

## SECTION 719

Concrete Mix Design Engineer” within ADOT’s latest list of approved laboratories. The latest list of approved laboratories is available on ADOT’s web page [www.azdot.gov](http://www.azdot.gov). The date of the design shall not be older than **one year** from the date of submittal, unless supportive documentation is provided and approved by the Engineer. (change to two year)

The mix design report shall include the following elements as a minimum.

- (1) The name and address of the testing organization and the person responsible for the mix design report.
- (2) The mix plant identification and/or location, as well as the supplier or producer name.
- (3) A description of all products that are incorporated in the asphalt concrete along with the sources of all products, including admixtures and asphalt binder, and their method of introduction.
- (4) The supplier and grade of asphalt binder, the source and type of mineral aggregate, and the percentage of asphalt binder and mineral admixture used.
- (5) The mix design report shall identify this as a Marshall 75-blow mix design
- (6) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (ASTM [D4867](#)), Marshall stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density. Historical abrasion values may be supplied on existing sources. The submittal should include a plot of the gradation on the Federal Highway Administration’s 0.45 Power Gradation Chart, plots of the compaction curves and the results of moisture sensitivity testing.
- (7) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design, and specific gravity at 77°F.
- (8) A specific recommendation for design asphalt binder content and any limiting conditions that may be associated with the use of the design, such as minimum percentages of crushed or washed fine aggregate.
- (9) The supplier’s product code, the laboratory Engineer’s seal (signed and dated), and the date the design was performed.

The mix design shall be submitted to the Agency or Engineer by the Contractor/Supplier for which it was developed as part of his project submittals. Once the mix design has been approved by the agency or Engineer, the Contractor and/or his supplier shall not change plants nor use additional mixing plants without prior approval of the Engineer. A new mix design shall be submitted when any changes occur in the plant operation, the producer’s pit, the asphalt binder, including modifiers in the asphalt binder, or any other item that will cause an adjustment in the mix.

**719.3.2 Mix Design Criteria:** The mix design shall be performed by the Marshall Mix Design method. A minimum of 4 points will be used to establish the mix design results. The oven aging period for Marshall mix design samples shall be 2 hours.

**719.3.2.1 Marshall Mix Design:** The Marshall Mix Design shall be performed in accordance with the requirements of the latest edition of the Asphalt Institute’s Manual, MS-2 “Mix Design Methods for Asphalt Concrete.” The mix shall use the compactive effort of 75 blows per side of specimen, unless specified otherwise by the engineer. The mix shall comply with the criteria in Table [719-3](#).

The mix design for PMAC shall be prepared by a laboratory that is accredited through the AASHTO Accreditation Program (AAP) in Hot Mix Asphalt Aggregates and Hot Mix Asphalt. The laboratory shall be under the direct supervision of a Civil Engineer, registered by the State of Arizona, and who is listed by ADOT as a “Qualified Asphalt Concrete Mix Design Engineer” within ADOT’s list of approved laboratories.

The date of the design shall not be older than **two years** from the date of submittal, unless supportive documentation is provided and approved by the Engineer.

Mix designs are subject to approval by the Engineer.

**NEW IN THE 2019 REVISION**

*Uniform Standard Specifications and Details for Public Works Construction—2019 Revision*  
The MAG Standard Specifications and Details Committee, with assistance from four special cases during the 2018 session. Of these, 13 were approved and included in this revision.

**Specifications rewritten, or with major updates:**

- Section 602: Trenchless or Open Cut Installation of Steel Casing
- Section 611: Water, Sewer and Storm Drain Testing
- Section 718: Preservative Seal for Asphalt Concrete
- Section 729: Expansion Joint Filler

**Specifications with minor updates:**

- Section 321: Placement and Construction of Asphalt Concrete Pavement
- Section 325: Placement and Construction of Asphalt-Rubber Concrete
- Section 326: Placement and Construction of Polymer Modified Asphalt Concrete
- Section 334: Preservative Seal for Asphalt Concrete
- Section 610: Water Line Construction
- Section 630: Tapping Sleeves, Valves and Valve Boxes on Water Lines
- Section 740: Polypropylene Pipe and Fittings for Storm Drain, Irrigation and Sanitary Sewer

**Details that have been updated:**

- Detail 100-1: INDEX
- Detail 100-2: INDEX
- Detail 236-3: 20'-35' ATTACHED SIDEWALK (COMPACT) ATTACHED
- Detail 252: BUS BENCH
- Detail 303-1: JOINT POLYETHYLENE WATER PIPES
- Detail 303-2: JOINT POLYETHYLENE WATER PIPES
- Detail 360-1: DETAIL INSTALLATION
- Detail 360-2: DETAIL INSTALLATION

**Changes made in the 2018 Revision**

*Uniform Standard Specifications and Details for Public Works Construction—2018 Revision*  
The MAG Standard Specifications and Details Committee, with assistance from four special cases during the 2017 session. Of these, 13 were approved and included in this revision.

**New Specifications**

- Section 323: Placement of Pervious Concrete
- Section 723: Pervious Concrete

**Specifications rewritten, or with major updates:**

- Section 337: Crack Sealing
- Section 415: Flexible Metal Guardrail
- Section 630: Tapping Sleeves, Valves and Valve Boxes on Water Lines

**Specifications with minor updates:**

- Section 105: Control of Work
- Section 310: Placement and Construction of Aggregate Base Course
- Section 321: Placement and Construction of Asphalt Concrete Pavement
- Section 331: Microsurfacing Specification
- Section 340: Concrete Curb, Gutter, Sidewalk, Curb Ramps, Driveway and Alley Entrance
- Section 604: Placement of Controlled Low Strength Material
- Section 725: Portland Cement Concrete
- Section 726: Concrete Curing Materials
- Section 728: Controlled Low Strength Material
- Section 729: Expansion Joint Filler

**New detail drawings:**

- Detail 236-4: 25'-35' R - RADIAL COMBINATION CURB RAMP
- Detail 236-5: 25'-35' R - RADIAL PARALLEL CURB RAMP
- Detail 238-1: PERPENDICULAR CURB RAMP (Revised from previous Detail 235-4)
- Detail 238-2: COMBINATION CURB RAMP (Revised from previous Detail 235-5)
- Detail 238-3 PARALLEL CURB RAMP

**Details that have been updated:**

- Detail 100-1: INDEX
- Detail 100-2: INDEX
- Detail 206-1: DETAIL ATTACHED SIDEWALK (COMPACT) ATTACHED
- Detail 227: INTEGRATED SIDEWALK ATTACHED
- Detail 236-3: 20'-35' ATTACHED SIDEWALK (COMPACT) ATTACHED
- Detail 252: BUS BENCH
- Detail 303-1: JOINT POLYETHYLENE WATER PIPES
- Detail 303-2: JOINT POLYETHYLENE WATER PIPES
- Detail 360-1: DETAIL INSTALLATION
- Detail 360-2: DETAIL INSTALLATION

**Detail**

- I

8/21/19 Update: Also Add: Traffic Rated Box and Cover, 319-1

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**SECTION 631**

with radius of not less than 18 inches. Polyethylene pipe has a cold flow characteristic and must not be installed under a stressed condition. Compression fittings only may be used with the plastic being held securely between metal to metal. Stainless steel or brass inserts shall be placed in the proper position in each compression fitting with care taken to assure that the insert remains in place when the fitting is tightened. All meter service lines shall extend at right angles from the main to the curb lines.

**631.3.5 Service Taps:** One inch and 3/4 inch service taps to new meter mains may be made with a saddle, tapped coupling or direct tap in accordance with the following provisions:

The Developer may use heavy tapped couplings for meter service connections on all sizes of pipe including the 3 inch pipe in cul-de-sac streets. Bronze corporation stops must be installed in the tapped couplings prior to pressure testing or disinfection of the water main. Normally in subdivisions no saddles are required for 6 inch pipe and larger. At the Contractor's option, saddles may be used on all 6 inch pipe and larger. All service connections on major and collector streets shall be made with saddles or heavy duty tapped couplings regardless of the water main size or service pipe size. All taps on pipe smaller than 6 inches must be made by either a saddle or heavy tapped coupling with bronze insert. Direct taps must be made by the use of a corporation stop with tapered AWWA machine thread. All wet taps must be made by the Mueller Type B-100 tapping machine or approved equal. A sharp tapping bit must be used in order to obtain clean sharp threads. In general, each tapping tool should be resharpened or discarded after making 6 taps. The minimum distance between taps, saddles, and tapped couplings shall be 3 feet.

**631.4 TESTING:**

All services, service taps and fittings shall be tested along with the water main in accordance with Subsection 610.14.

**631.5 CLEANUP AND COMPLETION:**

Upon completion and acceptance of all phases of the water main and meter service lines the Developer shall release the new subdivision water system to the Contracting Agency for final operation and maintenance with all interior valves and corporation stops in open position and with all meter curb stops and valves at the connections to existing mains closed.

**631.6 INSPECTION:**

The Developer's Engineer shall make an as-built plan and make a record of the locations of all water service connections prior to the connections being covered up. This as-built plan shall give the stationing of each service tap. The stationing to be continuous for each street, and shall begin at the street intersection or property line at the end of the block.

**631.7 SERVICE OVER 2 INCHES:**

All service taps larger than 2 inches shall be made by the Agency after an application and payment of prevailing fees, unless otherwise required by the Agency.

**631.8 SERVICE ON EXISTING MAINS:**

Where all or part of a new subdivision is served by existing water mains, only authorized personnel of the Contracting Agency shall install the service connections upon proper application and payment of prevailing fees.

- End of Section -

## SECTION 630

body shall be coated with a corrosion resistant shop coat primer unless otherwise specified by the Utility Owner. A 3/4" NPT test port is required on branch of sleeve for field testing prior to tap.

Flanged outlet shall have dimensions and drilling that complies with ASME B16.1 class 125 and per Manufacturer's Standardization Society (MSS SP-60).

Unless otherwise noted, approved elastomer compounds are SBR, Buna-N, EPDM, and Viton. Elastomer shall be compounded for use with water, salt solutions, mild acids and bases per ASTM D-2000.

Bolts to be corrosion resistant low alloy (AWWA C-111) unless otherwise specified by the Utility Owner.

Sleeve shall be compliant with the federal requirements of the Drinking Water Standard NSF/ANSI Standard 61 regulating the health effects of drinking water materials, treatment chemicals, and restricting the use of lead-containing materials.

Tapping sleeve shall be installed per the manufacturer's recommendations and Detail 340. Coupon extraction shall be available for inspection.

(B) Stainless Steel Tapping Sleeves shall conform to the following:

Stainless Steel, Type 304 ASTM A240, and meets or exceeds applicable AWWA C223 standards. Each weld is to be fully chemically passivated in accordance with ASTM A380. A 3/4" NPT test port is required on branch of sleeve for field testing prior to tap.

Flanged outlets shall be Type 304 Stainless Steel ASTM A240, AWWA C228 Class SD ANSI 150# drilling and recessed for tapping valves per Manufacturer's Standardization Society (MSS-SP 60).

The gasket shall be fully circumferential providing a 360 degree seal. The elastomer compound shall be 1/4" thick, have a grid patterned face, and certified to NSF/ANSI Standard 61-G & 372. Unless otherwise noted, approved elastomer compounds are SBR, Buna-N, EPDM, and Viton.

Elastomer shall be compounded for use with water, salt solutions, mild acids and bases per ASTM D-2000.

Bolts and Nuts shall be Type 304 Stainless Steel per ASTM A193 or ASTM A194.

Sleeve shall be compliant with the federal requirements of the Drinking Water Standard NSF/ANSI Standard 61 regulating the health effects of drinking water materials, treatment chemicals, and restricting the use of lead-containing materials.

Contractor to verify if size-on-size is acceptable to the Utility Owner.

Tapping sleeve shall be installed per the manufacturer's recommendations and Detail 340. Coupon extraction shall be available for inspection.

 (C) Tapping Sleeve Testing shall comply with the following:

Unless otherwise noted, the tapping sleeve assembly shall be pressure tested utilizing a sanitized hydrostatic pump to 200 psi for a minimum of 30 minutes. The pressure test shall occur prior to tapping the main. A 3/4" NPT test port is required on all sleeves for field testing prior to tap. Original manufacturer's test plug must be properly re-installed after testing is complete. All testing procedures shall comply with the NSF/ANSI Standard 60 and Standard 61 drinking water standard regulating the health effects of drinking water supplies, treatment chemicals, and restricting the use of lead-containing materials.

**630.4.3 Tapping sleeves for concrete pressure pipes shall be fabricated tapping sleeves and comply with the following:**

Except for meter service connections, taps shall be made by the Agency at prevailing rates or by approved Contractors when allowed or requested by the Contracting Agency. After installation of the tapping sleeve and valve, the Contractor shall provide an excavation sufficient in size to accommodate the tapping operation.

**Case 19-01 F:  
Correct miscellaneous typographic errors**

**Specific typographic errors:**

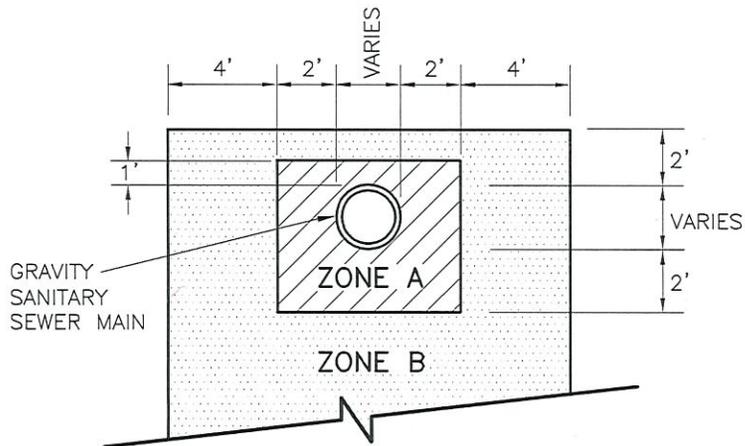
- Section 108.9 – Missing period (.) at end. Needs line space before Table 108-1.
- Section 331.5 – Needs line break
- Section 616.4.1 – Extra space in heading
- Sections 350.2.1, 350.2.2 and 350.2.3 – Move paragraph up after headings on subsections

**Headings missing the colon (:)**

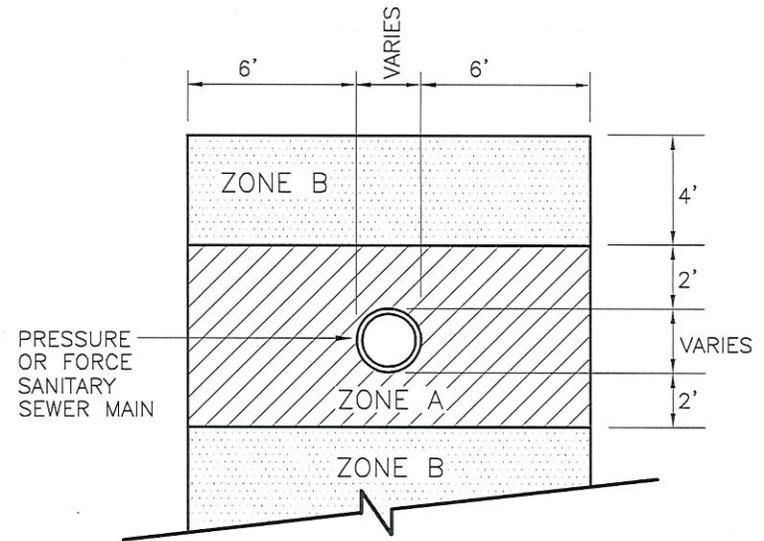
- 102.8
- 108.11
- 206.5.1
- 206.5.2
- 220.2
- 220.3
- 230.9
- 230.10
- 310.3
- 317.2
- 323.9
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- 325.9.2.2
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- 530.10
- 611.3
- 615.13
- 630.6
- 701.4
- 718.2
- 718.3
- 719.2.1

WATER LINE EXCLUSION AND EXTRA PROTECTION ZONES\*

GRAVITY SANITARY SEWER



PRESSURIZED SANITARY SEWER



NOTES:

ZONE A: NO WATER LINES ALLOWED/MINIMUM SEPARATION.

ZONE B: EXTRA PROTECTION REQUIRED FOR WATER LINES.

\* REFER TO ~~STANDARD~~ 610, WATER LINE CONSTRUCTION.  
SECTION

DETAIL NO.  
404-1



STANDARD DETAIL  
ENGLISH

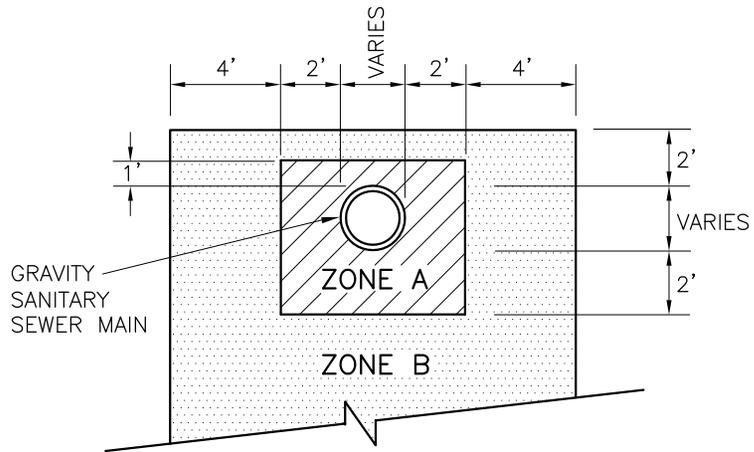
WATER AND SANITARY SEWER  
SEPARATION/PROTECTION

REVISED  
01-01-2006

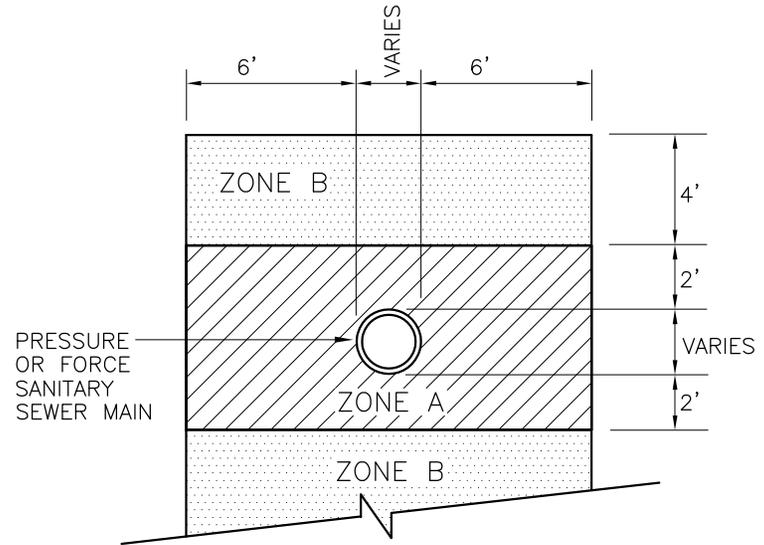
DETAIL NO.  
404-1

WATER LINE EXCLUSION AND EXTRA PROTECTION ZONES\*

GRAVITY SANITARY SEWER



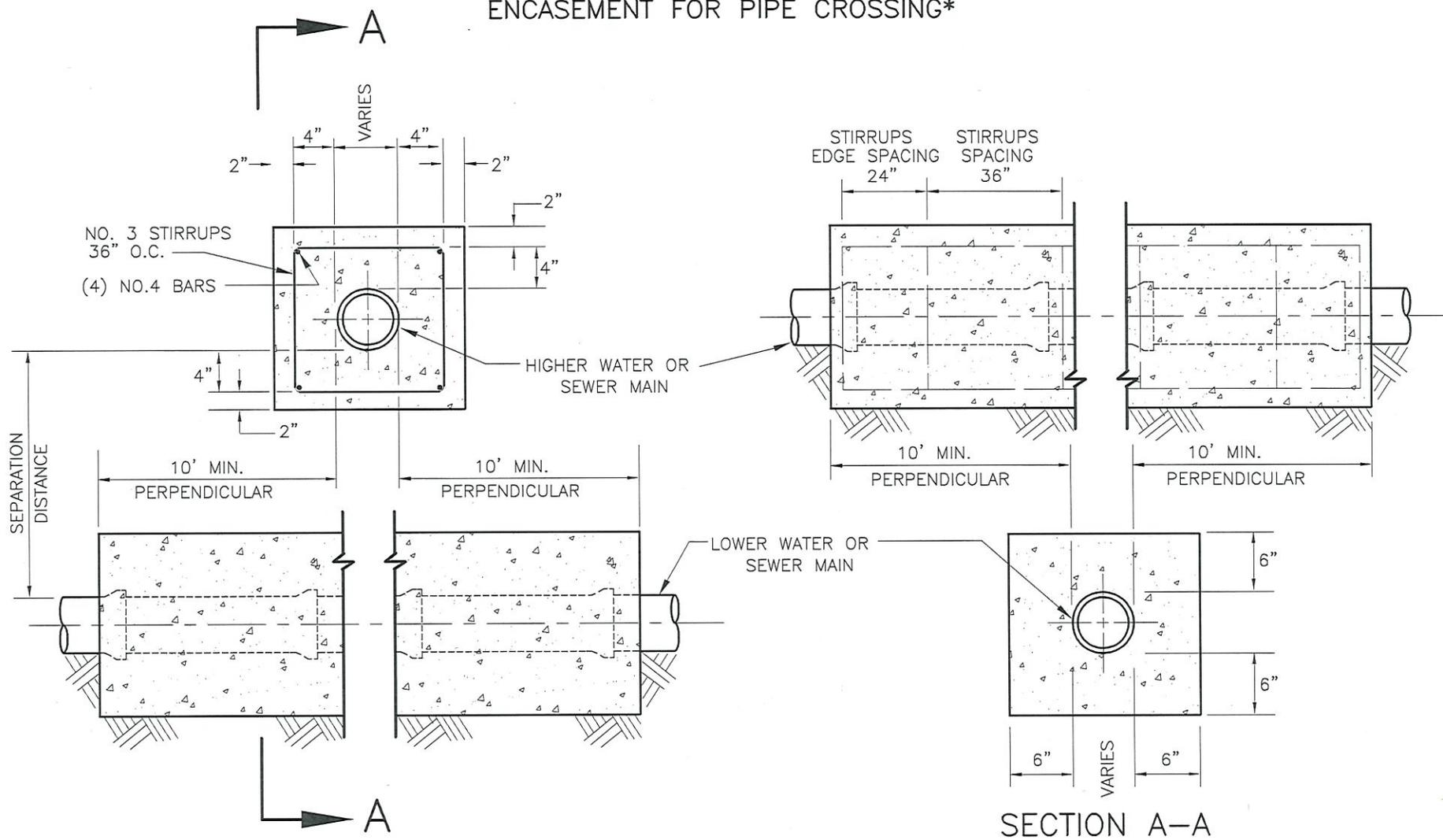
PRESSURIZED SANITARY SEWER



**NOTES:**

- ZONE A: NO WATER LINES ALLOWED/MINIMUM SEPARATION.
- ZONE B: EXTRA PROTECTION REQUIRED FOR WATER LINES.
- \* REFER TO SECTION 610, WATER LINE CONSTRUCTION.

# ENCASEMENT FOR PIPE CROSSING\*



## NOTES:

1. CLASS 'C' CONCRETE AS PER SECTION 725.

\*REFER TO MAG STANDARD SPECIFICATION SECTION 610,

*WATER LINE CONSTRUCTION*

DETAIL NO.  
**404-3**



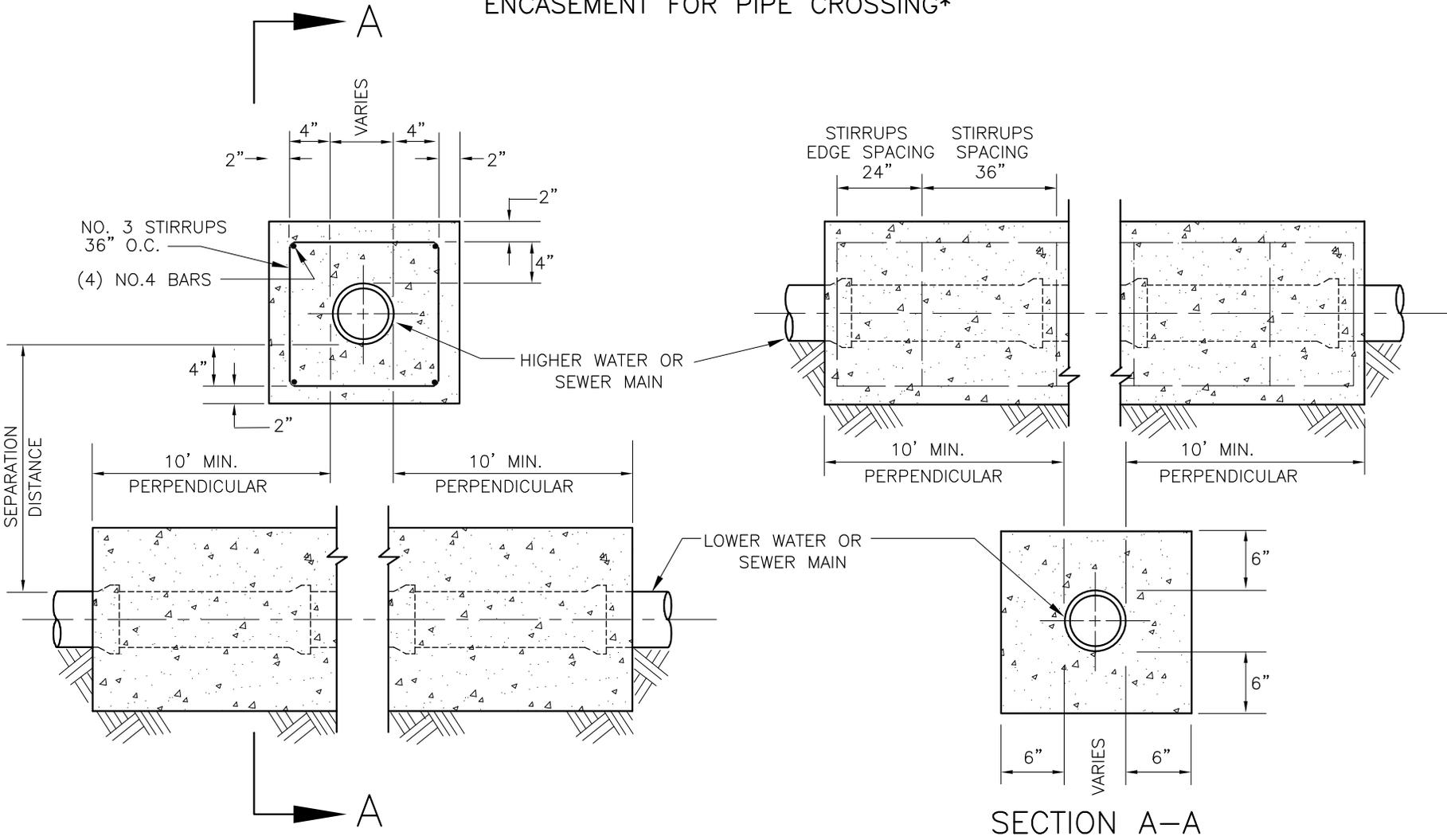
STANDARD DETAIL  
ENGLISH

**WATER AND SANITARY SEWER  
SEPARATION/PROTECTION**

REVISED  
01-01-2006

DETAIL NO.  
**404-3**

ENCASEMENT FOR PIPE CROSSING\*



SECTION A-A

- NOTES:**
1. CLASS 'C' CONCRETE AS PER SECTION 725.
  - \*REFER TO SECTION 610, WATER LINE CONSTRUCTION.

## Case 19-01 G: Misc. corrections from Avondale

- **Table of Contents:** 326 2019 Placement and Construction of Polymer Modified Asphalt ~~Concrete~~ **(Concrete)**
- **Sect 618.4 POST ~~INSTALLATION~~ INSPECTION AND TESTING: Installation**
- **Sect 625.3.1:** The excavation shall be in such a ~~manor~~ **manner**, access is maintained around the manhole base before, during, and after placement of the manhole.
- **Sect 206-2:** "~~Graduation~~" should be "**gradation**"
- **Section 618-2:** "~~Instillation~~" should be "**installation**"
- **Section 625-1:** "~~Manor~~" should be "**manner**"

## SECTION 206

**206.5.1 Measurement**

(A) **Structure Excavation:** Structure Excavation will be measured by the cubic yard, based on the volumes calculated from the measurement/pay limits shown on the Project Plans. If no limits are shown, the measurement for Structure Excavation shall be in accordance with the applicable details shown on the current Arizona Department of Transportation (ADOT) Standard Drawings ~~B-19.30~~ and/or ~~B-19.50~~.

SD 5.01 SD 6.01-4

No reduction in measurement for payment will be made when the Contractor elects to not excavate all material between the limits of the actual structure, and the pay limits shown on the Project Plans and/or the above referenced ADOT Standard Drawings.

No additional measurement for payment will be made for excavation resulting from lack of side support for structure excavations, nor due to carelessness of the Contractor.

(B) **Structure Backfill:** Structure Backfill will be measured by the cubic yard, based on the volumes calculated from the measurement/pay limits shown on the Project Plans. If no limits are shown, the measurement for Structure Backfill shall be in accordance with the applicable details shown on the current ADOT Standard Drawings ~~B-19.40~~ and/or ~~B-19.50~~.

SD 5.02 SD 6.01-4

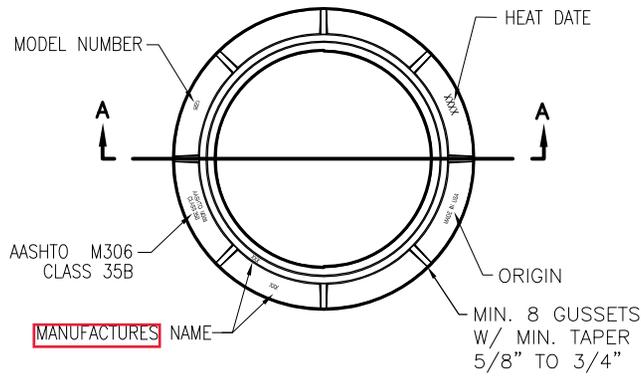
**206.5.2 Payment**

**Structure Excavation and Structure Backfill:** The accepted quantities of Structure Excavation and the accepted quantities of Structure Backfill will be paid for at their respective contract unit prices.

Hauling, placing, and compacting surplus Structure Excavation in embankments, or otherwise disposing of the material, shall be included in the contract price paid for Structure Excavation.

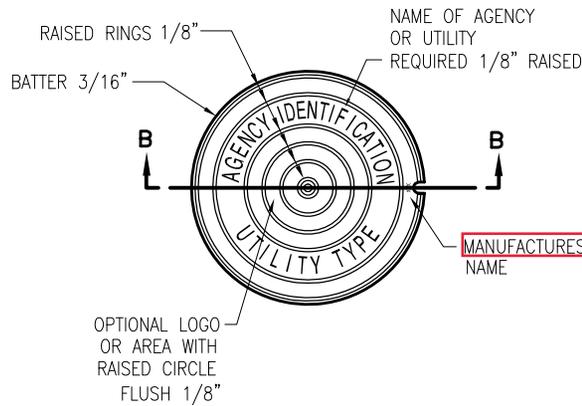
*- End of Section -*

**FRAME TOP VIEW**

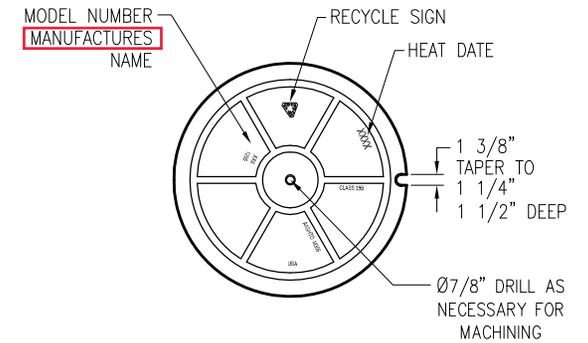


FRAME WT. (CL. 35) - 180 LBS

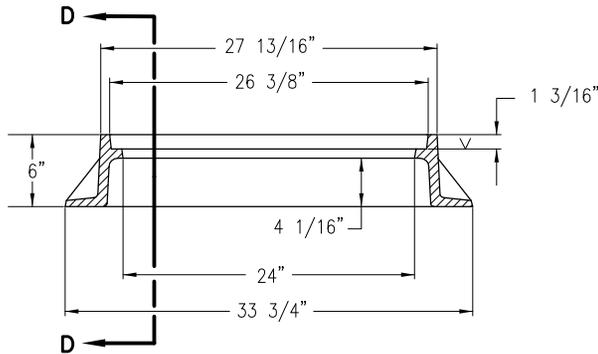
**COVER TOP VIEW**



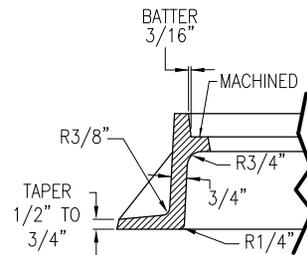
**COVER BOTTOM VIEW**



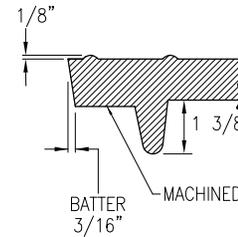
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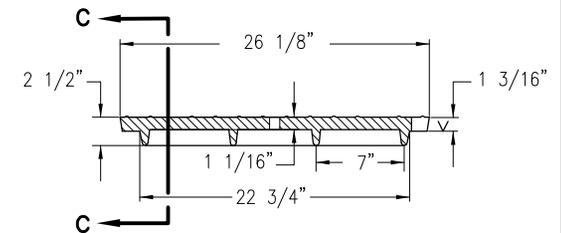
SECTION A



SECTION D



SECTION C



SECTION B

**NOTE:**

LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" IN HEIGHT AND RAISED FLUSH W/ TOP OF RINGS. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% MORE OR LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO ASTM A-48, CLASS 35 AND AASHTO M306. THE BEARING SURFACES OF THE FRAMES AND COVERS SHALL BE MACHINED AND THE COVERS SHALL SEAT FIRMLY WITHOUT ROCKING. ALL DIMENSIONS SHALL HAVE A 1/16" TOLERANCE.

DETAIL NO.

423-1



STANDARD DETAIL  
ENGLISH

24" CAST IRON  
MANHOLE FRAME AND COVER

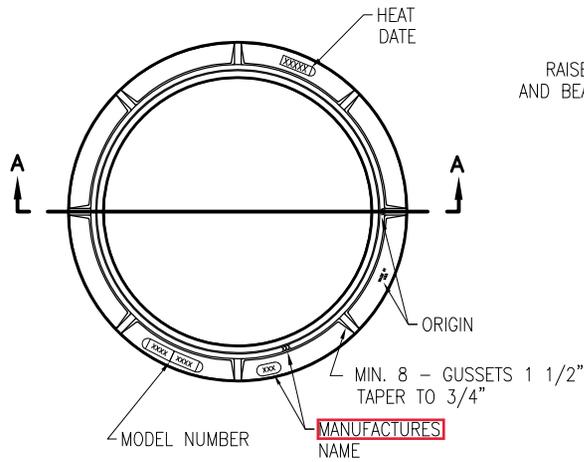
REVISED

01-01-2012

DETAIL NO.

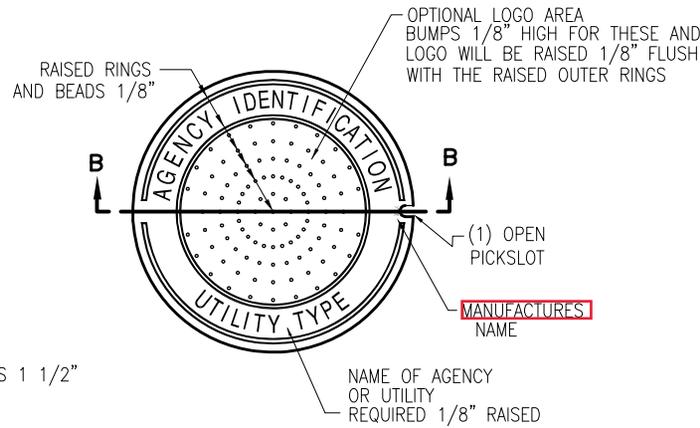
423-1

**FRAME TOP VIEW**

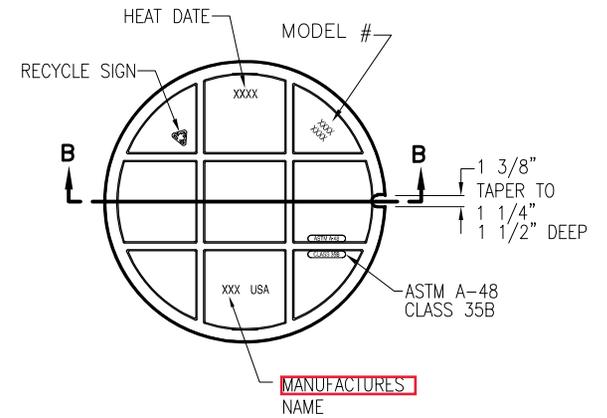


FRAME WT. (CL. 35) - 227 LBS

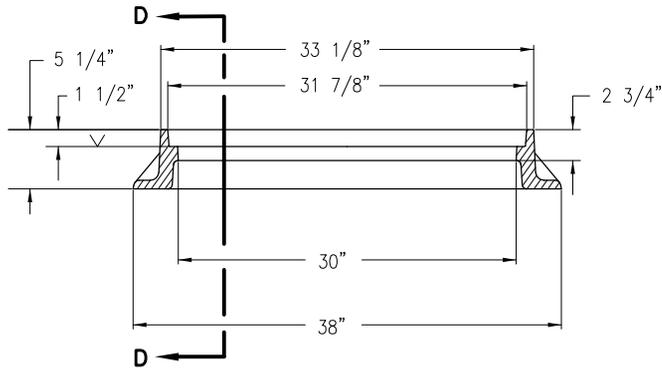
**COVER TOP VIEW**



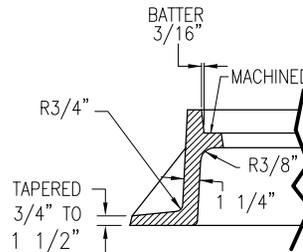
**COVER BOTTOM VIEW**



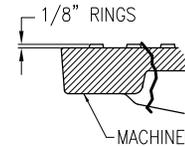
COVER WT. (CL. 35) - 210 LBS



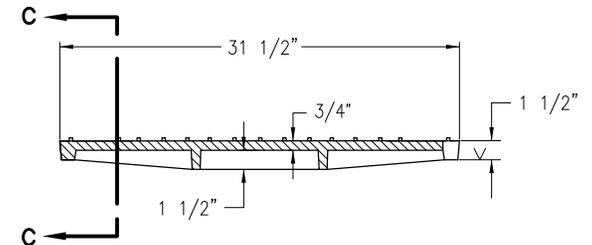
SECTION A



SECTION D



SECTION C



SECTION B

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DETAIL NO.  
**423-2**



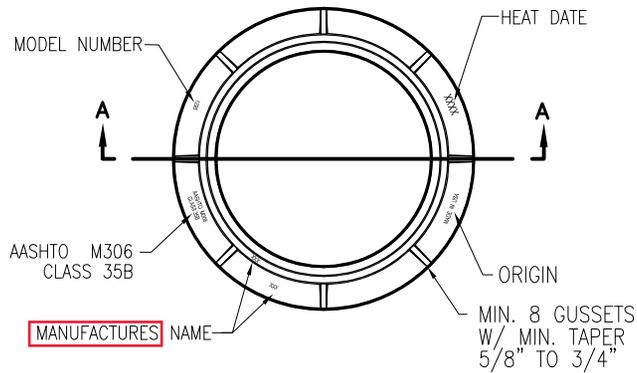
STANDARD DETAIL  
 ENGLISH

**30" CAST IRON  
 MANHOLE FRAME AND COVER**

REVISED  
 01-01-2012

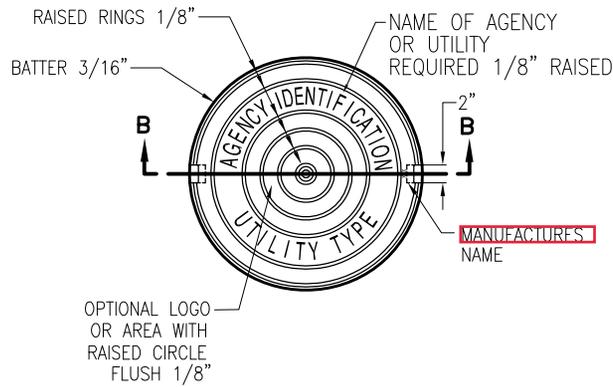
DETAIL NO.  
**423-2**

**FRAME TOP VIEW**

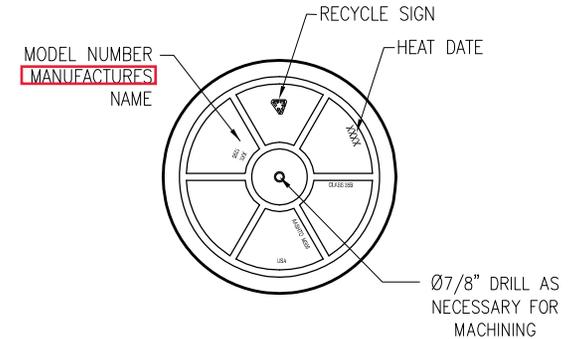


FRAME WT. (CL. 35) - 180 LBS

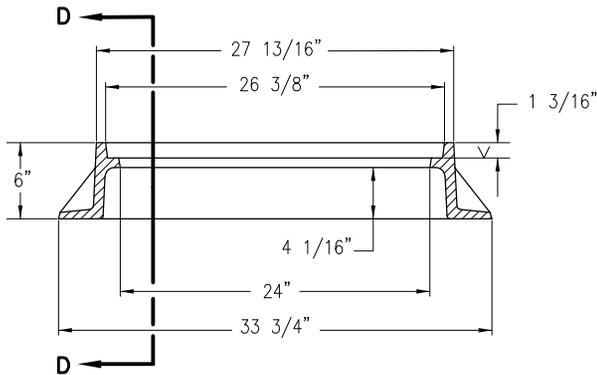
**COVER TOP VIEW**



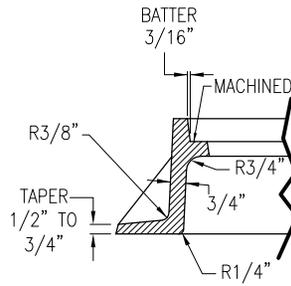
**COVER BOTTOM VIEW**



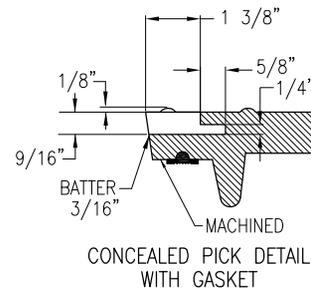
COVER WT. (CL. 35) - 188 LBS



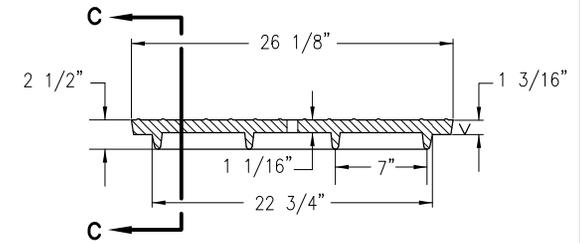
SECTION A



SECTION D



SECTION C



SECTION B

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DETAIL NO.

424-1



STANDARD DETAIL  
ENGLISH

**24" CAST IRON WATERTIGHT  
MANHOLE FRAME AND COVER**

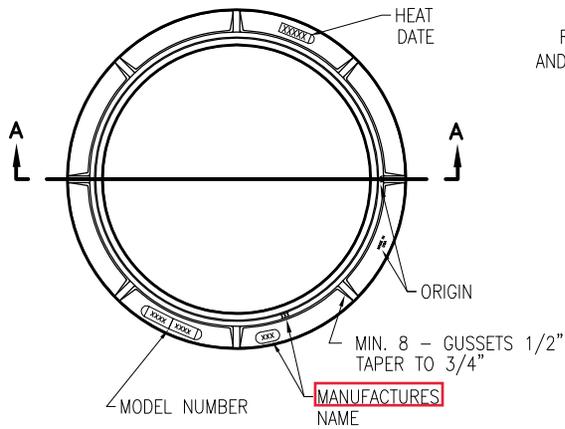
REVISED

01-01-2012

DETAIL NO.

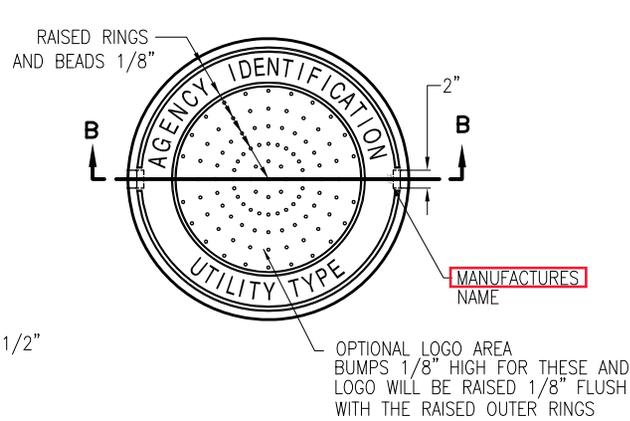
424-1

**FRAME TOP VIEW**

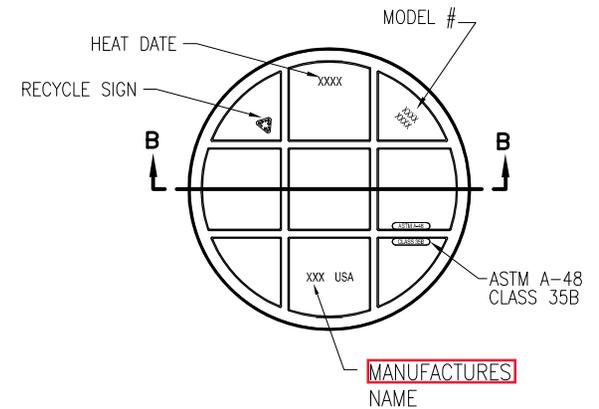


FRAME WT. (CL. 35) - 227 LBS

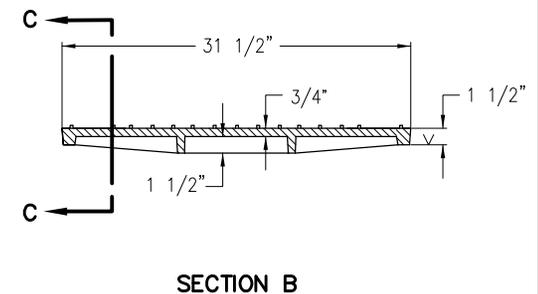
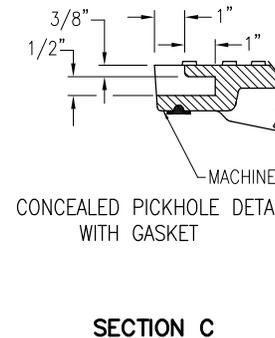
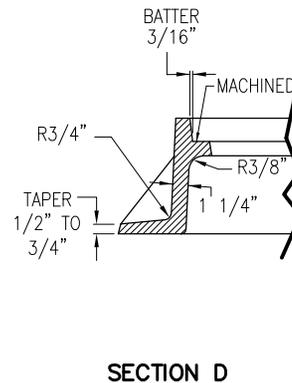
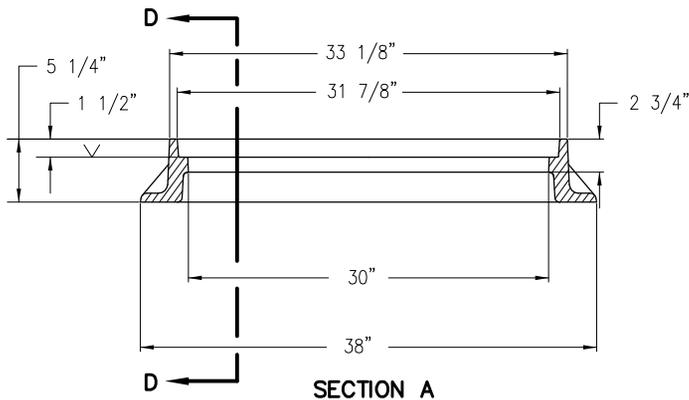
**COVER TOP VIEW**



**COVER BOTTOM VIEW**



COVER WT. (CL. 35) - 210 LBS



**NOTE:**

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DETAIL NO.  
**424-2**



STANDARD DETAIL  
ENGLISH

**30" CAST IRON WATERTIGHT  
MANHOLE FRAME AND COVER**

REVISED  
01-01-2012

DETAIL NO.  
**424-2**