City of St. Louis Department of Public Utilities Water Division

POLICIES AND REGULATIONS
FOR

LARGE SERVICE CONNECTIONS

LAYING OF WATER MAINS

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APRIL 2011

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1. GENERAL INFORMATION

1.0.1 It is a crime to tamper with or operate any appurtenance of the City of St. Louis water distribution system without the prior approval of the Water Division. By City Ordinance and State Law, fines and/or imprisonment are possible. Such action can also be considered a Federal crime and is punishable by significant penalties.

1.0.2 When seeking alterations to the water supply to a property, it is the present property owner's responsibility to correct all water service tap and line service issues that do not meet the requirements detailed within these standards. Examples are unused service taps that were not properly destroyed or undersized or very old service lines.

1.0.3 There is a list of phone numbers on Page 25 detailing which office can answer particular questions regarding regulations or where to obtain permits and applications.

1.0.4 All charges, fees and deposits for services provided by the Water Division as stated in this document are those in effect as of 4/1/11 and are subject to change without notice.

1.0.5 Within these policies and regulations, all references to a specific standard (AWWA; ANSI etc.) refer to the standard that is at the time of installation in effect.

1.1 DESIGN ISSUES

1.1.1 Approvals: Unless specifically stated elsewhere in this document, the Water Division shall be the only judge if the requirements of these regulations have been met. Federal, State and City legislation and regulations establish these regulations. In addition, many years of experience operating a water distribution system has proved that by following these regulations there are long term savings to both the customer and the City.

1.1.2 Pressure / Flow: The Water Division does not provide information on the available water pressure or flow for a specific location. Adaptors can be borrowed free of charge from the Water Division to attach to a hydrant to assist in field-testing.

1.1.3 Drawing: Detailed information on service line and meter box requirements, are to be shown on the drawing for the type water service connection being installed as well as the meter size and type.

1.1.4 Locating of Facilities: The Water Division will only respond to requests for main locates received through MO-1 Call. The Water Division will mark the location of water mains. Private service lines are not marked or located. Location information of service lines is available from the Estimator. Assistance will be provided to locate a service line valve or stop box, see Page 25.

1.1.5 Service Connection Ownership: The property owner owns the entire service connection from the water main to the structure. This includes all parts of that service connection: the tapping sleeve if used; the shut off valve connected to the main, any additional valves; meter and valve boxes, and all piping. The Water Division owns all water meters. The customer has to pay the initial cost for fire protection (FM & DC) meters.

1.1.6 Improvements to Plumbing System & Structure Rehabs: Whenever improvements are made to a structure (house, building, etc.), the service line to that structure (house, building, etc.) must meet the current requirements of the appropriate building codes. The size of the service line to a structure may have to be increased if additional water using devices are subsequently installed, or if the sizes of the water lines inside the building are increased. For a building that is being renovated, any existing service connection that was made of lead, steel, or unlined cast iron or that is fifty (50) or more years old must be properly destroyed and replaced with a new service connection. If a small service line is being replaced, the corporation must also be replaced. See Page 25 on how to determine the year the tap was installed. See Appendix A for the descriptions of the various levels of Building Alterations as defined by the City of St. Louis Building Code.

1.1.7 Address: Plot plans shall correctly locate structures and provide the correct address as established by the Building Division.

1.1.8 New Tap Required: A new tap on the water main is required whenever:

- New structures will require a new service connection
- Structures undergoing a Level II or Level III Renovation with a lead service line
- Structures undergoing a Level III Renovation with a service tap over fifty (50) years old

1.2 SERVICE LINES

1.2.1 Sizing Service Connection: It is the customer's responsibility to correctly size both the service tap and service line. Consideration should be given for possible future increases in water usage. If in the future, when a larger service connection is needed, it would be installed at a substantial cost paid by the customer. The minimum size of a water service line is established by the appropriate building codes as reviewed by the Fire Marshal's Office for fire protection systems and by the Building Division for general water use or the Revised City Code. The service connection can be larger than the minimum size. The current plumbing code and Revised City Code requires a minimum of a 1" copper service line from the water main to the property line.

1.2.2 Tap & Service Line of Equal Size: The size of the service tap does not have to be the same size as the service line. Prior approval must be obtained from either the Service Delivery Group's Engineering or Meter & Tap Sections to install a service line that is not the same size as the service tap.

1.2.3 Number of Service Lines: With a few exceptions for high risk customers (see Section 9.2 page 17), and commercial property, a structure can have only one service connection for fire protection (A.S.) and one service connection for general (G.S.) water use, including irrigation systems, or just one combined fire protection and general water use (A.S.-G.S.) service connection. If a new service connection is installed, all existing service connections of the same type, as shown on Water Division records, must be destroyed. See Page 25 on how to make arrangements to view these records.

1.2.3.a Commercial Property: Multiple general service connections can supply the same structure of commercial property if all of the following conditions are met.

- All of the general service connections to the structure are metered
- Each general service connection supplies a part of the structure which has a valid address and has its own separate exterior building entrance facing the street

1.2.4 Tap on Service Line: Except for split service connections, no attachment of any kind shall be made to a service line from the connection on the water main to that fitting which is farthest from the water main: the backflow prevention device, if required; the meter, if one is installed; or the stop & waste valve.

1.2.5 Orientation: The service line MUST RUN STRAIGHT AND PERPENDICULAR from the connection on the water main to the structure, entering the structure at least six (6) or more feet inside the building line. One exception to this rule is the lack of a direct right-of-way. In that situation, the service line is to run parallel to the street curb or alley line at least one (1) foot inside the street or alley limits, until the service line can turn 90 degrees and run straight, entering the structure six (6) or more feet inside the building line. If such a service line is parallel to a street curb or alley line is more than fifty (50) feet long, there shall be two water shut off valves on that line. One as near as possible to the water main as determined by the Water Division and the second immediately after the service turns to enter the property. Limited exceptions to this requirement will be reviewed on a case-by-case basis upon receipt of a written request. Additional installation requirements may be imposed to allow such exception. Poor planning or designs by the developer or contractor are not acceptable justifications for an exception to this regulation.

1.3 MAJOR REDEVELOPMENTS

1.3.1 Description: Major development projects are those projects involving large tracts of land where a number of existing structures may be removed, new structures will be added and the streets rebuilt. The following options are site-specific provisions allowed only upon the approval of the Water Commissioner. Only the Water Division will determine if a project meets the requirements of this section.

1.3.2 New main: It is strongly recommended that the developer consider replacing the existing water mains as part of major development projects, particularly if significant street rehabilitation is to be done.

1.3.3 Existing Service Taps: If a water main is to be abandoned, it is not necessary for all of the existing service connections to be actually destroyed before building demolition begins. The developer must submit detailed plans for the redevelopment. The construction phase of the development is to be under contract and a construction schedule provided. For each individual service tap that should be destroyed, the developer must complete a Tap Destroy Application with the projected date on which the main will be abandoned. A deposit as set by the Water Commissioner is to be submitted to insure that the taps are destroyed or the main abandoned. The Water Division will hold the deposit until the Water Division has actually disconnected the water main and it has actually been abandoned.

1.3.4 New Service Taps: When a new water main is installed as part of a development project, the service taps for the new buildings can be made at the time the main is installed. The developer must submit for approval by the Water Division, drawings detailing the exact location where the main is to be tapped, and where the temporary end of the service lines will be placed. The contractor is responsible for marking the water main for the location of the new service taps. There shall be a cap placed at the temporary end of the service line. Accounts must be opened for each service tap and a deposit as set by the Water Commissioner submitted in advance. The deposit is to pay for a tap destroys if the structure is not built. Once the service has been connected, the deposit would be returned. No allowance will be made for missed marked service tap locations or if the

building line changes such that the service line no longer enters the structure six (6) or more feet inside the building line. The newly installed service tap will then have to be destroyed and a second new service tap installed.

1.3.5 Water Main Installation: The Water Division will accept water mains installed by others under the following conditions:

- The Water Division determined that this water main is necessary
- The water main and all its appurtenances were constructed according to Water Division regulations, MO-DNR Constructions Standards and AWWA Standards
- An authorized representative of the Water Division has inspected the work during construction
- The water main has passed all hydrostatic and water quality tests
- Only Water Division approved appurtenances were used

1.4 OTHER DESIGN CONSIDERATIONS

1.4.1 Fire Hydrants: Only Water Division designed hydrants can be installed. Hydrants shall be installed such that the centerline of the breakaway flange connection is between 3 - 7 inches above the ground elevation. The hydrant shall be set two (2) feet from the center of the hydrant to the back of the curb. Hydrants cannot be located within ten (10) feet of a stormwater inlet or sanitary, stormwater or combined manholes. Hydrants must be at least five (5) feet from any curb rounding, which includes driveway entrances. There shall be a minimum three (3) foot clear radius around the hydrant to provide sufficient room to operate and maintain the hydrant.

1.4.2 Sanitary, Stormwater or Combined Structures: Per Missouri Department of Natural Resources (MO-DNR) Design Guide for Community Water Systems Section 8.6 "Separation of Water Mains, Sanitary Sewer, and Combined Sewers" establish the minimum separation requirements between potable water mains, appurtenances or service lines and sanitary and combined system lines, inlet or manhole. These requirements state that when lines cross, the potable water line must be at least eighteen (18) inches vertically above any sanitary or combined system lines with no joints in the potable water line for ten (10) feet either side of the crossing. When a potable water line runs parallel to, or pass by a manholes of other structures of a sanitary or combined system, there is to be a horizontal separation of ten (10) feet between potable and the sanitary or combined system appurtenances. If this horizontal separation cannot be maintained, either the potable water appurtenance or the sanitary or combined system appurtenance must be encased in an impervious enclosure around the appurtenance and for at least ten (10) feet either side of the other utility. Concrete encasement is NOT acceptable.

1.4.3 Backflow Prevention Device: The City of St. Louis Plumbing Code and the MO-DNR sets the standards for those applications that require backflow prevention devices. In addition, this document stipulates specific locations where backflow prevention devices are required in fire protection systems. The backflow prevention device shall be installed as close to the source as possible, in a position that is easily accessible for testing and repair, and is protected from freezing or submersion at all times. The installations requirements established by MO-DNR and the City Plumbing Section shall be followed for the installation of all Backflow Prevention Devices.

1.5 CONSTRUCTION

1.5.1 Configurations: Service line and meter box or meter vault installations must conform to the drawings that are specified for the specific type of connection and meter installed.

1.5.2 Permits: The contractor is to obtain all required permits necessary to complete the installation.

1.5.3 Work that can only be performed by Water Division authorized forces:

- Operation of all Water Division owned valves, hydrants and appurtenances
- Making all connections to the existing water distribution system
- Installation, relocation and removal of Water Division owned uncontrolled hydrants
- Meter installation, maintenance and removal
- Obtaining water samples and determining if the samples meet Water Division standards
- Repairs to private valves which require the isolation of the water main, such work is to be billed to the customer

1.5.4 Work to be performed by a plumbing contractor:

- Service line installation and service tap destroys
- Repairs to the service line, private valves and private valve boxes
- Meter and valve box installation, repair and removal
- Relocation of Water Division owned controlled hydrants subject to prior written approval of the Water Division
- New main lays, with all appurtenances, subject to prior written approval of the Water Division of the design and installation

1.5.5 Material Supplied: Only the following items, paid for by the contractor, are supplied by the Water Division. It is the contractor's responsibility to obtain all other items necessary for a complete service line installation. See the appropriate service line installation drawing at the end of these regulations for the material required for a complete service connection.

- Corporation or tapping valve and tapping sleeve when required
- Meters and the concrete cover for meter vaults or double meter vaults
- Valves and fittings necessary to make dual connections or to cut-in or cut-out a connection
- All material necessary to repair or replace a damaged private valve which requires the isolation of the water main
- Water Division fire hydrants

1.5.6 Making a Tap: The contractor requesting a service line connection shall do all excavating, installation of the piping, valve and meter box or meter vault, and complete all backfilling and grade restoration. Only the Water Division will make the actual tap into the main. The contractor is to clearly mark the main at the location of the tap.

1.5.7 Reverse taps: When underground structures prevent the attachment of the tapping equipment used to install the service line tap on the correct side of the water main, a reverse tap may be approved. Reverse taps will not be approved to avoid a surface or near surface obstruction such as trolley tracks.

1.5.8 Excavation: The bottom of the excavation shall be reasonably level with two (2) feet of clearance below the bottom of the water main. The size of an excavation depends on the type of

work; see Drawing No. 2 and Table 2 on Page 23, for taps up to 20". The excavation shall be free of water and mud (rock the excavation floor if necessary), have vertical sides and be shored to OSHA standards. If a pipe bell is exposed in the excavation or other obstacles are encountered, contact the Engineering Office. For taps involving mains larger than 20", contact the Engineering Office.

1.5.9 Shoring of Excavation: The Contractor will be responsible to adequately shore the excavation prior to the Water Division making the tap. Any excavation greater than five (5) feet in depth will require shoring. Shoring must meet OSHA standards. The Water Division inspector shall determine adequacy of the shoring at the time of the tap inspection.

1.5.10 Backfill and Grade Restoration: All backfill and grade restoration shall be done by the Contractor. All backfill material used in the public right-of-way and the final grade shall conform to the regulations of the Street Department. Any excavation not in the paved street is to be restored to the existing grade or as detailed on drawings.

1.5.11 Water Turn On: With the permission of the Engineering or Meter & Tap Sections, water can be used from an unmetered new service connection for construction purposes. The water service connection shall not be considered complete and the water available to the customer until the Water Division has inspected and approved the installation, and the meter, when required, has been installed.

2. TYPES OF SERVICE CONNECTIONS

2.0 Water service connections are divided based upon the following categories:

2.0.1 Size:
Small Service - all service lines that are not made of cast iron or ductile iron pipe
Large Connection (Cast Iron) - all 6" and larger taps, and those 3" & 4" taps installed using cast iron or ductile iron pipe

2.0.2 Use:
General Supply (G.S.) - domestic only
General Supply Limited Service Sprinkler (G.S. LSS) - domestic and limited fire protection
Automatic Sprinkler (A.S.) - fire protection only
Combined (A.S.-G.S.) - both domestic and fire protection

2.0.3 Number: See Drawing No. 1
Single - one service line for one use
Dual - two taps on either side of a line valve, which are then interconnected
Through - two or more taps on different water mains, with all of the service lines interconnected inside the property line

2.0.4 Piping: See Drawing No. 1
Single - one service tap supplying one service line crossing the property line
Split - one large service tap supplying two service lines crossing the property line, A.S. & G.S.

TYPE OF SERVICE CONNECTION

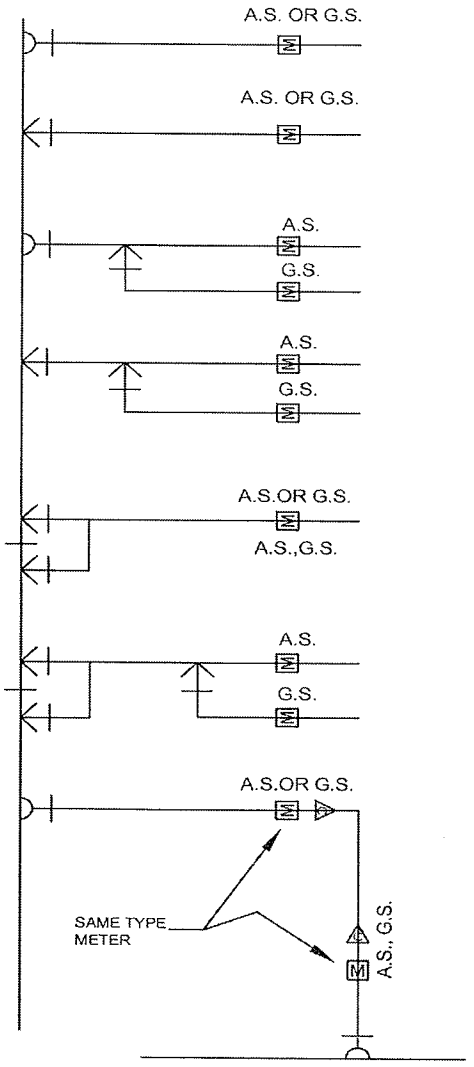
STRAIGHT CONNECTION W/SADDLE OR TEE

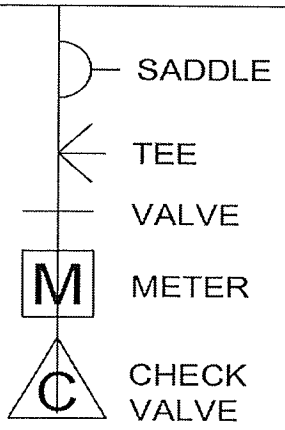
SPLIT CONNECTION W/SADDLE OR TEE

DUAL CONNECTION

SPLIT DUAL CONNECTION

THROUGH CONNECTION





DRAWING #1

Rev. 11-1-2011

3. METERS

3.0.1 All services 2" and greater shall be metered, except for certain fire protection systems.

3.1 ACCESS

3.1.1 Accessible: The meter must be accessible to the Water Division and in the public right-of-way. If for compelling reasons the meter cannot be located in the public right-of way, the property owner must provide easement rights to the Water Division for access to read and maintain the meter. Only the Water Division will determine if the physical conditions at a specific location are considered accessible.

3.1.2 Basement Meter Placement: Water meters can be located in a basement, if the basement is under the sidewalk, or if there are other compelling reasons why the meter cannot be installed outside of the structure. The area around a large meter must be walled off from the rest of the basement with access provided for the Water Division. Only the Water Division will determine if the condition of the specific location warrant inside metering and is accessible. Where inside meters are approved by specific request, the Water Division assumes no liabilities for damages should the installation subsequently leak.

3.2 METER BOX & VAULTS

3.2.1 Installation: The meter will not be installed until the complete service line is installed. There are several different configurations for a meter installation. See the appropriate drawing at the end of these regulations for detail installation requirements.

3.2.1.a Electrical Grounding Jumper: All meter installations not utilizing a meter setter, shall have a permanently install electrical grounding jumper. A length of No. 4 bare stranded copper wire is to be welded, cad welded or brazed to the inlet and outlet piping to the meter. The wire cannot be attached to the piping using the bolts for the water meter. The Jumper is to drop straight down at both attachment points and cross the floor of the meter box or vault. There shall have sufficient length of the jumper to insure no interference with the size and type of meter being installed.

3.2.2 Meter Boxes & Vaults: Meter boxes and vaults are to be sized for the meter being installed, as well as for the location of the installation. Meter boxes and vaults are to be exposed and at the proper grade. See appropriate meter box or vault drawing at the end of these regulations. Meter boxes and vaults are to be located in the public right-of-way. Meter boxes and vaults are normally located close to the curb or in the sidewalk. The lid for meter vault and double meter vaults will be delivered when the meter is ready to be set.

3.2.3 Meter Flanges: The flanges for three (3) inch and larger meters shall be oriented so that two bolt holes on the flange straddle the top center. Only one-piece flanges that are threaded, welded or silver soldered onto pipe shall be used inside meter boxes and vaults. The flanges shall be a minimum of six (6) inches from the sides of the meter box or vault. See Table 3 pg 24 for spacing between meter flanges.

3.2.4 Bypasses: No unmetered water bypasses or jumpers are permitted around a water meter

3.2.5 Valve, Meter Suction: A suitable water shut off valve for the type service connections shall be installed between the water main and the meter, in the proper type of valve box or stop box which is to be exposed and at the proper grade.

3.2.6 Valve, Meter Discharge: A suitable valve shall be installed on the discharge side of the meter. This valve shall be located between the meter and immediately inside the structure.

3.3 TYPE & SIZE

3.3.1 Domestic Meters: Owned and supplied by the Water Division. Meters are obtained, installed and maintained at no cost to the customer. The customer will be billed for damages to or the loss of a domestic meter.

3.3. DC and FM Meters: DC Detector Check and FM Fire Meters are initially purchased by the customer but are owned by the Water Division. The Water Division will obtain, install and maintain DC & FM meters at the customer's expense.

3.3.3 Meter Maintenance: Only Water Division personnel shall perform Meter work.

3.3.4 Size DC & FM Meters: The customer determines the size of DC and FM meters needed from the list of sizes available from the Water Division.

3.3.5 Size Domestic Meter: The initial domestic meter installed will be the same size as the service line. The Water Division can replace this meter with one of a different size or type if the Water Division determines that it is warranted. An example would be if the actual water use has changed from the initial estimate.

4. FIRE PROTECTION CONNECTIONS

4.0.1 Fire Marshal: Fire Marshal's Office must approve **all fire protection systems**. Contact that office for specific information about fire protection system connections, see Page 25.

4.1 TYPE CONNECTIONS

4.1.3 A.S. - no meter - 6" and larger fire protection connections that supply only sprinkler heads

4.1.4 A.S. - Detector Check (D.C.) Meter - Fire protection connection that supplies a standpipe, hose rack system or private outdoor hydrants

4.1.5 A.S.-G.S. - Fire Service (F.M.) Meter - A single service line that supplies both fire protection and domestic purposes

4.1.6 A.S.-G.S. - Split Service - See Drawing No. 1, page 10. A single service tap into the water main, where the service line is split in the street area providing separate fire protection and domestic service lines into the building.

4.2 BACKFLOW PREVENTION DEVICE REQUIREMENTS

4.2.1 Device Approval: All service line backflow prevention devices and the location of the proposed installation of this device shall be reviewed and approved by both the Plumbing Section and the Water Division before proceeding with the installation. The proof of compliance with MO-DNR backflow prevention requirements shall be furnished when the application is made for the service connection.

4.2.2 Class I: Approved Reduced Pressure Principle Backflow Preventor
Fire systems that contain any

- Antifreeze or foam solutions

4.2.3 Class II: Approved Double Check/Double Gate Backflow Preventor
Fire system that supplies ONLY sprinkler heads, either wet or dry

- Hose racks or stand pipes
- Private fire hydrants

5. COST ESTIMATES FOR WORK

5.0 Cost Estimate: Written cost estimates for work to be performed by Water Division forces will be provided upon receipt of a written request. The cost for a simple tap is established by the water main and tap size. The cost of the meter and other work vary significantly. The contractor is to obtain a cost estimate for each project. The request for the estimate must include all of the following information:

- A description of the work to be done.
- Approximate location of the work, specific location for the service tap(s).
- The type of service connection, if one is to be made:
  - Size: 6" to 12"
  - Use: domestic G.S., fire A.S. or combined use A.S.- G.S.
  - Type: single; dual; or a through connection
  - Piping: single; or split service.
- The approximate volume of water required in gpm, both normal and peak usage.
- An expected date it is planned for the work to be completed.
- Drawings showing ALL related details of the water service installation so that a clear understanding can be made of what work is to be accomplished. This shall include:
  - Site plans accurately locating and with an approved address for each structure.
  - Proposed piping layouts.
  - Proposed locations of water system appurtenances (service taps, valve & meter boxes, hydrants), backflow preventor, etc.

5.0.1 Valid Estimate: The customer has sixty (60) days from the date on the estimate to accept that estimate as the fixed cost to perform the tasks detailed. An estimate is considered as having been accepted when the Water Division has received written authorization to begin work and all specified deposits. In addition, the work must begin within one hundred and twenty (120) days.

Unless otherwise stated in a written correspondence, if either of these periods is exceeded, it may be necessary to recalculate the cost estimate.

6. WATER SERVICE ACCOUNTS & BILLING

6.1 ACCOUNTS

6.1.1 Flat Rate: Most residential water users are billed on a flat rate basis. Flat rate components include the number of rooms, toilets, bathtubs, showers (separate from a bathtub) and front footage of the lot. Metered accounts can be converted to flat rate, when all flat rate account requirements have been met. Flat rate accounts are available to residential structures of six units or less. No commercial or industrial customers can be a flat rate account. Not all flat rate customers are eligible for the service line insurance program. See Page 25 on how to contact the Customer Service Section for more information.

6.1.2 Metered: Except for some specific fire protection systems, all industrial and commercial customers and all service taps 2" and greater must be metered. The customer can request to be metered even if eligible to be a flat rate account.

6.1.3 A change in a building use can change whether a meter is required. See Page 25 on how to contact the Customer Service Section for more information.

6.1.4 New Buildings, Rehabs & Inactive Accounts: For all new construction, building rehabilitation and properties with an inactive water account, the service connection must meet the Water Division's current service connection standards prior to the water service being turned on.

6.1.5 Active Accounts: It is very important that service account information accurately reflects the present user of water service to prevent any interruptions of service. Contact Customer Service Section to resolve issues regarding an outstanding balance for a specific address or customer.

6.1.6 Account Deposit: A deposit as detailed in Table 1 is required. Actual water usage may result in an adjustment in the amount of the required deposit. After two (2) years of prompt payments, the deposit will be refunded with interest.

Table 1 Minimum initial deposit as of 11/1/10 for new-metered accounts

Small Service Connections		Large Service Connections	
1"	$50.00	4"	$750.00
1-1/2"	$190.00	6"	$1,000.00
2"	$370.00	8"	$1,500.00
3"	$500.00	10"	$2,500.00
		12" & larger	To be determined

6.2 WATER SERVICE TURN ON

Water will not be turned on until the following has been completed:

- Valve or stop box is exposed and at the correct grade, and the Tee head or valve is accessible
- An account has been opened in the name of the structure's occupant or owner
- All relevant fees, charges and deposits have been paid
- Where required, the meter box or vault meets all existing standards
- Where required, the water meter and/or backflow prevention device have been installed

7. INSPECTIONS - TAP EXCAVATION & METER INSTALLATION

7.1 INSPECTIONS

7.1.1 When Inspection Required: Three inspections are required as listed below for new tap and meter installations. See Page 25 on information to schedule an inspection.

- When the contractor is ready for the tap to be made
- When the contractor has completed all piping work for the service line & is ready to backfill
- When the contractor is ready for meter installation

7.1.2 Excavation for Tap: The contractor is to excavate at the location of the tap in the size as detailed in Drawing No. 2 and Table No. 2 on Page 23. The water main is to be exposed, cleaned, and the location of the tap clearly marked on the main. All excavations with a depth of five (5) feet or more to the bottom of the excavation shall be shored or stepped per OSHA regulations. The tap will not be scheduled until the excavation has been inspected.

7.1.3 Ready for Backfill: When the Contractor has installed all appurtenances of the service connection to the structure, the Water Division and the Plumbing Section both require that the work be inspected prior to backfilling and grade restoration. The Water Division's second inspection can be done at the same time the tap is installed if arrangements had been made when the tap was scheduled.

7.2 METER SETTING

After completion of all work on the service connection including the installation of all backflow prevention devices which were required, and when ready for meter installation, contact the Meter & Tap Section, Page 25, to schedule an inspection prior to installation of the meter.

8. DESTROYING SERVICE TAPS

8.0.1 Only a Water Division authorized representative is allowed to witness and approve a service tap destroy. PLUMBING INSPECTORS DO NOT HAVE THAT AUTHORITY.

8.1 GENERAL REQUIREMENTS

8.1.1 Tap Location: The Water Division will locate the water main only after receipt of such a request through Mo-1 Call, but will not mark private taps. The contractor can obtain private tap location information from the Estimator; see Page 25 for contact information.

8.1.2 Excavation Location: The contractor is to excavate at the recorded location of the tap.

8.1.3 Tap Not Found: If the tap cannot be located in the initial excavation, the contractor shall expose the water main for five (5) feet either side of the recorded location of the tap. When the Water Division is satisfied that a reasonable effort was made to locate the tap but it was not found, the contractor shall be released from having to destroy the tap.

8.1.4 Demolition Permit: All service taps indicated on Water Division's records to a structure must be destroyed before the Water Division will approve the issuance of a Demolition Permit, except as allowed in Section 8.1.5.

8.1.5 Water Used During Building Demolition: The Water Division will approve the use of an existing tap during the structure's demolition. The approval will be given to issue a Demolition Permit provided that the contractor has placed a deposit with the Water Division to insure that the contractor destroys the tap ($1,000.00 for a small service tap; $5,000.00 for a large service tap). The contractor has thirty calendar days to destroy the service tap. The deposit will be refunded if the contractor has destroyed the service tap within that period. The deposit will be forfeited if the tap is not destroyed within thirty (30) calendar days of receipt of the deposit. Time extension can be obtained if requested in writing. The existing service taps CANNOT be used for any new structure.

8.1.5 Leakage: If the service tap valve cannot be completely shut or if there is a water leak at the valve or piping, the Water Division will make the necessary repairs to stop the leakage. Work by the Water Division will not begin until receipt of a written request to make the repairs. The contractor shall be billed on a time and material basis for this work.

8.1.6 Inspection of Destroy: Requests for inspection of the tap destroy should be made the day before the inspection is to be made. The contractor is to have both street excavation and plumbing permits. Normally there is no charge for taps destroy inspection. If it is necessary to make additional inspections due to the contractor not being ready or not having properly performed the required tasks, the contractor shall be billed for each additional inspection.

8.2 STEPS TO DESTROY A TAP

The Contractor must obtain plumbing and excavation permits before beginning any work related to a tap destroy.

8.2.2 Large Service Taps:

- The service tap valve and service line are to be exposed and cleaned
- All bolts on the valve are to be replaced with the correct size stainless steel nuts and bolts
- The valve is to be operated several times, fully opened to fully closed (counter clockwise) to insure that the valve is left completely closed
- On those valves utilizing stem packing the existing packing around the valve stem is to be replaced

- The service line is to be opened at the meter or at another location to verify that the valve is shut, the contractor shall be prepared to handle any leakage that may occur due to the valve not shutting completely, if leakage occurs, the valve should be exercised several more times and left completely closed
- At least one foot of the service line is to be removed
- The valve body shall be mechanically restrained to the tee or water main. If the valve is not bolted to the tee or tapping saddle, then it will be necessary to physically tie back the valve to the water main or tee with clamps and three quarter inch (3/4") steel rods
- A cap is to be installed on the service line on the outlet side of the valve. This cap is to be restrained by use of three quarter inch (3/4") diameter steel rods and appropriate clamps, or other approved method
- Remove the valve operating nut
- The end of the service line toward the property is to be capped or sealed by mortar to prevent the intrusion into the service line of the backfill material
- An inspection of the destroyed service tap can be arranged with at least four (4) hours notice by contacting the Engineering Section, see Page 25.
- Remove valve box frame and cover and fill in valve box to Street Department standards

9. LARGE (6" AND LARGER) SERVICE CONNECTIONS

9.0 A large service connection is any tap of a water main that is six (6) inch in diameter and larger, and any other connection that was designated as a "Cast Iron Connection" by the Water Division at the time it was installed. These were 3" and 4" connections made with cast iron or ductile iron piping.

9.1 DESIGN

9.1.1 Technical Questions: Contact the Engineering Office, Page 25.

9.1.2 Pipe: Within the public right-of-way, all piping for large service connections shall be ductile iron pipe. The Plumbing Section's code requirements determine the pipe material allowable to be used for a large service line on private property.

9.1.3 Tap Size Limits: A service tap cannot be larger than the size main to which it is attached. The size of the service tap and meter will be subject to the limitations set by the Water Division and will be based on the ability of the water distribution system to handle the expected demand. The Water Division may require the owner or developer to pay the full cost of increasing the size of water mains in the area of the property in order to meet the demands of the property being served by the proposed service tap.

9.1.4 Service Line Size: The minimum size of a service line from the main to the meter will be 6" or as required by the Fire Marshal and/or Plumbing Section, whichever is larger. From the meter to the inside of the structure, the service line shall be at least the same size as the meter discharge or larger.

9.1.5 Water Shut off Box in Street: The shut off valve is to be located in the street in a valve box. The valve box must be exposed and at the proper grade. See Drawing No. C310AZ. The

valve box can be an approved trench adaptor (roadway box) or a cast iron frame and cover over either a single piece, reinforced, precast concrete pyramid box or a pyramid box made of approved, reinforced, precast concrete slabs. It is the owner's responsibility to maintain the valve box. The City will adjust a private valve box to grade if that box was covered during street paving performed after 1993.

9.2 MULTIPLE SERVICE CONNECTION

9.2.1 When Allowed: In high-risk facilities where a continuous source of water is essential or desired. This would be for the protection of the public, the facility or the equipment located at that site. Examples would be hospitals, nursing homes, manufacturing facilities, research facilities, and hotels. These structures typically require a continuous source of water and are required to have a secondary or redundant source of water in the event of disruption of water service. The Water Division will approve the final determination as to whether secondary or a redundant source of water is required or warranted to a specific location after a review of the facility's drawings and information regarding the planned water use.

9.2.2 Dual Connection: A secondary source of water obtained by installing two service taps off the same water main, separated by a line valve. This design is not a fully redundant source, as it uses the same service line from the point of interconnection of the service connections to the property line.

9.2.3 Through Connection: A fully redundant source of water is one that obtains water from two or more different water mains in either the same or different streets. These sources of water are then interconnected inside the property line. To prevent flow through this connection from one main to the other, at least check valves or similar approved backflow prevention device MUST be installed on both service lines. The Water Division MUST be informed of this type interconnection. Failure to inform the Water Division can result in significant delays in isolating one of the mains for maintenance or repairs. All of the meters installed on these service lines shall be of the same type (DC, FM, domestic). See Drawing No. 1 Page 10.

9.3 APPLICATION FOR A LARGE SERVICE TAP INSTALLATION

Before the Water Division will begin work to install the tap, the Contractor will need to complete an application for service. The Water Division will only schedule the installation of the tap after all of the items noted below have been supplied to the Water Division at the Pipe Yard Tap Application Desk see page 25. The application shall include all of the following items:

- A check or money order payable to the "CITY OF ST. LOUIS WATER DIVISION" in the amount of the cost estimate for the service tap installation
- Copy of the Excavation Permit, from the Street Department
- Copy of the Plumbing Permit, from the Building Division
- If a backflow prevention device is required, a copy of the purchase order or the Bill of Sale for the backflow prevention device
- Copy of an approved drawing stamped and signed by the Fire Marshal's office (for fire connections) and/or the Plumbing Section (for domestic service connections)
- Completion of an application for service from the Water Division Customer Service Section.
- The same plumbing contractor's name which is referred to on the tap applications, shall appear on the plumbing and excavation permits, the check or money order made payable to

the City of St. Louis Water Division to make the tap shall be from either the plumbing contractor or holder of the water service account

10. MATERIAL SPECIFICATIONS

10.1 DUCTILE IRON PIPE

10.1.1 Ductile Iron Pipe: All pipe used for large service connections within the City right-of-way shall be Class 52 ductile iron pipe, for use with potable water as specified in the American National Standards Institute Specifications ANSI A21.51-86 (or latest revision) and the American Water Works Association AWWA C151 Standards. From the service tap to the meter, the nominal pipe sizes to be used shall be six (6), eight (8), twelve (12), and twenty (20) inches in diameter.

10.1.2 Ductile Iron Fittings: All pipe fittings shall have a pressure rating of 250 psi (minimum) and a cast iron strength of 25,000 psi, or a 350 psi pressure rating when made of ductile iron. All pipefittings shall meet the standards for Gray Iron and Ductile Iron fittings as set forth in the American National Standards Institute ANSI A21.10-87 (or latest revision) and the American Water Works Association AWWA C110 Standards.

10.1.3 Restrained/Rubber Gasket Joints: All rubber gasket joints shall meet the standards for Ductile Iron and Gray Iron Pressure Pipe and Fittings as approved by the American National Standards Institute ANSI A21.11-85 (or latest revision) and the American Water Works Association AWWA C111 Standards.

10.1.4 Restrained Joint: All pipe and fitting joints within the City right-of-way shall be restrained joints. The use of U.S. Pipe Field-Lok rubber gaskets (or approved equal) is acceptable.

10.1.5 Gate Valves - Specifications for 6" Through 12" Gate Valves: Gate valves shall be manufactured in full compliance with the American Water Works Association AWWA C500 Standard for Resilient Seat Gate Valves.

- Gate Valve Type - Shall be resilient seat Side Wedge with Non-Rising Stem
- Valves shall open to the **RIGHT, CLOCKWISE**
- Valve End Connections - Gate valves shall be furnished with end connection as specified in the Application, either mechanical joint or 125# flanged
- 6" thru 12" gate valves shall have a 200 psi working pressure and 400 psi test pressures
- The valves shall be provided with "O" ring seals

10.1.6 Polyethylene Encasement: All direct buried pipe, fittings, valves, etc. shall be encased with polyethylene meeting the Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids as approved by the American National Standards Institute ANSI A21.5-88 (or latest revision) and the American Water Works Association AWWA C105 Standards.

10.1.7 Pipe Installation: All pipe, fittings and appurtenances shall be installed according to the Installation of Ductile Iron Water Mains and Their Appurtenances standard approved by the American National Standards Institute and American Water Works Association ANSI/AWWA C600 (or latest revision). The Ductile Iron Pipe Research Association also publishes a pamphlet entitled "A GUIDE FOR THE INSTALLATION OF THE DUCTILE IRON PIPE " which is useful in outlining and describing the proper installation methods.

10.2 VALVE, BOX, SETTERS

10.2.1 Water Shut Off Valve:
6" & Larger: resilient seat gate valves see Section 10.1.5

10.2.3 Meter Boxes, Vaults and Valve Boxes: All meter boxes, meter vaults and valve boxes shall be constructed as shown on the drawings at the end in these regulations or by approved precast vaults/boxes. Contractors shall submit shop drawings to the Water Division for approval when precast vaults or boxes are to be used when the tap request is submitted. Service connections larger than two (2) inches in size shall have flanged meter connections as called for in ANSI/AWWA C110 Standards.

10.2.4 Meter and Valve Box & Cover: Minimum requirement

3" to 8" meters, except F.M. meters - in/out of traffic
Large Pyramid Box (Slab No. 2 & No. 3) - Drawings No. C308IZ, C308EZ
With dual three part frame & cover - Drawing No. C283Z

10" and large meters and all F.M. meters except 10" x 2" F.M. - in/out of traffic
Meter Vault - Drawing No. B-350-CZ, or
Precast Meter Vault - Drawing No. B350-1cz
With Precast Meter Vault Cover 8" in traffic, 5" out of traffic - Drawing No. C307Z

10" x 2" F.M. meters - in/out of traffic
Double Meter Vaults - Drawing No. C-317Z or
Precast Double Meter Vault - Drawing No. C317-1Z
With Precast Meter Vault Cover 8" in traffic, 5" out of traffic - Drawing No. C307Z

Valve box – 6" – 12"
Trench Adaptor (Buffalo Box / Roadway Box) (not allowed in arterial streets)
Pyramid Box (Slab No. 1 & No. 2) - Drawings No. C308IZ, B309BZ
Large Pyramid Box (Slab No. 2 & No. 3) - Drawings No. C308IZ, C308EZ

10.3 WATER MAIN INSTALLATION EITHER ON OR UNDER BRIDGES

10.3.1 Pipe & Joints: Ductile Iron pipe is to be connected by restrained joints connections specifically approve for use on or under bridges, such as Griffin Snap-Lok; US Pipe TR Flex or an approved equal. Field-Lok gaskets are not acceptable. Restrain joints shall be used past the edge of the bridge to the connection to the existing Water Division facilities. When penetrating a concrete structure the pipe shall be centered in a properly sized sleeve made of an approved material.

10.3.2 Expansion Joint: Expansion joints are to be installed on the main that is under or on a bridge. A sufficient number of the type joints listed below are to be install for the amount of pipe expansion or contraction that is anticipated. Expansion / contraction fitting are to have stainless steel nuts, bolts and washers

- For straight runs of pipe without offsets, use ROMAC Model EJ-401 or an approved equal
- For pipe with offset – A ball type flex expansion fitting of either single or double ball design as approved by the Water Division. EBAA Iron Flex-Tend Model 908; Star-Flex Series 5000 or an approved equal

10.3.3 Rollers and Restrictors: The ductile iron pipe is to be support by AWWA approved pipe rollers. Spacing on the rollers are to be sufficient to support the pipe when fill with water. Duplicate sets of roller are to be installed on top of the main at each support to restrict vertical movement of the main. Rollers are to be ASTM B3120 hot dip galvanized rollers sized for the pipe being supported. A minimum of two roller & restrictors are required per pipe segment.

11. TESTING, FLUSHING & DISINFECTION OF NEW WATER MAINS

11.0 Only Water Division authorized personnel shall determine whether a water main has met all relevant standards before the Water Division accepts the water main.

11.1 DISINFECTION

11.1.1 Disinfection Procedure: Before beginning the disinfection process, the contractor shall provide for review by the Water Division detailed written procedure that will be followed.

- Who will be performing the procedure and which disinfection method is to be used
- Point at which the water main is to be filled and air is to be discharged
- Points at which disinfectant will be injected, and that water is to be discharged
- Does the discharged water require dechlorination, and steps to be taken to accomplish that
- How disinfectant residual will be neutralized if necessary

11.1.2 Hydrostatic Testing: New water mains shall be hydrostatic tested as detailed in AWWA Standard C600. The Water Division may monitor this test.

11.1.3 Pre-Flushing: New water mains shall be flushed so the water velocity inside the main is maintained at 2.5 ft/sec. for the minimum period as recommended by the Water Division, or for as long as field conditions make necessary.

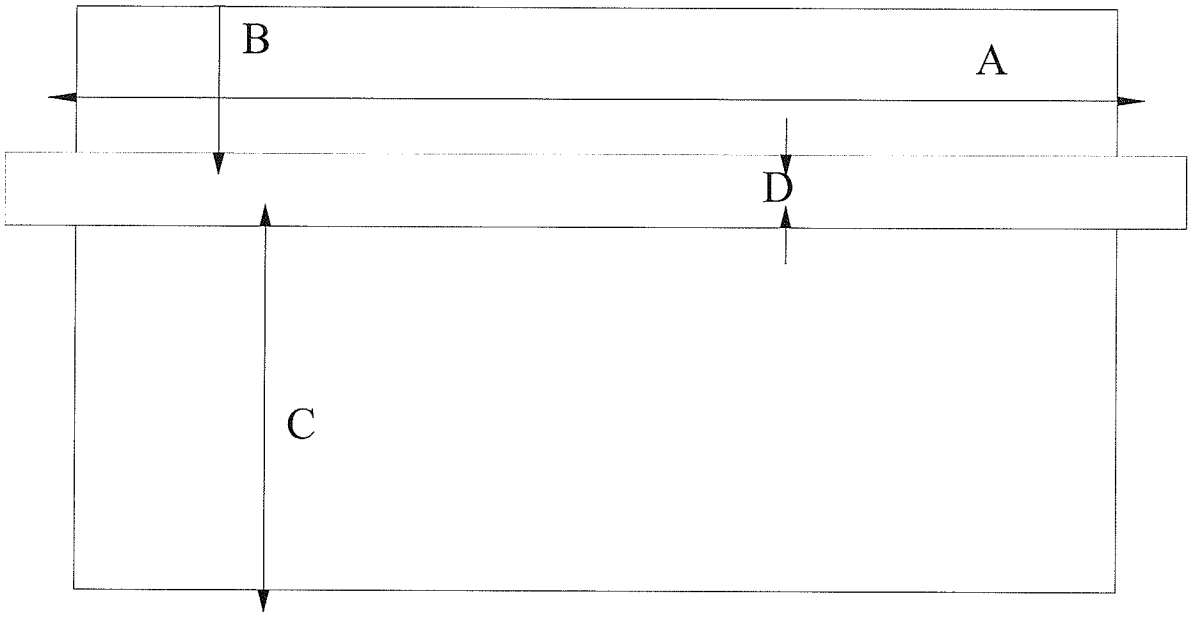
11.1.4 Disinfection: Prior approval must be obtained from the Water Division to use one of the methods detailed in AWWA Standard C651 for the disinfection of new water mains. The Water Division may monitor the disinfection process. If after the completion of the disinfection procedure, the required disinfectant level is not maintained, the contractor shall perform the procedure again. The contractor is to determine where the highly chlorinated water will be discharged and if that water must be dechlorinated per MO-DNR standards.

11.1.5 Post-Flushing: New water mains after disinfection shall be flushed so the water velocity inside the main is maintained at 2.5 ft/sec. for minimum of four hours or until the disinfectant level of the water being discharged has been reduced to a pre-established level plus one hour, whichever is longer.

11.1.6 Sampling: Only Water Division authorized personnel shall take water samples. If, in the opinion of the sample taker, the water quality discharged from the main does not meet the Division's minimum standards for turbidity or clarity, the water sample will not be taken. The contractor is responsible for performing those actions necessary to bring the main up to the standards set by AWWA.

11.2 FINAL ACCEPTANCE

Only Water Division authorized personnel shall determine if all relevant work has been completed to the satisfaction of the Water Division and the Water Division accepts the installation.



Drawing #2 Shape of Excavations

Table 2

Sizes of Excavations

Tap Size	Main Size	A	B	C	D	L X W
1 - 1"	6" - 12"	4'	1'	4'	1'	4' x 6'
1 - 1"	15" - 20"	4'	1'	4'	2'	4' x 7'
1 - 1-1/2" or 2"	6" - 12"	5'	1'	5'	1'	5' x 7'
1 - 1-1/2" or 2"	15" - 20"	5'	1'	5'	2'	5' x 8'
2 - 2"	6" - 12"	7'	1'	5'	1'	7' x 7'
2 - 2"	15" - 20"	7'	1'	5'	2'	7' x 8'
6" to 10" *	6" - 10"	5'	2'	7'	1'	5' x 10'
6" to 20" *	12" - 20"	6'	2'	7'	2'	6' x 11'
Tap Cut out or Replacement						
6" to 12" *	6" - 12"	6'	2'	5'	1'	6' x 8'
6" to 20" *	15" - 20"	8'	2'	5'	2'	8' x 9'
Dual Connection						
6" to 12" *	6" - 12"	11'	2'	5'	1'	11' x 8'
6" to 20" *	15" - 20"	13'	2'	5'	2'	13' x 9'

* Tap size can not exceed size of water main.

Table 5 STANDARD METER LAYING LENGTHS

METER SIZE	BOX TYPE	TYPE METER	METER LENGTH	GASKET & ADAPTOR ALLOWANCE	TOTAL LENGTH
			Small Service Connections		
5/8"	R or P	Domestic	1" Ford #84 Meter Setter		11"
3/4"	R or P	Domestic	1" Ford #84 Meter Setter		11"
1"	R or P	Domestic	1" Ford #84 Meter Setter		11"
1-1/2"	P	Domestic	13"	½"	13-1/2"
2"	P	Domestic	17"	½"	17-1/2"
3"	LP	Domestic	24"	½"	24-1/4"
			Large Service Connections		
3" [1]	LP	Domestic	24"	6-3/4"	30-3/4"
4" [2]	LP	Domestic	29"	4-1/4"	33-1/4"
6"	LP	Domestic	36-1/2"	½"	37"
8"	LP	Domestic	30-1/8"	½"	30-5/8"
10"	V	Domestic	41"	½"	41-1/2"
16"	V	Domestic	48-1/8"	½"	48-5/8"
4"x 2" FM [2]	V	Domestic & Fire	33"	4-1/4"	37-1/4"
6"x 2" FM	V	Domestic & Fire	45"	½"	45-1/2"
8"x 2" FM	V	Domestic & Fire	53"	½"	53-1/2"
10"x 2" FM	DV	Domestic & Fire	68"	½"	68-1/2"
4"x 1" DC [2]	LP	Fire	16-1/2"	4-1/4"	20 3/4"
6"x 1" DC	LP	Fire	22-1/2"	½"	23"
8"x 1" DC	LP	Fire	26-1/2"	½"	27"
10"x 2" DC	V	Fire	36"	½"	36-1/2"

R - Round meter box see Section 11.3.4 Page 17
P - Pyramid meter box see Drawing No. C308GZ
LP - Large pyramid meter box see Drawing No. C308EZ
V - Vault meter box see Drawing No. B-350-CZ
DV - Double vault meter box see Drawing No.C317-Z

1 - 6" Flange on inlet side and 3" flange on outlet side - use one (1) 6" x 3" meter adapter
2 - 6" Flange on inlet side and 4" flange on outlet side - use one (1) 6" x 4" meter adapter
If inlet & outlet piping are the same diameter, flange spacing should be as listed for that size meter.

CONTACT INFORMATION

Water main locations - MO-One Call 1-800-344-7483
The Water Division will only respond to facility locate requests received through Mo-One Call

Problems - Dispatchers - Service Delivery Group - 4600 McRee 314-633-9000 or
Water coming up, damage to Water Division property 314-771-4880
Help find or locate a valve or stop box Fax 314-771-4057
Low pressure / flow into facility
Emergency water Turn / Off

All Meters & Small Service Lines - Meter & Tap Section - 4600 McRee 314-633-9061
Small service technical information Fax 314-664-4074
All sizes and types of meter information
To schedule an inspection of a small tap destroy
To schedule an installation of a small service tap 1" - 3"
To schedule an inspection of meter box and meter installation
To obtain help on small service line performance

Service Tap Application Counter - Service Delivery Group - 4600 McRee Fax 314-664-4074
Purchase Small Tap (1" – 3" tap) 314-633-9029
Applications for a small service tap
Requirements for small service connections, 3" and smaller
Bidding, Scheduling & Status of Service Line Repair Program (Prop W)

Information on the locations of all service taps 314-633-9024
Estimate for work to be performed by the Water Division
To obtain information on Water Division facilities in a specific area
Requirements for large service connections, 6" and larger
Purchase: Large Tap (greater than 3"); hydrant relocate; or other work

Engineering - Service Delivery Group - 4600 McRee 314-633-9023
Technical information on large service connections Fax 314-664-4074
To schedule field inspections for large service connections 6" & larger
To schedule field inspections on main lays
To schedule inspection of large tap destroy
Review of engineering plans for proposed developments

Accounts - Customer Service Section - 1640 S. Kingshighway 314-771-2255
Opening a new account
Water rates
Deposit requirements new accounts
Water Turn On & Off, during normal business hours

Fire Protection Systems - Fire Marshall's Office 314-289-1900

Plumbing Systems - One Stop Building Permits, Building Division 314-622-3313

Excavation Permits - Street Department 314-647-3111 x 1019

13. Check List for Large Tap – 6" & larger

To Get the Tap NEED

- Accurate address for the structure
- Address has to have an opened account
- Copy Plumbing Permit
- Copy Excavation Permit
- Fire Marshall's Approval (if required)
- Sale slip Backflow Prevention Device (if it is required)
- Pay for tap (fix fee + cost of OT if necessary)
    - For fire flow meter (if required)
- Schedule tap when excavation is ready

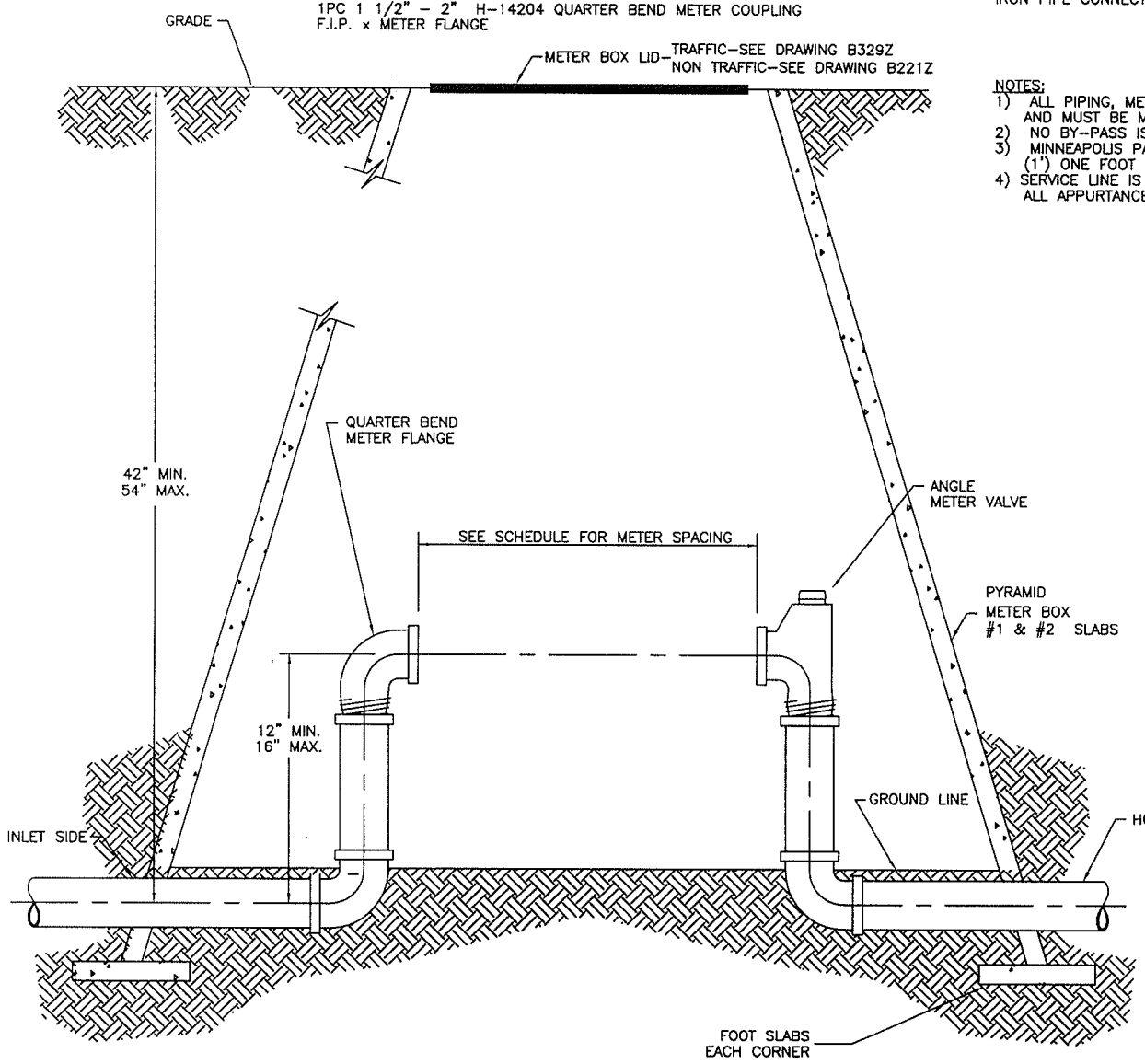
Placement & Condition of Excavation

- Service Tap located at least 6' inside building line
- Excavation sized for type tap see Table 2 pg 23
- Service line straight & perpendicular to main
- Excavation
    - shored,
    - rocked,
    - dry / mud free
- Main exposed,
    - clean
    - no pipe bell in immediate area of new tap (usually this means not in the excavation)
    - no other taps in immediate area of new tap (usually this means not in the excavation)

CITY OF ST. LOUIS

1 1/2" AND 2" METER SETTER REQUIREMENTS

1PC 1 1/2" – 2" H-14286-01 ANGLE METER STOP WITH LOCK WING
F.I.P. x METER FLANGE
1PC 1 1/2" – 2" H-14204 QUARTER BEND METER COUPLING
F.I.P. x METER FLANGE



THE PLUMBING CONTRACTOR IS TO FABRICATE THE METER SETTER ACCORDING TO FIELD CONDITIONS. ALL SOLDER JOINTS SHALL BE WITH SILVER SOLDER. BOTH THE ANGLE METER VALVE AND THE QUARTER BEND METER COUPLING WILL FIT EITHER 1 1/2" OR 2" METERS. BOTH HAVE 2" FEMALE IRON PIPE CONNECTIONS.

NOTES:
1) ALL PIPING, METER BOX, FRAME AND COVER BELONG TO THE CUSTOMER AND MUST BE MAINTAINED BY THE CUSTOMER.
2) NO BY–PASS IS PERMITTED ON THE METER SETTER.
3) MINNEAPOLIS PATTERN T–HEAD AND STOP BOX SHALL BE PLACED (1') ONE FOOT BEHIND THE CURB.
4) SERVICE LINE IS OWNED AND MAINTAINED BY THE CUSTOMER INCLUDING ALL APPURTANCES.

METER SIZE	SPACING
5/8" TO 1"	FORD #84 METERSETTING
1–1/2"	13–1/2"
2"	17–1/2"

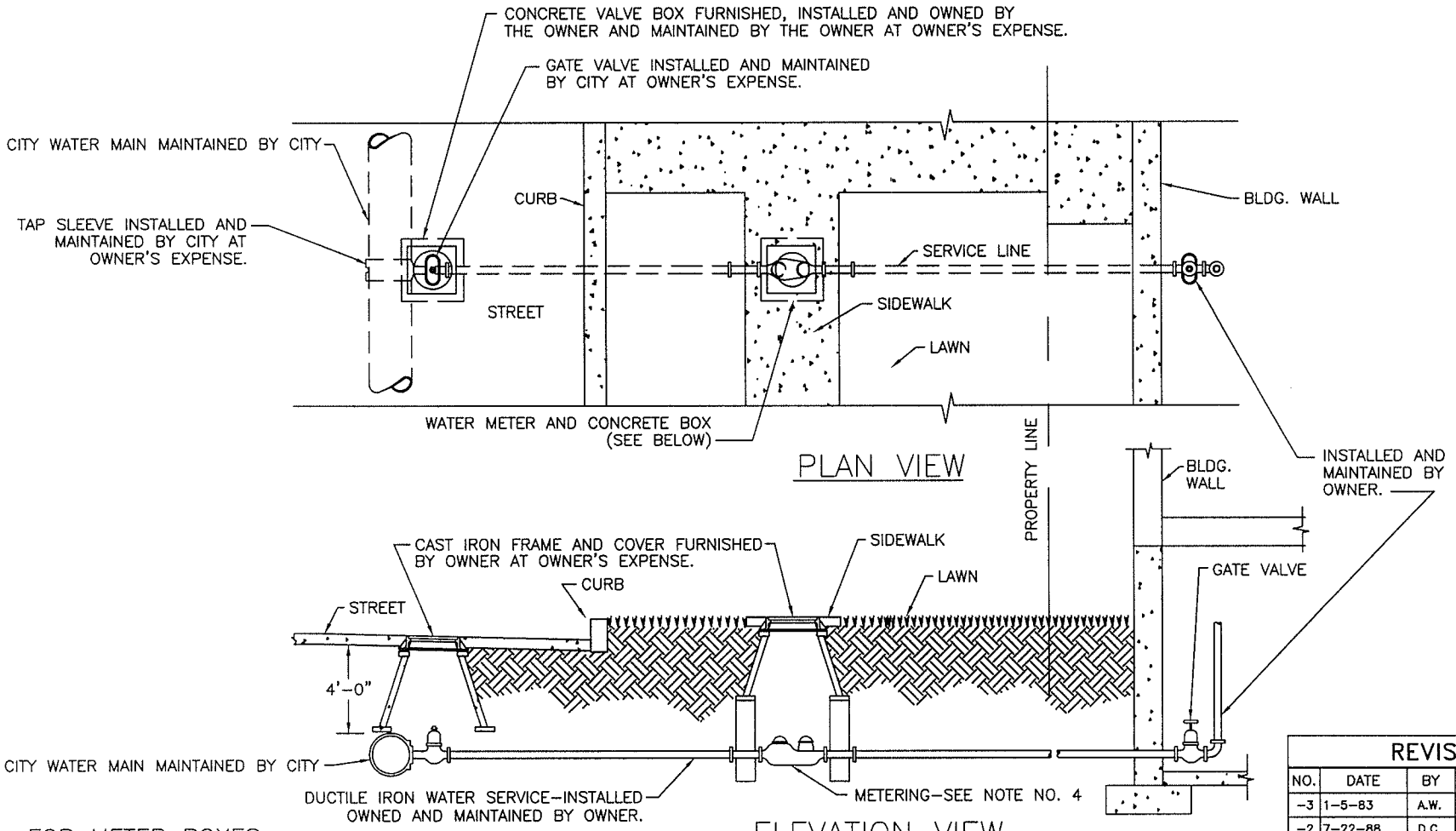
REVISIONS

NO.	DATE	BY	NOTE
1	5–7–2004	D.L.	DIMENSIONS
2	5–13–2004	D.L.	DWG. CHANGES

CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION – SERVICE DELIVERY GROUP

PYRAMID METER BOX
SETTER REQUIREMENTS

W.O. NO.		SHEET OF
DESIGNED BY:	DRAWN BY: WILEY	CHECKED BY: M.A.N.
APPROVED BY:		SCALE: NOT TO SCALE
FILE NO:	DRAWING NO: C308GZ	DATE CREATED: 6/12/98



FOR METER BOXES

SEE DRAWING C-308AZ FOR 1 1/2" & 2" DOMESTIC WATER SERVICE
SEE DRAWING C-308EZ FOR 3", 4", 6" & 8" DOMESTIC METER & 4", 6" & 8" D.C. METER SERVICE

NOTE 1 DUCTILE IRON WATER SERVICE FROM WATER MAIN TO PROPERTY LINE, INSTALLED AND MAINTAINED BY OWNER.

NOTE 2 ANY REPAIRS TO TAPPING SLEEVE OR TAPPING VALVE WHICH REQUIRE SHUTTING DOWN OF CITY MAIN MUST BE DONE BY WATER DIVISION AT OWNER'S EXPENSE.

NOTE 3 CONCRETE VALVE BOX MAINTAINED BY OWNER AT OWNER'S EXPENSE. ADJUSTMENT'S DUE TO PAVING WILL BE AT OWNER'S EXPENSE.

NOTE 4 METER'S – ON DOMESTIC LINE
FURNISHED, INSTALLED OWNED, AND MAINTAINED BY WATER DIV.
METER'S – ON AUTOMATIC SPRINKLER LINE
FURNISHED, INSTALLED AND MAINTAINED BY WATER DIVISION.

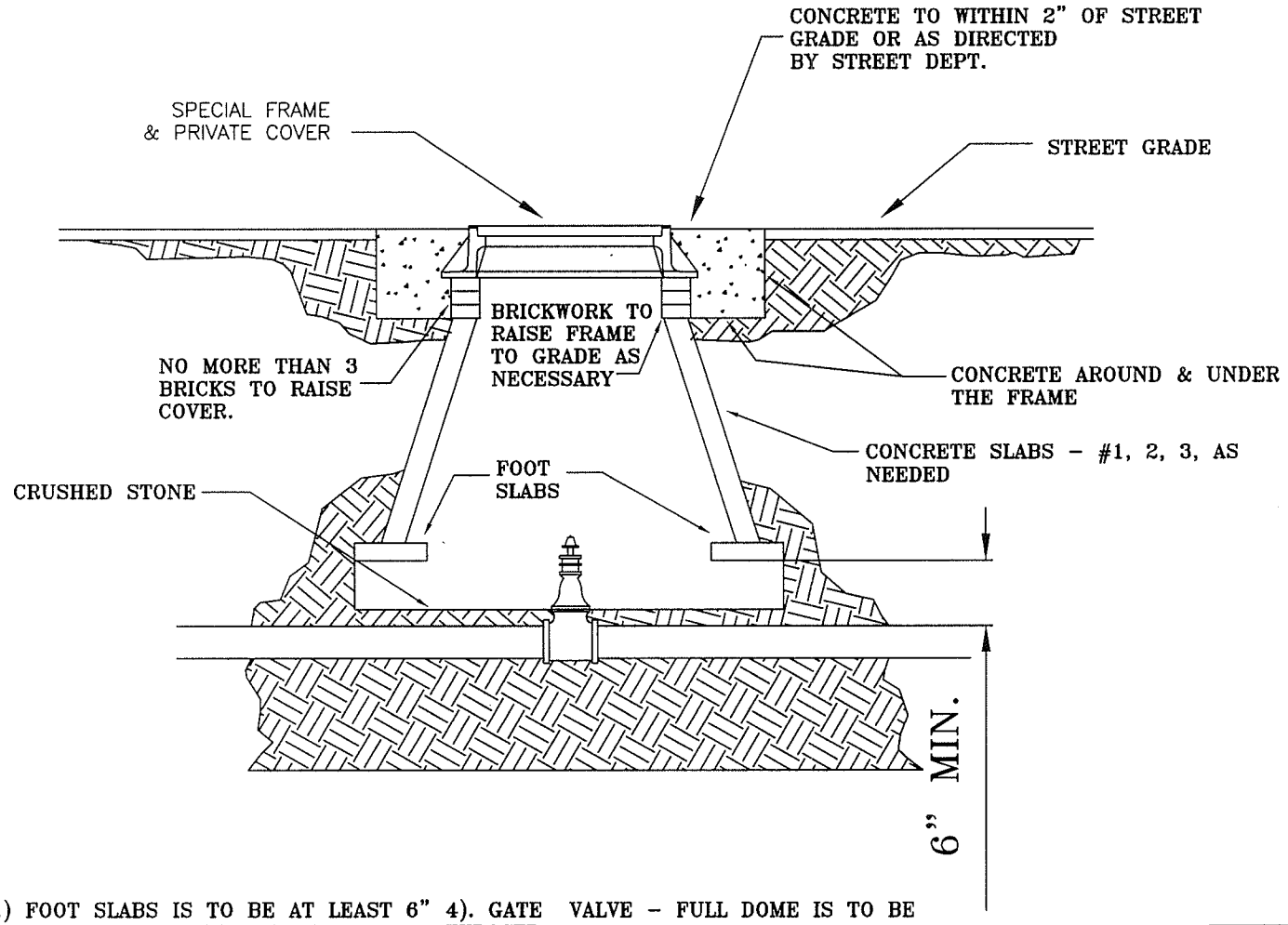
SEAL

REVISIONS			
NO.	DATE	BY	NOTE
-3	1-5-83	A.W.	
-2	7-22-88	D.C.	
-1	12-17-92	M.O'B.	
0	3/24/94	CFS	REDRAW IN CAD
1	8/31/99	BS	NOTES CHANGES

CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION – SERVICE DELIVERY GROUP

DETAIL OF INSTALLATION OF PRIVATE CAST IRON CONNECTIONS FOR DOMESTIC OR AUTOMATIC SPRINKLER SERVICES

W.O. NO.		SHEET OF
DESIGNED BY:	DRAWN BY: CFS	CHECKED BY:
APPROVED BY:		SCALE: NONE
FILE NO:	DRAWING NO: C308BZ	DATE CREATED: 3/24/94



NOTES:

1.) FOOT SLABS IS TO BE AT LEAST 6" FROM MAIN OR SERVICE LINE.

2.) IF VALVE IS ATTACHED TO A TAPPING SLEEVE, VALVE BOX IS TO STRADDLE VALVE & MAIN.

3.) APPROVED RISER CAN BE USED TO RAISE COVER.

4). GATE VALVE - FULL DOME IS TO BE EXPOSED.

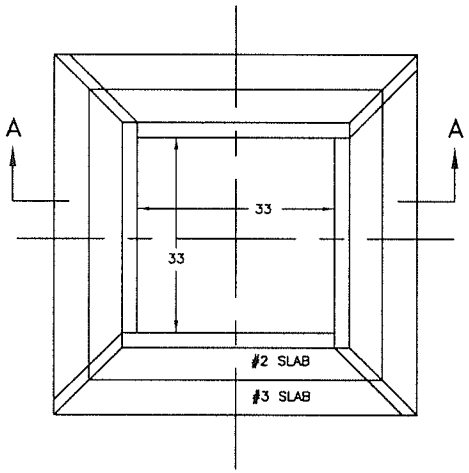
5.) BALL VALVE - ENTIRE VALVE IS TO BE EXPOSED.

SEAL

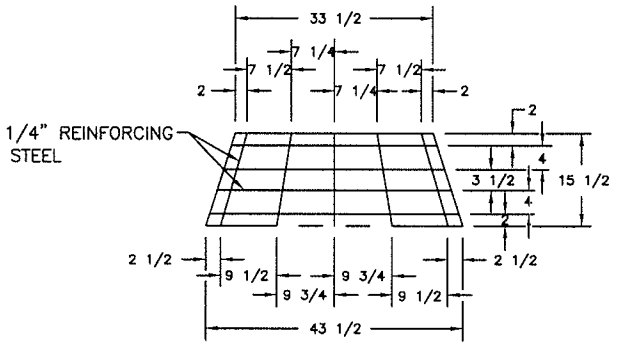
CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

VALVE BOX
INSTALLATION OR ADJUSTMENT
DETAIL

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: D.L.	CHECKED BY:
APPROVED BY:		SCALE: NO SCALE
FILE NO:	DRAWING NO: C310AZ	DATE CREATED: 5/14/2004

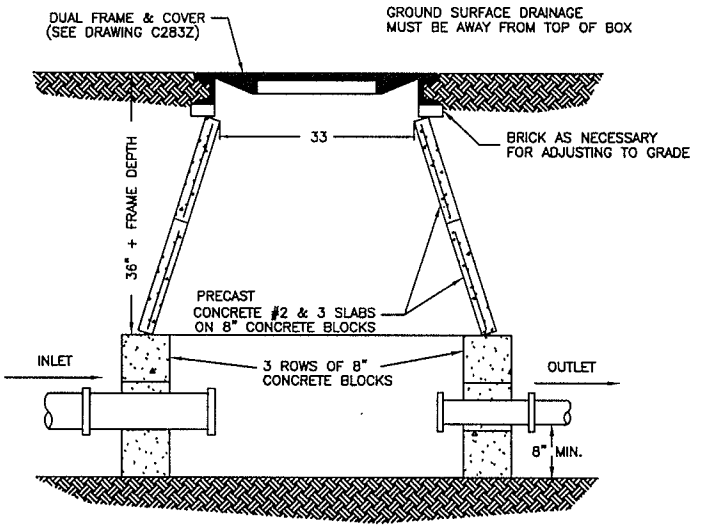


PLAN

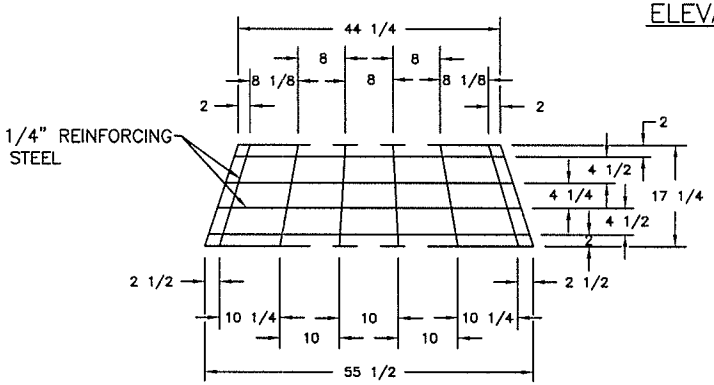


STEEL REINFORCING FOR #2 SLAB

Approx. 1.09 cu. ft.
of concrete or .04 cu. yds.
per section.

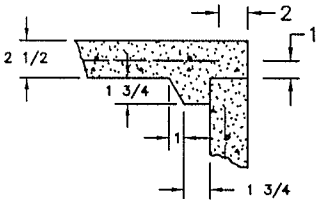


METER BOX ELEVATION

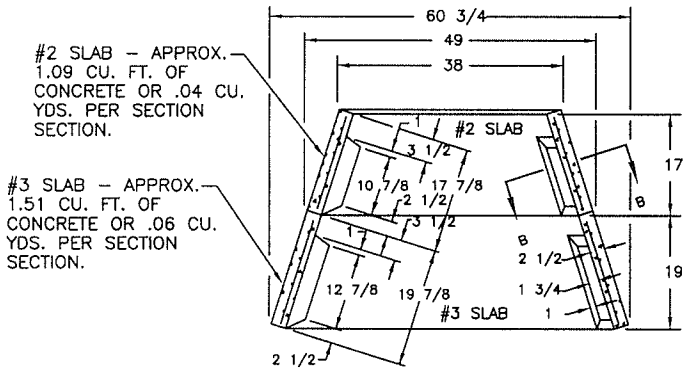


STEEL REINFORCING FOR #3 SLAB

Approx. 1.51 cu. ft.
of concrete or .06 cu. yds.
per section.



SECTION B–B



SECTION A–A

REVISIONS			
NO.	DATE	BY	NOTE
-2	10-xx-80		
-1	7-22-88	DC	
0	11-6-92	MOB	REV. FROM C-308-E
1	12-15-92	MOB	ADDED NEW NOTE #7.
2	3-23-94	BS	GENERAL CHANGES
3	8-31-99	BS	GENERAL CHANGE

NOTES:

1. Depth of box shall be at least 8" below bottom of the pipes.
2. There shall be at least 8" above the top of the pipe before the precast concrete slabs.
3. Any brickwork or concrete block work shall have cement mortar joints inside and outside.
4. Frame and cover shall be centered over meter.
5. The pipe coming into the box shall be at least 6" in diameter on the inlet side of the meter. Reducers shall be furnished by owner and installed in the meter box.
6. Meter box to be located in area other than Trafficway and where surface water will not drain into it.
7. Meter box to be installed in sidewalk area between curb & property line, unless another location is authorized by the St. Louis Water Division.
8. Damaged materials will not be acceptable and meter will not be set until corrections are made.

SEAL

PLOTTING NOTES:

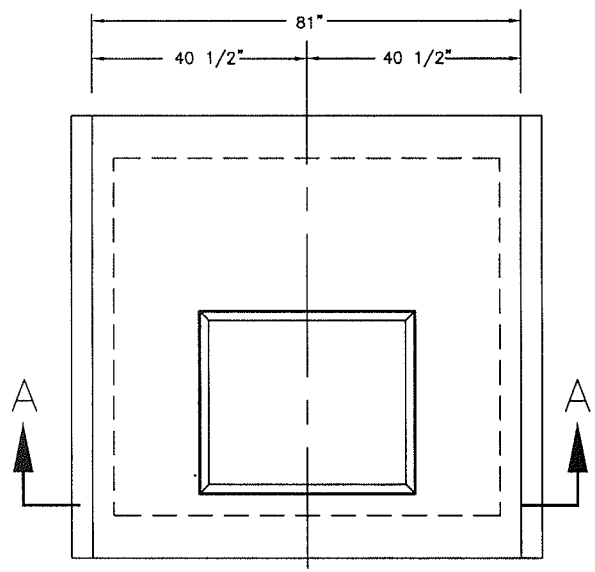
For Imaging in C.I. Specs, use Laser printer and ACI plotting file. Change scale in title block to "NOT TO SCALE" and plot at 0.22=12 scale. Adjust line weights for best appearance.

CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES

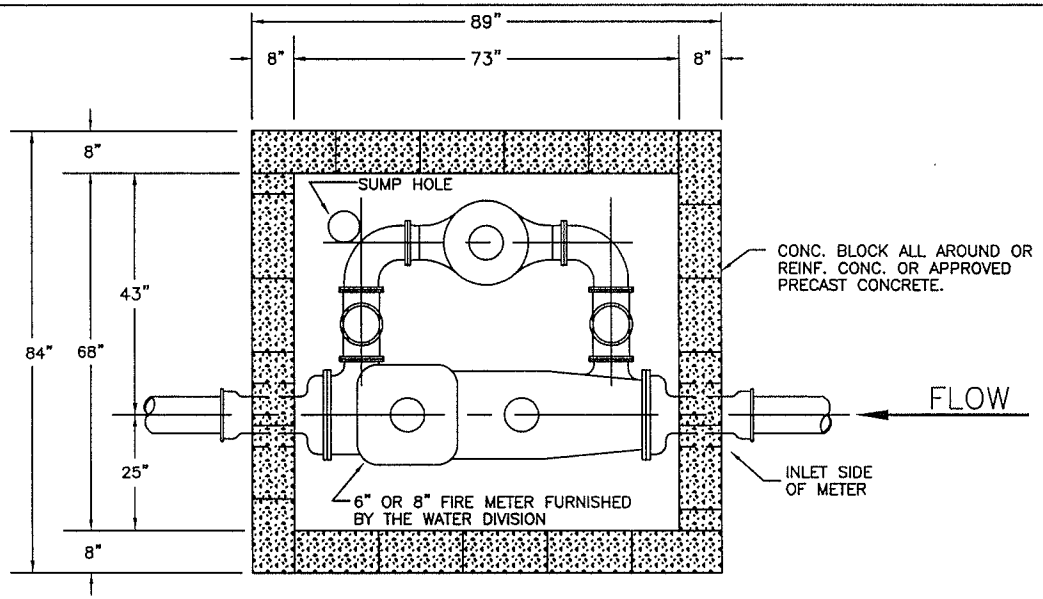
WATER DIVISION – SERVICE DELIVERY GROUP

CONCRETE SLAB DETAILS FOR
STANDARD METER BOXES
3", 4", 6" AND 8" DOMESTIC METER
4", 6" AND 8" D.C. METER

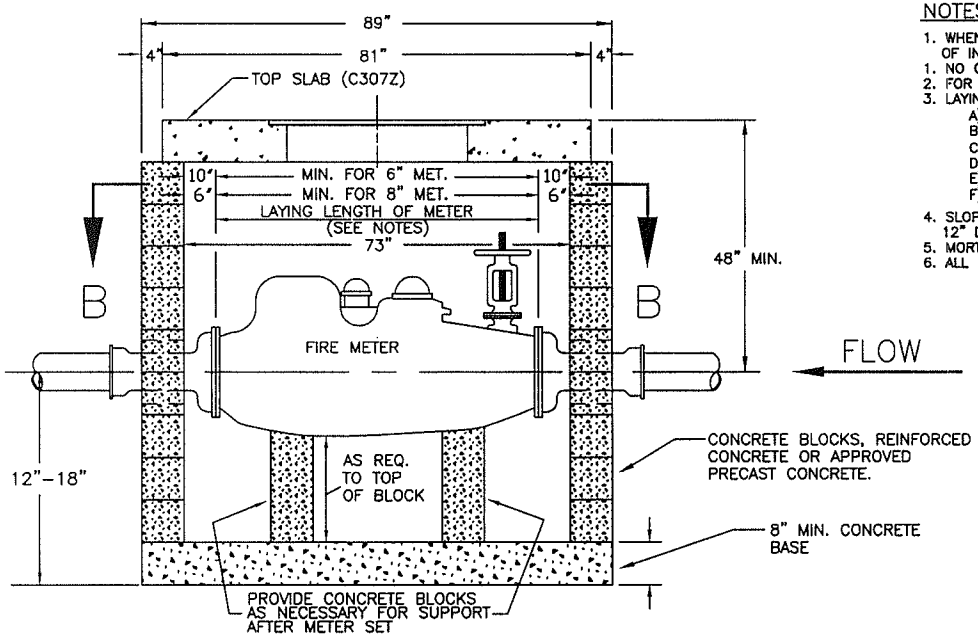
W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: MOB	CHECKED BY: TRS
APPROVED BY:		SCALE: 3/4" = 1'
FILE NO:	DRAWING NO: C308EZ	DATE CREATED: 11-6-92



PLAN VIEW



SECTION B–B



SECTION A–A

NOTES:

1. WHEN BUILDING METER BOX, PROVIDE AT LEAST 43" TO THE RIGHT OF INLET AS BY–PASS IS ON THAT SIDE.
1. NO CONNECTIONS, BELLS, ETC. SHALL BE WITHIN 6" OF THE WALLS.
2. FOR TOP SLAB SEE DRAWING NO. C–307Z.
3. LAYING LENGTH FOR METERS SHALL BE:
   - A) 10" DOM – 41–1/2"
   - B) 16" DOM – 48–5/8"
   - C) 4" F.M. – 37–1/4"
   - D) 6" F.M. – 45–1/2"
   - E) 8" F.M. – 53–1/2"
   - F) 10" D.C. – 36–1/2"
4. SLOPE FLOOR TO ANY ONE CORNER WHERE THERE SHALL BE A 6" DIA. BY 12" DEEP SUMP.
5. MORTAR JOINTS SHALL BE USED ON ALL BLOCK WALLS.
6. ALL PIPE SHALL BE ANCHORED IN AN APPROVED WAY.

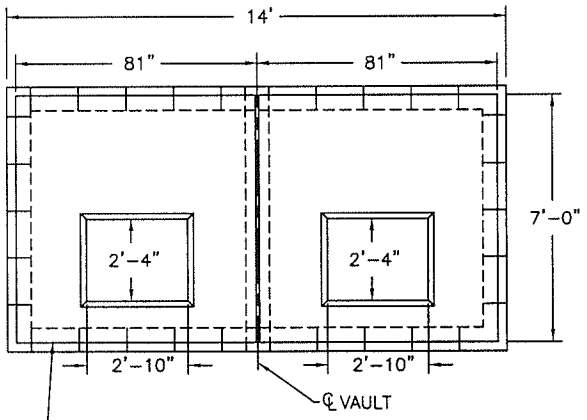
REVISIONS

NO.	DATE	BY	NOTE
–3	1/04/83	A.W.	
–2	7/22/88	D.C.	
–1	12/17/92	M.O'B.	
0	3/28/94	SC	REDRAWN IN COMPUTER
1	5/7/2004	D.L.	NOTE CHANGES

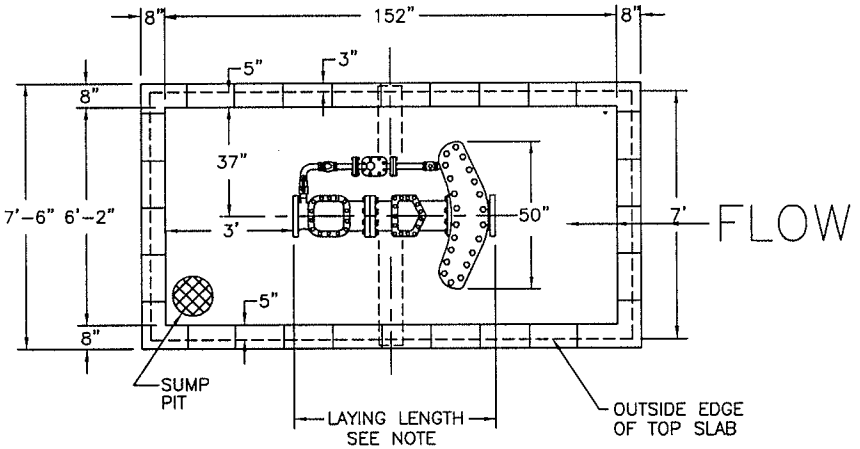
CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION – SERVICE DELIVERY GROUP

METER VAULT

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: SC	CHECKED BY: BS
APPROVED BY:		SCALE: 3/4" = 1'–0"
FILE NO:	DRAWING NO: B–350–CZ	DATE CREATED: 11/10/94



TOP VIEW

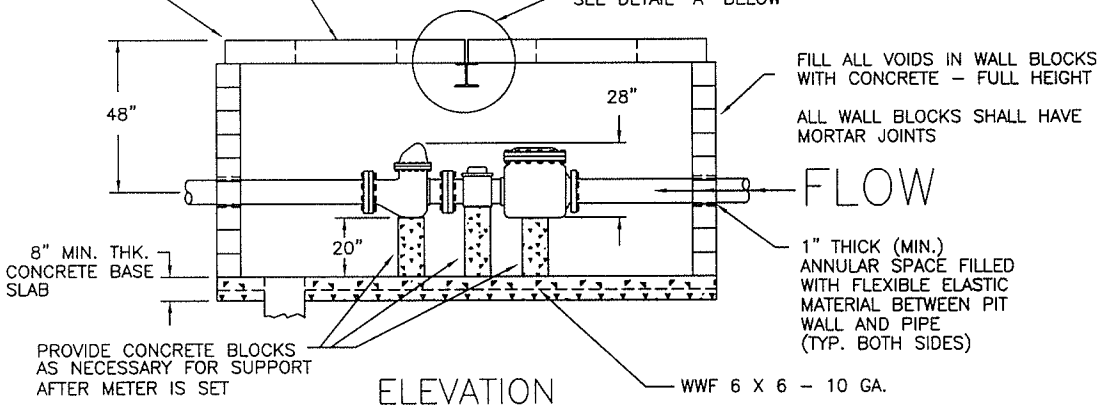


PLAN

6'-9" X 7'-0" X 8" THK. SLAB. SEE DWG. C-307

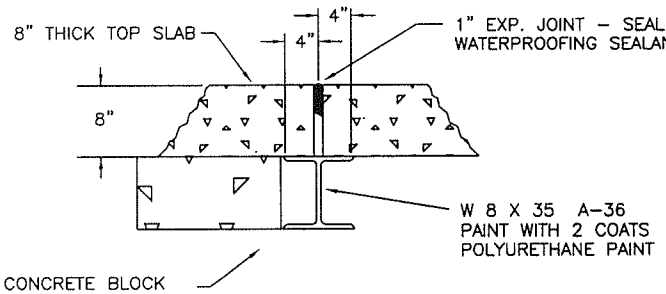
1" EXP JOINT AROUND EDGE.

SEE DETAIL "A" BELOW



ELEVATION

NOTE:
LAYING LENGTH EQUALS 68" + 1/2" GASKET ALLOWANCE.



DETAIL "A"

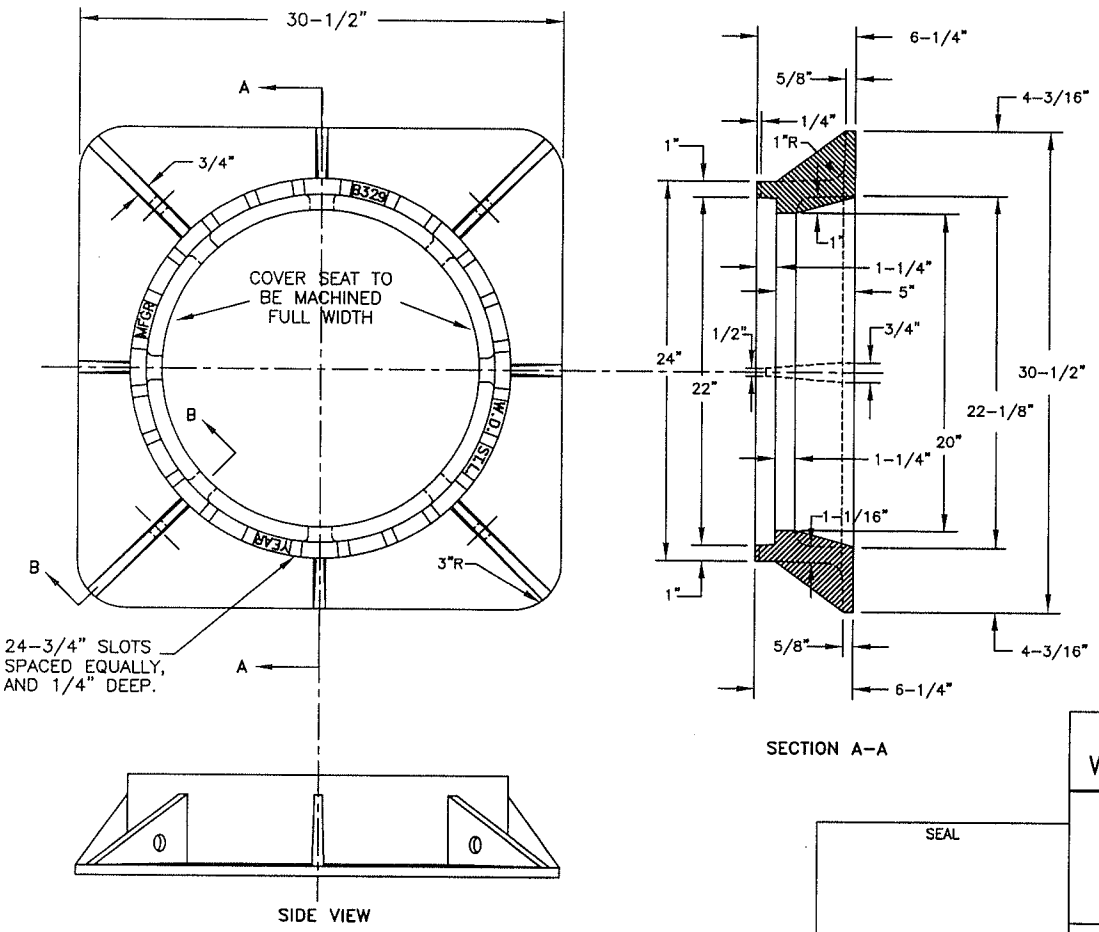
REVISIONS			
NO.	DATE	BY	NOTE

SEAL

CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

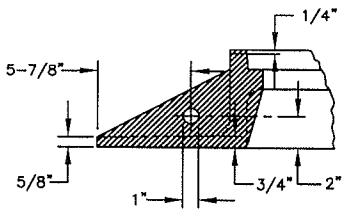
DOUBLE METER VAULT
10 INCH X 2 INCH F.M.

W.O. NO.		SHEET 1 OF 1
DESIGNED BY: STF	DRAWN BY: CAD	CHECKED BY: MAN
APPROVED BY:		SCALE: 3/8" = 1'-0"
FILE NO:	DRAWING NO: C317Z	DATE CREATED: 01-17-1992



NOTE: W.D.-ST.L.,YEAR,
B-329,& MFGR'S NAME
TO BE IMBEDDED 1/8"

SECTION A-A



SECTION B-B

EST. WEIGHT: 263 LBS (8-17-1948)

SEAL

REVISIONS

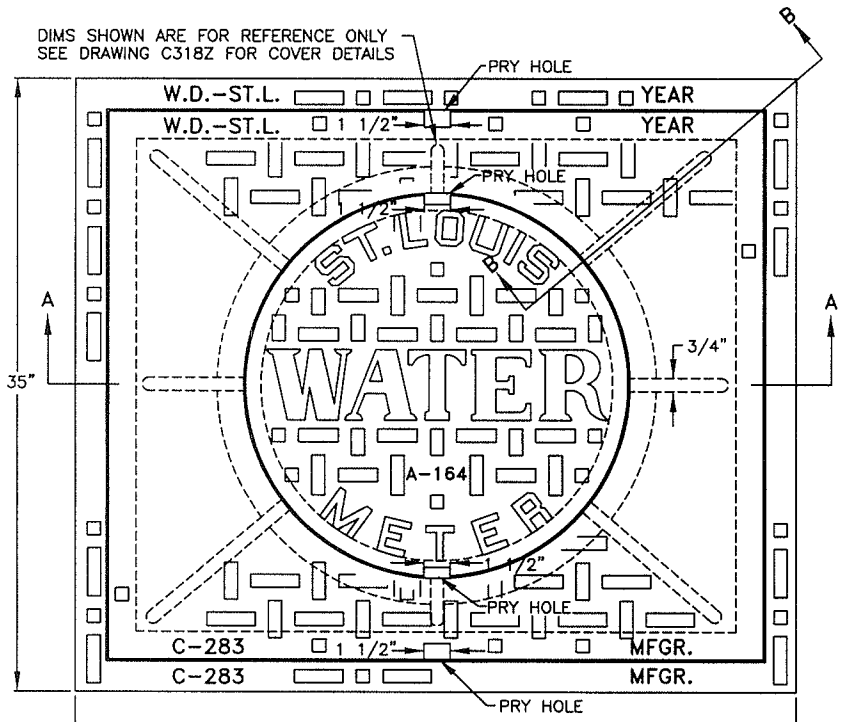
NO.	DATE	BY	NOTE
-5	03-26-1937	TEF	ORIG. ISSUE
-4	05-16-1938	TEF	
-3	09-07-1939	TEF	
-2	10-05-1945	JN	REPLACING B-213
-1	05-20-1958	JL	
0	5-7-2004	D.L.	TITLE CHANGE

CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES

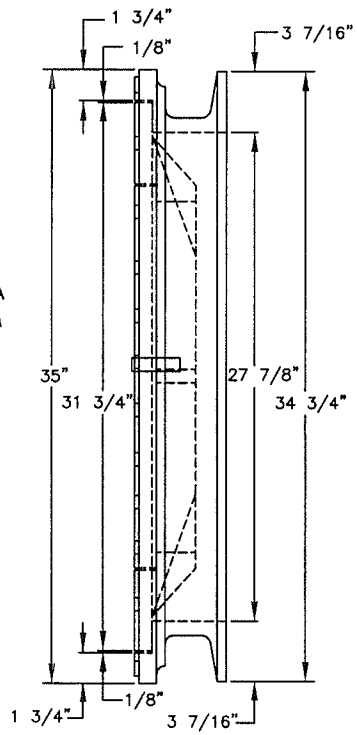
WATER DIVISION - SERVICE DELIVERY GROUP

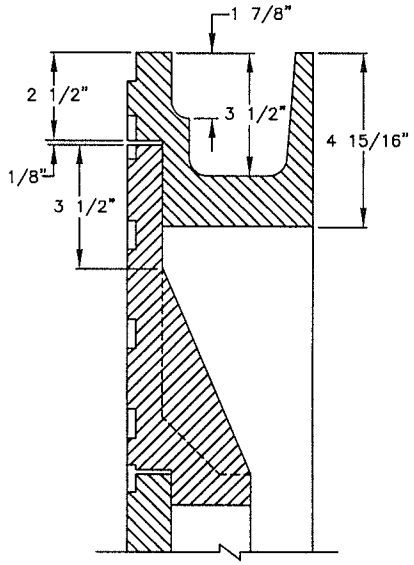
"SPECIAL" CAST IRON CIRCULAR FRAME
FOR VEHICLE TRAFFIC AREAS

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: CAD	CHECKED BY: TRS
APPROVED BY:		SCALE: 1/8" = 1"
FILE NO:	DRAWING NO: B329Z	DATE CREATED: 10-11-1991

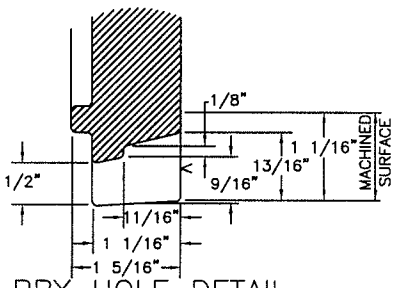


ELEVATION AT A-A



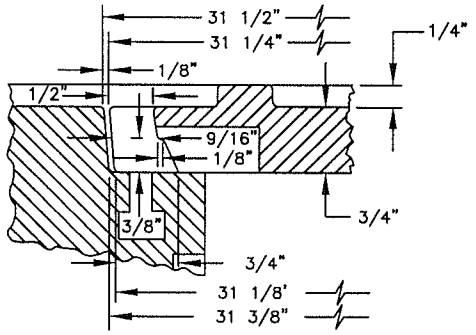


DETAIL OF SECTION B-B ENLARGED 2 TIMES

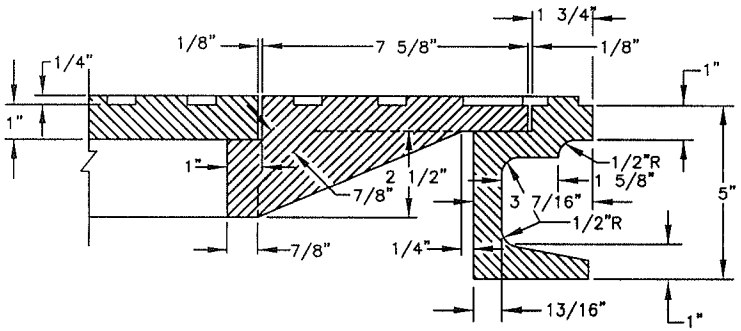


PRY HOLE DETAIL

NOTE: SCALE: 1" =1"
SLOTS (PRY HOLES) FOR RAISING COVER MUST BE OPPOSITE LETTER "T" IN WATER AS SHOWN.



ENLARGED DETAIL OF PRY HOLE IN SQUARE COVER



ENLARGED DETAIL OF SECTION A-A

EST. WEIGHT
FRAME = 311 lbs.
SQ. COVER = 219 lbs.
ROUND COVER = 105 lbs.
TOTAL = 635 lbs.

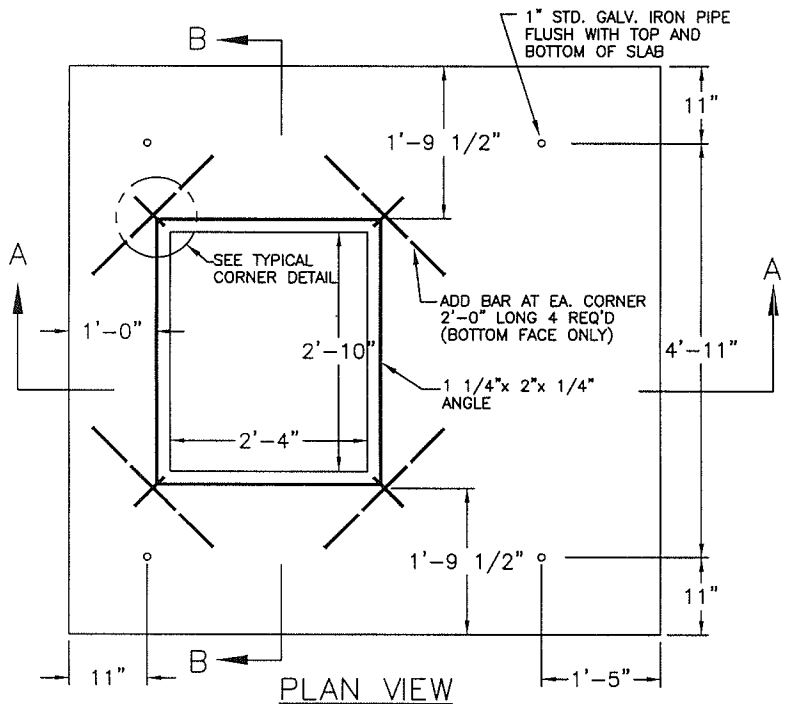
REVISIONS

NO.	DATE	BY	NOTE
-2	05-29-1946	WLH	ORIG. ISSUE
-1	05-21-1958	JL	

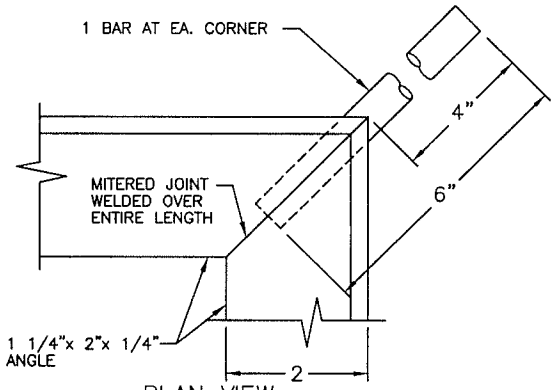
CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

DUAL FRAME AND COVER
FOR LARGE METER INSTALLATION

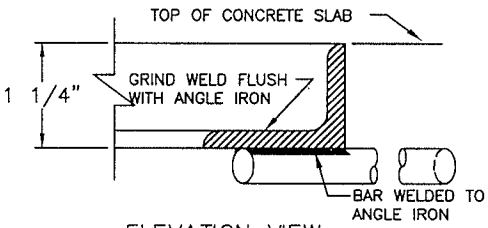
W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: CAD	CHECKED BY: TRS
APPROVED BY:		SCALE: 3/16" = 1"
FILE NO:	DRAWING NO: C283Z	DATE CREATED: 10-01-1991



PLAN VIEW
SCALE: 1" = 1'-0"

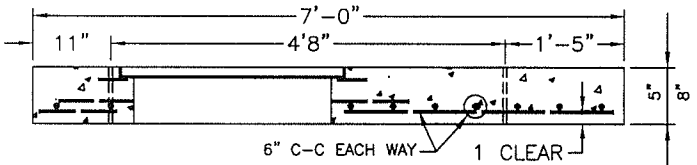


PLAN VIEW

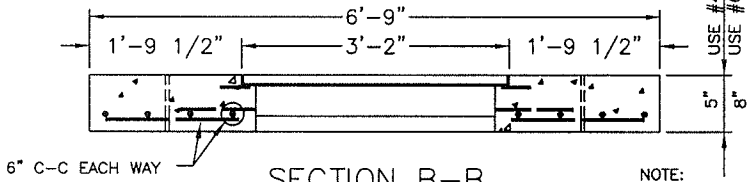


ELEVATION VIEW

TYPICAL CORNER DETAIL
NOT TO SCALE



SECTION A-A
SCALE: 1" = 1'-0"



SECTION B-B
SCALE: 1" = 1'-0"

NOTES:
1. ALL CORNERS OF FRAME MUST BE SQUARE. FRAME IS TO RECEIVE CAST IRON FRAME & COVER. SEE DRAWING C283Z.
2. PAINT ANGLE IRON WITH RED OXIDE PRIMER.
3. REFER TO DRAWING B350CZ FOR VAULT DETAILS.

NOTE:
FOR 5" THICK COVER USE #4 BARS
FOR 8" THICK COVER USE #6 BARS

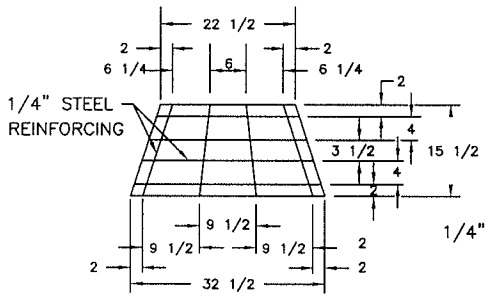
REVISIONS			
NO.	DATE	BY	NOTE
-1	7/22/88	DC	
0	10/01/94	AW	REDRAW
1	8/31/99	BS	NOTES CHANGES
2	5/7/2004	D.L.	TITLE CHANGES

SEAL

CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION – SERVICE DELIVERY GROUP

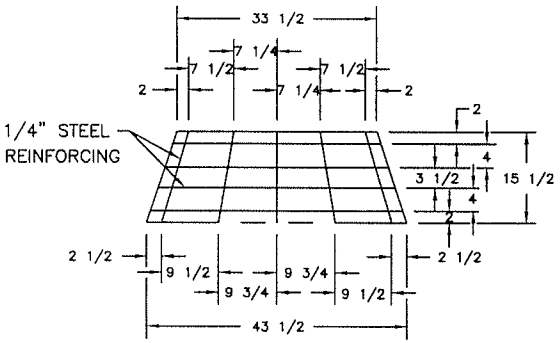
PRECAST METER VAULT
LID COVER

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: AW	CHECKED BY:
APPROVED BY:		SCALE: AS NOTED
FILE NO:	DRAWING NO: C307Z	DATE CREATED: 3-29-94



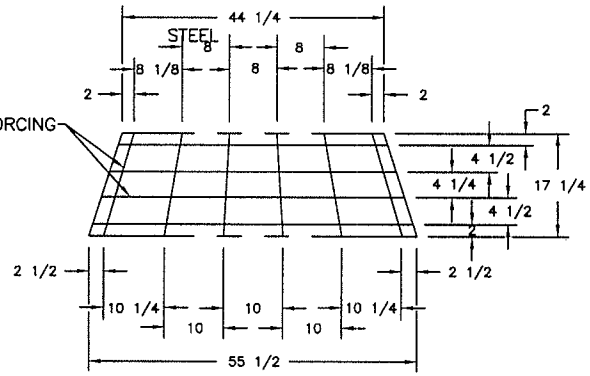
STEEL REINFORCING FOR #1 SLAB

Approx. .80 cu. ft. of concrete, or .03 cu. yds. per section.



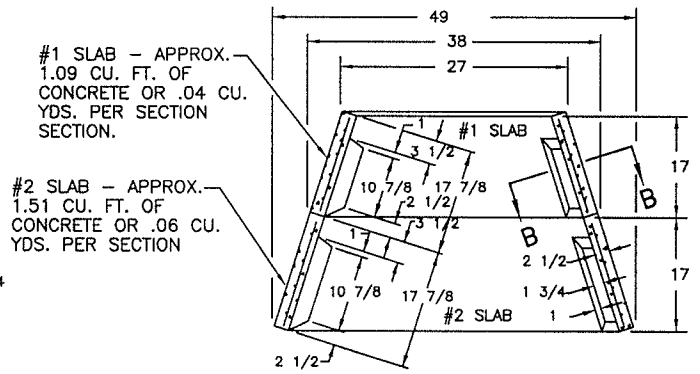
STEEL REINFORCING FOR #2 SLAB

Approx. 1.09 cu. ft. of concrete, or .04 cu. yds. per section.

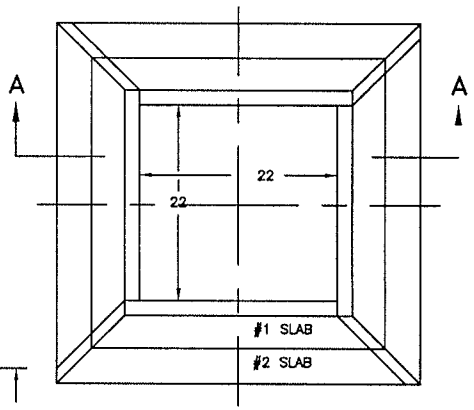


STEEL REINFORCING FOR #3 SLAB

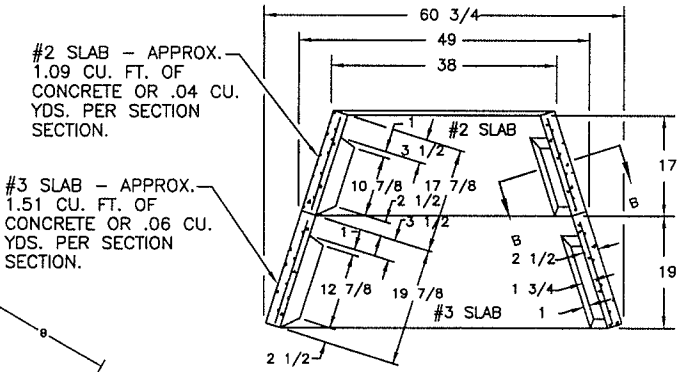
Approx. 1.51 cu. ft. of concrete or .06 cu. yds. per section.



SECTION A–A

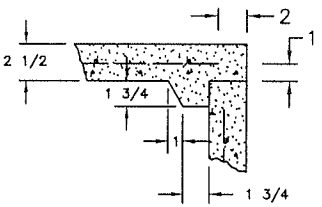


PLAN

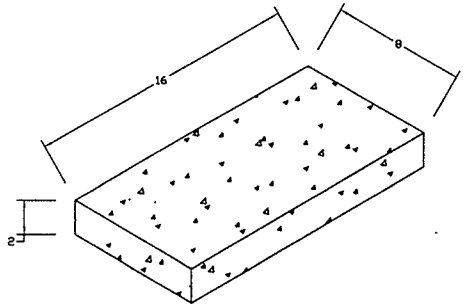


SECTION A–A

LARGE PYRAMID



SECTION B–B



CONCRETE FOOT SLAB

SEAL

PLOTTING NOTES:

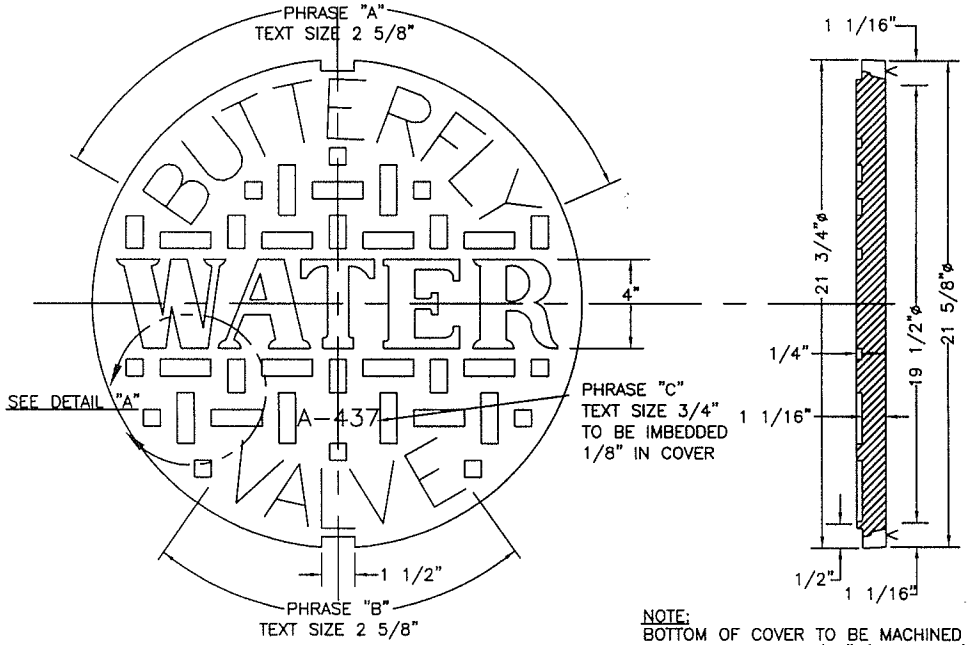
For including in C.I. Specs, use Laser printer and ADI plotting file. Change scale in title block to "NOT TO SCALE" and plot at 0.22=12 scale. Adjust line weights for best appearance.

CITY OF ST. LOUIS – DEPARTMENT OF PUBLIC UTILITIES

WATER DIVISION – SERVICE DELIVERY GROUP

CONSTRUCTION DETAILS FOR PYRAMID CONCRETE SLABS #1, 2, & 3

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: D.L.	CHECKED BY: TRS
APPROVED BY:		SCALE: NONE
FILE NO:	DRAWING NO: C308IZ	DATE CREATED: 5-11-2004



NOTE:
BOTTOM OF COVER TO BE MACHINED FROM EDGE IN 1 1/16" (AS SHOWN)

CAST IRON MANHOLE COVER (A-437)

SCALE: 1/4" =1"

NOTE:
MANHOLE COVER A-437 (BUTTERFLY VALVE) AS SHOWN ABOVE. ALL OTHERS ARE AS INDICATED IN PHRASE DESCRIPTIONS, AND SMALLER DETAILS ON THIS SHEET. ALL TEXT STYLES SHALL BE SIMILAR TO THOSE INDICATED ON THIS DRAWING. TEXT FOR PHRASES "A", "B", AND "WATER" SHALL BE RAISED 1/4".

PHRASE DESCRIPTIONS

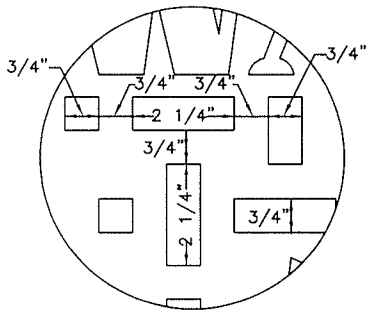
COVER NO.	MANHOLE COVER TYPE	PHRASE "A"	PHRASE "B"	PHRASE "C"
A-148	PRIVATE WATER VALVE	PRIVATE	VALVE	A-148
A-149	PITOMETER WATER TAP	PITOMETER	TAP	A-149
A-151	SEPARATING WATER VALVE	SEPARATING	VALVE	A-151
A-164	ST. LOUIS WATER METER	ST. LOUIS	METER	A-164
A-346	BLOW OFF WATER VALVE	BLOW OFF	VALVE	A-346
A-352	HYDRANT WATER VALVE	HYDRANT	VALVE	A-352
A-396	ST. LOUIS WATER DIVISION	ST. LOUIS	DIVISION	A-396
A-437	BUTTERFLY WATER VALVE	BUTTERFLY	VALVE	A-437

COVER NO. A-148 | COVER NO. A-149 | COVER NO. A-151
COVER NO. A-164 | COVER NO. A-346 | COVER NO. A-352 | COVER NO. A-396

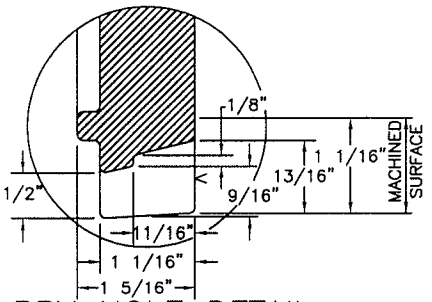
CAST IRON MANHOLE COVERS

NOT TO SCALE

NOTE:
THIS DRAWING SUPERSEDES THE FOLLOWING DRAWINGS: A-148, A-149, A-151, A-164, A-346, A-352, A-396 AND A-437; AND SHALL BE USED SOLELY IN THEIR PLACE.



DETAIL "A"
SCALE: 1/2" =1"



PRY HOLE DETAIL
SCALE: 1" =1"

NOTE:
SLOTS (PRY HOLES) FOR RAISING COVER MUST BE OPPOSITE LETTER "T" IN WATER AS SHOWN.

ESTIMATED WEIGHT: 105 lbs.

SEAL

CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

CIRCULAR COVERS

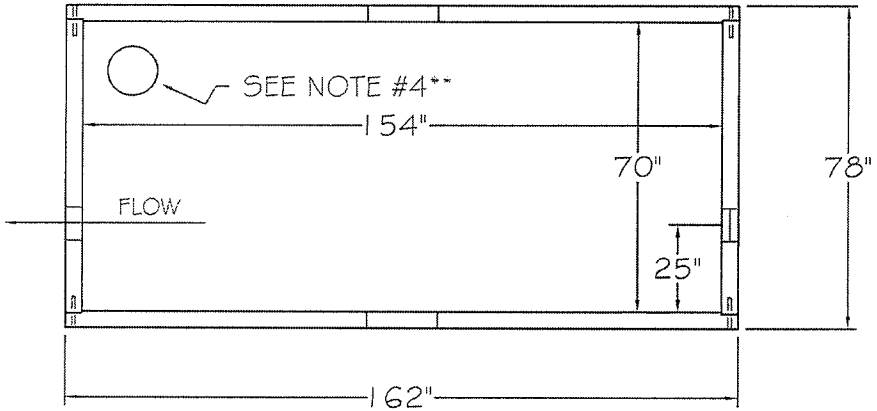
W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: AW	CHECKED BY:
APPROVED BY:		SCALE: AS NOTED
FILE NO:	DRAWING NO: C318Z	DATE CREATED: 8/15/94

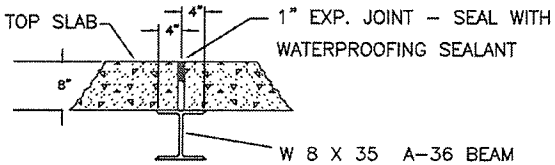
NOTES: APPROVED METER VAULTS
AVAILABLE FROM: 1) HEREFORD CONCRETE PRODUCTS
2) CHAMPION PRECAST INC.
F.M. METER VAULT LID DWG # C307Z (2 REQUIRED)
PROVIDE SUMP HOLE IN BASE

* WALL THICKNESS-4" TYPICAL & BASE
#5 REBAR @ 12" CC E & W IN BASE & SIDE WALLS

1. NO CONNECTIONS, BELLS, ETC. SHALL BE WITHIN 6" OF THE WALLS.
2. FOR TOP SLAB SEE DRAWING NO. C-307Z.
3. LAYING LENGTH FOR METERS SHALL BE:
   A) 10" DOM - 41-1/2"
   B) 16" DOM - 48-5/8"
   C) 4" F.M. - 37-1/4"
   D) 6" F.M. - 45-1/2"
   E) 8" F.M. - 53-1/2"
   F) 10" D.C. - 36-1/2"

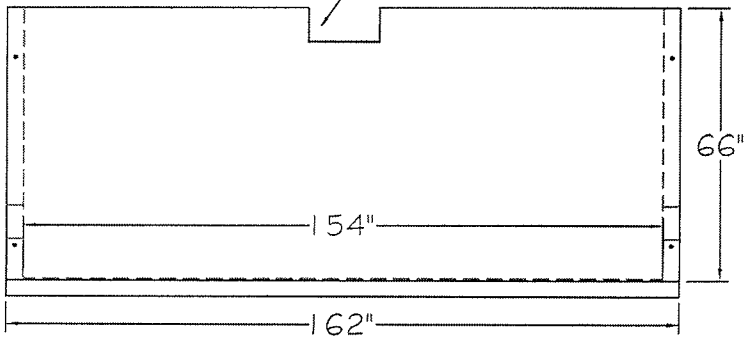
**4. SLOPE FLOOR TO ANY ONE CORNER WHERE THERE SHALL BE A "12" DIA. HOLE
USE 5 GALLON PAINT BUCKET AS SUMP PIT
5. ALL PIPE SHALL BE ANCHORED IN AN APPROVED WAY.

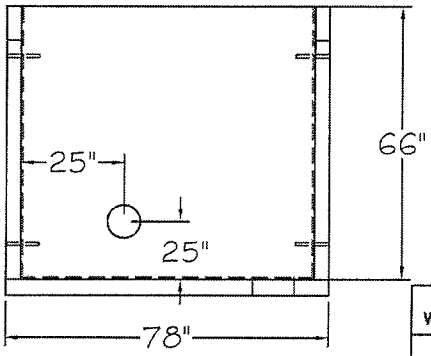




DETAIL "A"

NOTCH-8 1/2" WIDE X 8 1/4" DEEP
FOR "I"-BEAM PROVIDED WITH METER BOX
DETAIL "A"





CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

PRECAST LARGE METER VAULT
FOR USE WITH 10" X 2" F.M.

W.O. NO.			SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: SC	CHECKED BY: BS	
APPROVED BY:		SCALE:	
FILE NO:	DRAWING NO: C317-1Z	DATE CREATED: 6-28-2005	

NOTES: APPROVED METER VAULTS
AVAILABLE FROM: 1) HEREFORD CONCRETE PRODUCTS
2) CHAMPION PRECAST INC.
F.M. METER VAULT LID DWG # C307Z (2 REQUIRED)
PROVIDE SUMP HOLE IN BASE

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#5 REBAR @ 12" CC E & W IN BASE & SIDE WALLS

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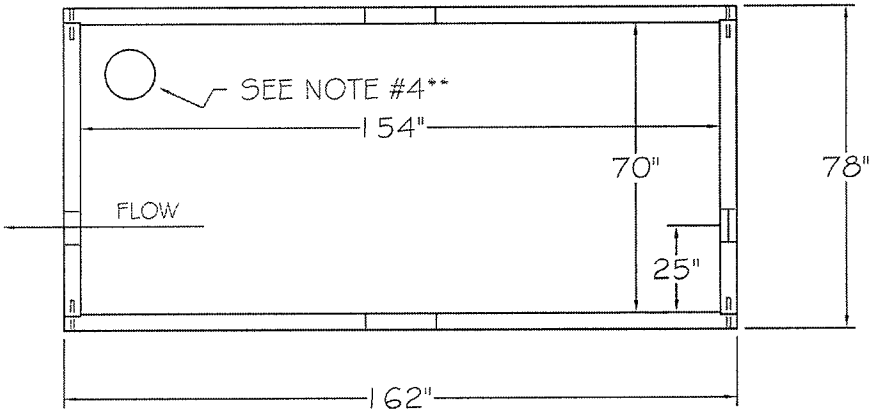
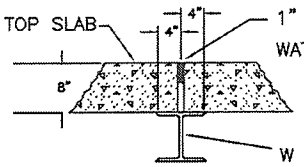
   - B) 16" DOM - 48-5/8"
   - C) 4" F.M. - 37-1/4"
   - D) 6" F.M. - 45-1/2"
   - E) 8" F.M. - 53-1/2"
   - F) 10" D.C. - 36-1/2"

**4. SLOPE FLOOR TO ANY ONE CORNER WHERE THERE SHALL BE A "12" DIA. HOLE USE 5 GALLON PAINT BUCKET AS SUMP PIT
5. ALL PIPE SHALL BE ANCHORED IN AN APPROVED WAY.





DETAIL "A"

NOTCH-8 1/2" WIDE X 8 1/4" DEEP
FOR "I"-BEAM PROVIDED WITH METER BOX
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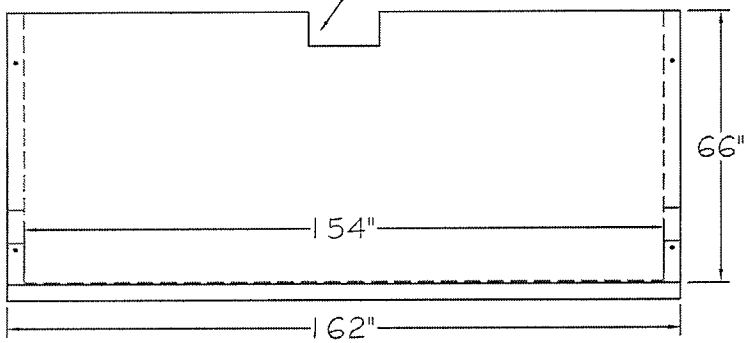
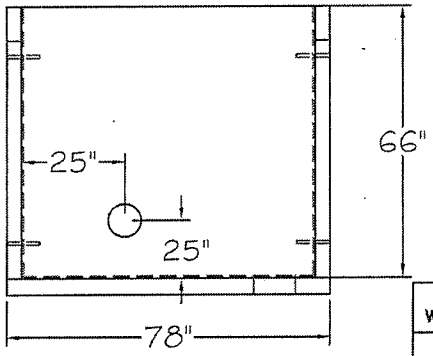
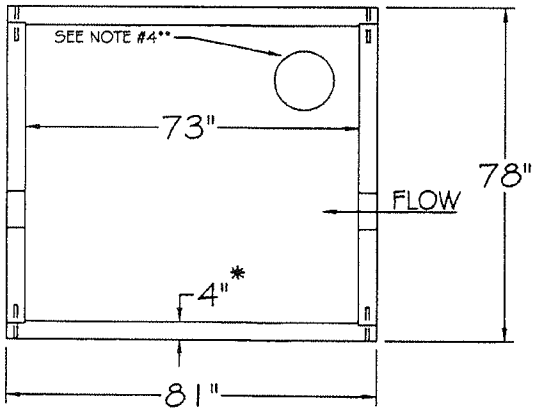




CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

PRECAST LARGE METER VAULT
FOR USE WITH 10" X 2" F.M.

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: SC	CHECKED BY: BS
APPROVED BY:		SCALE:
FILE NO:	DRAWING NO: C317-1Z	DATE CREATED: 6-28-2005



TOP VIEW

NOTES: APPROVED METER VAULTS AVAILABLE FROM:

1) HEREFORD CONCRETE PRODUCTS
2) CHAMPION PRECAST INC.

F.M. METER VAULT LID DWG # C307Z

PROVIDE SUMP HOLE IN BASE
*WALL THICKNESS-4" TYPICAL & BASE
#5 REBAR @ 12" CC BASE & SIDE WALLS

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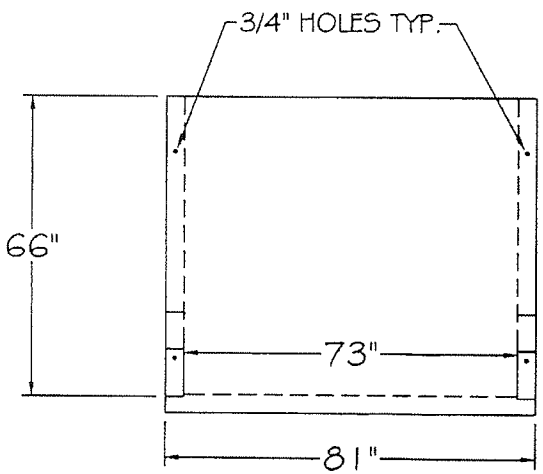
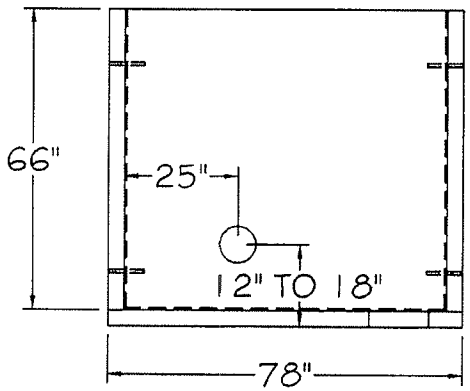
5. ALL PIPE SHALL BE ANCHORED IN AN APPROVED WAY.



FRONT VIEW



SIDE VIEW

CITY OF ST. LOUIS - DEPARTMENT OF PUBLIC UTILITIES
WATER DIVISION - SERVICE DELIVERY GROUP

PRECAST METER VAULT FOR USE WITH
3" THRU 8" F.M. METER VAULT
10" X 2" D.C. METER VAULT

W.O. NO.		SHEET 1 OF 1
DESIGNED BY:	DRAWN BY: SC	CHECKED BY: BS
APPROVED BY:		SCALE:
FILE NO:	DRAWING NO: C308PC	DATE CREATED: 6-28-2005