

Delete the following current section in its entirety (deletions are shown struck through).

33 10 00 WATER UTILITIES

~~.01 Water~~

~~A. Distribution Systems~~

- ~~1. Building service sizing, including meters, valves, etc., shall be performed by the Engineer of Record.~~
- ~~2. Waterlines~~
 - ~~a. Waterlines three inches in diameter and greater shall be ductile iron pipe meeting all requirements of ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11. The class for ductile iron pipe shall be thickness Class 52. Fittings shall be Class 350#, ductile iron compact or full body mechanical joint fittings. All ductile iron pipe and fittings shall be double cement lined and coated outside with a bituminous seal coat all according to ANSI/AWWA C104/A21.4 and ANSI/AWWA C151/A21.51 respectively. All pipe shall be push-on joint type with gasket conforming to ANSI/AWWA C111/A21.11 and shall be American Pipe Flex-Ring/Field Loc, Fast Grip gasket or equal as approved by Engineering Services.~~
 - ~~b. Waterlines smaller than three inches in diameter shall be copper service tubing conforming to the requirements of ASTM Designation B88, Type K, heavy wall, soft temper. Copper service lines shall have grip joint type fittings.~~
 - ~~c. Mechanical joint restraint shall be accomplished by the utilization of joint restraints ("Megalugs") with adequate concrete thrust blocks as approved by both the National Board of Fire Underwriters "Standard for Outside Protection" and Penn State Engineering Services.~~
 - ~~d. Provide air release/vacuum break at all high points in new distribution piping. Refer to Detail 15G-E. Details are not yet available in WEB-based manual.~~
 - ~~e. All water lines shall be designed to be a minimum of 4 feet and a maximum of 8 feet below finished grade. The trench shall be backfilled on the bottom and sides of the pipe to a height of one foot above the top of the pipe with crushed stone dust. The remaining backfill material shall be earth, free of wood, ashes and other debris, but may contain rock pieces not larger than one cubic foot in volume, but consisting of not more than twenty five percent rock by volume. No other material shall be used as backfill.~~
 - ~~f. Provide adequate thrust blocks.~~
- ~~3. Water Meters~~

- a. ~~The water flow to each building shall be metered with a cyclometer counter giving a direct reading in gallons. All meters larger than 2" shall be compound meters. A touch read remote transmitter shall be provided and the counter located in an approved location.~~
- b. ~~Meters shall conform to AWWA Standard. A full size bypass shall be provided around the meter to allow for servicing. Refer to Detail 15G-G. Details are not yet available in WEB based manual. Provide a meter manufacturer recommended strainer with each meter.~~
 - i. ~~At locations served by the University Park Utility Water Services system, meter and associated strainer shall be provided by Utility Services for installation by the contractor.~~
 - ii. ~~At all other locations, meter manufacturer shall be Neptune, unless otherwise required by the local water authority.~~

~~4. Valves - Underground~~

- a. ~~Gate valves shall be manufactured in accordance with ANSI/AWWA C509. The type shall be RESILIENT SEATED and shall have a nonrising stem. THE DIRECTION TO OPEN SHALL BE COUNTERCLOCKWISE. The operating nut shall be two inches square. Valves shall have ends suitable for use with mechanical joint pipe. Exterior of valve shall be coated with bituminous seal coat.~~
- b. ~~Valve boxes shall be cast iron of the three piece screw type installed over the bonnet and operating nut, and of sufficient length to reach the surface of the ground but not extend above the ground surface. The word "water" shall be cast in valve box lid.~~

~~5. Constant Pressure Pumps~~

- ~~See Division 22-00-00.~~

~~B. System Tests and Disinfection~~

- 1. ~~Testing shall conform to AWWA C-600.~~
- 2. ~~Disinfection shall conform to AWWA C-651. Contractor shall retain the services of a PaDEP-certified water testing laboratory to sample and test the potable water system. All test results shall be provided to Utility Services prior to activation of services by Utility Services.~~
- 3. ~~Meter and backflow prevention device shall be installed and inspected by Utility Services prior to service activation.~~

~~C. Fire Hydrants~~

- 1. ~~At University Park Campus, fire hydrants shall have National Standard threads. Fire hydrants shall conform to AWWA C-502. Fire hydrants shall have 2-2 1/2" hose outlets and one 4 1/2" pumper connection.~~

~~Hydrants shall be American Darling No. B-62-B-5 fire hydrants with traffic feature, or other as approved by Utility Services.~~

- ~~2.—At locations other than University Park Campus, coordinate threads and outlet size with fire department serving that location. Hydrants shall be American Darling No. B-62-B-5 fire hydrants with traffic feature, or other as approved by Utility Services.~~
- ~~3.—Refer to Detail 15G-F. Details are not yet available in WEB-based manual.~~
- ~~4.—At the University Park Campus, fire hydrant flow for existing hydrants may be available from Engineering Services.~~

~~D.—Backflow Prevention~~

- ~~1.—No water service connection shall be installed or maintained to or at any building where actual or potential cross-connections to the system would result, unless such actual or potential cross-connections are abated or controlled to the satisfaction of Engineering Services.~~
- ~~2.—No connection shall be installed or maintained whereby water from an auxiliary water supply may enter the University water system unless such auxiliary water supply and the method of connection and use of such supply shall have been approved by Engineering Services.~~
- ~~3.—An approved backflow prevention device shall be installed prior to the first branch line leading off each service line to a building water system.~~
- ~~4.—An approved double check or reduced pressure zone backflow prevention device shall be installed on each service line to a building water system. Type of backflow prevention device shall be determined by Engineering Services. Backflow prevention devices shall be installed at a location and in a manner approved by the Engineering Services and shall be installed by a person properly qualified. At University Park, Apollo brand backflow preventers shall be furnished by Utility Services for installation by the contractor on the potable water service. Reduced pressure backflow preventers shall not be located in pits or other areas that can fill with water unless previously approved by Penn State Engineering Services. Backflow prevention devices shall be located on the building side of the water meter, as close to the meter as is reasonably practical and prior to any other connection.~~
- ~~5.—An ASSE-certified double check valve shall be installed on each fire service. Fire service backflow preventers shall NOT be furnished by Utility Services, regardless of location.~~

~~E.—Booster Pumps~~

- ~~1.—Where a booster pump has been installed on the service line to or within any building, such pump shall be equipped with a low pressure cut-off device designed to shut off the booster pump when the pressure in the service line on the suction side of the pump drops to ten pounds per square inch gage or less for a period of 30 seconds or longer.~~

~~F.—Operation and Connection to Existing Waterlines~~

- ~~1. The operation of all existing water valves and hydrants shall be done only by University water system operators. The Contractor and any other personnel are expressly forbidden from operating the water system components.~~
- ~~2. At University Park, all connections to existing waterlines shall be done by the University. These connections shall be done as follows: The Contractor shall provide all required fittings, excavate a pit of sufficient size to install the tapping machine, provide equipment to place and remove the tapping machine, backfill the excavation after the tap is made, restore the surface area, and pay the University a fee for the tap. The fee shall be as determined by the Manager, Utility Services. The University will provide the tapping machine and perform the tapping of the existing waterline.~~
- ~~3. At all Penn State locations other than University Park, connections to existing waterlines shall be done by the contractor, but only in the presence of PSU Office of Physical Plant staff.~~

~~G. Temporary Water Service~~

- ~~1. Temporary service is defined as a water service provided for events, food vending, construction, or maintenance supplied from a building or hydrant using temporary piping for 30 days or less. Nonpermanent service (greater than 30 days) will be addressed by the Office of Physical Plant, Water Systems, on a case-by-case basis.~~
- ~~2. The Pennsylvania State University, Office of Water Systems, will provide customer hook up to an existing building source such as hose bibbs, including a backflow preventer, and water meter.~~
- ~~3. The University will ensure proper disinfection by sampling at the existing hose bibb for chlorine residual and coliform bacteria prior to customer use of the water.~~
- ~~4. It is the customer's responsibility to ensure that proper disinfection continues from the existing hose bibb to their equipment and to the consumer. The University will provide a procedure with recommendations to the customer to ensure proper disinfection. (See Fact Sheet.)~~
- ~~5. The temporary tap and sampling costs will be the responsibility of the customer.~~

Replace with following text.

*Editor note: To aid in the update of this standard, all of the references to the [hyperlinks](#) are indicated by **Blue Text**, followed by **(Insert hyperlink)**, in hidden text which should be removed prior to posting final document.*

33 10 00 WATER UTILITIES

.01 General

- A. Water Providers
 - 1. The University produces, treats, and distributes its own water at University Park Campus, Mont Alto Campus, Wilkes-Barre Campus, and other small remote University owned locations.
 - 2. The remaining Campuses and Facilities purchase water from the local public water supplier. The level of water system ownership and point of ownership varies from campus to campus. Please contact the PSU Engineering Services' Utility Systems Engineer – Water for specific information.
- B. Sources and Treatment at University Owned Systems
 - 1. The source and treatment standards for the University Owned Systems will be site specific. Please contact the PSU Engineering Services' Utility Systems Engineer – Water for specific requirements.
- C. The design by the Design Professional and installation by the Contractor shall comply with Pennsylvania State University's Design and Construction Standards Division 33 10 00 Water Utilities (University Standards), and in the event of a conflict between the American Water Works Association (AWWA) Standards and University Standards, the University Standards shall supersede.
- D. For Water Utilities Standards not covered in this section, please contact the PSU Engineering Services' Utility Systems Engineer – Water for specific requirements.
- E. University Water Service and Water Line Extension Plan Approval Requirements
 - 1. As part of the Project Design process, a plan shall be submitted to the PSU Engineering Services' Utility Systems Engineer – Water for review and approval for the following proposed modification of the University owned water distribution systems/service lines:
 - a. Modification of existing water services including meters and backflow preventers
 - b. Installation of new water services
 - c. Modification and relocation of existing water distribution system piping
 - d. Installation of new water distribution system piping.
 - 2. The plan submission shall include the PSU Project Name and Number, proposed construction dates, estimated average and peak domestic demand, estimated fire protection demands, and drawing/plans for the proposed modification. Refer to “**PSU Water Service and Water Line Extension Plan Approval Requirements**” document in **.04 Guideline Details** for all of the specific requirements of the plan submission.
 - 3. A Water Services System Modification Permit will be issue for each approved plan. The permit and installation must be followed and adhered, failure to comply with the permit, design standards, and required

inspections and testing will result in refusal of activation of the water service.

F. Distribution Systems

1. Building domestic and fire service sizing, including, but not limited to, meters, backflow preventers, valves, etc., shall be performed by the Engineer of Record. At University Park, the building shall be serviced with a common service line for both domestic and fire services from the distribution system to the building. The domestic and fire services shall be separated in the building's mechanical room. At all Penn State locations other than University Park, the building shall be serviced with a common service line for both domestic and fire services from the distribution system to the building, unless otherwise required by the public water supplier or local building code. The common service line shall be separated in the building's mechanical room for the domestic and fire services.

.02 System Requirements

A. Waterlines

1. Waterlines three inches in diameter and greater shall be ductile iron pipe meeting all requirements of ANSI/AWWA C110/A21.10 (latest version) and ANSI/AWWA C111/A21.11 (latest version). The class for ductile iron pipe shall be thickness Class 52. Fittings shall be Class 350#, ductile iron compact or full body mechanical joint fittings. All ductile iron pipe and fittings shall be double cement lined and coated outside with a bituminous seal coat all according to ANSI/AWWA C104/A21.4 (latest version) and ANSI/AWWA C151/A21.51 (latest version) respectively. All pipe joints shall be fully restrained either by mechanical joint ("Megalugs" style restraint) or push-on joint type with gasket conforming to ANSI/AWWA C111/A21.11 (latest version) and shall be American Pipe Flex-Ring/Field-Loc, Fast-Grip gasket or equal as approved by Engineering Services. All ductile iron pipe must be installed in accordance with ANSI/AWWA C600 (latest version). The design must be approved by PSU Engineering Services' Utility Systems Engineer – Water. At University Park, the installation must be inspected by Water Services prior to backfilling the excavation; the inspection shall be scheduled with the Water Services Supervisor a minimum of three (3) business days prior to the planned inspection. At other locations than University Park, the installation must be inspected by University Personnel prior to backfilling the excavation. Failure to have the inspection performed will result in refusal of services until the pipe is re-excavated and inspected at the **Contractor's expense**.
2. Waterline services connections smaller than three inches shall be constructed of high density polyethylene pipe (HDPE) and must conform

to ANSI/AWWA C901 (latest version). The minimum acceptable pressure class is 200 psi. The preferred installation will be a continuous section of pipe from the ductile iron isolation valve on the water main tap to the inside of the building. All underground splices must be a heat fusion connection. The design must be approved by PSU Engineering Services' Utility Systems Engineer – Water. At University Park, the installation must be inspected by Water Services prior to backfilling the excavation; the inspection shall be scheduled with the Water Services Supervisor a minimum of three (3) business days prior to the planned inspection. At other locations than University Park, the installation must be inspected by University Personnel prior to backfilling the excavation. Failure to have the inspection performed will result in refusal of services until the pipe is re-excavated and inspected at the **Contractor's expense**.

3. Pipe fitting other than mechanical joint restraint ("Megalugs") shall be accomplished by the utilization of adequate concrete thrust blocks as approved by both the National Board of Fire Underwriters "Standard for Outside Protection" and Penn State Engineering Services. The Design Professional shall submit the thrust block restraint calculations to PSU Engineering Services. All fittings shall be wrapped with polyethylene encasement to prevent concrete thrust blocking from contacting the joint fittings.
4. Connections and Tapping of Water Lines
 - a. At University Park Campus, all taps and connections must be made by Water Services, refer to section "K. Operation and Connection to Existing Waterlines", and the requirements in this section regarding material standards. At all Penn State locations other than University Park, connections to existing waterlines shall be done by the contractor, but only in the presence of PSU Office of Physical Plant staff, and the requirements in this section regarding material standards.
 - b. Taps shall be made using tapping sleeves for the connection piping two (2) pipe diameter sizes and smaller than the pipe to be tap. Taps shall be made by the installation of the appropriate sized tee for the connection piping of equal size and one (1) pipe diameter size smaller than the pipe to be "tapped".
 - c. Tapping sleeves shall be either full circumferential all stainless steel flanged outlet style, Ford FTSS, Romas SST III, or approved equal; or full circumferential all ductile iron flanged outlet style, American Flow Control Series 2800, or approved equal. Tapping Sleeve and Tapping Valve shall be a complete assembly, including tapping sleeve, tapping valve, and bolts and nuts.
 - d. Tapping valves shall be in conformance with the applicable provisions of AWWA C509 or C515 (latest version), and the exterior of valve shall be coated with fusion bonded epoxy coating complying with AWWA C550 (latest version). Tapping valves shall OPEN THE IN THE COUNTERCLOCKWISE direction.

The mechanical joint end of the tapping valve shall be in accordance with the applicable provisions of AWWA C111 (latest version). Tapping valves shall be furnished with a raised male face on the end flange, which fits into a recess on the tapping sleeve. This fit shall assure proper alignment between the sleeve and valve and facilitate passage of the cutter during the tapping procedure. The mating valve flange to the tapping sleeve outlet must have a raised male face, conforming to MSS SP-60, to ensure there alignment of valve and tapping machine. All interior and exterior ferrous surfaces shall be protected against corrosion by fusion-bonded-epoxy coating complying with AWWA C550 (latest version).

5. Boring and Encasement Piping

- a. The University shall require steel pipe encasement for water lines placed under critical roadways, tunnels, utility tunnels, and utility duct banks. For other boring applications to minimize ground surface damage and restoration costs, shall comply with this section.

- b. A steel encasement pipe shall be installed for water lines in each of these applications. All casing pipe, up to and including 24-inch diameter, shall be new uncoated, steel pipe in accordance with ASTM Specification A-53, Grade B and AWWA C200 (latest version); diameter as required to accommodate the water line and casing spacers; wall thickness as required; and minimum yield strength of 35,000 psi. Pipe larger than 24-inches shall be fabricated using ASTM, A283, Grade C steel with straight longitudinal welding seams. Casing pipe shall be furnished in 18 to 20-foot lengths. All casing pipe joints shall be butt welded completely around or along the joint by a certified welder in accordance with all applicable provisions of the American Welding Society and the American Water Works Association C-206 (latest version). The ends of the casing shall be sealed with a wrap-around casing end seal as to prevent the entrance of foreign material. Refer to **Boring and Encasement Piping Detail in .04 Guideline Details**.

- c. Casing pipe shall have a minimum wall thickness as listed below; note any local, state, federal, and railway transportation corporation permit requirements supersede the dimensions listed in the table below.

Encasement Pipe Outside Diameter (inches)	Road and Utility Crossing Wall Thickness (inches)	Railroad Crossing Wall Thickness (inches)
8	0.250	0.250
12	0.250	0.250

16	0.250	0.281
20	0.312	0.344
24	0.312	0.375
30	0.370	0.469
36	0.469	0.532
42	0.469	0.625
48	0.625	0.688

- d. The water lines placed in the encasement piping shall be ductile iron pipe meeting all requirements of ANSI/AWWA C110/A21.10 (latest version) and ANSI/AWWA C111/A21.11 (latest version). The class for ductile iron pipe shall be thickness Class 56. Fittings shall be Class 350, ductile iron compact or full body mechanical joint fittings. All ductile iron pipe and fittings shall be double cement lined and coated outside with a bituminous seal coat all according to ANSI/AWWA C104/A21.4 (latest version) and ANSI/AWWA C151/A21.51 (latest version) respectively. All pipe joints shall be fully restrained either by mechanical joint (“Megalugs” style restraint) or push-on joint type with gasket conforming to ANSI/AWWA C111/A21.11 (latest version) and shall be American Pipe Flex-Ring/Field-Loc, Fast-Grip gasket or equal as approved by Engineering Services.
- e. The boring and pipe installation shall adhere to the following requirements.
1. The Contractor shall use an experienced crew to operate the boring equipment being used. The crew shall have at least two (2) years of boring experience with this equipment.
 2. The Contractor shall excavate the boring pit of a width and length as required for that specific boring equipment. The Contractor shall be required to provide adequate protection for all existing utilities and structures encountered. The Contractor shall provide adequate sheeting/shoring on all of the walls of the boring pits. All sheeting/shoring must be in compliance with all local, state, and federal safety requirements, including U.S. OSHA standards.
 3. If water is known or expected to be encountered, pumps of adequate capacity to handle the flow of water shall be maintained at the boring location(s). These pumps shall be in attended and operated continuously until operation can be safely stopped.
 4. In an obstruction is encountered during installation, which stops the forward action of the pipe, and it becomes impossible to advance the pipe, the pipe shall be abandoned in place. The abandoned pipe must be completely filled with grout.

5. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe by more than one (1) inch, these voids shall be filled with grout.
 6. The grouting requirements to fill the annular space and void area between the disturbed earth and casing pipes and for abandoned casings shall be a uniform mixture of one (1) part of cement to six (6) parts of sand placed under pressure through the grout holes to fill any voids that exist between the casing pipe and disturbed earth.
 7. The waterline shall have casing spacers install around the circumference of the pipe prior to installation into the casing pipe. The casing spacers shall be made of high density polyethylene (HDPE) with tensile properties meeting or exceeding ASTM D638, and shall be installed according to manufacturer's recommendations and specifications. The casing spacers shall be RACI (Public Works Marketing, Inc., Dallas, TX), Ranger II (Pipeline Seal and Insulator, Inc. Houston, TX), or approved equal.
 8. The encasement piping shall have both ends of the pipe seal around the water line to prevent any material entering the encasement piping. The end seals shall consist of 0.125-inch minimum thickness synthetic neoprene rubber with self-adhesive/self-curing mastic applied rubber and specifically fabricated for the casing pipe/condition carrier dimensional condition with stainless steel bands to secure around the piping. The end seals shall be installed according to manufacturer's recommendations and specifications. The casing end seals shall be as manufactured by Public Works Marketing, Inc., Pipeline Seal and Insulator, Inc., or approved equal.
6. Provide combination air release/vacuum breaker devices at all high points in new distribution piping. Combination air release/vacuum breaker devices shall be automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The device shall open during draining or if a negative pressure occurs. The device shall also release accumulated air from the piping system while the system is in operation and under pressure. The device shall perform the functions of both air release and vacuum breaker and furnished as a single body or dual body type. The device shall be constructed of 304 or 316 stainless steel. The manufacture shall be Crispin, or approved equal. The air release/vacuum breaker devices shall conform to AWWA C512 Standard (latest version). The device shall be connected to the distribution pipe via an appropriately sized ductile iron tee fitting located on the distribution piping, have an isolation valve, OS&Y resilient-seated gate valves, epoxy coated, for water supply service

conforming to AWWA C509 Standard (latest version), and be located in a concrete vault. Refer to the **Air Release Detail** in [.04 Guideline Details](#) .

7. For non-looped and dead-end water lines, a blow off/flushing piping shall be provided. The blow off/flushing piping shall consist of ductile iron piping from a tee fitting, a gate valve, and other required fittings on the water line to be flushed. The blow off/flushing discharge pipe shall be above grade, directed away from waterways and streams, and installed to minimize velocity disturbance to land and structures. For blow off/flushing piping that does not drain by gravity, a “bleeder” hole shall be drilled in the pipe. **Refer to Blow-off Detail** in [.04 Guideline Details](#) .
8. All water lines shall be designed from the crown of the pipe to be a minimum of 4 feet and a maximum of 8 feet below finished grade. The trench shall be backfilled on the bottom and sides of the pipe to a height of one foot above the top of the pipe with crushed stone dust or PennDOT 2B stone. Refer to **Water Pipe Trench Details** for the applicable conditions in [.04 Guideline Details](#) . The remaining backfill material shall be earth, free of wood, ashes and other debris, but may contain rock pieces not larger than eight inches in their greatest dimension, but consisting of not more than twenty-five percent rock by volume. No other material shall be used as backfill.
 - a. Backfill material in non-structural areas must be placed in lifts as to exceed 12 inches and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor method (ASTM D698).
 - b. Backfill material in structural areas is defined as all fill placed under and around foundations, utilities, floor slabs, sidewalks, roadways and parking lots. Any borrow material utilized as fill should not contain rock greater than 3 inches in diameter, and should not contain more than 1 percent (by weight) of organic matter or other deleterious material. Unified Soils Classifications (ASTM D2487) of GW, GM, GC, SW, SM, SC, CL (LL<40) and combinations thereof are considered suitable for use as structural fill. Lateral confinement of poorly-graded sand and gravel will be required in order to limit horizontal movement and subsequent settlement or instability of the structural fill. Uniformly graded materials, such as PennDOT 2B or AASHTO #57 stone, are not considered an appropriate structural fill material. Potentially expansive materials such as mine tailings, pyritic shale and slag should not be used as structural fill material. All fill should have less than 0.1% total sulfur by weight as determined by ASTM D4239. Additional evaluation of suspected expansive shale should include wet-dry durability testing in accordance with PennDOT

Test Method No. 519. Other materials should be considered on a case-by-case basis; alternate materials should be approved by the project's geotechnical engineer. All structural fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness and within 2 percent of optimum moisture for compaction. The fill should be compacted to 100 percent of maximum dry density as determined by the Standard Proctor method (ASTM D698). Compaction testing shall be submitted to Engineering Services for review.

- c. Clay Dikes shall be required on pipe runs over 300 feet in length. The clay dikes shall be placed a maximum of every 300 feet. The clay dikes shall not cover or be within three (3) feet of any pipe joint, fitting, valve, or tap. The clay dike shall be constructed perpendicular to the trench, the base shall be constructed directly on top of undisturbed material, shall be the width of the trench, shall be the five (5) feet in length, and at least three (3) feet in height above the crown of the water pipe. The clay dike shall consist of clay containing no more than 15% (by volume) stone not larger than two (2) inches in diameter. The clay shall be placed in six (6) inch lifts and compacted by mechanical tamper to not less than 95% of maximum density at optimum moisture content. Refer to the **Trench Plug Installation** in **.04 Guideline Details**.
 - d. All water lines shall have a #10 tracer wire attached to the pipe in accordance with section Division 33 01 00.01 B. Metallic warning tape shall be installed in the trench approximately 18 inches above the crown of the pipe.
9. Provide adequate thrust blocks as approved by both the National Board of Fire Underwriters "Standard for Outside Protection" and PSU Engineering Services. All fittings shall be wrapped with polyethylene encasement to prevent concrete thrust blocking from contacting the joint fittings.
 10. For pipe connections and modifications to existing cast iron that is not mechanical restrained, a "reinforced concrete deadman" shall be installed to secure the existing pipe prior to cutting into the cast iron pipe. Refer to **Deadman Detail** in **.04 Guideline Details**.
 11. The design professional must submit as-built digital surveys of all water piping, valves, fittings, etc. to the Engineering Services Department, including pipe elevation and finished surface grade. The digital as-built surveys must be in AutoCAD, using Pennsylvania State Plane NAD 83.

B. Valves - Underground

1. Gate valves shall be manufactured in accordance with ANSI/AWWA C509 or C515 (latest version). The type shall be RESILIENT SEATED

and shall have a nonrising stem (NRS). THE DIRECTION TO OPEN SHALL BE COUNTERCLOCKWISE. The operating nut shall be two inches square. Valves shall have ends suitable for use with mechanical joint pipe. Exterior of valve shall be coated with fusion bonded epoxy coating complying with AWWA C550 (latest version).

2. Valve boxes shall be cast iron of the three piece screw type installed over the bonnet and operating nut, and of sufficient length to reach the surface of the ground but not extend above the ground surface. The word "water" shall be cast in valve box lid.

C. Valves – Water Distribution and Water Services

1. Valves, four (4) inches and larger, located in vaults and inside of buildings, including for water meters and backflow preventers shall be OS&Y resilient-seated gate valves, epoxy coated, for water supply service conforming to AWWA C509 Standard (latest version).
2. Valves, three (3) inches and smaller, located in vaults and inside of buildings, including for water meters and backflow preventers shall be full port ball valves approved for water supply service. The valves bodies shall be constructed of either 304 or 316 stainless steel, or brass/bronze. The valves must comply with the US EPA definition of being lead free; the 2011 amendments to Section 1417 of SDWA (the Reduction of Lead in Drinking Water Act). All components in contact with drinking water shall be listed by a third party agency to NSF 61 Certification.

D. Fire Hydrants

1. At University Park Campus, fire hydrants shall have National Standard (NH) threads. Fire hydrants shall conform to AWWA C-502 (latest version). Fire hydrants shall have two (2) 2.5-inch hose outlets and one (1) 4.5- inch pumper connection, NO CHAINS on hose outlet caps, and a 1.5-inch pentagon operating nut, open "LEFT". Hydrants shall be American Flow Control (formerly American Darling) No. B-62-B-5 fire hydrants with traffic feature, or other as approved by Engineering Services.
2. At locations other than University Park Campus, coordinate threads and outlet size with fire department serving that location. Fire hydrants shall conform to AWWA C-502 (latest version). Hydrants shall be American Flow Control (formerly American Darling) No. B-62-B-5 fire hydrants with traffic feature, or other as approved by Engineering Services. Refer to **Fire Hydrant Detail** in **.04 Guideline Details**.
3. At the University Park Campus, fire hydrant flow for existing hydrants may be available from the Engineering Services' Utility Systems Engineer – Water. All fire hydrant flow tests must be scheduled through Engineering Services' Utility Systems Engineer – Water. At University Park Campus, all fire hydrant flow tests must be performed by Water Services' Employees. At locations other than University Park Campus,

Engineering Services' Utility Systems Engineer – Water shall coordinate with the respective water supplier.

4. The fire hydrants at University Park shall be painted as per the following requirements:
 - a. Barrel shall be painted yellow.
 - b. If the 2.5-inch outlets have national standard hose (NH) thread, paint the 2.5-inch caps silver. If another thread pattern, paint all of the caps the same color.
 - c. Test hydrant by measurement of the flow from a single 2.5-inch outlet.
 - i. For flow less than 500 gallons per minute (gpm); the steamer cap and top shall be painted Red.
 - ii. For flow greater than or equal to 500 gpm, but less than 1,000 gpm; the steamer cap and top shall be painted Orange.
 - iii. For flow greater than or equal to 1,000 gpm, but less than 1,500 gpm; the steamer cap and top shall be painted Green.
 - iv. For flow greater than or equal to 1,500 gpm; the steamer cap and top shall be painted Light Blue.
 - d. For questions regarding fire hydrant flows, contact the PSU Engineering Services' Utility Systems Engineer – Water.

E. Water Meters

1. The water flow to each building shall be metered with a cyclometer counter giving a direct reading in gallons. All meters larger than 2" shall be compound meters. A touch read remote transmitter shall be provided and the counter located in an approved location.
2. Meters shall conform to AWWA Standards C700, C702, or C703 (latest version). A full-size bypass shall be provided around the meter to allow for servicing. Refer to **Water Meter and Backflow Preventer Details** for the applicable conditions in **.04 Guideline Details**. Provide a meter manufacturer recommended strainer with each meter.
 - a. At locations served by the University Park Utility Water Services system, meter and associated strainer shall be manufactured by Neptune Technology Group provided by Water Services for installation by the contractor, and billed to the Project at cost. The meter and strainer must be ordered from Water Services at least thirty (30) days prior to the planned installation. The current standard at University Park Campus for meters less than two inches is the Neptune Technology Group T-10 Meter with an E-Coder Head. The current standard at University Park Campus for meters greater than two inches is the Neptune Technology Group TRU/FLO Compound Meter with E-Coder Heads. The Engineer of Record shall be responsible for the proper sizing the meter and

strainer. The remote radio transmitter shall be “T-Clarity”, which shall be provided and installed by Water Services, and shall be billed to the Project at cost. For new buildings and building renovations, the water meter data shall be brought into the University’s BAS System instead of using the “T-Clarity” Radio Transmitter. This data will be brought into the BAS system via a single SCADAmetrics’ EtherMeter from the water meter’s E-coder registers. The contractor shall install a 120-volt, single phase, 20 amp circuit and 0.5-inch EMT conduit within five (5) feet of the water meter. The 0.5-inch EMT conduit shall extend from the water meter to a telecommunication junction point. The connection of the E-coder registers to the BAS System shall be performed by University’s Office of Physical Plant Personnel, and the cost of installation shall be billed to the Project at cost. Meters shall be inspected by Water Services prior to service activation.

- b. At all other locations, the meter and strainer manufacturer shall be Neptune Technology Group, unless otherwise required by the local water authority. The Engineer of Record shall be responsible for the proper sizing the meter and strainer.

F. Backflow Prevention

1. No water service connection shall be installed or maintained to or at any building where actual or potential cross-connections to the system would result, unless such actual or potential cross-connections are abated or controlled to the satisfaction of PSU Engineering Services’ Utility Systems Engineer – Water.
2. No connection shall be installed or maintained whereby water from an auxiliary water supply may enter the University water system unless such auxiliary water supply and the method of connection and use of such supply shall have been approved by PSU Engineering Services’ Utility Systems Engineer – Water.
3. An approved backflow prevention device(s) shall be installed prior to the first branch line leading off each service line to a building water system. Double check backflow prevention devices shall comply with AWWA Standard C510 (latest version). Reduced pressure zone backflow prevention devices shall comply with AWWA Standard C511 (latest version). Refer to **Water Meter and Backflow Preventer Details** for the applicable conditions in **.04 Guideline Details**.
4. An approved double check or reduced pressure zone backflow prevention device shall be installed on each service line to a building water system. Type of backflow prevention device shall be determined by PSU Engineering Services’ Utility Systems Engineer – Water. Backflow prevention devices shall be installed at a location and in a manner approved by the PSU Engineering Services’ Utility Systems Engineer – Water and shall be installed by a person properly qualified. At University

Park Campus, buildings shall have two backflow prevention devices installed in parallel. At University Park Campus, Apollo/Conbraco brand reduced pressure zone backflow preventers shall be furnished by Water Services for installation by the contractor on the potable water service, and billed to the Project at cost. The backflow prevention device(s) must be ordered from Water Services at least thirty (30) days prior to the planned installation. Reduced pressure backflow preventers shall not be located in pits or other areas that can fill with water unless previously approved by PSU Engineering Services' Utility Systems Engineer – Water. Backflow prevention devices shall be located on the building side of the water meter, as close to the meter as is reasonably practical and prior to any other connection. Refer to **Water Meter and Backflow Preventer Detail** for the applicable conditions in **.04 Guideline Details**. At University Park, backflow prevention device(s) shall be inspected and tested by Water Services prior to service activation.

5. An ASSE certified double check valve shall be installed on each fire service. Double check backflow prevention devices shall comply with AWWA Standard C510 (latest version), and have FM Global Approval. At University Park Campus, Ames Fire & Waterworks Model 3000SS brand double check backflow preventers. Fire service backflow preventers shall NOT be furnished by Water Services, regardless of location. At University Park, backflow prevention device(s) shall be inspected and tested by Water Services prior to service activation.

G. Constant Pressure Pumps

- See [Division 22 00 00](#).

H. Building Booster Pumps

- See [Division 22 00 00](#).

.03 Execution

G. Operation and Connection to Existing Waterlines

1. The operation of all existing water valves and hydrants shall be performed only by University's Water Services Operators. The Contractor and any other personnel are expressly forbidden from operating the water system components.
2. At University Park, all connections to existing waterlines shall be done by the University. These connections shall be done as follows: The Contractor shall provide all required fittings, excavate a pit of sufficient size to install the tapping machine, provide shoring, as required, to comply with U.S. OSHA Standards, provide equipment to place and remove the tapping machine, backfill the excavation after the tap is made, restore the surface area, and pay the University a fee for the tap. The fee shall be based on the actual cost incurred by Water Services, including, but not limited to manpower, materials, and equipment; and billed to the Project at cost. The University will provide the tapping machine and perform the tapping, and/or the connection to the existing waterline.

3. At all Penn State locations other than University Park, connections to existing waterlines shall be done by the contractor, but only in the presence of PSU Office of Physical Plant staff.

H. Temporary Water Service

1. Temporary service is defined as a water service provided for events, food vending, construction, or maintenance supplied from a building or hydrant using temporary piping for 30 days or less. Nonpermanent service (greater than 30 days) will be addressed and approved by the Office of Physical Plant, Engineering Services' Utility Systems Engineer – Water, on a case-by-case basis.
2. The Pennsylvania State University, Water Services, will provide customer hook-up to an existing source such as a building hose bibbs or fire hydrant, including a reduced pressure principal (RPZ) backflow preventer, and water meter.
3. The University will ensure proper disinfection by sampling at the existing hose bibb for chlorine residual and coliform bacteria prior to customer use of the water.
4. It is the customer's responsibility to ensure that proper disinfection continues from the existing hose bibb to their equipment and to the consumer. The University will provide a procedure with recommendations to the customer to ensure proper disinfection.
5. The temporary tap and sampling costs will be the responsibility of the customer.

I. System Tests and Disinfection

1. All water lines and services shall be hydrostatically tested to conform to AWWA C-600 (latest version). Water Services and PSU Engineering Services' Utility Systems Engineer – Water shall be notified of the testing a minimum of three (3) business days prior to the testing to allow scheduling for observation of the testing. At University Park, all hydrostatic tests must be observed and approved by Water Services personnel. At locations other than University Park Campus, all hydrostatic tests must be observed and approved by University Personnel.
2. Disinfection shall conform to AWWA C-651 (latest version). Contractor shall retain the services of a PA DEP certified water testing laboratory to sample and test the potable water system. The water line must be thoroughly flushed after disinfection and achieve ambient free chlorine residual concentrations prior to collecting the sample. Water Services shall be notified of the testing a minimum of three (3) business days prior to the testing to allow scheduling for observation of the testing and perform chlorine residual testing. At University Park, all flushing and sampling/field tests must be performed by Water Service Personnel. At locations other than University Park Campus, all flushing be performed by University Personnel and sampling/field tests must be observed and approved by University Personnel. All test results shall be provided to Engineering Services prior to activation of services by Water Services at University Park or University Personnel at other locations.

3. Meter and backflow prevention device(s) shall be inspected and tested by Water Services prior to service activation by Water Services.

.04 Guideline Details

- A. Professional shall carefully review and edit the guideline installation details below, adapting them as needed to achieve application-specific, fully developed details for each project.

Document	Version Date	Description
PSU Water Service and Water Line Ext Plan Approval Req.pdf	July 2014	Requirements for the submission of plans for new water services and water lines.
33 10 00_Boring & Encasement Piping Detail.pdf 33 10 00_Boring & Encasement Piping Detail.dwg	January 2014	Design detail requirements for boring and encasement piping for water lines.
33 10 00_Air Release Detail.pdf 33 10 00_Air Release Detail.dwg	January 2014	Design detail requirements for air releases and vacuum breakers on water lines.
33 10 00_Blow-off Detail.pdf 33 10 00_Blow-off Detail.dwg	January 2014	Design detail requirements for blow offs and flushing piping.
33 10 00_Waterline Trench Detail in Paved Areas.pdf 33 10 00_Waterline Trench Detail in Paved Areas.dwg	January 2014	Design detail requirements for Waterline Trenches in paved areas.
33 10 00_Waterline Trench in Non-Paved Areas.pdf 33 10 00_Waterline Trench in Non-Paved Areas.dwg	January 2014	Design detail requirements for Waterline Trenches in non-paved areas.
33 10 00_Trench Plug Installation.pdf 33 10 00_Trench Plug Installation.dwg	January 2014	Design detail requirements for trench plug/clay dike installation of water lines over 300 feet in length.
33 10 00_Deadman Detail.pdf	January 2014	Design detail requirements for reinforced concrete deadman piping on existing cast iron

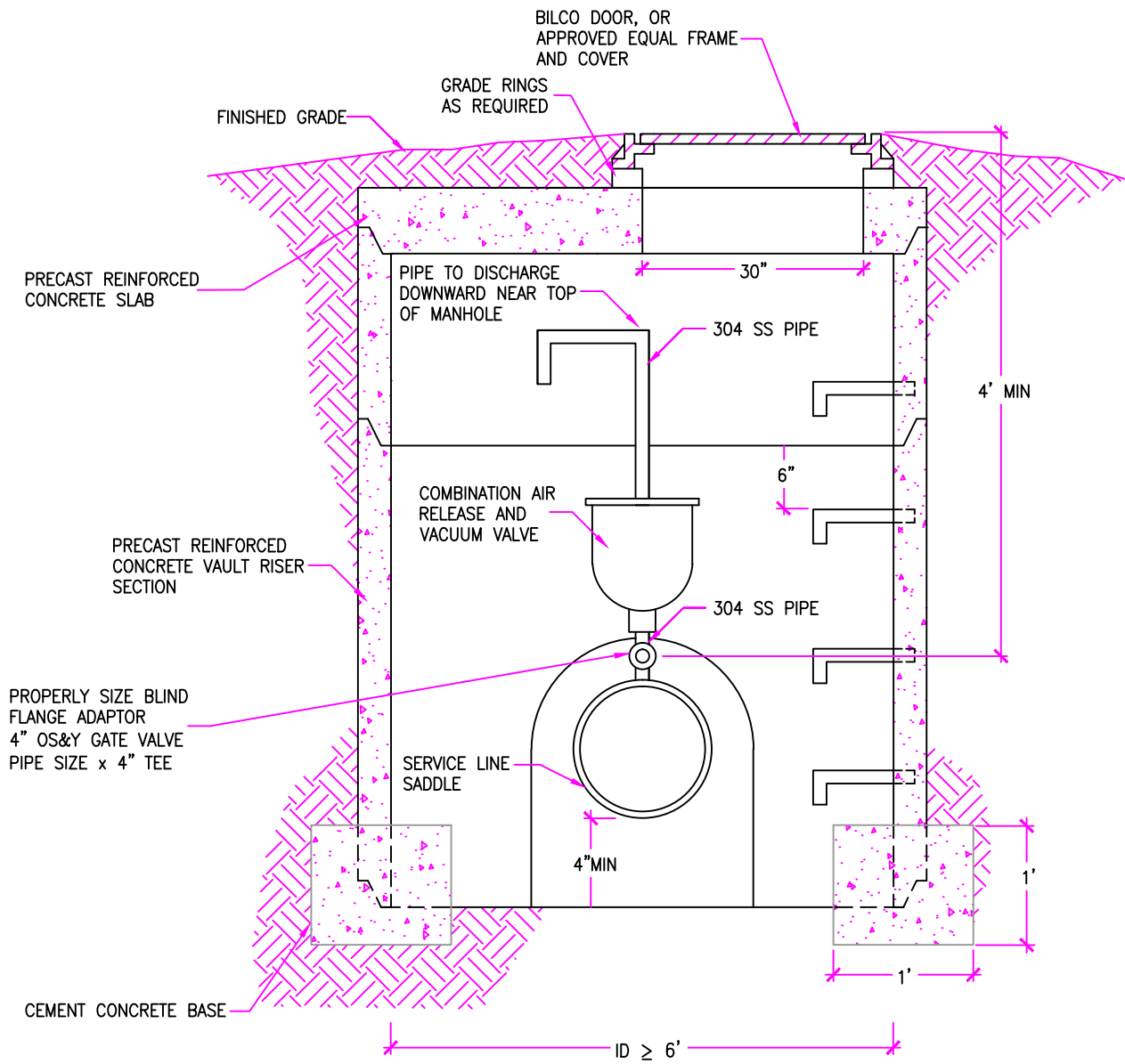
33 10 00_Deadman Detail.dwg		water lines.
33 10 00_Fire Hydrant Installation & Relocation.pdf 33 10 00_Fire Hydrant Installation & Relocation.dwg	January 2014	Design detail requirements for the installation of fire hydrants.
33 10 00_Domestic Meter- Backflow Assembly Detail.pdf 33 10 00_Domestic Meter- Backflow Assembly Detail.dwg,	October 2013	Design detail requirements for the install of water meters and backflow preventers on building water services for domestic services.
33 10 00_Fire_Domestic Meter-Backflow Assembly Detail.pdf 33 10 00_Fire_Domestic Meter-Backflow Assembly Detail.dwg	October 2013	Design detail requirements for the install of water meters and backflow preventers on building water services for domestic/fire services.

END of revision

Update Commentary:

Section was updated primarily for the following reasons:

- 1) *To modify and expand some technical content requirements, including but not limited to, University Water Service and Water Line Extension Plan Approval Requirements, materials of construction, and changes in manufacturers' names.*
- 2) *To reorganize the section into main parts as follows - General, System Requirements, Execution and Guideline Details. Then System Requirements is organized starting with distribution and ending with building service entrances.*
- 3) *Updated old drawings and added new drawings, each available in PDF or ACAD DWG electronic format.*

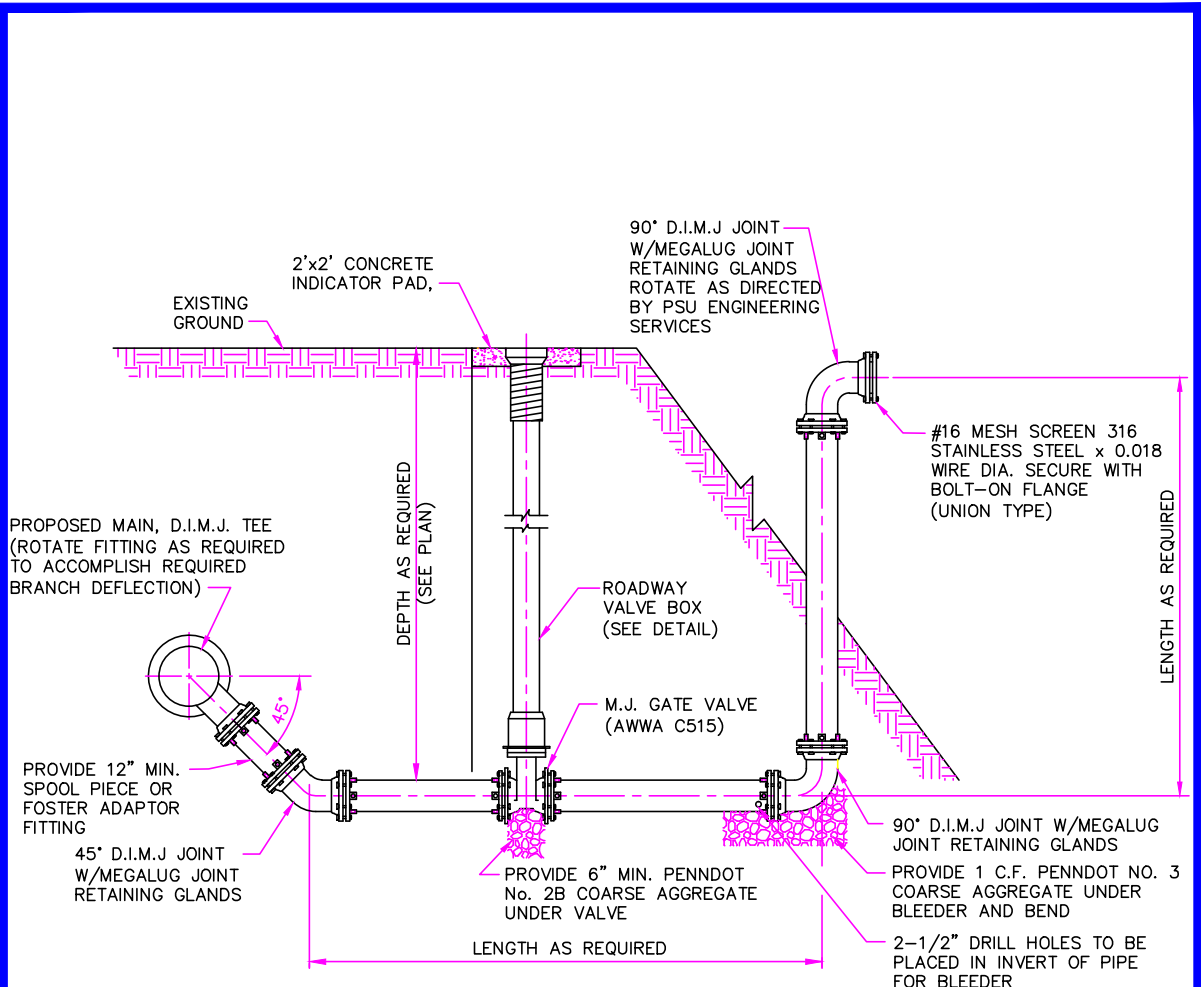


AIR RELEASE / VACUUM BREAKER DETAIL

SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL –
 AIR RELEASE / VACUUM BREAKER DRAWING

SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014



NOTES:

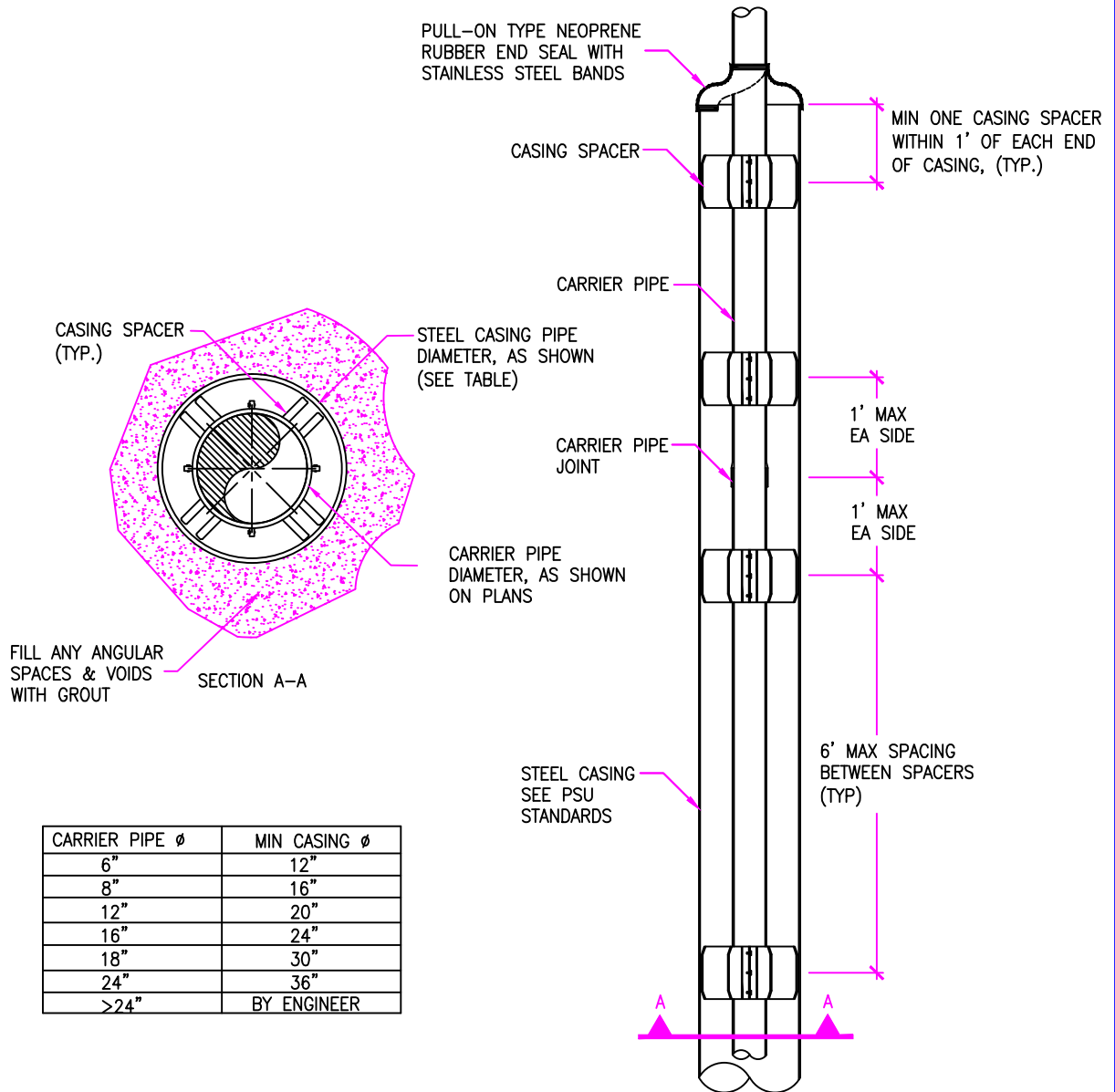
- PROVIDE EFFECTIVELY CONTINUOUS JOINT RESTRAINT FROM WATER MAIN LINE TEE TO DISCHARGE UTILIZING MEGALUG MECHANICAL RESTRAINT JOINT AT EACH FITTING AND PIPE CONNECTION.

BLOWOFF/FLUSHING PIPING

SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL –
 BLOWOFF/FLUSHING PIPING DRAWING

SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014

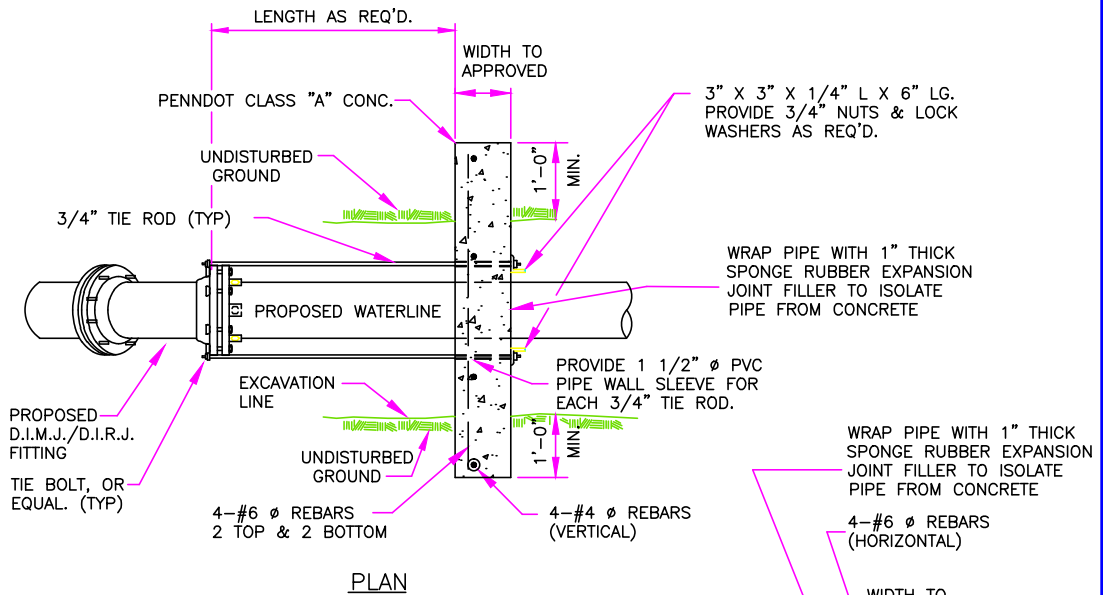


BORING AND ENCASEMENT PIPING DETAIL

SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL –
 BORING AND ENCASEMENT PIPING DRAWING

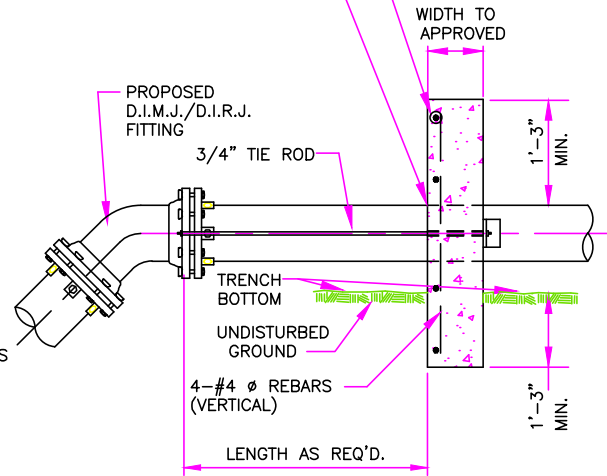
SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014



PLAN

NOTES:

- ALL TIE RODS, TIE BOLTS & ANGLES SHALL BE SURFACE PREPARED AND COATED WITH AN EPOXY COATING PER SPECIFICATIONS
- 4 TIE RODS REQ'D PER JOINT FOR 4", 6", 8", 10" AND 12" DIA. PIPE
- 8 TIE RODS REQ'D PER JOINT FOR 16" DIA. PIPE
- 10 TIE RODS REQ'D PER JOINT FOR 20" DIA. PIPE
- 12 TIE RODS REQ'D PER JOINT FOR 24" DIA. PIPE
- ALL CONC. ANCHORS MUST BE CURED A MIN. OF 7 DAYS BEFORE TIGHTENING TIE RODS.



ELEVATION

REINFORCED CONCRETE DEADMAN PIPING

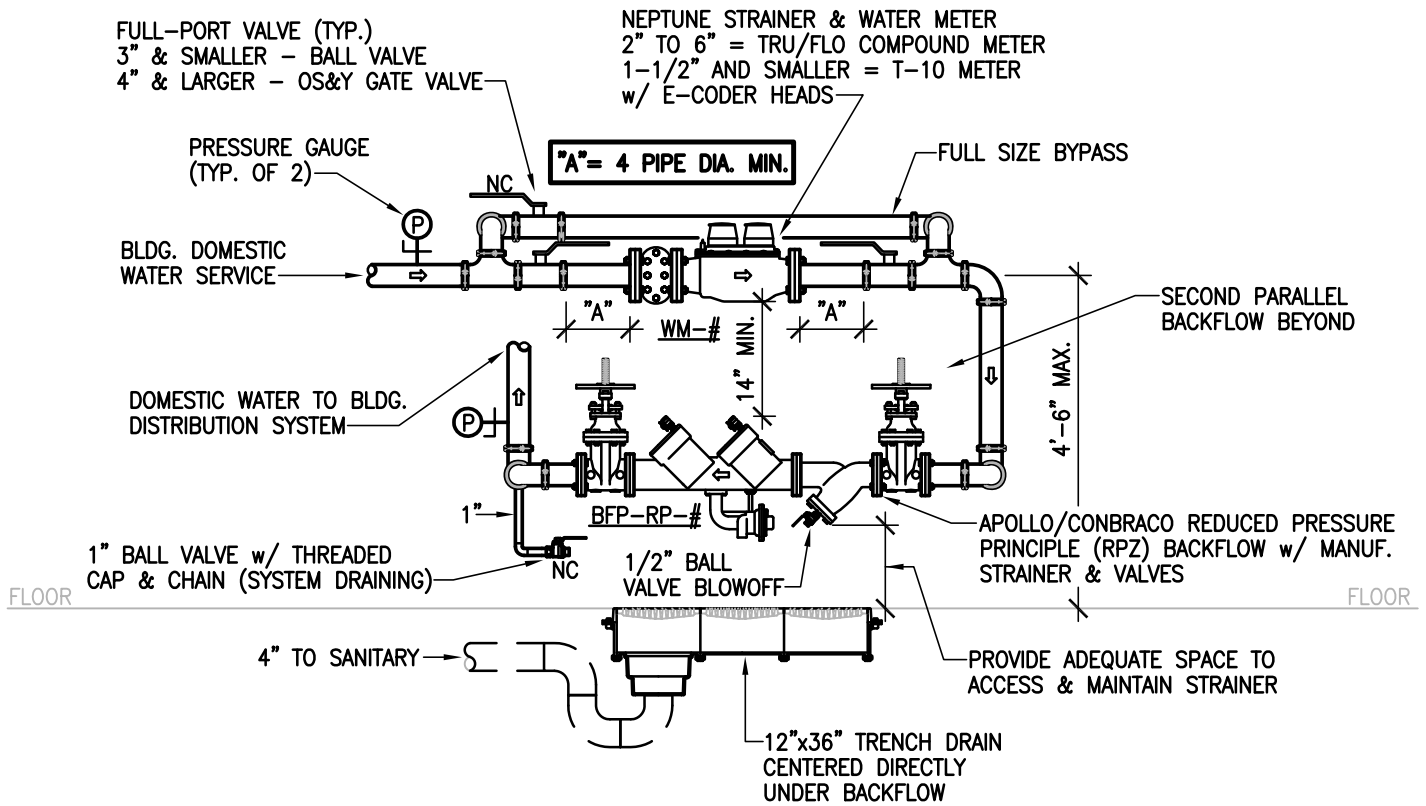
SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL – REINFORCED
 CONCRETE DEADMAN PIPING DRAWING

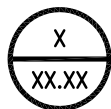
SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014

NOTES TO ENGINEER/DESIGNER:

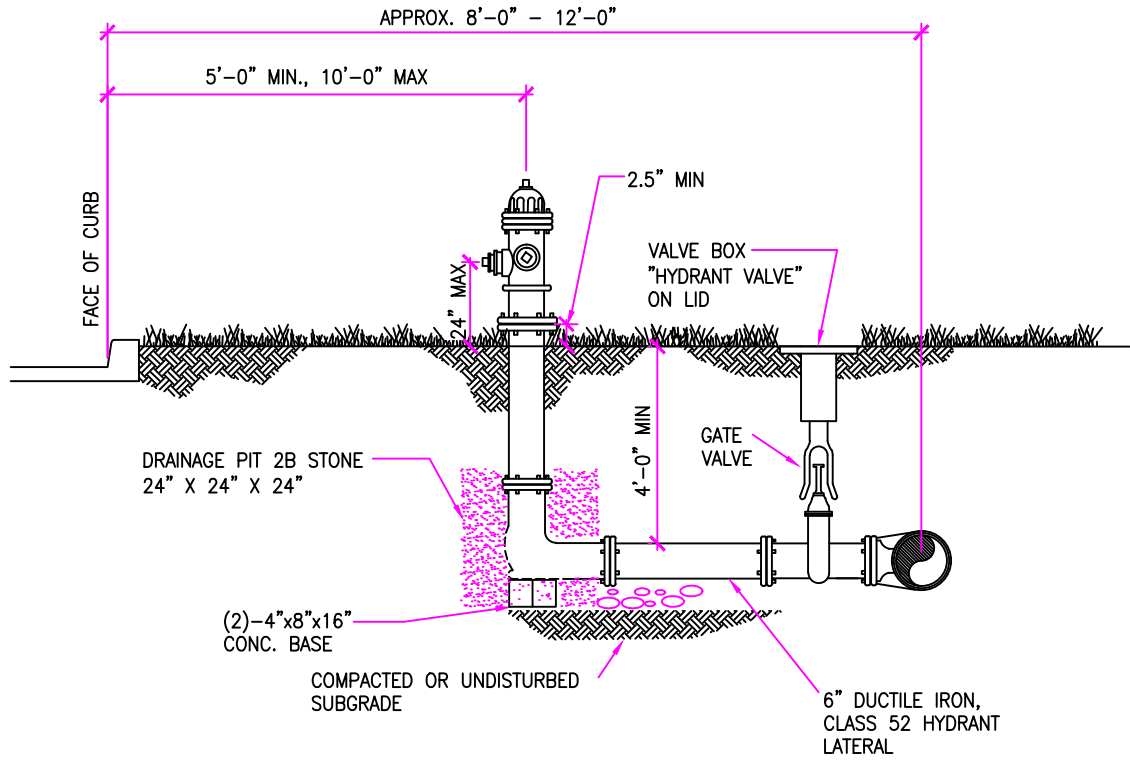
1. AT UNIVERSITY PARK CAMPUS, ALL DOMESTIC WATER SERVICES SHALL HAVE TWO PARALLEL BACKFLOW PREVENTION DEVICES INSTALLED.
2. PROVIDE UNISTRUT SUPPORTS OFF CONCRETE FLOOR TO SUPPORT WATER METER/BACKFLOW ASSEMBLY.
3. IF WATER METER/BACKFLOW ASSEMBLY IS LOCATED MORE THAN 30 FEET FROM WATER SERVICE ENTRANCE, PROVIDE FULL-PORT LINE SIZE VALVE AT WALL AFTER WATER SERVICE PIPING ENTERS BUILDING.
4. PIPING JOINTS AT THE WATER METER/BACKFLOW ASSEMBLY SHALL BE:
2-1/2" & LARGER - MECHANICAL TYPE SIMILAR TO VICTAULIC
2" & SMALLER - PRO-PRESS TYPE SIMILAR TO VIEGA
5. ALL WATER METERS & BACKFLOW PREVENTERS SHALL BE APPROPRIATELY SIZED FOR BUILDING FLOW.
6. WATER METER STRAINER SHALL BE ROTATED 90° FROM THE UPRIGHT POSITION BEFORE INSTALLATION TO ALLOW FOR EASIER MAINTENANCE.
7. STACKED CONFIGURATION SHOWN IS PREFERRED, BUT DEPENDING ON AVAILABILITY OF SPACE THE CONFIGURATION MAY CHANGE. REGARDLESS OF CONFIGURATION ALL MINIMUM AND MAXIMUM DIMENSIONS AND VALVE RELATIONSHIPS SHALL REMAIN THE SAME.



DOMESTIC WATER SERVICE- WATER METER & BACKFLOW ASSEMBLY DETAIL



NO SCALE



NOTES:

1. FIRE HYDRANT SHALL BE AMERICAN FLOW CONTROL NO. B-62-B-5 WITH TRAFFIC FEATURE.
2. ALL JOINTS SHALL BE MADE WITH "MEGALUG" RESTRAINTS.
3. PROVIDE BANDS/FITTINGS AS REQUIRED (AFTER TEE) FOR PROPER DEPTH OF BURIAL AND PLUMBNESS OF HYDRANT.
4. REFER TO FIRE HYDRANT SECTION OF PSU DESIGN AND CONSTRUCTION STANDARDS FOR ADDITIONAL REQUIREMENTS.

FIRE HYDRANT DETAIL DRAWING

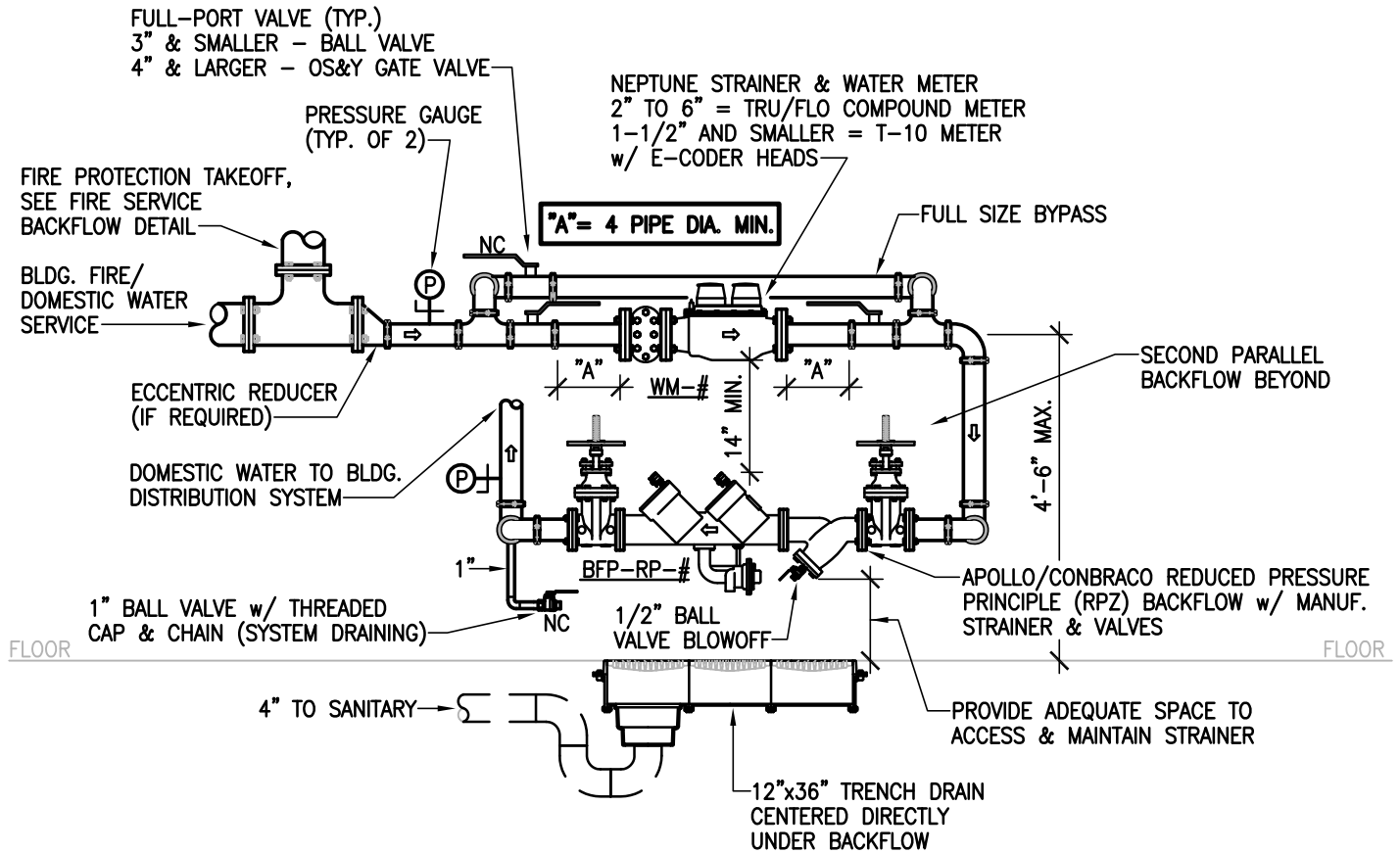
SCALE: NONE

PENN STATE UNIVERSITY
DESIGN STANDARD DETAIL —
FIRE HYDRANT DRAWING

SEC. 331000
SCALE: NONE
DATE: 01.27.2014

NOTES TO ENGINEER/DESIGNER:

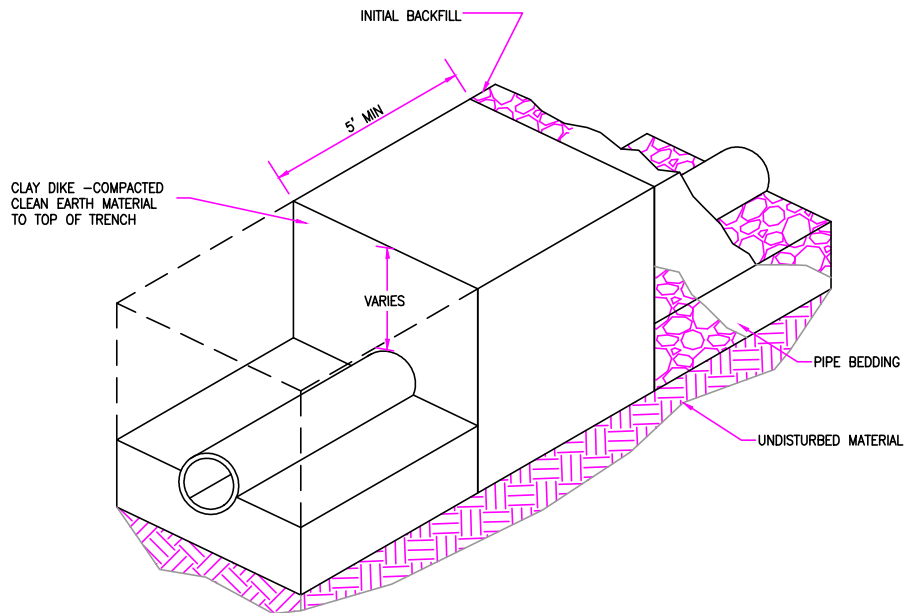
1. AT UNIVERSITY PARK CAMPUS, ALL DOMESTIC WATER SERVICES SHALL HAVE TWO PARALLEL BACKFLOW PREVENTION DEVICES INSTALLED.
2. PROVIDE UNISTRUT SUPPORTS OFF CONCRETE FLOOR TO SUPPORT WATER METER/BACKFLOW ASSEMBLY.
3. IF WATER METER/BACKFLOW ASSEMBLY IS LOCATED MORE THAN 30 FEET FROM WATER SERVICE ENTRANCE, PROVIDE FULL-PORT LINE SIZE VALVE AT WALL AFTER WATER SERVICE PIPING ENTERS BUILDING.
4. PIPING JOINTS AT THE WATER METER/BACKFLOW ASSEMBLY SHALL BE:
2-1/2" & LARGER - MECHANICAL TYPE SIMILAR TO VICTAULIC
2" & SMALLER - PRO-PRESS TYPE SIMILAR TO VIEGA
5. ALL WATER METERS & BACKFLOW PREVENTERS SHALL BE APPROPRIATELY SIZED FOR BUILDING FLOW.
6. WATER METER STRAINER SHALL BE ROTATED 90° FROM THE UPRIGHT POSITION BEFORE INSTALLATION TO ALLOW FOR EASIER MAINTENANCE.
7. STACKED CONFIGURATION SHOWN IS PREFERRED, BUT DEPENDING ON AVAILABILITY OF SPACE THE CONFIGURATION MAY CHANGE. REGARDLESS OF CONFIGURATION ALL MINIMUM AND MAXIMUM DIMENSIONS AND VALVE RELATIONSHIPS SHALL REMAIN THE SAME.



**COMBINED FIRE/DOMESTIC WATER SERVICE-
WATER METER & BACKFLOW ASSEMBLY DETAIL**

X
XX.XX

NO SCALE

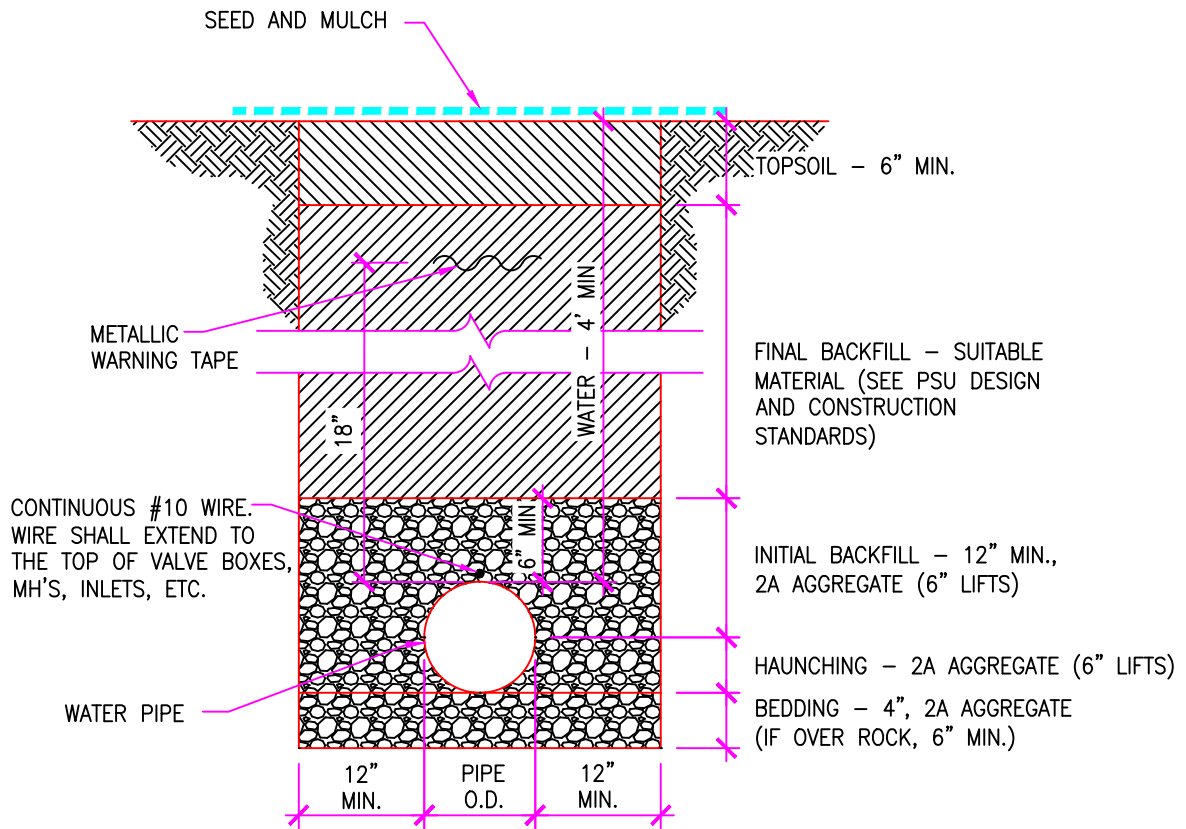


- NOTES:**
1. CLAY DIKE SHALL CONSIST OF CLAY CONTAINING NO MORE THAN 15% (BY VOLUME) STONE NOT LARGER THAN 2" IN DIAMETER, CLAY SHALL BE PLACED IN 6" LIFTS AND COMPACTED BY MECHANICAL TAMPER TO NO LESS THAN 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT

TRENCH PLUG INSTALLATION DETAIL
 SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL —
 CLAY DIKE DETAIL DRAWING

SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014



NOTES:

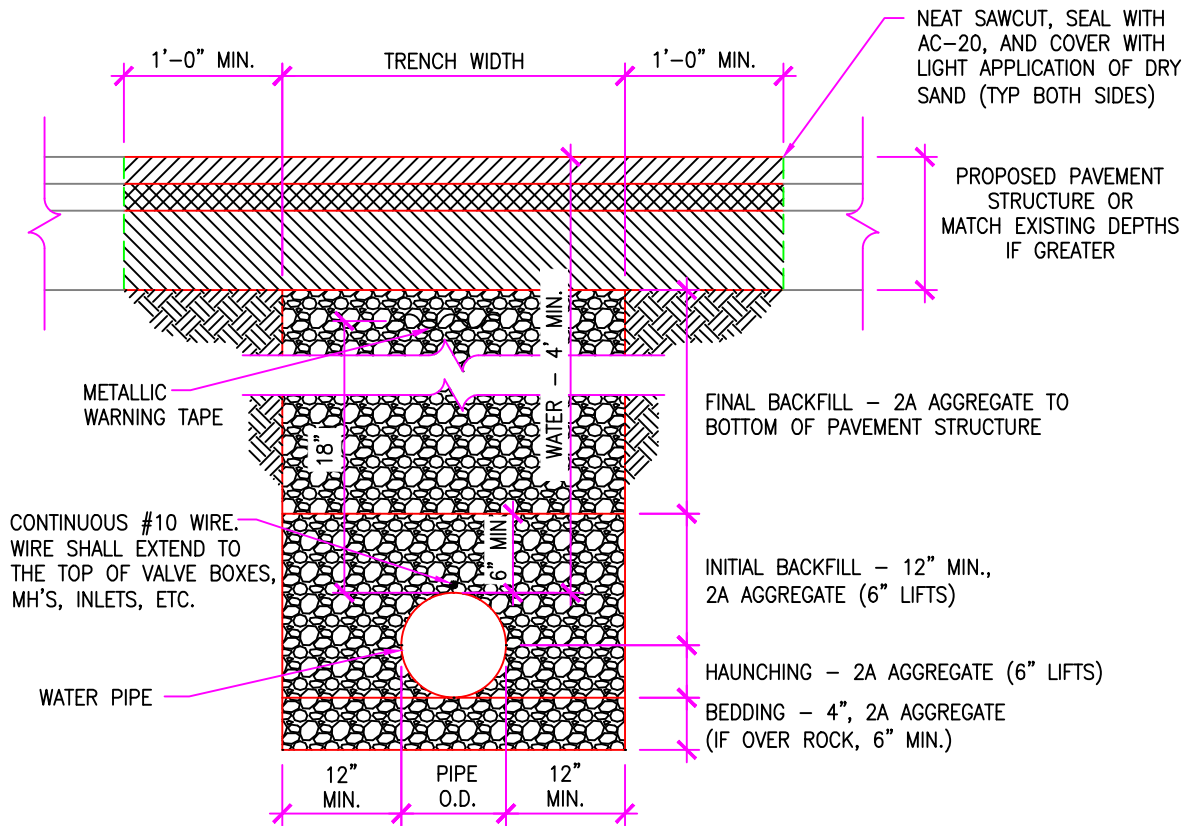
1. WATER LINE MAXIMUM DEPTH 8' TO CROWN OF PIPE.
2. CLAY DIKES INSTALLED ON PIPE RUNS OVER 300' IN LENGTH.

**WATERLINE TRENCH IN
NON-PAVED AREAS**

SCALE: NONE

PENN STATE UNIVERSITY
DESIGN STANDARD DETAIL - WATERLINE
TRENCH IN NON-PAVED AREAS DRAWING

SEC. 331000
SCALE: NONE
DATE: 01.27.2014



NOTES:

1. WATER LINE MAXIMUM DEPTH 8' TO CROWN OF PIPE.
2. CLAY DIKES INSTALLED ON PIPE RUNS OVER 300' IN LENGTH.

WATERLINE TRENCH IN PAVED AREAS

SCALE: NONE

PENN STATE UNIVERSITY
 DESIGN STANDARD DETAIL - WATERLINE
 TRENCH IN PAVED AREAS DRAWING

SEC. 331000
 SCALE: NONE
 DATE: 01.27.2014

Pennsylvania State University, University Park
University Water Service and Water Line Extension Plan Approval Requirements

The following information shall be submitted to the Pennsylvania State University (PSU) Engineering Services' Utility Systems Engineer – Water for review and approval for the modification of existing water services, installation of new water services, modification of existing water distribution system piping, and the installation of new water distribution system piping.

PSU Project Name and PSU Number

Proposed Construction Dates

Answer the following eight questions regarding the proposed water demand.

1. What is the initial estimated daily domestic water demand in gallons per day?
2. What is the initial estimated peak instantaneous domestic water demand in gallons per minute?
3. What is the final estimated daily domestic water demand in gallons per day?
4. What is the final estimated peak instantaneous domestic water demand in gallons per minute?
5. What is the initial estimated peak instantaneous fire protection water demand in gallons per minute?
6. What is the initial estimated duration of this peak instantaneous fire protection water demand in minutes?
7. What is the final estimated peak instantaneous fire protection water demand in gallons per minute?
8. What is the final estimated duration of this peak instantaneous fire protection water demand in minutes?

Please include calculations and basis for these estimations.

Drawing and Plan Requirements

Two (2) hardcopies and one (1) electronic copy of drawings shall be submitted for review.

If any portion of the proposed project is not located of University property, a copy of the record plat showing all easements, dimensions, and other information required to be presented on the record plat shall be submitted along with plans.

The site plan shall be of a scale not to be greater than one (1) inch equals twenty (20) feet nor less than one (1) inch equals one hundred (100) feet. The site plan and shall include more than one drawing where required for clarity.

The following shall be shown on the drawings and plans, when applicable:

- The proposed project title and Campus physical location or street address of the project and the name of the owner(s) if other than the University, engineer, architect, designer, or landscape architect of the development, north arrow, and date.
- A vicinity map showing the location of the project in relation to the surrounding Campus and community.
- The boundaries of the property involved, the location of all existing easements, section lines, and property lines, and other physical and natural features in or adjoining the project.
- Names and addresses of all adjoining landowners if applicable.
- Existing and proposed grades in 2-foot intervals. The datum for all elevations shall be USGS. The survey information shall be Pennsylvania State Plane NAD 83.

Pennsylvania State University, University Park
University Water Service and Water Line Extension Plan Approval Requirements
Page 2

- Location of existing and proposed buildings, sanitary and storm sewers, water mains, culverts, and other public and private utilities in or adjacent to the project.
- Location water service entry into the building with the finished floor and grade line elevations.
- Flood Hazard zone and boundaries, if applicable.

The design must conform to the University's Design and Construction Standards, and the Pennsylvania Department of Environmental Protection's Rules and Regulations.

The installation of the project must conform to the University's Design and Construction Standards, and the Pennsylvania Department of Environmental Protection's Rules and Regulations.

The water service will not be activated until the hydrostatic testing and inspection, disinfection, bacteriological testing, water meter inspection, and backflow prevention device(s) inspection and testing has been properly performed and verified by Water Services. Any deficiencies to the water system's installation must be corrected prior to the activation of the water service.

The plan approval information shall be submitted to the following address.

PSU Engineering Services' Utility Systems Engineer – Water
152N Physical Plant Building
University Park, PA 16802
Telephone: (814) 863-5536
E-mail: jkb125@psu.edu