

*San Antonio Water System Standard Specifications for Construction*

**ITEM NO. 824**  
**WATER SERVICE SUPPLY LINES**

**824.1**      **DESCRIPTION:** This item shall consist of water service supply lines adjustment and installation in accordance with these specifications and as directed by the Engineer.

**824.2**      **MATERIALS:** The materials for water service supply lines installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification Item Nos. 21-10, "Brass Gate Valves," 15-40, "Brass Goods," 15-01, "Copper Tubing," and 100-30, "Service Saddles."

**824.3**      **CONSTRUCTION:**

1.      General: Service supply lines and fittings, meter boxes and appurtenances shall conform to the Material Specifications and shall be installed by the Contractor as specified herein, or as directed by the Engineer and in accordance with the DD-824 Standard Drawing Series.
2.      Designation of Service Supply Lines: A service supply line located between the water main and the inlet side of the water meter is designated as a "water service line." A service supply line located between the outlet side of the water meter to the point of connection within the limits of the Customer's lot or property is designated as the "Customer's yard piping" and is covered under Item No. 822 of these specifications. Services 2 inches and smaller are designated "small services." Services 4 inches and larger are designated "large services."
3.      Service Relays: New transfer main(s) to which services are to be relayed, and are on the same side of the streets as the Customer's meter, are defined as "short relays." New transfer main(s) to which services are to be relayed, and are on the opposite side of the street from the Customer's meter, are defined as "long relays."

Service Reconnects: New transfer main(s) to which services are to be reconnected, and on the same side of the street as the old main, are defined as "short reconnects." Existing services on the opposite side of the street to the new main shall be defined as a "long reconnects."

4.      Service Relocates: Service Relocates are defined as services that are relocated from an alley or street to a side or front street. New transfer main(s) to which services are to be relocated, and are on the same side of

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the street as the Customer's new meter box location, are designated as "short relocates." New transfer main(s) to which services are to be relocated, and are on the opposite side of the street from the Customer's new meter box location, are designated as "long relocates."

5. New Services: If a new main is required to be extended to provide water service for new Customers, the service lines laid to the new main shall be designated as "new services." New laid main(s) to which new services are on the same side of the street as the Customer's new meter box location, are designated as "new short services." New laid main(s) to which new services on the opposite side of the street from the Customer's new meter box location, are designated as "new long services."
6. New Unmetered Services: New unmetered services are defined as services that are installed on existing or new mains to provide service to platted vacant lots. Where the new or existing main to which new unmetered services are being installed, is on the same side of the street as the Customer's new or existing meter box location (Inspector is to set location of new meter box if no existing meter box is set), the services to be laid are designated "new unmetered short services." Where the new or existing water main to which new unmetered services are installed, is on the opposite side of the street from the Customer's new or existing meter box location (Inspector is to set location of new meter box if no existing meter box is set), the services to be laid are designated "new unmetered long service." New unmetered long services and new unmetered short services will not include "Customer's yard piping," and no meter will be set.
7. Tap Holes: Tap holes are defined as excavations at existing mains, which are required in association with replacements of water service lines by pulling, boring or jacking operations.

All backfill material shall be as specified for all associated main and service line trench excavation.

For service lines and tap holes, payment for bedding, initial backfill and secondary backfill shall be included in the various sizes of each service placed.

8. Service Line Installation: Unless otherwise notified, service relays, service reconnects, service relocates and new services shall be installed as described herein, and in the DD-824 Standard Drawing Series. Unless otherwise indicated, existing meter and meter box relocation shall be

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included in the service line installation.

All service line installation shall include a dielectric union to be installed within the meter box on the outlet side of the meter, as shown in the DD-824 Standard Drawing Series.

Cutting, excavation, backfill and replacement of pavement shall be done as specified herein and in accordance with applicable sections of the City of San Antonio Specification Item No. 511, "Cutting and Replacing Pavements (Trench Repair), and Item No. 804, "Excavation, Trenching, and Backfill." The minimum trench width for small service lines shall be 8 inches, while the minimum trench width for large service lines shall be the nominal pipe diameter plus 16 inches, except when specified otherwise by the Engineer. For  $\frac{3}{4}$  inch to 2 inch Service lines, the minimum bury depth shall be 3 feet. For services greater than 2 inches, the minimum depth of bury shall be 4 feet.

All service lines shall be installed in accordance with the DD-824 Standard Drawing Series, SAWS' Standard Material Specification Item No. 100-30, except that two strap service saddle clamps shall be installed for all tap connections made on water mains located within boundaries of Pressure Zones 9 through 16.

The Contractor shall use precaution to protect and preserve the polyethylene wrap around ductile-iron water mains when installing service corporations. The required method is: wrap pipe tape around the pipe, over the polywrap, in the area to be tapped. The tap shall be made through the tape and polywrap. It is not necessary to remove and replace polywrap. All exposed pipe, corporation, and the first three feet of the service, shall be wrapped and taped to achieve a complete seal. In addition, a sand envelope shall extend over and around the connection to a depth of 8 inches above the main.

Small service lines shall be embedded in sand in accordance with Item No. 804, "Excavation, Trenching and Backfill."

When approved by the Inspector, the Contractor may lay the new service line from the corporation stop to the curb stop or angle valve. Upon completion, the Contractor shall isolate the new service line by closing the curb stop or angle valve until the meter box is set.

9. Splicing: A long service line single slice may be permitted by means of a 3-part compression or flared coupling only when approved in advance by

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the Inspector, provided the location of the splice is not under pavement or concrete. The segment added is required to be the same material as the existing service line, unless otherwise directed by the Inspector. Splicing short service lines will not be permitted.

10. Boring or Jacking Service Lines: Service lines which cross paved streets may be installed at the Contractor's option by boring or jacking operations. Where it becomes necessary to widen the main trench section to accommodate a bore pit, such widening shall not extend more than one additional foot into the traffic side of the street.
11. Tapping Asbestos Cement (AC) Pipe: All necessary service line tapping of AC pipe shall be completed during the period immediately before or after hydrostatic pressure testing operations so that subsequent flushing will maximize the elimination of contaminants associated with the tapping process. Direct tapping will not be allowed. Service saddles must be used when tapping AC pipe. Drill tools shall be used for services less than 2 inches. Shell type drills shall be used for all services 2 inches and greater.

The tapping of AC pipe must be done in accordance with manufacturers' recommendations and done only with tap machine having a built in flush valve and the flush valve must be open during the entire procedure.

12. Abandonment of Service Lines: The Contractor shall accomplish all cutting, capping, and plugging necessary to isolate new service lines transferred to new and existing mains from those abandoned, including service lines designated in the contract documents as "tap plug" and "tap kill." The corporation stop for an abandoned service line tapped on a ferrous main shall be removed, and the tap at the main shall be plugged with an appropriately sized brass plug. For a non-ferrous main, the corporation stop shall not be removed from the main. Instead, the corporation stop shall be closed and the flared nut shall be removed from the corporation stop. After the appropriately sized copper disc is inserted inside the flared nut, replace the flared nut on the corporation stop. The Contractor shall salvage copper service line tubing, brass fittings, and other materials as directed by the Inspector and return them to the Owner.
13. Tapping PVC (C-900) Pipe: Tapping of PVC pipe must be done in accordance with Uni-Bell procedures. Direct tapping will not be allowed. All drill cutting tools must be the "shell type" with internal teeth or double slots which will retain the coupon. The shell cutters must be designed for C-900 pipe, thus having sufficient root depth to handle the heavier walled pipe.

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14. Small Service Lines: Copper tubing shall be used for ¾ inch through 2 inch service lines. Brass fittings for ¾ inch and 1 inch service lines shall be of the flared or compression type for the use with Type 'K' soft annealed copper tubing. Brass fittings for 1½ inch and 2 inch lines shall be of the flared or compression type for use with type 'K' soft annealed copper tubing, except as modified by subsection No. 824.39.

Copper tubing shall be cut squarely by using an approved cutting tool and by avoiding excessive pressure on the cutting wheels which might bend or flatten the pipe walls. Following the copper tubing cut, but before flaring, a reamer shall be used to remove the inside rolled lip from the tubing. Flared ends shall be expanded by the use of a flaring tool using care to avoid splitting, crimping, or overstressing the metal. Pipe adjacent to the fittings shall be straight for at least 10 inches. Bending of tubing shall be accomplished by using an appropriate sized bending tool. No kinks, dents, flats, or crimps will be permitted, and should such occur, the damaged section shall be cut out and replaced. When compression fittings are used, the copper tubing shall be cut squarely prior to insertion into the fitting. Final assembly shall be in accordance with the manufacturer's recommendations.

15. Small Service Lines on New Mains: Installation of new copper service lines shall consist of all excavation through miscellaneous material encountered; trench excavation protection; drilling and tapping the new main with an approved tapping machine; setting the curb stop or angle valve at the meter; laying the new copper service line at the specified depth between the main and the meter and its tie-in at the corporation and the curb stop or the angle valve; relocating the existing meter and installing a new meter box in accordance with Item No. 833, "Meter and Meter Box Installation."; backfilling the trench with approved selected material and disposal of surplus excavated material; capping the tap hole with asphalt treated base, including the outer limits of the main trench line with service line trench; cutting and replacing pavements, curbing and sidewalks of all types over the limits of the main line trench and the completed service line trench.
16. Reconnecting Service Lines: Both old and new water mains at existing service line connections, as shown in the contract documents, shall be exposed. The old main shall be exposed for the purpose of gaining access to the existing service corporation stop and the new main for the purpose of installing the new corporation stop. The new main shall be exposed for the purpose of being drilled and tapped with an approved tapping machine,

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a new corporation stop installed under pressure, and the trench extended laterally to expose a sufficient length of the existing service line to provide slack to bend it into position for tying to the new corporation stop. After suitable notification to the Customer, the Contractor shall "kill" the existing service by closing the corporation stop, removing the existing flare nut, inserting inside the existing flared nut an appropriately-sized copper disc and replacing the existing flared nut on the corporation stop if the main is non-ferrous, or plugging the existing service line at the main if the main is ferrous. The Contractor shall then immediately open the stop and restore water service to the Customer. Where it is not possible to obtain sufficient length in the existing service to tie directly to the new main, at the direction of the Inspector, the Contractor shall splice the necessary length of new tubing and tie it to the existing service by means of a compression coupling at a point as close as practicable to the new main.

Cutting and bending of the tubing, introduction of slack to compensate for soil movement, and completion of the installation shall be as specified in subsection No. 824.17, "Relaying Service Lines."

Where old and new mains are on opposite sides of the street, service lines may be installed under the street pavement by boring rather than trenching.

17. Relaying Service Lines: The existing or new mains shown in the contract documents shall be exposed and opposite location stakes placed onsite at the direction of the Inspector. The existing or new main shall: be drilled and tapped with an approved tapping machine, a new corporation stop installed, and the trench extended laterally to the location specified for the meter box. The existing meter shall be reset and the meter box and base shall be installed at its staked location and perpendicular to the corporation stop in the water main. The meter box location shall not vary more than 24 inches in any direction from its staked location. The service line shall be installed with sufficient slack to compensate for soil movement. Where the location of the existing meter is not changed, the new service line shall be extended from the main to the existing meter, a new curb stop installed at the end of the service line, and connected to the inlet side of the meter. If disturbed, the existing meter box shall be reset to correct grade. Long service relays may be placed under the street pavement by boring or jacking rather than trenching.
18. Single Service Line - Dual Meters: The single service line - dual meter installation shall consist of a 1" copper service line reducing to two  $\frac{3}{4}$ inch

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copper service lines at a tee which shall be set in line with the front edge of meter boxes for  $\frac{5}{8}$ inch and  $\frac{3}{4}$ inch meters. A single service line with dual meters shall be installed in those new residential developments where new  $\frac{5}{8}$ inch and  $\frac{3}{4}$ inch meters are required and in main replacement work, where it is necessary to change the location of existing  $\frac{5}{8}$ inch and  $\frac{3}{4}$ inch meters. Single service line - dual meter materials and installation requirements shall conform to requirements established herein See DD824-05 Standard Drawing Series.

19. Small Service Lines on Existing Mains: The work involved in the installation of new copper service lines on existing mains shall consist of jacking, boring, tunneling, and, where authorized, open trench operations; all excavation through whatever material encountered; trench excavation protection; using the existing corporation when approved by the Inspector; tapping the existing main and installing the new corporation and setting the curb stop or angle valve at the meter; relocating the existing meter and installing a new meter box in accordance with Item No. 833, "Meter and Meter Box Installation;" abandoning the existing corporation stop, removing the existing flared nut, inserting inside the existing flared nut an appropriately-sized copper disc and replacing the existing flared nut on the corporation stop, if the main is non-ferrous, or plugging the existing service line at the main if the main is ferrous; installing the new service line at the same grade as the existing service line or at the specified grade between the main and the existing meter and its tie-in at the corporation and the curb stop; disposal of surplus excavated material; capping the tap hole with asphalt treated base including the outer limits of the main line trench and the service line trench; cutting and replacing all surfaces of whatever type encountered over the completed service line trench; restoration of the site.
20. Large Service Lines: Ductile iron pipe and cast iron fittings used for metered service lines and non-metered fire service lines larger than 2inch shall be installed in accordance with the applicable provisions of Item No. 812, "Water Main Installation," except where otherwise approved by the Engineer.
21. Large Service Lines on New Mains: Work involved in the installation of a new metered service lines and non-metered fire service lines shall consist of all excavation through whatever material encountered, trench excavation protection, installing tees, pipe and fittings of various sizes including main line and service line valves, valve boxes, ductile iron pipe, fittings, in accordance with the associated DD-824 Standard Drawing Series, and reaction block, backfilling with approved selected material,

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cutting and replacing pavements, curbing, and sidewalks of all types over the limits of the main line trench and the completed ductile iron service line.

22. Large Service Lines on Existing Mains: The work involved in the installation of the new metered service lines and non-metered fire service lines shall consist of all excavation through whatever material encountered, trench excavation protection, cutting-in tees and installing tapping sleeves and valves, pipe and fittings of various sizes including main line and service valves, valves boxes, ductile iron pipe, fittings and reaction block required, backfilling with approved selected material, cutting and replacing pavements, curbing, and sidewalks of all types over the limits of the main line trench and the completed ductile iron service line.

### **824.4**

#### **MEASUREMENT:**

1. Reconnect Short Service will be measured by the unit of the various types and sizes of each service line reconnected.
2. Relay Short Service will be measured by the unit of the various types and sizes of each service line relayed.
3. Relay Long Service will be measured by the unit of the various types and sizes of each service line relayed.
4. Relocate Short Service will be measured by the unit of the various types and sizes of each service line relocated.
5. Relocate Long Service will be measured by the unit of the various types and sizes of each service line relocated.
6. New Short Service will be measured by the unit of the various types and sizes of each new service line installed.
7. New Long Service will be measured by the unit of the various types and sizes of each new service line installed.
8. New Un-metered Short Service will be measured by the unit of the various type and sizes of each new un-metered service line installed.
9. New Un-metered Long Service will be measured by the unit of the various type and sizes of each new un-metered service line installed.



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**824.5**      **PAYMENT:** Payment for a Reconnect will be made at the unit price for each service line of the various sizes reconnected. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line reconnection.

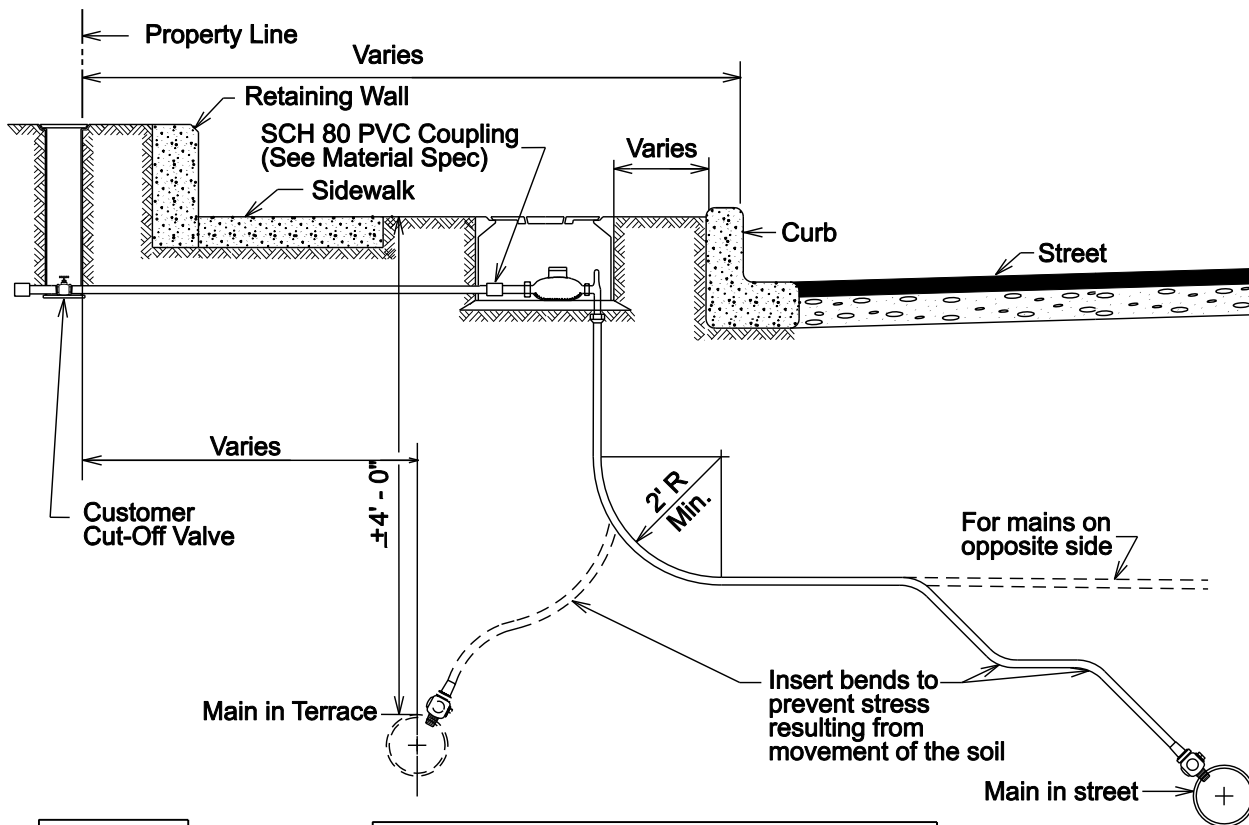
Payment for a Relay Short and Long Service will be made at the unit price for each service line of the various sizes relayed. Payment shall include reconnection of new service to the existing meter and the adjustment of the meter, meter box, and Customer valve. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line relay.

Payment for a Relocate Short and Long Service will be made at the unit price bid for each service line of the various sizes relocated. Such payment shall also include excavation, trench excavation protection, hauling and disposition of surplus excavated materials, sand backfill, meter box relocation, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, and copper tubing and fittings of the various sizes used in the service line relocation.

Payment for a New Short and Long Service will be made at the unit price bid for each new service line of the various sizes installed. Such payment shall also include excavated materials, trench excavation protection, sand backfill, cutting pavement and surface structures of whatever type encountered and replacement with whatever type specified, meter box, meter template, copper tubing and fittings of the various sizes used in the new service line installation.

Payment for a New Unmetered Short and New Unmetered Long Service will be made at the unit price bid for each new unmetered service line of the various sizes installed. Such payment shall also include excavated materials, trench excavation protection, sand backfill, cutting in pavement and surface structures of whatever type encountered and replacement with whatever type specified, meter box, meter template, copper tubing and fittings, of the various sizes used in the new unmetered service line installation.

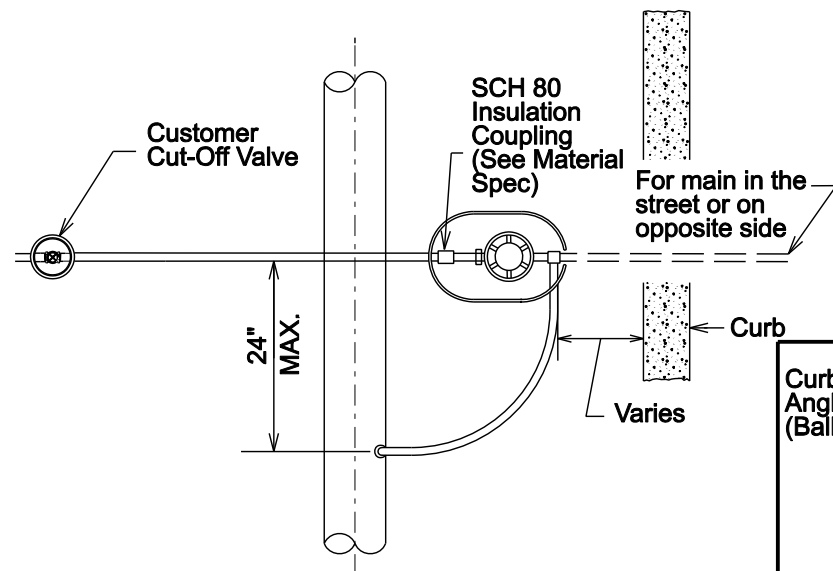
- End of Specification -



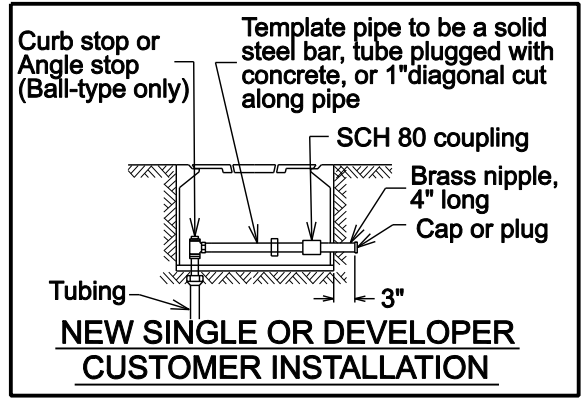
Insulation  
Coupling  
Component  
579 - 3/4"  
1580 - 1"

METER / METER BOX SCHEDULE	
Meter Size	Meter Box
5/8", 3/4" & 1"	C.I. Oval, SAWS Material Specification 10-30

Note:  
See Tapping Schedule  
DD-824-01 Sheet 3 of 3



**IMPROVED STREET**  
5/8" THRU 1" SERVICE



**NEW SINGLE OR DEVELOPER  
CUSTOMER INSTALLATION**

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
SAN ANTONIO, TEXAS

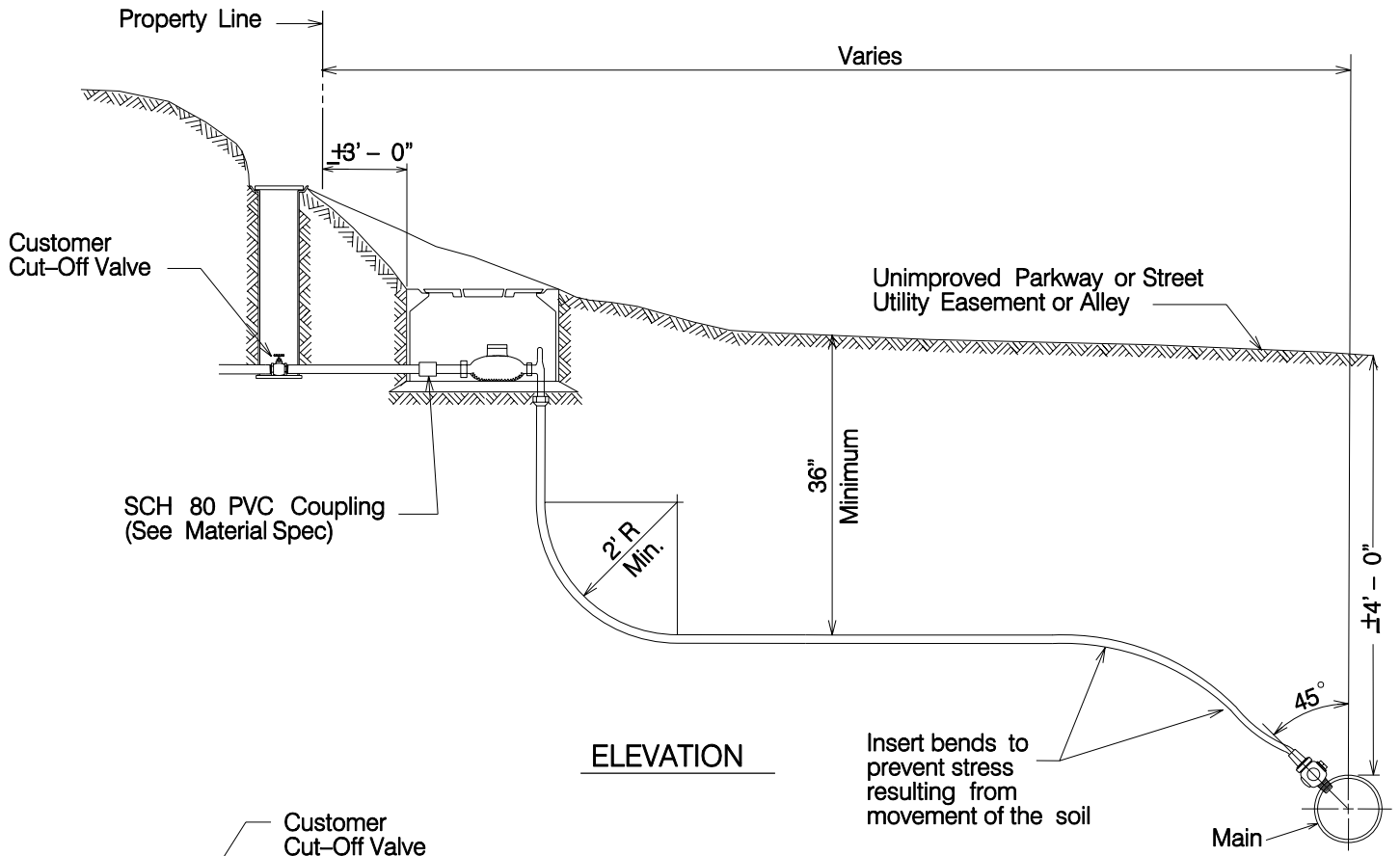
**COPPER  
SERVICE INSTALLATION  
MAIN IN TERRACE**

APPROVED  
MARCH 2008

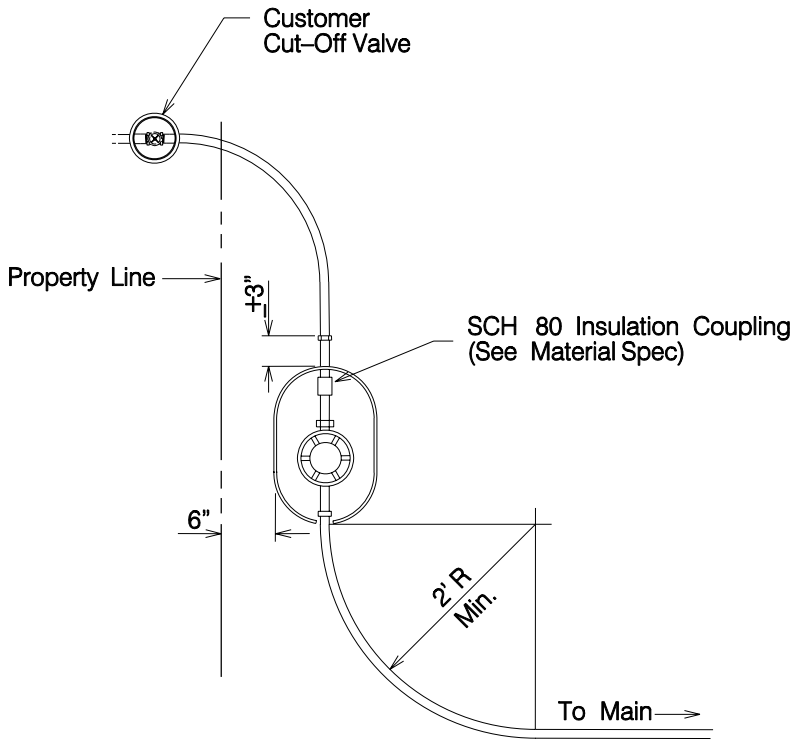
REVISED  
APRIL 2014

**DD-824-01**

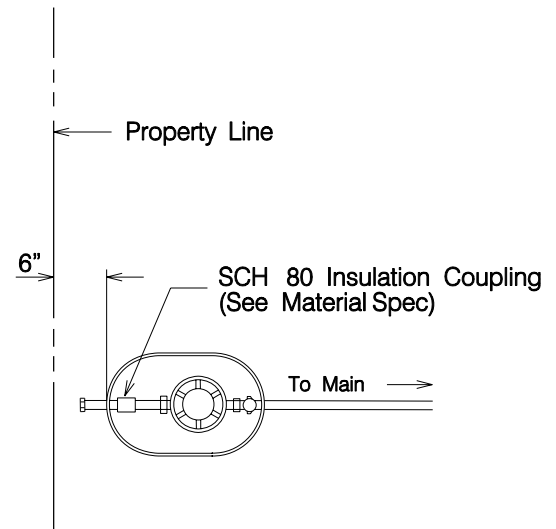
SHEET  
**1** OF **3**



ELEVATION



PARTIAL PLAN

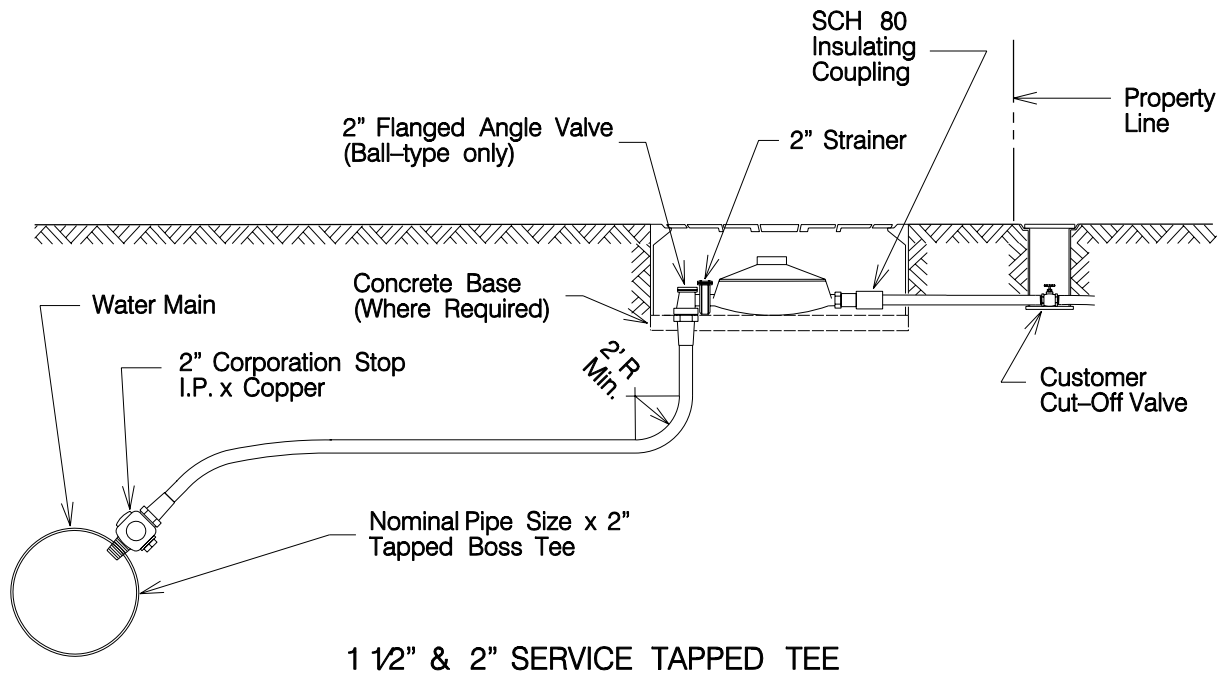


PARTIAL PLAN

UNIMPROVED STREET  
58" THRU 1" SERVICE

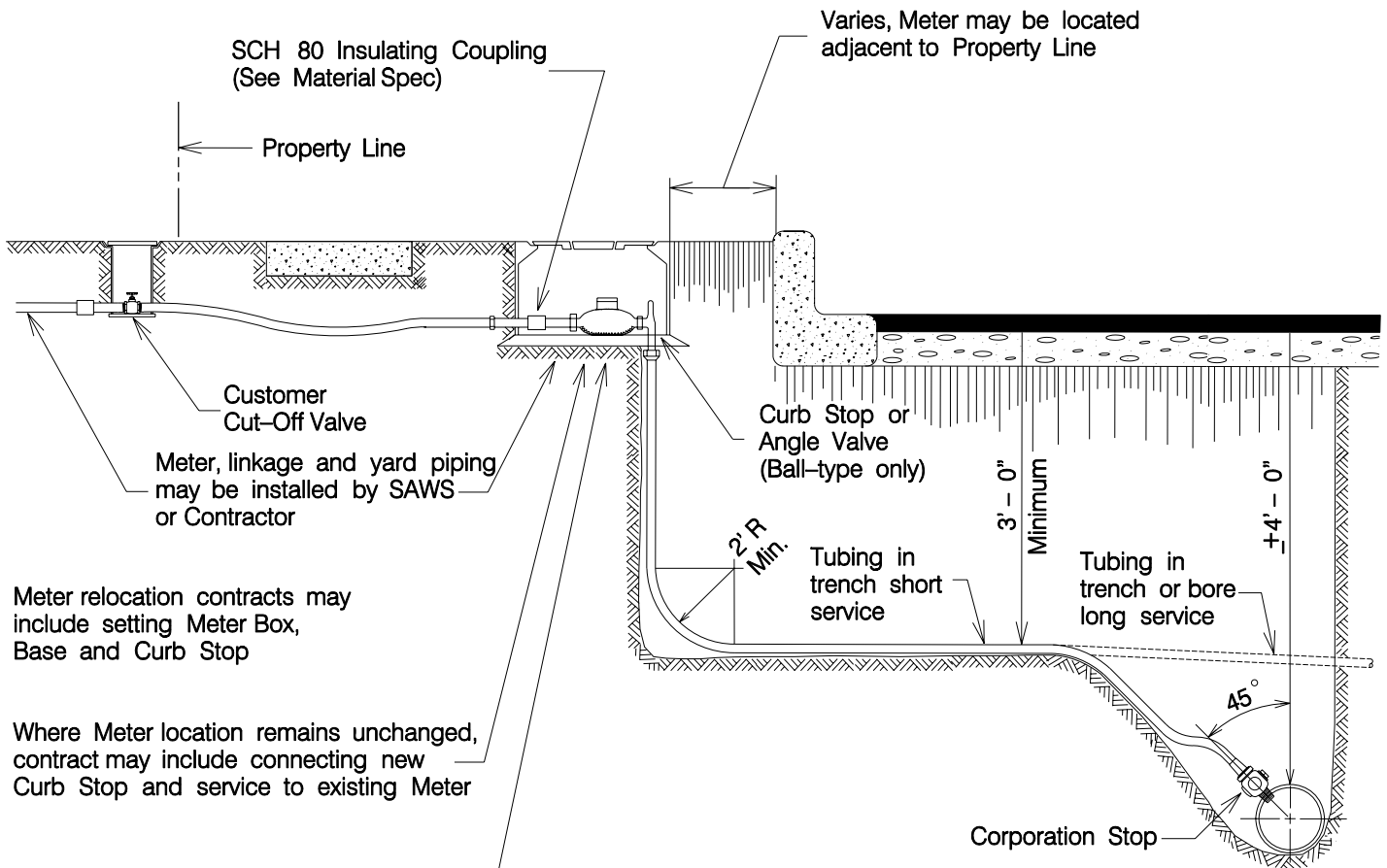
## PIPE TAPPING SCHEDULE

PIPE DIAMETER	SERVICE SIZE			
	3/4"	1"	1 1/2"	2"
6" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
6" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
8" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
8" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
8" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
10" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
10" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
10" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
12" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
12" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle
12" PVC	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
16" A.C.	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle	Tap With Service Saddle
16" C.I. or D.I.	Tap	Tap	Tap With Service Saddle	Tap With Service Saddle



Note:  
For direct tap to main, see Tapping Schedule

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>COPPER</b> SERVICE INSTALLATION TAPPING SCHEDULE	APPROVED	REVISED
		March 2008	
		<b>DD-824-01</b>	



Meter relocation contracts may include setting Meter Box, Base and Curb Stop

Where Meter location remains unchanged, contract may include connecting new Curb Stop and service to existing Meter

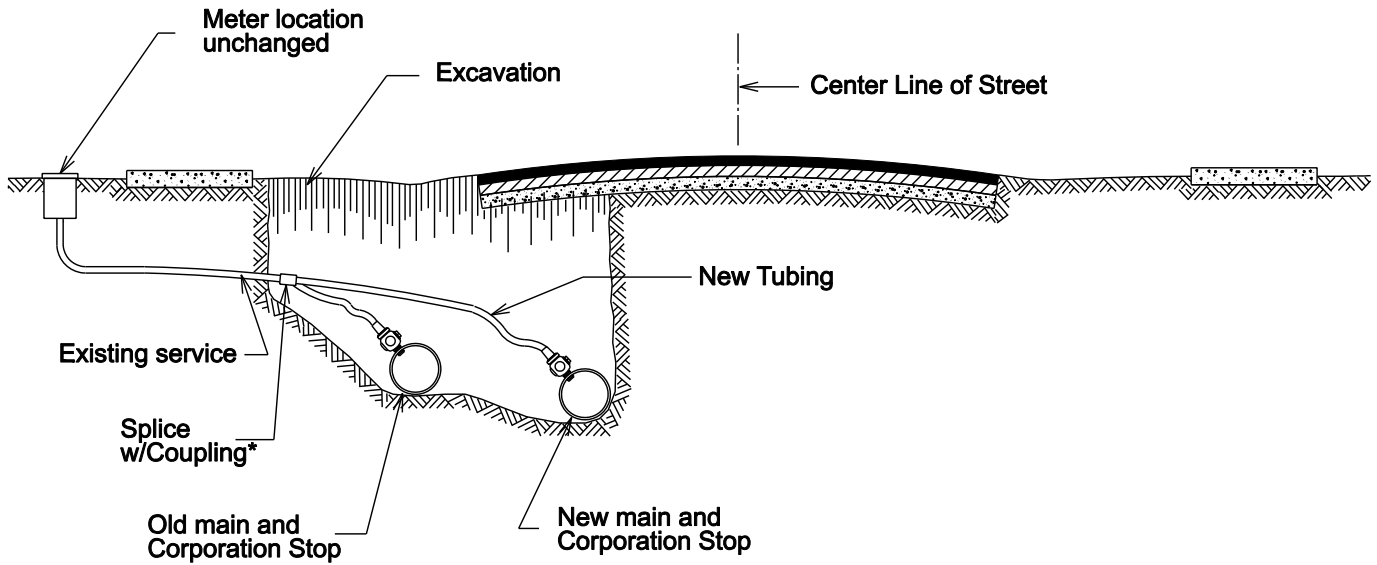
On new single or developer customer installations, See DD-824-01 Sheet 1 of 3

Note:  
See Tapping Schedule  
DD-824-01 Sheet 3 of 3

SERVICE RELAY, SERVICE AND  
METER RELOCATION

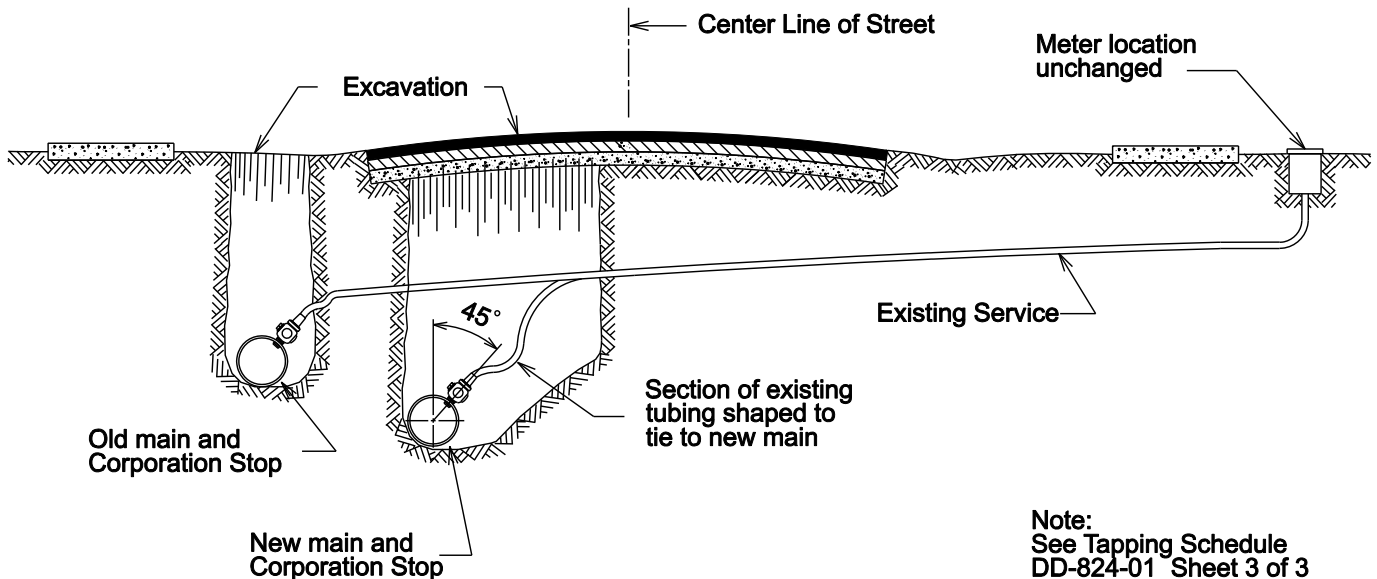
PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>SERVICE RELAY,          SERVICE RELOCATION</b> <b>3/4" THRU 2"</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-02</b>	

\* No splicing shall be accepted where the service line occurs under any pavement or impervious cover.



Note:  
Sections are representative of curbed street also, except meter near curb.

**SHORT RECONNECTION BETWEEN  
OLD AND NEW MAINS, SAME SIDE  
METER ON SAME SIDE**



Note:  
See Tapping Schedule  
DD-824-01 Sheet 3 of 3

**LONG RECONNECTION BETWEEN  
OLD AND NEW MAINS, SAME SIDE  
METER ON OPPOSITE SIDE**

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
SAN ANTONIO, TEXAS

**SERVICE RECONNECTION**  
3/4" THRU 2"

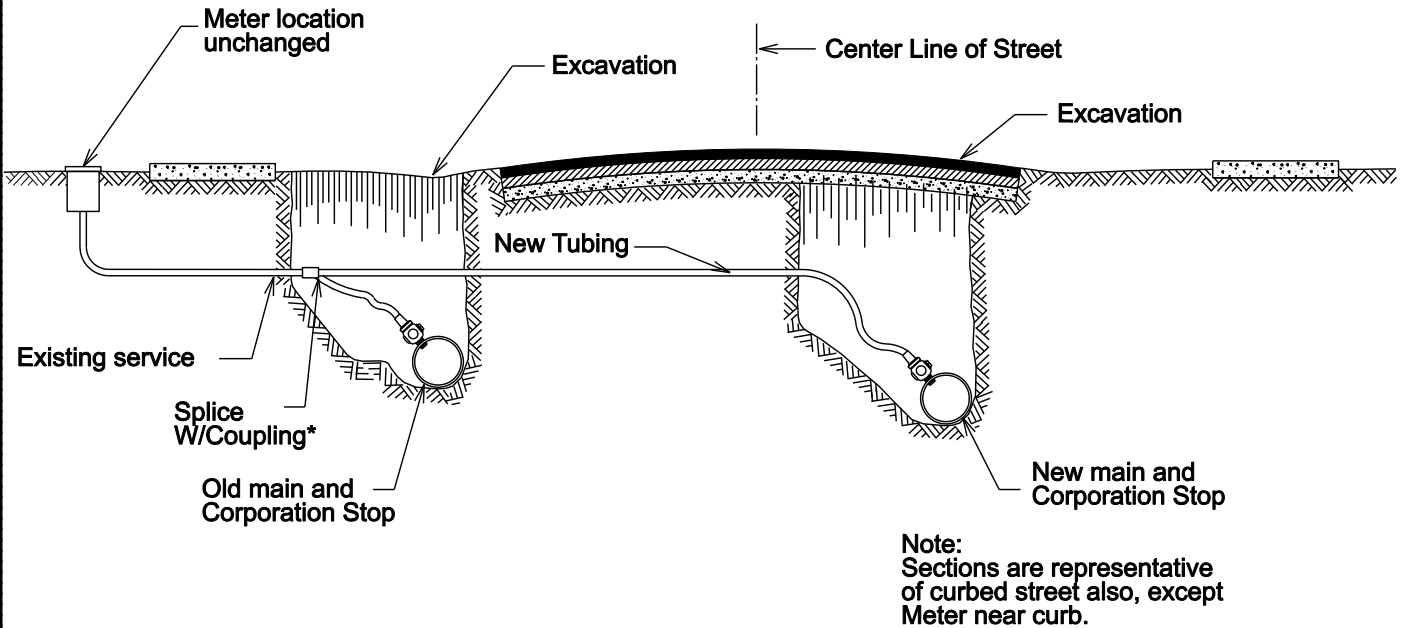
APPROVED  
MARCH 2008

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APRIL 2014

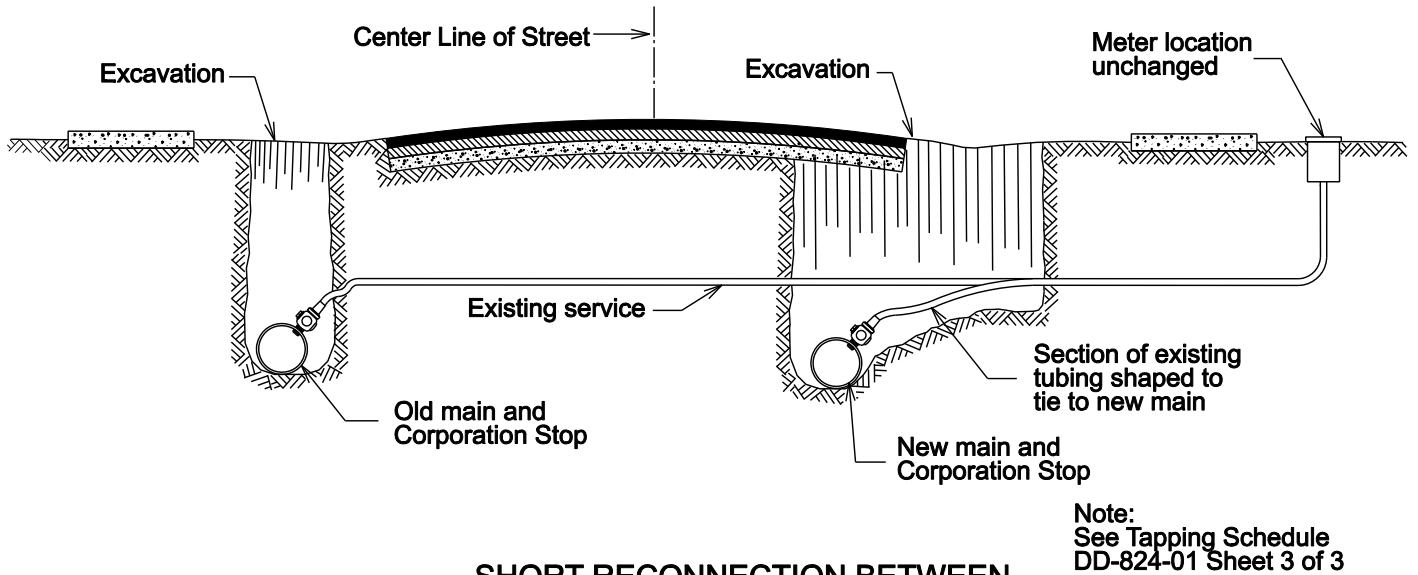
**DD-824-03**

SHEET  
**1** OF 2

\* No splicing shall be accepted where the service line occurs under any pavement or impervious cover.

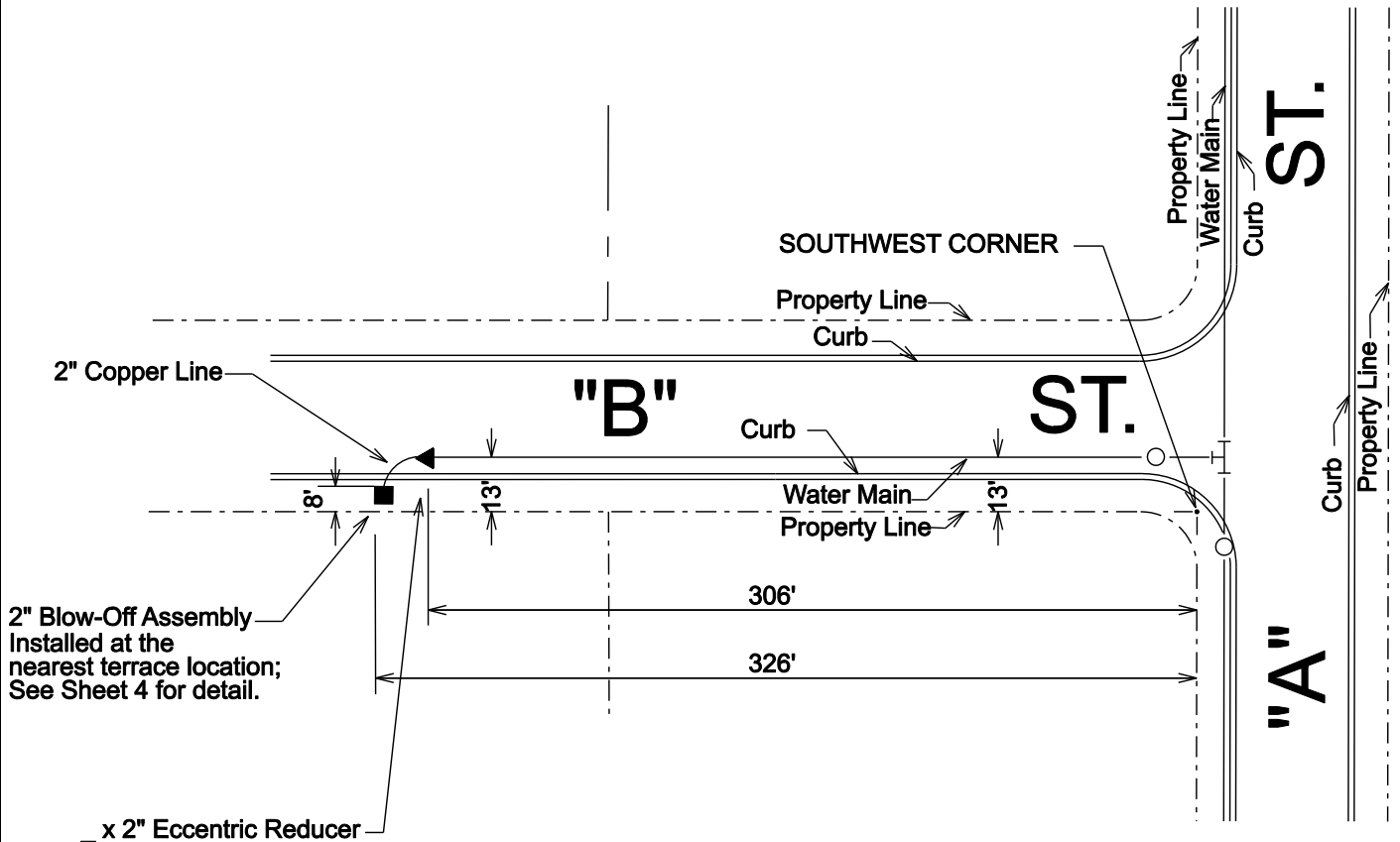


**LONG RECONNECTION BETWEEN  
OLD MAIN AND METER ON OPPOSITE SIDE  
OF STREET FROM NEW MAIN**



**SHORT RECONNECTION BETWEEN  
NEW MAIN AND METER ON OPPOSITE  
SIDE OF STREET FROM OLD MAIN**

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	SERVICE RECONNECTION 3/4" THRU 2"	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		<b>DD-824-03</b>	SHEET <b>2</b> OF <b>2</b>



2" Blow-Off Assembly  
Installed at the  
nearest terrace location;  
See Sheet 4 for detail.

\_ x 2" Eccentric Reducer

**BLOW-OFF MEASUREMENT:** From the Southwest Corner of "A" St. and "B" St. West 306' and North 13' to Eccentric Reducer, and West 326' and South 8' to Blow-Off Assembly Box.

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
SAN ANTONIO, TEXAS

**TYPICAL BLOW-OFF  
ARRANGEMENT ON  
DEAD END MAINS**

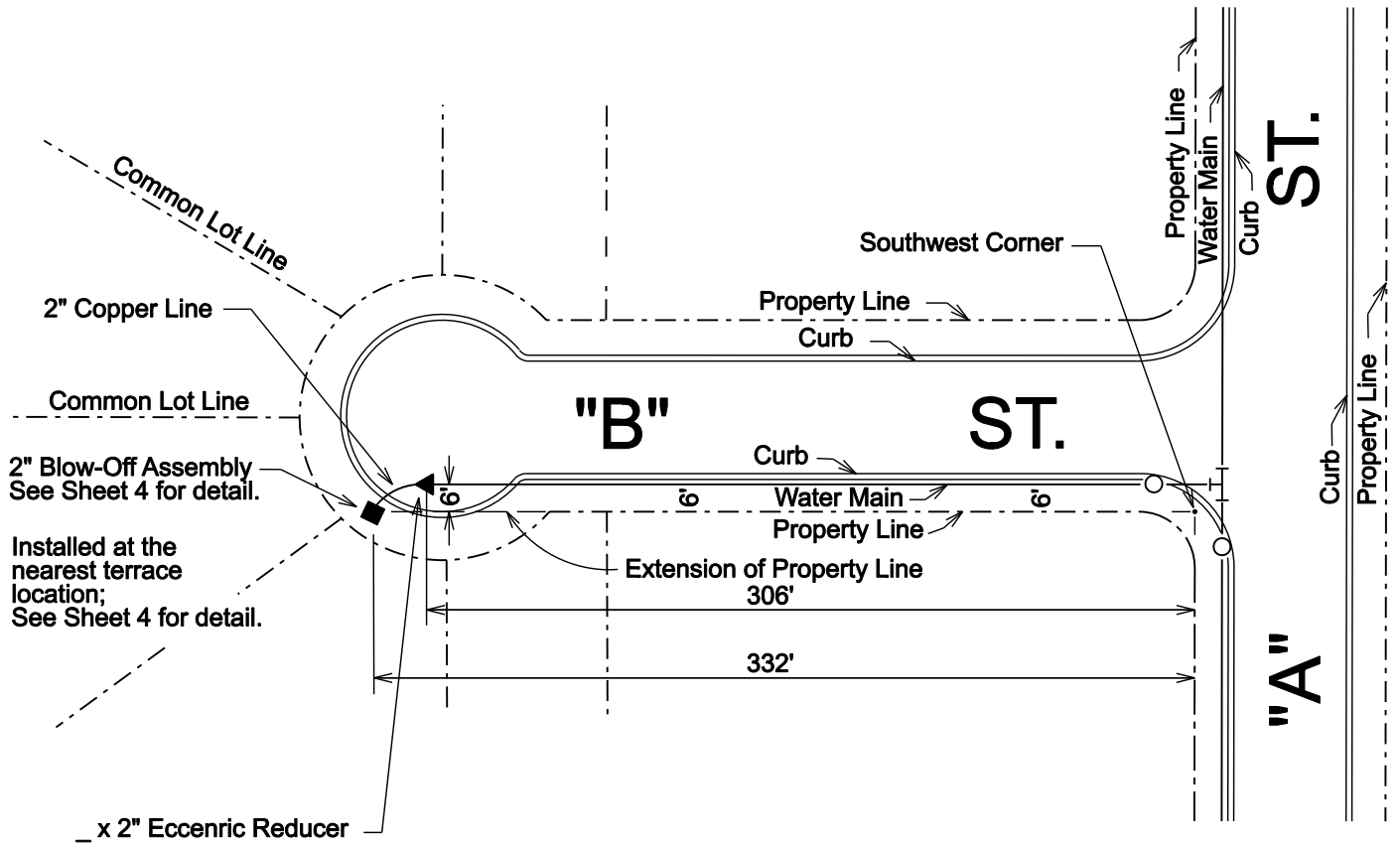
APPROVED  
MARCH 2008

REVISED  
APRIL 2014

**DD-824-04**

SHEET  
**1** OF **5**





**BLOW-OFF MEASUREMENT:** From the Southwest Corner of "A" St. and "B" St. West 306' and North 6' to Eccentric Reducer, and West 332' and South 0' to Blow-Off Assembly Box.

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

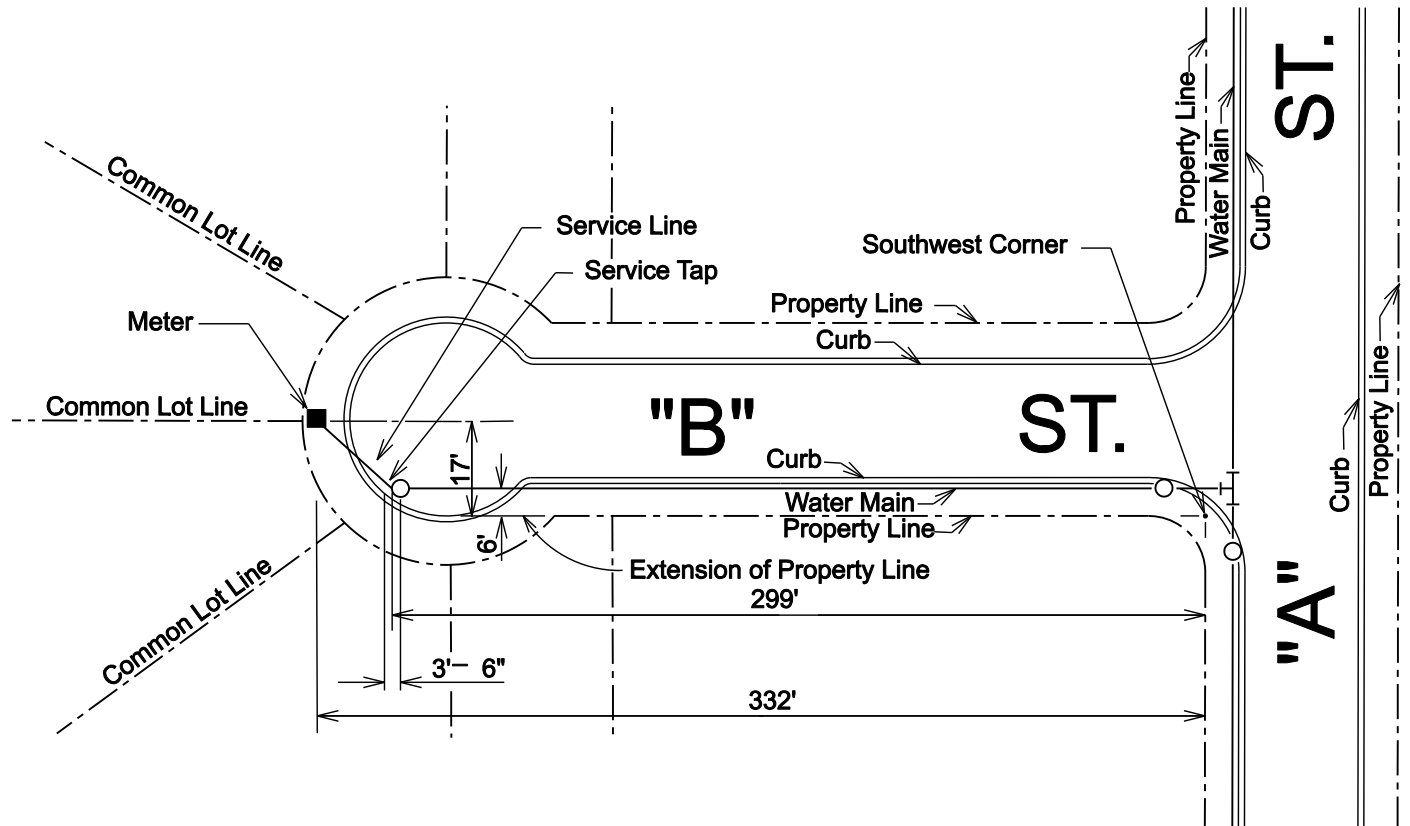
**TYPICAL BLOW-OFF  
 ARRANGEMENT  
 IN CUL-DE-SAC**

APPROVED  
 MARCH 2008

REVISED  
 APRIL 2014

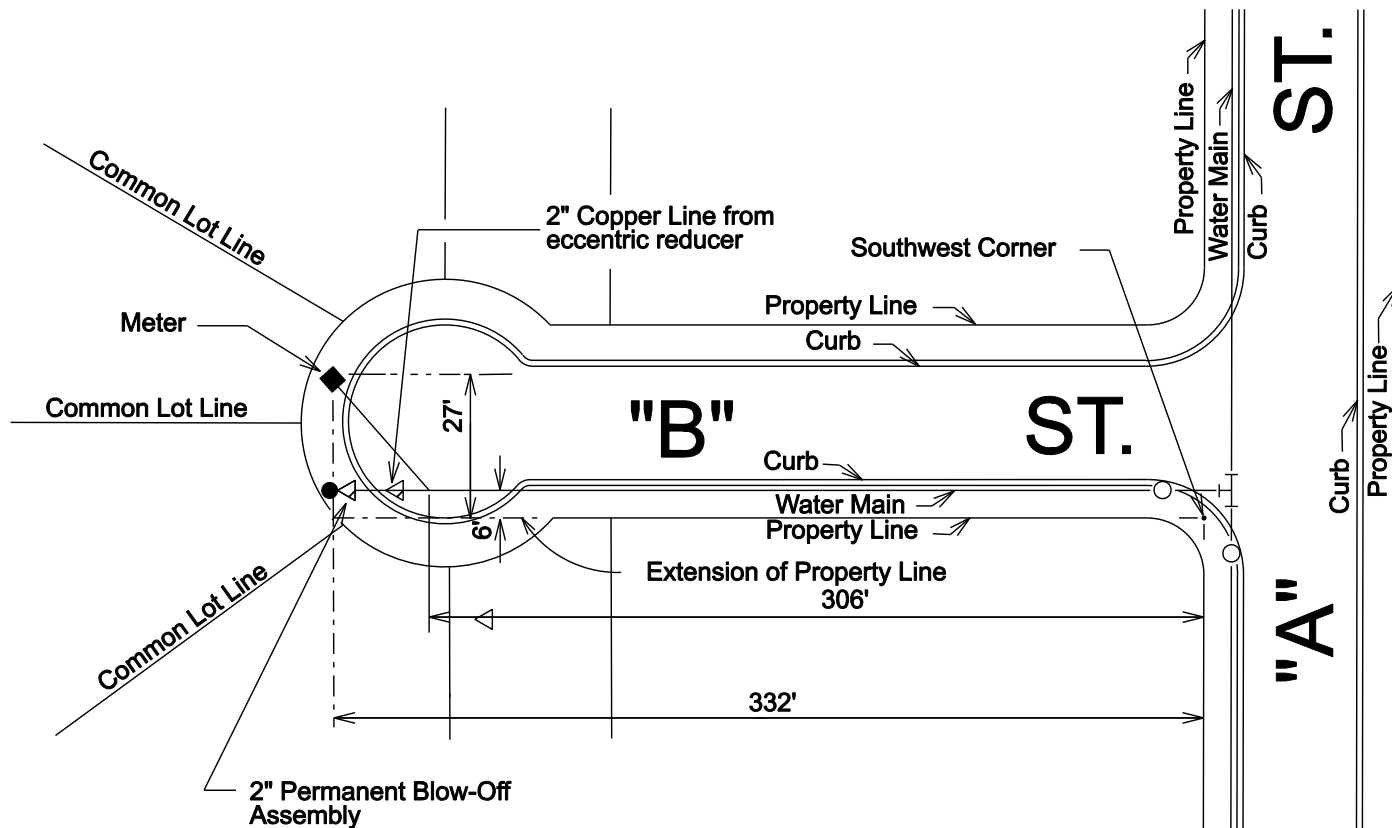
**DD-824-04**

SHEET  
**2** OF 5



**SERVICE MEASUREMENT:** From the Southwest Corner of "A" St. and "B" St. West 299' and North 6' to Tap, and West 332' and North 17' to Meter

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	TYPICAL SERVICE ARRANGEMENT IN CUL-DE-SAC	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		<b>DD-824-04</b>	SHEET 3 OF 5



**BLOW OFF MEASUREMENT:**

From the Southwest Corner of "A" St. and "B" St. West 306' and North 6' to end, of eccentric reducer, and West 332' and North 27' to assembly box.

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

**TYPICAL 2" BLOW-OFF  
 ARRANGEMENT ON  
 DEAD END MAINS**

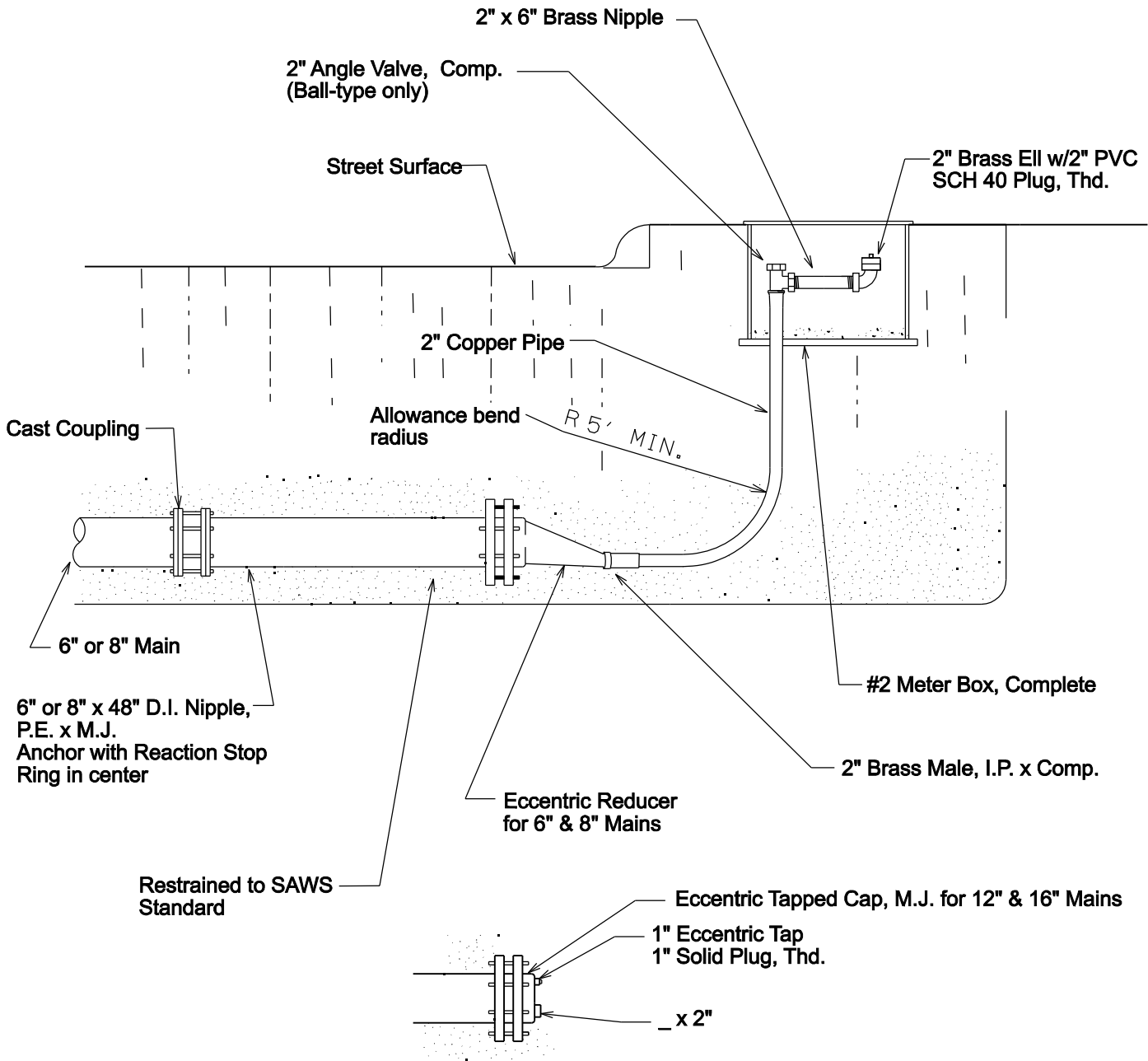
APPROVED  
 MARCH 2008

REVISED  
 APRIL 2014

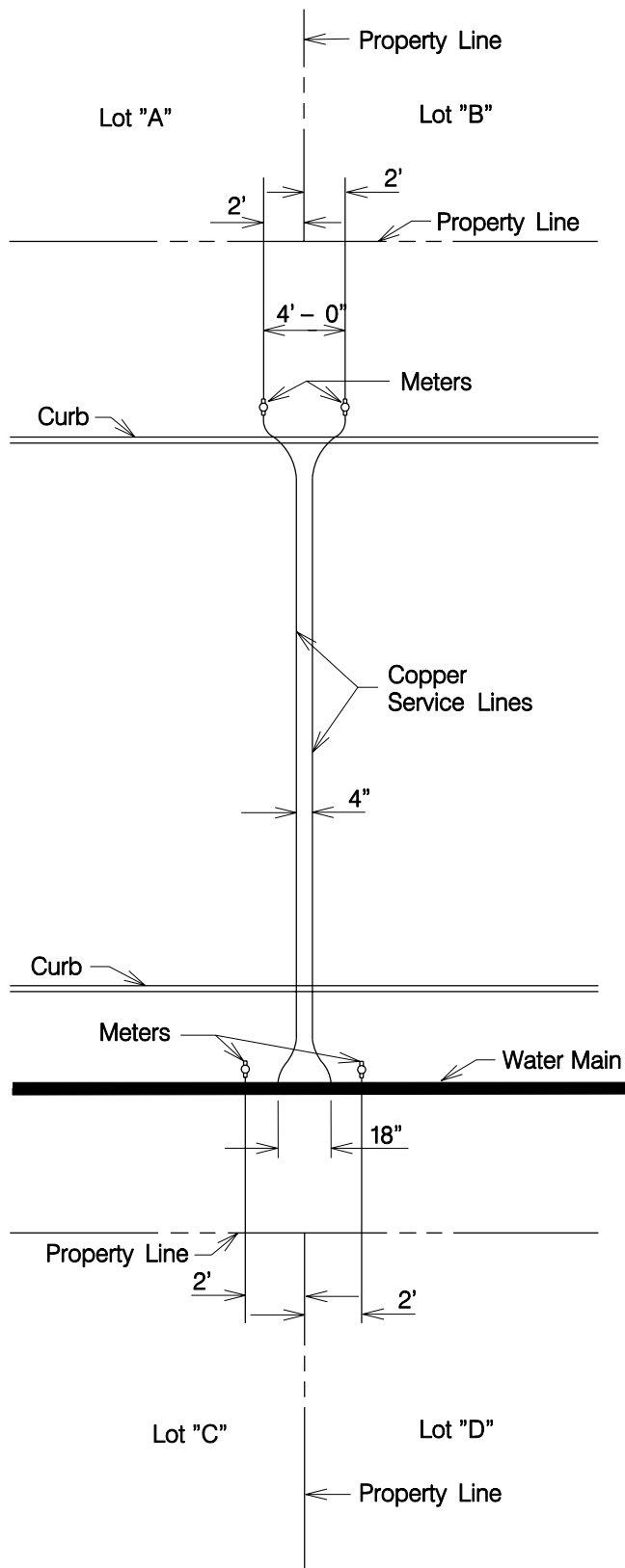
**DD-824-04**

SHEET  
 4 OF 5

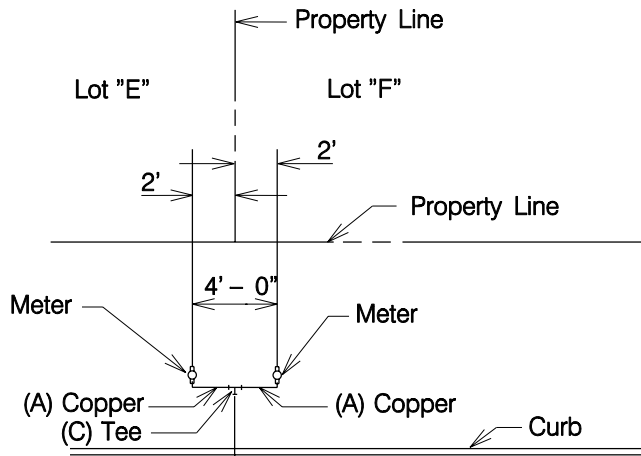
Notes:  
 All ferrous metal surfaces  
 in accordance with Item No. 814.



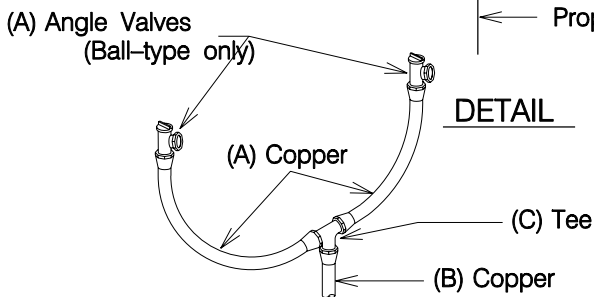
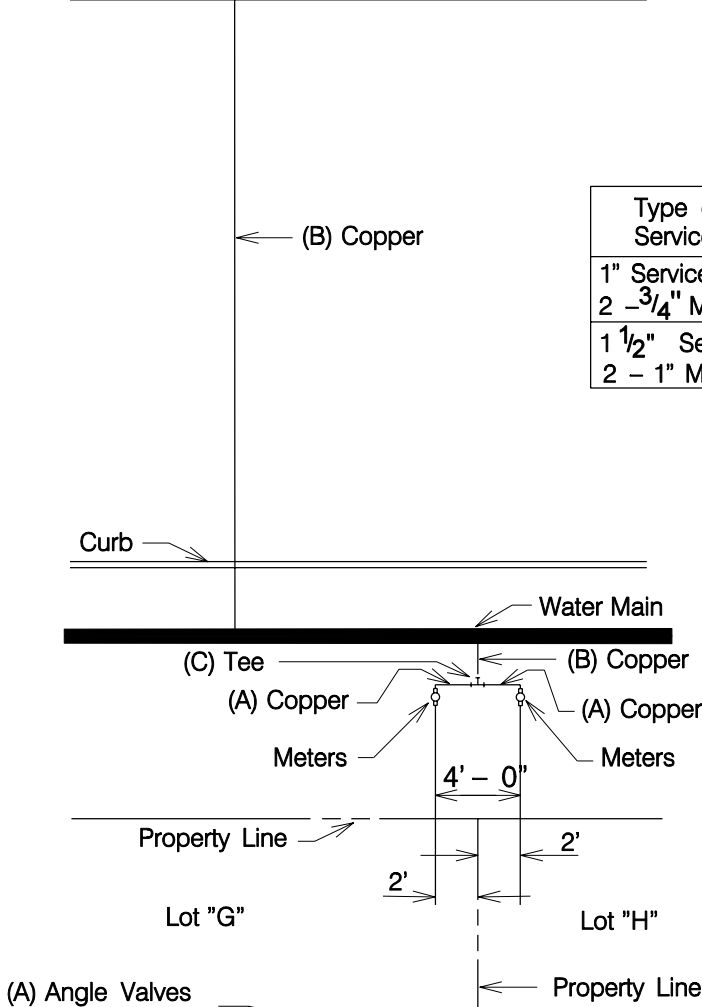
PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>2" PERMANENT          BLOW-OFF ASSEMBLY</b>	APPROVED	REVISED
		MARCH 2008	APRIL 2014
		<b>DD-824-04</b>	



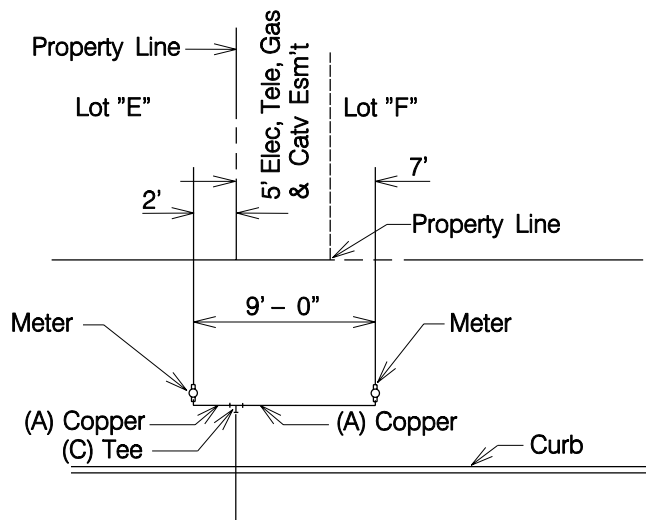
SINGLE SERVICE LINE – SINGLE METER



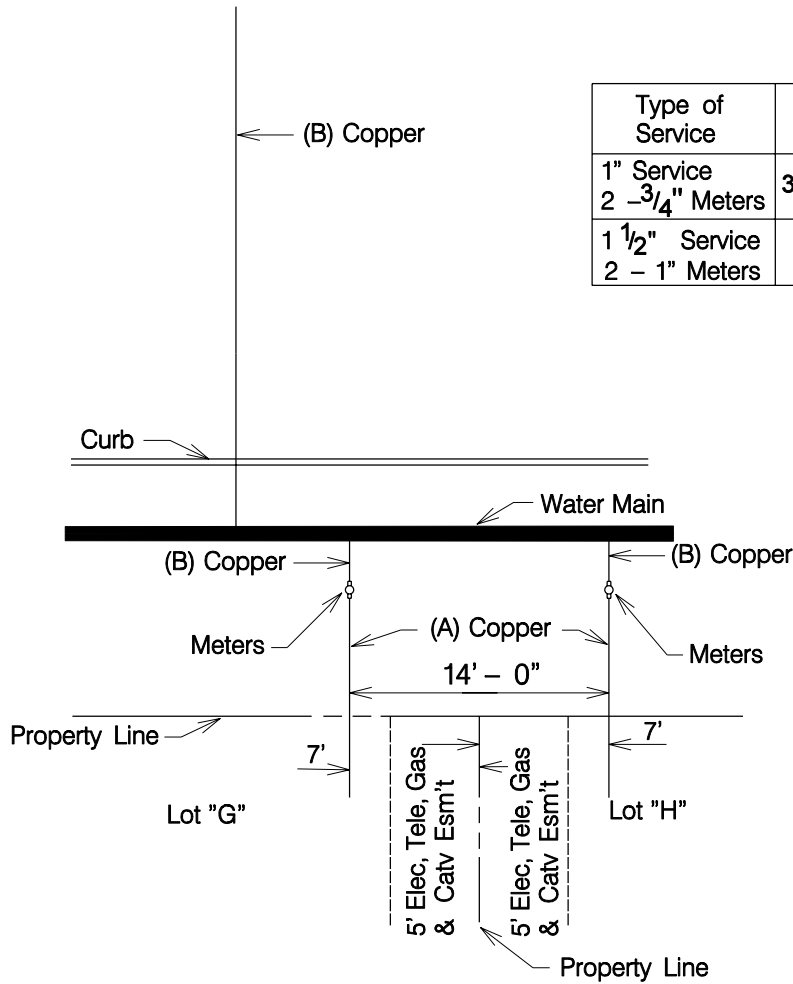
Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4" x 3/4" x 1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"



SINGLE SERVICE LINE - DUAL METER



SINGLE SERVICE LINE - DUAL METER W/EASEMENT

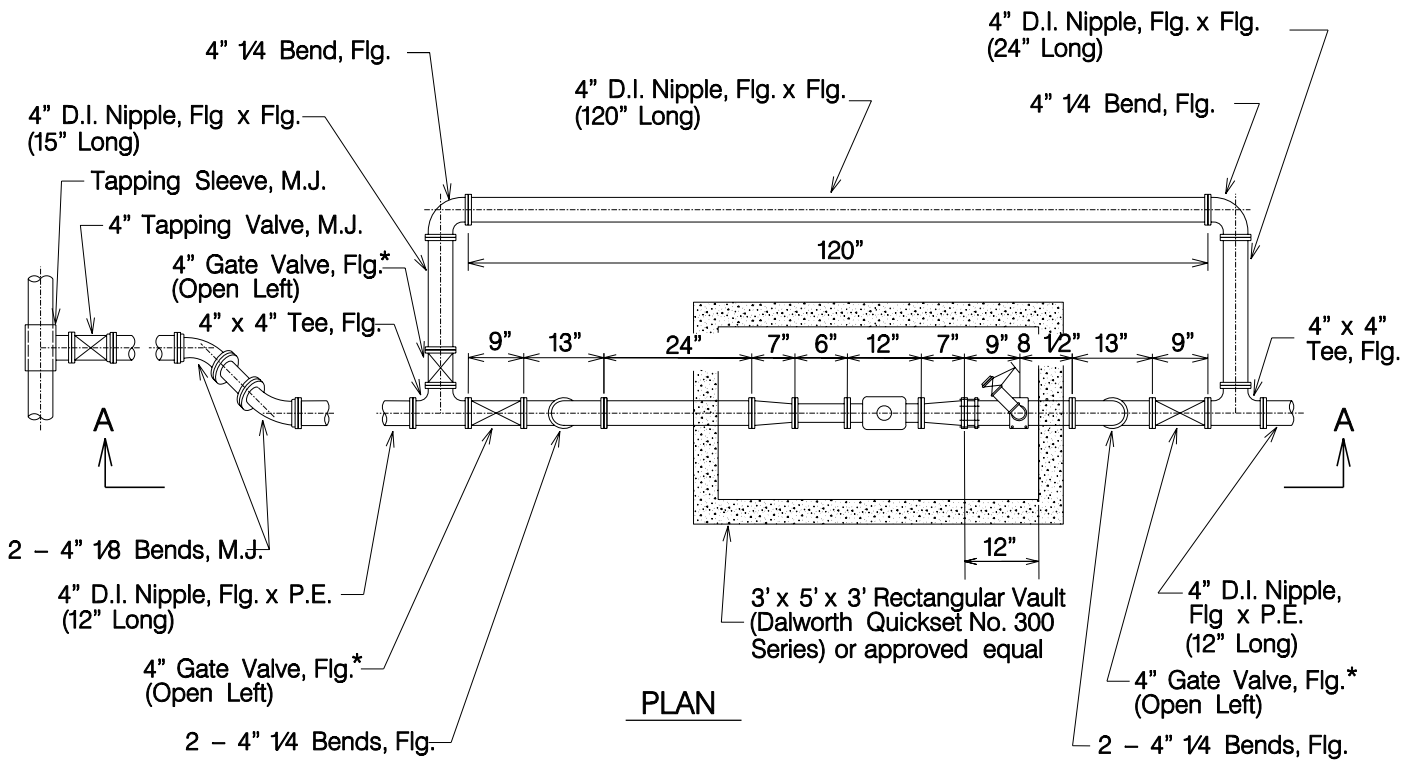


Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4" x 3/4" x 1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"

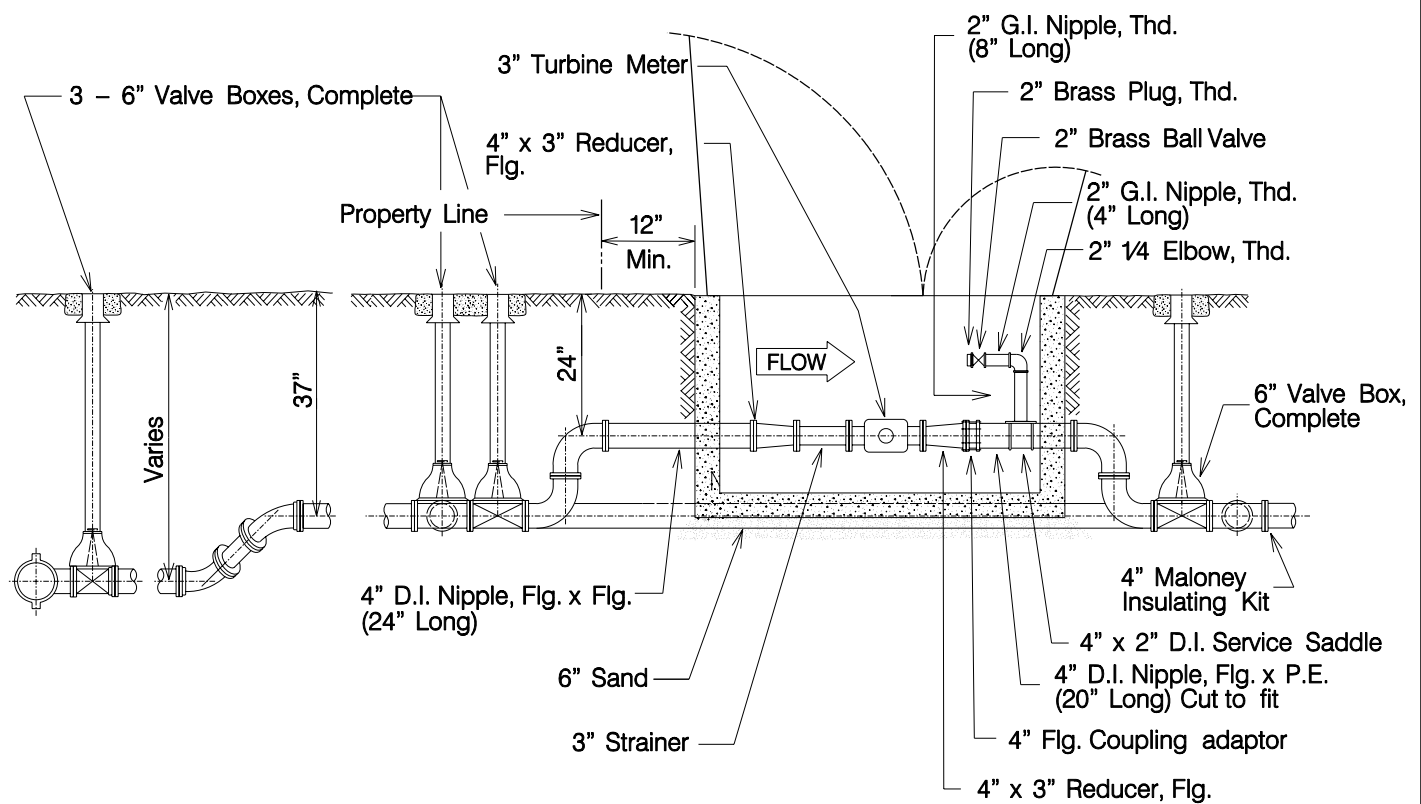
SINGLE SERVICE LINE W/EASEMENT







**PLAN**

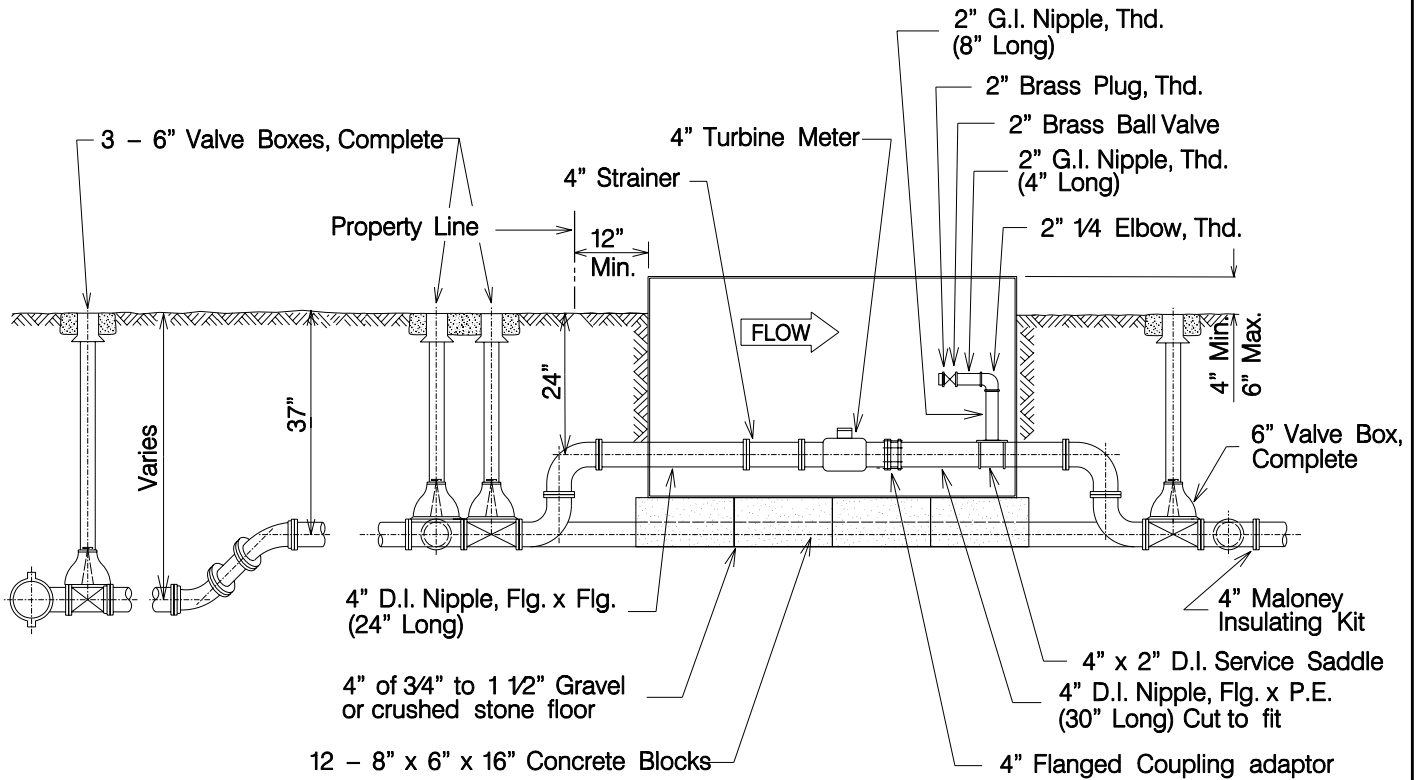
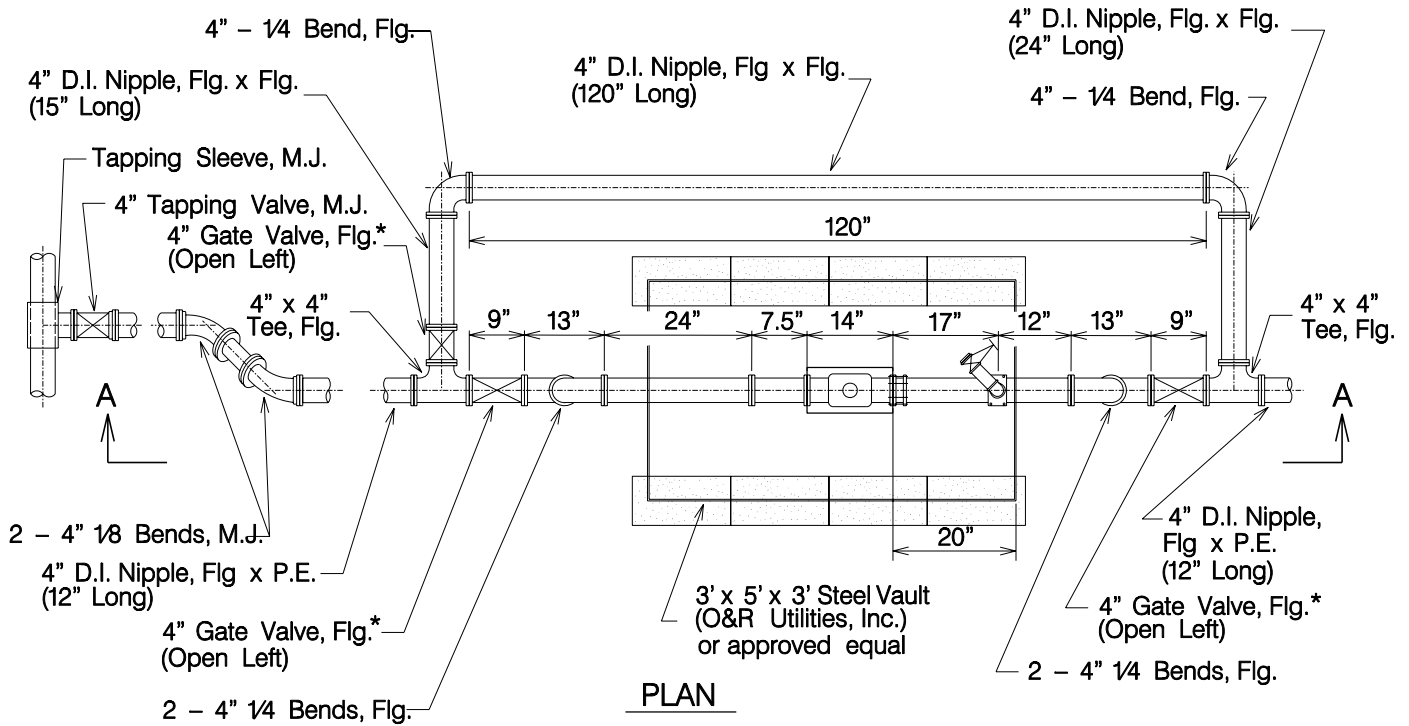


**SECTION A-A**

**3' x 5' x 3' RECTANGULAR CONCRETE VAULT  
(TRAFFIC BEARING LOCATION)**

\* Resilient Seat

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>3" TURBINE          METER INSTALLATION</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-06</b>	



3' x 5' x 3' STEEL VAULT  
(NON-TRAFFIC BEARING LOCATION)

\* Resilient Seat

PROPERTY OF  
SAN ANTONIO WATER SYSTEM  
SAN ANTONIO, TEXAS

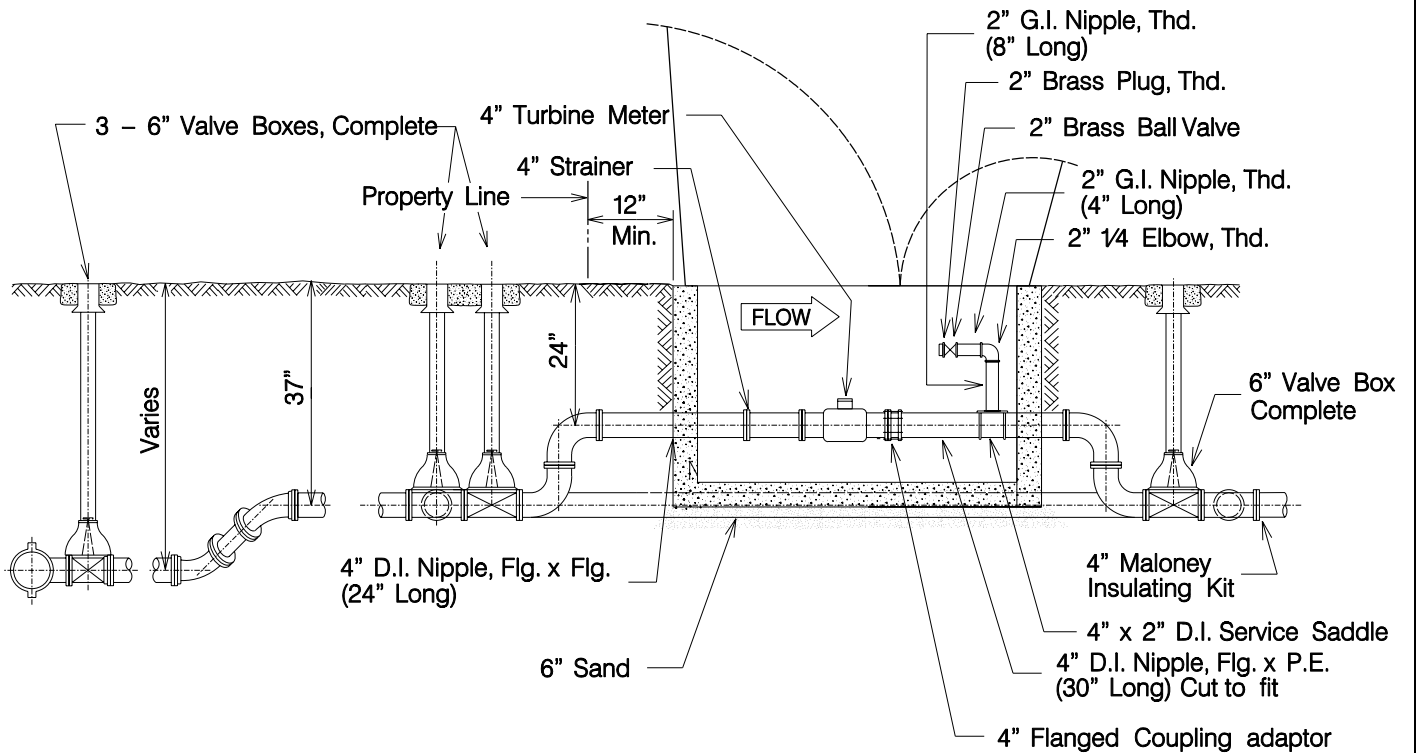
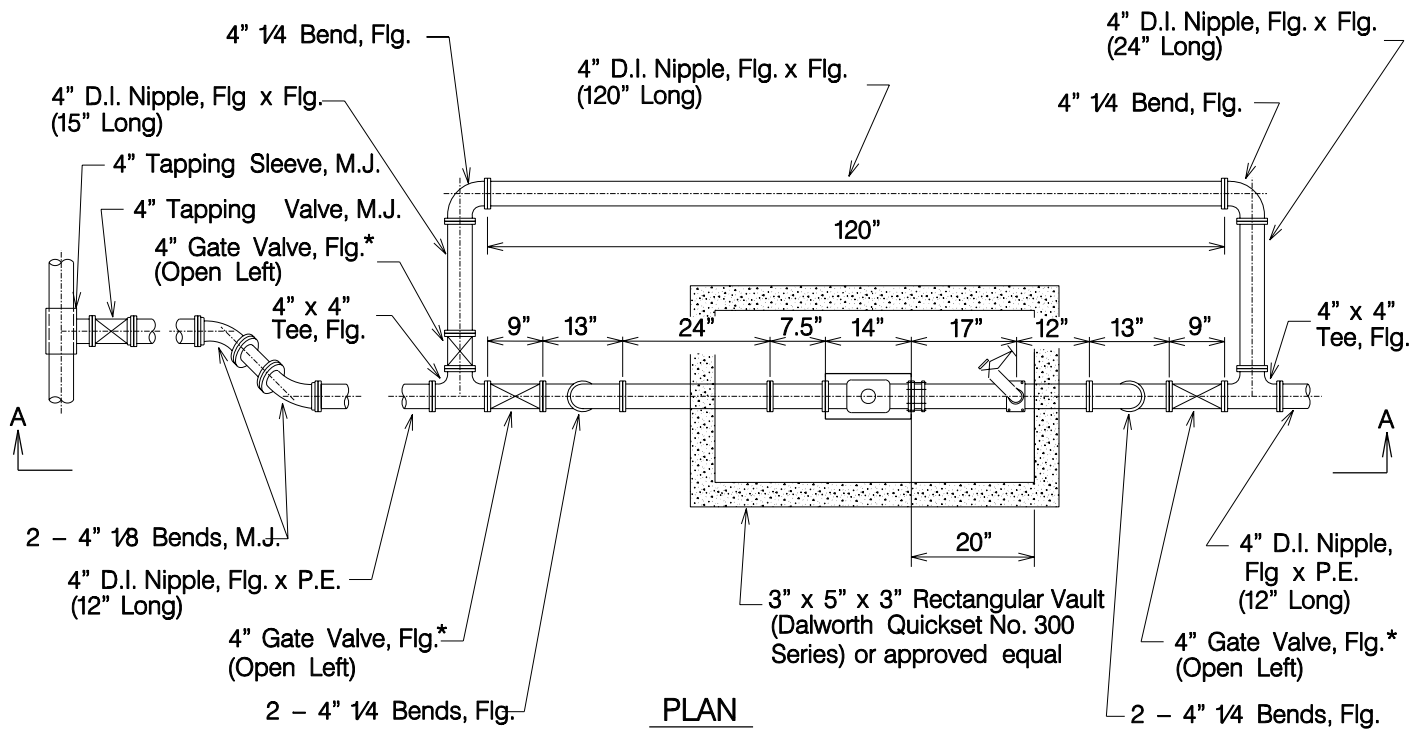
4" TURBINE  
METER INSTALLATION

APPROVED  
March 2008

REVISED

DD-824-07

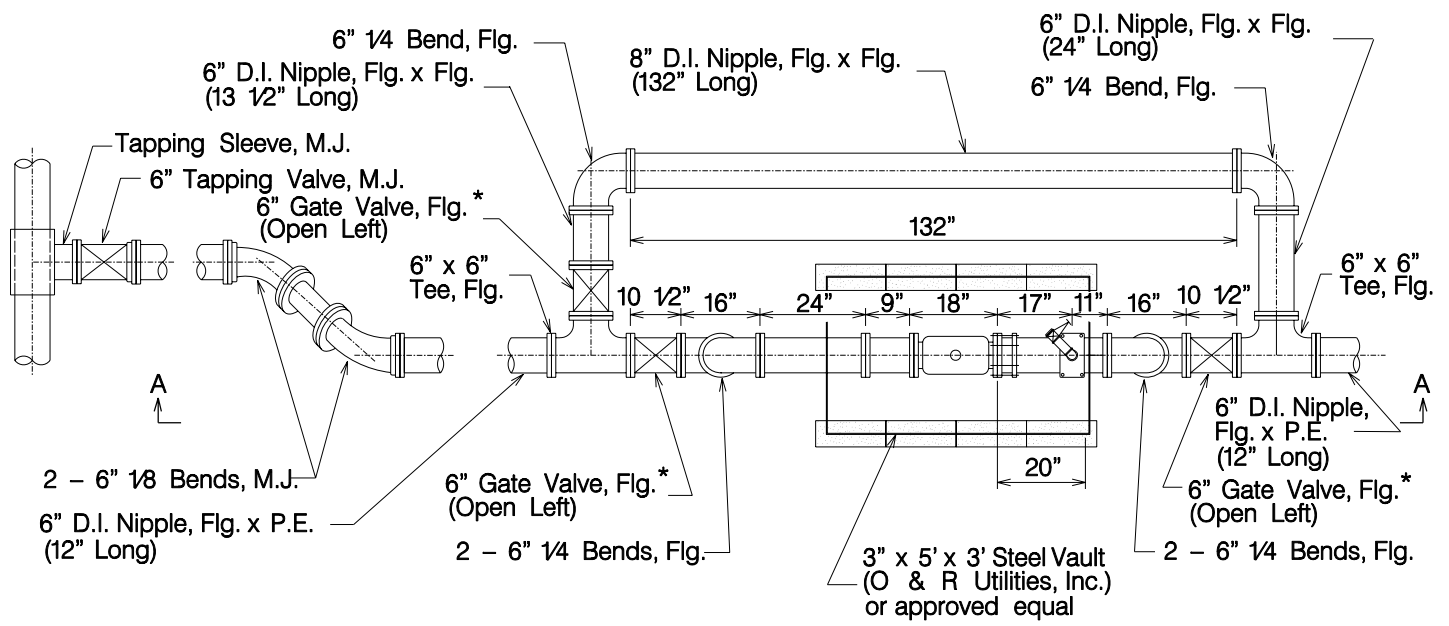
SHEET  
1 OF 2



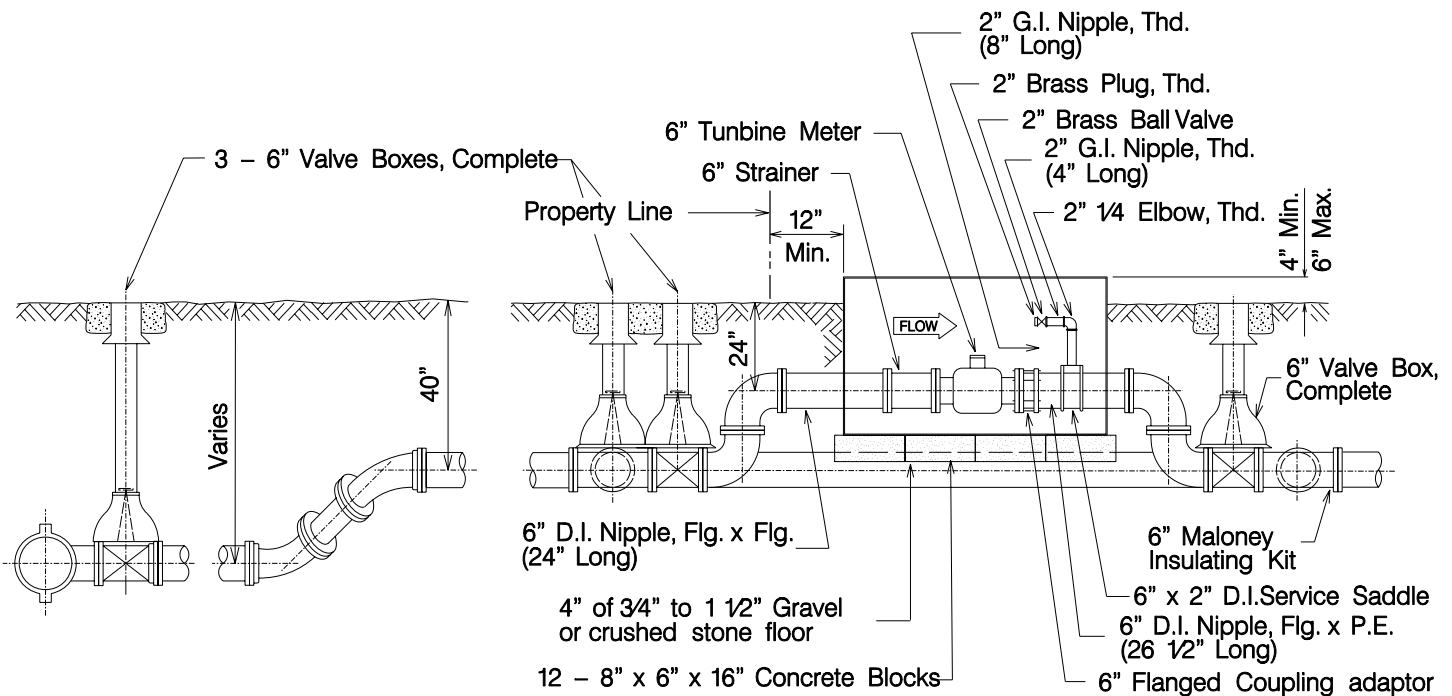
**3' x 5' x 3' RECTANGULAR CONCRETE VAULT  
(TRAFFIC BEARING LOCATION)**

\* Resilient Seat

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>4" TURBINE METER INSTALLATION</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-07</b>	
		SHEET 2 OF 2	



**PLAN**



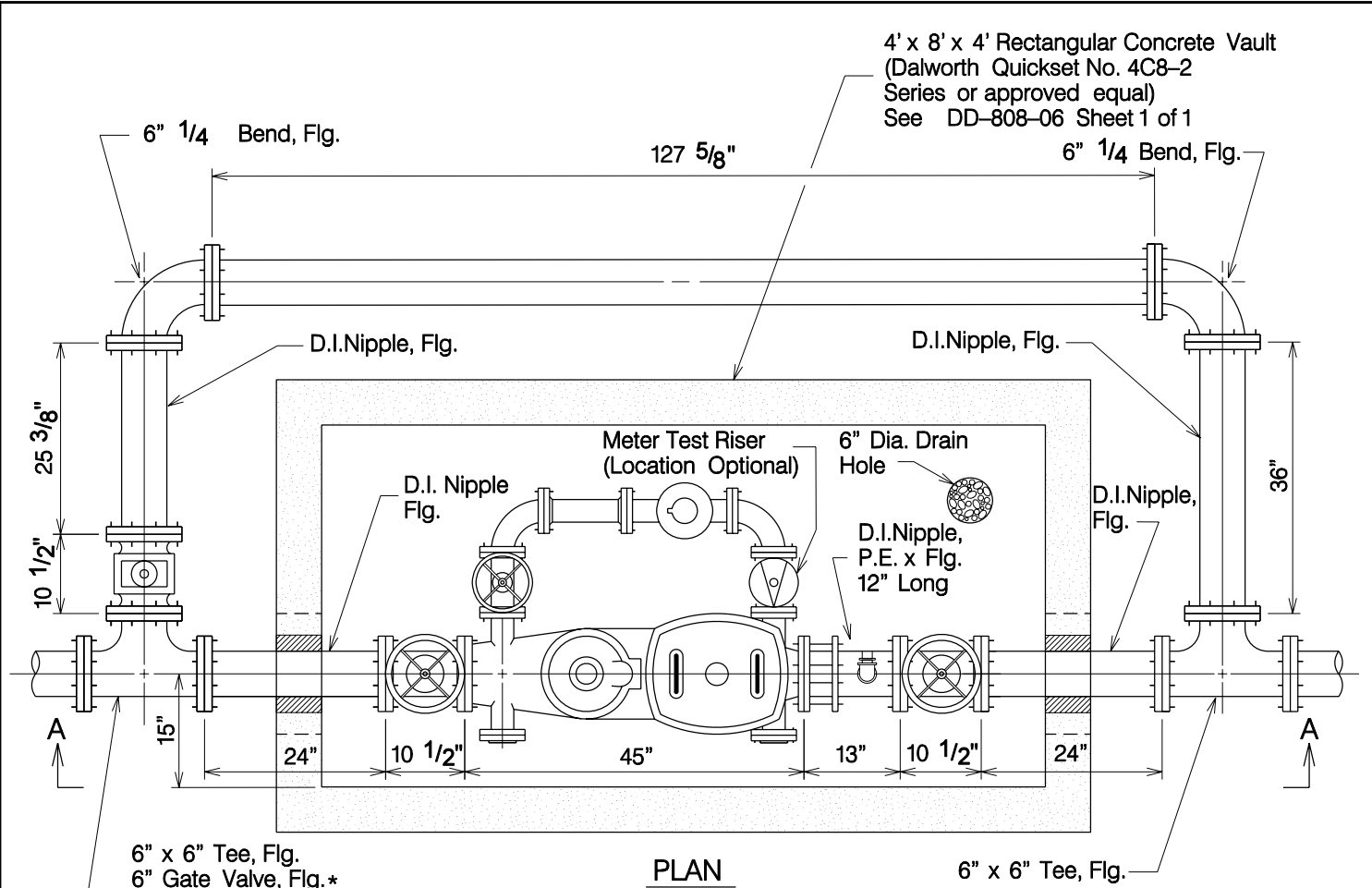
**SECTION A-A**

**3' x 5' x 3' STEEL VAULT  
(NON-TRAFFIC BEARING LOCATION)**

\* Resilient Seat

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>6" TURBINE METER INSTALLATION</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-09</b>	

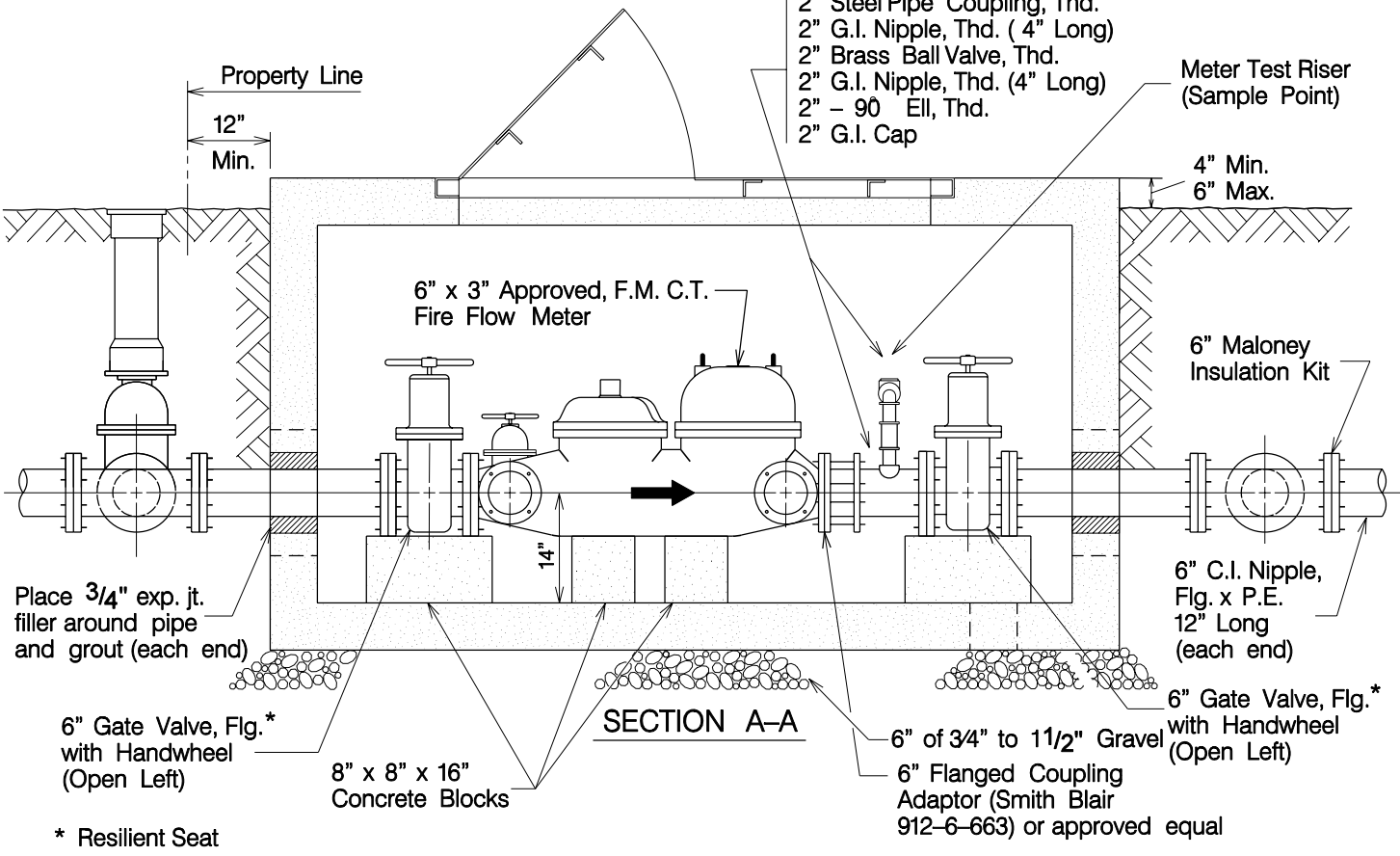




**PLAN**

**CONTRACTOR FURNISHED**

- 2" Steel Pipe Coupling, Thd.
- 2" G.I. Nipple, Thd. ( 4" Long)
- 2" Brass Ball Valve, Thd.
- 2" G.I. Nipple, Thd. (4" Long)
- 2" - 90° Ell, Thd.
- 2" G.I. Cap



**SECTION A-A**

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

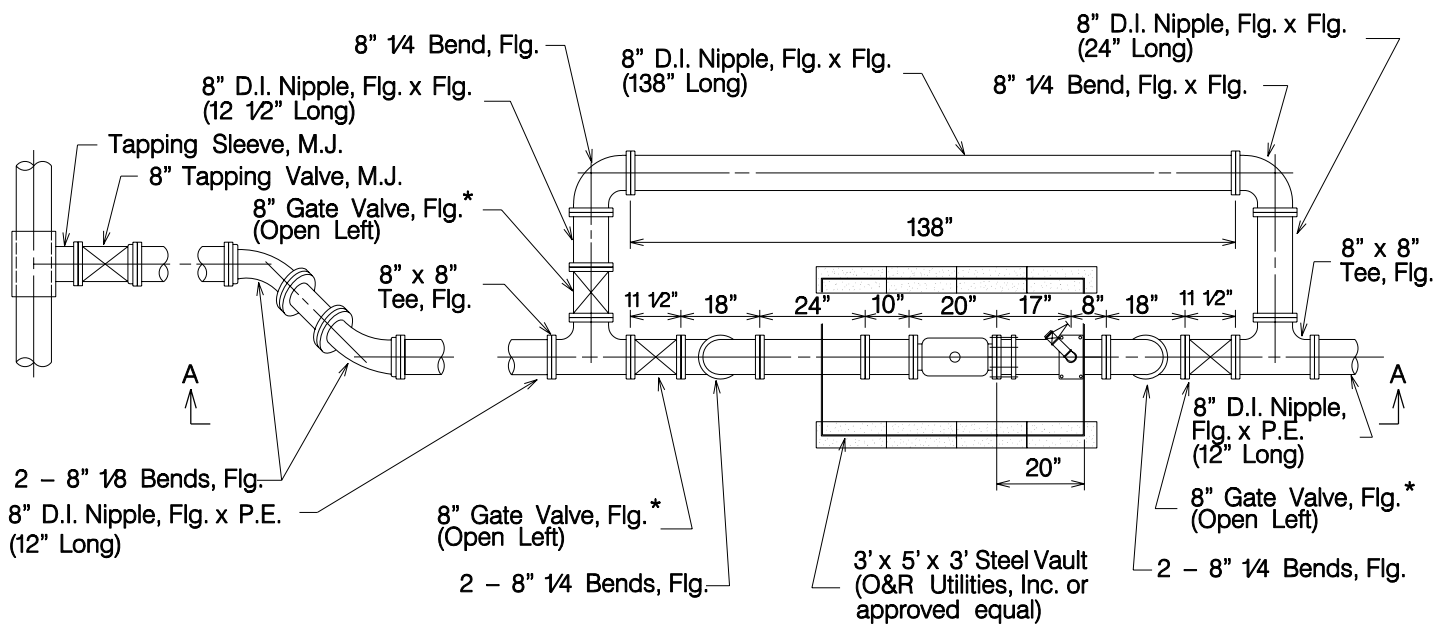
**6" X 3" FIRE FLOW  
 METER INSTALLATION**

APPROVED  
 March 2008

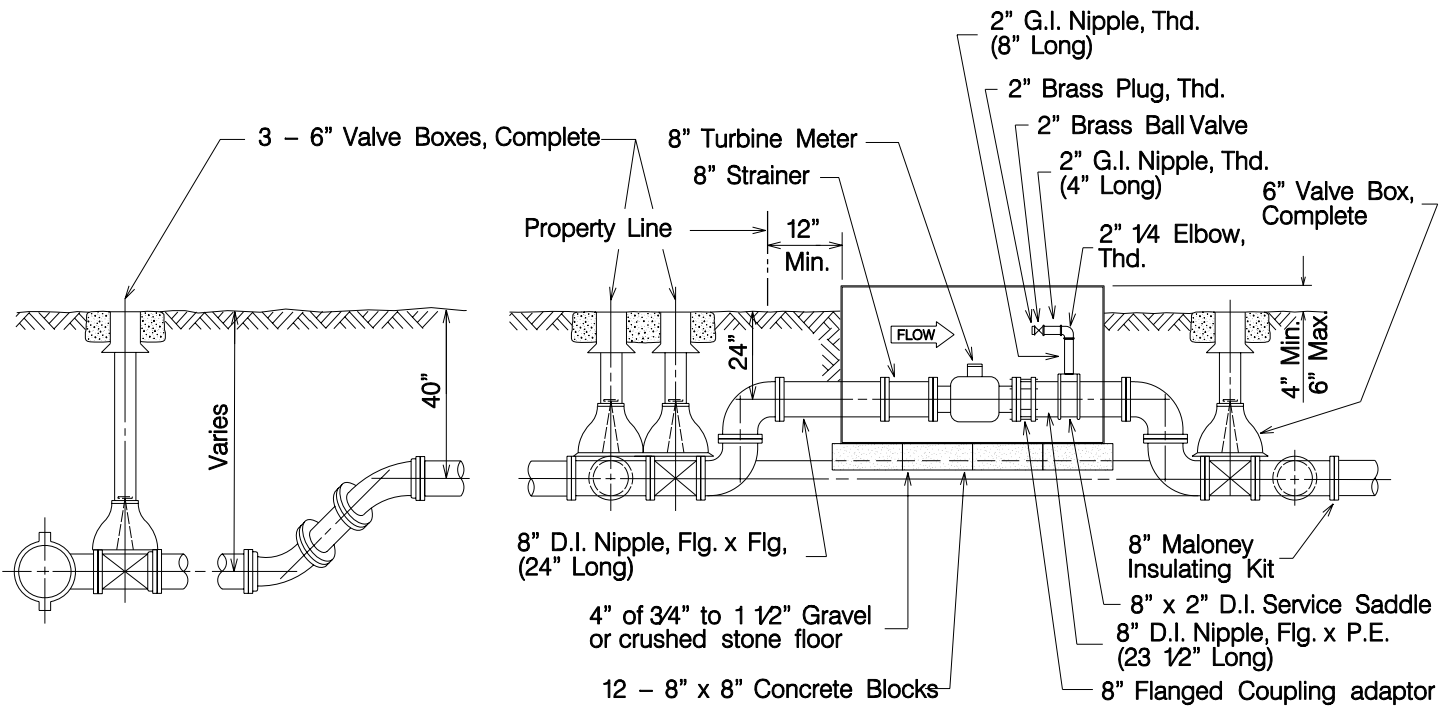
REVISED

**DD-824-10**

SHEET  
**1 OF 1**



PLAN



SECTION A-A

3' x 5' x 3' STEEL VAULT  
(NON-TRAFFIC BEARING LOCATION)

\* Resilient Seat

PROPERTY OF  
SAN ANTONIO WATER SYSTEM  
SAN ANTONIO, TEXAS

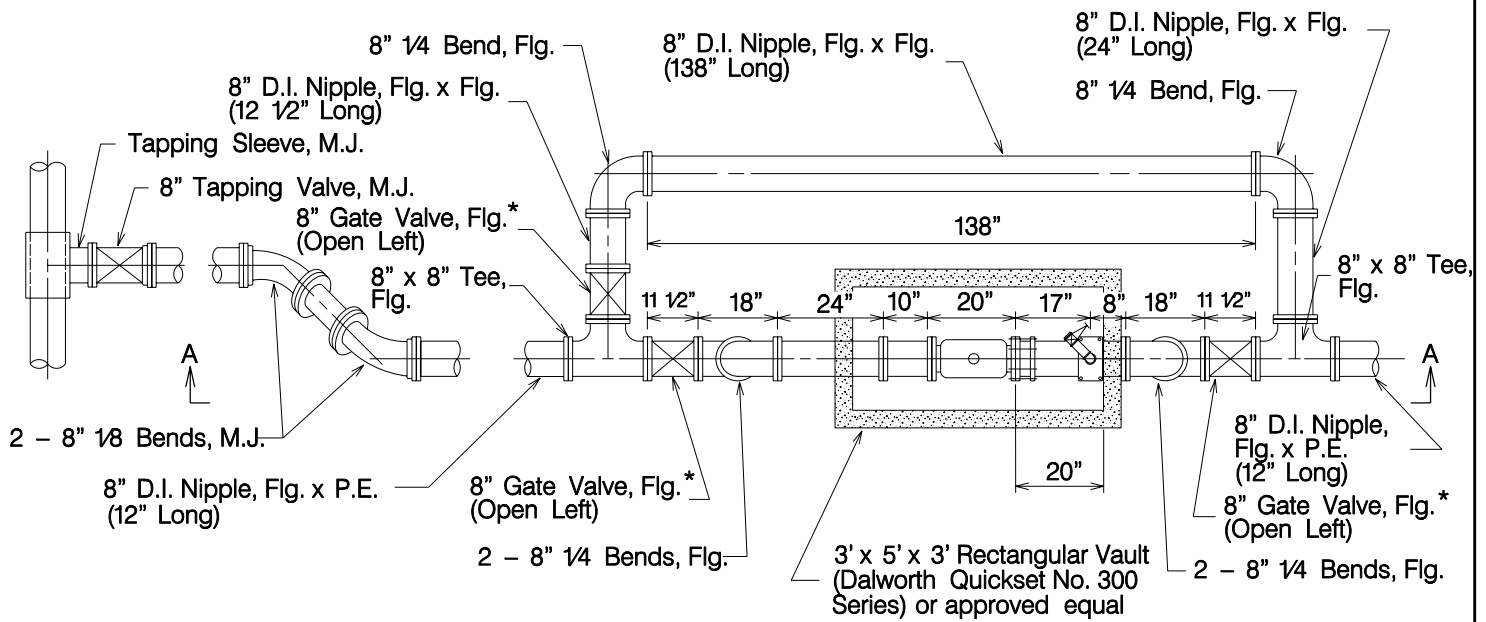
8" SERVICE WITH AN  
8" TURBINE METER

APPROVED  
March 2008

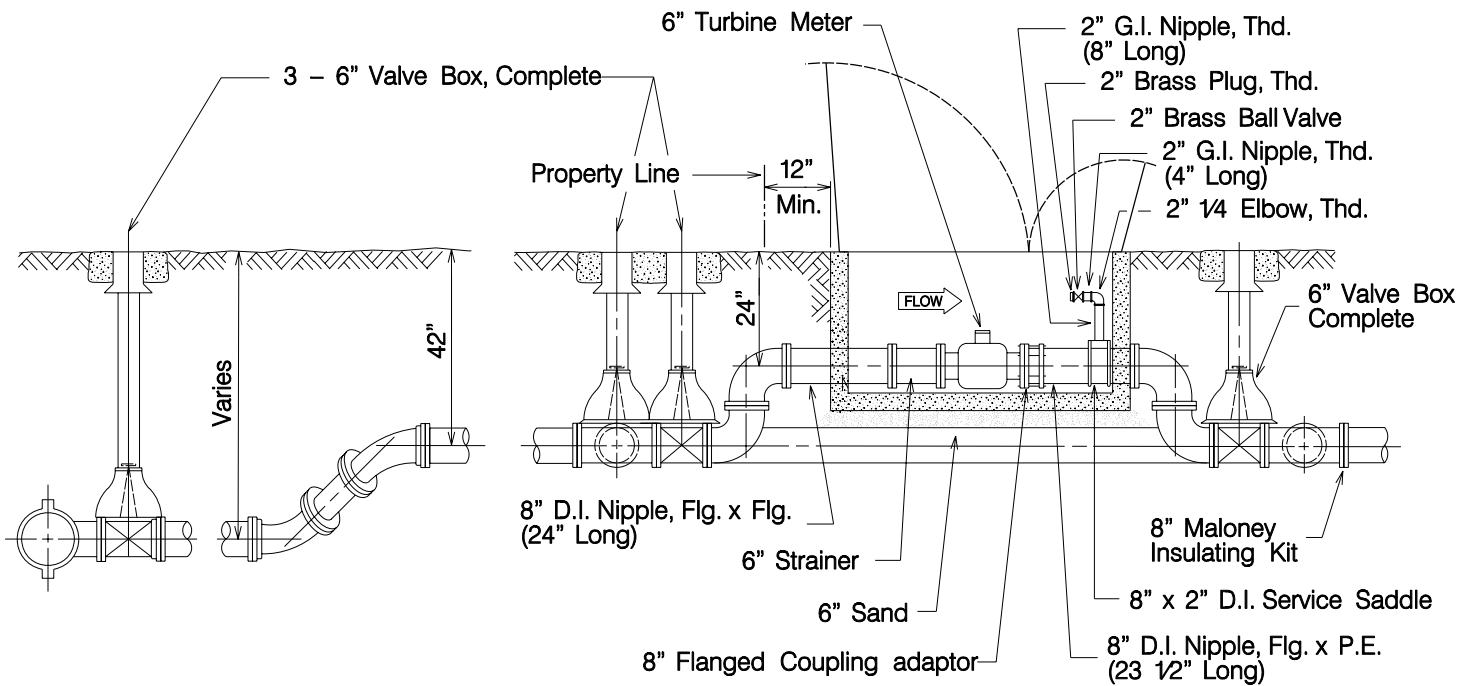
REVISED

DD-824-12

SHEET  
1 OF 2



**PLAN**



**SECTION A-A**

\* Resilient Seat

**3' x 5' x 3' RECTANGULAR CONCRETE VAULT  
(TRAFFIC BEARING LOCATION)**

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
SAN ANTONIO, TEXAS

**8" SERVICE WITH AN  
8" TURBINE METER**

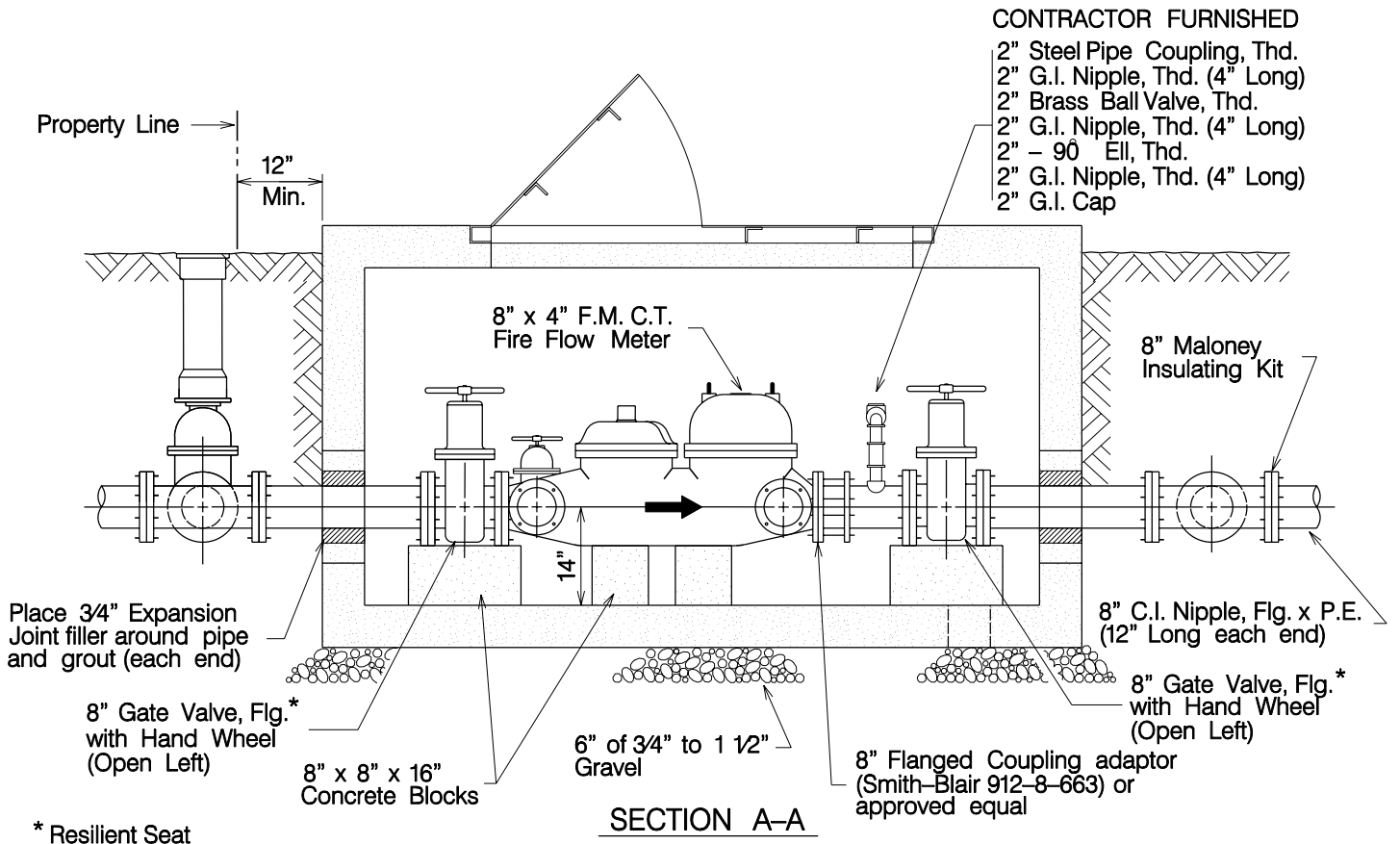
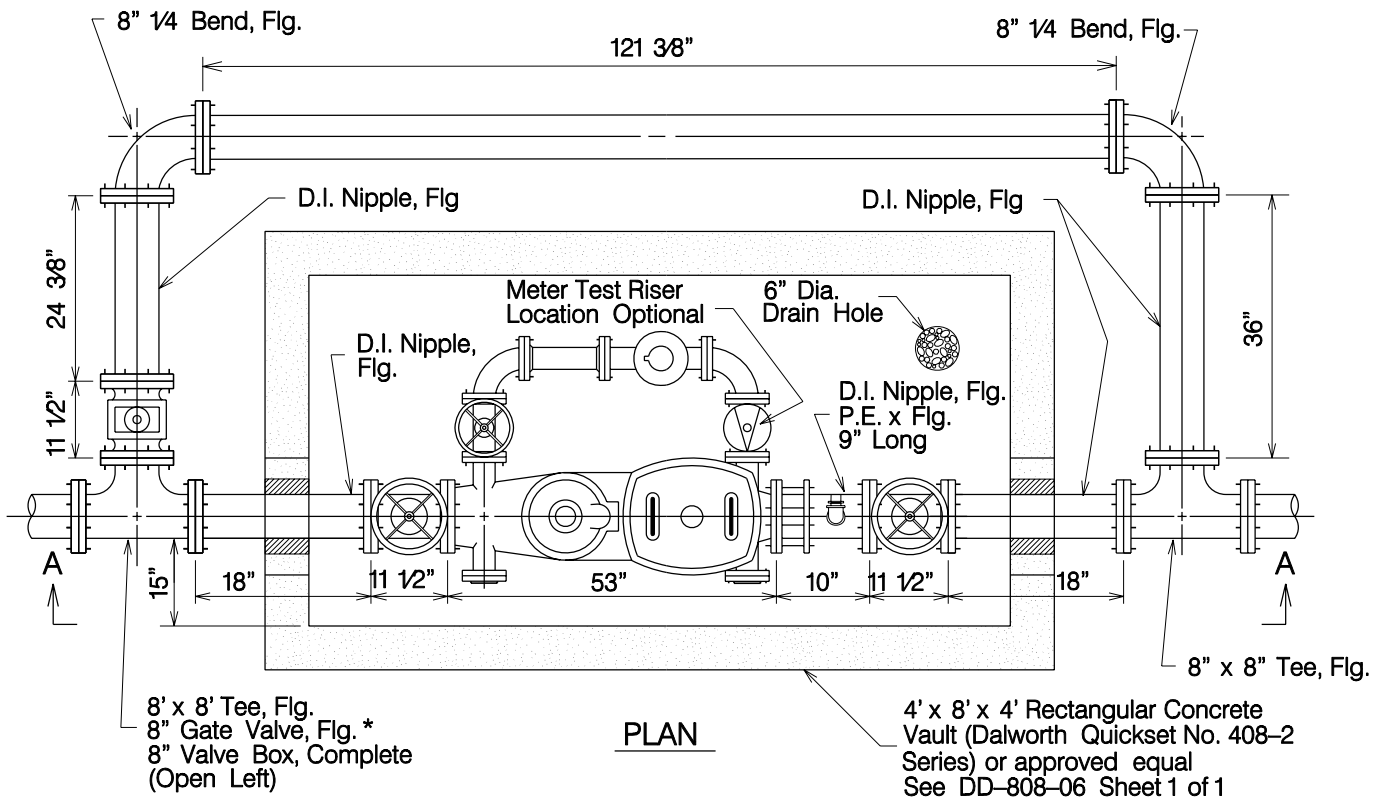
APPROVED  
March 2008

REVISED

**DD-824-12**

SHEET  
2 OF 2





PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

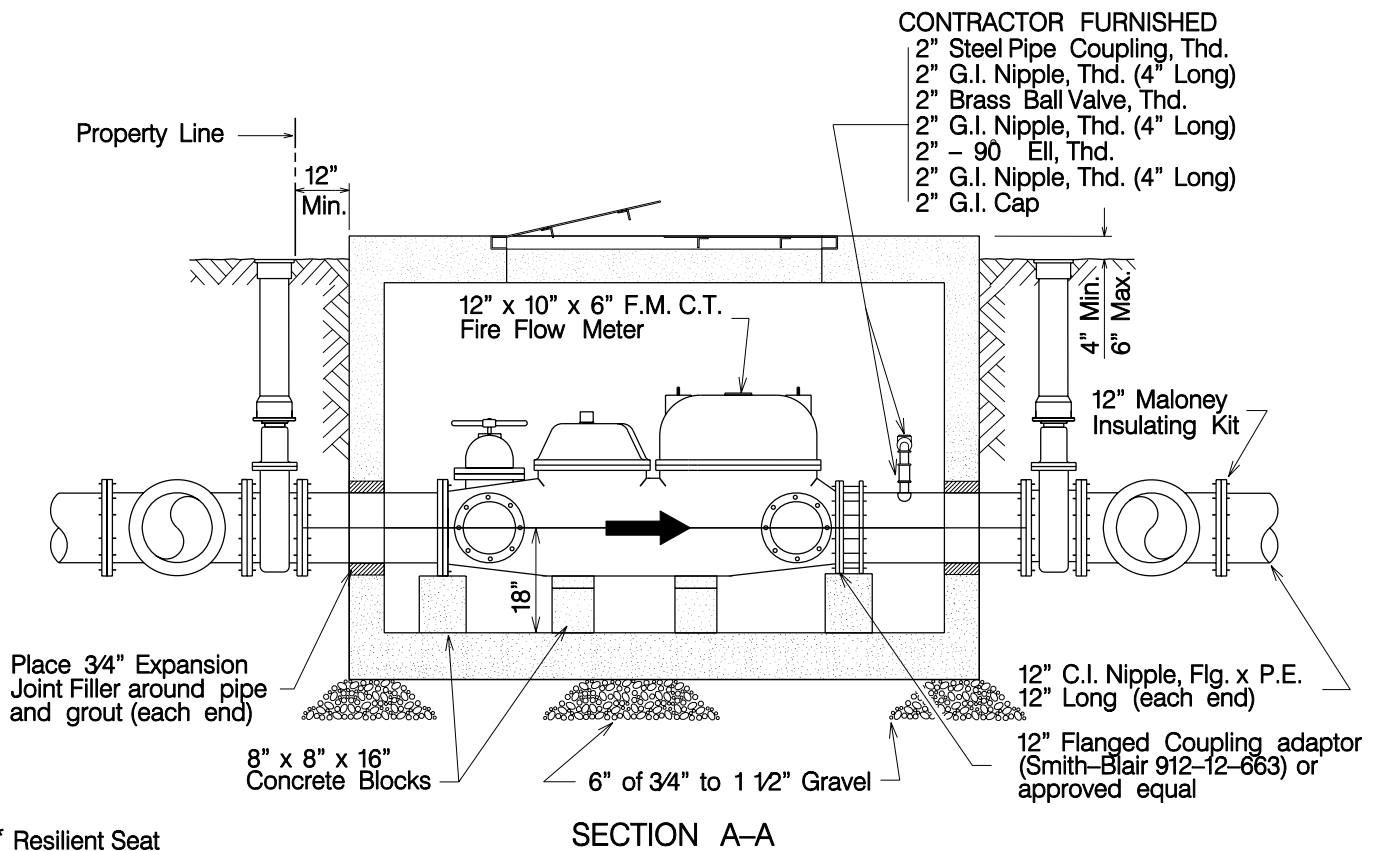
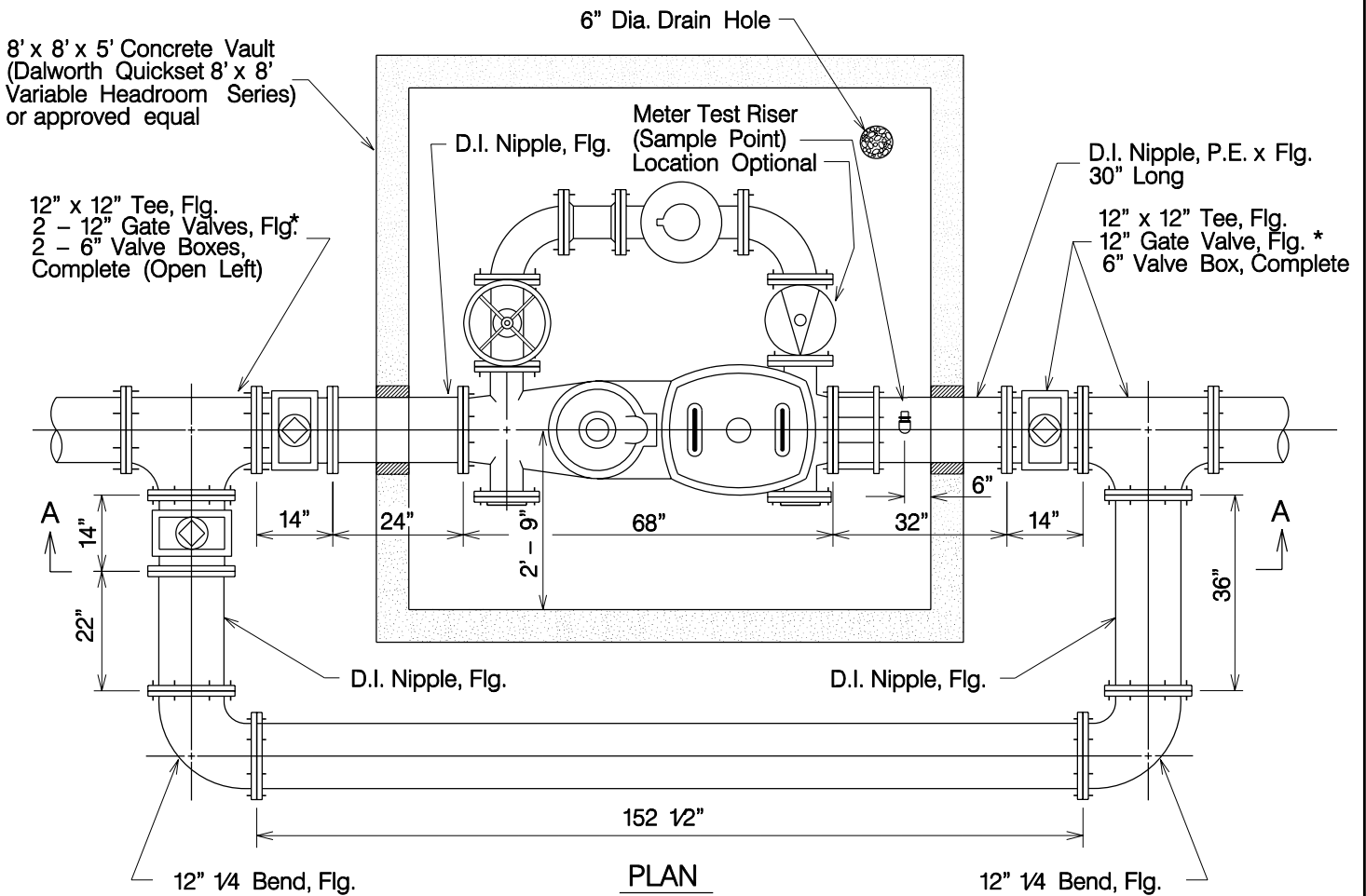
**8" X 4" FIRE FLOW  
 METER INSTALLATION**

APPROVED  
 March 2008

REVISED

**DD-824-13**

SHEET  
 1 OF 1



PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
SAN ANTONIO, TEXAS

**12" X 10" X 6 FIRE FLOW  
METER INSTALLATION**

APPROVED  
March 2008

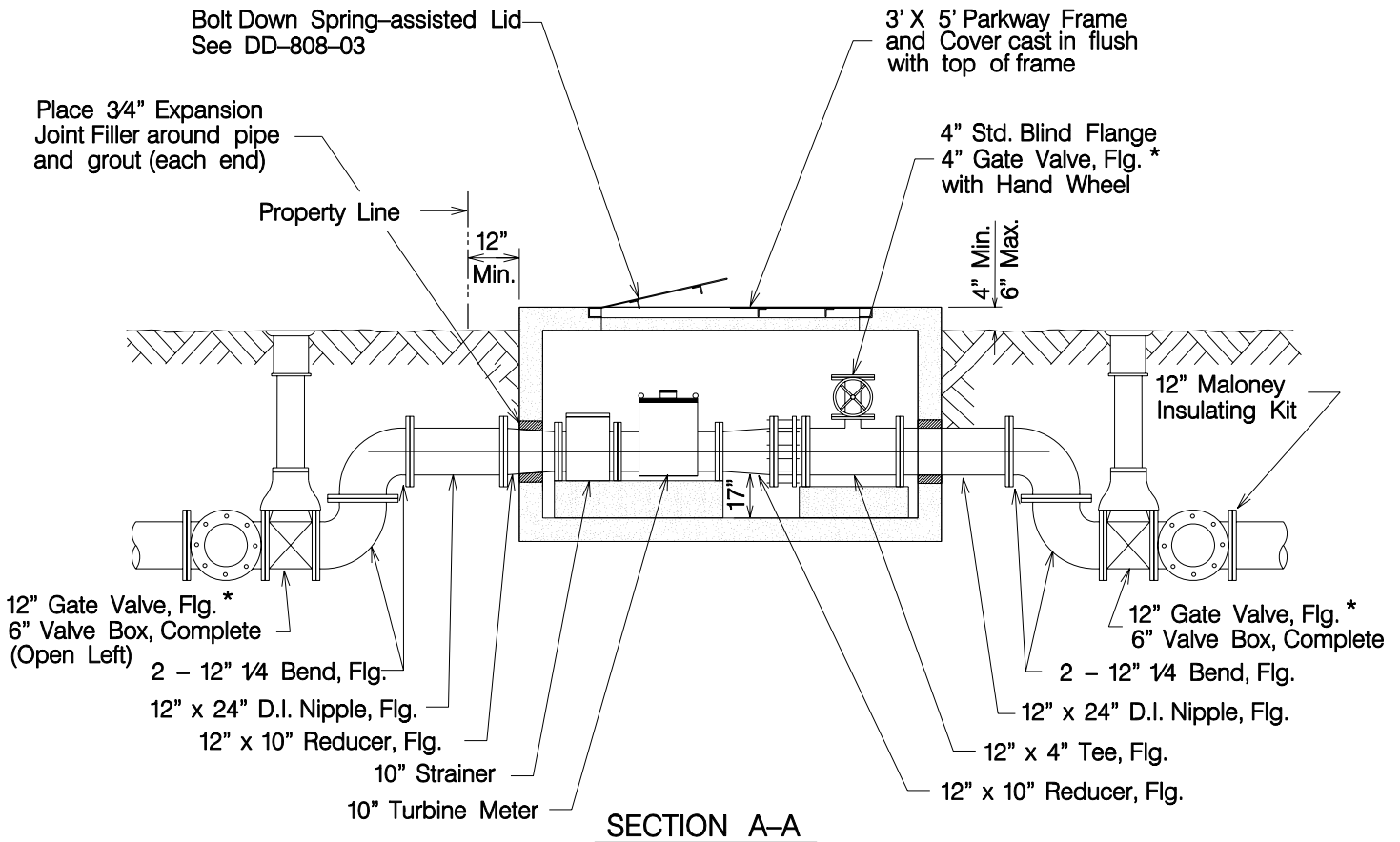
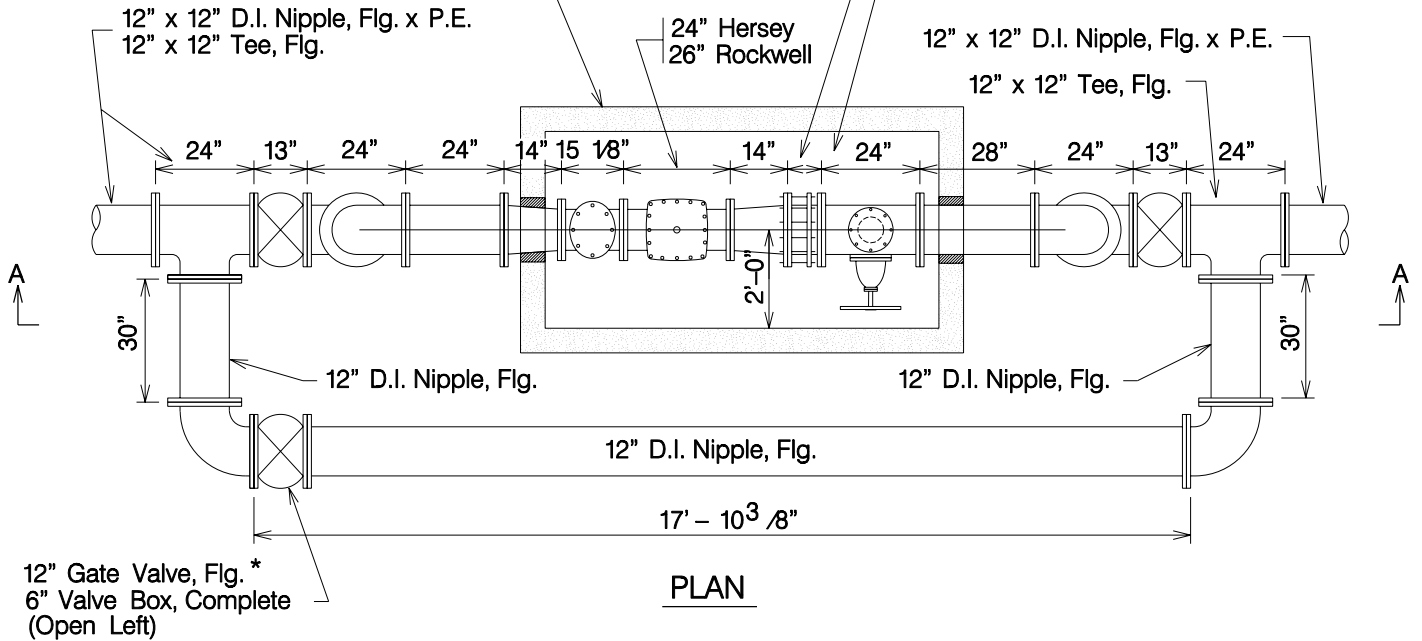
REVISED

**DD-824-14**

SHEET  
1 OF 1

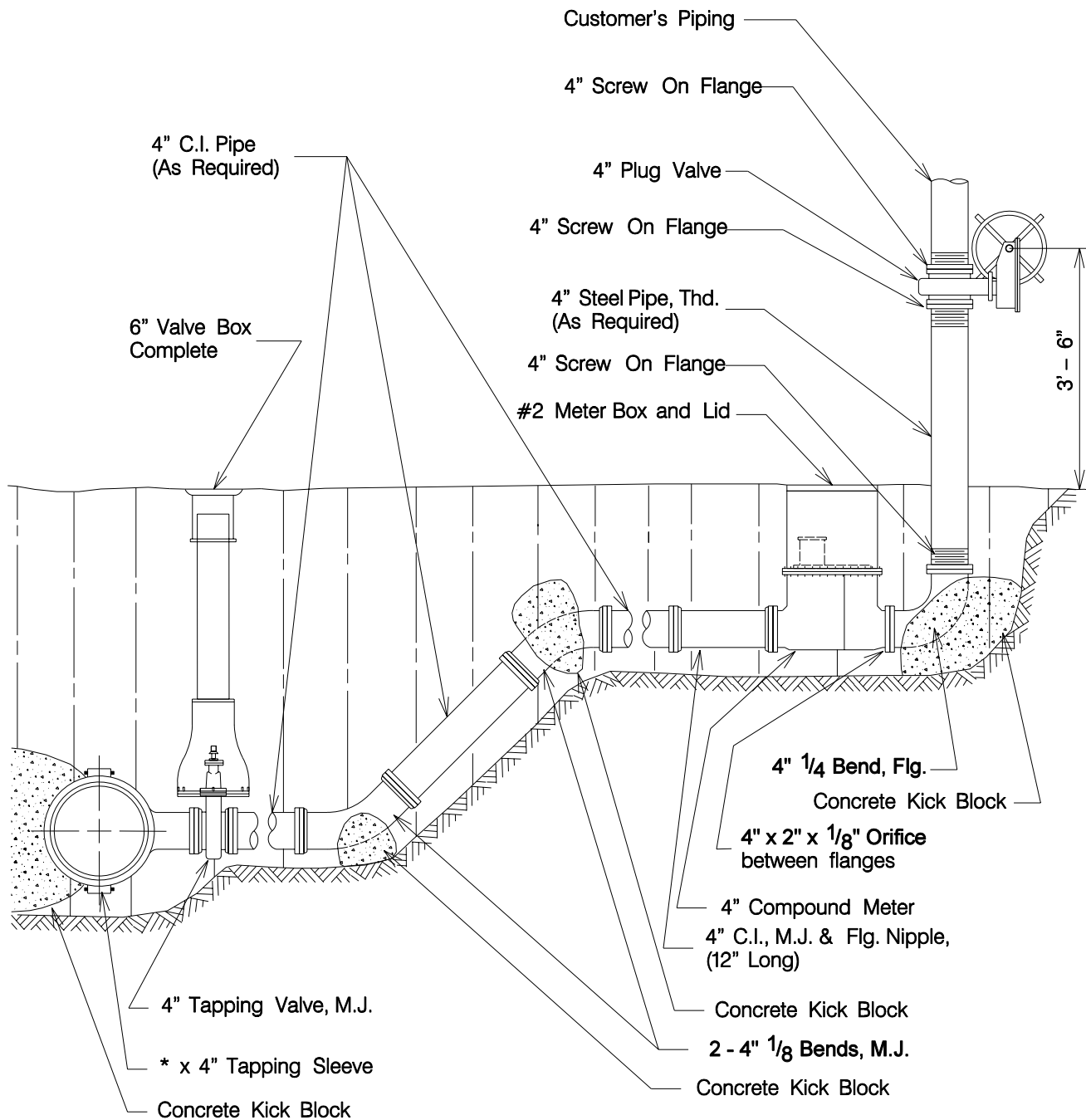
4' x 8' x 4' Rectangular Concrete Vault  
(Dalworth Quickset No. 408-2 Series)  
(Non-Traffic Bearing) or approved equal  
See DD-808-06 Sheet 1 of 1

12" Flanged Coupling adaptor  
12" D.I. Nipple, Flg. x P.E.  
10 7/8" with Rockwell Meter  
12 7/8" with Hersey Meter



\* Resilient Seat

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	12" SERVICE WITH 10" TURBINE METER	APPROVED	REVISED
		March 2008	
		<b>DD-824-15</b>	
		SHEET 1 OF 1	

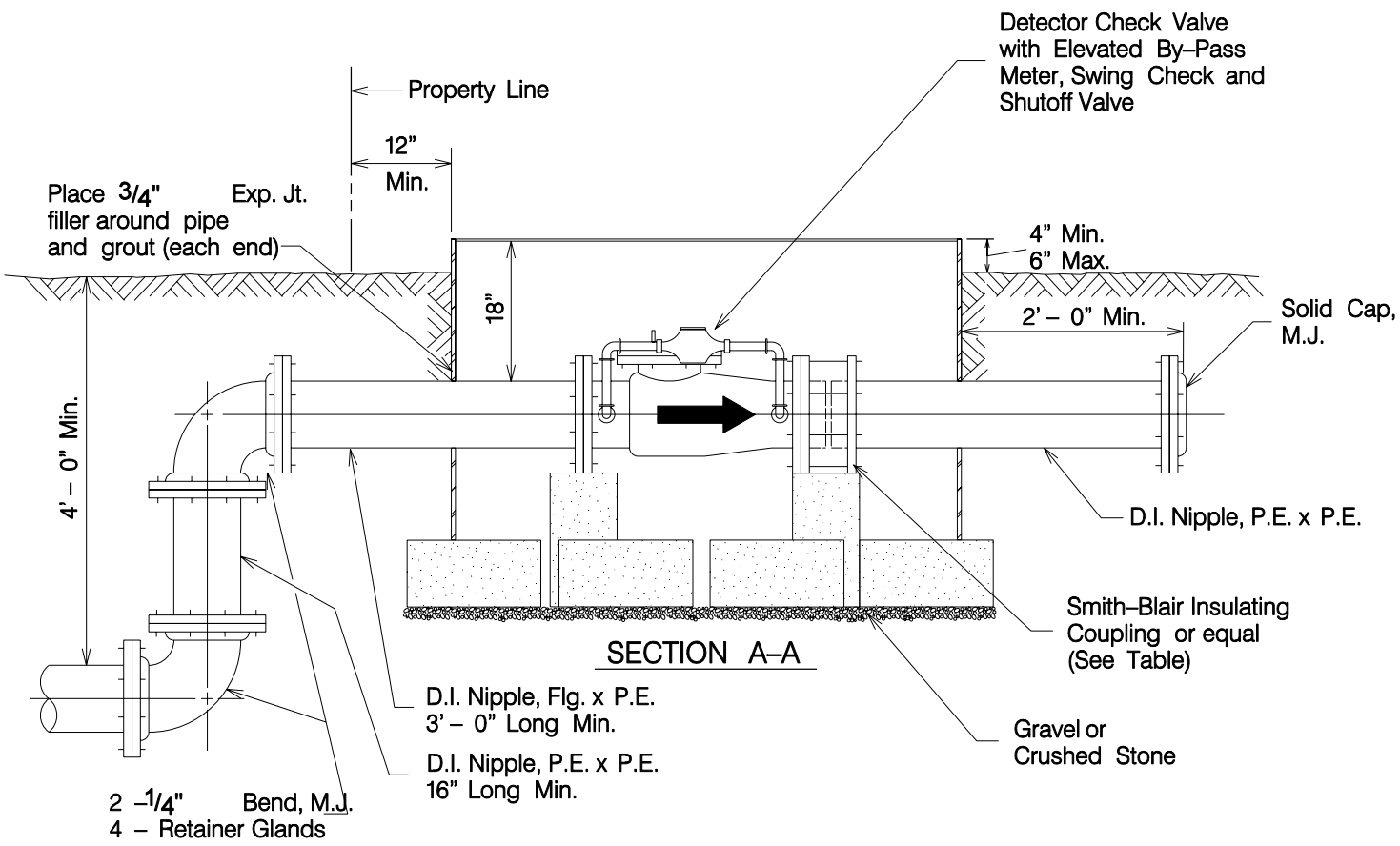
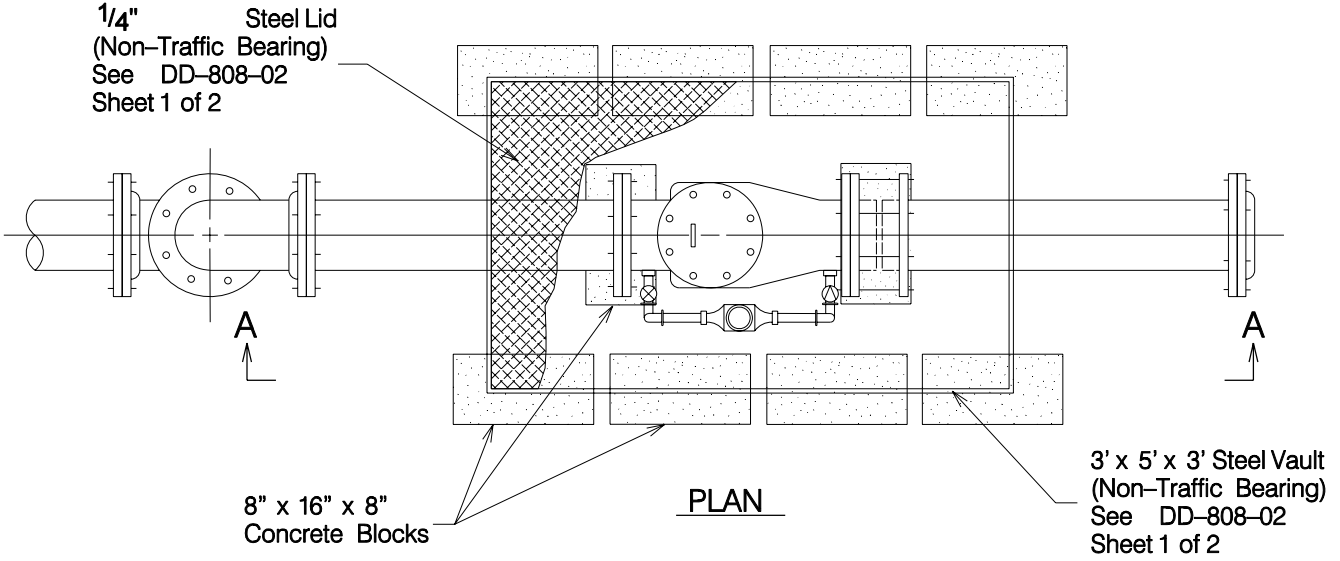


NOT TO SCALE

\* Existing main size and type

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL TEMPORARY 4" SERVICE WITH 4" METER (WITH PLUG VALVE)	APPROVED	REVISED
		March 2008	
		DD-824-16	SHEET 1 OF 1

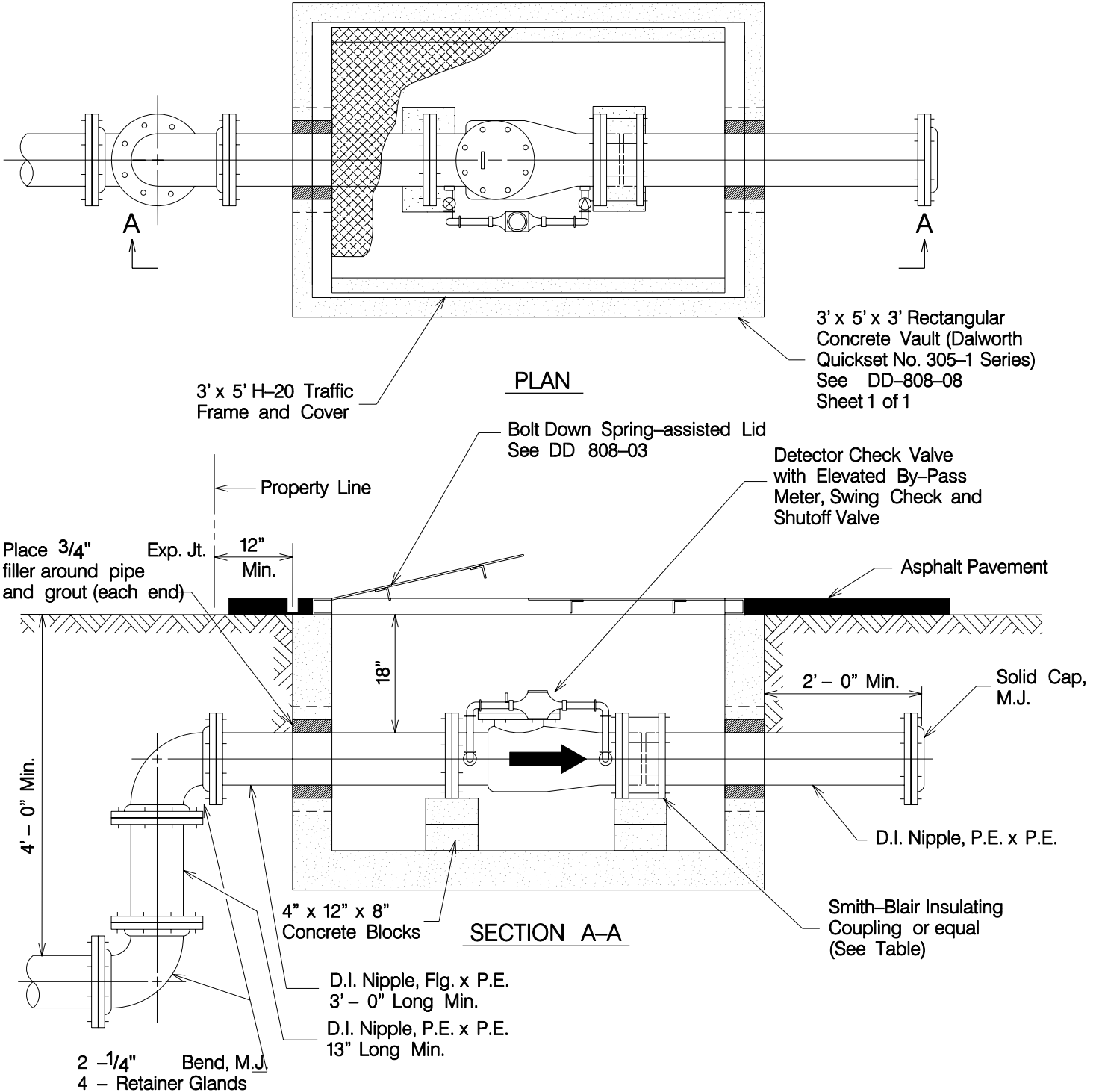
PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
6"	6"	3/4"	1932-6-690
8"	8"	1"	932-8-905



**3' x 5' x 3' RECTANGULAR STEEL VAULT  
(NON-TRAFFIC BEARING LOCATION)**

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>6" &amp; 8" DETECTOR CHECK FOR FIRE LINE</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-17</b>	
		SHEET <b>1</b> OF <b>2</b>	

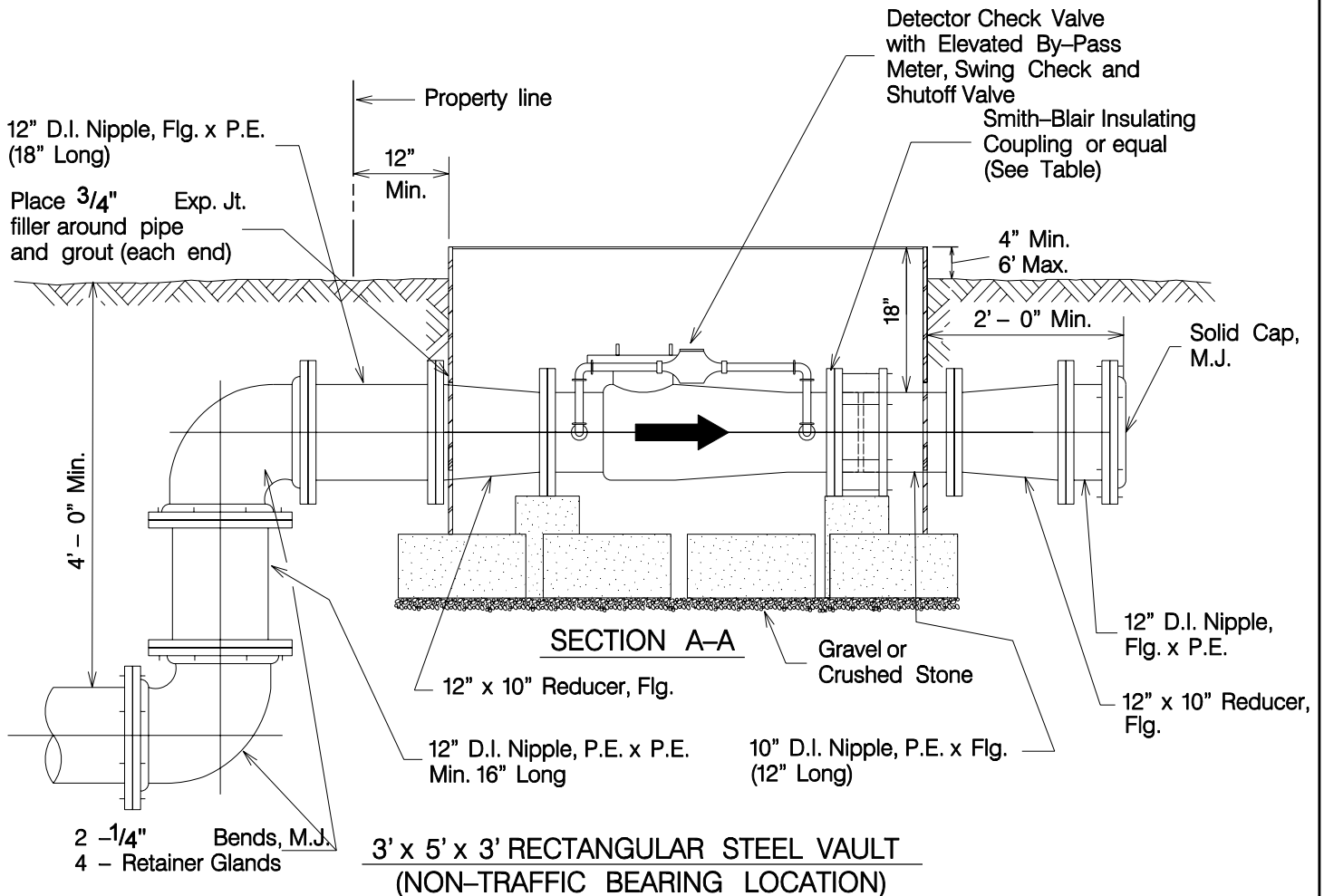
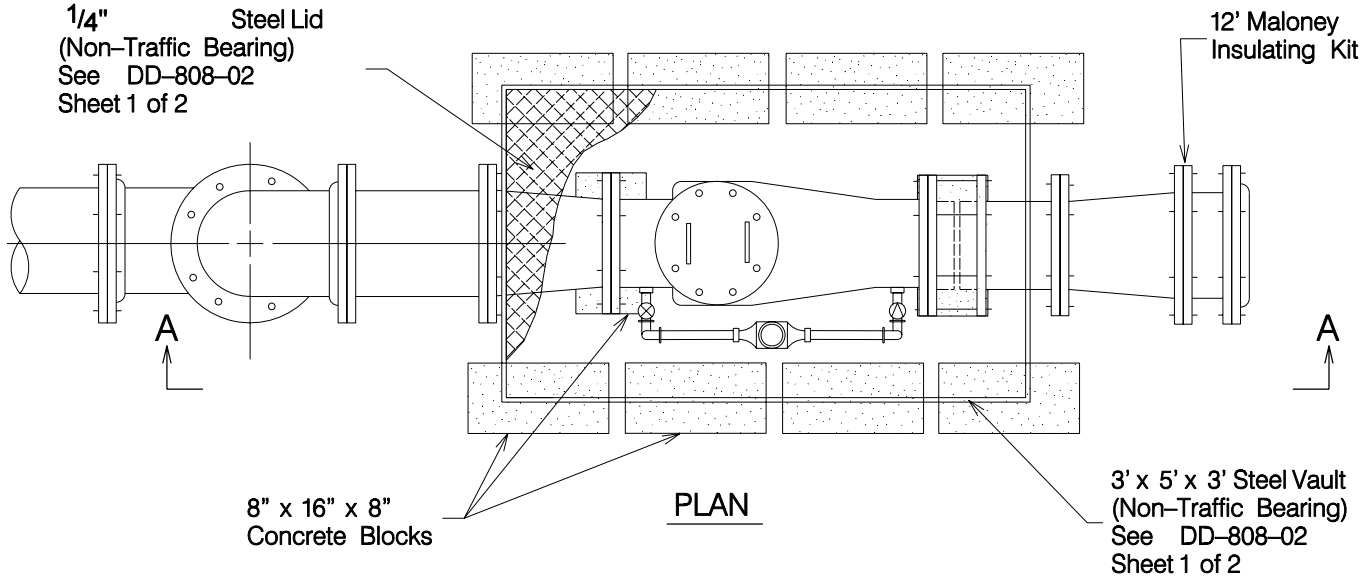
PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
6"	6"	3/4"	1932-6-690
8"	8"	1"	932-8-905



**3' x 5' x 3' RECTANGULAR CONCRETE VAULT  
(TRAFFIC BEARING LOCATION)**

PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	<b>6" &amp; 8" DETECTOR CHECK FOR FIRE LINE</b>	APPROVED	REVISED
		March 2008	
		<b>DD-824-17</b>	
		SHEET 2 OF 2	

PIPE DIAMETER	DETECTOR CHECK CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
10"	10"	1"	912-10-663



PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

**10" X 12" DETECTOR CHECK  
 FOR FIRE LINE**

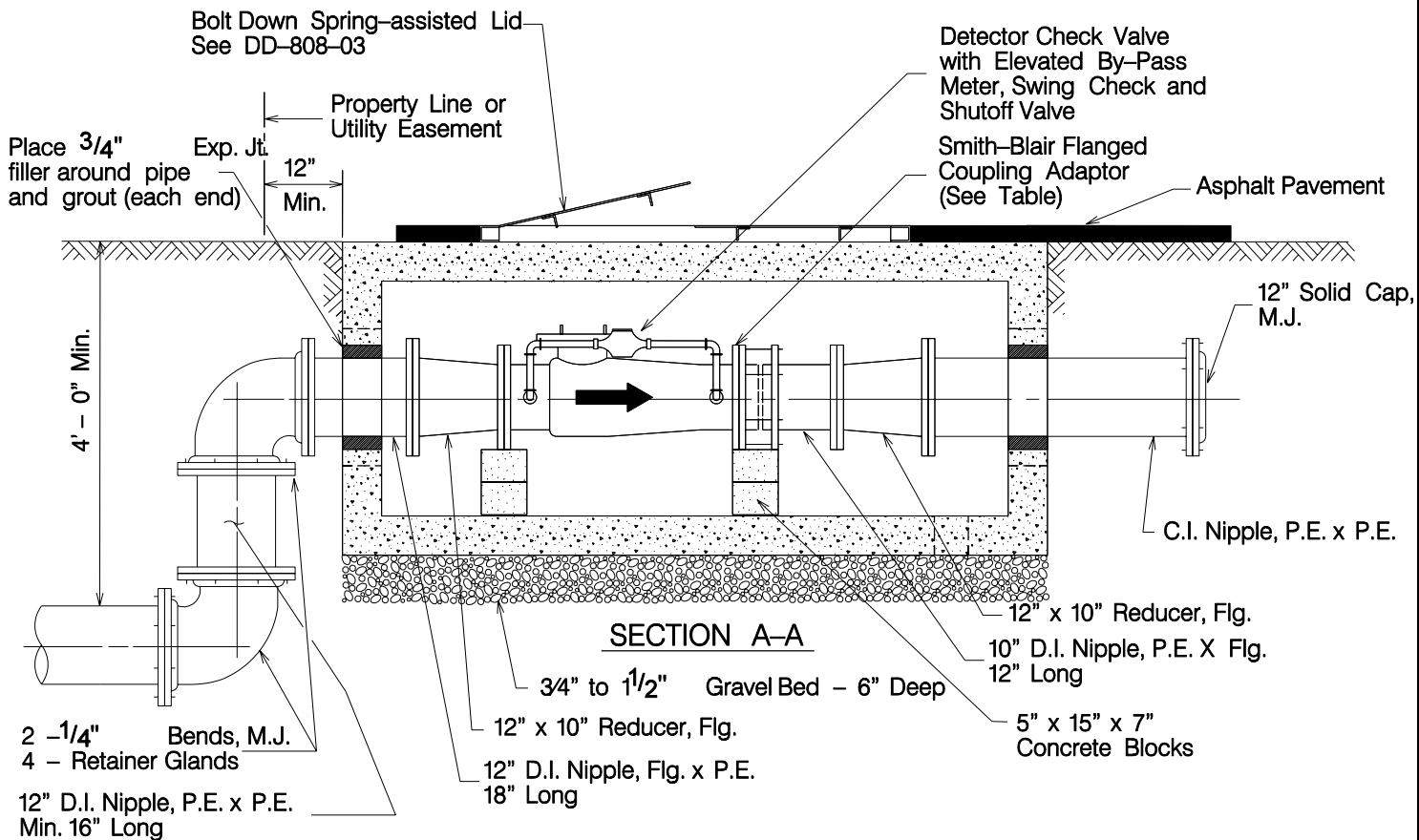
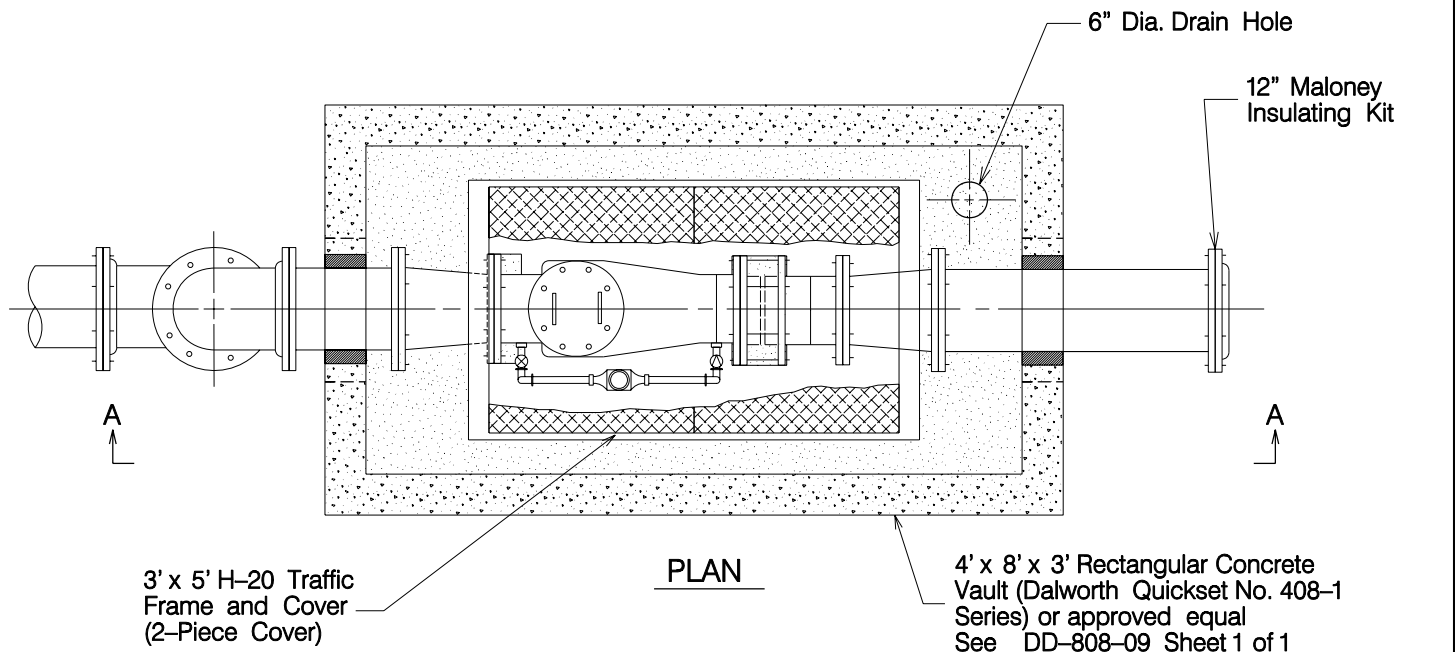
APPROVED  
 March 2008

REVISED

**DD-824-18**

SHEET  
**1 OF 2**

PIPE DIAMETER	DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
10"	10"	1"	912-10-663

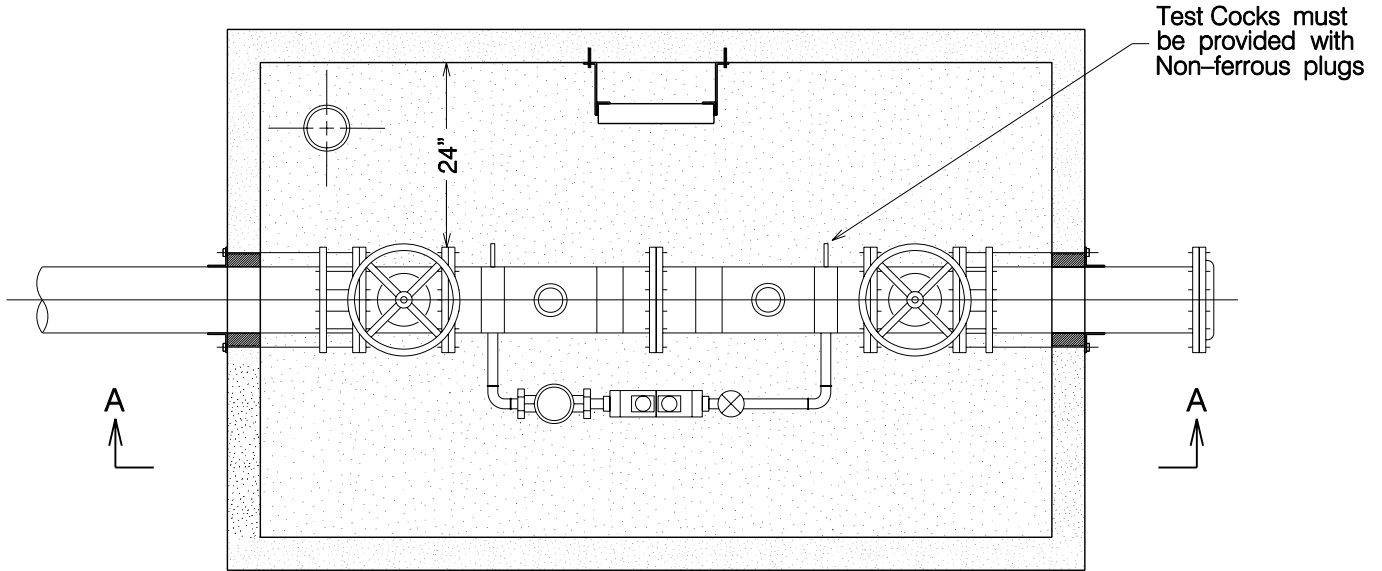


**4' x 8' x 3' RECTANGULAR CONCRETE VAULT  
(TRAFFIC BEARING LOCATION)**

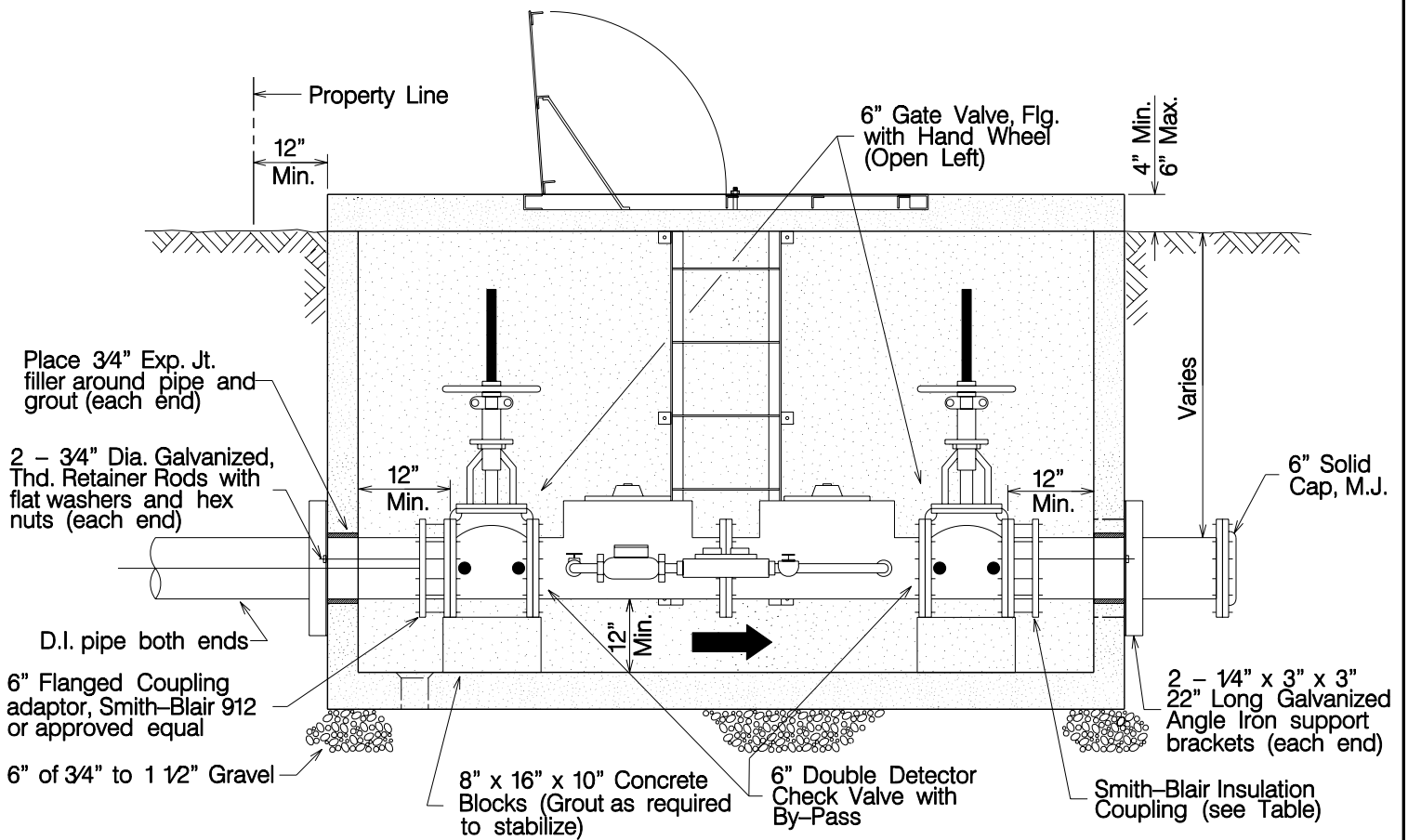
PROPERTY OF <b>SAN ANTONIO WATER SYSTEM</b> SAN ANTONIO, TEXAS	10" X 12" DETECTOR CHECK FOR FIRE LINE	APPROVED	REVISED
		March 2008	
		<b>DD-824-18</b>	
		SHEET 2 OF 2	



Pipe Diameter	Double Detector Check	By-Pass Meter	Smith-Blair Coupling
6"	6"	5/8" - 3/4"	1932-6-690
8"	8"	5/8" - 3/4"	932-8-905



**PLAN**

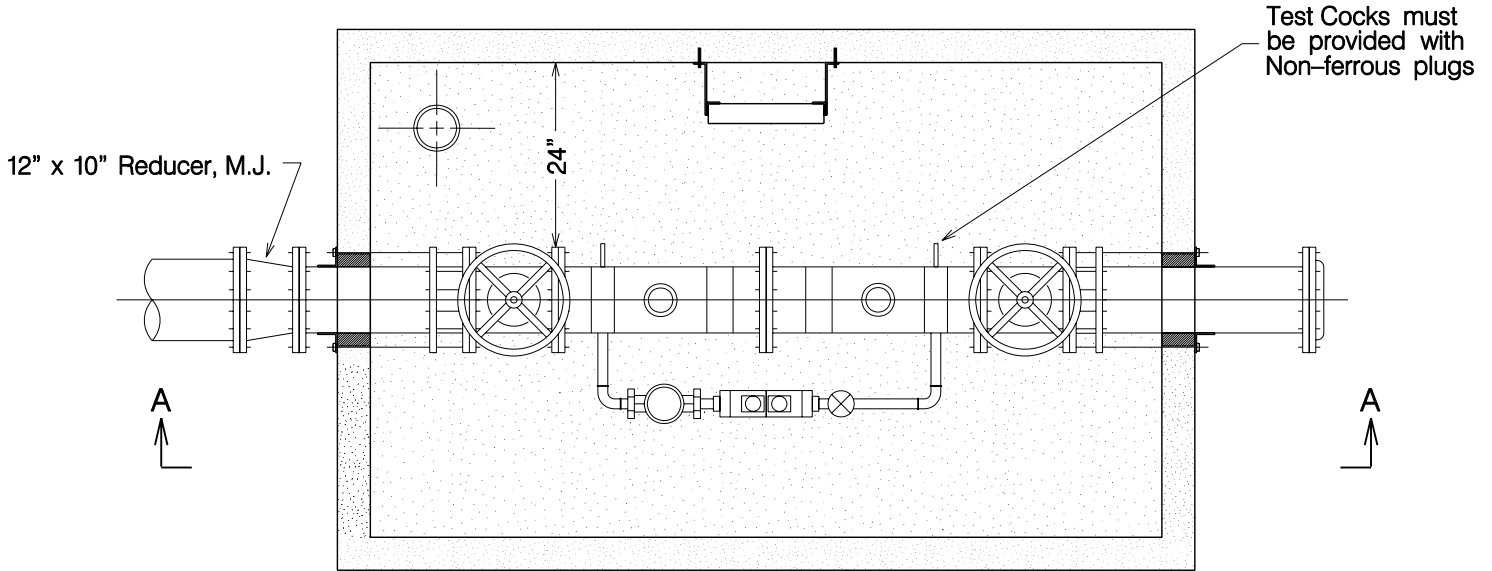


**SECTION A-A**

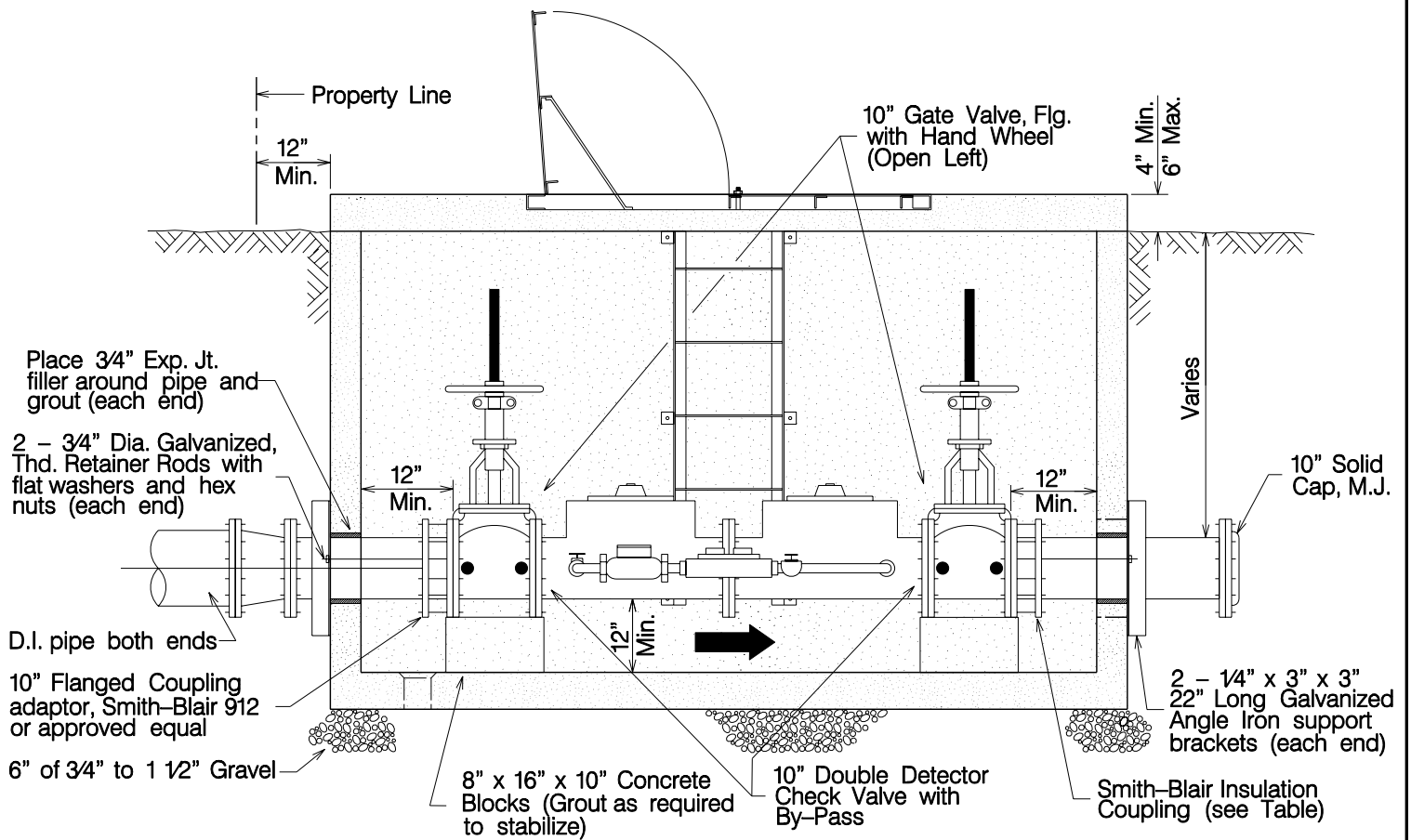
**Notes:**

1. Tamper switches may be required by Fire Code.
2. Assemblies must be U.L. Listed for Fire Protection purposes.

Pipe Diameter	Double Detector Check	By-Pass Meter	Smith-Blair Coupling
12"	10"	58" - 3/4"	932-10-1110



PLAN



SECTION A-A

Notes:

1. Tamper switches may be required by Fire Code.
2. Assemblies must be U.L. Listed for Fire Protection purposes.

PROPERTY OF  
SAN ANTONIO WATER SYSTEM  
SAN ANTONIO, TEXAS

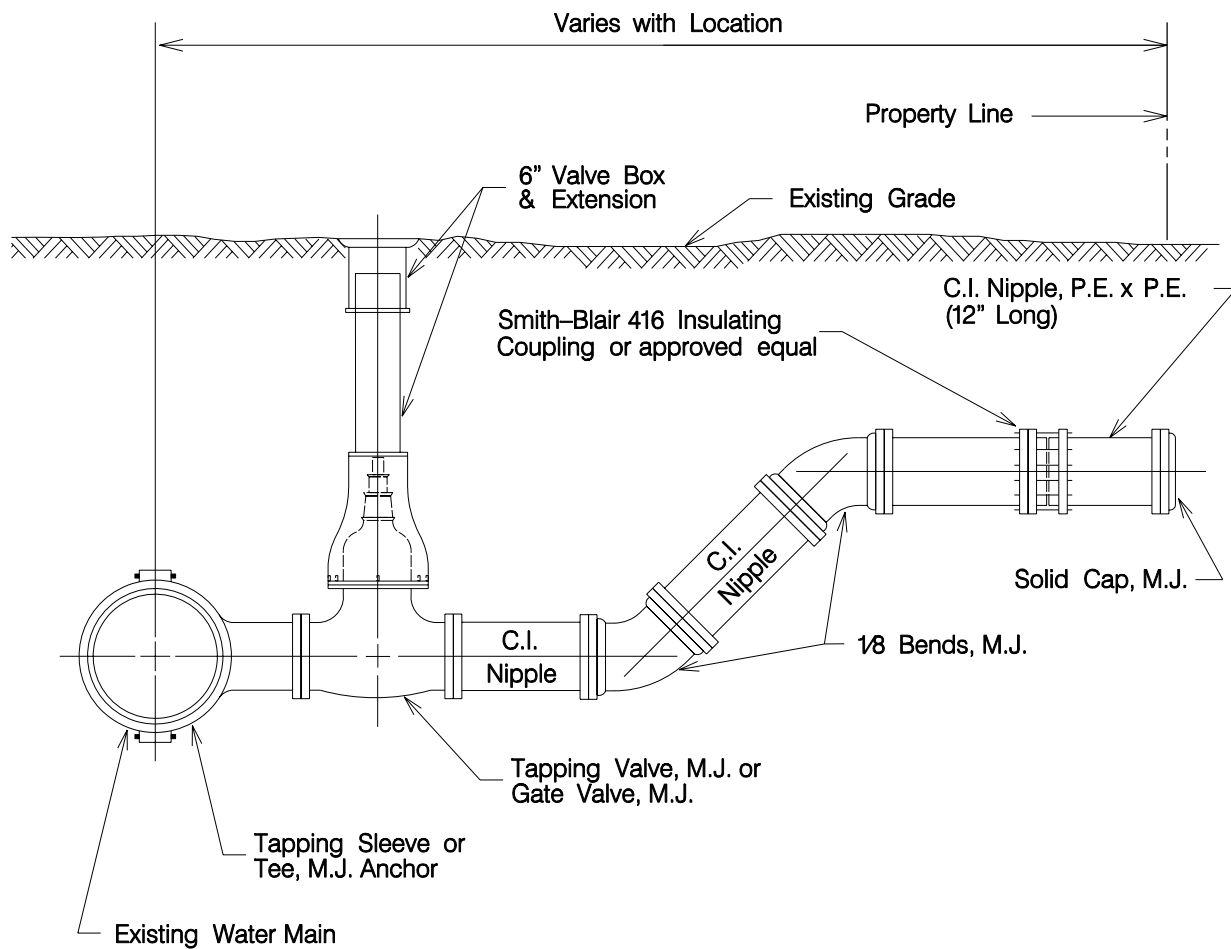
10" DOUBLE CHECK (DCDA)  
DETECTOR ASSEMBLY  
INSTALLATION

APPROVED  
March 2008

REVISED  
June 2009

DD-824-20

SHEET  
1 OF 1



Notes:  
 Thrust Blocking as per San Antonio Water System Specifications.  
 C-900 pipe may be used on short services with no vertical change.  
 If C-900 pipe is used, Insulating Coupling is not required.

PROPERTY OF  
**SAN ANTONIO WATER SYSTEM**  
 SAN ANTONIO, TEXAS

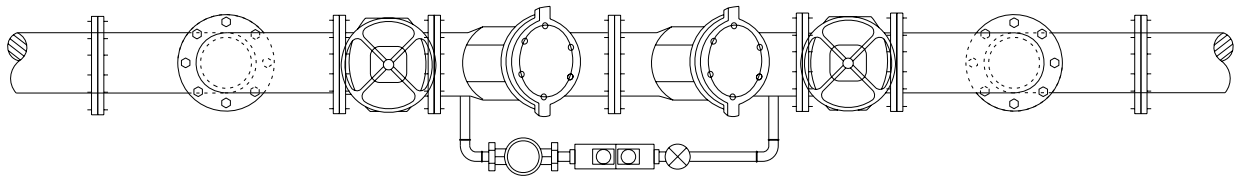
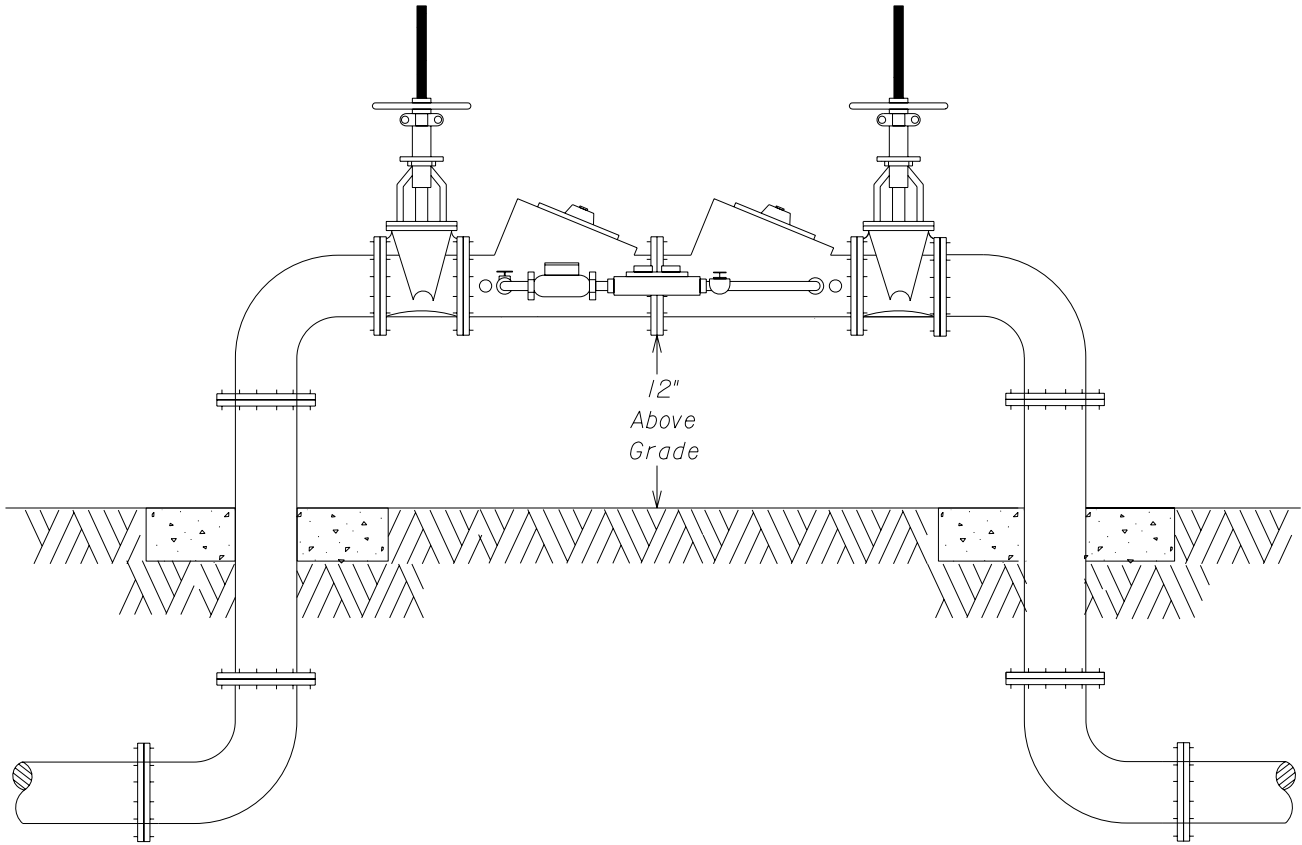
**4", 6" & 8" NON-METERED  
 FIRE SERVICE**

APPROVED  
 March 2008

REVISED

**DD-824-21**

SHEET  
**1 OF 1**



PROPERTY OF  
 SAN ANTONIO WATER SYSTEM  
 SAN ANTONIO, TEXAS

**DOUBLE CHECK DETECTOR  
 (DCDA) ASSEMBLY ABOVE  
 GRADE INSTALLATION**

**APPROVED**  
 June 2009

**REVISED**

**DD-824-22**

**SHEET  
 1 OF 1**