F. UNI-PUB-08 Tapping Guide for PVC Pressure Pipe

Products delivered under this specification shall be manufactured only from water distribution pipe and couplings conforming to AWWA C900 (PVC) or C906

HDPE - Pipe and fittings shall be made from virgin resins exhibiting a minimum cell classification of PE 345444C as defined in ASTM D3350 with an established hydrostatic-design-basis of 1600 psi for water at 73°F. The resin shall be listed by

he PPI (Plastic Pipe Institute) in its pipe-grade registry Technical Report (TR) 4,

2. Polyvinyl Chloride Pipe (PVC) - Restrained Joint PVC pipe and couplings shall be Design Basis (HDB) of 4000 psi for water at 73.4 Degrees F, in accordance with the requirements of ASTM D2837

1. The pipe products shall have been tested and approved by an independent thirdparty laboratory for continuous use at rated pressure. Copies of Agency approva reports or product listing shall be provided to the Engineer. Products intended for

ntact with potable water shall be evaluated, tested, and certified for conformance with NSF Standard 61 by an acceptable certifying organization D. Dimensions

1. Outside diameters and wall thicknesses shall follow the Dimension Ratio (DR) listed in this specification as prescribed in AWWA C900 for PVC or AWWA C906 for HDPE HDPE pipe diameters must be ductile iron outside diameter (DIOD). Laying lengths are 20 feet standard for PVC and 40 or 50 feet for HDPE.

HDPE Pipe

 HDPE pipe shall be fusion joined in accordance with ASTM F2620 for butt fusion or ASTM F1290 for electrofusion. Only flanges or other mechanical joint systems proven for HDPE pipes shall be used.

Connections to other pipe materials shall be made with "Harvey Style" HDPE

 The pipe shall be joined using non-metallic couplings which, together, have been High-strength flexible thermoplastic splines shall be inserted into matting 2.2 POLYVINYL CHLORIDE PRESSURE PIPE FOR POTABLE WATER

pipe bearing the "NSF" logo or mark.

 The pipe shall be joined using a separate PVC coupling with beveled edges, built in sealing gaskets and restraining grooves. The restraining splines shall be square and made from Nylon 101.

precision-machined groves in the pipe and coupling to provide full 360 degree

Couplings shall be designed for use at the rated pressure of the pipe with which

Pipe shall be legibly and permanently marked with the following information.

2. Pipe and fittings shall also bear the mark of the certifying agency(s) which have

1. As defined in AWWA C900, PVC pipe shall be homogeneous throughout and be free

of visible cracks, holes, foreign material, blisters, or other visible deleterious faults

2. As defined in AWWA C906, PE pipe and fittings shall be homogeneous throughout and free from voids, cracks, inclusions, and other defects, and shall be as uniform as

B. Directional boring may be utilized in lieu of open cut for areas not specifically indicated as directional bore areas on the plans. No additional payment will be

B. Work plan: Prior to beginning work, the CONTRACTOR must submit to the ENGINEER a

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· Pressure Class per applicable standard

Recommended Maximum Safe Pull Force

A. All directional drilling operations shall be done by a qualified directional drilling

B. Notify ENGINEER and OWNER a minimum of three (3) days in advance of the state of

A. The polyethylene pipe material shall meet AWWA C906 standards for Polyethylene pipe and fittings with a DR of 11. The pipe OD sizes shall be available in ductile iron pipe

B. The pipe is to be joined by heat fusion, flanges or other mechanical joint systems proven for HDPE pipes. Both pipe and fittings must be NSF listed by the manufacturer with the

C. Where HDPE pipe is upsized to meet the required design ID, ductile iron reducers shall

be used to connect to fittings and valves or the fittings and valves may be upsized to meet the pipe OD.

C. All work shall be performed in the presence of the OWNER or ENGINEER.

Fusion technician qualification for FPVC

work plan detailing the procedure and schedule to be used to execute the project. The

work plan should include a description of all equipment to be used, down-hole tools, a list of personnel and their qualification and experience (including backup personnel in the

event that an individual is unavailable), list of subcontractors, a schedule of work activity,

a safety plan (including MSDS of any potentially hazardous substances to be used), an environmental protection plan and contingency plans for possible problems. Work plan

should be comprehensive, realistic and based on actual working conditions for this particular project. Plan should document the thoughtful planning required to successfully

Material: Specifications on material to be used shall be submitted to ENGINEER.

Material shall include the pipe, fittings and any other item which is to be an

installed component of the project. The following product data is required at a

Equipment: Submit specifications on directional drilling equipment to be used to

ensure that the equipment will be adequate to complete the project. Equipment shall include but not be limited to: drilling rig, mud system, mud motors (if

applicable), downhole tools, guidance system, rig safety systems. Calibration

records for guidance equipment shall be included. Specifications for any drilling fluid additives that CONTRACTOR intends to use or might use shall be

nmercially practicable in color, opacity, density, and other physical characteristics

tested and approved the product for use in fire protection applications

Nominal Size & DR Rating/Pressure Class

they are utilized, and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477. Joints shall be designed to meet the leakage

restraint with evenly distributed loading

Manufacturer and Trade Name

Manufacturing Date Code

Locations where directional boring is required are indicated on the plans.

made for utilizing directional bore method in lieu of open cut.

Directional drilling contractor's qualifications and experience.

Pipe Size

work required of this project.

PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE PIPE

G. WORKMANSHIP:

1.5 LOCATIONS

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 Plyvinylchloride pipe shall be manufactured in a standard 20' nominal length. Polyvinylchloride pipe shall be blue in color for potable water use.

D. Pipe shall be marked as follows: Nominal pipe size Dimension Ratio, Standard Dimension Ratio, or Schedule AWWA pressure class

 AWWA standard designation number NSF-61 mark verifying suitability for potable water service

Trademark or trade name Cell Classification 12454 and/or PVC material code 1120 may also be included
Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

2.2.1 JOINTS The pipe shall be joined using non-metallic couplings which, together, have been designed as an integral system for maximum reliability and interchangeability. High-strength flexible thermoplastic splines shall be inserted into matting precision-machin groves in the pipe and coupling to provide full 360 degree restraint with evenly distributed

C. Couplings shall be designed for use at the rated pressure of the pipe with which they are utilized, and shall incorporate twin elastomeric sealing gaskets meeting the requirement of ASTM F477. Joints shall be designed to meet the leakage test requirements of ASTM

2.2.2 CONNECTIONS AND FITTINGS FOR PRESSURE APPLICATIONS A. Connections shall be defined in conjunction with the coupling of project piping, as well as the tie-ins to other piping systems.

 B. DUCTILE IRON MECHANICAL AND FLANGED FITTINGS Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard ductile iron fittings conforming to AWWA/ANSI C110/A21.10, or AWWA/ANSI C153/A21.53 and AWWA/ANSI C111/A21.11.

 Connections to fusible polyvinylchloride pipe may be made using a restrained or on-restrained retainer gland product for PVC pipe, as well as for MJ or flanged

Bends, tees and other ductile iron fittings shall be restrained with the use of hrust blocking or other means as indicated in the construction document

3. Ductile iron fittings and glands must be installed per the manufacturer's C. PVC GASKETED, PUSH-ON FITTINGS

All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Each person must have at least two years directional drilling

 A competent and experienced supervisor representing the CONTRACTOR and Drilling A competent and experienced supervision representing the CONTRACTOR and Diminig Subcontractor shall be present at all times during the actual drilling operations. A responsible representative who is thoroughly familiar with the equipment and type of work to be performed must be in direct charge and control of the operation at all times. In all cases, the supervisor must be continually present at the job site during the actual Directional Bore operation. The CONTRACTOR and Subcontractor shall have a sufficient number of competent workers on the job at all times to insure the Directional Bore is made in a timely and satisfactory manner

Personnel who are unqualified, incompetent or otherwise not suitable for the performance of this project shall be removed from the job site and replaced with a suitable person.

PART 3 EXECUTION 3.1 GENERAL REQUIREMENTS

Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard PVC

2. Bends, tees and other PVC fittings shall be restrained with the use of thrust

3. PVC gasketed, push-on fittings and mechanical restraints, if used, must be

Sleeve-type mechanical couplings shall be manufactured for use with PVC

pressure pipe, and shall be restraine as indicated in the construction documents

Sleeve-type couplings shall be rated at the same or greater pressure carrying

Expansion-type mechanical couplings shall be manufactured for use with PVC

Bolts and nuts for buried service shall be made of non-corrosive, high-strength,

ow-alloy steel having the characteristics specified in ANSI/AWWA C111/A2

1. The directional drilling equipment, as a minimum, shall consist of a directional

emergency and contingency plan as submitted per these specifications.

The directional drilling machine shall consist of a hydraulically powered system to

drilling rig of sufficient capacity to perform the bore(s) and pull-back of the

pipe(s), a drilling fluid mixing & delivery system of sufficient capacity to

boring operations, and trained and competent personnel to operate the system

All equipment shall be in good, safe operating condition with sufficient supplies

materials and spare parts on hand to maintain the system in good working order for the duration of this project. All required equipment shall be included in the

rotate, push and pull drill pipe while delivering a pressurized fluid mixture to a drill

head. The machine shall be anchored to withstand the pulling, pushing and rotating forces required to complete the project.

B. The drilling rig hydraulic system shall be of sufficient pressure and volume to

C. The drilling rig shall have a system to monitor pull-back hydraulic pressure during

A. The horizontal directional drilling equipment shall produce a stable fluid lined

B. The system must be able to control the depth and direction of the drilling

C. Drill head shall contain all necessary cutters and fluid jets for the operation, and

a. Drilling fluid shall be composed of clean water and the appropriate additive(s)

b. The water and additives shall be mixed thoroughly to assure the absence of

c. Drilling fluid shall be maintained at a viscosity sufficient to suspend cuttings

d. Drilling fluid shall be disposed of off-site in accordance with local, state and

e. No additional chemicals or polymer surfactants shall be allowed to be added

to the drilling fluid unless they have been submitted per this specification.

Drilling fluid mixing system shall be of sufficient size to mix and deliver drilling

The mixing system shall be able to ensure thorough mixing of the drilling fluid.

3. The mixing system shall continually agitate the drilling fluid during drilling

1. The drilling fluid pumping system shall have a minimum capacity to supply drilling

fluid in accordance with the drilling equipment pull-back rating at a constant

contained and properly disposed of. The use of spill containment measures shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and

drilling fluid recycling system (if used) to prevent spills into the surrounding environment. Pumps, vacuum truck(s), and/or storage of sufficient size shall be

2. The delivery system shall have filters or other appropriate in-line equipment to

3. Used drilling fluid and drilling fluid spilled during drilling operations shall be

Closed-loop drilling fluid system and a drilling fluid cleaning system should be used to whatever extent practical, depending upon project size and conditions. Under no circumstances shall drilling fluid that has escaped containment be

Calibration of the electronic detection and control system shall be verified prior to

The drilling head shall be remotely steer-able by means of an electronic or magnetic detection system. The drilling head location shall be monitored in three

4. For gravity application and on-grade drilling, sonde/beacon or approved

equipment applicable for grade increments of 1/10th of one percent shall be used

Pipe pull heads shall be utilized that employ a positive through-bolt design

2. Pipe pull heads shall be specifically designed for the pipe to be used as

Pipe rollers, if required, shall be of sufficient size to fully support the weight of the

be used to assure adequate support and excessive sagging of the product pipe.

2. A sufficient quantity of rollers and spacing, per the pipe supplier's guidelines shall

assuring a smooth wall against the pipe cross-section at all times.

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for the fluid to be used. Water shall be from a clean source and shall meet

shall be of the appropriate design for the ground medium being drilled.

tunnel with the use of a steer-able drill head and any subsequent pre-reaming

cessfully complete the crossing, a guidance system to accurately guide

pipe, and shall be restrained as indicated in the construction docume

pressure carrying capacity as the pipe itself.

regardless of any other protective coating.

2. Expansion-type mechanical couplings shall be rated at the same or greater

fusible polyvinylchloride pipe or other sections of PVC pipe shall include

gasketed PVC, push-on type couplings and fittings, including bends, tees, and

pressure fittings conforming to AWWA C900 or AWWA C905.

D. SLEEVE-TYPE COUPLINGS

F. CONNECTION HARDWARE

2.3 DRILLING SYSTEM EQUIPMENT

A GENERAL

C. DRILL HEAD

D. DRILLING FLUID SYSTEM

DRILLING FLUID (DRILLING MUD)

and maintain the integrity of bore wall(s).

F. DRILLING FLUID DELIVERY AND RECOVERY SYSTEM

in place to contain excess drilling fluid.

a. Offset from the baseline.

Point of rotation of the head shall also be monitored.

reused in the drilling system.

G. DRILLING CONTROL SYSTEM

dimensions:

C. PIPE ROLLERS

2.4 PERSONNEL REQUIREMENTS

federal requirements and/or permit conditions

E. EXPANSION AND FLEXIBLE COUPLINGS

A. The ENGINEER must be notified 3 days in advance of starting work. The Directional Bore shall not begin until the ENGINEER is present at the job site and agrees that proper preparations for the operation have been made. The ENGINEER'S approval for beginning the installation shall in no way relieve the CONTRACTOR of the ultimate ensibility for the satisfactory completion of the work as authorized under the

B. All work under this specification affecting the Indiana Department of Transportation (INDOT) property, right-of-way or facilities shall be carried out to the full satisfaction of the INDOT authorized representative. The CONTRACTOR shall fully inform himself of all requirements of the INDOT as it pertains to specific project and shall conduct all his work

C. All equipment used by the CONTRACTOR on Owner's property and right-of-ways may be inspected by the OWNER or the Owner's Representatives and shall not be used if considered unsatisfactory by OWNER or Owner's Representatives.

 The Contractor shall be fully responsible for all damages arising from his failure to comply with the regulations and the requirements of these Specifications. 3.2 DELIVERY AND OFF-LOADING A. All pipe shall be bundled or packaged in such a manner as to provide adequate

protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the owner or enginee Each pipe shipment should be inspected prior to unloading to see if the load has shifted or otherwise been damaged. Notify owner or engineer immediately if more than immaterial damage is found. Each pipe shipment should be checked for quantity and

Pipe should be loaded, off-loaded, and otherwise handled in accordance with AWWA

D. Off-loading devices such as chains, wire rope, chokers, or other pipe handling ents that may scratch, nick, cut, or gouge the pipe are strictly prohil E. During removal and handling, be sure that the pipe does not strike anything. Significant

02350-10

impact could cause damage, particularly during cold weather.

Pipe should be carefully lowered, not dropped, from trucks

3.3 HANDLING AND STORAGE A. Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work. Damaged areas, or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by the owner or

B. Any scratch or gouge greater than 10% of the wall thickness will be considered significant Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exerc

individual pieces. Care should be taken to insure that pipe is not dropped or damaged

to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter. D. Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or

E. If pipe is to be stored for periods of 1 year or longer, the pipe should be shaded or otherwise shielded from direct sunlight. Covering of the pipe which allows for temperature build-up is strictly prohibited. Pipe should be covered with an opaque material while permitting adequate air circulation above and around the pipe as required

F. Pipe shall be stored and stacked per the pipe supplier's guidelines.

3.4 FUSION PROCESS A. GENERAL

1. Pipe shall be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe

2. Fusible polyvinylchloride pipe shall be fused by qualified fusion technicians, as documented by the pipe supplier. 3. Each fusion joint shall be recorded and logged by an electronic monitoring device

(data logger) connected to the fusion machine 4. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must

a. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good

02350-11

condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's guidelines.

b. CARRIAGE - Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage c. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion

d. DATA LOGGING DEVICE - An approved datalogging device with the current version of the pipe supplier's recommended and compatible software shall be used. Datalogging device operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.

Other equipment specifically required for the fusion process shall include the a. Pipe rollers shall be used for support of pipe to either side of the machine

b. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement, extreme temperatures, and /or windy weather, per the pipe supplier's c. An infrared (IR) pyrometer for checking pipe and heat plate temperatures.

Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

 Facing blades shall be used for fusible polyvinylchloride pipe, which are specifically designed for cutting FPVC. B. JOINT RECORDING

Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion process. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report. 3.5 DRILLING OPERATIONS

> the bore may be modified based on field and equipment conditions. Entry and exit locations and control-point elevations shall be maintained as indicated in the contract documents unless approved otherwise by Owner or Engineer.

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B. LOCATION AND PROTECTION OF UNDERGROUND UTILITIES

A. GENERAL

Bore path and alignment are as indicated in the contract documents. The path of

of safe offset from existing utilities. This will include, but is not limited to, soil conditions and layering, utility proximity and material, HDD system and equipment, and foreign subsurface material. C. SITE LOCATION PREPARATION

Correct location of all underground utilities that may impact the HDD installation

2. Utility location and notification services shall be contacted by the Contractor prior

3. All existing lines and underground utilities shall be positively identified, including

is the responsibility of the Contractor, regardless of any locations shown on the

osing those facilities that are located within an envelope of possible impact of

DD installation as determined for the project specific site conditions. It is the

Contractor and HDD system operator's responsibility to determine this envelope

Work site as indicated on drawings shall be graded or filled to provide a level orking area. No alterations beyond what is required for operations are to be

Contractor shall confine all activities to designated work areas.

D. DRILLING LAYOUT AND TOLERANCES

1. The drill path shall be accurately surveyed with entry and exit areas placed in the appropriate locations within the areas indicated on drawings. If using a magnetic uidance system, drill path will be surveyed for any surface geomagnetic

Instrumentation shall be provided and maintained at all times that accurately locates the pilot hole, measures drill-string axial and torsional loads and measures drilling fluid discharge rate and pressure.

3. Entry and exit areas shall be drilled so as not to exceed the bending limitations of ne pipe as recommended by the pipe supplie E. PILOT HOLE BORE

Pilot hole shall be drilled along bore path. In the event that the pilot bore does deviate from the bore path, it may require contractor to pull-back and re-drill from the location along bore path before the deviation. 2. The Contractor shall limit curvature in any direction to reduce force on the pipe uring pull-back. The minimum radius of curvature shall be no less than that

specified by the pipe supplier and as indicated on the drawings. After successfully completing the pilot hole, the bore hole shall be reamed to a diameter which meets the requirements of the pipe being installed. The following table is offered as an estimated guide:

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Nominal Pipe Diameter Bore Hole Diameter

2. Multiple reaming passes shall be used at the discretion of the Contractor and

3. In the event of a drilling fluid fracture, returns loss or other loss of drilling fluid, the contractor shall be responsible for restoring any damaged property to original condition and cleaning up the area in the vicinity of the damage or loss.

3.6 PIPE PULL-BACK AND INSERTION

A. Pipe shall be fused prior to insertion, if the site and conditions allow, into one continuous B. Contractor shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not bend past the pipe supplier's minimum allowable bend radius, buckle, or otherwise become

damaged. Damaged portions of the pipe shall be removed and replaced C. The pipe entry area shall be graded as needed to provide support for the pipe and to

The pipe shall be guided into the bore hole to avoid deformation of, or damage The pipe may be continuously or partially supported on rollers or other Owner and

Engineer approved friction decreasing implement during joining and insertion, as long as the pipe is not over-stressed or critically abraded prior to, or during

3. A swivel shall be used between the reaming head and the pipe to minimize

D. Buoyancy modification shall be at the sole discretion of the Contractor, and shall not exceed the pipe supplier's guidelines in regards to maximum pull force or minimum bend radius of the pipe. Damage caused by buoyancy modifications shall be the responsibility

E. Once pull-back operations have commenced, the operation shall continue without interruption until the pipe is completely pulled through the bore hole. F. The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, or movement and distortion of surface features. Any damages caused by the Contractor's operations shall be corrected by the Contractor.

A. Following the installation, the project site shall be returned to a condition equal to or better than the pre-construction condition of the site. All excavations will be backfilled and compacted per the construction documents and jurisdictional standards. All

payement and hardscape shall be repaired per applicable jurisdictional standards, excess materials shall be removed from the site, and disturbed areas shall be re-landscaped. All drilling fluid shall be properly disposed of per these specifications and all applicable

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B. Contractor shall verify that all utilities, structures, and surface features in the project area

3.8 PREPARATION PRIOR TO MAKING CONNECTIONS INTO EXISTING PIPING SYSTEMS

A. Approximate locations for existing piping systems are shown in the construction documents. Prior to making connections into existing piping systems, the contractor

 Field verify location, size, piping material, and piping system of the existing pipe. 2. Obtain all required fittings, which may include saddles, sleeve type couplings, flanges, tees, or others as shown in the construction documents.

3. Have installed all temporary pumps and/or pipes in accordance with established B. Unless otherwise approved, new piping systems shall be completely assembled and successfully tested prior to making connections into existing pipe systems.

3.9 PIPE SYSTEM CONNECTIONS A. Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines and as indicated in the construction

documents. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines B. If possible, pipe installed via HDD shall be filled with water prior to making any connections to the existing system or other portions of the project

3.10 TAPPING FOR POTABLE WATER APPLICATIONS A. Tapping saddles for HDPE pipe shall be as recommended by the manufacturer, and tapping shall be performed in accordance with the manufacturer's recommendations. B. Tapping for PVC pipe shall be performed using standard tapping saddles designed for use on PVC piping in accordance with AWWA C605. Tapping shall be performed only with use of tap saddles or sleeves. NO DIRECT TAPPING WILL BE PERMITTED.

C. Service saddles shall be bronze or brass and shall be Ford S90/S91, Mueller H-13000 S-13000, or approved equal. Hinged design shall be used for 4" – 8" mains and 2-piece bolted design for 10" mains.

Tapping for PVC shall be performed in accordance with the applicable sections for

 All connections requiring a larger diameter than that recommended by the pipe supplier, shall be made with a pipe connection as specified and indicated on the drawings. Equipment used for tapping shall be made specifically for tapping PVC pipe:

Tapping bits shall be slotted "shell" style cutters, specifically made for PVC pipe. 'Hole saws' made for cutting wood, steel, ductile iron, or other materials are

CONTRACTOR SHALL ADHERE AND REFERENCE THE CURRENT FALI CREEK REGIONAL WASTE DISTRICT STANDARDS FOR DESIGN AND CONSTRUCTION OF SANITARY SEWERS.

2. Manually operated or power operated drilling machines may be used.

A. Cleaning and flushing are to be done by the CONTRACTOR in accordance with the

B. Directional drilling pipe shall be tested by CONTRACTOR after pullback. The average

Hydrostatic testing of HDPE pipe should be performed in accordance with ASTM F2164.

D. The manufacturer's recommendations on pipe stretch allowances, bend radius and tensile strength, allowable make-up water, and duration of test pressure shall be

After installation, the pipeline, having passed all required testing, shall be disinfected prior to

being put into service. Unless otherwise directed by the owner or engineer, the pipeline will be

Segments of the pipe may be tested separately in accordance with standard testing procedure

as approved by the owner and engineer. Testing of each HDD installation prior to connection to the system or other piping is preferred.

A. CONTRACTOR shall maintain a daily project log of drilling operations and a guidance

B. The drilling data shall be recorded every 25-feet during the actual drilling operation. The CONTRACTOR shall furnish "as-built" plan a profile drawing based on these recordings

"As-built" drawings shall be completed and certified by an Indiana registered professional

END OF SECTION

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showing the actual location horizontally and vertically of the installation, and all utility

acilities found during the installation. The data shall be certified accurate by the CONTRACTOR to the capability of the drilling system.

system log with a copy given to the ENGINEER at completion of proje

disinfected per AWWA C651. See specification Section 15371 for disinfection requirements

as directed by the OWNER at no additional expense to the OWNER.

Pipeline shall be tested end to end.

3.12 DISINFECTION OF THE PIPELINE FOR POTABLE WATER PIPING

pressure shall be maintained at 150 psi for six hours. The test pump and water supply shall be arranged to allow accurate measurements of the water required to maintain the test pressure. Any material showing seepage or the slightest leakage shall be replaced

ap,) or when the pipeline is not filled with water and not under pressure

3.11 TESTING

3.13 PARTIAL TESTING

3.12 RECORD KEEPING AND AS-BUILTS

Taps may be performed while the pipeline is filled with water and under pressure ('wet'

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DATE DESCRIPTION

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DRAWN BY TS/TD/GM CHECKED BY SEPTEMBER 8, 2020 SCALE

FCRWD SANITARY SEWER SPECIFICATIONS