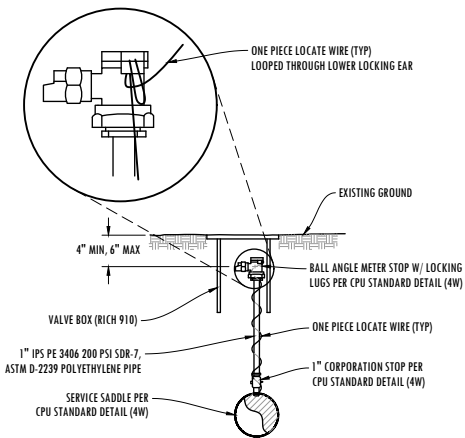


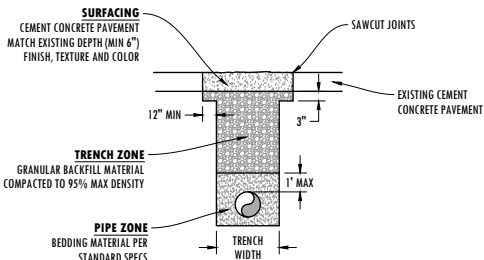
NOTES:

- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE 2000 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
- A WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK.
- WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
- A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
- LOCATE WIRE SHALL BE NON-COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
- NO CONNECTIONS WILL BE ALLOWED TO AN EXISTING SERVICE PRIOR TO AN APPROVED PURITY TEST. PURITY TEST SHALL PRECEDE PRESSURE TEST.
- STUB SERVICES SHALL BE PRESSURE TESTED WITH THE MAIN LINE AND BE CAPABLE OF WITH-STANDING THE MAINS TEST PRESSURE.
- ALL COMPRESSION FITTINGS TO HAVE STAINLESS STEEL INSERTS.



REVISED 04/17/2020

FILE NAME		STANDARD MANUAL AIR RELEASE VALVE	
9W			
SHEET	1 OF 1	STANDARD DETAILS	

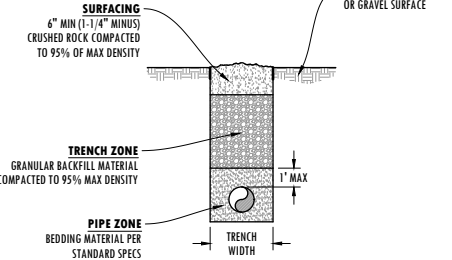


TRENCHING NOTES:

- SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
- NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
- TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
- IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		CEMENT CONCRETE PAVEMENT TYPE 'E' RESTORATION	
10W			
SHEET	1 OF 1	STANDARD DETAILS	

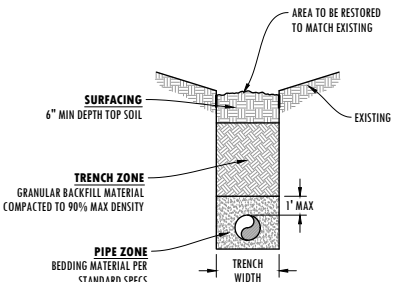


TRENCHING NOTES:

- SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
- NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
- TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
- IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		ROADWAY SHOULDERS, GRAVEL SURFACE TYPE 'B' RESTORATION	
11W			
SHEET	1 OF 1	STANDARD DETAILS	

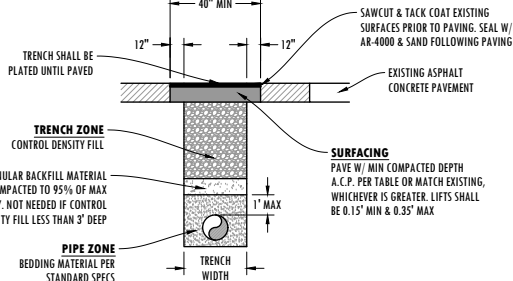


TRENCHING NOTES:

- SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
- NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
- TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
- IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		NATIVE BACKFILL OUTSIDE ROADWAY TYPE 'A' RESTORATION	
13W			
SHEET	1 OF 1	STANDARD DETAILS	

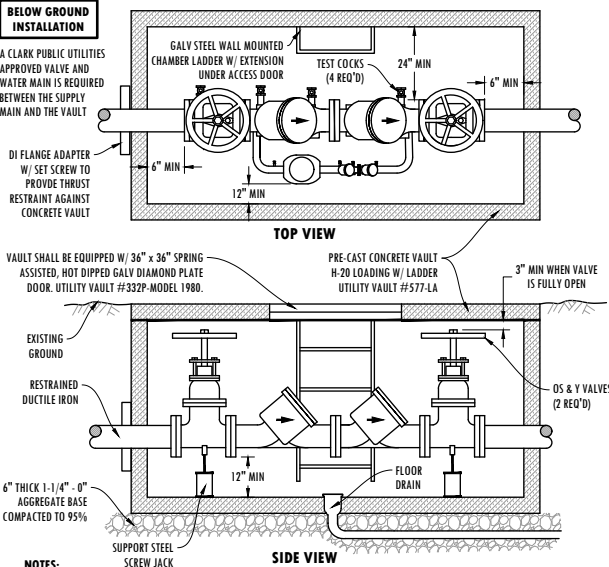


TRENCHING NOTES:

- SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
- NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
- TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
- IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020


FILE NAME		CONTROL DENSITY FILL - ASPHALT CONCRETE PAVEMENT TYPE 'D' RESTORATION	
14W			
SHEET	1 OF 1	STANDARD DETAILS	

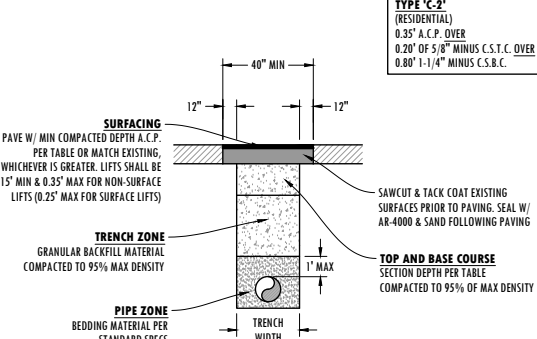


NOTES:

- APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
- THE D.C.V.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
- ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
- FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
- GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER-TITE GROUT.
- ALL VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
- VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
- VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
- THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME		STANDARD DCDA (DOUBLE CHECK DETECTOR ASSEMBLY) 2-1/2" & LARGER	<i>Clark Public Utilities</i> 
15W			
SHEET	1 OF 1	STANDARD DETAILS	

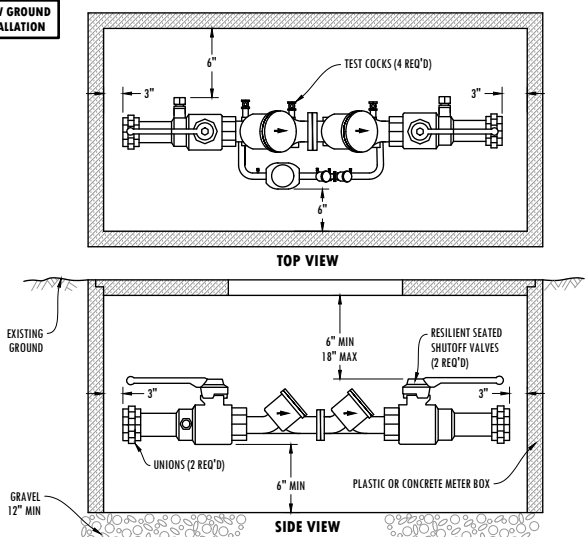


TRENCHING NOTES:

- SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
- NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
- TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
- IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020


FILE NAME		ASPHALT CONCRETE PAVEMENT TYPE 'C1' & 'C2' RESTORATION	
12W			
SHEET	1 OF 1	STANDARD DETAILS	



NOTES:

- APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
- DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
- THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
- DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
- MUST BE PROTECTED FROM FREEZING CONDITIONS.
- THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
- A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
- MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME		STANDARD DCDA (DOUBLE CHECK DETECTOR ASSEMBLY) 2" & SMALLER	<i>Clark Public Utilities</i> 
16W			
SHEET	1 OF 1	STANDARD DETAILS	

REVISED 04/17/2020



BELOW GROUND INSTALLATION

A CLARK PUBLIC UTILITIES APPROVED VALVE AND WATER MAIN IS REQUIRED BETWEEN THE SUPPLY MAIN AND THE VAULT.

DI FLANGE ADAPTER W/ SET SCREW TO PROVIDE THRUST RESTRAINT AGAINST CONCRETE VAULT

TOP VIEW

VAULT SHALL BE EQUIPPED W/ 3/4" x 36" SPRING ASSISTED, HOT DIPPED GALV DIAMOND PLATE DOOR. UTILITY VAULT #532P-MODEL 1980.

EXISTING GROUND

RESTRAINED DUCTILE IRON

6" THICK 1-1/4" - 0" AGGREGATE BASE COMPACTED TO 95%

SUPPORT STEEL SCREW JACK

SIDE VIEW

OS & Y VALVES (2 REQ'D)

FLOOR DRAIN

12" MIN

3" MIN WHEN VALVE IS FULLY OPEN

PRE-CAST CONCRETE VAULT H-20 LOADING W/ LADDER UTILITY VAULT #577-LA

NOTES:

- APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
- THE D.C.V.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
- ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
- FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
- GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER-TITE GROUT.
- ALL VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
- VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
- VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
- THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD DCVA (DOUBLE CHECK VALVE ASSEMBLY) 2-1/2" & LARGER	<div>Clark Public Utilities</div>
17W		
SHEET	1 OF 1	
STANDARD DETAILS		

BELOW GROUND INSTALLATION

TOP VIEW

SIDE VIEW

EXISTING GROUND

GRAVEL 12" MIN

TEST COCKS (4 REQ'D)

6" MIN

18" MAX

UNIONS (2 REQ'D)

RESILIENT SEATED SHUTOFF VALVES (2 REQ'D)

PLASTIC OR CONCRETE METER BOX

NOTES:

- APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
- DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
- THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET
- DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
- MUST BE PROTECTED FROM FREEZING CONDITIONS.
- THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
- A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
- MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD DCVA (DOUBLE CHECK VALVE ASSEMBLY) 2" & SMALLER	<div>Clark Public Utilities</div>
18W		
SHEET	1 OF 1	
STANDARD DETAILS		

ABOVE GROUND INSTALLATION

TEST COCKS (2 REQ'D)

RESILIENT SEATED SHUTOFF VALVES (2 REQ'D)

MINIMUM OF 6" CLEARANCE AROUND BACKFLOW PREVENTER - ALL SIDES, TOP AND BOTTOM.

UNIONS (2 REQ'D)

SCHEDULE 80 OR GALV. PIPE

GROUND/FLOOR

12" MIN. 5' MAX ABOVE HIGHEST POINT OF USE & ALL DOWN STREAM PIPING

NOTES:

- APPROVED PRESSURE VALVE BREAKER ASSEMBLY MUST BE INSTALLED VERTICALLY, 12" MIN TO 5' MAX ABOVE THE HIGHEST POINT OF USE AND ALL DOWNSTREAM PIPING.
- DESIGNED FOR BACK SIPHONAGE ONLY, NOT BACK PRESSURE.
- DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
- IF A PVBA IS INSTALLED INDOORS, CONSIDERATION MUST BE GIVEN TO WATER LEAKAGE IF THE BACKFLOW PREVENTER FAILS (EXCESSIVE WATER SPILLAGE).
- THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
- THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
- A PLUMBING PERMIT IS REQ'D. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
- MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD PVBA (PRESSURE VACUUM BREAKER ASSEMBLY) 2" & SMALLER	<div>Clark Public Utilities</div>
19W		
SHEET	1 OF 1	
STANDARD DETAILS		

ABOVE GROUND INSTALLATION

TEST COCKS (4 REQ'D)

EXISTING GROUND

RELIEF VALVE

PROVIDE HEAT OR INSULATION

TOP VIEW

SIDE VIEW

RESILIENT SEATED SHUTOFF VALVES (2 REQ'D)

EXISTING GROUND

12" MIN

RESTRAINED DUCTILE IRON

SUPPORT STEEL SCREW JACK

36" MIN

NOTES:

- APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
- THE R.P.B.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
- ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
- FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
- GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER-TITE GROUT.
- THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD RPBA (REDUCED PRESSURE BACKFLOW ASSEMBLY) 2-1/2" & LARGER	<div>Clark Public Utilities</div>
20W		
SHEET	1 OF 1	
STANDARD DETAILS		

ABOVE GROUND INSTALLATION

UNIONS (2 REQ'D)

TEST COCKS (4 REQ'D)

RESILIENT SEATED SHUTOFF VALVES (2 REQ'D)

MIN 12" OF CLEARANCE AROUND BACKFLOW PREVENTER - ALL SIDES, TOP AND BOTTOM

12" MIN 5' MAX

GROUND FLOOR

SIDE VIEW

ADEQUATE GRAVITY DRAINAGE SYSTEM REQUIRED W/ APPROVED AIR GAP

NOTES:

- APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY TO BE INSTALLED ABOVE GROUND WITH MINIMUM CLEARANCES.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
- DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
- DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
- MUST BE PROTECTED FROM FREEZING CONDITIONS.
- THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
- A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
- MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.
- ABOVE GROUND INSTALLATION REQUIRED.

REVISED 04/17/2020

FILE NAME	STANDARD RPBA (REDUCED PRESSURE BACKFLOW ASSEMBLY) 2" & SMALLER	<div>Clark Public Utilities</div>
21W		
SHEET	1 OF 1	
STANDARD DETAILS		

ABOVE GROUND INSTALLATION

ATMOSPHERIC VACUUM BREAKER (AVB)  
ONE FOR EACH IRRIGATION ZONE

VALVE BOX

CONTROL VALVE ONLY ALLOWED UPSTREAM (BEFORE) AN AVB

MINIMUM OF 6" ABOVE HIGHEST POINT

EXISTING GROUND

NOTES:

- ONE AVB IS REQUIRED ON EACH IRRIGATION ZONE. NO CONTROL VALVES ALLOWED DOWNSTREAM (AFTER) AND AVB.
- EACH AVB MUST BE INSTALLED A MINIMUM OF 6" ABOVE THE HIGHEST POINT OF WATER IN THE ZONE IT SERVES.
- NO CHEMICAL FERTILIZER MAY BE INTRODUCED INTO AN IRRIGATION SYSTEM EQUIPPED WITH AN AVB.
- NO PUMPS, AIR FITTINGS OR BACK PRESSURE SOURCE IS ALLOWED ON THE DOWNSTREAM SIDE (AFTER) AN AVB.
- MUST BE PROTECTED FROM FREEZING.

REVISED 04/17/2020

FILE NAME	STANDARD AVB (ATMOSPHERIC VACUUM BREAKER)	<div>Clark Public Utilities</div>
22W		
SHEET	1 OF 1	
STANDARD DETAILS		

CONCRETE THRUST BLOCK

WATERMAIN

WATERMAIN

ALL PIPE JOINTS TO BE RESTRAINED

MJ x MJ BEND w/ MJ RESTRAINT

ALL PIPE JOINTS TO BE RESTRAINED

PVC PIPE				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4" BEND	10'	10'	10'	10'
22-1/2" BEND	10'	10'	10'	12'
45° BEND	10'	13'	20'	24'
90° BEND	24'	32'	45'	60'

DIP PIPE (WITHOUT POLY BAG ENCASEMENT)				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4" BEND	10'	10'	10'	10'
22-1/2" BEND	10'	10'	10'	10'
45° BEND	10'	11'	15'	20'
90° BEND	19'	26'	36'	46'

NOTE: THESE ARE THE MINIMUM PIPE RESTRAINT LENGTHS UNLESS STATED OTHERWISE ON THE PLANS

REVISED 04/17/2020

FILE NAME	HORIZONTAL BEND WATER MAIN INSTALLATION DETAIL	<div>Clark Public Utilities</div>
23W		
SHEET	1 OF 1	
STANDARD DETAILS		

FINISH GRADE

3' STANDARD COVER

22.5" BEND MJ x MJ w/ MJ RESTRAINT

IF LONGER THAN ONE STICK OF PIPE, THEN ALL PIPE JOINTS TO BE RESTRAINED

ALL PIPE JOINTS TO BE RESTRAINED

22.5" BEND MJ x MJ w/ MJ RESTRAINT

DEPTH AS SHOWN ON PROFILE

NOTE:

CALL CPU INSPECTOR TO BE ON-SITE TO OBSERVE. TRENCH BOTTOM SUBGRADE MUST BE FIRM AND UNDISTURBED. PIPE BEDDING (5/8"-0. AGG BASE) SHALL BE A MINIMUM OF 6" EACH SIDE AND TOP AND BOTTOM OF PIPE COMPACTED.

PVC & DIP (WITHOUT POLY BAG ENCASEMENT)				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4" BEND	10'	10'	12'	14'
22-1/2" BEND	12'	15'	21'	27'

NOTE: THESE ARE THE MINIMUM PIPE RESTRAINT LENGTHS UNLESS STATED OTHERWISE ON THE PLANS

REVISED 04/17/2020

FILE NAME	VERTICAL FITTING WATER MAIN INSTALLATION DETAIL	<div>Clark Public Utilities</div>
24W		
SHEET	1 OF 1	
STANDARD DETAILS		

REVISED 04/17/2020

Clark  
Public  
Utilities

CALL 48 HOURS BEFORE YOU DIG 1-800-455-5344 ITS THE LAW! PERMIT REQUIRED FOR ALL WORK NOTIFICATION CENTER

FILE NAME

WATER MAIN  
INSTALLATION

CPU W-SD

STANDARD DETAILS

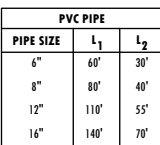
3 OF 4

SHEET



**Clark  
Public  
Utilities**

REVISÉ 04/17/2020



**L<sub>1</sub>:** REQUIRED LENGTH WHEN PIPE JOINT RESTRAINT IS ONLY EFFECTIVE IN TENSION (SUCH AS FIELD-LOK GASKETS OR OTHER SIMILAR RESTRAINT SYSTEMS)

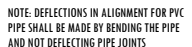
**REQUIRED LENGTH WHEN PIPE JOINT RESTRAINT IS ONLY EFFECTIVE IN BOTH TENSION AND COMPRESSION (SUCH AS A MJ SLEEVE WITH MJ RESTRAINT OR A PROPRIETARY INTEGRAL BELL & SPIGOT RESTRAINT SYSTEM).**

**Clark  
Public  
Utilities**

REVISÉ 04/17/2020



NO BENDING OF PVC PIPE ALLOWED FOR PIPE LARGER THAN 12" DIAMETER



**Clark  
Public  
Utilities**

REVISÉ 04/17/2020

1. MECHANICAL JOINT RESTRAINT SHALL BE ACCOMPLISHED BY A RESTRAINT DEVICE CONSISTING OF A FOLLOWER GLAND UTILIZING MULTIPLE GRIPPING WEDGES. GLAND BODY AND WEDGES SHALL BE DUCTILE IRON AND EPOXY COATED.
2. T-BOLTS AND NUTS SHALL BE HIGH STRENGTH LOW ALLOY STEEL T-BOLTS AND STEEL SHALL MEET AWWA C111 COMPOSITION SPECIFICATIONS.
3. RESTRAINT GLAND SHALL UTILIZE A STANDARD MECHANICAL JOINT GASKET.
4. THE FOLLOWING IS THE APPROVED LIST OF RESTRAINED JOINT SYSTEMS FOR MECHANICAL JOINTS AND DIP:
  - 4.1 "ROMAGRIP", ROMAC INDUSTRIES,
  - 4.2 "SERIES 1000 TUGGRIP", TYLER UNION,
  - 4.3 "MEGALUG", EBAA IRON, INC.
  - 4.4 APPROVED EQUIVALENT

1. PIPE JOINT RESTRAINT FOR DIP SHALL BE ACCOMPLISHED WITH A PIPE BELL/SPIGOT INTEGRAL LOCK MECHANISM.
2. AS AN ALTERNATIVE AND WHERE ALLOWED BY CLARK PUBLIC UTILITIES, A BOLTLESS RESTRAINING GASKETS FOR DIP TYTON JOINT STYLE PIPE MAY BE USED. THE RESTRAINT GASKET SHALL BE A BOLTLESS GASKET WITH INTEGRAL RESTRAINING SYSTEM UTILIZING STAINLESS STEEL PARTS AND SHALL BE PRESSURE RATED FOR 350 PSI. THE GASKETS SHALL BE IN CONFORMANCE WITH ANSI/AWWA C111/A21.1 AND CERTIFIED TO NSF/ANSI 6. THE FOLLOWING IS THE APPROVED LIST OF DIP PIPE JOINT RESTRAINED GASKET SYSTEMS:

1. PVC PIPE JOINT RESTRAINT FOR MAY BE ACCOMPLISHED BY UTILIZING A PROPRIETARY PVC PIPE WHICH UTILIZES A PIPE BELL/SPIGOT INTEGRAL JOINT RESTRAINT MECHANISM. THE FOLLOWING IS THE APPROVED LIST OF PROPRIETARY PVC C-900 PIPE JOINT RESTRAINED SYSTEMS:

- 1.1 "EAGLE LOC 900", JM EAGLE  
1.2 "CERTA-LOK (900/R)", CERTAINTED  
1.3 "DIAMOND LOK-21", DIAMOND PLASTICS INC.  
1.4 "RIEBERLOK" GASKET  
1.4 APPROVED EQUIVALENT
- AS AN ALTERNATIVE, PVC PIPE MAY BE COUPLED TO CREATE A RESTRAINED JOINT BY UTILIZING A GREY IRON OR DUCTILE IRON MECHANICAL JOINT LONG PATTERN SLEEVE WITH A RESTRAINT FOLLOWER GLAND UTILIZING MULTIPLE GRIPPING WEDGES.

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REVISÉ 04/17/2020

- REVISÉ 04/17/2020

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THE CONTRACTOR SHALL TRANSFER, MOVE AND/OR ABANDON EXISTING WATER SERVICES AS DIRECTED BY THE CLARK PUBLIC UTILITIES INSPECTOR.

1. EXISTING WATER SERVICES TO BE ABANDONED SHALL BE EXCAVATED TO THE CORP. STOP AT THE WATER MAIN AND THE CORP STOP SHALL BE CLOSED. THE METER BOX SHALL BE REMOVED AND THE WATER SERVICE LINE CAN BE ABANDONED IN PLACE. THE EXISTING METER SHALL BE RETURNED TO CLARK PUBLIC UTILITIES WATER DEPT. ROAD REPAIR SHALL BE AS REQUIRED BY THE CLARK COUNTY RIGHT OF WAY PERMIT REQUIREMENTS.
2. WHEN AN EXISTING WATER SERVICE IS TO BE MOVED, THE CONTRACTOR SHALL EXPOSE A PORTION OF THE EXISTING WATER SERVICE SO THAT THE CLARK PUBLIC UTILITIES INSPECTOR CAN EVALUATE THE MATERIAL SIZE AND CONDITION OF THE EXISTING WATER SERVICE LINE.

THE INSPECTOR WILL DETERMINE WHETHER THE WATER SERVICE LINE CAN BE EXTENDED OR SHORTENED. IF THE INSPECTOR DETERMINES THE EXISTING WATER SERVICE LINE IS SUBSTANDARD, THEN A NEW POLYETHYLENE (PE) SERVICE LINE SHALL BE INSTALLED FROM THE WATER MAIN (MINIMUM SIZE 1" DIA).

ALL EXISTING WATER SERVICE LINES THAT ARE LESS THAN 1" DIAMETER SHALL BE CONSIDERED SUBSTANDARD AND SHALL BE REPLACED WITH A NEW 1", 1-1/2", OR 2" WATER SERVICE LINE PER CLARK PUBLIC UTILITIES STANDARDS.

UNLESS OTHERWISE STATED ON THE PLAN, ALL MAIN LINE PIPE SHALL BE EITHER DUCTILE IRON PIPE (DIP), POLYVINYL CHLORIDE PIPE (PVC) OR HIGH-DENSITY POLYETHYLENE PIPE (HDPE). ALL PIPE SHALL BE SUITABLE FOR POTABLE WATER SERVICE IN ACCORDANCE WITH ANSI/NSF 61 STANDARDS.

- A. DUCTILE IRON PIPE SHALL CONFORM TO ANSI A21.51 OR AWWA C151. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS. ALL JOINTS TO IRON PIPE SHALL BE GAUGED FOR DIP 12" DIAMETER AND SMALLER. UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, 3"-12" PIPE SHALL BE PRESSURE CLASS 350 AND PIPE SIZES GREATER THAN 12" DIAMETER SHALL BE THICKNESS CLASS 52.
- B. POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (4"-30") USE UN-PLASTICIZED PVC PLASTIC PIPE WITH INTEGRAL BELT AND SPIGOT JOINTS. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS. PIPE SHALL MEET THE REQUIREMENTS OF DR 18, UNLESS OTHERWISE NOTED ON THE DRAWING. UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, 4"-12" PIPE SHALL MEET THE REQUIREMENTS OF AWWA C900 AND 14"-40" PIPE SHALL MEET THE REQUIREMENTS OF AWWA C905.
- C. HIGH-DENSITY POLYETHYLENE PIPE (HDPE) SHALL BE BLACK WITH A MINIMUM OF TWO EQUALLY SPACED BLUE COLORED STRIPES EXTRUDED INTO THE OUTER SHELL IN CONFORMANCE WITH THE UNIFORM COLOR CODE (UCC). UNLESS OTHERWISE NOTED ON THE DRAWINGS, PIPE SHALL BE IRON PIPE SIZE (IPS) AND HAVE A WALL-THICKNESS DIMENSION RATIO (DR) OF 30. SMALL DIAMETER PIPE (3/4"-3"), SHALL CONFORM TO ANSI/AWWA C900 AND LARGE DIAMETER PIPE (4"-65") PIPE SHALL CONFORM TO ANSI/AWWA C906.

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Utilities**

REVISÉ 04/17/2020

1. INSTALL WATER MAIN WITH 3.0 FEET OF MINIMUM COVER UNLESS OTHERWISE NOTED. DEPTH MAY INCREASE AT UTILITY AND CULVERT CROSSINGS.
2. LOCATE WIRE SHALL BE COATED (BLUE INSULATED), NO. 14 GA. SOFT DRAWN SOLID COPPER. USE WATERPROOF CONNECTORS AT ALL WIRE SPLICES.
3. NEW AND REPAIRED WATER MAINS SHALL BE DISINFECTED PER AWWA C651 PRIOR TO BEING PLACED INTO SERVICE. CONNECTION TO AN EXISTING WATER MAIN MAY ONLY BE DONE AFTER PROPER DISINFECTION, TESTING, FLUSHING AND APPROVAL BY CPU.
4. WHENEVER A PIPE IS CUT AND NOT RECONNECTED, THE CUT ENDS SHALL BE CAPPED OR PLUGGED, AS DIRECTED BY THE CPU INSPECTOR.
5. ALL WATER SERVICES, BLOW-OFF ASSEMBLIES, AIR RELEASE VALVES, FIRE HYDRANT ASSEMBLIES, VALVE BOXES AND THRUST BLOCKING SHALL BE INSTALLED PER THE STANDARD SPECIFICATIONS AND DETAILS.
6. WATER MAINS BEING INSTALLED NEAR TELEPHONE/CABLE COMMUNICATIONS SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
7. WATER MAINS BEING INSTALLED NEAR UNDERGROUND ELECTRICAL LINES SHALL HAVE A MINIMUM 60" HORIZONTAL AND 6" VERTICAL CLEARANCE.
8. REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWER LINES SHALL BE AS FOLLOWS:

A MINIMUM SEPARATION OF TEN (10) FEET (MEASURED EDGE TO EDGE) BETWEEN SANITARY SEWER LINES AND WATER LINES SHALL BE MAINTAINED WHENEVER POSSIBLE. WHEN CONDITIONS PREVENT THE MINIMUM TEN (10) FOOT HORIZONTAL SEPARATION THE ENGINEER SHALL BE NOTIFIED.

WATER LINES CROSSING SANITARY SEWER LINES SHALL BE LAID ABOVE THE SEWER LINES TO PROVIDE A SEPARATION OF AT LEAST 18" BETWEEN THE INVERT OF THE WATER PIPE AND THE CROWN OF THE SANITARY SEWER PIPE. A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING AND SHALL BE THE LONGEST STANDARD LENGTH AVAILABLE FROM THE MANUFACTURER.

9. THE CONTRACTOR SHALL USE CONSTRUCTION METHODS THAT PROTECT THE PIPE INTERIORS, FITTINGS AND VALVES AGAINST CONTAMINATION.
10. ANY PIPE, FITTINGS OR VALVES THAT CANNOT BE DISCONNECTED WITH THE MAIN LINE BY CHLORINE FOR 24 HOURS SHALL HAVE THE INTERIORS SWABBED WITH A 1% HYPOCHLORITE SOLUTION BEFORE INSTALLATION.
11. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AT ALL TEES, BENDS, DEAD ENDS AND WHERE INDICATED ON THE PLANS.
12. ALL MJ FITTINGS SHALL BE RESTRAINED USING MJ MECHANICAL RESTRAINT FOLLOWER GLANDS APPROPRIATE FOR THE PIPE MATERIAL.
13. 6" WATER PIPE LEADING TO FIRE HYDRANTS SHALL BE DUP AND SHALL BE ONE CONTINUOUS PIECE OF PIPE. IF THE RUN IS LONGER THAN ONE PIECE OF PIPE, THEN ALL PIPE JOINTS SHALL BE MECHANICALLY RESTRAINED WITH "FIELD-LOC" GASKETS OR OTHER CPD APPROVED RESTRAINTS.

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Utilities**

REVISÉ 04/17/2020

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE MOST CURRENT EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).

3. WORK WITHIN CITY OF CINCINNATI RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO USDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. VALVE SHALL BE 2" SQUARE OPERATING NOT OR AS SPECIFIED ON PLANS.
5. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-424-5555).
6. ONLY TAPPING COMPANIES APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
7. ACTUAL ROAD ALIGNMENTS MAY VARY FROM RIGHT-OF-WAY INDICATED. THE CONTRACTOR SHALL VERIFY THE PROPOSED PIPE ALIGNMENT AND REFER DIFFERENCES TO THE CPU INSPECTOR. ANY ALIGNMENT CHANGES MUST BE APPROVED BY THE CPU INSPECTOR PRIOR TO INSTALLATION.
8. DRIVEWAYS DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION. REFER TO PLAN FOR APPROXIMATE LOCATIONS AND TYPES.
9. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCUS, CONDUITS AND LINE LOCATION PRIOR TO CONSTRUCTION. DUE TO FIELD CONDITIONS, THE CONTRACTOR SHALL FIELD ADJUST THE VERTICAL AND HORIZONTAL ALIGNMENT OF THE WATER MAIN TO CLEAR THE UTILITY IN CONFLICT AND PROVIDE THE MIN. 3.0 FEET OF COVER AS APPROVED BY THE CPU INSPECTOR. ALL UTILITIES WHICH ARE DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS.
10. FENCES DISTURBED BY CONSTRUCTION SHALL BE RESTORED OR REPLACED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION.
11. CONTRACTOR SHALL VERIFY EXISTING SIGN AND MAILBOX LOCATIONS PRIOR TO CONSTRUCTION. SIGNS & MAILBOXES THAT ARE DISTURBED BY CONSTRUCTION SHALL BE RELOCATED BACK FROM EDGE OF PAVEMENT, 1.0 FEET CLEAR OF WATER MAIN. ANY SIGNS OR MAILBOXES DAMAGED SHALL BE REPAIRED OR REPLACED AS PER THE SPECIFICATIONS.
12. THE LOCATIONS OF ALL EXISTING UTILITIES ARE FOR INFORMATIONAL PURPOSES ONLY. MANY LOCATIONS ARE PER SCHEMATIC RECORD DRAWINGS. THE CURRENT AND EXACT LOCATIONS OF FACILITIES MUST BE VERIFIED PRIOR TO CONSTRUCTION. THE CONTRACTOR PERFORMS THE WORK SHALL COMPLY WITH THE PROVISIONS OF FACILITIES AT LEAST 48 BUSINESS DAY HOURS PRIOR TO EXCAVATION. CALL 1-800-553-4344 FOR UTILITY LOCATE SERVICE.
13. THE WATER FACILITIES SHALL BECOME THE PROPERTY OF CLARK PUBLIC UTILITIES AFTER A SATISFACTORY BACTERIA AND PRESSURE TEST HAVE BEEN PERFORMED BY THE UTILITY. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO A ONE YEAR WARRANTY, COMMENCING AT ACCEPTANCE OF FINAL TESTING. REPLACEMENT AND/OR REPAIRS OF DEFECTIVE MATERIALS SHALL BE THE DEVELOPERS/OWNERS RESPONSIBILITY.
14. WHEN ABRASION CONCRETE PIPE IS ENCOUNTERED, THE CONTRACTOR SHALL SUPPLY WORKERS WHO ARE CERTIFIED TO WORK ON ABRASION CONCRETE PIPE.
15. THE CONTRACTOR SHALL TRANSFER AND/OR ABANDON EXISTING SERVICES AS DIRECTED BY THE INSPECTOR.
16. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED AT A MINIMUM OF 200 PSI OR 1.5 TIMES THE WORKING SERVICE PRESSURE, WHICHEVER IS GREATER. THE TEST WILL BE PERFORMED BY THE CLARK PUBLIC UTILITIES INSPECTOR. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED.
17. THE INSTALLED WATER MAIN SHALL BE THOROUGHLY DISINFECTED AND FLUSHED IN ACCORDANCE WITH THE CLARK PUBLIC UTILITIES STANDARDS AND REQUIREMENTS. ONLY CLARK PUBLIC UTILITIES EMPLOYEES ARE PERMITTED TO FILL AND FLUSH THE WATER MAIN. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED. IN AREAS WHERE THE DE-CHLORINATION OF FLUSHED WATER IS NOT POSSIBLE, THE CONTRACTOR SHALL PROVIDE WATER TRUCKS TO FLUSH INTO.
18. PRIOR TO ACCEPTING THE SYSTEM OR ALLOWING THE MAIN TO BE PUT IN SERVICE, A WATER SAMPLE SHALL BE TAKEN BY THE CLARK PUBLIC UTILITIES INSPECTOR AND A TEST PERFORMED BY AN ACCREDITED LAB TO INSURE NO HAZARDOUS EXIST.

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REVISÉ 04/17/2020

1. MECHANICAL JOINT RESTRAINT SHALL BE ACCOMPLISHED BY A RESTRAINT DEVICE CONSISTING OF A FOLLOWER GLAND UTILIZING MULTIPLE GRIPPING WEDGES. GLAND BODY AND WEDGES SHALL BE DUCTILE IRON AND EPOXY COATED.
2. T-BOLTS AND NUTS SHALL BE HIGH STRENGTH LOW ALLOY STEEL T-BOLTS AND STEEL SHALL MEET AWWA C111 COMPOSITION SPECIFICATIONS.
3. RESTRAINT GLAND SHALL UTILIZE A STANDARD MECHANICAL JOINT GASKET.
4. THE FOLLOWING IS THE APPROVED LIST OF RESTRAINED JOINT SYSTEMS FOR MECHANICAL JOINTS AND DIP:
  - 4.1 "ROMAGRIP", ROMAC INDUSTRIES,
  - 4.2 "SERIES 1000 TUGGRIP", TYLER UNION,
  - 4.3 "MEGALUG", EBAA IRON, INC.
  - 4.4 APPROVED EQUIVALENT

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# WATER MAIN INSTALLATION

## STANDARD DETAILS