTING CABLE LINE
- IRR — EXISTING IRRIGATION
- EXISTING PROPERTY LINE
- EXISTING BARBED WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING STORM DRAIN PIPE
- EXISTING SIGN
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING GUY WIRE
- EXISTING MAILBOX
- EXISTING WATER METER
- EXISTING AIR/VACUUM RELEASE VALVE
- EXISTING BLOW-OFF
- EXISTING CONCRETE STAND-PIPE
- SURVEY MONUMENT
- EB — TRANSFORMER/ELECTRICAL CABINET
- GV — GAS VALVE
- C — CABLE BOX
- IRRIGATION VALVE
- LIGHT POLE

EXPIRED

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

CIRCLE G

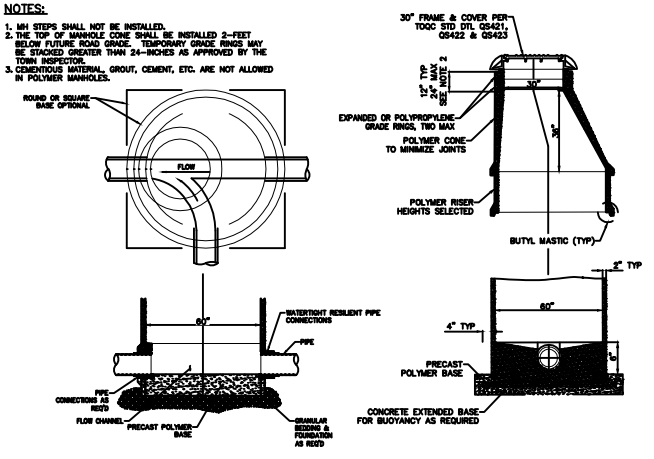
PEGASUS AIRPARK UNITS 3 AND 4
SEWER IMPROVEMENT PLANS
General Notes and Legend

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
01243	DMF	MAG		2 of 14	GN1

DETAIL NO.			REVISED:	DETAIL NO.
QS100c	STANDARD DETAIL	TYPICAL GENERAL NOTES SHEET	12/23/11 DATE	QS100c

NOTES:

1. MH STEPS SHALL NOT BE INSTALLED.
2. THE TOP OF MANHOLE CONE SHALL BE INSTALLED 2-FEET BELOW FUTURE ROAD GRADE. TEMPORARY GRADE RINGS MAY BE STACKED GREATER THAN 24-INCHES AS APPROVED BY THE TOWN INSPECTOR.
3. CEMENTIOUS MATERIAL, GROUT, CEMENT, ETC. ARE NOT ALLOWED IN POLYMER MANHOLES.

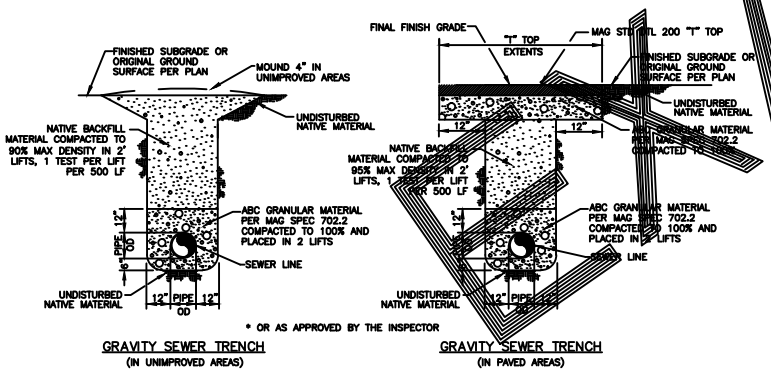


A ~ STD DTL QS420 – PRE-CAST SEWER MANHOLES
NOT TO SCALE

B ~ NOT USED
NOT TO SCALE

NOTES:

1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW OD OF PIPE AND REPLACED WITH CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2.
2. MINIMUM COVER SHALL BE MEASURED FROM THE EXISTING OR PROPOSED GRADE, OR FROM NATURAL GROUND, WHICHEVER IS DEEPER.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.
4. PVC PIPE BEDDING SHALL BE CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2
5. CONTRACTOR SHALL EXCAVATE REQUIRED TRENCH TO PREVENT CAVE-IN AND PROVIDE TRENCH SIDEWALL STABILITY. TRENCH EXCAVATION SHALL INCLUDE ALL DEWATERING, SHEETING AND SHORING NECESSARY TO INSTALL SEWER LINE.

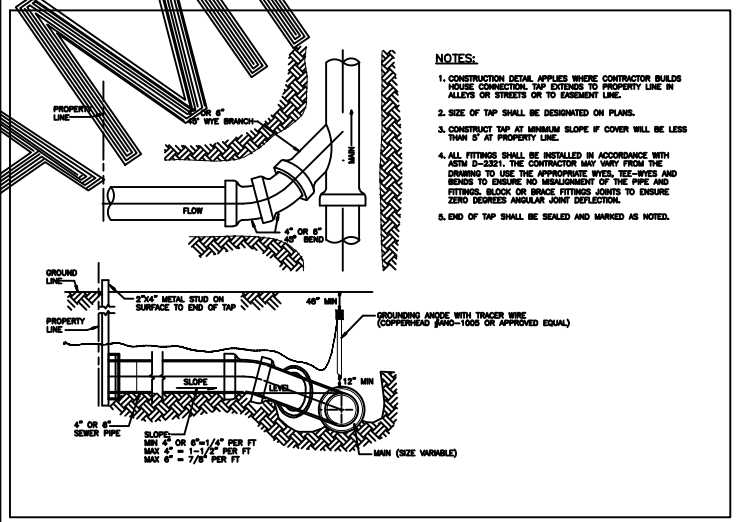


* OR AS APPROVED BY THE INSPECTOR

C ~ STD DTL QS442 – TYPICAL SEWER LINE TRENCH
NOT TO SCALE

NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. TAP EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO EASEMENT LINE.
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
3. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.
4. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTINGS JOINTS TO ENSURE ZERO DESIRED ANGULAR JOINT DEFLECTION.
5. END OF TAP SHALL BE SEALED AND MARKED AS NOTED.



D ~ STD DTL QS430-1 – TYPE 'A' BUILDING SEWER CONNECTION
NOT TO SCALE

811 Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

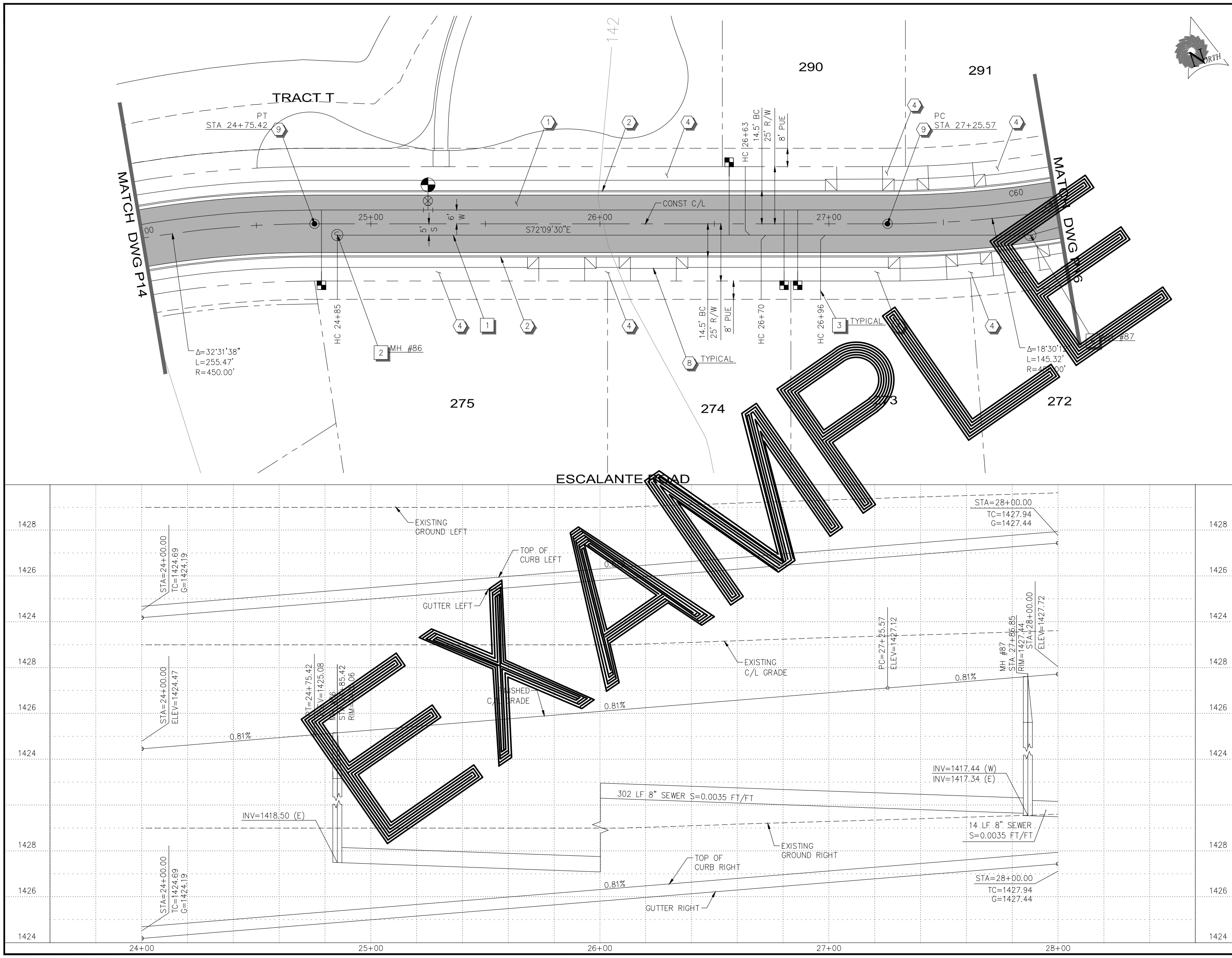
SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 • FAX 480.768.8609
www.sunrise-eng.com

TOWN OF QUEEN CREEK SEWER DIVISION

QUEEN CREEK VILLAGES
PHASE 2

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	DW	CY		3 of 25	D1

DETAIL NO.			REVISED:	DETAIL NO.
QS100d	STANDARD DETAIL	REQUIRED DETAILS FOR ALL SEWER PROJECTS	08/17/11 DATE	QS100d



PAVING NOTES

- S/M SAWCUT & MATCH.
- (1) CONSTRUCT PAVEMENT PER TYPICAL STREET CROSS SECTIONS SHEET TYP.
- (2) CONSTRUCT 6" VERTICAL CURB & GUTTER PER MAG STD DETAIL 220, TYPE A.
- (3) CONSTRUCT 6" VERTICAL CURB PER MAG STD DETAIL 222, TYPE A.
- (4) CONSTRUCT 6' SIDEWALK PER MAG STD DETAIL 230.
- (5) CONSTRUCT SIDEWALK RAMP PER MAG STD DETAIL 231, TYPE A.
- (6) CONSTRUCT SIDEWALK RAMP PER MAG STD DETAIL 233, TYPE C.
- (7) CONSTRUCT CONCRETE VALLEY GUTTER PER MAG STD DETAIL 240. 6' WIDE PER MAG REVISED 01-01-2010.
- (8) CONSTRUCT 20' CONCRETE DRIVEWAY PER MAG STD DETAIL 250 AND DETAIL A SHEET PDTL.
- (9) INSTALL SURVEY MARKER PER MAG STD DETAIL 120-1, TYPE B.
- (10) NOT USED.
- (11) PROPOSED IRRIGATION SLEEVES. FOR ADDITIONAL INFORMATION, SEE LANDSCAPE PLANS.

SEWER NOTES

- [1] INSTALL SDR35 PVC ASTM D3034 SEWER LINE. SIZE & LENGTH AS NOTED ON PROFILE.
- [2] INSTALL 5' SEWER MANHOLE PER MAG STD DETAIL 420 WITH TYPE A TOP, 30" FRAME & COVER PER TOWN OF QUEEN CREEK DETAIL U-201. ADJUST TO FINISH TO GRADE PER TOQC STD DETAIL U-201, SHEET SDTL1.
- [3] INSTALL 4" SEWER SERVICE PER DTL SDTL1 AND MAG STD DETAIL 440, TYPE A WITH ELECTRIC BALL MARKER PER MAG STD DTL 440-1. TYPICAL LOCATION 10' FROM PROPERTY LINE.
- [4] INSTALL SEWER PLUG PER MAG STD DETAIL 427. SIZE AS NOTED ON PLANS.
- [5] WATER & SEWER CROSSING PER QUEEN CREEK WATER CO. STD DETAIL Q605.
- [6] INSTALL 5' SEWER MH PER MAG STD DTL 420 WITH TYPE A TOP, 30" WATER TIGHT FRAME AND COVER PER MAG 423. ADJUST TO FINISH GRADE PER TOQC STD DTL U-201.
- [7] REMOVE SEWER PLUG.
- [8] INSTALL "#9800-WC ECLIPSE" AUTOMATIC FLUSHING DEVICE PER DETAIL, SHEET SDTL2.

REMOVAL NOTES

- (1) REMOVE EXISTING IRRIGATION FACILITIES.

NOTES

1. FOR STORM DRAIN INFORMATION SEE GRADING PLANS.
2. SEWER LENGTHS NOTED ARE MANHOLE TO MANHOLE OR MANHOLE TO MATCHLINE.

SCALE
20' 0 20'
HORIZ: 1" = 20'
VERT: 1" = 2'

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

THE ARIZONA PROMPT PAY LAW WILL BE ALTERED FOR THIS CONTRACT.

NOTICE OF EXTENDED PAYMENT PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO MAKE PAYMENT WITHIN 30 DAYS AFTER CERTIFICATION AND APPROVAL OF BILLING ESTIMATES.

NOTICE OF EXTENDED CERTIFICATION AND APPROVAL PERIOD PROVISION:

THE CONSTRUCTION CONTRACT WILL ALLOW THE CONSTRUCTION MANAGER TO CERTIFY AND APPROVE BILLINGS AND ESTIMATES WITHIN 30 DAYS AFTER THE BILLINGS AND ESTIMATES ARE RECEIVED FROM THE GENERAL CONTRACTOR.

REV NO.	COMMENT	DATE

FOR REVIEW ONLY
NOT
FOR CONSTRUCTION

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

STANDARD PACIFIC OF ARIZONA, INC

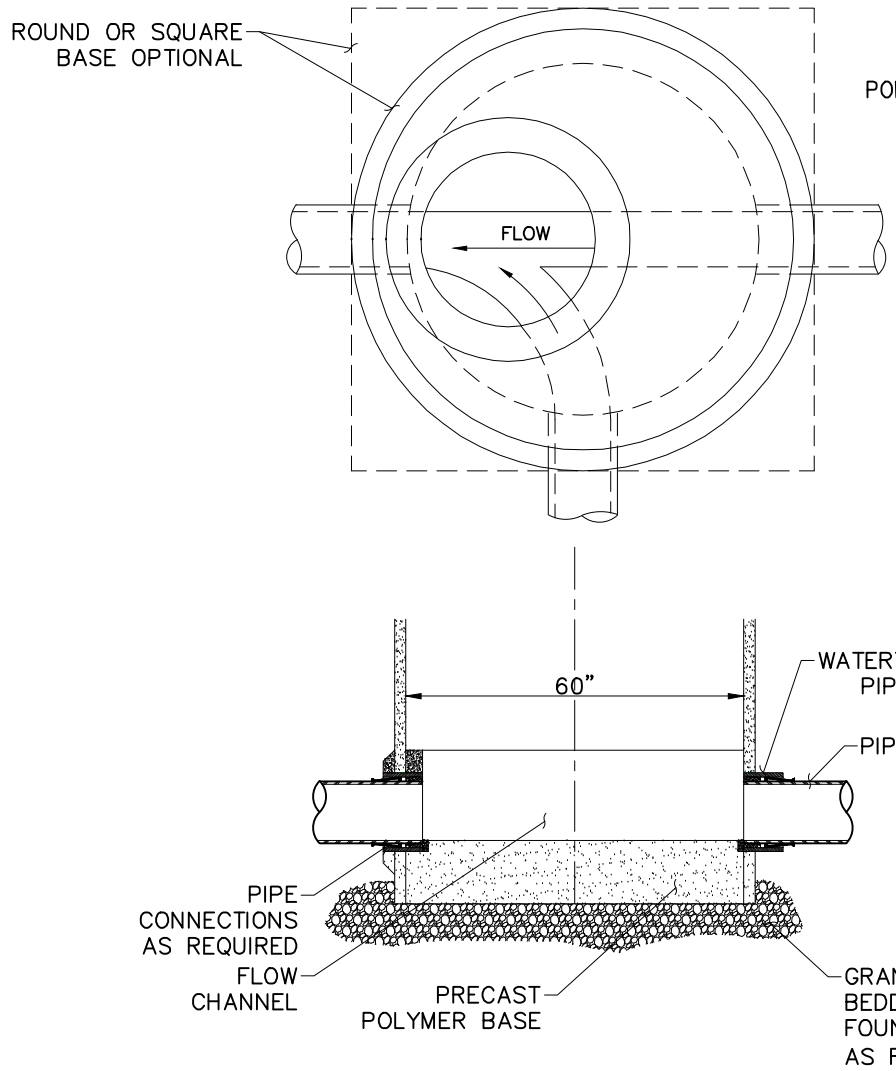
CHARLESTON ESTATES – UNIT 2
IMPROVEMENT PLANS
PAVING AND SEWER

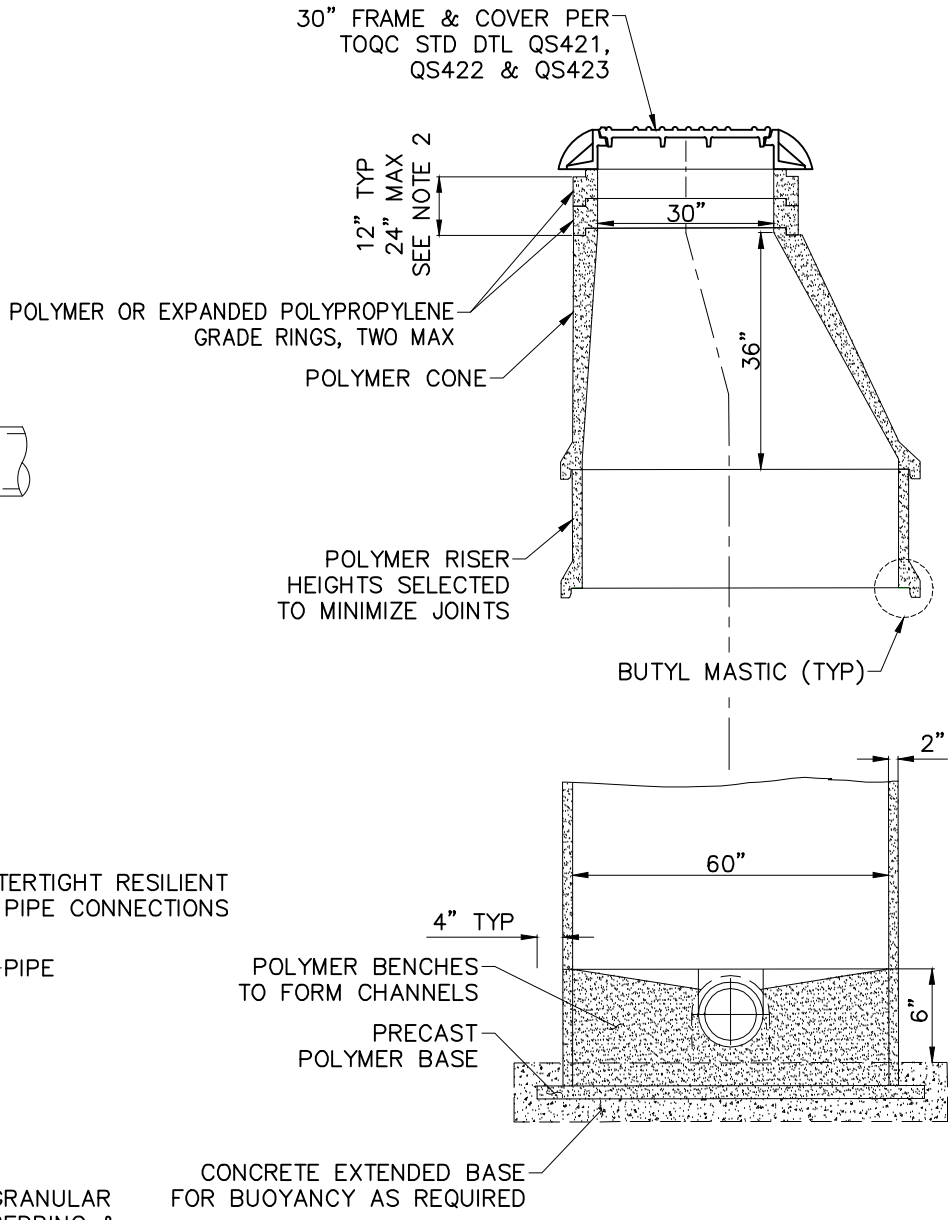
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
02081	CFM	SLF	MAG/DMF	21 of 56	P15

DETAIL NO.			REVISED:	DETAIL NO.
QS100e	TOWN OF QUEEN CREEK ARIZONA — STANDARD DETAIL	TYPICAL PLAN AND PROFILE SHEET FOR SUBDIVISIONS	04/30/13 DATE	QS100e

NOTES:

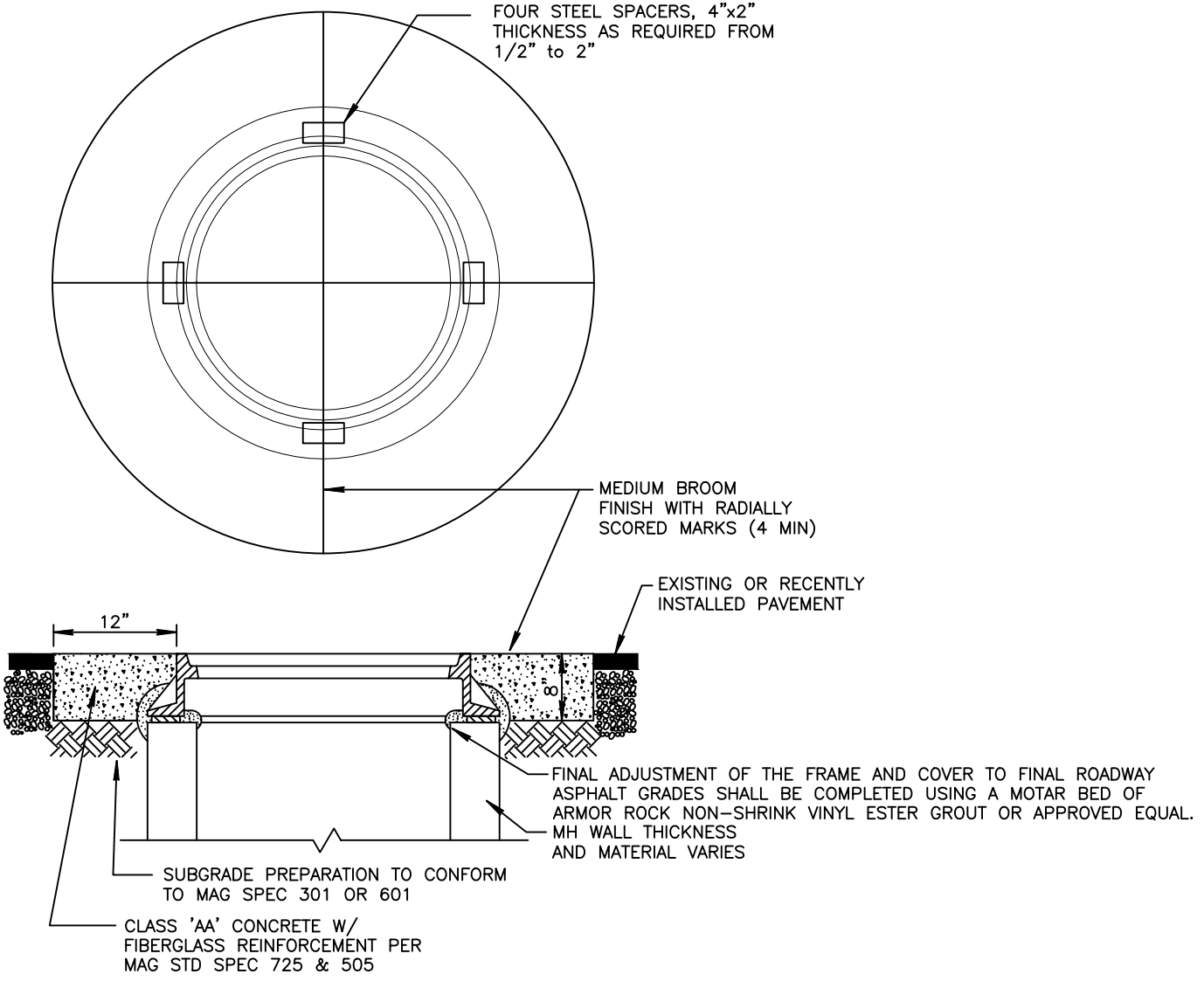
1. MH STEPS SHALL NOT BE INSTALLED.
2. THE TOP OF MANHOLE CONE SHALL BE INSTALLED 2–FEET BELOW FUTURE ROAD GRADE. TEMPORARY GRADE RINGS MAY BE STACKED GREATER THAN 24–INCHES AS APPROVED BY THE TOWN INSPECTOR.
3. CEMENTIOUS MATERIAL, GROUT, CEMENT, ETC. ARE NOT ALLOWED IN POLYMER MANHOLES.





DETAIL NO.			REVISED:	DETAIL NO.
QS420	STANDARD DETAIL	PRECAST SEWER MANHOLES	11/06/13 DATE	QS420

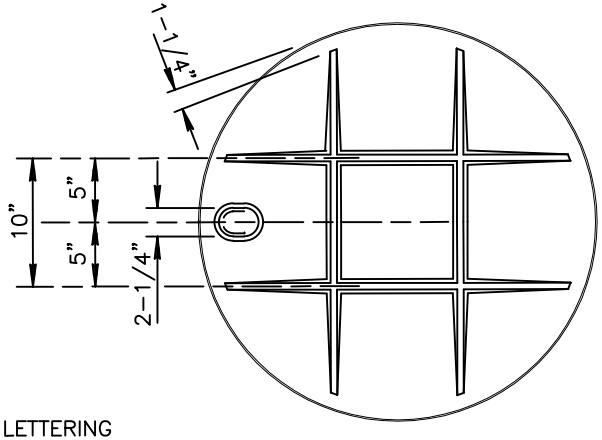
MH FRAME AND COVER PER TOQC
STD DTL QS422 & QS423



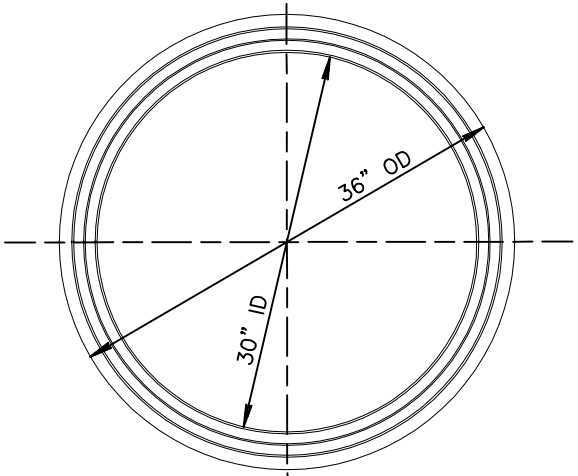
DETAIL NO.			REVISED:	DETAIL NO.
QS421	STANDARD DETAIL	SEWER MANHOLE COVER FRAME ADJUSTMENT	11/06/13 DATE	QS421

FOR COVER LETTERING
SEE NOTE ON TOQC STD
DTL QS423

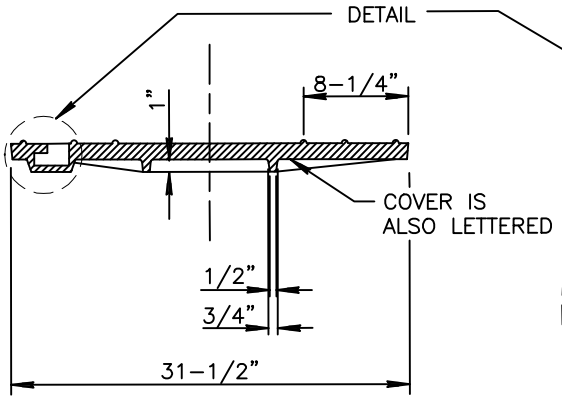
FACE OF COVER
CAST IRON



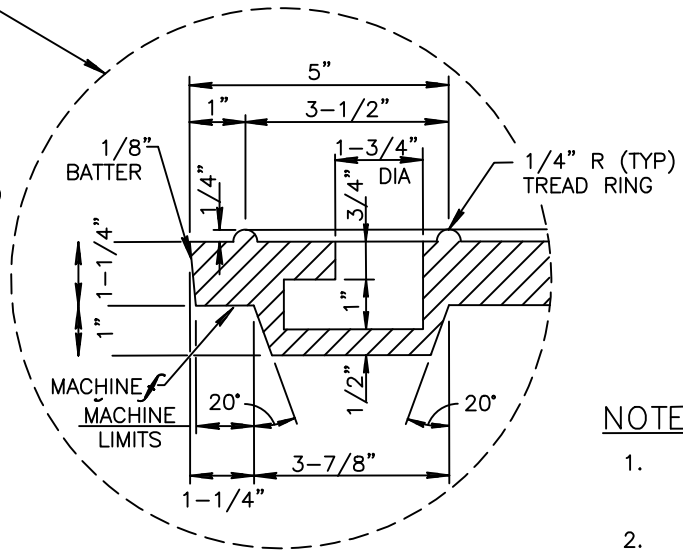
BACK OF COVER

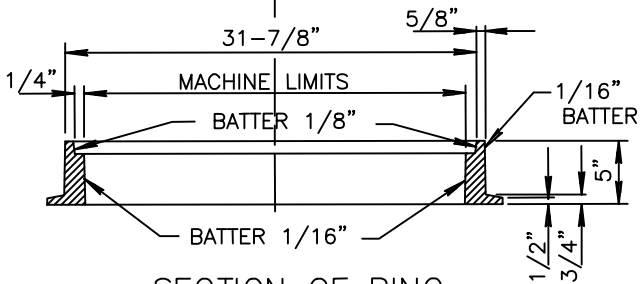


CAST IRON
MANHOLE RING



SECTION OF COVER
APPROX WEIGHT 276 LBS



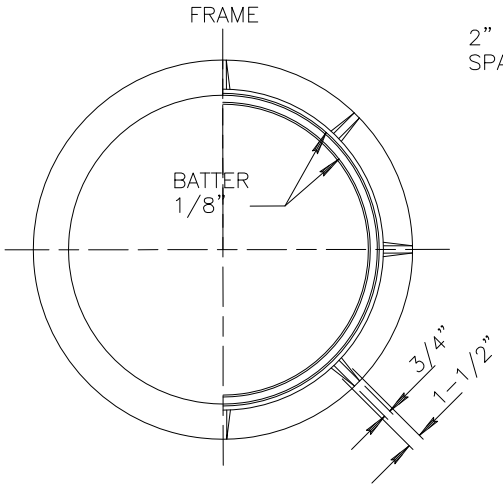


SECTION OF RING
APPROX WEIGHT 210 LBS

NOTES:

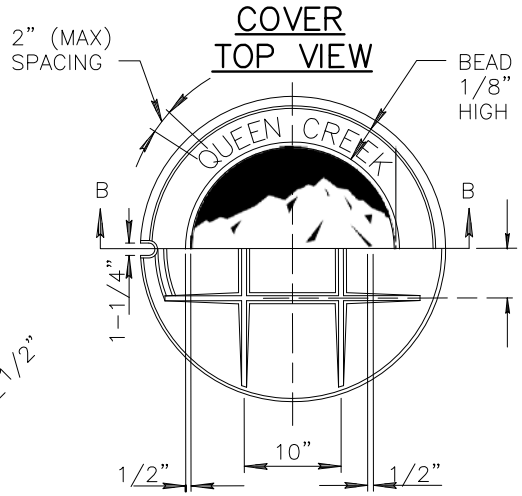
1. WEIGHT OF CASTING SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED.
2. CASTINGS SHALL CONFORM TO MAG SPEC 787.

DETAIL NO.			REVISED:	DETAIL NO.
QS422	STANDARD DETAIL	WATER TIGHT 30" MANHOLE FRAME AND COVER	12/22/11 DATE	QS422



BOTTOM VIEW – TOP VIEW

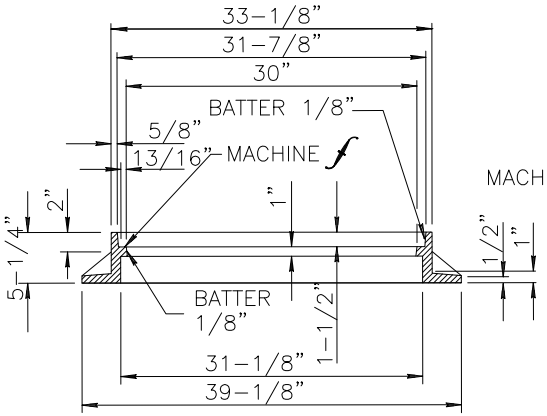
WT (CL 30) – 224 LBS
WT (CL 35) – 219 LBS



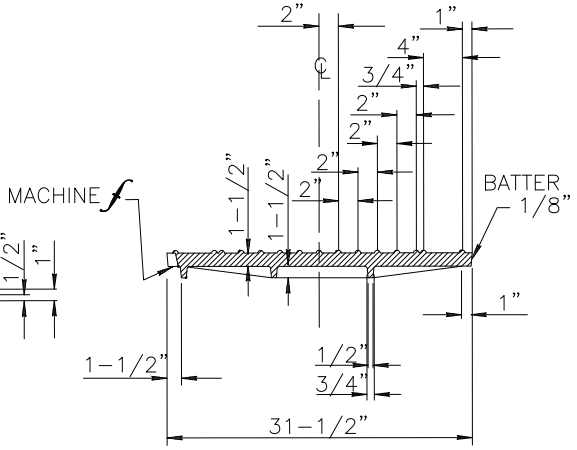
BOTTOM VIEW

WT (CL 30) – 324 LBS
WT (CL 35) – 207 LBS

30" MANHOLE FRAME AND COVER



SECTION OF FRAME

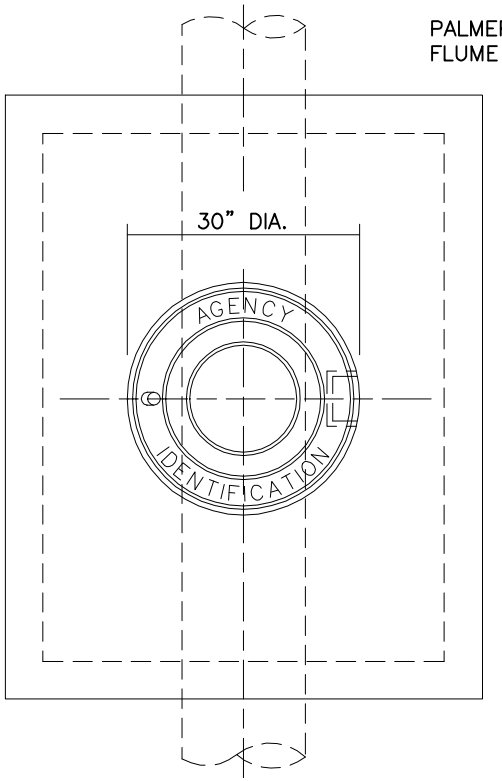


SECTION 'B–B' OF COVER

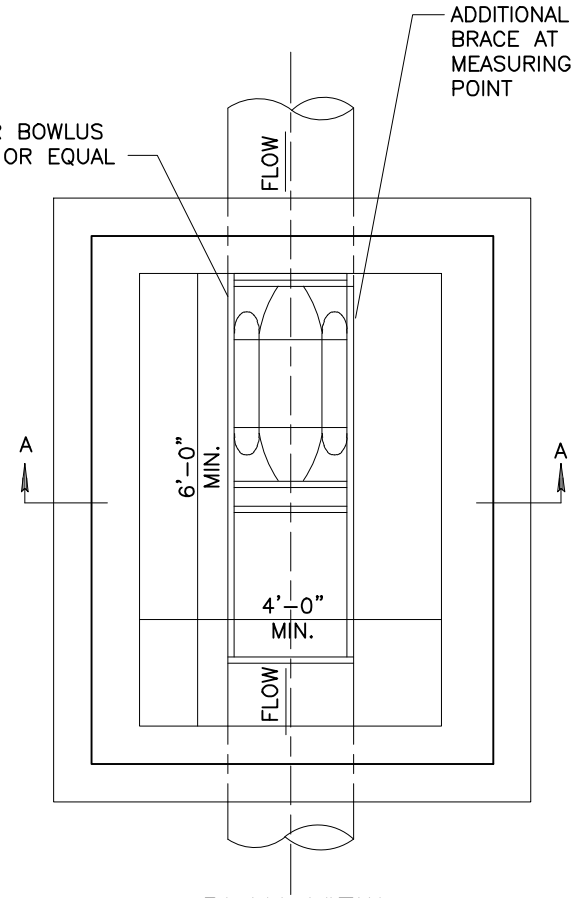
NOTES:

1. LETTERING ON MANHOLE COVER SHALL CONTAIN "QUEEN CREEK SANITARY SEWER". THE TOTAL WIDTH OF INDIVIDUAL LETTERS SHALL BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE LETTERING. THE LETTERS SHALL BE 2" IN HEIGHT AND RAISED 1/8" ABOVE THE LEVEL OF THE COVER. THE TYPE OF LETTERS SHALL BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% LASS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO MAG SPEC 787.
2. A SHORTENED FRAME MAY BE USED WHERE REQUIRED BY FIELD CONDITIONS. USE NEENAH #1296–R REVERSIBLE MANHOLE RING. TOTAL HEIGHT 4", WEIGHT ≈125 LBS.

DETAIL NO.			REVISED:	DETAIL NO.
QS423	STANDARD DETAIL	30" MANHOLE FRAME AND COVER	09/23/11 DATE	QS423

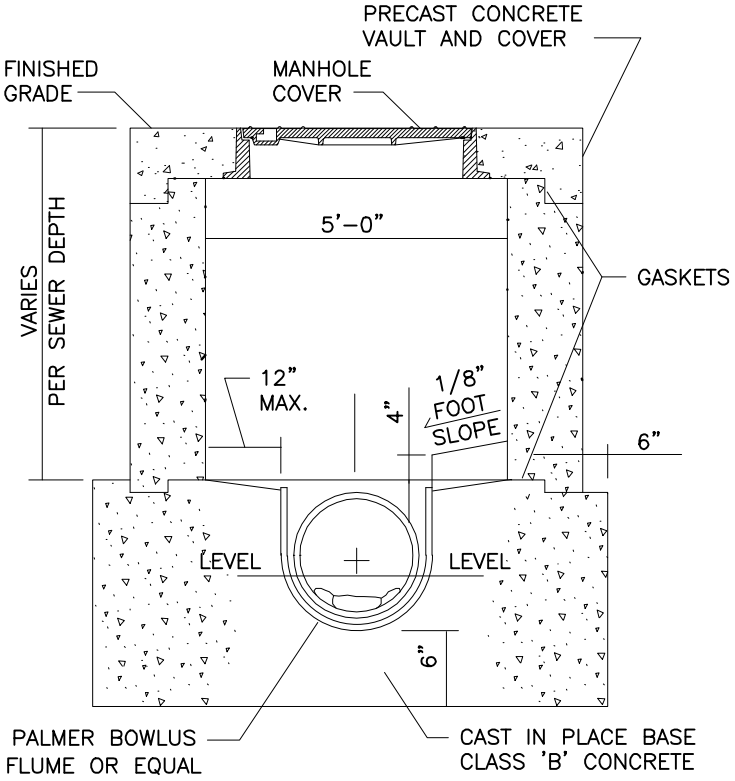


MANHOLE & COVER SLAB



PLAN VIEW

NOTE: WITH COVER REMOVED.



SECTION A–A

NOTE: SECTION SHOWN WITH COVER IN PLACE.

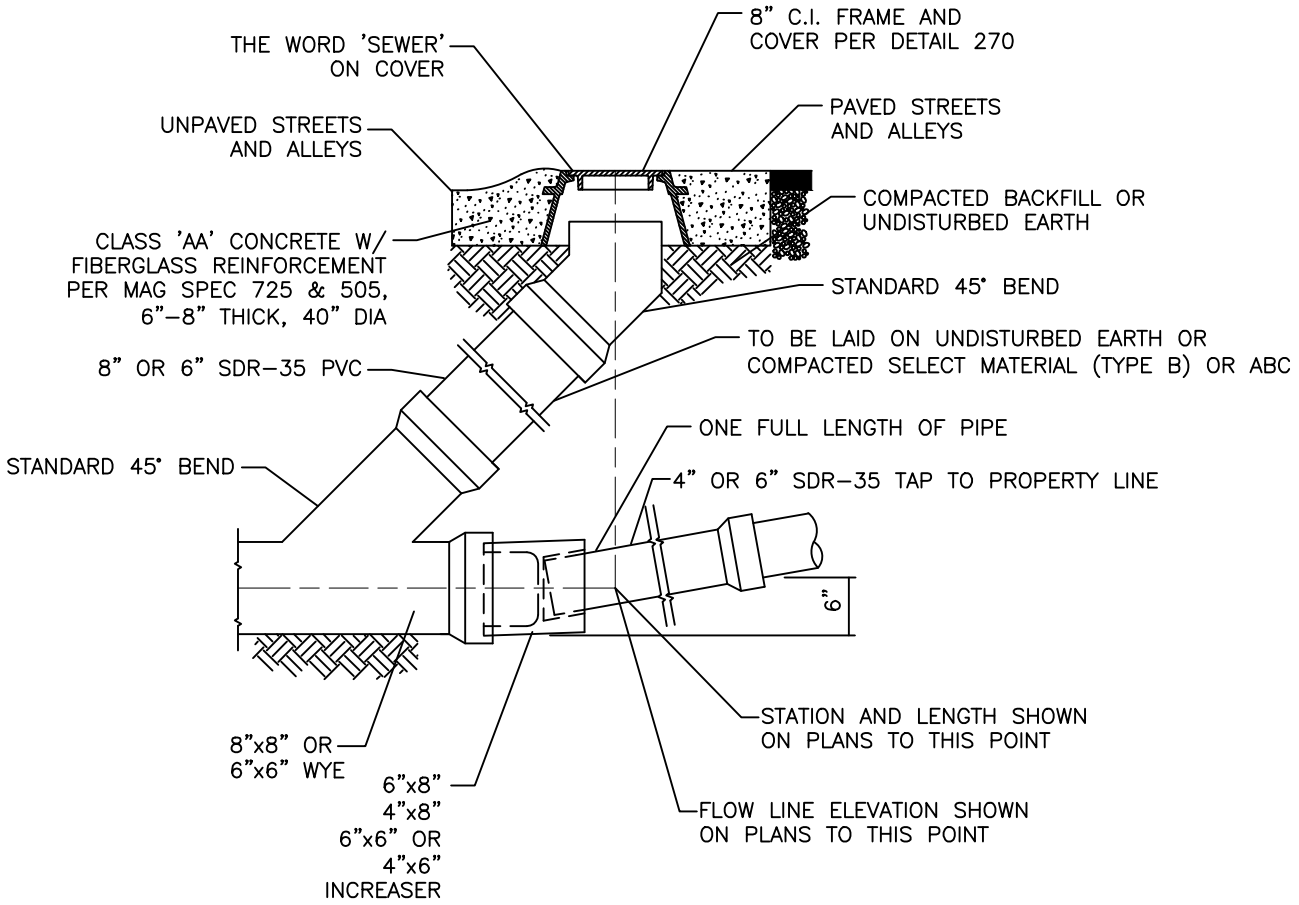
NOTES:

1. THIS CONTROL VAULT WITH MANHOLE AND COVER SHALL BE USED ON 6" AND 8" DIAMETER SEWER WITH FLOWS IN THE RANGE OF 40 TO 340 GPM.
2. VAULT TO BE CONSTRUCTED ON STRAIGHT RUN OF BUILDING SEWER. ACCESSIBLE AND SAFELY LOCATED ON THE OWNERS PROPERTY ADJACENT TO A PUBLIC RIGHT–OF–WAY.
3. THE PALMER BOWLUS FLUME SHALL BE INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS.
4. THE PRE–CAST CONCRETE VAULT SHALL BE RECTANGULAR WITH MINIMUM INSIDE DIMENSIONS OF 4" WIDE AND 6" LONG AND AT A DEPTH OF THE DESIGN OF THE BUILDING SEWER.
5. A SHOP DRAWING SHALL BE SUBMITTED TO THE CONTRACTING AGENCY FOR APPROVAL BEFORE INSTALLATION OF THE VAULT AND THE PALMER BOWLUS FLUME WILL BE ALLOWED.

DETAIL NO.		INDUSTRIAL WASTE CONTROL VAULT WITH MANHOLE	REVISED:	DETAIL NO.
QS424			09/23/11 DATE	QS424

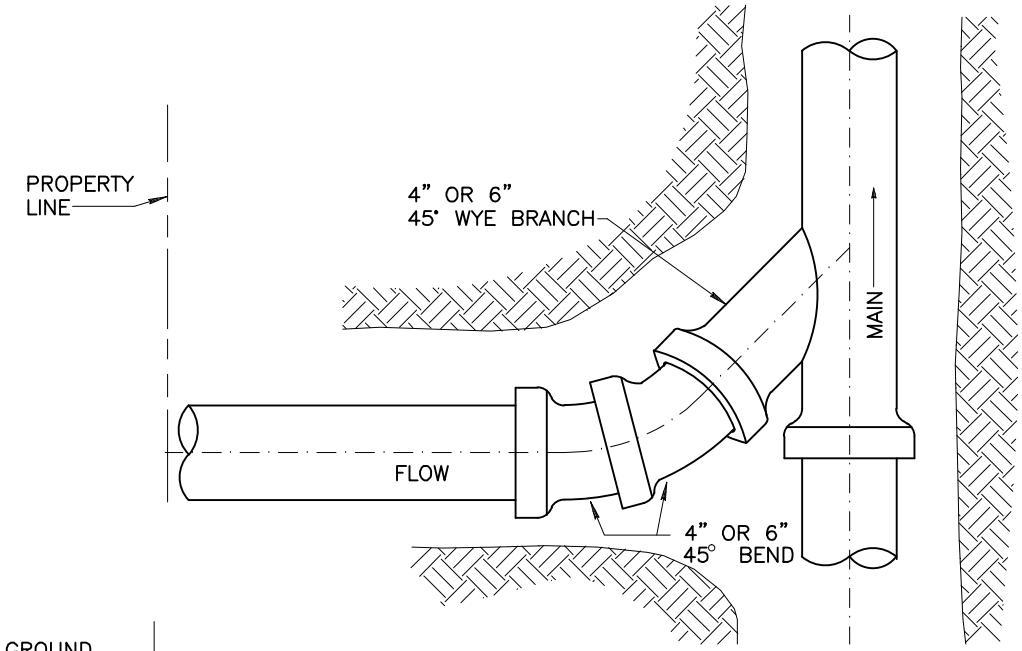
NOTE:

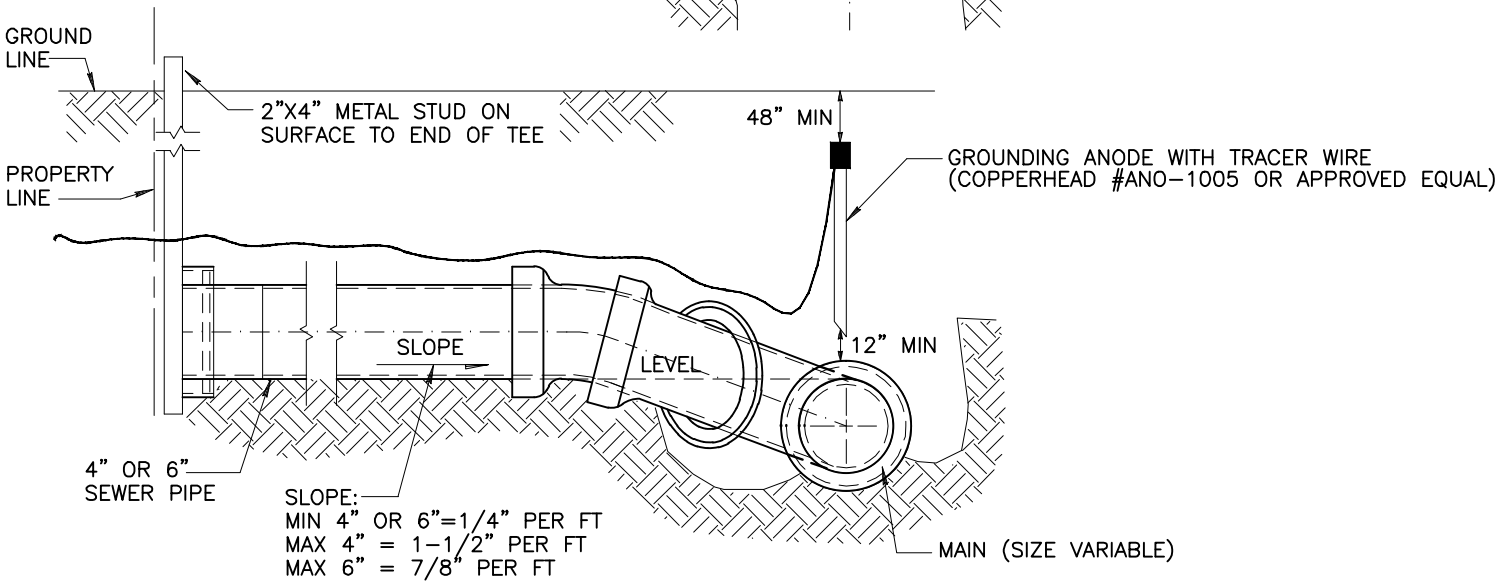
END OF SEWER TAP SHALL BE SEALED AND MARKED
IN ACCORDANCE WITH TOQC STD DTL QS430–1



SEWER TAP AT CLEANOUT

DETAIL NO.			REVISED:	DETAIL NO.
QS425	STANDARD DETAIL	SEWER CLEANOUT	01/11/12 DATE	QS425

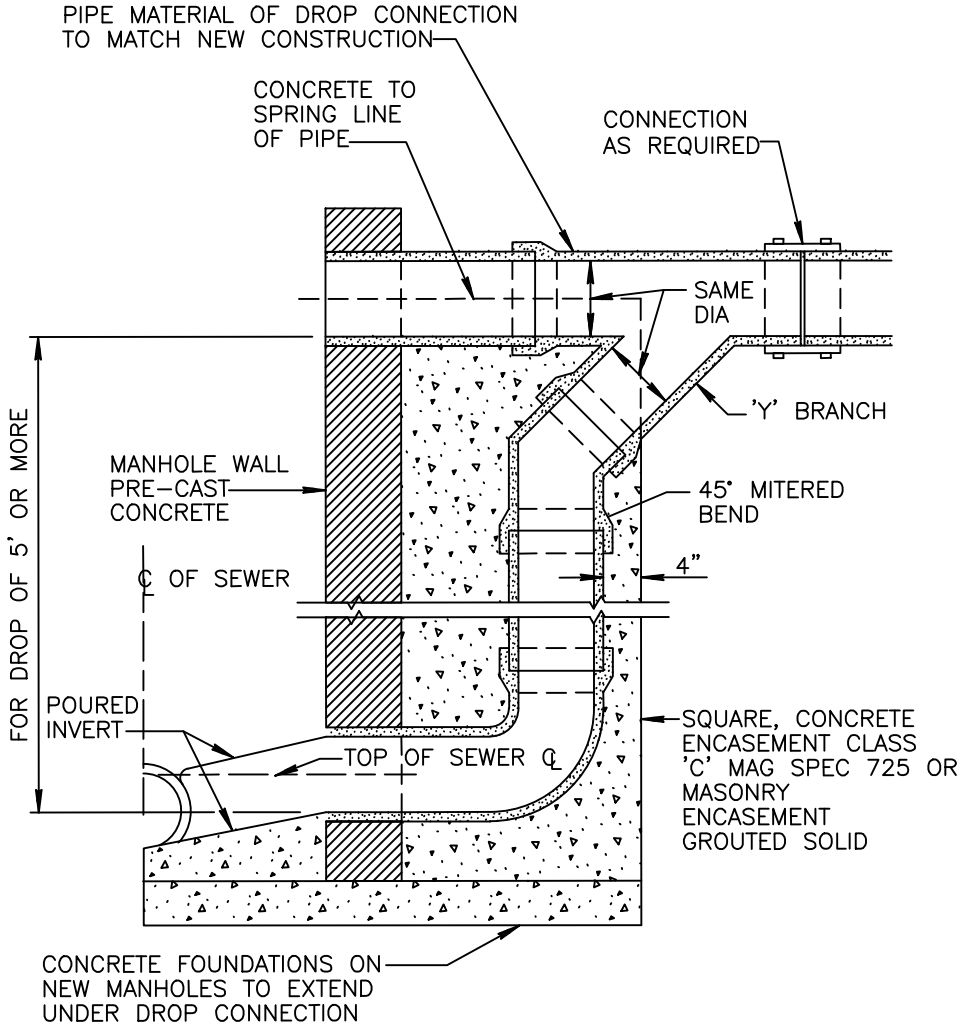




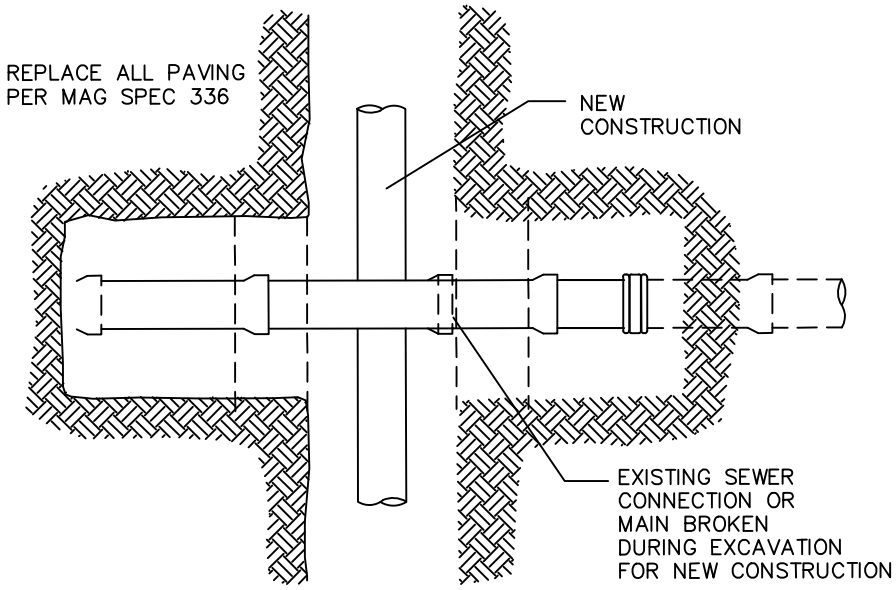
NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. LATERAL EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO EASEMENT LINE.
2. SIZE OF LATERAL SHALL BE DESIGNATED ON PLANS.
3. CONSTRUCT LATERAL AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.
4. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTINGS JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DEFLECTION.
5. END OF LATERAL SHALL BE SEALED AND MARKED AS NOTED.
6. WHERE LATERALS CROSS WATER MAINS, THE LATERAL SHALL CROSS UNDER THE WATER MAIN WITH 1' MINIMUM VERTICAL SEPARATION.

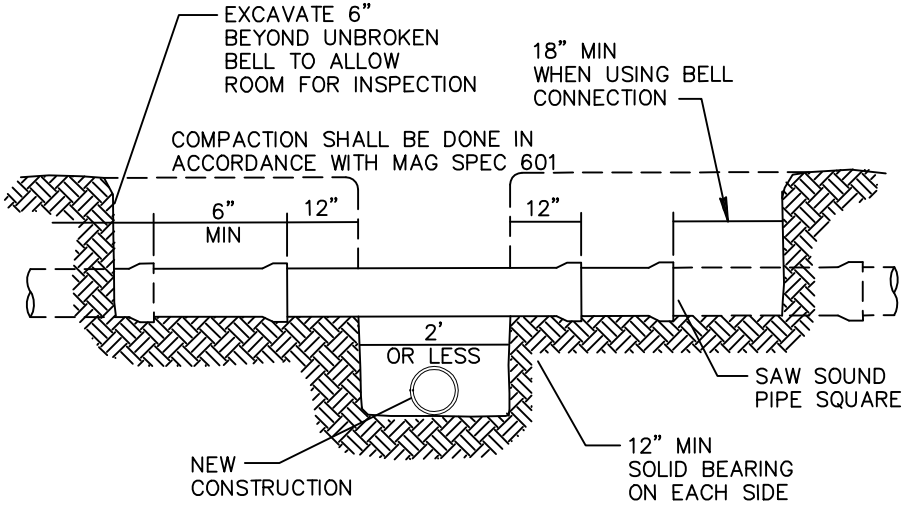
DETAIL NO.			REVISED:	DETAIL NO.
QS430	STANDARD DETAIL	SEWER SERVICE LATERAL	04/02/13 DATE	QS430



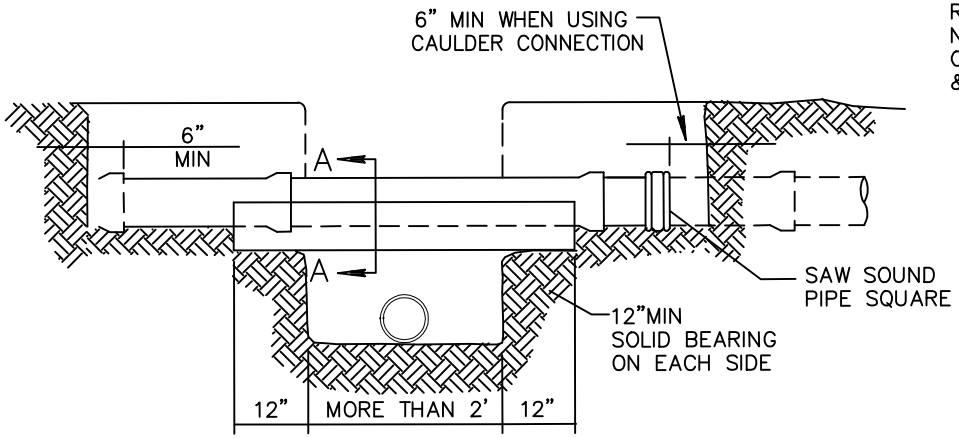
DETAIL NO.			REVISED:	DETAIL NO.
QS431	STANDARD DETAIL	DROP SEWER CONNECTIONS	04/09/13 DATE	QS431



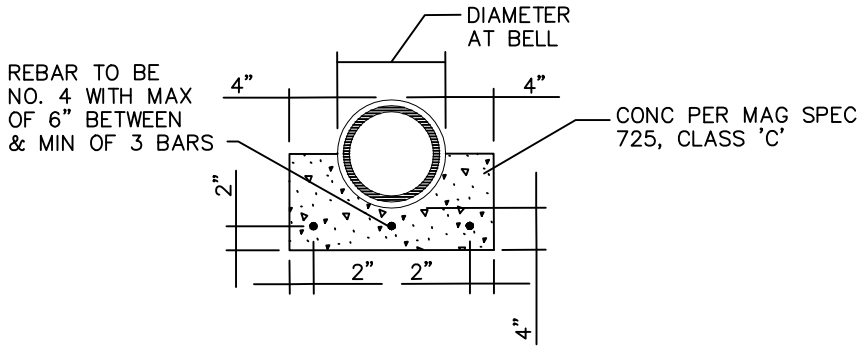
PLAN VIEW OF REPLACEMENT



REPLACEMENT WHEN NEW TRENCH
2' WIDE OR LESS



REPLACEMENT WHEN NEW TRENCH
MORE THAN 2' WIDE

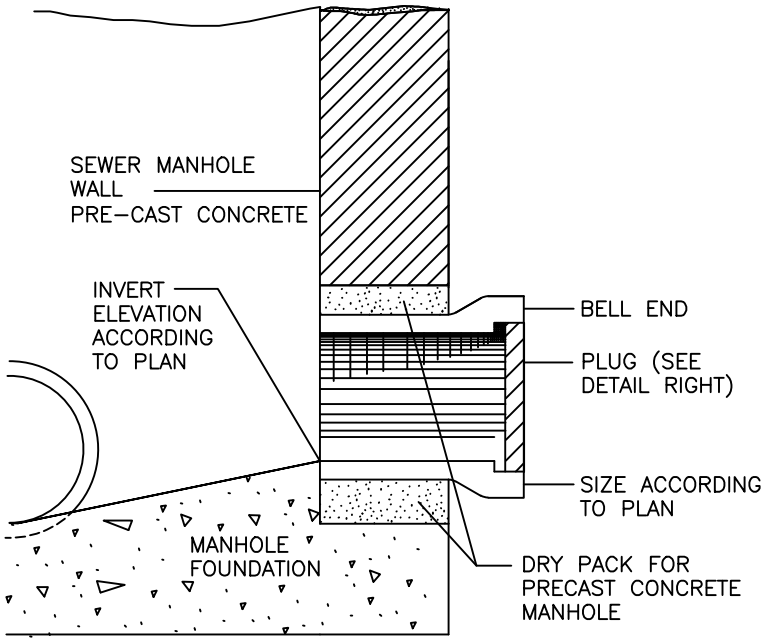


SECTION 'A–A'

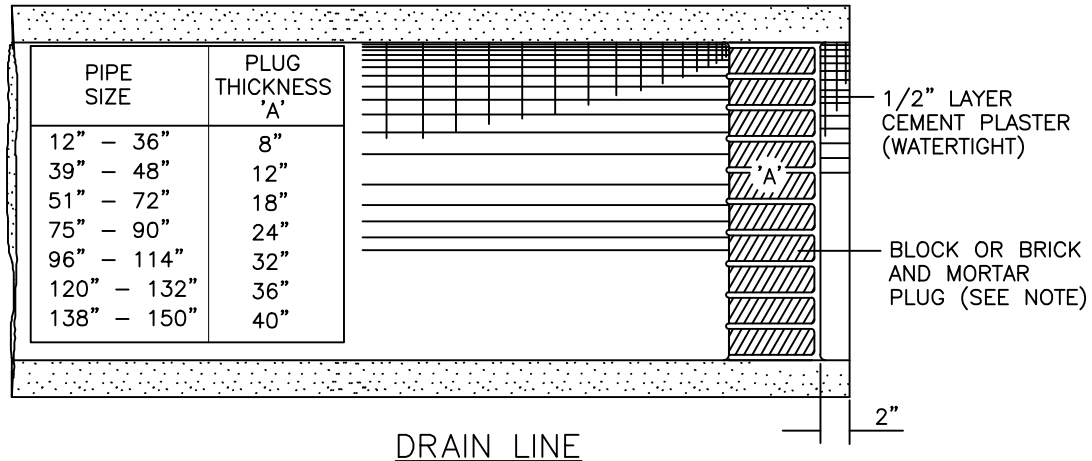
NOTES:

1. BROKEN PIPE SHALL BE REPLACED WITH A MINIMUM OF ONE FULL JOINT AND TWO SHORT LENGTHS WITH UNBROKEN BELLS. CONSTRUCTION AND JOINTS SHALL BE MADE AS PER MAG SPEC 615.
2. PRESSURE RETESTING REQUIRED.

DETAIL NO.			REVISED:	DETAIL NO.
QS440	STANDARD DETAIL	BROKEN SEWER LINE REPLACEMENT	09/26/11 DATE	QS440



TYPICAL STUB OUT

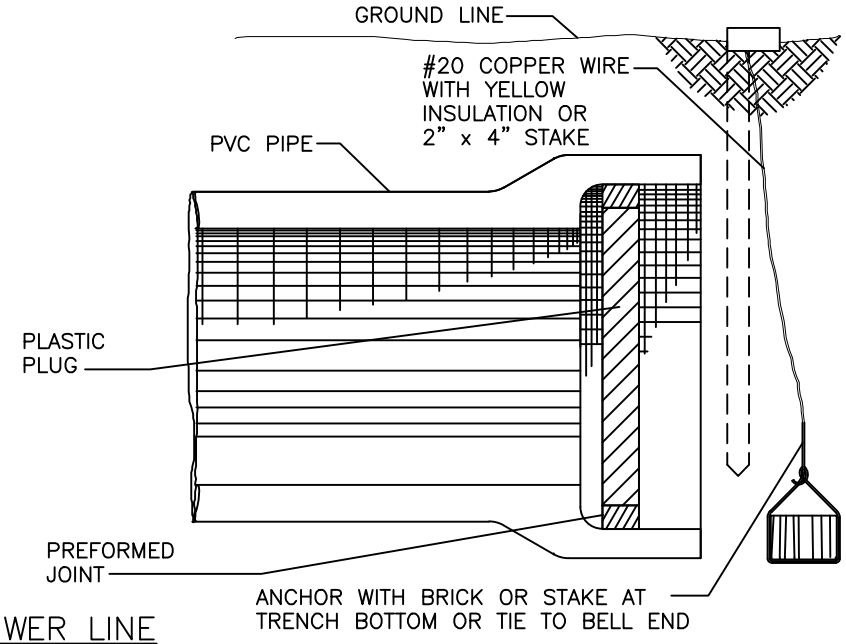


PIPE SIZE	PLUG THICKNESS 'A'
12" – 36"	8"
39" – 48"	12"
51" – 72"	18"
75" – 90"	24"
96" – 114"	32"
120" – 132"	36"
138" – 150"	40"

DRAIN LINE

NOTES:

1. NOTE: COMPACT SOIL AT END OF PIPE TO 95% OF MAXIMUM DENSITY.
2. IF DEPTH OF COVER IS LESS THAN 5' OR GREATER THAN 10' INCREASE PLUG THICKNESS A MIN. OF 4".

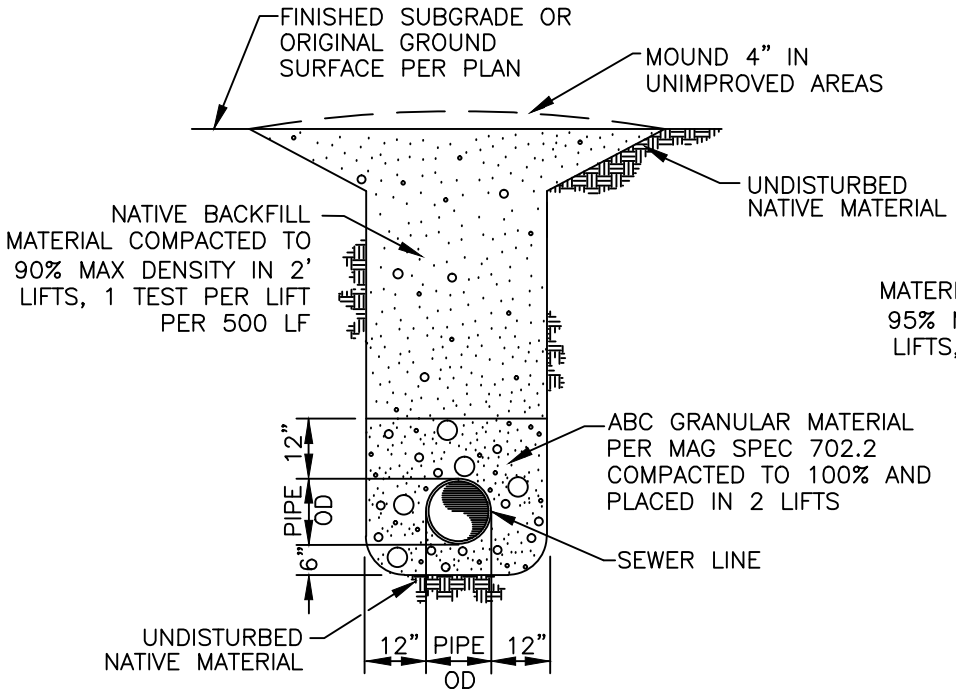


SEWER LINE

DETAIL NO.			REVISED:	DETAIL NO.
QS441	STANDARD DETAIL	STUB OUT AND PLUGS	09/26/11 DATE	QS441

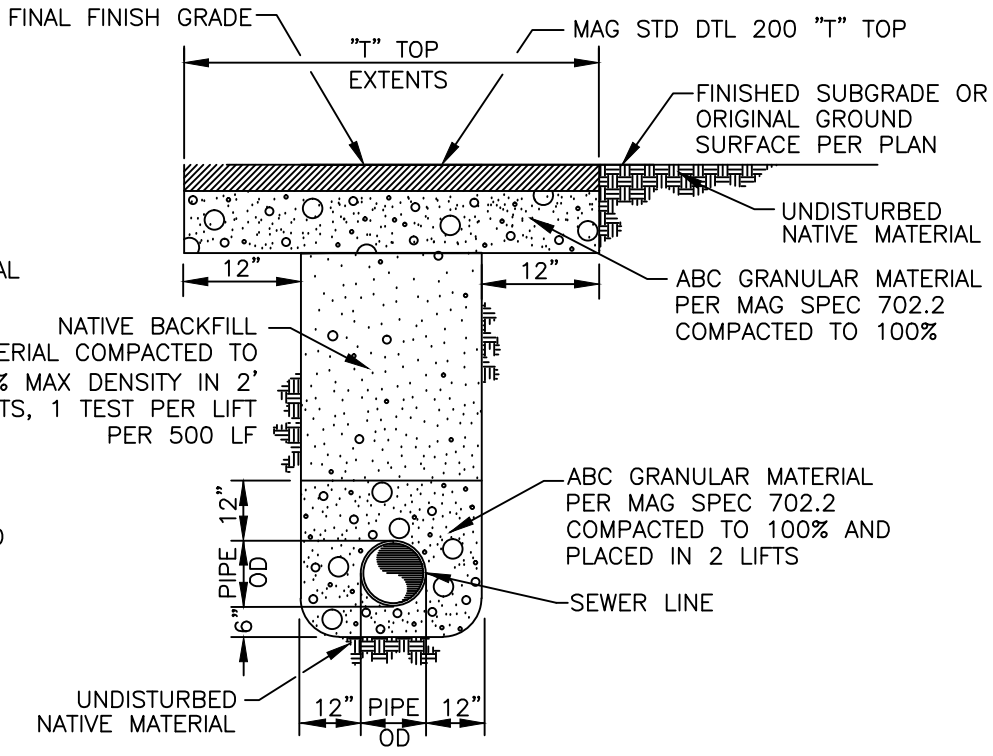
NOTES:

1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW OD OF PIPE AND REPLACED WITH CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2.
2. MINIMUM COVER SHALL BE MEASURED FROM THE EXISTING OR PROPOSED GRADE, OR FROM NATURAL GROUND, WHICHEVER IS DEEPER.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.
4. PVC PIPE BEDDING SHALL BE CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2
5. CONTRACTOR SHALL EXCAVATE REQUIRED TRENCH TO PREVENT CAVE-IN AND PROVIDE TRENCH SIDEWALL STABILITY. TRENCH EXCAVATION SHALL INCLUDE ALL DEWATERING, SHEETING AND SHORING NECESSARY TO INSTALL SEWER LINE.



GRAVITY SEWER TRENCH

(IN UNIMPROVED AREAS)

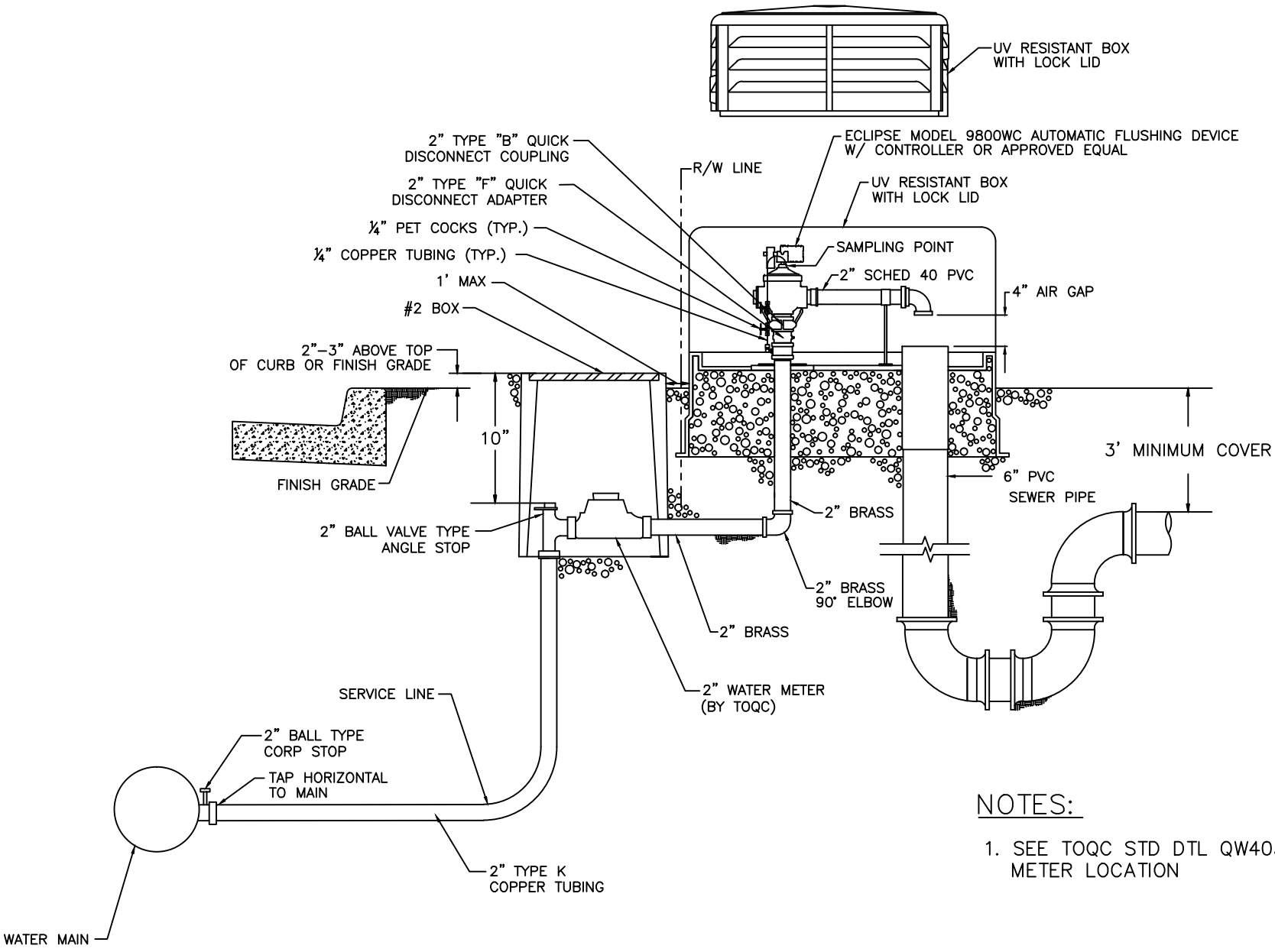


* OR AS APPROVED BY THE INSPECTOR

GRAVITY SEWER TRENCH

(IN PAVED AREAS)

DETAIL NO.			REVISED:	DETAIL NO.
QS442	STANDARD DETAIL	TYPICAL SEWER LINE TRENCH	01/31/12 DATE	QS442

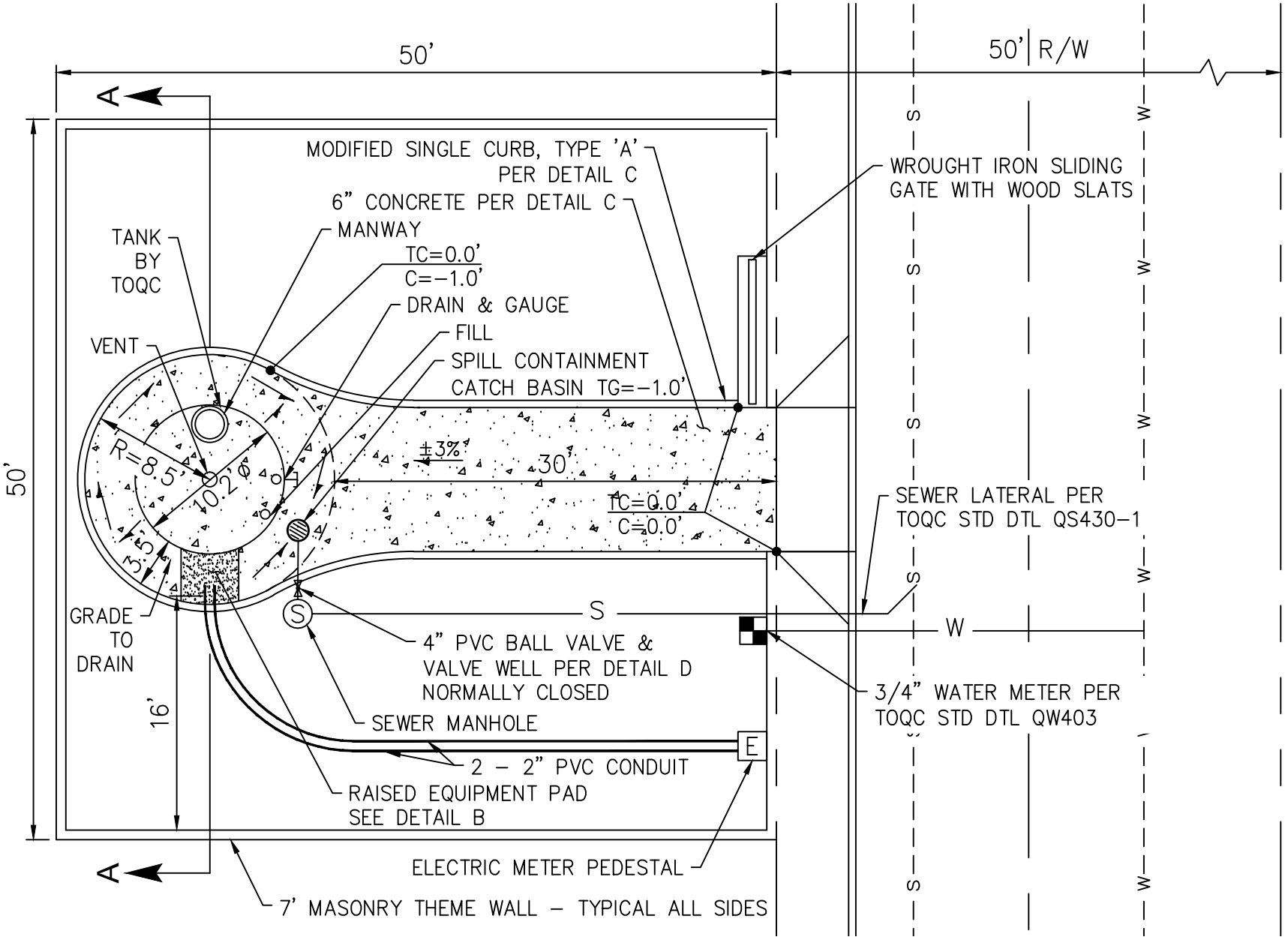


NOTES:

1. SEE TOQC STD DTL QW403 FOR WATER METER LOCATION

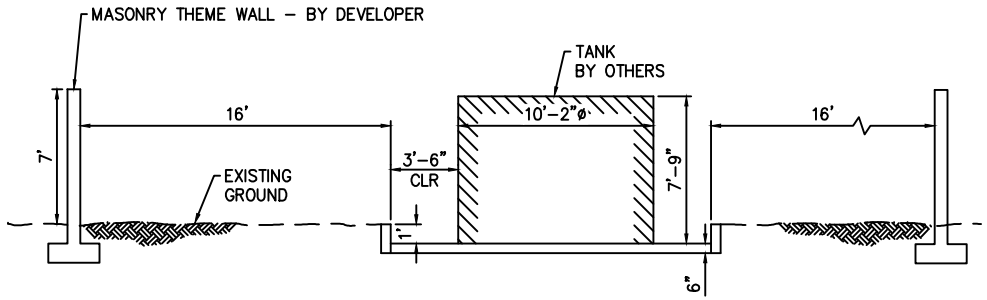
DETAIL NO.			REVISED:	DETAIL NO.
QS443	STANDARD DETAIL	SEWER AUTOMATIC FLUSHING DEVICE	09/26/11 DATE	QS443

P:\TOQC_Utilities\03408 2010–2012\PO #014 – Water Design and Construction Standards Manual Update\Dwg\Sheets\QS443 – Sewer Automatic Flushing Device.dwg Nov 06, 2013 4:11pm hpowell

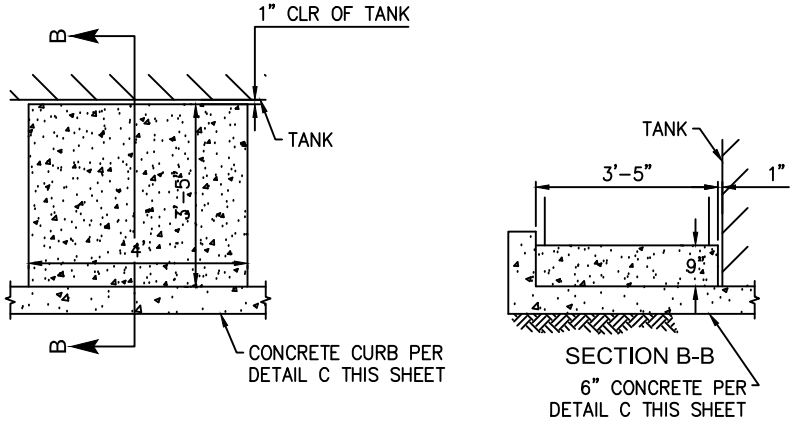


DETAIL NO.			REVISED:	DETAIL NO.
QS444-1	STANDARD DETAIL	ODOR TANK STANDARD SITE PLAN	01/13/12 DATE	QS444-1

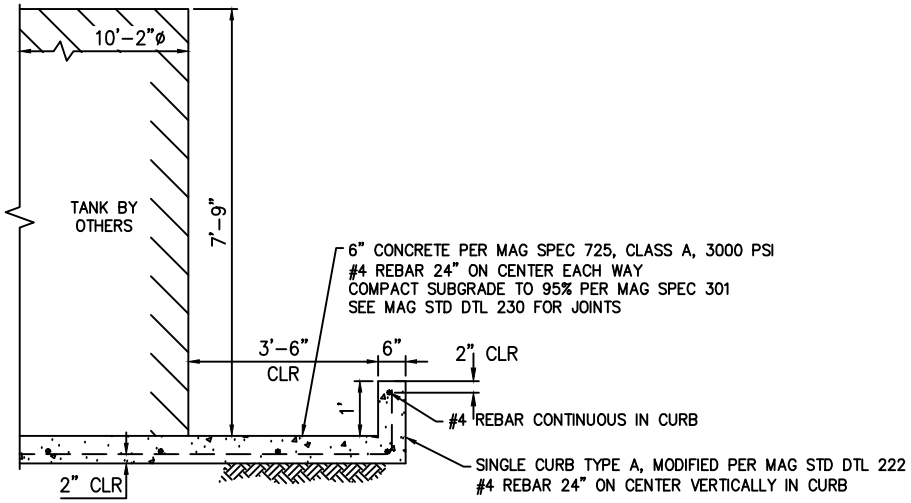
P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QS444-2 - Standard Odor Tank.dwg Nov 06, 2013 4:11pm hpowell



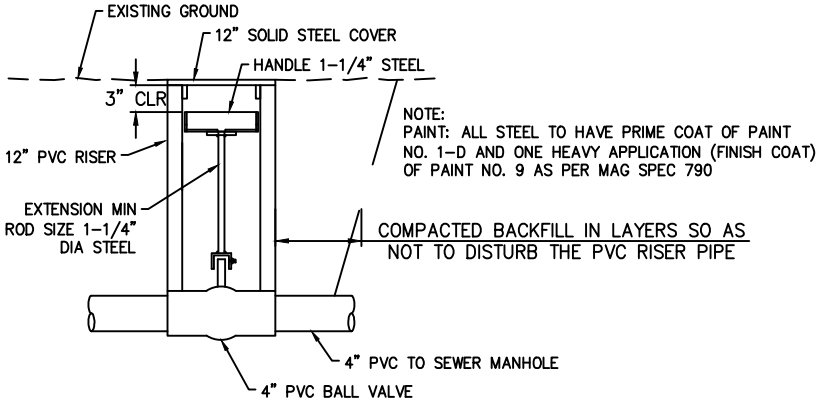
A ~ SECTION - A-A
NOT TO SCALE



B ~ DETAIL - RAISED EQUIPMENT PAD
NOT TO SCALE



C ~ DETAIL - CONCRETE & CURB
NOT TO SCALE



D ~ DETAIL - 12" VALVE BOX
NOT TO SCALE

DETAIL NO.			REVISED:	DETAIL NO.
QS444–2	STANDARD DETAIL	ODOR TANK STANDARD DETAILS	01/13/12 DATE	QS444–2

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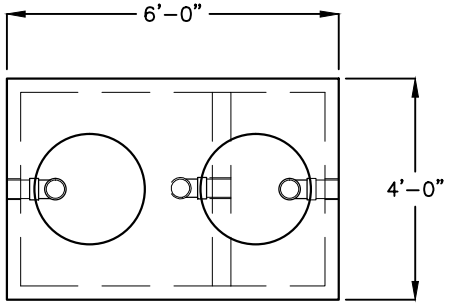
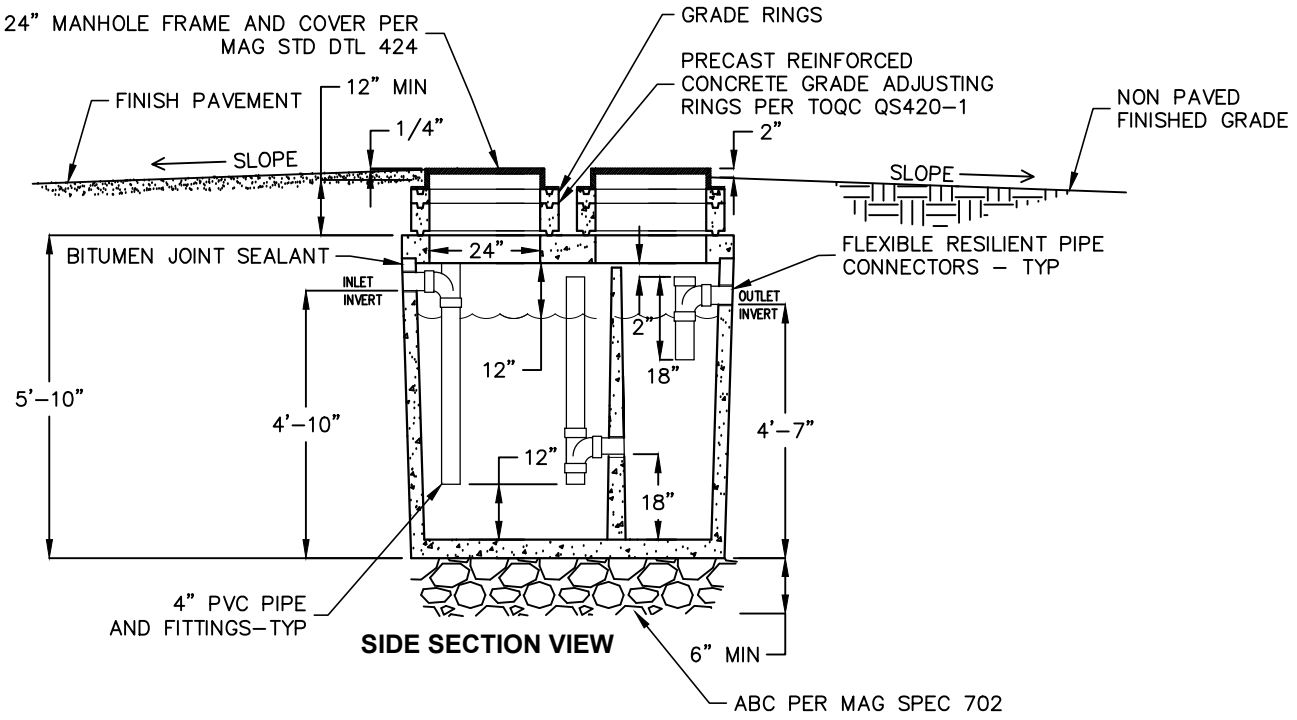


TOP VIEW
(COVERS & RINGS REMOVED)

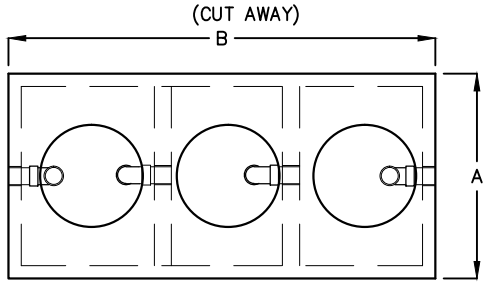
NOTES:

1. SLOPE FINISHED GRADE AWAY FROM MANHOLES TO PREVENT PONDING WATER ON MANHOLES
2. INSTALL 5 FEET OUTSIDE OF BUILDING MINIMUM
3. TANK SHALL BE MONOLITHIC PRECAST. NO JOINTS ALLOWED BELOW WATER LINE
4. PRECAST TANK REINFORCEMENT SHALL BE DESIGNED FOR H-20 LOADING AND SITE SOIL CONDITIONS. SUBMIT STAMPED STRUCTURAL CALCULATIONS TO TOWN FOR APPROVAL
5. EXCAVATION SHALL BE A MINIMUM OF 12" GREATER THAN TANK DIMENSIONS. EXCAVATION AND BACKFILL SHALL BE PER MAG SPEC 206

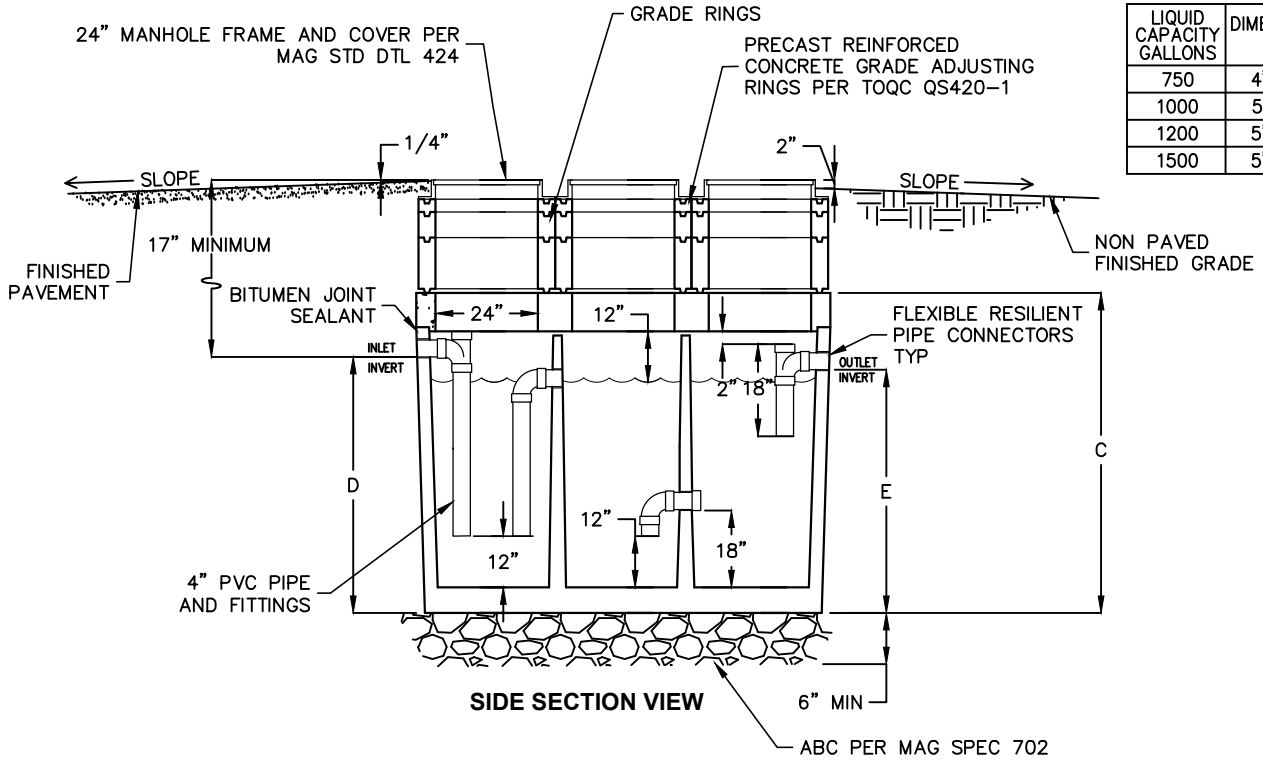


SIDE SECTION VIEW

DETAIL NO.			REVISED:	DETAIL NO.
QS445-1	STANDARD DETAIL	500 GALLON GREASE INTERCEPTOR	03/22/12 DATE	QS445-1



TOP VIEW
(COVERS & RINGS REMOVED)



SIDE SECTION VIEW

NOTES:

1. SLOPE FINISHED GRADE AWAY FROM MANHOLES TO PREVENT PONDING WATER ON MANHOLES
2. INSTALL 5 FEET OUTSIDE OF BUILDING MINIMUM
3. TANK SHALL BE MONOLITHIC PRECAST. NO JOINTS ALLOWED BELOW WATER LINE
4. PRECAST TANK REINFORCEMENT SHALL BE DESIGNED FOR H-20 LOADING AND SITE SOIL CONDITIONS. SUBMIT STAMPED STRUCTURAL CALCULATIONS TO TOWN FOR APPROVAL
5. EXCAVATION SHALL BE A MINIMUM OF 12" GREATER THAN TANK DIMENSIONS. EXCAVATION AND BACKFILL SHALL BE PER MAG SPEC 206

LIQUID CAPACITY GALLONS	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E
750	4'-0"	8'-1"	6'-3"	5'-0"	4'-9"
1000	5'-1"	8'-2"	6'-3"	5'-0"	4'-9"
1200	5'-9"	8'-6"	6'-6"	5'-0"	4'-9"
1500	5'-7"	10'-8"	6'-3"	5'-0"	4'-9"

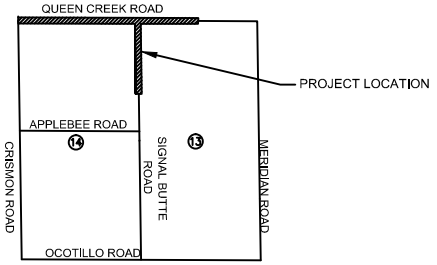
DETAIL NO.			REVISED:	DETAIL NO.
QS445-2	STANDARD DETAIL	750-1500 GALLON GREASE INTERCEPTOR	03/22/12 DATE	QS445-2

TOWN OF QUEEN CREEK UTILITY SERVICES DEPT

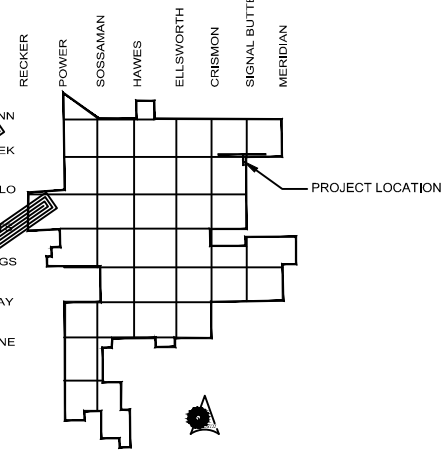
QUEEN CREEK ROAD IRRIGATION LINE EXTENSION

LEGAL DESCRIPTION

A PORTION OF SECTIONS 13 AND 14, TOWNSHIP 2 SOUTH, RANGE 7 EAST, GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, AZ



VICINITY MAP
NOT TO SCALE



TOQC SERVICE AREA
NOT TO SCALE

UTILITY LIST

DESCRIPTION	REPRESENTITIVE	PHONE	DATE PLANS SUBMITTED
SRP	RICH SEMINARA	602-236-0891	
QWEST	JOHN ODELL	602-630-0496	
SW GAS	EDWIN LONGWELL	602-484-5385	
COX CABLE	SCOTT GUSSO	623-322-7210	
TOWN OF QUEEN CREEK UTILITY DEPT	MIKE JOHNSON	480-987-3452	
QUEEN CREEK IRRIGATION COMPANY	DEAN GRIFFITH	480-987-3002	

OWNER

TOWN OF QUEEN CREEK
22350 S. ELLSWORTH RD.
QUEEN CREEK, AZ. 85242
TELEPHONE: (480) 358-3000
FAX: (480) 358-3133
CONTACT: GREG HOMOL

ENGINEER

SUNRISE ENGINEERING, INC.
2152 S. VINEYARD, SUITE 123
MESA, AZ. 85210
TELEPHONE: (480) 768-8600
FAX: (480) 768-8609
CONTACT: RICKY M HOLSTON, P.E.

APPROVALS

MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT. — DATE

TOWN OF QUEEN CREEK - UTILITY SERVICES DEPARTMENT DIRECTOR — DATE

TOWN OF QUEEN CREEK - TOWN ENGINEER — DATE

BASIS OF BEARING

N 00°03'58" W BETWEEN THE NORTHWEST CORNER OF SECTION 14 AND THE NORTH 1/4 CORNER OF SECTION 14 OF TOWNSHIP 2S RANGE 7E OF THE GILA AND SALT RIVER MERIDIAN

BENCHMARK

THE NORTH QUARTER CORNER OF SECTION 13 TOWNSHIP 2 SOUTH RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN BEING AN ALUMINIUM CAP WITH AN ELEVATION OF 1442.60 NAVD 88.

QUANTITIES

ITEM	QUANTITY
12" SDR 51 PVC PIPE	2,663 LF
12" GATE VALVE	1 EA
4" WATERMAN AIR VENT	4 EA
DUAL IRRIGATION SERVICE	12 EA
SINGLE IRRIGATION SERVICE	2 EA

SHEET INDEX

"AS-BUILT" CERTIFICATION

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

REGISTERED PRO ENG

DATE

811 Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

CIRCLE G

QUEEN CREEK ROAD
IRRIGATION LINE EXTENSION

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
01243	DMF	MAG		1 of 14	COV

P:\TOQC_Utilities\03408 2010-2012\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QI900a - Typical Irrigation Cover Sheet.dwg Nov 06, 2013 4:14pm hpowell

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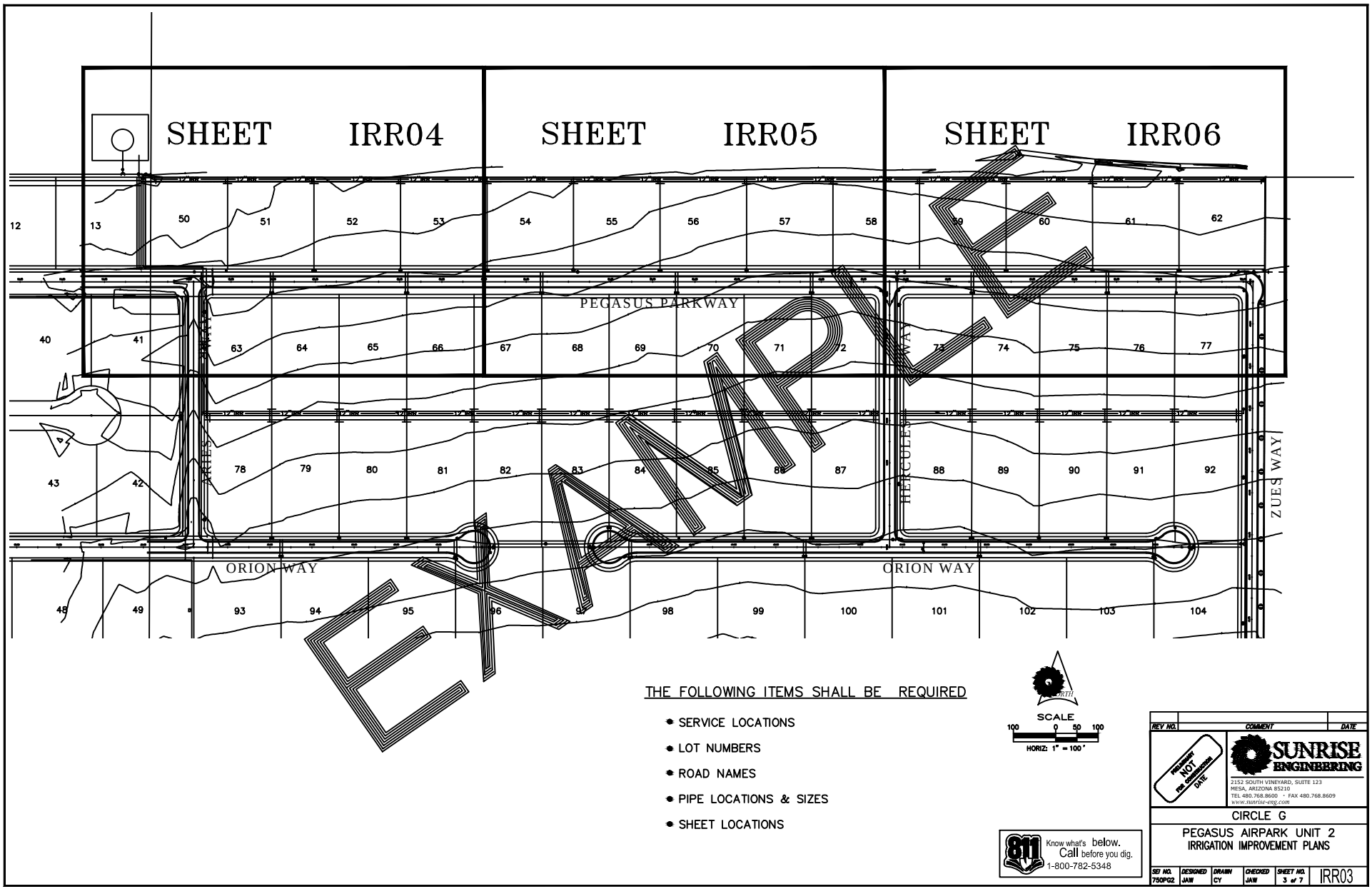
DETAIL NO.			REVISED:	DETAIL NO.
QI900a	STANDARD DETAIL	TYPICAL IRRIGATION COVER SHEET	04/30/13 DATE	QI900a



THE FOLLOWING ITEMS SHALL BE REQUIRED

- SERVICE LOCATIONS
- LOT NUMBERS
- ROAD NAMES
- PIPE LOCATIONS & SIZES
- SHEET LOCATIONS

SCALE
100 0 50 100
HORIZ: 1" = 100'

Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 · FAX 480.768.8609
www.sunrise-eng.com

CIRCLE G

PEGASUS AIRPARK UNIT 2
IRRIGATION IMPROVEMENT PLANS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
750PG2	JAW	CY	JAW	3 of 7	IRR03

DETAIL NO.			DETAIL NO.
QI900b	STANDARD DETAIL	TYPICAL INDEX OF SHEETS	QI900b

TOWN OF QUEEN CREEK ARIZONA

REVISED: 04/30/13 DATE

TOWN OF QUEEN CREEK WATER GENERAL NOTES

1. ALL WORK, TESTING AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE TOWN OF QUEEN CREEK WATER DEPARTMENT DESIGN AND CONSTRUCTION STANDARDS MANUAL. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH STANDARDS AND DETAILS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE. THE TOWN OF QUEEN CREEK WATER DEPARTMENT REPRESENTATIVE SHALL HAVE FINAL AUTHORITY ON ALL IMPROVEMENTS REGARDLESS OF THE PLANS AND/OR SPECIFICATIONS.
2. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH DEPARTMENT REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE DEPARTMENT FROM REQUIRING CORRECTION OF ERRORS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.
3. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING PERMITS AND RENEWAL OF LAPSED PERMITS.
5. THE WATER DEPARTMENT APPROVAL IS VALID FOR A PERIOD OF ONE YEAR. CONSTRUCTION PERMITS SHALL BE OBTAINED DURING THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR REVIEW AND APPROVAL.
6. AN APPROVED SET OF PLANS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
7. DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL PERMANENT AND TEMPORARY EASEMENTS PRIOR TO BEGINNING CONSTRUCTION.
8. PRIVATE ON-SITE WATER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISION OF THE UNIFORM PLUMBING CODE AND THE LATEST REVISION OF THE UNIFORM FIRE CODE.
9. ENGINEER CERTIFIES THAT HE HAS CONTACTED ALL INTERESTED UTILITY COMPANIES AND HAS TRANSFERRED ALL EXISTING AND/OR PROPOSED UTILITY LINES AND RELATED INFORMATION ONTO THESE PLANS.
10. THE ENGINEER SHALL CERTIFY THAT ALL WATER IMPROVEMENTS HAVE BEEN INSTALLED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE APPROVED PLANS.
11. THE ENGINEER SHALL CERTIFY THAT THE MINIMUM HORIZONTAL AND VERTICAL SEPARATION BETWEEN UTILITIES HAS BEEN MAINTAINED AS REQUIRED BY LAW OR POLICY.
12. THE CONTRACTOR SHALL ARRANGE TO PROVIDE ALL CONSTRUCTION STAKING REQUIRED FOR THE PROJECT.
13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE RELOCATION OF ALL UTILITIES, POWER POLES, IRRIGATION DRY-UPS, REMOVALS BY OTHERS, ETC.
14. ALL FRAMES, COVERS, VALVE BOXES, MANHOLES, ETC. SHALL BE INSTALLED TO FINISH GRADE OR SHALL BE ADJUSTED TO FINISH GRADE PRIOR TO PLACING OF ASPHALT SURFACE COURSE BY THE CONTRACTOR AS PER MAG STANDARD DETAIL 270 AND 422.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES PRIOR TO EXCAVATION AND AVOID DAMAGE TO SAME. CALL 602-263-1100 FOR BLUE STAKE TWO WORKING DAYS PRIOR TO DIGGING.
16. CONTRACTOR WILL EXPOSE ALL TIE-IN POINTS TO VERIFY LOCATION PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES.
17. THE TOWN OF QUEEN CREEK WATER DEPARTMENT IS NOT LIABLE FOR DELAYS NOR DAMAGES TO UTILITIES RELATED TO THIS CONSTRUCTION; NEITHER WILL THE WATER DEPARTMENT PARTICIPATE IN THE COST OF UTILITY RECONSTRUCTION OR RELOCATION.
18. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION AND TESTING. INSPECTIONS SHOULD BE COORDINATED WITH MIKE JOHNSON (480) 707-3894. INSPECTIONS ARE ON A DAY TO DAY FIRST COME FIRST SERVED BASIS. CONSTRUCTION CONCEALED WITHOUT THE REQUIRED INSPECTION SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.
19. THE CONTRACTOR WILL FOLLOW GUIDELINES AND REGULATIONS SET FORTH BY O.S.H.A. NEITHER THE ENGINEER OR THE TOWN WILL BE RESPONSIBLE FOR JOB-SITE SAFETY PROCEDURES OR CONDITIONS.
20. THE CONTRACTOR IS RESPONSIBLE FOR HIS OWN TAKEOFF QUANTITIES. QUANTITIES SHOWN HEREON ARE ESTIMATES ONLY AND AS SUCH ARE NOT TO BE USED FOR BID PURPOSES.
21. THE CONTRACTOR IS RESPONSIBLE FOR THE NOTIFICATION OF THE PROPER AUTHORITY(S) IF THERE ARE OBSTRUCTIONS TO PROPOSED IMPROVEMENTS AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY EXISTING ITEM REMOVED TO FACILITATE CONSTRUCTION SHALL BE REPLACED IN THE SAME OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
22. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL ON AND AROUND THE CONSTRUCTION SITE.
23. ALL WATERLINES SHALL HAVE 36" TO 48" MINIMUM COVER AS SPECIFIED IN THE TOWN OF QUEEN CREEK WATER DEPARTMENT DESIGN STANDARDS AND CONSTRUCTION MANUAL.
24. CONTRACTOR MUST MAINTAIN SLOPE OF WATER LINES TO HIGH POINTS AT COMBINATION AIR VALVES OR LOW POINTS AT BLOW OFFS OR FIRE HYDRANTS.
25. IN ACCORDANCE WITH AAC R18-4-213, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61.
26. DUCTILE IRON PIPE WHEN REQUIRED SHALL BE THICKNESS CLASS 52.
27. SERVICE CONNECTION BACK-FLOW PREVENTORS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
28. FIRE HYDRANTS SHALL RECEIVE 2 FIELD COATS OF CHROME YELLOW PAINT PRIOR TO ACCEPTANCE OF WORK BY THE WATER DEPARTMENT.
29. DEVELOPER IS TO INSTALL ALL TAPS AND METER BOXES. REFER TO THE WATER DEPARTMENT DESIGN AND CONSTRUCTION STANDARDS MANUAL FOR CLARIFICATION ON METER BOX LOCATION AND REQUIRED MATERIALS.
30. METERS SHALL BE FURNISHED AND INSTALLED BY THE WATER DEPARTMENT.
31. PAVEMENT REPLACEMENT AND TRENCH REPAIR SHALL BE DONE TO MAG STANDARD SPECIFICATIONS AND DETAILS.
32. ALL WATER SERVICE CONNECTIONS SHALL BE EXTENDED TO THE PROPOSED METER LOCATIONS AS INDICATED ON THE PLANS SUCH THAT ADDITIONAL EXTENSION WILL NOT BE REQUIRED.
33. IMPROVEMENTS SHALL NOT BE ACCEPTED UNTIL "AS-BUILT" PLANS HAVE BEEN SUBMITTED, REVIEWED AND APPROVED BY THE WATER DEPARTMENT.

LEGEND

- EXISTING WATER LINE
- EXISTING ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING GAS LINE
- EXISTING UNDERGROUND TELEPHONE
- EXISTING CABLE LINE
- EXISTING IRRIGATION
- EXISTING PROPERTY LINE
- EXISTING BLOCK WALL
- EXISTING BARBED WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING STORM DRAIN PIPE
- EXISTING SIGN
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING GUY WIRE
- EXISTING MAILBOX
- EXISTING WATER METER
- EXISTING AIR/VACUUM RELEASE VALVE
- EXISTING BLOWOFF VALVE
- EXISTING CONC STANDPIPE
- EXISTING TELEPHONE MANHOLE
- EXISTING SEWER MANHOLE
- PROPOSED IRRIGATION LINE
- ROADWAY CENTERLINE
- SECTION LINE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- BRASS CAP MONUMENT
- SURVEY CONTROL POINT
- PROPOSED AIR/VACUUM RELEASE VALVE
- PROPOSED BLOWOFF VALVE
- PROPOSED REDUCER
- PROPOSED THRUST BLOCK
- PROPOSED AIR VENT

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
MESA, ARIZONA 85210
TEL 480.768.8600 • FAX 480.768.8609
www.sunriseeng.com

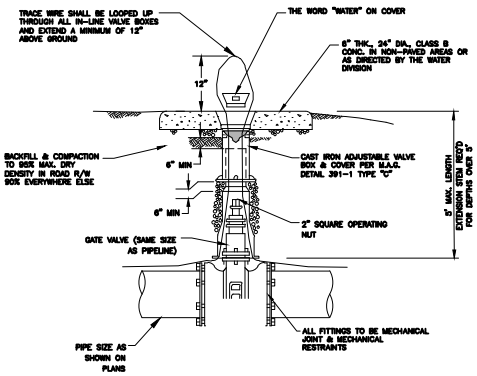
CIRCLE G

PEGASUS AIRPARK UNIT 2
IRRIGATION IMPROVEMENT PLANS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
750P02	JAW	CY	JAW	2 of 7	IRR02

P:\TOQC_Utilities\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QI900c.dwg Oct 12, 2011 11:27am cchristian

DETAIL NO.		TYPICAL IRRIGATION NOTES SHEET	REVISED:	DETAIL NO.
QI900c			08/11/05 DATE	QI900c

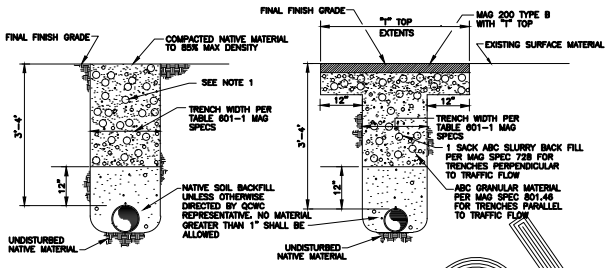


A ~ ToQC STD. DTL. Q302 – TYPICAL GATE VALVE

NOT TO SCALE

TRENCH NOTES:

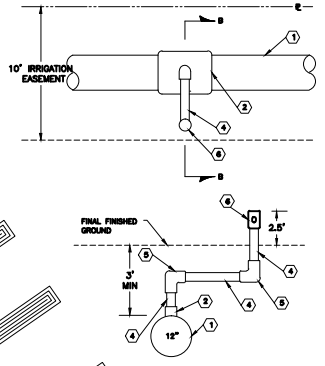
1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW PIPE AND REPLACED WITH 1" MINUS GRANULAR MATERIAL.
2. MINIMUM COVER SHALL BE MEASURED FROM THE FINAL FINISHED GROUND.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.



IN UNIMPROVED AREAS IN PAVED AREAS

B ~ ToQC STD. DTL. QI905 – TYPICAL WATER LINE TRENCH

NOT TO SCALE



SECTION B–B

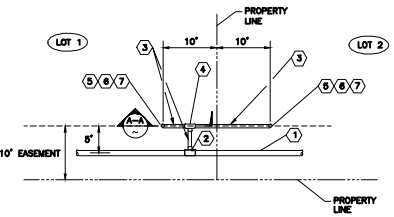
1. 80 PSI GASKETED PIP MAINLINE
2. 80 PSI MAINLINE X 4" SOLVENT WELDED PIP TEE
3. NOT USED
4. SCH 40 PVC PIPE
5. SCH 40 90° ELBOW
6. 4" WATERMAN AIR VENT

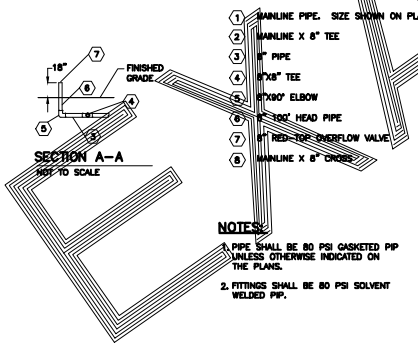
NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

C ~ ToQC STD. DTL. QI904 – AIR VENT

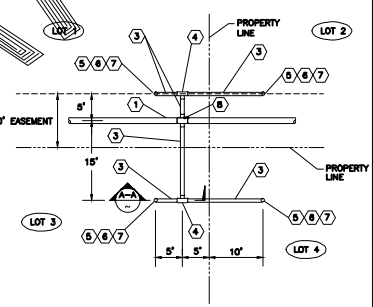
NOT TO SCALE





NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

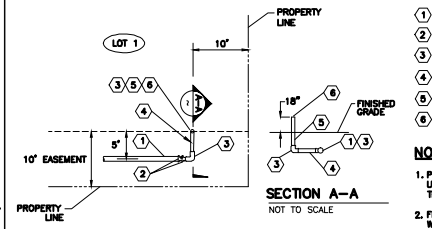


E ~ ToQC STD. DTL. QI902 – DUAL SERVICE PORT

NOT TO SCALE

F ~ ToQC STD. DTL. QI903 – QUAD SERVICE PORT

NOT TO SCALE



1. MAINLINE PIPE. SIZE SHOWN ON PLANS
2. REDUCER(S)
3. 6"X90° ELBOW
4. 6" PIPE
5. 6" 100' HEAD PIPE
6. 6" RED-TOP OVERFLOW VALVE

NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

D ~ ToQC STD. DTL. QI901 – SINGLE SERVICE PORT

NOT TO SCALE

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
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TEL 480.768.8600 • FAX 480.768.8609
www.sunrise-eng.com

TOWN OF QUEEN CREEK WATER DIV

HAPPY CAMPER ESTATES

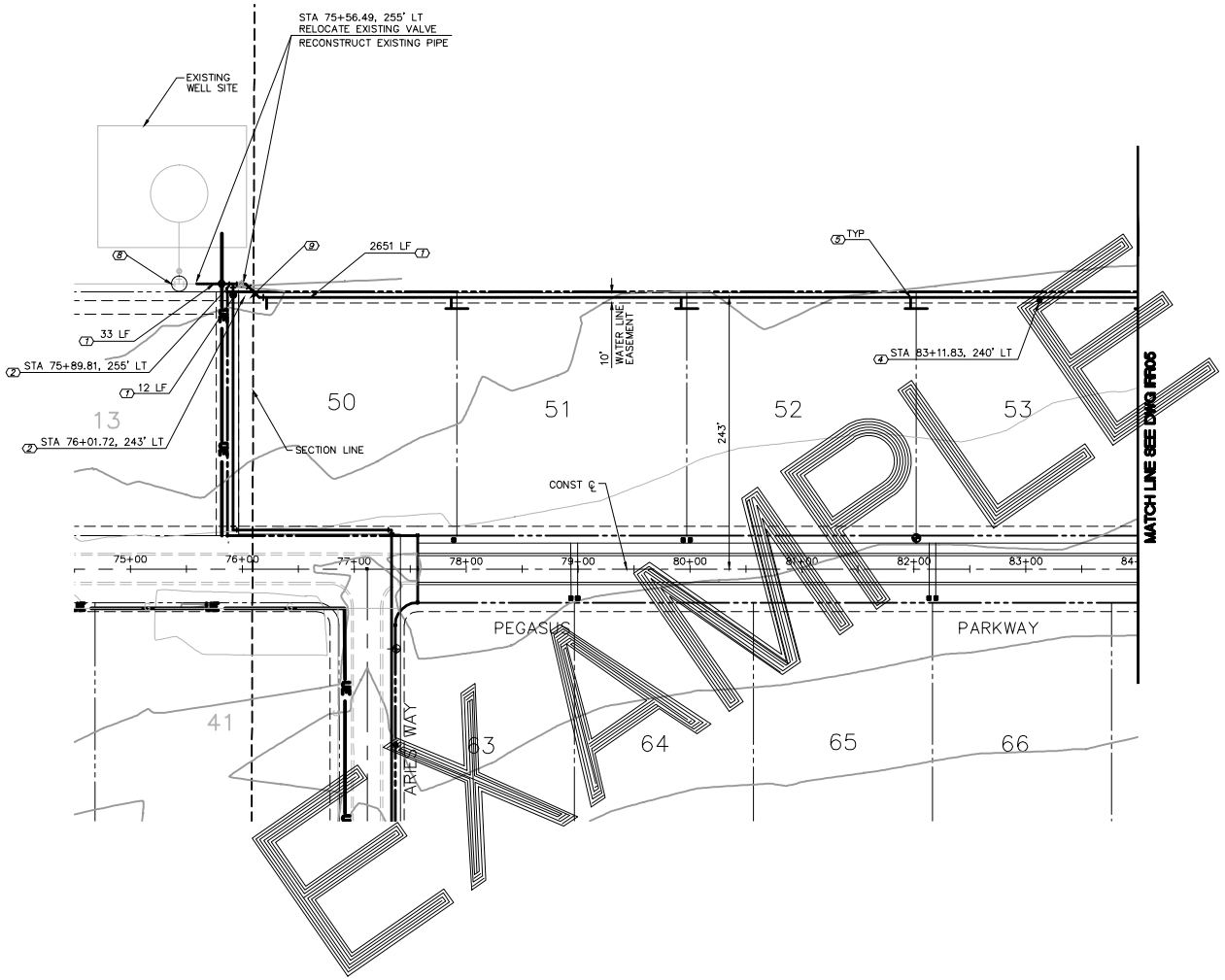
F99999

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	JW	CY	GDP	5 of 5	DT1

Know what's below. Call before you dig. 1-800-782-5348

P:\TOQC_Utilities\PO #014 – Water Design and Construction Standards Manual Update\Dwg\Sheets\QI900d.dwg Oct 12, 2011 11:27am cchristian

DETAIL NO.		REQUIRED DETAILS FOR ALL PROJECTS	REVISED:	DETAIL NO.
QI900d			08/11/05 DATE	QI900d



CONSTRUCTION NOTES

1. INSTALL 12" 80 PSI PVC PIP GASKETED PIPE. LENGTH AS INDICATED. 3' MIN. COVER
2. INSTALL 80 PSI 12"X45° SOLVENT WELDED PIP ELBOW
3. INSTALL 12" WATERMAN H-30-4 LINE GATE VALVE OR ALTERNATIVE APPROVED BY THE TOWN OF QUEEN CREEK WATER DIVISION
4. INSTALL 4" WATERMAN AIR VENT OR ALTERNATIVE APPROVED BY THE TOWN OF QUEEN CREEK WATER DIVISION AS SHOWN ON DETAIL E, SHEET IRR10
5. CONSTRUCT DUAL 8" IRRIGATION SERVICE AS SHOWN ON DETAIL B, SHEET IRR10
6. CONSTRUCT QUAD 8" IRRIGATION SERVICE AS SHOWN ON DETAIL C, SHEET IRR10
7. INSTALL 80 PSI 12"X12" SOLVENT WELDED PIP TEE
8. RECONSTRUCT EXISTING CONCRETE RISER AND GOOSE NECK SUPPLY PIPE AS SHOWN ON DETAIL F, SHEET IRR10
9. CONSTRUCT SINGLE IRRIGATION SERVICE AS SHOWN ON DETAIL A, SHEET IRR10
10. INSTALL 80 PSI 12" SOLVENT WELDED PIP CAP
11. INSTALL 80 PSI 12"X90° SOLVENT WELDED PIP ELBOW
12. CONSTRUCT CONCRETE RISER AS SHOWN ON DETAIL G, SHEET IRR10

GENERAL NOTES

1. LENGTHS OF PIPE ARE TO CENTER OF FITTING CLUSTER OR VALVE.
2. TRENCH CONSTRUCTION SHALL BE IN ACCORDANCE WITH QCWC STD. DET. QI905

811 Know what's below. Call before you dig. 1-800-782-5348

REV NO.	COMMENT	DATE

PRELIMINARY NOT FOR CONSTRUCTION DATE

SUNRISE ENGINEERING
2152 SOUTH VINEYARD, SUITE 123
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www.sunrise-eng.com

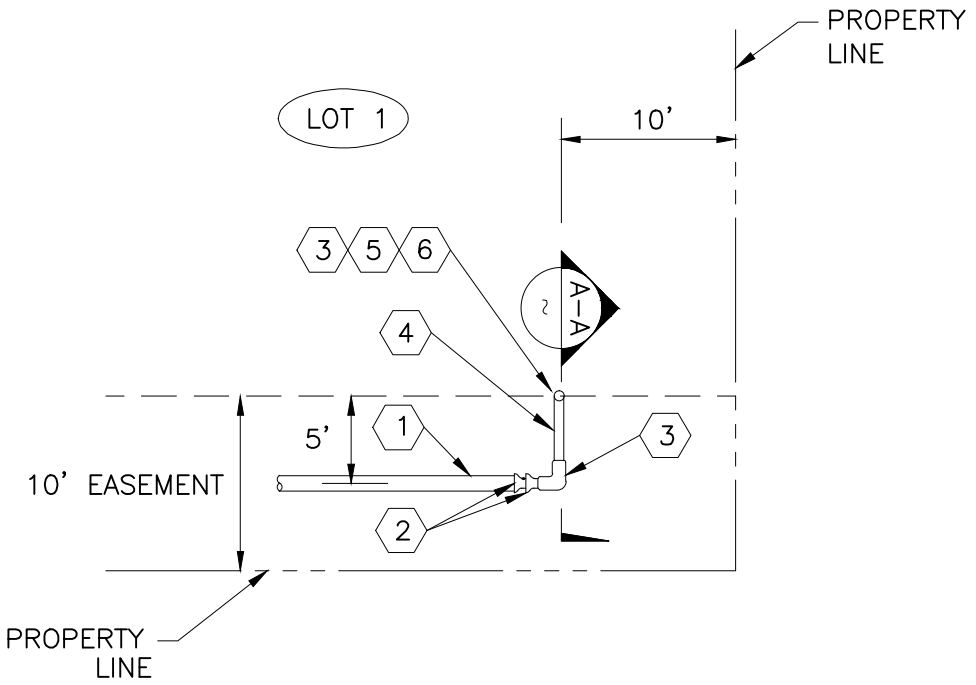
CIRCLE G

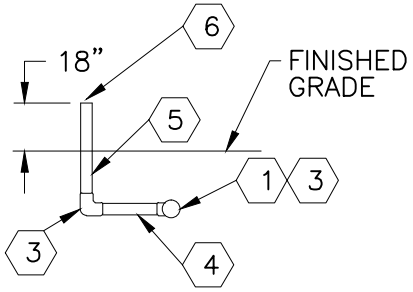
PEGASUS AIRPARK UNIT 2
IRRIGATION IMPROVEMENT PLANS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
750PG2	JAW	CY	JAW	5 of 25	IRR04

P:\TOQC_Utilities\PO #014 - Water Design and Construction Standards Manual Update\Dwg\Sheets\QI900e.dwg Oct 12, 2011 11:57am cchristian

DETAIL NO.		TYPICAL IRRIGATION PLAN	REVISED:	DETAIL NO.
QI900e			08/11/05 DATE	QI900e





SECTION A–A

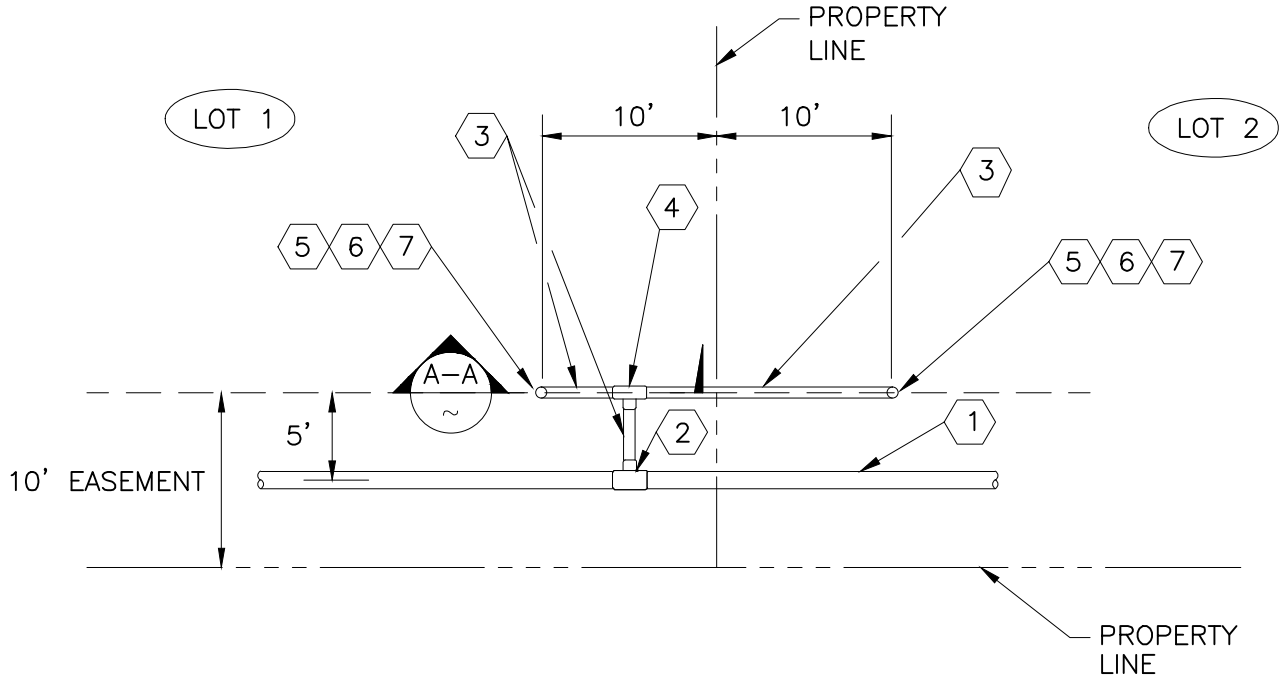
NOT TO SCALE

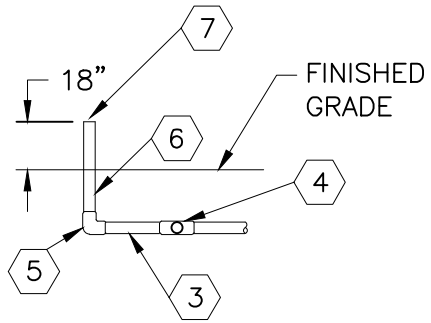
NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

1. MAINLINE PIPE. SIZE SHOWN ON PLANS
2. REDUCER(S)
3. 8"X90° ELBOW
4. 8" PIPE
5. 8" 100' HEAD PIPE
6. 8" RED–TOP OVERFLOW VALVE

DETAIL NO.		SINGLE SERVICE PORT	REVISED:	DETAIL NO.
QI901			08/04/03 DATE	QI901





SECTION A–A

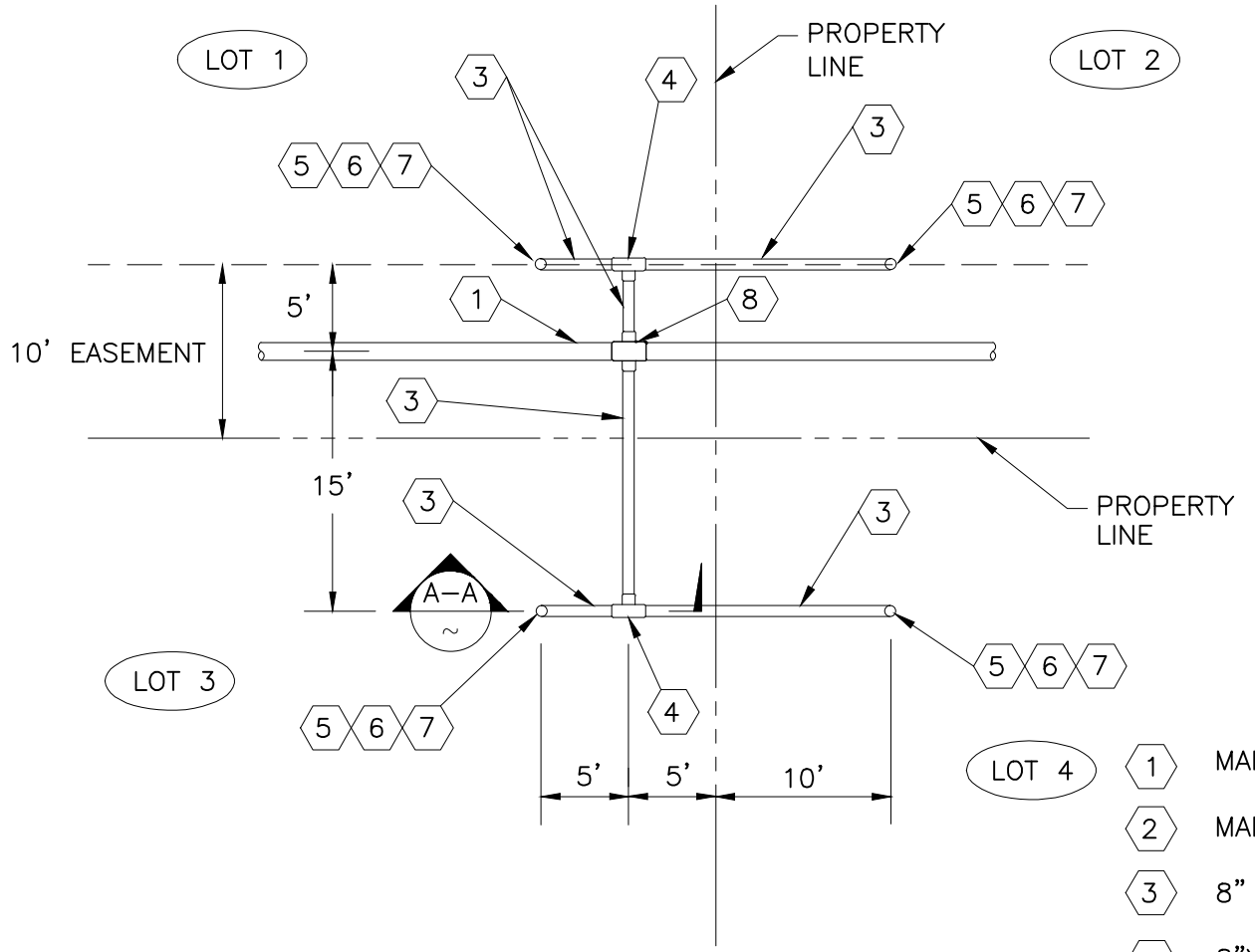
NOT TO SCALE

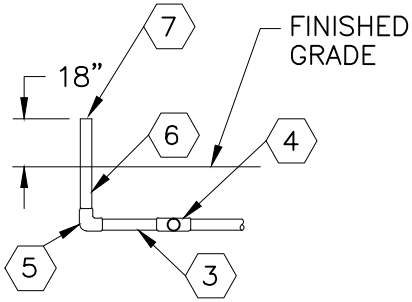
NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

1. MAINLINE PIPE. SIZE SHOWN ON PLANS
2. MAINLINE X 8" TEE
3. 8" PIPE
4. 8"X8" TEE
5. 8"X90° ELBOW
6. 8" 100' HEAD PIPE
7. 8" RED–TOP OVERFLOW VALVE

DETAIL NO.		DUAL SERVICE PORT	REVISED:	DETAIL NO.
QI902			08/04/03 DATE	QI902





SECTION A–A

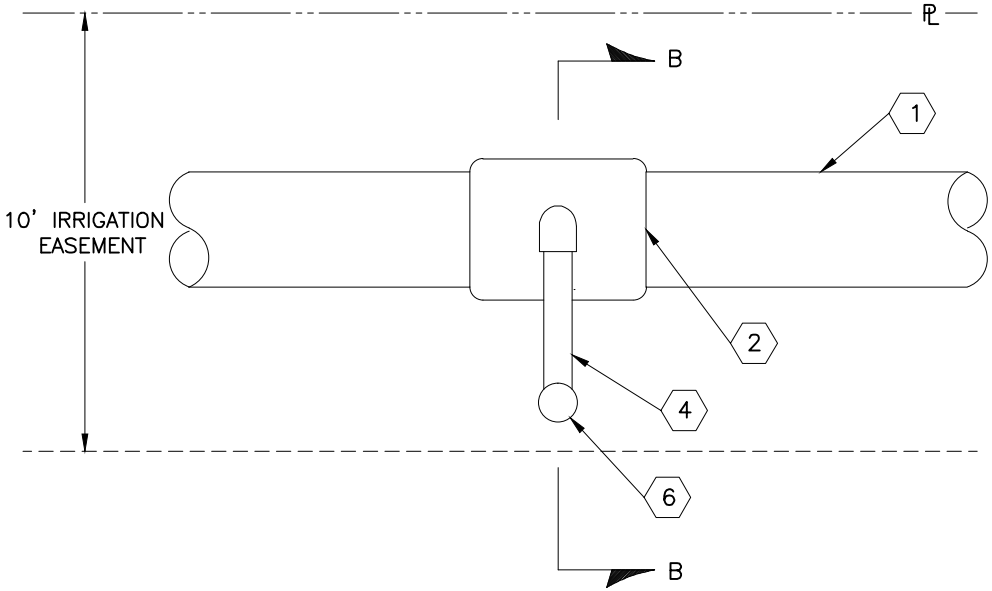
NOT TO SCALE

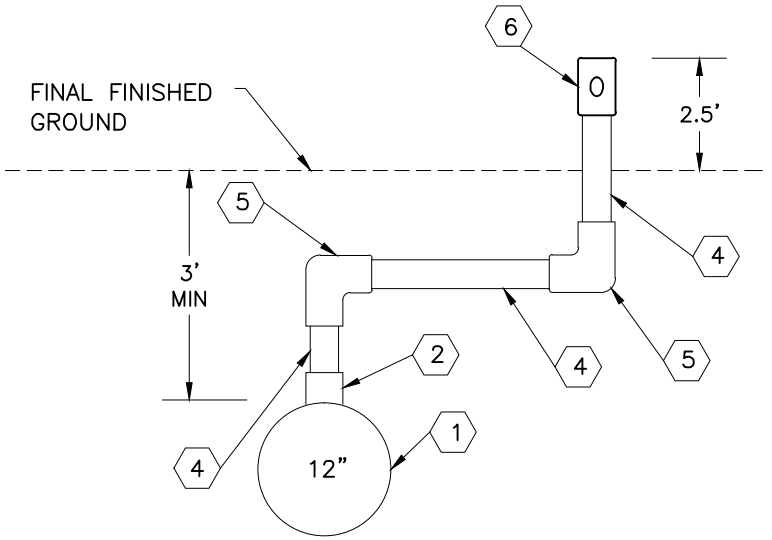
NOTES:

1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

1	MAINLINE PIPE. SIZE SHOWN ON PLANS
2	MAINLINE X 8" TEE
3	8" PIPE
4	8"X8" TEE
5	8"X90° ELBOW
6	8" 100' HEAD PIPE
7	8" RED–TOP OVERFLOW VALVE
8	MAINLINE X 8" CROSS

DETAIL NO.		QUAD SERVICE PORT	REVISED:	DETAIL NO.
QI903			08/04/03 DATE	QI903





SECTION B–B

NOTES:

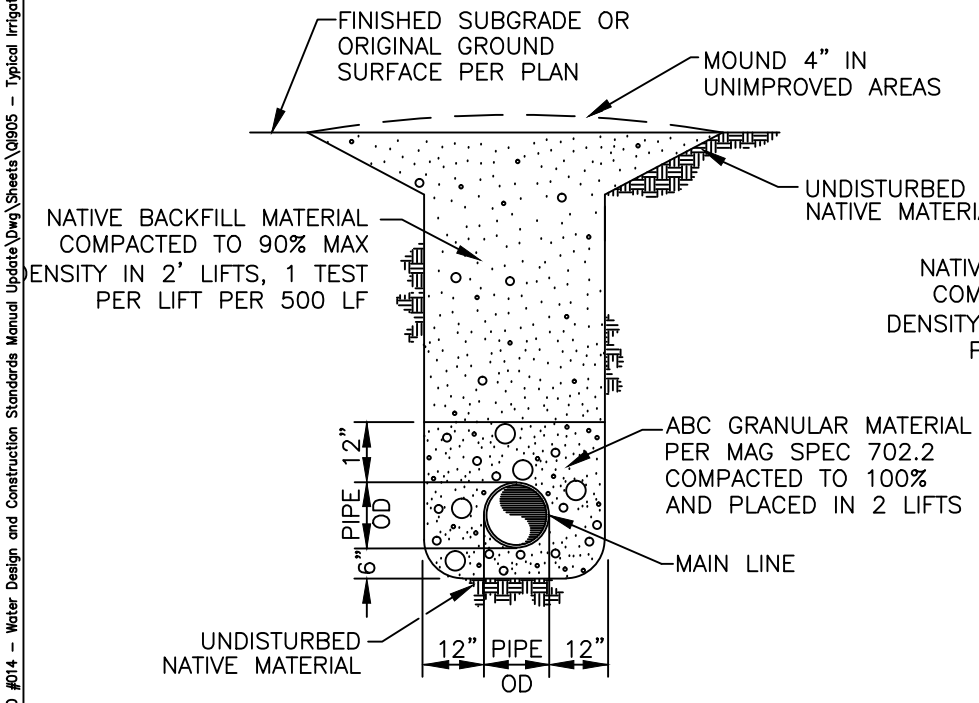
1. PIPE SHALL BE 80 PSI GASKETED PIP UNLESS OTHERWISE INDICATED ON THE PLANS.
2. FITTINGS SHALL BE 80 PSI SOLVENT WELDED PIP.

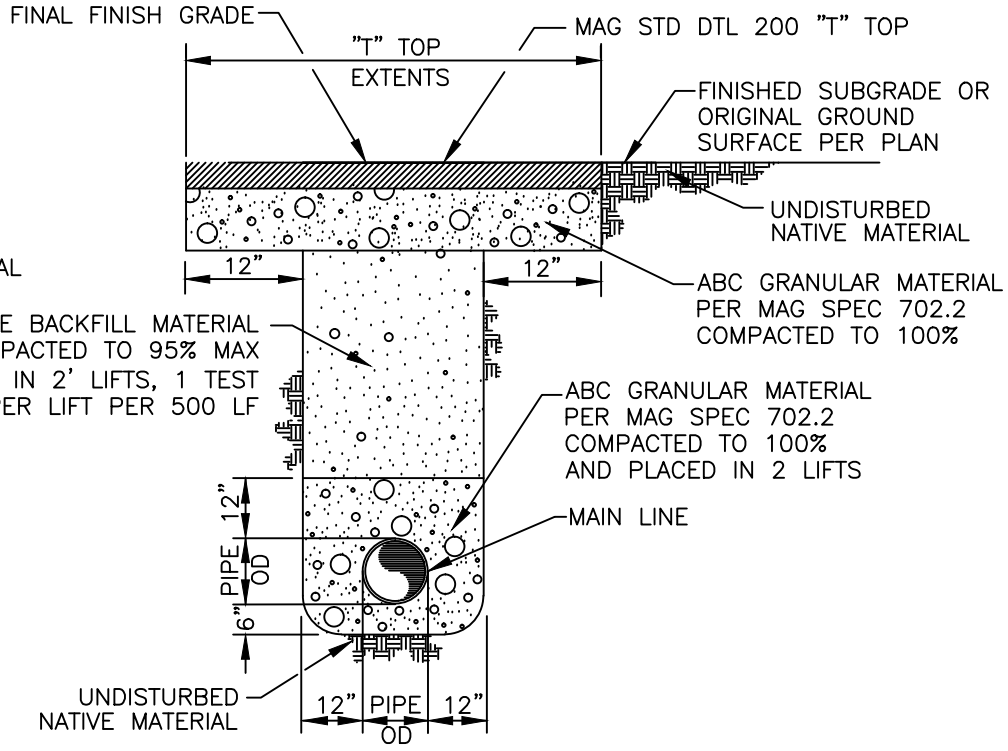
1. 80 PSI GASKETED PIP MAINLINE
2. 80 PSI MAINLINE X 4" SOLVENT WELDED PIP TEE
3. NOT USED
4. SCH 40 PVC PIPE
5. SCH 40 90° ELBOW
6. 4" WATERMAN AIR VENT

DETAIL NO.		AIR VENT DETAIL	REVISED:	DETAIL NO.
QI904			04/3/03 DATE	QI904

NOTES:

1. WHENEVER ROCK OR UNSUITABLE BEDDING MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, OVER EXCAVATION SHALL BE REQUIRED TO A MIN OF 6" DEPTH BELOW OD OF PIPE AND REPLACED WITH CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2.
2. MINIMUM COVER SHALL BE MEASURED FROM THE EXISTING OR PROPOSED GRADE, OR FROM NATURAL GROUND, WHICHEVER IS DEEPER.
3. CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS AND REGULATIONS FOR TRENCH EXCAVATION AND PIPE INSTALLATION.
4. PVC PIPE BEDDING TYPE SHALL BE CRUSHED AGGREGATE BASE IN ACCORDANCE WITH MAG SPEC 702.2
5. CONTRACTOR SHALL EXCAVATE REQUIRED TRENCH TO PREVENT CAVE-IN AND PROVIDE TRENCH SIDEWALL STABILITY. TRENCH EXCAVATION SHALL INCLUDE ALL DEWATERING, SHEETING AND SHORING NECESSARY TO INSTALL SEWER LINE.





* OR AS APPROVED BY THE INSPECTOR

IRRIGATION MAIN LINE TRENCH
(IN UNIMPROVED AREAS)

IRRIGATION MAIN LINE TRENCH
(IN PAVED AREAS)

DETAIL NO.			REVISED:	DETAIL NO.
QI905	STANDARD DETAIL	TYPICAL IRRIGATION MAIN LINE TRENCH	01/31/12 DATE	QI905