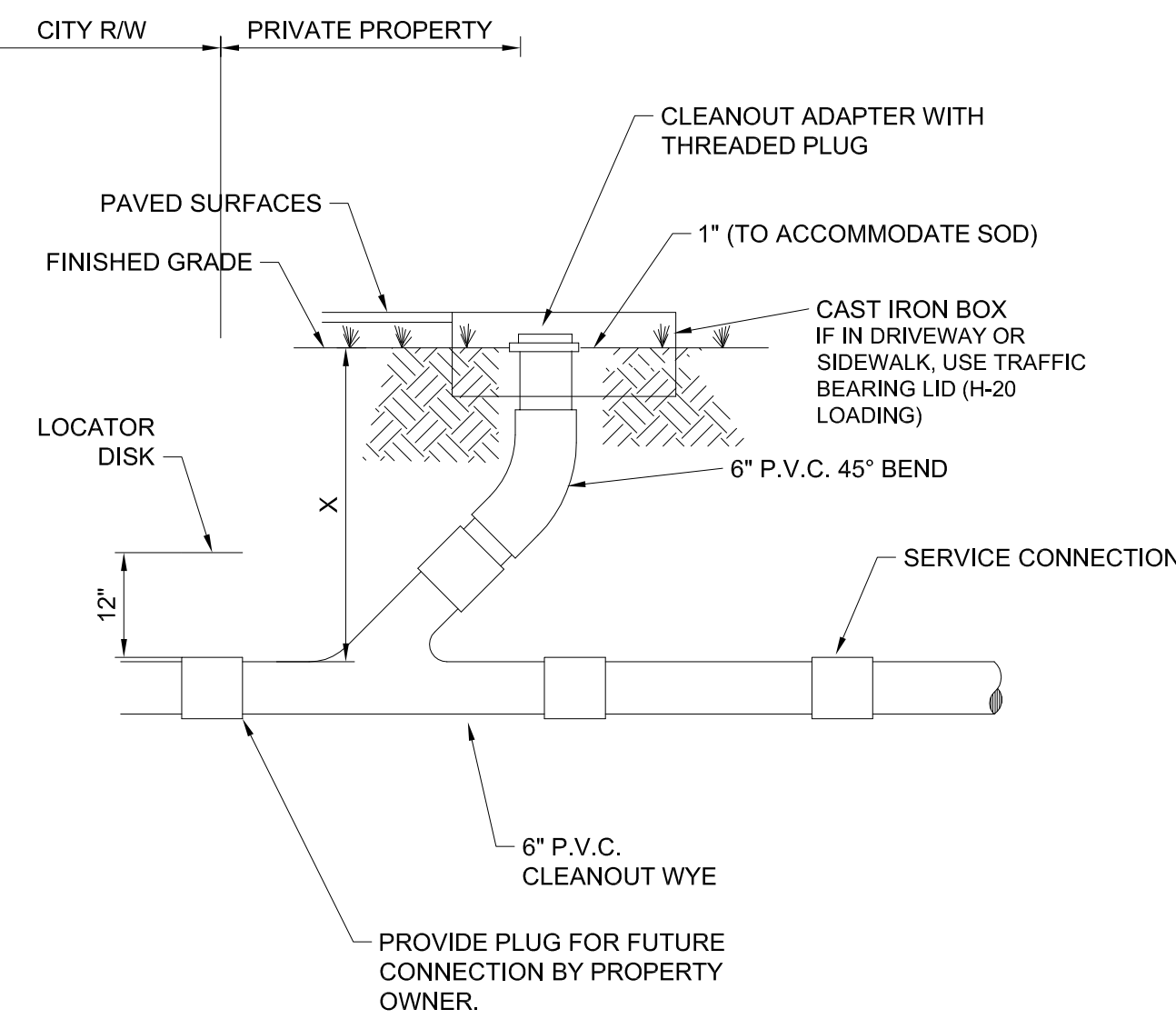


JOINT FOR DISSIMILAR GRAVITY SEWER PIPE

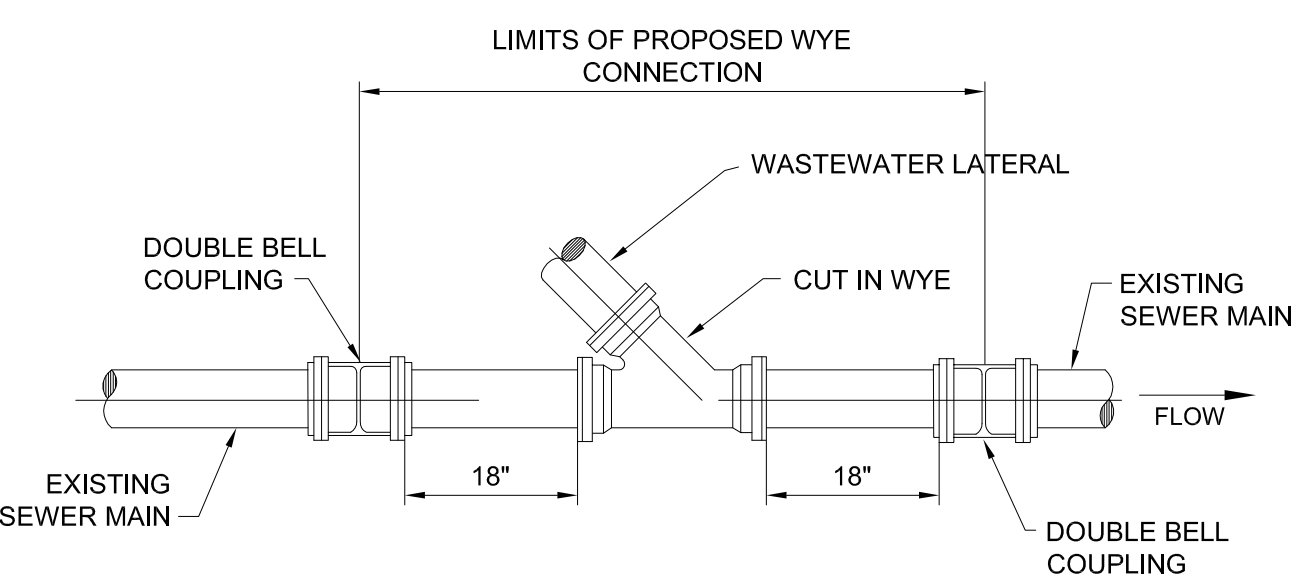
211



TYPICAL CLEANOUT INSTALLATION

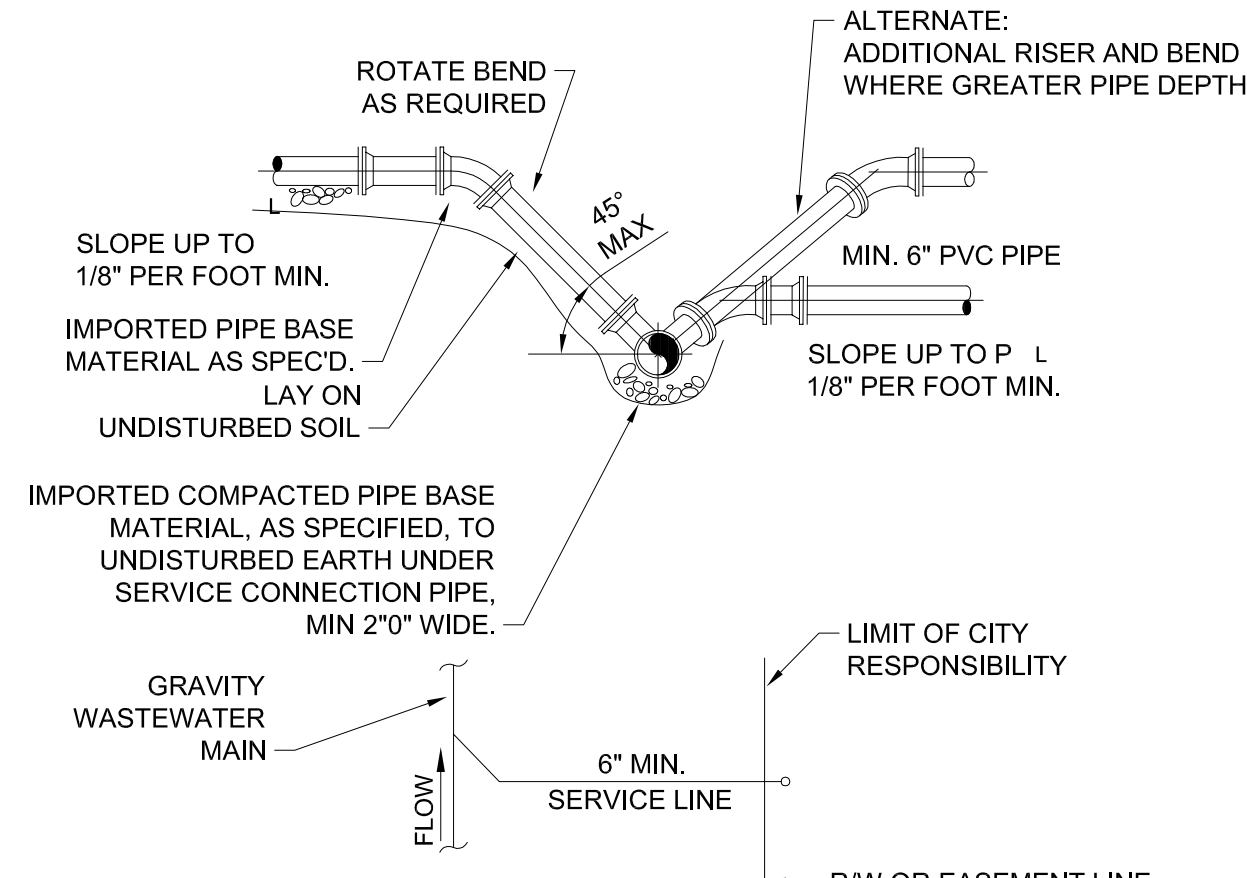
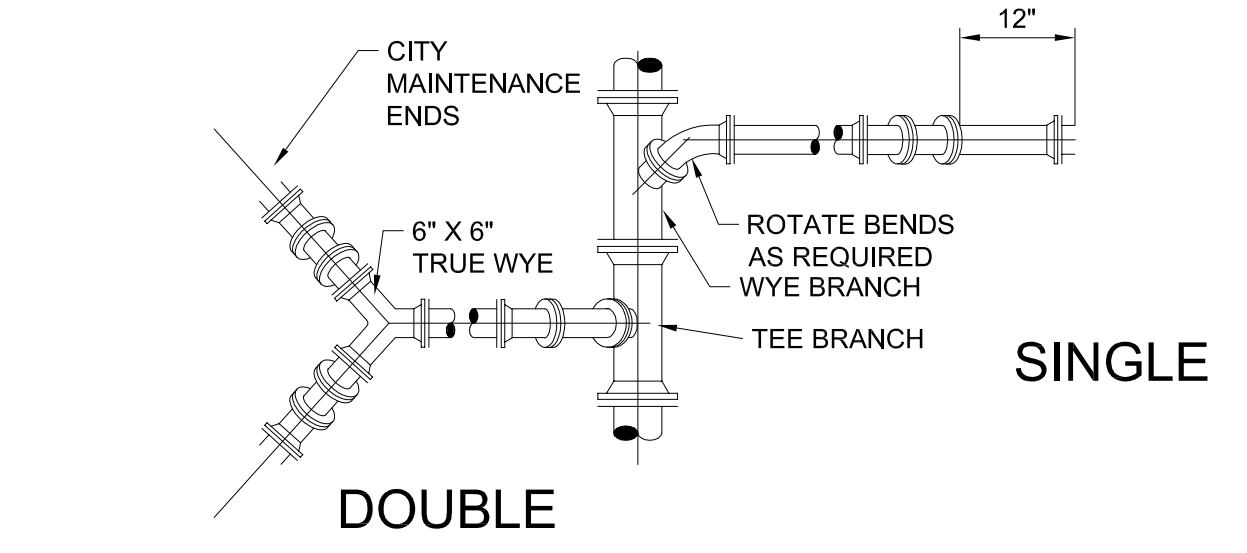
209

- NOTES:**
1. PROVIDE APPROVED PLUG OR JOINT FOR DISSIMILAR GRAVITY SEWER PIPE FOR SERVICE CONNECTION.
 2. CLEAN-OUT ASSEMBLY SHALL BE INSTALLED BY PROPERTY OWNER.
 3. X=30" MIN. OR 40" MAX. FOR RESIDENTIAL SERVICE UNLESS OTHERWISE SHOWN.



NEW LATERAL ON EXISTING GRAVITY WASTEWATER MAIN

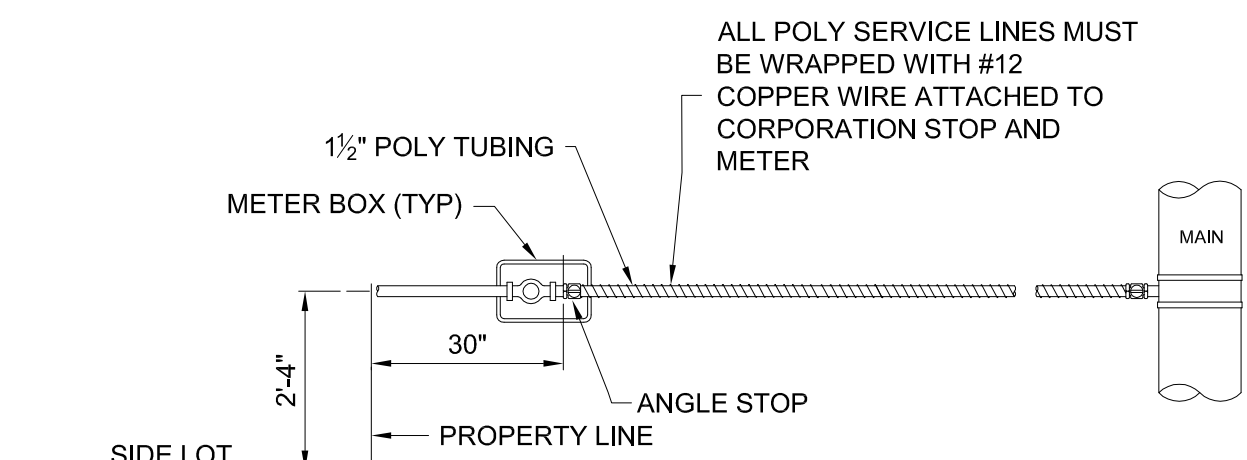
210



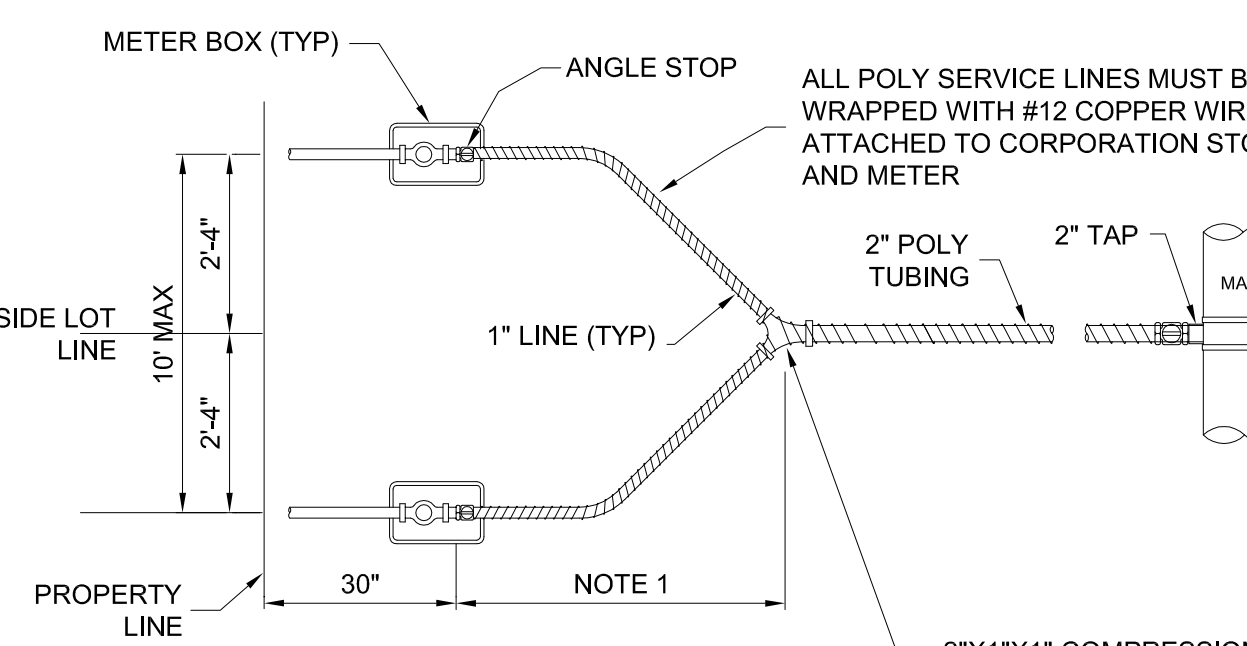
- NOTES:**
1. WASTEWATER MAIN WYE BRANCH TO MATCH MAIN PIPE MATERIAL.
 2. NO 90° BENDS SHALL BE USED FOR WASTEWATER SERVICE AND CLEANOUT INSTALLATIONS.
 3. SERVICE LATERALS SHALL TERMINATE AT 12" INSIDE THE PROPERTY LINE AT A DEPTH OF 3 FEET EXCEPT WHERE A DEEPER INVERT IS REQUIRED BY EXISTING BUILDING CONDITIONS.

TYPICAL WASTEWATER SERVICE CONNECTION

208



SINGLE NEW SERVICE PLAN

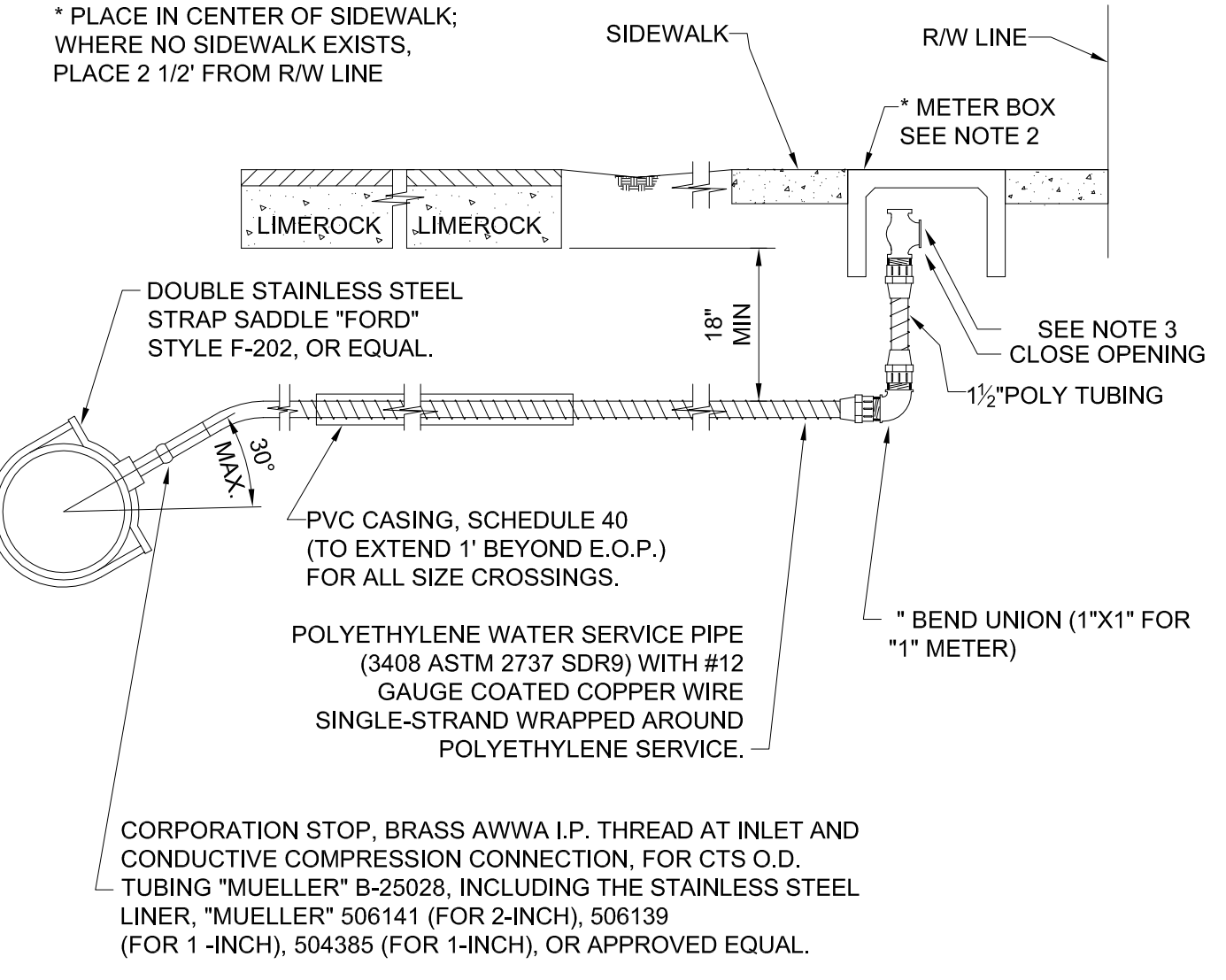


- NOTE:**
1. KEEP 1 1/2" WYE AS CLOSE AS POSSIBLE TO METER BOX.

DOUBLE NEW SERVICE PLAN

TYPICAL WATER SERVICE

301



- NOTE:**
1. GROUND KEY ANGLE METER STOP, CONDUCTIVE COMPRESSION FOR CTS O.D. TUBING, X METER FLANGE 180° TURN CHECK-LOCK WING "MUELLER" H-14277, FOR 2 INCH INCLUDING THE STAINLESS STEEL LINER, "MUELLER" 506141 (FOR 2 INCH) OR APPROVED EQUAL, AND MUELLER 110 COMPRESSION CONNECTION.
 2. METER BOXES FOR 5/8, 3/4, AND 1 INCH METERS SHALL BE THE OKIE DOKIE #890-40-260282 MEDIUM BOX AND 890-40-260257 MEDIUM LID OR EQUAL.
 3. CONNECT ANGLE VALVE TO EXISTING METER WHERE APPLICABLE.

TYPICAL WATER SERVICE INSTALLATION

300

WATER SYSTEM NOTES:

PIPE D.I.P.
Ductile iron water main pipe shall conform to the requirements of A.N.S.I./A.W.W.A. C-151/A 21.51-02 and lined and coated per A.N.S.I./A.W.W.A. C-104/A-214-03. 20" and smaller pipe shall be pressure class 350; 24" and larger, pipe shall be pressure class 250.

All DIP shall have adequate protective measures against corrosion and it shall be used only if as determined by the design engineer, based on field conditions.

All DIP shall be installed in accordance with A.N.S.I./A.W.W.A. C-600-99, or latest revision.

PIPE P.V.C.
All P.V.C. mains shall be series 1120, class 150 (DR 18) pressure pipe, conforming to A.N.S.I./A.W.W.A. C-900-07, or latest revision, and shall have push on joints, and iron pipe O.D.

All P.V.C. pipe shall be installed in accordance with the Uni-Bell plastic pipe Association's "Guide for installation of P.V.C. pressure pipe for Municipal water distribution system". Water distribution pipe shall be of "BLUE" color. All water main installations shall comply with the color coding requirements of Chapter 62-555.320 F.A.C. (Florida Administrative Code).

Detector tape on all P.V.C. mains shall be installed 18" above the water main.

All P.V.C. mains must have #6 copper wire, single strand, placed on top of pipe, shall be electrically continuous over the entire length of the pipe, and fastened every 10' with a #12 wire.

FITTINGS
Fittings shall be ductile iron meeting A.N.S.I./A.W.W.A. C153/21.00 and shall be coated with 6 to 8 mil. Thickness coal tar epoxy conforming to the requirements of A.N.S.I./A.W.W.A. C550-05 and C116/A21.03.

Restrained joint pipe shall be used for all bends, tees, crosses, plugs, and fire hydrants. Thrust blocks shall not be allowed.

Retainer glands/mechanical joint restraint shall be used only if authorized by the Engineer and shall conform to A.N.S.I./A.W.W.A. standards C 111/A-21.11-03, or latest revision.

All glands shall be manufactured from ductile iron as listed by underwriter's laboratory for 250 P.S.I. minimum water pressure rating.

Glands shall be CLOW Corporation model F-1058, standard fire protection equipment company, or approved equal.

VALVES
Tapping valves shall be Mueller H667 or approved equal.

Tapping sleeves shall be Mueller H615 or approved equal.

Gate valves 3" or less shall be NIBCO T-133 OR T-136 with malleable hand wheels. No substitutions allowed.

Gate valves 4" or larger shall meet A.W.W.A. C-500-02 specification (latest revision). Valves shall be Mueller Co. or approved equal.

All valves shall be furnished with extension type cast iron valve boxes of proper length for pipe depth. All boxes shall conform with A.W.W.A. specifications with a shaft of no less than 5 inches and have the word "WATER" cast in the cover. Base of valve box shall have a flared section to fit over stuffing box of valve.

HYDRANTS
Fire hydrants shall be breakaway Mueller Co., Centurion model #A-423, or Metrolinton 250 Eddy Compression type F.H. or approved equal.

Fire hydrants shall be installed with the center of the nozzle 18" above finished grade.

Dead-end water mains 6" or larger shall terminate with a fire hydrant.

PLACEMENT
All water mains shall be installed with a minimum cover of 36" for PVC and 30" for DIP except where shown differently on plans.

A continuous and uniform bedding shall be provided. Backfill material shall be tamped in layers around the pipe as shown on the plans and/or City of Fort Lauderdale Construction Standards and Specifications, January 1982. Rocks or stones larger than 3/4" diameter found in the trench shall be removed for a depth of at least 6" below the bottom of the pipe.

Pipe deflection shall not exceed 75% of the maximum deflection recommended by the manufacturer.

SEPARATION
Sanitary sewers and force mains should cross under water mains whenever possible. Sanitary sewers and force mains crossing water mains shall be laid to provide a minimum vertical distance of 18" between the invert of the upper pipe and the crown of the lower pipe whenever possible.

Where sanitary sewer force mains must cross a water main with less than 18" vertical separation, both the sewer and water main shall be constructed of ductile iron pipe (DIP) at the crossing. Sufficient lengths of DIP must be used to provide a minimum separation of 10 feet between any two joints. All joints on the water main within 20 feet of the crossing must be mechanically restrained. A minimum vertical clearance of 6" must be maintained at all crossings.

A minimum 10 foot horizontal separation shall be maintained between any type of sewer and water main in parallel installations whenever possible.

The preferred separation between water mains and sewer mains shall be 10 feet. In cases where it is not possible to maintain a 6 foot horizontal separation between the water mains and sewer mains, one of the following conditions must be met. The minimum separation between water and sewer mains shall be 3 feet:

The water main must be laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer or force main at such elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

The sewer or force main is encased in concrete or a watertight carrier pipe.

Both the sewer and the water main are constructed of pressure pipe tested to 150 p.s.i.

Where it is not possible to maintain a vertical distance of 18" in parallel installations, the water main shall be constructed of DIP and the sanitary sewer or force main shall be constructed of DIP, with a minimum vertical clearance of 6". The water main should be above the sewer. Joints on the water main shall be located as far apart as possible from the joints on the sewer or force main (staggered joints).

All crossings shall be arranged so that the sewer pipe joints and the water main pipe joints are equidistant from the point of crossing (pipes centered on the crossing).

Where a new pipe conflicts with an existing pipe with less than 18" vertical clearance, the new pipe shall be arranged to meet the crossing requirements above.

TESTING, DISINFECTION
Pipe shall be tested under constant pressure of 150 P.S.I. for a minimum test period of 2 hours and shall not exceed the leakage requirements as per A.N.S.I./A.W.W.A. specifications of C-600-05 leakage formula: $Q = (LD/P)^2 148,000$
Q = QUANTITY OF MAKEUP WATER, (IN GALLONS PER HOUR)
L = LENGTH OF PIPE SECTION BEING TESTED, (IN FEET).
D = NOMINAL DIAMETER OF THE PIPE, (IN INCHES).
P = AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST, (IN POUNDS PER SQUARE INCH GAUGE).

The City of Fort Lauderdale Public Services Department will take all bacteriological tests, to be scheduled via Inspector. If otherwise specified in contract detailed specification and/or authorized by the engineer of record, bacteriological tests may be performed by a certified environmental testing laboratory.

Disinfection of mains shall comply with A.N.S.I./A.W.W.A. C-651-05 standard. Bacteriological sampling points shall be designated on the engineering plans. Minimum one sampling point at each end. Maximum space between sampling points is 1200 feet.

CONNECTION
All connections to existing mains shall be made under the direction of the City of Fort Lauderdale.

SERVICE CONNECTIONS
All meter service connections shall be bronze from plug valve. No gate valves are to be used (2" or less).

Service saddles shall be ductile iron with stainless steel straps. Saddles shall be double strap type. All service saddles shall conform to A.N.S.I./A.W.W.A. C 111/A-21.11-00 and A.S.T.M. A588.

All service lines shall be copper tubing, type "K", or plasticized polyethylene 3408, A.S.T.M. D-2737, S.D.R. 9, 200 P.S.I.

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1700 N.W. 64th STREET, SUITE 400,
FORT LAUDERDALE, FLORIDA 33309-1801
PHONE: (954) 763-7811
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E.B. & L.B. #285

MICHEN PROPERTIES, LLC
192/115
Low Campaigne, Jr.
Professional Engineer No. 36762
Professional Surveyor and Mapper No. 4330
State of Florida

for **ham Townhomes**
809, 811, 813, 815, 817 & 819 N.E. 17th WAY,
CITY OF FORT LAUDERDALE, BROWARD COUNTY, FLORIDA
WATER & SEWER DETAILS

PROJECT NO. U9324
DATE 5/4/15
REVISION
8/6/15

DRAWING

C-4
SHEET
4 OF 6