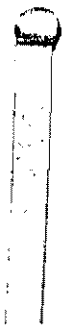
O.



Oxford® NO. R753 1/3

ESSELTE 10%

January 21, 2003

Mr. Ken Butler, Project Superintendent via fax # 972-866-9090
Pacific Builders, Inc.
3360 Wiley Post Road, Suite 100
Carrollton, TX 75006

RE: 3885 Arapaho Rd. Addison, TX – Osteomed Corp.

Dear Ken:

I am sorry for the delay in getting you the letter I promised you. After checking the water valves with Don Callahan of CalHar, I went back to verify that they had been repaired. It was then that I noticed that there were a couple other items that I inadvertently missed on our first walk-thru. The storm drain inlets need some finishing. There were form boards and other debris in them, and the inverts were not finished to facilitate smooth flow out of the inlet. I have since talked to Mr. Callahan, of CalHar, about this.

Another area I failed to mention in my letter of 11/22/02 is:

- The retention pond needs to be cleaned of debris, and the bottom finished to facilitate flow through the retention area. There is no sod in the bottom as noted on plan page C3.1. Also, it appears that sod was placed directly on top of large rocks and other debris, and the slope appears to be un-mowable, especially in the corners. They should be on a 4-1 grade (Plan page C3.2). Also, the pilot channel (C5.2) has not been constructed, as of this afternoon when I again checked the property.
- Mr. Ron Lee of our Parks Department asked me to mention also the condition of the perimeter of the property, especially the north side.

As stated above, I did go to the property today, and CalHar has cleaned out the form boards and debris from the inlets, but the west inlet in front of the building is still holding water. The valve covers and stacks have been taken care of, and the sewer lateral cleanouts have the locator pads on them. The west drive approach joint is still not sealed.

Please contact me when these items have been addressed, for a re-inspection of the property. I can be reached at 972-450-2847. Thank you for your timely attention to these matters.

Respectfully,

David E. Wilde, Public Works Inspector

Cc: Lynn Chandler, Building Official
Steve Chutchian, P.E., Assistant City Engineer
Jerry Davis, Utilities Superintendent
Ron Lee, Parks Superintendent
Mike Murphy, Director of Public Works
Jim Pierce, Assistant Director of Public Works

11/22/2002

Mr. Ken Butler, Project Superintendent
Pacific Builders, Inc.
3360 Wiley Post Road, Suite 100
Carrollton, TX 75006

RE: 3885 Arapaho Rd. Addison, TX – Osteomed Corp.

Dear Ken:

The results of the site walk-thru conducted with you yesterday by my assistant, Jose Flores and me are listed below. I would also like to call your attention to Item # 3 on the *General Construction Notes* paperwork you obtained from this office. This refers to the marking of the curbs for any services or conduits crossing under pavement or water valves in the vicinity of a curb. Also, be advised that as of the time of this letter, water accounts have not been applied for by the tenant/owner of the building (Item #12). This can be handled by our Utility Billing Department located at the Addison Finance Building at 5350 Belt Line Rd. (phone # 972-450-7081). General comments during the walk-thru included; the water valve stacks do not appear to comply your submittal or with Town of Addison Specifications (see enclosed); dressing up the perimeter of your site (#5); finding/establishing lot pins (#2); and providing reproducible (mylar) and electronic (Intergraph or CAD) copies of the As-Built plans (#7). Minor modification to Sheet C6.1 would remove the installation of the 12" x 8" Tapping sleeves and valves on Arapaho Rd., as these were installed by the Town's road contractor, and the location of the tap at STA 0+00 moved south approximately 5 feet to match the location of the re-located 12" water main.

Also, the timing of the walk-thru did not permit the verification of the integrity of the Town's irrigation system in the Right-of-Way. We reserve the right to require repairs to any facility that may have been, or may subsequently be, damaged by your construction activity.

Walk-Thru Punch-list 11/21/02

1. Valve stacks at STA 1+24 must be centered and installed according to Town of Addison Specifications.
2. Valve cover is broken and does not fit properly at STA 4+18.
3. Replace valve stack at STA 7+58.
4. Clean out debris from fire service vault and plug all double check valve assembly test cocks.
5. Repair rutting and verify no damage to Town's irrigation system in area East of East driveway entrance.
6. Install brass plugs in the test cocks of the irrigation service and domestic service double-check valve assemblies.
7. Replace broken valve cover at STA 9+62.
8. Saw and apply joint seal in all concrete joints at all drive approaches.

I call your attention to Item #s 13 and 14 of the *General Construction Notes*. We will be happy to answer any questions. I can be reached at 972-450-2847. Thank you for your cooperation and consideration during the execution and completion of this fine project.

Respectfully,

David E. Wilde, Public Works Inspector
Town of Addison

Cc: Lynn Chandler, Building Official
Steve Chutchian, P.E., Assistant City Engineer
Jerry Davis, Utilities Superintendent
Mike Murphy, Director of Public Works
Jim Pierce, Assistant Director of Public Works

Enclosed: Valve Box Detail
General Construction Notes

#R3-1

OSTEOMED CORPORATION

No Sidewalk required
Passed 11/26/02

November 18, 2002

Ms. Carmen Moran,
City Secretary and Director of Development
Town of Addison
5300 Belt Line Road
Dallas, TX 75254-7606

Dear Ms. Moran:

Pursuant to my recent discussions with you and Mr. Ron Whitehead, I am submitting this letter for consideration at the next city council meeting scheduled on November 26, 2002. Specifically, I am requesting a variance in order to abandon plans to construct a new sidewalk in front of property located at 3885 Arapaho Road.

OsteoMed Corporation is now in the final construction stages on its new corporate, manufacturing and distribution facility located at 3885 Arapaho Road in Addison, Texas. When the building was initially designed and approved by the city, a sidewalk was required in front of this property. However, after recent completion of Addison's Arapaho Road Phase II construction, a sidewalk in this location would be completely isolated and now appears to make little sense. On the property to OsteoMed's immediate east or west, there is no ability to construct a sidewalk. In addition, no sidewalk exists or appears planned further to the east or west of OsteoMed's property on the entire north side of Arapaho Road. Completing OsteoMed's sidewalk would require additional expense and appears to have little or no value at this time.

I understand that Mr. Whitehead has observed the proposed sidewalk location and is supportive of this variance request. I have attached pictures of the referenced site for your review. Please do not hesitate to contact me if you have any immediate questions or need any additional information regarding this matter. Otherwise, an OsteoMed representative and/or I will plan to be present during the City Council meeting on November 26th at 7:00 pm to answer any potential questions.

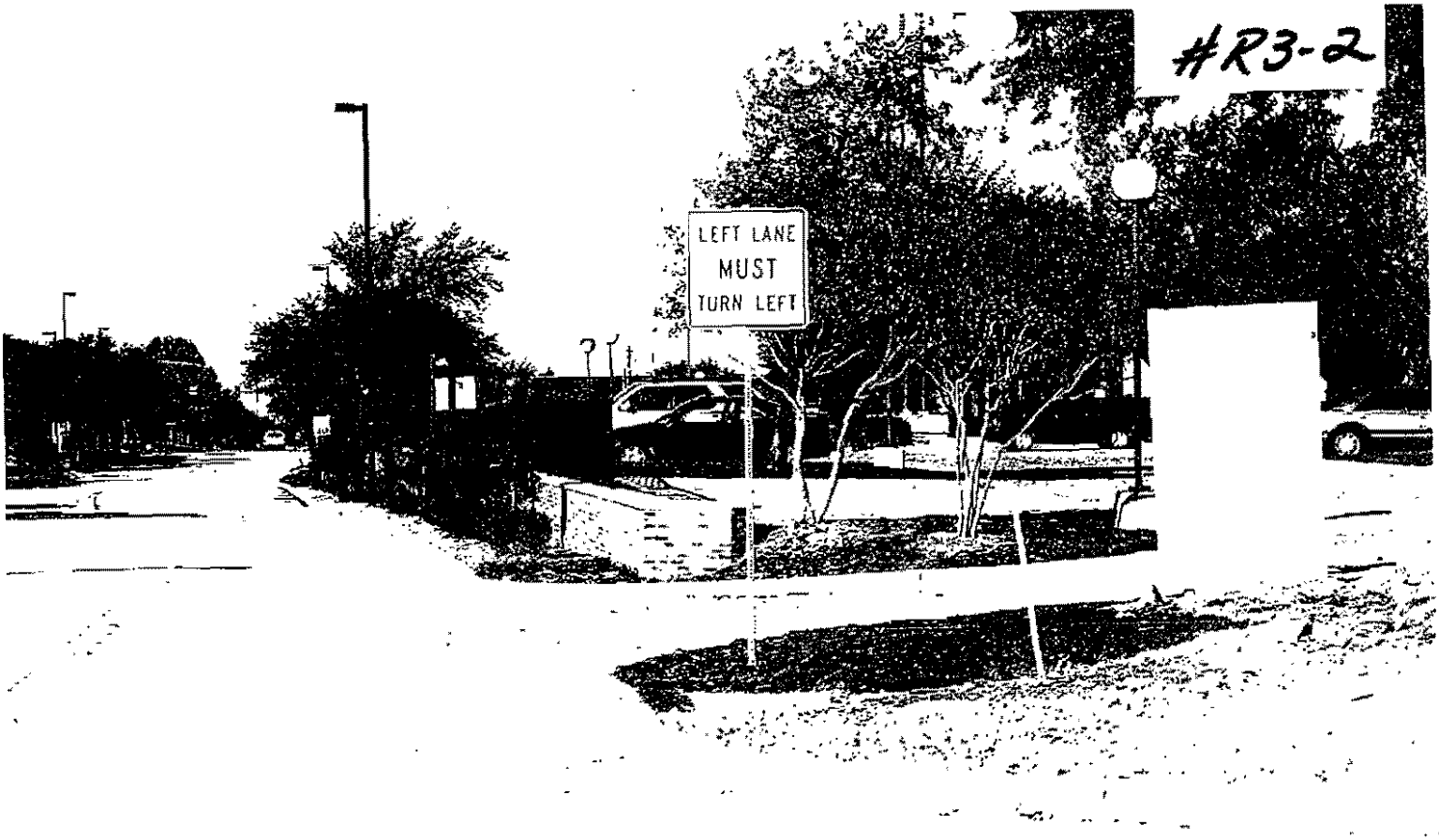
Sincerely,

Walter J. Humann
President

cc: Mark Stahl, Pacific Builders Inc. (via telecopy)
Mike Meinhardt, Meinhardt & Associates Architects, P.L.L.C. (via telecopy)

3750 Realty Road
Addison, Texas 75001-4311
(972) 241-3401 FAX: (972) 241-3507
Customer Service: (800) 456-7779

#R3-2



VIEW FROM PROPERTY LOOKING WEST ON ARAPAHO RD.

EXPANDED VIEW FROM PROPERTY LOOKING WEST ON ARAPAHO RD.

VIEW FROM PROPERTY LOOKING EAST ON ARAPAHO RD.

EXPANDED VIEW FROM PROPERTY LOOKING EAST ON ARAPAHO RD.

Steve Chutchian

To: Carmen Moran
Cc: Ron Whitehead; Michael Murphy; Robin Jones
Subject: RE: sidewalk for Osteomed

Carmen - I contacted Mr. John Edelmann, with Osteomed Corp., at 972-241-3401, regarding a variance for the construction of sidewalks along Arapaho Rd. He stated that his company will send a formal request to you on or before the 18th. of November, in order to get it on the November 26th. Council Agenda for consideration. He will also have someone, representing Osteomed, attend the Council meeting on that date. If you need any further information regarding this matter, please let me know. Thanks.

Steve C.

-----Original Message-----
From: Carmen Moran
Sent: Thursday, November 07, 2002 11:04 AM
To: Steve Chutchian; Robin Jones
Cc: Ron Whitehead
Subject: sidewalk for Osteomed

Ron called and said he doesn't have a problem supporting a variance from the sidewalk ordinance for OSTEOMED. Typically Robin brings those forward to Council. Can you call the OSTEOMED people and get them lined up for Council on the 26th?

Steve Chutchian

From: Carmen Moran
Sent: Friday, October 25, 2002 2:32 PM
To: Michael Murphy; Steve Chutchian
Subject: sidewalk for Osteomed

Trenna Burris, the architect for the Osteomed project called me. She said Steve was making them put in a sidewalk, and they didn't see any reason for it because it did not connect to anything. I pulled up the Council minutes, ordinance, etc, and told her that had been a requirement of their zoning approval, and that we had to start somewhere with a sidewalk or we never got there. She said they didn't want to put it in right now, and I told her she could call Mike to see if they could put up a bond or set a later date for installation, but that the only way they could be relieved of the requirement to put the sidewalk in would be to go back to Council and request the condition be deleted from their zoning. She is planning to call Mike.

CM

TOWN OF ADDISON
WATER MAIN EASEMENT

1804887

Deed 04/25/02 3207468 $31.00

STATE OF TEXAS

KNOW ALL PERSONS BY THESE PRESENTS

COUNTY OF DALLAS

That OsteoMed Corporation, for and in consideration of the sum of ONE DOLLAR ($1.00) and other good and valuable consideration to Grantor in hand paid by the Town of Addison, Texas, hereinafter referred to as "Town", the receipt and sufficiency of which is hereby acknowledged and confessed, has GRANTED, SOLD and CONVEYED, and does by these presents GRANT, SELL and CONVEY unto Town, a water main easement, on, over and across all those certain tracts or parcels of land described in EXHIBIT "A" attached hereto and made a part hereof for all purposes.

TO HAVE AND TO HOLD the same perpetually to said Town, its successors and assigns, together with the right and privilege at any and all time to enter upon said easement for the purpose of construction or reconstruction on and maintenance of water mains and facilities within this easement; and Grantor does hereby bind Grantor, Grantor's heirs, executors, administrators, and successors to WARRANT AND FOREVER DEFEND all and singular the said premises unto Town, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof; by, through or under Grantor but not otherwise.

Executed this 22nd day of April, 2002.

OsteoMed Corporation

By: _____

~~Partner~~ PRESIDENT

STATE OF TEXAS

COUNTY OF Dallas

This instrument was acknowledged before me on the 22nd of April, 2002 by WALTER J. HUMANN, ~~Partner~~ PRESIDENT of OsteoMed Corporation, on behalf of said corporation.

JEANETTE SIMPSON NOTARY PUBLIC STATE OF TEXAS Exp 11-15-03

Notary Public in and for the State of Texas

Print Name Jeanette Simpson

EXHIBIT A
15 ' WATER EASEMENT
TOWN OF ADDISON
DALLAS COUNTY, TEXAS

BEING a 20,169 square foot tract of land situated in the D. Myers Survey, Abstract No. 923, Dallas County, Texas and being part of Lot 4R, Block 1, Beltline-Marsh Business Park, an addition to the Town of Addison, Dallas County, Texas as recorded in Volume 95100, Page 3275, Deed Records of Dallas County, Texas, (D.R.D.C.T.), and being more particularly described as follows:

COMMENCING at the southwest corner of said Lot 4R, said point also being on the north line of Realty Road (84-foot right-of-way);

THENCE South 77 degrees 47 minutes 59 seconds East, along said north right-of-way line, a distance of 38.67 feet to the POINT OF BEGINNING;

THENCE North 11 degrees 44 minutes 14 seconds East, departing said north right-of-way line, a distance of 108.99 feet to a point for a corner;

THENCE North 78 degrees 15 minutes 46 seconds West, a distance of 18.26 feet to a point for a corner;

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THENCE South 11 degrees 56 minutes 57 seconds West, a distance of 33.19 feet to a point for a corner, said point being on a non-tangent circular curve to the right having a radius of 958.00 feet and whose chord bears North 77 degrees 58 minutes 20 seconds West, a distance of 5.77 feet, said point also being on the north right-of-way line of said Realty Road;

THENCE Northwesterly, along said north right-of-way line and along said curve, through a central angle of 00 degrees 20 minutes 41 seconds, an arc distance of 5.77 feet to a 1/2-inch found iron rod for the point of tangency;

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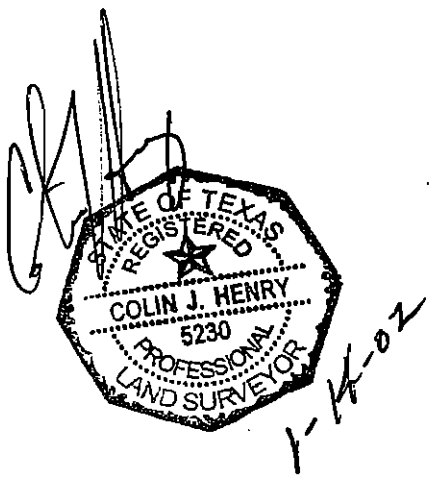
Basis of Bearing is the North line of Realty Road as recorded by the plat of "Beltline-Marsh Business Park", Lot 4R, Block 1 in Volume 95100, Page 3275, D.R.D.C.T.



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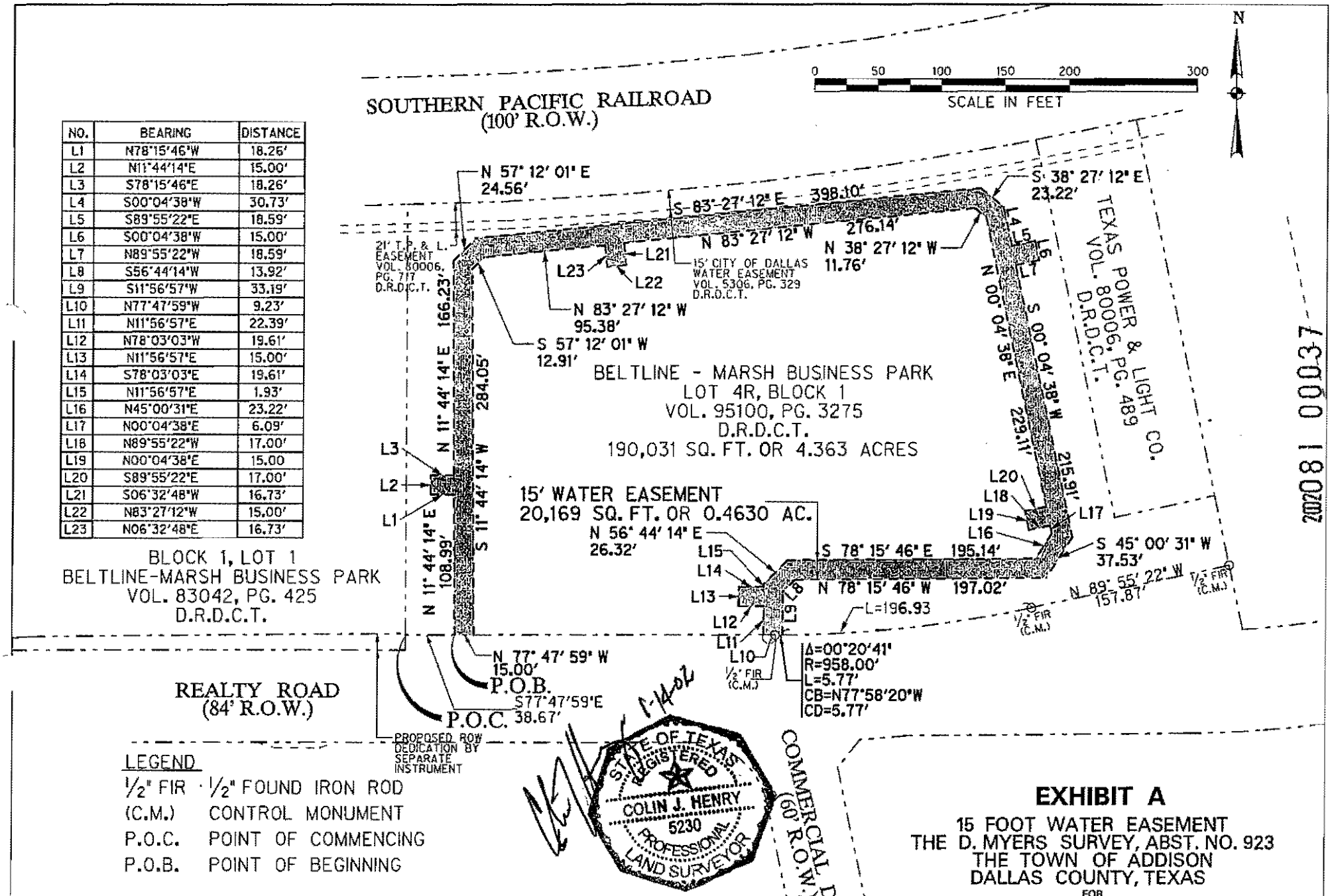

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BLOCK 1, LOT 1
BELTLINE-MARSH BUSINESS PARK
VOL. 83042, PG. 425
D.R.D.C.T.

LEGEND

1/2" FIR	1/2" FOUND IRON ROD
(C.M.)	CONTROL MONUMENT
P.O.C.	POINT OF COMMENCING
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EXHIBIT A

15 FOOT WATER EASEMENT
THE D. MYERS SURVEY, ABST. NO. 923
THE TOWN OF ADDISON
DALLAS COUNTY, TEXAS

FOR

OSTEOMED CORPORATION
3750 Realty Road
Addison, TX 75001

Prepared by
HALFF ASSOCIATES, INC.
8616 Northwest Plaza Drive
Dallas, TX 75225

SCALE: 1"=100' AVO 20079 JANUARY 2002 PAGE 5 OF 5

20020810000370

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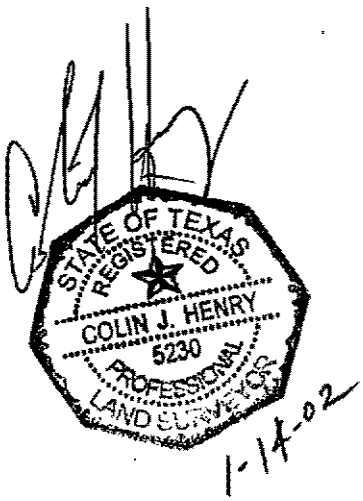

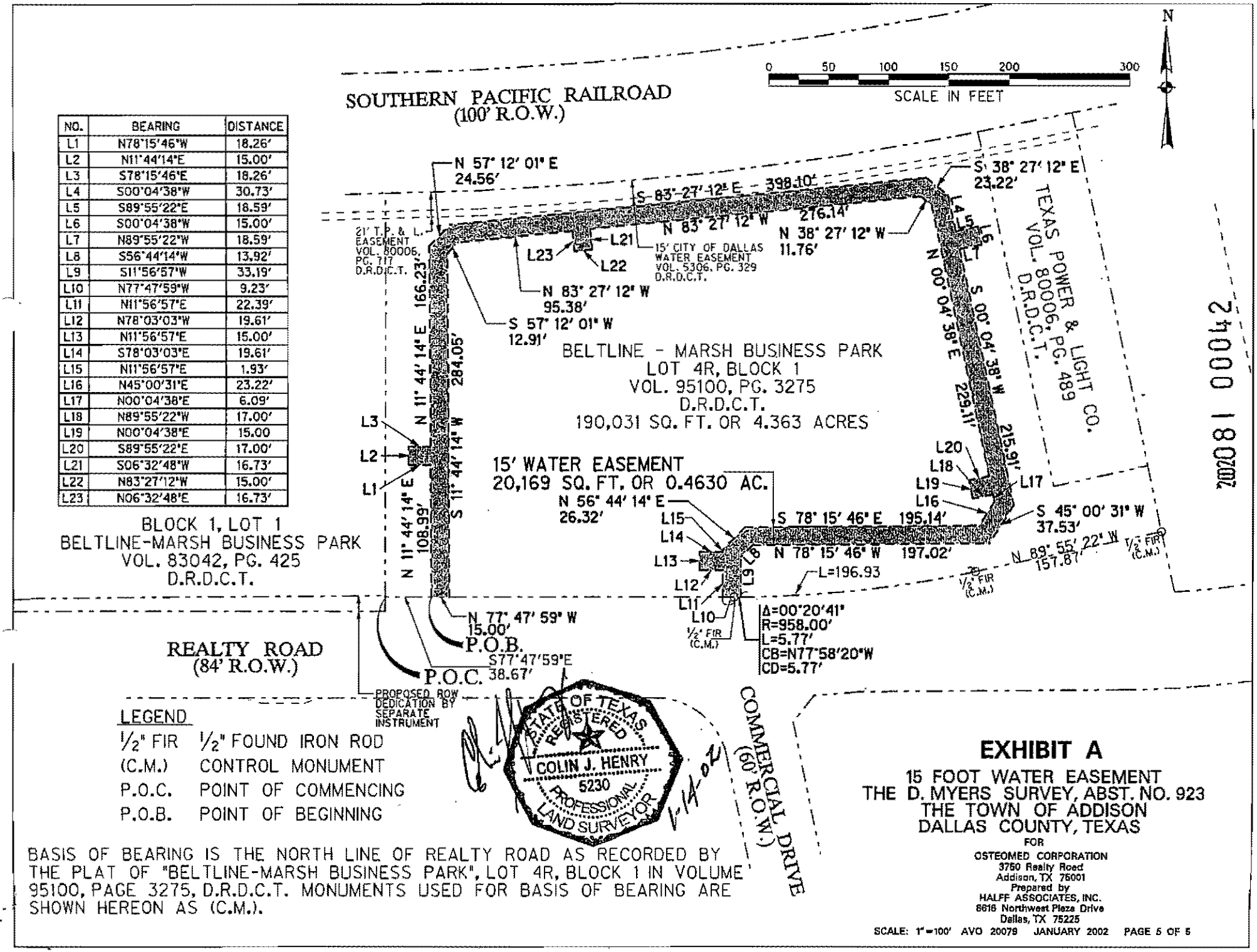

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THE D. MYERS SURVEY, ABST. NO. 923
THE TOWN OF ADDISON
DALLAS COUNTY, TEXAS

FOR
OSTEOMED CORPORATION
3750 Realty Road
Addison, TX 75001

Prepared by
HALFF ASSOCIATES, INC.
8616 Northwest Plaza Drive
Dallas, TX 75225

SCALE: 1"=100' AVO 20079 JANUARY 2002 PAGE 5 OF 5

20020108 00042400

17

WATER ~~AND WASTEWATER~~ EASEMENT

2001-0011

THE STATE OF TEXAS	)	KNOW ALL MEN BY THESE PRESENTS:
	)	
COUNTY OF DALLAS	)	

1392030

05/22/01 2661418 $17.00

Deed

That Morning Park, Inc., a Texas corporation

(hereinafter called "Grantor" whether one or more natural persons or legal entities) of the County of Dallas, State of Texas, for and in consideration of the sum of TEN AND NO/100------------------------- ($ 10.00) DOLLARS to the undersigned in hand paid by the City of Dallas, 1500 Marilla Street, Dallas, Texas 75201, a municipal corporation, (hereinafter called "City"), the receipt of which is hereby acknowledged and confessed, and the further benefits to be derived by remaining property as a result of projected public improvements, has granted, sold and conveyed and does hereby grant, sell and convey unto said City, its successors and assigns, an easement for the purpose of laying, constructing, maintaining, repairing and replacing a City water ~~and wastewater~~ main or mains and appurtenances and such additional main or mains and appurtenances as are needed in the future in, under, through, across and along all that certain lot, tract or parcel of land described in Exhibit "A": attached hereto and made a part hereof by reference for all purposes.

The City is acquiring this property for the purpose of laying, constructing, maintaining, repairing and replacing a City water ~~and wastewater~~ main or mains and appurtenances, and such additional main or mains and appurtenances as are needed in the future, according to such plans and specifications as will, in City's opinion, best serve the public purpose. The payment of the purchase price shall be considered full and adequate compensation for the easement rights herein granted.

Should one or more of the Grantors herein be natural persons and not joined by their respective spouse, it is conclusively presumed that the land herein conveyed is not the residence or business homestead of such Grantor(s). Should one or more of the Grantors herein be a legal entity other than a natural person, it shall be conclusively presumed that the person signing on behalf of such a party has been duly and legally authorized to so sign and there shall be no necessity for a seal or attestation.

The City shall have all other rights and benefits necessary or convenient for the full enjoyment or use of the rights herein granted, including, but without limiting the same to, the right of ingress and egress over and across said property to and from said easement for the purpose of constructing, reconstructing, maintaining, inspecting or repairing said main or mains and appurtenances.

The City shall have the right to remove and keep removed from the permanent easement herein granted any and all structures, fences, trees, shrubs, growths or other obstructions which may endanger or interfere with the construction, reconstruction, maintenance, repair or operation of the said main or mains. (Grantor, its successors or assigns, shall not place or store any material upon, or cover, bury, pave over or otherwise obstruct any cleanout, valve, meter or manhole located within the herein described permanent easement.)

Grantor, its successors or assigns, shall not be permitted to plant trees or shrubs of any kind within the boundaries of the herein described permanent easement.

All expenses in the construction and maintenance of said main or mains and appurtenances shall be borne by the City. In the construction of said main or mains and appurtenances, should the City find it necessary to remove any improvements now on the above-described property, all of those expenses shall also be borne by the City. Upon completion of construction, all surplus excavation, debris, trash or litter resulting from construction shall be cleaned up and hauled off the premises, and the easement property, including any fences disturbed, shall be restored to its original contour and condition.

Nothing in this easement shall be construed as a waiver by the City of any connection charge or charges imposed by ordinance or Charter of the City of Dallas.

SPECIAL PROVISIONS: ~~See Exhibit "B" attached hereto and made a part hereof~~ NONE

TO HAVE AND TO HOLD the above described easement, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said City of Dallas, its successors and assigns forever, and Grantor is hereby bound, together with all heirs, executors, administrators or successors, to Warrant and Forever Defend, all and singular the said easement unto the said City of Dallas, its successors and assigns, against every person whomsoever lawfully claiming, or to claim the same or any part thereof.

Executed this 19th day of April, ~~19~~ 2001.

Morning Park, Inc.,
a Texas corporation
By: William V. Bush II
Title: PRESIDENT

Re: Plan No. 685W385, Sheets 61-63

00110014100

20020181 00043

77UUU 180202

FILED

2002 APR 25 PM 3:32

EARL BULLOCK
COUNTY CLERK
DALLAS COUNTY

Any provision herein which restricts the sale, rental, or use of the described real property because of color or race is invalid and unenforceable under federal law.

STATE OF TEXAS COUNTY OF DALLAS

I hereby certify this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the named records of Dallas County, Texas as stamped hereon by me.

APR 23 2002

Earl Bullock
COUNTY CLERK, Dallas County, Texas

RETURN TO:

NAME Town of Addison

ADDRESS 5300 Belt Line Rd

CITY Addison, TX 75001

Addison!

STEVEN Z. CHUTCHIAN, P.E.
Assistant City Engineer
(972) 450-2886
(972) 450-2837 FAX
(214) 673-2518 Mobile
schutchian@ci.addison.tx.us E-mail

Town of Addison 16801 Westgrove Dr. P.O. Box 9010, Addison, Texas 75001-9010

4/22/02

GAYLE – CAN I GET YOUR ASSISTANCE IN FILING THIS EASEMENT WITH DALLAS COUNTY RECORDS. ALSO, I WOULD APPRECIATE A COPY OF THE FILED & RECORDED FORM FOR OUR RECORDS & ONE FOR CARMEN. THANKS!

Steve Chutchian

Steve, See attached!

Gayle W.

One filed stamped
One certified w/ page & volume # garden

TOWN OF ADDISON
WATER MAIN EASEMENT

STATE OF TEXAS

KNOW ALL PERSONS BY THESE PRESENTS

COUNTY OF DALLAS

That OsteoMed Corporation, for and in consideration of the sum of ONE DOLLAR ($1.00) and other good and valuable consideration to Grantor in hand paid by the Town of Addison, Texas, hereinafter referred to as "Town", the receipt and sufficiency of which is hereby acknowledged and confessed, has GRANTED, SOLD and CONVEYED, and does by these presents GRANT, SELL and CONVEY unto Town, a water main easement, on, over and across all those certain tracts or parcels of land described in EXHIBIT "A" attached hereto and made a part hereof for all purposes.

TO HAVE AND TO HOLD the same perpetually to said Town, its successors and assigns, together with the right and privilege at any and all time to enter upon said easement for the purpose of construction or reconstruction on and maintenance of water mains and facilities within this easement; and Grantor does hereby bind Grantor, Grantor's heirs, executors, administrators, and successors to WARRANT AND FOREVER DEFEND all and singular the said premises unto Town, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof; by, through or under Grantor but not otherwise.

Executed this 22nd day of April, 2002.

OsteoMed Corporation

By: _____
~~Partner~~ PRESIDENT

STATE OF TEXAS

COUNTY OF Dallas

This instrument was acknowledged before me on the 22nd of April, 2002 by WALTER J. HUMANN, ~~Partner~~ PRESIDENT of OsteoMed Corporation, on behalf of said corporation.

Notary Public in and for the State of Texas
Print Name Yolette Simpson

EXHIBIT A
15 'WATER EASEMENT
TOWN OF ADDISON
DALLAS COUNTY, TEXAS

BEING a 20,169 square foot tract of land situated in the D. Myers Survey, Abstract No. 923, Dallas County, Texas and being part of Lot 4R, Block 1, Beltline-Marsh Business Park, an addition to the Town of Addison, Dallas County, Texas as recorded in Volume 95100, Page 3275, Deed Records of Dallas County, Texas, (D.R.D.C.T.), and being more particularly described as follows:

COMMENCING at the southwest corner of said Lot 4R, said point also being on the north line of Realty Road (84-foot right-of-way);

THENCE South 77 degrees 47 minutes 59 seconds East, along said north right-of-way line, a distance of 38.67 feet to the POINT OF BEGINNING;

THENCE North 11 degrees 44 minutes 14 seconds East, departing said north right-of-way line, a distance of 108.99 feet to a point for a corner;

THENCE North 78 degrees 15 minutes 46 seconds West, a distance of 18.26 feet to a point for a corner;

THENCE North 11 degrees 44 minutes 14 seconds East, a distance of 15.00 feet to a point for a corner;

THENCE South 78 degrees 15 minutes 46 seconds East, a distance of 18.26 feet to a point for a corner;

THENCE North 11 degrees 44 minutes 14 seconds East, a distance of 166.23 feet to a point for a corner;

THENCE North 57 degrees 12 minutes 01 second East, a distance of 24.56 feet to a point for a corner;

THENCE South 83 degrees 27 minutes 12 seconds East, a distance of 398.10 feet to a point for a corner;

THENCE South 38 degrees 27 minutes 12 seconds East, a distance of 23.22 feet to a point for a corner;

THENCE South 00 degrees 04 minutes 38 seconds West, a distance of 30.73 feet to a point for a corner;

THENCE South 89 degrees 55 minutes 22 seconds East, a distance of 18.59 feet to a point for a corner;

THENCE South 00 degrees 04 minutes 38 seconds West, a distance of 15.00 feet to a point for a corner;

THENCE North 89 degrees 55 minutes 22 seconds West, a distance of 18.59 feet to a point for a corner;

THENCE South 00 degrees 04 minutes 38 seconds West, a distance of 215.91 feet to a point for corner;

THENCE South 45 degrees 00 minutes 31 seconds West, a distance of 37.53 feet to a point for a corner;

THENCE North 78 degrees 15 minutes 46 seconds West, a distance of 197.02 feet to a point for a corner;

THENCE South 56 degrees 44 minutes 14 seconds West, a distance of 13.92 feet to a point for a corner;

THENCE South 11 degrees 56 minutes 57 seconds West, a distance of 33.19 feet to a point for a corner, said point being on a non-tangent circular curve to the right having a radius of 958.00 feet and whose chord bears North 77 degrees 58 minutes 20 seconds West, a distance of 5.77 feet, said point also being on the north right-of-way line of said Realty Road;

THENCE Northwesterly, along said north right-of-way line and along said curve, through a central angle of 00 degrees 20 minutes 41 seconds, an arc distance of 5.77 feet to a 1/2-inch found iron rod for the point of tangency;

THENCE North 77 degrees 47 minutes 59 seconds West, continuing along said north right-of-way line, a distance of 9.23 feet to a point for corner;

THENCE North 11 degrees 56 minutes 57 seconds East, departing said north right-of-way line, a distance of 22.39 feet to a point for a corner;

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THENCE South 78 degrees 03 minutes 03 seconds East, a distance of 19.61 feet to a point for a corner;

THENCE North 11 degrees 56 minutes 57 seconds East, a distance of 1.93 feet to a point for a corner;

THENCE North 56 degrees 44 minutes 14 seconds East, a distance of 26.32 feet to a point for a corner;

THENCE South 78 degrees 15 minutes 46 seconds East, a distance of 195.14 feet to a point for a corner;

THENCE North 45 degrees 00 minutes 31 seconds East, a distance of 23.22 feet to a point for a corner;

THENCE North 00 degrees 04 minutes 38 seconds East, a distance of 6.09 feet to a point for a corner;

THENCE North 89 degrees 55 minutes 22 seconds West, a distance of 17.00 feet to a point for corner;

THENCE North 00 degrees 04 minutes 38 seconds East, a distance of 15.00 feet to a point for a corner;

THENCE South 89 degrees 55 minutes 22 seconds East, a distance of 17.00 feet to a point for a corner;

THENCE North 00 degrees 04 minutes 38 seconds East, a distance of 229.11 feet to a point for a corner;

THENCE North 38 degrees 27 minutes 12 seconds West, a distance of 11.76 feet to a point for a corner;

THENCE North 83 degrees 27 minutes 12 seconds West, a distance of 276.14 feet to a point for a corner;

THENCE South 06 degrees 32 minutes 48 seconds West, a distance of 16.73 feet to a point for a corner;

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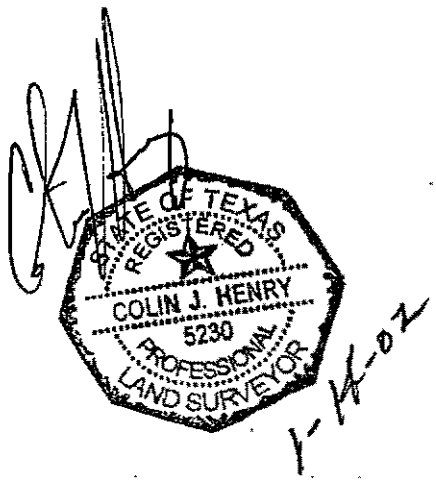
THENCE North 83 degrees 27 minutes 12 seconds West, a distance of 95.38 feet to a point for a corner;

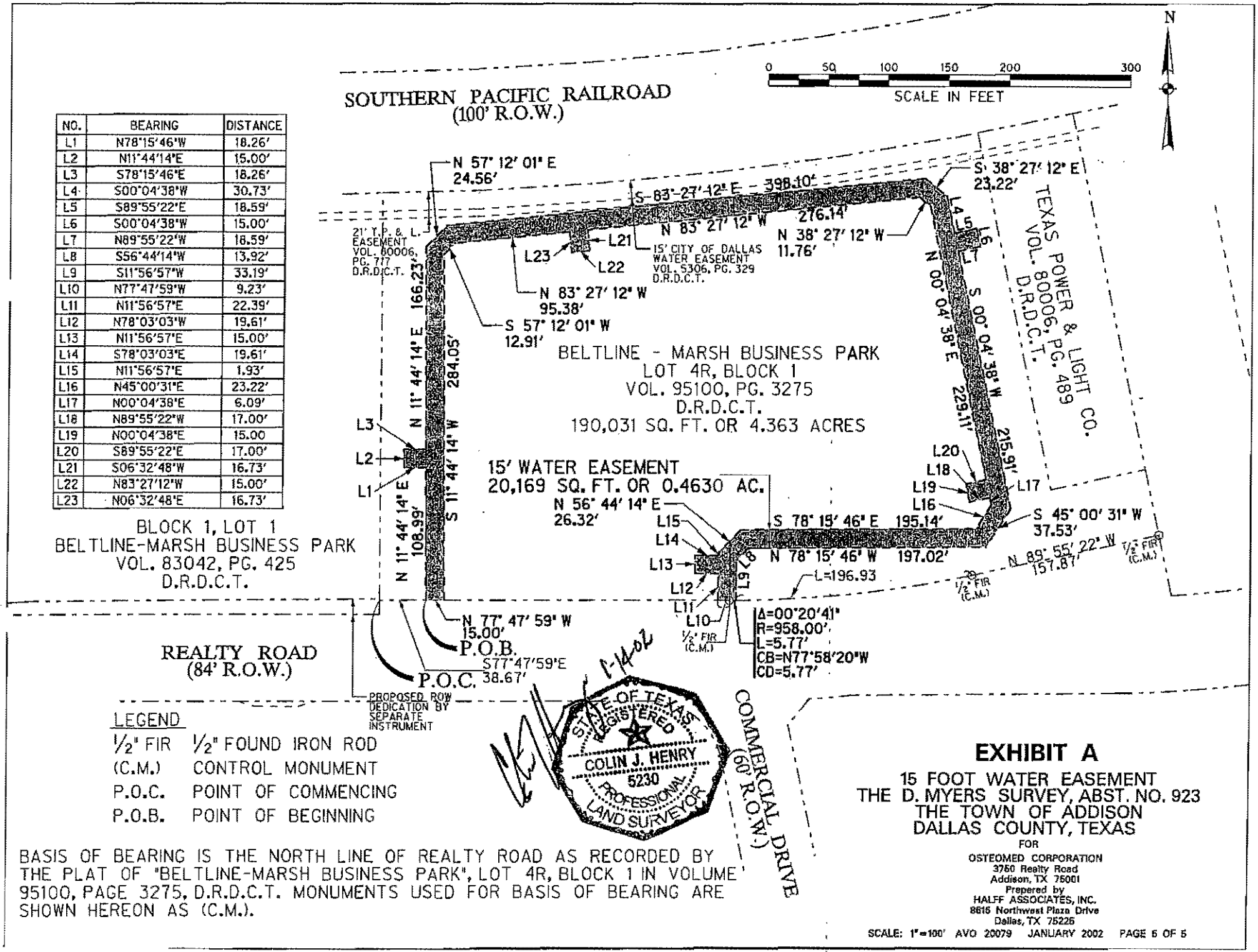
THENCE South 57 degrees 12 minutes 01 second West, a distance of 12.91 feet to a point for a corner;

THENCE South 11 degrees 44 minutes 14 seconds West, a distance of 284.05 feet to a point for a corner on the north right-of-way line of said Realty Road;

THENCE North 77 degrees 47 minutes 59 seconds West, along said north right-of-way line, a distance of 15.00 feet to the POINT OF BEGINNING and CONTAINING 20,169 square feet, or 0.4630 acres of land, more or less.

Basis of Bearing is the North line of Realty Road as recorded by the plat of "Beltline-Marsh Business Park", Lot 4R, Block 1 in Volume 95100, Page 3275, D.R.D.C.T.





NO.	BEARING	DISTANCE
L1	N78°15'46"W	18.26'
L2	N11°44'14"E	15.00'
L3	S78°15'46"E	18.26'
L4	S00°04'38"W	30.73'
L5	S89°55'22"E	18.59'
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L16	N45°00'31"E	23.22'
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L18	N89°55'22"W	17.00'
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L21	S06°32'48"W	16.73'
L22	N83°27'12"W	15.00'
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BLOCK 1, LOT 1
BELTLINE-MARSH BUSINESS PARK
VOL. 83042, PG. 425
D.R.D.C.T.

LEGEND

1/2" FIR	1/2" FOUND IRON ROD
(C.M.)	CONTROL MONUMENT
P.O.C.	POINT OF COMMENCING
P.O.B.	POINT OF BEGINNING

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EXHIBIT A

15 FOOT WATER EASEMENT
THE D. MYERS SURVEY, ABST. NO. 923
THE TOWN OF ADDISON
DALLAS COUNTY, TEXAS

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OSTEOMED CORPORATION
3750 Realty Road
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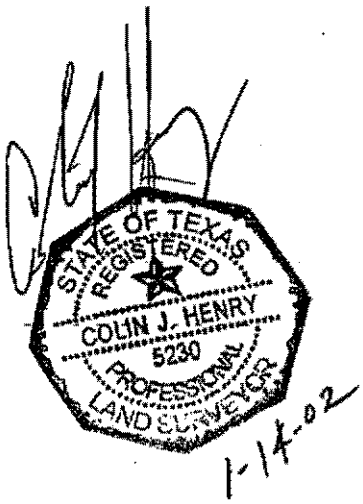

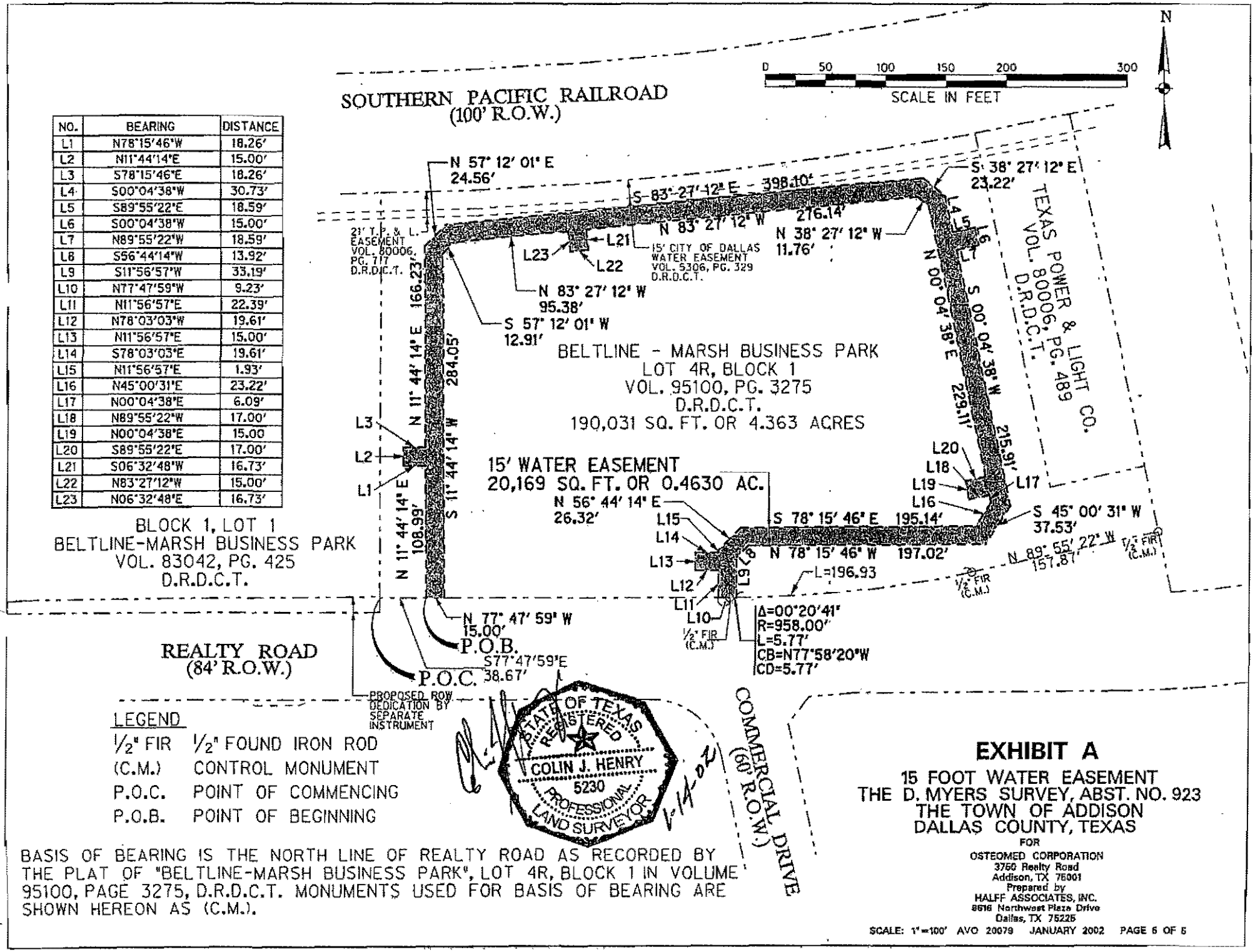

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2001-0011

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e undersigned in hand paid by the City of Dallas, 1500 Marilla Street, Dallas, Texas 75201, a municipal oration, (hereinafter called "City"), the receipt of which is hereby acknowledged and confessed, and the further fits to be derived by remaining property as a result of projected public improvements, has granted, sold and eyed and does hereby grant, sell and convey unto said City, its successors and assigns, an easement for the ose of laying, constructing, maintaining, repairing and replacing a City water ~~and wastewater~~ main or mains appurtenances and such additional main or mains and appurtenances as are needed in the future in, under, igh, across and along all that certain lot, tract or parcel of land described in Exhibit "A": attached hereto and a part hereof by reference for all purposes.

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Should one or more of the Grantors herein be natural persons and not joined by their respective spouse, it is lusively presumed that the land herein conveyed is not the residence or business homestead of such Grantor(s). uld one or more of the Grantors herein be a legal entity other than a natural person, it shall be conclusively umed that the person signing on behalf of such a party has been duly and legally authorized to so sign and e shall be no necessity for a seal or attestation.

The City shall have all other rights and benefits necessary or convenient for the full enjoyment or use of the ts herein granted, including, but without limiting the same to, the right of ingress and egress over and across property to and from said easement for the purpose of constructing, reconstructing, maintaining, inspecting or iiring said main or mains and appurtenances.

The City shall have the right to remove and keep removed from the permanent easement herein granted any all structures, fences, trees, shrubs, growths or other obstructions which may endanger or interfere with the struction, reconstruction, maintenance, repair or operation of the said main or mains. (Grantor, its successors assigns, shall not place or store any material upon, or cover, bury, pave over or otherwise obstruct any nout, valve, meter or manhole located within the herein described permanent easement.)

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Nothing in this easement shall be construed as a waiver by the City of any connection charge or charges posed by ordinance or Charter of the City of Dallas.

ECIAL PROVISIONS: ~~See Exhibit "B" attached hereto and made a part hereof~~ NONE

TO HAVE AND TO HOLD the above described easement, together with all and singular the rights and purtenances thereto in anywise belonging unto the said City of Dallas, its successors and assigns forever, and antor is hereby bound, together with all heirs, executors, administrators or successors, to Warrant and Forever fend, all and singular the said easement unto the said City of Dallas, its successors and assigns, against every rson whomsoever lawfully claiming, or to claim the same or any part thereof.

Executed this 19th day of April, ~~19~~ 2001.

Morning Park, Inc.,
a Texas corporation
By: William F. Bush II
Title: PRESIDENT

Plan No. 6850 385, Sheets 61-63

20011001/0160

2001100.01160

SITE UTILITIES
MATERIAL SUBMITTAL

PROJECT:
OsteoMed Corporation
Addison, Texas

Submitted By:
CalHar Construction, Inc.
2138 CalHar Drive
Melissa, TX 75454

Date: May 3, 2002

MATERIAL SUBMITTAL INDEX

A. WATER MATERIALS:

1. JM Pipe: 8"-6" DR18 CL150 PVC Water Pipe for Public Water
2. JM Pipe: 8" DR14 CL200 PVC Water Pipe for Underground Fire Line
3. US Pipe: 8" CL52 Tyton Joint Ductile Iron Pipe for Fire Line Riser
4. Mueller: 2"x40' KSoft Copper Tubing for Public Service from Main to Meter
5. JM Pipe: 2" SDR21 CL200 Gskt Joint PVC Pipe for Domestic Line to Bldg
6. Charlotte: 1-11/2" SCH40 PVC Pipe for Irrigation Line
7. Mueller: #A-2360 Resilient Wedge Gate Valve
8. Kennedy: UL/FM #741 Vertical Indicator Post
9. Bass & Hays: #2436-S USA Adjustable Cast Iron Valve Box
10. Mueller: Super Centurion Model Fire Hydrant
11. Smith Blair: #662 Stainless Steel Tapping Sleeve w/ Epoxy Coated Flange
12. Tyler/Union: Compact Ductile Mechanical Joint Fittings – C153
13. EBAA-Seal: Mechanical Joint Restraint
14. Mueller: #BR2B Dbl. Strap Bronze Service Saddle
15. Mueller: #H15023 2" – 1-1/2" Comp Corporation Valve
16. Mueller: #H14277 2" – 1-1/2" Comp Angle Meter Valve
17. Bass & Hays: #55-A Galvanized Meter Box
18. Watts: 2" #007 Backflow Preventor Box
19. Park Equipment: 8" Dbl. Detector Check & Vault Assy for Fire Line

B. SANITARY SEWER MATERIALS:

1. JM Pipe: 6" – 4" SDR35 PVC Sewer Pipe
2. SDR35 PVC Sewer Fittings
3. Bass & Hays: #404 Sanitary Lateral Cleanout

C. STORM SEWER MATERIALS:

1. CSR/Wall: Concrete Pipe Certification for RCP Pipe / ASTM C-76
2. RAM-NECK: RCP Pipe Joint Material
3. JM Pipe: 10"- 8" SDR35 PVC Sewer Pipe
4. Hughes Supply/American Pre-Cast: 5' Curb Inlet w/ #184 Access Cover
5. Hughes Supply/American Pre-Cast: Type "B" Headwall
6. Hughes Supply/American Pre-Cast: #36 Catch Basin w/Galvanized Hwy Grate as Alternate to 2-Grate & 3-Grate Inlets
7. Hughes Supply/American Pre-Cast: #20 Catch Basin
8. Cast-in-Place Concrete Structures / Hanson: Concrete Batch Mix Design

WATER MATERIAL INDEX

A. WATER MATERIALS:

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17. Bass & Hays: #55-A Galvanized Meter Box
18. Watts: 2" #007 Backflow Preventor Box
19. Park Equipment: 8" Dbl. Detector Check & Vault Assy for Fire Line

DR18 CL150 PVC WATER PIPE FOR WATER

Blue Brute® Pressure Pipe

Scope
The specification with which J-M Manufacturing's Blue Brute is manufactured designates general requirements for unplasticized polyvinyl chloride (PVC) plastic class water pipe with integral bell and spigot joints for the conveyance of water and other fluids.

Pipe
Blue Brute pipe is suitable for use as pressure conduit. The bell consists of an integral wall section with a factory installed, elastomeric ring that allows for expansion and contraction at each joint.

Joint Design
Blue Brute's joint design meets ASTM D3139 joint qualification performance testing requirements, with which the elastomeric ring is manufactured in compliance with ASTM F477.

Hydro Testing
Each section of pipe is tested to four times the pressure class for a minimum of 5 seconds as a matter of routine quality control testing.

Materials
Blue Brute pipe meets the requirements of the American Water Works Association water distribution standard AWWA C900. The PVC Cell Classification is 12454B as defined under ASTM D1784 . Pressure ratings and dimension ratios are as follows:

Pipe Class	DR	Max. Working Pressure @ 73°F
Class 100	25	100 psi
Class 150	18	150 psi
Class 200	14	200 psi

Applicable Specifications
All classes of Blue Brute pressure pipe are UL listed for water mains as well as being tested and certified to ANSI/NSF Standard 61.

Cast Iron O.D.
Available in 4",6",8",10" and 12" sizes, Blue Brute can be connected directly into cast iron and ductile iron fittings without adapters or complicated procedures.

Standard Laying Lengths
Standard laying lengths shall be 20 feet (±1") for all sizes.

Purple Reclaim and Green Sewer
J-M also manufactures AWWA C-900 pipe in Purple color specifically for reclaimed water systems, and Green for sewer forced main applications. These pipe are made and tested to the same requirements as our standard product, except that the pigment used is purple or green. These products will not be marked with the UL, FM or NSF listing marks. Additionally, the purple pipe will be marked : " Reclaimed Water... Do Not Drink "

Dimensions

Nominal Pipe Size	Outside Diameter (OD)	Nom. Inside Diameter (ID)	Wall Thickness Min. (T)	Approx. Wt. (Lbs./Ft.)
CLASS 100 (DR 25)				
4	4.80	4.39	0.192	1.9
6	6.90	6.30	0.276	3.9
8	9.05	8.28	0.362	6.7
10	11.10	10.16	0.444	10.1
12	13.20	12.08	0.528	14.4
CLASS 150 (DR 18)				
4	4.80	4.23	0.267	2.6
6	6.90	6.09	0.383	5.3
8	9.05	7.98	0.503	9.2
10	11.10	9.79	0.617	13.9
12	13.20	11.65	0.733	19.7
CLASS 200 (DR 14)				
4	4.80	4.07	0.343	3.2
6	6.90	5.86	0.493	6.7
8	9.05	7.68	0.646	11.6
10	11.10	9.42	0.793	17.6
12	13.20	11.20	0.943	25.1

Notes:

A. Outside Diameter (OD) average dimensions conform to Cast Iron OD (C.I.O.D.).

B. All dimensions are in inches unless specified otherwise.

C. Product information effective as of 7/00. Subject to revision at any time.

Reference Specifications;

A. AWWA C-900 : " PVC Pressure Pipe and Fabricated Fitting, 4"- 12", For Water Distribution "

B. ASTM F477 : " Elastomeric Seals (Gaskets) for Joining Plastic Pipe "

C. ASTM D1784 : " Specification for Rigid PVC Compounds and CPVC Compounds "

D. ASTM D3139 : " Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals "

FIRE LINE PIPE – DR14

Blue Brute® Pressure Pipe

Scope
The specification with which J-M Manufacturing's Blue Brute is manufactured designates general requirements for unplasticized polyvinyl chloride (PVC) plastic class water pipe with integral bell and spigot joints for the conveyance of water and other fluids.

Pipe
Blue Brute pipe is suitable for use as pressure conduit. The bell consists of an integral wall section with a factory installed, elastomeric ring that allows for expansion and contraction at each joint.

Joint Design
Blue Brute's joint design meets ASTM D3139 joint qualification performance testing requirements, with which the elastomeric ring is manufactured in compliance with ASTM F477.

Hydro Testing
Each section of pipe is tested to four times the pressure class for a minimum of 5 seconds as a matter of routine quality control testing.

Materials
Blue Brute pipe meets the requirements of the American Water Works Association water distribution standard AWWA C900. The PVC Cell Classification is 12454B as defined under ASTM D1784 . Pressure ratings and dimension ratios are as follows:

Pipe Class	DR	Max. Working Pressure @ 73°F
Class 100	25	100 psi
Class 150	18	150 psi
Class 200	14	200 psi

Applicable Specifications
All classes of Blue Brute pressure pipe are UL listed for water mains as well as being tested and certified to ANSI/NSF Standard 61.

Cast Iron O.D.
Available in 4",6",8",10" and 12" sizes, Blue Brute can be connected directly into cast iron and ductile iron fittings without adapters or complicated procedures.

Standard Laying Lengths
Standard laying lengths shall be 20 feet (±1") for all sizes.

Purple Reclaim and Green Sewer
J-M also manufactures AWWA C-900 pipe in Purple color specifically for reclaimed water systems, and Green for sewer forced main applications. These pipe are made and tested to the same requirements as our standard product, except that the pigment used is purple or green. These products will not be marked with the UL, FM or NSF listing marks. Additionally, the purple pipe will be marked : " Reclaimed Water... Do Not Drink "

Dimensions

Nominal Pipe Size	Outside Diameter (OD)	Nom. Inside Diameter (ID)	Wall Thickness Min. (T)	Approx. Wt. (Lbs./Ft.)
CLASS 100 (DR 25)				
4	4.80	4.39	0.192	1.9
6	6.90	6.30	0.276	3.9
8	9.05	8.28	0.362	6.7
10	11.10	10.16	0.444	10.1
12	13.20	12.08	0.528	14.4
CLASS 150 (DR 18)				
4	4.80	4.23	0.267	2.6
6	6.90	6.09	0.383	5.3
8	9.05	7.98	0.503	9.2
10	11.10	9.79	0.617	13.9
12	13.20	11.65	0.733	19.7
CLASS 200 (DR 14)				
4	4.80	4.07	0.343	3.2
6	6.90	5.86	0.493	6.7
8	9.05	7.68	0.646	11.6
10	11.10	9.42	0.793	17.6
12	13.20	11.20	0.943	25.1

Notes:

A. Outside Diameter (OD) average dimensions conform to Cast Iron OD (C.I.O.D.).

B. All dimensions are in inches unless specified otherwise.

C. Product information effective as of 7/00. Subject to revision at any time.

Reference Specifications:

A. AWWA C-900 : " PVC Pressure Pipe and Fabricated Fitting, 4"- 12", For Water Distribution "

B. ASTM F477 : " Elastomeric Seals (Gaskets) for Joining Plastic Pipe "

C. ASTM D1784 : " Specification for Rigid PVC Compounds and CPVC Compounds "

D. ASTM D3139 : " Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals "

CL52 DUCTILE IRON PIPE FOR FIRE LINE RISER

TYTON JOINT® Pipe

TYTON JOINT® is U.S. Pipe's trademark for pipe with a push-on type connection. Simplicity, sturdiness and water-tightness of the system are built into the system by design. Taking advantage of a background of more than 100 years experience with pipe and pipe connecting systems, U.S. Pipe made a thorough study of existing joining systems and requirements of pipe users. The results of this study showed the need for a simple, economical and reliable method of assembling pipe. A number of new designs were devised. A rigorous testing process resulted in the selection of the TYTON JOINT Pipe System.

After selection of the system, TYTON JOINT Pipe were then subjected to further testing designed to simulate extreme installation and service conditions which might be encountered in the field. It was only after these tests proved completely satisfactory and were confirmed by field installations that the decision was made to market TYTON JOINT Pipe in 1955. Convincing proof of its wide acceptance is shown by the fact that more than 95% of the pipe now sold by this company is TYTON JOINT Pipe.

The TYTON® Gasket—a circular rubber gasket which has a modified bulb shape in cross section—is the only required accessory. They are furnished in accordance with ANSI/AWWA C111/A21.11 *Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.* Composition and dimensions of the gasket have been carefully engineered to ensure a water-tight and lasting seal. The standard TYTON Gasket is manufactured of SBR - styrene butadiene rubber. Gaskets of special elastomers may be ordered for special applications.

The gasket contour and bell socket contour ensure that the gasket will remain seated during proper assembly of the pipe.

The plain end of the pipe is furnished beveled to ease assembly. Because TYTON JOINT Pipe assembles so easily, those not experienced with it may think that the system is not water-tight. More than 40 years of successful experience have proved its sealing capabilities. Hydrostatic tests have shown that the system will withstand pressures far in excess of rated pressures.

Ductile Iron TYTON JOINT Pipe are centrifugally cast in metal molds in accordance with ANSI/AWWA C151/A21.51 *Ductile-Iron Pipe, Centrifugally Cast for Water.*

TYTON JOINT Pipe, sizes 4"-16," is UL listed and FM approved.

The asphaltic outside coating is in accordance with ANSI/AWWA C151/A21.51. The cement-mortar lining and inside coating are in accordance with ANSI/AWWA C104/A21.4 *Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water*. Special linings and/or coatings can be furnished for specific conditions.

Sizes 4" through 42" are furnished in nominal 18-foot laying lengths. Sizes 48" through 64" are furnished in nominal 20-foot laying lengths.

As specified in ANSI/AWWA C151/A21.51, pipe weights have been calculated using standard barrel weights and weights of bells being produced.

When joint restraint is required for push-on joint pipe, two options are available from U.S. Pipe. For joint restraint of 4" through 24", FIELD LOK 350® Gaskets may be used. FIELD LOK 350 Gaskets are rated for 350 psi in sizes 4" through 24". In addition, for 4" through 64" sizes, TR FLEX® Pipe and Fittings may be used. TR FLEX Pipe and Fittings are rated for working pressures for 350 psi in 4" through 24" sizes, 250 psi in sizes 30" through 48", and 200 psi in sizes 54" through 64". For higher pressure applications contact your U.S. Pipe representative. Complete details on both FIELD LOK 350® Gaskets and TR FLEX® Pipe and Fittings can be found on our website, www.uspipe.com.

When TYTON JOINT Pipe are used for bridge crossings or other above-ground installations, each length of pipe must be supported in a manner to restrict both vertical and horizontal movement.

Note:
If specifiers and users believe that corrosive soils will be encountered where our products are to be installed, please refer to ANSI/AWWA C105/A21.5 *Polyethylene Encasement for Ductile Iron Pipe Systems*, for proper external protection procedures.

U.S. Pipe qualifies for Federal Procurement under Public Law No. 94-580, Section 6002, known as the Resource Recovery Act of 1976, since, due to modern technology, recycled iron and steel scrap is used to a large degree in our Ductile Iron Pipe production.

Thicknesses, Dimensions and Weights of Ductile Iron TYTON JOINT® Pipe Thickness Class

Thicknesses and dimensions of 4" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.

Size Inches	Thickness Class	Thickness	Outside Diameter*	18-Foot Laying Length	
				Weight Per Length†	Avg. Weight Per Foot††
		Inches		Pounds	
4	51	0.26	4.80	215	11.9
4	52	0.29	4.80	235	13.1
4	53	0.32	4.80	260	14.4
4	54	0.35	4.80	280	15.6
4	55	0.38	4.80	300	16.7
4	56	0.41	4.80	320	17.8
6	50	0.25	6.90	305	16.9
6	51	0.28	6.90	335	18.6
6	52	0.31	6.90	370	20.6
6	53	0.34	6.90	400	22.2
6	54	0.37	6.90	435	24.2
6	55	0.40	6.90	465	25.8
6	56	0.43	6.90	495	27.5
8	50	0.27	9.05	430	23.9
8	51	0.30	9.05	475	26.4
8	52	0.33	9.05	520	28.9
8	53	0.36	9.05	560	31.1
8	54	0.39	9.05	605	33.6
8	55	0.42	9.05	650	36.1
8	56	0.45	9.05	690	38.3
10	50	0.29	11.10	570	31.7
10	51	0.32	11.10	625	34.7
10	52	0.35	11.10	680	37.8
10	53	0.38	11.10	730	40.6
10	54	0.41	11.10	785	43.6
10	55	0.44	11.10	840	46.7
10	56	0.47	11.10	890	49.4
12	50	0.31	13.20	725	40.3
12	51	0.34	13.20	790	43.9
12	52	0.37	13.20	855	47.5
12	53	0.40	13.20	920	51.1
12	54	0.43	13.20	985	54.7
12	55	0.46	13.20	1045	58.1
12	56	0.49	13.20	1110	61.7

* Tolerance of O.D. of spigot end: 4-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.

†† Including bell; average weight, per foot, based on calculated weight of pipe before rounding.

2" Type KSoft Copper Tubing for Public Service to Meter

Copper tubing - standard dimensions, weights and tolerances

Standard copper water tube size type "K"	Nominal copper tube size	Outside diameter			Wall thickness		Nominal inside diameter	Actual inside area	Actual net copper area	Theoretical weight		Calculated ultimate tensile strength	Bursting* pressure	Hydrostatic** test pressure	Safe working pressure
			Tolerance												Safety factor of 8
		O.D.	Annealed	Drawn	Nominal	Tolerance +/-				Nominal	Tolerance +/-				
inches	inch	inches	inch	inch	inch	inch	inches	sq. in.	sq. in.	lbs. per feet	percent	lbs.	psi	psi	psi
-	1/4	.250	.002	-	.030	.0025	.190	.028	.021	.081	7	630	8305	1593	1038
-	3/8	.375	.002	-	.032	.0025	.311	.076	.034	.134	7	1020	5995	1099†	749
-	1/2	.500	.002	-	.032	.0025	.436	.149	.047	.182	7	1410	4530	809	566
3/8	-	.500	.0025	.001	.049	.004	.402	.127	.069	.269	7	2070	6848	1276†	856
-	5/8	.625	.0025	-	.035	.003	.555	.242	.065	.252	7	1950	3974	704	497
1/2	-	.625	.0025	.001	.049	.004	.527	.218	.089	.344	7	2670	5521	1004	690
5/8	-	.750	.0025	.001	.049	.004	.652	.334	.108	.418	7	3240	4622	827	578
3/4	-	.875	.003	.001	.065	.0045	.745	.436	.165	.641	7	4950	5239	948	655
1	-	1.125	.0035	.0015	.065	.0045	.995	.778	.216	.839	7	6480	4101	727	513
1-1/4	-	1.375	.004	.0015	.065	.0045	1.245	1.217	.267	1.04	7	8010	3366	590	421
1-1/2	-	1.625	.0045	.002	.072	.005	1.481	1.723	.351	1.36	7	10530	3155	551	394
2	-	2.125	.005	.002	.083	.007	1.959	3.014	.532	2.06	7	15960	2786	484	348

The above information was obtained from the following specification standards:
ASTM B68-1971, ASTM B88-1971, ASTM B-251-1971, and ANSI H23.1-1970.

The bursting pressures and the hydrostatic test pressures have been figured using the nominal dimensions of the tubing and the appropriate formula listed below:

$$P = \frac{S \times (D^2 - d^2)}{.334d^2 + 1.333D^2} \qquad P = \frac{2tS}{D - 0.8t}$$

Where S = 30,000 psi (ultimate tensile)
P = Bursting pressure (psi)
D = Outside diameter (in)
d = Inside diameter (in)

Where P = Hydrostatic pressure (psi)
t = Wall thickness (in)
D = Outside diameter (in)
S = Allowable stress of the material = 6000 psi

† This pressure listed to conform with formula. However, the tube need not be tested at a hydrostatic pressure over 1000 psi unless specified.
* Calculated from Clavarino's formula.
** Calculated from formula for thin hollow cylinders. See specifications ASTM B88-1962.

SDR21 CL200 Gskt Joint PVC Pipe for Private Domestic

SCH40 PVC Pipe for Irrigation Piping

CHARLOTTE
PIPE AND FOUNDRY COMPANY
P.O. Box 35430 • Telephone 704/372-5030
CHARLOTTE, NORTH CAROLINA 28235

PURSUING CHARLOTTE EXCELLENCE

This is to certify that products manufactured by Charlotte Pipe and Foundry Company, Plastics Division, conforms to the following standards:

SCH. 40 PVC PIPE
ASTM D-1784, ASTM D-1785
ASTM D-2665, FHA UM-41
FHA UM-79
FEDERAL SPECIFICATION L-P-320a
IAPMO IS 9-90, IAPMO IS 8-89
NSF STANDARD NO. 14
IAPMO UPC ON SPECIFIED ITEMS

SCH. 40 PVC-DWV PIPE-CELLULAR CORE
ASTM D-4396, ASTM F-891
NSF STANDARD NO. 14
IAPMO UPC

SCH. 40 PVC-DWV FITTINGS
ASTM D-1784, ASTM D-2665
FHA UM-79
FEDERAL SPECIFICATION L-P-320a
IAPMO IS 9-90
NSF STANDARD NO. 14
IAPMO UPC ON SPECIFIED ITEMS

PVC PRESSURE PIPE SDR-21
ASTM D-1784, ASTM D-2241
FHA UM-41
NSF STANDARD NO. 14

PVC PRESSURE PIPE SDR-26
ASTM D-1784, ASTM D-2241
FHA UM-41
NSF STANDARD NO. 14

PVC SEWER MAIN PIPE
ASTM D-1784
ASTM D-3034-SDR 35 AND SDR 26
ASTM D-3212, ASTM F 477

PVC WELL CASING PIPE
ASTM D-1784, ASTM F 480
NSF STANDARD NO. 14

SCH. 40 ABS PIPE
ASTM D-3965, ASTM D-2661
FHA UM-79
FEDERAL SPECIFICATION L-P-322b
IAPMO IS 5-90
NSF STANDARD NO. 14
IAPMO UPC

SCH. 40 ABS-DWV PIPE-CELLULAR CORE
ASTM D-3965, ASTM F-628
NSF STANDARD NO. 14

SCH. 40 ABS-DWV FITTINGS
ASTM D-3965, ASTM D-2661
FHA UM-79
FEDERAL SPECIFICATION L-P-322b
IAPMO IS 5-90
NSF STANDARD NO. 14
IAPMO UPC ON SPECIFIED ITEMS

SCH. 40 PVC PRESSURE FITTINGS
ASTM D-1784, ASTM D-2466
FHA UM-41
NSF STANDARD NO. 14

PVC THIN WALL PIPE AND FITTINGS
ASTM D-1784, ASTM D-2949
NSF STANDARD NO. 14

PVC SEWER MAIN PIPE-CELLULAR CORE
ASTM D-4396, ASTM F-891 PS 50

PVC SCH. 80 PVC PIPE
ASTM D-1784, ASTM D-1785 PVC 1120
NSF STANDARD NO. 14

Very truly yours,

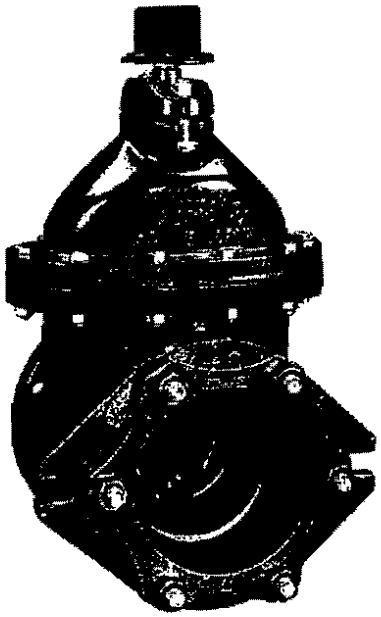
Alan Biggers
Senior Vice President

GATE VALVE - MA2360

10.6 Mueller Co. 4"-12" MUELLER® A-2360 RESILIENT WEDGE GATE VALVES WITH M.J. x FL. ENDS

Rev. 5-00

- ❑ Catalog number–
  A-2360-16 mechanical joint x flanged ends (with mechanical joint unassembled accessories)
  A-2360-19 mechanical joint x flanged ends (less mechanical joint accessories)
- ❑ Sizes— 4", 6", 8", 10", 12"
- ❑ Meets or exceeds all applicable requirements of ANSI/AWWA C509 Standard and is certified to ANSI/NSF 61
- ❑ Flanged end dimensions and drilling comply with ANSI B16.1, class 125
- ❑ Mechanical joint end complies with ANSI/AWWA C111 Standard
- ❑ Iron body with nominal 10 mils MUELLER® Pro-Gard™ Fusion Epoxy Coated interior and exterior surfaces
- ❑ Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard and is certified to ANSI/NSF 61
- ❑ Iron wedge, symmetrical & fully encapsulated with molded rubber; no exposed iron
- ❑ Non-rising stem (NRS)
- ❑ Triple O-ring seal stuffing box (2 upper &1 lowerO-rings)
- ❑ 2" square wrench nut (optional handwheel available)—open left or open right
- ❑ 4"-12" sizes—250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa) static test pressure
- ❑ UL Listed, FM Approved —200 psig (1379 kPa)



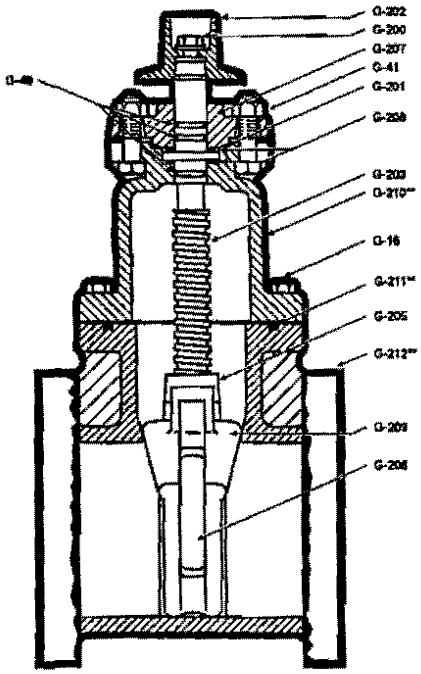
A-2360-16
M.J. accessories shipped unassembled

Options

See pages 10.68 and 10.69 for more information on Resilient Wedge Gate Valve options

- ❑ Position indicators
- ❑ Stainless steel fasteners: Type 304, Type 316
- ❑ ASTM B98-C66100/H04 stem
- ❑ Handwheel

Catalog Part No.	Description	Material	Material standard
G-16	Bonnet Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-41	Stuffing Box Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-49	Stem O -rings (3)	Rubber	ASTM D2000
G-200	Wrench Nut Cap Screw	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-201	Stuffing Box O -rings	Rubber	ASTM D2000
G-202	Wrench Nut	Cast Iron	ASTM A126 CL.B
G-203	Stem	Bronze	ASTM B138
G-204	Hand Wheel (not shown)	Cast Iron	ASTM A126 CL.B
G-205	Stem Nut	Bronze	ASTM B62
G-206	Guide Cap Bearings	Celcon	
G-207	Stuffing Box	Cast iron	ASTM A126 CL.B
G-208	Anti-friction Washers (2)	Celcon	
G-209	Wedge, Rubber Encapsulated	Cast Iron*	ASTM A126 CL.B
G-210 **	Bonnet	Cast Iron	ASTM A126 CL.B



* Fully encapsulated in molded rubber with no iron exposed

Previous to 1999 these parts on 4"-12" valves were designed with a gasket instead of an O-ring and with additional bolts. Confirm the type of seal when ordering a replacement gasket or O-ring.

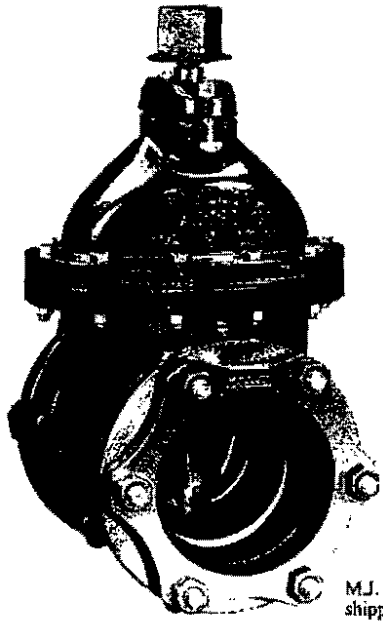
SEE PAGE 10.73 FOR ORDERING INSTRUCTIONS

Mueller Co.

2"-12" MUELLER® A-2360 RESILIENT WEDGE GATE VALVES WITH M.J. x M.J. ENDS

Catalog number—
A-2360-20 Mechanical joint ends (with mechanical joint unassembled accessories)
A-2360-23 Mechanical joint ends (less mechanical joint accessories)
A-2360-25 Mechanical joint ends (with transition gaskets)

- Sizes—2", 3", 4", 6", 8", 10", 12"
- Meets or exceeds all applicable requirements of ANSI/AWWA C509 Standard and is certified to ANSI/NSF 61
- Standard mechanical joint ends comply with ANSI/AWWA C111
- Iron body with nominal 10 mils MUELLER® Pro-Gard™ Fusion Epoxy Coated interior and exterior surfaces
- Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard and is certified to ANSI/NSF 61
- Iron wedge, symmetrical & fully encapsulated with molded rubber; no exposed iron
- Non-rising stem (NRS)
- Triple O-ring seal stuffing box (2 upper & 1 lower O-rings)
- 2" square wrench nut (optional handwheel available)—open left or open right
- 2"-12" sizes—250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa) static test pressure
- UL Listed, FM Approved: 200 psig (1379 kPa) — 3"-12" sizes



M.J. accessories shipped unassembled

A-2360-20

Options

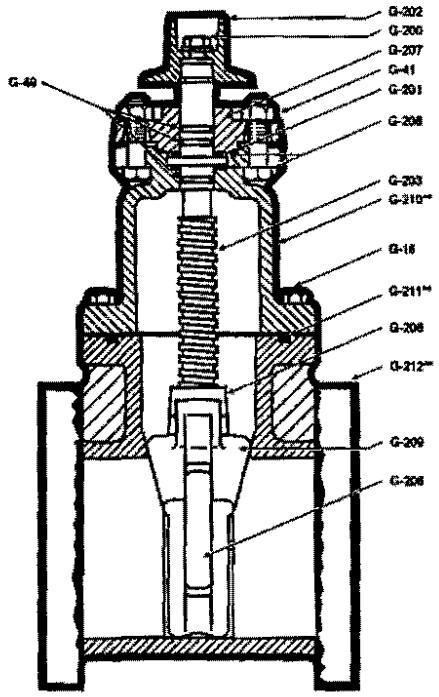
pages 10.68 and 10.69 for more information on Resilient Wedge Gate Valve options

- Position indicators
- ASTM B98-C66100/H04 stem
- Stainless steel fasteners: Type 304, Type 316
- Handwheel

Resilient wedge gate valve parts

Catalog Part No.	Description	Material	Material standard
G-16	Bonnet Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-41	Stuffing Box Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-49	Stem O-rings (3)	Rubber	ASTM D2000
G-200	Wrench Nut Cap Screw	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-201	Stuffing Box Seal	Rubber	ASTM D2000
G-202	Wrench Nut	Cast Iron	ASTM A126 CL.B
G-203	Stem	Bronze	ASTM B138
G-204	Hand Wheel (not shown)	Cast Iron	ASTM A126 CL.B
G-205	Stem Nut	Bronze	ASTM B62
G-206	Guide Cap Bearings	Celcon	
G-207	Stuffing Box	Cast iron	ASTM A126 CL.B
G-208	Anti-friction Washers (2)	Celcon	
G-209	Wedge, Rubber Encapsulated	Cast Iron*	ASTM A126 CL.B
G-210 **	Bonnet	Cast Iron	ASTM A126 CL.B
G-211 **	Bonnet O-ring	Rubber	ASTM D2000
G-212 **	Body	Cast Iron	ASTM A126 CL.B

* Fully encapsulated in molded rubber with no iron exposed
** Previous to 1999 these parts on 4"-12" valves were designed with a gasket instead of an O-ring and with additional bolt holes (2"-3" sizes retain gasket design affecting these parts). Confirm the type of when ordering a replacement gasket or O-ring.

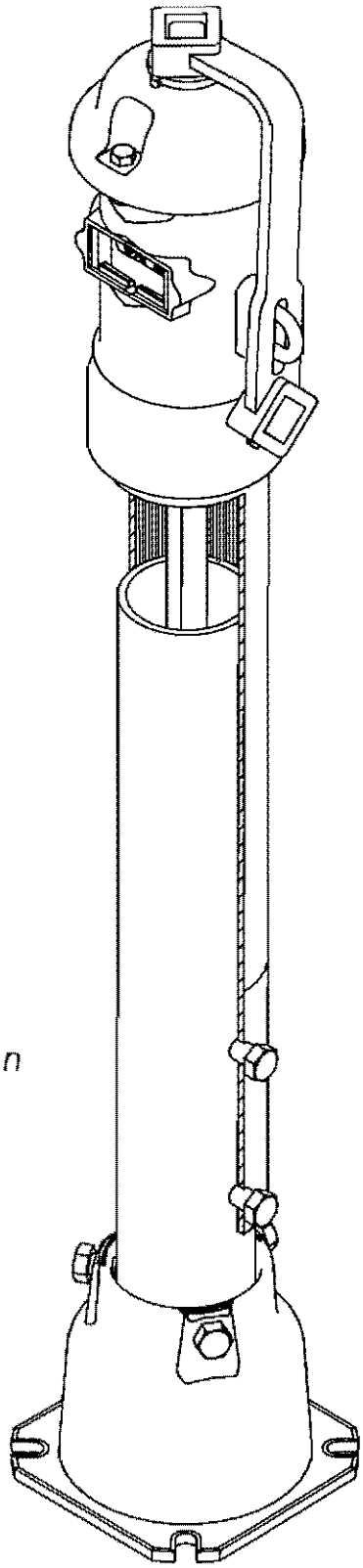


SEE PAGE 10.73 FOR ORDERING INSTRUCTIONS

#741 Vertical Valve Indicator Post

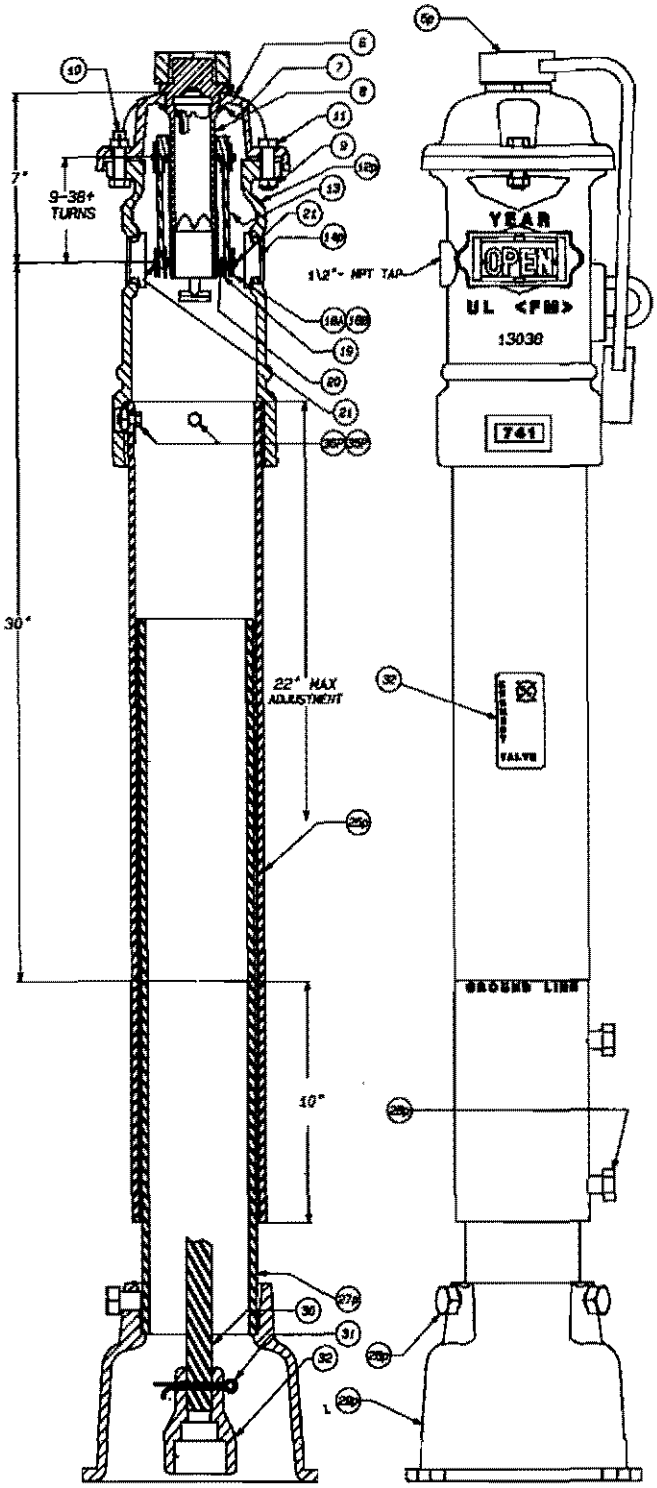
UL LISTED
FM APPROVED

FROM KENNEDY VALVE
THE LEADING
MANUFACTURER OF
UL/FM VALVES

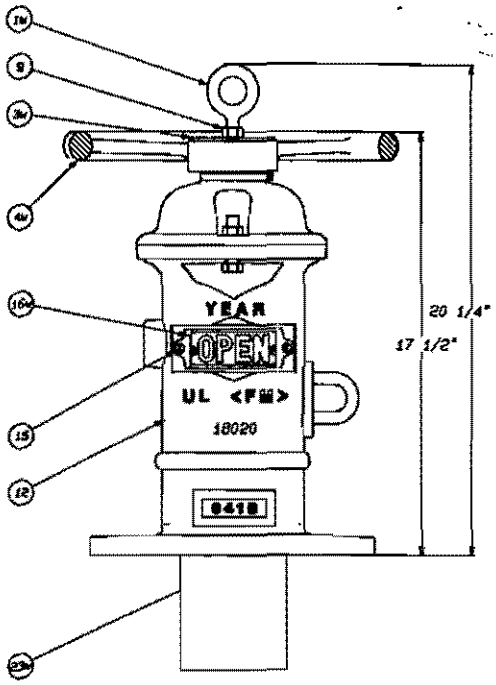


- *Three standard lengths with up to 24" of adjustment*
- *Target nut to allow 9 to 40 turns*
- *Rugged, durable construction*
- *UL listed/FM approved*
- *1 1/4" square operating nut (standard)*
- *Adjustable Indicator Plates (open/shut)*
- *Accomodates all UL/FM gate valves*
- *Unlimited flexibility in field extension*
- *Tapped for supervisory switch*
- *Approved by N.Y.C. Board of Standards and Appeals*
- *Also available for 14" and larger valves as well as longer trench depths on a special order basis*

Indicator Posts—UL Listed FM Approved



741 VERTICAL POST



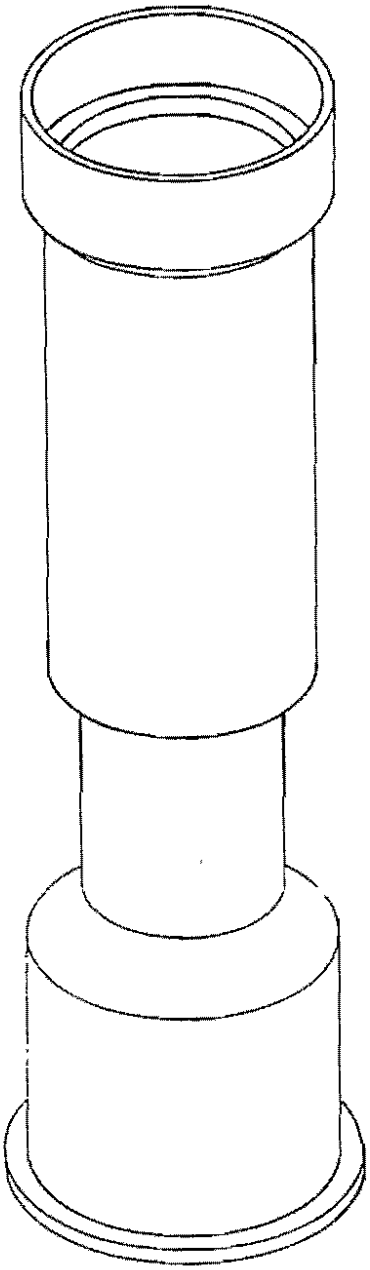
641S WALL POST

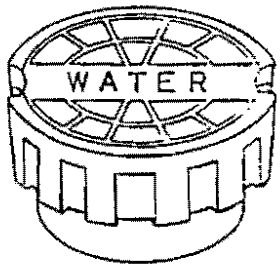
MATERIALS LIST

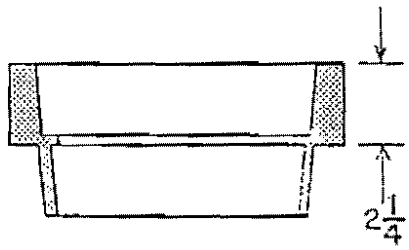
NO	ITEM	MATL	SPEC	
1w	FORGED EYE BOLT	STL		1\2-UNC WALL POST ONLY
3w	WASHER -PLATED	STL		WALL POST ONLY
4w	HANDWHEEL-14"DIA	CI		WALL POST ONLY
5p	WRENCH	NI		IND POST ONLY
6	COVER	CI	A126-B	
7	SNAP RING #5100-225	STL		ZINC PLATE
8	OPER STEM NUT	BR	AMWA"A"	
9	NUTS 1\2-UNC PLATED	RP STL		HEAVY HEX
10	BOLT 1\2-UNC x 2"	RP STL	A304	DRILLED-ONE END
11	BOLT 1\2-UNC x 1.75"	RP STL	A304	HEX
12w	TOP SECT.-WALL POST	CI	A126-B	WALL POST ONLY
12p	TOP SECTION	CI	A126-B	IND POST ONLY
13	TARGET NUT	BR	AMWA"A"	
14p	WINDOWS-"SNAP IN"	PLAST		LEXAN (FIG 741 POSTS ONLY)
14w	WINDOWS	PLAST		AND ALL PREVIOUS TO 1993 PLEXIGLASS FIG 541, 541S, 641 & 641S
15w	SCREWS-SELF TAP			BRASS P-RD HD
16w	FERRULE	STL		
17	COVER PLATES	STL		NOT SHOWN
18A	TARGET PLATE (OPEN)	ALUM		
18B	TARGET PLATE (SHUT)	ALUM		
19	CLAMPS -PLATED	STL		
20	NUTS-SQUARE	STL		
21	MACH SCREW-RD HEAD	BR		
22	PIPE PLUG-1\2 NPT	IRON		SOCKET HD
23w	PIPE-4" NPT 13" LG	STL		OPTIONAL-WALL POST ONLY
25p	DI TOP PIPE SECTION	DI		
27p	PIPE SECTION	DI		IND POST ONLY
28p	BOLTS 3\4UNC	cp stl		IND POST ONLY
29p	BOTTOM SECTION	CI	A126-B	IND POST ONLY
30	STEM -(ORD. BY LG)	STL		1" SQUARE
31	COTTER PIN	BR		
32	CRANK COUPLING	CI		
33	MARKING TAG	MYLAR		UL RATED MATL
34	ADJUSTMENT CARD			NOT SHOWN
35p	BOLTS 3\8-UNC X 1	RP STL	A304	IND POST ONLY
36p	NUTS 3\8-UNC	RP STL		IND POST ONLY

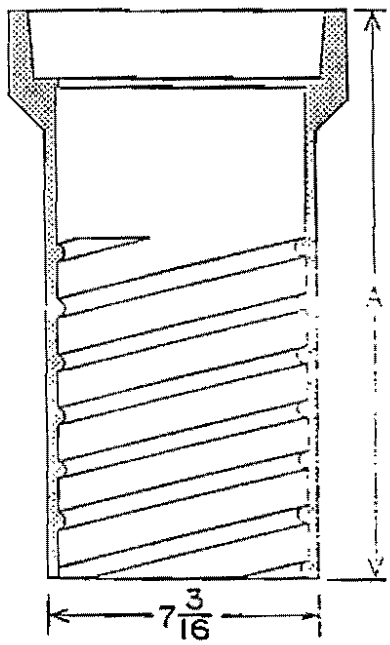
POST NO	GROUND LINE TO BOTTOM OF LOWER FLANGE	PIPE LG	CUT STEM LG TO
23	20.25	29.75	51
24	26.25	29.75	57
25	32.25	29.75	63
26	38.25	53.75	69
27	44.25	53.75	75
28	50.25	53.75	81
29	56.25	53.75	87
41	62.25	77.75	93
42	68.25	77.75	99
43	74.25	77.75	105
44	80.25	77.75	111

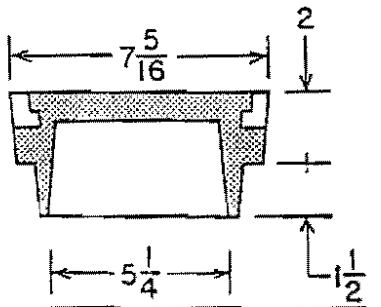
VALVE BOX

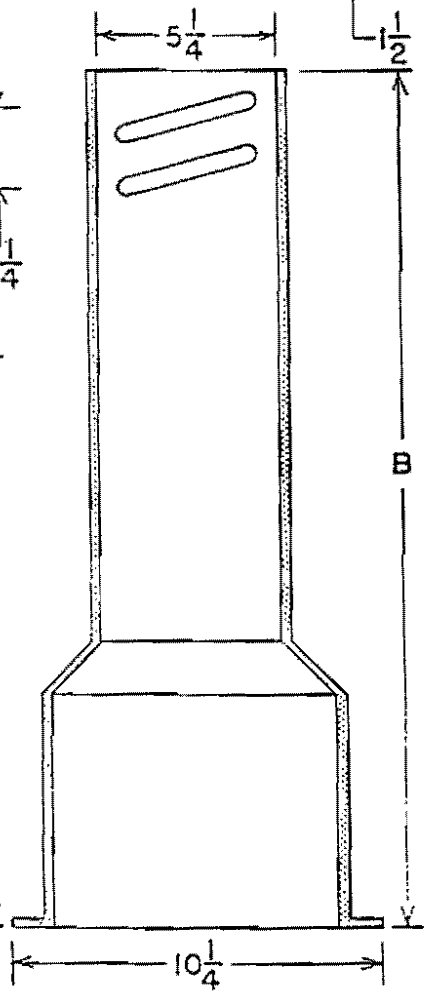












Three Piece Adjustable Screw-type Valve Boxes

Pattern	Extension	Top Section A	Weight	Bottom Section B	Weight	Lid Weight	Set Wt.
# 1824 S	19"-22"	10"	20 lbs	15"	25 lbs	15 lbs	60 lbs
# 2436 S	27"-37"	16"	30 lbs	24"	35 lbs	15 lbs	80 lbs
# 3648 S	39"-50"	16"	30 lbs	36"	45 lbs	15 lbs	90 lbs
# 3960 S	39"-60"	26"	50 lbs	36"	45 lbs	15 lbs	110 lbs

FIRE HYDRANTS - MUELLER

MUELLER® SUPER CENTURION® FIRE HYDRANT

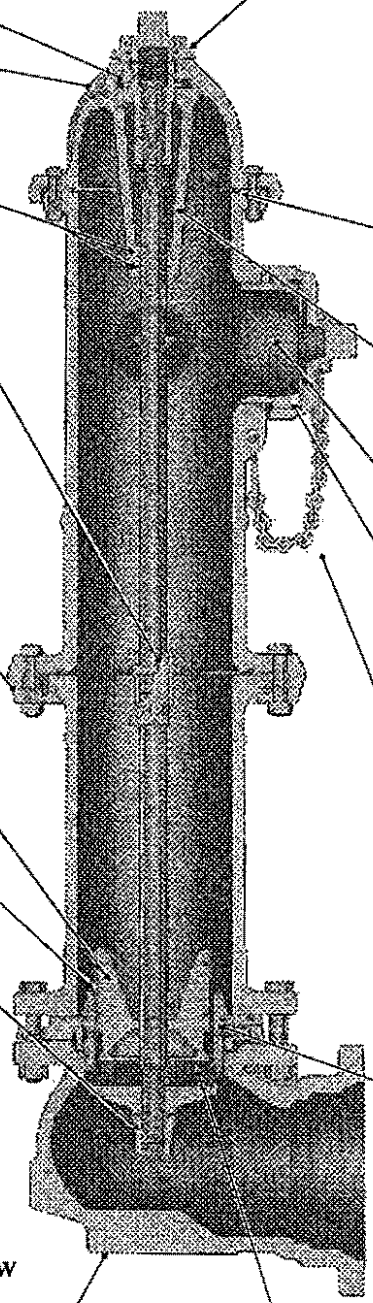
Mueller Co.

9.1

REV. 4-99

MUELLER SUPER CENTURION 250® 3-Way Fire Hydrant Features

- ANTI-FRICTION WASHER— helps assure easy turning operation for the life of the hydrant.
- OIL FILLER PLUG— permits quick check of oil level. Lets you add oil without removing bonnet.
- OIL RESERVOIR O-RING SEALS— seal oil in, water out.
- STAINLES STEEL SAFETY STEM COUPLING— pulls free if hydrant is hit by a vehicle preventing damage to the stem and main valve. Coupling will not break into pieces that could drop into lower barrel and affect valve operation. Top of lower stem is below the top of the lower barrel so that a tire cannot depress the stem and open the main valve. Repair is easy and economical.
- SAFETY FLANGE— breaks cleanly to help prevent barrel damage, yet is strong enough to withstand normal handling. Allows economical repair, adding of extension section, rotation or changing of upper barrel without digging or water shut-off.
- BRONZE UPPER VALVE PLATE—
- DRAIN VALVE FACINGS— specially designed, long-life facings provide effective sealing.
- DUCTILE IRON CAP NUT— retains main valve. Seats against cap nut gasket to prevent corrosion of stem threads. Locked in place by a stainless steel lock washer. Mueller HP Epoxy coated for durability.
- 250 PSIG— 3-way hydrant: 250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa)
- SHOE DESIGNED FOR MAXIMUM FLOW AND EASY CONNECTION— with its smooth transitional contours, extended neck and integral anti-rotation pads, allowing use of standard tee-head bolts. The inside of the shoe is covered with MUELLER HP® Epoxy Coating. This thermosetting epoxy forms a tough, corrosion-resistant barrier to chemicals, physical impact and electrical currents.
- HOLD-DOWN NUT— with integral weather seal. Design discourages unauthorized removal of the hold-down nut or bronze operating nut. Resilient wiper seal between hold-down nut and operating nut prevents water entry to protect operating nut from freezing. Wiper seal material is resistant to ultra-violet ray deterioration. O-ring seal provides second level of protection.



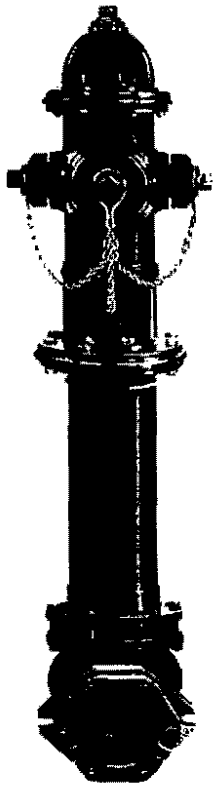
- MEETS OR EXCEEDS— all applicable requirements of ANSI/AWWA C502 Standard and UL 246 and FM 1510 specifications.
- O-RING SEALS AT BONNET, GROUND, AND SHOE FLANGES— for better leak resistance, easier maintenance.
- SEALED OIL RESERVOIR— O-ring sealed to prevent leakage. Provides positive lubrication of stem threads and bearing surfaces each time the hydrant is operated. Filled at the factory.
- FULL FLOW OPENINGS— large radius hose and pumper openings produce low friction loss.
- FIELD REPLACEABLE HOSE AND PUMPER NOZZLES— O-ring sealed. Threaded in place and retained by stainless steel locks. Nozzles are easily replaced.
- ELECTRO-GALVANIZED BOLTS AND NUTS— provide corrosion protection.
- NON-KINKING CHAINS— heavy-duty chains are securely attached to the hydrant. Special chain loop permits free turning of the cap.
- BRONZE SEAT RING— threaded into drain ring and O-ring sealed. Seat ring is easily removed or installed from above ground. Each time main valve is opened or closed, double drain valves force-flush both drain valve openings to keep them open for effective barrel drainage. Bronze drain valves are integral parts of main valve assembly.
- REVERSIBLE, COMPRESSION-TYPE MAIN VALVE — closes with pressure for positive seal. Rubber material has long service life, yet is reversible providing a convenient spare in place.

Manufactured under one or more of the following: U.S. Patent No. 4,717,178; 4,842,246.

Mueller Co.

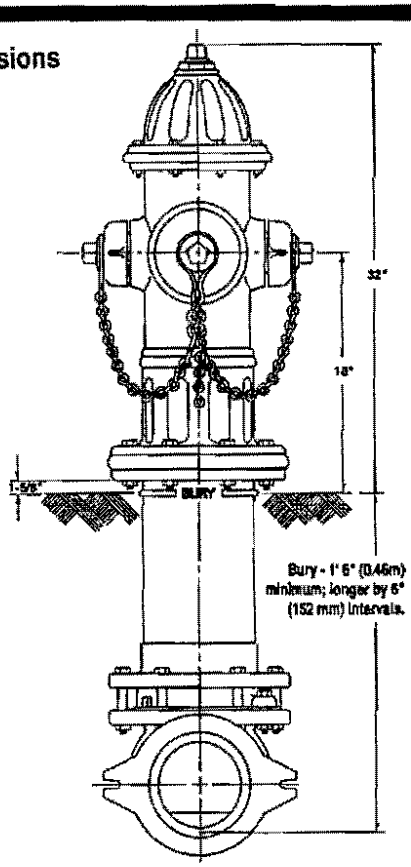
MUELLER® SUPER CENTURION® FIRE HYDRANT

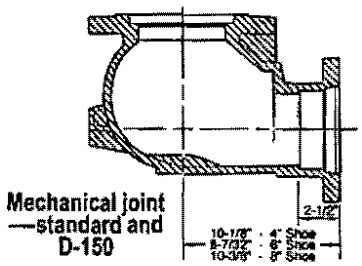
Super Centurion 250™ 3-way catalog numbers
(approved to UL 262, FM 1120/1130, ANSI/AWWA C502 Standards)—
A-421 4-1/2" main valve opening three way (two hose nozzles and one pumper nozzle)
A-423 5-1/4" main valve opening three way (two hose nozzles and one pumper nozzle)
Super Centurion 200™ 2-way catalog numbers
(approved to ANSI/AWWA C502 Standards)—
A-420 4-1/2" main valve opening two way (two hose nozzles)
A-422 5-1/4" main valve opening two way (two hose nozzles)
A-425 5-1/4" main valve opening two way (two pumper nozzles)
Super Centurion 200™ 1-way catalog number
(approved to ANSI/AWWA C502 Standards)—
A-424 4-1/2" main valve opening one way (one pumper nozzle)

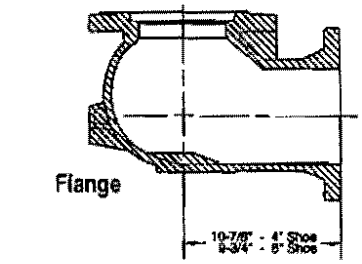


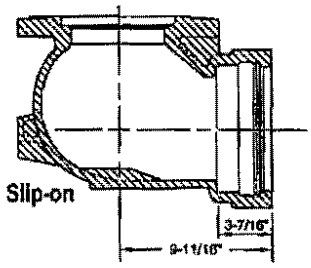
- 10 year limited warranty on material and workmanship
- Meets all applicable parts of ANSI/AWWA C502 Standard
- Post type dry barrel design
- Dry top design with O-ring sealed oil reservoir
- Traffic feature with stainless steel safety stem coupling
- Compression-type main valve closes with pressure for positive seal; it is made of rubber and is conveniently reversible providing a spare for long service life (Patent Pending)
- Operating nut available in wide variety of shapes and sizes—open left or right
- Field replaceable hose and pumper nozzles
- Hose and pumper nozzles have large radius, full flow openings for low friction loss
- Contoured shoe is designed for full flow
- Dual bronze drain valves provide effective barrel drainage
- 250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa) static test pressure for 3-way hydrants; 200 psig (1379 kPa) maximum working pressure, 400 psig (2758 kPa)

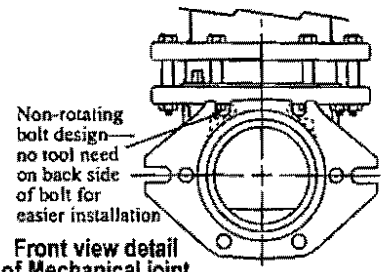
Dimensions

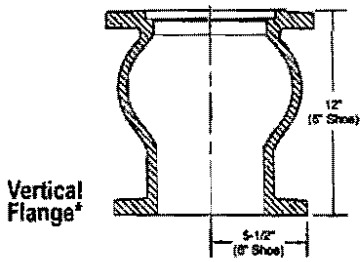












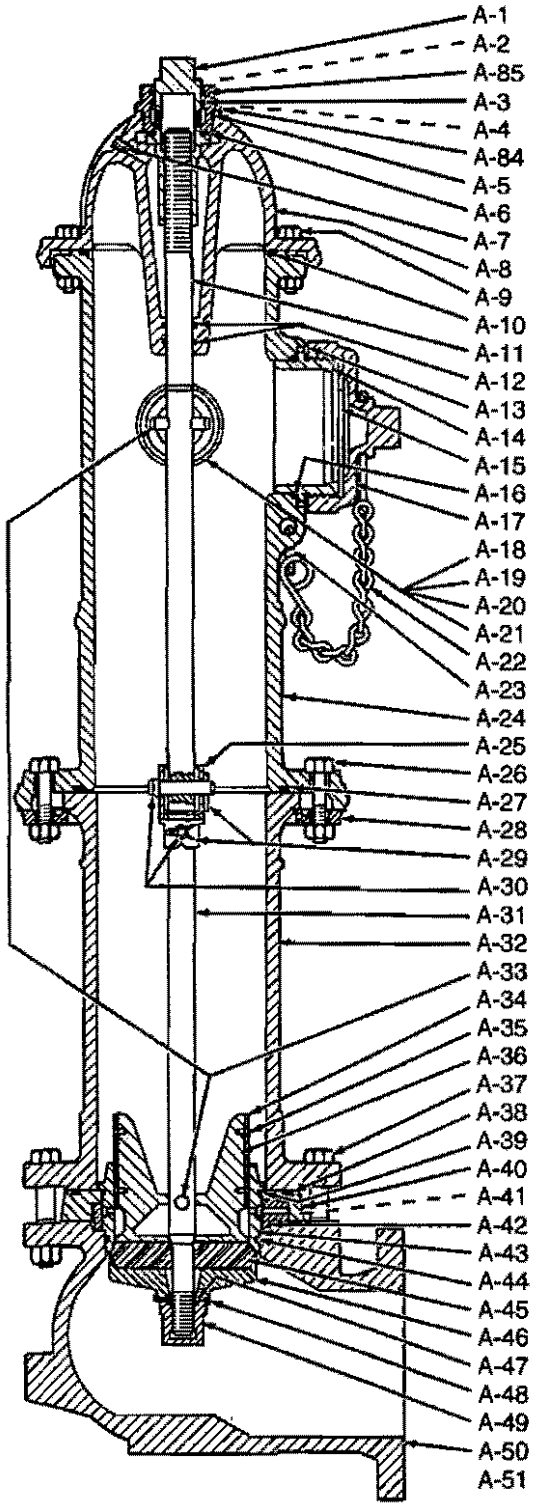
* 4" Vertical shoe available for A-420 and A-421 hydrants.

SEE PAGE 9.24 FOR ORDERING INSTRUCTIONS

MUELLER® SUPER CENTURION® FIRE HYDRANT PARTS

MUELLER Super Centurion Fire Hydrant Parts

Cat. part#	Description	Material	Material standard
A-1	Operating nut	Bronze	ASTM B584
A-2	Weather cap (not shown; used only on pre-1988 models)	Cast iron	ASTM A126 CL.B
A-3	Hold down nut O-ring	Rubber	ASTM D2000 BUNA N
A-4	Hold down nut (not shown; used only on pre-1988 models)	Bronze	ASTM B584
A-5	Bonnet O-ring	Rubber	ASTM D2000 BUNA N
A-6	Anti-friction washer	Celcon	
A-7	Oil plug	Brass	ASTM B16
A-8	Bonnet	Cast iron	ASTM A126 CL.B
A-9	Bonnet bolt and nut	Steel	ASTM A307 Plated
A-10	Bonnet O-ring (1997 and newer 3-way models; all pre-1997 models and 1-way and 2-way models have flat gasket)	Rubber	ASTM D2000 BUNA N
A-11	Upper stem	Steel	ASTM A576 GR.B
A-12	Stem O-ring	Rubber	ASTM D2000 BUNA N
A-13	Nozzle lock	Stainless steel	ASTM A276
A-14	Pumper nozzle	Bronze	ASTM B584
A-15	Pumper nozzle gasket	Rubber	ASTM D2000 Neoprene
A-16	Pumper nozzle O-ring	Rubber	ASTM D2000 BUNA N
A-17	Pumper nozzle cap	Cast iron	ASTM A126 CL.B
A-18	Hose nozzle	Bronze	ASTM B584
A-19	Hose nozzle gasket	Rubber	ASTM D2000 Neoprene
A-20	Hose nozzle O-ring	Rubber	ASTM D2000 BUNA N
A-21	Hose nozzle cap	Cast iron	ASTM A126 CL.B
A-22	Cap chain	Steel	Plated
A-23	Chain ring	Steel	Plated
A-24	Upper barrel less nozzles	Cast iron	ASTM A126 CL.B
A-25	Safety coupling	Stainless steel	ASTM A890
A-26	Safety flange bolt and nut	Steel	ASTM A307 Plated
A-27	Safety flange O-ring (1997 and newer models; pre-1997 models have flat gasket)	Rubber	Cellulose
A-28	Safety flange	Cast iron	ASTM A126 CL.B
A-29	Cotter pin	Stainless steel	ASTM A276
A-30	Clevis pin	Stainless steel	ASTM A276
A-31	Lower stem	Steel	ASTM A576 GR.B
A-32	Lower barrel	Cast iron	ASTM A126 CL.B
A-33	Stem pin	Stainless steel	ASTM A276
A-34	Drain valve facing	Plastic	
A-35	Drain valve screw	Stainless steel	ASTM A276
A-36	Upper valve plate (includes A-34 and A-35)	Bronze	ASTM B584
A-37	Shoe bolt and nut	Steel	ASTM A307 Plated
A-38	Drain ring housing O-ring (1997 and newer models; pre-1997 models have square gasket)	Rubber	ASTM D2000 BUNA N
A-39	Seat ring top O-ring	Rubber	ASTM D2000 BUNA N
A-40	Drain ring housing	Cast iron	ASTM A126 CL.B
A-41	Drain ring housing bolt and nut (not shown; used only on pre-1997 model hydrants)	Steel	ASTM A307 Plated
A-42	Drain ring	Bronze	ASTM B584
A-43	Seat ring	Bronze	ASTM B584
A-44	Seat ring bottom O-ring	Rubber	ASTM D2000 BUNA N
A-45*	Reversible main valve (1997 and newer models only; pre-1997 models use non-reversible main valve and lower valve plate - not shown)	Rubber	ASTM D2000
A-46	Lower valve plate (1997 and newer models for reversible main valve; pre-1997 models have non-reversible main valve - not shown)	Cast iron	ASTM A126 CL.B
A-47	Cap nut seal	Rubber	ASTM D2000
A-48	Lock washer	Stainless steel	ASTM A276
A-49	Lower valve plate nut	Cast iron	ASTM A126 CL.B
A-50	Shoe	Cast iron	ASTM A126 CL.B
A-84	Hold down nut	Bronze	ASTM B584
A-85	Weather seal	Rubber	ASTM D2000
A-51	10.5 oz. hydrant lubricating oil (not shown)		



* Pre-1997 models may be upgraded to use the reversible main valve by also replacing the lower valve plate with the 1997 model.

SEE PAGE 9.24 FOR ORDERING INSTRUCTIONS

TAPPING SLEEVES

SELECTION GUIDE TO SMITH-BLAIR® TAPPING SLEEVES

PRODUCT	PRODUCT NUMBER AND TYPE	APPLICATION	SIZES
	622 Tapping Sleeve	Reducing and size-on-size outlets on all types of pipe	4" & larger
	623 Carbon Steel Mechanical Joint	Reducing and size-on-size outlets	4" & larger
	625 Tapping Sleeve for concrete cylinder pipe	Reducing outlets on concrete steel cylinder pipe	12" & larger
	626 Weldon on outlet	Reducing outlet that can be welded onto any steel pipe	6" & larger
	662 Stainless Steel Tapping Sleeve with Flexi-Blue ® Epoxy Coated Flange	Reducing and size-on-size flanged 4" thru 12"	6" thru 24"
	663 Stainless Steel Tapping Sleeve with Stainless Steel Flange	Reducing and size-on-size flanged 4" thru 12"	6" thru 24"
	664 Stainless Steel Tapping Sleeve with Flexi-Blue ® Epoxy Coated Flange	Reducing and size-on-size flanged 4" thru 12"	6" thru 12"
	665 Stainless Steel Tapping Sleeve with Stainless Steel Flange	Reducing and size-on-size flanged 4" thru 12"	6" thru 12"

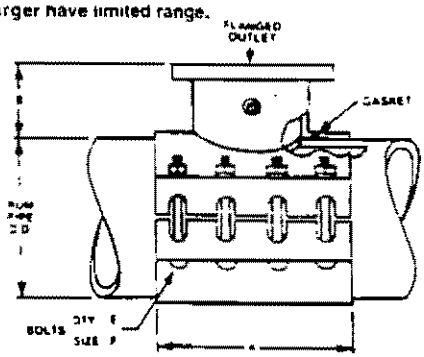
622 TAPPING SLEEVE SPECIFICATIONS

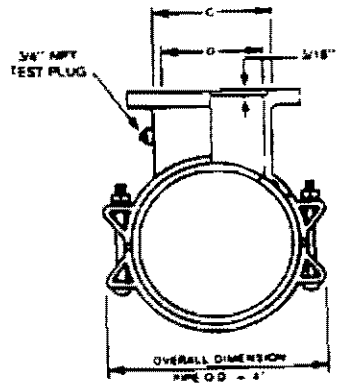
OUTLET SMALLER THAN RUN						
Flange Size	**A	B	C	D	E	F
4	12	5	5 7/16	4 1/2	6	1/2
6	12	5	7 1/16	6 1/4	6	3/4
8	16	5	9 1/16	8 1/8	8	3/4
10	20	5	11 3/16	10 1/4	10	1
12	20	5	13 3/16	12 1/4	10	1

**Pipe diameters 30.00" and larger with 12" outlets will have an "A" dimension of 24" and a quantity of 12 bolts.
For tap sizes 14" and larger, flange to have 7/16" recess. If deeper recess is required to mate with tapping valve, contact plant.
Outlets 14" and larger have limited range.

RUN AND OUTLET SAME NOMINAL SIZE						
Flange Size	A	B	C	D	E	F
4	9	3 1/2	5 1/16	4 1/2	6	1/2
6	12	5	7 1/16	6 1/4	6	3/4
8	16	5	9 1/16	8 1/8	8	3/4
10	20	5	11 3/16	10 1/4	10	1
12	24	5	13 3/16	12 1/4	12	1

Size-on-size tapping sleeves require use of a 1/2" undersize shell cutter.
*4.50 and 4.80 diameters size not furnished with test plug.





MATERIAL SPECIFICATIONS

BODY: 3/8" Carbon steel ASTM A285 Grade A or ASTM A283 Grade C 1/4" Top Plates and 3/8" Bottom Plates on 4.50 and 4.80 sizes.

FLANGES: AWWA C207 Class D. ANSI 150 lb. drilling.

GASKET: Grade 60 Concave Wedge Gasket—compounded to resist—oil, acids alkalies, most (aliphatic) hydro-carbon fluids, water and many chemicals. Temperatures up to 212°F.

BOLTS & NUTS: High strength low alloy steel with heavy semi-finished hexagon nuts to ASTM A-307 (ANSI A21.11) standards. Optional-type 304 stainless steel bolts. Stainless Steel nuts are Teflon coated to prevent galling.

FINISH: Blue shopcoat. Optional-Flexi-Blue® epoxy coating, coated to an average of 12 mil thickness.

Material specifications are subject to change.

DUCTILE IRON FITTINGS - CL153

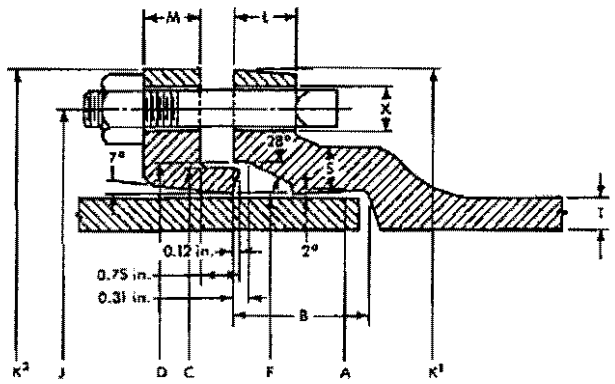
Tyler/Union

MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

Sizes 3" thru 12" UL Listed For Fire Main Equipment

SAMPLE SPECIFICATIONS

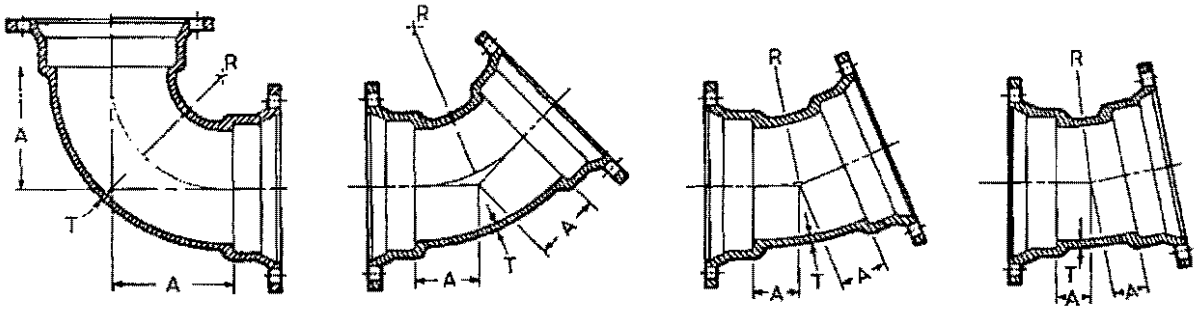
3" THRU 24" MECHANICAL JOINT DUCTILE IRON FITTINGS shall be produced in the USA in accordance with all applicable terms and provisions of ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11. All Ductile Iron Mechanical Joint (Only) Fittings are rated for 350 PSI working pressure, unless otherwise indicated. **NOTE:** Fittings are cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.4; also available double cement-lined or bare. All coated fittings meet requirements of NSF-61. See list price sheet for details.



JOINT DIMENSIONS IN INCHES

Size	A Dia.	B	C Dia.	D Dia.	F Dia.	J Dia.	K¹ Dia.	K² Dia.	L	M	S	T	X Dia.	BOLTS Size	BOLTS No.
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	.58	.62	.39	.33	3/4	5/8x3	4
4	**4.80**	**2.50**	**5.92**	**6.02**	**4.90**	**7.50**	**9.06**	**9.12**	**.60**	**.75**	**.39**	**.34**	7/8	3/4x3 1/2	**4**
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	.63	.88	.43	.36	7/8	3/4x3 1/2	6
8	**9.05**	**2.50**	**10.17**	**10.27**	**9.15**	**11.75**	**12.31**	**13.37**	**.66**	**1.00**	**.45**	**.38**	7/8	3/4x3 1/2	**6**
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	.70	1.00	.47	.40	7/8	3/4x3 1/2	8
12	**13.20**	**2.50**	**14.32**	**14.44**	**13.30**	**16.25**	**17.88**	**17.88**	**.73**	**1.00**	**.49**	**.42**	7/8	3/4x3 1/2	**8**
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	.79	1.25	.56	.47	7/8	3/4x4	10
16	**17.40**	**3.50**	**18.50**	**18.64**	**17.54**	**21.00**	**22.56**	**22.50**	**.85**	**1.31**	**.57**	**.50**	7/8	3/4x4	**12**
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	.68	.54	7/8	3/4x4	12
20	**21.60**	**3.50**	**22.70**	**22.84**	**21.74**	**25.50**	**27.08**	**27.08**	**1.02**	**1.44**	**.69**	**.57**	7/8	3/4x4	**14**
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	.75	.61	7/8	3/4x4 1/2	16

BENDS



Size	90° Bends (1/4) Dimensions T	A	R	Weight	45° Bends (1/8) Dimensions A	R	Weight	22 1/2° Bends (1/16) Dimensions A	R	Weight	11 1/4° (1/32) Dimensions A	R	Weight
3	.34	4.5	4.0	20	2.00	3.62	16	1.50	4.98	15	1.25	7.62	15
4	**.35**	**5.0**	**4.5**	**26**	**2.49**	**4.81**	**22**	**1.82**	**6.66**	**21**	**1.55**	**10.70**	**20**
6	.37	6.5	6.0	48	3.50	7.25	40	2.59	10.50	37	1.81	13.26	33
8	**.39**	**7.5**	**7.0**	**68**	**4.00**	**8.44**	**59**	**2.85**	**11.80**	**51**	**2.06**	**15.80**	**48**
10	.41	9.5	9.0	136	5.01	10.88	86	3.35	14.35	67	2.32	18.36	61
12	**.43**	**10.5**	**10.0**	**141**	**5.98**	**13.25**	**109**	**3.86**	**16.90**	**90**	**2.56**	**20.90**	**79**
14	.51	12.0	11.5	220	5.50	12.06	164	3.93	17.25	148	2.59	21.25	133
16	**.52**	**13.0**	**12.5**	**264**	**5.98**	**13.25**	**202**	**3.98**	**17.50**	**179**	**2.62**	**21.50**	**159**
18	.59	15.5	14.0	410	7.50	14.50	325	7.50	30.19	292	7.50	60.94	320
20	**.60**	**17.0**	**15.5**	**505**	**8.00**	**16.88**	**368**	**8.50**	**35.19**	**364**	**8.50**	**71.07**	**346**
24	.62	20.0	18.5	695	9.00	18.12	481	9.00	37.69	481	9.00	76.12	457

Tyler Pipe/Utilities Division • P.O. Box 2027 • Tyler, Texas 75710 • (903) 882-5511
Union Foundry Company • P.O. Box 309 • Anniston, Alabama 36202 • (256) 236-7601

EBAA-Seal Mechanical Joint Restraint

EBAA-SEAL™

The New Improved Mechanical Joint Gasket

SAMPLE SPECIFICATION

To improve the sealing capacity, the gaskets for all mechanical joints conforming to the requirements of ANSI/AWWA C110/A21.10, C111/A21.11, or C153/A21.53 shall be of a design that causes the gasket to deflect approximately 30% during assembly of the mechanical joint. The gasket material shall conform to the requirements of ANSI/AWAA C111/A21.11, section 11-6.4, of the latest revision. Mechanical joint gaskets shall be EBAA Iron's EBAA Seal - Improved Mechanical Joint Gasket or approved equal

Figure 1
Standardized MJ gasket during assembly.

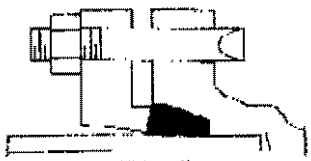


Figure 2
Standardized MJ gasket after assembly.

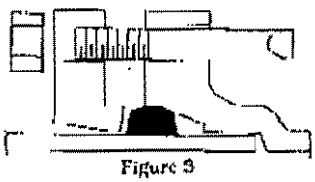
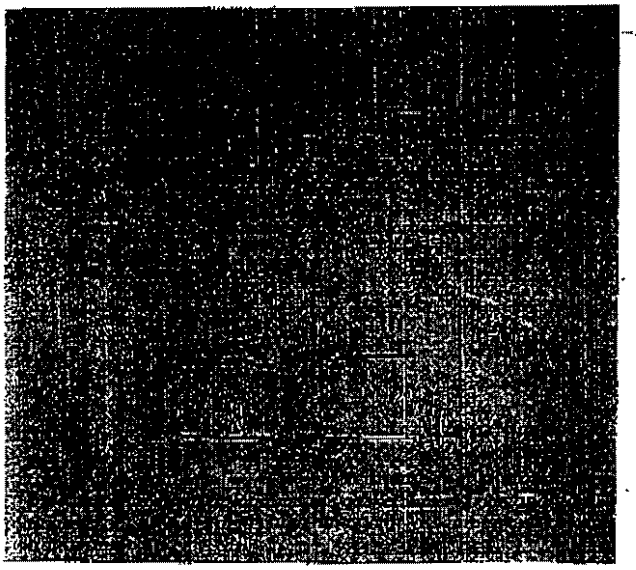


Figure 3
EBAA-Seal Gasket during assembly.

Figure 4
EBAA-Seal Gasket after assembly.

INSTALLATION

Fig. 3. Mechanical-Joint Assembly
From AWWA C600



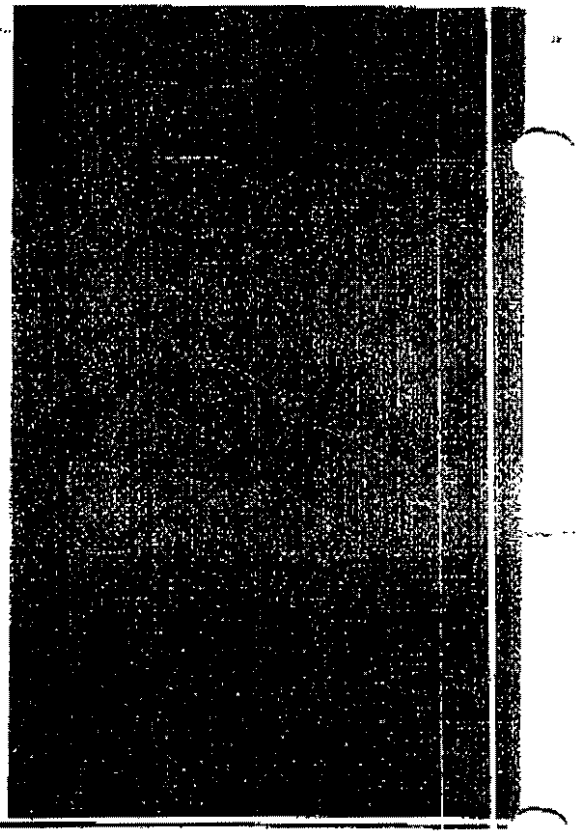


Table 3 Mechanical Joint Bolt Torque

Pipe Size In.	Bolt Size In.	Range of Torque ft-lb
3	⅝	45-60
4-24	¾	75-90
30-36	1	100-120
42-48	1 ¼	120-150

Call toll free for information: 1 800-433-1716

EBAA IRON SALES, INC.

P.O. Box 857 Eastland, Texas 76448
Phone: (254) 629-1731 Telefax: (254) 629-8931
ebaa@eastland.net http://www.ebaa.com

SERVICE MATERIAL

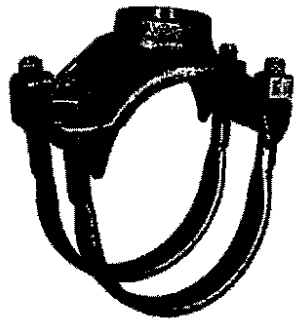
MUELLER® BR2B & BR2S SERIES BRONZE SERVICE SADDLES - DOUBLE STRAP

Mueller Co. **4.5**

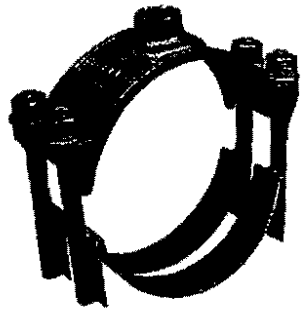
Rev. 4-01

MUELLER® Service Saddles for use on A-C, cast iron, ductile iron, and AWWA C900 PVC plastic pipe

- ❑ Outlet tapped with either AWWA taper (C.C.) or AWWA I.P. thread (F.I.P.T.)
- ❑ For use on A-C pipe, cast iron or ductile iron pipe and cast iron O.D. PVC pipe
- ❑ 200 psig (1379 kPa) maximum working pressure
- ❑ Available in single and double strap designs
- ❑ Brass body
- ❑ Flattened silicon bronze straps (standard)
- ❑ Optional 304L stainless steel straps
- ❑ Rolled strap threads
- ❑ O-ring sealed outlet
- ❑ 3/4" thru 2" tap sizes (5/8" some styles)
- ❑ Meets all applicable parts of ANSI/AWWA C800
- ❑ NSF 61 certified



BR 2 B Series



BR 2 S Series

MUELLER® Service Saddles with AWWA taper thread

Pipe O.D. range		Kind and size of pipe*		Bronze double strap with AWWA taper thread (C.C.)							Optional stainless steel double strap with AWWA taper thread (C.C.)						
Inch	mm	A-C	Cast or ductile iron, C900 PVC plastic pipe	Base Catalog Number	Size of tapping (add to "Base" to complete catalog number)						Base Catalog Number	Size of tapping (add to "Base" to complete catalog number)					
					5/8"	3/4"	1"	1-1/4"	1-1/2"	2"		5/8"	3/4"	1"	1-1/4"	1-1/2"	2"
4.74"-5.32"	121.0-135.0		4"	BR 2 B 0474 CC	062	075	100	125	150	200	BR 2 S 0474 CC	062	075	100	125	150	200
6.84"-7.45"	174.0-189.0		6"	BR 2 B 0684 CC	062	075	100	125	150	200	BR 2 S 0684 CC	062	075	100	125	150	200
8.99"-9.67"	229.0-245.0		8"	BR 2 B 0899 CC	062	075	100	125	150	200	BR 2 S 0899 CC	062	075	100	125	150	200
11.04"-12.12"	281.0-307.0		10"	BR 2 B 1104 CC	062	075	100	125	150	200	BR 2 S 1104 CC	062	075	100	125	150	200
13.14"-14.58"	334.0-370.0		12"	BR 2 B 1314 CC	062	075	100	125	150	200	BR 2 S 1314 CC	062	075	100	125	150	200
15.22"-16.88"	386.6-428.7		14"	BR 2 B 1522 CC	-	075	100	-	150	200	BR 2 S 1522 CC	-	075	100	-	150	200
17.32"-19.19"	439.9-487.4		16"	BR 2 B 1732 CC	-	075	100	-	150	200	BR 2 S 1732 CC	-	075	100	-	150	200

MUELLER® Service Saddles with AWWA iron pipe thread

Pipe O.D. range		Kind and size of pipe*		Bronze double strap with AWWA I.P. thread (F.I. P.T.)						Optional stainless steel double strap with AWWA I.P. thread (F.I. P.T.)					
Inch	mm	A-C	Cast or ductile iron, C900 PVC pipe	Base Catalog Number	Size of tapping (add to "Base" to complete catalog number)					Base Catalog Number	Size of tapping (add to "Base" to complete catalog number)				
					3/4"	1"	1-1/4"	1-1/2"	2"		3/4"	1"	1-1/4"	1-1/2"	2"
4.74"-5.32"	121.0-135.0		4"	BR 2 B 0474 IP	075	100	125	150	200	BR 2 S 0474 IP	075	100	125	150	200
6.84"-7.45"	174.0-189.0		6"	BR 2 B 0684 IP	075	100	125	150	200	BR 2 S 0684 IP	075	100	125	150	200
8.99"-9.67"	229.0-245.0		8"	BR 2 B 0899 IP	075	100	125	150	200	BR 2 S 0899 IP	075	100	125	150	200
11.04"-12.12"	281.0-307.0	**	10"	BR 2 B 1104 IP	075	100	125	150	200	BR 2 S 1104 IP	075	100	125	150	200
13.14"-14.58"	334.0-370.0		12"	BR 2 B 1314 IP	075	100	125	150	200	BR 2 S 1314 IP	075	100	125	150	200
15.22"-16.88"	386.6-428.7		14"	BR 2 B 1522 IP	075	100	-	150	200	BR 2 S 1522 IP	075	100	-	150	200
17.32"-19.19"	439.9-487.4		16"	BR 2 B 1732 IP	075	100	-	150	200	BR 2 S 1732 IP	075	100	-	150	200

*A-C pipe, classes 150-200 per ASTM C295 and AWWA C400 – actual O.D. of pipe being used must fall within the pipe O.D. range listed in the preceeding charts. Centrifugally cast pipe, classes 50-250 per ANSI/AWWA C102/A21.2; ANSI/AWWA C106/A21.6; ANSI/AWWA C108/A21.8, and Federal specification WW-P-421. Ductile iron pipe, classes 50-56 per ANSI/AWWA C151/A21.51; Cast iron O.D. PVC plastic pipe per AWWA C900.

** The outside diameter of A-C pipe varies from manufacturer to manufacturer, so make certain you select the proper clamp:

1) Determine the O.D. of the pipe at the point of saddle installation;

2) From the pipe O.D. range column of the above chart, choose a saddle that has a pipe O.D. range that includes the determined pipe diameter

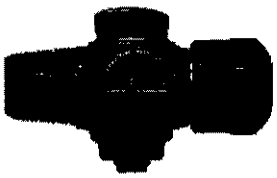
These machines may be used with the service saddles illustrated on this page

Machine	Service saddle tap size				
	5/8"	3/4"	1"	1-1/2"	2"
E-5™	X	X	X	X	X
D-5™	-	X	X	X	X
TRU-CUT™	-	X	X	-	-
MEGA-CUT™	X	X	X	X	X
PL-2™	-	X	X	-	-

TO ORDED SPECIFY QUANTITY, OUTLET TAPPING SIZE AND CATALOG NUMBER

Mueller Co.
A Grinnell company

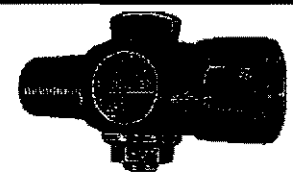
CORPORATION STOPS MUELLER 110® COMPRESSION CONNECTION



H-15008

Ground Key Corporation Stop
Inlet: AWWA taper (MUELLER "CC") thread
Outlet: MUELLER 110® Conductive Compression Connection for CTS O.D. tubing*

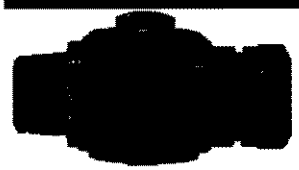
1/2"	3/4"	1"
25/Ctn	10/Ctn	10/Ctn



H-15028

Ground Key Corporation Stop
Inlet: AWWA I.P. thread
Outlet: MUELLER 110 Conductive Compression Connection for CTS O.D. tubing*

1/2"	3/4"	1"
25/Ctn	10/Ctn	9/Ctn



H-15013

MUELLER ORI-CORP® Corporation Valve
Inlet: AWWA taper (MUELLER "CC") thread
Outlet: MUELLER 110 Conductive Compression Connection for CTS O.D. tubing*

1-1/2"	2"
2/Ctn	4/Ctn

H-15023

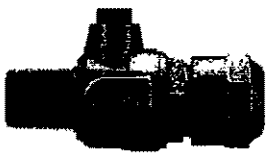
MUELLER ORI-CORP Corporation Valve
Inlet: AWWA I.P. thread
Outlet: MUELLER 110 Conductive Compression Connection for CTS O.D. tubing*

1-1/2"	2"**
4/Ctn	4/Ctn

B-25008

MUELLER® 300™ Ball Corporation Valve
Inlet: AWWA taper (MUELLER "CC") thread
Outlet: MUELLER 110 Conductive Compression Connection for CTS O.D. tubing*

3/4"	1"	1-1/2"	2"
10/Ctn	10/Ctn	5/Ctn	4/Ctn



B-25028

MUELLER 300 Ball Corporation Valve
Inlet: AWWA I.P. thread
Outlet: MUELLER 110 Conductive Compression Connection for CTS O.D. tubing*

3/4"	1"	1-1/2"	2"
10/Ctn	10/Ctn	5/Ctn	4/Ctn

H-15009

Ground Key Corporation Stop
Inlet: AWWA taper (MUELLER "CC") thread
Outlet: MUELLER 110 Compression Connection for IPS plastic pipe*

3/4"	1"
10/Ctn	10/Ctn

H-15029

Ground Key Corporation Stop
Inlet: AWWA I.P. thread
Outlet: MUELLER 110 Compression Connection for IPS plastic pipe*

3/4"	1"
10/Ctn	10/Ctn

B-25029

MUELLER 300 Ball Corporation Valve
Inlet: AWWA I.P. thread
Outlet: MUELLER 110 Compression Connection for IPS plastic pipe*

3/4"	1"
10/Ctn	10/Ctn

*See chart on page 5.7 for tubing and pipe that may be used with these connections.

NOTE: sizes shown above are nominal sizes of both inlet and outlet connections.

Mueller Co.

GROUND KEY ANGLE METER VALVES & SERVICE VALVES - 3/4" - 2"

Ground Key Angle Meter Valve
MUELLER 110® Conductive Compression Connection for CTS O.D.* tubing x meter flange
180° turn check - lock wing

H-14277

Catalog size	1-1/2	2††
Meter size	1-1/2	1-1/2, 2
Pipe size	1-1/2	2

Ground Key Angle Meter Valve
MUELLER® Pack Joint Connection for CTS O.D.* tubing x meter flange
180° turn check - lock wing

P-14277

Catalog size	1-1/2	2††
Meter size	1-1/2	1-1/2, 2
Pipe size	1-1/2	2

Ground Key Angle Meter Valve
Copper flare nut x meter flange
180° turn check - lock wing

H-14276

Catalog size	1-1/2	2††
Meter size	1-1/2	1-1/2, 2
Tubing size	1-1/2	2

Ground Key Angle Meter Valve
F.I.P. x meter flange
180° turn check - lock wing

H-14286

Catalog size	1-1/2	2††
Meter size	1-1/2	1-1/2, 2
Pipe size	1-1/2	2

Ground Key Angle Meter Valve
F.I.P. x F.I.P.
180° turn check - lock wing

H-14285

Catalog size	3/4

MUELLER Solid Tee Head Roundway Meter Stop
F.I.P. x F.I.P.
360° turn - lock wing

H-10281

Catalog size	1/2

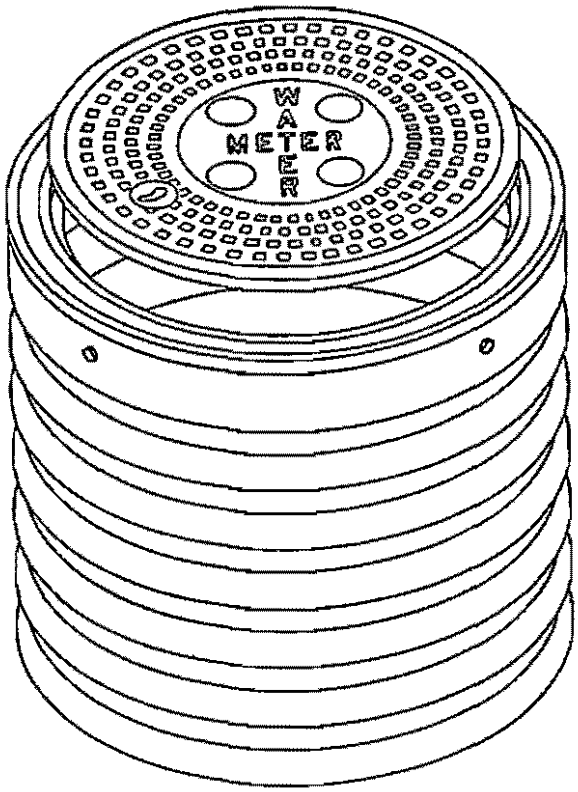
8 VALVES / CHECKS

* See charts on pages 8D.15 and 8D.16 for tubing and pipe that can be used with this connection.
†† These valves have meter flanges double drilled to fit either 1-1/2" or 2" meters.

MUELLER Valves and Couplings are manufactured and tested in accordance with ANSI/AWWA C800.

BASS & HAYS:

55[illegible] METER CAN FOR 2" METER



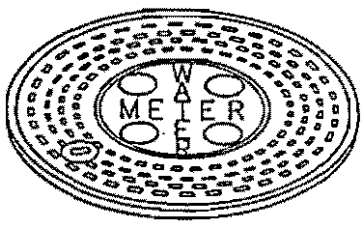
548 Series Galvanized Meter Boxes

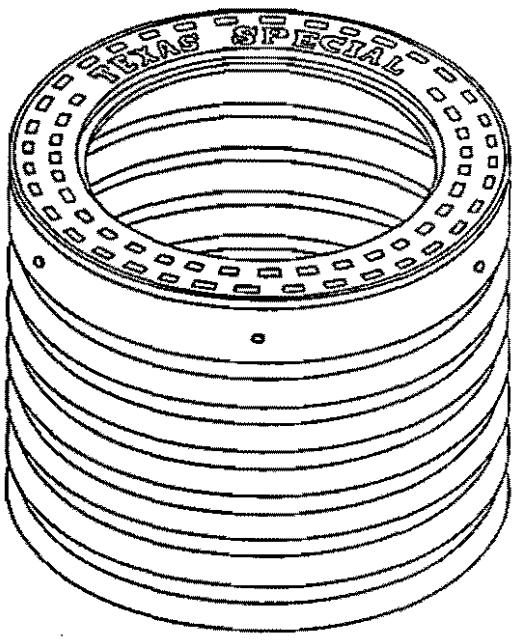
with 24" dia. corrugated cans

Part no.	Height	Weight
# 548 A	18"	80 lbs
# 548 B	24"	85 lbs
# 548 C	30"	90 lbs
# 548 D	36"	95 lbs
# 548 E	42"	100 lbs
# 548 F	48"	105 lbs
# 548 G	54"	110 lbs
# 548 H	60"	115 lbs

55 Series Galvanized Meter Boxes

with 28" dia. corrugated cans





Part no.	Height	Weight
# 55 A	18"	125 lbs
# 55 A1S	18"	125 lbs
# 55 A2S	18"	125 lbs
# 55 B	24"	130 lbs
# 55 C	30"	135 lbs
# 55 D	36"	140 lbs
# 55 E	42"	145 lbs
# 55 F	48"	150 lbs
# 55 A1S 18 ga. can - Dallas std		

BACKFLOW PREVENTOR

Series 007 ½" - 2", 007DCDA 2"

Double check valve assemblies

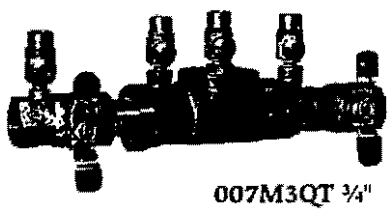
- Backflow preventers designed to protect potable water supplies in accordance with national plumbing codes for non-health hazard cross connections and continuous pressure applications.
- Provides protection against back siphonage and backpressure backflow.

Specifications

- All sizes supplied with resilient seated shutoffs
- Sizes: ½" - 1" (15-25 mm) have tee handle shutoffs. 1¼" - 2" (32-50 mm) have lever handle shutoffs.
- For supply pressures up to 175 psi (12.1 bars).
- Water temperature: sizes ½" - 2" (13-50 mm) from 33°F to 180°F (.55°C to 82°C).

Flow Charts see page 44, 45.

Features



007M3QT ¾"

- Line sized construction for reduced fouling
- Replaceable seats and seat discs
- No screws in the waterway for reliable operation
- Captured springs for safety
- Top entry, single cover for access ease
- Top mounted test cocks to simplify testing

For additional information, request ES-007.
For WattsBox Enclosures, request ES-WB and ES-WB-T.

Options *add Suffix:*

PC - with internal polymer coating

S - with bronze strainer

LF - without shutoff valves

LH - with locking handle ball valves (open position)

SH - with stainless steel ball valve handles

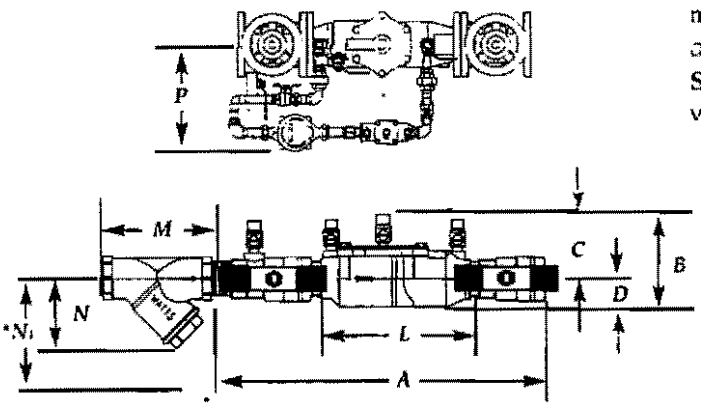
U - union connections

HC - with fire hydrant connections (female hose swivel x male NST)

add Prefix:

SS - with 316 stainless steel backflow preventer and ball valve shutoffs.

Dimensions/Wgts.



STRAINER DIMENSIONS

Size (DN) in.	Size (DN) mm	M in.	M mm	N in.	N mm	*N1 in.	*N1 mm
½	15	2¾	70	2¼	57	10	254
¾	20	3⅜	81	2¾	70	10	254
1	25	3¾	95	3	76	12	305
1¼	32	4⅜	113	3½	89	20	508
1½	40	4⅞	124	4	102	22¾	578
2	50	5⅝	151	5	127	28	711

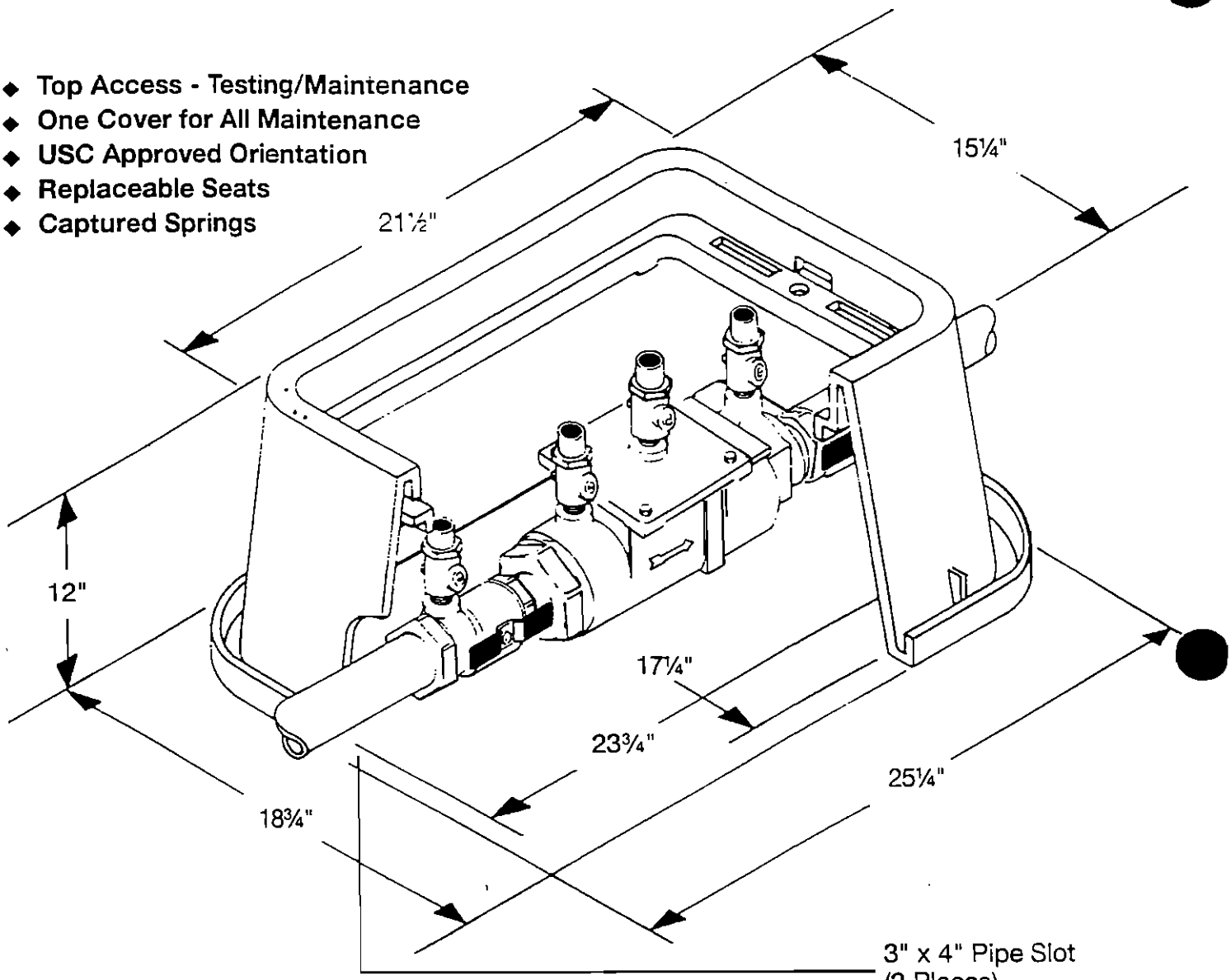
**Dimensions required for screen removal.*

Model	Order No§	Size (DN) in.	Size (DN) mm	A in.	A mm	B in.	B mm	C in.	C mm	D in.	D mm	L in.	L mm	P		Weight lbs.	Weight kg.
007QT	0062131	½	15	10	250	3⅛	79	2⅜	60	¾	19	5	127	–	–	4½	2.0
007M3QT	0062020	¾	20	11⅛	282	4	100	3⅛	79	⅞	22	5	127	–	–	5	2.3
007M1QT	0062306	1	25	13¼	337	5⅛	130	3⅞	98	1¼	32	6³⁄₁₆	157	–	–	12	5.4
007M2QT	0062681	1¼	32	16⅜	416	5	127	3½	89	1½	38	6³⁄₁₆	157	–	–	23	10.4
007M2QT	0062436	1½	40	16¾	425	5	127	3½	89	1½	38	7½	191	–	–	27	12.2
007M1QT	0062427	2	50	19½	495	6¼	159	3¾	95	2½	64	7½	191	–	–	25¾	11.7
007QT-S	0062132	½	15	10	250	6	150	2⅜	60	¾	19	9½	241	–	–	5½	2.5
007M3QT-S	0062021	¾	20	11⅛	282	6⅛	156	3⅛	79	⅞	22	9½	241	–	–	6¾	3.1
007M1QT-S	0062308	1	25	13¼	337	7¾	197	3⅞	98	1¼	32	9¾	248	–	–	14	6.5
007M2QT-S	0062450	1¼	32	16⅜	416	7	178	3½	89	1½	38	9¾	248	–	–	26	11.7
007M2QT-S	0062616	1½	40	16¾	425	7	178	3½	89	1½	38	13⅜	340	–	–	35½	16.0
007M1QT-S	0062428	2	50	19½	495	8¾	222	3¾	95	2½	64	13⅜	340	–	–	33½	15.2
*007DCDAOSY‡	0062665	2	50	35⅛	892	11	279	12¼	311	2¼	57			12¼	311	97	44

§- Contact your local Watts Agent or call Customer Service (978) 689-6066 for other models and order numbers or refer to PL-WR. For Union Models refer to ES-007. ‡ - models come with CFM/GPM meters. For GPM codes see price list.
**B dimension is from the lowest part of the valve (the unmachined relief port) to the highest part of the gate/ball valve shutoff.*

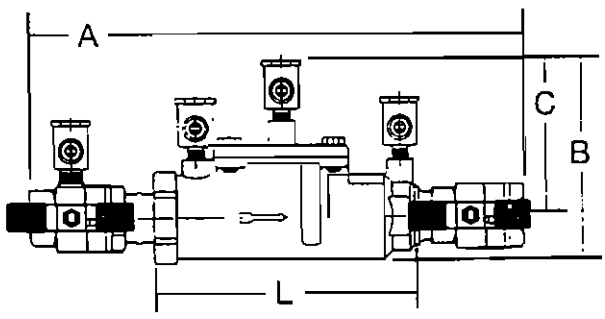
Meter Box Installation
Watts 007QT Double Check Assembly

- Top Access - Testing/Maintenance
- One Cover for All Maintenance
- USC Approved Orientation
- Replaceable Seats
- Captured Springs



Dimensions and Weights - Sizes 1¼", 1½", 2"

Size		Dimensions A		B		C		L		Weight	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
1¼	32	16⅜	416	5	127	3⁵⁄₁₆	84	9½	241	15	6.8
1½	38	16¾	426	4⅞	124	3½	89	9¾	248	15⅞	7.2
2	50	19½	495	6¼	159	4	102	13⅜	340	25¾	11.7



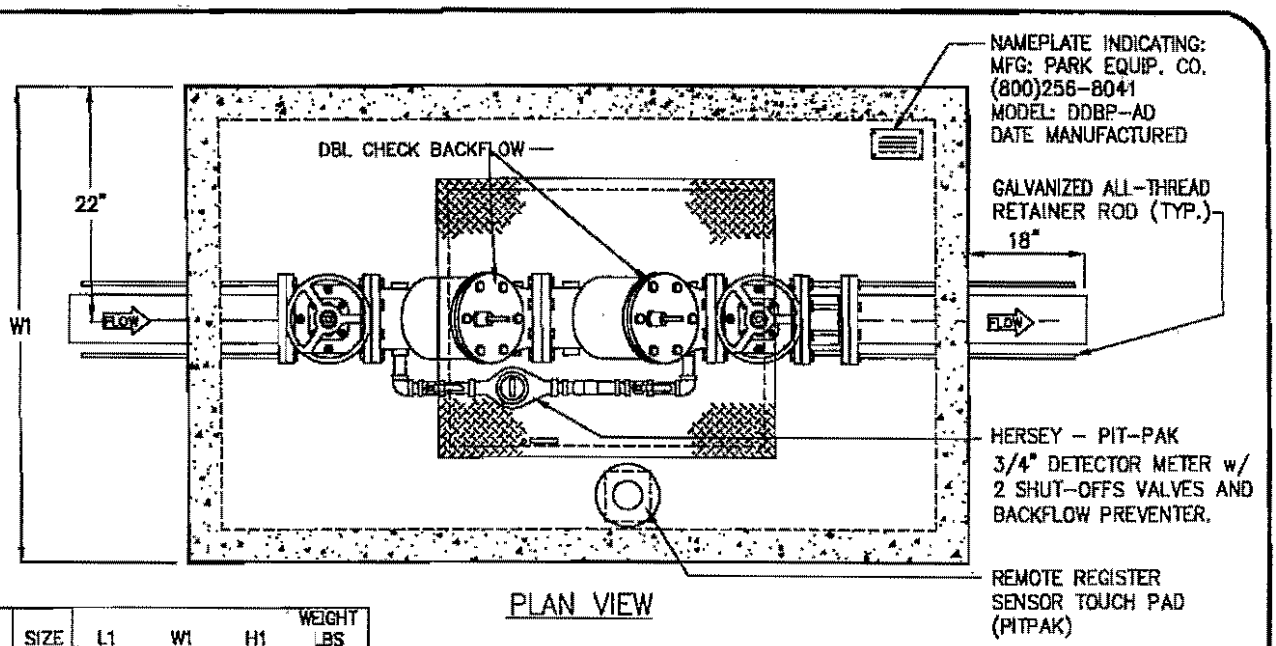
A LEADER IN VALVE TECHNOLOGY
WATTS REGULATOR
Since 1874 — Watts Industries, Inc.
Water Products Division • Safety & Control Valves

USA: 815 Chestnut Street, North Andover, MA 01845-6098
Canada: 5435 North Service Road, Burlington, Ontario L7L 5H7

ISO 9001 CERTIFIED

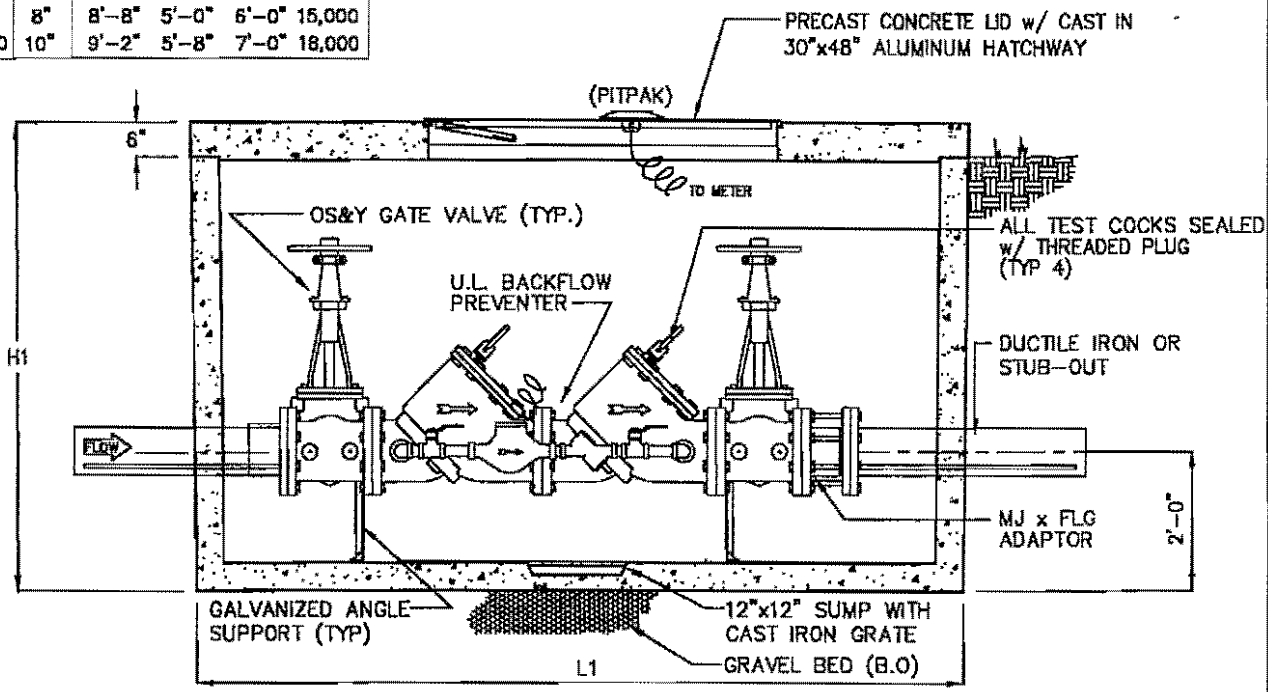
Printed in U.S.A.

Park Equipment:
8" Dbl. Detector Check & Vault Assembly



PLAN VIEW

MODEL	SIZE	L1	W1	H1	WEIGHT LBS
DDBP-AD4	4"	7'-10"	4'-4"	6'-0"	9,000
DDBP-AD6	6"	7'-10"	4'-4"	6'-0"	9,200
DDBP-AD8	8"	8'-8"	5'-0"	6'-0"	15,000
DDBP-AD10	10"	9'-2"	5'-8"	7'-0"	18,000



ELEVATION

Specifications

CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

HATCHWAY: 1/4" Aluminum diamond plate cover, with 1/4" extruded aluminum frame. Hatch to be furnished with 316 Stainless Steel snap lock & hinges.

Engineering Data

The backflow assembly shall be factory assembled in vault & hydrostatically tested prior to delivery. Field excavation & preparation shall be complete prior to delivery. Pipe, valves and fittings of the assembly shall be approved by one or more of the following associations:

AWWA UL UPC FM

PROJECT :

CUSTOMER :

ENGINEER :

PARK EQUIPMENT COMPANY

WATS 800-256-8041

TOWN OF ADDISON

4" THRU 10" DOUBLE DETECTOR CHECK BACKFLOW PREVENTER ASSEMBLY

SCALE	NONE	DWG. NO.	REV.
DATE	8/97	DDBP-AD	A

SANITARY SEWER MATERIAL INDEX

B. SANITARY SEWER MATERIALS:

1. JM Pipe: 6" – 4" SDR35 PVC Sewer Pipe
2. SDR35 PVC Sewer Fittings
3. Bass & Hays: #404 Sanitary Lateral Cleanout

SANITARY SEWER PIPE – SDR35

Ring Tite® Gravity Sewer Pipe

Scope
The specification with which J-M Manufacturing's Ring-Tite gravity sewer pipe is manufactured designates general requirements for unplasticized polyvinyl chloride (PVC) plastic pipe with integral bell and spigot joints for the conveyance of domestic sewage.

Pipe
The pipe is suitable for gravity conveyance of sewage with less than 25 feet of internal head pressure. The corrosion resistance of PVC enables a longer surface life than most other piping products. The bell consists of an integral wall section with a factory installed, solid cross section elastomeric ring that allows for expansion and contraction at each joint.

Joint Design
The joint design meets ASTM D3212 performance testing requirements, thereby assuring a watertight joint not to exceed an infiltration/exfiltration of 50 gallons/inch diameter/mile/day. The gasket for this joint assembly is made of an elastomeric ring in compliance with ASTM F477.

Materials
J-M's gravity sewer pipe meets the requirements of ASTM D3034 for pipe sizes 4" through 15", and ASTM F679 T-1 wall thickness for sizes 18" through 27".

Deflection Criteria
When installed per our recommendations, J-M's gravity sewer pipe will not exceed a long term deflection limit of 7.5% of the cross sectional area.

Flow Characteristics
With a Manning's "n" coefficient of 0.009, our smooth interior gravity sewer pipe provides the capability of using flatter grades during installation or selecting smaller diameter sizes than would be needed for other piping materials.

Standard Laying Lengths
Standard laying lengths shall be 13 feet (±1") for all sizes.

Dimensions

Nominal Pipe Size	Outside Diameter (OD)	SDR 35 , PS = 46 psi		SDR 26 Heavy wall, PS = 115 psi	
		Min. (T)	Lbs./Ft.	Min. (T)	Lbs./Ft.
4	4.215	0.120	1.1	0.162	1.1
6	6.275	0.180	2.4	0.241	3.1
8	8.400	0.240	4.2	0.323	5.6
10	10.500	0.300	6.6	0.404	8.8
12	12.500	0.360	9.5	0.481	12.5
15	15.300	0.437	14.1	0.588	19.1
18	18.701	0.536	21.4	---	---
21	22.047	0.632	29.9	---	---
24	24.803	0.711	39.0	---	---
27	27.953	0.801	49.5	---	---

Notes:

A. All dimensions are in inches unless specified otherwise.

B. (SDR) = Standard Dimension Ratio = OD ÷ T min.

C. (PS) = Pipe Stiffness, (T) = Wall Thickness, (Lbs/Ft) = approximate Weight.

D. Product information effective as of 7/00. Subject to revision at any time.

Reference Specifications:

A. ASTM F477 : " Elastomeric Seals (Gaskets) for joining Plastic Pipe "

B. ASTM F679 : " PVC Large Diameter Plastic Gravity sewer Pipe and Fittings "

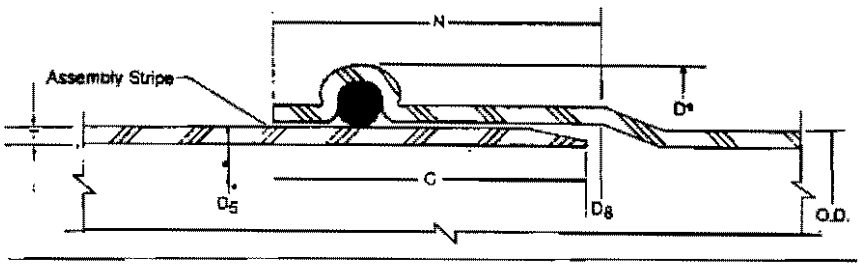
C. ASTM D1784 : " Specification for Rigid PVC Compounds and CPVC Compounds "

D. ASTM D3034 : " Type PSM PVC Sewer Pipe and Fittings "

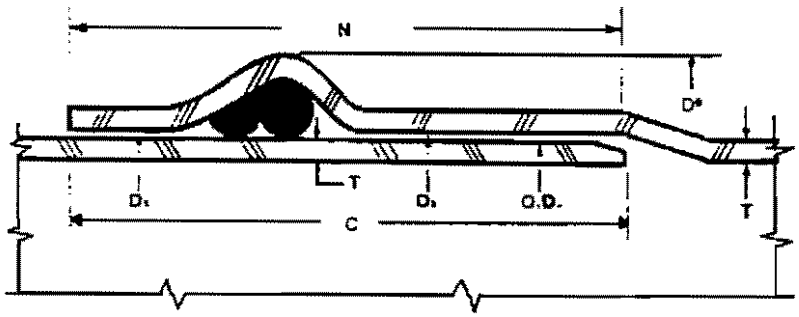
E. ASTM D3212 : " Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals "

Sizes, Dimensions and Weights

Bell and Spigot Assembly (Inches)



Pipe Size Inches	Pipe Details Average O.D.	Min. Wall Thickness "T"	Bell Details C	D5	D8	Approx. D9	N	Approx. Weight Lbs./Ft.
4	4.215	0.120	2.80	4.250	4.240	5.20	2.90	1.05
6	6.275	0.180	3.50	6.318	6.308	7.50	3.50	2.36
8	8.400	0.240	4.10	8.460	8.440	10.10	4.10	4.24
10	10.500	0.300	4.70	10.570	10.548	12.40	4.70	6.64
12	12.500	0.360	5.15	12.577	12.554	14.50	5.15	9.50
15	15.300	0.437	5.95	15.380	15.362	18.00	5.95	14.14
18	18.701	0.536	5.90	18.784	18.764	21.98	5.90	21.43
21	22.047	0.632	6.40	22.110	22.110	25.63	6.40	29.88



Pipe Size Inches	Ave. O.D.	Min. Wall Thickness "T"	C	D5	D8	Approx. D9	N	Approx. Wt. Lbs./Ft.
24"	24.803	0.711	15.75	24.99	24.99	28.80	11.25	38.96
27"	27.953	0.801	18.30	28.17	28.17	32.50	12.75	49.47

SEWER FITTINGS - SDR35

Products - Trench Tough - Short Form Specs

Introduction - Features & Benefits - Engineering Lay Lengths - Download Brochures

Trench Tough SDR35 Gasketed Sewer Fittings

Fittings 4" through 15" shall be molded and comply with ASTM D3034 and F1336 standards. Fittings shall be manufactured from a PVC compound having a minimum cell classification of 12454 per ASTM 1784. Molded wyes, t-wyes and tees must be a minimum of a SDR26 thickness where the branch connects to the body of the fitting. In addition, service branches and bells for 4" and 6" sizes must have a minimum of a SDR26 wall thickness. Materials used for gaskets must conform to the requirements of ASTM F477 or F913. All fittings must be manufactured with a locked-in, black color coded gasket having a durometer rating of 45. These fittings must be IAPMO approved and be third-party certified to CSA B182.1 and/or CSA B182.2.

Trench Tough SDR35 & Fabricated Gasketed Sewer Fittings

All fabricated fittings up to 48" shall be made from segment of third-party certified SDR35 pipe that exceeds the requirement of ASTM F679. The fittings shall consist of butt fused or welded pipe and solvent cemented service branches. All 4" through 6" service branches must be a minimum of SDR26 wall thickness. The fittings must conform to ASTM D3034, F1336 and F679 standards. All fittings shall be third-party certified to CSA B182.1 and/or CSA B182.2.

Trench Tough SDR35 Gasketed Sewer Fittings meet these standards:

ASTM D3034, F1336, & F679
CSA B182.1 & CSA B182.2
IAPMO file number: 1575

Trench Tough SDR 26 Heavy Wall Sewer Fittings

All heavy wall SDR26 gasketed sewer fittings shall conform to ASTM D3034 and F1336 and shall be manufactured from a compound having a minimum cell classification of 12454 as prescirbed in ASTM D1784. All molded wyes, t-wyes and tees must be a minimum of a SDR24 thickness for the body of the fitting. In addition, all outlets 4" through 6" service branches, bells and bodies must have a minimum of a SDR24 thickness. Materials used for gaskets must conform to the requirements of ASTM F913 or ASTM F477. All fittings must have a locked-in gray color coded gasket.

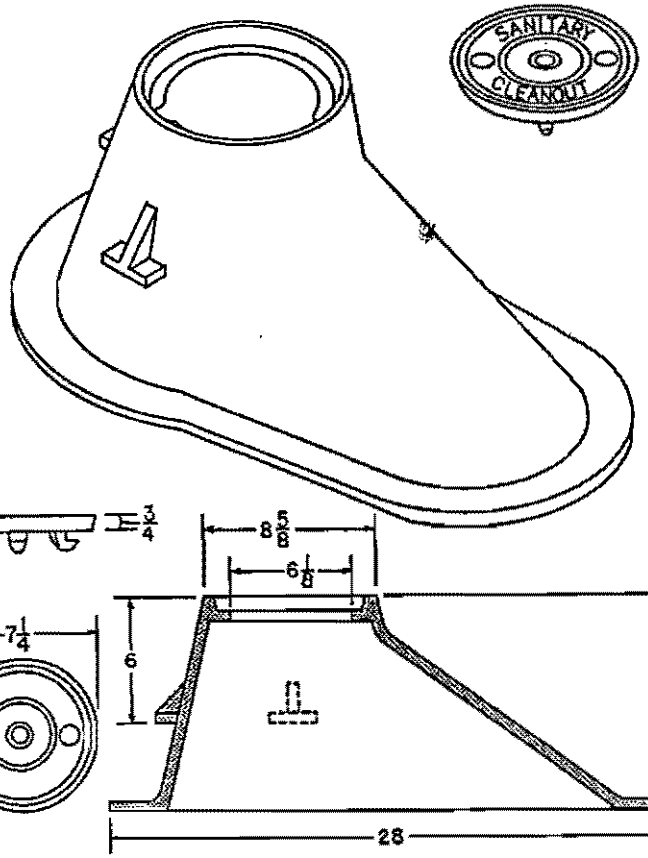
Trench Tough SDR 26 Heavy Wall Sewer Fittings meet these Standards:

ASTM F1336
ASTM D3034

Trench Tough CIOD Sewer Fittings for C900 Pipe

Injection-molded 4" to 8" CIOD gasketed sewer tees, couplings, elbows, plugs and reducers shall conform to AWWA C907 and be third-party certified to CSA B137I.2. They shall be UL listed and FM approved. All other configurations must have a minimum DR18 wall thickness. DR18 fittings shall be made from a compound with a minimum cell classification of 12454 per ASTM D1784. The compound must have a minimum Hydrostatic Design Basis of 4,000 psi

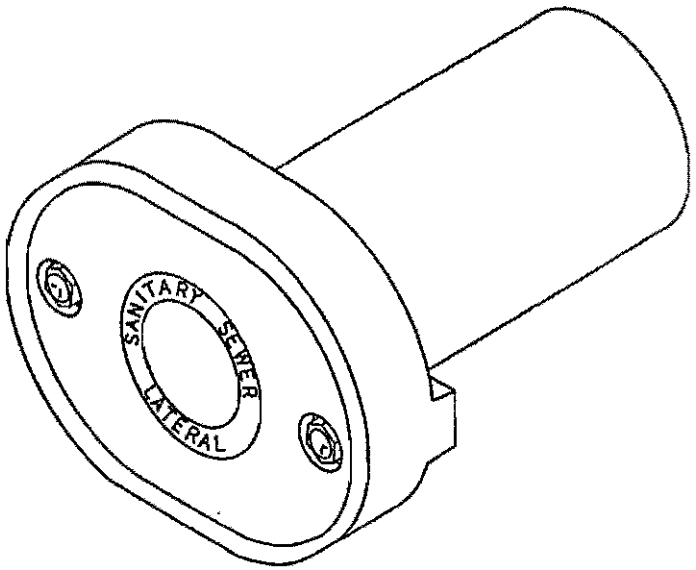
Bass & Hays: #404 Cast Iron Lateral Cleanout



339

Sanitary Cleanout Boot

BASE 92 lbs.
LID 8 lbs.
SET 100 lbs.

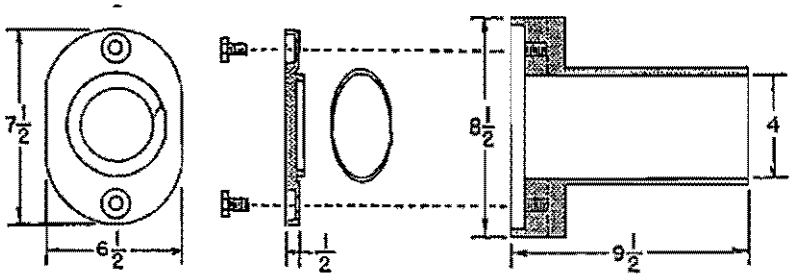


404

Lateral Cleanout

With Gasket, two Bolts

BASE 11 lbs.
LID 4 lbs.
SET 15 lbs.



STORM SEWER
MATERIAL INDEX

C. STORM SEWER MATERIALS:

1. CSR/Wall: Concrete Pipe Certification for RCP Pipe / ASTM C-76
2. RAM-NECK: RCP Pipe Joint Material
3. JM Pipe: 10"- 8" SDR35 PVC Sewer Pipe
4. Hughes Supply/American Pre-Cast: 5' Curb Inlet w/ #184 Access Cover
5. Hughes Supply/American Pre-Cast: Type "B" Headwall
6. Hughes Supply/American Pre-Cast: #36 Catch Basin w/Galvanized Hwy Grate as Alternate to 2-Grate & 3-Grate Inlets
7. Hughes Supply/American Pre-Cast: #20 Catch Basin
8. Cast-in-Place Concrete Structures / Hanson: Concrete Batch Mix Design

STORM SEWER
CONCRETE PIPE

CSR Wall

RE: Certification for Concrete Pipe, Box Sections, and Manholes

This letter is to certify that the concrete products manufactured by CSR Wall meet the following specifications:

Reinforced Concrete Pipe	A.S.T.M. C-76
Reinforced Concrete Arch Pipe	A.S.T.M. C-506
Precast Reinforced Concrete Box Culverts	A.S.T.M. C-789 or C-850
Reinforced Concrete Manholes	A.S.T.M. C-478

Sincerely,

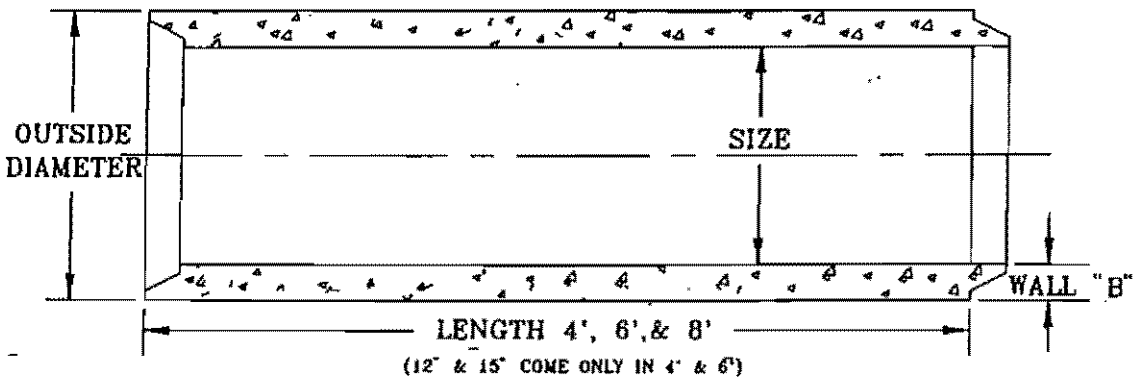
F. W. Kumpel P. E.

Subscribed to before me at Paris, Texas
this 27th day of July 1999.

NOTARY PUBLIC IN AND FOR LAMAR COUNTY, TX

SYBLE HARBISON
NOTARY PUBLIC
STATE OF TEXAS
My Comm. Exp 05-08-2002

CSR Wall, 1569 S. Church Street, Paris, Texas 75460
Telephone (903) 784-8652, Facsimile: (903) 785-2699



TONGUE AND GROOVE ASTM C-76 WALL B
REINFORCED CONCRETE PIPE

SIZE	WALL "B"	OUTSIDE DIAMETER	WEIGHT PER FOOT (LBS)
12" (300 MM)	2"	16"	100
15" (375 MM)	2 1/4"	19 1/2"	130
18" (450 MM)	2 1/2"	23"	170
21" (525 MM)	2 3/4"	26 1/2"	215
24" (600 MM)	3"	30"	270
27" (675 MM)	3 1/4"	33 1/2"	325
30" (750 MM)	3 1/2"	37"	380
33" (825 MM)	3 3/4"	40 1/2"	440
36" (900 MM)	4"	44"	510
39" (975 MM)	4 1/4"	47 1/2"	565
42" (1050 MM)	4 1/2"	51"	630
45" (1125 MM)	4 3/4"	54 1/2"	760
48" (1200 MM)	5"	58"	865
54" (1350 MM)	5 1/2"	65"	1050
60" (1500 MM)	6"	72"	1300
66" (1650 MM)	6 1/2"	79"	1520
72" (1800 MM)	7"	86"	1800
78" (1950 MM)	7 1/2"	93"	2130
84" (2100 MM)	8"	100"	2660
96" (2400 MM)	9"	114"	3565

WALL CONCRETE PIPE CO., INC.
1589 South Church: Paris, Texas 75460 (903)784-6852 Fax (903)785-2699

STORM SEWER
CONCRETE PIPE
JOINT MATERIAL

TECHNICAL DATA BULLETIN

RAM-NEK GASKET DIVISION
Preformed Flexible Plastic Joint Sealant

K. T. SNYDER COMPANY, INC.
2100 Travis Street • Houston, Texas 77002
Toll-Free (800) 231-4549 • Texas: Call Collect (713) 650-6174

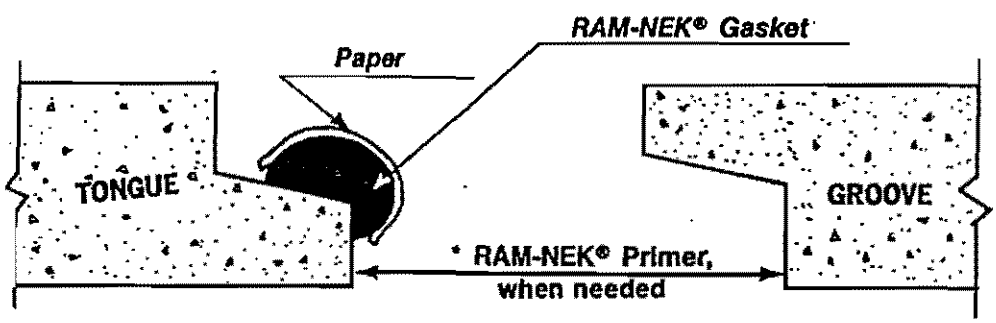
K.T. SNYDER SEALANTS SINCE 1955

RAM-NEK® FLEXIBLE PLASTIC GASKETS

SINGLE GASKET METHOD

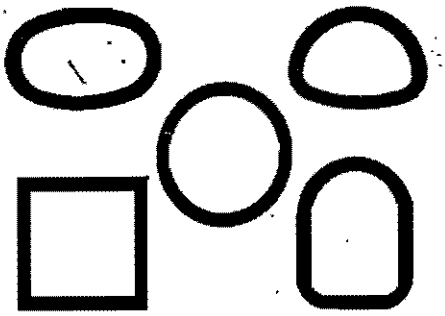
for sealing reinforced concrete culverts, storm drains & sewer pipe

THIS BULLETIN DESCRIBES A PLASTIC GASKET MATERIAL THAT MEETS HUNDREDS OF CITY, COUNTY, STATE AND FEDERAL SPECIFICATIONS, ALL OF WHICH ARE BASED ON MORE THAN TEN YEARS OF SUCCESSFUL, PROVEN FIELD PERFORMANCE.



The ON-THE-BANK FABRICATION of a RAM-NEK® joint. The sketch above is intended only to represent the proper positioning of the preformed plastic gasket strip.

Note: For exterior squeeze-out, place RAM-NEK® on the tongue of the pipe joint, as shown. For interior RAM-NEK® squeeze-out, place RAM-NEK® gaskets on the groove.



For Concrete Pipe of All Sizes, Shapes and Service

★ *RAM-NEK® Primer may not be required, but it is recommended.*

MINIMUM INSTALLATION REQUIREMENTS (Single Gasket)

TRENCH CONDITION — Conditions in the sewer trench shall be such that pipe jointing can be accomplished without getting mud, silt, gravel or other foreign material into the joint. In general this means that the trench shall be adequately dewatered, with a firm bottom free of muck.

GASKET APPLICATION — Apply one coat of RAM-NEK® Primer to clean, dry joint surfaces and allow to dry. Remove the paper wrapper from one side only of the two-piece wrapper on the RAM-NEK® gasket. The outside paper will protect the gasket and assure against stretching. Before laying the pipe in the trench, attach the plastic gasket strips end-to-end to the leading edge of the tongue or groove of each pipe joint, forming a continuous gasket around the entire circumference of the pipe joint. Remove outside wrapper prior to jointing the pipe.

HANDLING — Pipe handling after the plastic gasket has been affixed shall be carefully controlled to avoid bumping the gasket and thus displacing it or covering it with dirt or other foreign material. Any gaskets so ·rbed shall be removed and replaced if damaged ·epositioned if displaced.

PIPE ALIGNMENT — Care shall be taken to properly align the pipe before joints are forced home. During insertion of the tongue, the pipe shall be partially supported by the crane to maintain concentricity until the plastic gasket is properly compressed in the joint space.

PULL-UP OR PUSH-UP PRESSURE — Sufficient pressure shall be applied in making the joint to assure that the joint is home and evidence of a slight squeeze-out of the plastic gasket occurs at the outside or inside of the pipe joint. Backfilling can proceed as soon as jointing has been completed.

TECHNICAL SERVICE — In the event of difficulty with the use or application of RAM-NEK® Products, immediately contact the Technical Service Department of the K. T. SNYDER COMPANY, INC. for assistance.

*For the recommended size and quantity of strips, refer to the estimating guide on opposite page.

RAM-NEK® Flexible Plastic Gaskets meet the following national specifications:

- *Federal Specifications SS-S-210 A, "Sealing Compound, Preformed Plastic for Pipe Joints", Type I, Rope Form.*
- *AASHTO Designation M-198 75 I, Type B, Flexible Plastic Gasket (Bitumen).*

ASSOCIATE american concrete pipe association MEMBER

IMPORTANT

For maximum adhesion, or in cold or wet weather, it is recommended that both the RAM-NEK® gasket strip and the joint surfaces to be sealed be lightly torched immediately prior to application.

HOW TO SPECIFY

RAM-NEK® Preformed Plastic Gasket meets or exceeds all requirements of Federal Specifications SS-S-210 A*, "Sealing Compound, Preformed Plastic For Pipe Joints", Type I, Rope Form. Such Plastic gasket shall be equal to RAM-NEK® as manufactured by K. T. Snyder Company, Inc., of Houston, Texas, and shall meet the following requirements.

SS-S-210 A, (3.4 ADHESION & HYDROSTATIC PRESSURE). The sealing compound shall not leak at the joints (while being tested at 10 psi) for a period of 24 hours, as tested in section 4.5.2.

(3.5 SAG OR FLOW RESISTANCE) — vertical and overhead 1" wide joints no sagging shall be detected (while being tested at 135°F) for a period of 5 days.

(3.6 CHEMICAL RESISTANCE) no visible deterioration of the sealing compound (when immersed separately in solution of acid, alkalies and saturated hydrogen sulfide) for a period of 30 days.

The Sealing compound shall be produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced with inert mineral filler, and shall contain no solvents, irritating fumes or obnoxious odors. The compound shall not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. It shall be supplied in extruded rope-form of suitable cross-section and of such sizes as to fill the joint space when the pipes are laid. The sealing compound shall be protected by a suitable removable two-piece wrapper. The two-piece wrapper shall be so designed that one-half may be removed longitudinally without disturbing the other half to facilitate application of the sealing compound. The flexible plastic gasket shall also meet the requirements as stated in the following table:

COMPOSITION	TEST METHOD	MIN.	MAX.
Bitumen (petroleum plastic content)	ASTM D 4	50	70
Ash-Inert Mineral Matter	AASHTO T 111	30	50
Volatile Matter	ASTM D 6	—	2.0

PROPERTY	TEST METHOD	MIN.	MAX.
Specific Gravity @ 77°F	ASTM D 71	1.20	1.35
Ductility @ 77°F (cm)	ASTM D 113	5.0	—
*Softening Point	ASTM D 36	320°F	—
Penetration 77°F (150 gms) 5 sec.	ASTM D 217	50	120
*Flash Point, C.O.C.	ASTM D 92	600°F	—

**Due to the nature of the material, each sample to be tested must be manually kneaded, in lieu of heating and pouring, into various molds suggested by ASTM Standards to reduce the void content and improve testing accuracy and reproducibility.*

DATA SHEET AND ESTIMATING GUIDE (Approx.) SINGLE GASKET METHOD

IMPORTANT! The suggested gasket sizes shown will generally allow visual evidence of "Squeeze Out" after the pipes are properly jointed, and will "Fill the Joint".

GENERAL

For use with round C-76 mortar joint pipe, modified C-443, single and double offset and recessed pipe and for oval, arch, flat base, box and manhole pipe structures. Suitable for joints with (1) Tongue and groove slopes or tapers 1° to 14°; (2) Out of round up to ⅝" and (3) Annular space 1/16" to ¾".

DIMENSIONS

Gasket dimensions listed per pipe size are sized to fit most pipe meeting the above specification and having an approximate ¼" wide annular space after pipe are coupled. Check these dimensions with your pipe. Gaskets are available to fit any specific dimensions at proportionate prices.

PACKAGE

RAM-NEK® Gaskets are shipped in fiber cartons in straight cut lengths for easy makeup of joints with number of pieces of each type listed. (RAM-NEK® is self-welding, sticks to itself, guaranteeing continuous sealing at laps). ¾" is packed 50 pcs per carton / 1" - 35 pcs. per carton / 1¼" - 28 pcs. per carton / 1½" - 20 pcs. per carton / 1¾" - 13 pcs. per carton / 2" - 10 pcs. per carton. Each piece is individually wrapped in a two-piece paper wrapper for easy handling and application.

*The Commissioner, Federal Supply Service, General Services Administration, approved the Reinstatement of SS-S-210A by their notice of December 16, 1981.

Printed copies of this notice are available upon request.

CONCRETE CULVERTS, STORM DRAINS

Minimum Requirements Approximate (Tolerance ± 10%)

PIPE SIZE	PRIMER PER 100 JTS.	CUT LENGTHS PER JOINT	
12"	1.5 gals.	1½ pcs.	1" x 2'6"
15"	1.9 gals.	2 pcs.	1" x 2'6"
18"	2.7 gals.	2½ pcs.	1" x 2'6"
24"	3.8 gals.	2 pcs.	1½" x 3'6"
30"	6.2 gals.	2½ pcs.	1½" x 3'6"
36"	8.5 gals.	3 pcs.	1½" x 3'6"
42"	9.5 gals.	3½ pcs.	1½" x 3'6"
48"	12.0 gals.	4 pcs.	1¾" x 3'6"
54"	15.0 gals.	4½ pcs.	1¾" x 3'6"
60"	20.0 gals.	5 pcs.	1¾" x 3'6"
66"	25.0 gals.	5½ pcs.	1¾" x 3'6"
72"	30.0 gals.	6 pcs.	2" x 3'6"
84"	32.0 gals.	7 pcs.	2" x 3'6"
96"	35.0 gals.	8 pcs.	2" x 3'6"

TYPICAL RAM-NEK GASKET

SIZE	APPROX. SHAPE	CROSS-SECTION	IN'/FT.	LBS./PC.
¾"	⅜" x 1¼"	.47 sq. in.	5.6	.65 lb.
1"	½" x 1½"	.94 sq. in.	11.3	1.3 lbs.
1¼"	⅝" x 2"	1.25 sq. in.	15.0	2.7 lbs.
1½"	¾" x 2 ½"	1.88 sq. in.	22.5	3.5 lbs.
1¾"	1" x 3"	3.00 sq. in.	36.0	5.3 lbs.
2"	1" x 3½"	3.50 sq. in.	42.0	7.0 lbs.

Storm Drainage Pipe:
SDR35 PVC Pipe

Ring Tite® Gravity Sewer Pipe

Scope
The specification with which J-M Manufacturing's Ring-Tite gravity sewer pipe is manufactured designates general requirements for unplasticized polyvinyl chloride (PVC) plastic pipe with integral bell and spigot joints for the conveyance of domestic sewage.

Pipe
The pipe is suitable for gravity conveyance of sewage with less than 25 feet of internal head pressure. The corrosion resistance of PVC enables a longer surface life than most other piping products. The bell consists of an integral wall section with a factory installed, solid cross section elastomeric ring that allows for expansion and contraction at each joint.

Joint Design
The joint design meets ASTM D3212 performance testing requirements, thereby assuring a watertight joint not to exceed an infiltration/exfiltration of 50 gallons/inch diameter/mile/day. The gasket for this joint assembly is made of an elastomeric ring in compliance with ASTM F477.

Materials
J-M's gravity sewer pipe meets the requirements of ASTM D3034 for pipe sizes 4" through 15", and ASTM F679 T-1 wall thickness for sizes 18" through 27".

Deflection Criteria
When installed per our recommendations, J-M's gravity sewer pipe will not exceed a long term deflection limit of 7.5% of the cross sectional area.

Flow Characteristics
With a Manning's "n" coefficient of 0.009, our smooth interior gravity sewer pipe provides the capability of using flatter grades during installation or selecting smaller diameter sizes than would be needed for other piping materials.

Standard Laying Lengths
Standard laying lengths shall be 13 feet (±1") for all sizes.

Dimensions

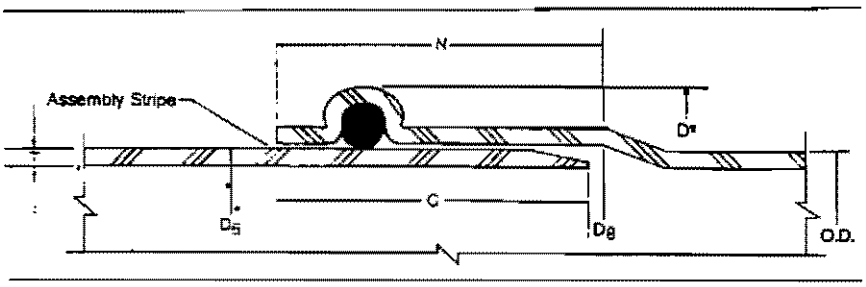
Nominal Pipe Size	Outside Diameter (OD)	SDR 35 , PS = 46 psi		SDR 26 Heavy wall, PS = 115 psi	
		Min. (T)	Lbs./Ft.	Min. (T)	Lbs./Ft.
4	4.215	0.120	1.1	0.162	1.1
6	6.275	0.180	2.4	0.241	3.1
8	8.400	0.240	4.2	0.323	5.6
10	10.500	0.300	6.6	0.404	8.8
12	12.500	0.360	9.5	0.481	12.5
15	15.300	0.437	14.1	0.588	19.1
18	18.701	0.536	21.4	—	—
21	22.047	0.632	29.9	—	—
24	24.803	0.711	30.0	—	—
27	27.953	0.801	49.5	—	—

Notes.
A. All dimensions are in inches unless specified otherwise.
B. (SDR) = Standard Dimension Ratio = OD ÷ T min.
C. (PS) = Pipe Stiffness, (T) = Wall Thickness, (Lbs/Ft) = approximate Weight
D. Product information effective as of 7/00. Subject to revision at any time.

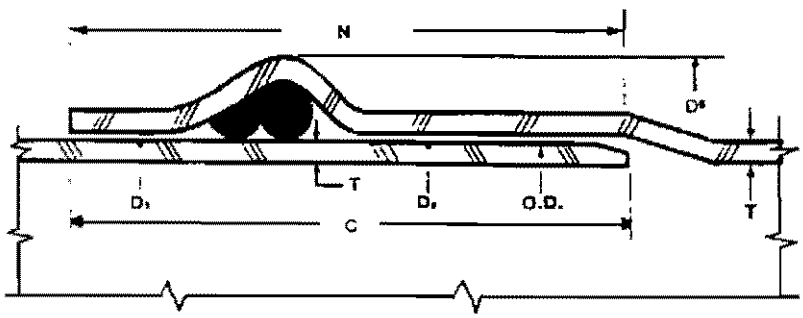
Reference Specifications:
A. ASTM F477 : " Elastomeric Seals (Gaskets) for Joining Plastic Pipe "
B. ASTM F679 : " PVC Large Diameter Plastic Gravity sewer Pipe and Fittings "
C. ASTM D1784 : " Specification for Rigid PVC Compounds and CPVC Compounds "
D. ASTM D3034 : " Type PSM PVC Sewer Pipe and Fittings "

Sizes, Dimensions and Weights

Bell and Spigot Assembly (Inches)



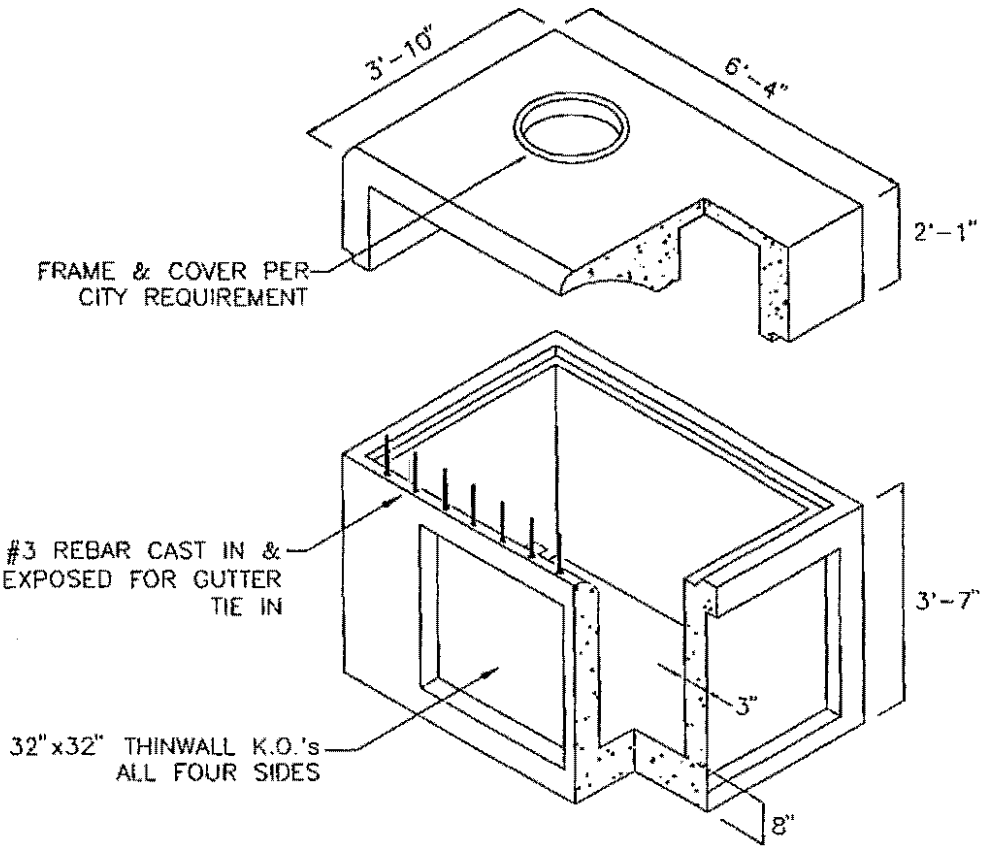
Pipe Size Inches	Pipe Details Average O.D.	Min. Wall Thickness "T"	Bell Details C	D5	D8	Approx. D9	N	Approx. Weight Lbs./Ft.
4	4.215	0.120	2.80	4.250	4.240	5.20	2.90	1.05
6	6.275	0.180	3.50	6.318	6.308	7.50	3.50	2.36
8	8.400	0.240	4.10	8.480	8.440	10.10	4.10	4.24
10	10.500	0.300	4.70	10.570	10.548	12.40	4.70	6.64
12	12.500	0.360	5.15	12.577	12.554	14.50	5.15	9.50
15	15.300	0.437	5.95	15.380	15.362	18.00	5.95	14.14
18	18.701	0.536	5.90	18.764	18.764	21.98	5.90	21.43
21	22.047	0.632	6.40	22.110	22.110	25.63	6.40	29.88

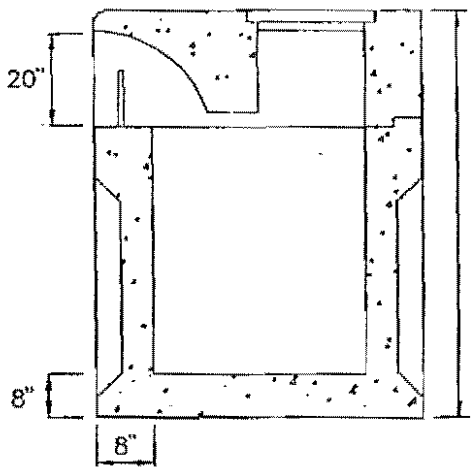


Pipe Size Inches	Ave. O.D.	Min. Wall Thickness "T"	C	D5	D8	Approx. D9	N	Approx. Wt. Lbs./Ft.
24"	24.803	0.711	15.75	24.99	24.99	28.80	11.25	38.96
27"	27.953	0.801	18.30	28.17	28.17	32.50	12.75	49.47

STORM SEWER
PRECAST STRUCTURES

5' Curb Inlet w/ #184 Access Cover





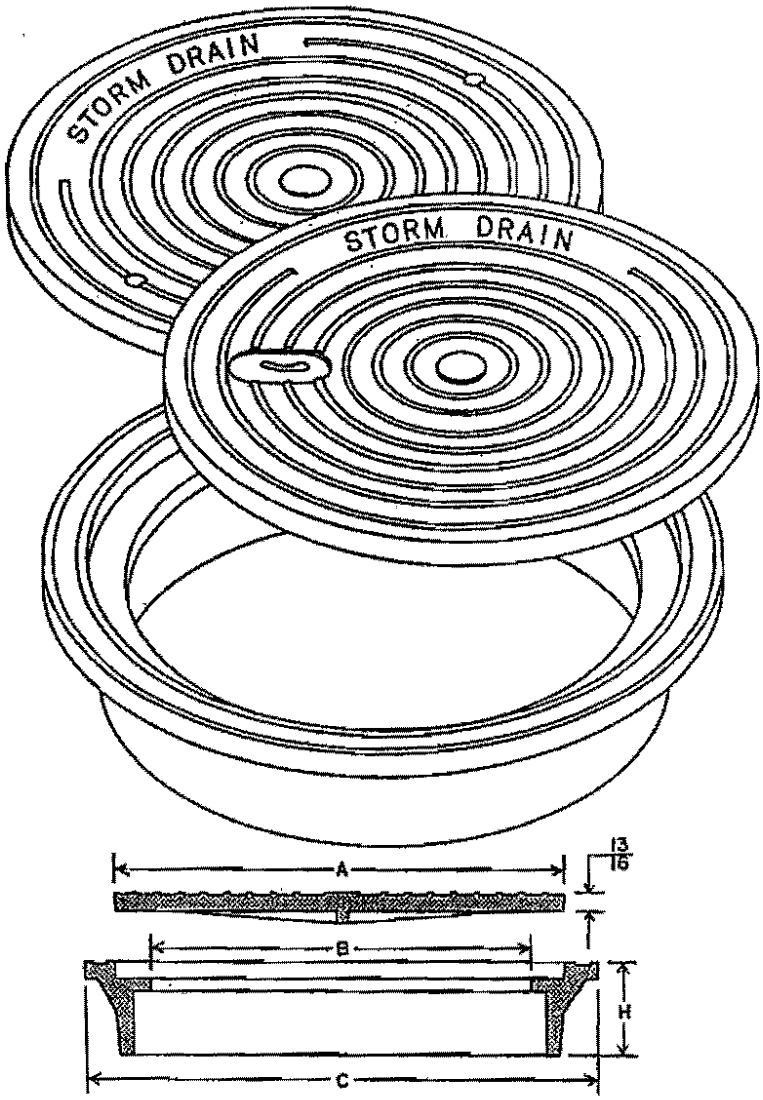
1. CONCRETE: 4500 PSI
2. REINF.: GRADE 60
3. MAX. PIPE SIZE 24" I.D.

WT.--14,700#

04698

DALLAS/FORT WORTH
5' CURB INLET W/5.0 INVERT

American Industrial Pre-Cast Products, Inc.
P.O. BOX 365 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

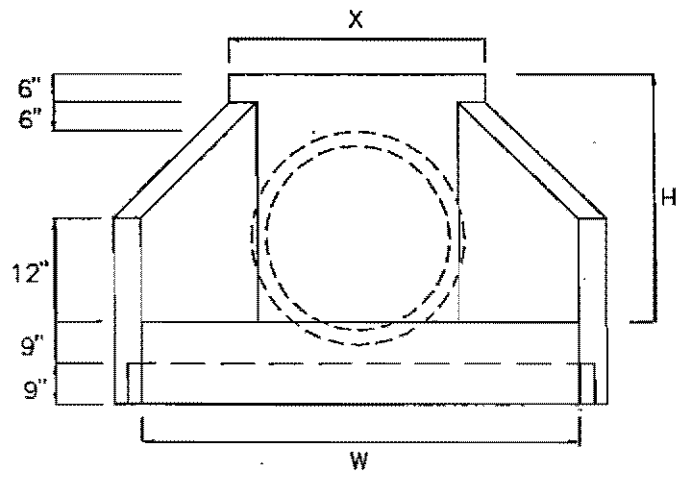


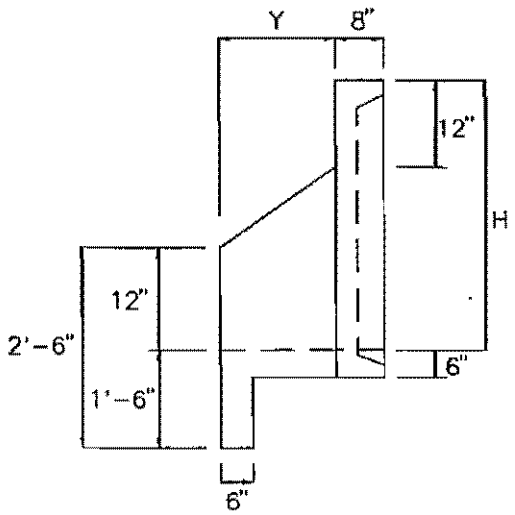
Inlet Rings & Covers

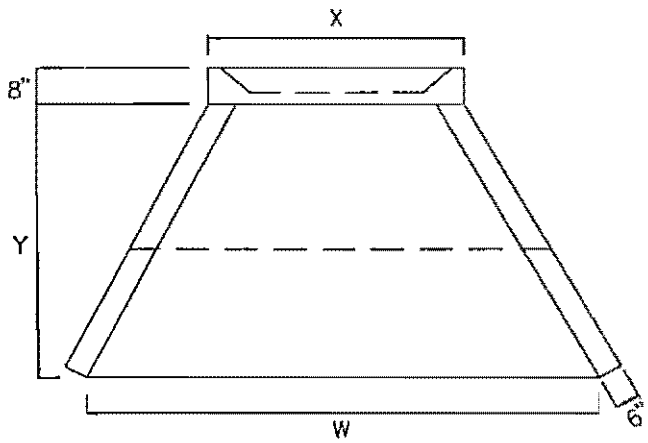
184 Lid 55 lbs.
184 Ring 51 lbs.
224 Lid 80 lbs.
224 Ring 60 lbs.
226 Ring 75 lbs.
228 Ring 90 lbs.
244 Lid 100 lbs.
244 Ring 65 lbs.

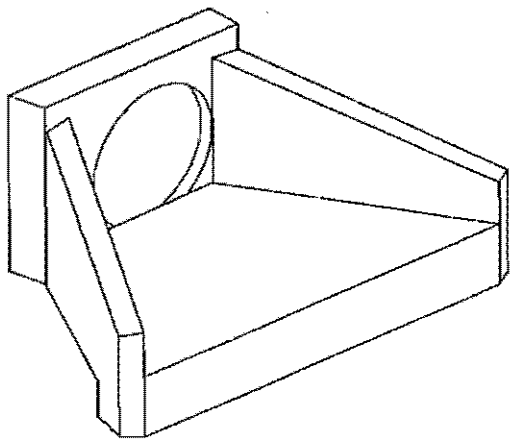
INLET	LOCK?	A	B	C	H	WEIGHT
# 184	no	19 7/16	16 1/2	22 1/4	4	106 lbs.
# 184 L	yes					
# 224	no	23 3/8	21 3/4	26 1/4	4	140 lbs.
# 224 L	yes					
# 226	no	23 3/8	21 3/4	26 1/4	6	155 lbs.
# 226 L	yes					
# 228	no	23 3/8	21 3/4	26 1/4	8	170 lbs.
# 228 L	yes					
# 244	no	25 1/4	24	28 3/4	4	165 lbs.

Type “B” Headwall









	X	H	Y	W		
HW18	2'-11"	2'-6"	2'-0"	4'-7/8"	FOR 12",15",18" RCP	WT. 3000#
HW24	3'-6"	3'-0"	3'-0"	5'-9¾"	FOR 21",24" RCP	WT. 5000#
HW30	4'-8"	4'-0"	4'-0"	7'-6""	FOR 27",30" RCP	WT. 8000##
HW36	4'-8"	4'-6"	6'-0"	9'-0"	FOR 33" ,36" RCP	WT. 10,000#

ALL EDGES CHAMFERED 3/4"

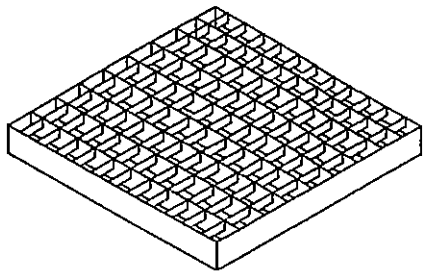
CONCRETE AND STEEL SPECIFICATIONS DESIGNED TO MEET TEXAS HIGHWAY DEPARTMENT STANDARDS

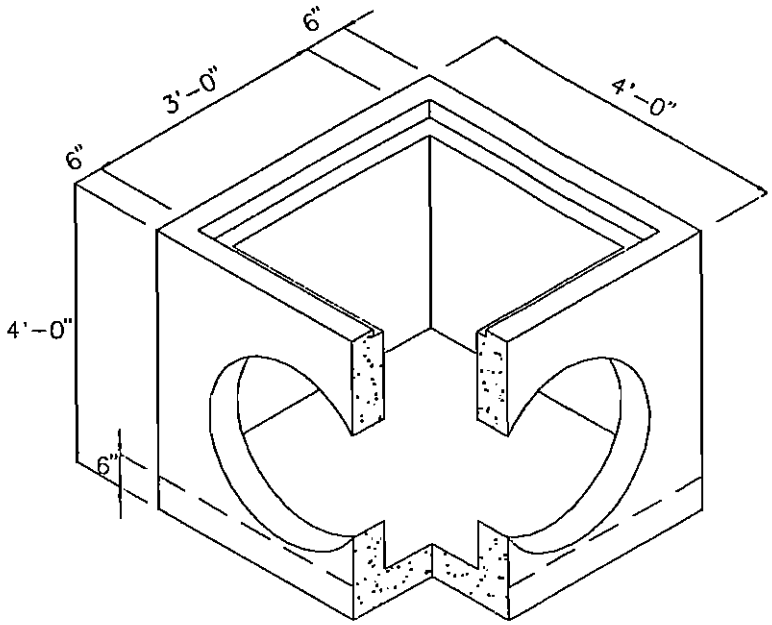
04698

HEADWALL-TYPE B

American Industrial Pre-Cast Products, Inc.
P.O. BOX 365 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

#36 Catch Basin w/ Galvanized Hwy Grate as Alternate to 2-Grate & 3- Grate Inlets





WT.
3'-6"--4815#

1. CONCRETE: 4500 PSI
2. REINF.: GRADE 60
3. 3'x3' GALV. GRATE
4. EXTENSION SECTIONS AVAILABLE 12", 24", 36", OR 48"
5. MAX. PIPE SIZE 30"RCP

04698

A

ALTERNATE: CATCH BASIN NO. 36
3'-0"x3'-0"X3'-6"

American Industrial Pre-Cast Products, Inc.
P.O. BOX 365 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

Grates - Heavy Duty
Part No. GHD _ -_ _

★ 3x3 Galvanized Hwy Grate

Required Wheel Loads

Government Specification	Wheel Load	Wheel Load (30% Impact)
UBC-Passenger Car	2,000 #	----------
AASHTO-H10 Loading	8,000 #	10,400 #
AASHTO-H15 Loading	12,000 #	15,600 #
AASHTO-H20 Loading	16,000 #	20,800 #

Allowable Wheel Loads On

AASTHO Spces	AISC Specs		
	Load AT Allow Working Stress	Load At Yield Stress	Yield Stress 1.7 Safety Factor
15,000#	20,570 #	46,290 #	27,2300 #

Certificates Upon Request

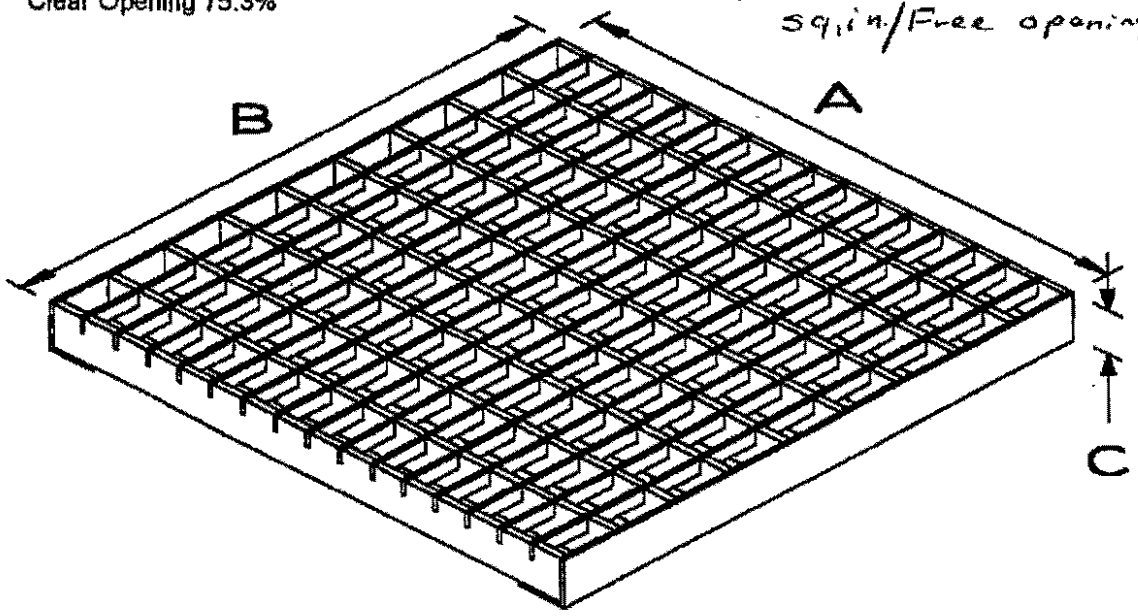
Grate Sizes		
A	B	C
28 1/2"	28 1/2"	3 1/4"
28 1/2"	40 1/2"	3 1/4"
40 1/2"	40 1/2"	3 1/4"
40 1/2"	52 1/2"	3 1/4"
52 1/2"	52 1/2"	3 1/4"
64 1/2"	64 1/2"	3 1/4"

Custom Sizes Upon Request
Clear Opening 75.3%

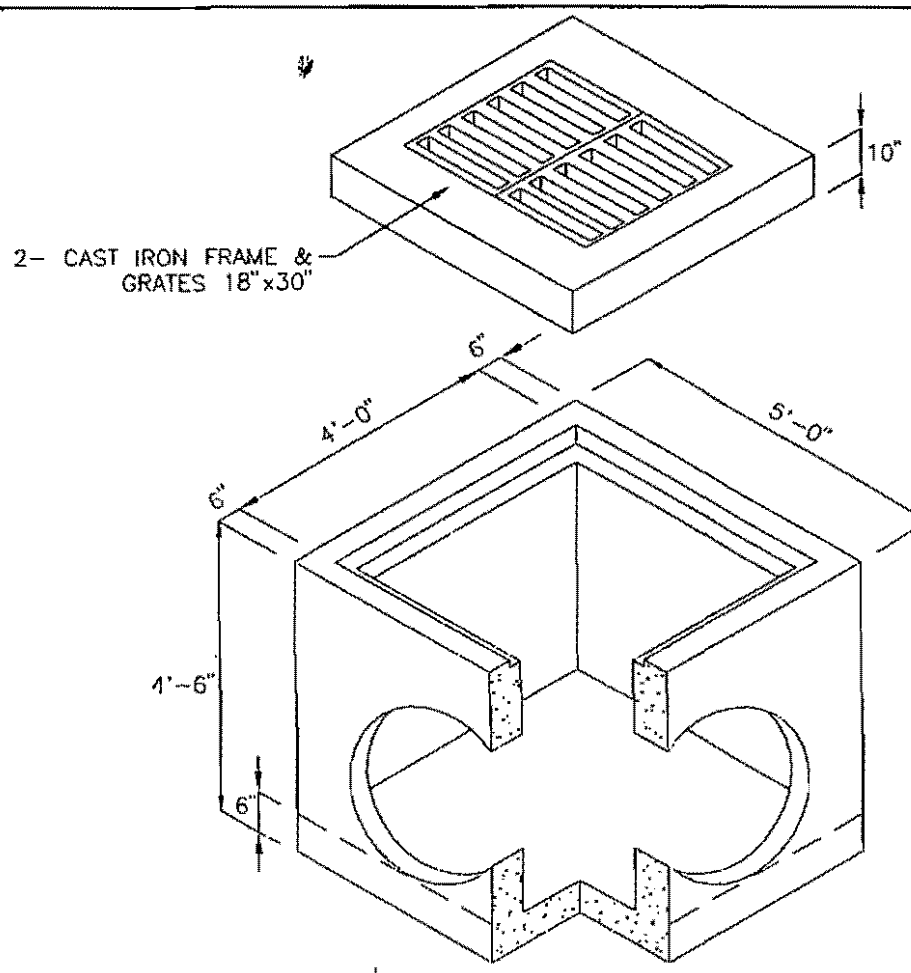
3x3 Grate
4x4 Grate ★

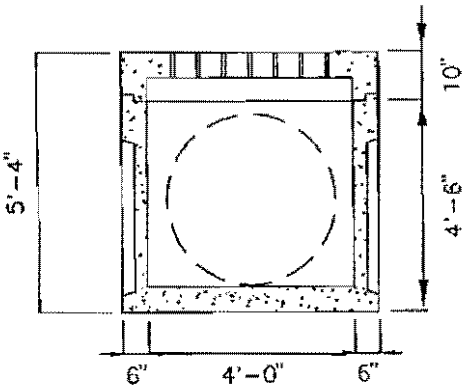
Part No. **GHD** 1 - 2 3
1 = Galvanized or Primed
2 = Dimension "A"
3 = Dimension "B"

3x3 Grate = 1235.00 sq in/free opening
★ 4x4 grate = 1681.00 sq in/Free opening



Free Area Per Grate = 244 Sq Inch : Total = 488 in²





WT.
4'-0" BASE--6000#
TOP---1200#

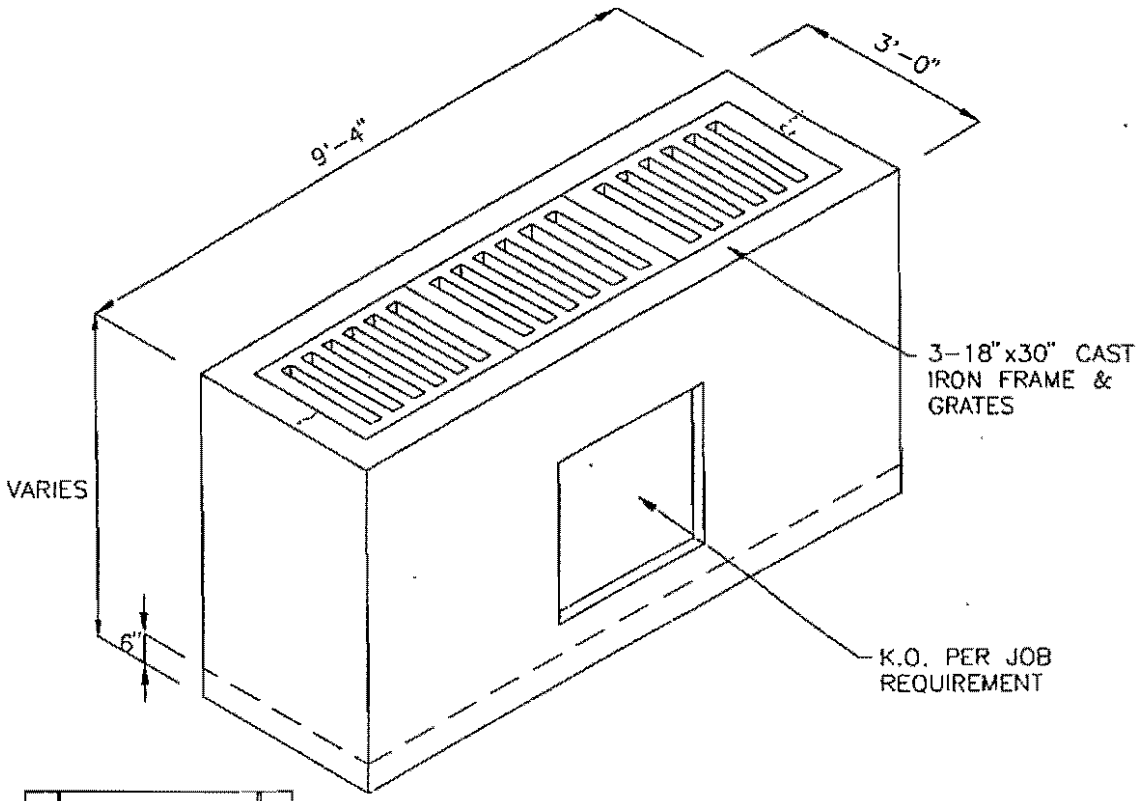
1. CONCRETE: 4500 PSI
2. REINF.: GRADE 60
3. EXTENSION SECTIONS AVAILABLE
4. MAX. PIPE SIZE 36" R.C.P. W/ADJACENT WALL 33" R.C.P.

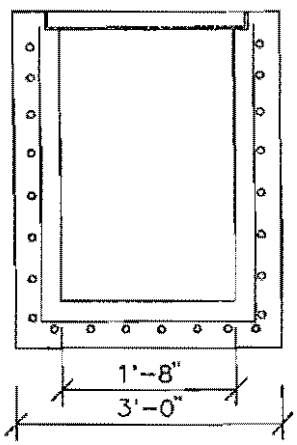
04698

2-GRATE INLET
4'-0"x4'-0"

American Industrial Pre-Cast Products, Inc.
P.O. BOX 394 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

Free Area Per Grate = 244 in² → Total = 732 in²





1. CONCRETE: 4500 PSI
2. REINF.: GRADE 60
3. FRAME & GRATE SUPPORTED BY I-BEAM

WT.
3'-0"--10,509#
4'-0"--12,655#

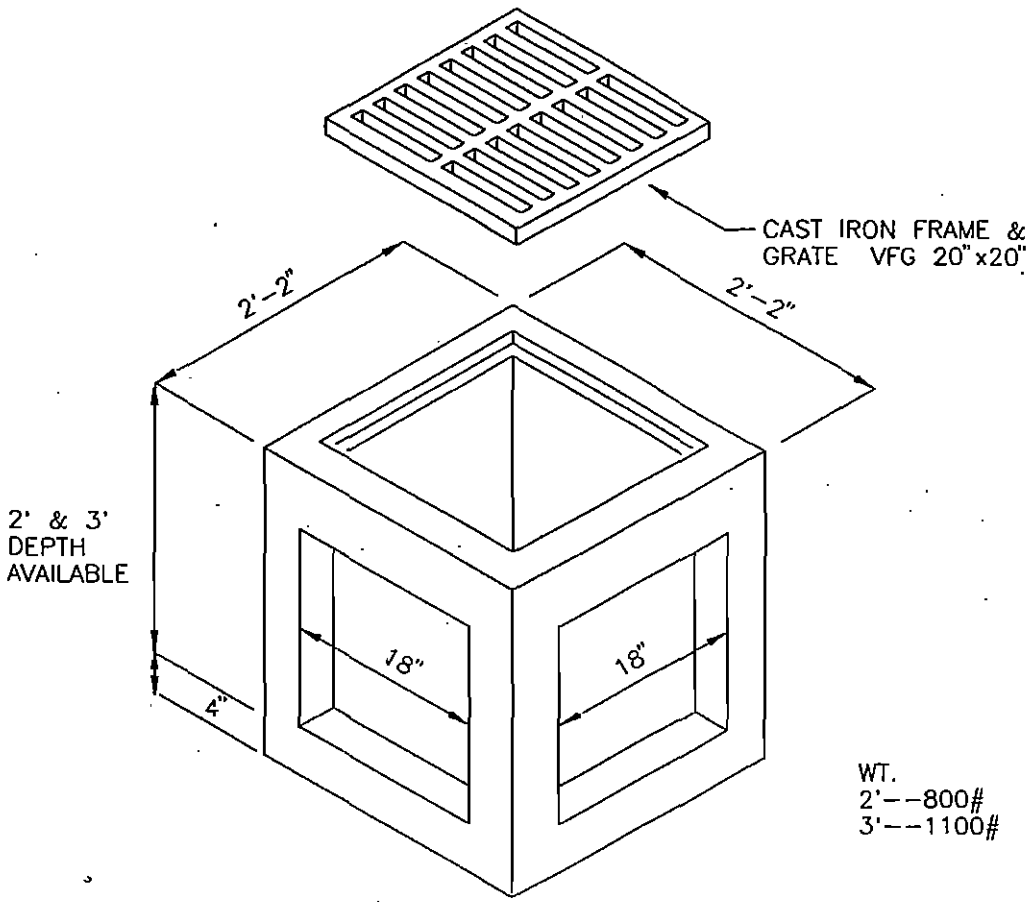
04698

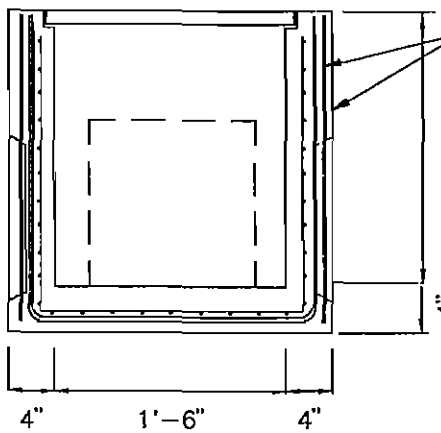
A

3-GRATE INLET
1'-8"x8'-0" I.D.

American Industrial Pre-Cast Products, Inc.
P.O. BOX 365 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

#20 Catch Basin (area drain)





1. CONCRETE: 4500 PSI
2. REINF.: GRADE 60
3. MAX. PIPE SIZE 12" I.D. R.C.P.
4. 4 THIN WALL K.O.'s

04698

CATCH BASIN
NO. 20

American Industrial Pre-Cast Products, Inc.
P.O. BOX 365 ALVARADO, TEXAS 76009. METRO: 817-477-5286
501 EAST BAXTER SEGUIN, TEXAS 78155 210-401-0555

Hanson Concrete:

Concrete Batch Mix Design for Cast-in-Place Concrete Storm Drainage Structures

Hanson

Hanson Concrete South Central, Inc.
8505 Freeport Pkwy N. Ste 200
Irving, Texas 75063
U.S.A.
Tel: (972) 621-0345
Fax:(972) 621-0280

FORMAL MIX DESIGN FOR READY MIX CONCRETE

CONTRACTOR:	*Calhar Construction Inc.*	DATE:	*March 20, 2002*
PROJECT:			
MIX DESIGN #:	*9375*		
SPECIFIC USE:			

MIX SPECIFICATIONS

STRENGTH:	4200 psi	SACK CONTENT:	6.50
SLUMP:	5" Max.		
AIR CONTENT:	3-6%		
W/C RATIO (GAL/SACK)	4.65		
W/C RATIO (LB/LB)	0.41		
MAX. TEMPERATURE:	95		

CONCRETE MUST BE SAMPLED PER ASTM C - 172.
TEST SPECIMENS MUST BE MADE AND CURED PER ASTM C - 31.

MATERIAL REQUIREMENTS

MATERIAL	ASTM STANDARDS		WEIGHTS	
CEMENT	ASTM C - 150 TYPE	I - II	611	LBS. CEMENT
FLY ASH	ASTM C - 618 TYPE			LBS. FLY ASH
COARSE AGGREGATE	ASTM C - 33	#57 1"	1840	LBS. C.A.
COARSE AGGREGATE	ASTM C - 33			LBS. C.A.
FINE AGGREGATE	ASTM C - 33		1229	LBS. SAND
FINE AGGREGATE	ASTM C - 33			LBS. SAND
LIGHTWEIGHT AGGREGATE	ASTM C - 330			LBS. LT. WT.
ADMIXTURE	ASTM C - 494 TYPE	A or D	18.3	OZ. ADMIX.
ADMIXTURE	ASTM C - 494 TYPE			OZ. ADMIX.
ADMIXTURE	ASTM C - 260		4	OZ. A.E.A.
ADMIXTURE				
WATER			252	LBS. WATER

PLEASE SEND THE TEST RESULTS FROM THIS PROJECT TO THE QUALITY CONTROL DEPARTMENT.

QUALITY CONTROL DEPARTMENT
240 SINGLETON BLVD.
DALLAS, TEXAS 75212
TEL: (214) 651-8020
FAX: (214) 651-1810

QUALITY CONTROL MANAGER
Gary C. DePriest
GARY C. DEPRIEST

Pioneer Concrete of Texas, Inc.

Mix No.:	9375	Contractor:	Various
Strength:	4500	Job:	Various
Agg. Size:	1"	Lab:	Various

Cement:	**611**	lb.
Fly Ash:		lb.
Coarse Aggregate:	**1840**	lb.
Coarse Aggregate:		lb.
Fine Aggregate:	**1229**	lb.
Fine Aggregate:		lb.
Admixture:	**18.3**	oz.
Admixture:		oz.
AEA:	**4**	oz.
Water:	**252**	lb.

Standard Deviation:	**422**
Average Strength:	**5293**

ACI 5.3.2.1 Required average strength

(1)	**5062 psi**
(2)	**4984 psi**

Date	Temp.	Slump	7 Day	7 Day	28 Day	28 Day	28 Day Average	3 Consecutive Average
9/13/00	93	3.5	4910	4820	4680	6000	5340	5708
11/22/00	55	4	4070	4140	5730	5410	5570	5653
12/8/00	65	4	4530	4440	5590	5420	5505	5472
3/20/01	80	6	3770	3830	4640	4630	4635	5237
3/20/01	84	5	3750	3160	4710	4650	4680	4940
3/20/01	85	6	4350	3510	5360	5130	5245	4853
3/22/01	66	1	4400	4230	4770	4930	4850	4925
3/30/01	66	5	4790	4770	5800	6110	5955	5360
6/1/01	90	2	4780	4590	5100	5180	5140	5315
6/6/01	76	3.5	4420	4470	5260	5330	5295	5463
6/6/01	81	3.75	4610	4690	5130	5360	5245	5227
6/11/01	91	4	3790	3750	5270	5210	5240	5260
6/20/01	88	3	3440	3570	4710	4750	4730	5072
6/20/01	88	3	3470	3620	5220	5120	5170	5047
8/16/01	92	5.25	4640	4360	6000	5710	5855	5252
8/16/01	95	3.5	4040	3980	5170	5270	5220	5415
11/2/01	75	4.75	4560	4390	5840	5890	5865	5647
11/7/01	77	4	4750	4730	5450	5370	5410	5498
11/7/01	82	5		3740	4610	4660	4635	5303
11/7/01	82	5	3660	3810	4630	4690	4660	4902
11/8/01	70	3	4470	4370	5950	5270	5610	4968
12/4/01	81	3.5	4220	4340	4870	4720	4795	5022
12/5/01		3	4690	4670	5480	5750	5615	5340
12/6/01	82	2.5	4760	4630	5830	5790	5810	5407
12/15/01	60	4.25	4090	4220	4900	4820	4860	5428
12/18/01	66	4	4760	4220	5700	5840	5770	5480
12/18/01	56	5	4390	4390	4990	5180	5085	5238
12/18/01	56	2.75	4320	4280	5440	5590	5515	5457
12/21/01	68	3.5	4490	4430	5720	5290	5505	5368
12/28/01	58	3.75	5020	5510	6030	5940	5985	5668

TRENCH SAFETY PLAN

OSTEDMED CORPORATION
REALTY RD & COMMERCIAL DR
ADDISON, TEXAS

TRENCH SAFETY PLAN

UTILITY LINES
OSTEDMED CORPORATION
IN AND AROUND REALTY RD & COMMERCIAL DR
ADDISON, TEXAS

FOR
OSTEDMED CORPORATION

Note: Soil information indicates that a stiff clay (Type "B" soil) to weathered and unweathered limestone will be found on the project site. The following applies:
H = ¼ on gray unweathered limestone.
H = 3/4 in stiff clay (Type "B" soil) and weathered limestone.
H = 1 or greater in Type "C" soil.

30 Apr 2002
STATE OF TEXAS
RICHARD HALDER
76134
REGISTERED
PROFESSIONAL ENGINEER

Trench Safety Plan	for: CALHAR CONSTRUCTION INC	Pg: 1 of: 5
Utility Lines Osted Med Corporation Addison, Texas	Job No: 2003 Date : 30 Apr 2002 Scale : As shown Design: R.H.	Richard Halder P.E. Trench Safety Engineering 833 Rachelle Red Oak, Texas 75154 1-800-900-9775

GENERAL NOTES

1. For all excavations of trenches, which will exceed a depth of five feet, the Contractors trench safety procedures shall meet the current standards established by OSHA on excavations, trenching, and shoring, all of which are incorporated herein by reference.

2. If details shown are not feasible due to unanticipated conditions, the Contractor shall notify the Trench Safety Engineer for re-evaluation.

3. These drawings assume all excavated areas remain free of water seepage or intrusion. Excavations shall be inspected after every storm or other hazard-increasing occurrence to assure the continued safety of the trench. The Contractor shall seek guidance from the Trench Safety Engineer where needed.

4. When installing a support system, shoring will be applied by starting at the top of the trench excavation and working downward. All cross beams, trench jacks, etc., will be placed in a true horizontal position. Support system removal shall begin at the bottom and proceed upward, performed from outside the trench.

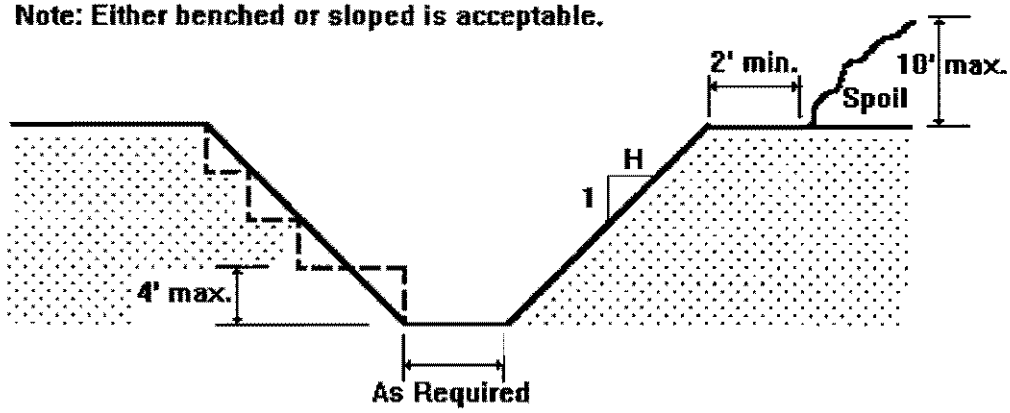
5. Materials used for sheeting, sheet piling, bracing, shoring, etc., shall be in good serviceable condition. Timbers used shall be sound and free from large or loose knots and shall be designed and installed so to be effective to the bottom of the excavation.

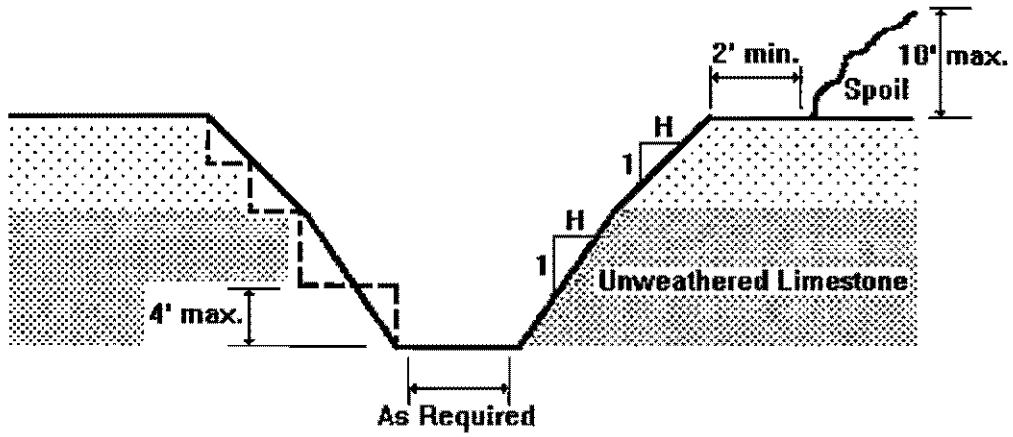
6. Alternate design for use of steeper slopes of the use of supporting systems, i.e., piling, cribbing, shoring, etc., may be submitted by the Contractor for evaluation by the Trench Safety Engineer.

7. Slopes shown shall be the maximum unless changed by the Trench Safety Engineer due to changing soil conditions. Slopes shown are for a short-term period. If excavations are open for more than 24 hours, the Trench Safety Engineer shall be contacted for evaluation.

8. Type "A" soil is a cohesive soil with an unconfined compressive strength greater than 3,000 psf. Type "B" soil is a cohesive soil with an unconfined compressive strength greater than 1,000 psf. and less than 3,000 psf. Type "C" soil is a cohesive soil with an unconfined compressive strength less than 1,000 psf. that is not flowing or submerged.

Note: Either benched or sloped is acceptable.





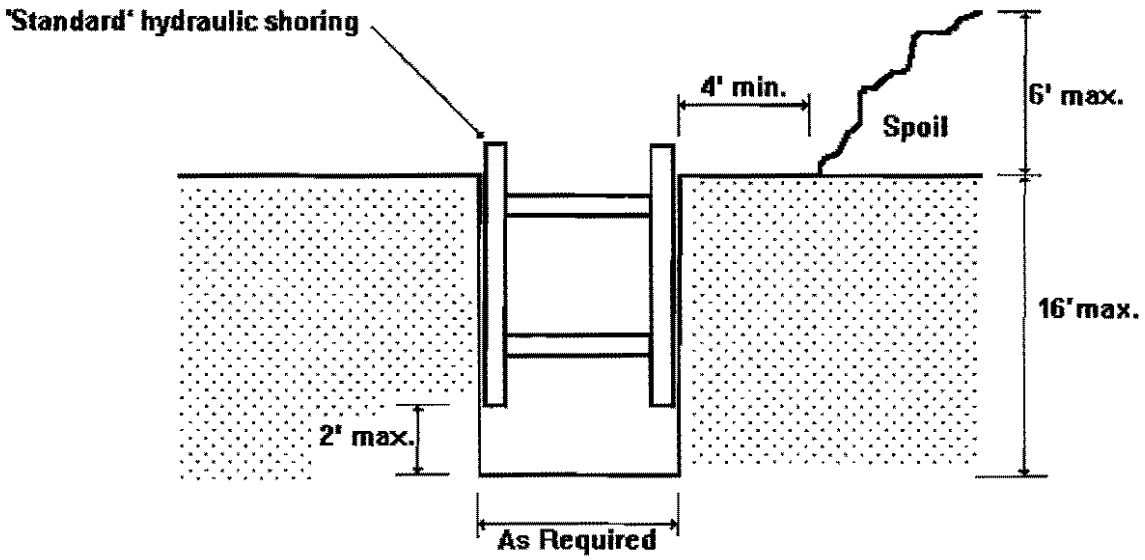
TYPICAL OPEN CUT CROSS SECTION
N.T.S.

Trench Safety Plan	for: CALHAR CONSTRUCTION INC	Pg: 3 of: 5
Utility Lines Osted Med Corporation Addison, Texas	Job No: 2003 Date :30 Apr 2002 Scale :As shown Design: R.H.	Richard Halder P.E. Trench Safety Engineering 833 Rachelle Red Oak, Texas 75154 1-800-900-9775

Spaced 6' to 8' o.c. in unweathered limestone.

Spaced 4' o.c. in stiff clay (Type "B" soil) and weathered limestone.

Spaced 4' o.c., in dry Type "C" soil sheeted with 3/4", 14-ply Finland Birch, or 1-1/8" CDX plywood, or approved equal.



The aluminum hydraulic shoring listed below are just three examples of trade names of 'standard' hydraulic shoring which are acceptable. The examples are with a width maximun of 55"

Speed Shore Hydraulic Shores, model No. V-7-55 or V-5-55, or V-3.5-55, or equal. Shores may be stacked.

GME Vertical Shores, model No. HVS-7-3455 or HVS-5-3455, or HVS-3.5-3455, or equal. Shores may be stacked.

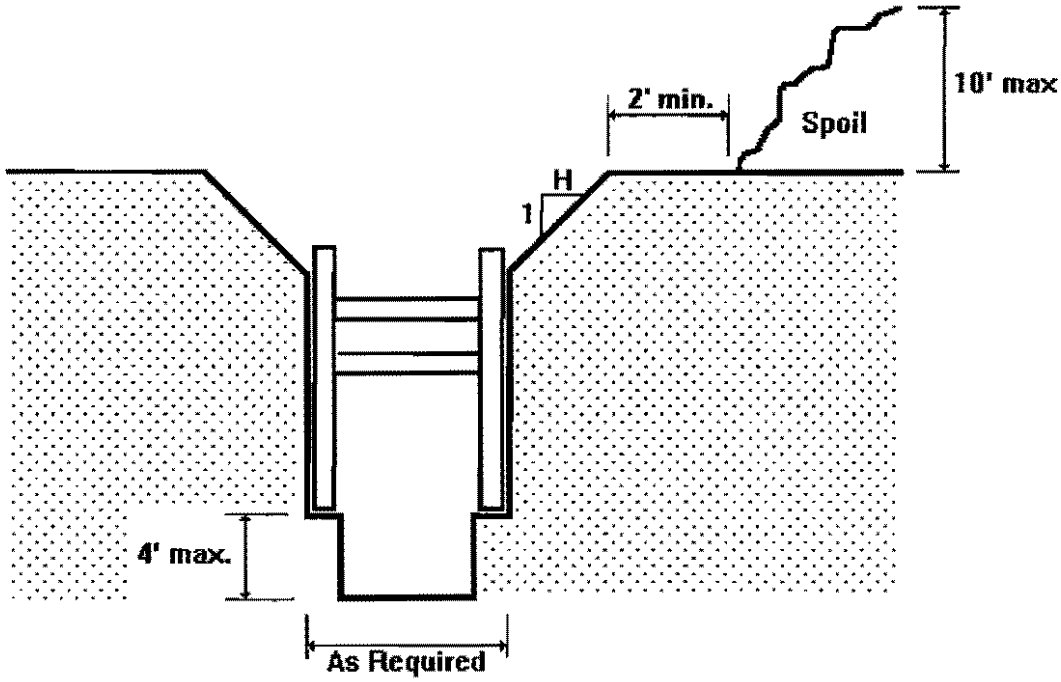
EFFICIENCY PRODUCTION, models No. 7X3455-S or 5X3455-S, or 3.5X3455-S, or equal. Shores may be stacked.

Also available are Speed Shore 'Heavy Duty' shores, which rails run in the 8', 12', and 16' range.

If sheeting is desired, 3/4", 14-ply Finland Birch, or 1-1/8" CDX plywood or equal, is acceptable.

ALTERNATE HYDRAULIC SHORING CROSS SECTION
N.T.S.

Trench Safety Plan	for: CALHAR CONSTRUCTION INC Pg: 4 of: 5	
Utility Lines Osted Med Corporation Addison, Texas	Job No: 2003 Date : 30 Apr 2002 Scale : As shown Design: R.H.	Richard Halder P.E. Trench Safety Engineering 833 Rachelle Red Oak, Texas 75154 1-800-900-9775



CROSS-SECTION
N.T.S.

Trench Box/Shield sidewall capacity shall be equal or greater than **350 psf.** This capacity is based on Type "B" soil, or better. If there are any changes in soil conditions, the Trench Safety Engineer shall be contacted for evaluation.

ALTERNATE TRENCH BOX CROSS SECTION
N.T.S.

Trench Safety Plan	for: CALHAR CONSTRUCTION INC Pg:5 of: 5	
Utility Lines Osted Med Corporation Addisnn, Texas	Job No: 2003 Date :30 Apr 2002 Scale : As shown Design: R.H.	Richard Halder P.E. Trench Safety Engineering 833 Rachelle Red Oak, Texas 75154 1-800-900-9775